Complete Train Control
Run Your Trains, Not Your Track!

DZ123Z0

Fits AZL Z GP-30 and others

Z Scale

Mobile Decoder
DCC Board Replacement
1 Amp/1.25 Amp Peak
2 FX³ 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.
- **Scalable Speed Stabilization (Back EMF)** with simple setup & 256 level resolution.
- **SuperSonic** motor drive for silent operation.
- **FX³** Functions for prototypical lighting effects:

  Constant Brightness Lighting with directional or independent control.

  Dynamic and Static Qualifiers operate functions based on direction, F0 on or off, loco 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.

  Advanced Consist Function Controls
- **Bright White LEDs** for added realism.
- **Transponder equipped** ready for transponding on your layout.
- **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 Protection** prevents damage to your loco and decoder.
- **Basic, Advanced & UniVersal Consisting**
- **2 Digit and 4 Digit Addressing**
- **DCC Compatible**

Parts List

1 DZ123Z0 Decoder

1 Instruction sheet

Installation Information

For Most Z Scale layouts, Digitrax recommends using 8V DC or less for operation to avoid damage to locomotive motors & shells. 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 - AZL GP-30 Locomotive

1. Carefully remove the locomotive's shell from the frame by holding the fuel tank and pulling the body shell straight up. Notice the orientation of the shell for reinstallation. ***Figure 1***.
2. Slide the factory light board toward the rear of the chassis to release it from the under the clips on the locomotive frame. Be careful not to distort the frame clips as you slide and lift the light board from the chassis.
3. Inspect the Motor Contact Clips to make sure they are almost perpendicular (85 – 90 degrees). Carefully bend the clips if necessary. ***Figure 2.***
4. Inspect the factory installed tape located on the frame near the Motor Contacts. This tape needs to be securely fastened to the frame and not interfering with the Motor Contacts. If necessary, use a piece of supplied Kapton tape to replace the factory installed tape to ensure proper adhesion to the frame. This tape is required to isolate the Motor Contacts from the frame. ***Figure 3***.

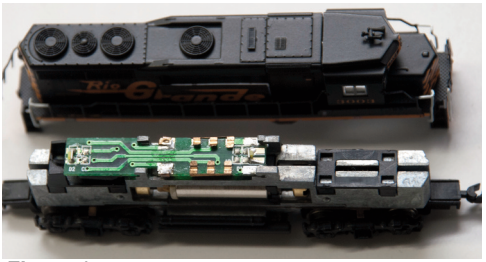

Figure 1: Remove loco shell

Figure 2: Inspect Motor Contact Clips to make sure they are almost perpendicular

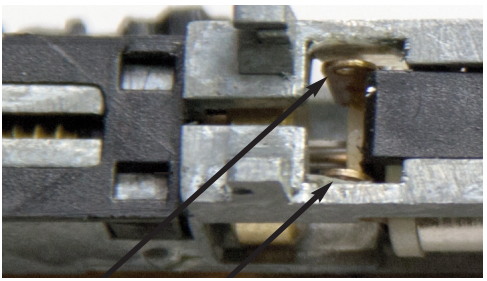

Figure 3: Ensure tape is properly insulating the frame from the motor tab.

5. Take the DZ123Z0 decoder (noting the correct orientation of the frame power pickups and motor contact clips) and slide the decoder forward and underneath frame clips as indicated in ***Figure 4***. Pay particular attention to the Motor Contact Clips during installation. Making sure the insulating tape stays in place and is not interfering with the Motor Contact Clips or Motor Contacts.

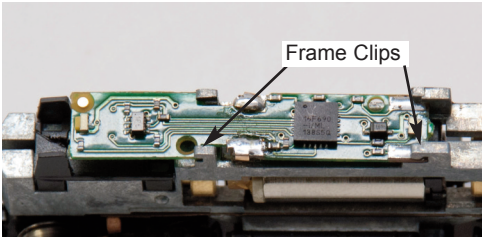

Figure 4

6. Using a quality multimeter, check for continuity between the Motor Contact Clip and Motor Contacts. The Motor Contacts can be accessed from the side of the chassis. The meter should read 0 ohms. If one or both sides read open, reinstall the decoder paying particular attention to the Motor Contact Clips and insulating tape. Check to make sure the Motor Contacts are not shorted to the frame. The meter should read infinite.

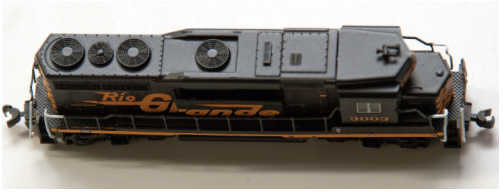

Figure 5

7. Once good continuity is made, place the chassis on the programming track and read the 2 digit address. If the decoder address read fails, reinstall the decoder again, following steps 5 and 6.
8. Replace the locomotive's shell. ***Figure 5***

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.

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. 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.

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.

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

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 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.

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 website.

Digitrax Transponding CV61

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.

Decoder Reset CV08

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. 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.

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 & FX³ 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.

Warranty & Repair

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 for complete warranty details and instructions for returning items for repair.

Damaged decoders should be returned directly to Digitrax for repair.

Caution: To prevent damage to your decoder and locomotive, track voltage used during operation must not exceed the operating parameters of the locomotive and its lighting system in which the decoder is installed (typically this is 12V DC). For most N scale layouts, Digitrax recommends using 14 volts DC or less for operation to avoid damage to the locomotive shell, lamps and decoder. For Most Z Scale layouts, Digitrax recommends using 8V DC or less for operation to avoid damage to locomotive motors & shells.

Digitrax, Inc. is not responsible for unintentional errors or omissions in this document.

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Fits AZL GP-30 and others

Go Beyond DCC With Digitrax® Complete Train Control

Main Station

Starter Sets
LocoNet® Power Supplies

DUPLEX EQUIPPED Available

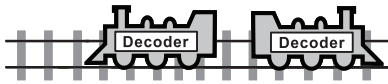
Your Digitrax LocoNet® Starter Set is just the beginning of an exciting trip! Pick the one that's right for you!

Super Chief xtra™
Super Empire Builder xtra™
Zephyr xtra™

LocoNet® The Digitrax Difference

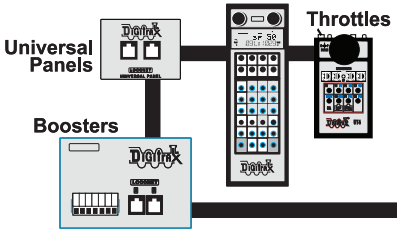
Locomotive Shops

Mobile Decoders
Function Decoders
SoundFX™ Decoders



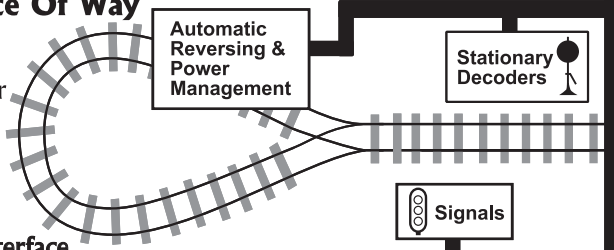
More Fun For Everyone

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



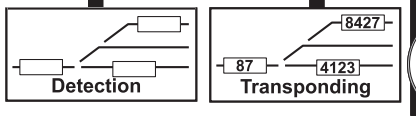
Maintenance Of Way

Make your layout more fun & simpler to operate!



Computer Controls

Computer Interface
Decoder Programmer
Sound Programmer



It All Adds Up To Complete Train Control

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