

# INFRARED TRAIN DETECTOR WITH RELAY (ITD-R)

The Infrared Train Detector with Relay (ITD-R) uses an Infrared (IR) sensor to detect trains on your layout. The ITD-R has a LED for giving a visual indication when a train is being detected as well as a relay for interfacing to other equipment or lights. They are ideal for giving the operator a visual indication or to automatically stop a train when it has reached a location on your layout that is obscured from view.

When a train passes over the sensor an infrared beam is reflected off the underside of your train and detected by the IR receiver. This will cause the LED to be turned on and the relay to be activated.

There is no modifications to rolling stock, simply mount the detector at the required location underneath your track.

## What you should have

1 x Sidetracked Electronics Infrared Train Detector with Relay (ITD-R).

1 x 3mm red LED.

1 x User manual.

## About this manual

Text written in *ITALICS* in this manual represents text as it is written on the ITD-R.

## Operation

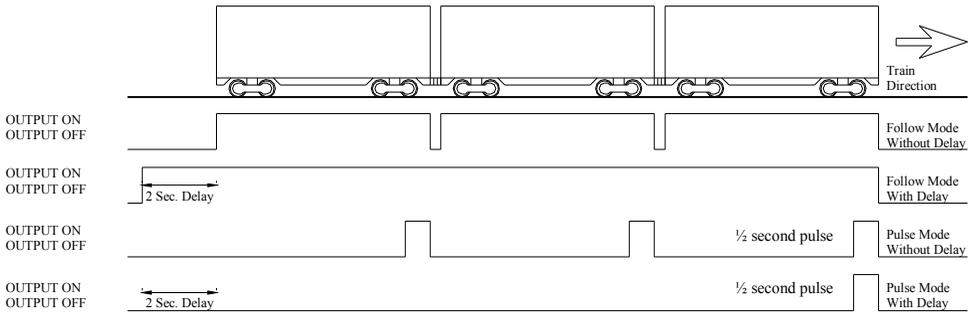
The ITD-R has four modes of operation.

**1) Follow with no delay:** when a train is detected the output comes on and stays on as long as the train remains detected.

**2) Follow with delay:** without the delay set it is possible for the output to be switched off at the gaps between rolling stock as the train passes over the IR sensor. With the delay set the IR sensor must be clear for two seconds before the output turns off.

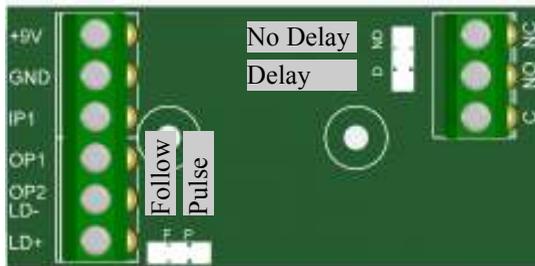
**3) Pulse with no delay:** when a train is first detected the output is pulsed on for half a second and then off again.

**4) Pulse with delay:** without the delay set it is possible for the output to be pulsed at the gaps between rolling stock as the train passes over the IR sensor. With the delay set the sensor must be clear for two seconds before the output can be pulsed again.



## Mode Selection

The ITD-R operating modes are selected by positioning the shorting links provided in the labelled locations below. You must turn the power off then on before the new mode settings take effect.

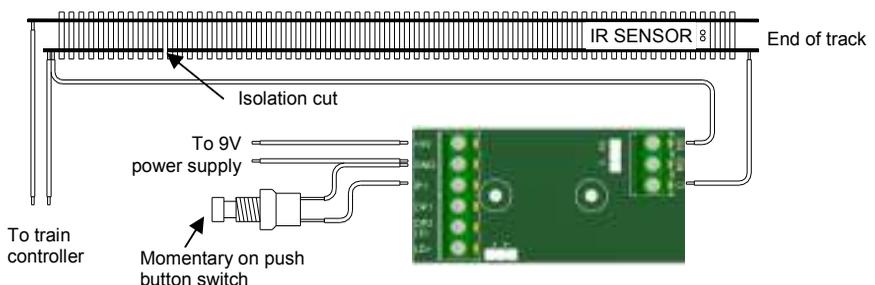


## Automatic Stopping

To stop a train automatically at the end of a track, set your ITD-R up in follow mode with delay. Cut the rail to isolate the end section of track as indicated. Ensure your locomotive will completely fit in the isolated section when detected. Wire power to the isolated rail through the *C* and *NC* terminals on the ITD-R and a momentary push button switch between the *GND* and *IP1* terminals. Install the ITD-R at the end of the track where you would like the train to stop.

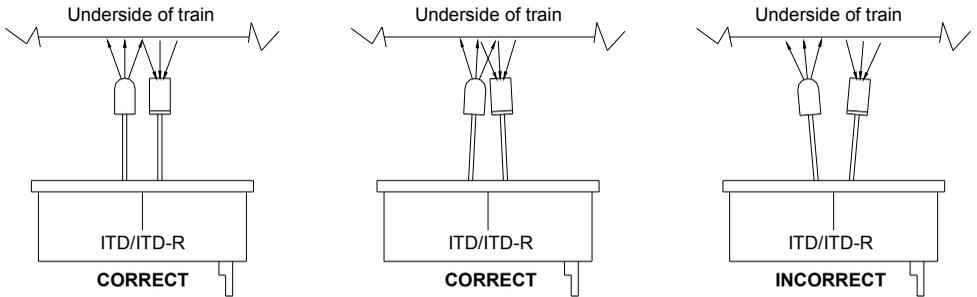
When the train is detected at the end of the track the ITD-R cuts power to the rail and stops the train. When you are ready to bring the train out, simply push the button and power will be supplied to the rail again. Be aware that you will have to manually change the direction of the train so it doesn't continue off the end of the track.

The ITD-R is not designed to stop trains operated by DCC.



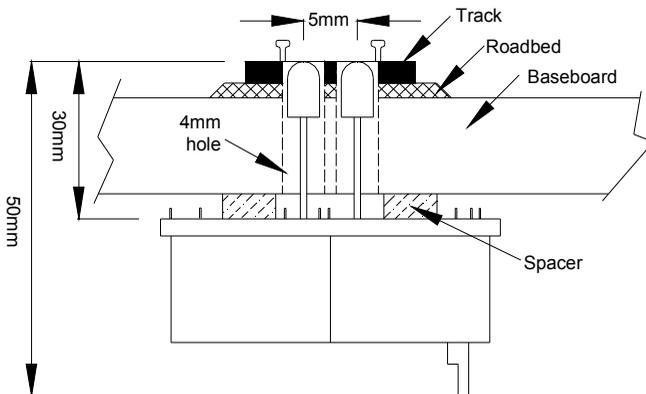
## Installing the ITD-R

There is two parts to each infrared (IR) sensor on the ITD-R, a transmitter and a receiver. When mounting the ITD-R make sure the two components of the IR sensor are pointing directly up or slightly bent in towards each other. The train acts like a reflector when it passes over the IR sensor so if they are pointing away from each other the train may go undetected.



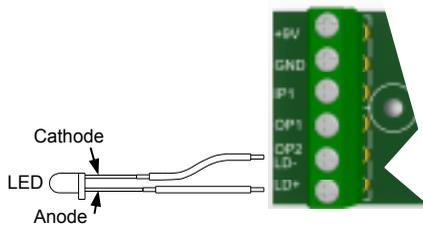
It is recommended that the ITD-R is mounted under your layout and the IR sensor pushed up between the sleepers in the centre of your track. Drill two 4.0mm (5/32 inch) holes with 5mm between their centres or make a 4.0mm x 9.0mm slot, being careful not to damage the track. Screw the IR sensor in place, adding a spacer if necessary so that the top of the IR sensor sits level with the top of your ballast or sleepers.

**IMPORTANT:** Make sure nothing covers the top of the IR sensor and that the rubber tubing that surrounds one of the sensors stays intact once the ITD-R has been installed. Do not apply any heat to the rubber tubing as it may distort and affect the operation of the sensor.



## Wiring an Indicator LED

LEDs have to be connected in a certain way in order for them to work. They are polarised, meaning they have a positive (anode) and a negative (cathode) pin. The cathode pin is easily identified as it is either the shorter of the two leads and/or its marked by a flat spot on the body of the LED. A LED can be mounted remotely and then wired to the ITD-R to



indicate when the output is active. To connect an indicator LED, wire the cathode of the LED to the *OP2/LD-* terminal and the anode to the *LD+* terminal. No resistor is required. Whenever the relay on the ITD-R is activated the LED will illuminate as well. A 3mm red LED is provided.

## Specifications

Dimensions:	65mm (width) x 32mm (depth) x 50mm (height)
Supply Voltage:	9V DC
Supply Current:	50mA
Maximum Relay (Track) Voltage:	30V
Maximum Relay (Track) Current:	2A

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