Chapter 5 – Adding an External Power Supply and Why I Use Barrier Strips

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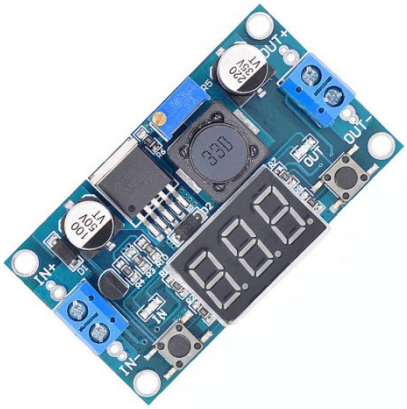
So far we have powered our Arduino through its USB connector attached to a USB port on our PC. This is fine for early development, but when it comes time to move your project away from your PC, you will need to power it another way. And even during development you may want to add an external power supply because the USB power may not be enough for current-hungry devices like motors. So, what do I do?

I like to power my projects with "wall warts". You are probably familiar with these over-sized adapters that take wall power (120V AC) and convert it into direct current at a lower voltage. They power things like DVR players, cell phone chargers, gaming systems, electronic keyboards, answering machines, printers and many other devices, and are available from AMAZON. It is difficult to recommend a specific one, because AMAZON's stock changes so frequently; it is not uncommon to find that a power supply I purchased one month to be unavailable the next. Just for the record, my most recent power supply purchase included one with an AMAZON ASIN of "B07VBR327W", but by the time you read this, that specific unit probably will be unavailable, but you will have options.

When I want a wall wart, I visit AMAZON and do a search. In my most recent search for "12VDC Power Supply", I got over 90K hits; even when I limited the results to 4 stars or higher there were still over 40K hits. I added "24W" to the search criteria (at 12VDC this is 2 amps), and again filtered on 4 star reviews which garnered about 3K hits. My experience is that most any of these would meet the need, so I decided how many I wanted and made a purchase. Just be careful that the description says 12VDC as the output, and it says 2 amps; AMAZON often give you options that do not exactly meet your search criteria.

When I get a power supply, I immediately cut off the connector at the end of the wire. I strip back the outside insulation about 2 inches and expose the positive and ground wires. I strip off about a quarter inch of these wires and solder on spade connectors (AMAZON ASIN: B00PFB2QGU, but there are many other

options). I connect the spades to a 2 position terminal block such as AMAZON ASIN B06W57X4MP. I plug it in and test the voltage. The positive wire is usually red and the ground wires is usually black, but use your volt meter and make sure. The recommended voltage is between 7 and 12 volts, and although the specification says Arduinos can handle up to 20VDC on input, if your new supply is much higher than 12VDC you might want to consider a "buck converter" (AMAZON ASIN: B07WQJ2GD6) to regulate the voltage.



When connecting the power supply to the Arduino, I take some 24 gauge red and black wires, solder on spade connectors and connect the power to the Arduino's VIN (Voltage Input) and GND (Ground) pins. You should be "good to go" for power in just about any model railroad situation you might encounter with your Arduino.

One more thing: remember that the output pins on an Arduino are limited to 40 milliamps, so if you want to power some high-current output device, it's best to power it through a relay.