Obsidian is a Dual Analog, Voltage Controlled LFO with Triangle and Square wave outs. A Symmetry CV input varies the shape of the Triangle waveform and also the pulse width of the Square wave. The two LFOs are Cross-modulated meaning that if nothing is patched to CV inputs, LFO1 modulates LFO2 Rate and vice versa through the Rate CV Attenuverters. Obsidian also features *Sum, Diff, Min, Max* analog logic outputs that are fed from the two waveform switches, allowing for a spectacular variety of complex waveforms!

Features:

- Two Analog Complex LFOs with a total of 8 simultaneous outputs.

- Cross-modulation! LFO1 modulates LFO2 *Rate* and vice versa.

- Triangle and Square waveform outs with Symmetry/Pulse-width CV control.

- *Sum, Diff, Min, Max* analog logic circuits for complex waveforms.

- Switches to select which waveforms will be compared by the analog logic circuits.

- Reset inputs for synchronizing the LFOs.

- Frequency range: 1 minute per cycle to 300Hz approximately.

Tech Specs:
Depth: 25mm. Skiff Friendly!
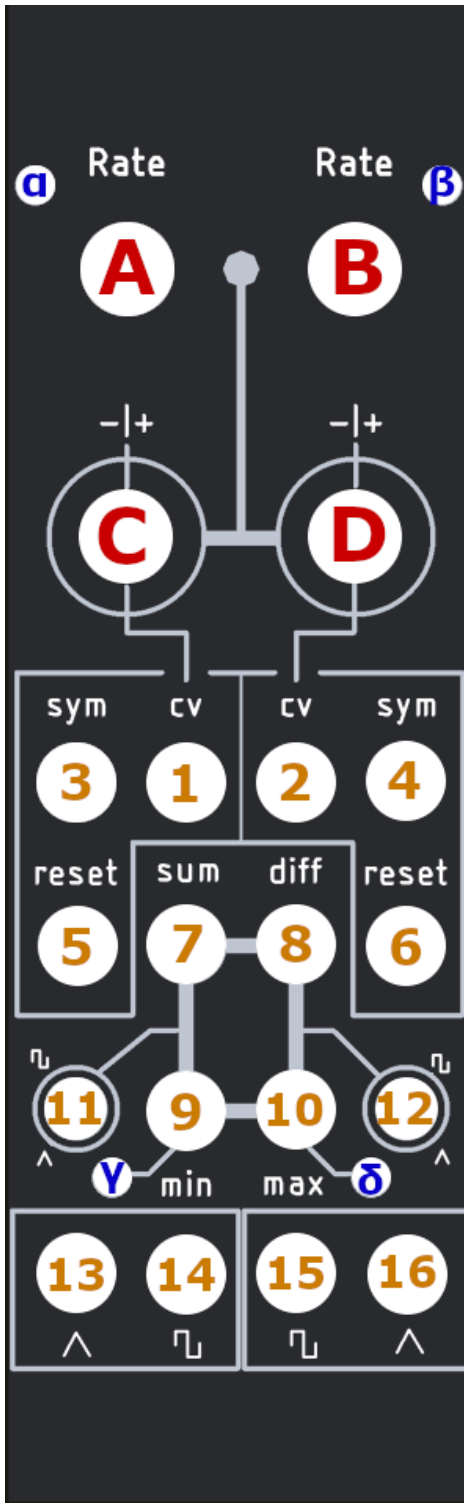Power: 51mA @+12V / 44mA @-12V
Reverse polarity protected!
8hp

<u>Installation</u>
Before installing this module disconnect the power from your system! Double check the polarity of the ribbon cable! The red stripe should be aligned with the -12V rail, on both the module (*white line*) and on the bus board.
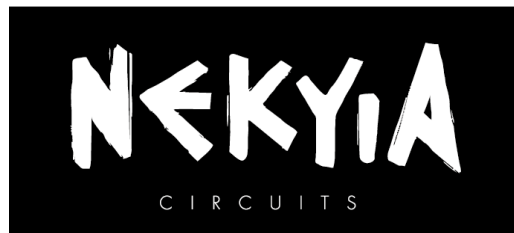
User Guide:

A. Frequency control for LFO1.
B. Frequency control for LFO2.
C. Attenuverter for Rate CV of LFO1.
D. Attenuverter for Rate CV of LFO2.

α. Bipolar indicator for LFO1 Rate.
β. Bipolar indicator for LFO2 Rate.
γ. Bipolar indicator for *Min* out voltage.
δ. Bipolar indicator for *Max* out voltage.

1. Voltage control input for LFO1 Rate.
2. Voltage control input for LFO2 Rate.
3. Voltage control of waveform shape or pulse width of LFO1.
4. Voltage control of waveform shape or pulse width of LFO2.
5. Trigger input that resets the LFO1 cycle.
6. Trigger input that resets the LFO2 cycle.
7. Summing output of the two LFO signals.
8. Output that subtracts the two LFO signals.
9. Outputs the minimum between the LFOs signals (+/- 10V).
10. Outputs the maximum between the LFOs signals(+/- 10V).
11. Selects LFO1 waveform for *Sum, Diff, Min, Max* input1.
12. Selects LFO2 waveform for *Sum, Diff, Min, Max input2*.
13. Triangle waveform output of LFO1 (+/- 10V).
14. Square waveform output of LFO1 (+/- 10V).
15. Square waveform output of LFO2 (+/- 10V).
16. Triangle waveform output of LFO2 (+/- 10V).

Tips & Tricks

- If no cable is patched into the CV inputs (1, 2), you can use Rate CV Attenuverter knobs (C, D) to cross-modulate the LFOs, meaning that LFO1 can modulate LFO2 Rate and vice versa. CV Attenuverters are calibrated so as in the middle position have no effect. However, you can patch a dummy cable on CV input to make sure that no cross-modulation is applied.

- Additionally the LFO's signals pass a minimum / maximum detector, a mixer and an inverter. Their signals go to four separate outputs and can output the momentary lowest or highest voltage, the sum and the difference, creating very interesting rhythmical variations of the two LFOs Rate.

- The symmetry control alters the triangle waveform shape from ramp down to triangle to ramp up as well as the pulse width of the square waveform.

- LFO sync is possible, by sending a trigger to the *Reset* input. LFO waveform reset and start from its zero point. You may need to adjust the Rate of the LFO in order to create a perfect shape clocked LFO.

- Self patching the module is highly recommended for achieving even more exotic waveforms!

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