

The

# AvonSynth User Guide

## AVS-VCO-1 Voltage Controlled Oscillator



Thank you for purchasing from AvonSynth

Congratulations on your purchase of a brand new AvonSynth AVS-VCO-1 Voltage Controlled Oscillator Eurorack Module. We trust that it will both serve and inspire you as you create beautiful music with it for years to come.

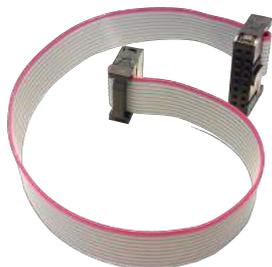
In order to get the most out of your module, please ensure that you read this User Guide in its entirety so that you fully understand all of its functionality, and that you follow all necessary safety directions during use.

### Included in the Box

1 x VCO Module



1 x 10 pin to 16 pin flat-cable power cord



4 x M3 Mounting Screws



4 x Nylon Washers



### Installation

**Step 1:** Power your system off. Place the module in your Eurorack-compatible rack in any convenient position. Affix the module to your rails using the included mounting screws and nylon washers. Neglecting to use these washers may result in unnecessary marking of the unit.

**Step 2:** Triple check the polarity of the power connector before connecting the power cord to your power supply. Ensure that the -12v line marked on the back of the module connects to the same end of the flat-cable that also connects to the -12v line on your power supply. While AvonSynth modules use shrouded connectors that make this process safer and more reliable, some systems do not conform to this polarity standard, so careful checking is **always** necessary. Connecting the module with incorrect polarity can result in damage done to the module which cannot be covered by warranty.

**Step 3:** Power up your system and start patching!



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## AVS-VCO-1 Voltage Controlled Oscillator

### Features & Specifications

- Fully Analogue, saw-core Voltage Controlled Oscillator
- 10 HP wide (50.5mm), 20mm deep
- 1v/Oct response, wide range, great tracking over 8 octaves
- Current consumption: +12V 25ma, -12V 25ma
- Temperature compensated
- Simultaneous sine, triangle, sawtooth, and pulse wave outputs
- Knob and attenuated CV-controlled Pulse-width modulation
- Separate coarse and fine pitch adjustment
- Separate attenuated exponential and linear pitch modulation
- Sync input

### Description of Functionality

#### Coarse and Fine Pitch Controls

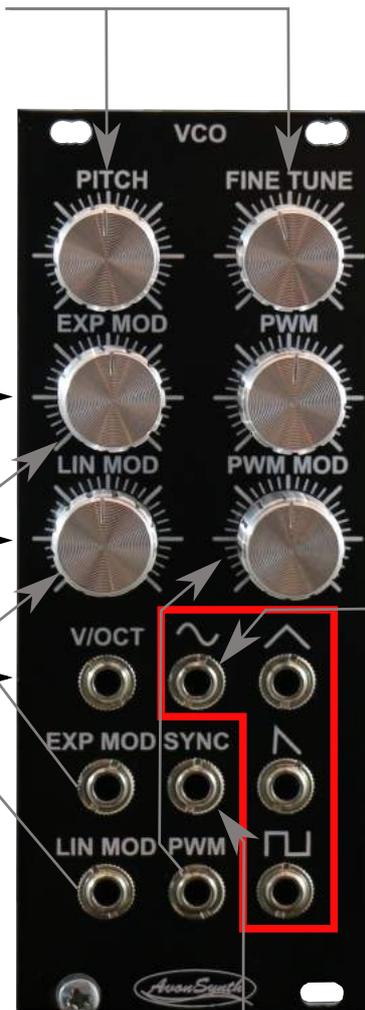
Both of these knobs control the VCO's pitch pre-modulation. The main Pitch knob spans beyond the entire audio range from approximately 16Hz to 25kHz, while the Fine Tune knob spans just a few semitones.

#### Pitch Modulation Attenuators

A CV present at the exponential and linear modulation inputs will alter the pitch of the VCO, and the amount of modulation can be adjusted with these knobs. Exponential modulation is often used with tonal music and vibrato, and linear modulation is more commonly used in audio-rate FM style patching.

#### 1 Volt per Octave Input

Input for the standard 1v/Oct scaled CVs output by many keyboards, sequencers, and other gear.



#### Pulse-Width Modulation

Pulse-Width Modulation controls the width of the waveform present at the Pulse output. The PWM knob sets the starting Pulse-Width, and a CV at the PWM input modulates this value. The PWM Mod knob is an attenuator that adjusts the amount of Pulse-Width Modulation.

#### Sine

#### Audio Outputs

Four simultaneous oscillator outputs with Sine, Triangle, Sawtooth, and Pulse wave shapes. Mix and match these different waves to create a variety of different timbres.

#### Triangle

#### Sawtooth

#### Pulse

#### Oscillator Sync

By sending another oscillator's output to this Sync input, each zero crossing of the source oscillator will cause this VCO's core to reset. By auditioning the audio output from this VCO and modulating the source VCO, an interesting special effect is achieved.

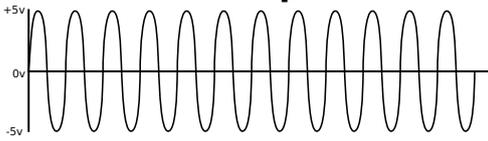
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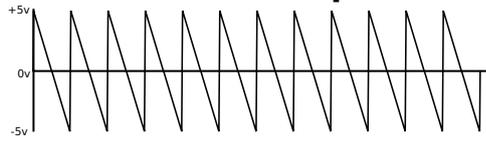
## AVS-VCO-1 Voltage Controlled Oscillator

### Waveform Diagrams

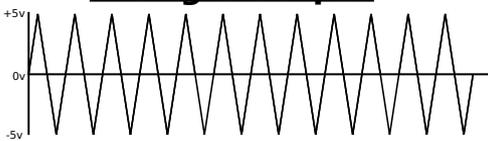
**Sine Output**



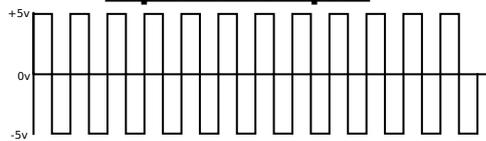
**Sawtooth Output**



**Triangle Output**



**Square Output**



### Calibration Trimpots

Your new AVS-VCO-1 Voltage Controlled Oscillator was expertly calibrated by hand for great 1v-per-octave tracking over a large frequency range. However, over time it is possible that the calibration could drift, or accidental movement of the calibration trimmers could decrease the precision of the tracking. Multiturn trimmer potentiometers are used in this module for increased accuracy in calibration and can be turned using a small flat-head screwdriver or other suitable implement.

Recalibrating this module requires the use of accurate multimeters, frequency counters, and precise control voltage generators. If you are not able to carry out recalibration yourself, the engineers at AvonSynth will be happy to recalibrate your

The Freq Init (Initial Frequency) trimpot is used to set the frequency range of the Pitch knob. This is generally set so that at the pitch knob's minimum value, the output frequency is just below the audible range. The 1v/Oct trimmer is responsible for setting the shape of the exponential relationship between the input CVs and the oscillator's output frequency. Calibration is carried out by monitoring an output, and feeding the 1v/Oct input precise control voltages in 1v increments. Adjust this trimmer until each 1v increment results in a doubling of the frequency of the output signal.

The Bias trimmer centers the Sawtooth wave symmetrically around ground. Since all of the outputs are derived from the sawtooth core of the oscillator, this affects the output of all waves and the Bias trimmer should be set first when calibrating. The Waveform Shape trimmer adjusts the symmetry of the triangle waveform, and since the sine wave is derived from the triangle wave, this also doubles as an adjustment of the shape of the sine.

**Initial Frequency**

**Pitch Tracking**

**Waveform Bias**

**Waveform Shape**



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### Safety Precautions

Please use this module in accordance with the following safety guidelines in order to maximize the life of the module and ensure warranty from AvonSynth.



Keep water and other conductive liquids and materials away from this module. It is not water proof, or even water resistant. Exposure to these can cause short-circuits that can render the equipment unusable.



Be sure to keep this equipment in an environment with an ambient temperature above  $-20^{\circ}\text{C}$  and below  $+50^{\circ}\text{C}$ . Excessively hot or cold temperatures can be damaging to the electronic circuits used.



Modules with exposed circuit-boards are delicate. Take the utmost care when handling and transporting this equipment, making sure not to subject it to excessive forces. Ensure that the module is installed correctly while being transported and that the original packing materials are used when sending the module anywhere by post.

### Warranty & Support

This product is covered by AvonSynth's warranty for one year from the manufacturing date. Within this timeframe, any manufacturing defect will be repaired or replaced by AvonSynth. Damage caused to the product due to not following the safety precautions above, unauthorized modification of the hardware, or misuse such as subjecting the unit to reverse or excessive voltages will void this warranty.

If you have any concerns about your AvonSynth hardware, please get in touch via [info@AvonSynth.com](mailto:info@AvonSynth.com) to discuss any issues. We will do our best to assist you in getting your hardware operating correctly, and if necessary, we will provide an RMA (Return Merchandise Authorization) to send back the unit for inspection. Any postal costs incurred in this process will be the responsibility of the customer. Please do not send back merchandise before receiving this authorization.