

## 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	Description	Range	Default
CV1	Short address	1-127	3
CV2	Start voltage	0-32	0
CV3	Acceleration	0-32	0
CV4	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
CV29	Basic configuration	---	2
CV7	Manufacturer version number	---	2
CV8	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	Master volume control	1-16	16
CV50	Horn type	0-22	13
CV51	Horn volume	0-15	12
CV52	Bell type	0-8	3
CV53	Bell volume	0-15	12
CV54	Bell ring rate	0-50	3
CV55	Diesel rumble volume	0-15	12
CV56	Brake squeal volume	0-15	7
CV58	Air release 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 wheel clack volume	0-15	12
CV65	kick start voltage	0-63	63
CV67-94	28 speed steps table while CV29.4=1	1-255	linear
CV105	User identification number	0-255	0
CV106	User identification number	0-255	0
CV112	Sand dropping volume	0-15	12
CV113	Back EMF Load control proportional gain Kp	0-31	20
CV114	Back EMF Load control integral gain Ki	0-31	10
CV115	Auto brake squeal enable/disable	0-1	1(enable)
CV116	Flange squeal volume	0-15	12
CV122	Diesel notch mode, 0=auto-notch3=manual notch	0-3	3
CV123	prime mover type ( 2 types )	3 or 4	3
CV124	Back EMF Load control intensity (0=off)	0-255	160
CV125	Program it to 1 will restore some CV to factory default setting	0-1	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 select 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. CV68's value must be greater than CV67's. When done with CV67-CV94, use read back CV to make sure their values are in increasing order.

Note: When using MRC Prodigy DCC to program addresses it will automatically disable the speed table (set CV29's bit 4 to "0"). Programming CV125 to 1 will also disable the speed table and re-program CV67-CV94 to a default linear speed setting.

## TROUBLE SHOOTING

Whenever the decoder doesn't work please use the program track to program CV# 125 with value 1 to restore some cv's to factory settings. This should bring the decoder to life with address #3. 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](http://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 \$10.50 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 \$50.00 to cover the cost of repair or replacement and return shipping and handling. **Be certain to return the decoder only. 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 6:00pm EST, or by emailing: [rrtech@modelrectifier.com](mailto:rrtech@modelrectifier.com)**  
Send the decoder to:

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

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

Item #0001907

Thank you for purchasing our most advanced DC/DCC ALCo sound decoder. Combined with any DCC System or MRC Tech 6 Sound Controller, 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
- Adjustable back EMF load control with ultra slow speed control
- 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 consist (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 pickup wires and unscrew the 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 pickup 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 one screw.

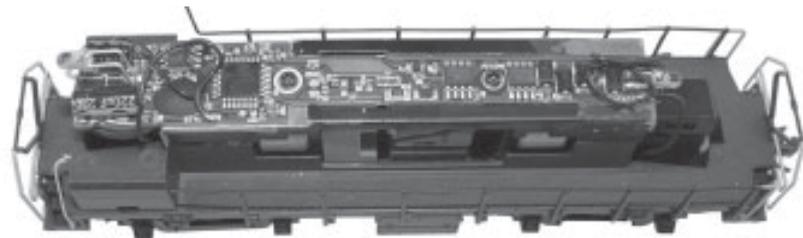
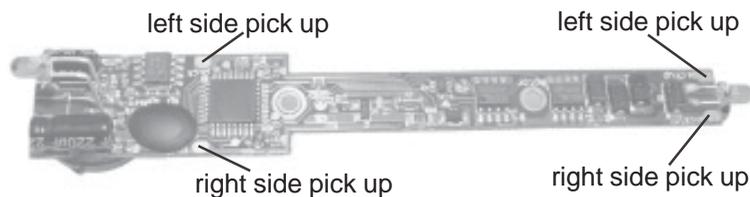
mill down both raised channels until weight is flat and tape it



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.



## SPECIAL NOTE

Due to one of the motor terminals of Atlas S2 or S4 locomotive is connected to its chassis, you have to make sure its four wheel pickup contacts not touch the chassis. If one of them touches the chassis the decoder will be damaged by the short.

## DCC OPERATION

The decoders have been factory programmed with address #3, 28/128 speed steps and maximum top voltage. Select the "Run" mode of your DCC system and select or acquire address #3. Move up the throttle and the loco should move.

The decoder has 2 types of diesel prime mover sounds, (AlCo 539T and AlCo 244). You can use F12 to change the prime mover sounds. You can also program CV123 to value of 3 or 4 to select the correct alco primer mover for matching your diesel engine.

The decoder has a start up and shut down feature. If the loco has been previously shut down, you have to start up the engine by simply pressing any numbered function button. To shut down the engine you must bring the loco to idle and then press F8 three times.

This decoder has 22 different horns. You can use F19 or program CV50 to select these 22 horns. You can also use F18 or program CV52 to select different 8 bell sounds.

Most of the sounds have their own volume control CV. There is also a master sound volume control CV49. Also F13 will reduce the master volume by 1 (you will hear an air release when you reach CV49=1). Pressing F14 will increase volume by 1 (you will hear an air release when you reach CV49=16). Programming CV49 to 0 will shut the sound off.

The decoder is default to automatic notching. You can program CV122 to 3 to set manual notching for realistic operation. And then use F9 to notch up and use F8 to notch down. This simulates the way a real locomotive operates.

This decoder is equipped with adjustable back EMF closed loop speed control. Its proportional gain (CV113), integral gain (CV114) and derivative gain (fixed) are pre-tuned for most locomotives. We recommend that you do not change these settings. Too much gain may cause the motor to oscillate (become unstable). Too little gain may cause slow response. Please get some basic knowledge of PID feedback control before trying to adjust CV113/114.

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

Note: Bell, Dynamic Brake and Rail Wheel Clack cannot play at the same time. If you activate 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 Dynamic Brake and Rail Wheel Clack sound there will be one second delay.

## DC OPERATION

With DC operation only the last programmed prime mover sound will play, and you can't control bells, horns, etc. We recommend you to use MRC Tech 6 Sound Controller, [item no. 0001200], for your DC operation. It will enable the full range of sounds on a DC system.

Function	Idle/Moving
F1	Bell on/off
F2	Horn
F3	Air release
F4	Coupling 1
F5	Brake release (idle) / brake squeal (moving)
F6	Dynamic brake on/off
F7	Air hose firing/uncoupling lever
F8	3 times will shut down when in idle / Manual notch down
F9	Engine cooling fan / Manual notch up
F10	Rail wheel clack (only moving)
F11	Traction air compressor
F12	Change prime diesel mover type, (CV123, 2 types)
F13	Master volume reduce by 1
F14	Master volume increase by 1
F15	Air compressor
F16	Flange squeal
F17	Air release
F18	Change bell type (use F1 to turn off bell after adjustment)
F19	Horn type select (total 22 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	Safety valve pop
F25	Air release
F26	Flange noise
F27	Sand drop
F28	Air release