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        | Acceleration                 | 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 follow its own address. When CV21=1, all functions follow the consist address | --- | 0       |
CV49 | ---      | Sound on/off (1=on)          | 0-1   | 1       |
CV51 | ---      | Horn volume                  | 0-3   | 3       |
CV53 | ---      | Bell volume                  | 0-3   | 3       |
CV54 | ---      | Bell ringing 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 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 clock             | 0-3   | 3       |
CV105 | ---    | User identification number   | 0-255 | 0       |
CV106 | ---      | User identification number   | 0-255 | 0       |
CV112 | ---   | Light effects                 | ---   | 3       |
CV113 | ---   | Ditch light rate              | 0-20  | 3       |
CV114 | ---   | Lights (green, brown)        | 0-12  | 3       |
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                 | 0-3   | 3       |
CV120 | ---   | Brake release                 | 0-3   | 3       |
CV121 | ---   | Mute noise enable             | 0-1   | 1 (enable) |
CV122 | ---   | Diesel sound type             | 0-3   | 1       |
CV124 | ---   | Speed curve select           | 0-2   | 0       |
CV125 | ---   | Factory default setting      | ---   | 0       |

LIGHT EFFECT PROGRAMMING CHART FOR CV#112
Your MRC Synchronized Diesel Sound Decoder is equipped with normal directional lighting, plus MRC light effects. (see connect lights diagram) you can choose from ditch lights, mars light or strobe light. Your diesel loco can also have “Rule 17” directional headlights, through simple programming, without any complicated wiring.

<table>
<thead>
<tr>
<th>Effect</th>
<th>Head Light</th>
<th>Head Light</th>
<th>Acct1 Light</th>
<th>Acct2 Light</th>
<th>CV Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CV#112</td>
<td>Normal on/off</td>
<td>Normal on/off</td>
<td>Ditch light</td>
<td>Ditch light</td>
<td>0</td>
</tr>
<tr>
<td>CV#112</td>
<td>Normal on/off</td>
<td>Normal on/off</td>
<td>Mars light</td>
<td>Single strobe light</td>
<td>1</td>
</tr>
<tr>
<td>CV#112</td>
<td>Normal on/off</td>
<td>Normal on/off</td>
<td>Mars light</td>
<td>Double strobe light</td>
<td>2</td>
</tr>
<tr>
<td>CV#112</td>
<td>Rule 17</td>
<td>Rule 17</td>
<td>Ditch light</td>
<td>Ditch light</td>
<td>16</td>
</tr>
<tr>
<td>CV#112</td>
<td>Rule 17</td>
<td>Rule 17</td>
<td>Mars light</td>
<td>Single strobe light</td>
<td>17</td>
</tr>
<tr>
<td>CV#112</td>
<td>Rule 17</td>
<td>Rule 17</td>
<td>Mars light</td>
<td>Double strobe light</td>
<td>18</td>
</tr>
</tbody>
</table>

UPGRADE
This decoder can be upgraded to MRC top line decoder performance that has 8 different bell sounds and 15 different horns. if you wish to upgrade your decoder please send in the decoder with $24.00 check.

TROUBLESHOOTING
Due to the nature of all sound decoders, the CV read back is not 100% correct. So you are experiencing. Please also include a $15.00 check for shipping and handling. If it should become necessary to return your decoder, unplug the decoder and send in the decoder with $24.00 check.

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

Note: Due to limitations in older DCC systems, some of the sound functions or light effects functions may not accessible. Also, you might be limited to direct CV, and programming on the main (ops mode programming).

NOTE: To replace most locomotive c Boris, Snap-in Diesel Sound Decoder with 17 Accessory Sound Functions

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.

- Replaces most locomotive circuit boards
- Synchronized diesel prime mover with randomly associated locomotive sounds
- 17 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
- Programmable for either ditch lights, mars light, or strobe light
- Supports advanced consisting (CV19)
- Supports programming on the main (OPS mode)
- Compatible with NMRA DCC standards
- Complies with Part 15 of FCC
- 28mm speaker included
- Dimensions: 75.0mm x 17.5mm x 7.5mm

HO Gauge EMD Modern Large
Snap-in Diesel Sound Decoder with 17 Accessory Sound Functions

Item #0001634

Printed in USA
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).

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

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.

LIGHT EFFECTS CONNECTION

If your loco has strobe lights, mars light or strobe light, you can connect these lights to the ACC1 and ACC2 extra tabs. Then program CV #112 for the desired light effect. CV #114 controls the output voltage (brightness) of the light effects.

The decoder allows you to use 1.5V/12V light bulb or LED Fig2 show how to connect your light.

SPEAKER SELECTION

The decoders come with a 28mm 8 ohm speaker. For narrow bodied locos, A 20mm round speaker or a 16x35mm rectangular speaker can also be purchased from MRC. However, reducing speaker size will affect the overall sound quality. 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.

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. 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

This decoder has engine start up and shut down sound. You must press any function key to start up the engine before operating the loco. The start up sound will enable only if you shut down the engine before turn off the power. To shut down the engine you must bring the loco to idle and then press F8 3 times.

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.

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

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