

Introduction:

As of 2017, renewable energy accounted for more than 25% of energy produced in the UK every year, with environmental targets making this figure likely to increase significantly in the years ahead. Elsewhere around the world, renewable energy is making a far higher contribution to electricity generation already, and solar energy has the potential to play a big part in this global drive for a more sustainable future. It has been estimated that covering just a fraction of the Sahara Desert in solar panels would provide enough electricity to power the energy needs of the whole world!

Kitronik can help towards this goal, as by combining a few components and kits, it is possible to build a simple solar charging and power supply system for a variety of useful low power devices.

Construction:

The Solar Charging System:

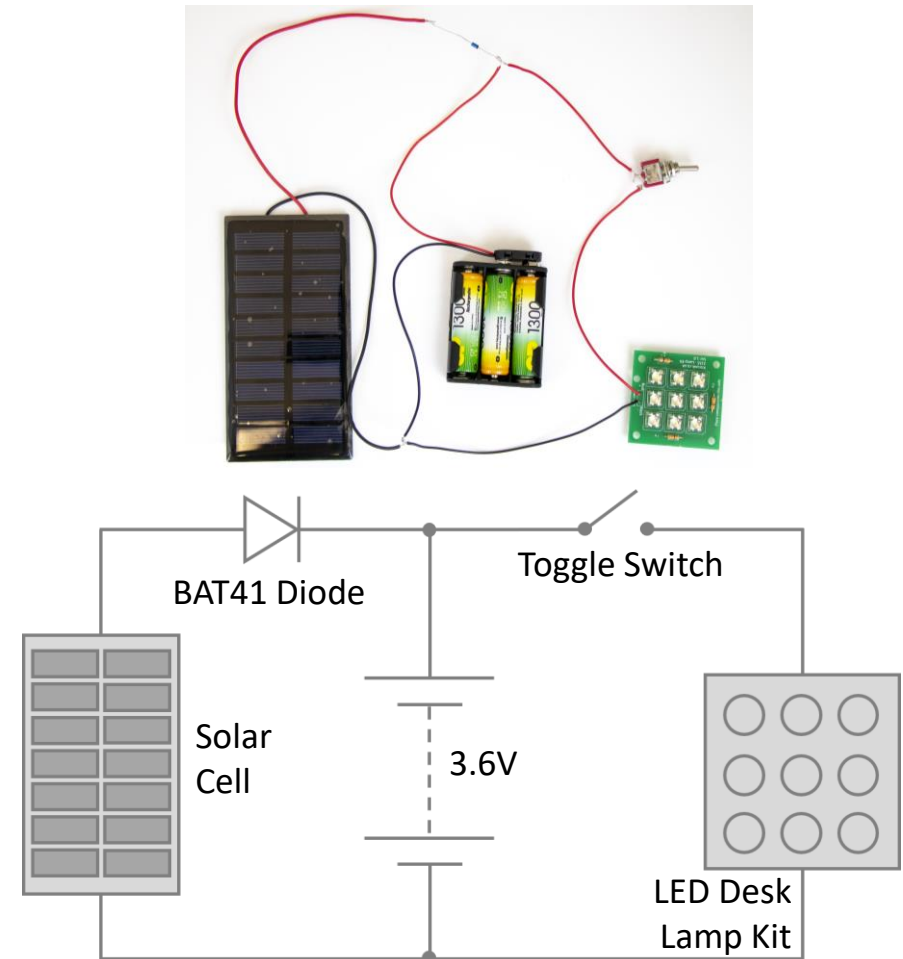
- 5.0V, 130mA Polycrystalline Solar Cell
- BAT41 Small Signal Schottky Diode
- 3xAA 1300mAh Rechargeable Batteries (in 3xAA Battery Cage)

These are all connected in series, with the diode preventing the batteries discharging through the solar cell if there is insufficient light. The solar cell will charge the batteries at a safe maximum of 10% of their total capacity (see Page 2 for more Electrical Information).

Devices to be powered can then be connected in parallel with the charging system – in the sample circuit shown to the right, the Kitronik LED Desk Lamp Kit has been used (this should provide enough light for reading). A toggle switch added to provide simple on/off functionality. Provided there is enough light falling on the solar cell, the batteries will continue charging whether the LEDs are on or off.

Other examples of Kitronik Kits which can be powered with this system have been provided on Page 2.

Example Circuit Setup:



Note: A soldering iron and some additional connection wires are required for construction.

Electrical Information

Solar Cell Nominal Voltage	5.0V
Solar Cell Output Current	Nominal: 130mA (UK Full Sun, June: 110mA)
Battery Nominal Voltage	3.6V
Battery Capacity	1300mAh
Charging Time (Flat to Full Capacity)	Min.: 10 hours (UK Full Sun, June: 12 Hours)
Using Kitronik Lamp Kit (2155):	
Lamp Kit Supply Voltage Range	2.5V – 5.5V
Lamp Kit Nominal Voltage	5.0V
Max. Current at Nominal Voltage	175mA
Max. Current at 3.6V (Nominal Battery Voltage)	75mA
Estimated Light Running Time (Fully Charged Battery to Flat)	17 Hours

Other Kitronik Kits to use instead of the Lamp Kit:

[FM Radio Kit V2.0 \(2157\)](#)

[Mono Amplifier Version 3.0 \(2165\)](#)

[USB Fan Kit \(2162\)](#)