

USER MANUAL

_PURE SUB

ARTURIA

_The sound explorers

Special Thanks

DIRECTION

Frédéric Brun

PURE SUB TEAM

Edouard Madeuf	Davide Gioiosa	Geoffrey Gormond	Bastien Hervieux
Maxime Audfray	Valentin Darmon	Pierre-Hugo Vial	
Maxence Berthiot	Simon Conan	Joe Sheldrick	

PROJECT MANAGEMENT

Pierre-Lin Laneyrie (lead)

PRODUCT MANAGEMENT

Edouard Madeuf (lead)	Callum Magill	Cédric Coudyser	Samuel Tracol
Maxime Audfray	Pierre Pfister	Christophe Luong	Thomas Guillory

DEVELOPMENT

Davide Gioiosa (lead)	Marie Pauli	Valentin Bonhomme	Kevin Arcas
Valentin Darmon	Alexandre Adam	Violaine Burlet	Alessandro De Cecco
Simon Conan	Yann Burrer	Lucile Cossou	Hugo Caracalla
Geoffrey Gormond	Patrick Perea	Florent Lagaye	Mauro De Bari
Pierre-Hugo Vial	Stéphane Albanese	Adrien Tisseraud	Marius Lasfargue
Pierre-Lin Laneyrie	Fabien Meyrat	Valentin Foare	Marc Antigny
Baptiste Aubry	Samuel Lemaire	Timothée Behety	Loris De Marco
Mathieu Nocenti	Pauline Alexandre	Samuel Limier	Andrea Coppola
Raynald Dantigny	Gonçalo Bernardo	Fanny Roche	Cyril Lepinette
Corentin Comte	Nathan Graule	Rasmus Kürstein	

DESIGN

Maxence Berthiot (lead)	Edouard Madeuf
-------------------------	----------------

SOUND DESIGN

Joe Sheldrick (lead)	Amoss	Level 8	Senbura
Lily Jordy	aowaves	mleuc	Trail
Quentin Feuillard	Christian Laffitte	Monty	Undulae
Florian Marin	DJ Hidden	Mr. Bill	Zain Hayat
Joseph Gilling	Edouard Madeuf	Osprey	
Martin Rabiller	Kaifu	Seb Rochard	

QUALITY ASSURANCE

Bastien Hervieux (lead)	Matthieu Bosshardt	Léo Chardon	Matthieu Visoz
Germain Marzin	Nicolas Stermann	Pierre Fleury	Félix Roux
Aurélien Mortha	Thomas Serafino	Aude De Bellefond	Enrique Vela

USER MANUAL

Robin Vincent (author) Félicie Khenkeo

IN-APP TUTORIAL

Gustavo Bravetti

BETA TESTING

Venus Theory	Osprey	Terry Marsden	Jay Janssen
Visages	Ruby	Fernando Manuel	Tony Flying Squirrel
Submarine	Mleuc	Rodrigues	Marco "Koskdukai" Correia
Senbura	Alckemy	Georges Ware	Richard Courtel
Cutspace	KAIFU	Kirke Godfrey	Andrew Macaulay
Mr. Bill	Cuevas Raphaël	Chuck Zwicky	Gustavo Bravetti
Undulae	Gary Morgan	Stephen Wey	Andrew Henderson
Nasko	Mat Herbert	Davide Puxeddu	Dwight Davies

© ARTURIA SA - 2026 - All rights reserved.
26 avenue Jean Kuntzmann
38330 Montbonnot-Saint-Martin
FRANCE
www.arturia.com

Information contained in this manual is subject to change without notice and does not represent a commitment on Arturia's part. The software described in this manual is provided under the terms of a license agreement or non-disclosure agreement. The software license agreement specifies the terms and conditions for its lawful use. No part of this manual may be reproduced or transmitted in any form or by any purpose other than purchaser's personal use without the written permission of ARTURIA S.A.

All other products, logos or company names quoted in this manual are trademarks or registered trademarks of their respective owners.

Product version: 1.O.O

Revision date: 27 August 2026

Thank you for purchasing Pure SUB!

This manual covers the features and operation of Arturia's **Pure SUB**, a software synthesizer dedicated to low-end, modern bass sound design with sub regeneration, a curated Sub Processor and dual harmonic engines.

Be sure to register your software as soon as possible! When you purchased Pure SUB, a serial number and an unlock code were sent to you by e-mail or registered in your Arturia user account and accessible via the Arturia Software Center app. These are required during the online registration process.

Special Messages

Specifications Subject to Change:

The information contained in this manual is believed to be correct at the time of printing. However, Arturia reserves the right to change or modify any of the specifications without notice or obligation to update the hardware or software that has been purchased.

IMPORTANT:

The software, when used in combination with an amplifier, headphones or speakers, may be able to produce sound levels that could cause permanent hearing loss. DO NOT operate for long periods of time at a high level or at a level that is uncomfortable.

If you encounter any hearing loss or ringing in the ears, you should consult an audiologist.

EPILEPSY WARNING – please read before using Pure SUB

Some people are susceptible to epileptic seizures or loss of consciousness when exposed to certain flashing lights or light patterns in everyday life. This may happen even if the person has no medical history of epilepsy or has never had any epileptic seizures. If you or anyone in your family has ever had symptoms related to epilepsy (seizures or loss of consciousness) when exposed to flashing lights, consult your doctor prior to using this software.

Discontinue use and consult your doctor *immediately* if you experience any of the following symptoms while using this software: dizziness, blurred vision, eye or muscle twitches, loss of consciousness, disorientation, or any involuntary movement or convulsion.

Precautions to take during use

- Do not stand too close to the screen
- Sit a good distance away from the screen
- Avoid using if you are tired or have not had much sleep
- Make sure that the room is well lit
- Rest for at least 10 to 15 minutes per hour of use

Introduction

Congratulations on your purchase of Arturia Pure SUB!

As with all of our products, we believe in offering the best of both worlds in a single package and letting you choose how you want to use it. Pure SUB offers all of the deepest bass and sub-bass synthesis, designed for modern sound design and processed through a unique chain of textures, filters and effects.

Pure SUB provides you with a bottom end that's righteously defined and full of personality, taking you from sweet spot to sweet spot while rattling your bass-loving rib cage.

Peace, love, and music,

The Arturia team

Be sure to visit the www.arturia.com website for information about all of our other great hardware and software instruments. They have become indispensable, inspiring tools for musicians around the world.

Table Of Contents

1. Welcome to Pure SUB.....	4
1.1. What is Pure SUB?	4
1.2. How does Pure SUB work?.....	5
1.3. Features of Pure SUB.....	6
2. ACTIVATION AND FIRST START.....	7
2.1. Register, activate, and install Pure SUB.....	7
2.2. Initial setup for stand-alone use.....	8
2.2.1. Audio and MIDI settings: Windows	8
2.2.2. Audio and MIDI settings: macOS.....	10
2.2.3. Using Pure SUB as a plug-in	11
2.3. Playing Pure SUB for the first time	12
3. User Interface Overview.....	13
3.1. FX	15
3.2. Common control behaviors.....	16
3.2.1. Value pop-ups.....	16
3.2.2. Parameter Descriptions.....	17
3.2.3. Fine adjustment.....	17
3.2.4. Double-click for default.....	17
3.3. Upper Toolbar	18
3.3.1. Main Menu	18
3.3.2. Browsing Presets	24
3.3.3. Synth and FX buttons.....	25
3.3.4. Output Level Knob.....	25
3.3.5. Settings.....	25
3.4. Lower Toolbar	26
3.4.1. Parameter Name and Description.....	26
3.4.2. Voicing Mode.....	27
3.4.3. Undo / Redo.....	27
3.4.4. CPU Meter.....	27
3.4.5. Resize handle	27
4. Engine	28
4.1. Sub	29
4.2. Sub Regen	30
4.3. Harmonics.....	31
4.3.1. Pressure.....	31
4.3.2. Reese.....	37
4.4. Pitch Envelope	39
4.5. Engine Phase.....	40
4.6. EQ	40
4.7. Engine Out	41
5. Texture.....	42
5.1. Noise Sample	42
5.1.1. Texture Shaper	43
5.2. Corroder	44
5.3. EQ	45
6. Filter.....	46
6.1. Common Filter controls.....	47
6.2. Filter Visualizer.....	47
6.3. Filter Types.....	48
6.3.1. Classic.....	48
6.3.2. Ripple.....	49
6.3.3. Reverb.....	50
6.3.4. Cluster.....	51
6.3.5. Phaser.....	52
6.3.6. Lofi	53
6.3.7. Rage	54
6.3.8. Surgeon.....	55
6.3.9. Analog.....	55
7. Sub Processor.....	56
7.1. Preset Modes	56

7.2. Amount Processing	57
7.2.1. Sub Regen	57
7.3. Sub Processor Macros	58
8. FX	59
8.1. FX Rack	60
8.1.1. FX Rack Presets	60
8.1.2. FX Routing	61
8.2. Selecting an effect	62
8.3. Common FX Features	63
8.4. Effects List	64
8.4.1. Reverb	64
8.4.2. Delay	65
8.4.3. Tape Echo	66
8.4.4. Pitch Delay	68
8.4.5. Compressor	69
8.4.6. Multiband	71
8.4.7. Filters	73
8.4.8. Param EQ	84
8.4.9. Distortion	85
8.4.10. Bitcrusher	87
8.4.11. Trance Gate	88
8.4.12. Super Unison	90
8.4.13. Chorus	91
8.4.14. Chorus JUN-6	92
8.4.15. Flanger	93
8.4.16. Flanger BL-20	95
8.4.17. Phaser	96
8.4.18. Panner	97
8.5. FX Out	98
9. Keyboard	100
9.1. Expression Controls	100
9.1.1. Pitch Bend	101
9.1.2. Mod Wheel	102
9.1.3. Vibrato	103
9.1.4. Glide	104
9.1.5. Velocity	104
9.2. Virtual Keyboard Interaction	105
9.2.1. Playing from a computer keyboard	105
10. Envelopes	106
10.1. Pitch Envelope	107
10.2. Amp Envelope	108
10.2.1. Time and Curve	108
10.3. Mod Envelope	109
10.3.1. Time and Curve	111
10.4. Assigning Envelopes	112
11. Modulators	114
11.1. Loading a Modulator Source	115
11.2. Assigning a Modulator	115
11.2.1. Sidechain Modulation	117
11.3. View and edit assignments	117
11.4. Removing an assignment	118
11.5. Swapping Modulation Sources	118
11.6. Modulation Sources	119
11.6.1. Envelope	119
11.6.2. Function	121
11.6.3. Random	130
11.6.4. Voice Modulator	133
11.6.5. Step Sequencer	134
12. Macros	141
12.1. Assigning Macros	142
12.2. Destinations List	144
13. The Preset Browser	145

13.1. Search and Results	146
13.2. Using Tags as a filter	147
13.2.1. Types and Subtypes	147
13.2.2. Styles	148
13.2.3. Banks	149
13.3. Search Results window	150
13.3.1. Sorting the Preset order	150
13.3.2. Clearing tags	151
13.3.3. Liking Presets	152
13.4. Sidebar	153
13.4.1. Sound Banks	154
13.4.2. My Favorites	155
13.4.3. My Playlists	156
13.5. Preset Info section	157
13.5.1. Editing info for multiple user presets	158
13.6. Macro knobs	159
13.7. Playlists	160
13.7.1. Create your first Playlist	160
13.7.2. Add a Preset	161
13.7.3. Re-order the Presets	162
13.7.4. Remove a Preset	162
13.7.5. Song and Playlist Management	163
14. Side Panel Settings	164
14.1. Settings tab	164
14.1.1. Global	165
14.1.2. Preset Settings	165
14.1.3. MPE Settings	165
14.2. MIDI Tab	166
14.2.1. MIDI Control	167
14.2.2. MIDI Mapping	168
14.3. Tutorials Tab	170
15. Software License Agreement	172

1. WELCOME TO PURE SUB



Thank you for purchasing Arturia Pure SUB, the bottom-end-dwelling addition to the Pure range of focused personality-driven synthesizers. Pure SUB is the rattle in your rib cage, the pressure in your bowels and the explosion in your kidneys. It tells no lies, takes no prisoners and will broaden your expectations downwards to the basement of your creativity. If you've never asked yourself how low can you go, now is the time.

1.1. What is Pure SUB?

Pure SUB is a monophonic bass design synthesizer with sub-octave kink that's capable of extracting teeth while shaking the dance floor. You can generate plenty of bass sounds from plenty of other virtual instruments, ours included, but there are very few that make bass their entire business. In Pure SUB everything is about the impact and exploration of those low frequencies, and the gravitas of those fundamental waves that underpin anything you might do with your electronic music.

Sub-bass as a concept has been around for as long as we've had music. It's generally regarded as that space a couple of octaves below Middle C (C4), or below 70Hz, where, as we descend towards the limits of our hearing we start to feel it more than hear it. The bottom note of the double bass is E1 or around 41Hz, the didgeridoo commonly comes in at 55Hz, the 32' stop of an organ pipe can be as low as 16Hz. These are visceral emotive sounds that play with our sensibilities and drive our love of subwoofers.

In many dance music genres such as EDM, drum and bass and dubstep, the low frequencies are what the music is built upon. In dub, hip-hop and reggae whole sound systems were invented to cope with fat bass waveforms. Experimental music likes to play with the unexpected arrival of bass tones only to pull them away to make you feel like you've just stepped into space and caught your breath.

With Pure SUB the bottom end is where it's at and every engine, texture, filter and effect is designed for maximum speaker wobble and heart-stopping tone.

1.2. How does Pure SUB work?



Pure SUB begins in the basement with a low frequency sine wave. This is tied to the main sound engine but is always singularly independent and remains the fundamental harmonic regardless of how you layer and process the overall sound.

The next section of the engine produces a layer of harmonics that builds on the sub. There are two engine modes: Pressure and Reese. Pressure mode uses a harmonic engine that constructs waveforms with up to 16 detuneable harmonics. Reese mode is a dual wavetable engine that uses detuning to cause subtle phase drift and cancellation between the wavetables. The "Reese Bass" is very popular in contemporary electronic music such as EDM, Bass music, Ambient, and modern pop, and references the bass sound in Detroit Techno legend Kevin "Reese" Saunderson's 1988 classic "Just Another Chance".

With your sub and engine locked in you have the opportunity to add some Texture. There's a catalogue of noise samples and you can choose from such as noise colors, Foley sounds, environmental noises, digital glitches, static and percussive instruments. Or you can go the Corroder route that uses a frequency modulated delay line through a bandpass filter to degrade the signal.

From there we're into the Filter where a whole raft of different modes and topographies are available to you to apply to any or all of the previous engines.



Wrapped around all of your bass sound design work like a warm embrace is the Sub Processor. It's a number of curated chains of signal processing that pull in distortion, EQ, compression, reverbs, delays, and more to build another layer of timbre in contrast to the synthesis. It's a sub-bass environment that gives your bass sounds life, love and terror.

With the click of a switch the synth section is replaced with a suite of effects to distort, compress, modulate and spatially place your sound. You can stack and rearrange up to 12 effects to push your sound into all sorts of wild directions. And finally, all the end of the chain you can explore the boundaries of loudness, pumping and clipping through the Maximiser hardwired to the output.

At all times, if you feel the fundamental gets lost in all the processing, you can regenerate the Sub sine wave, pushing it to the front, ensuring that Pure SUB fulfils it's brief of being the baddest bass design synthesizer you've ever used.

1.3. Features of Pure SUB

- Deeply dedicated bass design synthesizer for modern heavyweight bass sound
- Multi-stage bass design: Fundamental, Harmonics, Texture, Filters, Sub Processing and FX
- Two Harmonic sound engine modes: Pressure and Reese
- Independent Sub bass fundamental generation with clean sub regeneration
- Independent harmonic generation with timbre morphing , detune, width and randomisation
- Two Texture engine modes: Noise and Corroder, with masses of grit, noise and energy
- Dozens of Filter types for adding character, flavor and tonal shaping
- Dedicated, artist-driven Sub Processor offering a complex network of dynamic processing
- A full FX Rack with 12 slots and over 18 high quality effects
- An output Maximizer for pushing perceived loudness
- ADSR/ADR envelopes for Amp and Moduation
- Dedicated double-decay Pitch Envelope for 808-style kick bass
- Flexible modulator slots with Envelope, Function, Random, Voice mod, and Step Sequencer
- Macros for major changes with a single twist
- Smart Drag & Drop modulation workflow
- Full keyboard performance tools
- MPE Compatible
- Full scope for MIDI control
- Versatile preset management
- Plugin and standalone versions
- Integrated tutorials that take you through the synthesizer

2. ACTIVATION AND FIRST START

2.1. Register, activate, and install Pure SUB

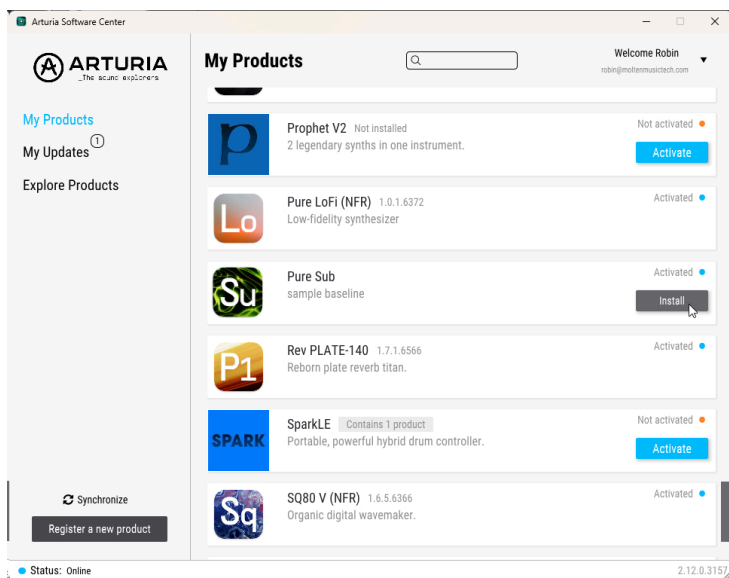
Pure SUB works on computers equipped with Windows 10 or later and macOS 11 or later. You can use it as a stand-alone instrument or as a plug-in for your favorite DAW (Digital Audio Workstation) in Audio Units, AAX, VST2, or VST3 format.



Before you install or register the software, you'll need to create a My Arturia account here, using an email address and password of your choice: <https://www.arturia.com/createanaccount/>

While it's possible to handle registration, activation, and other tasks manually online, it's far simpler to download and use the Arturia Software Center app, which can be found here: <https://www.arturia.com/support/downloads&manuals>

You'll enter your email address and password to set up Arturia Software Center, which acts as a central location for all of your Arturia software registrations and activations. It also helps you install and update your software by keeping track of current versions.



You can register, activate, and install your product inside Arturia Software Center by pressing the **Register a new product** button, and clicking the boxes to **Activate** and then **Install** your software. The registration process will require you to enter the serial number and the unlock code you received when you bought your software.

You can also do this online by logging into your account and then following the instructions here: <http://www.arturia.com/register>

Once you've registered, activated, and installed Pure SUB, it's time to get it to talk to your computer.

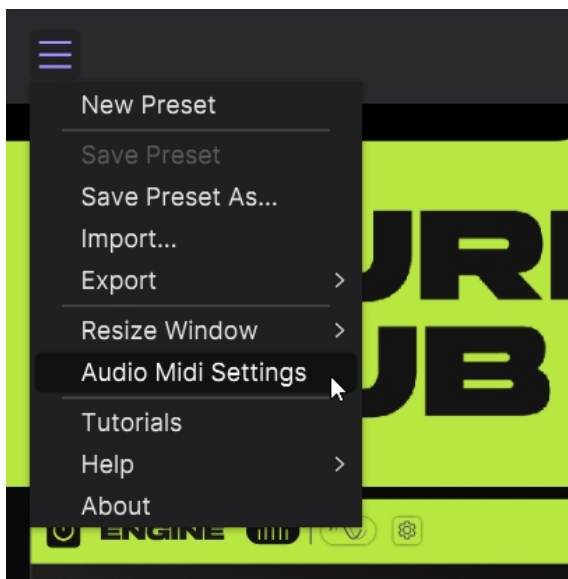
2.2. Initial setup for stand-alone use

If you would like to use Pure SUB in standalone mode, you will need to ensure that its MIDI input/output and audio outputs are being routed properly to and from the software. You'll generally only need to do this once, unless you change your MIDI controller or audio/MIDI interface. The setup process is the same on both Windows and macOS.

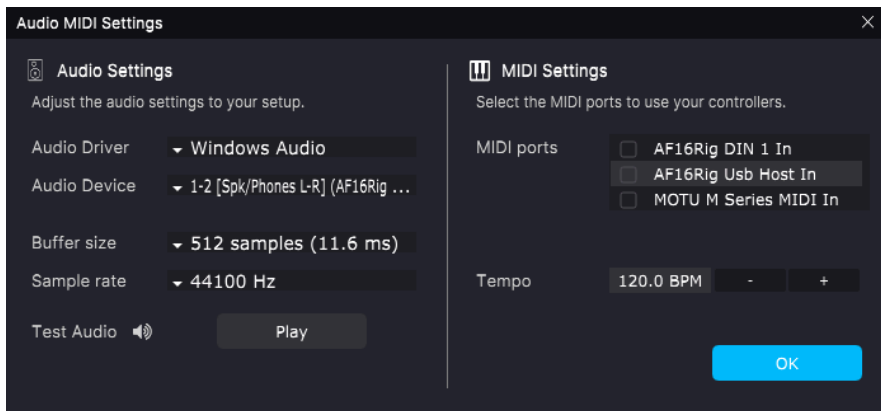
i This section only applies to those of you who plan to use Pure SUB in stand-alone mode. If you are only going to use Pure SUB as a plug-in inside a host DAW or other music software, you can safely ignore this section - your host music software handles these settings.

2.2.1. Audio and MIDI settings: Windows

At the top left of the Pure SUB application is a pull-down menu. It contains various setup options.



Click on **Audio Midi Settings** to open the following window. This works in the same way on both Windows and macOS, although the names of the devices available to you will depend on the hardware you are using. Remember, this menu option is only available (and needed) when running Pure SUB in stand-alone mode.



Audio and MIDI settings for Windows

Starting from the top, you have the following options:

- **Audio Driver:** Selects which type of audio driver that will handle playback of Pure SUB. This can be the built-in Windows Audio driver or a more specialist audio driver system like ASIO. ASIO is a high performance audio system supported by most audio interfaces and will give you the best audio performance. If you are relying on the internal sound of your computer then Windows Audio will be just fine.
- **Audio Device** This lists the devices available for the chosen type of audio driver. These will vary depending on what audio hardware you have connected to your computer. You should choose the one that matches the audio hardware through which you wish to hear Pure SUB.
- **Output Channels** This only exists if you have selected an ASIO audio device. It lets you select which of the available outputs will be used to route audio out. If you only have two outputs, this selection box will not be shown. If you have more than two, you can select a specific pair of outputs.
- The **Buffer Size** menu lets you select the size of the audio buffer your computer uses to calculate sound. The latency in milliseconds is displayed after the buffer size setting.



A smaller buffer means lower latency, i.e. a shorter delay between pressing a key and hearing the note, but loads your CPU more heavily and can cause pops or clicks. A larger buffer means a lower CPU load, as the computer has more time to think, but can result in a noticeable delay between playing a note and hearing it. A fast, modern computer should easily be able to operate at a buffer size of 256 or even 128 samples without clicks. If you still hear clicks, enlarge the buffer size until they stop.

- The **Sample Rate** menu lets you set the sample rate at which audio is sent out of the instrument. Some audio interfaces will not let you change the sample rate. In which case click on the **Show Control Panel** to access the interfaces direct audio settings where you will be able to set the sample rate.

i The options here will depend on what your audio device can support; nearly every device can operate at 44.1 kHz or 48 kHz, which will be perfectly fine for most applications. If you have a specific need to use a higher sample rate, up to 96 kHz, Pure SUB will happily support that.

- The **Show Control Panel** button will jump to the system control panel for whatever audio device is selected.

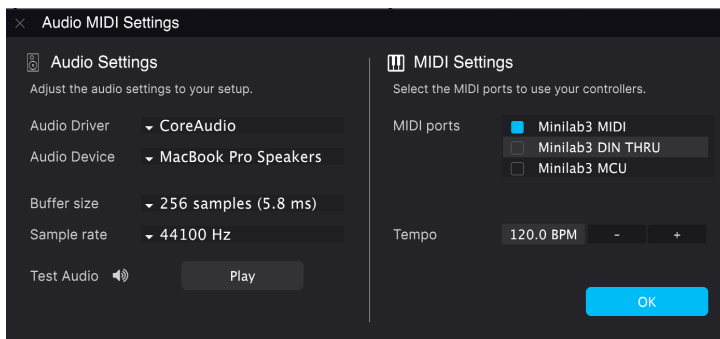
i Note that this button is only available in the Windows version.

- **Test Tone** sends a short test tone when you click the **Play** button, to help you troubleshoot audio issues. You can use this feature to confirm that the instrument is routed correctly through your audio interface and that audio is playing back where you expect to hear it (your speakers or headphones, for example).
- The **MIDI Settings** area will display any MIDI devices you have connected to your computer (if any). Click the check box to accept MIDI from the device(s) you want to use to control the instrument. You can select multiple MIDI devices at once with the checkboxes.

i In stand-alone mode, Pure SUB listens for all MIDI channels, so there's no need to specify a channel.

- **Tempo** sets a base tempo for features inside Pure SUB such as LFO and effects sync. When using Pure SUB as a plug-in, the instrument gets tempo information from your host software.

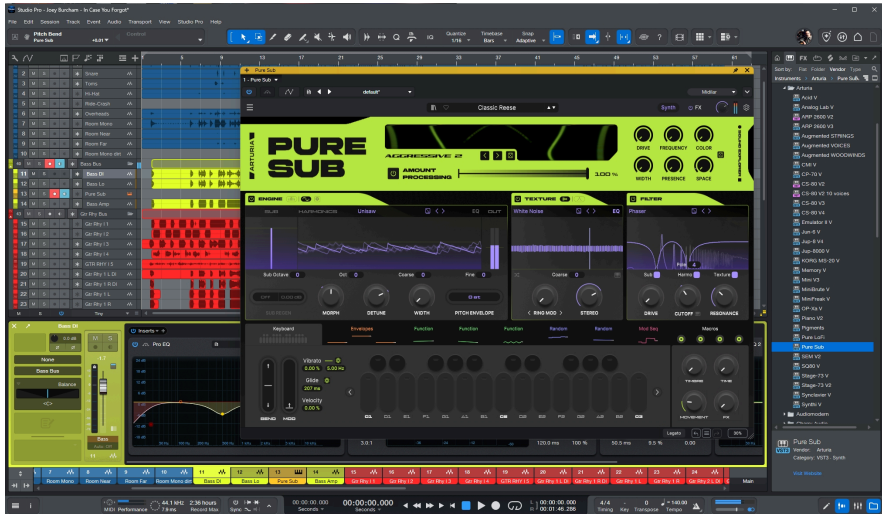
2.2.2. Audio and MIDI settings: macOS



Audio MIDI Settings for macOS

The menu for setting up audio and MIDI devices for macOS is accessed in the same way as for Windows, and the setup process is nearly identical. All options work the same way as described above in the Windows section. The only difference is that all macOS devices, including external audio interfaces, use the CoreAudio driver built into macOS to handle routing. In the second drop-down menu under **Device**, choose the audio device you wish to use.

2.2.3. Using Pure SUB as a plug-in



Here, Pure SUB is shown running as a VST plug-in within Fender Studio Pro.

Pure SUB comes in VST2, VST3, Audio Unit (AU), and AAX plug-in formats, for use in all major DAW software such as Ableton Live, Cubase, Logic, Pro Tools, Studio One, and more.

When using Pure SUB as a plug-in, all audio and MIDI device settings are handled by your host music software. Please refer to your host music software's documentation if you have any questions about loading or using plug-ins.

Note that when you load Pure SUB as a plug-in instrument inside your host software, its interface and settings work the same way as in standalone mode (see below), with a few small differences:

- Pure SUB will synchronize to your DAW's host tempo/BPM when sync is required
- You can automate numerous parameters using your DAW's automation system
- You can use more than one instance of Pure SUB in a DAW project
- You can run the outputs of Pure SUB through any additional audio effects available in your DAW, such as delay, chorus, filters, etc.
- You can route Pure SUB's audio outputs creatively inside your DAW, using the DAW's own audio routing system.
- You route the MIDI from the Multi-Arp to play other instruments inside or outside the DAW.

2.3. Playing Pure SUB for the first time

Now that you have Pure SUB up and running, let's take it for a quick test drive!

If you haven't done so already, launch Pure SUB as a plug-in or as a stand-alone instrument. If you have a MIDI controller set up, use it to play some notes on Pure SUB. You can also use your mouse to play the on-screen keyboard or use the keys of your [computer keyboard](#) [p.105].

The up and down arrows at the top of the instrument let you step through all of Pure SUB's available presets. Try playing a few, and when you find one that you like, try adjusting some of the other on-screen controls to see how they affect the sound.

Play with the controls, and don't worry – nothing is saved unless you specifically save a preset (described later in this User Guide), so there is no risk you'll mess up any of Pure SUB's factory presets.

We hope this chapter has gotten you off to a smooth start. Now that you're up and running, the rest of this guide will help you work your way through all of Pure SUB's features on a section-by-section basis. By the time you reach the end, we hope you'll understand all of Pure SUB's capabilities – and will be using this fantastic instrument to create equally fantastic music!

3. USER INTERFACE OVERVIEW

We'll start with an overview of the Pure SUB interface so you can get comfortable with what's going on, then jump right into playing and synthesizing some bass. With the basics squared away, you can then follow the links for deeper explanations and guidance through every aspect of the instrument.



The Pure SUB interface is neatly divided into a number of sections that take us through the sound generation and signal processing. The main synthesizer building blocks in the middle can toggle to show the effects section. The space where the keyboard is displayed at the bottom also doubles up as the interface for the modulators when selected.

Let's highlight the key functions.

Number	Area	Description
1.	Upper Toolbar [p.18]	Access to the main utility menu, audio/MIDI settings, tutorials, Preset Browser, FX panel switch, master output level, and a cogwheel button to open further settings, MIDI mapping, and tutorial panel.
2.	Sub Processor [p.56]	The Pure SUB post-production powerhouse of processing. It provides a curated chain of DSP that adds distinct character to the bass sounds along with intensity and visualization.
3.	Engine [p.28]	The source of both the original Sub fundamental and a Harmonics layer to build your bass. You have a choice of a "Pressure" harmonic engine or a "Reese" dual wavetable engine, with detuning, morphing and pitch envelope.
4.	Texture [p.42]	A noise generator that can blend a wide array of grit and grime to your sound, both natural and unnatural.
5.	Filter [p.46]	An overdriven filter section with multiple modes and filter types for sculpting frequencies in many different flavors.
6.	Keyboard [p.100]	A two-octave keyboard that can be played with a mouse or QWERTY keyboard. It also reflects any notes being played over MIDI. It has pitch and mod wheels and gives access to other MIDI performance controls such as velocity, aftertouch, release velocity, key tracking and MPE.
7.	Modulators [p.114]	Starting with three permanent envelopes that by default are for pitch, amplitude and modulation, and then offers 6 modulation slots that can be envelope, function, random, voice modulator or step sequencer.
8.	Macros [p.141]	Four controls that can be assigned to multiple parameters to cause a lot of change in a single twist.
9.	Lower Toolbar [p.26]	A space that shows pop-up descriptions of parameters. It also has the Voice modes, undo/redo history, CPU usage meter, and MIDI panic button.

The links above will take you to the various parts of the manual that cover these functions. You are welcome to jump around to find what you need, but we recommend going through the manual at least once to get the fullest Pure SUB experience. Pure SUB is designed so that you can get to work and be creative without having to look too deeply into the manual, but some subtle tricks and functions might not be obvious at first. Reading the manual will help you be sure that you have a good handle on what this instrument can do.

3.1. FX

The effects section is not immediately obvious when you first run Pure SUB. To open it up, click on the **FX** button in the Upper Toolbar and it will replace the whole synth section. The FX section has three main parts.



Number	Area	Description
1.	FX Rack [p.60]	A list of the currently loaded effects. You can drag them around to reorder them and turn them on and off. Comes with a library of preset racks.
2.	FX Slots [p.62]	You can load up to 12 effects in the main FX window. You can choose from Spatial, Dynamics, Filter/EQs, Distortions and Modulations. Each has its own display and controls.
3.	FX Out [p.98]	Sets and visualizes the final output after the effects and includes a compression and clipping Maximizer to increase the loudness perception.

Use the links above to visit the appropriate parts of the manual for more details.

3.2. Common control behaviors

All Arturia virtual instruments share some common control behaviors to make editing sounds easier.

3.2.1. Value pop-ups



Move or hover over any control, and a pop-up banner or "tool tip" will display its value and units. The value format depends on the nature of the control; it could be a percentage, a frequency value, time, or a value from 0 to 1.

3.2.2. Parameter Descriptions



Operating or hovering on any control displays its name and a brief description of its function in the left corner of the [Lower Toolbar \[p.26\]](#).

3.2.3. Fine adjustment

Hold the right mouse button or the CTRL/COMMAND key while dragging on any knob to adjust it more slowly. This helps when you want to dial in precise values.

3.2.4. Double-click for default

Double-click on any knob to return it to its factory default setting. This may not necessarily be the position set by the loaded preset.



You may also see one or more colored circles appear when you hover over a control. These are modulation assignments which you can find out about in the [Modulators \[p.114\]](#) chapter.

3.3. Upper Toolbar

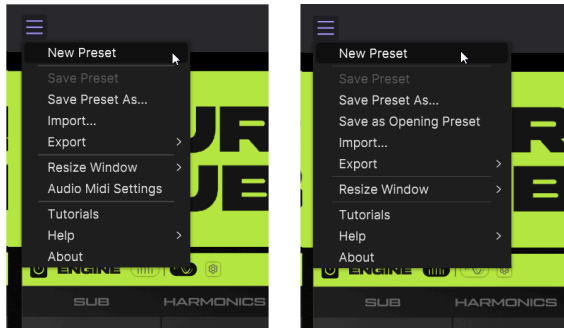
Before we jump into the main controls, we need to introduce you to the Upper Toolbar that runs along the top of the plugin's interface. It houses the main menu, the Preset Browser, a button to open the FX section, a knob to control the overall output level, and a cog-shaped button that opens the main settings, MIDI configuration, and Tutorial section.



Let's go through them from left to right.

3.3.1. Main Menu

Click the "hamburger" icon (three horizontal lines) in the top left corner of the upper toolbar to bring up the main menu. There are some useful functions here regarding presets and other tools to get you started with Pure SUB. The menu from the standalone and plugin versions differ slightly, which we'll point out as we go.



Standalone menu on the left; plugin version on the right.

3.3.1.1. New Preset

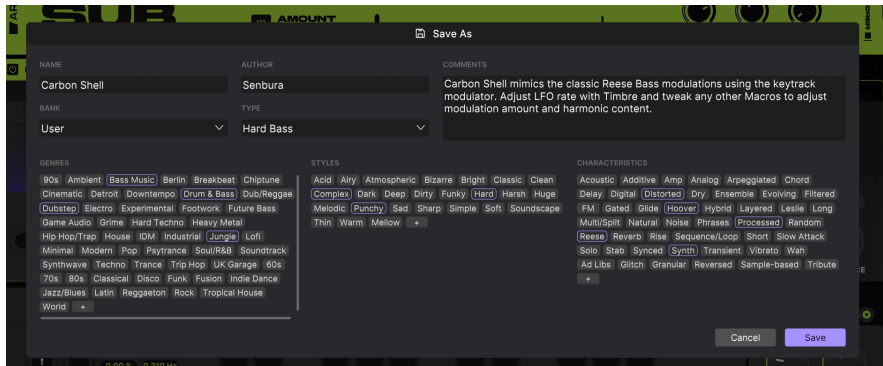
Creates a new preset with default settings for all parameters. The Default preset features the fundamental sub oscillator tone with the Thick Sub 1 harmonic engine preset that adds a couple of simple overtones. The Texture is turned down, the filter is fully open, and the Sub Processor is set to zero. Other than the basic Amp Envelope, there are no assigned modulations or active effects. It gives you a fresh, clean space in which to build your sounds.

3.3.1.2. Save Preset

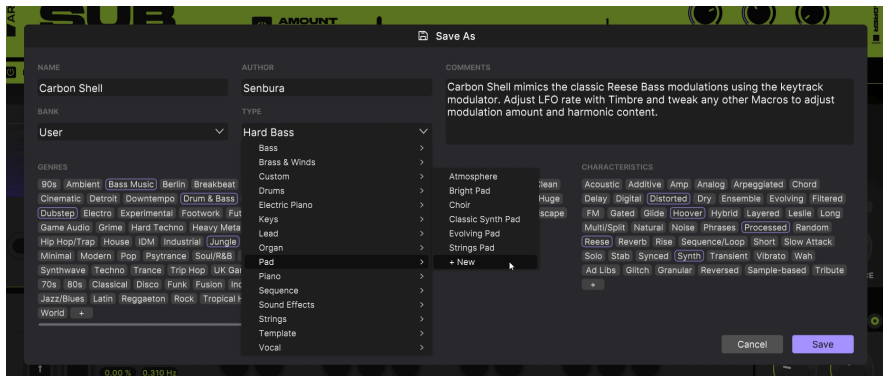
Overwrites the current preset with any changes you have made. This only applies to user presets, so the option is greyed out for factory presets, including the "Default" preset that's generated when you click "New Preset". To start saving a new preset, you need the option below.

3.3.1.3. Save Preset As

Saves the current state of the Pure SUB under a different preset name. Clicking this option opens the “Save as” window, where you can enter a preset name, add your name as the author, choose a Type, or add a new one that best describes your preset. You can also add tags from a list of Genres, Styles, and Characteristics. By default, the preset is saved in the “User” bank, but you can also create additional banks for more precise organization.



Pure SUB offers a highly detailed categorization system with many types and subcategories to help organize your presets. You can see this in the pop-up menus that appear when you click the dropdown menu under **Type**.



If nothing really matches, you can create your own.

 The Bank, Author, and Type fields are useful when searching for presets in the [Preset Browser \[p.145\]](#)

3.3.1.4. Save as Opening Preset

This option is only available when using Pure SUB as a plugin inside a DAW. It lets you select the Preset that is loaded into Pure SUB when you open a new instance of the instrument. You might have a preset you use all the time, or some settings you like to start with, and this will enable you to have it available as soon as you load it up.



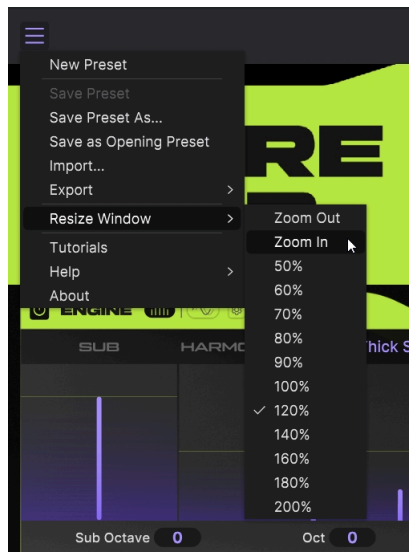
If you are running Pure SUB in Pro Tools then this option is not available in this menu; it's an option in a Pro Tools window.

3.3.1.5. Import

This command lets you import a Preset file, which can be either a single Preset or an entire bank of Presets. This can be useful if you were installing Pure SUB on another computer and wanted to transfer your user presets to that new machine, or if you wanted to use presets sent to you from another user.

3.3.1.6. Export

You can export presets in two ways: as a single Preset or as a bank. - **Export Preset:** Exporting a single Preset is handy when you want to share a Preset with someone else. The default path to these files will appear in the 'save' window, but you can create a folder at another location if you like. The saved Preset can be reloaded using the Import Preset menu option. - **Export Bank:** This option lets you export an entire bank of sounds from the instrument, which is useful for backing up or sharing Presets. Saved banks can be reloaded using the Import Preset menu option.



The Pure SUB window can be resized from 50% to 200% of its original size without any visual artifacts. On a smaller screen such as a laptop, you may wish to reduce the interface size so it doesn't dominate the display. On a larger screen or a second monitor, you can increase the size to get a better view of the controls. The controls work the same at any zoom level, but smaller controls can be easier to use at higher magnification.

While working with Pure SUB, you can also use keyboard shortcuts to quickly adjust the window size by one step up or down. On Windows, it's CTRL with the "+" and "-" keys on the numerical keypad, or CTRL- and SHIFT/CTRL+ on the regular keyboard. With macOS, it's COMMAND- / COMMAND+ on both the regular keyboard and numerical pad. Dragging the lower-right corner of the window ([Lower Toolbar \[p.26\]](#)) will also resize the interface to the next window size up or down. Note that in some DAWs, the same key commands may be used for zoom control. In this case, the DAW will take priority.

3.3.1.7. Audio MIDI Settings

These appear only if Pure SUB is working in standalone mode. Used as a plugin, these are handled in the context of your DAW or host software. Refer to the [First Start chapter \[p.7\]](#) for details on the settings for both Windows and macOS.

3.3.1.8. Tutorials

Pure SUB comes with integrated Tutorials that walk you through different features of the instrument. When you click on Tutorials in the main menu, a list of chapters will pop up on the right side of the main interface.



When you select a chapter, it will load a special preset and guide you through with step-by-step instructions on how to make the most of Pure SUB. As you go through the tutorial, parts of the control panel are highlighted to show you where to focus your attention.

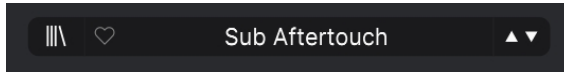


Click the X in the upper right corner to exit a particular chapter, and click Exit Tutorials at the bottom of the table of contents to close the Tutorials tab entirely.

i If you're editing a Preset, make sure to save it before opening the Tutorials, because doing so will replace your current Preset with a special Tutorial preset and overwrite any unsaved edits. Be sure to save frequently!

3.3.2. Browsing Presets

Pure SUB comes with a bunch of great-sounding presets, and there are three different ways you can access them via the Preset Browser controls in the middle of the Upper Toolbar.

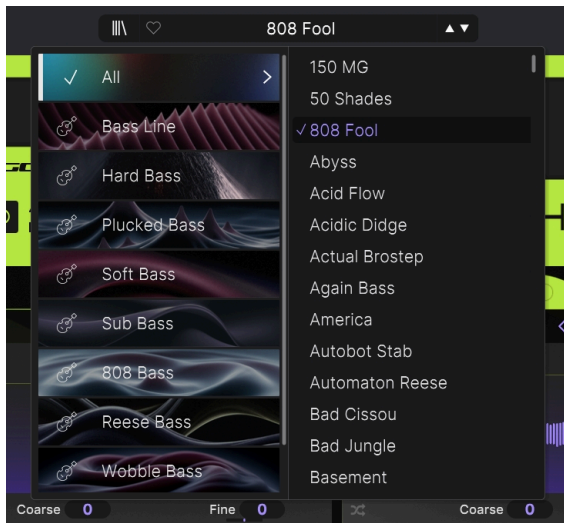


3.3.2.1. Preset Browser button

The Preset Browser button (the icon with four lines that look like books on a shelf) opens and closes the Preset Browser. This is covered in detail in the [Preset Browser \[p.145\]](#) chapter.

3.3.2.2. Preset Name

The Preset Name is listed alongside in the toolbar. Clicking the name reveals a dropdown menu that gives you access to the same presets as the Preset Browser, but in a more direct way, without the search tools. Click on any name to load that Preset or click away from the menu to close it. The sound categories on the left let you quickly jump to the appropriate subgroups of Presets (called [Types \[p.147\]](#)) without having to dive into the Preset Browser itself.



If you edit a Preset, an asterisk ("star") will appear next to the Preset Name, prompting you to save your edits before loading a different Preset. If you've set any search filters in the Preset Browser, pulling up any of these lists in this way ignores them. You will see all the Presets of the selected Type.

3.3.2.3. Arrows

The Arrow icons are the third way to access the presets, and you can simply select the next or previous preset in the filtered list by clicking on them. This is the same as clicking the Preset name and selecting the next patch on the list, but it does so with only one click.

3.3.2.4. Liked Presets

Between the Preset Browser button and the Preset name is a heart icon. This is the Like button that lets you quickly tag presets you like for easy recall later. Inside the Preset Browser, you can view, sort, and search for Liked Presets.

3.3.3. Synth and FX buttons



To the right on the Upper Toolbar, we have two buttons labeled Synth and FX. Clicking on either of these changes the view in the main center panel of Pure SUB. Clicking on Synth will show the Engine, Texture and Filter panels, whereas clicking on FX will show the FX Rack, FX slots and FX output panels. The currently selected one is highlighted in purple. The FX button also has a power button which enables you to turn the whole effects section on and off without switching the view.

3.3.4. Output Level Knob

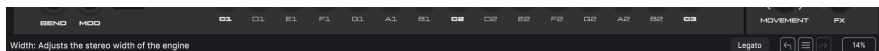
Very simply, it sets the overall output level of the instrument's sound from -60 dB to 0 dB, fully clockwise. The meters alongside give an indication of the level of the output.

3.3.5. Settings

The cog icon opens a side window that contains settings, MIDI configuration, and Tutorials. We have a whole chapter that digs into all these things; you can jump to it [here \[p.25\]](#).

3.4. Lower Toolbar

Running along the bottom of Pure SUB is the Lower Toolbar. It provides quick access to useful information, voice settings, and undo/redo history.



3.4.1. Parameter Name and Description

On the left, the Parameter Name area displays the name of a parameter and a description of what it does when you hover your mouse over it or click it to adjust its value. The control's current value pops up in a tooltip that appears next to the control.



You'll often find that simply hovering over a control brings up enough information to clarify what it does without having to go back to the manual or Tutorials.

3.4.2. Voicing Mode

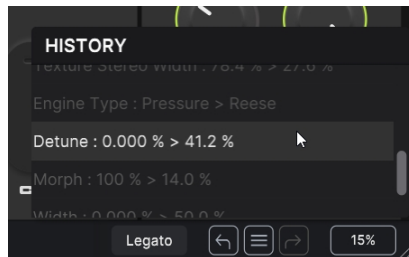


To the right we have the voicing mode. Pure SUB is monophonic but has two voicing mode options.

- **Retrig:** Plays a single note at a time and envelopes retrigger on every new note.
- **Legato:** Plays a single note, but the envelope only retriggers if the previous note has been released, allowing you to play in a legato style.

3.4.3. Undo / Redo

The left arrow undoes the last change to any parameter in Pure SUB, whereas the right arrow redoes the last undone change. If an event is selected in History, pressing Undo moves to the previous event, and pressing Redo moves to the next event.



The center icon with three horizontal "hamburger" lines displays a list of recent changes. Click on an entry to restore the patch to that state. This can be useful if you go too far in your sound design and want to revert to an earlier version.

3.4.4. CPU Meter

Displays the current CPU usage of the instrument. Hovering your mouse over the CPU Meter will change it into a PANIC button. In the event of stuck notes or other issues, clicking on PANIC will send a MIDI Panic message, silencing all notes and resetting other MIDI control values.

3.4.5. Resize handle

The diagonal lines in the corner allow you to resize the plugin window. Click and drag, then release the mouse; the interface size will jump to the nearest option in the Resize menu.

4. ENGINE

This manual is arranged to take you through Pure SUB by following the signal flow, from sound source to shaping, processing, and effecting. To that end, everything starts with the Engine. With "Synth" selected in the Upper Toolbar, the middle of Pure SUB displays the synthesis panels.



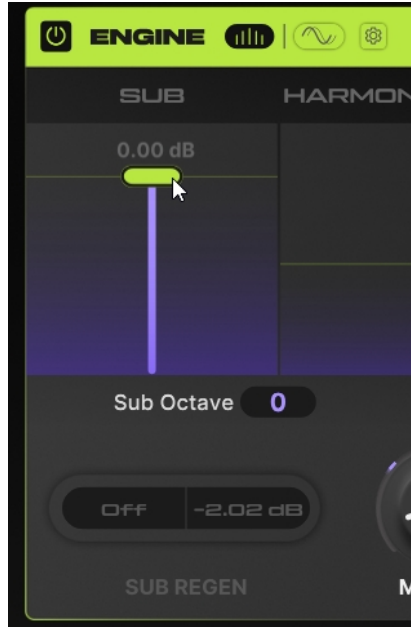
Every sound in Pure SUB is constructed from three elemental sources: **Sub**, **Harmonics** and **Texture**. The Engine deals with the first two, and we'll come on to Texture in the [next chapter \[p.42\]](#).

4.1. Sub

The Sub is the fundamental and foundation of your bass sound design. It is managed completely independently from the Harmonics and exists on a simple slider that defaults to 0dB and can be dragged down to essentially nothing. Alongside is a Sub Octave transpose value that can be set to 0, -1 or -2 octaves relative to the Engine pitch.



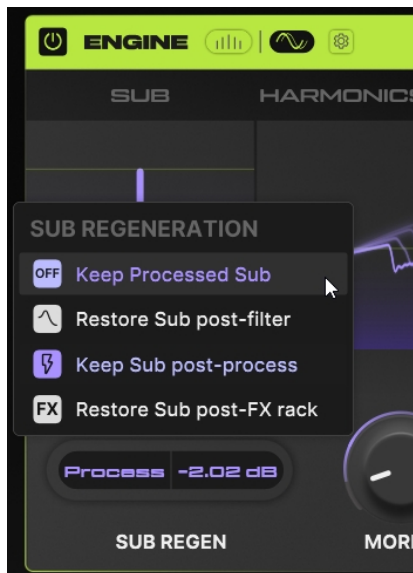
As you hover the mouse over the visualizer parts of the synth panels, any parameters that can be moved are shown with a vibrant green handle. For level controls, these intersect with a thin green horizontal line that shows the current value.



4.2. Sub Regen

When building a bass sound, the original fundamental can get lost through the layering and signal processing. However, at each stage the fundamental is vital in driving the filters, distortion, and effects, and defines the nature of the sound. To resolve the loss of amplitude and shifts in the phase of the fundamental, Pure SUB has the ability to regenerate a clean Sub signal and reinject it at different points in the signal chain after the heavy processing.

Sub Regen only feels important once you've started building in the Engine layers, Texture, and other processes. The controls exist right at the beginning of that journey to highlight its relationship to the fundamental - the Sub and Sub Regen go hand-in-hand.



Click on the Sub Regen Routing box, and you are presented with four options:

- **Off Keep Processed Sub:** No rerouting or regeneration.
- **Restore Sub post-filter:** Regenerate the Sub after the filter, before the Sub Processor.
- **Keep Sub post-process:** Regenerate the Sub after the Sub Processor, before the FX
- **Restore Sub post-FX rack:** Regenerate the Sub after the FX, before the Master out.

With a Regenerate option selected, the level control gives + or - 12dB of gain. The gain is relative to the level of the original Sub.

4.3. Harmonics

Independent from the Sub, Pure SUB has two Harmonic Engine modes that can be used to create specific types of bass, movement, and variation. The green header gives access to these modes along with a power button to turn off the whole panel.



Turning off the Engine also disables the Sub and Sub Regen.



To the right of the word **ENGINE** are two buttons. The left one turns on the Pressure engine, the right one enables the Reese engine. To the right of the Engine buttons is a Cog button for the main Engine [Phase settings \[p.40\]](#), which we will come to shortly.

4.3.1. Pressure

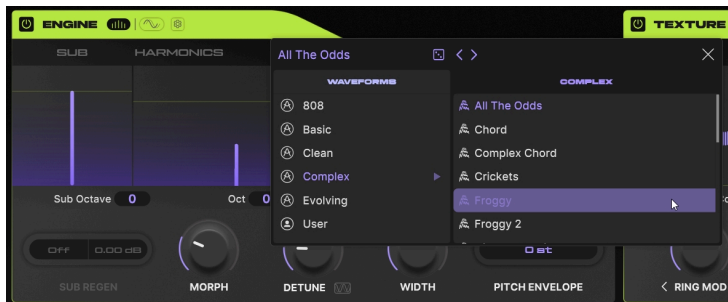


Pressure creates waveforms through the summing of simple harmonic tones. Collections of harmonics, called States, can be morphed between, detuned and widened into stereo placement. The main display visualizes the harmonics as a simplified frequency spectrum analyzer, with lower harmonics to the left and higher to the right.

The main controls are:

- **Morph:** Morphs the timbre by interpolating between the harmonics of up to 8 different states.
- **Detune:** Detunes the harmonics to create a chorus effect.
- **Detune Mode:** A waveform button next to the Detune knob which enables drift for different harmonic movements.
- **Width:** Spreads the individual harmonics in the stereo field.
- **Oct:** Sets the pitch of the Engine in octaves with up to + or - 2 octaves.
- **Coarse:** Sets the pitch of the Engine in semitones with up to + or - 36 semitones.
- **Fine:** Sets the pitch of the Engine in Cents with up to + or - 100 cents.
- **Pitch Envelope:** Sets the amount of pitch modulation applied by the [pitch envelope \[p.39\]](#).
- **Level:** The thin horizontal line on the display shows the current level of the harmonic layer from -70dB to 0dB. As you hover your mouse on the display, a green handle appears, although you do not need to click the handle to adjust the level. Simply click and drag anywhere in the display.

The Pressure mode has its own waveform library which can be accessed by clicking in the panel header alongside where it says **HARMONICS**. You can also use the left/right arrows to step through them or click on the dice to select one at random. The presets only change the waveforms and do not contain any information on the Morph, Detune, Width, or any other parameters; they will remain the same.



i A waveform preset may start with no harmonics at all. Moving the Morph knob may reveal other waveforms with more harmonics.

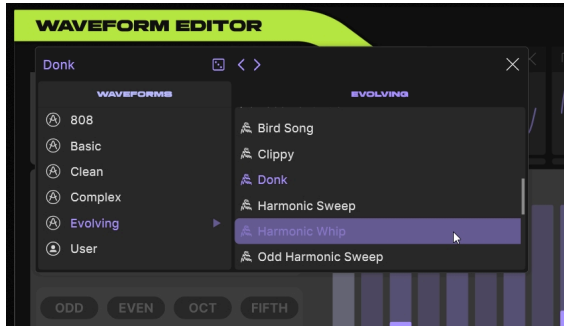
4.3.1.1. Waveform Editor

The preset library is there to give you an easily accessible starting point for your bass sounds. However, you can also build your own waveforms with the Waveform Editor. Click on the pencil icon to open it.



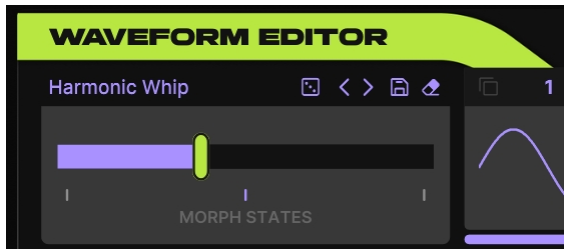
The Waveform Editor replaces the entire top half of the Pure SUB interface, giving you lots of room to play with the harmonics. Let's break it down.

4.3.1.2. Presets



At the top left, you have access to the same preset library as the main Engine window, along with the arrow buttons and dice for randomizing the selection. You also have the ability to save your harmonic creations through the little floppy disk icon, or clear the waveform with the eraser button.

4.3.1.3. Morph States



Under the presets is a "Morph States" horizontal slider that is identical in function to the Morph knob on the front panel. The Morph States slider morphs or interpolates between any of the active waveforms in the 8 waveform states to the right.

The position of the states on the slider depends on which ones are active. So, if State 1 and State 2 are active, then the interpolation occurs over the whole travel of the slider. As more States are active, they spread themselves equally along the slider, giving less room for each interpolation.

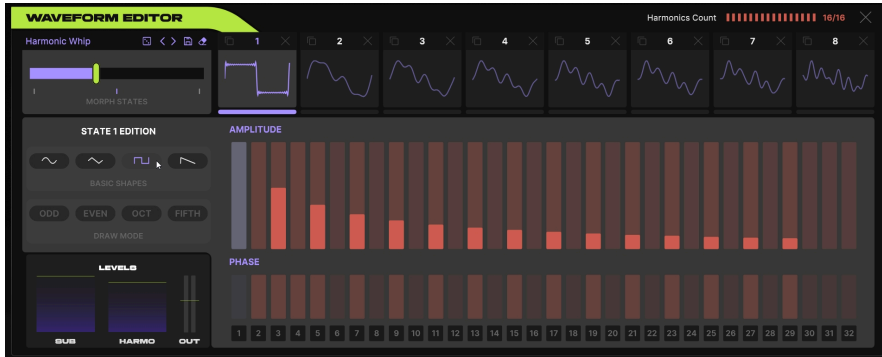


The morphing is not visualized in the Waveform Editor, but you will hear the change. The visualization is only available in the main Engine display.

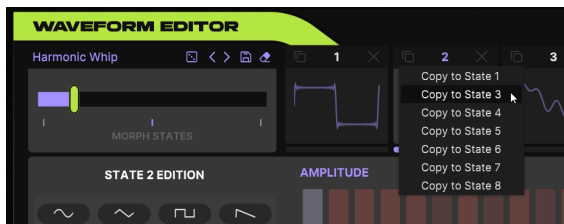
4.3.1.4. Waveform States



There are 8 states; each one can hold a waveform constructed of up to 16 harmonics. Click on a State to select it and begin building a waveform. If you wish, you can start with the four basic shapes on the left: sine, triangle, square, and sawtooth. Or simply add harmonics by clicking in the Harmonic Amplitude bar chart.

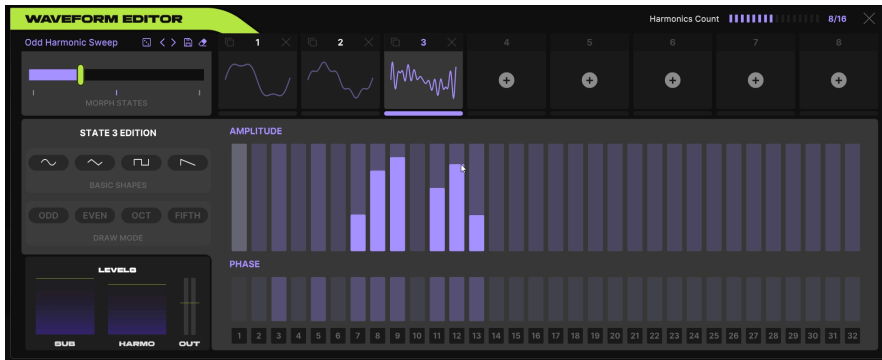


States can be copied to other states using the Copy button in the top left.



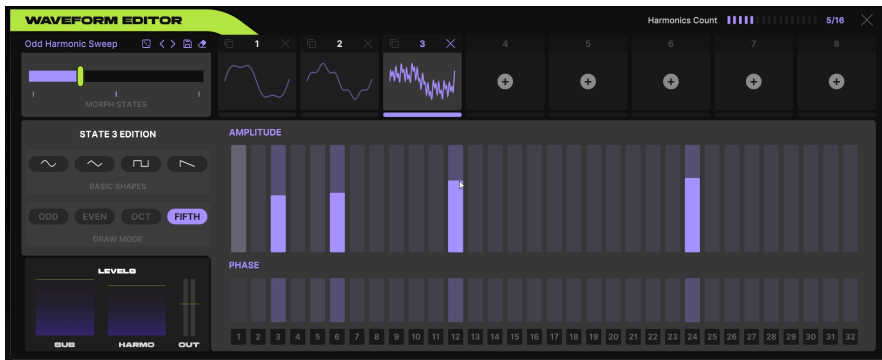
Use the X to delete the current waveform and leave the state empty.

4.3.1.5. Editing Harmonics



The harmonic editor shows 32 possible harmonics with corresponding phase positions. Select a State to display the harmonic makeup of the waveform held in that state. As you add, remove, or increase the amplitude of the harmonics, the waveform of the selected state will change to reflect it.

There are some tools to help you draw in the harmonics. Under the Basic Shapes panel are some Draw Modes that restrict the harmonic editor to Odd harmonics, Even Harmonics, Octaves, or Fifths.

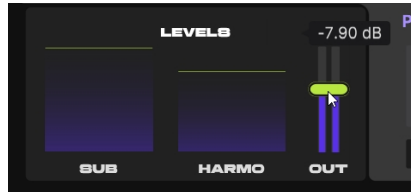


A couple of keyboard commands can let you move all the harmonics at once. Holding Shift while you click and drag across the harmonics will make them follow a line to your mouse pointer. Holding Alt when you click to edit a harmonic will move all the harmonics in the same way. Right-clicking any harmonic will remove it.



The harmonic editor turns red when all 16 harmonics have been used. The amplitude or phase of individual harmonics cannot be modulated; only the Morph States or Levels can be.

4.3.1.6. Mixing Levels

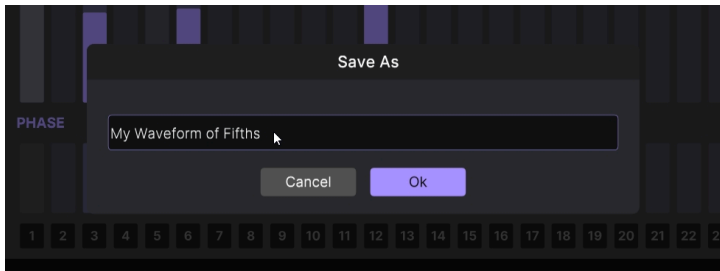


To the left is a panel called "Levels" where you can adjust the level of the Sub layer and the harmonic layer. The Sub is always the first harmonic of any waveform. If you remove all other harmonics, then you will be left with the sine wave of the Sub. The Sub's harmonic is not editable in the harmonic editor; instead, you can change the level here or in the main Engine window. As you change the level, you'll see the amplitude of the first harmonic change in the harmonic editor.

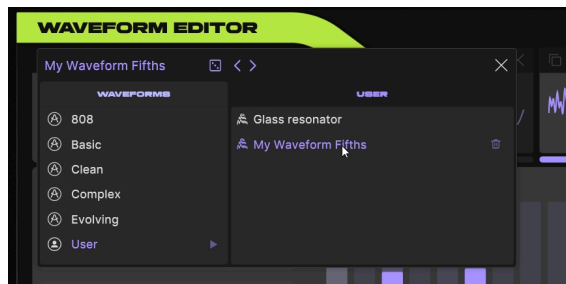
Alongside is the output level fader for the whole Engine.

4.3.1.7. Saving

Once you are happy with your 8-state morphable harmonic waveform, you can save it as a user preset by clicking the floppy disk icon just below where it says "Waveform Editor".



Choose a name for your waveform, and it will be saved in the Waveforms User bank.



The waveform presets are separate from the Pure SUB presets and do not have the same searchable tagging system.

4.3.2. Reese

Clicking on the sine wave icon to the right of Pressure switches to Reese mode.



Switching between modes does not affect any of the front panel parameters or modulation assignments.

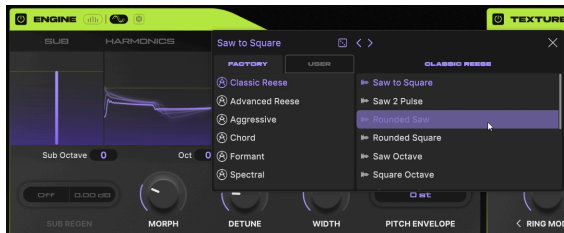


Reese mode uses a dual wavetable stereo engine designed to create a wide unison bass. Both engines contain the same wavetable, which allows for detuning and a stereo unison effect. The interaction is visualized on the display. As you change any of the parameters on the front panel, you will see and hear the result.

The main controls are:

- **Morph:** Morphs or interpolates between positions in the wavetable.
- **Detune:** Detunes the two wavetable engines.
- **Width:** Spreads the waveforms in the stereo field.
- **Oct:** Sets the pitch of the Engine in octaves with up to + or - 2 octaves.
- **Coarse:** Sets the pitch of the Engine in semitones with up to + or - 36 semitones.
- **Fine:** Sets the pitch of the Engine in Cents with up to + or - 100 cents.
- **Pitch Envelope:** Sets the amount of pitch modulation applied by the [pitch envelope \[p.39\]](#).
- **Level:** The thin horizontal line on the display shows the current level of the harmonic layer from -70dB to 0dB. As you hover your mouse on the display, a green handle appears, although you do not need to click the level. Simply click and drag anywhere in the display.

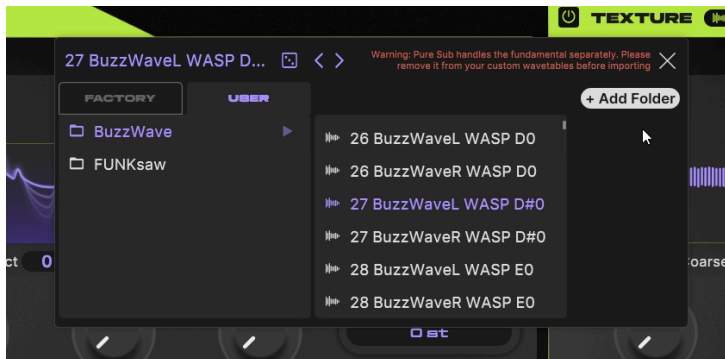
The Reese mode has its own wavetable library, which can be accessed by clicking in the panel header alongside where it says **HARMONICS**.



You can also use the left/right arrows to step through them or click on the dice to select one at random. The presets only change the wavetable and do not contain any information on the Morph, Detune, Width, or any other parameters; they will remain the same.

4.3.2.1. Adding Custom Wavetables

The Reese engine supports custom user wavetables.



Click on the *User* tab and then *Add Folder* and you'll be able to select a folder on your computer that contains the wavetable files, in .wav or .aiff format. They will then appear in the browser.

You can also drag and drop wavetables directly onto the Reese display for instant use. However, they won't appear in your user browser until you [save \[p.19\]](#), [export \[p.20\]](#) and [re-import \[p.20\]](#) the preset at which point a User folder will be created that contains the wavetable.



4.3.2.2. Fundamental Redundancy

In the User browser there's a warning to remove the fundamental from your wavetables before importing them. The Sub section generates the fundamental and so the one in your wavetable is redundant. This helps maintain clarity and avoids unwanted buildup. A simple way to do this is to use a steep high-pass filter just above the fundamental.

However, while removing the fundamental first is the best practice, Pure SUB will not come to any harm if you don't. You can also use the [Engine EQ \[p.40\]](#) settings to reduce the low end as it only affects the Engine, not the Sub.

4.4. Pitch Envelope

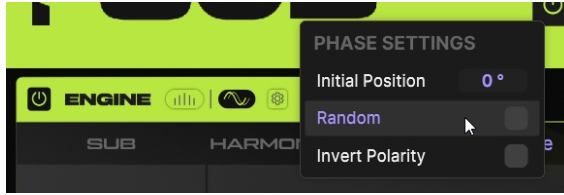
A key ingredient of 808-style bass sounds, kick bass and basses with a lot of punch and attack is the Pitch Envelope. You'll find an *Pitch Envelope Amount* setting to the right of the main Engine knobs. It goes from 0 up to 72 semitones of pitch change modulation and is connected to the Pitch Envelope, found under the Envelope tab of the Pure SUB modulation section.



There's no Attack stage on the Pitch Envelope, or at least the Attack is always 0; instead, we have a super-fast initial decay followed by a secondary, longer decay. You can make adjustments by clicking and dragging the envelope nodes or by using the knobs. Here's how they are defined:

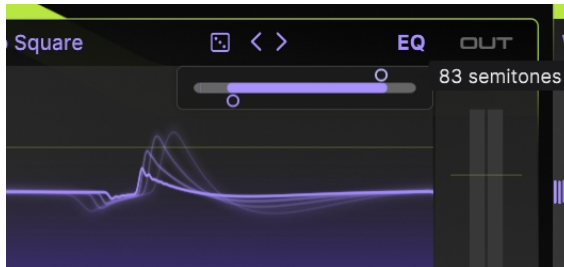
- **Decay 1:** Initial decay from the maximum value set by the Pitch Envelope Amount on the Engine front panel. It ranges from 1ms to 50ms, is linear, and is modeled around the pitch envelope used to create 808 bass sounds.
- **Level:** Sets the level point between Decay 1 and Decay 2.
- **Decay 2:** Sets the decay time from the Level point to 0. Ranges from 5ms to 5 seconds.
- **Curve:** Controls the curvature of Decay 2. Ranges from linear at 0 to -20%.

4.5. Engine Phase



Alongside the Pressure and Reese buttons is a cog button that opens the Phase Settings for the Engine. The initial position can be set from 0 or 360 degrees, which can be useful for matching the phase of other tracks in your mix. You can set it to inverse polarity, or you can have a random phase value for every note.

4.6. EQ

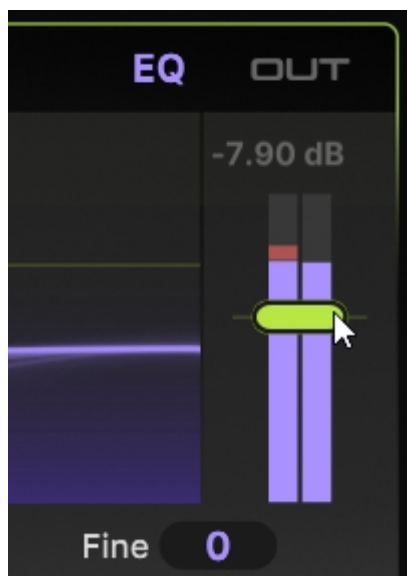


To the right of the waveform/wavetable presets is an EQ button. This reveals a small high-pass/low-pass filter where you can set an upper and lower cutoff frequency in semitones. Both filters are key-tracked and offset to the played key. They only affect the harmonic layer and are applied after any pitch offset or modulations.



The EQ is always on, and lit in purple, unless both cutoffs are set to their maximum left and right position, when it will be shown in grey.

4.7. Engine Out



The final part of the Engine is the OUT level and integrated VU meter. The default level is -6dB, but it can range from 0dB to -70dB and sets the output level of the Engine (Sub and Harmonics layer) going into the filter. The VU meter will display red when the output exceeds the nominal level.

5. TEXTURE

Texture is where we can add character, noise, and movement to the bass sound. It gives it a bite and grittiness that helps it stand out in a mix and feel more grounded in the dirt of your darkest tracks.

The original sound design technique involved blending noise with the bass to add character, and to create a psychoacoustic effect that helps the fundamental frequency of the bass stand out. Progressively it became a popular technique and aesthetic. It works particularly well when using ring modulation, or distortions, which can shape the noise using the fundamental, reinforcing its perceived pitch.



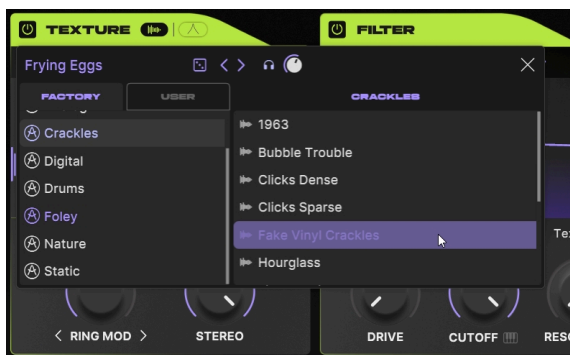
There are two modes:

- **Noise Sample:** The blending of sampled noise, digital glitches, crackling environments, and manipulated static.
- **Corroder:** The lo-fi, electrical grit and destruction of the Corroder effect first found in Pigments.

The modes are accessible from the buttons next to the word 'TEXTURE' in the green tab, where you'll also find the power button to turn the Texture engine on and off.

5.1. Noise Sample

The Noise Sample Texture mode brings in a library of sampled examples of noise and other gritty or frequency-rich textures. To get a feel for the diversity, click on the Dice icon a few times to randomly select a sample and hear how it changes the character of your bass sound. The currently loaded sample is visualized as amplitude over time in the display, and the current position of the play head is shown with a vertical line.



If you click on the name of the currently loaded sample, it will bring up the sample library where you can browse numerous categories of noise samples. If you single-click on a sample, you will see a visualization of the sample wave file up in the top right and, if enabled, hear a preview of the texture. To the left of the sample display is a small headphone icon. Click on the headphones to turn the preview on/off. The knob next to it controls the level of the preview. Single-clicking on any sample in the library will automatically preview it. To load it into the Texture engine, you'll need to double-click it.

Here are the main panel controls:

- **Level:** Hover the mouse over the display and the green handle for the level control will appear. Click and drag anywhere in the display to change the level between 0dB and -70dB. This lets you mix the level of the Texture against the Sub and Engine levels.
- **Texture Sample Start Random:** The icon of two arrows crossing over each other, to the bottom left of the display, enables a random start position whenever a key is played. When disabled, the sample always starts playing from the beginning on every key press.
- **Coarse:** Sets the pitch of the noise in a range of + and - 36 semitones.
- **Keyboard Tracking:** Enables keyboard tracking so the pitch of the noise follows the note that was played.
- **Texture Shaper Amount:** Sets the amount of transformation applied to the noise [Texture Shaper \[p.43\]](#)
- **Width:** Sets the stereo width of the Texture engine.

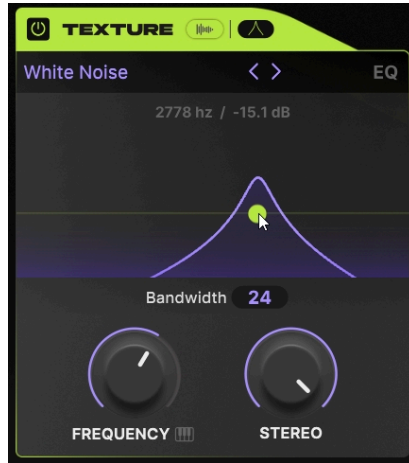
5.1.1. Texture Shaper

The Texture Shaper processes the Texture using one of three modes: Ring Mod, AM, or Disto. Use the arrows beneath the knob to select the mode, and turn the knob to set the effect amount.

- **Ring Mod:** A copy of the Sub signal is used as modulation to ring modulate the Texture amplitude.
- **AM:** Same as Ring Mod, but without phase shift and only on the positive side of the waveform.
- **Disto:** The Texture is mixed with a copy of the Sub and then saturated. This is then blended with another phase-inverted saturated Sub signal, which removes the Sub signal through phase cancellation, leaving the distorted Texture with a 'Sub imprint'.

5.2. Corroder

The Corroder mode is based on the Corroder effect from Pigments but with a simpler range of modulators and no drive circuit, as that's added in the Filter section. The Corroder effect adds lo-fi energy and gritty, electrical textures to your sound by degrading and eroding the signal. It uses a very short delay that's frequency-modulated by a selection of modulation sources and run through a bandpass filter.



The filter can be seen on the display. If you hover your mouse over the display, a green circle will appear that doubles as both the level control and the filter frequency. You can click and drag in both directions to change the frequency, as reflected in the 'FREQUENCY' knob and the level.

Here are the main controls:

- **Texture Modulator:** Click where you'd normally expect to find the presets, and you'll see a list of modulator options. You can choose from White Noise, Sine, Saw, or Square wave modulators. These can be stepped through with the left/right arrows.



- **Level:** Hover the mouse over the display and the green handle for the level control will appear. Click and drag anywhere in the display to change the level between 0dB and -70dB. This control doubles as a frequency control for the filter.
- **Bandwidth:** Sets the bandwidth of the bandpass filter from 0 to 100.
- **Frequency:** Sets the frequency of the bandpass filter applied to the modulation signal from 300Hz to 18kHz. This reflects the frequency control in the display.
- **Keyboard Tracking:** Enables keyboard tracking so the filter frequency follows the note that was played.
- **Stereo:** Sets the stereo width of the Texture engine.

5.3. EQ

Regardless of which Texture mode you are using, at the top right of the panel is an EQ button.



This reveals a small high-pass/low-pass filter where you can set an upper and lower cutoff frequency in semitones. Both filters are key-tracked and offset to the played key.

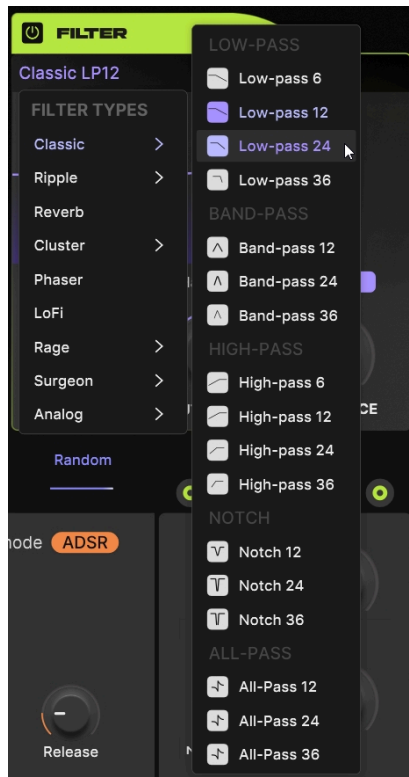


The EQ is always on and lit in purple, unless both cutoffs are set to their maximum left and right position, when it will be shown in grey.

6. FILTER



The Filter panel contains that vital sound-sculpting section that we probably feel very familiar with. However, within this panel are dozens of different filter types, each bringing different creative sound design opportunities to add character, flavor, and tonal shaping. There are also routing options, a Drive circuit, and a spectrum-analysis-style visualization of the frequency content of your bass sound.

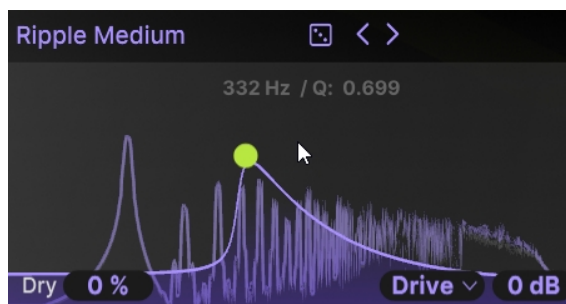


There are 9 filter types, each with several variations. These may be filter modes or different slopes, or variations based on severity. Most of them have similar controls that keep the same values and retain their modulation mappings as you switch between different filters.

6.1. Common Filter controls

- **Filter selection:** Click on the name of the current filter to bring up the filter list. The Dice icon will randomly select a filter for you, and the left/right arrow keys will step to the previous or next filter from the currently selected one.
- **Cutoff/Resonance Display:** If you hover the mouse in the display, a green dot will appear that you can move to control Cutoff in the X axis and Resonance in the Y axis. The values of both are displayed at the top.
- **Filter Routing:** The three sound-generating parts of Pure SUB; Sub, Harmo (Harmonics Engine), and Texture can be individually routed to the filter. Deselect them to bypass the filter.
- **Drive:** Uses a waveshaper distortion algorithm to apply distortion to the filter input.
- **Cutoff:** Sets the filter cutoff frequency from 20Hz to 20kHz.
- **Keyboard tracking:** When enabled, it offsets the cutoff relative to the note played.
- **Resonance:** Emphasizes the frequencies around the filter cutoff.

6.2. Filter Visualizer



Each filter has a graphical visualizer that displays its settings. When you make a change to the cutoff frequency or resonance, for example, you will see an equivalent change take place in the Filter View window.

In general, you can also click inside this window and drag the cursor to make changes: - Drag left and right to change the cutoff frequency, and - Drag up and down to adjust the amount of resonance.

Dragging may change different parameters for certain filter types, but you will always see the corresponding knob move at the same time.

Behind the filter graphic is a real-time FFT (Fast Fourier Transform) representation of the audio going through the filter. As you make any changes to the sound of the Engine or Texture, you will see it reflected in the display. The grey shape shows the frequency content at the input to the filter, and so any of the three enabled sound sources. The purple shape shows the same content after the filter has been applied.

6.3. Filter Types

While there are many common features and controls, the Filter Types do vary, and some have specific additional controls. Here are the filter details in full.

6.3.1. Classic



Classic offers a total of 17 different combinations of pass modes and slopes. This includes Low Pass, High Pass, Bandpass, Notch, and All Pass filters ranging from 6dB/Oct to 36dB/Oct slopes.

Parameter Description

- **Cutoff:** Sets the frequency at which the audio signal will begin to be emphasized or reduced.
- **Resonance:** Emphasizes a peak near the cutoff frequency.
- **Drive:** Applies distortion to the filter input.

6.3.2. Ripple



The Ripple Filter brings together a series of all-pass filters that allow all frequencies to pass with equal gain while altering their phase relationships, causing some frequencies to be delayed. This can produce deep phase shifts and rich tonal variations. A unique form of shaper is available through a choice of drive distortion or a positive or negative feedback loop.

Three types of Ripple filter are available: Subtle, Medium and Hard. Each one adds more all-pass filters to the system and deepens the phase shifting.

Parameter Description

- **Dry Level:** The amount of input signal added to the phase-shifted signal.
- **Ripple Mode:** Selects the shaper mode for the filter.
- **Drive (Drive mode only):** Sets the amount of waveshaper distortion.
- **Feedback (Feedback modes only):** Sets the amount of positive or negative feedback.
- **Drive:** Applies distortion to the filter input.
- **Cutoff:** The frequency around which the phase starts being shifted.
- **Resonance:** The bandwidth of the phase delay transition.

6.3.3. Reverb



The Reverb Filter uses a very short burst of reverb to modify the timbre of the sound, rather than give it a sense of space. The result is strange, fascinating, and particularly effective for bass design. At the output, we've added Tube Screamer-style distortion for fat, unique tones.

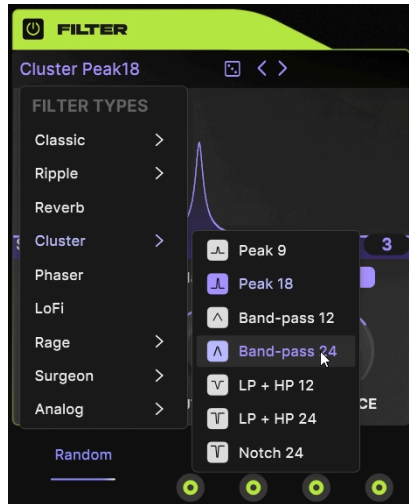
Parameter Description

- **Damping:** Controls how fast the high frequencies decay.
- **Reverb Drive:** Sets the amount of distortion applied to the filter's output.
- **Drive:** Applies distortion to the filter input.
- **Cutoff:** Sets the cutoff frequency of the filter.
- **Resonance:** Controls the level of the resonant peaks.

6.3.4. Cluster



Cluster filters are also called multi-peak filters, and cover a total of seven options via the Submenu.



The Peak, Bandpass, and Notch varieties all allow you to select from one to five peaks or notches. The Lowpass + Highpass types are, as the name suggests, a simple combination of these two types of filters.

Parameter Description

- **Spread:** Varies the distance between the peaks, notches, or lowpass/highpass bands.
- **Peak:** Selects the number of peaks, notches, or passbands.
- **Drive:** Applies distortion to the filter input.
- **Cutoff:** Sets the center frequency around which all bands/peaks/notches are boosted or cut.
- **Resonance:** Adjusts the height/depth of the peaks/notches in the amplitude domain.

6.3.5. Phaser



This filter is based upon an audio effect that has made frequent appearances in popular music since the 1960s. It is similar to a comb filter in that it uses a series of peaks and notches to process the input signal, which are usually then modulated with an LFO. This phaser also allows you to define the number of peaks (poles) that will be used.

Parameter Description

- **Poles:** Sets the number of peaks and notches to be used: minimum = 2; maximum = 12.
- **Drive:** Applies distortion to the filter input.
- **Cutoff:** Sets the frequency range of the peaks and notches.
- **Resonance:** Emphasizes the strength of the peaks and notches.

6.3.6. Lofi



The LoFi filter brings an old-school grungy quality to the sound via downsampling. A lowpass filter is placed before and after the LoFi filter to keep the downsampling artifacts under control.

Parameter Description

- **Pre-filter on/off:** Engages or bypasses the pre-downsampling filter.
- **Pre-filter frequency:** Offsets the cutoff of the pre-filter relative to the Lofi Filter frequency.
- **Post-filter on/off:** Engages or bypasses the post-downsampling filter.
- **Post-filter frequency:** Offsets the cutoff of the post-filter relative to the Lofi Filter frequency.
- **Drive:** Applies distortion to the filter input.
- **Frequency:** Sets the downsampling frequency of the lo-fi effect.
- **Jitter:** Adds random variations to the sample rate.

6.3.7. Rage



The Rage filter is all about distortion. There are five Rage filter modes that radically alter the character and color of the output by occupying a feedback loop designed to feed the resonance.



Diode offers sharp, asymmetric clipping; Distortion brings a balanced overdrive; Softclip is a smoother, warmer saturation; Tape adds a little compression and shaves off the edges; and Transistor is aggressive, bright, and edgy. All of them are bundled up with a resonant filter that emphasizes their energy.

Parameter Description

- **Rage:** Drives the distortion contained in the filter feedback loop.
- **Drive:** Applies distortion to the filter input.
- **Cutoff:** Controls the cutoff frequency of the filter.
- **Resonance:** Sets the strength of the resonant peak.

6.3.8. Surgeon



The Surgeon is an extremely steep filter (64dB per octave) with four Modes available – lowpass, highpass, notch, and bandpass – via its submenu in the main filter selection menu. Resonance that emphasizes the frequencies around the cutoff is not required in this filter.

Parameter Description

- **Drive:** Applies distortion to the filter input.
- **Cutoff:** Controls the cutoff frequency of the filter.
- **Spread:** Only available in Notch or Bandpass modes. Controls the width and depth of the affected zone.

6.3.9. Analog



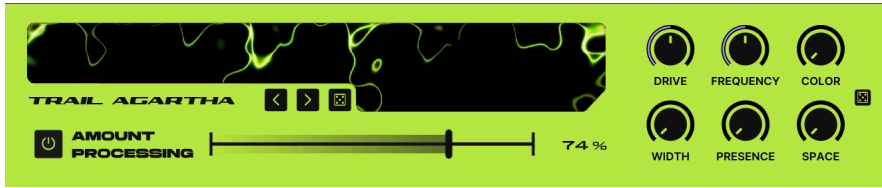
An analog-style filter based upon a classic circuit with a powerful and sometimes unruly resonance. There are both lowpass and highpass modes.

Parameter Description

- **Drive:** Applies distortion to the filter input.
- **Cutoff:** Controls the cutoff frequency of the filter.
- **Resonance:** Sets the strength of the resonant peak.

7. SUB PROCESSOR

After the filter and before the effects section comes the bold, brash and totally transforming Sub Processor. It's a crucial addition to the processing chain that just when you think you've crafted the perfect bass, it can show you a whole new level of bass-focused distortion, texture and playful reshaping.

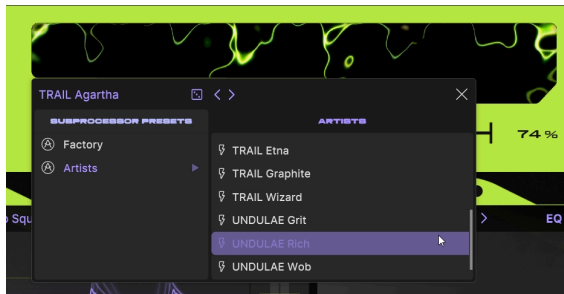


The Sub Processor has been built with expert sound designers and artists to let you dial in a perfect amount of transformation through 6 macro controls and an intensity slider. You don't have to know what's going on under the hood; you can just feel the vibrations and ride the outcome.

It lives in the acid-green environment of the Pure SUB header. It has its own twisted visualizer which taps into the flavor of its intentions, a preset library of modes, a huge slider, 6 knobs and a pair of dice.

7.1. Preset Modes

Directly under and encroaching on the visualizer is the Sub Processor preset library. The library contains Factory and Artist Sub Processor modes that contain a complex chain of effects, EQ, dynamics, and distortions designed to enhance, reshape, and blow your bass up into something epic.



Clicking on the current mode's name brings up the preset browser. You can also step through them using the left/right arrows, or pick one at random by rolling the dice.

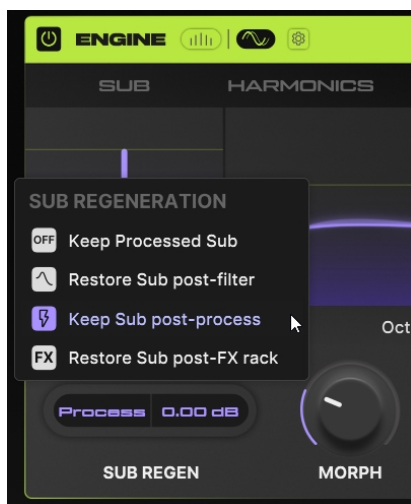
7.2. Amount Processing

Alongside the power button, which can turn off the whole Sub Processor section, we have the Amount Processing slider.



The slider controls the global amount of the sub processor being applied to your bass sound, from 0 to 100%.

7.2.1. Sub Regen



As you increase the processing on your bass sound you may find that the fundamental bass sound gets a bit lost. That's where the Sub Regen feature comes in. The Sub Regen can route a fresh and clean version of the Sub Engine to various points in the signal chain. To reinject the Sub after the Sub Processor select "Keep Sub post-process", and then set the level that sounds right to you.

7.3. Sub Processor Macros



The six Sub Processor macro knobs give you control over curated combinations of parameters. Each one is designed to boost or lessen particular aspects of the processing, as follows:

- **Drive:** Adds harmonic content and grit through distortion.
- **Frequency:** Sweeps through the spectrum using EQ or filters.
- **Color:** Adds an alternative timbre color to the sound.
- **Width:** Expands the stereo image and movement.
- **Presence:** Boosts high-frequencies to cut through the mix.
- **Space:** Adds a spatial dimension and depth to the sound.

Alongside is a dice button that will scatter the knobs into random values for unexpected explorations.

8. FX

Click on the FX button up in the [Upper Toolbar \[p.18\]](#), and the synth section is replaced by the FX section.



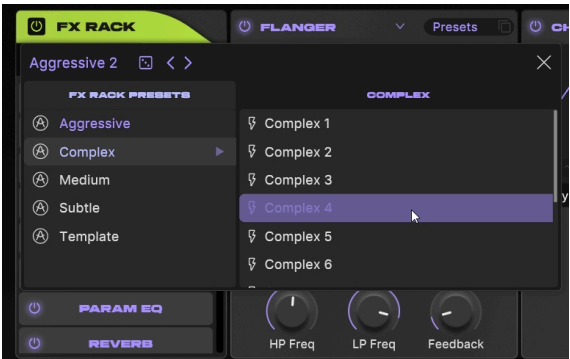
Pure SUB includes a suite of powerful stereo effects curated from our latest V Collection of virtual instruments. You can use up to twelve effects at once, and each of the twelve effects slots offers a choice of 18 high quality effects. The power button next to the FX button in the Upper Toolbar turns the FX rack on and off and can be used as a global bypass.

8.1. FX Rack



With so many effects and so many slots on offer, it could be difficult to keep track of what you have loaded. However, the FX Rack on the left is a useful and compact overview of your loaded effects that makes it easy to access the effect you want to change, and lets you quickly rearrange the order and turn effects on or off. Any reordering of effects in the FX Rack is immediately reflected in the effects slots on the right.

8.1.1. FX Rack Presets

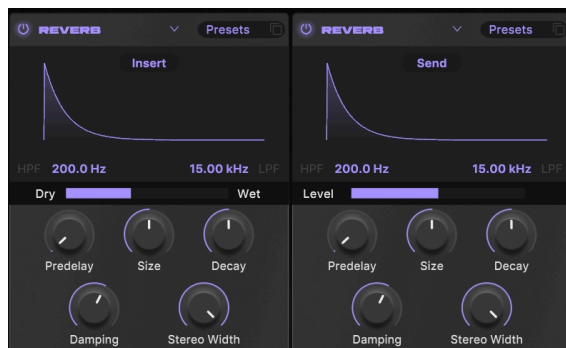


The FX Rack has its own library of presets with a handful of different categories. You can access them by clicking in the top section of the FX Rack above the stack of effects. You can also step through the presets with the left/right arrows or pick a random one by clicking on the dice. The floppy disk icon lets you save your current FX chain, and the eraser icon will clear the FX Rack, ready to begin again.

8.1.2. FX Routing

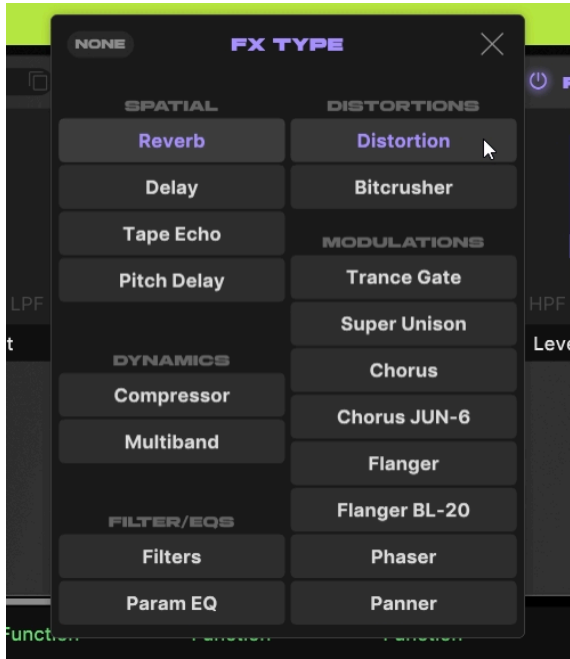


By Default, effects routing is “hard-wired” as serial *Insert* effects. The signal is first processed by the effect in the top slot of the FX Rack, then moves down from there (or left to right if you are looking at the effects slots). The balance between the the dry and processed signal is controlled by the Dry/Wet level. However, the Spatial effects (Reverb, Delay, Tape Echo and Pitch Delay) also offer send-based parallel routing.



When an effect is in Send mode, the dry signal (or the signal processed with effects up to that point) passes through at 100% while the Send Level controls how much of that input is fed into the effect, and on to the output. The effected signal bypasses the rest of the effects in the chain allowing you to have clean reverb tails and delays taps, while the dry signal can enjoy more processing.

8.2. Selecting an effect



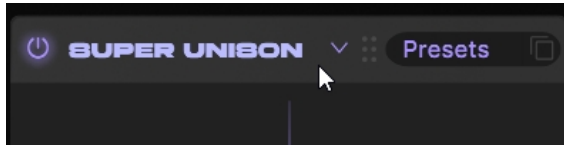
To add an effect to an empty slot click on where it says "Add an effect" and select it from the menu. To change an existing effect, click the name field at the top of any of the effects slots to bring up the effects selection menu. The effects are divided into five categories to make choosing a little easier.

- **Spatial:** Reverb, delays, and tape echo.
- **Dynamics:** Compressor and Multiband Dynamics.
- **Filter/EQs:** Multi-mode synth-like filter and parametric equalizer.
- **Distortion:** Distortion effect with 16 different algorithms and a Bitcrusher.
- **Modulations:** Super Unison, choruses, flangers, phaser, and stereo panner.

We will go through all the effects in detail below.

8.3. Common FX Features

Before we get to the individual effects, there are a couple of important functions that are common to all of them and live in the top row header of any loaded effect.



- **Power button:** Bypasses the effect.
- **Name:** The currently loaded effect and where you click to pull up the list of effects.
- **Drag and drop:** If you hover your mouse over an effect, a small bundle of 6 dots appears in the effect header. You can click and drag on the dots to rearrange the effects order.
- **Presets:** A selection of preset configurations of the effect, and where you can save your own.
- **Copy:** Copy one effect to another slot. When you click on the Copy icon, a list pops up where you can choose which slot to copy it to. Any existing effect will be replaced.



The top part of the effect visualizes some of the parameters and tries to give you a sense of what it's doing. If you click and drag in the visualizer, you'll find that you can intuitively control some of those values.

8.4. Effects List

What follows are details of all 18 effects that can be loaded into any of the effects slots.

8.4.1. Reverb

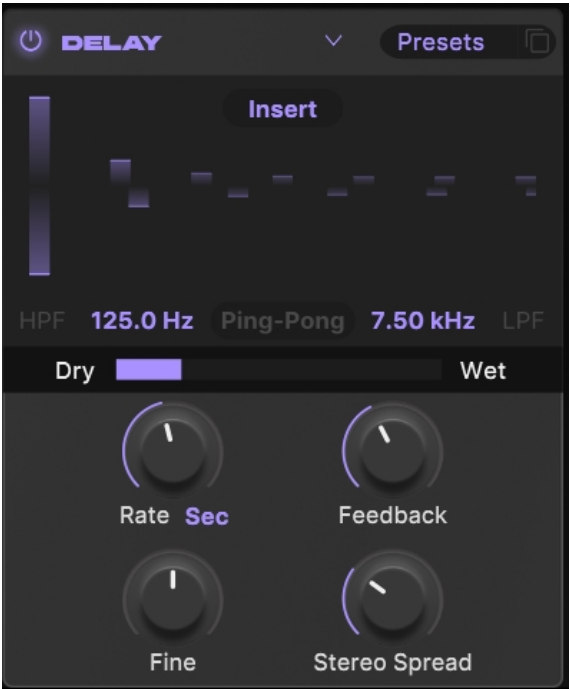


Reverb is the sound of a space – a recording studio, concert hall, stairwell, tiled bathroom, you name it. Reverb is often used as the final effect in a chain to blend everything else that’s going on into a single acoustic space, lending cohesiveness to the sound. Clicking and dragging up and down in the visualizer changes the Decay, whereas dragging left and right changes the size.

Feature	Description
HPF	High-pass filter, reduces the low frequencies below the set value.
LPF	Low-pass filter, cuts out the high-frequency content above the set value.
Slider	As an insert, the slider blends between the dry (before the effect) and wet (after reverb) sound. As a Send, it sets the amount of signal sent to the reverb.
Predelay	Sets the amount of time before the input signal is affected by the reverb.
Size	Adjusts the room’s size: counter-clockwise makes it smaller, clockwise makes it larger.
Decay	Determines the length of time the reverb effect will last.

Feature	Description
Damping	Controls the rate at which high frequencies decay.
Stereo Width	Adjusts the reverb from mono to an increasingly wide stereo space.

8.4.2. Delay



Delay is an effect that makes a copy of an input sound and repeats it at a set time period. We used Feedback to send the delayed sound back into the Delay to generate another repeat. We often experience it as an echo. How quickly and how many times it's repeated is defined by the rate and feedback controls. The visualizer shows the relative distance between repeats, the strength of each one and its stereo width. Clicking and dragging up and down in the visualizer changes the Feedback, whereas side-to-side changes the Rate.

Feature	Description
HPF	High-pass filter that reduces low frequencies in the delayed signal below the set value.
LPF	Low-pass filter that cuts out high-frequency content in the delayed signal above the set value.
Ping-Pong	Swaps between Classic L/R delay, where Stereo Spread introduces an offset between left and right for stereo effects, and Ping-Pong mode, where left and right delays alternate at a panning distance set by Stereo Width.
Slider	As an Insert, the slider blends between the dry (before the effect) and wet (after the Delay) sound. As a Send, it sets the amount of signal sent to the Delay.

Feature	Description
Rate	Changes the length of time between each delayed signal. It can be from 2ms to 2000ms, or 2 seconds, or synced to tempo with Straight, Triplet, or Dotted options. Sync options can be selected by clicking on the current mode next to "Rate".
Feedback	Sets how much of the delayed signal is fed back into the effect, which we hear as the number of repetitions before the echoes fade away. At maximum settings, this can lead to self-oscillation, where the echoes continue to build indefinitely.
Fine	Fine tunes the delay time ± 50 ms for very precise settings.
Stereo Spread/ Width	In Classic (non-Pin-Pong) mode, the Stereo Spread introduces an offset between left and right delays. In Ping-Pong, it becomes Stereo Width and increases the severity of the left/right width from mono to hard panning.

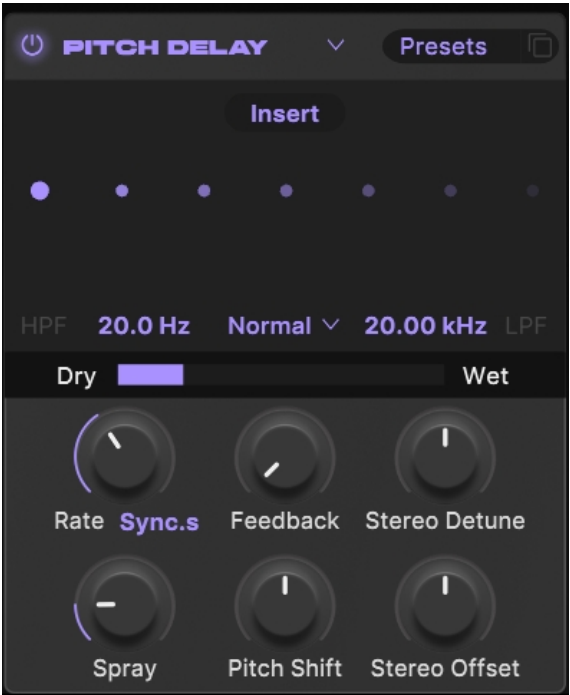
8.4.3. Tape Echo



A Tape Echo is a different sort of delay effect. It's modeled on the idea of using tape loops and playback heads to generate repeating echoes of the input signal. Because of the analog technology and the character of tape, it tends to impart warmth, saturation, and a certain amount of instability and loss of high frequencies that gets worse with each echo. Clicking and dragging up and down in the visualizer changes the Intensity, whereas side-to-side movement changes the Rate.

Feature	Description
Input	Sets the input gain to the Tape Echo from -12dB to +12dB. At positive dB values, the resulting echoes will be overdriven.
Ping-Pong	Swaps between Classic L/R delay, where Stereo Spread introduces an offset between left and right for stereo effects, and Ping-Pong mode where left and right delays alternate at a panning distance set by Stereo Width.
Slider	As an insert, the slider blends between the dry (before the effect) and wet (after the Echo) sound. As a Send, it sets the amount of signal sent to the Tape Echo.
Rate	Changes the length of time between each delayed signal. It can be from 10ms to 1000ms, or 1 second, or synced to tempo with Straight, Triplet, or Dotted options. Sync options can be selected by clicking on the current mode next to "Rate".
Intensity	Controls the amount of effected signal fed back into the Tape Echo, which determines the number of repetitions until the echoes fade away. At maximum intensity, the echo will loop indefinitely with ever-decreasing fidelity.
Fine	Fine tunes the delay time +50ms for very precise settings.
Stereo Spread/Width	In Classic (non-Pin-Pong) mode, the Stereo Spread introduces an offset between left and right delays. In Ping-Pong it becomes Stereo Width and increases the severity of the left/right width from mono to hard panning.

8.4.4. Pitch Delay



Pitch Delay adds a pitch-shifting element to an analog-style delay effect so that echoes can be higher or lower in pitch to the input signal. This can create harmonies and runs of notes along with some very weird shimmering and deteriorating sounds. Clicking and dragging up and down in the visualizer changes the Pitch Shift, whereas side-to-side movement changes the Rate.

Feature	Description
HPF	High-pass filter that reduces low frequencies in the delayed signal below the set value.
LPF	Low-pass filter that cuts out high-frequency content in the delayed signal above the set value.
Delay Mode	Gives a choice between Normal, which only repeats the Pitch Shift, and Octave Up or Octave Down, where an octave shift is added between the Pitch Shifts.
Slider	As an insert, the slider will blend between the dry (before effect) and wet (after Echo).
Rate	Changes the length of time between each delayed signal. It can range from 16ms to 2 seconds, or be synced to tempo with Straight, Triplet, or Dotted options. Sync options can be selected by clicking on the current mode next to 'Rate'.
Feedback	Controls the amount of pitch-shifted signal being fed back into the Pitch Delay. Each repetition gets a further pitch shift. With Pitch Delay, the repetitions tend to pitch themselves past the filter settings quite quickly, so self-oscillation or indefinite repeats are not possible.
Stereo Detune	Detunes between left and right channels.

Feature	Description
Spray	Adds jitter and small amounts of randomization to the delay time.
Pitch Shift	Sets the pitch shift in semitones up or down to +-24.
Stereo Offset	Adjusts the time offset between left and right channels to widen the stereo image.

8.4.5. Compressor



A Compressor is used to control the dynamic range of a sound: it reduces the difference between the softest and loudest levels a sound can have. It does this by reducing the gain by a certain amount (the ratio) once the audio reaches a certain level (the threshold). The meter on the side of the visualizer will show you how much compression is being applied.

Clicking and dragging up and down in the visualizer changes the Ratio, whereas dragging left and right changes the Threshold.

Feature	Description
Make-up	As a signal is compressed, the level is reduced. Enabling Make-up will automatically restore the overall level of the compressed signal while maintaining the compression.
Slider	Blends between the dry (before effect) and wet (after Compression) signal. Typically, compression is set fully wet.

Feature	Description
Threshold	Sets the level where compression will begin. Any sound that reaches or passes the threshold will be compressed.
Ratio	Determines the amount of compression to be applied once the threshold is reached.
Output Gain	Manually change the overall output level +- 36dB.
Attack	Adjusts the speed with which the compression will be applied once the threshold is reached.
Release	Sets how quickly the compression stops once the signal drops below the threshold.

8.4.6. Multiband



The Multiband compressor features three independent bands that can be used for compression or expansion. Each band works on a separate frequency range, so you can process the bass, middle, and high frequencies separately. It's designed to work on the overall sound of your patches to give them a polished, mastered quality, but you can also use them for sound design and other effects as you see fit.

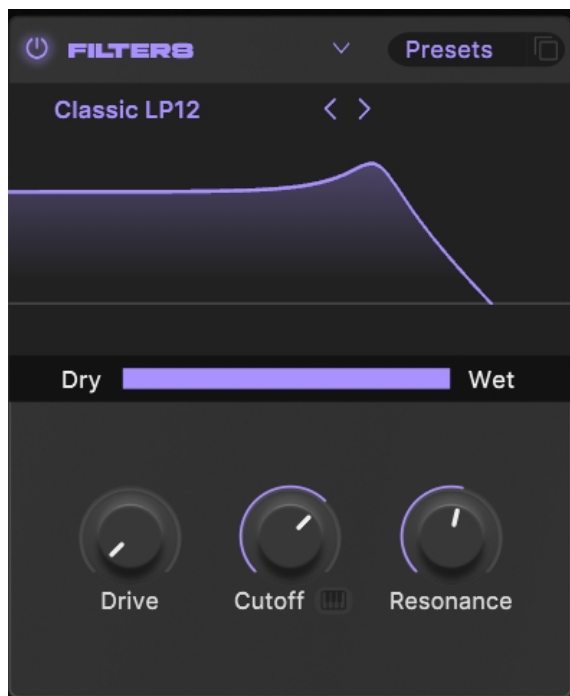
Central to its operation are the three bar-shaped columns. These represent the threshold and ratio of each band. The upper and lower bars allow different amounts of compression or expansion to be applied depending on whether the signal is above or below the respective thresholds. To control the compression or expansion ratio, click the relevant block and drag up or down. You'll see horizontal parallel lines begin to emerge from the solid color as the ratio approaches unity. When the 1:1 ratio is met, the parallel lines align with the lines outside the bars, indicating that no compression or expansion is being applied. To set the threshold of the upper or lower bar drag up or down on the leading edge.



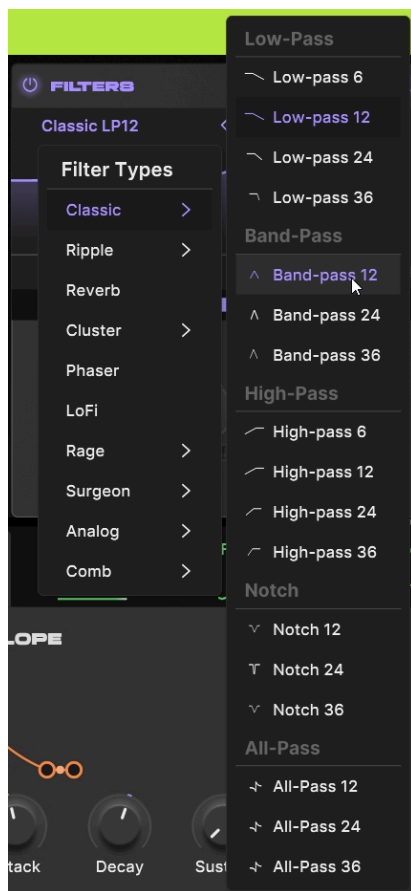
The upper bar compresses or expands any signals that are above the threshold, altering their level by the ratio. The lower bar will compress or expand any signals that are at or below the threshold, altering their level by the ratio.

Feature	Description
Threshold	Set in the visualizer by dragging on the leading edge of the bars.
Ratio	Set in the visualizer by dragging inside the bars.
Power Switch	The two power switches beneath the visualizer will turn off the low or high band leaving you with a two-band compressor.
Crossover Frequency	the frequency values next to the power buttons set the frequency at which the Low and Middle bands crossover, and the Middle and High bands crossover. Low to Mid crossover can be set from 30Hz to 3kHz, the Mid to High can be set from 300Hz to 15kHz.
Mode	Switches between dual-threshold processing (Above & Below), allowing compression or expansion above the upper threshold and below the lower threshold, and conventional above-threshold compression (Above Only).
Amount	Scales the overall amount of compression and expansion applied by the effect.
Out Low	Output control for the Low band.
Out Mid	Output control for the Middle band.
Out High	Output control for the High band.
Input	Sets the input gain from 124dB to +24dB.
Attack	Adjusts the speed with which the compression/expansion will be applied once the threshold is reached.
Release	Sets how quickly the compression/expansion stops once the signal drops below the threshold.
Output	Sets the overall make-up gain.

8.4.7. Filters



If the dedicated Filter section on Pure SUB's front panel isn't enough for you, then how about being able to insert as many duplicates as you like in the FX Rack? Filters gives you the same filter types, modes and configurations, ranging from classic emulations to strange LoFi and Reverb filters pulled from our flagship synthesizer, Pigments.



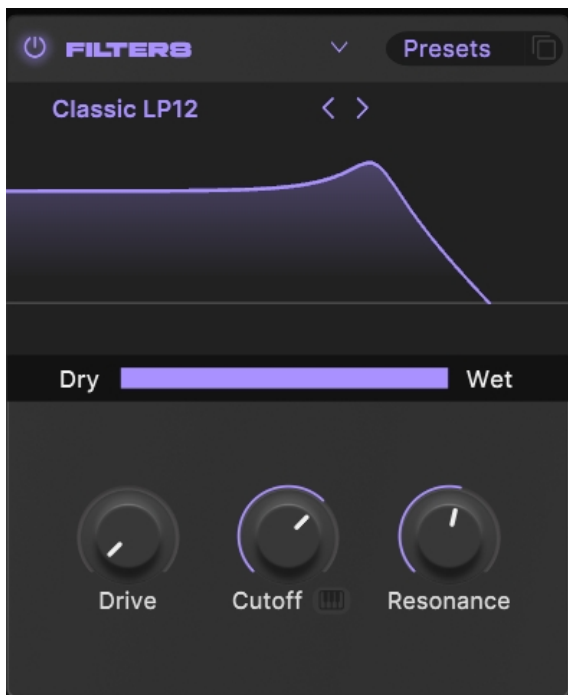
For the most part, they share the same controls and do similar things, but can offer a very different character and shape to your tone. The visualizer has a spectral analyzer superimposed behind the filter shape to show you how the sound is being affected. Clicking and dragging in that space will change the Resonance up and down and the Threshold from side to side.

Here are the common controls, but the exact behaviour depends on the filter type

Feature	Description
Filter name	Click on the filter name to bring up the list of filter types, or use the left/right arrows to step between them.
Slider	Blends between the dry (before effect) and wet (after filter) signal.
Drive	Applies distortion before the filter.
Cutoff	Sets the cutoff frequency where filtering starts to occur.
Key Tracking	The little keyboard icon turns on keyboard tracking, which changes the cutoff frequency based on your keyboard notes.
Resonance	Emphasizes the frequencies around the cutoff.

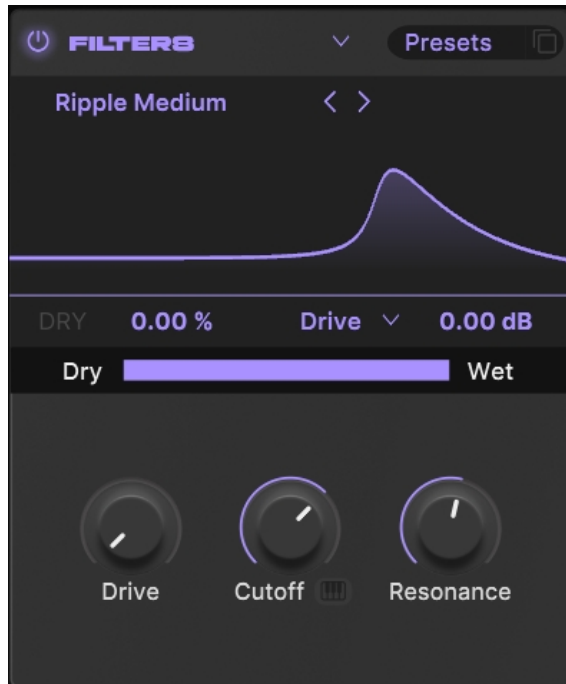
Here's a summary of the different filter types. For further information on every knob and parameter go to the [Filter \[p.46\]](#) chapter.

8.4.7.1. Classic



Regular, standard filter type featuring 17 modes spread across Low-Pass, Band-Pass, High-Pass, Notch, and All-Pass, with varying degrees of severity.

8.4.7.2. Ripple



The Ripple Filter brings together a series of all-pass filters that allow all frequencies to pass with equal gain while altering their phase relationships, causing some frequencies to be delayed. This can produce deep phase shifts and rich tonal variations. A unique form of distortion is available through a choice of Drive or a positive or negative feedback loop. Three types of Ripple filter are available: Subtle, Medium, and Hard. Each one adds more all-pass filters to the system and deepens the phase shifting.

8.4.7.3. Reverb



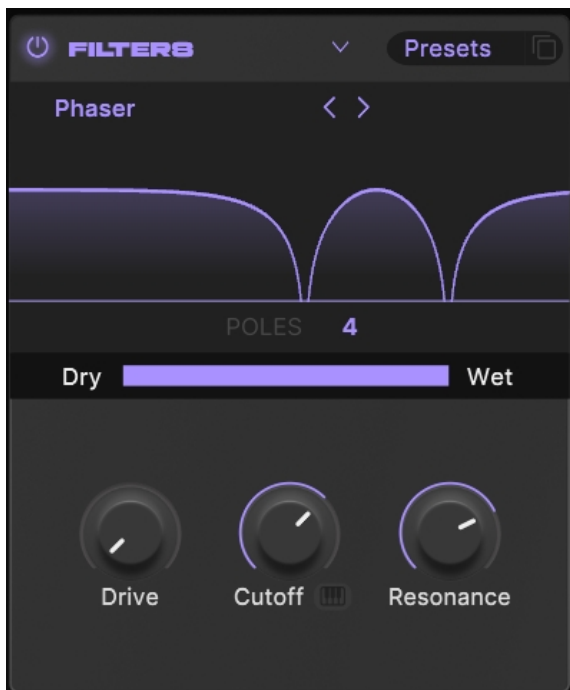
Uses a very short burst of reverb to modify the timbre of the sound rather than give it a sense of space. Damping increases the speed at which high frequencies decay, and Reverb Drive applies distortion to the output.

8.4.7.4. Cluster



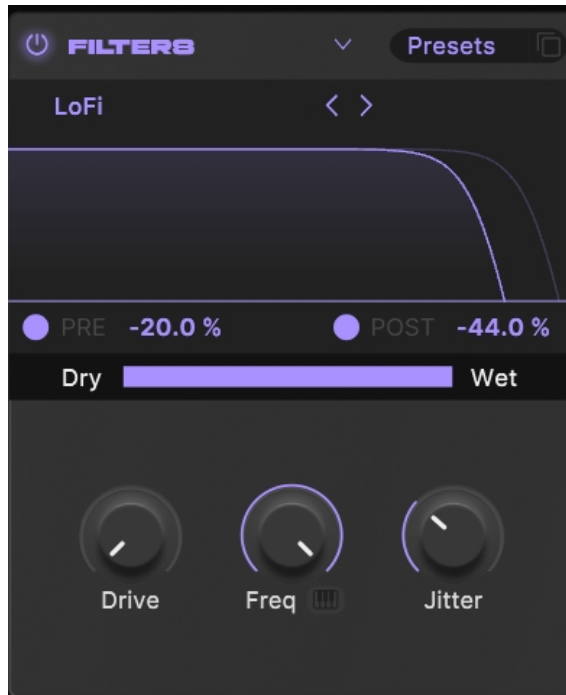
Also called multi-peak filters, and give us a total of seven options. The Peak, Bandpass, and Notch varieties all allow you to select from one to five peaks or notches. The Low-pass + High-pass types are, as the name suggests, a simple combination of these two types of filters.

8.4.7.5. Phaser



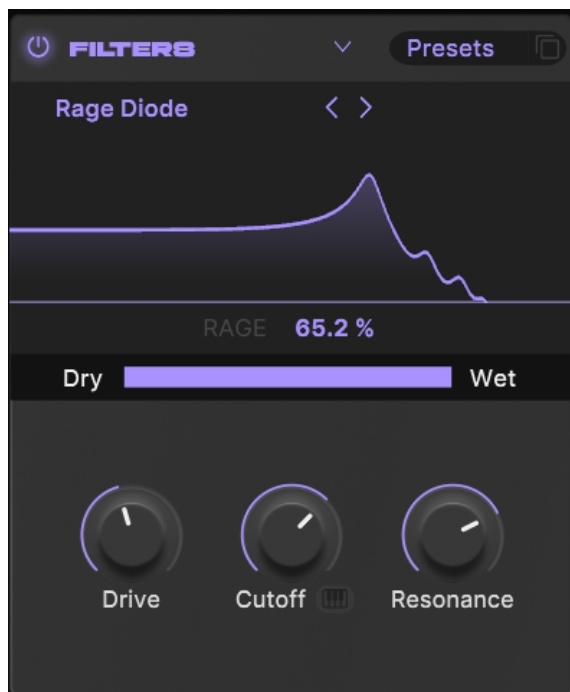
This filter is based upon an audio effect that has made frequent appearances in popular music since the 1960s. It is similar to a comb filter in that it uses a series of peaks and notches to process the input signal, which are usually then modulated with an LFO. This phaser also allows you to define the number of peaks (poles) that will be used.

8.4.7.6. Lofi



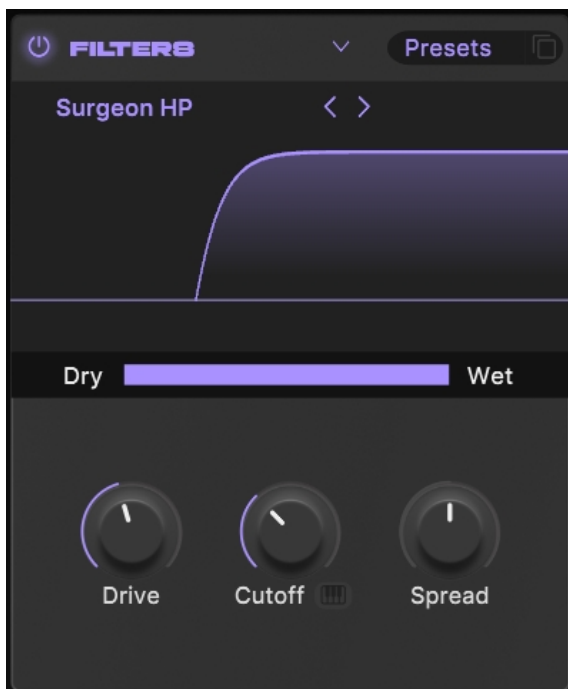
The LoFi filter seeks to add a pleasant, grungy quality to the sound via downsampling. The intended effect is not as drastic as what a bit-crusher might do. Notably, the amount of distortion doesn't build up when more notes are played, but instead stays consistent. To take the edge off things, there are pre- and post-filter low-pass filters that can be applied to varying degrees.

8.4.7.7. Rage



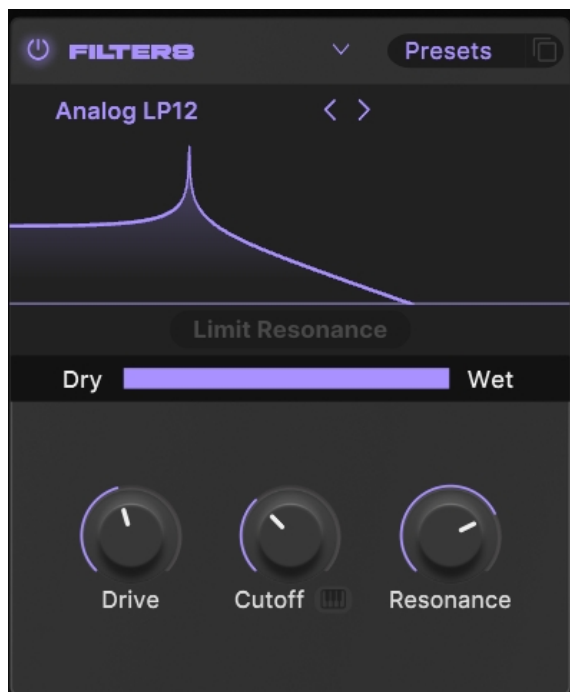
The Rage filter is all about distortion. There are five Rage filter modes, that radically alter the character and color of the output by occupying a feedback loop designed to feed the resonance. Diode offers sharp, asymmetric clipping; Distortion brings a balanced overdrive; Softclip is a smoother, warmer saturation; Tape adds a little compression and shaves off the edges; and Transistor is aggressive, bright, and edgy. All of them are bundled up with a resonant filter that emphasizes their energy.

8.4.7.8. Surgeon



This is an extremely steep filter (64dB per octave) with four Modes available – lowpass, highpass, notch, and bandpass

8.4.7.9. Analog



A pair of analog emulated filters that bring characterful tones via a 12dB/Oct low-pass and a 6dB/Oct high-pass. Both have Resonance limiters that keep things mellow and prevent self-oscillation.

8.4.8. Param EQ



The Parametric Equalizer lets you sculpt tone precisely to improve a sound's spectrum balance, as opposed to the broad tonal strokes you get from a synth filter or tone controls. It can be used to gently or surgically boost or cut certain frequencies, alter the overall sound, or remove problem frequencies.

It has five bands, and you can adjust the frequency, gain (boost or cut), and Q (how wide the band is around the selected frequency) for each. In fact, the ability to tweak the frequency and bandwidth is just what “parametric” means. Clicking in the visualizer, you can select bands directly and then drag up and down to change the Gain, and side to side to change the frequency of the band.

Feature	Description
Band Select	Click on the band; Low-Shelf, 1, 2, 3 or High-Shelf and then the rest of the controls are directed to that band.
Scale	Scales the overall intensity of the EQ relative to each band.
Frequency	Sets the center frequency of the current band. The frequency range varies depending on the selected band.
Gain	Boosts or cuts the selected band.
Q	The bandwidth or resonance of the selected band.

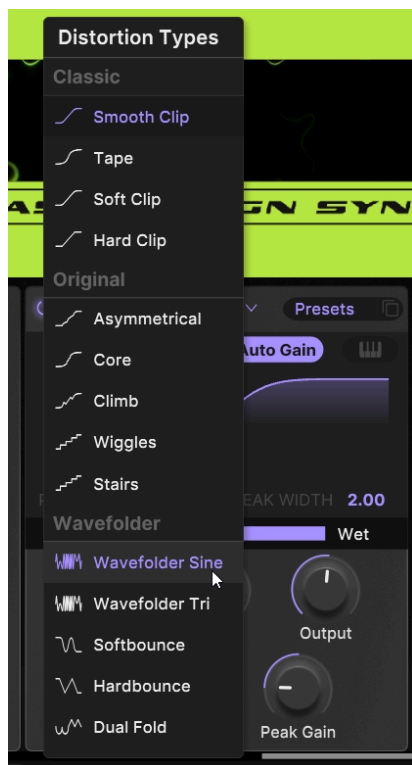
8.4.9. Distortion



The Distortion effect features multiple algorithms ranging from soft clipping to heavy saturation and extreme foldings. Additional controls such as Bias and a Peak EQ allow you to refine the harmonic response, including keyboard tracking for more precise control.

The visualizer displays the distortion curve and tone controls for the chosen algorithm. The tone controls apply complementary de-emphasis after the distortion, a boost before the distortion is followed by an equivalent cut, and vice versa. They appear as a 2-band parametric EQ when changing the Peak Frequency, Peak Width, Low Gain or Peak Gain. You can click and drag to alter the Drive, which affects the distortion curve.

There are 14 distortion algorithms that take on some classic shapes, original ideas, and wavefolding.



Otherwise, the controls are the same.

Feature	Description
Auto Gain	Enables volume compensation at the distortion output. This ensures there's a consistent output when you increase or lower the gain, so you can increase saturation without overloading the effect.
Keytrack	Keyboard tracking of the Peak Frequency.
Peak Freq	The frequency of the Peak EQ.
Peak Width	Defines the bandwidth of the Peak EQ.
Slider	Blends between the dry (before effect) and wet (after distortion) signal.
Drive	Determines the amount of distortion or wavefolding up to 48dB.
Bias	Changes the harmonic character of the distortion by adding even harmonics.
Output	Brings the output level under control from +3dB down to -24dB.
Low Gain	Adjusts how the low frequencies drive the distortion and operates a low shelf in the Peak EQ.
Peak Gain	Boosts or cuts at the Peak Frequency.

8.4.10. Bitcrusher



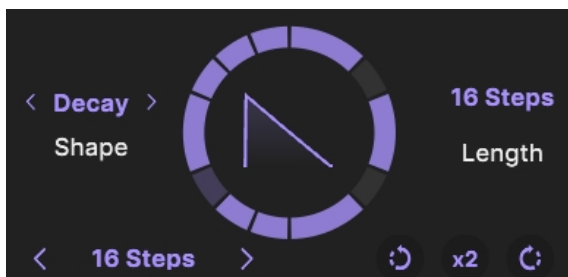
This bit-reducing effect offers several ways to deconstruct the sound. As the number of bits used to express the sound is reduced, details and fidelity are casually thrown away. Downsampling is another form of audio entropy that can provide just the right measure of de-evolution to your sound. As the sample rate is reduced, aliasing is introduced in the higher harmonics, which can produce sub-harmonics as well. For a truly lo-fi experience, the sample rate can be reduced to as low as 1/80th of the original. Clicking and dragging in the visualizer gives you control over Bit Depth (up and down) and Down Sample (side to side).

Feature	Description
Downsampling Mode	Smooth or not so smooth interpolation of the downsampling.
Slider	Blends between the dry (before effect) and wet (after Bitcrusher) signal.
Bit Depth	Reduces the number of bits used to render the sound. Range: from 16 down to 1.5 bits.
Down Sample	Divides the sample rate used to represent the signal. Range: 1.00x to 80.0x.
Jitter	Adds randomness to the downsampling frequency.
Scale	Increases bit quantization precision at lower volumes.
HP Freq	Sets cutoff of the input high-pass filter to remove low frequencies.
LP Freq	Sets cutoff of the input low-pass filter to remove high frequencies.

8.4.11. Trance Gate



Trance Gate creates chopping, gating, and stutter effects known from trance music, but it's useful in any application where you might want sequenced breaks in the sound. It loops a sequence of gates, from 2 to 32 steps, and you have a selection of envelope shapes to choose from to give the gates a character beyond a simple on and off.



The visualizer has an animated circular display that shows the movement of the sequence in real time and is always synced to the tempo. In the middle is the current envelope shape, which is selectable on the left. On the right, you can select the number of steps, while clicking on the steps in the circle turns them on and off. You can tie steps to create more interesting rhythms by clicking on an active step and dragging it into any number of following steps. You can also shift the sequence clockwise or anticlockwise and double its length with a single button press.

Here's a description of all the parameters:

Feature	Description
Shape	Use the left and right arrows to scroll through Classic, Triangle, Decay, Rise, and Trapeze envelopes that shape the volume of the sound during an active step.
Length	The length of the sequence from 2 to 32 steps. Click and drag to select.
Pattern Presets	Select from a bunch of curated Trance Gate favorites. You can also save your own.
Rotate	Rotate the pattern left or right to change the start of the sequence. The sequence always starts from the 12 o'clock position.
Duplicate	Doubles the length of the sequence and duplicates the pattern.
Slider	Blends between the dry (before effect) and wet, gated signal.
Rate	Sets the speeds of the sequence in divisions of the Global tempo. You can choose from all divisions, even divisions, dotted and triplets.
Morph	Changes the shape of the envelope. This could be pulse-width modulation for the square and trapezoidal shapes, or changing the slope curve for the ramp-type shapes.
Ratchet	Sub-divides the steps to create roll and ratchet effects. Tied steps will subdivide as a whole, giving a different result to single steps.
Retrig	When enabled, it restarts the sequence on every new note. When disabled, the sequence just continues to run.
Reset	Resets the sequence to the beginning after the set length of time. It can be set from 1 to 16 bars.



When used as a plugin, the Tempo refers to the Tempo of your DAW. When in standalone mode, the Tempo can be found in the Audio MIDI settings under the Hamburger menu in the Upper Toolbar.



Remember to reach for the Undo button in the lower toolbar to back out of any undesired changes. When you get a sequence you like, use the Save as operation in the effect presets menu.

8.4.12. Super Unison



Not unlike a synth’s Unison mode, this effect adds up to 8 duplicates of the input signal to itself, with the option to detune and modulate them to give fat and juicy sounds. The visualizer shows the number of voices and indicates the amount of detuning between them, along with their relative levels. Clicking and dragging in the visualizer up and down changes the detuning, while side-to-side movement adds or removes voices.

Feature	Description
HPF	High-pass filter that reduces low frequencies in the wet signal below the set value.
LPF	Low-pass filter that cuts out high-frequency content in the wet signal above the set value.
Retrig	Retriggers the detuning on every note for a more focused and consistent sound.
Slider	Blends between the dry (before effect) and wet, unison-infused signal. As you slide towards the wet end, the level of the voices increases until they reach an equal maximum level.
Rate	Sets the speed of modulation applied to the detuning of the unison voices. Ranges from zero to 1Hz.
Detune	Sets the amount of detuning between the voices.
Voices	Adds additional unison voices to the original from 1 to 8.
Stereo Width	Controls how the unison voices are spread in the stereo field.

8.4.13. Chorus



Chorus is a modulation effect that uses a modulated delayed copy of itself to create a thick, warm, ensemble sound from a simple input. It can be taken to warbly and wobbly extremes or used for adding subtle movement and detuning. Clicking and dragging in the visualizer up and down changes the Feedback, while side-to-side movement increases the delay between the original and the copy.

Feature	Description
Shape	Switch between sine wave or triangle wave modulation for a smoother flow or a slightly more direct movement back and forth.
Stereo	Switch between a stereo or mono output. In stereo mode, the left and right channels are modulated slightly differently.
Voices	sets the number of voices in the Chorus from 1 to 3.
Slider	Blends between the dry (before effect) and wet, chorused signal.
Rate	Speed of the LFO modulating the delay time from 0.1Hz to 5Hz.
Depth	The amount of modulation being applied to the delay time.
Delay	The actual static delay time between the original and the copy from 0.6ms to 20ms.
Feedback	The amount of effected signal being fed back into the Chorus.

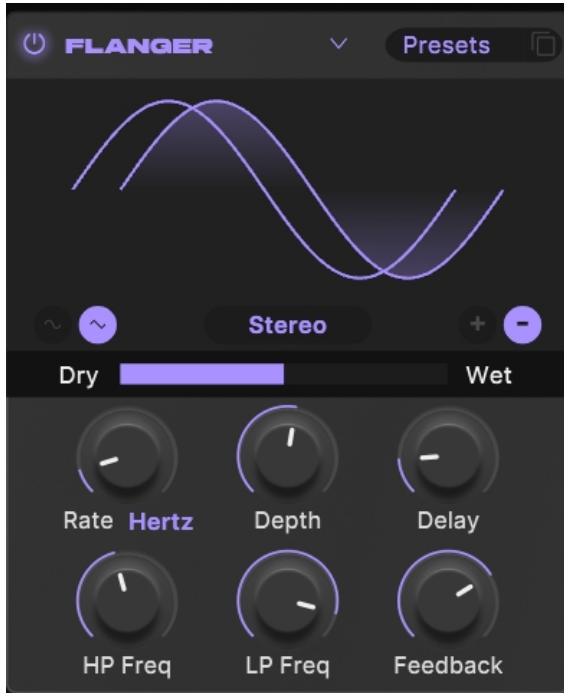
8.4.14. Chorus JUN-6



A Chorus effect modeled after the one found in a popular range of Japanese polysynths from the 1980s. It's generally regarded as iconic and is still a sought-after sound today. It has fewer controls than the other Chorus effect, but has a pleasing character that's very difficult to describe. Clicking and dragging in the visualizer up and down changes the Depth, while side-to-side movement increases the modulation rate.

Feature	Description
Slider	Blends between the dry (before effect) and wet, chorused signal.
Rate	Speed of the LFO modulating the delay from 0.051Hz to 15Hz. This can also be synced to tempo in straight, dotted or triplet timings.
Depth	The amount of modulation being applied by the LFO.
Phase	Offsets the phase of the modulator waveform from 0 to 180 degrees.

8.4.15. Flanger



The Flanger works in a similar way to the Chorus in that it uses a modulated, delayed copy of itself to produce the effect. However, in a flanger, the delay time is much shorter, and it has a more intense character akin to something like a comb filter. Clicking and dragging in the visualizer up and down changes the Feedback, while side-to-side changes the delay length.

Feature	Description
Shape	Switch between sine wave or triangle wave modulation for a smoother flow or a slightly more direct movement back and forth.
Stereo	Switch between a stereo or mono output.
Feedback Polarity	Switches between traditional Additive Feedback and more radical Subtractive Feedback.
Slider	Blends between the dry (before effect) and wet signal after the Flanger.
Rate	Speed of the LFO modulating the delay from 0.01Hz to 10Hz. This can also be synced to tempo in straight, dotted or triplet timings.
Depth	The amount of modulation being applied by the LFO.
Delay	The delay time between the original and the copy from 0.01ms to 10ms.
HP Freq	Sets cutoff of the input highpass filter to remove low frequencies.
LP Freq	Sets cutoff of the input lowpass filter to remove high frequencies.
Feedback	Adds feedback for a harsher or "ringing" sound. The maximum is 99% to avoid runaway self-oscillation.

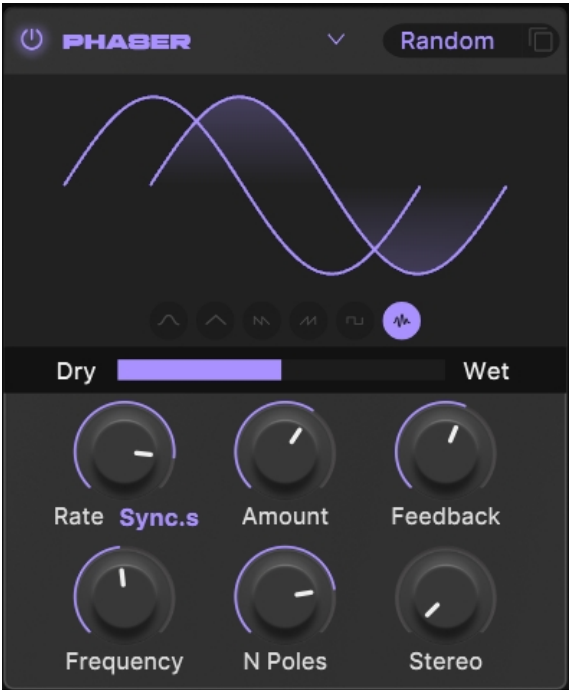
8.4.16. Flanger BL-20



The Flanger BL-20 is based on the sound of the rare and beautiful-sounding Bel BF-20 hardware flanger from the 1970s. It works in the same way as a regular Flanger but has a unique analog character and is capable of everything from subtle motion to wild sweeping resonant tones. Clicking and dragging in the visualizer up and down changes the Feedback, while side-to-side changes the delay length.

Feature	Description
Wide	Inverts the phase of the right channel to give a wider stereo field.
Mono Input	If enabled, a stereo input is summed to mono before the effect.
Slider	Blends between the dry (before effect) and wet signal after the Flanger.
Rate	Speed of the LFO modulating the delay from 0.17Hz to 5Hz. This can also be synced to tempo in straight, dotted or triplet timings.
Depth	The amount of modulation being applied by the LFO.
Delay	The delay time between the original and the copy.
Feedback	Sets the amount of signal being fed back into the Flanger.

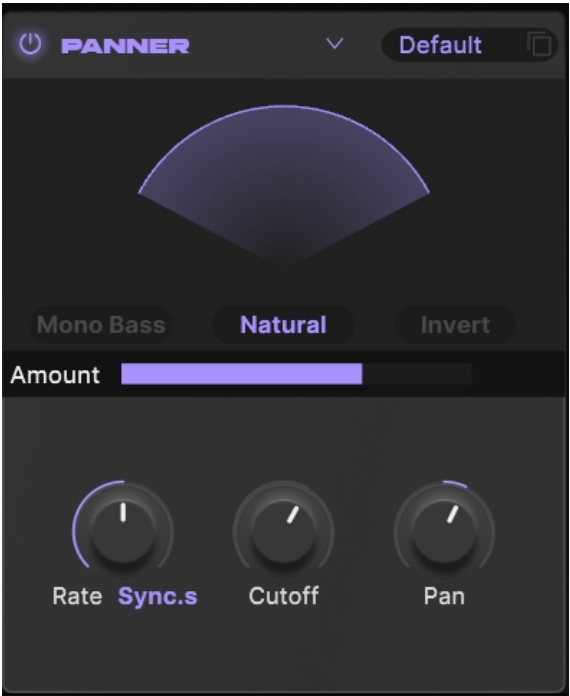
8.4.17. Phaser



A Phaser creates its effect by splitting the signal in two, changing the phase through an all-pass filter and mixing them back together to produce a notch-style comb filter. In this case, it's a twelve-stage phaser filter to produce multiple notches that are then modulated with a versatile LFO that sweeps through the frequency spectrum, causing that familiar “whooshing” sound. Clicking and dragging in the visualizer up and down changes the Feedback, while side-to-side changes the Frequency of the harmonic center.

Feature	Description
LFO Shape	Choose from 6 LFO waveforms for familiar sweeping effects, gating, and randomization.
Slider	Blends between the dry (before effect) and wet signal after the Phaser.
Rate	Speed of the LFO modulating the all-pass filter from 0.1Hz to 10Hz. This can also be synced to tempo in straight, dotted or triplet timings.
Amount	The depth of modulation being applied by the LFO.
Feedback	Controls the amount of Phaser resonance.
Frequency	Sets the base frequency of the filter.
N Poles	Determines the number of filter poles or stages of the Phaser.
Stereo	Gradually moves the output from mono to stereo.

8.4.18. Panner

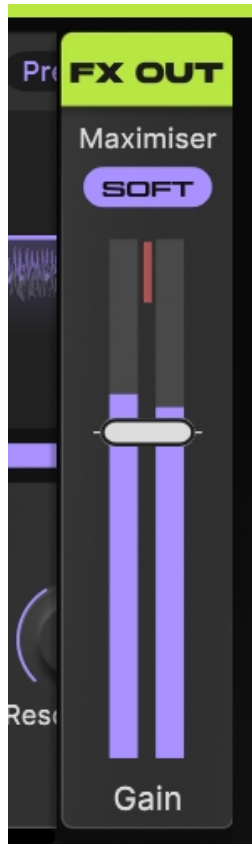


This is an LFO-driven effect that moves the signal from left to right in the stereo field. It can move the signal left and right ever-so-slightly from center, or it can swing wider and wider until it covers the entire range. It can also refrain from panning low-frequency signals, creating a sense of stability in the bass. Clicking and dragging up and down alters the Amount, or width, of the effect; dragging side to side does nothing.

Feature	Description
Mono Bass	When enabled the low-end frequencies are not panned and remain mono.
Pan Mode	Toggles whether the signal pans according to a Linear volume relationship between the sides, or a Natural, gentler logarithmic curve.
Invert	Inverts the LFO output, changing the "direction" of panning.
Amount	Controls the width of panning.
Rate	Speed of the LFO modulating the panning from 0.1Hz to 20Hz. This can also be synced to tempo in straight, dotted or triplet timings.
Cutoff	Sets the crossover frequency for the Mono Bass function from 50Hz to 200Hz.
Pan	Controls the position of the center so you can offset it in the stereo field.

8.5. FX Out

After all the effects have done their part, we reach the FX Out section. It doesn't just control the output level; hidden within it is a Maximiser that will push your bass sound further and fuller, increasing the perceived loudness, while keeping signal levels under control.



- **Mode:** Selects the Maximizer operating mode.
 - **Off:** Disables the Maximizer.
 - **Soft:** Applies transparent maximization with smooth peak control.
 - **Hard:** Applies more aggressive maximization and peak control.
- **Maximizer Gain:** Adjusts the signal level sent to the Maximizer.

The VU Meters show the post-effects level of the bass sound. As you push up the gain, any soft clipping will be shown as dark red above the purple meters. Any gain reduction applied by the limiter will be shown as a red line coming down from the top, between the two VU meters.



Pushing it a bit too far

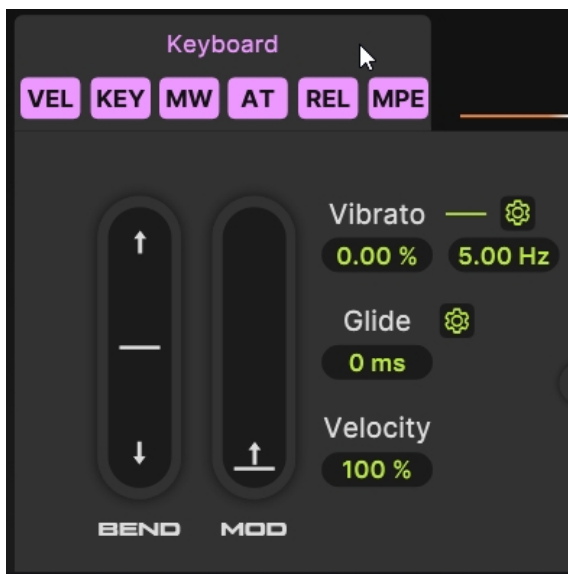
9. KEYBOARD



Beneath the Synth and FX section, hidden amongst the tabs of the animated modulators, is the Keyboard section. It features a two-octave virtual keyboard that acts as a virtual controller and MIDI monitor. You can click notes with your mouse, you can play it with your computer keyboard, or have it mirror the notes played on your hardware MIDI controller.

There are a surprising number of parameters that can be tied to the keyboard, and much you can do with just a mouse if you don't have a MIDI keyboard to hand.

9.1. Expression Controls



On the left of the virtual keyboard are some performance controls that make playing more expressive.

9.1.1. Pitch Bend

The Pitch Bend wheel defaults to +3 semitones. You can click-and-drag it forwards or backwards to bend the pitch of the current note, and it will return to the center when released.

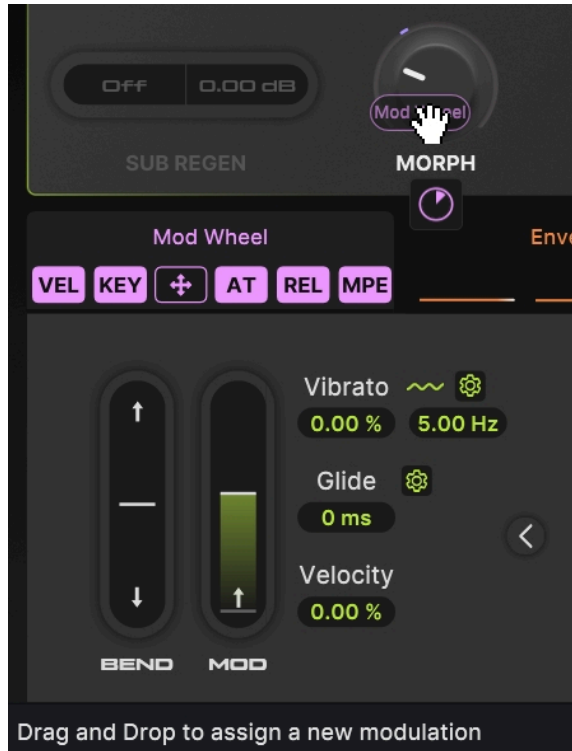
The Pitch Bend range can be changed in the [settings](#) [p.25], which are accessed by clicking the cogwheel in the top right corner.



9.1.2. Mod Wheel

In Pure SUB, the Mod Wheel is a lot more versatile than you would normally find, although by default it doesn't modulate anything. Instead, you can map it to all manner of things.

If you hover the mouse over the Keyboard tab, it flips to show you the modulation assignments of all the expressive features a MIDI keyboard may have. This includes Velocity, Key Tracking, Mod Wheel, Aftertouch, Release Velocity and MPE.

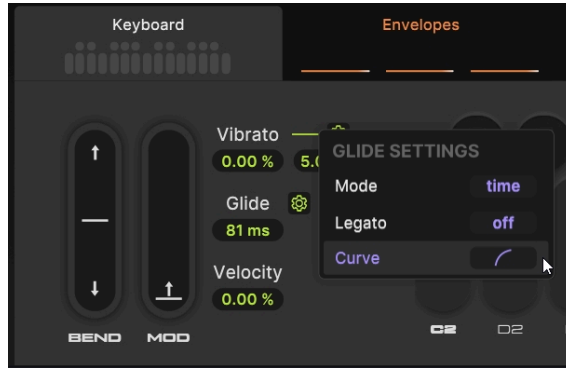


To assign the Mod Wheel to a parameter, click and grab the Mod Wheel assignment button, and then drag-and-drop it onto the knob or control you wish to assign it to.

If you hover your mouse back over the Mod Wheel assignment button, a panel will pop up to show you the assignment and give you control over the amount and curve of the interaction. This works for the other parameters as well.

9.1.4. Glide

Glide sets the time for the pitch to transition from one note to the next. You can set it in milliseconds all the way up to 10 seconds.



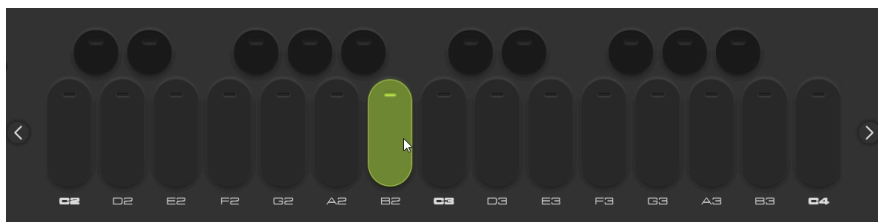
The cogwheel reveals a few additional settings:

- **Mode:** Switch between *time*, where the glide time between notes is always the same, or *rate*, where the glide time depends on the distance between the notes.
- **Legato:** When *on*, it only applies glide when the notes overlap.
- **Curve:** Modify the time response of the glide.

9.1.5. Velocity

Velocity alters the volume of a note depending on how hard the key was struck. By default, with a new preset, Velocity is set to zero and so all notes are played at the same level. The Percentage amount sets how much velocity affects the volume.

9.2. Virtual Keyboard Interaction



In terms of the virtual on-screen keyboard, you cannot access aftertouch or MPE control with a mouse. You can, however, interact with velocity. Velocity varies depending on where you click on a key. The highest velocity is at the leading edge of a key, and as you click towards the back of the key, the velocity decreases.



For velocity to work on the virtual keyboard, the velocity percentage must be more than zero.

9.2.1. Playing from a computer keyboard



If you don't have a MIDI controller keyboard, you can trigger notes from your QWERTY keyboard. You can play an octave plus a ninth in the key of C according to the diagram above. In addition, the Z key shifts the pitch range an octave or two down, and the X key shifts it an octave or two up.



This feature always works when Pure SUB is used in stand-alone mode, but may behave differently in a DAW when Pure SUB is run as a plug-in, as other key bindings may be in play. You may need to adjust your DAW's settings accordingly.

10. ENVELOPES



The second tab in the bottom section of Pure SUB opens up the editor for three permanent envelopes.

An Envelope changes a parameter or value over time in response to the press of a key. The shape it makes is visualized in the envelope editor and the progress is seen as a large orange dot moving along the contours. You can also see a small animated display of the envelope's shape in the Envelope tab as you play.

It is most commonly defined as having four stages:

- **Attack:** The time it takes for the value to rise to peak level once a note is played.
- **Decay:** The time it takes for the value to fall from peak level to the sustain level.
- **Sustain:** The level at which the value remains as long as a note is held.
- **Release:** The time it takes for the value to go from the sustain level to zero when a note is released.

The timings, levels, and response curves of all the stages can be edited on the knob controls, or by clicking and dragging the nodes in the graphic display.

The *Pitch* and *Amp* envelopes have hard-wired connections that the *Mod* envelope does not, but all three can be assigned to modulate any available parameter. The other [Modulators \[p.114\]](#) can also be envelopes, but these three are quick, easy, and always available.

10.1. Pitch Envelope

The Pitch Envelope is tied to the pitch of the Engine and can apply changes, bends, and movement to any notes being played. It's a key ingredient of 808-style bass sounds, kick bass, and basses with a lot of punch and attack. You'll find an *Pitch Envelope Amount* setting to the right of the main Engine knobs. It goes from 0 up to 72 semitones of pitch change modulation and is connected to the dedicated Pitch Envelope.



There's no Attack stage on the Pitch Envelope, or at least the Attack is always 0; instead, we have a super-fast initial decay followed by a secondary, longer decay. You can adjust this by clicking and dragging the envelope nodes or by using the knobs. Here's how they are defined:

- **Decay 1:** Initial decay from the maximum value set by the Pitch Envelope Amount on the Engine front panel. It ranges from 1ms to 50ms, is linear, and is modeled around the pitch envelope used to create 808 bass sounds.
- **Level:** Sets the level point between Decay 1 and Decay 2.
- **Decay 2:** Sets the decay time from the Level point to 0. Ranges from 5ms to 5 seconds.
- **Curve:** Controls the curvature of Decay 2. Ranges from linear at 0 to -20.

For the Pitch Envelope to be active, the *Pitch Envelope Amount* needs to be set in the Engine panel. When set to zero semitones, the Pitch Envelope has no effect.

10.2. Amp Envelope



The Amp Envelope is hard-wired to a VCA (voltage-controlled amplifier) after the Filter section and controls the overall level of Pure SUB before the Sub Processor and FX.

- **Attack:** The time it takes for the volume to rise to peak level once a note is played.
- **Decay:** The time it takes for the volume to fall from peak level to the sustain level.
- **Sustain:** The level at which the volume remains as long as a note is held.
- **Release:** The time it takes for the volume to go from the sustain level to zero when a note is released.
- **Mode:** Switches between regular ADSR and ADR where the note length (how long the note is held) is ignored and the envelope runs its entire cycle when triggered.

10.2.1. Time and Curve

By default, the Amp Envelope is set to control the time or the stages. If you click the *Time* button, it will toggle to *Curve*, where the knobs become controls for the response curve of each stage.



The *Sustain* control remains the same, as it's a level, not a time.

10.3. Mod Envelope



The Mod Envelope isn't hard-wired to anything, and so you are free to assign it to any available parameter or control you wish.

It is commonly used to control the Filter Cutoff, so, by way of example, you would do this by clicking and grabbing the Mod Envelope assignment button in the Envelope tab and dragging-and-dropping it onto the Cutoff knob.



The Little circle that appears beneath the Cutoff knob is called a *Quick Edit* control and lets you set the depth of modulation, or the amount of change the Mod Envelope will apply to the knob.



When you hover the mouse over the knob, any Quick Edit controls for assigned modulators will appear. If you hover a Quick Edit control, it will give you further information on its value and allow you to change it.

With our Mod Envelope assigned to the Filter Cutoff and the depth set by the Quick Edit control, here is what the knobs are defining:

- **Attack:** The time it takes for the cutoff frequency to rise from its current value by an amount set by the Quick Edit control, once a note is played.
- **Decay:** The time it takes for the cutoff frequency to fall from the maximum value set by the Quick Edit to the Sustain level.
- **Sustain:** The offset at which the cutoff frequency remains as long as a note is held.
- **Release:** The time it takes for the cutoff frequency to go from the sustain offset to the original cutoff frequency when a note is released.
- **Mode:** Switches between regular ADSR and ADR where the note length (how long the note is held) is ignored and the envelope runs its entire cycle when triggered.

10.3.1. Time and Curve

By default, the Mod Envelope is set to control the time or the stages. If you click the *Time* button, it will toggle to *Curve*, where the knobs become controls for the response curve of each stage.



The *Sustain* control remains the same, as it's a fixed value, not a time.

10.4. Assigning Envelopes

As with the Mod Envelope, the other two envelopes can also be assigned to modulate any available parameter or control.



The Pitch and Amp envelopes will still control the hard-wired destinations of pitch and level respectively, even if they are assigned to other parameters.

To make the assignment, click and hold on the envelope's assignment button in the Envelope tab, and then drag-and-drop it onto the knob you wish to control.



As you drop the assignment onto the knob, you'll see a little *Quick Edit* circle control appear. These controls set the depth of modulation, or amount of change, being applied by the envelope.

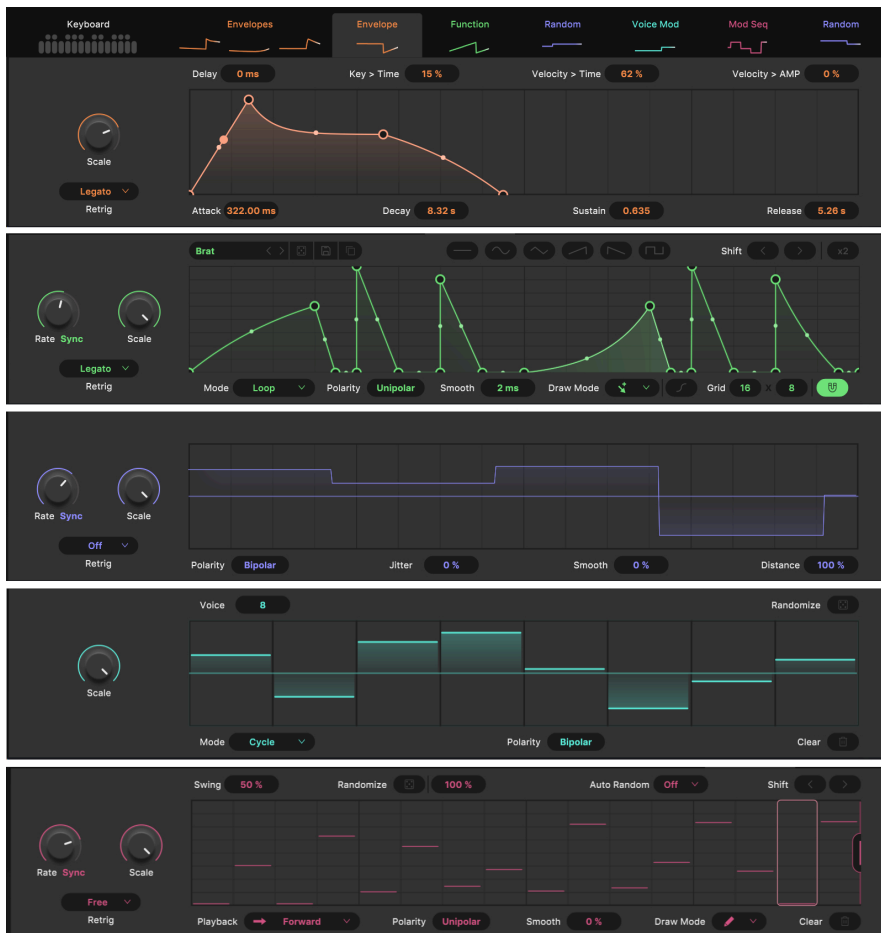


You can assign a single envelope to as many knobs and parameters as you like. You can even assign envelopes (and other Modulators) to control (or *Sidechain*) the depth of a Quick Edit control. If you hover your mouse back over the assignment button, a panel will pop up showing you the current assignments, modulation amounts, and any other modulators modulating the amount your envelope is modulating!



For more information on modulation assignment and control, please go to the [Modulators \[p.114\]](#) chapter.

11. MODULATORS



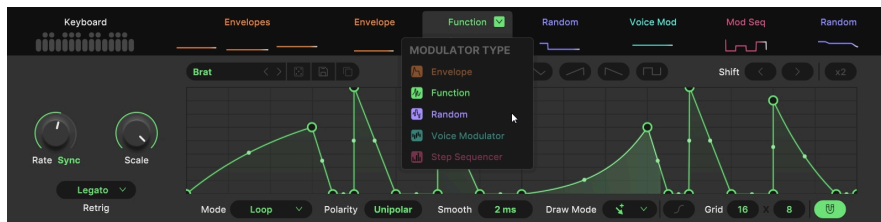
The remaining tabs in the bottom section of Pure SUB, after the keyboard controls and dedicated envelopes, give you 6 modulation slots. Each one can be filled with a choice from 5 advanced modulation sources for sophisticated movement and parameter manipulation.

They are really easy to use, simple to assign to parameters, have a unique approach to modulation, and are easily identifiable by their color.

Modulator	Color	Description
Envelope [p.119]	Orange	An ADSR envelope with delay.
Function [p.121]	Green	A multi-segment generator.
Random [p.130]	Purple	A generator of unpredictable values.
Voice Modulator [p.133]	Teal	A per-voice value generator.
Step Sequencer [p.134]	Pink	A step-sequencer for modulation.

11.1. Loading a Modulator Source

The Modulators are selected and chosen by clicking on their tabs.



Each of the 6 tabs can have the same or different Modulators loaded. In each tab, you get a useful display of the modulator in action. This is also where you perform the drag-and-drop of the modulator to a destination parameter.

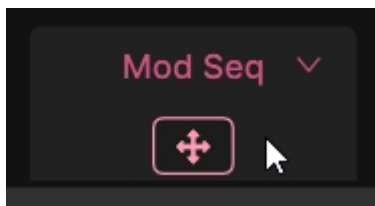
11.2. Assigning a Modulator

Before we can play with the Modulators and hear what they do, we'll have to assign them to control almost any knob or parameter in the main Synth or FX Pure SUB interface, including other Modulators.

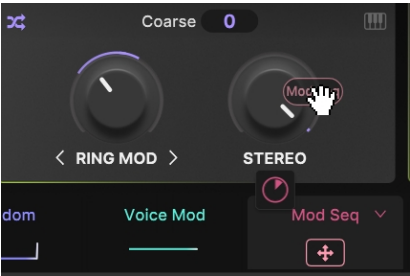
As an example, we're going to assign the Mod Seq (Step Sequencer) to the Texture controls in this preset.



Hover your mouse over the Mod Seq tab and the display will switch into the assignment tool.



Click and hold to capture the tool and then drag it onto any knob or parameter.



As you drop the assignment onto the knob, a colored "Quick Edit" knob/circle appears underneath. This controls the depth of modulation going to that parameter. It will appear whenever you hover your mouse over the knob being controlled, and you can simply move your mouse over it to edit it.



As you hover over or change the amount knob, it will display the current amount value along with the range of values the Modulator is modulating.

You can also assign it to more than one parameter; simply repeat the process and drag and drop the Modulator onto another knob. Or have multiple Modulators assigned to a single knob. You will see the other assignments slightly greyed out when you hover over the knob.



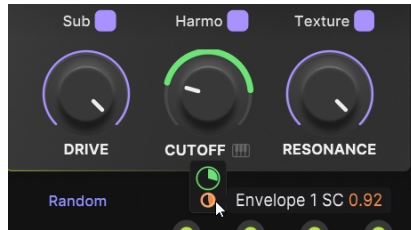
As you hover on a Quick Edit knob, the color of the modulator, the range, and position will be shown as a colored band around the knob, making it easy to see how it's being affected.

i To assign a Modulator to another Modulator or control something on another tab simply hover the mouse over the tab, and it will come into focus.

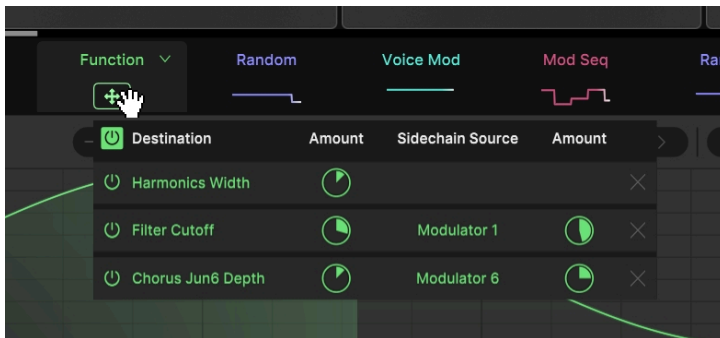
11.2.1. Sidechain Modulation

You may notice, as you are about to drop an assignment on a knob, that existing assignment Quick Edit circles have little circles underneath. These are places where you can assign a modulator to sidechain-modulate the amount of the assigned modulator.

So, you may have a Function Generator sending an LFO to the filter cutoff. You could sidechain an Envelope modulator to increase and decrease the amount of LFO modulation going to the cutoff.



11.3. View and edit assignments



To view and edit the assignments for any Modulator, hover the mouse over the tab; they'll be displayed as a list. The list also lets you disable any modulation without removing it by clicking its power button.

Hovering over any of the Amount controls will show the color of the modulator as the modulation amount, around the knob it's been assigned to, making it easy to identify.

The sidechain sources are also shown here. They are not named by the type of modulator but rather by the slot number it's coming from. This is so you can change the modulator being used in an assignment without breaking the connection.

i During normal usage, the total modulation of any knob in the main synthesizer interface will be animated in purple regardless of which or how many modulators are assigned to it. This is not related to the similar purple color used with the Random modulator.

11.4. Removing an assignment

To remove an assignment, double-click on its Quick Edit knob underneath the destination. This first sets the value to zero. Then, when your cursor leaves the area, the Quick Edit knob disappears. If you want to disable the modulation without removing it (so that you can hear other things better, for example), use the on/off buttons in the Source View lists. Don't forget to make use of the Undo/Redo buttons if you change or remove an assignment by accident.

11.5. Swapping Modulation Sources

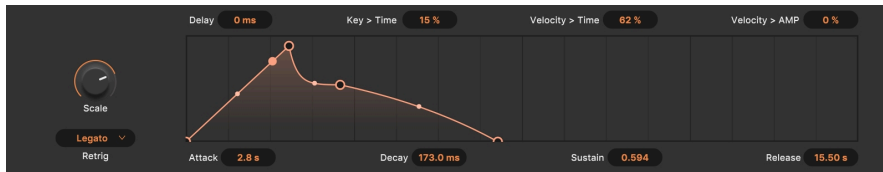
Selecting a different modulation source for one of the 6 available slots does not change any of the assignments for that slot – a source assigned to multiple destinations will retain them all. On the destination end, the Quick Edit knobs always reflect the order of modulation slots from left to right in the modulation view.

When you change the modulation source, the only thing that changes in terms of assignment is the color of the Quick Edit knob.

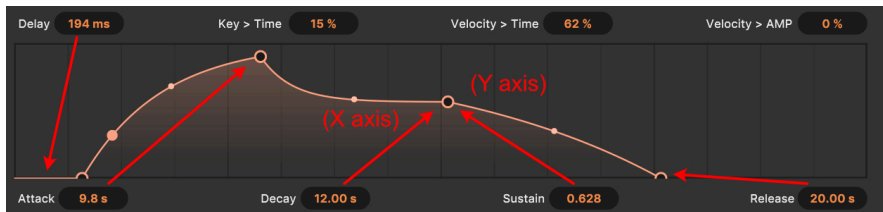
11.6. Modulation Sources

Let's have a look at each modulation source in more detail.

11.6.1. Envelope

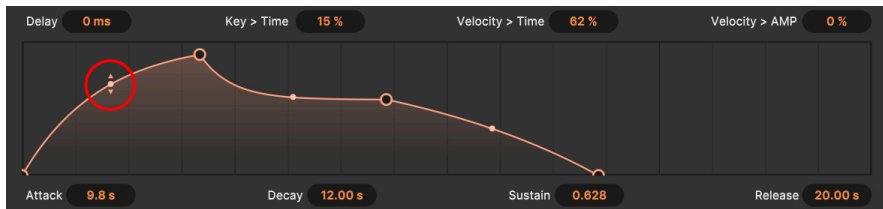


The Envelope modulator is essentially a synth envelope generator, with the addition of an adjustable delay before the attack phase begins. Instead of knobs, we have value fields that you can click and drag to change. You can also adjust its main settings by moving the breakpoints in the graphic visualizer. Try it, and you'll see their actions mirror each other.



Each parameter mirrors the position of a breakpoint in the graphic envelope.

11.6.1.1. Envelope Curves



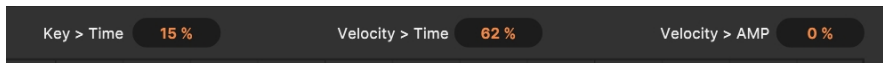
Grab the handle to adjust the shape of the envelope segment between each breakpoint. Hover over the small dot in the center of a segment. Up and down arrows will appear. Now, click and drag the segment into the desired shape.

11.6.1.2. Main envelope parameters

The main envelope parameters work as follows:

- **Delay:** Adds a time lag before the attack stage begins.
- **Attack:** Sets the time it takes for the envelope to rise to peak level once a note is played.
- **Decay:** Sets the time it takes for the envelope to fall from peak level to the sustain level.
- **Sustain:** Adjusts the sustain level at which the envelope remains as long as a note is held.
- **Release:** Sets the time it takes for the envelope to fall from the sustain level back to zero when a note is released.

11.6.1.3. Envelope MIDI modulations

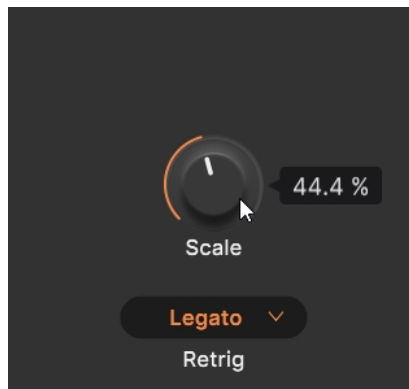


Three more parameters let MIDI notes and velocity affect the envelope for added expression.

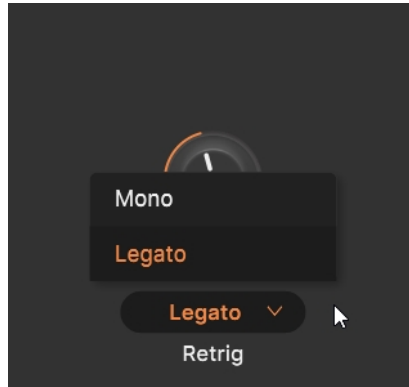
- **Key > Time:** Envelope times (attack, decay, release) become more sensitive to keyboard notes.
- **Velocity > Time:** Envelope times (attack, decay, release) become more sensitive to MIDI velocity.
- **Velocity > Amp:** Scale parameter becomes more sensitive to velocity

11.6.1.4. Envelope Scale

The Scale knob at the far left sets a ceiling on the overall modulation output of the envelope. You can think of it as determining the Envelope's peak level at the top of the attack phase.



11.6.1.5. Envelope Retrigger



The retrigger settings determine what actions will start the envelope over from the beginning of its cycle, and how notes are affected.

- **Mono:** Each new note starts the cycle over for all currently held notes.
- **Legato:** New notes played legato (before previous notes are released) will not retrigger the envelope.

To get familiar with these, assign an Envelope to something quite audible, like a filter cutoff. Then play notes, listen, and watch the tracer puck glide along the envelope curve, looking for when it goes back to the beginning.

11.6.2. Function



The Function generator can be thought of as a highly flexible envelope-meets-LFO – if the two were fused by a mad scientist. The concept is that you can create any kind of modulation shape you can imagine.

11.6.2.1. Rate

The Function's rate can run free or be synced to project tempo via a drop-down menu accessed by clicking on the current Rate setting.

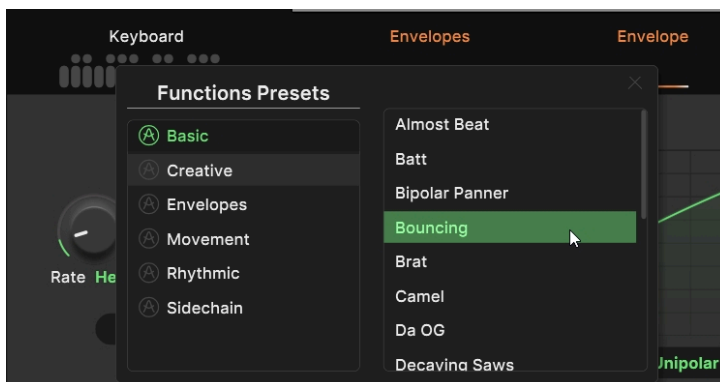
The options are:

- **Hertz:** Free-running time set as a frequency from 0.025Hz to 50Hz.
- **Sync:** All tempo divisions are available when you turn the knob.
- **Sync Straight:** Only even-numbered tempo divisions.
- **Sync Triplets:** Contains triplet tempo divisions where three notes are played in the time of two.
- **Sync Dotted:** Contains dotted tempo divisions, which add half the value of the note to itself.

11.6.2.2. Scale

As with the Envelope, the leftmost knob sets the scale (overall output) of the function, while preserving all of its time and level relationships.

11.6.2.3. Function Presets

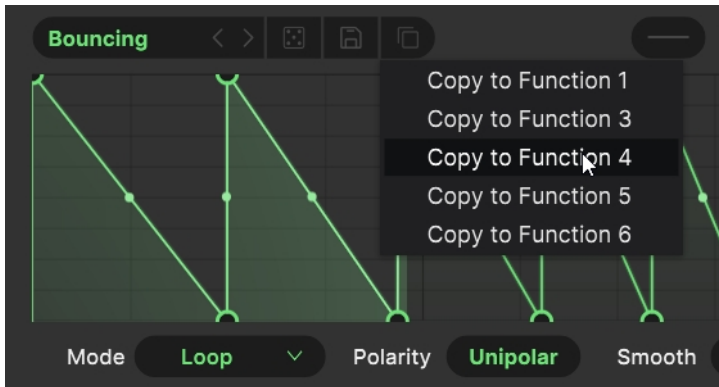


Function categories are on the left; individual presets on the right.

Before we create our own functions, click on the Presets field to see the factory selections and get an idea of just how many shapes a function can take. On the left are general categories of functions, and within each are a bunch of possibilities listed on the right.

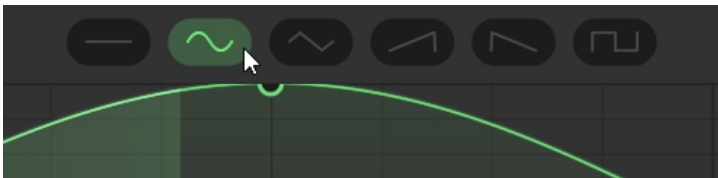
Click the dice icon to randomly select a preset from the library. Click the disk icon to save your own creations. A user category will then appear in the left column of the menu.

11.6.2.4. Function Copy



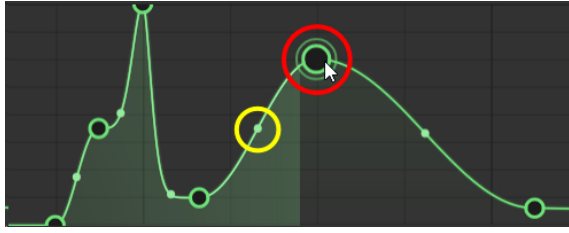
Click the double-document icon to copy the selected Function's settings to another modulator slot. If a different modulation source (Envelope, Random, or Mod Sequencer) is currently in the target slot, then it will replace it with another Function modulator.

11.6.2.5. Function LFO Shapes



In addition to this preset library, there are six basic waveshapes intended for use with the Function as an LFO or for starting your own shape: flat, sine, triangle, ramp, saw, and square.

11.6.2.6. Breakpoints and grab handles



A breakpoint is circled here in red; a grab handle in yellow.

Functions let you create any curve or shape of modulation with two simple tools: **breakpoints** and **grab handles**.

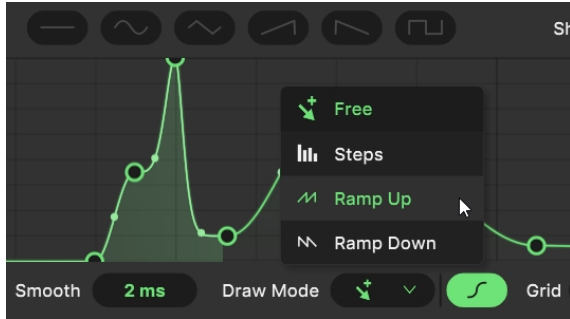
A breakpoint is a point in time at which the modulation changes direction, turns a corner, or adds a new segment. Left-click on the graph to add a breakpoint. Right-click on the point to delete it – a quick pop-up will appear to confirm your intention to delete. Or you can double-click a breakpoint to delete it instantly.

Between any two breakpoints, there is a grab handle that you can drag to change the shape or intensity of the curve between those two points, much like with the Envelope. Leaving a handle in mid-position would create a more or less straight line between points. Dragging it as far as it will go in a direction generally creates a steep “knee” shape.

Between grab handles and breakpoints, any shape can be created, from a simple sine wave for an LFO to extremely complex shapes for maximum movement.

11.6.2.7. Drawing Tools

Click on Draw Mode to bring up the list of drawing tools. These can speed up your Function creation by letting you draw repeating shapes via click-dragging inside the visualizer.



- **Free:** Creates a single point that can be dragged to any position between two other points.
- **Steps:** Creates a straight line the width of the current grid setting which can be dragged to any height. A new line appears as you cross a grid line, letting you easily create steps.
- **Ramp Up:** Creates a rising sawtooth pattern the width of the current grid setting.
- **Ramp Down:** Creates a falling sawtooth pattern the width of the current grid setting.

Position the mouse in the visualizer so that your cursor becomes a pencil icon. Then drag in either direction to produce the patterns or shapes. The pattern repeats as you cross grid lines set by the Grid value.

11.6.2.8. Curve



Left - Curve off, Right - Curve on

The S-shaped curve button to the right of the Draw Mode menu adds a smooth in-out transition to all points. This effectively adds curves to all diagonal lines, leaving vertical and horizontal ones unchanged.

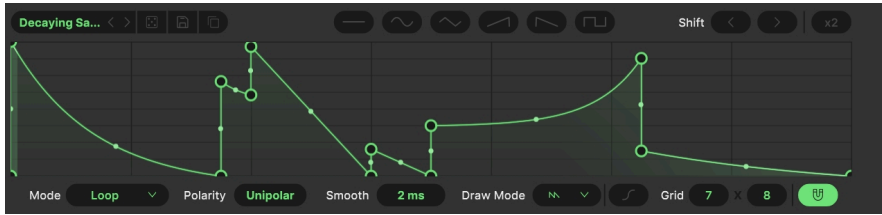
11.6.2.9. Grid and Magnetize



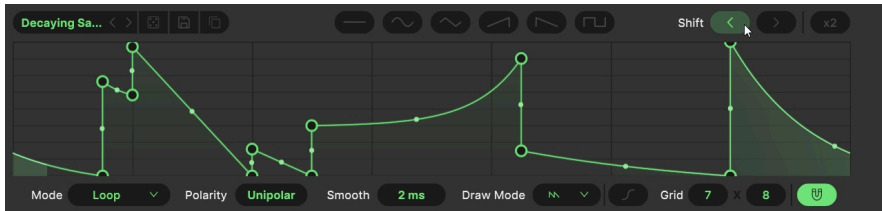
The Function visualizer has a faint grid overlaid in the background, which can be used as a guide to creating your function shapes. When the magnet button at the bottom right is lit, moving breakpoints around the display will have a magnetic pull towards the grid lines, making it easy to create rhythmic Functions and precise shapes. You can still place breakpoints off the grid, but if you want a freer hand, you should disable the magnet. Holding Shift while dragging temporarily disables the magnet. This does not affect the Draw Mode shapes, as they always fit to the grid size.

The grid can be anywhere from 3 to 32 segments horizontally and 1 to 24 vertically. Drag up and down on the numerical fields to adjust the resolution.

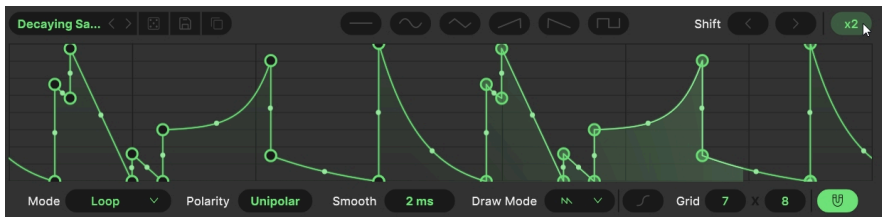
11.6.2.10. Shift and Duplicate



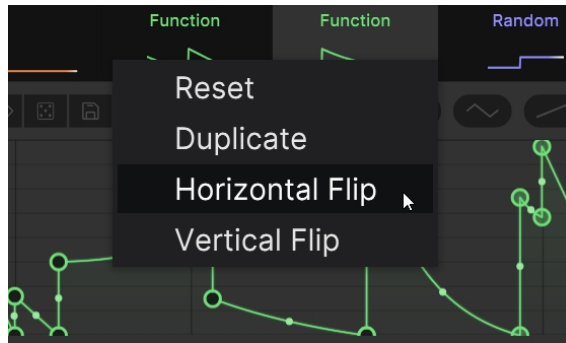
The Shift arrows at the top right move the Function forward or backward in time along the horizontal grid lines. As you shift it, the function wraps around so that the front appears at the back and vice versa, as below.



The "x2" button doubles the pattern of the function over the same amount of time, fitting in twice the modulation. One result of this is that each duplication doubles the speed of the original pattern. You can repeat the duplication as far as the grid will allow a segment to be halved.



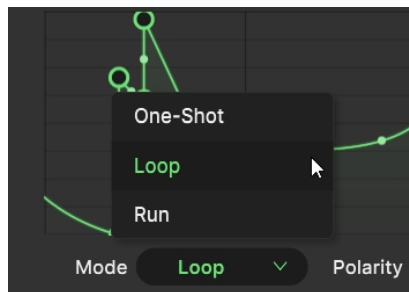
11.6.2.11. Additional Editing Tools



Right-click anywhere in the display other than on a breakpoint to bring up the above menu of editing options:

- **Reset:** Resets the function to “flatline” – be careful with this one!
- **Duplicate:** Creates a duplicate of the current function and places both in the space of the original, giving you twice the modulation in the same time.
- **Horizontal Flip:** Creates a mirror image of the function horizontally.
- **Vertical Flip:** Creates a mirror image of the function vertically.

11.6.2.12. Function Mode

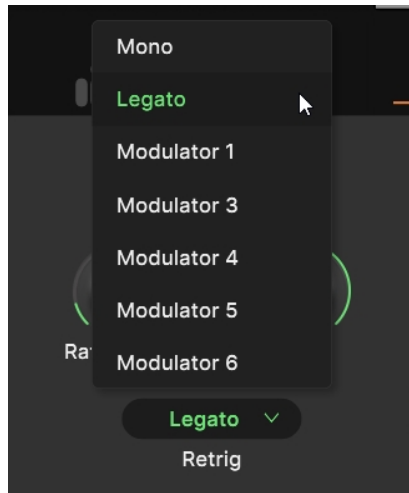


The Function Mode sets how the function plays and what happens when you get to the end; does it stop, does it loop, does it retrigger?

There are three options:

- **One-Shot:** The Function plays through once in response to a key press, and stops at the end.
- **Loop:** The Function loops constantly and is retriggered from the start on every key press.
- **Run:** The Function loops constantly regardless of any key presses, very much like an LFO.

11.6.2.13. Retrigger

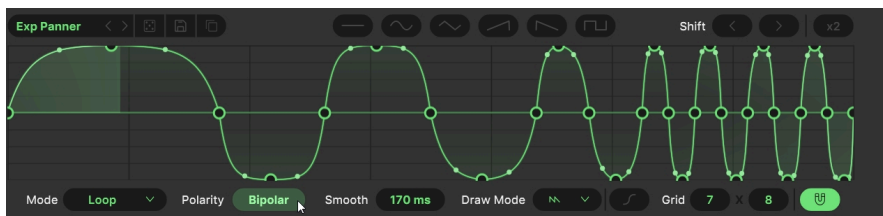


The Retriggering mode affects the function retriggering in the Function mode. It should be noted that in Run mode, retriggering is not a factor, and so it's disabled whenever Run is selected.

You have a number of options.

- **Mono:** Triggered with each new note.
- **Legato:** Not triggered for notes played legato.
- **Modulator 1-6:** Allows the Function to be triggered by one of the other modulators.

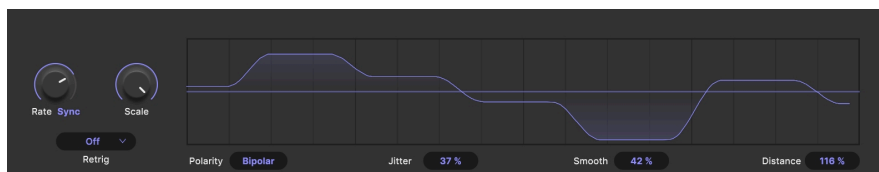
11.6.2.14. Polarity and Smooth



To the right of the Function Mode are two final parameters: *Polarity* and *Smooth*. Polarity toggles between unipolar, where the function is always a positive influence on a knob, and Bipolar, where a line appears across the center and everything above it is positive and everything below has a negative pull on the parameter, as in the image above.

The Smooth value eases the sudden change in direction at breakpoints to help reduce clicks and audio artifacts.

11.6.3. Random

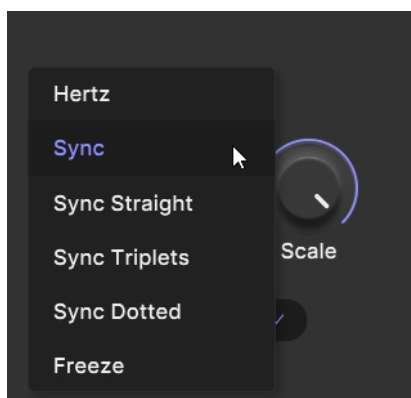


The Random function generates a continuous stream of random, unpredictable values. The values can be stepped or smooth, ordered or chaotic, and are perfect for adding rhythmic variations to carefully chosen parameters.

The four main controls along the bottom are as follows:

- **Polarity:** toggles between unipolar, where the function is always a positive influence on a knob, and Bipolar, where a line appears across the center, and everything above it is positive, and everything below has a negative pull on the parameter.
- **Jitter:** Adds a random amount of delay to the generation of the next value. It takes our very ordered pattern of steps or waves and messes with the width or regularity, so it becomes much less ordered.
- **Smooth:** Transforms the steps into flowing waveforms for smoother transitions between values.
- **Distance:** Sets the range within which a new random value can deviate from the current one. At 0%, the line becomes flat; at 100%, the values operate equally within the full range of values. When over 100% the values are scaled closer and closer to the maximum and minimum values until it reaches 200%, and the values flip between the top and bottom of the range.

11.6.3.1. Rate

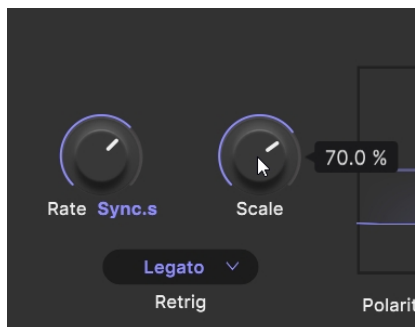


The Function's rate can run free, frozen or be synced to project tempo via a drop-down menu accessed by clicking on the current Rate setting.

The options are:

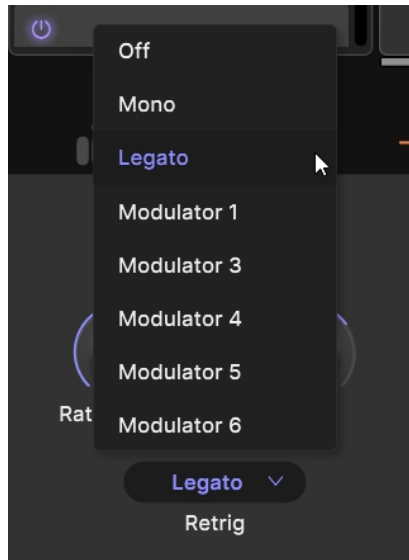
- **Hertz:** Free-running time set as a frequency from 0.025Hz to 50Hz.
- **Sync:** All tempo divisions are available when you turn the knob.
- **Sync Straight:** Only even-numbered tempo divisions.
- **Sync Triplets:** Contains triplet tempo divisions where three notes are played in the time of two.
- **Sync Dotted:** Contains dotted tempo divisions, which add half the value of the note to itself.
- **Freeze:** Gives you a new value on every key press and holds, or freezes, that value until the next key press. Freeze relies on the Retrigger mode being anything other than *Off*.

11.6.3.2. Scale



The Scale knob sets the Modulator's overall output while preserving all time and level relationships within it.

11.6.3.3. Retrigger

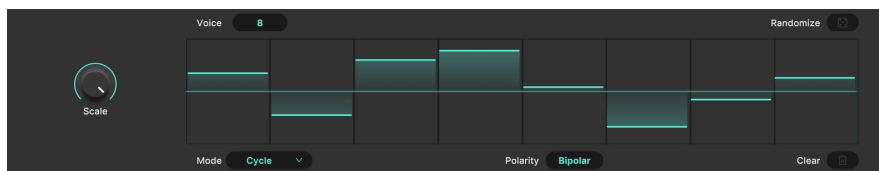


The Retriggering mode has an impact on when new values get generated. It should be noted that in all other Modulators, the visualizer shows values starting on the left and progressing to the right. In the Random modulator the new values emerge on the right and run to the left. So the visualizer is actually showing you past values rather than values coming up. This becomes clearer once you look into retriggering.

You have a number of options:

- **Off:** Random values are continuously generated according to the Rate, and are unaffected by key presses.
- **Mono:** A new value is generated on every key press.
- **Legato:** If the notes are played legato (you start a new note before the last note has finished), then a new value isn't triggered; the modulation continues to change in line with the Rate.
- **Modulator 1-6:** Allows the generation of a new value to be triggered by one of the other modulators.

11.6.4. Voice Modulator

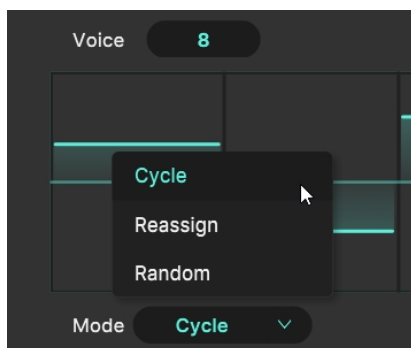


The idea behind the Voice Modulator is that each voice, or each played note, has its own set value that can be used to alter a parameter. So, for instance, the filter cutoff could be different for each voice, or the tuning could be different, or the decay of the envelope. When used moderately, it could mimic the differences you have between voices in an old analog synthesizer. Or it can be used wildly to create large variations between notes.

i Whether the Pure SUB Voicing Mode is set to Retrigger or Legato will affect how a modulator is triggered.

Each of the bars represents the modulation value for one voice. By clicking and dragging, you can set each of the bars to different values. The Mode then dictates how the values are assigned to the voices as you play.

i Pure SUB is a monophonic synthesizer, so the concept of *Voices* can feel a little strange, as it tends to be used in reference to polyphony. With Pure SUB, each note is seen as a new voice, even when other notes or voices cannot be playing.

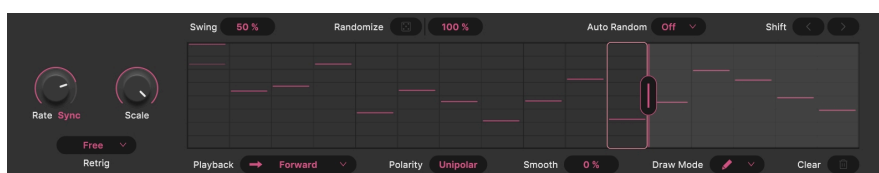


- **Cycle:** Each value is assigned in sequential order to the next note played. If you repeatedly play a note, the Voice Modulator will cycle through each value in turn.
- **Reassign:** Each value is assigned in sequential order to the next NEW note played. If you repeatedly play the same note, the Voice Modulator will assign it the same value. It's only when you play a new note that it gets the next value.
- **Random:** Each note is assigned a random value from the Voice Modulator.

Other controls are as follows:

- **Voice:** Sets the number of voices, and so the number of bars in the visualizer, available for values. This goes from 1 to 8.
- **Scale:** Sets the overall output of the Modulator while preserving all of the time and level relationships within it.
- **Randomize:** Generates a new set of randomized values
- **Clear:** Resets all voices to zero.
- **Polarity:** Toggles between unipolar, where the function is always a positive influence on a knob, and Bipolar, where a line appears across the center and everything above it is positive, and everything below has a negative pull on the parameter.

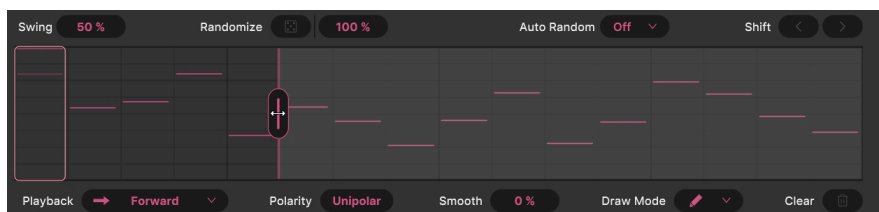
11.6.5. Step Sequencer



The Step Sequencer Modulator is designed to move parameters rather than play notes. However, you could assign the Step Sequencer to the coarse pitch of the Engine and use it like a regular step-sequencer, but it's not calibrated or quantized to note or semitone values, so it wouldn't necessarily be tuneful. The idea here is that you write a sequence of values that can modulate a destination in a rhythmic and repeatable way.

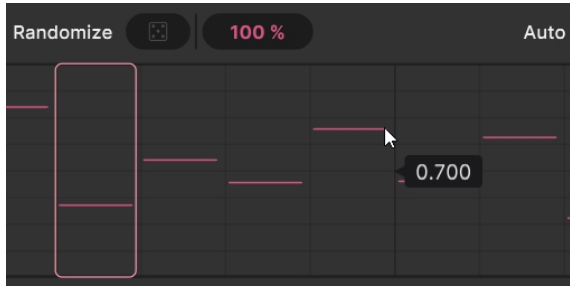
Step Sequencer has up to 16 steps, numerous playback directions, can scale and randomize, be stepped or smooth, shifted and retriggered, can swing itself out of time, and automatically re-randomize itself. It's a very fun modulator.

11.6.5.1. Setting Pattern Length



Grab the handle at the edge of the sequence, usually on the far right, and slide it back and forth to set the overall length of the pattern.

11.6.5.2. Setting Step Values

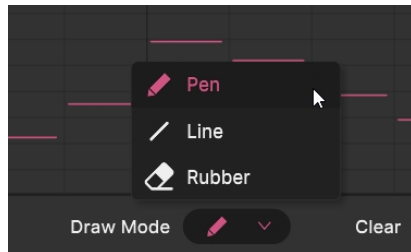


To set a step value, click anywhere in the grid at the step you want to add or edit, then drag up and down to fine-tune. The actual value will be displayed in a pop-up.



You don't have to click on an existing step line to edit it; the line will jump to wherever you click the mouse.

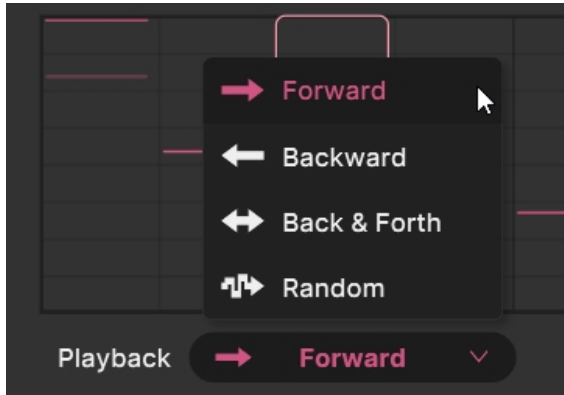
11.6.5.3. Drawing Modes



Mod Sequencer has a couple of drawing modes to speed up pattern creation. Click on the Draw Mode icon to show the pop-up.

- **Pen:** Free-drawing; drag the cursor across the grid, and new values will appear at each step
- **Line:** Creates an ascending or descending series of steps when you drag the mouse horizontally on the grid. Then, before you release the mouse, you can scale the steps by dragging vertically.
- **Rubber:** Eraser tool; click or drag across any steps to set them to zero.

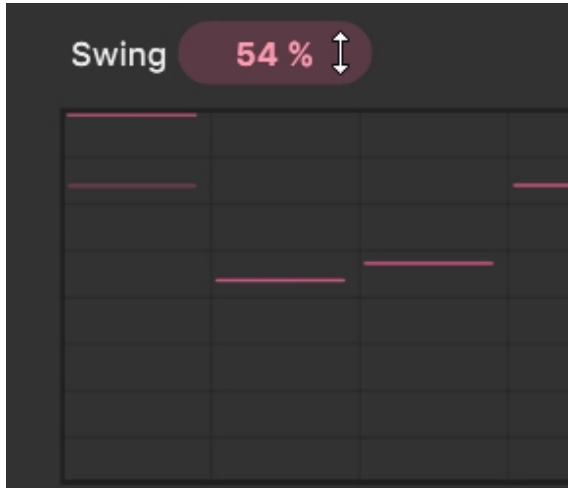
11.6.5.4. Playback Mode



The sequence can run in different directions. From the Playback pop-up menu, you can choose from:

- **Forward:** Sequence plays left to right.
- **Backward:** Sequence plays right to left.
- **Back & Forth:** Sequence plays in one direction, then reverses; first and last steps are repeated.
- **Random:** Sequence jumps to random steps.

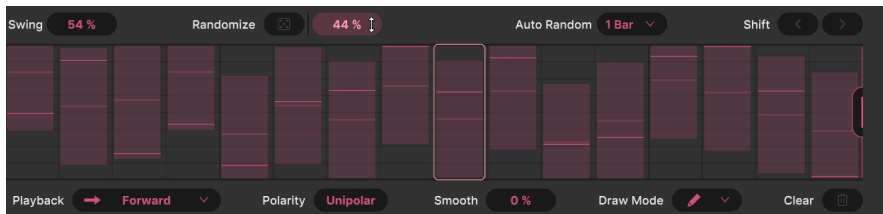
11.6.5.5. Swing



Introduces some swing to the rhythm of the playback by lengthening some steps and shortening others. The range is from 50% to 75%.

At 50%, the feel is completely straight and on the beat as the duration of each step is in an equal ratio. At 75%, it's developed a bit of a gallop as the duration is now at a ratio of 75 for one step and 25 for the next. You can find all sorts of feels in between.

11.6.5.6. Randomization



Click the "dice" icon to generate a completely random set of values for all steps. In any given step, the dimmer bar represents any manually set step value, and the brighter bar represents the new randomly generated one. If you continue to randomize, the dim original value stays the same as new random values appear.

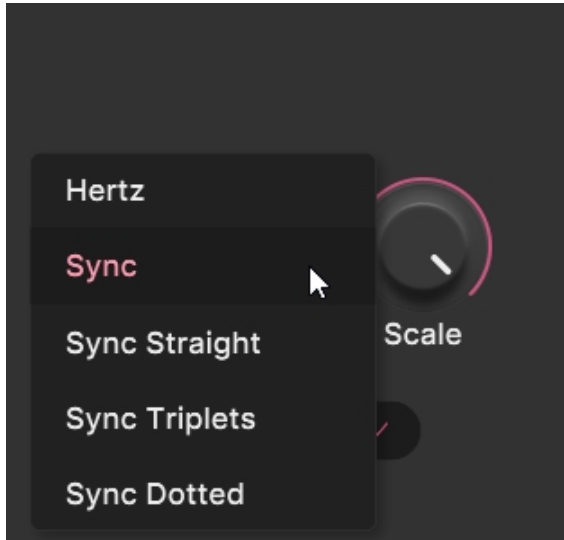
The percentage field to the right of the dice restricts the range within which a random value can be generated above and below the original value. Hover over it, and the sequencer displays the ranges as colored vertical bars.

At 100%, random values can appear in the whole range of the Mod Sequencer. At 0%, the randomizer button can't produce any new values.

11.6.5.7. Auto-Random

You can also let the Mod Sequencer generate a new set of random step values every bar or every two, four, or eight bars using the above menu. The generation is still restricted by the percentage range value and always re-generates random values around the original value. This is a great way of adding subtle variations to a repeating pattern.

11.6.5.8. Rate and tempo Sync.

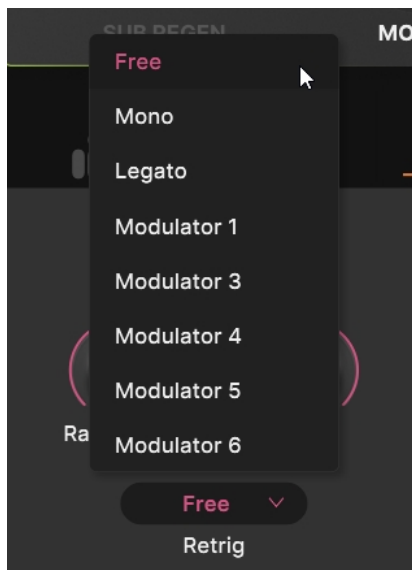


The sequencer can free-run or sync to project tempo. Access these options by clicking beneath the Rate knob:

The options are:

- **Hertz:** Free-running time set as a frequency from 0.1Hz to 20Hz.
- **Sync:** All tempo divisions are available when you turn the knob, including dotted and triplets.
- **Sync Straight:** Only even-numbered tempo divisions.
- **Sync Triplets:** Contains triplet tempo divisions where three notes are played in the time of two.
- **Sync Dotted:** Contains dotted tempo divisions, which add half the value of the note to itself.

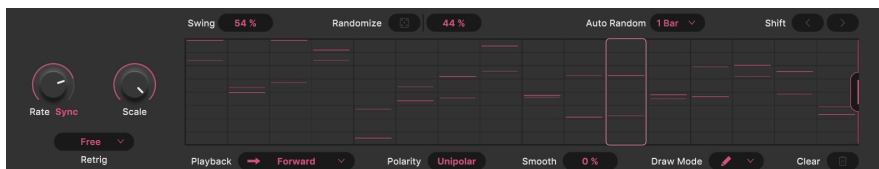
11.6.5.9. Retrig



You can determine which events will cause the sequencer to restart from the beginning of the pattern via the menu at the lower left of the window.

- **Free:** The sequence patterns runs continuously and are not triggered.
- **Mono:** The sequence restarts on any new note press.
- **Legato:** The same as Mono, but the sequence does not restart if notes are played legato, or overlapping.
- **Modulator 1-6:** Allows the sequence to be restarted by one of the other modulators.

11.6.5.10. Other parameters



There are a handful of other parameters that complete the function set of the Mod Sequencer.

Feature	Description
Scale	Sets the overall output of the Modulator while preserving all of the time and level relationships within it.
Clear Sequence	Resets all voices to zero.
Polarity	Toggles between unipolar, where the function is always a positive influence on a knob, and Bipolar, where a line appears across the center and everything above it is positive, and everything below has a negative pull on the parameter.
Smooth	Transforms the steps into flowing waveforms for smoother transitions between values.
Shift	The Shift arrows at the top right move the sequence forward or backward in time along the horizontal grid lines. As you shift it, the sequence wraps around so that the front appears at the back and vice versa.

12. MACROS



Macros are a longtime staple of Arturia instruments. They let you assign multiple parameters to a single knob that then can affect large amounts of change with a single turn. There are four Macro knobs, and you'll find them alongside the Modulators, and in the Preset Browser.



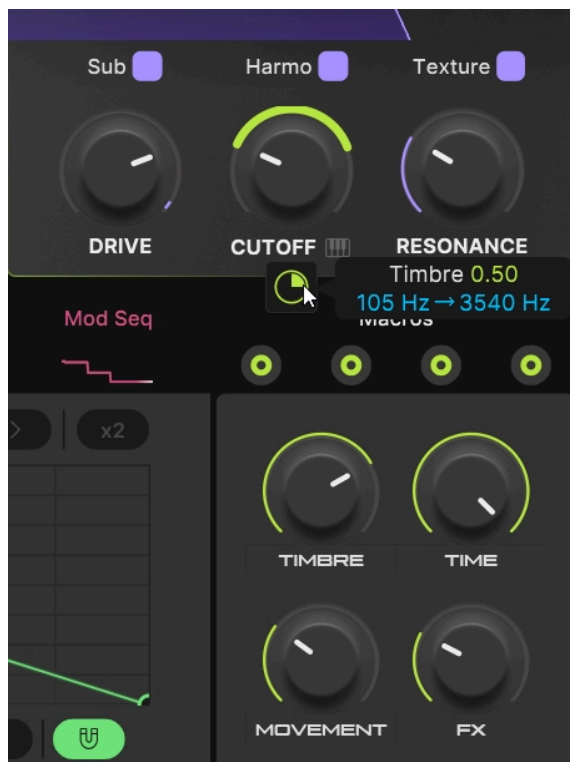
By default, the Macros are called *Timbre*, *Time*, *Movement*, and *FX*, and on the whole, the presets use these as suggestions for what the Macro might be controlling. However, you can rename them and use them however you wish.

12.1. Assigning Macros



Macros are assigned to parameters in the same way as the Modulators, by dragging the icon in the tab onto the knobs you wish to control. If you hover your mouse over the icon in the tab, you'll be able to see a list of exactly what that Macro is mapped to. As you move your mouse to each of the *Amount* knobs, you'll see a band of color around the assigned knob, making it easy to identify.

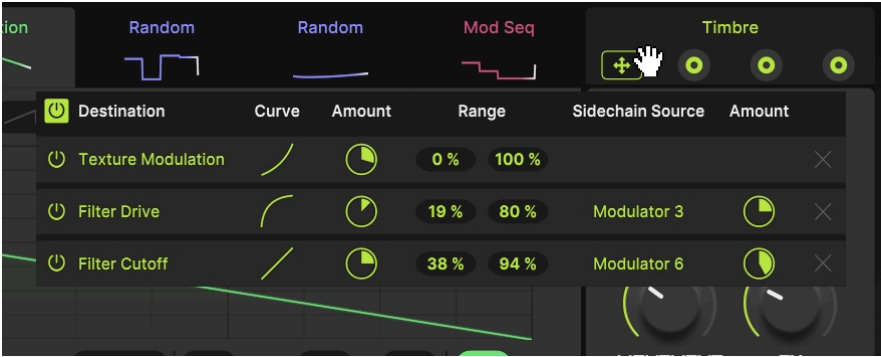
The tab pop-ups are useful because they let you do quick edits on all the Macro assignments without having to visit each knob in turn. Although, you can do that too.



If you hover the mouse over one of the assigned knobs, an acid green-coloured Quick Edit knob pops up that allows you to precisely adjust the range of modulation coming from the Macro. The pop-up includes the name of the Macro and the current value. You can double-click the Quick Edit knob to remove the assignment.

i All four Macros are represented by the same color Quick Edit knobs. To see which Macro they are assigned to, you need to hover your mouse over the Quick Edit knob, and it will be named in the pop-up.

12.2. Destinations List



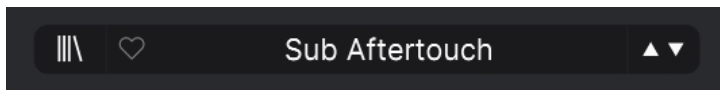
The Modulation Destinations List displays the assigned destinations and provides controls for managing modulation assignments and their behavior.

Feature	Description
On/Off	Disables the assignment without deleting it.
Destination	The parameter that's being controlled.
Curve	Response curve of the control. A straight line gives a linear rate of change as you turn the Macro, but you can click and drag to change the line into a curve to alter how the turn of the Macro changes the value.
Modulation Amount	Changes how much of the Macro will be sent to the destination. This can be positive to the right, or negative (inverted) to the left. So the Macro could be turning something down while it's being turned up. This mirrors the amount set on any Quick Edit knobs that pop up when you hover your mouse over a control in the main synthesizer.
Range	Determines the Macro range over which the modulation occurs.
Sidechain Source	When another modulator is assigned to the modulation amount, it is shown here.
Sidechain Amount	The amount of modulation being applied to the original modulation amount.
X	Removes the assignment.

i As you move the Macro knob, you will see the movement of purple modulation indicators around the knobs and parameters it has been assigned to. This is common for all modulators.

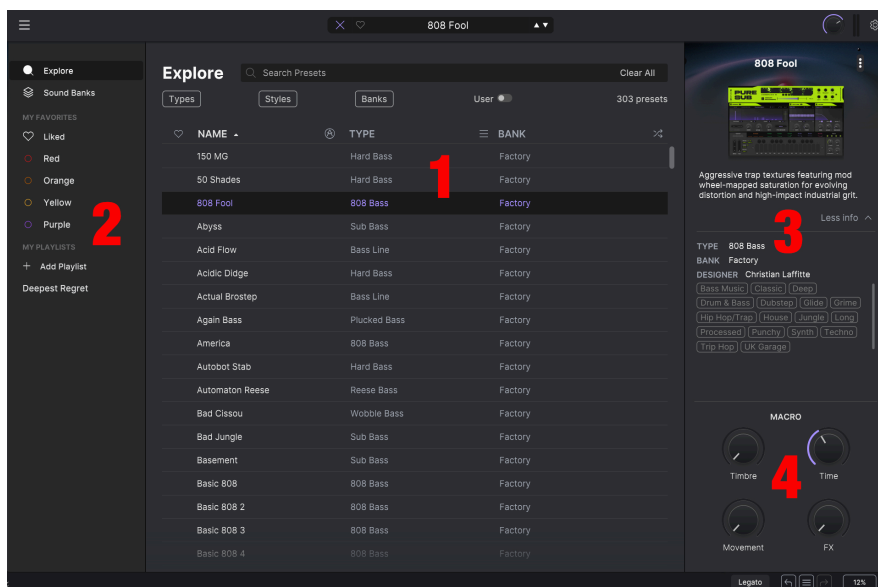
13. THE PRESET BROWSER

The Preset Browser is how you search, load, and manage sounds in Pure SUB. It can display different views but they all access the same Presets and subgroups of Presets.



You can quickly browse through presets by clicking on the preset name and selecting from the drop-down list. However, to access the full browser, with all the tools and features, click the browser button (the icon looks like books on a library shelf) to the left of the preset name. To close the browser, click the **X** that appears in its place.

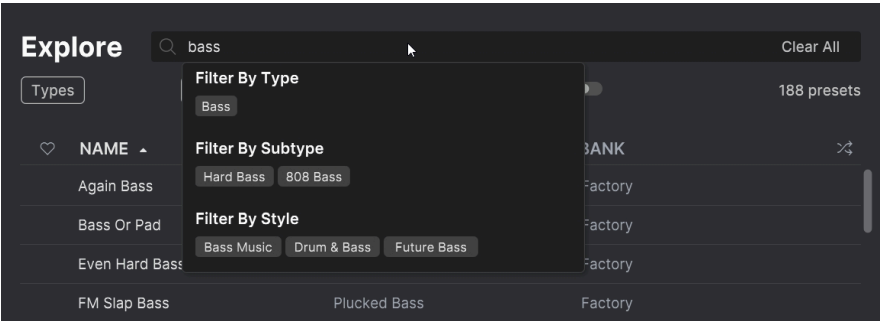
The browser has four main areas:



Number	Area	Description
1.	Search and Results [p.146]	Search Presets with text strings, and by tags for Type and Style
2.	Sidebar [p.153]	Manage Banks, Favorites, and Playlists
3.	Preset Info [p.157]	Summary of Bank and Tags, Designer name, and description info for current Preset
4.	Macro knobs [p.159]	Knobs that change multiple parameters with one control movement

13.1. Search and Results

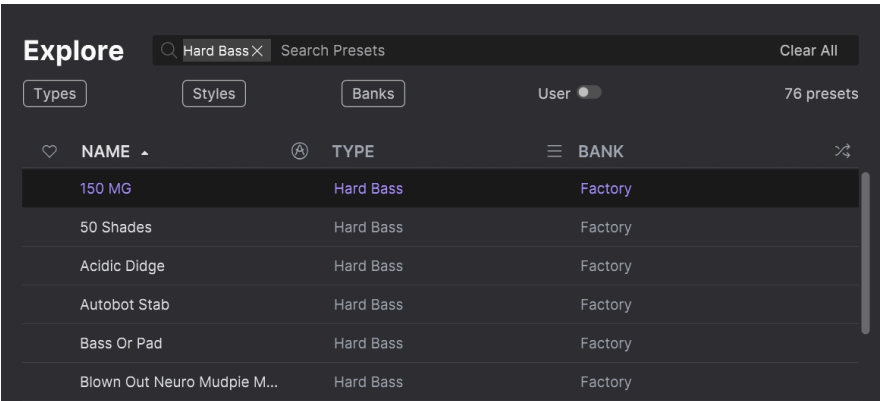
With *Explore* selected in the sidebar, click on the Search field at the top and enter any search term. The Results list beneath shows all Presets that fit your search. Click the X icon at right to clear your search terms.



The window shows real-time suggestions based on your search string

Notice a couple of things going on in the above example. In response to typing the letters “bass,” the main results list displays Presets with “bass” somewhere in the name. Also, the window that appears below the search bar dynamically finds tags where “bass” is relevant. In this case, those are Type, Subtypes, and Styles.

Click on any of the tags in this window to add it to the search bar. For example, if you click on the *Hard Bass* tag, you’ll get a list of all Presets that have that Subtype:



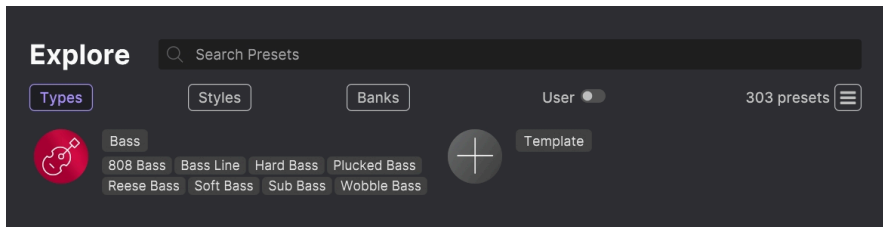
13.2. Using Tags as a filter

You can narrow (and sometimes expand) your search using different tags. There are two kinds of tags: *Types* and *Styles*. You can filter by one, the other, or both. Our extensive range of MIDI controller keyboards also allows you to browse sounds directly from the MIDI keyboard.

13.2.1. Types and Subtypes

Types are broad categories of instruments. Each has further subtypes that get more specific (bowed vs. plucked strings, for example). If you click on *Types* you'll see the Types listed with Subtypes underneath, and an appropriate icon for easier navigation.

As Pure SUB is fiercely and specifically a bass synth. So, unlike other Arturia Instruments it only has the one *Type*, which is *Bass*. However, it does have a few Subtypes to help you narrow the search down to the perfect bass.



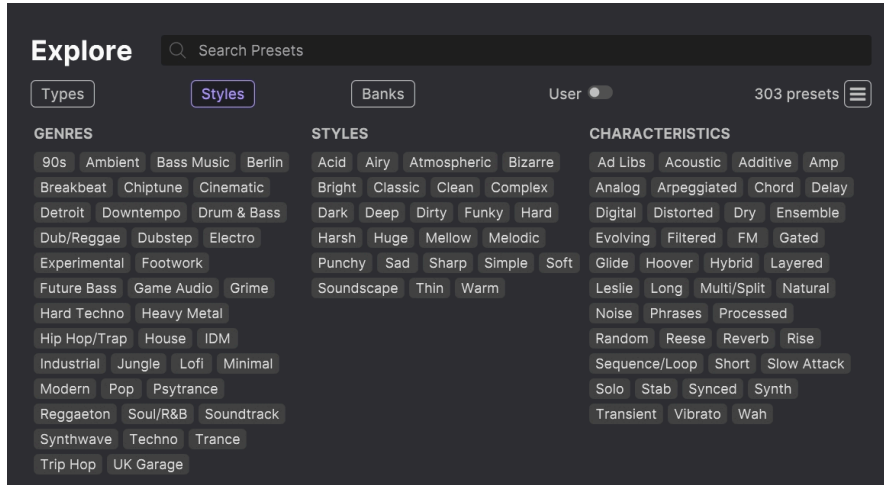
Click any Type or Subtype tag, and the results will show only Presets that match that tag. You can also select multiple tags using Cmd-click (macOS) or Ctrl-click (Windows). For example, if you aren't sure whether the Bass preset you're looking for was tagged with the subtype "Hard Bass" or "Plucked Bass", select both to broaden the search.

Results can be sorted and reverse-ordered by selecting a column (Name, Type, Designer) and clicking the arrow buttons to the right of their titles.

13.2.2. Styles

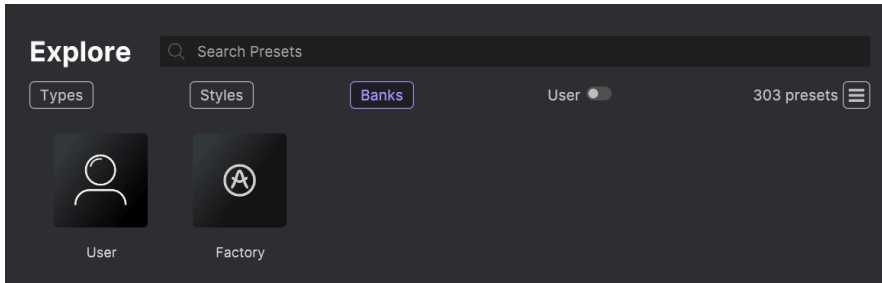
Styles refine your search according to even more detailed musical attributes. Accessed by the **Styles** button, this area has three further subdivisions:

- *Genres*: Identifiable musical genres such as decades, Trance, Techno, Synthwave, Disco, etc.
- *Styles*: General “vibe” such as Atmospheric, Dirty, Clean, Complex, Mellow, etc.
- *Characteristics*: Sonic attributes such as Analog, Evolving, Distorted, Dry, Rise, etc.



Click on any Style tag to select it. Click again (or right-click) to de-select it. Notice that when you select a tag, several other tags grey-out and become unselectable. This is because the browser is narrowing your search by a process of elimination. De-select any tag to remove that criterion and widen the search without having to start all over again.

13.2.3. Banks

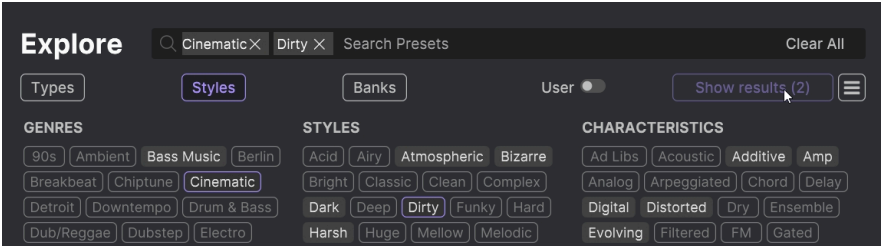


Next to the **Types** and **Styles** buttons is the **Banks** button, which lets you do your search (using all the methods above) within the factory or user banks.

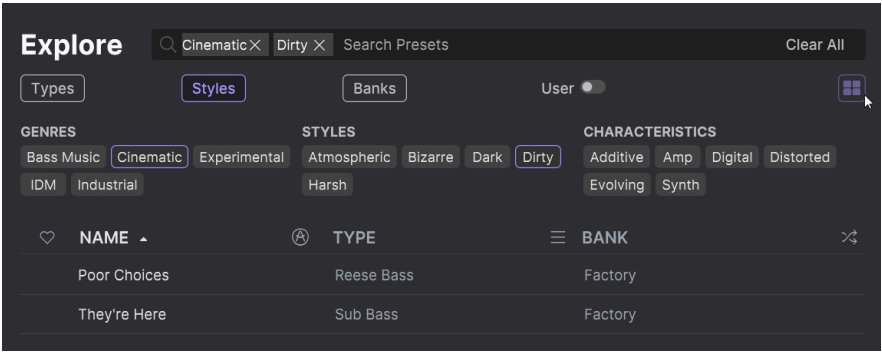


Here or in any search view, you can toggle the **User** switch to search only within User banks. Sound designers with a large portfolio are sure to find this handy!

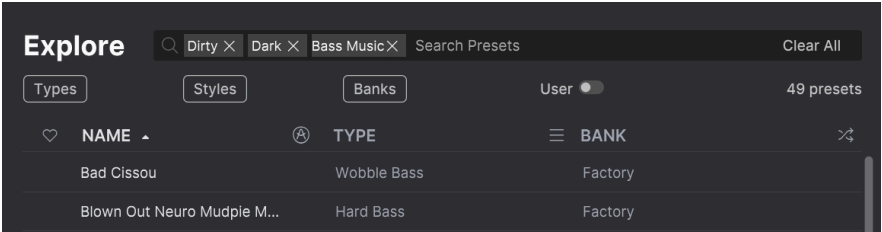
13.3. Search Results window



When searching by tags and styles you won't see the list of results until you click on the **Show Results** button. You can also click the "hamburger" (three lines) icon next to Show Results. The icon will change to four panes, and you will be able to see the Presets that fit your selected tags, as well as other tags that apply to them, like so:



13.3.1. Sorting the Preset order



Once you've found your list of presets through any of the searching methods you can sort them in a number of ways.

Click the **Heart Icon** to bring your favorited presets to the top.

Click the **NAME** header in first column of the Results list to sort Presets in ascending or descending alphabetical order.

Click the **TYPE** header in the second column to do the same thing by Type.

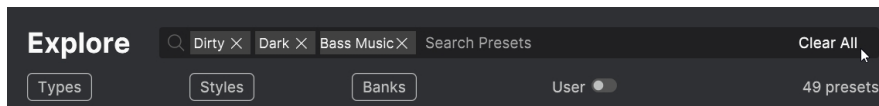
Click the **Arturia logo** to the left of **TYPE** to bring factory-featured Presets to the top of the list. These will appear just under any Presets you have [liked \[p.152\]](#).

Click the **User** toggle switch to restrict your search to Presets in user banks.

The third column has two header options: **DESIGNER** and **BANK**. Click the hamburger icon to choose between the two. Then click either header name, as with the other two columns, to switch the alphabetical order.

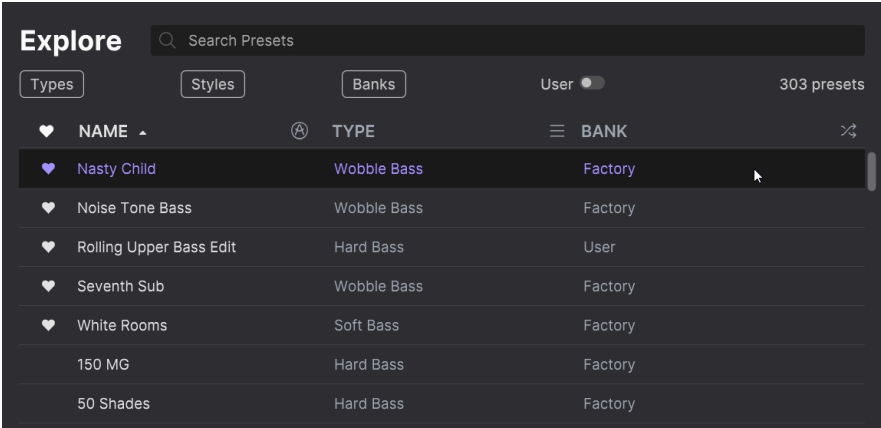
13.3.2. Clearing tags

Just above the Types, Styles, and Banks buttons, you will see labels for all the active tags in a search. Click the X next to any one to remove it (and thus broaden the results). Click **CLEAR ALL** to remove all tags.

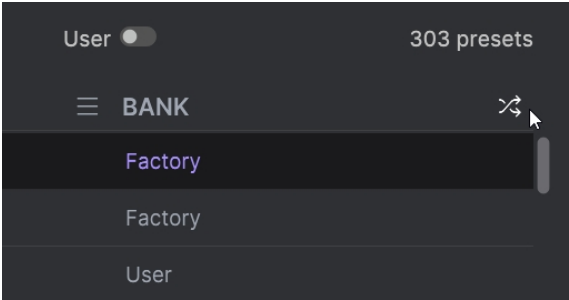


13.3.3. Liking Presets

As you explore and create Presets you can mark them as Liked by clicking the **heart** that appears to the left when you hover the mouse over a preset name. Later, click on the heart icon at the top to put all of your favorites at the top of the Results list.



13.3.3.1. Shuffle Presets



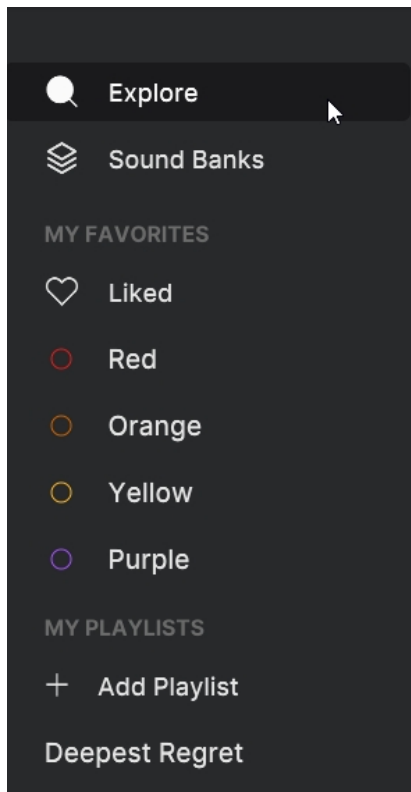
Clicking the "crossed arrows" button randomly reorders the Presets. This can be useful for finding something you like when your search results are a long list that takes time to scroll through – it might bring a killer Preset to the top. Shuffle mode is a toggle, so clicking it again will restore your search results to however they were previously sorted (by name, type, etc.).

Use as many of the sorting and filtering features as you need and you will find the exact sound you want every time.

13.4. Sidebar

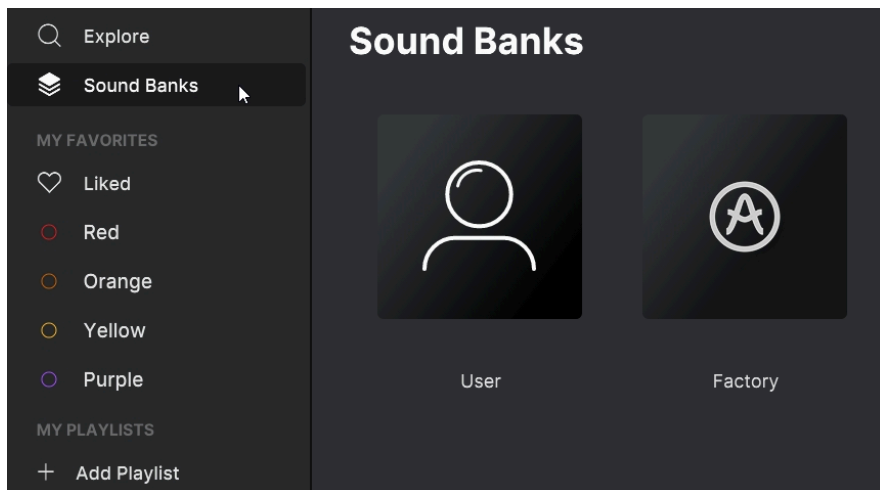
The leftmost section of the Preset Browser determines what is displayed in the [Search and Results \[p.146\]](#) section.

The topmost option is **Explore**:



The **Explore** section is the default, letting you search the current bank of Presets loaded into Pure SUB as we did in the previous section.

13.4.1. Sound Banks



Clicking **Sound Banks** brings up a window with all of the currently available Sound Banks, starting with the Factory bank. User banks appear next to it, and can be deleted, renamed, or exported by right-clicking them.

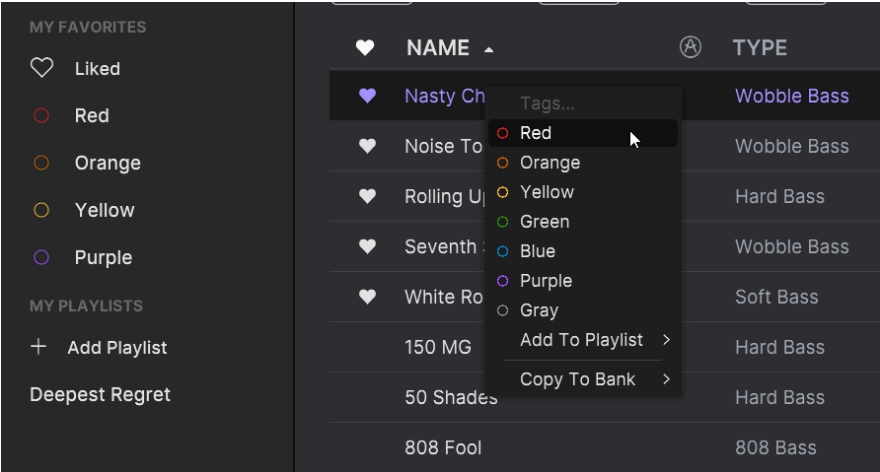
You can also add a user image in .png format to further personalize your user banks. Right-click on the desired User bank icon, then select *Import image* from the pop-up menu that appears. This menu also offers options to delete, rename, and export User banks.

13.4.2. My Favorites

The middle part of the Sidebar has a menu called **My Favorites**, which allows you to color-code certain groups of Presets for easy access. It also includes the **Liked** group, so you can quickly find Presets you've marked with the heart icon.

To decide which colors you'd like to display, hover over **My Favorites** and click **Edit**. Then use the toggle switches to select which colors you'd like to see or hide, then click **Done**.

Please note that you can also rename these favorites as desired. Just right-click on the color name in the sidebar and enter a new name.



To add Presets to a particular set of Favorites, simply drag-and-drop them over the appropriate color heading in the Sidebar, or right-click the Preset name and select the color. Then click on the color itself to display your grouping.

13.4.3. My Playlists

🔍 Explore

📁 Sound Banks

MY FAVORITES

♥ Liked

🔴 Red

🟠 Orange

🟡 Yellow

🟣 Purple

MY PLAYLISTS

+ Add Playlist

Deepest Regret

🎵

Deepest Regret

1 Song - Last updated on 05/08/2026 - 15:33

+ New Song ⋮

Song 1

1	Sleep Sub	Bass
2	Romp	Bass
3	Psy Op Sequence	Bass
4	Play Jam	Bass
5	Old Tank	Bass
6	Thumpy Roll	Bass

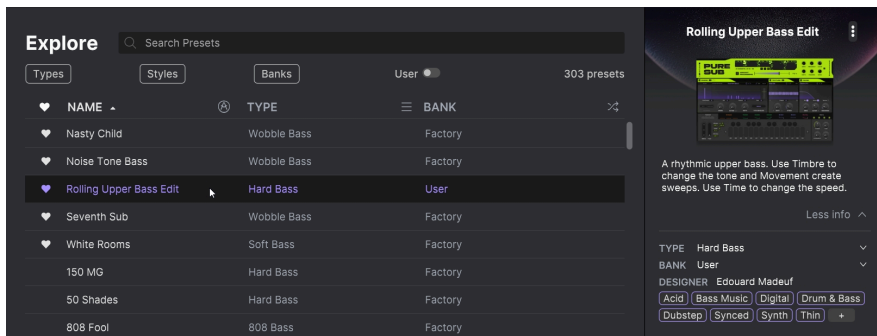
The bottom part of the sidebar displays any Playlists you have created or imported. Playlists are a very powerful management tool for set lists for gigs. Learn more about them in the [Playlists section \[p.160\]](#) below.



If you don't see anything here, it is because you haven't created any Playlists yet. Head to the [Playlists \[p.160\]](#) section at the end of this chapter to find out how.

13.5. Preset Info section

The right side of the browser window gives a brief description of each Preset.



If you click **More info** the bottom panel opens with Type, Bank and Designer information along with the tags that have been assigned to it. Factory Presets cannot be edited, however, everything within a User Preset is fair game.

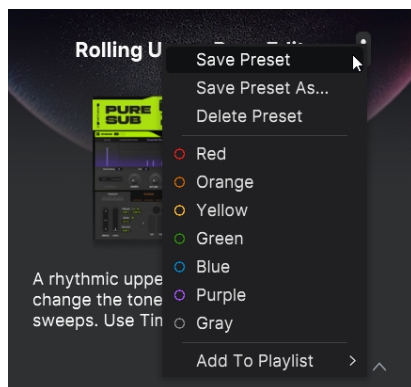
With a User Preset selected you can change the Type and Bank via pull-down menus, enter a Designer name, and click the + sign to add or delete Styles. When you click this icon, the results area is occupied by an edit list in which you can select and deselect Styles, Genres, and Characteristics:



Notice that each group has its own + icon at the end. Clicking this lets you create your own Styles, Genres, or Characteristics. Click the X at upper right when finished editing.

Type and Style changes you make here are reflected in searches. For example, if you remove the "Acoustic" Style tag and then save that Preset, it will not show up in future searches for Acoustic sounds. Again, all of this is possible only with user Presets.

Clicking on the three-dots icon at the top right pops up a management menu for the Preset.

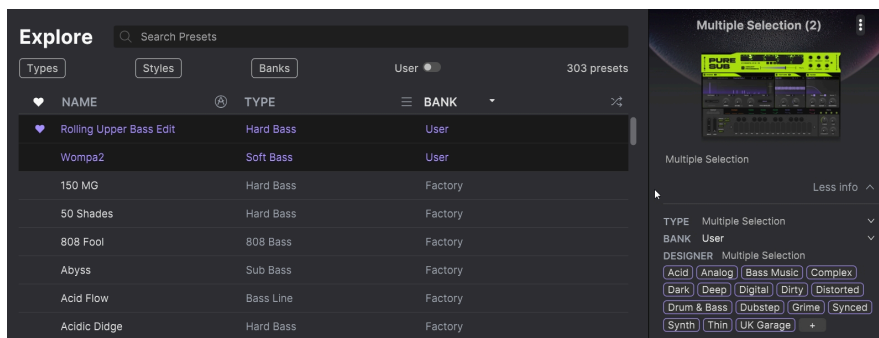


Options include *Save*, *Save As*, *Delete Preset*, and *Add to Playlist*, complete with an option to create a new [Playlist \[p.160\]](#). (You cannot overwrite or delete factory Presets, so the *Save* and *Delete* options appear for user Presets only.)

The dots with color icons allow you to add the Preset to a particular group of Favorites, which is described above.

13.5.1. Editing info for multiple user presets

If you'd like to move several User Presets to a different bank while preparing for a performance, or enter a single comment for several Presets at the same time, it's easy to do. Simply hold command (macOS) or ctrl (Windows) and click the names of the Presets you want to change in the Results list. Then enter the comments, change the Bank or Type, etc., and save the Preset.



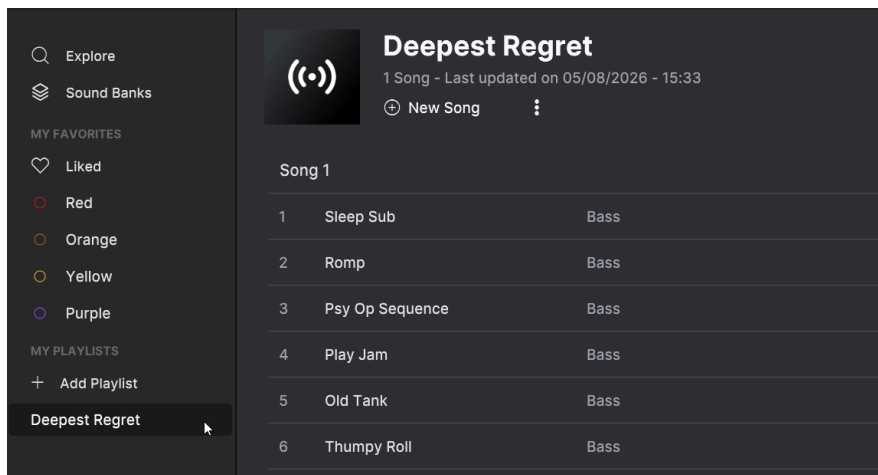
i If you want to alter the information for a Factory Preset you must first use the *Save As* command to re-save it as a User Preset.

13.6. Macro knobs

These are the same Macro knobs that you'll find on the main Pure SUB GUI. They give you a simple and effective way to interact with the presets without having to close the Preset Browser and get into the details.



13.7. Playlists



Playlists offer a powerful way to collect Presets into different groups for different purposes, such as a set list for a particular performance or a batch of Presets related to a particular studio project. Within a Playlist, Presets can be reordered and grouped into Songs, a handy addition to a set list.

Presets added to a playlist are copies of the originals. You can modify and save presets within a playlist without affecting the original presets.

Playlists and Songs also let you switch presets automatically using MIDI Program Change messages, making them valuable tools for automating preset changes during live performances.

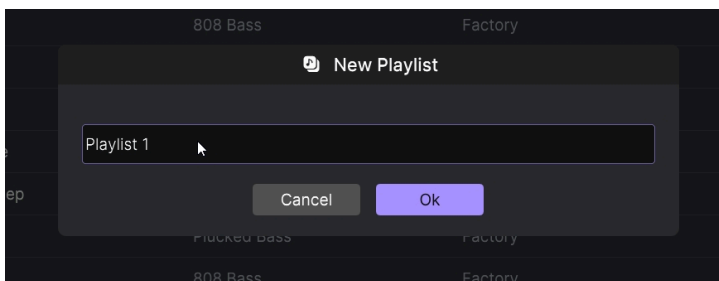


When sending a MIDI Program Change message, use Bank to select a Playlist, Sub to select a Song, and Program to select a preset within that Song.

The subheading **My Playlists** appears after the **My Favorites** section in the Sidebar. When you first start using Pure SUB, you'll have no Playlists yet – but it's very easy to create one!

13.7.1. Create your first Playlist

To get started, click **Add Playlist**. The following pop-up will appear, prompting you to name your Playlist.

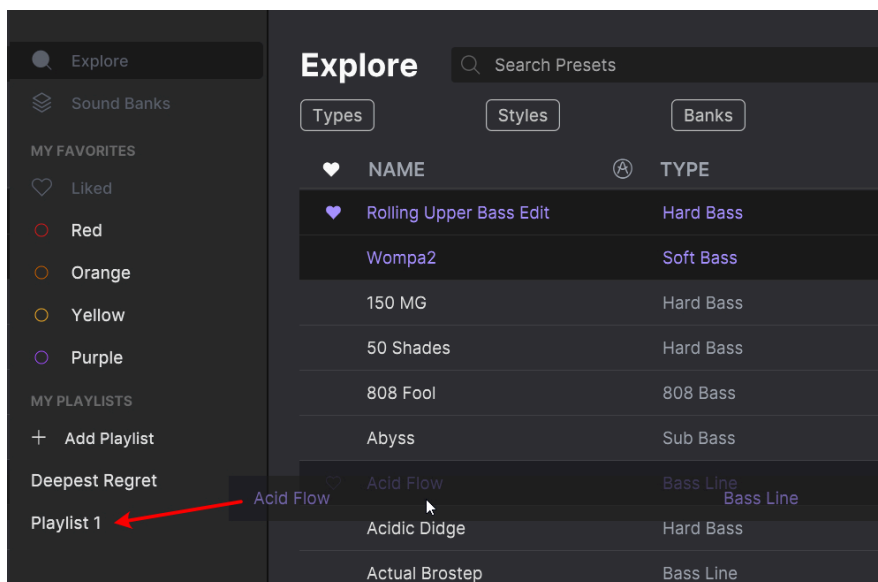


Once you've entered a name, that Playlist will now appear in the **My Playlists** section of the sidebar. You can create as many Playlists as you like.

Right-clicking on a Playlist name will pop up a set of options - you can *Rename*, *Duplicate*, *Delete*, or *Export* the Playlist to your computer, as a file with the ".aplst" extension.

13.7.2. Add a Preset

You can use all of the options in the Explore window to locate Presets for your Playlist. When you find a desired Preset, click-and-drag it onto the Playlist name.



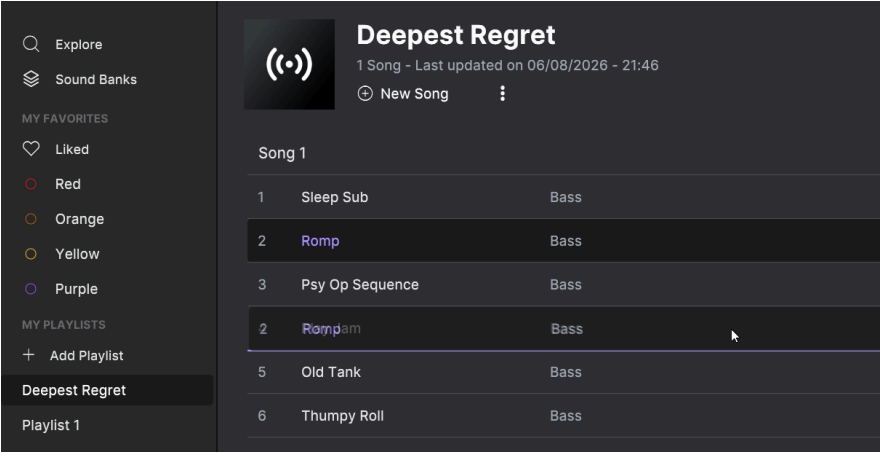
Dragging a preset to a Playlist

You can also right-click any preset and select "Add To Playlist" from the menu.

To view the contents of a Playlist, click on the Playlist name.

13.7.3. Re-order the Presets

Presets may be reorganized within a Playlist. For example, to move a Preset from slot 1 to slot 3, drag and drop the Preset to the desired location.



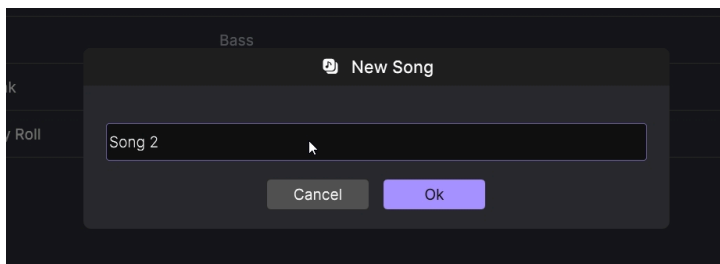
This will move other Presets up in the list to accommodate the new location of the Preset you just moved. A purple line will briefly appear at the “insert point.”

13.7.4. Remove a Preset

To delete a Preset from a playlist, select the Playlist, then right-click on the Presets name in the Results Pane to bring up a pop-up menu. This will only delete the Preset *from the Playlist*, not delete the Preset from the Pure SUB browser!

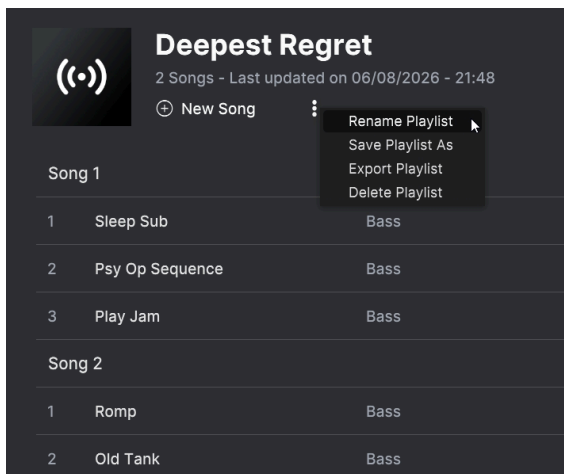
This menu also includes **Rename**, **Copy**, **Paste**, and **Duplicate** options. More management options are described below.

13.7.5. Song and Playlist Management



Any Playlist can be further divided into Songs, which is ideal for managing set lists for a live show. The **New Song** button creates a new Song at the bottom of the Playlist. You can name it, then click and drag it to position it in the Playlist and add Presets to it in the desired order. You can have multiple songs in each Playlist, and when dragging a song by its title, it brings all its Playlists with it – in order!

To access other Playlist management options, click on the three-dots icon next to the **New Song** button. This brings up a pull-down menu:



- **Rename Playlist:** Renames the current Playlist without making a copy.
- **Save Playlist As:** Creates a duplicate of the playlist with "Copy" appended to the name. You can change the name before saving.
- **Export Playlist:** Exports your Playlist to a location on your computer, with the filename extension ".aplst."
- **Delete Playlist:** Deletes the current Playlist but does *not* delete any of the Presets in it.

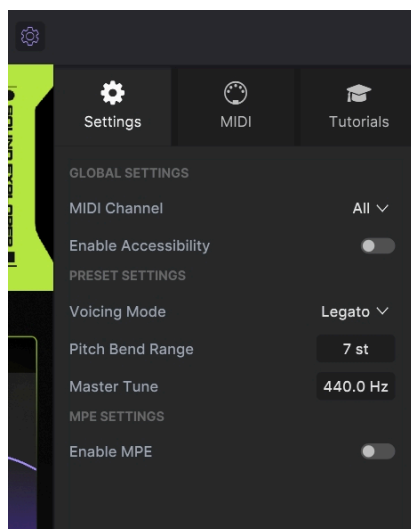
That's all there is to the Preset Browser! We hope you will enjoy many hours exploring the factory Presets and creating your own.

14. SIDE PANEL SETTINGS



If you press the cog icon at the top right of Pure SUB, in the Upper Toolbar you will reveal a side panel that contains important settings, MIDI control information and the Tutorials.

14.1. Settings tab



Click on the **Settings** tab to access some specific MIDI settings that are split into Global, Preset and MPE.

14.1.1.1. Global

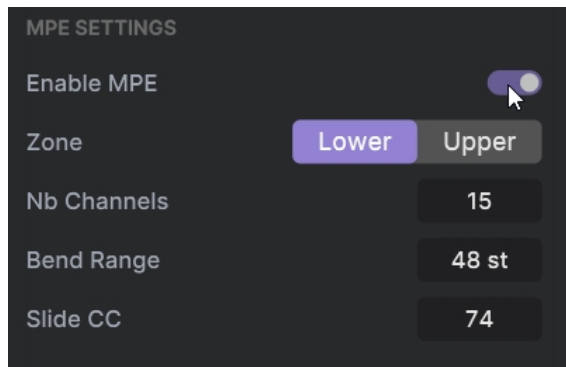
- **MIDI Channel:** Defines the MIDI Input channel for Pure SUB. It can be set to any channel 1-16 or "All" so it receives on all MIDI channels.
- **Enable Accessibility:** This enables any system-level accessibility tools to work with Pure SUB.

14.1.1.2. Preset Settings

- **Voicing Mode:** Sets the voicing mode to either *Legato* or *Retrig*. With Legato overlapping notes will be played without retriggering the envelope. With Retrig the envelope triggers on over note regardless of overlap.
- **Pitch Bend Range:** Sets the range of the Pitch Wheel from 1 to 12 semitones.
- **Master Tune:** Global tuning control set by default to 440Hz. It can be tuned up or down 40Hz.

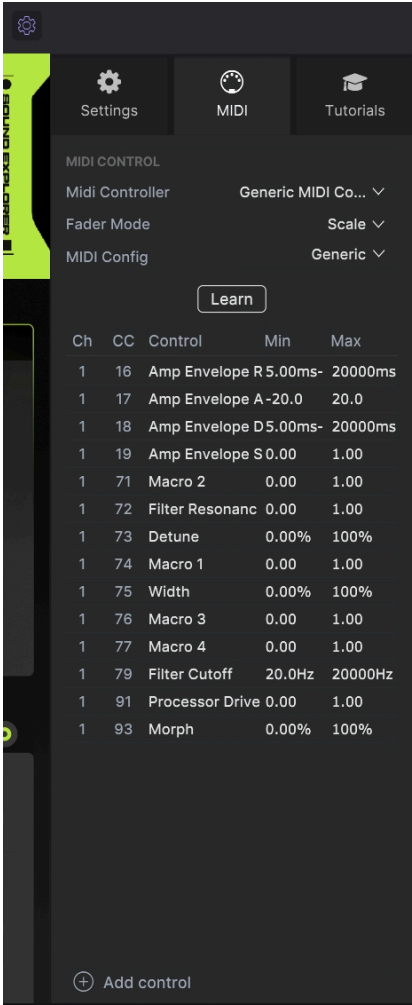
14.1.1.3. MPE Settings

If you are using an MPE compatible controller then click the button to enable full MIDI Polyphonic Expression for Pure SUB. A handful of extra settings will appear.



- **Zone:** If an MPE-capable controller can be split into lower and upper zones, this selects which zone sends the MPE messages.
- **Nb Channels:** Sets the maximum number of MIDI channels (and therefore simultaneous notes) on which MPE messages may be sent.
- **Bend Range:** Sets the maximum pitch bend range of each note, up to 96 semitones (48 by default). This should be set to the same value as on your hardware MPE controller.
- **Slide CC:** Selects the MIDI CC number used to send the slide information. By default, this is 74 but you can change it. When MPE is enabled, all the controls that listen to the selected CC will no longer receive it.

14.2. MIDI Tab

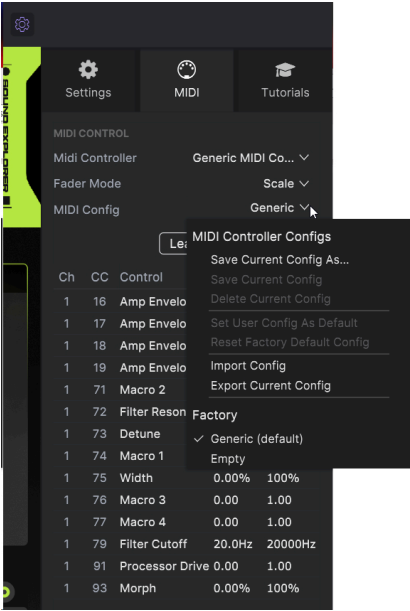


Click the **MIDI** tab in the side panel to access settings for your MIDI controller and to map hardware knobs and controls to on-screen parameters within Pure SUB.

14.2.1. MIDI Control

Pure SUB has direct support for a number of Arturia MIDI Controllers which can make mapping controls that little bit simpler. However, any MIDI controller should work just fine.

- **Midi Controller:** Select your Arturia controller from the drop down menu or choose *Generic MIDI Controller* for any other device.
- **Fader Mode:** Sets the pickup mode between hardware controls and on-screen controls. Or what happens when the hardware knob and the on-screen knob are at different values. Your options are:
 - **None:** As soon as you move the hardware control the on-screen control leaps to match the same value.
 - **Hook:** The on-screen control does not move until the hardware control passes through the same value.
 - **Scale:** The on-screen control scales itself to match the throw of the hardware control. So, if the on-screen knob is all the way over the right (maximum), and the hardware control is at 12 o'clock (halfway), the on-screen control will take the hardware position as the maximum and will turn completely to the left with only a half turn of the hardware knob.
- **MIDI Config:** Save and load different MIDI controller mappings and configurations.



MIDI Config options

14.2.2. MIDI Mapping

Click on **Learn** to enable MIDI Learn Mode.



All knobs and controls with a purple glaze are available for hardware MIDI control. Those in red have already been assigned but there's no reason why you can't change the mapping on those if you wish.

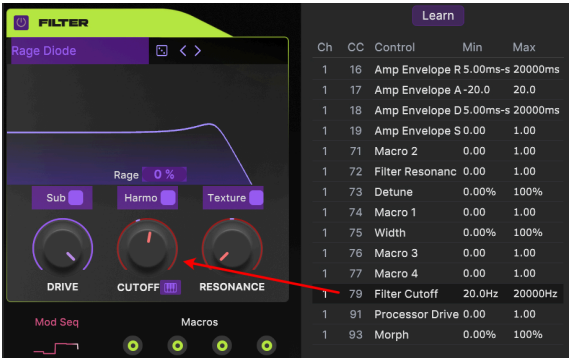
All you need to do is click on a control you wish to assign and then move the hardware control on your controller. The control should turn red and the mapping is complete.



You won't see anything move on Pure SUB while in MIDI Learn Mode. You have to exit by clicking on **Learn** again, and then you'll see the on-screen knob move in response to your hardware one.

14.2.2.1. Assignment List

As you make assignments you'll see them detailed in the list under the **Learn** button.



The details in the assignment list can be edited, so you can change the MIDI channel, the CC controller number and set a Min/Max range for the control. A CC# can only be mapped to one control, so if you use the same hardware knob to map to a second on-screen control, the original assignment will be lost.

14.2.2.2. Manually add a Control

If you can't see the on-screen control that you wish to assign or if you'd like to see a list of all possible controls then click on **Add Control** at the bottom of the MIDI tab. This will bring up a list of everything that can be controlled so you can choose and configure it manually.

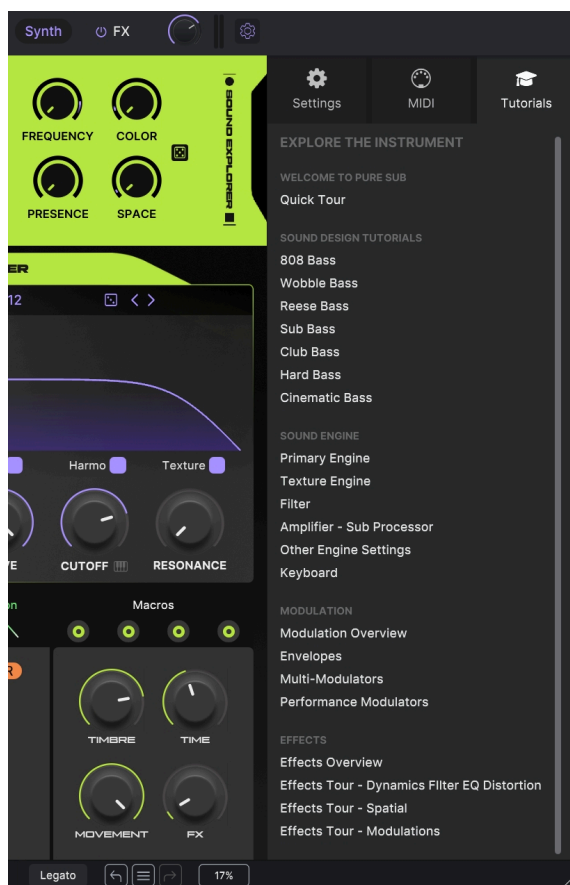
14.2.2.3. Reserved MIDI CC Numbers

Certain MIDI Continuous Controller (MIDI CC) numbers are reserved and cannot be reassigned to other controls. These are:

- Pitch-bend
- Modulation wheel (CC 01)
- Expression controller (CC 11)
- Sustain (CC 64)
- All Notes Off (CC 123)
- Aftertouch All other MIDI CC numbers may be used to control any assignable parameter in Pure SUB.

14.3. Tutorials Tab

Pure SUB comes with integrated Tutorials that walk you through different features of the instrument. When you click on the **Tutorials** tab, you'll be presented with a list of chapters.



When you select a chapter, it will load a special preset and guide you through with step-by-step instructions on how to make the most of Pure SUB. As you go through the tutorial, parts of the control panel are highlighted to show you where to focus your attention.



Click the X in the upper right corner to exit a particular chapter, and click Exit Tutorials at the bottom of the table of contents to close the Tutorials tab entirely.

15. SOFTWARE LICENSE AGREEMENT

In consideration of payment of the Licensee fee, which is a portion of the price you paid, Arturia, as Licensor, grants to you (hereinafter termed "Licensee") a nonexclusive right to use this copy of the SOFTWARE.

All intellectual property rights in the software belong to Arturia SA (hereinafter: "Arturia"). Arturia permits you only to copy, download, install and use the software in accordance with the terms and conditions of this Agreement.

The product contains product activation for protection against unlawful copying. The OEM software can be used only following registration.

Internet access is required for the activation process. The terms and conditions for use of the software by you, the end-user, appear below. By installing the software on your computer you agree to these terms and conditions. Please read the following text carefully in its entirety. If you do not approve these terms and conditions, you must not install this software. In this event give the product back to where you have purchased it (including all written material, the complete undamaged packing as well as the enclosed hardware) immediately but at the latest within 30 days in return for a refund of the purchase price.

1. Software Ownership Arturia shall retain full and complete title to the SOFTWARE recorded on the enclosed disks and all subsequent copies of the SOFTWARE, regardless of the media or form on or in which the original disks or copies may exist. The License is not a sale of the original SOFTWARE.

2. Grant of License Arturia grants you a non-exclusive license for the use of the software according to the terms and conditions of this Agreement. You may not lease, loan or sublicense the software. The use of the software within a network is illegal where there is the possibility of a contemporaneous multiple use of the program.

You are entitled to prepare a backup copy of the software which will not be used for purposes other than storage purposes.

You shall have no further right or interest to use the software other than the limited rights as specified in this Agreement. Arturia reserves all rights not expressly granted.

3. Activation of the Software Arturia may use a compulsory activation of the software and a compulsory registration of the OEM software for license control to protect the software against unlawful copying. If you do not accept the terms and conditions of this Agreement, the software will not work.

In such a case the product including the software may only be returned within 30 days following acquisition of the product. Upon return a claim according to § 11 shall not apply.

4. Support, Upgrades and Updates after Product Registration You can only receive support, upgrades and updates following the personal product registration. Support is provided only for the current version and for the previous version during one year after publication of the new version. Arturia can modify and partly or completely adjust the nature of the support (hotline, forum on the website etc.), upgrades and updates at any time.

The product registration is possible during the activation process or at any time later through the Internet. In such a process you are asked to agree to the storage and use of your personal data (name, address, contact, email-address, and license data) for the purposes specified above. Arturia may also forward these data to engaged third parties, in particular distributors, for support purposes and for the verification of the upgrade or update right.

5. No Unbundling The software usually contains a variety of different files which in its configuration ensure the complete functionality of the software. The software may be used as one product only. It is not required that you use or install all components of the software. You must not arrange components of the software in a new way and develop a modified version of the software or a new product as a result. The configuration of the software may not be modified for the purpose of distribution, assignment or resale.

6. Assignment of Rights You may assign all your rights to use the software to another person subject to the conditions that (a) you assign to this other person (i) this Agreement and (ii) the software or hardware provided with the software, packed or preinstalled thereon, including all copies, upgrades, updates, backup copies and previous versions, which granted a right to an update or upgrade on this software, (b) you do not retain upgrades, updates, backup copies and previous versions of this software and (c) the recipient accepts the terms and conditions of this Agreement as well as other regulations pursuant to which you acquired a valid software license.

A return of the product due to a failure to accept the terms and conditions of this Agreement, e.g. the product activation, shall not be possible following the assignment of rights.

7. Upgrades and Updates You must have a valid license for the previous or more inferior version of the software in order to be allowed to use an upgrade or update for the software. Upon transferring this previous or more inferior version of the software to third parties the right to use the upgrade or update of the software shall expire.

The acquisition of an upgrade or update does not in itself confer any right to use the software.

The right of support for the previous or inferior version of the software expires upon the installation of an upgrade or update.

8. Limited Warranty Arturia warrants that the disks on which the software is furnished is free from defects in materials and workmanship under normal use for a period of thirty (30) days from the date of purchase. Your receipt shall be evidence of the date of purchase. Any implied warranties on the software are limited to thirty (30) days from the date of purchase. Some states do not allow limitations on duration of an implied warranty, so the above limitation may not apply to you. All programs and accompanying materials are provided "as is" without warranty of any kind. The complete risk as to the quality and performance of the programs is with you. Should the program prove defective, you assume the entire cost of all necessary servicing, repair or correction.

9. Remedies Arturia's entire liability and your exclusive remedy shall be at Arturia's option either (a) return of the purchase price or (b) replacement of the disk that does not meet the Limited Warranty and which is returned to Arturia with a copy of your receipt. This limited Warranty is void if failure of the software has resulted from accident, abuse, modification, or misapplication. Any replacement software will be warranted for the remainder of the original warranty period or thirty (30) days, whichever is longer.

10. No other Warranties The above warranties are in lieu of all other warranties, expressed or implied, including but not limited to, the implied warranties of merchantability and fitness for a particular purpose. No oral or written information or advice given by Arturia, its dealers, distributors, agents or employees shall create a warranty or in any way increase the scope of this limited warranty.

11. No Liability for Consequential Damages Neither Arturia nor anyone else involved in the creation, production, or delivery of this product shall be liable for any direct, indirect, consequential, or incidental damages arising out of the use of, or inability to use this product (including without limitation, damages for loss of business profits, business interruption, loss of business information and the like) even if Arturia was previously advised of the possibility of such damages. Some states do not allow limitations on the length of an implied warranty or the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusions may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.