

Done in a Day

Build a portable DC power supply with Power Tool Batteries.

Bruce E. Hall, [W8BH](#)

Introduction.

It started with a cordless drill: a nice, contractor-style Makita drill. It came as a Christmas bundle with an impact driver, charger, and two batteries. Later I needed portable tire inflator. I opted for a Makita since it uses the same battery. In following summer I needed a string trimmer, so you know which one I purchased. Makita got me.

DeWalt, Bosch, Milwaukee, Ryobi, Power-Cable, etc, all offer power tools with interchangeable batteries. I now have 5 or 6 batteries. It occurred to me that they would make a decent DC power supply. True, these batteries don't use standard jacks, and the nominal 18V output isn't useful for many projects, but obstacles like that are good reasons to build my own supply.

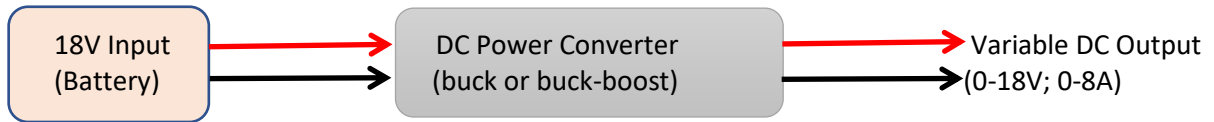
This article describes a quick and easy power supply that puts those power tool batteries to good use. Best of all, this project can be done in a day.



Bill of Materials

ITEM	SOURCE
18V Li-Ion Battery	Home Depot, Online
Battery Adapter	Amazon "Power Wheels Adapter"
DC Power Converter	DROK Power Converter (Amazon)
Anderson Powerpole Connectors	Powerwerx
2.1mm panel mount DC Jack	Adafruit #610
Misc: Wire, Enclosure, M3 hardware	

The project is quite simple indeed:



Perhaps the most interesting component is the battery adapter. The adapter I am using, at left, is compatible with Makita and Bosch batteries. You will need to obtain an adapter compatible with your batteries. A [Dewalt adapter](#) is shown below.



The next item is the DC power converter. I am using a module from DROK, which is an older-model buck converter. It can produce 0-18V at constant voltage or 0-8.1A at constant current. The display indicates output voltage and current, and, if desired, energy output in Wh. On the back of this unit are screw terminals for Battery input (+,-) and converter output (+,-)

The only remaining parts are the output jacks. I chose a DC barrel jack and Powerpole connectors, wired in parallel, but the choice is yours. Perhaps you'd prefer banana jacks or a USB jack instead.

The enclosure requires the most time. The case should be sturdy and provide adequate ventilation. I made a 3D printed enclosure because I just got a 3D printer, and now everything on my workbench looks like it needs a 3D printed accessory. I posted the design to my [Thingiverse account](#).

Step-by-step construction.

1. The enclosure body is mounted on top of the battery adapter by drilling holes in each and securing with three 8-32 screws/nuts. The photo at right shows the battery adapter shoe on bottom and the rectangular enclosure on top.

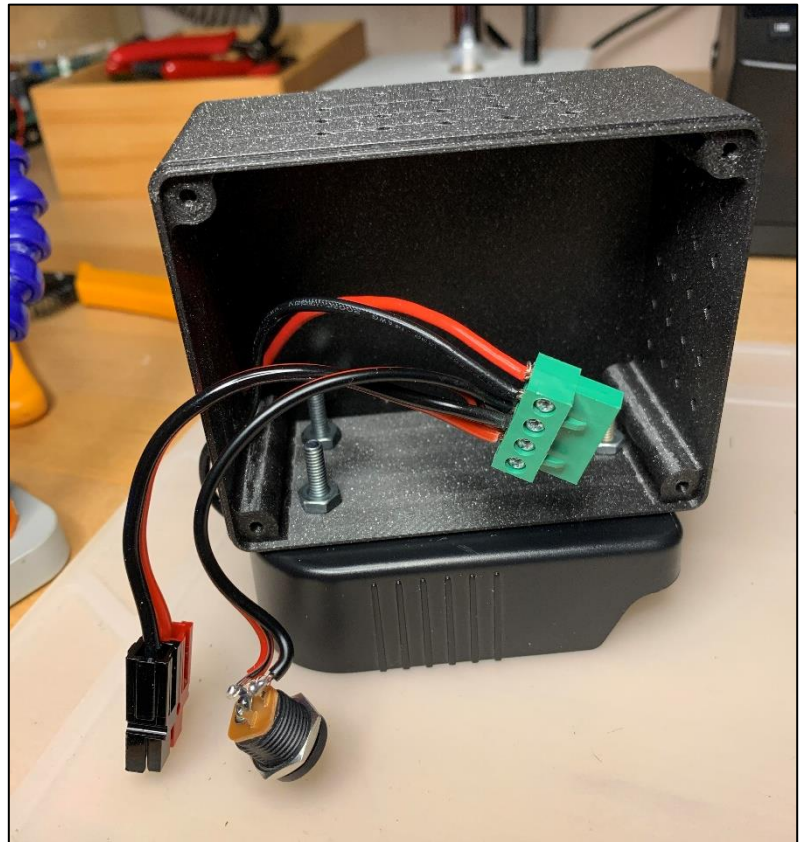
2. The red (+) and black (-) battery adapter wires feed into the enclosure and attach to the green terminal strip of the power converter.

3. The output terminals of the terminal strip are wired to the barrel jack and Powerpoles with two 4" lengths of red/black wire.

4. The power converter module and DC barrel jack are mounted to the front panel. The green terminal strip plugs into the back of the power converter.

5. The front panel is mated to the enclosure body with four M3 screws.

6. The battery adapter slides onto the top of the battery and snaps in place, just like a power tool would.



Enclosure Mounted on Battery Adapter

73,

Bruce.