

Luma-mu Quick Start Guide

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Luma-mu is a 10HP Eurorack module which plays back μ -Law encoded samples from a ROM. This is all done in hardware, with no microcontroller (and so no embedded software or firmware).

It is essentially a single drum channel of the Luma-1 Drum Computer. Rather than playing from RAM (like Luma-1), it plays from a ROM, and can select 1 of 8 sounds in that ROM to play.

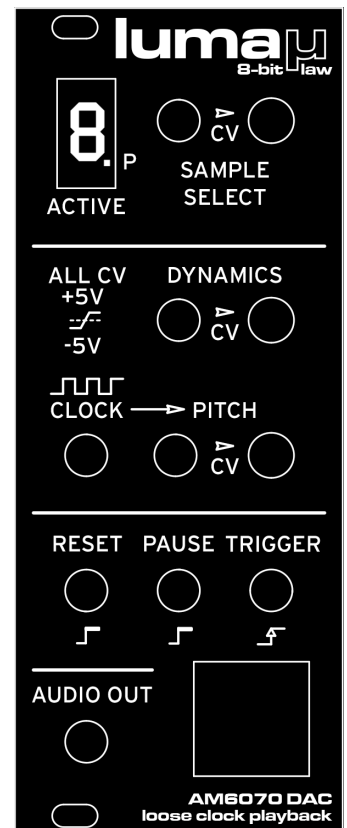
By playing the samples directly, without any microcontroller or firmware used, playback is triggered with the lowest latency.

Front panel knobs and CV ($\pm 5V$ full range) can be used to select which of 8 samples to play and the playback pitch. Sample playback can be triggered manually via a front panel button or with a Trigger input. Additionally, the sample rate clock can be fed in, and playback can be Paused or Stopped using front panel jacks (all $+3V \rightarrow +12V$ in).

Using the same 555 timer as the LM-1 and Luma-1 for Pitch (sample rate) control, the vintage 8-bit μ -Law AM6070DC DAC is driven with the same loose sample rate clock and delivers the same feel. It's perfect for Luma-1 expansion or standalone operation.

Luma-mu feature set:

- 8-bit μ -law EPROM playback, exact copy of LM-1/Luma-1 channel with authentic AM6072DAC (ceramic package, 40 years old)
- Removable EPROMs with 8 sounds on each, 16KB each (~1.5sec/ea)
- True hardware-only playback provides lowest (and constant) Trigger latency
- CV control for Sample Select allows changing sounds any time (even during playback)
- CV control for Pitch and Dynamics
- Gate control for Reset, Pause and sample Trigger
- Can be Clocked (sample rate) externally
- Play one shot **or** loop sounds (perfectly looped sounds enable use as a wave oscillator!)
- Comes with web-based tool to make your own sound EPROMs (see <https://luma.tools/>)



- EPROM accessible from front with optional Luma-mu Reacharound extender module
- Eurorack 10HP, 50mm depth, requires 5V/+12V/-12V, total current is less than 0.43A

Luma-mu front panel controls:

- **LED display** shows the selected active sample (8 total, numbered 0-7).
- **Sample Select** pot and CV input work together. When not patched, the pot selects the active sample. When patched, you can use the pot to set the offset for incoming CV (-5V to +5V full range). This way you can use it with CV signals in 0-10V range.
- **Dynamics** pot controls the loudness by adjusting the DAC reference voltage. This is the same hardware technique used for the LM-1/Luma-1 voice Loud/Soft dynamics, but on Luma-mu it is continuous, not just 2 fixed levels. The pot and CV input interact in a similar way as Sample Select, i.e., the pot sets the offset voltage when CV is patched.
- **Clock** is a gate input (3-12V) which allows you to feed in an external sample rate clock **instead** of using the on-board 555 clock. Nominal sample rate clock is ~23kHz.
- **Pitch** pot and CV input set the playback speed/pitch of the sample. The Pitch pot has a clear shaft and LED indicating playback. CV offset function is similar to other controls. CV range is 10V (-5V to +5V full range), pitch response is not linear and not thermally stable, as on the LM-1/Luma-1 designs.
- **Reset** gate input (3-12V) stops playback and resets sample to 0 position. Can be used to chop sounds in realtime in combination with Trigger input to start playback.
- **Pause** gate input (3-12V) sets playback on pause while gate voltage is applied. Can be used to stutter sounds in realtime. It “pauses” and “unpauses” the sound mid-playback.
- **Trigger** gate input (3-12V) replicates **Trigger** button and starts playing a sample. Triggering again while playing resets the position to 0 and continues playing (retrigger). Playback triggers on the positive edge of the signal, time applied doesn’t matter. Sample is always played in full unless **Reset** or **Pause** are used.
- **Audio** output is buffered output from DAC. When DAC is not playing it’s muted to keep S/N ratio low.

Luma-mu back side controls:

- **Loop** jumper sets the sample playback mode. With jumper installed it’s one-shot playback always. With jumper removed it’s in continuous playback mode (initial trigger required). This mode allows to use Luma-mu as an oscillator with a proper EPROM data (needs to be looped precisely).
- **EPROM** slot **note the PIN1** orientation when installing. Only 1Mbit EPROMs are supported, such as 27C010, 27C001, 39SF010.
- **Expansion** connector is not currently used.
- **Power** connector, **red stripe is down**.

