## PROGRAMMING

This decoder supports all program mode and read back feature. 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 |
| CV6 | | Speed curve select (0=linear, 1=slow increase at slow speed, 2=fast increase at slow speed | 0-2 | 0 |
| --- | 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 |
| CV50 | --- | Horn type | 0-16 | 4 |
| CV51 | --- | Horn volume | 0-3 | 3 |
| CV52 | --- | Bell type | 0-6 | 3 |
| CV53 | --- | Bell volume | 0-7 | 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 |
| CV113 | --- | Coupling fire volume | 0-3 | 3 |
| CV114 | --- | brake release volume | 0-3 | 3 |
| CV115 | --- | Auto brake squeal enable/disable | 0-1 | 1(enable) |
| CV116 | --- | Coupling sound type | 0-2, 0=off | 1 |
| CV122 | --- | Diesel notch mode, 0=auto-notch 3=manual notch | 0-3 | 0 |
| CV125 | --- | Factory default setting, program it to1 will restore all the CV to default settng | --- | 0 |

## TROUBLE SHOOTING

This decoder should perform well with all DCC systems. The maximum DCC output should be less than 18 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 to 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.

## ADDITIONAL INFORMATION

The MRC 1663 HO gauge synchronized diesel sound decoder should perform well when used with other brand command systems. See your DCC command stations 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.**

## 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

If it should become necessary to return your decoder, remove the decoder from the locomotive and return the decoder only. 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 $20.00 check to cover shipping and handling. **Be certain to return only the decoder.**
*Warranty does not include abuse, neglect, or using this product for anything other than it's intended purpose. Warranty coverage will be handled on a case by case basis, and other charges may apply for repair/replacement of the product.*
Send the decoder to:

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

# HO DC/DCC Synchronized Diesel Sound Decoder with 28 Accessory Functions for Atlas S2/S4 Locomotive

### Item #0001663

Thank you for purchasing our most advanced DC/DCC ALCo sound decoder. Combined with any DCC System or MRC Blackbox, our true live capture digital ALCo sound decoder will bring your Atlas S2/S4 loco to life.

- Synchronized diesel prime mover with random associated locomotive sounds
- 1.5 amp capacity
- Programmable for either 2-digit (1-127) or 4-digit (1-9999) addresses
- Programmable start voltage and top voltage
- Programmable acceleration and deceleration rate
- Programmable 14, 28/ 128 speed steps
- Directional lighting, (FO). Sunny White LED's included
- Programmable user selectable horns and bells
- Read back address and CV value
- 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
- Programmable individual sound volumes
- 18mm speaker included

## INSTALLATION

Refer to the instructions that came with your Atlas S2/S4 locomotive for removal of the handrails, cab and body shell. Unsolder the four pick up wires and unscrew two screws. Don't lose these two screws. Remove the original circuit board and the weight. You have to modify the weight for fitting in the decoder. **(Do not do any modifications to the weight while it is still attached to the chassis or damage to the decoder or motor can result)** Use a grinding wheel, belt sander, or a fine file, to modify the top weight as shown in the photos. Make sure the weight is clean of any debris before re-installing it in the chassis. Apply tape on the weight except the two screw area to prevent any short circuit. The trimmed ends of the pickup wire must be only 1/16" long. Too long will cause a short circuit and damage the decoder. Solder the four pick up wires to the decoder in the four spots, noted on the board as "pick", [see photos]. Make sure that there are no wire strands or solder bridges that will touch any of the decoder boards components or the weight after you install the decoder. Note: Some early versions of the loco may only have 1screw.



Now, insure the single contact on the bottom of the decoder is bent at approx 30 degrees to insure contact with top motor brush. Line up the screw holes in the decoder, with the the modified top weight, and use the screws to secure the decoder and the weight. **The narrow portion of the decoder should fit snugly in the channel of the top weight.**

The rear LED is set up at the factory to line up with the headlight lens in the cab, if due to shipping the LED does not quite line up with the lens, gently bend it back into position.

Re-install the body shell, cab, and handrails, and now your S2/S4 is ready to go to work on your railroad.
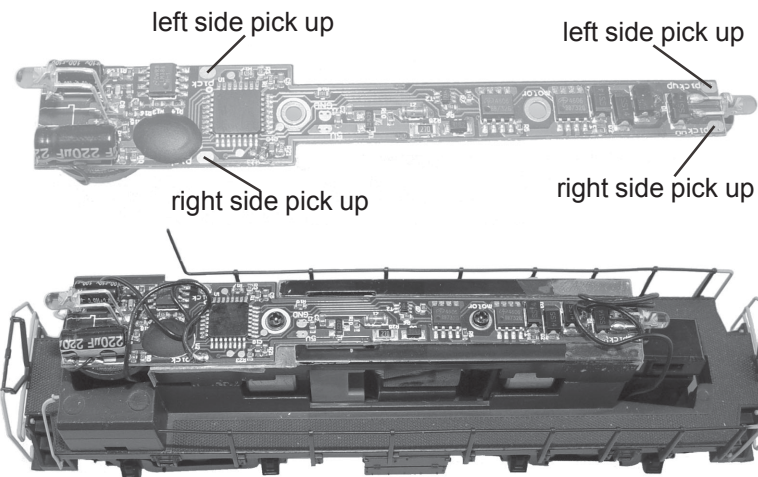


## Make a Test Track

Before you start with your decoder installation, we strongly recommend building a test track that uses a 20-ohm resistor to limit current. Only test your installed decoder on the test track. The test track will prevent any damage due to an incorrectly installed decoder.
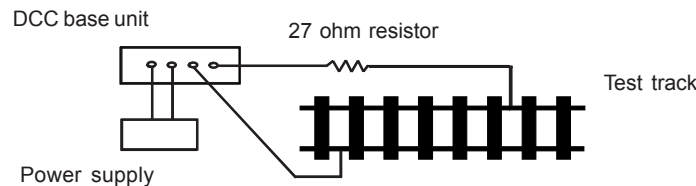


Figure 4. Diagram of test track

## TEST

All MRC decoders have been factory programmed with address #3, 28/128 speed steps and maximum top voltage. After you have finished your decoder installation you are ready to test it. Never run the installed decoder on your layout without first passing the test. You may damage the decoder if it is not wired correctly or if you have not properly isolated the motor and lights.

Put the loco on the test track. Select the "Run" mode of your DCC system and select or acquire address #3. Advance 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, the loco should change direction and the rear headlight, [if equipped], should come on. The locomotive cannot get to full speed, due to the resistor. If the loco moved forwards and backwards, and the light{s} came on, you did a great job. Congratulations!

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

*NOTE- If your installed decoder does not pass the test, find the problem, correct it and test it again. As long as you test the decoder on the test track there is little chance of damaging the decoder. Also do not confuse a test track with a program track. A program track does not use the current limiting resistor. Sound decoders need full power to the program track to install all programming instructions.*

## DCC OPERATION

This decoder has diesel start up and shut down features. 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. If the loco is previously shut down you have to start up the engine. You can use F19 to select 34 different horns and use F18 to select 1 of 8 bells. If you don't have MRC Prodigy Advance DCC you will have to use CV programming to select these features.

The decoder is defaulted to automatic notch. You can program CV122 to 3 to set manual notch for more realistic operation. Then use F9 to notch up and use F8 to notch down. In real life the notch level has noting to do with travel speed.

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

## DC OPERATION

This decoder provides synchronized, true ALCo diesel rumble sounds 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.

| Function | Idle/Moving |
|----------|-------------|
| F0 | Headlight on/off |
| F1 | Bell on/off |
| F2 | Horn |
| F3 | Air release |
| F4 | Coupling |
| F5 | Brake release (idle) / brake squeal (moving) |
| F6* | Dynamic brake on/off |
| F7 | Air hose firing/uncoupling lever |
| F8 | Click 3 times will shut down / notch down while CV122=3 |
| F9 | Engine cooling fan / notch up while CV122=3 |
| F10 | Rail wheel clack (only moving) |
| F11 | Traction air compressor |
| F12 | Sound on / off |
| F13 | short air release |
| F14 | flange noise |
| F15 | Air pump |
| F16 | Associated loco sound |
| F17 | flange noise |
| F18 | Change bell type (use F1 to turn off bell after adjustment) |
| F19 | Horn type select (total 34 different horns) |
| F20 | Associated loco sound |
| F21 | Change bell volume (use F1 to turn off bell after adjustment) |
| F22 | Change horn volume |
| F23 | Change diesel rumble volume |
| F24 | Coupling |
| F25 | air release |
| F26 | flange noise |
| F27 | Air hose firing |
| F28 | air release |

*Note: We know that real S2/S4 locos do not have dynamic brakes, but since most model railroads have steeper than normal grades, we added this feature as an additional option.*

*Note- Bell, Dynamic Brake, and Rail-Wheel Clack, cannot play at the same time.*