

POWER FOR MICRO:BIT

The MonkMakes Power for micro:bit opens up lots of ways of powering your micro:bit.

This tiny board has a standard DC barrel jack socket at one end and provides a regulated 3.3V output that you can use to power your micro:bit using the JST battery connector attached to wires coming from the other end of the board.

You might want to use a MonkMakes Power for micro:bit board if you want to use a AC to DC adapter, solar panels, or other sources of power that are not the 3V or so that the micro:bit is expecting. The Power for micro:bit will accept an input voltage of 4.5 to 12V DC from its standard DC barrel jack socket and convert it into a pleasantly regulated 3.3V for your micro:bit.



The advantages of using a Power for micro:bit instead of say a USB 5V power supply are firstly that some USB 5V adaptors can cause problems with the micro:bit (see micro:bit's safety guidelines) and secondly because the micro:bit's battery connector is connected directly to the 3V alligator clip-able connector of the micro:bit, you can supply other things that are connected to the micro:bit with a lot more than the allowed 90mA. In fact you can supply up to 200mA (although the regulator will get hot at high currents — see warning below). This makes the board great for use with things like NeoPixel strips or servomotors that need a bit more current.

WARNING

Under normal use, if you are powering just your micro:bit on its own, the Power for micro:bit or more specifically the voltage regulator chip marked below will not even get warm.



However, if you attach something high power (like a string of NeoPixels) to your micro:bit then the voltage regulator chip will get hot. This is perfectly normal, it's just how linear voltage regulators work.

Exactly how hot it will get depends on two things:

The supply voltage – the lower the voltage you connect to the DC barrel jack of the Power for micro:bit, the less hot the voltage regulator will get. That's why we recommend using a 4.5 to 6V power supply or battery pack.
The current drawn by the extras that you connect to the micro:bit. The higher the current, the hotter the voltage regulator will get.

Temperature

Here are some examples of the kinds of temperature you might find. These tests were at 20 degrees C

6V power supply, micro:bit only – No rise in temperature at all

12V power supply, micro:bit only – rise of 4 degrees C (7 degrees F) therefore the temperature will be $20 + 4 = 24$ degrees C.

6V power supply, micro:bit + 30mA load – No rise in temperature at all

12V power supply, micro:bit + 30mA load – rise of 4 degrees C (7 degrees F)

6V power supply, micro:bit + 80mA load – rise of 4 degrees C (7 degrees F)

12V power supply, micro:bit + 80mA load – rise of 10 degrees C (18 degrees F)

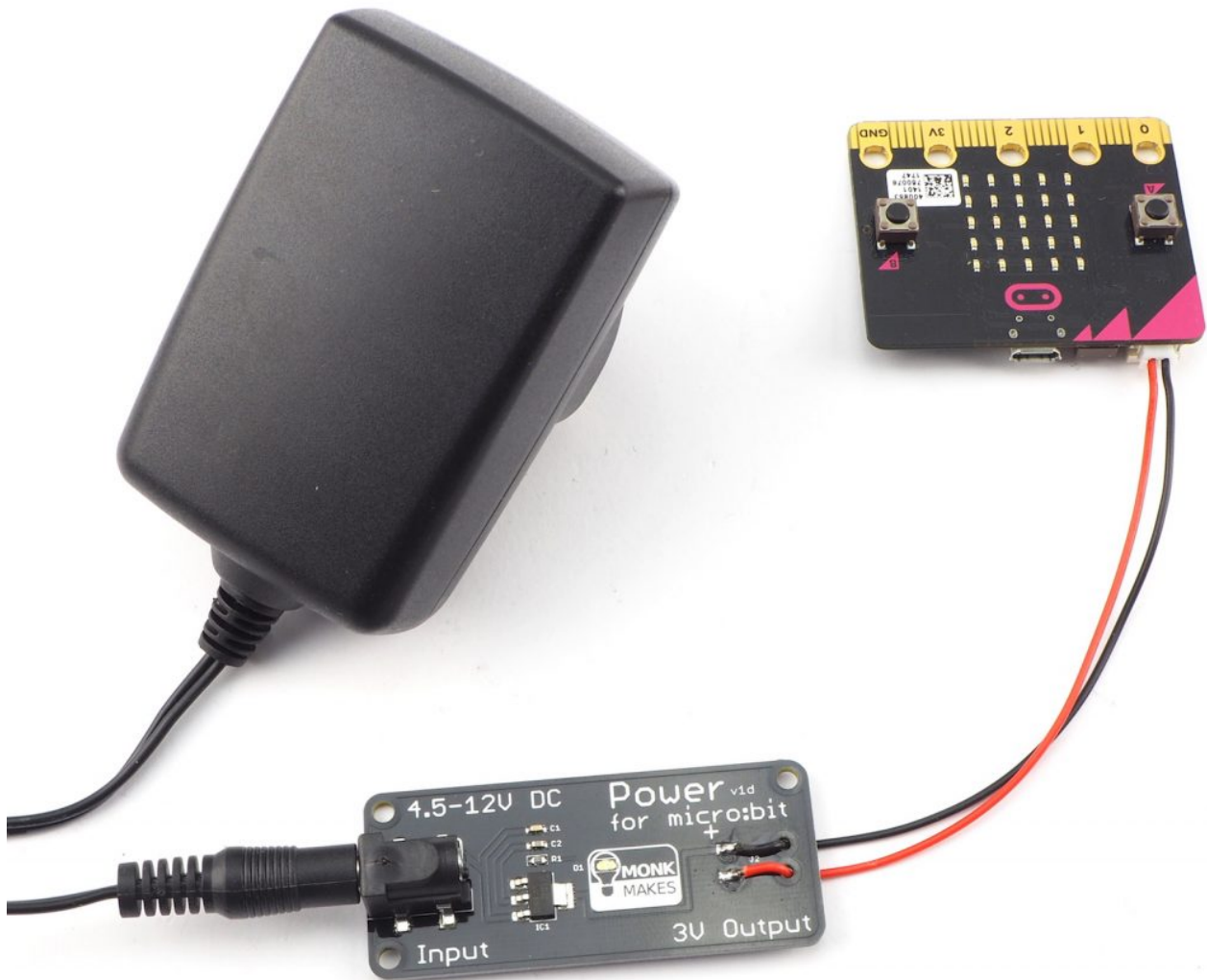
6V power supply, micro:bit + 200mA load – rise of 9 degrees C (16 degrees F)

12V power supply, micro:bit + 200mA load – rise of 25 degrees C (45 degrees F) and therefore the regulator could be as hot as 45 degrees C or hotter if you live somewhere hot.

We don't recommend using the Power for micro:bit to power loads more than 200mA.

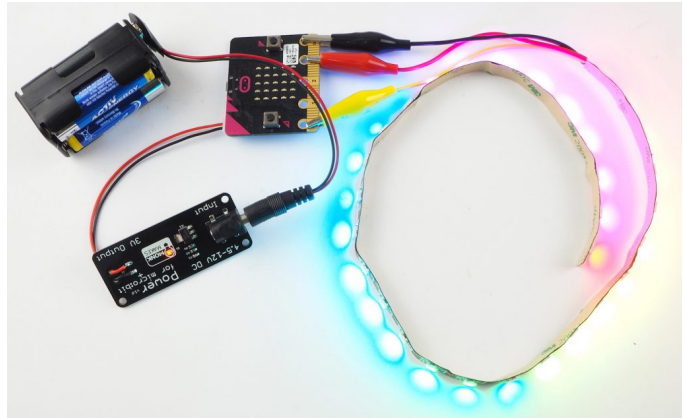
AC Power

If you need to power your micro:bit project for long periods of time, then you are going to get sick of changing the batteries all the time. By using an AC adapter (not included, but 6V recommended) you can power your micro:bit indefinitely.



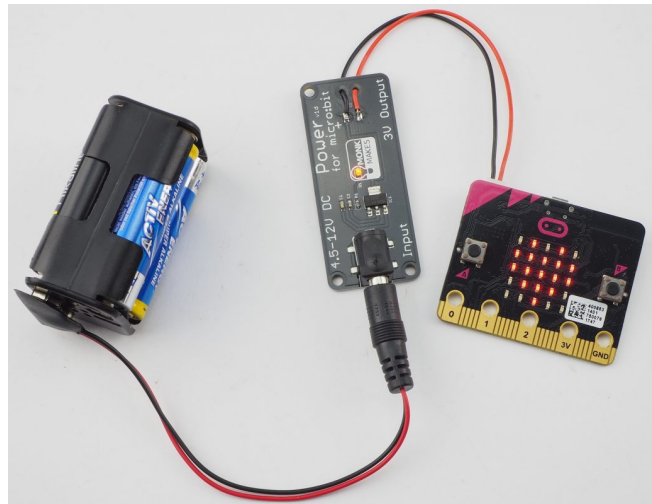
Higher micro:bit 3V output Current

When powered from USB power, your micro:bit can only supply a maximum of 90mA of current through its 3V connector. This means that powering Neopixel LED displays or servomotors that need more current, may not work, or be reliable. The MonkMakes Power for micro:bit boosts this maximum output current to a much more respectable 200mA. Enough to power far more Neopixels (the exact number depends on LED brightness) but you should be fine with 20 or 30 Neopixels if you drop the brightness a bit. If you try to draw too much current the regulator will reduce the current to protect itself from burning out.



Using Bigger Batteries

The standard AAA battery pack works well, but will only last for a few days of continuous use of the micro:bit. By using the Power for micro:bit with a bigger battery pack with a DC barrel jack (you can achieve much greater battery life). For example, using a 4 x AA battery pack should provide roughly 4 times the battery life that you would expect from an AAA battery pack.



Specification

Input connector: 2.1mm DC barrel jack connector positive center connector.

Output connector: JST-2.0mm on flying leads

Voltage regulator IC: LD1117-3.3V