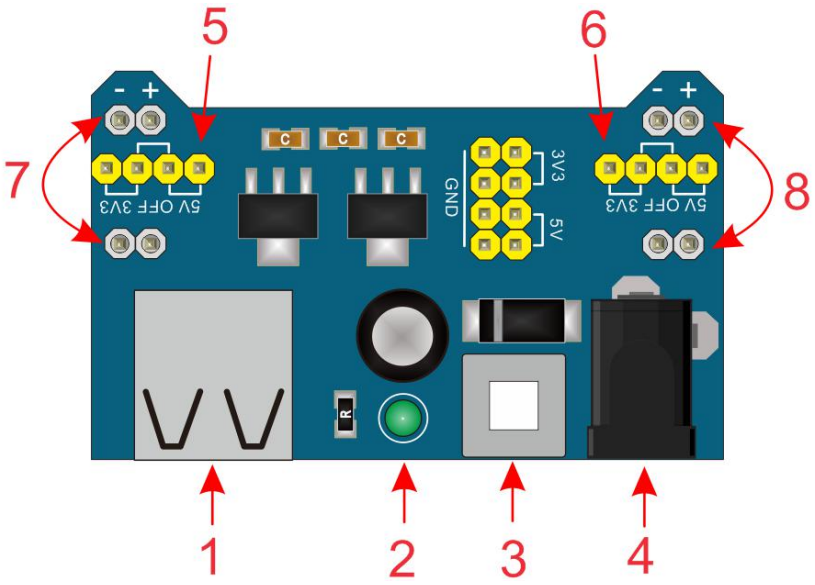
# 2.Breadboard power module and breadboard

## 1. Breadboard power module:

### 1.1 Application

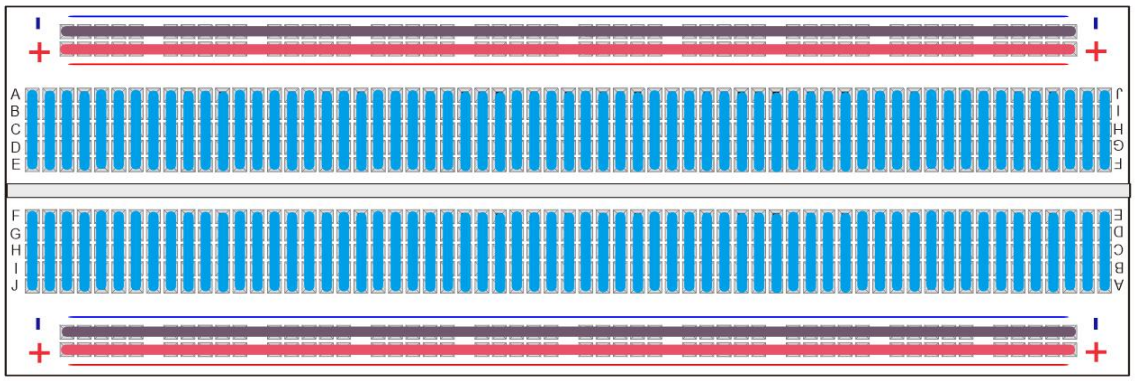
This is a power supply module designed for MB102 breadboards. It is powered by a 5V DC jack with an input voltage of 6.5v-12V. The module has a power button and power indicator LED on board. When you press the power button, the LED will brighten and the module starts working.
The module supports the output of 3.3V or 5V. Two circuits are set at top and bottom for separated control and output can be changed between 0V, 3.3V and 5V. You can connect the two rows of pins on the module for 3.3V/5V output, and the 5V USB Type-A port can be used to supply the MCU.

### 1.2 Specifications:

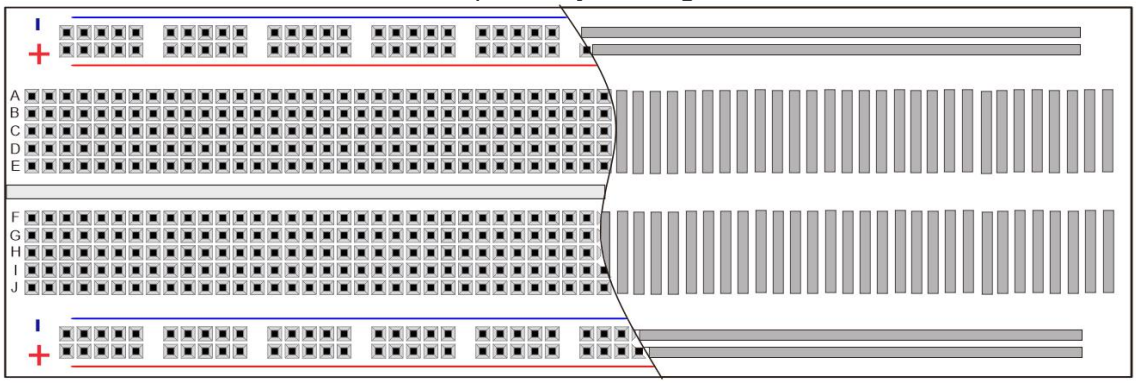



1. USB power supply port: 5V
2. Power indicator: When the DC interface is connected to the external power supply, the light will be on when the power switch is closed.
3. Power switch: control the connection and disconnection of the external power supply of the DC interface
4. DC power interface: DC6-12V power supply
5. Power pin header: by using the jumper cap you can choose the 7 power output is 3V3, 5V or off
6. Power pin header: by using the jumper cap you can control the 8 power output to 3V3, 5V or off
7. 3V3, 5V power output port: maximum output 1A current, can be directly inserted on the breadboard
8. 3V3, 5V power output port: maximum output 1A current, can be directly inserted on the breadboard
9. With this power module, you can do experiments and start learning in a more convenient and simpler way!

# 2. Breadboard:




explanatory drawing




Internal anatomy diagram

## 2.1 Uses of Breadboard:

A breadboard is used to make up temporary circuits for testing or to try out an idea. No soldering is required so it is easy to change connections and replace components. Parts are not damaged and can be re-used afterwards.

Breadboards have many tiny sockets (called 'holes') arranged on a 0.1" grid. The leads of most components can be pushed straight into the holes.

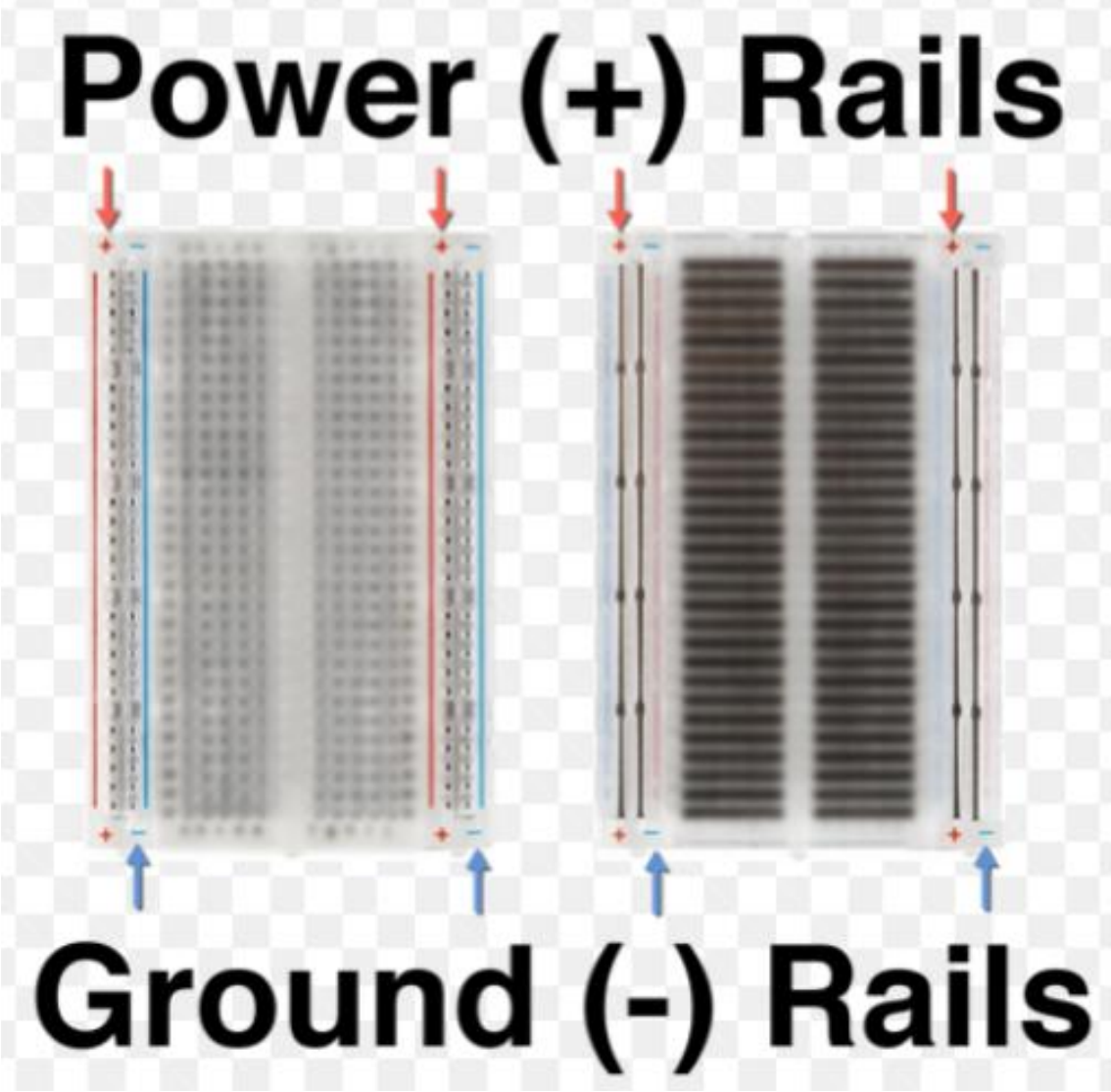
Note that the top and bottom rows of holes are connected horizontally and split in the middle while the remaining holes are connected vertically. For convenience of explanation and viewing, the relationship between the hole and the hole is indicated on the breadboard by three color lines.

As shown above, the holes on the same connected line are all connected, and the holes between the broken lines are not connected.

In the experiment, only the electronic components need to be inserted into the holes on the breadboard, and then connected through the DuPont line, a variety of interesting experiments can be realized.

For those new to electronics, breadboards are often the best place to start. They allow users to create a wide range of circuits — from very simple to incredibly complex — without having to commit to a layout or use a soldering iron.

Power Rails：

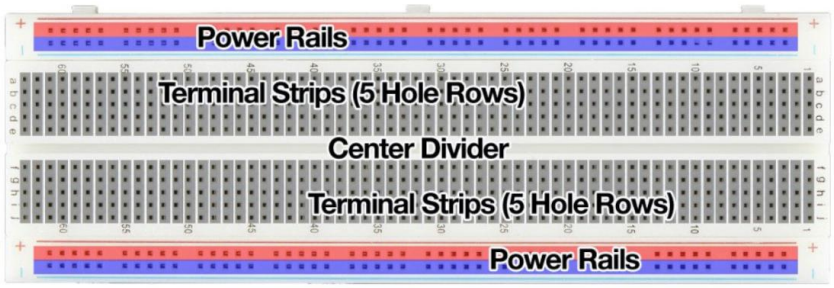



These power rails are metal strips that are identical to the ones that run horizontally, except they are, typically*, all connected. When building a circuit, you tend to need power in lots of different places. The power rails give you lots of easy access to power wherever you need it in your circuit. Usually they will be labeled with a '+' and a '-' and have a red and blue or black stripe, to indicate the positive and negative side.

It is important to be aware that the power rails on either side are not connected, so if you want the same power source on both sides, you will need to connect the two sides with some jumper wires.

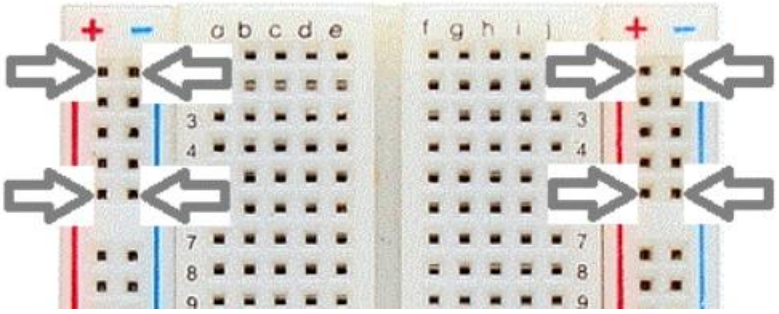
## 2.2 Rows and Columns

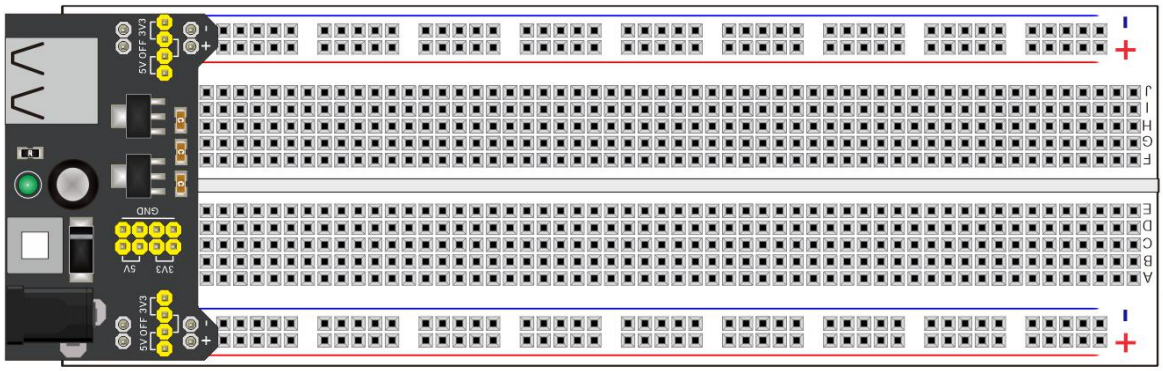
You may have noticed that many breadboards have numbers and letters marked on various rows and columns. These don't serve any purpose other than to help guide you when building your circuit. Circuits can get complicated quickly, and all it takes is one misplaced leg of a component to make the entire circuit malfunction or not work at all. If you know the row number of the connection you are trying to make, it makes it much simpler to plug a wire into that number rather than eyeballing it.




## 2.3 How to use a breadboard power module and a breadboard

Now we will install this breadboard power supply to breadboard. For this align bottom pins of breadboard power supply with outmost pins of breadboard like following:





Make sure that you align the module correctly on the breadboard. The negative pin(-) on module lines up with the blue line(-) on breadboard and that the positive pin(+) lines up with the red line(+). Failure to do so could result in you accidently reversing the power to your project.

On the circuit board, there are jumper pins so you can select the voltage rails you require. The left and right voltage output can be configured independently. To select the output voltage, move jumper to the corresponding pins. Note: power indicator LED and the breadboard power rails will not power on if both jumpers are in the "OFF" position. For example, I am choosing 3.3 V and 5 V rails each side. On the animated diagrams, you can see which side of the rails are for 5 V and which are for 3.3 V, based on the jumper pins.