



GROWTH

A living modulation instrument



User Manual

Version 1.3

Reactive Audio

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Welcome to Growth

Growth is a living modulation instrument. Instead of LFOs and envelopes it runs a reaction-diffusion simulation, the same maths behind coral, animal markings and Turing patterns. The field grows, drifts and reorganizes on its own and never repeats. You do not drive it like an X-Y pad: you drop *readers* onto it and let the moving pattern flow through them, into a built-in five-stage effect chain.

In short: The interface is the modulator. You see the field move and watch your readers turn that motion into sound.

Installation

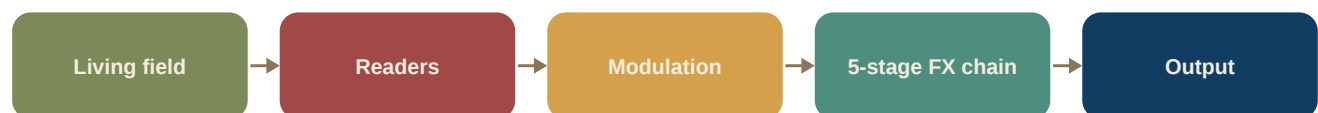
Growth ships as VST3 and AU plug-ins plus a Standalone application, for macOS (universal, 10.13+) and Windows 10/11 (64-bit).

Format	Location
macOS VST3	/Library/Audio/Plug-Ins/VST3/Growth.vst3
macOS AU	/Library/Audio/Plug-Ins/Components/Growth.component
macOS Standalone	Growth.app (copy to Applications)
Windows VST3	C:\Program Files\Common Files\VST3\Growth.vst3

The free demo is fully functional and mutes briefly every 30 seconds. Growth runs the field in audio time, so an offline bounce sounds exactly like realtime playback.

How Growth works

Audio passes through a chain of five effects. A living reaction-diffusion field evolves continuously, and a set of readers sample it and route their motion to any effect parameter. Every parameter is a modulation target.



The field feeds the readers; the readers modulate the effect chain that processes your audio.

The five effects, in order, are a morphing multimode filter, a granular texture, a frequency shifter, a reverb with tempo-synced delay (Space), and a stereo width / pan / tremolo stage.

The interface

The dark canvas in the centre is the living field, where you drag probes and draw scan paths. A row of tabs (Probes, Edges, Scan, Env) swaps the routing controls beneath it. The effect rack runs along the bottom (Filter, Granular, Shift, Space, Stereo), and the header carries the preset menu, output controls and version.

The living field

The field is the engine. A pattern menu loads classic reaction-diffusion behaviours, and three controls shape how it grows.

Control	Range	What it does
Pattern	presets	Loads a starting behaviour: spots, coral, stripes, cells, pulse or drift. Sets Feed and Kill for you.
Feed	0.010 to 0.090	The feed rate of the simulation. Small changes radically alter the pattern.
Kill	0.045 to 0.070	The kill rate. Together with Feed it decides whether you get spots, mazes, stripes or pulsing cells.
Flow	0 to 1	How fast the field evolves (simulation steps per tick). Higher is livelier and more turbulent.

Note: The field never loops. If it ever settles, nudge Feed or Kill, or reseed from the pattern menu, to bring it back to life.

Field snapshots and morph

New in v1.3. The field never repeats, but now and then it lands on a state worth keeping. Snapshots freeze the field into two slots, A and B, and the Morph control crossfades the living field between them. Because Morph blends both slots at once, you capture A and B independently and keep both.

Control	Range	What it does
Capture A / B	click	Freeze the current field into slot A or B. A filled dot marks a slot that holds a snapshot; click again to overwrite. Right-click or Alt-click clears the slot.
Morph	A to B	Crossfades the live field from snapshot A (fully left) to snapshot B (fully right).
Morph enable	on / off	While on, the field is driven by the morph blend. Turn it off and the simulation resumes evolving from wherever the morph left it.

Capture with Morph off: Snapshots grab the live, evolving field, so capture A and B with Morph off, then enable Morph to blend between the two moments. Snapshots are saved with the project and recalled when you reopen it.

Morph as a modulation target

Morph is also a modulation target. Route a scan, probe, or the envelope to Morph and the field crossfades between your two snapshots on its own, so the instrument animates the blend for you rather than settling on a fixed point between A and B.

Modulation sources

Readers turn the field's motion into modulation. Each source has a Target (which parameter it moves) and a bipolar Depth (-1 to +1). There are five kinds.

Probes (four)

Drag a probe anywhere on the field. It reads the value beneath it and routes that motion to its target. The inner dot brightens with the value it is currently outputting.

Control	Range	What it does
Position	drag on field	Where on the field the probe samples.
Target	13 options	The effect parameter this probe modulates.
Depth	-1 to +1	Amount and polarity of the modulation.

Edges (four)

An edge links two probes and derives a new signal from the relationship between them, sampled along a bendable path through the field.

Control	Range	What it does
Link	probe pair	Which two probes the edge connects. Off disables it.
Read	Average / Contrast / Flow	How the path is read: its average value, the contrast between ends, or how much it is changing (flow).
Bend	-1 to +1	Pushes the sampling path off the straight line between the probes.
Target / Depth	13 options / -1..1	Destination parameter and amount.

Scans (three)

Draw a path on the field and a dot travels it, emitting the values it passes as a modulation waveform shaped by both your drawing and the living pattern. Free-running or tempo-synced.

Control	Range	What it does
Draw / Clear	buttons	Arm drawing to sketch a path on the field, or clear it.
Rate	0.005 to 1 Hz	Travel speed when free-running. Swapped for a Division menu when Sync is on.
Sync	on / off	Lock the scan to host tempo; pick a note Division instead of a rate.
Target / Depth	13 options / -1..1	Destination parameter and amount.

Proximity

Measures how close two scan dots get. Because scans run at different rates they drift in and out of alignment, giving rhythmic pulses at the beat frequency between them.

Control	Range	What it does
Pair	Off / S1-S2 / S1-S3 / S2-S3	Which two scans to measure between.
Range	0.05 to 1	Distance at which the pulse reaches full value.
Target / Depth	13 options / -1..1	Destination parameter and amount.

Envelope follower

Routes the level of your incoming audio as a source, so the field's effects follow your playing.

Control	Range	What it does
Sense	0.5 to 16	Input gain into the follower. Higher reacts to quieter material.
Attack / Release	1-200 / 10-1000 ms	How fast the follower rises and falls.
Target / Depth	13 options / -1..1	Destination parameter and amount.

Reactive Field (MIDI) — new in v1.1

With Reactive Field enabled, incoming MIDI notes inject fresh seeds into the field. Note pitch maps low-to-high across the X axis and velocity up the Y axis, so the pattern blooms where you play, and a ripple marks each note on the visualizer. Route a MIDI track to Growth, raise Amount for bigger seeds, and the modulation follows your performance. The controls live on the Env tab.

Control	Range	What it does
Reactive Field	on / off	Master enable for MIDI seeding.
Amount	0 to 1	Size and strength of each injected seed.

Modulation targets

Any source can route to any of these parameters in the effect chain. Target None leaves the source idle (still useful for the visual).

Target	What it moves
Filter Cutoff / Reso / Morph	The multimode filter's frequency, resonance, and LP-BP-HP morph.
Grain Size / Mix	Granular grain length and wet level.
Reverb Size / Mix	Reverb decay size and wet level (Space).
Delay Fbk	Delay feedback amount (Space).
Pan / Width	Stereo position and stereo width.
Volume	Output level (use it as a field-driven tremolo).
Freq Shift	The frequency shifter's amount.
Morph	Crossfade between field snapshots A and B (new in v1.3).

The effect chain

Five effects process your audio in series. Each has a power toggle and every parameter is a modulation target.

Control	Range	What it does
Filter	Cutoff, Reso, Morph	A morphing multimode filter. Morph sweeps lowpass to bandpass to highpass.
Granular	Size, Density, Spread, Mix	A granular texture built from the incoming audio. Off by default.
Shift	Shift (-500..500 Hz), Mix	A frequency shifter (not a pitch shifter) for metallic and inharmonic motion.
Space	Delay Time/Sync/Div, Feedback, Delay Mix, Reverb Size, Reverb Mix	A reverb plus a tempo-syncable feedback delay.
Stereo	Width, Pan	Stereo width and equal-power pan, with a field-driven tremolo via the Volume target.

MIDI output: the field as a controller

New in v1.2. Growth can send its modulation back out as MIDI CC, so the field can drive other plugins, Max patches, or hardware. Each source emits its value on a CC, and combined with the reactive field (notes in, from v1.1) it makes Growth a two-way controller. The controls live on the MIDI tab.

Control	Range	What it does
MIDI Out	on / off	Master switch for MIDI output.
14-bit	on / off	High-resolution CC: sends an MSB/LSB pair (CC n and CC n+32) for smoother modulation. Leave off unless the destination supports it.
Channel	1 to 16	The MIDI output channel for all sources.
Per source	enable + CC	Probes, edges, scans, proximity, and the envelope each have an enable and a CC number. A source sends only while it's enabled and its value is changing.

Default CC map

Source	CC
Probes 1-4	CC 20 to 23
Edges 1-4	CC 24 to 27
Scans 1-3	CC 28 to 30
Proximity	CC 31
Envelope	CC 32

Routing: Sending a plug-in's MIDI to another device is host-dependent. In Bitwig, put a Note Receiver on the destination track sourced from Growth, then add a MIDI modulator on the target to map a CC. Painless in Bitwig, Ableton, and Reaper; fiddlier in Logic.

Output and tempo

Control	Range	What it does
Mix	0 to 1	Global dry / wet blend of the whole effect chain.
Output Gain	-24 to +24 dB	Final level trim.
Auto Gain	on / off	Level-matches the wet output to the dry input for fair A/B.
Bypass	on / off	Bypass all processing.

Scans and the Space delay can lock to host tempo. Turn Sync on and choose a note Division (for example 1/4 or 1/8 dotted) in place of the free rate or time.

Presets, tips and recipes

Eight factory presets in the header menu show the range, from ambient washes to rhythmic stutters. Your DAW saves the full state, including drawn scan paths, with the project.

The **RANDOM** button grows a fresh patch in one click: a new field, scattered probes, a drawn scan, and a tasteful set of effects, always routed so you hear something. It's the fastest way to a starting point. The **F / R / E / M** locks beside it keep the Field, Routing, Effects, or Morph while you reroll the rest; captured snapshots are always kept.

- **Evolving pad:** a probe to Filter Cutoff and a scan to Freq Shift, Flow low, for slow drifting motion.
- **Rhythmic pulses:** two scans tempo-synced to different divisions, Proximity to Volume or Delay Fbk.
- **Play it:** enable Reactive Field, route MIDI, and place a probe where your notes land so the field follows your part.
- **Tame the chaos:** lower Depths and raise the envelope Release for smoother, less jumpy modulation.

Troubleshooting

Symptom	Fix
No modulation heard	A source only matters where it is read and routed. Confirm an effect is enabled, a source Target is set, and its Depth is up.
Reactive Field does nothing	Enable it and route a MIDI track to Growth (host-dependent, fiddly in Logic). Place a reader where notes land.
Render differs from playback	It should not; the field runs in audio time. If it does, re-bounce after reopening the project.
High CPU	The granular stage is the heaviest. Disable it when unused, or freeze the track.

Specifications

Item	Detail
Formats	VST3, AU, Standalone
Platforms	macOS 10.13+ (universal), Windows 10/11 (64-bit)
Field	Reaction-diffusion, with two-slot snapshots + morph
Sources	4 probes, 4 edges, 3 scans, proximity, envelope, MIDI reactive field
Effects	Filter, Granular, Frequency Shifter, Reverb + Delay, Stereo
MIDI	Notes in (reactive field) · CC out (the field as a controller)
Version	1.3 (this manual)
Maker	Reactive Audio · nberley@gmail.com

Thank you for growing with Growth. Plant a reader and let it surprise you.