NUMERICAL

MIDIRack

Manual

The ultimate MIDI toolkit.

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Contents

MIDIRack Manual

MIDIRack is a **visual workbench for building MIDI processors and performance surfaces by hand** — no code. Patch a node graph, lay out knobs, faders and step grids, bind them to the parameters that matter, and play it as an **AUv3 plugin** or a **standalone app** on iPad.

It runs two ways:

- **Standalone** — its own transport, virtual MIDI ports, on-screen keyboard, and a built-in synth/drum voice so you can hear patches immediately.
- **AUv3** — a MIDI processor inside hosts like AUM, Logic Pro, Cubasis, Drambo or Loopy Pro. Insert it between a MIDI source and a synth; it follows the host transport and tempo automatically.

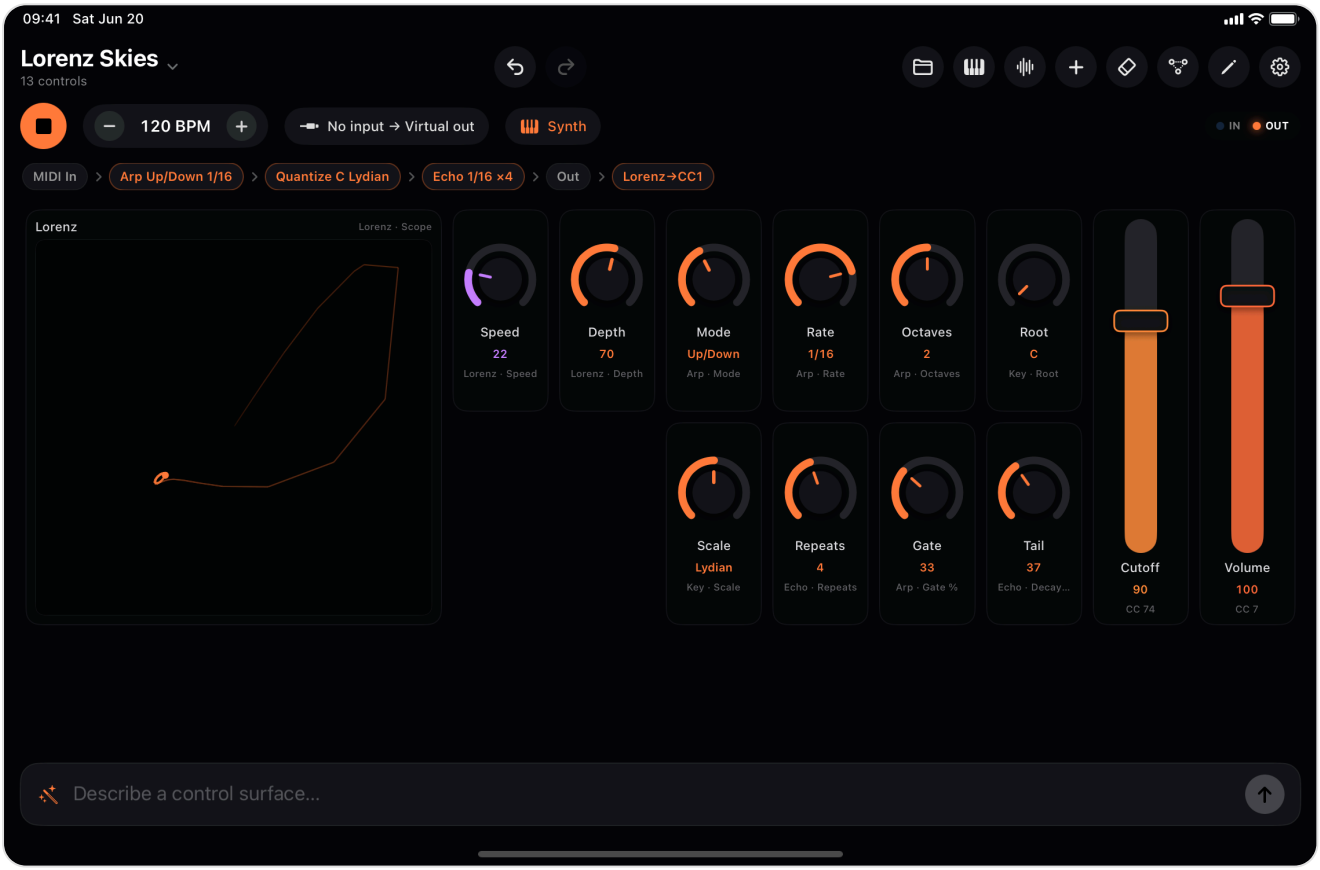
It runs on **iPad (iPadOS 17+)** and **iPhone (landscape only, iOS 17+)** — the standalone app and the AUv3 on both. A **Mac** version (macOS, Mac Catalyst) — the same app and AUv3 — is coming soon.

> **MIDIRack is a MIDI processor by default** — it receives, transforms and generates MIDI. To hear a patch you can:
>
> - Add **Synth** or **Drums** instrument nodes in the graph (built-in sound, no external synth required),
> - Turn on the **Synth/Drums** pill in the standalone transport bar (Transport & ports) — renders everything that would leave **MIDI Out**,
> - Or route **MIDI Out** into a synth in your host or another app.

Getting started

Standalone

1. Launch MIDIRack. **First Light** loads — a self-playing generative patch. (From then on the app reopens whatever patch you had last time; see Session restore.) Press **play** and listen. On first launch, a **Welcome Tour** spotlights the real UI (add menu, edit mode, graph, presets…) — a quick look-around, no hands-on work. When you want to learn by doing, open **Book → Tutorials** for two short guided lessons: **Basic Control Surface** and **Nodes & Bindings**. Reopen the tour anytime from **Book**.
2. To hear patches without routing anywhere, either add **Synth** / **Drums** nodes in the graph (Built-in instruments), or tap the **Synth/Drums** pill in the transport bar.
3. Or route **MIDIRack Out** into another app via the **cable** pill, press **play**, and perform.



AUv3

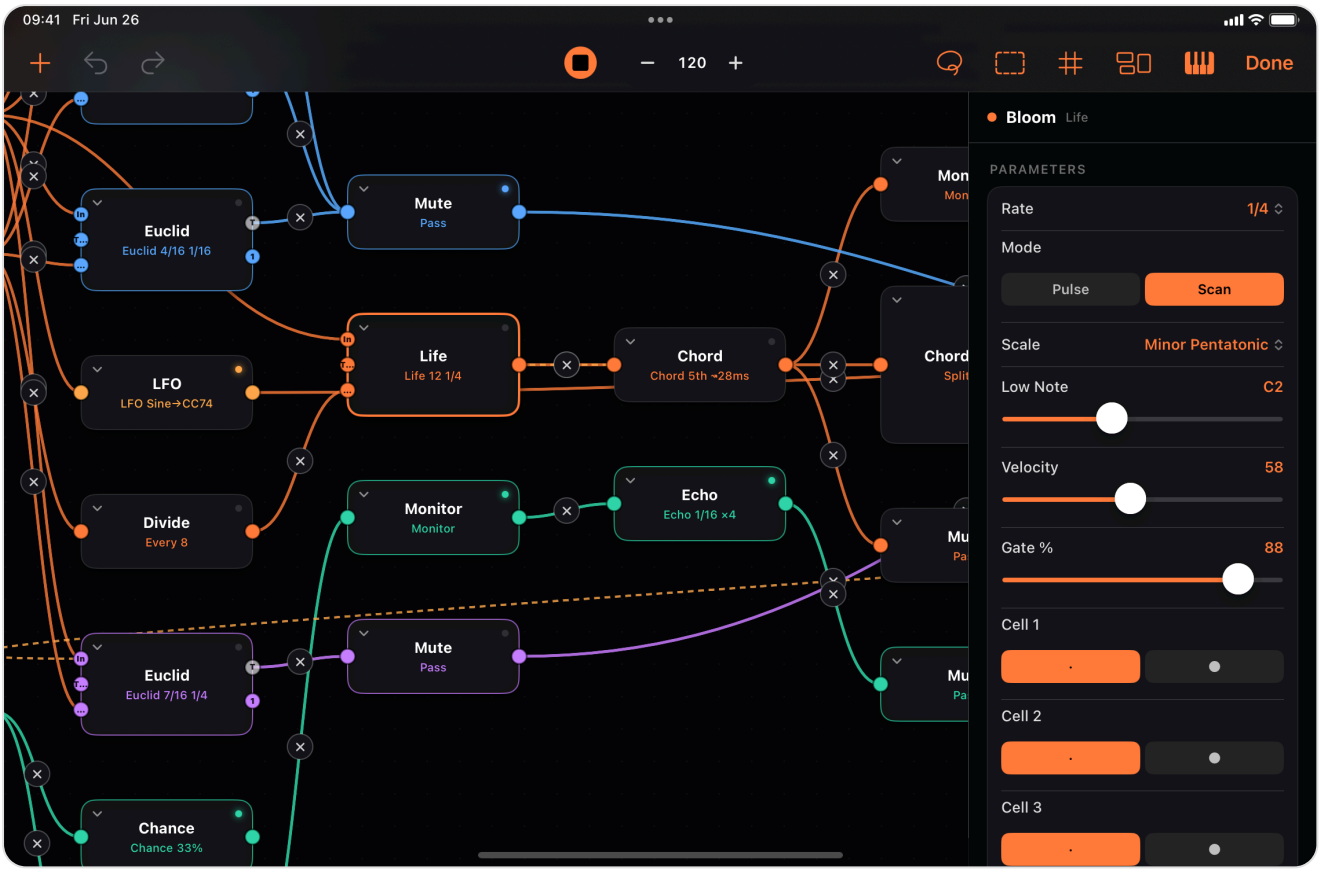
1. In your host, add **MIDIRack** as a *MIDI processor / MIDI plugin* (type `aumi`).
2. Route a MIDI source into it and a synth after it.
3. Press play in the host — tempo-synced nodes lock to host tempo.

MIDIRack accepts every view size the host offers. Below about 1000×640 the toolbar folds into compact chrome; if a host squeezes the plugin under 480×260 the full-size surface stays put and the window pans over it.

Build your first patch

This is the core loop: **graph + surface + play**. (The **Nodes & Bindings** tutorial in **Book → Tutorials** is a guided, hands-on version of steps 5–7.)

1. Tap the **folder** icon (or the patch name) and pick **Harmony Keys** — a simple one-finger chord patch. Press **play**.
2. Tap the **graph editor** icon (nodes) to open **Signal Flow**. You will see **MIDI In → processors → MIDI Out**.
3. Tap any node — the sidebar shows its parameters. Try changing **Chord** type or **Quantize** scale, then return to the surface and play.
4. Tap **+** on the graph toolbar → **Notes → Arp**. Drag it between **MIDI In** and the next node (or splice it onto the wire) so your chords arpeggiate.
5. On the surface, tap the **pencil** (edit mode), then **+** → **Add Knob**. Drag the knob into place.
6. With the knob selected, tap the **sliders** icon (inspector). Under **Binding**, pick a node parameter — e.g. the Arp's **Rate** or **Gate**.
7. Exit edit mode and turn the knob while holding a chord. You built it.



Try a factory preset

Tap **folder** to open the preset browser: **search**, category chips, and layout miniatures. Good first listens:

- **First Light** — the default boot patch; generative Life + arp, plays on launch.
- **Groovebox** — drum lanes + sliding bass with two pattern banks per lane; flip the whole kit from the **Scene Pads**.
- **Berlin School** — three Analog Seq rows of eight knobs: a plucked 1/16 riff with accents and 1/32 ratchet stutters, a slow **Roots** row that re-roots it bar by bar, and a stepped filter row. Twist **Direction** while it runs.
- **Infinity Canon** — one fractal melody at three time scales at once (a self-similar prolation canon); turn **Zoom** to invert the lead.
- **Clockwork** — a solid 4/4 kick and snare while hats (10), a clave (12) and a 3-beat bass gear against it, snapping back on the **Re-Lock** bar via the sequencers' Reset inputs — or instantly from the **Snap** pad.
- **Chord Voyage** — a chained chord progression on named chord pads.
- **Slide Bass** — a 303-style acid line where every note glides.
- **Lorenz Skies** — chaotic modulation + arp (self-playing; latch a chord).
- **Conway Choir** — Game of Life into a pad.

- **Trance Gate** — hold a chord, draw a gate pattern on the step row.

More presets are listed in the Factory preset list.

Using the app

Control surface

The main view is a grid of controls bound to the patch. Each control's caption tells you what it drives: `Arp · Rate` = a node parameter; `CC 74` = raw MIDI CC to your synth.

Knobs, faders, XY pads & buttons

- **Knobs / faders** — drag to set the value. A **fader** runs along its long axis: resize it wider than it is tall for a **horizontal** slider, taller than wide for a vertical one. Values display musically (note names, divisions like `1/8`, scale names). A knob's **Bipolar** switch (inspector) fills the dial from its center with a detent at 12 o'clock — for pan, detune, and other ± controls.
- **XY pads** — drag the puck; X and Y axes have independent bindings (node parameter or raw CC) in the inspector's **X Axis** / **Y Axis** sections.
- **Buttons** — send max when on, min when off. **Toggle** latches; **Momentary** is on only while held. Set mode with the **Momentary** switch in the inspector. Bind to **Mute**, **A/B Switch**, or **Pulse** node parameters to mute a branch, switch between A and B inputs, or fire a one-shot note/CC. Flip **Send Note** on to make the button play a note into the patch instead — momentary makes a trigger pad, toggle a latching drone switch (pick the note, velocity, and channel in the inspector).

Keyboards & pads

Performance controls that play notes *into* the patch. Each is its own node in the graph — route it independently through processors or to a specific output channel on **MIDI Out** (**Thru**, **Ch 1–16**, or **MPE**).

- **Keyboard** — piano; glissando by sliding across keys.
- **Drum Pads** — 4×4 GM kit on the percussion channel by default. **Layout** in the inspector picks GM, a chromatic grid, or a fully **Custom** per-pad note map (tap a pad in the inspector's mini grid to set its note and label, or learn it from a hardware pad hit).
- **Chord Pads** — one pad per scale degree (triad or 7th).
- **Scale Keyboard** — only in-scale keys; slide across to glissando.
- **MPE Seaboard / MPE Strings** — per-note pitch bend (glide), slide and pressure. External MPE synths **and the built-in Synth** now play with full per-note expression (see Built-in instruments). With **Glide off** a

slide retriggers each key (a glissando) instead of bending. **XY** mode turns every key into a small 2D pad: left-to-right position sends pressure, up-and-down sends slide, and the two move independently — hold a bright timbre at a soft level, or swell pressure without sweeping the filter. It trades per-note bend for that (Glide is off while XY is on, so a sideways slide glissandos across keys).

Keyboard toolbar — every keyboard carries a compact options bar across the top:

- **Latch** — notes sustain until tapped again (piano, chord and scale keyboards). **Polyphonic Latch** (inspector) controls whether latched notes stack or replace each other — chord pads default to **exclusive** (one chord at a time); piano and scale keyboards default to **polyphonic**.
- **Octave** — menu pill (C–1…C7) to set the played range.
- **Root / Scale** — pick the key (chord and scale keyboards).
- **Glide / Slide** — toggle horizontal pitch-bend and vertical timbre (CC 74) on the MPE surfaces. When an axis is off it sends nothing for it (Glide off glissandos across keys; Slide off sends no CC 74).
- **Pressure / XY** — two alternative feels for the MPE surfaces, one at a time. **Pressure** makes the vertical gesture send channel pressure only (for synths that expect aftertouch rather than CC 74). **XY** puts pressure on the horizontal position and slide on the vertical, independent of each other; Glide greys out while it's on.

Every change is saved with the patch and mirrored in the inspector. Hide the bar per control with **Show Toolbar** in the inspector (on by default).

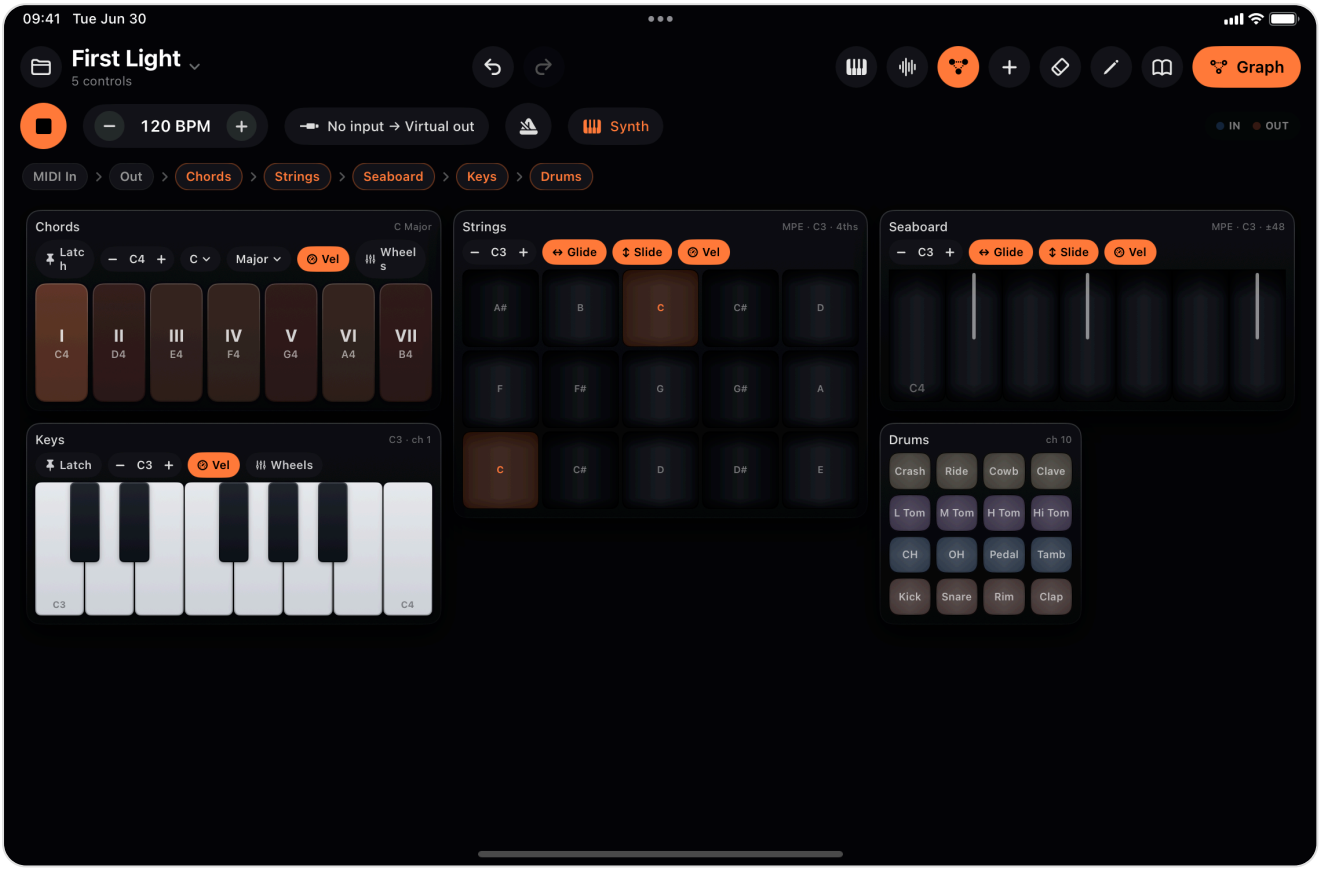
Velocity — keyboards and pads use **vertical touch position** for velocity by default (**Velocity Sensitive** in the inspector). Turn it off and set a fixed **Velocity** for uniform hits.

Apple Pencil — the Pencil has real force sensing, so on every keyboard and pad its strike force can drive velocity instead of the touch position — tap softly for a quiet note, jab for a loud one, anywhere on the key. The **Apple Pencil** option in the inspector picks what force controls: **Velocity**, **Pressure** (holding a key sends channel pressure — wire it to aftertouch-style modulation in your synth), both, or **Off**. On the **MPE surfaces** the Pencil goes further: force becomes true per-note Z while the vertical axis stays pure slide (CC 74) — the one input device where the two expression axes are genuinely independent, so they default to **Velocity + Pressure**. Drum pads use force for velocity only. Finger playing is unaffected either way.

Computer keyboard — on a Mac or an iPad with a hardware keyboard, the usual QWERTY piano plays too: **A S D F G H J K L ; '** are the white keys from C, **W E T Y U O P** the black keys, **Z / X** shift the octave and **C / V** step the velocity. It plays the **slide-up keyboard** whenever that's open (its octave display follows Z/X), otherwise the **last keyboard control you touched** — through that control's channel, so arps and scale mappings apply: on the scale keyboard and chord pads the white keys are scale degrees, drum pads take **1–8** (top two rows) and **Q–I** (bottom two), and the MPE surfaces open a per-note voice per key (chromatic on the Seaboard and the chromatic Strings grid, scale degrees on an in-key Strings grid). A held key is one note; typing in a text field always wins. Turn it off under **Settings → Hardware Keyboard** if you've bound those keys elsewhere. In the AUv3 the host owns the letter keys, so there they only play while the slide-up keyboard is open.

Pencil curves — with a Pencil mode on, the inspector shows a **Pencil Curve** plot (strike solid, hold dashed) and a set of rows per curve. Pick a preset from **Strike Curve** / **Hold Curve** (**Light**, **Natural**, **Linear**, **Firm**, **Hard**) or drag **Response** to lean it yourself: negative lifts light touches so a soft player reaches the

loud end sooner, positive holds them back so only a firm strike gets loud. **Full Force** sets how much of the Pencil's range counts as "all the way" — most people never comfortably reach 100%, so 60–70% makes a firm-but-sane strike hit the ceiling. **Velocity Min/Max** and **Pressure Min/Max** clamp the output — cap pressure at 64, say, to keep aftertouch modulation subtle. **Reset to Factory** in the preset menu puts a curve back. All of it saves with the patch, per control.



Step grids

Tap to toggle hits; **drag across a row** to draw a run. A playhead marks the current step while transport runs.

- **Microtiming** — long-press a step, drag left/right to nudge (up to half a step).
- **Melody lanes** — set a pitch per step on the surface grid. The bound **Step Seq** node's **Root** + **Scale** snap output in-key (**Chromatic** = off); the ladder shows the sounding note after quantization.

Lane+ — pattern, probability, tie & trigger conditions

Every sequencer lane (**Drum**, **Melody**, **Chord**, **CC**) adds the combined **Lane+** control: a small picker above the row switches between up to five layers on the *same* 16 cells —

- **Pattern** — the ordinary hit / pitch / chord / CC-value row described above.
- **Vel** — per-step velocity as a percentage of the lane's **Velocity** (default 100%). Drag a cell's height to shape accents and ghost notes; a tap toggles full ↔ half level. Hidden on lanes without velocity (CC).
- **Prob** — per-step probability 0–100%. Drag a cell's height to dial it in; tap toggles a step fully on/off. A step below 100% only fires *that* percentage of the time it's reached.
- **Tie** — tap a step to tie it to the previous one: the tied step doesn't retrigger, it just extends the previous note's gate through it (no pitch glide). Handy for held notes and legato drum rolls. Hidden on lanes without ties (CC).
- **Cond** — tap a step to cycle its trigger condition (**Always**, `1:2`, `2:2`, `1:3`, `2:3`, `3:3`, `1:4` … `4:4`): the step only fires on that one pass out of every *M* loops through the pattern — e.g. `1:3` fires once every three times round.

A **Chord Seq** lane uses the same card, but its pattern cells are **named chord pads**: each step shows its chord symbol ("C", "Am", "G7") with the roman numeral above, following the node's **Root** / **Scale** / **Chord**

knobs live — the progression reads at a glance. Drag up or down to pick the degree (I…VII); tap toggles a rest. The auto-attached lane fits itself to the active steps, so a 4-chord progression gets four big pads.

Long-press the control's edge to open its inspector and turn on **Hide Layer Picker** if you just want the plain pattern row back (probability/tie/ condition data on the node is untouched — only the picker bar disappears).

Pattern banks

Next to the layer picker, the Drum, Step and Chord Seq lanes show four **bank chips — A·B·C·D**: four independent 16-step patterns per lane, each with its own probability, tie, condition and microtiming layers. Tap a chip to edit that bank *and* switch the sequencer to it — the change lands at the next pattern wrap, so switches always hit the downbeat. A small dot marks the bank that's currently sounding when it differs from the one you're editing, and the playhead only shows on the sounding bank.

Auto-follow is on by default: the lane tracks whichever bank is sounding, so you watch a Chain cycle A→B→C or a modulated Pattern switch scenes without touching anything. Tapping any bank chip pins the lane for manual editing; the **eye chip** at the end of the strip re-engages follow. (Also in the control inspector as **Follow Playing Bank**.)

Two node parameters drive this (bindable and modulatable like any other):

- **Pattern** — the active bank. Bind a button for manual scene switches, or modulate it (a **Counter** fed by another lane's EOC makes verse/fill arrangements).
- **Chain** — Off, or cycle **A·B** / **A·B·C** / **A·B·C·D** automatically, one bank per pattern loop. While a chain runs it overrides **Pattern**.

To switch every lane at once, add **Scene Pads** (**+ → Scene Pads**): four pads (A–D) that point all Drum/Step/Chord Seq lanes at that bank in one tap — each lane still switches at its own wrap, so the whole kit lands together on the downbeat.

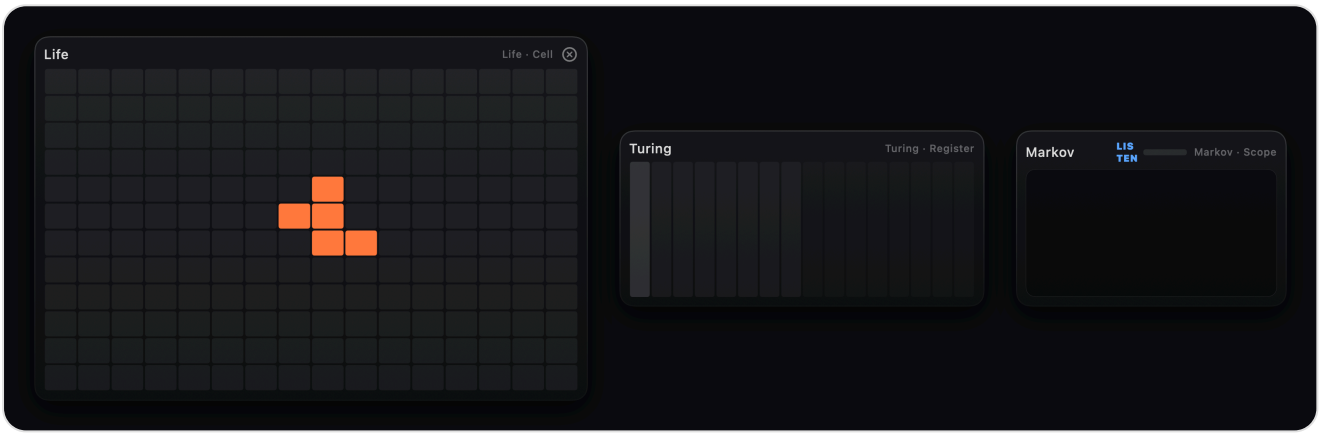
Presets saved before pattern banks existed simply play bank A, exactly as they always did.

Scopes & visualizers

- **Monitor** — text log of MIDI at a splice point (add from **+** menu).
- **Note Scope** — scrolling piano-roll of live note output (add from **+** menu).

- **CC Scope** — scrolling CC trace (add from **+** menu).
- **Looper** — record / play / clear for a Looper node. Add one from the **+** menu and it splices a Looper into the signal path automatically.

- **Life grid, Register views, Scopes** — attached automatically with their emergence nodes (Game of Life, Turing, **Rule**, Markov, Bounce, Attractor).



Every touch goes to the control under your finger — the surface scrolls only by the **scroll bar** on its trailing edge when a page is taller than the window (or by one-finger pan with **Scroll by touch** on in Settings). Drag a control taller in edit mode for full-height keyboards; the layout grows to fit. Cells never shrink below a playable size: in a very narrow window (a small AUv3 host slot) the grid keeps its minimum cell and a second scroll bar along the bottom pans it sideways. The slide-up keyboard needs about 360pt of height and greys out below that.

Pages

A surface can hold several **pages** — hardware-style banks you lay out explicitly, so a big patch splits into performance and mix views instead of one tall grid. When a patch has more than one page (or you're in edit mode), a **page strip** floats at the bottom of the surface: tap a number to switch, **+** (edit mode) adds a page.

- **Move controls between pages** with the **Page** row in the inspector (moves the whole selection; **New Page** creates one), or long-press a page number in the strip for **Move Selection Here**.
- **Name a page** by long-pressing it in the strip (edit mode) → **Rename Page…** — "Play", "Mix", "FX" instead of 1, 2, 3. Names show on the strip chips and in every page menu; leave one empty to go back to the number.
- **Delete a page** by long-pressing its number in the strip (edit mode) — its controls move to page 1, never silently deleted.

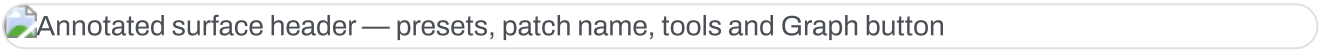
- **Bind a button to a page**: the button inspector's **Switch to Page** row makes pressing it flip the surface — a bank button. Combine with MIDI Learn and a foot switch turns pages hands-free.

Switching pages never cuts anything off: held and latched notes on other pages keep sounding, and everything on every page stays live in the graph. Which page you're looking at is not part of the patch — loading and saving always keeps your place.

See the Control catalog for a screenshot and description of every control type.

Header & edit mode

The surface header, left to right:


Annotated surface header — presets, patch name, tools and Graph button

Control	What it does
Folder / patch name	Open the preset browser
IN / OUT LEDs	MIDI activity (blue in, orange out) — shown in AUv3 and compact layouts
↶ / ↷	Undo / redo
Keyboard	Slide-up piano (injects notes into the graph)
Panic (raised hand)	All notes off, everywhere — see below. **⌘.** on a hardware keyboard
Signal flow	Show / hide the signal-flow strip above the surface (reclaims space in small windows)
+	Add a control, visualizer, looper, or sequencer lane
Eraser	Clear surface, graph, or everything
Pencil	Edit mode — move, resize, inspect controls
Book	Manual, the **Welcome Tour** (an interactive spotlight walkthrough of the live app; runs on first launch, replays from here) and **Tutorials** — two hands-on guided lessons, **Basic Control Surface** and **Nodes & Bindings**
Gear	App settings — launch behaviour, session restore, haptics

Graph	Open Signal Flow (accent button, far right)

Panic silences a stuck note without stopping the transport: every keyboard and pad lets go (latched notes and latched note buttons included), every node in the graph releases what it is sounding (arps, held chords, mono/glide voices, sequencers), note-offs go out for anything still ringing, and **CC 123** (All Notes Off), **CC 120** (All Sound Off) and **sustain off** are sent on all 16 channels for external gear that missed a note-off. The sequencer keeps running — the play/stop button is the only transport control.

Edit mode (pencil, or **double-tap** a control):

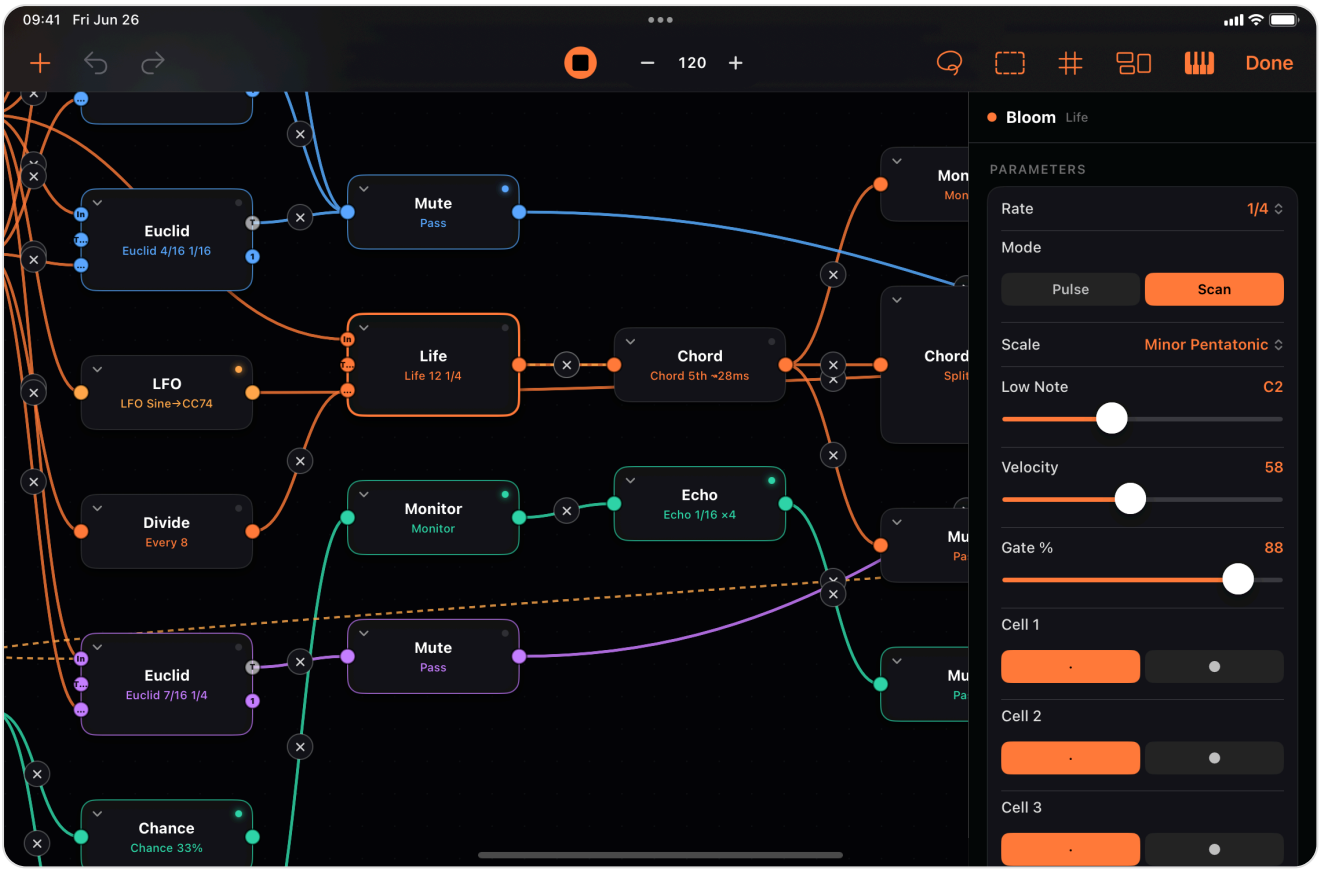
- **Move** and **resize** controls — others flow out of the way.
- **Add** controls or whole sequencer lanes from **+**.
- **Inspect** (sliders) — rename, rebind, recolor (**Appearance**).

> **Tip: long-press a control's edge** (~½ s) to open its inspector without entering edit mode. The long-press is on the border only.

Graph editor

Open **Signal Flow** from the graph icon or the signal-chain chips. MIDI flows **MIDI In → MIDI Out** on **solid orange wires**; **dashed wires** are *modulation*. Chips are **tinted to match** their node's color tag — tap one to jump to that node in the graph and open its inspector. Standalone toolbar also has **transport** and a **#** grid-snap toggle.

Every node is also a control source. Whatever continuous value a node produces — an **LFO**'s wave, a **CC Seq**'s steps, a **CC Envelope**'s level, **Sample & Hold**, keyboard **aftertouch** — drives a parameter the exact same way. There's no separate "CC" vs "modulation" signal: drag any output onto a node's body and choose **Modulate *param***. (A node's **Target CC** only matters when you also send its value onward to a synth.)



Wiring basics

Action	How
Select / edit	Tap a node — sidebar shows parameters
Select several	**Lasso** (toolbar) → drag a box; drag any selected node to move the group
Move	Drag
Connect	Drag from an output onto another node's **left input edge**
Connect without dragging	Node inspector → **Connections** → **Add Connection**
Modulate	Drag any output onto a node's **body** → pick **Modulate *param***
Scale a mod wire	Inspector → **Connections** → tap a mod wire's **range** pill → set **From / To**

Add mid-wire	Drop a wire on empty canvas → **Add Node**
Splice	Drag a node onto a wire
Disconnect	Tap × on a wire, or scissors in Connections
Tidy layout	**Group** icon — auto-arrange nodes
Color a path	Node inspector → **Color Tag** swatch
Node reference	Node inspector → **book** icon — that node's manual entry
Group frame	▢ (dashed-rectangle) toolbar icon
Bypass	Node inspector → **Bypass** toggle (or bind a button)
Fit graph	Toolbar **fit** icon — frame the whole patch in the viewport
Zoom	Pinch (centred on touch/cursor); tap **%** to reset

Each node has an **activity LED** (top-right) — the first dark LED is where MIDI stops.

The inspector's **Connections** section is a full patchbay of its own: **Add Connection** creates a MIDI or modulation link in either direction (multi-port nodes offer their port combinations), the **scissors** cuts one, and mod wires expose their **range** pill there. Duplicate links and MIDI loops are never offered. It works anywhere the inspector opens — including from the surface's signal-chain chips, without entering the graph editor.

Organizing: color tags & group frames

As a patch grows, two purely **cosmetic** tools keep it readable — neither changes the sound, and both ride along when an AI assistant builds a patch:

- **Color tags** — select a node, open the inspector's **Color Tag** swatches and pick a hue (**Default** clears it). The color flows **downstream**: the node, every node reachable from it along MIDI wires, and the wires between them all take the tint — up to (but not including) the shared **MIDI Out**. Color the bass generator and its whole chain lights up, so parallel paths read at a glance.
- **Group frames** — tap the ▢ (dashed-rectangle) toolbar icon to drop a labeled backdrop. With nodes selected it **wraps the selection**; otherwise an empty frame appears at the view centre. Drag its **title chip** to move the frame and everything inside together; drag the **corner handle** to resize. Select a frame to **rename, tint or delete** it (deleting leaves the nodes in place).

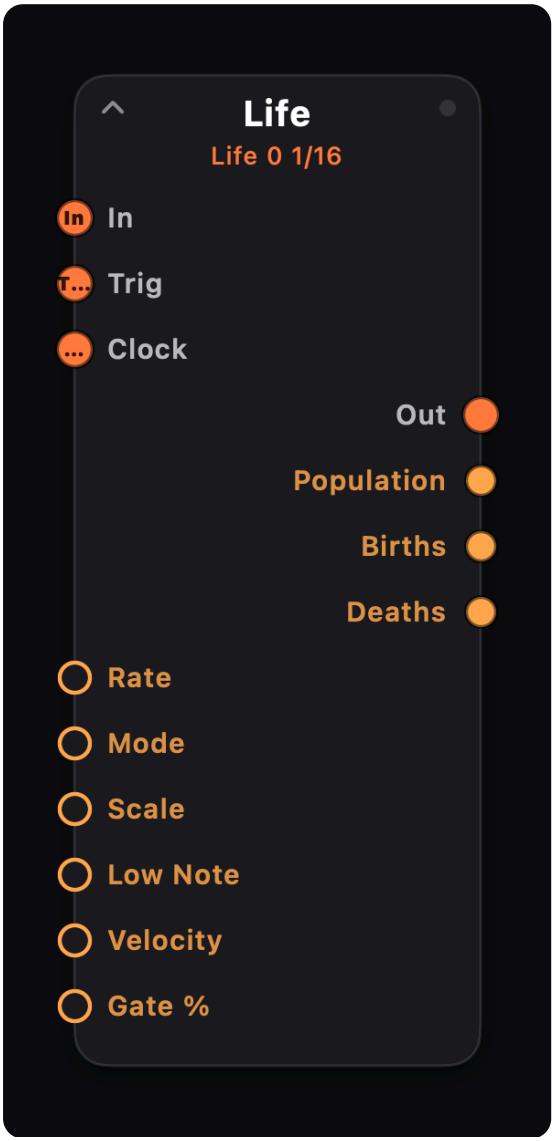
Bypassing a node

Open a node's inspector and flip **Bypass** to disable it — its MIDI then **passes straight through unprocessed** (the toggle reads **Active** / **Disabled**). Entering bypass flushes any notes the node was

holding as note-offs, so nothing hangs. Bypass is **bindable**: assign a button to the node's **bypass** slot to mute or A/B a processor live without rewiring. The state is saved with the patch.

Patchbay (expanded nodes)

Tap the **chevron** on any node to expand its patchbay — a labeled row per **output**, **mod source**, and **parameter input**. Dropping a wire on a parameter row is the fastest way to modulate; you can also drop on the node body and pick from the menu.



Port colors

Style	Examples	Role
Orange · solid	In, Out, Trig, Clock	MIDI in/out and external step clocks

Amber · filled	Population, Births, Deaths	Modulation *outputs* — drag onto any parameter
Amber · hollow	Rate, Mode, Scale…	Parameter *inputs* — receive mod wires

Life node expanded — compact patchbay with clock ports, scalar parameters, and three mod outputs. Sequencer step rows stay on the surface grid, not in the patchbay.

Scaling a modulation wire

By default a modulation wire drives its target across the parameter's **full range** — a source swinging 0…1 sweeps the whole parameter. To drive only a **slice**, open the **Connections** list in either node's inspector and tap the wire's **range pill**, then pick a **From** and **To** value. The choices are shown in the parameter's **own units** — *Rows … Columns* for a Matrix's Mode, note names for a pitch, percentages for a continuous control. **Full range** resets it.

This is what makes **stepped** modulation land where you expect. A **Counter** emits evenly-spaced values across the wire's range, so wire one into a Matrix's **Mode** and:

- leave the range **Full** with the Counter's `count` at **6** → it walks all six directions (Rows → Columns → … → Random);
- cap the wire to *Rows … Columns* with `count` **2** → it alternates just those two.

Rule of thumb: set the Counter's `count` to the number of values inside the wire's range.

Clocking a generator externally (Trig / Clock)

Every clock-driven generator — **Euclid, Random Notes, Fibonacci, Drum Seq, Step Seq, CC Seq, Game of Life, Turing, Rule, Markov, Random Walk, S&H** — has two extra input ports, **Trig** and **Clock**. Either one **takes over from the internal clock**; they're mutually exclusive (wire one or the other, not both), and the surface step grid's playhead follows whichever is driving.

- **Trig** — wire any **note source** (a keyboard, another sequencer, an arp). The node advances one step per incoming **note-on** instead of running at its **Rate**. It steps even while the transport is **stopped**, so you can hand-play or finger-drum a pattern.
- **Clock** — wire a **Clock** node (+ → Generate & Modulate → **Clock**). The node advances one step per clock **pulse**. Run one Clock node into several generators' Clock inputs to lock them all to one tempo and change it **from one place** — set the Clock's **Rate** (and **Sync** to follow the host transport, or **Free** to run independently).

Leave both unwired and the node clocks itself as usual.

The pattern sequencers — **Euclid, Fibonacci, Infinity, Drum Seq, Step Seq, CC Seq** and **Chord Seq** — carry a fourth input, **Reset**: a note-on or clock pulse there restarts the pattern at **step 1** on the next tick, on either clock mode. The pattern bank re-latches and the EOC realigns with it, so a reset re-syncs a whole

chained kit. Wire a master lane's **EOC** into the others' Resets to keep polymetric lanes locked, or a performance pad to yank every lane back to the downbeat.

Chaining patterns with EOC

Fixed-length cyclic nodes — **Drum Seq, Step Seq, Chord Seq, CC Seq, Matrix, Euclid, Fibonacci, Turing, Rule, Gate** and **Looper** — carry a second orange output, **EOC** (end-of-cycle), beside their main **Out**. It fires **one pulse each time the pattern wraps back to step 1** — a "bar done" tick that carries no notes.

Wire **EOC** into another node's **Trig** or **Clock** to chain patterns: flip an **A/B Switch** once per bar, advance a longer **Step Seq** one step per Euclid cycle (polymeter), or restart a follower so phrases stay locked. Nodes without a Trig/Clock input ignore it.

For variations *within* one sequencer you don't need EOC wiring at all: the Drum, Step and Chord Seq carry four **pattern banks** (A–D) with a built-in **Chain** — see Pattern banks above. Wire a lane's EOC into a **Counter** that modulates another lane's **Pattern** parameter for song structures beyond the built-in chain.

MIDI In as mod source

Source	Signal
Velocity	last note-on velocity
Note	last pitch (keytracking)
Gate	1 while any note held
Mod Wheel	CC 1
Pitch Bend	bipolar, centered
Pressure	aftertouch

Modulating from a node's output

When you wire a node's **Out** (or a split voice, chord voice, etc.) to modulate a parameter, the target follows the **pitch of notes that node actually emitted** — after transpose, quantize, arp, and other upstream processing. Named mod sources (MIDI In **Note**, Life **Population**, LFO, …) behave as before.

Built-in instruments

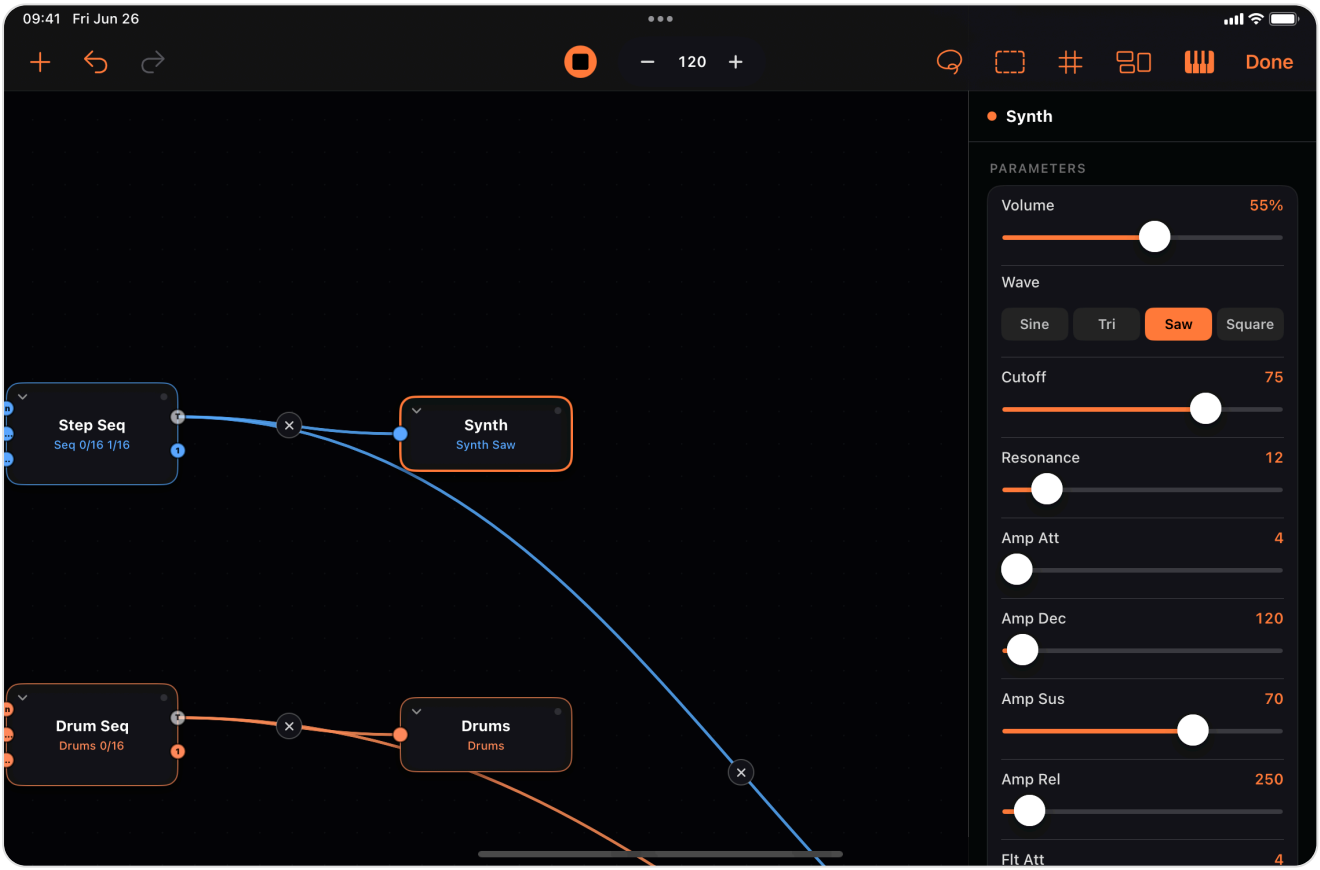
Synth, **Drums**, **Sampler** and **Slicer** are **terminal instrument nodes** — they consume MIDI and render audio inside MIDIRack. They emit **no MIDI downstream** (unlike **MIDI Out**). Add from **+ → Instruments**.

- **Synth** — polyphonic subtractive voice: pick a **Preset** (Warm Pad, Acid Bass, Bright Lead…) to load a starting sound, then tweak **Wave**, resonant lowpass (**Cutoff**, **Resonance**), amplitude ADSR and filter envelope (**Flt Env** depth in octaves). It's **MPE-aware**: play it from an MPE Seaboard/Strings keyboard and each note bends (**glide**) smoothly — pitch bend is slewed so MPE ribbons and **Glide** node ramps don't stair-step. **Slide** (CC 74) opens the filter and **channel pressure** swells volume, independently. On

ordinary single-channel MIDI, **mod wheel** (CC 1) adds **vibrato**; other patches behave as before. Hand-editing any control flips the preset to **Custom**.

- **Drums** — procedural GM kit: **Preset** (Punchy, Trap, Lo-Fi…) fills per-voice **Pitch** (±12 semitones) and **Decay** (% tail length) for Kick, Snare, hats, toms, Crash, Ride, Perc, etc.
- **Sampler** — SP-style chromatic sample player: pick a factory **Sample** or load your own from the node inspector (the root note is auto-detected so imports land in tune), trim the playable region on the waveform card, and set **Mode** to Loop to turn one-shots into playable pads, keys and basses. The Synth's resonant lowpass and amp ADSR shape the result; **Glide** node slides bend it like any synth voice.
- **Slicer** — loads a drum loop and cuts it at its detected hits into up to **16 one-shot slices**, slice 1 on note **36** (a fresh Drum Seq's default), slice 2 on 37, and so on — point one **Drum Seq** lane per slice and the loop becomes a kit you can resequence. Tap or drag markers on the waveform card; **Sense** re-runs detection, and each slice has its own **Pit** and **Dec**.

Wire keyboards, sequencers or generators into separate instrument branches for a **self-contained patch** — no external synth required. Multiple instrument nodes **sum** at the audio output.

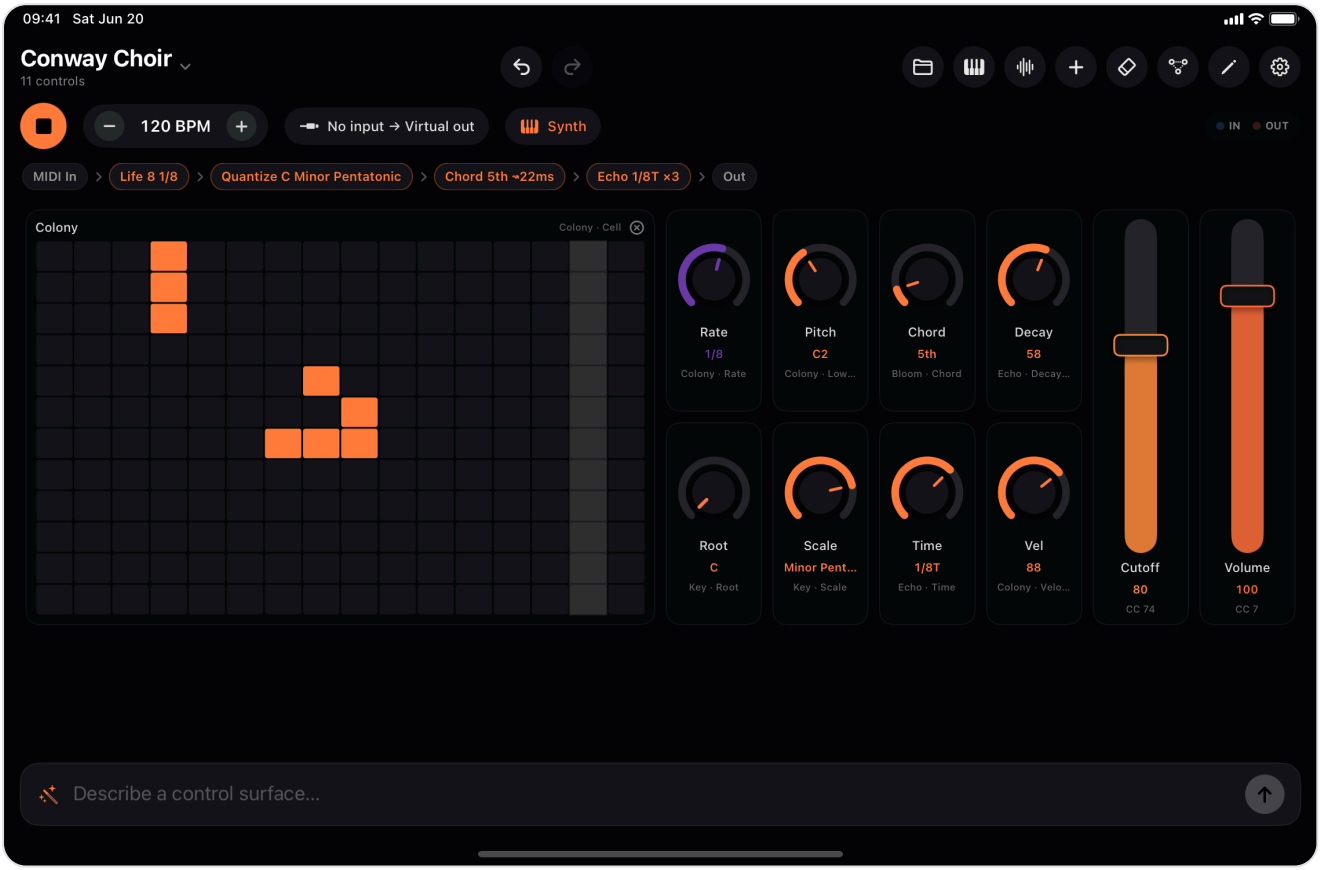


Standalone: the transport **Synth/Drums pill** renders the *entire* patch (what would leave **MIDI Out**). When you add a graph **Synth** or **Drums** node, the pill turns **off** automatically so you don't double the level — turn it back on if you want both the global voice and the instrument nodes.

AUv3: instrument nodes let the plugin produce audio directly in hosts that support a MIDI processor with audio output; you can still route MIDI onward to external synths on other tracks.

Emergence nodes

Game of Life, Rule, Turing, Markov, Bounce, Attractor — evolving patterns with live surface visualizers. Draw a Life seed and scan it into melody; flip Markov from **Listen** to **Generate**; wire Attractor **X/Y/Z** into any parameter. See the Node catalog for parameters.



Slide-up keyboard

The **pianokeys** button slides up a keyboard whose notes enter the graph like host MIDI — arps, splits and quantizers all process them. The **Octave** menu sets the range; multi-touch chords supported.

Transport & ports

Standalone only:

- **Play/stop** and **BPM** — tempo-synced nodes follow; AUv3 follows the host.
- **Metronome** — tap the metronome icon for a click on every beat (accent on the downbeat). Follows host transport in AUv3; silent while stopped.
- **Cable pill** — MIDI in/out. **MIDIRack Out** is always published.

- **Synth/Drums pill** — global built-in voice for instant audition of the whole patch output. Pick **Synth** (poly) or **Drums** (GM kit). Independent of graph **Synth** / **Drums** instrument nodes — see Built-in instruments.
- Stop releases all notes (stuck notes guarded at several layers).

MIDI Learn — hardware controllers

Any knob, fader, XY axis, selector or button on the surface can be driven by a knob on your hardware controller:

1. Select the control and open the inspector (**sliders** icon).
2. In its **Binding** section, tap **Learn** under **Hardware** — the row shows *Waiting for MIDI*.
3. Twist a knob (or move a fader) on the controller. The first CC that arrives becomes the mapping, shown as **CC n · Ch n**. **Relearn** replaces it, **Clear** removes it.

Learned mappings are saved **with the patch** and work identically in the standalone app and the AUv3. The on-screen control follows the hardware.

Buttons also learn pads and keys: while a button is armed, hitting a pad binds its **note** instead of a CC. A toggle button flips on every hit; a momentary button is on while the pad is held.

Per-mapping switches (shown for the mapping kind they apply to):

- **Relative Encoder** — for endless encoders that send two's-complement deltas (1…63 up, 127…65 down) rather than absolute positions: each detent nudges the control one step. No takeover needed — an encoder has no position to disagree with.
- **14-bit (MSB + LSB)** — controllers sending high-resolution CC pairs (a CC below 32 plus its +32 partner) drive the control at 14-bit resolution; the coarse byte applies immediately, the fine byte refines it.
- **Soft Takeover** (on by default) — the hardware pot is ignored until it sweeps across the control's current value, so the first nudge can't make the sound jump. Turn it off to have the control snap to the pot immediately.
- **Pass Through** (off by default) — normally a learned message is *consumed*: it drives the surface control and does **not** continue into the patch, so a controller knob mapped to filter cutoff doesn't also spray CC 74 through the graph. Turn Pass Through on to have it do both.

To use a controller **and** a keyboard at the same time, set the input in the **cable pill** to **All Inputs** — learned messages go to their controls, everything else plays the patch. Keyboards and pad **controls** on the surface are played through MIDI input as always — note learn is only for buttons.

Session restore

The standalone app autosaves the patch you're working on (a couple of seconds after each edit, and whenever the app goes to the background) and reopens it on the next launch — no need to save a preset just to keep your place. The autosave is separate from your preset library and never shows up in the browser; a restored patch still knows which preset it came from, so **Save** overwrites rather than duplicates.

If the app didn't shut down cleanly (a crash, a force-quit), it boots **First Light** and asks **Restore your last patch?** — **Restore** brings it back, **Start Fresh** leaves it on disk for later, so a patch that misbehaves on load

can never trap you at launch.

What comes back is the **patch** — controls, graph, parameters, layout — not the **performance**: looper recordings, Markov tables, Turing registers and sequencer playheads start empty, as they do after any preset load. The AUv3 isn't affected; the host saves its state with the project.

Session restore can be turned off in Settings — the app then opens on First Light every launch.

Settings

The **gear** button in the header opens the app settings sheet:

- **Start playing on launch** (standalone) — on by default: the app opens with the transport running, so a self-playing patch sounds right away. Turn it off to open silent — nothing sounds (or reaches external gear) until you press **play**.
- **Reopen last patch on launch** (standalone) — the session restore behaviour. Off starts on First Light every time; the autosave keeps running, so switching back on restores your latest work.
- **Sync presets with iCloud** (standalone) — on by default when the device is signed into iCloud: your saved patches and folders follow you to every device on the same account, and the library shows up in Files under **iCloud Drive › MIDIRack › Presets** (see Presets). Off keeps the library on this device only; nothing is deleted either way.
- **Haptics** — all of the app's haptic feedback (panic, save confirmation).
- **Version** — the installed app version and build.

The AUv3 shows the sheet too, minus the transport and session rows — the host owns both there.

Presets

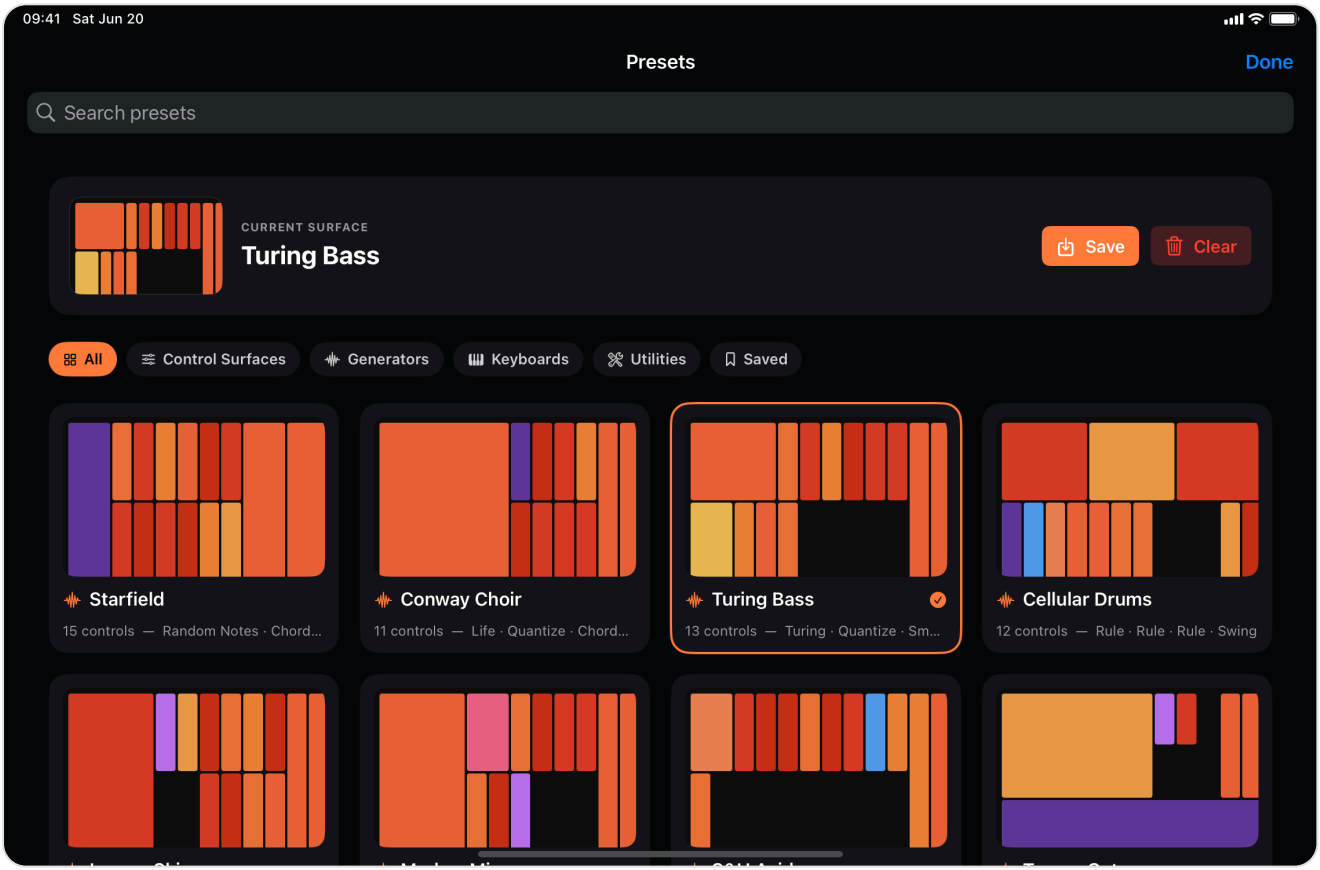
Folder or patch name → full-screen browser with search, category filters, and layout miniatures. The **All** view is split into **one section per category** (factory + your saved patches of that category, each with a labeled header and count), followed by a **My Presets** group for anything uncategorized; picking a category or the **Saved** chip shows a single grid. **Save** names the current patch and includes a **category picker** (pre-filled from the loaded patch) so it's filed in the right section. **Clear** = empty passthrough. AUv3 patches save inside the host project automatically.

Your folders. Saved patches can be filed into folders of your own — the save card's **folder picker** chooses one (or **New Folder…** creates it, and the picker remembers your last choice), and each folder appears as its own **chip** after Saved plus its own section in the Saved view. Long-press a saved card for **Move to Folder**; long-press a folder chip to **Rename** or **Delete** it (deleting a folder only unfiles its patches — nothing is ever deleted with it). Factory content stays where it is; folders are yours alone.

Sharing patches. Long-press any card → **Share…** exports the patch as a `.midirackpatch` file — AirDrop it to a friend (or your other iPad), attach it to a message, drop it in Files. Opening a `.midirackpatch` imports it into your library and loads it; the browser's **import** button (top corner) pulls in one or more patch

files from Files. Re-importing a newer copy of the same patch replaces it; a different patch that happens to share a name is kept alongside.

iCloud sync. With **Sync presets with iCloud** on (Settings), every saved patch — folders included — is mirrored to iCloud Drive and appears in the browser on your other devices signed into the same account, usually within seconds of saving. The same files are visible in the Files app (and Finder on a Mac) under **iCloud Drive › MIDIRack › Presets** — one `.midirackpatch` per patch, named after it — and the folder is live both ways: rename a file there and the patch is renamed, delete one and it leaves the library, drop a `.midirackpatch` in (or duplicate one) and it appears as a new patch. Two patches with the same name become “Groovebox” and “Groovebox 2” on disk. Turning sync on for the first time uploads the library you already have. Edits to the same patch on two devices resolve newest-wins; if both were edited while offline, the other version is kept as **“ (conflict)”** rather than lost. The AUv3 reads the app’s local copy, so open the app once on a device to pick up patches saved elsewhere before hosting.



Recipes

Short walkthroughs for common goals.

Arpeggiate held chords

1. Open **Harmony Keys** (or any patch with **MIDI In**).
2. Graph editor → splice **Arp** after **MIDI In** (or between existing nodes).
3. Set **Mode** (up/down/random), **Rate**, **Octaves**.
4. Add a knob bound to **Rate** on the surface for live control.
5. Play and hold a chord — or use latch on a surface keyboard.

Euclidean kick

1. **Clear** or start fresh. Graph editor → **+** → **Generate → Euclid**.
2. Wire **Euclid → MIDI Out**. Set **note** to kick (e.g. C1), **steps/pulses**.
3. **+** → **Add Drum Lane** on the surface — binds to the Euclid grid.
4. Press play. Tweak **rotate** and **gate** on the node or via knobs.

Scene-switch a groovebox

1. **+** → **Add Drum Lane** (repeat for more voices), **Add Melody Lane** for a bass. Draw bank **A** patterns on each lane.
2. Tap a lane's **B** chip and draw a variation — probability, tie, condition and microtiming switch with the bank.
3. **+** → **Add Scene Pads**. Tap **B**: every lane flips at its own pattern wrap, so the whole kit lands together on the downbeat.
4. For hands-free arrangements set a lane's **Chain** to **A·B** instead — the lane cycles banks itself, and the eye chip lets you watch it.

Slide bass (portamento)

1. Graph editor → wire your bass line (**Step Seq**, **Turing**, or a keyboard) into **Notes → Glide**, then to **MIDI Out**.
2. Sequenced lines: set Glide's **Mode** to **Always** — every note slides in from the previous pitch over **Time** ms, the 303 feel.
3. Played lines: put **Mono** (Mode **Legato**) before Glide and keep Glide on **Legato** — overlapping keys slide, detached notes retrigger.
4. **Bend Range** is announced to the synth automatically (RPN); match it manually only on hardware that ignores RPN. Try **Solo Lead** or **Slide Bass** to hear both setups.

Sequence a chord progression

1. **+** → **Add Chord Lane** — a **Chord Seq** wired to the output with a starter I–vi–IV–V, shown as named chord pads (C · Am · F · G).
2. Drag a pad up/down to pick the degree (I…VII); tap toggles a rest. Set **Root**, **Scale** and **Chord** (triad/7th) on the node — the pad names follow live.
3. Feed it to an **Arp** for broken chords, or **Chord Split** for per-voice processing. Bank a second progression on the **B** chip and **Chain** them.

Self-contained sound with instrument nodes

1. Graph editor → **+** → **Instruments** → **Synth** (or **Drums**).
2. Wire **MIDI In**, a sequencer, or a surface keyboard into the instrument's **In** — no **MIDI Out** needed for audition.
3. Standalone: the **Synth/Drums pill** turns off when an instrument node is added (avoids doubling); AUv3 hosts hear audio from the plugin directly.
4. Bind knobs to **Cutoff**, **Resonance** or per-drum **Pitch** / **Decay**.

Debug a silent patch

1. Check **OUT** LED (orange) — is MIDI leaving?
2. Open graph editor — follow activity LEDs left to right; first dark node = where the stream stops.
3. Splice a **Monitor** there and read its log.
4. Generators need transport running (play in standalone or host).
5. Standalone: turn **Synth/Drums** on, add **Synth** / **Drums** instrument nodes, or confirm a synth is after the plugin.

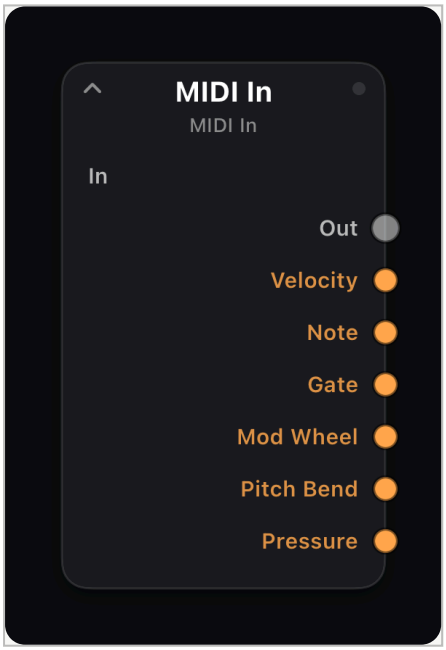
Reference

Lookup sections — skim Getting started and Recipes first if you're new.

Node catalog

Each entry shows the **expanded node card** as it appears in the graph editor, with ports, behavior, parameters and (when available) modulation outputs.

- **In / Out** — orange MIDI wires. Most nodes have one input and one output. Multi-port nodes label their connectors (**A**, **B**, **Trig**, **T**, **Low**, **High**, **1…n**).
- **Mod out** — amber modulation sources (MIDI In, Life, Attractor, LFO…); drag onto any parameter knob.
- **Instruments** — **Synth**, **Drums**, **Sampler** and **Slicer** are audio sinks (no MIDI out); they render sound inside the plugin or standalone app.
- **Clockable generators** — **In** (pass-through), **Trig** (step on note-on), **Clock** (step on pulse from a **Clock** node). Trig and Clock are mutually exclusive.
- **EOC** — fixed-length cyclic nodes (Drum/Step/Chord/CC Seq, **Matrix**, Euclid, Fibonacci, Turing, Rule, Gate, Looper) expose an **end-of-cycle** trigger beside **Out**. It pulses once per pattern loop — wire it to another node's **Trig** / **Clock** to chain or reset patterns.
- **Rate / Grid / Time** — clock divisions from `4/1` down to `1/64` (including `1/8T`), synced to host transport unless a node is in Free mode.



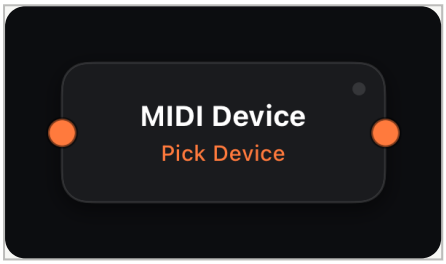
MIDI In

`In: — (graph entry) · Out: 1× MIDI`

`Mod out: Velocity · Note · Gate · Mod Wheel · Pitch Bend · Pressure`

The graph's **entry point**. Every note, CC, pitch bend, aftertouch and program change from the host track, hardware controller, virtual **MIDIRack In** port, or the slide-up keyboard arrives here. Exactly one MIDI In node is allowed per patch.

Expand the node to expose six **performance modulation sources**. Drag **Velocity** onto Echo **Decay** so harder playing lengthens repeats, or **Note** onto filter cutoff for keytracking. **Gate** is high while any key is held.



MIDI Device

`In: 1× MIDI (merge) · Out: 1× MIDI`

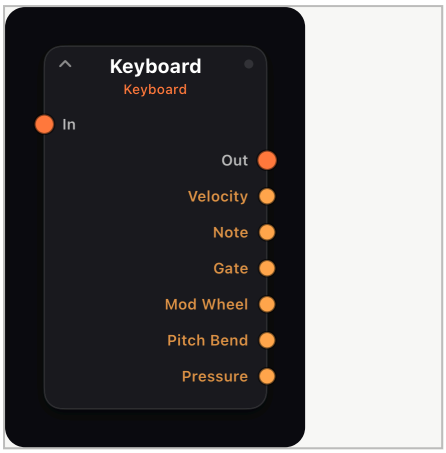
Standalone only: taps the MIDI of **one hardware input device**, picked in the inspector — so a single patch can route streams by origin: keyboard into an arp chain, pads into drum lanes, a fader box into CC lanes.

It is a **tap**, not a claim — the **MIDI In** node still receives everything. Needs the input set to **All Inputs** (cable pill). A device that is offline reconnects to its node by name. In a plugin host this node is silent: route the device to the track instead.

PARAMETERS

`Device`	The hardware input this node taps (inspector dropdown).

◉ Every parameter accepts amber mod wires (MIDI In signals, LFO, Attractor, Life stats, etc.).



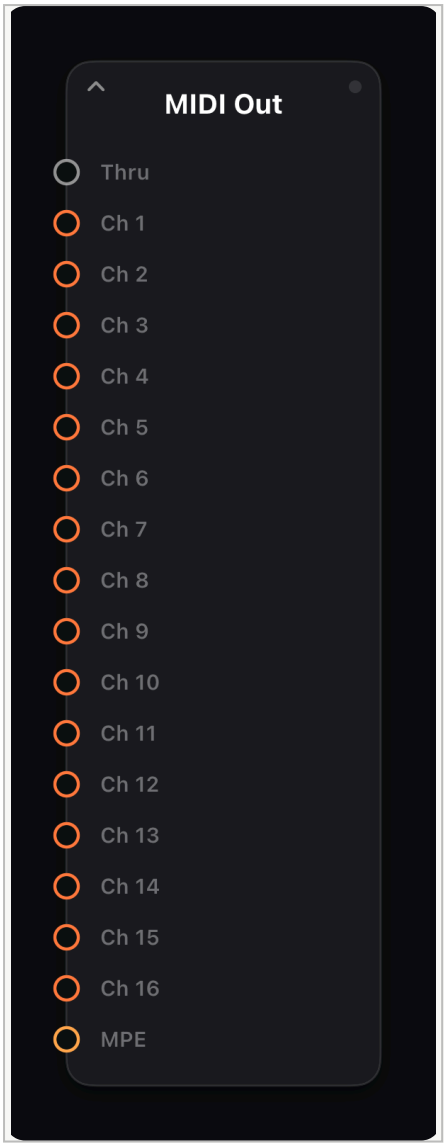
Keyboard

`In: 1× MIDI (merge) · Out: 1× MIDI`

`Mod out: Velocity · Note · Gate · Mod Wheel · Pitch Bend · Pressure`

The graph node **behind a surface keyboard or pad control** — it emits the notes that control plays, as its **own graph branch**. Every keyboard, pad grid and MPE surface is paired with one, so each can be routed independently: keys into an arp, pads straight to drums.

Adding it from the palette (**Play**) also places a piano keyboard on the surface, pre-wired to **MIDI Out**. Anything wired into **In** merges with the played notes.



MIDI Out

`In: Thru · Ch 1–16 · MPE · Out: — (graph exit)`

The graph's **exit**. Everything wired here reaches the AUv3 host, the **MIDIRack Out** virtual port, or the built-in synth.

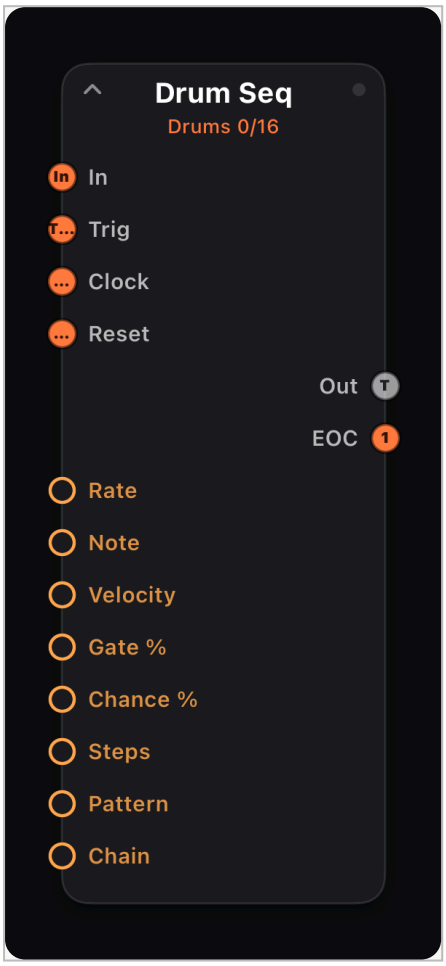
When connecting a wire, choose the input connector that matches your routing goal — see input ports below.

INPUT PORTS

`Thru`	Merge stream without changing MIDI channel.
`Ch 1–16`	Force all output to that channel (multitimbral setups).

MPE	Keep per-note channel assignment for MPE-capable synths.

Sequence — drum, melody, chord, CC lanes, gates, swing



Drum Seq

`In · Trig · Clock · Reset · Out: 1× MIDI + EOC`

A tempo-synced **16-step drum lane** for a single pitch — one node = one drum sound (kick, snare, hat…). The playhead advances at **Rate** (or from **Trig** / **Clock**); active steps fire note-ons with **Velocity** and **Gate**.

Incoming MIDI on **In** forwards unchanged, so branch several Drum Seq nodes in **parallel** from MIDI In to build a full kit. Bind a surface **Sequencer Lane+** control to edit the pattern along with per-step velocity, probability, tie, and trigger condition.

INPUT PORTS

`In`	Primary MIDI path — incoming events pass through unchanged to Out.
`Trig`	External step clock: each note-on advances the internal pattern one step (overrides **Rate**).
`Clock`	Wire from a **Clock** node — one pulse per step (mutually exclusive with **Trig**).
`Reset`	A note-on or clock pulse restarts the pattern at step 1 (on either clock mode) — wire a master lane's EOC or a performance pad here to re-align lanes.

OUTPUT PORTS

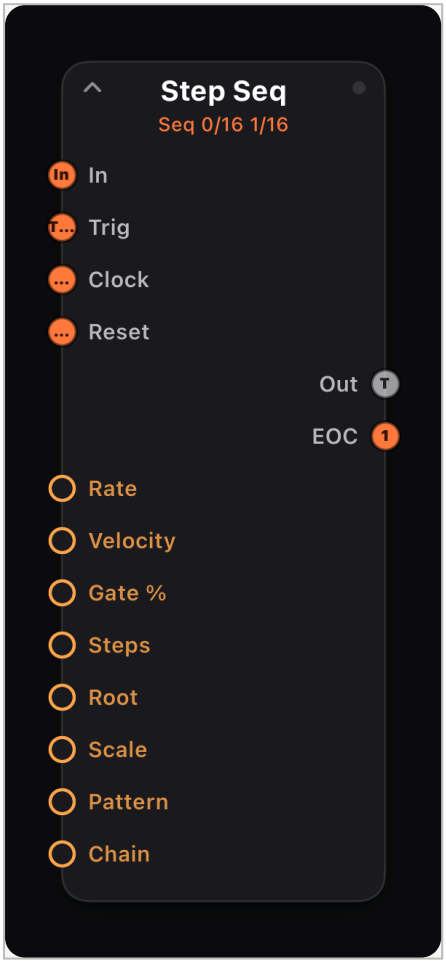
`Out`	Drum note-ons; input passes through alongside.
`EOC`	End-of-cycle trigger — one clock pulse each time the pattern wraps to step 1. Wire into another node's **Trig** or **Clock** to chain patterns.

PARAMETERS

`Rate`	Clock division (`4/1` … `1/64`, including `1/8T`). Follows host transport tempo.
`Note`	MIDI note number 0–127.
`Velocity`	Note-on velocity 1–127.
`Gate %`	Note length as percent of one grid step (1–100).
`Chance %`	Probability 0–100% that an event fires.
`Steps`	Pattern length 1–16.
`Pattern`	Active pattern bank **A–D** — four independent 16-step patterns per lane (steps, probability, tie, condition and microtiming all switch together). A switch lands at the next pattern wrap; pick banks on the Lane+ **A·B·C·D** chips or bind/modulate the parameter.
`Chain`	Off, or cycle banks **A·B** / **A·B·C** / **A·B·C·D** automatically — one bank per pattern loop (overrides **Pattern**).
`Step 1–16`	Per-step on/off (● = active). Edit on the surface step grid.
`Vel 1–16`	Per-step velocity as a percentage of **Velocity** (1–100, default 100) — shape accents and ghost notes. Lane+ control only.
`Prob 1–16`	Per-step probability 0–100% (default 100). Lane+ control only.
`Tie 1–16`	Per-step tie — suppresses the step's own note and extends the previous note's gate through it instead. Lane+ control only.

`Cond 1–16`	Per-step trigger condition — fires only on that one pass out of every *M* loops (Always, `1:2`…`4:4`). Lane+ control only.
`Micro 1–16`	Per-step timing nudge –50% … +50% of one grid step. Surface grid only.

◉ Every parameter accepts amber mod wires (MIDI In signals, LFO, Attractor, Life stats, etc.).



Step Seq

`In · Trig · Clock · Reset · Out: 1× MIDI + EOC`

A **monophonic melody sequencer**: one pitch per step (0 = rest). The playhead steps at **Rate** or external clock with configurable **Gate** and **Velocity**.

Built-in **Root** + **Scale** snap each step's output in-key (**Chromatic** = off). Draw pitches on the surface **Sequencer Lane+** control — the ladder shows the sounding note after quantization, and a layer picker switches to per-step velocity, probability, tie, and trigger condition.

`INPUT PORTS`

`In`	Primary MIDI path — incoming events pass through unchanged to Out.
`Trig`	External step clock: each note-on advances the internal pattern one step (overrides **Rate**).
`Clock`	Wire from a **Clock** node — one pulse per step (mutually exclusive with **Trig**).
`Reset`	A note-on or clock pulse restarts the pattern at step 1 (on either clock mode) — wire a master lane's EOC or a performance pad here to re-align lanes.

OUTPUT PORTS

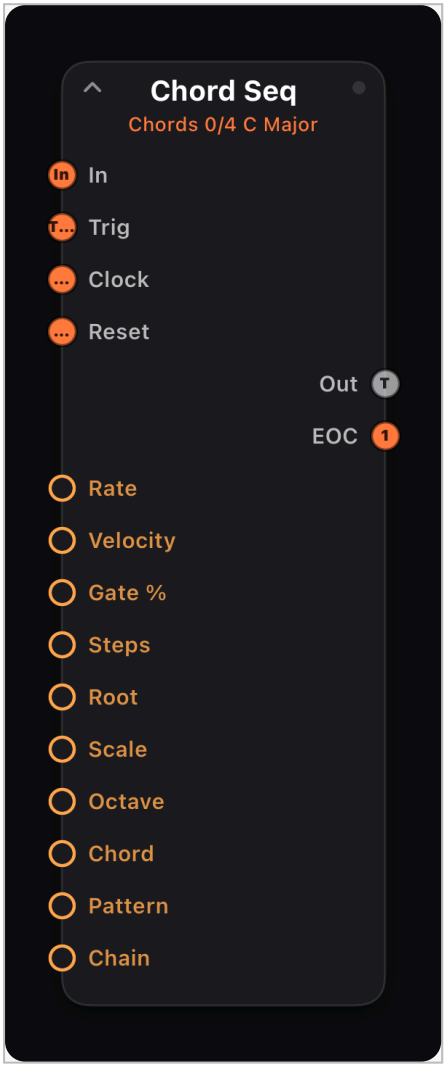
`Out`	Melody note per step; input passes through alongside.
`EOC`	End-of-cycle trigger — one clock pulse each time the pattern wraps to step 1. Wire into another node's **Trig** or **Clock** to chain patterns.

PARAMETERS

`Rate`	Clock division (`4/1` … `1/64`, including `1/8T`). Follows host transport tempo.
`Velocity`	Note-on velocity 1–127.
`Gate %`	Note length as percent of one grid step (1–100).
`Steps`	Pattern length 1–16.
`Root`	Scale root (C, C#, D…). Used with **Scale** to snap output notes in-key.
`Scale`	Scale name (Major, Minor, Pentatonic…). **Chromatic** (default) passes every note unchanged — effectively off.
`Pattern`	Active pattern bank **A–D** — four independent 16-step patterns per lane (steps, probability, tie, condition and microtiming all switch together). A switch lands at the next pattern wrap; pick banks on the Lane+ **A·B·C·D** chips or bind/modulate the parameter.
`Chain`	Off, or cycle banks **A·B** / **A·B·C** / **A·B·C·D** automatically — one bank per pattern loop (overrides **Pattern**).
`Step 1–16`	MIDI note per step (0 = rest). Edit on the surface step grid.
`Vel 1–16`	Per-step velocity as a percentage of **Velocity** (1–100, default 100) — shape accents and ghost notes. Lane+ control only.
`Prob 1–16`	Per-step probability 0–100% (default 100). Lane+ control only.
`Tie 1–16`	Per-step tie — suppresses the step's own note and extends the previous note's gate through it instead. Lane+ control only.

`Cond 1–16`	Per-step trigger condition — fires only on that one pass out of every *M* loops (Always, `1:2`…`4:4`). Lane+ control only.
`Micro 1–16`	Per-step timing nudge –50% … +50% of one grid step. Surface grid only.

◉ Every parameter accepts amber mod wires (MIDI In signals, LFO, Attractor, Life stats, etc.).



Chord Seq

`In · Trig · Clock · Reset · Out: 1× MIDI + EOC`

A **chord progression sequencer**: each step plays a diatonic chord on a scale degree (0 = rest, 1–7 = I…VII), voiced by stacking thirds in **Root** + **Scale** at **Octave** — as triads or, with **Chord** set to 7th, four-voice sevenths. Degrees 1·6·4·5 in C Major play the classic C–Am–F–G.

Scale / Chord knobs live, with per-step velocity, probability, tie (holds the previous chord through the step) and trigger condition layers.

INPUT PORTS

`In`	Primary MIDI path — incoming events pass through unchanged to Out.
`Trig`	External step clock: each note-on advances the internal pattern one step (overrides **Rate**).
`Clock`	Wire from a **Clock** node — one pulse per step (mutually exclusive with **Trig**).
`Reset`	A note-on or clock pulse restarts the pattern at step 1 (on either clock mode) — wire a master lane's EOC or a performance pad here to re-align lanes.

OUTPUT PORTS

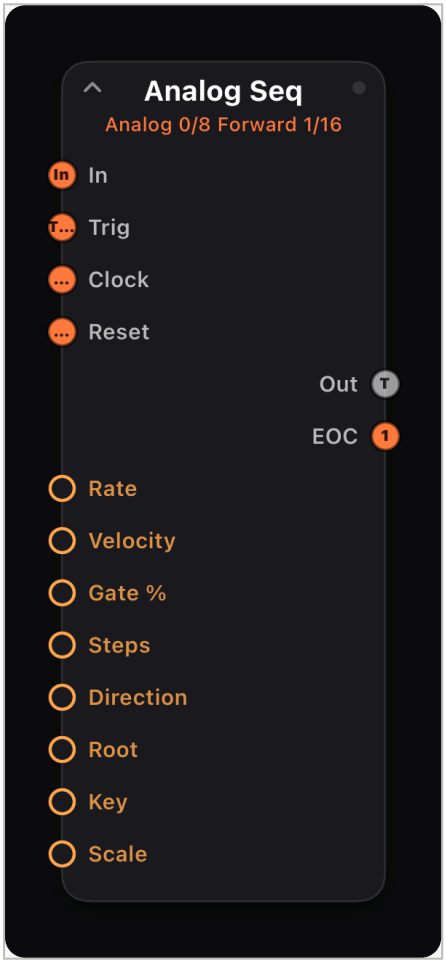
`Out`	Chord tones per step; input passes through alongside.
`EOC`	End-of-cycle trigger — one clock pulse each time the pattern wraps to step 1. Wire into another node's **Trig** or **Clock** to chain patterns.

PARAMETERS

`Rate`	Clock division (`4/1` … `1/64`, including `1/8T`). Follows host transport tempo.
`Velocity`	Note-on velocity 1–127.
`Gate %`	Note length as percent of one grid step (1–100).
`Steps`	Pattern length 1–16.
`Root`	Key root (C, C#, D…) the degrees are built in.
`Scale`	Scale the chords are stacked from (Major, Minor, modes…).
`Octave`	Register of the degree-1 chord root (1–7).
`Chord`	Triad or 7th — three or four stacked scale thirds.
`Pattern`	Active pattern bank **A–D** — four independent 16-step patterns per lane (steps, probability, tie, condition and microtiming all switch together). A switch lands at the next pattern wrap; pick banks on the Lane+ **A·B·C·D** chips or bind/modulate the parameter.
`Chain`	Off, or cycle banks **A·B** / **A·B·C** / **A·B·C·D** automatically — one bank per pattern loop (overrides **Pattern**).
`Step 1–16`	Scale degree per step (0 = rest, 1–7 = I…VII). Edit on the surface step grid.

`Vel 1–16`	Per-step velocity as a percentage of **Velocity** (1–100, default 100) — shape accents and ghost notes. Lane+ control only.
`Prob 1–16`	Per-step probability 0–100% (default 100). Lane+ control only.
`Tie 1–16`	Per-step tie — suppresses the step's own note and extends the previous note's gate through it instead. Lane+ control only.
`Cond 1–16`	Per-step trigger condition — fires only on that one pass out of every *M* loops (Always, `1:2`…`4:4`). Lane+ control only.
`Micro 1–16`	Per-step timing nudge –50% … +50% of one grid step. Surface grid only.

◉ Every parameter accepts amber mod wires (MIDI In signals, LFO, Attractor, Life stats, etc.).



Analog Seq

`In · Trig · Clock · Reset · Out: 1× MIDI + EOC`

The **knob-per-step analog machine**: eight pitches set as semitone offsets above **Root** (0 = off, +0…+24), walked **Forward, Backward, Pendulum or Random**. No banks, no piano roll — one row you dial in and perform.

Play a key and the whole row **re-roots to it live** (last-note latch, SH-101 style); the played note itself is consumed. A **Slide** step holds its note through the next step's onset — put **Mono + Glide** downstream and slides become true 303-style portamento. The velocity layer is the **accent row**: drag steps up to punch them.

INPUT PORTS

`In`	Primary MIDI path — incoming events pass through unchanged to Out.
`Trig`	External step clock: each note-on advances the internal pattern one step (overrides **Rate**).
`Clock`	Wire from a **Clock** node — one pulse per step (mutually exclusive with **Trig**).
`Reset`	A note-on or clock pulse restarts the pattern at step 1 (on either clock mode) — wire a master lane's EOC or a performance pad here to re-align lanes.

OUTPUT PORTS

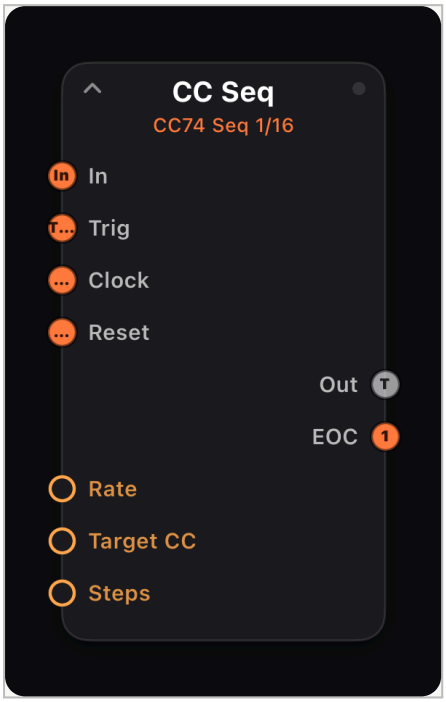
`Out`	The stepped row; non-note input passes through alongside.
`EOC`	End-of-cycle trigger — one clock pulse each time the pattern wraps to step 1. Wire into another node's **Trig** or **Clock** to chain patterns.

PARAMETERS

`Rate`	Clock division (`4/1` … `1/64`, including `1/8T`). Follows host transport tempo.
`Velocity`	Note-on velocity 1–127.
`Gate %`	Note length as percent of one grid step (1–100).
`Steps`	Row length, 1–8.
`Direction`	Forward · Backward · Pendulum · Random walk of the row.
`Root`	Base pitch when no key is held; playing a note re-roots the row.
`Key`	Quantizer key root; sounding pitches snap to Key + Scale.
`Scale`	Quantizer scale (Chromatic = off — offsets pass unchanged).
`Step 1–8`	Semitone offset per step (0 = off, 1–25 = +0…+24 st). Edit on the surface step grid.
`Vel 1–8`	Accent row — per-step % of Velocity.

`Slide 1–8`	Hold this step through the next onset (legato tie).

◉ Every parameter accepts amber mod wires (MIDI In signals, LFO, Attractor, Life stats, etc.).



CC Seq

`In · Trig · Clock · Reset · Out: 1× MIDI + EOC`

A **16-step automation lane** for one CC number — stepped filter sweeps, acid resonance, rhythmic tremolo. Each clock step writes the matching step value on **Target CC** while note data passes through.

Layer several CC Seq nodes on parallel branches to automate multiple parameters in sync.

INPUT PORTS

`In`	Primary MIDI path — incoming events pass through unchanged to Out.
`Trig`	External step clock: each note-on advances the internal pattern one step (overrides **Rate**).
`Clock`	Wire from a **Clock** node — one pulse per step (mutually exclusive with **Trig**).
`Reset`	A note-on or clock pulse restarts the pattern at step 1 (on either clock mode) — wire a master lane's EOC or a performance pad here to re-align lanes.

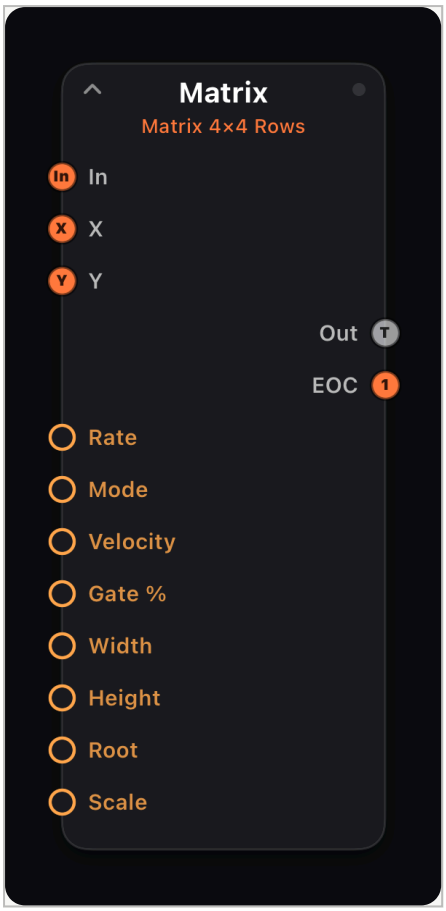
OUTPUT PORTS

`Out`	MIDI passthrough with the stepped value written on **Target CC**.
`EOC`	End-of-cycle trigger — one clock pulse each time the pattern wraps to step 1. Wire into another node's **Trig** or **Clock** to chain patterns.

PARAMETERS

`Rate`	Clock division (`4/1` … `1/64`, including `1/8T`). Follows host transport tempo.
`Target CC`	MIDI CC number to write (0–127).
`Steps`	Pattern length 1–16.
`Step 1–16`	CC value 0–127 per step. Edit on the surface step grid.
`Prob 1–16`	Per-step probability 0–100% (default 100). Lane+ control only.
`Cond 1–16`	Per-step trigger condition — fires only on that one pass out of every *M* loops (Always, `1:2`…`4:4`). Lane+ control only.

◉ Every parameter accepts amber mod wires (MIDI In signals, LFO, Attractor, Life stats, etc.).



Matrix

`In · X Trig · Y Trig · Out: 1× MIDI + EOC`

A **grid sequencer**: a grid of note values (0 = rest, default 4×4, up to 8×8). The internal clock walks the grid at **Rate** in a **Mode** — Rows, Columns, Snake, Diagonal, Spiral or Random — one cell per step, playing the current cell's note.

Or scan it as an **XY sequencer**: wire clocks into **X Trig** and **Y Trig** to advance column and row independently. Built-in **Root** + **Scale** snap each cell's output in-key (**Chromatic** = off). Like the other sequencers it pulses **EOC** when the cursor returns to the origin. Bind a surface **Matrix** control to edit the grid with a live playhead.

INPUT PORTS

`In`	Primary MIDI path — passes through unchanged to Out.
`X Trig`	Note-ons advance the **column** one step (overrides the internal clock).
`Y Trig`	Note-ons advance the **row** one step — wire two clocks for XY scanning.

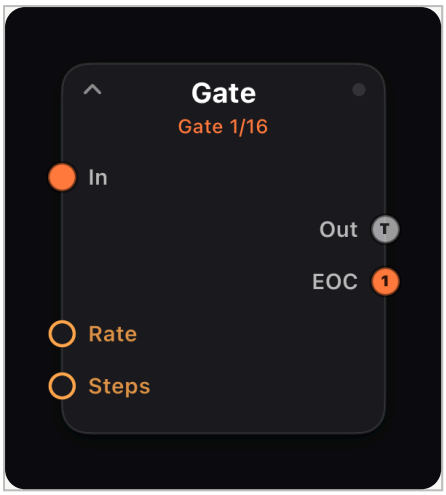
OUTPUT PORTS

`Out`	Note of the current cell (0 = rest); input passes through.
`EOC`	End-of-cycle trigger — one clock pulse each time the pattern wraps to step 1. Wire into another node's **Trig** or **Clock** to chain patterns.

PARAMETERS

`Rate`	Clock division (`4/1` … `1/64`, including `1/8T`). Follows host transport tempo.
`Mode`	Traversal: Rows, Columns, Snake, Diagonal, Spiral, Random.
`Velocity`	Note-on velocity 1–127.
`Gate %`	Note length as percent of one grid step (1–100).
`Width`	Active grid columns 2–8.
`Height`	Active grid rows 2–8.
`Root`	Scale root (C, C#, D…). Used with **Scale** to snap output notes in-key.
`Scale`	Scale name (Major, Minor, Pentatonic…). **Chromatic** (default) passes every note unchanged — effectively off.
`Cell 1–64`	MIDI note per cell (0 = rest); the active Width × Height subset plays. Edit on the surface Matrix grid.
`Prob 1–64`	Per-cell probability 0–100% (default 100). Engine-only — no dedicated surface control yet, but wireable as a mod destination.
`Tie 1–64`	Per-cell tie — suppresses the cell's own note and extends the previously fired note's gate through it instead. Engine-only.
`Cond 1–64`	Per-cell trigger condition — fires only on that one pass out of every *M* loops around the origin (Always, `1:2`…`4:4`). Engine-only.

◉ Every parameter accepts amber mod wires (MIDI In signals, LFO, Attractor, Life stats, etc.).



Gate

`In: 1× MIDI · Out: 1× MIDI + EOC`

Also called **Trance Gate**. **Holds** incoming notes and **chops** them with a 16-step on/off pattern — sustained chords become a rhythmic pulse without retriggering the source.

Unlike a sequencer, it reacts to whatever you play in real time. Draw the gate pattern on the step row for trance, house and EDM stutters.

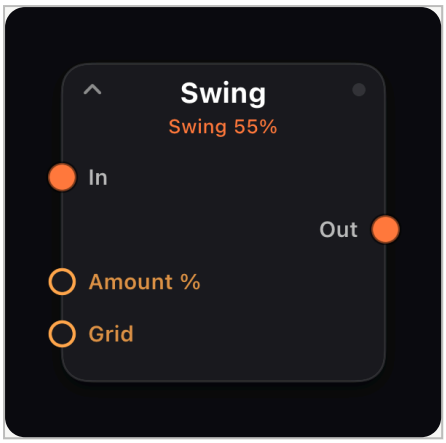
OUTPUT PORTS

`Out`	Gated note stream.
`EOC`	End-of-cycle trigger — one clock pulse each time the pattern wraps to step 1. Wire into another node's **Trig** or **Clock** to chain patterns.

PARAMETERS

`Rate`	Clock division (`4/1` … `1/64`, including `1/8T`). Follows host transport tempo.
`Steps`	Pattern length 1–16.
`Step 1–16`	Gate open (1) or closed (0) per grid step. Draw on the step row.

◉ Every parameter accepts amber mod wires (MIDI In signals, LFO, Attractor, Life stats, etc.).



Swing

`In: 1× MIDI · Out: 1× MIDI`

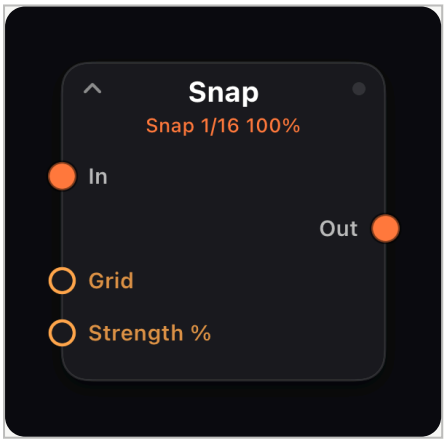
Adds **shuffle** by delaying off-beat note-ons. **Amount** sets how late (percent of half a grid step); **Grid** is the timing reference.

Place after sequencers, arps or generators to loosen rigid timing without changing the underlying pattern.

PARAMETERS

`Amount %`	Shuffle depth 0–100%. Higher = more laid-back off-beats.
`Grid`	Reference clock division for quantization or swing (`4/1` … `1/64`).

◉ Every parameter accepts amber mod wires (MIDI In signals, LFO, Attractor, Life stats, etc.).



Snap

`In: 1× MIDI · Out: 1× MIDI`

Quantizes note-on timing to the clock grid while preserving note lengths. **Strength** blends dry input (0%) with fully locked timing (100%).

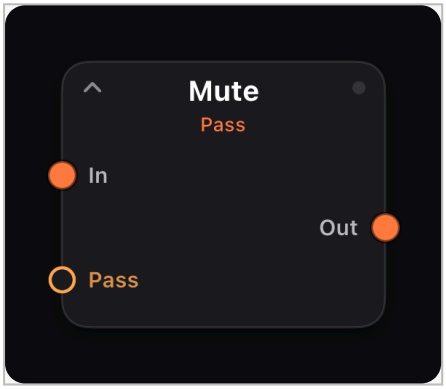
Use after live keyboard input or **Humanize** to tighten a part without reprogramming it.

PARAMETERS

`Grid`	Reference clock division for quantization or swing (`4/1` … `1/64`).
`Strength %`	Blend 0% = passthrough timing, 100% = fully snapped.

◉ Every parameter accepts amber mod wires (MIDI In signals, LFO, Attractor, Life stats, etc.).

Control — mute, A/B switch, seq router, triggers



Mute

`In: 1× MIDI · Out: 1× MIDI`

Branch **mute / bypass**. When **Pass** is Off the stream is silenced and held notes are flushed; On lets events through normally.

Bind a toggle button to **Pass** to mute a part during performance.

PARAMETERS

`Pass`	Off = muted (notes flushed), On = live.

◉ Every parameter accepts amber mod wires (MIDI In signals, LFO, Attractor, Life stats, etc.).

A/B Switch

`In: A · B · Trig · Out: 1× MIDI`

Routes one of two musical inputs to **Out**. **Active** picks A or B when no trigger is active. Wire a sequencer or keyboard to **Trig** for performance switching.

In **Gate** mode (default), B is selected while trigger notes are held; **Toggle** flips on each trigger note-on. **Off** ignores Trig.

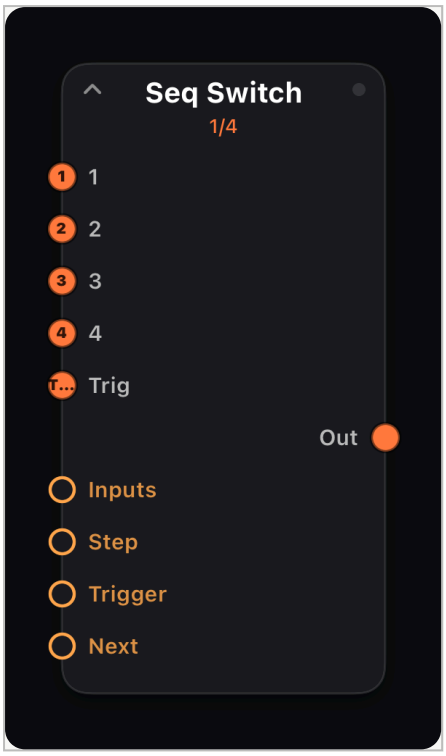
INPUT PORTS

`A`	First musical input — heard when **Active** is A.
`B`	Second musical input — heard when **Active** is B.
`Trig`	Control input — note-ons here drive **Gate** (hold B while trigger notes play) or **Toggle** mode.

PARAMETERS

`Active`	A or B when trigger input is idle.
`Trigger`	Off / Gate / Toggle — how **Trig** port behaves.

◉ Every parameter accepts amber mod wires (MIDI In signals, LFO, Attractor, Life stats, etc.).



Seq Switch

`In: 1…N + Trig · Out: 1× MIDI`

Sequential router: wire different musical sources to inputs **1…N** and a clock or trigger source to **Trig**. Each trigger note-on advances the active step and passes only that input through.

Step selects manually when **Trigger** is Off. Held notes are flushed on step change to avoid stuck notes.

INPUT PORTS

`1…N`	Musical inputs (count = **Inputs**). Only the active step's stream reaches Out.
`Trig`	Advance clock — each note-on moves to the next input when **Trigger** is On.

PARAMETERS

`Inputs`	Number of musical input ports (2–8).
`Step`	Active input index (0-based). Manual when Trigger is Off.
`Trigger`	Off = manual **Step**; On = advance on each Trig note-on.
`Next`	Momentary — advance one step (same as a trigger pulse).

◉ Every parameter accepts amber mod wires (MIDI In signals, LFO, Attractor, Life stats, etc.).

Pulse

`In: 1× MIDI · Out: 1× MIDI`

Momentary trigger node. A rising edge on **Fire** emits a short note burst or a CC value depending on **Mode**. Incoming MIDI passes through unchanged.

Bind a momentary pad or button to **Fire** for one-shot hits and automation spikes.

PARAMETERS

`Fire`	Momentary — rising edge fires the pulse.
`Mode`	Note = MIDI note burst; CC = single CC value.
`Note`	MIDI note number 0–127.
`Velocity`	Note-on velocity 1–127.
`Channel`	MIDI channel 1–16 for Note mode.
`CC`	CC number for CC mode.
`Value`	CC value 0–127 for CC mode.

◉ Every parameter accepts amber mod wires (MIDI In signals, LFO, Attractor, Life stats, etc.).

Filter & Route — channel, range, split, chance

Channel

`In: 1× MIDI · Out: 1× MIDI`

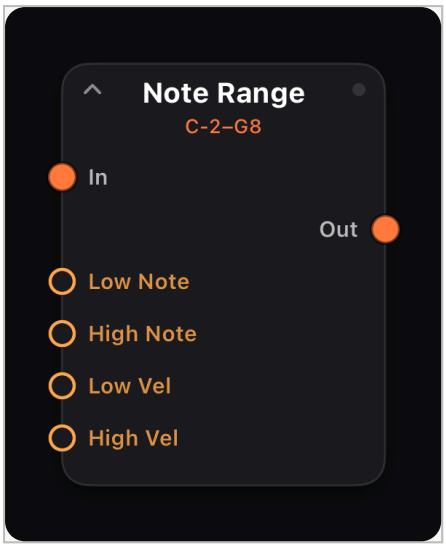
Filters MIDI by channel and optionally remaps it. Passes only events on **Input Ch** (0 = any channel) and can rewrite them to **Output Ch** (0 = leave channel unchanged).

Route one branch to channel 10 for drums and another to channel 1 for bass in a multitimbral rig.

PARAMETERS

`Input Ch`	0 = accept any channel; 1–16 = filter to that channel.
`Output Ch`	0 = keep original channel; 1–16 = force output channel.

◉ Every parameter accepts amber mod wires (MIDI In signals, LFO, Attractor, Life stats, etc.).



Note Range

`In: 1× MIDI · Out: 1× MIDI`

Passes only notes inside pitch and velocity windows. Events outside **Low/High Note** or **Low/High Vel** are dropped; CC and other message types pass through.

Split a keyboard by pitch, isolate hard hits, or block low-end rumble before a bass synth.

PARAMETERS

`Low Note`	Lowest pitch in range (0–127).
`High Note`	Highest pitch in range (0–127).
`Low Vel`	Minimum velocity 1–127.
`High Vel`	Maximum velocity 1–127.

◉ Every parameter accepts amber mod wires (MIDI In signals, LFO, Attractor, Life stats, etc.).

Msg Filter

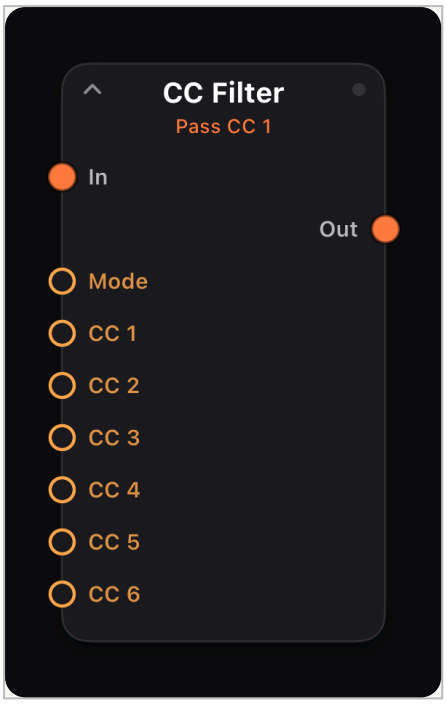
`In: 1× MIDI · Out: 1× MIDI`

Per-type **Pass/Block** switches for Notes, CC, Pitch Bend, Aftertouch and Program Change. Strip CC clutter or pass only notes to a monophonic line.

PARAMETERS

`Notes`	Pass or Block note on/off.
`CC`	Pass or Block control change.
`Pitch Bend`	Pass or Block pitch wheel.
`Aftertouch`	Pass or Block channel pressure.
`Prog Change`	Pass or Block program change.

◉ Every parameter accepts amber mod wires (MIDI In signals, LFO, Attractor, Life stats, etc.).



CC Filter

`In: 1× MIDI · Out: 1× MIDI`

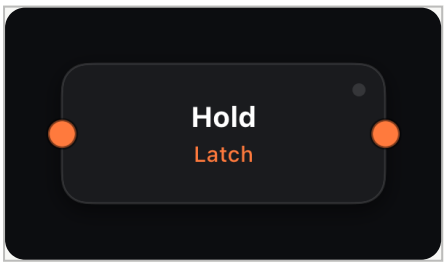
Per-**number** CC filter: list up to six CC numbers and choose **Pass Listed** (only those survive) or **Block Listed** (everything but those). Non-CC messages always pass.

Keep just the mod wheel and CC 74 for a synth that misbehaves on stray controllers, or strip one noisy encoder without losing the rest. Set a slot to **Off** (128) to leave it unused.

PARAMETERS

`Mode`	Pass Listed = only the listed CCs survive; Block Listed = they are removed.
`CC 1–6`	CC numbers 0–127; Off (128) = slot unused.

◉ Every parameter accepts amber mod wires (MIDI In signals, LFO, Attractor, Life stats, etc.).



Hold

`In: 1× MIDI · Out: 1× MIDI`

A **monophonic note latch**: each new note-on replaces the previous held note. The prior note-off is sent when the next note arrives — legato overlap on a single voice with no extra parameters.

Chance

`In: 1× MIDI · Out: 1× MIDI`

Probabilistic gate: each note-on passes with **Chance** %; note-offs always pass so notes never stick. Thin dense streams or add organic drop-outs to arps and generators.

PARAMETERS

`Chance %`	Probability 0–100% that an event fires.

◉ Every parameter accepts amber mod wires (MIDI In signals, LFO, Attractor, Life stats, etc.).

Divide

`In: 1× MIDI · Out: 1× MIDI`

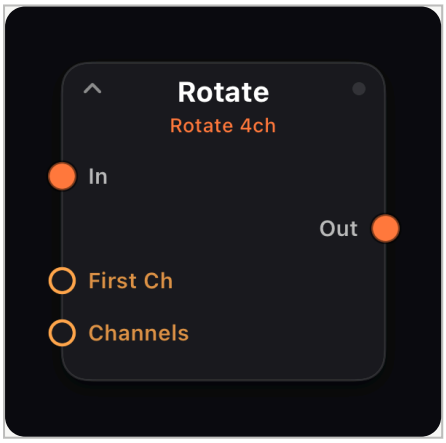
Passes every **Nth** note-on after skipping **Offset** hits — accent every third note in a run, or extract a sparse melody from busy generator output.

Also **divides clock pulses**: every **Nth** pulse from a **Clock** node passes through (separate counter from notes). Halve or quarter a master clock into a generator's **Clock** input.

PARAMETERS

`Every N`	Pass every Nth note-on or clock pulse (1–8).
`Offset`	Skip this many events before counting (0–7).

◉ Every parameter accepts amber mod wires (MIDI In signals, LFO, Attractor, Life stats, etc.).



Rotate

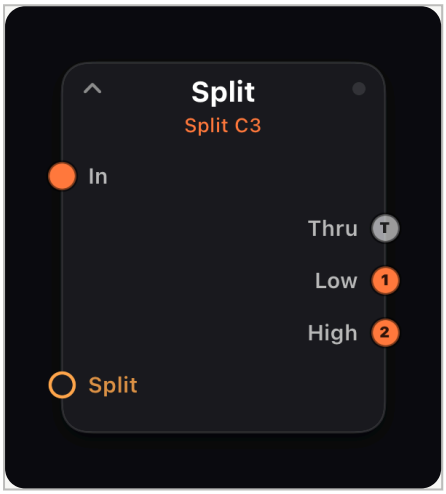
`In: 1× MIDI · Out: 1× MIDI`

Round-robin channel assignment: first note goes to **First Ch**, then increments, wrapping after **Channels** count. Spread one stream across multitimbral timbres or layered synth patches.

PARAMETERS

`First Ch`	MIDI channel for the first note (1–16).
`Channels`	How many channels to cycle through (1–16).

◉ Every parameter accepts amber mod wires (MIDI In signals, LFO, Attractor, Life stats, etc.).



Split

`In: 1× MIDI · Out: T · Low · High`

Keyboard split at **Split** pitch. Notes at or below the split point route to **Low**; above to **High**. **T** outputs the full input.

CC, pitch bend and aftertouch copy to both zones.

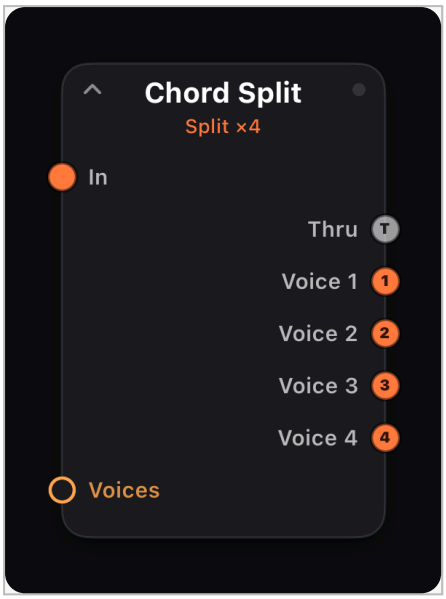
OUTPUT PORTS

`T`	Thru — full unmodified input.
`Low`	Notes at or below **Split** pitch.
`High`	Notes above **Split** pitch.

PARAMETERS

`Split`	Split pitch 0–127 (default middle C = 60).

◉ Every parameter accepts amber mod wires (MIDI In signals, LFO, Attractor, Life stats, etc.).



Chord Split

`In: 1× MIDI · Out: T · 1…n voices`

Decomposes each chord into separate **voice** outputs (up to **Voices**). Lowest note → port 1, next → port 2, etc. **T** passes the untouched chord.

Route each voice to different processing chains for per-note effects.

OUTPUT PORTS

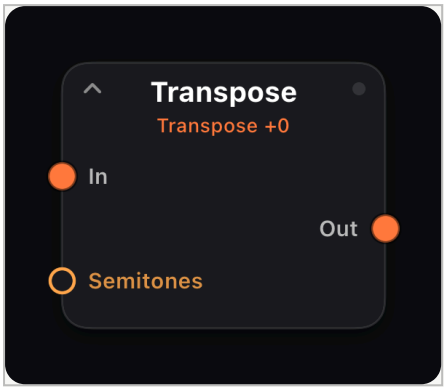
T	Thru — full chord unchanged.
1…n	Individual chord voices (count = **Voices**), lowest note on port 1.

PARAMETERS

`Voices`	Number of voice outputs 2–8.

◉ Every parameter accepts amber mod wires (MIDI In signals, LFO, Attractor, Life stats, etc.).

Notes — transform, chords, mono lines, echo, humanize



Transpose

`In: 1× MIDI · Out: 1× MIDI`

Shifts every note by **Semitones** (−24…+24). Note-offs track the transposed pitch so voices don't stick. Instant key change or fine interval tweak (+7 = fifth up).

PARAMETERS

`Semitones`	Interval shift −24 … +24 semitones.

◉ Every parameter accepts amber mod wires (MIDI In signals, LFO, Attractor, Life stats, etc.).

Mirror

`In: 1× MIDI · Out: 1× MIDI`

Inverts pitch around **Pivot** — notes above become equidistant below and vice versa. Set pivot to the tonic for inverted lines that stay in register.

PARAMETERS

`Pivot`	Mirror axis 0–127 (MIDI note number).

◉ Every parameter accepts amber mod wires (MIDI In signals, LFO, Attractor, Life stats, etc.).

Chord

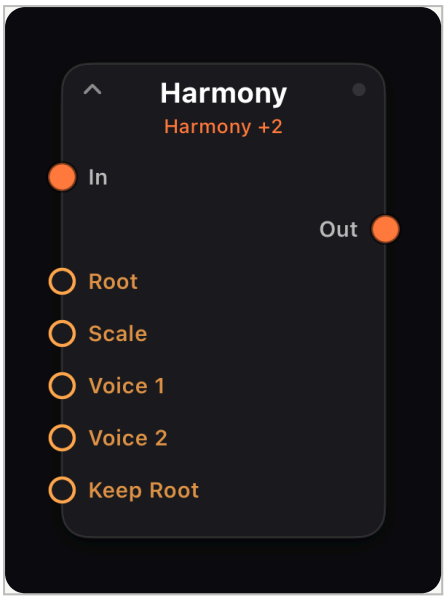
`In: 1× MIDI · Out: 1× MIDI`

Expands each note-on into a full **Chord** type (Major, Minor, 7ths, sus, etc.). **Spread** staggers voice onsets in milliseconds for a strummed feel. One-finger pad chords.

PARAMETERS

`Chord`	Chord quality (Major, Minor, dim, aug, 7ths, sus...).
`Spread ms`	Delay between chord voices 0–100 ms.

◉ Every parameter accepts amber mod wires (MIDI In signals, LFO, Attractor, Life stats, etc.).



Harmony

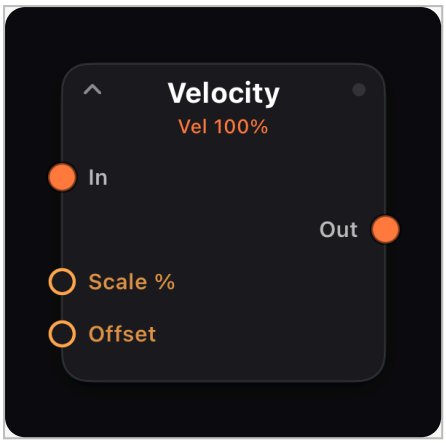
`In: 1× MIDI · Out: 1× MIDI`

Adds up to two **diatonic voices** at scale-degree offsets from **Root** + **Scale**. **Keep Root** On = original note plus harmonies; Off = harmony voices only.

PARAMETERS

`Root`	Scale root (C, C#, D…).
`Scale`	Diatonic scale for voice selection.
`Voice 1`	Scale-degree offset for first harmony (−7…+7).
`Voice 2`	Scale-degree offset for second harmony (−7…+7).
`Keep Root`	On = pass input note plus harmonies; Off = harmonies only.

◉ Every parameter accepts amber mod wires (MIDI In signals, LFO, Attractor, Life stats, etc.).



Velocity

`In: 1× MIDI · Out: 1× MIDI`

Scales note-on velocity: multiply by **Scale** % then add **Offset**. Compress or expand dynamics from a controller, sequencer or humanized stream.

PARAMETERS

`Scale %`	Velocity multiplier 0–200%.
`Offset`	Added after scaling (−64…+64).

◉ Every parameter accepts amber mod wires (MIDI In signals, LFO, Attractor, Life stats, etc.).

Note Length

`In: 1× MIDI · Out: 1× MIDI`

Forces a fixed **Length** (clock division) on every note. Input note-offs are ignored; the node issues its own off at grid time — staccato lines from legato input.

PARAMETERS

`Length`	Fixed note length as a clock division (`4/1` … `1/64`).

◉ Every parameter accepts amber mod wires (MIDI In signals, LFO, Attractor, Life stats, etc.).

Mono

`In: 1× MIDI · Out: 1× MIDI`

A **voice limiter**: only one note sounds at a time. **Priority** picks the winner — Last (newest press steals), Low or High — and releasing the sounding key falls back to the best still-held key, like a classic mono synth.

Mode orders the switch: Retrig closes the old note before the new one; Legato opens the new note first, so a legato-mode synth slides instead of restarting its envelope. Put it before mono basses, leads, or **Glide**.

PARAMETERS

`Priority`	Which held note wins the voice: Last, Low, or High.
`Mode`	Retrig = off-then-on; Legato = overlapped on-then-off.

◉ Every parameter accepts amber mod wires (MIDI In signals, LFO, Attractor, Life stats, etc.).

Glide

`In: 1× MIDI · Out: 1× MIDI`

Pitch-bend portamento (the 303 slide): a voice's first note passes through, and when its target note changes the change becomes a smooth pitch-bend ramp toward the new pitch over **Time** ms instead of a retrigger. Releasing back to a still-held key slides back down. **Polyphonic** — up to 8 voices glide independently: held notes are ranked by ascending pitch, each rank keeps its own voice, so whole chords slide when the harmony shifts.

Pitch bend is channel-wide, so each voice gets its own fixed output channel (**Channel Base** + voice index, wrapping mod 16) — the one-channel-per-voice trick MPE controllers use. **Bend Range** is announced on every voice channel as pitch-bend sensitivity (RPN 0,0), so the built-in **Synth** — and RPN-honoring hardware — lands exactly on pitch; jumps beyond the range re-anchor with a fresh note and keep sliding. **Always** mode glides even detached notes in from the previous pitch.

PARAMETERS

`Time ms`	Glide time 5–2000 ms per slide.
`Bend Range`	Bend span in semitones (1–48); match the receiver.
`Mode`	Legato = only overlapping notes slide; Always = every note.
`Channel Base`	Lowest of the 8 per-voice output channels (1–16).

◉ Every parameter accepts amber mod wires (MIDI In signals, LFO, Attractor, Life stats, etc.).

Ratchet

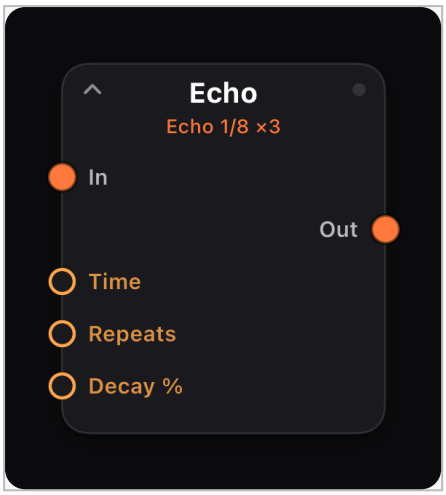
`In: 1× MIDI · Out: 1× MIDI`

On each incoming note-on, fires **Repeats** additional hits at **Rate** with **Decay** % velocity falloff and **Chance** % per hit. Machine-gun hi-hats and trap snares.

PARAMETERS

`Repeats`	Extra hits per note-on 1–4.
`Rate`	Clock division (`4/1` … `1/64`, including `1/8T`). Follows host transport tempo.
`Decay %`	Velocity falloff per repeat 0–100%.
`Chance %`	Probability 0–100% that an event fires.

◉ Every parameter accepts amber mod wires (MIDI In signals, LFO, Attractor, Life stats, etc.).



Echo

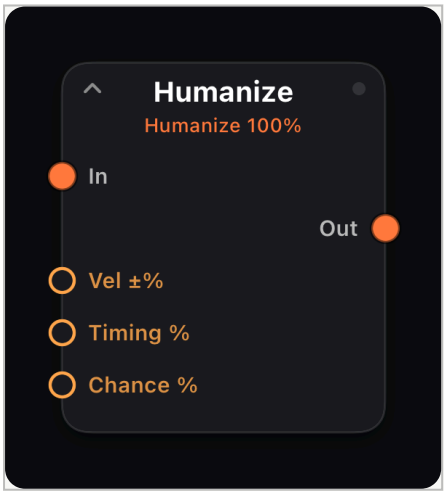
`In: 1× MIDI · Out: 1× MIDI`

Tempo-synced **MIDI delay**: **Repeats** echoes at **Time** division, each quieter by **Decay** %. Original notes pass through; echoes are added alongside.

PARAMETERS

`Time`	Delay interval as a clock division (`4/1` … `1/64`).
`Repeats`	Number of echo taps 1–8.
`Decay %`	Velocity reduction per repeat 0–100%.

◉ Every parameter accepts amber mod wires (MIDI In signals, LFO, Attractor, Life stats, etc.).



Humanize

`In: 1× MIDI · Out: 1× MIDI`

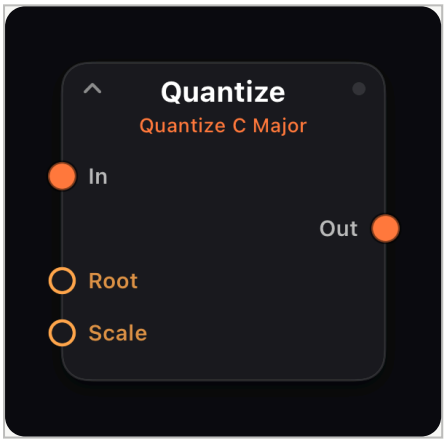
Adds controlled randomness: **Vel ±%** jitter, **Timing** % shift and **Chance** % dropouts. Place after sequencers for life; before **Snap** to tighten back up.

PARAMETERS

`Vel ±%`	Random velocity variation 0–100%.
`Timing %`	Random timing jitter 0–100%.
`Chance %`	Probability 0–100% that an event fires.

◉ Every parameter accepts amber mod wires (MIDI In signals, LFO, Attractor, Life stats, etc.).

Pitch & Scale — quantize and arpeggiate



Quantize

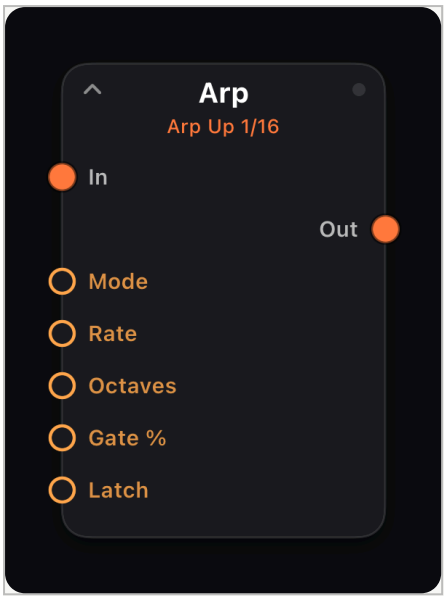
`In: 1× MIDI · Out: 1× MIDI`

Snaps every note to **Root** + **Scale**. Essential after **Random Notes**, **Walk**, or emergence generators; also sweetens live keyboard input into a chosen key.

PARAMETERS

`Root`	Scale root (C, C#, D...).
`Scale`	Scale name (Major, Minor, Pentatonic, etc.).

◉ Every parameter accepts amber mod wires (MIDI In signals, LFO, Attractor, Life stats, etc.).



Arp

`In: 1× MIDI · Out: 1× MIDI`

Arpeggiates held notes in **Mode** (Up, Down, Up/Down, Random…) at **Rate** across **Octaves** with **Gate** % length. **Latch** keeps running after keys are released.

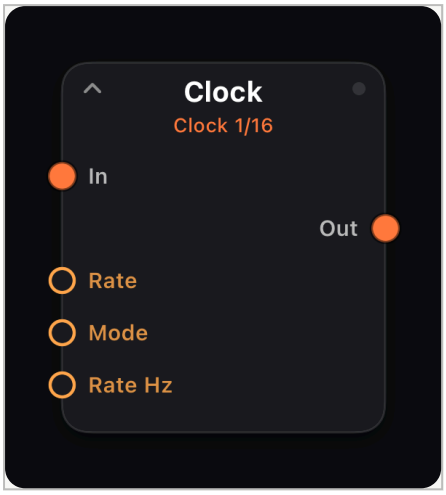
Hold a chord for running trance and synth-wave leads.

PARAMETERS

`Mode`	Arp direction / pattern.
`Rate`	Clock division (`4/1` … `1/64`, including `1/8T`). Follows host transport tempo.
`Octaves`	Range extension 0–4 octaves.
`Gate %`	Note length as percent of one grid step (1–100).
`Latch`	Off = stop when keys released; On = keep arpeggiating.

◉ Every parameter accepts amber mod wires (MIDI In signals, LFO, Attractor, Life stats, etc.).

Generate & Modulate — clock, euclidean, LFOs, CC tools



Clock

`In: 1× MIDI (pass-through) · Out: 1× MIDI + clock pulses`

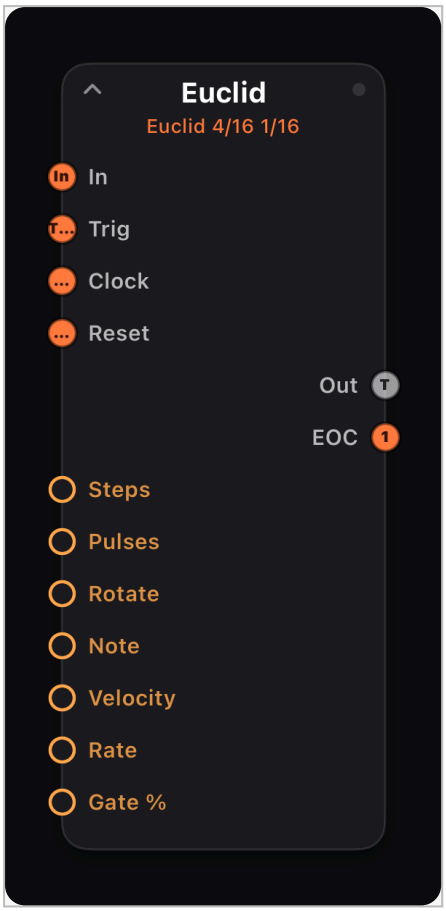
A dedicated **timing pulse** generator. Emits one clock pulse per **Rate** step on the MIDI stream (in addition to passing input through). Wire **Out** to the **Clock** input of sequencers and generators to drive many nodes from one master tempo.

Sync steps on a clock division, locked to the host transport (pauses when stopped). **Free** ticks at a **Rate Hz** you set — independent of the transport *and* the tempo, so it keeps going while stopped and doesn't speed up with the song.

PARAMETERS

`Rate`	Clock division (`4/1` … `1/64`, including `1/8T`). Follows host transport tempo.
`Mode`	Sync = follow host transport on the clock division; Free = run at Rate Hz.
`Rate Hz`	Free mode only: cycles per second, 0.05–20 Hz. Shown in place of the clock division once Mode is Free; ignored in Sync.

◉ Every parameter accepts amber mod wires (MIDI In signals, LFO, Attractor, Life stats, etc.).



Euclid

`In · Trig · Clock · Reset · Out: 1× MIDI + EOC`

Euclidean rhythm generator: distributes **Pulses** hits evenly across **Steps**, with **Rotate** phase offset. Fires **Note** at **Rate** or external clock.

Input on **In** passes through — layer polyrhythms on top of existing material without replacing it.

INPUT PORTS

`In`	Primary MIDI path — incoming events pass through unchanged to Out.
`Trig`	External step clock: each note-on advances the internal pattern one step (overrides **Rate**).
`Clock`	Wire from a **Clock** node — one pulse per step (mutually exclusive with **Trig**).
`Reset`	A note-on or clock pulse restarts the pattern at step 1 (on either clock mode) — wire a master lane's EOC or a performance pad here to re-align lanes.

OUTPUT PORTS

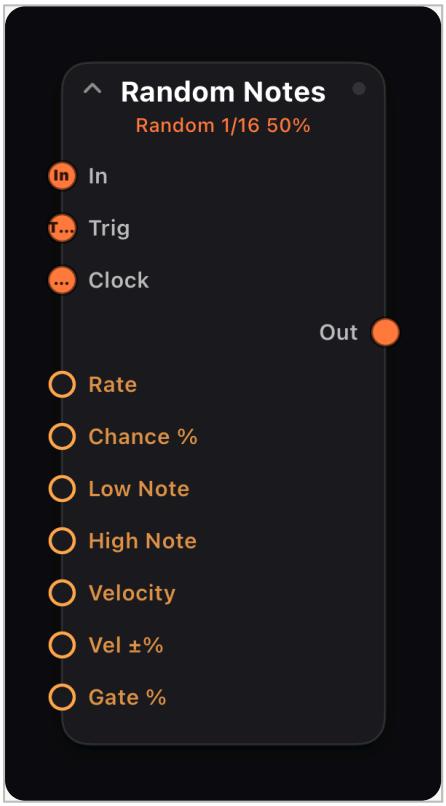
`Out`	Euclidean note hits; input passes through alongside.

`EOC`	End-of-cycle trigger — one clock pulse each time the pattern wraps to step 1. Wire into another node's **Trig** or **Clock** to chain patterns.

PARAMETERS

`Steps`	Pattern length 1–16.
`Pulses`	Number of hits in the pattern 0–16.
`Rotate`	Rotate pattern start 0–15.
`Note`	MIDI note number 0–127.
`Velocity`	Note-on velocity 1–127.
`Rate`	Clock division (`4/1` … `1/64`, including `1/8T`). Follows host transport tempo.
`Gate %`	Note length as percent of one grid step (1–100).

◉ Every parameter accepts amber mod wires (MIDI In signals, LFO, Attractor, Life stats, etc.).



Random Notes

`In · Trig · Clock · Out: 1× MIDI`

Probabilistic melody generator at **Rate**: random pitches between **Low/High Note** with **Chance** % and **Vel ±%** variation.

Follow with **Quantize** unless you want chromatic chaos.

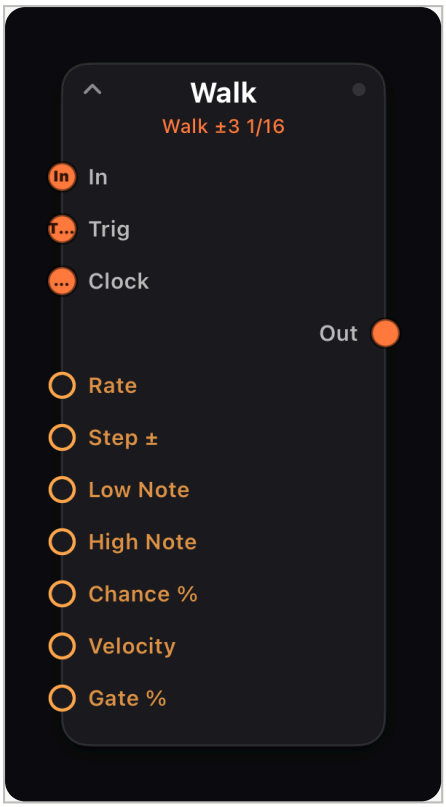
INPUT PORTS

`In`	Primary MIDI path — incoming events pass through unchanged to Out.
`Trig`	External step clock: each note-on advances the internal pattern one step (overrides **Rate**).
`Clock`	Wire from a **Clock** node — one pulse per step (mutually exclusive with **Trig**).

PARAMETERS

`Rate`	Clock division (`4/1` … `1/64`, including `1/8T`). Follows host transport tempo.
`Chance %`	Probability 0–100% that an event fires.
`Low Note`	Lowest pitch in range (0–127).
`High Note`	Highest pitch in range (0–127).
`Velocity`	Note-on velocity 1–127.
`Vel ±%`	Random velocity spread 0–100%.
`Gate %`	Note length as percent of one grid step (1–100).

◉ Every parameter accepts amber mod wires (MIDI In signals, LFO, Attractor, Life stats, etc.).



Walk

`In · Trig · Clock · Out: 1× MIDI`

Random-walk melody: each tick moves ±**Step** semitones, clamped to **Low/High Note**. Wandering, self-similar lines for ambient and generative bass.

INPUT PORTS

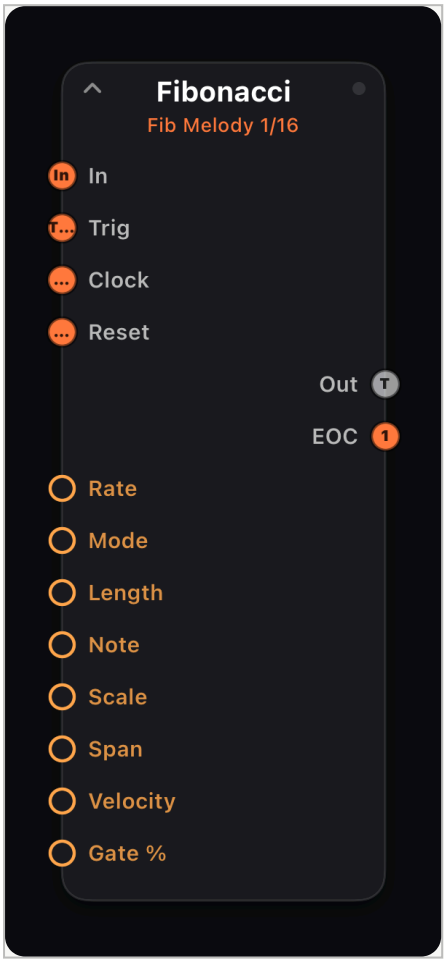
`In`	Primary MIDI path — incoming events pass through unchanged to Out.
`Trig`	External step clock: each note-on advances the internal pattern one step (overrides **Rate**).
`Clock`	Wire from a **Clock** node — one pulse per step (mutually exclusive with **Trig**).

PARAMETERS

`Rate`	Clock division (`4/1` … `1/64`, including `1/8T`). Follows host transport tempo.
`Step ±`	Max semitone jump per tick 1–12.
`Low Note`	Lowest pitch in range (0–127).
`High Note`	Highest pitch in range (0–127).
`Chance %`	Probability 0–100% that an event fires.

`Velocity`	Note-on velocity 1–127.
`Gate %`	Note length as percent of one grid step (1–100).

◉ Every parameter accepts amber mod wires (MIDI In signals, LFO, Attractor, Life stats, etc.).



Fibonacci

`In · Trig · Clock · Reset · Out: 1× MIDI + EOC`

Two modes: **Melody** walks Fibonacci scale degrees; **Rhythm** fires only on Fibonacci step indices (1, 2, 3, 5, 8…). Self-similar phrases that never quite repeat.

INPUT PORTS

`In`	Primary MIDI path — incoming events pass through unchanged to Out.
`Trig`	External step clock: each note-on advances the internal pattern one step (overrides **Rate**).

`Clock`	Wire from a **Clock** node — one pulse per step (mutually exclusive with **Trig**).
`Reset`	A note-on or clock pulse restarts the pattern at step 1 (on either clock mode) — wire a master lane's EOC or a performance pad here to re-align lanes.

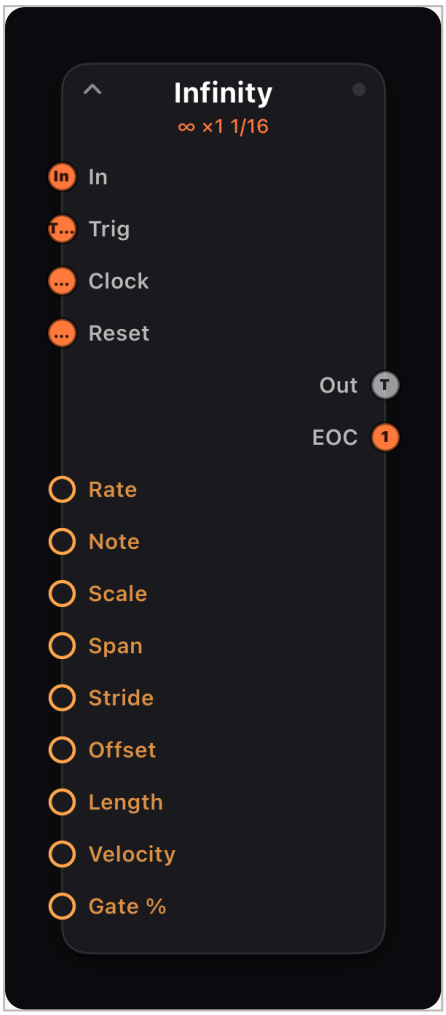
OUTPUT PORTS

`Out`	Generated notes; input passes through alongside.
`EOC`	End-of-cycle trigger — one clock pulse each time the pattern wraps to step 1. Wire into another node's **Trig** or **Clock** to chain patterns.

PARAMETERS

`Rate`	Clock division (`4/1` … `1/64`, including `1/8T`). Follows host transport tempo.
`Mode`	Melody = pitch walk; Rhythm = Fibonacci hit pattern.
`Length`	Pattern length 2–16.
`Note`	MIDI note number 0–127.
`Scale`	Scale for melody mode.
`Span`	Scale-degree span 2–24.
`Velocity`	Note-on velocity 1–127.
`Gate %`	Note length as percent of one grid step (1–100).

◉ Every parameter accepts amber mod wires (MIDI In signals, LFO, Attractor, Life stats, etc.).



Infinity

`In · Trig · Clock · Reset · Out: 1× MIDI + EOC`

Per Nørgård's **infinity series** — a fractal melody played as scale degrees around **Note**. The sequence contains itself at every scale: **Stride** plays every Nth term, so 4, 16 or 64 reproduce the very same melody and 2 or 8 play its mirror inversion — a zoom knob for self-similarity you can hear.

Offset starts the loop deeper in the series, **Length** sets how many notes before the loop wraps (EOC pulses there), and **Span** caps how far the melody strays. Always lands in the chosen scale — no quantizer needed.

INPUT PORTS

`In`	Primary MIDI path — incoming events pass through unchanged to Out.
`Trig`	External step clock: each note-on advances the internal pattern one step (overrides **Rate**).

`Clock`	Wire from a **Clock** node — one pulse per step (mutually exclusive with **Trig**).
`Reset`	A note-on or clock pulse restarts the pattern at step 1 (on either clock mode) — wire a master lane's EOC or a performance pad here to re-align lanes.

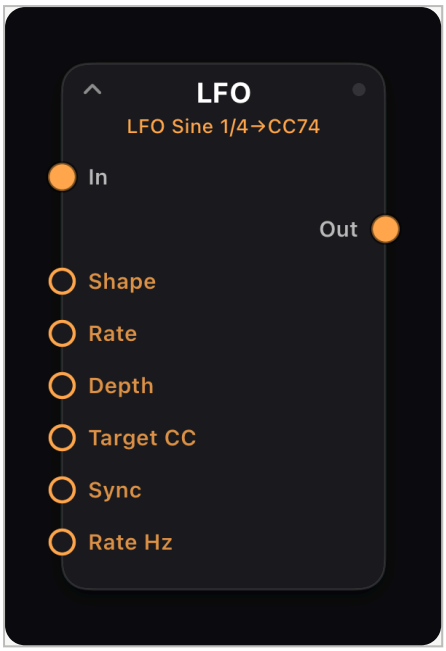
OUTPUT PORTS

`Out`	Generated notes; input passes through alongside.
`EOC`	End-of-cycle trigger — one clock pulse each time the pattern wraps to step 1. Wire into another node's **Trig** or **Clock** to chain patterns.

PARAMETERS

`Rate`	Clock division (`4/1` … `1/64`, including `1/8T`). Follows host transport tempo.
`Note`	Centre note the degrees walk around.
`Scale`	Scale the degrees are drawn from.
`Span`	Maximum scale-degree excursion 2–24.
`Stride`	Play every Nth term (1–32) — 4/16/64 replay the series, 2/8 invert it.
`Offset`	Where in the series the loop starts (0–127).
`Length`	Loop length 2–64; the EOC pulse fires at the wrap.
`Velocity`	Note-on velocity 1–127.
`Gate %`	Note length as percent of one grid step (1–100).

◉ Every parameter accepts amber mod wires (MIDI In signals, LFO, Attractor, Life stats, etc.).



LFO

`In: — · Out: CC on Target CC`

`Mod out:` `main LFO signal (0–1)`

Low-frequency oscillator writing **Target CC** continuously. **Shape** (sine, triangle, square…), **Rate**, **Depth** and **Sync/Free** mode. In **Sync** the cycle is a clock division locked to the host transport; in **Free** it runs at **Rate Hz** — unaffected by transport or tempo.

The amber **mod out** port drives any parameter directly — wire to Echo **Decay**, filter cutoff, or another node's knob.

PARAMETERS

`Shape`	Waveform (Sine, Triangle, Square, Saw, Random…).
`Rate`	Clock division (`4/1` … `1/64`, including `1/8T`). Follows host transport tempo.
`Depth`	Modulation amount 0–127.
`Target CC`	MIDI CC number to write (0–127).
`Sync`	Sync = tempo-locked clock division; Free = Hz-based rate.
`Rate Hz`	Free mode only: cycles per second, 0.05–20 Hz. Shown in place of the clock division once Mode is Free; ignored in Sync.

◉ Every parameter accepts amber mod wires (MIDI In signals, LFO, Attractor, Life stats, etc.).

CC Map

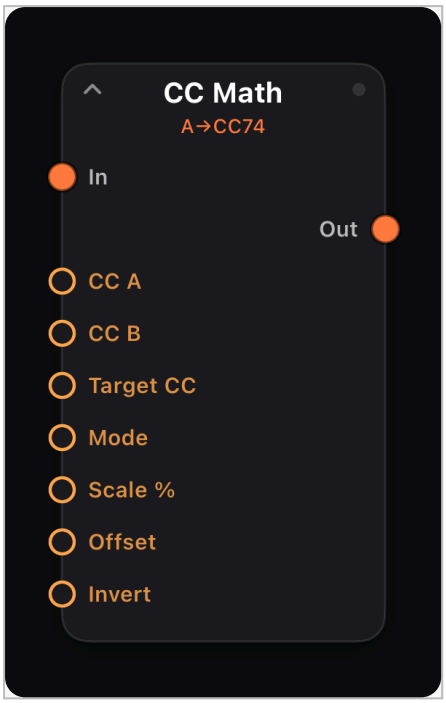
`In: 1× MIDI · Out: 1× MIDI`

Remaps **From CC** → **To CC** on **Channel** (0 = any). Duplicate a mod wheel to multiple targets or translate controller numbers for incompatible synths.

PARAMETERS

`From CC`	Source CC number 0–127.
`To CC`	Destination CC number 0–127.
`Channel`	0 = any channel; 1–16 = filter to channel.

◉ Every parameter accepts amber mod wires (MIDI In signals, LFO, Attractor, Life stats, etc.).



CC Math

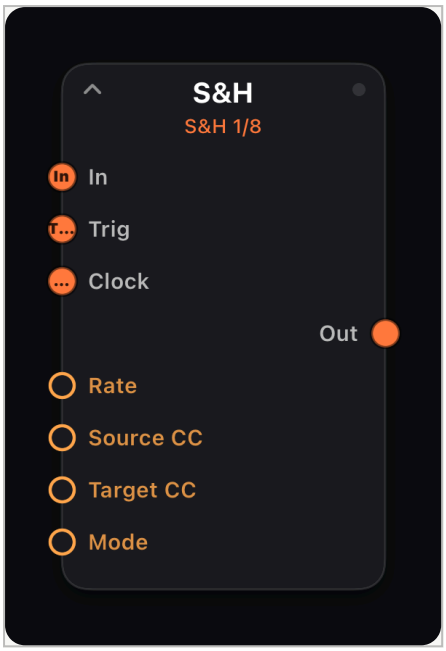
`In: 1× MIDI · Out: 1× MIDI + Target CC`

Combines incoming **CC A** and **CC B** values: A, A+B, A−B, Average, Max or Min — then **Scale**, **Offset** and optional **Invert** on **Target CC**.

PARAMETERS

`CC A`	First operand CC 0–127.
`CC B`	Second operand CC 0–127.
`Target CC`	MIDI CC number to write (0–127).
`Mode`	Math operation applied to A and B.
`Scale %`	Output multiplier 0–200%.
`Offset`	Added after scaling −127…+127.
`Invert`	Off / On — flip output (127 − value).

◉ Every parameter accepts amber mod wires (MIDI In signals, LFO, Attractor, Life stats, etc.).



S&H

`In · Trig · Clock · Out: 1× MIDI`

Each **Rate** tick, **Sample** holds the current **Source CC** value or **Random** throws a new value on **Target CC**. Classic stepped and random filter sweeps.

INPUT PORTS

`In`	Primary MIDI path — incoming events pass through unchanged to Out.
`Trig`	External step clock: each note-on advances the internal pattern one step (overrides **Rate**).
`Clock`	Wire from a **Clock** node — one pulse per step (mutually exclusive with **Trig**).

PARAMETERS

`Rate`	Clock division (`4/1` … `1/64`, including `1/8T`). Follows host transport tempo.
`Source CC`	CC to sample 0–127.
`Target CC`	MIDI CC number to write (0–127).
`Mode`	Sample = track input CC; Random = new value each step.

◉ Every parameter accepts amber mod wires (MIDI In signals, LFO, Attractor, Life stats, etc.).

Counter

`In: 1× MIDI · Out: 1× MIDI`

`Mod out: stepped count (0–1)`

A **stepped counter**: its value rises by one on every input event — a **note-on** or a **clock / EOC** pulse — and is exposed on the amber **mod out**. Wire it onto another node's indexed parameter (waveform, scale, clock division, **Selector**…) to walk through the options; set **Count** to the number of options so each input advances exactly one.

Mode picks Wrap (cycle), Up-Down (bounce) or Clamp (rise once and hold). Input passes through unchanged — the count never appears as MIDI.

PARAMETERS

`Count`	Number of steps before wrapping / bouncing 2–32.
`Mode`	Wrap = cycle; Up-Down = bounce; Clamp = rise once and hold.

◉ Every parameter accepts amber mod wires (MIDI In signals, LFO, Attractor, Life stats, etc.).

Note→CC

`In: 1× MIDI · Out: 1× MIDI + Target CC`

Maps **Note #** or **Velocity** to **Target CC** on every note-on — keytracking and performance-driven automation without a separate LFO.

PARAMETERS

`Source`	Note # = pitch drives CC; Velocity = dynamics drive CC.
`Target CC`	MIDI CC number to write (0–127).

◉ Every parameter accepts amber mod wires (MIDI In signals, LFO, Attractor, Life stats, etc.).

Smooth

`In: 1× MIDI · Out: 1× MIDI`

Slew-limits CC changes over **Time** ms. **CC** 0 smooths all CCs; otherwise only the named CC. Glides stepped sequencers and S&H into usable sweeps.

PARAMETERS

`CC (0=all)`	Which CC to smooth (0 = all CC messages).
`Time ms`	Slew time 10–2000 ms.

Every parameter accepts amber mod wires (MIDI In signals, LFO, Attractor, Life stats, etc.).

Envelope

`In: 1× MIDI · Out: 1× MIDI + Target CC`

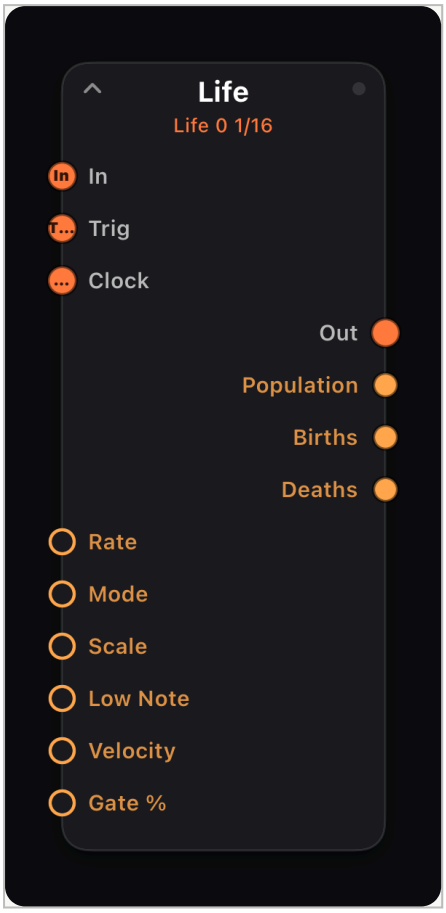
Per-note **Attack / Decay / Peak** envelope on **Target CC**, retriggered each note-on. Auto-filter sweeps and pluck brightness from your playing.

PARAMETERS

`Target CC`	MIDI CC number to write (0–127).
`Attack ms`	Rise time 1–2000 ms.
`Decay ms`	Fall time 10–5000 ms.
`Peak`	Maximum CC value 1–127.

Every parameter accepts amber mod wires (MIDI In signals, LFO, Attractor, Life stats, etc.).

Emergence — generative, evolving patterns



Life

`In · Trig · Clock · Out: 1× MIDI`

`Mod out: Population · Births · Deaths`

Conway's **Game of Life** on a 16×12 grid. **Pulse** mode fires notes from live-cell events; **Scan** reads columns as time and rows as scale degrees for looping ostinatos.

Draw a seed on the surface Life grid. Pair with **Quantize** or use built-in **Scale** mapping.

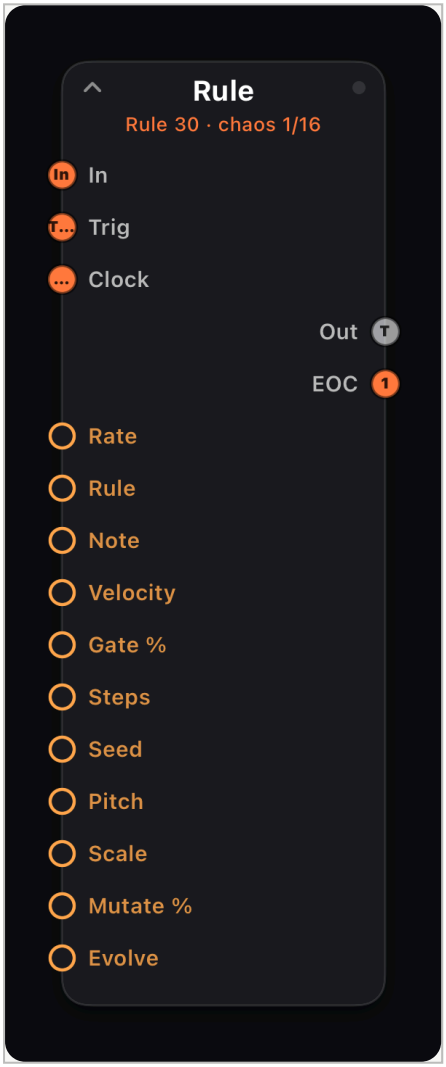
INPUT PORTS

`In`	Primary MIDI path — incoming events pass through unchanged to Out.
`Trig`	External step clock: each note-on advances the internal pattern one step (overrides **Rate**).
`Clock`	Wire from a **Clock** node — one pulse per step (mutually exclusive with **Trig**).

PARAMETERS

`Rate`	Clock division (`4/1` … `1/64`, including `1/8T`). Follows host transport tempo.
`Mode`	Pulse = event-driven; Scan = column scanner.
`Scale`	Pitch mapping for live cells.
`Low Note`	Lowest pitch in range (0–127).
`Velocity`	Note-on velocity 1–127.
`Gate %`	Note length as percent of one grid step (1–100).
`Cell 1–192`	Seed pattern on the 16×12 Life grid (bottom row = lowest pitch). Surface editor.

◉ Every parameter accepts amber mod wires (MIDI In signals, LFO, Attractor, Life stats, etc.).



Rule

`In · Trig · Clock · Out: 1× MIDI + EOC`

1D **Wolfram cellular automaton** (**Rule** 0–255; notable rules show tags like **90 · fractal**). **Trigger** pitch mode fires from live cells; **Melody** maps columns to scale degrees.

Seed Center or Random initializes the row. **Mutate %** flips random cells each generation (0% = pure automaton). Dead or frozen rows **reseed** automatically so every rule stays musical.

Evolve morphs the row every 1/2/4/8 steps (**Loop** = once per pattern wrap, the default). **Register** view edits live cells (same idea as the Life grid seed editor).

INPUT PORTS

`In`	Primary MIDI path — incoming events pass through unchanged to Out.
`Trig`	External step clock: each note-on advances the internal pattern one step (overrides **Rate**).
`Clock`	Wire from a **Clock** node — one pulse per step (mutually exclusive with **Trig**).

OUTPUT PORTS

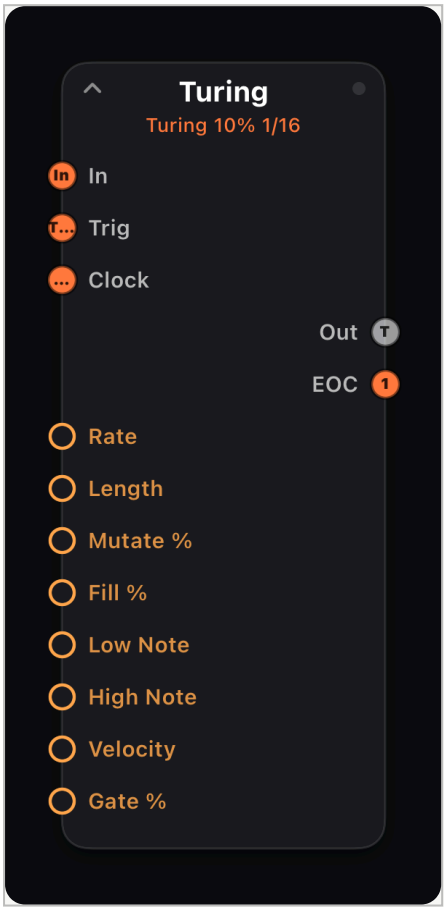
`Out`	Cellular-automaton notes; input passes through alongside.
`EOC`	End-of-cycle trigger — one clock pulse each time the pattern wraps to step 1. Wire into another node's **Trig** or **Clock** to chain patterns.

PARAMETERS

`Rate`	Clock division (`4/1` … `1/64`, including `1/8T`). Follows host transport tempo.
`Rule`	Wolfram rule number 0–255 (notable rules tagged in the UI).
`Note`	MIDI note number 0–127.
`Velocity`	Note-on velocity 1–127.
`Gate %`	Note length as percent of one grid step (1–100).
`Steps`	Pattern length 1–16.
`Seed`	Center = single cell; Random = scattered start.
`Pitch`	Trigger = rhythm from cells; Melody = pitched output.
`Scale`	Scale for Melody mode.
`Mutate %`	Random cell flips per generation (default 10%).

`Evolve`	Loop, 1 Step, 2 Steps, 4 Steps or 8 Steps between row morphs.
`Cell 1–16`	Live row bits — tap or drag in the **Register** view to poke cells on/off.

◉ Every parameter accepts amber mod wires (MIDI In signals, LFO, Attractor, Life stats, etc.).



Turing

`In · Trig · Clock · Out: 1× MIDI + EOC`

Self-mutating **shift register**: **Length** bits, **Fill** % density, **Mutate** % bit-flip chance per step. Pattern slowly evolves from locked to chaotic.

INPUT PORTS

`In`	Primary MIDI path — incoming events pass through unchanged to Out.
`Trig`	External step clock: each note-on advances the internal pattern one step (overrides **Rate**).
`Clock`	Wire from a **Clock** node — one pulse per step (mutually exclusive with **Trig**).

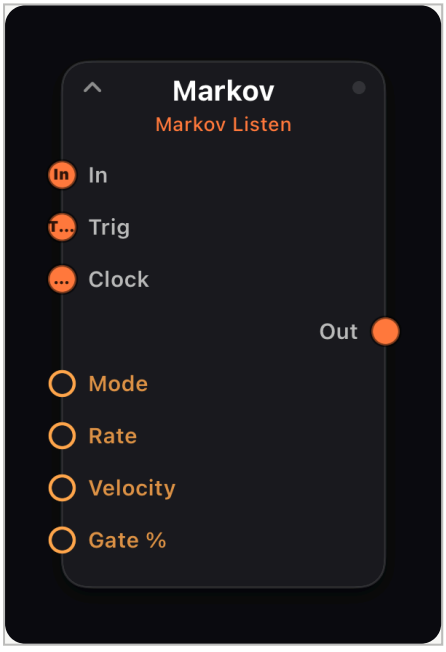
OUTPUT PORTS

`Out`	Shift-register notes; input passes through alongside.
`EOC`	End-of-cycle trigger — one clock pulse each time the pattern wraps to step 1. Wire into another node's **Trig** or **Clock** to chain patterns.

PARAMETERS

`Rate`	Clock division (`4/1` … `1/64`, including `1/8T`). Follows host transport tempo.
`Length`	Register length 2–16.
`Mutate %`	Bit-flip probability per step 0–100%.
`Fill %`	Initial ones density 1–100%.
`Low Note`	Lowest pitch in range (0–127).
`High Note`	Highest pitch in range (0–127).
`Velocity`	Note-on velocity 1–127.
`Gate %`	Note length as percent of one grid step (1–100).

◉ Every parameter accepts amber mod wires (MIDI In signals, LFO, Attractor, Life stats, etc.).



Markov

`In · Trig · Clock · Out: 1× MIDI`

Learns note transitions from incoming MIDI. **Listen** = pass-through training; **Generate** improvises at **Rate** in the learned style.

Feed it a melody loop in Listen mode, then switch to Generate for variations.

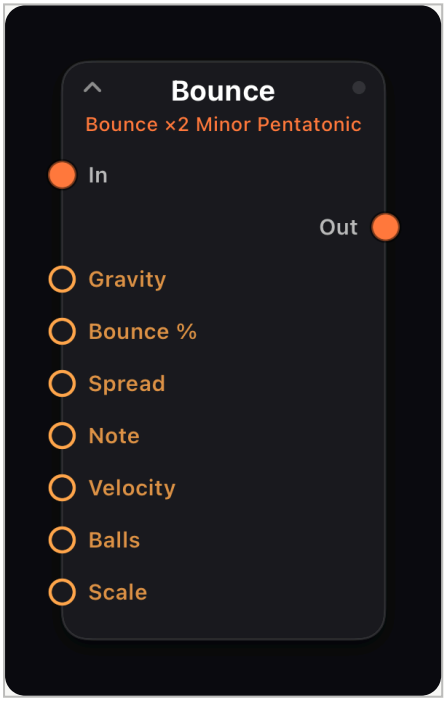
INPUT PORTS

`In`	Primary MIDI path — incoming events pass through unchanged to Out.
`Trig`	External step clock: each note-on advances the internal pattern one step (overrides **Rate**).
`Clock`	Wire from a **Clock** node — one pulse per step (mutually exclusive with **Trig**).

PARAMETERS

`Mode`	Listen = learn + pass through; Generate = improvise.
`Rate`	Clock division (`4/1` … `1/64`, including `1/8T`). Follows host transport tempo.
`Velocity`	Note-on velocity 1–127.
`Gate %`	Note length as percent of one grid step (1–100).

◉ Every parameter accepts amber mod wires (MIDI In signals, LFO, Attractor, Life stats, etc.).



Bounce

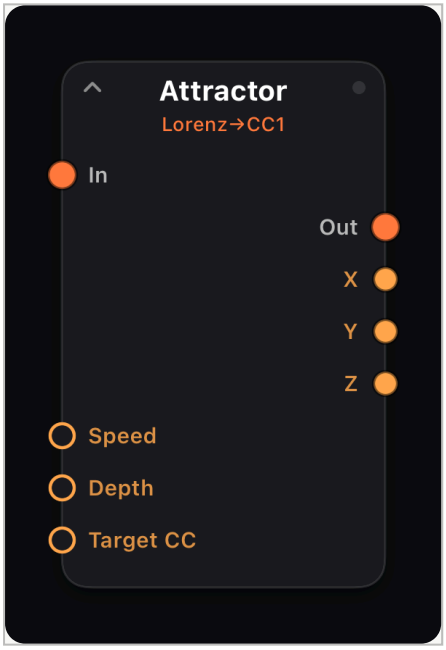
`In: 1× MIDI (pass-through) · Out: 1× MIDI`

2-D physics simulation: balls under **Gravity** bounce off walls and play scale degrees on impact. Organic polyrhythms from motion rather than fixed grids.

PARAMETERS

`Gravity`	Downward acceleration 1–100.
`Bounce %`	Wall rebound energy 50–95%.
`Spread`	Initial horizontal spread 0–100%.
`Note`	MIDI note number 0–127.
`Velocity`	Note-on velocity 1–127.
`Balls`	Number of balls 1–4.
`Scale`	Pitch map for wall impacts.

◉ Every parameter accepts amber mod wires (MIDI In signals, LFO, Attractor, Life stats, etc.).



Attractor

`In: — · Out: CC on Target CC`

`Mod out: X · Y · Z`

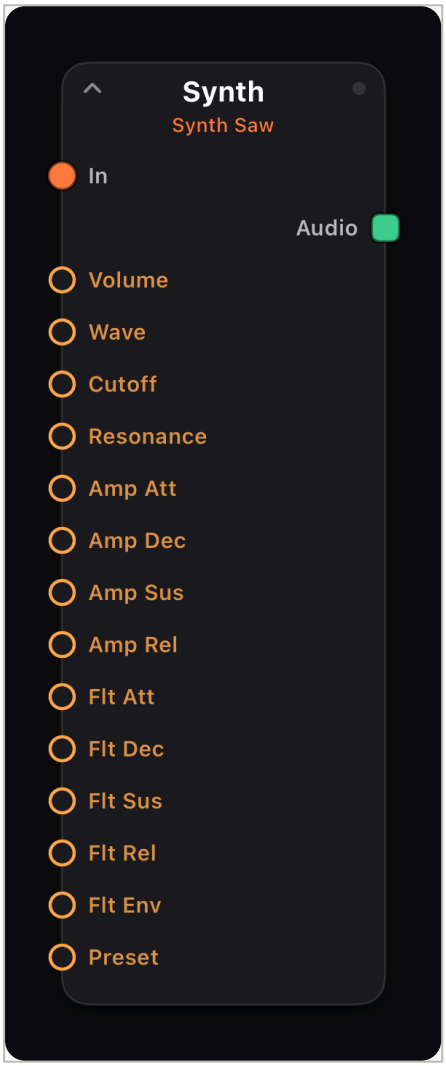
Lorenz **chaotic attractor** driving **Target CC**. Never-repeating organic modulation — wire **X**, **Y**, **Z** mod ports to cutoff, resonance and LFO rate for evolving textures.

PARAMETERS

`Speed`	Evolution rate 1–100.
`Depth`	Output amplitude 0–127.
`Target CC`	MIDI CC number to write (0–127).

Every parameter accepts amber mod wires (MIDI In signals, LFO, Attractor, Life stats, etc.).

Instruments — built-in synth and drum kit



Synth

`In: 1× MIDI · Out: — (audio sink)`

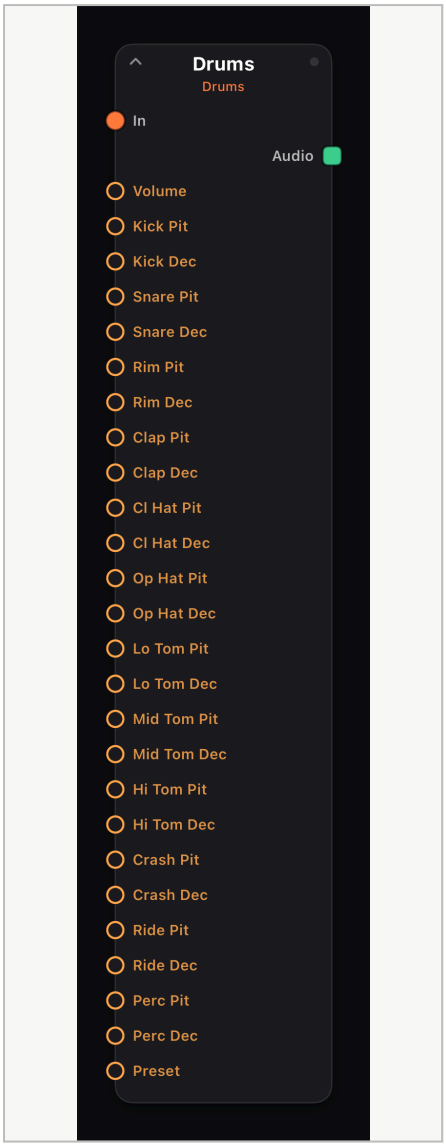
Terminal **polyphonic subtractive synth**. MIDI on **In** is rendered to audio inside MIDIRack — nothing passes downstream. Oscillator, resonant lowpass and dual ADSR envelopes (amplitude + filter).

Wire sequencers, arps or keyboards into one or more **Synth** nodes for a self-contained patch. Multiple instruments sum at the output.

PARAMETERS

`Preset`	Sound preset: Init, Warm Pad, Pluck, Acid Bass, Bright Lead, Soft Keys, Sub Bass, Sweep Pad. Picking one fills the controls below so you can tweak from there.
`Volume`	Master level 0–1.
`Wave`	Oscillator waveform: Sine, Tri, Saw, Square.
`Cutoff`	Lowpass cutoff 0–100.
`Resonance`	Filter resonance 0–100.
`Amp Att`	Amplitude attack 0–2000 ms.
`Amp Dec`	Amplitude decay 0–5000 ms.
`Amp Sus`	Amplitude sustain 0–100%.
`Amp Rel`	Amplitude release 0–5000 ms.
`Flt Att`	Filter envelope attack 0–2000 ms.
`Flt Dec`	Filter envelope decay 0–5000 ms.
`Flt Sus`	Filter envelope sustain 0–100%.
`Flt Rel`	Filter envelope release 0–5000 ms.
`Flt Env`	Filter envelope depth −4…+4 octaves.

◉ Every parameter accepts amber mod wires (MIDI In signals, LFO, Attractor, Life stats, etc.).



Drums

`In: 1× MIDI · Out: — (audio sink)`

Terminal **procedural GM drum kit**. Each MIDI note triggers a synthesized voice (kick, snare, hats, toms, crash, ride, percussion). Renders audio in-plugin — no MIDI output.

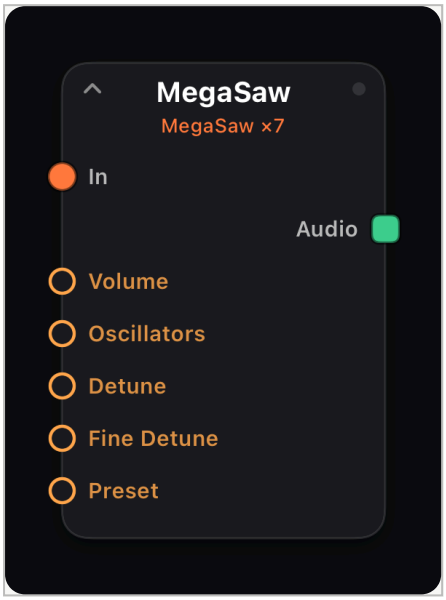
Tune and shape each voice independently. Route a **Drum Seq** branch or **Drum Pads** into **Drums** for an all-in-one groovebox.

PARAMETERS

`Preset`	Sound preset: Init, Punchy, Boomy, Tight, Lo-Fi, Trap, Acoustic. Picking one fills the per-voice controls below so you can tweak from there.
`Volume`	Master level 0–1.

`Per-voice Pit / Dec`	Kick, Snare, Rim, Clap, Cl/Op Hat, Lo/Mid/Hi Tom, Crash, Ride, Perc — each has **Pit** (−12…+12 semitones) and **Dec** (25–400% tail length).

◉ Every parameter accepts amber mod wires (MIDI In signals, LFO, Attractor, Life stats, etc.).



MegaSaw

`In: 1× MIDI · Out: — (audio sink)`

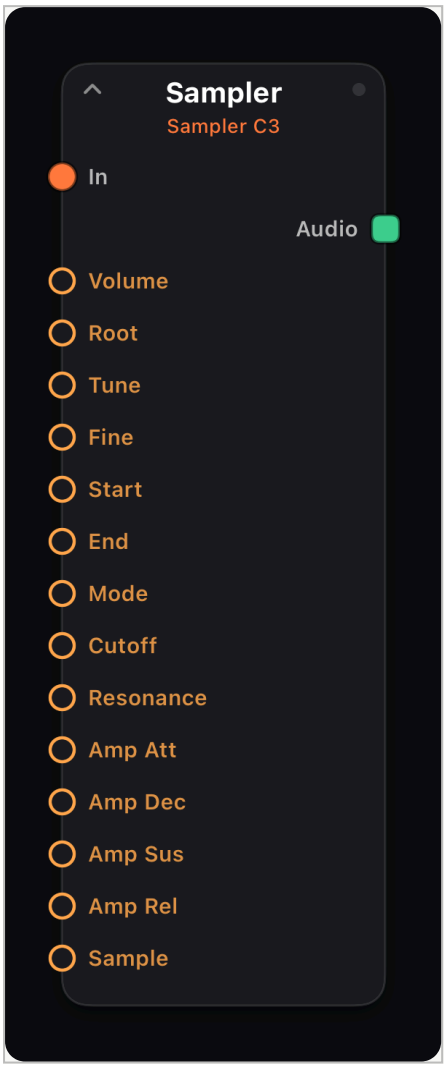
Terminal **unison saw stack** — up to **200 detuned sawtooth oscillators per voice** for supersaw leads, trance pads and walls of sound. Renders audio in-plugin; no MIDI output.

Spread is two-stage: **Detune** sets the coarse pitch spray across the stack, **Fine Detune** adds slow-beating shimmer within it. More oscillators = thicker (and louder — presets lower Volume as the count grows).

PARAMETERS

`Preset`	Sound preset: Init, Classic Supersaw, Wide Trance, Massive Wall, Subtle Unison, Detuned Chaos, Monster (200). Picking one fills the controls below so you can tweak from there.
`Volume`	Master level 0–1.
`Oscillators`	Saws per voice, 1–200.
`Detune`	Coarse detune spread 0–100.
`Fine Detune`	Slow-beat shimmer within the stack, 0–100.

Every parameter accepts amber mod wires (MIDI In signals, LFO, Attractor, Life stats, etc.).



Sampler

`In: 1× MIDI · Out: — (audio sink)`

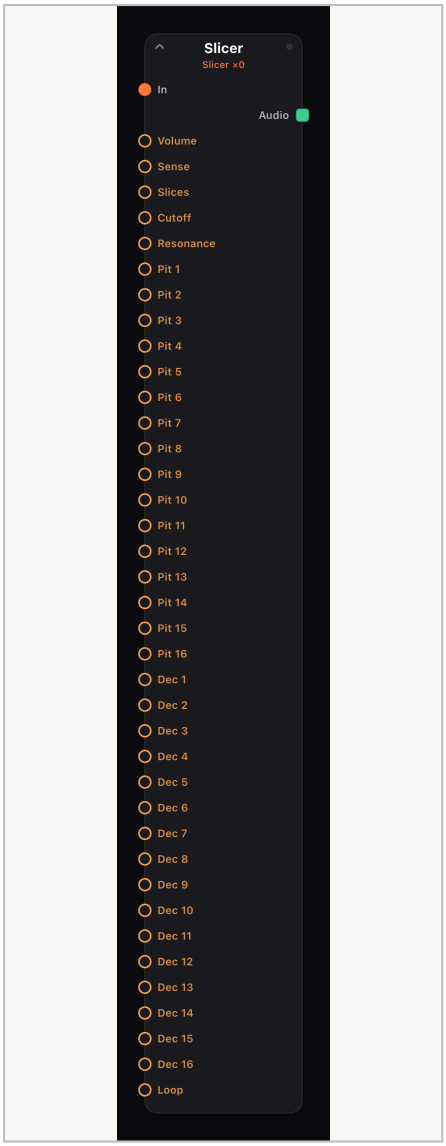
Terminal **sample player**: one sample repitched chromatically around its root note, SP-style — no time-stretch, and the character that comes with that. Pick a factory sound with **Sample**, or load your own file from the node inspector; the root note is detected automatically so imports land in tune.

The waveform card on the surface trims the playable region. **Mode** Loop finds a sustain loop inside the region, turning one-shots into playable pads, keys and basses; the Synth's lowpass and amp envelope shape the result. Slides from a **Glide** node bend the sample like any synth voice.

PARAMETERS

`Sample`	Factory sound picker (Init keeps the loaded sample). Loading your own file flips it to Custom.
`Volume`	Master level 0–1.
`Root`	The note the sample plays at original pitch (auto-detected on import).
`Tune / Fine`	Coarse ±12 semitones, fine ±50 cents.
`Start / End`	Playable region, % of the file.
`Mode`	Gate follows note-off · One-Shot plays through · Loop sustains.
`Cutoff / Resonance`	Resonant lowpass, as on the Synth.
`Amp Att–Rel`	Amplitude ADSR.

◉ Every parameter accepts amber mod wires (MIDI In signals, LFO, Attractor, Life stats, etc.).



Slicer

`In: 1× MIDI · Out: — (audio sink)`

Terminal **loop slicer**: load a drum loop and it's cut at its detected hits into up to 16 one-shot slices, each on its own note — slice 1 on note **36** (a fresh Drum Seq's default), slice 2 on 37, and so on. Point one **Drum Seq** lane per slice at its note and the loop becomes a kit you can resequence.

The waveform card shows the markers: tap to add or remove one, drag to nudge. **Sense** re-runs detection — more sensitivity, more slices. Marker positions live in the patch like any other parameter, so edits persist and undo.

PARAMETERS

`Loop`	Factory loop picker (Init keeps the loaded loop). Imported loops are sliced on load.
`Volume`	Master level 0–1.
`Sense`	Onset-detection sensitivity 0–100 — re-slices the loop.
`Slices`	Active slice count (written by detection, editable).
`Cutoff / Resonance`	Resonant lowpass over all slices, as on the Sampler.
`Per-slice Pit / Dec`	Each slice has **Pit** (−12…+12 semitones) and **Dec** (25–400% — under 100 chokes the hit early).

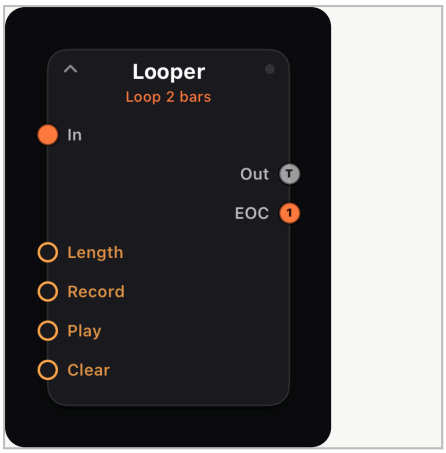
◉ Every parameter accepts amber mod wires (MIDI In signals, LFO, Attractor, Life stats, etc.).

Utility — monitor and loop

Monitor

`In: 1× MIDI · Out: 1× MIDI (unchanged)`

Zero-latency **debug tap** — MIDI passes through unchanged while messages log to the surface Monitor readout or a bound **Note Scope**. Splice anywhere the stream goes dark.



Looper

`In: 1× MIDI · Out: 1× MIDI + EOC`

Tempo-synced **MIDI looper**: **Record** overdubs new material, **Play** loops captured events, **Clear** wipes the buffer. **Length** sets loop size in bars.

Drive from a surface Looper control for hands-free capture.

OUTPUT PORTS

`Out`	Live input plus looped playback.
`EOC`	End-of-cycle trigger — one clock pulse each time the pattern wraps to step 1. Wire into another node's **Trig** or **Clock** to chain patterns.

PARAMETERS

`Length`	Loop length in bars 1–8.
`Record`	Off / On — enable overdub recording.
`Play`	Off / On — playback loop.
`Clear`	Momentary — wipe loop buffer.

◉ Every parameter accepts amber mod wires (MIDI In signals, LFO, Attractor, Life stats, etc.).

Control catalog

Each entry shows the control as it appears on the performance surface. Add controls from the header **+** menu in edit mode, then drag into place and open the inspector (sliders icon) to bind.

- **Caption** — `Node · Parameter` when bound to the graph; `CC n` when sending raw MIDI to your synth.
- **Performance controls** (keyboards, pads) inject notes into a `keyboardSource` graph node — route that branch independently.

- **Visualizers** attach to a specific node and update live from the patch.

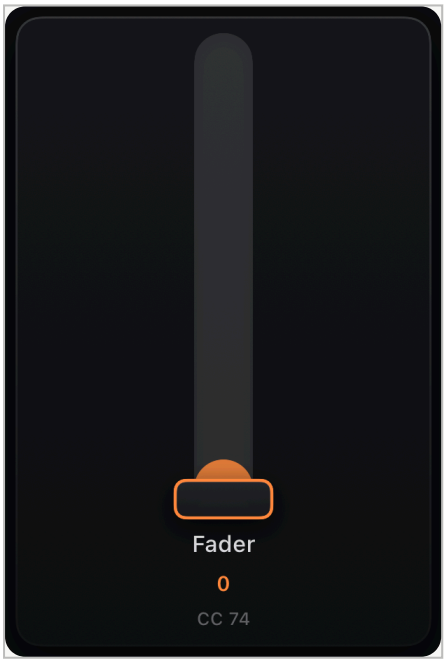
Adjust & trigger — knobs, faders, XY, buttons

Knob

`Binding: node parameter or CC · drag vertically`

Rotary control for any bound parameter or raw CC. Values display musically when the target is a note, clock division or scale name.

Resize in edit mode; color via **Appearance** in the inspector.



Fader

`Binding: node parameter or CC · drag vertically`

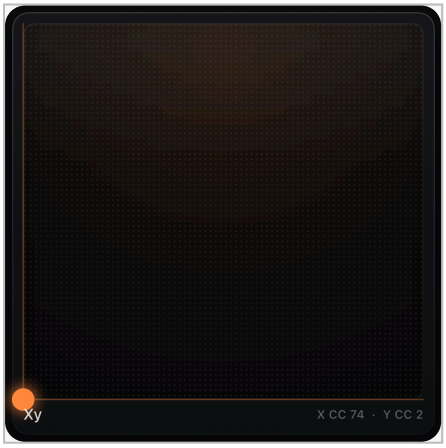
Vertical slider — same binding model as a knob, better for long throws (filter sweeps, levels).

Selector

`Binding: indexed node parameter (or CC) · tap / scroll to pick`

Touch-friendly picker for **indexed / named** parameters — waveform, scale, mode, chord type, clock division. It adapts to the option count: a **segmented pill bar** for short lists, a **scroll-wheel drum** for long ones.

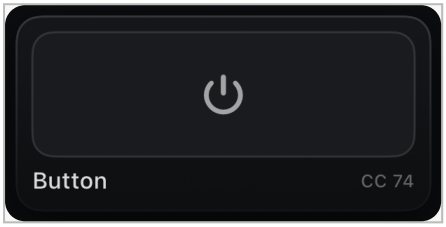
Prefer it over a knob whenever the parameter is a list of choices rather than a sweepable range. Short enums also appear as inline pills in the node inspector.



XY Pad

`Binding: X and Y each → parameter or CC · drag the puck`

Two-axis control. Set **X Axis** and **Y Axis** independently in the inspector — mix filter cutoff and resonance, or drive two node parameters at once.

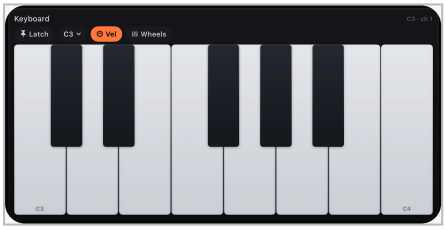


Button

`Binding: parameter or CC · sends max on, min off`

Toggle latches on/off; **Momentary** is active only while held. Use for gates, mode switches, or momentary CC bursts.

Performance — keyboards and pads



Keyboard

`Emits: notes · own graph branch via keyboardSource`

Piano keyboard — slide across keys for glissando. **Octave** menu (C−1…C7) and **Octaves** span set range; **Latch** on the toolbar sustains notes. **Velocity Sensitive** (inspector) maps vertical touch to dynamics.

Each keyboard is a graph node. Wire its output through processors or to a specific **MIDI Out** channel.

Drum Pads

`Emits: GM drum notes · channel 10 by default`

4×4 pad grid mapped to General MIDI percussion (kick, snare, hats…). Set **Channel** in the inspector for non-GM rigs.

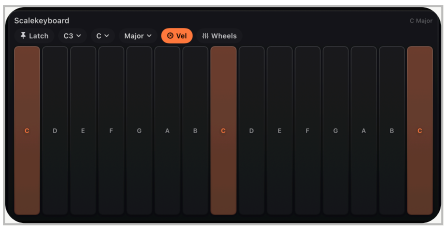
Switch **Layout** to **Chromatic** in the inspector for a pad grid rising semitone-by-semitone from **Base Note** at the bottom-left pad — for samplers, slicers, and gear with its own drum maps.

Custom layout maps every pad yourself: tap a pad in the inspector's mini grid to set its note and label, or **Learn** it from a hardware pad hit. Pads start from what the previous layout showed, duplicates are allowed, and **Reset** returns to the GM map.

Chord Pads

`Emits: stacked chord per scale degree`

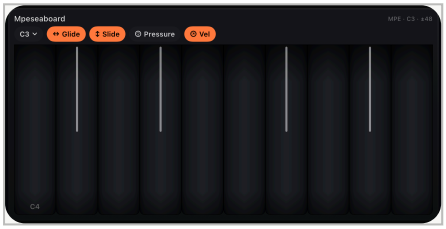
One pad per diatonic degree — plays a triad or 7th from **Root** + **Scale**. **Voices** picks triad vs seventh. Toolbar: latch, octave, root and scale.



Scale Keyboard

`Emits: in-scale notes only`

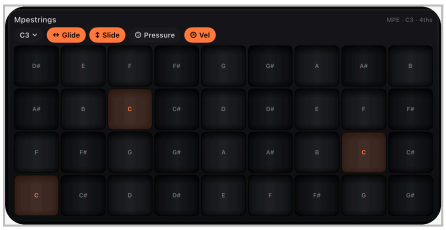
Every visible key is in **Root** + **Scale** — no wrong notes. Good for live performance and teaching patches.



MPE Seaboard

`Emits: per-note MPE · glide, slide, pressure`

Continuous ribbon surface: horizontal **glide** (pitch bend per finger), vertical **slide** (CC 74), and **pressure**. Routes to MPE-capable synths on per-note channels.



MPE Strings

`Emits: per-note MPE · grid tuned in fourths`

Linnstrument-style grid: rows in fourths, columns chromatic. Same MPE expression as Seaboard with a different layout.

Sequencer — step grids

Sequencer Lane+

`Binding: sequencer lane node · hit, note, deg or val prefix`

The default sequencer-lane control: a 16-step row with a small **layer picker** above it — **Pattern** (hits, pitches, chords or CC values, same tap/drag/microtiming gestures as a plain Step Grid), **Vel** (per-step velocity as a % of the lane's Velocity — drag to shape accents and ghost notes; hidden on CC lanes), **Prob** (per-step probability, drag to set), **Tie** (tap to tie a step to the previous note's gate — hidden on lanes without ties, like CC Seq), and **Cond** (tap to cycle the step's trigger condition). A moving playhead tracks every layer.

On a **Chord Seq** lane the pattern cells are **named chord pads**: each step shows its chord symbol ("C", "Am", "G7") with the roman numeral above, following the node's Root / Scale / Chord knobs live. Drag up/down to pick the degree I…VII; tap toggles a rest. The auto-attached lane fits itself to the active steps, so a 4-chord progression gets four big pads.

The **A·B·C·D chips** beside the picker are the node's four pattern banks: tap one to edit that bank and switch the sequencer to it at the next pattern wrap. By default the lane **auto-follows** whichever bank is sounding (watch a Chain cycle); tapping a bank chip pins it for manual editing and the **eye chip** re-engages follow. A dot marks the sounding bank when it differs from the one shown.

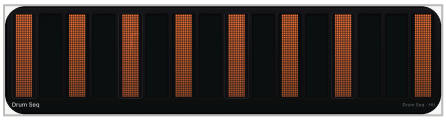
Add from **+ → Drum / Melody / Chord / CC Lane** — MIDIRack creates the matching sequencer node and binds the control automatically. Long-press the control's edge and turn on **Hide Layer Picker** to collapse it back to a plain pattern row (the Prob/Tie/Cond data stays on the node either way).

Scene Pads

`Binding: none · drives every bankable lane's Pattern`

A **scene launcher**: four pads (**A–D**) that point every bankable sequencer lane — Drum, Step and Chord Seq — at that pattern bank in one tap. Each lane switches at its own pattern wrap, so the whole kit lands on the downbeat.

The lit pad is the **armed** scene (every lane agrees); dots mark banks still sounding during the crossover. Lanes running a **Chain** keep cycling — set Chain to Off to hand them to scenes. Add from **+ → Scene Pads**.



Step Grid

`Binding: sequencer node · hit1…16, note1…16 or val1…16 prefix`

16-step row with moving playhead. Tap toggles steps; drag across a row to draw a run. Long-press a step and drag horizontally for **microtiming** nudges. Melody lanes show the **sounding pitch** after the bound node's **Root** + **Scale** quantizer.

The plain, single-layer grid — new lanes get **Sequencer Lane+** above instead; use this (or Lane+ with **Hide Layer Picker**) when you just want the pattern row.

Matrix Grid

`Binding: Matrix node · cell1…64 grid`

A grid of knobs (default 4×4, up to 8×8) mapped to a **Matrix** node's cells — each knob sets that cell's note (0 = rest), and a **live playhead** highlights the cell currently playing. Knob labels reflect the **sounding pitch** when **Root** + **Scale** quantize is on.

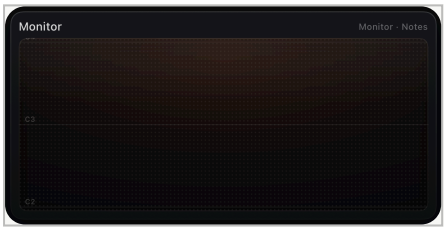
Auto-attached when you add a **Matrix** node; resize the control and the node's **Width** / **Height** follow.

Visualizers & debug — scopes, monitor, looper

Monitor

`Target: Monitor node · text log`

Scrolling text log of MIDI at a splice point. Add from **+** → **Monitor** — splices a **Monitor** node into the signal path.



Note Scope

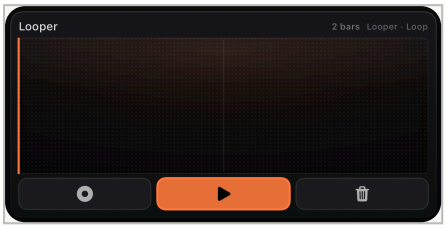
`Target: Monitor node · piano-roll view`

Scrolling piano-roll of note-ons and offs — see arps, sequencers and generators as they play.

CC Scope

`Target: Monitor node · CC trace`

Oscilloscope-style CC history: value on Y, time scrolling. One color per CC number — watch filter automation and LFOs.

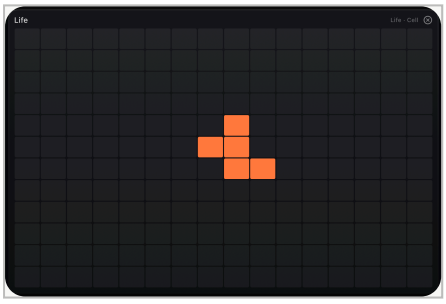


Looper

`Target: Looper node · Record / Play / Clear`

Transport for a **Looper** node: record overdubs, play the loop, clear the buffer. Shows loop length and playhead. Add from **+ → Looper** to splice the node automatically.

Emergence views — Life, Turing, scopes



Life Grid

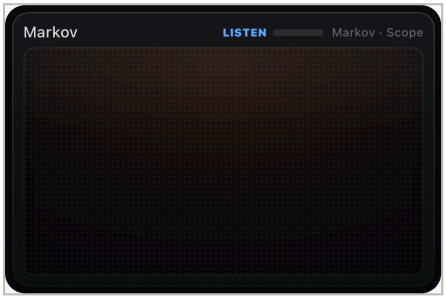
`Target: Life node · cell1…192 seed`

16×12 **Game of Life** colony. Tap cells to draw the seed; the pattern evolves while transport runs. Attached automatically when you add a Life node, or bind manually.

Register

`Target: Turing or Rule node · live bit loop`

Live view of a **Turing** shift register or **Rule** automaton row — active steps, playhead and mutations as the pattern evolves. Tap or drag to poke **Rule** cells on or off.



Scope

`Target: emergence node · physics / melody trail`

Node-specific visualizer: Markov note trail, Bounce ball physics, Attractor trajectory. Pairs with **Markov**, **Bounce** and **Attractor** nodes.

Factory preset list

Boot patch: First Light — generative Life colony + arp; loads on launch.

Grooveboxes & lines (self-playing): **Groovebox** — three drum lanes and a sliding bass, each with two pattern banks flipped from **Scene Pads**; **Infinity Canon** — one fractal melody at three time scales at once, a self-similar prolation canon locked by the sequencers' Reset inputs; **Clockwork** — a solid 4/4 anchor with polymetric hats, clave and a 3-beat bass gearing against it, re-locked every N bars (or by hand from the Snap pad) through the sequencers' Reset inputs; **Amen Engine** — a generative jungle breakbeat machine: three drum lanes cut an Amen-style break that never plays the same bar twice (per-step probability, trigger-condition fills, Ratchet snare rolls, Humanize), with a scale-locked sub sliding underneath through Glide; **Berlin School** — a classic modular sequencer patch in three rows of eight knobs: a plucked 1/16 riff with per-step accents and occasional 1/32 Ratchet stutters, transposed bar by bar through the Analog Seq's note latch by a slow Roots row whose EOC also re-locks the phrase, over a CC Seq stepping the filter; **Chord Voyage** — a chained chord progression on named chord pads; **Slide Bass** — a 303-style acid line where every note glides.

Emergence (mostly self-playing): Conway Choir, Turing Bass, Cellular Drums, Lorenz Skies, Markov Mirror, S&H Acid, Golden Spiral.

Also included: Part Control, Trance Gate, Solo Lead (mono + glide portamento keyboard), Harmony Keys, Tighten, CC Shaper, performance keyboards, drum pads, chord pads, mixers, Starfield and more — browse by category in the preset browser.

Troubleshooting

- **No sound** — standalone: turn **Synth/Drums** on, add **Synth** / **Drums** instrument nodes, or route **MIDIRack Out** to a synth. AUv3: place a synth after the plugin or use instrument nodes. Check the orange **OUT** LED.
- **Too loud / doubled** — graph **Synth** / **Drums** nodes plus the **Synth/Drums** pill both render audio; the pill turns off when you add an instrument node, but you can re-enable it deliberately.
- **Patch is silent** — follow activity LEDs in the graph; splice a **Monitor** at the first dark node. Generators need transport running.
- **Knob does nothing** — read the caption. `CC 74` hits your *synth*, not the patch graph — rebind in the inspector if you meant a node parameter.
- **Sequencer frozen** — press play (standalone) or start host transport (AUv3).
- **Stuck note** — tap **Panic** (the raised hand in the header, or **⌘.**). It releases everything the surface and graph are holding and sends All Notes Off / All Sound Off / sustain off on every channel, without stopping the transport. If an external synth still rings, it is ignoring CC 120/123 — retrigger the note on that device.