Jacobsen Declaration Exhibit AI

KAM Industries

KAM Industries
2373 NW 185th Ave
sales@kamind.com
Hillsboro, Or 97124

Phone 503 291 1221
email:

Fax 503 291 1221

Decoder Commander® software

Configuration and User Manual

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For more information on KAM Industries products, please contact

KAM Industries.
2373 NW 185th Ave., #416
Hillsboro, Oregon 97124

EMAIL: sales@kamind.com
WEB: http://www.kamind.com
FAX #: (503) 291-1221

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Table of Contents

Introduction

KAM has two different programming philosophies for programming decoders, a simple programmer (Engine Commander® software) and a fully function do everything programmer (Decoder Commander® Software).

Engine Commander implements a basic programming capability for programming decoders. Engine Commander allows you to read and write CV's, program decoder address and speed curve. Engine commander programming is a simple programmer, allowing you to read and write your decoder

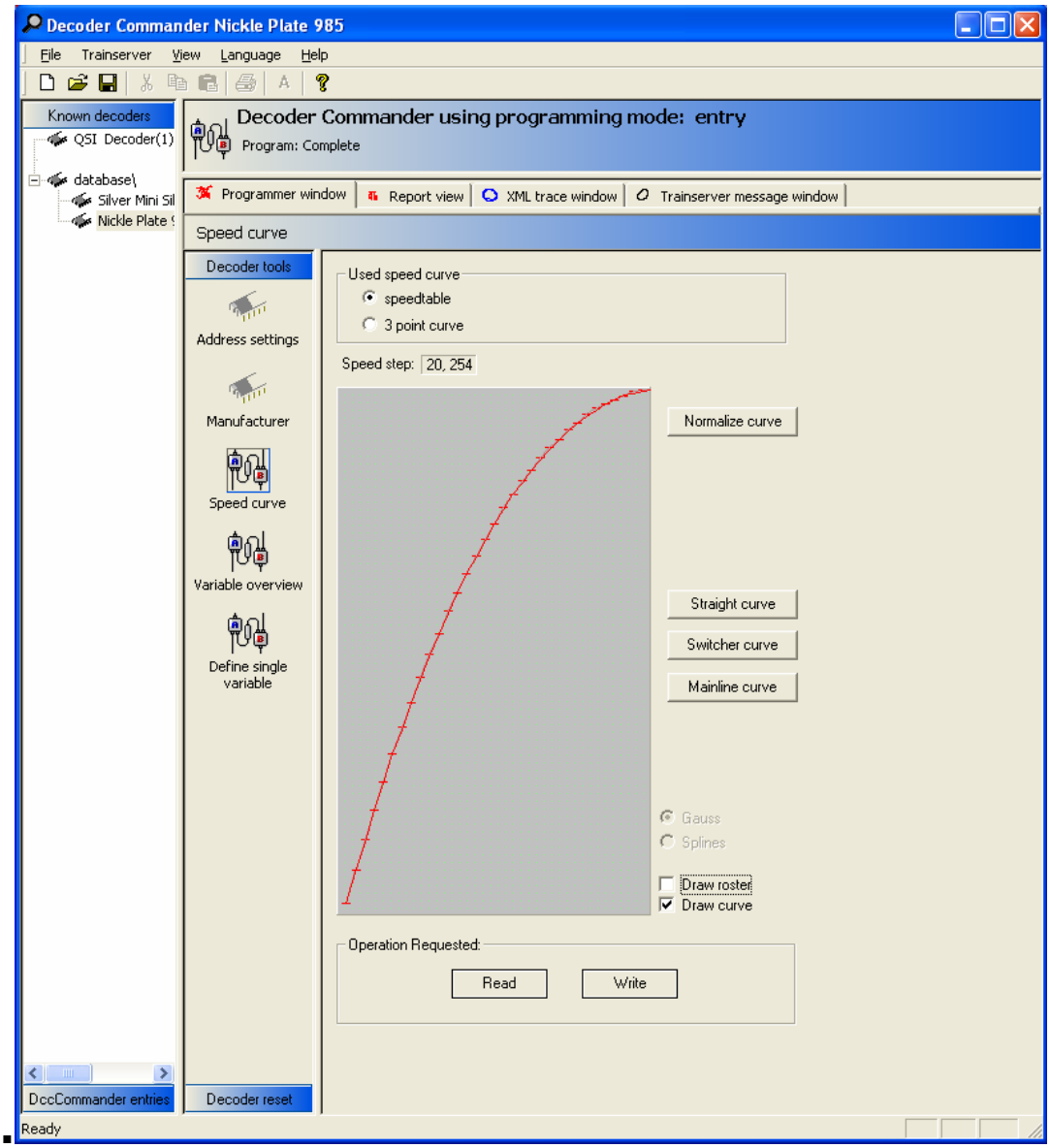

Figure 2. Train Tools installation screen

Decoder Commander is a serious decoder programmer that allows you to do everything that Engine Commander does plus configure advance decoder functions, clone decoders, customize speed curves, configure advance function mapping from the Dcc Commander SQL database. Decoder Commander allows you full access to the manufacture specific decoder information so you may customize the decoder as you see fit.

Installing Decoder Commander Software

To install Decoder Commander software you need to complete these three steps

1. Insert the CDROM in your computer. Select Install Train Tools. Follow the instructions in the installation manual. If you do not have a product key, use the custom option to install Decoder Commander evaluation software.

    a. The Train tools CD-ROM has numerous examples on how to use KAM's software. These examples are in a short 3 -5 minute video tutorials that explain the operation of KAM's software

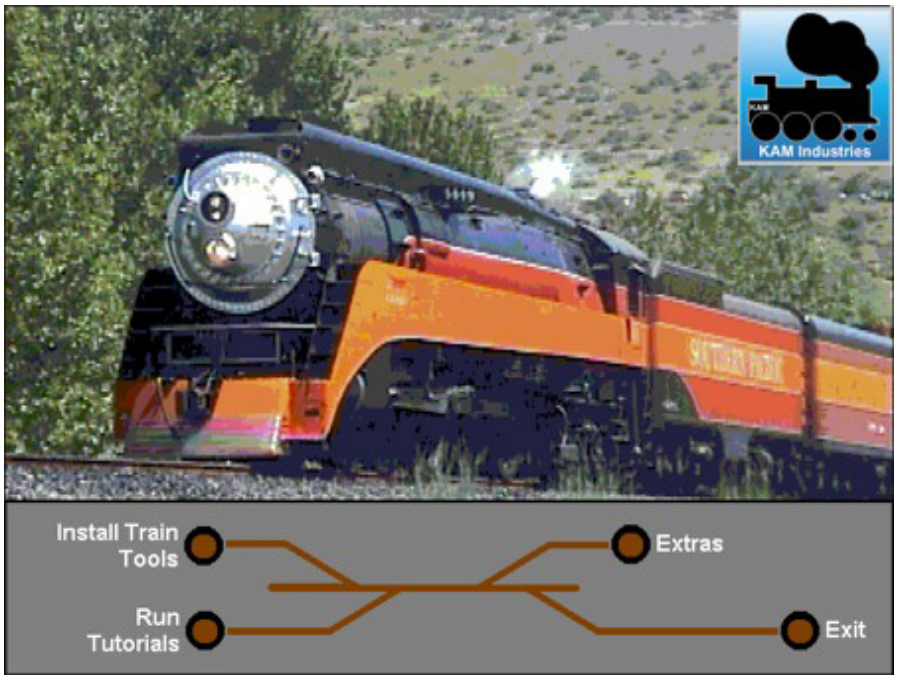

Figure 2. Train Tools installation screen

2. Follow the information in your installation instructions for the easy to use setup. You will need to have your serial number handy during the installation process. Your serial number is available on the "your Information" page on the KAM website and will be emailed to you on all product downloads.

3. Please refer to the "Getting Started with Train Server" guide for configuration of Train Server.

4. You are now ready to run Decoder Commander software.

Decoder Commander Basic Operations

Start Train Server® Manager

If Train Server Manager is not yet running on the PC running Train Server, you must start Train Server Manager in order to start Train Server. If you have not yet configured any command stations, please read the previous section and complete this step first.

- Start Train Server Manger. It is located in your start menu in the "Train Tools" program group.

  Train Server will remember the last command station configured, so you only need to enter the command station information one time.

TIP: Train Server must be running before you continue. If you have not selected a command station in Train Server, Layout commander will not control the layout.

Start Decoder Commander®

- Start Decoder Commander. It is located in your start menu in the "Train Tools" program group.

  When Decoder Commander starts, there will be a delay while Decoder Commander attempts a database connection to the Microsoft SQL Server Express database. The Microsoft SQL server desktop. The connection is automatic.

TIP: If you see an error that Decoder Commander cannot find the database, then run the Dcc Commander manager to configure the SQL database.

- After Decoder Commander attaches to the database, there is a delay while the software loads the manufactures decoder models from the Microsoft SQL database for the program to use. This may take a few minutes depending on the size of your disk.

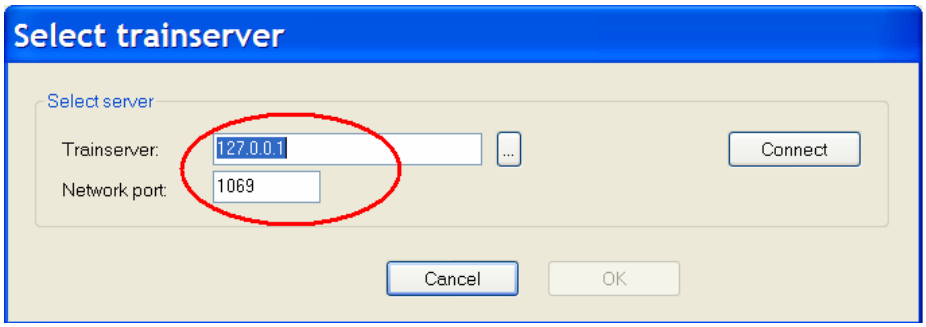

Figure 1: Decoder Commander main window

Connect Decoder Commander to Train Server

- Enter the TCP/IP address or the computer's network name that is running Train Server.

  TCP/IP is the networking protocol used for Microsoft networks and the TCP/IP address is how each computer on the network is uniquely identified.

  If your are running Decoder Commander on a different computer than the PC running Train Server you must enter the TCP/IP address or computer name of the PC running Train Server. See the Troubleshooting section of this manual for help in obtaining the TCP/IP address of another computer.

  The first time Decoder Commander is run, it will use the TCP/IP address of the computer it is running on as the default value for the server address.

  After Decoder Commander is run the first time, the default server address displayed will be the last address entered. Some networks use dynamically assigned TCP/IP addresses (DHCP) which can cause the address of a PC to change when rebooted which will cause the previously used address to be incorrect. See the Train Server Administrators manual for more information.

- Enter the TCP/IP port number that Train Server is using.

  This will always be port 1069 unless Train Server was intentionally reconfigured.

- Click the "Connect" button.

Decoder Commander Console

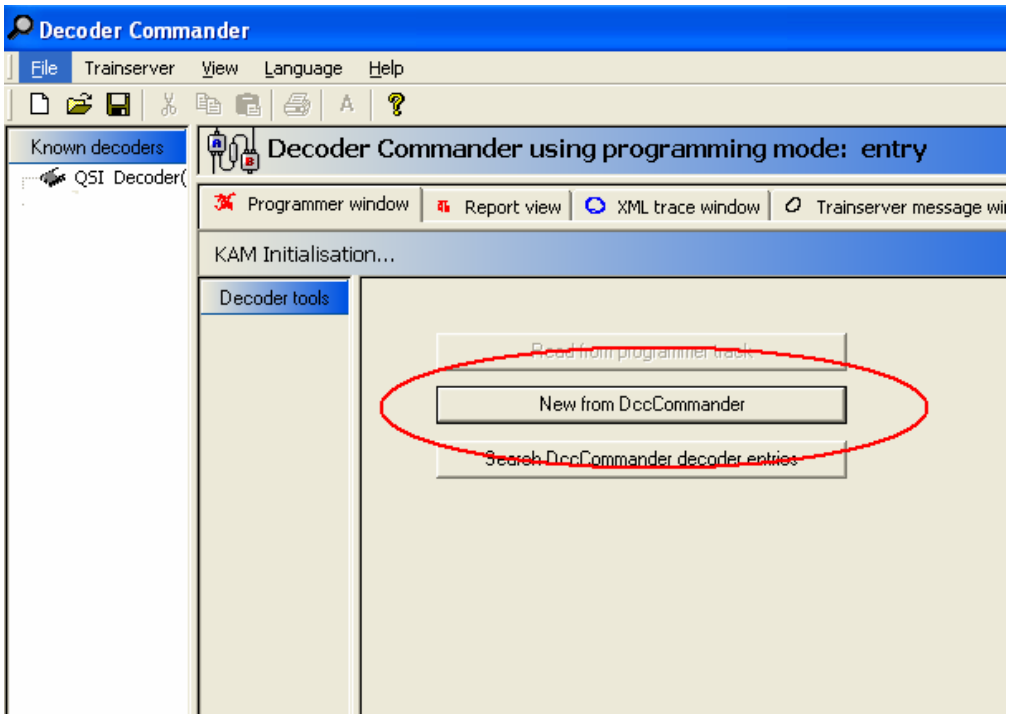

Figure 2: Decoder Commander startup screen

After you have selected the connect button, Decoder Commander, connects to Train Server and loads any know decoder that you have programmed, and sets up the programming mode form your last session.

Decoder Commander uses decoder models form the SQL database, that conform to the manufactures decoders specification. These decoder models are used as to create a new decoder that has the properties of the locomotives on your layout.

Using Decoder Commander the first time

Terminology

Decoder Commander is a decoder programmer tool designed for programming model railroad decoders. Before you begin to program your model railroad decoders, there are a few terms that describe the operation of Decoder Commander and the capabilities of the software.

Decoder	A hardware component in your model train that controls the operation of the model train. Decoders have a control variable specification that defines the operations characteristic of the decoder and how the model train will operate.
Control Variable	Control Variables or CV's contain configuration information on the operation of the decoder. The CV's are defined by the National Model Railroad Organization (NMRA), and conform to a standard that all model train manufactures support.
NMRA Standard	The NMRA Digital Computer Control(DCC) standard is located at www.nmra.org.
Programmer	A software tool design to program the configuration variables on a mobile decoder. KAM's Decoder Commander and Engine Commander is a software programming tool.
SQL Database	All decoders have unique characteristics. KAM has created a SQL database that contains the manufacturers decoder specifications. Users may extend the supported decoders by adding decoders locally, or through our web site and downloading a new database image.
Command Station	A hardware component used to control your model railroad layout. Command Stations support two different programming capabilities, Operation mode and service mode. Service mode requires a programming track for operation.

Programming	A command to change the CV in the decoder. Programming is either a "read" (service mode) or "write" (operations and service mode) for the desired CV.
Read	A decoder may only be read in service mode. This requires that the decoder is placed on the programming track.
Write	A decoder may be written in operations mode (on the mainline) or in service mode (on the programming track).
Operations mode	Operations mode is a programming mode that is used when the model train is operating on the layout. A decoder address can not be programmed in operations mode. Operations Mode only supports an unverified write operation to the decoder. This is because the decoder is on the mainline operations track.
Decoder Address	A decoder address is an address that the computer uses to recognize the locomotive on the model railroad layout. Decoder addresses do not need to be unique. If two locomotives have he same address and are on the layout, then the both locomotives will respond to any computer command.
Programming Track	A set of track attached to a command station where you can program the decoder in service mode.
Service Mode	Service mode is a programming mode that uses the programming track on a command station. In service mode, there are three different programming operations support by the command station. These are page, direct and register. Service mode is used to program the decoder CV values and addresses. Service mode uses different types programming formats to program a decoder. Service Mode supports both "read" and "write" operations to the decoder. This is because the decoder is on the programming track.
Programming formats	There are three different types of programming formats used to program a decoder in service mode. These programming formats are page, direct and register.

Programming a Decoder with the wizard

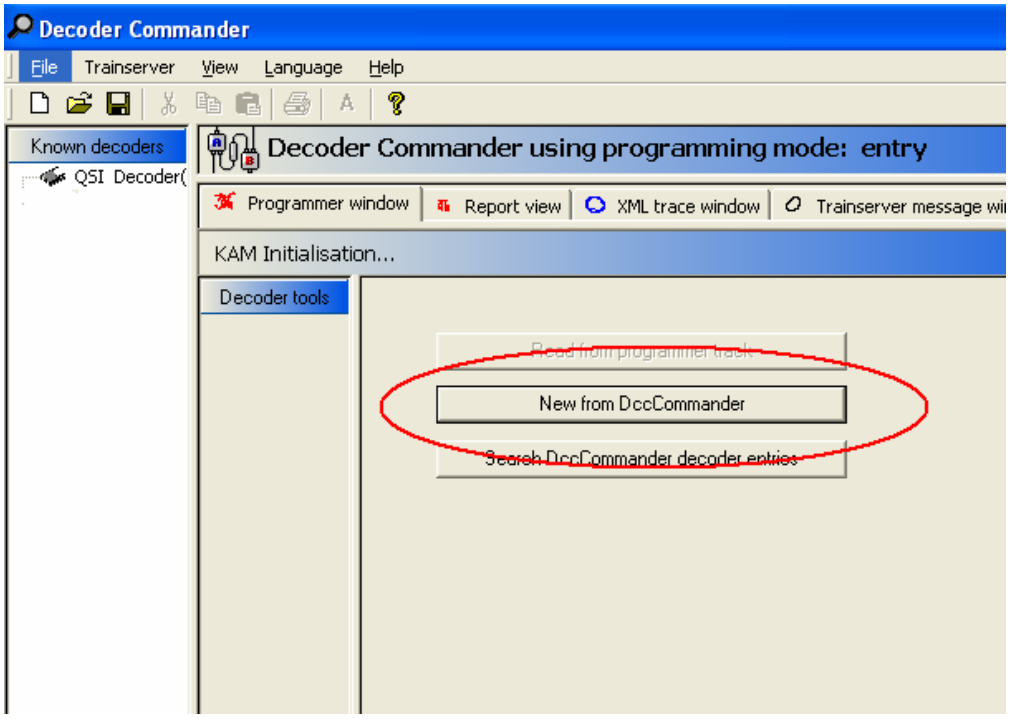

Figure 3: Programming your first decoder

- Decoder Commander uses programming wizard when you program a decoder for the first time.

TIP: Before you start the decoder wizard, create a directory called "My Decoders". Locate this directory in the "My Documents" directory. This will allow you to save your decoders to disk.

Decoder Commander uses both the NMRA service mode programming and the operations mode programming.

When you program a locomotive decoder for the first time, you will need to place the locomotive decoder on the service mode programming track to program the decoder CV's. After the decoder is programmed, you can program the decoder on the mainline.

- Select either the "new" file or "new from Dcc Commander" decoder database to begin the programming process for your locomotive decoder.

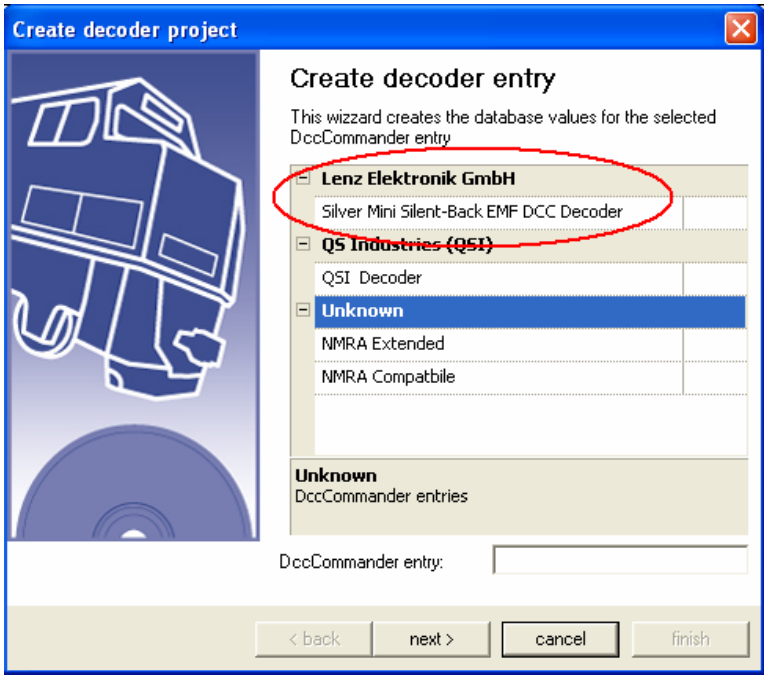

Figure 4: Running Decoder Commander Programming wizard

- After starting the wizard, select the decoder model that matches your decoder as close as possible. In our example, we have selected an All Mobile CV for the Nickel Plate 941

  All of the information collected from the decoder will be stored in a readable data file. You can use the Decoder Commander to print out the decoder information for your records.

- Select next and enter information about the decoder project

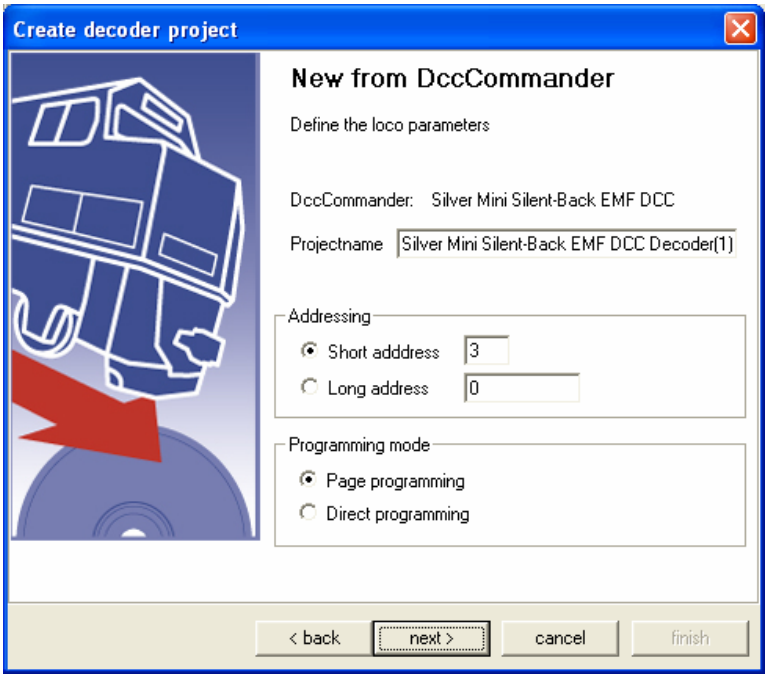

Figure 5: Entering project information for your decoder

TIP: When you name a decoder project, name it with a value that is descriptive of the locomotive. This will make it easier to maintain the decoder over time.

- Select next after you have entered the decoder address and project name

- Select a directory where you would like to save the decoder information that you have created. You can save this information anywhere on your disk.

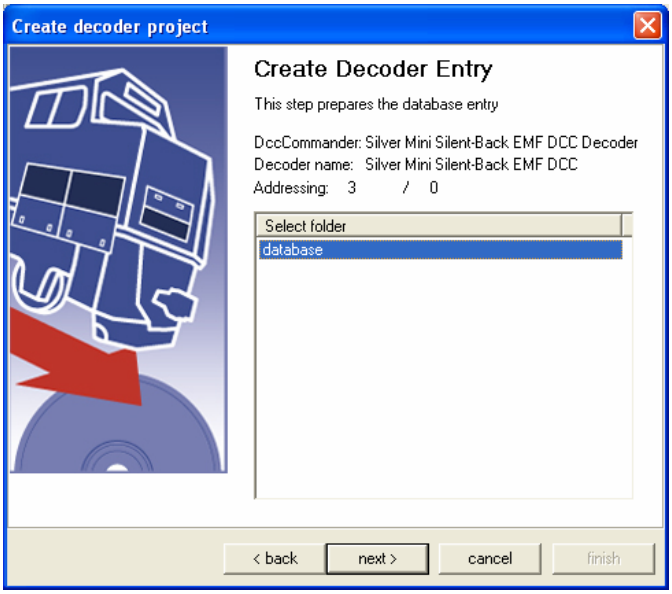

Figure 6: Entering project information for your decoder

- The Programming wizard allows you to specify the programming operation that you want to perform on the decoder.

  There are three programming modes that you can perform. If you do not plan to program your decoder, just select "finish", and a new decoder state table will be created. You can always program your existing decoders at any time. The programming options are described in the table below.

Clone decoder	(optional) Select the decoder that you wish to copy. This will read one of your existing decoders, and either program the decoder, or create a new model for use with the wizard
Read a decoder	Read a decoder's CV's form the programming track and save the information to your decoder database for this locomotive
Write a decoder	Write a decoders CV's to the programming track from the data file or a clone decoder (if selected). It is best to clone a decoder on write operations, unless your club layout has a decoder standard.

TIP: When programming a new locomotive, place the locomotive on the programming track, before you decoder commander wizard. If you have purchased a sound decoder, check the manufactures instructions on programming. You may need to purchase a programming booster to program this decoder.

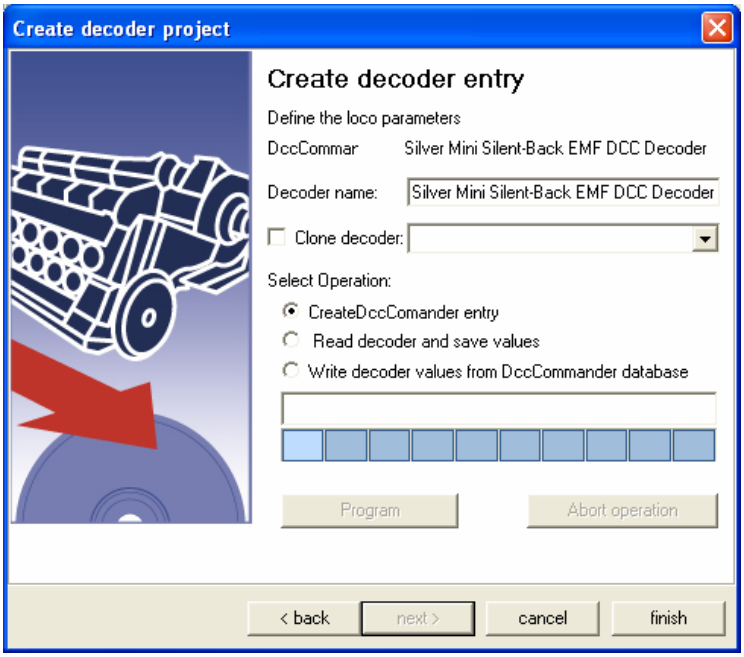

Figure 7: Entering project information for your decoder

Figure 14, shows that have decided to "read the decoder", and store the information into our decoder file, under the name of "Silver Mini Silent-Back". To start the operation, we select program.

TIP: reading and writing a decoder takes time.. The read/write time may be upwards of 30 seconds per CV. Advance decoders typically have 50 CV's, so it is not uncommon to wait 10 minuets to read or write a mobile decoder.

- To begin the programming operation, select "Program". If you wish to abort the programming cycle, select "Abort". Stopping a command station programming sequence may take 30 seconds or more to stop the programming cycle.

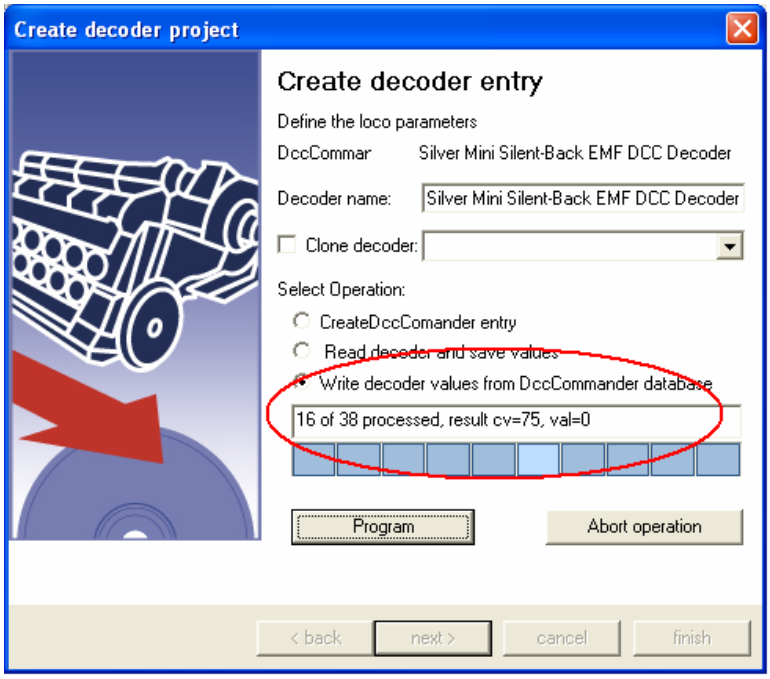

Figure 8: Programming operation status update

- At the end of the programming cycle, you select finish. This will update the Decoder in your known decoder list.

  Figure 15, shows the status update of the programming operation. This display will show you the number of CV's that are processed, and the value of each CV.

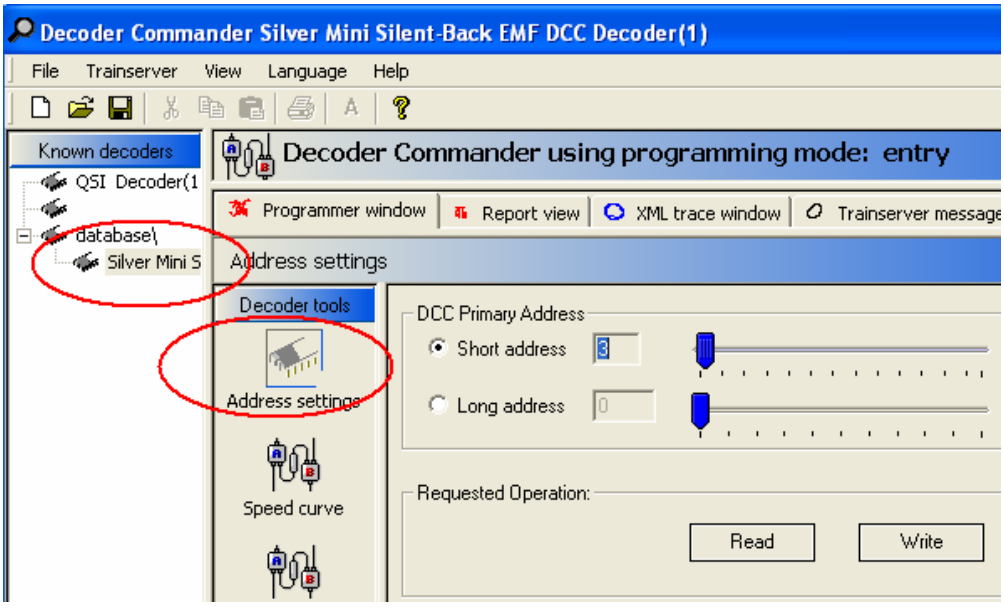

Figure 9: Status area updated with new Decoder information

After you have completed the programming operation, the Decoder Commander console is updated with the decoder information that we just read earlier.

Decoder Commander will scan your hard drive when Decoder Commander is started. The decoder information is stored in a XML data file in the directory that you specified.

Configuration Options and Tools

Decoder Tools

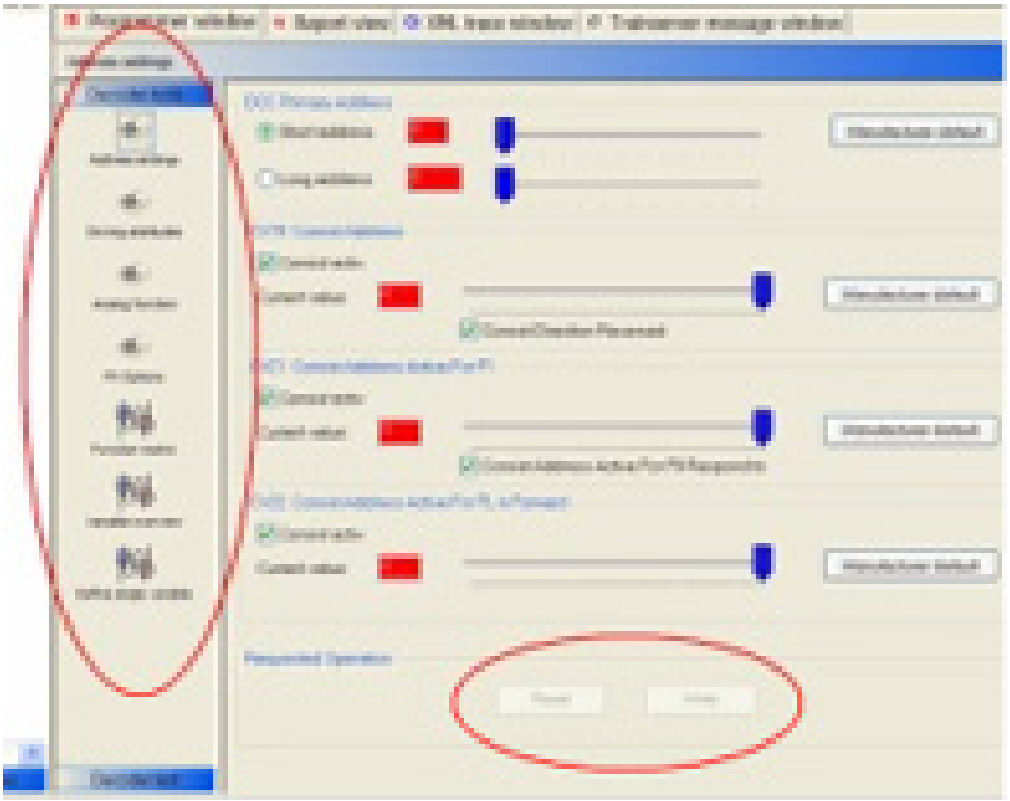

Figure 10: Programming with Decoder Commander Tools

You can use "Decoder Tools" to program your decoder. Decoder Tools allows you to program individual CV's, as groups of CV's. To use the Decoder Tools, select one of the known decoders. Known decoders are decoder's whose data files are located on your disk. Known decoders are created using Decoder Commander programming wizard.

The Decoder Tools menu expands with the decoder tool options. In our example, we have started a programming operation (read was selected). The values that will be read, are changed to -1, and are colored red. Once the decoder values are returned from the command station these values are updated to returned values, and the background changes to white.

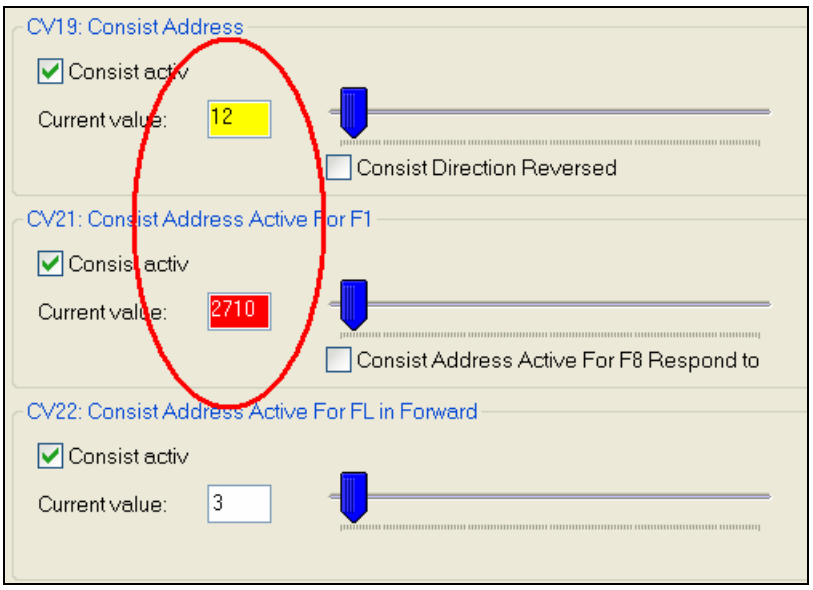

Figure 11: Information display on programming CV's

Decoder Commander allows you to program individual CV's in a group, and displays the status information about the programming operation. Decoder Commander uses KAM's Smart Decoder Technology to determine which CV needs to be written and updated to the decoder.

Yellow Shows a changed value for write operations. This value will be written to the decoder when the user depress the write operation.

Values that are in white are ignore on decoder write operation.

Red If the number displayed is in red and is not a -1, then this value is an error value. The value entered is out of range for the CV.

A -1 value in red, means that this information is being read from the decoder. The return value will be updated as clear text

TIP: If you wish to abort a programming operation, just select a different "decoder Tool". This action will abort the programming operation.

Address Setting

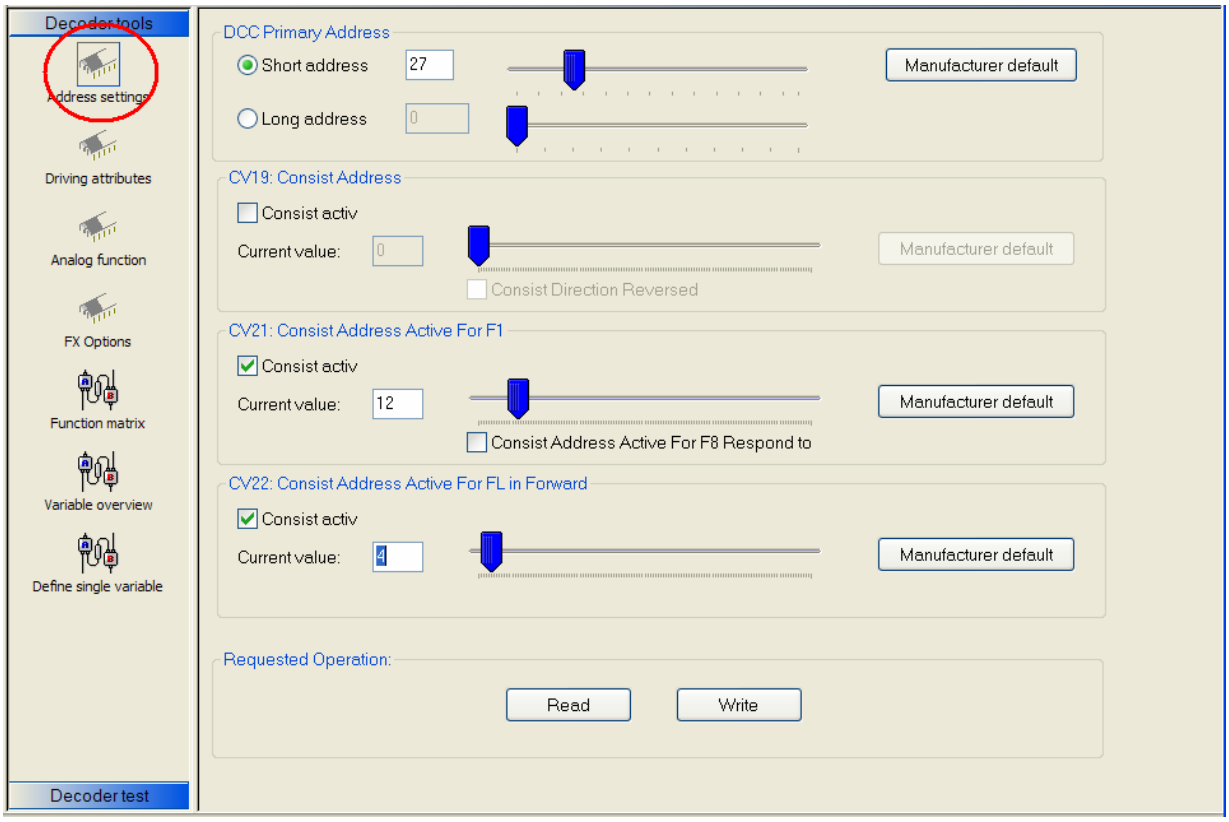

Figure 12: Address setting CV's

Decoder addresses can only be program in service mode, and not in operations mode, with the exception of consist packet information (CV21 and CV22). All other CV's can be programmed on the main.

Driving Attributes

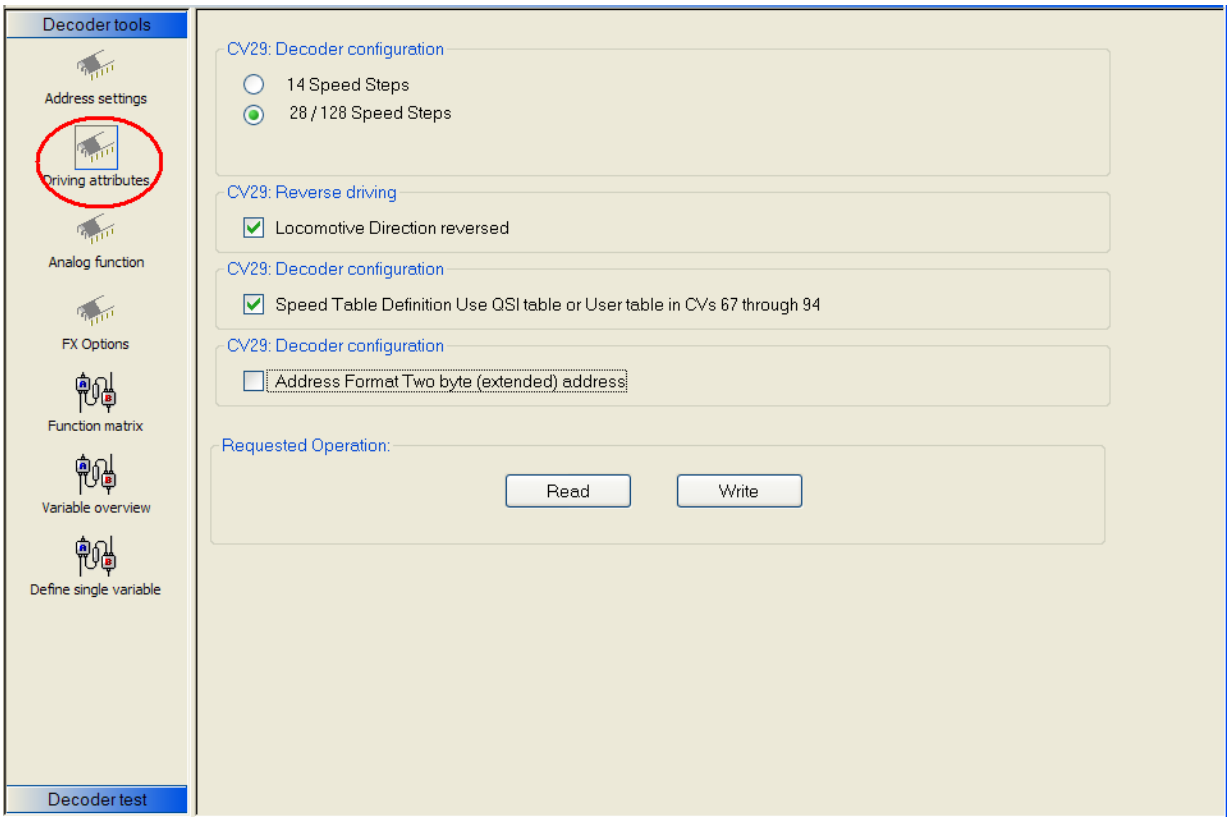

Figure 13: Driving Attributes

Driving attributes are those CV's that effect the operation characteristics of the locomotive decoder. Driving characteristics include speed step (14/28 mode), enabling a decoder speed table by use of the decoder, and to set the locomotives direction of operation (used for double headers)

Analog Functions

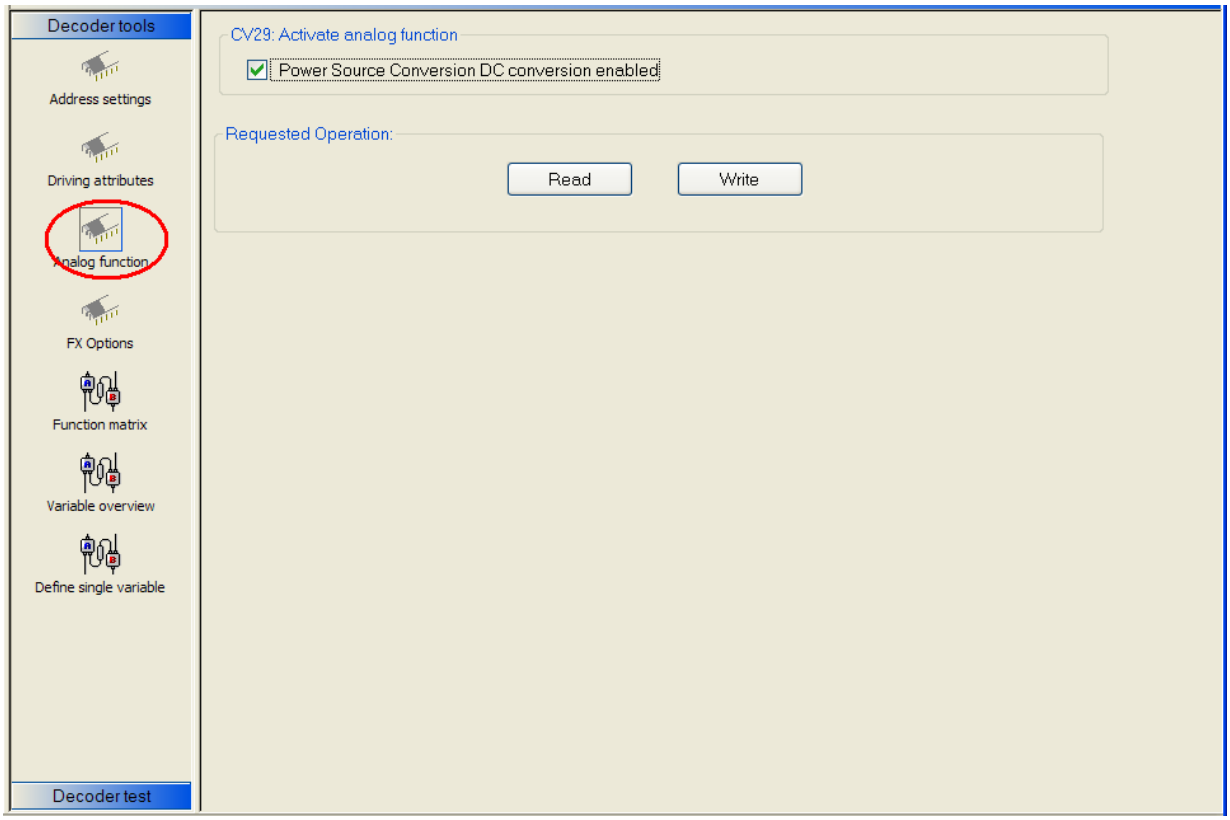

Figure 14: Analog Functions

Analog function support allows the locomotive to operate in analog mode, on a model railroad layout where a Digital Command and Control systems is not available. This capability is unique to each decoder, and is not universal across all decoders that are produced. If you wich to run your locomotive on a layout that does not support DCC, you will need to have CV29 analog mode enabled.

TIP: Analog mode does not always work with all Locomotives motors. You will need to check with the locomotive manufacturer to verify if the locomotive motor supports analog operation.

Likewise, all locomotive motors do not support DCC. Iron core motor typically will heat up and burn out on DCC layouts unless there is some electrical modifications made to the motor circuit.

FX Options

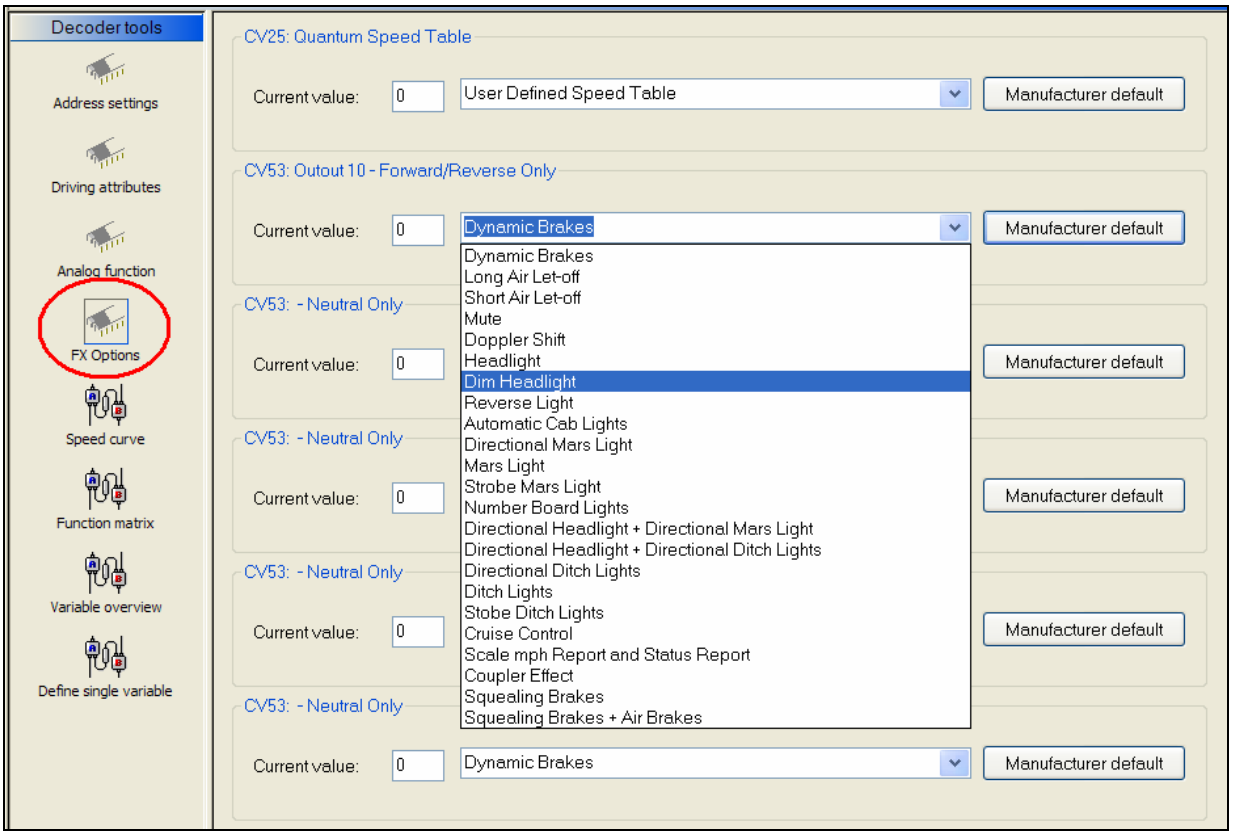

Figure 15: FX Function support

FX function support allows you to define the function bit modes of the decoder. These modes allow you different operating characteristics of the locomotive on the layout. Check with your decoder manufacturer to verify that bit mode is supported

Speed Curve

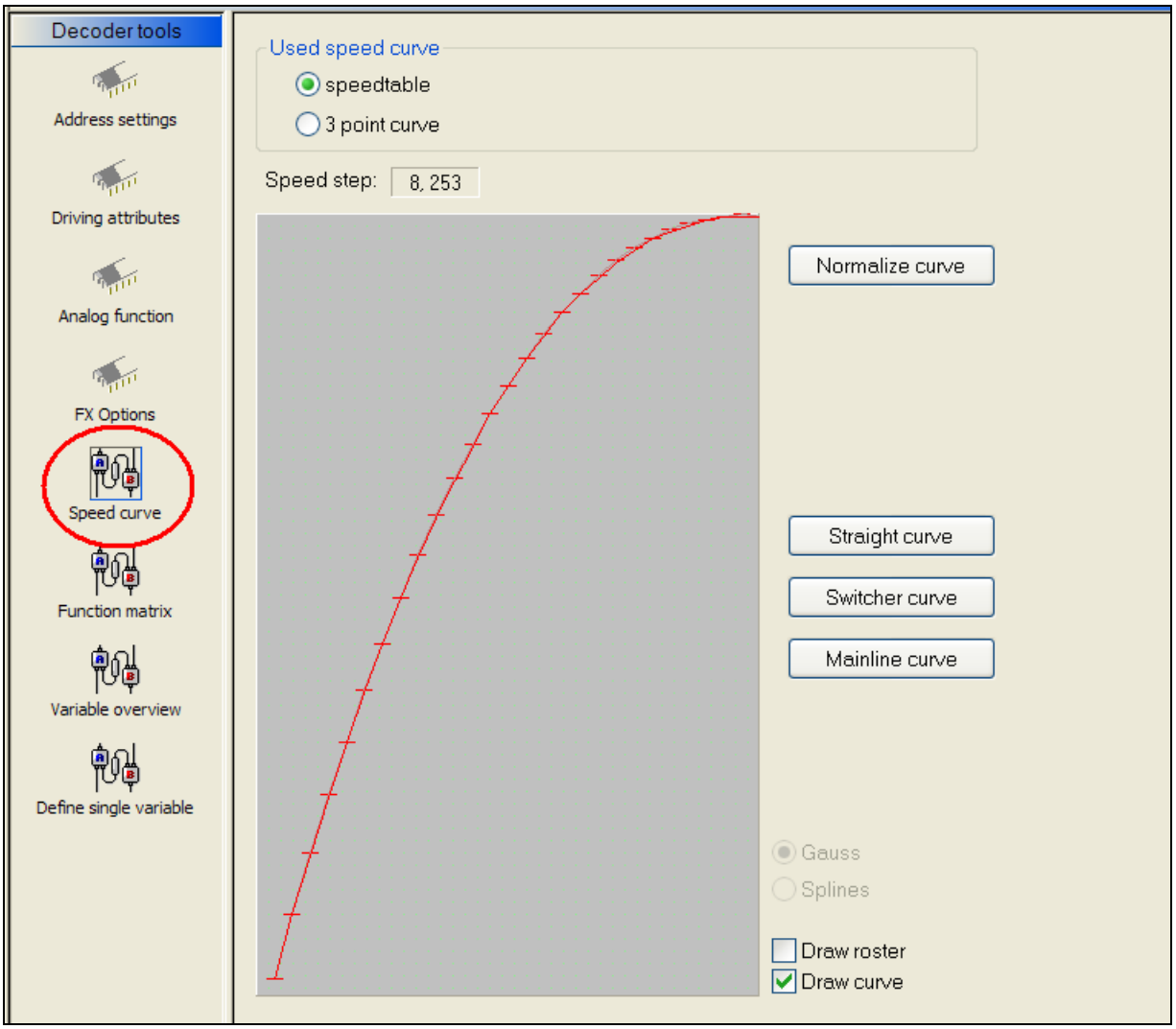

Figure 16: Speed Curve support

Decoder Commander supports speed, if the locomotive decoder supports speed curve. The decoder tools allows you to define any type of speed curve that makes sense for you locomotive. The tools support some preprogrammed speed curves, that would represent a switcher and mainline (freight/passenger).

On any speed curve, you need to be able to modify the speed curve. The decoder Tools, allow you to modify individual elements and normalized the curve.

If you choose a "read" operation, the decoder will be read, and the speed curve will updated based on the information from the locomotive.

TIP: Before you modify a speed curve, always read the speed curve from the locomotive. This will give you a base line to make your speed curve modifications.

Function Matrix

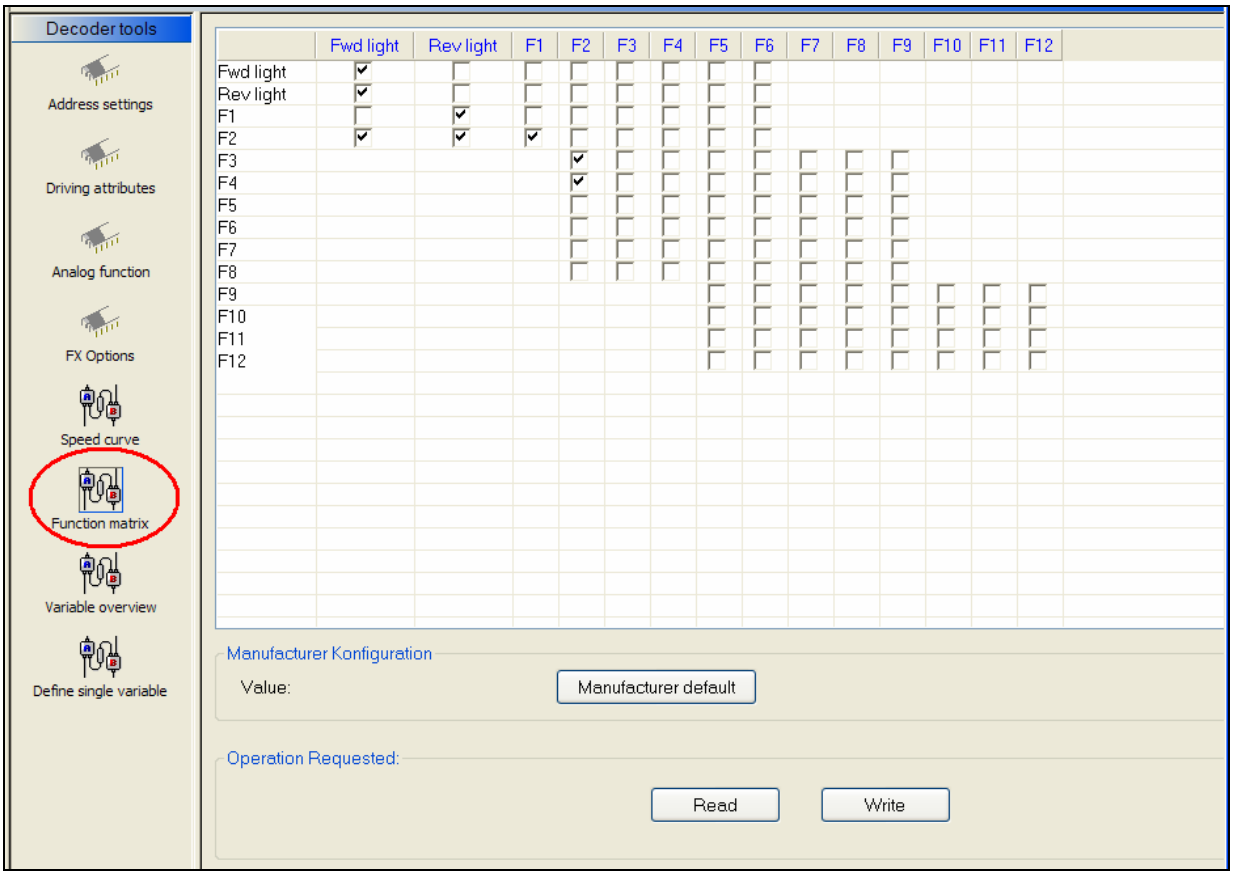

Figure 17: Function Matrix mapping

Some decoders allow you to cross map the decoder functions, this is useful if you want to have a different operation sequence. For example, if you may desire to configure ditch lights of the locomotive when the head light is turned on. Another example, would be the operation of an uncoupler in a switcher. In running a switcher, you may desire to map the uncoupler to the rev light, so when a switch changes direction you can dropt he cars behind it.

In both of theses cases, you would map the decoder functions in the function matrix as shown above.

Variable Overview

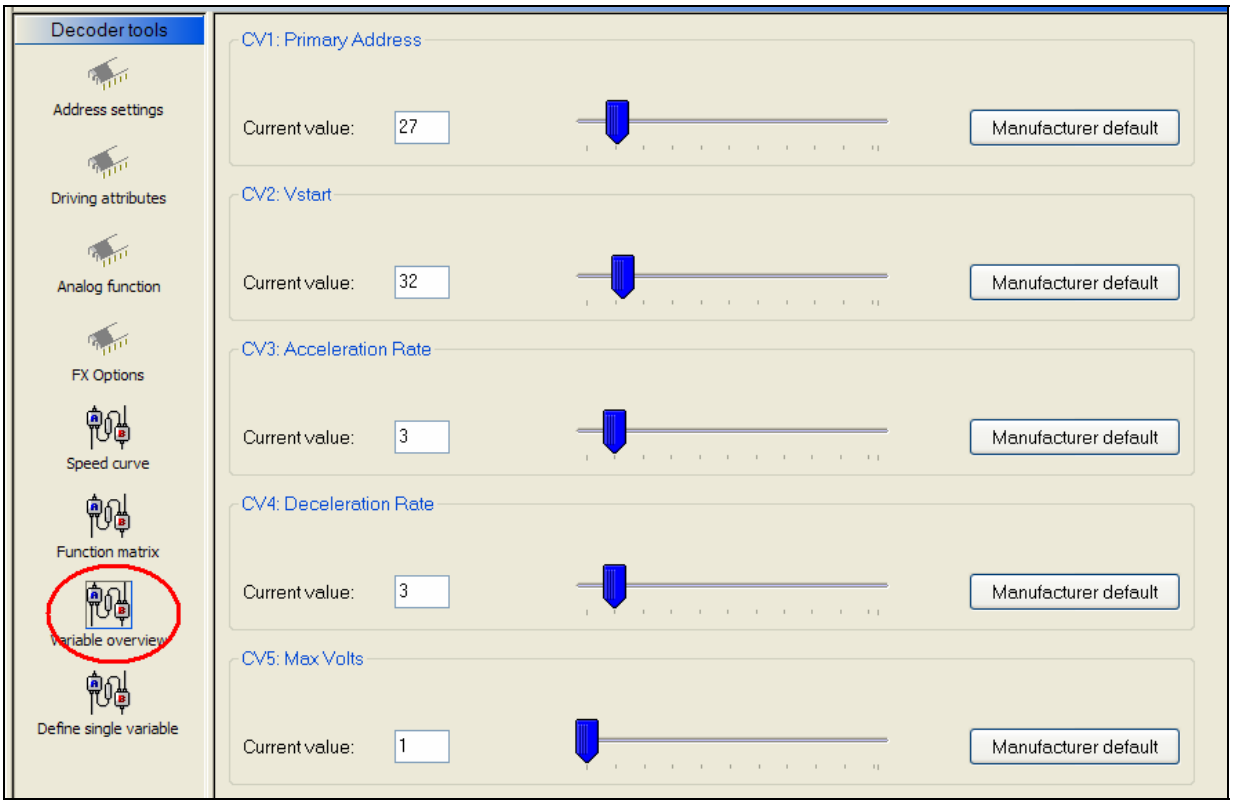

Figure 18: Decoder CV Overview

Variable Overview allows you to read and write a single CV variable or multiple CV variables to the decoder. The CV values and descriptions are from the decoder database. The CV's are programmed based on the decoder model that is used, or Decoder Commander programming override.

To program a CV, find the correct CV that you wish to program, and move the slider till the appropriate value. Change one or all values. When it is time to program, Decoder Commander will program the CV's to the desired state.

Select the desired programming operation, either read or write. You can view the programming status in the status bar or the message window.

Define Single Variable

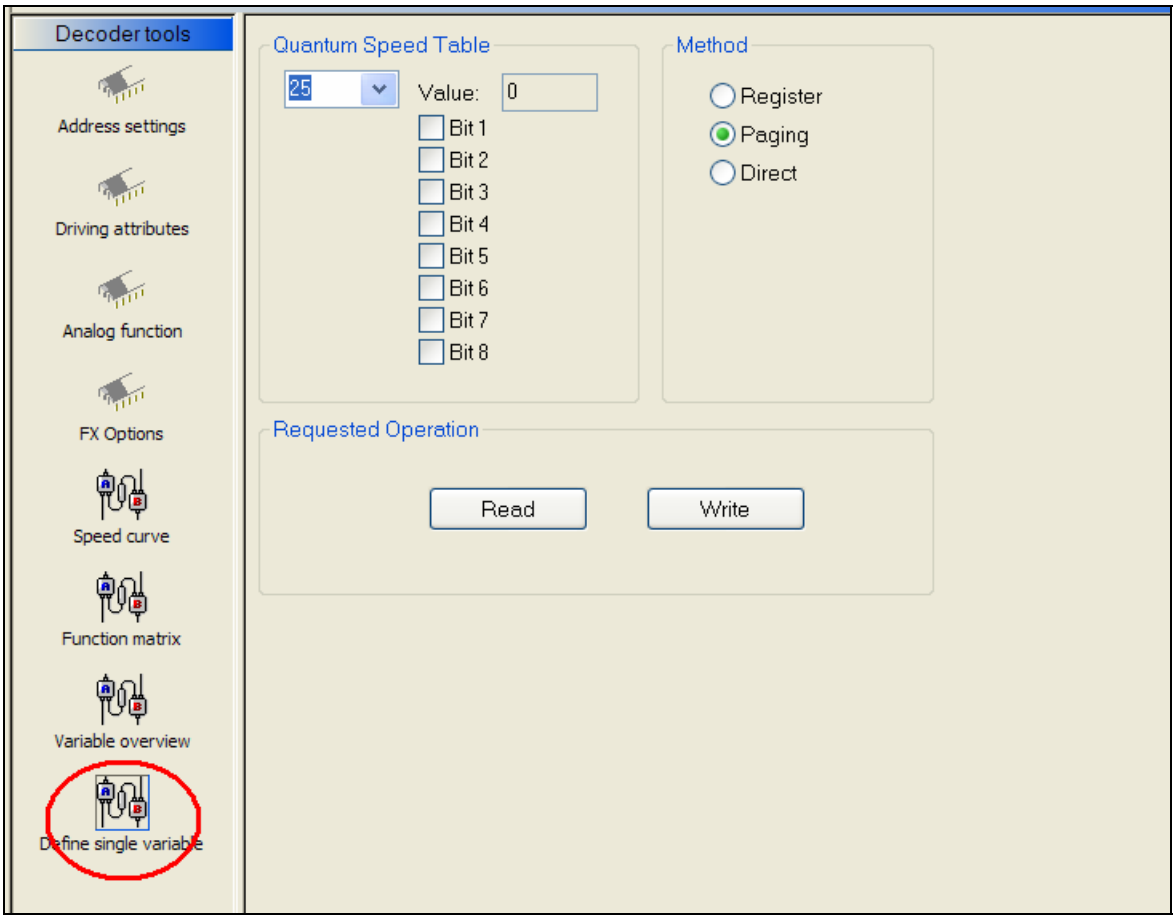

Figure 19: Single CV variable programming

Define single variable allows you to read and write a single CV variable to the decoder. The decoder database contains the necessary information about the decoder's CV, and displays that information. The programming operations displayed are derived from the decoder database.

Programming Information Windows

Status Menus

Decoder Commander maintains a runtime control of the decoder operations. There are four different status menus, Programmer window (default), report view, XML trace window and Train server message window.

Programmer window

The programmer window is the default view that allows the user to control the programming operations in decoder commander.

Report view window

The report view window is a print view of the decoder characteristics. This view is updated real time when the changes are reported by train server. If you desired to print a decoder summary, display the report view first, then select he print operation from the file menu.

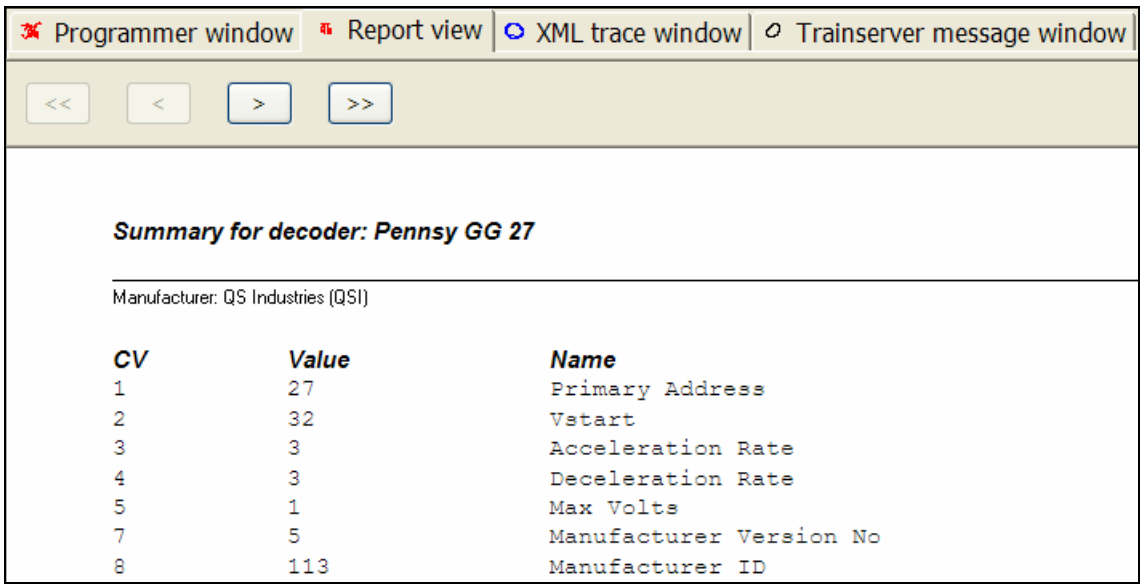

Figure 20: Report View print window

Train Server Message Window

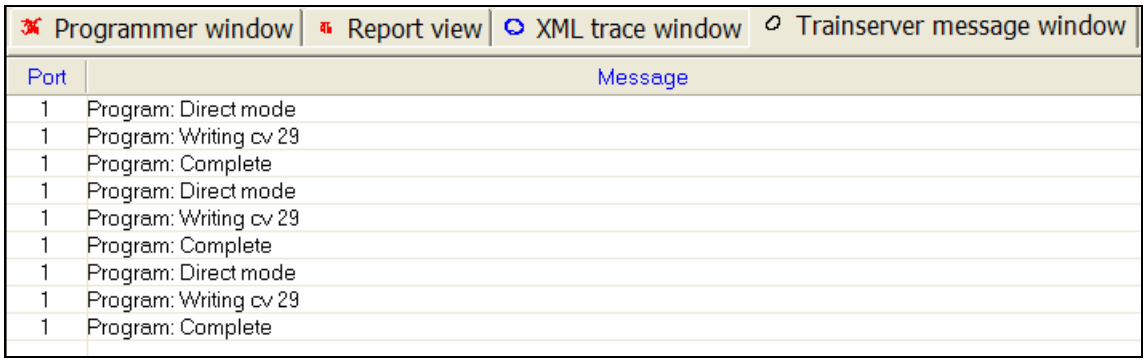

Figure 21: Train Server status window

Train Server message window displays the message feedback information from the command station.