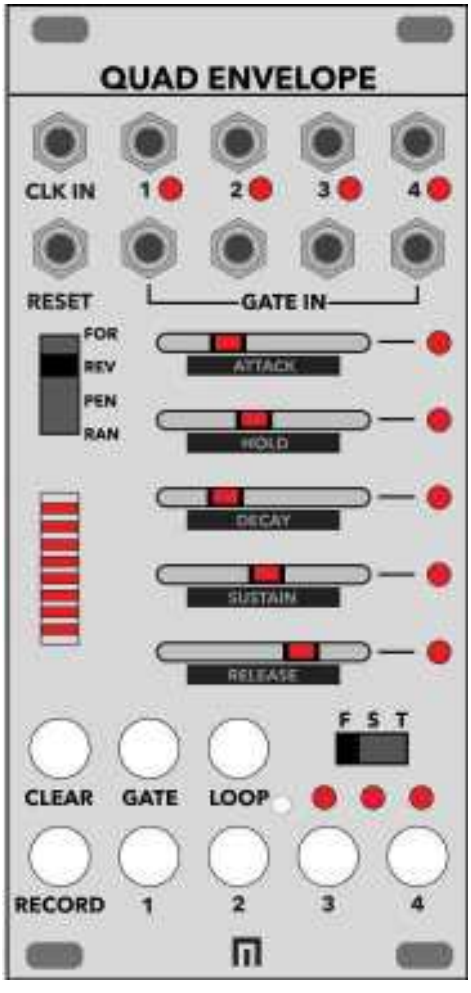
QUAD ENVELOPE MANUAL V.1



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SPECIFICATIONS

FORMAT:
EURORACK

DIMENSIONS:
12HP, 26mm deep

INTERNAL AND EXTERNAL SIGNALS (3.5mm jacks):
0-5V Logic I/O

MAX CURRENT:
+12V: 100mA
-12V: 15mA
+5V: n/a

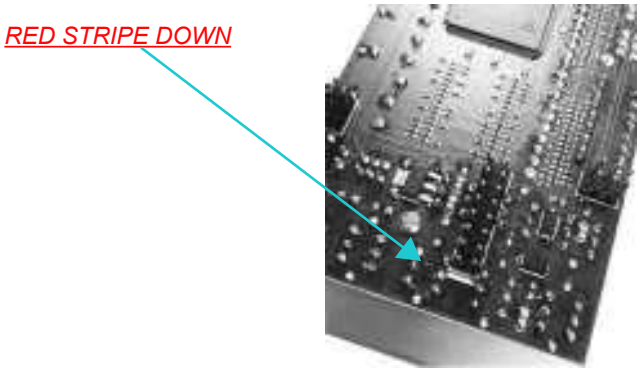
INSTALLATION

Remove module from packaging.

Power down your modular synthesizer and disconnect the power cable from the wall outlet.

Attach the included power cable to the module's power connector and connect the other end to the power distribution bus in your EuroRack synthesizer case. Position the red stripe DOWN.

Position the module on the mounting rails in your EuroRack case and screw down mounting screws. Power up! If your case does not turn on properly then you have installed the module incorrectly. Simply power down and make sure to follow the diagram when reconnecting the module.



DESCRIPTION

Quad Envelope includes 4 individual AHDSR envelope generators with individual outputs as well as a 16-step automation sequencer per channel. Hold the RECORD button and move the sliders for Attack, Hold, Decay, Sustain and Release to animate each of these settings for a given channel. Autosave in stand-alone mode, or save up to 16 presets of these settings using Varigate 4+ or up to 100 presets using Varigate 8+.

You can set each envelope to either Trigger, Gate, Loop or Gate/Loop. You can also set each individual envelope to either Fast, Slow or Tempo synced modes. Each automation sequencer can be set to either Forward, Reverse, Pendulum or Random. Link Mode allows for linking envelope channels 2-4 to channel 1. The Quad Envelope allows for a multitude of dynamic possibilities for live performance and recording.

Features include:

- 4 individual AHDSR envelopes with independent outputs.
-16 steps of automation recording for AHDSR settings per channel (+ Clear Automation function)
- Gate Mode
- Loop Mode
- Gate/Loop Mode
- Tempo Sync
- Link Mode (link channels 2-4 to 1)
- Forward, Reverse, Pendulum and Random switch for sequenced automation per track
- Autosave stand-alone or save up to 16 presets with Varigate 4+ and 100 with Varigate 8+
- Switch between Fast, Slow or Tempo Sync per envelope
- Clock in
- Reset in

CONTROLS

ENVELOPE OUTPUT CHANNELS 1-4:
Connect your patch cables from these outputs to other module CV inputs to modulate them with the QUAD ENVELOPE. There are a total of 4 individual envelope/outputs, each with an LED indicating output is active.

CLK IN:
An external CLOCK INPUT is required for the automated sequencer to run. Clock is also received from a Varigate 8+ or 4+ if connected to the same busboard.

RESET:
Gate input for resetting to step 1 of the animation sequencer.
- Forward, Pendulum, Random reset to step 1.
- Reverse resets to step 16.

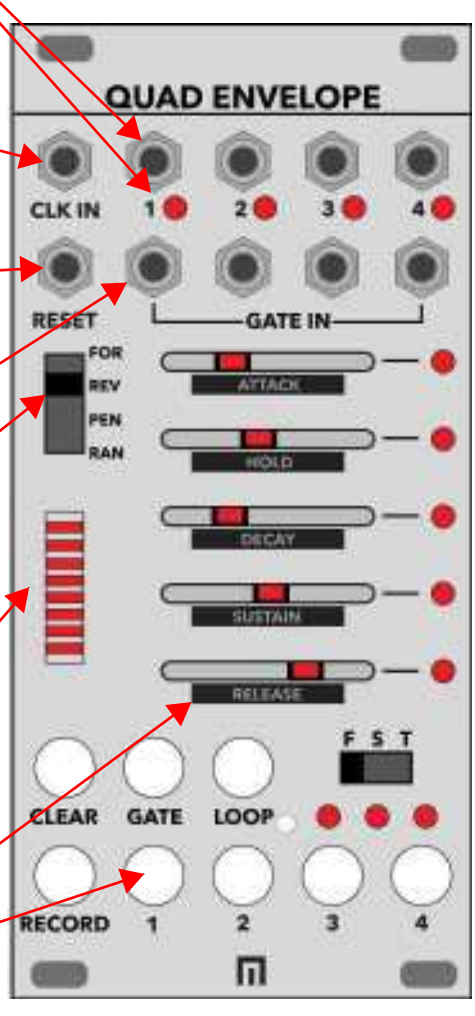
GATE INPUTS:
Insert a trigger or gate from external source to trigger an envelope to start.

FORWARD/REVERSE/PENDULUM/ RANDOM SWITCH:
Switch to change the direction of sequenced, automated recording of an envelope. To enable a particular direction for each of the 4 envelopes, press an envelope channel select button and then move the switch.

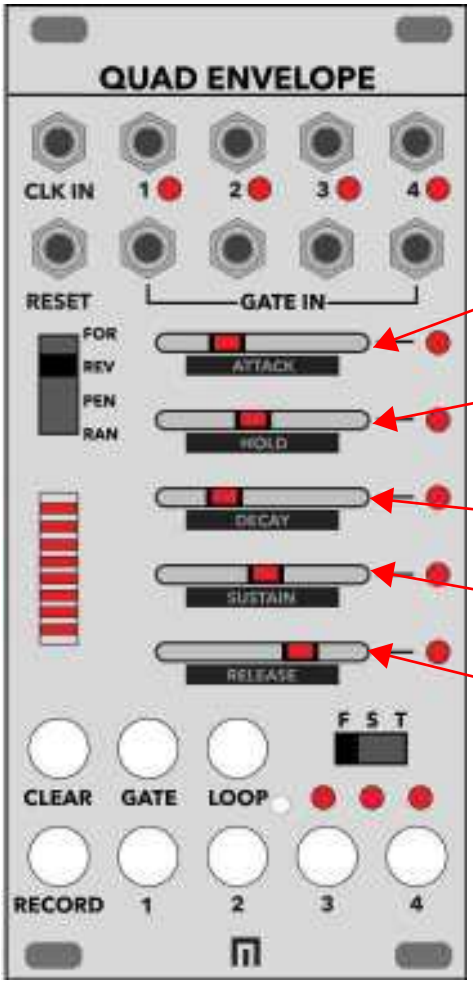
LED BAR GRAPH:
Displays the sequence direction. Each step will pulse twice for a total of 16 steps.

ENVELOPE PARAMETER SLIDERS:
Each of the 4 envelopes include their own set of parameters that can be adjusted with the sliders. Select envelope buttons 1-4 and then move the sliders to adjust ATTACK, HOLD, DECAY, SUSTAIN and RELEASE per envelope.

AUTO-SAVE:
After making your final setting, wait 10 seconds before you power down. Then recycle your power and your settings will recall on power-up. See pg.7 for more info on saving Quad Envelope presets with the Varigate 4+ and 8+.



CONTROLS



ATTACK:
Sets the rate of attack stage from zero to max.

HOLD:
Adjusts the hold time that the voltage is at its maximum value after the attack is done rising and before the decay starts falling.

DECAY:
Adjust the rate of decay to sustain.

SUSTAIN:
Adjust to set the sustain value.

RELEASE: Sets the rate of release to zero.

The LEDs to the right of these sliders indicate the position of the slider (brightest red for sliders set all the way to the right).

CONTROLS

ENVELOPE 1-4 CHANNEL SELECT BUTTONS:
To select an envelope for parameter editing, press one of these buttons. The active envelope LED will now be lit and you can now start dialing various settings. To switch to another envelope, push another one of the buttons and so forth.

RECORD:
To record parameter automation in a sequence for an envelope, select the envelope channel button you want to record sequenced automation so that it is lit, then hold the RECORD button while you move the sliders. Make sure you are already receiving incoming clock or this feature will not work otherwise. Now you can change the direction of the sequence as well by adjusting the sequence direction switch.

CLEAR:
To clear an automated sequenced recording for an envelope, press the envelope channel select button so that it is lit, then hold the CLEAR button while moving sliders.

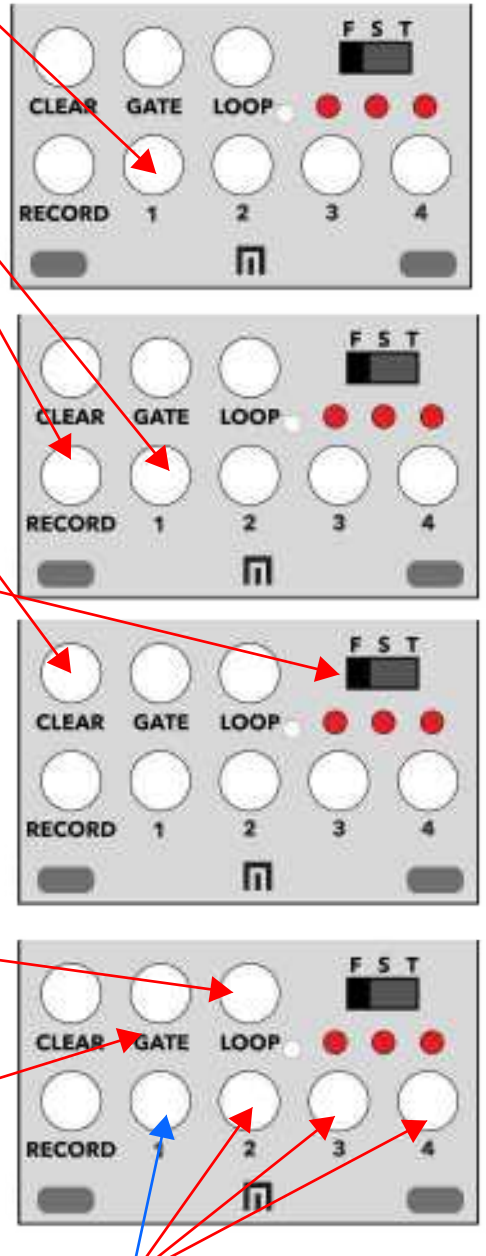
FAST/SLOW/TEMPO SPEED SWITCH:
Set each envelope to either FAST, SLOW or TEMPO based. See pg. 7 for more information and measurements for this feature.

TRIGGER MODE:
TRIGGER MODE is the default mode (both GATE and LOOP buttons are off). In this mode, an envelope will start when an external input (gate or trigger), is patched and sending signal to the envelope GATE inputs. It is simply looking for a rising edge as the start point.

LOOP MODE:
To enter LOOP MODE, press an envelope channel select button to enter editing mode and then press the LOOP button. In this mode the envelope will loop back to attack as soon as release reaches zero.

GATE MODE:
To enter GATE mode, press an envelope channel select button to enter editing mode and then the GATE button. This mode will play a standard AHDSR envelope when a trigger or gate input is patched and said envelope will respond accordingly to the pulsewidth of the incoming gate (shorter or longer pulsewidths will affect the length of the HOLD setting).

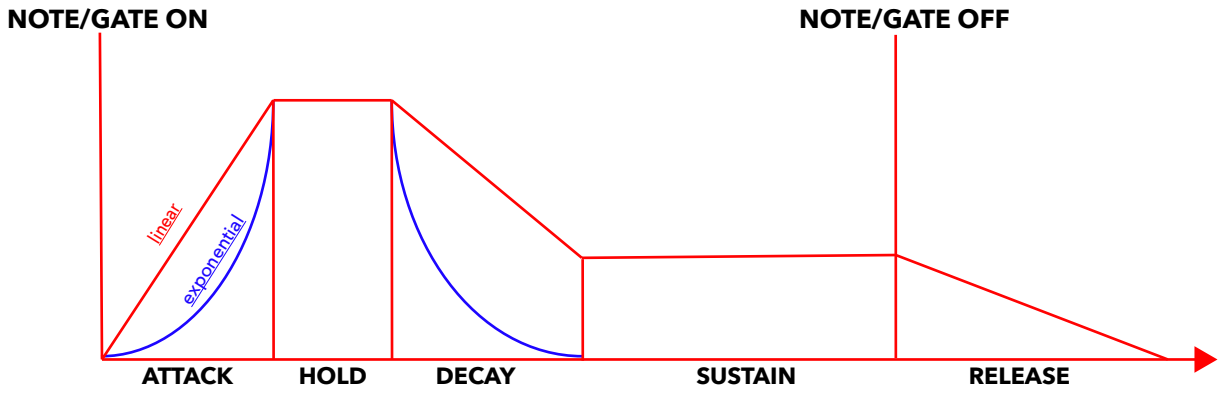
GATE/LOOP MODE:
To enter GATE/LOOP mode, select an envelope button to enter editing mode and then the GATE and the LOOP button so that they are both lit.
In this mode, a loop will cycle within the pulsewidth of the incoming gate. It will start looping at the rise of the gate and stop looping when the gate pulsewidth ends at zero.



LINK MODE:
Link Mode allows you to link envelope channels 2-4 to the same incoming trigger/gate input on channel 1.

To link: Hold down channel button 1 while selecting 2-4. You will now see that when you press the channel 1 button, the buttons for the other channels that are linked will also be lit.

FAST, SLOW & TEMPO MODE MEASUREMENTS



ATTACK CURVES

FAST MODE: exponential
SLOW MODE: linear
TEMPO MODE: variable from expo at fastest to linear at slowest

ATTACK TIMES:

TRIGGER MODE	GATE MODE
F) min 2ms, max 300ms	F) min 2ms, max 300ms
S) min 50ms, max 28sec	S) min 40ms, max 28sec
T) variable*	T) variable*

HOLD TIMES:

TRIGGER MODE	GATE MODE
F) min 0ms, max 280ms	F) min 0ms, max 280ms
S) min 0ms, max 28sec	S) min 0ms, max 28sec
T) variable*	T) variable*

DECAY CURVES:

FAST MODE: exponential
SLOW MODE: linear
TEMPO MODE: variable from expo at fastest to linear at slowest

DECAY TIMES:

TRIGGER MODE	GATE MODE
F) min 2ms, max 1.4sec	F) min 2ms, max 1.4sec
S) min 47ms, max 28sec	S) min 50ms, max 28sec
T) variable*	T) variable*

SUSTAIN:

TRIGGER MODE: Sets voltage level where transition from Decay to Release occurs. Creates break point (gate sustain is ignored in TRIGGER MODE).

GATE MODE: Sets voltage level where gate sustains (0v-10v) before Release

RELEASE CURVE:

FAST MODE: linear
SLOW MODE: linear
TEMPO MODE: variable from expo at fastest to linear at slowest

RELEASE TIMES:

TRIGGER MODE	GATE MODE
F) min 20ms, max 9sec	F) min 20ms, max 9sec
S) min 50ms, max 28sec	S) min 50ms, max 28sec
T) variable*	T) variable*

*1/32,1/16,1/8,1/4,1/2 or 1/1

USING THE QUAD ENVELOPE WITH THE VARIGATE 8+ OR VARIGATE 4+

ENVELOPE 1-4 CHANNEL SELECT BUTTONS:
When connected to the same power bus, the Quad Envelope will receive incoming clock from the Varigate 8+ or Varigate 4+ over the bus (there is no need to connect a clock input to the front of the Quad Envelope).

Using the Quad Envelope in tandem with the Variage 8+ also enables you to save up to 100 Quad Envelope presets. To save presets simply hold SAVE and then press one of the Gate channel select buttons on the Varigate 8+ (just as you would normally save a preset on the Varigate 8+.

Using Quad Envelope in tandem with the Varigate 4+ enables up to 16 Quad Envelope presets. Follow the same instructions as outlined for the Varigate 8+.

WARRANTY

This product is covered by the Malekko Heavy Industry warranty, for one year following the date of purchase. This warranty covers any defect in the manufacturing of this product. This warranty does not cover any damage or malfunction caused by incorrect use such as, but not limited to, power cables connected backwards, excessive voltage levels, or exposure to extreme temperature or moisture levels. The warranty covers replacement or repair, as decided by Malekko Heavy Industry. Please visit our website malekkoheavyindustry.com to obtain full warranty information and to register your product for coverage.