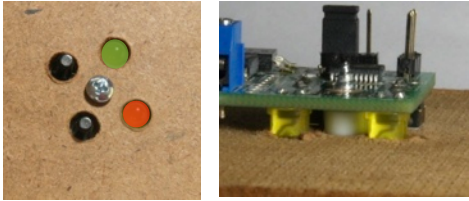


Singlet DCC Decoder and Servo Driver With Automatic Endpoints - BiColor

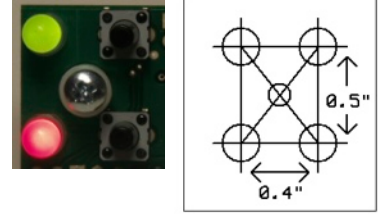
Installation

Mount the decoder on the back of your fascia or control panel. Drill 4 7/32" holes for the LEDs and switches and a center 1/8" hole for the mounting screw according to the drilling template to the right.

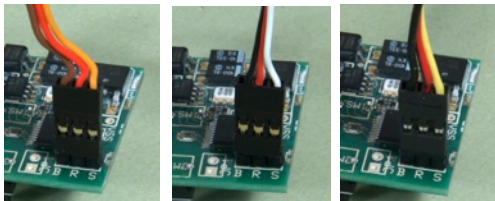


Photos of the Singlet mounted on the fascia. The plastic washers go between the fascia and the decoder to

Mount the servo below the switch with the points centered. There are a number of ways to mount the servo, the picture shows one method using a hole through the sub-roadbed under the throw-bar.



Connect the DCC bus to the blue 2-position terminal block. If not using DCC, the power can be any power supply from 7-18V AC or DC.



The 3 most common servo lead colors and how they plug in.

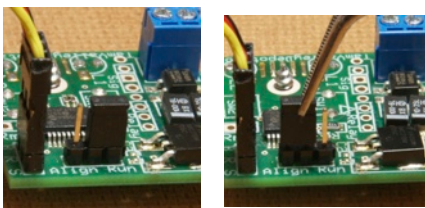
Plug the servo in to the 3-prong connector on the board marked "BRS" (for black/red/signal). The black/brown wire should be on the side marked "B". If the servo lead is too short, then a servo extension may be used to lengthen the run or you can splice in your own wire. Depending on the make of the servo you can extend the servo lead quite far - up to 15 feet in most cases.



Turn the power on to center the servo before mounting. *The points should be between the stock rails.*

Automatic Endpoint Adjustment

The Singlet can automatically adjust the servo endpoints. The servo starts in the center position and then searches to one side until it finds a hard stop (i.e. the stock rails of a turnout) and then backs off a bit. It then searches for the other stock rail in the opposite direction. CV50 can be used to change the current setpoint. To start the search move the Run/Auto jumper to the **Align** position (right photo). After a 2 second delay, the servo will start slowly moving. The LED will flash rapidly as it searches when it finds the stock rail it will start slowly flashing to indicate it is fine tuning the final position. It then starts to adjust the second endpoint. When finished it will flash both LEDs several times. Move the jumper back to the **Run** position (left photo).



To **abort** the alignment operation, press either button.

Servo Reverse - If you put the Align jumper on briefly - for less than a second, the servo will swap endpoints relative to the buttons and LEDs.

Note - if there are not hard stops at the endpoints then the servo will set the endpoints to the maximum range. If you are animating something other than a turnout without hard endpoints, you may want to use a couple of nails to mark the endpoints or you can manually adjust the endpoints (see below).

Manual Programming

The unit can be completely programmed using the two buttons including the 2 servo endpoints, the LED colors, the speed and the DCC address. As shipped the both endpoints are set close to either side of the center position and the DCC address is 1.

Servo Endpoints, LED Colors and Speed

You can use the buttons to fine-tune the servo endpoints and to change the servo speed. Hold down one of the buttons for about 1 second until the corresponding LED flashes. Using the two buttons you can now move the endpoint until the points are firmly against the desired rail. Usually you move it until it touches and then give it one more to make it firm. **DO NOT** over-adjust the servo so it is pushing hard against the rail - this will use

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excessive power. Hold down the same button again until the LED stops flashing. You can now cycle the LED colors by pushing the two buttons. This will be the ON color for the LED corresponding to the button you held down and the OFF color for the other one. To set the second position, hold down the other button and repeat for the other endpoint. Hold the button again and set the LED colors for this position. To set the speed, hold this same button again until the LEDs flash alternately. In this mode, pushing one button makes the servo go faster and the other makes it go slower. Each time you press the button the servo changes position so you can observe the new speed setting. When done, hold down the button again to exit programming mode. See the table for a summary of the procedure.

DCC Address

Hold down both buttons at the same time for about 1 second until both LEDs start flashing. The decoder will now remember the next stationary decoder address issued. Issue the stationary decoder command (on Digitrax this is called *switch* on NCE use *Select Accy*) with the new DCC address. Use throw, (t) or close (c) (NCE calls these N and R) to match the state the turnout is currently in. I.e., if the turnout is thrown issue a throw command; if the turnout is closed issue a close command. This will set the sense of throw and closed. The LEDs will stop flashing to indicate the address has been accepted.

Connect the blue terminal to the DCC bus for DCC control. For non-DCC uses use any power supply from 7-18V AC or DC

Remote signal input point. A 5V logic signal can be attached here to **Sig**. The round hole is ground, square hole is the signal input.

Remote Relay Connector (see below for more information)



Servo Connector

Automatic endpoint adjustment jumper. Move to Align position (as shown) to start the automatic search. When finished put the jumper back to Run.

Remote switch attachment point. A toggle or a momentary NO switch can be attached here across these 2 holes. More than one momentary switch may be added for multiple control points.

To reset the decoder to its factory default settings, first turn off the power (or remove one of the power leads). While holding down both of the buttons turn the power back on. The servo endpoints will be centered and the DCC address set to 1.

Programming Summary (see text for full explanation)

Button	LEDs	Action
Hold Button 1	LED1 flashing	Set the endpoint for Button 1
Hold Button 1	Sets the LED colors for position 1	Push each LED until the colors are correct
Hold Button 2	LED2 flashing	Set the endpoint for Button 2
Hold Button 2	Sets the LED colors for position 2	Push each LED until the colors are correct
Hold Button 2	Both LEDs flash alternately	Set the servo speed
Hold Button 2	No flash	Exit if not setting the DCC address
Hold Both Buttons	Both LEDs flashing together	Set DCC Address and throw/close

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DCC Programming (Optional - you can program all functions with the buttons)

The decoder can be programmed in three ways to enable it to work with most DCC systems. (All the functions can also be programmed with the three programming buttons, so DCC programming is not required, nor is a DCC system needed to use the Singlet for driving servos.) ***It is easiest to change the address using the programming buttons (see above) as stationary decoder addresses are confusing to program with CVs!***

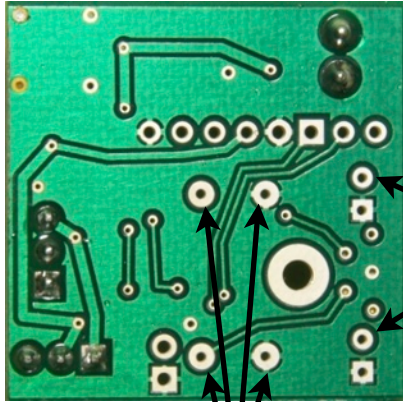
The default address is 1 when the decoder ships or if a factory reset is done.

- 1) **OPS mode for Accessory Decoders (programming on the main).** If this mode is available then it is the preferred mode. It can be done with the decoder in place. While there is no way to read back of CVs in this mode you can see the affects of the commands immediately. Not all DCC systems support this mode however.
- 2) **OPS mode as locomotive #1 (programming on the main).** If decoder is in DCC address programming mode (hold both buttons for 1 sec until both lights are flashing) then the decoder will respond to OPS mode commands address to loco address 1. It will do this even if its accessory decoder address is not. Make sure you do not have a locomotive addressed as 1 on the track at the same time. *When done, remove from programming mode by holding one of the buttons until the lights stop flashing.*
- 3) **Direct Mode on a programming track.** This is probably only useful for initial setup as it is inconvenient to move the decoder to the programming track. For the decoder to have its CVs read back a servo must be connected to generate the acknowledgment pulse used in reading back CVs. Also a programming booster may be needed as is often the case for sound locomotives, since the decoder draws a fair amount of power. We can recommend the PowerPax by DCC Specialties or the SPROG II. *Even if the decoder is not able to respond to CV read commands it will still save CV writes.*

CV	Function	Default	Range	Notes
1	Address	1	1 - 127	7 lowest bits of address (Address = CV1 + 128 * CV9)
2 - 6	Not used			
7	Version	37	Read Only	
8	Manufacturer	59	Read Only	NMRA assigned Manufacturer ID
9	High address	0	0-7	3 highest bits of address
10 - 28	Not Used			
29	Configuration	0		No uses of CV29 are currently used
30 - 32	Not Used			
33	ServoClosed	94	0-200	100 = Centered, 0 = minimum and 200 is maximum throw
34	ServoThrown	106	0-200	100 = Centered, 0 = minimum and 200 is maximum throw
35	Servo1Speed	5	1-40	1 = slow creep and 40 = very fast
36	dccReverse1	0	0-1	Controls the reversing of DCC throw commands - i.e. if set to 1 then a "c" is interpreted as "t" and <i>vice versa</i> .
37	Reverse	0	0-1	Controls overall reversing of buttons and LEDs (equivalent to turning unit over or reversing servo on vertical axis)
38	LED1OnColor	2 (Green)	0-3	Off=0, Red=1, Green=2, Yellow=3
39	LED1OffColor	1 (Red)	0-3	Off=0, Red=1, Green=2, Yellow=3
40	LED2OnColor	2 (Green)	0-3	Off=0, Red=1, Green=2, Yellow=3
41	LED2OffColor	1 (Red)	0-3	Off=0, Red=1, Green=2, Yellow=3
50	AutoAlignCurrent	0	0-255	The auto adjust current. A zero means use the default of 24. Change to ~10 if alignment current is too high.

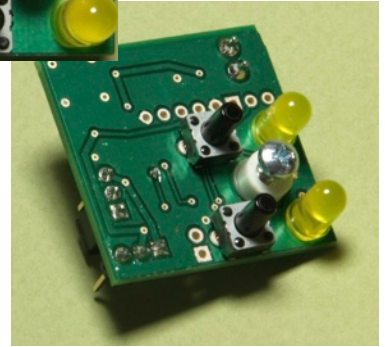
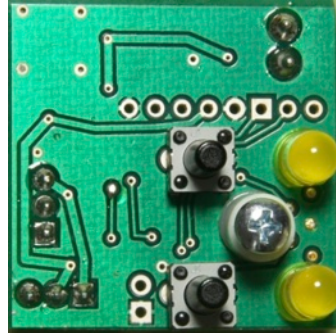
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Kit Assembly Information



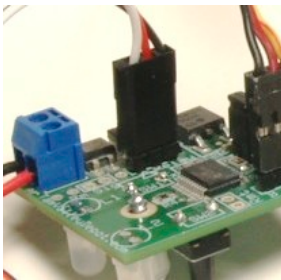
Long lead of LED goes in the round hole.

Switches go in these holes - polarity does not matter. Note: you may substitute any type of momentary NO switch.



Remote Relay

A remote relay can be added to control the frog power or feedback for a signaling system. Shown below is the wiring for the SPDT relay. A DPDT relay is also available if two sets of contacts are desired. The relay switching is delayed such that the polarity changes when the servo passes through the center point.



Plug remote relay in so that the white (signal) wire is near white triangle marking on board as shown.

Frog wiring with DPDT relay

Connect 1 and 3 to the rails - they may need to be swapped to get the polarity right.

Connect 2 to the frog.

