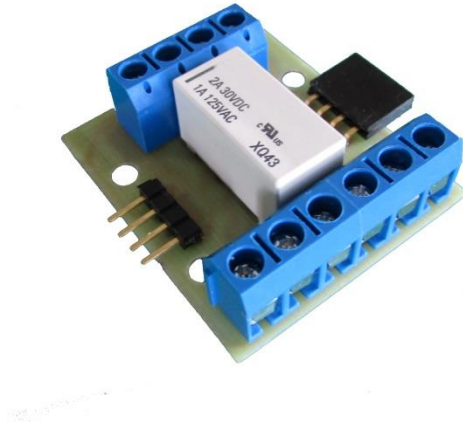


# JTElectronics

## Expandable Latching Relay Board

### Model: LRL1



This relay board will allow switching power to tracks or points or turnouts or lights or whatever other purpose you see fit with separate control coils for “SET” and “RESET” states. The relay is a “latching” type meaning the output contacts will stay in either the SET or RESET position even when power is removed from the relay control coils. Its like they have a “memory”.

The relay control consists of two coils which when momentarily supplied with power will either “SET” or “RESET” the relay output contact state depending on which coil was energised. The relay control coils are rated at 12VDC (continuous) but will handle a higher voltage for a brief time eg. A pulse from your high voltage points motor Capacitor Discharge Unit. Having all four relay control coil terminals available gives great versatility to how you can connect them... If you are familiar with a 3-terminal relay coil arrangement, just connect “SET-” and “RESET-” terminals together and onto the common control wire (There is a set of solder pads under the relay that can also be joined by a blob of solder to achieve this) and connect your two control signals to the “SET+” and “RESET+” terminals.

The relay output contacts are “Double-Throw” so there is a COMMON terminal connected to either the SET or RESET terminal depending on which relay control coil was last energised. If you need more relay output contacts, the relay board can be expanded by plugging another relay board in series with the first one and the four control coil connections are passed onto the next relay board. The **Expanded Latching Relay Board** image below shows the system expanded to four sets of output relay contacts, and you could easily plug in more relay boards to expand the sets of output contacts to the required amount – all controlled from the same control signals.

The control coils will NOT work with AC power source, only DC of about 12V. If you really want to control the relays from an AC power source, just put a diode in series with it to convert the AC to DC. Of course the output contacts will handle either Ac or DC without a problem...

## SINGLE LATCHING RELAY BOARD

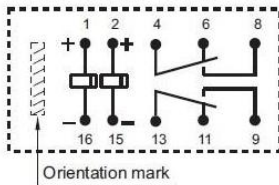
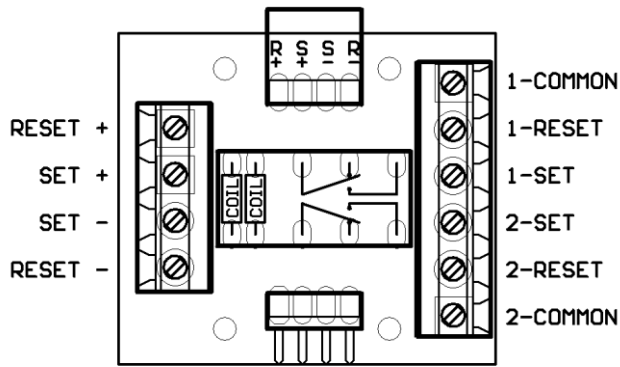
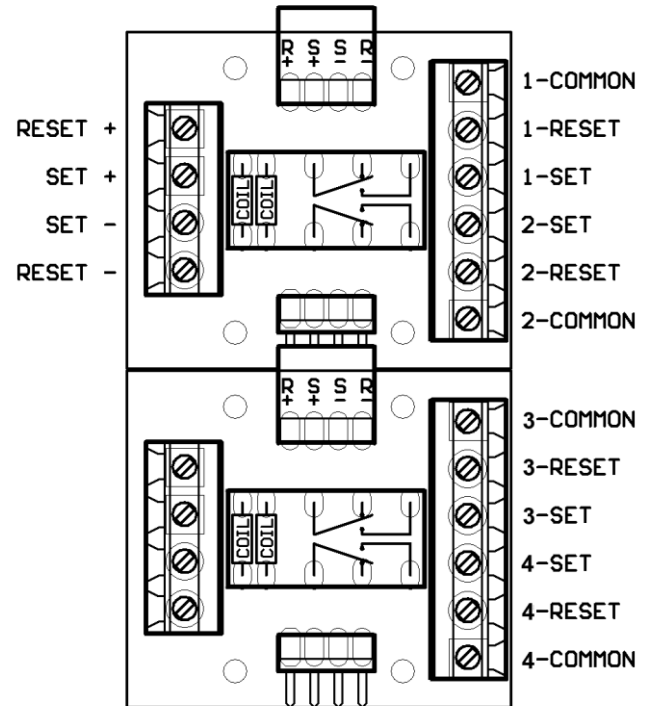


Diagram shows the "reset" position  
Energize terminals 1 and 16 to "set"  
Energize terminals 2 and 15 to "reset"

## EXPANDED LATCHING RELAY BOARD

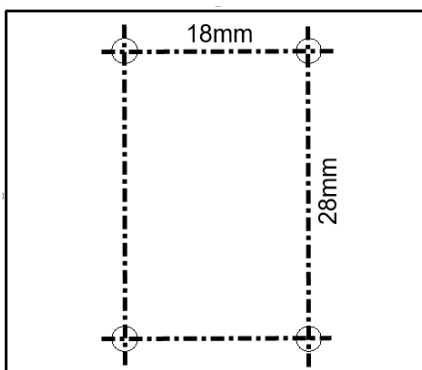


## **LATCHING RELAY DIAGRAM**

### LATCHING RELAY BOARD SPECIFICATIONS:

Coil Nominal Voltage	12VDC (use a series diode with an AC control voltage)
Coil Max Voltage	24VDC
Coil Switching Power	150mW
Contact Max Current	2A @ 30VDC
Contact Switching Time	4.5ms Max
Board Dimensions	Approx. 40mm x 35mm
Mounting Hole Grid	18 x 28mm
Mounting Hole Diameter	3.5mm

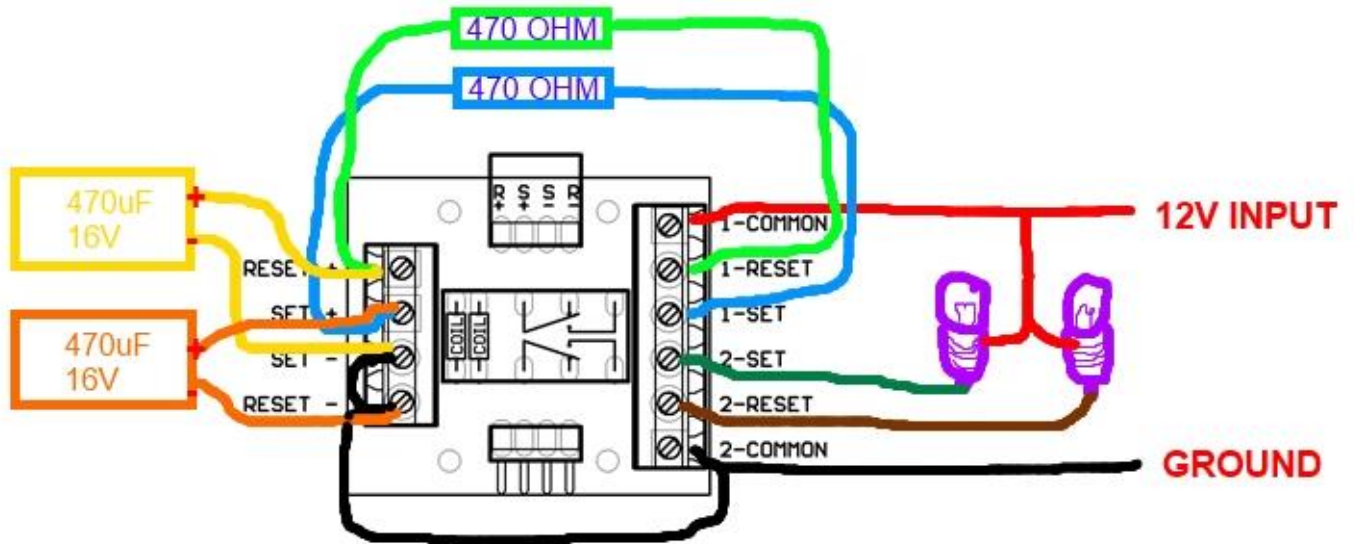
### MOUNTING HOLE DRILLING TEMPLATE



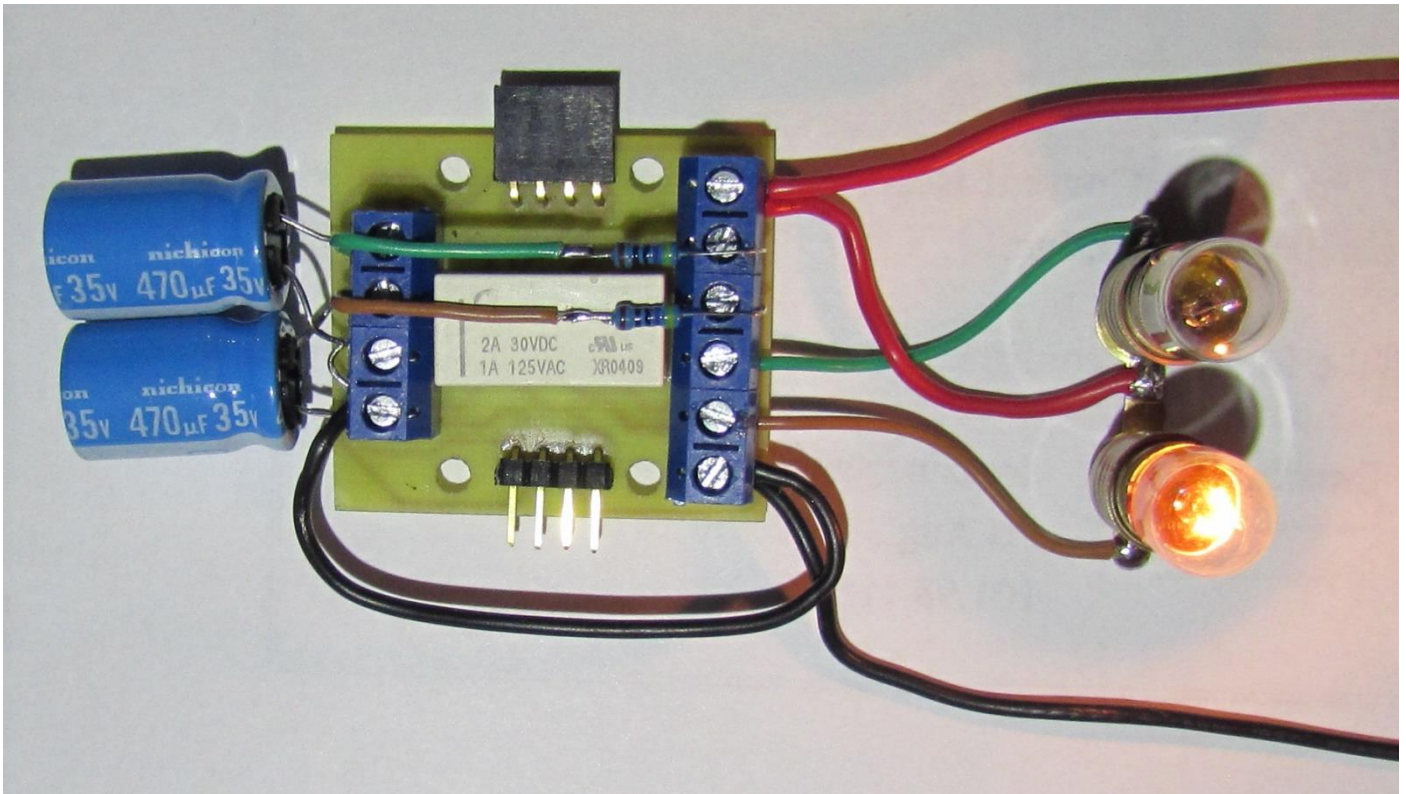
## USING THE LATCHING RELAY BOARD AS A FLASHER

With a few extra components you can use the latching relay board as a flasher unit for your railway crossing lights. Sure you can get some electronic flashers but using this relay board is nearly indestructible, and gives you an insight into how the latching relay works and what else you could use it for... With the components specified the relay will switch between states approximately every half-second. The switching rate also depends on your supply voltage so some experimentation with resistor values may be required to get the exact desired speed. Smaller resistors will cause a faster flash, and larger resistors will cause a slower flash.

**Flasher Circuit Wiring Diagram:**



**Photo Of Completed Flasher Wiring:**





## USING THE LATCHING RELAY BOARD AS AN AUTO-REVERSE or BACK & FOURTH CONTROLLER

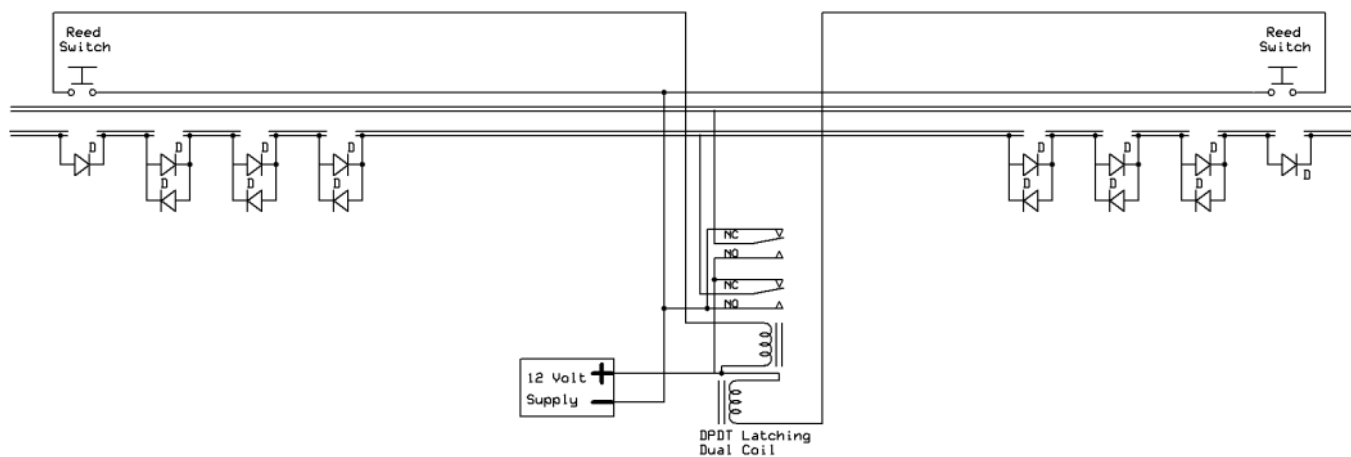
Information obtained from: [http://www.trainelectronics.com/Reverse\\_loop\\_dual\\_coil\\_relay/](http://www.trainelectronics.com/Reverse_loop_dual_coil_relay/)

The DPDT dual-coil latching relay can be used to create what may be the simplest auto-reverse controller you can make. Auto-reverse controllers are frequently used to operate a trolley or other small engine on a single run of track. The trolley goes to one end, reverses and proceeds to the other end where the back & forth operation continues.

To wire this controller replace the two push button switches in the diagram above with magnetic reed switches. Then glue a magnet to the bottom of an engine or trolley so that it passes directly over each of the reed switches as it travels back and forth. It will trigger the appropriate coil to change the polarity as the train reaches the end of a point-to-point track. Place the reed switches between the rails a few inches before the diodes at either end of the track. The diodes are optional and are only there to stop the train should the reed switch fail to sense the magnet passing over it.

This version adds pairs of diodes to the ends of the point-to-point. These sets of diodes will gradually slow the train as it nears the end of the line. Most common diodes will drop a voltage going through them by approximately 0.7 volts. This circuit will first slow the train a bit by dropping the voltage by 0.7 volts then a bit more by another 0.7 volts and so on until the reed switch is encountered. Note that there are two diodes wired back-to-back at each block. This is so that the train can go in either direction through the blocks. Additional blocks can be added to slow the train more and more. Just be sure that there is enough power at the last block to allow the train to make it to the reed switch rather than just stopping short! Also check there is enough power available for the train to start moving in the opposite direction!

Even though the sets of diodes are shown very close together in this drawing on a layout there would be one or more feet between each set.



**Better still, you could easily replace the reed switches & magnets in these diagrams with my IRLD1 infra-red locomotive detector boards at either end of the track to detect the train. The IRLD1 boards are more reliable at detecting the train and don't require any modification to the train!**

## USING THE LATCHING RELAY BOARD AS A REVERSE LOOP CONTROLLER

Information obtained from: [http://www.trainelectronics.com/Reverse\\_loop\\_dual\\_coil\\_relay/](http://www.trainelectronics.com/Reverse_loop_dual_coil_relay/)

