

LED TriLight

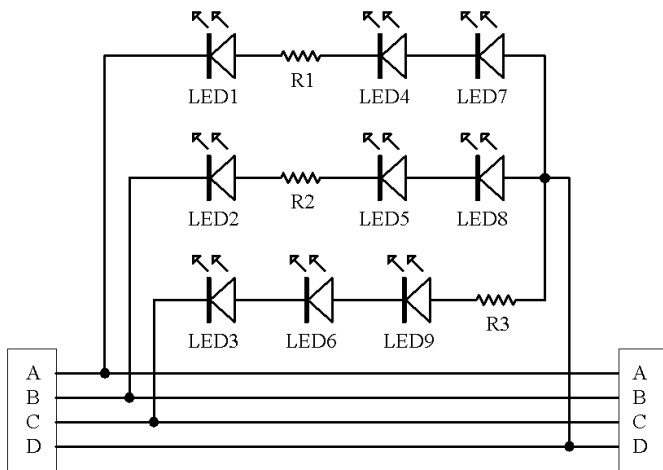
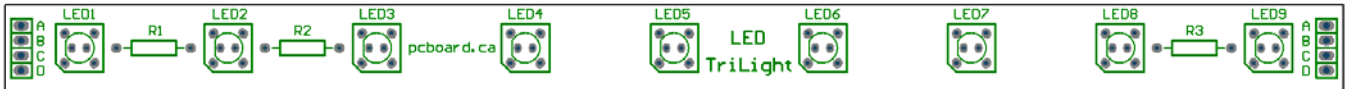
LED Light Bar

LED TriLight - 9-Inch LED Light Bar

Light Emitting Diodes (LEDs) are an attractive, economical and convenient option for lighting applications. Available in a wide variety of colors, styles, sizes and intensities, LEDs provide for inexpensive, highly-efficient, low-voltage, reliable lighting solutions. Applications range from lighting in aquariums, recreational vehicles, marine & aircraft to computer case mods, under-vehicle lighting, emergency/security lighting and accent-lighting in the kitchen and around your home – the options are endless.

One challenge with LEDs is the mounting of the displays. We produce several innovative solutions, including the **LED TriLight**.

The **LED TriLight** is a versatile mounting system which holds nine equally-spaced LEDs on a compact 9" x .580" (229mm x 15mm) display board. The **LED TriLight** supports three separate inputs, each driving a separate set of three LEDs. This allows for the placement of Red, Green and Blue LEDs on the board – which can be used with products such as our **LED Rainbow Controller** to produce stunning lighting effect. A unique feature of the design allows for the mounting of standard 5mm LEDs or Super Flux / Piranha 4-pin LEDs. Shown below is the layout of the **LED TriLight**, showing the mounting locations of the nine LEDs and three current limiting resistors.



The **LED TriLight** board design allows for power input to be applied to the left or right sides of the board. Total power consumption of a properly configured **LED TriLight** system should be about 60mA in total. Another design feature of our board allows for the power to be drawn off the opposite side of the board to run a second board. The daisy-chaining process has been proven to handle 10 boards connected end-to-end without problem.

Using LEDs does require care to limit the maximum current through the circuit – this is known as Current Limiting. Current Limiting is the process of restricting or controlling the total current draw of a circuit with the use of resistors.

This is accomplished on the **LED TriLight** with current limiting resistors located at positions *R1*, *R2*, and *R3*. *R1* limits the current for the LEDs at *LED1*, *LED4* and *LED7*, while *R2* limits the current through the LEDs at *LED2*, *LED5* and *LED8*, and *R3* limits the current through *LED3*, *LED6* and *LED9*.

The value of the current limiting resistor is determined by the supply voltage to the circuit, the voltage drop across each LED and the current desired through the circuit. As a rule, keep the current through each leg of the circuit to approximately 20mA to 25mA, which is normally the standard for LEDs. The chart below will assist you in determining the correct dropping resistor needed for your specific application.

Resistor Selection Chart				
LED Type/Color	White, Green & Purple	Blue	Red & Yellow	
LED Forward Voltage	Vf=3.2v	Vf=3.3v	Vf=2.0v	
Supply Voltage	14.6v to 15.0v	270-ohm	270-ohm	470-ohm
	14.1v to 14.5v	270-ohm	240-ohm	430-ohm
	13.6v to 14.0v	220-ohm	220-ohm	430-ohm
	13.1v to 13.5v	200-ohm	200-ohm	390-ohm
	12.6v to 13.0v	180-ohm	160-ohm	360-ohm
	12.1v to 12.5v	150-ohm	150-ohm	330-ohm
	11.6v to 12.0v	120-ohm	110-ohm	330-ohm
	11.1v to 11.5v	100-ohm	82-ohm	300-ohm
	10.6v to 11.0v	75-ohm	56-ohm	270-ohm
	10.1v to 10.5v	47-ohm	33-ohm	240-ohm

1/4 watt Resistor Color Codes		
470-ohm (yellow-violet-brown-gold)	430-ohm (yellow-orange-brown-gold)	390-ohm (orange-white-brown-gold)
360-ohm (orange-blue-brown-gold)	330-ohm (orange-orange-brown-gold)	300-ohm (orange-black-brown-gold)
270-ohm (red-violet-brown-gold)	240-ohm (red-yellow-brown-gold)	220-ohm (red-red-brown-gold)
200-ohm (red-black-brown-gold)	180-ohm (brown-gray-brown-gold)	160-ohm (brown-blue-brown-gold)
150-ohm (brown-green-brown-gold)	120-ohm (brown-red-brown-gold)	110-ohm (brown-brown-brown-gold)
100-ohm (brown-black-brown-gold)	82-ohm (gray-red-black-gold)	75-ohm (violet-green-black-gold)
56-ohm (green-blue-black-gold)	47-ohm (yellow-violet-black-gold)	33-ohm (orange-orange-black-gold)

For example, if you were going to run a set of three White LEDs in an automobile, the normal battery voltage of a car is approximately 13.8v. Based on the chart, the supply voltage is between 13.5v and 14.0v and the White LED option shows you would require a 220-ohm dropping resistor.

It is important that you use the correct current limiting resistor, as using a value too low can result in permanent damage to the LEDs in your circuit. If you use a value larger than is needed, the LEDs will not glow as brightly and no damage will occur.

As a final mounting option for your **LED TriLight**, you can encase your board in a see-thru plastic or acrylic tube (available separately). This will protect the board from outside contaminants or inclement weather to prolong the usefulness of your LEDs and board.

The two images below illustrate the flexibility of the **LED TriLight**. The top image shows 5mm LEDs mounted on the board while the bottom image shows Super Flux / Piranha 4-pin LEDs mounted on the board.

