



Digitrax Command Control  
Run Your Trains, Not Your Track

# DZ125

Fits Many Z, N and HO Scale  
Locomotives

Z Scale

Mobile Decoder  
1 Amp/1.25 Amp Peak  
2 FX<sup>3</sup> Functions, 0.5 Amp  
with 7 lead wire set

## Features:

- Works with many Z, N, and HO scale locomotives up to 18V track voltage
- **Digitrax LocoMotion<sup>®</sup> System**-Your locomotives look like the real thing. The Digitrax LocoMotion System makes them run like the real thing, too!
  - Torque Compensation** for smooth as silk silent operation.
  - 128 Speed Step** operation (14 or 28 steps can also be used).
  - Momentum** with acceleration and deceleration.
  - Normal Direction of Travel** is user selectable.
  - Switching Speed** feature for easier and faster access to yard speeds.
  - 3 Step Speed Tables** set start, mid and max voltage for custom control.
  - 28 Step Speed Tables** with 256 level resolution for precise control.
- **Scaleable Speed Stabilization (Back EMF)** with simple setup & 1024 level resolution.
- **SuperSonic** motor drive for silent operation.
- **FX<sup>3</sup> Function** outputs for prototypical lighting effects and on/off control:
  - Constant Brightness Lighting** with directional or independent control.
  - Realistic Effects** like Ditch lights, Mars lights, strobes, and many more.
  - FX<sup>3</sup> & Standard Function Qualifiers** operate functions based on direction, F0 on or off, direction and F0, and whether loco is moving.
  - Function Remapping** of 14 functions for custom function setup.
  - Master Light Switch** turns off all lights & functions with one keystroke.
- **Transponder ID Equipped** ready for transponding on your Layout  
Compatible with digital surround sound systems
- **All Mode Programming**
- **Decoder Reset CV** with or without speed table reset.
- **Motor Isolation Protection** prevents damage to your decoder.
- **Basic, Advanced & UniVersal Consisting**
- **2 Digit and 4 Digit Addressing**
- **DCC Compatible**

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## Parts List

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1 DZ125 Decoder

1 Instruction sheet

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## Installation Information

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See the Digitrax Decoder Manual for complete decoder test procedures, installation instructions, programming and technical information. Digitrax manuals and instructions are updated periodically. Please visit [www.digitrax.com](http://www.digitrax.com) for the latest versions, technical updates and additional locomotive-specific installation instructions.

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## Installation Instructions

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1. Carefully remove the locomotive's shell from the frame. Notice the orientation of the shell to the frame so that you can reinstall correctly.
2. The DZ125 has 6" wires that you will solder directly to the appropriate connections inside the locomotive. The smaller size allows the decoder to be easily installed in a variety of locomotives. The bare ends of the wires are wired to the motor connections, power pickup connections and the lights according to the following diagram. (*Figure 1*)

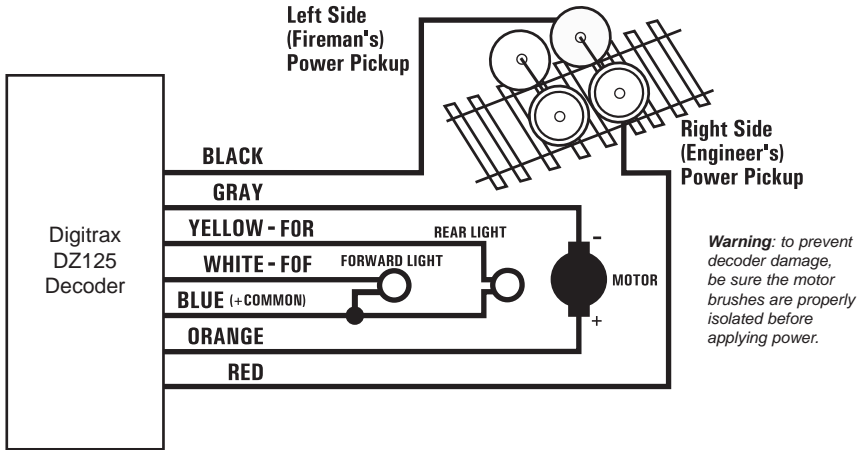
Note: Avoid stressing the solder connections of the wires to the decoder board. If a connection is broken, carefully solder the wire to the board, making sure not to contact any other parts or pads where it might cause a short circuit.



3.

You are now ready to run your locomotive. The DZ125 is factory programmed to address 03. You can easily customize the address and other features. See section "Customizing Your Decoder" that follows.

Figure 1. DZ125 Wiring Diagram



**Installation Notes:**

1. Do not exceed the decoder's 500mA total function output rating.
2. We recommend that the Blue wire, also called +Common or Lamp Common, be connected as shown. If you wish to omit the Blue wire in your installation, consult the Digitrax Decoder Manual for more information.
3. The head lamp should be hooked up using the Blue/+Common wire for optimal Digitrax transponding operation.
4. To use a function output with an inductive (coil) type load, see the Digitrax Decoder Manual for more information to avoid damage to the decoder.
5. See the Digitrax Decoder Manual for full details of wiring 12-16V lamps, 1.5V lamps, and LEDs. Lamps that draw more than 80 mA when running require a 22 ohm 1/4 watt resistor in series with the directional light function lead to protect the decoder.
6. Some locomotives employ filter capacitors for RFI suppression in the locomotive wiring. These may cause problems with Supersonic decoders and non-decoder analog operation on DCC. This capacitor should be removed for best operation.



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## Customizing Your Decoder

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Your Digitrax decoder is ready to run and will operate using address 03 with no additional programming. For a more prototypical railroading experience, your decoder can be customized for your specific locomotive by programming some of the Configuration Variables, or CVs, available. See the Digitrax Decoder Manual or the Digitrax web site for more information.

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## Changing the Decoder Address

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The first CV most people change is the decoder address. This allows you to independently control each loco with a unique address. Digitrax decoders are shipped with CV01 (AD2), the two digit address, set to 03. Following is a brief description of how to change the decoder address with a Digitrax DT series throttle. See your Starter Set Manual for complete programming instructions.

- 1 Place the loco on the programming track. Go into Program Mode on your system. On DT400 press **PROG**. On DT300, DT100 & DT200 press **RUN/STOP & FN/F0**.
2. Choose AD2 for 2 digit addressing or AD4 for 4 digit addressing (DT300 & DT400). (Ad for DT100 & DT200, see your Starter Set manual for 4 digit instructions).
3. Use your throttle to choose the address you want to set up for the decoder.
4. Complete address programming. On DT400 press **ENTER**. On DT300, DT100 & DT200 press **SEL**.

Loco Type	V Start CV02	V Mid CV06	V Max CV05
<b>Switcher</b> Concentrated low speed. Limited top speed	002/x02	038/x26	064/x50
<b>Road Switcher</b> Prototypical top speed w/evenly distributed curve from 0 to top speed	002/x02	048/x30	098/x62
<b>Mainline Loco</b> Quick increase to cruising speed then levels off to prototypical top speed.	002/x02	128/x80	154/x9A

**Note:** CV29 must also be programmed to e.g. 38 to enable 4 digit addressing, this is done automatically by the DT300 & DT400 but not on earlier throttles.



450 Cemetery Street  
Norcross, GA USA 30071  
www.digitrax.com

T 770-441-7992  
F 770-441-0759  
E sales@digitrax.com

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## **Digitrax LocoMotion® System**

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Your locomotives look like the real thing, now you can make them run like the real thing, too. Digitrax decoders incorporate torque compensation for smooth as silk operation. You can also program CVs that control momentum, 3 step and 128 step speed tables, switching speed, normal direction of travel and more to take full advantage of the Digitrax LocoMotion System.

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### **Momentum-CV03 & CV04**

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Momentum is part of the LocoMotion System. Acceleration is controlled by CV03 and deceleration by CV04. Both come from the factory set to 000/x00. A range of 000/x00 to 031/x1F is available for both accel and decel. We recommend that you try CV03:003/x03 and CV04:000/x00 as a starting point for experimenting with momentum.

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### **Speed Tables-How the Loco Responds to the Throttle**

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With Digitrax LocoMotion, there are two types of speed tables: 3 Step Tables and High Resolution 28 Step Tables. Please see your Digitrax Decoder Manual for a discussion of the 28 Step Tables. The 3 Step Tables are set up by programming 3 CVs: Start Voltage (CV02), Mid point Voltage (CV06) and Max Voltage (CV05). These values are set at 000/x00 at the factory. All have a range of values from 000/x00 to 255/xFF. We recommend the following CV values as a starting point for experimenting with speed tables.



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## Other LocoMotion® Features: Switching Speed & Normal Direction of Travel

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**Switching speed** is controlled by CV54. The factory setting is 000/x00 for OFF. To turn on the switching speed feature, program CV54 to a value of 001/x01. When this feature is on, use F6 to activate and deactivate switching speed. When switching speed is ON and F6 is ON, the switching speed feature is on. With the feature ON, the throttle's target speed is effectively reduced by about 50% and the effects of accel and decel programmed into the decoder are reduced by 1/4. This is useful for yard switching operations.

**Normal Direction of Travel** is controlled by CV29. See your decoder manual for additional information on the settings for CV29.

This decoder **supports** Scaleable Speed Stabilization (Back EMF)

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## SuperSonic Silent Operation and Torque Compensation

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The factory settings in the decoder provide silent, smooth operation of your locomotive under most conditions. For more information about these settings, please see the Digitrax Decoder Manual or our website.

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## Digitrax Transponding CV61

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**Digitrax Transponding** is controlled by CV61. The initial factory set value is 000/x00 for **OFF**. To turn **ON** transponding, program CV61 to a value of 002/x02. This allows you to use Digitrax transponding to keep track of your rolling stock. When transponding is enabled, the front light of the locomotive will flicker slightly to indicate transponding signal is being communicated. For optimal transponding operation, we recommend that you hook up the forward and rear lights as shown in the wiring diagram (*Figure 1*).

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## Decoder Reset CV08

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**Decoder reset** lets you reset all CV values to the initial factory settings. To reset all CV values, program CV08 to a value of 008/x08. You also have the option of resetting all values except the 28 speed step tables. To do this, program CV08 to a value of 009/x09.



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## Function Outputs on the DZ125

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The DZ125 is set up at the factory to control two function outputs. The DZ125 is configured to control the forward and reverse lights on the locomotive through the white lead and yellow lead using Function 0 (F0F-forward and F0R-reverse) for directional lighting. Both function outputs can be easily set up with Digitrax FX<sup>3</sup> lighting effects or as standard on/off functions with the following operational qualifiers:

1. Forward or Reverse direction of travel, or
2. Whether F0 is on or off, or
3. Both direction of travel and whether F0 is on or off, or
4. Whether the locomotive is stopped or moving.

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## Master Light Switch

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Each of the function outputs can be programmed to turn on and off with the F0 ON/OFF key on your throttle, creating a Master Light Switch. The CV values for creating this effect are listed in the Digitrax Decoder Manual in the section: *Setting Up FX & FX<sup>3</sup> Effects on Function Outputs.*

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## Warranty & Repair

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All warranties on Digitrax products are limited to refund of purchase price, repair or replacement at Digitrax's sole discretion. Except as expressly stated in the full warranty statement, there are no warranties, express or implied, including but not limited to any warranties of merchantability or fitness for a particular purpose. This decoder is not warranted for track voltages above +/- 20V in DCC or DC operation. Be sure to check your DCC or DC system does not create voltages on the tracks above this limit. For complete warranty details see [www.digitrax.com](http://www.digitrax.com).

**Damaged decoders should be returned directly to Digitrax for repair.**

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DZ125

Fits a Variety of N Scale Locomotives

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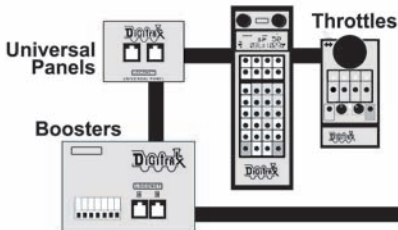
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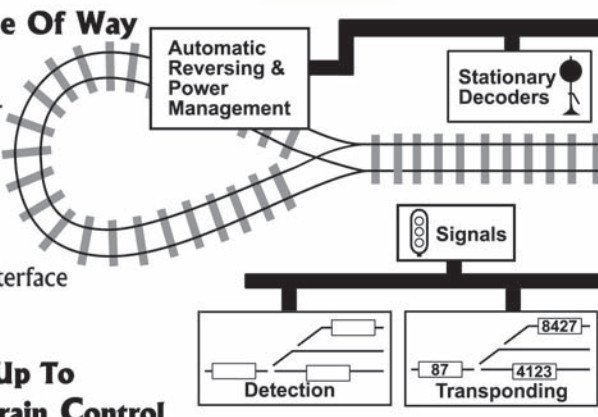
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450 Cemetery Street  
Norcross, GA USA 30071  
www.digitrax.com  
T 770-441-7992  
F 770-441-0759  
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