## PROGRAMMING FOR DCC OPERATION – DIGITAL MODE

This decoder supports all program methods including register, paged mode, direct CV programming, and programming on the main (OPS mode)

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 function will follow its own address. When CV21=1, all functions will follow the consist address	0-1	0
CV49		Sound on/off (1=on)	0-1	1
CV50	---	Whistle type	0-11	3
CV51	---	Whistle volume	0-3	3
CV52	---	Bell type	0-3	3
CV53	---	Bell volume	0-3	3
CV54	---	Bell ring rate	0-50	3
CV55	---	Chuff type(0-5=single chuff, 8-12=double chuff)	0-12	0
CV56	---	Chuff volume	0-3	3
CV57	---	Brake squeal volume	0-3	3
CV58	---	Air release volume	0-3	3
CV59	---	Blower hiss volume	0-3	3
CV60	---	Random noise volume	0-3	3
CV61	---	Injector volume	0-3	3
CV62	---	Coupling volume	0-3	3
CV63	---	Air pump type	0-3	0
CV64	---	Air pump volume	0-3	3
CV105	---	User identification number	0-255	0
CV106	---	User identification number	0-255	0
CV112	---	Conductor volume	0-3	3
CV115	---	Auto brake squeal enable/disable	0-1	1(enable)
CV116	---	coupling sound type	0,2,3	3
CV118	---	Shoveling volume	0-3	3
CV119	---	Coupling fire volume	0-3	3
CV120	---	Chuff rate	0-30	---
CV121	---	Chuff start point	0-5	---
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, program it to1 will restore all the CV to default settng	---	0

Speed curve of different value of CV #124
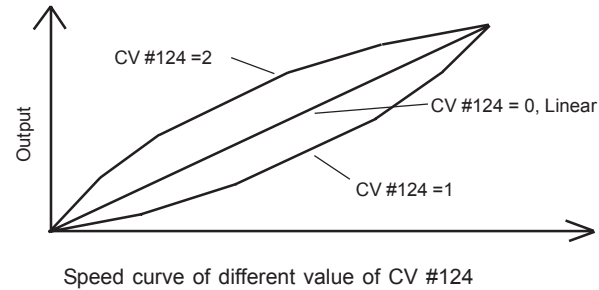
TROUBLE SHOOTING

This 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 may not work.

Whenever the decoder doesn't work it may lose its address. 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 N Gauge Steam Sound Decoder with 19 Accessory Sound Functions
Item #0001637

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

- Synchronized steam chuff with random sounds
- 12 selectable chuff sounds (4 regular/ 4 articulated)
- User selectable 12 different whistles and 4 bells
- 19 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
- Directional lighting control for front and rear lights at 0.2 amp rate.
- Programmable chuff rate and chuff starting point
- Supports advanced consisting (CV19)
- Supports programming on the main, (Ops mode)
- Compatible with NMRA DCC standard
- Complies with the part 15 of FCC
- 17mm speaker included
- Dimensions: 30.0mm x 10.0mm 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 requirements, 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).

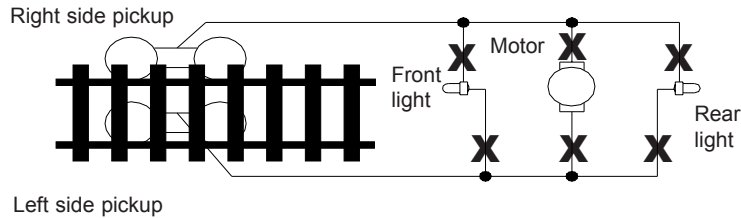*Note: The 'X' marks indicate where to disconnect (isolate).*

Figure 1. Connection of standard locomotive

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.

Figure 2. 0001637 decoder wiring diagram
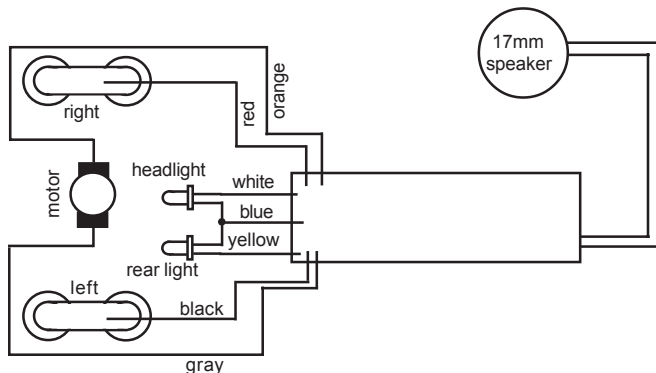
Each manufacturer and loco may have different ways of decoder installation. There is no standard rule for installing decoders. It is always better to consult the loco manufacturer on how to install a decoder in that particular loco.

All the decoder's light outputs are track output voltage (around 14V) supplied by your DCC system. They are designed for 12V light bulbs. 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 INSTALLATION

Use hot glue or double-sided sticky tape to affix the speaker inside the loco shell.

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 will not protect an incorrectly installed decoder.
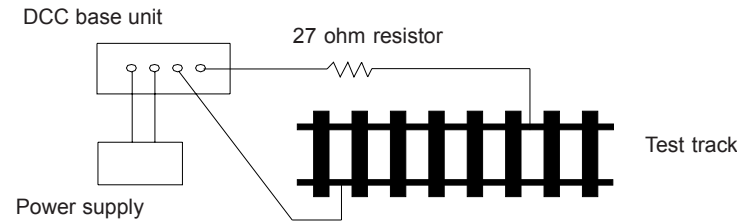

Figure 3. Diagram of test track

TEST

The decoder has 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. Congratulations!

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

There are eleven whistle sounds, four bell sounds, and three air pump sounds for you to choose. The choice of air pump sound is for randomly played sounds when the loco is at idle. If using the MRC Prodigy Advance DCC System, you can use F19 to scroll through eleven different whistles. Synchronizing Steam Chuff needs a series CV programming. Program CV #121 with a right value to make chuff sound start when loco start to move. Program CV #120 to change chuff rate to make four chuffs for per revolution. It may take many times to try to get a perfect synchronization.

Double clicking your headlight button (F0) will turn on or off sound. You can also use CV49 to turn on/off sound. Program CV49 to 0 will turn off sound. Program CV49 to 1 will turn on sound.

You can use F12 to turn the steam chuff sounds on or off. When the loco is drifting the chuff should be off. On real steam loco, once they are up to speed the engineer will shut off power to conserve steam and fuel. When loco is moving you can use F6 to switch between chuff sound and railroad click sound.

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

STEAM SOUNDS / ACCESSORY FUNCTION CHART

Function	Idle/Moving
F0	Directional lights / Double click all sounds on/off
F1	Bell on/off
F2	Whistle
F3	Air release
F4	Coupling
F5	Brake squeal
F6	Conductor
F7	Fire box door open/close
F8	Air pump
F9	Associated loco sound
F10	Water
F11	Blower hiss
F12	Chuff on / off (drifting)
F13*	Coal auger
F14*	Air hose firing
F15*	Sand drop
F16*	Shoveling
F17*	Short air release
F18*	Injector
F19*	Whistle type select*
* Note: Only MRC Prodigy advance DCC has F13-F19 accessory functions	

NOTE: **Due to limitations in some types of DCC systems or older DCC systems, some of the sound/accessory functions may not be able to be accessed. Also, you might be limited to factory default CV settings.**