Euro Quad Envelope User Guide

Attack Stage: Envelope attack control range is 0.0003-20s

Decay Stage: Envelope decay range 0.0003-20s.

CV AMT Led indicator: Brightness indicates CV amount and colour indicates positive or negative response. If GREEN positive voltage CV adds to the stage duration and RED subtracts. If the CV voltage is negative the opposite holds true. When LED is off the CV Amount is 0 for that stage.

Edit Selector Switch: Selects between the 4 envelopes making them active to edit.

Delay Stage: Sets the delay time duration relative to the start of the gate pulse rising edge. 0-10s range. The gate must be longer than the delay time or will be ignored.

CV Modulation Routing: Assigns the stage that CV modulation will be applied to. Can be any or all stages. Works in tandem with the CV AMOUNT control below to set the amount and polarity of the CV routed to each stage. Each envelope only has one CV jack so MOD control is used to distribute CVs to each stage independently.

Hold Stage: Sets the time that the envelope is at maximum peak value between attack and decay stages. Has an effect similar to peak compression on audio adding punch or "presence" to fast envelopes. 0-10s range.

CV Amount: Sets the depth of CV modulation from each CV jack in conjunction with MOD routing control above. The CV amount is summed with the stage pots. Positive values add to the time duration of the stage while negative values subtract. The individual stage Bi-Color LEDS show the amount and polarity of the CV.

Sustain: Sets the sustain value between 0 and 8V

Envelope Curve selector: Each of the 4 envelopes can have a different shape as indicated by the panel graphics. The LED colours are:
- ●⌒=OFF
- ®⌒=RED
- ©⌒=GREEN
- ⓨ⌒=YELLOW

See page 2 for alternate function

Status LEDs: Indicate the state of each of the 4 Envelopes

CV Inputs: Each envelope has 1 CV input which is routed to the stages using MOD selector and depth is set with CV AMOUNT pot. Each envelope stage (Attack, Decay, etc) can have different CV amount and polarity per envelope.

Save: Button to store all settings before power down.
See page 2 for alternate function

Gate Inputs: Gate Input for each of the 4 Envelopes. Gate range should be 2.5-10V (5V optimum)

Release Stage: Sets the release value between 0.0003-20s

Envelope Outputs: Output for each of the 4 Envelopes. Output range is 0-8V

QUAD ENVELOPE

DELAY ATTACK ENV EDIT

HOLD DECAY MOD

SUSTAIN RELEASE CV AMOUNT

CURVE ENV1 CV ENV2 CV ENV3 CV ENV4 CV

SAVE GATE1 GATE2 GATE3 GATE4

ENV1 ENV2 ENV3 ENV4

modcan
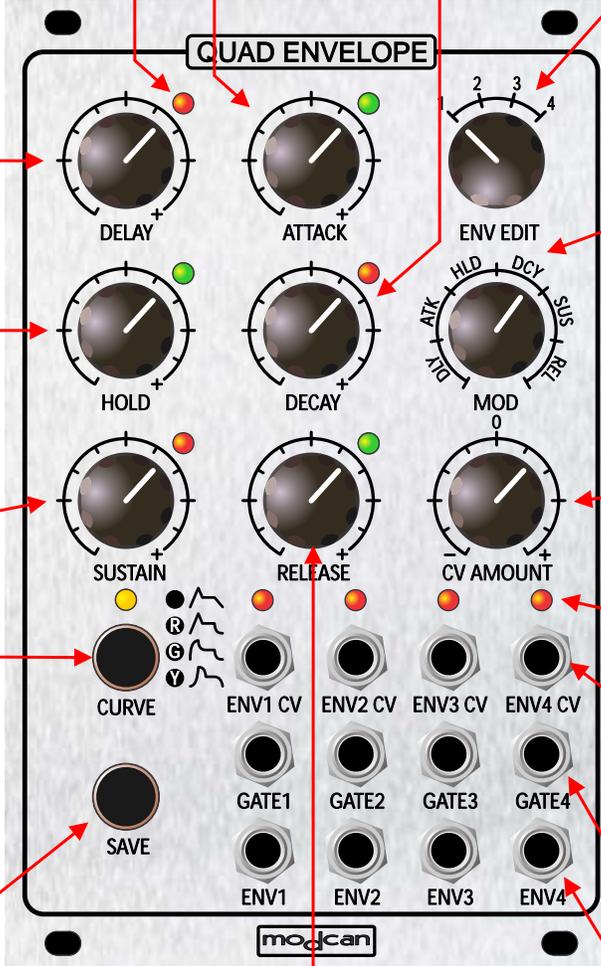
Button Switch Functions

Curve Switch: The **Curve** Switch has 4 options to change the shape of the envelope stages to various combinations of linear, exponential and log curves. These can be useful for changing the way the sound fades to silence or when creating percussive sounds that need snappy attacks etc. Each of the 4 Envelopes can have its own curve setting and the selection is saved when SAVE is initiated. The **Curve** Button has a secondary function. ON powering up the module hold the **Curve** button in for 2 seconds approx and the module will switch to **POLY MODE** (see below). If you want to stay in this mode as default then do a **SAVE**. To revert back to Normal Mode do the same button depress on power up and it will switch back to Normal mode. Again do a save to make this the default.

Normal Mode vs Poly Mode: In Normal mode each Envelope has independent settings for stage durations, CV routings and envelope curves. In Poly Mode Channel 1 or Envelope 1 sets the values for all envelopes including stage durations, curves and CV Routings. The CV input jack on channel 1 applies to all envelopes. The gates remain independent for each envelope but all the envelope parameters are set by channel 1. The Poly Mode is for those occasions where the user wants to have the same settings for all the envelopes in case of a polyphonic setup with 4 channels of gates and wants the envelopes to respond in the same way. Typically the user will be in Normal mode for standard Monophonic use.

SAVE: A short tap on the SAVE button will store all settings of the Quad Envelope so that when powered off will retain those values. The secondary function for this button is as a **Factory Reset**. ON powering up the module depress and hold the **SAVE** button in for 2 seconds approx and the module will revert to factory settings with all modulation **CV Amounts** set to 0 and envelope durations set to default values.

CV Modulation

CV Modulation Routing (MOD): Assigns the stage that CV modulation will be applied to. Can be any or all stages simultaneously within one envelope. Works in tandem with the **CV AMOUNT** control that sets the amount and polarity of the CV routed to each stage. Each envelope only has one CV jack so **MOD** control is used to distribute CVs to each stage independently. Select the routing destination with the **MOD** control first (i.e. Attack, Decay, Sustain etc.) before adjusting the **CV Amount**. The LEDs mounted next to each Envelope stage knob indicate the amount of modulation by their brightness and colour. The brighter the LED the greater the CV amount. Green LED indicates a positive amount which will result in a lengthening of the time duration of the stage or in the case of Sustain increase the level, while a RED Led indicates a negative amount which will shorten or decrease the stage duration or reduce the Sustain level. The amount that the CV adds or subtracts is added together with the stage knob setting so for example if the Attack knob is set to 0 subtracting (RED LED) will have no effect as Attack is already set to it's minimum value. Positive (GREEN LED) will make the Attack longer though in this example. When modulation LEDs are **OFF** the **CV Amount** is zero or off for that stage**.** Start with modulating one stage at a time till you get a handle on how this works as it can get quite complex with all stages having different modulation amounts and polarities.

Envelope Stage Knobs

To maximize functions and save on panel space the Quad Envelope uses a "paging" style user interface.
Users familiar with the Modcan Quad LFO will easily grasp the similarities between the two modules.
The concept is that each of the 4 envelopes share common controls (knobs , switches) which become active for a given envelope by selecting with the ENV EDIT Rotary Switch. Selecting the 1 position for example makes all the knobs and switches become active for ENV1. The knobs use a "Jump" system where the value does not change until the knob is moved and then the value updates to the position of the knob. Switching between envelopes during editing can mean that the position of the knobs does not reflect the values for the active envelope but turning the knob will instantly change the value and override the value that was stored in memory. Some designers prefer a "match" system where the value only changes when the knob position is matched to the value stored in memory but I found that didn't work well for an envelope with too much time spent "hunting" for the match position and felt that an edit should be an immediate change.

Possible stages for the Envelope

Envelope Durations

Hold

Attack

Decay

Delay

Sustain

Release

Gate On	Gate Off

Gate State
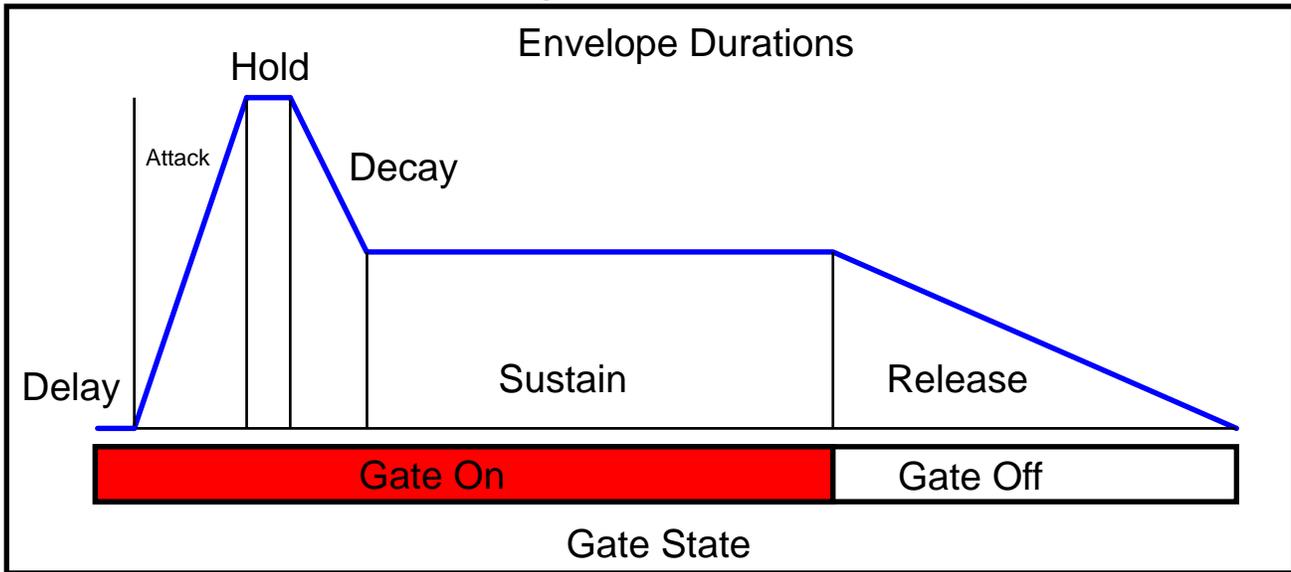
A Typical Envelope setup

Envelope Durations

Attack

Decay

If the envelope is producing unwanted clicking check that the attack and release are not set to fast settings. Clicking can be good though for percussion sounds.

Sustain

Release

Gate On	Gate Off

Gate State
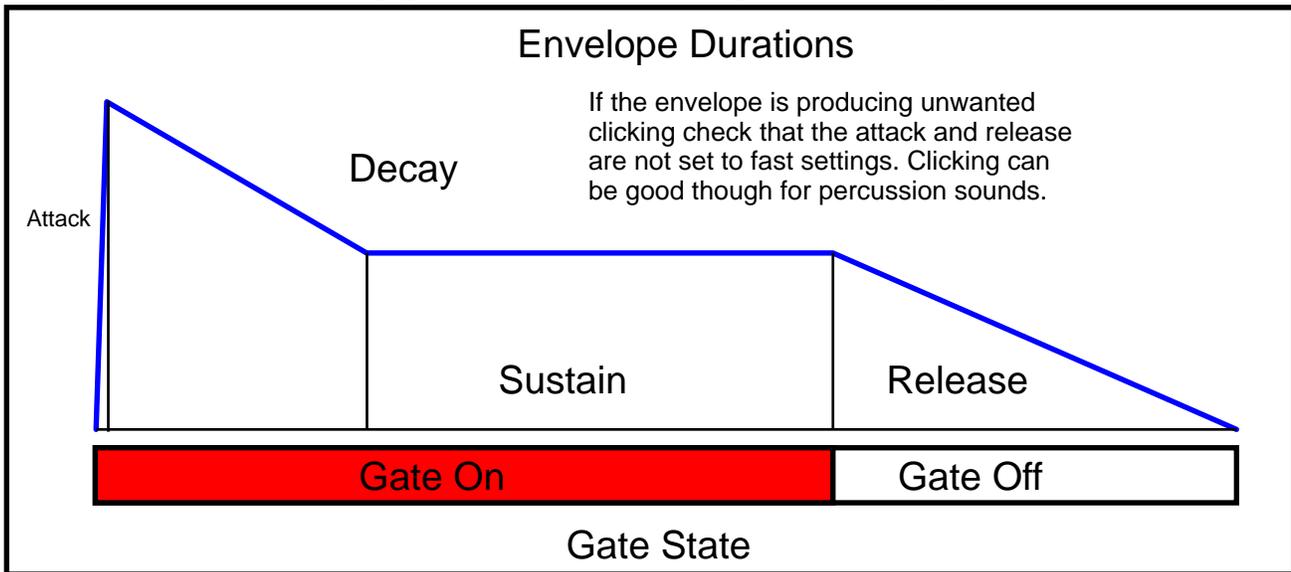
Same settings as above with Hold added for punch
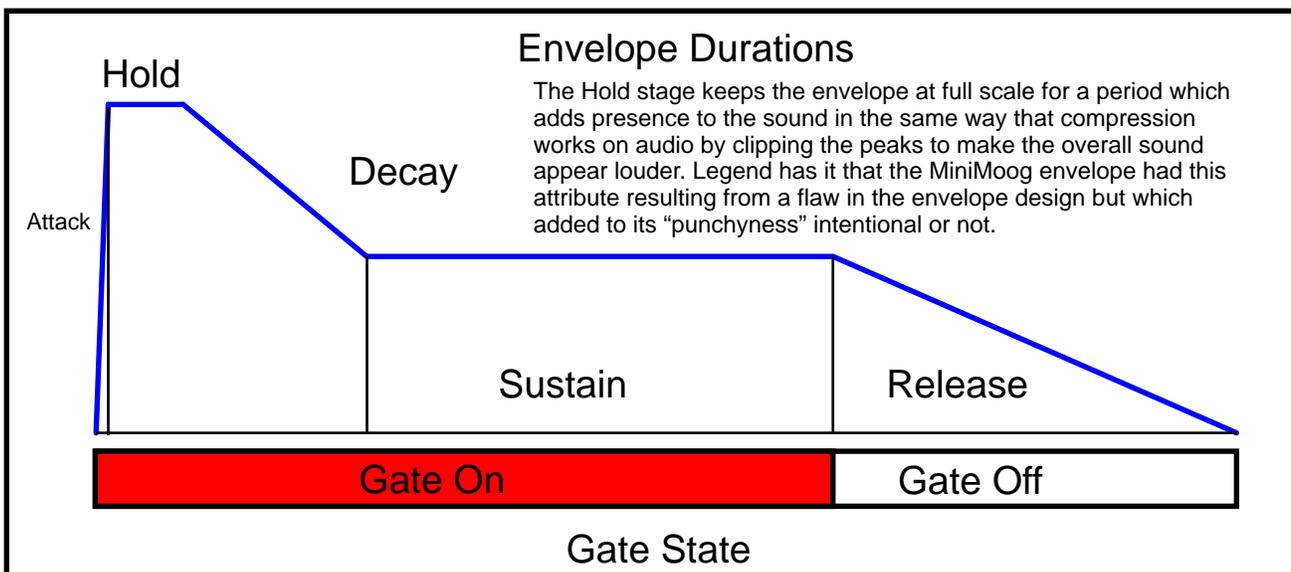
Envelope Durations

Hold

Attack

Decay

The Hold stage keeps the envelope at full scale for a period which adds presence to the sound in the same way that compression works on audio by clipping the peaks to make the overall sound appear louder. Legend has it that the MiniMoog envelope had this attribute resulting from a flaw in the envelope design but which added to its "punchyness" intentional or not.

Sustain

Release

Gate On	Gate Off

Gate State

The following examples show the importance of picking the right gate length for the situation. The length of the gate plays an important role in how the envelope responds.

If Gate is short with same setting from Typical example on previous page

Envelope Durations

Attack

Decay

Sustain is ignored because decay
is longer than the gate time and

Release

| Gate On | Gate Off |

Gate State
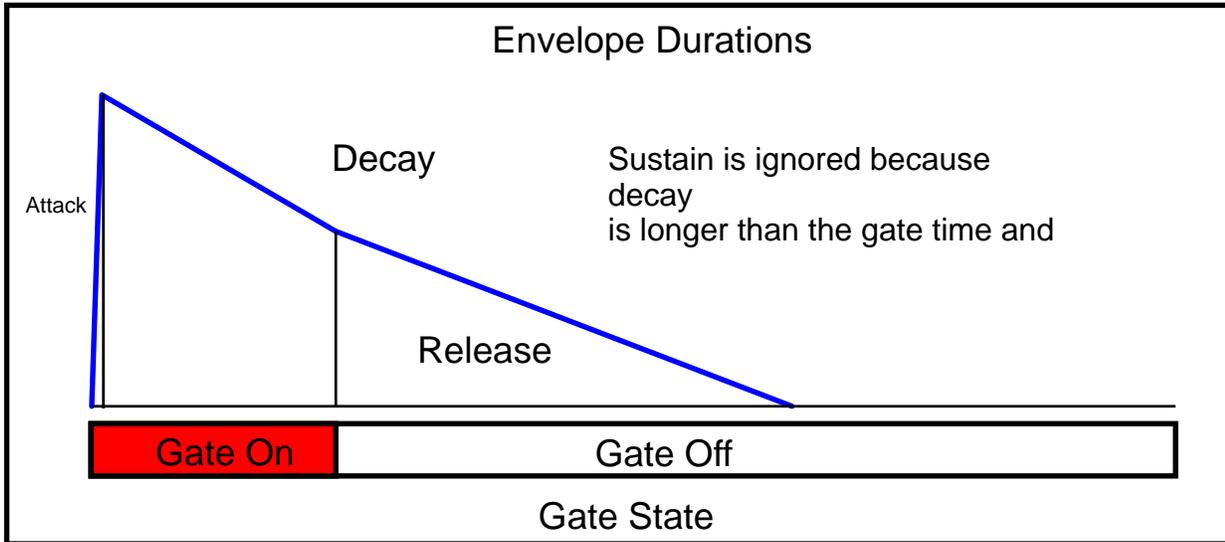
Long gate with fast Decay

Envelope Durations

Attack

Decay

Sustain is set to 0 here so no sustain. Fast decay goes to 0V so release is ignored. These can be good settings if only an Attack/Decay type envelope is wanted. Shorten the gate to only the Attack duration and it will become an Attack/ Release type envelope.

| Gate On | Gate Off |

Gate State
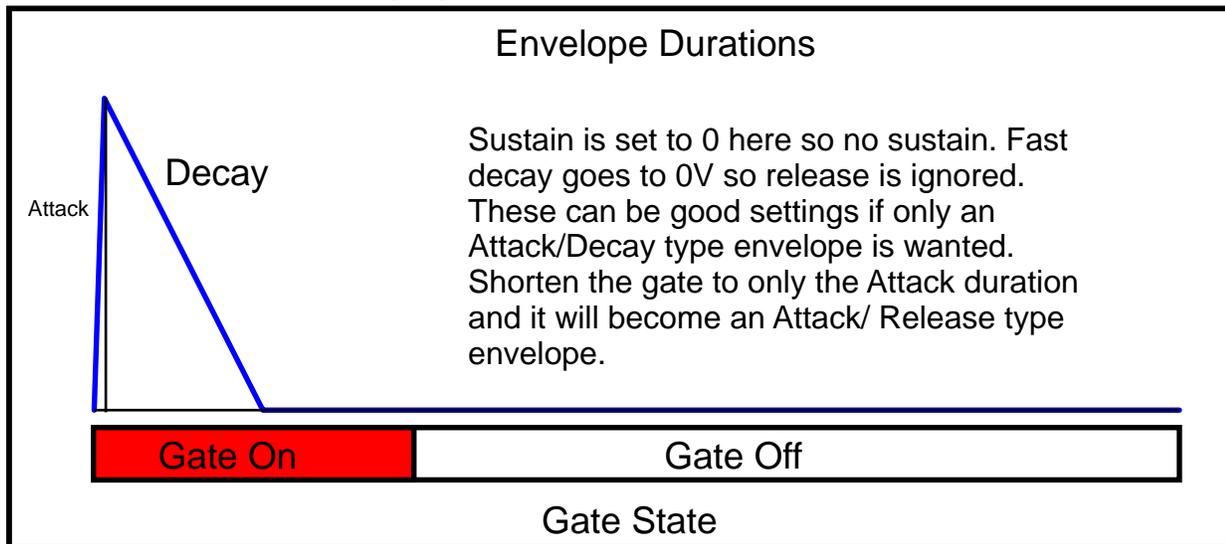
Long Attack with short Gate
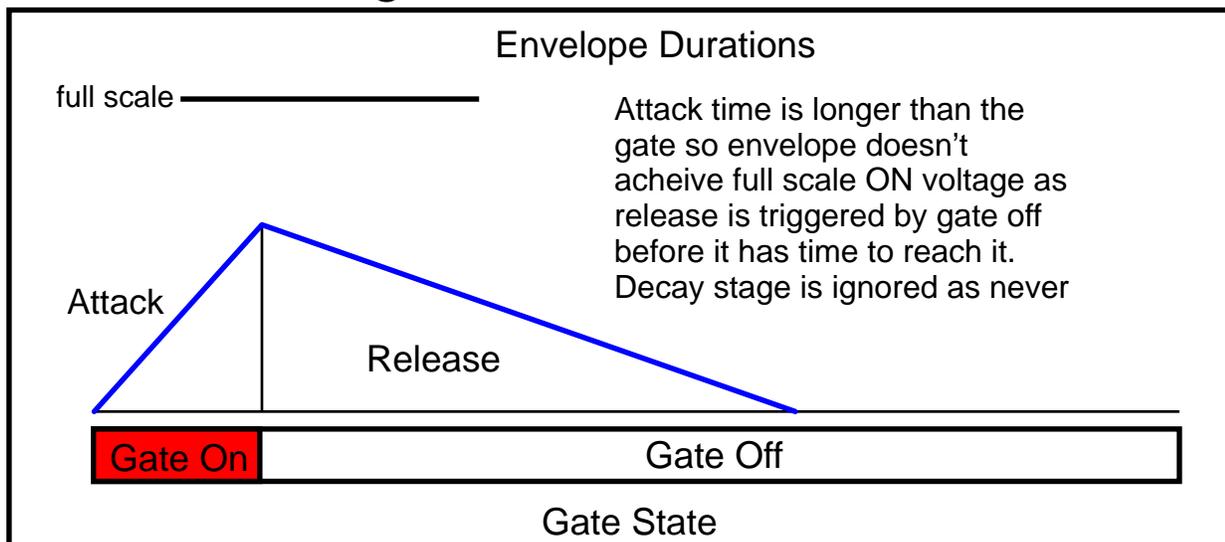
Envelope Durations

full scale ——————

Attack time is longer than the gate so envelope doesn't acheive full scale ON voltage as release is triggered by gate off before it has time to reach it. Decay stage is ignored as never

Attack

Release

| Gate On | Gate Off |

Gate State

The following examples show the importance of picking the right gate length for the situation. The length of the gate plays an important role in how the envelope responds.

Short Gate with long Delay

Envelope Durations

Attack

Release

Delay

Decay is ignored as never reaches that stage as gate cuts off before hand. If the Delay time is longer than the gate there will be no envelope at all.

Gate On	Gate Off

Gate State
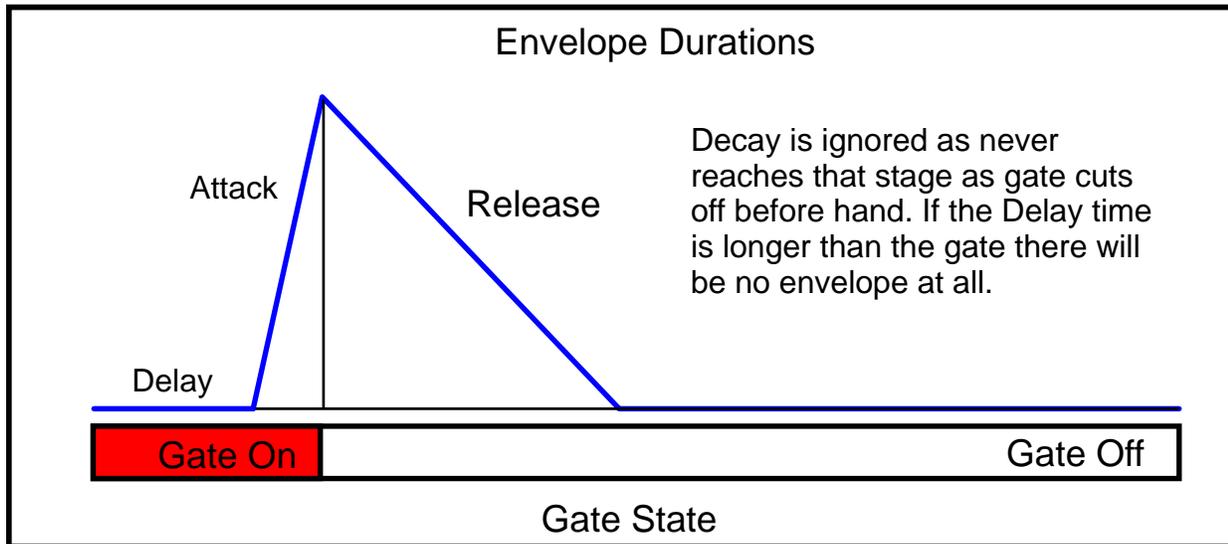
If Hold is set to longer period than gate

Envelope Durations

Hold

Attack

Release

Decay and Sustain are ignored. When gate goes low it jumps to release immediately. This setup could also introduce clicks with VCAs on mellower sounds. This can be a good or bad thing depending on the type of sound. desired.

Gate On	Gate Off

Gate State