PROGRAMMING

This decoder supports all programming methods including: register, paged CV, direct CV, and programming on the main (ops mode programming).

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
---	R6	Page number	---	---
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	---	When CV21=0, all accessory functions will follow its own address. When CV21=1, all functions will follow the consist address	---	0
CV49		Sound on/off (1=on)	0-1	1
CV50	---	Horn type	0-16	4
CV51	---	Horn volume	0-3	3
CV52	---	Bell type	0-8	3
CV53	---	Bell volume	0-3	3
CV54	---	Bell ring rate	0-50	3
CV55	---	Diesel rumble volume	0-3	3
CV56	---	Brake squeal volume	0-3	3
CV57	---	Dynamic brake volume	0-3	3
CV58	---	Air release volume	0-3	3
CV59	---	Air pump volume	0-3	3
CV60	---	Safety pop valve volume	0-3	3
CV61	---	Engine cooling fan volume	0-3	3
CV62	---	Coupling volume	0-3	3
CV63	---	Random noise volume	0-3	3
CV64	---	Rail wheel clack	0-3	3
CV105	---	User identification number	0-255	0
CV106	---	User identification number	0-255	0
CV115	---	Auto brake squeal enable/disable	0-1	1(enable)
CV116	---	Coupling sound type	0-2, 2=off	1
CV117	---	Lights enable/disable	0-1	1(enable)
CV119		Coupling fire volume	0-3	3
CV120		Brake release volume	0-3	3
CV121		random noise enable	0-1	1(enable)
CV122		Diesel sound type (0=off, 1=rpm & notch synchro to speed, 3=notch up/down (F8=notch down, F9=notch up))	0-3	1
CV123		back emf on/off (1=on)	0-1	0
CV124		Speed curve select (0=linear, 1=slow increase at slow speed, 2=fast increase at slow speed	0-2	0
CV125	---	Factory default setting: Programming to 1 will restore all CV's to default setting	---	0

NOTE: Due to limitations in older DCC systems, some of the sound functions or light effects functions may not accessable. ALSO, you might be limited to factory default CV values.

TROUBLE SHOOTING

The MRC 0001643 HO diesel sound decoder should perform well with all DCC systems. See your DCC system manual to learn how to program and operate the decoder. For more information about register/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.**

Due to the nature of all sound decoders, the CV read back is not 100% correct. So this feature is not supported in the decoder. This is not a defect of the decoder or your DCC.

Whenever the decoder doesn't work please use program track to re-program the loco address or program CV# 125 with value 1 to restore the decoder to factory setting. This should bring the decoder to life.

FCC COMPLIANCE

This device complies with the part 15 of FCC rule. 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 cause undesired operation.

RETURN PROCEDURE

If it should become necessary to return your decoder, unplug the decoder and return the decoder only. Please include a letter (printed clearly) with your name, address, a daytime telephone number, and a detailed description of the problem you are experiencing. Please also include a $15.00 check for shipping and handling. **Be certain to return only the decoder.**

Send the decoder to:

> Model Rectifier Corporation
> Attn: Parts & Service
> 80 Newfield Avenue
> Edison, NJ 08837-3817 U.S.A

MRC
TECHNOLOGY. PERFECTED.
MODEL RECTIFIER CORPORATION

Sheer Brilliance Mini HO EMD Modern Switch Diesel Sound Decoder with 19 Accessory Sound Functions

Item #0001643

Thank you for purchasing our highly advanced DCC locomotive sound decoder. Combined with any DCC System, our new decoder with authentic diesel sound truly will make your model railroad come to life.

- Synchronized diesel prime mover with randomly associated locomotive sounds
- User selectable 15 different horns and 7 bells
- 19 accessory functions allowing more sound control than ever
- Programmable individual sound volumes
- 1.5 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
- Directional lighting (FO) at 0.2 amp rate
- Programmable "Rule 17" directional lighting
- Supports advanced consisting (CV19)
- Supports programming on the main (OPS mode)
- Compatible with NMRA DCC standards
- NMRA 8 pin plug included for easy installation
- Complies with Part 15 of FCC
- 20mm speaker included
- Dimensions: 33.0mm x 10.5mm x 5.0mm

INSTALLATION

It is quite a challenge to install a decoder into a loco. You should have some basic electrical knowledge and soldering skills. If you do not have the above require- ments, please ask the dealer for help in installation.

Figure 1 shows the electrical circuit of most standard locos. The terminals of the motor and light(s) are directly connected to the wheel pickup. Each type of loco has its own method of electrical pickup and distribution. The connection between the wheels, motor and light(s) could be wires, clips, the body or chassis, PC board or any other type of conductor. First, figure out your loco's electrical wiring and how to disconnect (isolate) the motor and light(s).

Figure 1. Connection of standard locomotive.   *Note: The 'X' marks indicate where to disconnect (isolate).*
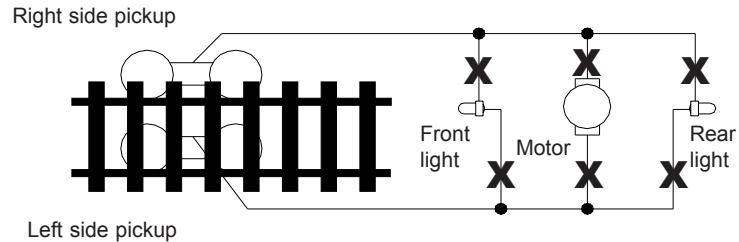

The decoder will be inserted between the wheel pickup and the motor.

Figure 2 shows how to wire the decoder. After disconnecting the motor terminals from the pickup, connect the red wire to the right side pickup and the black wire to the left side pickup. Connect the orange wire to the motor terminal that was originally connected to the right pickup. Connect the gray wire to the motor's other terminal. Connect the front light to the blue wire and the white wire. Connect the rear light to the blue wire and the yellow wire.

The blue wire is the common terminal for lights and accessory functions. You may use the black wire or the red wire to replace the blue wire. This is useful when isolating one of the light terminals from the pickup is difficult. Wiring the bulb this way will make the light dimmer. If your loco has only a front light, you should connect the white and the yellow wires together. If your locomotive has a NMRA 8 pin receptacle, remove the dummy plug. Match first pin and plug in the decoder.

Figure 2. 0001643 decoder wiring diagram
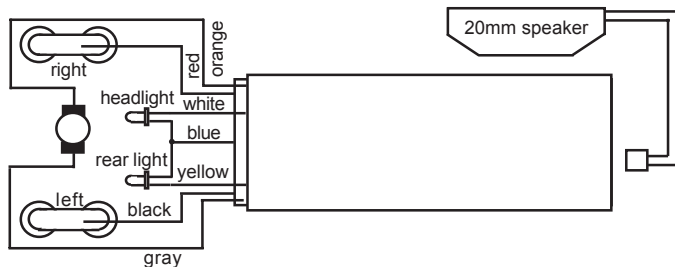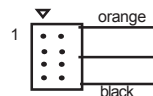
Each manufacturer and loco may have different ways of decoder installation. There is no standard rule for installing decoders. It is always better to consult the loco manufacturer on how to install a decoder in that particular loco.

All the decoder's light outputs are track output voltage (around 14V) supplied by your DCC system. They are designed for 12V light bulb. Please contact your loco manufacturer for lights' operation voltage. If you have a 1.5V bulb or LED, you should connect a 1k ohm resistor in series to one of the leads to limit current.

SPEAKER SELECTION

The decoders come with a 20mm 8 ohm speaker. other size speaker such as 28mm, 16x35mm and 20x40mm rectangular speaker can also be purchased from MRC. Use hot glue or double-sided sticky tape to affix the speaker inside the loco shell. If the baffle is too tall, you may remove excess for desired height. Note: Completely removing the baffle will result in poor sound quality.

MAKING A TEST TRACK

Before you begin 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.

Note: The program track is NOT a test track. The program track does not use a current limiting resistor. So it can't protect an incorrectly installed decoder.
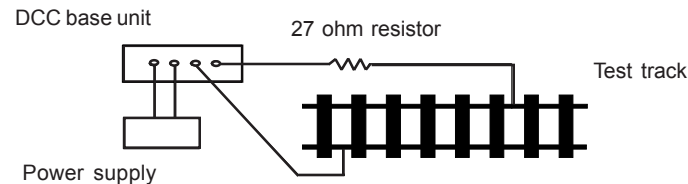

Figure 3. Diagram of test track

TESTING

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 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. Congratula- tions!

Do not run the loco for an extended period of time on the test track or the resistor will overheat.

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

OPERATION

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. Once you shut down the engine it will not start up until you press any function keys F1-F9.

This decoder can also be used in an Electric Type Traction Loco such as Trolley or GG-1 by turning off diesel sounds. To turn off the diesel prime mover sounds, program CV #122 with value 0.

If using the MRC Prodigy Advance DCC System, you can use F18 to select different bells. First use F1 to activate bell. Then use F18 to scroll through seven different bell sounds. You can use F19 to scroll through eleven different horns. When using other DCC systems you have to program CV #52 to select bell and CV #50 to select horn.

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

DIESEL SOUNDS CHART

Function	Idle/Moving
Double click F0	Turns on/off accessory lighting
F1	Bell on/off
F2	Horn
F3	Air release while moving or prime mover rev up during idle
F4	Coupling/air hose firing
F5	Brake release (idle) / brake squeal (moving)
F6	Dynamic brake on/off
F7	Air hose firing/uncoupling lever
F8	notch down (when CV122=3)/3 times will shut down while in idle
F9	notch up (when CV122=3)/associated loco sound
F10	Rail wheel clack (only moving)
F11	Traction air compressor
F12	Engine cooling fan
F13*	short air release
F14*	Associated loco sound
F15*	Air pump
F16*	Associated loco sound
F17*	flange noise
F18*	Change bell type
F19*	Horn type select *

* Note: Only MRC Prodigy advance DCC has F13-F19 accessory functions

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