

INSIGHT



Part #: 83400
User Booklet 1



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Version 1

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Chapter 1: Welcome!

This manual will introduce you to the various features available in the Insight console hardware and the Insight USB Interface software.

- Your new Insight is an amazingly compact device that will provide you with real-time information about your vehicle's operation, Diagnostic Trouble Codes, vehicle performance, and other useful data.

Features of the Insight:

-
- Predefined "Factory Default" Displays showing OBDII Parameter IDs (PIDs) in an organized fashion
- User defined Displays that can show any supported PID subset in a user chosen format
- 2 Function Digital (Two large font numeric parameters on your screen)
- 3 Function Digital (Three medium font numeric parameters on your screen)
- 4 Function Digital (Four medium font numeric parameters on your screen)
- 2 Function BAR (Two large font numeric parameters with an updating "Bar" gauge on your screen)
- 6 Function Digital (Six small font numeric parameters on your screen)
- 7 Function Digital (Seven small font numeric parameters in a list)
- User navigation of displays via the *UP* and *DOWN* keys
- Real-Time Fuel System Status (on Vehicles that support Fuel System Reporting)
- Menu timeouts when no key presses are detected (which returns the user to the previously selected display)
- Variable polling schedules for PIDs to reduce CAN bus load
- Data Logging capability (on-board) that can be uploaded to a PC via the USB connection
- Variable Length Data Logs (chosen by user up to ~20 minutes!)

- Staged Alerts change the background color (user customizable) as monitored parameters meet up to three separate thresholds (warning, urgent, and Alarm).
- User customizable settings, such as screen layout, display parameters, screen color, Alert colors and thresholds, are editable via the PC software as “Profiles”
- Multiple Profiles can be stored on the PC and quickly downloaded to the Insight via the USB connection.
- The device is updatable via the USB connection and download/software from Edge
- LED backlight color user customizable
- User selectable/changeable Alerts
- “Normal” ranges shown in 2 Bar Graph and values Flash when out of range on other displays (enabled via the Alert setup screen)
- Triggered mode for the Data Log
- View the data being recorded in a Data Log in real time
- 0-60 Times with Speed and RPM recorded
- 1/4 mile Times/ET (with 60 ft and 1/8 mile splits) with Speed, RPM and 2 additional user selectable inputs recorded
- 0-60, 1/4 mile, and Data Logging data can be uploaded to a PC via the USB connection
- Settings Profiles that can be Opened and Saved on your PC, making it very easy to set up your custom displays, alerts, and LCD Screen settings.
- Instantaneous Mile Per Gallon reading
- Instantaneous Gallons Per Hour reading.

Chapter 2: Installation

Installation of your Insight in the vehicle involves *NO TOOLS* and a couple minutes. Installation is very straight forward, and often times the most complicated part of the process is finding a nice way to route the cable!

- Locate the vehicle's OBD II Diagnostic port. Most times, it is located at the lower left of the dashboard, just under the "lip" of dashboard.

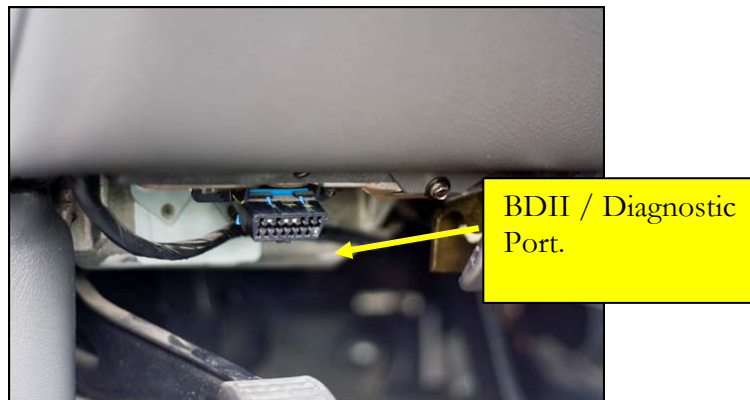


Figure 1 Typical OBDII Port Location

- Plug the cable into the port and route the cable so as not to interfere with vehicle controls or block the driver's vision or access to controls.



Figure 2 Example of cable routing

- Turn the vehicle's ignition key to the **ON** position. The engine does **NOT** have to be running for this.
- Plug the Insight into the other end of the cable. The Splash Screen will appear, and then you will be prompted to read any new notices or instructions. Carefully read the agreement/notices and then press "ENTER" to acknowledge and your Insight will start communicating with the vehicle! The agreement screen will show for the first five (5) times the device is powered up initially. Once you have agreed five times, the notice will no longer be displayed.
- Read further in this User Guide and the online HELP for the main operational features of your Insight

Chapter 3: Operation of your Insight

- In this section, you will learn all the features that your Insight offers. Before we dive in, here are some basic concepts:

Insight Controls and Keys

- **UP/DOWN arrow keys** - when on a Display, pressing the **UP** or **DOWN** arrow key will navigate to the **NEXT** or **PREVIOUS** Display. When in a Menu, use the **UP/DOWN** arrow keys to navigate through the list of menu choices.
- **MENU key** - This key will enter into the **MENUS** that allow access to various Features. Pressing the **MENU** key while in a Menu will back you up one menu.
- **ENTER key** - this key is used for confirmation of a selection or to toggle through various choices when in the Menu mode.
- When you are on a main Display, you can press the **ENTER** key to enable you to adjust the Display brightness. To dim/brighten the display, press **ENTER** and then press the **UP ARROW** (brighter) or **DOWN ARROW** (dimmer) keys. An asterisk (*) will appear in the upper right hand corner of the screen while in the mode. Press **ENTER** when finished and the Display Number will be restored in place of the asterisk (*).

Note

The MENU key can be used in any menu to go back one menu level (all the way to a Display).

The ENTER key can be used to enter the Display Dimming mode from a main Display. When in dimming mode, the upper right corner number will change to a “” to indicate dimming mode. Use the UP and DOWN arrow keys to brighten or dim the screen back light. Hit ENTER again to exit this mode.*

Chapter 4: Diagnostics

- By choosing the “DIAGNOSTICS” Menu from the Insight, you have access to many diagnostic related features as discussed below.

Retrieving Diagnostic Trouble Codes (DTCs)

- After choosing the “Diagnostics” menu, select “Retrieve Diagnostic Trouble Codes” and your Insight will query the vehicle and retrieve the DTCs (if any).
- If your vehicle reports DTCs, it may be either an “Current” or “Historical” code. Current codes are either DTCs that are currently valid or are pending to flag a problem. Historical codes indicate DTCs that have been detected and stored, but aren’t currently Active. The code may have been cleared via the “CLEAR DTC” command or because the vehicle has corrected the problem via a preset number of drive cycles or warmup cycles without the DTC being detected again.
- The DTCs will be displayed with the international standard designation in the form of a letter followed by letters, along with a brief description.
- **Example:** P0112 Intake Air Temperature Circuit Low Input
- **Where:** “P” indicates Powertrain, “0112” is the DTC number, and the brief description
- Normal convention is that “P” = Powertrain (engine/transmission), “B” = Body, “C” = Chassis, “U” = Network/Unknown

Clearing Diagnostic Trouble Codes (DTCs)

- By simply choosing the “Clear Diagnostic Trouble Codes” and pressing ENTER, Insight will command the DTCs to be cleared.

Diagnostic Trouble Code (DTC) Types

- There are two types of DTCs reported:
- **CURRENT:** This report indicates codes that are CURRENTLY either suspected (have occurred X out of Y times) or active (set by the PCM). These are set and cleared for the current drive cycle. When you issue a "CLEAR DTC" command, Insight issues the SAE defined OBDII "Clear Codes" command. This will clear an active/suspected code immediately BUT if the condition that set the code is still present, the code will set again almost immediately.

- **HISTORICAL:** This reports codes that have been stored as OCCURRED or OBII LONG TERM and which may have occurred in previous drive cycles. The "CLEAR DTC" command will tell the PCM to mark them to be cleared once the federally mandated OBDII criteria have been met (which in most cases involves multiple OBDII drive cycles).
- OBDII drive cycles usually include such things as a minimum coolant temp, a successfully completed PCM initiated OBDII defined test (like the O2 sensors tests), a certain minimum engine run time, distance covered and/or certain range of operation for the monitored system. Depending on the code, it could take up to 5 drive cycles before the code will be reset. There are certain classes of DTCs that may take upwards of 80 cycles to clear, if they are determined to "Catalytic Converter Harmful."

Most vehicles will clear ACTIVE codes immediately, but MAY RETAIN THE HISTORICAL CODES FOR A NUMBER OF DRIVE/WARMUP CYCLES OR KEY ON/OFF CYCLES BEFORE CLEARING! This is actually a feature to make sure that any problem that has occurred can be logged and diagnosed properly before resetting.

DATA LOGGING

- The on-board Data Logger allows you to capture 5 parameters for approximately 90 seconds. These parameters are configurable (as described below) and can be VERY useful in capturing and reviewing critical vehicle data for diagnosis of a problem or tuning of the vehicle.

Choosing the Parameters to Record

- Choose the "Data Logger Configure" menu and then scroll through the various parameters to select the ones you wish to record. When you have selected all five parameters, exit by using the MENU key.

Configure the Data Logger

- START:
- Press **MENU** to select **MAIN MENU**
- Select Diagnostics and press **ENTER**

- Select DataLogger Config and press **ENTER**
- Select **Log Parameter** and press **ENTER**
- Scroll through the Parameter List using **UP/DOWN** Arrows. **NOTE:** Parameters followed by a (+) are Not Supported for this Vehicle.
- Press **ENTER** to select Parameter
- Select Next **Log Parameter**
- When Finished, Press **MENU** (Repeat) to EXIT the current Display back to **Start**

Activating the Data Logger

- Choose the “Data Logger Start” option to begin recording the parameters. A progress bar will appear and the Insight will start recording after a brief initialization process. Be sure that you allow yourself 2-3 seconds for this initialization to occur.

Starting the Data Logger

- **START:**
- Press **MENU** to select **MAIN MENU**
- Select Diagnostics and press **ENTER**
- Select DataLogger Start and press **ENTER**
- The DataLogger progress field will indicate progress. The DataLogger will automatically stop when the capacity is full OR you can Press **MENU** (Repeat) to EXIT the current Display back to **Start**

Parm 1 100.00	Parm 4 100.00
Parm 2 100.00	Parm 5 100.00
Parm 3 100.00	Progress 77 %

Figure 0-1 Data Logging Display

- Once you have Recorded a Log, you can review it directly on the Insight and/or upload it to your PC software (included) for further analysis.

Viewing the Data on the Insight

- Choose the “Data Logger Viewer” option and you will be shown a list of the five parameters that you have recorded and an indication of which “frame” you are looking at with an informational message “Frame X of Y”. Scroll through the frames using the UP/DOWN arrow keys. To exit, press MENU.

Viewing the Data Logger Captured Data

- **START:**
- Press **MENU** to select **MAIN MENU**
- Select Diagnostics and press **ENTER**
- Select DataLogger View and press **ENTER**
- The first frame of recorded data is displayed.
- Press the **UP/DOWN** arrows to scroll through the data frames.
- Press **MENU** (Repeat) to EXIT the current Display back to **Start**

Parm 1 100.00	Parm 4 100.00
Parm 2 100.00	Parm 5 100.00
Parm 3 100.00	Progress Frame 1

Figure 0-2 Reviewing Data Log Screen

Note: Additional ways to view and analyze the data are available to you by uploading the data to your PC using the included PC software and USB cable

Chapter 5: Displays

- The Set Up menu (accessed via the **MENU** key) gives you access to the various configuration options in your Insight.
- You can customize the look of your Displays via the “Displays” option
- You can set up, turn ON and turn OFF Alerts
- Adjust the LCD Settings including color and contrast
- Switch between English and Metric Units
- Access and use the Valet Mode

CUSTOM DISPLAYS

- Custom Displays can be set up on the device, to customize a display on the Insight, you will be presented a list of the four Displays. Select the one you wish to customize and press “**ENTER**”. A list of possible formats for the Displays is then presented.
- **NOTE: You will NOT see parameters that are not supported by the vehicle you are connected to.** The parameters for selection *WILL* change based on the vehicle you connect with! Also, the PC software allows you to set up custom screens regardless of which vehicle you are connected to as “Profile” (refer to section *Settings Editor* later in this document)

Custom Display Setup

- **START:**
- Press **MENU** to select **MAIN MENU**
- Select Setup and press **ENTER**
- Select Display and press **ENTER**
- Select Custom Display Number and Press **ENTER**
- Select Display Type and Press **Enter**. Examples of these Display Types are illustrated in the following Section.
- Select **Parameter** Number/Location
- Scroll through the Parameter List using **UP/DOWN** Arrows. **NOTE:** Parameters followed by a (+) are Not Supported in for this Vehicle.
- Press **ENTER** to select Parameter

- Select Next **Parameter** Number/Location
- When Finished, Press **MENU** (Repeat) to EXIT the current Display back to **Start**

Two Function Digital Display

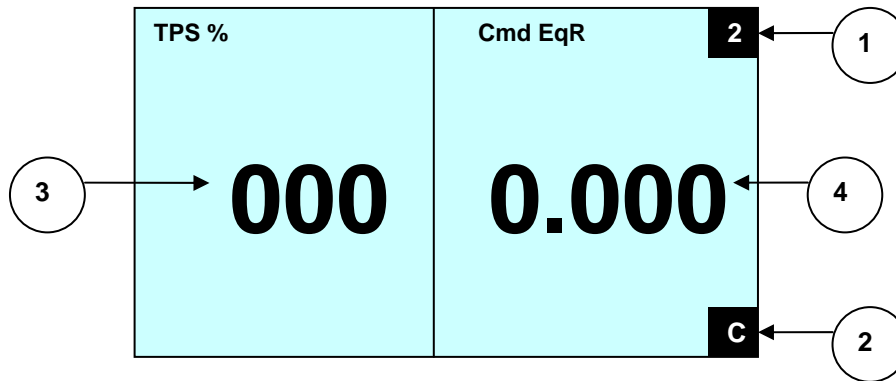


Figure 1 Two Function Digital Display

- Fuel System Status (C = Closed Loop, O = Open Loop, L = Open Loop due to Engine Load, F = Open Loop due to a Failure/Trouble Code, P = Closed Loop with Problems, - = Data not available, U = unknown status)

Note: Diesel vehicles may not return a “Fuel Status”, so the display will indicate a “-“

Two Function Bar Graph

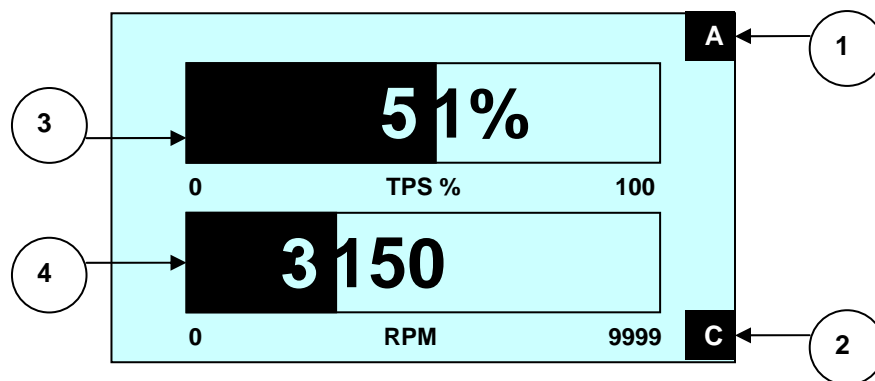


Figure 2 Two Function Bar Graph Display

- Fuel System Status (C = Closed Loop, O = Open Loop, L = Open Loop due to Engine Load, F = Open Loop due to a Failure/Trouble Code, P = Closed Loop with Problems, - = Data not available, U = unknown status)

Note: Diesel vehicles may not return a “Fuel Status”, so the display will indicate a “-“

- Three Function Digital Display

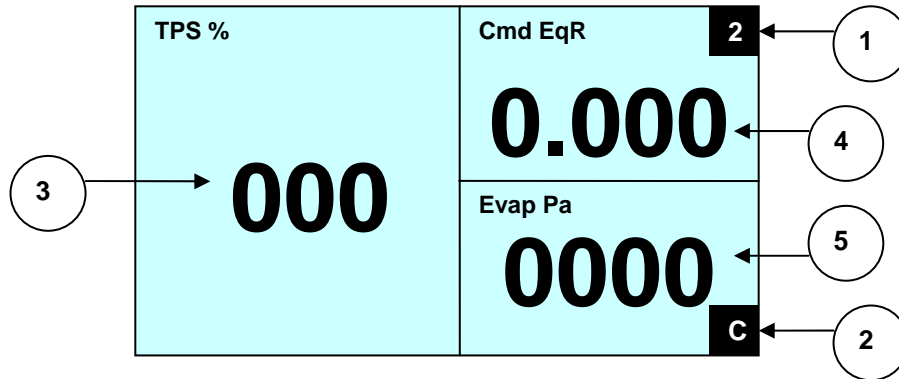


Figure 3 Three Function Digital Display

- Fuel System Status (C = Closed Loop, O = Open Loop, L = Open Loop due to Engine Load, F = Open Loop due to a Failure/Trouble Code, P = Closed Loop with Problems, - = Data not available, U = unknown status)
- Four Function Digital Display

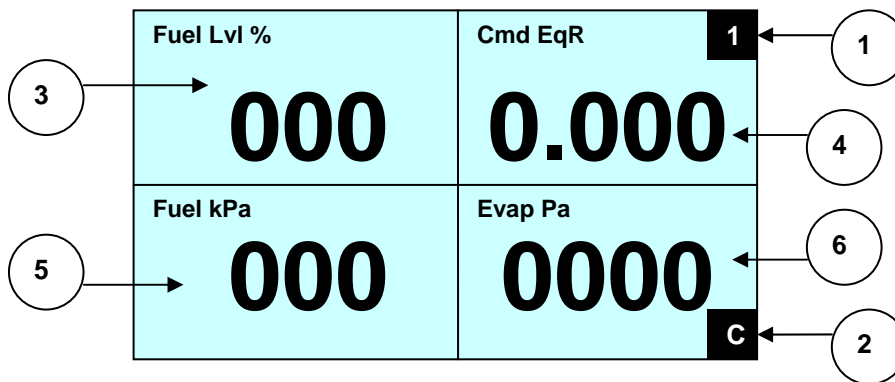


Figure 4 Four Function Digital Display

- Fuel System Status (C = Closed Loop, O = Open Loop, L = Open Loop due to Engine Load, F = Open Loop due to a Failure/Trouble Code, P = Closed Loop with Problems, - = Data not available, U = unknown status)

Note: Diesel vehicles may not return a “Fuel Status”, so the display will indicate a “-“

- Six Function digital display

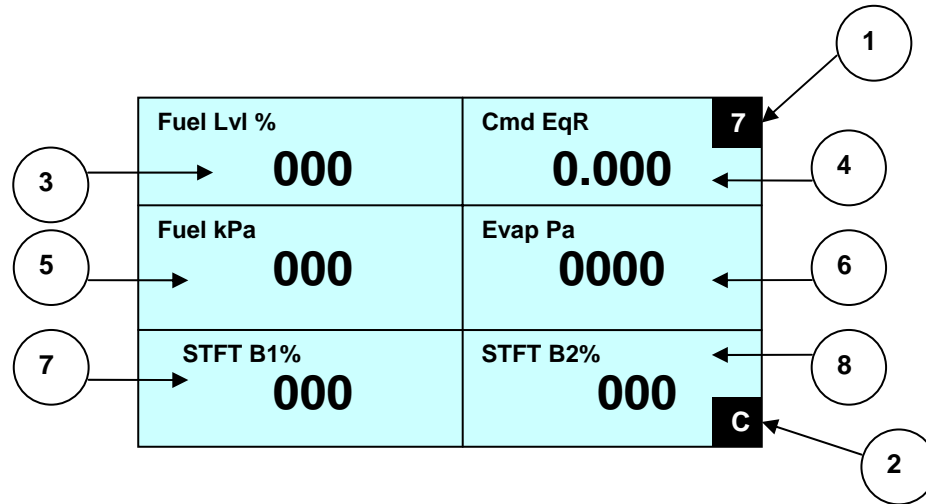


Figure 5- Six Function Digital Display

- Fuel System Status (C = Closed Loop, O = Open Loop, L = Open Loop due to Engine Load, F = Open Loop due to a Failure/Trouble Code, P = Closed Loop with Problems, - = Data not available, U = unknown status)

Note: Diesel vehicles may not return a “Fuel Status”, so the display will indicate a “-“

- Seven Function Digital Display

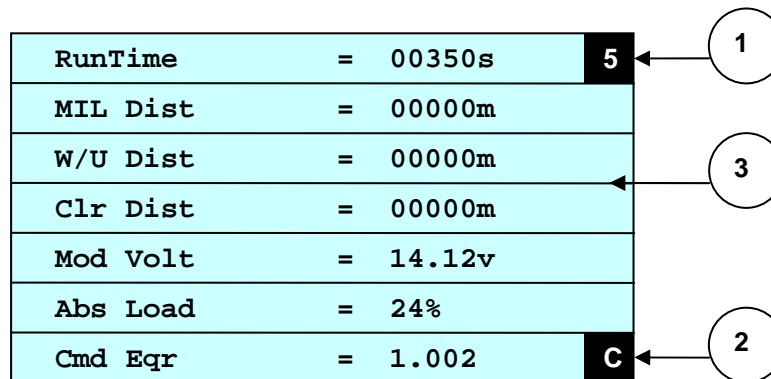


Figure 6- Seven Function Digital Display

Adjust LCD Settings

- This handy feature allows you to change the color of the backlight and screen contrast on your Insight.

Screen Color

- Simply choose this option and then either RED, GREEN, or BLUE and adjust it to match your vehicle's dashboard lighting, the conditions or your mood!

Screen Contrast

- Select CONTRAST and use the UP/DOWN Arrow keys to adjust to taste. Settings of 25% to 40% are usually most visible in daylight conditions.

Dimming the Display

- This feature is especially useful during night driving or low light situations. To dim the display, simply hit **ENTER** while in a normal Display. Display and an asterisk (*) will be displayed in place of the Display Number to indicate the mode. Use the **UP** and **DOWN** arrow keys to brighten and dim the display respectively. Press **ENTER** again to exit the mode and the asterisk (*) will be replaced with the Display Number.

Switch to Metric/English

- Choose this option to toggle between English and Metric units.

Staged ALERTS

- *BE SURE TO ENABLE YOUR CHOSEN ALERTS BEFORE EXITING THE MENU!*
- Alerts are *VERY* useful tools for ensuring that the monitored parameters are within normal range.
- A good example of an Alert is to use it to set a SHIFT LIGHT indication. Simply choose RPM and then set the various thresholds to approximately 100 RPM below the actual set point you wish (to give enough time to react). Your Insight background color will change (to what you have set it too ... default is YELLOW, ORANGE, and RED) progressively as you reach the thresholds. When the ALARM threshold is reached, it will FLASH the

Display with the Alert value and beep. It will return to the normal display when the value drops below the threshold.

Alerts Setup

- The following steps will allow you to set up the various Alert functions:
- **START:**
- Press **MENU** to select the Main Menu
- Select Setup and press **ENTER**
- Select Alerts and press **ENTER**
- Select:
- ALERTS ON/OFF (Toggles Alert function on/off)
- SHOW NORMALS (Toggles Normal indication on/off)
- PID ONE THROUGH FIVE (choose the parameter you wish to monitor)
- Press **UP/DOWN** arrows to select the PID
- Press **ENTER** to choose the PID
- Press **UP/DOWN** arrows to choose Alert Stage threshold or color
- Press **ENTER** to choose Stage or color
- Press **UP/DOWN** arrows to set **VALUE** or **COLOR**
- Press **ENTER** to save **VALUE** or **COLOR**
- Press **MENU** (Repeat) to **EXIT** current Display back to **START**

Show “Normals” Feature

- Another neat feature dealing with Alerts involves the “Show Normal Values” option. By turning this option “ON” you will see the following on a 2 Bar Graph display:

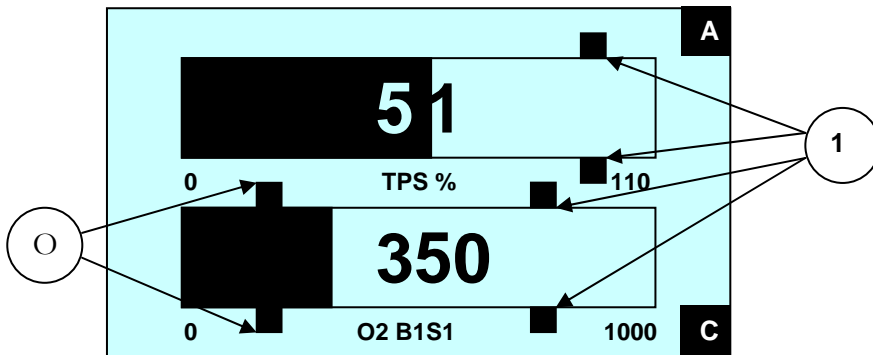


Figure 7 “Tick Marks” showing “Normals” thresholds

- Where “1” points to the indicators for the Normal Maximums and “2” points to the indicators for the Normal Minimums.

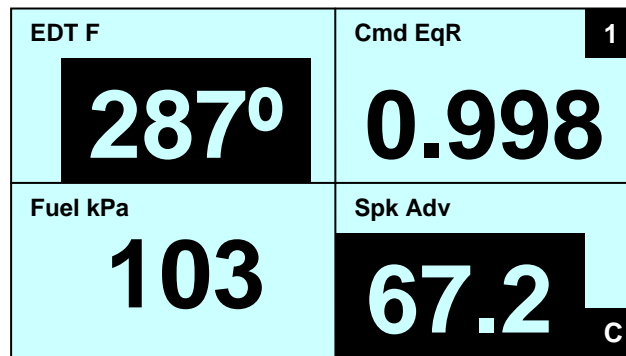


Figure 8 Inverted values showing parameters beyond set “Normals”

- In all the other displays, the number that falls out of “Normal” range will be highlighted (inverted in color) to alert you that something needs attention.

VALET/MAXIMUMS

- The Valet mode is a protected mode that allows you to see and reset various monitored “Maximums”, such as maximum RPMs, maximum Speed, etc. This can be especially useful when taking a car to the dealership, parking at a valet parking facility, or even when loaning the car to someone.
- To secure access, first choose the “Set PIN” option and choose a *FOUR* digit PIN. This PIN will be required to access the Valet menu from here on.

- **BE SURE TO WRITE YOUR PIN DOWN IN A SECURE PLACE!
WITHOUT IT YOU WILL NOT BE ABLE TO ACCESS THE VALET
MODE!**

Technical Support: 1-888-360-3343

To expedite your support call, please have part number (i.e.,10103), version number, and Date of Manufacture ready prior to calling support

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Chapter 1: Insight Software

Another powerful component of your Insight system consists of a software package that runs on your PC. Once you have it installed, you can upload data from your Insight for further review. *You can also configure and upgrade your Insight directly ... no need to send the unit back to the factory for updates or new features!*

INSTALLING THE SOFTWARE

- The PC software on the included PC (or downloaded from the Web) consists of a standard InstallShield package. Simply double click on the **SETUP.EXE** file and follow the on-screen prompts.



Figure 1 Introduction Screen for the Installation Package

THE MAIN SCREEN

- The main screen presents a series of buttons and utilities for you to use with your Insight connected to your PC. Use the included USB cable to plug your Insight into the USB port on your computer. There is a small rubber cover on the RIGHT side of the device that can be carefully removed to allow access to

the port. It is recommended that you replace the rubber cover when finished to keep the port clean and free of dust/contaminants.

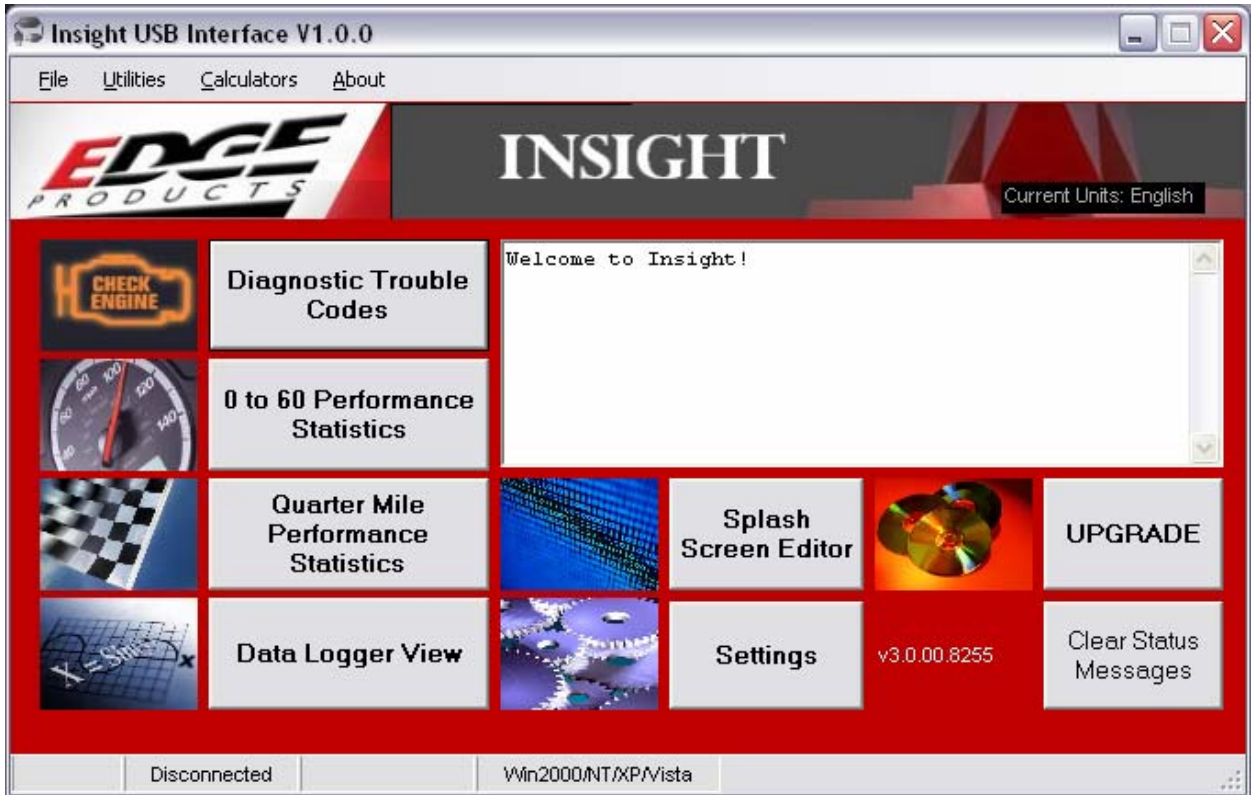


Figure-2 Main Screen

STATUS BAR

- The bottom status bar will give you some basic information about your Insight connection (Com Port, Connection status, Windows version).



Figure 3 Status Bar

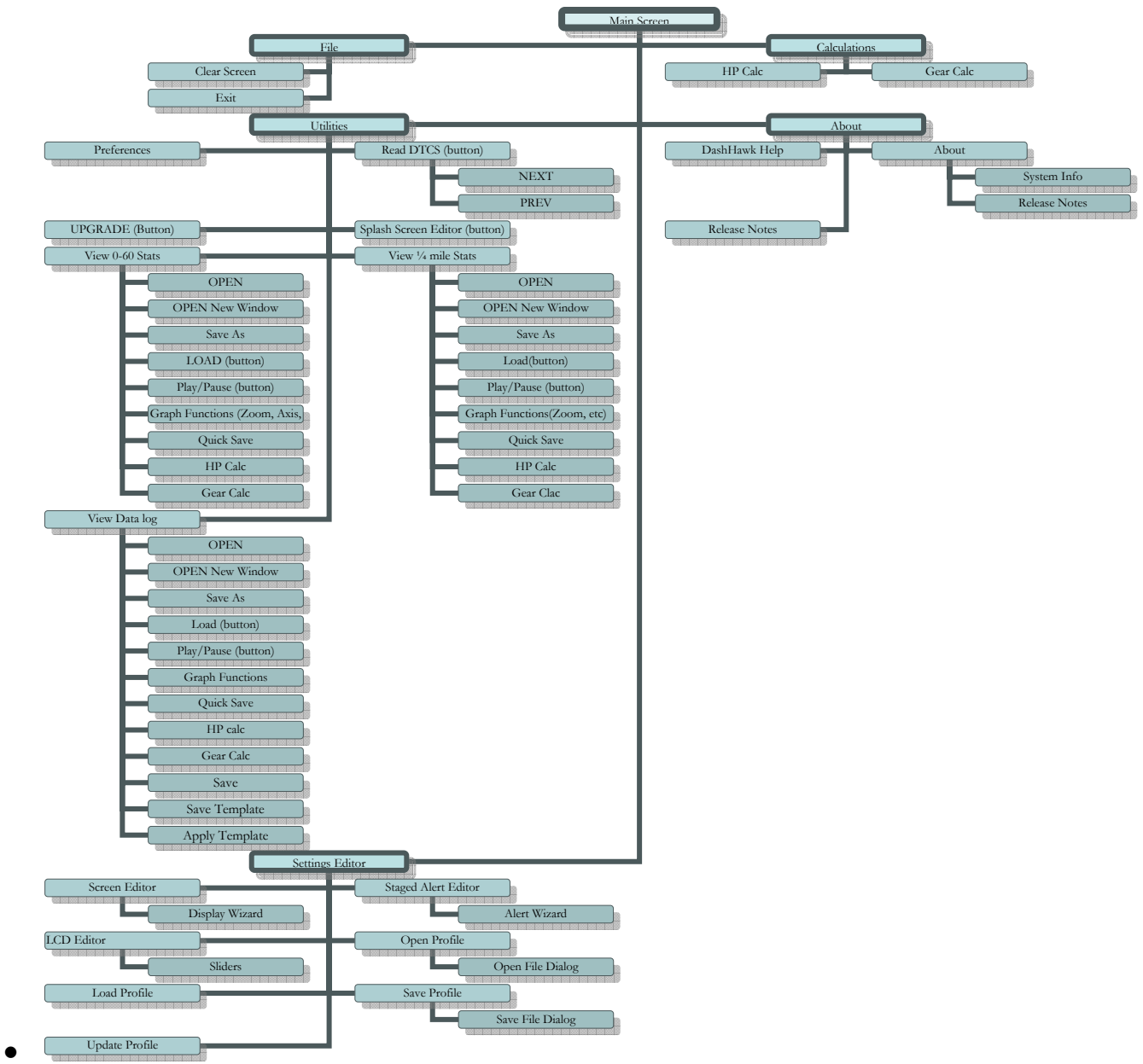
- Although most features require you to be connected to the Insight, you can also use the Data Log, 0-60, and quarter mile features to review data that you have previously uploaded and saved to your PC ... **WITHOUT** having your Insight attached. You can also save copies of anything loaded from your Insight for later comparison and review. The **UPGRADE** utility allows you re-flash your Insight with new features, new software, and the latest versions.

- Note

YOU MUST DISCONNECT THE OBD II CABLE FROM THE CAR BEFORE ATTACHING THE USB CABLE FOR UPLOADING FILES OR UPGRADES. The USB port is not active unless the OBDII cable is unplugged.

MENU STRUCTURE

- The following illustrates the menu hierarchy for the PC software:



PULL DOWN MENUS

- Many functions are available via the “Pull Down Menu” at the top of the screen in addition to the various buttons.




Figure 4 Pull Down Menus

- **FILE MENU**

- Clear Screen - Clears the white Status Message box
- Exit - Exits Insight

- **UTILITIES MENU**

- View Data Log - acts the same as the Data Log button and opens the [Data Log View](#)
- View Zero to Sixty Log - acts the same as the 0 to 6- Stats button and opens the [Zero to Sixty Logging View](#)
- View Quarter Mile Log - acts the same as the Quarter Mile Stats button and opens the [Quarter Mile Logging View](#)
- Read DTCs - acts the same as the Diagnostic Trouble Code button and opens the [DTC Read/Clear View](#)
- Splash Screen Editor – allows you to change the start up screen
- Upgrade Dash Hawk - acts the same as the [Upgrade button](#) and allows you to load new upgrades/features to your Insight.
- Settings Editor – allows you to load/update Profiles of settings (Screen formats, PIDs, colors, Alert parameters, etc) from/to your Insight and Open/Edit/Save the profiles on your PC.
- Preferences – sets various preferences for the application

 Note

YOU MUST DISCONNECT THE OBD II CABLE FROM THE CAR BEFORE ATTACHING THE USB CABLE FOR UPLOADING FILES

OR UPGRADES. The USB port is not active unless the OBDII cable is unplugged. When the unit is plugged into the USB port, the display will be “dark” ... that is normal behavior.

- **CALCULATORS**
- HP Calculator - a handy Horsepower Calculator
- Gear Ratio Calculator - a handy Gear Ratio Calculator.

Splash Screen Editor

- The Splash Screen Editor is available by clicking on the “Splash Screen Editor” button:

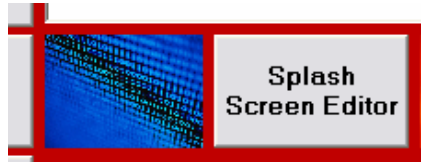


Figure 5 Splash Screen Editor Button

- This will bring up a screen where you can load a BITMAP image (ONLY) to customize your own splash screen (to be shown when the Insight powers up).



Figure 6 Splash Screen Editor

- Splash Display Time – the amount of time (in seconds) for the screen to display on Power Up
- Open New Image – this will allow you to open a new Splash Screen Image saved on your computer. The resulting image will be displayed in the white “box” on this screen.
- Send Image to Insight – if your Insight is connected to your computer with the USB cable, you can send your new Splash Screen Image to the Insight by clicking this button.

The BITMAP image MUST be black and white AND must be of the appropriate size. A template of the proper size (blank.bmp) is included in the Splash directory during the install. Use a copy of this template to create new Splash Screen Images with a suitable graphics tool (MS Paint, IconView, etc.)

Preferences

- The Preferences menu provides you a way to customize some of the simple features/appearance options for the application.

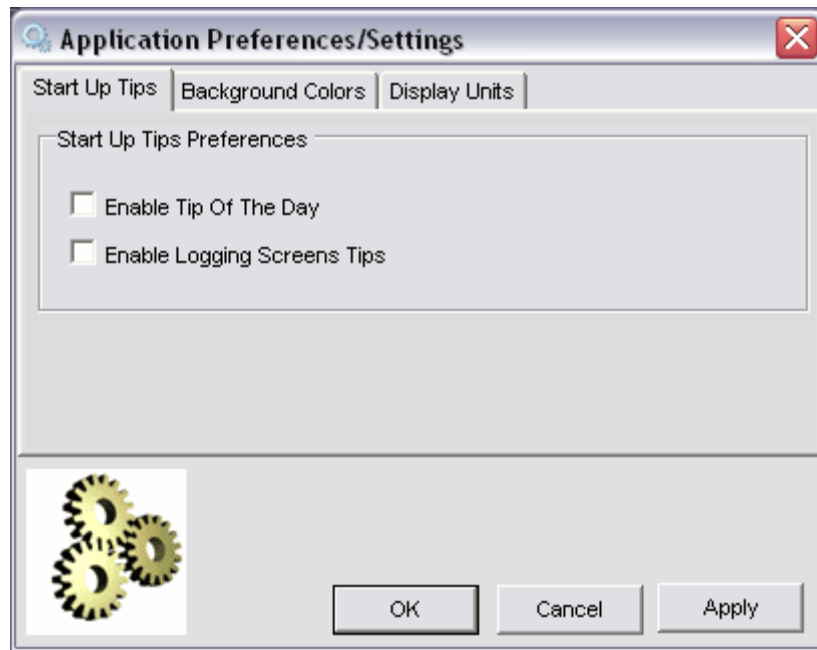


Figure 7 Application/Settings Preference – Tip of the Day Settings

- The “*Start Up Tips Preferences*” option allows you to turn the various “*Tip of the Day*” pop ups on/off.

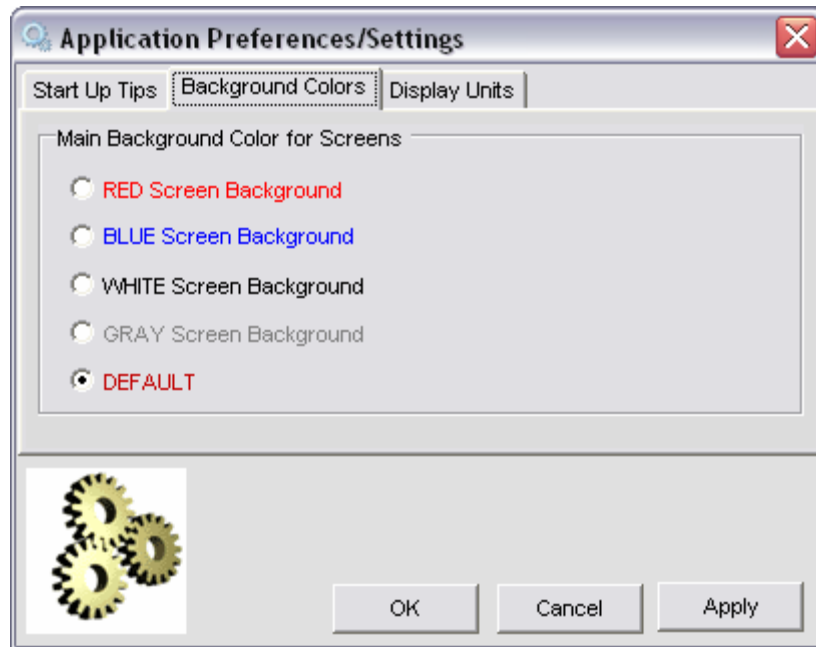


Figure 8 Application/Settings Preference - Background Screen Colors

- The “Main Background Color for Screens” allows you to set the background color for the various screens to a color that fits your monitor/taste.

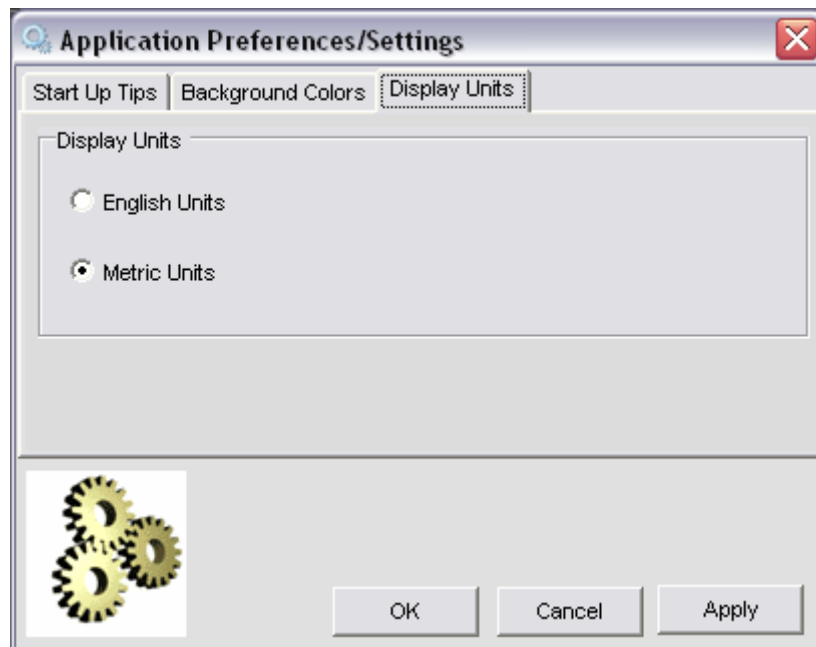


Figure 0-9 Application/Settings Preference - Metric/English Display Units


- The “Display Units” tab allows you to switch between Metric and English units. This will affect the viewing of Logs/Graphs and the setting of Alerts. It is

independent of your choice on the Insight Console Device. Various screens will indicate the current units being displayed.

- To test your settings without committing them, click the “**APPLY**” button and see the results. If you like the results, then click “**OK**” to save them. If you don’t wish to make any changes, click “**CANCEL**”.

Chapter 2: Updating your Insight

Your Insight has the unique ability to be reloaded with new firmware from the USB port. This allows you to keep current with new features/fixes and to add to the functionality of your device as new accessories become available.

 Note

YOU MUST DISCONNECT THE OBD II CABLE FROM THE CAR BEFORE ATTACHING THE USB CABLE FOR UPLOADING FILES OR UPGRADES. The USB port is not active unless the OBDII cable is unplugged. Also, the screen on the Insight will be dark while programming via the USB port.

- To load new software, you must have your Insight attached via the USB cable. Then click the **UPGRADE** button.

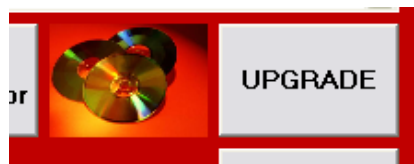


Figure 10 Upgrade Button

- You will be warned to be sure you save your Profile.



Figure 11 Upgrade Warning Dialog

- The Fusion Web Update application will appear:



Figure 12 Fusion Web Update Dialog

- Follow the prompts and your unit will be loaded with the latest firmware. When complete, click the “Close Fusion” button and you will be returned to the main application.
- You are now ready to unplug your Insight and use your newly upgraded device!

Chapter 3: Uploading and Reviewing Captured Data

- The Data Log, 0-60 Stats, and Quarter Mile Stats features all use a very similar graphically based display method. Although there are differences in the data displayed and some of the graphics, the concepts covered in this section apply across the board.
 - Each screen has a top section that contains Digital readouts, gauges, or a combination of readouts and gauges. The information displayed here *corresponds to the cursor location on the plotted graph* in the lower section of the screen. The cursor is the vertical line that automatically plays whenever you upload data or open a saved data file.
-



Figure 0-1 Quarter Mile Replay

NAVIGATION

- To change what data point is being displayed on the gauges/readouts, click on the cursor and drag it to the desired section of the graph.

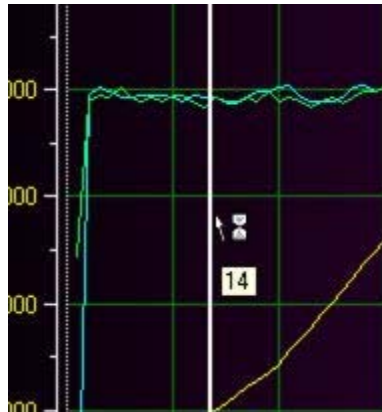


Figure 0-2 Data Cursor (Vertical Line)

Tool Bar Controls

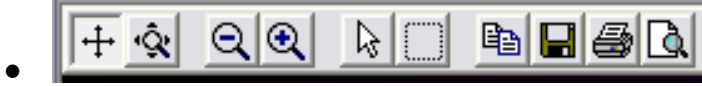


Figure 3 Tool Bar Buttons

TIP:

All toolbar controls have a brief description if you "hover" your mouse pointer over them for a few seconds.


PLAY BUTTON

-  - Starts or Resume playback


PAUSE BUTTON

-  - Pauses playback

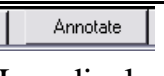
QuickSave BUTTON

-  - Saves the current log to the Data Folder with a name of "QuickSave" and the current data/time. An example would be "QuickSave05-20-2007-14-14-21.log". This example shows the file was saved 05/20/2007 at 14:14.21. The time is in Military time.


LOAD LOG BUTTON

-  - when your Insight is connected, it will initiate an transfer of data from the Insight

Annotate BUTTON


-  - you can use this button to add various Annotations (Notes) to the Log display. You may choose your Font, Color, and orientation for the note and all annotations are saved as part of your log file. Right Click to edit or delete an annotation.

Markers BUTTON


-  - you can use this button to add various Markers to the Log display. Marker styles include vertical lines, horizontal lines, ellipses/circles, rectangles,

and arrows. Rectangles and Ellipse may be resized and all markers can be repositioned when the SELECT button on the toolbar is active.


Axis Scroll and Zoom Buttons

-  - The **Scroll** button will allow you to scroll the axis that you click on using the graph below. This can be very useful if you wish to skew one of the data parameters to line up with others for comparison. The **Zoom** button will stretch or squeeze the scale of the axis that you choose, which can be helpful to compress or expand a data trace for comparison.


Graph Zoom Buttons

-  - use these buttons to zoom the entire graph area.


SELECT AREA

-  - use this button to "lasso" a section of the graph and zoom in for a better look.


SELECT OBJECT

-  - use this button to select an item on the graph, such as an annotation or a marker.

COPY TO CLIPBOARD

-  - use this button to copy the graph (picture) to the clipboard. This is useful if saving a snapshot for pasting into email or another document.

SAVE

-  - this saves a PICTURE of the graph to the harddrive. To save the entire data set, use the FILE -- SAVE function from the drop down menus

PRINT

-  - prints a PICTURE of the graph

PREVIEW



- - shows a preview of what will be printed

READ OUTS/Gauges/Axis

Axis Colors/Fonts

- The color of the scale labels on an axis will correspond to the color of the parameter listed in the legend and the data trace line on the graph.

Read Outs

- These will track (as previously described) to the cursor position. They may appear in the color of the trace/legend as well in the case of the Data Log screen.

Summary Data

- Things such as E.T., 1/4 mile MPH, 60 ft times, 0-60 times will be displayed either to the right or the bottom of the screen and labeled.

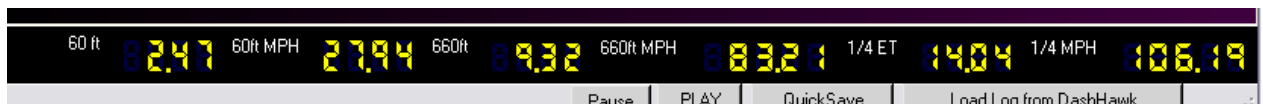


Figure 4 Summary Data

Data Logger Special functions – Selectable Parameter Display

- A handy function with the Data Logger Replay is the ability to display/hide parameters shown on the graph via the “checkbox” next to the parameter name.

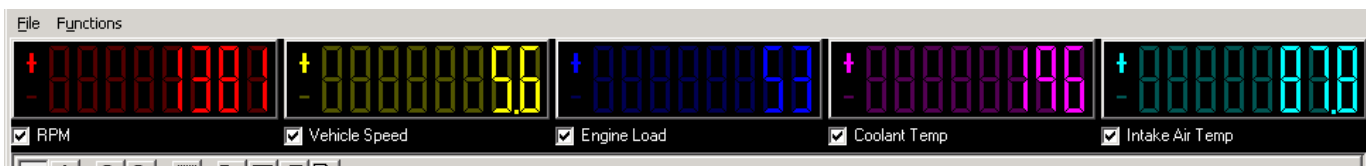


Figure 5 Selectable Parameters via Check Box

- In general, the graphs in the various data acquisition screens will have a top X-Axis that represents “Samples” (each time a value is retrieved from the ECUs), a bottom X-Axis that represents time (in seconds), and a series of Y-Axis grouped on either side that are color coded to match the parameter values displayed at the top of the chart.
- See Figure 9-6.



Figure 6 Data Logger Replay with all parameters checked



Figure 7 Data Logger Replay with only RPM and Vehicle Speed checked

Special Functions for Data Views

Annotations

- This is an advanced feature that allows you to add notes to the graphing display that are saved along with your log file. Click on the Annotate button and the annotate dialog is displayed.

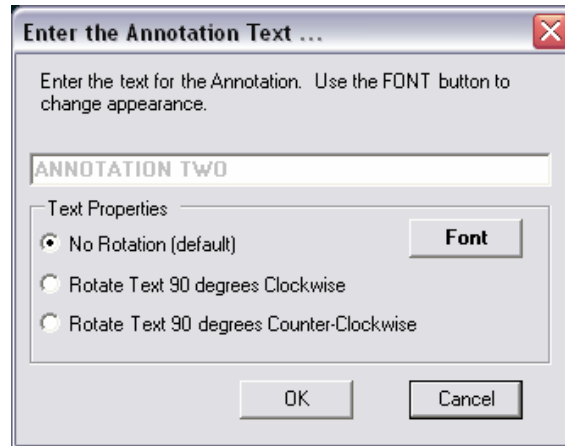


Figure 8 Annotation Dialog

- Enter the text for the Annotation in the space provided and then choose the FONT button to modify its appearance.

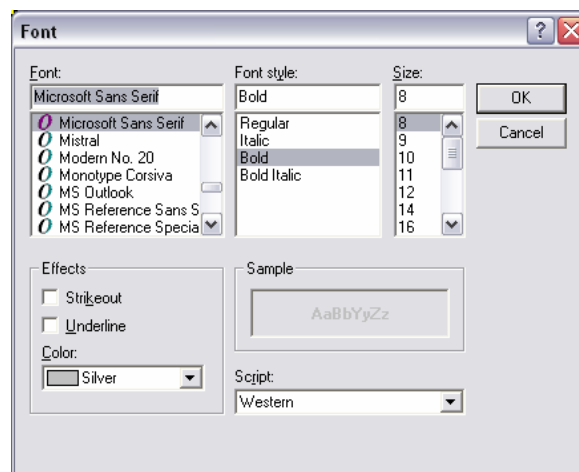


Figure 9 Annotation FONT Dialog

- The Figure above shows a data log with an orange rectangular marker, a pink circular/elliptical marker, a blue horizontal line marker, a blue “right” arrow, and two text annotations.

- Simply **RIGHT CLICK** while **IN SELECT MODE** on an Annotation to Edit or Delete an Annotation.

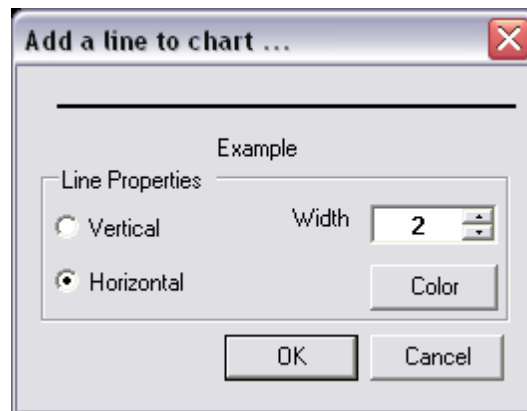
Markers

- This feature is similar to the Annotation function, but allows you to add graphical items to the graphing display that are saved along with your log file. Click on the Markers button and the Marker dialog is displayed.



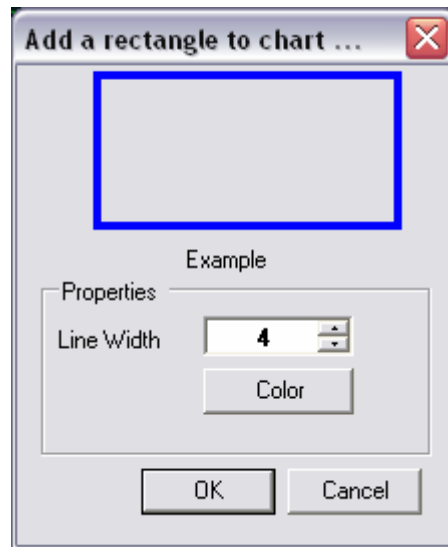
• *Figure 10 Graphical Marker Dialog*

- Once you choose a Marker Style, further dialogs will be presented to allow you to choose various unique options (such as line width, line color, orientation, etc.)



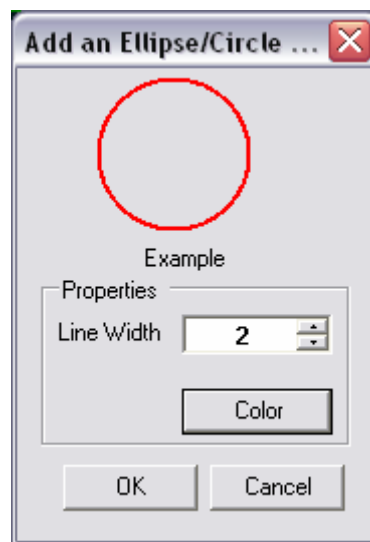
• *Figure 11 Line Marker Dialog*

- This dialog lets you customize a linear marker by specifying the line width, the line color, and the line orientation (vertical or horizontal). After the line is added to the chart, you can move its position using the **SELECT MODE**.



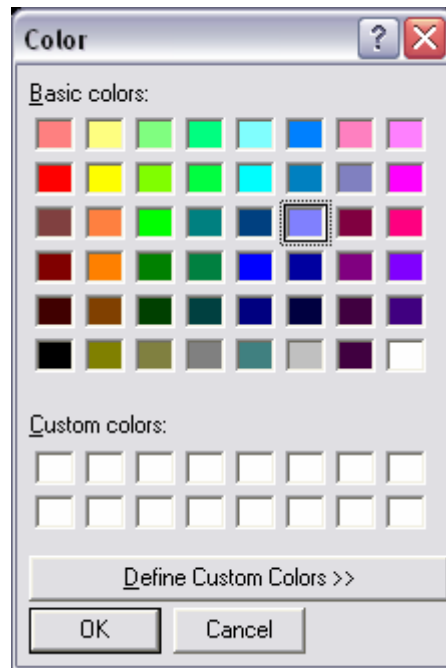
• *Figure 12 Rectangle Marker Dialog*

- This dialog lets you customize a rectangular marker area by specifying the line width and the line color. Once the rectangular marker is added to the chart, you can resize and reposition it using the SELECT MODE.



○ *Figure 13 Ellipse/Circle Marker Dialog*

- This dialog is allows you to specify the line width and line color for a circular/elliptical marker area. Once it has been added to the chart, you can resize and reposition it using the SELECT MODE.



• *Figure 14 Color Chooser Dialog for Graphic Markers*

- This dialog is common to the Line, Rectangle, and Circle/Ellipse Markers and allows you to choose colors.



• *Figure 15 Arrow Marker Dialog*

- This dialog allows you to pick an arrow style (Style One or Style Two) and then change it direction by choosing UP, RIGHT, DOWN, or LEFT radio buttons. Once you have added the arrow to the chart, you can reposition it using the SELECT MODE.



Figure 16 Data Log with multiple Annotations and Markers

Graphing Layout Palette

- An advanced feature that can allow you to customize the Plot Area, the Axes, and the Data Cursor to fit your needs is available via a RIGHT CLICK on the object (Axis, Plot Area, Data Cursor, Legend, etc).

BE VERY CAREFUL USING THIS OPTION! If you save your log file while using this method, it will save your customizations and there is no way to undo it.

- An example of the “Palette” presented for the Plot Area follows:

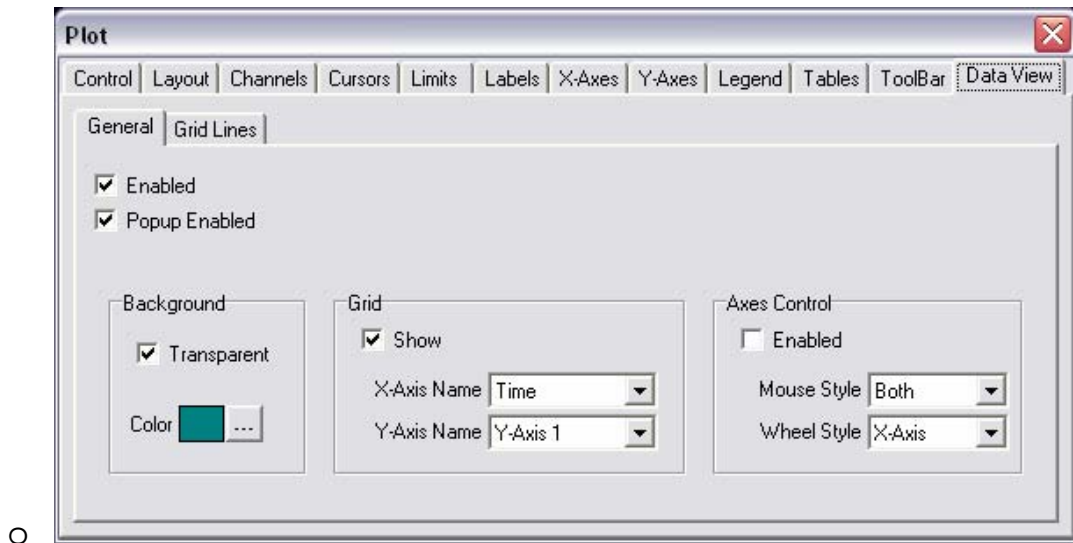


Figure 17 Advanced Plot Layout Tools

Template Functions

- You can change the look of the graph using the Layout Palette (e.g. background colors, line widths, channel colors, grid lines, etc.) and then save this “look” as a TEMPLATE via the File->Save As Template command. To apply this “look” to other logs, simply choose the “Apply Template” command via the File->Apply Template menu. This will make the changes to the currently opened log (Quarter Mile, 0-60 or Data Log) and will be saved with the log when you perform a Save As or Save.

Multiple Logs Open Simultaneously

- You also have the ability to open MULTIPLE LOGS via the “Open New Window” option on the File Menu. This allows you to open saved logs (or a new uploaded log) and compare the various readings.

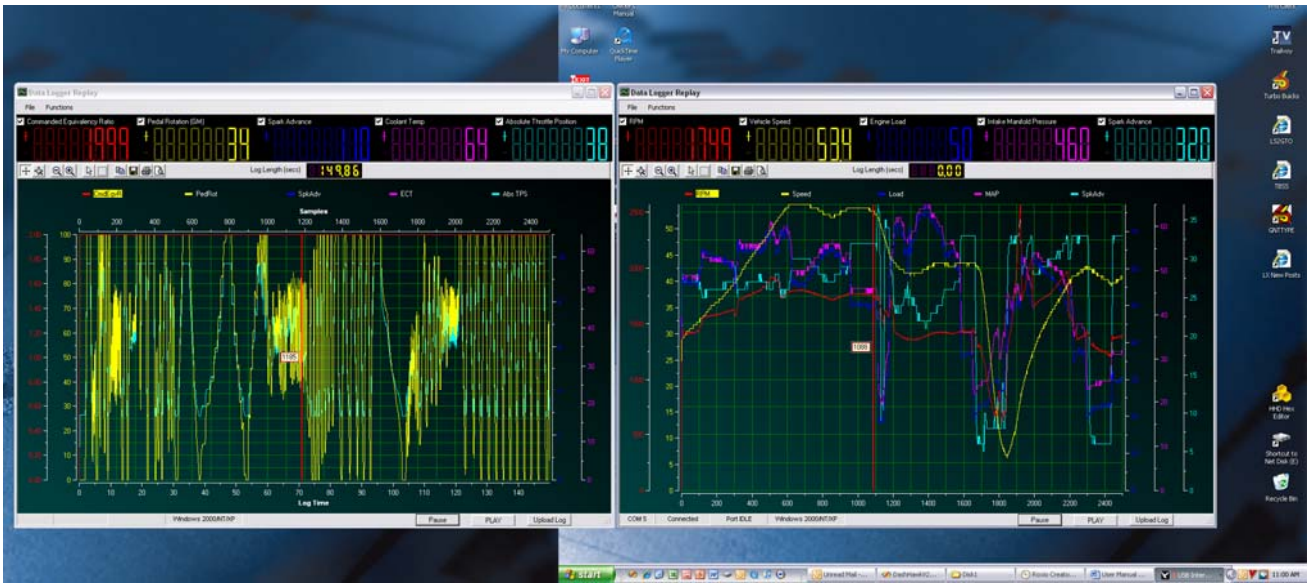


Figure 18 Multiple Log Windows Opened Simultaneously

Chapter 2 Diagnostic Trouble Codes on the PC

- Whenever you retrieve diagnostic trouble codes from your vehicle, you can upload them to your PC for further diagnosis and troubleshooting.
- If there were no DTCs, you will see a status message appear:

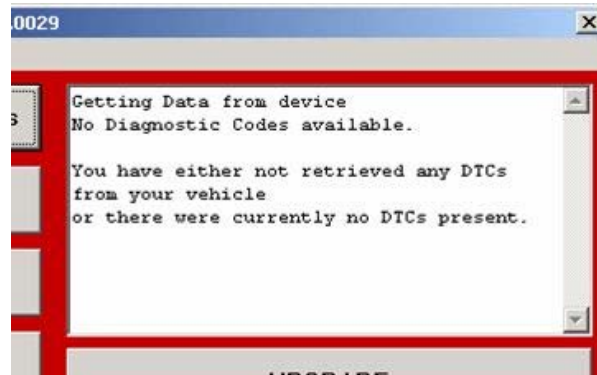


Figure 1 DTC Status Message for No DTCs

- If you have DTCs, the DTC viewer will appear and you can page through any DTCs and their descriptions using the buttons on the form.

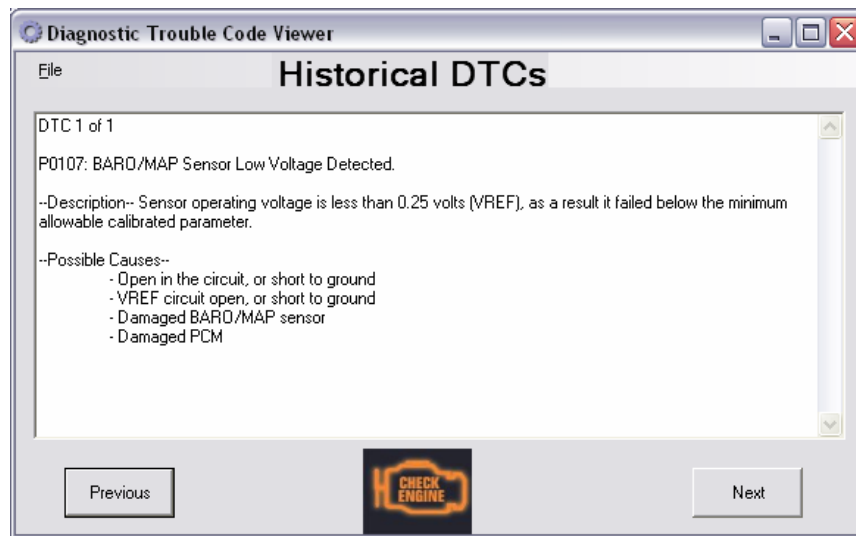


Figure 2-2 DTC Viewer Dialog

Diagnostic Trouble Code (DTC) Types

- There are two types of DTCs reported:
-

- **CURRENT:** This report indicates codes that are CURRENTLY either suspected (have occurred X out of Y times) or active (set by the PCM). These are set and cleared for the current drive cycle. When you issue a "CLEAR DTC" command, Insight issues the SAE defined OBDII "Clear Codes" command. This will clear an active/suspected code immediately BUT if the condition that set the code is still present, the code will set again almost immediately.
- **HISTORICAL:** This reports codes that have been stored as OCCURRED or OBDII LONG TERM and which may have occurred in previous drive cycles. The "CLEAR DTC" command will tell the PCM to mark them to be cleared once the federally mandated OBDII criteria have been met (which in most cases involves multiple OBDII drive cycles).
- OBDII drive cycles usually include such things as a minimum coolant temp, a successfully completed PCM initiated OBDII defined test (like the O2 sensors tests), a certain minimum engine run time, distance covered and/or certain range of operation for the monitored system. Depending on the code, it could take up to 5 drive cycles before the code will be reset. There are certain classes of DTCs that may take upwards of 80 cycles to clear, if they are determined to "Catalytic Converter Harmful".

Chapter 3 Settings Editor

- By clicking on the Settings button, you can access the various Configuration Editors to customize your Insight Profile. You can then save the Profiles to your PC and/or download them to the Insight. To access the Settings Editor, click the “Settings” button:

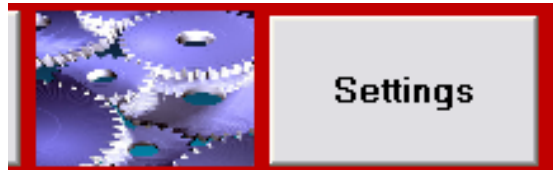


Figure1 Settings Button

- Use the tabs along the top of the screen to activate the following tools:
 - **Screen Configuration Editor** – this tool allows you to customize the four screens on the Insight by setting the layout (2 function digital, 2 function bar graph, 3 function digital, 4 function digital, 6 function digital, or 7 function digital) and choosing which parameters are displayed in the layout.
 - **LCD Configuration Editor** – this tool allows you to customize the screen backlight color and contrast via the sliders or direct entry into the text boxes
 - **Alert Configuration Editor** – this tool allows you to customize the five different Alerts available on the Insight. You can choose the parameter to monitor, the three thresholds for different Alert notifications (warning, urgent, and alarm), and the color for the warnings.
 - Use the buttons along the bottom of the screen to:
 - **Get a Profile from the Insight** – this loads the current settings from the Insight (connected via the USB port) to the PC
 - **Update a Profile to the Insight** – this will send a new Profile to the Insight and update the settings on the Insight
 - **Open Profile** – this will allow you to open a previously saved Profile on the PC for further editing or Updating to the Insight
 - **Save Profile** – this will allow you to save a previously edited/loaded Profile to the PC. You can save as many Profiles as you have space for.
-

Screen Configuration Editor

- The Screen Configuration Editor shows you a “thumbnail” of each of the four Customizable Displays on your Insight. When first opened, you will be prompted to choose an action:

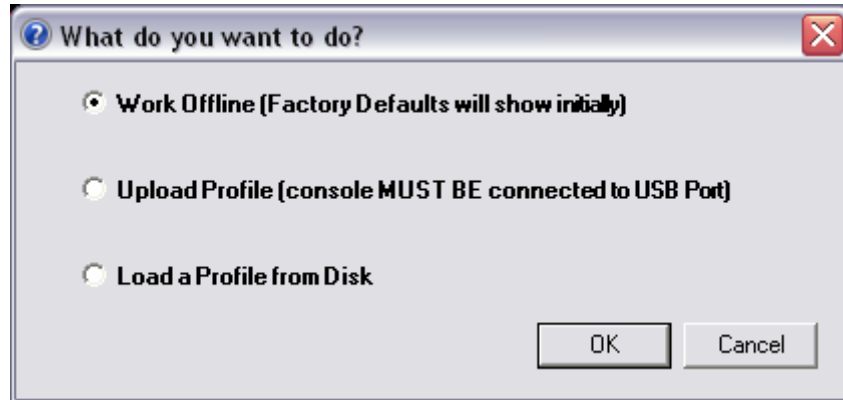


Figure 2 Screen Editor Initial Action Prompt

- If you choose “Work Offline”, then the editor will show the DEFAULT Profile (notice the “Profile: DEFAULT” at the bottom/left corner of the screen.).
- If you choose “Upload Profile”, the profile to be edited will be loaded from the attached DashHawk.
- If you choose “Load a Profile from Disk”, you will be prompted to pick a saved Profile.
- You can start editing these displays by clicking on the EDIT SCREEN button associated with each thumbnail OR you can load a previously saved Profile from your PC OR you can Get a Profile from the Insight (connected via the USB cable).

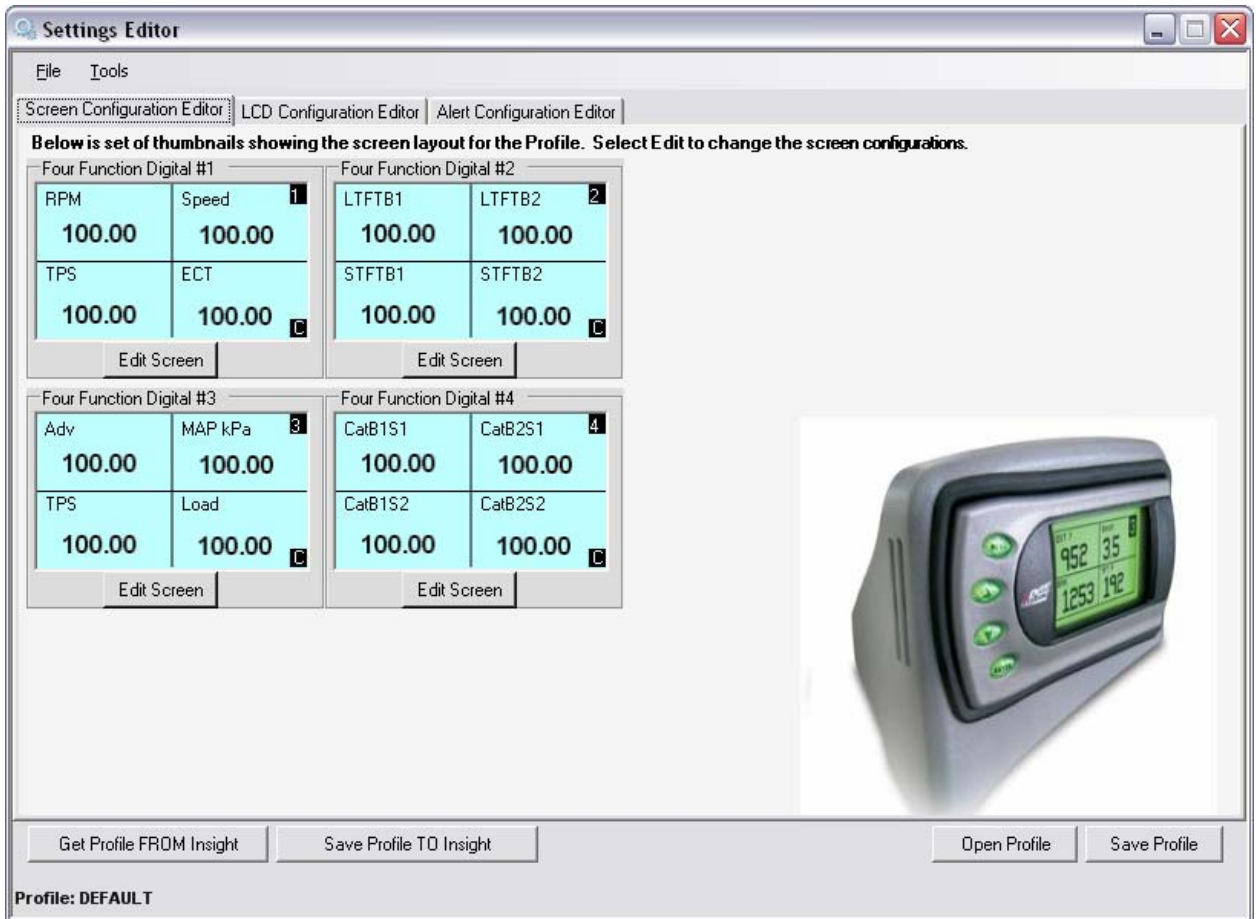


Figure 3 Screen Configuration Editor

Edit the Display

- **START:**
- Click **Edit Screen** button under the display thumbnail of your choice. A Screen Setup Wizard will appear and ask you to either pick **NEXT** or **CANCEL**:

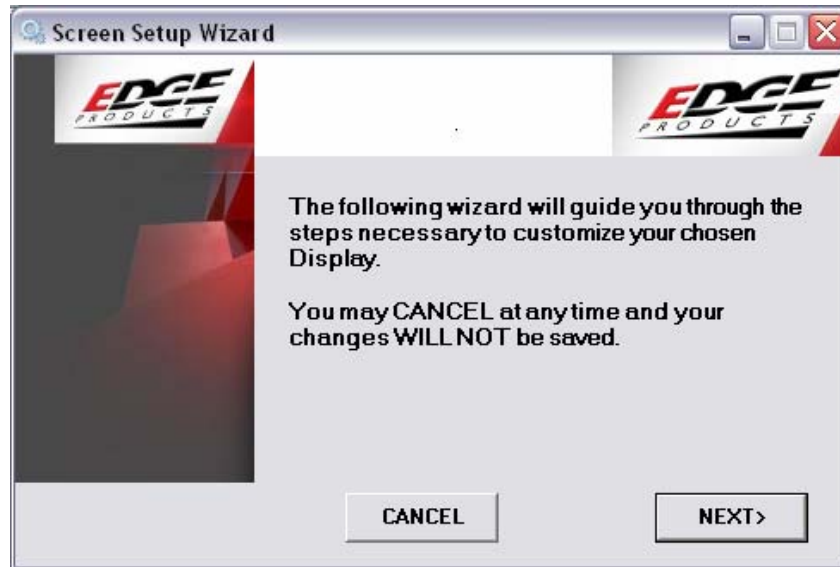


Figure 4 Screen Setup Wizard

- Select **NEXT** to continue (or **CANCEL** to Quit). If you choose NEXT, the next step of the Wizard will present you with a thumbnail of the current Display Layout and will allow you to choose your desired layout from a list of choices (Radio Buttons).

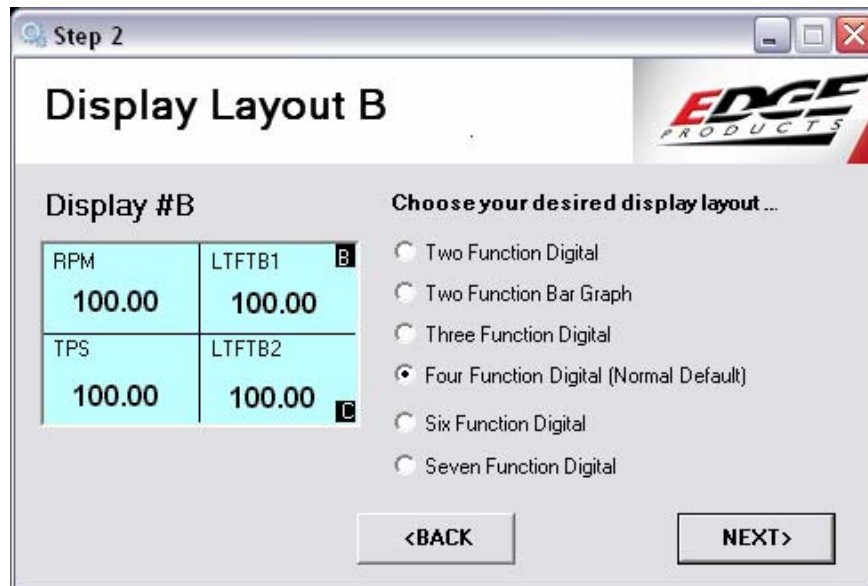


Figure 5 Select Display Layout Step

- When you select a radio button, the format of the thumbnail will change to let you preview your choice.

NOTE: the color of the thumbnail will correspond to the color chosen for the screens via the LCD Configuration Editor.

- Select **NEXT** and you will then be presented with the next step of the Wizard. This step allows you to select the desired from the menu “Tree” on the right.
- **Double CLICK** on the desired parameter in the tree (or click **NEXT** to advance without changing the parameter). Each subsequent **NEXT** will advance to the next parameter (highlighted in RED) until all parameters are chosen.

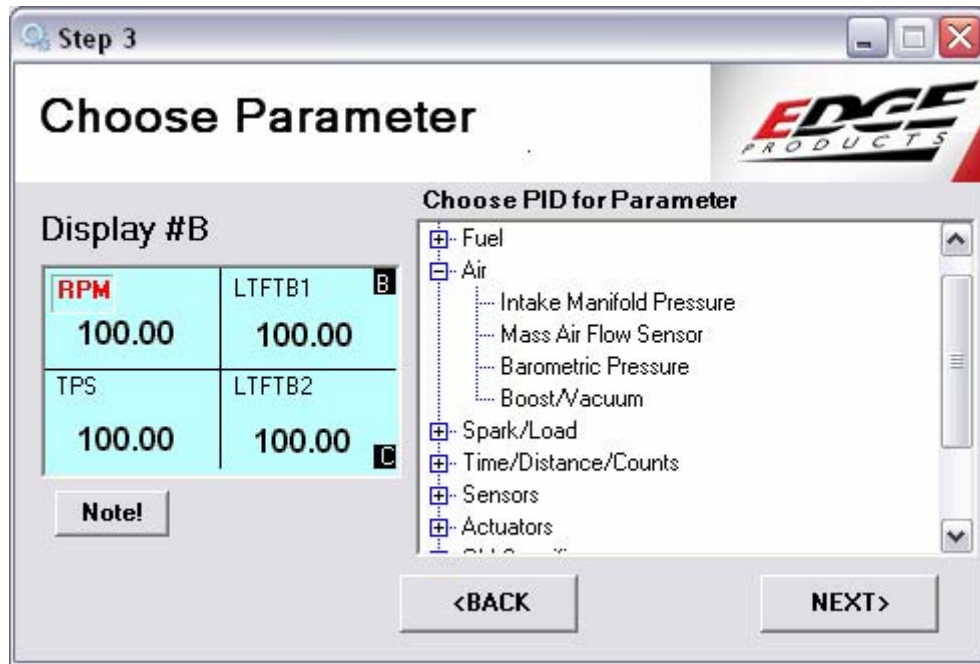


Figure 6 Choose the Parameter Step

- Click **FINISH** to save your changes. The Wizard will close and the thumbnail will be updated in the Screen Configuration Editor.

LCD Configuration Editor

- The LCD Configuration Editor shows you the color settings of the backlight on your Insight. By moving the sliders or typing a value in the boxes, you can set the color. The color box to the right changes in real time to reflect these

adjustments (as well as on the Screen Configuration Editor thumbnails and the thumbnails in any of the Wizards).

- The contrast slider and text box operate in a similar fashion. It is recommended that you leave the setting for the contrast around 50% for clarity on the Insight. All the colors are approximate renditions and may look slightly different on the device, since the mechanisms for rendering colors is going to vary between your PC screen and the actual Insight.

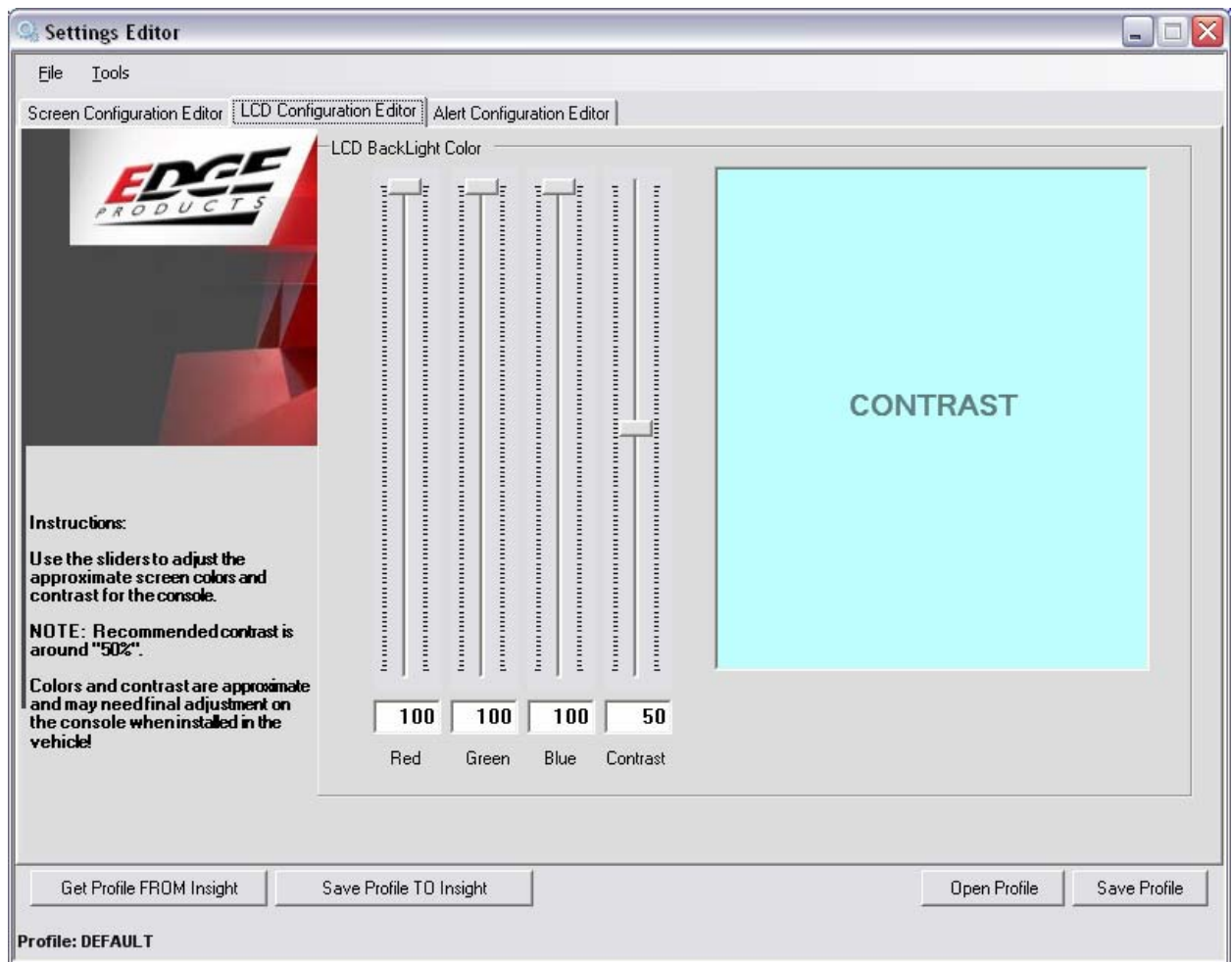


Figure 7 LCD Configuration Editor with color/contrast sliders

Alert Configuration Editor

- The Alert Configuration Editor allows you to customize the powerful Stage Alerts functionality on your Insight. You can pick up to five (5) parameters for

alerts and within each monitored parameter set three (3) thresholds for various types of warnings (Stage 1, Stage 2, and ALARM).

- To change any of the Alerts, simply click the Edit button next to the desired Alert and the Alert Wizard will lead you through the process of setting up the Alert. Notice the Alerts button on the left side of the screen (Red Circle). This button is the master control to turn the Alerts ON or OFF.

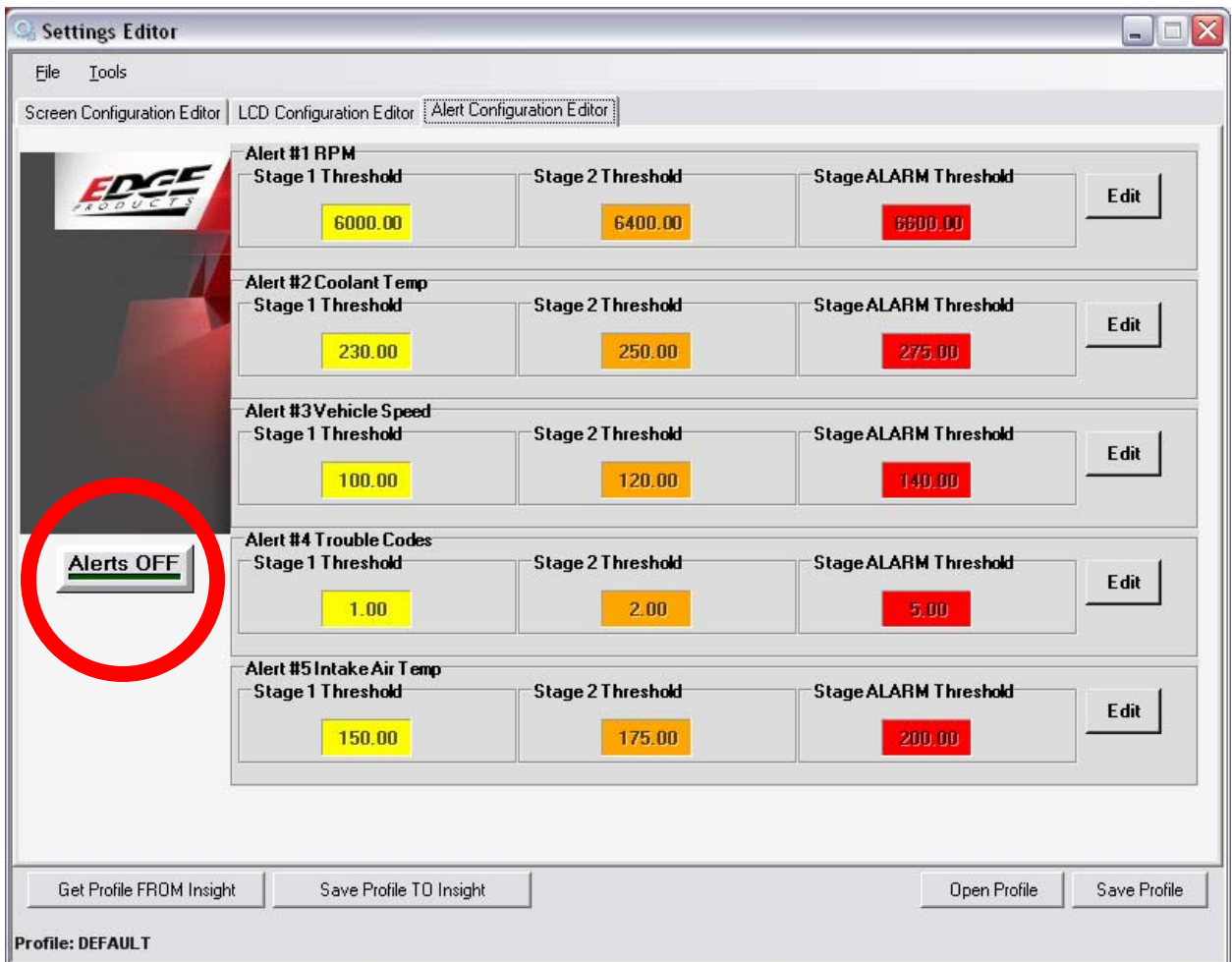


Figure 8 Alert Configuration Editor with Five Staged Alerts

Edit the Alert

- **START:**
- Click the **Edit** button to the right of the Alert of your choice. An Alert Configuration Wizard will appear and ask you to either pick **NEXT** or **CANCEL:**



Figure 9 The Alert Wizard for Alert #1 (RPM)

- Clicking **NEXT** will advance to the next step in the Wizard allowing you to choose which parameter you wish to monitor. Double **CLICK** the parameter of your choice from the “Tree” menu.

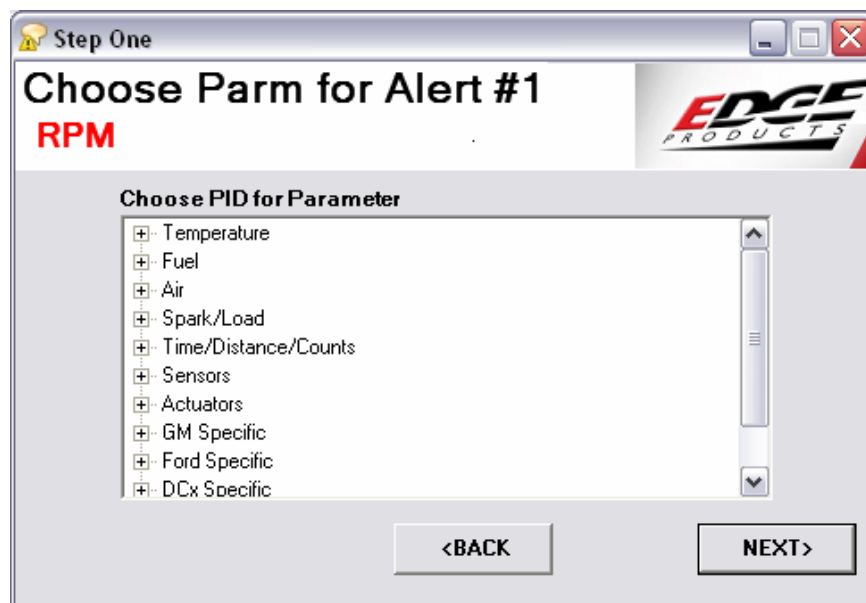


Figure 10 "Tree" menu of parameters to choose for Alert

- Clicking **NEXT** will advance you to the next step of the Wizard which will allow you to choose the color of the Alert and the threshold. When this Stage 1 Threshold is reached, the backlight of the screen will turn this color (regardless if the parameter is on the current display). This will alert you of something that needs your attention.

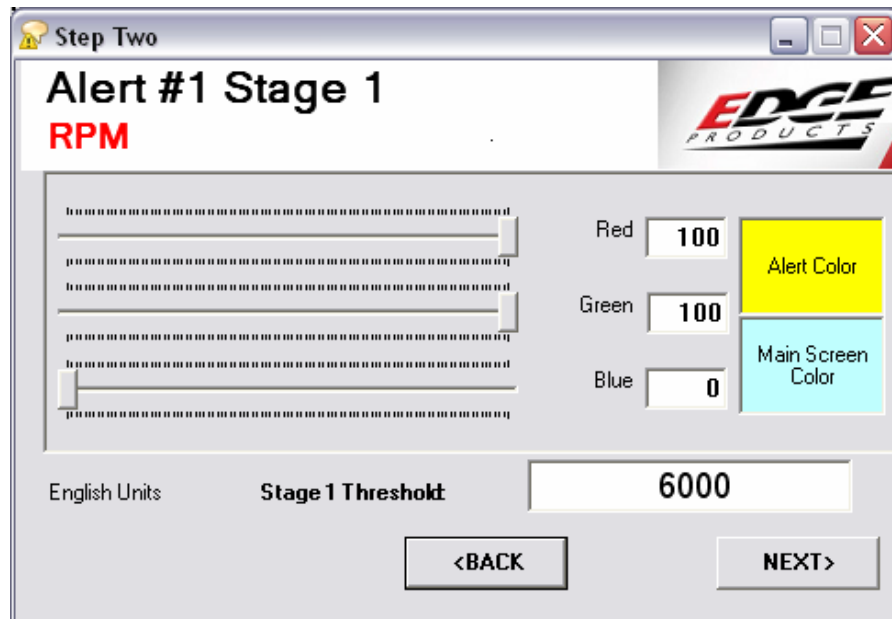


Figure 11 choose the Alert color and threshold for Stage 1 of the Alert

- Click **NEXT** to advance to the Stage 2 Alert (more urgent). Again, adjust the color and the threshold value.

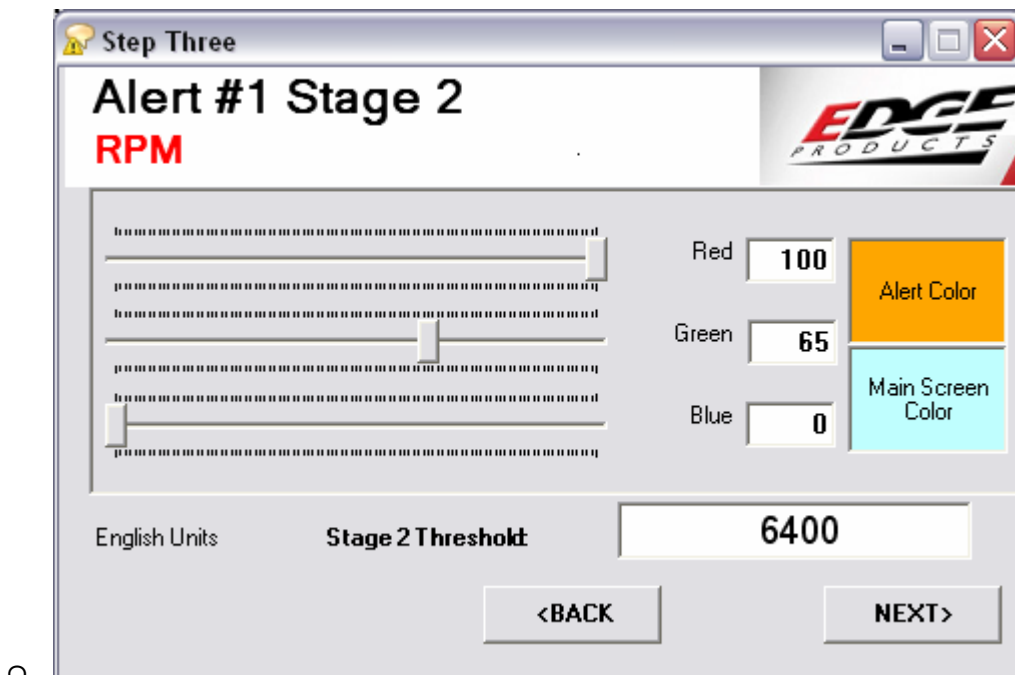
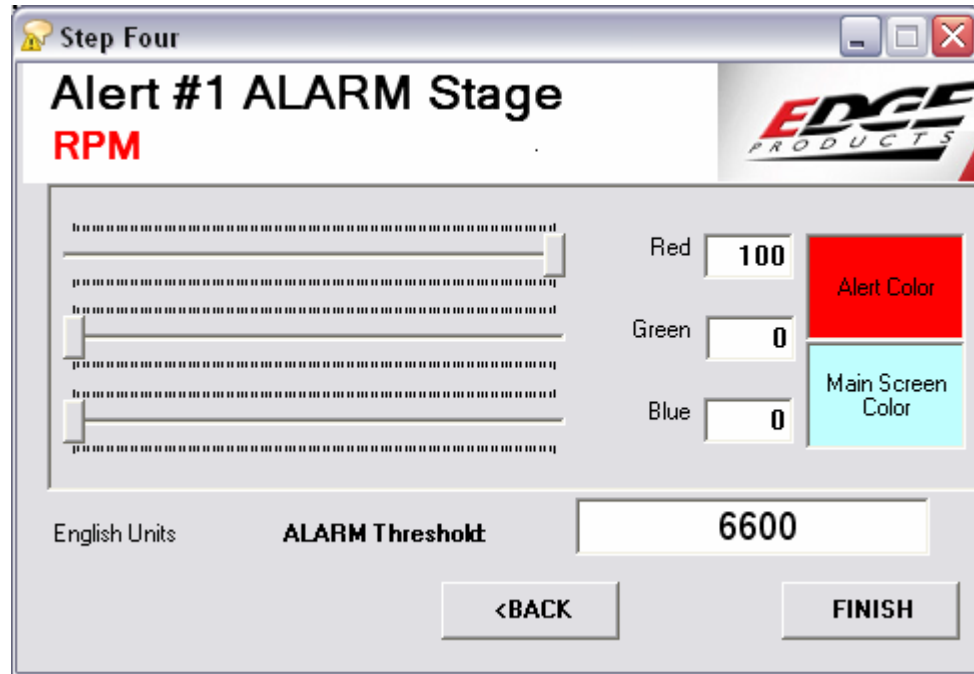


Figure 11 Choose the color and threshold for Stage 2 of the Alert

- Click **NEXT** to advance to the ALARM level of Alert. This will actually result in an audible alarm and the Insight screen will flash at you until the condition is resolved.



○ *Figure 12 Choose color and threshold for the ALARM Stage of the Alert*



▪ *Figure 13 Insight Alert/Alarm Display*

- Click **FINISH** to commit your changes. The Alert Configuration Editor will reflect your changes on the screen. The example just shown is one of a progressive “Shift Light” ... warning you as you approach redline in stages.



- **HOT TIP!** – to organize all of your Staged Alerts, it is often helpful to choose one Custom Display and set it up as a Six Function Digital display with each Alert parameter on it. This can centralize all of your Alerts for a “one glance” check of status whenever an Alert is triggered in the low or medium alert levels.

Profile Saving/Loading/DEFAULTS

- You may **SAVE** your Profile (which includes Alert settings, LCD settings, and Display settings) at any time by clicking the “**Save Profile**” button (lower/right corner) or by choosing “*File -> Save Settings Profile As*” menu.



Figure 14 Saving your Profile

- To Update the Profile to the Insight, click the “**Update Profile to Insight**” button or choose “*File->Update Settings Profile to Insight*” menu. This will send the currently displayed Profile to the Insight via the USB cable.



Figure 15 Updating the Profile on the Insight

- At any time, you can revert to the **DEFAULT** settings profile in any of the Editor Tools by choosing “*File-> Reset DEFAULTS*” menu.
- Retrieving the Insight current Profile is as easy as clicking on the “**Get Profile from Insight**” button. The settings Profile will be loaded to the current Editor Tools for saving or editing.

Chapter 4 SPECIAL GM OPTIONS

- In addition to monitoring your GM vehicle, you can also command certain special functions on SOME GM vehicles. These commands are listed below and can be found in the “GM Commands” Menu in the Diagnostic Menu on your Insight.

FAN CONTROL

- If your vehicle has electric fans, you can command the vehicle to:
 - Turn on the LOW Fan
 - Turn on the HIGH Fan
 - Turn on Fan 3 (*)
 - Turn OFF all Fans briefly (*)
 - Return Fan control to PCM (*)
- * = IF EQUIPPED

Note

If you command the fan to turn OFF, this will only be effective for 8-10 seconds before fan control reverts to the PCM to avoid overheating/damage. When you exit this menu, the Insight will revert control to the PCM automatically.

RESET FUEL TRIMS

- This command allows you to reset any learned fuel trims (Long/Short Term Fuel Trims) and will force the PCM to reset and “relearn” the trims. It is suggested that you drive the vehicle several miles in varying conditions after this is performed.

CASE Relearn

- CASE Relearn is the Crank Angle Sensor Error relearn procedure. This is necessary if:
 - A P1336 Crankshaft Position Sensor Error DTC is present
 - A brand new PCM is installed
-

- The engine crank sensor has been disassembled or replaced
- The engine balancer and/or timing chain has been removed or replaced
- This procedure is prompted with various menus on the Insight, but it is **VERY IMPORTANT THAT THESE PROCEDURES BE CAREFULLY UNDERSTOOD AND FOLLOWED CAREFULLY** or the CASE relearn may not be successful.
- These procedures are as follows:
- Be sure the engine coolant temperature is at **LEAST 158 degrees F**. The Insight will check and will not let you perform the procedure if this condition is not met.
- Set the Parking Brake and make sure the hood is closed.
- Turn the engine off for at least 10 seconds.
- **PLACE YOUR FOOT FIRMLY ON THE BRAKE**. This is **VERY** important, as the procedure will **NOT** work if you do not have the brakes firmly engaged!
- Go to the Diagnostics Menu->GM Commands->CASE Relearn menu on your Insight.
- Start the vehicle and let the idle stabilize.
- Follow the prompts on the Insight screen. When ready, hit **ENTER** to initiate the process.
- When the Insight tells you to, ***steadily*** rev the engine up to approximately 4000 RPM until you feel the engine stutter or “top out”.
- **IMMEDIATELY** back off the throttle and let it return to idle.
- Check the DTCs and see if P1336 is present. If not, then the relearn procedure is complete.

Chapter 5 Instant Fuel Economy Set Up

- Your Insight has the ability to display instant fuel economy figures while you drive. This can be very helpful in modifying your driving habits for best economy and mileage by learning which factors in your normal driving style contribute to good (and bad) fuel economy.
 - Two different parameters are available to any vehicles that support a Mass Air Flow sensor, a Vehicle Speed Sensor, a Throttle Position Sensor and an Engine Coolant Temperature Sensor. These parameters are:
 - **Fuel Economy** – this parameter indicates the instant fuel economy in either miles per gallon (MPG) or Liters per 100 kilometers (L/100km).
 - **Fuel Flow** – this parameter indicates the flow rate of the fuel in either gallons/hour (GPH) or Liters/hour (LPH).
 -
 - For accurate results, you must calibrate the Insight by doing the following:
 - With the ignition key on and the Insight in a normal display, press the MENU key
 - Choose the “Configuration” menu
 - Choose “Fuel Setup”
 - Choose “Fuel Type” and then “Gasoline”, “Diesel” or “E85”. This is important, since it affects the density and air/fuel ratio calculations for the fuel.
 - Choose “Fuel Quality” and then “High”, “Medium”, “Low”. This will slightly change observed economy figures by adjusting the density of the fuel for seasonal variations, more/less enhancers (such as ethanol, MMT, etc.), and blending for different altitudes. Feel free to play a bit with these selections to make the observed mileage fit your expectations, since the quality, density, and composition of the fuel can make significant differences.
-

Chapter 6 Special Diagnostic Modes

- In the rare instance that you need to ensure your hardware is working properly, or the vehicle you are connecting to has some "hidden" information you need for technical support, Insight has a couple of special modes you can use.

Mode 1

- This mode will try to communicate with your vehicle in several ways and then will display the results.
- **TURN THE VEHICLE KEY ON/ENGINE OFF**
- **PRESS AND HOLD** the **ENTER** key on the Insight while plugging the Insight into the vehicle.
- Release the **ENTER** key when you see:
- **VIN Number** (first portion of the VIN)
- Country of Origin
- Press **ENTER** and then you will see:
- **PIDs Supported** - list of zeros and ones that indicate supported parameters
- Press **ENTER** again and you will scroll through each supported parameter.
-

Mode 2

- Again, with **KEY ON/ENGINE OFF**, plug your Insight into the cable, while **HOLDING** the **UP** arrow key. This will make the device enter a series of hardware tests that will test your display, the communication port, and the CAN bus connection. It is normal for the "CAN failure" to show while connected to the vehicle, since the test is designed to work with a loopback plug at the factory.

Mode 3

- Again, while plugging your Insight into the cable, press the **DOWN** arrow key and it will show version information.
-

Appendix A Parameter Reference

- A list of the various parameters displayed by your Insight is as follows:

General Definitions

Status Indicators

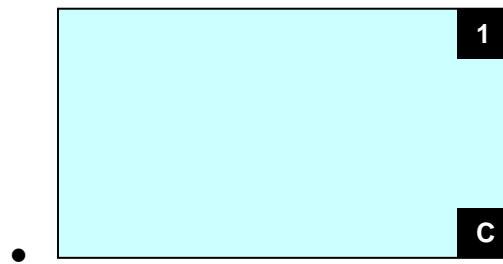


Figure 1 Insight Screen with Display Number and Fuel Status

- **Display Number** – small number in the upper right corner of all the screens
1 through 9, A, B = Display Number
D = Data Log Status Display
* = Unit is in Dim/Brightening mode
- **Fuel Status** – small letter in the bottom right corner of all the screens (except data logging).
- O = Open Loop – internal strategies and tables used with minimal sensor feedback
C = Closed Loop – all sensors used in calculations and corrections
L = Open Loop due to Load – some sensor feedback due to engine conditions (i.e. acceleration enrichment, deceleration fuel cut off, etc.)
F = Open Loop due to Failure – Open Loop due to some detected system fault
P = Closed Loop with Fault – Closed Loop with at least one Oxygen Sensor
- = Data not available at this time
U = Unknown status response

When this value is displayed on the screen or on the PC from a data log, the following values are used:

- 0 = Unknown
 - 1 = Open Loop
 - 2 = Closed Loop
 - 4 = Open Loop due to Engine Load
 - 8 = Open Loop with Fault
 - 16 = Closed Loop with Fault
-

Fuel

- **STFT B1** = Short Term Fuel Trim Bank 1. This is the fuel correction percentage being used by the closed loop fuel strategy for Bank 1 (if a V style engine or for all cylinders if an inline engine). If the fuel system is in open loop, this number will be reported as 0%
- **STFT B2** = Short Term Fuel Trim Bank 2. This is the fuel correction percentage being used by the closed loop fuel strategy for Bank 2 (if a V style engine). If the fuel system is in open loop, this number will be reported as 0%
- **LTFT B1** = Long Term Fuel Trim Bank 1 This is the fuel correction percentage that is “learned” and stored as “long term” and persists between key cycles. This correction is used in both open and closed loop for Bank 1 (if a V style engine or for all cylinders if an inline engine). If the fuel system is in open loop, this number will be reported as 0%
- **LTFT B2** = Long Term Fuel Trim Bank 2. This is the fuel correction percentage that is “learned” and stored as “long term” and persists between key cycles. This correction is used in both open and closed loop for Bank 2 (if a V style engine). If the fuel system is in open loop, this number will be reported as 0%
- **Fuel kPa** = Fuel Pressure kiloPascals. This reading is at the fuel rail and is referenced to atmosphere.
- **Fuel PSI** = Fuel Pressure Pounds per Square Inch. This reading is at the fuel rail and is referenced to atmosphere
- **FuelR kPa** = Fuel Rail Pressure. Fuel Rail Pressure referenced to manifold vacuum in kilopascals (kPa)
- **FuelR PSI** = Fuel Rail Pressure. Fuel Rail Pressure referenced to manifold vacuum in Pounds per Square Inch (PSI)
- **FuelDI kPa** = Fuel Pressure for Direct Injection. Fuel pressure referenced to atmosphere in kiloPascals. This is used for direct injection gasoline engines and Diesel engines which have very high fuel pressures.
- **FuelDI PSI** = Fuel Pressure for Direct Injection. Fuel pressure referenced to atmosphere in Pounds per Square Inch (PSI). This is used for direct injection gasoline engines and Diesel engines which have very high fuel pressures.
- **Fuel Lvl** = Fuel tank level in percent

- **Cmd EQ R** = Commanded Equivalency Ratio. Fuel systems that utilize conventional oxygen sensor shall display the commanded open loop equivalence ratio while the fuel control system is in open loop. Cmd EQ R shall indicate 1.0 while in closed loop fuel. Fuel systems that utilize wide-range/linear oxygen sensors shall display the commanded equivalence ratio in both open loop and closed loop operation. To obtain the actual A/F ratio being commanded, multiply the stoichiometric A/F ratio by the equivalence ratio.

For example, for gasoline, stoichiometric is 14.64:1 ratio. If the fuel control system was commanding an 0.95 Cmd EQ R, the commanded A/F ratio to the engine would be $14.64 * 0.95 = 13.9$ A/F

- **S Aux Wideband Fuel Trim B1** = Bank 1 OEM (Factory) Wide Band O2 Sensor Short Term Fuel Trim
- **L Aux Wideband Fuel Trim B1** = Bank 1 OEM (Factory) Wide Band O2 Sensor Long Term Fuel Trim
- **Fuel Type** = type of fuel being used for multi-fuel capable vehicles.
- **Alcohol %** = percentage of alcohol in the fuel, usually associated with “FlexFuel” designated vehicles that have a fuel density sensor.
- **Fuel Flow** = fuel flow rate in Gallons Per Hour or Liters per hour
- **Fuel Economy** = instantaneous fuel mileage in Miles Per Gallon or Liters per 100 Kilometers

Air

- **MAF G/S** = Mass Air Flow Grams/Second
- **Baro KPa** = Barometric Pressure in kiloPascals absolute
- **MAP kPa** = Manifold Absolute Pressure kiloPascals absolute
- **Boost/Vac InHg/PSI** = Manifold Pressure referenced to atmosphere. This reading incorporates calculations to display the “gauge” pressure (referenced to atmospheric) Boost/Vacuum. It will read Inches of Mercury (InHg) for vacuum and Pounds per Square Inch (PSI) for positive pressure. To be supported, the vehicle must supply both the barometric pressure (BARO) and manifold absolute pressure (MAP) parameters. The appropriate label will be displayed dynamically on the Insight (either “Boost” or “Vacuum” and the correct units “PSI” or “InHg”).

Temperature

- **IAT** = Intake Air Temperature (Fahrenheit)
- **IAT C** = Intake Air Temperature Celsius
- **AAT** = Ambient Air Temperature Fahrenheit
- **AAT C** = Ambient Air Temperature Celsius
- **ECT F** = Engine Coolant Temperature Fahrenheit
- **ECT C** = Engine Coolant Temperature Celsius

Spark/Load

- **Load** = Engine Load.
- Characteristics of LOAD are:
- Reaches 1.0 at WOT at any altitude, temperature or rpm for both naturally aspirated and boosted engines.
- Indicates percent of peak available torque.
- Linearly correlated with engine vacuum
- Often used to schedule power enrichment.
- Diesel Engines will use fuel flow in place of airflow for the above calculations.
-
- **Adv** = Spark Advance in degrees. Ignition timing advance for #1 Cylinder (not including mechanical advance, if any).
- **Abs Load** = Absolute Engine Load. The absolute load value has some different characteristics than the ENGINE LOAD defined above
- Characteristics of Abs Load are:
- Ranges from 0 to approximately 0.95 for naturally aspirated engines, 0 – 4 for boosted engines,
- Linearly correlated with engine indicated and brake torque,
- Often used to schedule spark and EGR rates,
- Peak value of Abs Load correlates with volumetric efficiency at WOT.,
- Indicates the pumping efficiency of the engine for diagnostic purposes.
-

Time/Distance/Counts

- **RunTime** = time in seconds the engine has been running. If the engine stalls, the display will not update until the engine is running again. This is reset during every key on/engine off position.
- **# Codes** = Number of Diagnostic Trouble Codes
- **MIL Dst** = distance in miles that the Malfunction Indicator Light has been ON.
- **W/U Cnt** = Number of OBD warm-up cycles since all DTCs were cleared (via Insight or possibly, a battery disconnect). A warm-up is defined in the OBD regulations to be sufficient vehicle operation such that coolant temperature rises by at least 22 °C (40 °F) from engine starting and reaches a minimum temperature of 70 °C (160 °F) (60 °C (140 °F) for diesels).
- **Clr Dst** = distance in miles since DTCs were cleared. Distance accumulated since DTCs were cleared (via Insight or possibly, a battery disconnect).
- **MIL Time** = Time that the Malfunction Indicator Light has been ON
- **Clr Time** = Time since DTCs were cleared in seconds

Sensors

- **TPS** = Throttle Position Sensor in percent. This is the relative or “learned” throttle position, scaled from 0% - 100%. TPS will display a value of 0% at the “learned” closed-throttle position.
- For example, if a 0 to 5.0 volt sensor is used (uses a 5.0 volt reference voltage), and the closed throttle position is a 1.0 volts, TPS will display $(1.0 - 1.0 / 5.0) = 0\%$ at closed throttle and 30% at 2.5 volts. Because of the closed-throttle offset, wide open throttle will usually indicate substantially less than 100%.
- **RPM** = Revolutions Per Minute
- **SPEED MPH** = Speed in miles per hour
- **SPEED KPH** = Speed in kilometers per hour
- **EVAP Pa** = Evaporative system pressure in Pascals absolute
- **O2 Sensor Operation (Primary PreCatalytic Converter)**
- The following section discusses the typical operation of a “switching” or “narrow band” O2 sensor, such as those most often employed by factory pre-catalytic converter exhaust systems.

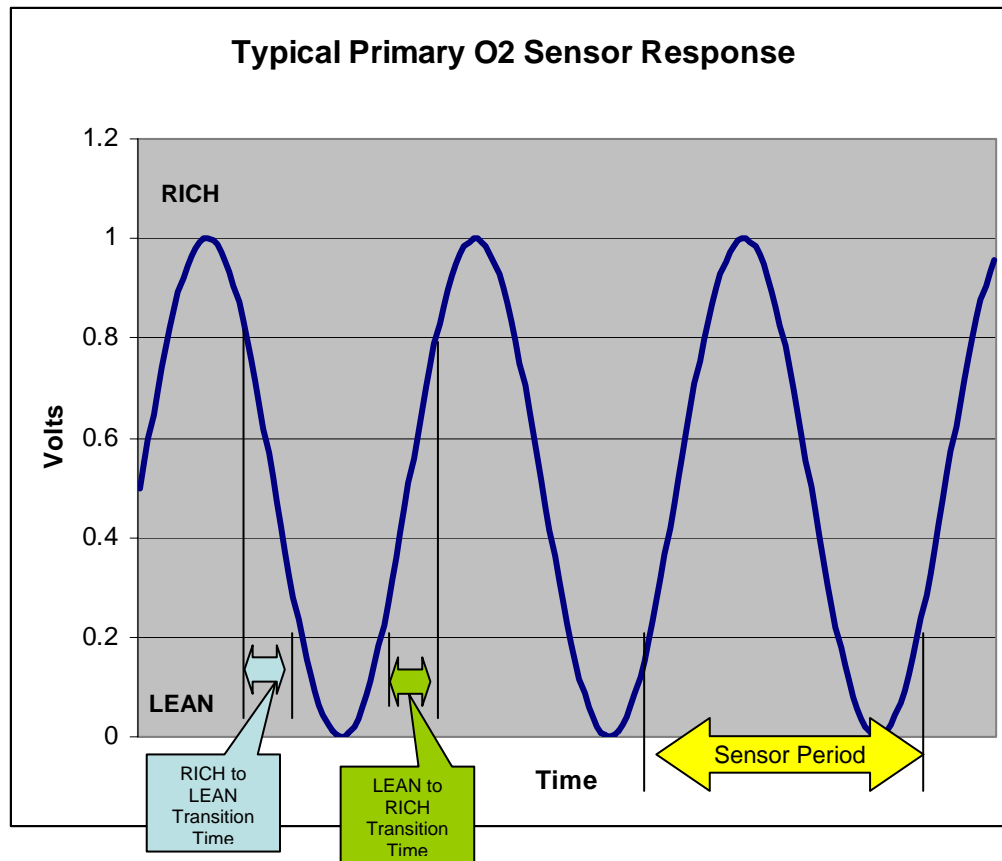


Figure 2 Typical Primary O₂ Sensor Response Graph

- The Oxygen Sensors in the “O₂ Bx Sx” parameters are called “switching” type sensors. The basic operation involves the ECU driving the air/fuel mixture rapidly from Rich to Lean (several times per second) and measuring the O₂ sensor’s response over a time period to determine the actual fuel/air mixture. This also allows the catalytic converter to function at its peak efficiency, since it needs a certain amount of unburned fuel to operate.
- In the above graphic, starting at the left, the ECU drives the mixture RICH and then starts to drive it LEAN. The BLUE arrow represents the time it takes to drive from the RICH threshold (in this example 800mv) to the LEAN threshold (in this example 200mv). *The actual thresholds and time periods will vary with sensor types, manufacturer strategies and type of fuel used.*
- The GREEN arrow represents the transition time from LEAN to RICH. The ECU strategy (in general terms) is trying to make these times approximately equal. Averaged over the SENSOR PERIOD (YELLOW arrow), this results in

a air/fuel mixture that averages as stoichiometric (which in our example, is about 500mv).

- **O2 B1 S1** = Oxygen Sensor Bank 1 Sensor 1 in millivolts
- **O2 B1 S2** = Oxygen Sensor Bank 1 Sensor 2 in millivolts
- **O2 B1 S3** = Oxygen Sensor Bank 1 Sensor 3 in millivolts
- **O2 B1 S4** = Oxygen Sensor Bank 1 Sensor 4 in millivolts
- **O2 B2 S1** = Oxygen Sensor Bank 2 Sensor 1 in millivolts
- **O2 B2 S2** = Oxygen Sensor Bank 2 Sensor 2 in millivolts
- **O2 B2 S3** = Oxygen Sensor Bank 2 Sensor 3 in millivolts
- **O2 B2 S4** = Oxygen Sensor Bank 2 Sensor 4 in millivolts
- **OEM WB O2 S1 Voltage** = Original Equipment Manufacturer (factory) Oxygen Sensor 1 in volts
- **OEM WB O2 S2 Voltage** = Original Equipment Manufacturer (factory) Oxygen Sensor 2 in volts
- **OEM WB O2 S3 Voltage** = Original Equipment Manufacturer (factory) Oxygen Sensor 3 in volts
- **OEM WB O2 S4 Voltage** = Original Equipment Manufacturer (factory) Oxygen Sensor 4 in volts
- **OEM WB O2 S5 Voltage** = Original Equipment Manufacturer (factory) Oxygen Sensor 5 in volts
- **OEM WB O2 S6 Voltage** = Original Equipment Manufacturer (factory) Oxygen Sensor 6 in volts
- **OEM WB O2 S7 Voltage** = Original Equipment Manufacturer (factory) Oxygen Sensor 7 in volts
- **OEM WB O2 S8 Voltage** = Original Equipment Manufacturer (factory) Oxygen Sensor 8 in volts
- **OEM WB O2 S1 Equivalency Ratio** = Original Equipment Manufacturer (factory) Oxygen Sensor Equivalency Ratio (-2 to +2). Note: Equiv Ratio = 1/Lambda so values >1 indicate RICH and values < 1 indicate LEAN
- **OEM WB O2 S2 Equivalency Ratio** = Original Equipment Manufacturer (factory) Oxygen Sensor Equivalency Ratio (-2 to +2).

- **OEM WB O2 S3 Equivalency Ratio** = Original Equipment Manufacturer (factory) Oxygen Sensor Equivalency Ratio (-2 to +2).
- **OEM WB O2 S4 Equivalency Ratio** = Original Equipment Manufacturer (factory) Oxygen Sensor Equivalency Ratio (-2 to +2).
- **OEM WB O2 S5 Equivalency Ratio** = Original Equipment Manufacturer (factory) Oxygen Sensor Equivalency Ratio (-2 to +2).
- **OEM WB O2 S6 Equivalency Ratio** = Original Equipment Manufacturer (factory) Oxygen Sensor Equivalency Ratio (-2 to +2).
- **OEM WB O2 S7 Equivalency Ratio** = Original Equipment Manufacturer (factory) Oxygen Sensor Equivalency Ratio (-2 to +2).
- **OEM WB O2 S8 Equivalency Ratio** = Original Equipment Manufacturer (factory) Oxygen Sensor Equivalency Ratio (-2 to +2).
- **OEM WB O2 S1 Heater Current** = Original Equipment Manufacturer (factory) Oxygen Sensor Heater Current (-128 mA to 128 mA)
- **OEM WB O2 S2 Heater Current** = Original Equipment Manufacturer (factory) Oxygen Sensor Heater Current (-128 mA to 128 mA)
- **OEM WB O2 S3 Heater Current** = Original Equipment Manufacturer (factory) Oxygen Sensor Heater Current (-128 mA to 128 mA)
- **OEM WB O2 S4 Heater Current** = Original Equipment Manufacturer (factory) Oxygen Sensor Heater Current (-128 mA to 128 mA)
- **OEM WB O2 S5 Heater Current** = Original Equipment Manufacturer (factory) Oxygen Sensor Heater Current (-128 mA to 128 mA)
- **OEM WB O2 S6 Heater Current** = Original Equipment Manufacturer (factory) Oxygen Sensor Heater Current (-128 mA to 128 mA)
- **OEM WB O2 S7 Heater Current** = Original Equipment Manufacturer (factory) Oxygen Sensor Heater Current (-128 mA to 128 mA)
- **OEM WB O2 S8 Heater Current** = Original Equipment Manufacturer (factory) Oxygen Sensor Heater Current (-128 mA to 128 mA)
- **Cat B1S1 F** = Catalytic Converter Temperature Bank 1 Sensor 1 Fahrenheit. This displays catalyst substrate temperature for a Bank 1 catalyst, if utilized by the control module strategy for OBD monitoring, or the Bank 1, Sensor 1

catalyst temperature sensor. This reading may be obtained directly from a sensor, or may be inferred by the control strategy using other sensor inputs.

- **Cat B1S2 F** = Catalytic Converter Temperature Bank 1 Sensor 2 Fahrenheit. This displays catalyst substrate temperature for a Bank 1 catalyst, if utilized by the control module strategy for OBD monitoring, or the Bank 1, Sensor 2 catalyst temperature sensor. This reading may be obtained directly from a sensor, or may be inferred by the control strategy using other sensor inputs.
- **Cat B2S1 F** = Catalytic Converter Temperature Bank 2 Sensor Fahrenheit. This displays catalyst substrate temperature for a Bank 2 catalyst, if utilized by the control module strategy for OBD monitoring, or the Bank 2, Sensor 1 catalyst temperature sensor. This reading may be obtained directly from a sensor, or may be inferred by the control strategy using other sensor inputs.
- **Cat B2S2 F** = Catalytic Converter Temperature Bank 2 Sensor 2 Fahrenheit. This displays catalyst substrate temperature for a Bank 2 catalyst, if utilized by the control module strategy for OBD monitoring, or the Bank 2, Sensor 2 catalyst temperature sensor. This reading may be obtained directly from a sensor, or may be inferred by the control strategy using other sensor inputs.
- **Cat B1S1 C** = Catalytic Converter Temperature Bank 1 Sensor 1 Celsius. This displays catalyst substrate temperature for a Bank 1 catalyst, if utilized by the control module strategy for OBD monitoring, or the Bank 1, Sensor 1 catalyst temperature sensor. This reading may be obtained directly from a sensor, or may be inferred by the control strategy using other sensor inputs.
- **Cat B1S2 C** = Catalytic Converter Temperature Bank 1 Sensor 2 Celsius. This displays catalyst substrate temperature for a Bank 1 catalyst, if utilized by the control module strategy for OBD monitoring, or the Bank 1, Sensor 2 catalyst temperature sensor. This reading may be obtained directly from a sensor, or may be inferred by the control strategy using other sensor inputs.
- **Cat B2S1 C** = Catalytic Converter Temperature Bank 2 Sensor 1 Celsius. This displays catalyst substrate temperature for a Bank 2 catalyst, if utilized by the control module strategy for OBD monitoring, or the Bank 2, Sensor 1 catalyst temperature sensor. This reading may be obtained directly from a sensor, or may be inferred by the control strategy using other sensor inputs.
- **Cat B2S2 C** = Catalytic Converter Temperature Bank 2 Sensor 2 Celsius. This displays catalyst substrate temperature for a Bank 2 catalyst, if utilized by the control module strategy for OBD monitoring, or the Bank 2, Sensor 2 catalyst

temperature sensor. This reading may be obtained directly from a sensor, or may be inferred by the control strategy using other sensor inputs.

- **Mod Volt** = Module Voltage. This is normally battery voltage less any voltage drop in the circuit between the control module and the battery.

Actuators

- **Cmd EGR** = Commanded Exhaust Gas Recirculation (EGR) percentage. If the EGR device is an on/off solenoid, it will display 0% when off and 100% when on. If the device is a stepper motor, vacuum solenoid, etc. then 0% will indicate fully closed while ranges up to 100% will indicate duty cycle or percent open.
- **Abs Thrt** = Absolute Throttle Position in percent. Absolute throttle position (not “relative” or “learned” throttle position) is displayed as a “normalized” value scaled from 0 to 100%. For example, if a 0 to 5.0 volt sensor is used (uses a 5.0 volt reference voltage), and the closed throttle position is a 1.0 volts, Abs Thrt will display $(1.0 / 5.0) = 20\%$ at closed throttle and 50% at 2.5 volts. Throttle position at idle will usually indicate greater than 0%, and throttle position at wide open throttle will usually indicate less than 100
- **EGR Err** = EGR percentage of error from commanded percentage
- **Cmd PRGE** = Commanded percentage of duty cycle for the fuel tank purge solenoid
- **Abs ThrtB** = Absolute Throttle Position B in percent. Absolute throttle position B, if utilized by the control module, (not “relative” or “learned” throttle position) is displayed as a value, scaled from 0 to 100%. For example, if a 0 to 5.0 volt sensor is used (uses a 5.0 volt reference voltage), and the closed throttle position is a 1.0 volts, Abs ThrtB will display $(1.0 / 5.0) = 20\%$ at closed throttle and 50% at 2.5 volts. Throttle position at idle will usually indicate greater than 0%, and throttle position at wide open throttle will usually indicate less than 100%.
- **Abs ThrtC** = Absolute Throttle Position Sensor C in percent. Absolute throttle position C, if utilized by the control module, (not “relative” or “learned” throttle position) is displayed as a value, scaled from 0 to 100%. For example, if a 0 to 5.0 volt sensor is used (uses a 5.0 volt reference voltage), and the closed throttle position is a 1.0 volts, Abs ThrtC will display $(1.0 / 5.0) = 20\%$ at closed throttle and 50% at 2.5 volts. Throttle position at idle will usually indicate greater than 0%, and throttle position at wide open throttle will usually indicate less than 100%.

- **Abs PedID** = Absolute Pedal Position Sensor D in percent. If utilized by the control module, (not “relative” or “learned” pedal position) will be displayed as a value, scaled from 0 to 100%. For example, if a 0 to 5.0 volt sensor is used (uses a 5.0 volt reference voltage), and the closed pedal is 1.0 volt, Abs PedID will display $(1.0 / 5.0) = 20\%$ at closed pedal and 50% at 2.5 volts. Pedal position at idle will usually indicate greater than 0%, and pedal position at wide open pedal will usually indicate less than 100%.
- **Abs PedIE** = Absolute Pedal Position Sensor E in percent. If utilized by the control module, (not “relative” or “learned” pedal position) will be displayed as a value, scaled from 0 to 100%. For example, if a 0 to 5.0 volt sensor is used (uses a 5.0 volt reference voltage), and the closed pedal is 1.0 volt, Abs PedIE will display $(1.0 / 5.0) = 20\%$ at closed pedal and 50% at 2.5 volts. Pedal position at idle will usually indicate greater than 0%, and pedal position at wide open pedal will usually indicate less than 100%.
- **Abs PedIF** = Absolute Pedal Position Sensor F in percent. If utilized by the control module, (not “relative” or “learned” pedal position) will be displayed as a value, scaled from 0 to 100%. For example, if a 0 to 5.0 volt sensor is used (uses a 5.0 volt reference voltage), and the closed pedal is 1.0 volt, Abs PedIF will display $(1.0 / 5.0) = 20\%$ at closed pedal and 50% at 2.5 volts. Pedal position at idle will usually indicate greater than 0%, and pedal position at wide open pedal will usually indicate less than 100%.
- **Cmd T Act** = Command Throttle Actuator Position in percent. These systems use a variety of methods to control the amount of throttle opening.
- If a linear or stepper motor is used, the fully closed throttle position will be displayed as 0%, the fully open throttle position will be displayed as 100%. Intermediate positions shall be displayed as a percent of the full-open throttle position.
- Any other actuation method will display 0% when the throttle is commanded closed and 100% when the throttle is commanded open.

GM Specific Parameters

Fuel

- **CmdA/F** = Command Air/Fuel Ratio (GM). Air Fuel Ratio being commanded by the ECU.
- **BLMCell** = Block Learn Multiplier Cell (GM). This indicates the current BLOCK in the fuel correction strategy being used for fuel correction.

Air

- **Calculated Vacuum** – vacuum in kPa calculated from the engine strategy
- **Calculated Airflow** – air flow calculated from the engine strategy

Spark/Load

- **TqSpkRtd** = Torque Management Spark Retard (GM). This indicates the spark retard in degrees being commanded by the Torque Management strategy. Torque Management is often used to “soften” shifts or protect components (such as the driveline or transmission) from stress.
- **CylKnk** = Cylinder that Knocked (GM). Last cylinder which reported “knock”.
- **SpkRtd** = Spark Retard (GM). Degrees of spark advance retard (subtracted from commanded timing advance).
- **AdptRtd** = Adaptive Spark Retard (GM). Degrees of “learned” retard, if supported by the vehicle.
- **Current Misfire Cyl 1** – Number of current Misfires for Cylinder 1
- **Current Misfire Cyl 2** – Number of current Misfires for Cylinder 2
- **Current Misfire Cyl 3** – Number of current Misfires for Cylinder 3
- **Current Misfire Cyl 4** – Number of current Misfires for Cylinder 4
- **Current Misfire Cyl 5** – Number of current Misfires for Cylinder 5
- **Current Misfire Cyl 6** – Number of current Misfires for Cylinder 6
- **Current Misfire Cyl 7** – Number of current Misfires for Cylinder 7
- **Current Misfire Cyl 8** – Number of current Misfires for Cylinder 8
- **Historical Misfire Cyl 1** – Historical Number of Misfires for Cylinder 1
- **Historical Misfire Cyl 2** – Historical Number of Misfires for Cylinder 2
- **Historical Misfire Cyl 3** – Historical Number of Misfires for Cylinder 3
- **Historical Misfire Cyl 4** – Historical Number of Misfires for Cylinder 4
- **Historical Misfire Cyl 5** – Historical Number of Misfires for Cylinder 5
- **Historical Misfire Cyl 6** – Historical Number of Misfires for Cylinder 6
- **Historical Misfire Cyl 7** – Historical Number of Misfires for Cylinder 7
- **Historical Misfire Cyl 8** – Historical Number of Misfires for Cylinder 8

- **Total Misfires** – total number of misfires
- **Misfire Cycles** – number of misfire cycles

Sensors

- **Oil Pressure** = Oil pressure (GM). Oil pressure as returned by the vehicle ECU (most GM vehicles). Some GM vehicles may return a value, but it may not be accurate or enabled for that platform. If the vehicle has an oil pressure switch instead of a transducer, it may return “0” when the switch is off and “1” when the switch is on.
- **Transmission Temp** – Temperature reported for Transmission Oil
- **Oil Temp** – Temperature reported for Engine Oil

Actuators

- **Pedal Rotation** – percentage of accelerator pedal rotation
- **Fan Speed** – Cooling Fan speed in RPM
- **Desired Fan Speed** – Commanded/Desired Fan Speed in RPM.
- **Fan Speed Error (%)** – Percentage of error of commanded/desired Fan Speed to Actual Fan Speed\
- **VBS Force Motor Duty Cycle (%)** – Percentage of Duty Cycle for the Transmission Force Solenoid. The Force Solenoid controls line pressure of the transmission and effects shift firmness and timing
- **VBS Force Motor Current** – Actual electrical current (in Amps) being used by the Transmission Force Motor Solenoid.
- **TCC Duty Cycle (%)** – Percentage of Duty Cycle for the Torque Converter Clutch (TCC) in the transmission. In cars that use a progressive lockup strategy (to avoid sudden jerks or engine RPM changes), this indicates the amount of lock up being applied
- **Transmission Input Shaft Speed** – Input shaft speed in RPM
- **Transmission Output Shaft Speed** - Output shaft speed in RPM
- **TCC Slip** – RPM slippage in the Torque Converter Clutch. This may go negative if the converter “overruns” the input shaft (for example, on deceleration)

- **Transmission Current Gear** – Transmission Gear as reported by the transmission controller (not the dash indicator). “1” is normally reported for Park and Reverse in most applications.
- **Transmission Last Shift Time** – time (in seconds) for the last shift
- **Transmission 1-2 Shift Time** – time (in seconds) calculated for the 1st to 2nd gear shift
- **Transmission 2-3 Shift Time** – time (in seconds) calculated for the 2nd to 3rd gear shift
- **Transmission 3-4 Shift Time** – time (in seconds) calculated for the 3rd to 4th gear shift
- **Transmission 1-2 Shift Error** – time (in seconds) of error for the last 1st to 2nd gear shift
- **Transmission 2-3 Shift Error** – time (in seconds) of error for the last 2nd to 3rd gear shift
- **Transmission 3-4 Shift Error** – time (in seconds) of error for the last 3rd to 4th gear shift
- **Inj PW 1** – Injector Pulse Width for Bank #1
- **Inj PW 2** – Injector Pulse Width for Bank #2
- **Cylinder Deactivated** – Status of the Displacement on Demand cylinder deactivation
- **DoD Distance Activated** – Displacement on Demand (DoD) distance activated
- **DoD Distance Deactivated** – Displacement on Demand (DoD) distance deactivated

Ford Specific Parameters

Air

- **EGT** = Exhaust Gas Temperature
- **EGT B1S1** = Exhaust Gas Temperature Bank 1 Sensor 1
- **EGT B1S2** = Exhaust Gas Temperature Bank 1 Sensor 2
- **EGT B1S3** = Exhaust Gas Temperature Bank 1 Sensor 3
- **EGR S1** = Exhaust Gas Recirculation Sensor 1

- **EGR S1** = Exhaust Gas Recirculation Sensor 2
- **Boost(g)** = Manifold Boost Pressure (gauge ... i.e. Boost/Vacuum)
- **Back Press** = Diesel Exhaust Back Pressure

Fuel

- **Fuel PSI** = Fuel Rail Pressure
- **Diesel FP** = Diesel Fuel Pressure
- **Inj PW** = Injector Pulse Width (milliseconds)

Spark/Load

Sensors

- **EngOilTemp** = Engine Oil Temperature
- **TOT** = Transmission Oil Temperature
- **HeadTemp** = Cylinder Head Temperature
- **DTSlip** = Amount to RPM slippage across the torque converter
- **Diesel TQ** = Diesel Torque
- **TQ Net** = Diesel Torque Net
- **Trans T** = Transmission Temperature
- **Knk S1** = Knock Sensor 1
- **Knk S2** = Knock Sensor 2
- **Shft Spd** = Transmission Input Shaft Speed
- **T Line** = Transmission Line Pressure
- **Press Ctl** = Transmission Control Pressure
- **Outshft Spd** = Transmission Output Shaft Speed
- **Shft Time** = Transmission Shift Time
- **TCC DC %** = Transmission Torque Converter Clutch Duty Cycle percentage
- **TCC Rat** = Transmission Torque Converter Ratio (Input speed/output speed)
- **TFT V** = Transmission Temperature Sensor Volts
- **PRNDL2** = Transmission selector position
- **PRNDL** = Transmission selector position

- **TQ Slip** = Transmission Torque Converter Slippage
- **TQ Des Slip** = Transmission Torque Converter Desired Slippage
- **Turbine Spd** = Transmission Turbine Speed (RPM)

Actuators

- **AccelPos** = Accelerator Pedal Position
- **Cmd Gear** = Transmission Commanded Gear
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DCx (Chrysler, Jeep, Dodge) Specific Parameters

NOTE:

Due to the way DCx vehicles vary parameters and values across years/platforms, you may see parameters in the categories that might not apply to your vehicle, EVEN THOUGH IT SHOWS UP IN THE “Pick List”. You can usually quickly identify these by the values returned. Some applications may return a response (i.e. Fuel Level or Knock Sensor) that may be supported, but returns incorrect values.

Air

- **Trk Soot** = Truck Soot Filter Pressure (Diesel)
- **Trk Turbo** = Truck turbocharger speed in RPM (Diesel)
- **Trk Turbo Out** = Truck turbocharger compressor output temperature (Diesel)
- **Trk Turbo In** = Truck turbocharger compressor input temperature (Diesel)

Fuel

- **Fuel Level** = Fuel Tank Level in % for DCx specific vehicles since SAE Fuel Level is not correct
- **Tot Time D** = Total run time (Diesel)
- **Tot Idle Time** = Total idle time (Diesel)
- **Trk Rail Press** = Truck Fuel Rail Pressure

Spark/Load

- **KS1Volts** = Knock Sensor 1 Voltage
- **KS2Volts** = Knock Sensor 2 Voltage

- **KnkRtd** = Knock Retard in degrees

Sensors

- **MDS Stat** = Multiple Displacement System Status Active or InActive
- **Oil Pressure** = Oil Pressure from the PCM
- **Input Speed 1** = Input shaft sensor 1 (transmission) in RPM
- **Input Speed 2** = Input shaft sensor 2 (transmission) in RPM
- **Output Speed** = Output shaft speed (transmission) in RPM
- **Turbine Speed** = Transmission Turbine Speed in RPM
- **Trans Temp** = Transmission Temperature
- **Trk Out Shft** = Output Shaft Speed (Diesel)
- **Trk Trans Tmp** = Transmission Temperature
- **Trk TC Tmp** = Transmission torque converter temperature (Diesel)
- **Trk TQ Lmt** = Transmission torque Limit (Diesel)

Actuators

- **Throttle Blade Position** = actual throttle blade position in %
- **Current Gear** = Current transmission gear
- **Target Gear** = targeted transmission gear during operation, may differ significantly from current gear depending on operating conditions, engine load, speeds, etc.
- **Trk Gear** = Current Gear (Diesel)
- **Trk Tgt Gr** = Target Gear (Diesel)

