



Complete Train Control
Run Your Trains, Not Your Track!

TL1

All Scales

**Single DCC Function
Decoder with Transponder**

**Stationary Decoder
Single DCC Function Decoder with
Integrated Transponding
.125 Amp / .250 Amp Peak**

Features:

- Can Function only DCC decoder with transponding
- Can Function only DCC decoder without transponding.
- Single 125mA function output for lights or other functions (Peak rating is 250mA)
- Single function output can be turned on and off using F0, F1, F2 F3, or F4
- Supports Both 2 Digit & 4 Digit Address Modes
- Programmable from DCC compatible equipment
- Configurable Strobe feature lets you simulate flashing lights on locos like FRED, Strobes, Mars Lights, etc.
- Programmable strobe effect & rate of the lighting effect
- Integrated Digitrax DCC Transponder
- Can be used as a stand alone transponder
- Can be added to a unit that already has a non-transponding DCC decoder

Parts List

1 TL1 Decoder

1 Instruction sheet

Please Note: Some systems use hex notation and others use decimal notation. In this manual both values are given. The number preceeded by the "x" is the hex number and the other number is the decimal value corresponding to the hex number. Simply use the correct notation for the system you are using. CV values shown as 2 digits are the same in hex & decimal



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Installation Information

A TL1 should not be connected to an existing transponder equipped DCC decoder unless the DCC decoder's transponder is disabled. This avoids having 2 transponders responding to the same address in the system.

Installation Instructions

Program the TL1's Address & Function Output

1. Before using your TL1, set its address. This may or may not be the same address as a mobile decoder already installed in the loco or car depending on how you are planning to use the TL1. In the case of TL1s being used as a stand alone transponder or as a function decoder, choose an address that is not associated with another mobile decoder address in use on the layout.
2. Connect the RED & BLACK wires of the TL1 to a service mode DCC programmer and program the TL1's address as you would any mobile decoder-address. Follow the instructions for programming mobile decoders in your-command station manual for the exact steps to use. The TL1 can be programmed with a 2 digit (Ad2/AD01/CV01) or 4 digit address (Ad4/CV17 & CV18). Remember to set CV29 to the appropriate value per your Decoder Manual for 2 digit or 4 digit operation. For 2 digit addressing CV29 is most commonly set to x06/006 decimal*. For 4 digit addressing, CV29 is most commonly set to x26/038 decimal*.
3. Set up which function number controls the TL1's function lead. Program values for CV61 & CV64 per TABLE I. Notice that if you wish to disable transponding and use the TL1 as a function only decoder, program CV61 to 00 or 01.
4. Set up the configurable strobe effect for the TL1's function lead by programming a value between 00 & 07 into CV49 (See Table II).
5. Set up the rate of the effect by programming a value between 00 & 07 into CV62. See TABLE III.
6. When programming is complete, exit programming mode. Test for correct operation of the function after you install the TL1 in the locomotive.
7. Programming a TL1 after it is installed in tandem with a DCC decoder may yield unexpected results because of differences in the way various DCC decoders respond to programming. If you are not able to program your installed TL1, first try a different programming method. If this does not work, remove the TL1 and program it separately on the service mode track, then re-install it in the loco.

Note: The TL1 does not use Operations Mode Programming.

TL1s are shipped with the two digit address set at 03 and with CV61 set at 02 and CV64 set at 00 to enable transponding & use F1 for function control. CV49 is set at a value of 00 for on/off function control.

Service Mode Programming Track Example

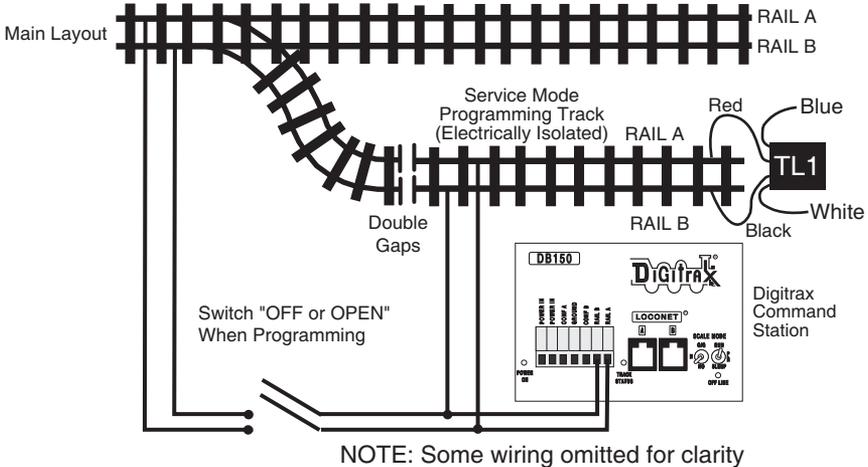


TABLE I: Function# for TL1's function output

White Lead Responds To	Transponding Enabled		Transponding Disabled	
	CV61	CV64	CV61	CV64
F1	02	00	00	00
F2	02	01	00	01
F3	02	02	00	02
F4	02	03	00	03
F0	03	00	01	00

Please refer to your Decoder Manual for additional information about CV61 & its uses.

TABLE II: CV49 Values for Configurable Strobe Effect Selection

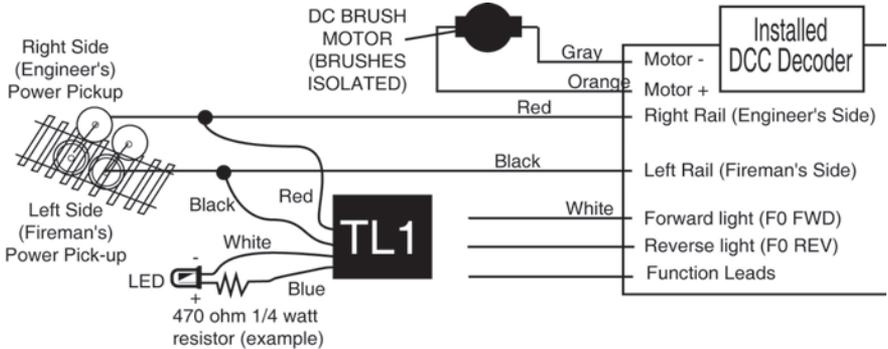
Value	Configurable Strobe Effect
00	Normal on/off
01	Simulated FRED
02	Simulated Mars
03	Slow Strobe
04	Single Pulse
05	Double Pulse
06	Medium Pulse
07	Mostly on blinking off

TABLE III: CV62 Values for Setting Effect Rate

00 (Slowest) to 07 (Fastest)

Install the TL1 in the Loco or Rolling Stock

1. Connect the TL1's RED and BLACK wires to the matching RED and BLACK track feed wires of an installed DCC mobile decoder.
2. If the TL1 is used by itself, for example in a caboose or box car without a DCC mobile decoder installed, connect the TL1's RED wire to the right hand track pickup and the TL1's BLACK wire to the left side track pickup.
3. No other parts are required to set up the transponder current pulses, since this is self-contained in the TL1.
4. Install the light using the TL1's blue and white leads. The example below shows how to install an LED. Note that a resistor must be installed as shown. You can choose different resistor values depending on how bright you want the LED to be. This is limited by the current rating of the LED & the function lead being used.
5. Test for correct function operation using your DCC system.



Test the installed TL1 for correct transponder operation

1. Place the unit with the installed TL1 on an empty transponding track section. This test assumes that the transponding track section is already been set up, tested and is working before you start TL1 testing.
2. Using a DCC throttle, select the TL1 address that was programmed into the TL1 and verify that the transponder detector identifies the presence of the transponder device. Depending on how you have set up your transponding reporting to the system, your system should detect the presence of the address in that transponding section. For example, if you have an LT5 connected to the same BDL16 Zone plug as the track's Zone, you should show a blinking Zone power light that blinks when the TL1 equipped unit is placed on the empty transponding track section, and is steady when the TL1 is removed. This confirms correct installation and function of the TL1.
3. Another way to check the newly installed TL1's transponder address and location is to use any of the following:
 - a. The Find feature of a DT400 (See the DT400 or Super Chief Manual)
 - b. The transponder display of an attached PC with transponder capable software
 - c. Checking for <D0> type LocoNet messages with a LocoNet monitor program like the LocoMon Application running on a Palm OS PDA.