



Molecule multi-band processor

# WHAT IS IT

## INTRODUCTION

Molecule is a multi-band processor that allows you to split the sound into three frequency bands – low, mid, high – and pass them independently through different effects. It includes a vast array of algorithms such as comb filter, chorus ensemble, frequency shifter as well as barber-pole phaser, circuit-bent filter, digital- and analog-style distortion. Each of the three bands also gets its own tempo-synchronised modulator with multiple waveforms and realtime randomisation. Moreover, Molecule lets you store up to eight complete snapshots of itself and switch between them in realtime or via host automation.

The graphic interface in Molecule uses a new design language with bold, colour-coded shapes that openly show all of the building blocks and their interconnections. With hardware-accelerated rendering and all-round parameter smoothing, it offers pleasant and intuitive operation. Altogether this makes Molecule a fun yet productive tool that goes as far as you want it to – from careful spicing-up to complete reconstruction.

## SPECIFICATIONS

- Three crossover filters with -24 dB/octave slope.
- Multiple processing algorithms: comb filter, chorus ensemble, ring modulator, frequency shifter, barber-pole phaser, sample rate and bit depth reduction, analog drive, hard clip, circuit-bent filter, fold-back distortion, two wave transformers.
- Three modulation generators with 8 different waveforms, per-cycle chaos function and lag switch.
- Eight full parameter snapshots for realtime switching and automation.
- Advanced transport sync algorithm with support for tempo and time signature automation.



# THE BASICS

## CROSSOVER FILTERS

As the input signal goes into Molecule, it is split into three frequency bands – low, mid and high. You can adjust the **crossover frequency** between the low-mid bands in the range of 100 to 500 Hz, and the mid-high bands in the range of 500 Hz to 5 kHz.

## EFFECT PROCESSORS

Each of the low, mid and high bands has its own dedicated effects processor with up to 16 different algorithms. The effect algorithm **type** is selected by clicking and dragging its name left or right. The effect **parameter** value is displayed below the dynamic graphic is adjusted in the same way. To leave the band dry, without any effect applied, set the type to “bypass”. The band on/off **switch** allows to mute a band completely.

## MODULATORS

There are three separate tempo-synchronised modulators in Molecule, one for each effect band. Eight **waveform** shapes are available (triangle, saw, square, pulse, trapezoid, notch, 3x and 4x staircase) and the **rate** can go in a very wide range from 1/28th note to 1/6 bars. Both waveform and rate are adjusted by clicking and dragging its left or right, and the waveform itself can be clicked to invert its **polarity**. The **chaos** function makes the modulator randomise its amplitude for each individual cycle. The **lag** function switches the waveform edge shape from fast and snappy to slow and lazy. To adjust the **modulation depth** of the effect parameter, drag the vertical arrow from the modulator towards the effect.

## SNAPSHOTS

Within a single preset, Molecule allows to store up to 8 separate “snapshots”, each of which holds its whole parameter set – crossover frequencies, band effects, modulators. Effectively, these are eight presets in one. The round numerical buttons switch between the snapshots, and snapshot number can also be automated in the host application.

Below the snapshot numbers, the following utility functions are available:

- **copy** and **paste** allow to copy one snapshot into another.
- **reset** sets all parameters of the current snapshot to their default values.
- **chaos** randomises all parameters in the current snapshot.

# EFFECTS GUIDE

Low, middle and high bands:

**bypass** leaves the original signal unchanged; in this mode the modulators can be applied onto the dry signal level.

**comb filter +/-** is a high-feedback delay line, tuned to emphasise even (+) or odd (-) harmonics in the signal's spectrum, making it sound like it's placed in a tube or a can (20 to 500 Hz), or producing flange effects (0.5 to 2 kHz).

**chorus ensemble** mixes three detuned copies of the input signal, resulting in a lush ensemble effect.

**ring modulator** multiplies the signal with a sine wave running at 30 Hz to 1 kHz, producing an entirely new sound spectrum with a cold, metallic character.

**frequency shifter +/-** shifts each frequency component of the input signal into higher (+) or lower (-) frequencies, resulting in a smooth but dissonant, metallic effect.

**barber-pole +/-** produces a very smooth feedback phaser effect that endlessly cycles down (+) or up (-).

**sample rate** resamples the signal at a reduced rate (100 Hz to 10 kHz) to degrade its quality, adding harsh, digital distortion.

**bit depth** reduces the digital resolution of the signal in the range of 1 to 12 bits, making it very buzzy and noisy.

Low band only:

**circuit bender** is a filter with intentionally broken internal connections; adds very harsh and noisy distortion.

**analog drive** boosts the signal level and mathematically wraps its shape within 0 dB limit, resulting in a smooth, rounded overdrive effect.

**hard clip** boosts the signal level and abruptly cuts it above 0 dB, producing a bright, powerful overdrive effect.

**foldback** is another, harsher distortion that radically wraps the waveform into itself.

**transformer** is a special sinusoid distortion algorithm that "curls" the signal waveform in real time, producing a powerful synthetic sound.

**2x transformer** employs two sinusoid distortion stages for a more spectrally rich effect.