

Ghostbusters Proton Pack Attenuator 2.0

First and foremost, a sincere thank you for supporting my creative endeavors by purchasing this custom made attenuator. Without your support, none of this would be possible.

This version of the Ghostbusters Proton Pack Attenuator has taken key elements from my original attenuator, with some new functionality and style, while still paying tribute to Adam Savage's brilliant idea and fandom.

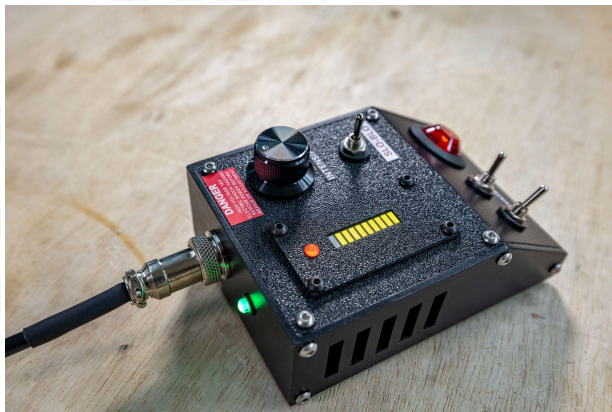
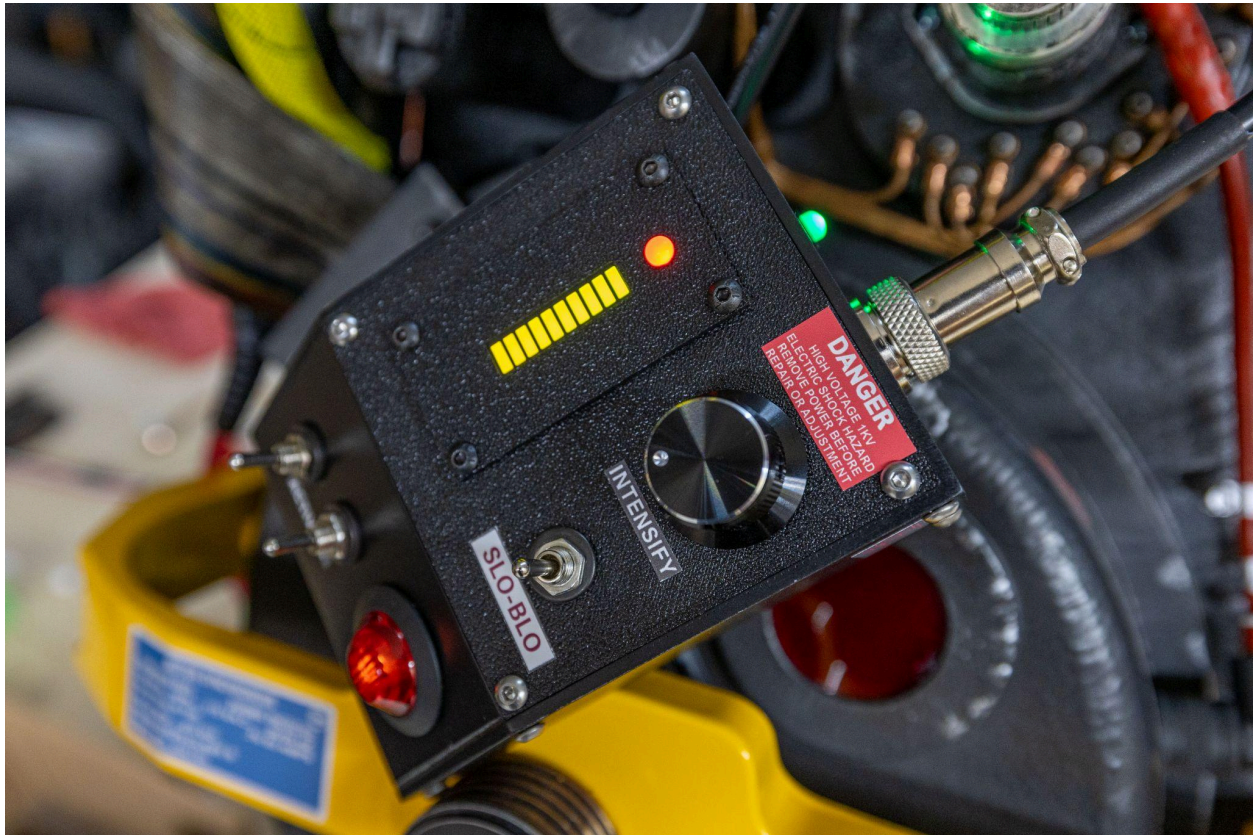


Table of Contents

Page 3 - Important Information **READ FIRST**

Page 4 - Attenuator 2.0 Variants

Page 6 - Hardware list for build your own kit

Page 7 - Haslab pack side installation

Page 8 - Haslab board callouts

Page 9 - Ninjatunes pack side installation

Page 11 - Ninjatunes board callouts

Page 12 - Build your own reference library

Page 16 - Relay programming information

Page 17 - How to use Attenuator 2.0

Page 18 - Additional reference photos

Important Information

Attenuator 2.0 was designed to be universal and is compatible with both the STOCK electronics Haslab proton packs and the Ninjatunes electronics upgraded Haslab proton packs. However, it is truly universal and could be adapted to other proton pack kits with some adaptation by the end user.

Attenuator 2.0 is available in 4 different kit variants.

1. Complete **with** venting kit
2. Complete **without** venting kit
3. Build your own **with** venting kit
4. Build your own **without** venting kit

Depending on which kit variant you purchase, you may not use all wire connections or included parts, but parts are still included for future use or future adaptations.

When attenuator 2.0 is installed on a **STOCK** electronics Haslab proton pack, it will function as a **keep alive kit** for the **pack only** and keep the pack running indefinitely.

IMPORTANT: Attenuator 2.0 is not designed to work with other keep alive mods for the pack or wand and is not recommended to be used with them. I assume no liability for adverse effects, damage or unintended outcomes due to experimentation of Attenuator 2.0 with other electronic pack modifications.

Attenuator 2.0 is designed to run on 5 volts only. **DO NOT** run power greater than 5 volts or damage to the electronics will occur.

The venting control module is just a simple relay and the output acts as a switch. The wiring output in the kit is made specifically for the Haslab and Ninjatunes boards. If you want to use Attenuator 2.0 on a different kit, you can replace the output wiring of the relay with a standard two wire connector.

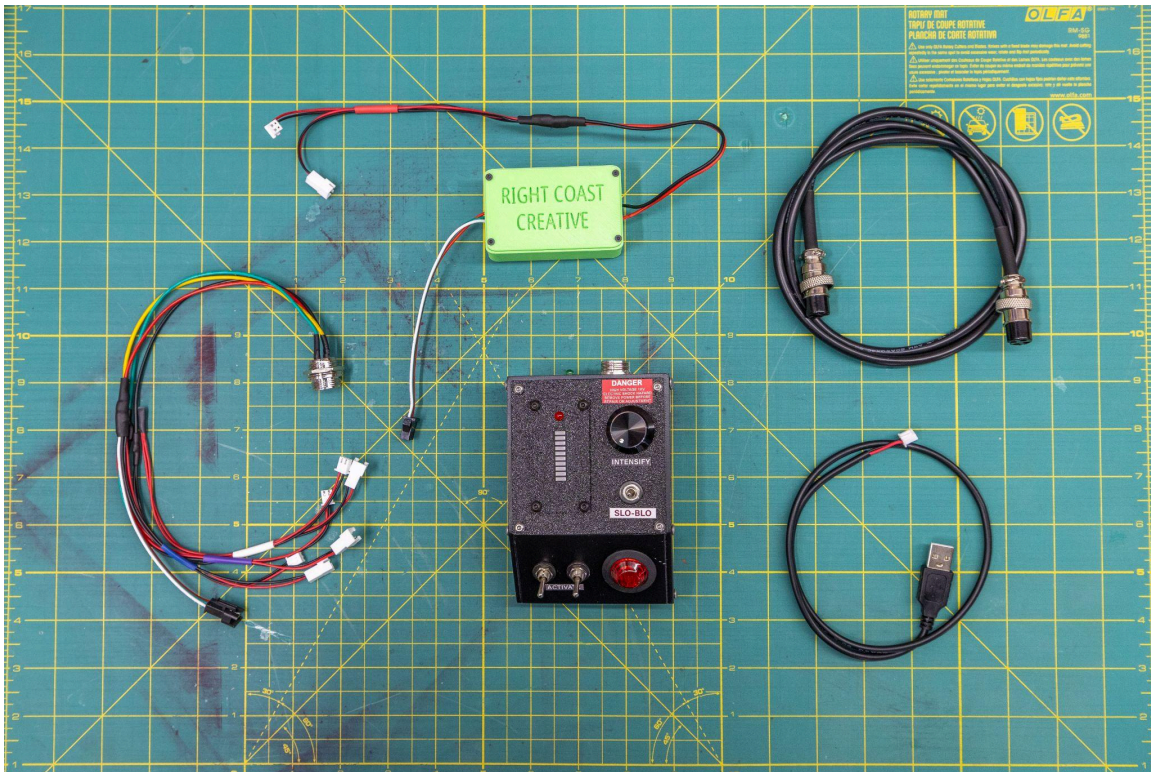
Connection from the Attenuator 2.0 to the Proton Pack uses a 4 pin GX16 connector and cable set up, commonly called an "Aviation Cable" and is listed as such throughout the instructions.

When vent mode is toggled, venting acts the same as when the ribbon cable is removed from the cyclotron. The Haslab proton pack will make the containment unit failure sound effect. The Ninjatunes kit will trigger the Ninjatunes vent relay and optional smoke kit (if installed).

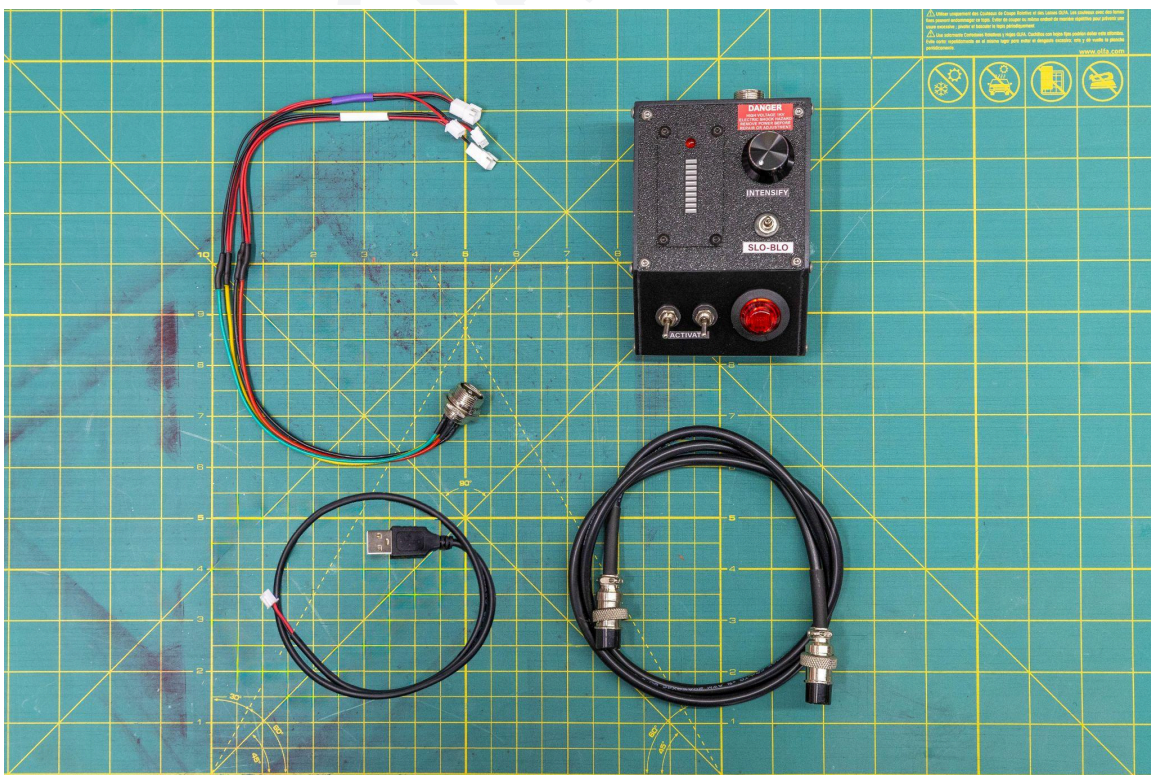
On Ninjatunes, if your wand is on, manual venting is not possible. This is because of the programming of the Ninjatunes board, it will override manual venting when it senses the wand is active in preparation for overheat venting of the wand.

Variants

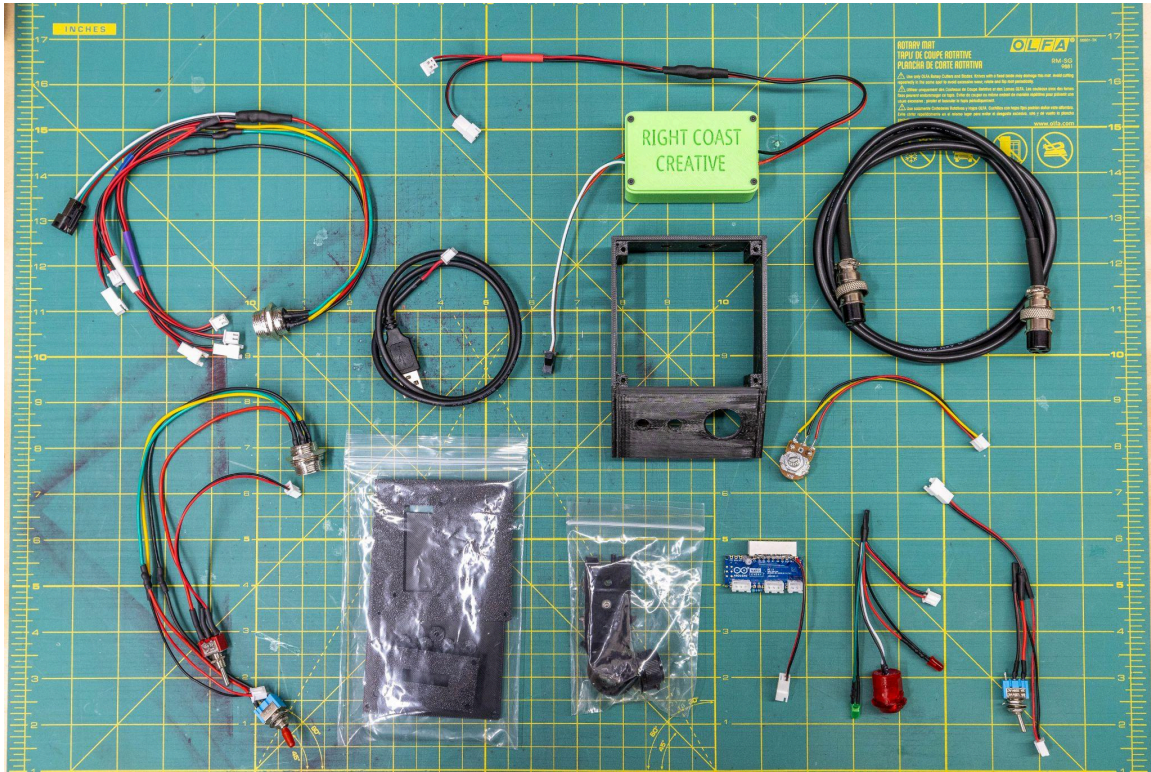
Complete kit with venting



Complete kit without venting



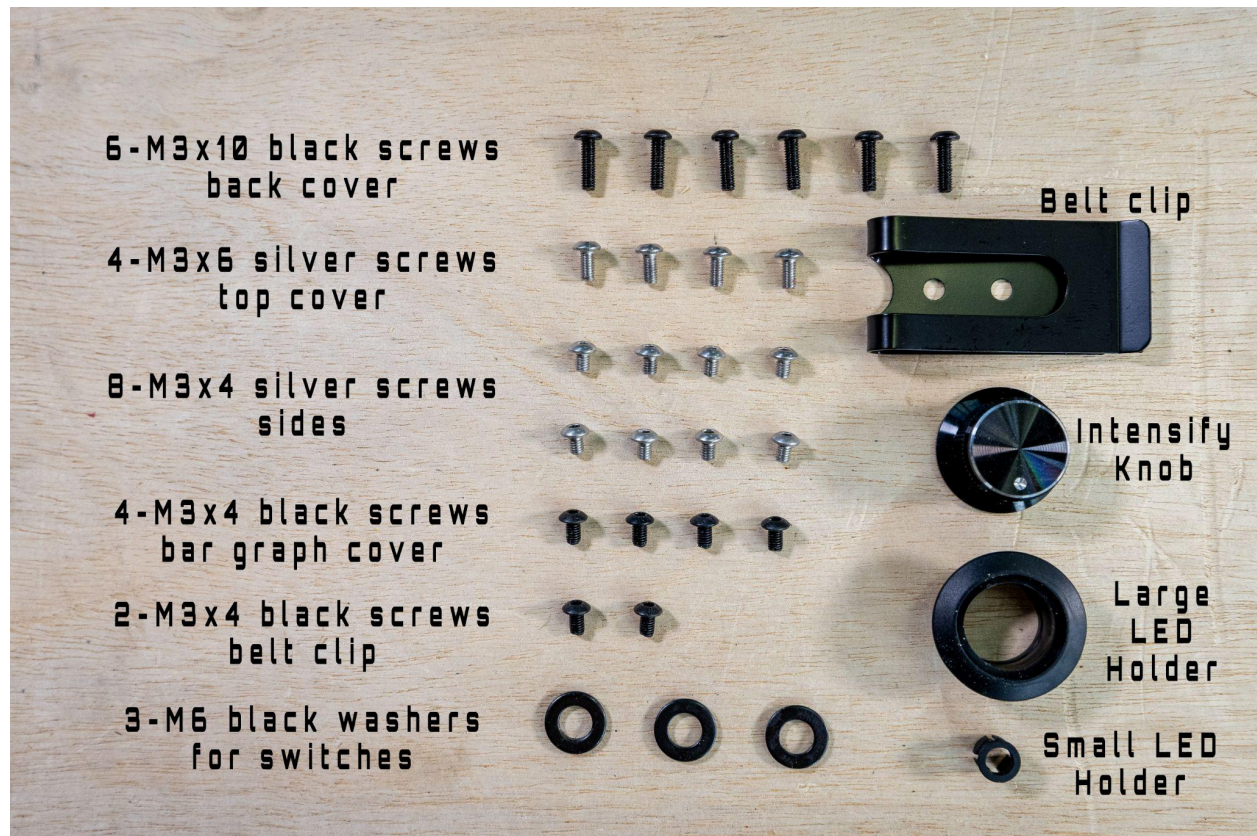
Build your own with vent



Build your own without vent



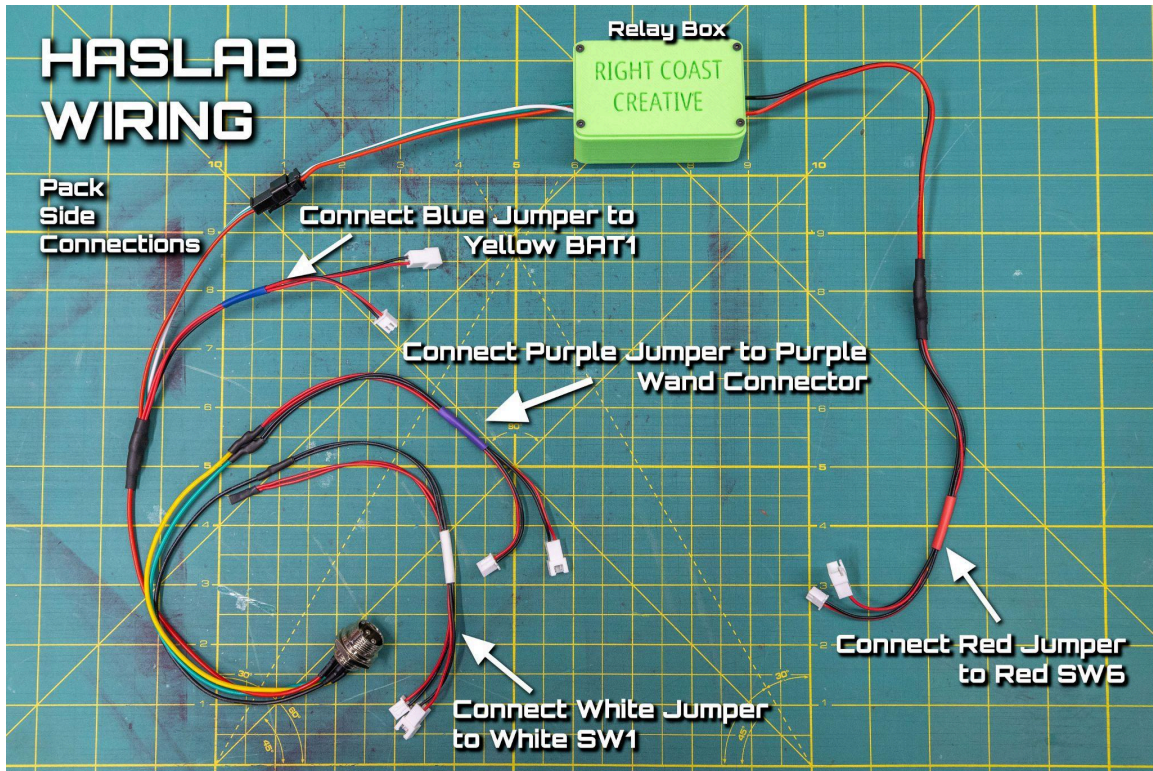
Build your own kit included hardware list



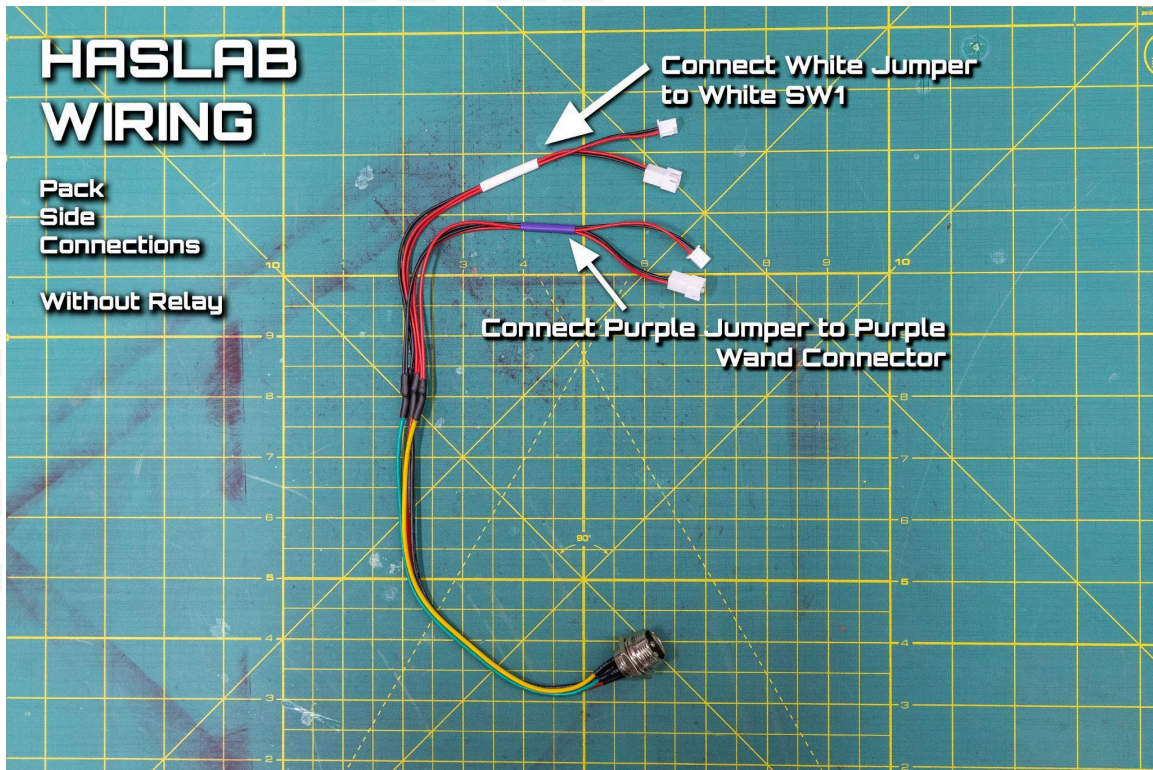
- 6 - M3 x 10mm black screws to secure the back cover of attenuator
- 4 - M3 x 6mm silver screws to secure the top cover of the attenuator
- 8 - M3 x 4 silver decorative screw for both sides of the attenuator
- 4 - M3 x 4mm black screw to secure the bar graph holder to the attenuator
- 2 - M3 4mm black screws to secure the belt clip to the back of the attenuator
- 3 - M6 black washers for switches
- 1 - Belt clip
- 1 - Intensify knob
- 1 - Large LED holder
- 1 - Small LED holder

Haslab installation Pack Side

Complete kit with venting



Complete without venting



Haslab pack-side wiring will have either 2 or 4 heat shrink color coded jumper wires depending on variant.

With venting

Blue jumper connects inline of Haslab board at **Yellow BAT1** connector

Purple jumper connects inline of Haslab board at **Purple wand** connector

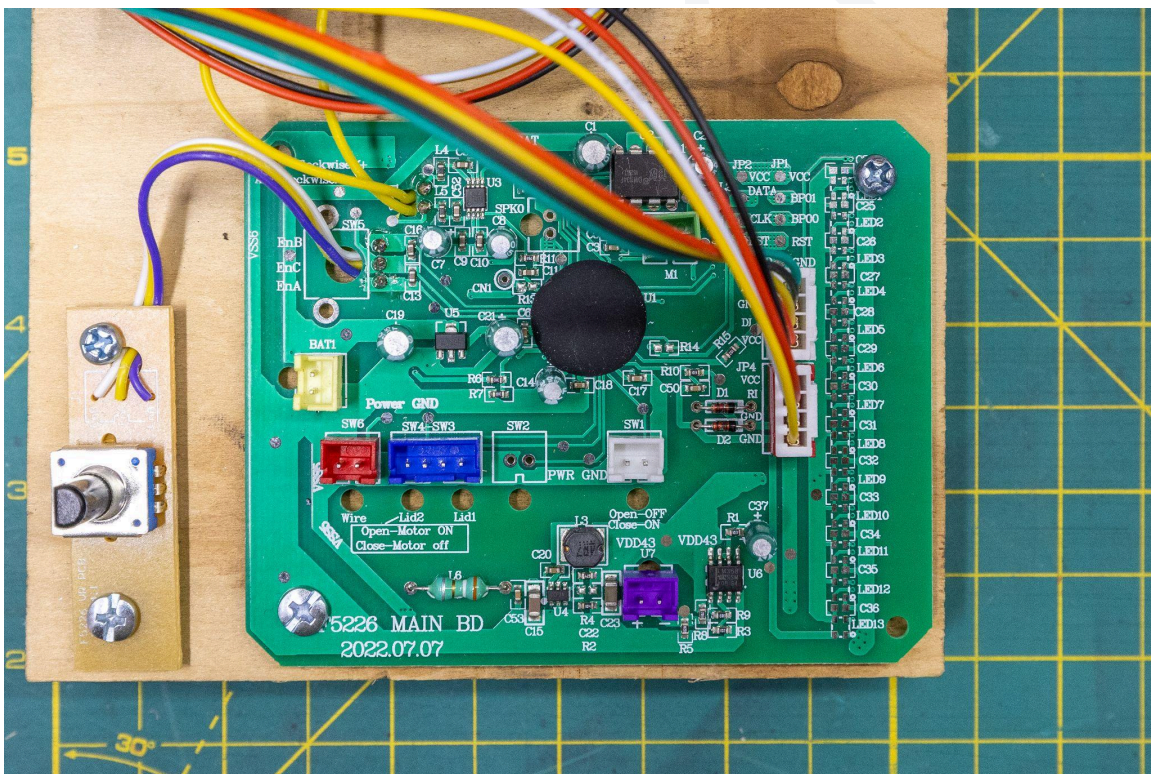
White jumper connects inline of Haslab board at **White SW1** connector

Red jumper connects inline of Haslab board at **Red SW6** connector

Without venting

Purple jumper connects inline of Haslab board, **Purple wand** connector

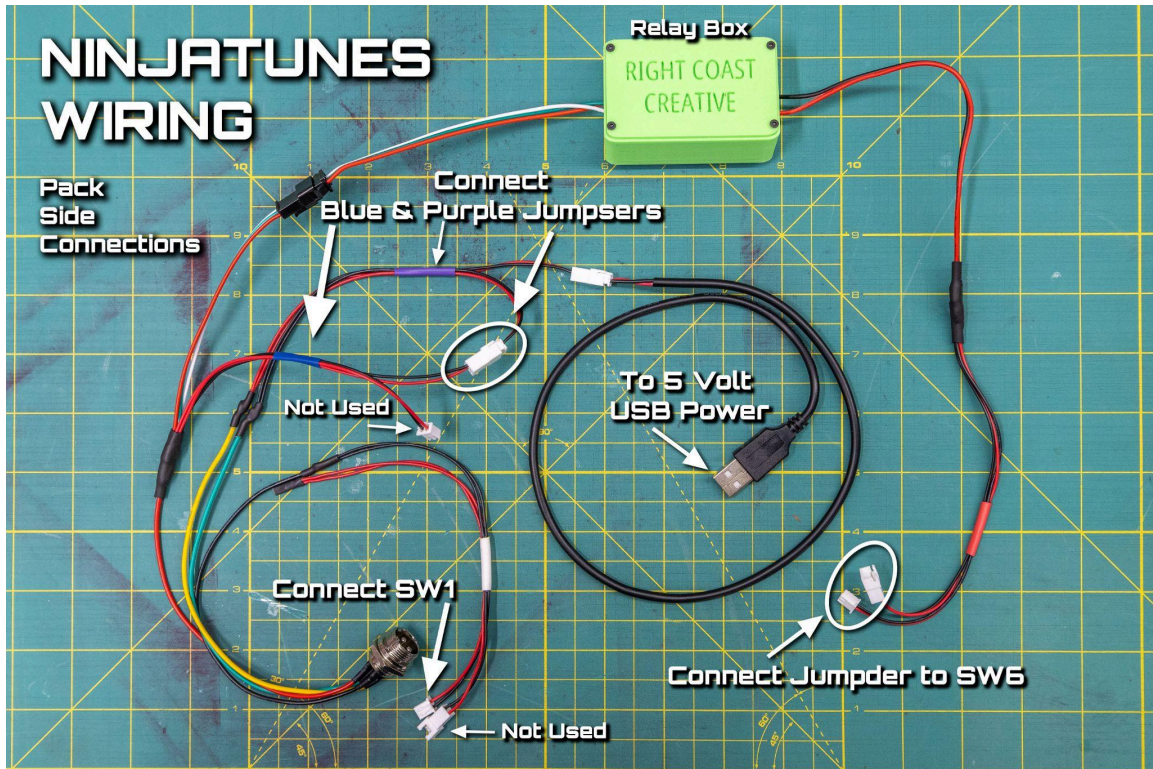
White jumper connects inline of Haslab board, **SW1** connector



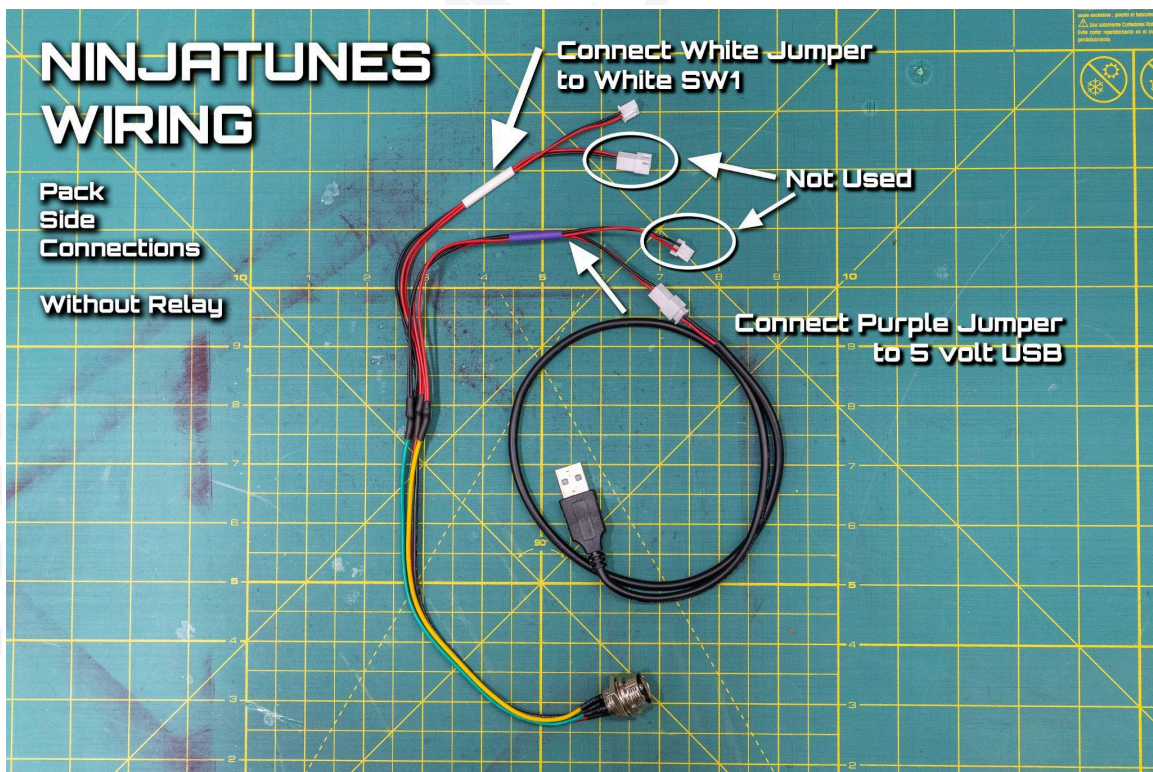
NOTE: When Attenuator 2.0 is connected to the Halsab proton pack, only one on/off switch will work at a time, either the proton pack or the Attenuator 2.0. It is recommended to leave the pack side on/off switch in the off position and control the on/off function via Attenuator 2.0.

Ninjatunes Installation Pack Side

Complete kit with venting



Complete kit without venting



The Ninjatunes pack side wiring will have either 2 or 4 heat shrink color coded jumper wires depending on variant. (see above photos)

In this version, power to Attenuator 2.0 comes from a separate 5 volt USB source. Since the Ninjatunes uses the 12 volt port of a talent cell, we will use the 5 volt USB port to power Attenuator 2.0. Following the above reference photos with the directions below.

There are some variations in Ninjatunes boards, but the color codes and callouts should be the same between variations. (see reference on page 11). We will only be using SW1 and SW6 on the Ninjatunes boards.

The Ninjatunes board also has a feature for a separate killswitch, which will be utilized for Attenuator 2.0.

First you will need to remove the Ninjatunes red killswitch terminal jumper from the killswitch port of the Ninjatunes board. (See reference photo on page 11 for killswitch.)

Disconnect the factory Haslab on/off switch from SW1 of the Ninjatunes board and plug it into the killswitch port of the Ninjatunes board, then follow the instructions below instructions.

With venting

Connect the **Male** end of the **Blue** jumper to the **Female** end of the **Purple** jumper, then connect the USB cable to the **Male** end of the **Purple** jumper. The male end of the blue jumper is not used in this configuration. (see photos on page 9)

Connect the **Female** end of the **White** jumper to **SW1** (see photos below). The male end of the white jumper is not used in this configuration.

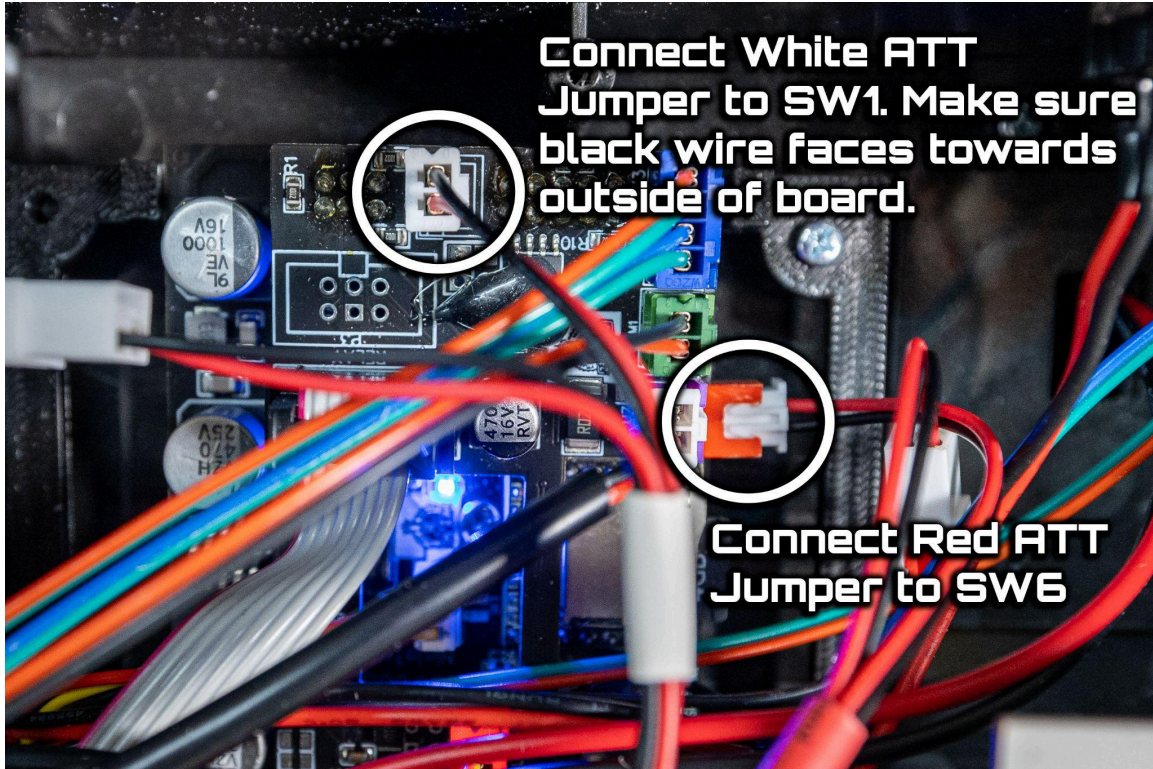
Connect the **Red** jumper inline of Haslab board, **Red SW6** connectors

Without venting

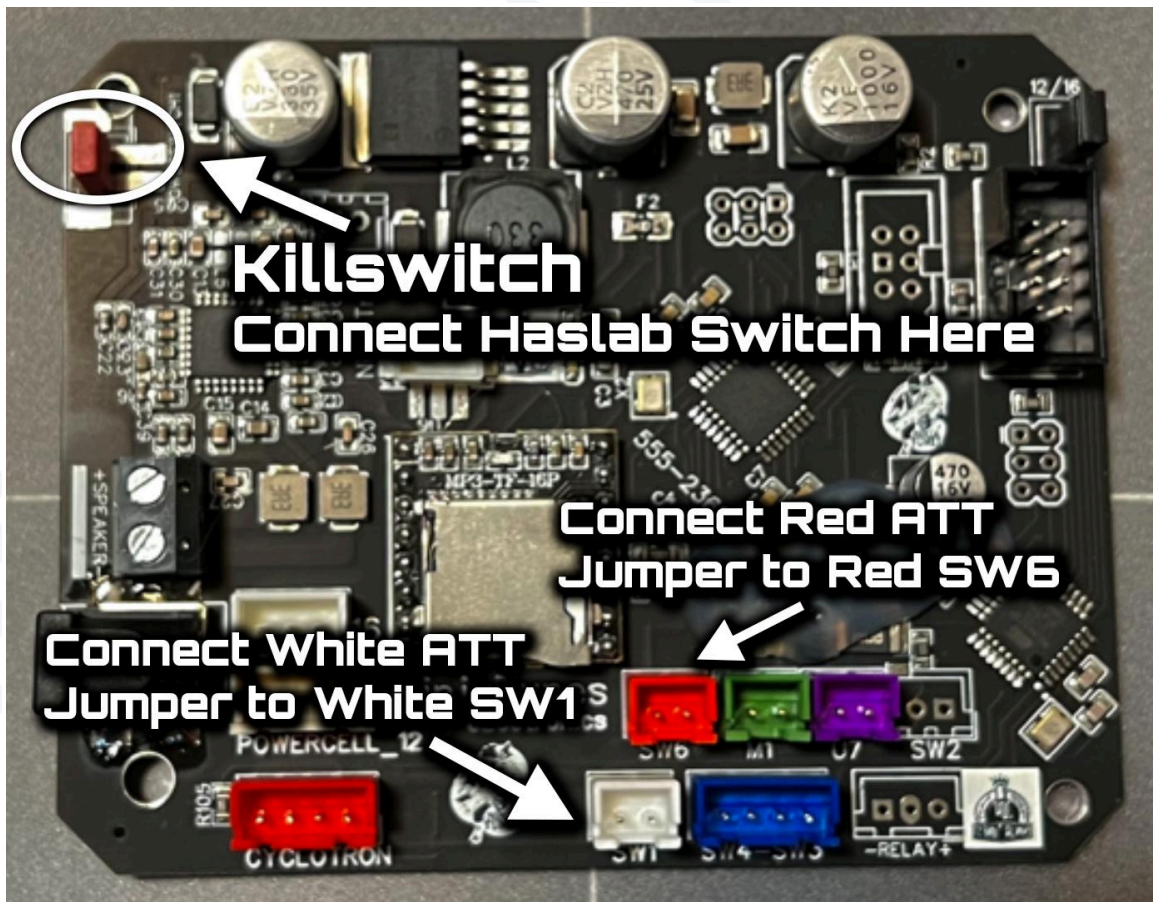
Connect the **Female** end of the **White** jumper to **SW1** (see photos below). The male end of the white jumper is not used in this configuration.

Connect the **Red** jumper inline of Haslab board, **Red SW6** connectors

Ninjatunes version 1

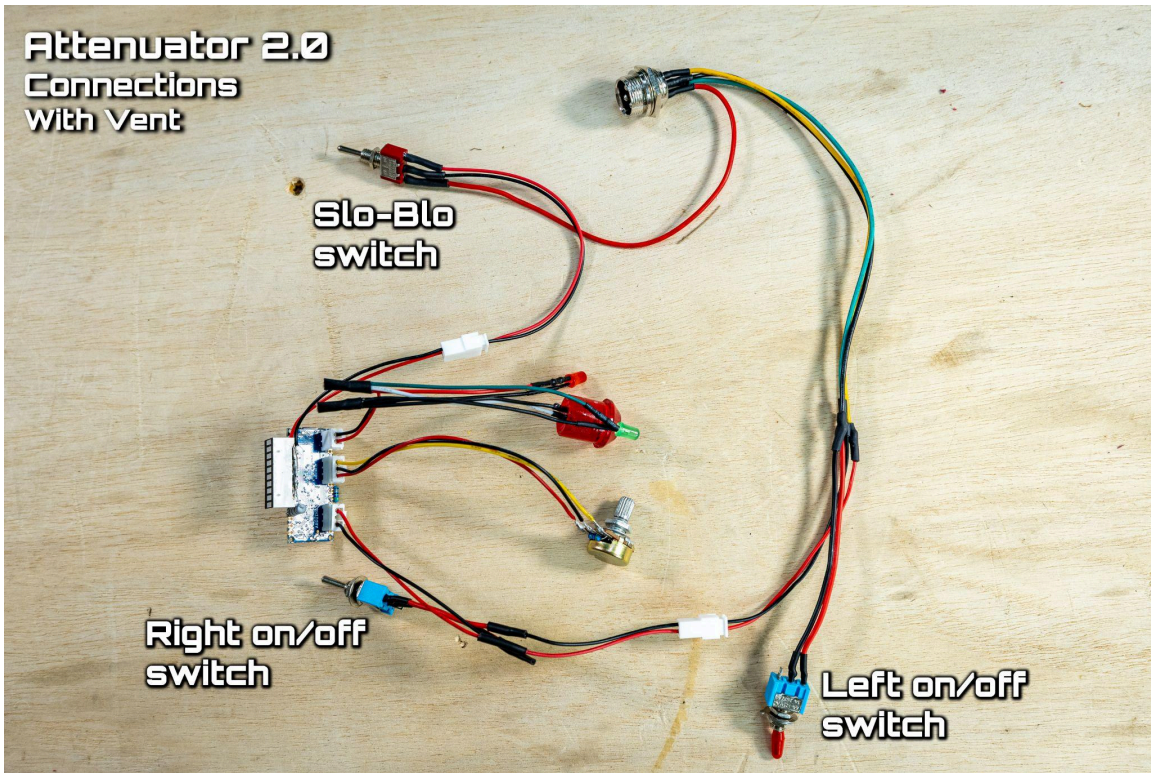


Ninjatunes version 2

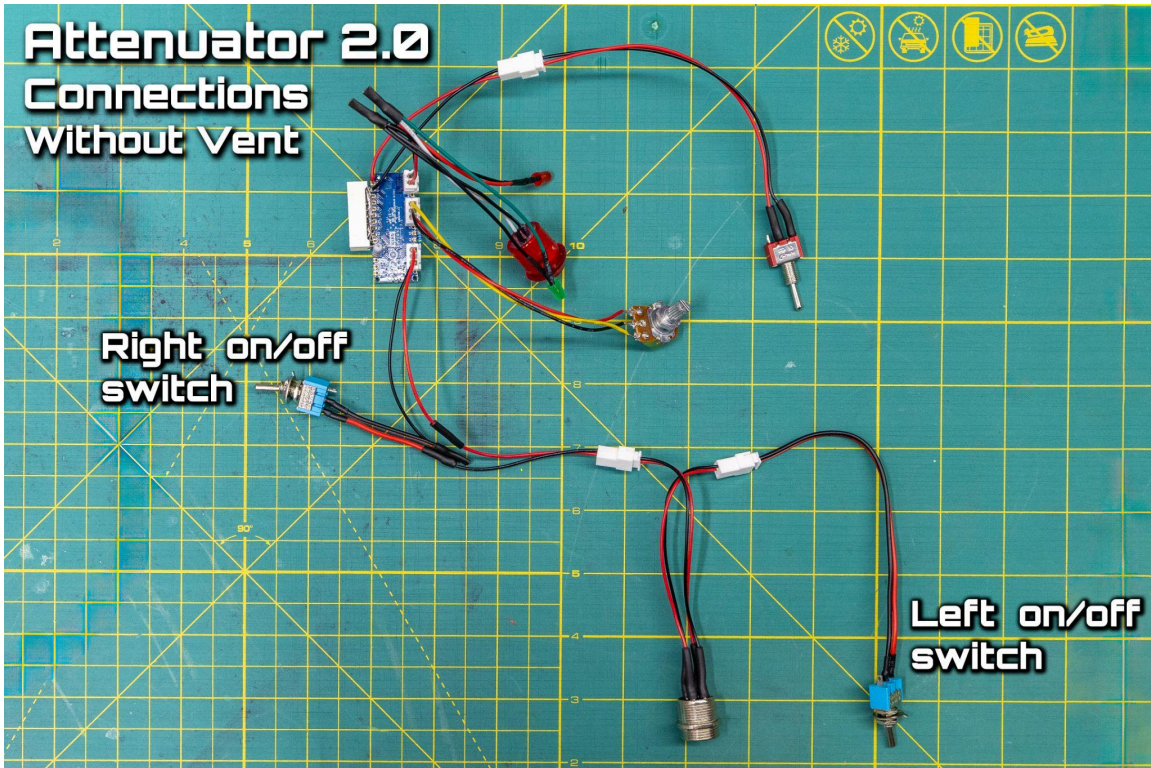


Build Your Own Attenuator 2.0

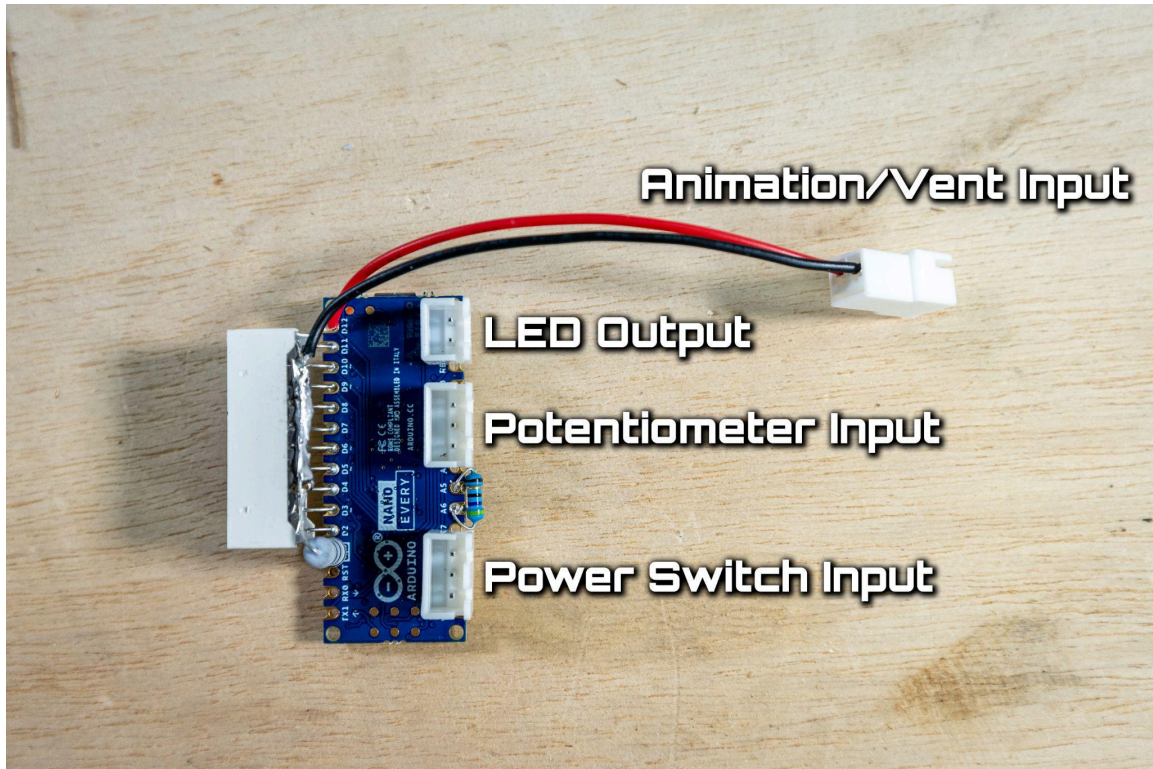
Wiring reference connections with venting



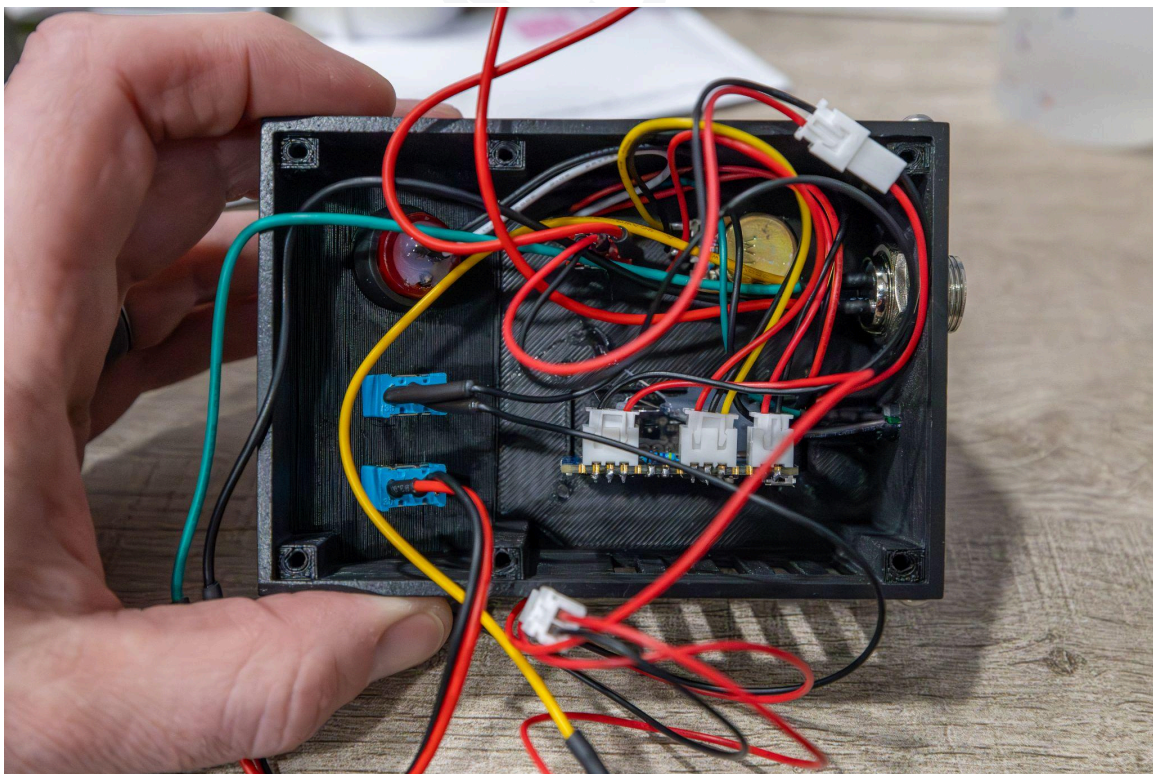
Wiring reference connections without venting



Bar graph PCB module pin callout



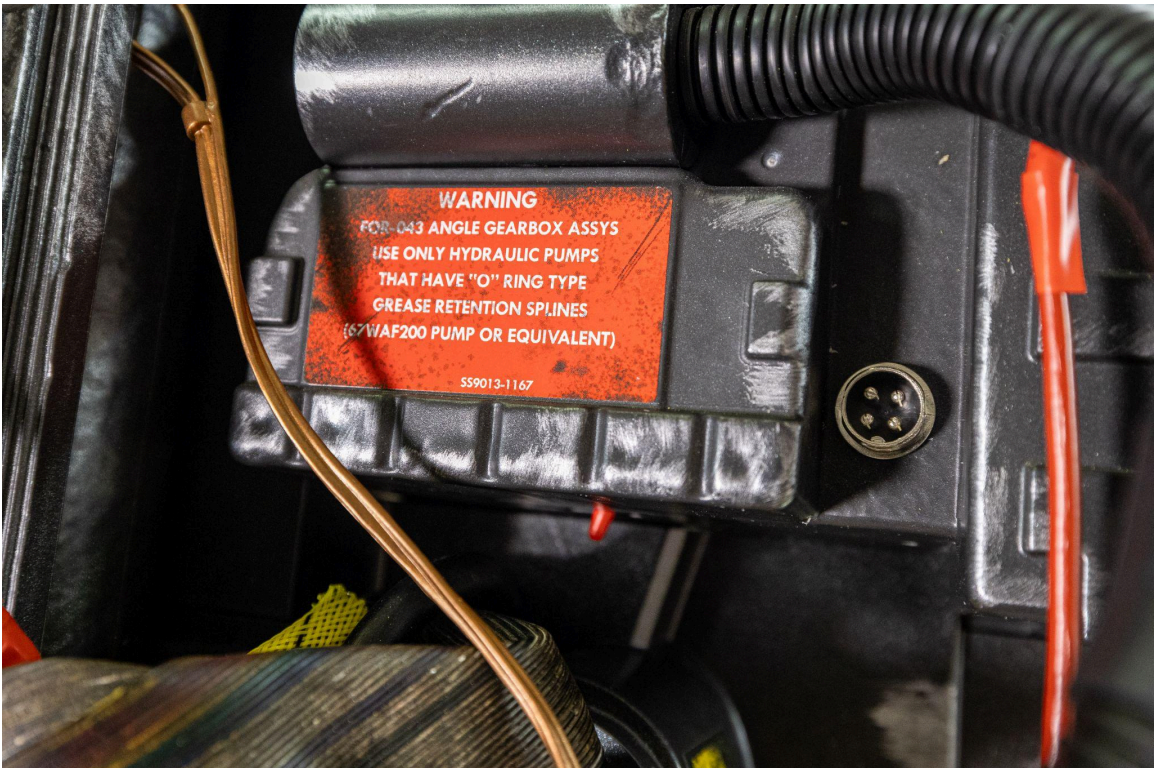
Inside of Attenuator 2.0. The bar graph PCB module slides into the holder. A small amount of hot glue will help hold it in place.

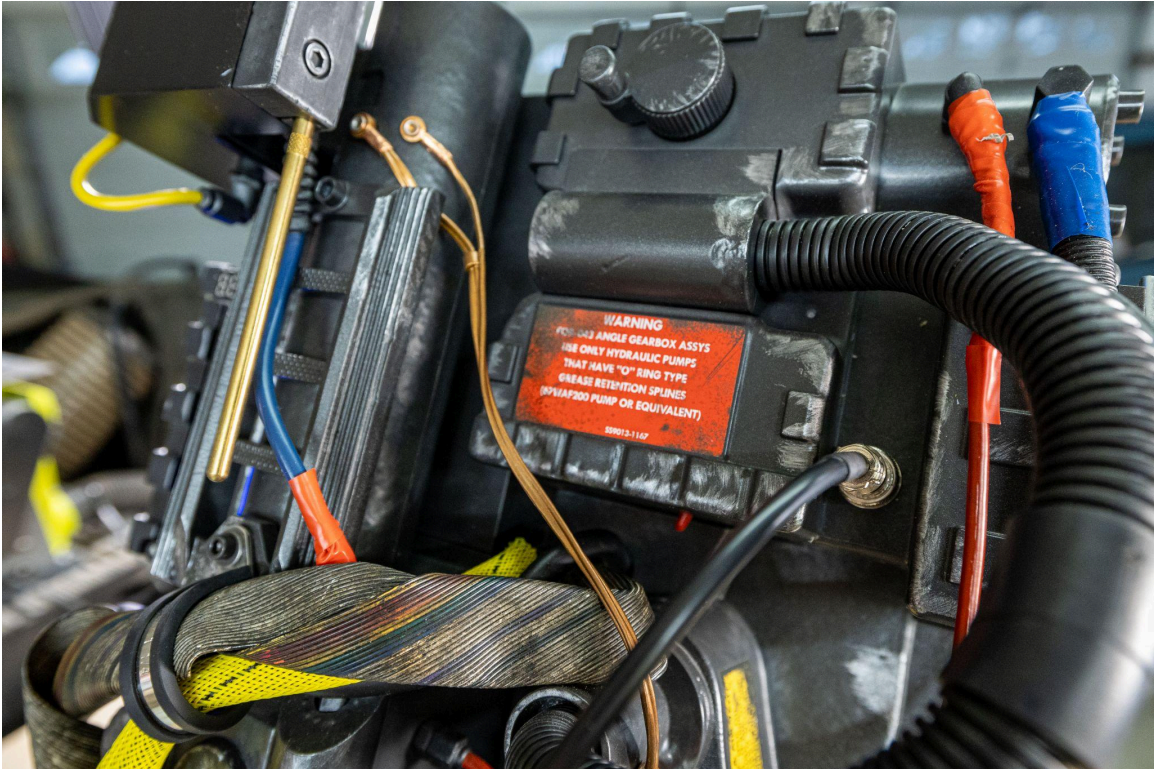
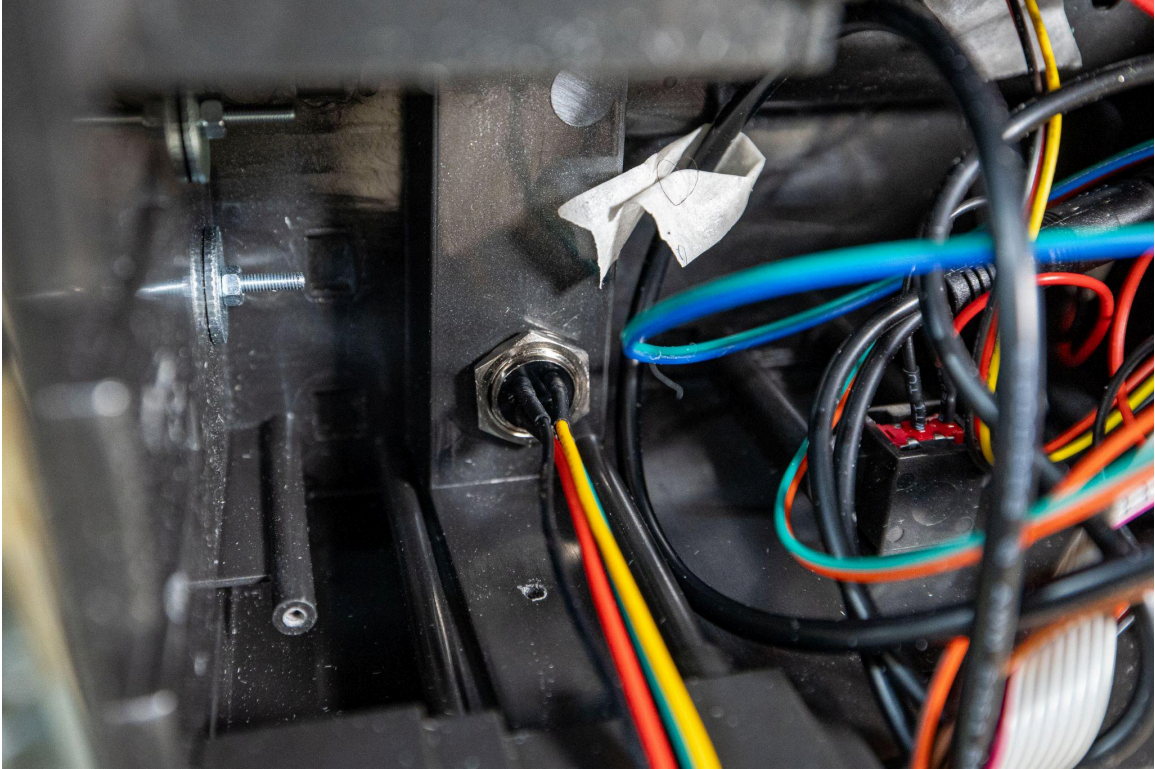


Relay box mounting location suggestion



When installing the aviation cable, the location is really up to you on where you want to route the wiring. However, I found it easy to drill a hole in the front of the proton pack as shown in the photos below.





Relay programming

For Attenuator 2.0, we use programming F4 with a 10 second delay. Relay comes pre programmed and ready to use. Info provided is for your information on its functions and for future adaptations.

Delay is adjusted by the blue/gray potentiometer

Pressing the set button will select the function after the light starts flashing.

X1 is trigger input

F1 relay turns on after delay

F2 relay turns on immediately and off after delay

F3 on/off with trigger

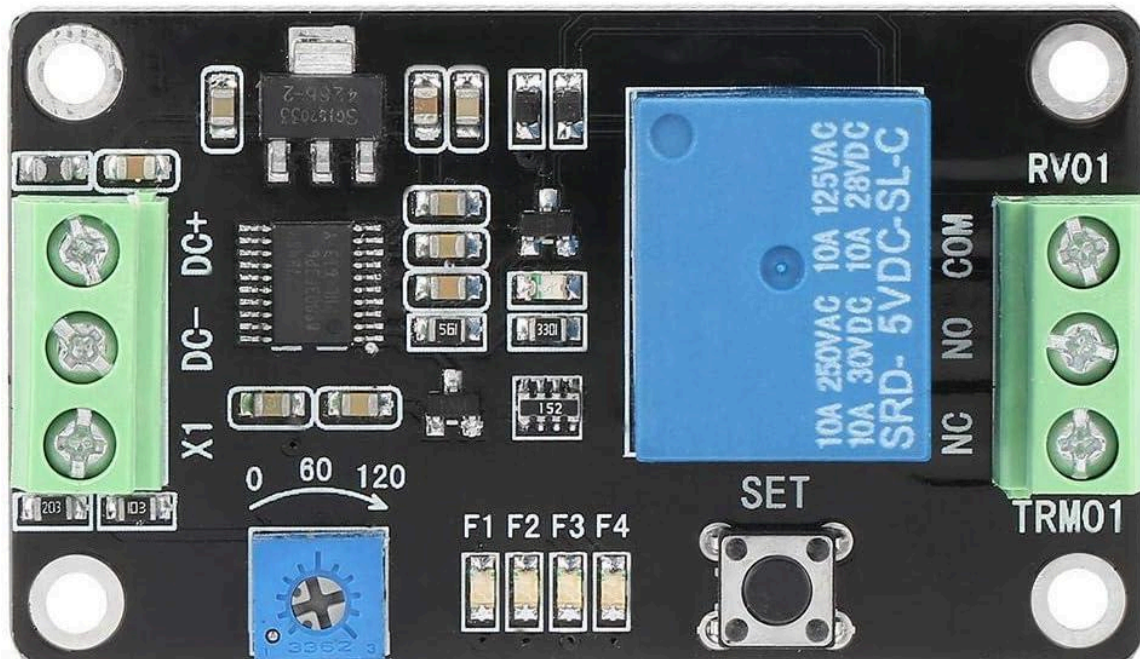
F4 relay locks in with trigger.

F1 and F2 work by turning the power off and on

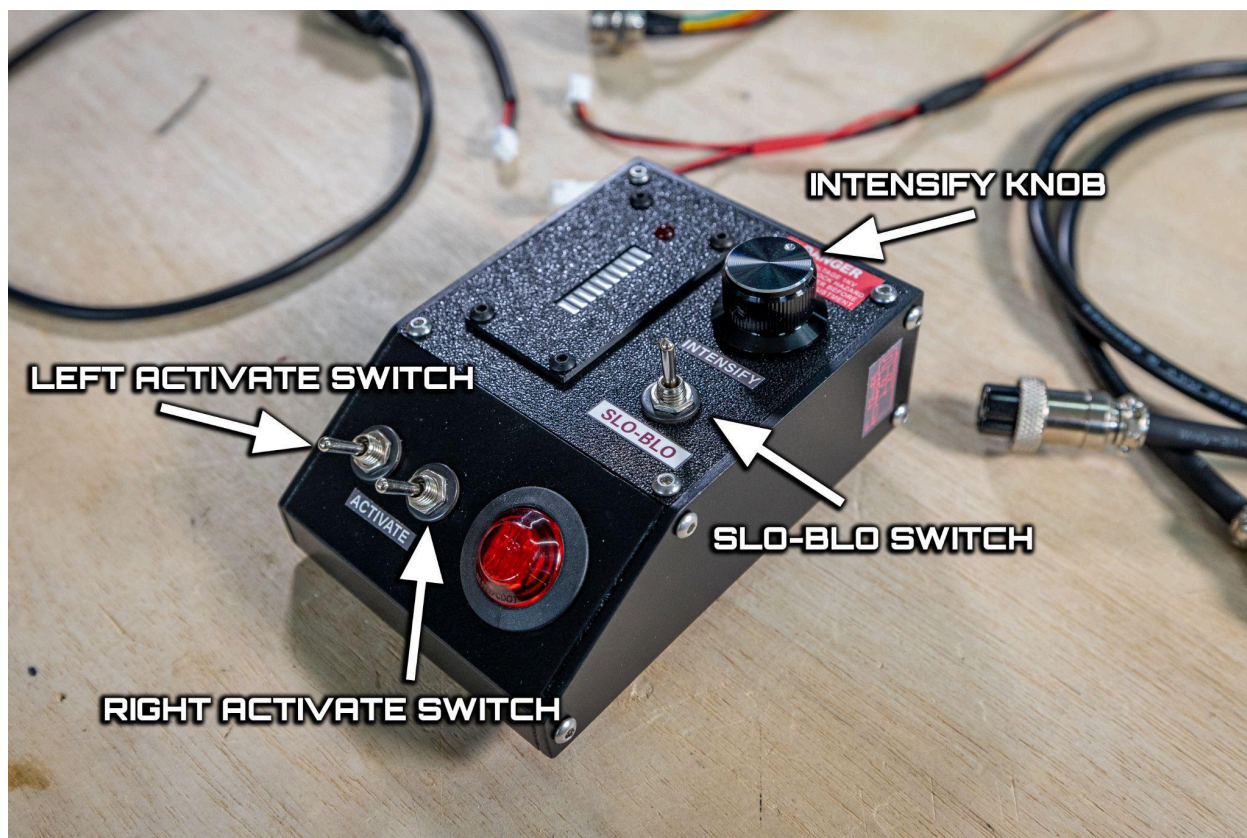
Com is ground

NO = relay normally open

NC = relay normally closed



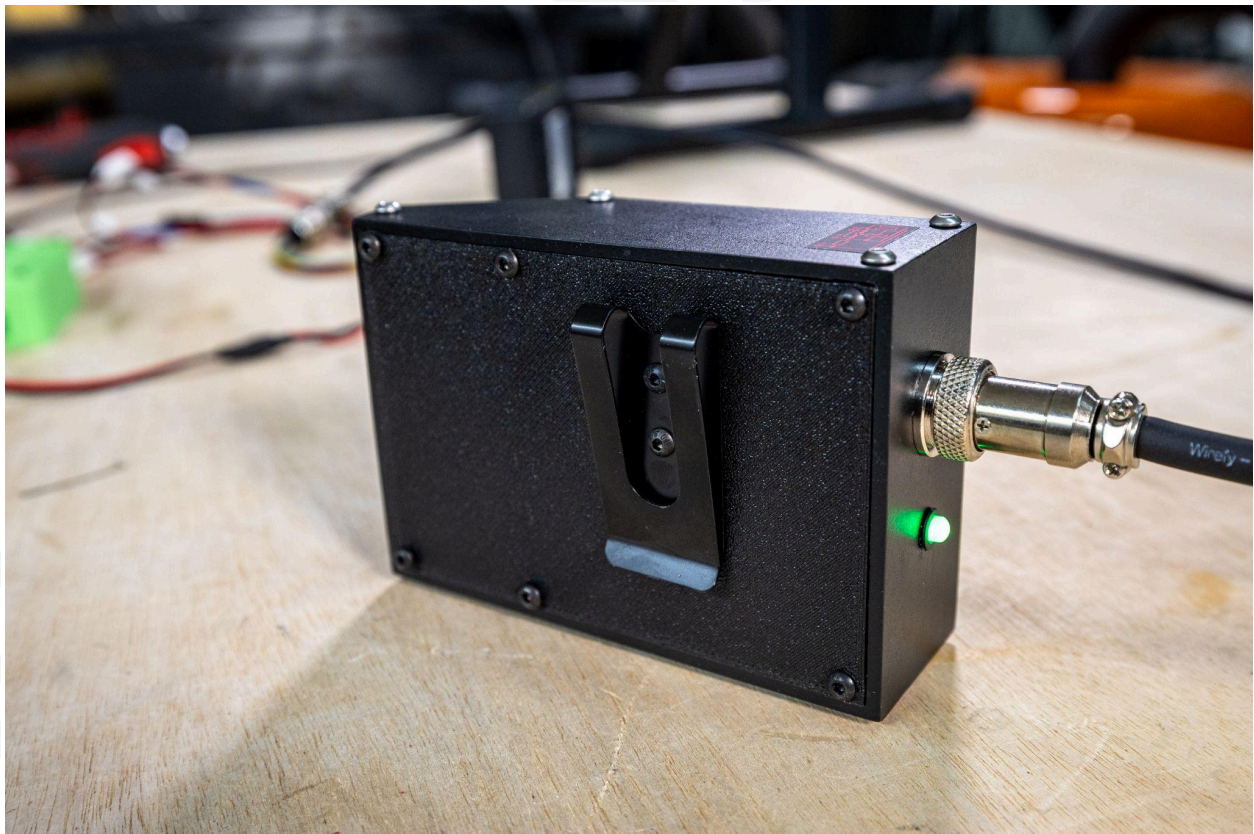
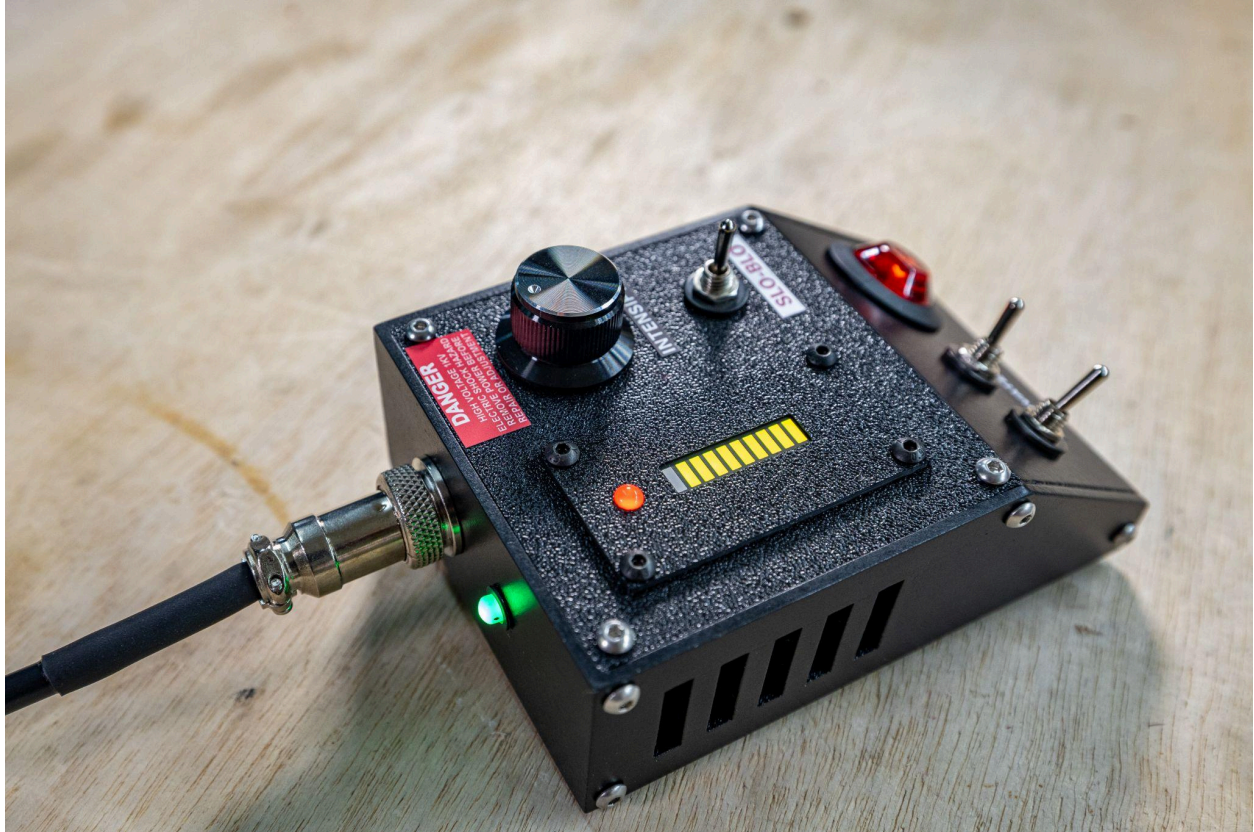
How to use Attenuator 2.0

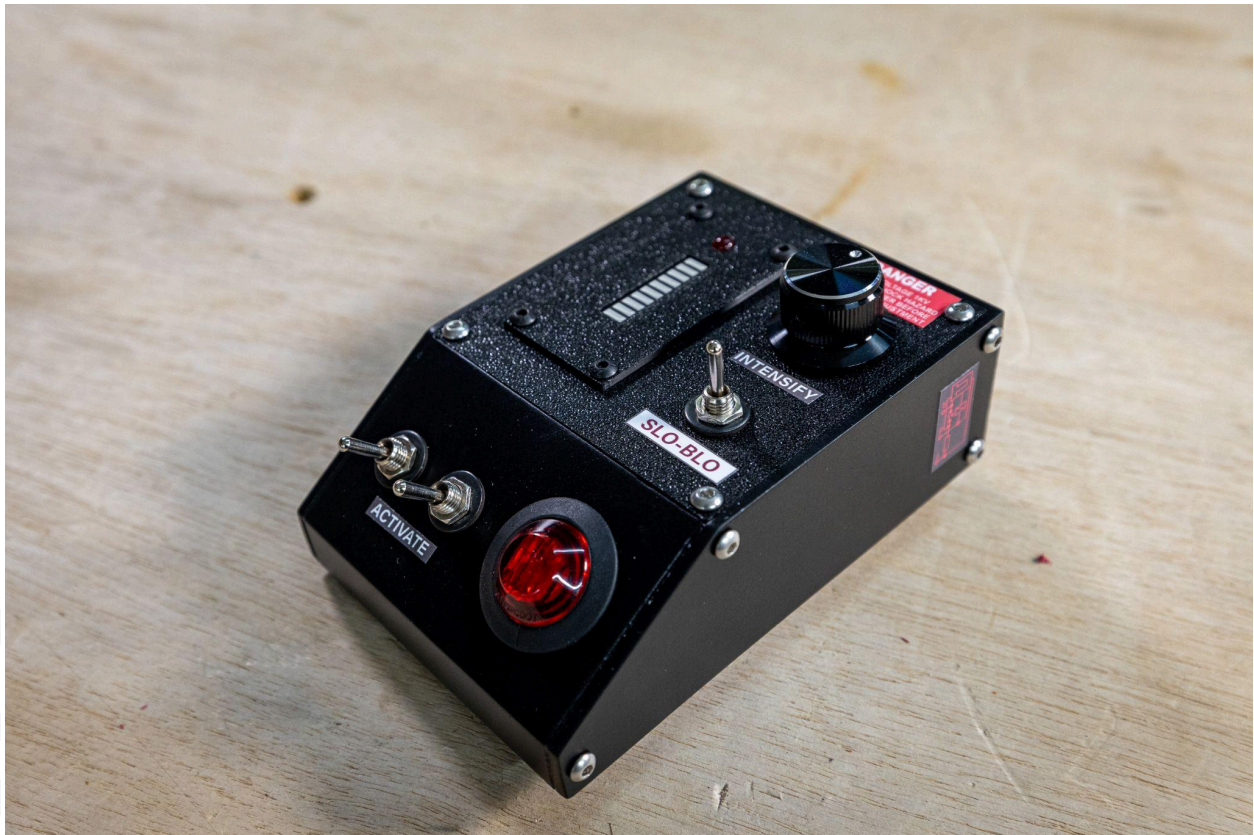
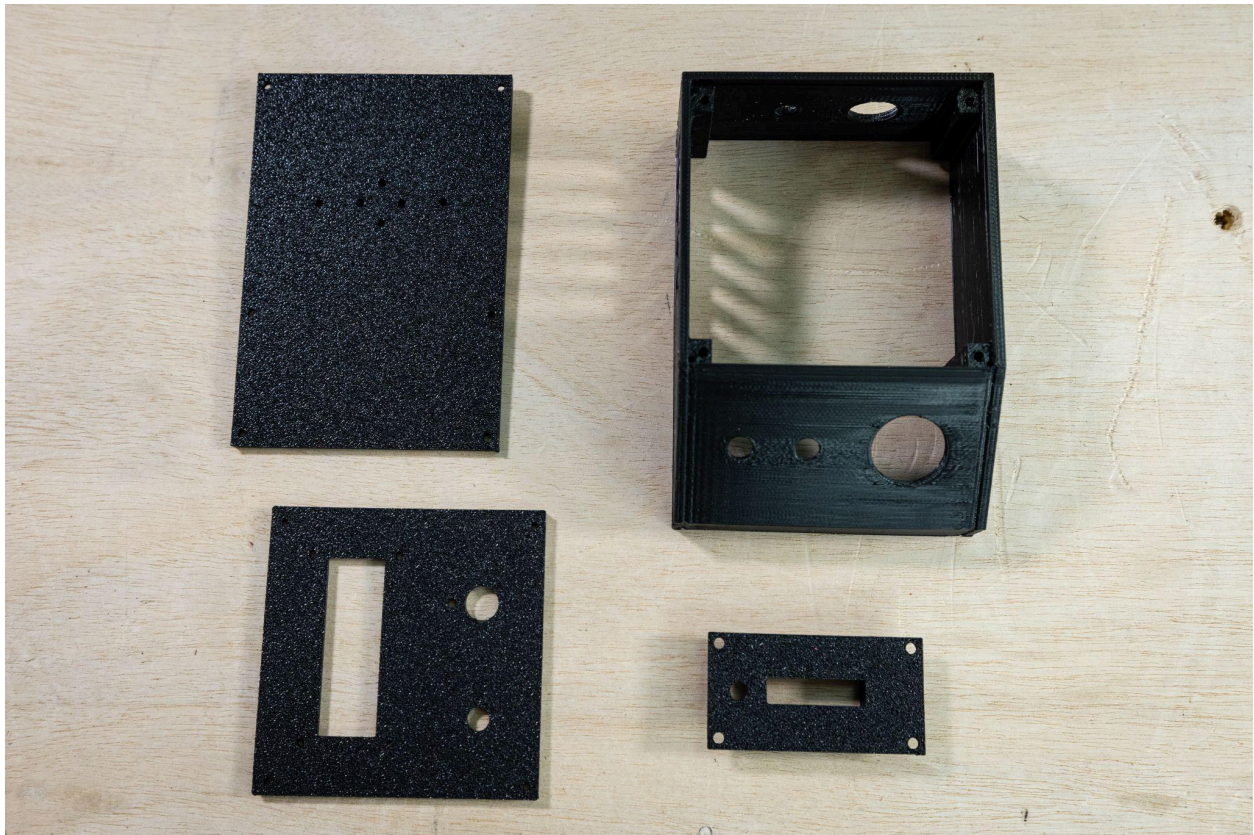


- Left on/off (activate) switch turns on/off the proton pack.
- Right on/off (activate) switch turns on/off the Attenuator 2.0 (and acts as Haslab keep alive).
- Intensify knob controls the speed of the bar graph animation.
- Pushing up on the slo-blo switch changes the bar graph animation (there are 5 animations to choose between).
- Pushing down on the slo-blo switch triggers a manual vent cycle (if equipped).

On Haslab packs, if the left activate switch is turned off while the attenuator is on, the pack will shut down, but turn right back on because of the keep alive feature. On Haslab, once the initial left activate switch is on and the pack is running, future on/off functions will be controlled by the right activate switch, unless left off for an extended period of time, then you will have to start the initial sequence again.

Additional reference photos







DANGER
HIGH VOLTAGE 1KV
ELECTRIC SHOCK HAZARD
REMOVE POWER BEFORE
REPAIR

INTENSIFY

SLO-BLO

ACTIVATE