PROGRAMMING

This decoder supports all program modes and read back features. With MRC Prodigy Advance DCC you can read its address and CV value.

CV	Register	Description	Range	Default
CV1	R1	Short address	1-127	3
CV2	R2	Start voltage	0-32	0
CV3	R3	Acceleration	0-32	0
CV4	R4	Deceleration	0-32	0
CV5	---	Top voltage	0-32	32
CV29	R5	Basic configuration	---	2
CV7	R7	Manufacturer version number	---	32
CV8	R8	Manufacturer ID	---	143
CV17	---	Long address upper byte	192-231	192
CV18	---	Long address lower byte	0-255	3
CV19	---	Advanced consist address	0-127	0
CV21	---	CV21=0 all functions follow the set address CV21=1 all functions follow the consist address	0-1	0
CV49		Master volume control (0=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)	0-8	5
CV53	---	Bell volume	0-15	15
CV54	---	Bell ring rate	0-50	20
CV55	---	Diesel rumble volume	0-15	15
CV56	---	Brake squeal volume	0-15	10
CV57	---	Dynamic brake volume	0-15	15
CV58	---	Air release volume	0-15	15
CV59	---	Air pump volume	0-15	15
CV60	---	Safety pop valve volume	0-15	10
CV61	---	Engine cooling fan volume	0-15	15
CV62	---	Coupling volume	0-15	15
CV64	---	Rail wheel clack	0-15	15
CV65		Kick start voltage	0-63	63
CV67-94		28 speed steps table while CV29.4=1	1-255	linear
CV105	---	User identification number	0-255	0
CV106	---	User identification number	0-255	0
CV112	---	Sand dropping volume	0-15	12
CV116	---	Flange squeal volume	0-15	12
CV117		Light brightness	0-255	200
CV122	---	Diesel notch mode, 0=auto, 3=manual	0-3	3
CV123		Prime mover type, 6 types	0-5	2
CV125	---	Programming 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.

TROUBLE SHOOTING

This decoder should perform well with all DCC systems. The maximum DCC output should be less than 15 V. If the locomotive does not respond to commands, it may have lost its address. Please re-program the address and program CV19 to 0 (disable consist). If it responds slowly, you should clear its momentum by reprogramming CV3 and CV4 to zero. If step 1's speed is too high, you should program start voltage, CV2 to zero. If its top speed is too slow, program top voltage CV5 to 31. You should also clean the track to improve electrical pickup. Read your DCC system manual to learn how to program and operate the decoder. For more information about registers/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**. 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.

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.

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 copy of the original sales receipt**. Please include a letter (printed clearly) 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 $11.00 to cover return shipping and handling. If the decoder is no longer considered under warranty, then please include a check or a money order for $35.00 to cover the cost of repair or replacement and return shipping and handling. **Be certain to return the decoder only.**

Any questions regarding Warranty Policy can be directed to our Customer Service Department by calling 732-225-6360 between the hours of 8:00am and 5:00pm EST, or by emailing: mrcsupport@modelrectifier.com

Send the decoder to:

Model Rectifier Corporation
360 Main St. STE # 2
Matawan, NJ 07747 U.S.A

Printed in USA

N Gauge DCC/DC Synchronized Diesel Sound Decoder with 28 Accessory Sound Functions

Item #0001808-V2 (Fits Kato SD80)

Thank you for purchasing our most advanced 16-bit DCC locomotive sound decoder. Combined with any DCC System or Tech 6 Hybrid, our true live capture digital sound decoder will make your model railroad come to life.

- Six types of synchronized diesel prime mover sounds to choose from
- 0.75-amp capacity
- 22 different types of horns and 8 types of bells
- Programmable individual sound volumes (16 levels)
- Programmable either 2-digit or 4-digit addresses
- Programmable start voltage and top voltage
- Programmable acceleration and deceleration rates
- Programmable 14, 28, 128 speed steps
- Supports full read back of CV's
- Selectable factory default speed curve
- Advanced speed table control CV67-CV94
- Kick start voltage control CV65
- 28 accessory functions (F1-F28)
- Supports advanced consisting (CV19)
- Supports programming on the main (OPS mode)
- Compatible with NMRA DCC standards
- Complies with Part 15 of FCC regulations
- 10mm, 32-ohm speaker included
- PCB size: 77mm x 9.7mm x 3.5mm
- Directly replaces Kato SD80 circuit board

Rev: Feb 2024

INSTALLATION

Your new MRC 0001808-V2 16-bit Sound Decoder will virtually "drop-in" to a Kato SD80 diesel locomotive. Although easy, please follow the instructions carefully. Remove the locomotive body following Kato's instructions. Remove the original circuit board by very carefully sliding the circuit board slightly to the rear of the chassis. Lift out. The sound decoder is installed in the same location.

First, deburr the chassis (with emery cloth) any casting flash that may cause a sharp edge under the location of the insulation tape. Then, using **electrical or equivalent plastic tape**, carefully tape the chassis in the areas as indicated (See fig 1 & 2) 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. Gently press down on the rear (speaker side) 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 (on the decoder) 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.

Fig1

Tape here   Chassis Slots

Chassis Slots   Tape **must** extend down the sides as shown.
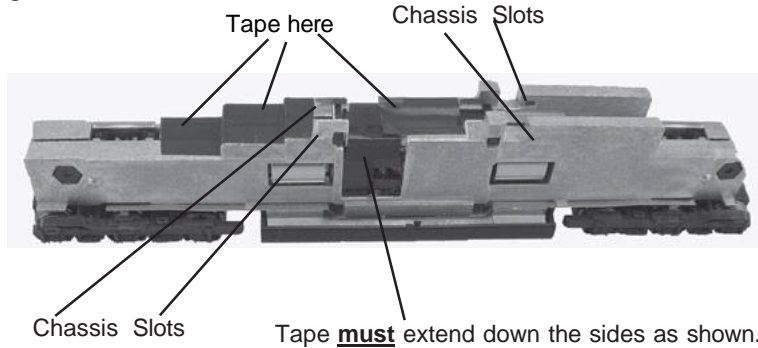
CAUTION:
The decoder must be isolated as shown. Apply electrical tape or plastic equivalent tape in the areas shown in red to prevent the electrical contacts from touching the chassis and damaging the decoder.

Fig2

Speaker location directly under chip on top of tape

vertical motor contact (must be positioned as shown)

Truck/Chassis contact
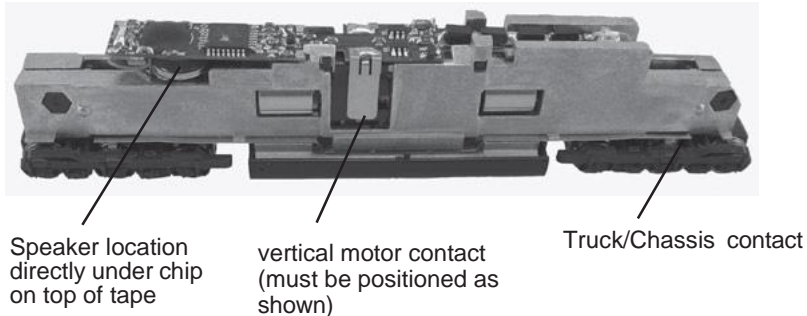
MAKING A TEST TRACK

When you complete the decoder installation, we strongly recommend building a test track with a 27-ohm resistor to limit current. Only test your installed decoder on the test track. The test track may prevent damage from an incorrectly installed decoder.
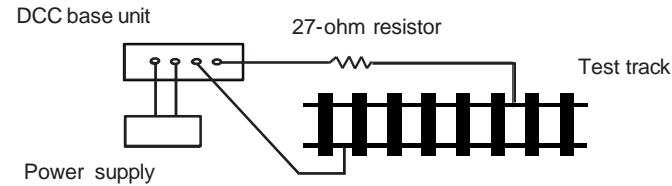

DCC base unit   27-ohm resistor   Test track

Power supply

Fig3. Diagram of test track

TEST

All MRC decoders have been factory programmed with address #3, 28/128 speed steps and maximum top voltage. **Never run the installed decoder on your layout without first successfully running on test track.** Otherwise, you may damage the decoder if it is not wired correctly or if you have not properly isolated the motor, chassis, and lights.

To test, place the loco on the test track. Select the "Run" mode of your DCC system and select or acquire address #3. Move up the throttle and the loco should move forward. Push the light button [F0] and the front headlight should come on. Change the direction of the loco and the loco should change direction and the rear headlight (if equipped) should come on. The loco cannot reach full speed, due to the resistor. If all above occurs, you passed the test. Congratulations!

If your installed decoder does not pass the test, find the problem, correct it, and test it again.

OPERATION

The decoder has start up and shut down features. If the loco was previously shut down, you must start up the engine. 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 three times.

You can use F19 to select 22 different horn sounds and use F18 to select 8 different bell sounds. With MRC's Prodigy Advance² DCC, which has 28 functions, you can easily setup and access all the decoder's functions. If your DCC system is limited in functions, or cannot program CV's, you may not be able to access all the features of this decoder. With some DCC systems you will have to use CV programming to set up the decoder.

The decoder default is set to automatic notch. You can program CV122 to 3 for manual notch for realistic operation. And then use F9 to notch up and use F8 to notch down.

There are many more program features available with this decoder. Please refer to the CV chart to explore other features of the decoder.

The decoder can also be operated by the MRC Tech 6 (item # 0001200) if you don't have a DCC system. It will allow you to control all the sounds in your sound equipped locomotives. And the MRC Tech 6 is easy to set up and use!

Function	Idle/Moving
F0	Headlight on/off
F1	Bell on / off
F2	Horn
F3	Air release
F4	Coupling 1
F5	Brake release (idle) / brake squeal (moving)
F6	Dynamic brake on / off
F7	Air hose firing / uncoupling lever
F8	Click 3 times during idle to shut down / Manual notch down
F9	Engine cooling fan / Manual notch up
F10	Rail wheel clack (only moving)
F11	Traction air compressor
F12	Change prime diesel mover type (CV123, 6 types)
F13	Master volume reduce by 1 / air release when reach maximum
F14	Master volume increase by 1 / air release when reach maximum
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
F28	Air release

Note2: when CV122=3 (manual notch up/down, F8 will notch down and F9 will notch up.

Bell, Dynamic Brake and Rail Wheel Clack cannot play at the same time. If you activate the Bell sound [F1], while either the Dynamic Brake or Rail Wheel Clack sounds are in use, the Bell sound will override the other 2 sounds. Rail Wheel Clack cannot play while the loco is in idle. When you turn off Dynamic brake and Rail Wheel Clack sound there will be one second delay.