

CLX

User Manual

Revision A



Introduction

Thanks for purchasing the CLX Eurorack synthesizer module from Evaton Technologies! The CLX module is a dual analog square-wave oscillator module with logic outputs, in addition to the two clock outputs. Each oscillator has a high and low frequency range, selectable by a toggle switch, with the frequency controlled by front panel knobs.

The outputs of the CLX are unipolar; they go from 0 volts to 8 volts. Four outputs are provided: **A** clock output, **B** clock output, the “**And**” output, and “**Xor**” output. The **And** output is 8 volts when both the **A** and **B** clocks are high, and zero volts otherwise. The **Xor** output is an inverted exclusive-OR output. It is low only when either the **A** clock is high or when the **B** clock is high, but not both.

The logic outputs allow you to create complex rhythmic patterns based on the ratio of the **A** and **B** clock frequencies. When using all four outputs simultaneously to clock different parts of your patch, very complex rhythmic patterns can be achieved and altered in real time.

Specifications

- **Width:** 6 HP
- **Height:** 3U
- **Depth:** 21mm
- **Power:** +12V @ 9.0 mA, -12V @ 9.0 mA
- **Signal Output:** 0 to 8 VDC, 1000 ohm impedance
- **Frequency, Low Range:** 0.5 Hz to 10 Hz
- **Frequency, High Range:** 7 Hz to 135 Hz
- **Format:** Euro modular
- **Construction:** Made in Pittsburgh, USA, from RoHS-compliant components

Precautions

The CLX outputs signals from 0 to +8 volts DC. While most Eurorack modules are tolerant of this voltage on any input, be sure to check your module's specs to make sure, before plugging the CLX's output into an audio input, or into any external audio equipment that is not designed to handle synth-level signals.

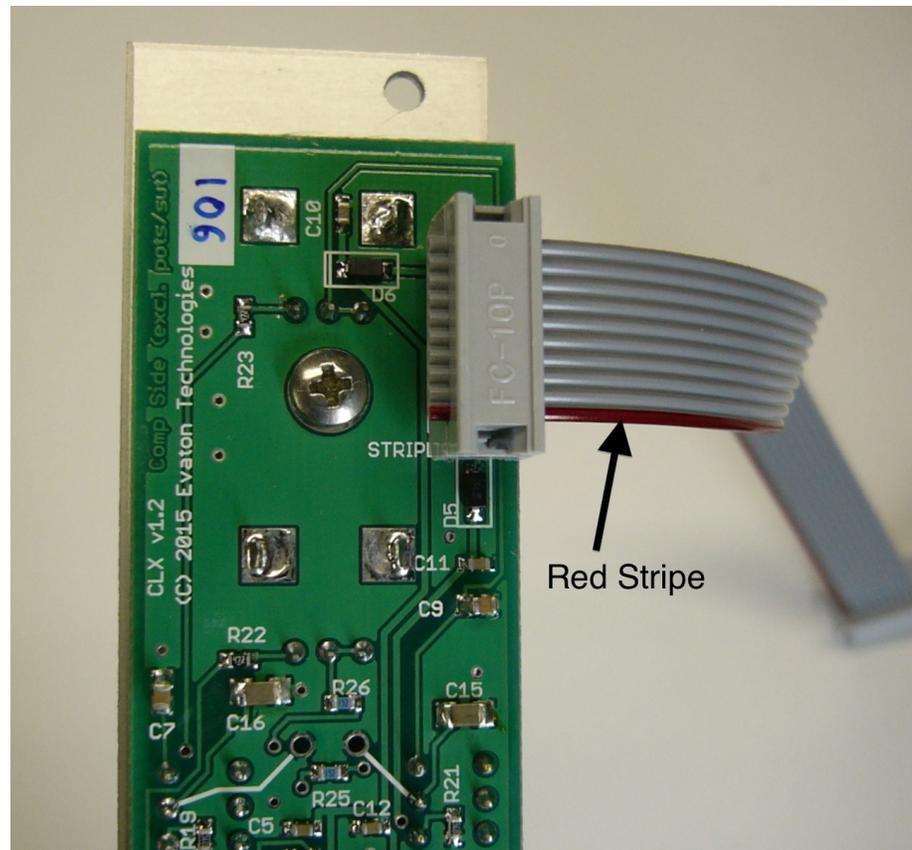
Installation

Install the CLX by first powering-down your modular synthesizer. Connect the supplied ribbon cable to the 10-pin dual-row header connector on the CLX.

Note that the red stripe on the cable faces the bottom of the module, and the board is marked "Stripe" next to the pin where the stripe should go. Be careful not to install the cable backwards, or off by one position, as this can cause damage to the CLX or your synthesizer.

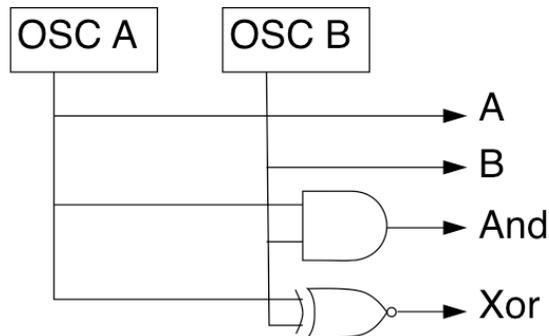
Connect the 16-pin end of the ribbon cable to your synthesizer's power bus. The red stripe on the ribbon cable

should face the -12VDC (negative) end of the power connector on the bus, typically also marked "Stripe". Once you are certain the power cable is connected properly (Check twice!), install the module into your rack with the supplied M3x6mm screws.



Signal Flow

The CLX consists of two 50% duty-cycle square wave generators that feed the A and B outputs, respectively. Also, A **AND** B are available on the **And** output, and A **XOR**¹ B is available on the **XOR** output.



Logic Outputs

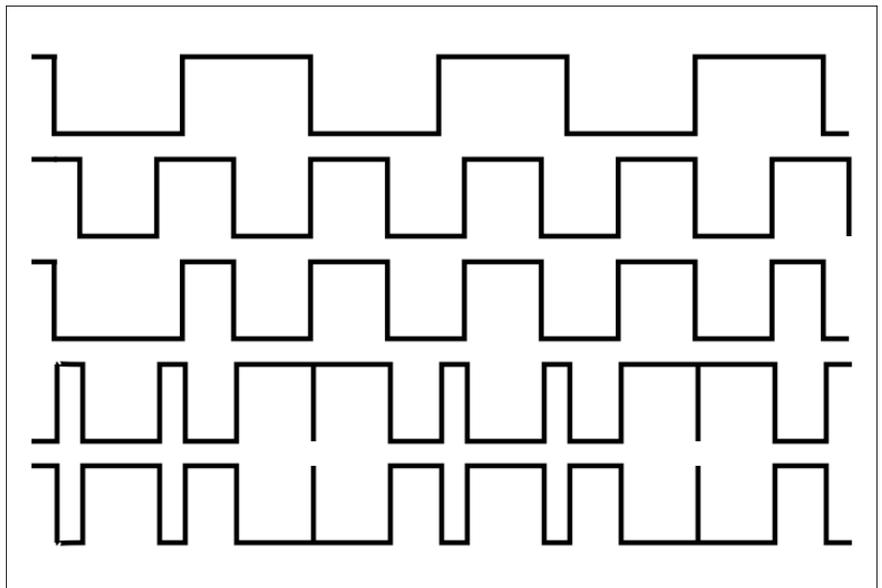
For those unfamiliar with Boolean logic, the AND of two signals is high when BOTH signals are high. Logical XOR is high only when one of the signals is high or the other, but not both. The CLX's **Xor** output then inverts this signal, which allows it to fit better rhythmically against the other outputs.

The diagram to the right shows these logic relationships.

The top waveform is the "A" clock and the next waveform is the "B" clock.

The middle waveform is "A **AND** B". The next waveform is "A **XOR** B". Finally, at the bottom is the inverted "A **XOR** B" output.

The relationship of the A and B frequencies will have a great effect on the patterns coming out of the **And** and **Xor** outputs.



¹ Technically, it is XNOR -- Inverted Exclusive OR.

Knob Description

The **A** knob controls the frequency² of the A oscillator.

The **B** knob controls the frequency of the B oscillator.

The **Hi/Low** switches select the high or low range of frequencies.

Patch Ideas

The CLX can be used as a dual LFO, as a gate source, as a trigger for drums, as a complex clock input to sequencers and S/H modules and more. Also, because it goes up into the low audio range, it can even be used as a drone generator. AND and XOR sound a little bit like ring modulation, so experiment with those outputs as audio sources, too!

Note that XOR output makes a great Gate output, with the pulse width varying as the two clocks go in and out of phase. AND makes a great clock source for random rhythm patterns. Try clocking your favorite sequencer or sample/hold module with this.

Warranty Information

Every Evaton Technologies module is covered by a 1 year limited warranty. The product is warranted against defects in construction and materials during this period. Damage caused by incorrect power supply connection, incorrect power supply voltages, lightning discharge, or other causes determined by Evaton Technologies to be the result of abuse or improper application are not covered.

Evaton Technologies assumes no liability for consequential damages caused by the use of this product.

During the warranty period, contact Evaton Technologies prior to returning equipment for repair. Repairs will be made at no cost, although shipping to Evaton Technologies will be the owner's responsibility. Repairs required after the warranty period will be charged at the usual shop rate.

Please contact russ@evatontechnologies.com with any questions, concerns, or comments...

² Note that while A and B oscillators are independent, there is a tiny amount of oscillator soft-sync at the fully clockwise position of the dial. If this is not desired, rotate the knob CCW a little bit.