XL SYSTEMS INC
14 Dora Ln Holmdel, NJ 07733
Item #0001808
N Diesel DCC/DC Decoder for Kato SD80 and other

- Six diesel prime movers with randomly associated locomotive sounds
- User selectable 22 different horns and 8 bells
- 28 accessory functions allowing more sound control than ever
- Programmable individual sound volumes
- 1.0 amp capacity
- Programmable for either 2-digit (1-127) or 4-digit (1-9999) addresses
- Programmable start voltage
- Programmable acceleration rate
- Programmable deceleration rate
- Programmable top voltage
- Programmable 14, 28, 128 speed steps
- Selectable factory default speed curve
- Supports advanced consisting (CV19)
- Supports programming on the main (OPS mode)
- Compatible with NMRA DCC standards
- Complies with Part 15 of FCC
- Speaker included

INSTALLATION: The coder will virtually drop in to a Kato SD80 diesel loco. Remove the loco body following Kato's instructions. Remove the original circuit board by sliding the circuit board slightly to the rear of the chassis and lift it out. The sound decoder is installed in the same location. First, deburr the chassis any casting flash that may cause a sharp edge under the location of the insulation tape. Then, using electrical or equiv plastic tape, carefully tape the chassis in the areas as Fig1 indicated to isolate the decoder from the chassis. This must be done to prevent damage to the decoder. Align the decoder and carefully insert it in the slots in the chassis. Don't bend the decoder too much. Gently press down on the rear of the decoder while sliding it into position, being careful not to bend the vertical copper motor contacts on the side of the chassis. Ensure the vertical copper contacts cover the thin vertical motor contacts. The motor contact must not touch the loco chassis. Remove the white protective film from the speaker and "stick" it in place as shown. The decoder installation is complete. When replacing the body, ensure the copper contacts on the trucks are under the horizontal chassis contacts.

Fig 1

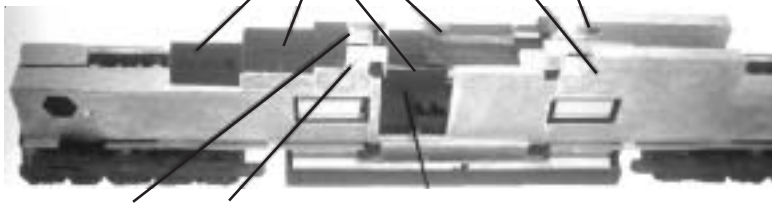
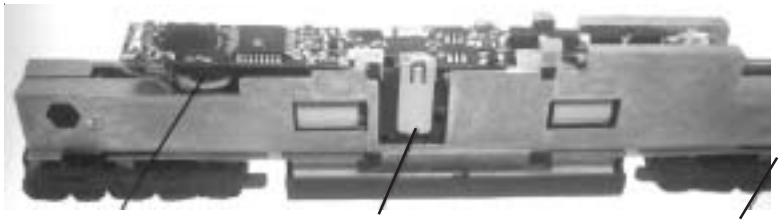


Fig 2



DCC OPERATION: The decoder has been factory programmed with address #3. F12 will change prime diesel rumble type (CV123, 6 types). Use F19 to select 22 different horns and use F18 to select 8 bells. This decoder has start up and shut down feature. You must press any function key to start up the engine before operating the loco. To shut down the engine you must bring the loco to idle and then press F8 3 times.

DC OPERATION: The decoder provides synchronized diesel rumble sound with DC operation. Bells, horns, etc., cannot be accessed. Use of the MRC BlackBox will enable the full range of sounds on a DC system.

SPEED TABLE CV67-CV94 FOR 28 SPEED STEPS

When CV29's bit 4 is set to "1" it will use the speed table formed by CV67-CV94 to control speed (motor voltage). It allows you to setup each speed for all 28 speed steps. First, program CV29 to 18 for short addresses (1-127) or program CV29 to 50 for long addresses (128-9999) to enable speed table control. Then select throttle to 28 speed steps and run your loco at speed step 1. Use program
CV on the main to change CV67's value (1-255) to adjust step 1's speed. The kick voltage, CV65 is only applied when the speed step changes from 0 to 1. You should switch between 0 to 1 many times to check step 1's speed. When done with CV67, select speed step 2 and program CV68. CV68's value must be greater then CV67's. When done with CV67-CV94, use read back CV to make sure their values are in increasing order. Note: When using MRC Prodigy DCC to program addresses it will automatically disable the speed table (set CV29's bit 4 to "0"). Programming CV125 to 1 will also disable the speed table and reprogram CV67-CV94 to a default linear speed setting.

TROUBLE SHOOTING: Whenever the decoder doesn't work, please use the program track to program CV# 125 with value 1 to restore the decoder to factory settings. This should bring the decoder to life with address #3. This decoder should perform well with all DCC systems. Read your DCC system manual to learn how to program and operate the decoder. For more information about CVs and their functions, please refer to the NMRA DCC Standard & Recommended Practices, RP-9.2.2. This is available directly from the NMRA or their website at **www.nmra.org**.

About US

XL Systems Inc has designed and manufactured model rail road products for MRC for more than 20 years. All MRC DCC products are made by XL Systems Inc. All our DCC products are compatible MRC DCC products. We will introduce more new products to meet customer's beget. We also provide installation and special programming and modification for customer. If you have special needs please contact to us at: linzping@gmail.com or maxiulandcc@gmail.com.

RETURN PROCEDURE

This decoder carries a 6 month warranty against factory defects. This warranty does not include abuse, misuse, neglect, improper installation, or any modifications made to this decoder, including but not limited to the removal of the NMRA plug if applicable. If it should become necessary to return the decoder for warranty repair/ replacement, please include a letter with your name, address, daytime phone number, and a detailed description of the problem you are experiencing. Please also include a check or a money order for $9.00 to cover return shipping and handling. If the decoder is no longer considered under warranty, then please contact XL Systems for a price quote to cover the cost of repair or replacement of the decoder, and return shipping and handling. Customers outside the continental United States, including; Hawaii, Alaska, Canada and Mexico, have to contact us for exact return shipping rates for both warranty and non-warranty repairs. Contact to us at **linzping@gmail.com**.

Send the decoder to: XL SYSTEM INC. 14 DORA Lane HOLMDEL, NJ 07733

FUNCTION CHARTER

	Function	Idle/Moving
F1		Bell on/off
F2		Horn
F3		Air release
F4		Coupling 1
F5		Brake release / brake squeal
F6		Dynamic brake on/off
F7		Air hose firing/uncoupling lever
F8		Click 3 times will shut down when in idle/Manual notch down
F9		Engine cooling fan / Manual notch up
F10		Rail wheel clack (only moving)
F11		Traction air compressor
F12		Change prime diesel rumble type (CV123, 6 types)
F13		Master volume reduce by 1 / air release
F14		Master volume increase by 1 / air release
F15		Air compressor
F16		flange squeal
F17		Air release
F18		Change bell type (8 types plus off)
F19		Horn type select (total 22 different horns plus off)
F20		Associated loco sound
F21		Change bell volume (go up by 1 and back 0 when reach top)
F22		Change horn volume (go up by 1 and back 0 when reach top)
F23		Change diesel rumble volume(go up by 1 and back 0 when reach top)
F24		Safety valve pop
F25		Air release
F26		Flange noise
F27		Sand drop
F28		Air release

CV CHARTER

CV#	Description	Range	defualt
CV1	Short address	1-127	3
CV2	Start voltage	0-63	10
CV3	Acceleration	0-63	0
CV4	Deceleration	0-63	0
CV5	Top voltage	0-63	63
CV29	Basic configuration		2
CV19	Advanced consist address	0-127	0
CV21	CV21=0, all accessory functions follow its own address. When CV21=1, all functions will follow the consist address		0
CV49	Master volume control 16=max volume, 0=sound off	0-16	16
CV50	Horn type (22 types plus off, 22=off)	0-22	13
CV51	Horn volume	0-15	15
CV52	Bell type (8 types plus off, 8=off)	0-7	5
CV53	Bell volume	0-15	15
CV54	Bell ring rate	0-50	3
CV55	Diesel rumble volume	0-15	12
CV56	Brake squeal volume	0-15	12
CV57	Dynamic brake volume	0-15	12
CV58	Air release volume	0-15	12
CV59	Air pump volume	0-15	12
CV60	Safety pop valve volume	0-15	12
CV61	Engine cooling fan volume	0-15	12
CV62	Coupling volume	0-15	12
CV64	Rail wheel clack	0-15	12
CV65	Kick start voltage	0-63	63
CV67-94	28 speed steps table while CV29.4=1	1-255	
CV112	Back EMF start speed adjudstment	0-7	0
CV113	Back EMF load control proportional gain kp	0-31	20
CV114	Back EMF load control integral gain ki	0-31	10
CV115	Brake sound type: 2=breke sound off	0-2	0
CV117	Light brightness	0-15	0
CV120	Light brightness	0-255	255
CV121	Air compressor mode (1=change with engine rpm)	0-1	0
CV122	Diesel notch mode, 0=auto notch 3=manual notch	0-3	0
CV123	Diesel prime mover select	0-5	0
CV124	Back EMF load control intensity (0=off)	0-255	0
CV125	Program to “1” will restore some CV’s to factory settings	….	0

CV123 PRIME MOVER CHARTER

CV123	Prime mover	Suitable for the locomotive
0	EMD645E	SD39, SD40, SD40A, SD40-2, SD40T-2, SD45, SDP45, SD45X, SD45-2, SD45T-2, F45, FP45, DDA40X, GP15T, GP39, GP39-2, GP40, GP40-2
1	EMD645	SW 1000, SW1001, SW1500, SW1500, SW1504, MP15DC, MP15AC,MP15T, GP38, GP38-2, SD38, SD38-2, GP15AC, GP15-1
2	EMD710	SD70AC, SD70M-2
3	ALCO244	RS-3, PA1, PB1
4	ALCO539T	S-2, S-4, RS-1, RSC-1, RSD-1, DL-105, DL-107, DL-108, DL-109, DL-110
5	EMD567	F2A/B, F3A/B, F7A/B, F9A/B, BL1, BL2, FP7, FL9, FT, GP7, GP9 ,GP,GP28 E6, E7, E8, E9, NW2, NW3, NW4, SW1, SW7, SW8, SW9, SW600, SW900