

SULAMITH USER MANUAL

BUTTON

Button is a multi-functional trig-driven utility module.

- Manual TRIG button
- 2 CLK/TRG/GT inputs
- **Probability** (applied globally to all outputs)
- TRIG output
- GATE output
- **GATE length knob** (0.1s-10s)
- A & B outputs act as **Toggle, Constant Voltage Source** or **Random Voltage**
- **Constant Voltage** or **Random Voltage Range** knob (1 to 10/-10 to 10/0 to 10)
- Mode Switch for A & B: **Toggle, RND bipolar, RND unipolar**
- Text input for **LABELING**.
- **RETRIG** options in right-click menu*
- **SLEW** for custom length Gates in right-click menu**
- **SLEW** for bi- and unipolar Random Voltages in right-click menu**

Buttons can be used in many capacities:

As a Manual and/or CLK/TRG/GT driven Trigger generator, manual Gate, Trigger to Gate converter, Clock randomizer (similar to a Bernoulli Gate), constant Voltage source, on/off Toggle, Random Voltage generator & random trig/gate/cv/note Sequencer, slewed Gates for opening VCAs, slewed RND for smoother modulation.

The two Inputs work as OR logic circuit.

Probability goes from 0% (never) to 100% (always) and will randomly deny input signals based on its setting. Feeding Button two clock divisions and turning probability down can quickly generate interesting rhythms. Try Drum sequencing or envelope triggering.

When the **Gate Length knob** is turned all the way to the left, gates will stay high as long as the button is pressed/incoming gates are high. Setting a gate length will ignore incoming gates and **re-triggers*** (context menu): Gate stays high for set duration.

Toggle is a simple A/B Switch. Output Voltage can be set individually. i.e. as Constant Voltage source or for transposition of sequences.

Random can be set to uni or bipolar and will output two random signals to **A** and **B** output within the defined range. Can be used as CV Modulators or Random Note Sequencers. The Trig/Gate outs can trigger envelopes on changing notes, probability makes this a generative sequencer.

Random Range applies an offset in bipolar mode.

Bipolar 10 will be +5 to -5 whereas unipolar 10 is 0 to +10.

Text-Input for Label shows 6 characters. Its shoddy coding (sorry) but works and can be useful when using multiple instances of Button in your patch. i.e.: for Muting.

***ReTrig** can be enabled/disabled globally via the context menu. Disabling ReTrig will only apply if a custom Gate Length is set. Then: incoming Clock signals will be ignored until Gate is low again. Disabling ReTrig globally comes in handy when using custom Gates with the Random Voltages for sequencing (to sync vOct & GT/Trig). ReTrig is disabled for custom length Gates by default.

****SLEW** for **Random CV** in context menu. Fixed slew amount for a fast Attack-Decay style envelope. Slew is slightly influenced by Range (the higher the range, the slower the slew and vice versa).

****SLEW for Gates** in context menu. Fixed slew amount for a fast Attack-Decay style envelope. Slew is slightly influenced by Gate length (the longer the gate, the slower the slew and vice versa).

Gate lengths below 0.35s will go low before slew can reach 10v.

Everything above will reach 10v before slewing down again.

TO-DO

1. Context-Menu: set Input 2 to be a Poly CV input sent to A/B Toggle outputs
2. Context-Menu: set A/B Toggle to a Bogaudio-Style temporary Switch Toggles A as long as input is high, Toggles to B as soon as input is low
3. Context-Menu: add Slew to A/B Toggle (to add a crossfade effect)
4. Context-Menu: Slew short / medium option
5. Context-Menu: Slew all on/off
6. Panel: write what's what on it
7. Context-Menu: merge ON OFF options into Toggles (ON/OFF)
8. Context-Menu: Add Global Settings

KNOWN PROBLEMS

1. Slewed Gates out of Sync with regular Gates (see Image B):
ReTrig is off by default for custom length Gates; and that extends to slew.
A (custom) Gate can only be triggered when it is low (0v).
Decaying slew is applied to the trailing edge, extending the gates length.
Depending on the clock input: gates of the same length will go out of sync when one module uses Slew and the other doesn't (image B)

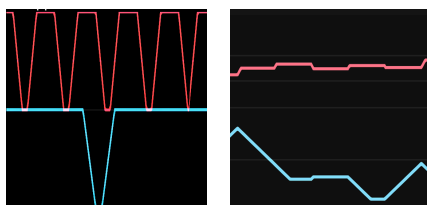
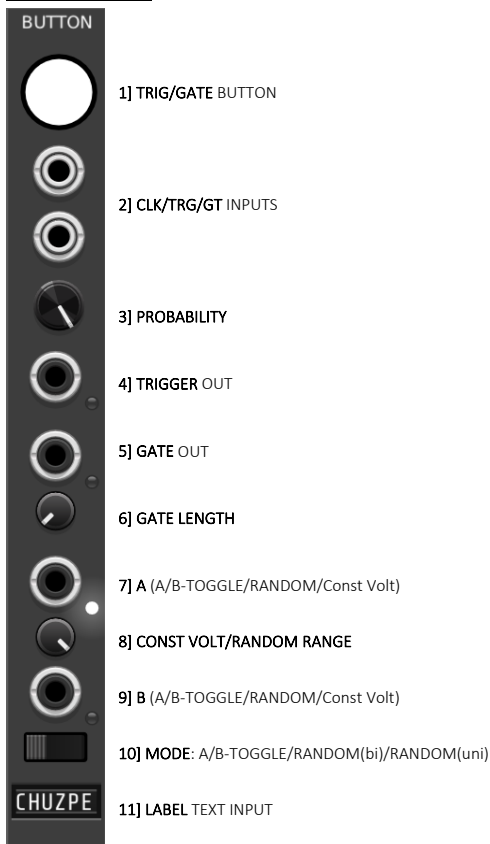
Forced Sync (see Image E):

To fix this just send the Slew Gate output to an Input of the other Button module.

The OR-Logic inputs will ignore incoming Triggers as long as one input is high. This enforces RETRIG OFF on the left Button, which might cause problems in other places (if a clock that should generate CV is ignored).

Just add a third module if that should happen.

BUTTON MODULE



A. GATE SLEW CURVE

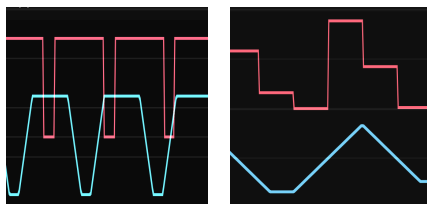
Top: Slew for 1.6s Gate

Bottom: Slew for 6.7s Gate

C. RND SLEW CURVE

Top: Slew for 1v range

Bottom: Slew for 9v range



GATE REGULAR & SLEWED

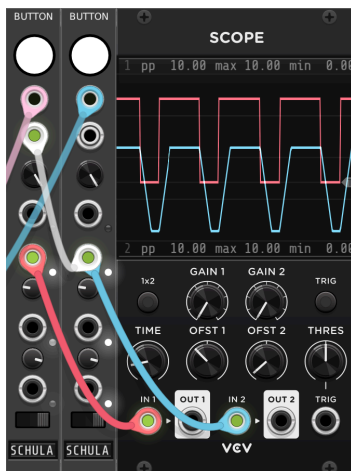
Top: no Slew 2s length

Bottom: Slew 2s length

D. RND REGULAR & SLEWED

Top: no Slew 9v range

Bottom: Slew 9v range



E. SYNC A SLEW GT W/ REG GT

Left: slewed Gate (right(to input (left)

Scope: Gates are synced