Adding LEDs to Cobalt turnout motors

Adding LEDs to Cobalt Turnout motors:

Electronically, stall motor types do vary, and there are actually three different types of Cobalt motor.

Each type needs a different approach to adding LEDs. Cobalt motors have lots of built-in switching too, so they also allow you more than one way to add control panel LEDS. How you choose to do it is up to you, but be sure you use the method that specifically suits your motors!

Standard DC powered Cobalt Motors

### This includes original Cobalt Classic and the new Cobalt Ω (Omega) turnout motors.

The motor drive in these types has constant DC power, with the polarity reversing to change the turnout.

The combination of the motors own internal resistance plus any resistances within the drive circuit inside the motor provide enough resistance, so you can connect LEDs directly in-line with a motor lead without the need to add a resistor, providing you are using DCCconcepts recommended drive voltage range of 9~12v DC or utilising a DCCconcepts AD series accessory decoder.

Adding panel LEDs is simple and can be done as per these diagrams.

(1) Two LEDs put back-to-back in one lead from the DC Power supply

(+) (-) (+) (-)

12v DC Power Supply (regulated)

Classic Cobalt = control by terminals 1 + 8

Classic
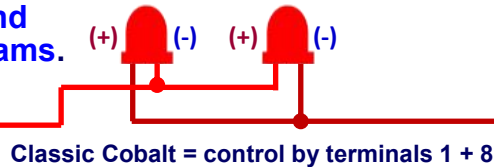
NOTE: if you use green or blue LEDs, please use a 12 volt DC power supply as they drop 2~3 volts

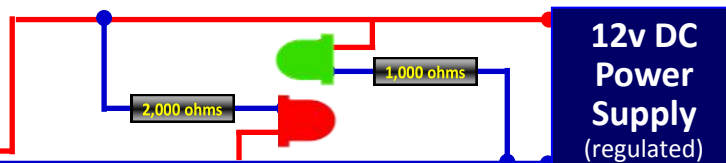(2) Bi-Colour LED and switches that are in the DCCconcepts switch packs

12v DC Power Supply (regulated)

Classic

Ω Omega

(+) (-) (+) (-)

12v DC Power Supply (regulated)
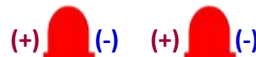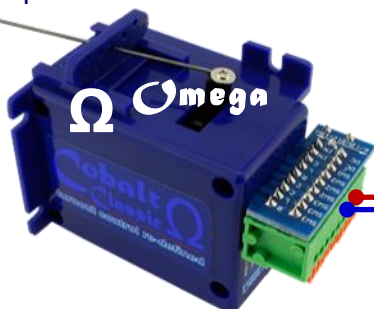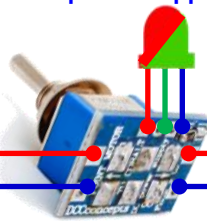
Cobalt Ω (Omega) = control by terminals 1 + 2.

IF YOU ARE NOT USING OUR SWITCHES, WE THINK THIS IS THE BEST WAY TO DO IT

Ω Omega

2,000 ohms

1,000 ohms

12v DC Power Supply (regulated)

Placing the LEDS across the power supply wires is the BEST way.

This is also a better way if you're using red &green as you can vary the resistor values to match the light output levels of the two LED colours.

Adding LEDs to Cobalt turnout motors

Continued...
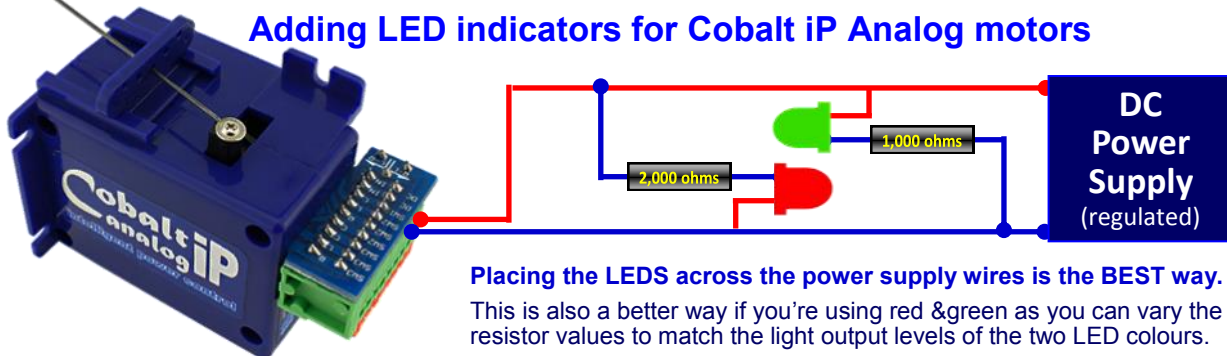
Adding LEDs to Cobalt iP Analog turnout motors:

Cobalt "Intelligent power" motors such as Cobalt iP Analog and Cobalt iP Digital manage their power use quite differently to the Cobalt classic and the Cobalt Ω Omega, and this means we cannot use the same methods for adding LED indicators to our control panels

This is because the current draw varies during the throw cycle. While Cobalt iP motors typically draw less than 4 mA while static and waiting to be thrown, the current draw rises and falls as they change, with peaks at between 40 and 60mA for less than a second at the mid point of the throw.
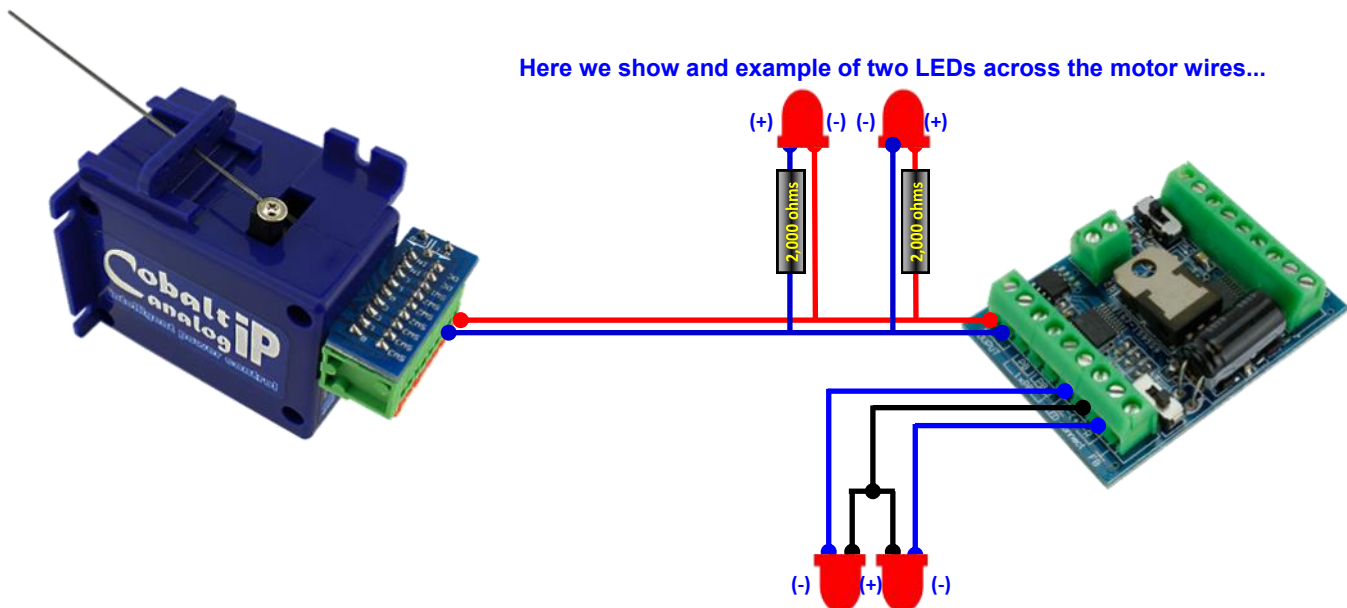
It is therefore not possible to use an LED inserted into the power supply lead. Doing that would simply destroy the LED and leave an open circuit so that the motor would no longer work.

Fortunately Cobalt iP Analog and Cobalt iP Digital offer several other ways to add Panel LEDs that are equally easy AND in some ways better, as they have the advantage that the illumination level will not vary as the motor moves (Inline LEDs DO dim and vary in brightness as the motors change).

Adding LED indicators for Cobalt iP Analog motors

2,000 ohms   **1,000 ohms**

DC Power Supply (regulated)

Placing the LEDS across the power supply wires is the BEST way.
This is also a better way if you're using red &green as you can vary the resistor values to match the light output levels of the two LED colours.

Here we show and example of two LEDs across the motor wires...

(+) (-) (-) (+)

2,000 ohms   2,000 ohms

(-) (+) (-)

Of course, if you use DCCconcepts AD-2fx or AD-8fx decoders...
With EITHER Cobalt iP Analog or Cobalt Ω Omega - you have the choice of adding the LEDS to the decoder (or you can use decoder outputs for other things like computer I.O. or light-signal control)

We hope that you have found this article useful. It is one of many advice-type documents that we've made available on our website at **www.dccconcepts.com**.   If you need more, email **questions@dccconcepts.com**

Adding LEDs to Cobalt turnout motors

Continued...

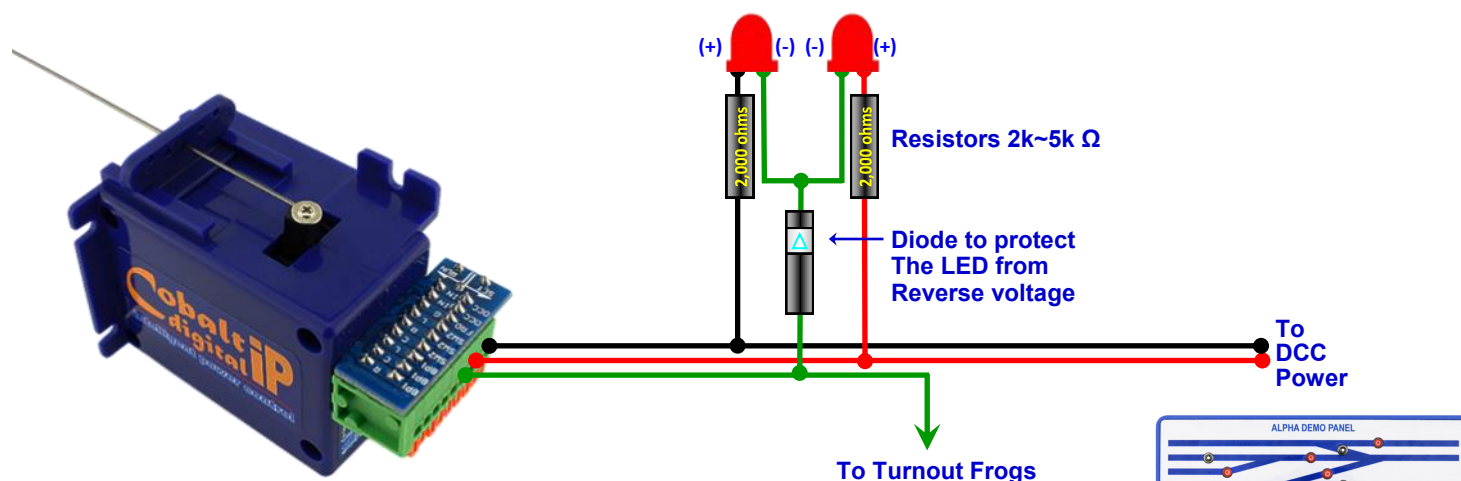## Adding LEDs to Cobalt iP Digital (and Original digital) turnout motors:

Cobalt "Intelligent power" motors such as Cobalt iP Analog and Cobalt iP Digital manage their power use quite differently to the Cobalt classic and the Cobalt Ω Omega, and digital motors also tend to higher voltages. This means we cannot use the same methods for adding LED indicators to control panels

With iP motors, this is because the current draw varies during the throw cycle. While Cobalt iP motors typically draw less than 4 mA while static and waiting to be thrown, the current draw rises and falls as they change, with peaks at between 40 and 60mA for less than a second at the mid point of the throw.

It is therefore not possible to just use an LED inserted into the power supply lead. Doing that would simply destroy the LED and leave an open circuit so that the motor would no longer work.

Fortunately Cobalt iP Digital (and original digital) offers other ways to add Panel LEDs that are equally easy AND in some ways better, as they have the advantage that the illumination level will not vary as the motor moves (Inline LEDs DO dim and vary in brightness as the motors change).

Adding LED indicators for Cobalt iP Digital / original digital motors uses Terminal 1/2/3

(+) (-) (-) (+)

2,000 ohms   2,000 ohms

Resistors 2k~5k Ω

Diode to protect
The LED from
Reverse voltage

To DCC Power

To Turnout Frogs

ALPHA DEMO PANEL

Cobalt iP Digital motors can also control LEDs via the SPDT changeover switch that is built in, however you may wish to reserve this for other things…

Therefore DCCconcepts introduced a neat new pack of control panel LED + switch combinations for your DIY panel.

This will have switches with integrated LEDs that can add manual control for your Cobalt iP digital at the control panel.
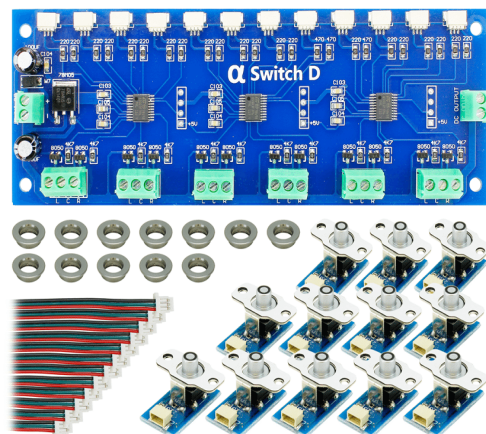
They will also feature on-board memory so they remember all of the turnout positions even after power has been turned off!

The part numbers of these switches are

DCD-DSR Cobalt AlphaSwitch-D Red (12 Pack).

Also DCD-DSG (Green) and DSG-DSB (Blue).

A 12V Regulated power supply is required.

α Switch D

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