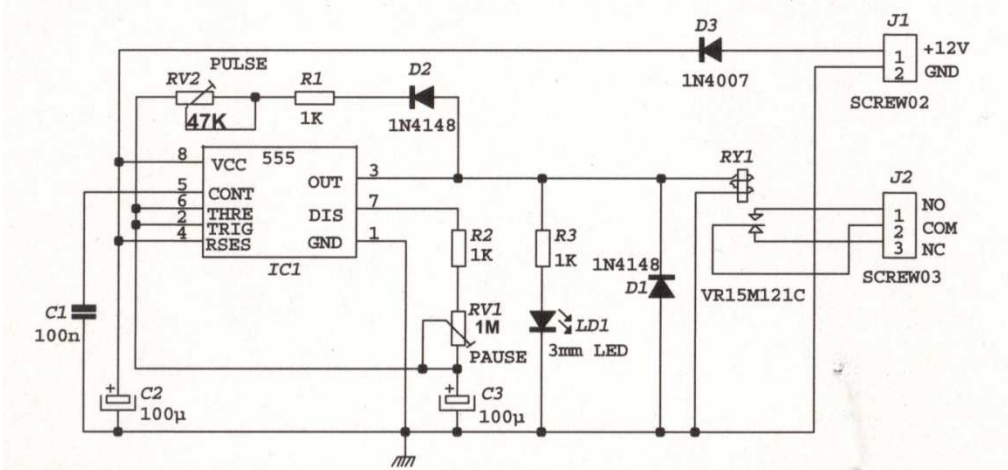
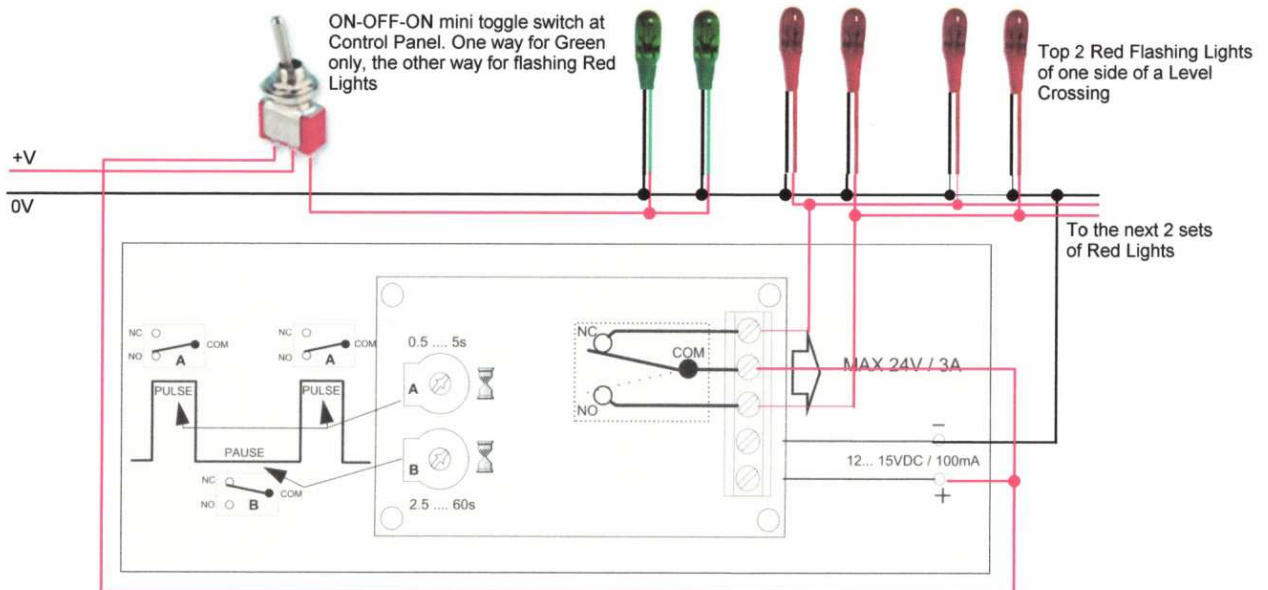


## MR410 Level Crossing Flashing Lights Kit

This document describes how you can use our timer circuit EM120 to drive the flashing light system on a Model Rail Level Crossing. The EM120 comes as a U assembly kit with Pulse and Pause variable resistors. The diagram below is the basic timer circuit that comes on the printed circuit board.



Once the printed circuit board is assembled test the circuit and adjust the presets to give an equal ON - OFF of the LED on the board. This should give approximately what you require. The drawing below shows how you add in the 8 Red lamps and 4 Green lamps. These can be any filament type 12 - 15v bulb. (the ones shown are Wheat Germ Bulbs). As the Green Lamps are steady and don't flash they are controlled by the toggle switch in one position, when the toggle switch is moved to the other position it switches OFF the Green lamps and switches ON the Timer which makes the Red lamps flash.



On the left you have the positive and negative voltage of 12 - 15vDC coming in, the black wires are negative or 0V and the red wires are positive or +V. The Black and Red little dots show where the wires are connected to each other. Please note all the left hand Red lamps (4) are connected to the Normally Closed (NC) of the relay and the right hand Red lamps (4) are connected to the Normally Open (NO) side of the relay, so they flash left to right as in real life.

Parts List:

Timer:	EM120
Toggle Switch:	SW303
Green Wheat Germ Bulbs:	LB154
Red Wheat Germ Bulbs:	LB152

**You can also have the Level Crossing Lights fully automatic. Please see the circuit on the reverse of this page:-**

To automate the Level crossing you first have to place sensors on the track to detect the presence of a train. The train will have a small magnet glued to the underside to activate the switch. These are miniature glass switches called Reed Switches. You will need two different types, one to switch ON the level crossing timer and the other to switch it OFF. The distance from the level crossing should be a little longer than the full length of the locomotive and carriages. Position the Reed switch as shown in Fig 1, underneath the track between the sleepers. The contact wires should be sleeved after you have soldered the wires to them, small holes can be drilled between the sleepers outside the tracks so the wires go under the base board. Use long nosed pliers to hold the wires between the glass and where you want to bend them. this will give support to the glass/wire connection as it is very fragile.

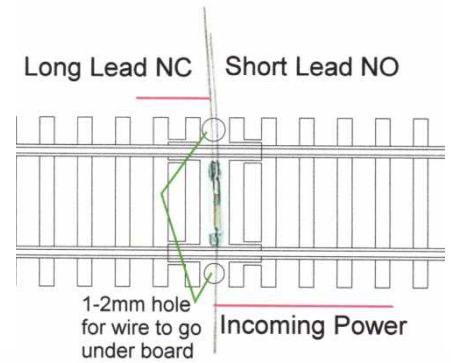


Figure 2 shows a section of double track around a Level crossing.

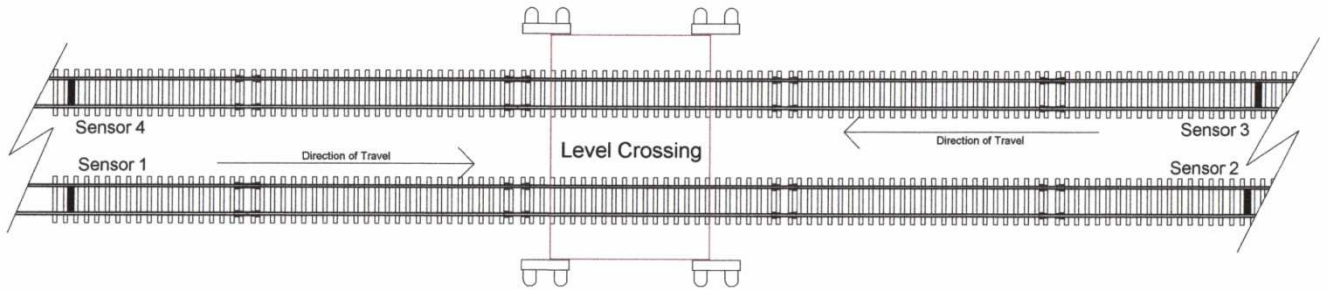


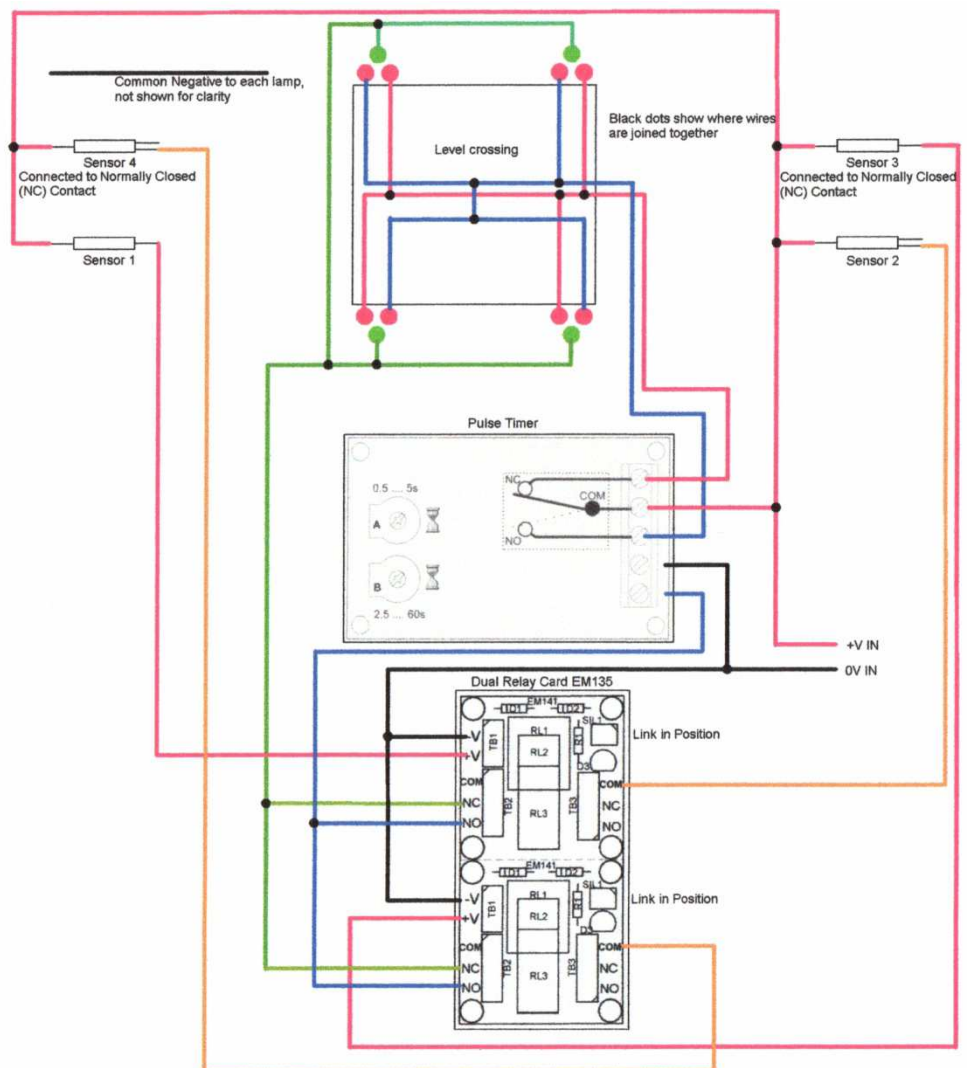
Figure 3 shows the wiring diagram for a fully automatic Level crossing lighting system.

First position the sensors and wire them as per drawing running wires back to a point where your PCB's will be. You should have 5 wires, 1 common Positive feed to each REED and then one wire from each switch.

Next wire the lights of the level crossing, when finished you should only have 4 wires leading to the PCB's. One common negative connected to each lamp, One wire from all 4 Green lamps. One wire from all left hand Red lamps, and one wire from all right hand Red lamps.

Now Position and fix the timer circuit, and wire into this the 2 Red lamp wires, and the Positive and Negative feeds for you power source. Also the positive feed for the switches can be wired into the positive feed here.

Now Position and Fix the EM135 Relay card. First connect the Positive & Negative feeds, that's black (negative), Blue (Positive). Connect the Green lamps to the NC terminals. Connect Sensor 1



to the +V of the top Relay card. Connect Sensor 3 to the +V of the lower relay card.






Now connect the orange wires from Sensor 2 & Sensor 4 to the COM on the right side terminals. This is the latching of the Relay to allow the timer to pulse while the train travels from one sensor to the other.

**PARTS LIST**

Magnet	SW932
Sensor 1	SW923
Sensor 2	SW928
Sensor 3	SW923
Sensor 4	SW928
Red Lamps	LB152
Green Lamps	LB154
Pulse Timer	EM120
Dual Relay Card	EM135

All these items can be purchased separately using the Part Number on our web site

The following is a few other sensors that could be used.

Magnets		SW932 This is a 6mm diameter by 2mm high magnet with a small indent on one side to indicate the North side.
		SW933 This is a 3mm diameter by 2mm high magnet with a small indent on one side to indicate the North side.
Sensor Switches		SW927 Encapsulated magnetic reed switches, Normally open contact. Switching current 100mA. Size 15mm long, 3.2mm wide, 4.2mm high. Lead spacing 12mm. Operating Distance 5 to 12mm.
		SW926 Encapsulated magnetic reed switches, Normally open contact. Switching current 500mA. Size 20mm long, 3.2mm wide, 4.2mm high. Lead spacing 18mm. Operating Distance 5 to 18mm.
		SW929 Encapsulated magnetic reed switches, Changeover contact. Switching current 500mA. Size 20mm long, 3.2mm wide, 4.2mm high. Lead spacing 18mm. Operating Distance 5 to 18mm.

SW929 can be used in place of SW928.

SW927 & SW926 can be used in place of SW923.