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  Description  Range  Default
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CV1  Short address  1-127  3
CV2  Start voltage  0-63  10
CV3  Acceleration  0-63  0
CV4  Deceleration  0-63  0
CV5  Top voltage  0-32  32
CV6  Ultra slow speed enable for speed step 1 and 2 0-1 0
CV29  Basic configuration  ---  2
CV7  Manufacturer version number  ---  0
CV8  Manufacturer ID  ---  143
CV17  Long address upper byte 0x00-255 102-251 100
CV18  Long address low byte 0-255 0-255 3
CV19  Advanced consist address 0-127 0
CV21  When CV21=0, functions follow its own address.  ---  0
CV21+1, functions follow the consist address  ---  0
CV37  0=normal, 1=F5 and F4 exchange 0-1 0
CV38  0=normal, 1=F5 and F5 exchange 0-1 0
CV42  0=normal, 1=F12 and F12 exchange 0-1 0
CV49  All sounds off / on 0-1 1
CV50  Horn type 0-3 0
CV51  Horn volume 0-15 12
CV52  Bell type 0-3 0
CV53  Bell volume 0-15 12
CV54  Bell ringing rate 0-50 3
CV55  Prime mover type 0-15 12
CV56  Brake squeal volume 0-15 12
CV57  Dynamic brake volume 0-15 12
CV58  Air pump volume 0-15 12
CV59  Air pump volume 0-15 12
CV60  Safety pop valve volume 0-15 12
CV61  Engine cooling fan volume 0-15 12
CV62  Coupling volume 0-15 12
CV64  Rail w/ micro click 0-15 12
CV65  Kick start voltage 0-63 83
CV67-CV94  28 speed steps while in CV29=1 0-255 0-255
CV112  Back EMF start speed adjustment 0-7 0
CV113  Back EMF Load control proportional gain Kp 0-31 20
CV114  Back EMF Load control integral gain Ki 0-31 10
CV115  Brake sound type, 2-brake sound off 0-2 0
CV117  Headlight light effect 0-15 0
CV118-119  Acceleration light mode 0-15 0
CV120  Light brightness 0-255 0-255
CV119  ACC light mode 0-6 0
CV121  Air compressor mode (1=change w 4th engine rpm) 0-1 0
CV122  Diesel night mode, 0=auto, 3=manual 0-3 0
CV124  Back EMF Load control intensity (off) 0-255 0-255
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 set 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's value must be greater then CV67's. When done with CV67-CV94, use read back CV to make sure their values are in increasing order.

TROUBLESHOOTING
If the loco is running without sound click F12 to turn on the sound. Whenever the decoder doesn't work please use the program track to program CV81 29 for a value of 1 to restore the decoder to the factory settings. This should bring the decoder to life with address #3. This decoder should perform well with all DCC systems. The maximum DCC output should be less than 21V. If the locomotive does not respond to commands, it may have lost its address. Please re-program the main address and program CV19 to 0 (disable consist). If it responds too 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. For CV29 to 50 for long speeds. If its top speed is too slow, program top voltage CV3 to 51. 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 see the NMRA DCC Standards & 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
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 $15.00 to cover the cost of repair or replacement and return shipping and handling. Be certain to return the decoder to the original manufacturer.

Any questions regarding Warranty Policy can be directed to our Customer Service Department by calling 732-225-6360 between the hours of 8:30am and 6:30pm EST, or by emailing: rtech@modelrectifier.com

Send the decoder to:
Model Rectifier Corporation
Attn: Parts & Service
80 Newfield Avenue
Edison, NJ 08837-3817 U.S.A
Printed in USA

HO Gauge DCC Diesel Sound Decoder
Fits Many Atlas/Kato/Athearn/Intermountain Locomotives
Item #0001619/1620/1621/1622/1623/1624

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

- Synchronized prime mover sounds
- 1.5 amp capacity
- 4 different types of horns and bells
- Adjustable 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
- Back EMF load control
- Service brake and dynamic brake sync with sound
- Supports read back address and CV values
- Advanced speed table control CV67-CV94
- Kick start voltage control CV65
- Easy function mapping
- 17 light effects: ditch lights, mars light, gyro light, strobe light, prime strobe light and on/off
- 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 Rules
- Speaker included
- Dimensions: 73.0mm x 17.8mm x 7.7mm
The motor terminals must be isolated from the wheel pickups. The four pickup wires go to pickup tabs. The motor wires go to motor tabs.

You can use speaker sizes from 18mm to 28mm. The larger speaker will give a better sound quality. For locos with light space, 18mm can be mounted on the decoder. If your loco has space for a larger speaker we recommend you use 28mm speaker for a better sound quality. Always use 8 ohm speakers.

If you use 1.5V bulbs or LED’s, you should connect a 1k ohm resistor in series to each of the leads to limit current. Use CV120 to adjust the brightness.

**OPERATION**

The decoder has a default address #3. Select address #3 on your DCC. Release service brake (F5) and dynamic brake (F6). You will hear the brake release sound when you turn off F5. Move up the throttle and the loco should start to move. If the loco does not move a speed 1 you can add more start voltage by programming CV2 with a large number. You can program the acceleration notch level is not controlled by loco speed. It is controlled by F9 ( notch up) and F8 three times.

This decoder has an easy function exchange feature (re-mapping) that allows you to select horn. And use F18 or program CV52 to select bell.

This decoder has 4 different horns and bells. You can use F19 or program CV50 to select horn. To shut down the engine you must bring the loco to idle and then press F8 three times. This decoder has 4 different horns and bells. You can use F19 or program CV52 to select bell.

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