A compact, but incredibly musical sequencer / quantizer / arpeggiator – you name it! The Popcorn sequencer allows you to create a variety of melodic patterns by rearranging it's 8 tunable notes with several different types of control signals. It is incredibly musical when used with rhythm sequencers such as the Knit Rider, because it has two triggers, A and B, which will go 1,2,3, or 4 steps forward or backward, depending on the settings of their dedicated knobs. You can also address the steps with CV or 3 binary gates. You can use CV to transpose the pitch, transpose it in quantized steps or change the scale to minor or major with agate signal.

instruction

❶ Steps

Popcorn is a CV and Gate sequencer. It has 8 steps. Each step has a button, a knob and an LED. One of the steps is always ACTIVE (it has the cursor on it) and is routed to the CV and GATE outputs. The ACTIVE step is indicated by the step LED with the highest brightness. The Gate Buttons are used to either set the GATE (FN LED OFF) or the SLIDE (FN LED DIMMED) for the step. In combination with the FN button, the step buttons are used to adjust Popcorn's main settings. The Step knobs are used to set the voltage that goes to the CV Out. The voltage from the knobs is processed through the quantizer when activated.

❷ CV out

The CV Out is a 0-5V calibrated output that can create precisely quantized voltages (which correspond to the semitones in the V/Oct scheme). It outputs voltage based on the KNOB position of the ACTIVE step, processed by the quantizer. It can be also be transposed, using the CV input.

❸ Gate Out

The Gate Out outputs 5V gates on each ACTIVE STEP change. The Gate goes high only when the STEP GATE is ON (LED of the STEP is OFF when in GATE MODE). The length of the gate depends on the Gate Time parameter. If Gate Time is fully CW the gate holds HIGH as long as the step is active.

❹ Reset In

If a rising edge of a gate appears on the Reset Input the ACTIVE step is set to 1. The only exception from that rule is when using the RESET OFFSET feature - see CV INPUT.

❺ Trigger A and Trigger B

These trigger inputs are the key element of popcorn sequencer. On the rising edge of a gate or trigger they advance the ACTIVE step according to the setting of the TRIG knob, indicated by the 3 bi-polar LEDs. Turning the TRIG A or B knob (in GATE mode - see FN BUTTON) shows you green or red lights 1,2,3 or 4 (all of them ON). Green light means the trigger will advance the given number of steps forward (e.g. if the ACTIVE STEP is 2 and there is a green light indicating 3, the sequencer advances to step 5 on the next Gate). A Red light means the trigger will go the given number of steps backward (e.g. if the ACTIVE STEP step is 6 and there is red light indicating 2, the sequencer goes back to step 4 on the next Gate).
When the ACTIVE step position goes beyond number 8 it starts back at 1.

❻ FN Button

By shortly pressing the FN button, you switch between GATE (FN LED OFF) and SLIDE (FN LED DIMMED) modes.

When in **GATE MODE**, the STEP buttons are used to activate or deactivate the gates to be output from the GATE output. In GATE mode the TRIG A and B knobs are used to set the TRIG A and B step settings.

In **SLIDE MODE** the STEP buttons are used to activate or deactivate the SLIDE (slew limiter) on the CV OUT for individual steps. Also in SLIDE mode, turning the TRIG B knob allows you to set the GATE TIME and turning the TRIG A knob sets the SLIDE TIME.

While the FN button is **held down**, another layer of features is available on the STEP buttons and on the TRIG knobs. All labels in non-black color correspond to the functionality when the FN button is held down.
- Holding down the FN button and pressing STEP buttons 1,2 or 3 sets the RANGE of the CV Output. You can choose 1, 2 or 5 Octaves.

-Holding down the FN button and pressing STEP button 4 changes the mode of the CV Input (see its section).
-Holding down the FN button and pressing STEP buttons 5,6,7 or 8 changes the settings of the QUANTIZER (see its section).

Holding down a STEP button and then pressing the FN button will make that step ACTIVE in the same way as the Jump feature on the separate gate expander module.

❼ Range

The output CV range of the Popcorn sequencer can be 1, 2 or 5 octaves. Hold down the FN button and press step buttons 1,2 or 3 to select the range. 1 octave range means the output voltage is 0-1 volts , 2 octaves 0-2 volts and 5 octaves 0-5 volts.

❽ Quantizer

The Quantizer enables Popcorn to output voltages that correspond to the exact voltages of semitones (in equal temperament) in the volt per octave scheme. In other words, it takes the input voltage from a Step knob and changes it to the nearest voltage that corresponds to an exact semitone voltage. The quantizer on Popcorn enables you also to filter semitones in a musical way.
To setup the quantizer you need to hold down the FN button and press buttons 5,6,7 and 8 to set what you desire.

To turn the QUANTIZER ON (led 5 on) or OFF (led 5 off) hold the FN button and press step button 5.

To select between chromatic mode (led 6 off), scale mode (led 6 dimmed) and chord mode (led 6 on) hold the FN button and press step button 6. The quantizer has to be turned ON for this.

To switch between MINOR (led 7 off) or MAJOR (led 7 on) scales or chords, hold the FN button and press step button 7. The quantizer has to be turned on and you have to be in scale or chord mode to be able to do this.

To be more specific about the scale or chord, hold the FN button and press step button 8. The scale can be diatonic (led 8 off) , pentatonic (led 8 dimmed) or blues (led 8 on). The chord can be root+3rd+5th (led 8 off) ,root+5th (led 8 dimmed)

or root+3rd+5th+7th (led 8 on). The quantizer has to be turned on and you have to be in scale or chord mode to be able to do this.

See the following table for more details

	Chromatic Scale	Minor Scale	Major Scale	Minor Pentatonic	Major Pentatonic	Minor Blues	Major Blues	Minor Chord	Major Chord	Whole Tone Scale	5th	Minor 7th Chord	Major 7th Chord
Chroma Scale Chord	○	◐	◐	◐	◐	◐	◐	●	●	●	●	●	●
Minor Major	○	○	●	○	●	○	●	○	●	○	●	○	●
Regular Penta 5th Blues 7th	○	○	○	◐	◐	●	●	○	○	◐	●	●	●
B	●	●	●	○	○	○	○	○	○	○	○	○	○
A#	●	○	○	○	○	○	○	○	○	○	○	○	○
A	●	●	●	○	●	○	●	○	○	●	○	○	○
G#	●	○	○	○	○	○	○	○	○	○	○	○	○
G	●	●	●	●	●	●	●	●	●	●	●	●	●
F#	●	○	●	○	○	●	○	○	○	●	○	○	○
F	●	●	○	○	○	●	●	○	○	○	○	○	○
E	●	○	●	○	●	○	●	○	●	●	○	○	●
D#	●	●	○	●	○	●	○	●	○	○	○	●	○
D	●	●	●	●	●	○	●	○	○	●	○	○	○
C#	●	○	○	○	○	○	○	○	○	○	○	○	○
C	●	●	●	●	●	●	●	●	●	●	●	●	●

B

ALL

CV Input

The CV input has an input range of -5 to +5 volts and is calibrated. It can be assigned one of various functions. Hold down the FN button and press STEP button 4 to browse the different functions. Each one is indicated by a simple animation.

TRANSPOSE
Animation: step leds 1,2,3,4 are being lit up from the bottom upwards.
The Transpose feature simply adds the voltage on the CV input to the voltage of the output (after quantizing). Please note that the CV Output voltage has a limited range of 0-5V and it cannot go beyond that.

QUANTIZED TRANSPOSE
Animation: step leds 1,2,3,4 are being lit up from the bottom and step led 5 is blinking. Quantized Transpose adds the voltage on the CV input to the input voltage of the quantizer. This means that in this mode, Popcorn can be used simply as quantizer. Also, if you use it this way you can transpose sequences without messing up the harmonies set up in the quantizer! Another great use case is feeding a signal to the CV input which is converted to an arpeggio by the quantizer, which you can then transpose with the STEP knobs!

OFFSET
Animation: step leds going 1,2,3,4,5,6,7,8.
The offset immediately adds a certain offset to the ACTIVE step position. The offset is 0 to 7 steps corresponding to 0 to 5 volts and 0 to -7 steps corresponding to 0 to -5 volts.

RESET OFFSET
Animation: 3 red leds blinking on the TRIG A and B while step leds going 1,2,3,4,5,6,7,8.
The Reset trigger usually takes you to step 1. With the Reset Offset feature though, you can change the reset step number! The step number is 1 to 8 corresponding to 0 to 5 volts and vice versa with the negative voltage.

TRIG A STEPS
Animation: going thru -4,-3,-2,-1,1,2,3,4 on TRIG A leds
The CV on the CV input changes the number of steps to be advanced by TRIG A. The CV is added to the position of the TRIG A knob.

TRIG B STEPS
Animation: going thru -4,-3,-2,-1,1,2,3,4 on TRIG B leds
The CV on the CV input changes the number of steps to be advanced by TRIG B. The CV is added to the position of the TRIG B knob.

SLIDE TIME
Animation: green circular movement on TRIG A leds
The CV on the CV input is added to the SLIDE TIME parameter.

GATE TIME
Animation: green circular movement on TRIG B leds
The CV on the CV input is added to the GATE TIME parameter.

TRIG A AND B INVERT
Animation: TRIG A and TRIG B leds turning red and green
This works with a gate input which inverts the number of steps advanced by the triggers. E.g. when Trig A should advance 2 steps, a high gate on the CV input will make it go 2 steps backwards instead.

MINOR/MAJOR
Animation: step led 7 blinking, step 5 led ON
Works with a gate, which inverts the current state of the minor/major settings of the quantizer.

RANDOM STEP
Animation: flashes at random step numbers
Jumps to random step when a gate or trigger signal is sent to the CV input.

Boot menu

The Boot menu gives you access to a few more specialised settings. Hold down the FN button when powering up and Popcorn starts into the Boot menu.
In the boot menu each step button sets a different parameter.
Press step buttons 1,2 and 3 to select the type of Dual mode.
See DUAL MODE for more details.
Press step button 4 to make the CV output only active for steps with a lit gate LED (otherwise the CV output always sends the active step's CV no matter if a gate is output or not).
Press step button 5 to activate a bit of latency to the TRIG A and TRIG B inputs.

Press step button 6 to activate a bit of latency to the RESET input. - this allows you to prioritise between RESET or TRIG.
Press step button 7 to activate alternative functionality of the CV input expander module.
Press step button 8 to enter V/Oct tuner mode. See the website for more info.
Press the FN button to save the settings and exit the Boot menu.

Dual Mode

You can connect two Popcorn sequencers on the back side with a cable to enable dual mode. At startup the dual mode is never active. You have to activate it by holding the FN button on the master sequencer and pressing the FN button on the slave sequencer. By this routine you can decide which one is master and which one is slave. This difference is mainly on how the quantizer should be set. Also, the type of dual mode is taken from the settings of the master sequencer. You can set the dual mode type in the boot menu.

DUAL MODE 1
In this dual mode the two popcorns form a 16 step sequencer. All scale and quantizer settings are taken from the master sequencer. All trigger inputs can be used to control the sequencers. The cursor of the active step will be able to go across the two units.
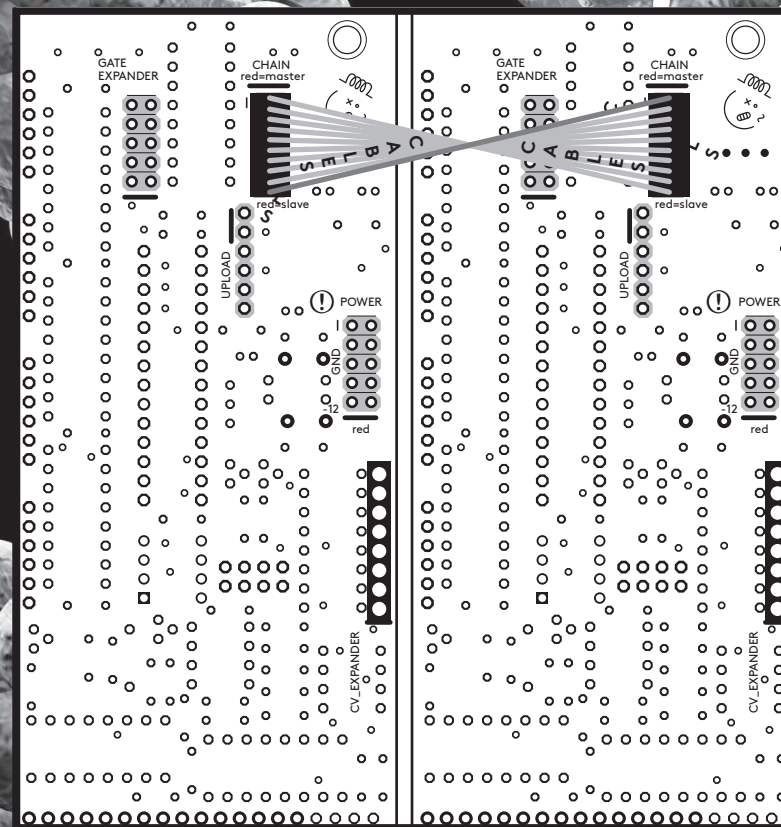
DUAL MODE 2
In this dual mode the two popcorns form two 16 step sequencers with two cursors for selecting the activated step. Settings of scale and quantizer are independent on each popcorn. Trigger inputs at each sequencer are used to advance that sequencers output. The cursor of the activated step will be able to go across the 16 steps.

DUAL MODE 3
In this dual mode the two popcorns work as two independent 8 step sequencers, but the activated step is always synchronised on both units. This mode can be used to sequence two linked parameters such as pitch and velocity or pitch and slide time etc.

You can exit the dual mode by holding the FN button on one sequencer and pressing the FN on the other sequencer.
dual mode connection

B

P.C. B Popcorn
Dual Mode Connection

Take it Carefully

technical details

- 10HP width
- PTC fuse and diode protected 10pin power connector
- 35mm deep
- current consumption: +12V: <65mA, -12V: <5 mA

features

- Selectable CV out range (1,2 or 5 octaves)
- CV input with adjustable destination (transpose, quantized transpose, offset, reset offset, trigger steps, invert steps, random step etc.)
- Gate OUT
- Adjustable Gate Time
- Adjustable Gates per step
- Quantizer (chromatic, scales – diatonic, pentatonic, blues, chords-7th, 5th, minor/major)
- Slide per step
- Adjustable Slide Time
- trigger A and B for moving through the pattern – the sequencer can go 1,2,3 or 4 steps forward or backward
- Reset Input
- trigger/reset priority settings
- dual mode: connect two sequencers to get 16 steps ! (3 different modes)

connecting module to your system

Before connecting the ribbon cable to this module disconnect your system from power !
Double check the polarity of the ribbon cable and that it is not shifted in any direction. The red cable should be attached to the -12V rail, both on the module and on the bus board side!

please make sure of the following
- you have a standard pinout eurorack bus board
- you have +12 and -12 power rails on that bus board
- the power rails are not overloaded by current

Although we put protection circuits in the device, we do not take any responsibility for damages caused by wrong power supply connection. After you connected everything, double checked it and closed your system so no power lines can be touched by your hand, turn on your system and test the module.