

# AI Synthesis AI004 OTA Filter: Manual

This is the Manual for the [AI004](#) OTA Filter, you can purchase it by going to:

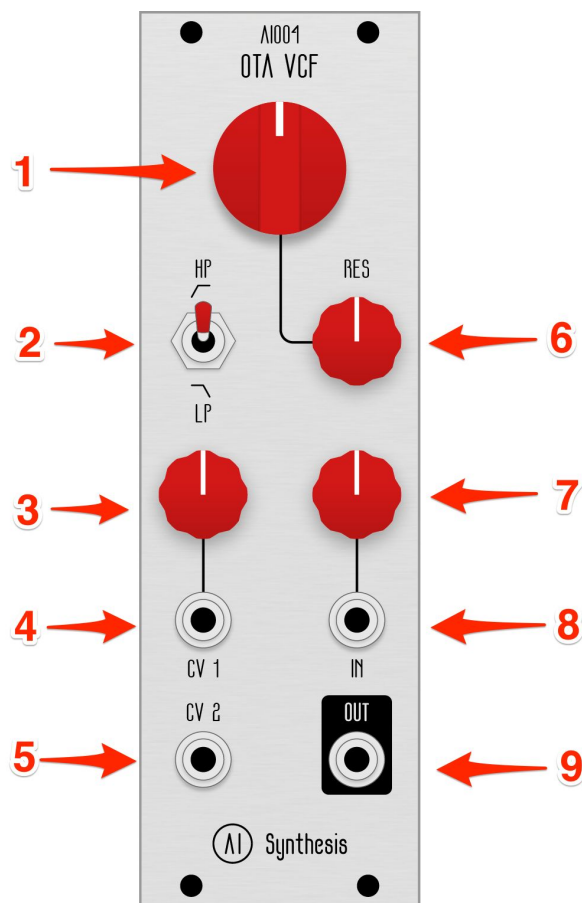
<https://aisynthesis.com/product/diy-ms-20-filter/>.

## 1. About the OTA Filter

If you are new to DIY electronics, this is the third module you should build. The first module, the [AI001 Multiple](#) is ideal for beginners, as it teaches how to solder and signal flow. The [AI002 Mixer](#) familiarizes you with common electronic components, and is powered.

The AI004 is an idea third module as it is slightly more complicated than the mixer, but still much easier than most modules, and acts as a great bridge between beginner and intermediate builds. The AI004 DIY Kit is a voltage controlled filter that uses the same topology as the late MS-20 filter. The filter can operate in either a hi-pass or lo-pass mode, and with the resonance high, as a non volt/octave sine wave oscillator.

## 2. Controls



**1. Filter Cut-off.** This knob sets the frequency in the harmonic spectrum where the filter is applied in either lo-pass or hi-pass mode.

**2. LP/HP Toggle.** This toggle selects the two modes of the Looping Envelope Generator. In HP mode, the filter will cut frequencies below the frequency, and pass frequencies above it (hence Hi-Pass). In LP mode, the filter will cut frequencies above the frequency and pass frequencies below it.

**3. CV 1 Attenuverter.** This knob controls the amount of modulation from the CV1 input and the positive or negative voltage effect of that control modulation. At 12' o'clock, there will be no modulation from CV 1. As the knob moves clockwise, it will allow more input positively, as the knob travels counter-clockwise, it will all more input from CV1, but will invert that signal.

**4. CV1 Input.** This is the control voltage input for Frequency. The amount of control voltage that is applied to the frequency depends on the position of the CV1 attenuverter.

**5. CV2 Input.** This is an additional, un-attenuated CV input that controls frequency..

**6. Resonance.** Resonance boosts frequencies near

that point of the frequency knob. When turned fully up, the filter will self-oscillate, and behave as a sine wave oscillator.

**7. Input Attenuator.** This knob attenuates the input signal. When fully counter-clockwise, the attenuator will fully cut out the input signal, when fully clockwise, the full input signal will be fed into the filter. The gain of the input will interplay with the self oscillation of the resonance. If you aren't getting enough resonance to your liking, you can try turning down the input.

**8. In.** This is the input for the filter.

**9. Out.** This is the primary filter output.