

# Simple Signals 1.0

Simplified Electronic Control for Model Railways

## Signal Control for Model Railways

WEB [www.drnow.net](http://www.drnow.net) email [david@drnow.net](mailto:david@drnow.net)

Simple Signal is used for controlling Signals automatically in response to train movements to add extra realism and animation to your model railway.

Many different signalling configurations, as seen following, can be controlled. Searchlight signals or Semaphore Signals can also be controlled (*with the addition of a servo controller*).

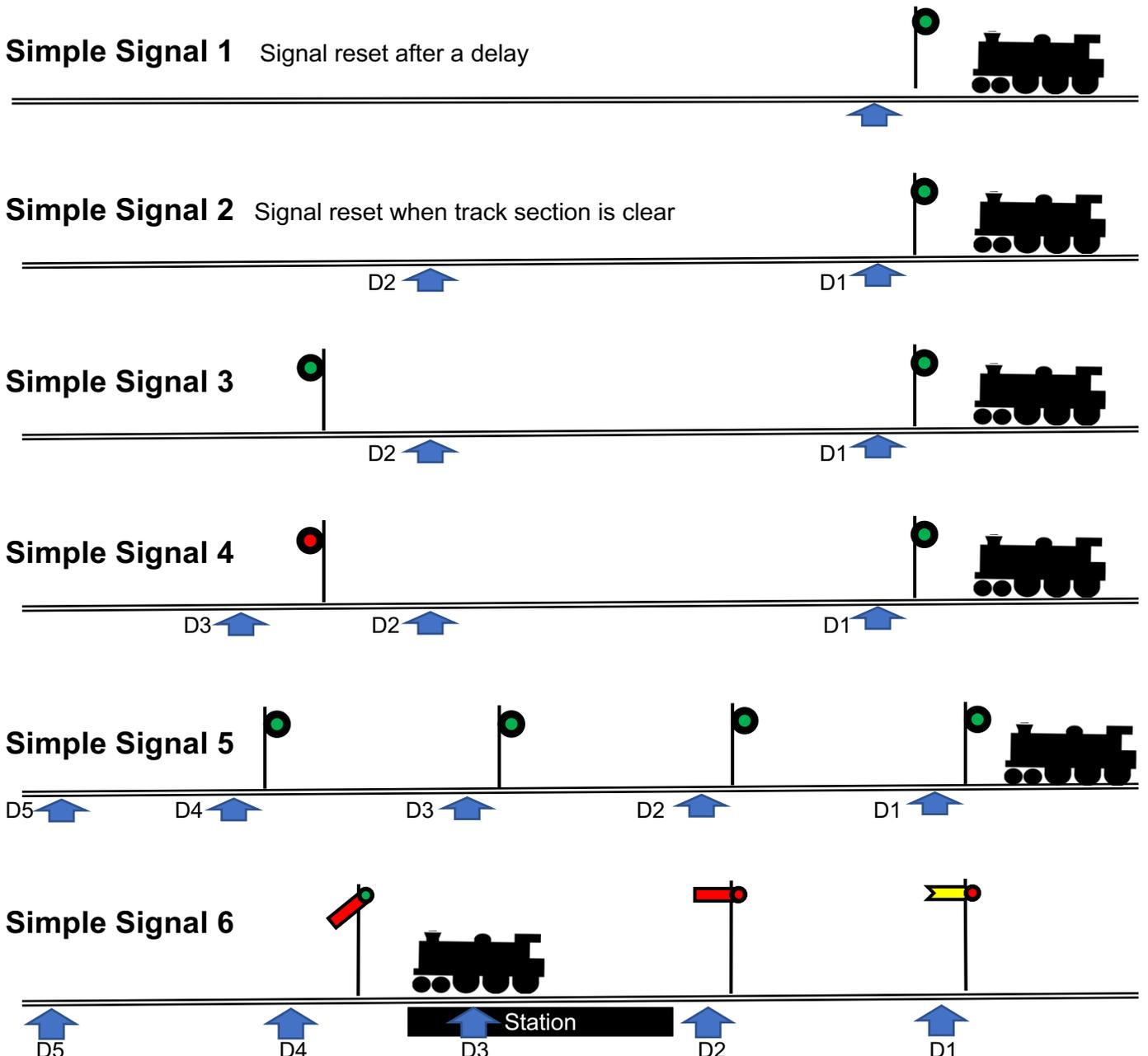


Signal lights activated by your trains can be for either single or dual direction of travel.

Train movement is detected with **IR optical detectors** placed below the track (indicated with the blue arrow in the diagrams).

Standard Signal controllers available for two position signals.

Changing the links on the board allows you so switch between



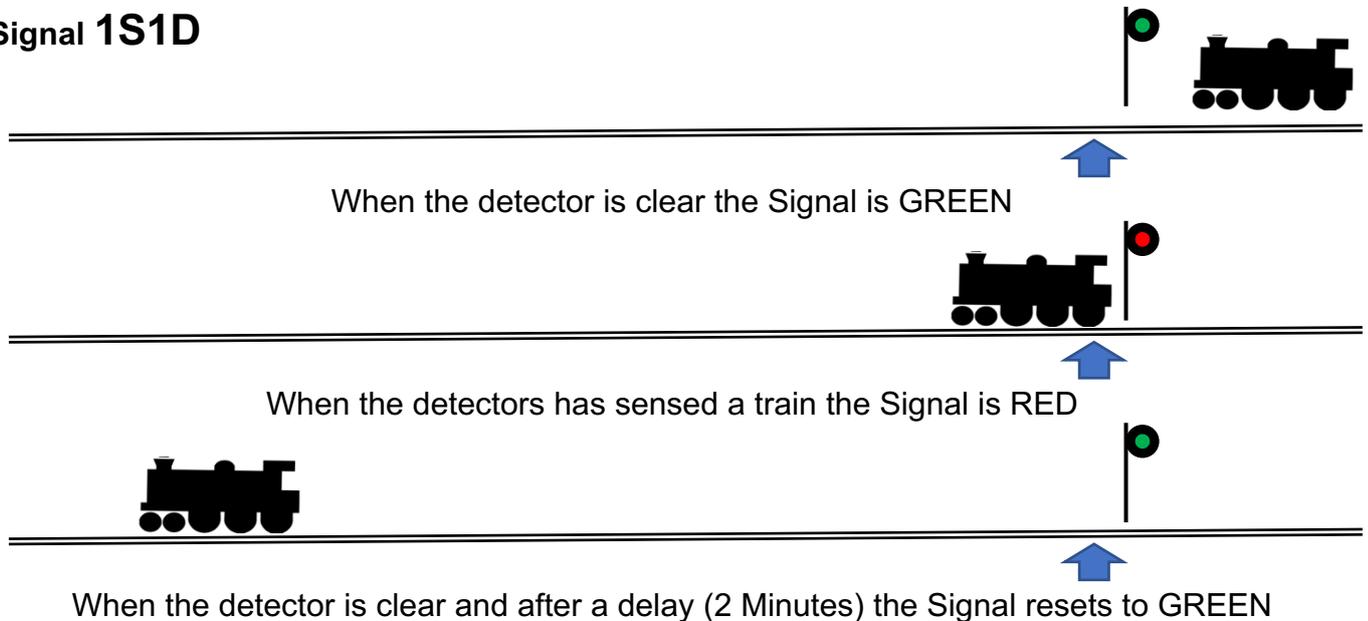
# Simple Signal 1

Simplified Electronic Control for Model Railways

**Simple Signal 1** is a simple way to start signalling your model railway.  
It is good for track where trains travel in only direction.

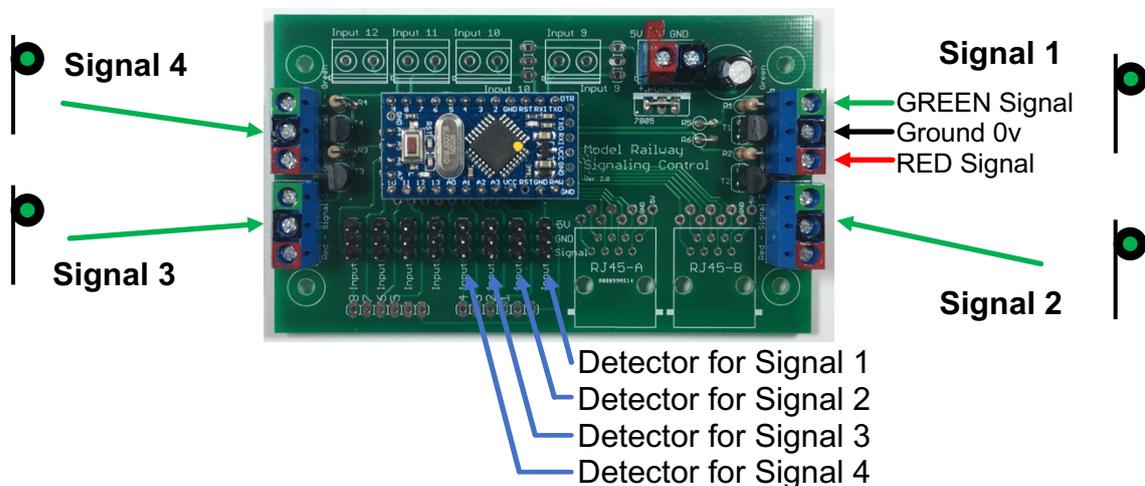
1 RED / GREEN Signal to protect a section of track - Operated with 1 detector.  
Install the detector in between the track after the signal as shown in the diagram below.  
(The Detector is indicated with the blue arrow in the diagrams).

## Signal 1S1D



With **Simple Signal 1** a train approaching from the opposite end (LHS) will also trigger a RED signal at the detector, there will then be the delay before the Signal resets to GREEN.

To set the Control Board for **Simple Signal 1**  
No links in Inputs 10,11 or 12



Up to 4 **Simple Signal 1** - Signals can be controlled by each **Simple Signal 1.0** Control Board



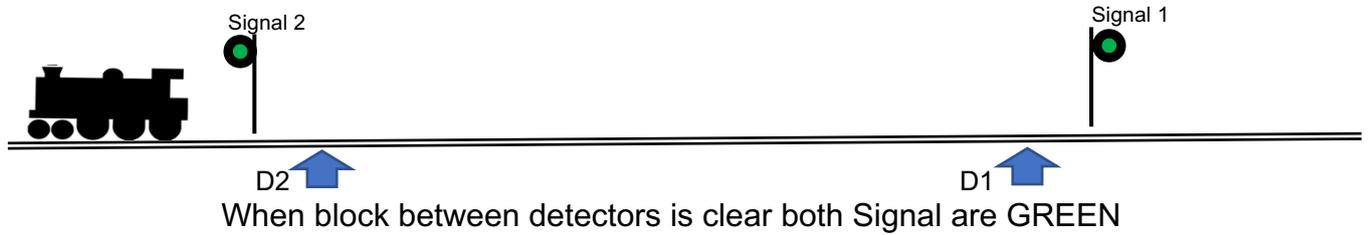
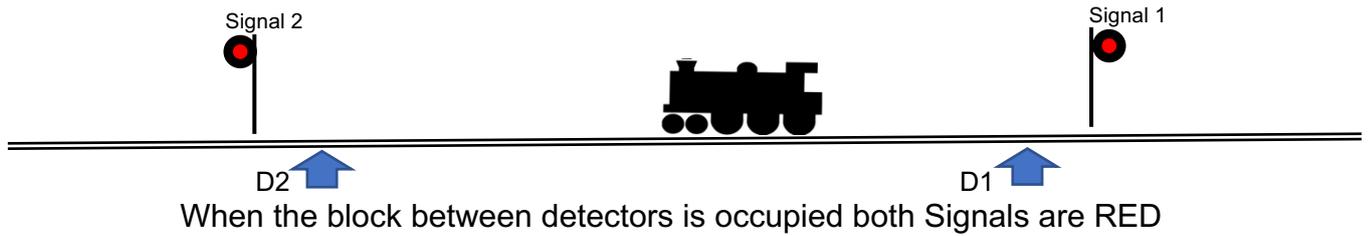
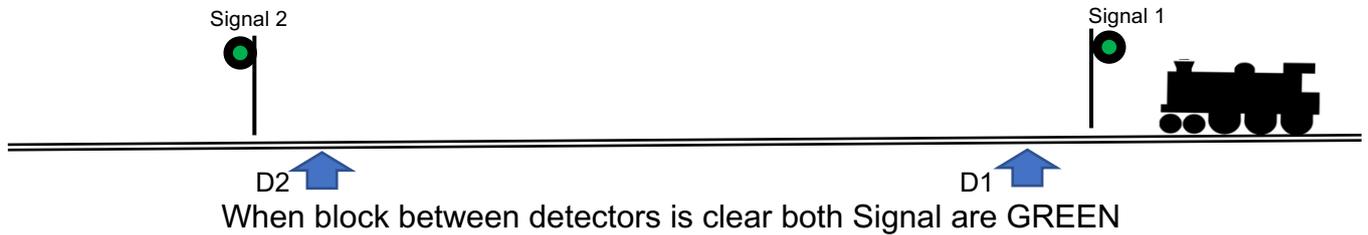
# Simple Signal 3

Simplified Electronic Control for Model Railways

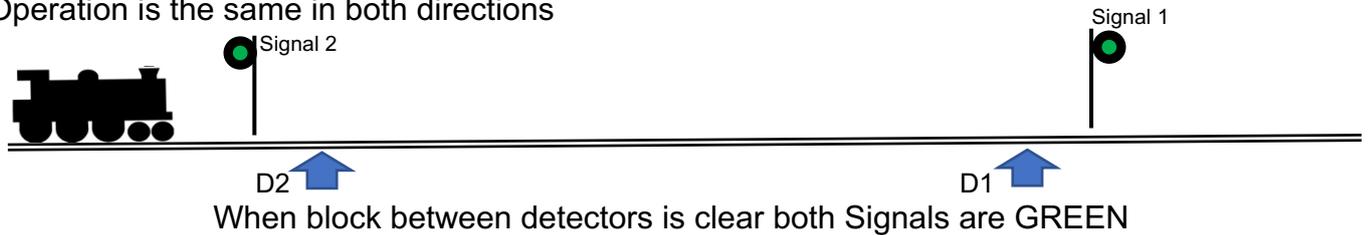
**Simple Signal 3** is a simple way to start signalling your model railway.

It is good for track where trains travel in both directions.

2 RED / GREEN Signal to protect a section of track - Operated with 2 detectors ( **D1** & **D2** )

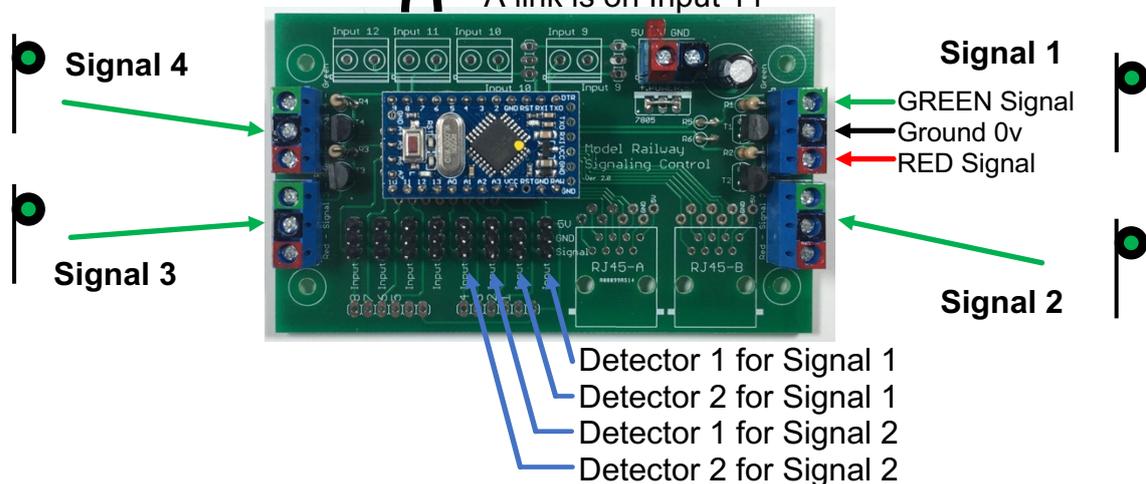


Operation is the same in both directions



**Simple Signal 3** effectively protects a block of track with trains traveling in either direction. This is an upgrade from **Simple Signal 2** with signalling for both directions in visible areas.

To set the Control Board for **Simple Signal 3**  
A link is on Input 11



Up to 2 **Simple Signal 3** - Signals can be controlled by each **Simple Signal 1.0** Control Board

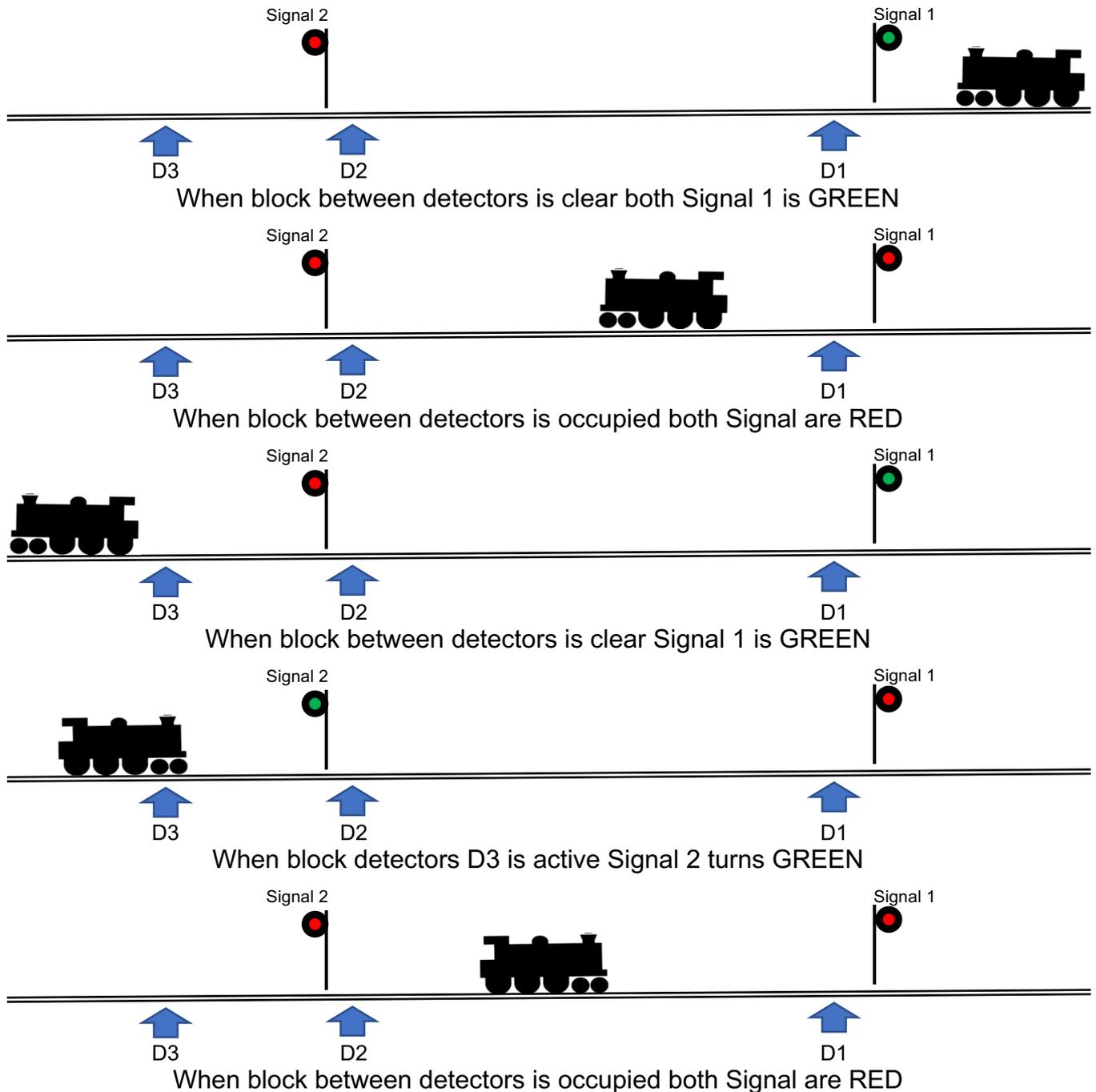
# Simple Signal 4

Simplified Electronic Control for Model Railways

**Simple Signal 4** is good for track where trains travel in both directions.

Used when you don't want both signals to show clear at the same time.

2 RED / GREEN Signal to protect a section of track - Operated with 3 detectors ( **D1, D2 & D3** )



**Simple Signal 4** effectively protects a block of track with trains traveling in either direction. This is an upgrade from **Simple Signal 3** as only one signal will be green at any time.

When a train activates D3 - Signal 1 changes to RED immediately to prevent two trains entering the block at the same time.

- After a short delay to prevent a train entering past Signal 1, Signal 2 then turns GREEN to allow the train to proceed.

When the train passes D2 Signal 2 turns to RED (Signal 1 is already RED).

When the train passes D1 the block is reset, Signal 1 to GREEN, Signal 2 to RED.

Wiring diagram is on the next page

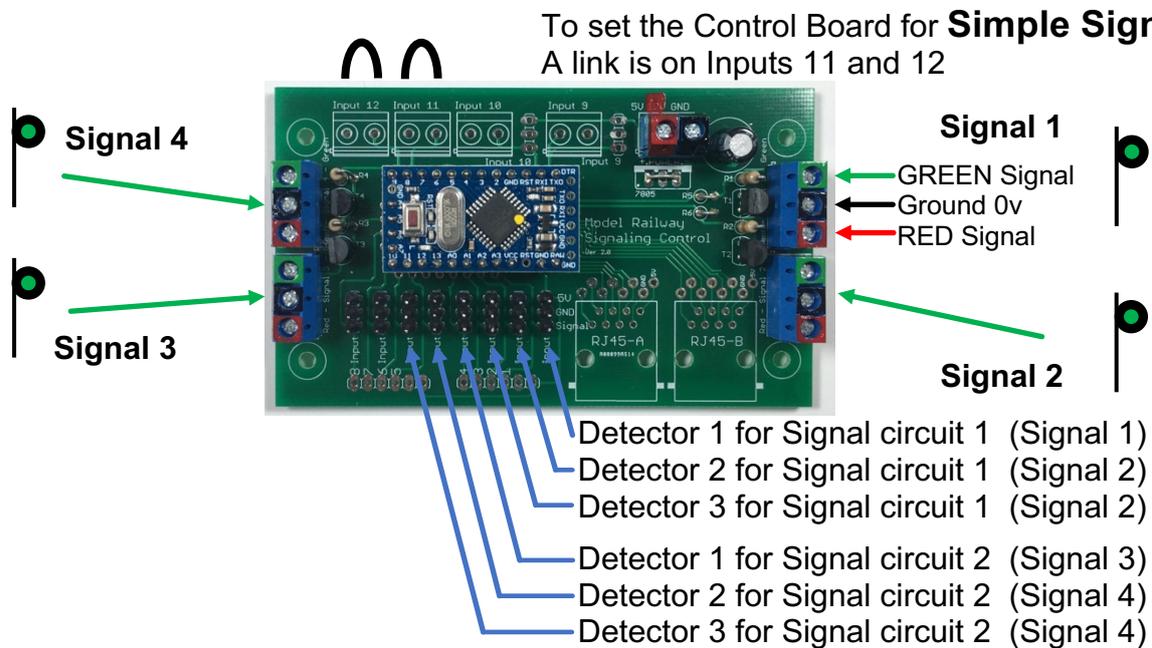
# Simple Signal 4

Simplified Electronic Control for Model Railways

**Simple Signal 4** is good for track where trains travel in both directions.

Used when you don't want both signals to show clear at the same time.

2 RED / GREEN Signal to protect a section of track - Operated with 3 detectors ( **D1, D2 & D3** )



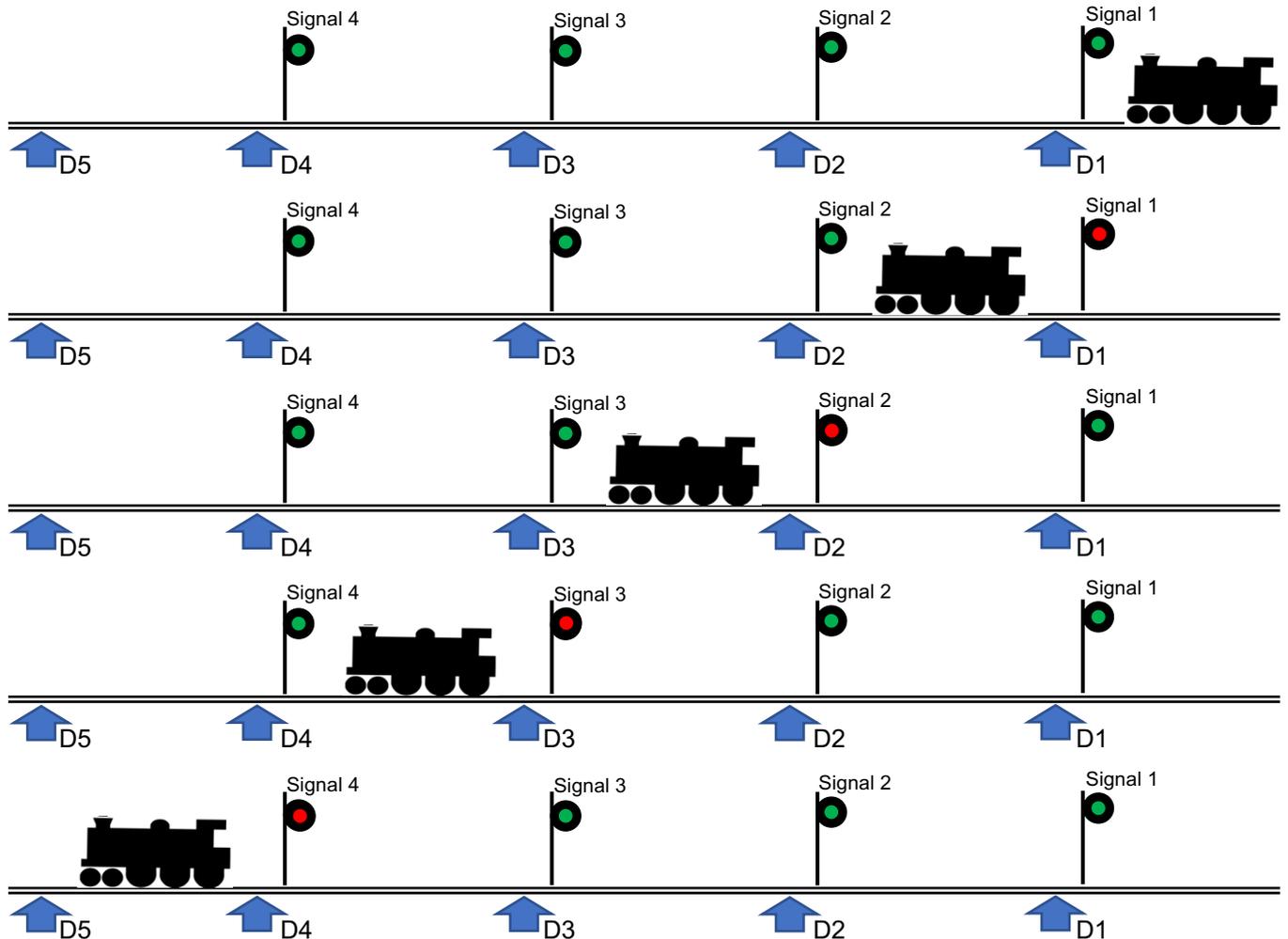
Up to 2 **Simple Signal 4** - Signals can be controlled by each **Simple Signal 1.0** Control Board

# Simple Signal 5

Simplified Electronic Control for Model Railways

**Simple Signal 5** is a simple way to start signalling a line of your model railway.

4 RED / GREEN Signal to protect a section of track - Operated with 4 detectors



Signal 4 clears to green when the train has passed Detector 5

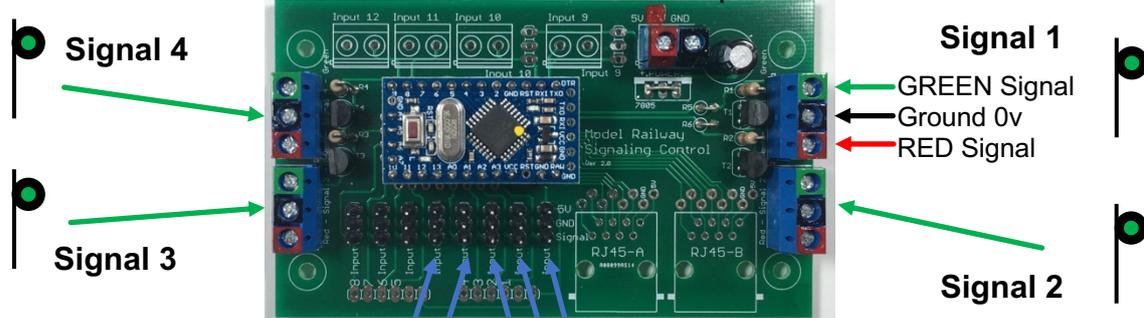
This signalling arrangement could be made for either Searchlight Signals, Semaphore Signals or a mix of both if that was what you wanted.

This requires 5 Optical Detectors (the blue arrows) placed between the rails just after the signals so the signal changes once the train has just passed the signal.

This can be linked to other Signal Control Boards for more signals in a row.

To set the Control Board for **Simple Signal 5**

A link is on Input 10



- Detector 5 to clear Signal 4
- Detector 4 for Signal 4
- Detector 1 for Signal 1
- Detector 2 for Signal 2
- Detector 3 for Signal 3

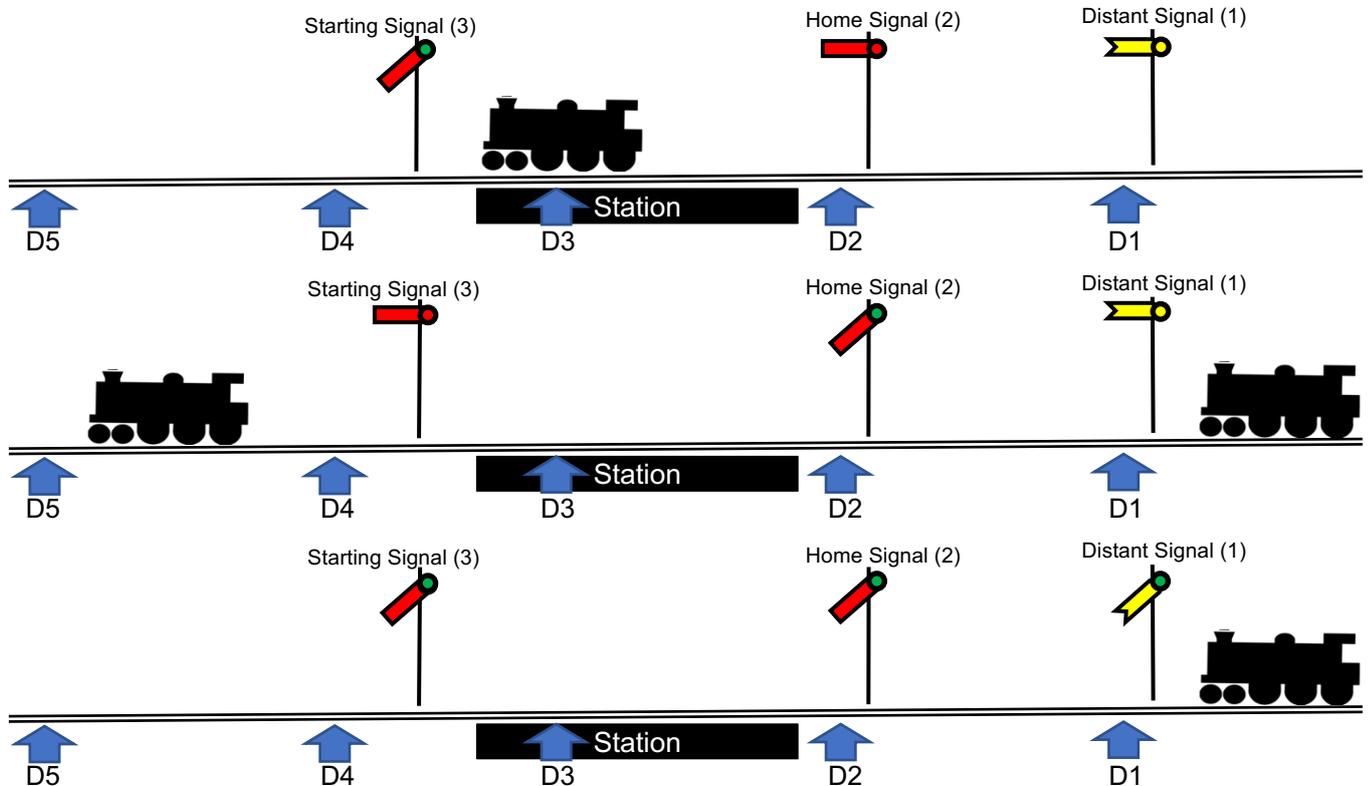
One **Simple Signal 5** can be controlled by each **Simple Signal 1.0** Control Board

# Simple Signal 6

Simplified Electronic Control for Model Railways

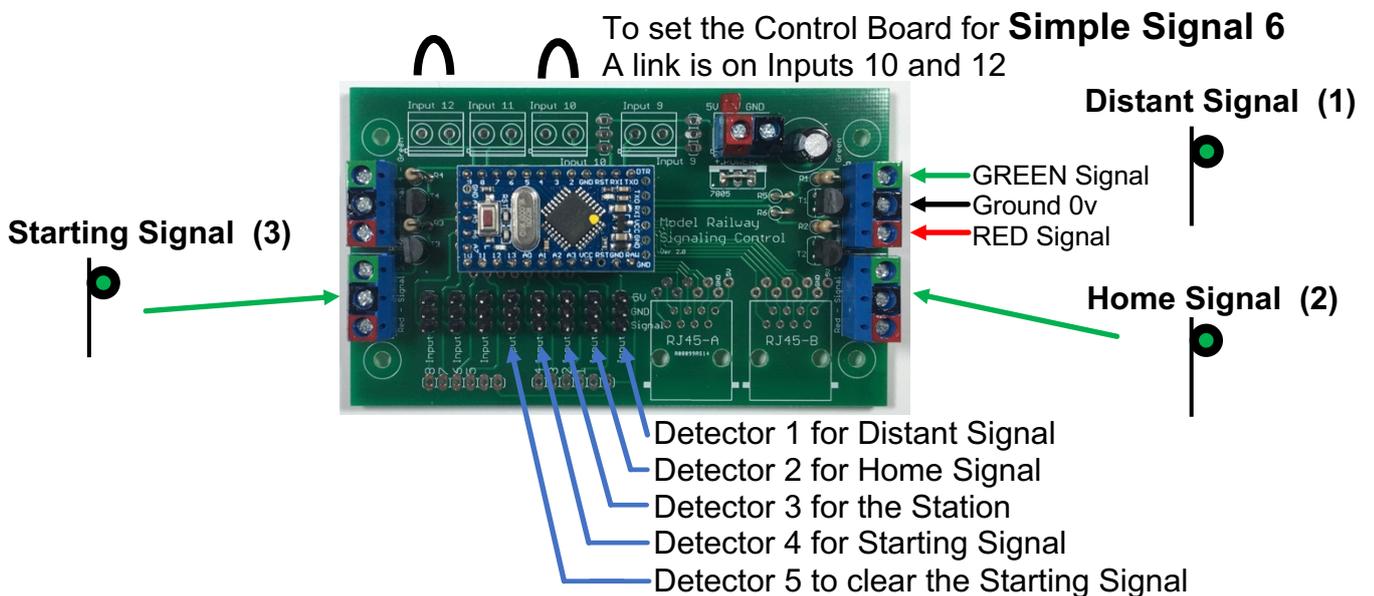
**Simple Signal 6** is a simple way to start signalling a line of your model railway. It is good for track where trains travel in one direction.

3 RED / GREEN Signal to protect a station - Operated with 5 detectors



This signalling arrangement could be made for either Searchlight Signals, Semaphore Signals or a mix of both if that was what you wanted.

This requires four Optical Detectors (the blue arrows) placed between the rails. Three are just after the signals so the signal changes once the train has just passed the signal. One is at the station to detect a train stopped at the station



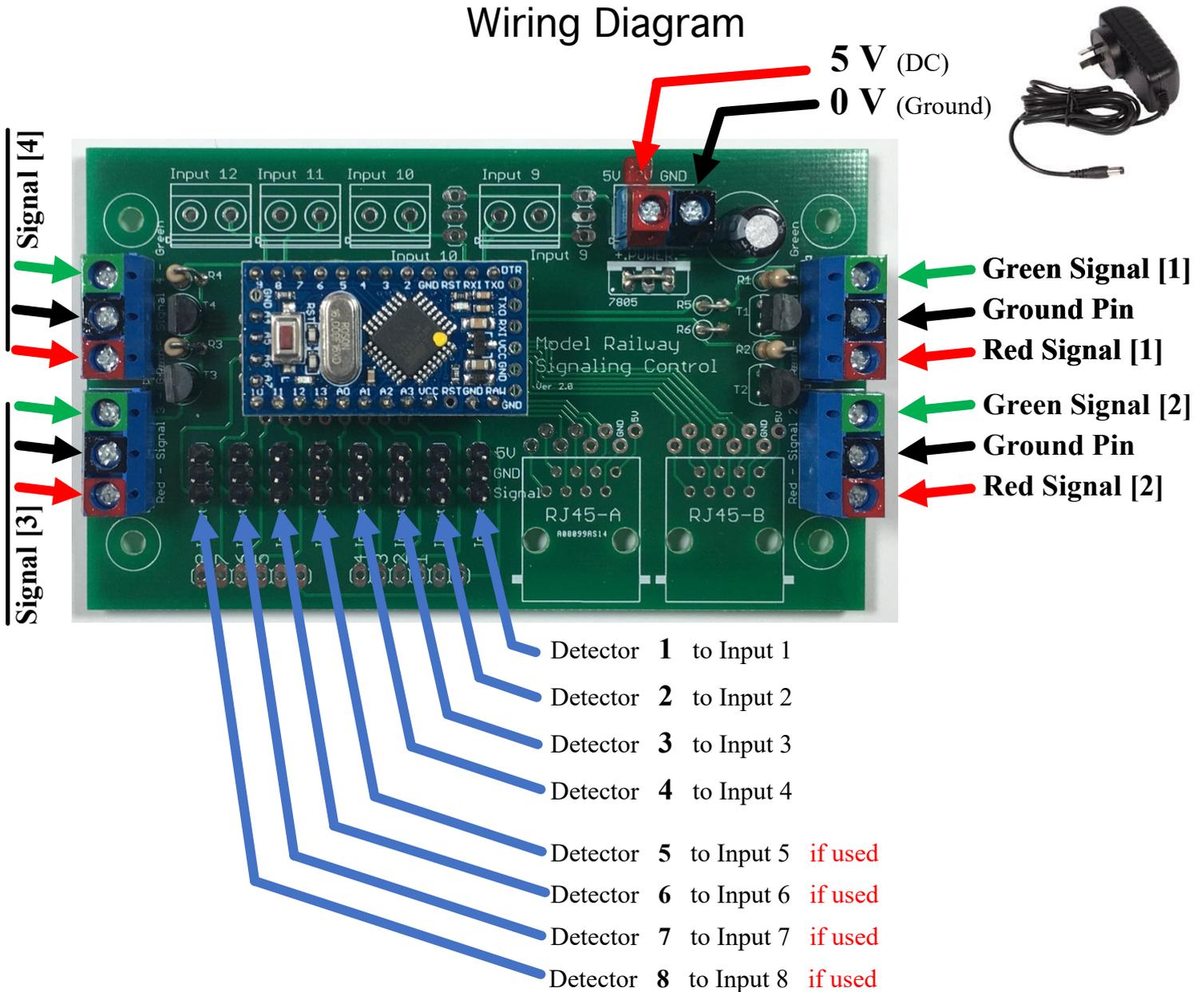
**One Station** can be controlled by each **Simple Signal 1.0** Control Board

# Simple Signals

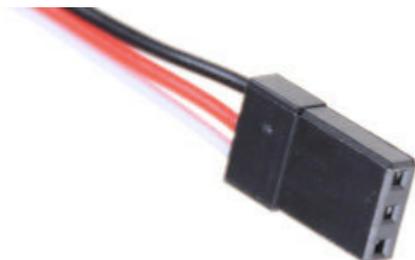
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## Wiring Diagram



Detector Connection to main Board is with 3 pin cables,



(these can be extended with servo extension cables if required)

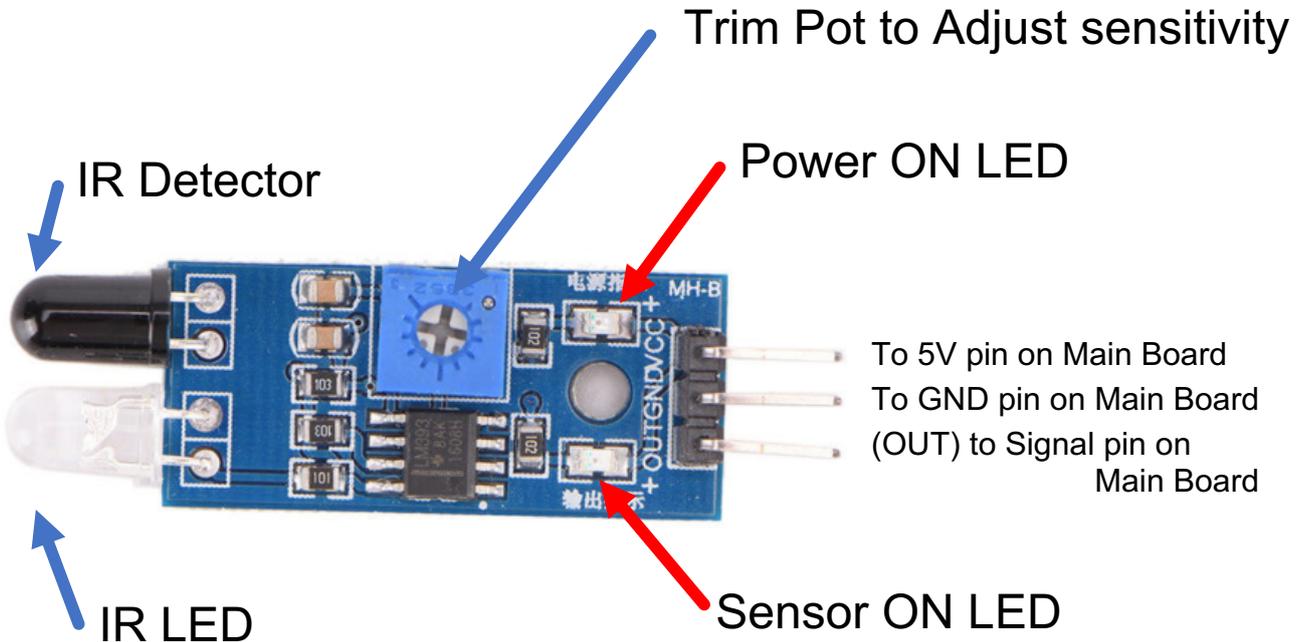
Take care to match the OUT pin of the Detector with the **Signal** pin on the main Board.

# Simple Signals

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## IR Detector



To set the Detector connect it to the main board and apply power. The small red Power ON LED will be on.

Adjust the trim pot so the Sensor ON LED is only on when a train (or your hand) is directly above the sensor.

The second RED LED is off when there is no train above the sensor.

*(If the Power ON LED does not come on, check you have the three pin connector cable Pins correct)*

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*I can supply all that you need for your application*

*Some Parts are available online, ebay etc if you would like to supply them yourself.*

For the IR Detector search

[Arduino IR Infrared Obstacle Avoidance Sensor Module](#)

Note that I modify the detector so the IR (clear) LED and the IR detector (Black LED) can be mounted between the rails and the trim pot is still accessible for sensitivity adjustment. (I will soon have a video to show you how to do this.)

For the cable that connect the IR Detector to the main Board search

[Male to Male Quadcopter Extension Servo Lead](#)

To extend the cable that connect the IR Detector to the main Board search

[Male to Female Servo Extension Lead](#)

[5V DC plug pack](#), and [3 Pin DC Power Plug Connector Socket Z2R8](#)

Or to convert your 12v Supply to 5V

[LM2596 DC-DC Adjustable Step Down Module Power Supply](#)

[Cat5 Network Cable](#) try your local computer Shop.