Breadboard Power Supply Guide

A breadboard power supply is a companion module, which provides 5 V, 3 V, and 12 V rails on a <u>solderless breadboard</u>. It is an extremely useful facility, which provides regulated voltage rails for project circuits. The module design is usually in the form of a plug-in, which connects onto the breadboard, and the power to the module usually comes from an adapter or USB port of a PC.

USB

Some modules provide a +5 V regulated output through a female USB socket to power other USB devices, which can be extremely useful. Some modules also allow the board to receive power through the same socket.

5V/ 3.3 V/ 12 V

Breadboard power supply modules are getting very popular in recent times, and there are many firms providing solutions depending upon the breadboard type. The most commonly available and widely used one is a small circuit board that connects above the breadboard and provides power to the voltage rails.

These modules are usually fixed dual output 3.3 V and 5 V regulated designs which cater for the most widely used TTL and CMOS based chips. However, some of the latest designs emerging have a variable power supply option. These provide an adjustable output voltage, which can be useful if you need 9 V, or 12 V, as motor driver circuits tend to run at those voltages.

5 V and 3.3 V are the most vital in projects, whilst 12 V is usually not as important since many people may already have a 12 V adapter.

Best Module

Apart from the usual eye-candy, such as LED lights, what should you be looking for in a power supply? The best power supply may have one or more of the following features.

The first thing you must look for is the type of short circuit protection it offers because there are bound to be mistakes in project circuits, and short circuits will happen. It is the nature of designing on a breadboard, and beginners tend to make many mistakes. Therefore, one needs a module that is very tolerant of short circuits. Hence, how quickly does it cut and restore the power is an important aspect to consider.

The voltage regulator that is employed, and whether it is able to handle over-current situations is very important. Many voltage regulators have built-in short-circuit protection circuitry, and thermal overload detection to prevent damage.

In a school environment, such modules need to have a hardy protection mechanism. If it simply dies after a short circuit, then it is not good. Alternatively, a kit that requires the *surface-mount device* (SMD) voltage regulators replaced frequently is also no good as it takes up too much of your time in repair.

USB Power

If you are powering the module from the USB port of a PC, what happens when there is a short circuit on the breadboard? Ideally, the best power supply will cut the power thereby protecting the computers power circuitry. However, some of the poor quality ones will not have this protection and risk damage to the computer. In a school environment, it is vital that there is adequate short circuit protection; otherwise, you could find all the computers in the class damaged within a single lesson!

The best module design also has to be one that does not use up too many breadboard tie points. If the module covers over too many tie points then that is wasteful and not cost-effective.

Homemade Power Supply

It is great fun to build your own breadboard power supply. If you want to make your own, using the most affordable components currently available, then the following article will help.

How to make a Breadboard Power Supply DIY

DIY projects like these are very popular as you may already have some of the components such as 5 V and 3.3 V regulators, a small prototyping board, and a couple of capacitors. Building your own power supply can be exciting and many hobbyists do just that, especially since it requires just a handful of commonly available components.

Kits vs. Readymade

Many of these modules come in a kit form, which is very exciting if you like spending the whole day soldering all the SMD components onto the board. However, just make sure you have good eyesight, as some of those components can be very small. In addition, you will also need some good quality tools to make a decent job of building the kit.

Where to Buy and Price

The current price of a breadboard power supply varies significantly, and there are many firms selling their own designs. Hence you can expect to pay anywhere in the region of £2.00 to £10.

The cheapest ones were on eBay and Amazon for as little as £2.00 including postage and they come from China. They are very popular products on eBay that many people are buying. These are readymade to save you time having to solder the SMD components.

Amazingly, it seems to work very well, and you can see more photographs of this in the following sections of this article.