



SynthMaster One User Manual

Version 1.0.5

Written By

Bülent Bıyıkoglu and Ronan Macdonald

Credits

Design & Programming :	Bulent Biyikoglu
User Interface Development:	Satyatunes Voger Design
User Manual:	Bulent Biyikoglu, Ronan Macdonald
Factory Wavetables:	Galbanum , KV331 Audio
Factory Presets	Arksun Aiyin Zahev BigTone BluffMonkey Bulent Biyikoglu Gercek Dorman Kevin Schroeder Nori Ubukata Rob Lee Ufuk Kevser The Machine Vorpai Sound Xenos Soundworks

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XML processing is done using TinyXML.
HTTP/FTP processing is done using LibCurl.

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Introduction

System Requirements

SynthMaster One comes in the following formats:

Format	System Requirements	DAW Requirements
VST Instrument & Effect	Windows 7 and above MacOS X 10.6 and above 2GB RAM, 2GHz CPU	VST Host supporting VST 2.4 plug-ins
AU Instrument & Effect	MacOS X 10.7 and above 2GB RAM, 2GHz CPU	AU Host application such as Logic or GarageBand.
AAX Instrument	Windows 7 and above MacOS X 10.6 and above 2GB RAM, 2GHz CPU	32-bit: Pro Tools 10.3.7 and above 64-bit: Pro Tools 11 and above
Standalone (Windows only)	Windows 7 and above 2GB RAM, 2GHz CPU	ASIO compatible soundcard or ASIO4ALL installed

Downloading the Installer

The SynthMaster One full installer can be downloaded at:

- [Windows \(32/64-bit\)](#)
- [Mac OSX \(32/64-bit\)](#)

To start your download, enter your registered email address and serial number:

File Download

Before downloading 'synthmaster25alphawindows.zip', please enter the following information:

E-mail Address:

Serial Number:

Forgotten Your Serial Number?

Retrieving your forgotten serial number is easy. Just go to <http://www.kv331audio.com/requestlicensefile.aspx>

Request Serial Number

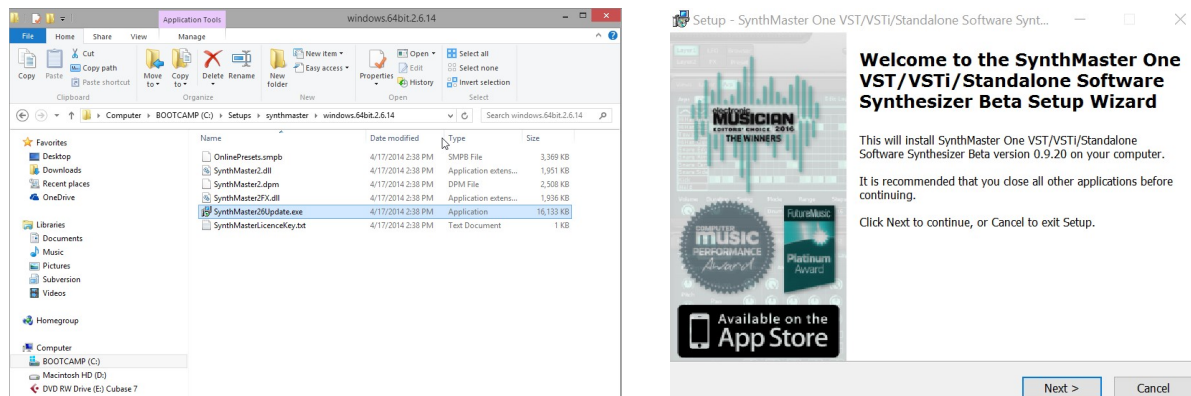
Please enter the e-mail address you used when purchasing SynthMaster to receive your serial number

E-Mail Address:

Enter your registered email address and click the “Send Request” button. You’ll receive your serial number within a couple of minutes.

Installing the Latest Version of SynthMaster One

Once you've downloaded the zip archive containing the SynthMaster One setup files, simply extract its contents to a temporary location and run the setup application: **SynthMasterOneSetup.exe** on Windows, **SynthMasterOneSetup.pkg** on macOS/OS X.



By default, SynthMaster One will install into the following directories:

- Data files:
 - Windows: **C:\Program Files\KV331 Audio\SynthMaster One**
 - macOS/OS X: **/Library/Application Support/KV331 Audio/SynthMaster One**
- VST binaries:
 - Windows 32 bit: **C:\Program Files\VstPlugins\KV331 Audio**
 - Windows 64 bit: **C:\Program Files (x86)\VstPlugins\KV331 Audio**
 - macOS/OS X: **/Library/Audio/Plug-Ins/VST**
- AudioUnits binaries:
 - macOS/OS X: **/Library/Audio/Plug-Ins/Components**
- AAX binaries:
 - Windows 32 bit: **C:\Program Files (x86)\Common Files\Avid\Audio\Plug-Ins**
 - Windows 64 bit: **C:\Program Files\Common Files\Avid\Audio\Plug-Ins**
 - macOS/OS X: **/Library/Application Support/Avid/Audio/Plug-Ins**

Changing Data Folder

If you want to place SynthMaster One data files in a different folder, you can either choose a new data folder during the installation procedure, or do the following:

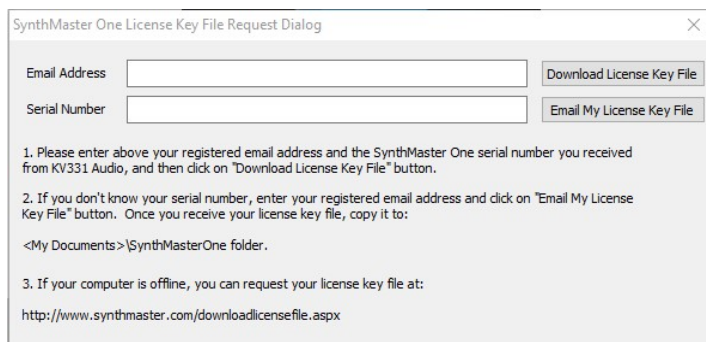
- Copy all SynthMaster One data files to into the new folder of your choice.
- Open the **SynthMasterOneFolders.txt** file located in the **<Documents>\SynthMaster One** folder using a text editor, and change the following line:

RootFolder=<new folder path goes here>

- Save the **SynthMasterOneFolder.txt** file and run the SynthMaster One app or plug-in again.

Downloading the License Key File

When you run the SynthMaster One plug-in or app for the first time, the license key file dialog will appear. Follow the instructions to download the license key file necessary to run SynthMaster One.



SynthMaster One License Key File Request Dialog

Email Address Download License Key File

Serial Number Email My License Key File

1. Please enter above your registered email address and the SynthMaster One serial number you received from KV331 Audio, and then click on "Download License Key File" button.

2. If you don't know your serial number, enter your registered email address and click on "Email My License Key File" button. Once you receive your license key file, copy it to:

<My Documents>\SynthMasterOne folder.

3. If your computer is offline, you can request your license key file at:

<http://www.synthmaster.com/downloadlicensefile.aspx>

To download the license key file, enter your registered email address, SynthMaster One (or SynthMaster) serial number and click the *Download License Key File* button.

If your computer is offline, download the license key file at <http://www.synthmaster.com/downloadlicensefile.aspx> from a computer that's online, then move the downloaded license key file to the **Documents/SynthMasterOne** folder.



synthmaster 2.8

VST AAX Available on the App Store

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Download License Key File

E-Mail Address

Serial Number

Product

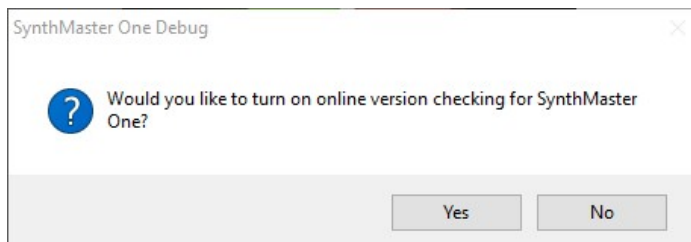
Operating System

Download

Download Updates
Download Expansions
Download License Key File
Request License Key File

Automatic Version Checking

When you run the SynthMaster One plug-in or app for the first time, it will display the following dialog box, asking if you want to turn on weekly version checks:

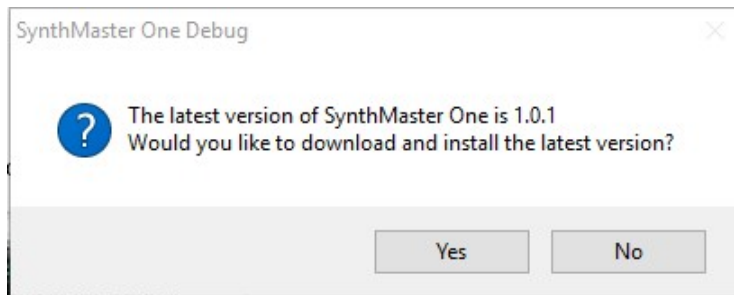


SynthMaster One Debug

Would you like to turn on online version checking for SynthMaster One?

Yes No

If your answer is “Yes”, SynthMaster One will automatically check for a new update once a week, and notify you when it finds one:

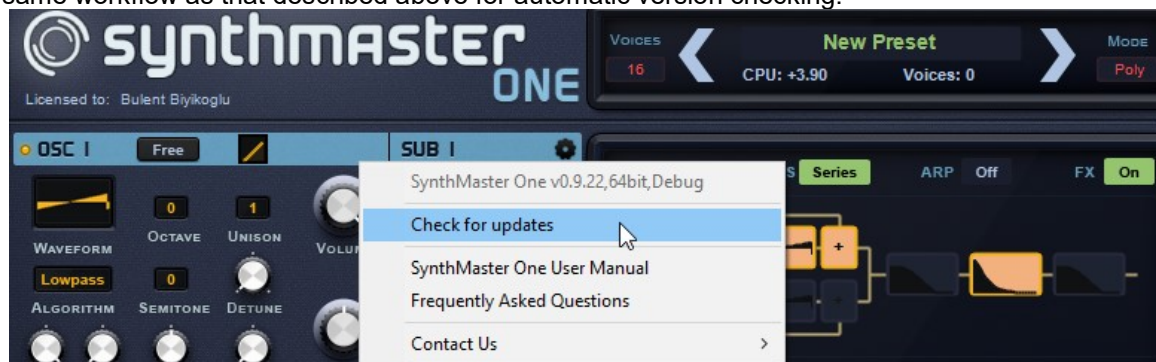


If you choose “Yes” to download the latest update, SynthMaster One will redirect you to it:



Checking for Updates Manually

You can check for updates manually, too. Right-click anywhere in the SynthMaster One GUI to bring up a menu with your SynthMaster One version number at the top. Select “Check for updates” and follow the same workflow as that described above for automatic version checking:



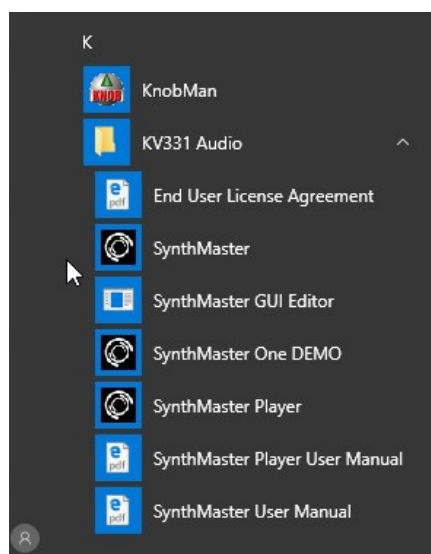
Getting Started with SynthMaster One

With SynthMaster One installed, you're ready to make music with it! The formats in which it works vary between macOS and Windows:

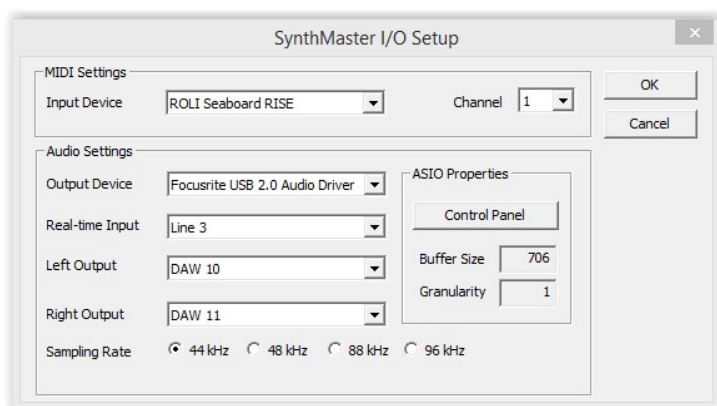
On Windows 7 and above	On macOS/OS X 10.7 and above
VST instrument/effect	VST instrument/effect
AAX instrument	AAX instrument
Standalone	Audio Units instrument/effect

Running SynthMaster One as a Standalone App

In Windows, SynthMaster One is installed under the KV331 Audio group. Click it to launch the standalone app:



When you run the app for the first time, the SynthMaster I/O Setup dialog is displayed. Here, you can choose your MIDI input and Audio output devices. If no MIDI devices are available, “PC Keyboard” is selected by default:




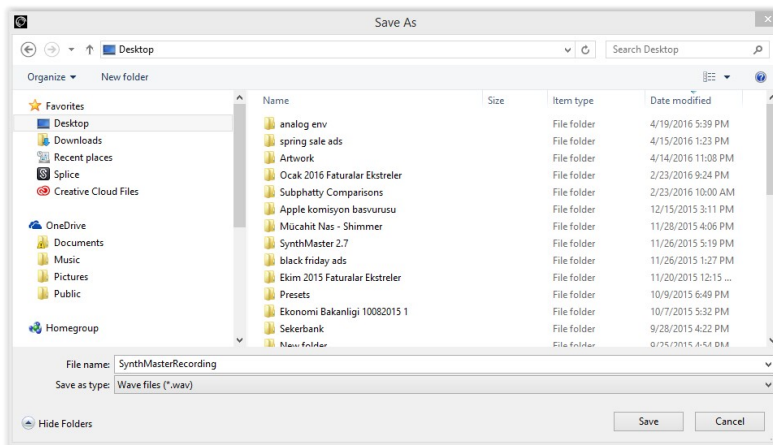
Once you've selected the input/output devices and clicked OK, SynthMaster One launches:



Recording SynthMaster One Standalone's Output to an audio File

It's possible to record the output of the synth to a wave file. To start recording:

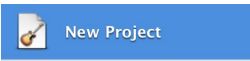

1. Click the  button next to the output file name, and choose a file path for the wave file:




- Click the  button to start recording. When you're done, click the button again to stop.

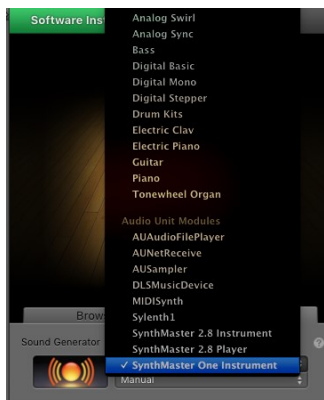
Running SynthMaster One as a Plug-in

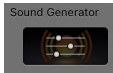
SynthMaster One supports the VST, Audio Units and AAX plug-in formats. To be able to use it as a plug-in, you'll need a DAW application supporting one or more of those formats. GarageBand comes with macOS/OS X, so Mac users can run SynthMaster AU in that if they don't have any other DAW installed:

- Start GarageBand, click  then . GarageBand will launch with a single piano track in place:



- Click the  combobox to select SynthMaster One as an instrument:

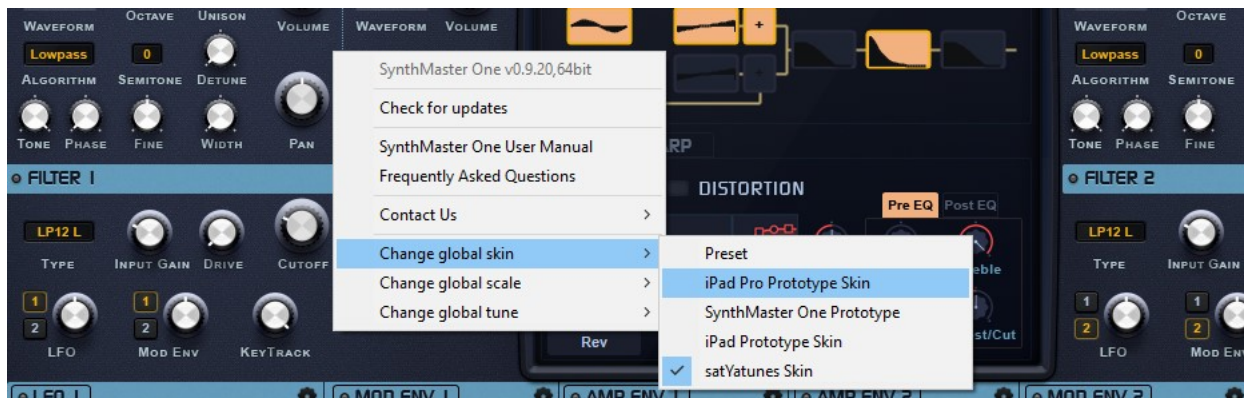


- SynthMaster One will be instantiated. To bring up the user interface, click the  button:

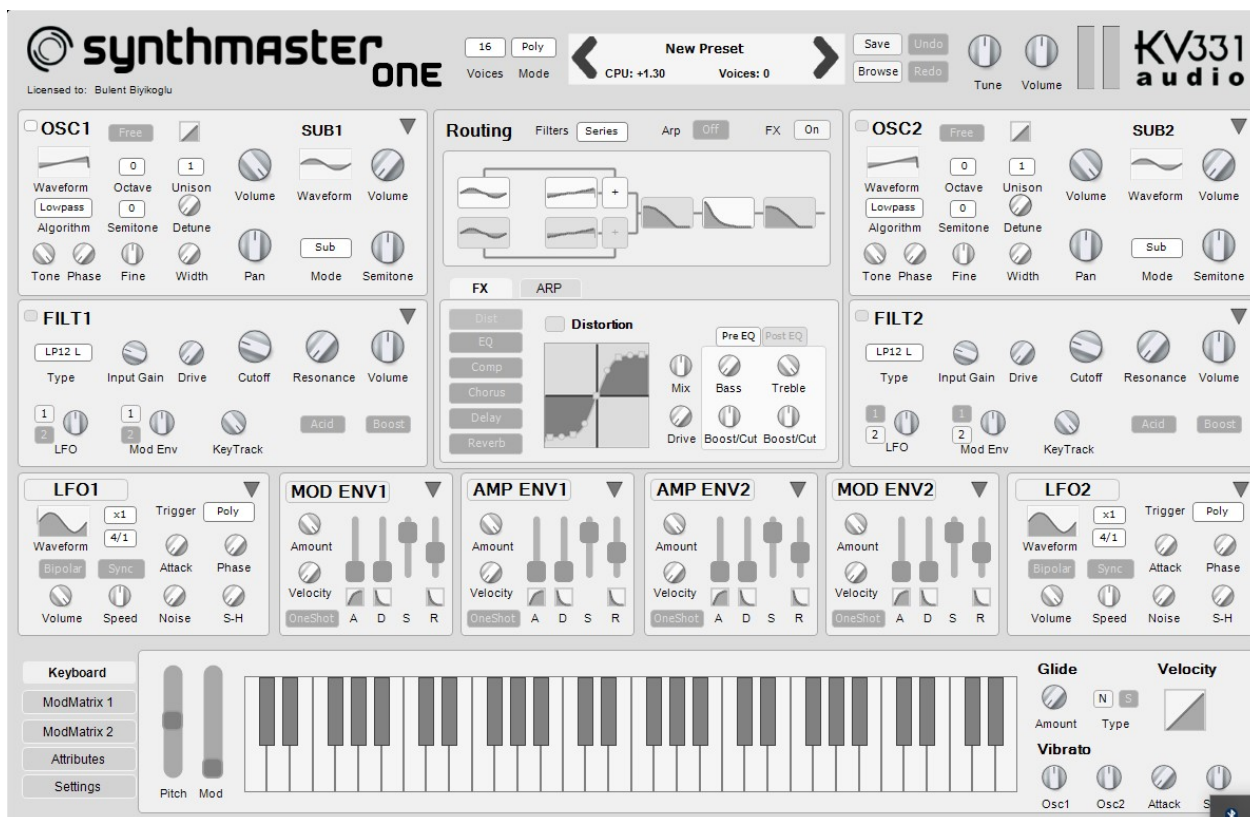


Changing Skins

SynthMaster supports switchable skins/interfaces, and comes with several of them included. To switch between skins, right-click anywhere, select “Change global skin” and choose the skin you’d like to change to from the submenu:

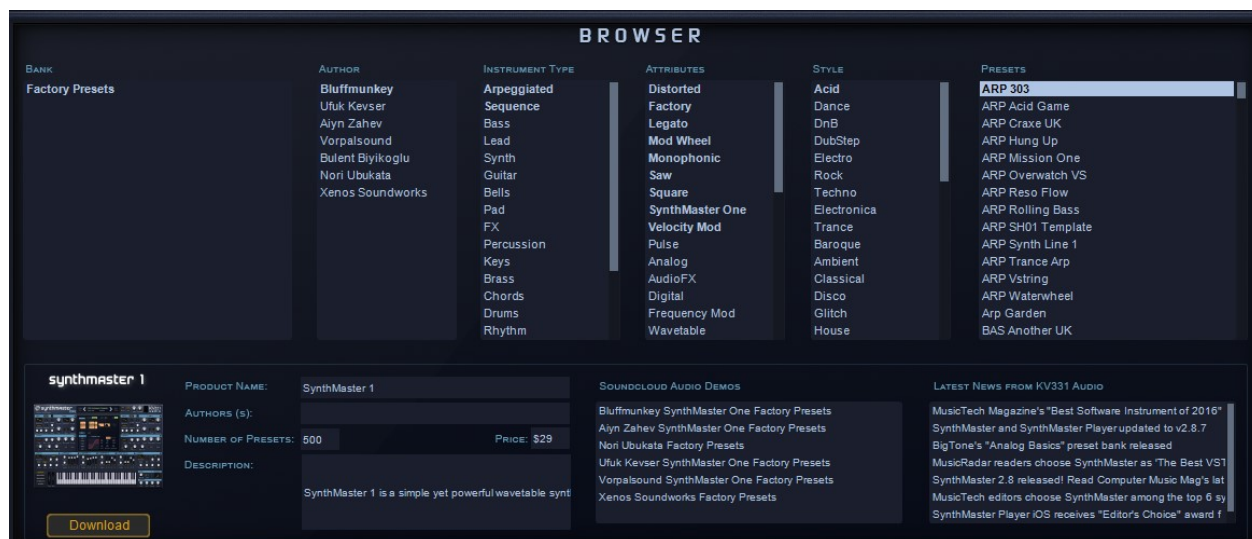


For the skin change to take effect, you'll need to close and reopen the plug-in window.



Browsing Presets

SynthMaster One comes with a library of 650 presets. To start browsing them, click the **Browse** button:



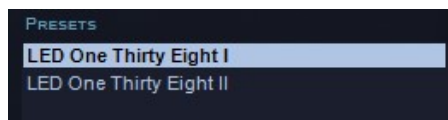
Selecting a preset from the list loads it and displays its settings.

Presets can be filtered in the browser by:


- Instrument Type
- Attributes
- Music Style
- Preset Author
- Bank Name


For example, if you want to see all trance-appropriate sequenced mono Factory presets by Ayn Zahev, select the *Factory Presets*, *Ayn Zahev*, *Sequence*, *Monophonic* and *Trance* entries in the five browser columns:



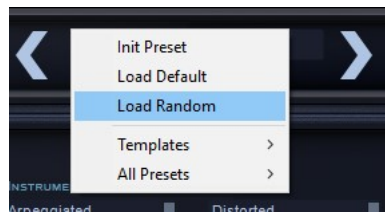



To load a preset, click it:

To go to the next preset in the list, click the  arrow in the preset bar at the top of the interface, press the “Down” cursor key on your keyboard, or scroll your mouse wheel down.

To go to the previous preset on the list, click the  arrow in the preset bar at the top of the interface, press the “Up” cursor key on your keyboard, or scroll your mouse wheel up.

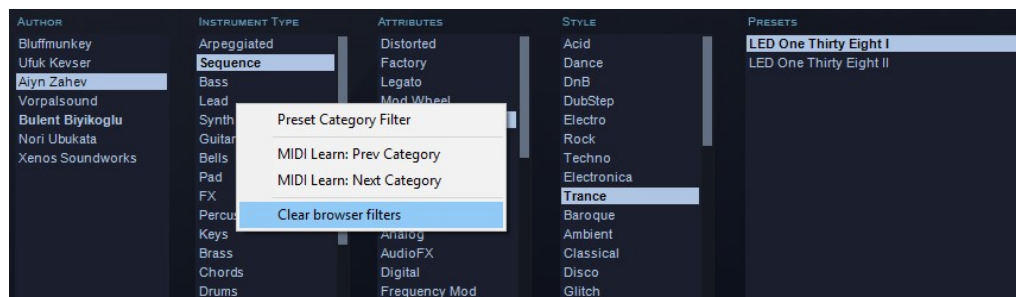
To load a random preset from the list, click the preset name (or “New Preset” if no preset is loaded), and select the “Load Random” menu item:



To search for a preset by name, type the text into the search textbox  and press the Enter key or click the Search icon. All matching presets will be displayed in the list:



To clear all browser filters, right-click and select the “Clear browser filters” menu item:

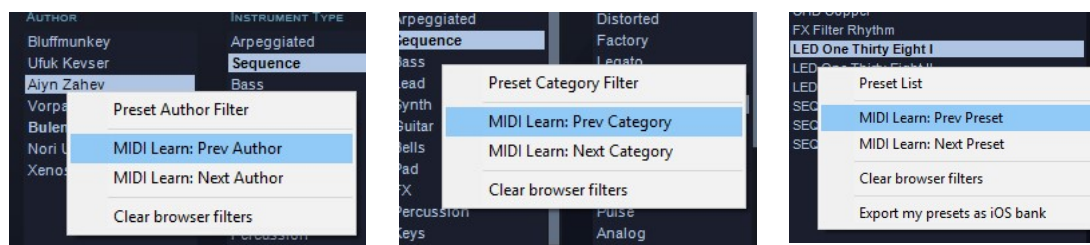


Controlling the Browser from your MIDI Controller

You can navigate SynthMaster One's browser from your MIDI controller by sending MIDI CC messages. Buttons can be assigned for scrolling up/down through:

- Instrument type
- Music style
- Preset Author
- Presets

To link a button to a filter list, right-click the list and select the “MIDI Learn: Prev Preset” or “MIDI Learn: Next Preset” menu entry.



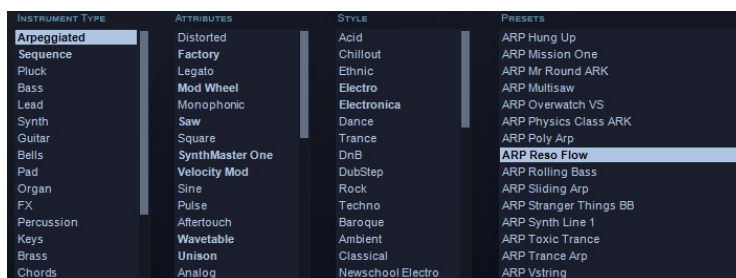
Having made your selection, press a button on your MIDI controller to send its MIDI CC message. SynthMaster One assigns that button to the browser function and saves the assignment into the SynthMaster One configuration file, so you only have to do this once.

Assigning Presets to a MIDI Bank

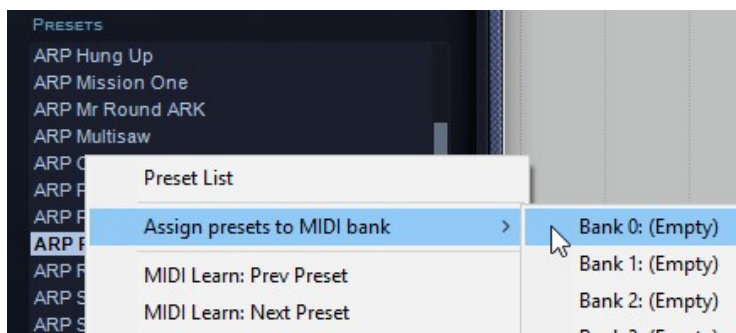
SynthMaster One supports MIDI Bank Change and MIDI Program Change messages. Especially during live performance, changing presets using MIDI messages is a real necessity.

To be able to use program change messages, you should assign presets to a MIDI bank first. To do that, follow these steps:

1. Filter the presets you'd like to add to the MIDI bank. For instance the screenshot on the right shows “Arpeggiated” presets.



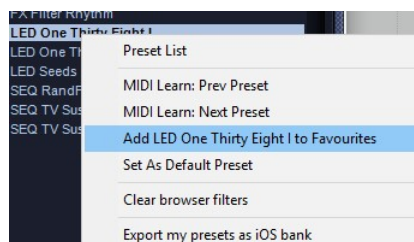
2. Move mouse over the Presets list and right click. From the context menu, choose “Assign presets to MIDI bank” sub menu and then choose an empty bank. If the number of presets exceed 128, the presets will span more than 1 MIDI bank.



Adding Presets to Your Favourites List

You can mark any presets you particularly like as Favourites, for quick and easy loading from the browser. To add a preset to your Favourites list:

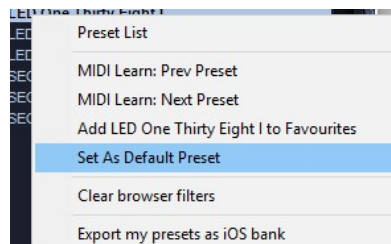
- Click the preset name to select the preset
- Right-click the preset name to bring up the dropdown menu
- Choose “Add to Favourites”



Assigning the Default Preset

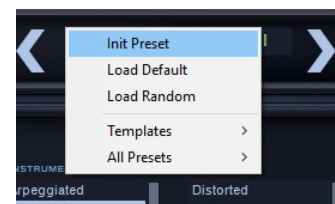
The Default preset is the preset that's loaded when a new instance of SynthMaster One is created. To assign a preset as the Default preset:

- Click the preset name to select the preset
- Right-click the preset name to bring up the dropdown menu
- Choose “Set As Default Preset”



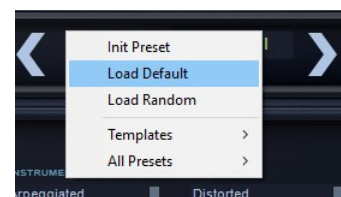
Creating a New Preset from scratch

To initialize the preset, click the preset name (or “New Preset” if no preset is loaded) in the preset bar at the top of the GUI and choose “Init Preset” from the menu. SynthMaster One resets to its initialized settings.



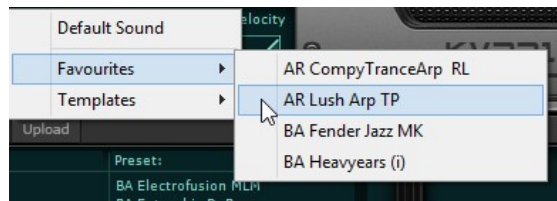
Loading the Default Preset

Rather than load the initialized preset, you can load the Default preset by clicking the preset name (or “New Preset” if no preset is loaded) and choosing the “Load Default” menu item.



Loading a Preset from the Favourites List

As well as the Init and Default presets, you can load a preset from your Favourites list by clicking the preset name (or “New Preset” if no preset is loaded) and choosing one from the “Favourites” menu item.

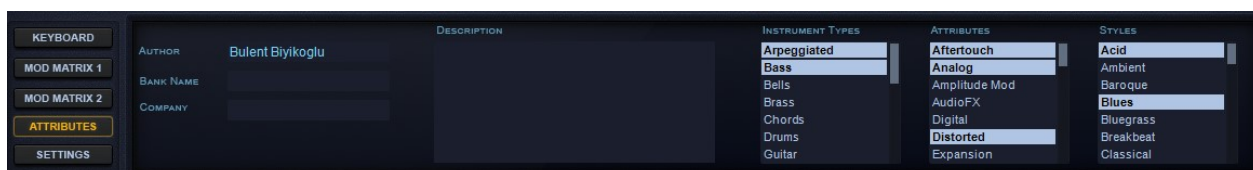


Preset Attributes (Metadata)

The following attributes/tags can be edited for any SynthMaster One preset:

- Author name
- Company name
- Bank Name
- Comments
- Instrument type
- Attributes
- Music Style


To edit the attributes, click the **ATTRIBUTES** button. Multiple entries can be made for *Instrument type*, *Attribute* and *Style*:






TIP: Select “Template” as an Attribute to have the preset appear in the menu of Template presets invoked by clicking the preset name in the preset bar.

Editing Preset Parameters

SynthMaster One features many user-adjustable interface elements:

Type	Description
Knob 	<ul style="list-style-type: none"> • Drag the knob up and down (Y axis) to turn it clockwise and anticlockwise • Drag away from the center of the knob on the X axis (left or right) to progressively increase the resolution of movement on the Y axis • Shift + drag to edit the knob at much finer resolution • Double-click or Cmd (macOS)/Ctrl (Windows) + click to reset the knob to its default value • Mouse wheel up to turn the knob clockwise • Mouse wheel down to turn the knob anticlockwise

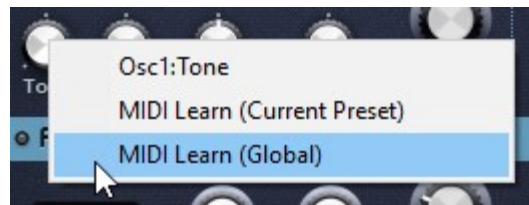
<p>Slider</p> 	<ul style="list-style-type: none"> • Drag up to raise the slider • Drag down to lower the slider • Double-click or Cmd (macOS)/Ctrl (Windows) + click to reset the slider to its default value • Shift + drag to edit the slider at much finer resolution • Mouse wheel up to lower the slider • Mouse wheel down to raise the slider
<p>Dropdown</p> 	<ul style="list-style-type: none"> • Dropdown controls display menus of values and settings. Click a setting to open the dropdown and make your selection. To cancel a selection and close the dropdown, click anywhere outside it • Double-click or Cmd (macOS)/Ctrl (Windows) + click to reset the dropdown to its default value • Mouse wheel up to scroll upwards through the menu • Mouse wheel down to scroll downwards through the menu
<p>Toggle Button</p> 	<ul style="list-style-type: none"> • On/Off buttons. Click to toggle between on and off

Linking Parameters to MIDI Controllers (MIDI Learn)

In SynthMaster One, any continuous parameter can be assigned to a MIDI controller via *MIDI Learn*. Up to 32 assignments can be defined and saved within the preset.

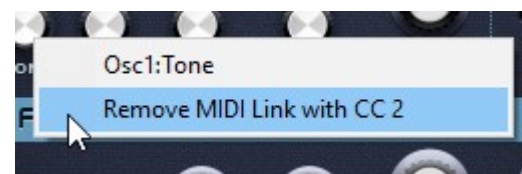
To assign a controller using MIDI Learn, place the mouse pointer over the SynthMaster One parameter (knob, slider, etc) that you want to control, and right-click to bring up the content menu.

Select “MIDI Learn (Global)” or “MIDI Learn (Current Preset)” and move the knob or slider on your MIDI controller that you want to assign. As soon as SynthMaster One receives the transmitted MIDI CC message, it assigns that controller to the parameter.



To Remove a MIDI Controller Assignment, place the mouse pointer over the assigned parameter (knob, fader, etc) and right-click to bring up the content menu.

Select “Remove MIDI CC Link” to delete the assignment.



Creating and Editing Modulation Assignments

In synthesizer terminology, modulation means changing the value of a parameter over time using a control signal called a 'modulation source'. Modulation is an essential element of synthesizer sound design, bringing otherwise static patches to life by automating the movement of particular knobs in response to a range of input signals. For example, by assigning an LFO to the filter cutoff, the filter can be made to open and/or close rhythmically according to the movement of the LFO.

In SynthMaster One, up to 12 modulators can be assigned to up to 24 targets, and the following modulation sources are available:

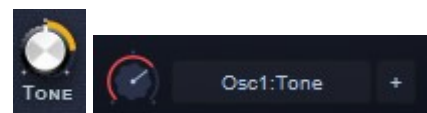
MIDI	Note Velocity, Poly (Note) Aftertouch, Channel Aftertouch, Pitch Bend, ModWheel (CC1), Breath Ctrl (CC2), Foot Ctrl (CC4), Volume (CC7), Pan (CC10), Expression (CC11), Brightness (CC74)
LFOs	LFO 1/2, Vibrato LFO
Envelopes	ADSR Amp Env 1/2, ADSR Mod Env 1/2
Other	Constant, Alternating, Bipolar Keytrack, Unipolar Keytrack, Bipolar Random, Unipolar Random

LFOs 1 and 2 can be applied polyphonically (each voice triggers its own LFO), or monophonically (a single LFO is triggered by the first voice played, applied to all voices and reset when all notes/voices are released and a new note/voice is played). LFOs can only modulate FX parameters monophonically. We'll get into the specifics of the LFOs and envelopes later in this manual.

In SynthMaster One, every modulation assignment is one of two types, selected by clicking the button at the right hand end of each Target slot:

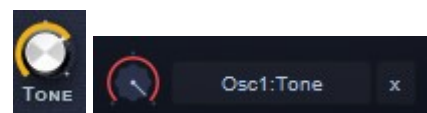
+ Modulation: In this mode, the modulation amount is always between -1 and +1. The default center value indicates zero modulation, and the value of the target parameter is calculated using this formula:

Modulated parameter value = Target + (Modulation Curve[Source X Via] X Mod Amount)



X Modulation: In this mode, the modulation amount is always between 0 and 1, and the target parameter is calculated thus:

Modulated parameter value = Target x ((1-Mod Amount)+(Modulation Curve[Source X Via] X Mod Amount))



There are two ways to assign a modulation source to a target parameter:

1. Drag and drop the source onto the target
2. Choose them from the menus in the Modulation Matrix

Any source can be assigned to as many targets as you like, up to the global maximum of 24 (12x2) assignments.

Assigning Modulation Sources by Drag and Drop

The easiest, most intuitive way to assign a modulation source to a parameter knob in SynthMaster One is via drag-and-drop.

The following modulation sources are available for drag-and-drop assignment:

- ADSR Envelopes: Amp Env 1, Amp Env 2, Mod Env 1, Mod Env 2

- LFOs: LFO 1, LFO 2

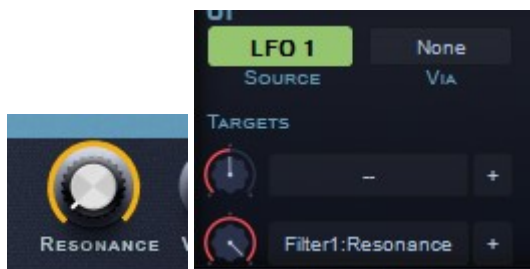
To make a new assignment, simply drag the name of the modulator towards the target parameter knob.



When the mouse pointer is positioned over any modulateable knob, that knob is highlighted:



Releasing the mouse button with the pointer over a highlighted knob creates a new assignment, which instantly appears in the Modulation Matrix:



Assigning Modulation Sources in the Modulation Matrix

Modulation assignments can be made directly in the Modulation Matrix. To reveal the first six blocks of the Modulation Matrix, click the Mod Matrix 1 button; to reveal blocks 7-12, click Mod Matrix 2.

Each block consists of a Source slot, a Via slot and two Target slots. The Source modulates each Target independently, while the Via modulator modulates the modulations. Don't worry – it's not as complicated as it sounds...

To load a source modulator, right-click the Source slot and make your selection from the MIDI, Other, LFOs or Envelopes submenu. The LFOs and Envelopes will be covered later in this manual, but here's a breakdown of the modulators in the Other category:

Constant

Outputs a constant fixed value, as set directly by the Modulation Amount knob for each Target. Use Constant like a 'macro', for adjusting multiple parameters with a single knob, and for manual operation of SynthMaster One's 'hidden' parameters (see below).

Alternating

Toggles between high and low values with each successive MIDI note, the two values being determined by the position of the Modulation Amount knob.

Bipolar Random

Outputs a random value between -1 and +1 with each MIDI note. The maximum and minimum possible values are determined by the Modulation Amount.

Unipolar Random

Outputs a random value between 0 and +1 with each MIDI note. The maximum possible value is determined by the Modulation Amount.

Bipolar Keytrack

Outputs a value between -1 and +1, depending on the triggering MIDI note: -1 for MIDI note 0, +1 for MIDI note 127, and 0 for MIDI note 64, for example.

Unipolar Keytrack

Outputs a value between 0 and +1, depending on the triggering MIDI note: 0 for MIDI note 0, +1 for MIDI note 127, and 0.5 for MIDI note 64, for example.

To assign a target parameter, click either of the block's Target slots and choose from the menu that pops up, which lists every modulateable knob in SynthMaster One, plus many parameters that aren't accessible in the main interface. Perhaps the most important of these are:

The rest of the parameters that only available in the Modulation Matrix are:

- **Osc: KeyTrack Base** (0.5 by default, which corresponds to note 64)
- **ADSR Env: Final Level** (0 by default)
- **LFO: Delay Time** (0 by default)
- **LFO: Attack Slope** (0.5 by default)
- **LFO: Release Time** (0 by default)
- **LFO: Release Slope** (0.5 by default)
- **LFO: Final Level** (1.0 by default)
- **Arp: Volume** (1.0 by default)
- **Lo-Fi: SH Filter Reso** (0 by default)
- **Phaser: Effect Amount** (0.5 by default)
- **Chorus: Effect Amount** (0.5 by default)
- **Chorus: Pan** (0.5 by default)
- **Chorus: Stereo Width** (1.0 by default)
- **Chorus: L-R Phase Diff** (90 degrees by default)

Additionally, the Tone Target enables the Tone knob to be accessed in a wavetable oscillator. When a wavetable is loaded into an oscillator, the Tone knob switches role to become the Wave Index knob, but by assigning the Constant Source to the Tone Target, manual control of it is regained.

To load a Via modulation source, right-click the Via slot and choose from the same list of modulators as found in the Source menu. The Via modulator modulates the amount of Modulation Amount for each target – see p21 for how this cross-modulation is calculated.

Displaying Targets for a Modulation Source

Click the name of a modulator directly in its interface or in the Modulation Matrix to select it. If it already has targets assigned, the min/max range of each modulation is displayed as a ring around the relevant knob, and all Source slots in the Modulation Matrix containing that modulator are highlighted green:



Editing Modulation Amounts

The depth of the modulation applied by any given source to any given target can be set in one of two ways:

In the main GUI, by selecting the modulator as described above, then dragging up and down on the collar of the target parameter knob.



In the Modulation Matrix, by dragging the Modulation Amount knob at the left hand end of the Target slot.

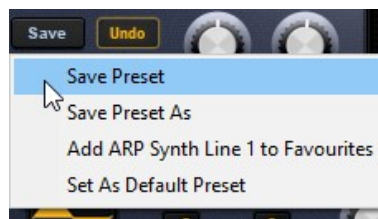


Whichever method is used, the range of modulation is shown as an orange ring that appears around each target knob when its modulating source is selected.

Don't forget that the modulation amount is itself modulated by the Via source in the block as well, if one has been assigned. If you find anything unexpected happening with your modulations, this should be your first troubleshooting port of call.

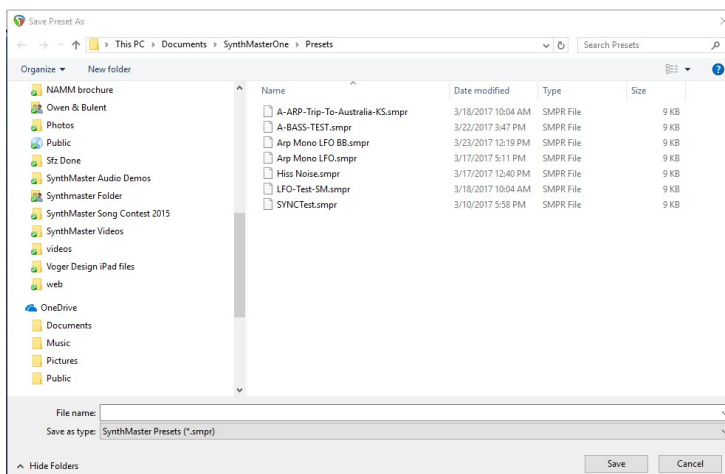
Saving Presets

When you're done editing the parameters and attributes of your SynthMaster one patch, it's time to save it as a preset. To save a preset, click the **Save** button. A popup menu will be shown:



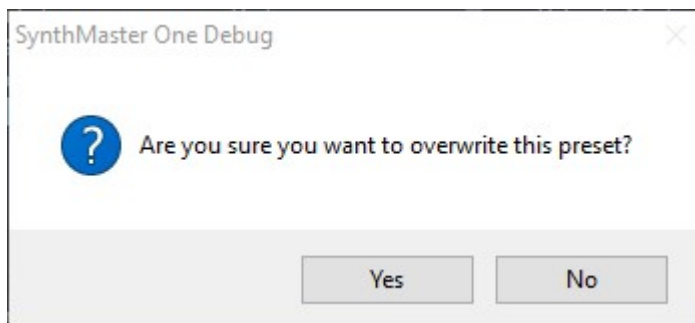
If you started working on a new patch from SynthMaster One's initialized state, click on the “*Save Preset*” menu item. A dialog will pop up asking you to name the preset and specify the location into which it should be saved

(**Documents/SynthMasterOne/Presets** folder by default). Click *Save* to complete the process.



If, on the other hand, you've made changes to an existing preset, click on the “*Save Preset As*” menu item to save the preset as a new preset or “*Save Preset*” menu item to overwrite the existing preset.

Selecting “*Save Preset*” opens a confirmation dialog: “Are you sure you want to overwrite this preset?” Click *Yes* to overwrite the preset with your edits. Note that you can't overwrite the Factory Presets.



Global & Preset Settings

Clicking the **SETTINGS** button at the bottom left of the SynthMaster One interface opens the Settings page in the lower panel, where various global and preset-specific properties and preferences can be tweaked.



Pitch Bend Range

Sets the *Up* and *Down* pitch bend ranges globally and for the current preset, with a range of 0-48 semitones. When *Global Pitch Bend Range* is set to “Preset” (as it is by default), the *Preset Pitch Bend Range* is used; otherwise, the *Global Pitch Bend Range* takes precedence.

Engine Quality and Buffer

There are two settings that govern SynthMaster One's rendering quality:

Engine Quality sets the internal sampling rate. It has four possible values: “Draft” (No oversampling), “Good” (2x), “Better” (3x) and “Best” (4x).

Engine Buffer Size determines the smallest buffer size at which the internal LFOs, envelopes, etc, are recalculated. It also has four possible values: “Short” (16 samples), “Normal” (32 samples), “Large” (64 samples), and “XLarge” (128 samples).

The global *Realtime* settings apply to the 'live' output of the synth, while the *Offline* settings are used when rendering/bouncing in the host DAW or from SynthMaster One standalone. If *Realtime* and *Offline* are set to anything other than “Preset”, their global values override the preset values. Use the “Draft” setting in *Realtime* mode to save on system resources, then use “Best” in *Offline* mode for mixdown.

Skin

Each SynthMaster One instance can have its own skin setting. If *Global Skin* is set to a skin other than “Preset”, it always overrides the *Preset Skin* selection.

Scale

Each SynthMaster One instance can have its own custom tuning, loaded from a [Scala tuning file](#):

Scala tuning files are simple text files that define custom scales:

```
!Equal Tempered.scl
Basic equal tempered scale
12
!rootnote=C4
100.000 cents
200.000 cents
300.000 cents
400.000 cents
500.000 cents
600.000 cents
700.000 cents
800.000 cents
900.000 cents
1000.000 cents
1100.000 cents
2/1
```

The tuning definition files in Scala format (.scl) are placed under:

- Windows: **C:\Program Files\KV331 Audio\SynthMaster One\Scales**
- macOS/OS X: **/Library/Application Support/KV331 Audio/SynthMaster One/Scales**

A number of Scala tuning files are installed with SynthMaster One. To add to them, copy your tuning files to:

<Documents>\SynthMaster One\Scales

The default tuning is “EqualTempered”. In the Scala tuning file, you can change the root note by editing the “!rootnote” comment. For example:

```
!rootnote=A4
```

The above is not part of the Scala tuning format – we added it as a workaround to be able to define root notes for loaded scales.

If *Global Scale* is to any value other than “Preset”, it always overrides the *Preset Scale*.

Background Noise

Generates one of five background hiss types, sampled from one of five hardware synthesizers: the Moog Sub Phatty, Korg MS20, Roland SH-101, Boom SEM and Novation BassStation. The hiss is summed with the filter output, before both are routed to the amp envelope.

Filter Nonlinearities

Works in the feedback loop nonlinearities inherent to all analogue filters, for a more authentic 'analogue' sound. The "Basic" setting uses less CPU and is suitable for most situations, but at high resonance values, the "Normal" setting sounds more realistic.

MIDI CC Update

Sets the length of the smoothing filter (from 10-200ms) applied to incoming MIDI CC, Channel Aftertouch and Pitch Bend signals.

Parameter Update

Sets the length of the smoothing filter (from 10-200ms) applied to parameter automation data from the host DAW.

Map CC74 to CC1

Convert MIDI CC74 messages to MIDI CC1 messages. MPE keyboards like the ROLI Seaboard are capable of outputting CC74 (Brightness), and by converting that stream to CC1, we can take advantage of its modulation in presets with CC1 (Modwheel) assigned as a source.



Arp MIDI Output

Outputs the notes generated by the Arpeggiator as MIDI into the host DAW. Set "SynthMaster One" as the input to a MIDI track to record them.

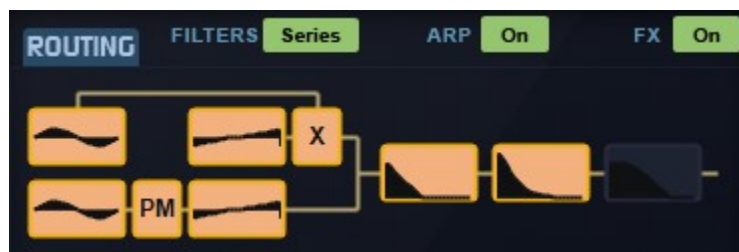
Arp Align to Beat

Set to "On" to align Arpeggiator/sequencer step start positions to the beginnings of beats, as defined by the host DAW's timeline.

SynthMaster One Architecture

SynthMaster One's architecture is intuitive and easy to negotiate, but boasts enough flexibility and depth to deliver a limitless range of electronic sounds. It consists of two Oscillators with associated Sub Oscillators, the mixed outputs of which feed into two Filters, which in turn output to one or two envelope-modulated amplifiers, followed by a series of master FX. To turn an oscillator or filter on and off, click the small button  at the left hand end of its title bar. To copy and paste settings between oscillators, filters, LFOs or envelopes, click the 'cogwheel' buttons  at the right hand ends of their title bars.

The signal flow between the oscillators and filters can be reconfigured using the Filters menu in the Routing panel:



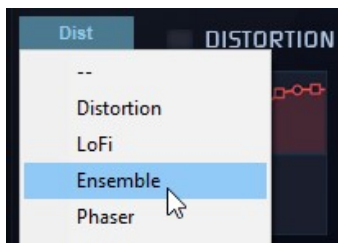
- In “*Split*” mode, Oscillator/Sub 1 outputs to Filter 1, Oscillator/Sub 2 outputs to Filter 2, and each filter outputs to its corresponding Amp Envelope (Filter 1 to Amp Env 1, Filter 2 to Amp Env 2).
- In “*Parallel*” mode, both Oscillator/Sub pairings are mixed, with the resulting signal sent to both Filters in parallel. Each filter outputs to its corresponding Amp Envelope (Filter 1 to Amp Env 1, Filter 2 to Amp Env 2).
- In “*Series*” mode, both Oscillator/Sub pairings are mixed and routed through Filter 1, then Filter 2, before outputting to Amp Envelope 1. Amp Envelope 2 is disconnected from the amplifier but remains available as an assignable modulation source.


The Routing panel visually represents the current mode as a set of 'blocks', each one containing the waveform, frequency response curve or envelope shape of its corresponding Oscillator, Sub Oscillator, Filter or Amp Envelope. The waves and curves update to reflect changes made to their parameters in real time. Click an Oscillator or Filter graphic to turn that Oscillator/Sub or Filter/Amp Env pair on and off.

The signal flow through the FX section runs from the top of the 'rack' to the bottom:



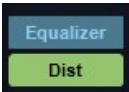


To load an effect into one of the six slots or replace a loaded effect with a different one, right-click the slot and choose a module from the menu – the specifics of each effect are described later in this manual.



With a slot selected, the controls for its loaded effect appear in the panel to the right. To turn the currently selected effect on and off, click the button  next to its name **DISTORTION** in the controls panel. To toggle an unselected effect on and off, scroll the mouse wheel up or down with the pointer placed over its slot.

To reorder the effects:

- Click an effect and start moving the mouse: 
- Drag and drop the effect onto another one: 
- The effects swap places: 

Voice Parameters

Polyphony Mode

Three voicing configurations are available, selected from the *Mode* menu at the top of the interface:

Poly

In “Poly” mode, SynthMaster One can play multiple voices simultaneously, up to the number set by the *Voices* parameter, from 4-32. This maximum is absolute, regardless of the number of unison oscillators (see below) being generated by each oscillator – ie, ‘note stealing’ doesn’t occur. So, with all 32 voices of polyphony playing and both oscillators set to output 16 unison oscillators, what you’re hearing is effectively 1024 simultaneous oscillators!

Mono

In “Mono” mode, each oscillator only plays a single voice at a time, and the envelopes are retriggered whenever a new note is received. SynthMaster One’s Mono mode has last note priority, so if multiple notes are on, only the last one played is heard.

Legato

The same as “Mono” mode, but with envelopes retriggering only when all held notes are released and a new note is received.

Glide

In “Mono” and “Legato” modes, the *Glide* knob (at the right hand end of the Keyboard panel) determines the time it takes to slide from one note’s pitch to the next. Its value is between 3ms and 11 seconds.

Glide Type

Two *Glide Types* affect the way overlapping and consecutive notes are handled:

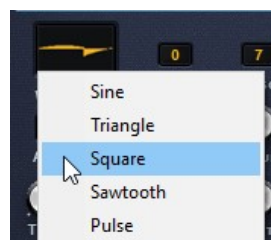
- **“N”ormal**: Slide occurs only when a new note on message is received while another note is being held.
- **“S”lide**: Slide occurs whenever a new note on message is received, whether it’s played over another held note or not.

Oscillators



SynthMaster One's two stereo oscillators are capable of loading standard analogue-style waveforms, as well as sampled single-cycle waveforms and wavetables.

To load a waveform or wavetable into either oscillator, click its waveform display and make your choice from the menu that appears. The first five entries are the Basic waveforms (ideal sine, square, triangle and sawtooth shapes), and below those are the *Waveforms* and *Wavetables* submenus, each containing its own categorized collection of waves.



Waveforms

These single-cycle waveforms were sampled from a wide range of classic and vintage hardware synthesizers, and provide a wealth of characterful alternatives to the regular analogue shapes.



Wavetables

Captured from the same classic hardware synths as the Waveforms, these multi-period waves have been designed with movement in mind. By manipulating the Index control (either manually or with modulation), the 'playhead' can be shuttled backwards and forwards through the wavetable, generating smooth textural shifts, 'sample and hold'-style effects and more. The wavetable library also includes wavetables built by KV331 Audio's internal wavetable editor, which will be part of SynthMaster 3, which is expected to be released in 2018.



Waveshaping Algorithms

The raw output of each oscillator can be shaped using one of 16 waveshaping algorithms in four categories:

Spectral algorithms: Lowpass, Highpass, LowShelve, HighShelve, Bandpass, Bandstop
These algorithms apply spectral filtering to the waveform.

Bend algorithms: Bend+, Bend-, Bend +/-

Three algorithms that literally 'bend' the waveform out of shape.



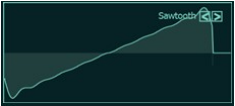
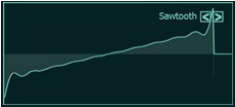



Sync algorithms: Sync No Window, Sync Half Window, Sync Cos Window, Sync Triangle Window, Sync Saw Window

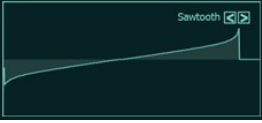






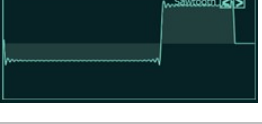

Syncs the oscillator to a hidden sine wave oscillator, with optional windowing to fade out the ends of the wave. The windowing function varies according to the algorithm type.

Other algorithms: Pulse1, Pulse2, Bit Crush

Apply pulse width modulation or digital distortion.

For each algorithm, the Phase and Tone parameters have specific functions:

Algorithm	Phase parameter	Tone parameter
Lowpass 	Phase	Hi Cut Frequency
Highpass 	Phase	Lo Cut Frequency
LowShelve 	Boost/Cut	Shelve Frequency
HighShelve 	Boost/Cut	Shelve Frequency
BandPass 	Lo Cut Frequency	Hi Cut Frequency
BandStop 	Hi Cut Frequency	Lo Cut Frequency
Bend + 	Bend+	Hi Cut Frequency

<i>Bend –</i> 	<i>Bend-</i>	<i>Hi Cut Frequency</i>
<i>Sync No Window</i> 	<i>Sync</i>	<i>Hi Cut Frequency</i>
<i>Sync Half Window</i> 	<i>Sync</i>	<i>Hi Cut Frequency</i>
<i>Sync Cos Window</i> 	<i>Sync</i>	<i>Hi Cut Frequency</i>
<i>Sync Tri Window</i> 	<i>Sync</i>	<i>Hi Cut Frequency</i>
<i>Sync Saw Window</i> 	<i>Sync</i>	<i>Hi Cut Frequency</i>
<i>Pulse 1</i> 	<i>Pulse Width</i>	<i>Hi Cut Frequency</i>
<i>Pulse 2</i> 	<i>Pulse Width</i>	<i>Hi Cut Frequency</i>
<i>Bit Crush</i> 	<i>Bits</i>	<i>Hi Cut Frequency</i>

Oscillator Parameters

As well as the waveform displays and Algorithm controls, the oscillators feature the following editable parameters:

Volume: Controls the volume of the oscillator.

Pan: Controls the stereo pan of the oscillator, ranging from hard left to hard right. At the default middle value, the pan is centered.

Octave: Controls the octave register of the oscillator, from -3 to +3 octaves. Use in conjunction with the *Semitone* and *Fine Tune* controls to set the overall pitch.

Semitone: Raises the oscillator pitch by up to 11 semitones. Use in conjunction with the *Octave* and *Fine Tune* controls to set the overall pitch.

Fine Tune: Controls the pitch of the oscillator, from -64 to +63 cents. Use in conjunction with the *Octave* and *Semitone* controls to set the overall pitch.

Unison: Stacks up to 15 unison oscillators onto the main oscillator. You can spread various parameters between these voices to generate chorus and 'supersaw' sounds. See below for details.

Detune: sets the amount of detune applied to the unison oscillators.

Width: Progressively spreads the unison oscillators out across the stereo field.

Free: Randomises the start phase of the oscillator waveform, like a free-running analogue synthesizer oscillator. This is especially useful when the Unison parameter is increased to create 'SuperSaw' type sounds.

Detune Curve: Adjusts the curvature of the unison detune depth. The more logarithmic the curve gets, the more pronounced the spacing distribution becomes as the number of unison oscillators increases.

Unison

When unison is active for one or both oscillators, multiple voices (up to 16 per oscillator, selected in their *Unison* menus) are played simultaneously for each MIDI note on message received, creating an extremely rich chorus effect. Since it wouldn't make sense for all voices to share the same parameters (that would just result in a volume increase), five Spread parameters are available in the Modulation Matrix (two of them also accessible in the main GUI) to introduce variation into each voice. Each one offsets its named parameter progressively further away from the main voice for each additional unison oscillator, to an extent determined by the amount of modulation applied to it.

- **Detune Spread** (also accessible in the main GUI – see above)
- **Width** (Pan Spread, also accessible in the main GUI – see above)
- **Wave Index Spread**
- **Tone Spread**
- **Phase Spread**

Sub Oscillators



Each SynthMaster One oscillator has an associated sub oscillator, for use as an audible signal generator or a main oscillator modulation source. The Sub Oscillator panel features the following controls:

Volume: Sets the volume level of the sub oscillator.

Waveform: Sets the sub oscillator to output a Sine, Triangle, Square or Sawtooth wave, one of eight noise types, or a wave from SynthMaster One's *Waveforms* library.

Semitone: By default, the sub oscillator tracks the main oscillator at the same pitch. Use the *Semitone* knob to offset it by up to 64 semitones up or down.

Mode: Choose one of five sub oscillator modes. “Sub” outputs the loaded waveform as an audible signal. “Amp Mod”, “Ring Mod”, “Phase Mod” and “Freq Mod” use the sub oscillator output as a source for modulating the main oscillator. In these four modes, the sub oscillator isn't routed to the amplifier and thus can't be heard.

- **Ring Mod:** The oscillator and sub oscillator waveforms are multiplied, and the sum and difference of their frequencies are output.
- **Amp Mod:** Similar to Ring Modulation, with one important difference: An offset value (1) is added to the sub oscillator signal, which preserves the frequencies of the oscillator signal.
- **Phase Mod:** Modulates the phase of the main oscillator. This is the method used in FM synths like Yamaha DX7.
- **Freq Mod:** Modulates the frequency of the main oscillator. This method is similar to analog frequency modulation.

Oscillator Drift and Keytracking



Analogue synthesizer oscillators are susceptible to very subtle drifts in pitch from one moment to the next, due to the natural fluctuations in voltage that occur in any electronic system. Far from being a detrimental effect, though, this drift is accepted as contributing to the character of the instrument, adding a certain motion and energy that couldn't be replicated by hand.

SynthMaster One is able to emulate these desirable analogue imperfections independently for each oscillator, by modulating their pitches with a random LFO. The Drift controls are at the right hand end of the Settings panel:

Drift Amount: Controls the volume of the random drift LFO added to the oscillator pitch. Its value ranges from 0-1 semitones. The final oscillator pitch is calculated by this formula:

$$\text{Osc Pitch} = \text{Octave tune} + \text{Semitone tune} + \text{Fine tune} + \text{Pitch Drift Amount} + \text{Global Tune}$$

Drift Speed: Controls the frequency of the random drift LFO added to the oscillator pitch.

Also in this section of the Settings panel, the **Keytrack Amount** knob controls how the pitch of the oscillators follows the pitches of the incoming MIDI notes. At its default +1 setting, MIDI note and oscillator pitch are directly connected – as the MIDI notes get higher, so does the oscillator. At 0, the oscillator's pitch remains fixed (at C3 if no tuning adjustments have been made), no matter what the MIDI note. At -1, the relationship inverts, so that oscillator pitch goes up as MIDI notes go down, and vice-versa.

Vibrato



Located at the right hand end of the Keyboard panel, the Vibrato section enables the independent application of LFO pitch modulation to each oscillator. It has four controls:

Osc 1 and **Osc 2:** Sets the depth of pitch modulation applied to each oscillator by the Vibrato LFO. At the center position, no modulation occurs. Turn clockwise to dial in pitch modulation starting at the Vibrato LFO 'up' phase, and anticlockwise for pitch modulation starting at the Vibrato LFO 'down' phase..

Attack: Fades the Vibrato LFO in over a period of time between 3ms and 11 seconds.

Speed: Sets the Vibrato LFO rate, with a range of 0.01-100Hz.

Importing Waveforms/Wavetables

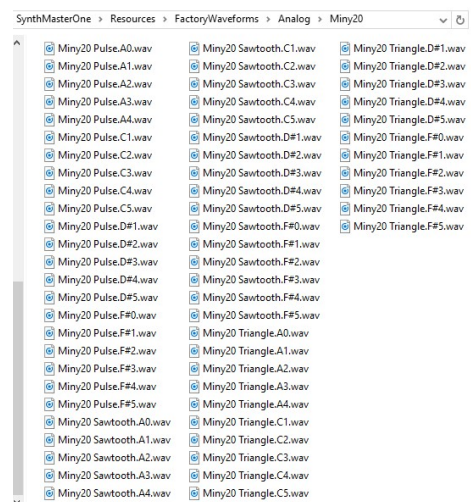
You can add to SynthMaster One's Wavetable library with your own wavetables and single cycle waveforms, including ones taken at different root keys. The screenshot on the right shows how the default waveforms in SynthMaster One are imported.

To import the waveforms, place the WAV/AIFF waveforms under:

<My Documents Folder>\SynthMaster One\Waveforms

If you have waveforms sampled at different root notes, they should be named like this:

- <Waveform>.<Root Note>.<file extension>



Documents > SynthMasterOne > Waveforms > M4-Digital-Hybrid

Name	Date modified	Type	Size
01-Gentle Speech.wav	10/17/2014 4:23 PM	WAV File	33 KB
02-Modern Talking.wav	10/17/2014 4:24 PM	WAV File	49 KB
03-Deep Throat.wav	10/17/2014 4:28 PM	WAV File	33 KB
04-Melomantic.wav	10/17/2014 4:29 PM	WAV File	89 KB
05-Melofant.wav	10/17/2014 4:31 PM	WAV File	121 KB
06-Digigrain I.wav	10/17/2014 4:36 PM	WAV File	209 KB
07-Digigrain II.wav	10/17/2014 4:52 PM	WAV File	169 KB
08-Formant Saw.wav	10/17/2014 4:53 PM	WAV File	153 KB
09-Formant Square.wav	10/17/2014 4:54 PM	WAV File	65 KB
10-Sonic.wav	10/17/2014 4:54 PM	WAV File	41 KB
11-Squelchy.wav	10/17/2014 4:55 PM	WAV File	81 KB
12-Duckorgan.wav	10/17/2014 4:55 PM	WAV File	33 KB
13-Flenders I.wav	10/17/2014 4:57 PM	WAV File	33 KB
14-Flenders II.wav	10/17/2014 4:57 PM	WAV File	33 KB
15-Flenders III.wav	10/17/2014 4:58 PM	WAV File	81 KB
16-Digi Cook I.wav	10/17/2014 4:58 PM	WAV File	33 KB
17-Digi Cook II.wav	10/17/2014 4:59 PM	WAV File	33 KB
18-Digi Cook III.wav	10/17/2014 5:00 PM	WAV File	33 KB

When importing waveforms or wavetables, SynthMaster One takes care of the resampling, filtering and phase alignment of multisamples automatically, using spectral (FFT/IFFT) processing.

Note that the maximum period length supported by SynthMaster One is 2048 samples. Also, if you are importing wavetables (multiple periods in a wave file) the file length must be a multiple of 2048 samples.

Importing Waveforms/Wavetable via drag-n-drop

Starting with version 1.0.5, you can drag and drop wave files/folders containing single cycle waveforms or wavetables on to an oscillator waveform display:



Filters



Filters in synthesizers are used to boost/cut certain frequency ranges, depending on their type. SynthMaster One has two zero delay feedback 'analogue' filters with four type categories:

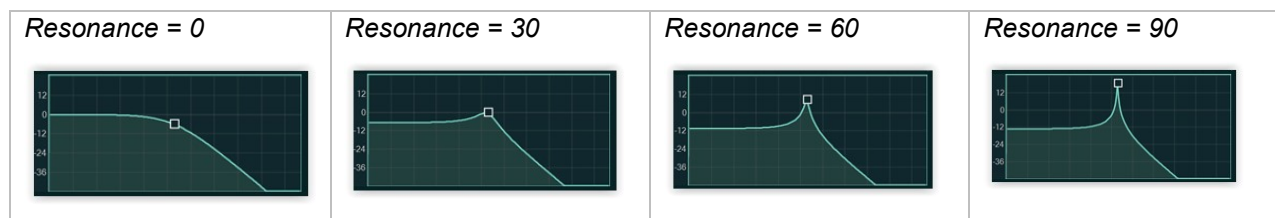
1. Ladder
2. Diode Ladder
3. State Variable (SVF)
4. Bite

All four categories of filters have the following common parameters:

Cutoff: is the frequency at which attenuation is -3dB.



Resonance: emphasizes frequencies around the cutoff frequency. Setting the resonance towards maximum causes the filter to self-oscillate, creating a sine-like tone at the cutoff frequency, even with no or very little input.



Volume: Sets the output volume of the filter. The corresponding envelopes are hardwired to the filter volume (ADSR Envelope -> Filter 1 Volume, ADSR Envelope -> Filter 2 Volume)

Input Gain: Before the input signal passes through the filter, it's boosted by the Input Gain amount, which ranges from 0dB to +40dB. Boosting the input can result in nicely distorted filter sounds, as it changes the mix ratio of input + fed back resonant signal.

Drive: Boosts the signal within the filter. Useful for adding 'edge', particularly when combined with the *Input Gain* and *Resonance* parameters.

KeyTrack: Adjusts the amount by which the filter cutoff is modulated by MIDI note pitch. When set to max, the cutoff frequency follows the MIDI note directly: Cutoff 16 corresponds to the MIDI note frequency, Cutoff 28 is one octave higher than the MIDI note frequency, Cutoff 40 is two octaves higher, etc.

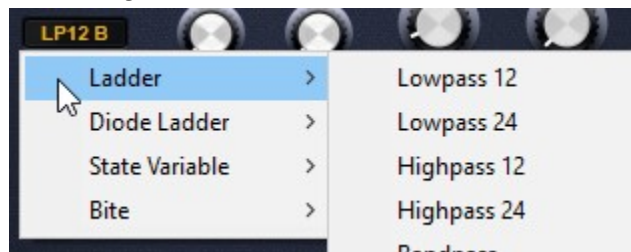
LFO: The 1 and 2 buttons select one of SynthMaster One's two LFOs for modulation of the filter cutoff, and the knob controls the amount of modulation applied by it.

Mod Env: The 1 and 2 buttons select one of SynthMaster One's two Mod Envelopes for modulation of the filter cutoff, and the knob controls the amount of modulation applied by it.

Acid: Couples the filter resonance to the cutoff frequency, so that when the cutoff decreases, the resonance decreases as well, giving a TB-303 style 'acid' filter response.

Boost: Compensates for the gain drop that comes with high resonance settings when using the Ladder and Diode Ladder filter types.

Filter Types



Ladder Filter

Modeled on the famous Moog ladder filter, with a choice of two slopes (12dB/octave and 24dB/octave) and four filter types (*Lowpass*, *Highpass*, *Bandpass* and *Bandstop*).

Diode Ladder Filter

Modeled on the well-known analogue filter circuit of the Roland TB-303. Includes only one filter type: *Lowpass* with 24dB/octave slope

State Variable Filter

Modeled on the analogue state variable filter found in the Oberheim SEM. This one's available in four types: 12dB/octave *Lowpass*, 12dB/octave *Highpass*, *Bandpass* and *Bandstop*.

Bite Filter

Modeled on the 12dB/octave *Lowpass* and 6dB/octave *Highpass* filters of the legendary Korg MS20 synth.

Modulation Sources

SynthMaster One features the following voice modulation sources, which are available separately for each voice (as opposed to global modulation sources – MIDI CCs, Constant, Keytrack, etc):

- 4 ADSR envelopes
- 2 LFOs
- 1 Vibrato LFO
- MIDI Velocity
- Bipolar/Unipolar Random (described on p23)
- Alternating (described on p23)

ADSR Envelopes



The two ADSR (Attack, Decay, Sustain, Release) Amp Envelopes are hardwired to the amplifiers, while the two Mod Envelopes are hardwired to the filters. All four, however, are also available for assignment to any other parameters, as described in the *Creating Modulation Assignments* chapter (p21). The envelope output is unipolar (between 0.0-1.0). The envelope controls comprise:

A(ttack): Sets the time the envelope takes to rise from initial level to maximum output.

D(elay): Sets the time it takes for the signal to drop from maximum output to the Sustain level.

S(ustain): Sets the level at which the envelope 'settles' after the Decay stage, until the voice receives a MIDI note off message (or the Hold pedal is released).

R(elease): Sets the time it takes to drop from the Sustain level to zero after a MIDI note off message is received.

Amount: Controls the volume of the envelope.

Velocity: Determines the degree by which MIDI note velocity modulates envelope output volume. At zero, all notes are triggered at full volume, no matter what their velocity. At maximum, note velocity directly affects the output volume, with velocity 0 delivering silence and velocity 127 triggering the envelope at full volume.

OneShot: With this button activated, the envelope bypasses the Sustain segment, so that Decay is followed immediately by Release. Use this when programming percussion, plucks and other very short sounds.

Envelope curves: Shape the Attack, Decay and Release stages by dragging up and down on the curve displays underneath each one. Attack ranges from linear to logarithmic, while Decay and Release range from linear to exponential.

Velocity Curve Display



Found at the right hand end of the Keyboard panel, the **Velocity Curve display** determines the shaping of incoming MIDI velocity. The X axis represents the incoming MIDI velocity, the Y axis represents the output MIDI velocity calculated after the shaping. Inside SynthMaster's engine, the output velocity is used as a modulation source. By the default, the shaping is linear so output velocity is equal to input velocity. The shaping can be changed by dragging the mouse upwards or downwards.

LFOs



SynthMaster One's two LFOs (Low Frequency Oscillators) are hardwired to the filters (see p39) but also available as assignable modulation sources. They share the same set of editable parameters:

Waveform: Select a wave shape for the LFO from the categorized *Waveforms* menu, including the analogue basics (Sine, Triangle, Square, Sawtooth and Saw Down) and your own custom waves.

Bipolar: With *Bipolar* active, the LFO output ranges between -1.0 and +1.0. With *Bipolar* inactive, the LFO is unipolar, outputting values between 0.0 and 1.0.

Volume: Sets the output volume level of the LFO.

Speed: Sets the rate of the LFO, from 0.01-100Hz, in unsynced mode. When Sync is activated, the Speed knob scales the *Beat Multiplier* value, from 100% fully clockwise, through 50% at the center position (eg, if the *Beat Multiplier* is set to "1/4", the LFO rate halves to 1/2) to 0% (ie, the LFO becomes static) fully anticlockwise.

Sync: Turn this on to sync the LFO to the host DAW's tempo, cycling to the beat division set in the *Beat Multiplier* menus above.

Beat Multiplier: With *Sync* activated, select a note value for the LFO rate in the bottom menu and a multiplier for it in the bottom menu: "x1", "x1.5" or "Divided by 3" (for triplets). The Beat Multiplier has no function when *Sync* is turned off.

Trigger mode: Set the LFO to trigger in "Global" (the LFO is triggered by the host DAW transport – ie, when song playback starts), "Mono" (all voices share a single LFO that's triggered when), "Poly" (each voice triggers its own LFO) or "Random" (each voice triggers its own LFO at a random start phase) mode.

Attack: Fades the LFO in over a time period between 3ms and 11 seconds.

Phase: Adjusts the start phase of the LFO.

Noise: Mixes a noise signal in with the LFO output. Set the volume of the noise with this knob.

S+H: The LFO output can be sampled and held. Set the size of the S+H window here, which ranges between 0 (S+H disabled) to 1 (LFO period/2)

Arpeggiator/Sequencer



SynthMaster One features a very powerful Arpeggiator/sequencer with up to 16 steps. Each step has its own *Velocity*, *Length*, *Slide*, *Hold* and *Delta* (Arpeggiate mode only) settings, and *Note number(s)* (Sequence mode only). Using the Arpeggiator/sequencer, you can create rhythmic arpeggios and polyphonic sequences. The Arpeggiator receives MIDI input and sends MIDI output.

TIP: With the VST version of SynthMaster One, you can record the output of the arpeggiator to other MIDI tracks.

The Arpeggiator/sequencer has the following modes:

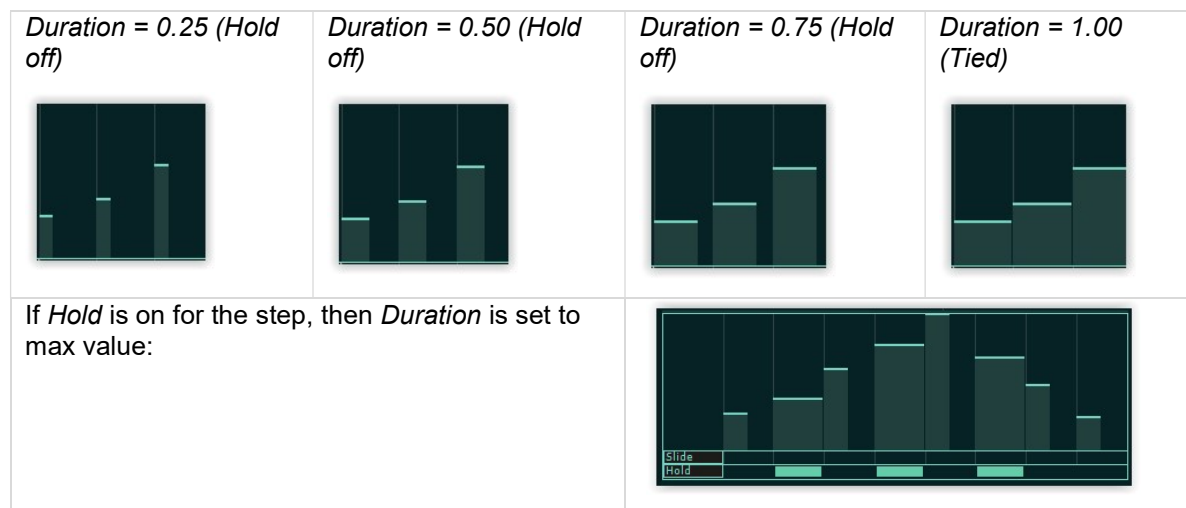
- Classic: Up, Down, UpDown, DownUp, UpDown2, DownUp2, As Played, Chord
- Arpeggiate
- Sequence

All modes have the following parameters in common:

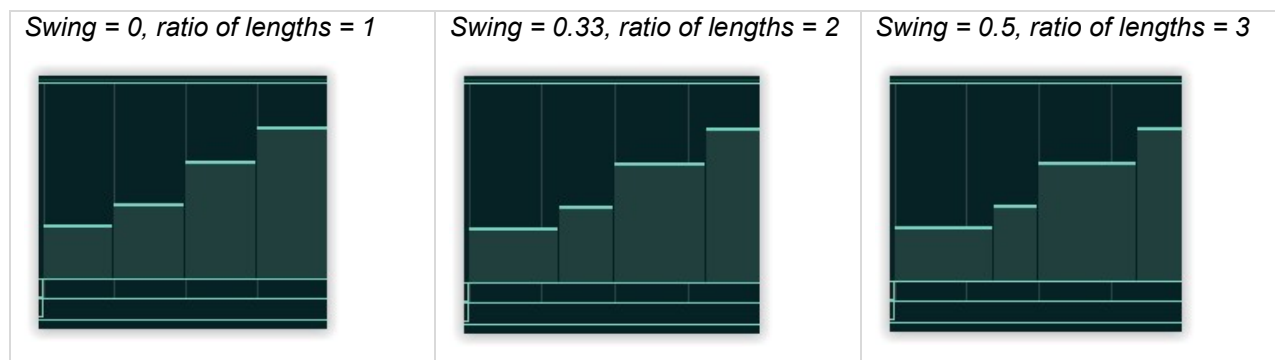
Steps: Determines the total number of steps, from 1-16. There's also a special "--" setting for the Classic arpeggio modes, where the arpeggio plays continuously until the current playing step exceeds the *Range* limit, upon which it resets back to the first step.

BaseTime: The base length of each step, synchronized to host tempo. For example, if BaseTime is set to "1/4" (quarter notes) and the host tempo is 120bpm, each step will be 0.5 seconds long: 60 (seconds)/120 (beats).

Duration: The note on duration of each step is calculated as *BaseTime X Duration X Step Length*. If *Duration* is at maximum and *Polyphony* is set to "Mono", notes are tied:



Swing: increases and decreases consecutive step lengths by the *Swing* amount.




Range: Determines the range of the arpeggios in Classic and Arpeggiate modes. In Sequence mode, the sequence steps up an octave with each cycle until the *Range* value is reached, whereupon it resets to the initially played octave.

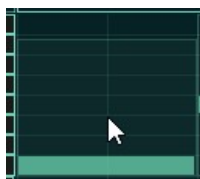
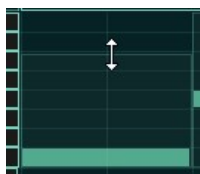
Velocity Mode: Each step generates a corresponding MIDI note on/off message, the velocity of which is determined by the following formula (Input Note Velocity refers to the velocity of the played notes triggering the arpeggio/sequence):

- When Velocity Mode = Step -> $Volume \times Step \ Volume$
- When Velocity Mode = Note -> *Input Note Velocity*
- When Velocity Mode = Step + Note -> $Input \ Note \ Velocity + Volume \times Step \ Volume$
- When Velocity Mode = Step x Note -> $Input \ Note \ Velocity \times Volume \times Step \ Volume$


Step Volume: The volume of each step is between 0 and 1. When the step volume is 0, the step is considered a rest and doesn't generate any MIDI note on/off messages.

There are two ways to edit the step volume:

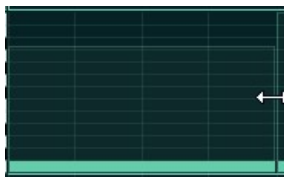
1. Move the mouse pointer to the top right corner of the step. The cursor will change to : . Click and drag up or down.
2. Move the mouse pointer over the step and scroll the mouse wheel up or down.



Step Length: The Length of each step is between 1 and 8. The note on duration of each step is calculated as $BaseTime \times Duration \times Step \ Length$

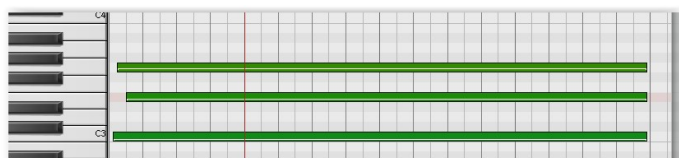
To edit the Step Length, move the mouse pointer to the right hand border of the step. The cursor will change to: 

Click and drag left and right to change the Step Length.

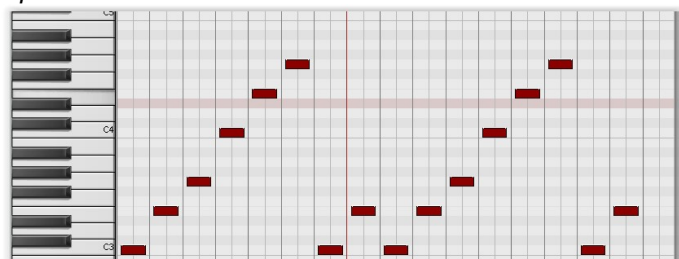


Classic Modes

Here are some examples of how the Classic Arpeggiator modes work, triggered by a chord comprising the notes C3, G3 and E3. The *Range* is set to “2 Octaves” and the number of Steps is set to “8”:



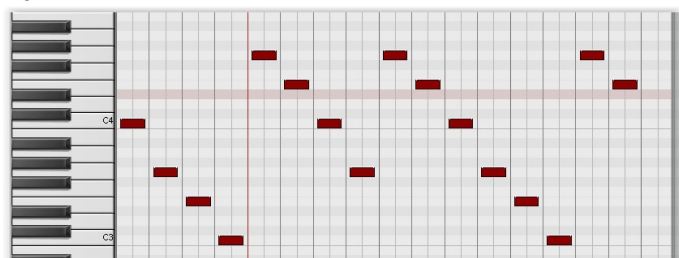
Up



In “Up” mode, the arpeggio starts at the first note (C3) and plays upwards over the 2-octave *Range*. When the *Range* limit is reached, the arpeggio goes back to the first note (C3) and starts again.

When the Steps value (“8”) is exceeded, the arpeggio resets back to the first step (first note).

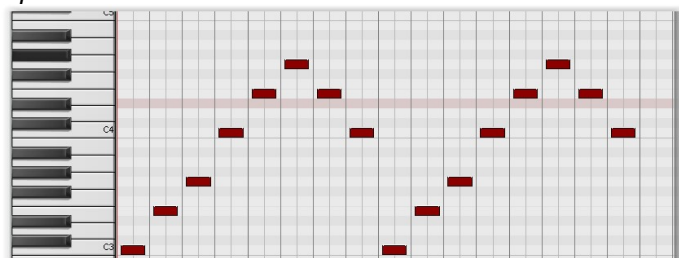
Down



In “Down” mode, the arpeggio starts at the last note, which is C5, since the *Range* is 2 Octaves. The notes then progress downwards through the chord until the first note is reached.

When the Steps value (“8”) is exceeded, the arpeggio resets back to the first step (last note).

UpDown



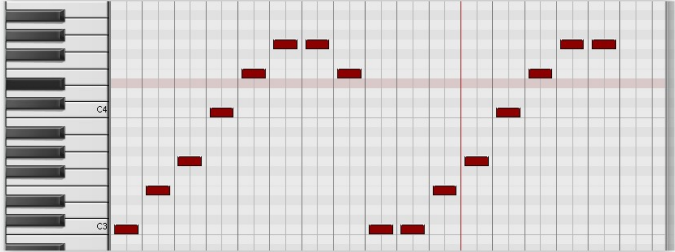
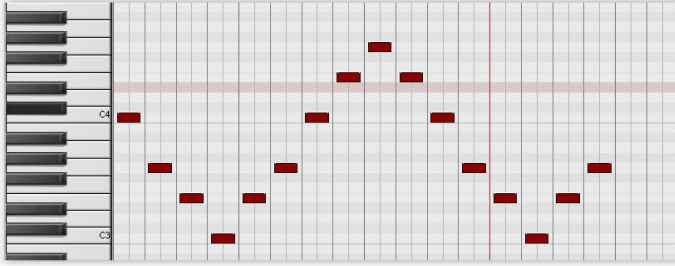
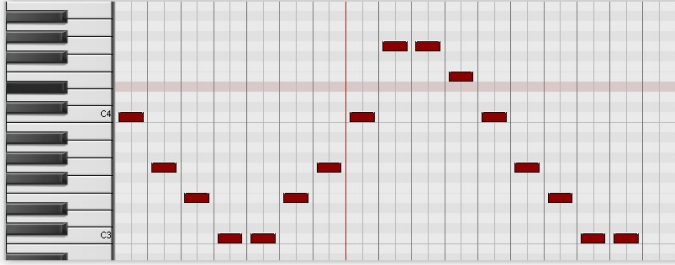
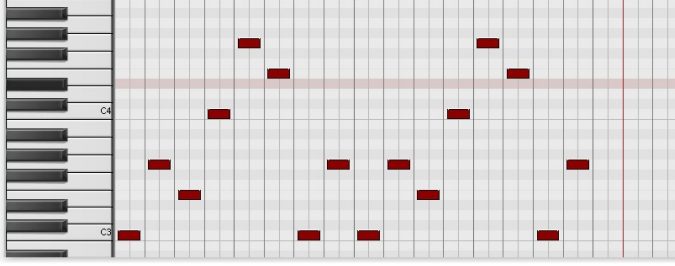
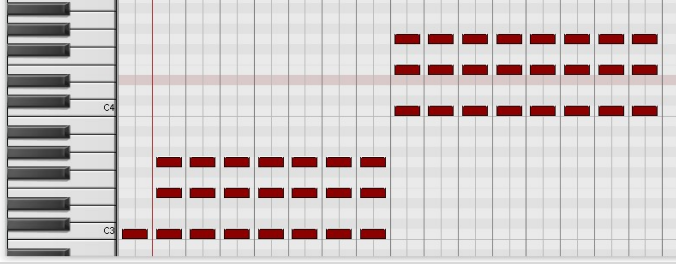
In “UpDown” mode, the arpeggio starts at the first note (C3) and plays upwards over the 2-octave *Range*. When the *Range* limit is reached, the arpeggio starts moving in the opposite direction (down).

When the Steps value (“8”) is exceeded, the arpeggio resets back to the first step (first note).

UpDown2

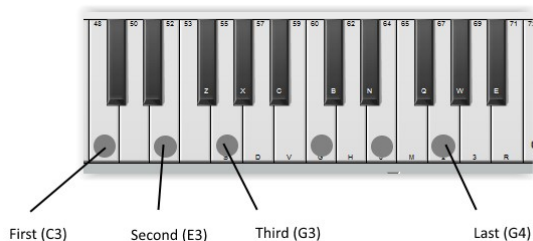
The same as “UpDown”, but the first and last notes are repeated twice.

When the Steps value (“8”) is exceeded, the arpeggio resets back to the first step (first note).

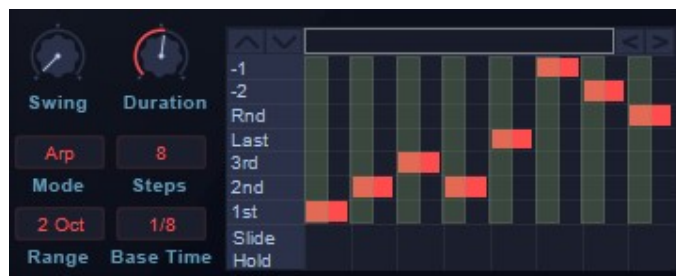
	
<p><i>DownUp</i></p> 	<p>In “DownUp” mode, the arpeggio starts at the last note (C5 at the time of start) and plays downwards over the 2-octave <i>Range</i>. When the <i>Range</i> limit is reached, the arpeggio starts moving in the opposite direction (up).</p> <p>When the Steps value (“8”) is exceeded, the arpeggio resets back to the first step (last note).</p>
<p><i>DownUp2</i></p> 	<p>The same as <i>DownUp</i>, except that the first and last notes are repeated twice.</p> <p>When the Steps value (“8”) is exceeded, the arpeggio resets back to the first step (last note).</p>
<p><i>As Played</i></p> 	<p>In “As Played” mode, the notes are generated in the order they’re played (C, then G, then E), for each octave in the <i>Range</i>.</p> <p>When the Steps value (“8”) is exceeded, the arpeggio resets back to the first step (first note).</p>
<p><i>Chord</i></p> 	<p>In “Chord” mode, the notes are played together, rhythmically, as a chord.</p> <p>When the <i>Steps</i> value (“8”) is exceeded, the <i>Steps</i> cycle restarts and the octave number is increased by 1. When the octave number exceeds the <i>Range</i>, it resets back to the played octave.</p>

Arpeggiate Mode

SynthMaster One's Arpeggiate mode lets you design your own custom arpeggios, setting successive note increments/decrements within the stack of notes defined by MIDI note input and the *Range* parameter. For example, if the MIDI notes received by the Arpeggiator are C3, E3, and G3, and the *Range* is set to "2 Octaves", the stack of notes will be:



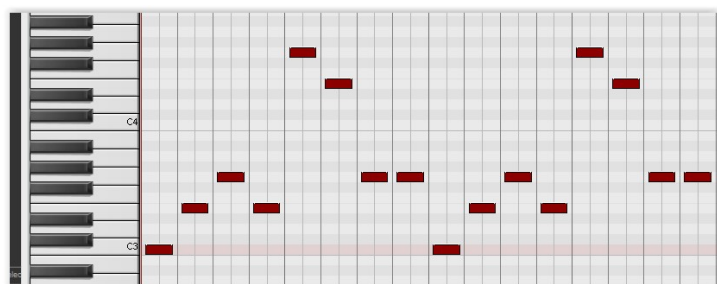
To better understand Arpeggiate mode, let's analyze the below pattern:



With the arpeggiator input notes being C3, E3 and G3, the generated notes are:

Step Number	Delta Value	Generated Note
1	1 st	The first note in the stack: C3
2	2 nd	The second note in the stack: E3
3	3 rd	The third note in the stack: G3
4	2 nd	The second note in the stack: E3
5	Last	The last note in the stack: G4
6	-1	1 note down in the stack from G4: E4
7	-2	2 notes down in the stack from E4: G3
8	0	Stay at the previous note: G3

When we run the arpeggio, the following notes are rendered:



Sequence Mode


In Sequence mode, you can edit, record or import monophonic or polyphonic (chord) sequences.




In this mode, each step can play back up to four notes at once.

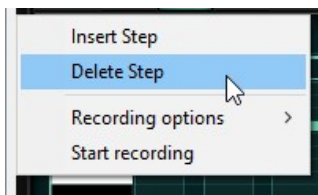
To add a new note, click a cell in the grid  – the note will be inserted into that cell: 

To delete an existing note, click its cell.

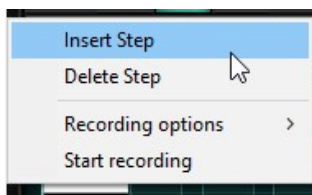
The sequence can cover four octaves (from -24 to +24 semitones around the reference note – see below), but only one octave is visible in the display. To view a different octave, click the up/down arrows , drag up and down on the piano keys, or move the mouse pointer over the piano keys and scroll the mouse wheel up or down.

If the number of steps exceeds 16, the scrollbar becomes active – click the left/right arrows  to scroll between the steps, or drag the scrollbar itself.

To delete an existing step completely, right-click it and select “Delete Step” from the menu:




To insert a step into the sequence, position the mouse pointer over the step next to which you want the new step to appear, right-click and select “Insert Step” menu from the menu:



Recording Sequences Using MIDI Input

The easiest way to enter sequences is to record them by sending MIDI to the Arpeggiator/sequencer from your keyboard or other device. In “Poly” Mode, up to four notes can be recorded per step.

To start recording, click the *Arp On/Off/Record* button until it changes state to “Recording” 

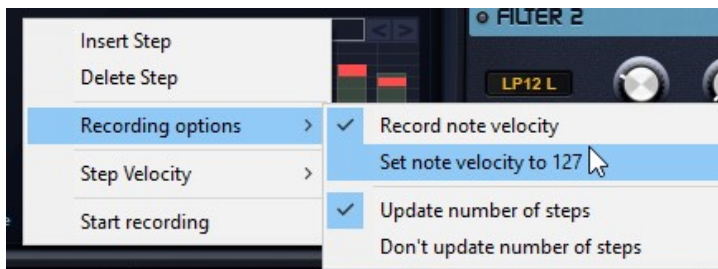
The first step is highlighted and the first note received by the sequencer becomes the reference (zero) note:



As each new note/chord is received and recorded, the sequence progresses a step. If the *Steps* value is exceeded, it automatically increases by 1 up to its maximum possible value ("16").

When you've finished recording, click the *Arp On/Off/Rec* button again. Recording will stop and Arpeggiator's state will change to **Off**.

When recording MIDI input, the input note velocity is captured as well. To turn off velocity sensitivity during recording, right-click the Arpeggiator display and choose "Set note velocity to 127" from the "Recording Options" submenu.



Recording Monophonic Sequences Using MIDI Input

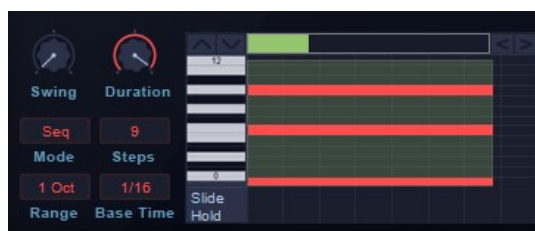
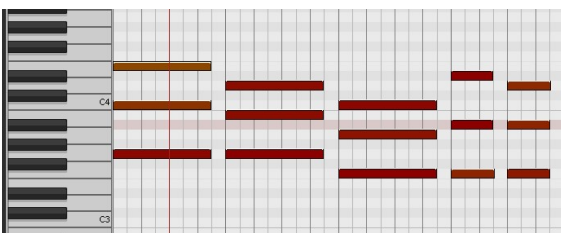
If SynthMaster One is in "Mono" *Mode*, the sequencer only records one note at a time. It also detects tied notes and turns on *Hold* for that step automatically.



Importing MIDI Sequences into Arpeggiator

To import monophonic or polyphonic (chord) MIDI sequences into the Arpeggiator/sequencer, drag and drop a MIDI file onto the Arpeggiator display.

When the MIDI data is imported, the *Mode* is set to "Sequence", and the *Steps* and *BaseTime* parameters are calculated automatically:



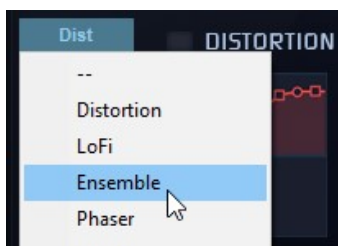
TIP: Before importing a MIDI file, make sure you quantize the note durations.


Effects

The signal flow through the FX section runs from the top of the 'rack' to the bottom:



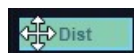
To load an effect into one of the six slots or replace a loaded effect with a different one, right-click the slot and choose a module from the menu – the specifics of each effect are described later in this manual.



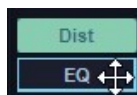
With a slot selected, the controls for its loaded effect appear in the panel to the right. To turn the currently selected effect on and off, click the button  next to its name **DISTORTION** in the controls panel. To toggle an unselected effect on and off, scroll the mouse wheel up or down with the pointer placed over its slot.

To reorder the effects:

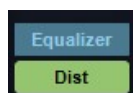
- Click an effect and start moving the mouse:



- Drag and drop the effect onto another one:



- The effects swap places:



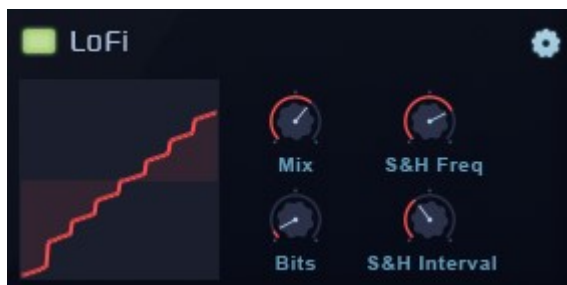
Distortion



The Distortion effect in SynthMaster consists of a 2-band shelving EQ followed by a distortion stage, followed by another 2-band shelving EQ. To edit the pre-distortion EQ, click the *Pre EQ* button. To edit the post-distortion EQ, click *Post EQ*.

The distortion curve is fully editable in the curve display, and the *Drive* parameter overdrives the input signal into the effect.

LoFi



The LoFi effect applies bit depth and sample rate reduction (through sample and hold)

The output bits are controlled by the *Bits* parameter

The output sample rate is set by the *S&H Interval* parameter, while *S&H Frequency* controls the cutoff frequency of a 2nd order resonant low-pass filter.

The display visualizes the digital distortion applied by the effect.

Ensemble



The ensemble effect generates up to six 'unison' voices in parallel at different delay modulations. Select the number of voices with the *Stages* buttons.

Two independent LFOs modulate the initial delay/delay spacing, which is determined by the *Delay* knob. The rate and modulation amount of each LFO are set using the *Speed 1/2* and *Mod 1/2* knobs.

The stereo width and positioning of the output signal are controlled by the *Width* and *Pan* parameters.

Phaser



A 4-, 8-, 12- or 16-stage analogue modeled phaser.

The *Feedback (FB)* parameter feeds the phaser output into its input.

The *Cutoff* and *Spacing* parameters adjust the frequencies and distribution of the Phaser's all-pass filters.

The filters can be modulated by the internal LFO, the speed of which is controlled with the *Speed* parameter. Set the modulation depth with the *Mod Amt* knob.

Equalizer



A 6-band EQ, editable using the knobs and/or by dragging the filter nodes in the display. **Ctrl/Cmd + click** a filter node to reset it.

To activate the 24dB/octave Highpass and Lowpass filters, click the *HP* and *LP* buttons.

The *Bass* and *Treble* knobs set the gains of the 6dB/octave low and high shelving bands.

The frequencies and gains of the Lo Mid and Hi Mid bands are adjusted in the display, by dragging their two filter nodes. The *LM Q* and *HM Q* knobs adjust their Q (resonance) values.

Vocoder

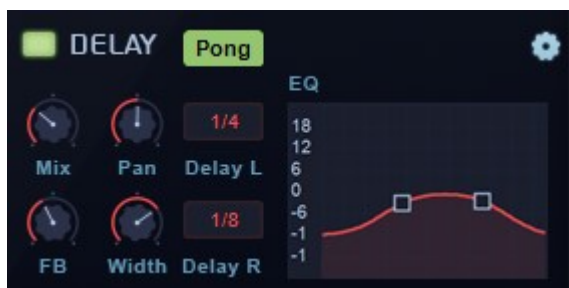


SynthMaster One's Vocoder consists of 16 analysis and 16 synthesis filters (1 LP + 14 BP + 1 HP).

The analysis filters are at fixed frequencies (like an analogue vocoder), but the initial frequencies of the synthesis filters are controlled by the *Frequency* parameter. Drag the bars in the display to adjust the band volume levels, and use the *Gain* knob to set the modulator gain (between -20/+20 dB)

To use SynthMaster One as a vocoder, it needs to be loaded as a MIDI-controlled audio effect. See your DAW's documentation for instructions on how to do this.

Delay



A stereo delay effect with built-in 2-band EQ. Select the left and right channel delay times from the *Delay L* and *Delay R* menus.

Generate repeating echos by feeding the delayed + EQed Left/Right signals back into the input using the *Feedback* parameter.

When the *Pong* button is activated, the left output feeds back into the right input, and the right output feeds back into the left input.

Use the 2-band EQ to filter the delayed outputs, and control the stereo imaging of the delay outputs with the *Width* and *Pan* parameters.

Chorus



The Chorus effect adds time variable delays to its stereo inputs.

The delay modulation depth is controlled by the *Mod Amt* knob; the delay modulation rate is controlled by the *Speed* parameter; and the feedback of the delayed output is controlled with the *FB* knob.

The initial delays for left and right channels can be set with *Delay L* and *Delay R* knobs.

Tremolo



The Tremolo effect modulates the amplitude of its stereo inputs based on the movement of an internal stereo LFO.

The base LFO rate is controlled by the *Speed* knob, while the differences between the left and right outputs in terms of speed and phase are set by the *L-R Ratio* and *L-R Phase* knobs

Reverb



SynthMaster One features a powerful Reverb effect, used to simulate rooms and spaces.

The early/late reflection mix ratio is controlled using the *E/L Mix* parameter.

The late reflections reverb time (ie, the time it takes to decay by 60dB) is set by the *Time* knob.

The *Size* parameter calculates the early reflection tap delays/gains behind the scenes.

The *Distance* parameter controls the distance between the listener and the reverb inputs.

The *Damping* parameter controls the high frequency loss that occurs when reflections in a room bounce off the walls.

The *Density* parameter affects the smoothness of the tail.

The *Mod Amount* parameter controls the amount of random modulation applied to the delay line lengths within the reverb algorithm.

Compressor



The Compressor effect is used for dynamic gain reduction, automatically lowering the output level in response to changes in input signal gain.

The *Ratio* parameter sets the compression ratio, with a range of 1:1 to 1:20 (in dB)

The *Threshold* parameter determines the input level at which compression starts.

The *Attack* and *Release* knobs set the time it takes for the compressor to engage and disengage when the input signal exceeds and drops back below the *Threshold*.

Knee controls the smoothness of the compression curve. The curve is at it's sharpest when *Knee* is set to "0".