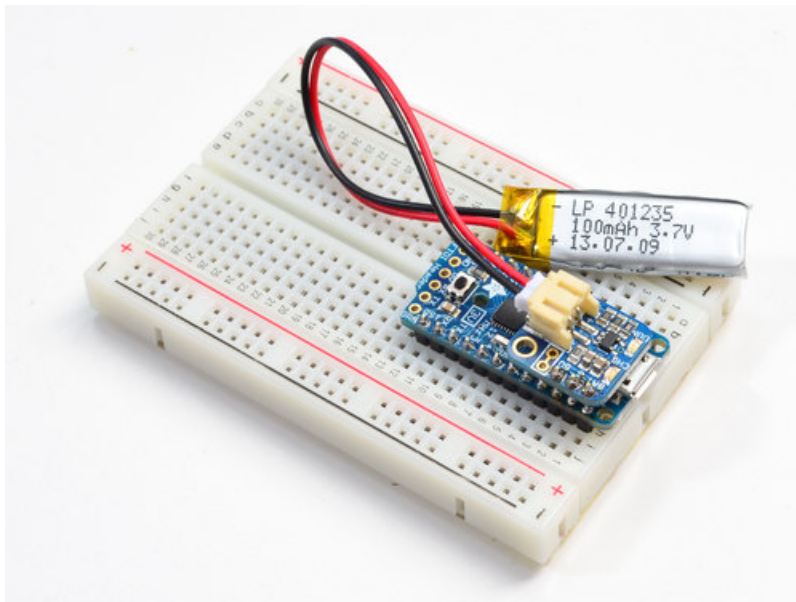


Adafruit Pro Trinket LiPoly/Lilon Backpack

Created by lady ada

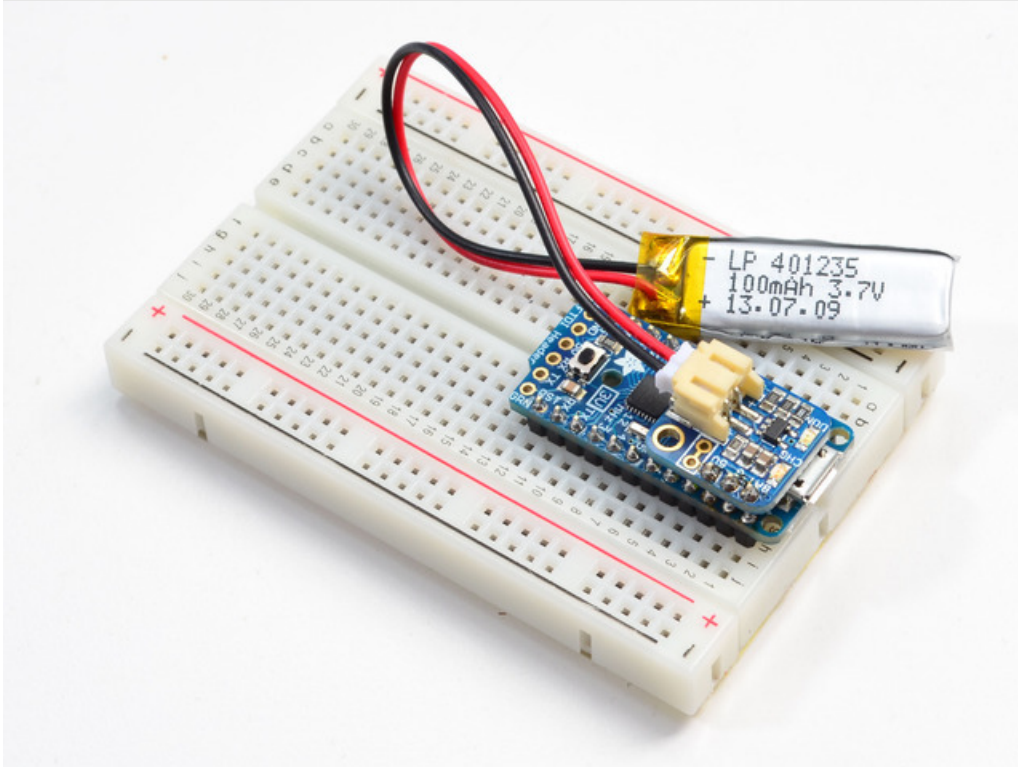


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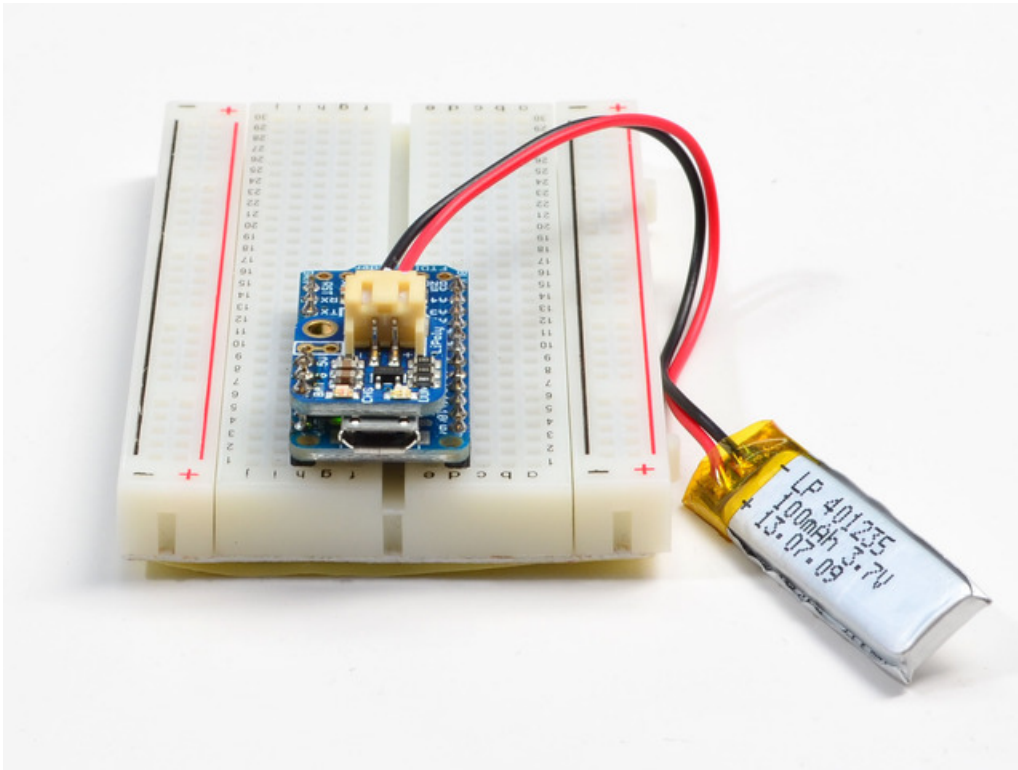
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Overview

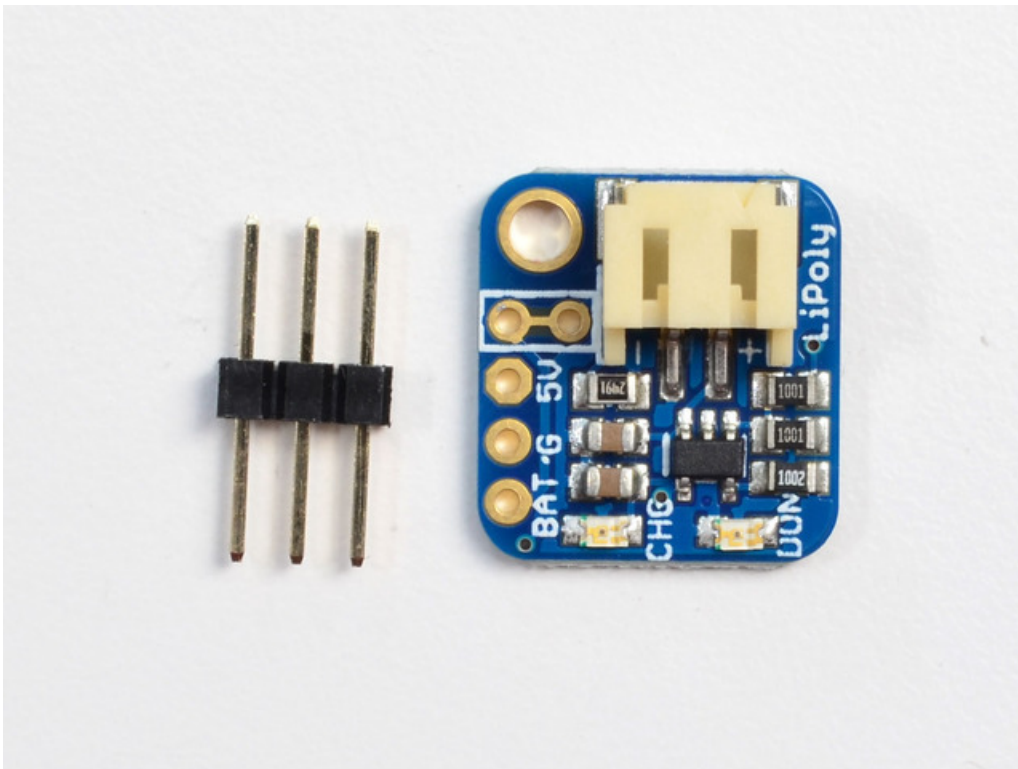


If you have a Pro Trinket you probably know it's the perfect little size for a portable project. This LiPoly backpack makes it really easy to do! Instead of wiring 2 or 3 boards together to make a charging system, this little PCB sits on top of the Pro Trinket and allows a LiPoly/Lilon battery to plug in. When the Pro Trinket USB port is powered, the battery is recharged automatically. Unplug the USB port and the Pro Trinket will switch over to the rechargeable battery.

It does not work with normal Trinkets. However, you *can* use it with our [Adafruit Sound FX board series \(https://adafru.it/rd9\)](https://adafru.it/rd9)!



Ideally, this backpack is for use with the 3.3V Pro Trinket, so that the battery voltage (3.7V-4.2V) will get regulated down to 3.3V on the Pro Trinket board. However, many times, you can run a 5V Pro Trinket + accessories off of the ~4V from the LiPoly battery with no problem. (Technically its overclocking but we've never seen that affect the Pro Trinket itself, AVRs are happy to overclock without complaint).

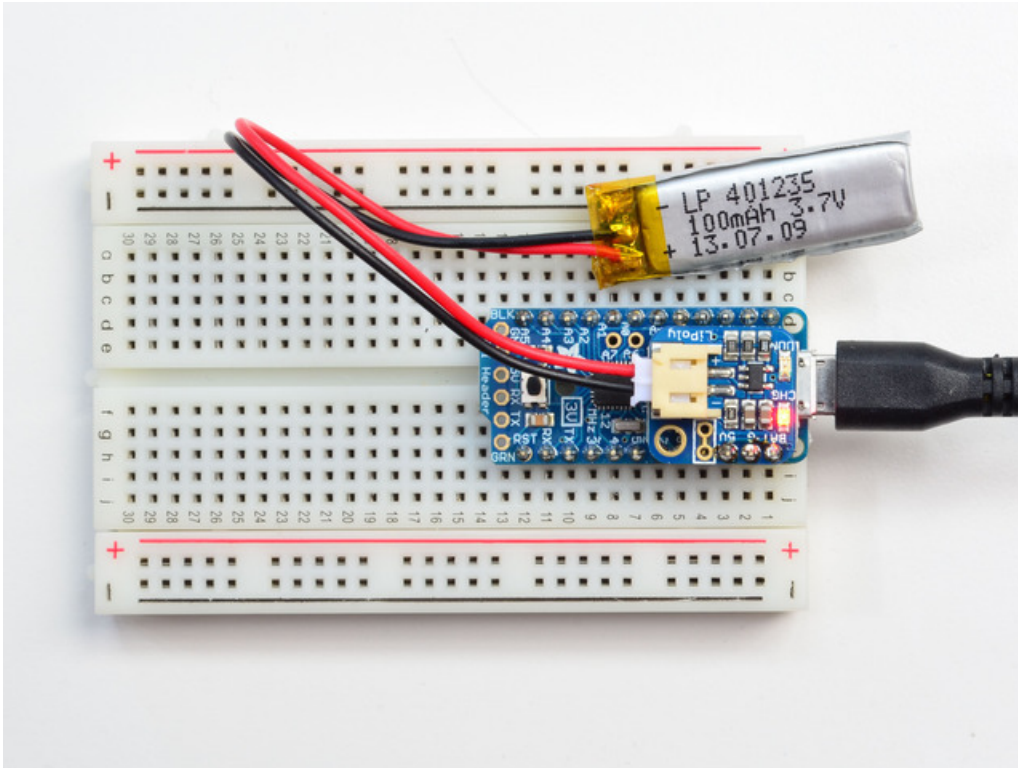


Solder the backpack on with the extra long header so that it can still plug into a breadboard, or clip the long header

leads short afterwards for a slim package.

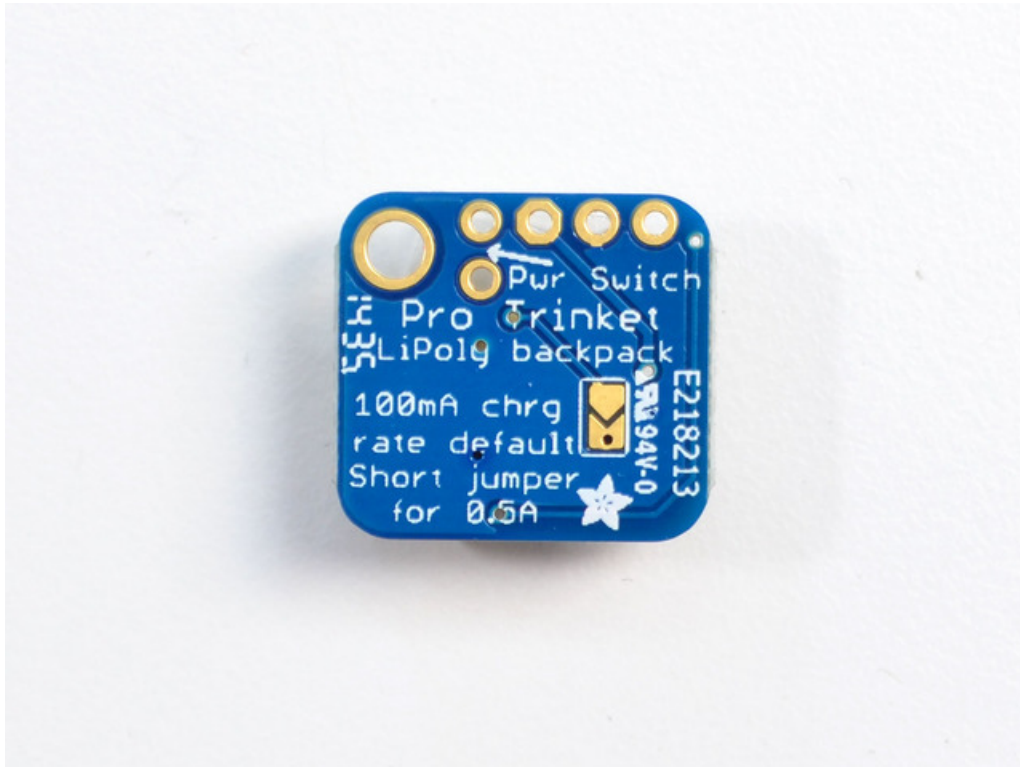
There are two LEDs - one red and one green. While charging, the red LED is lit. When the battery is fully charged and ready for use, the green LED turns on. Seriously, it could not get more easy.

Please use care when assembling to make sure the bottom of the PCB including the solder jumper doesn't rest on the microUSB connector and possibly short to ground. If you want to rest the backpack onto the micro USB connector, cover up the jumper with kapton tape.



If you want to add an On/Off switch, we also made that really easy. The two 0.1" holes with a box around them are the battery output line. Carefully cut the trace between them with a hobby knife and [replace with two wires from a switch like this slide switch \(https://adafru.it/drN\)](https://adafru.it/drN), or [this pushbutton one \(http://adafru.it/1683\)](http://adafru.it/1683), for example.

Charging is performed in three stages: first a preconditioning charge, then a constant-current fast charge and finally a constant-voltage trickle charge to keep the battery topped-up. The charge current is 100mA by default, so it will work with any size battery and USB port. If you want you can easily change it over to 500mA mode by soldering closed the jumper on the bottom, for when you'll only be charging batteries with 500mAh size or larger.

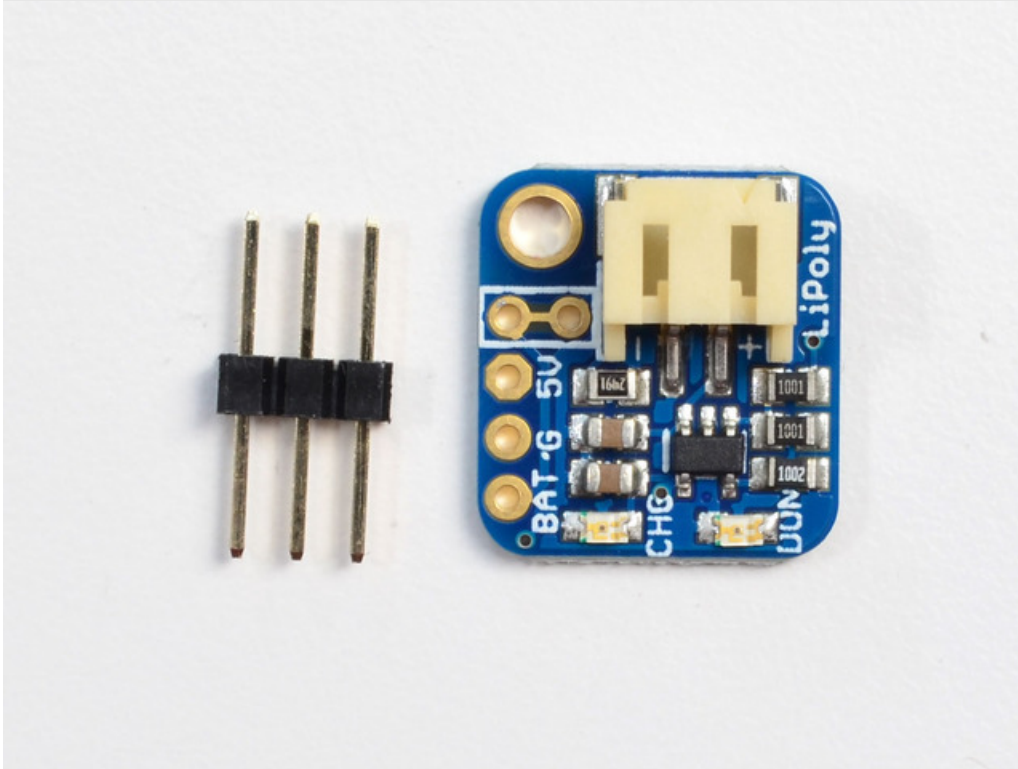


For use with Adafruit LiPoly/Lilon batteries only! Other batteries may have different voltage, chemistry, polarity or pinout.

- Comes assembled and tested
- Uses the 5V input via Micro-B USB connector on the Pro Trinket
- For charging single Lithium Ion/Lithium Polymer 3.7/4.2v batteries (not for older 3.6/4.1v cells)
- 100mA charge current, adjustable to 500mA by soldering a jumper closed

Batteries (<http://adafru.it/258>) not included.

Pinouts

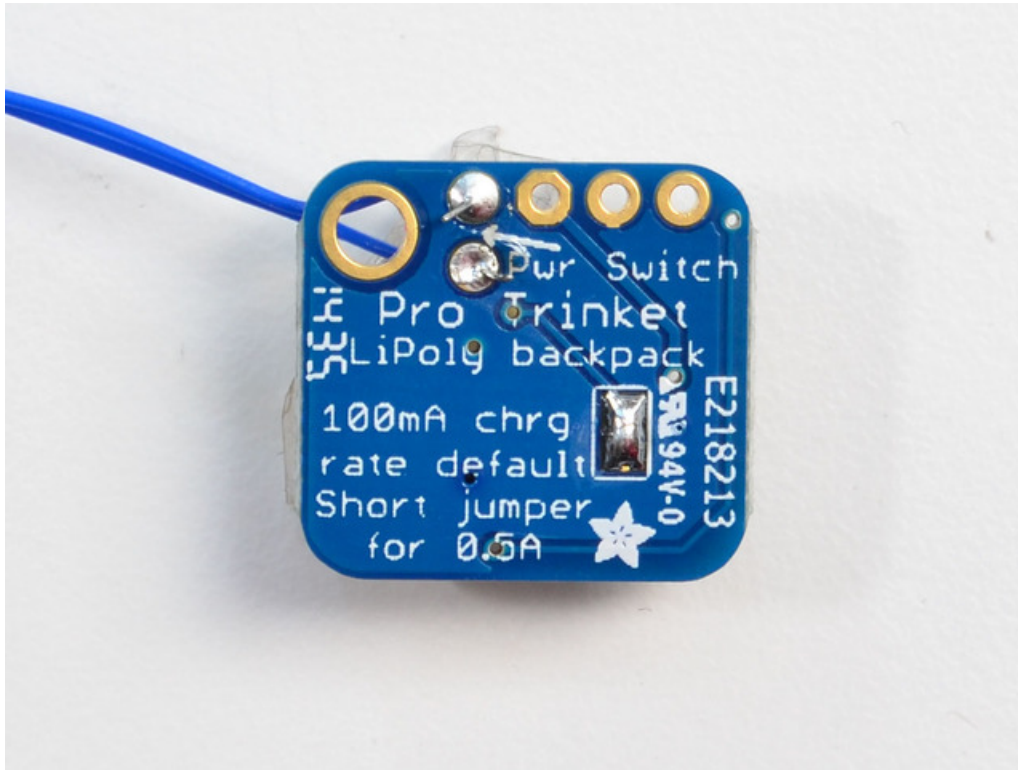


This little backpack is very "short & sweet" when it comes to pinouts:

- **5V** - this is the pin that comes from the USB port power, with 5V DC to charge the battery.
- **G** - this is the common ground pin, shared with the battery and charger
- **BAT** - this is the voltage out from the battery, which will range from 3.2V when the battery is dead to 4.2V when it's charged.

Adjusting Current Rate

The default current rate is 100mA, which is safe for any battery 100mAh or greater capacity. If you're going to be using larger batteries, you may want to bump up the charge rate for faster charging. Easy! Just solder the jumper on the bottom of the board as shown here:



LEDs

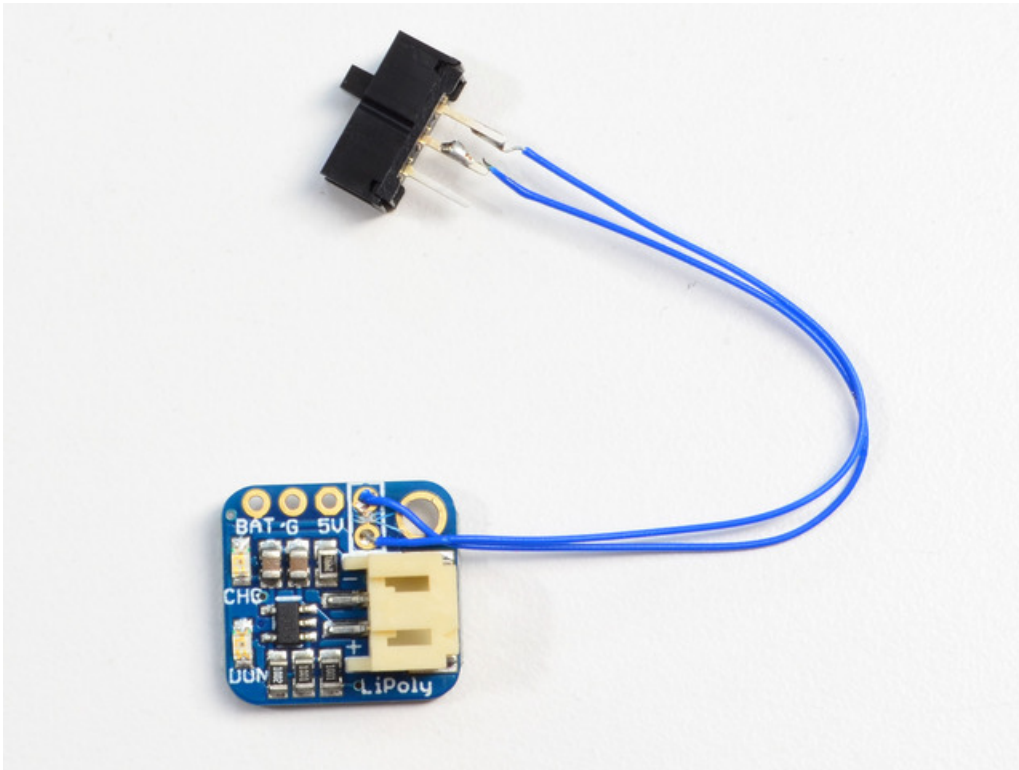
There's two LEDs on the backpack

- **CHG red LED** - This LED is lit when the battery is being charged.
- **DON green LED** - this LED is lit when the battery is done being charged (charge complete)

When the backpack is installed on the Pro Trinket, but not charging, you may notice these LEDs faintly glowing. That's a side effect of a slight current leakage through one of the protection diodes on the Pro Trinket. It's not harmful at all and you can basically ignore it.

Optional Switch

If you want to have an on/off switch for your project, it's a quick mod. The line from the battery to the VBAT pin has a 0.1" breakout with a thin trace in between. Cut the trace between the two outlined pins and solder a switch in place. The switch is current-carrying so make sure it can handle the current draw you're expecting



Downloads

Files & Datasheets

- [Datasheet for the MCP73831 charger chip \(https://adafru.it/dvn\)](https://adafru.it/dvn)
- [Fritzing object in Adafruit Fritzing Library \(https://adafru.it/aP3\)](https://adafru.it/aP3)
- [EagleCAD PCB files on GitHub \(https://adafru.it/pwD\)](https://adafru.it/pwD)

Schematic

