

Simplified Bidirection LED and Headlight Control From AirWire Decoder (G2 or G3)

This is a very simple circuit that uses an external relay to control the applied polarity to any locomotive factory supplied lighting circuitry. The AirWire decoder is totally isolated from the lighting circuitry by the external relay. The only purpose of the relay is to flip the polarity of the battery voltage that is driving the lighting circuit. This is commonly required when headlights are paired with bidirectional LED marker lights as found in many older USA Train locomotives. This circuit uses the FR output of the G3 to flip the polarity.

With this circuit, the headlights are turned on the moment battery power is turned on to the Airwire decoder. To use the directional lighting, F0 must be turned on. Once F0 (headlight control) is on, the throttle direction key controls the polarity.

If the polarity is reversed for the locomotive movement, simply reverse the two wires going to the lighting circuit board.

The recommended relay is rated at 1 amp and uses a 12VDC coil. The coil will tolerate up to 18VDC or as low as 10VDC.

The silicon diode is essential for proper operation. It must be oriented exactly as shown.

As of the date on the bottom of this page, Mouser had good stock of the diode and relay. The Mouser catalog number is shown for both.

Warning: Make sure the motors are not connected to the lighting circuitry in any way. There is risk of damaging the decoder.

