



# **BINARY EDITOR**

## **HELP FILE**

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# 1 INTRODUCTION

Binary Editor also known as BE is a tool that allows you to calibrate and or log data from the Electronic Engine Control Computer (EEC). Some of the key features as listed below.

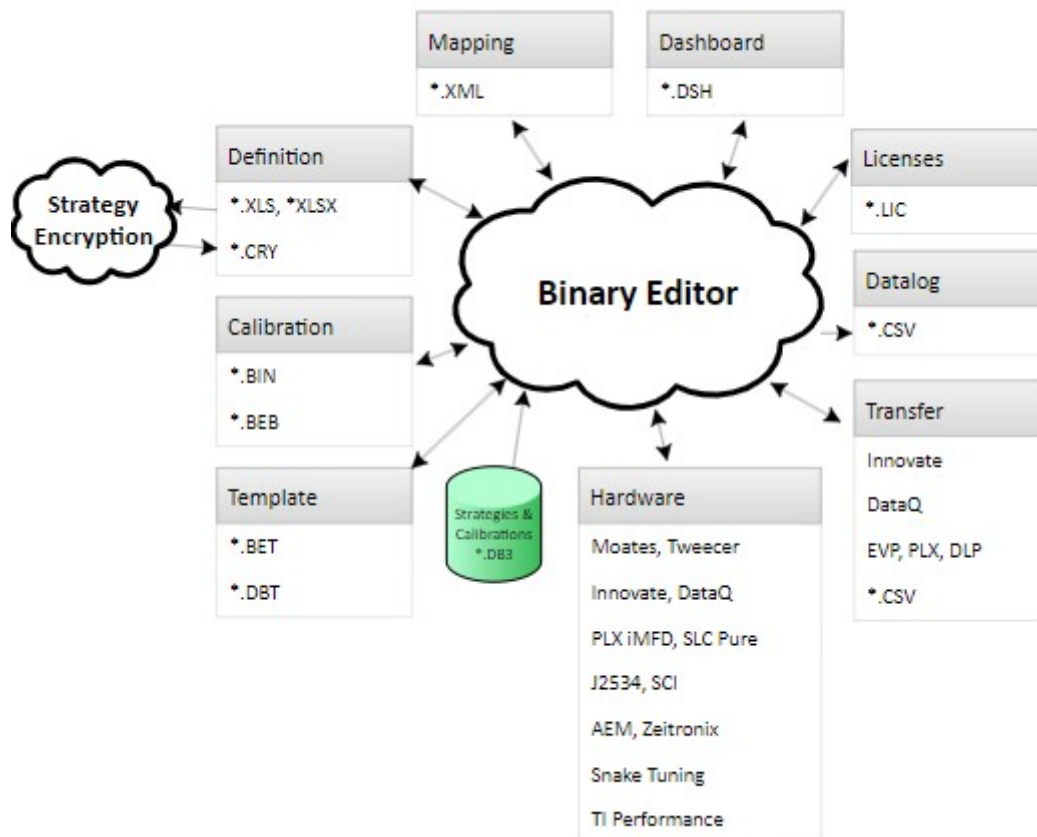
- Build and edit calibration files (aka tunes).
- Build and edit strategy files (aka definitions).
- Supports multiple hardware types ie Moates, TwEECer, SLC Pure Plus, Drew Technologies, McS1, Innovate LMx, PLX SM, Chrysler SCI (limited), Zeitronix, Snake Performance, TI Performance.
- Comparing of Calibrations
- Logging of key parameters in real time
- Update parameters while the engine is running
- Live table tracing
- Live table mapping
- MAF Auto Tuning
- Log multiple hardware at the same time

To see a full block diagram of the BE and the supported files see the diagram in section 1.2.

## 1.1 SCOPE

Welcome to the world of tuning. This document will help you get started using the Binary Editor also known as BE. Below are a few topics that will aid in the installation and setup of the software and hardware. These topics will also help explain how to use the software.

## 1.2 STRUCTURE



## **1.3 DEFINITIONS**

### **1.3.1 EEC**

The Electronic Engine Control module also known as EEC or ECM or PCM

### **1.3.2 Strategy, Definition**

The Strategy and Calibration are the parts of the code within the EEC that defines what and how the EEC operates. The Strategy (aka Definition) defines where all of the parameters will reside within the EEC's memory (Memory Map).

### **1.3.3 Catch Code, Tare Tag, Binary, Tune, Calibration**

Ford EEC's have two parts to the software. The first part is known as the Strategy (AKA Definition) which tells the EEC where the memory locations are (Memory Map) and how to perform calculations (The algorithms that perform engine control). An example of a strategy is GUFB.

The second part of the software is known as the calibration (AKA catch code, tune, tare tag and or binary). The calibration is the raw data that gives the strategy its inputs for calculations. The idle set point and spark tables are an example of the data within the calibration. An Example of the calibration code is A9L.

## 2 INSTALLING

### 2.1 SOFTWARE

Before installing Binary Editor make sure that Microsoft Dot Net framework 4.0 is installed. You must use a Microsoft Windows based system that is Windows XP or greater. After all prerequisite are installed download and install the Binary Editor software from the following web site [www.EECAnalyzer.net](http://www.EECAnalyzer.net). Once installed, start the application while still connected to the internet.

If Binary Editor informs you that there are updates, then allow Binary Editor to download and install them. The public strategy files can also be downloaded once Binary Editor is open. Select the web menu and then press the strategy button. Binary Editor will check the web for available strategies. If strategies are downloaded they will be placed in the following Directory "C:\Program Files\Binary Editor\DEF". Strategy files are the files that tell Binary Editor where and how to present the Calibration information to you.

## 2.2 HARDWARE

Before installing any drivers make sure Binary Editor is installed first. If you are using a Microsoft Windows based PC, plug in the hardware device. If Microsoft Windows prompts you for the location of the newly inserted device then look at the following table to determine the location of the drivers for a given piece of hardware:

### 2.2.1 . Links

Manufacture	Product	Driver Location
Moates	Quarterhorse	Download these from <a href="https://ftdichip.com/">https://ftdichip.com/</a>
	RoadRunner	
	F3	
	Burn1 / Burn2	
	Destiny	
	Jaybird	
STKR	TwEECer	Download these from <a href="https://www.tweecer.com/">https://www.tweecer.com/</a>
	TwEECer RT	
Drew Technologies	Mongoose	<a href="http://www.drewtech.com/products/mongoose.html">http://www.drewtech.com/products/mongoose.html</a>
DataQ	RS194	Install WinDaq/Lite <a href="http://www.DataQ.com">www.DataQ.com</a>
	DI145	
	DI148	
	DI149	
	DI158	
PLX	SM	<a href="http://www.PLXDevices.com">www.PLXDevices.com</a>
Zeitronix	ZTx	<a href="http://www.Zeitronix.com">www.Zeitronix.com</a>
Innovate	LM1, LM2	<a href="http://www.InnovateMotorsports.com">www.InnovateMotorsports.com</a>
14point7	SLC Pure Plus	<a href="http://www.14point7.com">www.14point7.com</a>
J3 EEC Programmer	TI Performance	<a href="https://www.tiperformance.com.au/">https://www.tiperformance.com.au/</a>

Once the drivers are installed make sure to unplug the device and plug it back in. This will reset the newly added driver to its default settings.

## 2.3 DRIVERS

### 2.3.1 Moates

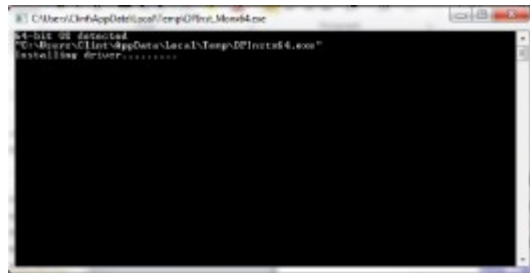
#### 2.3.1.1 INSTALL

This install procedure was written around Windows 7. Other versions of windows (XP, Vista) are the same but the screens may look a little different. Download and install the drivers from the following link. Make sure to run the WHQL Certified Setup Executable.

<http://www.ftdichip.com/Drivers/VCP.htm>



You may see the following screen flash and then disappear

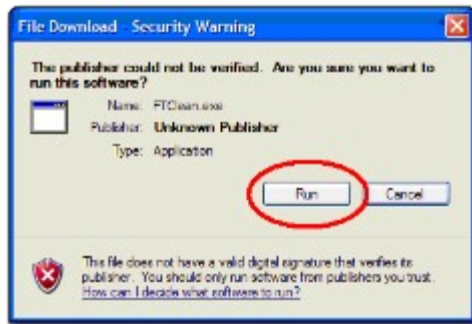


You will **NOT** need to repeat this for different Moates hardware. This procedure is only needed for the first Moates device installed.

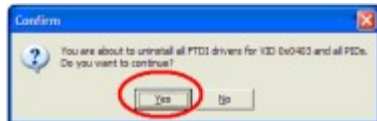
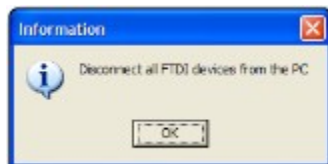
#### 2.3.1.2 UNINSTALL

The uninstalling of the drivers is **ONLY** needed if the installed drivers are suspected to be corrupt. Installing new drivers over the top usually fixes any issues. In rare cases uninstalling is required. To completely remove the drivers follow the instructions below.

- Download [FT\\_Clean](http://www.ftdichip.com/Resources/Utilities/FTClean.zip) (CTRL-Click while connected to the Internet to download it). <http://www.ftdichip.com/Resources/Utilities/FTClean.zip>
- Extract the two files onto the desktop.
- Make sure all USB devices are unplugged
- Execute the FT\_Clean.exe utility to remove all previous drivers. Follow the red circles.



You should see:



Reboot the PC to finalize the removal of the old drivers

## 2.3.2 SCI

### 2.3.2.1 INSTALL

Follow the TwEECer install procedure except choose the SCI\_Bus.inf and SCI\_Port.inf file.

### 2.3.2.2 UNINSTALL

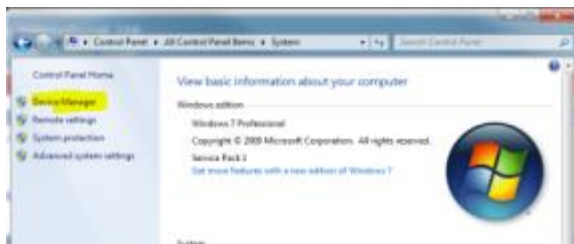
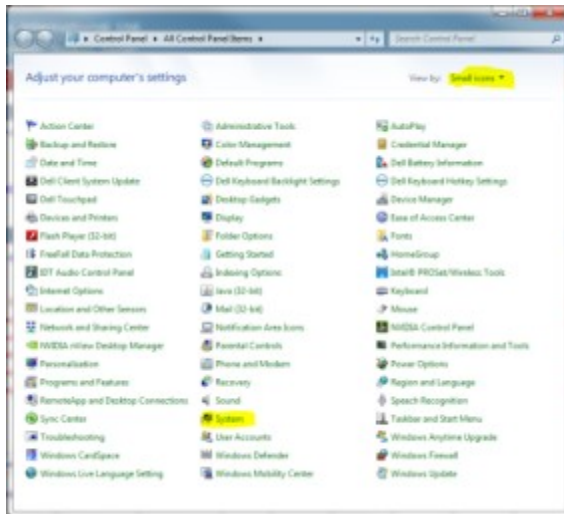
Follow the same procedure as the Moates uninstall except enter in the 0403 for the VID and 9494 for the PID.



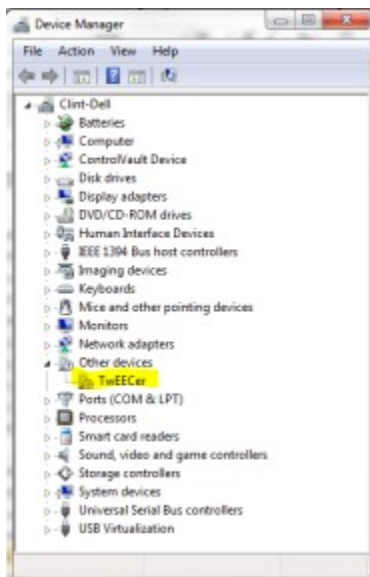
## 2.3.3 TwEECer

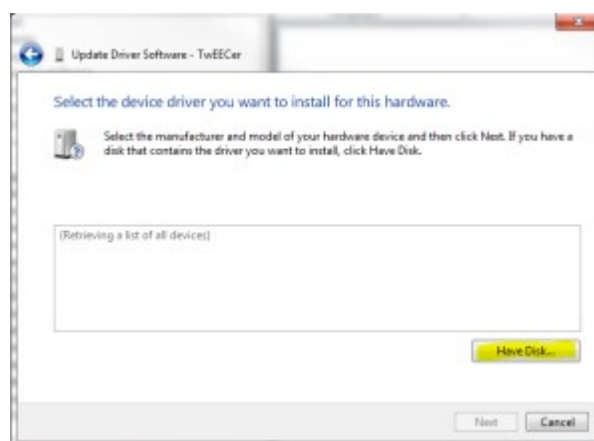
### 2.3.3.1 INSTALL

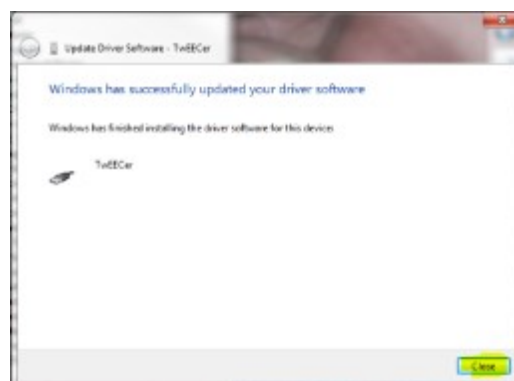
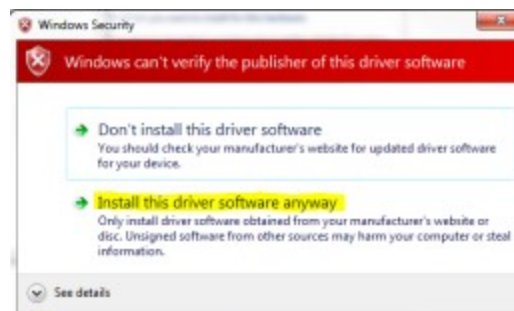
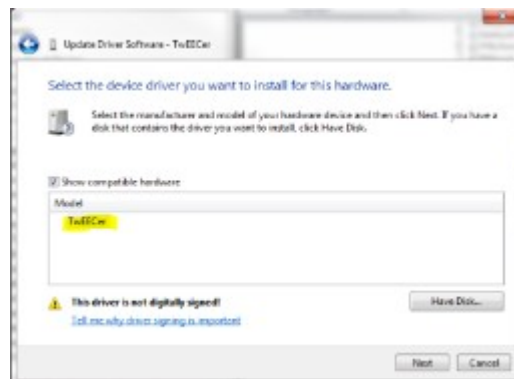
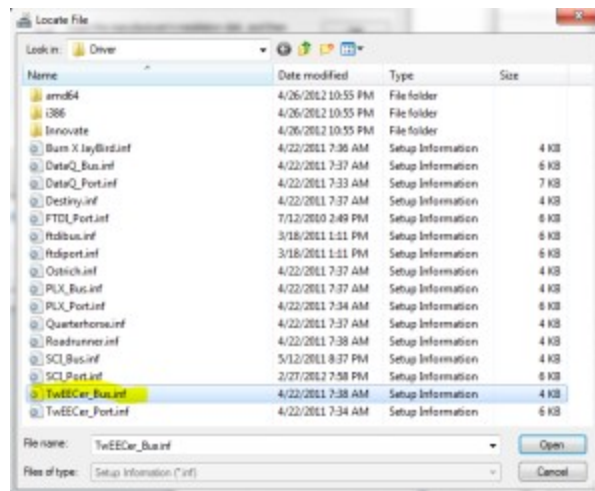
This install procedure was written around Windows 7. Other versions of windows (XP, Vista) are the same but the screens may look a little different. Follow the screen shots below with the yellow highlights.



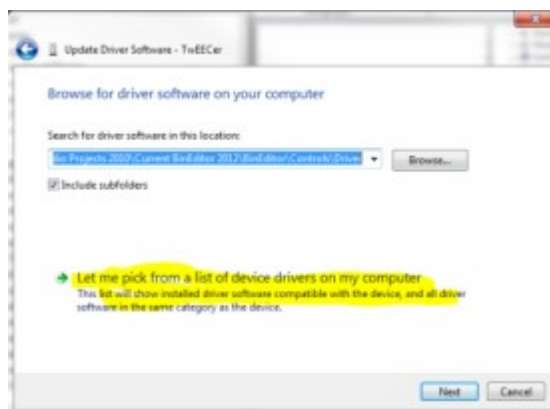
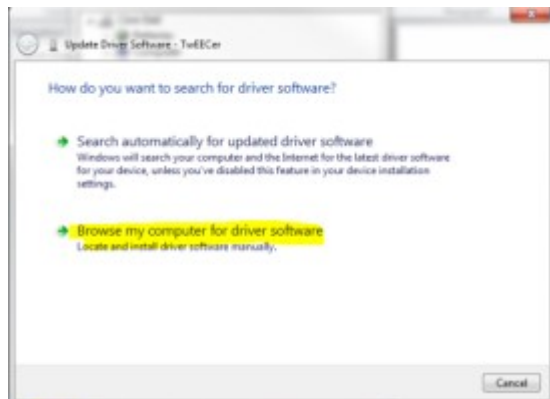
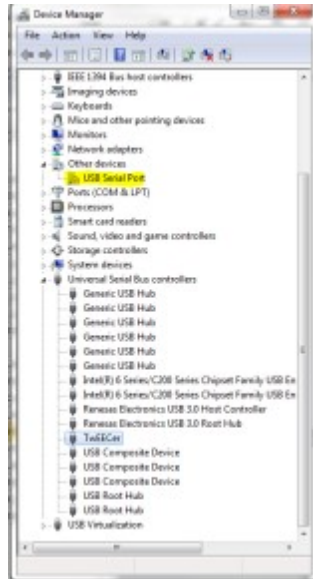
Plug in the TwEECer and wait for windows to fail installing the drivers. Right click the “TwEECer” and choose ‘Update Driver’.

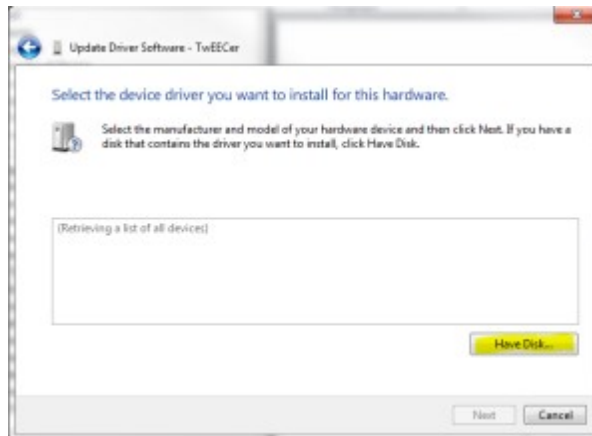
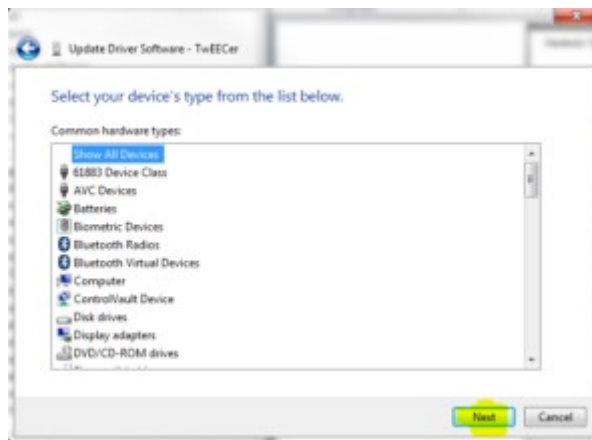




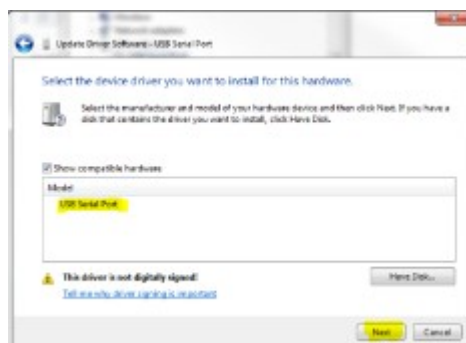
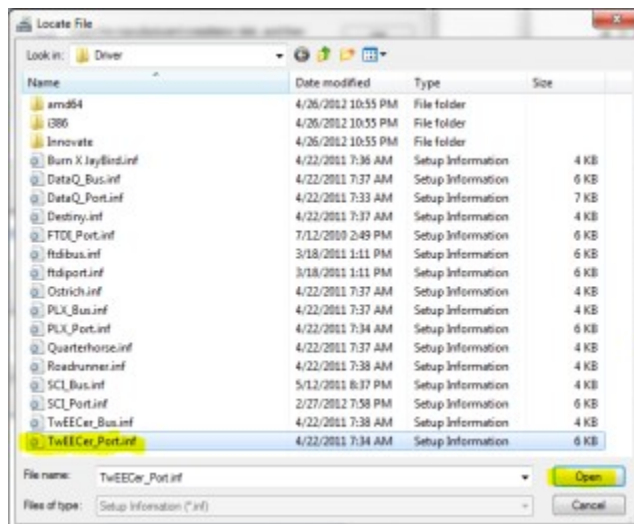


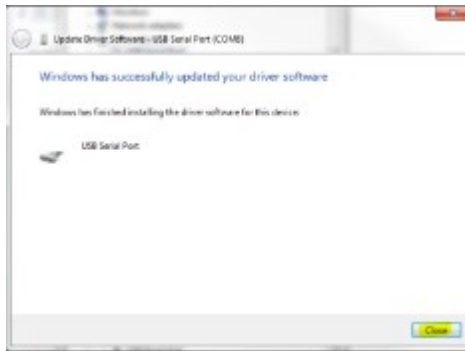
Now the USB bus is installed there will be a Com Port that shows in the “Other Devices” section. Right click and update the driver. The same procedure is required but now the Tweecer.





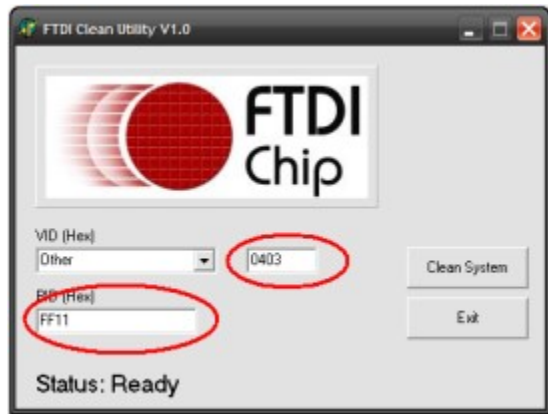
Make sure to select the PORT ini file this time





### 2.3.3.2 UNINSTALL

Follow the same procedure as the Moates uninstall except enter in the 0403 for the VID and FF11 for the PID.



## 2.3.4 PLX iMFD

### 2.3.4.1 INSTALL

Follow the TwEECer install procedure except choose the PLX\_Bus.inf and PLX\_Port.inf file.

### 2.3.4.2 UNINSTALL

Follow the same procedure as the Moates uninstall except enter in the 0403 for the VID and 9493 for the PID



## 2.3.5 DATAQ

### 2.3.5.1 INSTALL

Download and install WinDataQ lite from the <http://www.dataq.com>. After installing the DataQ test out the logging using WinDataQ Lite and make sure all works as desired.

#### IMPORTANT!!!!

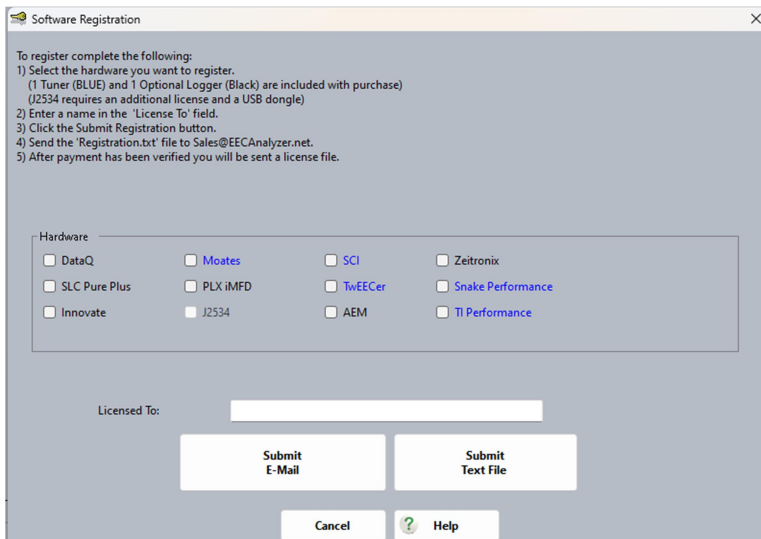
If using the DataQ with TwEECer or Moates devices, the drivers for all devices plugged in must be the same version. If they are different version BE will crash or lock up when any of the devices are logged together. To check the version go to the device manager and expand the USB section and the Com Ports section. Plug all devices in that will be logged together. When they show up in the device manager right click the device and select properties. Then go to the driver tab and note the version number. At the time this document was published the current version was 2.6.0.0. Do the same for all of the devices in the USB section and in the Com Port section. Make sure the versions all match. If they do not match then choose the option to update the driver. Let windows do the work and it should update the driver to the highest numerical version available.

## 3 LICENSING

### 3.1 SOFTWARE LICENSE

A software license is defined as a combination of personal computer serial numbers (aka Machine Code) and a registration number provided after purchase. These two pieces of information create a LIC file (aka Software License). This software license resides on the personal computer from which the Machine code was given and thus licenses the software. The software license is only good for the one physical PC and is non-transferable.

To register Binary Editor go to the registration menu and then select application. Fill out the form shown below and press the submit registration button. Select one tune and optionally select one logger.



The 'Software Registration' dialog box contains the following elements:

- Instructions:**
  - 1) Select the hardware you want to register.  
(1 Tuner (BLUE) and 1 Optional Logger (Black) are included with purchase)  
(J2534 requires an additional license and a USB dongle)
  - 2) Enter a name in the 'License To' field.
  - 3) Click the Submit Registration button.
  - 4) Send the 'Registration.txt' file to Sales@EECAalyzer.net.
  - 5) After payment has been verified you will be sent a license file.
- Hardware Selection:** A group box containing checkboxes for:
  - DataQ, SLC Pure Plus, Innovate
  - Moates, PLX iMFD, J2534
  - SCI, TwEECer, AEM
  - Zeitronix, Snake Performance, TI Performance
- Licensed To:** A text input field.
- Buttons:** 'Submit E-Mail', 'Submit Text File', 'Cancel', and 'Help'.

After the submit registration button is pressed the following will be displayed. Email this to TechSupport@EECAalyzer.net. After purchase has been verified a license file will be emailed back. The license file needs to be placed in the root directory of where Binary Editor was installed. This is usually in "C:\Program Files\Binary Editor\".




### 3.2 HARDWARE LICENSE

A hardware license is defined as a physical device (USB Dongle) connected to a personal computer which then licenses the software. The hardware license can be moved from one personal computer to another. One may have the software loaded on as many personal computers as desired. The software will only be licensed if the hardware license is detected. The J2534 license is only available on the hardware license.

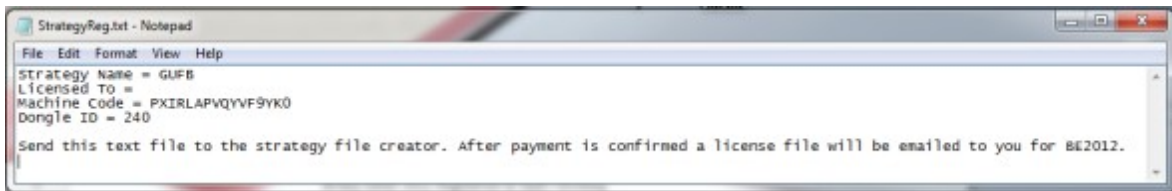
### 3.3 STRATEGY LICENSE

Strategy licenses are very similar to software license. The Machine code is given to the strategy creator. The strategy creator will then return a LIC file along with its associated strategy file to the end user. The license file can then be imported by pressing the “Import LIC” button on the registration menu. The application will place the license file in the correct location. This is usually “C:\Program Files\Binary Editor\”. The strategy file can then be placed anywhere the user desires. By default this is “C:\Program Files\Binary Editor\DEF\ (Strategy Name)\”. The User can then open Binary Editor and the associated strategy file.

To register a strategy open BE and go to the registration menu and then strategy. Fill out the form shown below and press the submit button.

A screenshot of the 'Strategy File Registration' dialog box. It has a title bar with a close button. Inside, there are two text input fields. The first is labeled 'Strategy Name' and contains the text 'GUFB'. The second is labeled 'Name of company or creator of the Strategy file' and contains the text 'Clint Garity'. Below these fields are three buttons: 'Submit E-Mail', 'Submit Text File', and a 'Help' button with a question mark icon.

After the submit button is press the following will be displayed. Email this to the strategy owner and they will respond with a license file



### 3.4 DATABASE

A database is a group of strategies and their associated calibrations. Databases require the use of a Hardware license (USB Dongle). A database enforces consistency. This means that all strategies within the database will have common names, units, and levels for parameters across all strategies. This common organization and structure will allow users to toggle between different strategies while the look and feel will be very similar to one another. The use of a database only requires the user to enter in the box code associated with the EEC processor they are working with. When entering a box code the database will open the associated strategy and then open the calibration.

#### 3.4.1 Tokens

Tokens are prepaid writes. A write is when a calibration is written to any supported hardware. Only the use of a database requires tokens. Each EEC-IV/V calibration requires the use of one token. When a calibration is written, it will consume a token and lock itself to that vehicle. This same calibration can be modified and rewritten to the same vehicle without consuming any additional tokens. It cannot be written to any other vehicle without consuming a new token. Tokens are not required to modify calibrations. They are only required when writing to hardware.

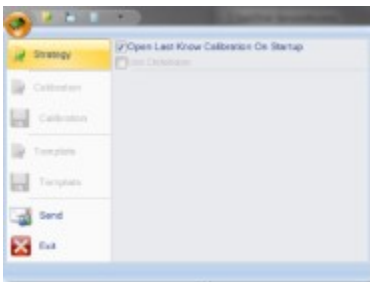
## 4 USING BINARY EDITOR

### 4.1 STARTUP

Each time Binary Editor is started, it will automatically check the internet for updates for the application. The strategy files and or database updates are not automatic. You can manually check for strategy and or database updates once Binary Editor is open and by navigating to the web menu. Once Binary Editor is open and all automatic updates are applied, you can begin configuring Binary Editor. At this point you will need to know what vehicle processor catch code you are working with and what strategy (AKA Definition file) the catch code belongs to. The Catch code is located on the 60 pin connector or the 108 pin connector on the Ford EEC's. The catch code will be a 3 or 4 alpha numeric phrase like A9L or DDX3. You can also use <http://www.tweecer.com/ccode/> to help in determining the strategy and catch code for a given vehicle. Once the catch code and strategy are known, you can configure Binary Editor for the specific vehicle.

### 4.2 STRATEGY FILES

Start by opening the Strategy file by pressing the open button on the menu bar. Browse to the "C:\Binary Editor\DEF\...." and locate the strategy that the vehicle is associated with. As an example you can open the GUFB folder and then open the GUFB.xls file.



At this point Binary Editor will have the strategy file loaded and you will see a list of parameters but with no values. In the lower left corner of the status bar you will see what strategy file is loaded. If you double click the name GUFB.XLS then the details for that strategy file will show. **Note** not all strategy files have this information filled out. As strategy files are updated the details will be updated too.



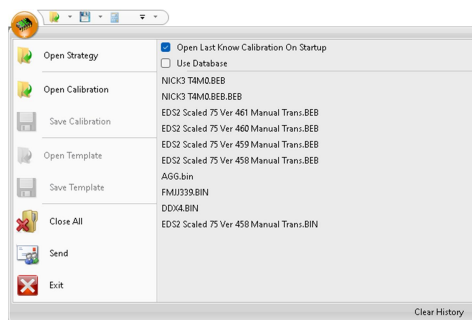


The strategy files can be modified by opening in Microsoft Excel.

There are a couple of key things to remember when creating a strategy file within excel. The column names **CANNOT** be changed. The MAF Transfer parameter name must be "MAF Transfer" in order for the import and export of the MAF to be possible. Use the file "Strategy\_Template.XLS" for a template. It is located in the root directory of \\...\\BinaryEditor\\DEF\\Strategy\_Template.XLS. There is a help file that describes how to configure and create a strategy file. For more details on how to create a strategy file read the Strategy File Creation section of this document.

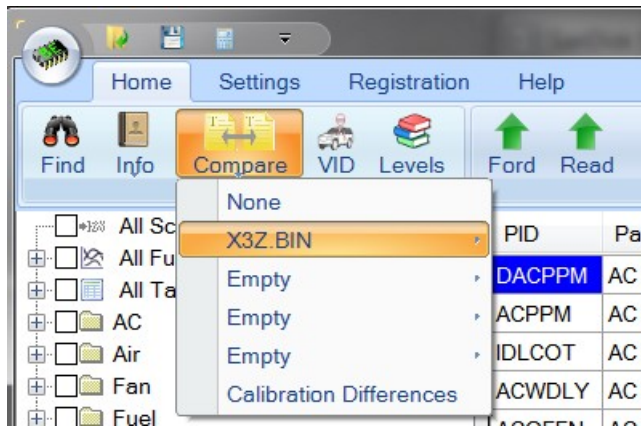
### 4.3 CALIBRATION FILES

Now open a calibration file (aka binary file) by pressing the open button menu bar. The calibration file is the actual tune the vehicle runs off of. As an example you can open the A9L.BIN file located at "C:\\Program Files\\Binary Editor\\DEF\\GUFB\\".



## 4.4 COMPARING CALIBRATIONS

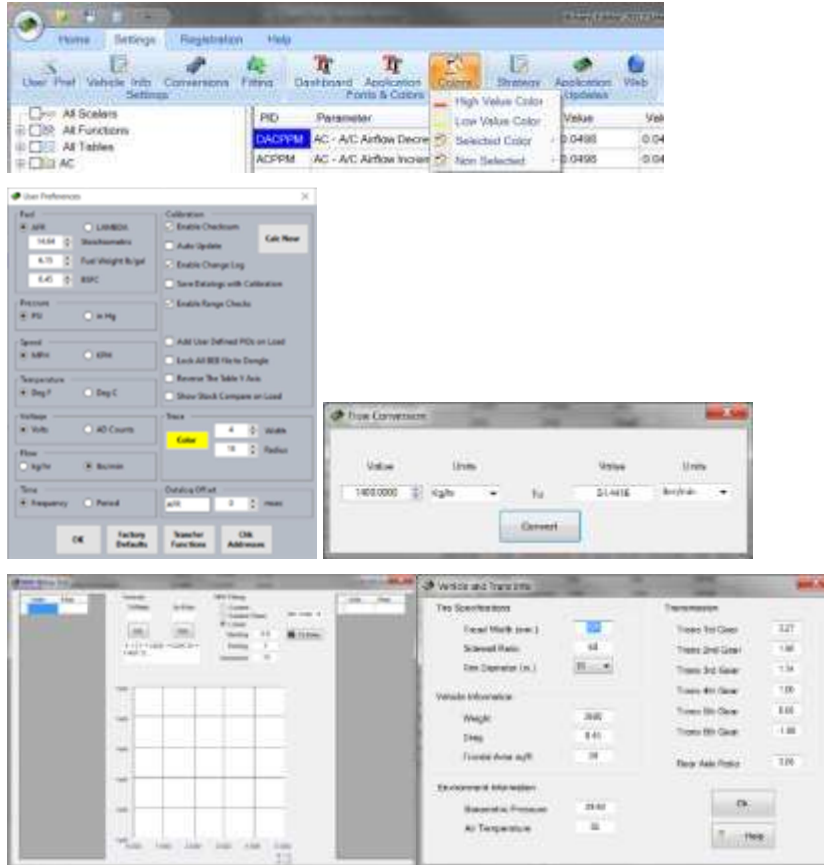
Binary Editor allows four calibrations to be loaded for comparison. Only one of the loaded calibrations, at a time, can be compared against the base calibration. The Base calibration is the calibration that is loaded for edit. To open a base calibration file see section 3.3. The compare calibrations are loaded by pressing one of the four buttons menu bar. When the compare calibration is loaded the name of the file will be displayed next to the associated button. When the check box next to the associated button is selected, Binary Editor will display the compare calibration next to the base calibration. This will populate the “Value2” column on the Scalars tab and the 3rd and 4th columns on the Functions tab and the bottom table on the Tables tab. The cells associated with the compare calibration are editable but cannot be saved. This allows you to cut and copy from one calibration to another. If you have multiple compare files loaded you can toggle between them using the hot keys associated with the compare calibration. The hot keys are CTRL + x [ x = 1-4].



## 4.5 SETTINGS

### 4.5.1 Fuel

Setup the fuel type by selecting the User Preferences from the Settings menu bar. Make sure to set the AFR to the type of fuel you are running. Most cases this is 14.64, but it is becoming more common to see ethanol blends like E10, which has an AFR of 14.08. Now determine how you want Binary Editor to display fuel, either AFR or LAMBDA. If you are running a Supercharger or turbo then set the Brake Specific Fuel Consumption (BSFC) to 0.66 otherwise leave it at 0.45. The BSFC is what Binary Editor uses to horsepower and torque. The AFR is used to calculate miles per gallon (MPG). Not all definition files support displaying LAMBDA but as the definition files are updated they will support LAMBDA or AFR.

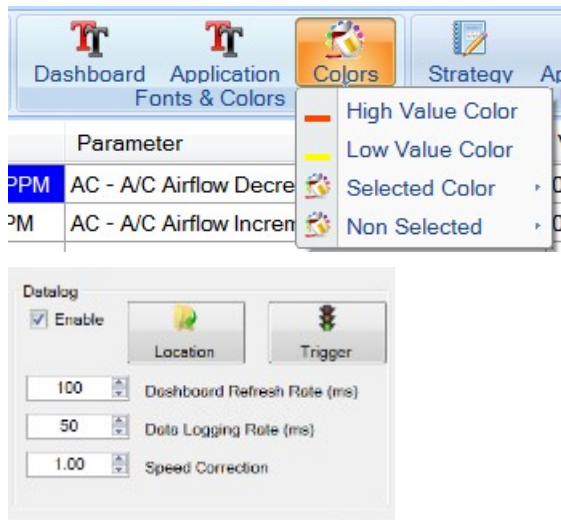


Fuel Type	AFR
Gasoline	= 14.64
E5	= 14.35
E10	= 14.08
E15	= 13.79
E20	= 13.49
E30	= 12.92
E40	= 12.34

Fuel Type	AFR
E50	= 11.77
E60	= 11.20
E85	= 9.76
E100	= 9.00
VP C16	= 14.77
LPG (Propane)	= 15.50
CNG	= 17.20
Methanol	= 6.40

## 4.5.2 Other Settings

The next part is setting the Other Options. Determine if you want Binary Editor to check for updates when it starts. The “table/function tracing” is for real time logging. When enabled, the tables and functions will indicate the active cell that the EEC is using. If your speedometer is accurate then leave the “Speed Correction” set to 1 otherwise set it according to how far the speedometer is off. For example if the speedometer is off by 10% then set the “Speed Correction” to 1.10. Each tune is divided into banks. Each bank uses 56k of memory. Binary Editor will automatically detect the size of your tune. Use windows explorer and locate your tune. Look at the file size of your tune and it will either be a 56k (1 Bank), 112k (2 Bank) or a 256K (4 bank tune). The Vehicle Identification Block (VID) is a specific memory range in the 2 and 4 bank tunes. This VID block contains information like the VIN number, Axel Ratio and Ignition Key Security called PATS information. Each parameter in the tune belongs to a visible level. You can choose which levels you want BE to display. By default all levels are selected. At this point you can set the fonts of the dashboard and or fonts for Binary Editor in general.



### 4.5.3 Checksum

The checksum is Fords way of detecting if a calibration is corrupt. The Checksum is a mathematical addition of all parameters within a tune. When the EEC is powered up it goes through a self-test and calculates a checksum. It then compares this checksum to a stored value in memory. If both values match then the tune is good. If the checksum does not match, then the tune is assumed to be bad and a check engine light may illuminate. The starting and ending addresses are the range in which the EEC adds all parameter values to come up with the checksum. The result is then compared to the value displayed is the ROM PID.

The image shows a 'User Preferences' dialog box with a light blue background and a title bar with a close button. The dialog is organized into several sections:

- Fuel:** Includes radio buttons for 'AFR' and 'LAMBDA' (selected). Below 'LAMBDA' are three input fields: '14.08' (Stoichiometric), '6.15' (Fuel Weight lb/gal), and '0.45' (BSFC).
- Pressure:** Includes radio buttons for 'PSI' (selected) and 'in Hg'.
- Speed:** Includes radio buttons for 'MPH' (selected) and 'KPH'.
- Temperature:** Includes radio buttons for 'Deg F' (selected) and 'Deg C'.
- Voltage:** Includes radio buttons for 'Volts' (selected) and 'AD Counts'.
- Flow:** Includes radio buttons for 'kg/hr' and 'lbs/min' (selected).
- Time:** Includes radio buttons for 'Frequency' (selected) and 'Period'.
- Calibration:** A section with several checkboxes:
  - ☒ Enable Checksum (with a 'Calc Now' button to its right)
  - ☐ Auto Update
  - ☒ Enable Change Log
  - ☒ Save Datalogs with Calibration
  - ☒ Enable Range Checks
  - ☐ Add User Defined PIDs on Load
  - ☐ Lock All BEB file to Dongle
  - ☐ Reverse The Table Y Axis
  - ☐ Show Stock Compare on Load
  - ☐ Confirm Writes with Readback (Tweecer)
- Trace:** Includes a yellow 'Color' button, a 'Width' input field set to '4', and a 'Radius' input field set to '18'.
- Datalog:** Includes a dropdown menu set to 'AFR', a 'msec offset' input field set to '0', and a 'Rolling Average' input field set to '4'.

At the bottom of the dialog are four buttons: 'OK', 'Factory Defaults', 'Transfer Functions', and 'Chk Addresses'.

## 4.6 CHART FUNCTIONALITY

### 4.6.1 Function Chart

The chart has a few properties that are available through the context menu. In the chart area, right click your mouse to view the context menu also known as the properties window. Below is a list of the available context menu options:

<b>Zoom In</b>	Will zoom in 10% of the current range by simply clicking anywhere on the chart.
<b>Zoom Out</b>	Will zoom out 10% of the current range by simply clicking anywhere on the chart.
<b>Zoom Pan</b>	Will allow the chart to move on its X and Y-axis's while maintaining the current zoom level.
<b>Zoom Extents</b>	will zoom out or in to the extents of what the datalog contains. This means it will zoom to the extents of all pens.
<b>Edit Point</b>	This will allow the user to drag and drop a data point on the chart. This is especially helpful when trying to fine-tune a curve. Users can now drag and drop data points to fit any desired curve. This option is not available on the Injector Slope tab or the HP/TQ tab. The edit point option was disabled on the previously mentioned tabs because of the amount of data points that are possible far exceeds the resolution of the chart. This means that the user may have a data log that contains 25K points, which may have four or five data points right on top of one another and the chart would not know which one you want to move or edit.
	There are two shortcut keys that maybe helpful while moving a data point. If you hold the V keys while moving a point, the vertical axis (X) will be locked in place and the horizontal (Y) axis will continue to move with the mouse. If you hold the H keys while moving a point, the horizontal axis (Y) will be locked in place and the vertical (X) axis will continue to move with the mouse.
<b>Properties</b>	Will allow custom settings for the given chart. Each pen can have its color, thickness and visibility changed. The properties window allows for customization of the axis scales and the amount of divisions per axis. There are also some visibility options for gridlines and record count. Each axis can also auto detect the range of a give pen. The font and the font style and size can also be changed. The properties dialog saves all settings upon exiting the dialog.
<b>Chart Color</b>	This feature allows the background color of the chart to change to any user defined color.
<b>Gridline Color</b>	This feature allows the gridline color if enabled to change to any user defined color.
<b>Zoom Color</b>	This feature allows the Zoom box that is dragged around a desired zoom an area to have any user defined color.
<b>New Window</b>	This feature allows the opening the chart in a new window. This allows side-by-side comparisons of charts and or maximizing the

chart to encompass the entire screen size.

- Vertical Bar** This feature displays the values of each Pen where the vertical bar intersects the line defined by each pen. The vertical bar can only be shown if there is no Zoom or Panning active. The bar is displayed by left clicking on the chart. While holding down the left mouse button the vertical bar can be moved.
- The legend** This displays the values and colors of each pen as they cross the vertical line.
- Auto Scaling** The auto scale adjusts the MAX and MIN of a given axis to the range of the data values using the following three rules
- If Data Range is **greater** than 5 the axis max value will be the range plus 1% and the axis min value will be the range – 1%
- If Data Range is **Less** than 5 the axis max value will be the range plus 2.5% and the axis min value will be the range – 2.5%
- If Data Range is **equals** 0 (i.e. all of the data values are the same) the axis max value will be the data value plus 5 and the axis min value will be the data value –5
- Measure** This allows measuring between two vertical points on a chart.

The last feature is the cursor location. All charts provide the user with the scaled location of the cursor. This is a nice feature when trying to figure out a peak in the HP/TQ curves or on the Injector slopes tab. All charts remember their last known setting for future reference.

## Shortcuts

All charts have the following shortcuts:

Command	Shortcut
Zoom Out	Page Up
	Mouse Wheel (Away)
Zoom In	Page Down
	Mouse Left Click and drag
	Mouse Wheel (Toward)
Zoom Extents	ALT + E
Pan	ALT + Mouse Left Click and drag
	ALT + Left Arrow
	ALT + Up Arrow
	ALT + Right Arrow
	ALT + Down Arrow
Vertical Bar	Mouse Left Click
Chart Properties	ALT + R
Chart Help file	ALT + F1
Open Chart In new Window	ALT + W
Measure between vertical bars	CTRL + Mouse Left Click and drag
Refresh	F5

### 4.6.2 Data log Chart

The data log chart is a custom chart that has all of the functionality of the chart used for the functions and more. The data log chart allows each pen to be scaled automatically so that all selected pens fit on the same chart.

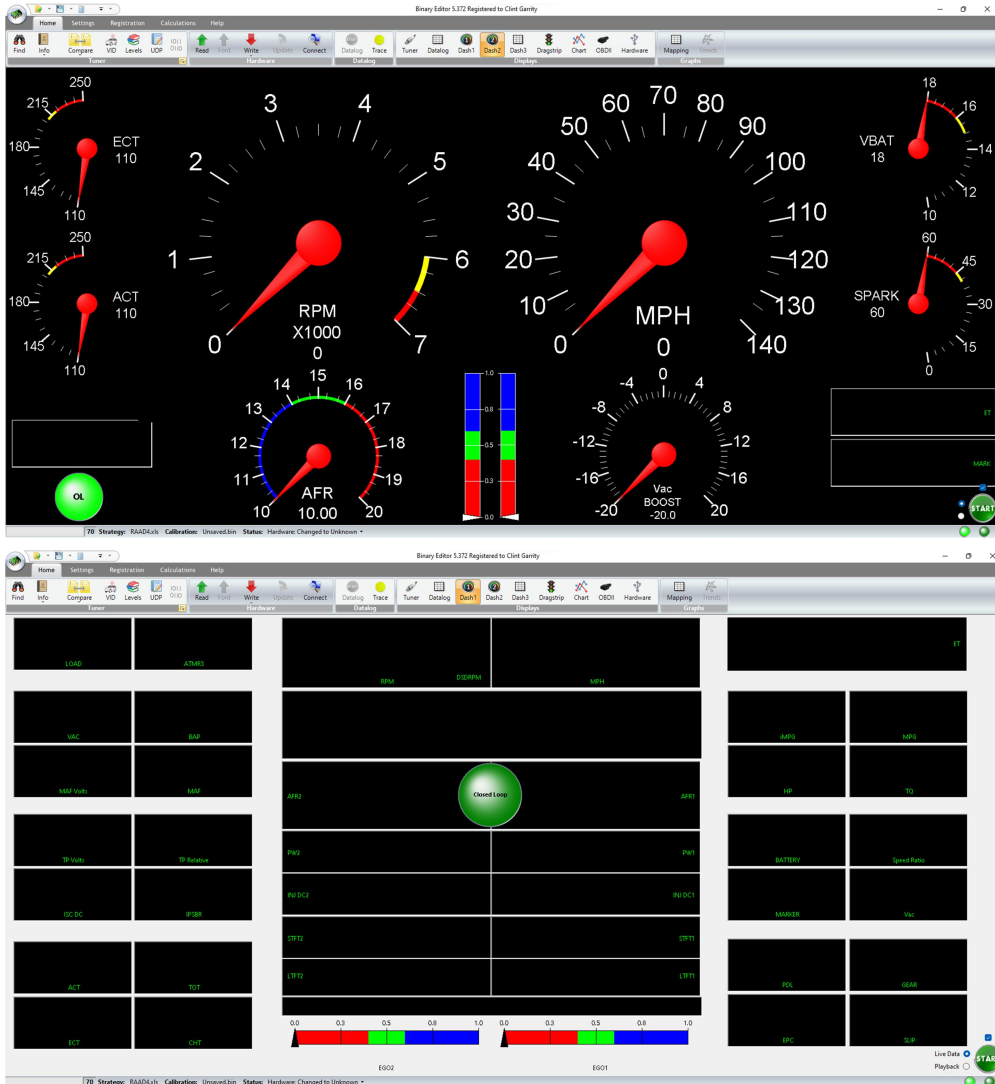
Selecting a pen will change the pens color to a user defined color, it will also change the Y axis scale to match the selected pens scale. Zooming in on pens is performed by right clicking and dragging. This will create two vertical bars. The area between the vertical bars is the area that will be zoomed when releasing the right click. While zooming, the actual span in Elapsed Time (ET) will be displayed on the X Axis.

There are chart enhanced options on the right of the chart. These options include zooming in/out on a single pen, panning the entire chart Up/Down/Left/Right, Scaling a pen up/down, and zooming the entire chart in/out and to extents of all pens.

The Datalog Chart also playback data logs. While playback is active, the vertical bar will move across the chart at the rate the data log was created. The dashboards will also display the data log info while playback is active. The playback can also be started at any given point within the data log by selecting a position on the chart before starting a playback session.

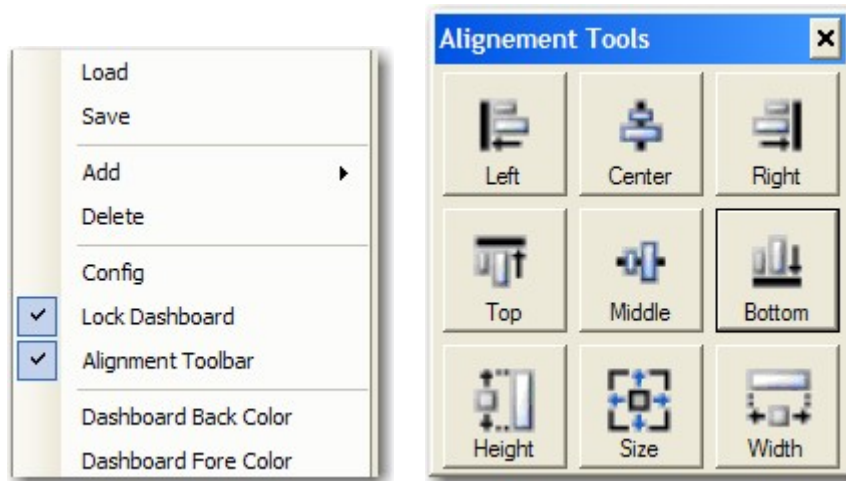
## 4.7 DASHBOARD

Each gauge has a few properties that are available. Double click in the gauge area to view the configuration window. Below is a list of the available options. The most important option is the **Datalog TAG**. The value of this TAG is what the gauge will display. Without a TAG defined the gauge will not display any data. Below are two samples of dashboards.



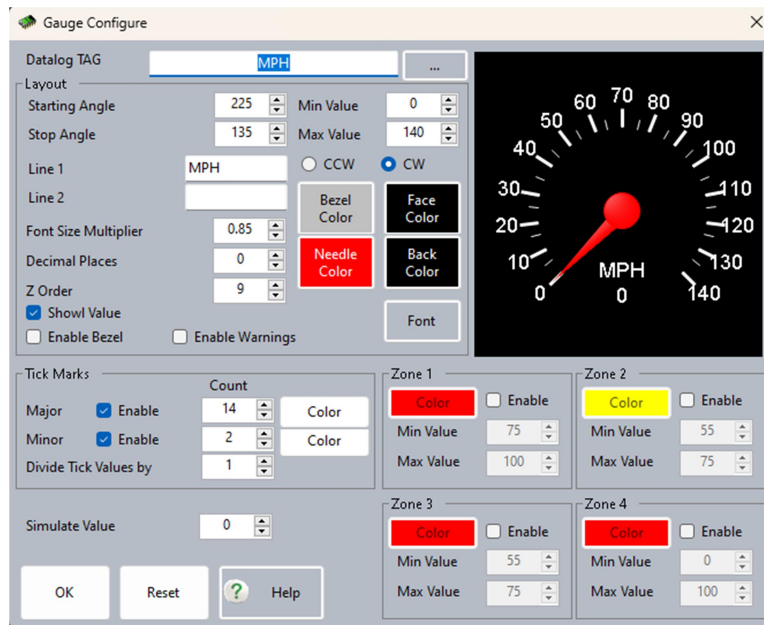
### 4.7.1 Dashboard Configuration

There are two configurable dashboards. Configurations can be saved and loaded on demand. The key to configuring the dashboard is the right click of the mouse. With the right click



<b>Load</b>	Allows the user to load custom dashboard configurations.
<b>Save</b>	Allows the user to save custom dashboard configurations.
<b>Add</b>	When the dashboard is unlocked gauges can be added to the dashboard. The types of gauges are described in the following sections.
<b>Delete</b>	When the dashboard is unlocked gauges can be deleted from the dashboard.
<b>Config</b>	There are two ways to configure a gauge. One is to right click the gauge and select config or two, double click the gauge.
<b>Lock</b>	Locking the gauge prevents any movement, resizing, adding or deleting from the dashboard.
<b>Alignment</b>	When not locked and two or more gauges are selected (yellow highlight) the gauges can be aligned to the edge selected in the alignment toolbar.
<b>Back Color</b>	The background color of the dashboard.
<b>Fore Color</b>	The text color of the dashboard (Start Stop Button in lower right corner).

## 4.7.2 Analog Gauge



### Layout

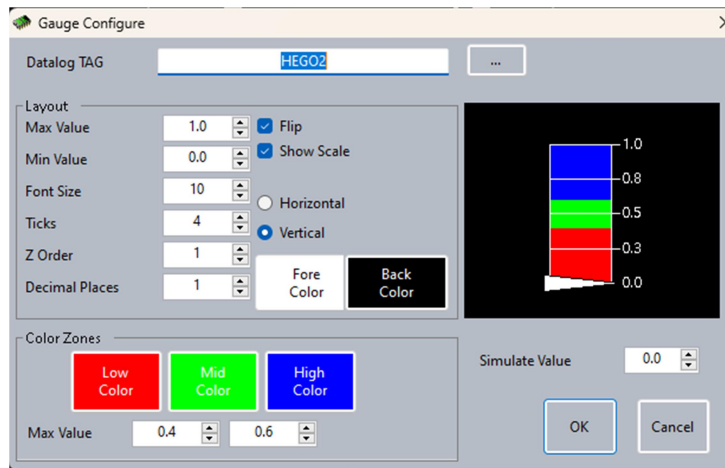
- Start Angle** This is the angle at which the gauge will start its rotation of tick marks. The start and stop angles have a range of 0-360.
- Stop Angle** This is the angle at which the gauge will stop its rotation of tick marks. The start and stop angles have a range of 0-360.
- Min Value** This is the minimum value the gauge can display.
- Max Value** This is the maximum value the gauge can display.
- Line1** This is the first line of text that shows up below the needle
- Line2** This is the second line of text that shows up below the needle
- Show Value** If checked, this will display the current digital value of the gauges below the needle.
- Font** This allows for font and style changes. Note the font size will be changed. Use the Font Multiplier to change the size of the font.
- Font Size Mult** This multiplies the font size of all of the font within the gauge.
- CCW/CW** This option defines orientation of the gauge. The gauge can sweep counter clockwise or the clockwise.
- Face Color** This is the color of the face of the gauge
- Back Color** This is the color of the background of the gauge
- Needle Color** This is the color of the needle
- Bezel Color** If the bezel is enabled this will be the color of the bezel

### Tick Marks

- Major Enable** If checked this will display the larger tick marks and their associated values
- Minor Enable** If checked this will show the small tick marks between the larger tick marks but without any values

<b>Major Color</b>	This is the color of the major tick marks and there associated numeric values
<b>Minor Color</b>	This is the color of the minor tick marks
<b>Major Count</b>	This is the total number of major tick marks that are displayed between the start and stop angles of the gauge
<b>Minor Count</b>	This is the total number of minor tick marks to be displayed between <b>each</b> major tick mark
<b>Divide Tick Values by</b>	This will divide the value of each major tick mark by the entered value while retaining the raw value under the needle. A good example of this is the RPM gauge. All of the tick marks are divided by 1000 while the value under the needle remains untouched.
<b>Z Order</b>	The depth order the gauge resides on the dashboard. This is used to layer gauges on top of one another
<b>Zone 1-4</b>	
<b>Enable</b>	If checked this will display a colored section defined by the min and max values of the given zone. An example of a zone is something like an RPM range that is defined as a warning range and then there maybe another zone that is defined as an alert range
<b>Min</b>	The value at which the color zone will start. This value must be within the min and max values of the gauge
<b>Max</b>	The value at which the color zone will stop. This value must be within the min and max values of the gauge
<b>Color</b>	This is the color of the selected zone

### 4.7.3 Bar Gauge



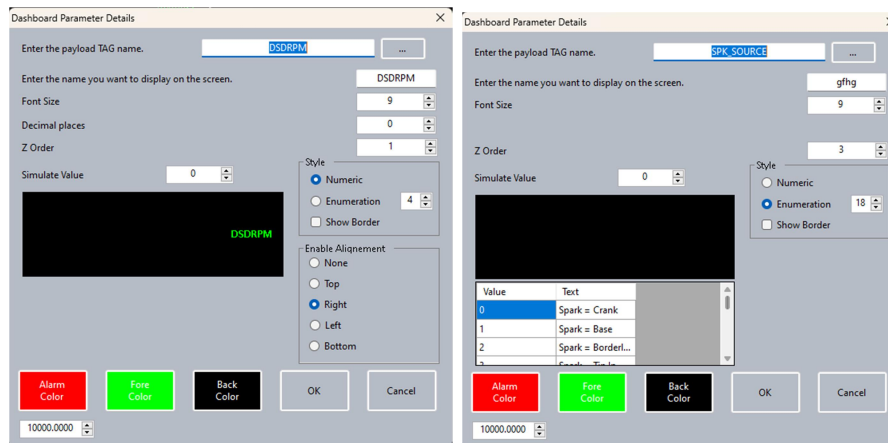
#### Layout

<b>TAG</b>	The name given to the logging parameter that the gauge will display.
<b>Max Value</b>	The maximum value the gauge will display
<b>Min Value</b>	The minimum value the gauge will display
<b>Ticks</b>	The number of tick marks from the minimum value to the maximum value.
<b>Show Border</b>	This will display the 3d border around the gauge
<b>Show Scale</b>	This will display the numeric value along the side of the gauge
<b>Horizontal</b>	Display the gauge horizontally.
<b>Vertical</b>	Display the gauge vertically.
<b>Back Color</b>	This is the color of the background of the gauge
<b>Fore Color</b>	This is the color of the pointer, tick marks, and numeric values
<b>Flip</b>	This will flip the scale on the opposite side of the gauge
<b>Z Order</b>	The depth order the gauge resides on the dashboard. This is used to layer gauges on top of one another

#### Color Zones

<b>Low Color</b>	This sets the color from the scale minimum value up to the value dictated by Low Zone
<b>Mid Color</b>	This sets the color from the Low Zone upper limit to the value dictated by Mid Zone
<b>High Color</b>	This sets the color from the Mid Zone upper limit to the scales Max value.

## 4.7.4 Digital Gauge



**TAG** The name given to the logging parameter that the gauge will display.

**Name** The text that appears in the center of the LED

**Decimal Places** The number of places to the right of the decimal the gauge will display.

**Style** Either the gauge will display a numeric value or a enumerated value. An enumerated value is a text string that is represented by a numerical value. An example would be the throttle position. It can either have a Part Throttle, Closed Throttle or a Wide Open Throttle.

**Alignment** This will place the Name of the digital gauge in the quadrant of the display.

**Z Order** The depth order the gauge resides on the dashboard. This is used to layer gauges on top of one another

**Back Color** This is the color of the background of the digital gauge

**Fore Color** This is the color of the numeric values

### 4.7.5 LED Gauge

Dashboard Parameter Details

Enter the payload TAG name.  ...

Select the BIT Level TAG name

Enter the text for the ON state  Open Loop

Enter the text for the OFF state  Closed Loop

Font Size

Z Order

Back Color Font Color ON Color OFF Color

OK

#### Layout

<b>TAG</b>	The name given to the logging parameter that the gauge will display.
<b>BIT Number</b>	The binary bit within TAG that represents a on or off state.
<b>Name</b>	The text that appears in the center of the LED
<b>Font Size</b>	The size of the text in the center of the LED.
<b>Z Order</b>	The depth order the gauge resides on the dashboard. This is used to layer gauges on top of one another
<b>Back Color</b>	This is the color of the background of the LED
<b>Font Color</b>	This is the color of the font

### 4.7.6 Global to all Gauges

**Left Mouse Click** Will move the gauge with the mouse movement

**CTRL+ Left Click** Will resize the gauge with the mouse movement

## **4.8 DRAG STRIP**

The Drag Strip tab will simulate and report a time slip form live data from the hardware. The time slip will show the time and trap speeds for the following:

- 60 foot
- 0-60 MPH
- 1/8 Mile
- 1/4 Mile

### **4.8.1 Data Required**

The payload must have the MPH and RPM selected. Also make sure the MPH is accurate and is not skewed because of tire size. Lastly, tire spin will cause the calculation to be inaccurate.

Pressing the stage button will set the Binary Editor into monitor mode. This will monitor the vehicle speed sensor (VSS) or Miles Per Hour (MPH) for a change. Once a change is detected a timer will start and the quarter mile time is started.

## 4.9 OBDII

Binary Editor (BE) can be configured to operate with a few different OBDII tools utilize the J2534 protocol. BE has been tested with the Drew Technologies Mongoose and the EPod McS1.

The J2534 devices can be used as a Scan Tool for vehicle diagnostics which can read and reset the Diagnostic Trouble Codes (DTC). They can also display PID/TID data in real time which can be logged and played back

The J2534 devices can also read and write calibrations. You can use the editing capabilities of BE to edit a calibration and then write the calibration back to an ECM. The Mongoose can also monitor and log data at a much faster rate on the J1850 protocol. The J2534 device will require software drives to be installed from the manufacture of the J2534 device.

### 4.9.1 Setup

Once you have the drivers installed choose the correct device from the dropdown in BE on the OBDII screen. The protocol will also need to be selected. The protocol is automatically selected when using some strategies. All EEC5's will use J1850 with a baud rate of 41666. All Power PC, Copperhead and Tricore PCM's will use ISO15765 with a baud rate of 500000.

Pressing the open button on the BE screen will open the communication port and retrieve the device name. Once communications are established, the 'Start' button in the data log/dashboard group and the 'Get Vehicle Info' button are enabled.

The 'Get Vehicle Info' will retrieve the VIN number along with the OBDII standards that pertain to the vehicle. Not all vehicles will respond to retrieving the VIN. This will also retrieve the PID (Parameter Identification) that the vehicle supports. The PID's listed on datalogging table will change color depending on the supported PID's. The following is a legend for the supported PID's:

<b>Black</b>	Supported Mode 1 and/or Mode 2
<b>Blue</b>	Extended PID's (Ford Only)
<b>Green</b>	Direct Memory Request (DMR)

#### **4.9.2 DTC Tab**

This is for retrieving and clearing of the Diagnostic Trouble Codes (DTC) for a J2534 compliant vehicle. When pressing get DTC's the application will retrieve any pending and or permanent codes and display them with a short description of what the code means. This will also display the emissions monitor flags.

Some of the EEC V vehicles support a Key On Engine Running (KOER) and a Key On Engine Off (KOEO) self-test. What each of these self tests do is based on the year and model. See the Ford manual to see what each of these tests will do.

#### **4.9.3 TID Tab**

The table on the TID (Test Identification) tab lists most of the common parameters. More TID's will be added upon request and as more information on the TID become publicly available. This requires an edit to the "TID Information.xml" file. This will occur in one of two ways. One would be directly modifying the XML file or, two, by you sending the TID information to TechSupport@EECAalyzer.net and it will be added.

#### **4.9.4 OSC Tab**

This table on the OSC (Output State Change) tab lists most of the common parameters that allow the user to take control of the outputs of the PCM. Certain conditions must be met in order to take control of a output. For example the ISC cannot be controlled if in gear and moving.

#### **4.9.5 Functional Test Tab**

This table chart on the Functional Test tab can help diagnose a cylinder misfire and a relative compression test. This is still under construction and may not be supported on all vehicles.

## 4.10 DATALOG

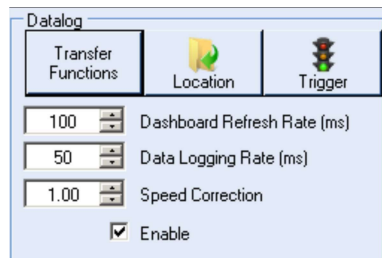
The Binary Editor allows for monitoring and or logging of data from the Quarterhorse, TwEECer RT and or a compliant J2534 device. Once a payload has been defined the start button will allow you to monitor the data in a grid format or a dashboard format. The dashboard has a lot of predefined locations for displays; All of the gauges are configurable by double clicking on them. Double clicking on one of the gauge types will cause the “Dashboard Parameter Details” window to appear. This is where the user enters in the parameter details such as the TAG name, Display Name and the precision.

### 4.10.1 Payloads

A payload is defined as a set of parameters that are selected to be monitored. The maximum number of parameters that can be configured in a single payload is dependent on the number of bytes the parameter use. The maximum number of bytes a payload can use is 32. When a payload is modified the Background on the WRITE button will change to red. This indicates that the payload has changed but has not been downloaded. Clicking on the WRITE button will change the background back to normal color and cause the background on the “Save” button to change to Red under the Binary group. This means the payload has been downloaded but has not been saved to disc. You can either download the binary to the EEC or save it to disc. It may be desirable to not save it to disc. This preserves the original file on disc.

### 4.10.2 Datalog Auto Start (Trigger)

Datalogs can also be automatically started based off of a user defined TAG and its corresponding value. To utilise this feature select the “Trigger” button on the datalog screen.



Check the “Triggered Start” tick box and use the drop down selection to pick the datalogging payload item TAG that you wish to use as the trigger (in this example it is ‘LOAD’). Enter the value you want to act as the threshold for triggering the auto start and close the window.



When Auto Start is enabled, Binary Editor will keep a 200 row buffer in memory until the value of the specified TAG has been exceeded. When the Auto Start has been triggered the buffer will be flushed to the data log to record what happened just prior to the trigger.

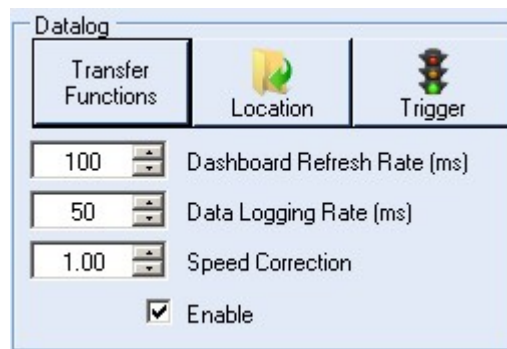
### 4.10.3 Marker

While logging, if you want to mark a section of the log then simply hit the control key to start marking rows within the log, then simply hit the control key again to stop marking. Each data log can have several marked sections. Each marked section will be indicated in the data log column named 'Marked' with a number corresponding to the number of times the control key was pressed.

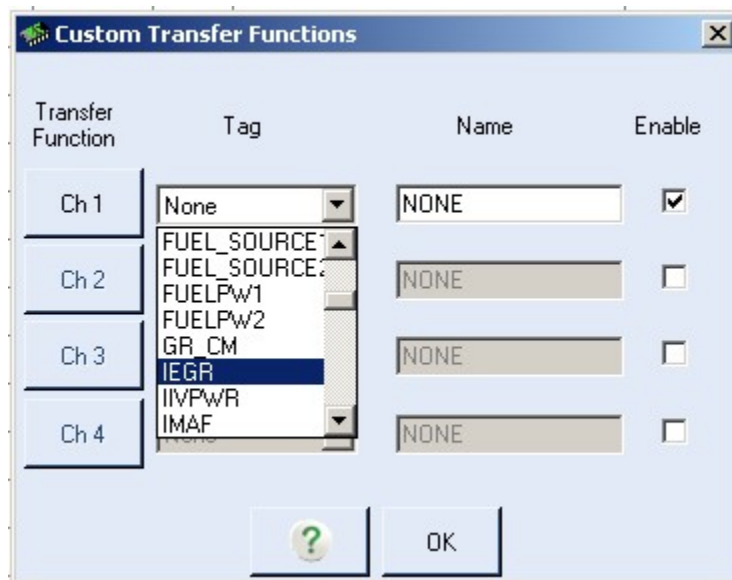
### 4.10.4 Custom Transfer Function (TwEECer / Quarterhorse)

Binary Editor can be used to monitor up to four EEC analogue signal inputs. These inputs typically have a range of 0-5 volts and therefore can be used to monitor an additional sensor such as a Wide Band Oxygen sensor, Boost gauge or Fuel pressure, etc. when the input signal is not being used by the EEC.

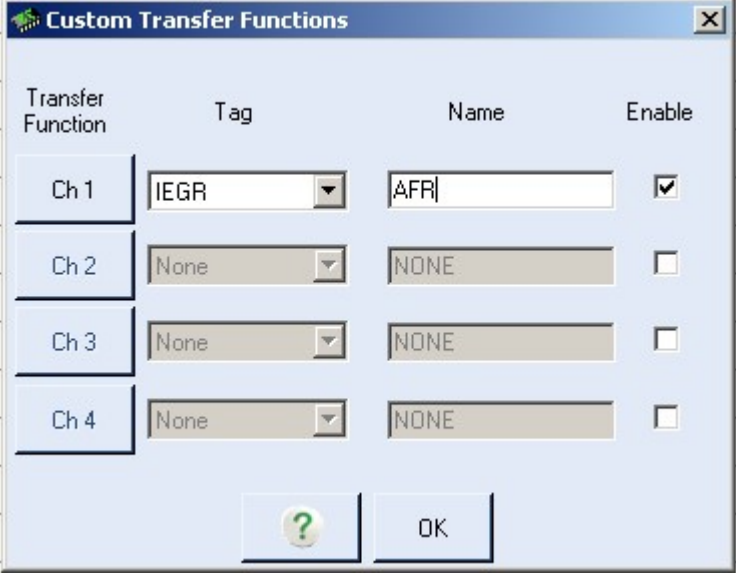
To utilize this feature select the "Transfer Functions" button on the data log screen.



Next enable one of the four custom transfers and use the drop down selection to pick the data logging payload item TAG of the EEC analogue signal input that you want to assign a transfer function to (in this example it is 'IEGR')



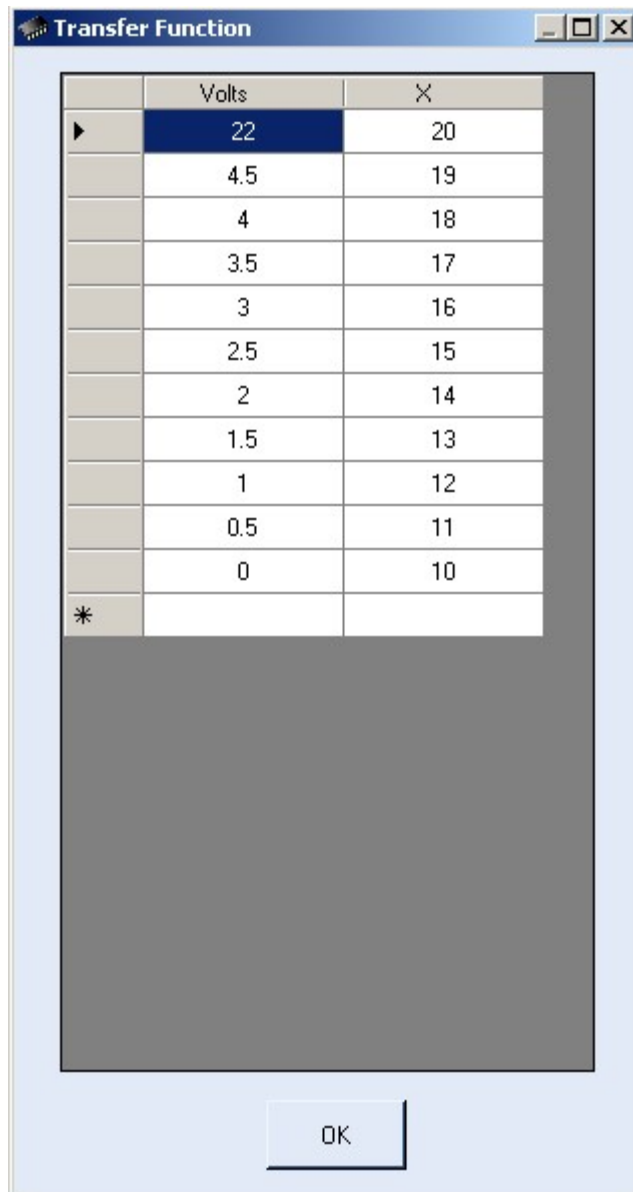
Give the transfer function a name (in this example it is 'AFR').



The image shows a software dialog box titled "Custom Transfer Functions". It contains a table with four rows, each representing a channel (Ch 1 to Ch 4). The columns are "Transfer Function", "Tag", "Name", and "Enable". For Ch 1, the "Tag" is "IEGR" and the "Name" is "AFR", with the "Enable" checkbox checked. For Ch 2, Ch 3, and Ch 4, the "Tag" is "None" and the "Name" is "NONE", with the "Enable" checkboxes unchecked. At the bottom of the dialog, there is a help button (a circle with a question mark) and an "OK" button.

Transfer Function	Tag	Name	Enable
Ch 1	IEGR	AFR	<input checked="" type="checkbox"/>
Ch 2	None	NONE	<input type="checkbox"/>
Ch 3	None	NONE	<input type="checkbox"/>
Ch 4	None	NONE	<input type="checkbox"/>

Lastly define the input voltage value against the output value by selecting the appropriate channel 'Ch 1' to 'Ch 4' button.



A common example of using this feature is to utilize the Exhaust Gas Recirculation (EGR) valve position sensor input. Binary Editor gives the user the ability to turn the EGR logic off within the EEC. The scalar to disable the EGR has different names for different strategies therefore you will need to look for the correct parameter to set. Choose the data log TAG parameter 'EVP' on the Transfer Functions screen and give it a name like 'AFR'. Once the EGR is disabled the EEC still monitors the input signal but will do nothing with it. The only thing required is the hardware you want to monitor or log and the wiring to connect it to the EVP connector.

This EGR system is an emissions related component so it is NOT recommended to tamper with emissions components if you need to meet smog requirements.

#### 4.10.5 Data Q

The Data Q is an external device that allows for monitoring and logging of additional analog or digital signals. The only required hardware is the DataQ and cable. Depending on the model of the Data Q, up to 8 analog/digital channels can be monitored or logged.

Each channel will come in to BE as a voltage ranging from 0 to 10 volts. Each voltage signal goes through a transfer function to display an Engineering scaled value. The voltage and or Frequency and result of the transfer function are displayed on the hardware tab. On some models there are digital inputs, outputs, rate and counter channels.

The DataQ has parameters to define the communications between itself and the PC. They are as follows:

**Channel Enable** = If check the channel will be scanned by the hardware.

**Transfer Function** = Array of Voltage or frequency to Engineering values.

**Scan Rate Per Ch** = The desired scan rate per channel at the hardware level. The actual scan rate per channel will be based on the number of channels enabled.

**Events Per Scan** = Number of samples per scan before the PC is notified. If the scan rate per channel is 1000 hz and the events per channel is 50 then the PC will be notified every 50 ms.

#### 4.10.6 Innovate LC-1/LM-1

The LC1 is a Lambda Controller made by innovate motorsports. This controller is an external device that allows for monitor and or logging of analog signals. The only required components are the LC-1/LM-1 controller and cable. Each channel is configured using the Innovative software.

The label and scaling information for each channel is automatically read into BE. The ability to over write the channel names in BE is available if desired. Each channel has a configurable transfer function within BE. These transfer functions are only used if the associated LC-1/ LM-1 channel is configured for a 0-5 volts dc signal.

#### 4.10.7 Zeitronix ZT3, ZT2

The ZT series Lambda Controller is made by Zeitronix. This controller is an external device that allows for monitor and or logging of analog signals. The only required components are the ZT2 or ZT3 controller and cable. A USB to serial cable will need to be acquired and installed. Each channel is configured within BE on the hardware screen.

The label and scaling information for each channel is automatic for channels 1-5. Channels 6 and 7 are user defined. The signals come in as a 0-5 vdc. A transfer function can be defined to scale this 0-5vdc to whatever is needed.

## 4.11 VEHICLE INFORMATION AND TRANS INFO

The vehicle information allows Binary Editor to calculate estimated HP and Torque based off an accelerometer. It also allows Binary Editor to estimate what gear the transmission is in based off of MPH and RPM.

The data logging payload must have the MPH and RPM selected. Also make sure the MPH is accurate and is not skewed because of tire size.

### Tire Specification

Tire information is need in order for BE to estimate distance traveled. Enter the tire width in millimeters and enter the tire profile in percentage and finally enter the rim diameter. This will also calculate revs/mile and N/V which can be copied to the calibration.

### 4.11.1 Environment Information

This data is used to calculate Horsepower and Torque. This calculation will only work if you have an accelerometer (G Force meter) connected via a DataQ and or LC1. The data logging tag must be named ACCELL. You must also log RPM, MPH. If you log BAP then it will be used otherwise the BAP entered in here will be used as the default.

### 4.11.2 Vehicle information

This data is used with the environment information to calculate Horsepower and Torque. This drag and frontal area of a vehicle must be estimated and or measured. A lot of cars information can be found at <http://mayfco.com/tbls.htm>

### 4.11.3 Transmission

Model	Gear Ratio					
	1ST	2ND	3RD	4TH	5TH	REVERSE
Mustang T5 '83-'84	2.95	1.94	1.34	1.00	0.72	2.76*
Mustang T5 '85-'89	3.35	1.93	1.29	1.00	0.68	3.15
Mustang T5 '89-on	3.35	1.99	1.33	1.00	0.68	3.15
Tremec TKO 500	3.27	1.98	1.34	1.00	0.68	3.01
Tremec TKO 600	2.87	1.89	1.28	1.00	0.64	2.56
Tremec TKO 600	2.87	1.89	1.28	1.00	0.82**	2.56
4R70W	2.84	1.55	1.00	0.70		2.32
C4/C6	2.46	1.46	1.00			
FMX/AOD	2.40	1.47	1.00			
E4OD/4R100	2.71	1.54	1.00	0.71		
5R110W	3.09	2.20	1.53	1.00	0.71	
Top Loader Wide Ratio	2.42	1.61	1.00			
Top Loader Close Ratio	2.99	1.75	1.00			

\*Ford also offered a 0.63:1 Overdrive ratio in 1983.

\*\*This trans is the road-race option where the rpm drop between Fourth and Fifth is much narrower.

## 4.12 FEATURES

### 4.12.1 Shortcuts

Below is a list of the shortcuts

Tables, Functions, and Scalars	
ALT + A	Add the entered value to all selected cells
ALT + D	Divide the entered value by all selected cells
ALT + M	Multiply the entered value by all selected cells
ALT + O	Set all selected cells to original
ALT + S	Subtract the entered value from all selected cells
ALT + T	Sets all selected cell to the user entered value
CTRL + A	Selects All
CTRL + C	Copy selected cells into the clipboard
CTRL + V	Paste from the clipboard
CTRL + Z	Set all selected cell to the original values
ALT +	Increases selected cells by the PID resolution
ALT -	Decreases selected cells by the PID resolution
CTRL +	Increases selected cells by the PID resolution *10
CTRL -	Decreases selected cells by the PID resolution *10
Compare Binaries	
CTRL + 0	Turns off all compare binaries
CTRL + 1	Set the compare binary to position 1
CTRL + 2	Set the compare binary to position 2
CTRL + 3	Set the compare binary to position 3
CTRL + 4	Set the compare binary to position 4
Global	
F1	Help
ALT + SHIFT + O	Opens the Binary Explorer
CTRL + D	Binary Difference
CTRL + E	Opens the Live Fuel Trim Screen
CTRL + F	Find
CTRL + I	Customer Info
CTRL + K	Kills off the DataQ process if it is running
CTRL + L	Set USB Latency (default =16) (range 2 - 16)

CTRL + M	Rescan for Moates Devices
CTRL + O	Load Calibration
CTRL + P	Rescan the connected USB devices
CTRL + Q	Show Moates Quaterhorse/Destiny Configuration
CTRL + R	Read Hardware
CTRL + S	Save Calibration
CTRL + T	Toggle between Moates and Advanced
CTRL + W	Write Hardware
CTRL + ALT + O	Opens a Template
CTRL + ALT + S	Saves a Template
CTRL + SHIFT + O	Load Strategy
<b>Data Logging</b>	
CTRL	Toggle the data log marking value by 1
<b>Charts</b>	
H	Horizontal Bar Lock (Only when editing a point)
V	Vertical Bar Lock (Only when editing a point)

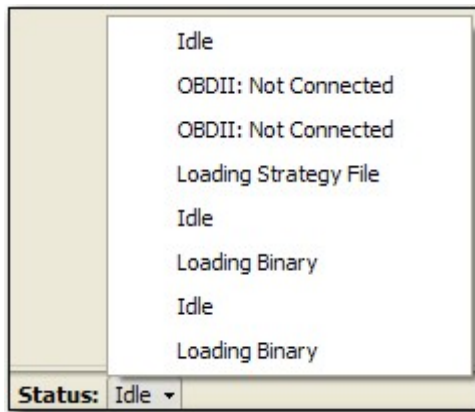
#### 4.12.2 Collapseable Panels

There are different collapsible panels within Binary Editor. Clicking on the area shown below in red will collapse or expand the panel depending on its previous state. The panels can be resized by clicking and dragging the border of the panel marked in blue.



#### 4.12.3 Status Bar

The status bar will give a brief description of the last 16 actions performed by Binary Editor. Each of the items in the status list is color coded. If the status is red, then the importance of the message is HIGH. Red indicates there was an error in the last action or the user needs must take some action. To clear the list, double click on the word "Status:" in the status bar and the list will be cleared.



#### 4.12.4 Table links (Normalizers)

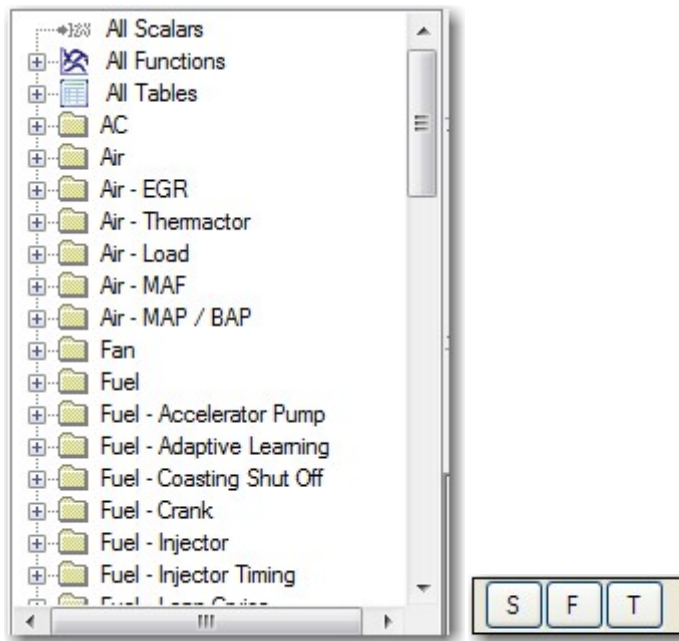
In the screen shot below, FN070 and FN071 are hyperlinks to the functions that define the table axis headers. These are commonly referred to as normalizers. If clicked, a popup screen will list all tables that use the same normalizer and it will also list one function that defines the normalizer itself.

A screenshot of a software interface showing a table. At the top left, there is a dropdown menu with 'Air - EGR Altitude' selected. To the right of the table, there is a link labeled 'FN070'. Below the table, there is a link labeled 'FN071' and a 'Load' button. The table itself has columns for RPM (500.00, 700.00, 900.00, 1100.00) and rows for Load (75.00, 60.00, 50.00, 40.00, 30.00). The data in the table is as follows:

	500.00	700.00	900.00	1100.00
75.00	0.00	0.00	0.00	0.00
60.00	0.00	0.00	0.00	0.00
50.00	0.00	0.00	0.00	4.00
40.00	0.00	0.00	0.00	7.00
30.00	0.00	0.00	0.00	5.00

#### 4.12.5 Tree View

The tree view categorizes the parameters by their associated LEVELs. Some parameters may belong to two levels. If the tree view is collapsed then three buttons along the top will appear. These three buttons are shortcuts to the Scalars, Functions, and Tables. With the tree view visible there is a right click menu allowing collapse and or expanding all branches of the tree. There is also the ability to auto configure a mapping view from any selected table in the tree view.



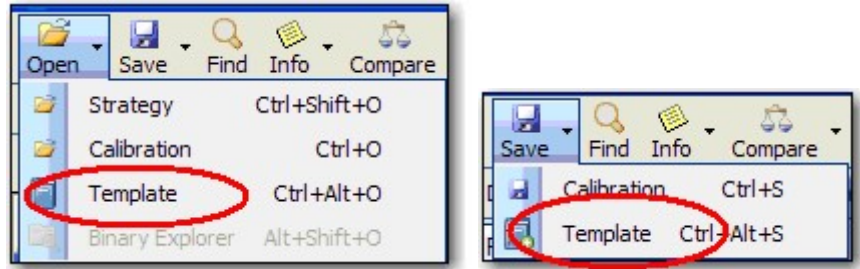
#### 4.12.6 Gauges

All gauges on the analog or digital dashboard can be resized and or moved. To move the gauge, left click and move the mouse. To resize the gauge, press and hold the control key while moving the mouse. To configure the gauge, double click the gauge. The LEDs in the status bar can also be configured by double clicking them, but they cannot be moved. See the DASHBOARD section of this document for details on each type of gauge.

#### 4.12.7 Templates

Binary Editor can load pre-defined values for things like new injectors, long tube header, boosted spark and fuel tables into the base binary at the touch of a button. Opening a template file will modify the base tune with the contents in the template file. This is a fast and easy way to take a stock tune and modify it for a particular fuel injector size and or some other common modification.

Binary Editor can also create templates once you find a good combination of parameters for a given engine modification. To create a template, select the checkboxes next to the parameters in the tree view that you want in the template file. Once all desired parameters are selected choose the Save and then Template from the menu bar. Give the template a name and click save.

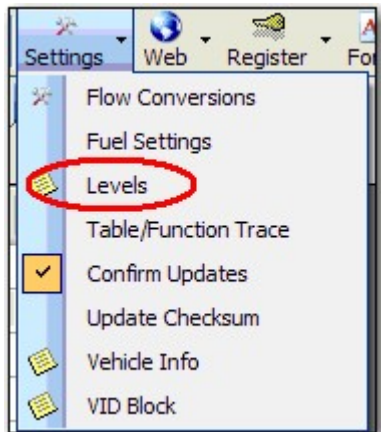


#### 4.12.8 Colors

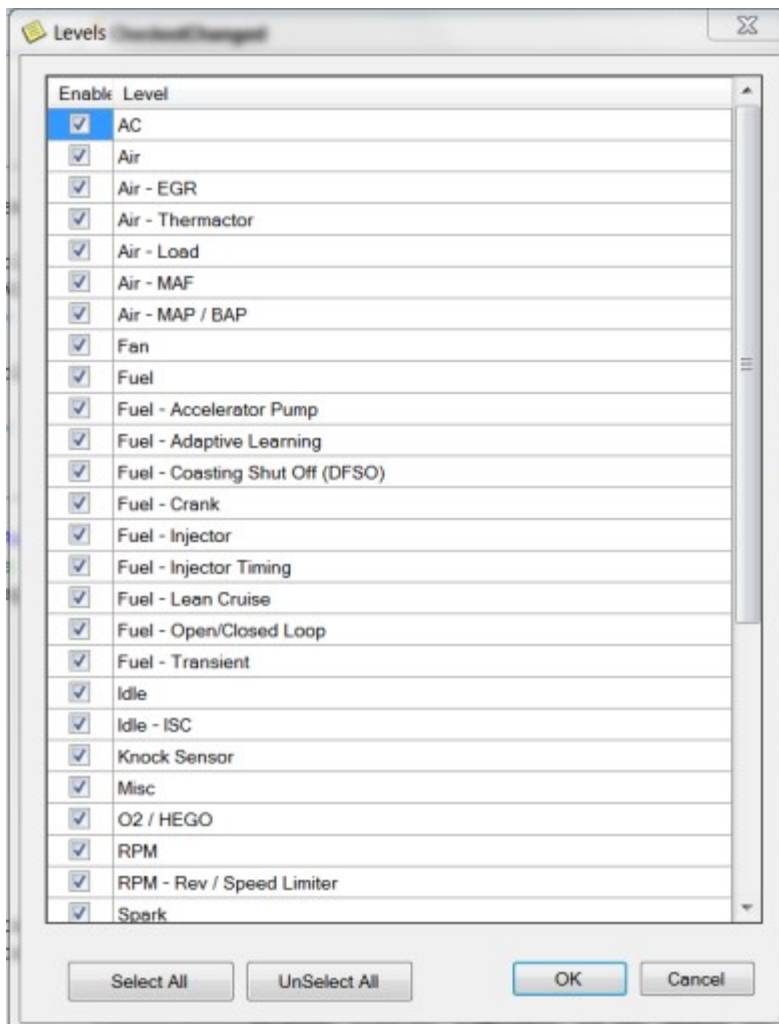
If the current cell has a yellow background then the cells value is lower than the original. If the current cell has an Orange background then the cells value is greater than the original. The original value can be displayed if you let the mouse hover over the cell. This is also known as the tool tip. The tool tip will always display the original value. If the cell has a red background then the cell has an invalid value. This means that the data entered in the cell is not numeric. If the compare binary option is checked and the compare cell has a yellow background then the compare cell is different from the editable binary.

#### 4.12.9 Level

The level option is a way to narrow down the viewable parameters. See the “Definition Files” help file for more details on defining levels. You can choose which levels to display by going to the settings tab and pressing the levels button.



Now select the desired levels and press ok.



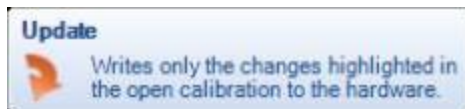
#### 4.12.10 Read / Write / Ford /Status



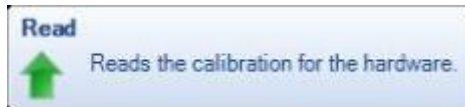
These buttons on the “Home” tab allow the user to read and write calibrations from the tuning device. On some selected tuning devices they also allow the user to read the factory Ford Calibration from the ecu.



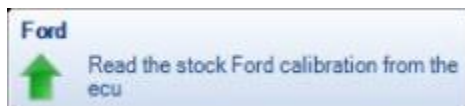
The “Write” button writes the entire calibration to the tuning device.



The “Update” button writes only the changes in the open calibration to the tuning device.



The “Read” button reads the entire calibration from the tuning device.



The “Ford” button reads the factory Ford calibration from the ECU. When reading the factory Ford calibration from the ECU the ignition key should be ON with the engine OFF.



The “Connect” button scans the USB ports for any connected tuning devices.

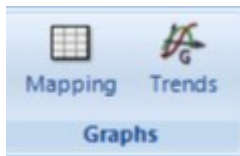
#### 4.12.11 Database Users

When using Binary Editor with databases a token based system is implemented. Tokens are purchased through the web site and are used each time the Calibrator writes a calibration to an ECU or J3 adapter. In order to keep track of calibrations that have a token associated with them a color scheme is incorporated. The following table describes the color scheme applied to the calibration name in the status bar:

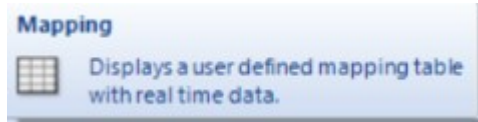
Calibration Name	No token and created by someone else
<b>Calibration Name</b>	No token and created by you
Calibration Name	Has token and written by someone else
<b>Calibration Name</b>	Has token and was created by you

The calibration name must be bold and green In order for you to not be charged for a token when writing to an ECU.

#### 4.12.12 Trending / Mapping



These buttons on the “Home” tab allow the user to watch live data as it streams from the vehicle.



The “Mapping” button displays a table that is user configurable. This table will populate its cells based in the TAGs the user has configured for the table.



The “Trends” button will display live streaming data from the vehicle in a chart format. This screen allows the user to select multiple TAGs that are currently being streamed from the vehicle.

#### 4.12.13 Live Fuel Trim

The live Fuel Trim screen monitors commanded fuel, actual fuel and calculates an average Fuel Trim correction. This correction can be applied to the MAF and or speed density tables. When logging is active and the Live Fuel Trim screen is active, the Fuel Trim Correction is constantly calculated based on the rolling average defined time. When the apply button is pressed the Fuel Trim is applied to the currently active cell(s) on the current function or current table.



- There is a field on the screen for the Percentage of error. This is the percentage of the calculated Fuel Trim to apply when the Apply button is pressed. For example if the Fuel Trim is at 0.96 and the percentage is set to 50%, the applied fuel trim would be 0.98.
- There is a time field on the screen. This is the rolling average time the command fuel vs actual fuel is being calculated.

The **(Target)** fuel is obtained by logging one or more of the following parameters; (X) can be either 1 or 2:

LAMBSE(x)  
LAM\_FINAL(x)  
LAMBSE(x)\_Ford  
LAMBSE(x)\_1\_Ford  
LAMBSE(x)\_FNL\_Ford  
LAMBSE(x)\_Ford\_ISO

The **(Actual)** fuel is obtained by logging one or more of the following parameters; (X) can be either 1 or 2:

AFR  
AFR(x)  
LAMBDA  
LAMBDA(x)

For MAF based vehicles, logging the Y column of the MAF transfer function is required; this is most likely MAF or AM.

If this is for a speed density, log the parameters that define the X and Y normalizers of the table, this is most likely RPM and LOAD.

Make sure to have the MAF function or the VE table visible before using the Apply button.

**Note:** If you want to have the apply button write directly to the hardware (Quarterhorse and TwEECer only) then enable the Auto Update in the user preferences

#### 4.12.14 Speed Density

The Volumetric Efficiency (VE) tables play a big part in the PCMs fueling calculations. These VE table(s) calculate the primary fueling for Speed Density PCMs and Transient and predictive Fueling on MAF based PCMs. One of the fueling calculations is called manifold filling. Manifold filling is responsible for calculating inferred manifold vacuum and the first stage of the transient fuel.

The Speed Density screen will display the VE table(s) for a given Manifold Absolute Pressure (MAP) and RPM range. Most calibrations use either one of two types of calculations. The first calculation is the Y intercept equation. This equation is used on all PCM types and is the simplest calculation. The second equation is the Quadratic, and it is used on some PPCs and all Copperhead and Tri Core processors.

The Speed Density screen will retrieve the necessary data from the open Calibration and perform the required calculations. The Calculated results are then display as the VE table(s). The EEC-V has one VE table whereas all other PCMs, at the time of this document, have a list of tables. This list of table is dependent on the CAM angle in the PPC processors and or HDFX index in the Copperhead and Tricore Processors.

There is an option to display the data in VE or Airflow. Each column of data in the VE table has a set of calibration parameters called SLOPE, OFFSET and a QUADRATIC. These parameters are defined as a function for an EEC-5. These same parameters are defined as tables for all other PCM types. These functions and or tables are in the Alpha N level within the BE.

If you modify data within a VE table and press the calculate button, the parameters will be calculated and stored back into the correct functions and or tables within the calibration. The VE table will then recalculate the entire table and display the new values. These new values will NOT be exactly what you entered in during the editing process. This is due to the way the Y intercept and Quadratic calculations work. When one cell is changed multiple other cells are affected by that calculation.

Some calibrations have a MAP sensor and others infer it. If the calibration being modified infers MAP then a MAP sensor will need to be install and logged with a DataQ or other logger. The inferred BAP will also need to be locked to the days current BAP so it cannot change. Remember to set the inferred BAP back to its enabled state after all editing is complete. Logging Inferred Vacuum and Actual vacuum allows for a comparison between actual and calculated. This can be used to determine how far off the calibration is. At a minimum the log must contain RPM, Load, MAP, and AM (lbs/sec). Logging Inferred Vacuum if available is recommended.

Run the mapping tool from within the Speed Density screen. This will preset set the mapping axis to match the Speed Density table. Make sure to define the Mapping table as Follows:

Columns = RPM

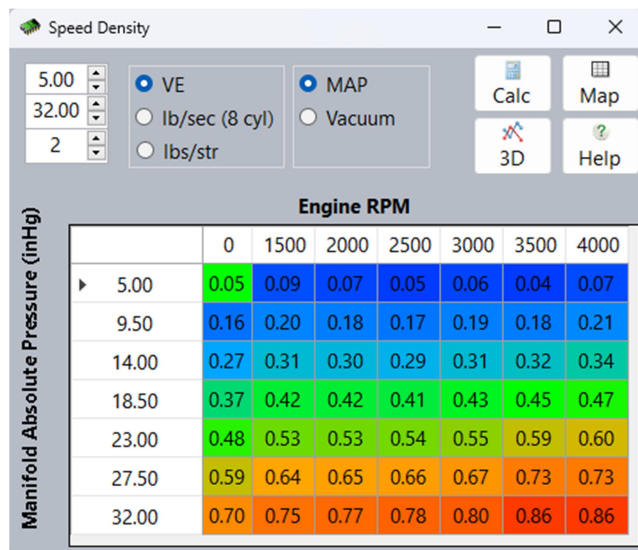
Rows = Actual MAP or Vacuum

Table = Load or AM.

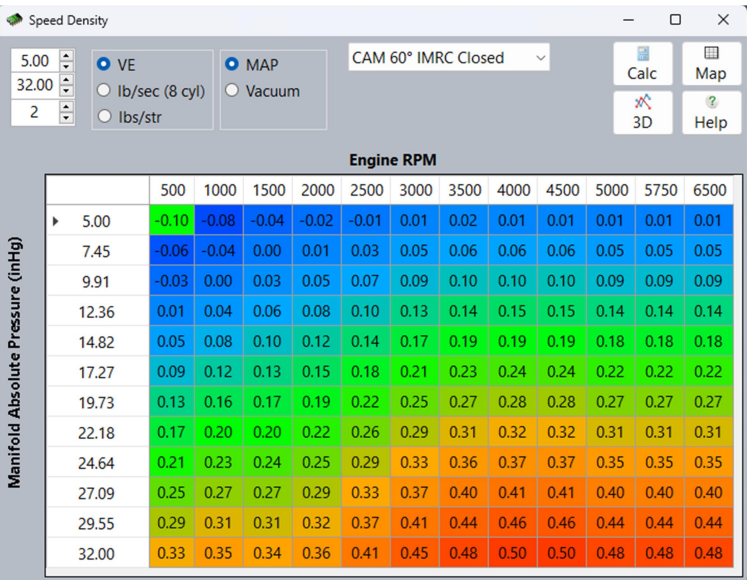
Load and populate the mapping table with a datalog. The mapping table should now have Load or AM in a bunch of cell. On the mapping table make sure the option to average the values is selected. Copy and Paste the cells from the mapping table to the Speed Density table and press the calculate button. This process may need to be done a few times to get the speed density and mapping tables to look close to one another. Remember they will never look exact alike due to the nature of the calculations. When done, write the calibration to the vehicle and repeat the process until:

- Inferred vacuum or MAP matches the actual vacuum or MAP
- Actual Load matches the Speed Density calculated Load
- For PCMs that use the VE tables for primary fueling, the learned fuel corrections should get closer and closer to zero.

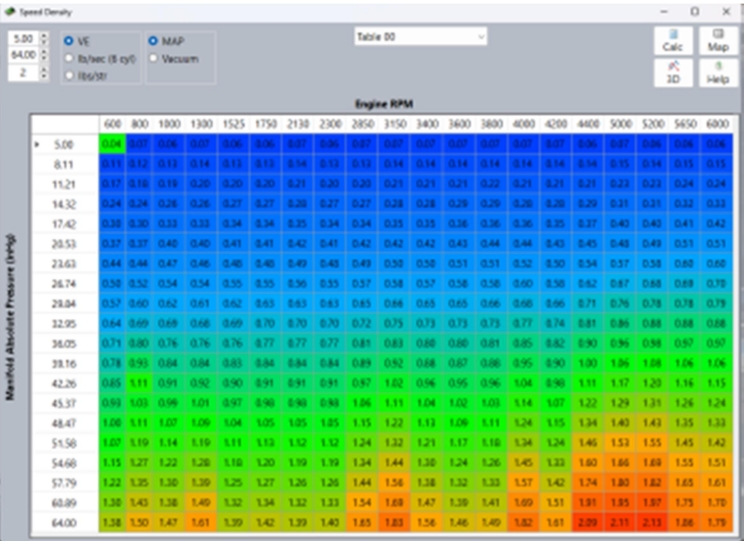
Below are sample screen shots. The first one is of an EEC-V



Below is an example of a Power PC.



Below is an example of a Copperhead and Tricore.



## 5 MOATES HARDWARE

There are four Moates hardware types that are supported by the Binary Editor (aka BE). Each hardware type serves a different purpose. Below are descriptions of each and how to use each of them with BE. To use any of these devices make sure to install the most recent drivers. The driver installation can be found in the Getting Connected Help file.

Below are the EEC bank sizes and their associated years. There are some exceptions to this, but this is the general rule of thumb.

1986 - 1995 Use a 1 bank calibration which are 56k in size

1996 - 1998 Use a 2 bank calibration which are 88k or 112k in size

1999 – 200x Use a 4 Bank calibration which is either 216k or 224k in size

### 5.1 FORD F3 OR F3V2



The F3 is a module that plugs onto the J3 port of the Ford EEC. When plugged in to the J3 connector the F3 module will disable the internal Ford tune and use the tune on the F3 Module. The F3 module is very simple to use and install. In order to program an F3 module you will need to have a Burn1 or Burn2 programmer along with the F2A adapter or a Jaybird interface. If you want to read the factory tune then you will also need the Burn1 or Burn2 programmer together with the F2A and F2E adapters. You can purchase any of these at [www.moates.net](http://www.moates.net).

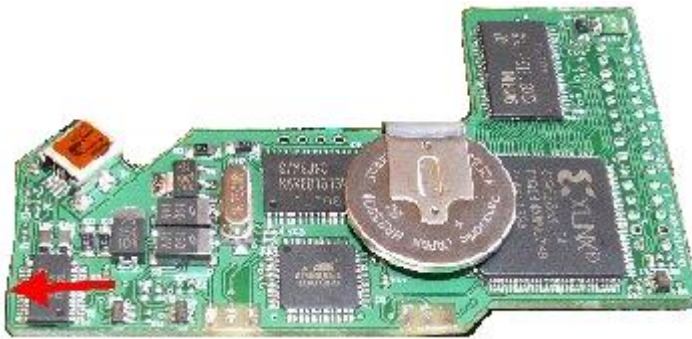
To program the F3 module with BE, simply do the following:

- 1) Plug the F2A into the Burn programmer. Skip this step if you have a Jaybird
- 2) Slide the F3 module onto the F2A adapter or Jaybird
- 3) Plug the Burn1 or the Jaybird into the PC via USB
- 4) If the Found New Hardware pops up on your PC copy the USB drivers from the C:\Program Files\Binary Editor\Drivers\i386 directory into the c:\windows\system32 directory. Note: if you are running an AMD 64 bit processor and a Windows x64 OS then copy the USB drivers from the C:\Program Files\Binary Editor\Drivers\amd64 directory instead.
- 5) Start BE and look at the lower right corner and see if the green LED is on. If it is then BE has detected the Moates device. If not then the drivers were not installed correctly
- 6) Look on the hardware tab and verify the Moates group is enabled and the device description says Burn1, Burn2 or Jaybird version XXXX.
- 7) Now load the definition file (example GUFB) for the tune you are working with
- 8) Load the tune that goes with the definition (example A9L) file.
- 9) Make any edits to the tune that you want and press the Download button to write the tune to the F3 Module.

10) Now unplug the USB and disconnect the F3 from the Burn1 and install the F3 on the EEC J3 connector.

Note: If using an older Burn1 firmware 5.9 or below you will need to set the baud rate to 115200. The only way to do this is by editing the config XML for Moates. This file is in the Config folder of BE. There will need to be a line added for the "BaudRate" = 115200. If you need assistance on this contact tech support. All other supported Moates hardware uses a baud rate of 921600.

## 5.2 QUARTERHORSE



The Quarterhorse (aka QH) is a module that plugs onto the J3 port of the Ford EEC and allows real time tuning and datalogging. When plugged in to the J3 connector the QH will disable the internal Ford tune and use the tune on the QH Module. The QH module is very simple to use and install. All that is needed to program a QH is a standard USB cable and BE. The QH is a tuning device along with an extremely fast data logger. The QH can read the factory tune if the QH is version 1.6 and later. You can purchase the QH at [www.moates.net](http://www.moates.net).

### Recommendations:

It is recommended to use mode 2 for single bank tunes and mode 3 for the 2 bank tunes and mode 4 for the four bank tunes.

The QH has 6 modes of operation and they are listed below:

- Mode 0:** The QH is disabled and the factory tune is enabled. The QH can monitor some data in this mode but NOT all data. Any data logging parameter with an address between 00-FF for any 1 bank tune or any address between 00-1FF for any 2 or 4 bank tune cannot be data logged or monitored in this mode.
- Mode 1:** The QH is configured for 4 single bank tunes with a physical switch to select between the tunes. The physical switch will tell the QH which tune to present to the EEC. The tune selection in BE is defined on the Hardware tab within the Moates group. This tune selection is only to tell the QH which tune BE is going to work with. This mode is very similar to mode 5 except for switch position 1. Refer to mode 5 for more details.
- Mode 2:** The QH is configured for 8 single bank tunes **WITHOUT** a physical switch. The tune selection in BE on the hardware tab will tell the QH what tune to present to the EEC.
- Mode 3:** The QH is configured for four 2 bank tunes **WITHOUT** a physical switch. The tune selection in BE on the hardware tab will tell the QH what tune to present to the EEC.
- Mode 4:** The QH is configured for two 4 bank tunes **WITHOUT** a physical switch. The tune selection in BE on the hardware tab will tell the QH what tune to present to the EEC.
- Mode 5:** The QH is configured for 4 single bank tunes with a physical switch to select between the tunes. If the physical switch is in position 2-4 then the QH will present the corresponding tune to the EEC. If the physical switch is in position 1 then the QH will present the tune that BE has selected. The user can configure BE to run off of any one of the four tunes. The tune selection in BE is defined on the Hardware tab within the Moates group. This mode is very similar to mode 1 except switch position 1.

To program the QH module with BE, simply do the following:

- 1) Plug the QH into the PC
- 2) If the Found New Hardware pops up on your PC copy the USB drivers from the C:\Program Files\Binary Editor\Drivers\i386 directory into the c:\windows\system32 directory. Note: if you are running an AMD 64 bit processor and a Windows x64 OS then copy the USB drivers from the C:\Program Files\Binary Editor\Drivers\amd64 directory instead.
- 3) Start BE and look at the lower right corner and see if the green LED is on. If it is then BE has detected the Moates device.
- 4) Look on the hardware tab and verify the Moates group is enabled and the device description says Quarterhorse version XXXX.
- 5) Now load the definition file (example GUFB) for the tune you have
- 6) Load the tune that goes with the definition (example A9L) file.
- 7) Select the QH mode of operation and tune selection. See above for details on the Modes of operation.
- 8) Make any edits to the tune that you want and press the Download button to write the tune to the QH.
- 9) The QH may now be installed on the EEC J3 connector with or without the USB cable connected depending on whether you wish to do real time tuning or datalogging.

The QH's memory is battery backed therefore there is no need to turn the key on to the vehicle to download or upload to and from the QH. This also means that while data logging BE has no idea that the key has been turned off. The user has to reach over and **Stop** the logging off. A feature has been added to BE that will automatically stop the logging if there is no data change within the user specified time frame. The default is one second. If logging a key transition from on to off or off to on is desired then set the "Auto Stop" to something like 60.

### 5.3 DESTINY



The Destiny (aka F8) is a module that plugs onto the J3 port of the Ford EEC and allows for up to 8 four bank tune. The Destiny CANNOT have any of its tune read back. All of the tunes stored on the Destiny are encrypted so that no one can read them and still your hard work. You can store comments and version numbers in with the tune if so desired. When plugged in to the J3 connector the Destiny will disable the internal Ford tune and use one of the tunes on the Module. The Destiny module is very simple to use and install. All that is needed to program a Destiny is a standard USB cable with the HUNLOG and BE. The Destiny can be switched on the fly from 1-8 different tunes. If you have the PC connected to the Destiny then you can switch the tunes using the PC. For more information visit the web site [www.moates.net](http://www.moates.net).

## 5.4 ROADRUNNER



The Roadrunner is a module that plugs onto the Chrysler ECUs. This is still under development. If you would like more information please contact [TechSupport@EECAalyzer.net](mailto:TechSupport@EECAalyzer.net)  
For more information visit the web site [www.moates.net](http://www.moates.net)

## 6 TI PERFROMANCE

Below are the EEC bank sizes and their associated years. There are some exceptions to this, but this is the general rule of thumb.

1986 - 1995 Use a 1 bank calibration which are 56k in size

1996 - 1998 Use a 2 bank calibration which are 88k or 112k in size

1999 – 200x Use a 4 Bank calibration which is either 216k or 224k in size

### 6.1 J3 EEC PROGRAMMER



The J3 Chip is a module that plugs onto the J3 port of the Ford EEC. When plugged in to the J3 connector the Chip will disable the internal Ford tune and use the tune on the J3 Chip. The Chip is very simple to use and install. In order to program a Chip you will need to have a programmer, J3 Chip, Ribbon cable, and USB cable.

To program the J3 Chip with BE, simply do the following:

- 1) Plug the J3 Chip into the ribbon cable
- 2) Plug the other end of the ribbon cable into the programmer.
- 3) Plug the programmer into the PC via USB
- 4) Start BE and look on the hardware screen in the TI performance group and see if the green LED is on. If it is then BE has detected the programmer. If not then the drivers were not installed correctly.
- 5) Now load the definition file (example GUFB) for the tune you are working with
- 6) Load the tune that goes with the definition (example A9L) file.
- 7) Make any edits to the tune that you want and press the Download button to write the tune to the J3 Chip.
- 8) Now unplug the USB and disconnect the J3 Chip from the ribbon cable and install the chip on the EEC J3 connector.

## **7 STRATEGY FILE CREATION**

In the root directory where the Binary Editor was installed is a directory called “Def” aka Strategies. In this folder is a strategy template file. All strategy files must be in excel 2003-2007 format. Do not change the formatting on any cell, or the file may not work. All cells must be left as text format. Below are sections that will describe each worksheet and the configuration for those worksheets.

## 7.1 SCALARS

Scalars are single parameters that can define a selection, switch or even an analog value. Use the “Strategy\_Template.XLS” as a template. The scalars worksheet has the following configuration:

Column Name	Description	Limits	Required
Level	This is the level that is assigned to the parameter for filtering. See the Level section for more details on filters	1 – 120	Yes
Level2	This is the level that is assigned to the parameter for filtering. See the Level section for more details on filters	1 – 120	No
KEY	The KEY must be a unique name. This KEY is used internally within BE to link tables and functions and for searching.  Note: Must be unique value Not Displayed within Binary Editor	255 char	No
PID	The Parameter IDentification. Most of these PID names come from a strategy book if it is available. If the PID is unknown then use SCALxxx. Replace the x with a sequential number.	255 char	No
Parameter	A short description of what the function is for the parameter	255 char	Yes
Units	The unit of measure like MPH, RPM, Deg F  If defining an array, this must be ‘ARRAY’. The enumeration name and values will define the array length and column 1 values.	255 char	No
Comments	Any comments	N/A	No
Address	The hexadecimal address where the parameter is in the PCM. The format must be “0x0000”. Do not use an ‘H’ in place of the ‘x’ or any other character.  <b>Note</b> you can place multiple addresses in the address column separated by a coma. BE will read the first address and display that to the user and BE will write to all addresses if user changes the value	0x0000-0x3FFFF	Yes
Bytes	This is the number of bytes for a given parameter. If 4 bytes are used and the signed bit is set, BE will treat it as a IEEE float. If the signed bit is false, BE will treat it as un signed 32 bit integer.	1, 2, 4	Yes
Signed	Indication if the parameter can have a negative value.	TRUE or FALSE	Yes
DecimalPL	This is the number of decimal places that the parameter will show on the screen.	0- 10	Yes
Equation	This is the equation that will be executed on the raw value from the EEC. Place an “X” in the cell if no scaling is going to be done on the parameter. If the parameter is going to be divided by 512 then place	Most simple equations	Yes

Column Name	Description	Limits	Required
	an "X/512" in the cell. If the raw value needs to be separated by the bits within the value then enter "B0" or "B1" or "B2" or "B3". When using an equation for bit level make sure the size is set to 1 and the signed column is set to false.		
Min	Absolute minimum scaled value for the parameter	Data Size	No
Max	Absolute maximum scaled value for the parameter	Data Size	No
EnumName	Enumeration Names separated by comas  If defining an array the first element is the size of the array and the second is the column 2 name and the third is column 1 name. Example 8,Injector, Timing	N/A	No
EnumVal	Enumeration Values separated by comas  If defining an array the, this is column 1 names separated by a coma Example 1,2,3,4,5,6,7,8	N/A	No
ParentPID	The PID that determines the visibility of the current row.  Note Usually a scalar that enables/disables hardware	Any Valid PID name	No
ParentVal	The value of the ParentPID that will allow the current row to be visible	Any valid value of the parent PID	If ParentPID then yes it is required

## 7.2 FUNCTIONS

Functions are plot on an X Y coordinate graph. Each function may vary is length but the length for the X and Y must be the same. Use the “Definition\_Template.XLS” as a template. The functions worksheet has the following configuration:

Column Name	Description	Limits	Required
Level	This is the level that is assigned to the parameter for filtering. See the Level section for more details on filters	1 – 120	Yes
Level2	This is the level that is assigned to the parameter for filtering. See the Level section for more details on filters	1 – 120	No
KEY	The KEY must be a unique name. This KEY is used internally within BE to link tables and functions and for searching.  Note: Must be unique value Not Displayed within Binary Editor	255 char	No
PID	The Parameter IDentification should be a unique name. Most of these PID names come from a strategy book if it is available. If the PID is unknown then use FNxxx. Replace the x with a sequential number.	255 char	No
Title	A short description of what the function is for the parameter	255 char	Yes
Comments	Any comments	N/A	No
Rows	Number of rows the function will use	1 +	Yes
Bytes	This is the number of bytes for a given parameter. If 4 bytes are used and the signed bit is set, BE will treat it as a IEEE float. If the signed bit is false, BE will treat it as un signed 32 bit integer.	1, 2, 4	Yes
YSigned	Indication if the row values can have a negative value.	TRUE or FALSE	Yes
YDigits	This is the number of decimal places that the row values will show on the screen.	0- 10	Yes
YEquation	This is the equation that will be executed on the raw value from the EEC. Place an “X” in the cell if no scaling is going to be done on the parameter. If the parameter is going to be divided by 512 then place an “X/512” in the cell.	Most simple equations	Yes
YUnits	The unit of measure like MPH, RPM, Deg F	255 char	Yes
YPayloadTag	Holds the TAG name of the payload parameter that is used to look up the X or Y axis during real time monitor.	Payload Tag	No
XAddress	The hexadecimal address where the rows start in the EEC. The format must be “0x0000”. Do not	0x0000-0x35FFF	Yes

Column Name	Description	Limits	Required
	use an 'H' in place of the 'x' or any other character.		
XSigned	Indication if the row values can have a negative value.	TRUE or FALSE	Yes
XDigits	This is the number of decimal places that the row values will show on the screen.	0- 10	Yes
XEquation	This is the equation that will be executed on the raw value from the EEC. Place an "X" in the cell if no scaling is going to be done on the parameter. If the parameter is going to be divided by 512 then place an "X/512" in the cell.	Most simple equations	Yes
XUnits	The unit of measure like MPH, RPM, Deg F	255 char	Yes
XPayloadTag	Holds the TAG name of the payload parameter that is used to look up the X or Y axis during real time monitor.	Payload Tag	No
XMin	Absolute minimum scaled X value for the parameter	Data Size	No
XMax	Absolute maximum scaled X value for the parameter	Data Size	No
YMin	Absolute minimum scaled Y value for the parameter	Data Size	No
YMax	Absolute maximum scaled Y value for the parameter	Data Size	No
ParentPID	The PID that determines the visibility of the current row.  Note Usually a scalar that enables/disables hardware	Any Valid PID name	No
ParentVal	The value of the ParentPID that will allow the current row to be visible	Any valid value of the parent PID	If ParentPID then yes it is required

## 7.3 TABLES

Tables are rows and column of data. The row headers and column headers are usually defined by one of the defined functions.

Column Name	Description	Limits	Required
Level	This is the level that is assigned to the parameter for filtering. See the Level section for more details on filters	1 – 120	Yes
Level2	This is the level that is assigned to the parameter for filtering. See the Level section for more details on filters	1 – 120	No
KEY	The KEY must be a unique name. This KEY is used internally within BE to link tables and functions and for searching.  Note: Must be unique value Not Displayed within Binary Editor	255 char	No
PID	The Parameter IDentification should be a unique name. Most of these PID names come from a strategy book if it is available. If the PID is unknown then use TBLxxx. Replace the x with a sequential number.	255 char	No
Title	A short description of what the function is for the parameter	255 char	Yes
Comments	Any comments	N/A	No
Address	The hexadecimal address where the rows start in the EEC. The format must be "0x0000". Do not use an 'H' in place of the 'x' or any other character.	0x0000-0x35FFF	Yes
Bytes	This is the number of bytes for a given parameter. If 4 bytes are used and the signed bit is set, BE will treat it as a IEEE float. If the signed bit is false, BE will treat it as un signed 32 bit integer.	1, 2, 4	Yes
Signed	Indication if the row values can have a negative value.	TRUE or FALSE	Yes
DecimalPL	This is the number of decimal places that the row values will show on the screen.	0- 10	Yes
Rows	Number of rows the function will use	1 +	Yes
Cols	Number of columns the function will use.	1 +	Yes
YlabelLink	This is the KEY value of the function that defines the row headers.	255 char	No
YUnits	The unit of measure like MPH, RPM, Deg F	255 char	No
YPayloadTag	Holds the TAG name of the payload parameter that is used to look up the X or Y axis during real time monitor.  If multiple TAGs are required then enter the tags separated by a coma and then place the formula at the end. For example: FRCBFT,ACT,ECT,(A*B+(1-A)*C)  FRCBFT = variable A	Payload Tag	No

Column Name	Description	Limits	Required
	ACT = Variable B ECT = Variable C		
YLabels	This is the default header text for the rows. Each Header text is separated by comas. Example -50,0,50,100,150,200,250	255 char	No
XlabelLink	This is the KEY value of the function that defines the column headers.	255 char	No
XUnits	The unit of measure like MPH, RPM, Deg F	255 char	No
XPayloadTag	Holds the TAG name of the payload parameter that is used to look up the X or Y axis during real time monitor.  If multiple TAGs are required then enter the tags separated by a coma and then place the formula at the end. For example: FRCBFT,ACT,ECT,(A*B+(1-A)*C)  FRCBFT = variable A ACT = Variable B ECT = Variable C	Payload Tag	No
XLabels	This is the default header text for the columns. Each Header text is separated by comas. Example -50,0,50,100,150,200,250	255 char	No
ZEquation	This is the equation that will be executed on the raw value from the EEC. Place an "X" in the cell if no scaling is going to be done on the parameter. If the parameter is going to be divided by 512 then place an "X/512" in the cell.	Most simple equations	Yes
ZUnits	The unit of measure like MPH, RPM, Deg F	255 char	No
Min	Absolute minimum scaled value for the parameter	Data Size	No
Max	Absolute maximum scaled value for the parameter	Data Size	No
ParentPID	The PID that determines the visibility of the current row.  Note Usually a scalar that enables/disables hardware	Any Valid PID name	No
ParentVal	The value of the ParentPID that will allow the current row to be visible	Any valid value of the parent PID	If ParentPID then yes it is required

## 7.4 LEVELS

Levels are the filters that can be applied to the list of functions scalars and tables. The filter will be applied to the loaded definition file. Use the “Strategy\_Template.XLS” as a template. If a PID is has been assigned two levels the PID will show up if either of the levels is enabled.

## 7.5 PAYLOAD

A Payload is a set of parameters that can be logged by the hardware. The TwEECer can log a maximum of sixteen parameters or 32 bytes depending on the Tweecer worksheet configuration. The Quarterhorse can also log and the maximum number of bytes it can log is 100 bytes.

Column Name	Description	Limits	Required
TAG	The Parameter Identification (PID) <b>Must be a unique</b> name. Most of these TAG names come from a strategy book if it is available. If the TAG name is unknown then abbreviate the name of the parameter. For example: Air Charge Temperature = ACT	255 char	Yes (unique)
Description	A short description of what the function is for the PID	255 char	No
Address	The address of the PID to be logged or monitored.  B= The Bank the address resides in. Usually 8 or 1.	0xB0000-0xBFFFF	Yes
Bytes	This is the number of bytes for a given parameter. If 4 bytes are used and the signed bit is set, BE will treat it as a IEEE float. If the signed bit is false, BE will treat it as un signed 32 bit integer.	1, 2, 4	Yes
HILO	This column is optional depending on the patch code and the byte size of the given PID. If the patch code supports bytes rather than words than this column is not needed. If the patch code only supports words (Most TwEECer RT), this column determines which byte in the word contains the data for the given PID. If the PID uses two bytes then this columns is disregarded.	1-2	No
Signed	Indication if the parameter can have a negative value.	TRUE or FALSE	Yes
Equation	This is the equation that will be executed on the raw value received from the EEC. Place an “X” in the cell if no scaling is going to be done on the PID. If the PID is going to be divided by 512 then place an “X/512” in the cell. If the value is going to be parsed out at the BIT level then place a ‘B’ in the cell.	Most simple equations	Yes
Digits	This is the number of decimal places that the PID will show on the screen.	0- 10	Yes
Units	The unit of measure like MPH, RPM, Deg F	255 char	No

Column Name	Description	Limits	Required
Bit0-7	<p>These eight columns contain the PIDs that are associated with the bits for the value of the PID defined in the TAG column.</p> <p>For example the TAG 'FLAGS1' in the GUFb strategy uses bit 2 for the Open Loop indication. The 'Bit2' column is set to 'OL'. The name or acronym is up to you.</p>	255 char	

## 7.6 TWEECER

The TwEECer is hardware that allows for tuning and logging of data. The TwEECer worksheet lists the patch code that is downloaded with the tune to enable the data logging. This patch code is what defines where and what the EEC will retrieve and push to the TwEECer. This will require the knowledge of machine code and a good understanding of the EEC processor.

Column Name	Description	Limits	Required
Data	The data to be placed in the EEC address defined by the address column.	0x00- 0xFF	Yes
Address	The address location within the EEC that the data column will be placed  B= bank (0,1,8,9)	0xB0000-0xBFFFF	Yes

Parameter	Description	Value	Required
32BytePayload	if parameter is omitted then BE defaults to False which is 16 parameters. This parameter must match the type of patch code being used	True/False	No
PollingAddresses	Starting Address to place the patch code results	0x0000-0xFFFF	No

## 7.7 QHORSE

The Quarterhorse is a piece of hardware that allows for tuning and logging of data. Depending on the address of the selected payload TAG a patch code maybe required. The patch code is only required if the address for the selected payload TAG is below 0x00FF for any EEC-IV or below 0x01FF for any EEC-Vs. The Quarterhorse can monitor any RAM address that is external to the EEC processor (8061 or 8065). The patch code essentially asks the EEC processor to take a copy of its internal address and place it in external RAM so that the Quarterhorse can access it.

The QHorse worksheet defines the patch code that is downloaded to the hardware to enable the logging of EEC processor specific addresses. BE will determine if the patch code is required automatically by looping through all of the user selected payload TAGs. If the address is determined to be a EEC specific address then the patch code is required and BE will insert it for you.

Column Name	Description	Limits	Required
Data	The data to be placed in the EEC address defined by the address column.	0x00-0xFF	Yes
Address	The address location within the EEC that the data column will be placed  B= bank (0,1,8,9)	0xB0000-0xBFFFF	Yes

Parameter	Description	Value	Required
DatalogOffset	<b>Note:</b> This is where the internal EEC specific parameters will be placed in external RAM.  (Internal RAM address plus DatalogOffset).	0000-FFFF (HEX)	Yes
TunePosition	The address where to store the Moates Quarterhorse Switch position value	0000-FFFF (HEX)	No
LTMTB1	The address of the Learned KAMRF table for bank 1	0000-FFFF (HEX)	No
LTMTB2	The address of the Learned KAMRF table for bank 2	0000-FFFF (HEX)	No
AutoGenerate PatchCode	If set to <b>True</b> then BE will auto generate a patch code and insert it for you at the time of enabling the payload. If set to <b>False</b> or the parameter does not exist then the patch code on the QHorse tab will be used.	True/False	No
RAM	The Moates Quarterhorse will use this value for the Datalogging RAM. If the parameter is not configured, then BE will use RAM 3 for all single bank calibrations and RAM 1 for any 2 or 4 bank calibrations.	0-3	No

## 7.8 CONFIG

This is a worksheet that list general configuration parameters for Binary Editor. There is a column "Parameter" and "Value". Bold items are the defaults.

Parameter	Description	Value	Required
ChecksumStartX (X= 0,1,8,9)	The starting address used to calculate the checksum	0x0000-0xFFFF	Yes
ChecksumEndX (X= 0,1,8,9)	The ending address used to calculate the checksum	0x0000-0xFFFF	Yes
ChecksumStore	This is where the final calculated checksum will be placed. Usually set to "ROM_TO"	Any Scalar PID name	No
BINSave	If the definition file is going to be encrypted (*.CRY) then you can give the option to allow the tune (*.bin) to be saved. By default this is set to false	True/False	No
Revision	This field is displayed to the user when the definition name in BE is double clicked	Any number	No
Owner Name	The name of the owner of the definition file This field is displayed to the user when the definition name in BE is double clicked	Text Field	No
Owner Email	The Email address of the owner of the definition file This field is displayed to the user when the definition name in BE is double clicked	Text Field	No
Owner Phone	The Phone number of the owner of the definition file This field is displayed to the user when the definition name in BE is double clicked	Text Field	No
PCMType	EEC_32K, EEC_56K, EEC_88K EEC_112K, EEC_216K, EEC_256K, <b>Unknown</b>	Text Field	Yes
EEC	This allows the address field to be proceeded by the bank number. For exammple 0x08642D is bank 8 address 642D	True/False	No
BypassLicense	Set this to 'True' if the encrypted def files (*.CRY) is going to be a full version without the need for licensing. The license scheme if this parameter is mssing.	True/False	No
EnumWorksheet	This is a new worksheet that defines all enmuerations for the strategy. Please contact Tech support to get all of the details.	True/False	No
PIDVisible	If set to TRUE the following will be visible: PID name in the legend PID column on the SCALARS PID in the search window	True/False	No
LTMTB1	The starting address of the KAMRF1 table	0x0000-0xFFFF	No
LTMTB2	The starting address of the KAMRF1 table	0x0000-0xFFFF	No
RF_KAMRF	The starting address of the Retrunless Fuel KAMRF table	0x0000-0xFFFF	No
Unit labels (See Label Names in Description)	When a user selects a desired Unit on the user preference screen, one of the following will be displayed depending on what unit is selecceted:  Deg F, Deg C, PSI, In Hg, MPH, KPH, AFR, LAMBDA  The above are the defaults which can be overwritten by adding one or all of the of the following parameters with its corresponding new value. Below is an example:	Any String	No

Parameter	Description		Value	Required
	Parameter	Value		
	TempF	Degrees F.		
	TempC	Degrees C.		
	PSI	Pressure 2in		
	in Hg	in Hg		
	MPH	mph		
	KPH	kph		
	AFR	Fuel Ratio		
	LAMBDA	lambda		

## 8 EULA

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Licensing Support  
EEC Analyzer Support  
620 Wiegand Way  
Dixon, Ca. 95620 USA

or email [Clint@EECAnalyzer.net](mailto:Clint@EECAnalyzer.net)  
17 November 2011

## 9 EXTERNAL INPUT

### 9.1 EGR

Disabling the EGR is not recommended if the vehicle must comply with emission. The EGR signal can be used as an external input to the processor if the application is for off road use and no smog equipment is utilized. This has only been tested on a few vehicles such as the 86-95 Mustangs.

If you have an application that utilizes one of the processors mentioned above, then pin 27 on the processor can be used as an additional input. This input is a 0 to 5 volt DC signal. Be careful not to apply more than 5.10 volts to pin 27, or damage may occur to the internals to the processor. This input is labeled as the EGR Valve Position (EVP). This input can be wired up to the output of devices such as:

Innovate Wideband controller

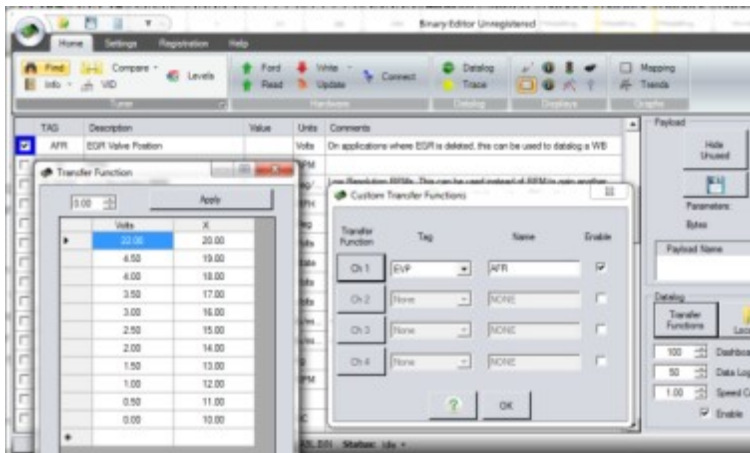
AEM Wideband controller

GM map sensor.

EGT sensor that outputs 0-5vdc

Fuel Pressure sensors

Once the input is wired up to pin 27, Binary Editor will need to be configured to map this input to the screen and datalog. Before configuring Binary Editor make absolutely sure the EGR is disable within the calibration. Once the EGR is disabled, the EVP must be selected on the data logging screen. Now a transfer function must be entered in order for Binary Editor to display the correct values. See section 4.10.2 on how to setup the custom transfer functions.



## **9.2 DATAQ**

See section 4.10.5 on more detail for the DataQ devices

## **9.3 INNOVATE**

See section 4.10.6 on more detail for the Innovate devices

## **9.4 ZEITRONIX**

See section 4.10.7 on more detail for the Zeitronix devices

## 10 REVISION HISTORY

### 10.1 BUILD 388 RELEASE DATE 24-JAN-2023

#### General

- Fixed a few spelling errors
- Added logic to ensure a stock calibration is selected when the compare selection window is open.

#### OBD2

- Added more support for PATS
- Reworded some PATS prompts

### 10.2 BUILD 376 RELEASE DATE 30-OCT-2023

#### General

- Add a new Chip burner to the supported hardware (TI Performance)
- Fixed a few spelling errors
- Removed a prompt after a QH write
- Updated screen shots to the help file

### 10.3 BUILD 355 RELEASE DATE 26-JUN-2023

#### Datalog

- All DMR, Ford Enhanced, SAE are on one screen
- Added tree view for selecting TAGs
- Parameter comments open is a separate window
- Levels have been added to the parameters.
- Dash Three retains filters when changing payloads
- Data logging screens will only show supported PIDs by default

#### OBD2

- Removed the PID tab, it is part of the data logging screen.
- Added support for TriCore 298 (Multicore)
- Elapsed time added to the read and write operations

#### MAF Mapping

- Allows for multiple tags in one column or row

#### Dashboard

- Dashboards have an option to play and pause data logs

#### Tuner

- A 'Favorites' folder has been added to the tree view
- Right click a Parameter in the tree view to add and remove to favorites.
- Levels have been standardized across all PCM types.
- Fixed a bug when saving a calibration it was all uppercase

### 10.4 BUILD 307-308 RELEASE DATE 16-FEB-2023

#### General

- Fixed a bug in the compare screen that I accidentally created

## OBD2

- Added support for flashing Black Oak 1472 SCP for 2002-2004 SVT focus
- Added count downs for the erase on EEC PCMs
- Optimize code to speed up some of the processes

### **10.5 BUILD 303 RELEASE DATE 06-JAN-2023**

#### General

- Errors loading a calibration will be in the status bar rather than popup messages.

#### OBD2

- Added more DTC to the P codes and the U codes.
- Get All DTC with status will now break each byte down to the bit level

### **10.6 BUILD 302 RELEASE DATE 04-JAN-2023**

#### General

- Fixed UDP (User Defined Parameter) address length to allow 8 digits

### **10.7 BUILD 301 RELEASE DATE 19-DEC-2022**

#### General

- Arrays can now have names for both columns
- Multiple Arrays can now be open at the same time

### **10.8 BUILD 300 RELEASE DATE 12-DEC-2022**

#### General

- Fixed a concern when BE starts it is at a fixed minimized size in the task bar
- Added the ability for strategy owners to add links in the comments field
- Added the ability for strategy owners to one more level deep in the tree view
- Web interface was updated to use industry standards for communications

### **10.9 BUILD 255 RELEASE DATE 01-NOV-2022**

#### General

- Fixed spelling in a couple of areas
- Added a Speed Density Calculation for Tricore, Copperhead, PPC and EECV in section 4.12.14
- Fixed a bug when using the edit point option on the chart view and when comparing multiple functions at the same time.
- Added the ability to scramble a calibration to make it difficult for others to read it.
- Added N/V and Tire Rev/Mile to the Vehicle and Trans screen.
- Refactored the startup so BE starts faster
- Refactored the Charts so they are smoother while zooming