Complete Train Control
Run Your Trains, Not Your Track!

DN123K3

Fits Kato NW-2 N Scale Locomotives

N Scale

Mobile Decoder
1.25 Amp/2 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 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 quiet operation.
- **FX³** Functions for prototypical lighting effects:
  - **Constant Brightness Lighting** with directional or independent control.
  - **Realistic Effects** like Ditch lights, Mars lights, strobes, and many more.
  - **FX3 & 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**
- **Transponder equipped** ready for transponding on your layout.
- **All Mode Programming with Operations Mode Read Back** reads back CV values right on the mainline.
- **Decoder Factory CV Reset** with or without speed table initialize.
- **Motor Isolation Protection** helps prevent damage to your loco and decoder.
- **2 Digit and 4 Digit Addressing**
- **DCC Compatible**
- **FCC Part 15, Class B RFI compliant**

Parts List

1 DN123K3 Decoder

1 Instruction sheet

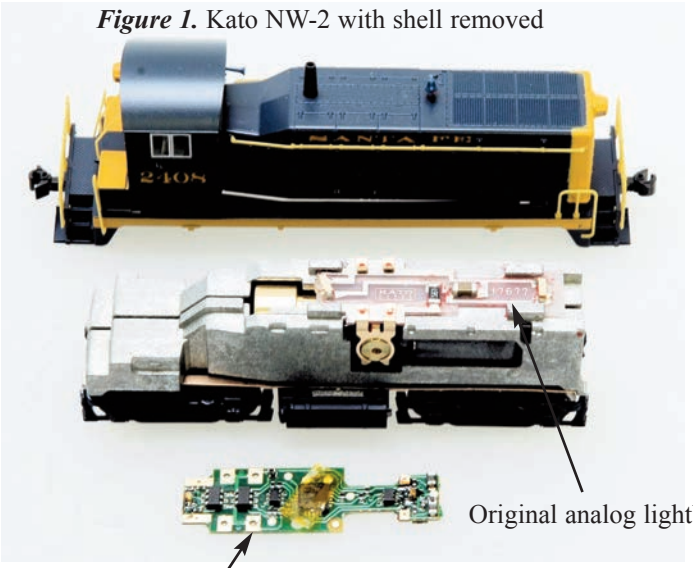
Installation Information

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

1. Carefully remove the locomotive's shell from the frame. ***(Figure 1)*** Notice the orientation of the shell to the frame so that you can reinstall correctly.

Figure 1. Kato NW-2 with shell removed



2. To remove the Kato NW-2 standard lightboard you will need to remove the motor clips first. The NW2 Motor clips can be most easily removed by rotating the motor gently so that the circular motor brush caps release the motor clip. Next pull the motor clip directly off each side of the light-board. Remove the light-board by pulling forward and then upward from the frame halves. ***(Figure 2)***

Figure 2. Kato NW-2 motor clip removal

3. Before moving on to the decoder PCB installation, take a moment to retension the motor clips according to the following diagram. ***(Figure 3)***

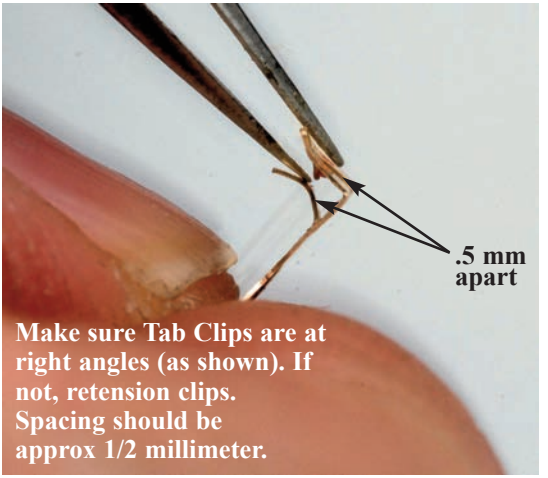


Figure 3. Kato NW-2 motor clip retensioning

4. Place the DN123K3 decoder in as shown ***(Figure 4)*** The decoder should be placed down and backward, so as to engage frame clips. If done correctly, the decoder should fit snugly.

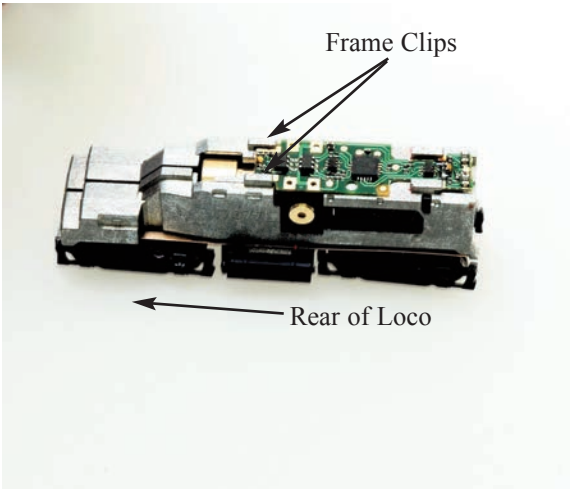


Figure 4. Decoder PCB Installation

5. **If needed**, one or more strips of Kapton tape can be placed as a spacer to raise the PCB up as shown ***(Figure 5)*** across frame halves, in order to minimize unwanted movement of the decoder PCB.

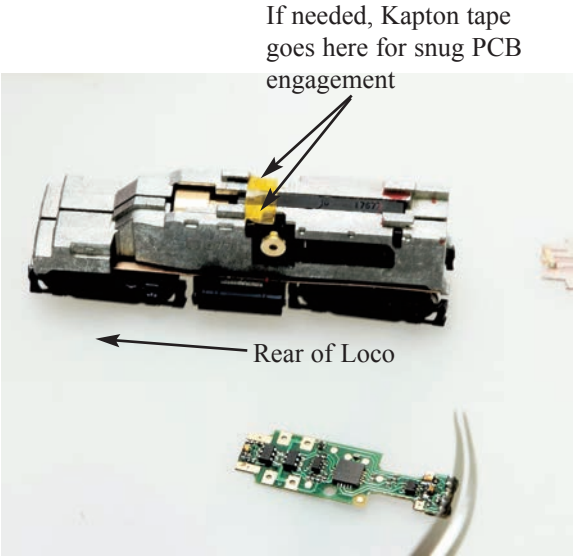


Figure 5. Optional Tape placement

6. Finally, re-install the NW2 Motor clips.***(Figure 6)***

Figure 6. Motor clip Installation

7. You are now ready to run your locomotive. The DN123K3 is factory programmed to address 03. You can easily customize the address and other features. See section *Customizing Your Decoder* that follows.

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 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.

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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

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. We recommend that you try CV03:003 and CV04:000 as a starting point for experimenting with momentum.

Speed Tables-How the Loco Responds to the Throttle

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. 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.

The intensity, or droop, of **Scaleable Speed Stabilization (Back EMF)** 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

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

Digitrax Transponding CV61

Digitrax Transponding is controlled by CV61. The default 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.

Decoder Reset CV08

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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Function Outputs on the DN123K3

The DN123K3 is set up at the factory to control two functions. The DN123K3 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 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.

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.

Master Light Switch

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 & FX3 Effects on Function Outputs.*

Warranty & Repair

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

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.

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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™

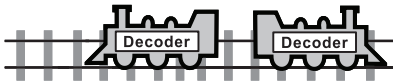
Super Empire Builder xtra™

Zephyr xtra™

LocoNet® The Digitrax Difference

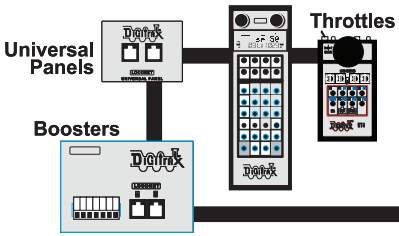
Locomotive Shops

Mobile Decoders
Function Decoders
SoundFX™ Decoders



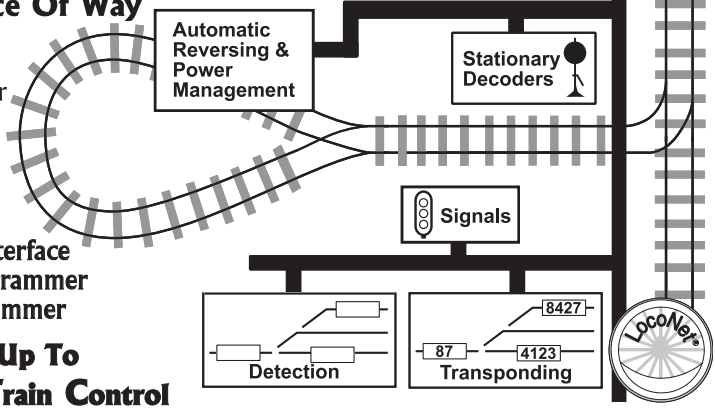
More Fun For Everyone

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

Made in U.S.A.

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