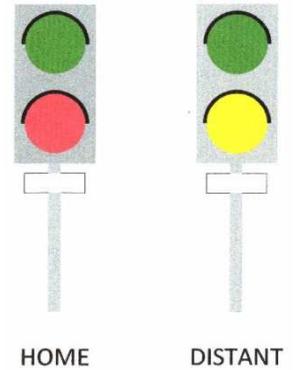


2 Aspect Model Railway Signals (British System)

A simple 2-aspect colour light signal (right) which would act as a replacement for a semaphore stop signal. The Home signal would have Green & Red aspects. The Distant signal would have Green & Yellow aspects. The white plate below the signal will display an identification plate using the reference letters of the controlling signal cabin and the signal number.

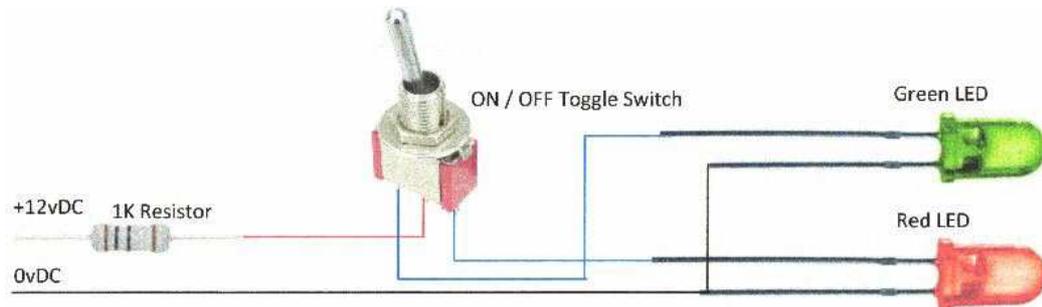


There are a number of ways to control these signals on a Model Rail layout.

Manual.

Individual Signal

A simple ON / OFF miniature toggle switch for each signal will do the job, see the circuit.

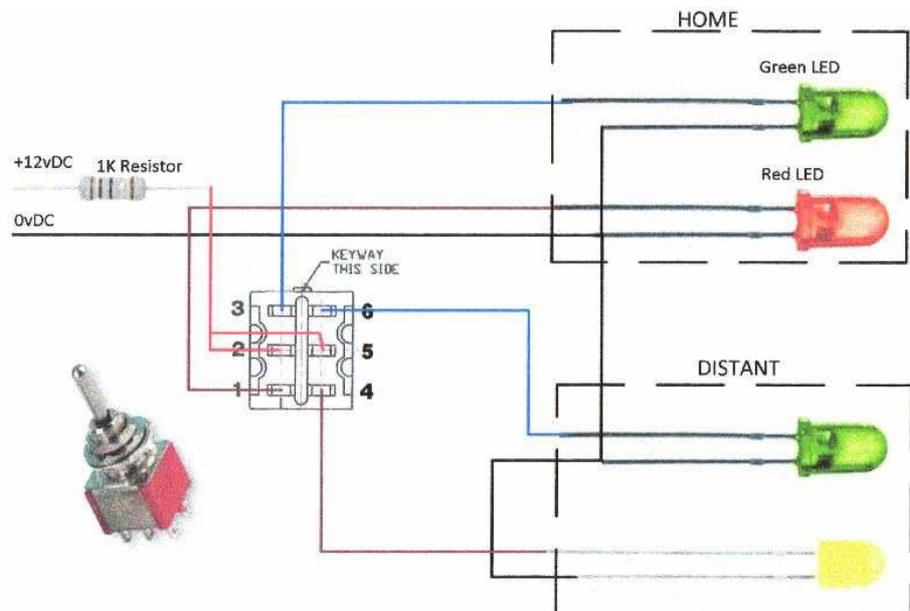


In this circuit the bulbs are LED's so a dropping resistor is required 1K (RE137), the toggle switch is a simple ON/OFF switch (SW305). If you are using Wheat Germ bulbs then the dropping resistor is not required. Wheat Germ bulbs are 12v, Green (LB154) and Red is (LB152)

The same circuit can be used for the 'Distant' signal by replacing the Red for Yellow, LED (SL102) or Wheat Germ (LB155)

Dual Signals from 1 Switch

In this circuit both the 'Home' and 'Distant' signals are controlled by one toggle switch.



Here we are using a DPDT Toggle switch (Double Pole Double Throw) SW312. The left side (Pins 1,2,&3) control the 'Home' signal, and the right side (Pins 4,5,&6) control the 'Distant' signal.

There is a little conjecture regarding the sequence of the signals so changing the sequence can be done by swapping around pins 4 & 5, or replacing the colour of the bulbs.

The principle of the resistor and bulbs applies as above.

Please Note:

LED's are polarity sensitive, therefore the short lead (Cathode) should always be Negative (0v), and only work on a small DC voltage 2 to 3v hence the reason for the 'Dropping Resistor'. With the Wheat Germ bulbs the polarity is not important as they are miniature filament lamps, and rated at 12vDC or AC.

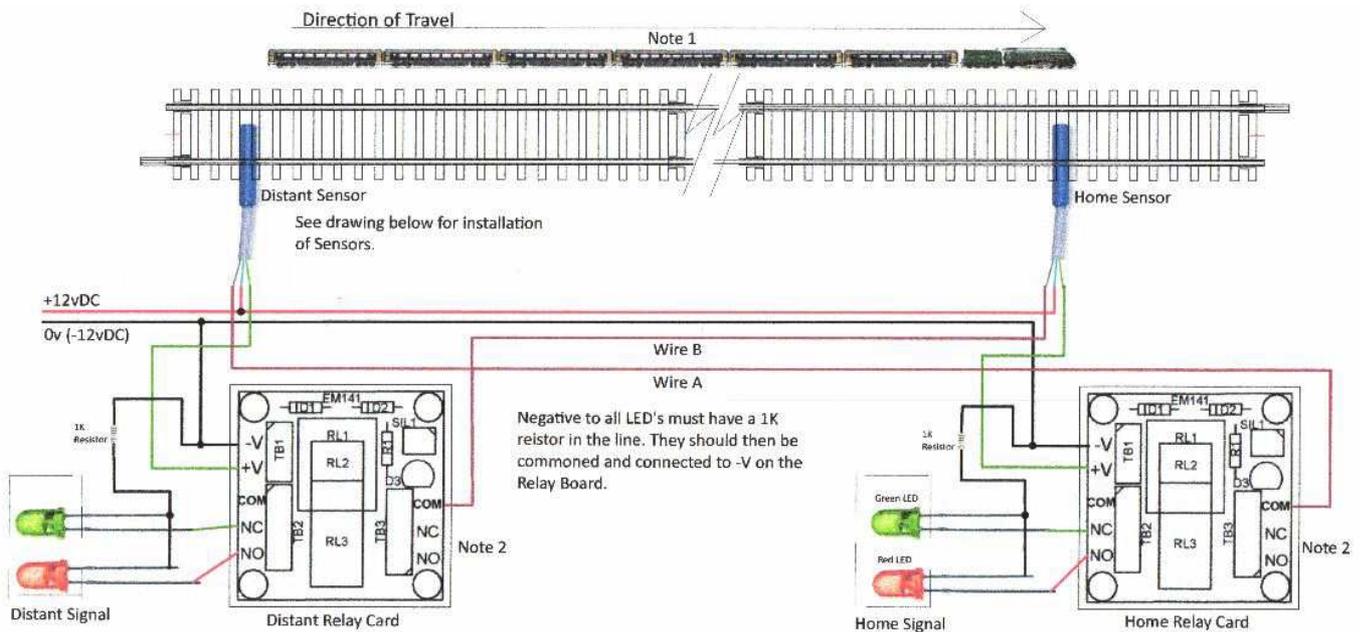
Automatic Signals.

There are a number of ways to automate the signals, however all require a sensor of some sort to detect the presence of the Train. The sensor can be a Reed switch, a Micro switch, IR detectors, with all of these the sensor has to remain active for a while after the train has passed otherwise the signal just flashes from one aspect to the other and back again. To make it realistic the sensor has to latch for a predetermined period, either until the train has reached the next signal, or until the train has completely passed the signal.

In reality one signal controls the next signal in conjunction with the position of the train, and what the signal controller wants the train to do.

Cascading signals is possible but does require a certain amount of relays circuits, wiring and sensors.

This circuit shows how 2 signals are controlled automatically by the train.



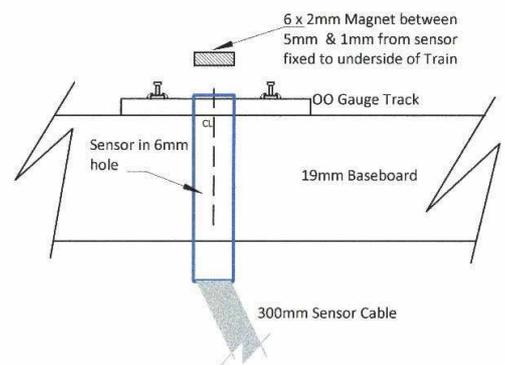
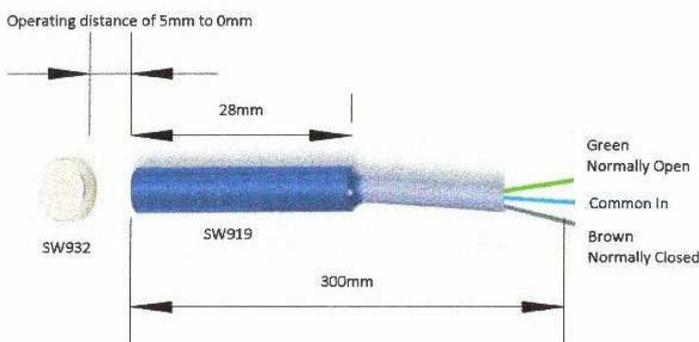
Firstly position and fit the 2 sensors opposite or just in front of the signals. the signals must be at least a train length apart. See the drawing below on how to fit the sensors.

Next fit the EM134 relay cards, these can be on the underside of the baseboard on near the control panel, depending on your layout and how much wire you want to use.

Wire the signals as shown (remember the short lead on an LED is the negative). the GREEN Led / lamp goes to the NC (Normally Closed) position on both cards, and the RED Led / lamp goes to the NO (Normally Open) position.

Now connect the Sensors to the Relay cards, NO (Normally Open - Green) to the +V, and Common In (White on the Sensor) to +12vDC (Red on the drawing)

The Negative from the Power source goes to the -V on the relay card and the short leads on the LED's



Now the Cascading.

As we only have 2 Signals the Cascading is as follows:

The Normally Closed wire on the 'Distant Sensor' is connected to the COM on Home Relay Card this is wire A.

The Normally Closed wire on the 'Home Sensor' is connected to the COM on the Distant Relay Card this is wire B

You could have as many signals on the one line as you like each controlling the next, in a continuous loop around the track. By using an EM135 the dual relay board, you could Isolate the track behind the Signal immediately after the train had passed the signal.

Note 1

The distance between signals will depend on the size of your layout, and the length of your Trains.

Note 2

These contacts will work the same way as the contacts on the left side of the relay card. So could be used to switch ON an indicator on the control panel.

Parts List Per Signal.

Manual:

Switch	SW305
Resistor	RE137

Automatic:

Sensor	SW919
Relay Card	EM135
Resistor	RE137
Magnet	SW932