SUPERCRITICAL

Redshift 6

MANUAL

Firmware 1.2

Last update: April 4, 2025

Table of Contents

Table of Contents **1**
Safety Instructions **3**
FCC Information (USA) 3
For Canada 3
European Union Regulation Compliance Statement 3
Maintenance Instructions 4
Turning the Redshift 6 On and Off 5
Introduction **6**
Foreword 6
How to Use This Manual 7
Typographic Conventions 7
Key Terminology 8
Overview **9**
Redshift 6 Synthesizer 9
Engines 9
Front Panel Descriptions 10
Rear Panel Descriptions 11
Interface and Display 12
Demon Core Oscillator 14
Variable Character Filter 15
Character and Drive 16
Getting Started **17**
Internal Keyboard 17
Selecting a Preset 18
Saving a Preset 19
Deleting a Preset 19
Alternative Functions with [SHIFT] 20
Parameter Fine-tuning 20
SHIFT Lock 20

Part Grid....21
DCO: DUAL engine....22
VCF: CLASSIC engine....24
AMP....27
PERFORM....28
MOD MATRIX....29
Modulation Grid....30
Assigning Modulations....31
Modulation Source Lock....32
Adding a Via....32
ENV....33
LFO....35
KEY....38
VEL....40
AT....42
WHEEL....43
VOICE....45
GATE....46
Global Grid....47
Parts....48
Settings....52
Clock....53
Voices Grid....54
Updating the Firmware....55
APPENDIX-A: Preset list....56
APPENDIX-B: Modulation sources....59
APPENDIX-C: Modulation destinations....61
APPENDIX-D: MIDI Implementation....63

Safety Instructions

FCC Information (USA)

IMPORTANT NOTICE: DO NOT MODIFY THIS UNIT!

This product, when installed as indicated in the instructions contained in this manual, meets FCC requirements. Modifications not expressly approved by Supercritical may void your authority, granted by the FCC, to use the product.

IMPORTANT:

When connecting this product to accessories and/ or another product use only high-quality shielded cables. Cable/s supplied with this product MUST be used. Follow all installation instructions. Failure to follow instructions could void your FCC authorization to use this product in the USA.

NOTE:

This product has been tested and found to comply with the limit for a Class B Digital device, under Part 15 of the FCC rules. These limits are designed to protect reasonably against harmful interference in a residential environment. This equipment generates, uses, and radiates radio frequency energy and, if not installed and used according to the instructions found in the user manual, may cause interferences harmful to the operation of other electronic devices. Compliance with FCC regulations does not guarantee that interferences will not occur in all the installations. If this product is found to be the source of interferences, which can be determined by turning the unit "OFF" and "ON", please try to eliminate the problem by using one of the following measures:

- Relocate either this product or the device affected by the interference.
- Use power outlets that are on different branch (circuit breaker or fuse) circuits or install AC line filter(s).
- In the case of radio or TV interferences, relocate/reorient the antenna. If the antenna lead-in is 300 ohm ribbon lead, change the lead-in to coaxial cable.
- If these corrective measures do not bring any satisfactory results, please the local retailer authorized to distribute this type of product. If you cannot locate the appropriate retailer, please contact Supercritical.

For Canada

NOTICE:

This class B digital apparatus meets all the requirements of the Canadian Interference-Causing Equipment Regulation.

AVIS:

Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

European Union Regulation Compliance Statement

This product has been tested and found to comply with the Low Voltage Directive 2014/35/EU and the Electromagnetic Compatibility Directive 2014/30/EU.

Maintenance Instructions

• Read these instructions.

• Use the unit only with the supplied power adapter.

• Connect the power adapter to the correct voltage (voltage is marked on the power adapter).

• Protect the power adapter cord from being walked on, and do not place heavy objects on it.

• Do not drop or subject to a strong impact.

• Do not place heavy objects on the unit or block the ventilation of the unit.

• Do not use this unit near water.

• Do not expose the unit to rain, moisture, dripping, or splashing water.

• Do not expose the unit to direct sunlight or use it in temperatures exceeding 40°C.

• Do not store the unit in hot or damp conditions.

• Do not place the unit next to heat sources such as radiators and other heat-producing apparatuses.

• Do not open the unit or insert anything into the unit. This may cause an electric shock or a fire.

• Use a dry soft cloth to clean the unit. Do not use chemicals like benzene, thinners,

Alcohol, solvents, or aggressive cleaners for cleaning the unit.

• Do not use the unit during thunder or lightning.

• Avoid using the unit extended times at high volume to avoid any hearing loss.

• Turn off the unit immediately if an abnormality or malfunction occurs

Turning the Redshift 6 On and Off

NOTE:
Before connecting the Power Adapter to the wall current, make sure that the Power Adapter is using the correct power plug for the region.

Turning the Power On

Before turning on the Redshift 6, always make sure that the volume is turned all the way down. You can hear some sound when switching on the unit, even when the volume is turned down. This is completely normal and not a sign of any malfunction.

1. Before turning on the Redshift 6, make sure that the connected equipment is powered off.
2. Turn the Volume knob all the way to the minimum volume.
3. Turn on the Power switch located in the left corner of the rear panel.
4. Switch on the equipment connected to the unit and adjust the level of volume to the desired level.

Turning Off the Power

1. Before turning off the power, turn the volume on the connected equipment to the minimum.
2. Turn off the power from all the audio devices connected to the Redshift 6.
3. Turn off the Power from the Redshift 6.

NOTE:
Do not power off the Redshift 6 while updating the firmware.

Introduction

Foreword

Congratulations!

You're holding a Redshift 6, our first polyphonic desktop synthesizer, in your hands. The main idea of the Redshift 6 is to update some of the classic analog synthesizer designs and concepts to the 2020s, to have the modern conventionals, and to keep the classic polyphonic spirit in its analog heart. It should always be in tune (unless wanted to) and it should always sound the same (unless wanted to) when choosing the same preset.

Apart from the hardware, software-wise it is meant to be evolving for a long time span. We hope to unlock plenty more features that this hardware allows. Be sure to check out the newest firmware at our website www.supercriticalsynthesizers.com with the updates on the firmware development.

The Redshift 6 synthesizer is our contribution to the analog polysynth tradition.

We hope you like it.

Sincerely,
The Supercritical Team
Tampere
Finland

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How to Use This Manual

This manual is structured to guide you through Redshift 6 in a logical sequence of topics. It's designed so that beginners can read it from start to finish, covering the fundamental concepts first. As you progress, the manual delves into more advanced topics.

For experienced users, this manual serves as a helpful reference, allowing you to navigate directly to relevant sections as needed. Lastly, the Appendices offer detailed information about the Redshift 6.

Typographic Conventions

To keep this manual easy to read, we've taken the following steps with naming whenever possible:

- The name of a physical knob, button, or LED is printed inside square brackets **[NAME]**. Usage example:
    - Turn the **[CUTOFF]** knob.
- The 8 Soft Knobs, located around the display, have variable functions, depending on the display page. They are referenced as **<ParameterName>** Soft Knob. Usage example:
    - Press the **[AMP]** button and turn the **<Pan>** Soft Knob.
- Alternative functions can be accessed by holding the **[SHIFT]** button and pressing another **[NAME]** button or knob, or turning **[NAME]** knob. Usage example:
    - While holding the **[SHIFT]** button, press the **[KEY]** button.
    - Press **[SHIFT] + [KEY]**.

NOTE:
All knobs, except **[VOLUME]**, also function as a button.

Key Terminology

This list of a few term definitions helps you to get a head start on some of the technical expressions in this manual.

Voice
In a polyphonic synthesizer, a voice is the most basic component responsible for producing sound. It contains all the hardware and software required to generate a single note. The Redshift 6 features 6 voices, meaning it has 6 independent "sound-producing components." These voices are triggered when MIDI Notes are received.

Polyphonic
Each note uses one voice (or more) with independent control of all sound parameters, including pitch, timbre, and amplitude. The maximum number of Polyphonic voices is 6, hence the name Redshift 6.

Paraphonic
A single voice can have multiple notes assigned to it, each with its independent pitch and amplitude control, but they share the same signal path, including the filter. The benefit of this is that only one voice is needed to produce chords, leaving the rest of the voices available for other sounds. The downside is that filter sweeps etc cannot be produced for individual notes.

Overview

Redshift 6 Synthesizer

The Redshift 6 synthesizer combines technology from Supercritical's previous products, the Demon Core Oscillator and the Neutron Flux Filter. Each of the six voices features a DCO with analog waveforms generated under digital control. The filter core is an analog 4-pole state variable filter also digitally controlled to act like almost any classic vintage synthesizer filter.

Redshift 6's idea is something that is wrapped in the moniker "Variable Character Synthesizer". Each voice's analog path regarding tuning, gain staging, filter, and more is under strict digital control. Redshift 6 has a lush and warm sweet spot inspired by the analog polysynth tradition, but it can also cover the full range from almost digitally sterile and clean to distorted misbehavior and beyond. The signal path is all analog until the bypassable stereo DSP effects processor.

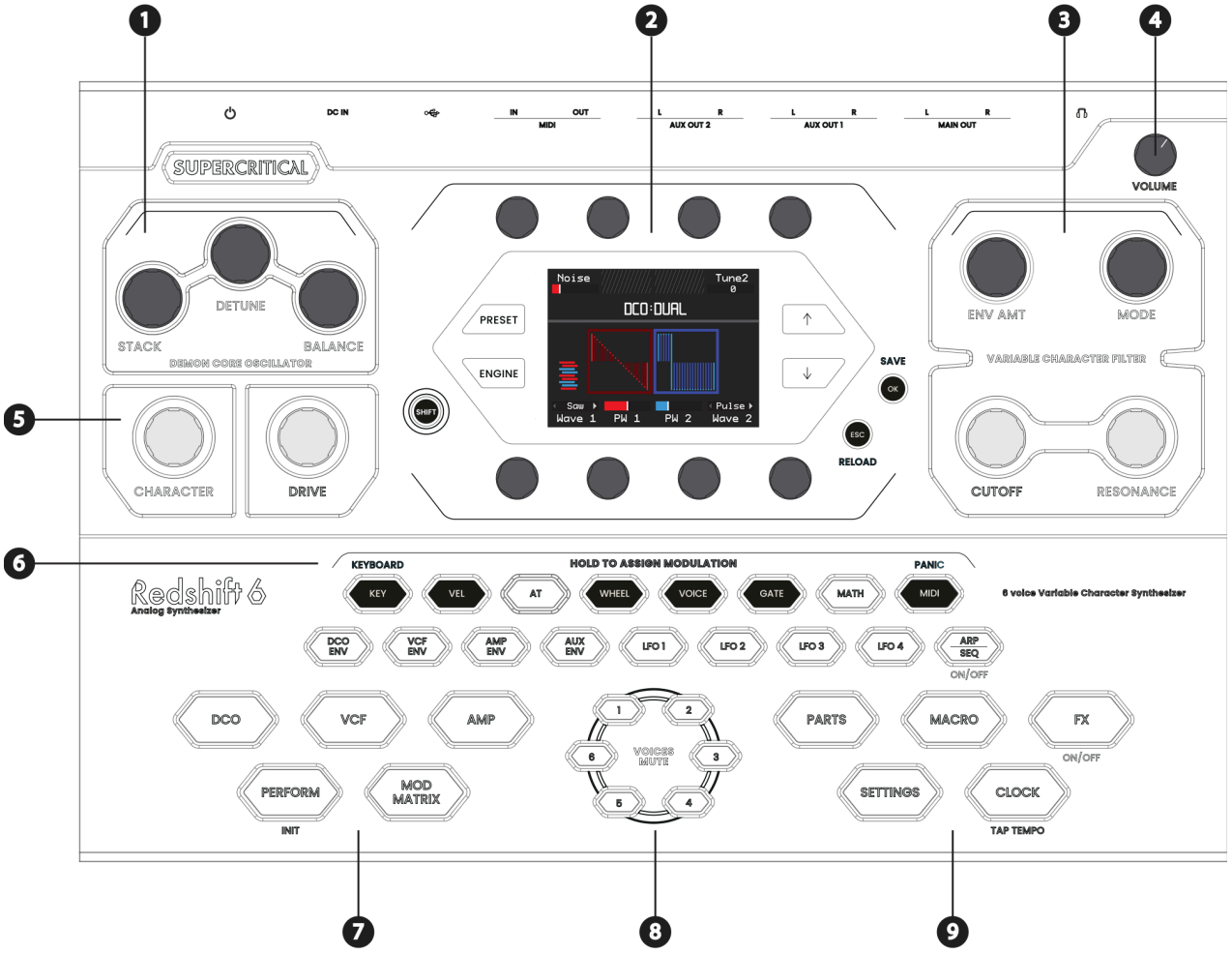
Engines

To take full advantage of the Demon Core Oscillator and the extremely versatile 4-pole state variable filter, Redshift 6 uses different engines for its oscillator and filter. Engines change the behavior of the analog signal path to offer a vast sound palette not possible with traditional analog synths.

The **[ENGINE]** button changes the engine.

NOTE:
The current firmware only offers one DCO engine (DCO: DUAL) and one filter engine (VCF: CLASSIC).

Front Panel Descriptions



1. Demon Core Oscillator

2. Interface and Display

3. Variable Character Filter

4. Volume (for main out and headphones)

5. Character & Drive

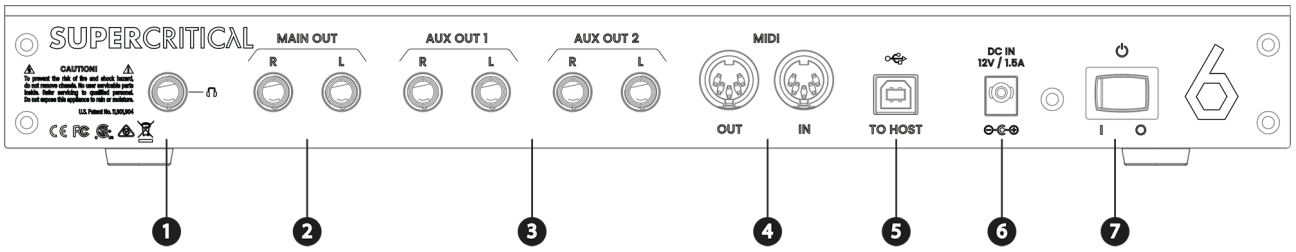
6. Modulation Grid

7. Parts Grid

8. Voices Grid

9. Global Grid

Rear Panel Descriptions

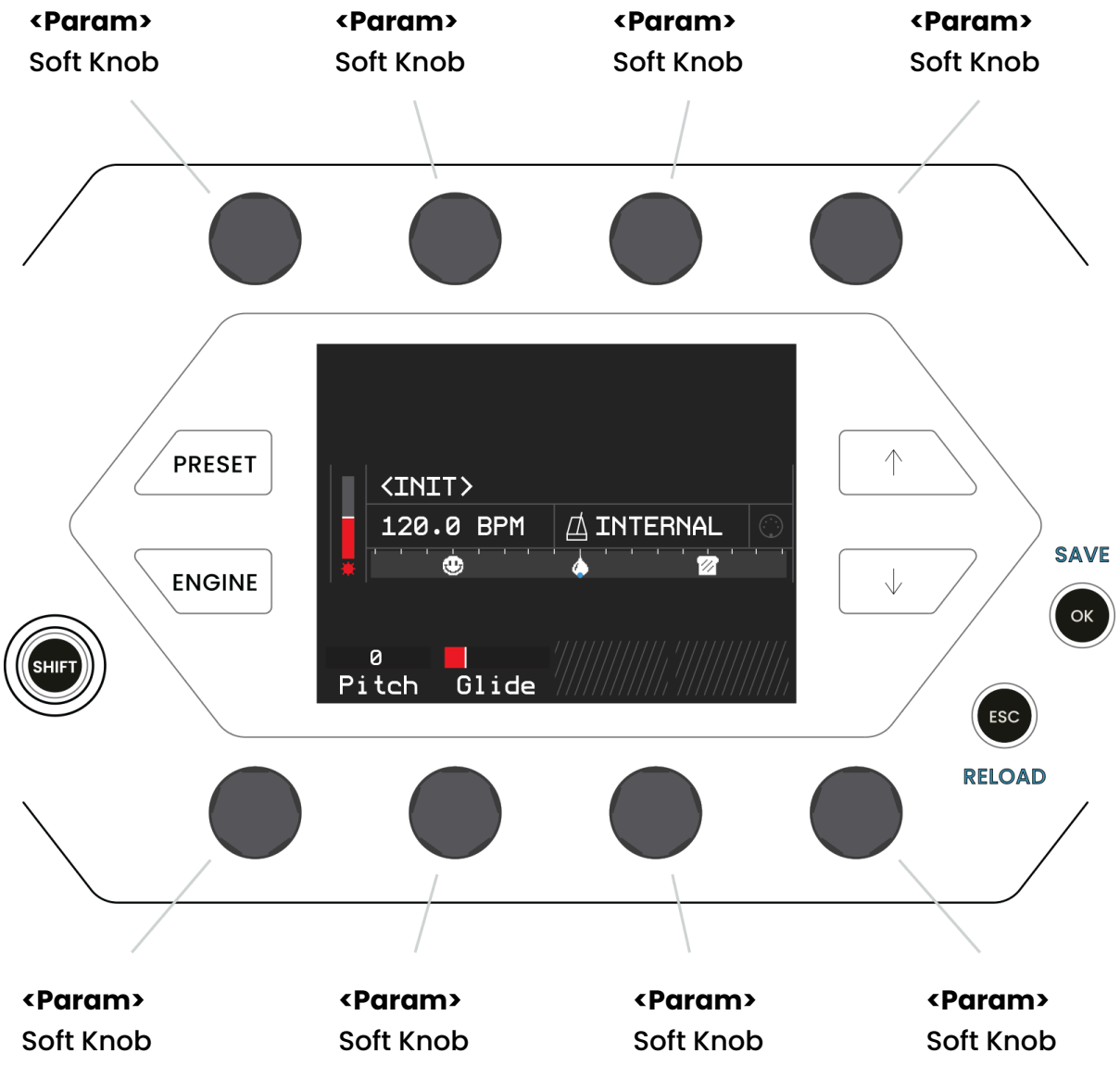


1. **HEADPHONES** - Stereo TRS headphone output.
2. **MAIN OUT** - Pseudo-Balanced TRS, line-level audio outputs.
3. **AUX OUT 1 & 2** - Pseudo-Balanced TRS, line-level auxiliary audio outputs.
4. **MIDI** - MIDI input and output for transmitting and sending MIDI data.
5. **USB** - USB connection to a computer..
6. **DC IN** - Input for the power adapter.
7. **POWER SWITCH** - Turns Redshift 6 On/Off.

NOTE:
Redshift 6 is a class-compliant USB device that needs no drivers on Pc, Mac, or Linux. The USB 2.0 port enables bidirectional MIDI communication with a computer but does not transmit audio.

Interface and Display

The interface and display section controls the various parameters of the Redshift 6 synthesizer. Redshift 6's user interface is designed to keep the menu diving minimal. The eight clickable **Soft Knobs** around the display provide quick and easy parameter adjustment. The 2.7" TFT IPS color display shows which parameters can be adjusted with the Soft Knobs.

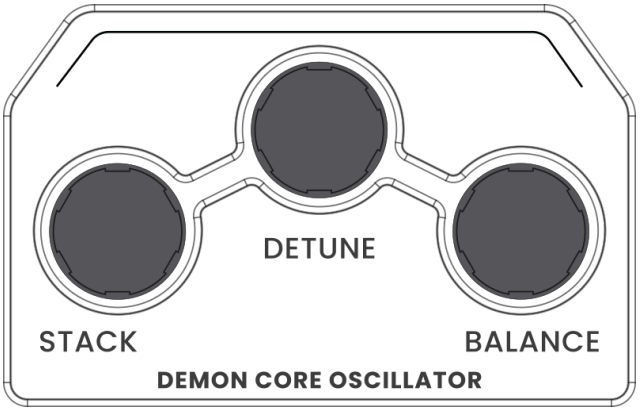


- The eight **Soft Knobs** around the display are used to select and adjust the parameters shown on the display.
- The arrow **[↑] [↓]** buttons are used for moving up and down on the display and other functions depending on the page.
- The **[PRESET]** button opens up the list of preset patches.
- The **[ENGINE]** button changes the engine for the selected feature.
- The **[SHIFT]** button is used for accessing alternative functions on buttons that have two functions and fine-tuning values adjusted via knobs.
- The **[OK]** button confirms the selection, and the alternative function **[SAVE]** saves the current patch.
- The **[ESC]** button exits from the selection/menu, and the alternative function **[RELOAD]** reverts the current patch to the last saved state.

Demon Core Oscillator

The Demon Core Oscillator is a digitally controlled analog oscillator circuit MDCO (Multiperiod Digitally Controlled Oscillator), our innovation, that is featured in each of Redshift 6's six voices. The circuit is capable of forming up to 16 simultaneous oscillators with separate pitch, amplitude, and phase control.

- The **[STACK]** knob controls the number of oscillators.
- The **[DETUNE]** knob controls the amount of detuning between the oscillators.
- The **[BALANCE]** knob controls the amplitude of the oscillators.

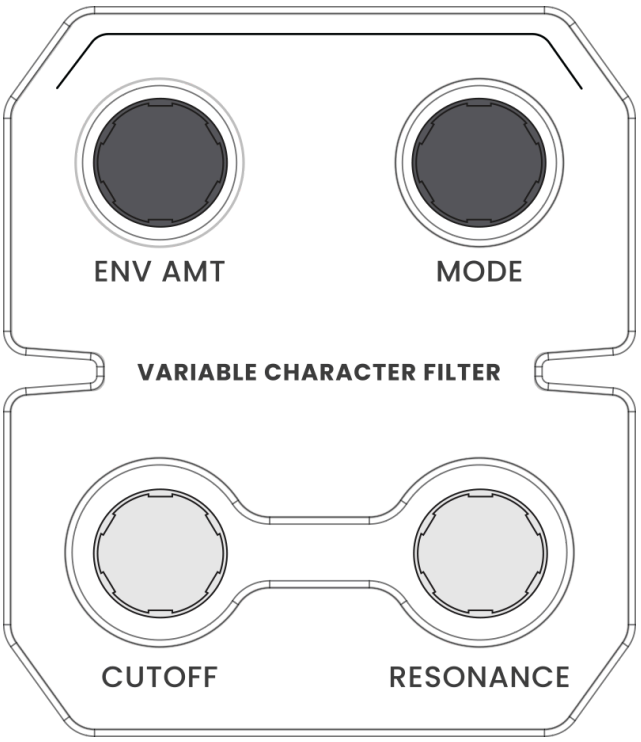


NOTE:
Knob functions can vary depending on the selected DCO engine.

Variable Character Filter

Redshift 6's filters are analog 4-pole state variable filters with digital control. Each voice features a single analog filter, but in future updates, the voices can be chained to form chains of 8 pole filters or even more interesting filters. The filter does not do any modeling but can be configured to function like almost any analog synthesizer filter.

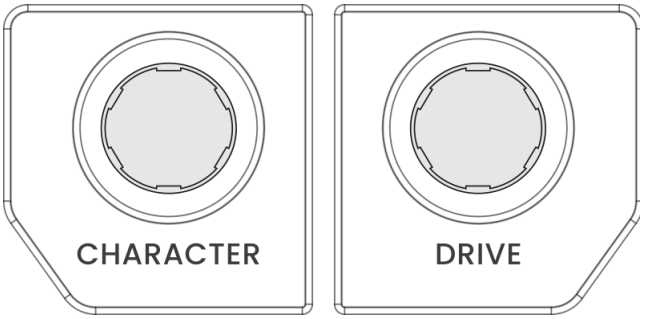
- The **[CUTOFF]** knob controls the cutoff frequency of the filter.
- The **[RESONANCE]** knob controls the amount of emphasis on a narrow band near the cutoff frequency.
- The **[MODE]** knob changes the filter mode.
- The **[ENV AMT]** knob controls the intensity of the filter envelope modulating the filter's cutoff frequency.



Character and Drive

With different character profiles, each voice's analog signal path regarding tuning, gain staging, filter, amp, and envelope behavior can be changed from almost digitally sterile and clean to distorted misbehavior and beyond.

- The **[CHARACTER]** knob selects the Character profile.
- The **[DRIVE]** knob controls the amount of pre and post-filter gain.



TIP:
Hold the **[SHIFT]** button while turning the **[CHARACTER]** knob to interpolate between the characters.

Character descriptions

Liquid Spacey resonance, filter pings dripping with dew.

Crisp A bright state variable filter.

Fat Our take on a ladder-ish filter character.

Sour The squelchy acid thing.

Mean Highly unstable, bad behavior, and distortion.

The sound character of legendary synths is what they are revered and desired for. This character is made up of various distortion characteristics, the precise shape of the filter response curve, the envelope shape, tuning accuracy and variations in all of these between voices. In designing our analog circuits and their control algorithms, we had to decide which character we would aim towards... and decided to not decide! Using our ultra-flexible filter design from the Neutron Flux Filter, variable gain staging, the fine-tuning capabilities of the DCO, and digital control of all these, we're able to approximate many very different characters. We've packaged five of them to the Character control of the Redshift, and as an extra treat, we let you interpolate between them to find your perfect sweet spot!

Getting Started

Follow the steps to get your Redshift 6 up and running:

1. Connect the Power Adaptor to the DC IN.
2. Turn on the Redshift 6.
3. Connect your headphones, or connect the Main Out to your amp/mixer/powered speaker and turn up the volume.
4. Connect your DAW, controller, or keyboard with USB or MIDI.
5. Turn up the volume on the Redshift 6.

TIP:
You can also use the internal keyboard to play the synthesizer.

Internal Keyboard

To play the sounds without any external controller, use the Redshift 6's internal keyboard mode.

To access the Internal Keyboard:

- Hold **[SHIFT]** while pressing the **[KEY]** button. The Modulation Grid buttons now function as a Musical Keyboard, ranging from C to D one octave higher. Use the **[SHIFT] + [↑] [↓]** arrow buttons to change the octave.
- Exit the Internal Keyboard mode by pressing the **[SHIFT] + [KEY]**.

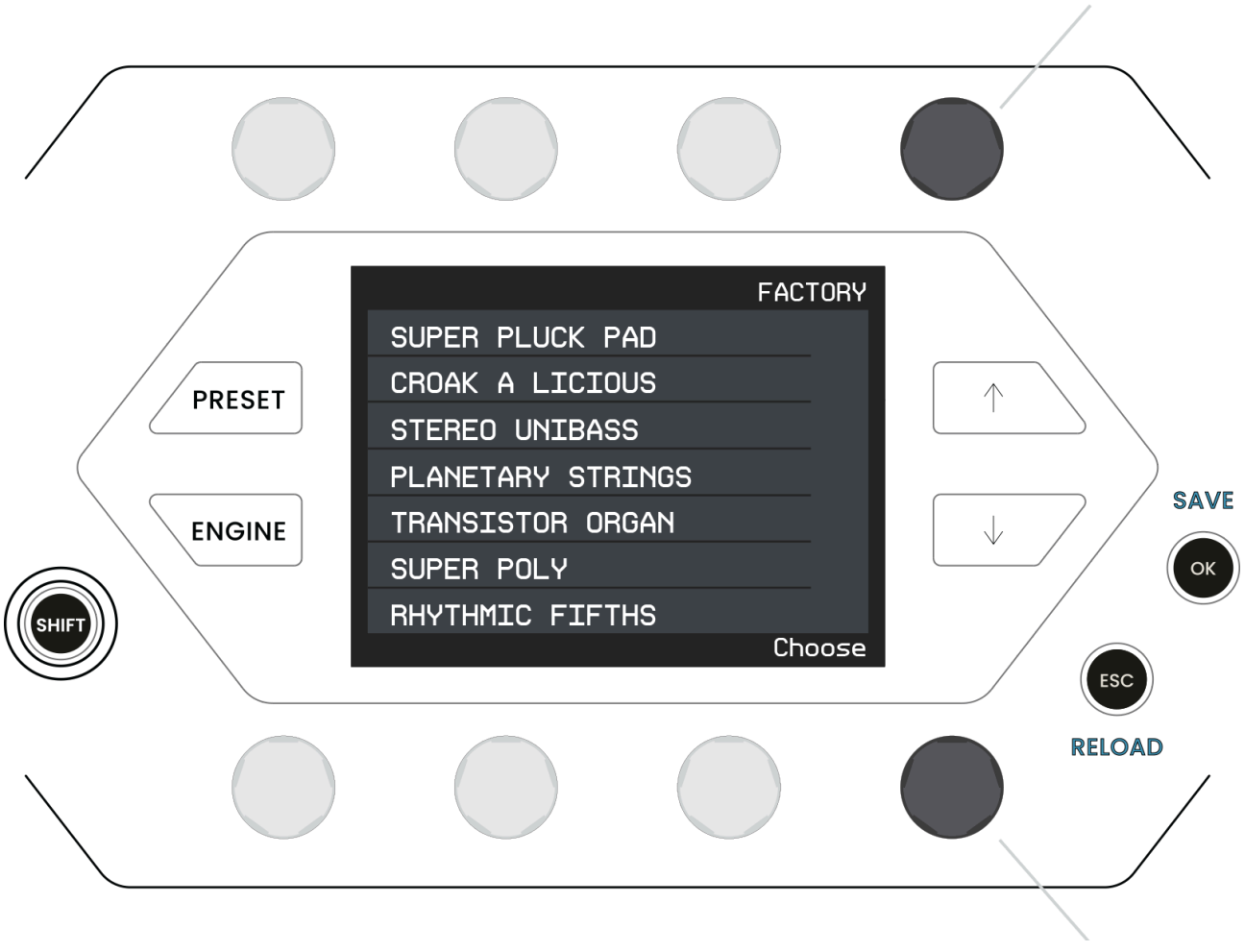
NOTE:
Modulation Grid cannot be accessed while the Internal Keyboard is in use.

Selecting a Preset

Redshift 6's memory is divided into two parts, **FACTORY** and **USER**.

- The **FACTORY** set contains the preset patches which cannot be overwritten or deleted.
- The **USER** set contains the user presets. When shipped, the **USER** set is empty.

‹FACTORY/USER›
Selects between sets



‹Choose›
Select between presets
Push to select

- Press the **[PRESET]** button to show the preset list.
- Browse presets with the **Soft Knobs** or the **[↑] [↓]** buttons buttons.
- Press the **[OK]** button or the **‹Choose›** Soft Knob to select.

Saving a Preset

To save a user preset, hold the **[SHIFT]** button and press the **[OK]** button.

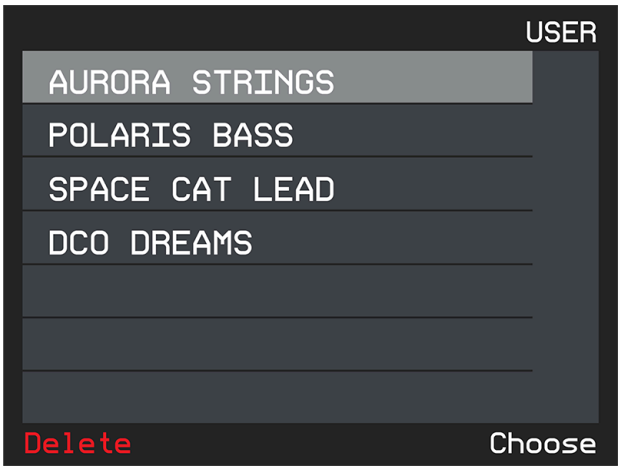
- **<Cursor>** Soft Knob moves the cursor.
- **<Edit>** Soft Knob selects a letter or a number.

After naming, the preset can be saved by pressing the **[OK]** button.



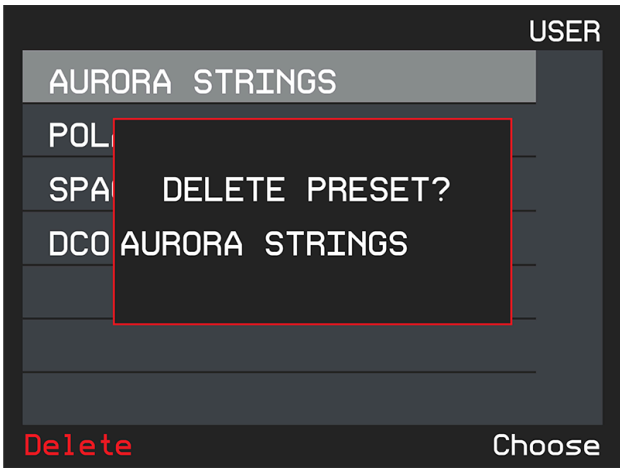
Deleting a Preset

Select the preset to be deleted with the **<Choose>** Soft Knob and confirm by pushing the **<Delete>** Soft Knob.



The deletion of the selected preset is confirmed by pressing the **[OK]** button.

Deleting the preset can be canceled by pushing the **[ESC]** button.



Alternative Functions with [SHIFT]

Some buttons have alternative functions that are indicated with light blue text next to the button. These functions can be accessed while holding the **[SHIFT]** button.

- **INIT** = **[SHIFT]+[PERFORM]** - initializes the current patch.
- **SAVE** = **[SHIFT]+[OK]** - saves the current patch.
- **RELOAD** = **[SHIFT]+[ESC]** - reloads the last saved state of the current patch.
- **KEYBOARD** = **[SHIFT]+[KEY]** - turns the Modulation Grid into a mini keyboard.
- **TAP TEMPO** = **[SHIFT]+[CLOCK]** - tap tempo for the internal master clock.
- **PANIC** = **[SHIFT]+[MIDI]** - sends MIDI Reset message.
- **FX ON/OFF** = **[SHIFT]+[FX]** - bypasses master output DSP effects. Not yet implemented.
- **ARP|SEQ ON/OFF** = **[SHIFT]+[ARP|SEQ]** - bypasses arpeggiator or sequencer. Not yet implemented.
- **VOICES MUTE** = **[SHIFT]+[VOICES 1-6]** - mutes parts. Not yet implemented.

NOTE: To activate alternative functions, the **[SHIFT]** key must be held until all other buttons are released.

Parameter Fine-tuning

The **[SHIFT]** button also functions as a fine-tuning mode for all knobs. Hold the **[SHIFT]** button while turning any knob (except **[Volume]**) for precise adjustments.

TIP: Some parameters have fixed steps that can be accessed by pressing the knob while adjusting.

SHIFT Lock

Shift Lock mode removes the need to hold the button while adjusting a parameter.

- Double-click the **[SHIFT]** button to activate the SHIFT LOCK.
- To cancel, press the **[SHIFT]** button again, or the **[ESC]** button.

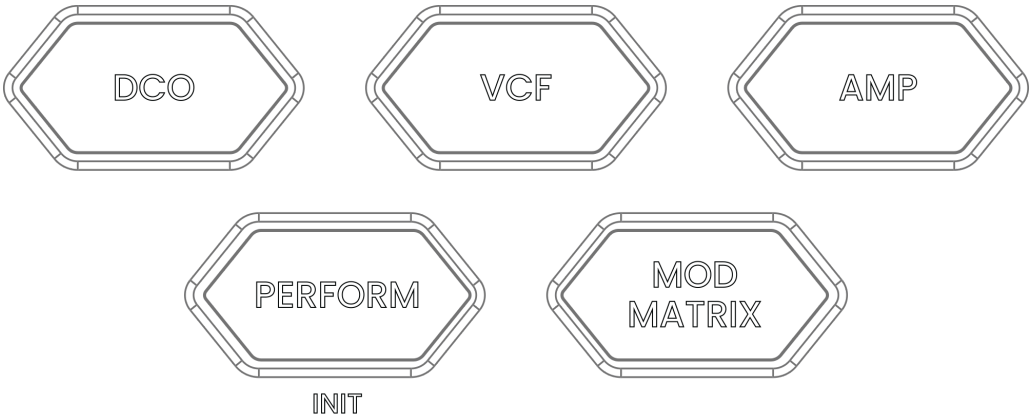
Part Grid

Part Grid holds the building blocks for making sounds.

Sounds contain three elements:

- pitch (frequency)
- timbre (brightness)
- amplitude (loudness)

In the Redshift 6 synthesizer, these elements can be controlled on the following blocks:



- The **[DCO]** button shows the pitch-related parameters.
- The **[VCF]** button shows the timbre-related parameters.
- The **[AMP]** button shows the amplitude-related parameters.

Parts Grid also contains:

- The **[PERFORM]** button shows the performance-related parameters.
- The **[MOD MATRIX]** button shows all the assigned modulations and their parameters.

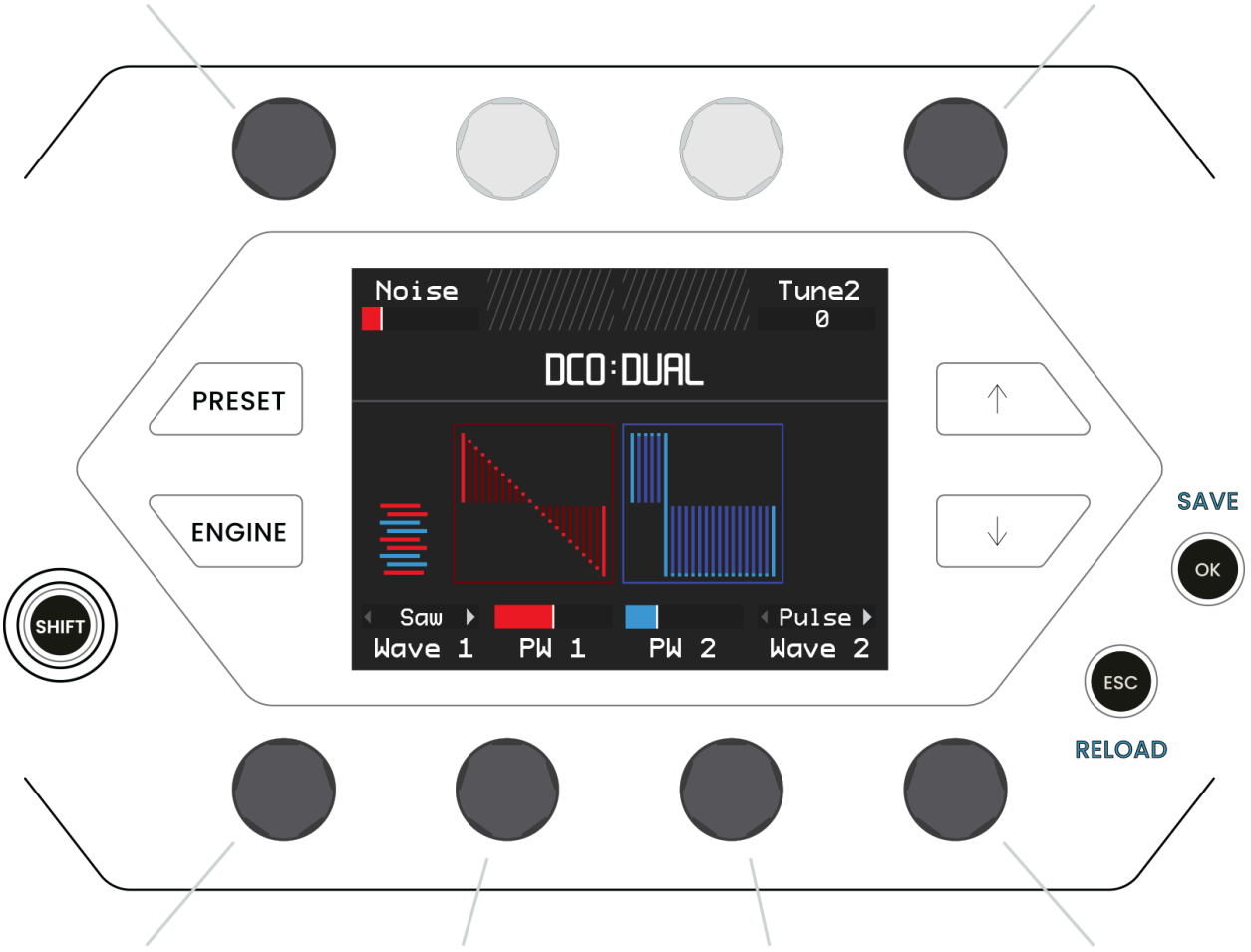
DCO: DUAL engine

The DCO: DUAL engine embodies the essence of the legendary analog polyphonic synthesizers. Two independently tunable oscillators give a wide sonic palette from lush pads and fat basses to screaming leads and beyond. Each oscillator provides a saw waveform and a square waveform with pulse width modulation.

Unlike most traditional synthesizers, the DCO: DUAL engine allows a single voice to stack up to 15 simultaneous waveforms. It also has a noise source that can be used to color the sound or to synthesize drum sounds.

‹Noise›
Noise Volume

‹Tune2›
Osc 2 tune



‹Wave 1›
Osc 1 Waveform

‹PW 1›
Osc 1 Pulse Width

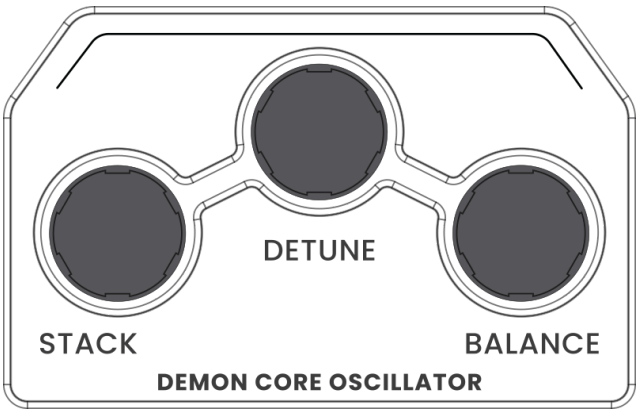
‹PW 2›
Osc 2 Pulse Width

‹Wave 2›
Osc 2 Waveform

TIP: OSC 2 can be fine-tuned by holding the **[SHIFT]** button while turning the **‹Tune2›** Soft Knob.

Parameter	Value	Description
‹WAVE 1›	SAW, PULSE	OSC 1 Waveform
‹WAVE 2›	SAW, PULSE	OSC 2 Waveform
‹PW 1›	0% … 100%	OSC 1 Pulse Width
‹PW 2›	0% … 100%	OSC 2 Pulse Width
‹NOISE›	0% … 100%	Noise Volume
‹TUNE 2›	-24st … +24st	OSC 2 tuning

- **[STACK]** knob controls the size of the oscillator stack.
- **[DETUNE]** knob controls the amount of detuning between the oscillators.
- **[BALANCE]** knob controls the amplitude of the OSC 1 and OSC 2.

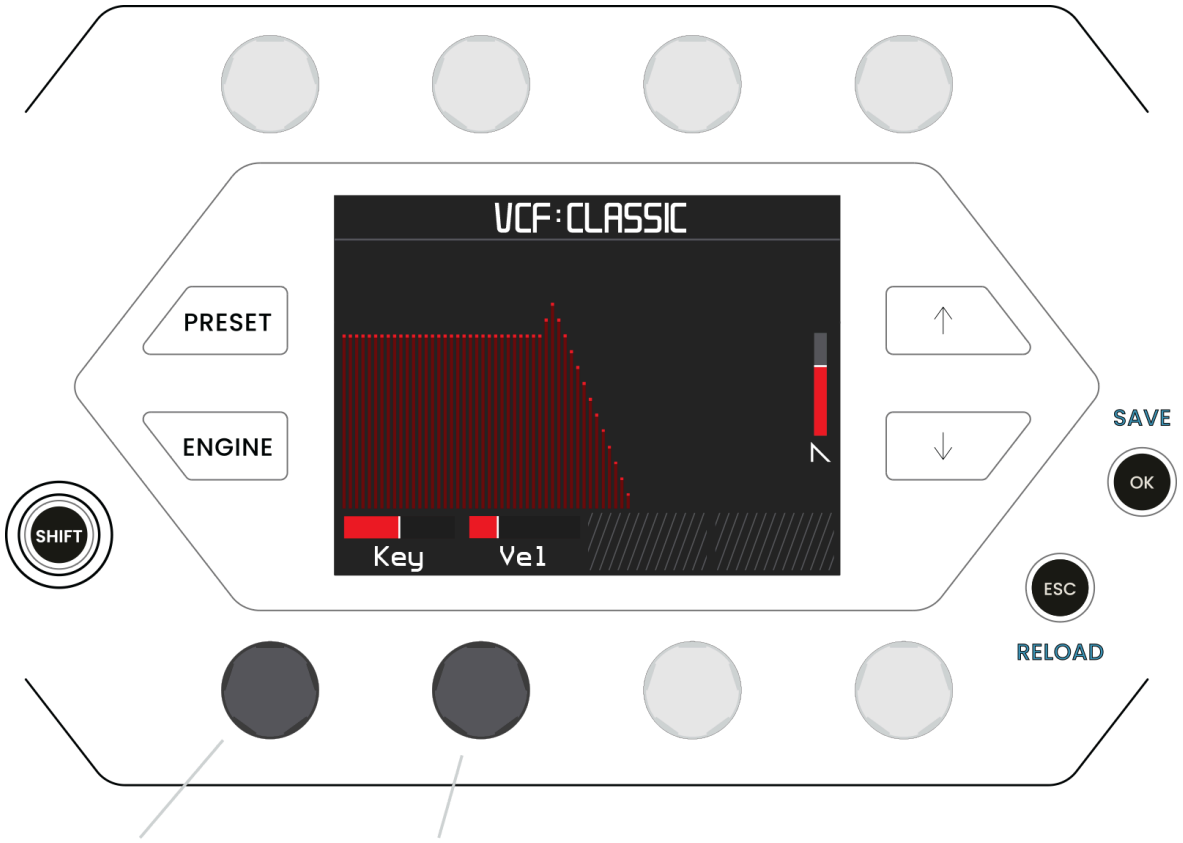


Stack	← Detune →														
1								1	2						
2							2	1	2						
3						1	2	1	2	1					
4					2	1	2	1	2	1	2				
5				1	2	1	2	1	2	1	2	1			
6			2	1	2	1	2	1	2	1	2	1	2		
7		1	2	1	2	1	2	1	2	1	2	1	2	1	
8	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2

TIP: Pulse Width for the oscillators can be set to 25%, 50%, and 75% by holding down and turning the **‹PW 1›** or **‹PW 2›** Soft Knob.

VCF: CLASSIC engine

The Classic VCF engine is our “baseline” filter engine that shows off the more standard synth filters that the Redshift 6 is capable of. By rotating the Character control, the filter differences are accentuated by adjusting (amongst tuning, envelope, etc.) the filter response with the gain staging. This extends to the Drive control as well. In this mode, every filter control works as it says on the tin.

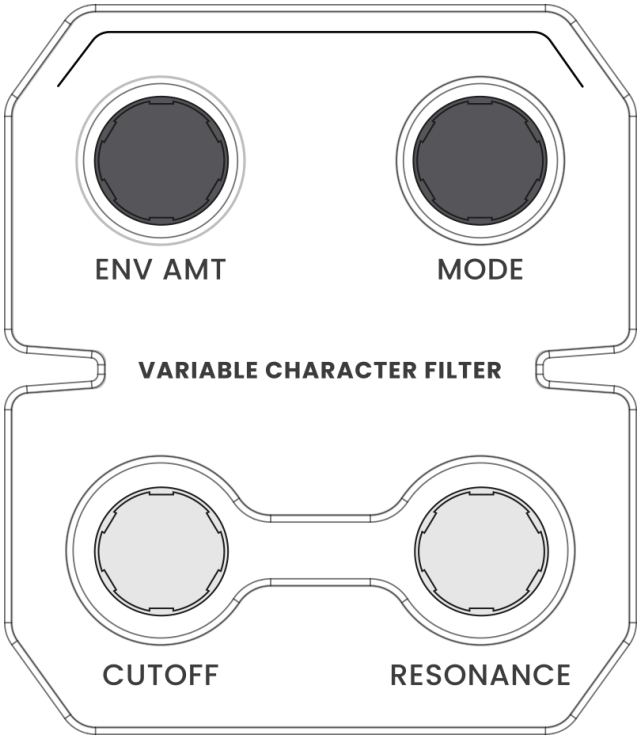


‹Key›
Key Follow

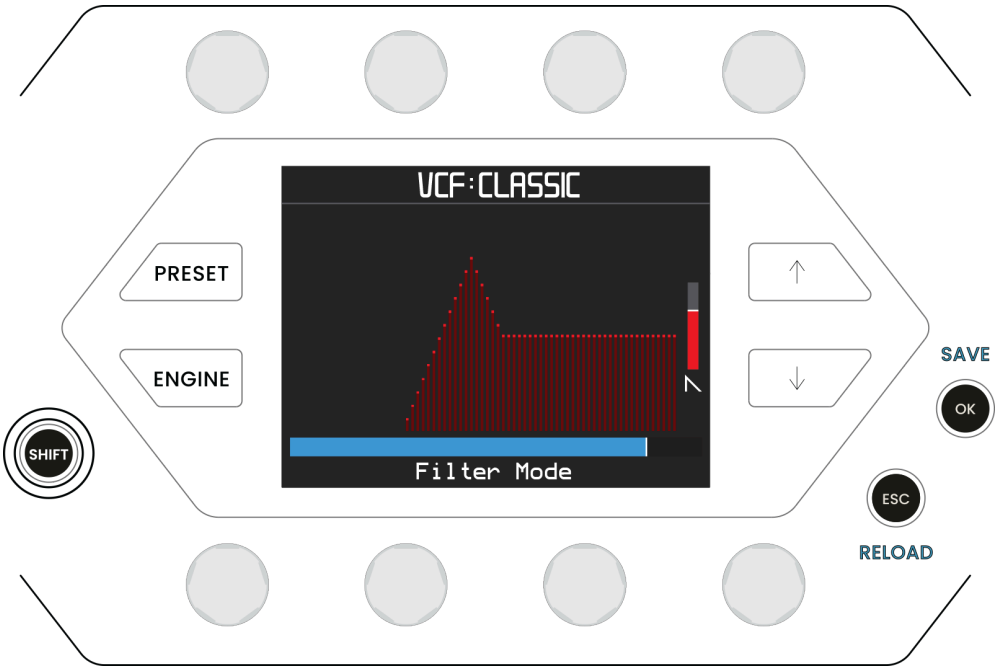
‹Vel›
Velocity >VCF ENV

Parameter	Value	Description
‹Key› Key Follow	0% … 100%	The amount to which the filter cutoff tracks the keyboard.
‹Vel› Velocity > VCF ENV	0% … 100%	The amount that the note-on velocity affects the strength of the **VCF ENV** modulating of the filter cutoff.
[ENV AMT] VCF ENV amount	-100% … +100%	The amount that the filter envelope **VCF ENV** affects the filter cutoff.

- **[CUTOFF]** knob controls the cutoff frequency of the filter.
- **[RESONANCE]** knob controls the amount of emphasis on a narrow band near the cutoff frequency.
- **[MODE]** knob interpolates between LPF … BPF … HPF modes.
- **[ENV AMT]** knob controls the intensity of the filter envelope **[VFC ENV]** modulating the cutoff.



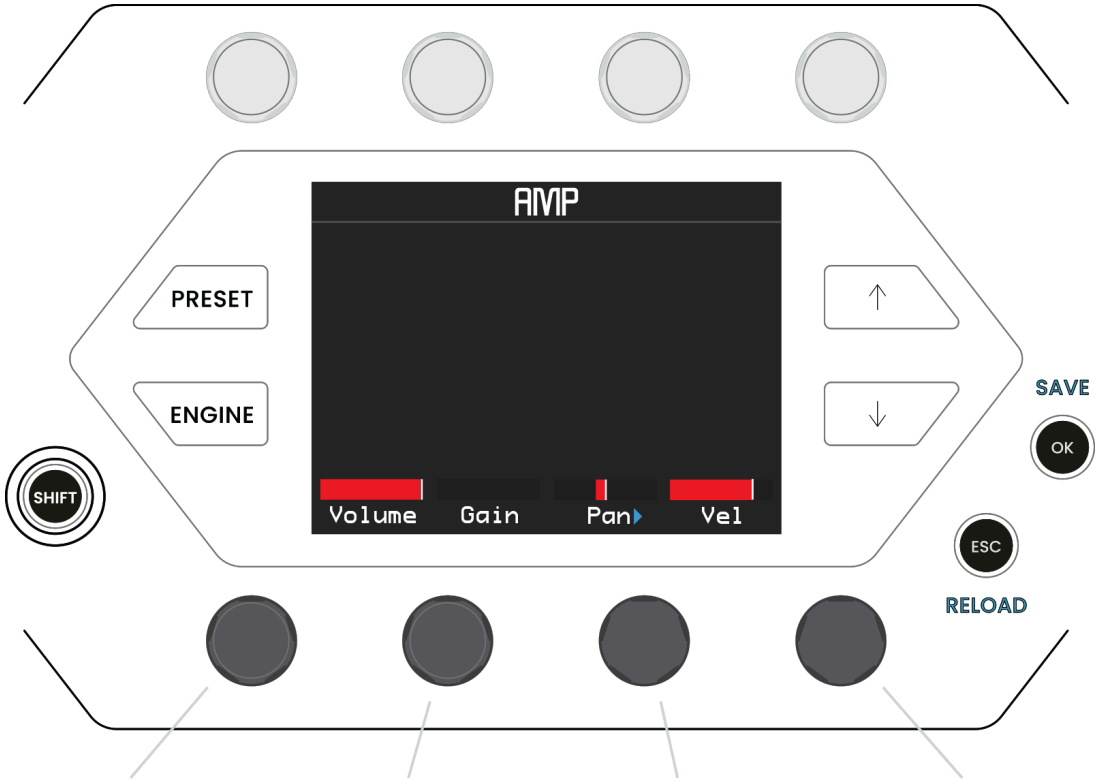
Filter Modes:



- **LPF - Low-Pass Filter -** Allows frequencies below a certain cutoff point to pass through while attenuating higher frequencies.
- **BPF - Band-Pass Filter -** Allows a specific band (range) of frequencies to pass through while attenuating both lower and higher frequencies outside of that band.
- **HPF - High-Pass Filter -** Allows frequencies above a certain cutoff point to pass through while attenuating lower frequencies.

AMP

The amplitude-related parameters, like volume, gain, stereo pan, and key velocity can be adjusted here. The AMP is always affected by the **[AMP ENV]**, even though this connection isn't visible in the **[MOD MATRIX]**.



‹Volume›
Volume

‹Gain›
Gain

‹Pan›
Stereo Pan

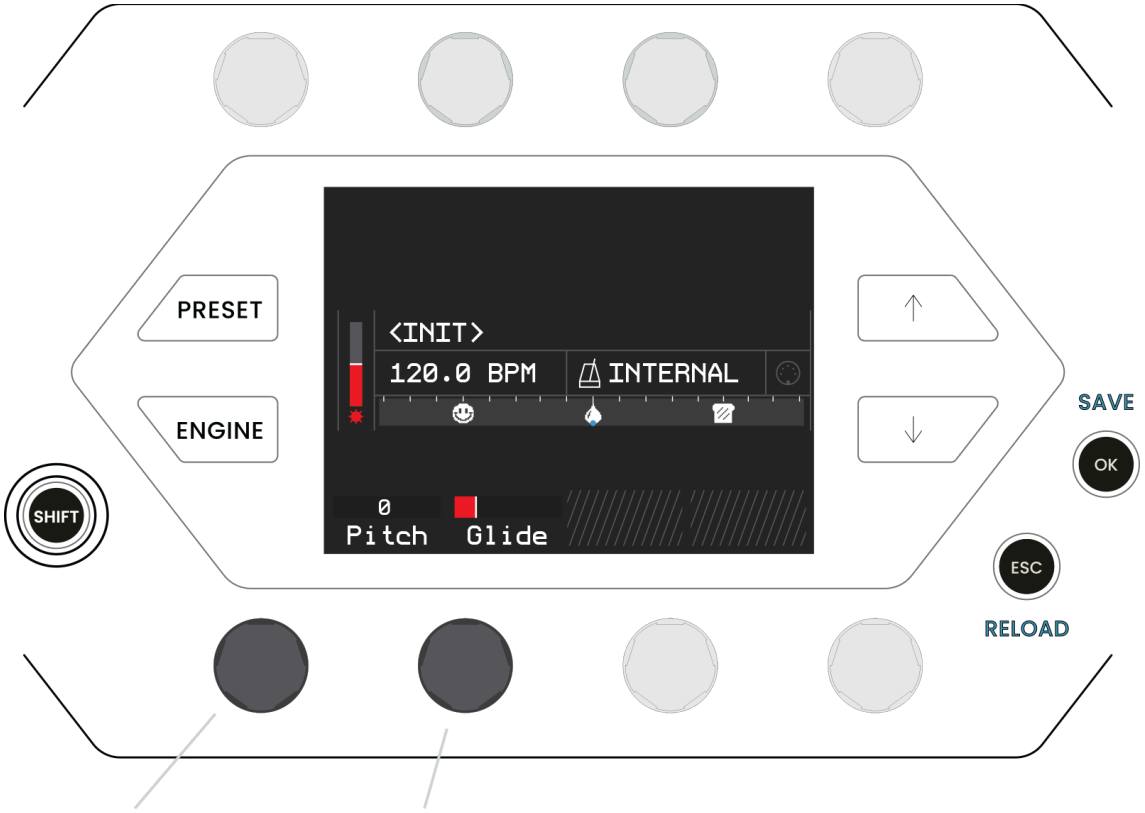
‹Vel›
Velocity›AMP

Parameter	Value	Description
‹Volume›	0% … 100%	Volume
‹Gain›	0% … 100%	VCA Gain, "drone-mode"
‹Pan›	-100% … +100%	Stereo Pan
‹Vel›	0% … 100%	Velocity › AMP

TIP: A high **Gain** setting can be used for constantly playing "Drone" sounds.

PERFORM

Perform view shows the Preset name, selected Character, amount of the Drive, Tempo, and Clock Sync (Internal/MIDI). It also indicates all incoming MIDI messages and shows the pitch and glide values for the part.



‹Pitch›
Pitch of the selected part

‹Glide›
Amount of Glide (Portamento)

Parameter	Value	Description
‹Pitch›	-24 st ... + 24 st	Pitch of the selected part
‹Glide›	0% ... 100%	Amount of Glide (Portamento)

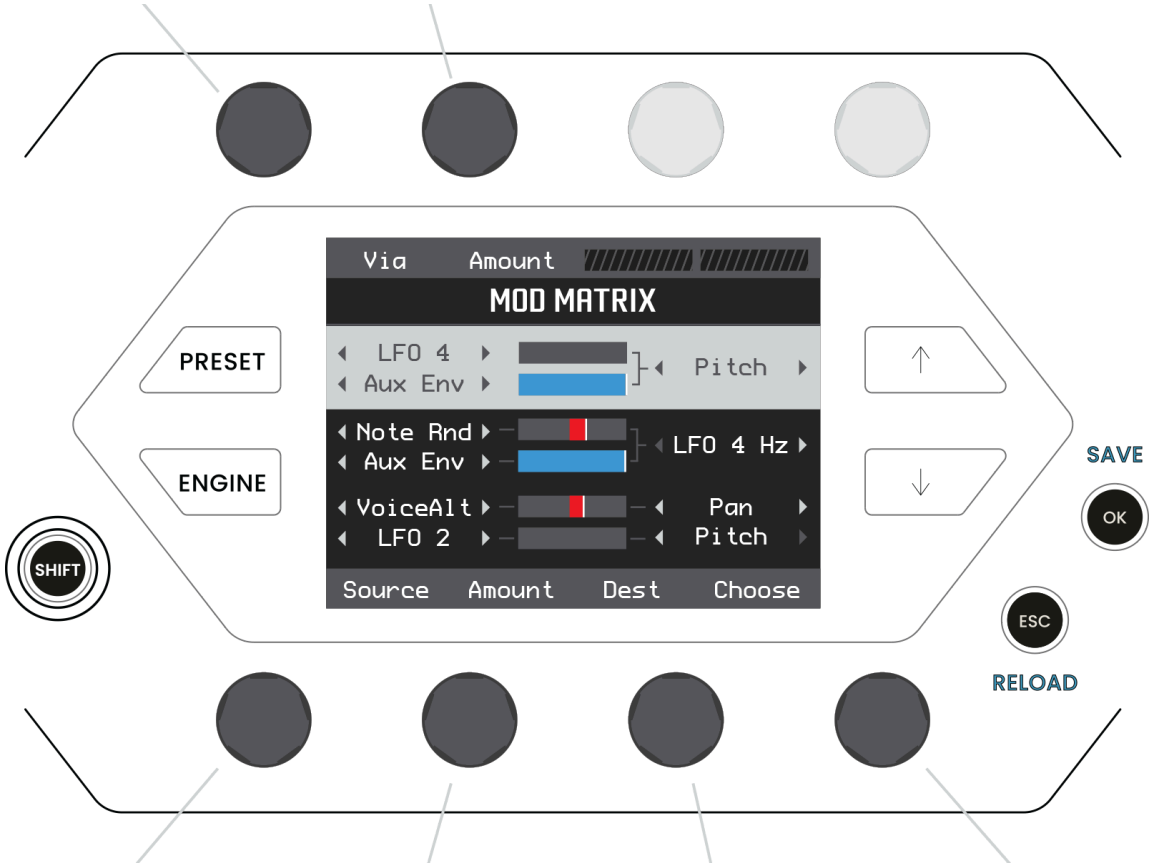
MOD MATRIX

MOD MATRIX lists all the assigned modulations and makes controlling complex modulations simple. Besides showing the assigned modulations, the MOD MATRIX can also be used to set new modulation sources and targets.

Modulations can be combined using **‹Via›**, which sends the selected modulation source through the selected **‹Via›** modulation source.

‹Via›
Via modulation source

‹Amount›
Amount of the Via modulation



‹Source›
Source of the modulation

‹Amount›
Amount of the modulation

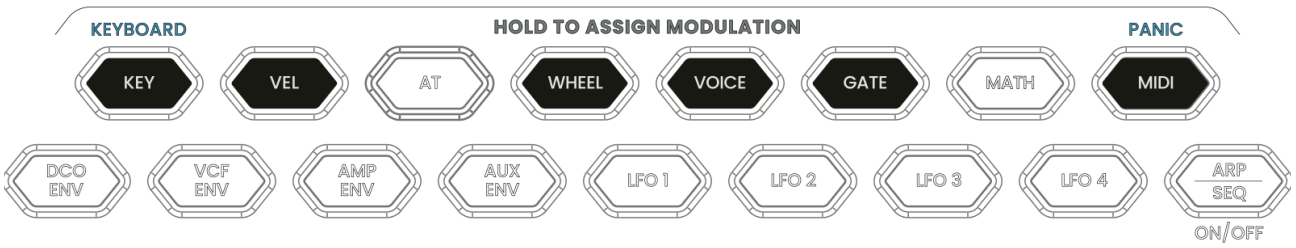
‹Dest›
Destination of the modulation

‹Choose›
Select the modulation slot for editing

TIP: Hold the **[SHIFT]** button and press the parameters **knob** or **Soft Knob** to reset the parameter to its default value. Turning the parameter **Soft Knob** while holding down the **[SHIFT]** button enables fine-tuning mode. Holding down the **Soft Knob** while turning sets the edited parameters value to -100% / 0% / +100%.

Modulation Grid

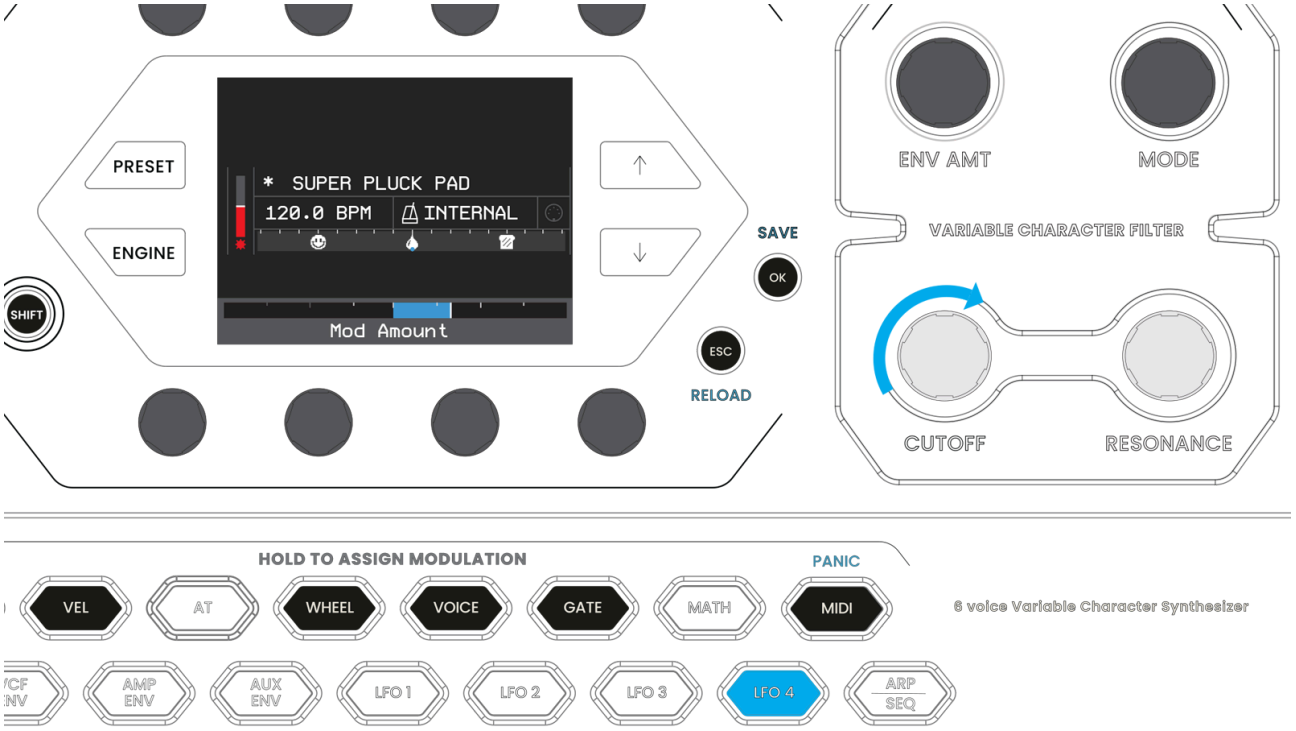
The Modulation Grid provides access to modulation sources and their parameters and is used to assign modulation.



- The **[KEY]** button assigns the MIDI note key as a modulation source.
- The **[VEL]** button assigns note velocity as a modulation source.
- The **[AT]** button assigns aftertouch as a modulation source.
- The **[WHEEL]** button assigns the Modulation Wheel as a modulation source.
- The **[VOICE]** button assigns Redshift 6's voice number as a modulation source.
- The **[GATE]** button assigns the MIDI note-on/off as a modulation source.
- The **[MATH]** button is not yet implemented.
- The **[MIDI]** button is not yet implemented.
- The **[DCO ENV]** button assigns the DCO envelope as a modulation source.
- The **[VCF ENV]** button assigns the VCF envelope as a modulation source.
- The **[AMP ENV]** button assigns the AMP envelope as a modulation source.
- The **[AUX ENV]** button assigns the auxiliary envelope as a modulation source.
- The **[LFO1]**, **[LFO2]**, **[LFO3]**, and **[LFO4]** buttons assign LFO1-4 as a modulation source.
- The **[ARP|SEQ]** button is not yet implemented.

Assigning Modulations

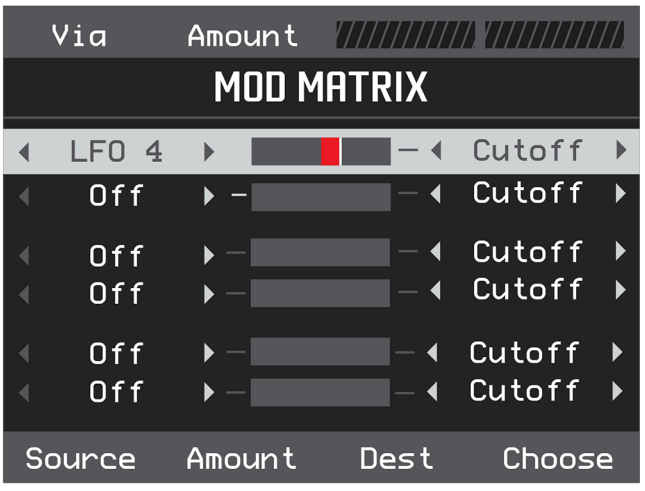
While it is possible to add all the needed modulations directly from the **[MOD MATRIX]** page, the modulations can also be quick-assigned and adjusted by holding a modulation source button and turning a knob controlling a modulation target parameter.



For example, holding the **[LFO 4]** button while turning the **[CUTOFF]** knob will assign **LFO 4** to modulate the filter **Cutoff**.

Assigned modulations can be edited in detail by pressing the **[MOD MATRIX]** button.

Hold the **[SHIFT]** button while pressing the assigned modulation parameter **knob** or **Soft Knob** to reset its value.



Modulation Source Lock

Quick-assigning modulations can require finger dexterity and complex two-handed combinations, especially if Via's are used. Modulation Source Lock mode makes adding modulations easier.

- Double-click the modulation source button to activate Mod Source Lock mode. The modulation source LED will blink.
- Locate the page with the parameter used as a modulation destination.
- Turn a Soft Knob to assign modulation.
- Exit the Modulation Source Lock mode by pressing the selected modulation source again, or with the **[ESC]** button.

Adding a Via

Via's can be added to control the modulation intensity with another modulation source. A common usage of Via's is the Mod Wheel controlling the amount of LFO modulation DCO Pitch, where the intensity of the vibrato effect is related to the position/value of the Mod Wheel.

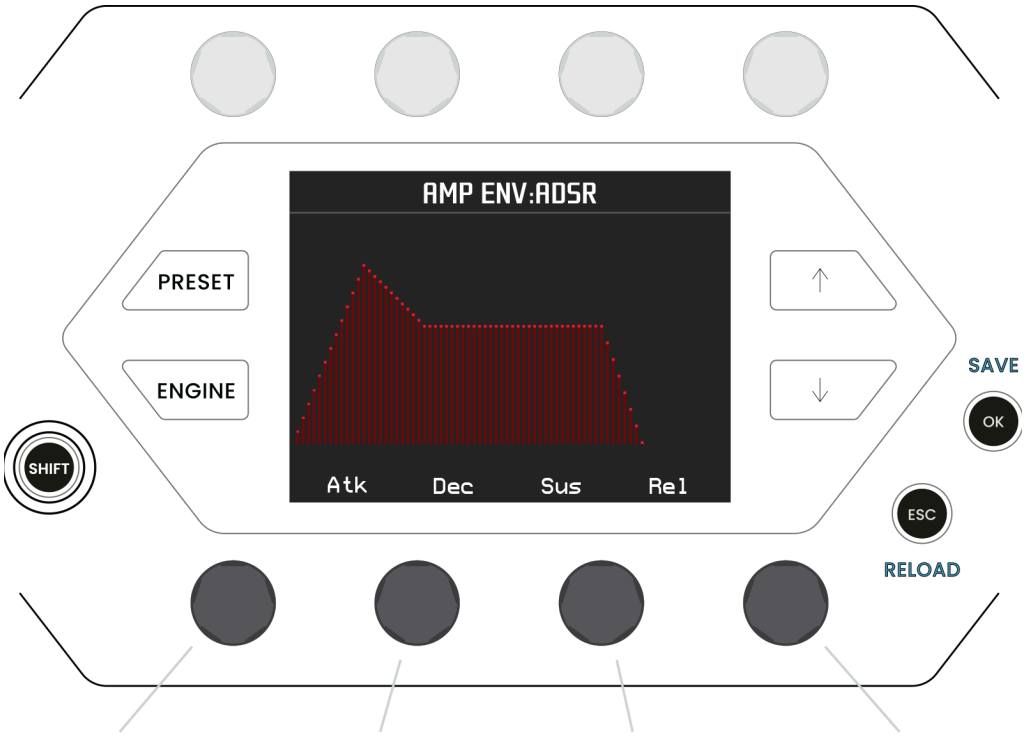
- Hold two modulation buttons while turning a **knob** will assign a modulation with a **Via**.
- To access the Modulation Source Lock mode, double-click both modulation source buttons simultaneously, or hold one modulation source button and double-click the other one.

TIP:
Press the assigned modulation destination **knob** or **Soft Knob** to show the parameter value without a need to change the value.

NOTE:
Some modulation sources can only be accessed via **[MOD MATRIX] <Source>** -list. Refer to the modulation source and destination for the complete list.

ENV

Redshift 6 has four envelopes: **[DCO ENV]**, **[VCF ENV]**, **[AMP ENV]**, and **[AUX ENV]**, that control how the sound changes over time. They are typically used to shape the pitch, timbre, amplitude, or other aspects of the sounds.



‹Atk›
Attack time

‹Dec›
Decay time

‹Sus›
Sustain level

‹Rel›
Release time

Parameter	Value	Description
‹Atk› Attack Time	1ms … 60sec	Sets the duration for the envelope to move from its initial minimum to maximum level.
‹Dec› Decay time	1ms … 60sec	Sets the duration for the envelope to move from the maximum level to the sustain level after the attack stage.
‹Sus› Sustain level	0% … +100%	The level the envelope holds while the key is held down.
‹Rel› Release time	1ms … 60sec	The time it takes for the envelope to fade out to its initial minimum level.

Each envelope can be used as a modulation source for any modulation destination, and is shown in the **MOD MATRIX**, with the following exceptions:

- The **[AMP ENV]** functions as a modulation source for the **[AMP]** with full modulation amount.
- The **[VCF ENV]** functions as a modulation source for the filter **[CUTOFF]** with the **[ENV AMT]** knob controlling the modulation amount.
- The **[DCO ENV]** functions as a modulation source for the individual paraphonic oscillators amplitude with full modulation amount while **<para>** is set to 2 … 16.

  These modulations are always set and are not shown in the **[MOD MATRIX]**.

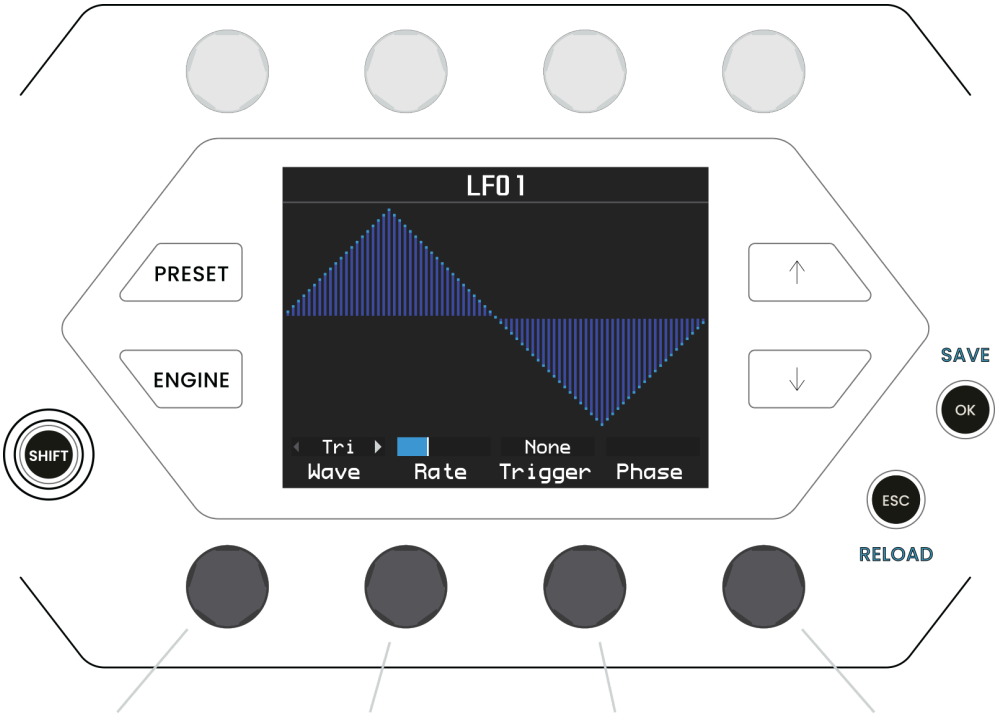
The envelope is initiated when a MIDI note-on message is received. After the Attack and Decay stages, the envelope is held at Sustain Level until a midi note-off message is received, which starts the Release state. If a new MIDI note-on message is received while the last Release stage is not fully completed, the envelope will continue to the Attack stage from its current level.

Practical ideas for ENV modulations:

- Filter Cutoff modulation - The **VCF ENV** modulates the **<Cutoff>** frequency to create a filter sweep.
  - Adjust **[VCF ENV]** **<Atk>**, **<Dec>**, **<Rel>** parameters to your liking, add a relatively low **<Sus>** level, and turn **[ENV AMT]** Knob for adjusting the modulation amount.
  - If needed, turn **[CUTOFF]** counterclockwise to hear the effect. Boost the effect with **[RESONANCE]**
- Pitch modulation - The **ENV** modulates the **<Tune2>** of the **[DCO]** to create a “Blip” for a synth brass.
  - Adjust **[AUX ENV]** to have immediate **<Atk>** and **<Rel>**, relatively fast **<Dec>**, and minimum **<Sus>** level.
  - Hold **[AUX ENV]**, press **[DCO]**, and turn **<Tune2>** Soft Knob for adjusting the modulation amount. Fine-tune in **MOD MATRIX**.

LFO

Redshift 6 has 4 LFOs, Low-Frequency Oscillators: **[LFO 1]**, **[LFO 2]**, **[LFO 3]**, and **[LFO 4]**, that control how the sound changes over time. They are typically used to shape the pitch, timbre, amplitude, or other aspects of the sounds.



‹Wave›
LFO waveform

‹Rate›
LFO rate

‹Trigger›
LFO trigger source

‹Phase›
LFO phase

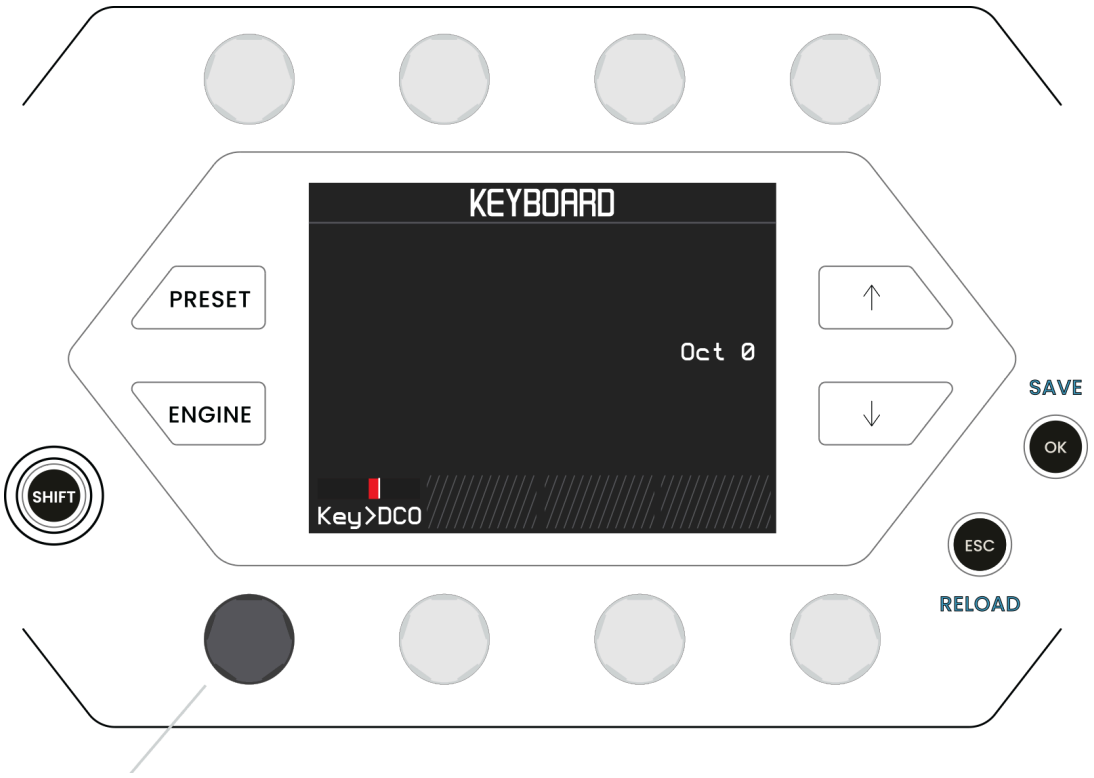
PARAMETER	VALUE	Description
‹Wave›	Tri	Triangle Wave
	Sqr	Square Wave
	Sin	Sine Wave
	Saw	Saw Wave
	RevSaw	Reverse Saw
	Exp	Exponential Curve
	RevExp	Reverse Exponential Curve
	Log	Logarithmic Curve
	RevLog	Reverse Logarithmic Curve
‹Rate›	10s … 100 Hz	LFO frequency. If Sync = Clock, divisions.
‹Sync›	None	Free running
	NoteOn	Midi note-on retriggers the LFO
	NoteOff	Released note retriggers the LFO
	LFO1	LFO1's complete cycle retriggers the LFO
	LFO2	LFO2's complete cycle retriggers the LFO
	LFO3	LFO3's complete cycle retriggers the LFO
	LFO4	LFO4's complete cycle retriggers the LFO
	Clock	LFO is tempo-synced to the master clock
‹Phase›	0 … 360 deg	LFO waveform phase

Practical ideas for LFO modulations:

- Pitch modulation - The **LFO** modulates the **<Pitch>** of a sound to create a Vibrato effect.
    - Hold **[LFO 1]**, press **[PERFORM]**, and turn **<Pitch>** Soft Knob for adjusting the modulation amount.
- Amplitude modulation - The **LFO** modulates the **<Volume>** to create a Tremolo effect.
    - Hold **[LFO 1]**, press **[AMP]**, and turn **<Volume>** Soft Knob for adjusting the modulation amount.
- Filter Cutoff modulation - The **LFO** modulates the **<Cutoff>** frequency to create a sweeping “wah-wah” effect.
    - Hold **[LFO 1]**, and turn the **[CUTOFF]** knob for adjusting the modulation amount.
- Adding movement and texture: Subtle LFO modulations can be used to introduce slight variations in pitch, volume, or timbre, adding a sense of movement and richness to the sound.
    - Hold **[LFO 1]**, press **[DCO]**, and turn **<Tune2>** Soft Knob slightly for adjusting the modulation amount. Hold **[SHIFT]** for fine-tuning.
- Modulating panning: The LFO can control the stereo position of a sound, creating a panning effect where the sound moves back and forth between the left and right speakers.
    - Hold **[LFO 1]**, press **[AMP]**, and turn **<Pan>** Soft Knob for adjusting the modulation amount.

KEY

Key Follow (or Keyboard Tracking) is a modulation source that is based on the pitch of the MIDI note being played. It allows different keys across the keyboard (MIDI note-on messages) to modulate aspects of the sound, making the instrument more responsive and dynamic.



‹Key›DCO›
Key to DCO modulation amount

Parameter	Value	Description
‹Key›DCO› Key to DCO mod amount	-400% … +400%	Sets the Key Follow for the DCO (Oscillator Pitch). This setting must be adjusted to 100% for “normal playing”.

TIP:
Press and hold the **‹Key›DCO›** Soft Knob while turning it to select values: -100%, 0%, and +100% (default).

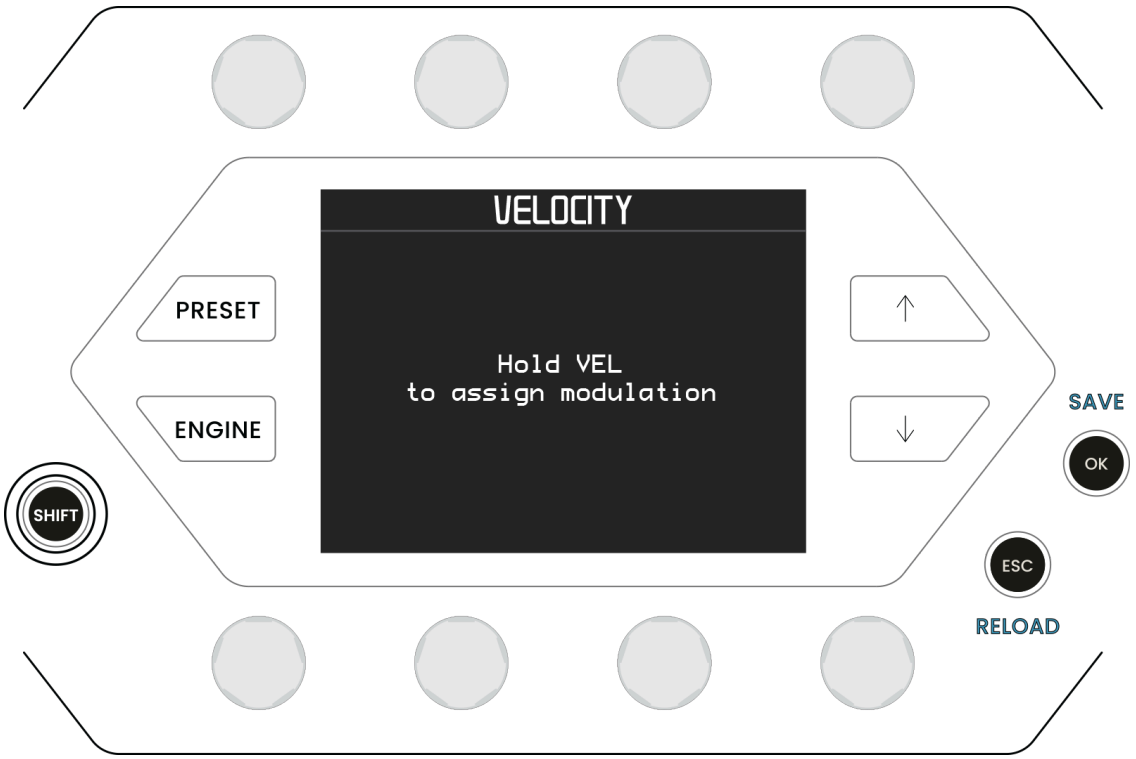
NOTE:
The fixed zero point is MIDI note number 69 (A4).

Practical ideas for KEY modulations:

- Filter cutoff modulation - The **KEY** modulates the **CUTOFF** of the filter to create a brighter timbre with higher notes.
    - Press the **[VCF]** button, and turn the **<Key>** Soft Knob to adjust the modulation.
- LFO rate modulation - The **KEY** modulates the **<Rate>** of the **[LFO 1]** to create a faster vibrato with higher notes.
    - Hold the **[LFO 1]** button, press the **[PERFORM]** button, and turn the **<Pitch>** Soft Knob to assign and adjust modulation.
    - Hold the **[KEY]** button, press the **[LFO 1]** button, and turn the **<Rate>** Soft Knob fully clockwise for the maximum mod amount.

VEL

Note-on (and note-off) velocity can be used as a modulation source, allowing for dynamic, expressive control over various sound parameters based on how hard a key is pressed, or how fast it is released. Unlike a simple on/off trigger, velocity-sensitive modulation can mimic the natural response of many acoustic instruments.



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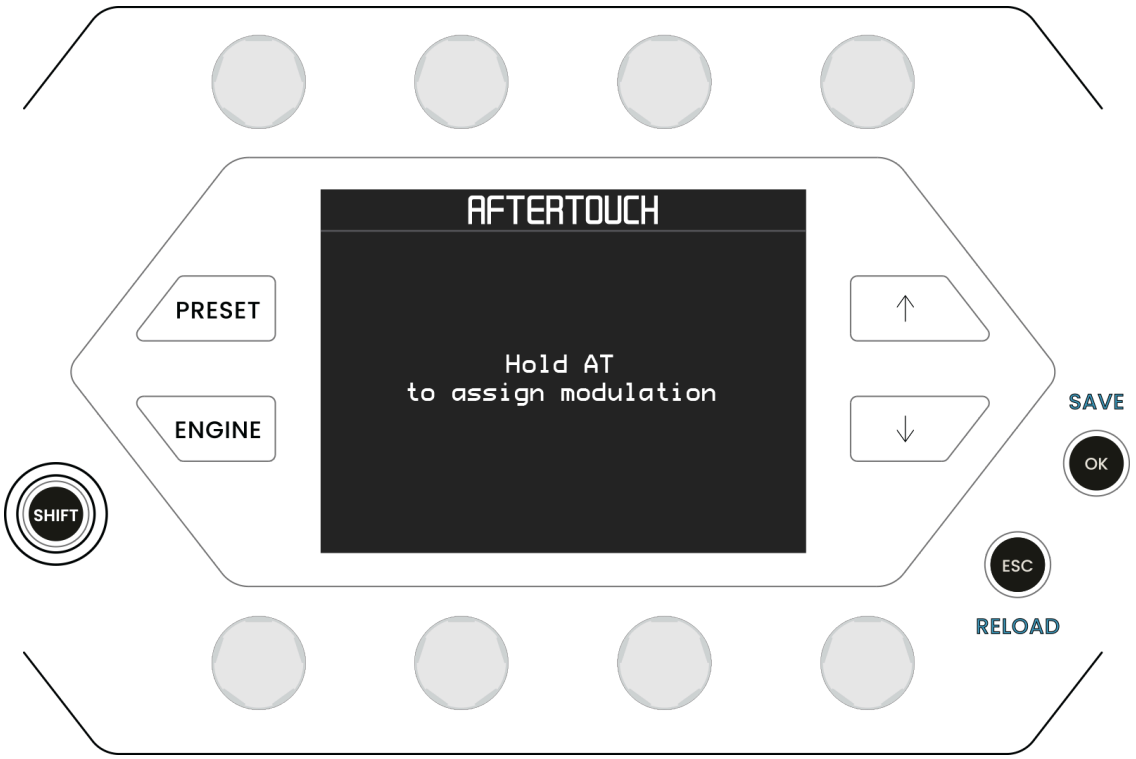
NOTE:
Note-off velocity (Off Vel) can be assigned as a modulation source only from the **[MOD MATRIX]**.

Practical ideas for VEL modulations:

- VCA amplitude modulation - The **VEL** modulates the **AMP** (amplitude). The harder key presses (=MIDI note-on velocity) produce a louder sound.
    - Press the **[AMP]** button, and turn the **<Vel>** Soft Knob to adjust the modulation.
- VCF ENV intensity modulation - The **VEL** modulates the intensity of **VCF ENV** modulating the **VCF** cutoff. The higher MIDI note-on velocity values produce a brighter sound.
    - Press the **[VCF]** button, and turn the **<Vel>** Soft Knob to adjust the modulation.
- VCF Envelope modulation - **VEL** modulates the envelopes **<Atk>**. The softer key presses result in a slower attack, while harder presses create a snappier response.
    - Adjust **VCF ENV <Atk>** to have a relatively slow attack. Adjust the **[CUTOFF]** and **[ENV AMT]** to hear the effect of the **VCF-ENV**.
    - Press the **[VEL]** button, and turn the **<Atk>** Soft Knob counterclockwise to adjust the modulation.

AT

Aftertouch is a dynamic modulation source that activates when additional pressure is applied to a key after it has been pressed (depending on the controller or keyboard used). It allows for real-time expressive control without needing to use extra knobs, wheels, or pedals. Redshift 6 responses to both Channel and Polyphonic Aftertouch.



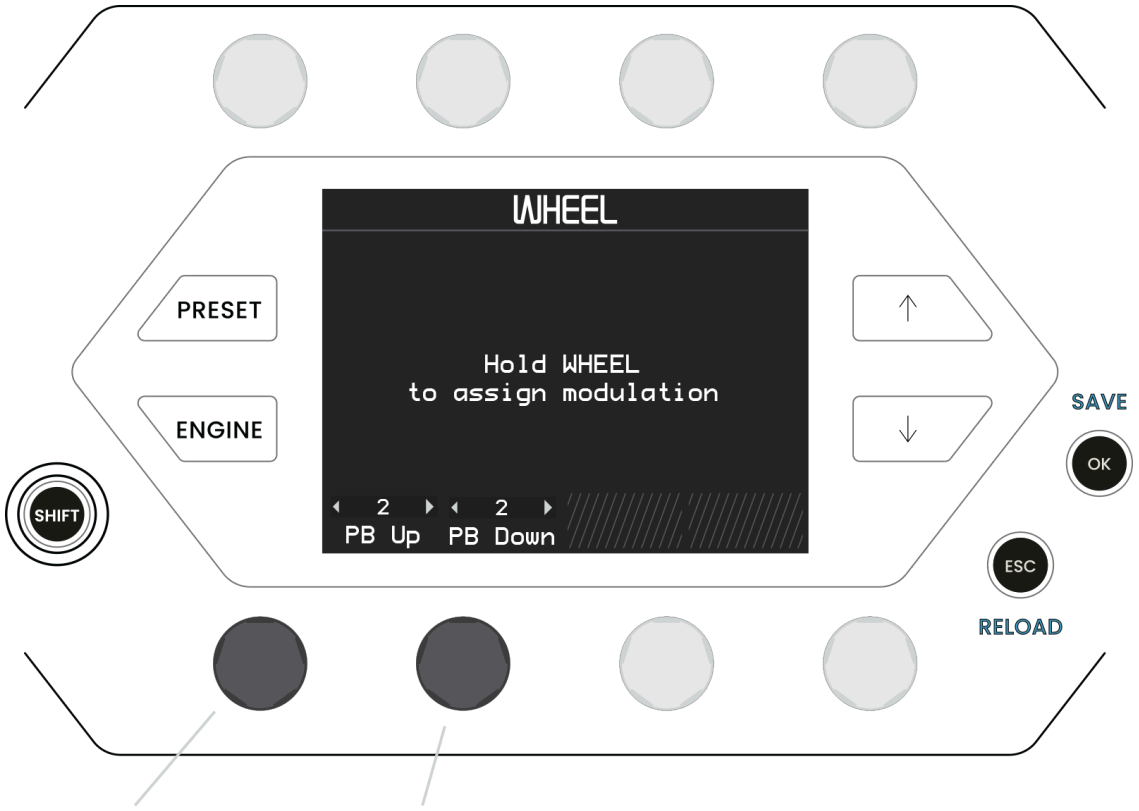
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Practical ideas for AT modulations:

- VCF cutoff modulation - The **AT** modulates the cutoff of the **VCF**. The harder key press (= high AT value) produces a brighter sound.
    - Hold the **[AT]** button, and turn the **[CUTOFF]** knob to adjust the modulation.
- DCO pitch modulation - The **AT** adjusts the amount of **LFO1** modulating the **DCO** pitch.
    - Hold the **[LFO] + [AT]**buttons, press the **[DCO]** button, and turn the **<Pitch>** Soft Knob to adjust the modulation.

WHEEL

The Pitch Wheel and the Modulation Wheel are the most commonly used modulation sources in synthesizers, allowing players to dynamically control various parameters in real-time, adding expressiveness and movement to sounds.



‹PB Up›
Pitch Wheel
Semitones up

‹PB Down›
Pitch Wheel
Semitones down

Parameter	Value	Description
‹PB Up› Pitch Wheel Semitones up	0 … 24	Sets the maximum effect of the “Pitch Wheel up” in semitones.
‹PB Down› Pitch Wheel Semitones down	0 … 24	Sets the maximum effect of the “Pitch Wheel down” in semitones.

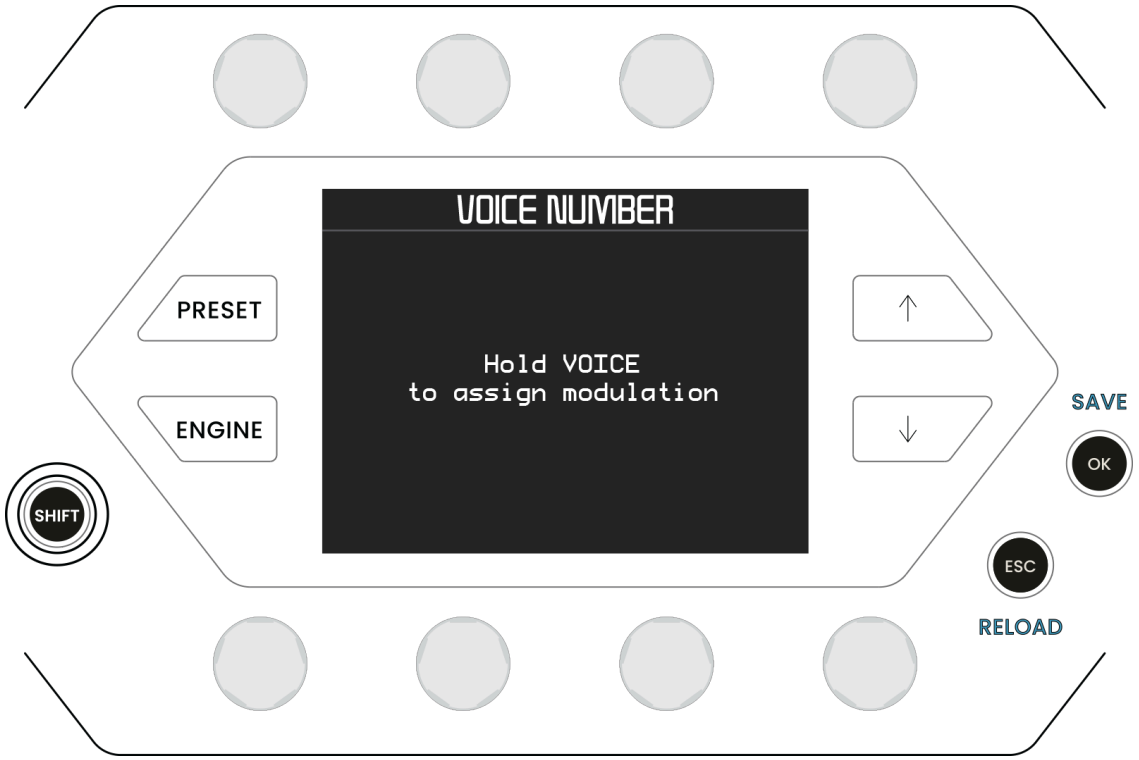
Note: Pitch Wheel is fixed as a modulation source to DCO pitch and cannot modulate anything else currently.

Practical ideas for WHEEL modulations:

- DCO Pitch modulation (vibrato) - The Modulation Wheel controls the intensity of the LFO modulating the DCO pitch.
    - Hold the **[LFO1] + [WHEEL]** buttons, press **[PERFORM]**, and adjust **<Pitch>** Soft Knob.
- Filter cutoff modulation - The Modulation Wheel controls the **CUTOFF** of the filter making the sound brighter or darker.
    - Hold the **[WHEEL]** button, and turn the **<CUTOFF>** knob to adjust the modulation.

VOICE

Voice refers to a fixed value that is assigned to all available Voices. Refer to APPENDIX Modulation Sources for all available variations.



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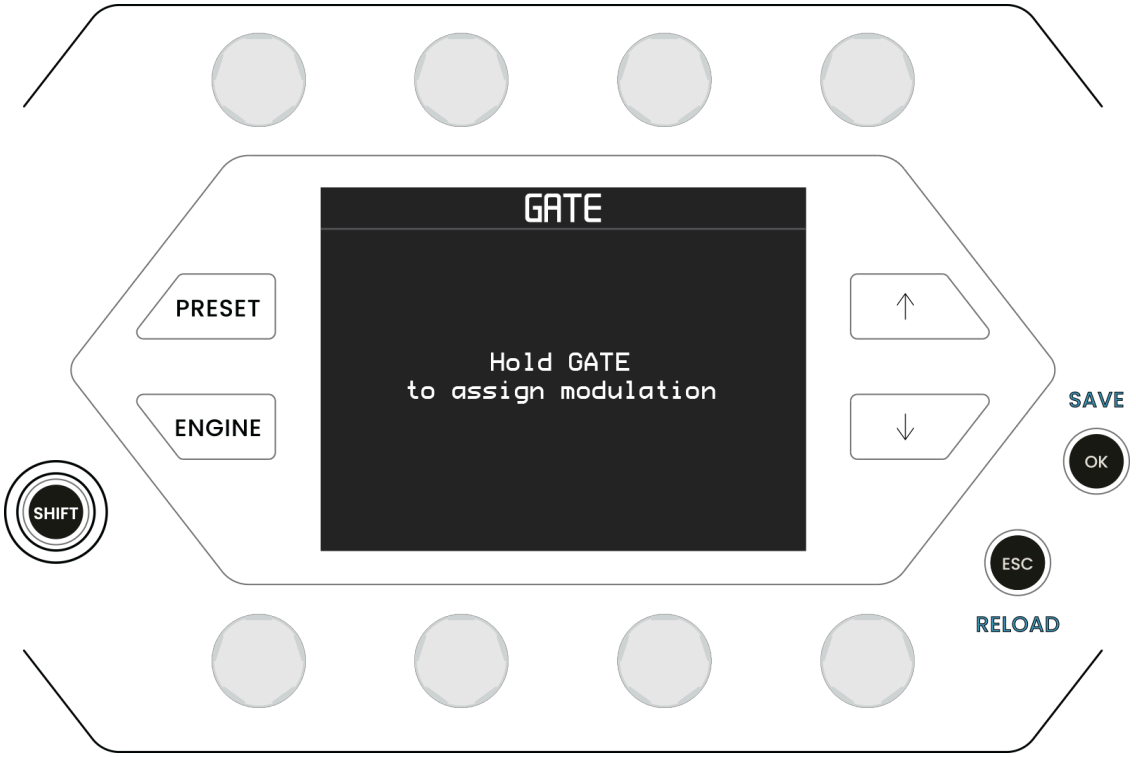
Practical ideas for VOICE modulations:

- Stereo Panning - The **VOICE** modulates the **AMP <Pan>** for a stereo panning effect, creating a wider and more immersive spatial experience.
    - Hold the **[VOICE]** button, press the **[AMP]** button, and turn the **<Pan>** Soft Knob to adjust the modulation.

NOTE:
Some of the voice related modulation sources can be assigned only from the **<Source>** list on the **[MOD MATRIX]** page.

GATE

The Gate is an On/Off type (MIN/MAX) of modulation source, triggered by a MIDI note-on message (a key press). It is used for triggering all Envelopes, but it also can modulate other modulation destinations.



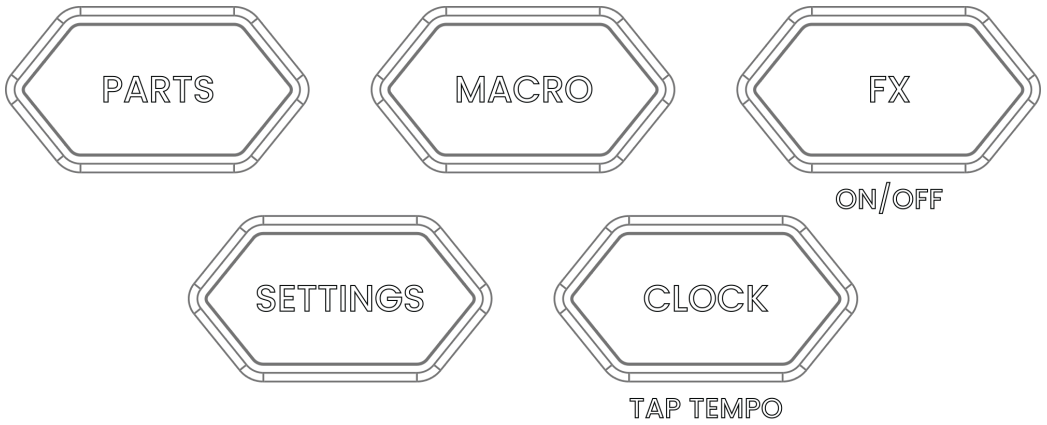
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Practical ideas for GATE modulations:

- Balance Modulation - The **GATE** modulates the **[BALANCE]** for a timbre change at the **AMP ENV** Release stage.
    - Adjust **[DCO]** page **<tune2>** Soft Knob to -1 oct.
    - Adjust the [AMP ENV] page **<Rel>** Soft Knob to a relatively long Release.
    - Hold the **[GATE]** button, press the **[AMP]** button, and turn the **[BALANCE]** Soft Knob fully clockwise to assign the modulation.

Global Grid

Global Grid has global controls that are not specific to part.



- The **[PARTS]** button controls Voice assignment parameters.
- The **[MACRO]** button assigns global macros for the Soft Knobs. Not yet implemented.
- The **[FX]** button controls the main output DSP FX. Not yet implemented.
- The **[SETTINGS]** button adjusts global settings.
- The **[CLOCK]** button adjusts clock settings.

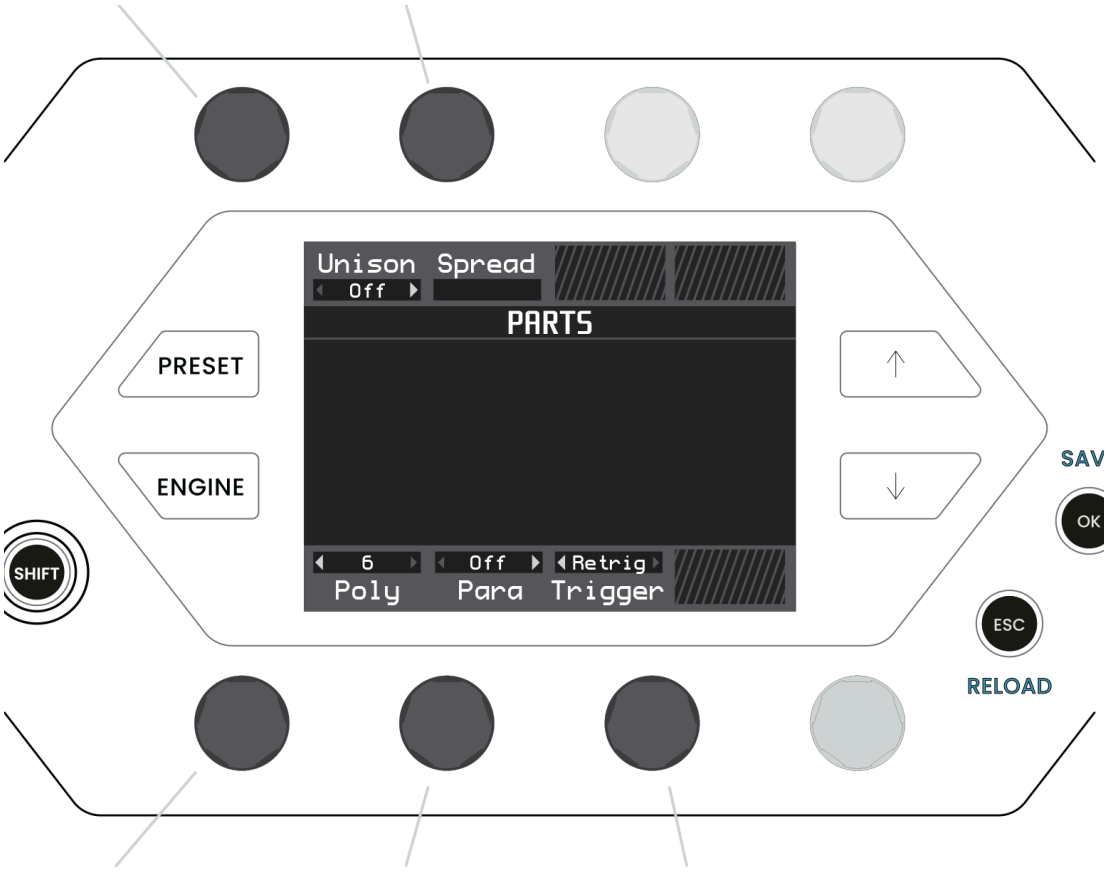
TIP:
Tap the **[CLOCK]** button while holding the **[SHIFT]** button to set the tap tempo.

Parts

Parts view shows the parameters used for the part-specific parameters. Voice assignment of the part has three parameters; Poly, Unison, and Para, which in combination can be used to define how Redshift 6 allocates available six voices. Unison mode has its own stereo pan parameter. Trigger mode defines whether or not the envelopes are retriggered while legato playing.

‹Unison›
Number of voices per note

‹Spread›
Stereo pan of Unison voices



‹Poly›
Max number of voices

‹Para›
Max number of paraphony

‹Trigger›
Trigger mode for envelopes

PARAMETER	VALUE	Description
‹Unison›	Off, 2-6	Voices per note
‹Spread›	0% … 100%	Stereo Spread of Unison voices
‹Poly›	1-6	Max number of polyphony
‹Para›	Off, 2-16	Max number of paraphony
‹Trigger›	Retrig / Legato	Envelope trigger mode

Assigning Unison Mode

All Redshift 6's six voices can be triggered with a single note in Unison mode to create a wall of sound, spread in the stereo field.

The amount of the voices playing in unison is selected by the **<Unison>** Soft Knob.

NOTE:
The unison limits the polyphony. For 6-voice unison, the polyphony must be set to 1 with the **<Poly>** Soft Knob.

TIP:
To play voices with stereo panning, set the **<Unison>** to 2 or more, and **<Poly>** to 3 or less, and adjust the stereo width with the **<Spread>** Soft Knob.



Assigning Mono Mode

Legato triggering mode can be assigned to create classic monophonic analog synth sounds for lead melodies and bass parts.

When playing monophonic sounds, the voice allocation is set to play only one voice by turning maximum polyphony to 1 with the **<Poly >** Soft Knob.

The Envelope Trigger mode can be set to either Retrig or Legato with the **<Trigger>** Soft Knob, allowing for selectable triggering behavior of the envelopes.



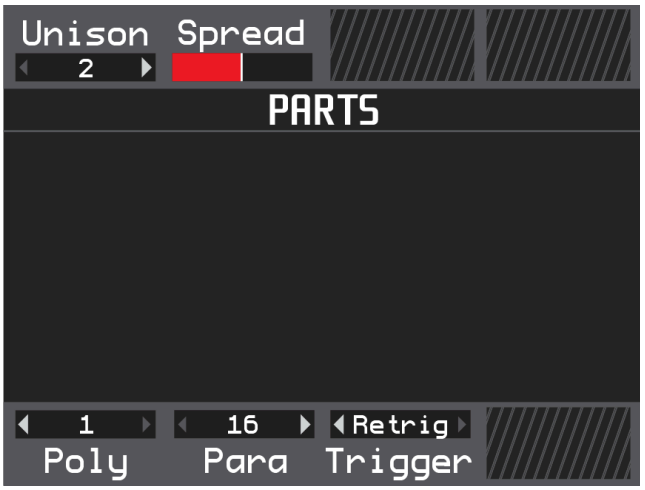
Assigning Paraphonic Mode

Paraphonic mode can be used to create vintage string machine-type sounds.

The max amount of the paraphony is selected by the **<Para>** Soft Knob.

NOTE:
The DCO **<Stack>** size limits the number of paraphony. **DCO ENV** will shape the amplitude of each paraphonic oscillator.

TIP:
To play voices with stereo panning, set the **<Unison>** to 2 or more, and adjust the stereo width with the **<Spread>** Soft Knob.



TIP: Try Paraphonic mode with the Drive set relatively high for aggressive electric guitar-style sounds. The main difference between Poly mode and Paraphony mode is that in Paraphony mode there is only one overdrive stage for multiple midi notes.

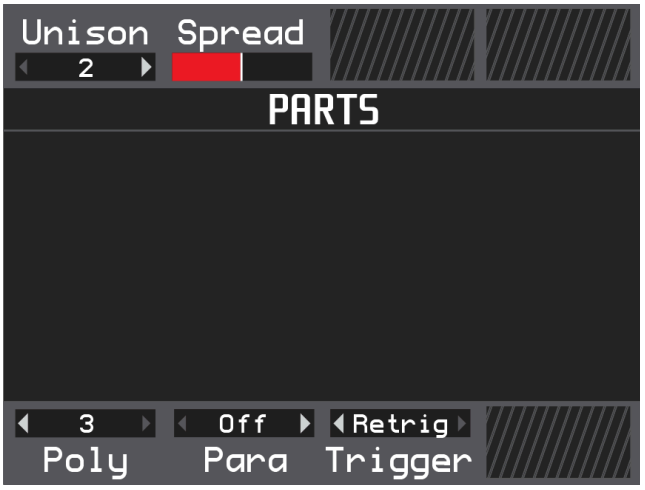
Assigning True-Stereo Poly Mode

A combination of **<Poly>** and **<Unison>** values can be used to create true stereo polyphonic sounds.

The max amount of polyphony selected by the **<Poly>** Soft Knob.

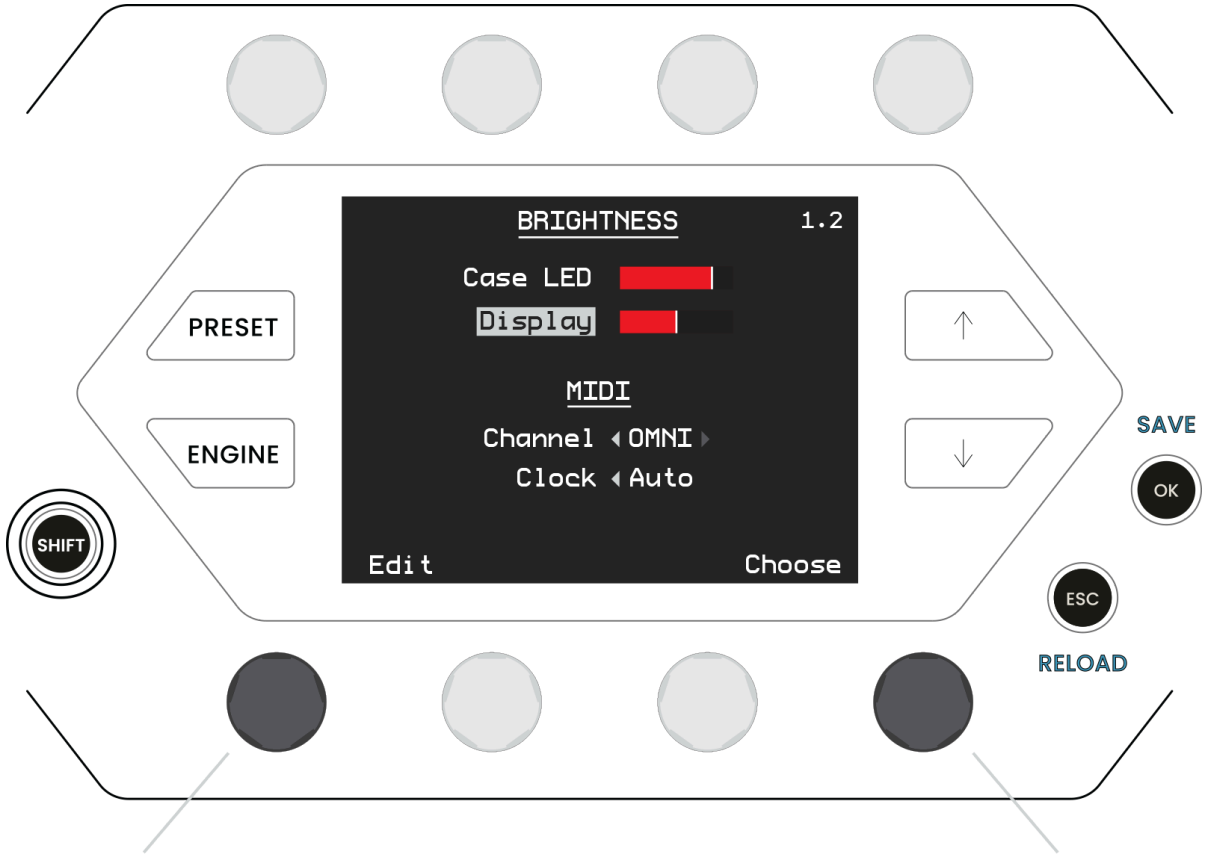
NOTE:
The unison limits the polyphony. For 2-voice unison, the polyphony must be set to 3 with the **<Poly>** Soft Knob.

TIP:
To play voices with stereo panning, adjust the stereo width with the **<Spread>** Soft Knob.



Settings

The Settings page shows the global settings.



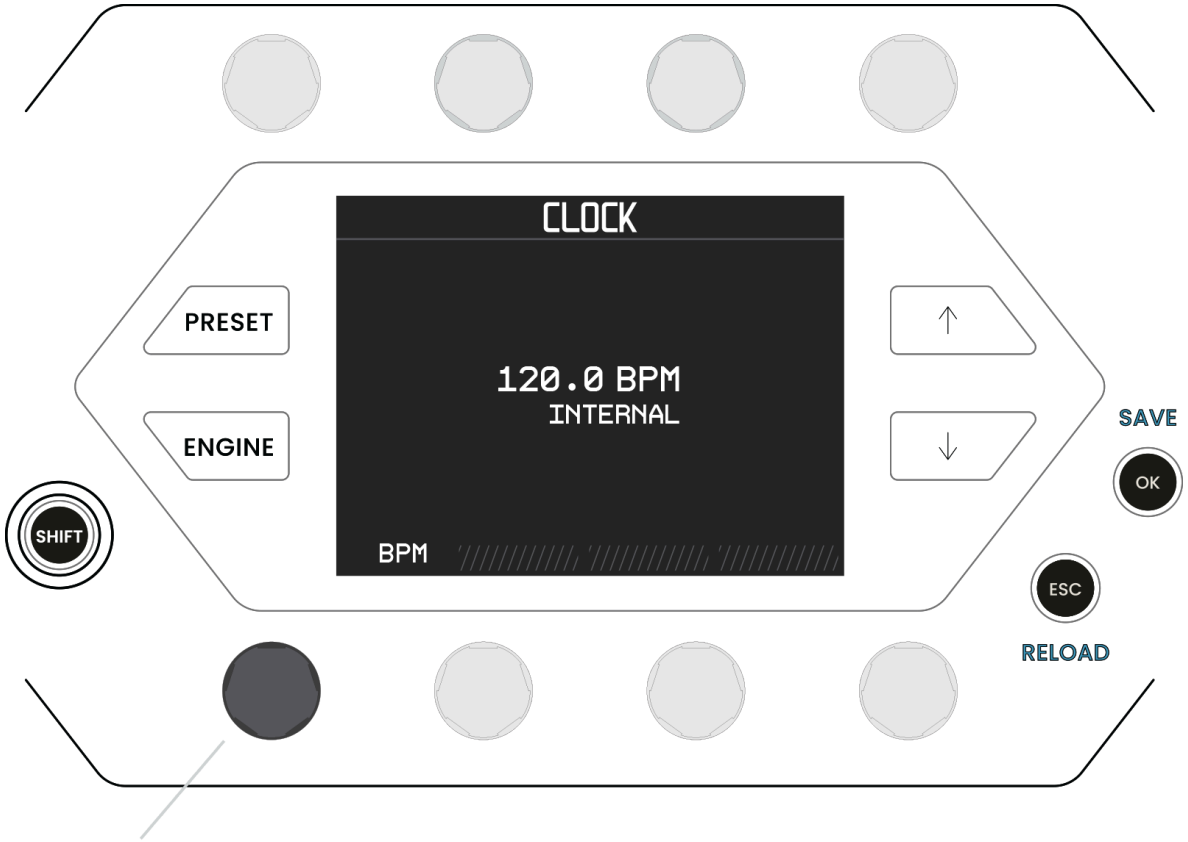
‹Edit›
Edit selected parameter

‹Choose›
Choose parameter for editing

Parameter	Value	Description
‹Case LED›	0% … 100%	Case LED's brightness
‹Display›	0% … 100%	Display brightness
‹Channel›	1-16, OMNI	Midi Channel
‹Clock›	Internal, Auto	Midi Clock source select

Clock

The Clock view displays the parameters that control the Redshift 6's Clock sync and global internal BPM tempo. Hold **[SHIFT]** while pressing **[CLOCK]** multiple times for Tap Tempo. The **[CLOCK]** LED indicates the current tempo.



‹BPM›
Tempo adjust

Parameter	Value	Description
‹BPM›	10 … 250 BPM	Tempo (Beats per minute)

Clock modes:

Clock mode can be selected from the **[SETTINGS]**.

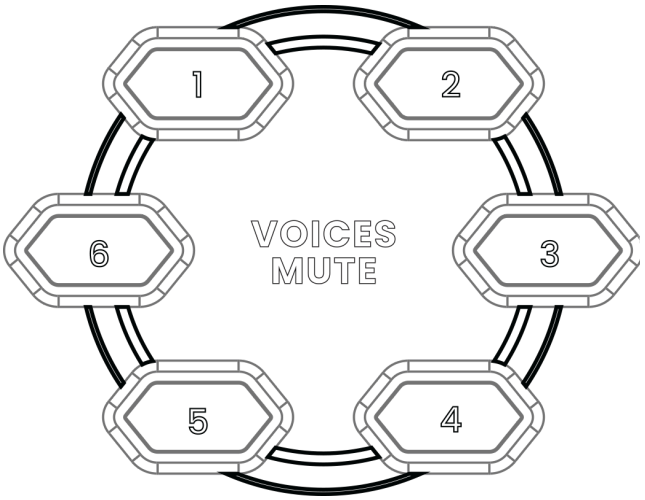
- Auto - External MIDI clock is used when received. If not, the internal clock is used.
- INTERNAL - MIDI clock is disabled, using only the internal clock.

Voices Grid

Voices Grid shows which voice is currently active.

- The **[1] - [6]** LEDs show which of the 6 voices are currently playing.
- The **[1] - [6]** button selects which part is currently active for editing. Not yet implemented.

TIP:
Press the **[SHIFT] + [1]-[6]** buttons to mute a part. Not yet implemented.



Updating the Firmware

The latest version of the firmware can be downloaded from Supercritical's **website**.

NOTE:
Before updating, check the current version of your Redshift 6.

The current version can be displayed by pushing the **[Settings]** button. The version number is in the upper right corner of the display.

Update process

1. Power off the Redshift 6.
2. Connect the supplied USB cable between your computer's USB port and the Redshift 6's USB port.
3. Power on the Redshift 6.
4. Open the Redshift 6 Updater on your computer and click **Start**.
5. When the updater screen displays "All done, bleep away!", the update process is complete.
6. Enjoy the newly updated firmware!

APPENDIX-A: Preset list

Preset Name	Created by
SUPER PLUCK PAD	Supercritical
CROAK A LICIOUS	Supercritical
STEREO UNIBASS	Supercritical
PLANETARY STRINGS	Supercritical
TRANSISTOR ORGAN	Supercritical.
SUPER POLY	Supercritical
RHYTHMIC FIFTHS	Supercritical
RAVE UNISON	Supercritical
FOR TOM AND EDDIE	Supercritical
ANGRY ROCKET SHIP	Supercritical
HUMANA AFTER ALL	Supercritical
PULSATILE REZ PAD	Supercritical
ANTHEM BRASS	Supercritical
PARAPHONIC DRIVE	Supercritical
WORN STRING MACHINE	Supercritical.
VELOBASS	Supercritical
RESO UNISON SWEEP	Supercritical
BON VOYAGER	Supercritical
VINTAGE LEAD	Supercritical
POLY BRASS	Supercritical
SWEEP MOVER	Supercritical
VINTAGE STRINGS	Supercritical
80S POLYSAW	Supercritical
AGING POLY LEGEND	Supercritical.
DUSTY DCO ECHOES	Supercritical
ETHEREAL PAD	Supercritical
INTERSTELLAR DEBRIS	Supercritical
NEW TINES	Supercritical
PARA SAMPLE N HOLD	Supercritical
MUTED GUITAR	Supercritical
80S POLYPWM	Kebu
BETTE DAVIES EYES	Kebu
DCO ENV LEAD	Kebu
JUNE HARP	Kebu
PARAPHONIC STAB	Kebu
	Kebu

Preset Name	Created by
PARACHORDS STAB	Kebu
SUPERSAW AT PLUCK	Kebu
SUPERMASSIVE	Gattobus
NEUTRINO PULSE	Gattobus
PARABOLIC DECAY	Gattobus
STRINGS THEORY	Gattobus
SYNCO WAVES	Gattobus
SUBATOMIC BASS	Gattobus
MULTI DIM SWEEP	Gattobus
PURE JUNE	Gattobus
808 LEAD	Starsky Carr
ACID BASS	Starsky Carr
ACID BASS 2	Starsky Carr
ARP1	Starsky Carr
ARP2	Starsky Carr
ARP3	Starsky Carr
BRASSY 5TH	Starsky Carr
BRASSY PAD	Starsky Carr
BROKEN PLUCK	Starsky Carr
CLASSIC	Starsky Carr
CRIPS PAD	Starsky Carr
DIRTY MOON	Starsky Carr
DIRTY VIBE	Starsky Carr
ELEC BASS	Starsky Carr
ELEC PIANO	Starsky Carr
FALLING BELL	Starsky Carr
FAUX REV ECHO	Starsky Carr
HARMONICS	Starsky Carr
HOOVERISH	Starsky Carr
INHARMONIC CLANGS	Starsky Carr
LOFI ORGAN	Starsky Carr
MOD PAD	Starsky Carr
OCT LEAD	Starsky Carr
OCTAVE BASS	Starsky Carr
ONLY LEAD	Starsky Carr

Preset Name	Created by
POLY 1	Starsky Carr
POLY 2	Starsky Carr
P5 BASS	Starsky Carr
PW CHILLC	Starsky Carr
PWM BASS	Starsky Carr
PWM PAD	Starsky Carr
PWM PAD 2	Starsky Carr
PWM PAD 3	Starsky Carr
REESE BASS	Starsky Carr
RELEASE REZ	Starsky Carr
RESO DROP	Starsky Carr
RISER	Starsky Carr
SAW BASS	Starsky Carr
SEQ BASS	Starsky Carr
SEQ BASS 2	Starsky Carr
SOFT 5TH	Starsky Carr
SOLID BASS	Starsky Carr
SPACE BELLS	Starsky Carr
SQ BASS	Starsky Carr
SYNTH BASS	Starsky Carr
SYNTH BASS 2	Starsky Carr
SYNTH HARP	Starsky Carr
THE MAJOR	Starsky Carr
THE MINOR	Starsky Carr
UNI STACK RATTLE	Starsky Carr

APPENDIX-B: Modulation sources

Source	[Button]	Description
DCO Env	[DCO ENV]	DCO envelope (unipolar)
VCF Env	[VCF ENV]	VCF envelope (unipolar)
Amp Env	[AMP ENV]	AMP envelope (unipolar)
Aux Env	[AUX ENV]	Aux envelope (unipolar)
LFO 1	[LFO 1]	LFO 1 (bipolar)
LFO 2	[LFO 2]	LFO 2 (bipolar)
LFO 3	[LFO 3]	LFO 3 (bipolar)
LFO 4	[LFO 4]	LFO 4 (bipolar)
Velocity	[VEL]	Note-on velocity
Off Vel	-	Note-off velocity
AT	[AT]	Channel and Polyphonic Aftertouch
Key	[KEY]	Key Follow
Gate	[GATE]	MIDI note-on = max, note-off = min
ModWheel	[WHEEL]	Modulation Wheel
VoiceIdx	[VOICE]	Min … Max value is equally divided by voices
VoiceAlt	-	Min and Max value alternate within voices
VoiceRnd	-	Random number for every voice
Uni Idx	-	Min … Max value is equally divided by **<Unison>**
Uni Alt	-	Min and Max value alternate within Unison
Poly Idx	-	Min … Max value is equally divided by **<Poly>**
Poly Alt	-	Min and Max value alternate within Poly

Source	[Button]	Description
Note Rnd	-	Random value with every note-on

NOTE: Modulation sources that do not have its own physical **[Button]** can be selected from the **[MOD MATRIX]** pages **<Source>** list.

Tip:
For understanding (unipolar) Voice/Unison/Poly Idx and Alt sources, in the following chart the Min value is equal to -1 and the Max value is equal to +1.

<Poly> = 3, <Unison> = 2

	Voice #1	Voice #2	Voice #3	Voice #4	Voice #5	Voice #6
VoiceIdx	-1	-0,6	-0,2	+0,2	+0,6	+1
VoiceAlt	-1	+1	-1	+1	-1	+1
Poly Idx	-1	-1	0	0	+1	+1
Poly Alt	-1	-1	+1	+1	-1	-1
Uni Idx	-1	+1	-1	+1	-1	+1
Uni Alt	-1	+1	-1	+1	-1	+1

<Poly> = 2, <Unison> = 3

	Voice #1	Voice #2	Voice #3	Voice #4	Voice #5	Voice #6
VoiceIdx	-1	-0,6	-0,2	+0,2	+0,6	+1
VoiceAlt	-1	+1	-1	+1	-1	+1
Poly Idx	-1	-1	-1	+1	+1	+1
Poly Alt	-1	-1	-1	+1	+1	+1
Uni Idx	-1	0	+1	-1	0	+1
Uni Alt	-1	+1	-1	-1	+1	-1

APPENDIX-C: Modulation destinations

Destination	Description
Aux Atk	<Atk> Soft Knob on [AUX ENV] page
Aux Dec	<Dec> Soft Knob on [AUX ENV] page
Aux Sus	<Sus> Soft Knob on [AUX ENV] page
Aux Rel	<Rel> Soft Knob on [AUX ENV] page
Cutoff	[CUTOFF] knob
Reso	[RESONANCE] knob
Mode	[MODE] knob
LFO 1 Hz	<Rate> Soft Knob on [LFO 1] page
LFO 2 Hz	<Rate> Soft Knob on [LFO 2] page
LFO 3 Hz	<Rate> Soft Knob on [LFO 3] page
LFO 4 Hz	<Rate> Soft Knob on [LFO 4] page
Tune2	<Tune2> Soft Knob on [DCO] page
Detune	[DETUNE] knob
Balance	[BALANCE] knob
Noise	<Noise> Soft Knob on [DCO] page
PW1	<PW 1> Soft Knob on [DCO] page
PW2	<PW 2> Soft Knob on [DCO] page
DCO Atk	<Atk> Soft Knob on [DCO ENV] page
DCO Dec	<Dec> Soft Knob on [DCO ENV] page
DCO Sus	<Sus> Soft Knob on [DCO ENV] page
DCO Rel	<Rel> Soft Knob on [DCO ENV] page

Destination	Description
Gain	<Gain> Soft Knob on [AMP] page
Pan	<Pan> Soft Knob on [AMP] page
Amp Atk	<Atk> Soft Knob on [AMP ENV] page
Amp Dec	<Dec> Soft Knob on [AMP ENV] page
Amp Sus	<Sus> Soft Knob on [AMP ENV] page
Amp Rel	<Rel> Soft Knob on [AMP ENV] page
VCF Atk	<Atk> Soft Knob on [VCF ENV] page
VCF Dec	<Dec> Soft Knob on [VCF ENV] page
VCF Sus	<Sus> Soft Knob on [VCF ENV] page
VCF Rel	<Rel> Soft Knob on [VCF ENV] page
Charactr	[CHARACTER] knob
Volume	<Volume> Soft Knob on [AMP] page
Pitch	<Pitch> Soft Knob on [PERFORM] page

APPENDIX-D: MIDI Implementation

MIDI CC & NRPN

Parameter	CC	NRPN	MSB	LSB
Character	70	0	0	0
Drive	78	1	0	1
DCO: Osc 1 Wave		128	1	0
DCO: Osc 2 Wave		129	1	1
DCO: Osc 1 PW		130	1	2
DCO: Osc 2 PW		131	1	3
DCO: Osc 2 Tune		132	1	4
DCO: Stack	75	133	1	5
DCO: Detune	76	134	1	6
DCO: Balance	77	135	1	7
DCO: Noise Level		136	1	8
VCF: Cutoff	74	256	2	0
VCF: Resonance	71	257	2	1
VCF: Env Amount	73	258	2	2
VCF: Filter Mode	72	259	2	3
VCF: Key Follow		260	2	4
VCF: Vel > VCF Env		261	2	5
Amp: Gain		384	3	0
Amp: Pan	10	385	3	1
Amp: Vel > Amp		386	3	2
Perform: Pitch		512	4	0
Perform: Glide	5	513	4	1
Parts: Volume	7	768	6	0

Parameter	CC	NRPN	MSB	LSB
Parts: Polyphony		769	6	1
Parts: Unison		770	6	2
Parts: Unison Pan Spread		771	6	3
Parts: Paraphony		772	6	4
Parts: Trigger Mode		773	6	5
Clock: BPM		1280	10	0
Key: DCO Key Follow		1408	11	0
Wheel: Pitch Bend Up		1792	14	0
Wheel: Pitch Bend Down		1793	14	1
Amp: Attack		2432	19	0
Amp: Decay		2433	19	1
Amp: Sustain		2434	19	2
Amp: Release		2435	19	3
VCF: Attack		2560	20	0
VCF: Decay		2561	20	1
VCF: Sustain		2562	20	2
VCF: Release		2563	20	3
DCO: Attack		2688	21	0
DCO: Decay		2689	21	1
DCO: Sustain		2690	21	2
DCO: Release		2691	21	3
Aux: Attack		2816	22	0
Aux: Decay		2817	22	1
Aux: Sustain		2818	22	2
Aux: Release		2819	22	3
LFO 1: Rate		2944	23	0
LFO 1: Clock Multiplier		2945	23	1

Parameter	CC	NRPN	MSB	LSB
LFO 1: Wave		2946	23	2
LFO 1: Sync		2947	23	3
LFO 1: Reset Phase		2948	23	4
LFO 2: Rate		3072	24	0
LFO 2: Clock Multiplier		3073	24	1
LFO 2: Wave		3074	24	2
LFO 2: Sync		3075	24	3
LFO 2: Reset Phase		3076	24	4
LFO 3: Rate		3200	25	0
LFO 3: Clock Multiplier		3201	25	1
LFO 3: Wave		3202	25	2
LFO 3: Sync		3203	25	3
LFO 3: Reset Phase		3204	25	4
LFO 4: Rate		3328	26	0
LFO 4: Clock Multiplier		3329	26	1
LFO 4: Wave		3330	26	2
LFO 4: Sync		3331	26	3
LFO 4: Reset Phase		3332	26	4