Digitrax Command Control

DN149K2
1Amp Plug N' Play DCC Mobile Decoder
for KATO N-scale SD-40 Locomotive

1.0 Amp (1.5 Amp Peak) Mobile DCC Decoder

Easy, no solder installation

User Scalable High Resolution Speed Stabilization (Back EMF)

Integrated Digitrax Transponder

Supports Both Short (127) & Long (10,000) Address Modes

Programmable from DCC compatible equipment without opening the loco

User Programmable Address, Acceleration, Deceleration,
Start-voltage, Mid-point voltage, Max voltage and more

Automatic conversion to analog operation

4 User Configurable, Independent Functions Rated at 200ma
Use These as Regular Function Outputs or as FX^{TM} Outputs
To Generate Special Lighting Effects
Choose from Mars, Gyralite, Single or Double Strobe, Ditch Lights and more

Smooth locomotive speed control with user selectable
14, 28, or 128 forward & reverse speed step capabilities

User loadable speed tables for customized speed control
with 128 speed step resolution

Supports Basic, Advanced & UniVersal Consisting

User configurable loco direction of travel, you decide
which way is forward without rewiring the motor

Compatible with the DCC Standard   **Made in USA**

Digitrax manuals & instructions are updated periodically.
Please visit www.digitrax.com for the latest version.

**Decoder Installation Instructions.
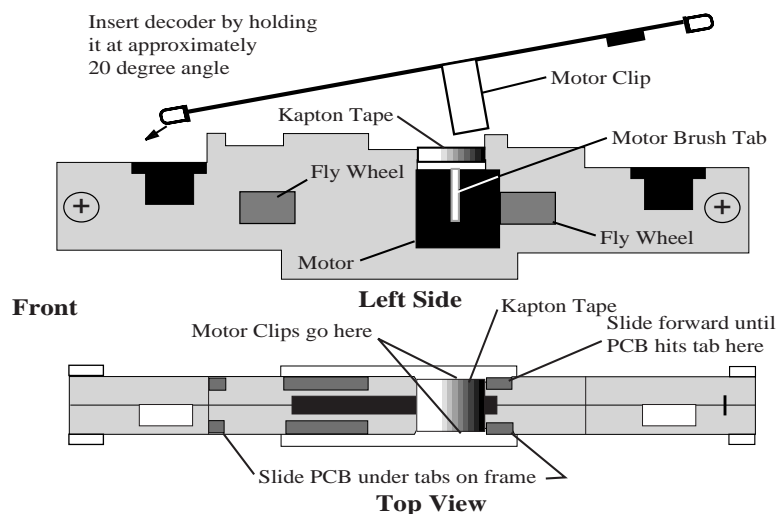For DN149K2 In Kato N-scale SD40-2**

**See Digitrax Decoder Users Manual for complete decoder test procedures,
installation instructions & technical information. This manual is available
at no charge from your dealer. If your dealer is out of these manuals, contact
Digitrax (770) 441-7992, Fax (770) 441-0759, or e-mail sales@digitrax.com
and we will gladly send you a copy.**

1. Remove locomotive shell and walkway.
2. Remove the lamp board by gently sliding it back and lifting up. Be sure front LED does not catch on frame during removal. (If Lamp Board won't slide back, loosen the two frame screws 1/2 turn.)
3. Your decoder was shipped secured to a piece of foam packing material by a piece of yellow Kapton tape. Remove this tape carefully for use in step 4.
4. To insure motor isolation from the frame, cut a 3/8" x 1/2" piece of yellow Kapton tape (Provided) and place it accross the top of the frame directly over the motor opening as shown in FIGURE 1 below. Be sure that the motor brushes are free of the tape.

> Caution: It is nessessary to flex the PCB when installing. Caution should be taken to keep this to a minimum to avoid undue stess to the PCB.

5. Insert the front of the decoder into the front of the frame by lowering the decoder at a 20 degree angle. Gently engage the front end of the decoder in the notches in the front of the frame.
6. Once the front part of the decoder is engaged, lower the copper motor clips over the motor brush tabs. You may need to hold the brush tabs in with your fingers as you slide the motor clips over them.
7. Engage the rear section of the decoder under the notches in the frame.

FIGURE 1

8. To secure the decoder in the frame, push the decoder forward into the frame until it rests against frame tabs. See FIGURE 1. (If you had to loosen frame screws in step 2, tighten them now.)
9. To remove the decoder, disengage the decoder by pushing it toward the rear of the frame. Once the rear tabs are free, lift the back of the decoder and continue sliding toward the rear until disengaged. Be sure front LED does not catch on frame during removal.

How to set up a loco with scaleable speed stabilization

1. Install the decoder.
2. Program CV57 (Droop control) to a starting value of x05005.
   This will enable speed stabilization.
3. Put the loco on level track and run it at about 20% of full speed. In Program Mode increase the value in CV55 (Static) from the default value of x80/128 upward until you observe the loco jumping as speed steps increase. Finish this step b programming CV55 to the value that is one just before the jumping started.
   Note: OPS MODE programing on the main line works very well here.
4. Follow the same procedure with CV56, beginning with the default value of x30/048 and increasing it until you notice the loco oscillating, faster-slower, faster-slower, as speed is increased. Finish this step by programming CV56 to the value just before the oscillation started.
5. Follow the same procedure with CV57, beginning with the value x05/005 as programmed in step 1. Increase the value in this CV until the speed when going up hill is roughly equivalent to the speed on level track. This will yield a best droop value consistent with the locomotive characteristics.
6. Keep notes about the values you program for these 3 compensation control CVs so that you can use them as a starting point for setting up scaleable speed stabilization in similar locomotives.

For more information on Scaleable Speed Stablization consult your Digitrax Decoder Manual or our web page at www.digitrax.com
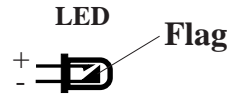
Commonly Used Configuration Variables			Commonly Used Configuration Variables		
CV#	Used For	Default	CV#	Used For	Value
CV01	2-digit address	x03/003	CV61	Directional Lights	x0
CV02	Start Voltage	x00/000		White=F0 & Yellow=F4.	x1
CV03	Acceleration Rate	x00/000		Disable BEMF w/F5 ON	1x
CV04	Deceleration Rate	x00/000		Disable Vstart,Vmid,Vmax	
CV05	Maximum Voltage	x00/000		in 128 step mode	2x
CV06	Mid Point Voltage	x00/000			
			CV49-54	FX Effect Set Ups	See Manual
CV55	BEMF Static Adj.	x80/128		See note below for F2 FX	
CV56	BEMF Dynamic Adj.	x30/048	CV65-95	Loadable Speed Tables	See Manual
CV57	BEMF Droop	x00/000			
	0x=Std				
	x0=Adv. Consist				

CV29	Configuration	x06/006=Advanced Mode, Analog Conversion On
	Register	x04/004=Standard Mode (14 Speed Steps), Analog Conversion On
	Examples:	x07/007=Reversed Direction, Advanced Mode, Analog Conversion On
		x16/022=Enable Loadable Speed Table, Analog Conversion On

CV VALUES ARE SHOWN AS x## FOR HEXADECIMAL AND ### FO DECIMAL NOTATION

Functions on the DN149K2

DN149K2 comes equipped with two yellow LED's set up as F0 fwd and F0 rev, this means that when you install the decoder your headlights will be directional.

> **Note: If you use white LED's to replace the yellow LED's on the decoder make sure the polarity is the same by looking at the flag inside the LED.**
>
> **LED**
> **Flag**
> +
> -

If you wish to control these lights separately from your throttle, then you can program F0 reverse to run on F4 as an independent non-directional function. (see CV61 in chart on previous page)
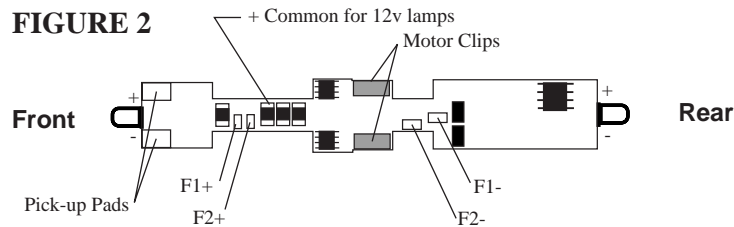
Function 1 & Function 2 are also available on the decoder. If you wish to use these functions you will need to solder wires to the pads indicated in FIGURE 2, then run the wires to the lights or other functions you wish to control. If you are using 1.5V lamps or LED's, the current setting resistors are already connected to F1+ and F2+ on the PCB for these applications.

All four functions can be set up with Digitrax Real FX™ functions. See your Digitrax Decoder Manual for complete instructions for setting up these special lighting effects.

Special note on FX operation of F1 & F2 with DH142, DN142, DN141K2, DN141E2 & DN149K2

When F1 is set up for FX operation, F2 must also be used as an FX function (it can't be used as a standard on/off function). If you want to use a combination of FX and standard on/off operation with Functions 1 & 2, please use F1 for the standard on/off lead and F2 for the FX lead.

> **Caution: When soldering wires to the function pads, make sure these connections cannot come in contact with the locomotive frame.**

FIGURE 2

+ Common for 12v lamps
Motor Clips

Front
Rear

Pick-up Pads
F1+
F2+
F1-
F2-

Damaged decoders should be returned directly to Digitrax for repair. The standard repair charge is $17. Please use the original foam packing block if you do need to ship any DN149K2's for repair. Please follow installation instructions carefully to avoid breaking the PCB.

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