

## Multiple Feedback Low Pass Gate

### Quick Specs:

**Size:** 4hp Wide, 2.375 inches deep (including power header)

**Power Draw (max):** +12V: 14.3mA, -12V: 14.3mA

Two channel low pass gate with a unique architecture

Vactrol free; tight CV response with great offness

Naturally soft clips, adding subtle character to any input signal

Internal normalizations for patching flexibility

Hand matched, high quality film capacitors used in the audio signal path

Limited release, handmade in NYC

### Installation:

To install the MFB LPG, allocate 4hp of space in your modular case. Before installing the module, examine the ribbon cable and ensure that the red stripe aligns with the **RED STRP (-12V)** indicator on the PCB. When installing the ribbon cable on the PSU of your modular case, ensure that its red stripe aligns with the **-12V** or **RED STRIPE** indicator on the power supply PCB. Failure to do so can result in permanent damage to the MFB LPG, your power supply, and/or other modules in your case. When the ribbon cable is guaranteed to be in its correct position, place the module in your case, screwing the panel to the rails.

### What does it do? :

The MFB LPG is a two channel low pass gate. Each channel features a two-pole low pass filter coupled with a voltage controlled amplifier in a single gain stage. The CV input provides simultaneous control of the cut off frequency of the LPF and the gain of the VCA. This results in louder sounds being brighter and quieter sounds being darker. Low pass gates are great tools for synthesizing organic percussive sounds. Striking a drum hard produces a loud and brilliant sound, while striking a drum softly produces a quiet and subdued sound

Traditionally, low pass gates utilize vactrols, which are light dependent resistors coupled with an LED. Vactrols have many limitations and vary heavily from unit to unit, which increases the cost and complexity of manufacturing modules that use them. The Multiple Feedback Low Pass Gate is unique in that it does not use vactrols. Instead, the MFB LPG utilizes a diode network to enable voltage control over the gain and cut off frequency of the LPG's core. These diodes also add subtle soft clipping to the input signal, which is then tamed by the low pass filter, making this module a great choice for adding character and color to any signal.

## How to patch it? :

Patching the dual lowpass gate is simple. Apply a standard +/- 5V oscillator to the signal input. Find a CV source, like a decay envelope, and apply it to the CV input. The CV input expects a range of 0 - 10V, however exceeding these voltages (up to +/- 12V) will not damage the module. Apply the output of the low pass gate to the output of your modular system and then trigger your envelope while listening to the output.

Because the audio path utilizes a two-pole voltage controlled low pass filter coupled with a VCA in a single gain stage, increasing CV will cause the output to become louder and brighter, and decreasing CV will cause the output to become quieter and darker.

While there is no resonance control, the resonance of the MFB LPG naturally varies as it opens and closes. With long envelope times or slow LFO's you will be able to hear certain harmonics of your waveform briefly become emphasized as the LPG opens and closes.

**A little more complex:** The output of the first low pass gate is normalled to the input of the second, and The CV input of the first low pass gate is normalled to the CV input of the second. While applying audio and CV into the respective inputs of the first channel, listen to the output of the second channel and compare it to the sound of the first channel. Because there are effectively two low pass filters and two VCA's being applied to the same signal, compositely the two channels create a low pass gate that is made up of a four pole LPF with a VCA that responds twice as fast.

Inserting a cable into the second channel's CV input interrupts the internal normalization. Monitor the output of the second low pass gate while applying an LFO to the first channel's CV input and an envelope to the second channel's CV input. The LFO will act as a velocity or master level control, while the envelope carries out its typical duties.

Another way to take advantage of these normalizations is to use the second channel as a voltage controlled effects send. Apply an audio signal to the input of the first channel while applying an envelope to the accompanying CV input. Find a separate modulation source to modulate the CV input of the second channel, like a slow cycling envelope.

Apply the output of the first LPG to the input of a mixer. This will be the "dry" signal. Apply the output of the second LPG to an effect, like reverb or delay, the mix of which is set to 100% wet. The effect's output will be routed to another channel on the aforementioned mixer. The control voltage modulating the second low pass gate will allow you to control how often and how much of the first low pass gate's output is being sent to your effect. Adjusting the input signal feeding an effect, rather than the output level of the effect, will allow the effect to naturally decay after the input has been silenced. This is great for achieving dub style effects.

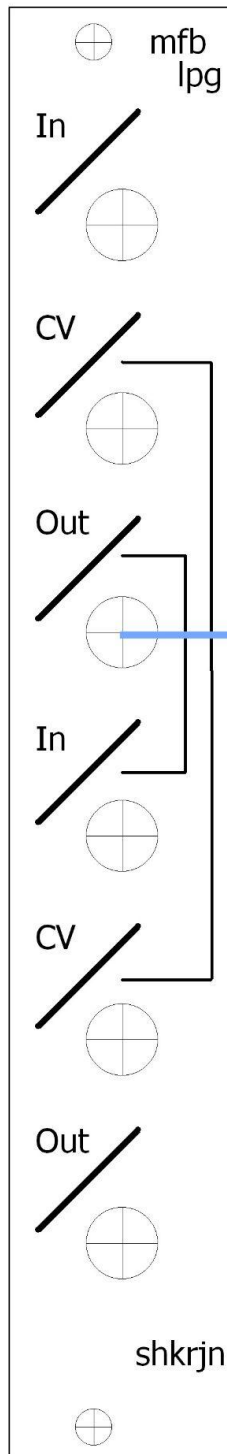
**a quick note:** Some lowpass gates are able to be "pinged", meaning that a gate or short trigger applied to the CV input will briefly excite the vactrol, causing the low pass gate to rapidly open and then naturally decay. Because the MFB LPG is vactrol-free, it is unable to be pinged.

However, the pinging effect can be mimicked by using a short and plucky decay envelope to quickly open up the LPG.

**In**  
 Signal to be processed by  
 the low pass gate  
 DC coupled; expected  
 range: +/- 5V

**CV**  
 Determines the gain and cutoff  
 frequency of the LPG's core  
 Expected range: 0 - 10V  
 The LPG is fully closed at 0V  
 Unity Gain: 8V

**Out**  
 Signal output of the LPG;  
 DC coupled  
 When the control voltage is  
 equal to 8V, the amplitude of  
 the output signal equals the  
 amplitude of the input signal  
 (unity gain)



The lines connecting various  
 jacks visualize the internal  
 normalizations.

The output of the first  
 channel is normalized to the  
 input of the second channel.

The CV input on the first  
 channel is normalized to the  
 CV input of the second  
 channel

The module contains two  
 independent low pass gates,  
 which can be used together  
 via the internal  
 normalizations

The normalizations can be  
 broken by inserting a cable  
 into the associated input

The two channels function  
 identically; their separation is  
 indicated by the blue line