

# ULT-SOUND DS-1 OPERATION MANUAL

Thank you for choosing the ULT-SOUND DS-1, a compact and versatile drum synthesizer designed for Eurorack modular systems. This module is a streamlined version of our flagship ULT-SOUND DS-4M, adapted to fit seamlessly into your modular setup while maintaining the core sound and functionality of its larger counterpart.

The DS-1 harnesses the same analog circuitry and design philosophy as the DS-4M, but in a more space-efficient format. We've tailored it specifically for the Eurorack environment, enhancing its capabilities with patch points and controls that leverage the interconnectivity of modular systems.

Key features of the DS-1 include:

- A multi-waveform VCO
- Versatile noise generator with multiple percussion modes
- Mixer for blending VCO and noise sources
- LFO with speed and level controls, plus retrigger option
- Various CV inputs for extensive modulation possibilities
- Current draw: +12V 40mA, -12V 40mA
- 16hp, 35mm depth

Before diving into your new sonic adventures, we recommend familiarizing yourself with this manual to fully unlock the potential of your ULT-SOUND DS-1. Enjoy exploring the rich world of analog drum synthesis in your Eurorack system!

## PANEL LAYOUT

### 1.SENSE LEVEL

The SENSE LEVEL knob adjusts how the module responds to incoming GATE signals. Its function changes based on the BEAT SENSE switch setting:

BEAT SENSE OFF:

- Set SENSE LEVEL to HIGH for reliable gate detection
- Ensures the module properly recognizes incoming triggers

BEAT SENSE ON:

- SENSE LEVEL fine-tunes the module's response to varying gate voltages

- Allows you to set the range of dynamics the module will react to  
This control is crucial for optimizing the module's triggering behavior, especially when using external sequencers or drum pads with varying output levels. For more details on how this interacts with your input signals, refer to the GATE INPUT section in the manual.

### 2.VCO

The Ult-Sound DS-4M offers a versatile sound generation system with three primary waveforms: SQUARE, SINE, and TRIANGLE. Users can fine-tune the pitch through multiple controls:

- TUNING knob (C to B range)
- BEAT TUNE and FINE TUNING sliders
- OCTAVE switch (1-5 range)

The BEAT TUNE slider introduces GATE INPUT modulation to the VCO, while activating the BEAT SENSE switch allows pitch control via GATE level adjustments. FINE TUNING provides subtle pitch variations of +/- one semitone. External pitch control is also possible through the V/OCT input.

Complementing the VCO, a NOISE section offers five options:

- C1 (Cymbal1)
- C2 (Cymbal2)
- S (Snare drum)
- N (White Noise)
- E (External audio input)

The MIXER potentiometer blends NOISE sources with VCO signals. It's worth noting that pitch adjustments don't affect the noise sources.

This combination of features provides users with extensive sound-shaping capabilities, from pure synthesized tones to complex percussive textures.

### 3.ENVELOPE

The SUSTAIN slider and ATTACK pot work together to shape the sound envelope:

SUSTAIN slider:

- Adjusts the duration of the sound
- Slide towards SHORT for quick, percussive hits
- Slide towards LONG for extended, resonant tones

ATTACK pot:

- Controls the initial transient of the sound
- Turn clockwise to add a pronounced click at the start
- Turn counterclockwise for a softer onset

These controls allow you to craft everything from sharp, punchy drum hits to longer, evolving percussion sounds. Experiment with different combinations to find the perfect envelope for your rhythmic needs.

### 4.LFO

This section is used to add vibrato to the sound. Use the waveform selector switch to select a SQUARE or TRIANGLE waveform and use the FREQUENCY control slider to determine the vibrato speed. Depth of the vibrato is controlled using the LEVEL knob. The LFO RETR. switch is a LFO retrigger which restarts LFO waveform from 0.

### 5.SWEEP

SWEEP adds an envelope to the tune of the VCO. The UP or DOWN switch selects a positive or negative envelope. The WIDTH slider determines the amount of the envelope.

### 6.MIXER

Use the MIXER knob to balance the level between VCO and NOISE sources switch.

## CONNECTIONS

### 1.INPUTS

1. V/OCT adjusts the pitch of the VCO. It is commonly controlled by a 1V/ Oct keyboard, sequencer, or LFO, with a voltage range of 0-5V.
2. GATE IN is a dynamic input that reacts differently to varying pulse levels when the BEAT SENSE switch is turned ON. For instance, you can use an external VCA module to adjust the gate level with an external LFO, then route it to the GATE INPUT. This allows you to hear changes in volume or pitch (if you've adjusted the BEAT TUNE slider) based on the incoming signal's level (0-5V).
3. EXT. IN - external audio input (0-5v)
4. LFO SPEED - controls the rate of LFO as an offset to the LFO FREQUENCY slider (0-5v)
5. LFO LEVEL - controls the LFO depth as an offset to the LFO LEVEL knob (0-5v)
6. MIX - controls the mix between VCO and NOISE sources as an offset to the MIX knob (0-5v)
7. SWEEP LEVEL - controls the amount of envelope being sent to the VCO as an offset to the WIDTH slider (0-5v)

### 2. OUTPUTS

1. OUT - is an unbalanced audio output at eurorack levels.

### 2. POWER

1. Standard eurorack power +/-12v.

## INSTALLATION

Turn off your modular system and unplug its power cable. Take the included ribbon cable and connect it to the DS-1's power connector, ensuring the red stripe aligns with the white line on the module's back panel. Attach the other end of the ribbon cable to the power distribution bus in your modular case. Once everything is connected, plug in and turn on your modular system