LENNAR DIGITAL

~ Sylenth 1 ~

Polyphonic VSTi syntheziser

User Manual

Version 1.01

http://www.lennardigital.com

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Table of Contents

1. Introduction

Sylenth1 is a virtual analog synthesizer that takes the definitions of quality and performance to a higher level. Until now only very few software synthesizers have been able to stand up to the sound quality standards of hardware synths. Sylenth1 is one that does.

Sylenth1 is not just another synth. It was built from a producer's point of view. It was built to produce superior quality sound and music. It was built to perform. A lot of research has been invested in order to achieve unheard warmth and clarity. The graphical interface ensures the highest level of useability so you can fully unleash your creativity.

Oscillators
At its core Sylenth1 houses 4 alias-free unison oscillators, which generate analog shaped waveforms. Each oscillator is capable of producing 8 unison voices in full stereo, adding up to a total of 32 voices per note. With its 8 notes of polyphony this means you can play up to 256 voices simultaneously! The oscillators perform extremely well in both the very low (down to 0.01Hz and below!) and very high (all the way up to half the samplerate) frequency regions without losing their sharpness, liveliness or character. This makes them well suited for all kinds of sounds, from the deepest basses imaginable to the highest crystal clear bells.

Filters
On top of that there are 2 state of the art, pure analog sounding filter sections. Each of these consists of 4 filter stages with nonlinear saturation incorporated, in order to emulate the warmth and drive of a real analog filter. The resonance control can be turned up to a level way beyond self-oscillation and combined with the drive control this makes it possible to let the filters *SCREAM*! Where a lot of digital filters sound like they're made out of cheap plastic, these filters sound rock-solid, warm and raw.

Modulation
Sylenth offers many modulation options to sculpture the sound any way you like. There are 2 ADSR envelopes and 2 LFO's which can be used to modulate a whole set of different parameters. Next to that, it is possible to use the extra 2 amplitude envelopes, velocity, keyboard track or modulation wheel as a source for modulation.

Master FX
The final part of this synth is the master effects section. A set of 6 professional quality sound effects conveniently grouped into an LCD panel structure.

- **Distortion** - Three different types of distortion in full stereo, uses 4x oversampling to minimize aliasing artifacts.

- **Equalizer** - Bass and treble adjustment by frequency and amplification.
- **Phaser** - 6-Stage stereo phaser, with 2x oversampling, an embedded LFO, feedback and frequency spread adjustment.
- **Delay** - Delay module with low and high pass filters, unique echo smearing function, pingpong mode with stereo spreading, independent left and right delay time and adjustable stereo width.
- **Reverb** - Smooth reverb with adjustable pre-delay, damp, size and stereo width.
- **Compressor** - Stereo compressor with attack, release, threshold and ratio settings, which can be used to increase punch, drive, warmth and analog feel of your sounds.

Performance

With all the functionality and processing horsepower mentioned above, you might expect that this synth would max out even the fastest CPU in no-time, especially considering the high sound quality of each single voice and effect. Well, the good part of this synth is that it doesn't. It uses highly optimized code and SSE instructions in order to reduce the CPU usage to a minimum. It will also automatically turn off any parts that are not used to save extra CPU time. This enables you to create pure quality sound using only very little system resources.

2. Installation

Use the installer to install Sylenth1 into your common VST plugins folder (for example C:\Program Files\Steinberg\VSTPlugins\). In most cases your host software will automatically recognize the plugin.

Please refer to the manual of your host software for more information on how to open and use VSTi plugins with it.

Note to FL Studio users: Make sure the setting "*Reset plugins on transport*" in the audio options is *disabled* for optimal performance.

Purchasing the Full Version

The demo version comes with a few limitations, as listed below. If you would like to buy the full version without limitations, then please visit our online webshop at http://www.lennardigital.com

After you have purchased Sylenth1 you will receive the full version installer and a personal license file. Run the installer and install Sylenth1 it into your common VST plugins folder. You can uninstall the demo first if you like, but it's not strictly necessary. After installation you need to manually copy your personal *license.dat* file to the Sylenth1 subfolder of the installation folder, where all other .dat files are also located (for example: C:\Program Files\Steinberg\VSTPlugins\Sylenth1\).

If you encounter any problems or have any questions, head over to our website (www.lennardigital.com), or email us at support@lennardigital.com

Minimum System requirements

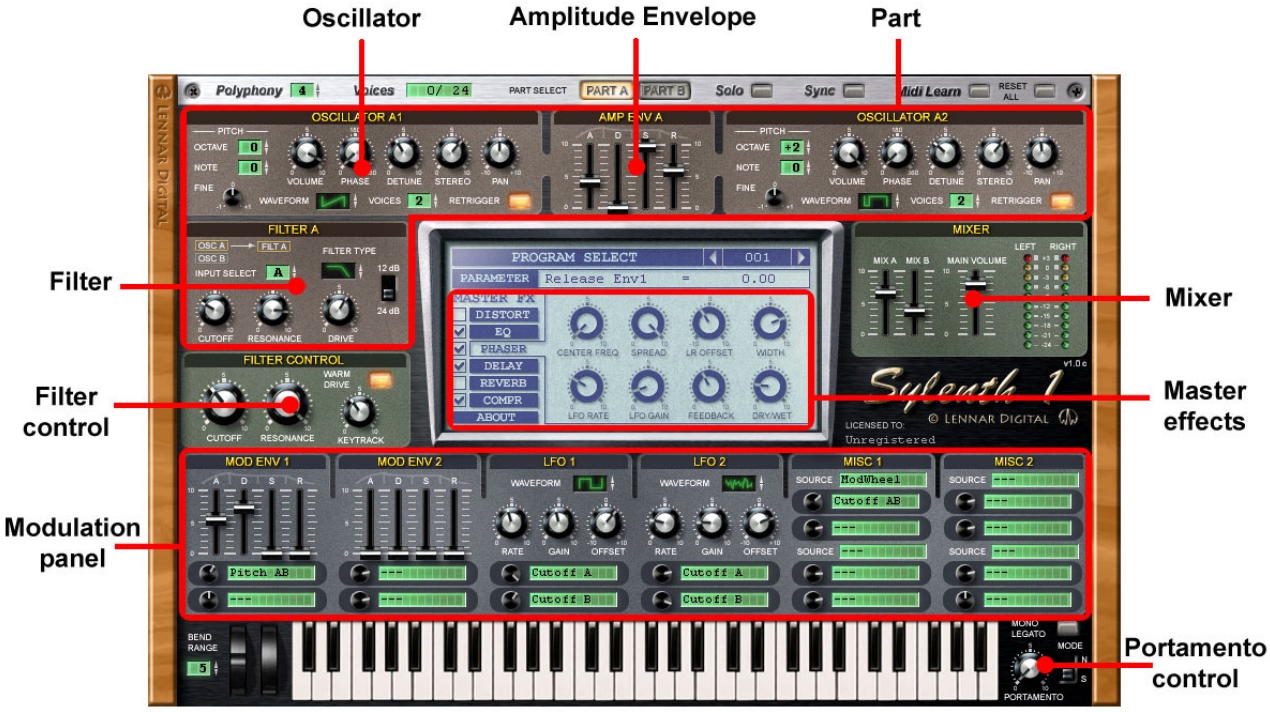
- Any CPU that supports SSE (Intel Pentium III and above, AMD XP and above)
- 128MB RAM
- 10 MB free harddisk space
- Windows 2000/XP operating system
- VSTi compatible host software

Limitations of the demo version

- A demo reminder sample will be heard about every 30-60 seconds
- Half of the modulation options have been disabled
- Limited to 32 presets

3. Overview

Sylenth1's user interface is divided into four main sections. Each section has a different color which makes them easy to distinguish. The first section contains two oscillators and a filter and is called the *Part* section. Sylenth1 has two of these parts, *Part A* and *Part B*, but only one of them is shown at a time on the user interface. *Part A* has a red background color, *Part B* yellow.



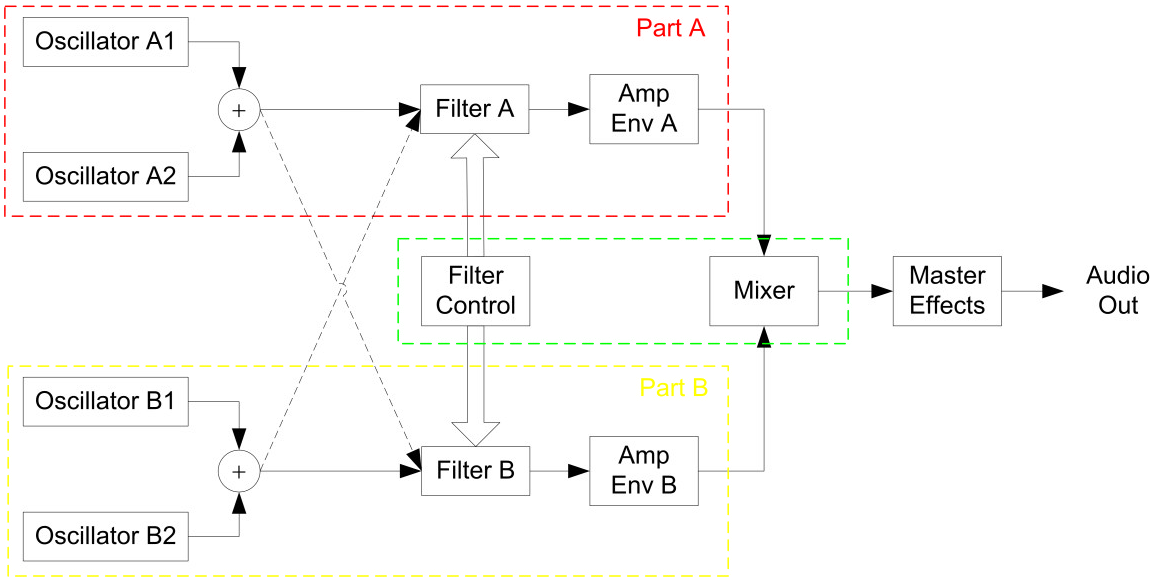
The second section, colored green, contains the filter control and mixer panels. They control the sound from both parts. The blue panel at the bottom of the interface, the third section, contains all modulation options. Finally, the fourth section is formed by the LCD display and contains the six master effects.

Next to the four main sections, there's a keyboard, pitchbend and modulation wheel and portamento control located at the bottom of the interface.

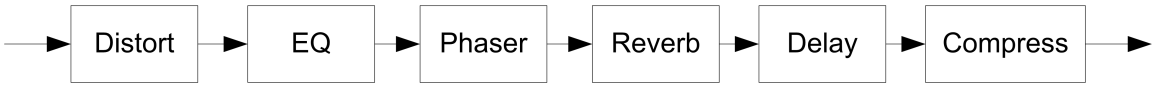
3.1 The Audio Path

The block scheme below shows the internal structure of the audio path in Sylenth1. Each line represents a stereo audio signal. The outputs of the two oscillators on each part are added together, and run into the filter sections afterwards. It is also possible to run the output of the oscillators from part *A* into the filter of part *B*, as indicated by the dashed crossing lines.

The outputs of the filters are then shaped by the amplitude envelope generators and enter the mixer afterwards. Finally, the master effects are applied and the audio output is sent to the host.
As you can see in this diagram, the Filter Control panel controls both filters *A* and *B* at the same time.



The master effects section consists of six sound effects stacked in series. The first effect applied is distortion, followed by the equalizer, phaser, reverb, delay and finally the compressor.



3.2 Working with parts

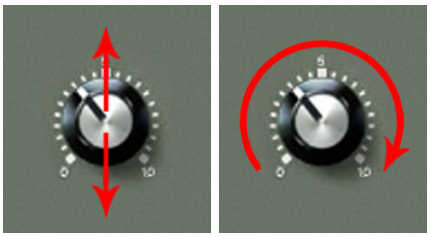
Part Select

You can switch between the two parts using the *Part Select* buttons shown on the top bar on user interface. It is easy to see which part is currently shown on the interface, because part *A* has a reddish background color, while part *B* is colored yellow.

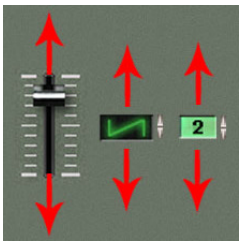
Solo
Right next to the part select buttons you'll find a button named *Solo*. Whenever this button is activated, you will hear only the sound of the currently selected part. This is very useful if you are working on complex sounds.

3.3 Controlling Knobs

Rotary knobs
Rotary knobs can be controlled in two different manners using the mouse. By clicking the knob and dragging up or down in vertical direction, you can easily set it to a coarse value. If you need a higher accuracy, you can drag the mouse in a big circle around the knob.



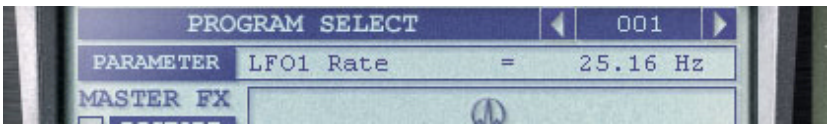
Other controls
Sliders, waveform selectors and value controls can all be controlled by dragging the mouse up and down. Switches and on/off buttons can simply be switched by clicking them.



Fine-tuning
A knob's value can be fine-tuned by holding down the Ctrl key while dragging the knob with the mouse.

Center value
Some knobs and controls have a centered default setting, like the pan knob or the octave and note values on the oscillators for example. Double-clicking these controls will make them jump to their center value.

Parameter value display
Whenever you change the value of a parameter by dragging a knob, the value of that parameter will be displayed on the LCD screen.



If you want to know the exact value of a parameter, but you do not wish to change it, you can simply click a knob once. This will display its value on the screen without changing it.

3.4 MIDI control

Most knobs on Sylenth1 can be controlled by MIDI Control Changes (CC). Each knob has a default CC parameter, listed in the appendix. You can also very easily assign CCs to knobs by using the *MIDI Learn* buttons located on the top bar on the user interface.

If you press the *MIDI Learn* button, it will light up and wait for MIDI input. Turn a knob on your MIDI controller, and drag a knob you want to control on the user interface with the mouse. The *MIDI Learn* button will now go back to grey and controller has been linked. Sylenth1 will store the CC parameters it learned permanently, so they will still be active after you close and restart your host.

Right next to the MIDI learn button you'll find a button named *Reset All*. Pressing this button will reset all learned MIDI CC values to the default settings as listed in the appendix.

3.5 Changing Programs

The currently selected program number is shown on top of Sylenth's LCD display.

There are several ways to change the program.

- By using the host software functionality to change programs.
- By using the *Program Select* arrows on the LCD display.
- By clicking on the program number on the LCD display, this will show a popup menu containing all 128 program numbers.
- By sending a program change message via MIDI.

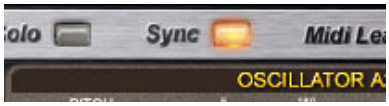
3.6 Polyphony

Sylenth1 is a polyphonic synthesizer, which means you can play multiple notes at the same time. The maximum number of simultaneous notes can be controlled by the *Polyphony* control located on the top bar of the user interface. It can be set anywhere between 0 and 8.

Voices

The Voices indicator displays the number of active voices and the maximum total number of voices. Each oscillator can generate several voices. The maximum number of voices is equal to the sum of voices generated by all oscillators, multiplied by the maximum number of polyphonic notes. For example, when there are 2 oscillators active which generate 3 voices each, Sylenth1 will synthesize 6 voices for every note you play. When polyphony is set to 4, this means there's a maximum of 24 voices in total.

3.7 Sync



The Sync button is located on the top bar of the user interface. It forces several timing parameters like LFO rates and delay times to be synchronized with the host tempo.

If Sync is turned off, these parameters will display their values in seconds or Hertz. When it is turned on, they will show their values in bar parts. One bar contains four beats, so a value of 1/4 means once every beat, and a value of 1/8 means twice every beat.

4. Components Detailed

In this chapter we will take a closer look at the different sections of the Sylenth1. Each section consists of several components that will be discussed one by one.

4.1 The Part Section

As said before, there are two *Part* sections on the Sylenth1, named *A* (red) and *B* (yellow), which can be switched using the part select buttons. Each of these parts contains two oscillators, a filter panel and an amplitude envelope.

4.1.1 The Oscillator

Voices
Each oscillator on the Sylenth1 synthesizer can generate 0 to 8 voices in unison. You can select the number of voices by dragging the *Voices*-selector up or down. The oscillator can be turned of by setting the number of voices to 0.

Waveform
By dragging the *Waveform* selector up and down, you can select the type of waveform all oscillator voices will generate. There are 8 different waveforms emulating common analog wave shapes.

Pitch
On the left part of the oscillator panel, you'll find the pitch control. Using the *Octave* and *Note* controls, you can tune the oscillator voices to any note you like. With the knob *Fine* the pitch can be fine-tuned between two half notes. Double-clicking these controls will reset them to their default 0 value.

There are a set of rotary knobs which can be used to change the sound of the oscillator:

- ***Volume*** – Sets the output volume of the oscillator.
- ***Phase*** – This knob will change the starting point of the waveform. It will only function when *Retrigger* is enabled.
- ***Detune*** – Detunes the pitch of the individual voices with a certain amount around the center pitch. This can be used to create supersaw hover effects, widen the sound, or add analog sounding effects.
- ***Stereo –*** Sets the level of stereo separation between the individual voices. If set to 0 it will generate a mono sound, if set to 10 the voices will be fully spread over the left and right channels. This only has effect if there are more than 1 voices.
- ***Pan –*** Pans the output of the oscillator to the left (0) or right (10) channel.

Retrigger and Phase

The *Retrigger* button can be used to force all voices to start at the exact same location on the waveform every time a new note is played. That location can be changed using the *Phase* knob. If *Phase* is set to 0, the voices will restart at the beginning of the waveform period. If it is set to 180 degrees, the voices will start halfway the period, while setting it to 360 degrees will make them start at the end of the waveform, which is equivalent to the beginning.

The phase setting can not be heard if there's only one oscillator active, but as soon as there are two or more oscillators running at the same pitch and both have the retrigger button enabled, you can create useful effects with it. You can accentuate the level of bass tones for example, or create PWM-like effects by modulating the phase.

4.1.2 The Filter

Input Select

The outputs of the oscillators are shaped by the filters. Usually the output of the oscillators from *Part A* will be filtered by *Filter A*, but it is also possible to route the outputs of oscillators *B* to *Filter A,* and vice versa. This can be done by using the *Input Select* control. If it is set to *A*, only oscillators *A1* and *A2* will be filtered. If set to *AB*, all oscillators from part *A* and *B* will be routed to the filter. If set to --, this means the filter does not have any input. The routing scheme above the *Input Select* control will show the internal routing.

Filter Type
With the *Filter Type* selector the filter type can be set. There are 4 types:

-  **Bypass –** This setting bypasses the filter.
-  **Lowpass –** Attenuates all frequencies above the cutoff frequency, and lets the lower frequencies pass unchanged.
-  **Bandpass –** Attenuates frequencies above and below the cutoff frequency, and lets only a small band of frequencies pass unchanged.
-  **Highpass –** Attenuates all frequencies below the cutoff frequency, and lets the higher frequencies unchanged.

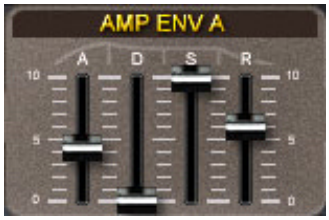
The amount of attenuation can be set using the switch on the right side of the filter panel. The attenuation can be switched between 12dB per octave or 24dB per octave.

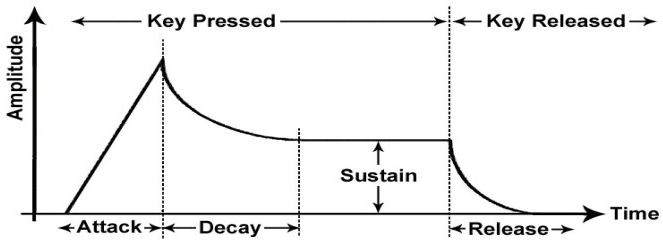
Cutoff and Resonance
The cutoff frequency can be changed using the *Cutoff* knob, and the *Resonance* knob sets the amount of filter resonance at the cutoff frequency. Setting the resonance to a very high level makes the filter self-oscillate, which means that it generates a tone all by itself.

Drive
You might already be familiar with the *Cutoff* and *Resonance* knobs, but the *Drive* knob is one that is not so common on synthesizers. It can be used to overdrive the internal filter stages. The filter contains four filter stages and each stage incorporates a non-linear saturation function. Driving these stages adds higher harmonics to the input signal, making the filter sound warmer and fuller, similar to the way an analog filter does.

4.1.3 The Amplitude Envelope

The sound created by the oscillators and filters can be shaped with the amplitude envelopes. These are common ADSR envelopes, with *Attack*, *Decay*, *Sustain* and *Release* parameters. You can use these to make the sound fade in and out, or add punch to it for example.





Note that setting the *Attack* or *Release* settings to 0 creates a very sharp on/off switching effect, which might result in a clicking sound. While this is very useful for sounds that need a lot of punch, like a kick drum, it might be an unwanted effect for other sounds. If this is the case, then simply give *Attack* and *Release* a small value, so that any clicking effects will be eliminated.

4.2 The Main Section

4.2.1 The Filter Control Panel

The filter control panel contains controls that apply to both filters from *Part A* and *B* simultaneously. Note that this panel does not contain an individual filter; it merely controls the filters *A* and *B*.

Cutoff and Resonance
With the *Cutoff* knob you can change the cutoff frequency from both filters *A* and *B*. This is useful, because it allows you to control the timbre of the sound created by the filters using a single knob. In a similar fashion the *Resonance* knob controls the resonance of both filters.

Keytrack
It is possible to link the cutoff frequencies of the filters to the pitch of the note played on the keyboard. This can be done using the *Keytrack* knob. When this knob is set to 0, the cutoff frequency will not depend on the note played. However, when this knob is set to 10, the cutoff frequency will change with the pitch of the note played. This enables you to keep (or change) the timbre of a sound whenever higher or lower notes are played.

If the filter is put into self-oscillation, setting the *Keytrack* knob to 10 makes it possible to play the filter like a piano.

Warm Drive

Turning the *Warm Drive* button on, makes the filter stages use a higher quality of saturation which introduces more higher harmonics. Turning this option off, makes the filters use less CPU power. If you're using a lot of polyphonic voices, it might be a good idea to turn it off when CPU usage becomes a concern.

4.2.2 The Mixer

The sounds produced by the oscillators and filters from Part A and B are mixed together using the Mixer panel. *Mix A* sets the volume of Part A; *Mix B* sets the volume of Part B. The *Main Volume* knob sets the volume of Sylenth1's audio output after the master effects have been applied.

On the right side of the Mixer panel is a VU meter which measures the output level. Please note that it is in general not a problem when the red LEDs are lighting because the output of Sylenth1 is not clipped. The host software can turn the volume down if needed to prevent clipping.

4.3 The Modulation Section

The modulation panel enables you to modulate a whole set of parameters using two ADSR envelope generators, two Low Frequency Oscillators and a set of other sources. Each source can be linked to two different parameters, which can be chosen from a popup menu that appears when you click on one of the destination displays.

You can set the amount of modulation for each parameter using the small rotary knobs next to the destination displays. Turning them to the right results in a positive modulation value, turning them to the left gives a negative value. The middle position is the default position and means there is no modulation. If you double-click the knob it will jump back to this default position.

4.3.1 The modulation envelope

The modulation envelopes are common ADSR envelopes with *Attack*, *Decay*, *Sustain* and *Release* settings, similar to the amplitude envelope. It can be used for all kinds of modulation, but two commonly used destinations are the filter cutoff (aka FEG) and the pitch (aka PEG).

4.3.2 The LFO

The Low Frequency Oscillator (LFO) is also a common modulation source. The two LFOs on Sylenth1 offer 10 different waveforms to be chosen from. The *Rate* knob sets the oscillator frequency, the *Gain* knob changes the amplitude and the *Offset* knob can be used to add a positive or negative constant value to output of the LFO. If *Offset* is set to 0, the output wave will be centered around 0.

Using the LFO you can create all kinds of vibrato effects, sweeping sounds and special effects.

4.3.3 The Miscellaneous Modulation Panel

The Miscellaneous Modulation panels allow you to choose other modulation sources, like velocity, keytrack, modwheel, the amplitude envelopes and the modulation envelopes and LFOs.
Since there are four of these selectable inputs, each with two destinations, this gives you a wide variety of modulation options. Again, each modulation amount can be changed using the small rotary knobs.

4.4 The Master Effects Section

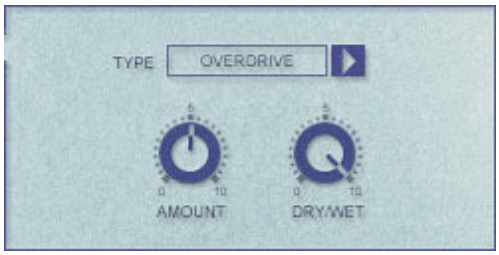
The Master effects are applied at the end of the audio path. They can be controlled using the LCD screen located in the middle of user interface. There are six types of effects, each of which has their own settings panel on the LCD screen. To switch between the different effect panels, click on the name of the effect on the left side of the screen.

Effects can be turned on and off by clicking the checkbox next to the effect's name. If an effect is turned off, it will stop processing, and free up CPU time.

4.4.1 Distortion

Type

Sylenth1 offers three types of distortion: *Overdrive*, *Foldback* and *Clip*. Each type has a different sound and harmonic content. You can switch between the types by clicking on the arrow button, or by dragging the type display up and down.



Amount

The Amount knob sets the harshness of the distortion. A low amount will produce a soft distortion effect which can be used to add warmth to a sound, much like a tube amplifier does. High amounts of distortion can be used to create a raw heavy distorted sound.

Dry/Wet
The Dry/Wet knob defines at what rate the distorted (wet) and original (dry) signals are mixed. A value of 0 means only the original signal is passed, while a value of 10 means only the distorted signal is passed.

4.4.2 Equalizer

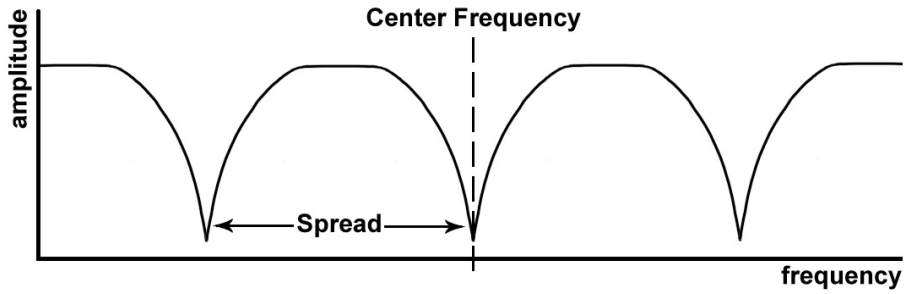
The equalizer can be used to make quick and simple adjustments to the bass and treble of the sound. The *Bass* knob will turn up the amount of bass, and the maximum bass frequency can be set using the *Bassfreq* knob. The treble can be adjusted in a similar way using the *Treble* and *Treblefreq* knobs.

If the *Bass* and *Treble* knob are both set to 0, the sound will be unchanged. Note that the equalizer will automatically normalize the volume level whenever bass or treble is added.

4.4.3 Phaser

The six-stage stereo phaser creates notches in the frequency spectrum and shifts them up and down using the internal LFO.

CenterFreq
The *CenterFreq* knob sets the position of the middle notch in the frequency spectrum. Turning this knob makes all notches go up or down in frequency. This parameter can be modulated by the internal LFO, but you can also use the modulation panel to modulate it, or turn it by yourself. By doing so, you can make the phaser sound like a multistage filter effect.



Spread
The *Spread* knob determines the distance between the notches in the frequency spectrum. A low spread pushes the notches close together and creates a classical phaser sound. A higher spread can be used to create filter-like effects.

LR Offset
With the *LR Offset* knob you can change the amount of frequency-offset between the centerfrequencies for the left and right channels. This will create stereo phasing effects.

Width
The stereo width of the phaser effect is controlled by the *Width* knob. Set this knob to 0 to create mono sounding phaser effects, or set it higher to create wide stereo effects.

LFO Rate and LFO Gain
The phaser has an internal LFO, which modulates the phaser's center frequency. *LFO Rate* sets its frequency, and *LFO Gain* sets its amplitude. If you set the *Gain* to 0, the LFO will be turned off.

Feedback
The output of the phaser is fed back to the input to create resonance peaks between the notches in the frequency spectrum. This effect can be controlled using the *Feedback* knob. A high feedback creates sharp peaks with a characteristic resonating sound.

Dry / Wet
The phasing depth can be controlled using the Dry/Wet knob. This knob sets the ratio between the effect and the original dry input signal.

4.4.4 Delay

The delay panel can be used to create echoing sound effects. You can set the delay times for the left and right channel independently using the *Delay L* and *Delay R* knobs respectively.

Feedback
With the *Feedback* knob you can control the speed with which the delays will fade away. A high amount of feedback will produce long lasting echoes.

PingPong
There are two delay modes, normal and pingpong. In normal mode, the left and right channels have independent delays, but in pingpong mode the sound jumps from left to right and back, using the delay times specified by the *Delay L* and *Delay R* knobs. Pingpong mode can be enabled and disabled by clicking the *PingPong* checkbox.

Spread
The spread knob has only influence on the delay in pingpong mode. It determines the spreading of the echoes over the left and right channels. When Delay L and Delay R have different values, a spread of 0 can create Left-Center-Right delay types, while a spread of 10 will create pure pingpong delays.

Width
The stereo width of the delay effect can be changed using the *Width* knob. Echoes panned fully left or right usually sound too wide, so you can pull them to the center by lowering the width value. A width of 0 creates mono echoes.

Low Cut and High Cut
The sound of the echoes can be changed by filtering the high or low frequencies at each delay. The *Low Cut* knob determines how much of the low frequency content is filtered out. The *High Cut* knob does the same for the high frequencies and creates muffled sounding echoes.

Smear
In real world echoes, the sound also changes because its frequency content is smeared out over time. Sylenth's delay can simulate this effect to create real sounding echoes. Turning up the *Smear* knob will make this effect more pronounced. If it is set to 0, the delays will not be smeared out.

Dry / Wet
The level of delays compared to the original dry input signal is set using the *Dry/Wet* knob. A value of 0 will mute the delays, while a value of 10 will mute the original signal.

4.4.5 Reverb

The Reverb effect simulates sound reflections from surrounding walls or objects. Adding reverb to your sound will make it sound more realistic and adds depth to it.

Size
The size of the simulated room is controlled by the *Size* knob. A high value will generate a slowly decaying reverb, similar to what can be heard in a very large hall.

Damp
The brightness of the reverb can be changed using the *Damp* knob. A high damping value attenuates the higher frequencies. Damping can also be thought of as a damping material that covers the walls of the room.

PreDelay
With the *PreDelay* knob you can add a delay to start of the reverb. This can be compared to the distance of the walls that reflect the sound. Predelay can also be used to create rhythmic reverb bursts when the *Size* parameter is low for example.

Width
The Width knob sets the stereo width of the reverb effect. Setting the width to 0 makes the reverb mono, while setting it to 10 maximizes the stereo width.

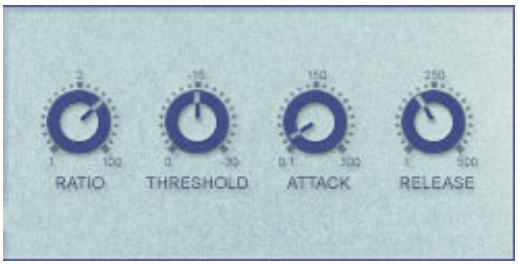
Dry / Wet
You can set the amount of reverb compared to the original dry input signal using the *Dry/Wet* knob.

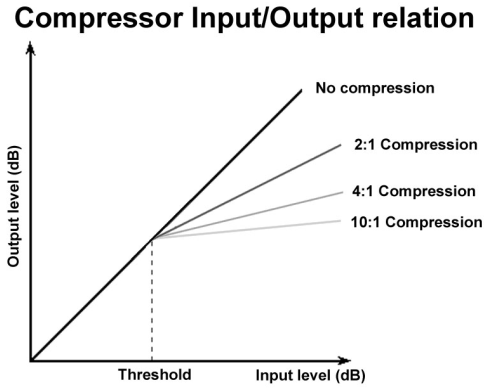
4.4.6 Compressor

The compressor can be used to limit loud or peaky sounds like a high resonance peak caused by a filter for example. It can also be used to accentuate softer sounds like reverb or delays in between pauses of the notes, or to add extra punch to sounds with a sharp attack for example.

A compressor is basically a variable gain device, where the amount of gain used depends on the level of the input. The gain will be reduced more when the signal level is higher, so that it reduces the dynamic range of the sound.

Ratio
The amount of gain reduction is determined by a *Ratio* control. For example, a ratio of 4:1 means that the input level would have to increase by 4 dB to create a 1 dB increase in the output. When the ratio is set to 1:1, no compression is applied. When the ratio is set to 100:1, the compressor works like a limiter.





Threshold
The *Threshold* knob sets the minimum amplitude level above which the compressor starts working. If the threshold is set to 0dB, it will compress close to nothing, since the input level doesn't exceed 0dB. Setting the threshold to -30dB means everything louder than -30dB will be compressed. Since most part of the sound will be louder than that, the compressor will be clearly audible.

Attack
The *Attack* knob determines how fast the compressor responds to changes in the input level. If set to a small value, the compressor will reduce the gain immediately after the threshold has been exceeded. If set to a higher value, the compressor will only slowly turn down the gain.

Release
When the input level drops below the threshold level again, the compressor will take some time to increase the gain until it reaches its uncompressed value. This time is controlled by the *Release* knob. A short time will make the gain increment very fast, while a long release time will only slowly increase the gain.

4.5 The Keyboard Section

The keyboard section at the bottom of the user interface consists of a 5-octave keyboard, a pitch bender, a modulation wheel and portamento controls.

Pitchbend

The leftmost wheel is the pitch bender. It can be controlled by MIDI or with the mouse and it will bend the pitch up or down. You can specify the bending range in half notes using the *BendRange* control.

Modwheel

The modulation wheel is located right next to the pitch bender. It can be used as a modulation source in the miscellaneous modulation panels for any type of modulation.

Mono Legato

When the *Mono Legato* button is activated, Sylenth1 will be forced into mono mode and the polyphony setting on the top bar will be discarded. It will also stop retriggering notes whenever another key is pressed. This enables you to slide notes up and down in pitch and velocity without actually restarting a new note.

Portamento

The *Portamento* knob sets the amount of time it takes to slide from one note to another. A small value makes notes slide fast, while a higher value will make them slide slower.

There are two portamento modes, *Normal (N)* and *Slide (S)*, which can be selected using the *Mode* switch right next to the portamento knob. In *Slide* mode it will always slide the pitch to the next note played. In *Normal* mode however, it will only slide notes whenever at least one other key is pressed, but it will not slide when you play a single note at a time.

5. Tips on Reducing CPU Usage

When using a lot of software synthesizers and audio effects at the same time (which you normally would do while producing music), CPU usage can become a problem. Here are some tips to reduce Sylenth1's CPU usage to a minimum.

Polyphony
Probably the most important setting concerning CPU usage is polyphony. For every polyphonic note, almost a whole copy of the audio path is made (except for the master effects). So two notes played simultaneously costs almost twice the amount of CPU needed for one note. Always try to keep the polyphony to a minimum.

Envelope generators
Try to keep the Decay and the Release parameters as small as possible. Sounds with a smaller release time will usually also use less notes of polyphony.

Filters
If you don't use the filters, switch them to bypass mode. This will force them to stop processing. If you use a high number of polyphony, switch off the *Warm Drive* function to save some extra CPU time.

Master Effects
Switch off any effects that you don't use or need. If you run several instances of Sylenth1, all with the same kind of reverb, you might be better off using one external reverb send effect instead and route all audio signals to it. Be aware though that some reverb VSTs consume a lot more CPU time than Sylenth1's reverb!

Pitch and Phase modulation
Modulating the oscillators' pitch and phase can be quite demanding on sounds with a lot of voices, because each single voice needs to be modulated. If you need pitch or phase modulation, try to limit the total number of voices used.

6. Appendix

6.1 MIDI Control Changes

Parameter name	MIDI CC nr
Modwheel	1
Portamento	5
Main Volume	7
Mix A	8
Mix B	9
Volume A1	10
Phase A1	11
Detune A1	12
Stereo A1	13
Pan A1	14
Volume A2	15
Phase A2	16
Detune A2	17
Stereo A2	18
Pan A2	19
Volume B1	20
Phase B1	21
Detune B1	22
Stereo B1	23
Pan B1	24
Volume B2	25
Phase B2	26
Detune B2	27
Stereo B2	28
Pan B2	29
Filter Drive A	67
Filter Drive B	68
Resonance A	69
Resonance B	70
Resonance AB	71
Cutoff A	72
Cutoff B	73
Cutoff AB	74
Keytrack	75
Attack A	76
Decay A	77
Sustain A	78

Release A	79
Attack B	80
Decay B	81
Sustain B	82
Release B	83
LFO1 Rate	84
LFO1 Gain	85
LFO1 Offset	86
LFO2 Rate	87
LFO2 Gain	88
LFO2 Offset	89
Reverb Dry/Wet	91
Delay Dry/Wet	92
Distortion Amount	93
Distortion Dry/Wet	94
Phaser Dry/Wet	95
Phaser Centerfreq	96
Phaser Spread	97
Reverb Predelay	102
Reverb Damp	103
Reverb Size	104
Reverb Width	105
Delay L	106
Delay R	107
Delay Lowcut	108
Delay Hicut	109
Delay Smear	110
Delay Spread	111
Delay Feedback	112
Delay Width	113
Phaser LR Offset	114
Phaser Width	115
Phaser LFO Rate	116
Phaser LFO Gain	117
Phaser Feedback	118
EQ Bass	119
EQ Bassfreq	120
EQ Treble	121
EQ Treblefreq	122
Comp Ratio	123
Comp Threshold	124
Comp Attack	125
Comp Release	127