

Using a PC power supply as a power source

Sometimes it is handy to operate your field equipment from the mains but dedicated power supplies can be expensive. An economical alternative is a PC power supply. These can provide outputs of 3.3, 5 and 12v at several Amps. This makes them particularly useful for powering chargers, motors and electronic items without having to charge your field battery or power pack.

A PC power supply is a self-contained unit attached to a number of wire looms and connectors. These power the various electronic circuits, fans and disk drives within your PC. The wires are colour coded to indicate the supply voltage that they are carrying. Most power supplies will have a label on the side showing the voltages and current rating of each coloured wire. You may find one or two additional wires, which are used to switch the PSU on and off. Modern processors and computer systems are more power-hungry than some of the older models, so these will often have a more powerful power supply unit.

My own supply came from a new 2Ghz PC, which belonged to a friend of mine. The supply had developed an annoying whistle, so he decided to replace it. I managed to scrounge the old one off him and set about turning it into my workshop PSU. The whistle only occurs when the 5v output is loaded, but as I will mainly be using the 12v supply, the whistle is not much of a problem. My unit is made by Q-Tec and is the 400w Dual Fan Gold model.

Here is a chart of the various voltages produced by this PSU.

Output Voltage / Function	Peak Current	Max Current	Wire Colour
+3.3v	20A	14A	Orange
+5v	30A	25A	Red
+12v	16A	12A	Yellow
-5v	1A	.5A	White
-12v	1A	.5A	Blue
+5v sb	2A	-	Purple
0v	<i>All voltages are specified relative to 0v</i>		Black
Power Good	<i>Used to indicate that unit is "on"</i>		White
PS-On	<i>Connect to 0v to switch PSU on.</i>		Green

For the supply to operate it needs to be connected to the mains via an IEC plug and the green wire needs to be connected to 0v. I have heard that some PSUs will only provide an output on the 12v wire if the 5v circuit is loaded. If this is the case with your unit, I suggest you try connecting a resistance of a few tens of ohms between the 5v supply and 0v.

The connectors can all be cut from the wiring loom once you have identified the different voltages present. I suggest that you double-check the voltage on each wire using a multi-meter. The wire colours may differ from those on my unit, so compare them by referring to the diagram below. This shows how the wires are arranged on my largest power connector.

Main Power connector

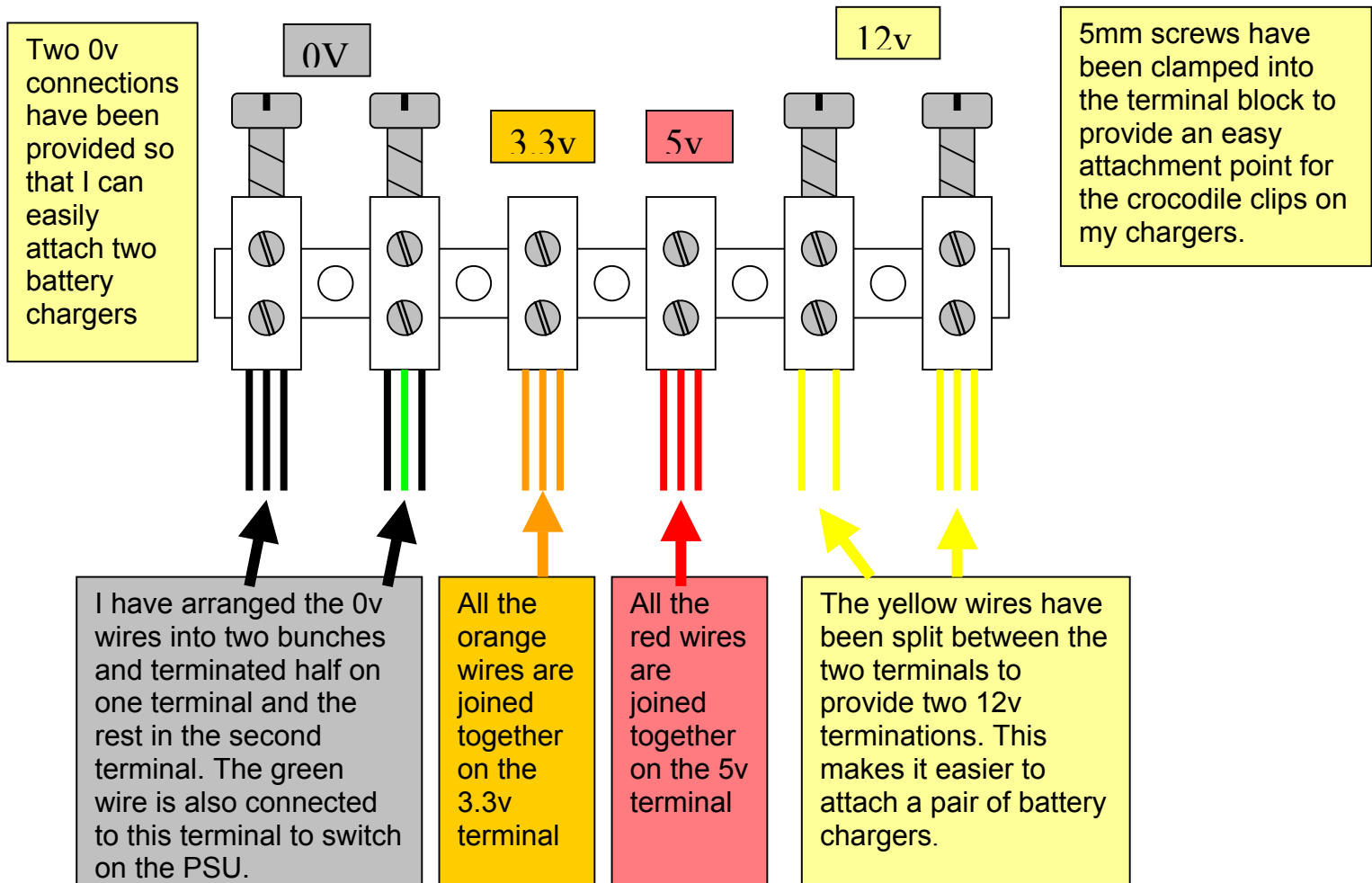
Red	Red	White	Black	Black	Black	Green	Black	Blue	Orange
Yellow	Purple	Grey	Black	Red	Black	Red	Black	Orange	Orange

Viewed with from the wire side with the retaining catch above.

The most useful outputs are +12v, +5v and +3.3v. I am sure that I can find a use for the others but have not used them yet.

Each coloured wire comes from the same point on the power supply circuit board as all the other wires of the same colour, so it makes sense to join them together to share the current supplied by the unit. I use my PSU to supply two chargers, so I have split the yellow (+12v) and black wires (0v) between two terminals. This makes it easier to attach the crock clips when running both chargers together. For a really professional job you could mount some 4mm binding posts on the case and run the wires internally.

My method was not quite as elegant but it does the job. I have screwed a 15 amp terminal block to the outside of the case and terminated the wires as shown below.



The unused output wires from my PSU have been cut and the ends insulated, so that they can be brought into service if ever I can find a use for them. They form part of the main loom, which has been cable tied to keep things tidy.

In use

The power supply is great for charging nicads using my field chargers and saves me the hassle of discharging my field battery. The 5v and 3.3 v outputs are handy for running in new motors. *Leaving a sealed can motor running for a couple of hours at a low voltage really helps the brushes bed-in and mould themselves to the shape of the commutator for minimum resistance and maximum power.*

My PSU has quite an effective over-current trip. This can cut in when running a hot motor or if you accidentally short the terminals together. The trip will reset if you leave the unit unplugged for about 20 seconds. Do not expect all PC power supplies to be protected in this way so take care when connecting anything that could short or overload the unit.

Where to obtain your PSU

1. Ask among your friends or your companies IT department. I think you will be surprised at the number of dead or outdated PCs gathering dust in attics and store rooms.
2. Check out the computer section on the Ebay auction site.
3. Buy a new power supply – *a good source for these at reasonable prices here in the UK and US is www.ebuyer.com*

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www.homepage.ntlworld.com/fast.electrics