



# DH165L0

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

**HO Scale**

**Mobile Decoder**

**Plug N' Play**

**SFX SoundBug™ compatible**

**1.25 Amp/2 Amp Peak**

**6 FX<sup>3</sup> Functions, 0.5 Amp**

## Features:

- **Accepts Plug-in SFX SoundBug™ sound modules**
- **Regulated Headlights:** convenient no-resistor install of LEDs and lamps.
- **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.
- **Scalable Speed Stabilization** with simple setup & 1024 level resolution.
- **SuperSonic** motor drive for silent operation.
- **FX<sup>3</sup> Functions** for prototypical lighting effects:
  - **Constant Brightness Lighting** directional or independent control.
  - **Realistic Effects** like Ditch lights, Mars lights, strobes, and many more.
  - **Dynamic and Static Qualifiers** operate functions based on direction, F0 on or off, loco 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 (Head light/F0) 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**-read back CV values right on the mainline.
- **Decoder Factory CV Reset** with or without speed table initialize.
- **Motor Isolation Detection** prevents damage to your decoder.
- **Basic, Advanced & UniVersal Consisting**
- **2 Digit and 4 Digit Addressing**
- **DCC Compatible**

## Parts List

1 DH165L0 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](http://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 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 DH165L0 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/LEDs.
4. The decoder should be taped flat and spaced from the frame using non-conductive tape. A plastic spacer placed between the decoder and frame is the recommended method for spacing. (*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.

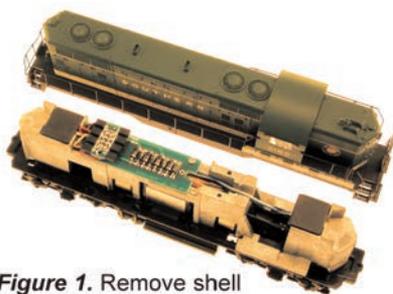


Figure 1. Remove shell

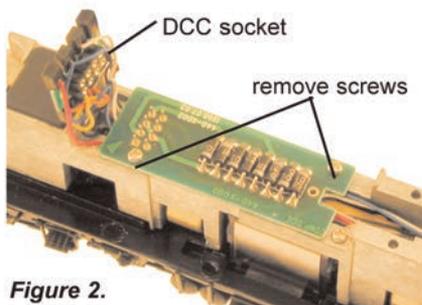


Figure 2.

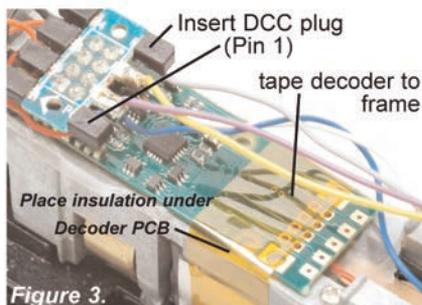
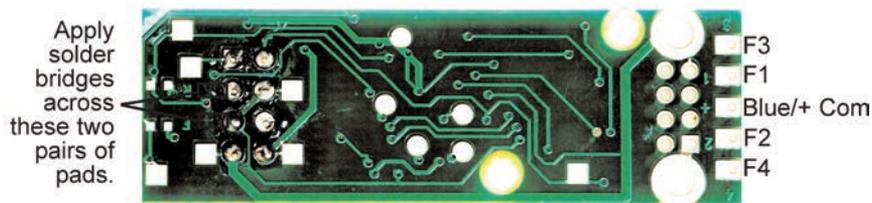


Figure 3.

## 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 onboard current regulator for the factory lamps (or LEDs) when using the maximum DCC track voltage of up to 16V. To bypass the current regulator and use 12V or 16V lamps on F0F and F0R, bridge each of the two pair of solder pads as shown on the back side of the decoder in *Figure 4*. Be sure to replace the yellow insulating tape on the decoder back and change the locomotives lamps to 12V to 16V bulbs.



**Figure 4:** Current regulator bypass (bottom side of the decoder)

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. 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.

## 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/DT402 press **PROG**. On DT300, DT100 & DT200 press **RUN/STOP & FN/F0**.
2. Choose AD2 for 2 digit addressing or AD4 for 4 digit addressing (DT400/DT402 and DT300). (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/DT402 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 DT400/DT402 & DT300 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 at the factory. All have a range of values from 000 to 255. We recommend the following CV values as a starting point for experimenting with speed tables.

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



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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. A range of 000 to 031 is available for both accel and decel. Try CV03:003 and CV04:000 as a starting point for experimenting with momentum.

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

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**Switching speed** is controlled by CV54. The factory setting is 000 for OFF. To turn on the switching speed feature, program CV54 to a value of 001. When this feature is on, use F6 to activate and deactivate switching speed. 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.

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

## 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 web site.

## Functions on the DH165L0

The DH165L0 has six function outputs available. The DH165L0 is configured to control the 1.5V lamps/LEDs on the factory light board through the integrated DCC medium plug using Function 0 (F0F-Forward and F0F-Reverse) for directional lighting.

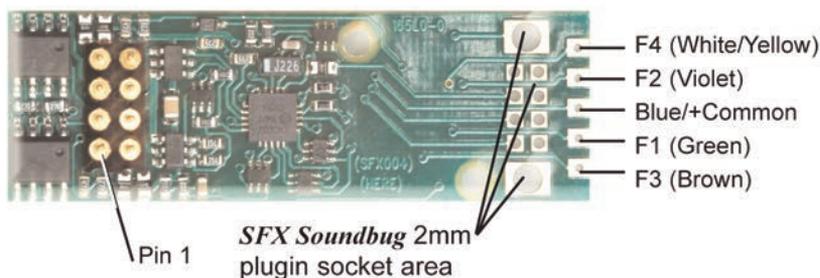
Functions F1 (Green), F2 (Violet), F3 (Brown) and F4 (White/Yellow) are available on the decoder and can be used by soldering wires from the pads indicated to additional lights (or other functions) you wish to control. Function outputs F1, F2, F3, and F4 switch the full track voltage from the Blue/+Common 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 on the board where they might create a short circuit.

All six function outputs can be easily set up with Digitrax FX3 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.

**Figure 5:** DH165L0 Decoder Function Output (top side view)





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## Function Mapping

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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 web site for information on function remapping.

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## Digitrax Transponding CV61

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**Digitrax Transponding** is controlled by CV61. The initial factory set value is 000 for OFF. To turn ON transponding, program CV61 to a value of 002. 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 using the standard installation instructions.

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## Decoder Reset CV08

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**Decoder reset** lets you reset all CV values to the factory default settings. To reset all CV values, program CV08 to a value of 008. 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.

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## Master Light Switch

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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 which is available at our website.

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## Warranty & Repair

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Digitrax gives a one year *"No Worries" Warranty* against manufacturing defects and accidental customer damage on all Digitrax products.

**That's it! A simple, straightforward warranty with no tricky language!**

Visit [www.digitrax.com](http://www.digitrax.com) for complete warranty details and instructions for returning items for repair.



# DH165L0

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

## Go Beyond DCC With Complete Train Control

### Main Station

Starter Sets  
LocoNet®  
Power Supplies



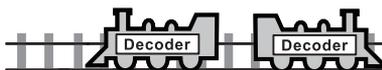
Your Digitrax LocoNet® Starter Set is just the beginning of an exciting trip! Pick the one that's right for you!



LocoNet®  
The Digitrax  
Difference

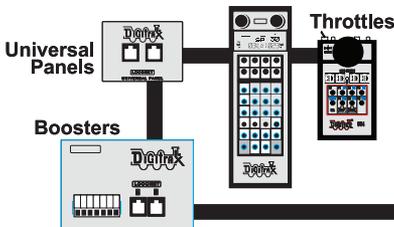
### Locomotive Shops

Mobile Decoders  
Function Decoders  
SoundFX™ Decoders



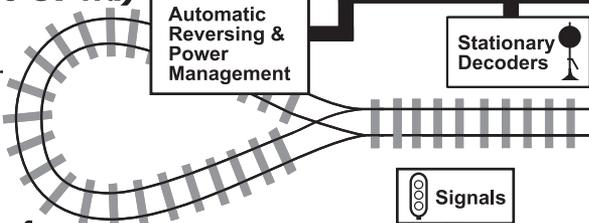
### More Fun For Everyone

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



### Maintenance Of Way

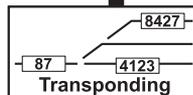
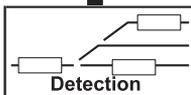
Make your layout more fun & simpler to operate!



### Computer Controls

Computer Interface  
Decoder Programmer  
Sound Programmer

### It All Adds Up To Complete Train Control

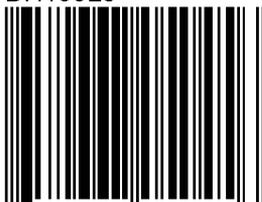


2443 Transmitter Road  
Panama City, FL 32404  
www.digitrax.com  
T 850-872-9890  
F 850-872-9557

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