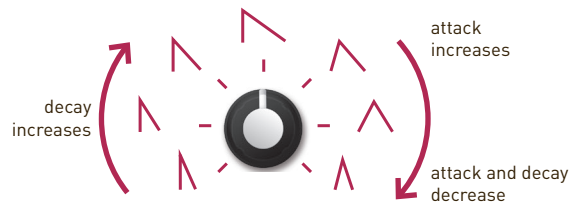


## Envelope generator

In this mode, **EXCITE** behaves like a trigger input, triggering an envelope generator. This envelope is internally routed to the VCA and the VCF.

**SHAPE** controls the envelope attack and decay time.



The envelope curve depends on the amplitude (height) and duration (width) of the trigger pulse.

**MOD** controls the range of filter modulation.



## Vactrol emulation

In this mode, the VCA gain and VCF frequency are controlled by a moody Vactrol low-pass gate emulation. **EXCITE** is the amplitude/brightness CV input.

**SHAPE** controls the Vactrol on/off response times, and **MOD** the amount of damping - using the same control scheme as for the envelope mode.

## Signal follower

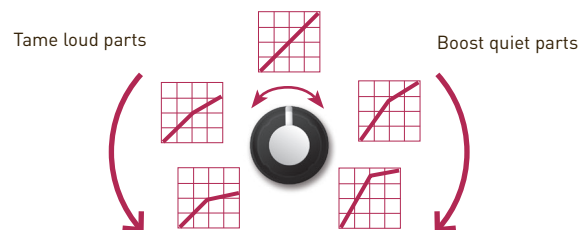
The **EXCITE** signal is analyzed to extract its amplitude and cutoff envelopes. The **IN** signal is then amplified and filtered with these envelopes.

**SHAPE** controls the attack and release time of the detector. **MOD** controls the range of filter modulation.

## Compressor

In this mode, the VCF is disabled and the VCA is used to compress the dynamic range of the **IN** signal. Optimal results are obtained when the VCA response curve is set to exponential. **EXCITE** is a sidechain input - for normal operation, leave it unconnected.

**SHAPE** controls the compression threshold, from -30dB to 0dB. **MOD** controls both the compression ratio and make-up gain:



The compressor has a fast detector (0.2ms attack time, 150ms release time) and a hard knee.

## Tips and tricks

### Heck, no input?

In Vactrol mode, leave **IN** unconnected, send a CV to **EXCITE** and get a smoothed CV on **OUT**.

In envelope or Vactrol mode, leave **IN** unconnected, send a positive CV to **LEVEL MOD**. Use the linear/exponential control to waveshape it, and the **MOD** control to filter it.

To get an envelope CV out of the envelope follower, leave **IN** unconnected.

In envelope (or Vactrol) mode, patch a velocity CV to **IN** and send a trigger (or gate) to **EXCITE**, to get a velocity-scaled envelope on **OUT**. Use **MOD** to control envelope smoothness.

### Offsets and boosts

In Vactrol mode, leave **LEVEL** unconnected and use **LEVEL MOD** to add a gain offset, pushing the VCA into saturation.

Leave **EXCITE** and **LEVEL** unconnected. Set the VCA response to exponential. Use **LEVEL MOD** to drastically boost the **IN** signal until saturation is reached. Tame it back by adjusting cutoff with **MOD** - that's why we put the VCF after the VCA!

### Combos

Use channel 1 to shape a CV and channel 2 to apply it to an audio signal. Use channel 1 to filter/distort/boost an audio signal and channel 2 to compress it.



Mutable  
Instruments



Streams

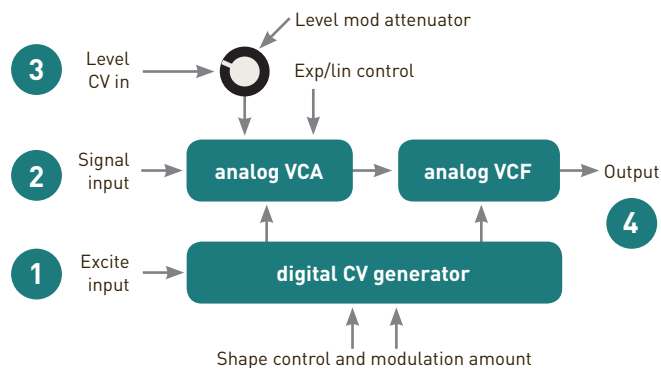
Dual dynamics gate

## About Streams

Streams is a dual-channel toolbox for shaping the amplitude and brightness of audio signals or CVs.

Each channel consists of a VCA and a VCF. The control voltages for these two analog circuits are digitally generated, by “reacting to,” “following” or “listening to” a multi-purpose input called **EXCITE**. There are 4 different ways in which the module can adjust its gain and cutoff frequency in response to the excitation signal: envelope generation, Vactrol emulation, signal following, and dynamic compression.

Additionally, the VCA gain can be directly controlled by a CV - independently of the digital control path.



## Installation

Streams requires a **-12V / +12V** power supply (2x5 pin connector). The red stripe of the ribbon cable (-12V side) must be oriented on the same side as the “Red stripe” marking on the board. The module draws **30mA** from the **-12V** rail and **100mA** from the **+12V** rail.

## Online manual and help

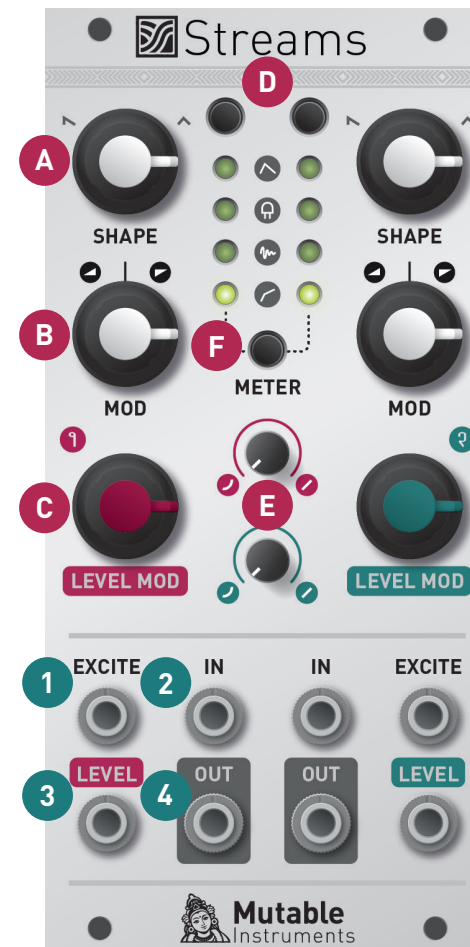
The full manual can be found online at [mutable-instruments.net/modules/streams/manual](https://mutable-instruments.net/modules/streams/manual)

For help and discussions, head to [mutable-instruments.net/forum](https://mutable-instruments.net/forum)

## Front panel

### Inputs and Outputs

1. Multi-purpose **excitation input**.
2. DC-coupled **signal input**, normalized to a constant +5V offset.
3. Unipolar **VCA CV input**, normalized to a constant +8V offset. Unity gain is achieved with a voltage equal to +5V.
4. DC-coupled **signal output**.



## Controls

### A. B. Digital CV generator parameters.

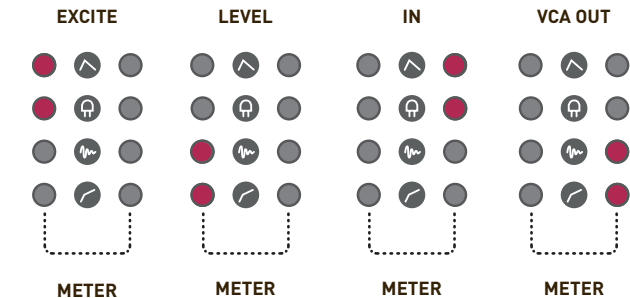
**SHAPE** controls how fast the module adjusts amplitude and brightness in reaction to the excitation signal. **MOD** controls the amount and range of VCF modulation. These knobs also control compression threshold and ratio when the dynamic compressor mode is used. More details are provided in the next pages.

### C. Level CV input attenuator.

**D. Function selector.** Cycles through the four functions.

**E. VCA response curve**, from exponential to linear.

**F. Metering button.** Press to display the bargraph. Press again to select which signal is to be monitored.



Audio signals are metered with a dB scale of 6dB/LED. Slow CVs are displayed with a linear scale of 2V/LED - the LED color indicates signal polarity.