



7" Portable HDMI Monitor

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Guide Contents

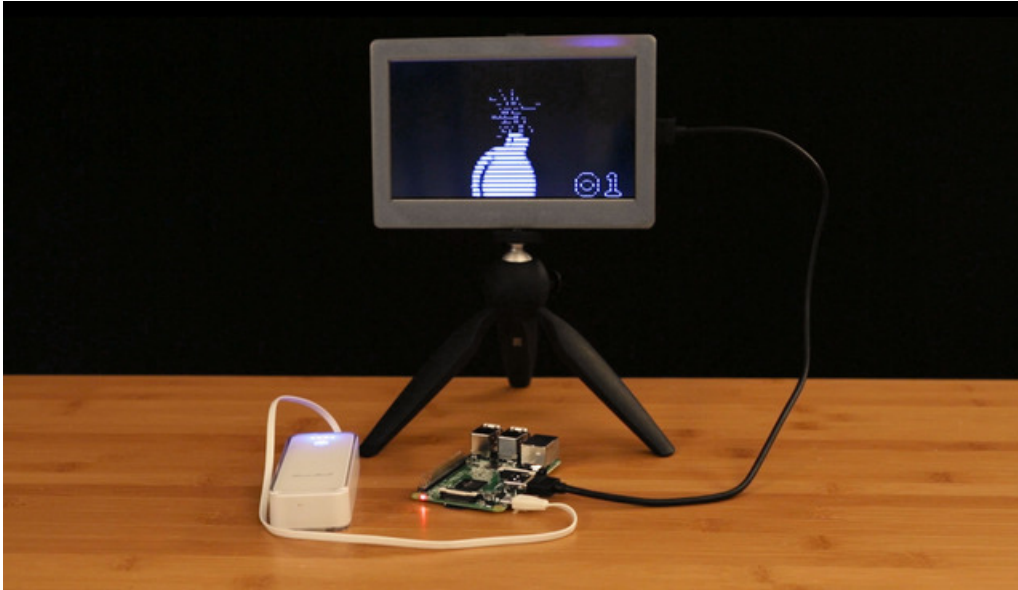
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Overview

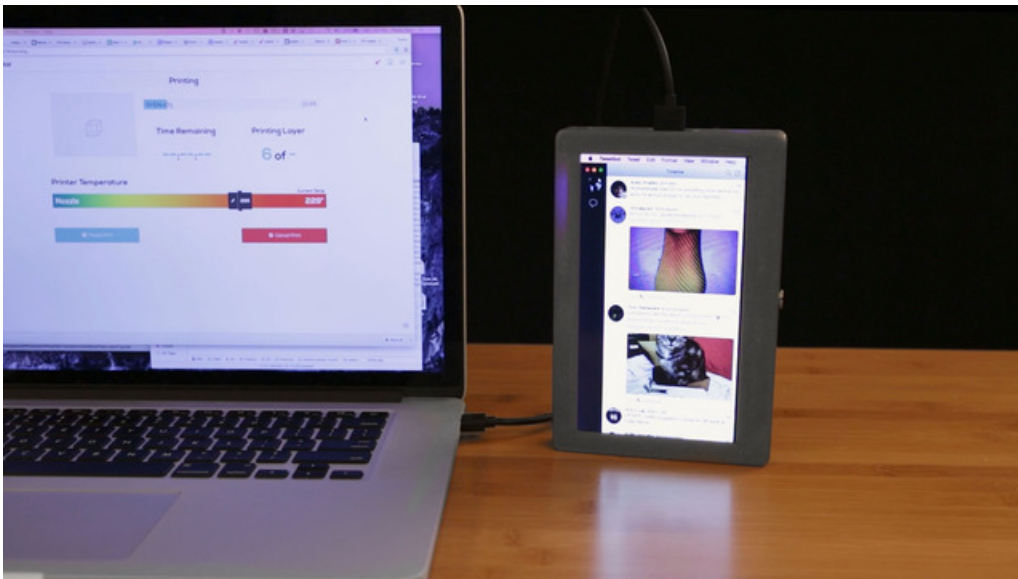
DIY Monitor

In this project, we're going to make a DIY monitor using an 7" HDMI display backpack and a 3D printed enclosure.

This display monitor is very helpful as a second display for a computer, camera and of course a Raspberry pi. The Adafruit HDMI 7" display backpack features an integrated mini display driver that is great for DIY projects. It's fully assembled, works with any HDMI device and includes mounting tabs for easily attaching to a surface.



Connect to a Raspberry pi



Use as a second monitor



Camera preview monitor

Prerequisite Guides

- [7" HDMI Monitor Backpack \(https://adafru.it/j7F\)](https://adafru.it/j7F)

Parts

We have all the lovely components and tools to build this project. Be sure to check out the featured products on the right sidebar.

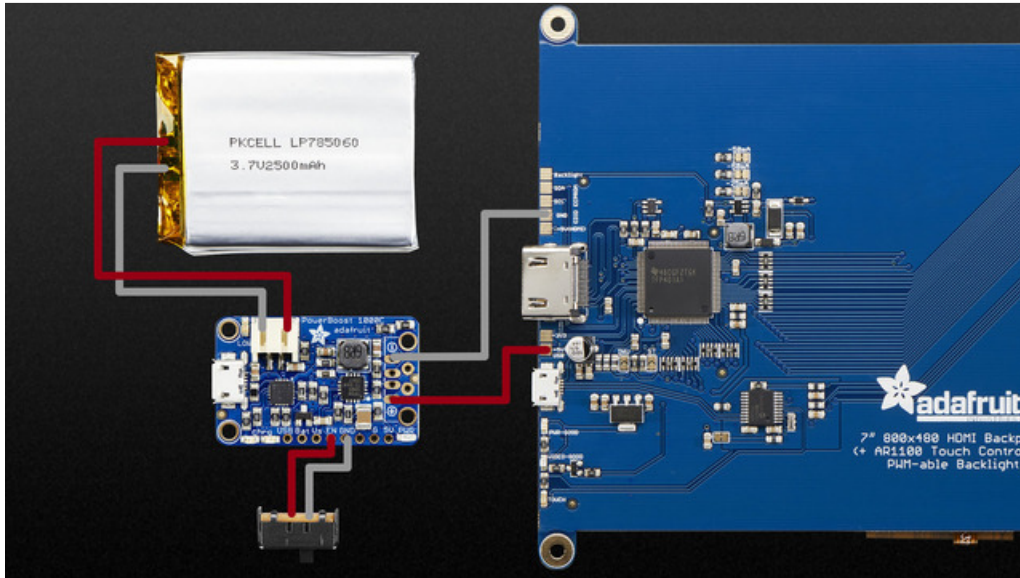
- [HDMI 7" Display Backpack \(http://adafru.it/2406\)](http://adafru.it/2406)
- [2X SPDT Slide Switch \(https://adafru.it/drN\)](https://adafru.it/drN)
- [UBEC DC/DC Step-Down \(https://adafru.it/efD\)](https://adafru.it/efD)
- [JST Extension \(https://adafru.it/doS\)](https://adafru.it/doS)
- [2500mAh lipo battery \(https://adafru.it/enl\)](https://adafru.it/enl)
- [PowerBoost 1000C \(https://adafru.it/f9N\)](https://adafru.it/f9N)
- [Camcorder Battery Holder \(https://adafru.it/wB2\)](https://adafru.it/wB2)
- [1/4" to 3/8" Convert Screw Adapter for Tripod \(https://adafru.it/efF\)](https://adafru.it/efF)
- [1/4" Mount Adapter To Video Camcorder Hot Shoe \(https://adafru.it/efG\)](https://adafru.it/efG)
- [Phillip Flat Head #4-40 x 3/8 \(https://adafru.it/eIL\)](https://adafru.it/eIL)
- [3/8" to 1/4" Adapter Screw \(http://adafru.it/2392\)](http://adafru.it/2392)
- [Swivel-Head Pan Tilt \(http://adafru.it/2464\)](http://adafru.it/2464)

Tools & Supplies

You'll need a couple of hand tools and accessories to assist you in the build.

- [Solder Iron \(http://adafru.it/1204\)](http://adafru.it/1204) + [Solder \(http://adafru.it/734\)](http://adafru.it/734)
- [Silicone Wire \(http://adafru.it/1877\)](http://adafru.it/1877)
- [PLA Filament \(https://adafru.it/dtp\)](https://adafru.it/dtp)
- [3D Printer \(https://adafru.it/tkf\)](https://adafru.it/tkf)

Circuit Diagram



The Circuit Diagram

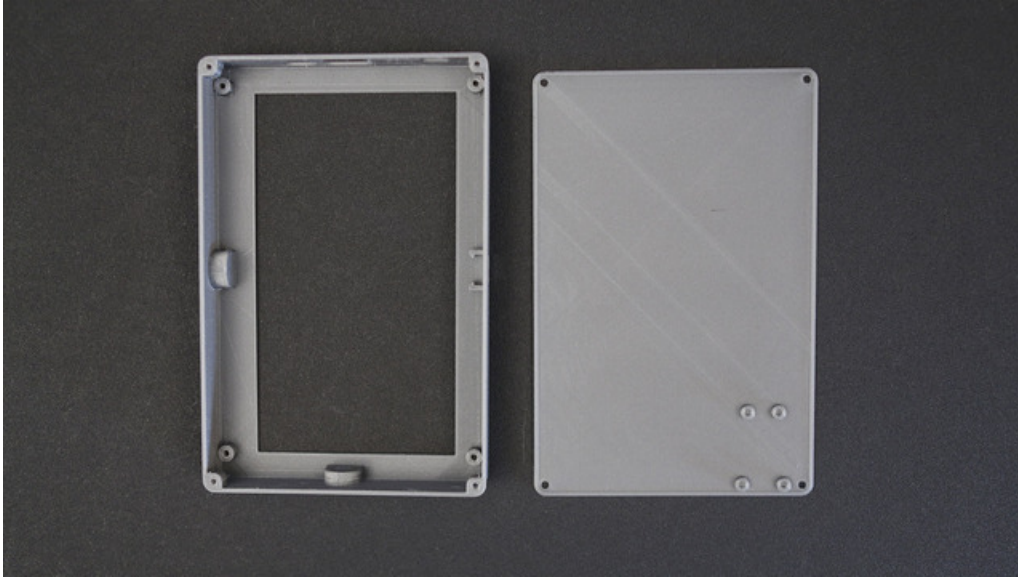
The slide switch connects to the **EN** and **GND** pins on the PowerBoost1000C.

The Battery plugs into the **JST** connection on the PowerBoost

+ and - pins connect to **GND** and **+5V** on the monitor.

You can charge the battery by connecting a cable to the USB port on the PowerBoost.

3D Printing



The parts are optimized to print with no support material. The two enclosure parts are held together with machine screws. They're oriented in center and should be good to print as is.

<https://adafru.it/fCU>

<https://adafru.it/fCU>

7inCase.stl	220c Extruder	about 4.5 hours
7inLid.stl	10% Infill	
	2 Shells	
	90/120 speeds	

Customize Design

You can modify the original solids in the CAD files to make a custom project.

Materials

The parts can be printed in different types of filament. The most common filaments like PLA and ABS will do just fine but you can of course experiment with copperFill, bambooFill, Semiflex, PET and Nylon.

Tolerances

The parts were tested with common printing settings (listed in the table). With a parameter of 2 shells, there's only a few areas where tolerances really matter - the port cutouts and the mounting holes.

Test fit the parts by inserting the top enclosure part over the Raspberry Pi. Check to see if the cutouts fit over the USB and ethernet ports. If the cutout is too tight, you can loosen it with a filing tool.

The standoffs with counter bores should fit the machine screws listed in the BOM. These can be threaded by fastening in the appropriate sized screw.

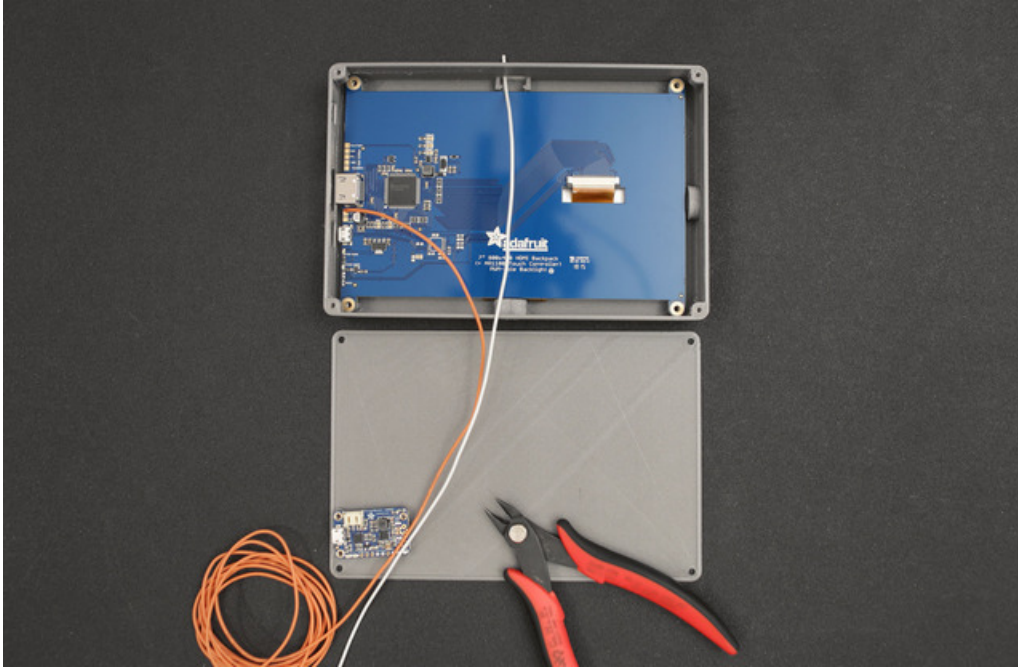
Bed Leveling

Any parts with large surface require a well leveled build plate. If you're using a heated bed, you can minimize warping. Blue masking tape, build tak, and sticky adhesives can help keep your part flat and adhere to the bed.

Clean up

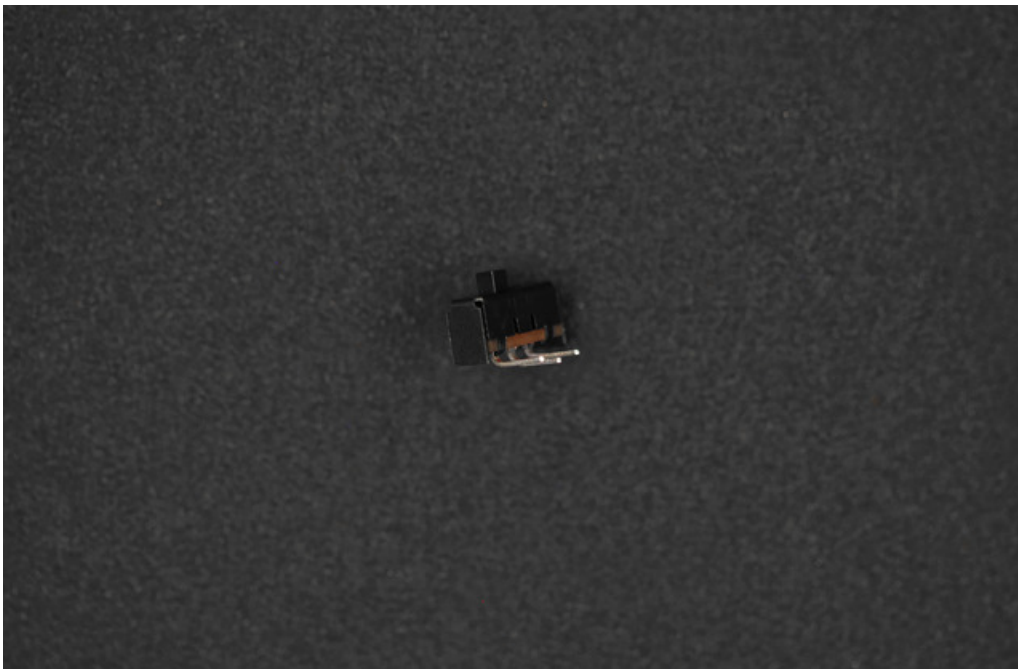
If there's any string or artifacts left over from retraction and oozing, clean up the part by trimming them off using a pair of flush snips.

Assembly



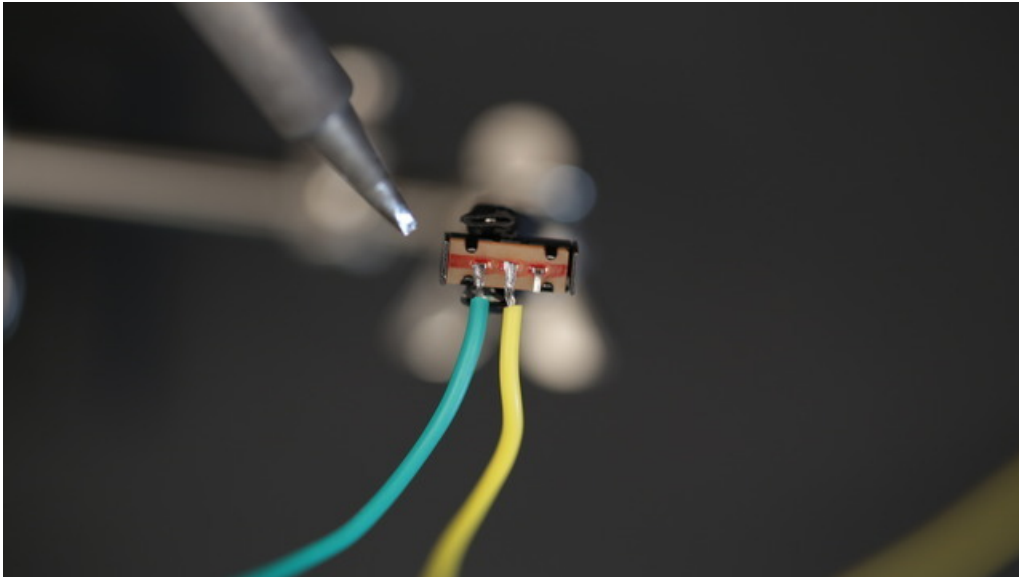
Wire length

Measure each wire so that you have enough slack to reach the PowerBoost while the lid is open. Take note of the position of the lid, PowerBoost and slide switch.



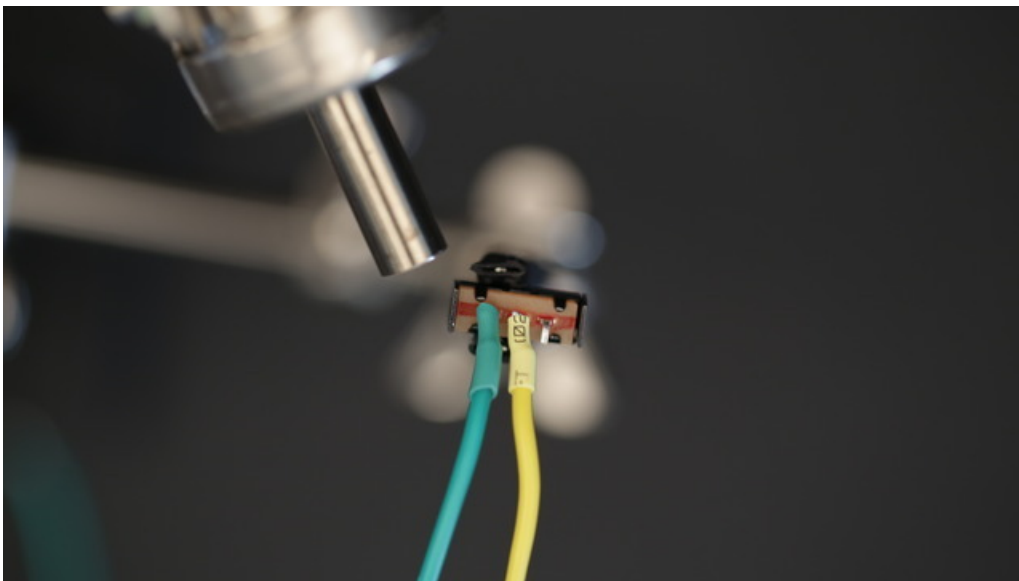
Bend slide switch leads

To make room for the slide switch, we'll need to bend the leads upward so they can fit inside the enclosure. Use flat pliers to bend all three leads upwards and cut off the excess.



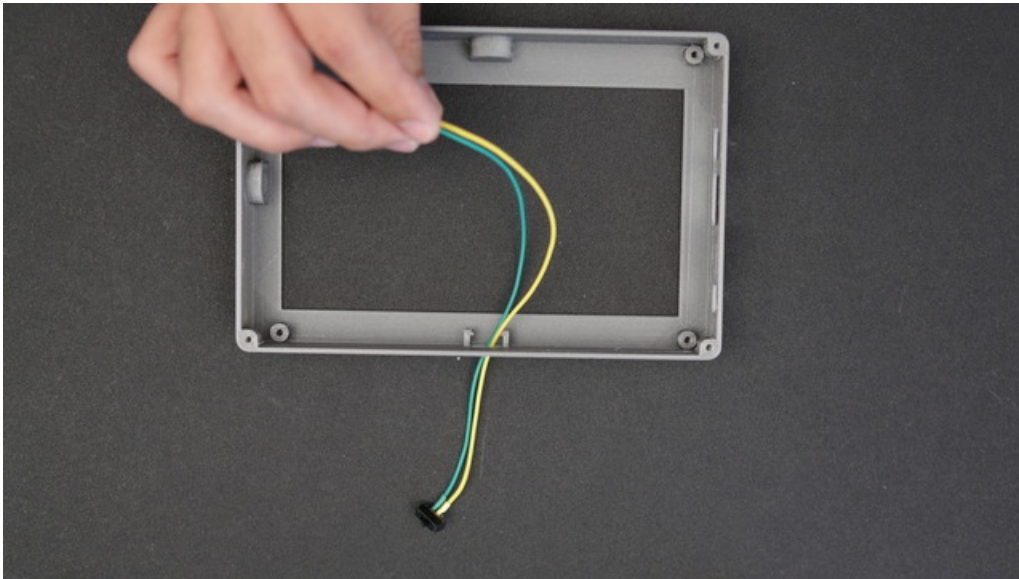
Tin and solder switch

Add solder to both the wires and leads on the slide switch.



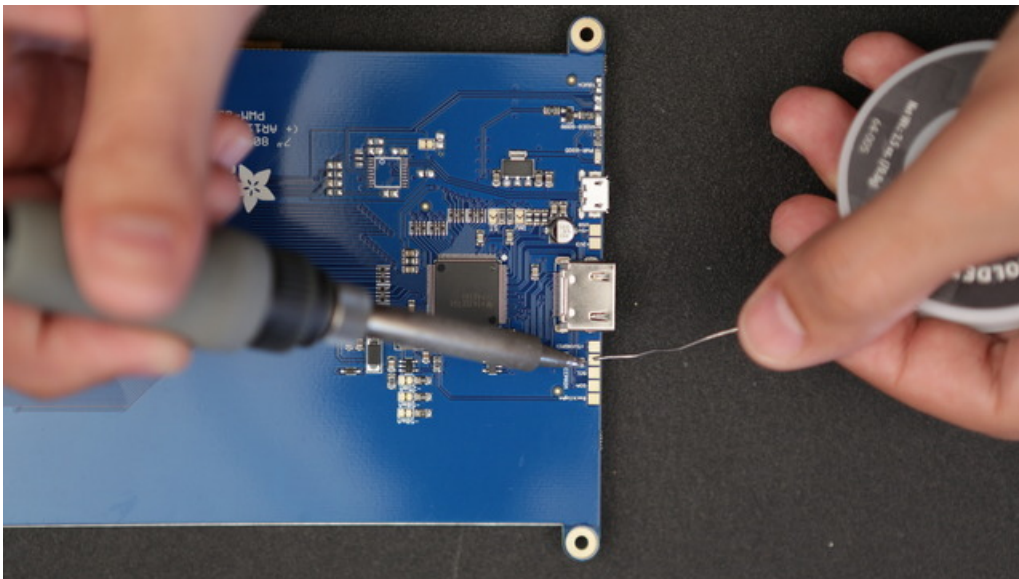
Heat shrink

Cover the soldered leads with heat shrink tubes and apply heat with something like a [Hot Air Station](http://adafru.it/1869) (<http://adafru.it/1869>).



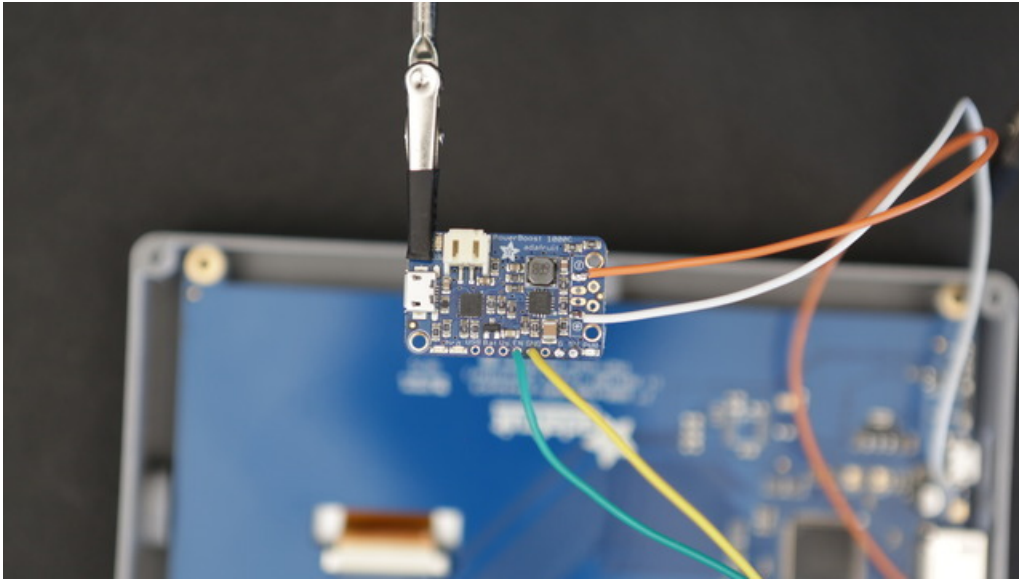
Mount slide switch

Thread the slide switch wires through the middle port opening. You may need to widen the port depending on your printer tolerance. It should snap into place with a bit of force.



Tin and solder monitor pads

Apply a small amount of solder to the **GND** and **+5V** pads on the backpack.

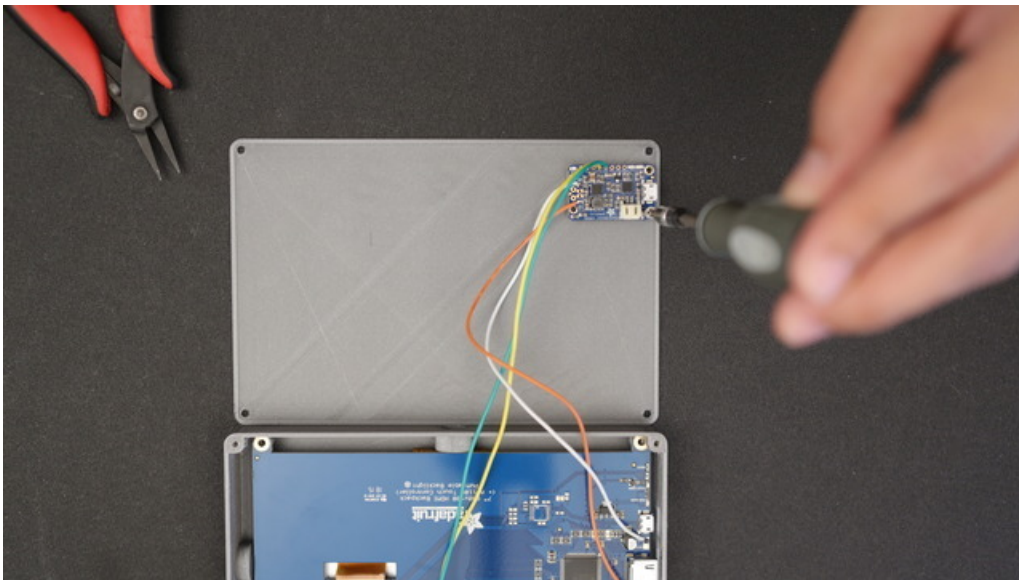


Solder PowerBoost

Tin and solder the **+5V** from the monitor to the **+** on the PowerBoost. Connect **GND** on the monitor to the **-** pin on the PowerBoost.

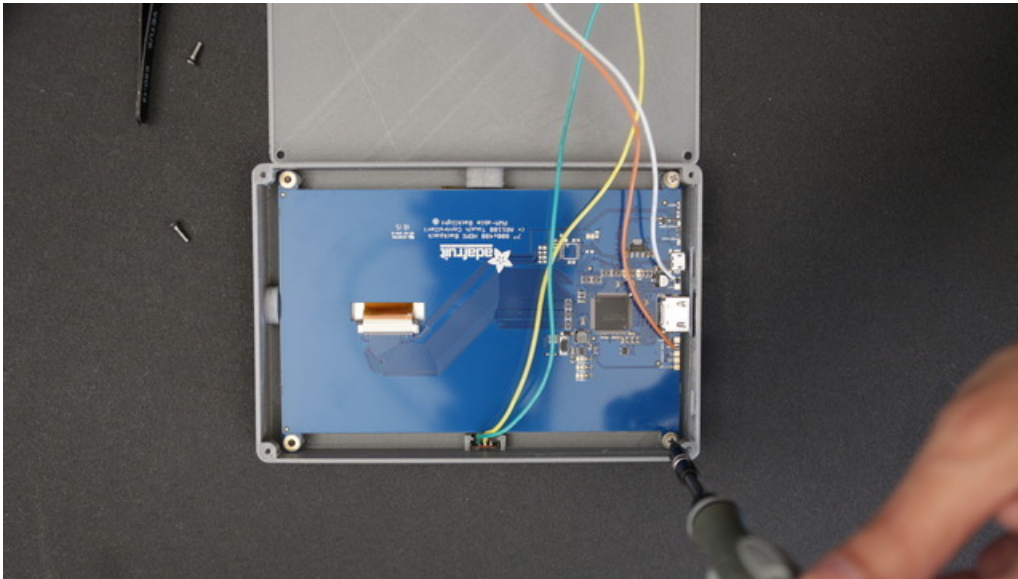
Connect Slide Switch

Solder **EN** and **GND** on the PowerBoost to each lead on the slide switch.



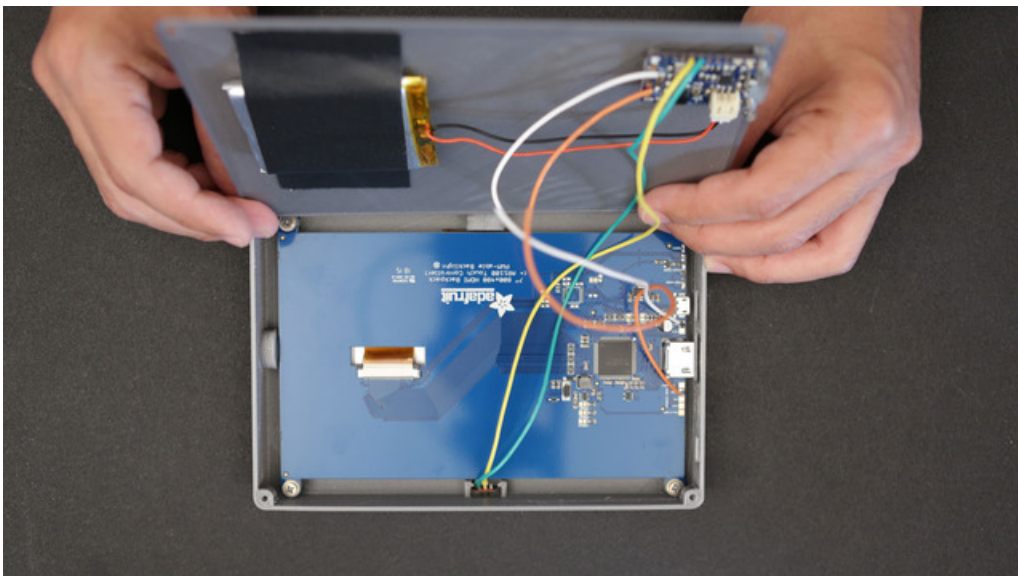
Mount PowerBoost

Use #4-40 screws to attach the PowerBoost to the **Lid** part of the enclosure.



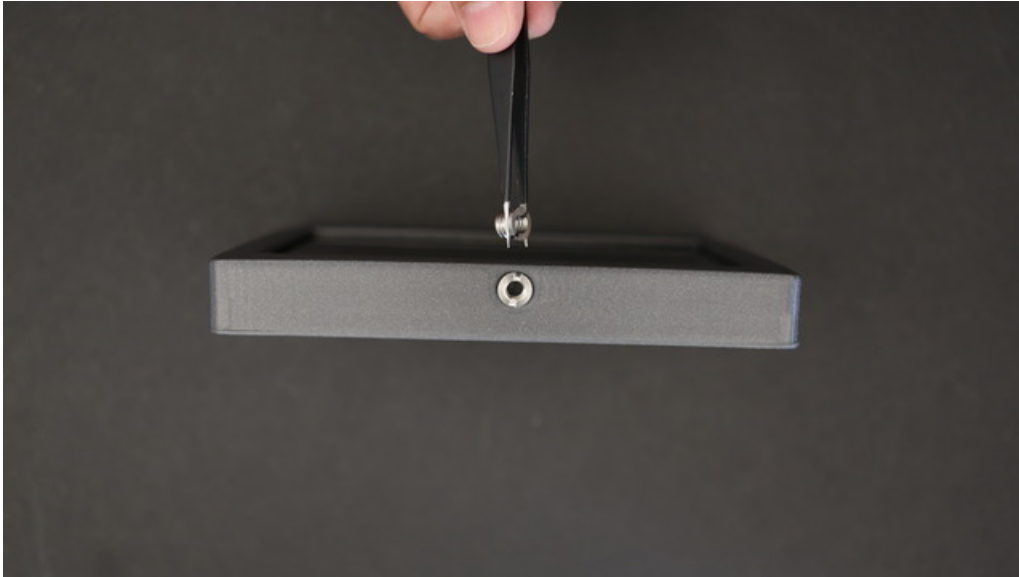
Mount monitor

Use four more #4-40 screws to secure to monitor to the inside of the enclosure.



Attach Battery

Use a piece of gaffers tape to secure the battery to the Lid. Use another set of #4-40 screw to attach the Lid to the enclosure.



1/4-20 Tripod screw

To attach the monitor to a tripod, we can use a thread adapter with female 1/4" thread to male 3/8" thread. There are two slots on the enclosure to add the thread adapters to allow portrait and landscape setups.





Camera battery powered

To power the monitor through regular camera batteries like a canon, nikon or panisonic; check out the guide for adding a UBEC DC/DC Step-Down Converter:

<https://learn.adafruit.com/diy-camera-monitor/circuit-diagram> (<https://adafru.it/j8a>)