

Siren: multi-oscillator drone generator

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Siren is a digital stereo module packing 21 oscillators and 23 LFOs to generate lush drones. Macro controls set their respective pitch, waveform, and amplitude. Siren is not meant to be the tool you reach for when wanting to write explicit chord progressions and harmonies. Instead, the few provided macro controls make a wide parameter space accessible and fun to explore. Find sweet spots of your liking by the turn of a knob and add subtle modulation to find new musical ideas and progressions. Use rhythmically related control voltages to explore a vast world of weird musical progressions that fall between the cracks of the discrete nature of music theory.

Siren is a digital module and does very little to hide this heritage. Oscillators are not anti-aliased and control voltages are not filtered. This minimizes latency and yields a very crisp snappy sound, however, at the cost of introducing artifacts when the module is pushed outside of its sweet spot. Everything is perfectly in tune in relation to harmonics and sub-harmonics of the base pitch. This is achieved by stacking oscillators in Just Intonation instead of the more traditional Equal Temperament. Thus, some of the sounds and progressions might sound alien and strange at times.

1 QUICKSTART

Set all knobs to roughly 12 o'clock. Start turning knobs, begin at X.

2 CONTROLS

X. This is the most drastic timbral control and influences the oscillator stacking. This control is akin to a chord selection, although allowing for a smooth selection that allows in-between chords to be selected.

Y. Controls the octave for the individual oscillators (e.g. chord inversion).

Z. Controls the timbre of the oscillators. Based on the selected wavetable **INDEX**, the Z parameter smoothly blends the waveform inside of the wavetable.

PITCH. Controls the base pitch of all oscillators. Use the lock button next to it to prevent accidental changes during live performances.

INDEX. Selects the wavetable for all oscillators and the waveforms for lfo1 and lfo2.

ANIMATE. Gradually detunes the stack of oscillators, increases stereo width, and increases the speed of all LFOs.

Attenuverters. The attenuverters are for the control voltage inputs for X, Y, Z. Note that the Y and Z input have lfo1 and lfo2 normalized to the input, respectively.

3 OUTPUTS

LEFT. audio output (10Vpp).

RIGHT. audio output (10Vpp). Sums left and right when no cable is plugged into the **LEFT** output.

LFO1. unipolar LFO1 outputs (0-5V).

LFO2. unipolar LFO2 outputs (0-5V).

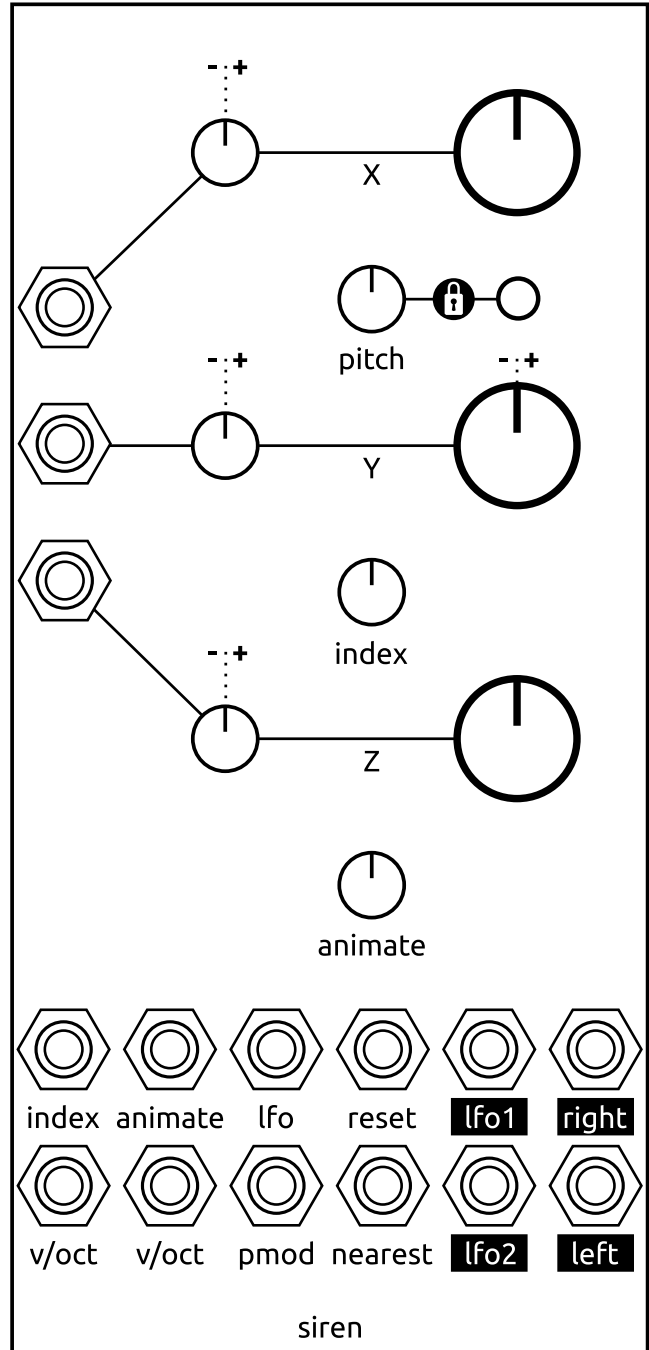


Fig. 1. The Siren front panel

4 CONTROL VOLTAGE INPUTS

V/OCT, v/OCT. Bipolar inputs (-5V to 5V) for the base pitch. The second input is mostly intended for modulation purposes in conjunction with an external attenuverter but is calibrated to track 1V/octave.

PMOD. Phase modulation for the entire oscillator stack. The input is bipolar (-5V to 5V) and ac-coupled.

NEAREST. Gate input that turns off all interpolation for X,Y,Z and snaps to the nearest value instead. Interpolation is turned off while the gate is held high.

X, Y, Z. Bipolar inputs (-5V to 5V) for the X, Y, Z timbre controls. The voltage is attenuverted by their respective attenuverters and summed to the knob setting. Note that the attenuversion is performed digitally, therefore input voltages that exceed the (-5V to 5V) range will be clipped regardless of the attenuverter setting!

INDEX, ANIMATE. Bipolar inputs (-5V to 5V) summed to the knob value.

LFO. bipolar control (-5V to 5V) to control the speed of all LFOs.

RESET. Trigger input that resets the phase of the oscillators and LFOs.

5 NORMALIZATIONS

Y ← LFO1

Z ← LFO2

RIGHT ← LEFT + RIGHT (if LEFT is not plugged in)

6 FIRMWARE UPDATE

Please visit <https://electro-smith.github.io/Programmer/> to access the daisy web programmer.

Remove the module from your case and connect a micro-USB cable to the board on the back of the module. To flash the firmware, the module needs to be put into the bootloader mode. On the yellow board, there are two little buttons. Hold the *BOOT* button down, and then press and release the *RESET* button.

Next, proceed to the website and press the *Connect* button on the page. On the bottom of the page, you can upload a firmware file from your computer. Upload the *siren.bin* file here.

Now press the *Program* button on the website to flash the image.

7 TIPS AND PATCH IDEAS

7.1 Tuning the oscillator

Setting X all the way to the left will stack the oscillators in octaves which makes tuning of the base pitch more convenient. Setting the *PITCH* control to about 12 o'clock results in a base pitch playing a C.

7.2 Phase Modulation

Phase modulation can become noisy very quickly on Siren. Setting X all the way to the left will stack the oscillators in octaves and result in cleaner tones.

7.3 LFO speed control

Plug an external knob sending out a voltage between -5V to 5V to the LFO input. This will allow to control the speed of all LFOs with this knob.

7.4 Pseudo-VCA

Set *INDEX* to about 3 o'clock to select the wavetable where the Z control effectively becomes a volume control. Set Z all the way to zero, which should mute the signal. Feeding a control voltage (for example from an envelope) into the Z input will control the pseudo-VCA.

7.5 LFO glitch

The waveform of the LFOs depends on the selected *INDEX*. Feeding the output of one of the LFOs into the *INDEX* input will thus self-modulate and exhibit chaotic behavior.

7.6 Heavy aliasing

Pushing the base pitch of the module way above its internal sampling rate will unravel a strange world of stereo aliasing and noise. Send 5V to both *V/OCT* inputs and optionally crank up the Y, *PITCH* knobs.