DH163L0

**Fits LifeLike GP7, SD60
and Other Locos with LifeLike
DCC medium plug arrangement.**

HO Scale

**Mobile Decoder
Plug 'N Play
1.5 Amp/2 Amp Peak
6 FX^3 Functions, 0.5 Amp**

Features:

- **Digitrax LocoMotion™ 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 & 256 level resolution.

- **SuperSonic™** motor drive for silent operation.

- **FX^3** 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^3 & Standard Function Qualifiers operate functions based on direction, F0 on or off, direction and F0, and whether loco is moving.

    Function Remapping for custom function setup.

    Master Light Switch turns off all lights & functions with one keystroke.

    Advanced Consist Function Controls

- **Current Regulator** lets you use loco's original lamps with no modifications.

- **Plug 'N Play** design makes installation quick and easy.

- **Transponder equipped** ready for transponding on your layout.
    Compatible with digital surround sound systems

- **All Mode Programming with Operations Mode Read Back** reads back CV values right on the mainline.

- **Decoder Reset CV** with or without speed table reset.

- **Motor Isolation Protection** helps prevent damage to your decoder.

- **Basic, Advanced & UniVersal Consisting**

- **2 Digit and 4 Digit Addressing**

- **DCC Compatible**

- **FCC Part 15, Class B RFI**

Parts List

1   DH163L0 Decoder   1   Instruction sheet

Installation Information

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 for the latest versions, technical updates and additional locomotive-specific installation instructions.

Installation Instructions - LifeLike GP7 Locomotive

1. Remove locomotive shell, noting the orientation of the circuit board inside. (*Figure 1*)

2. Unplug the the manufacturer's DCC socket from the pins on the factory board. Remove the two screws that hold the board in place. (*Figure 2*) Lift out the factory board and save the two screws for future use.

3. Insert the locomotive's DCC socket onto the pins on the Digitrax DH163L0 decoder board. (Pin 1 is the lower left pin.) (*Figure 3*) The decoder is factory configured to work with the original locomotive 1.5V lamps.

4. The decoder should be taped flat against the frame using nonconductive tape. Be sure to leave the factory applied yellow protective tape in place on the bottom of the decoder to prevent short circuits. (*Figure 3*)

5. Replace the loco shell on the frame. The loco is now ready to run on your DCC system using the factory set address 03. See next page for customizing.
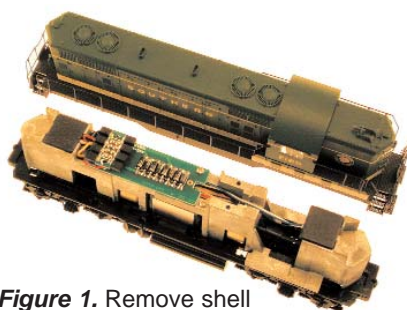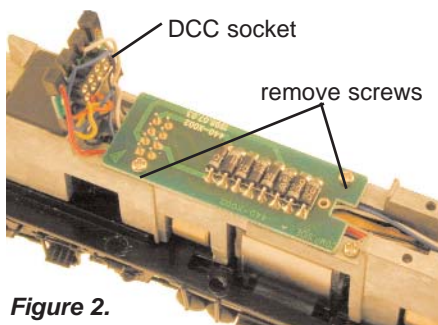
Figure 1. Remove shell

DCC socket

remove screws

Figure 2.

Insert DCC plug (Pin 1)

tape decoder to frame

Figure 3.

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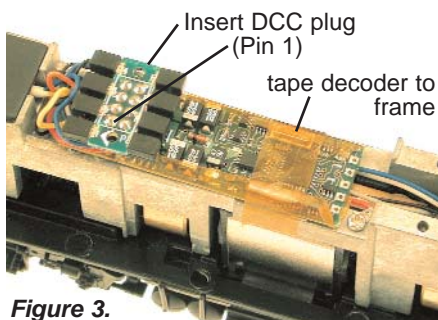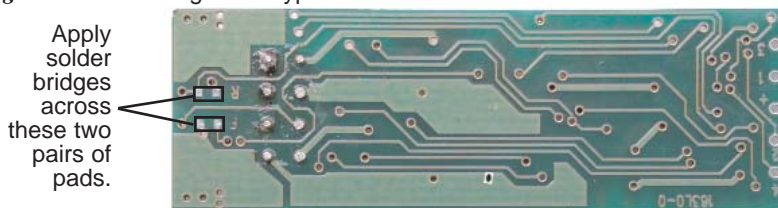**Installation Notes:**

1. Do not exceed the decoder's 500mA total function output rating.

2. The decoder F0F and F0R functions are factory configured with an on-board current regulator for the factory lamps (or LEDs) when using a maximum DCC track voltage of up to 16Volts. To bypass the current regulator and use 12V to 16V lamps on F0F and F0R, peel back the yellow tape and bridge each of the two pair of solder pads as shown on the back side of the decoder in *Figure 5*. Be sure to replace the yellow insulating tape on the decoder back and change the locomotive lamps to 12V to 16V bulbs.

Figure 5. Current regulator bypass

Apply solder bridges across these two pairs of pads.

3. Functions F1, F2, F3 and F4 do not have current regulators, they do switch the full track voltage from the Blue/+Common lead, so LEDs or 1.5V lamps being run on these function leads need a current setting resistor or similar.

Customizing Your Decoder

Your Digitrax decoder is ready to run and will operate using address 03 with no additional programming. However, for a more prototypical railroading experience, your decoder can be customized for your specific locomotive and layout requirements by programming some of the many Configuration Variables, or CVs, available. Some of the most commonly used CVs, their factory settings and uses are listed below. The Digitrax Decoder Manual, available on line at www.digitrax.com, contains complete information on how to use these and other CVs and the range of CV values available.

Changing the Decoder Address

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 set manual for 4 digit instructions).

3. 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**.

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

Digitrax LocoMotion™ System

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, scaleable speed stabilization and more to take full advantage of the Digitrax LocoMotion™ System.

Speed Tables-How the Loco Responds to the Throttle

With Digitrax LocoMotion™, there are two types of speed tables: 3 Step Tables and High Resolution 28 Step Tables. Please see your 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.

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

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Momentum-CV03 & CV04

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.

Other LocoMotion™ Features: Switching Speed, Normal Direction of Travel & Scaleable Speed Stabilization (Back EMF) Features

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 (NDOT) is controlled by CV29. See your decoder manual for additional information on the settings for CV29.

Scaleable Speed Stabilization (Back EMF) intensity, or droop, is controlled by CV57. The factory setting for this feature is 006/x06 which is suitable for most locos. You can adjust this value in the range of 000/x00 for OFF to 015/x0F for the maximum effect. Consult your Digitrax Decoder Manual for info about CVs 55 & 56 and their effects on scaleable speed stabilization. The factory setting for both CV55 & CV56 is 000.x00.

SuperSonic™ Silent Operation and Torque Compensation

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 web site.

Function Outputs on the DH163L0

The DH163L0 has six function outputs available. The DH163L0 is configured to control the 1.5V lamps on the factory light board through the integrated DCC medium plug using Function 0 (F0F-forward and F0R-reverse) for directional lighting.

Function outputs F1/Green, F2/Violet, F3/Brown and F4/White/Yellow are available on the decoder and can be used by soldering wires from the pads indicated to additional lights (or other functions) you wish to control. Function outputs F1, F2, F3 and F4 switch the full track voltage from the Blue/+Common lead, so LEDs or 1.5V lamps being run on these function leads need a current setting resistor or similar.
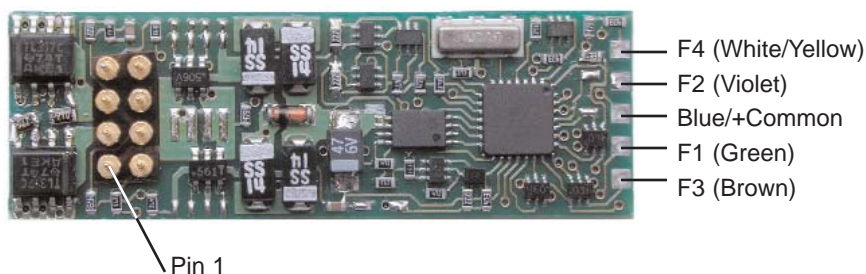
CAUTION: When adding function wires, be very careful that the wires you add do not come into contact with any other pads or components thus creating a short circuit.

All six function outputs can be programmed as Digitrax FX^3 lighting effects or as standard on/off functions.

All function outputs can be qualified based on:

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.

Figure 4. DH163L0 Decoder Function Outputs

F4 (White/Yellow)
F2 (Violet)
Blue/+Common
F1 (Green)
F3 (Brown)

Pin 1

Master Light Switch

Each of the six 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^3 Effects On Function Outputs*.

Function Remapping

Function remapping allows you to program the function outputs of your decoder to be controlled by selected function keys on your throttle. Please consult the Digitrax Decoder Manual or website for information on function remapping.

Digitrax Transponding CV61

Digitrax Transponding is controlled by CV61. The initial factory set value is 000/x00 (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 that a transponding signal is being communicated.

Decoder Reset CV08

Decoder reset lets you restore all CV values to their initial factory settings. To reset all CV values, program CV08 to a value of 008/x08. To reset all CV values EXCEPT for the values entered in your 28 speed step tables, program CV08 to a value of 009/x09.

Warranty & Repair

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. For complete warranty details see www.digitrax.com.

Damaged decoders should be returned directly to Digitrax for repair.

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DH163L0

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Movin' Down The Tracks With Digitrax

Digitrax
Command
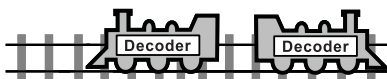**C**ontrol

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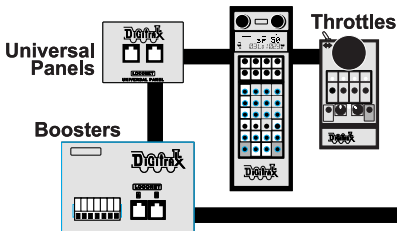The Digitrax
Difference

Locomotive Shops

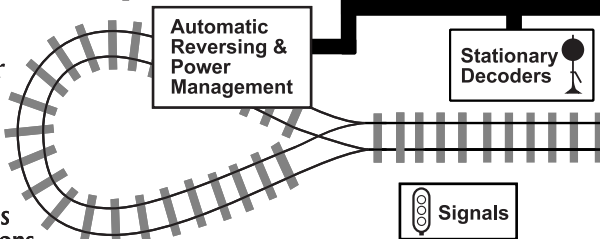Mobile Decoders
Function Decoders

Decoder   Decoder

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Advanced & Simple Throttles,
Power Supplies,
Universal Panels,
IR and/or Radio
for more trains and operators.

Universal Panels

Boosters

Throttles

Maintenance Of Way

Make your
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fun & simpler
to operate!

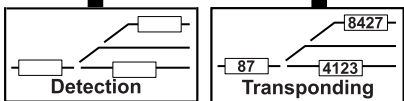**Automatic Reversing & Power Management**

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