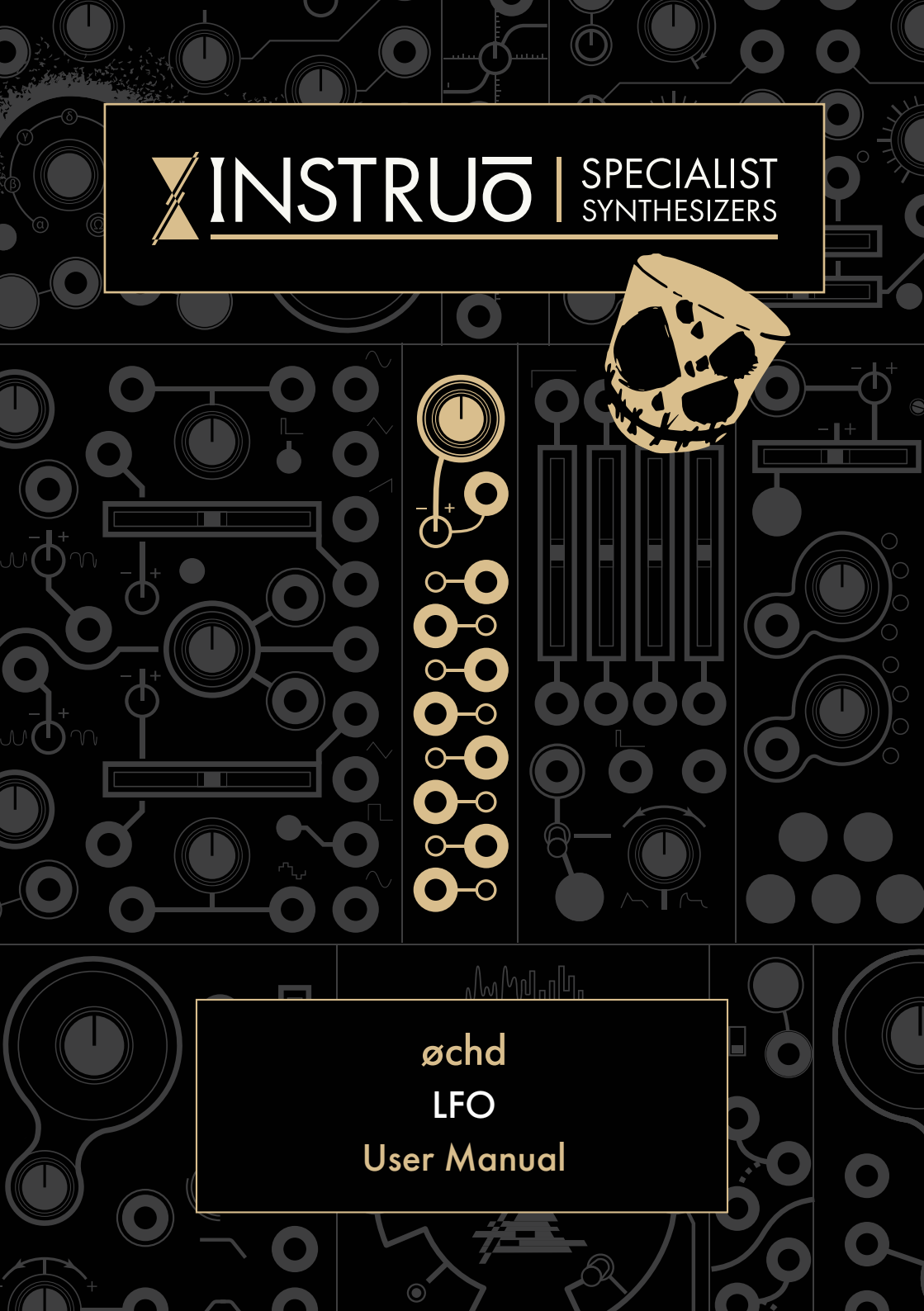
INSTRUŌ | SPECIALIST SYNTHESIZERS



# øchd

## LFO

## User Manual

# Contents

## Description

Designed in collaboration with **Ben "DivKid" Wilson**, the Instruō **øchd** packs 8 all analogue LFO's into a convenient 4HP package. Each independent core is free running with rates configured from fastest to slowest arranged from top to bottom. Each frequency range was tuned by ear during development to give the optimum spread of control frequencies running in parallel. Being 100% analogue, the LFO's will phase organically with the ability to ebb and flow together with their global frequency control.

Modulation breathes life into otherwise static patches, but CV sources can often run out quickly, even in larger systems. **øchd** adds a lot of movement without hogging a lot of space. Both small lunch box cases and larger set ups can be made to drift, move, and organically change over time. With either subtle use of **øchd** to keep things alive or wider ranging use that drives a whole patch that drifts around itself.

## Features

- 8 free-running bipolar triangle waveform LFOs
- Single rate control with CV input and attenuverter
- Track and hold/LFO stalling capabilities with negative CV
- Self-patchable for unique waveshaping possibilities
- Fastest LFO can go up to 160Hz without external CV
- Slowest LFO can go down to a 25 minute cycle without external CV
- Bipolar LED for each LFO
- 100% analogue

## Installation

1. Confirm that the Eurorack synthesizer system is powered off.
2. Locate 4 HP of space in your Eurorack synthesizer case.
3. Connect the 10 pin side of the IDC power cable to the 2x5 pin header on the back of the module, confirming that the red stripe on the power cable is connected to -12V.
4. Connect the 16 pin side of the IDC power cable to the 2x8 pin header on your Eurorack power supply, confirming that the red stripe on the power cable is connected to -12V.
5. Mount the Instruō **øchd** in your Eurorack synthesizer case.
6. Power your Eurorack synthesizer system on.

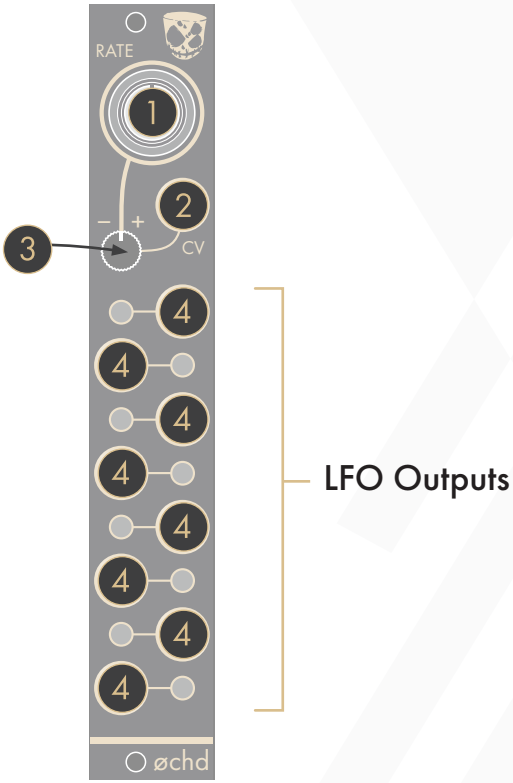
### Note:

This module has reverse polarity protection.
Inverted installation of the power cable will not damage the module.

## Specifications

- Width: 4 HP
- Depth: 32mm
- +12V: 80mA
- -12V: 80mA

**øchd** | ɔxg | **pronoun** (plural in construction) something having eight units or members, amounting to eight in number, a set of this many things.



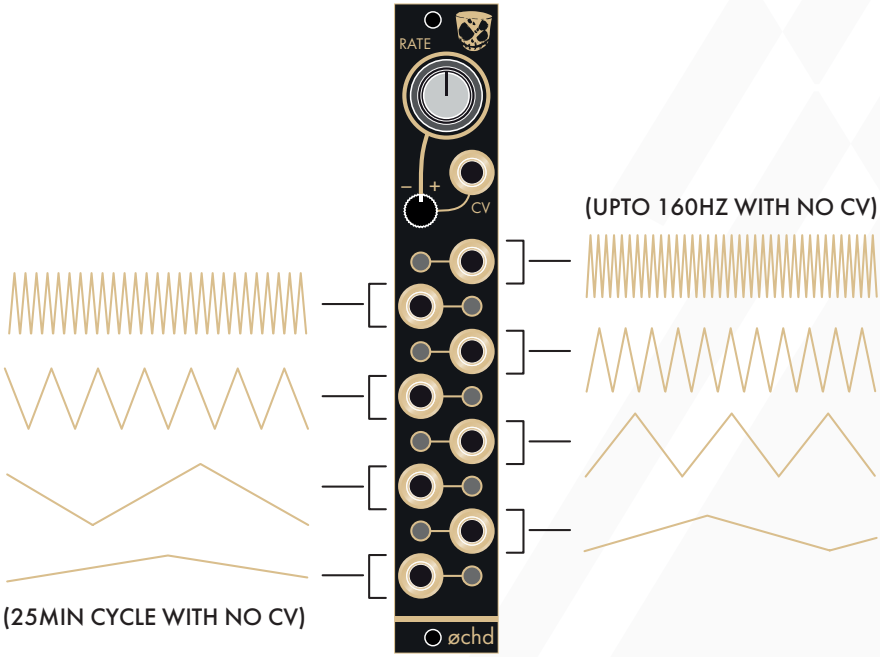

## Key

1. Rate
2. Rate CV Input
3. Rate Attenuverter
4. LFO Outputs

## Low Frequency Oscillators

**Rate:** The **Rate** knob is a global parameter that sets the frequency of all eight LFOs.

- When the knob is fully clockwise, each individual LFO will be at the top of its range. **LFO 1**, which is the fastest LFO, can go up to 160Hz without external control voltage applied.
- When the knob is fully anticlockwise, each individual LFO will be at the bottom of its range. **LFO 8**, which is the slowest LFO, can go down to a 25 minute cycle without external control voltage applied.
- When the knob is in its centre position, **LFO 1** is set to vibrato rate - between 3Hz and 7Hz.



**Rate CV Input:** The **Rate CV Input** is a bipolar control voltage input for the **Rate** parameter.

- Control voltage is summed with the knob position and scaled and/or inverted by the **Rate Attenuverter**.
- Applying positive control voltage can force the frequency of each individual LFO to exceed the range accessible by the **Rate** knob.
- Applying negative control voltage can force each individual LFO to completely stall, similar to a track and hold circuit.
- Bipolar CV Input.

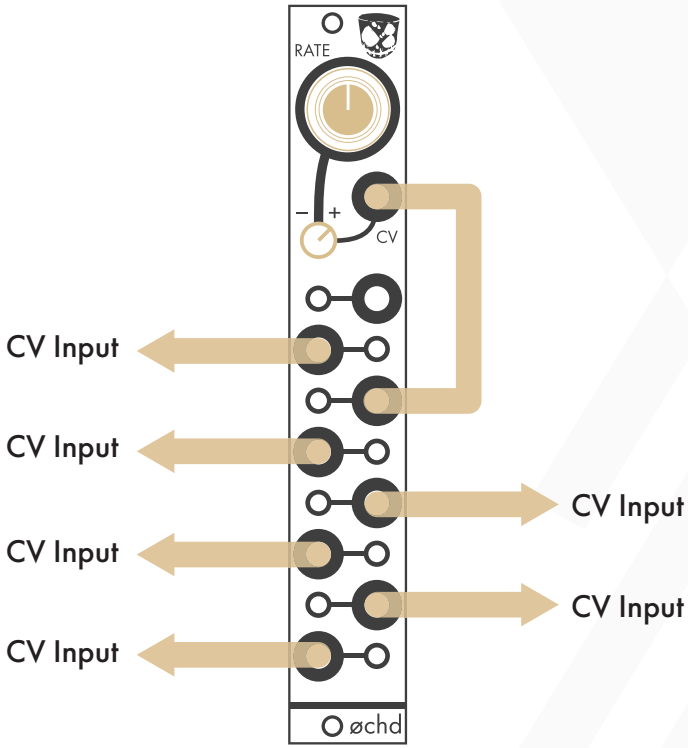
**Rate Attenuverter:** The **Rate Attenuverter** scales and/or inverts the signal present at the **Rate CV Input**.

**LFO Outputs:** Eight bipolar triangle waveform LFOs are configured from fastest to slowest, arranged from top to bottom.
Output range: 10Vpp.

## Patch Examples

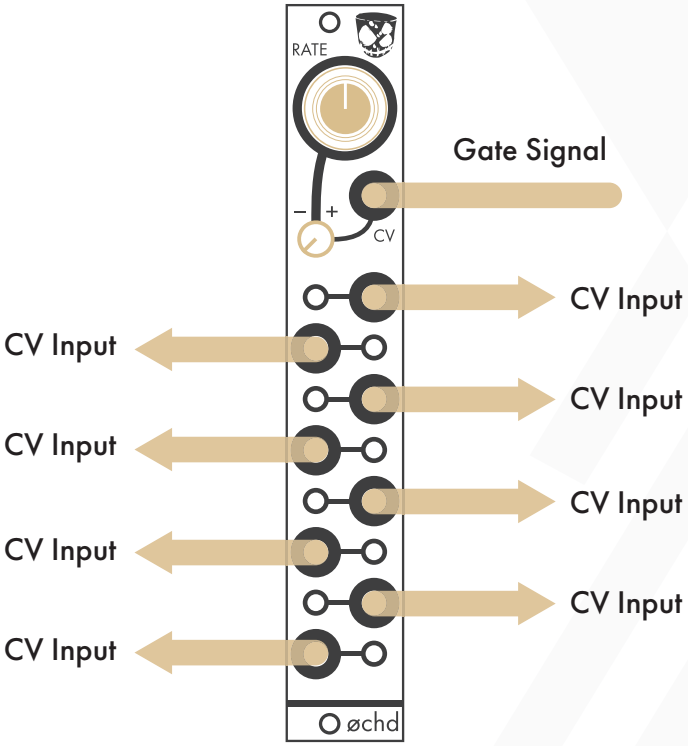
### Feedback Waveshaped LFOs:

**Summary:** Connect any of the **LFO Outputs** to the **Rate CV Input** and scale the amount of modulation with the **Rate Attenuverter**.



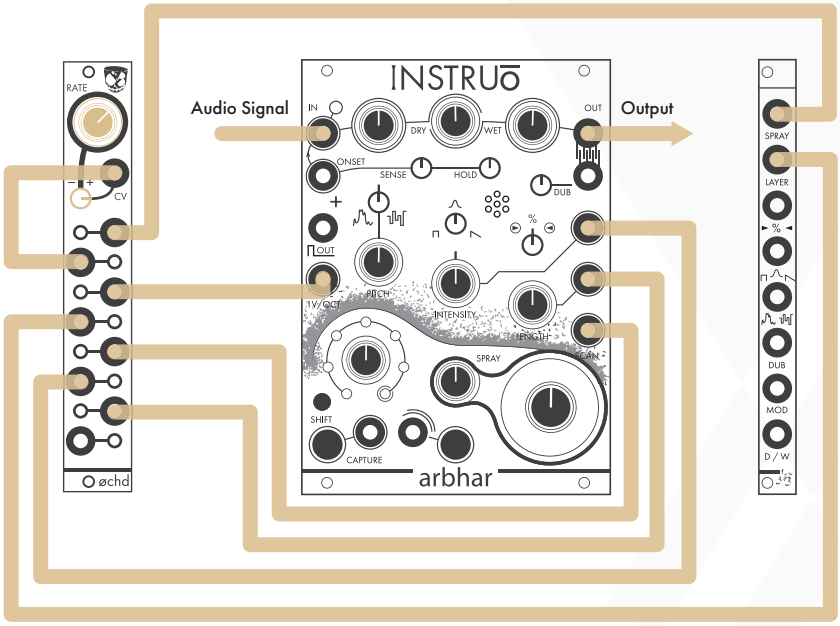
## LFO Stall/Track & Hold:

**Summary:** Connect a gate signal to the **Rate CV Input** and turn the **Rate Attenuverter** fully anticlockwise so that it inverts the gate signal. The LFOs will all stall at their current voltage level. This is essentially a track and hold function, as it tracks the LFO voltage and then holds it in time.



## Granular Drifter:

**Summary:** Connect the **LFO Outputs** to any of the CV inputs on arbhar.




Manual Author: Collin Russell
Manual Design: Dominic D'Sylva

CE This device meets the requirements of the following standards: EN55032, EN55103-2, EN61000-3-2, EN61000-3-3, EN62311.