PROGRAMMING

This decoder supports all program modes and read back features. With MRC Prodigy Advance DCC you can read its address and all CV values.

CV	Register	Description	Range	Default
CV1	R1	Short address	1-127	3
CV2	R2	Start voltage	0-32	0
CV3	R3	Acceleration	0-32	8
CV4	R4	Deceleration	0-32	8
CV5	---	Top voltage	0-32	32
---	R6	Page number	---	---
CV29	R5	Basic configuration	---	2
CV7	R7	Manufacturer version number	---	19
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
CV37		0=normal, 1=F3 and F4 exchange	0-1	0
CV39		0=normal, 1=F5 and F6 exchange	0-1	0
CV42		0=normal, 1=F8 and F12 exchange	0-1	0
CV49		Sound on/off (1=on, 0=off, Whistle always on)	0-1	1
CV50	---	Whistle type	0-33	4
CV51	---	Whistle volume	0-3	3
CV52	---	Bell type	0-7	3
CV53	---	Bell volume	0-3	3
CV54	---	Bell ring rate	0-50	10
CV55	---	Chuff type (12 types)	0-11	0
CV56	---	Chuff volume	0-3	3
CV57	---	Brake squeal volume	0-3	1
CV58	---	Air release volume	0-3	3
CV59	---	Blower hiss volume	0-3	3
CV60	---	Fire box door volume	0-3	3
CV61	---	Injector volume	0-3	3
CV62	---	Coupling volume	0-3	3
CV63	---	Air pump volume	0-3	0
CV64	---	Rail clack volume	0-3	3
CV65	---	Kick start voltage	0-63	63
CV67-94		28 speed steps table while CV29.4=1	1-255	linear
CV112	---	Conductor volume	0-3	3
CV114		Air pump type	0-3	3
CV115	---	Auto brake squeal enable/disable	0-1	1(enable)
CV118		Shoveling volume	0-3	3
CV119	---	Coupling fire volume	0-3	3
CV120	---	Chuff rate	0-40	20
CV121	---	Chuff start point	0-10	3
CV122	---	Double chuff enable	0-1	1(enable)
CV124	---	Load control on/off(1=on. 0=off)	0-1	0
CV125	---	Factory default setting, program it to1 will restore some CV to default settng	---	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 then 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

Loco runing without sound click F12 or Double click FO turn on/off sound. 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. This decoder should perform well with all DCC systems. The maximum DCC output should be less than 21 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 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**.

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 $8.00 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 $29.00 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
Send the decoder to: Model Rectifier Corporation
Attn: Parts & Service
80 Newfield Avenue
Edison, NJ 08837-3817 U.S.A   Printed in USA

MRC
TECHNOLOGY. PERFECTED.
MODEL RECTIFIER CORPORATION

HO Gauge DC/DCC Steam Sound Decoder with 24 different chuff sounds

Item #0001823

with NMRA 8pin and 9pin connect

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

- 24 types of synchronized chuff sounds
- Double chuff enabling
- 1.5 amp capacity
- 34 different types of whistles and 7 types of bells
- Programmable individual sound volumes
- Programmable either 2-digit or 4-digit addresses
- Programmable start voltage and top voltage
- Programmable acceleration and decelaration rates
- Programmable 14, 28, 128 speed steps
- Supports full read back of address and CV values
- Selectable factory default speed curve
- Advanced speed table control CV67-CV94
- Kick start voltage control CV65
- Directional Head lights
- Mars light and firebox flicker
- 28 accessory functions (F1-F28)
- Supports full read back of CV's
- Supports advanced consisting (CV19)
- Supports programming on the main (OPS mode)
- Compatible with NMRA DCC standards
- Complies with Part 15 of FCC Rules
- 28 mm speaker included
- Dimensions: 40.0mm x 17.0mm x 6.5mm

INSTALLATION

It is quite a challenge to install the decoder in your loco. You should have some basic electrical knowledge. If you do not have, please ask the dealer for help in installation.

Figure 1 shows the electrical circuit of most standard locos. The terminals of the motor and lights are directly connected to the wheel pickup. Each type of loco has its own method of electrical pickup and distribution. There is no standard rule for installing decoders. It is always better to consult the loco manufacturer on how to install a decoder in your particular loco. First, figure out your loco's electrical wiring and how to disconnect (isolate) the motor and light(s). Label all wires before you disconnect them.

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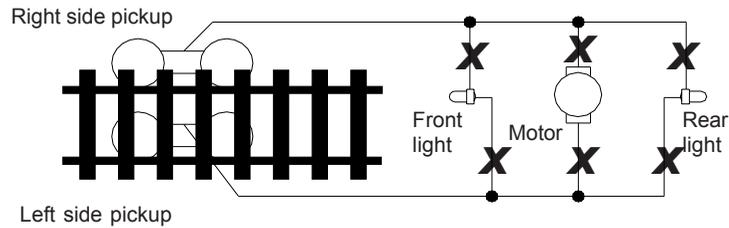

Figure 2. How to wire the decoder.

This decoder is equipped with a wire harness that has an N.M.R.A. 8 pin medium plug on one end that simply plugs into a dcc ready locomotovive, if you locomotive has a 9 pin JST decoder plug, simply unplug the wire harness of the decoder at the end of the board and plug the decoder into the 9 pin receptacle. If your locomotive is not dcc ready and does not have a decoder plug, use the following directions:

The decoder will be inserted between the wheel pickup and the motor. After disconnecting the motor terminals from the pickup, connect the right side pickup wires to the red decoder wire, and connect the left side pickup wires to the black decoder wire. Connect the right motor terminal to the orange decoder wire, then connect the left motor terminal to the grey decoder wire. Always use good soldering techniques, and use shrink wrap to isolate the connections. The white decoder wire is for the front headlight and the yellow decoder wire is for the rear light. The blue decoder wire is the light common. The pink and green wires of the decoder are for your accessory lights, use the blue decoder wire as the common for these extra lights. Use double-sided sticky tape to place the decoder in a safe place. The decoder can't touch any metal part or bare wires. The 40 mm speaker should have an enclosure made for a better sound quality.

If you have a 1.5V bulb or LED, you should connect a 2k ohm resistor in series to one of the leads to limit current.
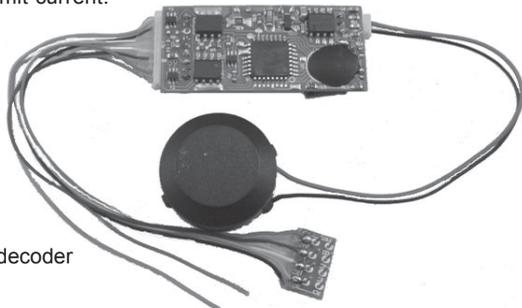

Figure 2. 0001823 decoder

MAKING A TEST TRACK

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 will reduce the chance of damaging your decoder due to an incorrectly installed decoder. Note- The test track is not your program track.
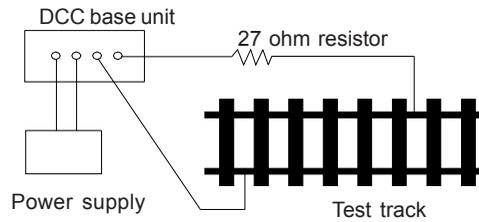

Figure 3. Diagram of test track

TESTING

The decoder has been programmed to address #3, 28/128 speed steps. To test, place the loco on the test track. Select address #3 and 28 speed step. Move up the throttle and the loco should move. Push the light button [F0] and headlight should come on. Change the direction of the loco and the loco should change direction. The loco cannot reach full speed, due to the resistor. If all the 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. As long as you test the decoder on the test track there is little chance of damaging the decoder. This is why the test track is so important.

OPERATION

The decoder has 24 types of chuff sounds. You can use F24 to select them or F12 to turn the chuff off,with the whistle always remaining on. With our unique double chuff enable, (CV 122), you can also have 12 articulated chuff sounds. You can use F19 to select 34 different whistles, and use F18 to select 7 different bell sounds. With MRC Prodigy Advance[2] DCC which has 28 functions, you can easily setup and access all the decoder's functions. With all other DCC systems you have to use CV programming to setup the decoder.

If your locomotive has a Mars Light, use acc 1 light for hook up. The Mars Light flash rate can not be changed. If you want your locomotive to have a firebox flicker, use acc 2 light for hook up. The firebox flicker rate can not be changed.

This decoder also features easy re-mapping. This feature lets you easily switch 3 functions to different buttons if you desire. See the enclosed CV chart for CV numbers- 37, 39 and 42.

The decoder can also be operated by a regular DC power pack. This will give you synchronized engine sounds only. If you wish to enjoy the full array of sound functions using your DC power pack, the unique MRC Blackbox (item #0001050) for DC operation will allow you to control all of the sounds in your sound equipped locomotives. And, the MRC Blackbox is easy to setup and use.

Function	Idle/Moving
F0	Headlight on/off
F1	Bell on/off
F2	Whistle
F3	Air release/ mars light on/off (acy 1)
F4	Coupling
F5	Brake release (idle) / brake squeal (moving)
F6	Conductor while idle/Rail wheel clack while moving
F7	Fire box open and close-Kick start boost, (CV 65)*
F8	Injector
F9	Metal crank sound on/off (moving), steam associated sound (idle)
F10	Water injector
F11	Blower hiss
F12	Sound on/off (whistle always on)
F13	Short air release/ firebox flicker on/off (acy 2)
F14	Air hose firing/uncoupling lever
F15	Flange noise
F16	Shoveling
F17	Coal auger
F18	Change bell type (use F1 to turn off bell after adjustment)
F19	Whistle type select (total 34 different ones)
F20	Bell rate change (use F1 to turn off bell after adjustment)
F21	Change bell volume (use F1 to turn off bell after adjustment)
F22	Change whistle volume
F23	Change chuff volume
F24	Chuff type select (total 24 types)
F25	Air release
F26	Sand dropping
F27	Associated loco sound
F28	Associated loco sound

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

Note: If your loco at low speed binds or stops in a curve, or climbing a grade repeatedly pressing F7 will give little kick start boosts to the loco, until it is able to sustain the low speed setting on it's own.