

## HO Loco Genie™ Diesel Universal DCC Sound Decoder Instruction Guide

Congratulations on the purchase of your new Loco Genie™ DCC Decoder with MRC state-of-the-art 16 bit dual-mode DCC/AC/DC Sound

- 2.4ghz bonding technology allows for multiple locos to operate on the same track.
- 6 types of synchronized prime mover sounds
- 1.5 amp capacity
- 22 types of horn and 8 types of bells
- Programmable individual sound volumes (64-levels)
- Programmable either 2-digit or 4-digit addresses
- Programmable starting, middle, and top-end voltage
- Programmable acceleration and deceleration rates
- Programmable 14, 28, 128 speed steps
- Back EMF load control w/adaptive PID control.
- User controlled service brake and dynamic brake 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, prime strobe...
- 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

**WARNING:** Do not use G scale power packs to operate this decoder. The maximum track voltage is 15 Volts.

### DCC OPERATION

The decoder has a default address of #3. Select address #3 on your DCC system. Press and release service brake (F5) and dynamic brake (F6). You will hear the brake release sound when you turned off (F5). Move up the throttle and the loco should start to move. If the loco does not move on speed 1 you can add more starting voltage by programming CV2 with a large number. You can program the acceleration momentum with CV3 and deceleration momentum with CV4, to simulate a real train. The decoder has start up and shut down features. If the loco was previously shut down, you must start up the engine first. Press any function key to start up the engine. To shut down the engine you must bring the loco to idle, and then press (F8) three times. The decoder has six prime movers. You can program CV123 (see the CV123 chart) to match your model. It also has 22 different horns and 8 different bells. You can use (F19) or program CV50 to select horn. Also use (F18) or program CV52 to select bell.

The decoder has an easy function exchange feature (re-mapping), which allows certain pairs of functions to be swapped. For example, program CV37 with a value of 1 will make (F3) and (F4) exchanged. For more information on "function re-mapping" please visit our website [www.modelrectifier.com](http://www.modelrectifier.com)

The decoder default is set to automatic notch mode. You can program CV122 to "3" for manual notch mode, allowing more realistic operation. In the manual notch mode, the notch level, is not controlled by loco speed. It is controlled by (F9) (notch up) and (F8) (notch down).

To make the air compressor's speed synchronized to the prime mover, program CV121 with a value of "1". For a constant speed, program CV121 with a value of "0".

### DCC AND WIRELESS OPERATION AT THE SAME TIME

This decoder allows for DCC and wireless remote control simultaneously. It provides regular DCC users with an extra wireless throttle. Gain quick access to adjusting starting voltage. Add momentum control for tight turns, changes in gradients, and station approach. Speed setting will follow the last speed command from either DCC Throttle or Transmitter. Do more with your DCC!

### LIGHT EFFECT PROGRAMMING CHART FOR CV#117/118/119

The decoder has 17 different lights effects. CV117 controls both the front and rear headlight effects. Use (F0) to turn on or off the Headlights. CV118/CV119 control ACC1/ACC2 light effect. Use (F3/F7) to turn on or off ACC1/ACC2. For ditch light operation, you must program CV118 and CV119 to the same ditch light type. In type A, the ditch lights will flash when (F2) (horn) or (F3) is on. In type B the ditch lights will flash when (F2) is on and stay on when (F3) is on.

### SERVICE BRAKING

To apply the service brake (needs CV4 set to almost maximum) set throttle to zero and press (F5). The loco will slow down fast and you will hear the brake squeal. You can pump the brake by turning (F5) on and off to stop the loco at a desired location. The brake rate is proportional to deceleration rate that you program in CV4. If you forget to turn off (F5) and move the throttle up. The loco will move. However, when you release the throttle, the service brake will apply again. The service brake can only operate when throttle is at "0".

### TROUBLE SHOOTING

**When you hear "off" it indicates overload or over voltage. Correct problem it will operate normally. 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. 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 it's top speed is too slow, program top voltage CV5 to 63. 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).

### LIGHT EFFECT CHART

Light Effect CV117, CV118, CV119			
Value	Light effect	Value	Light effect
0	Normal on/off	9	Prime strato light
1	Dynamo effect (fading)	10	Single strobe light
2	Dim, bright, off cycle	11	Double strobe light
3	Rule 17	12	Rotating beacon
4	Both headlights on	13	Flashing Rear End Device
5	Ditch Light type A	14	Firebox Flicker A
6	Ditch Light type B	15	Firebox Flicker B
7	Gyalite	16	Engine Exhaust Flicker
8	Mars Light		

### DCC FUNCTION CHART

Function	Idle/Moving
F0	Headlight on/off
F1	Bell on/off
F2	Horn
F3	Acc1 light on/off / Air release (Air release disable when CV63=0)
F4	Coupling
F5	Brake handle: brake when moving, brake release when idle
F6	Dynamic brake on/off. The loco will slow down when F6 is on
F7	Acc2 light on/off, Air hose firing/uncoupling lever
F8	3 times will shut down when in idle / Notch down when in manual notch
F9	Engine cooling fan / Notch up when in manual notch
F10	Rail wheel clack (only moving)
F11	Traction air compressor
F12	Toggle between max master volume and sound off (CV49)
F13	Reduce master volume by 1 / air release when reach minimum
F14	Increase master volume by 1 / air release when reach maximum
F15	Air compressor on/off
F16	Flange squeal
F17	Air release
F18	Change bell type CV52 (use F1 to turn off bell after adjustment)
F19	Change horn type CV50
F20	Associated loco sound
F21	Increase bell volume CV53 by 1. It will roll back to 0 when reach 15
F22	Increase horn volume CV51 by 1. It will roll back to 0 when reach 15
F23	Increase diesel volume CV55 by 1. It will roll back to 0 when reach 15
F24	Safety valve pop
F25	Air release
F26	Flange noise
F27	Sand drop
F28	Air compressor speed mode change (CV121) / with Air release

See Other Side for Installation Instructions, DC & AC User Guides  
Visit us on the web @ [www.modelrectifier.com](http://www.modelrectifier.com) for more information on DCC and Loco Genie™ by MRC

CV Chart	Description	Range	Default
CV1	Short address	1-127	3*
CV2	Start voltage	0-255	60*
CV3	Acceleration	0-255	20*
CV4	Deceleration	0-255	40*
CV5	Top voltage, 255=full speed, 0=half of the top speed	0-255	255*
CV6	Middle point voltage	0-255	128
CV29	Basic configuration	---	6*
CV7	Manufacturer version number	---	0*
CV8	Manufacturer ID	---	143*
CV9	Adaptive back EMF control enable, 1=enable, 0=disable	0-1	0
CV10	EMF feedback cut out	1-128	128
CV17	Long address upper byte		192
CV18	Long address lower byte		3
CV19	Advanced consist address	0-127	0*
CV21	0=functions follow its address. 1=to 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	Master sound volume, 16=max volume, 0=sound off	0-16	16*
CV50	Horn type	0-21	18*
CV51	Horn volume	0-15	15
CV52	Bell type	0-7	5
CV53	Bell volume	0-15	15
CV54	Bell ring rate	0-255	50
CV55	Prime mover volume	0-15	15
CV56	Brake squeal volume	0-15	15
CV57	Dynamic brake volume	0-15	15
CV58	Air release volume	0-15	15
CV59	Air pump volume	0-15	15
CV60	Safety pop valve volume	0-15	15
CV61	Engine cooling fan volume	0-15	15
CV62	Coupling volume	0-15	15
CV63	F3 control air release enable	0-1	1
CV64	Rail wheel dack	0-15	15
CV65	Kick start voltage	0-255	200
CV67-94	28 speed step table while CV29.4=1	1-255	Linear*
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
CV116	Brightness of dim light	0-255	100
CV117	Headlight light effect	0-16	0
CV118-119	Accessory light mode	0-16	5
CV120	Light brightness	0-255	255*
CV121	Air compressor mode (1=change with engine rpm)	0-1	0
CV122	Diesel Notch mode, 0=auto, 3=manual	0-3	0
CV123	Prime mover type	0-5	5*
CV124	Back EMF Load control intensity (0=no Back EMF)	0-255	0*
CV125	Program to "1" will restore key CV with (*) to factory settings	---	0

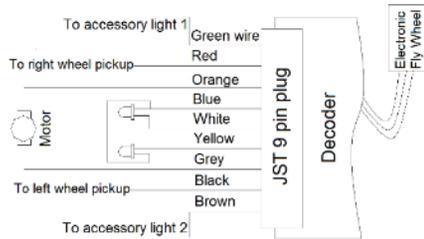


**Loco Genie™**  
**Wireless Locomotive**  
**Control System**  
**DIESEL (#021700/#021701)**  
**Receiver/Transmitter**  
**Installation & User Guide**

**WARNING: Do not use G scale power packs to operate this product. The maximum track voltage is 15 Volts.**

**INSTALLATION**

If your loco has a 9 pin JST plug or NMRA 8 pin socket, you can simply unplug the original connector and plug in the decoder.  
 If not, you will have to cut off the 8 pin plug hard wire in the decoder. After disconnecting the motor terminals from the pickups, connect the right side pickup wires to the red decoder wire, and connect the left side pickup wires to the black wire. Connect the right motor terminal to the orange wire, then connect the left motor terminal to the grey wire. The motor will no longer receive power from the electrical pick-ups directly. The motor will be controlled by the decoder. **The motor terminals must be isolated from the wheel pickups. Failing to do so will destroy the decoder.**  
 The white wire is for the front headlight and the yellow wire is for the rear light. The green wire (ACC1) and brown wire (ACC2) are for the accessory lights. The blue wire is the common wire for lighting. If you use an LED or 1.5V bulb, you must use a series 750 Ohm resistor to limit the current. The decoder can't touch any metal parts or bare wires. Do not wrap the decoder, as this will increase heat and potentially harm the decoder. Instead use tape to cover all the metal parts and weight that the decoder may touch. Otherwise it will burn your decoder out. Remember to use good soldering techniques, and shrink wrap to isolate the connections. The decoder comes with an 18mm speaker and a speaker baffle ring. Place the speaker into body shell with baffle ring to improve the sound. If a larger speaker can fit in the loco, you may order one to replace the 18mm speaker. Larger speakers provide better sound quality.



**POWERING LOCO GENIE™**

Use an existing DC Power Supply (12-14v), or use a Loco Genie™ AC/DC Wallpack. #025201 – 1 amp (2-3 locomotives) or #020200 – 3 amp (6-8 locomotives).

Connect the lead wires to your terminal track.

NOTE: Do NOT use more than one power supply without proper block wiring on your layout. Doing so will short/burn any decoder and power supply.

**BOND THE LOCO GENIE™ RECEIVER AND TRANSMITTER**

The Loco Genie™ receiver and transmitter must bind prior to operation

1. Make sure all power is off to the track.
2. Install two AAA batteries into the transmitter. If batteries are already installed, remove and re-install. The LED on the transmitter will begin to flash.
3. Plug in wall adaptor or turn on DC Power Supply. DC power supply should be set to 70% or higher.
4. Bonding is complete when the LED has stopped flashing. If bonding fails, repeat the above procedure.
5. Press the horn key to verify the bonding process is complete.

**NOTE: Do NOT use throttle control from DC Power Pack with Loco Genie™ installed.**

**Loco Genie™ is now operational.** The receiver and transmitter will remain bonded until the batteries are removed. If you have multiple Loco Genie™ sets, repeat the above steps. Be sure to bring all other locomotives to an idle position or simply remove them temporarily from the track.

**COMMAND LOCO GENIE™ RECEIVER AND TRANSMITTER**

Loco Genie™ will now grant you wireless locomotive control using its 2.4 GHz remote. **Press and immediately release** any button on the transmitter to control your locomotive. The horn button may be held for longer operational use.

**Operation**

Press **▲** the loco should start to move slowly. This will increase the speed one step at a time. For a faster increase in speed, press **x4**. To improve your locomotives responsiveness, adjust the starting voltage to make the locomotive start faster by pressing **x4 & Bell (together)** and start slower by pressing **■ & Bell (together)**.

**Momentum Control**

Tight turns, slight decline, or approaching a station, Loco Genie™ provides the unique feature of momentum control. Press **■** to put the brakes on, the locomotive will begin to slow with momentum. Press **▲** or **▼** any time during the brake process, and maintain speed or simply allow the locomotive to come to a stop. Press the **■** twice for an immediate stop.

Be sure to stop the locomotive before turning off the power, at the end of your session.

**PROGRAMMING LOCO GENIE™ WITH TRANSMITTER**

Loco Genie™ comes with a lot of advanced features that can be unlocked with your transmitter. Press the **▼&▲** simultaneously. The locomotive will come to a stop if moving. You will hear an audible “program” confirming that you are in program mode. Once in program mode, follow the transmitter function chart to change features such as prime movers/chuff, horns/whistles, bells, volume, lighting effects and more.

Loco Genie™ can only perform 30 program commands in each program session. To exit program mode press **▼&▲** simultaneously.

**Note:** The Loco Genie™ transmitter can only allow you to increase the momentum and reduce the top voltage. If you over adjust these settings, you must set the decoder back to factory default settings and start over again.



Loco Genie™ Transmitter Function Table		
Key	Operation Mode	Program Mode
Bell	Bell On/Off	Change Bell
Horn	Horn/Whistle	Change Horn/Whistle
◀▶	Change Direction	Change Prime Mover/Chuff
▲	Increase Speed by One Step	Increase Master Volume
▼	Reduce Speed by One Step	Decrease Master Volume
X4	Adjust Speed by Four Steps	Change ACC1 Light Effect
■/Double	Stop / Emergency Stop	Change ACC2 Light Effect
⊙	Turn On/Off All Lights	Change Headlight Light Effect
X4 & ⊙**	Accessory Light On/Off	Back To Factory Default
■ & ⊙**	Sound On/Off	Reduce Top Voltage
X4 & Bell**	Increase Start Voltage	Increase Acceleration Rate
■ & Bell**	Reduce Start Voltage	Increase Deceleration Rate
▲ & ▼**	Enter Program Mode	Exit Program Mode
<b>** Keys Must Be Pressed Simultaneously. These two keys functions are labeled on the back of the transmitter for your quick reference.</b>		

**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. **WARNING:** Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. **NOTE:** This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures: Reorient or relocate the receiving antenna. Increase the separation between the equipment and receiver. Connect the equipment into an outlet on a circuit different from that to which the receiver is connected. Consult the dealer or an experienced radio/TV technician for help. **RF WARNING STATEMENT:** The device has been evaluated to meet general RF exposure requirement. The device can be used in portable exposure condition without restriction.

**RETURN PROCEDURE**

This decoder carries a 1 year limited 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.** 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 \$12.50 to cover return shipping and handling. If the decoder is no longer considered under warranty, then please contact Model Rectifier Corp. for a price quote to cover the cost of repair or replacement of the decoder, and return shipping and handling. **Customers outside the continental United States, including: Hawaii, Alaska, Canada and Mexico, have to contact MRC for exact return shipping rates for both warranty and non-warranty repairs. Contact [rrectech@modelrectifier.com](mailto:rrectech@modelrectifier.com).** 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: [rrectech@modelrectifier.com](mailto:rrectech@modelrectifier.com)  
 Send the decoder to:

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