

# **PROGRAMMING LOCOMOTIVES WITH MORE THAN ONE DECODER**

## ***Setting a locomotive to use the Four Digit Address using Easy DCC.***

1. Decide what the two-digit address will be for the two decoders to be used in programming. My recommendation is to use the last two digits of the road # as the short address for the motor decoder and one number higher for the sound decoder, i.e., locomotive 2574 would use 74 (motor) and 75 (sound) for the two-digit addresses. It is crucial to have a different address for each decoder to use in programming because CV assignments vary from one manufacturer to another, except for those mandated in the NMRA DCC Standard.
2. Place the locomotive on the programming track and use the following key sequence: PRGM PrTRK, 3 (advanced decoders only), LOCO, YY (where YY is the desired two-digit address for the sound decoder), ENT, ESC.
3. Then, move the locomotive to the main track and use the following key sequence: PRGM MnTRK, YY, ENT, CV/3, 1, ENT, 1 (for Valu), XX (where XX is the desired two-digit address for the motor decoder), ENT, ESC. This will change only the motor decoders two-digit address because address programming on the mainline is disallowed by Soundtraxx decoders.
4. Now, assign Throttle A to XX and Throttle B to YY. Throttle A should control the motor decoder and its functions and Throttle B should control the sound decoder and its functions. This is a test to verify that the new two-digit address assignments are working properly. If all is well, proceed to the next step. If not, start over with step 1 above.
5. Now, place the locomotive on the programming track and use the following key sequence to program the four-digit address for both decoders, simultaneously: PRGM PrTRK, 3 (advanced decoders only), LOCO, XXXX (where XXXX is the desired four-digit address for the two decoders), ENT, ESC. This programs the four-digit address stored in CV17 & 18 and sets CV29 so the decoders respond to the four digit address and use the standard linear speed table. NOTE: If you are using a motor decoder and a DSX for the sound decoder, stop here. If a DSD has been used for the sound decoder in addition to a motor decoder, go to the next step.
6. When using a DSD for the sound decoder in multi-decoder installations, I install a 160 ohm resistor across the sound decoder motor leads to simulate the presence of a motor and allow CV read-back by the command station. With that in mind, I program the following CV's on the motor decoder to prevent excess heat build-up from the resistor. (Examples represent a Soundtraxx DSD type decoder; use the procedure in the following section to program the DSD decoder to these values.)
  - CV 25 to a value of 2 to select one of the pre-loaded custom speed tables.
  - CV 66 (forward trim) and CV 95 (reverse trim) to a value of 1 to minimize applied motor voltage in both directions.
  - CV 29 to a value of 50 so the motor decoder responds to the four-digit address and to the custom speed table settings.
7. You should now be able to assign a throttle to the locomotives four-digit address and have control of both the motor and sound decoders and their functions.

## ***Programming other CV's using the two digit addresses after the four-digit address has been set as the main address:***

1. First, use the following key sequence to digitally separate the two decoders for programming: PRGM MnTRK, XXXX, ENT, CV/3, 29, ENT, 1 (for Valu), 6, ENT, ESC.
2. To program a specific CV in one of the decoders use the following sequence: PRGM MnTRK, XX or YY, ENT, CV/3, ?? (where ?? is the CV you want to program), ENT, 1 (for valu), ## (desired valu), ENT, ESC. Repeat this step to program all CV's you wish to change.
3. When done, use one of the following to digitally recouple the sound and motor decoders:
  - a. Motor decoder and DSX: Place the locomotive on the programming track and use the following key sequence: PRGM PrTRK, 3 (advanced decoders only), LOCO, XXXX, ENT, ESC. This is the simplest way of getting back to the desired four-digit address.
  - b. Motor decoder and DSD: With locomotive on the main track, use the following key sequence: PRGM MnTRK, XX, ENT, CV/3, 29, ENT, 1 (for valu), 34 (for motor decoder), ESC, then, : PRGM MnTRK, YY, ENT, CV/3, 29, ENT, 1 (for valu), 50 (for sound decoder), ESC.
8. You should now be able to assign a throttle to the locomotives four-digit address and have control of both the motor and sound decoders and their functions.

## ***Changing a locomotive from using a four-digit address to using a two-digit address:***

1. With the locomotive on the main track, use the following key sequence to digitally separate the two decoders: : PRGM MnTRK, XXXX, ENT, CV/3, 29, ENT, 1 (for Valu), 6, ENT, ESC.
2. Use the following calculation to find the values for CV 17 & CV 18:
  - a. Add the motor decoders desired four-digit address for programming to the number 49152.
  - b. Divide this number by 256 and record the quotient and the remainder.
  - c. Program CV 17 on the motor decoder to the quotient and CV 18 on the motor decoder to the remainder. Then, program CV 17 on the sound decoder to the same quotient and CV 18 on the sound decoder to a number one digit higher than the motor decoder's remainder. Example, using 1027 as the motor decoder's four-digit address and 1028 as the sound decoder's four-digit address:
    1. Adding 1027 to 49152 = 50179
    2. Divide 50179 by 256 and you get 196.01171. 196 is the Quotient (Value for CV17, both decoders)
    3. 196 X 256 = 50176.
    4. 50179-50176 = 3. 3 is the Remainder (value for CV 18 in the motor decoder).
    5. 4 would be the Remainder (value for CV 18 in the sound decoder) to set the sound decoder's four digit address to 1028.

# PROGRAMMING LOCOMOTIVES WITH MORE THAN ONE DECODER

- Using the sequence in the above section "Programming other CV's using the two digit addresses after the four-digit address has been set:", program CV's 17 and 18 in both decoders to the proper values, as outlined in the above calculation.
- Now, place the locomotive on the programming track and use the following sequence to program CV 1 in both decoders to the desired two-digit address: PRGM PrTRK, 3 (advanced decoders only), CV/3, 1, ENT, XX (where XX is the desired two-digit address for the both decoders), ENT, ESC. If you are using a motor decoder and a DSX, you may stop here. If using a motor decoder and a DSD, go to the next step.
- Place the locomotive on the programming track and program CV 29 to a value of 34 using the following sequence: PRGM PrTRK, 3 (advanced decoders only), CV/3, 29, ENT, 34, ENT, ESC.
- Then, place the locomotive back on the main track and use the following sequence to program the proper values in CV29 on both decoders (programmed separately, not simultaneously) using the four-digit address to do the programming: PRGM MnTRK, XXXX or YYYY, ENT, CV/3, 29, ENT, 6 (for the motor decoder XXXX) or 18 (for the sound decoder YYYY), ENT, ESC. This sequence tells the motor decoder to respond to the two-digit address and the standard linear speed table, while the sound decoder will respond to the two-digit address and the custom speed table setting, to prevent excess heat build-up on the installed 160 ohm resistor. Remember to program CV's 25, 66 and 95, if not already done. The reason is outlined above in the first section. You should now be able to run the locomotive again on the two-digit address and have control of all motor and sound decoder functions.

## *Programming other CV's using the four-digit addresses after the two-digit address has been set as the main address:*

- First, use the following key sequence to digitally separate the two decoders for programming: PRGM MnTRK, XX, ENT, CV/3, 29, ENT, 1 (for Valu), 34, ENT, ESC.
- To program a specific CV in one of the decoders use the following sequence: PRGM MnTRK, XXXX or YYYY, ENT, CV/3, ?? (where ?? is the CV you want to program), ENT, 1 (for valu), ## (desired valu), ENT, ESC. Repeat this step to program all CV's you wish to change. When done with programming, you must digitally recouple the locomotives.
- If using a motor decoder and DSX, place the locomotive on the Programming track and use the following sequence: PRGM PrTRK, 3 (advanced decoders only), CV/3, 29, ENT, 6, ENT, ESC.
- If using a motor decoder and DSD: With the locomotive still on the main track, use the following sequence to program the proper values in CV29 for digital recoupling using the four-digit addresses to do the programming: PRGM MnTRK, XXXX or YYYY, ENT, CV/3, 29, ENT, 6 (for the motor decoder XXXX) or 18 (for the sound decoder YYYY), ENT, ESC. This sequence tells the motor decoder to respond to the two-digit address and the standard linear speed table, while the sound decoder will respond to the two-digit address and the custom speed table settings, including CV's 25, 66 and 95. You should now be able to run the locomotive again on the two-digit address and have control of all motor and sound decoder functions.

**NOTE:** The above sequences are quite complex. Please read through the descriptions carefully to make sure you are using the proper steps to accomplish your desired programming need. If you have any questions, please feel free call to or email me. And remember, if all else fails, the decoders can be reset to factory defaults quite simply and programming can be restarted at step 1. Hope this helps.

**NOTE:** The Easy DCC name is copyrighted and a trademark of CVP Products, Richardson, Texas.

Kenny Collins  
Decoder Installation Services  
3721 O'Henry  
Garland, TX 75042  
(972) 272-8810  
[kennyc@dccplus.com](mailto:kennyc@dccplus.com)