

LIL MODULAR

 BY LESSONS IN LIVE · USER MANUAL

A Eurorack-style case inside Ableton Live: add modules, patch them with cables and play the result like any other instrument. Thirty modules, from oscillators, filters and envelopes to a step sequencer, wavetables, FM and ten effects, every cable polyphonic, and 50 presets to start from.



INSTALLING

First quit Ableton Live (and any other music software), so the plug-in can be replaced cleanly.

Mac (macOS 11 or later, Apple Silicon and Intel): unzip `LilModular-<version>-Installer.zip`, open the `.pkg` inside and follow the steps. The installer is not signed yet: if macOS says it can't check it, right-click the file and choose **Open**, or allow it under System Settings › Privacy & Security. It installs the VST3 into `/Library/Audio/Plug-Ins/VST3` and, if you tick it under Customize, a stand-alone app into `/Applications` (to try it without Live, with a MIDI keyboard).

Windows (64-bit Windows 10 or 11): unzip `LilModular-<version>-Windows-Installer.zip` and run the installer inside. It isn't signed yet, so Windows may say it doesn't know the publisher: click **More info**, then **Run anyway**. It installs the VST3 into `C:\Program Files\Common Files\VST3` and, if you keep it ticked, a stand-alone app.

Then, on both:

1. Open Live. If Lil Modular doesn't appear under **Plug-Ins › Lessons in Live Tools**, open Live's Settings › Plug-Ins (Preferences in Live 11), make sure **Use VST3 Plug-In System Folders** is on, and click **Rescan**.
2. Drag **Lil Modular** onto a MIDI track.
3. Play. Lil Modular starts as a free **30-day trial** with everything working; the bar at the top shows the days left. After the trial it keeps working in **demo mode**, with a short silence every minute. Saved sets always open and play.
4. Activate it with a serial: click **BUY** in the bar at the top (or RACK › Buy Lil Modular...) to get one on lessonsinlive.com. Then click **ENTER SERIAL** (or RACK › Enter serial number...), paste the serial from your order e-mail (also under My Account on lessonsinlive.com) and click **Activate**. This needs an internet connection once; after that Lil Modular works offline and the bar disappears.

One serial works on up to 3 computers, Mac and Windows. To move it to another computer, choose RACK › Deactivate this computer first.

Updates: when a new version of Lil Modular is out, a green bar at the top of its window says so. **DOWNLOAD** gets the installer for your computer: install it over the old version, your serial stays activated. **WHAT'S NEW** shows what changed, and **x** skips that version. Lil Modular asks lessonsinlive.com at most once a day, only while its window is open, and sends nothing about you or your computer. RACK › Check for updates now asks straight away; untick RACK › Check for updates automatically to stop the daily check.

YOUR FIRST SOUND

Lil Modular opens with the **Starter Patch**, a tour of the rack that is also a big sound. Play chords:

- **The pad** (rows 1 and 2, 6 voices): a 3 OSC with stereo unison and a touch of FM shimmer, layered with a WAVETABLE morphing through vowels. Each side has its own MIXER, LADDER filter and VCA, so the stereo is real. One envelope opens the filters, one shapes the level, then CHORUS. A slow LFO makes the unison width breathe, and a tempo-synced LFO morphs the wavetable over four bars.
- **The arp** (row 3): a second MIDI IN, in mono, runs a SEQ 16 from the key you pressed last. It plays a VCO through an ACID filter, sixteenths in minor pentatonic, locked to Live's tempo. When Live is stopped, it starts from step 1 each time you press a key.
- **The mix** (row 4): the arp goes through a ping-pong DELAY; the pad and the arp meet in a pair of MIXERs (left and right), then REVERB and OUTPUT.

The cables are colour-coded: amber and white for audio (left and right), blue for pitch, red for gates, yellow for envelopes, purple for LFOs, green for the sequencer's pitch and pink for the delay. To mute the arp, turn down LEVEL 2 on the two MIXERs in row 4.

BUILDING YOUR OWN PATCH

Choose **Basic Polysynth** from the preset list for the classic chain, or **Empty Rack** to start from nothing. A first patch from scratch:

1. + **ADD MODULE**: add a MIDI IN, a VCO, a VCF, an ADSR, a VCA and an OUTPUT.
2. Patch MIDI IN **V/OCT** to the VCO's **V/OCT**, and MIDI IN **GATE** to the ADSR's **GATE**.
3. Patch the VCO's **SAW** to the VCF's **IN**, the VCF's **LP** to the VCA's **IN**, and the VCA's **OUT** to the OUTPUT's **L**.
4. Patch the ADSR's **ENV** to the VCA's **CV**. Play: that's a polysynth.
5. Patch the ADSR's **ENV** to the VCF's **CV** as well and turn up the VCF's **CV** knob: the filter now opens with every note.

From there, add an LFO into the VCO's PWM, a second VCO through a MIXER, a DELAY before the OUTPUT... There is no wrong patch.

HELP WHILE YOU PATCH

New to modular? Lil Modular tells you where things go.

- **Rest the mouse on any jack** for a moment: a tip says what it does, where it usually goes (or comes from) and what it's patched to now.
- **Right-click a jack**: under **WHERE TO PATCH IT** (or **WHAT TO PATCH IN** for an input) are the usual partners. Pick one and the cable is made for you. If that module isn't in the rack yet, choose + *add a ...* and it's added next to this one and patched, in one go (one undo step).
- **Right-click a module** › *What does this module do?* explains it in a few sentences.
- Know your way around? Switch the tips off in **RACK** › *Patching tips when hovering over a jack*.

THE RACK

- **+ ADD MODULE** adds a module in the nearest free space. Right-click empty rack space to add one right there.
- **Move a module** by dragging its faceplate (the title area is easiest to grab). Drop it on other modules and they slide aside to make room, keeping their order; you see where everything goes while you drag. Drag left past a module's middle to go in front of it, right past its middle to go behind it. The outline turns red only when the row has no room left.
- **Right-click a module** to duplicate it, reset its knobs or remove it.
- **RACK** sets the case size: 1 to 8 rows, and 42 to 168 HP wide (84 HP is a standard case). It also loads the Starter Patch, the Basic Polysynth or an empty rack, and shows what Live is sending (see Tips).
- **ZOOM** fits the rack to the window width, or sets a fixed size. The window can be resized from its corner.

PATCHING

- **Drag** from one jack to another, or **click** one jack and then the other.
- Outputs sit in the dark boxes. An output can feed any number of cables; an input takes one cable (a new one replaces the old one).
- **Pick up a plug** from an input to move its cable somewhere else. Drop it in empty space to unplug it. **Esc** cancels.
- **Right-click a jack** to change its cable colour or unplug it. **CABLES** sets how see-through and how slack the cables are.
- **Cables are polyphonic.** A cable can carry up to 16 voices, and polyphonic cables are drawn thicker. Patch a mono signal (an LFO, say) into a polyphonic input and it reaches every voice.

KNOBS AND MACROS

Drag up and down to turn a knob (hold Shift for fine control), double-click to reset it, or use the mouse wheel. Hover over a knob to see its value.

Macros (automation in Live): right-click any knob › *Follow a macro*. Lil Modular has 64 macros, which are what Live sees as parameters (Macro 1–64). A knob that follows a macro shows a small M tag. Automate or MIDI-map the macro in Live, and the knob follows. Turning the knob moves the macro too, so Live records it. Several knobs can follow the same macro.

PRESETS AND PATCHES

The display in the top bar shows the patch you're playing. Use ‹ › to step through all the patches, or click the name to pick one from the list. There are 50 factory presets in five categories: Bass, Leads, Pads, Keys and Sequences. A * after the name means you've changed the patch since you loaded it.

Favourites: click the **star** at the right end of the patch name to mark it as a favourite; it turns amber. Your favourites are listed under ★ **FAVORITES** at the top of the patch list, and they have a star in their own category too. Click the star again to remove it. Favourites are shared by every Lil Modular on your computer. Patches go by their file: rename one or move it to another category folder in Finder and the list, the ‹ › arrows and its star follow. (The Starter Patch, the Basic Polysynth and the Empty Rack aren't patch files, so they can't be starred.)

SAVE stores the patch as a `.lilpatch` file. Patches live in `~/Library/Lessons In Live/Lil Modular/Patches` on a Mac and in `%APPDATA%\Lessons In Live\Lil Modular\Patches` on Windows, one folder per category; a new folder becomes a new category in the list. The list also offers the Starter Patch, the Basic Polysynth, an Empty Rack, opening a patch file from anywhere and showing the patch folder. Factory presets are copied there the first time you open Lil Modular. A later version with updated factory presets replaces the old factory files and keeps a copy of each one in an "Old factory presets" folder, so nothing you changed is lost.

Sequences run from the SEQ 16 and follow Live's tempo. Hold a key to play one: C3 plays the sequence as written, and other keys transpose it. When Live is playing, the sequence locks to the song position. When Live is stopped, it starts from step 1 each time you press a key.

Your patch is also saved with the Live set, including any wavetables you loaded.

UNDO

The curved arrows next to SAVE undo and redo (or press `Cmd+Z` and `Cmd+Shift+Z` while the window has focus; `Ctrl+Z` and `Ctrl+Shift+Z` on Windows). Undo covers adding, moving and removing modules, cables and cable colours, knobs and switches, rack size, loading presets and loading wavetables, 100 steps back. Modules that stay in the rack keep playing while you undo.

VOLTAGES

Lil Modular follows Eurorack habits: audio is ± 5 V, pitch is 1 V per octave (0 V = C4), gates are 0 or 10 V and envelopes run from 0 to 10 V.

THE MODULES

NOTES AND SEQUENCES

MIDI IN (8 HP): turns Live's notes into V/OCT (pitch), GATE and VEL (velocity), with one channel per voice, plus MOD (the mod wheel). VOICES sets the polyphony from 1 to 16; at 1 it plays mono with last-note priority, and every new note restarts the envelopes. The last entry, **LEG** (legato), also plays one voice, but a note you play while another key is still held glides to its pitch without restarting the envelopes: GATE stays high, so lines slur like a 303 (with GLIDE up you hear the slide). Let go of a key and it glides back to the one still held; let go of every key and the next note starts fresh, without a slide. LEG is also handy for sequences: with the MIDI IN's GATE in a SEQ 16's RUN, overlapping keys transpose the running sequence instead of restarting it. BEND sets the pitch bend range and GLIDE adds portamento. Each LED shows a voice playing. PRESS gives each voice its key pressure (polyphonic aftertouch, channel aftertouch or MPE pressure) and SLIDE its CC 74, both 0–10 V.

MPE: set MPE to ON to play Lil Modular from an MPE controller (Push 3, ROLI, Linnstrument, Osmose...) or from MPE clips in Live. Every note then has its own pitch bend (± 48 semitones, or whatever your controller sets), pressure and slide, so you can bend one note of a chord, swell a single voice with PRESS → VCA, or open its filter with SLIDE → VCF. Channel 1 is the master channel: its pitch bend still moves every note by the BEND range. In Live, also turn on MPE for the device: right-click Lil Modular's title bar and choose **Enable MPE Mode**. Give it enough VOICES for the notes you hold.

SEQ 16 (32 HP): a 16-step sequencer that follows Live's tempo. Each step has a pitch knob (-12 to $+24$ semitones) and a pad to switch it on or off; the pad with the white ring is the playhead. RATE goes from $1/4$ to $1/32$ (with triplets) and DIRECTION is forward, reverse, ping-pong or random. SCALE and ROOT keep every step in key. LENGTH sets 1 to 16 steps and SWING delays every second step. GATE sets the note length; at 100 % the notes tie into each other. Outputs: V/OCT, GATE and TRIG (a short pulse on every step). Inputs: CLOCK (step on each pulse instead of Live's tempo), RESET (the next step becomes step 1), RUN (gates only while it's high; patch the MIDI IN's GATE here) and TRANSP (added to the pitch; patch the MIDI IN's V/OCT here).

The two dice roll a new sequence. **NOTES** gives every step a new note in the SCALE and ROOT you chose, with about a third of them on the root, so it still sounds like a key. **STEPS** rolls which pads are on: step 1 always plays, and about two in three of the others do. Right-click a dice for more ways to roll. For NOTES: over two octaves, root, fifths and octaves (for basslines), or change just a few notes. For STEPS: sparse, busy, change just a few steps, or all steps on. Every roll is one undo step, so Cmd+Z (Ctrl+Z on Windows) takes back a roll you don't like.

CLOCK (8 HP): gates locked to Live's tempo. RATE sets the main clock ($1/1$ to $1/32$, with triplets), with WIDTH (gate length) and SWING. Outputs: CLK, x2 (twice as fast), $/2$, $/4$, BAR (every downbeat) and RESET (when Live starts playing). RUN: PLAY runs only while Live plays, on the song's grid; ALWAYS keeps going while Live is stopped. Patch it into the SEQ 16's CLOCK, the RANDOM's TRIG or a STUTTER's GATE.

SOUND SOURCES

VCO (10 HP): an oscillator with sine, triangle, saw and square outputs at the same time. It has OCT, TUNE and FINE, a pulse width control (PW), DRIFT for analog-style pitch wander, exponential FM, PWM, and hard SYNC (it restarts its cycle on each rising edge). UNI fades in six detuned copies, up to 25 cents apart, as in Driftwood. The waves are band-limited, so high notes stay clean.

3 OSC (22 HP): a complete oscillator voice in one module. Three oscillators, each with its own wave (SIN, TRI, SAW, SQR), OCT, TUNE and LEVEL, wired as an FM chain: FM 2>1 lets oscillator 2 modulate oscillator 1, FM 3>2 lets 3 modulate 2, and FEEDBK feeds oscillator 3 back into itself (from a sine to a buzzing saw-like tone). Turn an oscillator's LEVEL down to use it only as a modulator: classic 3-operator FM. UNISON fades in six detuned copies of the whole stack, DETUNE sets how far apart they are (up to 50 cents), SPREAD places them across the stereo field, and DRIFT adds analog wander. Outputs: L and R (stereo unison), and MONO. Inputs: V/OCT, FM CV (adds 10 % FM per volt to both FM knobs) and UNI CV.

WAVETABLE (12 HP): an oscillator that morphs through a wavetable. TABLE picks one of eight built-in tables (BASIC: sine to triangle to saw to square; PWM; HARMONICS; VOCAL; SYNC; FM; RESO; SPECTRAL), and POS sweeps through it; the screen shows the frames stacked in depth, with the current one lit. POS has a CV input with its own amount knob (POS CV, which can also invert), so an LFO or envelope can morph the sound. OCT, TUNE and FINE set the pitch, FM is exponential (with its own input), UNI adds six detuned copies, DRIFT adds analog wander and SYNC restarts the cycle. SUB is a sine an octave below.

Your own wavetables: click the TABLE display and choose *Load your own (.wav)*, right-click the module, or drag a .wav or .aiff onto the panel. Lil Modular reads Serum-style wavetables (frames of 2048 samples, or the frame size Serum stores in the file) and single-cycle waveforms of any length. Up to 256 frames are used. The table is stored inside your Live set and patch, so it opens on any computer. Every table is band-limited, so high notes stay clean.

NOISE (4 HP): white, pink and red noise.

FILTERS AND SHAPERS

VCF (10 HP): the Driftwood filters. LADDER is Moog-style, ACID is 303-style (its bass stays when it squelches), and SVF is a singing SEM/Juno-style state-variable filter. Low pass, band pass and high pass come out at the same time, at 12 or 24 dB per octave. FREQ, RES and DRIVE set the sound. The CV input has its own amount knob (CV, which can also invert), and KEY sets the key tracking from a V/OCT cable. It runs at twice the sample rate, four times when DRIVE is up, so it stays clean.

WAVEFOLDER (8 HP, "FOLDER"): West Coast folding: FOLD drives the signal into a sine-shaped folder for more and more harmonics, SYMMETRY offsets it for even harmonics, and FOLD CV (with its own amount) lets an envelope or LFO sweep it. Runs at 4× the sample rate, so it stays clean; polyphonic.

ENVELOPES AND MODULATION

ADSR (10 HP): an envelope for each voice. The shape is LIN or ANALOG (curved like a hardware envelope). RETRIG restarts the attack. The ENV output runs from 0 to 10 V and INV is the same envelope upside down. The screen shows the curve, with a dot that follows the last voice played.

LFO (8 HP): sine, triangle, saw, square and sample & hold outputs at the same time. It runs free (0.02–40 Hz) or locked to Live's tempo (SYNC: 4 bars to 1/16, with triplets). RANGE switches between ±5 V and 0–10 V. It has a RATE CV input (1 V per octave) and a RESET input.

RANDOM (8 HP): on every pulse at TRIG (or at its own RATE when TRIG is empty): S&H samples IN (or noise), STEP plays a looping random sequence of LENGTH steps (LOCK at 100 % repeats it, at 0 % it's always new, like a Turing Machine), SMOOTH glides between random values, and GATE fires with probability PROB.

AMPS AND MIXERS

VCA (6 HP): sets the level of a signal from a control voltage. With nothing patched into CV, the VCA is fully open (at the LEVEL setting). The response can be LIN or EXP.

MIXER (10 HP): four inputs with levels and a MASTER. Polyphonic: each voice is mixed with the same voice.

UTILITIES

OFFSET (8 HP): two attenuverters. $OUT = IN \times AMOUNT + OFFSET$; AMOUNT goes from -100 % (inverted) to +100 %, OFFSET from -5 to +5 V. With nothing patched into IN it's a steady voltage you set by hand. Polyphonic.

SLEW (6 HP): a voltage glides instead of jumping, with separate RISE and FALL times (up to 5 s) and a LIN or EXP shape: portamento for a sequence, smoothing a stepped LFO, or an attack/release envelope from a gate. Polyphonic.

QUANT (6 HP, quantizer): snaps any voltage to the nearest note of a SCALE in a ROOT, plus TRANSP; TRIG pulses when a note changes. Polyphonic. Patch a RANDOM or LFO through it for melodies that stay in key.

LOGIC (6 HP): gates in (above 1 V is on), gates out: A AND B, A OR B, A XOR B, NOT A. Polyphonic.

SCOPE (12 HP): a two-channel oscilloscope (A amber, B blue). TIME sets how much it shows (1–500 ms), GAIN zooms in, and LOCK holds a waveform still by starting at A rising through 0 V. The voices of a polyphonic cable are added up. A and B pass through to the outputs, so it can sit in the middle of a patch.

EFFECTS

All ten effects are stereo: patch L only and R follows. Every voice on a polyphonic cable is mixed in, and MIX blends the effect with the dry signal (at 0 % the signal passes unchanged).

DRIVE (8 HP): distortion with four curves: SOFT, HARD, FOLD (wavefolding) and TUBE (lopsided, warm). AMOUNT drives up to +36 dB into the curve while the level stays about the same, and TONE darkens it. It runs at eight times the sample rate, so it stays clean, and its dry signal is lined up with the wet one, so MIX never thins the sound. AMT CV adds to AMOUNT.

CRUSH (8 HP): bit depth (BITS, 1–16, continuous) and sample rate reduction (RATE, 100 Hz–48 kHz, with a 1 V/oct RATE CV input).

CHORUS (8 HP): two modulated delays a quarter cycle apart, for a wide ensemble. RATE, DEPTH, MIX and a RATE CV input.

FLANGER (8 HP): a jet sweep. Negative FEEDBACK sounds hollow, positive sounds metallic. RATE, DEPTH, MIX and a RATE CV input.

PHASER (8 HP): six stages sweeping from 200 Hz to 4 kHz, with FEEDBACK for the whistle. RATE, DEPTH, MIX and a RATE CV input.

RING MOD (8 HP): multiplies the input by a sine carrier (FREQ 5 Hz–5 kHz, FREQ CV 1 V/oct) for bells, metal and robots. Patch a VCO into CARRIER to use it instead.

DELAY (10 HP): a stereo delay locked to Live's tempo (1/32 to 1/2, with dotted and triplet times). FEEDBACK saturates gently, TONE darkens each repeat, PING PONG bounces the repeats left and right, and MIX blends it in.

REVERB (10 HP): stereo, with SIZE, DAMP, WIDTH and MIX. FREEZE holds the tail forever.

STUTTER (8 HP): beat repeat. While HOLD is on, or the GATE input is high, it plays the next slice (1/32 to 1/2, locked to Live's tempo) and then repeats it until you let go. PITCH plays the repeats faster or slower, and DECAY makes each repeat quieter. Patch an LFO square or the SEQ 16's GATE into GATE for rhythmic glitches.

GRAIN (10 HP): a granular cloud from the last couple of seconds. SIZE, DENSITY, PITCH (with a 1 V/oct PITCH input) and SPRAY (how far back grains may start). MODE plays grains forward, reversed, both, or FREEZE (the cloud hangs on the last moment).

OUTPUT

OUTPUT (8 HP): sends the sound to Live. All voices on a cable are added together, and R follows L when nothing is patched into it. It has a level knob, LED meters and a clip light, plus a soft limiter on the last 2 dB.

TIPS

- **PANIC** (top bar) releases every note.
- **CPU**: in a patch where a MIDI IN's GATE drives an ADSR, Lil Modular only computes the voices that are sounding (a held key, or an envelope still running, release included). A patch costs very little while you're not playing, and a chord costs only its own voices. Fewer VOICES on the MIDI IN and less unison on the 3 OSC make a patch lighter while it plays.
- **RACK › ENGINE** shows what Live is sending: the sample rate, block size, how many MIDI events have arrived and the output peak since you last looked. If you play and hear nothing, this tells you whether sound leaves Lil Modular.

- **Levels:** Lil Modular works in volts, and a chord of many voices adds up. Use the OUTPUT's LEVEL knob to set the level going into Live; the light above the meters shows when its soft limiter is working.