

# SWITCHED SLOPE

analog A/D envelope

## FLOOR and CEILING CV inputs

CV inputs set the lowest and highest level of the envelope.

## GATE input

A gate signal holds the envelope high after the attack stage as long as the GATE is high.

## TRIG input

A gate signal causes the envelope to run thru both the attack and decay stages without holding.

## SLOPE input

A gate input switches between the 2 SLOPE sliders.

gate HI = top slider  
gate LO = bottom slider

## A2 control

Sets the 2nd attack time

## A2 input / LED

A gate input switches the attack time to the A2 setting and illuminates the LED when active  
[reference jumpers diagram](#)

## ATT control

Sets the attack time of the envelope

## TIME switch

Sets the overall time window for the envelope.

## THRESHOLD (T/H) slider / outputs

The T/H slider compares a threshold level to the envelope and outputs 4 gates from the different envelope stages.

The red slider LED illuminates when the envelope is over the threshold.  
The top slider position is off.

## ENVELOPE outputs

The envelope output in both 10 and 5 volts.

## POSITIVE INVERSE output

The envelope output inverted and shifted.

## FULL CYCLE output

A gate output that is high for the full envelope cycle

## D2 control

Sets the 2nd decay time

## D2 input / LED

A gate input switches the decay time to the D2 setting and illuminates the LED when active  
[reference jumpers diagram](#)

## DEC control

Sets the decay time of the envelope

## ENVELOPE LEDs

Display the output of the envelope



## SLOPE sliders / switch

The 2 slope sliders select between  $\wedge$  and  $\vee$  or  $\cup$  shapes.

The 2 sliders are normalized thru the SLOPE jack and switch with the ATT/DEC cycle.

## GATE INPUTS

TRIG input: any length of gate will trigger the envelope and cause the envelope to immediately start the decay stage after the end of the attack stage.

GATE input: will trigger the envelope and as long as the gate input is high, the envelope will hold open at the end of the attack stage. Only when the gate input goes low will the envelope move onto the decay phase.

Both inputs can be used simultaneously.

## ENVELOPE OUTPUTS

The envelope is output in both 10v and 5v. A positive inverse envelope that moves from 5v to gnd, back to 5v is also output.

### FLOOR (analog OR)

↑ FLOOR: Use 0 to 5V CV to set the lowest level the envelope can reach. The envelope will not go lower than this input. Use to control the lower envelope level or to merge the output of a 2nd envelope or cv source. reference combining two envelopes diagram

### CEILING (analog AND)

↓ CEILING: Use 0 to 5V CV to set the highest level the envelope can reach. The envelope will not go higher than this input. Use to control the upper envelope level with velocity, a sequenced level, etc. reference ENV2 ducks ENV1 diagram

## TIME

The TIME switch sets the overall time range of the envelope.

ATTACK RANGE ≈ Short = 0.8ms-1.5sec Medium = 1.6ms-5.5sec Long = 7ms-25sec

DECAY RANGE ≈ Short = 8ms-1.5sec Medium = 30ms-5.5sec Long = 120ms-25sec

## ATT/DEC

The ATT and DEC controls set the attack and decay times for the envelope between a fast and slow rate.

## A2/D2

The 2nd set of attack and decay times are switched on with a gate signal patched into the A2/D2 jacks. The yellow LED illuminates when a gate signal is present. Switching on the 2nd ATT and DEC times can happen between or during the envelope cycle.

Switching the A2/D2 times between envelope cycles creates 2 envelopes with their own specific times, whereas switching during the cycle bends the envelope at the transition point to the new time setting.

reference jumpers diagram

JUMPERS (A2 norm)(D2 norm) jumpers normalize the envelope to switch to the A2 and D2 times at the threshold point during the envelope cycle.

## SLOPE

The SLOPE sliders set the envelope between the  $\wedge$  shape and either  $\wedge$  or  $\cap$  shapes. Only one of the two sliders is active at a given time, and can be selected between with the SLOPE input. A high gate selects the top slider. The slider LEDs display which slider is active.

By default the sliders are switched with the attack and decay envelope stages, and are normalized through the SLOPE jack. Try patching a T/H output into the SLOPE input to change the slope during the envelope cycle.





## THRESHOLD (T/H)

The T/H switches on above an adjustable level from the output of the linear envelope, and features 4 gate outputs from the different stages of the envelope.


The T/H is adjustable with the slider between very close to gnd to over the top of the envelope cycle. At the lowest level the T/H will turn on almost as soon as the envelope starts and ends, where at the highest level the T/H will never turn on. The THRESHOLD is normalized to switch to the 2nd ATT/DEC times so that there are 2 ATTACK and 2 DECAY times per cycle, A1/D1 under and A2/D2 over the threshold.

## THRESHOLD OUTS

The four T/H outputs compare the threshold to the attack and decay stages of the envelope and output corresponding gates.

-  Outputs a high gate over the T/H only in the attack stage.  
The backpanel jumper connects it to the A2 switch by default.
-  Outputs a high gate over the T/H in both the attack and decay stages.  
This output correlates to the T/H slider LED.
-  Outputs a high gate over the T/H only in the decay stage.  
The backpanel jumper connects it to the D2 switch by default.
-  Outputs a high gate under the threshold only in the decay stage.  
When the T/H slider is at the highest level this output represents the decay stage of the envelope.

## FULL CYCLE OUT

-  Outputs a gate that is high during the entire envelope cycle.

## ENVELOPE LEDS

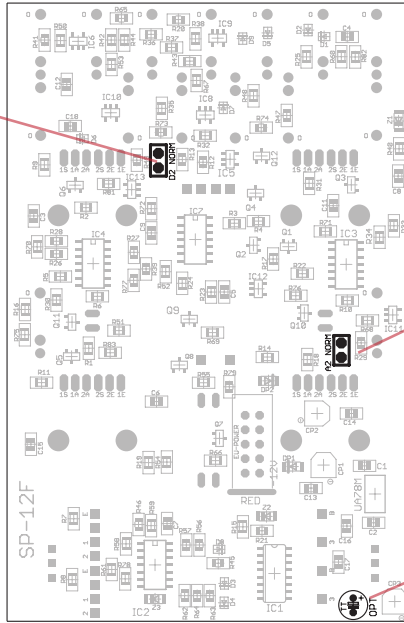
The green LEDs display the output of the envelope.  
The LEDs will include any CV from FOOR and CEILING.

## JUMPERS DIAGRAM



**D2 norm jumper**  
put jumper over both pins to have the DECAY time change to D2 when over the threshold.

same patch as with jumpers on

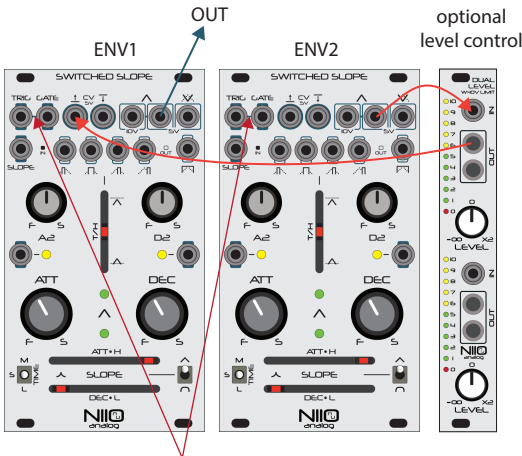


**A2 norm jumper**  
put jumper over both pins to have the ATTACK time change to A2 when over the threshold.

**OPT capacitor mod**  
if a longer (L) time is desired, solder in a polarized capacitor such as 4.7uf (which will double the time) or greater.  
*pay attention to polarity*

## EXAMPLES

Combining two envelopes



*triggered/gated together or separately*

Looping



*use A2/D2 to set time*

*use the T/H slider to fine tune the cycle time*

A very useful way to merge a 2nd envelope or CV source while maintaining the mods levels- (not adding together, but allowing the maximum level to take precedence.)  
Trying this patch with a 2nd envelope is recommended.