

Train Tech overview - ask for free catalogue

Signal kits - OO/HO low cost easy to make signals for DC

Sensor Signals - easy automatic block signalling - DCC or DC

Smart Lights - small effects built in - DC/DCC - just 2 wires:
Arc welding • Emergency vehicle • TV • Fire effect • Party disco

Automatic Coach Lights - motion - no pickups or wiring:
Older Warm White • Modern Cool White • Tail Light • Spark Arc

Automatic Tail Lights - motion - easy, no wires - lantern LED:
Flickering flame oil lamp • Modern Flashing • Constant light

Track Tester - quickly tests DC polarity or DCC - N-TT-HO-OO
SFX+ Sound capsules - no wires! - real trains - DC or DCC
Steam • Diesel • DMU • Passenger coach • Shunted stock

Buffer Light - clip in lights for buffer stops - N or OO - DC/DCC

LFX Lighting effects - DC/DCC - screw terminals - with LEDs:
Home & Shop lighting • Welding • Flashing Effects • Fire

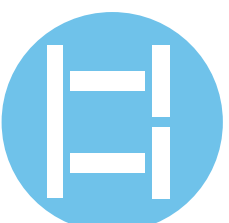
Traffic Lights - fully assembled - just connect to DC or DCC

Level Crossings - assembled - N & OO versions - DC / DCC

DCC controlled and automatic signals - easy one touch setup:
2 aspect • 3 aspect • 4 aspect • Dual head • Feathers • Theatre
LEDs, connectors, battery holders

DCC Signal & Point Controllers

Test Equipment, Tools etc



Train-Tech

Model Technology Made Easy

SVP1 Servo Controller Starter pack

- Includes controller and miniature servo
- For Crossing Barrier, Points, animation
- Control by DCC, DC or Track sensor
- Can be controlled to specific positions
- Power by 9-16 volts smooth DC or DCC

COMPREHENSIVE CATALOGUE FREE ON REQUEST

www.train-tech.com

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www.Train-Tech.com

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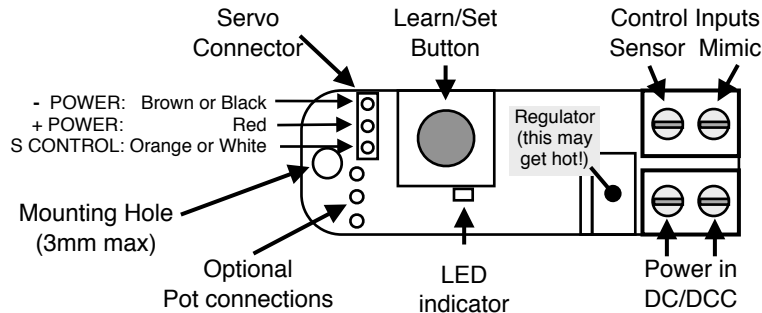


Please handle carefully & read these instructions fully before using!!

Introduction

The Train-Tech SV1 Servo controller connects directly to most types of regular analogue radio control servo and enables you to control servo movement to specific defined positions or by variable amounts using Track Sensors, Sensor Signals, DCC commands or manually using switches.

Connections



Contents

Servo setup and control using DCC:

- DCC Loco command - enables variable control of the servo position or choice of four positions: page 2
- DCC Accessory command - moves the servo between 2 positions which you can define: page 2

Servo setup and control using DC:

- DC powered with control to 2 positions using a 2 position switch: page 3
- DC powered with control to any position using a potentiometer (variable resistor) control: page 3
- **Servo Control using Track Sensor, Sensor Signal or Mimic Switch:** page 4
- Using a Servo to activate level crossing barriers: page 5
- Automatic control of Train-Tech Level Crossing barriers using Track Sensors/Sensor Signals: page 6 & 7

Servos

Most regular analogue 5 volt, three wire servos can be used and will usually just plug directly in to the standard 3 pin plug on the servo controller board. Note that one controller will only safely power a single servo, so if you wish to control more than one servo simultaneously you need to use a separate controller for each and link them so that they work together as shown in these instructions.

This controller is also available as part of a set SVP1 which also includes a basic Micro 9g servo. The controller can supply a continuous power of 100mA (0.1A) and a peak of 400mA (0.4A). Servos like the Futaba micro range and Tower SG90 are ideal, though check they are genuine as some on auction sites are not and can be sub-standard and have rough mechanisms or take excessive power. (NB The small 9g servo supplied in the starter pack is available separately on www.gaugemaster.com/train-tech as SVS1).

Please note that we cannot accept any responsibility for compatibility of servos except the one we supply.

Caution - only ever connect with all power turned off and ensure you never touch any other connections or components otherwise permanent damage will result.

Troubleshooting

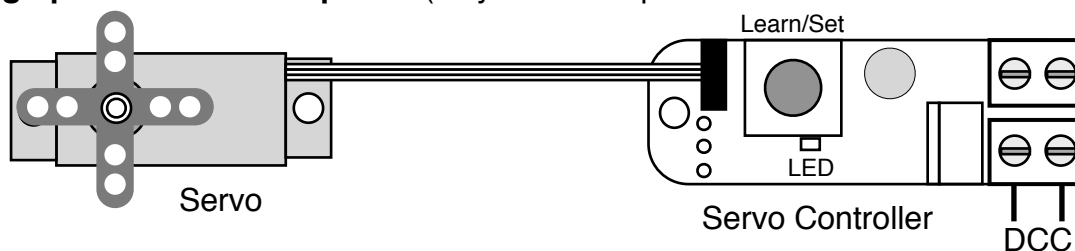
This product is designed to be easy to connect and use but here are a few tips which may help should you have problems following installation. Remember only ever wire and install with all power turned OFF.

- If the Servo does not move at all, check that it is plugged in the correct way round on the connector; the control wire (usually orange and marked Δ on the plug) should be to the inside pin which is marked S.
- If wishing to control Servos using DCC Accessory addresses, you must first set your DCC controller to accessory command mode to set up and use it - refer to your controller manufacturers instructions.
- On DCC: if LED does not flash when you press Learn button, ensure F8 is OFF on **ALL** loco addresses
- Factory reset - Press and hold the Learn/set button for more than 1 minute. The LED will flash 3 times once it has reset. This clear positions stored etc and returns the SV1 to original factory settings.
- It is normal for the Regulator (see picture above) to get quite hot and note that only one servo must be connected and powered from one controller! See instructions how to synchronise more than one servo.

• Servo setup and control using Digital DCC

The Servo controller incorporates a power regulator and a DCC decoder to enable the Servo to be controlled by both Loco (full control) and Accessory (two positions only) types of DCC commands.

Connecting up Servo and DCC power (only connect up with DCC Power switched OFF!)



SETTING UP - you need to set up the servo controller before controlling a servo using DCC.

Whether you intend to control your servo by Loco or Accessory commands, the Servo controller must first be set up using DCC Loco commands at Loco address 54 (this is fixed, so if you have a train already assigned to this address either change it or remove it from the track while setting up).

We recommend resetting your DCC controller before setting up to turn off all Loco F functions!

• **To enter setup**, select loco address 54 then press Learn/Set button on servo controller twice. LED should double flash to show its in setup mode. *If LED does not flash, check that **NO** F8 are on!*

• To set and store servo positions:

Move your DCC train controller speed control to move the servo head over its range, then select: F3 to set position A: F4 to set position B: Then optionally: F5 to set position C: F6 to set position D

• To set the servo speed:

Select F7 and servo will scan back and forth between the preset positions A and B. Adjust your DCC train controller speed control until the servo head moves at the speed you want it to.

• **To set a semaphore signal type 'bounce'** where the servo speeds up then bounces at the end: Select F0 to turn bounce on when servo reaches preset position B (Deselect F0 to turn off bounce) *NB bounce is only recommended when using just the two main positions A and B, not C and D.*

• **To save all settings:** Select F8 *NB switch off F8 after saving so that you can edit settings again*

• **To quit setting up without saving any changes:** select F1.

DCC LOCO CONTROL uses a DCC loco address and enables you to move the servo head using your regular train speed control and move the servo to preset positions using F function buttons.

Assigning a DCC Loco address to control the Servo controller:

To set address press Learn/Set button once - LED will flash. Set DCC controller to Loco address you want to control servo, then select F2 to save. LED will stop flashing and Servo will respond to the address. *NB If LED does not flash when Learn/Set is pressed, check that **NO** F2 are turned on.*

DCC Loco commands control of the Servo:

Set your DCC controller to the loco address you have set to control the servo

The DCC controller train speed control will manually adjust the position of the servo

F3 to F6 will move the servo to the servo stored positions A to D

DCC ACCESSORY CONTROL only has 2 'states', so can only move the servo between 2 preset positions A and B using a DCC accessory address, for example for Level Crossing barrier or gates. *Tip Give servo the same address as level crossing lights or signal to make them change together.*

Assigning a DCC Accessory address to the Servo controller:

Press the Learn/Set button once, the LED should flash. Then set your DCC train controller to the accessory address you want the servo to respond to & send a command (usually direction or 1/2).

DCC Accessory commands control of the Servo:

Set accessory address on DCC controller and use direction or 1/2 to move servo to positions A & B

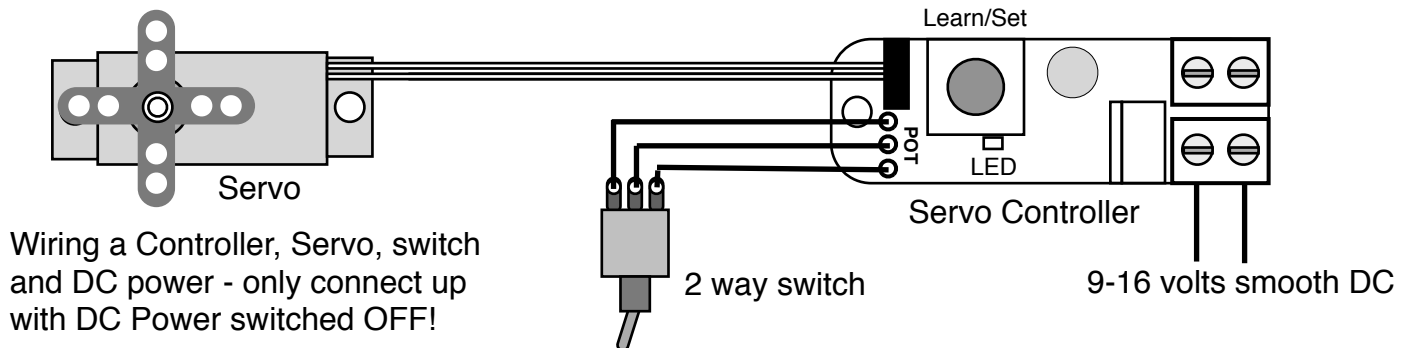
Tip: Press Learn/set button as the controller is powered up to move the Servo to its centre position

• Servo setup and control using Analogue DC

The Servo controller incorporates a power regulator and circuitry to enable a Servo to be powered by DC and controlled by either a switch or a potentiometer. You will need a smooth DC power supply with a voltage output of 9-16 volts DC at 0.5A.

Please note that connecting a switch or potentiometer will require wiring and soldering.

Controlling the Servo using a switch



Wiring a Controller, Servo, switch and DC power - only connect up with DC Power switched OFF!

Setting up the Servo positions with a switch

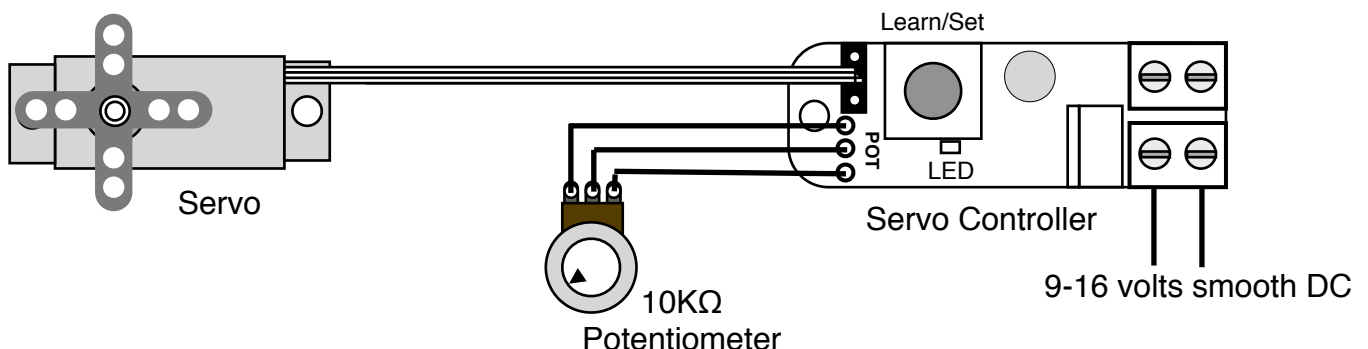
Note: If you have a DCC controller it may be more easily set up using DCC (p 2), then use on DC

- Switch on the DC power - the LED should light.
- Set the 2 way switch to the stored position you want to set up first, eg A
- To locate the position you want to store, press and hold the Learn/set button and the servo head will slowly move in one direction - press and hold it again to move it in the opposite direction. When the servo reaches the position you want to store release the Learn/set button and the controller will store that position for A.
- To set the other stored position B, move the switch to the other side and repeat above.
- To add a semaphore signal type 'bounce' effect at the second position B, press the Learn/set button twice quickly and the LED will flash twice indicating that the bounce is turned on. Press the Learn/set button twice quickly again and the LED will flash once and the bounce effect will be off.

Tip: To move servo to centre position, press the Learn/set button as controller is powered up

Connecting up Servo, Potentiometer & DC power (only connect with DC Power switched OFF!)

The servo can also be controlled by a potentiometer (variable resistor) control, so that you can remotely control the position of the servo manually by moving the control knob.

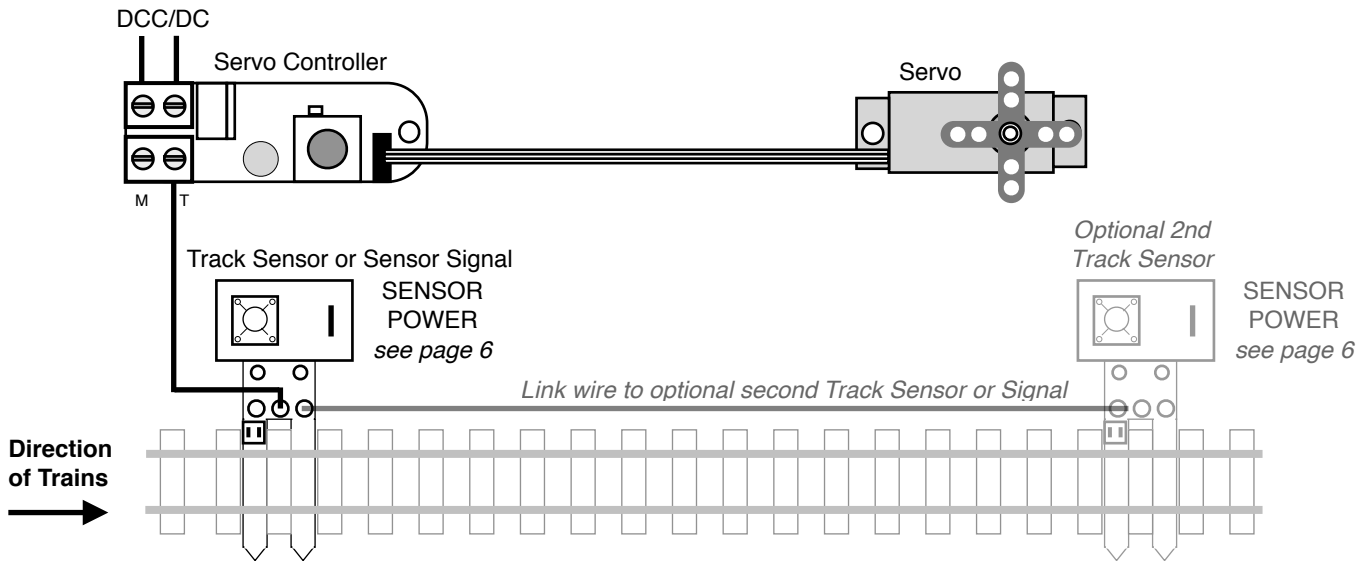


A potentiometer is a variable resistance control and is what is usually used in a radio as a volume control. The Servo controller needs a potentiometer (pot) with a value of 10 kΩ (10,000 ohms) and a Linear track, along with a suitable control knob for your control panel etc. Connect using three wires between the three 'POT' connections on the Servo controller and the potentiometer.

NB Train-Tech, some model shops and most electronic component suppliers can supply a suitable '10K LIN potentiometer' and control knob (eg POT1 from www.gaugemaster.com/train-tech)

• Servo control using Track Sensors/Sensor Signals (DC/DCC)

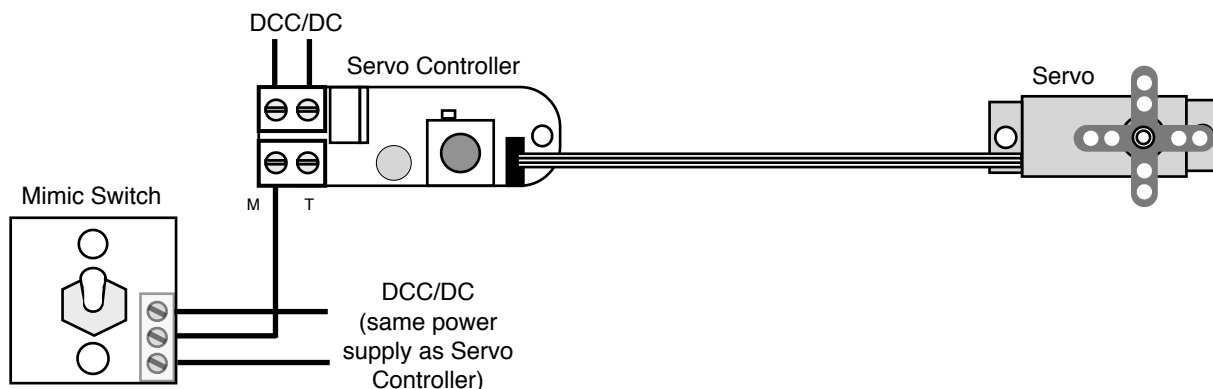
A Track Sensor or Sensor Signal can be connected to the Servo controller to enable servo to move between two positions when a Train goes over sensor, ideal for Level Crossings, Semaphores, etc.



First you need to setup the Servo Controller with the two positions A and B which the servo has to go to and from when a train passes - see page 2 (DCC) or 3 (using DC) to see how to set it up. Wiring is easy with just one link wire between a Track Sensor and the Servo Controller and they both need to be powered from the same power supply, either DC or DCC. When using one Track Sensor, the Servo will move as soon as the train passes the sensor and then will return to its other position around 7 seconds after the train has passed. If you use an optional second Track Sensor as shown, then the Servo will not return to the other position until the train passes the 2nd sensor.

• Servo control using a Mimic Switch (DC or DCC)

A Mimic Switch can be connected to the Servo controller to enable a servo to move between two positions depending on the position of a MS1 Toggle mimic switch or MS2 Pushbutton mimic switch.



First you need to setup the Servo Controller with the two positions A and B which the servo has to go to and from when a train passes - see page 2 (DCC) or 3 (using DC) to see how to set it up. There are just three wire connections to a Mimic switch. The centre terminal should be linked to the M terminal on the Servo controller and the the two outside terminals are connected to the same DC or DCC power supply as the Servo controller (which also provides the 'common rail' between them).

The Mimic Switch can be located a good distance from the Servo Controller and once connected and powered up the Mimic switch will move the servo between the two positions, with the Mimic Switch LEDs indicating which position the servo is in.

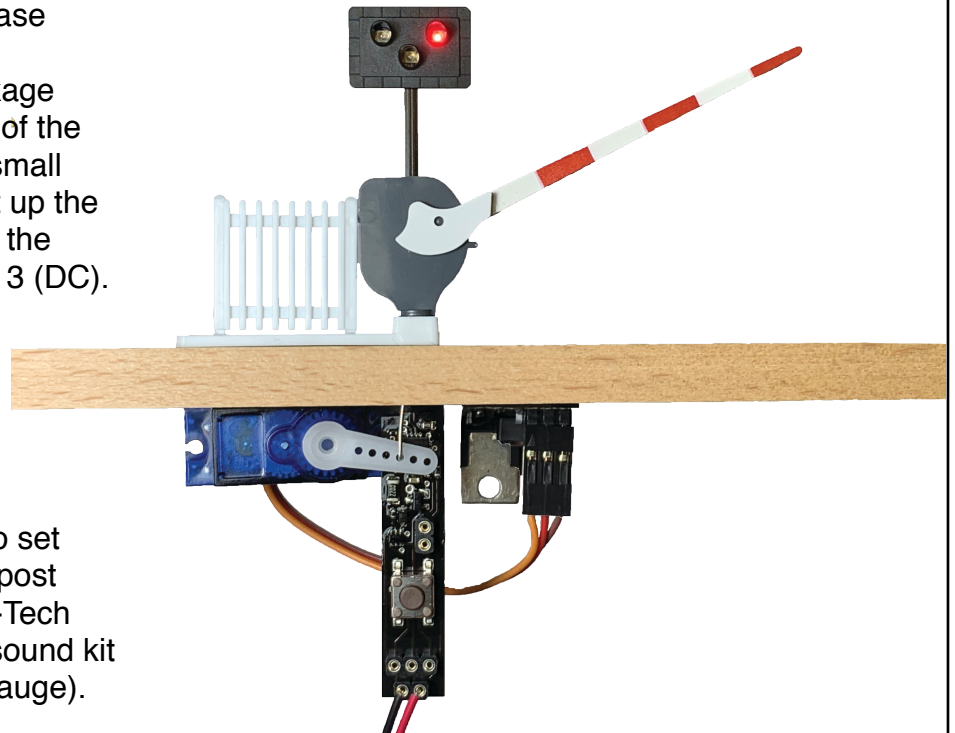
This is particularly useful for controlling the Servo using a Mimic Switch on a control panel for example.

• Using a Servo to activate Level Crossing Barriers

One of the most popular applications for servos in model railways is to operate level crossings. Whilst of course it is up to the modeller how they operate their models, we thought the following showing how we fitted servos to our LC Level Crossing light and sound barrier sets may be useful.

• Servo underneath the baseboard

This shows how we mounted the servo controller and servo under the base board and, using a straightened paperclip, made a short wire linkage from the servo head to the back of the barrier and passed it through a small hole in the base board. Then set up the two positions of the servo to suit the barrier, as on page 2 (DCC) and 3 (DC).

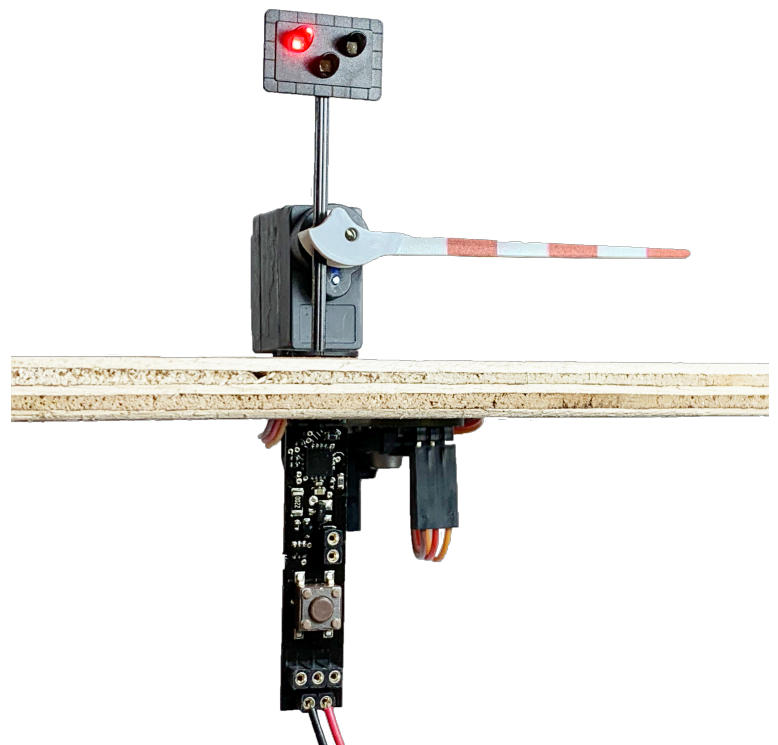


The photograph shows the servo set with the barrier, light and sound post which is all included in the Train-Tech Level crossing barrier light and sound kit LC10 (OO/HO) and LCN10 (N gauge).

• Disguising the servo on the surface

It is not always possible to have easy access underneath a baseboard, so we came up with this idea of mounting the barrier directly onto the servo spindle and then camouflaging the servo to look like a control box or lineside hut on top of the board. The small SG90 type servo is ideal for this project because after cutting off the mounting ears the height is just right to mount the barrier on for OO, or horizontally mounting for N. We fixed the barrier by slightly enlarging the small hole already there and fastening it to the servo spindle using one of the small screws supplied with the servo. Finally we glued the cable to the back of the servo and disguised it all by painting it dark grey and touching in a handle and frame like a door!

The photo shows a Train-Tech Level crossing barrier light and sound kit LC10 (OO/HO). The N gauge model is LCN10.



• Automatic Level Crossing: Single Track - one direction

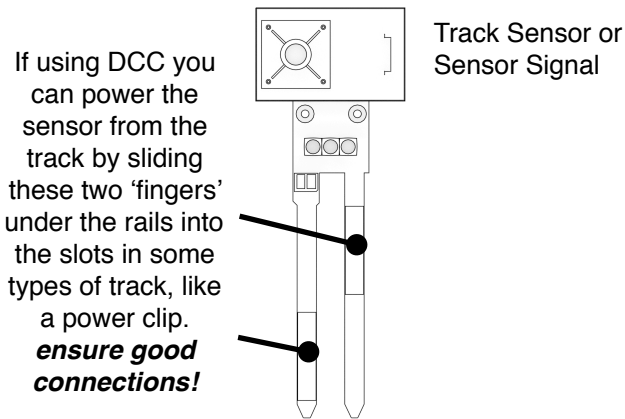
As shown on the previous pages, it is relatively easy to control a servo from a Track Sensor and use it to activate level crossing barriers, so these pages show how you can link Track Sensors or Sensor Signals with Servos and Train-Tech Level Crossings to make complete automatic working level crossings with lights, sounds and moving barriers!

The Level Crossing, Track Sensor and Servo controller must all be powered by the same power supply which can either be Digital DCC or Analogue 9-16 Volts smooth DC, and just one wire links all three parts together as shown below. Always switch power off before making connections!

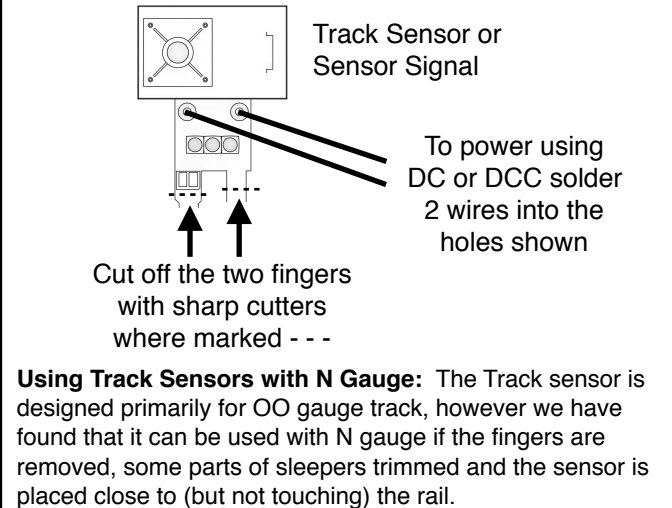
If used on DCC a Track Sensor or Sensor Signal can be clipped straight into some types track into the power clip slots (eg Hornby or Bachmann), but if not the slide-in fingers can be cut off and the two connections shown wired to either DCC or 9-16 Volts DC - see below.

You need to set up the two Servo positions for the barriers, A and B, as pages 2 (DCC) & 3 (DC).

Power by sliding sensor into track - for DCC

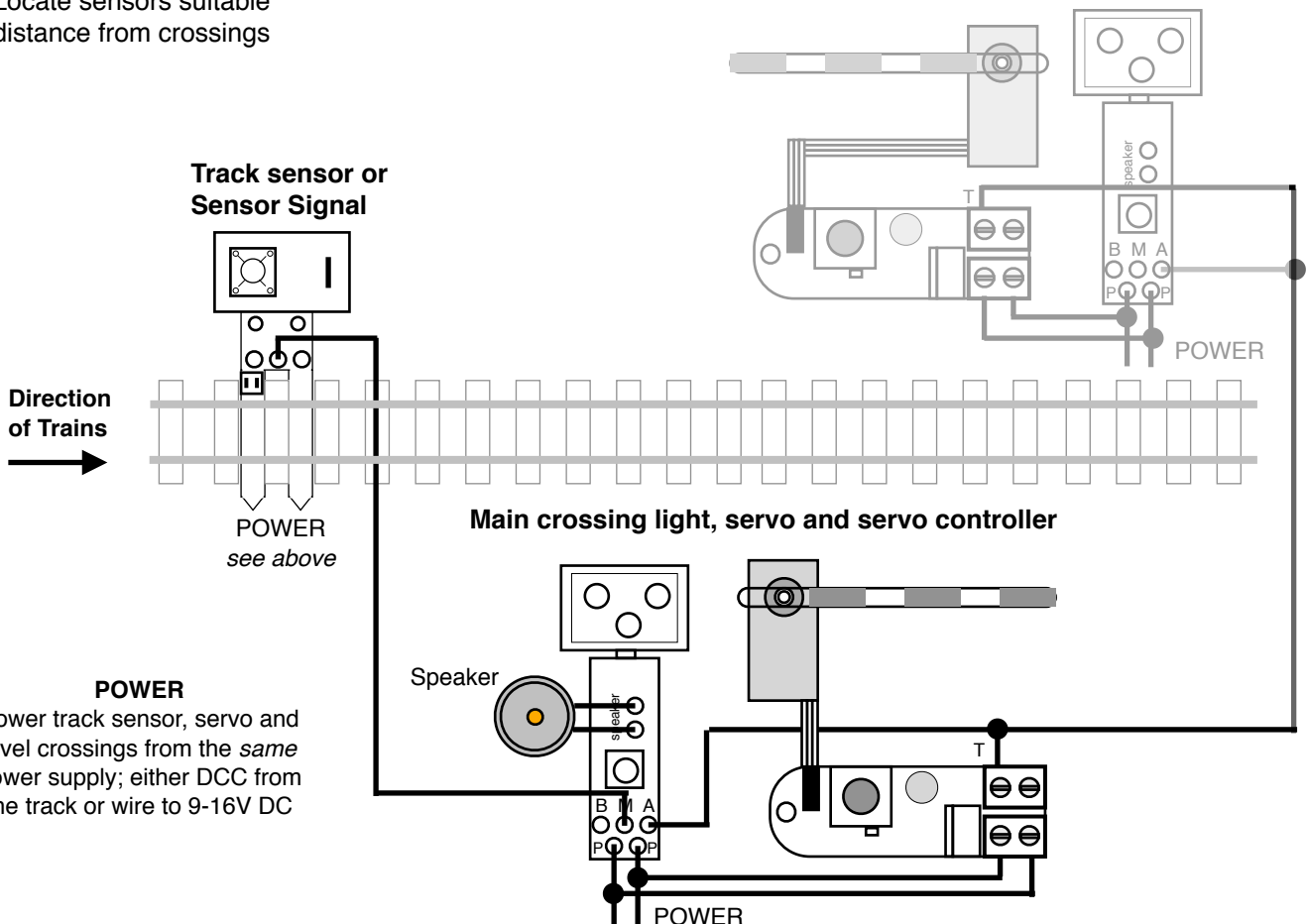


Power by wiring to sensor - for DC or DCC



Locate sensors suitable distance from crossings

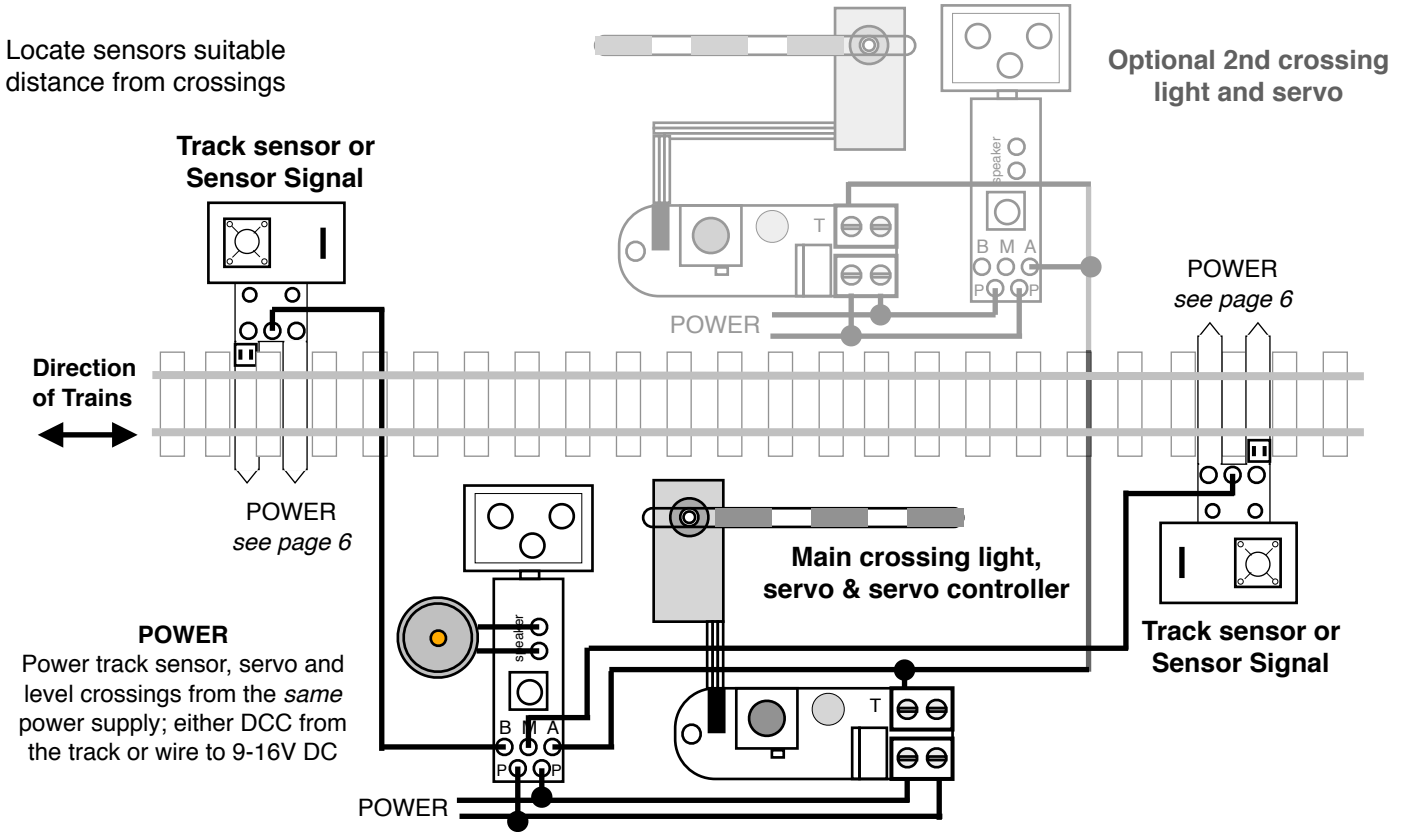
Optional second crossing light and servo



• Automatic Control: Single Track crossing - both directions

If you have a single track level crossing which has trains going in either direction (single line working) you will need 2 sensors so that you can trigger the crossing lights from either direction. Below shows how to wire 1 or 2 crossing lights and servos to 2 Track Sensors or Sensor Signals:

Locate sensors suitable distance from crossings



• Automatic Control: Double track crossing - up & down lines

Most double track crossings comprise one Up and one Down Line, so you need to trigger the level crossing from opposite sides on each track with a Track Sensor or Sensor Signal as follows:

Locate sensors suitable distance from crossings

