

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	Register	Description	Range	Default
CV1	R1	Short address	1-127	3
CV2	R2	Start voltage	0-32	10
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, 2=fast increase at slow speed)	0-2	0
---	R6	Page number	---	---
CV29	R5	Basic configuration	---	2
CV7	R7	Manufacturer version number	27	1
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, functions follow its own address. CV21=1, functions follow the consist address	---	0
CV49		odd number sound on, even sound off	1	on
CV50	---	Horn type	0-22	6
CV51	---	Horn volume	0-15	12
CV52	---	Bell type	0-7	3
CV53	---	Bell volume	0-15	12
CV54	---	Bell ring rate	0-50	3
CV55	---	Traction Motor volume	0-15	12
CV56	---	Brake squeal volume	0-15	7
CV57	---	Dynamic brake volume	0-15	12
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
CV63	---	Sand release volume	0-15	12
CV64	---	Rail wheel clack	0-15	12
CV65		Start Kick voltage	0-15	12
CV67-94		28 speed steps table while CV29.4=1	1-255	linear
CV112		Air compressor volume	0-15	12
CV113	---	Coupling fire volume	0-15	12
CV114	---	Brake release volume	0-15	0
CV115	---	Auto brake squeal enable/disable	0-1	1(enable)
CV116	---	Flange squeal volume	0-15	12
CV117		Light mode, 0=normal headlight 1=off, dim, bright cycle, 2=rule 17	0-2	0
CV122	---	Not Used	0-3	0
CV123		Traction Motor sound on/off	0-1	1(on)
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 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

Reset: 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 15 V. If the locomotive does not respond to commands, it may have lost its address. Please reset the decoder or reprogram it address. 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.

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 \$9.00 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 \$35.00 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



N Gauge DC/DCC Electric Traction Sound Decoder

Item #0001952 drop-in for Kato GG-1

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

- Realistic Electric Locomotive Traction Motor Sounds
- 0.75 amp capacity
- 22 different types of horns and 8 types of bells
- Programmable 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
- Ultra slow motion control
- Back EMF load control
- Supports full read back of decoders
- Selectable factory default speed curve
- Advanced speed table control CV67-CV94
- Kick start voltage control CV65
- 3 headlight effects: Directional / rule 17 /off-dim-bright 3 states cycle
- 27 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
- 10 mm speaker included

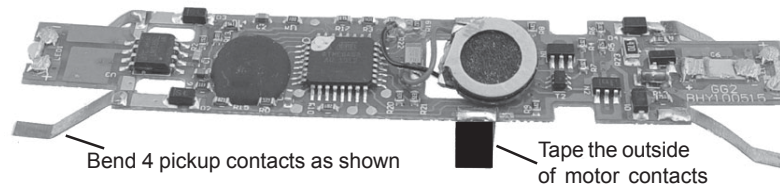
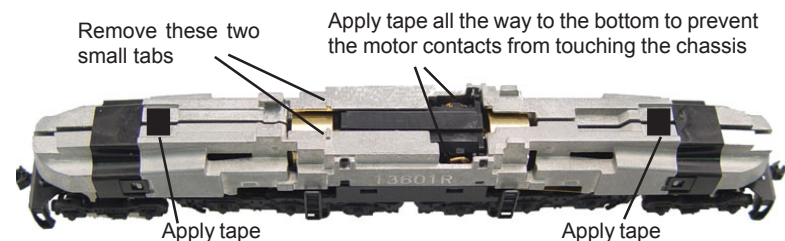
INSTALLATION

It is quite a challenge to install the decoder in your loco. You should have some basic electrical knowledge. In all decoder installations, you must isolate the chassis and motor from the wheel pickups, otherwise the decoder will be damaged. The decoder is inserted between the pickups and motor leads. If you are not sure how to install the decoder, please ask the DCC dealer for help in installation.

Note: To install this decoder, you must file 2 small tabs off the chassis halves, this may void your locomotive's warranty.

Refer to the instructions that came with your Kato GG-1 locomotive for removal of the body shell. Remove the original circuit board by sliding it up and out. Even though the GG-1 body shell is symmetrical, the chassis is not. There are 6 tabs facing upwards on the top of the chassis halves, [3-left side/3 right side]. The two larger tabs at each end of the chassis fit into notches on the decoder board, facing the decoder in its proper orientation on the chassis, [the speaker sits directly over motor brush tabs, large opening]. The two smaller tabs, [**see photo below**], must be filed flat, or clipped with cutting pliers first and then filed flat, flush with the top of the chassis halves, so the decoder board sits flush on top of the chassis. **Use care when filing metal as to avoid any metal filings from getting lodged in the motor or drive train, We recommend to apply tape to cover chassis before filing.** There are four contact strips on the outer edges of the decoder that must be bent down at a 45 degree angle, with a little "V" bend at the ends as picture shown, to make contact with the chassis halves.

Before installing the decoder, you must apply two small pieces of insulating tape on each side of the chassis, inside of the motor contact slots. Apply all the way to bottom of the slots. Do not cover the copper motor brush tabs. These tabs need to contact to the decoder's motor contacts. Use a # 11 blade to burnish the tape to the inside of the chassis halves. [**see photo below**]. Also apply tape on the outside of the decoder's motor brush feed contacts. You may need to bend the decoder's motor brush feed contacts slightly inward to make positive contact with the motor brush tabs. Slide these tabs and the decoder downward on the chassis, making sure to align the notches in the decoder with the four remaining chassis tabs. Seat the decoder flush on the top of the chassis. Make sure the decoder's four contact strips are making good electrical contact with the chassis halves. The speaker must face upwards and sit in the hole on the decoder board. Re-check your installation, then test run the chassis with installed decoder on the test track. If the decoder installation passes, Install the body shell. Now your GG-1 is ready to go to work on your railroad.



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.

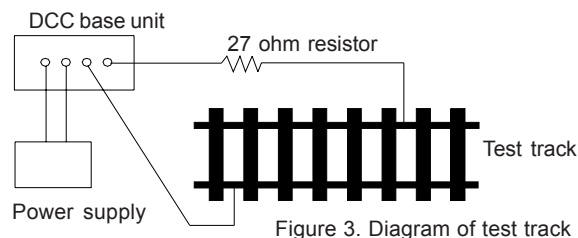


Figure 3. Diagram of test track

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

You can use F12 or CV 123 to turn off the traction motor sounds. You can use F19 or CV50 to select 22 different horn sounds and use F18 or CV52 to select 8 different bell sounds. With MRC Prodigy Advance² DCC which has 28 functions, you can easily setup and access all the decoder's functions. If not, you may not be able to access all the features of the decoder. And you have to use the CV program to setup the decoder.

CV117 controls the function of headlight. CV117=0 sets normal directional on/off. CV117=2 sets rule 17 light effect. CV117=3 sets three cycles light effect (off, dim and bright)

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) or Tech 6 (item #0001200) for DC operation will allow you to control all of the sounds in your sound equipped locomotives. And, the MRC Blackbox and Tech 6 are easy to setup and use.

Function	Idle/Moving
F0	Headlight on/off or rule 17 or cycle of dim, bright, off
F1	Bell on/off
F2	Horn
F3	Short air release
F4	Coupler cut lever
F5	Brake release (idle) / brake squeal (moving)
F6	Dynamic brakes
F7	Air hose firing/uncoupling lever
F8	Not used
F9	Engine cooling fan
F10	Rail wheel clack (only moving)
F11	Traction air compressor on/off
F12	Traction Motors off and horn on
F13	Short air release
F14	Coupler crash
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
F20	Associated loco sound
F21	Change bell volume (use F1 to turn off bell after adjustment)
F22	Change horn volume
F23	Change traction motor volume
F24	Safety valve pop
F25	Air release
F26	Flange noise
F27	Sand release
F28	Air release

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