DecoderPro3® User's Guide

Version 3.4

8/21/2013

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Revised 8/21/2013

DecoderPro®3 is a Java-based cross-platform application for model railroaders.

DecoderPro3 ® can run on any computer system that will run Java 1.6.0 or later, whether it is Macintosh, Windows, or Linux based. It does require that Java be installed on the computer. You can get Java as a free (but very large...) download at:

java.sun.com/getjava/

Note: All screen shots in this manual are from a Windows machine using the "Metal" User Interface option, Your screens may differ in some layout details, they will be essentially the same. All programming examples shown are with Digitrax PR3 (MS100 mode) connected to Digitrax Super Chief Radio Command Station. Most of the decoders in locomotive samples will be Digitrax, except for sound examples.

Note: This entire manual has been updated to correspond to JMRI® 3.4 DecoderPro3® only from the SHTML on line version.

Revisions

Version	Revision Date	Editors	Major Revisions
2.14.1	2/26/2012	Dale A. Tripp Bruce Shanks	Create DecoderPro 3® User's Guide
3.0	8/4/2012	Dale A. Tripp Bruce Shanks	Update to version 3.0
3.2	1/12/2013	Dale A. Tripp	Update to version 3.2
3.4	8/21/2013	Dale A. Tripp	Update to version 3.4

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Preparing to Install JMRI®

The JMRI software package includes:

- DecoderPro
- DecoderPro 3
- PanelPro
- SoundPro
- Operations is embedded in DecoderPro3® and PanelPro®

There are always two versions of the software available:

- Production Version: The current stable version that is fixed in design and for general use. If just starting, this is the version for you.
- Development Version: The version that is under development for testing and is used to validate new features and changes to existing features. If you are familiar with JMRI and want to help in the validation and testing process, then use this version.

Supported systems (check www.jmri.org/help/en/html/hardware/index.shtml).

Prior to installing JMRI, you must www.jmri.org/download/index the correct version for your computer system.

- Windows
- Mac OS X
- Linux

Installing JMRI software

After downloading the JMRI file, now install using the appropriate Installation guide:

- Windows Installation Guide www.jmri.org/install/WindowsNew
- Mac OS X Installation Guide www.jmri.org/install/MacOSX
- Linux Installation Guide
    - Ubuntu GNU/Linux www.jmri.org/install/Linux
    - Xubuntu www.jmri.org/install/Ubuntu
    - OpenSuSe linux http: www.jmri.org/install/OpenSUSE

Getting Started with DecoderPro3®

What is DCC?

In short, DCC is Digital Command Control, a system for operating model railroads in a more prototypical manner. Each locomotive contains a tiny, specialized controller. These controllers (decoders) accept digital commands over a network (the rails) addressed to them and interprets them to control the locomotive's speed, direction, lighting effects, sound, and other functions. Each decoder responds only to those commands addressed to it. Not every decoder will have functions beyond basic throttle commands available. Although there are NMRA® standards for the format of communication (allowing the decoders from different manufacturers to work on the same railroad), beyond that there is considerable variety in the functions supported and the implementation of those functions.

Just like any other controller, decoders must be programmed by the user to reach their full potential. While they come with basic "default" programs, most users will want to customize the decoder address, motor control, lights, sound, and other functions to meet their specific needs. You do so by editing **CV**s, or **Configuration Variables**, in the decoder. Some CVs use values ranging from 0 to 255, others use their space in the decoder's memory as a bank of 8 on/off switches. While this lets you do a lot with very little memory, it can get very complex for those of us that are not on speaking terms with binary code.

Decoder Pro attempts to help overcome the inevitable complexity of this system by providing a clear, usable, user friendly open source software solution for programming these on-board decoders. Programming panel designs are written in **XML**, (a close relative of HTML) and can be modified or even created from scratch by users with even a passing familiarity with the format without previous XML experience.

What DCC systems will DecoderPro3® work with?

Decoder Pro3® will work with the following DCC systems:

- Atlas
- Bachrus
- C/MRI
- CTI Electronics Acela
- CVP Products Easy DCC
- DCC Specialties
- Digitrax (Loconet)
    - Digitrax PR3 interface
    - RR-CirKits LocoBuffer-USB
    - LocoBuffer-II (LocoBuffer)
    - MS100 interface
- ESU
- Fleischmann
- Hornby
- Lenz
- Lionel TMCC
- Maple Systems
- Marklin
- MERG CBUS
- NCE
- Oak Tree Systems
- Pro Trak Grapevine
- QSI Solutions
- PI Engineering RailDriver
- Roco
- SPROG
- SRCP
- Uhlenbrock
- Wangrow
- X10
- Zimo
- ZTC Controls

Depending on the specifics of your system and computer, some type of hardware interface may be required. www.jmri.org/help/en/html/hardware/index

What hardware do I need?

You will need a means to connect between your computer and the track on which the locomotive rests, that will take serial instructions and generate DCC packets on the rails. At a minimum, a command station/booster (your DCC system will probably suffice), an additional hardware interface to send commands from your computer to the command station (this could be as simple as a serial cable), and a programming track set up according to the manufacturer's instructions.

For some systems, you will also need an additional hardware interface to send the commands from your computer to the command station, and from there on to the decoder in the locomotive. For a Digitrax system, for example, you will need either the **PR3 programmer** or a **LocoBuffer**. The **PR1** device from Digitrax is a stand-alone programmer and is not usable with this software.

For those who do not have any DCC hardware yet and are considering purchasing a DCC locomotive and want to use Decoder Pro to program it consider the SPROG II USB. It has all the electronics in one package with enough output to run a locomotive. It comes complete with the USB cable, power supply, instructions and JMRI on disk. All you need in addition is the test track.

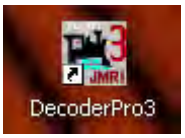
You will also need, of course, some locomotives with the decoders installed which you can program.

How do I start the DecoderPro3® program?

If you are a first time user with no entries in the roster or preferences perform these step using the wizard.

For First Time User

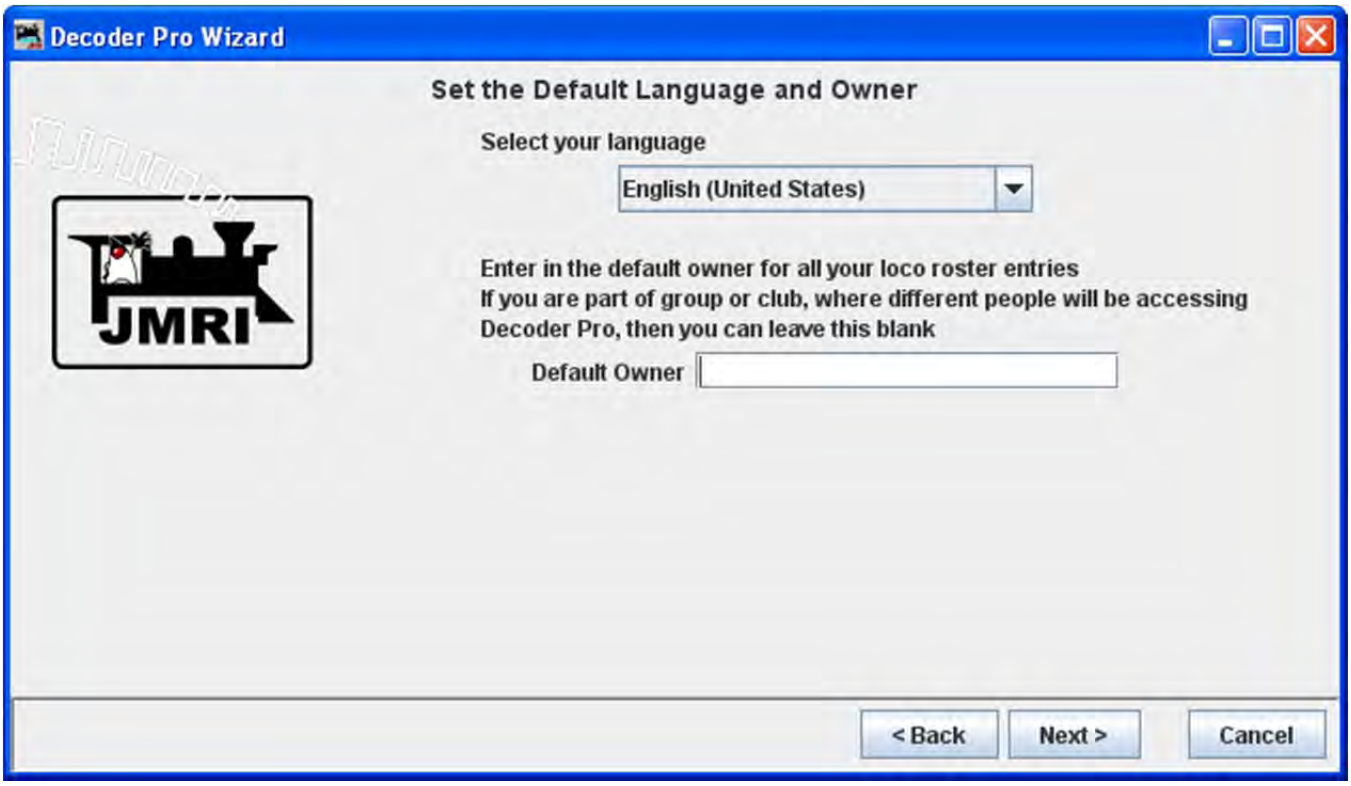
or totally new Install. Once you have downloaded the JMRI software and installed it, simply open the program in the usual manner for your operating system. An icon for DecoderPro3® should be installed on your Desktop.



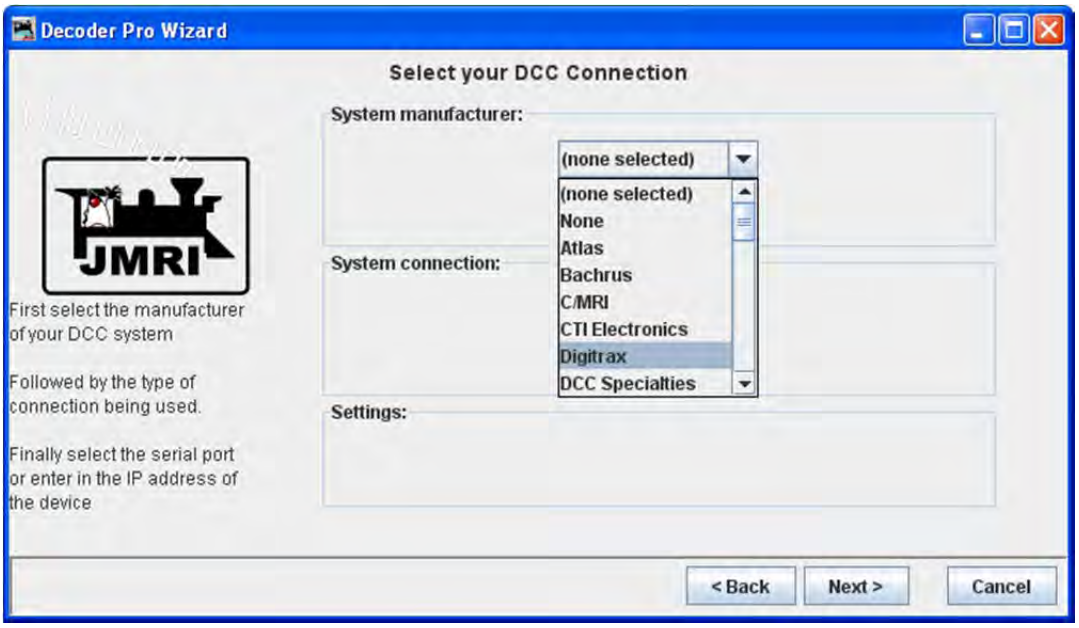
DecoderPro3® may be opened by double click on the Desktop icon and the DecoderPro3® initial screen as shown below will be displayed on completion of startup for a brand new install with no settings stored in your computer..

First time install start screen

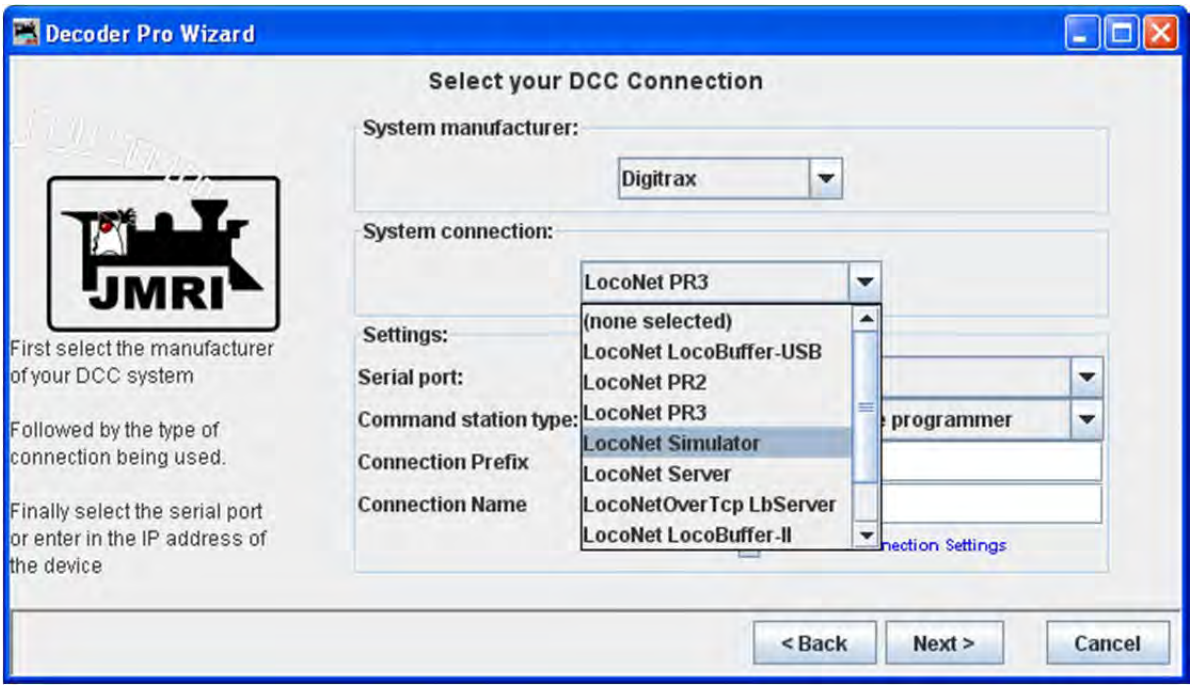
Press Next button starts the wizard..



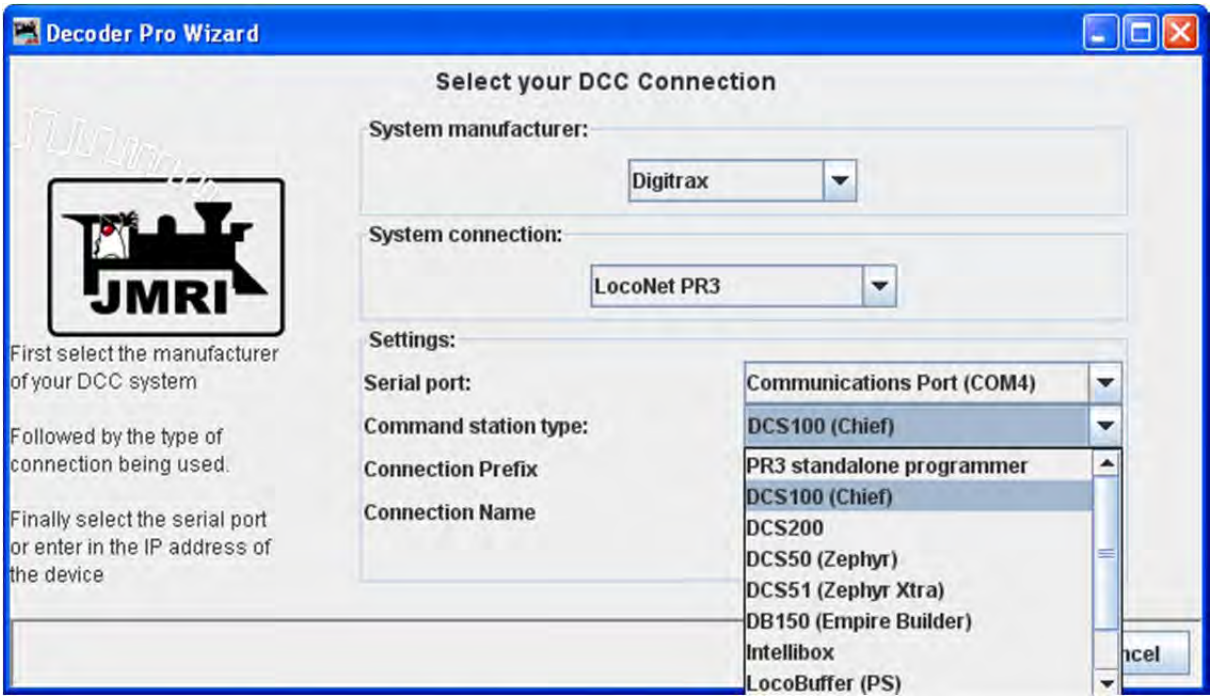
Press the Next button to continue



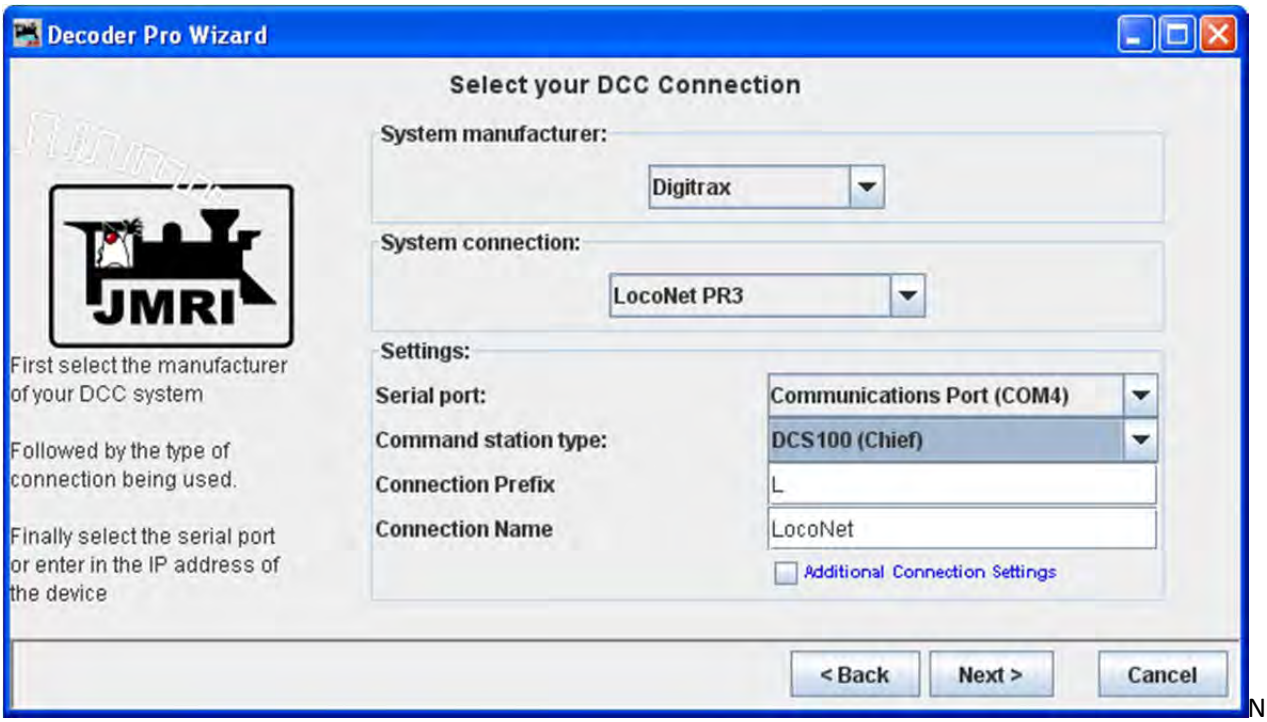
Select your system and other options for your system will be shown.



Select your system connection.

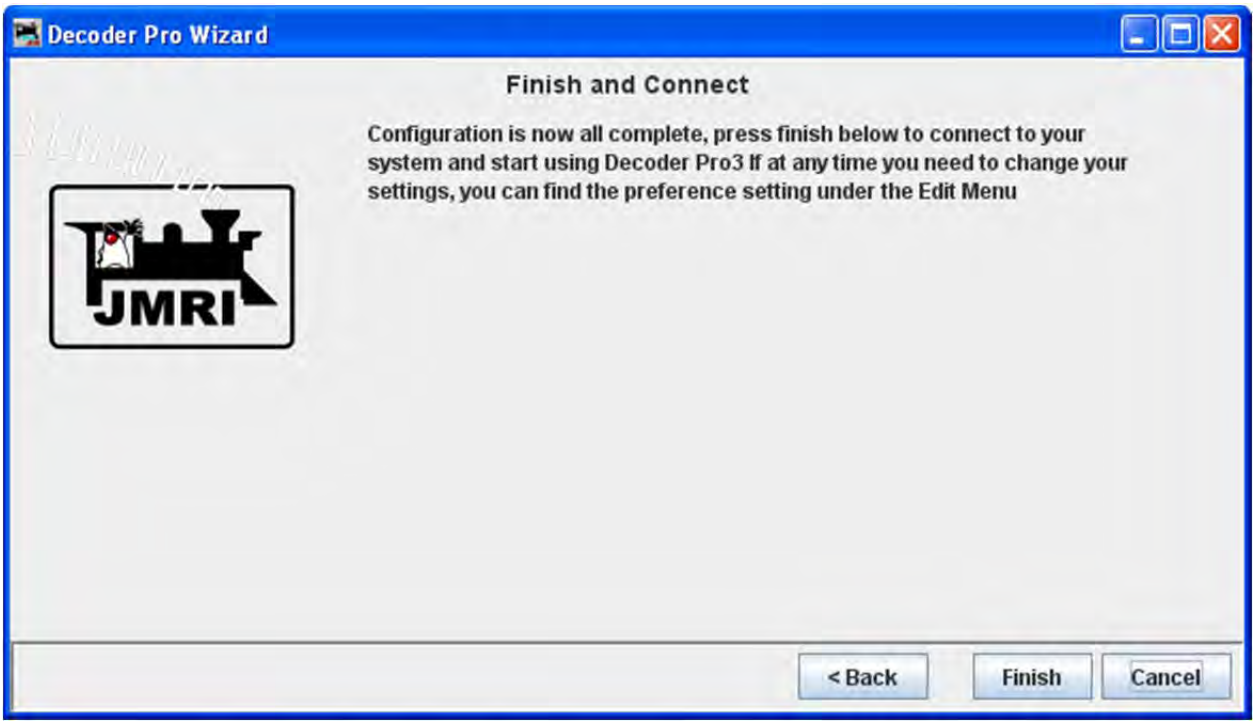


Select your Serial port and Command station type.



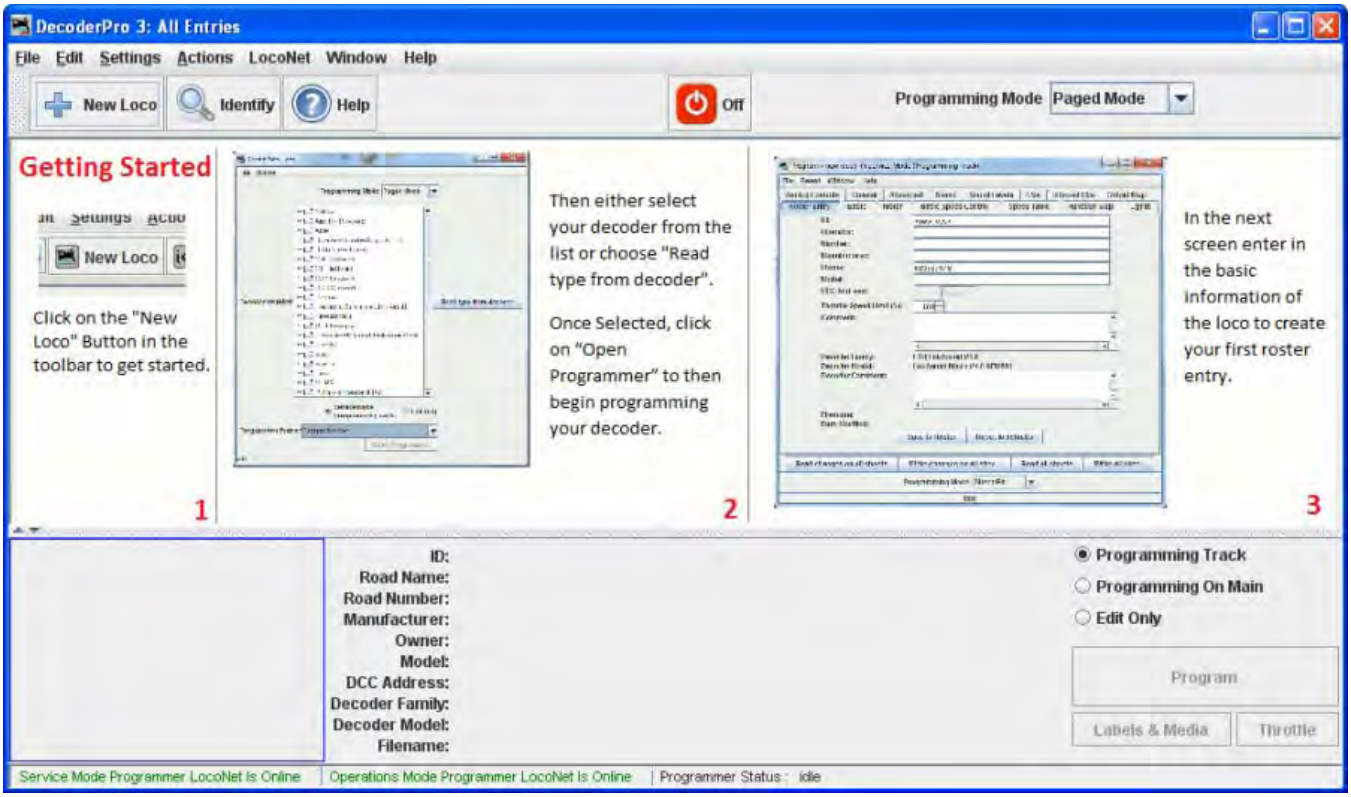
Next

Connection Prefix and Connection Name, at this time leave as default. Press the Next button



Press the Finish button

DecoderPro3® main window is displayed with instructions for Getting Started

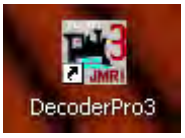


You may want to set up the other preferences at this time, if so go to Preferences screen will come up that allows you to set up the system for your particular configuration.

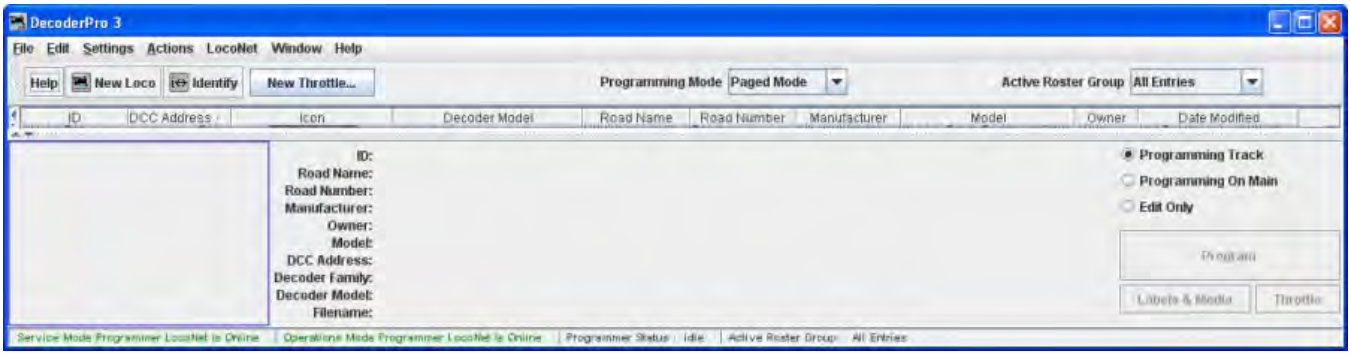
Previous user

If you are updating and DecoderPro® has been installed previously, then proceed here:

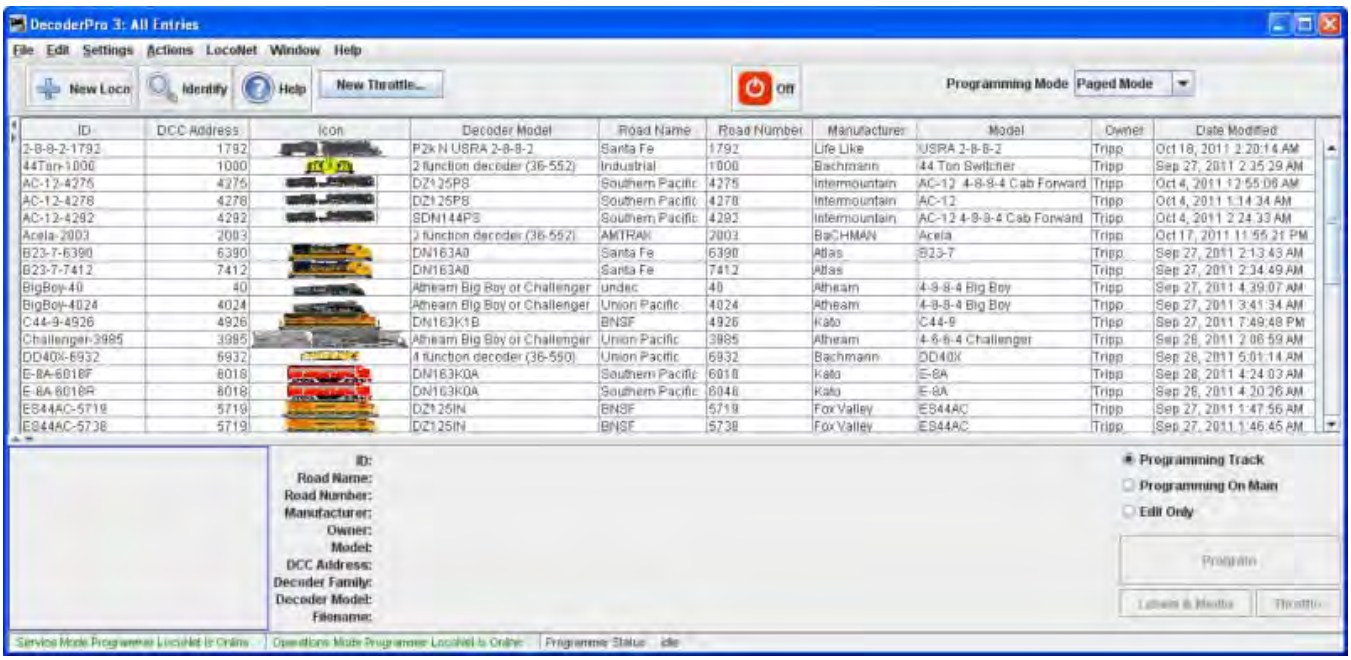
Once you have downloaded the JMRI software and installed it, simply open the program in the usual manner for your operating system. An icon for DecoderPro3® should be installed on your Desktop.



DecoderPro3® may be opened by double click on the Desktop icon and the DecoderPro3® initial screen as shown below will be displayed on completion of startup with no roster entries.



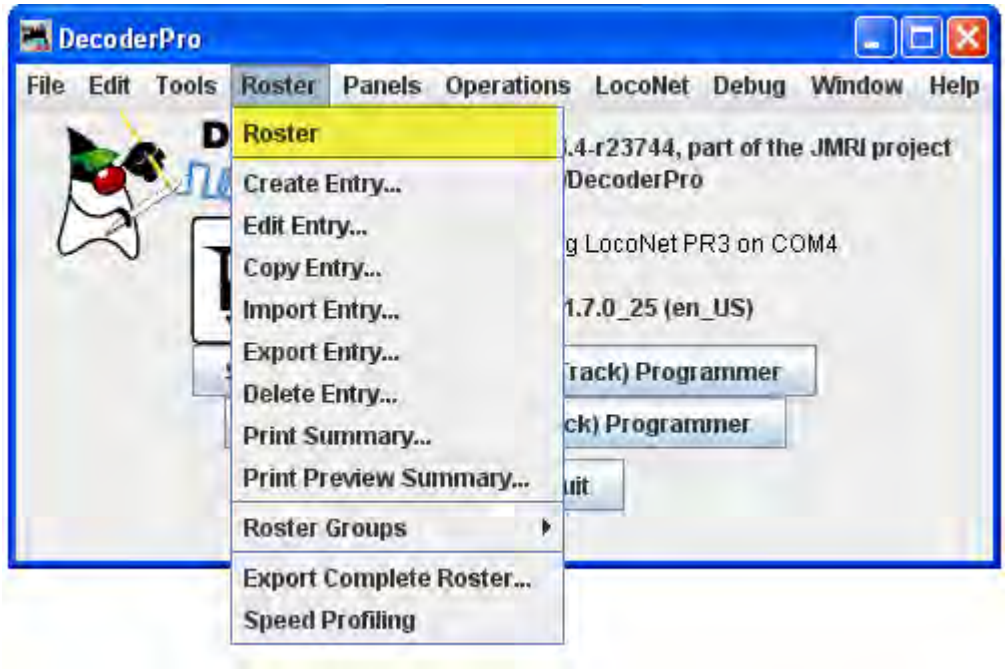
DecoderPro3 will open showing your roster entries if you already have established a roster of locomotives.



It may take a while for this screen to come up, especially on older and slower computers. Remember that you are essentially running the program on a Java emulator over your native operating system software. New computers can do this fairly quickly, but older ones will feel like they're taking forever. Be patient - it will come up eventually! Even on older computers, once the program is up the response time is quite good.

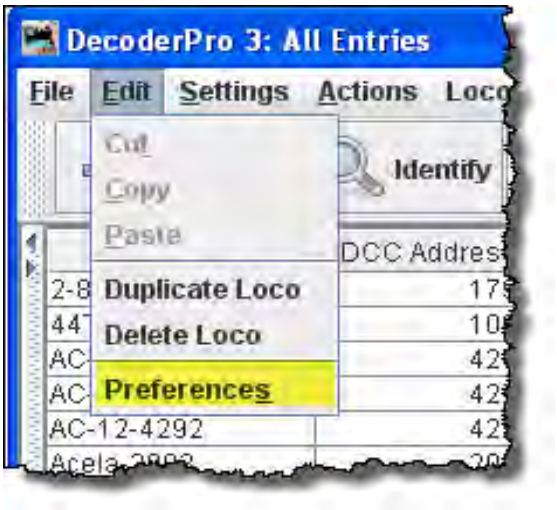
If this is the first time you have run the program after you installed the software, the Preferences screen will come up automatically to allow you to set up the system for your particular configuration. Also if you change your system configuration, or if you have your laptop away from the railroad, but you want to play with JMRI there is a simulator mode you may want to try. So click next, and we'll have a look at preferences.

DecoderPro3 may be opened from DecoderPro Roster Menu



How do I set up my preferences?

From the Edit menu in DecoderPro3 select **Preferences** option:



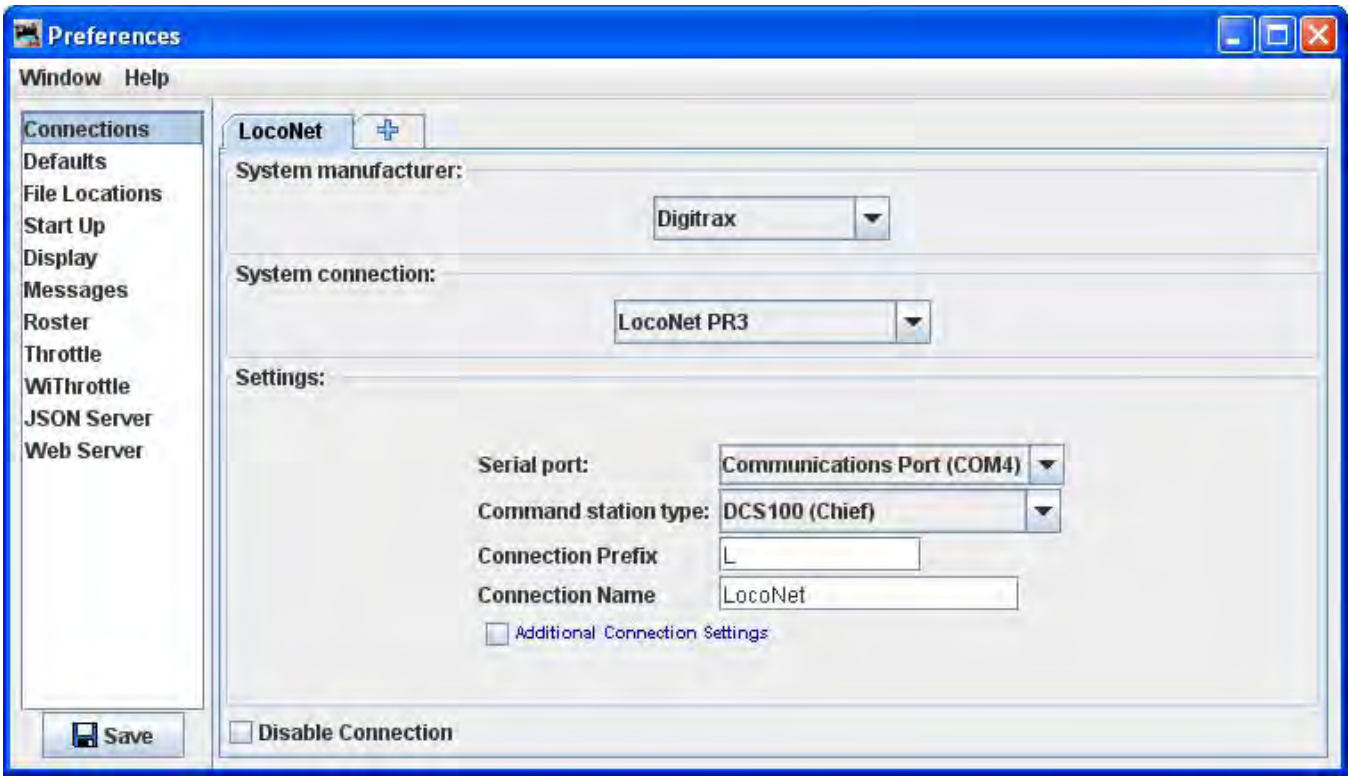
(This window may open automatically the first time you run the program.)

As a first time user the most important information is the **Connections** screen where you describe how the computer will talk to the command station. Most of rest you can leave at the initial or "default" settings until you find a need to change things to suit your fancy.

Most importantly, you must click the Save button to finalize your settings and then re-start the program to have them take effect.

The Preferences window provides access to the basic configuration information to connect your computer to your DCC system. You will be using that system to actually program and operate trains equipped with DCC decoders. An important concept to keep in mind is that JMRI is nothing more than a very smart throttle. If you can do something with your throttle you can probably do it faster and easier with JMRI. However, if your system can't do what you want, either because your system is not connected properly (it's broken) or the system manufacturer did not incorporate that capability, then JMRI will not be able to do it either. In the latter case JMRI will probably give you an error message or have the command "greyed out" to help you identify why it can't accomplish your request.

The window is split into two panes, on the left side is a list of preference groups that may be set. Clicking on one of the items opens the options that may be set in the right side pane. No selection have been made



Connections	Allows you to select the system connection that you are using for controlling DCC and the connection to your computer. This is the only required preferences to define your DCC system. The rest of the features are used to customize your specific system.
Defaults	Shows system default settings
File Locations	Set default location for saving User files and Script Files
Start Up	Allows you to set Actions, Buttons, Files and Scripts that run at Start Up
Display	Allows you to select your computer display mode
Messages	Set default actions for system message when displayed
Roster	Allows you to set your default Programmer and roster location
Throttle	Allows you to set up you Throttle preferences
Wi Throttle	Allows you to set up a Wi Throttle settings
JSON Server	The JMRI JSON Servlet provides web access to lists and values for numerous JMRI-defined entities, in the modern JSON format.
Web Server	Sets up the Decoder Pro® miniServer

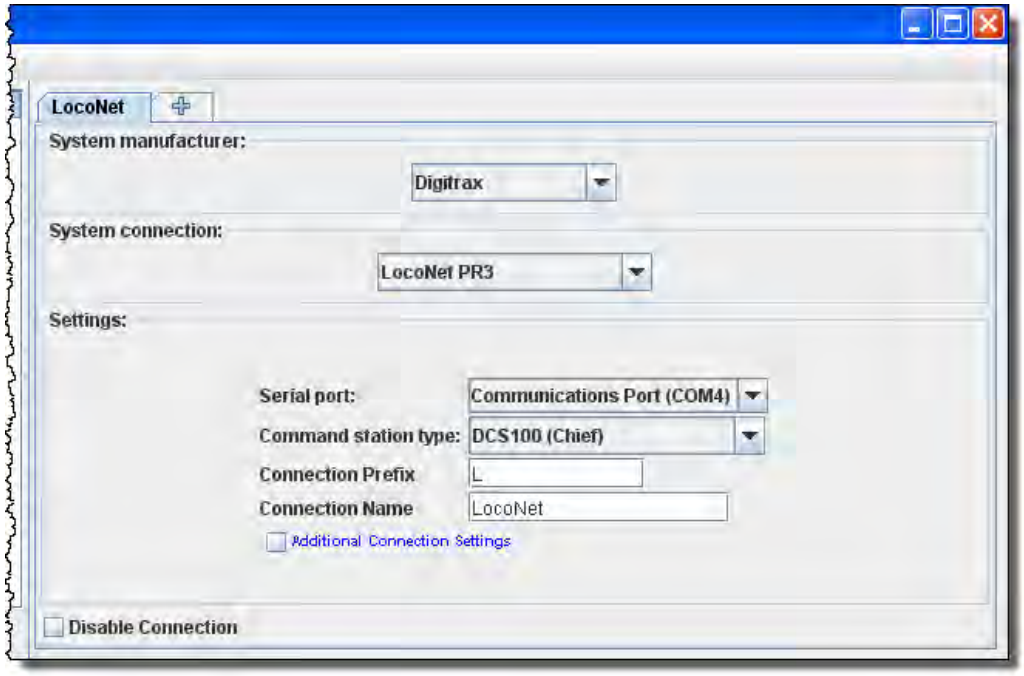
Now we will set up preferences for the JMRI environment with your command station.

I am using a Digitrax Super Chief Command Station (radio) interfaced to the computer via loconet, PR3 (MS100 mode) and USB port. I keep master roster on the System Drive.

Connections Pane

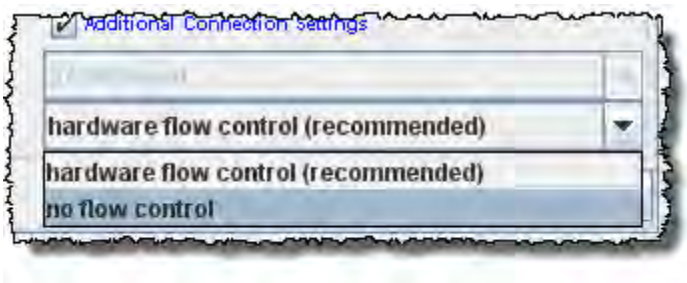
(TABS are configured to the system your selected)

Now select Connections and connection options display in right pane. After saved and restarted, the TAB will read LocoNet. This the set up for Digitrax Chief System with PR3 interface.



System manufacturer:	Drop-down list with all the supported DCC manufacturers, select the manufacturer of your system.	
System connection:	Drop-down list with all of the supported DCC system interfaces supported by the manufacturer that you selected, select the interface that you are using.	
Settings:	Serial Port:	Drop-down list to select the serial port to which your DCC interface is connected. If you do not know, check your system hardware configuration manual. A second drop-down list may include a selection if there are more than one possibility. Possibility Drop-down list to select the serial port to which your DCC interface is connected. If you do not know, check your system hardware configuration manual. A second drop-down list may include a selection if there are more than one possibility
	Command station type:	Drop-down list to select the command station type that JMRI will be using to send your DCC commands.
	Connection prefix	Include the prefix for your connection, in the case shown the "L" is default
	Connection name	Should default to the connection used

Additional Connection Settings, if checked:

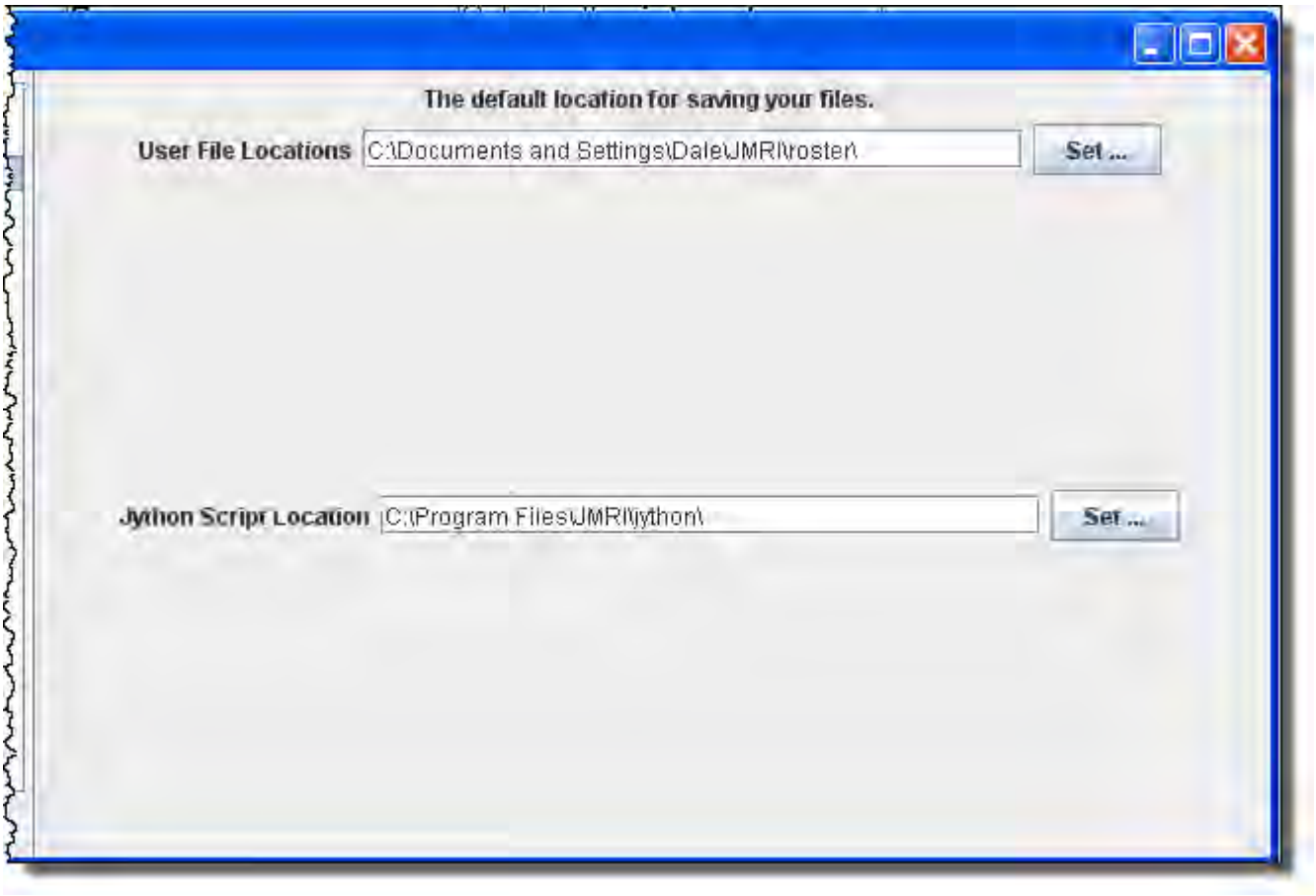


Disable Connection This option will disable all the connection settings.

Defaults Pane

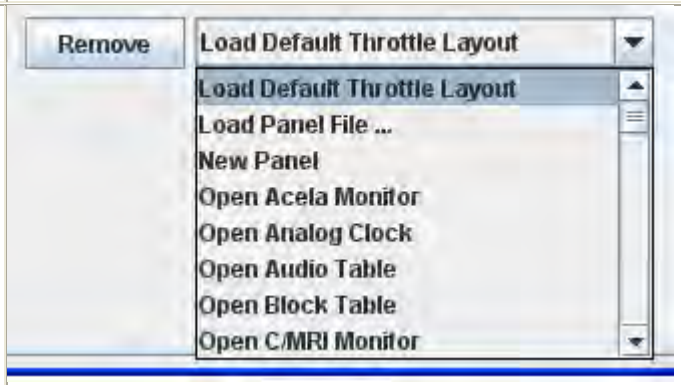
Shows the default settings which will depend upon the system used.

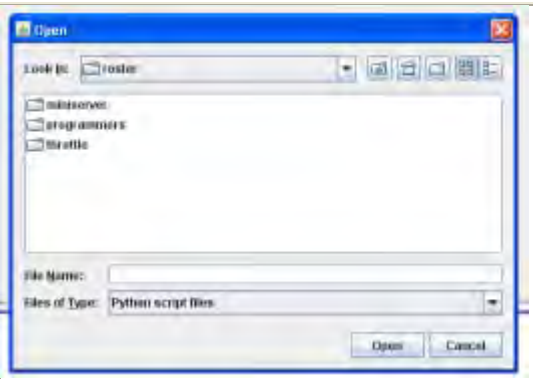
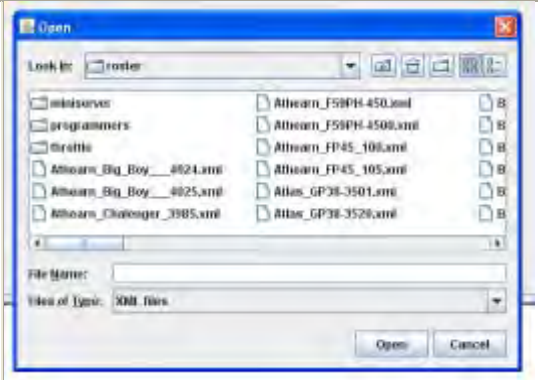
File locations Pane



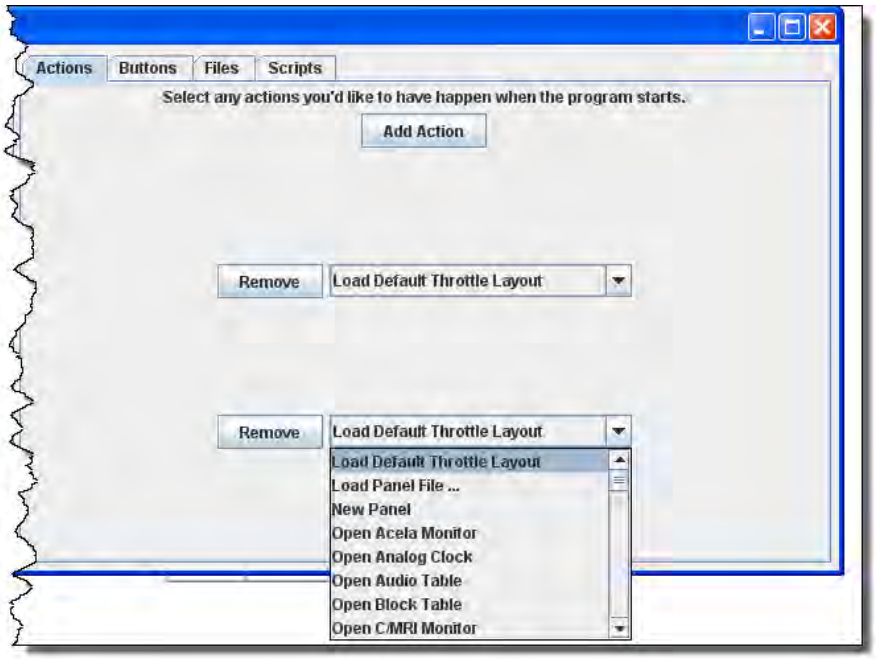
User File Locations	Select the location for your user files on your system
Jython Script Location	Set the location of Jython Script files

Start Up Pane

Actions TAB	Add Action to set up a Startup action	
Buttons TAB	Add Button to the toolbar of DecoderPro3	 

Files TAB	Add Files that you want to load at startup	
Scripts TAB	Add Scripts to load at startup	

You may add as many items as you want to open on start up. Example of **Actions**



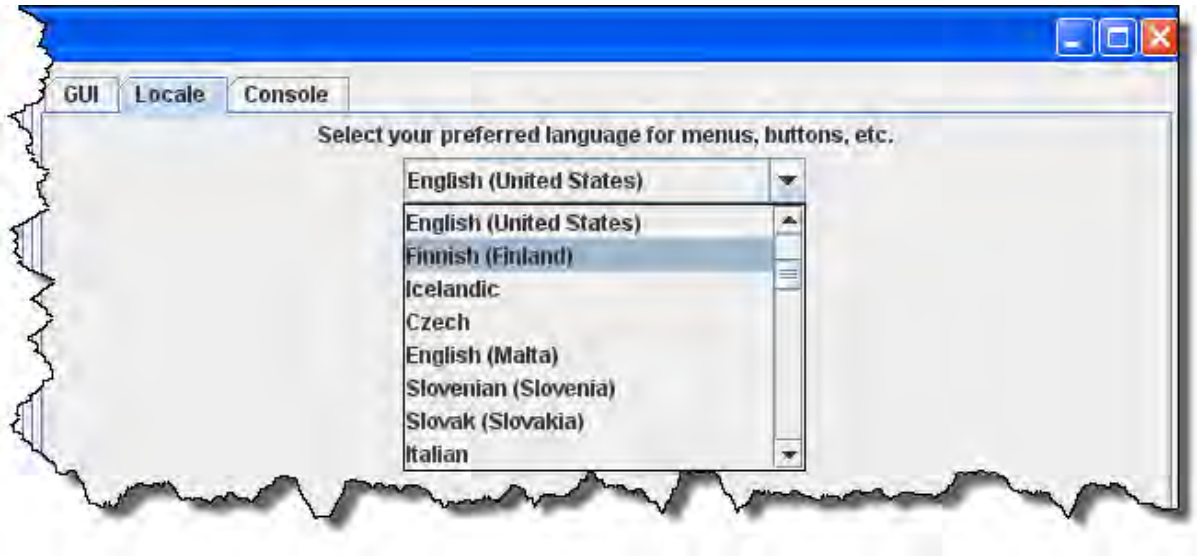
Remove Removes the item from the Start Up sequence. All of the panes are of the same format.

Display Panes

GUI TAB

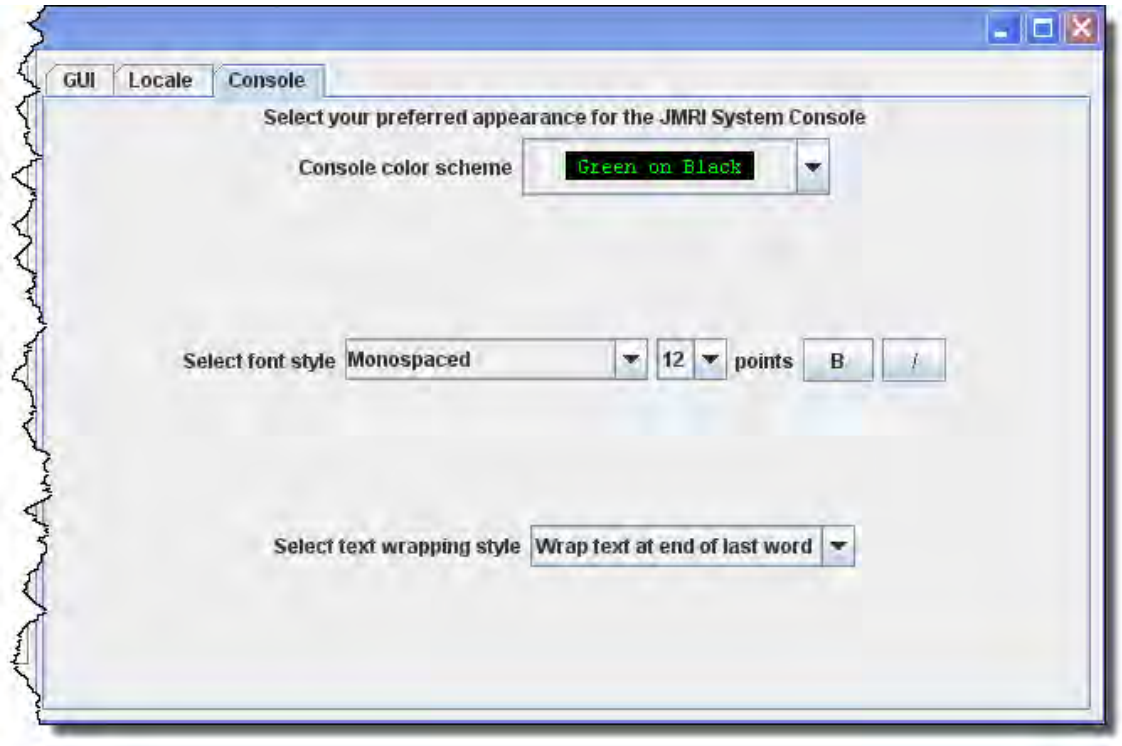
elect your preferred appearance for buttons, menus, etc.	Metal
	Windows Classic
	CDEMotif
	Windows
	Nimbus
Select font size in points	select font size
Use non-standard release event for mouse click?	

Locale TAB



Drop-down list to select your location and language

Console TAB



Display settings for the JMRI system console.

Messages Panes

TABS and selections can be used to set how and when messages are displayed.

Roster Panes

Programmer TAB

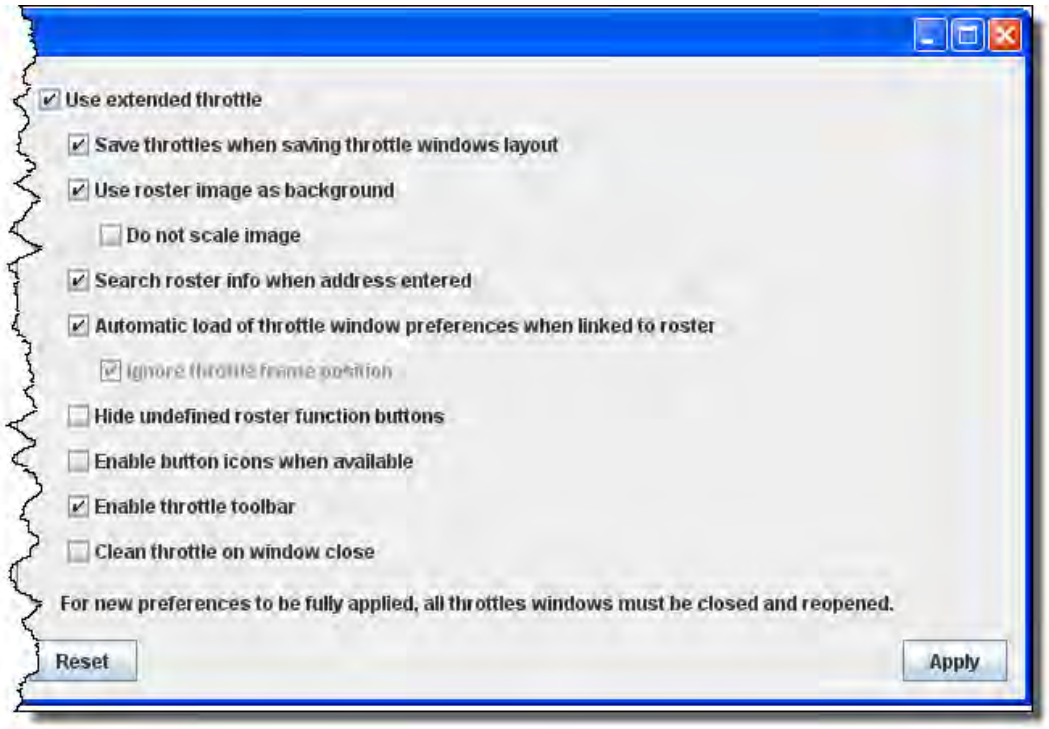
This pane is used to set the preferred decoder programmer.

Roster TAB

You may set the default location of the locomotive roster and the default owner's name.

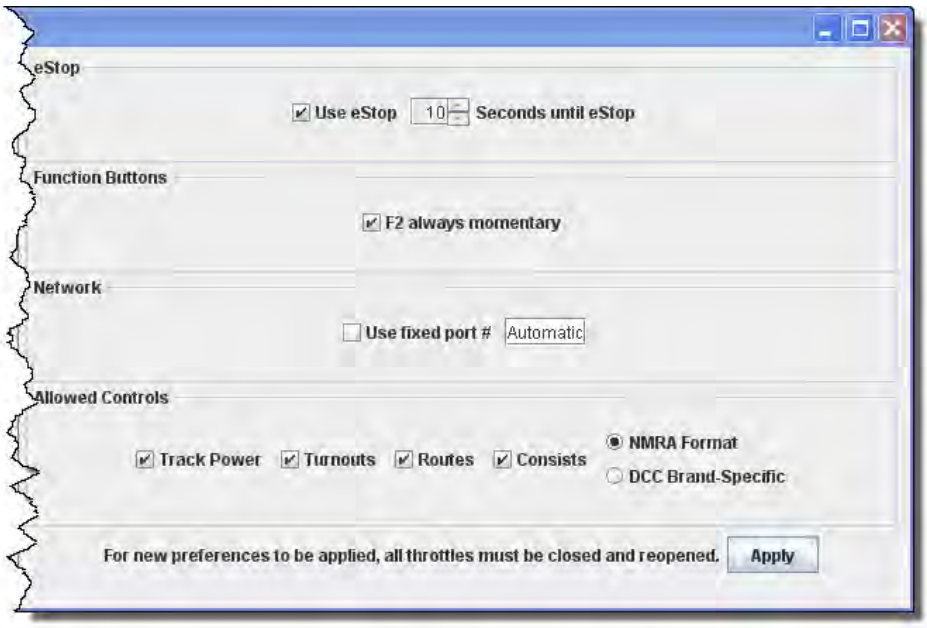
Throttle Pane

Select throttle startup conditions, shown are defaults, but you may change the settings.



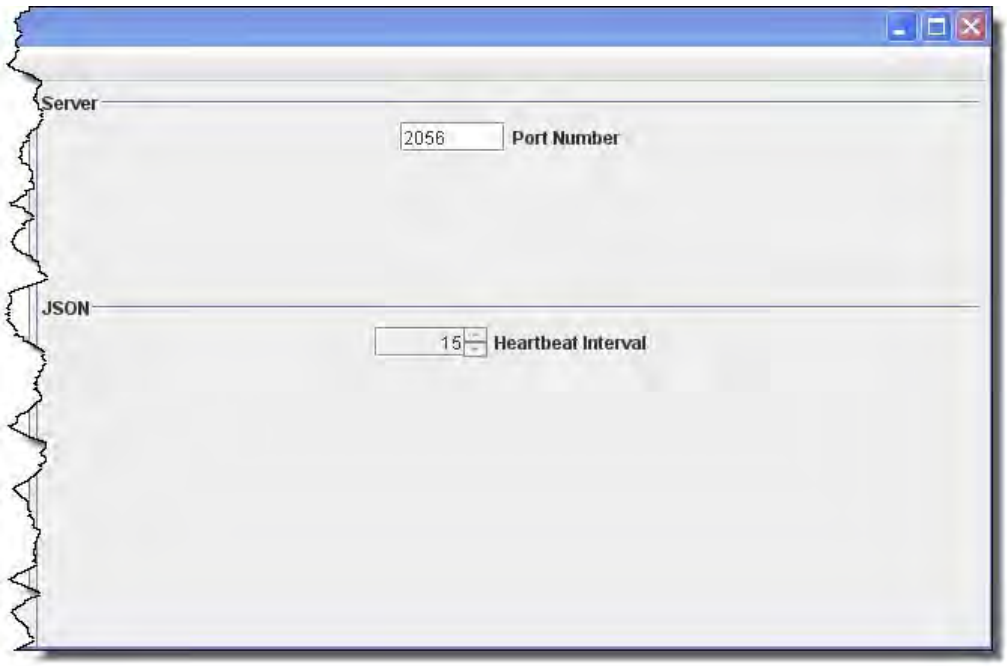
WiThrottle Pane

This pane allows WiThottle users to customize the setup.



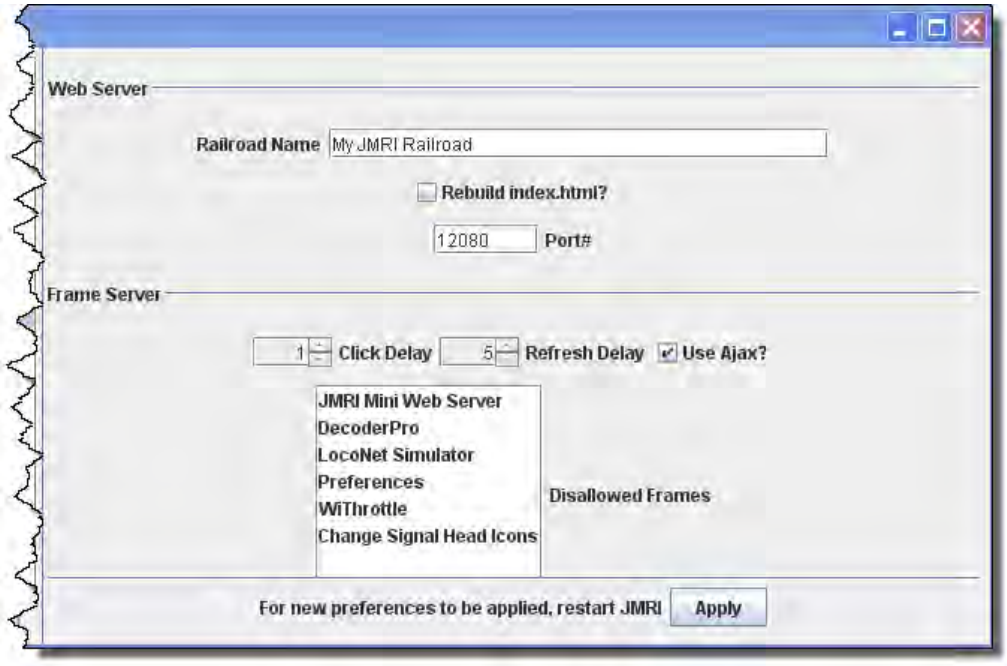
JSON Server Pane

The JMRI *JSON* Servlet provides web access to lists and values for numerous JMRI-defined entities, in the modern *JSON* format.



Web Server Pane

Use this pane to setup MiniServer if you are using it.
Ajax is now in use for smoother image refresh and clicking. For older browser you may want to unselect Ajax.



Before you exit the preferences, click on 

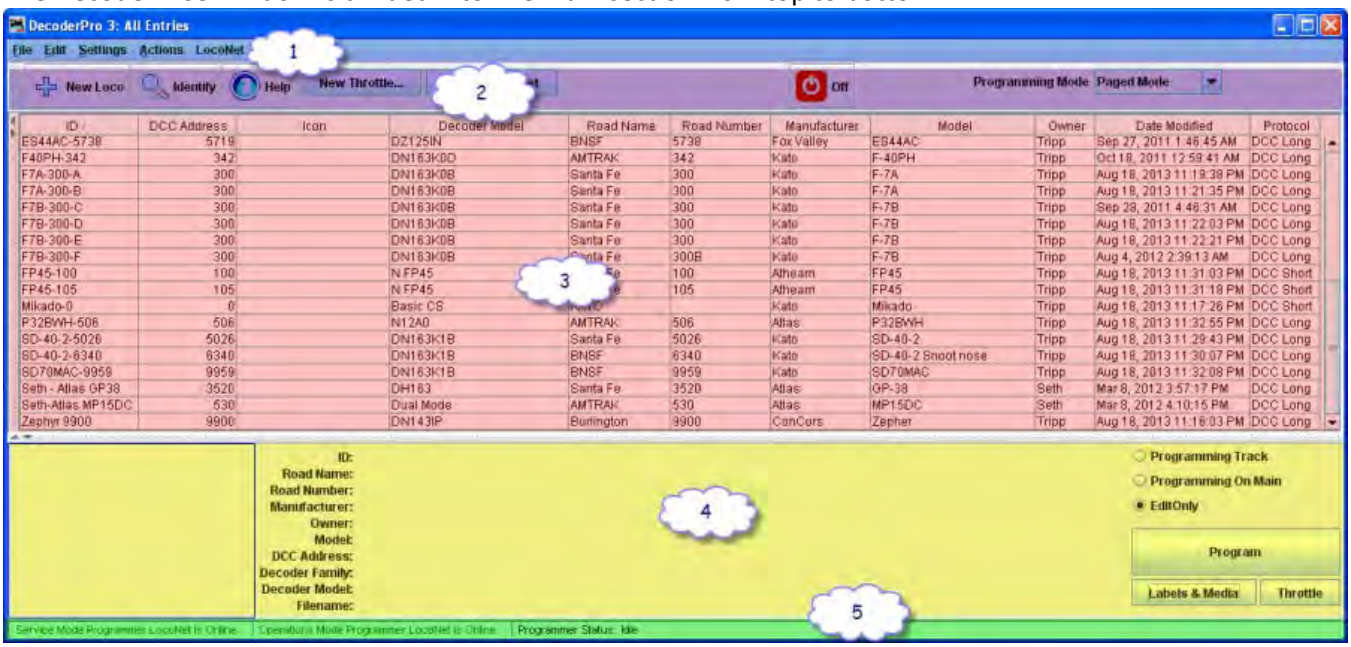
button to save all your selections.

You must restart DecoderPro for preferences to take effect

How do I set up to program a decoder?

Prior to using the programmer you need to have completed the previous section (Getting Started), have your computer connected to your command station/booster with the required interface device for your DCC system, you are now ready to actually program a decoder that has been installed in your locomotive.

On your initial opening DecoderPro3, the main page will be displayed: (After preferences are set) The list of locomotives programmed by DecoderPro3 will be blank until you add a locomotive. From then on when it is opened a list of all the locomotives whose decoders you have previously programmed in DecoderPro3 or classic DecoderPro will be listed.
DecoderPro3 provides access to the JMRI tools required to program DCC decoders. If you are an advanced user, using PanelPro to run your layout, then you may start PanelPro and then from the File menu start DecoderPro3.
If you already have roster entries and you want to start programming in **Comprehensive Programmer**, double-click on the roster entry.
DecoderPro3 by its self may program DCC decoders and also use the other JMRI tools to manually operte your trains from the computer interface. These include throttle control and power control of your layout if your DCC system allows them..
The DecoderPro3 window is divided into five main section from top to bottom.



1. **The Menu Bar**.
2. **The Tool Bar**
3. **The Roster Table** a list of all the decoders in your roster that are part of the active roster group. To set-up a roster group in addition to the default group of **All Entries** see **Settings for Roster groups.**.
4. **The Decoder Information Area**. Show information about any selected locomotive in the roster list.
5. A **status bar** that reports information about DecoderPro3 operation including errors.

Anywhere in the roster table you may right-click and a context menu will be displayed.

Context Menu (Right click)

Program

Programmer type

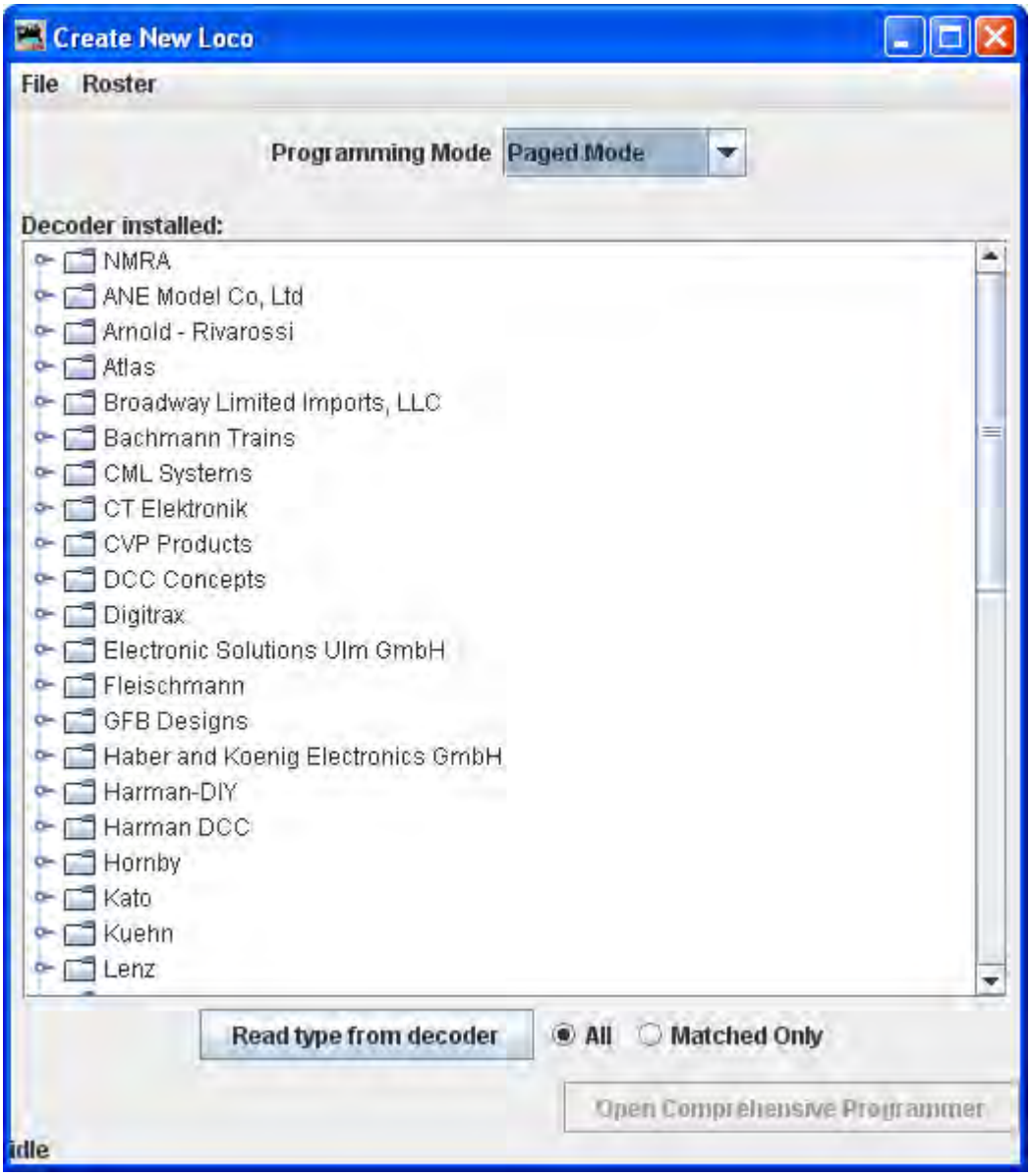
- Programming Track
- Programming on Main
- Edit (Allows you to edit roster without making changes to program)

Labels and Media	Opens programming page to select either Labels TAB or Roster Media TAB
Throttle	Opens a JMRI Throttle
Duplicate	Duplicates the selected roster entry to use for same type of locomotive.
Delete	Deletes roster entry.

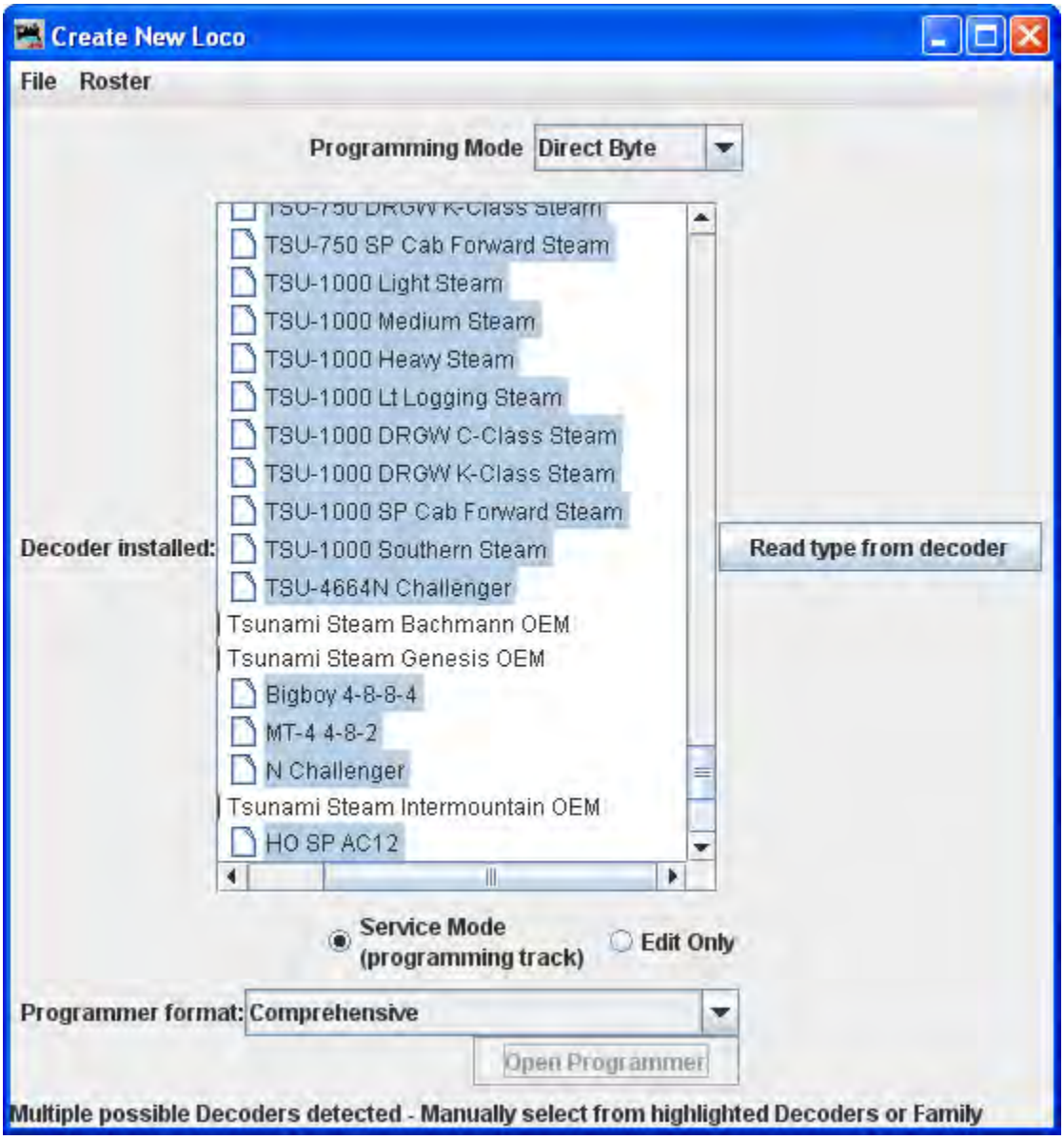
At this time a new user will have no entries in the Roster list of locomotives. If you are updating program and have a Roster installed the Roster list will be populated as shown. We can now add a locomotive to the list.

Adding New Locomotive

On the Tool Bar is an icon labeled **New Loco**, click on the icon and the **Create New Loco** window opens. Place a locomotive (with the decoder installed) on the Programming Track (Service Mode), click on Read type from decoder button (mid right side)

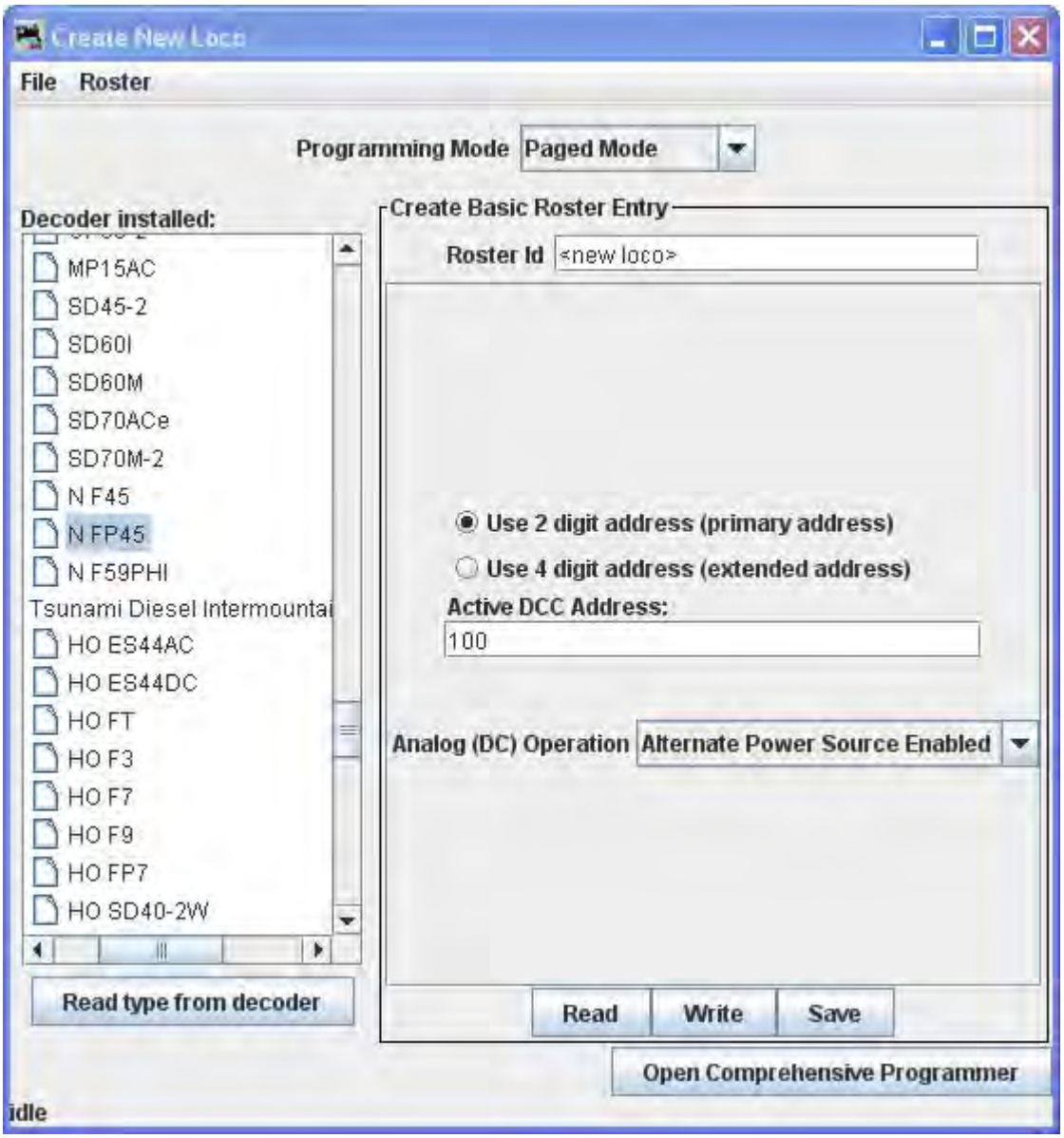


The screen below several possible decoders will probably be highlighted. This happens because the decoders are electrically the same but are packaged differently to fit the locomotives that they are used in. If you know which decoder is in use, then select that one. If not, in most cases any of the highlighted decoders will work, and you should select the one with the least letters at the end, since letters are often used to denote locomotive specific variations. Note all of the Tsunami decoders are using the same hardware in different configurations.



Note that we have selected a decoder, which is highlighted. Also the **Open Programmer** button is activated to allow us to enter the programmer and the Pr**ogrammer format** may be set to **Basic** or **Comprehensive** using drop down list.. As a beginner you may select **Basic,** or if experienced select **Comprehensive.**

I know that this decoder is Athern FP-45 factory installed decoder in nscale. So I will select that decoder.



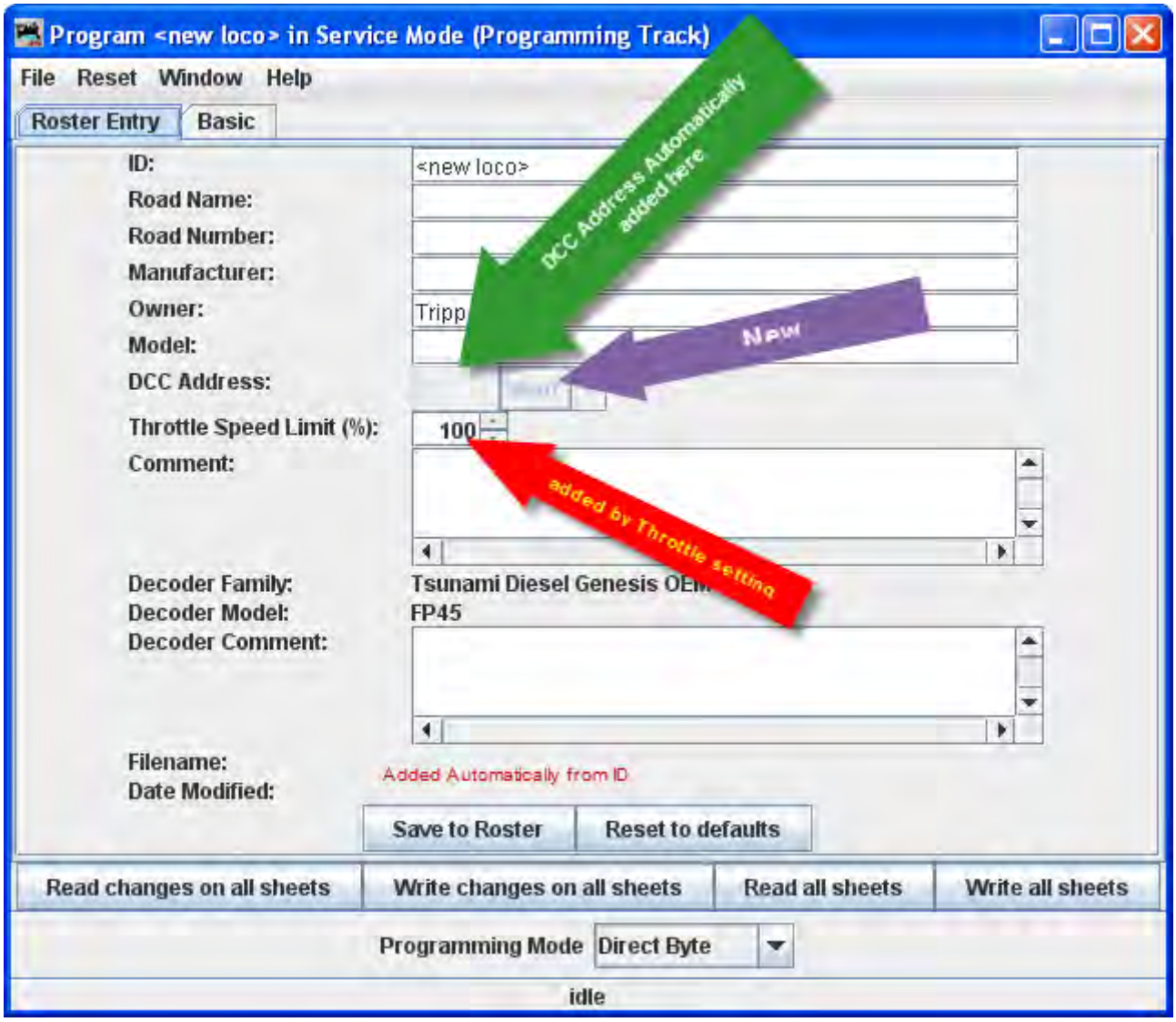
Click on the **Open Programmer** button and the **Roster Entry** Pane will open for the Selected Programmer. The programmer is opened.

The Basic Programmer

The Roster Entry Pane

The Basic Programmer uses only the required screens to set up the decoder for DCC operation and creating a Roster entry and uses only the first two TABs. The first action in programming a locomotive with DecoderPro3® is to fill out the roster entry screen.

A **roster** is a database of all locomotives that your installation of DecoderPro3® has programmed. All of this information will be contained in the list on the DecoderPro3 main page. It includes the information seen in the screen below:



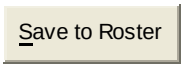
Most of these fields are self-explanatory. However, note that the first field (**ID**) becomes the file name in the Roster for the locomotive you are programming. Set up a schema to identify your locomotive to its decoder

program. I.e. Mfr, Loco Type, and Address (Kato_SD40-2_5645). Spaces in the ID field will be changed to underscores (_) when the file is written. In a club environment, often the ID begins with the owner's name, or member number. This way the Roster (which is sorted alphabetically) will keep all of an owner's locomotives listed together. This is not as necessary with DecoderPro3 as it is in the classic DecoderPro®, because it is now possible to sort the information on the opening screen using any of the columns by clicking on the column heading. DecoderPro3 also allows you to categorize roster entries into Groups, so you could have a separate group for each member.

We'll get to Groups and all the other neat stuff that can be done with DecoderPro3 in a while. I just thought I'd give you peek behind the curtain, and give you a chance to mentally thank the JMRI developers for all their work on DecoderPro3. Of course a message to that effect posted to the JMRI Yahoo group would also be warmly received.

The DCC address will be filled in automatically when we get to programming the address. The Decoder Family and Model are entered automatically from the Selection page we just used to get here.

The **Decoder Comment** field is a good place to add the date you purchased the locomotive, price, or any other information you might feel is important to record.

The 

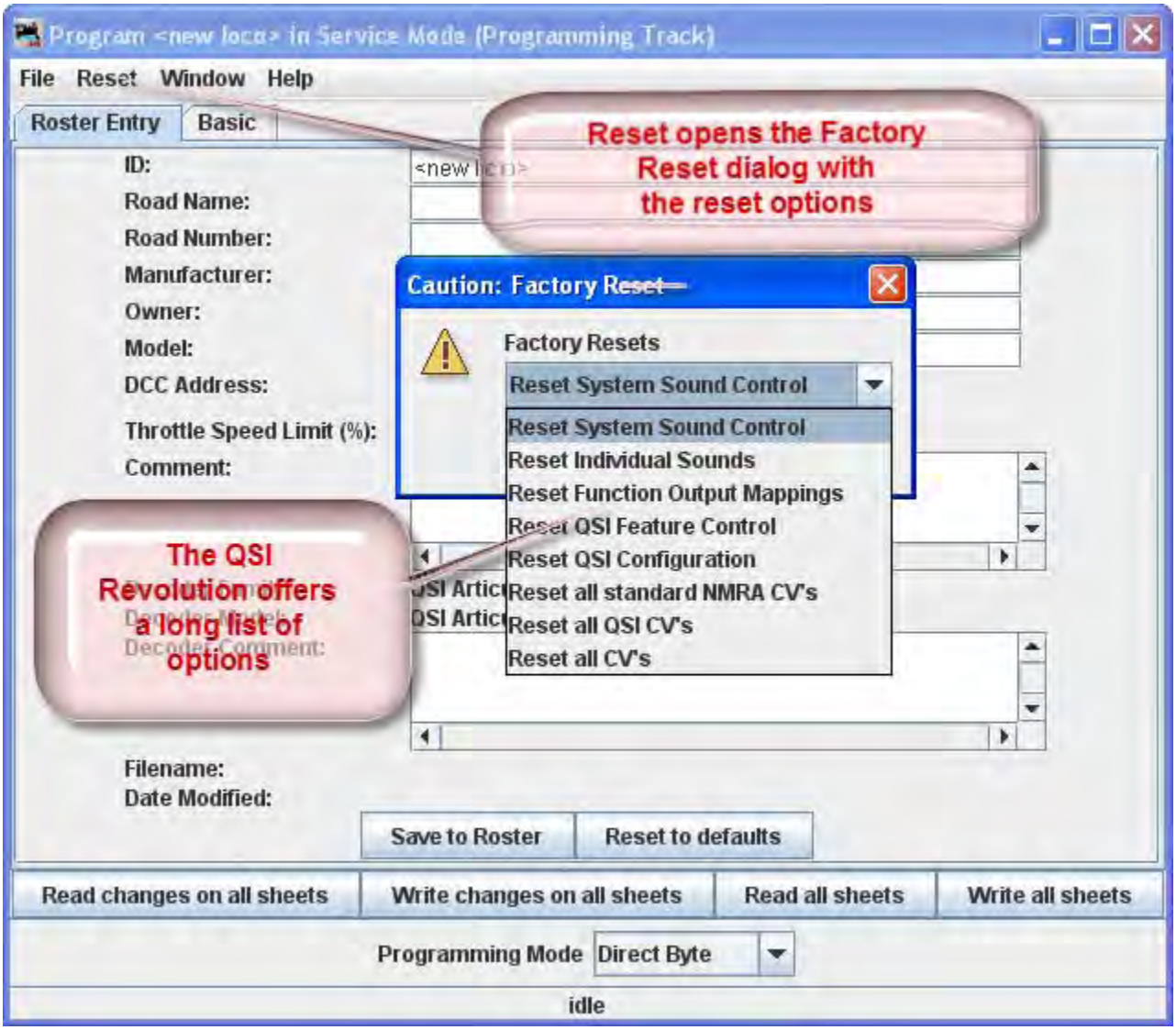
button stores the current decoder information to your computer hard drive and folder where your roster file is located. The default storage is the same directory where the program is installed.

The 

button can be used to return the Roster file to the condition of a new file for the type and version of the decoder listed in the roster entry. It does NOT change the values in the roster file on your hard disk, unless you specifically save it after using this reset button. It also is not written to the decoder until you specifically select a write operation. It was included in DecoderPro so that if you get hopelessly confused in proceeding screen to screen entering variables, you can return to the decoder manufacturers baseline default set and start again.

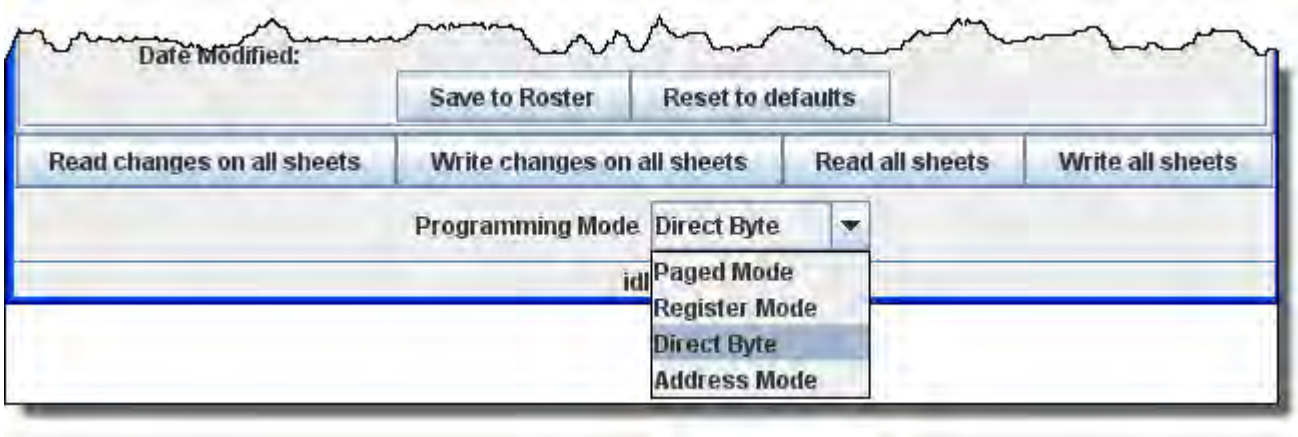
Most decoders will activate the **Reset Menu** (next to the File menu at the top of the page). This will reset the decoder to the manufacturers default settings for all the CVs, or just some of them if the manufacturer has several reset routines. It does this by writing directly to a CV in the decoder, if the decoder has that feature, CV8 in the case of Digitrax. All decoders may not support reset and how they work is manufacturer and decoder dependent.

One decoder with a lengthy list of reset routines is the QSI Revolution decoder, which enables a drop-down list of options for resetting the decoder as shown below:



You will note that the decoder address is shown but grayed out (or blank if this is a new locomotive in the roster). This field is automatically filled in by the program and is determined from the address entered using the **Basic** tab which we will get to shortly. This address is used with the **Ident** function on the start page if you wish to recall a locomotive that is already in your roster.

The Programming mode can be changed by clicking on the drop down box

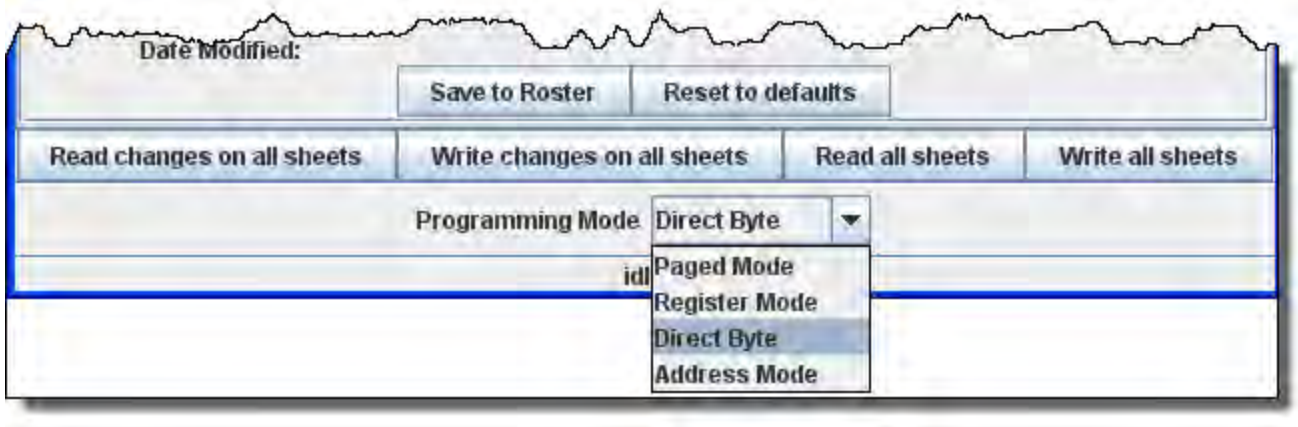


There are options for several **programming modes**. JMRI now selects the best mode for you. It determines this from the command station type you are using and the decoder model you are attempting to program. Usually this will be OK. If you find that you are having a problem with programming you may try a different mode.

For most newer decoders, stay with **Paged mode** or whichever Direct mode your Command Station supports. Your decoder documentation should let you know if programming in some other mode is necessary... but if you are having problems, experiment. If a mode is not supported for the selected decoder and system, that option will be grayed out. For this decoder I will use Direct Bye Mode.

When you make your selection, the programming mode should now display to the left of the in the dropdown box.

Programming Modes



Some brief comments on Programming Modes

Address Mode is an outdated programming method that is included here for the sake of full compliance with the NMRA DCC standard.

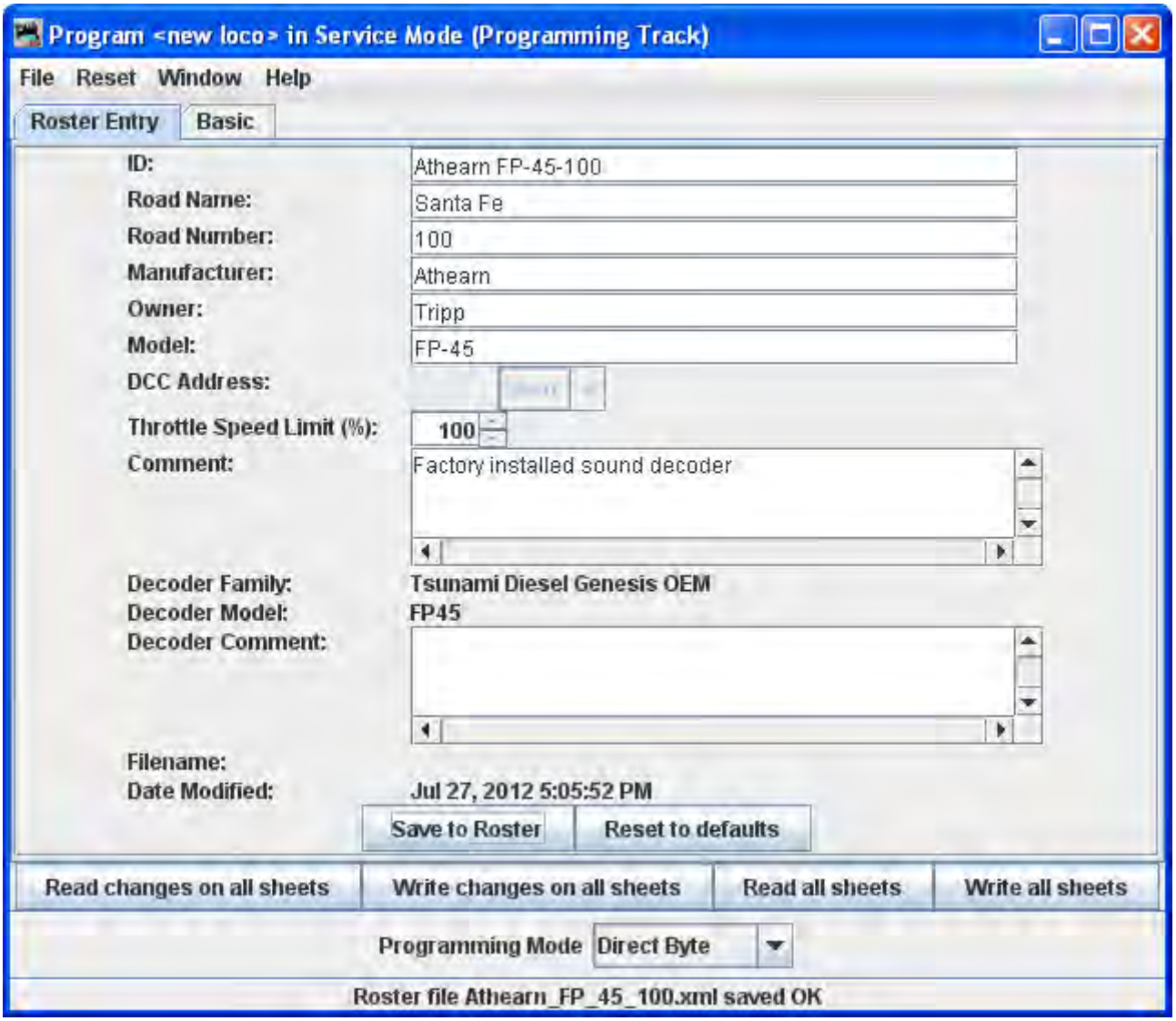
Register Mode is an expanded form of Address Mode, and is still used by some older and/or lower end decoders, particularly some from MRC and Wangrow. It is inherently limited in its ability to access all CVs in a decoder.

Paged Mode is an expansion of Register mode that gives full access to all decoder CVs.

Direct Mode is another method, not yet supported by all decoders, that allows full access. There are two ways of implementing Direct Mode. The radio button(s) for the Direct Mode method(s) your command station supports will be activated.

If you experience difficulty programming a decoder in Paged Mode, try Direct Mode, then Register Mode, and finally Address Mode. The EasyDCC AD4 Accessory Decoder can only be programmed in Direct Mode.

Below is a Basic Programming Roster setup for Athearn FP-45 locomotive in n scale with OEM decoder (Tsunami 750) decoder. Note in the status at the bottom of pane indicates that the file has been saved.



Now that we have the Roster information all in order, we can continue with programming the decoder.

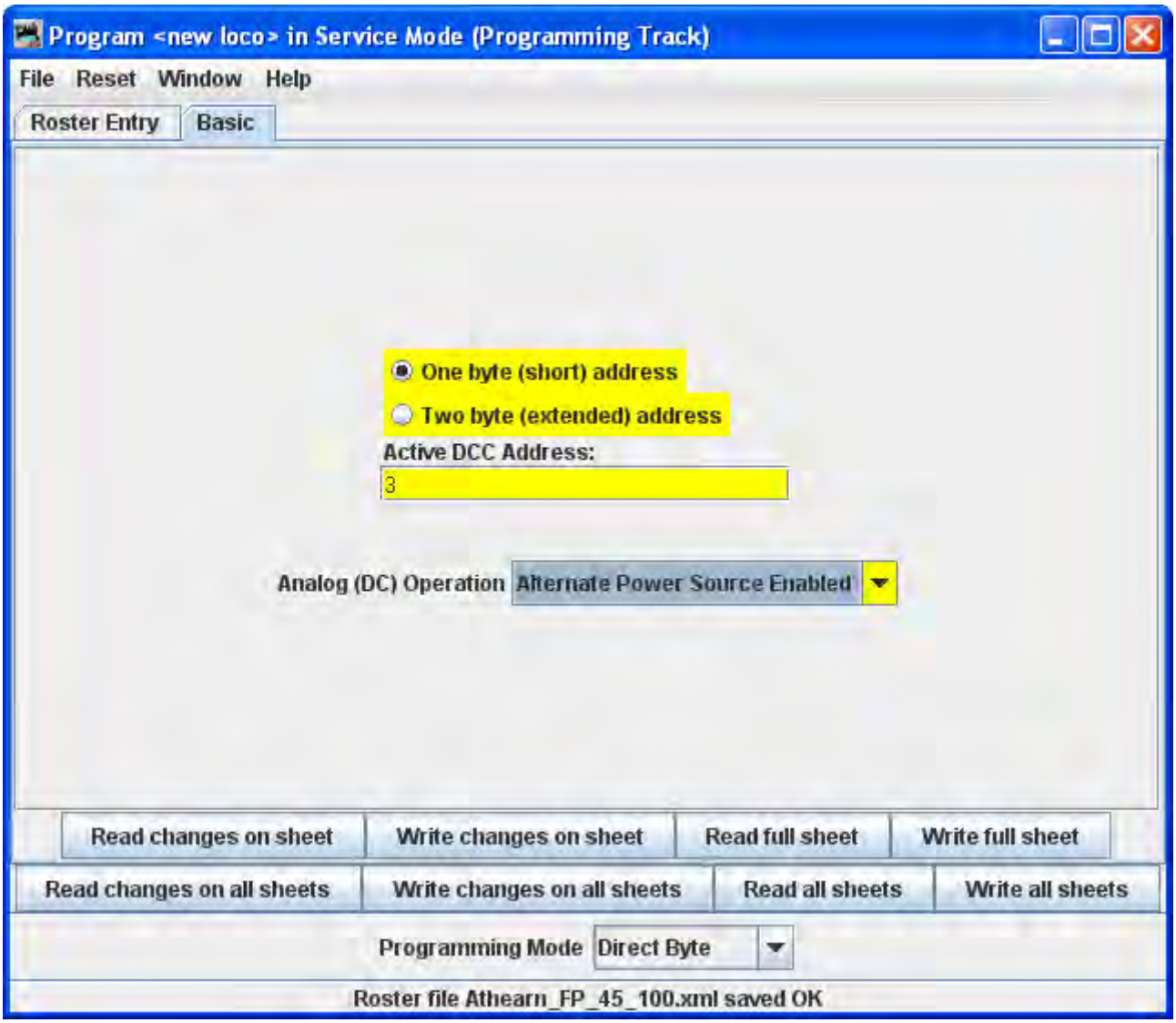
Now it's time to click on the **Save to Roster** button to save this data. Note that there will be brief message in status bar at the bottom of the screen that roster has been saved.

Let's move on to the Basic Programmer.

Basic Pane

You may have noticed that at the top of the window are two tabs: **Roster Entry** and **Basic**. We have completed the **Roster Entry** pane of the Program window, now, click on the **Basic** tab to change panes to continue with programming your decoder. The **Basic** pane will be displayed and look similar to the following illustration: Many panes in the programmer contain decoder dependent features, as a result what you see may not exactly agree with what you see here. Only those variables that your decoder can implement will be shown.

Below is a screen for OEM decoder that is used in the **Athearn FP-45** locomotive. Shown in factory settings, which is normally address 3



.

You will see three options you can change, highlighted in yellow:

1. The decoder address (should be unique among your locomotives, unless you are operating sevral as a set) often the locomotive number is used.
2. Two radio buttons that let you toggle between 2 digit (one byte, "Normal") or 4 digit (two byte, "Extended") addressing
3. Analog operation (enables the decoder to run under regular DC voltage/analog control) Enable Analog Operation with caution, as some decoders will jump to full speed resulting in a "Runaway locomotive" if they are enabled for Analog Operation and encounter power spikes on a DCC digital signal. They seem to get confused, and revert to Analog operation and use the full track voltage DCC power to take off and GO! There is no stopping them without removing layout power. Very disturbing to your operating mates, but better than running into them at full tilt.

   To enable Analog (old style DC, some vendors refer to this as dual mode) Operation select the appropriate entry from the drop-down list.

The yellow highlighting indicates these options are "probable" settings and have not been confirmed from the decoder. Settings that have been changed by the user and have not been written back to the decoder appear in a orange color. You will see examples of
this throughout the manual.

To read the actual settings for these options (and IF your system and installed decoder will allow read back of decoder values), click on the **Read full sheet** button. The individual settings will turn red while they are in the process of being read (clever, eh?), and will turn white once the values have been read successfully from the decoder. Once again, Decoder Pro must play "Twenty Questions" to get this information, and sometimes even has to ask a couple of times.

Be patient, especially with older computers. At the very bottom of the pane (where it says "idle") you will see a running account of exactly what DecoderPro is doing, for example, the specific CV being read.

Again, the Read full sheet button and Read all sheets buttons functions are dependent on your command station. If your system does not have the capability to read CVs, then these buttons will not be available.

If you wish to change the address of the locomotive, type in the new address. To turn on or off 4 digit addressing, select the desired radio button. . Be sure that the address type agrees with the number of characters in the address.

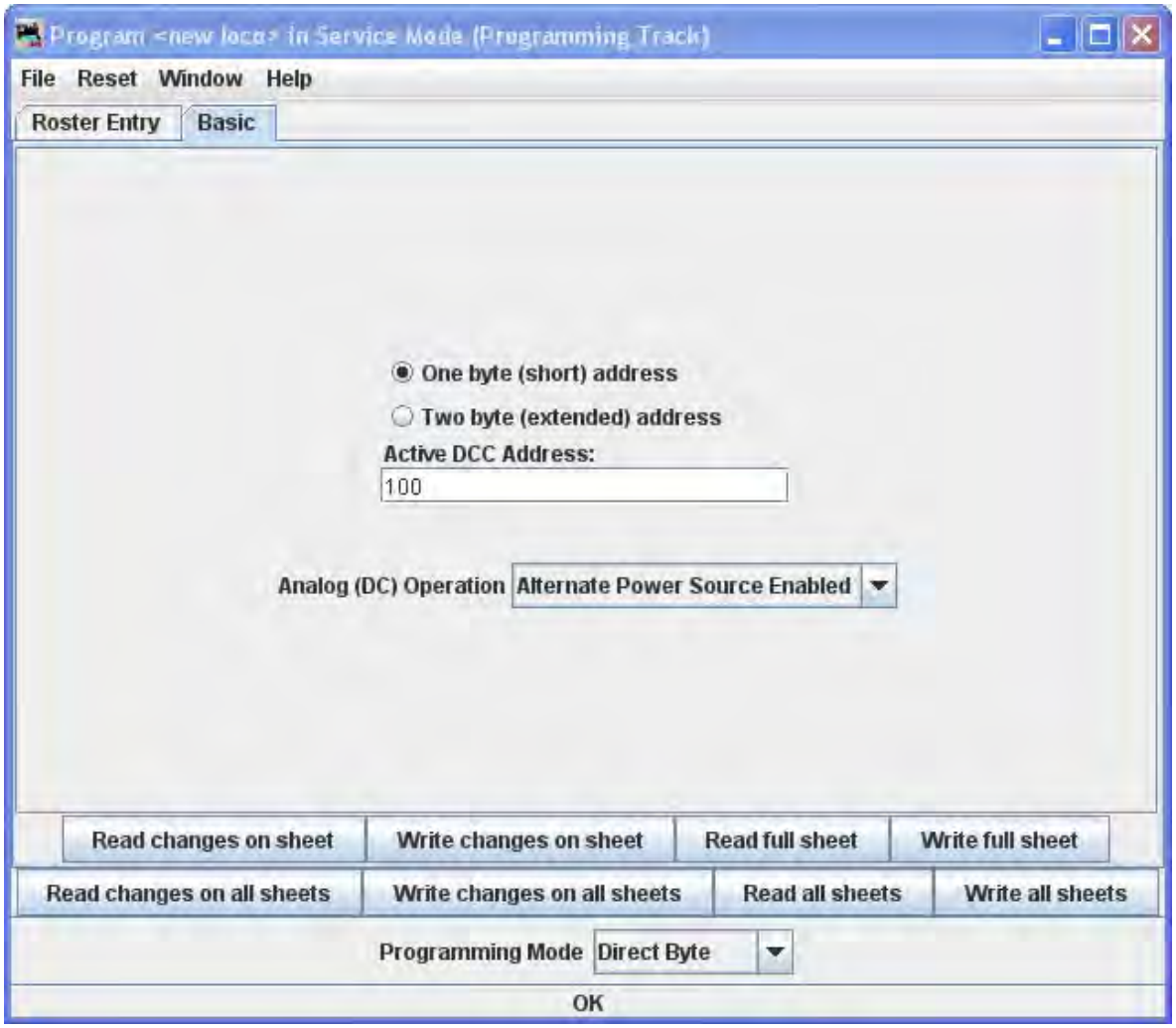
When you are finished, click on Write full sheet button to write the new values in the decoder.

Writing usually takes much less time than reading, because the value can be sent directly. As the write operation proceeds, the data will change from yellow to white. If there is difficulty writing to the decoder, the data will change to red. The software will automatically keep trying until the write operation is successful. In some instances the system will "time-out" after a certain number of tries without an acknowledgement from the

decoder. This does not necessarily mean that the values have not been written, just that the program has not received an acknowledgement. This can be due to the locomotive moving and getting on dirty track so that it can't pulse back or possibly because the command station or decoder cannot read back. Try moving the loco and try again. If it is a command station or decoder read-back issue, try the loco on the mainline and see if the programming was successful.

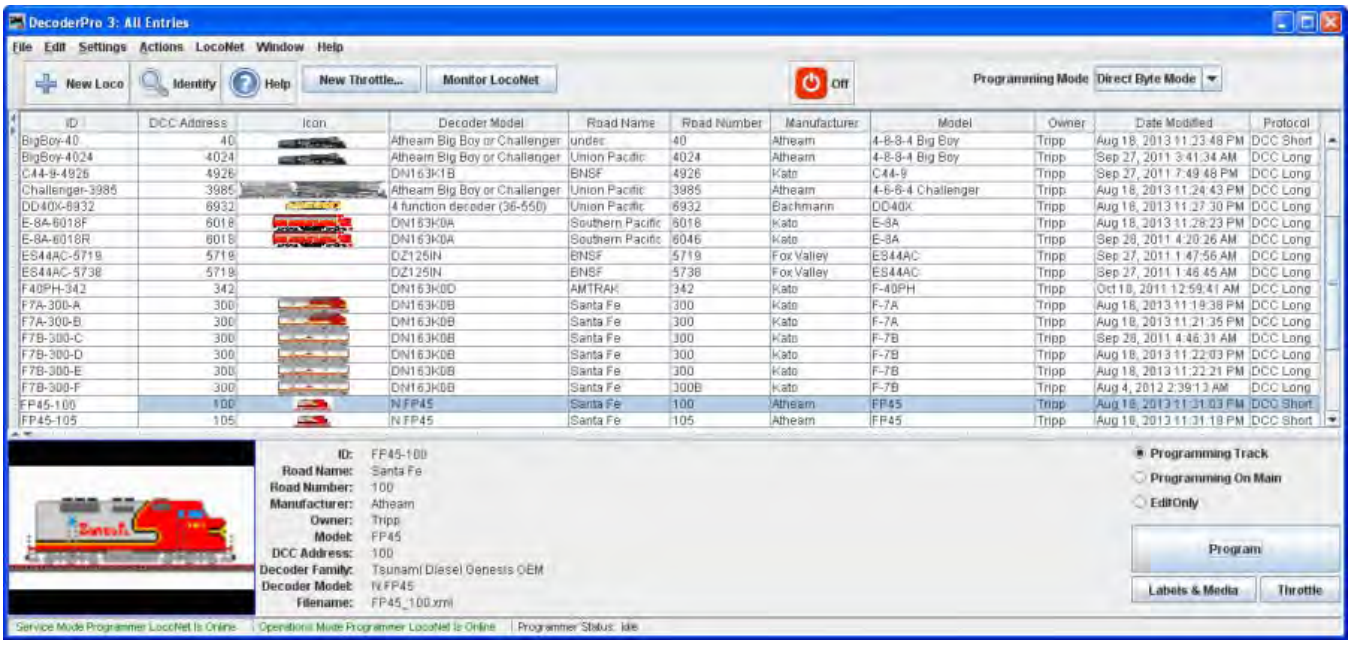
To finish this "basic" programming of a decoder, click once more on the **Roster Entry** tab, You will see that the address field has now been filled in, so you can now click on the **Save to roster** button. Your new decoder settings have now been written not only to the decoder, but also saved to a computer file where they may be recalled in the future.

I have programmed the address for this locomotive and clicked on the **Write full sheet** button to send the address to the command station to program the decoder. Note that the status line keeps you updated as to what is writing and should finish with OK, which is good or an error message which usually means the write was not completed. All the entries are now in white color as they match the decoder.



Now that we have entered the Roster data and set the desired address, let's return to DecoderPro3 Main window by closing the Programming window.

Notice that we now have a list of all the locomotives programmed so far that is in our roster.



What we've done so far is what is available in the Basic mode of programming in DecoderPro3. Which i basically puts the Locomotive in the roster and assigns an address. A good place to start for new folks or at a club programing locomotives. It's hard to go wrong, but you can change the loco address and add it the roster, which are the two most often needed actions with programming.

The classic DecoderPro offered a number of modes, most of which were often redundant and confusing showing how the user could edit the underlying file to make special application programming modes. The Comprehensive Programmer was the most popular for a long time until Advanced came along with added features. So now they've been combined in DecoderPro3. Thus the Comprehensive Programmer with added advanced features is the only other programmer that DecoderPro3 offers.
Since we've already covered **Basic**, let's explore the DecoderPro3 Comprehensive Programmer!

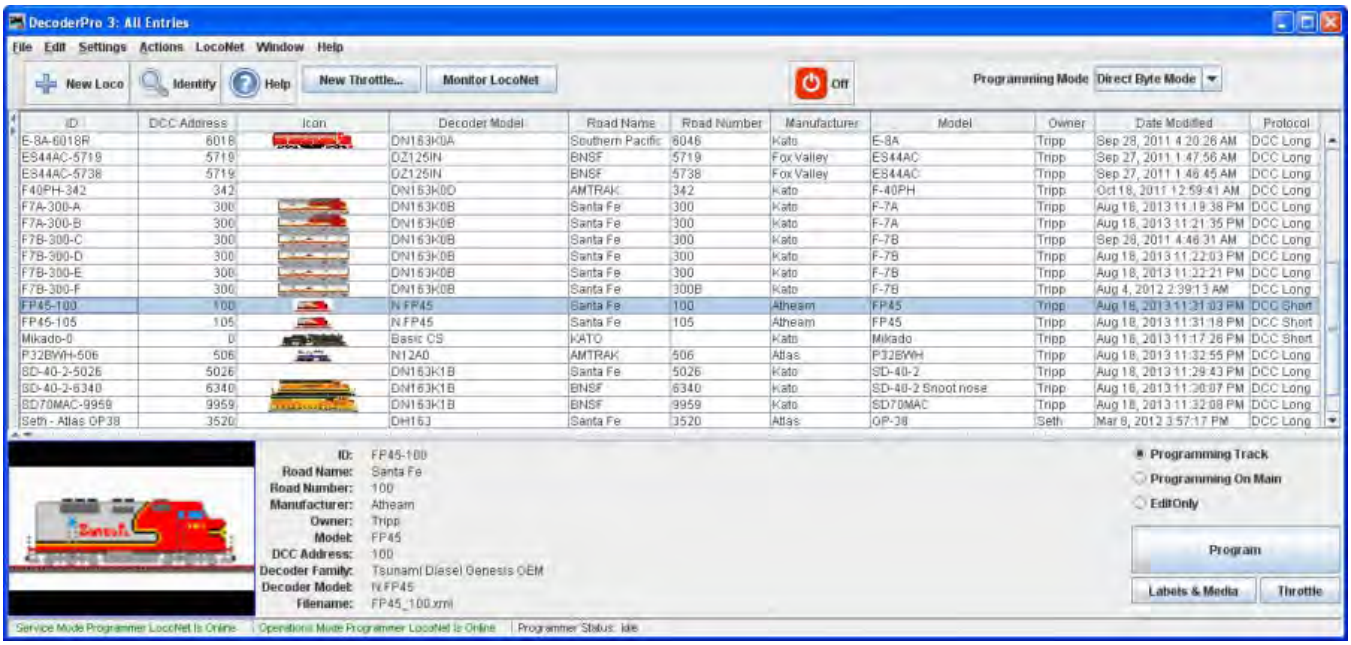
At the bottom of the window is the **Labels & Media** and **Throttle** buttons. Use these buttons to set up the Icon photos for your roster entries and to set-up the Function Labels on the software throttle included in JMRI®. Go to those pages and take a look.

DecoderPro3® Comprehensive Programmer

Roster Entry Pane

The **Comprehensive Programmer** begins the same way as the **Basic Programmer**, with a **Programmer Setup Pane** and a **Roster** Pane. The content are identical, so they will not be repeated here.

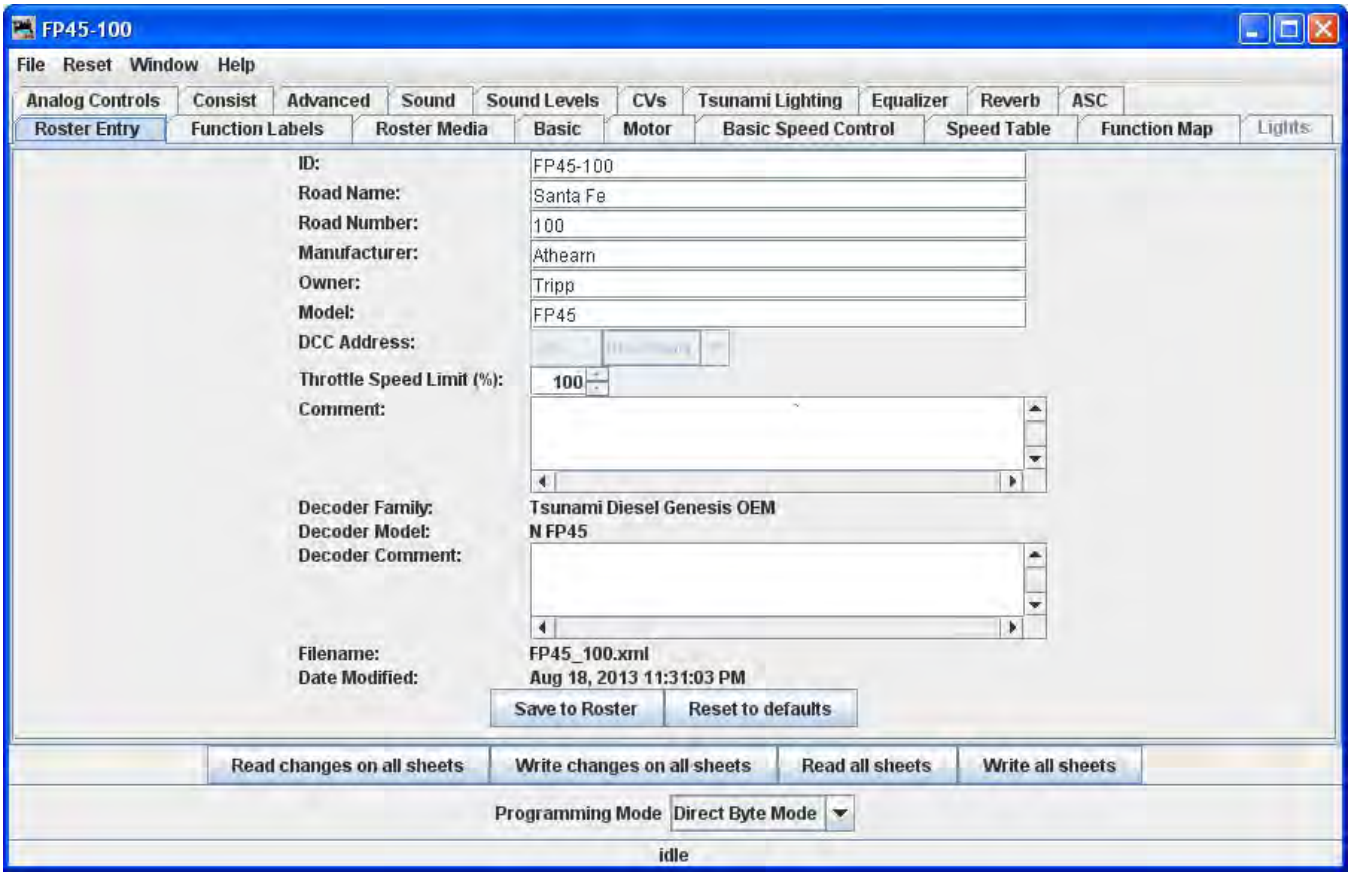
Just be sure that you select the **Comprehensive Programmer** in the DecoderPro3 **Preferences**, **Roster** pane, Program TAB, then select locomotive you wish to program from the DecoderPro3 main screen from the roster list, now press the **Program** button.



We have programmed the Athearn FP-45 in the Basic Programmer, it is on the roster list and has been addressed. If we want to add the extra features of the decoder, we will select the locomotive from the roster list then, set preferences for Comprehensive Program then click the **Program** button.

The Programmer window will open as shown below. All programmers, Basic and Comprehensive, open to the Roster Entry pane, which will be similar to that shown below for the FP-45.

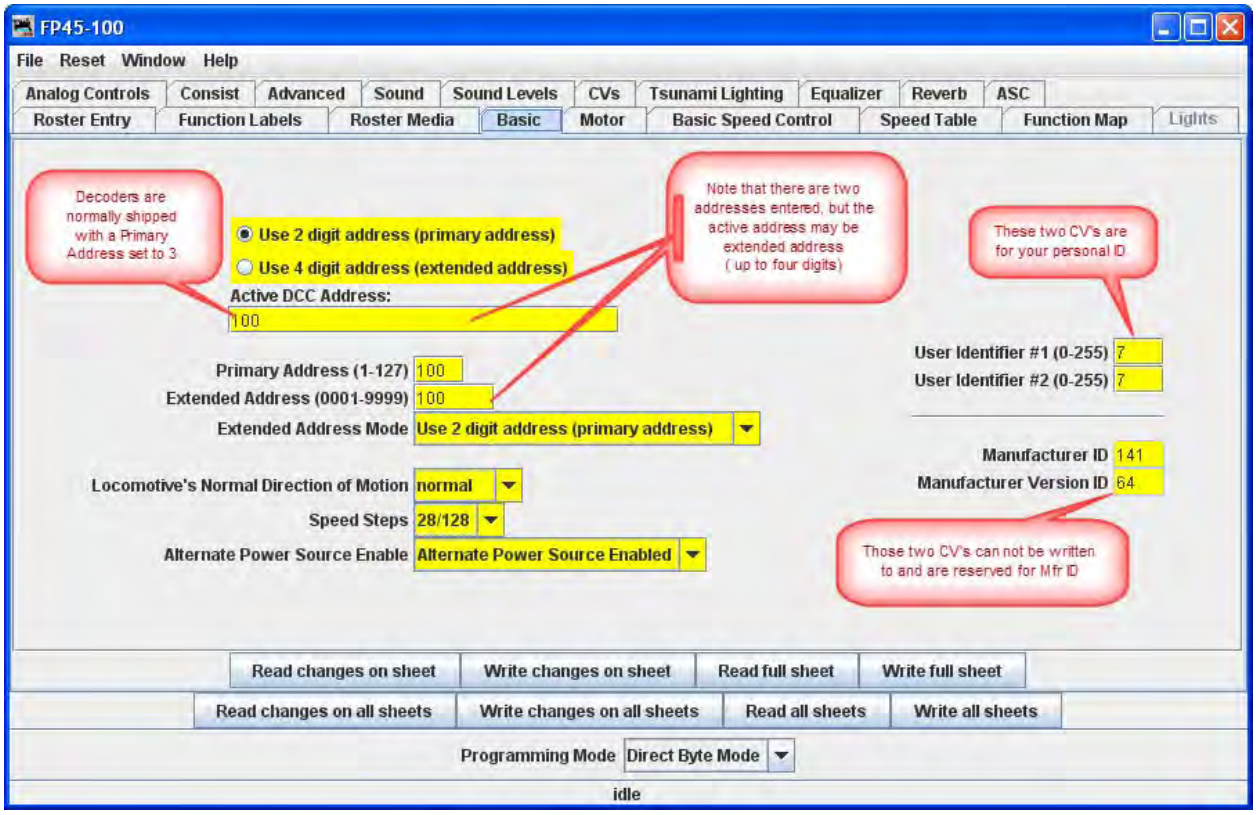
The programmer opens with the roster entry page filled in because we selected the loco from the roster panel in the previous screen.. Note that there are now a whole lot more TABs at the top of the page, allowing us to open many panes to program more features. The number of TABS will depend upon the decoder being programmed. This Tsunami Sound Programming has several TABS that are unique to sound decoders.



Note that the **Roster** pane is essentially unchanged from the **Basic** programmer, but the window has a LOT more options in the **Tabs** at the top. If you are unsure how to handle the **Roster** information, go back to that section in the **Basic Programmer**. If you're ready to move on to bigger and better things, let's go to the next tab.

Expanded Basic Pane

One of the first things you will notice about the expanded **Basic** Pane in the **Comprehensive Programmer** is that there are a lot more options than you found in the **Basic Programmer**. Now use the Read full sheet button to read the values that the locomotive is programmed to. Now you can determine if you want to change any values.



Select 2 or 4 digit **addressing** radio button to select which mode of addressing you wish to be active

You can enter locomotive addresses in both the **Primary address** and/or the **Extended address**. The address of a decoder is the prefix for the code it responds to. This is how you are able to run multiple locomotives on a single line and keep all their speeds and functions independent. Decoders originally could have only a two digit address... after all, who could possibly need more than 100 locomotives? Some lower-end command stations and decoders still use only two digit addressing. Newer decoders can have up to a four digit address. The "**Addressing Mode**" option lets you choose between two and four digit addresses. The addresses themselves are input into the appropriate text boxes. The "**Extended Addressing**" check box turns on and off the 4 digit address mode. This allows you to have two different addresses stored in a decoder, and toggle between the two.

Normal direction of motion: Set the **Locomotive direction: normal** or **reverse** from the drop-down list. The option for **Normal direction of movement** is important for people who model railroads like the NS, who ran diesel locomotives long hood forward, or for the person who occasionally makes a mistake and hooks the decoder up in reverse. It lets you change the direction defined in the decoder as "forward" (no disassembling and rewiring).

Speed Steps: Unless your command station or decoder can only handle 14 speed steps, choose the 28/128 setting. If your decoder offers 128 speed step operation, you'll find you get much finer control of your locomotives by using the **128 speed steps** setting. You choose between 128 or 28 with your throttle, when the locomotive is ready to roll on the track.

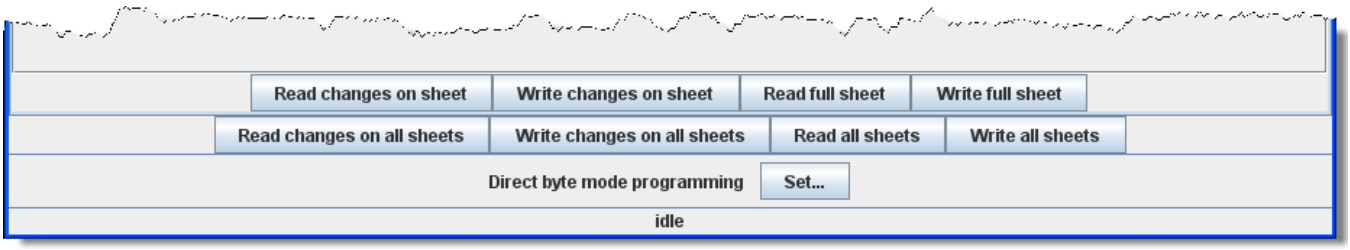
Analog operation (enables the decoder to run under regular DC voltage/analog control) Enable Analog Operation with caution, as some decoders will jump to full speed resulting in a "Runaway locomotive" if they are enabled for Analog Operation and encounter power spikes on a DCC digital signal. They seem to get confused, and revert to Analog operation and use the full track voltage DCC power to take off and GO! There is no stopping them without removing layout power. Very disturbing to your operating mates, but better than running into them at full tilt.

To enable Analog (old style DC, some vendors refer to this as dual mode) Operation select the appropriate entry from the drop-down list.

User ID #1" and **User ID #2** (off to the right} there are two CVs that have nothing to do with any function of the decoder. They simply provide you with a method of electronically marking your equipment. Use these CVs, even though you may have custom-painted equipment for your own free-lanced railroad - it provides one more way to identify your decoders if they are removed from the loco.

The Read and Write Buttons

At the bottom of all the programmer panes you will find three rows of buttons, as shown :



The top row operates **ONLY** on the currently visible pane. These buttons are:

1. **Read changes on sheet** - an "Oops!" button that lets you recover data from the decoder if you've changed it accidentally on the computer (and don't remember what the values were!), but only if you haven't written it yet.
2. **Write changes on sheet** - faster than writing all the data on the sheet, and ideal for tweaking changes in **Ops mode**, programming on the main track.
3. **Read full sheet** - read all data in this pane from the decoder. Note this may take a great deal of time, depending upon the speed of your computer and the controller station in use.
4. **Write full sheet** - writes all data in this pane to the decoder.

The second row of buttons performs essentially the same functions, but on the **entire range** of CVs for the decoder. This allows you to read all CVs, for example, or to make a series of changes across several panes, and when done then write them all to the decoder. Again, you have the option of reading/writing only the changed data, or all data.

Below the two rows of buttons is a text line that shows what the current **programming mode** setting, and a **Set...** button that allows you to change it without exiting the programmer. **Go to Programming Modes** for further information.

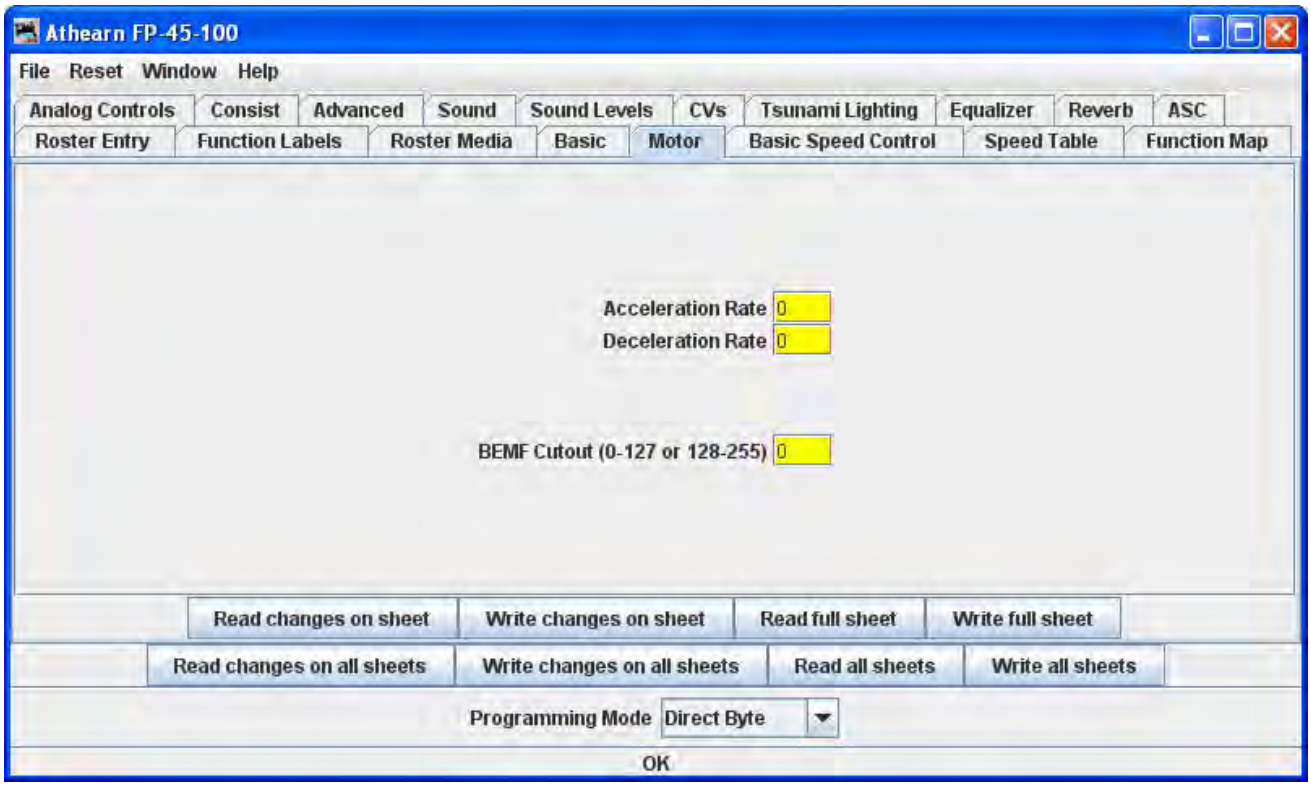
Finally, the bottom line of the pane is a status bar that tells you exactly what the system is doing. It shows **idle** in these screen shots because the system was not actively programming decoders when they were made.

Now let's go to the Motor TAB.

Motor Control Pane

Motor control is divided into three separate panes. The **Motor Control pane** deals with CV's for simulating locomotive weight or inertia. The **Basic Speed Control pane** deals with basic motor control CV's and the third **Speed Table pane** covers those dealing with the **Speed Table** method of controlling the motor. These last two methods of motor control are mutually exclusive. The selection is made with a radio button at the top of each of those two panes. The default selection is **Basic Speed Control.**

The Motor Pane



The contents of the Motor pane will vary significantly between different brands and models of decoders. In the case of the decoder shown in the illustration:

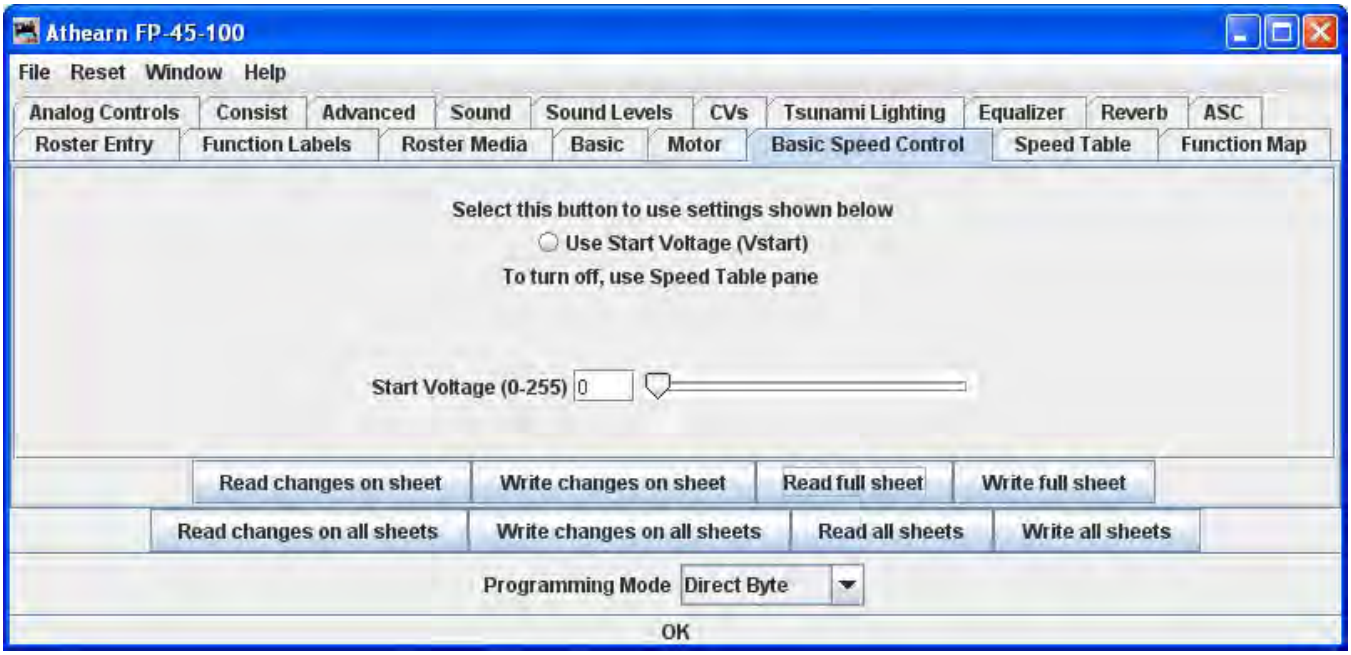
Acceleration Rate and **Deceleration Rate** help simulate a locomotive under load - but don't use them unless you have very clean track, because an interruption of power can make a locomotive stop and cycle through the acceleration curve again! On the latest Tsunami Diesel sound decoders the firmware has been changed. The decoder now returns to the last speed setting before the power interruption but it has no knowledge of where it was in the acceleration curve. So if you have been in the habit of using lots of momentum and setting speed to maximum to get the sound of a notch 8 motor, be aware that if the loco loses power for just an instant from a dirt spot on the rails, it will resume at the top speed step and appear to be running away.

High deceleration rates can make station stops and switching realistic, but very challenging!

Back EMF or **Speed stabilization** is implemented differently by each manufacturer.. See your decoder documentation for the best ways to implement these variables, and be prepared to do a lot of experimenting! However they do it and whatever they call it, you should find it in this pane.

Speed Control Pane

The **Speed Control pane** looks very complicated, but it can be one of the most significant in improving the performance of your locomotive fleet. Remember if you use **Speed Table** TAB this TAB is not used.



Let's look first at the top of the pane: You now have the option of using Basic Speed Control (this pane) or Speed Table to control your locomotive's speed. Use the tabs at the top of the screen to select the method you wish to use and then click the button in the top center for the page to select that method of speed control. Whichever one you select last with the button will be the method used for speed control.

Now back to Basic Speed Control Pane. We see the **Start Voltage (0-255)** slider to set the start voltage. What appears in the body of this panel is dependent on what is available from your decoder manufacturer. Most have something similar to what is shown, but the Soundtraxx Tsunami series is very limited. We'll show you a way around this limitation when we get to the Speed Table screen.

Three important CVs are programmed in this pane Vstart, Vmid and Vhigh. They work together to make a very basic three point speed table. On some decoders these settings may be labeled differently and all three may not be available. Decoder Pro will show the correct options for your selected decoder.

Possible setting that can appear on this TAB.

Vstart (**Start Voltage**) is the voltage at the first speed step. If your locomotive didn't start moving until there were three volts on the track with analog power, this lets you set up the decoder to give it 2.99 volts right away, so it will start moving when you advance your DCC throttle.

Vhigh (Top Voltage, Max Voltage, Maximum Voltage) is the maximum amount of power the locomotive will get from the decoder. If your locomotive looks like Chuck Yeager's X-1 at full throttle, then you can trim the top speed down to a more reasonable scale level. A similar looking limit can be set on the Roster Entry screen, but it only apples to JMRI Throttles.

Vmid (**Mid Voltage, Midpoint Voltage)** lets you configure the slope between **Vstart** and **Vhigh** a bit, so that if your locomotive reaches full speed at 5 volts, you can stretch out the lower end of the curve to get more fine control in a useful speed range.

If you are having problems with unpredictable speeds with your locomotives, check these settings. Sometimes, one or more of these settings have been changed accidentally (usually due to an error in programming CV's with a throttle), leading to very odd speed performance. In particular, if the **Vmid** is lower than **Vstart** or higher than **Vhigh**, results can be highly unpredictable. Decoder Pro will not let you make this mistake.

Forward Trim and **Reverse Trim** allow you to compensate for differences in the forward speed and reverse speed of the locomotive. Most model locomotives do not run at exactly the same speed forward and backward due to the motor mechanics and the gear train to the wheels.

The settings for these controls are not as intuitive as you might think. A setting of 0 in these CVs turns them off. However, a setting of 128 in either of them will have no visible effect! To make the forward and reverse trim effective, raise the value above 128 to increase speed, and lower it below 128 to decrease speed in this pane. The Forward and Reverse Trim does not work the same for all decoders, with variations between manufacturers.

Use these suggestions for using the basic motor controls and programming them on the main.

Unless you want to get into some precision speed matching, you probably won't need to use the **Speed Tables** you'll see on the **Speed Table pane**- you'll be able to accomplish much of what you want using just **Kick start**, and **Start Volts**, **Mid Volts**, and **Max Volts** if they are available in this pane... but how to do this?

Start with the **Kick start** value, and **Programming on the main** rather than the programming track. Set the locomotive to be programmed on throttle step 1. If it moves at all, don't changes the **Kick start** value. If it doesn't move, slowly step up the throttle until it does. Then, turn the throttle down. If the locomotive stops at the same setting it started, you won't need to set the **Kick start** value. However, if it continues to run at a slower speed than it would start, then increase the **Kick start** value until it will start and run at its slowest possible speed.

Now, if the locomotive isn't running at throttle step 1, increase the **Start Volts** value (and write it) without changing the throttle until the locomotive barely crawls... you can usually get this down to a speed of a tie a minute or so if you like! Remember, you are doing this in "**ops mode**", so you can make these changes while the locomotive is actually running. Don't forget to write the value changes to the decoder - they won't take effect unless you do.

Now, set the top speed of the locomotive. Run the throttle up to full, and lower the **Max Volts** value (and write it) until the locomotive runs at the maximum speed you want it to reach, but don't forget that adding a train will slow it down!

Finally, set the **Mid Volts** value about half-way between **Start Volts** and **Max Volts**. Setting it above or below the median of the **Start Volts** and **Max Volts** values will give you a crude, three point speed table.

There are no hard and fast rules for the exact numbers to use. Even identical locomotives with identical decoders will need different numbers, due to variances in motors and drive trains. Experiment with the settings - Decoder Pro makes it easy!

Note: Not all decoders will have Start, Mid and Max Volts, but will have some version of this which will be displayed by Decoder Pro for the specific decoder.

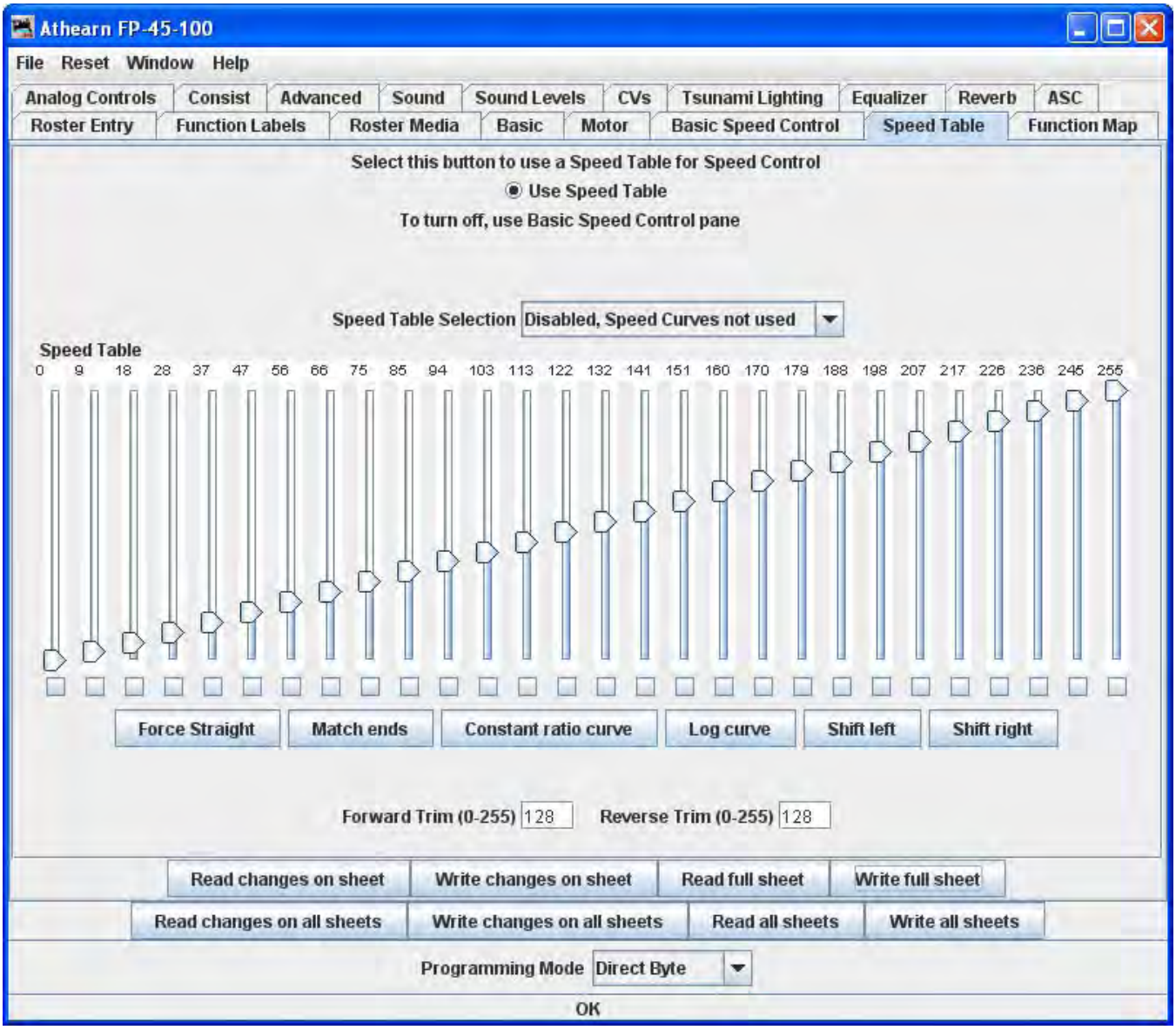
If you select **Speed Table** all of the settings in this pane are ignored.

The Speed Table Pane

The **Speed Table** allows you to fine-tune the throttle response of your locomotive. You might opt to match all of your locomotives so they run at the same speed for the same throttle setting, or you might want to set the table up so that your locomotive runs at the actual scale speed indicated by the throttle. Or maybe you have someone in your operating group that likes to switch the yard at Mach 2.5, and you want to slow them down a bit. There are a lot of ways to use this feature. (This feature may vary by manufacturer and decoder series) Some decoders may only have preset curves that you can select.

You now have the option of using **Speed Table** (this pane) which if selected and written to the decoder will replace the **Basic Speed Control** to set your locomotive's speed control mode. Whichever one you select last and write to your decoder will be the method used for speed control. To select the use of **speed tables**, the **Use Table** radio button is selected at the top of the pane, and in the case of Soundtraxx and QSI decoders, the drop down selection box must be used. See the discussion at the end of this section for an example.

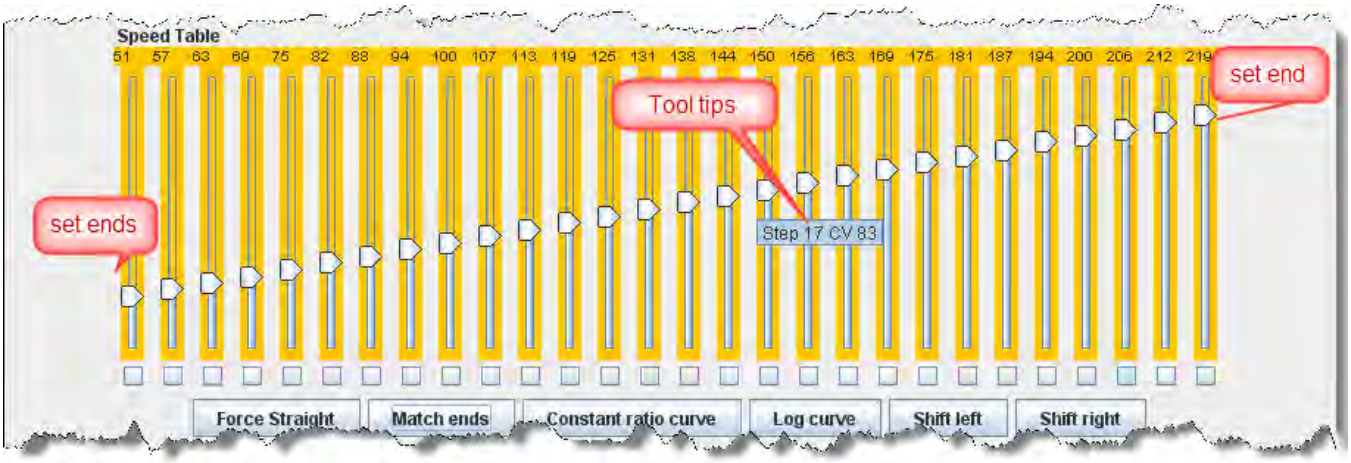
The default speed table for most decoders is a straight line from zero on the left to maximum on the right. The below the table duplicates that in the table..



Straight Line Speed Curve

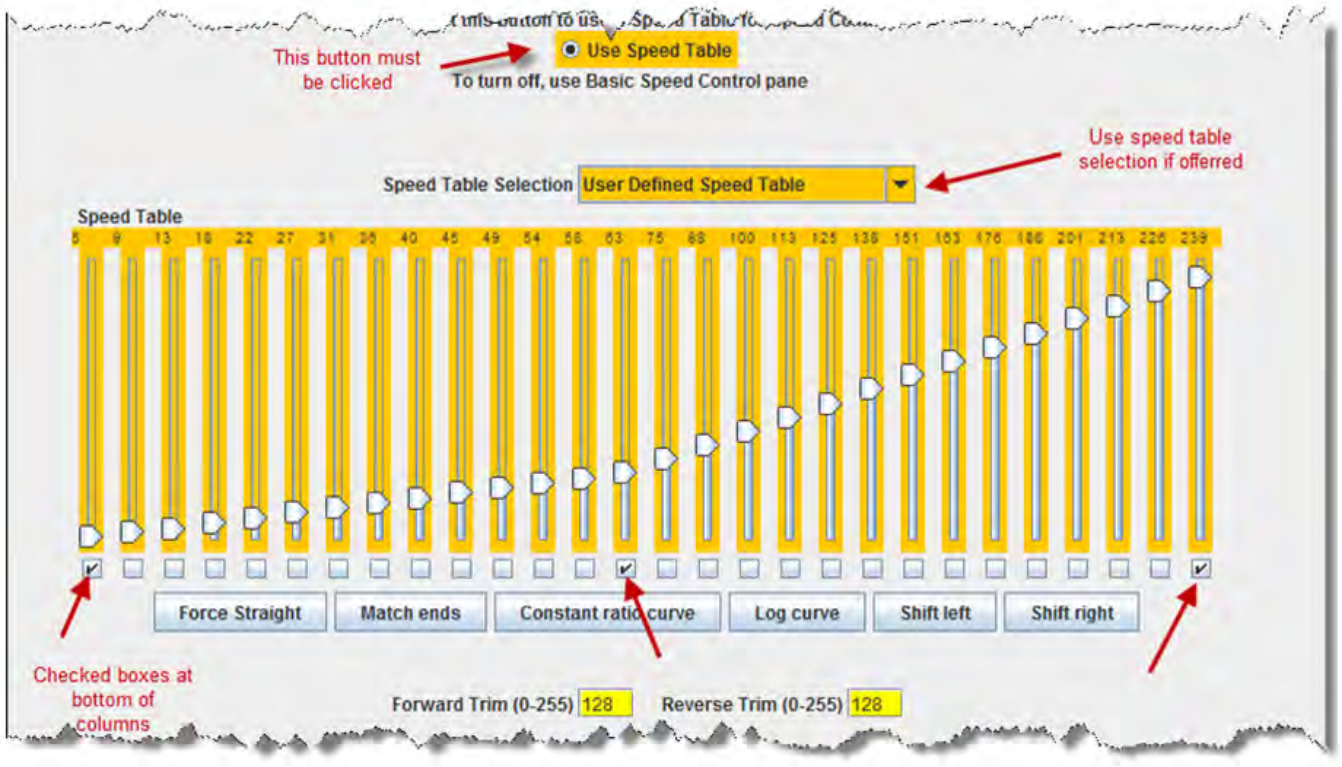
As you can see, you have both numbers and sliders to work with. Changing either a number or slider will make the other change to match it. If you are CV inquisitive, you can use the tool tip to advantage. By hovering over any of the sliders, the tool tip will reveal the CV to which you are pointing.

The **Match ends** button will also result in a straight-line graph, but you can offset the beginning and end by any amount you wish. The first and last steps are used to set to minimum and maximum values for the straight line. The function will then draw a straight line between those two end points. Below is an example of the result.



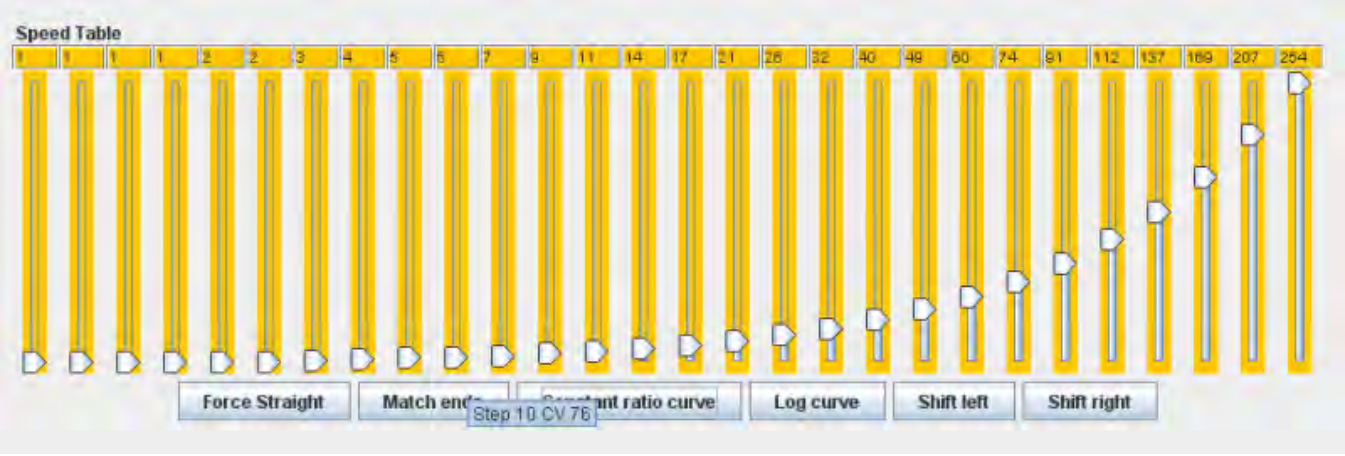
Now if you've used DecoderPro in the past, you're probably wondering what those little boxes at the bottom of each slider are used for. Well, they're difficult to explain, but easy to use. They basically allow you to set a slider to control every slider in columns to its left as well as to its right. If you click two of the boxes and then move one of those sliders you'll see that they are linked to the sliders between them. Points to the right never are higher than the slider being moved, and the points to the left are never lower that the slider being moved. This "always increasing left to right" is normally the way the sliders worked, but now the ones in between the check are linked. If the slider is lowered and then raised the straight line is drawn between the column checked to the right and the column that the slider is controlling. It's difficult to describe, but try it and you'll see.

What could that possibly be used for, you ask? Well, many decoders (like the Soundtraxx Tsunami in this example) do not support V-start, V-mid and V-max. So, if you are trying to use the simplified method of speed matching locos, these decoders won't support it. Well now you have a way. Check the left-hand, right-hand and middle columns. Set the left-hand column to V-start, the right-hand to V-max and then slide the middle slider up and down until you get the V-mid that you want. Now all you have to do is write this speed table to the loco and you've accomplished what you wanted to do, but the decoder manufacturer didn't provide for.



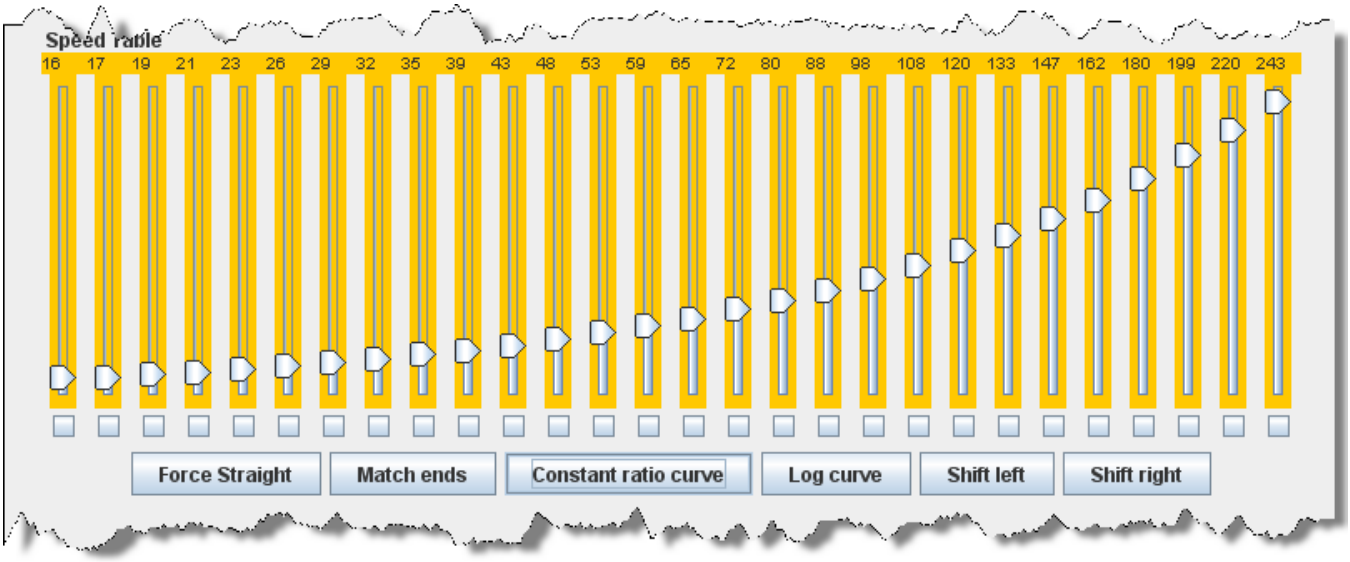
Substitute for Quick Speed Matching

If you want to set up a loco for switching you can set a start speed that is the same for the first portion of the throttle revolution and lower the top speed for use in the yard as shown below:



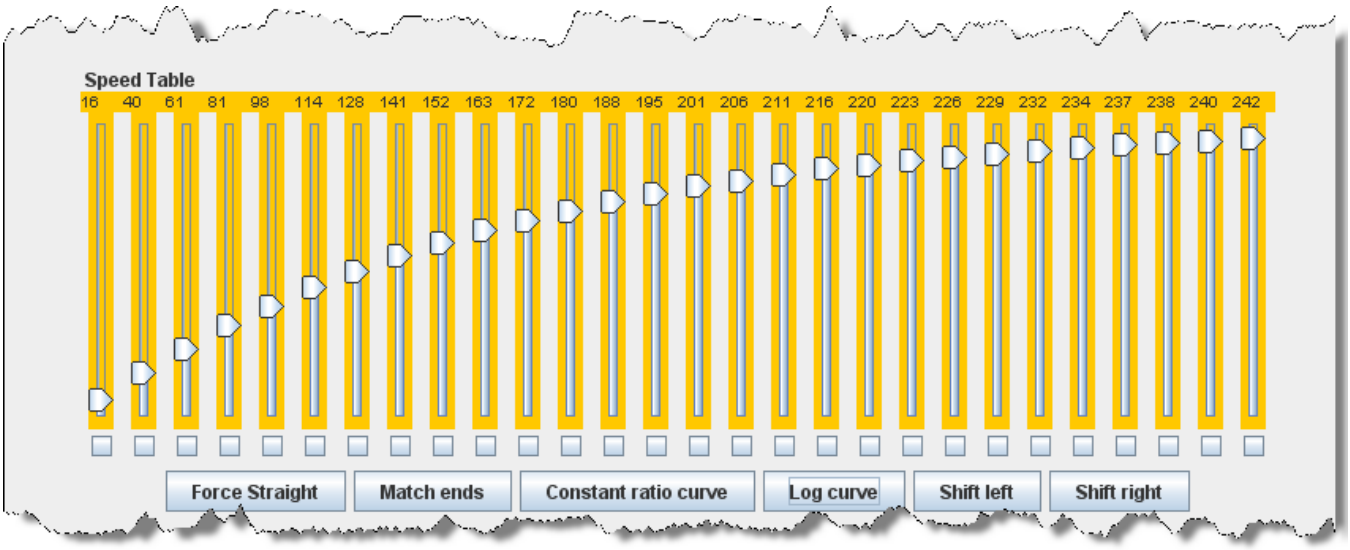
Switcher Speed Curve

if you don't desire a strait-line response curve there are other options available. The Constant ratio curve gives you a response that increases slowly in the low end and rapidly at high throttle. This function will also draw the curve between preset end points.



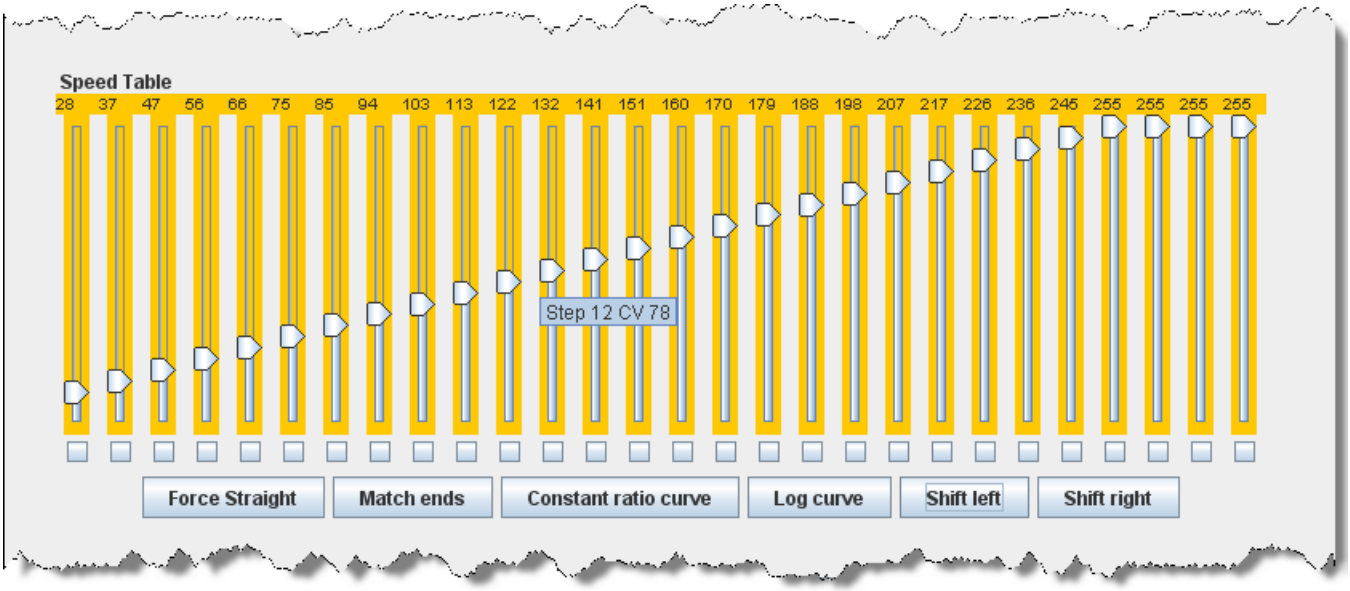
Constant Ratio Curve

The **Log curve** reverses this response, giving you a logarithmic response curve with high acceleration at low speeds, but topping out quickly. It will also draw the curve between preset end points.



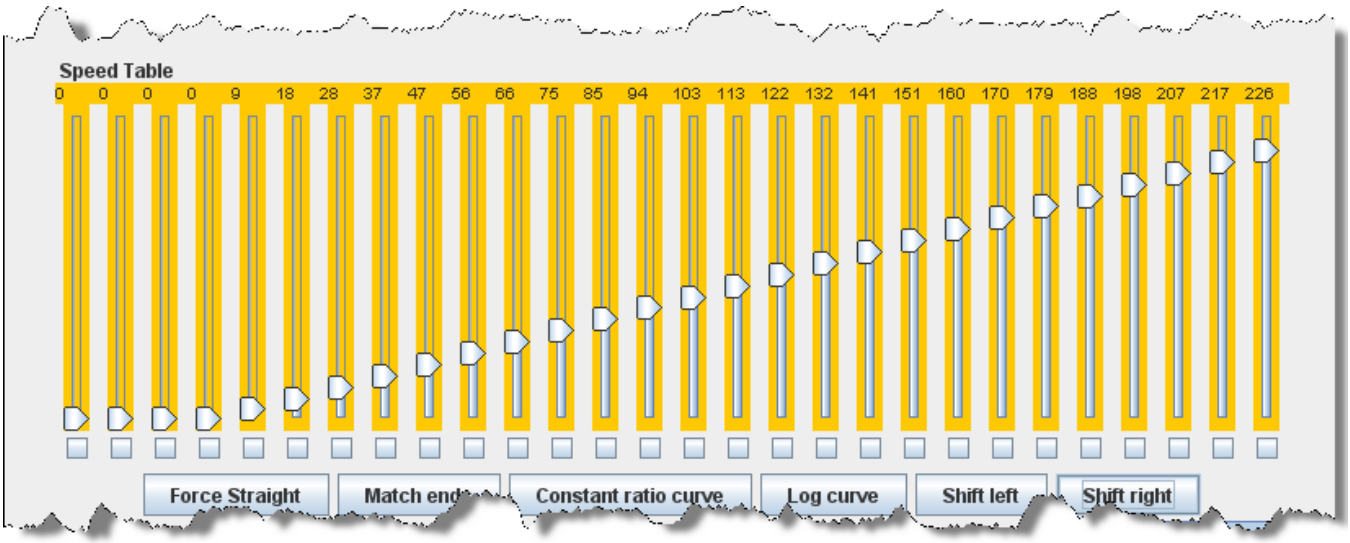
Logarithmic Speed Curve

The **Shift left** button moves the entire speed table to the left one space with each click on the button. The example below shows a linear 0-255 speed table that has been **shifted left** three times.



Curve Shifted Left

The **Shifted right** button move the entire speed table to the right one space with each click on the button. The example below shows a linear 0-255 speed table that has been **Shifted right** three times.

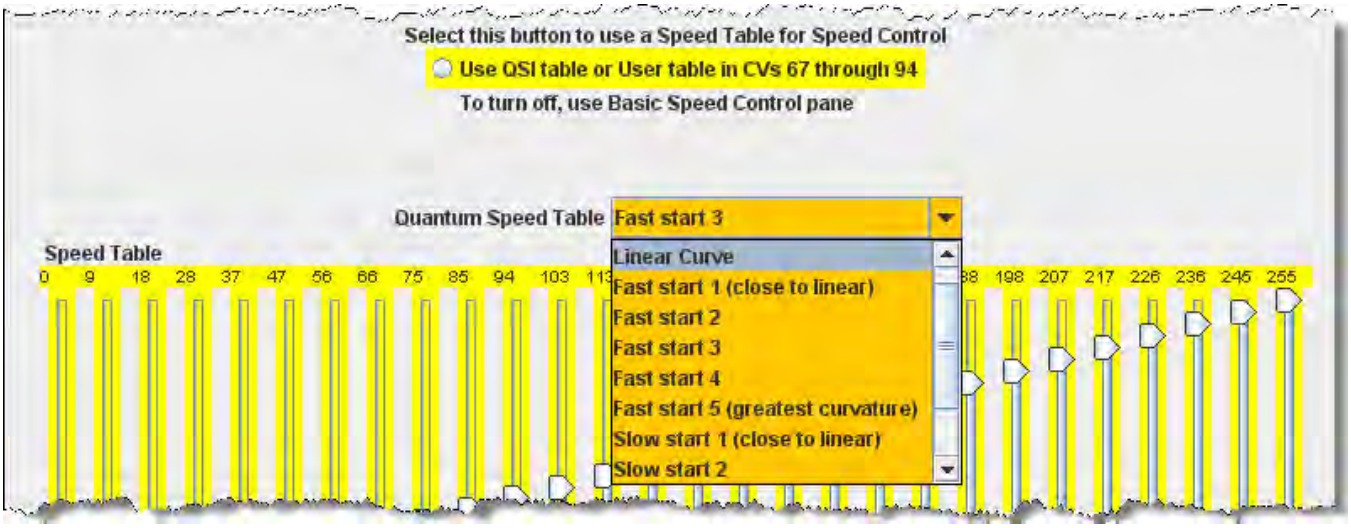


Curve Shifted Right

Of course, you can enter the numbers individually or move the sliders one at a time to create your own fully customized speed table. To aid you with setting the individual values, the slider value is shown at the top of each slider. Also, by hovering the mouse at a slider column the number of the CV being entered will be revealed.

One very important thing to remember: **No matter how pretty your speed table looks, it has absolutely no effect on the locomotive unless you write it to the decoder!**

And this point is especially pertinent with the QSI and Soundtraxx Tsunami decoders, because they have a separate drop down box like the QSI box below. They require that you select the **user defined** speed table entry in this box or your table will not be written to the decoder. Interestingly, Tsunami puts the selection at the bottom of the list making it very easy to miss.

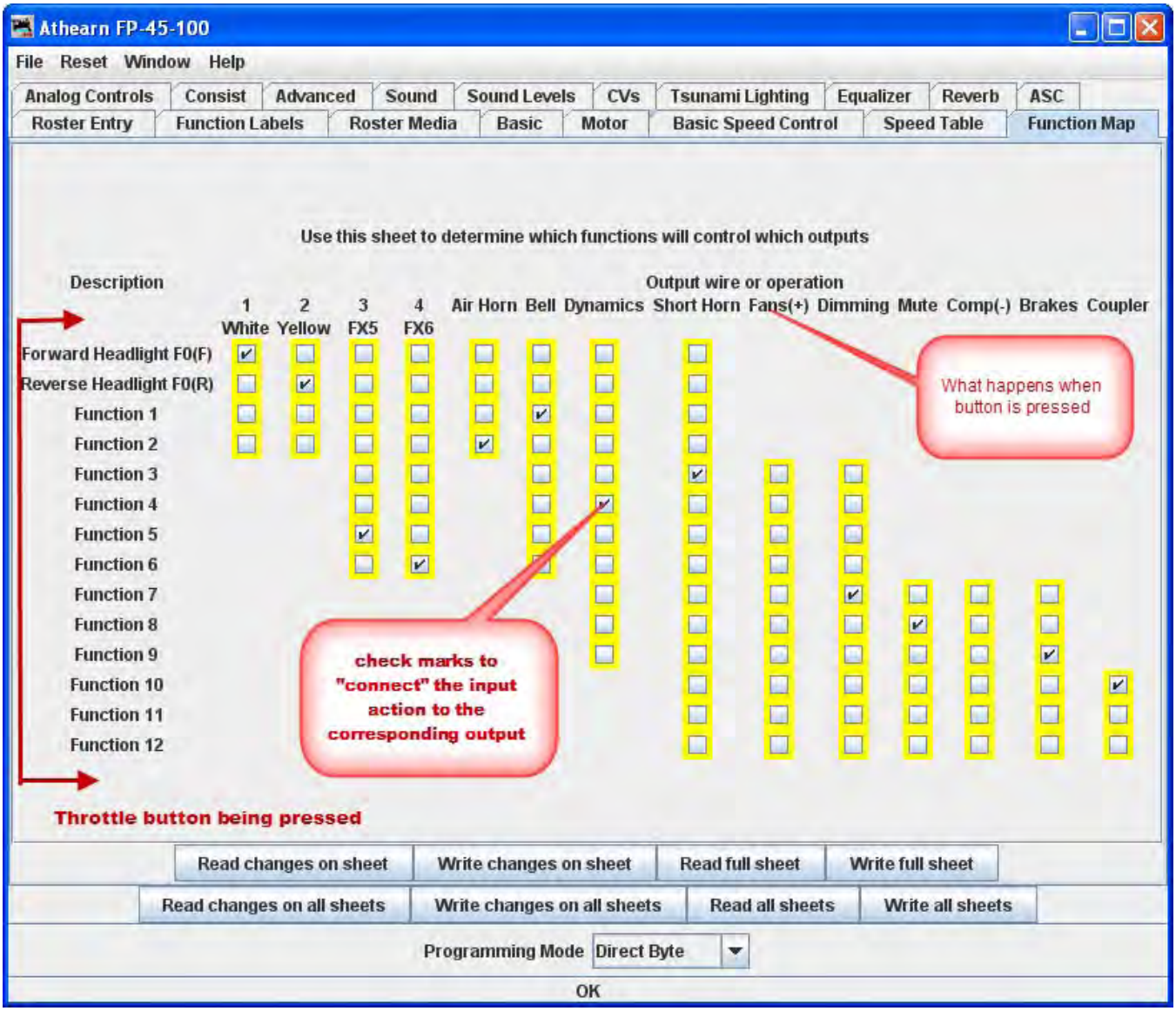


Function Mapping Pane

Some decoders allow you to change the function assigned to each set of output wires (or pads). Multiple choices for function assignments are shown by several check boxes. This is more common in decoders with more than four functions, and in sound decoders.

Some of the new sound decoders may have up to 28 functions, and your throttle may have a limited function capability. So, here's your opportunity to pick which ones you can operate from your throttle.

When this capability is present, the check boxes as shown in the window below are active and allow you to choose to which function key on the throttle each output responds.

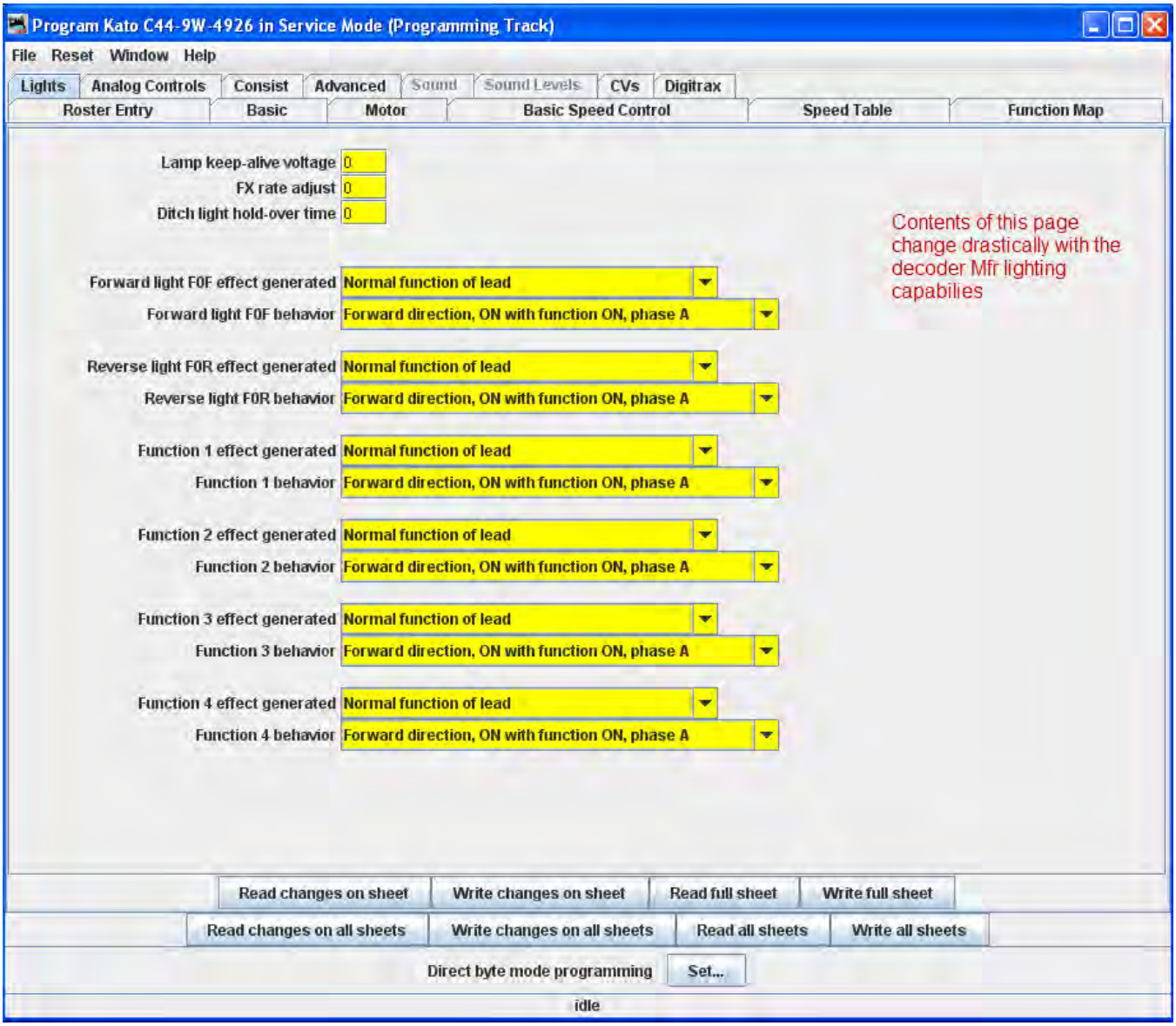


If a checkbox is dimmed that indicates that no changes in function assignments are possible. Not all decoders allow you to remap the functions and others have very limited functions. Only remap functions if you are sure you know what you are doing.

Lighting and FX Functions Pane

This pane provides for control of some of the most "gee-whiz" functions on the decoder. While fine-tuning the motor is important, and speed tables help add to the realism of operation, everyone notices the lights - especially when they change intensity, flicker, flash, or fade. They attract even more attention when, for example, the ditch lights that were steadily shining as the locomotive approached the crossing suddenly begin flashing alternately, then return to a steady glow; or when a locomotive pulls into a siding, stops, and dims its headlight for the approaching train. All these effects are possible with the right decoder and proper set-up, and set-up is what DecderPro is all about.

Every Manufacturer and decoder family handles the lighting in a unique manner, so there are many versions of this pane.



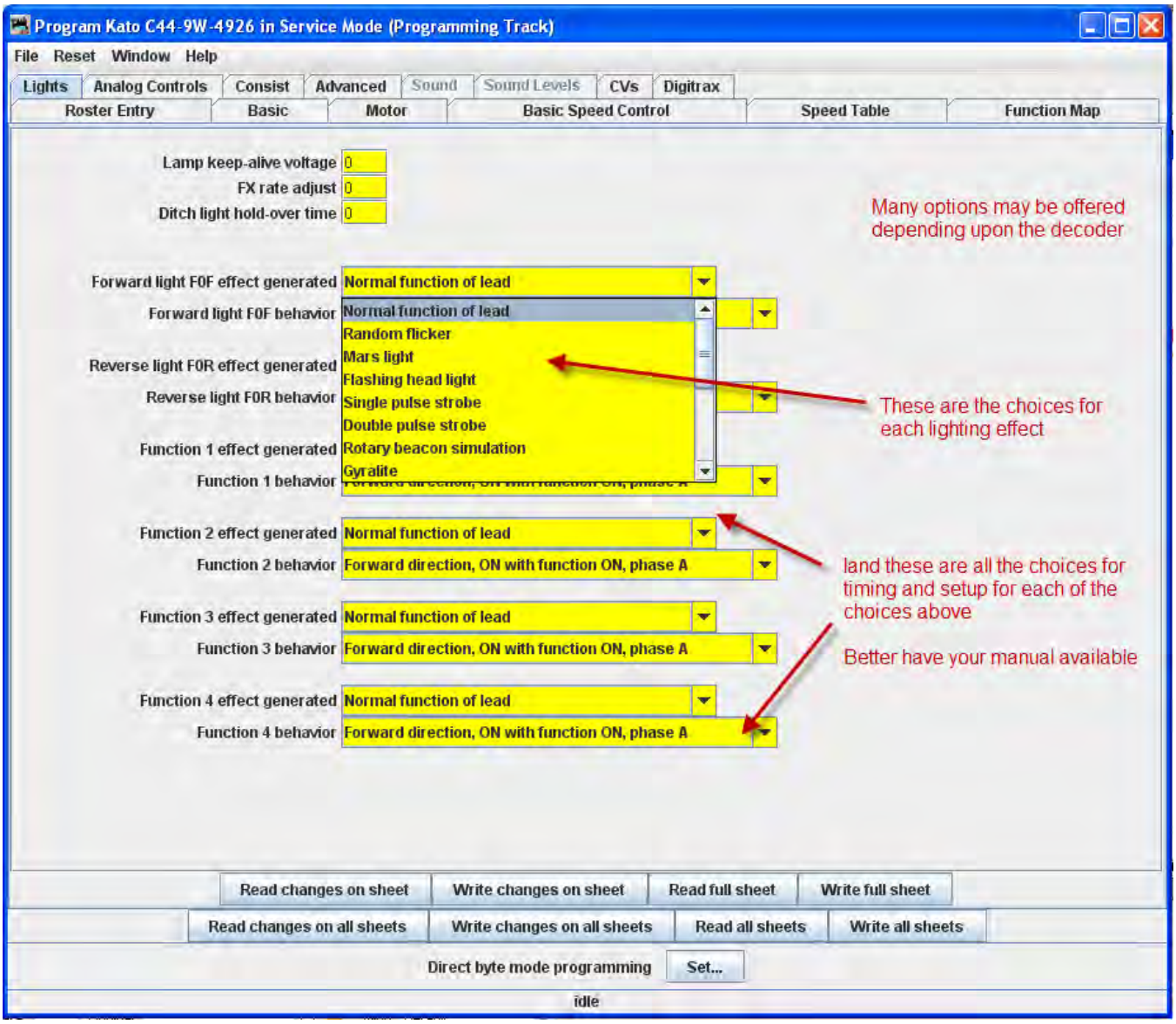
The specific effects available differ widely between manufacturers, and even between different "families" of decoders from the same maker. The above example is from a Digitrax FX decoder. Some of the advanced features you will see in many decoders (though they may go by different but similar names)

The **Lamp keep-alive voltage** determines how dark a light gets between "full on" moments. This can let you adjust effects to give the impression of, for example, a marker light that also has a rotary beacon in the same housing. Play with this value and see what kind of results you get for your specific decoder.

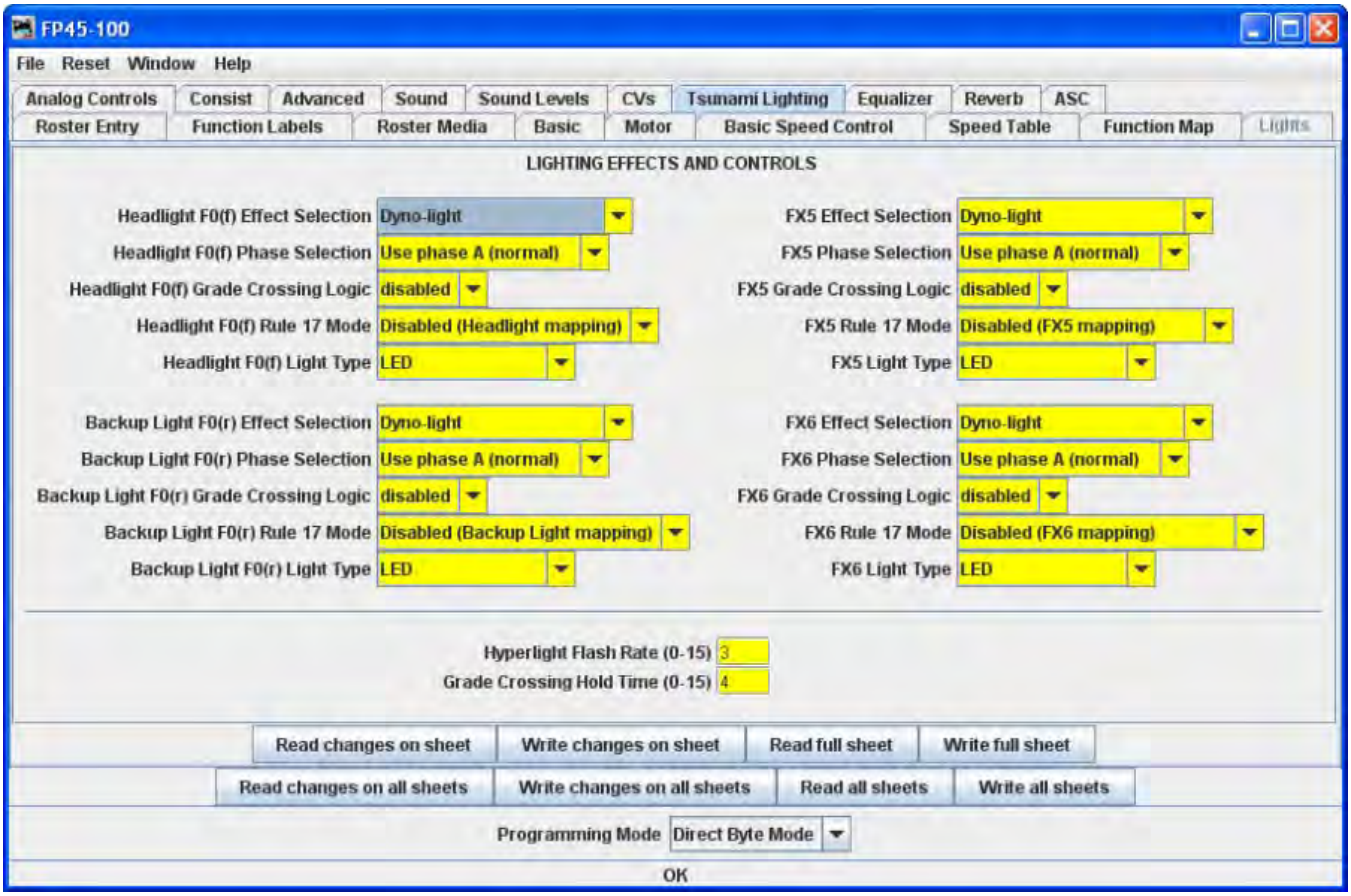
FX rate adjust controls how fast an FX effect operates. The higher the number, the slower the frequency of flash or "rotation" of the effect. This can be used to set subtle differences between locomotives. As you can see from

the panel above, there are twin alternating strobe lights on the engines. If you vary the setting for the **FX Rate** slightly, the locomotives flash at slightly different rates. This keeps MU units from looking too coordinated!

Ditch light hold-over time CV establishes how long the ditch light effect (alternating flashing) stays activated after you hit the **F2** function key. Since the **F2** key is non-latching (think of it as a momentary contact switch) that normally turns off when it is released. By raising the value of this CV you can make them stay on for up to 30 seconds from a single momentary activation.



Sound decoders , such as the Tsunami in our OEM FP-45, have an extremely complicated Lighting program pane.



Note that some of the lighting functions can be tied to a sound function which is unique to sound decoders. Sound decoders have many more functions than normal motor control decoders.

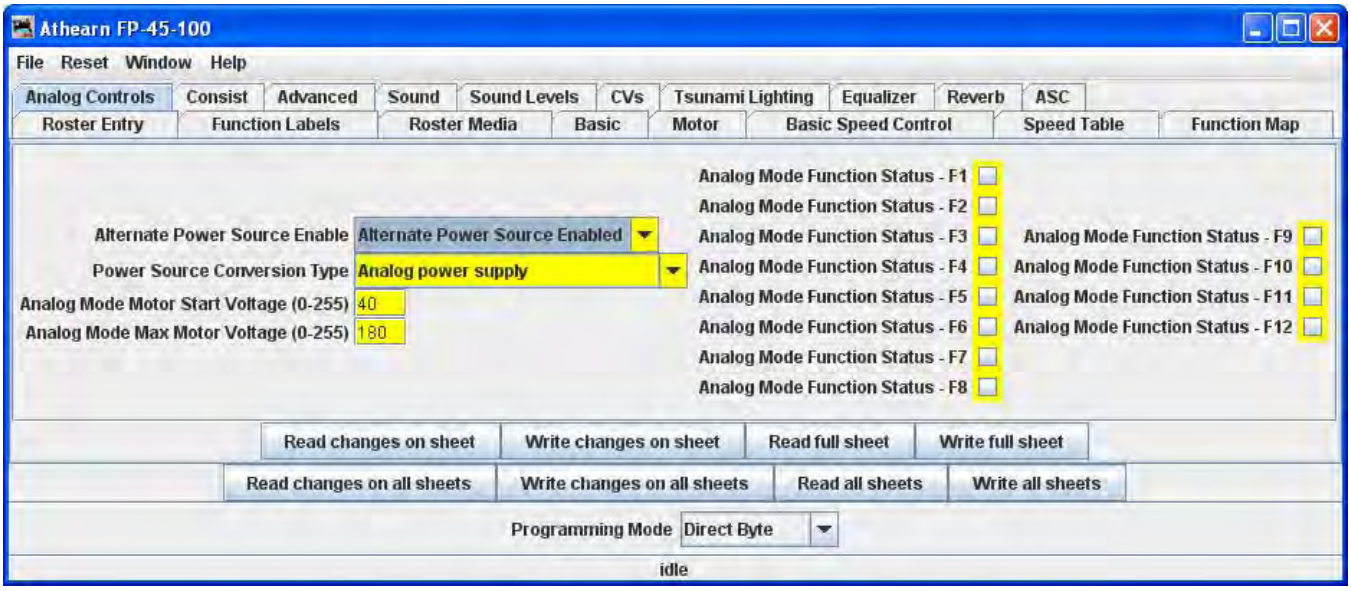
The other lighting effects are highly variable between decoders. Check your specific decoder documentation for what the decoder is supposed to be capable of doing, and have fun playing with them. They are the most visually satisfying of all the capabilities of the decoders!

Even if the function and effect are available, you may have to add the lighting to your locomotive in order to be able to use that function, such as adding ditch lights, beacons, etc.

Analog Controls Pane

As discussed in the **Expanded Basic Pane**, some decoders allow operation on Analog or Conventional DC layouts. At the discretion of the manufacturer, some of the non-motor responses may be changeable by setting CV's in the decoder. This pane is where you would set these values. Typical would be whether any of the various functions (such as lights and bell) would be on or off when in DC mode. Consult your decoders manual for options available.

Some decoders are Analog Controls panes are simple and others such as the FP-45 are complicated.



Consisting Functions Pane

Consisting is a means to have two or more locomotives respond to orders from the command station, and do it together in unison. There are a number of terms used to describe consisting, and the manufacturers don't agree what those terms should be. The NMRA has adopted terminology, so that is what will be used in this discussion.

Address Consisting. You merely set the address of every locomotive to be the same, and we can use the Basic Programmer pane to do this. Then a DCC instruction sent to a locomotive with address XX will cause all the locomotives with address XX to respond. It works well for locomotives that are always run together, and is portable from one layout to the other. The disadvantage is that it's a pain to keep re-addressing your locomotives if you don't always run them together.

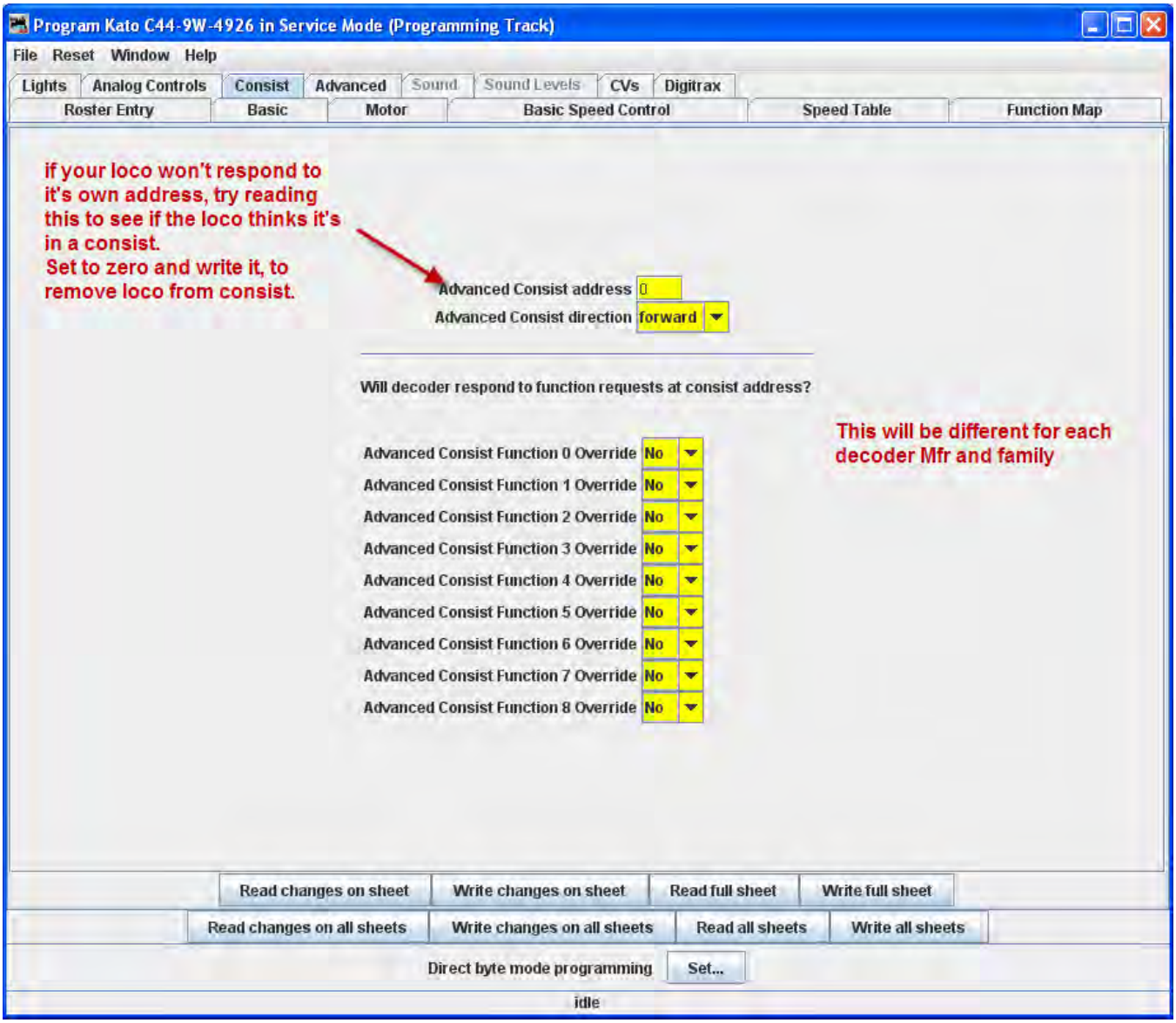
So, the NMRA came up with two additional means of consisting. One is set up in, and remembered by the command station, and the other is set in the decoders.

The NMRA calls the command station based system Basic Consisting. The command station keeps a list of all the locos in the consist. When an action is needed the command station sends an individual packet to every locomotive in the consist, which causes them to then act together. Since this method is command station based the consist is not portable to another system. Also, since it does not need to be programmed into the decoders, DecoderPro doesn't need to deal with it.

The NMRA calls the decoder based system Advanced Consisting. To implement this system the decoder has to have a special memory space (CV19) which is used to store a consist address. This type of consisting is portable between layouts, since the information that the loco is part of a consist, and the address information for that consist is carried in the decoder. The disadvantage is that once the locomotive is assigned to a consist it will only respond to the consist address. If you forget to "break " the consist at the end of an operation, you will be

puzzled as to why your locomotive won't respond to requests for motion, even though it will respond to some of the lighting functions.

DecoderPro utilizes the Consisting Pane to set up NMRA Advanced Consists and the response of the locomotive to function requests sent to the consist address.



The Advanced Consist Address is for **EPF** (**Extended Packet Format**, as defined by the NMRA Recommended Practices for DCC). If the consist address is **any value other than zero**, the locomotive is considered to be in a consist and will only respond to instructions sent to the consist address. Thus we set a short address here to create a multiple engine group that will all respond to the same address. Think of it as an MU specific locomotive address. Since the address is in the same range as non-consisted locomotives with short addresses, we need to be sure the address is unique on the layout. A way of doing this is to use higher end of the short address range

starting from 127 and going down. Most folks working with single locomotives with short addresses tend to be using the manufacturer's default of 3, or other low values, typically for their logging locomotives.

This Pane also allows one to instruct the decoder what effects are to be active when the locomotive is in part of a consist, assuming the decoder is capable of responding appropriately. As an example, this allows you to specify if the headlights and other lighting functions are to be always off if the locomotive is in the middle, or tail end. This can be handy if only the "B" unit has sound. You can set it's lights to be off in a consist, but it can sound it's horn even though it's in the consist.

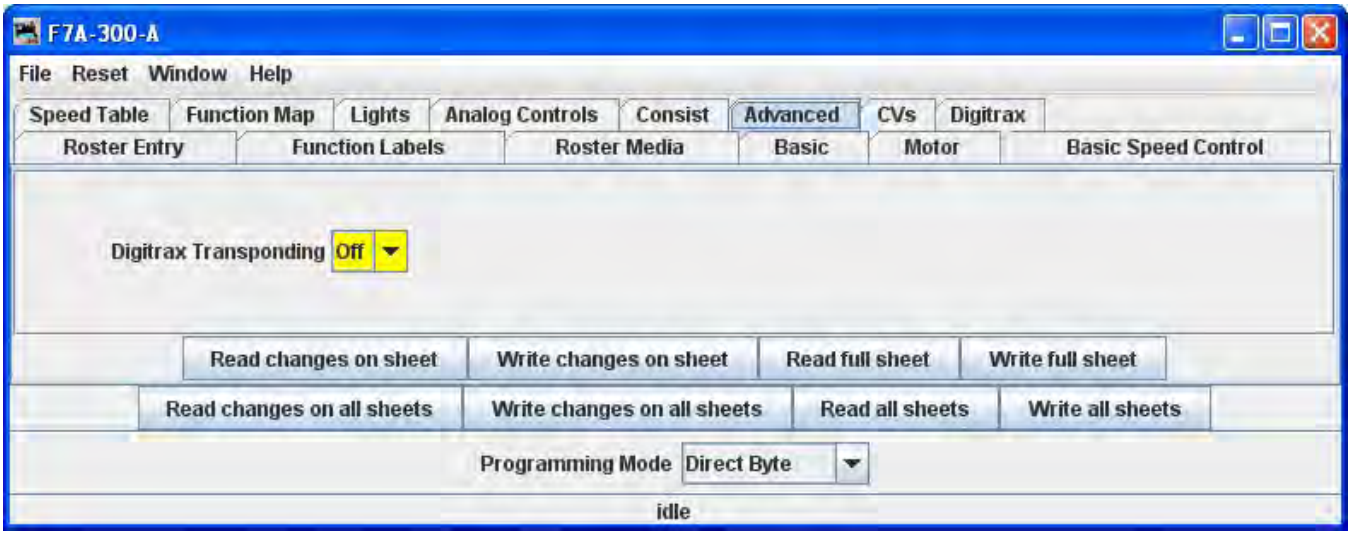
If you've had your locomotives on another layout and ran them together, but can't get them to run separately on your home system, check this to see if it's consist address has been set.

Advanced Features Pane

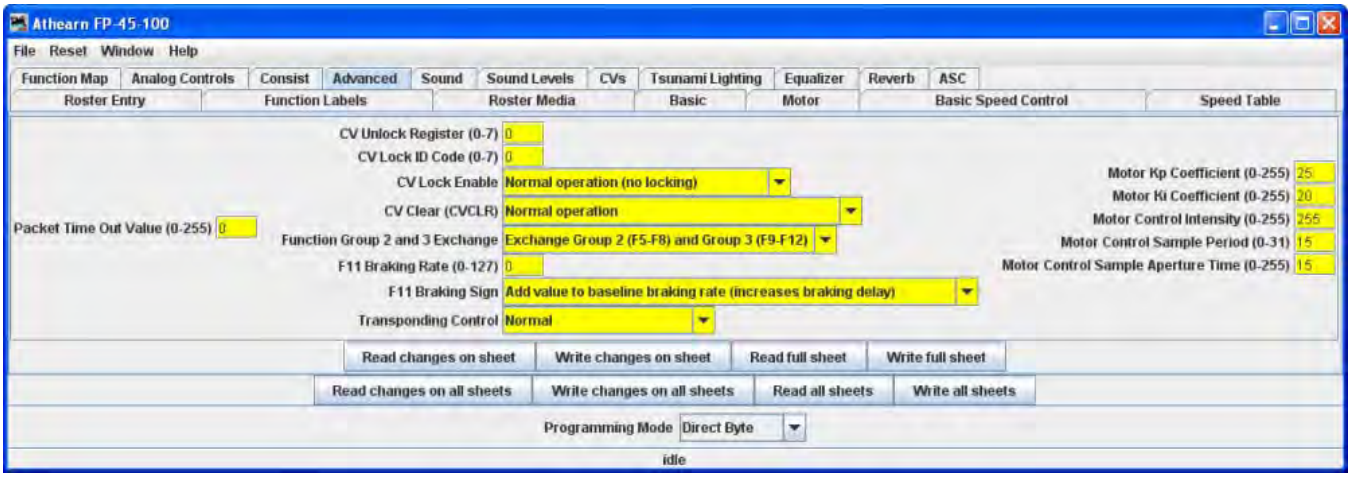
The **Advanced Features** pane covers CVs that don't fall readily into one of the other categories, and more importantly are not generally part of the NMRA DCC standard. This is a bit like the Netscape/Microsoft Browser Wars, areas where the manufacturer is pushing the envelope. In this case, the CV here controls the Transponding feature of newer Digitrax decoders, which allows them to report their location and engine number back to the Loconet.

There may be one or several of these panes, depending on how complex the decoder programming is and the style of the person who wrote the definition file for your particular decoder.

This is the Simple Advanced pane for Digitrax decoder.



The Complex Advanced pane used with the Tsunami OEM of the FP-45 decoder.



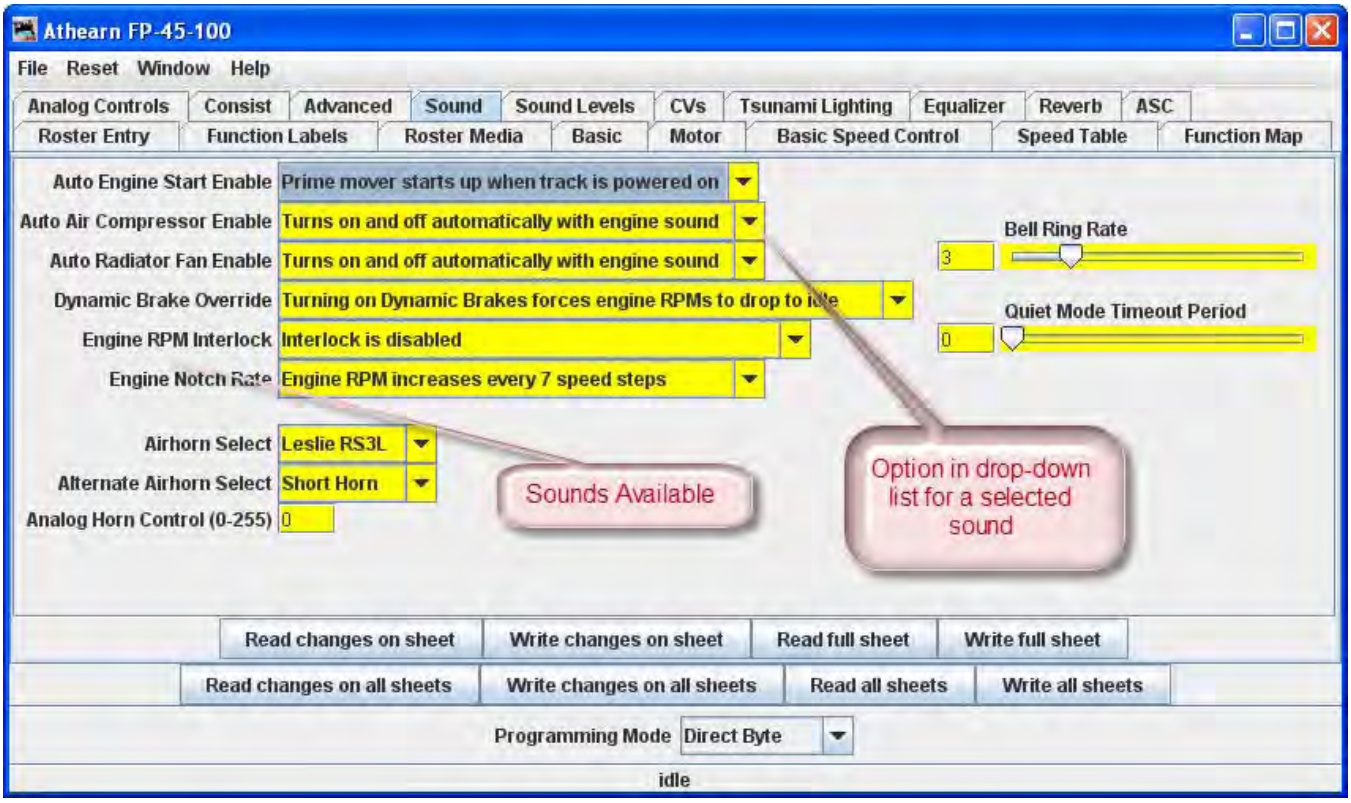
Sound FX Pane

This pane will only be displayed for Sound decoders.

Several manufacturers now offer decoders that include sound functions. This pane is designed to control those CVs. The screen shot below is from a programmer for Tsunami OEM FP-45 sound decoder. There are also steam sound decoders available.

These sounds can be coordinated with the mechanism of the locomotive, and appropriate sounds can be triggered from the function keys of the throttle. Others can be set to be triggered at startup or to run in the background.

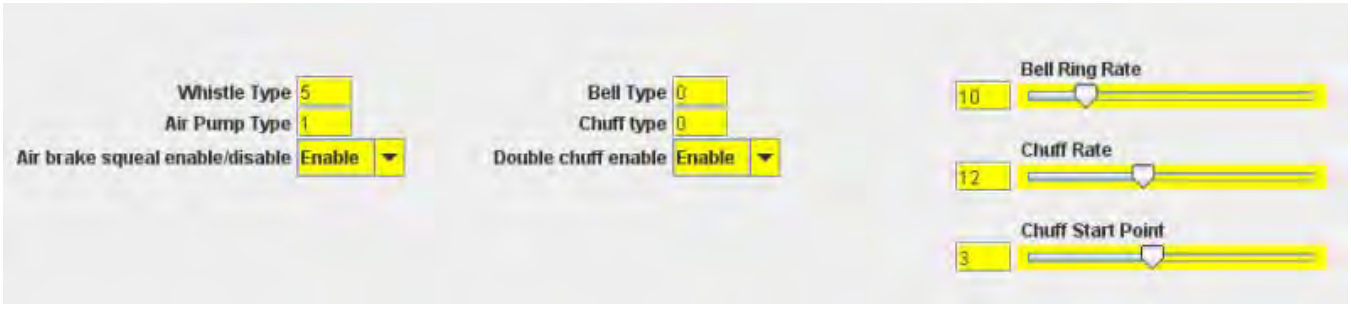
This pane allows for the selection of sound effects from sound decoders, and the **Sound Levels Pane** allows for setting the loudness levels of those sounds when they play back.



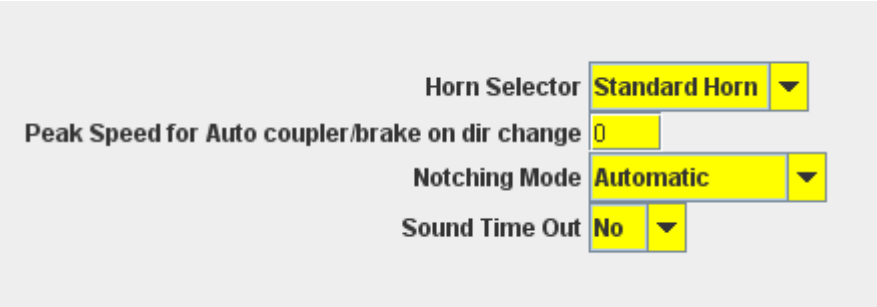
For specific function options, see your decoder documentation and the programmer for the specific decoder. Sometimes (depending on the volunteer that wrote the decoder definition file) there are "tool tips" that appear if you hover over a selection entry box.

Here are is a sampling of sound functions on some other decoders:

Athearn N Scale Big Boy and Challenger

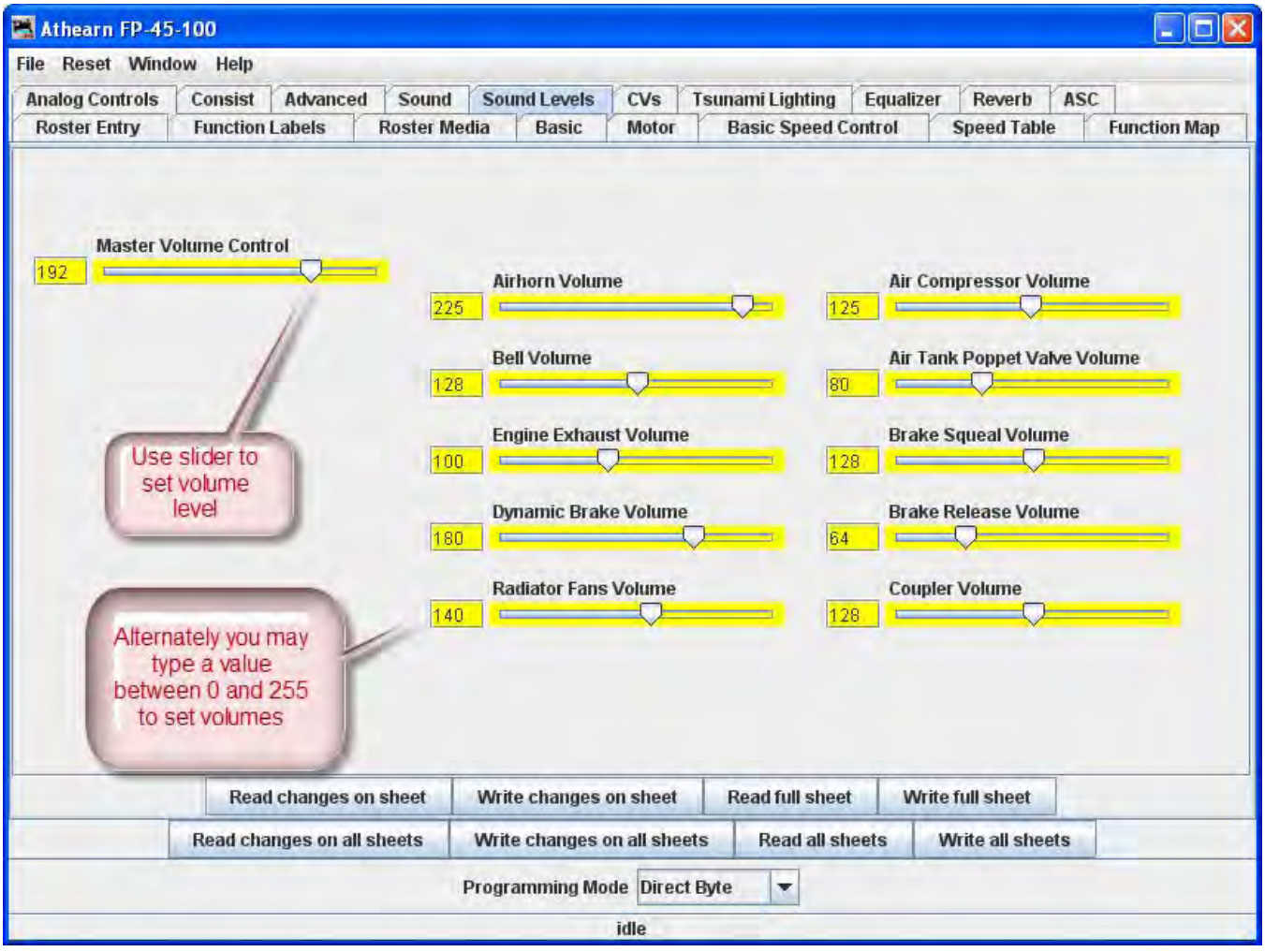


Digitrax F40PH



Sound Levels Pane

Here are the controls for the relative volume levels and timing nuances of the sound decoder. Again, this is an example of one implementation. See your decoder documentation and the specific decoder programmer for details applicable to your equipment. Above all, don't be afraid to play with these settings and those in the **Sound** pane until you get sound you like. It's much easier to do here than it is to try to program these using a throttle! And even easier, if you are using the **Ops Mode option** to program the unit when it's running on the track. If you "write changes" after doing your selection change, you'll get instant feedback of how the sound has changed.



Global CV Listing Pane

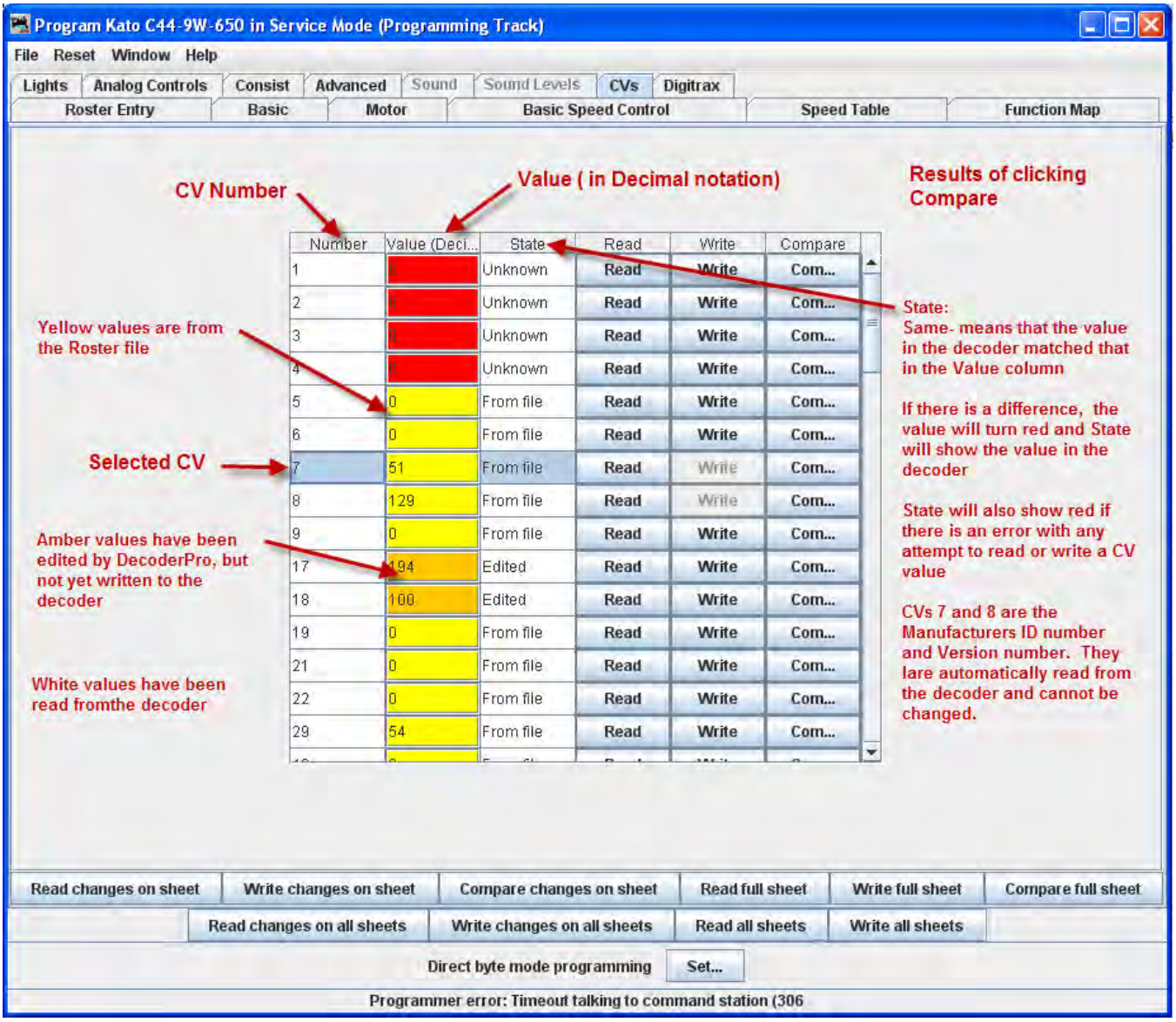
For the hard-core programmer, this pane is a listing of the raw CV data by CV number, with data in decimal format. You may change data by typing new numbers into the **Values** window. **State** shows the validity of the data, whether it was taken **From file** (the decoder information saved in the **Roster**), **Edited**, **Read** directly from the decoder, **Stored** to the decoder or if the status is **Unknown**. Note the **scroll bar** on the right side of the listings. You may scroll up or down to access all of the CV listings.

Decoder Locking

You tried to read a CV value and get "Error 308, No Acknowledgement from Decoder", well the decoder may be locked. CV 15 and 16 deal with locking, if your manufacturer implements this feature (and manufacturers have slight differences as to how they implement it). If the decoder is locked, then you will not be able to read data from it or write to it. To unlock the decoder, you must enter a value into CV15 (the only CV that can be written when the decoder is locked), that is equal to the value that is currently in CV16. Now I hear you thinking "but I can't read CV16 to know what to put into CV15". Well, you'll have to try all possible values, which isn't that hard since it can only have 8 possible values 0 thru 7. After each write, try to read CV16. It's the fastest read since it can only have 8 possible values. If JMRI responds with the no-ack error, then try the next value. If it returns the value in CV16, you've unlocked the decoder and you're in. If you have unsuccessfully tried all the 8 possibilities, then check your layout connection and the loco's wheels for poor connections and try again. Now you say, "I've looked thru the list several times and CV 15 doesn't appear". That's on purpose, to minimize inadvertent locking by a Write All Sheets. You will have to use the **Single CV Programmer** to write CV15. It can be found in the Tools menu on the Main Page, under Programmers.

If you have more than one decoder in your locomotive, you probably have a decoder locking scheme implemented to be able to access each one individually for programming.

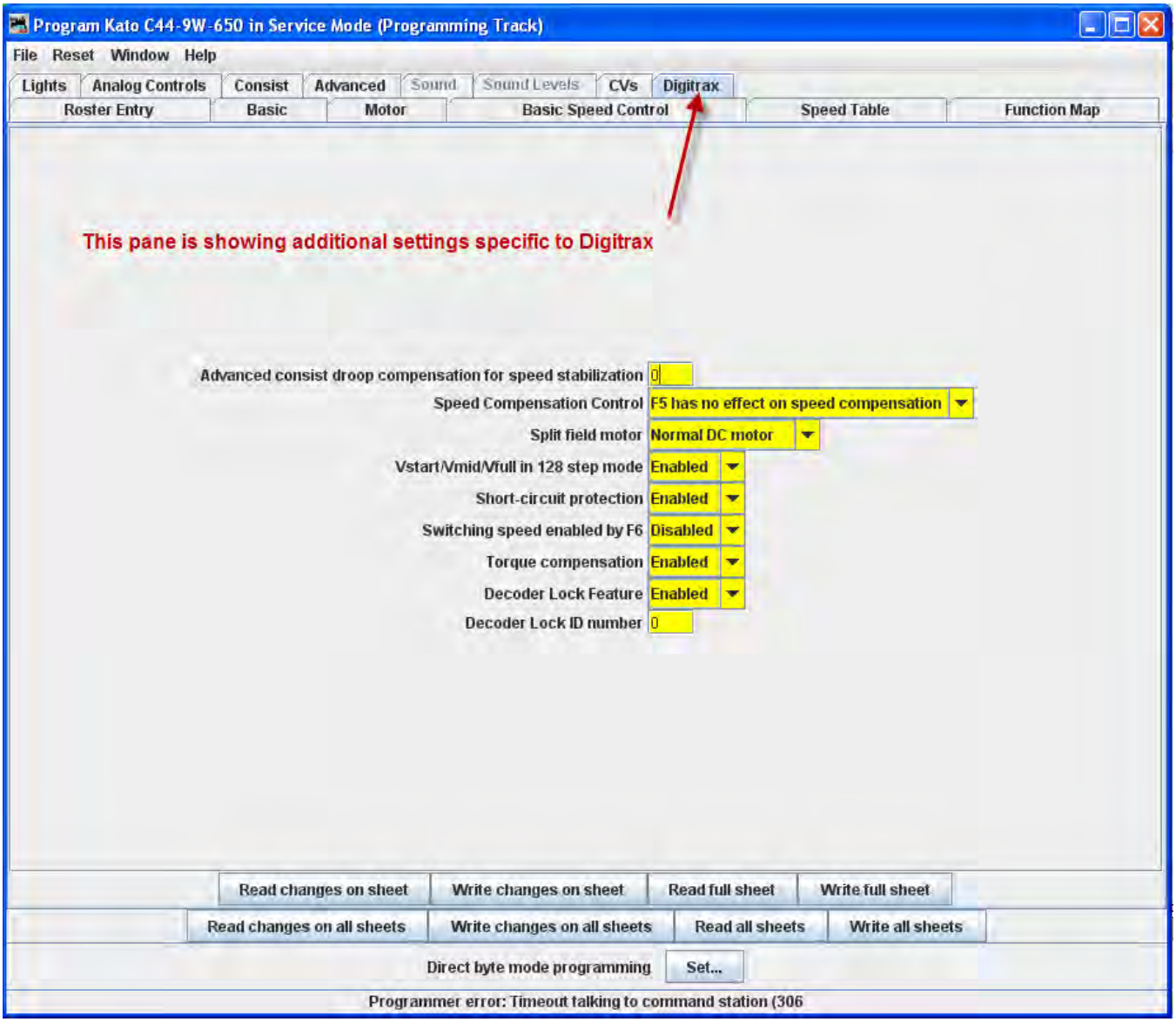
You may **Read** or **Write** individual CVs using the buttons in their row. On this page, a **Read sheet** or **Write sheet** operation is the same as a **Read all** or **Write all**. Again, a reminder: you can only read CVs if your command station has that capability.

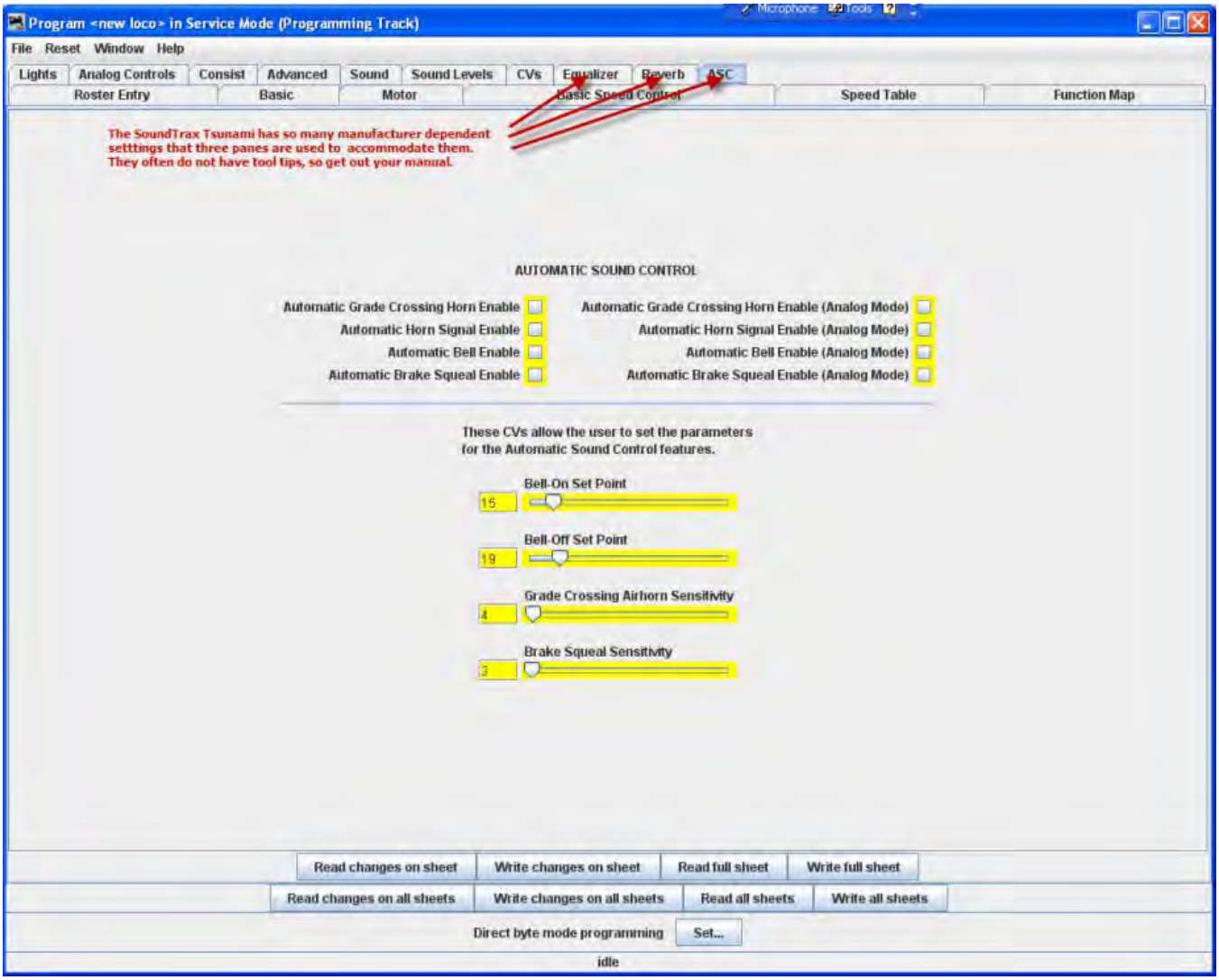


One thing to keep in mind about the **CV** listing on this pane - anything you can do here you can do from one of the other panes in Decoder Pro, without having to know the **CV** number or how to compile the values to get the desired effect. This pane is meant for advanced users of DCC used to crunching the numbers themselves. Those new to DCC can safely ignore this panel without losing any capability at all.

Manufacturer Specific Data Pane

This pane in the **Comprehensive Programmer** provides programming for functions that are specific to an individual manufacturer, but outside the realm of the DCC standard. While items like **Transponding** may eventually find a place in the NMRA DCC standard, and are therefore in the advanced pane, these items are obviously beyond that category. This pane will be manufacturer dependent and decoder family dependent


Program Kato C44-9W-650 in Service Mode (Programming Track)
File Reset Window Help
Lights Analog Controls Consist Advanced Sound Sound Levels CVs Digitrax
Roster Entry Basic Motor Basic Speed Control Speed Table Function Map
This pane is showing additional settings specific to Digitrax
Advanced consist droop compensation for speed stabilization 0
Speed Compensation Control F5 has no effect on speed compensation
Split field motor Normal DC motor
Vstart/Vmid/Vfull in 128 step mode Enabled
Short-circuit protection Enabled
Switching speed enabled by F6 Disabled
Torque compensation Enabled
Decoder Lock Feature Enabled
Decoder Lock ID number 0
Read changes on sheet
Write changes on sheet
Read full sheet
Write full sheet
Read changes on all sheets
Write changes on all sheets
Read all sheets
Write all sheets
Direct byte mode programming
Set...
Programmer error: Timeout talking to command station (306

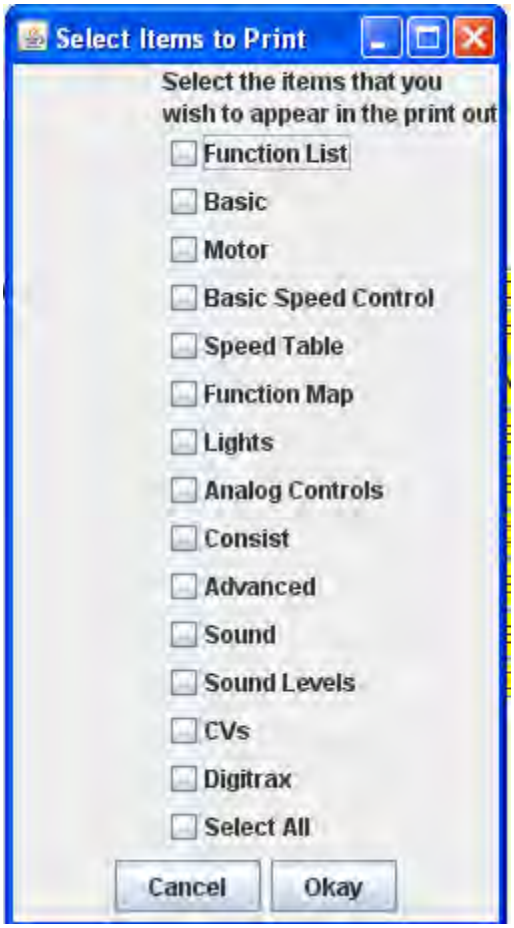


These items will, by definition, vary greatly between manufacturers. Once again, your best resource is the documentation for the specific decoder you are programming and this pane in the programmer for that decoder.

Printing Decoder Data

Print Data: DecoderPro provides the capability to print out a full list of the decoder CV data or selected data. To print, select the **File** menu of any Comprehensive Programmer Pane, then select the Print or Print Preview options.

- **Print all..., Preview all...** Displays **Select Items to Print** dialog box



Select each or all of the decoder items that you want to print

Click the **OKay** button to print then the Print dialog for your computer system is displayed.

- **Print CVs..., Preview CVs...**Displays **Select Items to Print** Dialog box or Preview screen

These printouts show the variables by name in each category that is selected.(as shown on the DecoderPro panes) along with their CV number and Value. Use as a handy reference for the future. You may print these as PDF documents and save them on your computer for reference or future printing.

Print preview will look like it's about to print the list, and ask for which printer to use. Don't panic!, that's only to get the preview to work. Go ahead and select the printer and you'll only get the preview.

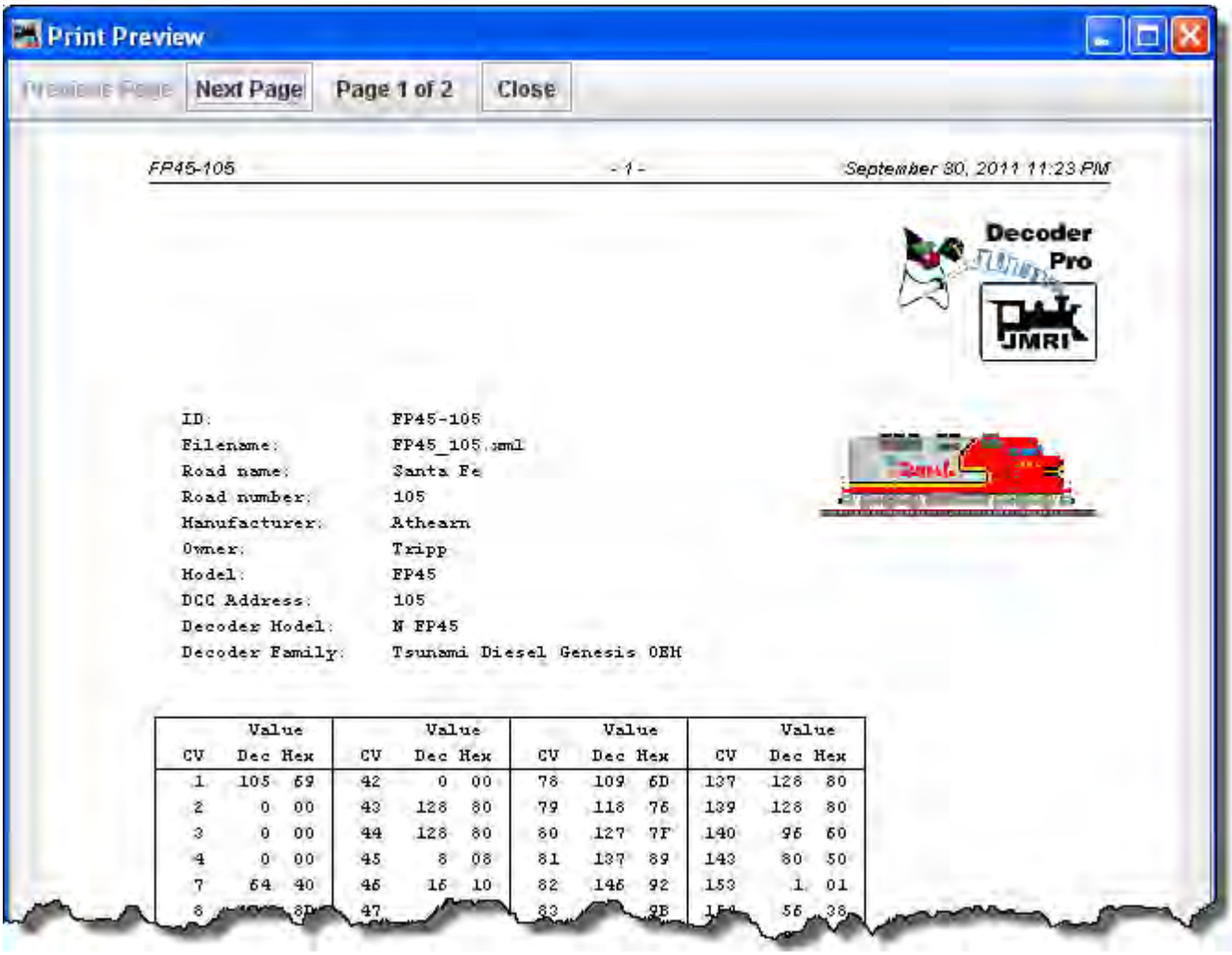
Import Data: You may import the list from another computer in the PR1 file format. Thus, the Export and Import capability allows you to take the data from one computer system to another.

Export Data: you may export the list as one of several file types :

- CSV file... (Comma separated variables)
- PR1DOS file...

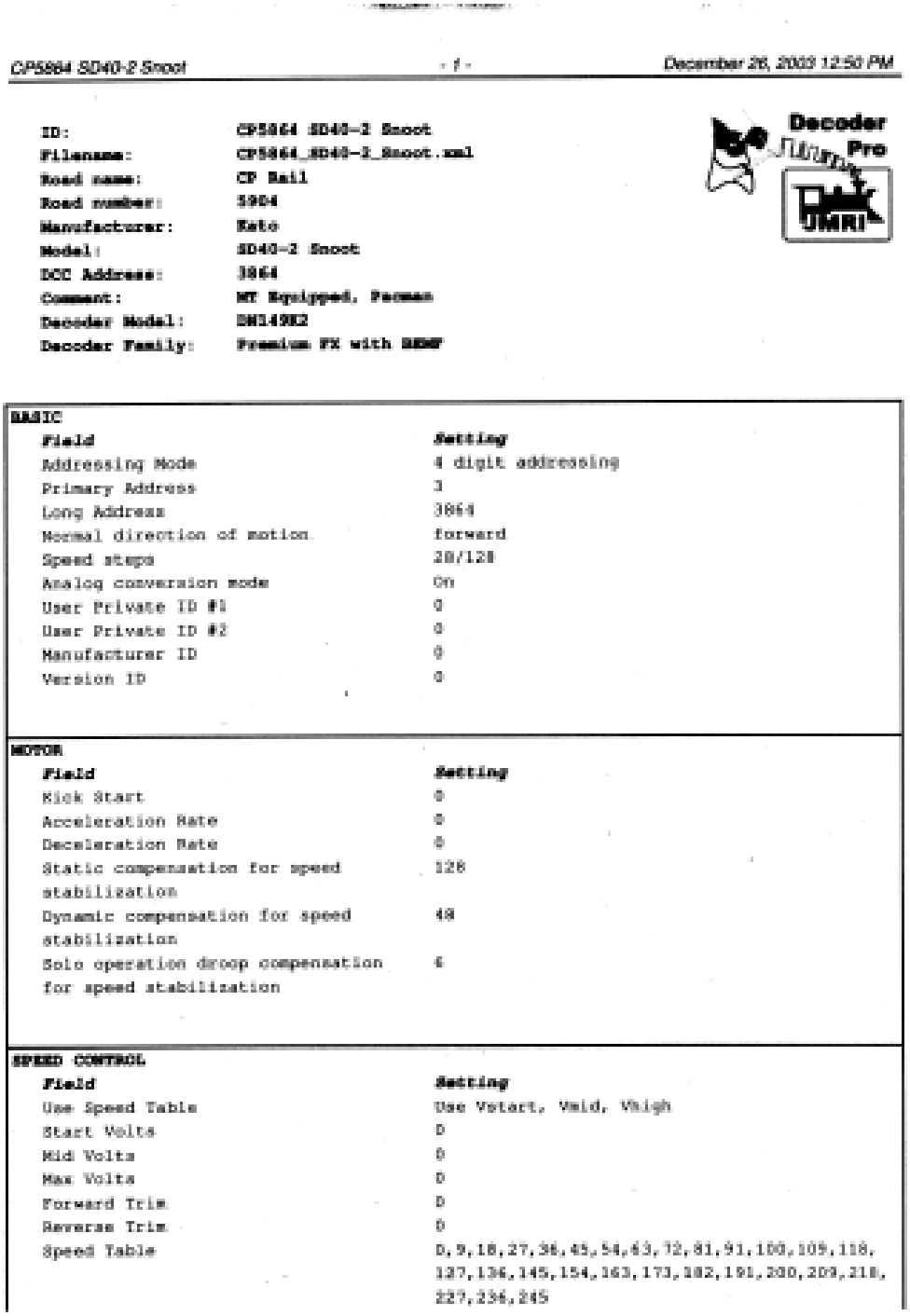
- PR1WIN file...

All are two columns, CV#, and Value in Decimal and Hexadecimal



CV	Value Dec	Hex	CV	Value Dec	Hex	CV	Value Dec	Hex	CV	Value Dec	Hex
1	105	69	42	0	00	78	109	6D	137	128	80
2	0	00	43	128	80	79	118	76	139	128	80
3	0	00	44	128	80	80	127	7F	140	96	60
4	0	00	45	8	08	81	137	89	143	80	50
7	64	40	46	16	10	82	146	92	153	1	01
8		8D	47			83		9B	154	56	38

The three images below are samples of the "**All**" printout from the SD40-2 that has been used as an example in many places in this manual. Click on the page to see a larger image in a new window.



CP5864 SD40-2 Snoot - 1 - December 26, 2003 12:50 PM

ID:	CP5864 SD40-2 Snoot
Filename:	CP5864_SD40-2_Snoot.xml
Road name:	CP Rail
Road number:	5864
Manufacturer:	Kato
Model:	SD40-2 Snoot
DCC Address:	3864
Comment:	MT Equipped, Paxman
Decoder Model:	SN145X2
Decoder Family:	Premium FX with SUSI

BASIC

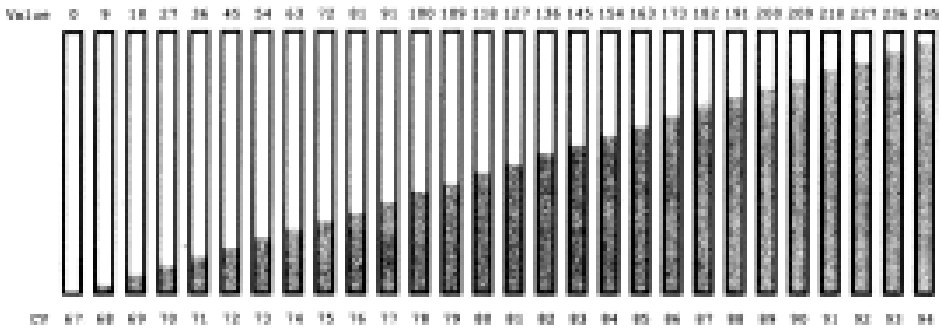
Field	Setting
Addressing Mode	4 digit addressing
Primary Address	3
Long Address	3864
Normal direction of motion	forward
Speed steps	28/128
Analog conversion mode	On
User Private ID #1	0
User Private ID #2	0
Manufacturer ID	0
Version ID	0

MOTOR

Field	Setting
Kick Start	0
Acceleration Rate	0
Deceleration Rate	0
Static compensation for speed stabilization	128
Dynamic compensation for speed stabilization	48
Solo operation droop compensation for speed stabilization	6

SPEED CONTROL

Field	Setting
Use Speed Table	Use Vstart, Vmid, Vhigh
Start Volts	0
Mid Volts	0
Max Volts	0
Forward Trim	0
Reverse Trim	0
Speed Table	0,9,18,27,36,45,54,63,72,81,91,100,109,118,127,136,145,154,163,173,182,191,200,209,218,227,236,245



FUNCTION MAP

Field	Setting
FL(f) controls output 1	0
FL(r) controls output 2	0
F1 controls output 3	0
F2 controls output 4	0

LIGHTS

Field	Setting
Directional Headlights	Normal headlight operation
Lamp keep-alive voltage	0
FX rate adjust	0
Ditch light hold-over time	0
Forward light FOF effect generated	Normal function of lead
Forward light FOF behavior	Forward direction, ON with function ON, phase A
Reverse light FOR effect generated	Normal function of lead
Reverse light FOR behavior	Forward direction, ON with function ON, phase A
Function 1 effect generated	Normal function of lead
Function 1 behavior	Forward direction, ON with function ON, phase A
Function 2 effect generated	Normal function of lead
Function 2 behavior	Forward direction, ON with function ON, phase A
F0 Forward during DC operation	Off
F0 Reverse during DC operation	Off
F1 during DC operation	Off
F2 during DC operation	Off

CONSIST

Field	Setting
Advanced Consist address	0
Advanced Consist direction	forward

ADVANCED

Field	Setting
Digitrax Transponding	Off

CVS

CV	Value Dec	Hex	CV	Value Dec	Hex	CV	Value Dec	Hex	CV	Value Dec	Hex
1	3	03	50	0	00	70	27	1B	84	154	9A
2	0	00	51	0	00	71	36	24	85	163	A3
3	0	00	52	0	00	72	45	2D	86	173	AD
4	0	00	53	128	80	73	54	36	87	182	B6
5	0	00	56	48	30	74	63	3F	88	191	BF
6	0	00	57	6	06	75	72	48	89	200	C8
7	0	00	61	0	00	76	81	51	90	209	D1
8	0	00	62	0	00	77	91	5B	91	218	DA
13	0	00	63	0	00	78	100	64	92	227	E3
17	207	CF	65	0	00	79	109	6D	93	236	EC
18	24	18	66	0	00	80	118	76	94	245	F5
19	0	00	67	0	00	81	127	7F	95	0	00
29	38	26	68	9	09	82	136	88	105	0	00
49	0	00	69	18	12	83	145	91	106	0	00

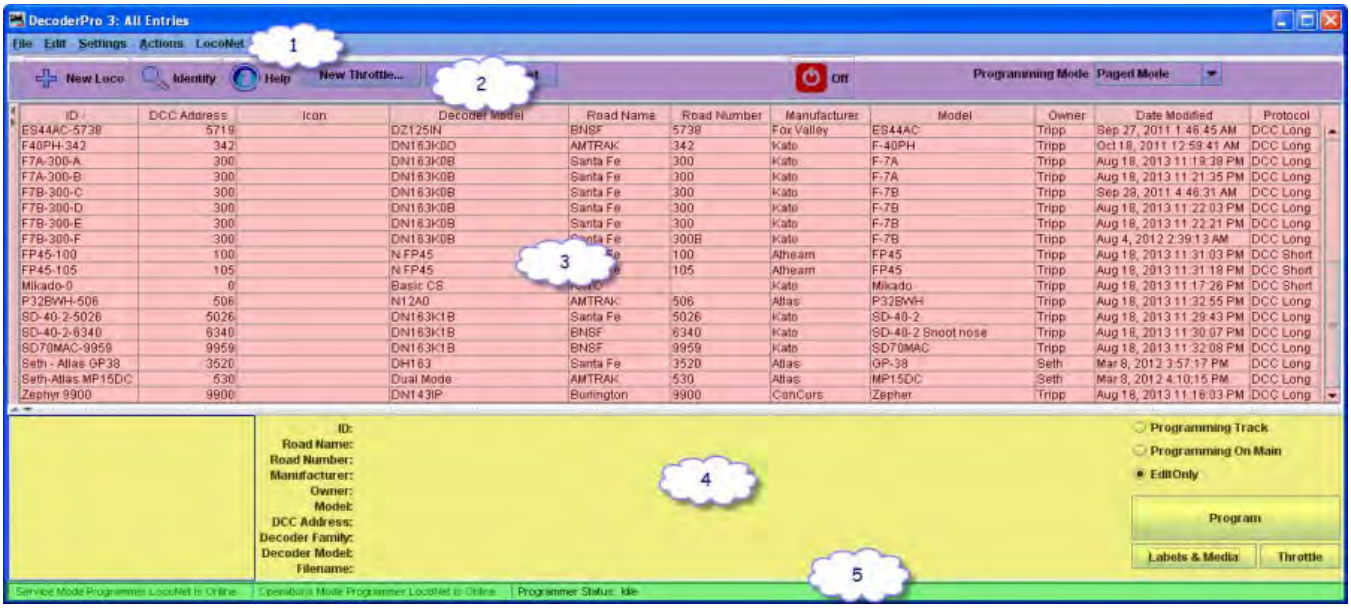
DIGITRAX

Field	Setting
Advanced consist droop compensation for speed stabilization	0
Speed Compensation Control	F5 has no effect on speed compensation
Split field motor	Normal DC motor
Vstart/Vmid/Vfull in 128 step mode	Enabled
Short-circuit protection	Enabled

DecoderPro3® Main Window

Main Window Overview

When you start Decoder Pro3®, the Roster window is displayed. All of the JMRI functions can be accessed via the menu bar on the DecoderPro3® window.



Menu bar

Most of the DecoderPro3® functions can be accessed via the menu bar.

File

New Roster Window

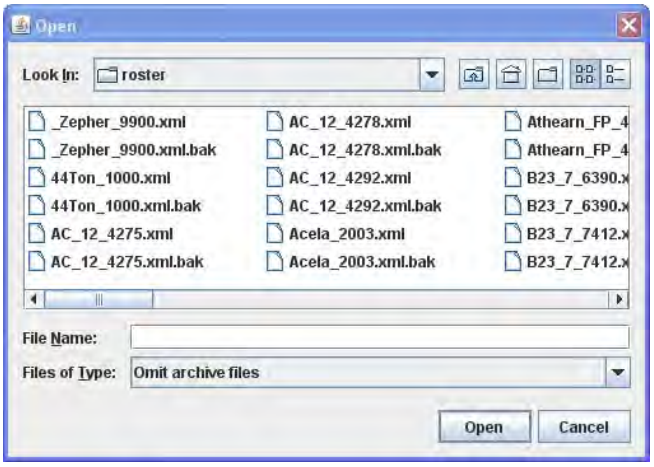
Another instance of DecoderPro3 **Roster** window is opened.

Import Roster

Imports Roster into DecoderPro3®

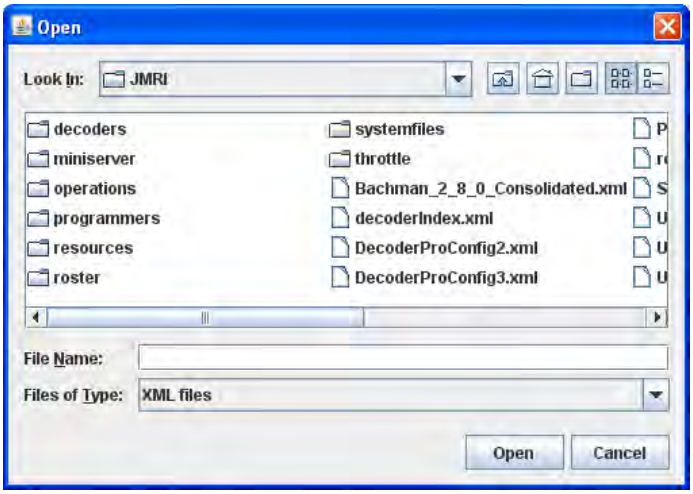
Import Roster Entry

Open the **Open** dialog to allow you to select a Roster Entry to import.

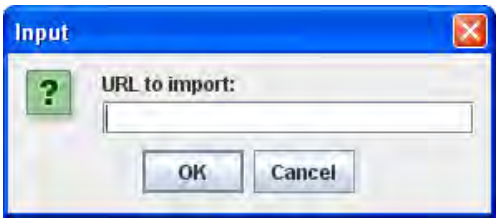


Import Decoder File

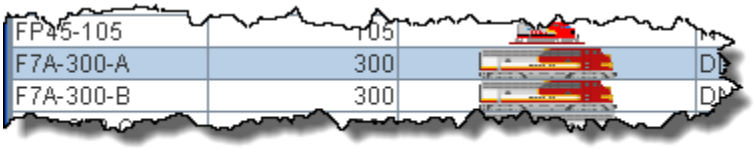
Opens the Open dialog allowing you to select a Decoder File to import.



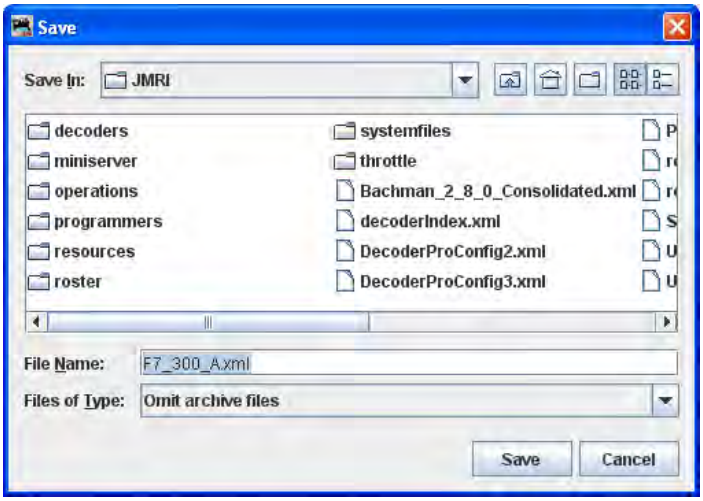
Import Decoder URL



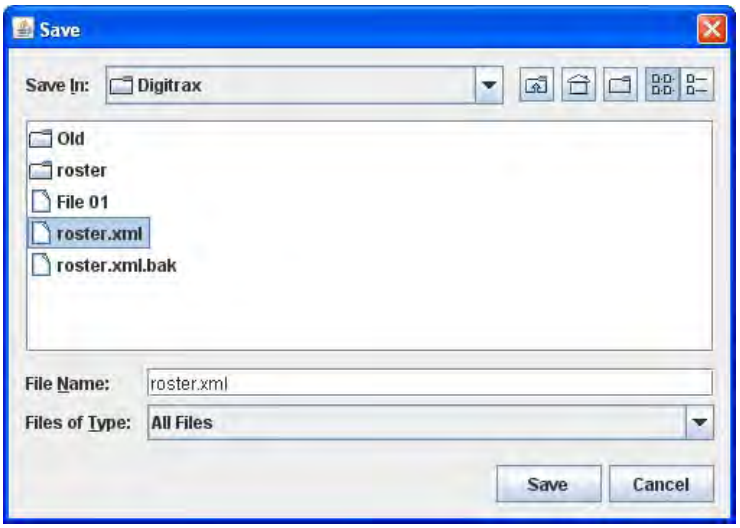
Export Roster Entry



Exports .xml file for the selected locomotive on your roster.



Export Complete Roster



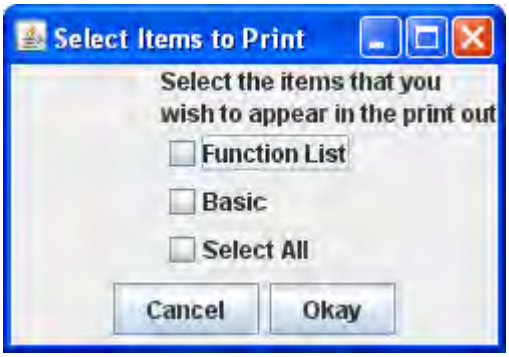
Close Window

Greyed out if only one Roster Window has been opened. Allows you to close an extra Roster Window that is no longer needed.

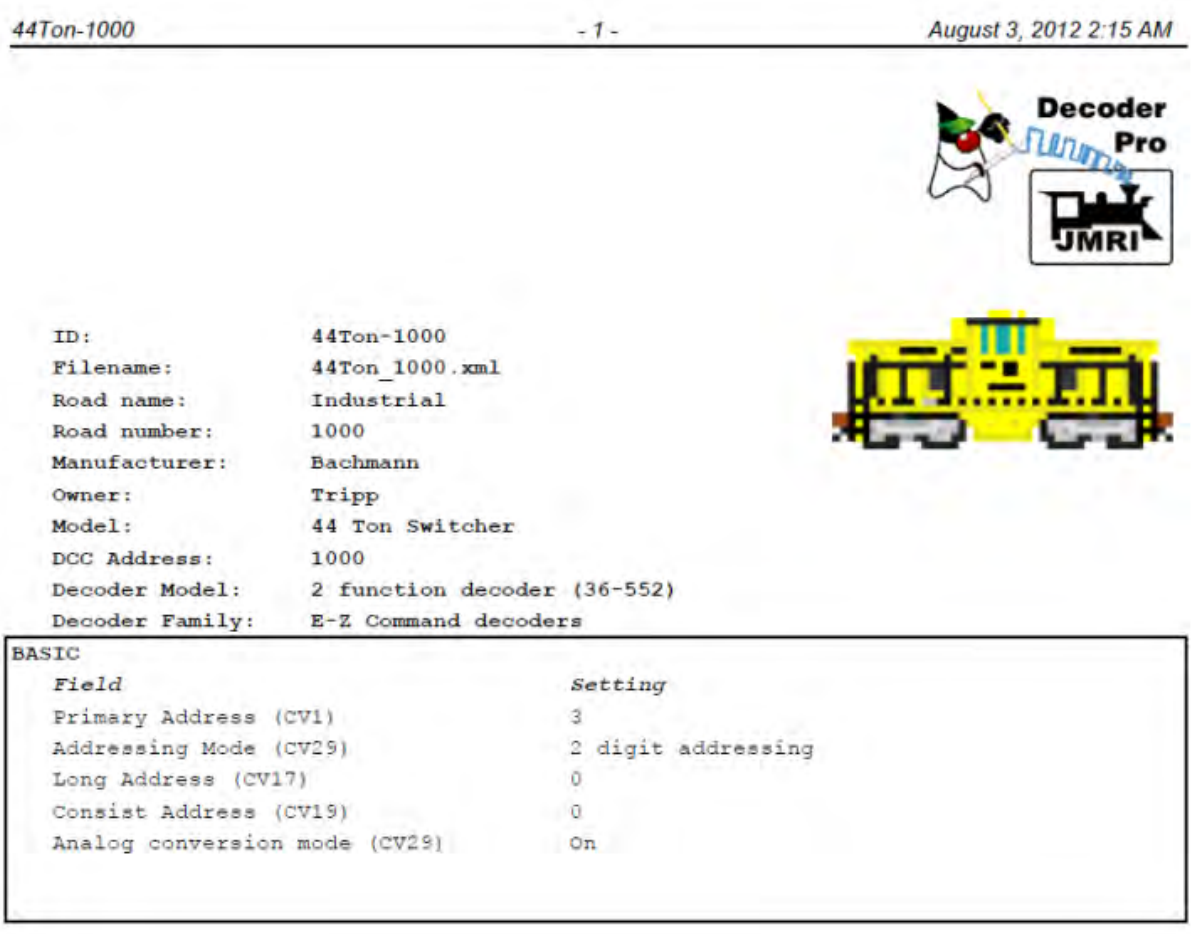
Print Roster

Entry

Opens the **Select Items to Print** dialog



Printed page for selected Roster Entry.



44Ton-1000 - 1 - *August 3, 2012 2:15 AM*

Decoder Pro JMRI

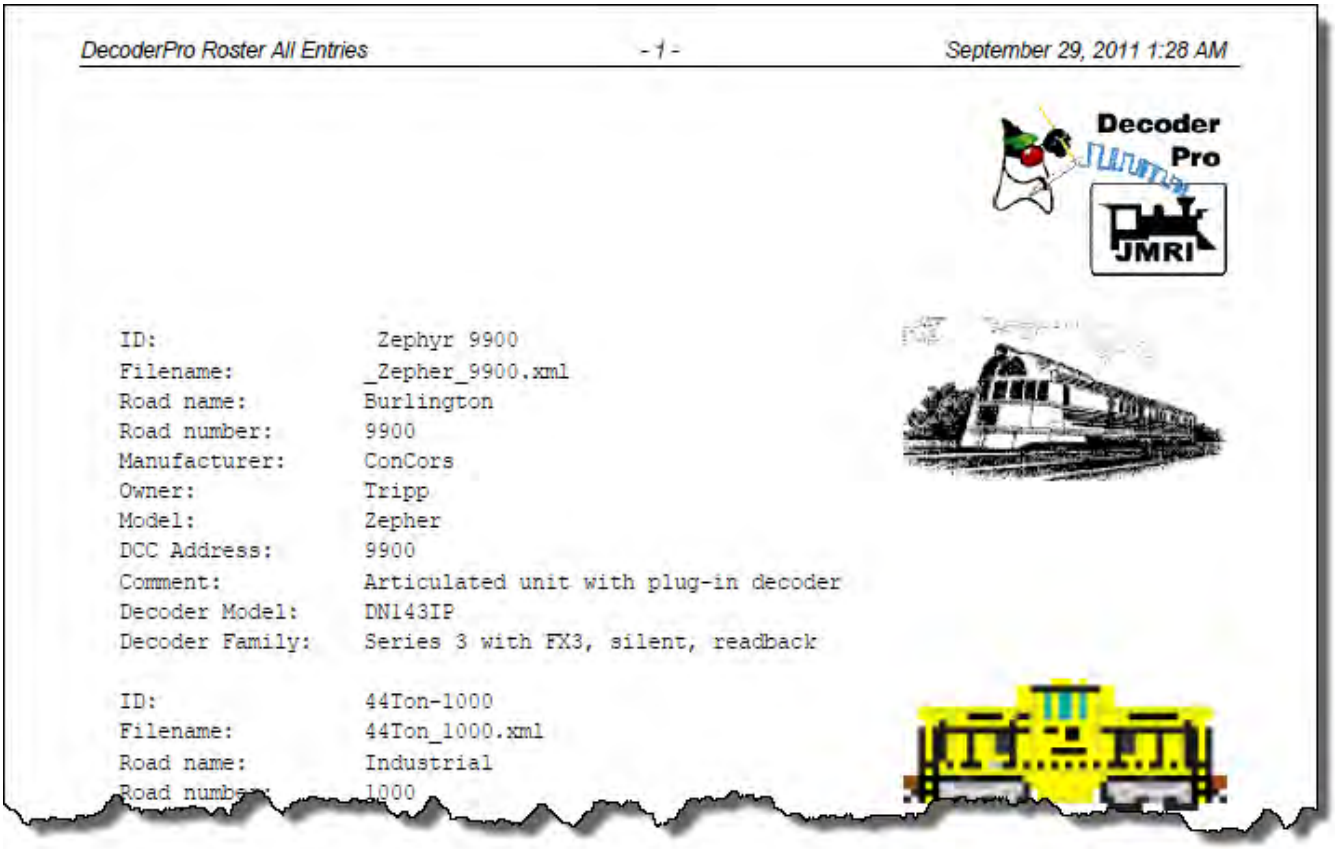
ID:	44Ton-1000
Filename:	44Ton_1000.xml
Road name:	Industrial
Road number:	1000
Manufacturer:	Bachmann
Owner:	Tripp
Model:	44 Ton Switcher
DCC Address:	1000
Decoder Model:	2 function decoder (36-552)
Decoder Family:	E-Z Command decoders

BASIC

Field	*Setting*
Primary Address (CV1)	3
Addressing Mode (CV29)	2 digit addressing
Long Address (CV17)	0
Consist Address (CV19)	0
Analog conversion mode (CV29)	On

Summary

This printout may be many pages. You can print to pdf file using printer dialog.



Print Preview Roster

Entry

Same as print except it uses the system printers Preview window.

Summary

Quit

Shuts down DecoderPro3.

Edit

Cut

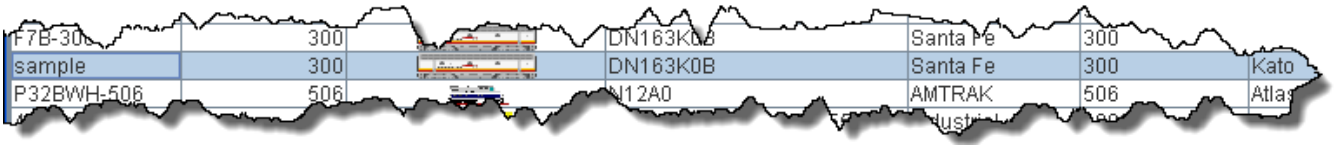
Copy

Paste

Duplicate Loco

Select the roster entry that you would like to duplicate. Enter a new name for the duplicate entry.

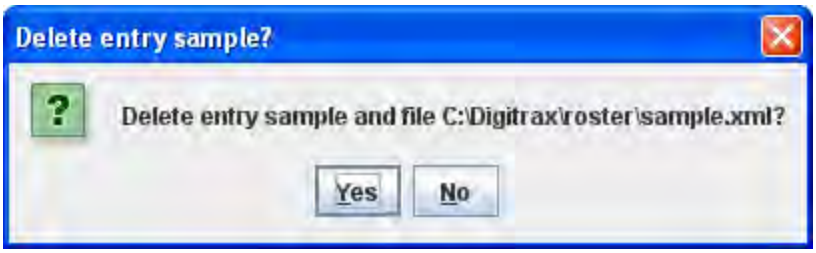
press OK and the duplicate is now added to the roster list. You may now edit or reprogram as required.



.

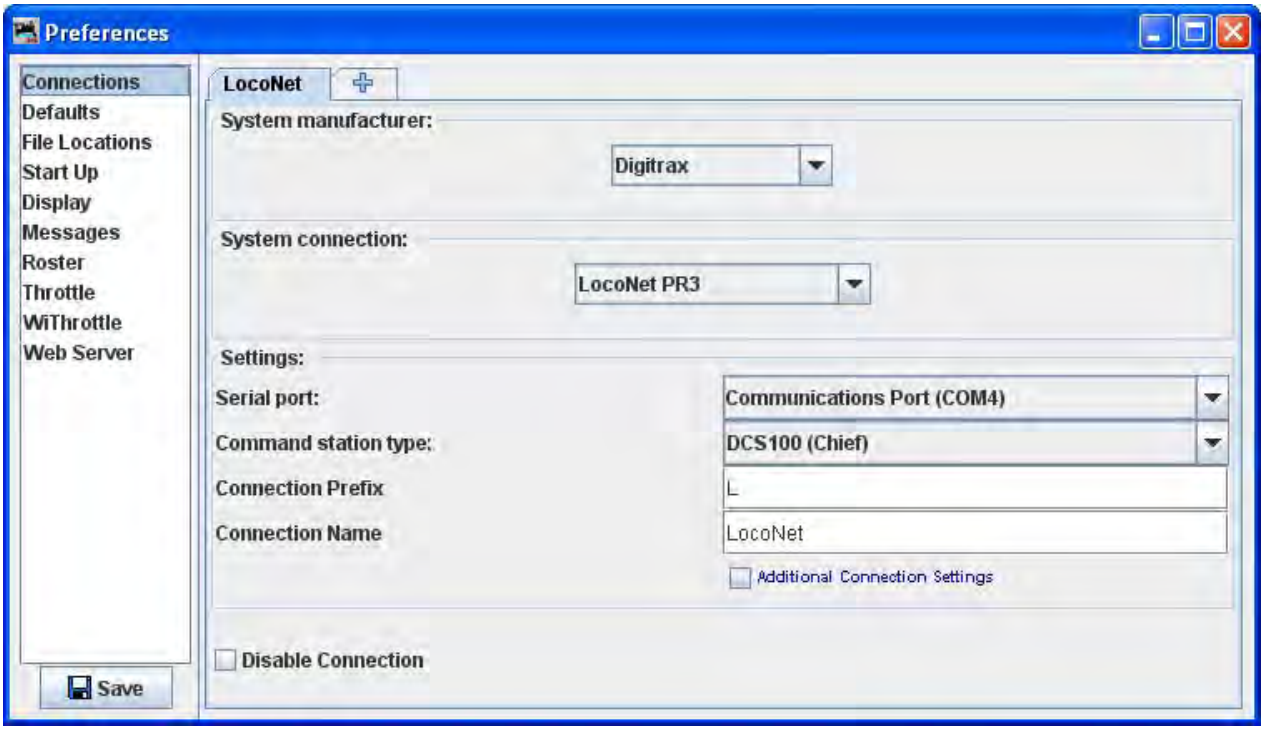
Delete Loco

Select the loco that you wish to delete in the roster list, select menu item.



Preferences

Preferences window is displayed.

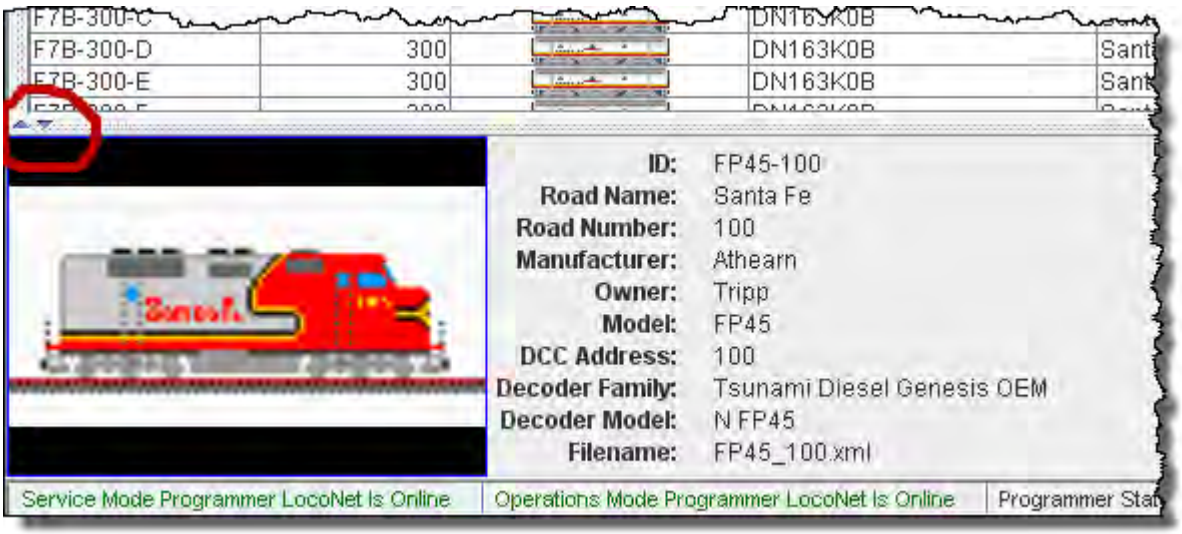


Settings

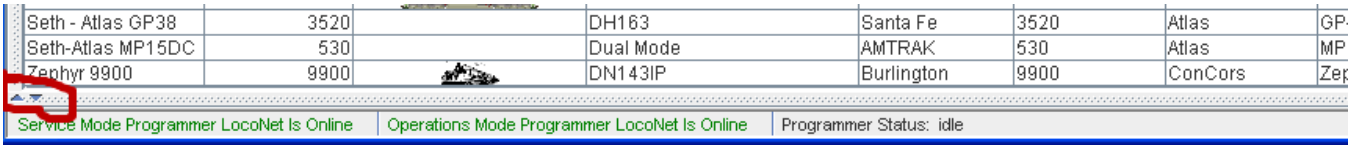
Hide/Show Summary Pane

Toggles the decoder information on/off, Part 4 of the main window

Show decoder summary pane



Hide decoder summary pane



Note the up and down arrows in the area above the summary pane. The down arrow will hide the summary pane and the up arrow will show the summary pane when clicked on.

Reset Window Sizes

not available yet

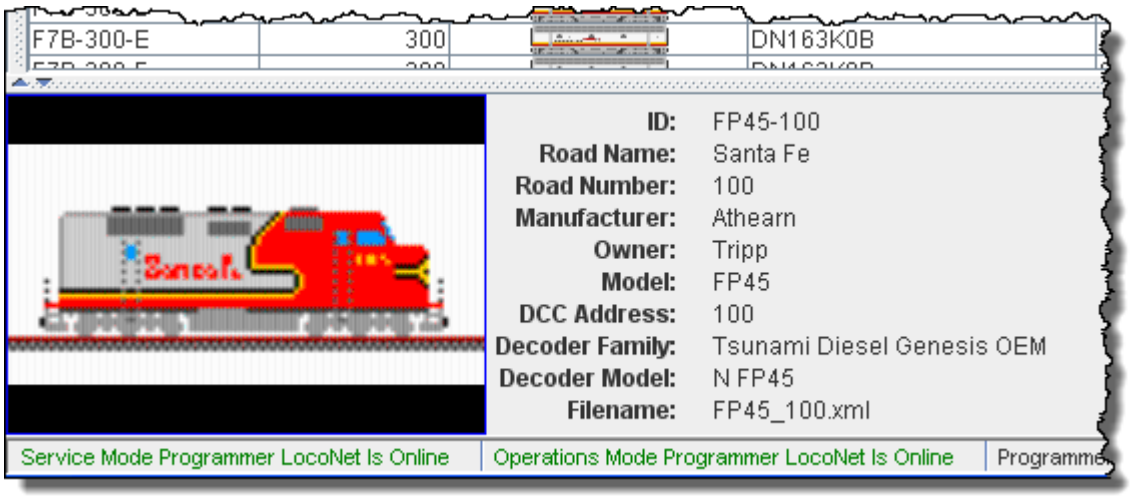
Reset Column Widths

Resets all of the columns to default settings if you have resized any of them.

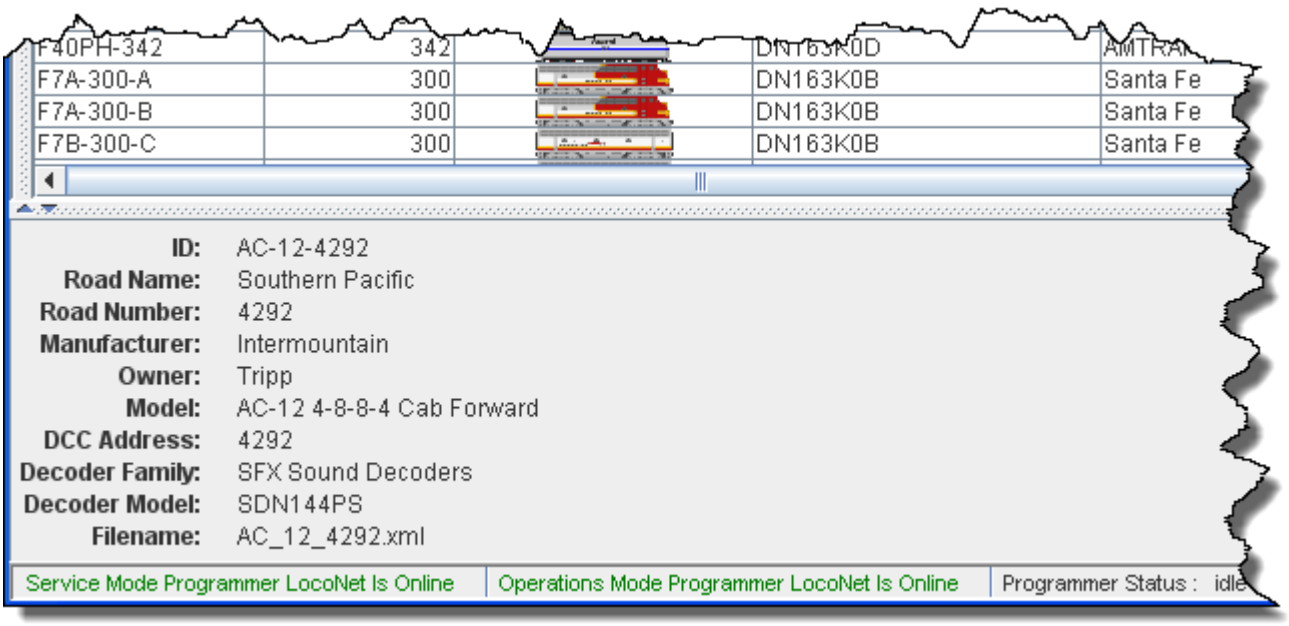
Hide/Show Roster Images

Toggles the roster image in Part 4 of the main window to show or hide

Show Roster image.



Hide Roster image.

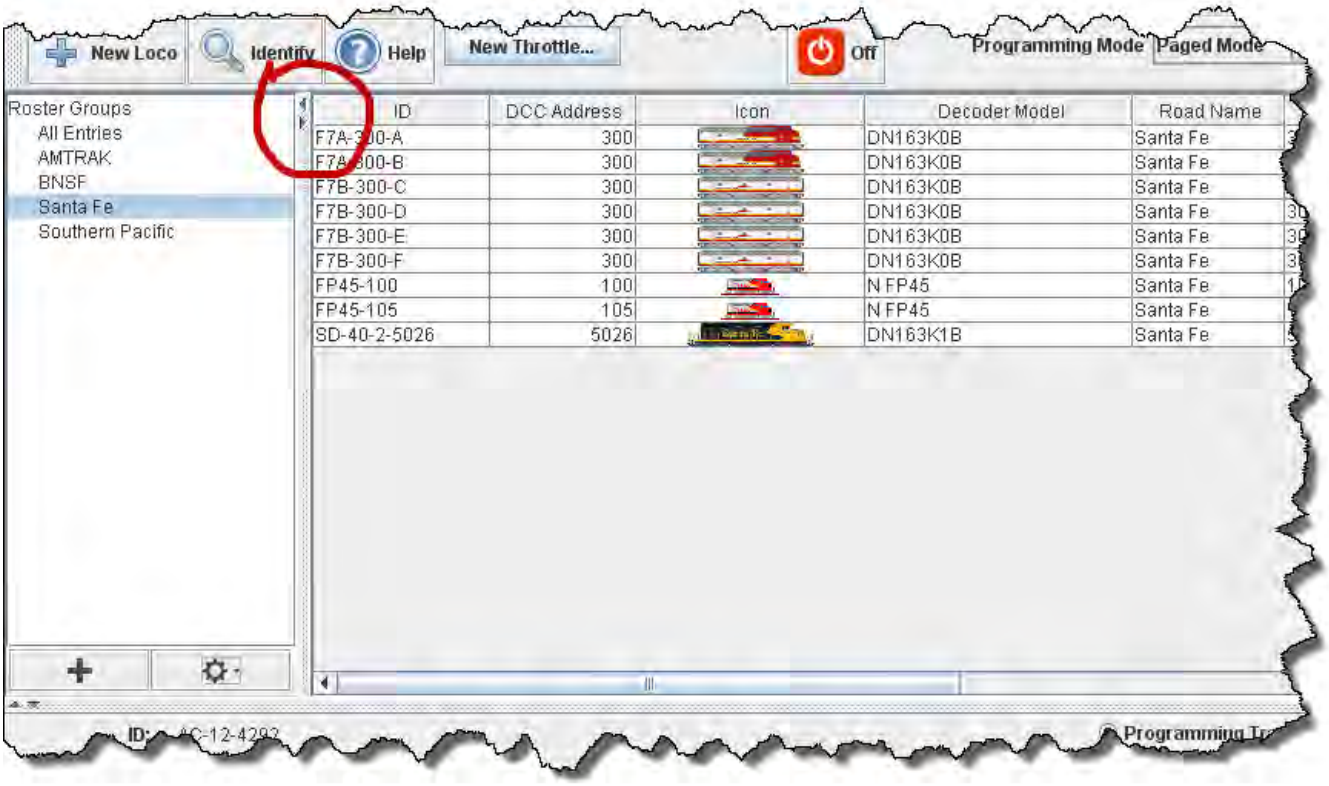


Hide/Show Roster Groups

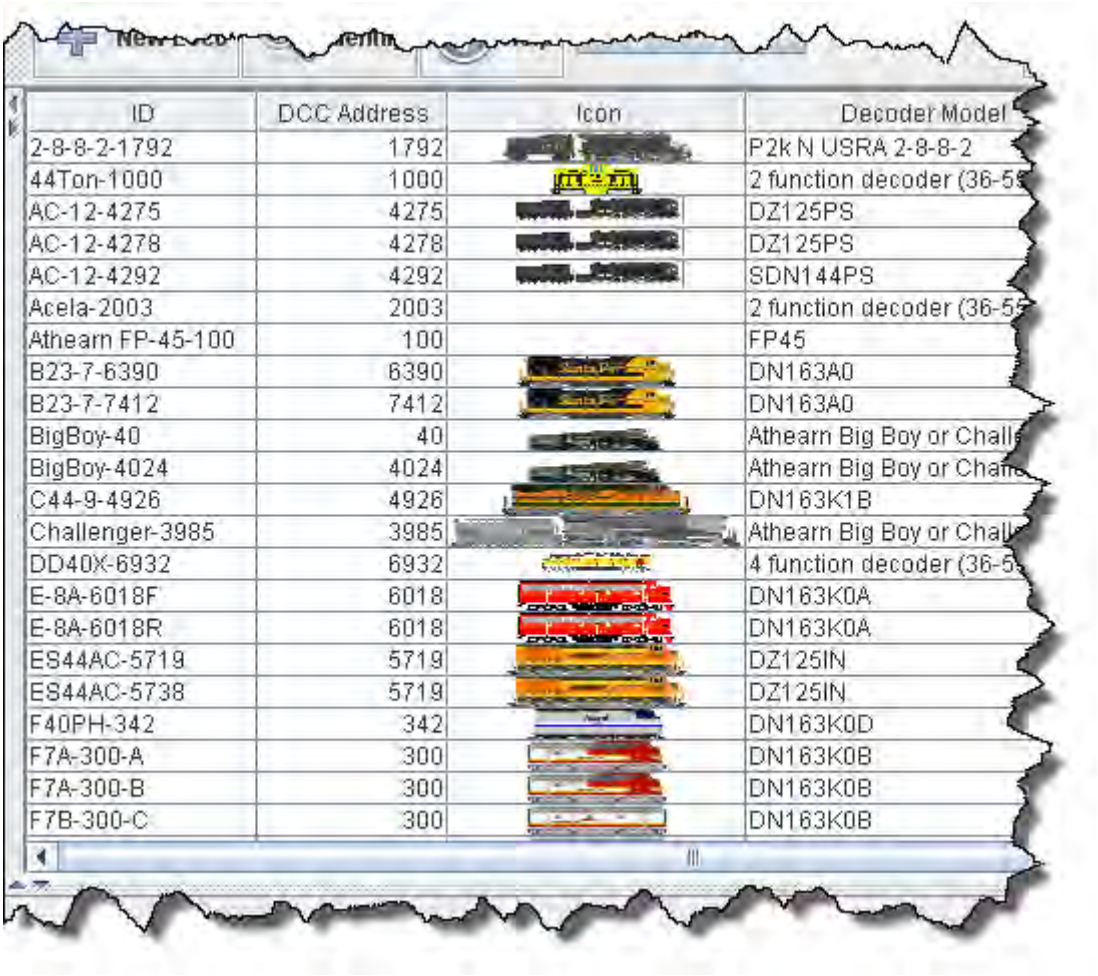
Show Roster Groups Pane

Selected group Roster Entries will be displayed. Select All Entries to show complete Roster.

Note the arrows on the border of the Roster Table. Right arrow shows Roster Groups pane and Left arrow hides the Roster Groups pane.



Hide Roster Groups ***Pane***.

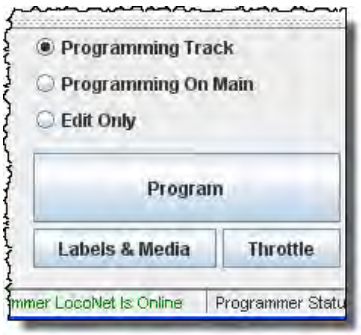


ID	DCC Address	Icon	Decoder Model
2-8-8-2-1792	1792		P2k N USRA 2-8-8-2
44Ton-1000	1000		2 function decoder (36-5
AC-12-4275	4275		DZ125PS
AC-12-4278	4278		DZ125PS
AC-12-4292	4292		SDN144PS
Acela-2003	2003		2 function decoder (36-5
Athearn FP-45-100	100		FP45
B23-7-6390	6390		DN163A0
B23-7-7412	7412		DN163A0
BigBoy-40	40		Athearn Big Boy or Chall
BigBoy-4024	4024		Athearn Big Boy or Cha
C44-9-4926	4926		DN163K1B
Challenger-3985	3985		Athearn Big Boy or Chall
DD40X-6932	6932		4 function decoder (36-5
E-8A-6018F	6018		DN163K0A
E-8A-6018R	6018		DN163K0A
ES44AC-5719	5719		DZ125IN
ES44AC-5738	5719		DZ125IN
F40PH-342	342		DN163K0D
F7A-300-A	300		DN163K0B
F7A-300-B	300		DN163K0B
F7B-300-C	300		DN163K0B

Programming

Programming Track

Selects the **Service Mode** (Programming Track)

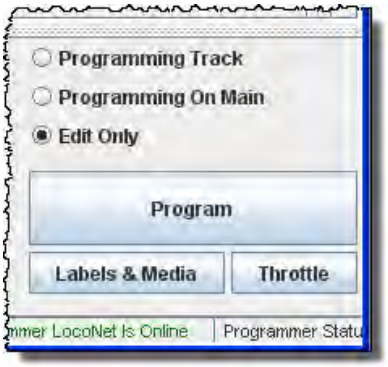


Programming on Main

Selects the Operations Mode (Program on Main)

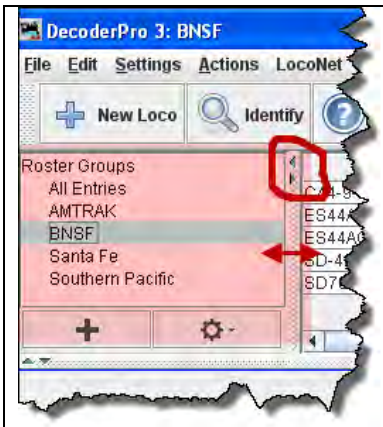
Edit Only

Selects Edit Mode that allows you to edit locomotive roster without changing the program



Create Roster Group

Use Create Roster Group to define any other groups you wish. From the Settings menu Create Roster Group opens the **New Roster Group** dialog. This same **New Roster Group** dialog may be opened using the + button above.



Creates a New Roster Group

The **OK** button will Add the Roster Group to the list in the panel and to the drop-down list on Main window toolbar. You can now add locomotives to the Groups either by dragging from the locomotive roster list or using the Table Associate, discussed later.

Opens menu for Roster Groups

Open in New Window

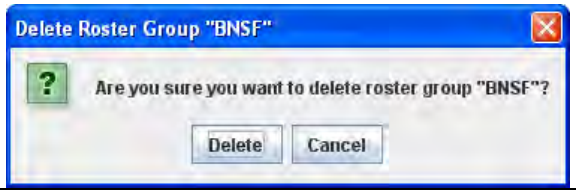
A window may be opened for each group if you wish.

Export...

Opens Save dialog box allowing you to save the group to a file. Rename...

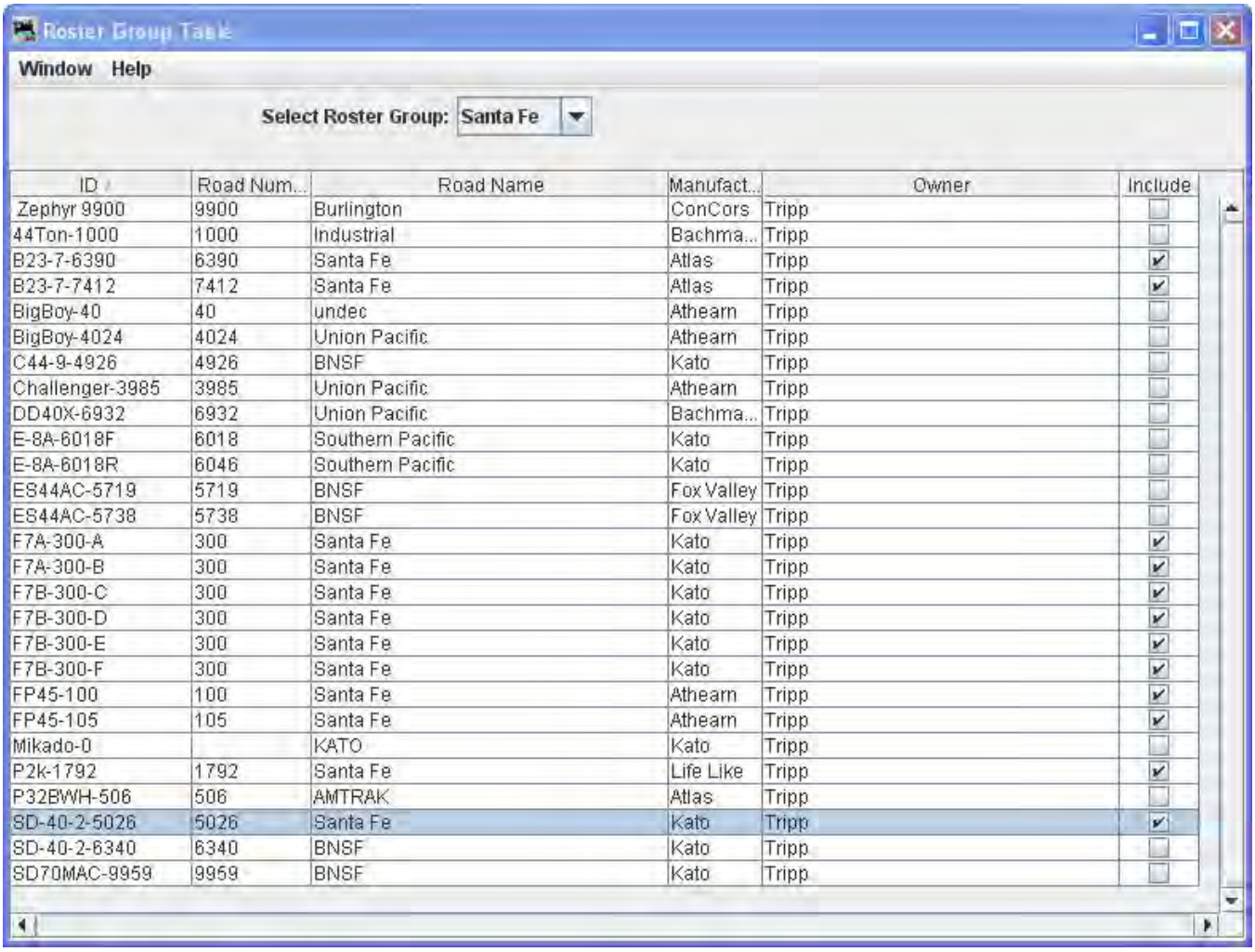
Duplicate

Delete



Roster Group Table Association

Once the groups are named, then you "associate" the roster entries with their group. This can be done by using the **Table Association** selection. At the top of the table you select the group you wish the roster entries to be associated with, then the roster entries that you want to associate with that group.



ID	Road Num...	Road Name	Manufact...	Owner	Include
Zephyr 9900	9900	Burlington	ConCors	Tripp	☐
44Ton-1000	1000	Industrial	Bachma...	Tripp	☐
B23-7-6390	6390	Santa Fe	Atlas	Tripp	☑
B23-7-7412	7412	Santa Fe	Atlas	Tripp	☑
BigBoy-40	40	undec	Athearn	Tripp	☐
BigBoy-4024	4024	Union Pacific	Athearn	Tripp	☐
C44-9-4926	4926	BNSF	Kato	Tripp	☐
Challenger-3985	3985	Union Pacific	Athearn	Tripp	☐
DD40X-6932	6932	Union Pacific	Bachma...	Tripp	☐
E-8A-6018F	6018	Southern Pacific	Kato	Tripp	☐
E-8A-6018R	6046	Southern Pacific	Kato	Tripp	☐
ES44AC-5719	5719	BNSF	Fox Valley	Tripp	☐
ES44AC-5738	5738	BNSF	Fox Valley	Tripp	☐
F7A-300-A	300	Santa Fe	Kato	Tripp	☑
F7A-300-B	300	Santa Fe	Kato	Tripp	☑
F7B-300-C	300	Santa Fe	Kato	Tripp	☑
F7B-300-D	300	Santa Fe	Kato	Tripp	☑
F7B-300-E	300	Santa Fe	Kato	Tripp	☑
F7B-300-F	300	Santa Fe	Kato	Tripp	☑
FP45-100	100	Santa Fe	Athearn	Tripp	☑
FP45-105	105	Santa Fe	Athearn	Tripp	☑
Mikado-0		KATO	Kato	Tripp	☐
P2k-1792	1792	Santa Fe	Life Like	Tripp	☑
P32BWH-506	506	AMTRAK	Atlas	Tripp	☐
SD-40-2-5026	5026	Santa Fe	Kato	Tripp	☑
SD-40-2-6340	6340	BNSF	Kato	Tripp	☐
SD70MAC-9959	9959	BNSF	Kato	Tripp	☐

Select Roster Group: from drop down list the roster group that you want to add entries to.

The table shows all the engines in your roster.

In the right column, Include... select the entries that you wish to add to the Roster Group, click individually to select a single item, hold the shift key down to select a range of items, hold the CNTRL key down to randomly select items. Close the Table and the entries will be added to the group.

Once the associations have been made, then you can select the Active Roster Group. Once this is done then the Print and Print Summary actions will show only the roster entries associated with that group. As an example you could select the Group **Santa Fe** and only the roster entries in this Roster Group will be printed. The printout

does not currently show the active group in the header. The active group will also influence any drop down box which has a list of entries in it, such as Throttle, edit entry, copy, etc. Also, when adding a new roster entry it will automatically be associated with the currently active group, so it is good practice when finishing working with a group to return the active group to Global.

Restoring Roster to include all Engines

To return your roster to show all engines, **Select Roster Group** to All Entries, or Global. Then you may be certain that you are working with all engines in your roster.

Disassociation of Roster Entry to Group

To disassociate a roster entry to a Roster Group, open Roster Group Table and uncheck roster selection and save new Group by closing the Roster Group Table.

Actions

Program

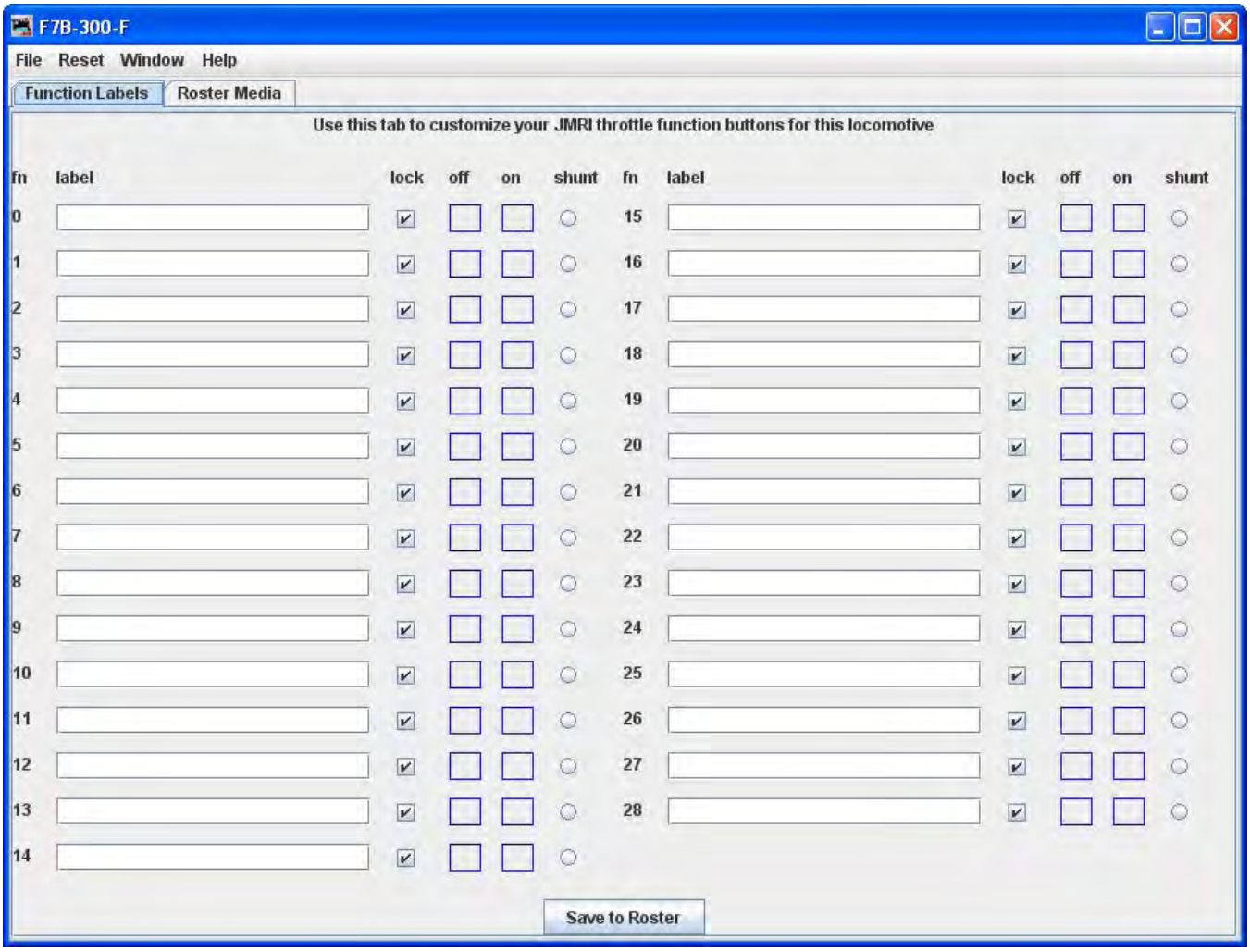
Opens the Programmer that is setup in your preferences for the selected Roster Entry, **Comprehensive Programmer**, defaults to **Basic Programmer**

Labels and Media

Opens the Labels and Media window with two tabs allowing you to set these parameters for the selected roster entry in your roster. Select the **Function Labels** TAB to edit your throttle function labels. Select the **Roster Media** TAB to edit the icon for your roster selection.

Function Labels Pane

This pane is opened from the **Labels & Media** button the DecoderPro3 main window or from the **Actions** menu.

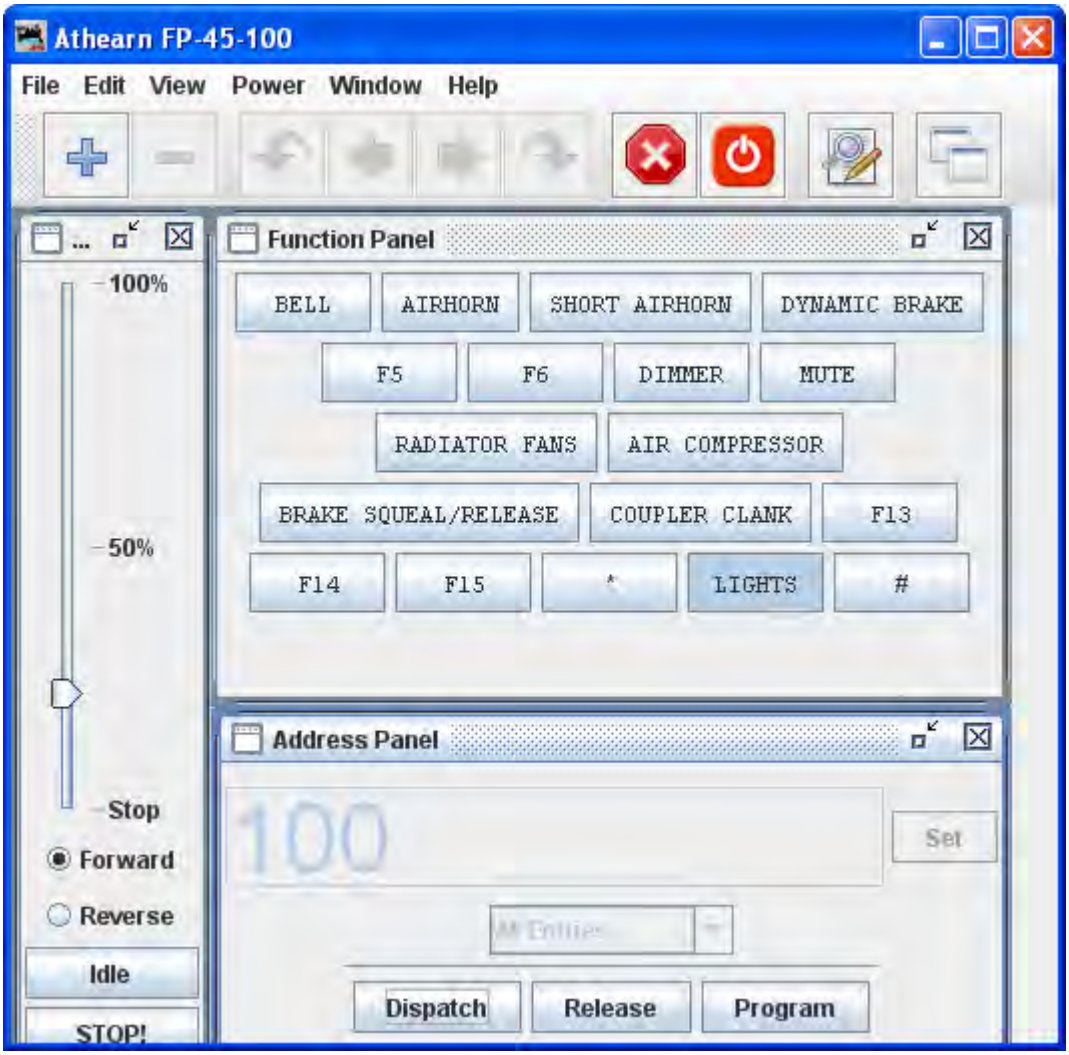


This pane is more than a scratch pad to keep track of what happens when function buttons are pushed. It also interacts with the **JMRI throttle**.

The **Function Label**s Tab makes settings for the Software Throttles within JMRI. Primarily the on-screen throttles, but some of the settings are mirrored on smart-phones (iPhone/Android) using the WiThrottle interface.

When you use the roster pull-down on the JMRI throttle to select a loco from your roster, the function buttons will be marked with the descriptions you have entered for those functions in this pane.

In this example, the Function keys on the Throttle will be labeled for the FP-45 with Tsunami OEM Sound decoder with sounds and lighting functions.


Athearn FP-45-100
File Edit View Power Window Help
Function Panel
BELL
AIRHORN
SHORT AIRHORN
DYNAMIC BRAKE
F5
F6
DIMMER
MUTE
RADIATOR FANS
AIR COMPRESSOR
BRAKE SQUEAL/RELEASE
COUPLER CLANK
F13
F14
F15
*
LIGHTS
#
100%
50%
Stop
Forward
Reverse
Idle
STOP!
Address Panel
100
Set
Dispatch
Release
Program

Using the checkboxes, space holders and the radio button to the right of each function may be set to:

lock	Makes the function button "latching" or "non-latching". When the box is checked the function is "locked" or "latched". **Latched Function** when pressed will stay on(down position) until pressed again i.e. Function button labeled "Bell" would ring until pressed again. **Unlatched Function** when pressed toggles on and then off. i.e. Function Button labeled "short horn", when pressed provides one blast of horn.
off	Place holder for icon that is displayed on Function Button when it is in off state.
on	Place holder for icon that is displayed on Function Button when it is in on state.
shunt	Sets "virtual" function key for software throttle. The "lock" option also needs to be set simultaneously with the "shunt" virtual function key activation. When this Function key is pressed the throttle speed slider on the software throttle changes to "center off" style for shunting, rather than the "full-range with separate direction key"

You may drag and drop icons into the off or on space holder herer or in the Throttle Function pane properties.

You may also edit the function button text in the **JMRI Throttle** and save those changes to the selected Roster entry. To use these changed entries in the future, make sure you click on the Save to Roster to save these values into the Roster entry that is in use.

Roster Media Pane

The Roster Media Pane is opened from the DecoderPro3 button in main window or from the Action menu, then select the Roster Media TAB.

The Roster Media Pane allows you to add a main image and an icon to the engines roster. The main image may be used for Throttle background image if selected in the Throttle preferences. The icon image is used in the Throttle list and various roster combo boxes.

The icon is the image that will appear in the Decoder Information part of the DecoderPro3 initial screen, once you have selected a locomotive from the list. The icon will also display in the icon column of the Locomotive Roster List.

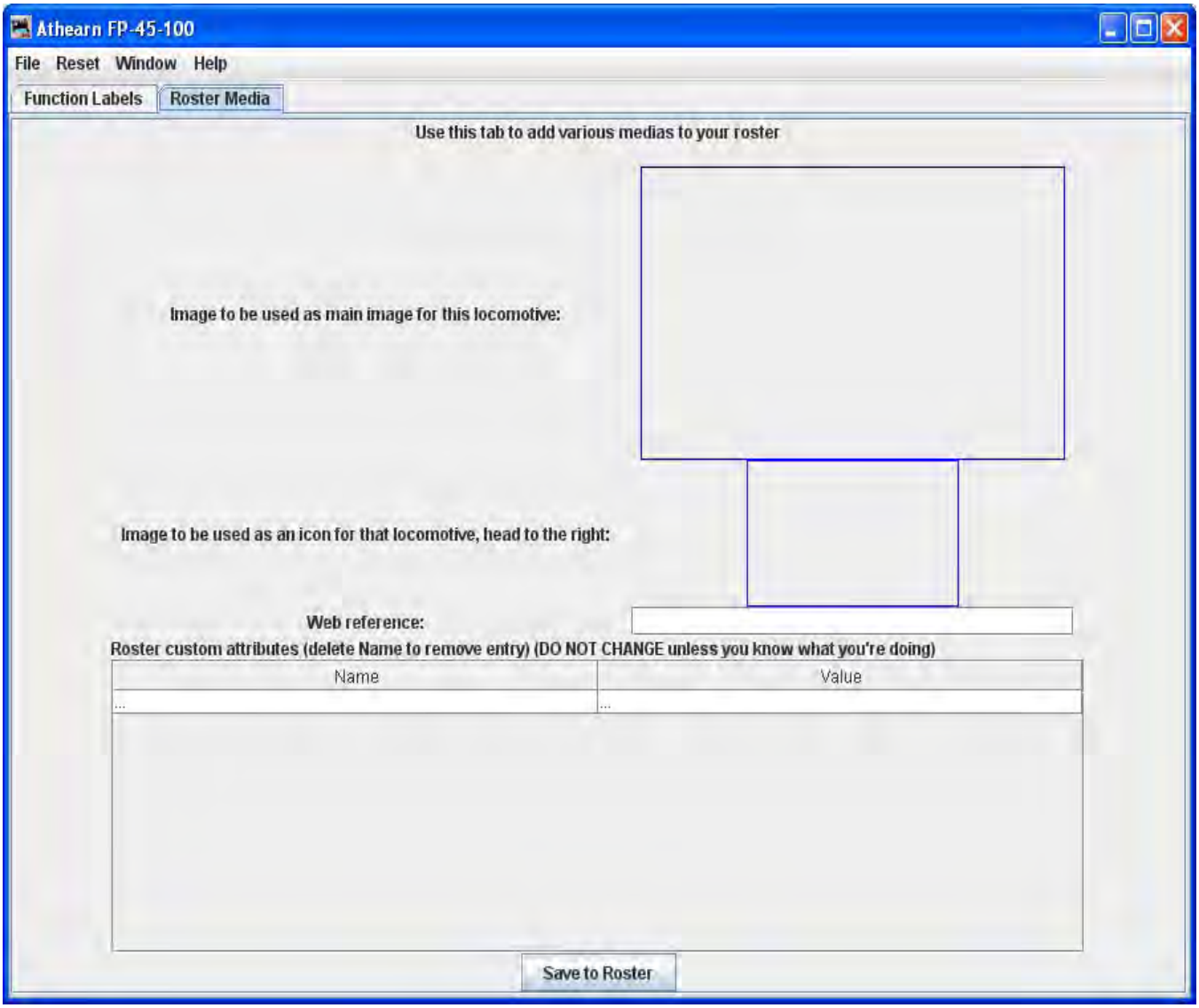
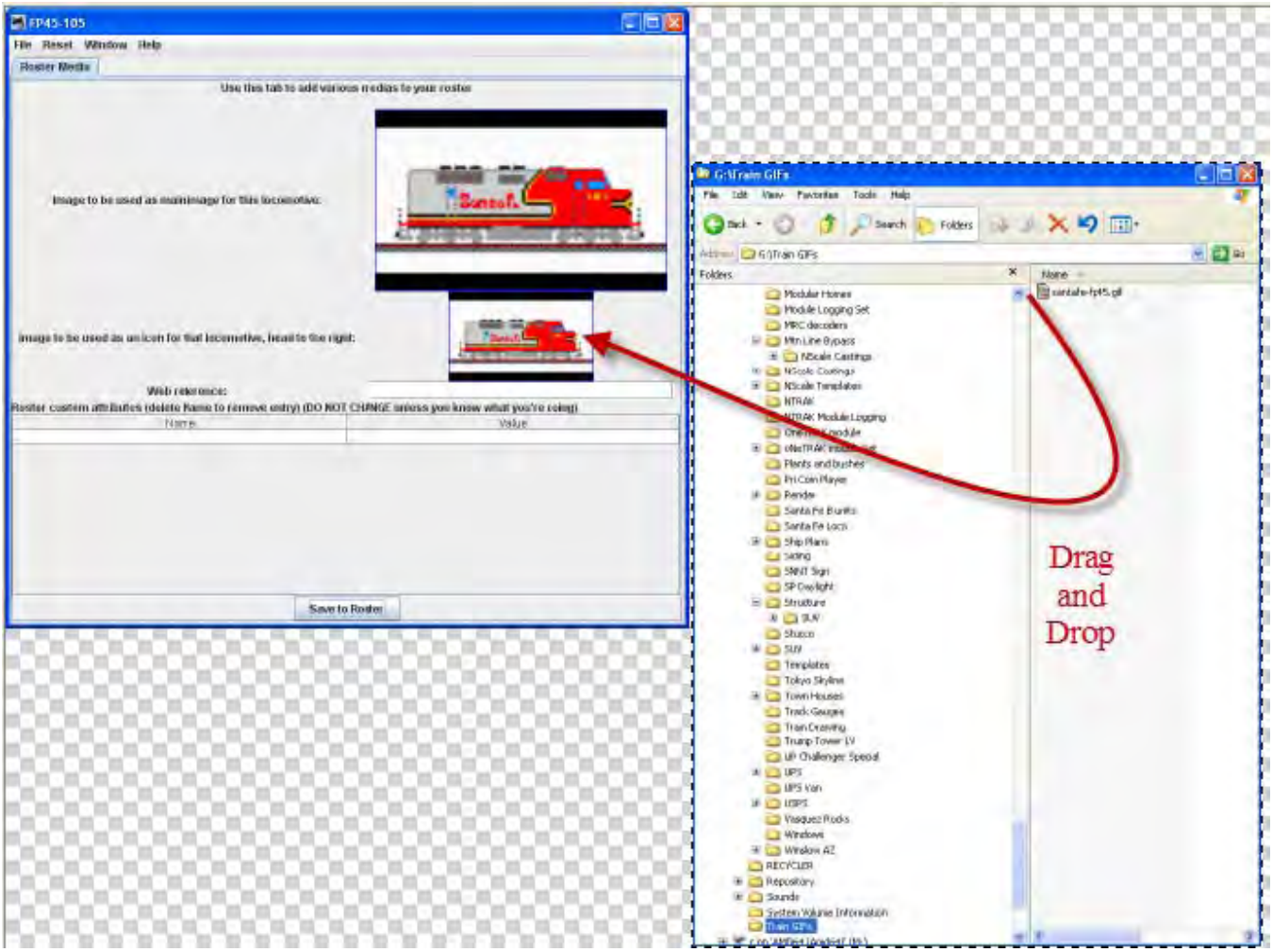


Image to be used as main image for that roster: The large black box is the image holder. The image is placed into the image holder by following these instructions.

1. First you must find the image of the Locomotive and store it on your disk drive.
    a. Sources
        1. Images downloaded from a website to your computer
        2. Photos taken with a digital camera or scanned from film
        3. Other sources, CD, DVD frames from videos etc. saved as an image to your computer
    b. Format
        1. The GIF format is preferred with transparent background
        2. PNG with transparent background
        3. JPG

2. After storing image on your computer open the Roster Media Pane, then open Windows Explorer or File Manager for your system and drag and drop the image file into the large black box. You may also save the image to your Desktop and drag and drop to Roster Media from there. DO NOT try to drag and drop from a website.
3.

   Roster images are stored in the <JMRI Preferences folder>/resources. When an image is updated or removed it is not removed from this folder.



To remove either image from the Roster, Right click and click remove in the context that displays, however, it will not remove the image from the Resources folder.

Image to be used as icon for that roster, head to the right: similarly, there is a small black box which can be filled with a picture to be used as an icon for roster entry identification. The instructions are the also similar:

1. Next you must find the image of the Locomotive to use as an icon and store it on your disk drive.

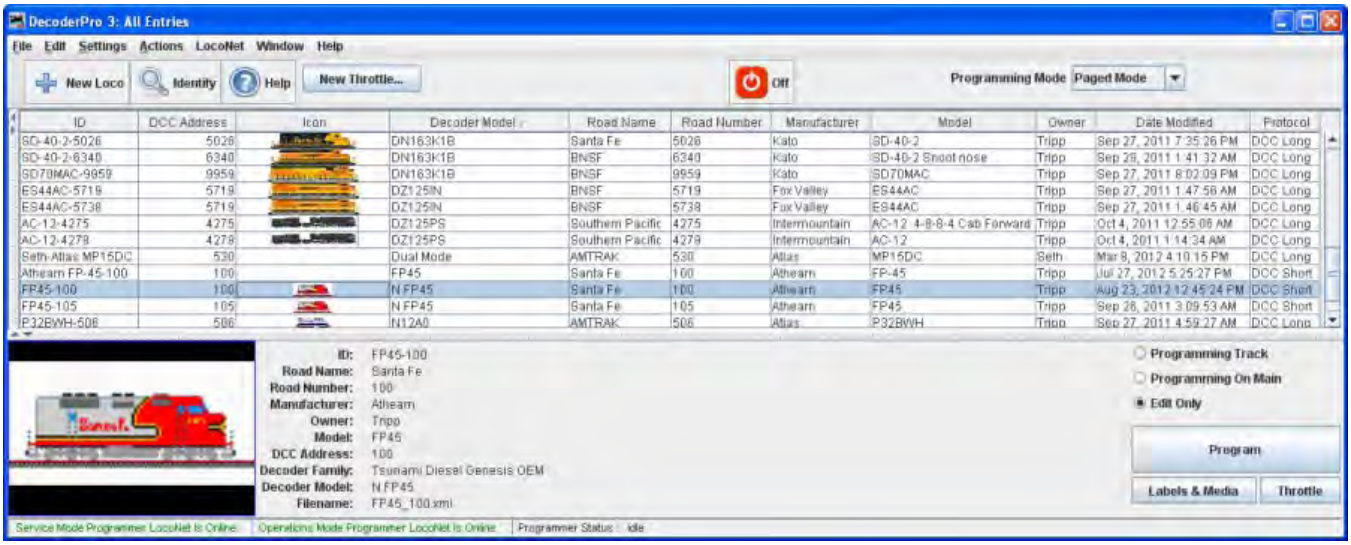
a. Sources
    1. Images downloaded from a website to your computer
    2. Photos taken with a digital camera or scanned from film
    3. Other sources, CD, DVD frames from videos etc. saved as an image to your computer
b. Format
    1. The GIF format is preferred
    2. PNG with transparent background
    3. Do not use JPG.

2. After storing icon image on your computer open the Roster Media Pane, the open Windows Explorer or File Manager for your system and drag and drop the image file into the small black box. You may also save the image to your Desktop and drag and drop to Roster Media from there. DO NOT try to drag and drop from a website.

To remove either image from the Roster, Right click and click remove in the context that displays, however, it will not remove the image from the Resources folder.

Web reference: You can copy the URL of the website where you located the images for reference

Save to Roster After adding images to the image boxes for main image and icon, click on this button to store images in your Roster. Now the image will appear in your roster list in DecoderPro3.



Links for icons in GIF and images of most Locomotives are listed below:

Rail Serve www.railserve.com/TrainGIFs/

Train GIF Railyard www.djcooley.com/info/gifs/loco/gifloco

Karl's RR Pages www.kls2.com/~karl/rr/consists/

ED Bindler Train GIF.s www.bluarcher.com

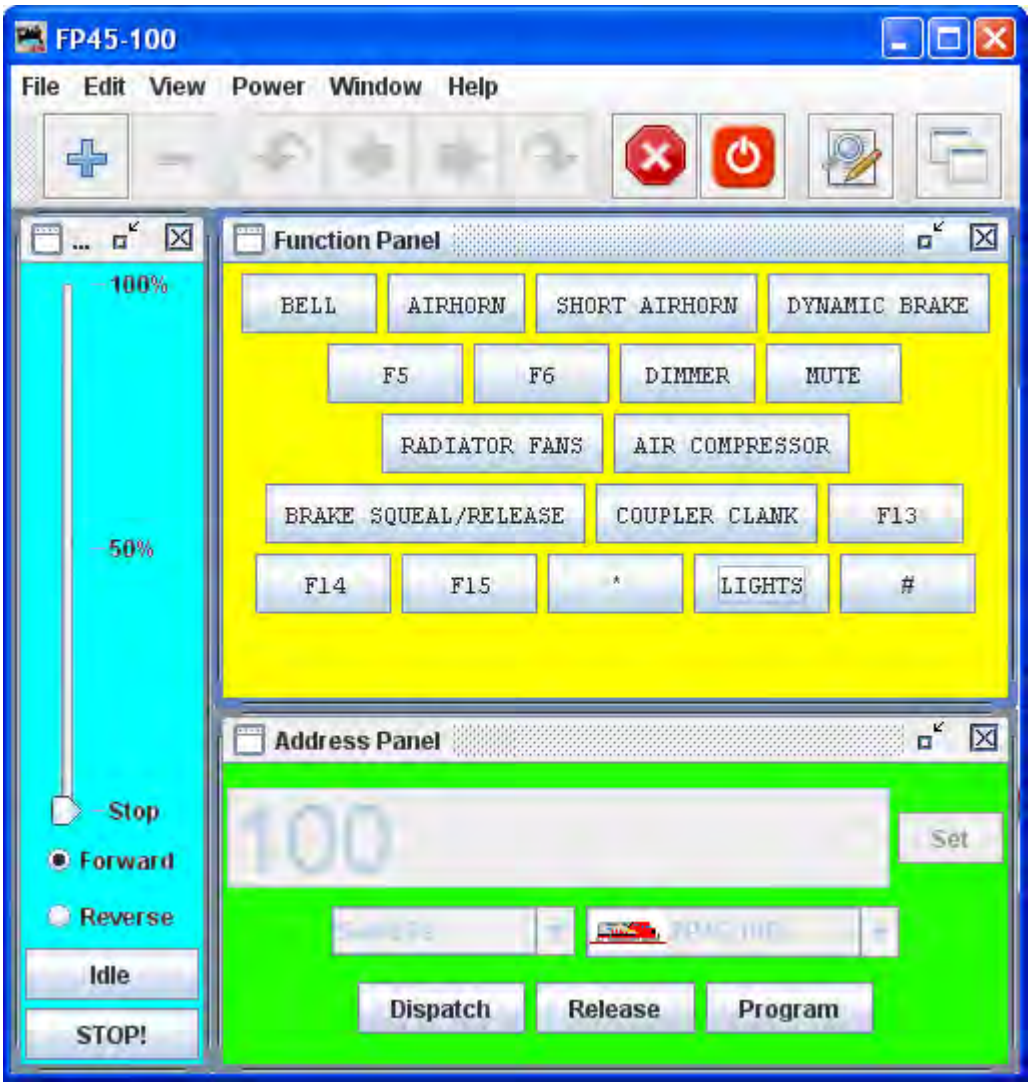
New Throttle

Load Default Throttle Layout

Opens the default throttle that is set in preferences

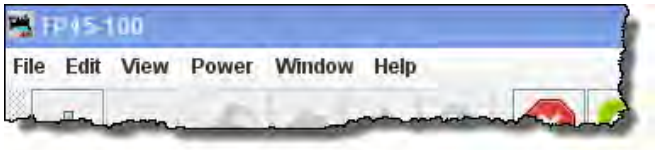
JMRI® Throttle Window

The JMRI® Throttle may be used on your computer screen to replace the vendor throttle that is furnished with your DCC system. One or several throttles may be in use at one time. The Throttle opens as a floating window that may be positioned anywhere on your desktop. Note the Title Bar contains the locomotive address information.



(Color shading added to show functional areas throttle panels)
The Throttle Window contains **Menu Bar**, **Toolbar** and three panels which may be enabled or disabled via check box in the View menu. Each panel has a title bar with windows controls to minimize, maximize and exit: : **Warning!!!** Be careful with the left hand (minimize) buttons. In Windows, if the little guy is clicked it will minimize the panel, which means it is no longer visible but the restore button is lost behind the rest of the panels. The way to easily get it back, is to go into the view menu, uncheck it there, then go back again and re-check it. You may also drag the panels out of the way to uncover the Maximize icon for a minimized panel.

Throttle Window Menu Bar

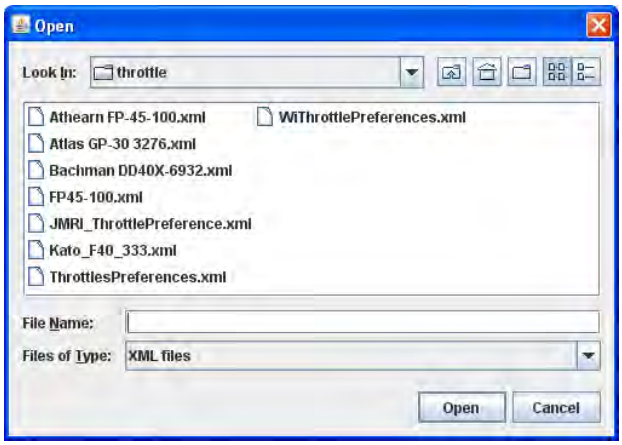


File

New Throttle...

Opens new copy of the throttle

Open Throttle

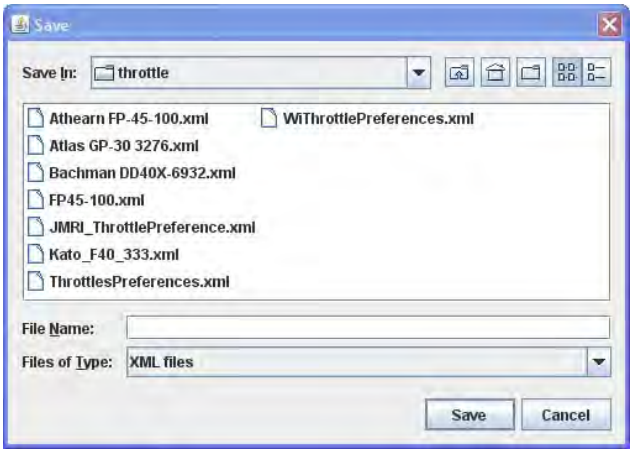


Select a saved throttle XML: file.

Save Current Throttle

Save a throttle file that has been opened and modified

Save Current Throttle As...



Opens the Save dialog to allow you to save the Throttle XML file in the location you select and using the name you specify

---

Open Throttles Layout...

Opens Throttle layout that you select.

Save Throttles Layout...

Save Throttles Layout to file in Throttle Folder

Load Default Throttles Layout

Load the default throttle layout from Throttle Folder

Save As Default Throttles Layout

Save as the default throttle layout from Throttle Folder

Start WiThrottle

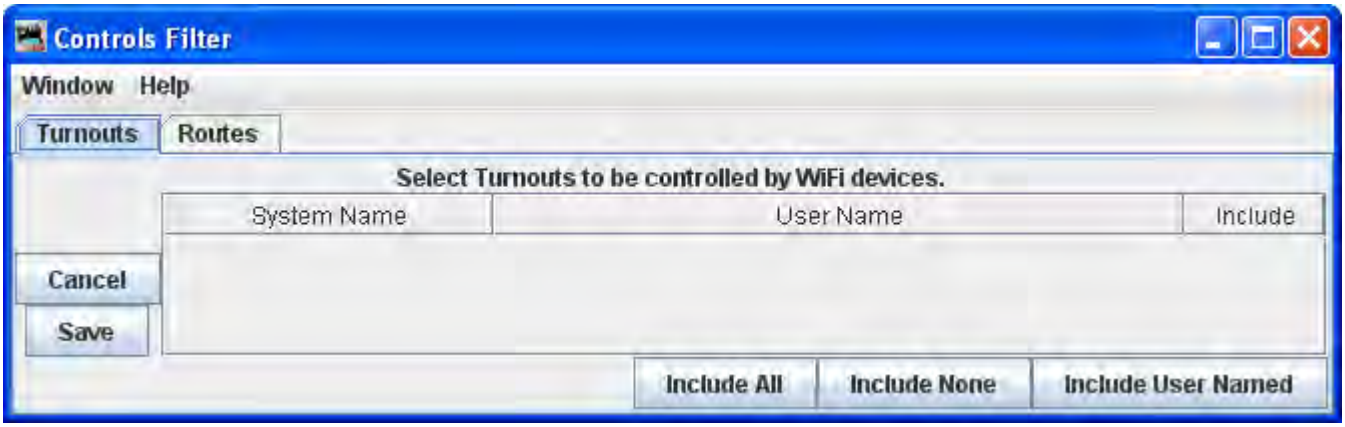
This window controls the connection between WiFi throttles, e. g. an iPhone, iPod Touch, or Android Phone and **JMRI Preference** in the Wi/Throttle Pane.

Menu Bar

- WiThrottle
  - Start Server

Starts the server for the WiThrottle

  - Filter Controls



Set up Turnouts and Routes that can be controlled by DecoderPro3® for control by WiThrottle.

  - Preferences...

Opens the WiThrottle Preferences Pane in **preferences.**

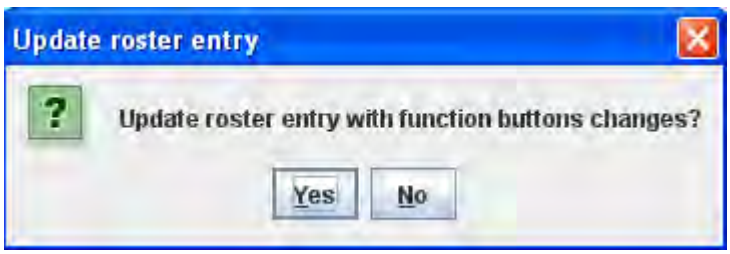
- Window
- Help

Edit

Frame Properties

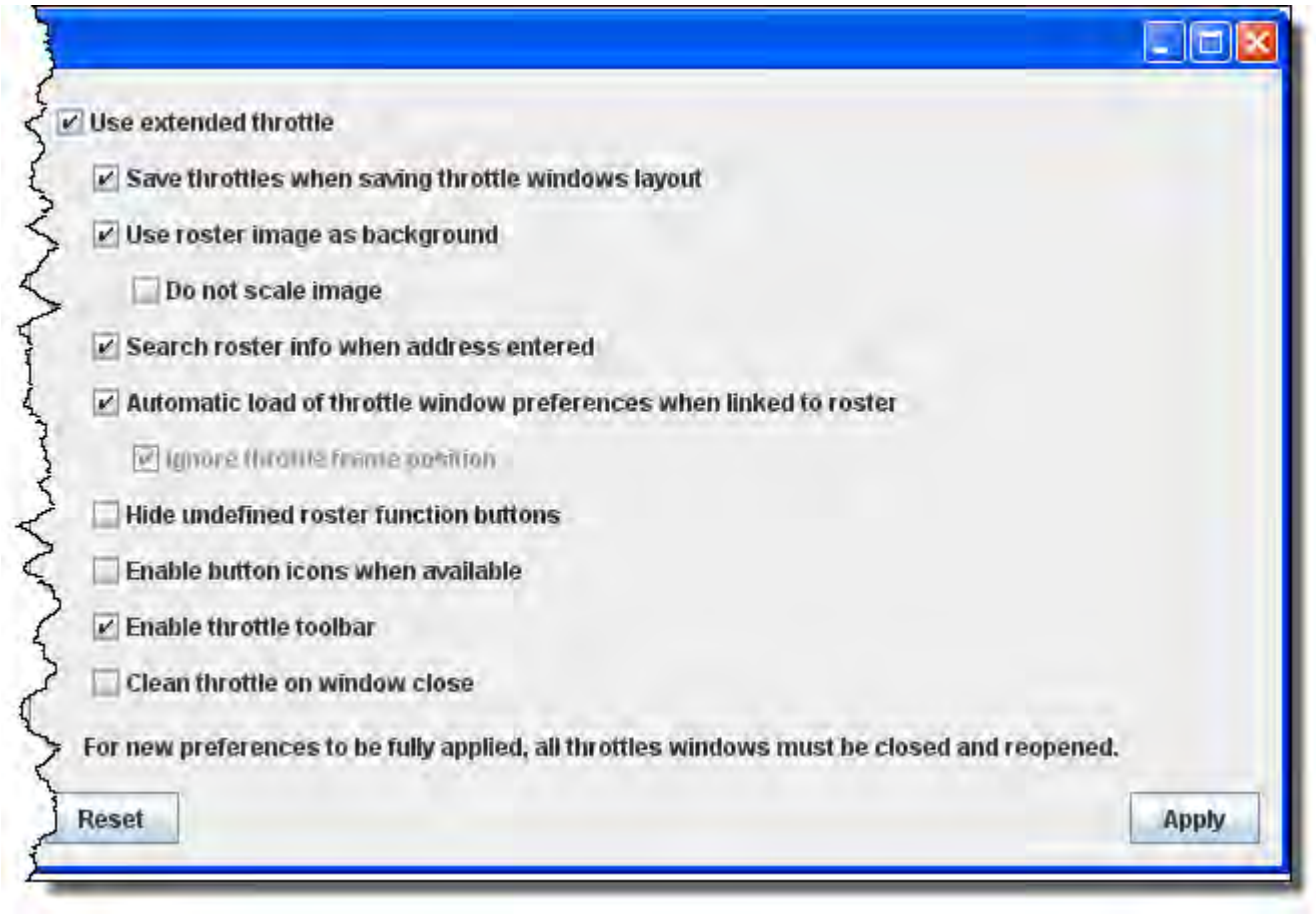
- **Frame Title:** Type the title of your choice for the Throttle frame. This is referred to below as "text".
- **Frame Title Components:** Select the text component desired. There are two components which can be in the title bar of the throttle "Text" and "Address" The selections allow either or both to be in the title (in the order they appear in the selection), or one can opt for the description in the locomotive Roster Entry
- **Address** --Automatically display the address of whatever locomotive is selected. (default)
- **Text** -- Display the text that you enter in the field as the title at the top of this window
- **Text Address** -- Display the text you entered, followed by the selected address
- Address Text -- Display the selected address, followed by the text you entered
- **Roster ID** -- Display the selected roster ID
- (Note that if you enter text, it will not be visible unless one of the middle three modes is selected)
- ☐ **Frame Decorations**:
- This will remove the individual control bars for the separate panes of the throttle. This is advised for Windows users, as clicking the minimize buttons causes the restore button to be lost behind the rest of the panels. Recovery entails using the view menus to remove and then restore the panel in question.
- adds the edits
- aborts the operation

Export Current Throttle Customization to roster



Throttle Preferences

Select throttle startup conditions, shown are defaults, but you may change the settings.



View

Allows you to select which of the three panels of the throttle are being shown. Place a check mark in each of the panels that your want to display.

- **Address Panel**
- **Control Panel**
- **Function Panel**

You may ask yourself, "Why would I want to turn off any of these panels?" As only one example, let's say we have an observation car at the rear of a passenger train. We could equip this car with a function only decoder to control:

1. Interior lights,
2. Rear marker lights, and
3. A rear Drum light.

We have no need for the speed control pane and only need three function buttons for this "Throttle". With a whole passenger train equipped like this, lots of screen space can be conserved by using the throttle set-up files to optimize the **Throttle** windows. Then you could turn off the lights in the kitchen and lower the lights in the dining area so the passengers can enjoy the sunset as they transit the Rockies enjoying the beautiful sunset sipping Cognac…. but I digress. You get the idea.

Reset Function Buttons

Resets all the Function buttons to the default settings, , , etc.

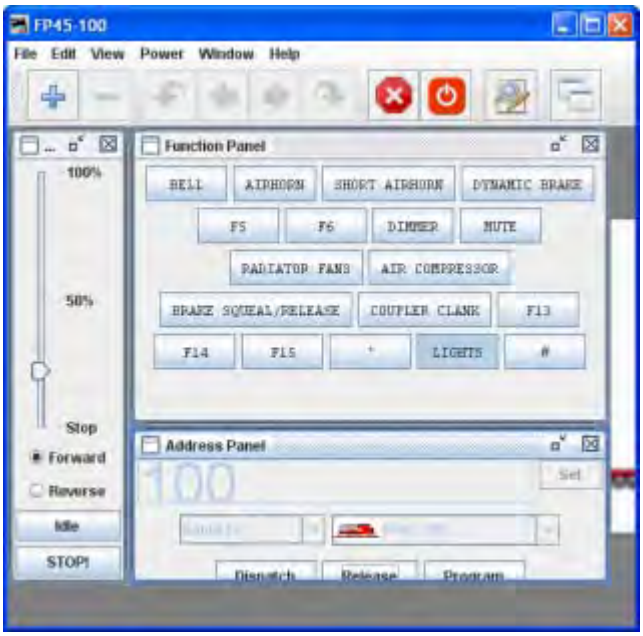
Get all current throttle components in bounds

Returns all the throttle panels to the throttle frame.

Switch Throttle frame view mode

Toggles the Throttle frames on/off

Frames on.



Frames off

Show/Hide Throttles list window

Toggles the **Local JMRI throttles** list window on or off

Opens the Local JMRI throttles Window displaying all the throttles that are in use on your program.

	Opens a new Thottle
	Emergency stop for all Throttles under JMRI control
	Track power control
	Opens the Throttles preferences window

•

Power (*track power control, if supported by your system)*

- **Power On**
- **Power Off**

Window

- **Minimize**
- Lists all open DecoderPro windows. If one of the windows is clicked it will be brought to the front so that you can minimize it to the system tray.

Help

- **Window Help...**
- **General Help...**
- **License...**
- **Locations...**
- **Context**
- **System Console**
- **Upload Debugging Info...**

Throttle Toolbar

The Throttle toolbar is enabled from the **Throttles Preferences** Pane

Use Throttles preferences window to set the desired preferences.

When it is enabled, a Throttle Window can host a set of Throttles. You can browse through these throttles: Add a new Throttle in that Throttle Window. Once the number of Throttles in a Throttle Window is greater than one, Next and Previous Icons are enabled.

Throttle Toolbar

 Open a new Throttle Window

 Closes the current Throttle Window

 Return to Previous running Locomotive.

 Goes to previous throttle.

 Goes to next throttle

 Goes to next running locomotive

 Issues an emergency stop command to all locomotives under JMRI control.

 Controls track power on or off, if supported.

 Switch to or revert from Edit Throttle mode.

 Opens the Local JMRI Window

Throttle Address Panel

(green shading) facilitates setting the address of the locomotive you wish to control with the throttle.

Primary use is to identify the decoders address, and to dispatch or release the identified address. Locomotive address may be entered by one of two methods: typed into text box or use drop-down list to select locomotive from your roster. . If you have added **Function labels,** to your Roster, the label text from the Roster will be displayed on the throttle function buttons.

Click on the Set to send the address to your system to make this throttle active.

Dispatch is used to dispatch the locomotive which releases the throttle for that address so that it can be acquired by another throttle

Release is used to release the address from your system.

Program opens the **Programmer** for the locomotive selected in ops-mode (Programming on the Main) Only active when roster entry is used to select the address for the throttle.

Any of the buttons may be grayed out depending on the status of your system.

Control Panel (blue shading) contains the controls for applying power to the locomotive that is addressed and controlling speed

Throttle Control Panel

Speed Control Panel

Right Click in the Speed Control Panel space and context menu with Properties is displayed.

Click on Properties and Edit Speed Control Panel window opens.

Control Panel Properties may be set by right clicking on the Throttle Control Panel(Speed), the **Edit Speed Control Panel** dialog is displayed. This allows you to select either of the two slider or step speed control

Display Speed Slider(from 0 to 100)-- displays the Throttle Control shown at the left

Display Speed Steps -- displays the Throttle Control shown in the middle

Display shunting speed slider(from 100 to 0 to 100) -- displays the Throttle control shown on the right

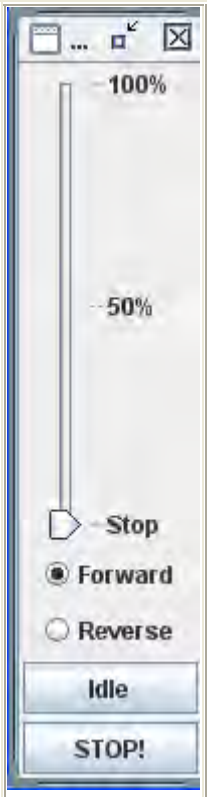
Track sider in real time

Switch to contiuous speed slider on function:

F5 Enter the function from the **Function Panel** that you want to use.

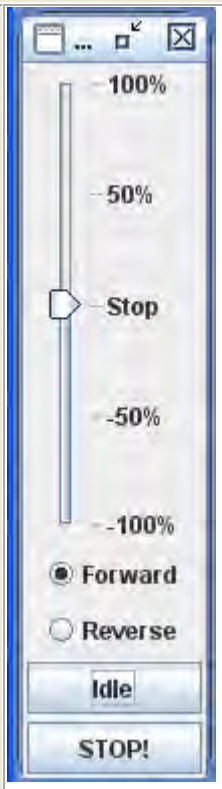
OK button Sets the selections

Cancel button Cancels any settings



Slider from 0% to 100%

Speed steps



Slider 100% to 100% through 0%

After you have established an address for the throttle, you should be able to run the train on your layout. The Speed Control panel is used to control the speed and direction on your locomotive when the throttle is used to operate on a layout.

The throttle slider controls the speed and indicates the percentage of power from **Stop** to **100%**. Use mouse to drag the slider to the desired speed

Alternately, the slider may be set to STOP in the middle and move to + 100% or to -100% to control locomotive speed.

In the Step mode the up and down arrows control the speed one step at a time, or you may enter a number into the text box area between 0 and the max step indicated.

Forward and **Reverse** set the locomotives direction.

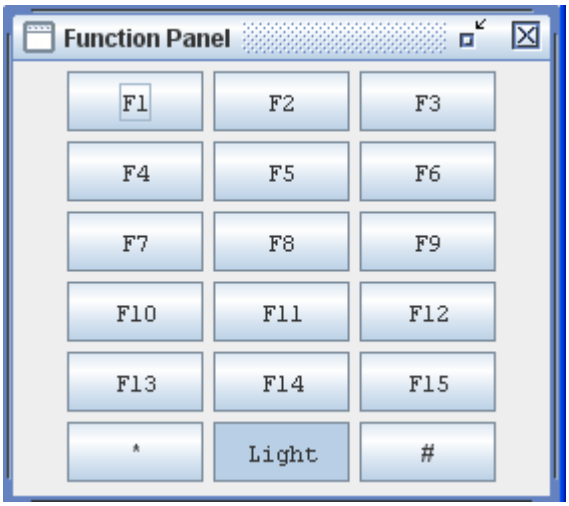
executes an emergency stop, locomotive stops immediately overriding any BEMF or momentum programmed into the decoder.

stops the locomotive smoothly using any momentum setting programmed into the decoder..

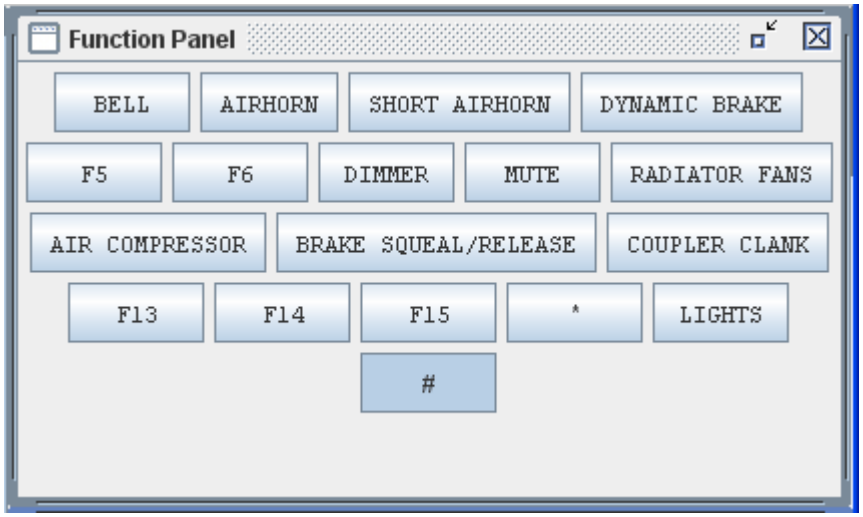
Back

Throttle Function Panel

The **Throttle Function Panel** allows you to select the decoder functions from F0 through F15 on first overlay and F16 through F28 on second overlay. Many new Sound decoders use up to 28 functions.. use the to toggle between the two overlays



If you have entered **Function labels**, the label text will appear on the throttle Function buttons.



Another way to change the labels on the function buttons, is to right click on the button that you want to edit, the word **Properties.** Is displayed and when clicked on, an **Edit Function Button** dialog box will be displayed.

Edit Function Button allows you to edit the text displayed on the button and the function assigned.

Function Number: text box to set the function assigned to the button.

Warning!!! Make sure you do not assign the same function number to more than one button, otherwise, undesirable results may occur

Text: the text you want displayed on the button.

Font Size: Select the font size in points.

☑ **Lockable** - locks the function when button is clicked. eg makes the button a push on / push off button.

☑ **Visible** - makes the button visible. When unchecked the button will not show in the panel. To restore use the **View** menu and select **Show All Function Buttons** option.

Function off icon:

Drag and drop icon of your choice into the box. To remove icon right click and click on Remove.

Function on icon:

Drag and drop icon of your choice into the box. To remove icon right click and click on Remove.

OK button sets all the values edited.

Cancel button exits dialog without change.

You can use the **Save** button on the Address Panel to save the edited functions to your locomotives Roster entry.

The descriptions shown above are only a small part of what the Throttle Window can do. The author(s) of the Throttle Window have created an extensive set of Help files to help you customize Throttle Windows to your way of operating. To access Help, just open a New Throttle. Then, click on Help and select Window Help from the dropdown box. There's lots of good stuff in there.

Loads Default Throttle Layout

Opens the default throttle that is set in preferences

Consisting Tool

Three types of consists are used on DCC systems:

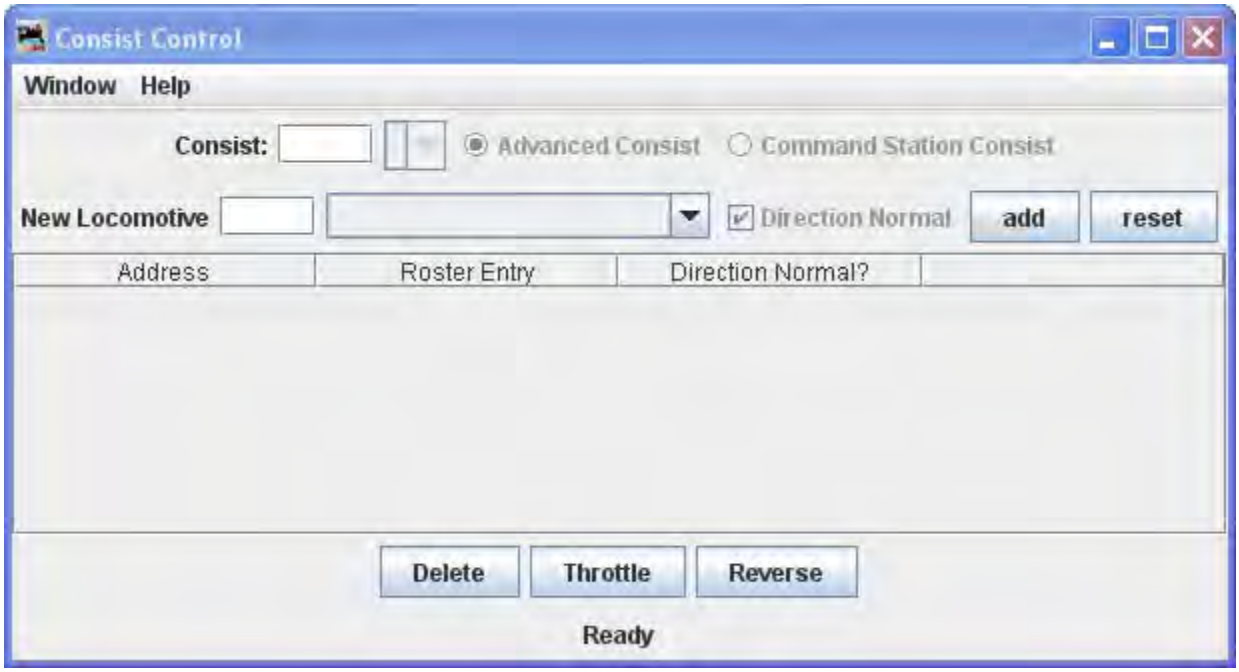
- A ***basic*** or ***primary address consist***, where each locomotive is assigned the same address on the programming track, or on the main with **OpsMode Programming** (if supported by the command station and decoder).
- A ***Command Station Assisted Consist*** (CSAC) which builds the consist using a function of your command station. Command Station Assisted Consists go by the trade names listed below.

Manufacturer	Trade Name	Usage Notes
Digitrax	Universal Consist	Limited to the number of slots supported by the system. Allows any address
Lenz	Double Header	Limited to 2 locomotives. Allows any address but 00 to be used
NCE	Old Style Consist	Limited to 8 locomotives. Allows any address but 00 to be used
EasyDCC	Standard Consist	Limited to 8 locomotives. Allows any address but 00 to be used

- A ***Decoder Assisted Consist (***DAC), often referred to as Advanced Consist. The NMRA® has set aside CV19 as a dedicated location for consist addresses. If CV19 contains a value other than 0, the locomotive will respond to speed and direction instructions sent to the address in CV19. If CV19 contains zero then it will respond to speed and direction commands sent to the usual short or long decoder address. Since the consist address is a single CV, it is limited to the range of 1 to 127. If you add 128 to the consist address, the locomotive will run backwards (relative to it's normal direction of travel) in the consist. The DAC can be set up in the **Consisting** tab in the Comprehensive Programmer.

DecoderPro Consisting Tool

The consist tool provides a visual tool for manipulating the ***Decoder Assisted Consists*** and , on some command stations, ***Command Station Assisted Consists.***



The **Advanced Consist** and the **Command Station Consist** allow you to select either consisting mode if supported by your command station. If not supported the options will be grayed out.

Consist text box: type the consist ID assigned to the locomotives in the consist for ***Decoder Assisted Consists.*** For Command Station Consist, this is automatically filled in with the address of the lead locomotive in the consist.

New Locomotive text box : type in a new locomotive address or select from you roster using the drop-down list.

Clicking the adds button will add the locomotive to the consist and it will appear in the list area of the window.

Clicking the reset button will clear the information of the current locomotive.

The **Direction Normal ?** determines the direction of the locomotive travel as forwarded or reverse when the consist is traveling forward. Will be grayed out until the lead locomotive is selected.

DEL button removes the consist. The list of the consist will have a DEL button for each locomotive, allowing you to remove any locomotive from the consist.

Delete button --deletes the entire consist.

Throttle button --o pens a **throttle** for the consist.

Reverse button -- reverses the direction of the consist.

Turnout Control

Turnout Control

Turnout

Enter the accessory number or tunout system name for the accessory or turnout you wish to control. For example, entering 678 and by pressing either the Thrown or closed, you should be able to change the state of accessory number 678 on the layout.

Another example, a valid turnout system name for NCE could be NT456. Then by pressing either the Thrown or closed, you should be able to change the state of turnout or accessory number 456 on the layout

Another example, a valid turnout name could be IT123 which is internal turnout number 123. Pressing either the Thrown or closed will only change the state of the internal turnout and will not change a turnout on the layout.

current state: A turnout can have four states: <unknown>, <inconsistent>, <thrown> and <closed>

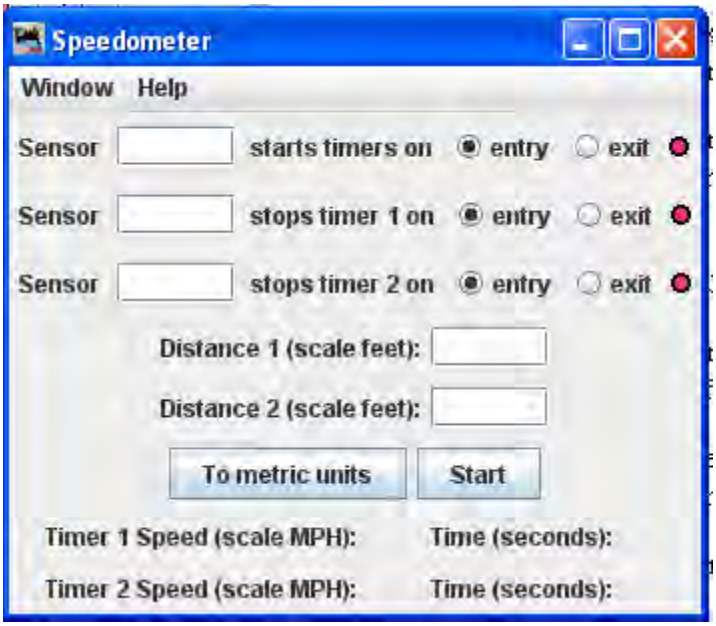
feedback mode: some of the available feedback modes are: <DIRECT>, <ONE SENSOR>, <TWO SENSOR>, and <MONITORING>. A turnout using DIRECT mode does not have feedback from the layout. ONE SENSOR use one sensor on the layout to provide feedback on he state of the turnout. TWO SENSOR uses two sensors for feedback, one for closed and one for thrown. MONITORING gets feedback from the system by either listening to cab commands on the layout or polling the system for turnout status.

Caboperation: some turnouts can be locked. If the control button is grayed out, the lock feature is not available.

Pushbuttons: Shows state of Pushbuttons.

Power Control

Speedometer



Three sensors are installed on your layout, sensor 1 and 2 for slow speeds, and sensor 1 and 3 used for higher speeds. The time to travel between the sensors is used with the distance to calculate the speed in English or Metric units

Enter the sensor number for each of the sensors in the **Sensor** text box. You can set to start or stop on the **entry** or **exit** of the block.

Enter the **Distance 1 (scale feet):** in text box, which is the distance between sensor 1 and 2.

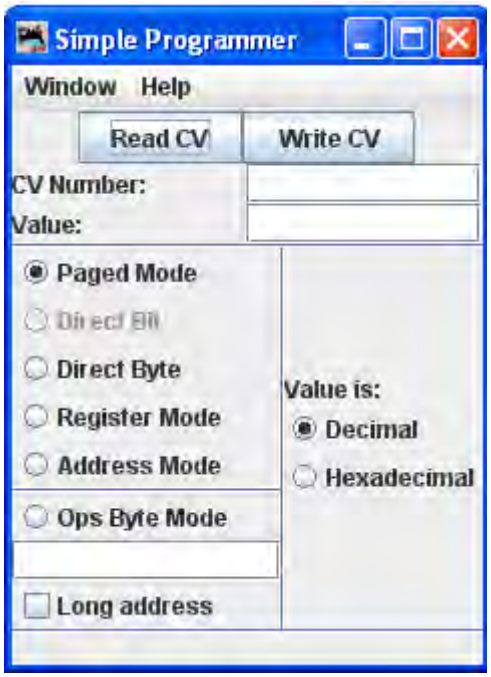
Enter the **Distance 2 (scale feet):** in text box, which is the distance between sensor 1 and 3.

The **Start** button starts the speedometer. **To metric units** button converts output to metric values.

The **Timer 1 and 2 Speed(scale MPH):** and **Time (seconds)** is displayed.

Single CV Programmer

The **Simple Programmer** is opened from the **Main** Page of DecoderPro3® **Action** menu. The **Simple Programmer** allows you to read or write CV values in DCC decoders one at a time.



Prior to reading a CV value you should enter the CV Number (address) into the **CV Number** text box. If writing a CV value you should enter the CV Number and then a value in the **Value** text box. You may enter the value as Decimal or Hexadecimal depending upon the option selected in **Value is:** area.

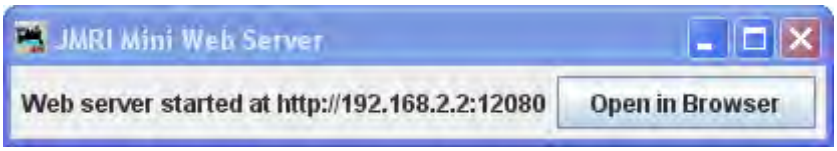
On the left side of the window you can select the Programming Mode. Any mode not supported by your command station will be grayed out.

If you select the **Ops** mode, which programs on the main track, you need to enter the address of the decoder (locomotive) that you are programming. Your DCC system may require you to check the **Long address** check box if the address is a long address. Most DCC systems do not allow you to read on the main, if so, the **Read CV** button will be disabled.

Now that you have everything setup, you may read the current value in the decoder's memory from the CV by clicking on the **Read CV** button or write your new value to the CV by clicking on the **Write CV** button.

Start WiThrottle Server

Start Web Server



Recreate Roster Index

Recreates the Roster Index when adding new XML roster files.

Recreate Decoder Index

Used to update Decoder Index when new decoder files are added.

Run Script

Opens a dialog to allow you to select a script that will run within DecoderPro3®.

Manufacturer Specific Menu

This menu is dependent upon the equiment you are using.

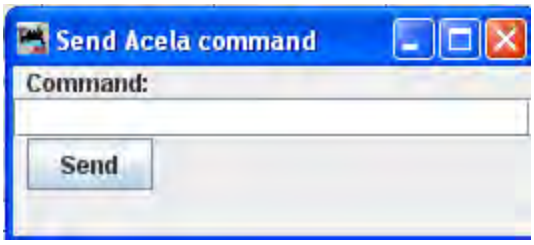
Acela

- **Command Monitor**

Opens the Communications Monitor Window and automatically displays the information that is being sent and received on the communications link between your computer and your DCC system.

- **Send Command**

Opens the **Send Acela command** prompt, type in your command and click on **Send** button to execute the command.



- **Configure Nodes**

Opens the Configure Nodes window. This tool facilitates configuring the Acela network nodes.

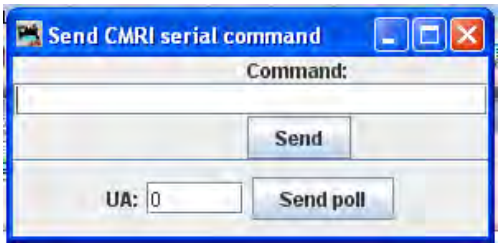
CMRI

- **CMRI Monitor**

Opens the Communications Monitor Window and automatically displays the information that is being sent and received on the communications link between your computer and your DCC system.

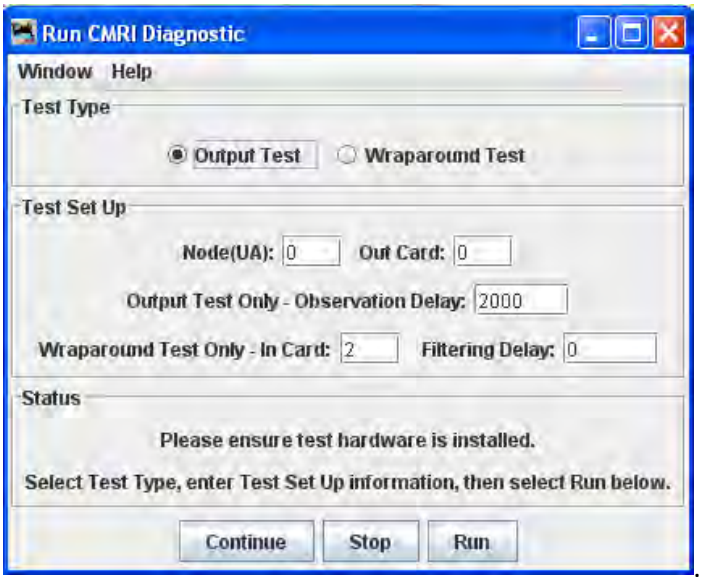
- **Send Command**

Opens the **Send CMRI serial command** prompt. You may poll devices on the CMRI serial link, using the **Send poll** button. You can send a command to the device using the **Command:** text box and the **Send** button.



- **Run Diagnostics**

Provides a tool for testing your CMRI serial cards in the system using either an Output Test or a Wraparound Test.

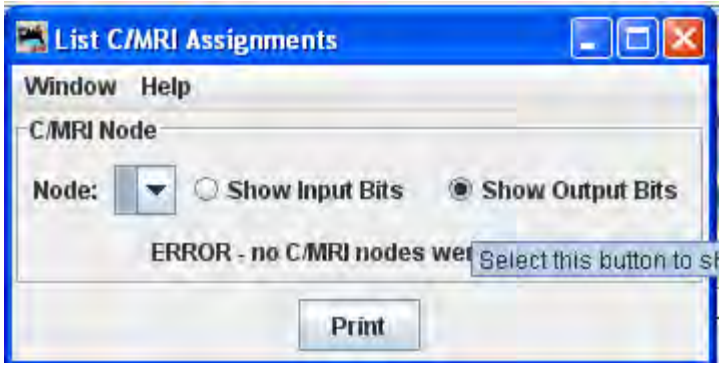


- **Configure C/MRI Nodes**

Tool the allows you to configure your C/MRI system Nodes.

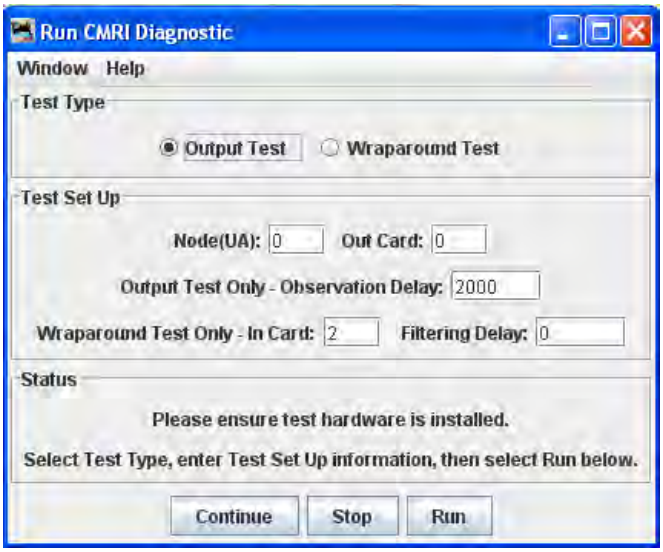
- **List Assignments**

Opens **List C/MRI Assignments** window. Thsi tool lets you check teh pin assignments of your C/MRI Nodes and print them.

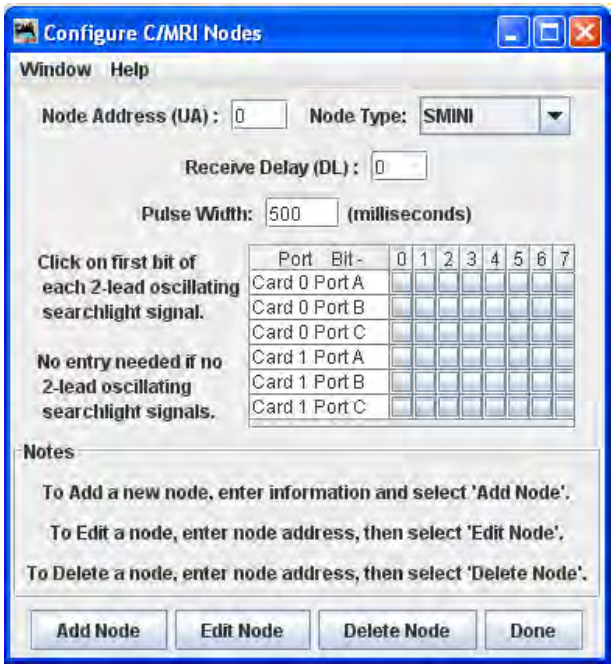


Run CMRI Diagnostic window

Provides a tool for testing your CMRI serial cards in the system using either an Output Test or a Wraparound Test.



Configure C/MRI Nodes Window
Tool the allows you to configure your C/MRI system Nodes.



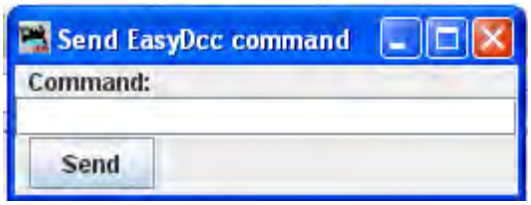
EasyDCC

- **Command Monitor**

Opens the Communications Monitor Window and automatically displays the information that is being sent and received on the communications link between your computer and your DCC system.

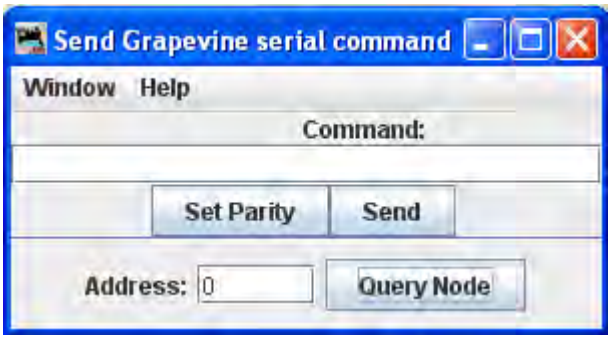
- **Send Command**

Opens the Send EasyDcc command prompt, which is used to send commands using DecoderPro.

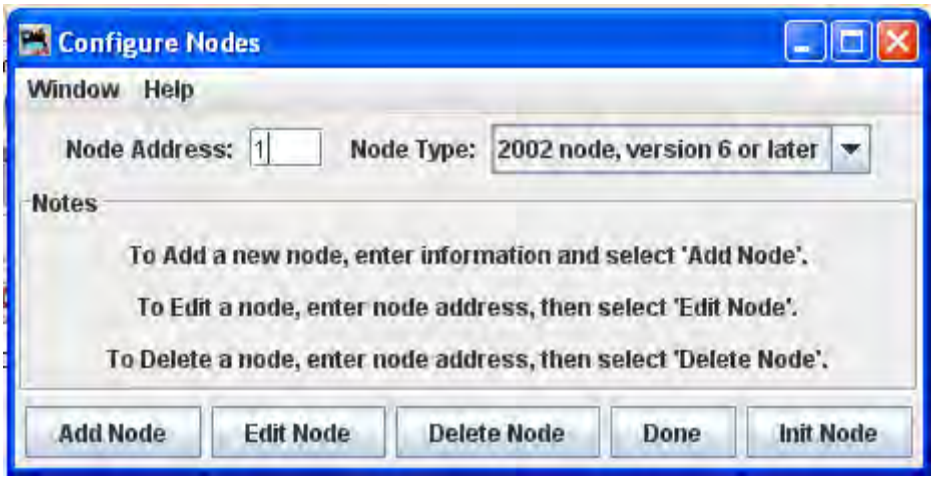


Grapevine

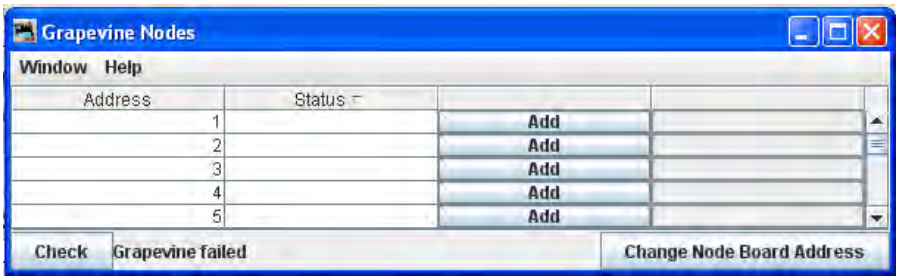
Communications Monitor
Opens the Communications Monitor Window and automatically displays the information that is being sent and received on the communications link between your computer and your DCC system.
Send Command
Opens **Send Grapevine serial command** prompt. Type **Command** and click the **Send** button to send the command via serial Bus. Type node **Address** and click on **Query Node** button to query the Grapevine serial bus node.



Configure Nodes
Opens **Configure Nodes** window, which provides the tools for setting the Grapevine Serial Bus nodes.



Node Table
Opens **Grapevine Nodes** window which displays a table of the nodes.



LocoNet

Monitor LocoNet
Opens the Monitor LocoNet Window(Gerneric Communications Monitor Window) and automatically displays the information that is being sent and received on the communications link between your computer and your DCC system.

Monitor Slots
Slots are used to control individual locomotive and consists. The display includes the decoder's speed step format, current speed and function settings, consist information and status. You may choose to show all slots or just the ones being actively used.

The checkboxes at the top allow to select what slots are displayed.

☐ **Show unused slots**

☐ **Show system slots**

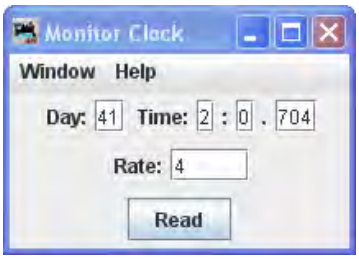
estop all Executes an **Emergency Stop** for all locomotives.

The columns are:

Column	**Displays**	
Slot	The number of the slot	
Address	Locomotive address the slot controls	
Speed	For unconsisted locomotives and addresses that are at the top of a consist, this is the current speed setting. It is an internal value for consisted slots.	
Decoder Type	The format of the commands being sent to the decoder, typically, either 128 step or 28 step, though other values are possible.	
Status	One of the four possible states:	
	Free	Not reserved for any particular use, no contents
	Idle	Not reserved for any particular use, no contents
	Common	Not in use at the moment, but still contains valid data for the last decoder to use it.
	In Use	Currently controlling a decoder
Consisted	Displays the consist status of the slot, whether it is not consisted, the top of a consist, included in a consist, etc.	
Throttle ID	The UT4 throttles have a fixed throttle ID. The DT400 has a fixed common leading HEX value and a user programmable second HEX value. . It is displayed as two hexadecimal bytes, see the Digitrax instructions for details.	
Direction	Whether the decoder is currently being commanded to go Forward or Reverse.	
F0-F8	The current function settings	

- **Monitor Clock**

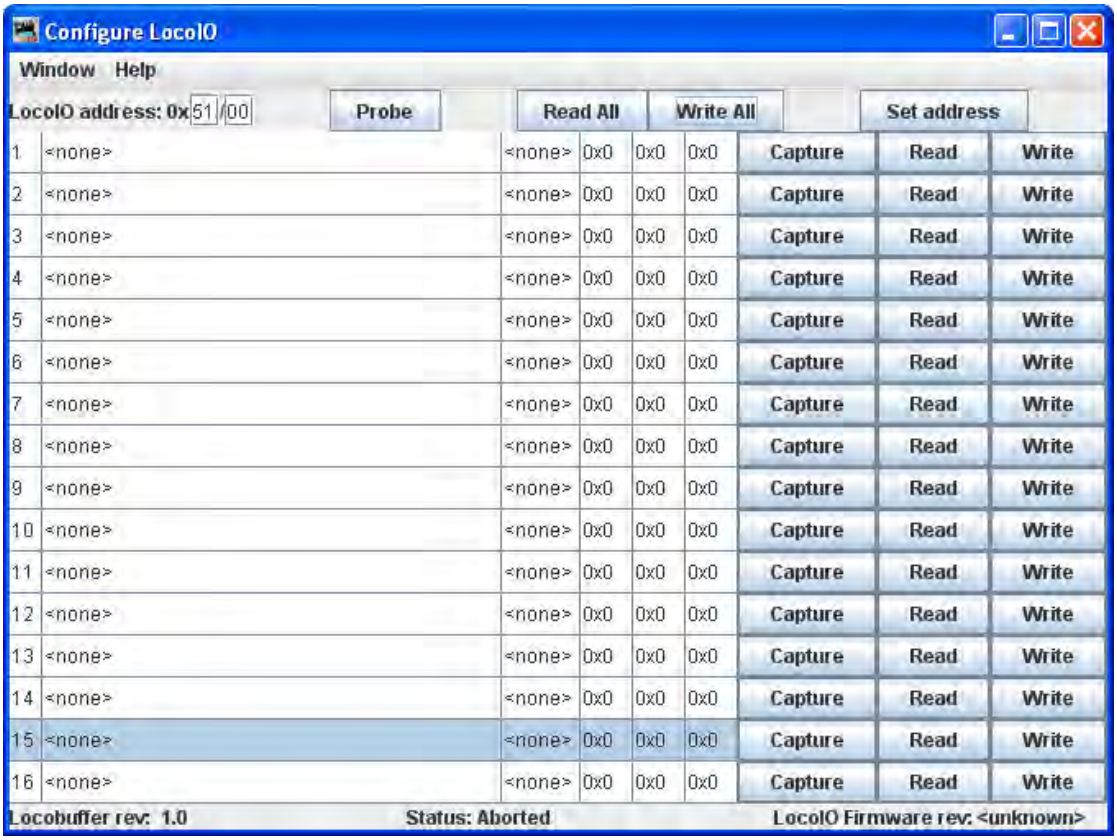
A Digitrax LocoNet can contain it's own fast clock timebase. This can be driven either by a DCS100/DCS200 command station, or by a separate fast clock module such as those made by Logic Rail Technologies. The **Monitor Clock** dialog allows you to control this feature.



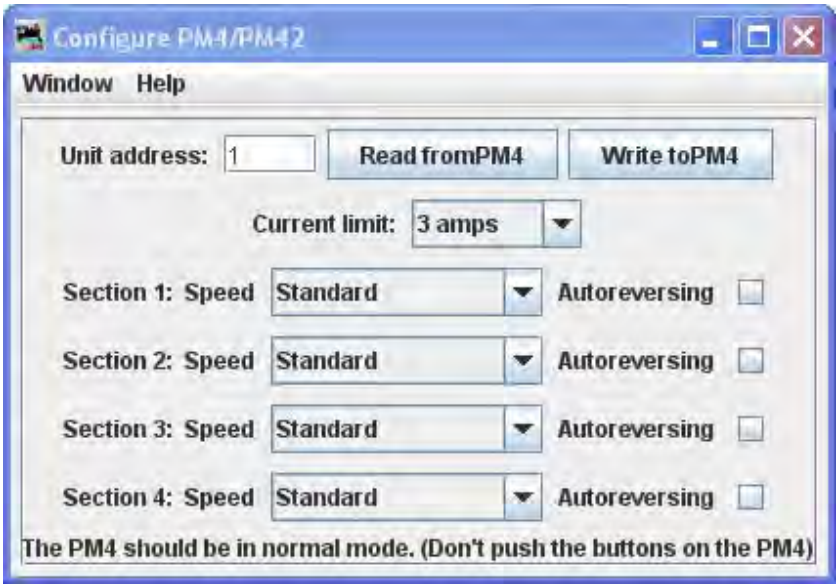
Monitor LocoNet Stats
If active displays the statistics related to traffic on the LocoNet Monitor **LocoNet Stats** Window.

Configure BDL16/BDL168
Opens Configure BDL 16/BDL168 window

Configure LocoIO
Opens the Configure LocoIO window.



Configure PM4/PM42
Opens the Configure PM4/PM42 window.



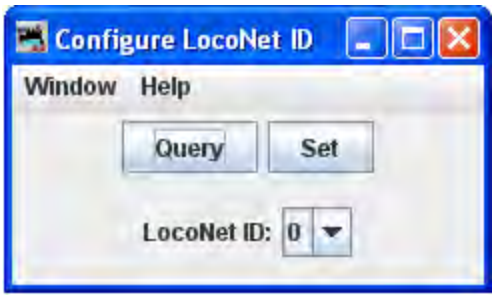
Configure SE8C
Opens the Configure SE3C window.

Configure DS64
Opens the Configure DS64 window.
The DS64 programming tool lets you configure the internal options of a DS64 directly from your computer. Type the address of a DS64 board in the text field and click the Read from DS64 button.. The tool will read back the current state of the various options, and set the check boxes to correspond to their current values.
You can then, if you wish, change the checkboxes and click Write to DS64 to make your changes permanent.
Limitations
Because of the way the DS64 board works, this tool can't change the basic address of the unit.

At present, DS64 routes cannot be programmed by this tool. It's possible, but nobody has written the code for it yet because JMRI routes are more powerful and easier to use.

Configure Command Station
Opens the Configure Command Station window
Configure LocoNet ID

Opens the **Configure LocoNet ID** dialog that allows you to Read or Set the LocoNet ID **Value:**



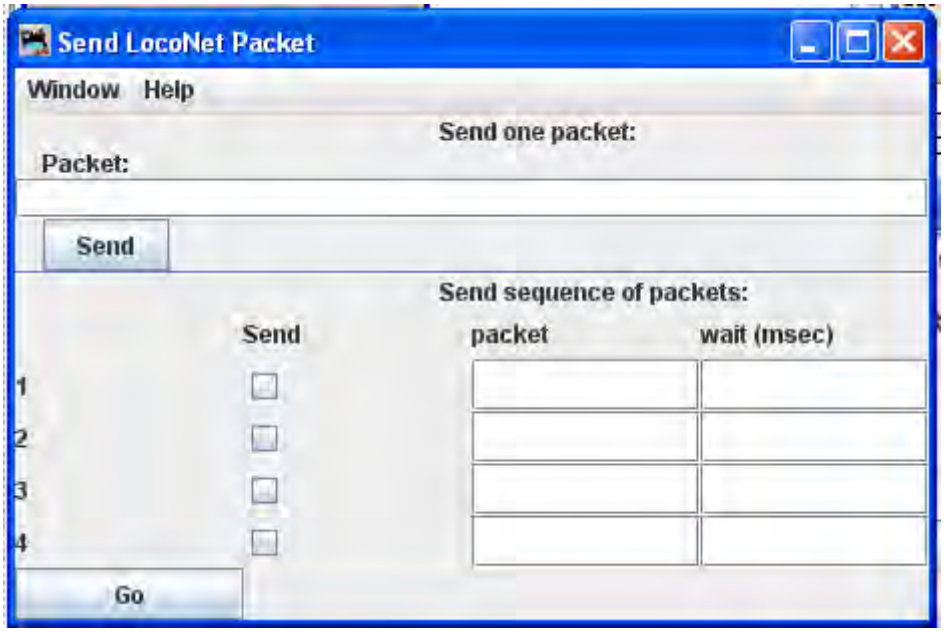
Configure Duplex Group

Provides dialog to configure duplex Radio system

Send Throttle Messages

Opens **Throttle message** prompt with limited capabiltiy to send messages to handheld throttle.

Send LocoNet Packet
Opens the Send LocoNet Packet dialog that lets you directly command LocoNet devices.

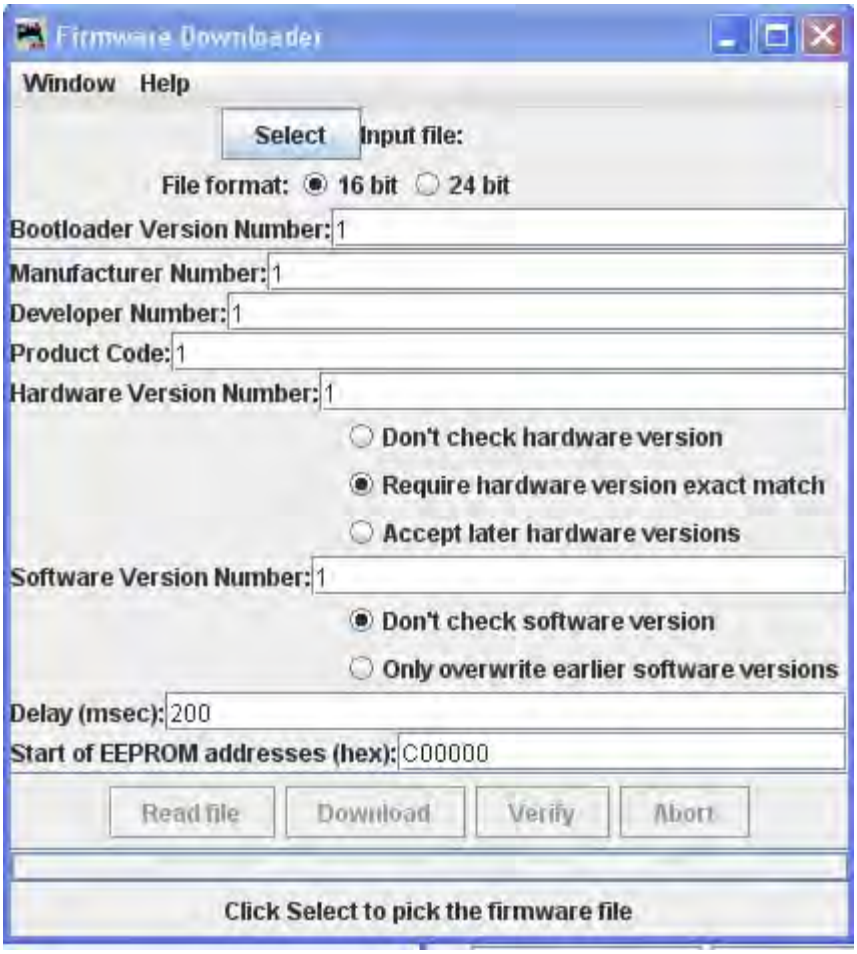


LocoNet packets are sent in raw hexadecimal format, you may use the Monitor Window in the **Show Raw Data** option to monitor the packets.
The top section lets you send a single LocoNet packet. Type the hexadecimal numbers and click Send button, you should include the byte for the checksum at the end of the message.
The bottom section lets you enter from one to four packets that will be repeatedly sent in sequence, with the user-defined delays in between. Press Go button to start transmission sequence, and press again to stop the sequence.

Select PR3 Mode
Opens the **Select PR3 Mode** dialog.

Download Firmware
Opens the Firmware Downloader.

ome Digitrax products can have new firmware downloaded to them.The firmware updates are distributed as .dml (Digitrax Mangled Firmware) files. They contain both the code itself, and various management information to make sure that it can be downloaded into the hardware it expects.



To use this tool:
Click Select button and select the .dmf file you want to download.
Click Read file button to read the file into the program and verify its contents.
Only if instructed to by Digitrax, change the various values in the control fields (this is usually not needed
Click Download button to load the firmware. This will take a little while.

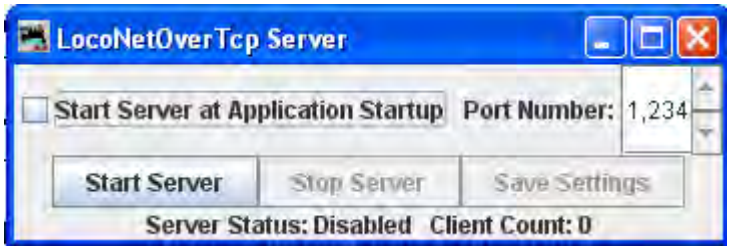
Download Sounds

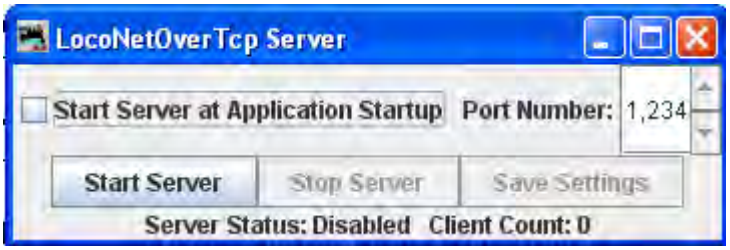
Digitrax sound decoders are loaded with "sound projects", stored in "Sound Project" (.spj) files. Those contain a number of "sound fragments" in .wav format, plus some additional control information.
The Decoder Sound Downloader tool lets you load a new .spj file into a Digitrax sound decoder via a Digitrax PR2 or PR3 interface. If you're using a PR3, it needs to be put into "Programmer mode" before trying to download, see the main PR3 page.
Digitrax provides sample sound project files at their Sound Depot (http://www.digitrax.com/sounddepot.php) web site. You can also find links to documentation and additional tools there.
JMRI also provides tools for editing sound project files to include new sounds and even to change the sound logic. When you first select the Download Sounds tool, it opens a dialog with most of the controls disabled:

(Click on any image on this page to see a larger version)
The status line at the bottom will walk you through the steps needed.
First, click "Select" and pick the .spj file you want to download.
Next, click "Read" to read the file (this is a separate step so you can just click "Read" multiple times if you're editing and saving new versions of the file).
If everything is OK, the file will be read into the program and verified, a version string from the file will be displayed, and the "Download" button will be enabled.
Click "Download" to start the download process. It will take a little while. The progress is described in the status line:
"Starting download; erase flash"
The first step is to erase the decoders memory so it can take new data. This will take up to about 30 seconds, depending on the specific decoder.
"Sending initialization message"
Set up the decoder to accept data after being erased. This should only take a fraction of a second.
"Send SDF data"
Load the Sound Definition data into the decoder, which should only take a few seconds
"Send WAV data"
The sound data is being downloaded. As each block is sent you'll get an update: "Send WAV data block 1", then 2, then 3, etc.
"Done"
The download completed OK.
If something goes wrong, the final status will be "Download aborted". The most common reason is that the PR2 couldn't handle the data that was being send, which is listed as "PR2 not ready". If this happens repeatedly, make sure that the serial port and cable that the PR2 is using as the control lea

Edit SPJ Sound File
Opens Sound File editing tool

Start LocoNet Server
Starts the LocoNet server.
Start LocoNet over TCP Server
Opens the **LocoNetOver Tcp Server** dialog.





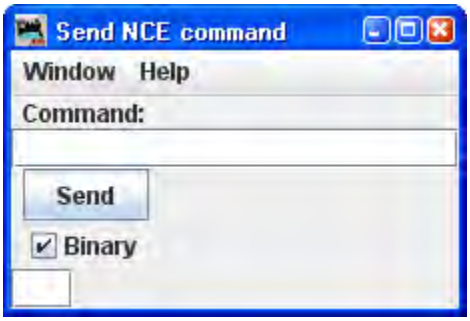
NCE

Command Monitor

Opens the Communications Monitor Window and automatically displays the information that is being sent and received on the communications link between your computer and your DCC system.

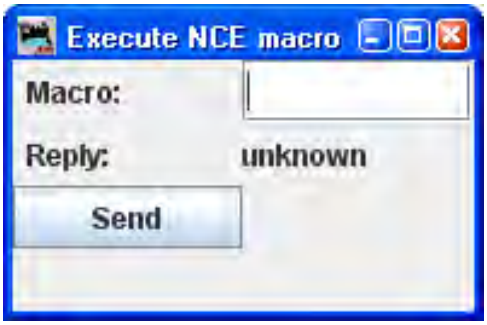
Send Command

Opens the **Send** prompt with a text box to enter the NCE Format command that you want to send.



Send Macro

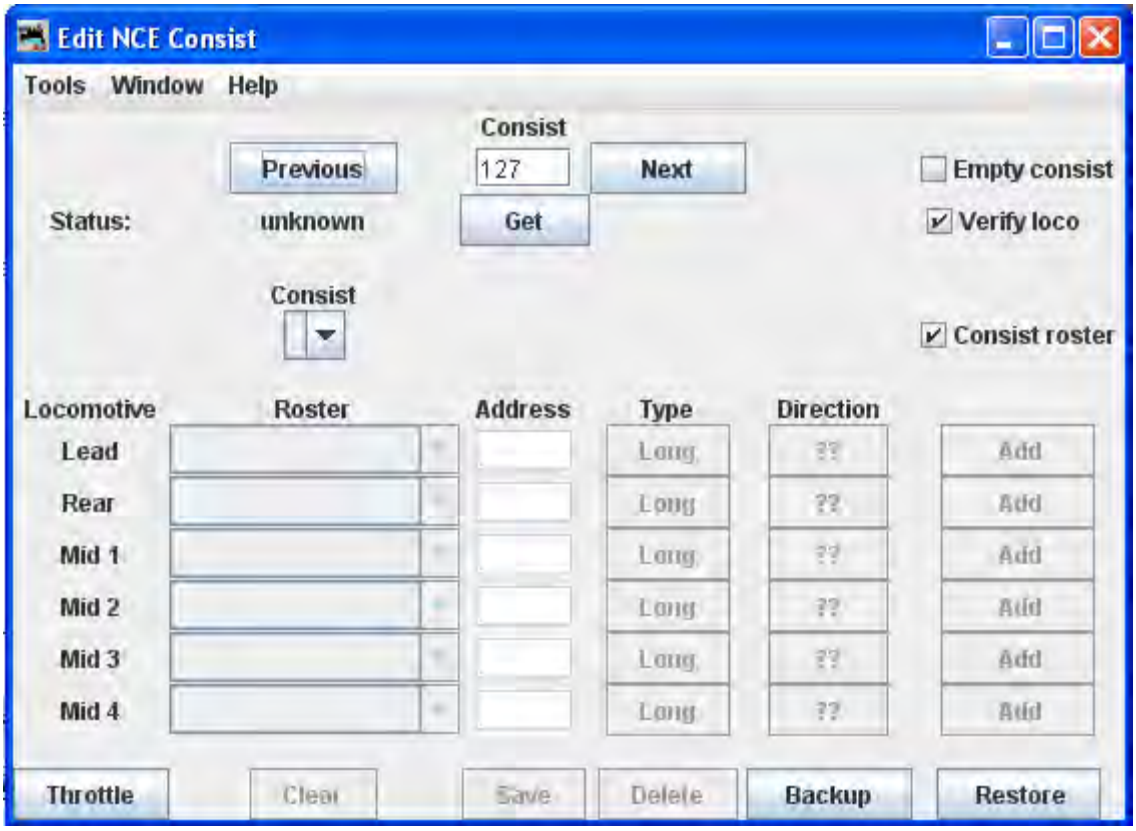
Opens the **Execute NCE Macro** Window which allows you to enter the Macro number to be executed. Clicking the **Send** button sends the macro.



Edit Macro
This tool allows you to review, edit and save NCE style macros. It also allows you to backup and restore all the NCE command station macros to and from a file. The file format is identical to NCE, so you can restore a file that was generated by the NCE backup command. It is recommended that you set the baud rate at 9600 when using this tool.

Backup button
Click on the **Backup** button located on the bottom row. This will open the **Save** dialog. This will read the NCE command station memory and store the contents into the file you selected.
Restore button
Click the **Restore** button located on the bottom row. This will display the **Open** dialog, select the file you want to restore to the NCE command stations memory and click on **Open** button.
Get button
To review a macro, enter the number of the macro in the text box under the heading **Macro** and click the **Get** button. This will retrieve the macro from the command station's memory. If the the macro currently exists, **Reply:** will be macro found. If the macro does not exist, the **Reply:** will be macro empty. If there is a macro, the editor will show a list of accessories that the macro is programmed to activate.
Add button
Links The **Add** button will add an accessory's address
Delete button
The **Delete** button will remove an accessory's address
Link Macro button
this macro to another one.
Previous and Next buttons
Allow you to search the macros.

Save button
Saves macros to the NCE command station
Edit Consist
This tool allows you to review, edit and save NCE style consists. Also allows you to backup and restore all the NCE command station consists to and from a file.

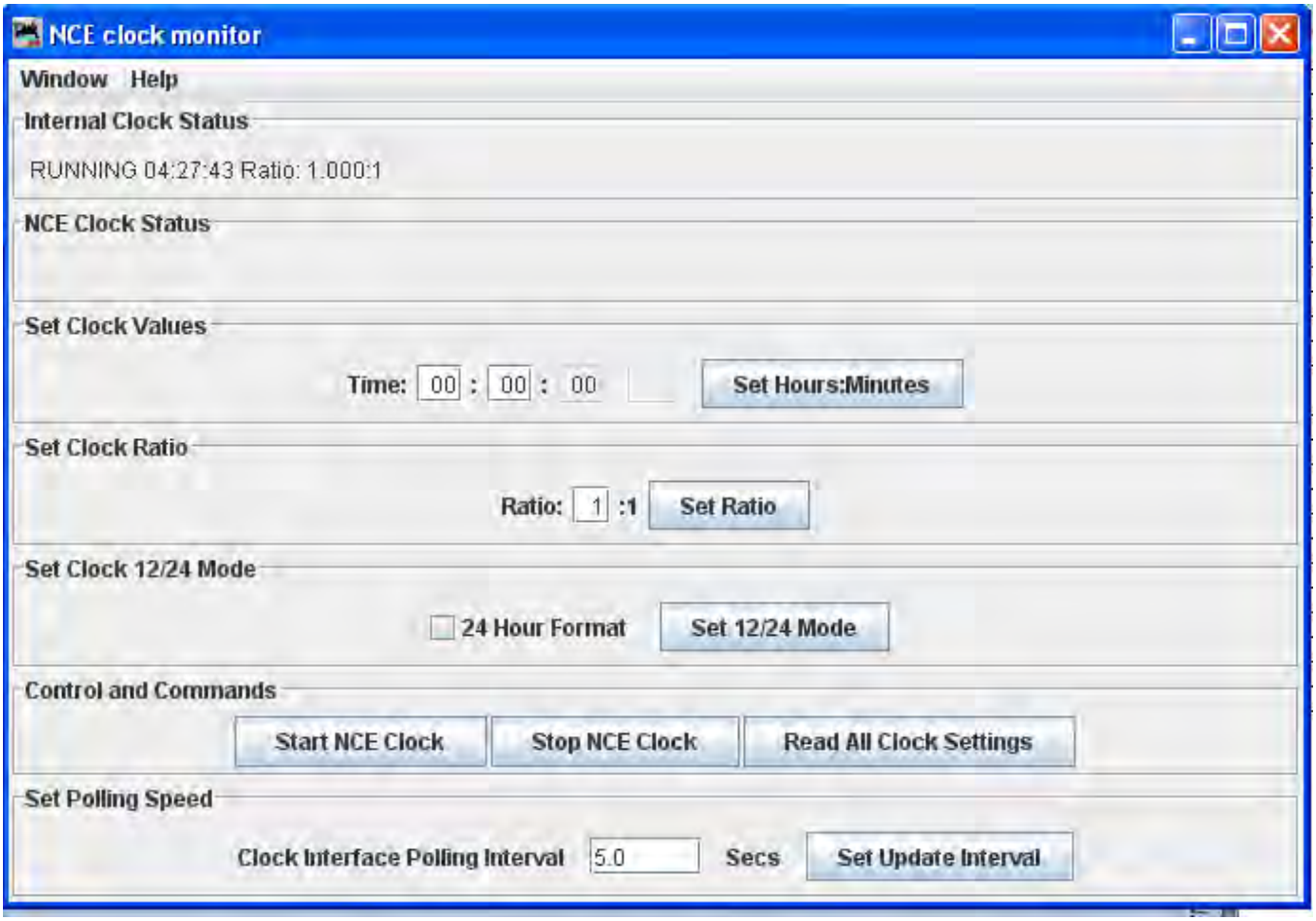


Backup button allows you to backup all of your consists to a file from the NCE command Station.
Restore button allows you restore consists from a file to the NCE command Station.
Get button is used to retrieve the consist from the command station's memory.
You may add a locomotive by entering the address and clicking the **??** button to set forward or reverse running. The **Type** button toggles between **Long** and **Short** address (remember that NCE allows both long and short addresses in the range below 128). Click the **Add** button and that locomotive will be added to the consist. Alternately, you may add a locomotive from your roster with the drop-down list, then click the **Add** button.

☑ **Consist roster** enables saving and maintaining consist roster when checked.
Save and **Load** Button is displayed as a **Save** button when program has detected that a change has been made to a consist. When you select a consist to load from the consist menu, it becomes the **Load** button.
Clear button removes all the locomotives from a consist.
DCC Packet Analyzer
The DCC packet analyzer entry is software to log data from a hardware device sold by NCE which allows the user to observe the packets on the NCE Command Bus, or alternatively directly from the track. The latter feature allows the device to look at track packets sent from any Command Station that conforms to the NMRA standard (such as Digitrax or Lenz). The input signal is interpreted and sent to JMRI through a serial interface. With it the user can see speed and function instructions being sent from the Command Station to the decoder

Monitor Clock

Opens the NCE Clock Monitor window. When the clock is running as clock master mode, the internal clock rate is adjusted to match time with the NCE command station clock. The goal is the minute should roll over at the same time for the internal clock and ProCab displays.



Show Cabs

Opens a window that displays the cabs currently on the system. This is handy for determining the cab number assigned to a throttle that doesn't have a display. Just use "Show Cabs" to display the cabs currently on the system. Then plug in the cab in question and use it again to see which one is added. If you have a standalone set-up bench it's even easier. Cycle the power to clear the command station memory. Then plug in the new cab and Show Cabs will display its number

Booster Programming

Booster Programming is stated to be only for NCE booster testing, and warns that the booster must be disconnected from the track before using.

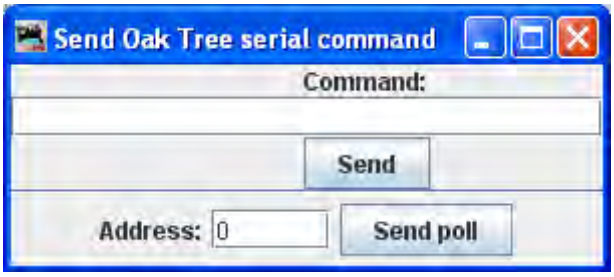
OakTreeSystems

Communications Monitor

Opens the Communications Monitor Window and automatically displays the information that is being sent and received on the communications link between your computer and your DCC system.

Send Command

Opens the Send Oak Tree serial command prompt, which will allow you to type in a **Command:** then click on Send. You may also type in an **Address:** and poll the system by clicking on the Send poll.



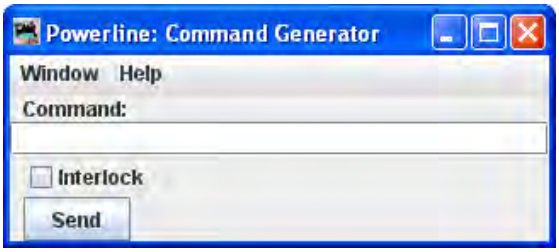
Powerline

Communications Monitor

Opens the **Communications Monitor** Window and automatically displays the information that is being sent and received on the communications link between your computer and your DCC system.

Send Command

Opens the **Send power line device command** prompt to allow you to type in a **Command** and it to the powerline device.



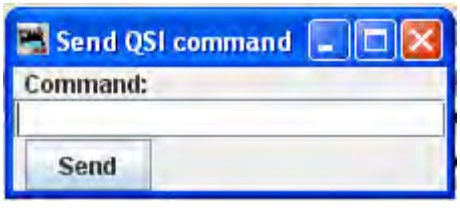
QSI

Command Monitor

Opens the Communications Monitor Window and automatically displays the information that is being sent and received on the communications link between your computer and your DCC system.

Send Command

Opens the **Send QSI command** prompt to type in a **Command:** and click on Send.



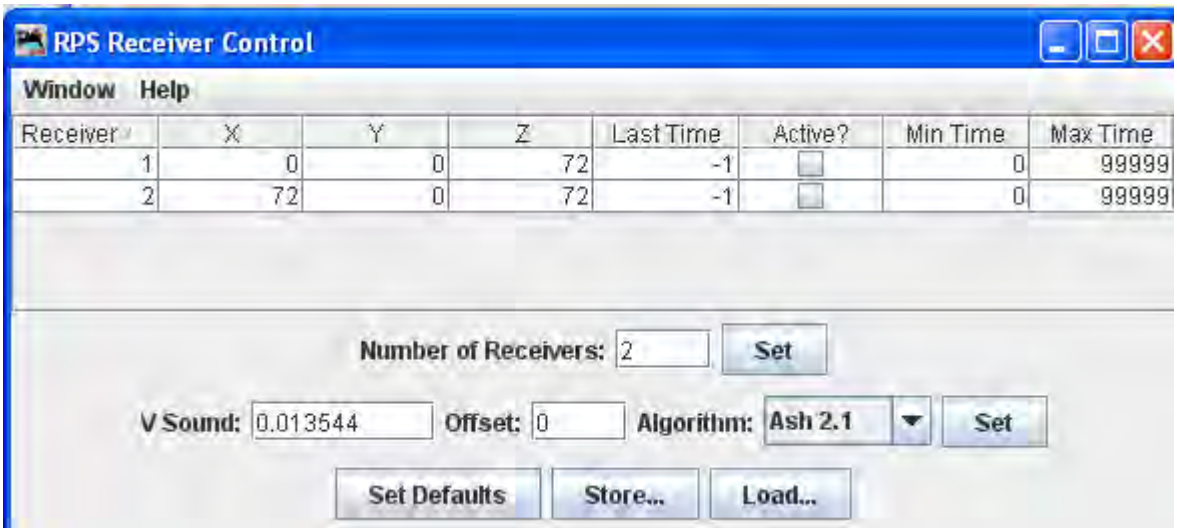
RPS

RPS Monitor

Opens the Communications Monitor Window and automatically displays the information that is being sent and received on the communications link between your computer and your DCC system.

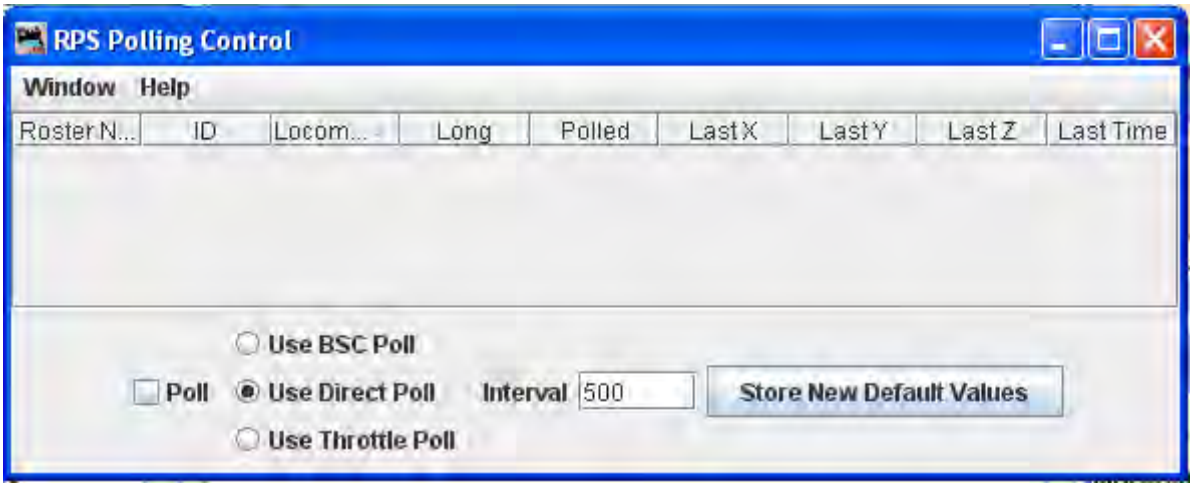
RPS Receiver Control

Opens the RPS Receiver Control window, which will detect how many receivers it has and set up a table with the right number of rows.



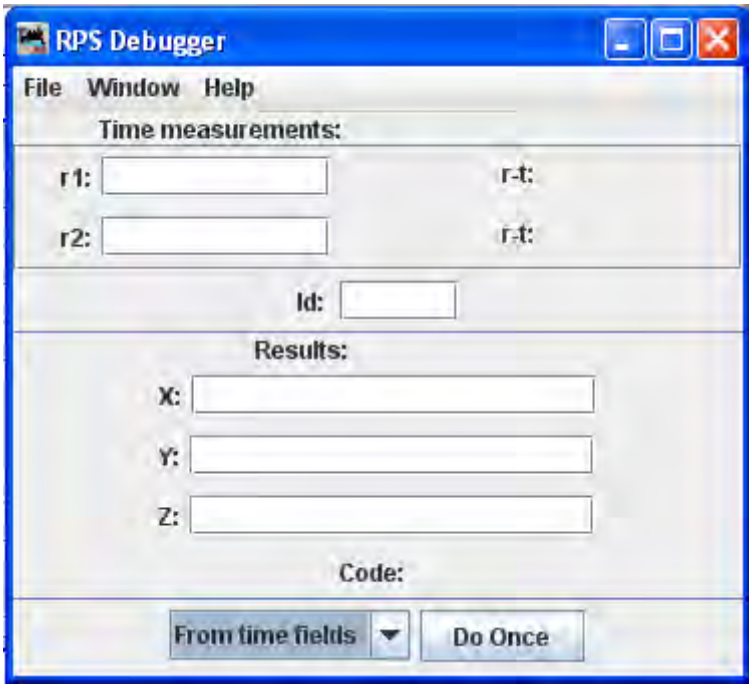
RPS Polling Control

Opens the RPS Polling Control window where you tell the RPS system which of your locomotives have RPS transmitters installed, and how often to talk to them.



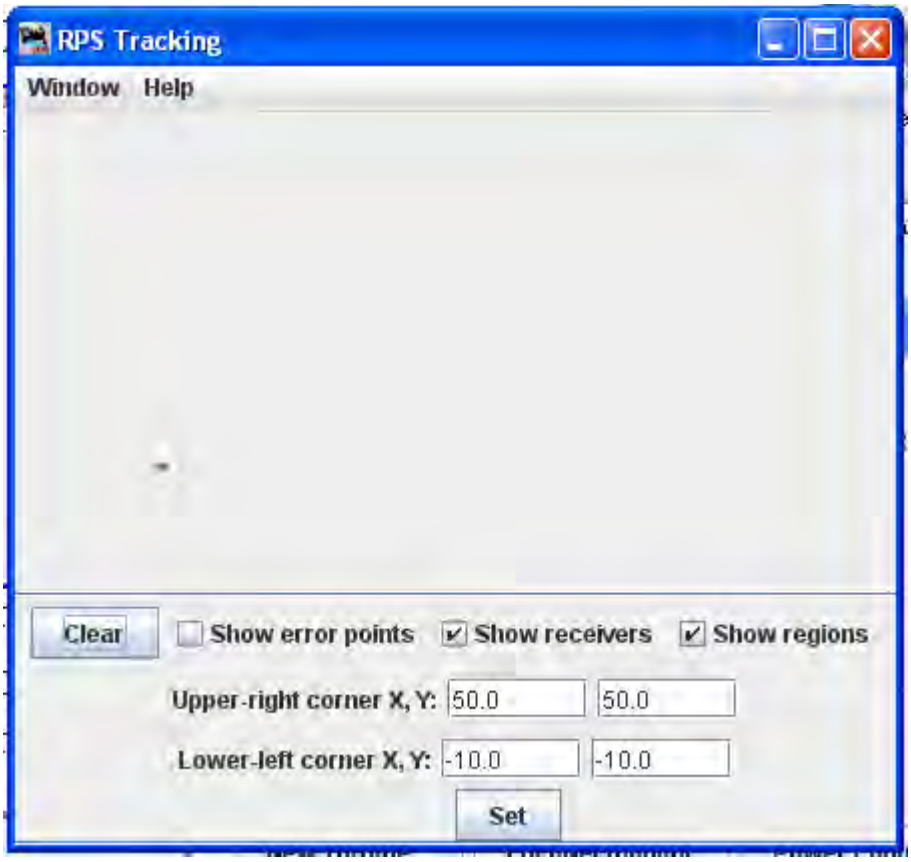
RPS Debugging Window

Opens the RPS Debugger window that lets you look at information as it moves throught the RPS system.



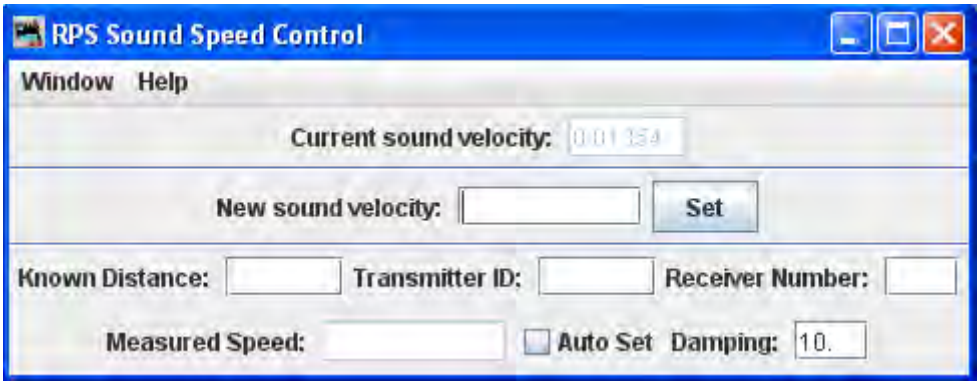
RPS Tracking Display

Opens the RPS Tracking frame that displays two types of things, the measured positions and paths of RPS transmitters and the *detection regions* used for RPS blocks and sensors.



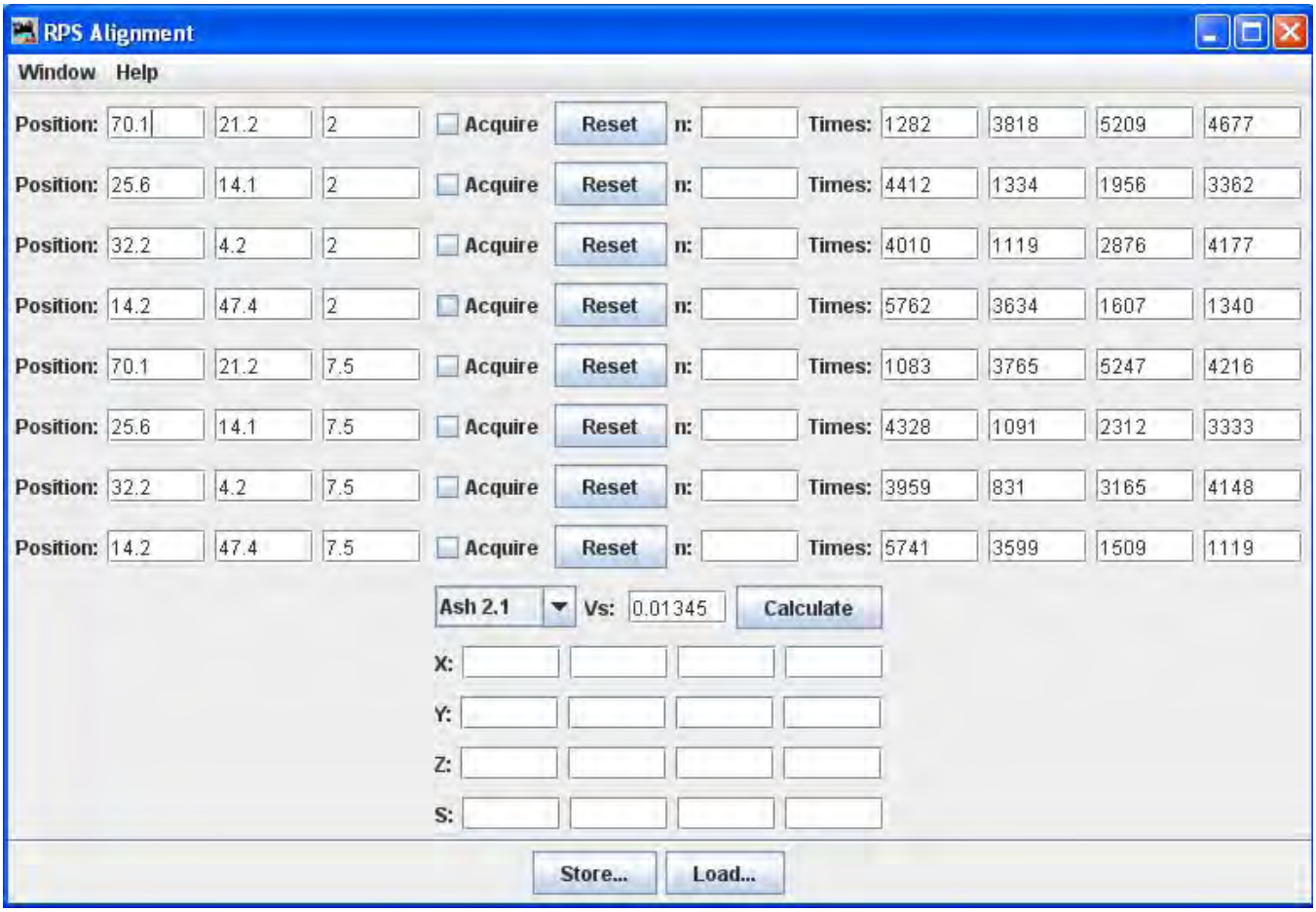
RPS Sound Speed Monitor

Opens the RPS Sound Speed Control window that lets you monitor and control the speed of sound used by the RPS system.



RPS Alignment Tool

Open the RPS Alignment window that allows you to align the sensors.



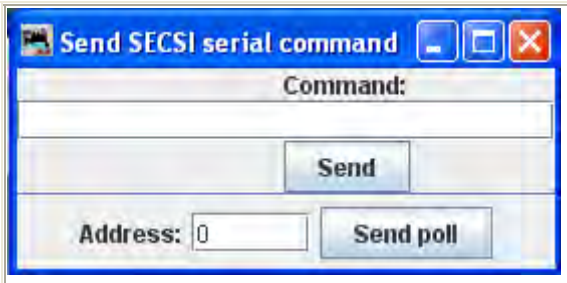
SECSI

Communications Monitor

Opens the Communications Monitor Window and automatically displays the information that is being sent and received on the communications link between your computer and your DCC system.

Send Command

The **Send SECSI serial command** prompt opens.



Type the **Command** into the text box and click the **Send** button to send the command.

A polling **Address**: may be typed in the text box at the bottom of the prompt box and click on **Send poll** to poll the addresses on the communications link.

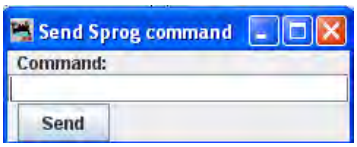
SPROG

Command Monitor

Opens the Communications Monitor Window and automatically displays the information that is being sent and received on the communications link between your computer and your DCC system.

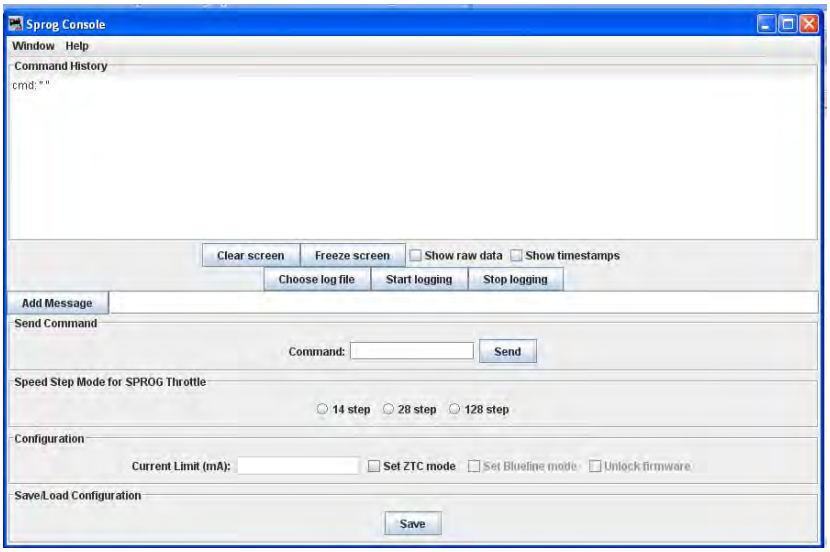
Send Command

Opens the Send prompt with a text box to enter the **Command** message that will be sent to the DCC system when you click on the **Send** button.



Console

Opens the Sprog Console window that combines the communications monitor, Send Command and other features into a single user interface.

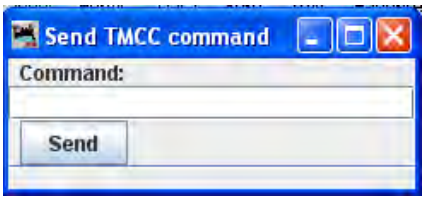


Get SPROG Firmware Version
Retrieves the SPROG firmware version and displays that information.
SPROG V3/V4 Firmware Update
Starts the SPROG Firmware Update wizard.

SPROG II Firmware Update
Starts the SPROG II Firmware Update Wizard (basically the same as above)

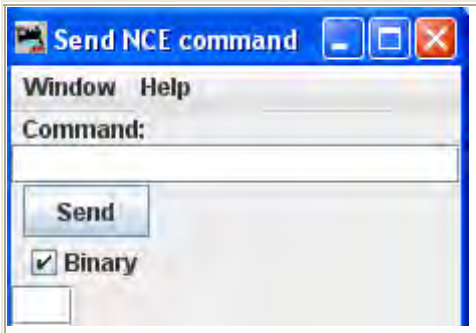
TMCC

TMCC Monitor
Opens the Communications Monitor Window and automatically displays the information that is being sent and received on the communications link between your computer and your DCC system.
Send Command
Opens the Send TMCC command prompt to send a command to the DCC system by typing in the **Command** text box and clicking the **Send** button to send the oommand.



wangrow

Command Monitor
Opens the Communications Monitor Window and automatically displays the information that is being sent and received on the communications link between your computer and your DCC system.
Send Command
Opens the NCE Command Generator, Whose binary commands are designed to work in a computer friendly mode.
Command format (cmd number) (data) (data) ...
Commands range from 0x80 to 0xBF



Command:— type the command in the text box.
Send button —sends the command to the DCC command station in the proper format.

Binary check box is checked for binary commands

Text box at bottom of dialog can be used to override the number of bytes sent.

XpressNet

XpressNet Menu

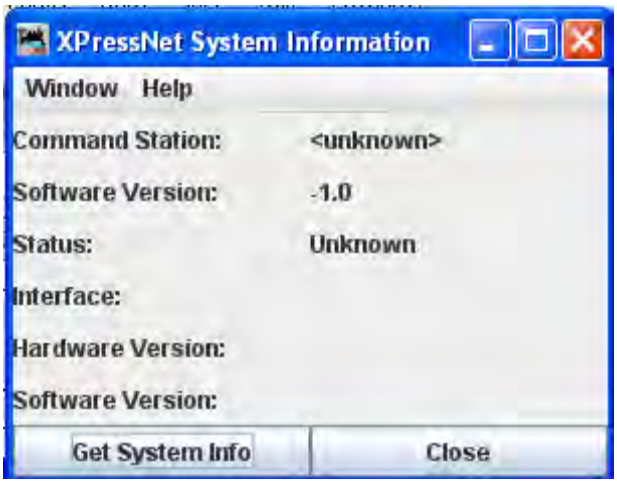
XpressNet Monitor

Opens the Communications Monitor Window and automatically displays the information that is being sent and received on the communications link between your computer and your DCC system.

XpressNet System Information

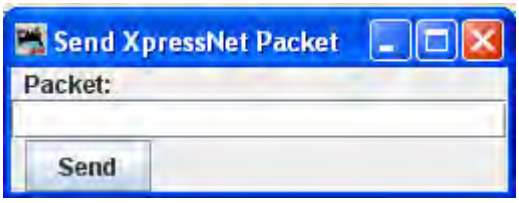
XPressNet System Information Dialog

Click on the Get System Info to query the system (Lenz or other) for system information that will be displayed in the dialog. Click on Close to close the dialog.



Send XpressNet Command

Opens the Send XpressNet Packet prompt so that you can type in a Packet: and click on the Send to transmit via XpressNet to your system.

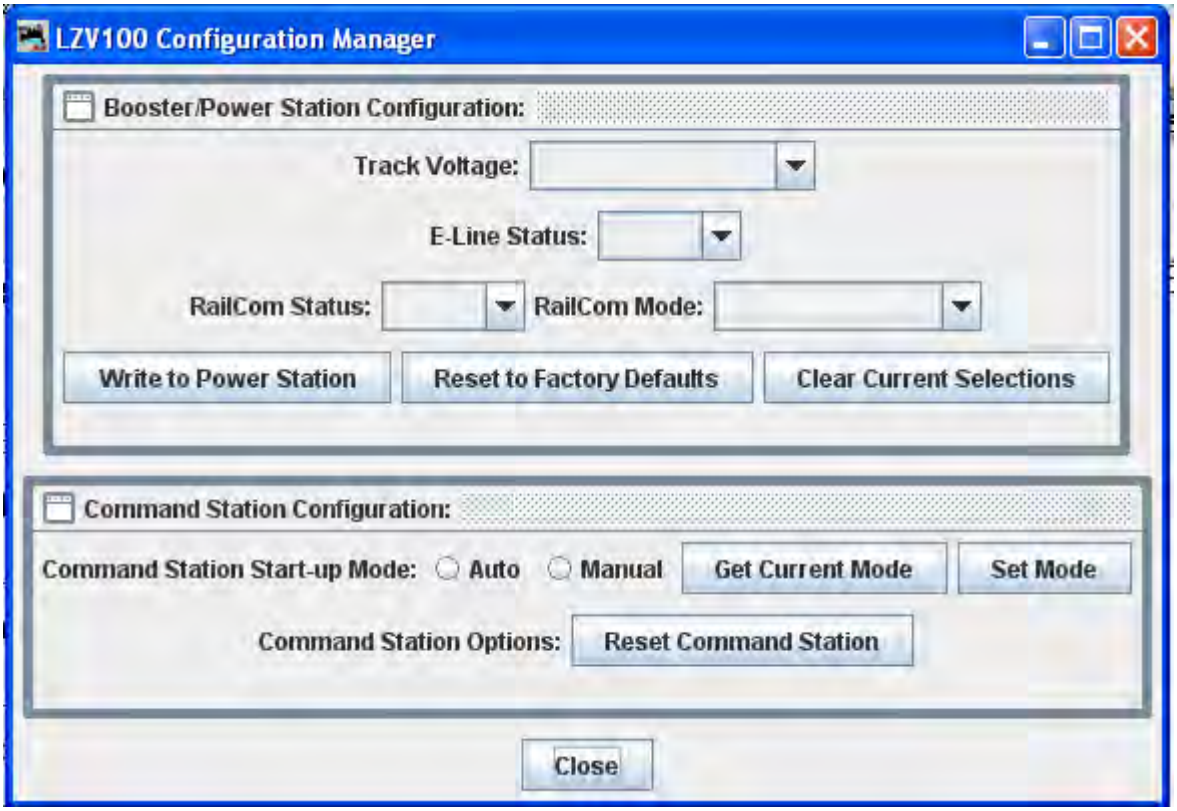


Command Station Database Manager
Command Station Stack Monitor
Click the Refresh to update the display to the current information.

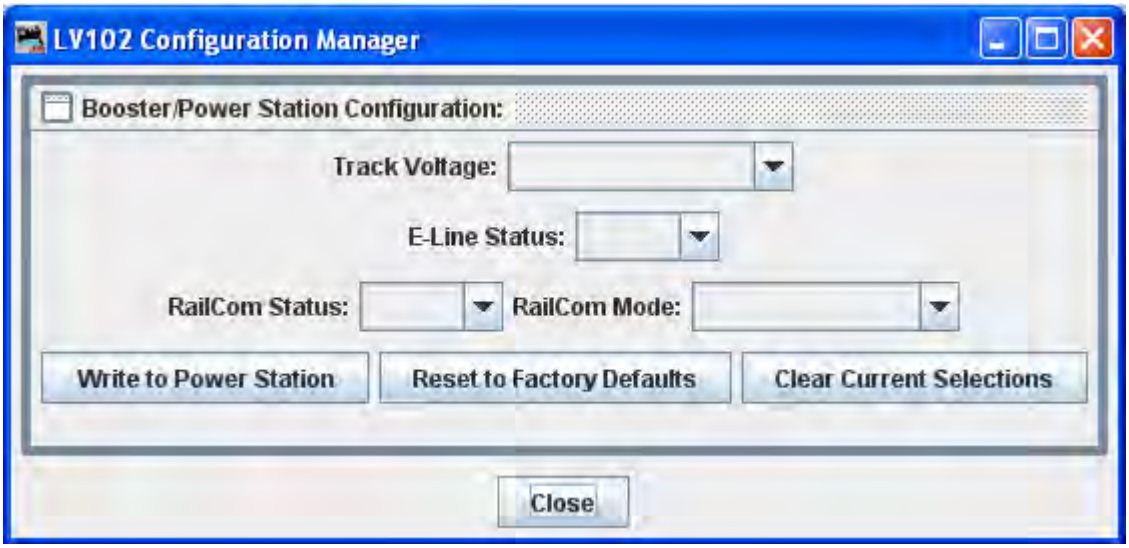
LI101 Configuration Manager
Open the LI101 Configuration Utility Window.

LZ100 Configuration Manager
Open the LV100 Configuration Manager Window

LZV100 Configuration Manager
Open the LZV100 Configuration Manager Window



LV102 Configuration Manager
Open the LV102 Configuration Manager Window.



Zimo

Command Monitor

Opens the Communications Monitor Window and automatically displays the information that is being sent and received on the communications link between your computer and your DCC system.

Send Command

Opens the Send prompt with a text box to enter the Packet message that you want to sent.

Window

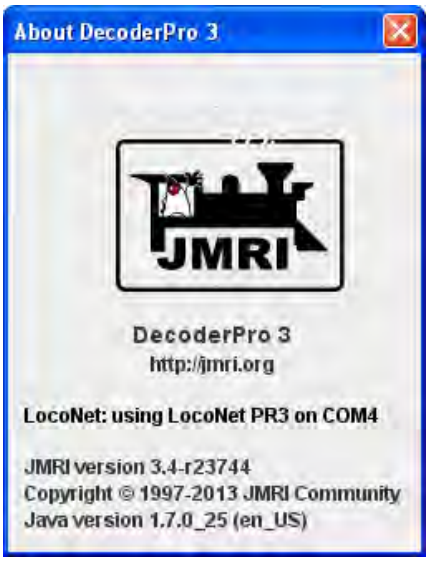
- Minimize

- open windows listed

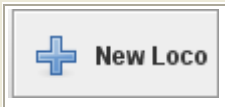
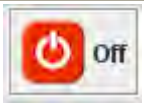
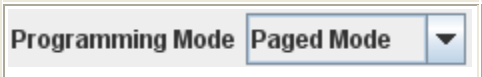
Help

- Window Help...
- General Help...
- License...
- Locations...
- Context...
- System Console...
- Upload Debugging Info...

- About DecoderPro3



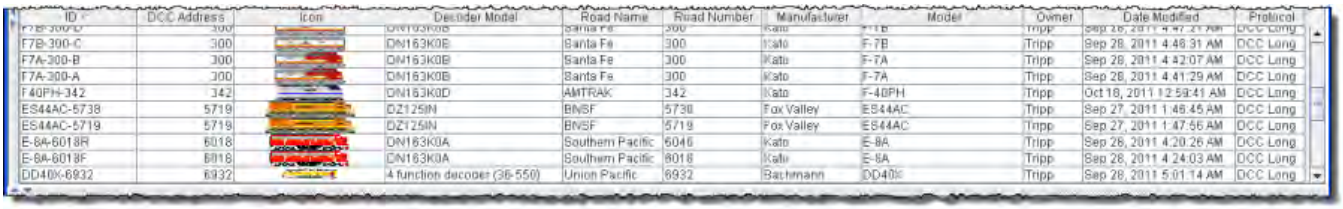
Main Window Tool Bar

	Opens the **create new loco** window
	Attempts to Identify the locomotive if it is in the roster.
	Dispays the Help file for the DecoderPro® window
	Opens new **Throttle or other buttons added by preferences.**
	Controls Track power if your command station supports this feature.
	Drop down list allows you to select Progamming Mode

Roster Table

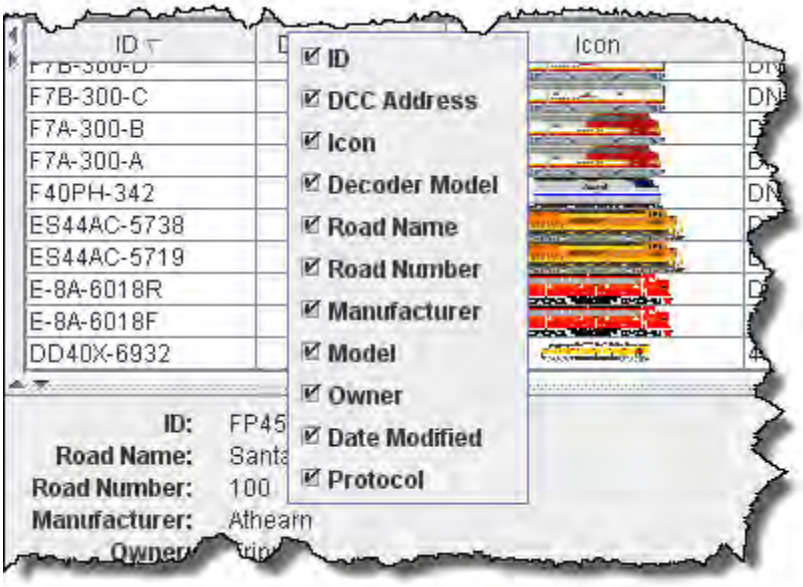
The Roster Table in the main body of DecoderPro3® displays all of the locomotives in your roster or selected roster groups.

SORT by any column by clicking on the column header. Roster above is sorted by DCC addresses.

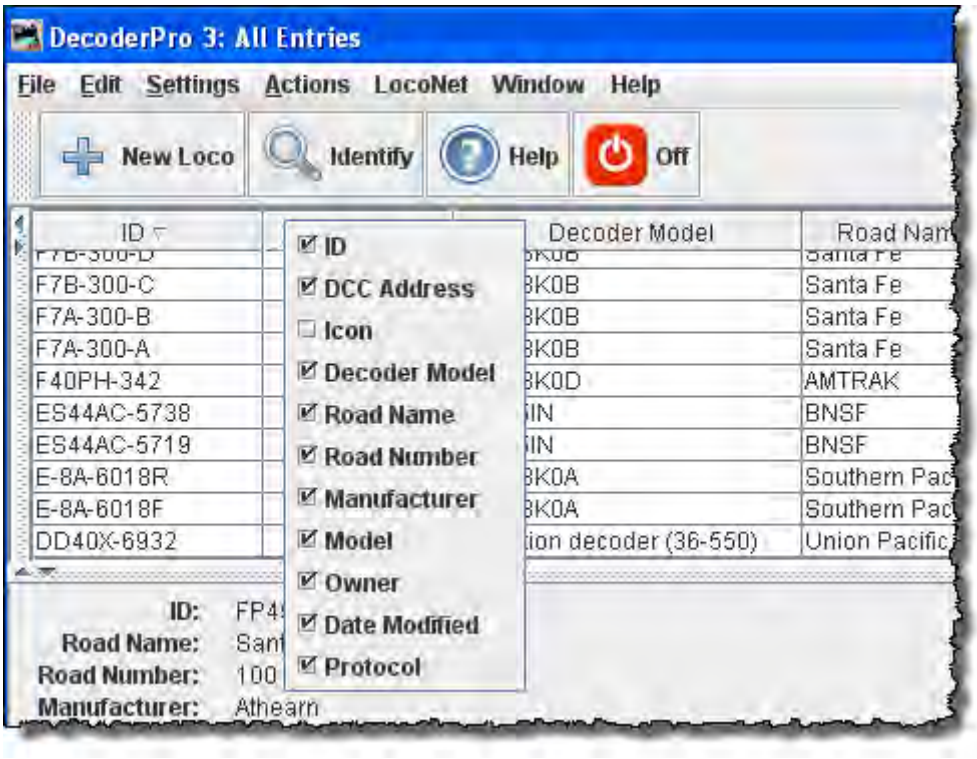


ID	DCC Address	Icon	Decoder Model	Road Name	Road Number	Manufacturer	Model	Owner	Date Modified	Protocol
F7B-300-C	300		DN163K0E	Santa Fe	300	Kato	F-7B	Tripp	Sep 28, 2011 4:46:31 AM	DCC Long
F7A-300-B	300		DN163K0B	Santa Fe	300	Kato	F-7A	Tripp	Sep 28, 2011 4:42:07 AM	DCC Long
F7A-300-A	300		DN163K0B	Santa Fe	300	Kato	F-7A	Tripp	Sep 28, 2011 4:41:29 AM	DCC Long
F40PH-342	342		DN163K0D	AMTRAK	342	Kato	F-40PH	Tripp	Oct 18, 2011 12:59:41 AM	DCC Long
ES44AC-5738	5719		DZ125IN	BNSF	5738	Fox Valley	ES44AC	Tripp	Sep 27, 2011 1:46:45 AM	DCC Long
ES44AC-5719	5719		DZ125IN	BNSF	5719	Fox Valley	ES44AC	Tripp	Sep 27, 2011 1:47:56 AM	DCC Long
E-8A-6018R	6018		DN163K0A	Southern Pacific	6046	Kato	E-8A	Tripp	Sep 28, 2011 4:20:26 AM	DCC Long
E-8A-6018F	6018		DN163K0A	Southern Pacific	6018	Kato	E-8A	Tripp	Sep 28, 2011 4:24:03 AM	DCC Long
DD40X-6932	6932		4 function decoder (36-550)	Union Pacific	6932	Bachmann	DD40X	Tripp	Sep 28, 2011 5:01:14 AM	DCC Long

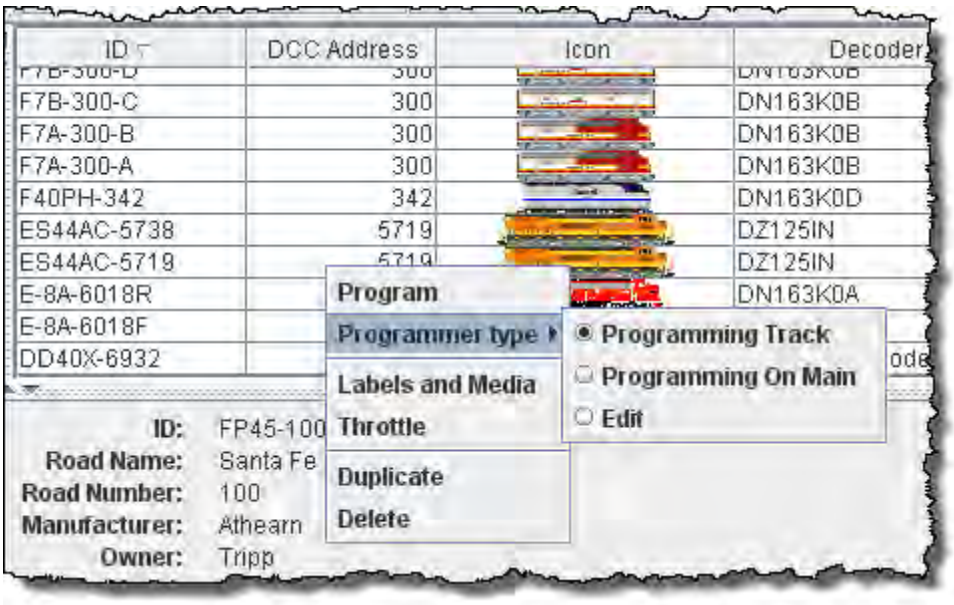
Hide/show any column by right clicking anywhere in the Roster header and checking columns to be displayed and unchecking columns to hide.



With columns hidden.



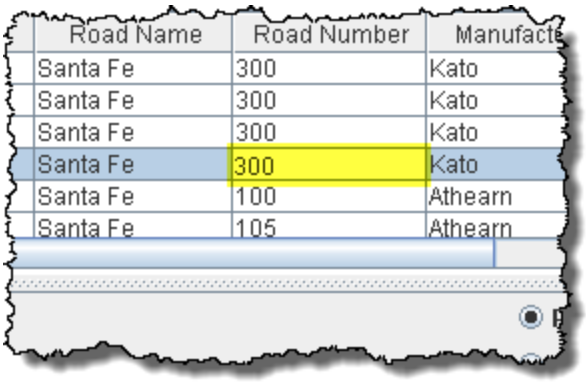
Selecting Actions using Context menu (Right Click) on locomotive selected. Select the action you would like to perform.



Double Click on Selected locomotive and Programming Window will open.

Editing column of a Roster Entry in the table. Select locomotive then click on column that you want to edit. Type your change.

The following columns may be edited.
ID Col
Road Name
Road Number
Manufacturer
Model
Owner

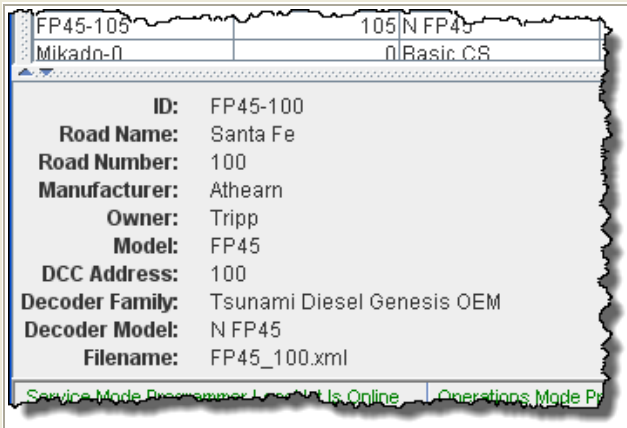
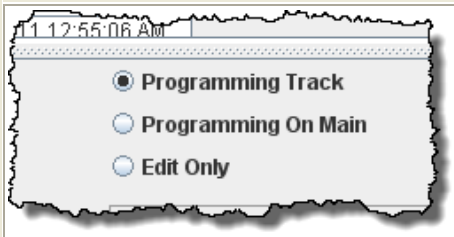
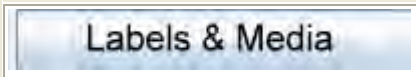
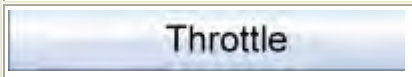


Column sequence may be modified and Saved. Just Drag and Drop the column header to the desired position.

Column Width may be changed by grabbing the divider between the column until the double headed arrow shows and move the arrows to the desired column width.

You may use the same technique to resize panes or the main window.

Decoder Information Area

	Displays the information about the current decoder selected.
	You may select the progamming mode: **Programming Track** **Programming on Main** **Edit Only** allows you to edit the roster without programming the locomotive.
	Opens the **Default Programmer** for the selected decoder in the Roster List
	Opens the Labels & Media Window for the selected roster member. **Functions labels** TAB opens the Function labels pane which allows you to label throttle function buttons **Roster Media** TAB opens the Roster Media pane which allows you to assign an image to the roster entry
	Opens a **throttle** tool for the selected loco in the Roster List.

Status bar

Displays message, so that you can determine the state of DecoderPro3 during operation.

Decoder Programmer Common Error Messages

Various things can go wrong when JMRI tries to work with your DCC command station to program a DCC decoder. This page lists the error message that can result, and describes what they mean.

JMRI Error Codes

301 — no locomotive detected

The command station has reported that it doesn't see a locomotive on the programming track.

This can happen if the locomotive isn't making good electrical contact or if there's a wiring fault in the locomotive.

302 — programmer busy

The command station has reported that it's busy doing something else, and can't do any programming right now. This usually means that some other part of the DCC system is doing a programming operation, e.g. a hand-held throttle.

Some DCC systems can't do ops-mode programming (programming on the main) while also using the service mode programming track, in which case they'll return this error message.

303 — requested not implemented in command station

This means that JMRI has requested the command station do something that it doesn't support.

This is not supposed to happen, as JMRI should disable programming modes that the command station can't provide. If you do see this message, please report the circumstances on the jmriusers mailing list.

304 — aborted by user

The user has requested that the read or write operation stop early.

This is considered an error, because the program doesn't know whether the decoder actually saw the operation complete or not.

305 — confirm failed

Some command stations allow you to "confirm" the content of a CV, rather which read the value from it. In general, this is faster than doing a complete read. If the value in the CV doesn't match the expected value, this message is issued. It's considered an error because if the values don't match, we know that we don't know the correct value for the CV contents.

306 — timeout talking to command station

The program did not hear back from the command station when it expected to.

This is by far the most common error message when people first start using JMRI. In that case, it usually means that the connection to the command station isn't correct. This could be a problem with the cable(s) making the connection, or a problem with how the preferences are set. Picking the wrong serial port is particularly common.

Once JMRI is working properly, this error may occasionally happen due to a transient error. DecoderPro generally will retry it successfully in that case.

307 — Unknown error

An error has happened, but JMRI doesn't know enough about it to be able to report more detail.

In general, JMRI is pretty good at deciphering what went wrong, and this message isn't very common. If you do see this message, please report the circumstances on the jmriusers mailing list.

308 — No acknowledge from locomotive

At the end of a CV read or write operation, the locomotive replies ("acknowledges") to the command station using a pulse of current.

If that pulse isn't seen, some command stations provide this error message. It could be due to poor electrical connections to the programming track or within the locomotive. It could also be that the decoder doesn't support readback.

Some decoders, particularly certain sound decoders, draw so much current that the reply pulse isn't detected by the command station. In that case, one of the various "programming boosters" may solve the problem.

309 — Short Circuit on Programming Track

The command station has reported seeing a short circuit on the programming track. That prevents programming operations.

Check the electrical connections to the programming track, and also within the locomotive.

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