

DT-01 Decoder Tester Manual

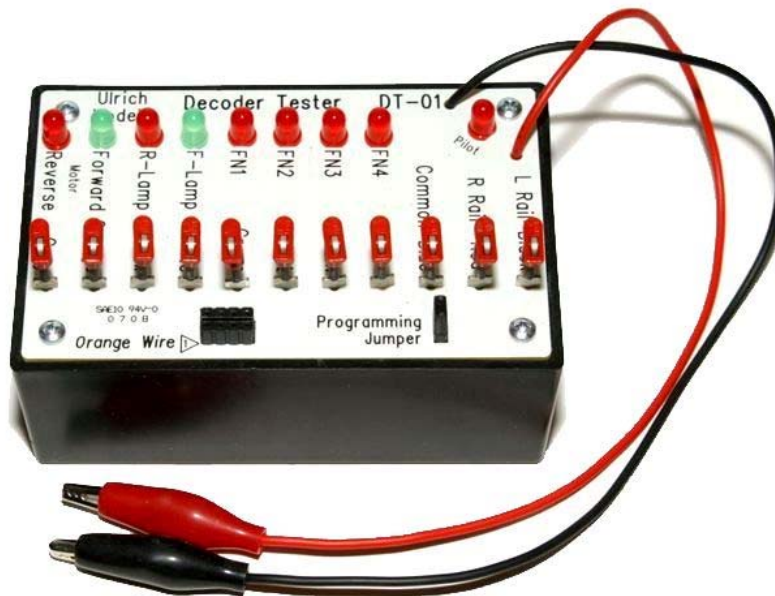
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1. Introduction

The DT-01 Decoder Tester can test all types of DCC and Sound decoders for Z, N, and HO scales. All types of decoder wire interfaces can be connected to the Decoder Tester.

- Direct Wire Decoders
- Decoders with 8 Pin DCC Plugs
- Decoders with 9 Pin (JST) DCC plugs
- Board Replacement Decoders
- Decoders with Integrated Pins (IP).

The Decoder Tester can also be used to program decoders out of the engine.



Ulrich DT-01 Decoder Tester

The Decoder Tester comes with an 8-pin socket for testing decoders with 8 pin DCC plugs. It also includes high quality spring clips for testing direct wire decoders such as the DZ143.

Notes: When reading this manual, function outputs are referred to as AUX1 – AUX4. It is also common to refer to them as F1 - F4 and FN1- FN4. They are listed as FN1 - FN4 on the Decoder Tester top panel. All terms are in common use and have the same meaning.

The term "Throttle" is use to describe the DCC controller. Each manufacturer uses their own term. For example, NCE uses "Cab" while Digitrax uses "Throttle".

An inexpensive adapter harness is required to test decoders with 9 pin, DCC Quick Connect plugs (Also known as JST connectors).



JST 9 Pin Adapter Harness

Note: Any DCC wire harness with an eight pin plug and 9 pin JST connector will work. Our harness has some strain relief and the purple lead is 1" longer to aid in connection to the purple (F2) spring clip.

For Board Replacement (Drop-In) Decoders, the easy attach, Clip Harness with spring clips is required.



Decoder Clip Harness (pin 1 is marked with a red dot).

2. Decoder Tester Basics

DCC 8 pin Socket

The Decoder Tester has an 8 pin DCC socket for testing decoders with 8 pin DCC connectors. Decoders with an 8 pin DCC connector can be plugged directly into the tester socket. The socket is marked for proper connector insertion; pin 1 (orange lead) on the lower left corner.

Track Power Clips

The red and black alligator clips are for powering the Decoder Tester; one for the right rail and one for the left. There is no polarity requirement and the clips can be connected to either rail as long as both rails are connected.

Always disconnect the power leads while connecting and disconnecting a decoder or turn DCC power off.

Programming Jumper

When the programming jumper is removed, a 120 ohm resistor is placed in series with track power. This limits the current to the decoder and is an extra measure protection. When this jumper is not installed, the LED indicators will be dimmer and there will be some dimming when multiple LEDs are on.

As long as decoders are inserted correctly into the decoder DCC socket or wire leads are clipped to the correct test clip, there is little need to run with this jumper removed. However, when connecting a decoder with a wire harness to the spring clips or a board replacement decoder using the Clip Harness, it is prudent to remove the jumper until you are certain the decoder is correctly connected. The decoder can be tested completely with the jumper removed.

The jumper is required to insure proper voltages when programming decoders. When removing the jumper, it can be slipped on one lead to prevent losing it.

Spring Clips

There are ten spring clips for connecting decoders with only a wire harness and no DCC plug. Each spring clip is labeled with the correct color for each decoder wire. These are very high quality spring clips and are very easy to use. They are one of the most expensive components of the Decoder Tester.

LEDs

There are nine LEDs in the tester which are used to indicate power, direction and function output activity. All LED indicators are designed for 12 volt decoder outputs and will not function if connected to regulated outputs designed for 1.5 volt lamps.

Indicator List

- **Pilot** – Indicates track power is applied.
- **Motor Forward and Reverse** – These two LEDs indicate motor direction and speed. The higher the DCC speed step the brighter the LED. Since most motor decoders use some type of pulsing to enhance motor operation, the lights may flicker.
- **Lamp Forward and Reverse** – Indicates the status and brightness of the headlight and backup light. The headlight is usually activated by pressing F0 on the throttle. The behavior of the lamps depends on various decoder settings such as brightness, on/off, and direction behavior settings.
- **FN1 through FN4** – Indicates the status of the AUX1 through AUX4 function outputs.

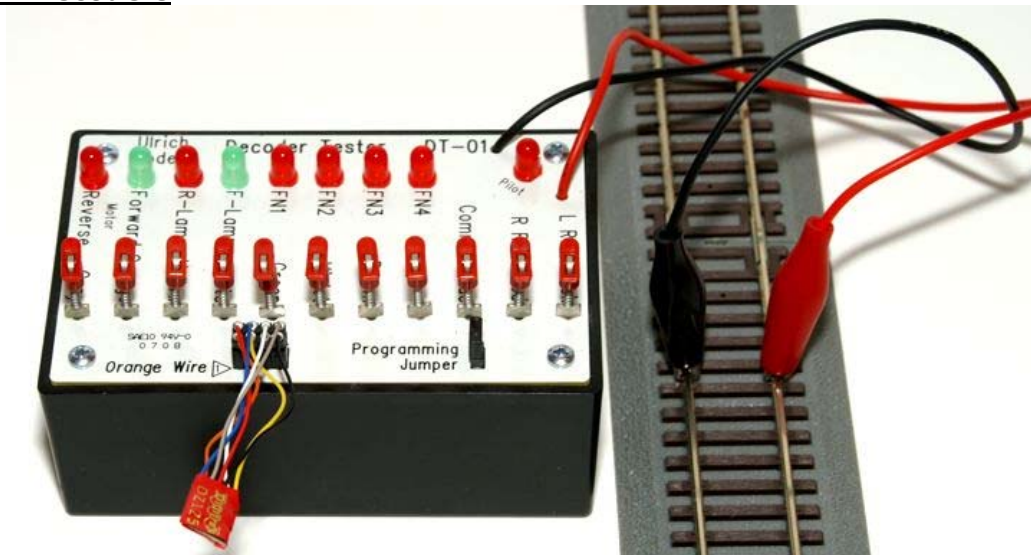
These outputs are normally activated by pressing function keys on the throttle. On non-sound decoders, the default assignments are usually F1 = AUX1, F2 = AUX2 and etc. However, sound decoders depend entirely on the default function key mapping and vary widely.

The operation of AUX1 through AUX4 depends entirely on the internal function mapping of the decoder for both on/off and lighting effect operation. If these outputs do not behave as you expect, use the throttle to read the decoder's mapping CVs to verify behavior. Resetting the decoder will set it back to its default mapping

3. Testing DCC Decoders

Most decoders are tested by connecting the decoder to the tester using the 8 pin socket, or the direct wire spring clips. The red and black alligator clips are clipped to DCC track power. Decoders with a JST 9 pin connector require the JST Clip Harness and Board replacement decoders require the Clip Harness.

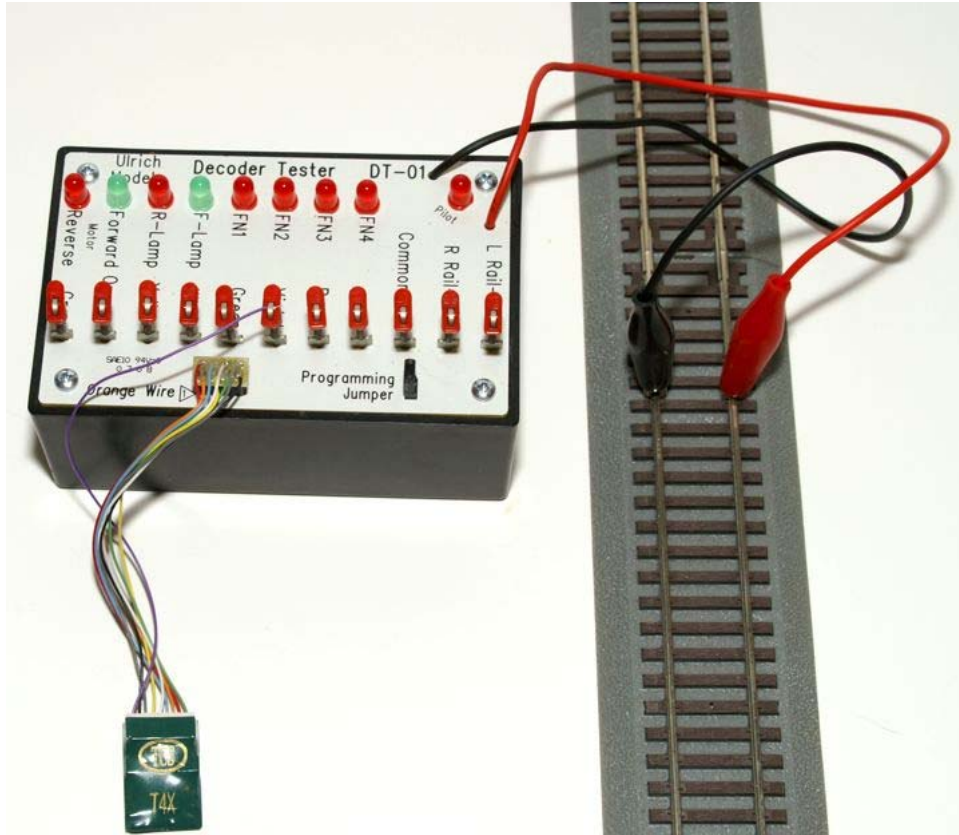
8 Pin Decoders



Testing a decoder with an 8 pin DCC connector is easy. Just plug it into the DCC socket with the orange lead (pin 1) at the lower left corner.

All functions can be tested and programmed including motor forward and reverse, headlight, backup light and AUX1. If the decoder has additional AUX outputs, connect the wire leads to the proper spring clip. The spring clip has the color of the wire for the proper AUX output listed above it. Remember, the decoder function mapping and lighting effects programming determine the behavior of the function keys in relation to AUX outputs.

9 Pin Decoders



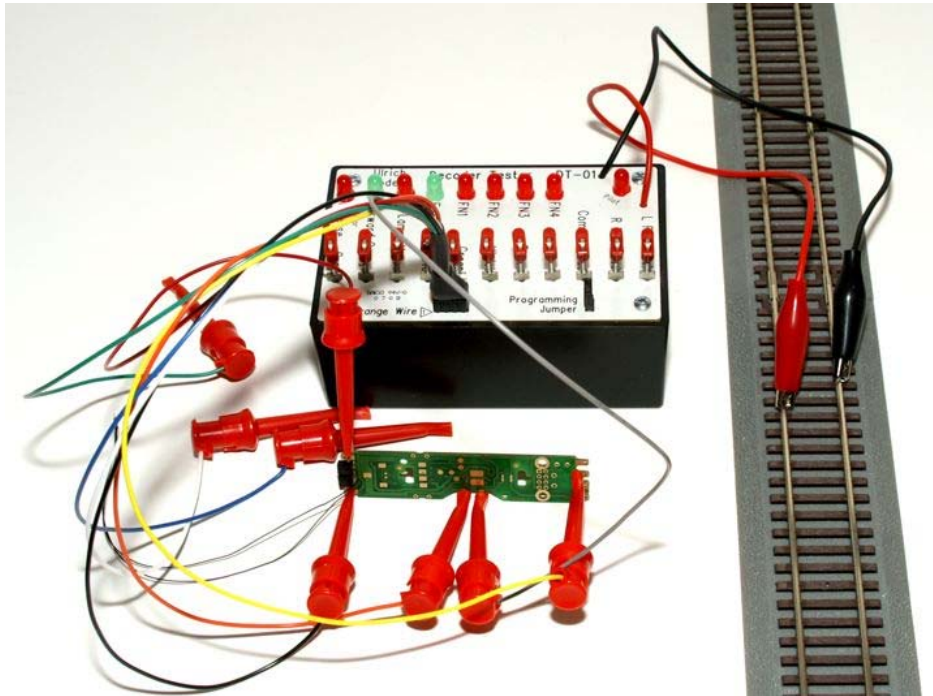
The 9 pin connectors used as an integrated part of these decoders are often referred to as 9 pin easy connect or 9 pin JST connectors. JST is the manufacturer of these type connectors.

The JST 9 pin connectors support track voltage, motor, headlight, backup light, AUX1 and AUX2 in the connector. This gives greater flexibility than the 8 pin DCC connector. They plug directly into Athearn, Proto and many other locomotives. They often come with a direct wire harness for installation in locomotives without a DCC connector.

To test these decoders, use the optional 9 Pin JST harness. Connect the extra purple lead wire to the purple lead spring clip on the decoder (FN2).

Connections made with JST connectors are often very tight and sometimes are difficult to separate. When removing the decoder from the JST harness, do so carefully to prevent damage to the harness. If the harness is damaged, contact us for a replacement. There is no shipping fee. Only the nominal cost for the harness itself.

Board Replacement Decoders



Testing a Digitrax DH165A0 Board Replacement Decoder

Board replacement decoders are among the more complicated decoders to test. They require using the Clip Harness and their function outputs have varied capabilities. To insure proper alignment of the Clip Harness into the decoder socket, pin 1 is marked with a red dot. Line the dot up with the pin 1 indicator on the tester.

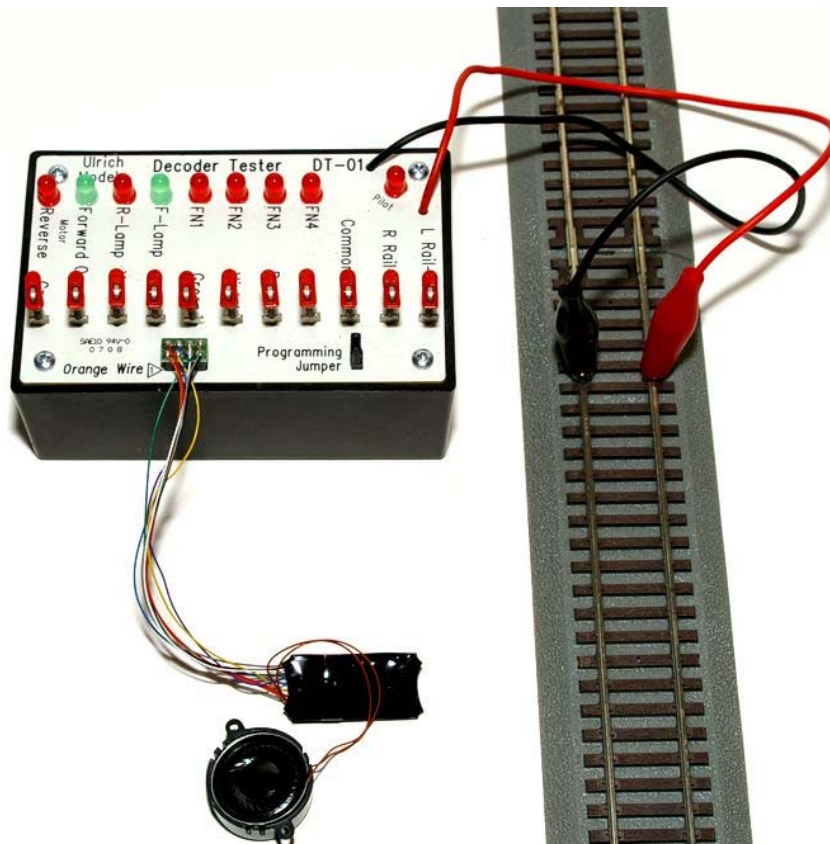
The Digitrax DH165, Athearn replacement decoder has regulated lamp outputs that will not drive the lamp LEDs in the tester; the LED indicator circuits are designed for 12 volt outputs. The motor circuit can be connected and tested but the lamp circuit, in this case, is tested by connecting a 1.5 volt lamp across the F0F and F0F+ outputs. The same holds true for the F0R and F0R+ outputs.

Another way to test the lamp circuits is to connect the white and blue leads to the FO and FO+ decoder tabs, The 1.5 volt lamp is then clipped across the white (headlight) and blue (common) spring clips. A similar procedure works for the reverse lamp.

Other board replacement decoders such as the SDH104K1A or DN163K2 have the forward and reverse light LEDs mounted right on the board and testing the lamp circuits is easy with no lamp clips required.

Watch for application notes posted on the Ulrich Models web site to aid in testing the more complicated decoders.

4. Testing Sound Decoders



Sound decoders with an attached speaker can be tested and programmed using the Decoder Tester. A LokSound decoder is shown here. The LED motor circuit works correctly with most motor decoders so you can listen to the sounds at all engine speeds.

When testing sound decoders, remember that most function keys are mapped to sounds and it may be necessary to remap the keys to test AUX1-AUX4. The headlight and backup light are normally mapped to the F0 function key.

The LokSound programmer can be interfaced directly to the Decoder Tester by attaching the track leads to the two track power spring clips. Make sure the decoder programming jumper is installed.

5. Adding a Motor to the Tester

A motor can be attached to the Decoder Tester by connecting the two motor leads to the orange and gray motor spring clips.

6. Warranty

The decoder tester is warranted for one year and will be repaired or replaced free of charge if it malfunctions. The one-year warranty does not include the Clip Harness or the JST Harness. These are more fragile and are subject to wear from use. The JST Harness is inexpensive to replace. The Clip Harness is inexpensive to repair. There is no return shipping fee for one year on these items (applies to domestic shipping only). After one year, there is a nominal shipping fee for 1st class mail. If we ship you a defective harness, it will be replaced free.