MEG v1.1

by neutral labs

Manual

Hello, owner.

Congratulations on your new MEG module. MEG is a waveshaper that works in a unique way. The front panel uses pictograms to help you intuitively understand all knob and jack functions, so feel free to jump right in and skip this manual, you’re unlikely to break anything. However, for the best possible experience, it’s recommended to spend a few minutes on a quick read-through.

Specifications

- Width: 6 HP
- Supply voltage: +12 V/-12 V (Eurorack 10-pin header)
- Current draw:
    - +12V: 12 mA
    - -12V: 12 mA
    - 5V: unused, 0 mA
- CV inputs: 2x -10 V to 10 V usable, -12 V to 12 V absolute

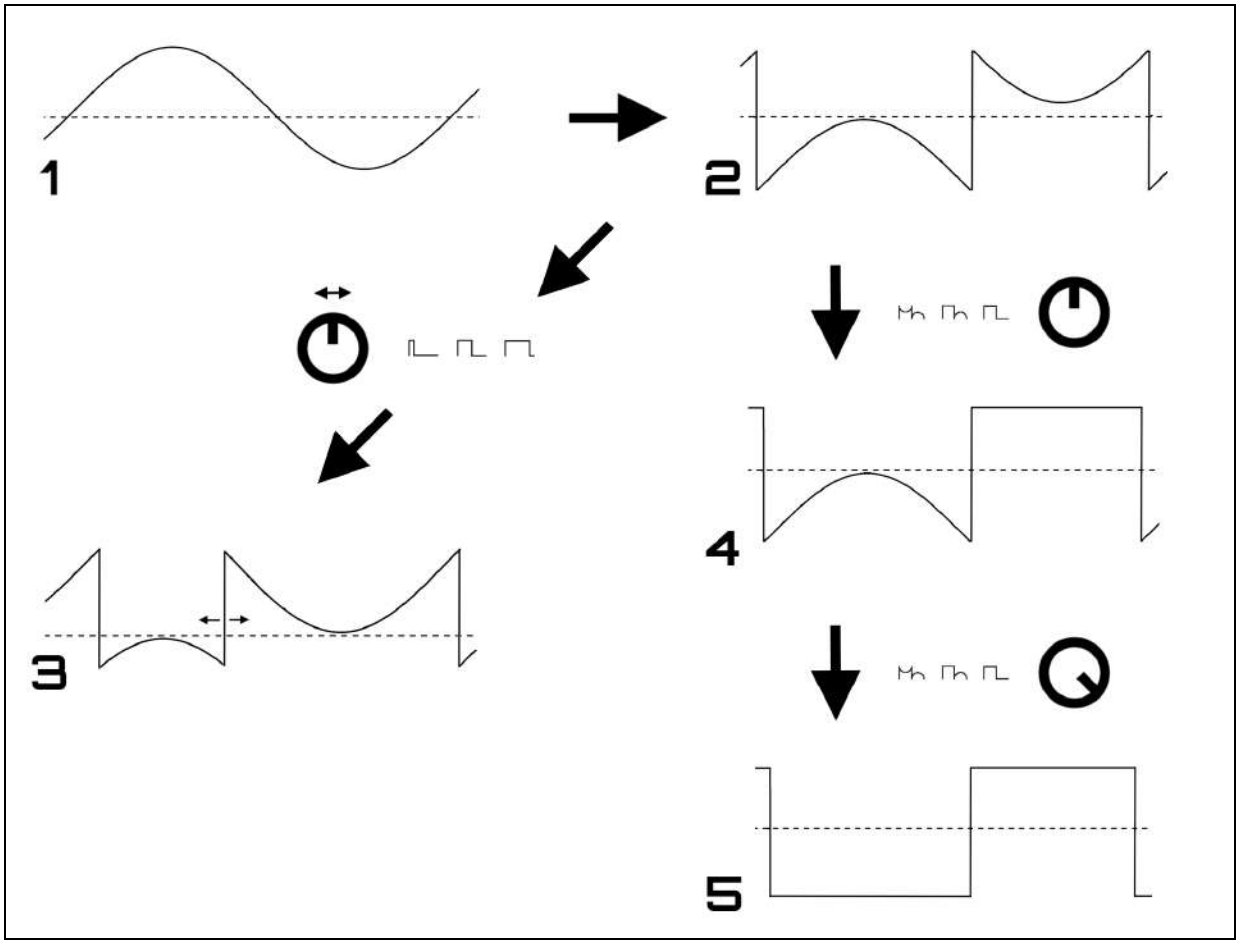
Connecting MEG to Eurorack power

Connect a 10 pin Eurorack power cable to the 2x5 power header on the back of the module. There is an arrow indicator next to the word STRIPE on the circuit board. Unsurprisingly, the red stripe side of the cable goes on the side that says STRIPE. The module (and your power supply) is protected in case you should ever connect it the wrong way around, but it won't turn on if you do.

Module Function

MEG is a waveshaper, meaning it changes the shape of an incoming audio signal.

Unlike a common wavefolder that folds the wave back in on itself at a certain threshold, MEG manipulates the wave in a more sophisticated way. It shifts parts of the wave up or down, with the shifting threshold being adjustable. The resulting 2 half-waves can be flattened one by one, essentially morphing into a half square wave and eventually a full square wave. Essentially, it will add pulse-width modulation (and more) to any kind of wave. Assuming that the reader might now have a puzzled look on their face, the effect may best be expressed in visual form.

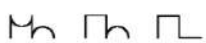


As our input, consider a simple sine wave (1). MEG will shift a part of the sine wave up and the other part down, as if adding an inverted square wave at the same frequency (2). (Well, not just as if, that's actually exactly how this effect is achieved in the circuit.)

Moving the knob or modulating it via CV results in a change of the voltage threshold at which the shifting occurs (3). Above this threshold, the wave will be shifted down, below it the wave will be shifted up. This results in an effect that is essentially like pulse-width modulation (PWM).

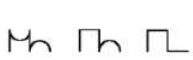
Turning the knob clockwise (or modulating it via CV in the same way) will gradually flatten the top half of the resulting wave (4). Turning it even further clockwise will eventually flatten the bottom half as well until we get a pulse wave (5).

Manual Controls

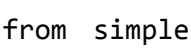
Control	Function
	This adjusts the threshold at which the inversion of the incoming waves sets in. The result on a simple triangle or sine wave input is similar to pulse width modulation (PWM). The result on a more complex wave will be equally complex and usually very rewarding. **Note:** Depending on the amplitude of the incoming audio, there may be “dead spots” around the fully clockwise and fully counterclockwise positions of this knob, where no effect occurs. This is inherent to the functionality of the module, as the amplitude of the input signal cannot easily be foretold. If it bothers you, simply boost the input audio volume. MEG works best with input signals that are -5 V to +5 V (10 V peak-to-peak), which is most commonly seen at VCO outputs, but other amplitudes will work as well.
	This gradually (and asymmetrically) flattens the inverted waves of the incoming audio. In the counterclockwise position, the waves are preserved with no flattening. By turning the knob clockwise, one half wave will be flattened first, which can lead to interesting harmonics. As the knob is turned further, the other half wave will be flattened as well. In the fully clockwise position, the result is a square wave, with the other knob controlling its pulse width.
Coupling selector (jumper on the back of the module)	This is a 3-pin header with a jumper that connects the middle pin to either the left or the right pin. The position of the jumper determines whether the output of the module will be AC coupled or DC coupled. (If the jumper is not present, the module will still be functional and the output will be AC coupled.) In case you are not sure what setting you need, use AC coupling for audio signals and DC coupling for CV signals. If you’re going to use the module for both audio and CV, go with DC coupling.

Control Voltage (CV) Inputs

Both CV inputs expect signals within the -10 V to +10 V range. Don’t worry about supplying a higher or lower CV though: It will not harm the module. CV modulation at frequencies within the audio range is both possible and recommended.

Input	Function
	This controls the threshold at which the inversion of the incoming waves sets in, same as the knob next to it. The knob itself has no function while a cable is connected to this CV input.
	This gradually flattens the inverted waves of the incoming audio, same as the knob next to it. The knob itself has no function while a cable is connected to this CV input.

Patch ideas

- Feed MEG some audio from a simple (sine, square, triangle or saw) VCO. Turn the  knob to the middle position and wiggle it slightly.
- Feed MEG some audio from a complex VCO. Modulate the  input from a different VCO that has a frequency close to the first one. Now slightly change one of the VCO frequencies.
- If you happen to own several MEG modules, daisy-chaining them and setting the respective  knobs to different positions creates fairly complex waves from simple input signals, even more so when CV-modulating the inputs.