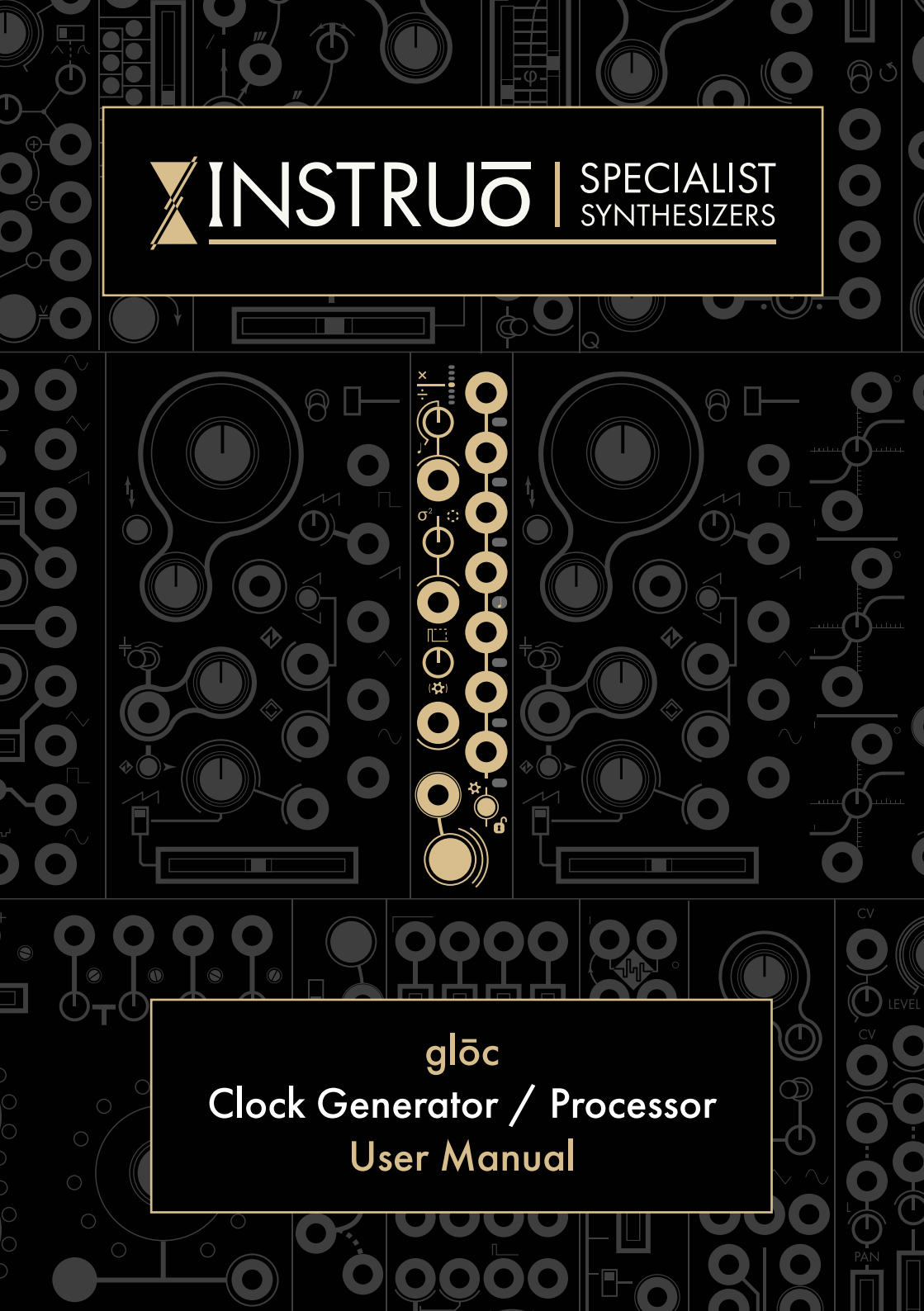
INSTRUŌ | SPECIALIST SYNTHESIZERS



glōc

Clock Generator / Processor

User Manual

Contents

Description

Introducing glōc, a clock generator and processor. Capable of turning a single internal/external clock input into a stream of related clock sources. Predictable division/multiplication, complex trigger/gate sequences via probabilistic masking - or any combination of both across each of its 7 clock pulse outputs. Onboard dynamic phase alignment, smart tap tempo detection and locked vs live modes make glōc excellent for performative and generative temporal exploration!

Features

- Tap tempo clock generator
- 1 clock input to 7 output Clock processor
- Manual or CV control over the spread of clock divisions/multiplications
- Probabilistic “coin-toss” logic for random phrasing
- Probabilistic density masking for repeated phrasing
- Manual Pulse width control over Clock Pulse outputs
- Dedicated Clock Reset input
- Live and Lockable Clock Pulse output states
- Smart tempo follower and manual button
- Save and recall settings between power cycles

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 **glōc** 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: 31mm
- +12V: 75mA
- -12V: 2mA

glōc | klɒk | **noun** (clock) a device for measuring time by mechanical means. A synchronising device that produces pulses at regular intervals.

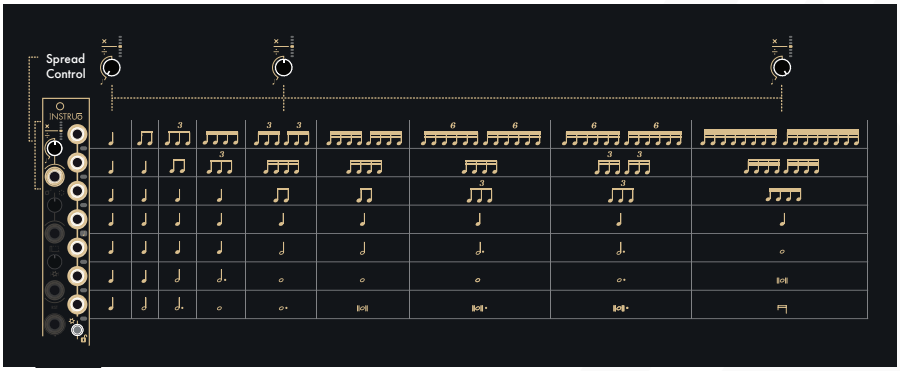
Key

1. Clock Pulse Output 1
2. Clock Pulse Output 2
3. Clock Pulse Output 3
4. Clock Pulse Output 4
5. Clock Pulse Output 5
6. Clock Pulse Output 6
7. Clock Pulse Output 7
8. Spread Knob
9. Spread CV Input
10. Probability Knob
11. Probability CV Input
12. Clock Input
13. Tap Tempo Button
14. PWM Knob
15. Reset Input
16. Mode Toggle

Spread Control

Spread Knob: The **Spread Knob** applies values from a specified division/multiplication array to each of the seven **Clock Pulse Outputs**.

- With the **Spread Knob** centred each **Clock Pulse Output** will produce the following values from the division/multiplication array, based on the current tempo (either via external clock or taps issued at the **Tap Tempo Button**).
    - **Clock Pulse Output 1** - semiquaver triplets (sixteenth note triplets)
    - **Clock Pulse Output 2** - semiquavers (sixteenth notes)
    - **Clock Pulse Output 3** - quavers (eighth notes)
    - **Clock Pulse Output 4** - crotchets (quarter notes) Base Clock
    - **Clock Pulse Output 5** - minims (half notes)
    - **Clock Pulse Output 6** - semibreves (whole notes)
    - **Clock Pulse Output 7** - dotted semibreves (dotted whole notes)



- Turning the **Spread Knob** left-of-centre decreases the spread of available division/multiplication variation for each of the **Clock Pulse Outputs**.
- Turning the **Spread Knob** right-of-centre increases the spread of available division/multiplication variation for each of the **Clock Pulse Outputs**.

- Turning the **Spread Knob** fully left results in all **Clock Pulse Outputs** producing quarter notes at the base clock rate set by an external clock source or the **Tap Tempo Button**.
- Turning the **Spread Knob** fully right results in the **Clock Pulse Outputs** producing clock pulses with the maximum spread of longest to shortest pulse intervals from the division/multiplication array. The longest pulse interval is a maxima (octuple whole note); the shortest pulse interval is a hemidemisemiquaver (sixty-fourth note).

Spread CV Input: The **Spread CV Input** accepts bipolar control voltage with a range of -/+5 volts.

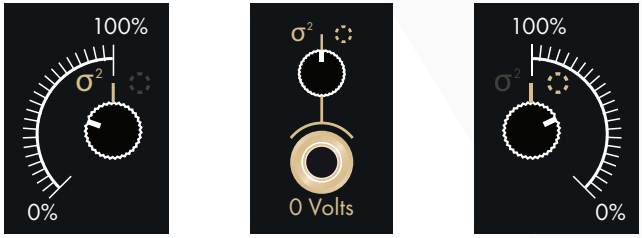
- Control voltage sums with the position of the Spread Control knob.

Once set, multiplication/division values for each output can be locked via the **Lock Programming Mode**. This feature allows users to curate the clock values from across different locations of the division/multiplication array and map them to individual
Clock Pulse Outputs.

See Lock Programming Mode for more information.

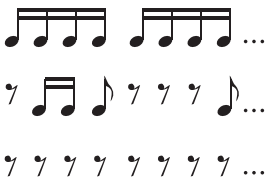
Probability Control

Probability Knob: Introduces random phrasing density or repeating phrasing density to each of the **Clock Pulse Outputs**.

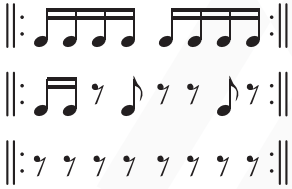


100% probability
when at 12 o'clock

Random Phrasing Density



Repeating Phrasing Density



- When the **Probability Knob** is in the centred position the **Clock Pulse Outputs** have 100% probability of producing clock pulses.
- Turning the **Probability Knob** left-of-centre decreases the probability of the **Clock Pulse Outputs** firing by introducing "coin-toss" logic, for random phrasing density.
- Turning the **Probability Knob** right-of-centre decreases probability of the **Clock Pulse Outputs** firing by introducing a density mask. This can be thought of as a looping 8-step sequence of clock pulses and rests for repeating phrasing density.
- Turning the **Probability Knob** fully left or fully right results in zero probability of a **Clock Pulse Output** producing clock pulses.

- A density mask sequence is preserved for as long as the **Probability Knob** and/or **Probability CV Input** is unchanged.
- A new sequence can be generated when changes are made to the position of the **Probability Knob** or value at the **Probability CV Input**.

Probability CV Input: The **Probability CV Input** accepts bipolar control voltage with a range of -/+5 volts.

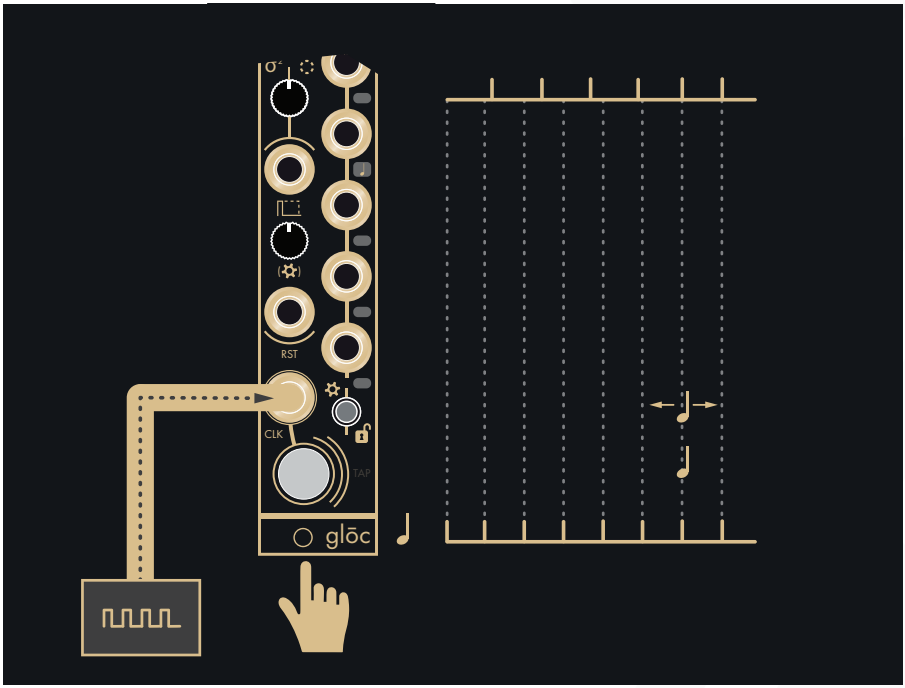
- Control voltage sums with the position of the **Probability Knob**.

Once set, individual **Clock Pulse Outputs** can have their probability values locked via the **Lock Programming Mode**. This feature allows users to curate "coin-toss" logic patterns and/or density masked sequences generated and mapped to individual **Clock Pulse Outputs**.

(See Lock Programming Mode for more information).

Clock

Clock Input (CLK): The **Clock Input** is a trigger input for setting the precise tempo of glōc. If the time between successive clock signals is variable, glōc will smoothly increase or decrease to new values, providing musical transitions between tempos.



Clock Pulse Outputs: glōc produces 5V clock pulse signals from each of its seven **Clock Pulse Outputs**.

- The **Clock Pulse Outputs** generate either: subdivided/multiplied, probabilistic or rhythmically-relevant stochastic clock pulse signals, determined by their output jack position and the values set by the **Spread Knob** and **Probability Knob.**

See the Programming Modes for more information.

PWM Knob: The **PWM Knob** controls the pulse width of all the **Clock Pulse Outputs**, globally.

- Turning the **PWM Knob** anticlockwise will decrease the pulse width of the pulses from the **Clock Pulse Outputs**.
- Turning the **PWM Knob** clockwise will increase the pulse width of the pulses from the **Clock Pulse Outputs**.

Reset Input (RST): When a trigger/gate signal is received at the **Reset Input (RST)** the internal counter used for determining the clock divided/multiplied outputs is reset. Similarly, the **Reset Input (RST)** can be used to reset the 8-step pattern generation to step1 for any applied repeating phrasing density.

Tap Tempo Button: The **Tap Tempo Button** is a manual control for precise tempo setting on glōc.

- Pressing the **Tap Tempo Button** two times will calculate a new tempo.
- Tap Tempos issued with the **Tap Tempo Button** will be ignored if an external clock source is present the **Clock Input (CLK)**.

As with external signals to the **Clock Input (CLK)**, glōc will smoothly increase or decrease the current tempo to new tap tempos issued via the **Tap Tempo Button**, providing musical transitions between tempos. The **Tap Tempo Button** blinks white at steady tempos, amber while transitioning between tempos, and off-white when an external clock signal or dummy cable is present.

Programming Modes

The glōc has three main modes selected by the position of the **Mode Toggle**.

Lock Programming Mode (Toggle Left): With the **Mode Toggle** set to the left position, users can set and store the **Spread Control** and the **Probability Control** values applied to individual **Clock Pulse Outputs**. This allows users to curate specific values from the division/multiplication array and/or rhythmic pulse sequences.

The **Output Select/PWM Knob** is used to select a **Clock Pulse Output** and the **Tap Tempo Button** is used to select/deselect the state. **Clock Pulse Output** states are indicated by their respective LED indicators.

An unilluminated LED indicates a **Clock Pulse Outputs** in an unlocked state.

A white illuminated LED indicates the current **Clock Pulse Output** to be selected.

An amber/white mix illuminated LED indicates the current **Clock Pulse Output** in a locked state.

An amber illuminated LED indicate **Clock Pulse Outputs** in a locked state.

Regular Mode (Toggle Centre): With the **Mode Toggle** set to the centre position, **Clock Pulse Outputs** will fire in accordance to their output position, values set by **Spread Knob/CV Input**, **Probability Knob/CV Input** or any settings stored via the **Lock Programming Mode**.

Live Mode (Toggle Right): With the Mode toggle set to the right position, all locked states applied to the **Clock Pulse Outputs** are ignored, reverting back to the current settings defined by the **Spread Knob/CV Input** and **Probability Knob/CV Input**.

Here the **Mode Toggle** can become a performative tool to quickly switch between locked grooves (**Regular Mode**) and steady/modulated clocking (**Live Mode**).

Saving a Configuration

glōc is capable of saving its current tempo as well as the locked/unlocked states of the **Clock Pulse Outputs**, to be preserved through power cycles. To do so, ensure that the **Mode Toggle** is in either the **Regular Mode** or Live Mode, and press and hold the **Tap Tempo Button**.

Factory Reset

To reset all **Clock Pulse Outputs** to their default unlocked states, press and hold both the **Tap Tempo Button** and switch the **Mode Toggle** left and right 8 times.

Manual Author: Ben (Obakegaku) Jones
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.