

## 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	Register	Description	Range	Default
CV1	R1	Short address	1-127	3
CV2	R2	Start voltage	0-32	0
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 at slow speed, 2=fast increase at slow speed)	0-2	0
---	R6	Page number	---	---
CV29	R5	Basic configuration	---	2
CV7	R7	Manufacturer version number	---	32
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 functions will follow its own address. When CV21=1, all functions will follow the consist address	---	0
CV50	---	Horn type	0-16	4
CV51	---	Horn volume	0-3	3
CV52	---	Bell type	0-6	3
CV53	---	Bell volume	0-7	3
CV54	---	Bell ring rate	0-50	3
CV55	---	Diesel rumble volume	0-3	3
CV56	---	Brake squeal volume	0-3	3
CV57	---	Dynamic brake volume	0-3	3
CV58	---	Air release volume	0-3	3
CV59	---	Air pump volume	0-3	3
CV60	---	Safety pop valve volume	0-3	3
CV61	---	Engine cooling fan volume	0-3	3
CV62	---	Coupling volume	0-3	3
CV63	---	Random noise volume	0-3	3
CV64	---	Rail wheel clack	0-3	3
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
CV113	---	Coupling fire volume	0-3	3
CV114	---	brake release volume	0-3	3
CV115	---	Auto brake squeal enable/disable	0-1	1(enable)
CV116	---	Coupling sound type	0-2, 0=off	1
CV122	---	Diesel notch mode, 0=auto-notch 3>manual notch	0-3	0
CV123	---	Diesel rumble type, total 4 types	0-3	1
CV125	---	Factory default setting, program it to 1 will restore all the CV to default setting	---	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

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 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](http://www.nmra.org). 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.

## 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](mailto:rrtech@modelrectifier.com)**

Send the decoder to:

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



## N Gauge Synchronized Diesel Sound Decoder with 28 Accessory Functions for Kato F3 Locomotive

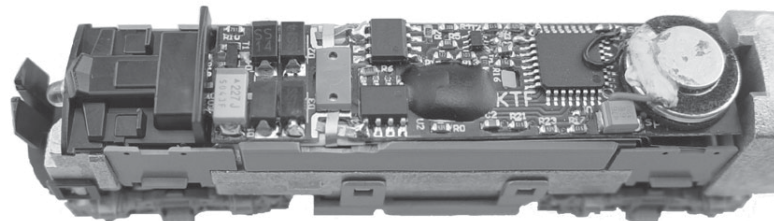
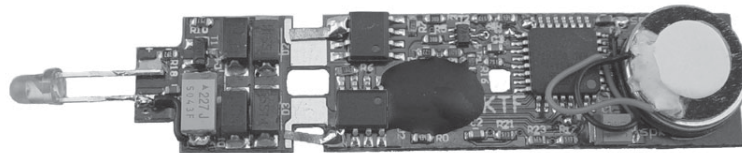
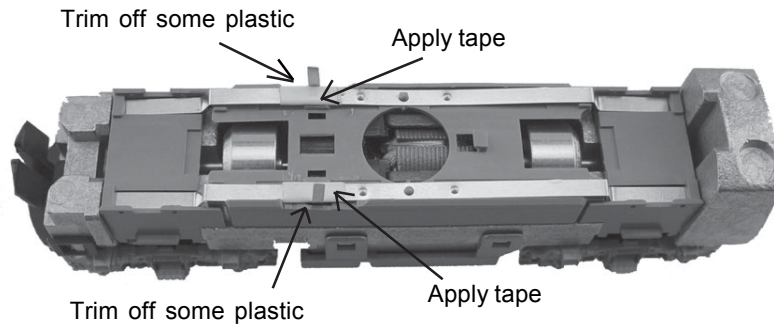
Item #0001658

Thank you for purchasing our highly advanced dual mode DCC/DC locomotive sound decoder. Combined with any DCC System or the MRC BlackBox, our new decoder with authentic diesel sounds will bring your Kato F3 locomotive come to life.

- Synchronized diesel prime mover with random associated locomotive sounds
- 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 included
- Programmable user selectable different horns and bells
- 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 regulations
- Programmable individual sound volumes
- 13mm speaker included

## INSTALLATION

Refer to the instructions that came with your Kato F3 locomotive for removal of the body shell. Remove the original circuit board by very carefully removing the plastic clip and sliding the PCB out. Don't lose the clip. There are two wheel pickup contact strips. These strips must be wrapped with tape approx. 1/4 wide (as shown in the image below) to prevent them from touching the motor leads. Trim off some material from the plastic cradle under the motor lead area to compensate for the tape thickness. After applying the tape and trimming the plastic, reinstall the strips. before installing the new decoder, bend the spring contacts under the rear of the decoder approx 45 degrees to provide correct contact. Now, install the decoder in place of the original PCB and reinstall the plastic clip you removed earlier. Apply a strip of tape over the clip & down the chassis sides to help hold the decoder in place. Re-install the body shell. Now your loco is ready to go to work on your railroad.



## MAKE A TEST TRACK

Before you start with your decoder installation, we strongly recommend building a test track that uses a 20-ohm resistor to limit current. Only test your installed decoder on the test track. The test track will prevent any damage due to an incorrectly installed decoder.

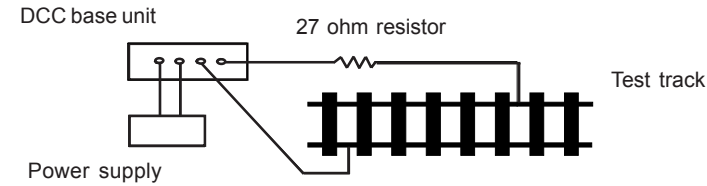


Figure 4. Diagram of test track

## TEST

All MRC decoders have been factory programmed with address #3, 28/128 speed steps and maximum top voltage. After you have finished your decoder installation you are ready to test it. Never run the installed decoder on your layout without first passing the test. You may damage the decoder if it is not wired correctly or if you have not properly isolated the motor and lights.

Put the loco on the test track. Select the "Run" mode of your DCC system and select or acquire address #3. Move up the throttle and the loco should move forward. Push the light button, [F0], and the front headlight should come on. Change the direction of the loco, the loco should change direction and the rear headlight, [if equipped], should come on. The locomotive cannot get to full speed, due to the resistor. If the loco moved forwards and backwards, and the light{s} came on, you did a great job. Congratulations!

Do not run the loco for an extended period of time on the test track or the resistor will overheat.

\*NOTE- 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. That is why the test track is so important. Also do not confuse a test track with a program track. A program track does not use the current limiting resistor. Sound decoders need full power to the program track to install all programming instructions.

## DCC OPERATION

The decoder has four types of prime diesel rumble. You can use F12 to select different diesel rumble. The factory default setting is authentic F diesel sound. The decoder has start up and shut down feature. Press any function key to start up the engine before operating the loco. To shut down the engine you must bring the loco to idle and then press F8 three times. If the loco is previously shut down you have to start up the engine. You can use F19 to select 34 different horn sounds and use F18 to select different 8 bell sounds. If you don't have MRC Prodigy Advance DCC you have to use CV program to select these feature.

The decoder is default to automatic notch. You can program CV122 to 3 to set manual notch for realistic operation. And then use F9 to notch up and use F8 to notch down. In real life the notch level has nothing to do with travel speed.

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

## DC OPERATION

This decoder provides four sets of synchronized true diesel rumble sound. However, with DC operation you can only access one set of rumble. And you can't control Bells, horns, etc. We recommend you to use MRC BlackBox for your DC operation. It will enable the full range of sounds on a DC system.

Function	Idle/Moving
F0	Headlight on/off
F1	Bell on/off
F2	Horn
F3	Air release
F4	Coupling
F5	Brake release (idle) / brake squeal (moving)
F6	Dynamic brake on/off (you loco may not have this brake)
F7	Air hose firing/uncoupling lever
F8	Click 3 times will shut down / notch down while CV122=3
F9	Engine cooling fan / notch up while CV122=3
F10	Rail wheel clack (only moving)
F11	Traction air compressor
F12	Select diesel rumble type, total 4 types
F13	short air release
F14	flange noise
F15	Air pump
F16	Associated loco sound
F17	flange noise
F18	Change bell type (use F1 to turn off bell after adjustment)
F19	Horn type select (total 34 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	Coupling
F25	air release
F26	flange noise
F27	Air hose firing
F28	air release

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 does not operate while the loco is in idle. There will be a slight delay when you turn off Dynamic brake and Rail Wheel Clack sounds.