

XL SYSTEMS INC

14 Dora Ln Holmdel, NJ 07733

#0001958

N Diesel DCC/DC Decoder for Kato PA1 #0001958

- 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: Remove the original circuit board by very carefully removing the plastic clip and sliding the circuit board out. You must remove the copper contact strips. Wrap them with tape to prevent them from touching the motor leads as Fig1 shows. Trim off some plastic near to the tape to compensate for the tape thickness. Bend the four spring pickup contact 45 degrees to provide correct contact force. Now, slide in the decoder and reinstall the plastic clip. Apply tape over the clip and down the chassis sides to help hold the decoder in place. If you drill a 10mm hole with 2mm depth on rear chassis under speaker, the sound volume will increase by 30%.

DCC OPERATION: N scale should run under 12V. Your DCC track voltage should never over 14V. The decoder has been factory programmed with address #3, 28/128 speed steps and maximum top voltage.

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. You can use F12 to change prime mover sound. You use F18 and F19 to change bell and horn type. F14 can increase master volume. F13 can reduce master volume. There are many more program features available with this decoder. Please refer to the CV Chart to explore other features of the decoder.

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.

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.

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 \$10.00 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 and turn on the bell
F22	Change horn volume
F23	Change diesel rumble volume
F24	Safety valve pop
F25	Air release
F26	Flange noise
F27	Sand drop

CV CHARTER

CV#	Description	Range	Default
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	Sand dropping sound volume	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	Auto brake squeal enable/disable	0-1	1
CV116	Flange squeal volume	0-15	0
CV117	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

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 than 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 re-program CV67-CV94 to a default linear speed setting.

Fig 1

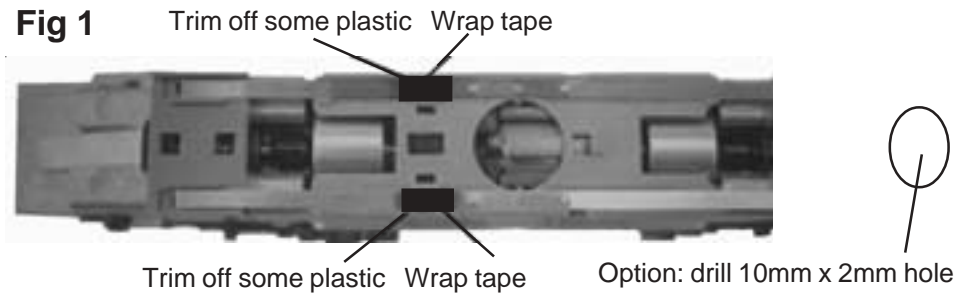
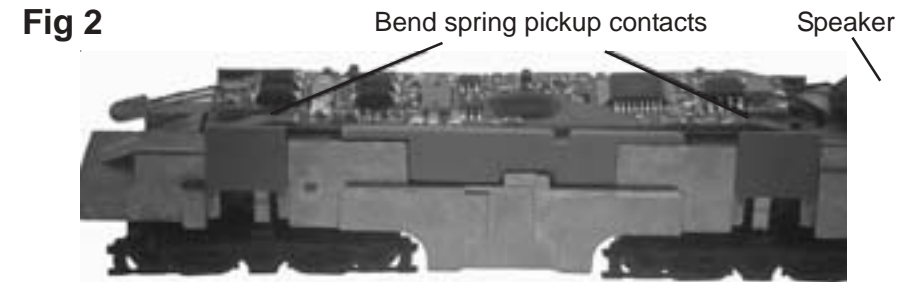


Fig 2



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

FCC COMPLIANCE

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions. (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.

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.