
hover


ARCHAEA

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## WARNING - READ THIS FIRST!

Before you plug this module into your rack and start to use it:

1. Disconnect your rack from the mains supply.
2. **MAKE SURE THE POWER CABLE CONNECTORS ARE INSERTED THE CORRECT WAY ROUND!** The red stripe on the Eurorack power cable must be orientated as indicated on your rack power supply bus. This module comes supplied with a power cable already connected and a shrouded header to prevent mis-orientation. If the power cable is changed from the supplied cable, an incorrectly assembled cable could still cause issues. If the stripe on a different cable does not match the stripe on the module when plugged in, do not power up, and use a different cable!
3. Double check the power cable orientation before switching the rack power on!

**Your rack MUST have sufficient spare power available to power the module**, otherwise unexpected behaviour will occur. The maximum current requirements of the module for each voltage are given in the Specifications section. The current draw of each module, for each voltage, must add up to less than the total current capability of your rack power supply.

The maximum voltage range which can be present at the input or output jack sockets is -12..12V. The warranty does not cover damage to the module from incorrectly powering the module or exceeding the jack voltage range.

## Credits


Designed and made in Bristol, UK by Archaea.

Many thanks to Sean Costello (Isostatic) for beta testing and feature suggestions.



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First of all, thank you for purchasing this module from Archaea! We hope this provides you with a fun and useful way of adding movement to your modulations!

## Overview

Hover is an analog synthesizer beam controller that can be used to add expression to modulation creation with the ease and control of a hand movement. Vertical hand movements are measured with an infrared beam and converted into CV and gate signals. The output can be frozen in a variety of ways using the modifier button. Hover can also be used to create LFO modulations by allowing hand movements to be recorded and looped.

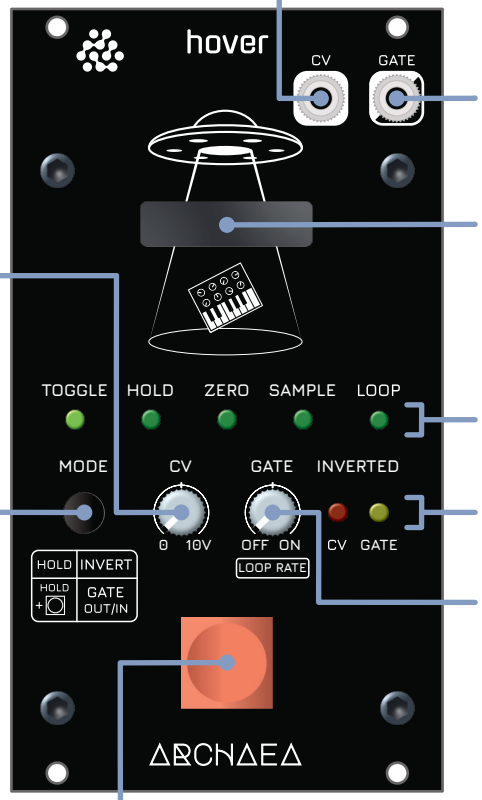
## Getting Started

The front panel of the Hover Euro module panel is shown in the diagram to the right, **Front Panel**. Connect a mono-jack lead between the Control Voltage (CV) output jack socket and the input socket of a module you want to modulate. The CV level needs to be adjusted to the desired range of the connected module input. Hover generates CV between 0V and the set CV level, up to a maximum of 10V.

Hover ships starting up in the TOGGLE mode, with the modifier button glowing continuous red, meaning the CV is being held in the stop state. If Hover is in a different mode, press the MODE button repeatedly until the mode, shown by the mode indicators, advances back to TOGGLE. Press the modifier button to toggle into the run state, which is indicated by the modifier button flashing green. The CV output will now track between 0V and the CV setting as you move you hand up and down in front of the sensor. To freeze the CV, press the modifier button with your other hand, which toggles back to the stop state.

Connecting a mono-jack lead between the GATE socket and a module with a gate input allows you to send a gate signal responding to your hand position in the beam. The gate output will be either high (5V) if your hand is lower the gate threshold (closer to the panel), or low (0V) if your hand is higher than gate threshold.

## Front Panel




**CV Out Jack**
The CV output signal.

**Gate In/Out Jack**
The GATE input or output signal. The direction is set by GATE in/out mode. Gate signals are 0V (low) or 5V (high).

**CV Level**
The control voltage output range. The range is between 0V and the set level. The maximum level can be increased up to 10V.

**Sensor**
The hand distance sensor. When using Hover, position your palm directly above this window.

**Mode Button**
There a three ways to use the mode button:
1) A single press will advance to the next main mode, from left to right as shown by the mode indicators. Pressing in LOOP mode returns the mode to TOGGLE.
2) Holding the button down will advance the INVERTED mode, between the set of combinations of CV and GATE inverted or non-inverted states.
3) Holding the switch down followed by a single press to the modifier button will toggle the GATE in/out mode.

**Mode Indicators**
Glow according to the current mode.

**Inverted Indicators**
Glow when the CV or GATE outputs are inverted.

**Gate Threshold/ Loop Rate**
In all modes except LOOP, this sets the threshold of the hand distance at which the GATE output goes high or low. When full left, the GATE is always low. When full right, the GATE is always high. When in the LOOP mode, this sets the playback rate.

**Modifier Button**
A press to the modifier button will modify the CV output depending on the current mode. The button will glow and flash red, amber and green to indicate the current mode and run state.

## Main Modes

A short press to the MODE button cycles through each of the 5 main modes, which are described below.

### TOGGLE MODE

The modifier button toggles between stop (red glow) and run (green flash) states. When running, the output follows the sensor input. When stopped, the output is the last sensor input before being stopped.

### HOLD MODE

The modifier button switches between the run (green glow) state when held, and the stop (red flash) state when released.

### ZERO MODE

The modifier button switches between the run (green glow) state when held, and the zero (red flash) state when released. The zero state will always output CV=0V, see the invert modes section for more details.

### SAMPLE MODE

The modifier button samples and holds the current sensor input when pressed (single green flash), and is otherwise in the stop (red glow) state.

### LOOP MODE

The modifier button toggles between play (green glow) and record (red flash) states. After power-up, there is no loop to play. Pressing the modifier button starts the recording of hand movements. Pressing again stops recording and starts playback.

Playback endlessly loops the recording. The loop point is indicated by the modifier button flashing red. The loop playback rate can be adjusted by turning the GATE (LOOP RATE) knob. By default, the playback rate is as recorded, regardless of the knob position. When the knob is moved, the playback is adjusted. The 12 o'clock position is the normal playback rate; turning clockwise increases it, counter-clockwise decreases it.

Note: when in the stop state of the TOGGLE to SAMPLE modes, you can find the last position your hand was in before stopping from the modifier button, which indicates the position by glowing amber. This way, you can start the CV output from where you left off. When in the LOOP mode, the modifier button will glow amber to indicate the position of your hand when you started recording the loop. This allow you to return to the start position and avoid a 'jump' in the loop. Also note if in the GATE input mode, then the last position is indicated in all modes by glowing red, see below.

## INVERT Modes

Hold down the MODE button to cycle through the INVERT modes. The CV and GATE outputs are inverted when their invert mode is glowing. CV invert mode will apply to the recording in loop mode.

Note: the ZERO mode always outputs 0V for the CV when in the zero state, even when the CV is inverted.

## GATE Input/Output Modes

By default, Hover is in gate output mode, as described up until now. Additionally, the gate can be switched to respond as an input. This allows Hover to be triggered, for example, by a sequencer. The GATE input/output mode is toggled by holding down MODE and then pressing the modifier button. The modifier button indicates the GATE mode by glowing when in the stop state: red for GATE output mode, or amber for GATE input mode.

### GATE INPUT MODE

When in the TOGGLE to SAMPLE modes, a trigger pulse on the GATE input will act like a press to the modifier button. In the LOOP mode, it will restart the loop, indicated by an amber flash of the modifier button. If the loop reaches the end before a GATE input trigger, then it will restart.

## Linear/Non-Linear Response Modes

Hover ships from the factory with the beam sensor response to set to linear mode. This response gives a CV output that is approximately proportional to the hand distance. This gives a more natural 'feel' and a more usable hand-distance range, but a lower resolution and a slightly more noisy response at the top of the hand-distance range.

The intrinsic response of the sensor is a non-linear function of 1/distance, which tends to bunch most of the response close to the sensor. However, this may be useful if very a low noise response is required so Hover can also be switched to the non-linear response. This is done by holding down the modifier button at power up, then releasing. Repeating this will toggle the response mode back to linear.

# Additional Notes

• The sensor reading bottoms out at 'zero' when your hand is about 3-4cm away from the module panel. Moving your hand closer will eventually cause the sensor input to start rising again.

• The beam sensor samples at approximately 100 times a second. The output is filtered to smooth out the sample steps to give a continuous analog CV signal.

• The mode settings are stored when the power is off. They are stored 2 seconds after the last mode change. Hover should be turned off a few seconds after the mode is changed to avoid the mode settings from being stored incorrectly.

• The maximum loop time is approximately 394 seconds (6.5 minutes).

• The loop is stored in a RAM, so it is not saved between powering off and on.

• We recommend using right-angled jack cables, as straight jack cables can prevent your hand from getting close enough to the panel when reaching the bottom of the range.

## Features

- CV output 0-10V
- Gate input and output 0/5V, gate output ON-OFF threshold 0-100% of sensor range
- CV and gate output waveform inversion modes
- Sensor range: 0-300mm
- Modes: toggle, hold, zero, sample, loop
- Maximum loop time 6.5 minutes

## Measurements

| | |
|---|---|
| Width | 14HP (70.8mm) |
| Height | 3U (Eurorack, 128.5mm) |
| Depth requirement for skiff/rack | 31mm (including power connector) |
| Current requirement | 5V: 0mA, 12V: 70mA, -12V: 0mA |

## Safety Instructions

1. Keep this equipment away from water.
2. Clean only with a dry cloth.
3. Keep away from sources of heat, such as radiators or other apparatus that produces heat.
4. Operating temperature range 5° to 45°C (41° to 113°F).

This product is not designed or intended to be used by children.

## Warranty

Archaea Modular Synthesis Ltd warrants this product to be free of defects in materials or workmanship and to conform with the specifications at the time of shipment for two years from the date of purchase. During that period, any malfunctioning or damaged units will be repaired, serviced, and calibrated on a return-to-factory basis. This warranty does not cover any problems resulting from damages during shipping, incorrect installation or power supply, improper working environment, abusive treatment, or any other obvious user-inflicted fault. For more information contact support@archaea.co.uk quoting the serial number, which can be found on the reverse of the product.

## Disposal

This product must NOT be disposed of with household waste. It should be taken to a recycling centre licensed for the recycling of waste electrical and electronic equipment (EEE). Please contact your local city office for more information of where you can take waste equipment.