

SERGE

MEDUSA SUBHARMONIC OSCILLATOR

FOR EURORACK



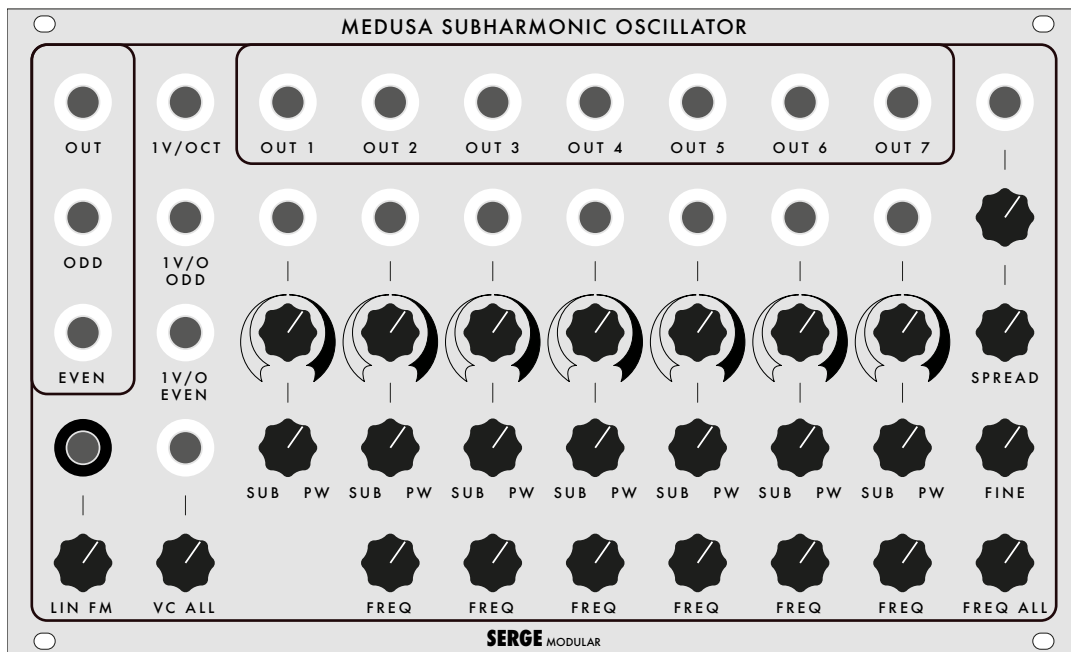
USER MANUAL

V1.0

RANDOM*SOURCE

MEDUSA

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MEDUSA

SUBHARMONIC OSCILLATOR

“This is my version a cluster generator. Clusters are part of the contemporary music arsenal of effects. The swarm has a total, tracking, V/octave range that is the same as all our VCOs, however, it outputs only pulse waves. Pulse-width operates from instantaneous -> square wave > 1st sub-harmonic > 2nd sub-harmonic ...> Nth sub-harmonic. You guessed it, this is one VCO that sounds like a symphony orchestra playing Atmosphere by György Ligeti.”

Serge Tcherepnin, 18 October 2023

Installation

Always turn the eurorack case off and unplug the power cord before plugging or unplugging any eurorack power cable. Do not touch any electrical terminals when attaching any eurorack power (bus board) cables. **Do not touch any trimmers on the back of the module - MEDUSA is meticulously calibrated and even the slightest changes to the trimpots are likely to require a full factory recalibration.**

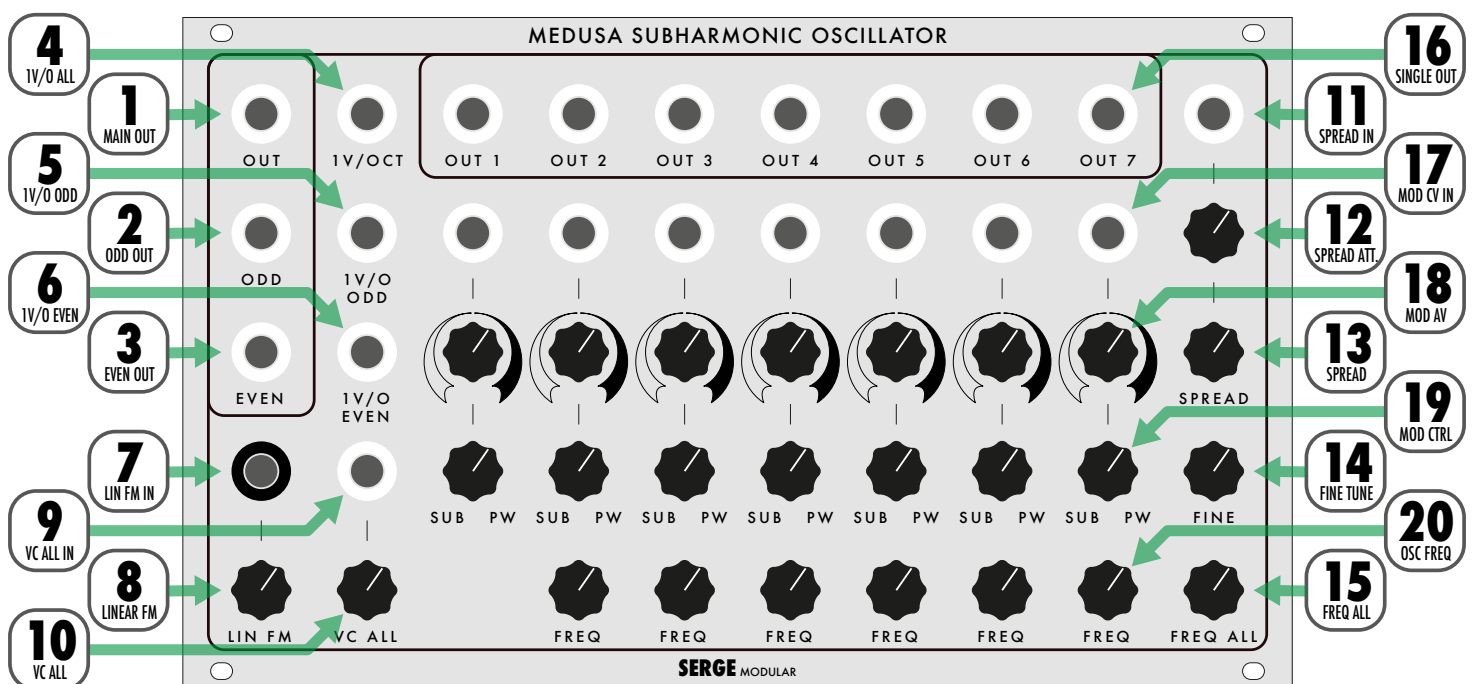
The Serge MEDUSA is an electronic music module requiring about 220mA of +12VDC and 200mA of -12VDC regulated voltages and an appropriate power connector to operate. It must be properly installed into a eurorack format modular synthesizer system case.

POWER YOUR CASE OFF before installing the module. Please use the power cable provided to connect the small end of the power cable to the module: RED STRIPE to “-12V”, as indicated on the back of the module. Carefully install and secure the module in your case. Power on and your module should be ready to go now :-)

Please beware: Powering the module on anything more (or less) than +/-12V is not recommended and may damage the module. Feeding any of the inputs (or outputs) with voltages outside a +/-12V range may damage the module. This type of damage is not covered under warranty.

Overview

The Subharmonic Oscillator is one of Serge's latest inventions and also one of his most extraordinary designs. 7 accurate analog VCOs tied at the waist—in unison, yet their frequencies can open up like a fan, creating complex clusters. Each voice generates a pulse wave. It is **temperature compensated** and follows **exceptional 1V/Octave tracking**. In addition, each voice provides (voltage controlled) **pulse width modulation** or **subharmonic division** as well as an individual output. The precision of these voices in combination with a global Spread control and various FM inputs opens up an enormous sonic range from massive unisono sounds to dissonant, orchestra-style textures.



- OUT (1) Main Output, the sum of all seven oscillators. DC coupled, level depends on the phase cancellations / addition of the individual pulse waves, usually in a 0V to 7V range, this is a very rough indication, however.
- ODD OUT (2) Sum of Oscillators 3, 5 and 7. Can be used as a pseudo-stereo output (L)
- EVEN OUT (3) Sum of Oscillators 2, 4 and 6. Can be used as the other side of pseudo-stereo output (R)
- 1V/OCT IN (4) Main 1V/Octave input that controls all seven oscillators.
- 1V/O ODD (5) 1V/Octave input to control (only) the odd oscillators. Please note that all the 1V/Oct inputs work together, e.g. if you use the main 1V/Oct input (4) to set a base pitch / sequence and then send -1V into 1V/O ODD, the odd oscillators jump down one octave, still following the main sequence.

1V/O EVEN (6) 1V/Octave input (banana jack) to control the even oscillators (2, 4 and 6). Again, the main 1V/Oct input (4) is added to any CV sent in here.

Frequency and Modulation

LIN FM IN (7) CV Input for linear frequency modulation (FM).

LIN FM (8) CV Attenuator, controls the level of (linear) CV (18) being sent to the seven oscillators.

CV IN (9) Exponential CV input affecting all seven voices, ideal for **exponential** frequency modulation (**FM**) and (in combination with Spread) metallic sounds.

VC ALL (10) CV Attenuator, controls the level of (exponential) CV being sent to the seven oscillators.

FREQ ALL (15) Controls the (base) pitch of all 7 oscillators.

FINE (14) Like FREQ ALL (15), but with a very narrow range to allow cent-accurate tuning.

Spread

Medusa is carefully calibrated so that all seven oscillators can play the same pitch / frequency. Of course, Medusa is a fully analog design, so do not expect the voices to act 100% in unison without any Schwebung. To get a unisono sound (with exceptional tracking), make sure Spread (11) is turned all the way down and the FREQ knobs of oscillators (2) to (7) are all turned to minimum (CCW). Now voices 2 to 7 should follow the main oscillator (1) and are controlled by FREQ ALL (15), FINE (14) as well as the 1V/Oct input (4).

Spread now allows to space out the seven voices in a controlled manner, from a “swarm” or tuning orchestra effect to more drastic dissonance, creating a very massive, overtone-rich soundscape. Spread can be controlled manually or by CV. Interesting effects can be achieved when the spreaded sound is filtered and/or FM is applied.

SPREAD CV (11) CV input to control the spacing between the oscillators (“Spread”). Spread allows to go from unison to “Schwebung” to dissonant soundscapes (and back).

SPREAD A (12) Spread CV attenuator, controls the level of Spread CV (11) actually used.

SPREAD (13) Manual control over Spread.

Individual Oscillator Control

OSC OUT (16) Single oscillator output. Useful to check the current settings (pitch, SUB PW effect etc.).

FREQ (20) Manual pitch control for a specific voice / oscillator. Shifts the pitch up from the (global) Base Frequency. Turn to minimum to have the voice play unison with the Base Oscillator (#1). Only available for oscillators 2 to 7, oscillator 1 sets the base and is directly controlled by FREQ ALL (15), and FINE (14).

- SUB PW (**19**) Manual **SUB**harmonics to Pulsewidth (**PW**) control. At center position (or slightly to the right) each oscillator generates a pulse wave with a fairly high duty cycle. Turning the SUB PW knob to the right decreases the pulse width (without changing the frequency). **Left of the center, however, the SUB PW knob causes a subharmonic pulse division, making the oscillator jump to lower frequencies that are still based on the original (center) frequency: 1st subharmonic, 2nd subharmonic etc.** Beware that these may be go to very low frequencies, which might give the wrong impression of the oscillator not running. **Turn this knob to about 1'o clock or higher before trying to get a unisono sound.**
- SUB PW CV (**17**) CV Input to control the SUB PW setting for each oscillator.
- SUB PW AV (**18**) Attenuverter (Processor) for the SUB PW control voltage (**17**), allows to dose CV in both directions for Pulse Width Modulation (PWM) or subharmonic changes or both.

Band Practice

MEDUSA is a complex beast - don't expect to discover all her secrets in the first session. Some tips:

The output signal(s) are very overtone rich, providing an ideal starting point for all sorts of filtering. Using multiple filters (in series or parallel) can give very interesting results.

Using EVEN / ODD outs as a stereo pair generates a very dimensional image, however, it requires separate filtering when you want to preserve the stereo image.

Try using the individual outputs to controll the SUB PW settings of other outputs or for FM.

Going into the subharmonic side can add a very orchestral / tuning touch to the overall sound.

Let us know what else you discover!

(Version 20 October 2024)

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