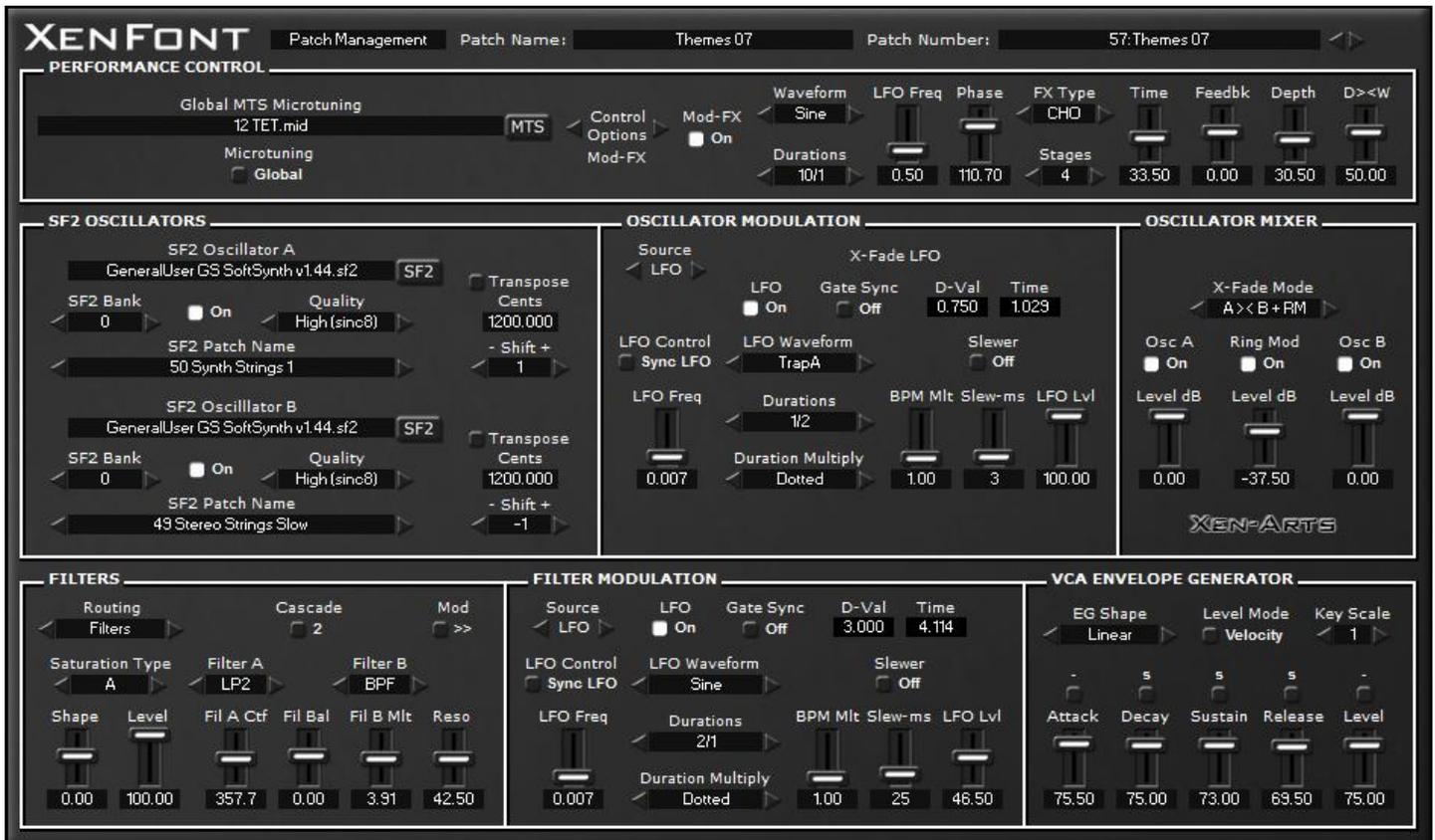


XEN-ARTS

presents

XENFONT



A HYBRID SOUNDFONT & SUBTRACTIVE SYNTHESIS VSTI FOR THE CREATION OF MICROTONAL AND XENHARMONIC MUSIC

INSTRUCTION MANUAL

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XenFont

The Microtonal SoundFont Synthesizer

by Xen-Arts

XenFont is a two oscillator, hybrid **SF2 SoundFont & Subtractive Synthesis** VSTi that features full-controller MIDI Pitch Micro-tuning using the **MTS** (MIDI Tuning Standard) format, where any MIDI Note Number can be freely microtuned to any desired pitch across the MIDI range, enabling computer musicians and composers to explore the vast expressive possibilities of composing music with alternative intonation systems.

XenFont is a microtonal sound-designer's SF2 sample-based synthesizer, with a carefully designed ergonomic workflow for quickly creating powerful sounding and musical useful timbres. The instrument enables users to load their own SF2 SoundFont files and thereby any special timbres required of the music at hand, from classical acoustic instruments, to synthesized ones. Routing the SF2 SoundFont Oscillators through the internal synthesis functions of the VSTi, provides a way to radically transform the original sounds and create new synthesized timbres.

XenFont is also an educational tool for learning about computer music sound-design, sampling and subtractive sound synthesis, as well as musical instrument intonation (aka microtuning and xenharmonics).

XenFont embodies a design philosophy of simplicity for microtonal music sound-design...

- Enables computer musicians and composers to freely load their own SF2 SoundFonts into a fully microtonal, hybrid sampling & subtractive synthesis based VSTi.
- A 'knob-less' design featuring slider controls only, which enables intuitive direct control with a computer mouse.
- A dedicated control signal system mapped to the most important synthesis functions.
- Settings are made by typing values into fields, dropdown lists, left-and-right arrows, switches and sliders.
- Enables musicians to specify precise microtonal pitch-bend settings.
- Features arbitrary microtonal oscillator transposition settings.
- Velocity modulation of harmonics enables dynamically playing harmonics of the fundamental pitch.
- Envelope generators with per-stage ADSR keyboard tracking.

Detailed Features...

Oscillator Section

- Two Soundfont Oscillators that enable users to load their own SF2 files.
- Microtonal, Harmonic Series and Subharmonic Series Oscillator Transposition.
- Pitch Envelope Generator with Per-Stage ADSR Keyboard Tracking and Polarity Switching.
- Host Synchronized LFO (with Rate Sequencer) for Cross-Fade Modulation between Oscillators.
- Analog Pitch Drift Emulator with both Unipolar and Bipolar Modulation
- Velocity-to-Harmonics Modulation enables oscillators to dynamically sound harmonics of the fundamental pitch
- Ring Modulation
- Oscillator and Ring Modulator Mixer with Six Cross-Fade Modes.

Filter Section

- Pre-Filter Saturation Stage with 20 Saturation Types.
- Two Independent Filters with Six Filter Types: LP4, LP2, HPF, BPF, BR, APF.
- One and Two Stage Filter Cascade.
- Host Synchronized LFO (with Rate Sequencer) and Envelope Generator for Filter Cutoff Frequency Modulation.
- Filter Envelope Generator with Per-Stage ADSR Keyboard Tracking and Polarity Switching.
- LFO and Envelope Generator enables both Unipolar and Bipolar Filter Modulation.

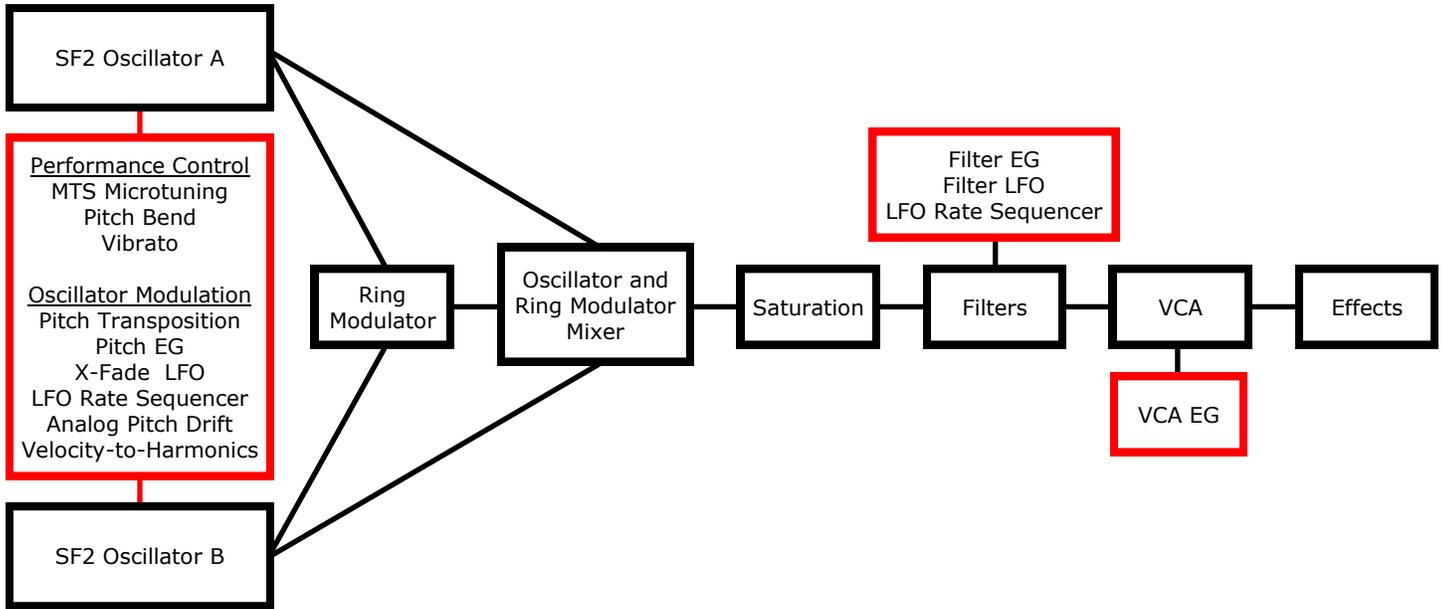
VCA Section

- Dedicated Envelope Generator.
- VCA Envelope Generator with Per-Stage ADSR Keyboard Tracking.
- Switchable Velocity Sensitivity and Fixed Volume Control.

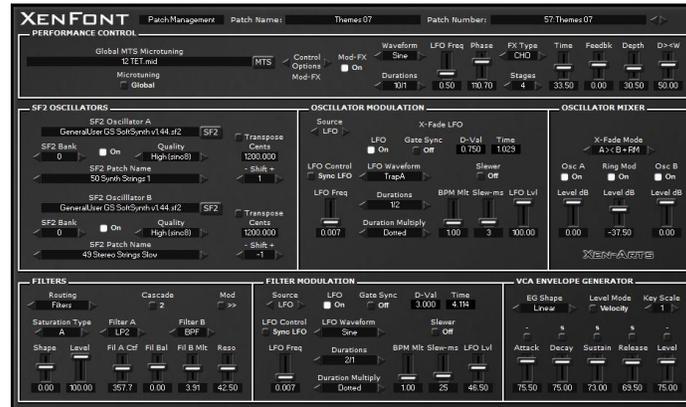
Performance Control

- MIDI Pitch Microtuning with MTS (MIDI Tuning Standard).
- MTS Support for both Single Note and Bulk Dump.
- Loads MTS Microtuning Format Files Internally and Receives MTS Externally.
- Local (Per-Patch) and Global Microtuning (Static Microtuning for All Patches).
- Microtunings can be loaded from any directory on hard drives or storage devices connected to the computer.
- Ten Note Polyphonic.
- Monophonic Legato Mode.
- Polyphonic Portamento with Three Glide Modes.
- Microtonal Pitch Bend.
- Vibrato.
- Effects include Chorus, Flanger, Phasers, Warm Filter and Stereo Ensemble.

XENFONT | SIGNAL FLOW BLOCK DIAGRAM



Black = Audio Signal Flow Red = Modulation Sources



XENFONT | SYSTEM REQUIREMENTS

System Requirements

OS: Ivor is a 32-bit VSTi For Windows XP Pro or higher.

Host DAW: The VSTi was rigorously tested in Reaper, Cubase, Ableton Live and FL Studio and is known to work without problems in these hosts.

MTS Microtuning Creation: Install and use Scala to create your own custom microtunings for this instrument. <http://www.huygens-fokker.org/scala/downloads.html>

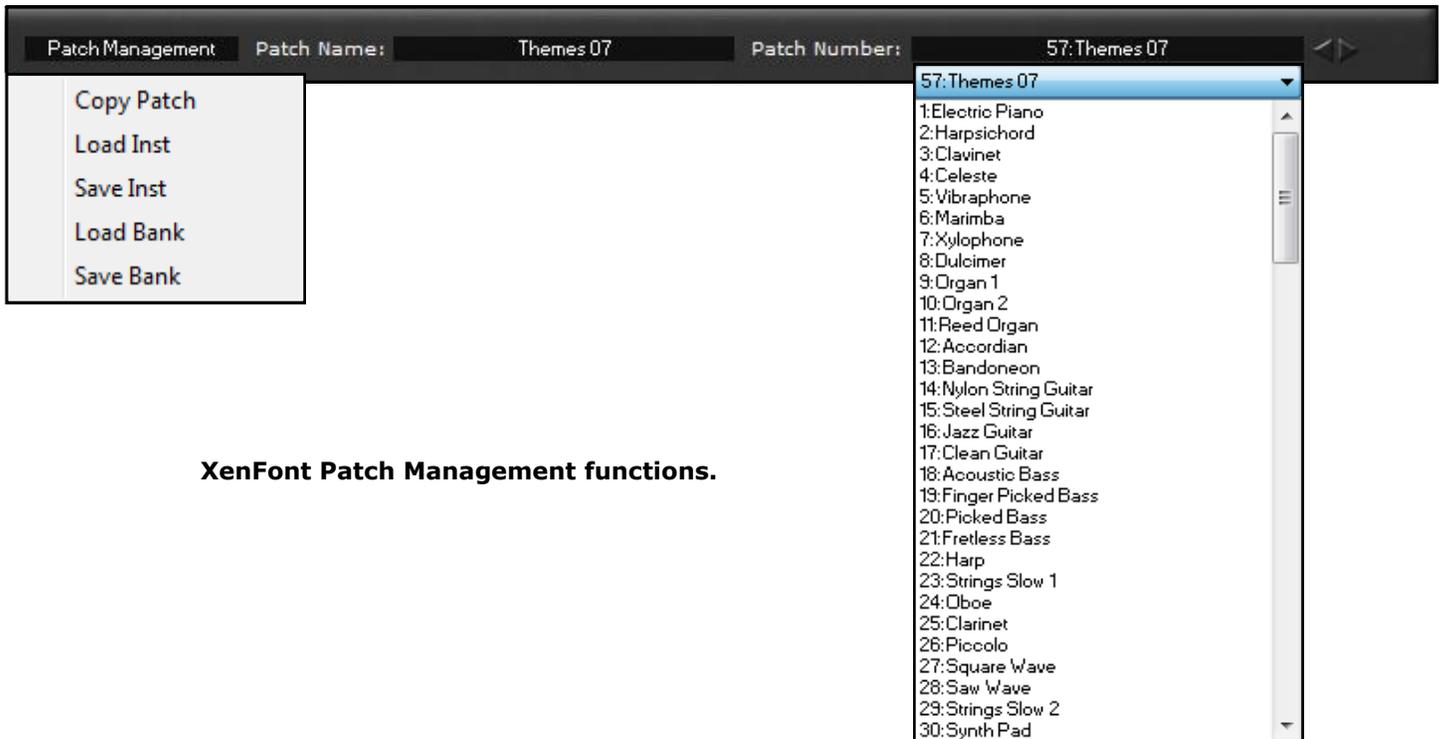
MIDI Controller: Requires the use of an external MIDI Controller such as a USB Halberstadt keyboard (standard 12-tone keyboard), a Generalized Keyboard such as the Axis-64 from C-Thru Music, the Opal Chameleon available from The Shape Of Music, the Starr Labs Microzone U-648 or U-990.

End User: Basic knowledge and experience with the subtractive synthesis method is assumed for the use of this instrument and manual.

Installation

Extract the entire contents of the archive to your VST directory. This will place the VST DLL and all of the dependent files for the plugin in the required place and will insure the correct operation of all the synthesis features. Win 7 users should install the plugin in My Documents or some other directory other than Program Files due to UAC.

XENFONT | PATCH MANAGEMENT



XenFont Patch Management functions.

Use the Patch Management features at the top of the VSTi to load, create and store your instrument patches and banks.

Click the **Patch Management** button to access patch **Copy**, **Load** and **Save** options:

- Copy patches to a single location or to a range of patches with the **Copy Patch** menu option.
- Load an FXP single instrument patch file with the **Load Inst** menu option.
- Save an FXP single instrument patch file with the **Save Inst** menu option.
- Load an FXB bank file that can contain up to 128 patches with the **Load Bank** menu option.
- Save an FXB bank file that can contain up to 128 patches with the **Save Bank** menu option.

Type a new name for the current patch into the **Patch Name** field when designing custom timbres.

Select from the available 128 patches stored in the current bank by clicking the **Patch Number** drop-down menu, or alternatively use the left and right arrow buttons found to the right of the menu to step through the available patches in a bank.

Any changes made to the currently selected patch are automatically saved with that patch number.

IMPORTANT INFORMATION ABOUT THE DEFAULT BANK IN THIS VSTI:

All of the default 'factory' patches in this instrument are made with the SF2 SoundFont file:
GeneralUser GS SoftSynth v1.44.sf2.

1. **Patches 1-32 use only SF2 Oscillator A, and have all of the synthesis functions of the instrument disabled.** These simple patches are a great way to explore microtunings using only a single SF2 source without any of the synthesis and signal processing features being activated. They can also be used as basic initialization patches and starting points for creating one's own custom timbres.

2. **Patches 33 and above use both SF2 Oscillators A & B in conjunction with the synthesis functions;** many of which showcase the various unique features of the instrument, such as the Per-Stage ASDR Keyboard Tracking, Velocity-to-Harmonics Modulation, Microtonal Oscillator Transposition, LFO Controlled Oscillator Cross-Fading and Rate Sequencing. These patches also provide great starting points for one's own custom, although more complex, sound-designs.

XENFONT | PERFORMANCE CONTROL



The XenFont VSTi can load both a Global and Local MTS microtuning.

PERFORMANCE CONTROL | Microtuning

The **XenFont** VSTi enables musicians to load both a **Global MTS Microtuning** as well as a **Local MTS Microtuning**. The Global MTS Microtuning will stay loaded even on patch changes and can be used to play in a constant tuning while previewing the patches in a bank. The Local MTS Microtuning, however, is saved at the patch level and is restored whenever a patch with an associated microtuning is opened. Load the desired Global and Local MTS Microtuning files by clicking the appropriate **MTS** button.

Choose to play the current patch with either the loaded Global or Local MTS Microtuning by using the **Microtuning** button beneath the MTS file loading features.

An important feature of all Xen-Arts VSTi is that they enable musicians and composers to load, and make music with, MTS microtunings that are stored in any directories on their computers. This includes connected external drives and USB storage devices.

XENFONT | PERFORMANCE CONTROL



The MIDI page of Control Options in the Performance Control section.

There are four pages of **Control Options** in the **Performance Control** section: **MIDI**, **Pitch**, **Mod-FX** and **Ensemble**. Switch between these pages using the **Control Options** left and right arrows.

PERFORMANCE CONTROL | Control Options | MIDI

The **BPM** display reports the tempo of the host DAW.

Use the **MIDI Ch** selectors or drop-down list to choose the MIDI reception channels All or 1-16.

Activate or deactivate **Monophonic Mode** with the **Mono Mode** selector. While in **Mono Mode** the synthesizer will only be capable of playing one note at a time, which is useful for bass and single note melodic lines and leads.

Activate or deactivate **Mono Retrigger** using the selector. Enabling **Mono Retrigger** while the synthesizer is in **Mono Mode** causes **Envelope Generators** to be retriggered with each note-on. Leave this in the Off position to play smooth mono-legato passages.

Activate or deactivate **Glide** – aka **Portamento** – using the selector. There are three Glide Modes:

Chord - Enables glide between held notes of chords.

Note 1 – Glides from the last voice.

Note 2 – Glides between notes.

Each of these modes behaves quite differently depending on whether the synth has **Mono Mode** activated or not. Generally speaking, **Chord** mode is useful for polyphonic playback, while **Note 1** and **Note 2** may be more suitable for monophonic lines, although all three may be freely used as the music requires.

Choose between the two **Glide Response** modes using the selector. They are **Rate** and **Time**:

Rate – The glide transition between pitches is determined by interval distance.

Time – The glide transition is a fixed value in milliseconds as specified by the Glide ms slider.

Set the **Glide Time** in milliseconds using the **Glide ms** slider.



The Pitch page of Control Options in the Performance Control section.

PERFORMANCE CONTROL | Control Options | Pitch

Choose between the two **pitch-bend modes** using the **Bend Sel** selector:

9/8 – Sets the pitch bender to bend a precise interval of **9/8** at a value of **204 cents**. This is a fundamental musical interval for pitch bend.

Cents – This mode enables musicians to type in a pitch bend value in cents. The maximum range is 4800 cents, which is four full octaves. This unique feature enables musicians to precisely specify arbitrary microtonal pitch bend values as needed for any imaginable intonation system.

The **P-Bend** slider displays the value and position of movements of a MIDI Pitch Bend controller.

Activate or deactivate **Vibrato** using the selector.

Choose from the available **vibrato waveforms** using the **Vibrato Wave** dropdown list.

Set the **vibrato rate** in Hertz using the **Vib Frq** slider.

Set the **depth of vibrato** using the **Vib Dpt** slider.

Vibrato is by default mapped to the **MIDI Modulation** controller. Movements of the **Mod-Wheel** on an attached MIDI controller will move the **Vib Mod** slider. It is possible to map this parameter to other MIDI Continuous Controllers if needed.

XENFONT | PERFORMANCE CONTROL



The Mod-FX page of Control Options in the Performance Control section. In the above image the Chorus FX Type is selected for the current patch.

PERFORMANCE CONTROL | Control Options | Mod-FX

The **Mod-FX** (Modulation Effects) page is actually made up of three different effects processors in one compact space: **Chorus**, **Phaser 1** and **Phaser 2**. Switch between these three effects by using the **FX Type** selector.

Chorus is an effect that is created with multiple LFO modulated delay lines, where each of the LFO waveforms can be set to modulate with a different phase. Chorus is capable of making, for instance, ensemble detuning effects.

Phaser (or Phase Shifting) is also an LFO modulated effect that is typically created with multiple phase-shifted allpass filters. The input signal is notched by the filters as they are slowly swept across a wide frequency range. The effect can create sounds that can remind of pulse-width modulation on an analog synthesizer, or perhaps parallel filter modulation effects, although it is a unique effect unto itself.

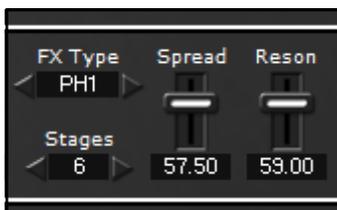
Notice that when changing between the three different effects, some control labels change to reflect the unique settings for the selected FX Type, while the other controls are universal and are applied to all of the effects.

The controls that change according to the selected **FX Type** are as follows:



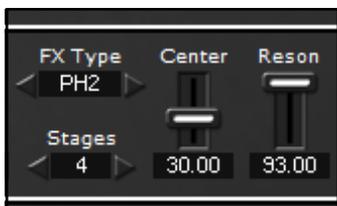
CHO | Chorus

When the **FX Type** is set to **CHO**, the **Chorus** effect is activated, and its unique controls for **Stages**, **Time** and **Feedback** are visible.



PH1 | Phaser 1

When the **FX Type** is set to **PH1**, the **Phaser 1** effect is activated, and its unique controls for **Stages**, **Spread** and **Reson** (Resonance) are visible.



PH2 | Phaser 2

When the **FX Type** is set to **PH2**, the **Phaser 2** effect is activated, and its unique controls for **Stages**, **Center** and **Reson** (Resonance) are visible.

XENFONT | PERFORMANCE CONTROL



The Mod-FX page of Control Options in the Performance Control section. In the above image the Chorus FX Type is selected for the current patch.

PERFORMANCE CONTROL | Control Options | Mod-FX | Chorus

CHO | Chorus

When the **FX Type** is set to **CHO**, the **Chorus** effect is activated, and its unique controls for **Stages**, **Time** and **Feedback** are visible.

As before mentioned, **Chorus** is an effect that is created with multiple LFO modulated delay lines (called here Stages) with short time delays, where each of the LFO waveforms can be set to modulate with a different phase. These modulated delay line Stages (independent voices in the Chorus) are mixed with the dry input signal, which creates the characteristic ensemble effect that we typically associate with chorus.

A related effect is called Flanging. The difference between Flanging and Chorus is a matter of the delay times of the modulated delay lines:

- Flanging delay times are typically within an approximate boundary of 0-20 ms. Flanging also incorporates higher level Feedback settings to get that characteristic notched sweeping sound.
- Chorus delay times are typically within an approximate boundary of 20-60 ms. Chorus will usually have lower, or no, Feedback settings.

The Chorus effect in this VSTi is extremely versatile and can operate within a range of 0-100 ms, making it possible to create myriad fine gradations of Flanging and Chorus sounds.

Activate or deactivate the Modulation Effect using the **Mod-FX On-Off** button.

Select the waveform for the LFO using the **Waveform** selector. Options are **Sine**, **Tri**, **Peak**, **Dip**, **Hump** and **Noise**, each of which imparts a unique modulation character to the selected **FX-Type**.

Select the musical duration period for the selected LFO waveform using the **Durations** selector. The first option available in the list of choices is **Hertz**, and when this is selected, the rate of the LFO is set manually using the **LFO Freq** slider within a range of **.001-10 Hz**. When any of the other musical duration options are selected, the LFO operates in a mode in which it is synced to the host DAW tempo.

Use the **Phase** slider to change the phase relationships of the four internal LFOs that are used to modulate each **Stage** of the selected effect. Changing these phase relationships creates a corresponding change to the sonic character of the modulation, as well as the overall timbre of the oscillator signal.

Use the **Stages** selector to specify the number of available stages that will be modulated by the LFO. Chorus has from 1 to 4 Stages. Set the delay time in milliseconds using the **Time** slider. The **Time** range is from 0 to 100 ms. Set the feedback level using the **Feedbk** slider. The feedback range is from **-100 to 100** and the extremes of high and low feedback settings will produce a sound that is more characteristic of **Flanging**, while lower, or no, feedback settings are typical of **Chorus**. Set the depth at which the LFO will modulate the selected effect using the **Depth** slider. This is an important setting for creating a useful blend and fusion between the dry oscillator signal and the wet processed one. Balance the levels between the dry oscillator signal and the processed effect signal using the **D><W** slider. At a setting of 50 there is an equal mix of dry signal with the effect, at 0 all Dry, at 100 all Effect. This is also a critical setting for creating a musically useful blend between the dry and effects signals.

XENFONT | PERFORMANCE CONTROL



The **Mod-FX** page of **Control Options** in the **Performance Control** section. In the above image the **Phaser 1** FX Type is selected for the current patch.

PERFORMANCE CONTROL | Control Options | Mod-FX | Phaser 1

PH1 | Phaser 1

When the **FX Type** is set to **PH1**, the **Phaser 1** effect is activated, and its unique controls for **Stages**, **Spread** and **Reson** (Resonance) are visible.

As before mentioned, **Phaser** (or Phase Shifting) is also an LFO modulated effect that is typically created with multiple phase-shifted allpass filters. The input signal is mixed with the filter modulated signal which creates notched frequency effects as they are slowly swept across a wide frequency range. The effect can create sounds that can remind of pulse-width modulation on an analog synthesizer, or perhaps parallel filter modulation effects, although it is a unique effect unto itself. Phase Shifting effects typically work best on sustained bright timbres with lots of upper partials.

The **Phaser 1** effect in this VSTi is based on LFO modulated allpass filters and can have from 1 up to 32 stages.

Activate or deactivate the Modulation Effect using the **Mod-FX On-Off** button.

Select the waveform for the LFO using the **Waveform** selector. Options are **Sine**, **Tri**, **Peak**, **Dip**, **Hump** and **Noise**, each of which imparts a unique modulation character to the selected **FX-Type**.

Select the musical duration period for the selected LFO waveform using the **Durations** selector. The first option available in the list of choices is **Hertz**, and when this is selected, the rate of the LFO is set manually using the **LFO Freq** slider within a range of **.001-10 Hz**. When any of the other musical duration options are selected, the LFO operates in a mode in which it is synced to the host DAW tempo.

Use the **Phase** slider to change the phase relationships of the four internal LFOs that are used to modulate each **Stage** of the selected effect. Changing these phase relationships creates a corresponding change to the sonic character of the modulation, as well as the overall timbre of the oscillator signal.

Use the **Stages** selector to specify the number of available stages that will be modulated by the LFO. **Phaser 1** has from **1 to 32 Stages**.

Set the spacing between the **Phaser Stages** using the **Spread** slider.

Set the resonance level using the **Reson** slider.

Set the depth at which the LFO will modulate the selected effect using the **Depth** slider. This is an important setting for creating a useful blend and fusion between the dry oscillator signal and the wet processed one.

Balance the levels between the dry oscillator signal and the processed effect signal using the **D><W** slider. At a setting of 50 there is an equal mix of dry signal with the effect, at 0 all Dry, at 100 all Effect. This is also a critical setting for creating a musically useful blend between the dry and effects signals.

XENFONT | PERFORMANCE CONTROL



The Mod-FX page of Control Options in the Performance Control section. In the above image the Phaser 2 FX Type is selected for the current patch.

PERFORMANCE CONTROL | Control Options | Mod-FX | Phaser 2

PH2 | Phaser 2

When the **FX Type** is set to **PH2**, the **Phaser 2** effect is activated, and its unique controls for **Stages**, **Center** and **Reson** (Resonance) are visible.

As before mentioned, **Phaser** (or Phase Shifting) is also an LFO modulated effect that is typically created with multiple phase-shifted allpass filters, however, the unique character of the **Phaser 2** effect is based on the use of LFO modulated state variable filters and can have from 1 up to 4 stages.

The input signal is mixed with the filter modulated signal which creates notched frequency effects as they are slowly swept across a wide frequency range. The effect can create sounds that can remind of pulse-width modulation on an analog synthesizer, or perhaps parallel filter modulation effects, although it is a unique effect unto itself. Phase Shifting effects typically work best on sustained bright timbres with lots of upper partials.

Activate or deactivate the Modulation Effect using the **Mod-FX On-Off** button.

Select the waveform for the LFO using the **Waveform** selector. Options are **Sine**, **Tri**, **Peak**, **Dip**, **Hump** and **Noise**, each of which imparts a unique modulation character to the selected **FX-Type**.

Select the musical duration period for the selected LFO waveform using the **Durations** selector. The first option available in the list of choices is **Hertz**, and when this is selected, the rate of the LFO is set manually using the **LFO Freq** slider within a range of **.001-10 Hz**. When any of the other musical duration options are selected, the LFO operates in a mode in which it is synced to the host DAW tempo.

Use the **Phase** slider to change the phase relationships of the four internal LFOs that are used to modulate each **Stage** of the selected effect. Changing these phase relationships creates a corresponding change to the sonic character of the modulation, as well as the overall timbre of the oscillator signal.

Use the **Stages** selector to specify the number of available stages that will be modulated by the LFO. **Phaser 2** has from **1 to 4 Stages**.

Set the center around which the LFO will modulate the filters using the **Center** slider, which is useful for dialing in the sweet spot of the effect.

Set the resonance level using the **Reson** slider. Higher values can produce a deeper notched and ringing effect.

Set the depth at which the LFO will modulate the selected effect using the **Depth** slider. This is an important setting for creating a useful blend and fusion between the dry oscillator signal and the wet processed one.

Balance the levels between the dry oscillator signal and the processed effect signal using the **D><W** slider. At a setting of 50 there is an equal mix of dry signal with the effect, at 0 all Dry, at 100 all Effect. This is also a critical setting for creating a musically useful blend between the dry and effects signals.

XENFONT | PERFORMANCE CONTROL



The Ensemble page of Control Options in the Performance Control section.

PERFORMANCE CONTROL | Control Options | Ensemble

Activate or deactivate the **Warm** filter using the selector. This is a 6 dB per octave filter that can be used to gently roll off high frequencies in complex synthesis waveforms.

Select the cutoff frequency of the **Warm** effect using the **Warm Cutoff** left and right arrows.

Activate or deactivate the **Ensemble** effect using the selector. This is a four-voice ensemble detuning effect that can be used to make waveforms more rich sounding by playing copies of the sound at different closely spaced intervals.

Choose to place the four voices of the **Ensemble** effect in either a stereo arrangement, or otherwise collapse all of them to mono using the **Ens Routing** options.

The **Ensemble** effect has a **crossover filter** that passes frequencies in the synthesizer signal above the filter cutoff which are then processed by the four-voice stereo (or mono) Ensemble effect, while frequencies beneath the cutoff frequency are not processed and are heard in mono.

Set the filter response of the crossover filter using the **X-Over Filter** selectors. The options are:

6 dB - 6 dB per octave Low-Pass and High Pass filters.

12 dB - 12 dB per octave Low-Pass and High Pass filters.

18 dB - 18 dB per octave Low-Pass and High Pass filters.

Bypass - In the Bypass mode, the crossover filter is disabled and the full frequency range of the synthesizer signal is processed by the Ensemble effect.

Set the **cutoff crossover frequency** in Hz of the **X-Over Filter** using the **Cutoff** slider. This can radically transform and shape the sound of the synthesizer in quite musically useful ways.

Set the depth of detuning of the **Ensemble** effect using the **Cents Dt** slider. The maximum range is -/+ 55 cents.

Set the **dry-to-wet balance** of the **Ensemble** effect using the **D><W** slider. Values below 50 have less of the effect, while greater than 50 makes the effect more pronounced. It is often a good idea to allow some of the dry signal to pass through by keeping the slider in the middle range, as the dry synth sound is also a 'voice' in the effect.

Special Note: Xen-Arts cares about protecting musician's audio gear and has added to the Ensemble section of this VSTi a steep low-cut filter. This hidden filter attenuates extremely low frequencies that are typically beneath the reproducible range of most consumer monitors and headphones.

XENFONT | OSCILLATORS



The XenFont VSTi Oscillators A & B can layer two different SoundFonts.

OSCILLATORS | SF2 Oscillators A & B | SF2 SoundFonts

There are two oscillators with identical features: **SF2 Oscillator A** and **SF2 Oscillator B**. All of the internal sound-bank patches have been created using a single open-source **General MIDI** compliant **SF2 SoundFont**, called **General User GS SoftSynth v1.44.sf2**, but it is easy and quite a lot of fun to create unique custom patches by loading other preferred SoundFonts as required by the music.

Load different **SF2 SoundFont** files into each **Oscillator** by clicking on the **SF2** button, navigating to a location on the computer containing **SF2** files, and then opening them into the VSTi. SoundFonts can be opened from any location on the user's computer, but a recommended practice for this VSTi is to store additional SF2 files into the **XenFont plugin directory** with the microtunings and other program content, which makes it easier to manage and locate the SoundFonts where one may be working on many complex concurrent projects.

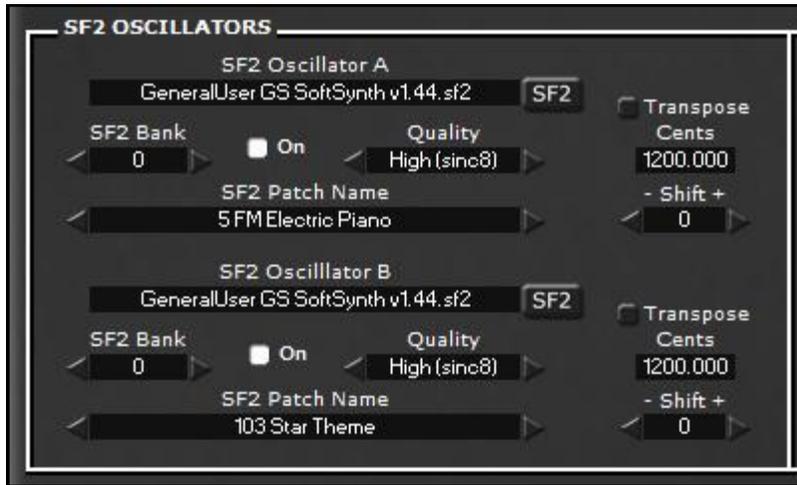
Activate or deactivate an **SF2 Oscillator** by using the **On-Off** button under the SF2 file loading field.

Some **SF2 SoundFonts**, such as the **GM** one used for creating the default internal patches, can have multiple banks of alternate sampled sounds. If a loaded SF2 has other banks of sampled instruments, these timbres can be accessed using the **SF2 Bank** selectors for each Oscillator.

Change the character of the samples using the **Quality** selectors for each Oscillator. These options enable the user to choose from a range of possible quality settings; from sonically degraded low-fi to high quality. Interesting effects can be produced by combining low quality settings on one oscillator, while the other has high quality settings.

Access all of the available timbres for the loaded **SF2 SoundFont** by using the **SF2 Patch Name** selectors for each Oscillator. Please note that some SF2 files may only contain single instruments, while others may contain many individual timbres (and banks) in one single file.

XENFONT | OSCILLATORS



The SoundFont and Transpose functions of the SF2 Oscillators section.

OSCILLATORS | Transpose

Oscillators A and B feature versatile transposition controls enabling musicians to directly specify precise pitch offsets as required by particular musical settings. There are two transposition modes available:

Cents – Enables musicians to type in any desired offset value into the provided **Cents** field, then using the **- Shift +** selector, transpose the oscillators between -16 to 16 times the specified value. For instance, typing 1200 cents into the Cents field and shifting -1, will lower the pitch of the oscillator 1 octave. Conversely, shifting to 1 will raise the pitch of the oscillator 1 octave.

The flexibility of the **Cents** transposition mode becomes more apparent though when working with intonation systems which do not repeat at an interval of an octave (2/1 @ 1200 cents), such as the **Bohlen-Pierce** microtuning, which instead has a repeat value of 3/1 @ 1901.955 cents. Worth mentioning are three other rather famous microtonal tunings discovered by Wendy Carlos which feature both narrow and wide 'pseudo-octaves':

Alpha (78.00 Cents Equal Temperament)

Degree 15, Lower Pseudo-Octave: 1170.00 cents
Degree 16, Upper Pseudo-Octave: 1248.00 cents

Beta (63.80 Cents Equal Temperament)

Degree 19, Lower Pseudo-Octave: 1148.40 cents
Degree 20, Upper Pseudo-Octave: 1212.20 cents

Gamma (35.10 Cents Equal Temperament)

Degree 34, Lower Pseudo-Octave: 1193.40 cents
Degree 35, Upper Pseudo-Octave: 1228.50 cents

Most synthesizers only permit transposition offsets of the oscillators in terms of octaves and cents, while this instrument permits musicians to directly specify any arbitrary transposition values as required by particular musical and intonation settings. The permitted range is a maximum of 4800 cents, or four octaves.

Harm | Sub – The second transposition mode enables the oscillators to be transposed by degrees of either the **Harmonic Series** or **Subharmonic Series**. Switch between **Harmonic** and **Subharmonic** modes using the selector switch. Use the **F-Ratio** selectors to specify the desired offsets. The range is from 1 to 32, and when **Harmonic** mode is active, increasing the value will raise the pitch of the oscillator by harmonics, while conversely, when **Subharmonic** mode is active, increasing the value will lower the pitch by degrees of the subharmonic series.

XENFONT | OSCILLATOR MODULATION



The Pitch Envelope Generator.

OSCILLATOR MODULATION

The **Oscillator Modulation** section provides dedicated modulation sources for both oscillators and there are four pages in this section that give access to the various functions. Switch between these pages using the Source selectors. The available options are as follows:

OSCILLATOR MODULATION | Source: PEG | Pitch Envelope Generator

This is the page for the dedicated **Pitch Modulation Envelope Generator**. Activate or deactivate the **Pitch Modulation Envelope Generator** using the **EG** selector. Set the **ADSR** timings for the **PEG** using the provided sliders, or otherwise type values into the fields beneath them.

Above each **ADSR** slider there is a three position selector for configuring the behavior of linear keyboard tracking for each stage of the envelope generator. In the 's' position, keyboard tracking is disabled and the stage is controlled entirely by the slider alone. When set to '+', playing lower on the MIDI controller will shorten the time of the envelope stage, while playing higher will lengthen it. Conversely, when the selector is set to '-', playing lower on the MIDI controller will lengthen the time of the envelope stage, while playing higher will shorten it.

Use the **Key Scale** selector to scale the linear keyboard tracking. This operates in direct relation to, and in interaction with, the settings made to the keyboard tracking selector for each of the envelope stages, and enables the user to find the best balance and tracking behavior for the ADSR across the MIDI range.

Set the depth of the interaction of **MIDI Velocity** with the **PEG** using the **Level** slider, or otherwise type values into the field beneath it.

Specify the shape of the **PEG** control signal using the **Pitch EG Shape** selectors. When in **Linear** mode, the **Attack**, **Decay** and **Release** slider values represent seconds, while the other modes radically change the timing and rate of the control signal, which can be useful for synthesizing plucked-string-like timbres, percussive sounds, as well as wild pitch sweep effects.

Set the polarity of the **PEG** control signals going to Oscillators A and B using the **Osc A** and **Osc B** selectors. The options are:

+ Modulates pitch in a positive direction.

- Modulates pitch in a negative direction.

Off disables the **PEG** for the oscillator. This can be useful for keeping the pitch of one oscillator static, while bending the other.

XENFONT | OSCILLATOR MODULATION



The X-Fade LFO works in conjunction with the X-Fade Mode of the Oscillator Mixer, for Cross-Fade Modulating between two loaded SF2 SoundFonts

OSCILLATOR MODULATION | Source: LFO | Cross-Fade Low Frequency Oscillator

This is the page for the dedicated **Cross-Fade Low Frequency Oscillator (X-Fade LFO)** that is used for **cross-fade modulation** between the two loaded **SF2 SoundFonts**. Settings here directly interact with those made to the **X-Fade Mode** in the **Oscillator Mixer** section, which should be set to any of the cross-fade options other than **Sum**. In the **Sum** mode, Oscillator Cross-Fading is disabled and the all the Oscillator signals are summed together.

Activate or deactivate the LFO using the **LFO** selector.

Choose whether or not to sync the LFO waveform to each **MIDI Note-On** using the **Gate Sync** selector. Leave this **Off** for pad type sounds for a continuously evolving modulation effect, and **On** for timbres that use the LFO as a kind of periodic envelope generator, where one needs the LFO waveform to consistently start at the beginning.

Specify whether or not to have the LFO synchronize to the host tempo using the **LFO Control** selector. The options are Sync LFO and Frequency. When in the **Freq LFO** mode, use the **LFO Freq** slider to specify the LFO rate in Hertz. When in the **Sync LFO** mode, the period of LFO modulation is set using the **Durations** and **Duration Multiply** selectors and the LFO is synchronized to the host DAW tempo.

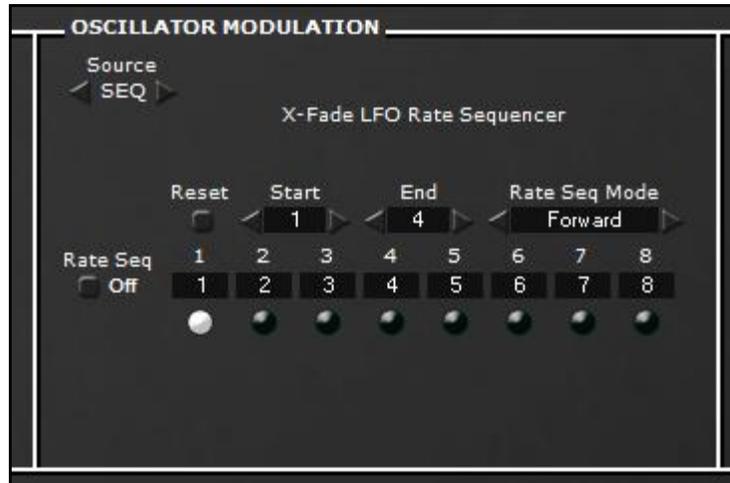
Select the modulation waveform using the **LFO Waveform** selectors. Select the modulation period of the LFO using the **Durations** selectors. The range is from 128/1 to 1/128. Switch between **Normal** (multiple -of-two), **Dotted**, **Triplet** and **Quintuplet** duration values using the **Duration Multiply** selectors. The decimal value for the selected LFO duration is show in the **D-Val** display, while the Time in seconds is shown in the **Time** display.

Use the **BPM Mlt** slider or data field to multiply the rate of the LFO. The range is 1 to 2048 times the host DAW tempo. Higher values can modulate Phase and PWM at audio-rates, which can introduce complex sidebands into the composite synthesizer signal.

Activate or deactivate the slewer using the **Slewer** selector. Set the timing of the Slewer in milliseconds using the **Slew-ms** slider or data field. The slewer can be used to smooth the LFO modulation signal, which can be useful for removing clicks when, for instance, modulating with square, pulse and ramp waves. Range is from **0** to **250 ms**.

Set the depth of the LFO using the **LFO Lvl** slider. This slider directly interacts with the settings made to the **X-Fade Mode** in the **Oscillator Mixer** section, which determine the oscillator cross-fade method. The **X-Fade Mode** should be set to anything other than **Sum** to activate **X-Fade LFO Modulation**. See the **Oscillator Mixer** section of this manual for more details.

XENFONT | OSCILLATOR MODULATION



The X-Fade LFO Rate Sequencer has eight steps that multiply the rate of the LFO with each MIDI Note-On.

OSCILLATOR MODULATION | Source: SEQ | X-Fade LFO Rate Sequencer

This page accesses the functions for the **X-Fade LFO Rate Sequencer**. The X-Fade LFO Rate Sequencer is an innovative 8-step sequencer that multiplies the LFO modulation rate with each MIDI Note-On.

Activate or deactivate the X-Fade LFO Rate Sequencer using the **Rate Seq On-Off** selector.

There are eight numbered data fields for creating a rate-sequence. Type integers into these fields which will be used to multiply the LFO rate with each MIDI Note-On. The range is from 1 to 2048 times the host tempo. When triggering a rate-sequence from a MIDI controller, the current step is visualized with the LED beneath each step.

Reset the rate-sequence to the beginning using the **Reset** button. Creative rate-sequencing can be achieved by mapping the **Reset** button to a button on a MIDI controller so that resetting the sequence can be performed without having to do it on the synth UI.

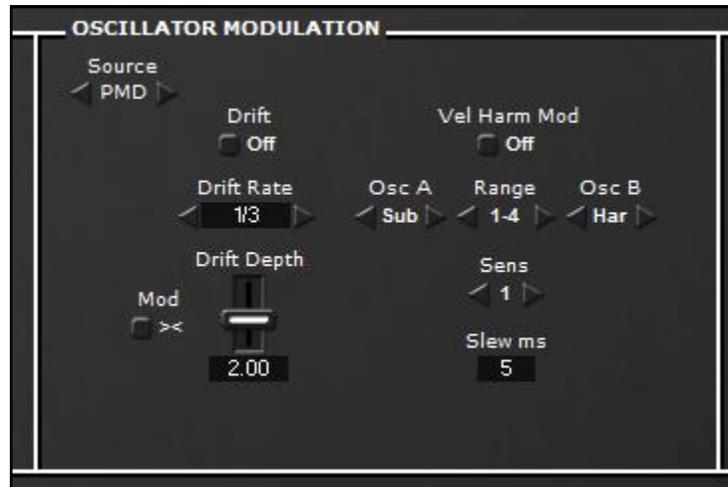
Set the range of the rate-sequence using the **Start** and **End** selectors.

Set the direction of the rate-sequence using the **Rate Seq Mode** selectors.

The **X-Fade LFO Rate Sequencer** can be used to create astonishing host-synchronized Cross-fading patterns that dynamically and rhythmically change the sound of the instrument. Slower modulation rates can create simple cross-fades between the two oscillators, while rapid modulation at audio-rates can introduce complex sidebands into the composite signal of the synthesizer.

For the X-Fade LFO Rate Sequencer to have any affect on the sound, the X-Fade LFO must be active and the X-Fade Mode in the Oscillator Mixer section must be in a X-Fade Mode other than Sum.

XENFONT | OSCILLATOR MODULATION



The Pitch Modulation (PMD) Source in the Oscillator Modulation section features both an Analog Pitch Drift Emulator as well as Velocity-to-Harmonics Modulation.

OSCILLATOR MODULATION | Source: PMD | Pitch Modulation

The Drift feature of the oscillator section emulates the oscillator pitch instability and drift of some older analog synthesizers. Activate or deactivate the emulation of analog synthesizer pitch drift using the **Drift** selector. Set the rate of the pitch drift emulation using the **Drift Rate** selectors. Set the depth of the pitch drift emulation using the **Drift Depth** slider, or alternatively, type in a depth value using the field beneath the slider.

The Drift control signal that is used for modulating the pitch of both oscillators may be set to either **Unipolar** or **Bipolar** modulation. Use the **Mod** switch to change between these two modes:

Unipolar Modulation Mode = >>

The unidirectional modulation mode causes the Drift control signal to modulate the pitch of both oscillators in the same direction.

Bipolar Modulation Mode = ><

The bidirectional modulation mode causes the Drift control signal to modulate the pitch of both oscillators in an opposite direction, creating rich detuning effects between the two oscillators.

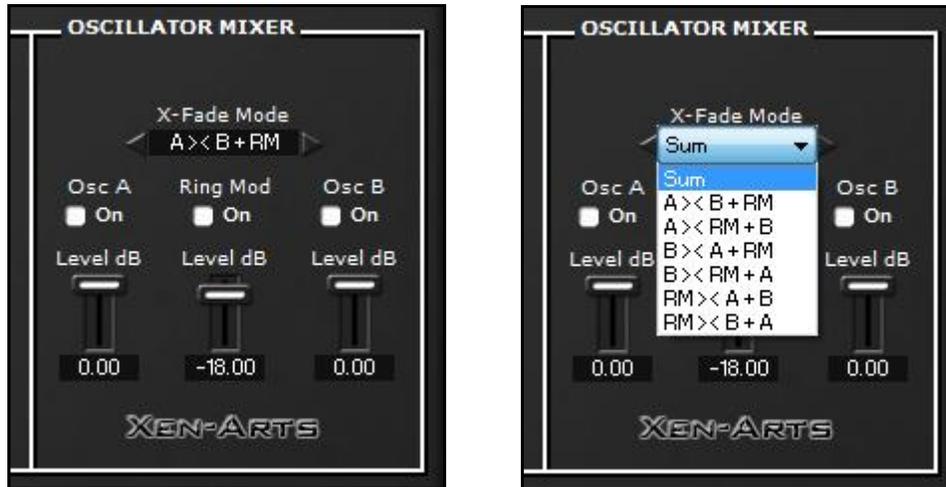
This VSTi has a unique feature found only in **Xen-Arts** instruments: **Velocity-to-Harmonics Modulation**, which enables musicians to dynamically break out harmonics (or subharmonics) of the fundamental pitch in a manner similar to acoustic instruments such as winds and strings, where force from MIDI Velocity directly controls the harmonic level.

Activate or deactivate Velocity-to-Harmonics Modulation using the **Vel H/S Mod** selector. Set the harmonic range using the **Range** selector. Options are harmonics **1-2**, **1-4**, **1-8** and **1-16**.

Specify whether MIDI Velocity will modulate the oscillator pitch according to a **Harmonic Series** or **Subharmonic Series** using the **Osc A** and **Osc B** harmonic selectors. Options are **Har**: Harmonic Series, **Sub**: Subharmonic Series and **Off**: which disables harmonic modulation for the selected oscillator and can be used to play the fundamental pitch of one oscillator, while another is harmonically modulated by MIDI Velocity.

Set the sensitivity response of MIDI Velocity for harmonic modulation using the **Sens** selectors. Options are **1**, **2** and **3**. A lower setting sets the sensitivity such that stronger force is required to break out higher harmonics, while higher settings require lighter force on the MIDI controller. Type in the slew rate in milliseconds using the **Slew ms** field. This can be used for creating short pitch glides that smooth the transitions of dynamic harmonic modulation. Range is from **0** to **250 ms**.

XENFONT | OSCILLATOR MIXER



The **Oscillator Mixer** combines signals from **Oscillators A** and **B** with the **Ring Modulator** and also features **Cross-Fade Modulation** settings that interact with the **X-Fade LFO** and **X-Fade LFO Sequencer**.

OSCILLATOR MIXER

The **Oscillator Mixer** section provides a simple mixer for setting the relative volume balance between **Oscillators A** and **B**. This section also includes a basic **Ring-Modulator**, into which **Oscillators A** and **B** are routed, which is treated here as another discrete signal that can be mixed with the oscillators for creating complex composite waveforms. Extraordinarily rich and evolving timbres can be created with the ring-modulator, especially when cross-fade modulating of **Oscillators A** and **B** with the **X-Fade LFO**.

Activate or deactivate **Oscillator A**, the **Ring-Modulator** and **Oscillator B** using the appropriate selectors.

Ring Modulation is a signal processing technique in which two signals are multiplied and the resulting waveform contains both the sum and difference frequencies of the two source signals. It is important to understand that even when **Oscillators A** and **B** have been turned off, they are still internally routed into the ring-modulator. This enables making timbres in which only the **RM** signal is sounded, while **Oscillators A** and **B** are in the **Off** position.

Set the relative volume levels (in decibels) of **Oscillator A**, the **Ring-Modulator** and **Oscillator B** using the **Level dB** sliders.

Use the **X-Fade Mode** selector to specify the cross-fade mode for **Oscillators A & B** and the **Ring Modulator**. Options are:

Sum: **Oscillators A & B**, and the **Ring Modulator**, are Summed together and **X-Fade Modulation** is disabled.

A >> B + RM: **Osc-A** x-fades with **Osc-B**, while **RM** is sustained.

A >< RM + B: **Osc-A** x-fades with **RM**, while **Osc-B** is sustained.

B >> A + RM: **Osc-A** x-fades with **Osc-B**, while **RM** is sustained.

B >< RM + A: **Osc-B** x-fades with **RM**, while **Osc-A** is sustained.

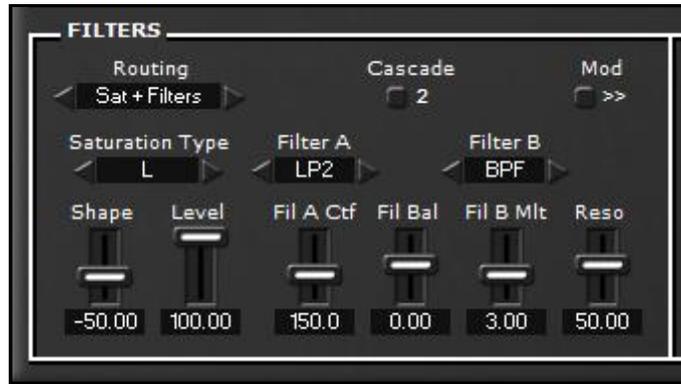
RM >< A + B: **RM** x-fades with **Osc-A**, while **Osc-B** is sustained.

RM >< B + A: **RM** x-fades with **Osc-B**, while **Osc-A** is sustained.

The X-Fade Mode in the Oscillator Mixer directly interacts with both the X-Fade LFO and the X-Fade LFO Rate Sequencer.

For cross-fade modulation to be activated, the X-Fade LFO must be On, and the X-Fade Mode set to any of the above options other than Sum.

XENFONT | FILTERS



The Filter section features a saturation stage followed by two parallel filters with six filter types.

FILTERS

This section features a pre-filter saturation stage followed by two parallel filters.

Configure the way the source oscillators and ring modulator signals are processed by the filter section using the **Routing** selectors. The options are:

Bypass – In this mode the source signals bypass the saturation and filters entirely.

Saturation – The source signals are passed through the saturation stage only and the filters are bypassed.

Sat + Filters – The source signals are passed through both the Saturation stage and Filters.

Filters – The source signals are passed through the filters only and the saturation stage is bypassed.

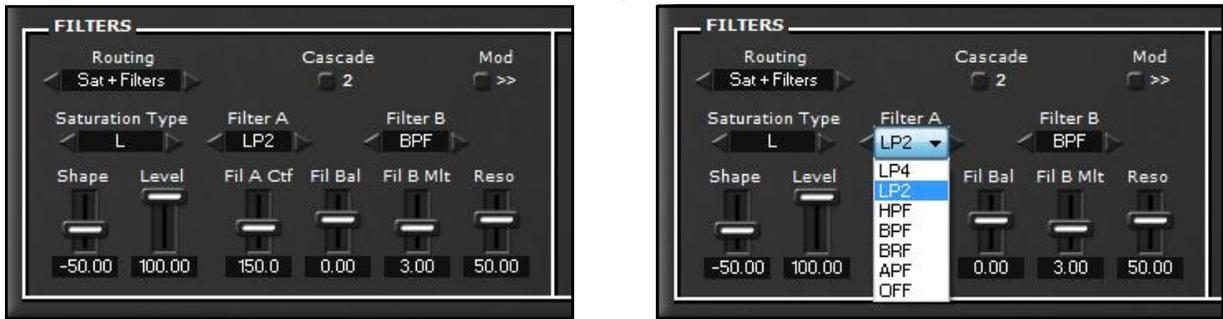
Using the **Saturation Type** selectors, select from the available 20 different saturation types, each of which imparts a unique quality of saturation, from subtle wave-shaping to extreme distortions.

Use the **Shape** slider to change the wave-shaping and tone quality of the saturation.

Control the relative wet and dry balance between the unprocessed source signals and the saturation effect using the **Level** slider. Lower settings let more of the unprocessed signal pass through, while when set to 100%, the source signals are fully processed by the saturation stage.

Use the **Cascade** selector to switch between (1) a single filter for filters A and B, and (2) two filters in series for each filter.

XENFONT | FILTERS



Choose from the six different filter types using the Filter A and Filter B selectors.

There are two parallel filters with six different filter types. Select from the filter types using the **Filter A** and **Filter B** selectors. When the **Cascade** selector is set to **1**, the available filter responses are as follows:

LP4 – 4-Pole, 24 dB per octave, Low-Pass filter with a saturation stage and aggressive resonance, which sounds similar to a Moog style filter.

LP2 – 2-Pole, 12 dB per octave, Low-Pass Filter.

HPF – 2-Pole, 12 dB per octave, High-Pass Filter.

BPF – 1-Pole, 6 dB per octave, Band-Pass Filter.

BRF - 1-Pole, 6 dB per octave, Band-Reject Filter.

APF - 2-Pole, 12 dB per octave, All-Pass Filter.

OFF – Disable the filter.

When the **Cascade** selector is set to **2**, then the filter responses for filters A and B are doubled.

Set of the cutoff frequency for Filter A using the **Fil A Ctf** slider. The range is 30 Hz to 8 kHz.

Use the **Fil Bal** slider to set the relative balance between Filter A and Filter B. Negative values balance towards Filter A, while positive ones toward Filter B. This enables creating unique and complex composite filter sounds. A setting of 0 creates an equal balance between the filters.

The cutoff frequency of Filter B is specified as a multiple of the Filter A cutoff frequency using the **Fil B Mlt** slider. Range is from 1 to 8 times the setting for the Filter A cutoff frequency. For instance, if the cutoff frequency of Filter A is set to 100 Hz, and the Fil B Mlt slider is set to a value of 3, then the cutoff frequency of Filter B is 300 Hz.

Set the resonance of Filters A and B using the **Reso** slider. Be aware that high resonance settings, especially with the Cascade selection of 2, can produce exceedingly loud audio signals. It is advised to take precautions to protect both hearing and audio gear in the event that one chooses to generate loud audio signals in this manner.

The modulation signals that are used for modulating the cutoff frequencies of Filter A and Filter B may be set to either **Unipolar** or **Bipolar** modulation. Use the **Mod** switch to change between these two modes:

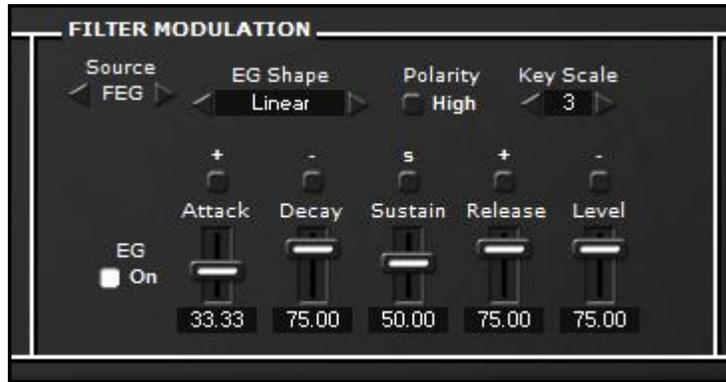
Unipolar Modulation Mode = >>

The unipolar modulation mode causes the modulation signals to modulate the cutoff frequencies of Filter A and Filter B in the same direction.

Bipolar Modulation Mode = ><

The bipolar modulation mode causes the modulation signals to modulate the cutoff frequencies of Filter A and Filter B in an opposite direction. This modulation mode for the filters is capable of creating some extraordinary filtered synthesizer sounds.

XENFONT | FILTER MODULATION



The Filter Envelope Generator can be used to modulate the cutoff frequencies of Filters A and B.

FILTER MODULATION

The **Filter Modulation** section provides dedicated modulation sources for both filters and there are three pages in this section that give access to the various functions. Switch between these pages using the Source selectors. The available options are as follows:

FILTER MODULATION | Source: FEG | Filter Envelope Generator

This is the page for the dedicated **Filter Modulation Envelope Generator**.

Activate or deactivate the **Filter Modulation Envelope Generator** using the **EG** selector.

Set the **ADSR** timings for the **FEG** using the provided sliders, or otherwise type values into the fields beneath them.

Above each **ADSR** slider there is a three position selector for configuring the behavior of linear keyboard tracking for each stage of the envelope generator. In the 's' position, keyboard tracking is disabled and the stage is controlled entirely by the slider alone. When set to '+', playing lower on the MIDI controller will shorten the time of the envelope stage, while playing higher will lengthen it. Conversely, when the selector is set to '-', playing lower on the MIDI controller will lengthen the time of the envelope stage, while playing higher will shorten it.

Use the **Key Scale** selector to scale the linear keyboard tracking. This operates in direct relation to, and in interaction with, the settings made to the keyboard tracking selector for each of the envelope stages, and enables the user to find the best balance and tracking behavior for the ADSR across the MIDI range.

Set the depth of the interaction of **MIDI Velocity** with the **FEG** using the **Level** slider, or otherwise type values into the field beneath it.

Specify the shape of the **FEG** control signal using the **EG Shape** selectors. When in **Linear** mode, the **Attack**, **Decay** and **Release** slider values represent seconds, while the other modes radically change the timing and rate of the control signal, which can be useful for synthesizing plucked-string-like timbres, percussive sounds, as well as wild filter sweep effects.

Set the polarity of the **FEG** control signal **Polarity** selector. The options are:

Low - In this mode, the Filter Envelope Generator modulates the cutoff frequency within a range of -5 to 5 volts. This can be useful when one wants the EG to sweep the filter starting from below the cutoff frequency specified by the **Fil A Ctf** slider in the Filters section.

High - In this mode, the Filter Envelope Generator modulates the cutoff frequency within a range of 0 to 10 volts. This can be useful when one wants the EG to open the filter starting at the cutoff frequency specified by the **Fil A Ctf** slider in the Filters section.

XENFONT | FILTER MODULATION



The Filter LFO can be used to modulate the cutoff frequencies of Filters A and B.

FILTER MODULATION | Source: LFO | Low Frequency Oscillator

This is the page for the dedicated **Low Frequency Oscillator** that is used for modulating the cutoff frequencies of Filters A and B.

Activate or deactivate the LFO using the **LFO** selector.

Choose whether or not to sync the LFO waveform to each **MIDI Note-On** using the **Gate Sync** selector. Leave this **Off** for pad type sounds for a continuously evolving modulation effect, and **On** for timbres that use the LFO as a kind of periodic envelope generator, where one needs the LFO waveform to consistently start at the beginning.

Specify whether or not to have the LFO synchronize to the host tempo using the **LFO Control** selector. The options are Sync LFO and Frequency.

When in the **Freq LFO** mode, use the **LFO Freq** slider to specify the LFO rate in Hertz. When in the **Sync LFO** mode, the period of LFO modulation is set using the **Durations** and **Duration Multiply** selectors and the LFO is synchronized to the host DAW tempo.

Select the modulation waveform using the **LFO Waveform** selectors.

Select the modulation period of the LFO using the **Durations** selectors. The range is from 128/1 to 1/128.

Switch between **Normal** (multiple-of-two), **Dotted**, **Triplet** and **Quintuplet** duration values using the **Duration Multiply** selectors.

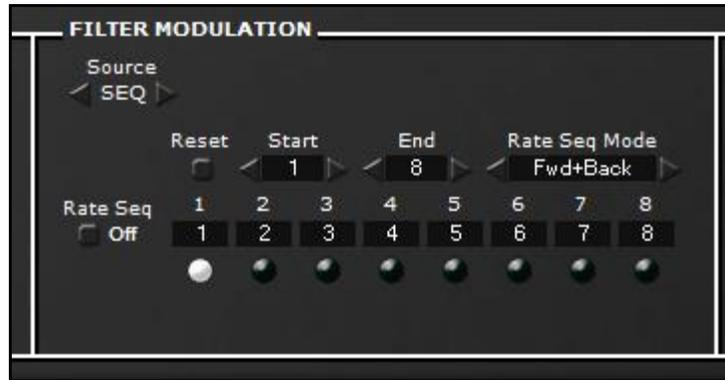
The decimal value for the selected LFO duration is shown in the **D-Val** display, while the Time in seconds is shown in the **Time** display.

Use the **BPM Mlt** slider or data field to multiply the rate of the LFO. The range is 1 to 2048 times the host DAW tempo. Higher values can modulate the filter's cutoff frequencies at audio-rates, which can introduce complex sidebands into the composite synthesizer signal.

Activate or deactivate the slewer using the **Slewer** selector. Set the timing of the Slewer in milliseconds using the **Slew-ms** slider or data field. The slewer can be used to smooth the LFO modulation signal, which can be useful for removing clicks when, for instance, modulating with square, pulse and ramp waves.

Set the depth of the LFO using the **LFO Lvl** slider.

XENFONT | FILTER MODULATION



The LFO Rate Sequencer has eight steps that multiply the rate of the LFO with each MIDI Note-On.

FILTER MODULATION | Source: SEQ | LFO Rate Sequencer

This page accesses the functions for the **LFO Rate Sequencer**. The LFO Rate Sequencer is an innovative 8-step sequencer that multiplies the LFO modulation rate with each MIDI Note-On.

Activate or deactivate the LFO Rate Sequencer using the **Rate Seq** selector.

There are eight numbered data fields for creating a rate-sequence. Type integers into these fields which will be used to multiply the LFO rate with each MIDI Note-On. The range is from 1 to 2048 times the host tempo. When triggering a rate-sequence from a MIDI controller, the current step is visualized with the LED beneath each step.

Reset the rate-sequence to the beginning using the **Reset** button. Creative rate-sequencing can be achieved by mapping the **Reset** button to a button on a MIDI controller so that resetting the sequence can be performed without having to do it on the synth UI.

Set the range of the rate-sequence using the **Start** and **End** selectors.

Set the direction of the rate-sequence using the **Rate Seq Mode** selectors.

The LFO Rate Sequencer can be used to create many types of musically useful host-synchronized Filter Modulation patterns that dynamically and rhythmically change the sound of the instrument. Slower modulation rates can create typical sounding filter modulation effects, while rapid modulation at audio-rates can introduce complex sidebands into the composite signal of the synthesizer.

XENFONT | VCA ENVELOPE GENERATOR



The VCA Envelope Generator modulates the amplitude of the instrument.

VCA ENVELOPE GENERATOR

Set the **ADSR** timings for the **VCA Envelope Generator** using the provided sliders, or otherwise type timing values into the fields beneath them.

Above each **ADSR** slider there is a three position selector for configuring the behavior of linear keyboard tracking for each stage of the envelope generator. In the **'s'** position, keyboard tracking is disabled and the stage is controlled entirely by the slider alone. When set to **'+'**, playing lower on the MIDI controller will shorten the time of the envelope stage, while playing higher will lengthen it. Conversely, when the selector is set to **'-'**, playing lower on the MIDI controller will lengthen the time of the envelope stage, while playing higher will shorten it.

Use the **Key Scale** selector to scale the linear keyboard tracking. This operates in direct relation to, and in interaction with, the settings made to the keyboard tracking selector for each of the envelope stages, and enables the user to find the best balance and tracking behavior for the ADSR across the MIDI range.

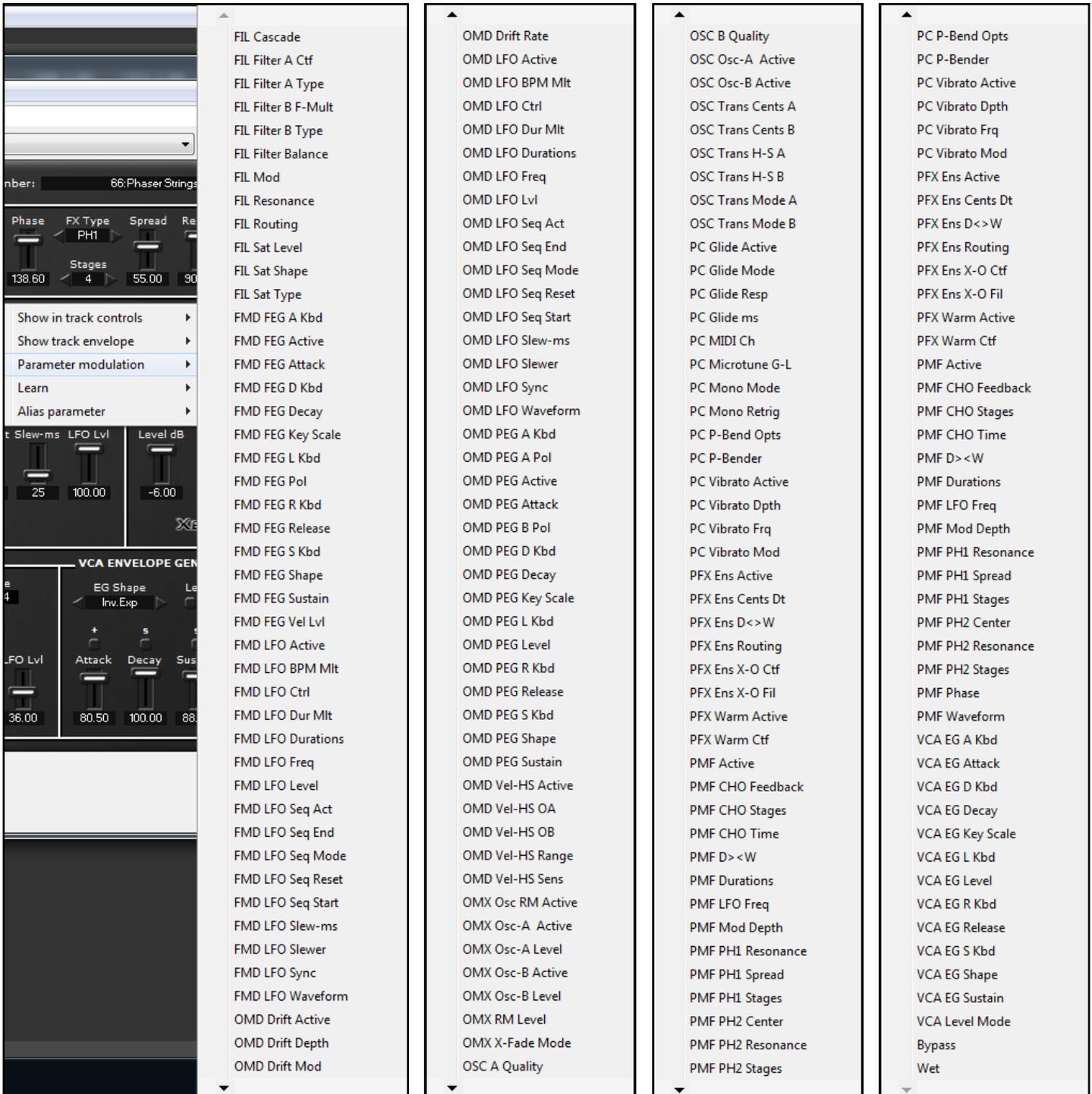
Specify the shape of the **VCA EG** control signal using the **EG Shape** selectors. When in **Linear** mode, the **Attack**, **Decay** and **Release** slider values represent seconds, while the other modes radically change the timing and rate of the EG control signal, which can be useful for synthesizing plucked-string-like timbres and percussive sounds.

Use the **Level Mode** selector to switch between the two level modes, which also determines the behavior of the **Level** slider:

Volume - In this mode the overall volume of the synthesizer is set with the **Level** slider and the VCA does not respond to MIDI Velocity.

Velocity - In this mode the **Level** slider sets the depth of MIDI Velocity amplitude modulation, enabling dynamic performance volume control. Softer play on the MIDI controller will sound quieter, while harder play will be louder.

XENFONT | MIDI AUTOMATION



The Parameter Modulation list in the REAPER DAW showing some of the available automation targets.

This VSTi exposes **156 MIDI Automation Targets** to the host DAW and practically every function of the synth can be track automated. Consult your DAW manual for instructions on how to automate these parameters.

Pages 28 through 32 contain a reference list of all these automation targets including brief explanations and the page numbers in this manual for more detailed information about each synthesis function.

XENFONT | MIDI AUTOMATION | HOST DAW AUTOMATION TARGETS

| Automation Label | Synth Section | Automation Function | Manual Page |
|---------------------|-------------------------------|---|-------------|
| FIL Cascade | Filters | Set the Filter Cascade. | 21-22 |
| FIL Filter A Ctf | Filters | Set the Cutoff Frequency of Filter A. | 21-22 |
| FIL Filter A Type | Filters | Set the filter type for Filter A. | 21-22 |
| FIL Filter B F-Mult | Filters | Set the Cutoff Frequency of Filter B as a multiple of the Cutoff Frequency of Filter A. | 21-22 |
| FIL Filter B Type | Filters | Set the filter type for Filter B. | 21-22 |
| FIL Filter Balance | Filters | Set the Balance between Filters A and B. | 21-22 |
| FIL Mod | Filters | Switch the Filter Modulation relationship of Filters A and B between Unipolar and Bipolar. | 21-22 |
| FIL Resonance | Filters | Set the Resonance level for the filters. | 21-22 |
| FIL Routing | Filters | Select Filter Routing options. | 21-22 |
| FIL Sat Level | Filters | Set the Saturation Level. | 21-22 |
| FIL Sat Shape | Filters | Set the Saturation Shape. | 21-22 |
| FIL Sat Type | Filters | Select Saturation options. | 21-22 |
| FMD FEG A Kbd | Filter Modulation Filter EG | Select Keyboard Tracking options for the Attack stage of the ADSR. | 23-25 |
| FMD FEG Active | Filter Modulation Filter EG | Enable or disable the Filter Envelope Generator. | 23-25 |
| FMD FEG Attack | Filter Modulation Filter EG | Controls the Attack Rate of the Filter Envelope Generator. | 23-25 |
| FMD FEG D Kbd | Filter Modulation Filter EG | Select Keyboard Tracking options for the Decay stage of the ADSR. | 23-25 |
| FMD FEG Decay | Filter Modulation Filter EG | Controls the Decay Rate of the Filter Envelope Generator. | 23-25 |
| FMD FEG Key Scale | Filter Modulation Filter EG | Set the scaling level of Keyboard Tracking for the ADSR. | 23-25 |
| FMD FEG L Kbd | Filter Modulation Filter EG | Select Keyboard Tracking options for the Level of the ADSR. | 23-25 |
| FMD FEG Pol | Filter Modulation Filter EG | Set the Polarity of the Filter Envelope Generator. | 23-25 |
| FMD FEG R Kbd | Filter Modulation Filter EG | Select Keyboard Tracking options for the Release stage of the ADSR. | 23-25 |
| FMD FEG R Kbd | Filter Modulation Filter EG | Select Keyboard Tracking options for the Release stage of the ADSR. | 23-25 |
| FMD FEG Release | Filter Modulation Filter EG | Controls the Release Rate of the Filter Envelope Generator. | 23-25 |
| FMD FEG S Kbd | Filter Modulation Filter EG | Select Keyboard Tracking options for the Sustain stage of the ADSR. | 23-25 |
| FMD FEG Shape | Filter Modulation Filter EG | Controls the Shape of the Filter Envelope Generator. | 23-25 |
| FMD FEG Sustain | Filter Modulation Filter EG | Controls the Sustain Level of the Filter Envelope Generator. | 23-25 |
| FMD FEG Vel Lvl | Filter Modulation Filter EG | Controls the Level of Velocity Modulation for the Filter Envelope Generator. | 23-25 |
| FMD LFO Active | Filter Modulation LFO | Enable or disable the Filter LFO. | 23-25 |
| FMD LFO BPM Mlt | Filter Modulation LFO | Use this slider to Multiply the LFO Rate when the LFO Control mode switch is set to Sync LFO. | 23-25 |
| FMD LFO Ctrl | Filter Modulation LFO | Switch between Host Sync LFO and Frequency LFO modes. | 23-25 |
| FMD LFO Dur Mlt | Filter Modulation LFO | Select the LFO Duration Multiplier value. | 23-25 |
| FMD LFO Durations | Filter Modulation LFO | Select the Duration of the LFO modulation. | 23-25 |
| FMD LFO Freq | Filter Modulation LFO | When LFO Control mode is set to Freq LFO, this slider controls the LFO Frequency (Hz). | 23-25 |
| FMD LFO Level | Filter Modulation LFO | Set the Level of the Filter LFO Modulation. | 23-25 |
| FMD LFO Seq Act | Filter Modulation LFO | Enable or disable the LFO Rate Sequencer. | 23-25 |
| FMD LFO Seq End | Filter Modulation LFO | Set the End Position of the LFO Rate Sequencer. | 23-25 |

XENFONT | MIDI AUTOMATION | HOST DAW AUTOMATION TARGETS

| Automation Label | Synth Section | Automation Function | Manual Page |
|-------------------|---|---|-------------|
| FMD LFO Seq Mode | Filter Modulation LFO | Set the LFO Rate Sequencer Mode. | 23-25 |
| FMD LFO Seq Reset | Filter Modulation LFO | Reset the LFO Rate Sequencer. | 23-25 |
| FMD LFO Seq Start | Filter Modulation LFO | Set the Start Position of the LFO Rate Sequencer. | 23-25 |
| FMD LFO Slew | Filter Modulation LFO | Enable or disable the LFO Slew. | 23-25 |
| FMD LFO Slew-ms | Filter Modulation LFO | Set the Slew time in milliseconds. | 23-25 |
| FMD LFO Sync | Filter Modulation LFO | Enable or disable LFO Sync. | 23-25 |
| FMD LFO Waveform | Filter Modulation LFO | Select the LFO Waveform for modulating the Filters Cutoff Frequency. | 23-25 |
| OMD Drift Active | Oscillator Modulation Pitch Mod | Enable or disable the Analog Pitch Drift Emulation. | 16-19 |
| OMD Drift Depth | Oscillator Modulation Pitch Mod | Controls the Depth of the Analog Pitch Drift Emulation. | 16-19 |
| OMD Drift Mod | Oscillator Modulation Pitch Mod | Switch the Analog Pitch Drift Emulation between Unipolar and Bipolar Modulation. | 16-19 |
| OMD Drift Rate | Oscillator Modulation Pitch Mod | Controls the Rate of the Analog Pitch Drift Emulation. | 16-19 |
| OMD LFO Active | Oscillator Modulation X-Fade LFO | Enable or disable the X-Fade LFO | 16-19 |
| OMD LFO BPM Mit | Oscillator Modulation X-Fade LFO | Use this slider to Multiply the LFO Rate when the LFO Control mode switch is set to Sync LFO. | 16-19 |
| OMD LFO Ctrl | Oscillator Modulation X-Fade LFO | Switch between Host Sync LFO and Frequency LFO modes. | 16-19 |
| OMD LFO Dur Mit | Oscillator Modulation X-Fade LFO | Select the LFO Duration Multiplier value. | 16-19 |
| OMD LFO Durations | Oscillator Modulation X-Fade LFO | Select the Duration of the LFO modulation. | 16-19 |
| OMD LFO Freq | Oscillator Modulation X-Fade LFO | When LFO Control mode is set to Freq LFO, this slider controls the LFO Frequency (Hz). | 16-19 |
| OMD LFO Lvl | Oscillator Modulation X-Fade LFO | Set the Level of the X-Fade LFO. | 16-19 |
| OMD LFO Seq Act | Oscillator Modulation X-Fade LFO Rate Seq | Enable or disable the LFO Rate Sequencer. | 16-19 |
| OMD LFO Seq End | Oscillator Modulation X-Fade LFO Rate Seq | Set the End Position of the LFO Rate Sequencer. | 16-19 |
| OMD LFO Seq Mode | Oscillator Modulation X-Fade LFO Rate Seq | Set the LFO Rate Sequencer Mode. | 16-19 |
| OMD LFO Seq Reset | Oscillator Modulation X-Fade LFO Rate Seq | Reset the LFO Rate Sequencer. | 16-19 |
| OMD LFO Seq Start | Oscillator Modulation X-Fade LFO Rate Seq | Set the Start Position of the LFO Rate Sequencer. | 16-19 |
| OMD LFO Slew | Oscillator Modulation X-Fade LFO | Enable or disable the LFO Slew. | 16-19 |
| OMD LFO Slew-ms | Oscillator Modulation X-Fade LFO | Set the Slew time in milliseconds. | 16-19 |
| OMD LFO Sync | Oscillator Modulation X-Fade LFO | Enable or disable LFO Sync. | 16-19 |
| OMD LFO Waveform | Oscillator Modulation X-Fade LFO | Select the LFO Waveform for modulating the Oscillators Phase or PWM. | 16-19 |
| OMD PEG A Kbd | Oscillator Modulation Pitch EG | Select Keyboard Tracking options for the Attack stage of the ADSR. | 16-19 |
| OMD PEG A Pol | Oscillator Modulation Pitch EG | Controls the Polarity of the Oscillator Pitch Envelope Generator for Oscillator A. | 16-19 |
| OMD PEG Active | Oscillator Modulation Pitch EG | Enable or disable the Oscillator Pitch Envelope Generator. | 16-19 |
| OMD PEG Attack | Oscillator Modulation Pitch EG | Controls the Attack Rate of the Oscillator Pitch Envelope Generator. | 16-19 |
| OMD PEG B Pol | Oscillator Modulation Pitch EG | Controls the Polarity of the Oscillator Pitch Envelope Generator for Oscillator B. | 16-19 |
| OMD PEG D Kbd | Oscillator Modulation Pitch EG | Select Keyboard Tracking options for the Decay stage of the ADSR. | 16-19 |
| OMD PEG Decay | Oscillator Modulation Pitch EG | Controls the Decay Rate of the Oscillator Pitch Envelope Generator. | 16-19 |
| OMD PEG Key Scale | Oscillator Modulation Pitch EG | Set the scaling level of Keyboard Tracking for the ADSR. | 16-19 |

XENFONT | MIDI AUTOMATION | HOST DAW AUTOMATION TARGETS

| Automation Label | Synth Section | Automation Function | Manual Page |
|-------------------|-----------------------------------|--|-------------|
| OMD PEG L Kbd | Oscillator Modulation Pitch EG | Select Keyboard Tracking options for the Level of the ADSR. | 16-19 |
| OMD PEG Level | Oscillator Modulation Pitch EG | Controls the Level of the Oscillator Pitch Envelope Generator. | 16-19 |
| OMD PEG R Kbd | Oscillator Modulation Pitch EG | Select Keyboard Tracking options for the Release stage of the ADSR. | 16-19 |
| OMD PEG Release | Oscillator Modulation Pitch EG | Controls the Release Rate of the Oscillator Pitch Envelope Generator. | 16-19 |
| OMD PEG S Kbd | Oscillator Modulation Pitch EG | Select Keyboard Tracking options for the Sustain stage of the ADSR. | 16-19 |
| OMD PEG Shape | Oscillator Modulation Pitch EG | Controls the Shape of the Oscillator Pitch Envelope Generator. | 16-19 |
| OMD PEG Sustain | Oscillator Modulation Pitch EG | Controls the Sustain Level of the Oscillator Pitch Envelope Generator. | 16-19 |
| OMD Vel-HS Active | Oscillator Modulation Pitch Mod | Enable or disable Velocity Harmonic Modulation. | 16-19 |
| OMD Vel-HS OA | Oscillator Modulation Pitch Mod | Specify the Velocity Harmonic Modulation type for Oscillator A. | 16-19 |
| OMD Vel-HS OB | Oscillator Modulation Pitch Mod | Specify the Velocity Harmonic Modulation type for Oscillator B. | 16-19 |
| OMD Vel-HS Range | Oscillator Modulation Pitch Mod | Set the Range for Velocity Harmonic Modulation. | 16-19 |
| OMD Vel-HS Sens | Oscillator Modulation Pitch Mod | Set the Sensitivity level for Velocity Harmonic Modulation. | 16-19 |
| OMX Osc RM Active | Oscillator Mixer | Mute or unmute the Ring-Modulator. | 20 |
| OMX Osc-A Active | Oscillator Mixer | Mute or unmute Osc-A. | 20 |
| OMX Osc-A Level | Oscillator Mixer | Set the Level of Osc-A in dB. | 20 |
| OMX Osc-B Active | Oscillator Mixer | Mute or unmute Osc-B. | 20 |
| OMX Osc-B Level | Oscillator Mixer | Set the Level of Osc-B in dB. | 20 |
| OMX RM Level | Oscillator Mixer | Set the Level of the Ring-Modulator in dB. | 20 |
| OMX RM Type | Oscillator Mixer | Select the Ring-Modulator Type. | 20 |
| OMX X-Fade Mode | Oscillator Mixer | Select the Crossfade Modulation Mode. | 20 |
| OSC A Quality | Oscillators | Quality settings for the SF2 Oscillator. | 14-15 |
| OSC B Quality | Oscillators | Quality settings for the SF2 Oscillator. | 14-15 |
| OSC Osc-A Active | Oscillators | Activate or Deactivate Oscillator A. | 14-15 |
| OSC Osc-B Active | Oscillators | Activate or Deactivate Oscillator B. | 14-15 |
| OSC Trans Cents A | Oscillators | When the Transposition Mode of Oscillator A is set to Cents, use this selector to Transpose the pitch according the value set in the Cents field. | 14-15 |
| OSC Trans Cents B | Oscillators | When the Transposition Mode of Oscillator B is set to Cents, use this selector to Transpose the pitch according the value set in the Cents field. | 14-15 |
| OSC Trans H-S A | Oscillators | When the Transposition Mode of Oscillator A is set to Harmonic-Subharmonic, use this switch to change between Harmonic or Subharmonic Series Transposition. | 14-15 |
| OSC Trans H-S A | Oscillators | When the Transposition Mode of Oscillator A is set to Harmonic-Subharmonic, use this selector to Transpose by degrees of either the Harmonic or Subharmonic Series as specified. | 14-15 |
| OSC Trans H-S B | Oscillators | When the Transposition Mode of Oscillator B is set to Harmonic-Subharmonic, use this switch to change between Harmonic or Subharmonic Series Transposition. | 14-15 |

XENFONT | MIDI AUTOMATION | HOST DAW AUTOMATION TARGETS

| Automation Label | Synth Section | Automation Function | Manual Page |
|-------------------|-------------------------------|--|-------------|
| OSC Trans H-S B | Oscillators | When the Transposition Mode of Oscillator B is set to Harmonic-Subharmonic, use this selector to Transpose by degrees of either the Harmonic or Subharmonic Series as specified. | 14-15 |
| OSC Trans Mode A | Oscillators | Switch the Transposition Mode of Oscillator A between Cents and Harmonic-Subharmonic. | 14-15 |
| OSC Trans Mode B | Oscillators | Switch the Transposition Mode of Oscillator B between Cents and Harmonic-Subharmonic. | 14-15 |
| PC Glide Active | Performance Control | Enable or disable Glide (aka Portamento). | 6-13 |
| PC Glide Mode | Performance Control | Switch between Glide Modes. | 6-13 |
| PC Glide ms | Performance Control | Glide time (aka Portamento) in milliseconds. | 6-13 |
| PC Glide Resp | Performance Control | Switch Glide Response between Rate and Time. | 6-13 |
| PC Microtune G-L | Performance Control | Switch between Global and Local Microtuning. | 6-13 |
| PC MIDI Ch | Performance Control | MIDI Channel. | 6-13 |
| PC Mono Mode | Performance Control | Enable or disable Monophonic Mode. | 6-13 |
| PC Mono Retrig | Performance Control | Enable or disable Retriggering Envelope Generators in Monophonic Mode. | 6-13 |
| PC P-Bend Opts | Performance Control | Switch between Pitch Bend options. | 6-13 |
| PC P-Bender | Performance Control | MIDI Pitch Bend Controller. | 6-13 |
| PC Vibrato Active | Performance Control | Enable or disable Vibrato. | 6-13 |
| PC Vibrato Dpth | Performance Control | Vibrato Depth. | 6-13 |
| PC Vibrato Frq | Performance Control | Vibrato Frequency (Hz). | 6-13 |
| PC Vibrato Mod | Performance Control | Vibrato Modulation (1 - Mod Wheel). | 6-13 |
| PFX Ens Active | Performance Control Effects | Enable or disable the Ensemble Effect. | 6-13 |
| PFX Ens Cents Dt | Performance Control Effects | Cents Detune offset of the Ensemble Effect. | 6-13 |
| PFX Ens D<>W | Performance Control Effects | Dry and Wet balance of the Ensemble Effect. | 6-13 |
| PFX Ens Routing | Performance Control Effects | Switch the Ensemble Effect between Stereo and Mono Routing. | 6-13 |
| PFX Ens X-O Ctf | Performance Control Effects | Filter Cutoff Frequency of the Ensemble Crossover Filter. | 6-13 |
| PFX Ens X-O Fil | Performance Control Effects | Change the filter response of the Ensemble Crossover Filter. | 6-13 |
| PFX Warm Active | Performance Control Effects | Enable or disable the Warm Filter. | 6-13 |
| PFX Warm Ctf | Performance Control Effects | Specify the Cutoff Frequency of the Warm Filter. | 6-13 |
| PMF Active | Performance Control Mod-FX | Activate or Deactivate the Mod-FX. | 6-13 |
| PMF CHO Feedback | Performance Control Mod-FX | Set the Feedback level for the Chorus Effect. | 6-13 |
| PMF CHO Stages | Performance Control Mod-FX | Set the number of Stages for the Chorus Effect. | 6-13 |
| PMF CHO Time | Performance Control Mod-FX | Set the Time in milliseconds for the Chorus Effect. | 6-13 |
| PMF D><W | Performance Control Mod-FX | Wet / Dry Balance of selected Modulation Effect | 6-13 |
| PMF Durations | Performance Control Mod-FX | Select the musical duration for the LFO wave cycle. | 6-13 |
| PMF Feedback | Performance Control Mod-FX | Feedback for the selected Modulation Effect | 6-13 |
| PMF FX Type | Performance Control Mod-FX | Switch between effects: Chorus, Phaser 1, Phaser 2 | 6-13 |
| PMF LFO Freq | Performance Control Mod-FX | LFO Frequency in Hertz | 6-13 |
| PMF Mod Depth | Performance Control Mod-FX | The Depth of LFO Modulation | 6-13 |
| PMF PH1 Resonance | Performance Control Mod-FX | Set the Resonance value for the Phaser 1 Effect. | 6-13 |
| PMF PH1 Spread | Performance Control Mod-FX | Set the Spread value for the Phaser 1 Effect. | 6-13 |

XENFONT | MIDI AUTOMATION | HOST DAW AUTOMATION TARGETS

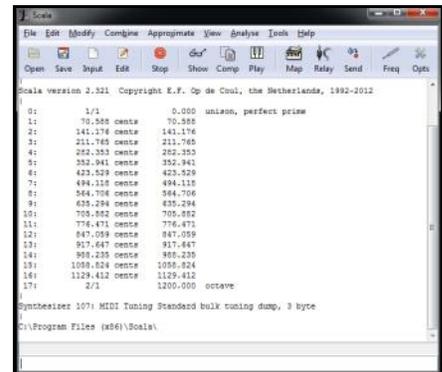
| Automation Label | Synth Section | Automation Function | Manual Page |
|-------------------|-------------------------------|--|-------------|
| PMF PH1 Stages | Performance Control Mod-FX | Set the number of Stages for the Phaser 1 Effect. | 6-13 |
| PMF PH2 Center | Performance Control Mod-FX | Set the Center value for the Phaser 2 Effect. | 6-13 |
| PMF PH2 Resonance | Performance Control Mod-FX | Set the Resonance value for the Phaser 2 Effect. | 6-13 |
| PMF PH2 Stages | Performance Control Mod-FX | Set the number of Stages for the Phaser 2 Effect. | 6-13 |
| PMF Phase | Performance Control Mod-FX | LFO Phase | 6-13 |
| PMF Time | Performance Control Mod-FX | Modulation Time in milliseconds | 6-13 |
| PMF Waveform | Performance Control Mod-FX | Select the Waveform of the LFO for the Modulation Effect. | 6-13 |
| VCA EG A Kbd | Filter Modulation Filter EG | Select Keyboard Tracking options for the Attack stage of the ADSR. | 26 |
| VCA EG Attack | VCA Envelope Generator | Controls the Attack Rate of the VCA Envelope Generator. | 26 |
| VCA EG D Kbd | Filter Modulation Filter EG | Select Keyboard Tracking options for the Decay stage of the ADSR. | 26 |
| VCA EG Decay | VCA Envelope Generator | Controls the Decay Rate of the VCA Envelope Generator. | 26 |
| VCA EG Key Scale | Filter Modulation Filter EG | Set the scaling level of Keyboard Tracking for the ADSR. | 26 |
| VCA EG L Kbd | Filter Modulation Filter EG | Select Keyboard Tracking options for the Level of the ADSR. | 26 |
| VCA EG Level | VCA Envelope Generator | Controls the Level of either the Volume or Velocity Modulation for the VCA Envelope Generator, depending on the setting made with the Level Mode switch. | 26 |
| VCA EG Release | VCA Envelope Generator | Controls the Release Rate of the VCA Envelope Generator. | 26 |
| VCA EG S Kbd | Filter Modulation Filter EG | Select Keyboard Tracking options for the Sustain stage of the ADSR. | 26 |
| VCA EG Shape | VCA Envelope Generator | Controls the Shape of the VCA Envelope Generator. | 26 |
| VCA EG Sustain | VCA Envelope Generator | Controls the Sustain Level of the VCA Envelope Generator. | 26 |
| VCA Level Mode | VCA Envelope Generator | Switch the VCA Envelope Generator between the Volume and Velocity Modes. | 26 |

XENFONT | MICROTUNINGS

| MTS Microtuning Files | Description |
|--------------------------|------------------------------|
| 05 TET.mid | 5 Tone Equal Temperament |
| 07 TET.mid | 7 Tone Equal Temperament |
| 08 TET.mid | 8 Tone Equal Temperament |
| 09 TET.mid | 9 Tone Equal Temperament |
| 10 TET.mid | 10 Tone Equal Temperament |
| 11 TET.mid | 11 Tone Equal Temperament |
| 12 TET.mid | 12 Tone Equal Temperament |
| 13 TET.mid | 13 Tone Equal Temperament |
| 14 TET.mid | 14 Tone Equal Temperament |
| 15 TET.mid | 15 Tone Equal Temperament |
| 16 TET.mid | 16 Tone Equal Temperament |
| 17 TET.mid | 17 Tone Equal Temperament |
| 18 TET.mid | 18 Tone Equal Temperament |
| 19 TET.mid | 19 Tone Equal Temperament |
| 20 TET.mid | 20 Tone Equal Temperament |
| 21 TET.mid | 21 Tone Equal Temperament |
| 22 TET.mid | 22 Tone Equal Temperament |
| 23 TET.mid | 23 Tone Equal Temperament |
| 24 TET.mid | 24 Tone Equal Temperament |
| 25 TET.mid | 25 Tone Equal Temperament |
| 26 TET.mid | 26 Tone Equal Temperament |
| 27 TET.mid | 27 Tone Equal Temperament |
| 28 TET.mid | 28 Tone Equal Temperament |
| 29 TET.mid | 29 Tone Equal Temperament |
| 30 TET.mid | 30 Tone Equal Temperament |
| 31 TET.mid | 31 Tone Equal Temperament |
| Bohlen-Pierce.mid | 13 Tone Division of 3/1 |
| Harmonics 05-10.mid | Harmonics 5-10 |
| Harmonics 06-12.mid | Harmonics 6-12 |
| Harmonics 07-14.mid | Harmonics 7-14 |
| Harmonics 08-16.mid | Harmonics 8-16 |
| Harmonics 09-18.mid | Harmonics 9-18 |
| Harmonics 10-20.mid | Harmonics 10-20 |
| Harmonics 11-22.mid | Harmonics 11-22 |
| Harmonics 12-24.mid | Harmonics 12-24 |
| Harmonics 13-26.mid | Harmonics 13-26 |
| Harmonics 14-28.mid | Harmonics 14-28 |
| Harmonics 15-30.mid | Harmonics 15-30 |
| Harmonics 16-32.mid | Harmonics 16-32 |
| Subharmonics 10-05.mid | Subharmonics 10-5 |
| Subharmonics 12-06.mid | Subharmonics 12-6 |
| Subharmonics 14-07.mid | Subharmonics 14-7 |
| Subharmonics 16-08.mid | Subharmonics 16-8 |
| Subharmonics 18-09.mid | Subharmonics 18-9 |
| Subharmonics 20-10.mid | Subharmonics 20-10 |
| Subharmonics 22-11.mid | Subharmonics 22-11 |
| Subharmonics 24-12.mid | Subharmonics 24-12 |
| Subharmonics 26-13.mid | Subharmonics 26-13 |
| Subharmonics 28-14.mid | Subharmonics 28-14 |
| Subharmonics 30-15.mid | Subharmonics 30-15 |
| Subharmonics 32-16.mid | Subharmonics 32-16 |
| Wendy Carlos - Alpha.mid | 78 Cents Equal Temperament |
| Wendy Carlos - Beta.mid | 63.8 Cents Equal Temperament |
| Wendy Carlos - Gamma.mid | 35.1 Cents Equal Temperament |

The microtunings included with this VSTi have the 1/1 mapped to C60 @ 262 Hz.

XENFONT | MICROTUNINGS | SCALA: CREATING MTS MICROTUNING FILES



Create MTS microtuning files for this VSTi with the popular Scala microtuning software application developed by Manuel Op de Coul.

MTS is the **MIDI Tuning Standard**, which is a kind of MIDI System Exclusive (SYSEX) that is able to do full keyboard microtunings in the same way that the popular TUN format can, although there are distinct advantages over these kinds of fixed tuning-table formats, such as the ability to retune ensembles of MTS-enabled VSTi from a single track in a DAW by transmitting the MTS to a number of VSTi instrument tracks simultaneously.

MTS files can be created in **Scala** in the same way that TUN files are, with the variation of setting the synth type to a different number (107).

MTS is really just a MIDI file, with a file extension of MID, and this kind of file is basically 'played' into, or transmitted, to the synth. In the Xenharmonic FMTS VSTi, the transmission of the MTS file can be done internally using the MTS file open dialogs, or it can receive MTS externally by playing it from a track in your DAW and routing the MIDI to the VSTi track.

To create MTS files in Scala:

1. Open Scala.
2. Using the menus File/New/Scale or Ctrl+N, open the Input Current Scale dialog to create a new scale. Paste or type your tuning values into the Pitches field and click OK. Obviously, there are a number of ways to create tunings, such as opening SCL files from the Scala archive, or using the other File/New options.
3. To see your scale, type Show then press Enter, or press the Show button on the toolbar, or even press F6 on your keyboard.
4. To set Scala to create the MTS (Synthesizer 107: MIDI Tuning Standard bulk tuning dump, 3 byte), type 'set synth 107' into the command line at the bottom of the program and press Enter. Alternatively, click the Opts button on the toolbar to display the User Options dialog. Click the Synth button on the left to switch the dialog to the Synth options. Under Synthesizer Tuning Options, choose Tuning Model: "107: MIDI Tuning Standard bulk tuning dump."
5. On the File menu choose Export Synth Tuning, or press Shift+Ctrl+T, to open the export dialog (Curiously, this dialog is titled Select MIDI File To Save).
6. Use the Places navigation pane on the left to navigate to a directory where you wish to save your MTS file. Type a file name at the bottom with the file extension MID, such as '5-tet.mid'. Press OK.

Now you have saved an MTS file that can be opened by this VSTi.

Scala: <http://www.huygens-fokker.org/scala/>

Please note that the microtunings included with this VSTi have the 1/1 mapped to C60 @ 262 Hz.

XENFONT | Notes and Tips

Some Background Information

Sometime after the release of the Xen-Arts IVOR VSTi, it was requested to consider producing a microtonal SF2 SoundFont instrument. At first it was my impression that the SF2 format was generally dead; superseded by the newer SFZ format used in many current popular VSTi.

This turned out to be not entirely accurate, and it appears rather that the SF2 format is alive and well, and is used in quite a number of popular music software applications; in particular on the Mac OS, where there is a full featured microtonal SoundFont instrument available. But on the Windows side of the OS universe, there have been far less options for serious microtonal and xenharmonic composition using SF2 SoundFonts.

With the ability to freely load any 'historical' SoundFont files one may have in their sample archive, or tapping into the vast numbers of free ones available around the web, this VSTi provides a way to dust off those old SF2 and give them a new sonic life, in a no-compromise, fully microtonal, hybrid sampler-synthesizer instrument.

Per-Stage ADSR Keyboard Tracking

Another of the innovative synthesis features offered in this VSTi, are the Per-Stage ADSR Keyboard Tracking functions, where each stage of the ADSR may be independently modulated by keyboard-tracking. These are the three position switches that appear over the ADSR Envelope Generator sliders in the Oscillator Modulation, Filter Modulation and VCA Envelope Generator sections.

These switches, when used in conjunction with the Key Scale feature, enable setting up sophisticated, keyboard-position dependent modulation effects, where each note across the range can potentially have it's own unique envelope character.

When, for instance, they are applied to the Pitch Envelope Generator in the Oscillator Modulation section, the character and timing of the pitch modulations can be configured to change as one plays across the MIDI range, where they might get shorter as one plays higher, and longer when lower.

Also one might apply these keyboard tracking functions to pad type sounds and make the attack fade in more slowly when playing higher on the controller, while faster in the lower range. The applications are fairly infinite, and this unique feature makes this instrument stand out as an incredibly expressive tool for microtonal music sound-design.

Bass and Distortion Timbres

XenFont is a great character synthesizer that is capable of radically transforming the input SF2 samples, by using the quality settings, layering, cross-fading, ring-modulating, filtering, chorusing, flanging, phase-shifting and ensemble spatializing them. Of course, musicians can play it straight too, and disable all of the synthesis features for playing clean unprocessed SoundFonts as well.

XenFont inherits a number of features from the Xen-Arts Ivor VSTi, which was originally conceived as a bass and distortion synthesizer capable of creating deep basses and heavy distorted guitar-like timbres. The key features that are involved in creating these kinds of distortion patches with this VSTi, are the Pitch Envelope Generator and X-Fade Modulation LFO found in the Oscillator Modulation section, as well as the Saturation stage found in the Filters section. Emulation of guitar-like sounds relies heavily on being able to synthesize the plucked attack and the PEG with its many control Shapes makes this possible. The Analog Pitch Drift feature also contributes to this kind of sound by emulating the random micro-fluctuations of pitch observable in many analog, acoustic and electro-acoustic musical instruments.

Polyrhythmic LFO

Using the Low Frequency Oscillators found in the Oscillator Modulation and Filter Modulation sections, together with the LFO Rate Sequencers, makes it possible to create myriad kinds of polyrhythmic transformations to the timbre of the instrument. Setting each LFO and Rate Sequencer to different durations that change with each MIDI Note-On is capable of creating incredibly complex and sonically alluring rhythmic timbral effects that can be synced to the musician's host DAW.

Microtunings

In designing the patch bank for this instrument (unlike Xen-FMTS) no attempt has been made to assign specific microtunings to patches and the default Global microtuning is 12-ED2, while the default Local microtuning is set to 8-ED2. The choice of what microtunings to use - or whether to use them at all - is left entirely to musician's and composer's choice.

It was not the design goal for this VSTi to try to feature a comprehensive selection of microtunings and only a very basic set are included as factory defaults. The included microtunings should essentially be regarded as starting points for further investigation. In this case too, the creation and exploration of custom microtunings is left to the discretion of musicians. Microtonal and xenharmonic music - and musical instrument intonation in general - is a vast topic, and a field in which one should anticipate working with lots of different intonations and spending a significant number of years to understand and master the use of alternative intonation systems in one's music.

Microtonal Pitch Bends

One of the powerful features of this synthesizer is the ability for musicians and composers to precisely specify the pitch-bend range in cents. While there are many possible applications for this functionality, one use for this is to configure a pitch bend range that lies directly between a single step of an equal temperament.

For example, in the case of 8 tone equal temperament, we know that the tuning is made up of equal step sizes of 150 cents. To set a pitch bend range at 1/2 of this step size, we can type in 75 cents into the pitch bend cents field, and with the Bend Selector in the Cents mode, when we bend the pitch wheel of the MIDI controller we are able to precisely play pitches that lie between the steps of 8-TET, which, are in fact, notes found in the next highest multiple of this temperament: 16-TET. So in effect we are able to move the pitch wheel to precisely play notes from a higher multiple of a given equal-temperament, and with this same kind of logic, we can examine any microtuning to determine what would be other musically useful settings for expressive microtonal pitch-bends that are contextual to a given intonational setting.

Microtonal Oscillator Transposition

In addition to the microtonal pitch bend functions, this VSTi also features the ability to precisely configure transposition offsets of the oscillators in terms of cents, harmonic series and subharmonic series.

While most synthesizers and samplers force musicians to use octaves, semitone steps of 12 tone equal temperament and cents, this VSTi enables musicians to easily make oscillator transposition settings that fit with any intonational context required by the music at hand. This is especially useful for musical composition scenarios in which the intonation system does not repeat at an exact interval of 2/1 @ 1200 cents and there are many beautiful microtunings of this nature, such as Bohlen-Pierce and the wonderful Wendy Carlos, Alpha, Beta and Gamma; all of which are included as default microtunings in this instrument.

MIDI Velocity Modulation of Harmonics

Musicians and composers who are familiar with playing acoustic instruments such as winds and strings will appreciate the expressive ability to sound harmonics of the fundamental pitch by over-blowing or plucking at harmonic nodes. This VSTi has a unique feature that enables direct pitch modulation of the oscillators by degrees of the harmonic (and subharmonic) series using MIDI Velocity, where, when activated, increased force on the controller can be used to break out higher harmonics, which are in effect, integer multiples of the fundamental frequency of the sounding waveform. As previously explained in the Oscillator Modulation section of this manual, the range options are from 1-2, 1-4, 1-8 and 1-16 harmonics. The interaction between the sensitivity setting and the range of harmonics can be easily configured by musicians to fit with the requirements of a particular musical or performance scenario.

XENFONT | ACKNOWLEDGEMENTS

Concept, user interface, design, patch bank and this manual by **Jacky Ligon**.

Xen-Arts

xen-arts.com

This instrument was created in the **SynthEdit** environment from developer **Jeff McClintock**. The highest possible level of gratitude goes out to Jeff for implementing MTS (MIDI Tuning Standard) in SynthEdit; the ultimate microtonal tuning format.

SynthEdit

synthedit.com

This instrument features many fine 3rd party SynthEdit modules developed by **Chris Kerry** and **Etric Van Mayer**:

CK Modules & VST

chriskerry.f9.co.uk/CK_Modules.html

EVM Modules for Synthedit

<http://evm.110mb.com/>

All of the patches in the XenFont default bank have been created using the SF2 SoundFont:

GeneralUser GS SoftSynth v1.44.sf2

S. Christian Collins

<http://www.schristiancollins.com/generaluser.php>

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The **MTS** microtunings included with this synthesizer were created using the **Scala** application developed by **Manuel Op de Coul**. Many thanks goes out to Manuel for his decades long support of microtonal musicians and composers and for offering his application as freeware.

Scala Home Page

huygens-fokker.org/scala

XENFONT | EULA

End User License Agreement

This instrument is offered as freeware as a way to inspire musicians and composers experiment with computer music, sound synthesis and alternative musical instrument intonations (aka microtonal and xenharmonic music).

The instrument can be used in any kind of musical production, commercial or otherwise, completely free of charge.

Selling this VSTi is not permitted.

It is not permitted to distribute this VSTi in any way without prior permission.

Xen-Arts assumes no responsibility for any kind from damages resulting from the use of this software.

The exploration of alternative intonation systems as a facet of one's routine musical practice, is largely about a quest for aesthetic beauty, personal expression and the completion of the creative cycle, where musicians and composers share these unique microtonal sound-worlds - and their own artistic visions - with listeners.

The creation of the small suite of Xen-Arts freeware microtonal instruments has been a design labor-of-love, where one of the most exciting end results is getting to hear what musicians and composers make with the tools. If you make microtonal and xenharmonic music with this VSTi, consider sharing your work with other people, including the Xen-Arts developer, who would greatly appreciate getting to hear any music created with this instrument, as many countless hours and great care went into its design and creation.

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