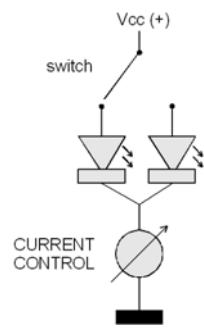
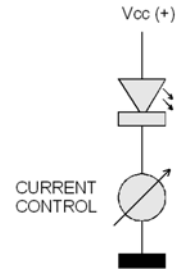


Connecting multicolor and RGB LED's to the PhidgetLED64

The LED64 uses a special LED-driver to control the current (not voltage!) through the LED's. Setting an LED to 100 will drive 30ma through the LED, if possible. The voltage will be varied to attain the required current, to a maximum of 3.5 volts. It's not possible to drive more than one LED from an output. An RGB LED counts as three.

The current is controlled by a constant-current sink driver. This means that all LED's are connected to a shared positive connection (common anode) while the current is controlled from the negative connection (cathode). This is illustrated in the illustration at the right.



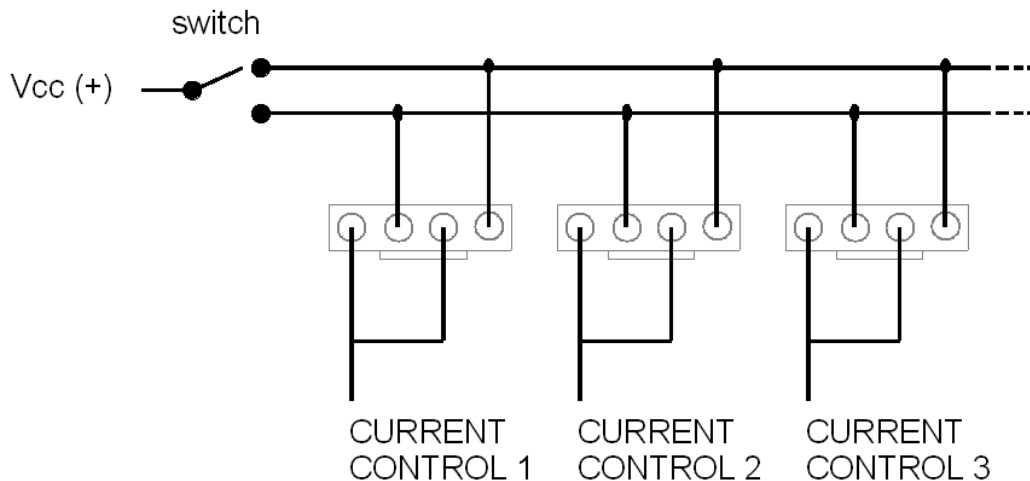
In order to control the intensity of 64 LED's, 64 current control circuits would be required. This would result in an extremely expensive PhidgetLED64 board!

Therefore the circuit from the illustration at the left is used. Two LED's are connected to a single current controller. A switch is used to select between the left and the right LED. If switching is done very fast (e.g. by a microcontroller), the human eye can't perceive the switching and both LED's appear to be lit at the same time.

This circuit is repeated 32 times on the LED board to control the 64 LED's with only 32 current controllers (see sketch below).

Because of this special setup a multicolor or RGB LED can not simply be connected to the Phidget64 board. One has to take into account the following limitations:

- 1) Since the brightness of the LED is controlled through the cathode (-), only multicolor LED's with a **common anode** (+) can be used.
- 2) Since not all LED's are connected at the same time to the positive supply voltage and the two LED's from a single connector are controlled by the same current controller it is NOT possible to connect the cathodes from the same multicolor LED to a single controller. When connecting a RGB or color LED one should use only the ODD or only the EVEN numbered outputs (see example on next page).



Example: Two RGB LED's connected to the Phidget64

