



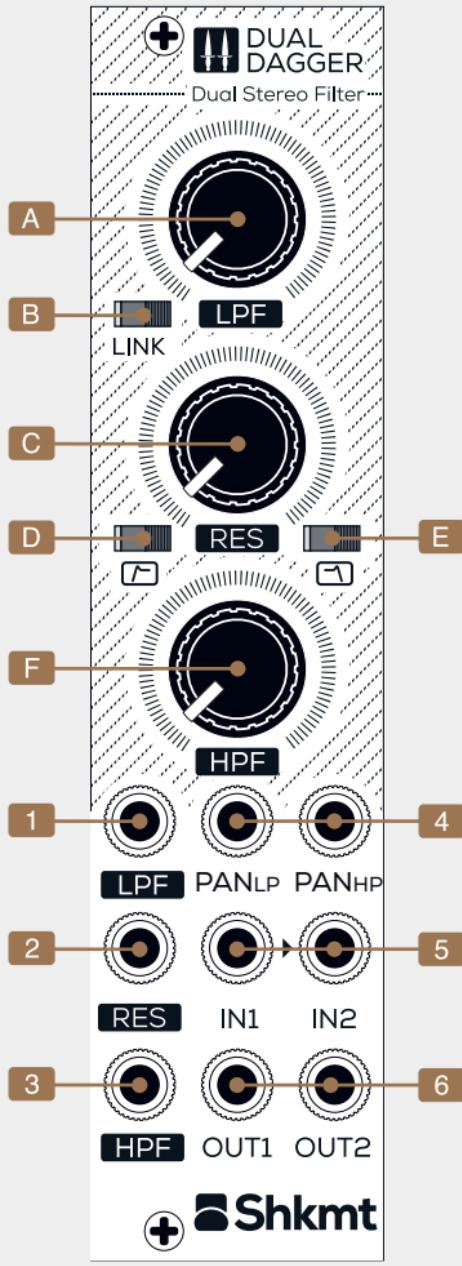
# Shakmat Dual Dagger

• 6HP Eurorack Module

• Built & designed in E.U.

• [www.shakmat.com](http://www.shakmat.com)





# Introduction

The Dual Dagger is a double-sided weapon, carefully sharpened to chop stereo signals. The module gives independent control over low-pass and high-pass cutoff frequencies, and an assignable resonance is shared on one control. The Link function turns the dual filter into a band-pass filter, with control over frequency, bandwidth and band edges resonance! The module is carefully calibrated to share the exact same parameters on both audio channels and thanks to the pan function, it is easy to break up the cutoff frequencies of each side up, which leads to a whole new territory of stereo treatments!

- |                              |                      |
|------------------------------|----------------------|
| A Low-pass potentiometer     | 1 Low-pass CV input  |
| B Link switch                | 2 Resonance CV input |
| C Resonance potentiometer    | 3 High-pass CV input |
| D High-pass resonance switch | 4 Pan CV inputs      |
| E Low-pass resonance switch  | 5 Inputs             |
| F High-pass potentiometer    | 6 Outputs            |

# Installation

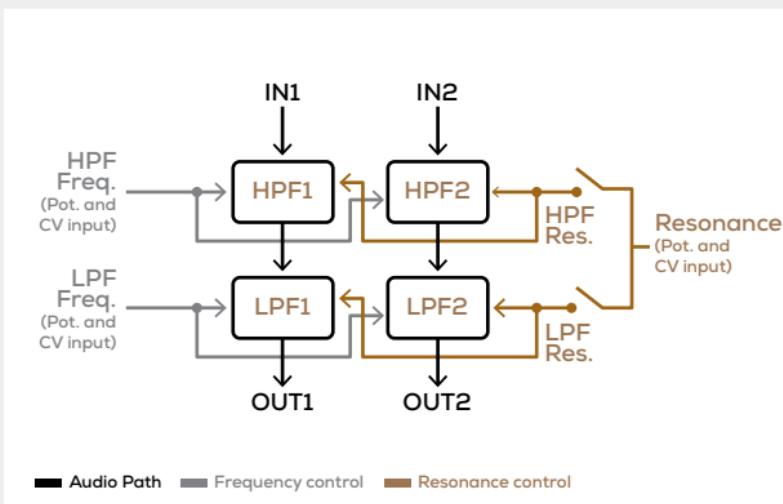
The Dual Dagger requires a standard 2x5 pin eurorack power cable. Make sure the red stripe on the cable matches the -12V side of the Dual Dagger power header.

# Basics

Despite its little size, the Dual Dagger contains four different analogue filters: two low-pass and two high-pass filters, all with a -24dB/octave slope. The LPF potentiometer [A] and CV input [1] control the cutoff frequency of the two low-pass filters. The HPF potentiometer [F] and CV input [3] control the cutoff frequency of the two high-pass filters.

The Resonance potentiometer [C] and CV input [2] control the low-pass filters resonances if the low-pass resonance switch [D] is engaged. When the high-pass resonance switch [E] is engaged, the Resonance potentiometer controls the high-pass filters' resonance. When both resonance switches are engaged, the resonance is affecting both the high and low-pass.

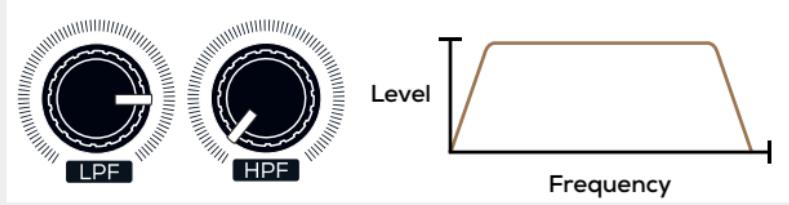
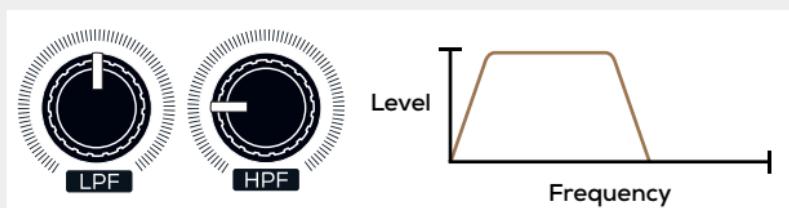
**Fig. 01 — Dual Dagger simplified architecture**



# Link switch

The Link switch [B] turns the module into a powerful 8<sup>th</sup> order stereo bandpass filter with CV control over frequency and bandwidth. When engaged, the Link function makes the low-pass filters follow the high-pass filters. Therefore, the control of the high-pass moves the four filters and the low-pass control only affects the low-pass section. In a bandpass perspective, high-pass control is now the bandpass (lowest) frequency and the low-pass control is the filter's bandwidth. Resonance still acts selectively on the high-pass edge and/or the low-pass edge according to the switches.

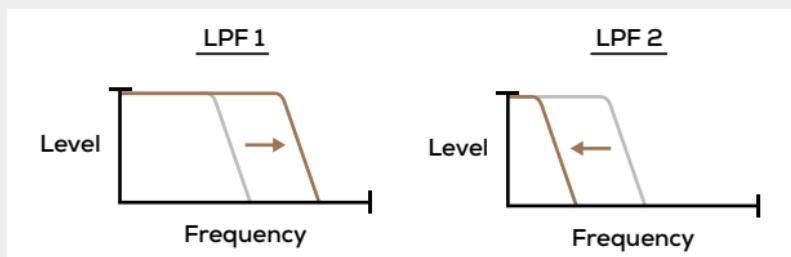
Fig. 02 — Bandpass filtering with Link switch engaged



# Panning

The Dual Dagger has CV inputs that allow to differentiate the cutoff frequencies of each channel, leading to a whole new territory of stereo effects. When a positive voltage is received in the Pan inputs [4], the corresponding filter cutoff frequency of the first channel increases as the second one decreases. In short, sending a positive voltage in the PANLP input will cause the left filter to open and the right filter to close.

**Fig. 03 — Positive voltage sent to PANLP**



When a negative voltage is received, the first channel filter cutoff frequency decreases as the second channel filter cutoff frequency increases. It is of course possible to combine the use of Pan inputs with the Link function and thus creating great stereo bandpass filtering effects!

# Jumper

The jumper on the back of the module allows to set the resonance potentiometer range. In "Lo" position the range is limited, avoiding the filter to self-oscillate. In "Hi" position the resonance can go much higher, allowing self-oscillation.

# Patch ideas

Besides all obvious stereo treatment and filtering, the Dual Dagger can be used in many creative ways, here are some ideas.

## Summing Outputs

Use a mono source and mix both outputs, you now have a double peak high pass and low pass filter - with resonance engaged, use the pan inputs to control the "distance" between two resonant peaks!

## Simple Voice

While using only one channel, use the high pass section as a sine wave VCO tracking V/Oct over a few octaves (resonance at max will cause the filter to self-oscillate). In order to create more complex waveforms, use the second channel to fm the PANhp. Now that you have a lot of harmonics, the low pass section will be handy to smooth out the harsh timbre. Another trick is to mix both channels and to use the PANhp as a "detune" parameter between the two sine VCOs.

## Kick Drum

We know a sinewave can be easily turned into a kick drum sound when being FMed by a decaying envelope. Based on that, the Dual Dagger leads to a wide range of kick drums : mix both outputs and use the pan input to detune sections, try with both sections set to be highly resonant, use the resonance input instead of a VCA,...

## LR & MS

Our SumDif module is a great companion for this filter as it allows to convert left right stereo to mid side stereo ! Combined with the Dual Dagger you can explore peculiar panning effects while using the pan section which will offset the cut off frequency of the centre signal from the side signal.

# Specifications

Size

6 HP

Depth

29 mm

Audio Inputs

-5 to 5V

Current Draw

65 mA @ +12V

80 mA @ -12V

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