

SONICBITS

Exakt Lite User Manual



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www.sonicbits.com

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Introduction

Thank you for using Exakt Lite! Exakt Lite is an easy to use FM synthesizer instrument. From the harsh digital and cold known from the FM era to warm and organic, Exakt Lite can create a wide range of sounds.

Getting in touch

If you experience any problems while using this plugin, or you just wish to pass on your comments regarding Exakt Lite or this manual, or links to cool tunes made with Exakt Lite, you can email the developer directly at: info@sonicbits.com.

We're also available on Twitter: [@sonic_bits](https://twitter.com/sonic_bits)

Installing Exakt Lite

Exakt Lite is available in both Windows and macOS versions. It is designed to be used within a 64bit host audio application that supports the VST and AU (macOS only) plugin format.

Installing on Windows

Double-click the Exe installer. It will prompt for the location of your VST folder. You can choose whether you want to install the VST2 and/or the VST3 plugin format.

The presets will be installed to

C:\Users\USERNAME\AppData\Roaming\Sonicbits Exakt Lite.

Installing on macOS

Double-click the PKG installer. You can either install everything or you can choose whether you want to install the VST2, VST3 and/or the Audio Unit (AU) plugin format.

The presets will be installed to

Library/Application Support/Sonicbits Exakt Lite

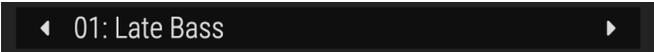
Getting Started

Step 1: Add Exakt Lite

Exakt Lite should be added to an instrument (MIDI) track. This is the same procedure as if you add any other software instrument in your DAW. For details about that, please refer to your audio host documentation or contact us via email or Twitter, and we'll try to help you.

Step 2: Select and play a Preset

Let's just assume you don't want to create your own sounds from scratch. A good place to get started is by selecting a preset. The preset list is at the top of the plugin window:



◀ 01: Late Bass ▶

Select a preset by clicking somewhere on the preset name. A list with all 32 available presets in this bank appears. You can also cycle through this list by clicking on the arrows beside the preset name.

You can play the preset by clicking on the keyboard within the plugin window or by simply play a few keys on your connected MIDI keyboard.

The virtual keyboard in the plugin window supports different velocity levels. Clicking the keys in the lower area plays with higher velocities than if the key is clicked at the top.

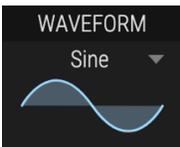
Step 3: Using the controls to edit a preset

Using the mouse, you can edit any parameter. There are different controls available:



Knobs

Knobs can be rotated using the mouse. If you click on a knob and hold the button, moving the mouse up and down increases and decreases the value. For finer control hold the Ctrl key while moving the mouse. A double-click on a knob resets its value to the one in the preset.



Dropdown lists

Dropdown lists can be used to select an item from a given list. Clicking somewhere in the dropdown area opens the list.



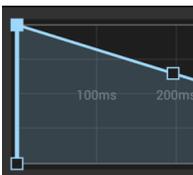
Button

Buttons can be clicked to turn something on or off. When the button is lit, it means the according parameter is turned on.



Tabs

Exakt Lite has got 4 identical operators. By clicking the according tab button, the parameters for the selected operator appear. The selected tab is lit. The same applies to the envelope tabs.



Envelopes

Exakt Lite has got envelopes which support value entry by selecting and dragging the envelope points with the mouse. The currently selected point is filled out and its values appear on the right side of the envelope. If you click inside the envelope area and drag the mouse up or down, you can zoom in and out. If you double-click the envelope, the zoom level is adjusted so all points fit into the envelope window. You can select whether you want the envelope to sustain or to just finish regardless of whether a key is hold by clicking the "SUS" button on and off.

When you're happy with your sound editing, you can save your own presets by clicking on the cog symbol in the top right of the plugin window. Select "Save Preset..." and enter a preset name to preserve your sound for another session. Use the same menu to load a preset.

About FM Synthesis

Frequency Modulation (FM) synthesis has been invented by Dr. John Chowning at Stanford University in the late 1960s. Dr. Chowning's theory was that instrument emulations would be possible by modulating a waveform with others that were tuned to the harmonic series.

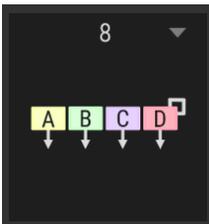
Digital FM synthesis (implemented as phase modulation) was the basis of several musical instruments beginning as early as 1974. Yamaha built the first prototype digital synthesizer in 1974, based on FM synthesis, before commercially releasing the Yamaha GS-1 in 1980.

The Synclavier I, manufactured by New England Digital Corporation beginning in 1978, included a digital FM synthesizer, using an FM synthesis algorithm licensed from Yamaha. Yamaha's groundbreaking DX7 synthesizer, released in 1983, brought FM to the forefront of synthesis in the mid-1980s.

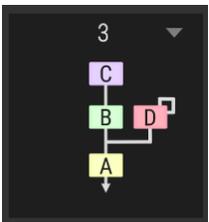
Unlike previous FM synthesizers of the era, released in 1987, Yamaha's TX81Z was the first to offer a range of oscillator waveforms other than just sine waves, conferring the new timbres of some of its patches when compared to older, sine-only FM synths. The TX81Z has developed a famous reputation, largely based on some of its preset bass sounds. A keyboard version with more onboard editing abilities was released the following year as the Yamaha DX11.

Frequency Modulation is a method of synthesis that uses the frequency of one waveform to modulate the frequency of another. In FM synthesis, these waveform generators are called "operators."

Operators and the FM Algorithm



Operators are arranged in different relationships to one another; these arrangements are known as **algorithms**. Depending on the algorithm, one or more operator is usually routed directly to the audio output. For example, with Exakt Lite's algorithm 8, all four of operators are routed directly to the output.



In other algorithms, the operators are not routed directly to the output, but modulate another operator. These modulating operators are then called **modulators**, and those modulated and outputting sound are **carriers**.



The graphic for each algorithm has a loop drawn around operator D. This indicates that there is a **feedback** loop attached to that operator. The feedback level can be controlled by the feedback knob. This feedback loop modulates operator D with itself.

The operator section at the top left of the plugin window builds the sonic heart of Exakt Lite.



In this section, you can access the four operators and determine their waveform, frequency and detune settings, the phase shift, the pan position and the output level which is used in the FM algorithm.

You can choose between the following waveforms:

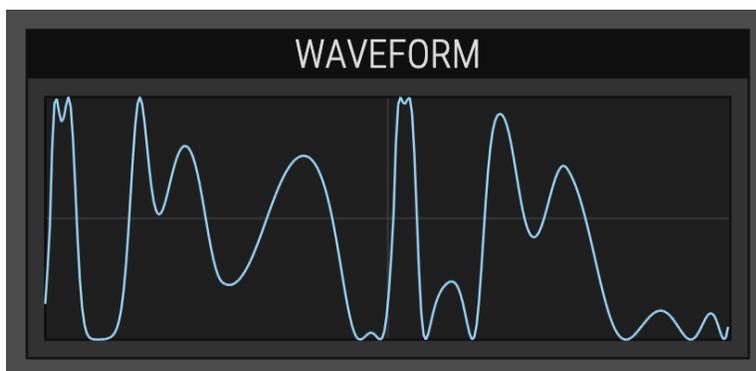
- Sine
- Saw
- Square
- Triangle
- TX Wave 2
- TX Wave 3
- TX Wave 4
- TX Wave 5
- TX Wave 6
- TX Wave 7
- TX Wave 8

The TX Waveforms emulate those available in the Yamaha TX81Z.

Modifying the operator rate, will change the frequency at which it plays. For example, a rate of 2.0 will play an octave higher and a rate of 0.5 will play an octave lower. By setting the rate to other values than multiplies of the base rate, interesting modulations and atonal effects can occur. Setting the rate always sets the operator frequency to the according multiply. By setting a fixed offset value, the operator frequency will always be played at the key frequency plus the fixed offset value.

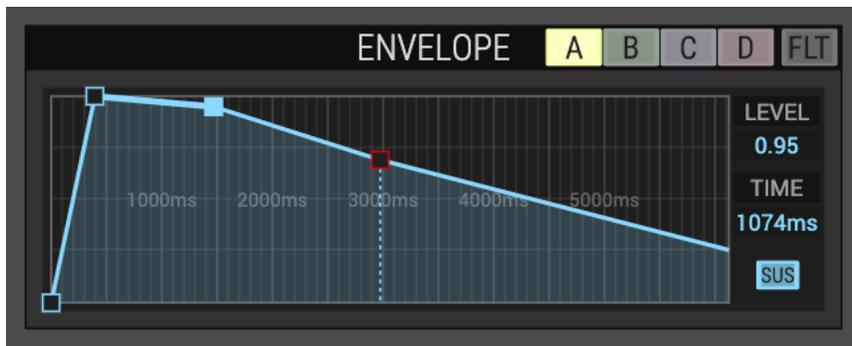
You can change the rate and offset values by clicking and dragging the mouse up and down. Double-clicking a value resets it to 1.0.

After selecting an FM algorithm you can start by modulating the carriers with the modulators. As soon as you increase the level of a modulator, the waveform display to the right of the operator section shows how the final waveform will look like when the operators have reached their final level.



The Envelopes

The envelope section lets you edit the four envelopes for the operators A-D and there's also an envelope for the filter. The currently selected envelope button is lit.



You can change the envelope by clicking and holding an edge. By dragging, the level and time will be changed. Those values are displayed to the right of the envelope.

If you click inside the envelope area and drag the mouse up or down, you can zoom in and out. If you double-click the envelope, the zoom level is adjusted so all points fit into the envelope window. You can select whether you want the envelope to sustain or to just finish regardless of whether a key is held by clicking the "SUS" button on and off.

If sustain is enabled, the 2nd last level point will be drawn in red and a dashed line shows where the level will be held as long as you hold a key.

The Filter

The filter section lets you select the filter type and edit the cutoff frequency, the resonance amount and the envelope amount and velocity sensitivity.



The filter type can be selected in the top right. The filter slope is 24db/oct. You can select between lowpass, highpass or bandpass type.

The LFO and Modulation section

The LFO section lets you edit the values for the low frequency oscillator.

The LFO supports different waveforms and its tempo can either be synchronized to the DAW host or can be set in Hz. In order to synchronize the tempo, make sure the SYNC button is lit. The RATE knob will then show the different time markers.



If the FREE button is off, the LFO will be reset by each key played. If it's off, it will run freely.

The modulation area contains the different LFO modulation targets. You can choose to modulate all four operators A-D, the pitch and the filter cutoff frequency.

The modulation amount is determined by the target value and also the LFO depth value.