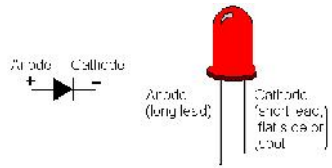


RC TRAINS

Using LEDs with RC Trains receivers



Light Emitting Diodes (LEDs) provide illumination but draw a lot less current than incandescent bulbs. They can therefore be powered by **RCT/Deltang** receivers without overloading them. LEDs need protection from overload. This is usually provided by placing a resistor in series with the LED. The value of the resistor is dependent on the voltage being supplied to the LED (and the characteristics of the LED).



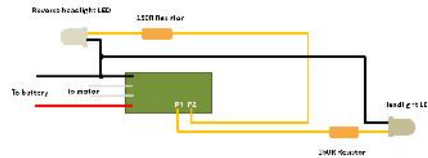
Using LEDs with the RCT-Rx102 receiver

If you are using LEDs powered by the **RCT-Rx102**, then there is no need for an additional resistor as one (180ohm) is included onboard the receiver for each output.

Using LEDs with the RCT-Rx65b receiver / controller

If you are intending to use an LED with the **RCT-Rx65b**, then the value of the resistor will be dependent on which output pads are being used.

Pads 1-12 provide 3.5 volts positive output when triggered. The positive lead (anode) of the LED is therefore connected to the pad



Pads A, B and C provide 0v output when triggered. A lead from the one of these pads needs to be connected to the negative lead (cathode) of the LED. The positive lead (anode) of the LED must therefore be connected via a resistor to the positive terminal of the battery supplying power to the receiver. The value of the resistor will be dependent on the supply voltage being used.

- For **3.5v (or less)**, a 150ohm resistor is needed. Pre-wired LEDs for this voltage are supplied by **RC Trains** with an **orange lead**.
- For **7.5v (or less)**, a 270ohm resistor is required. Pre-wired LEDs for this voltage are supplied by **RC Trains** with a **yellow lead**.
- For **12v (or less)**, a 680ohm resistor is required. Pre-wired LEDs for this voltage are

Using LEDs with RC Trains receivers

supplied by **RC Trains** with a **red lead**.

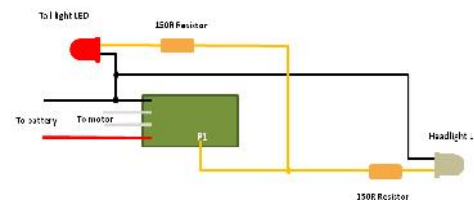
- For 18v (or less), an 820ohm resistor is required. Pre-wired LEDs for this voltage are supplied by **RC Trains** with a **brown lead**.

If, for example, your loco is powered by a 6v supply and you are using Pad A for its headlight, then you should use the 7.5v pre-wired LED. It will be slightly dimmer than when powered by 7.5v but not noticeably so.

Please note: The exact value of the resistor required is also dependent on the characteristics of the LED being used. The above values are matched to the specific LEDs which are supplied by **RC Trains**. If you use LEDs from another source you should check their *forward voltage* and *maximum current* and then calculate the precise value of resistor required. If in doubt, opt for a larger value resistor than those shown above. The precise value of the resistor can be calculated using online tools such as - <http://ledcalc.com/>

Head and tail lights

If you want the headlight **and** a tail light to come on automatically, then you need to wire both the head and tail light LEDs to the same pad, like this



RC TRAINS

Bi-colour LEDs

Bi-colour LEDs generally come in two types of packages - those with two legs and those with three legs. Bi-colour LEDs with two legs are energised by reversing the input polarity - connect the two leads one way round on the battery supply and it will glow with one colour, connect it the other way round on the battery and it will glow the second colour.

The type of bi-colour LED which is most useful for use with **RCT/Deltang** receivers is the one with three legs. The two internal LEDs share the middle leg (cathode - negative) and the LED is made to glow one colour by connecting one leg to the positive supply and it will glow the alternative colour by disconnecting the first leg and then connecting the second leg to the supply. This makes it more suitable for switching with the output pads from the **RCT/Deltang** receivers.

If using two LEDs (one for the front of the loco and the other for the rear), then the LEDs can be connected as below. When the loco runs forward, the front LED will glow white and the rear LED will glow red. When it runs in reverse, the colours will be reversed (ie red at the front and white at the rear).

