InterACQ for Windows
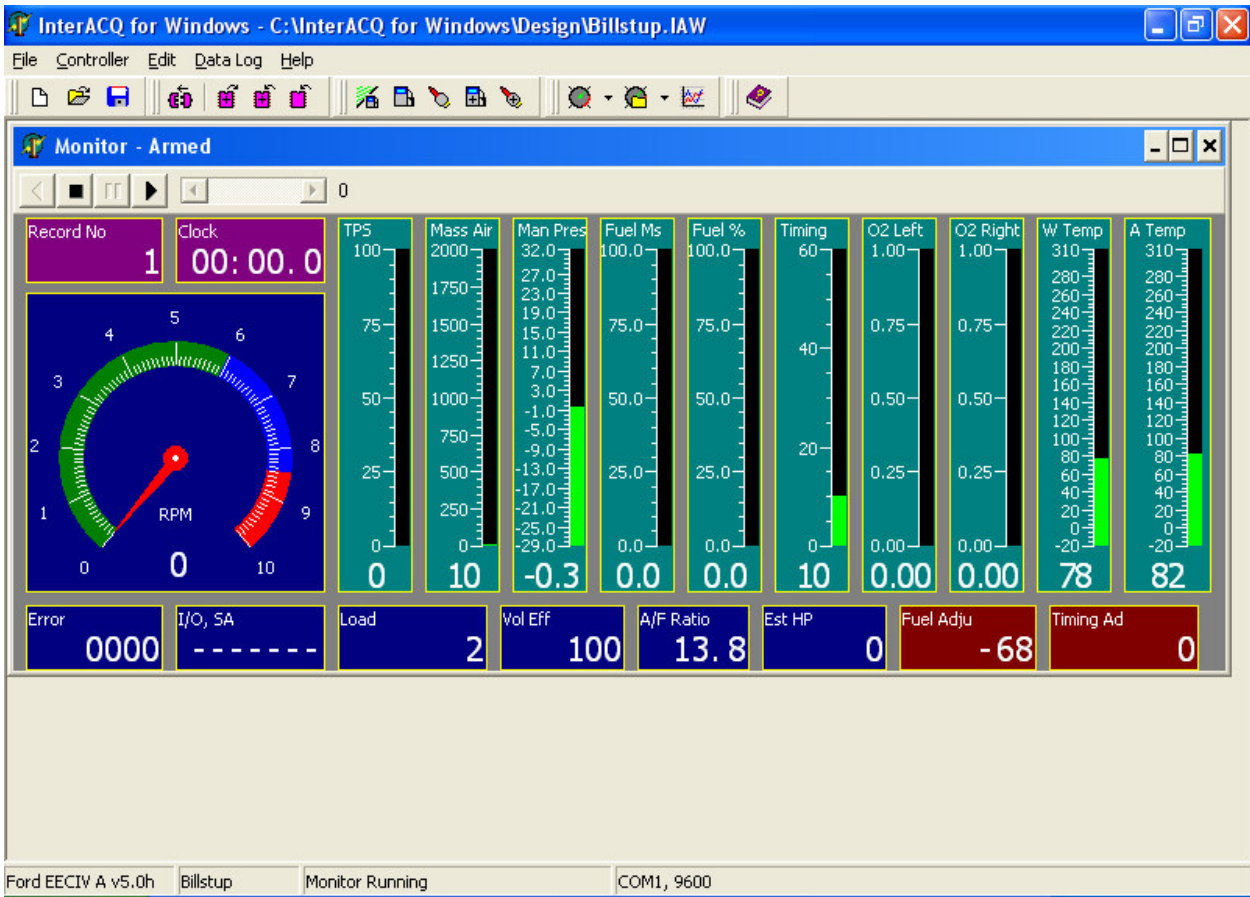
User's Guide

Plus 1 Micro   •   P.O. Box 1781   •   Lawrenceville, GA 30046

LIABILITY RELEASE / LIMITED WARRANTY

WARNING:
THIS PRODUCT IS INTENDED FOR OFF ROAD USE ONLY. INSTALLATION ON A VEHICLE USED ON PUBLIC ROADS MAY VIOLATE UNITED STATES, CANADIAN, OR STATE LAWS REGARDING POLLUTION CONTROL REQUIREMENTS. CHECK LOCAL LAWS AND REGULATIONS IN YOUR AREA. IN ADDITION, THE INSTALLATION OF THIS PRODUCT MAY AFFECT OR VOID THE WARRANTY COVERAGE ON YOUR VEHICLE.

PLUS 1 MICRO, INC. warrants the media on which the Product is recorded to be free of defects in parts or workmanship for a period of six (6) months. PLUS 1 MICRO, INC. does not warrant that the Product will be error free, nor that all program errors will be corrected. In addition PLUS 1 MICRO, INC. makes no warranties if the failure of the Product results from accident, abuse or misapplication. All warranties will be void if the Product is abused, altered, damaged, improperly installed, or rendered unserviceable due to malfunction of equipment, negligence, or by any other cause within the control of the BUYER. PLUS 1 MICRO, INC. makes no specific claims of engine performance increase. This is a LIMITED WARRANTY and is the ONLY warranty made by PLUS 1 MICRO, INC. or agents thereof. The BUYER receives no other warranty expressed or implied, and there are expressly excluded all warranties of merchantability and fitness for a particular purpose. PLUS 1 MICRO, INC. shall have no liability with respect to its obligations under this agreement for consequential, exemplary, incidental damages including, but not limited to, lost profits. PLUS 1 MICRO, INC.'s liability for any damages to BUYER or any other party shall in no event exceed the amount paid by the BUYER for the PRODUCT, regardless of the form of the claim. Some states do not allow the exclusion or limitations of incidental or consequential damages, so these limitations and exclusions may not apply to you. PLUS 1 MICRO, INC grants to the Buyer one License, a nonexclusive license to use the PRODUCT on only one hardware system (that is a system containing no more than one central processing unit) at a time.

NOTE: This Warranty and License is NOT TRANSFERRABLE. This License permits one (1) copy of the InterACQ program to be registered with one (1) PMS.

Completing the Registration states that you have read the above warranty and warnings and acknowledge and agree to the said requirements.

Registration Information

When the program is first installed it is configured with a temporary Trial Registration. This period lasts 20 days and starts when you first connect to the **PMS**. At this time, a special 4 character PMS Code is generated. Together with the Serial Number and UnLock Key, this information must be submitted to Plus 1 Micro, Inc. (or authorized agent) to receive the final Registration Code. (This will also activate the Warranty period). During the Trial Registration period, you will be reminded on occasion to submit the registration information. In addition, some features of the program are disabled during the Trial period. In addition to receiving your Final Registration Code, you will be eligible for Technical support and software upgrades for a period stated in the Liability and Warranty.

Warning - If at the end of the Trial period you have not received the Final Registration, you will not be able to Connect to the **PMS**.

A preprinted Registration form is included with the CD. You may either use this form to submit you registration (fill in the appropriate fields), or the program can print one with known data fields already fill in. There are numerous methods you can use to submit the Registration:

Mail:
>
> **Plus 1 Micro, Inc**.
> PO Box 1781
> Lawrenceville, GA
> 30046

FAX:
>
> 770-513-1583

email:
>
> plus1m@mindspring.com

InterACQ for Windows - Table of Contents

Introduction

InterACQ for Windows, programs created by **Plus 1 Micro, Inc**., greatly enhances the usefulness of the **EFI Systems, Inc**. Programmable Management System (**PMS**) by allowing the user to tailor it to a variety of uses and situations unavailable when using only the PMS hand held data terminal.

InterACQ for Windows is provided as is. By purchasing and using this product the purchaser is doing so entirely at their own risk. **Plus 1 Micro, Inc**. advises that serious engine damage is possible if this product is improperly used, and **Plus 1 Micro, Inc**. accepts no liability, written or implied, in providing this product for your use. Always exercise caution when using the **PMS** and **InterACQ for Windows**. If in doubt, consult someone with expert tuning knowledge. Doing so will always lead to the best performance and safety outcome.

This software is designed to work exclusively with the **PMS** from **EFI Systems, Inc**. If you have purchased this software separately from the PMS, at a later date, it may be necessary to update the EPROM code and/or hardware in the **PMS** Controller. Contact **EFI Systems, Inc**., to inquire.

InterACQ provides a comprehensive **PMS** editing and tuning tool. Throughout this manual, differences between the two programs will be noted as needed.

InterACQ for Windows is a comprehensive editing and tuning tool for the **PMS**. It has extensive Adjust Table edit capabilities, as well as the ability to configure the **PMS** to be a partial Stand Alone engine control system. In addition, **InterACQ** provides robust Data Acquisition and Graphing.

General System Requirements:

This product is designed to run on a computer with the following minimum system requirements:

Computer Type:	IBM-Compatible Personal Computer (PC)
Processor:	80486DX4 / 100mhz or higher
Memory:	16 megabytes minimum. Additional memory is **highly** recommended to improve data acquisition performance
Operating System:	Windows 95, Windows 98, Windows 2000 or Windows XP
Disk Space:	Minimum 10 megabytes (for the application). (Please allow ample space for acquisition data.)

Monitor:	Color VGA or higher
Mouse:	Standard mouse or other pointing device
Ports:	Minimum of one (1) unused standard 9-pin Serial Port

> **Note:** The use of USB serial ports is supported only with the use of Radio Shack Part # 26-183 or IOGear Part #GUC232A at this time. Other equivalent adapters may also work, but have not yet been tested.

Installation

Software Installation

The software installs from the program CD into the user specified hard drive directory.

1. Insert CD into CD-ROM Drive
2. The Install program should start automatically, if it does, skip to step 7
3. Click Start on the Windows Taskbar, then click Run.
4. Click Browse, and select the CD ROM Drive (mostly D)
5. Select IAWSetup.EXE.
6. Click OK, and Click Run.
7. Follow the on-screen instructions.

Vehicle Installation / Registration

For situations requiring the EPROM in the PMS to be changed, see the attached sheets.

1. Plug the 9 pin cable from the purple PMS Controller box to an unused standard 9-pin serial COM port on your PC or to an unused USB port using one of the USB adapters listed above.
2. Turn on the ignition in your car, but **DO NOT START THE ENGINE**.
3. Start the **InterACQ for Windows** program by double clicking on its icon.
4. Click the Connect button (If Connect fails, verify correct COM port in the Edit, PC/Preferences Menu)
5. Follow the on-screen instructions to complete the installation / registration.

Note: During the vehicle installation / registration process, the original factory PMS EEPROM data will be saved to a file on your PC. The EEPROM data file will have an .E2P file extension and will be saved to the main directory you selected for the installation of the InterACQ software. It is **highly** recommended that you do not delete or alter this file. You may use this file and the **Copy EEPROM From File** command described on page 54, to reload the original factory data in the PMS, if necessary.

Main Window

This section shows the layout of the main window of **InterACQ for Windows** and the menus and submenus related to it. Specific information about how to use the menu and submenu items is included under **"Basic Operation"** (beginning page 14) and **"Advanced Features"** (beginning page 28).
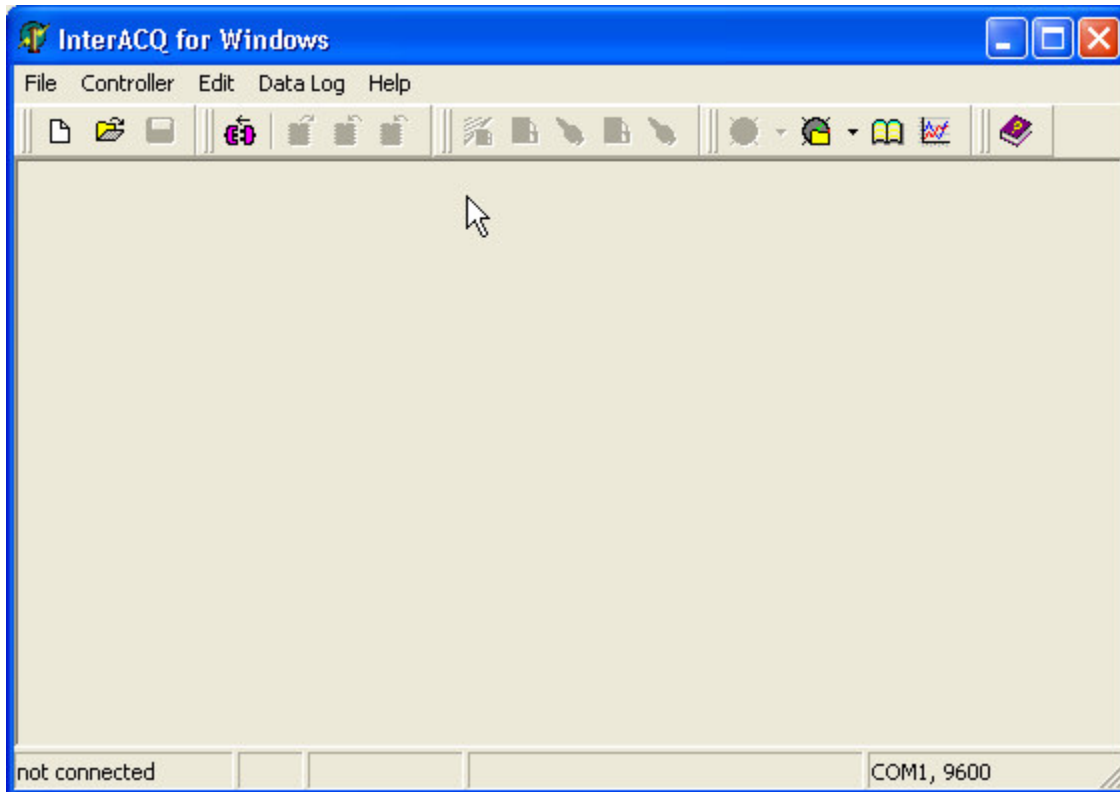
The **InterACQ for Windows** main window provides access to the Top Level Menus as the normal Windows functions of opening and closing the window, sizing the window, etc.

The menu selections are **File, Controller, Edit, Data Log**, and **Help**, which are described in detail below. Some of the functions will not be available (grayed out) unless there is a live connection to the PMS and/or a Design File is open. The status line at the bottom of the main window will display the connection status, com port and baud rate.

File Menu

The **File Menu** gives you access to the following tasks:
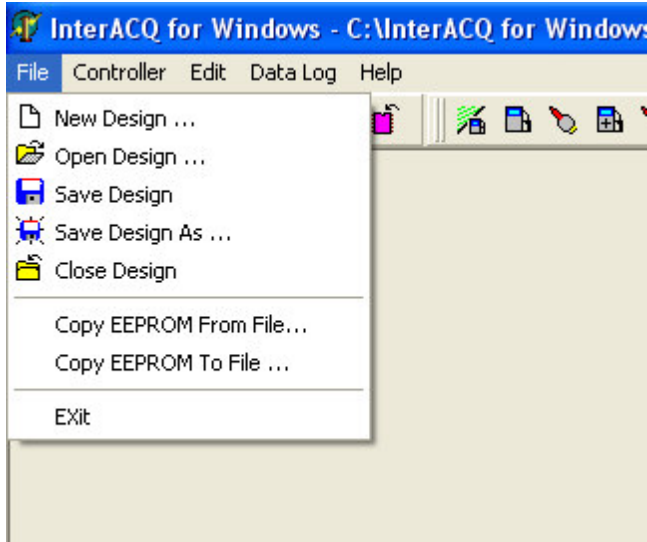
New Design - Clears all tables, parameters, and data to get ready for a new Design. If another design is currently loaded, you are prompted to save it first.

Open Design - Select **Open** to load a previously saved Design.

Save Design / **Save As** - The current Design is saved in a file on your PC's hard drive. If a file name has not been specified, you will be prompted for one. The Design will also be saved each time you Update Input Tables. **Save As** always prompts for a new file name.

Close Design - Closes the current Design. If any changes have been made, you will be prompted to save it first.

Copy EEPROM From File - This command allows you to load the entire contents of the EEPROM in the PMS from a file previously saved on your PC, including all Adjust Tables and Stand Alone Fuel and Timing Data.

> **Note:** During the vehicle installation / registration process, the original factory PMS EEPROM data will be saved to a file on your PC. The EEPROM data file will have an "E2P" file extension and will be saved to the main directory you selected for the installation of the **InterACQ** software. It is **highly** recommended that you do not delete or alter this file. You may use this file and the **Copy EEPROM From File** command, to restore the original factory data in the PMS, if necessary.

Copy EEPROM To File - This command makes a copy of the contents of the entire EEPROM in the PMS to a file on your PC, including all Adjust Tables and Stand Alone Fuel and Timing Data.

> **Note:** Only the Input tables stored in the EEPROM are included - not the entire Design; the Design file is stored in a separate file on your PC using the **Save Design** and **Save Design As** commands described above. Also, this is the only method to save Adjust Tables stored in the PMS onto your PC.

Exit - Closes the **InterACQ** program. If any Design has not been saved, you will be prompted to do so first.

Controller Menu

The **Controller Menu** gives you access to the following tasks related to the PMS Controller.
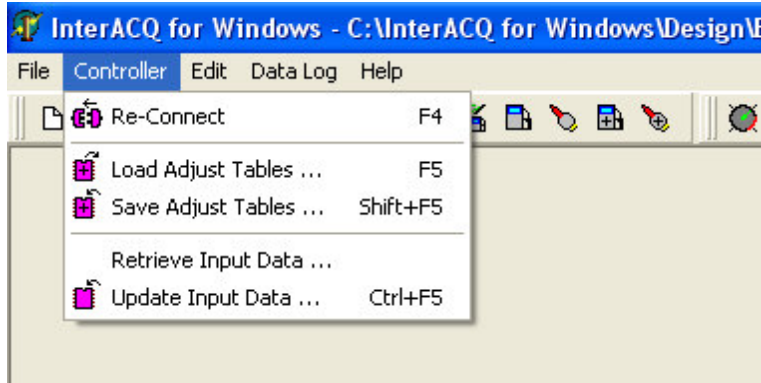
Connect or Re-Connect - Use this menu selection, the F4 key or the "**Connect**" button on the tool bar to initiate (or re-initiate) the process of connecting InterACQ to the PMS Controller.

Load Adjust Tables - Use this menu selection, the F5 key or the "**Load Adjust Tables**" button on the toolbar to copy the current Adjust Table Data Set from the EEPROM in the PMS to the RAM on your PC. The data is copied to the PC so that you can use the InterACQ software to make changes to the Adjust Tables. This screen allows you to select the Adjust Table Data Set that you want to edit and have the PMS use.

Save Adjust Tables - Use this menu selection, the Shift+F5 key or the "**Save Adjust Tables**" button on the toolbar to save the current Adjust Table Data Set in the RAM on your PC back to the EEPROM in the PMS. This screen allows you to save the Adjust Table Data Set you have been editing to the Adjust Table Data Set location of your choice (1, 2 or 3) in the PMS. **Note:** Any changes made to the Adjust Tables with the InterACQ software will be lost when the program is closed if they are not first saved to the PMS.

Retrieve Input Data - Use this menu selection to copy the Fuel and Ignition Stand Alone Input tables from the EEPROM in the PMS to your PC. These are the part of the Design data that the PMS Controller uses as Input signals to replace the stock ECM Input signals.

Update Input Data - Use this menu selection, the Ctrl+F5 key or the "**Update Input Data**" button on the toolbar to copy the Fuel and Ignition Stand Alone Input tables created or modified with the InterACQ software from your PC to the EEPROM in the PMS Controller.

> **Note:** Any changes made to the Input Tables with the InterACQ software will be lost when the program is closed unless they are either saved as part of a Design File on your PC or saved using this command to the PMS. Also note that using this command will write over the original factory PMS Stand Alone (fuel and timing) data.

Edit Menu

The **Edit Menu** gives you access to the following tasks:
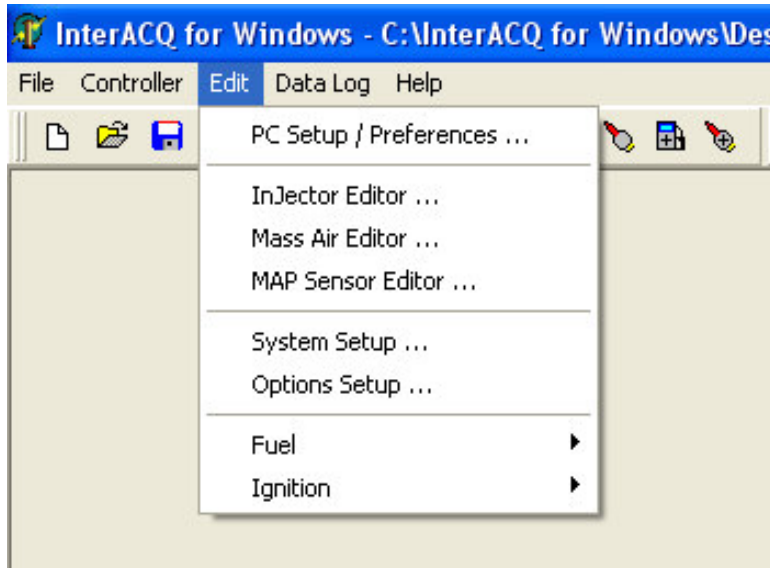
PC Setup / **Preferences -** This menu selection brings up a screen which allows you to set up parameters specific to your hardware or personal preferences. This screen contains four tabs labeled **Forms & Menus**, **Monitor**, **COM Setup**, and **Export**.

Injector Editor - This menu selection allows you to define and edit the parameters for the injectors you are using. For information on using this screen see page 37.

Mass Air Editor - This menu selection allows you to define and edit the parameters for the Mass Air meter you are using. For information on using this screen see page 38.

MAP Sensor Editor - This menu selection allows you to define and edit the parameters for the MAP sensor you are using. For information on using this screen see page 39.

System Setup - This menu selection allows you to set up parameters specific to your vehicle. Normally the information in this form has already been determined by software and/or the PMS Controller during initial setup via the PMS hand held terminal. For information on using this screen see page 17.

Options Setup - This menu selection allows access to the options that are available for each Data Set. Not all options are supported for each vehicle type and are indicated thus by being disabled (grayed out). For information on using this screen see page 28.

Fuel - Slide the mouse over the "arrow" to see the following sub-menu selections

Fuel Input Submenus - There are three submenu selections under the Fuel Input submenu screen. They are:
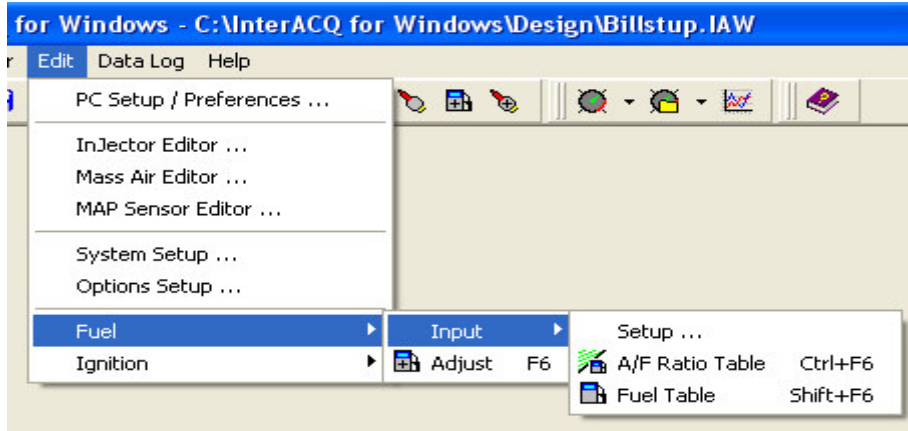
Setup - Selecting this submenu item will bring up a screen allowing you to create a Stand Alone Fuel Input table to replace the default Fuel Input table in the PMS. (For information on using this screen see page 34.)
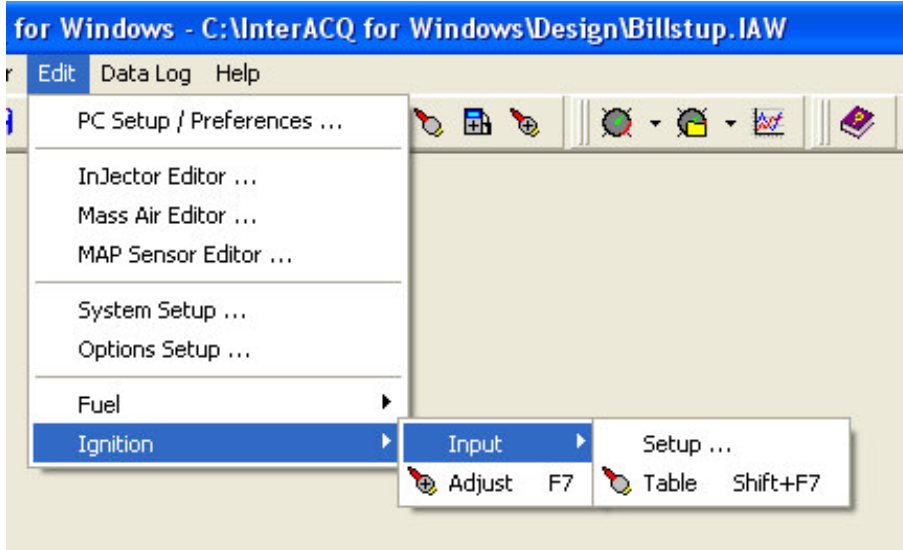
A/F Ratio Table - Selecting this submenu item will bring up an Air/Fuel Ratio table created with the **Fuel Input Setup** submenu item. You can use this screen to view or customize the table. This table is used for the creation of a Stand Alone Fuel Input table, described below. (For information on using this screen, see page 35.)

Fuel Table – Selecting this submenu item will bring up a Stand Alone Fuel Input table created with the **Fuel Input Setup** submenu item. This table is linked to the Air/Fuel Ratio Table described above. (For information on using this screen, see page 36.)

Fuel Adjust Submenu - Selecting this menu item will bring up the Fuel Adjust Table screen. (For information on using this screen, see page 18)

Ignition - As in the Fuel selections, slide the mouse over the "arrow" to see the following submenu selections:

Ignition Input Submenus - There are two submenu selections under the Ignition Input submenu screen. They are:

Setup - Selecting this submenu item will bring up a screen allowing you to create a Stand Alone Ignition table to replace the default Ignition Input tabe in the PMS. (For information on using this screen see page 34.)

Table – Selecting this submenu item will bring up a Stand Alone Ignition Input table created with the **Ignition Input Setup** submenu item. You can use this screen to view or customize the table. (For more information on using this screen see page 35.)

Ignition Adjust Tables - Selecting this menu item brings up the Ignition Adjust Table. (For information on using this screen see page 18.)

Data Log Menu

The **InterACQ Data Log** menu allows you to graphically view your engine's performance in "real time," or to record the performance for later review. Data graphically displayed includes engine RPM, ignition timing, fuel percentage, engine load, volumetric efficiency, and up to 8 customizable analog Inputs. The Data Log Menu submenus are:
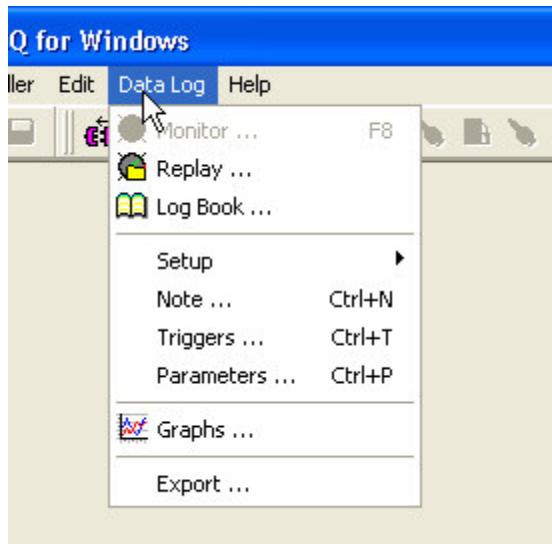
Monitor - This window contains a complete array of visual controls allowing you to see engine performance data in real time. However, the real power of the Monitor feature lies in its ability to:

A.   Exist on-screen while you make changes to the engine's control parameters from other menus. This enables you to tune the engine to your exact specifications, while immediately observing the results of your adjustments.

B.   Record and playback almost an hour of engine data, with complete control over Triggers criteria and replay speed and direction (Trace mode).

C. Save the monitor data for review or comparisons at a later date (Replay).

Replay - This selection loads previously saved Monitor Data Files for further review in the exact same format as the Monitor form.

Log Book – Opens a list of recent saved Monitor Log data (DAB) files for review.

Setup – This menu item contains three submenu items. The submenu items are:
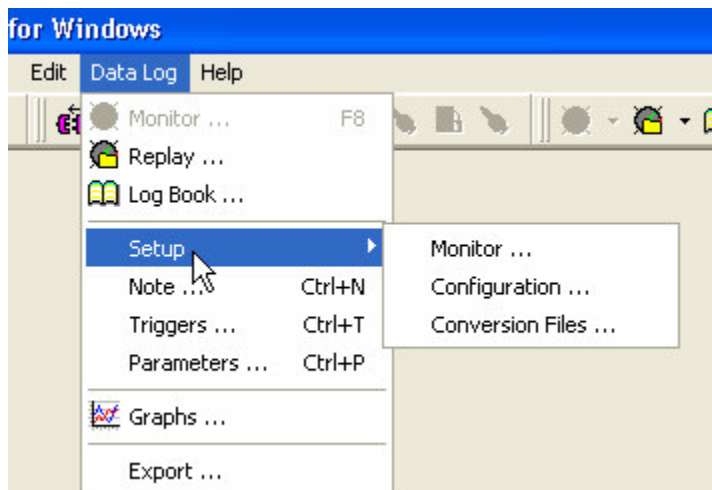
**Monitor –**The Monitor Setup menu selection will allow you to customize the look and feel of the Monitors. The program includes a Default graphical Monitor and a Text Monitor. Either of these Monitor forms can be edited or you can create a fresh Monitor design. For more information on how to use this function, see page 45.

Configuration –This menu function allows you access to the form which

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tells "how" the data gets from the PMS hardware to the software. For information on how to use this function, see page 46.

Conversion Files –This menu function allows you to edit the conversion files used by InterACQ when reading the data stream from the PMS, and is used in conjunction with the **Configuration** menu item. This function can be useful if you are using non-stock engine sensors and need to calibrate them for use with the program. For information on how to use this function, see page 45.

Notes – This option allows you to set the default text notes that are saved with each Monitor Data log (DAB) file. You can edit each note individually either from the Monitor Screens, or in the Log Book.
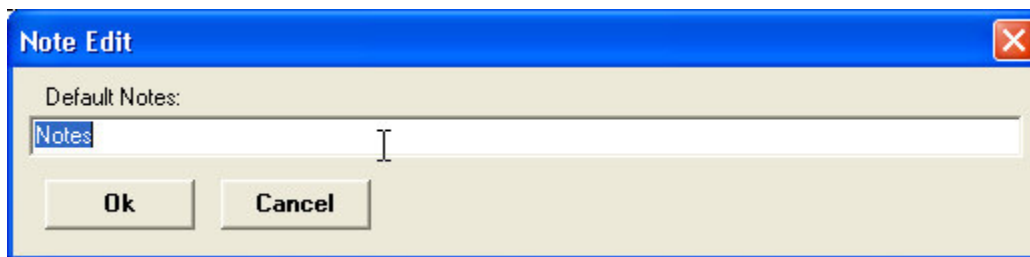

Triggers –This option allows you to select the RPM and Throttle Positions at which the Monitor will start and stop recording automatically. For the Triggers to function correctly, however, the Monitor must be open and Armed. Additionally, the TPS On and Off settings must be greater than zero. The Triggers may be set with either the On settings being greater than the Off settings or vice versa. For information on the use of the Monitor for capturing data, see page 25.

Parameters –This option allows you to speed and manner in which the Review and Playback of captured Monitor data will be displayed. For information on the use of the Monitor for replaying captured data, see page 26.

Graphs - This option will allow you to compare the data collected on multiple runs in an X/Y graphical mode. For information on using this screen see page 52.

Export - This function allows you to export data saved in the program's native "DAB" format to a "TXT" file that can be used by spreadsheet or database programs to allow for a much more thorough examination and analysis of captured data. The output file will contain several additional columns of information not usually seen on the Monitor replay.
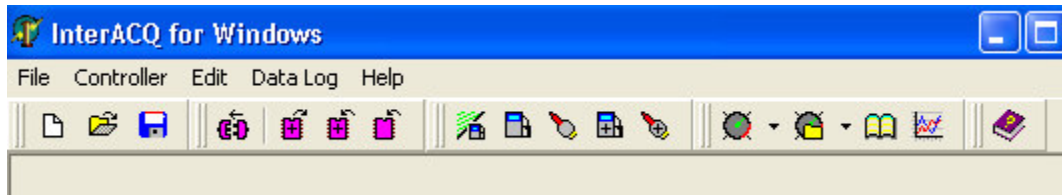
Help Menu
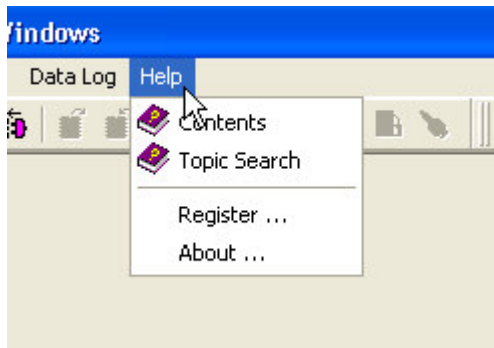
Contents - Displays the Contents Page of Help, allowing you to address the Help topics byname.

Topic Search - Displays the Search Dialog of Help, allowing you to search by topic.

Register - Allows you to edit Registration information.

About - Displays the registered user's name, along with the program version and date.

Tool Bar/Speed Buttons

Along the top of the main screen are some speed buttons with pictures (glyphs). These are short-cuts for some of the more commonly used menu functions. The easiest way to discover what each button does is to hold the mouse cursor over the button for a few seconds *without clicking*. The Tool Bar is divided into 5 goups, each corresponding to the 5 main Menu Topics. Each group can be moved or arranged as you desire. As you move the cursor A small hint box will appear describing the function of the button. Two of the buttons (Monitor and PlayBack) have a small down arrow next to them. When you click on these, a Popup Menu appears. The items in the Popup Menu are the three current Monitor Screens available that are selected in **PC Setup/Preferences.**

Status Bar

Along the bottom of the screen is the Status Bar. This is where information is displayed to reflect the current of the operation or state of the program. The Status Bar is divided into 4 sections or panels. The first shows the PMS model when connected. The second panel shows the Design file name, once it's been saved on the hard drive. If the

Design has not been saved, or one not found when the PMS connects, then a "*" is displayed. The third panel displays various operational messages. The fourth panel doubles as a second message display area, and also as progress meter when lengthy I/O is required between InterACQ and the PMS. When the progress meter is active, another speed button appear on the far right. This buttons serves to cancel the given operation.

Short Cut Keys

Also a new feature with Version 3 is the ability to access the common PMS actions with just the function keys, and not to have to worry about the mouse and clicking.

|	
F4	Connect
F5	Load Adjust Tables
Shift-F5	Save Adjust Tables
Ctrl-F5	Update Input Tables
F8	Monitor
Ctrl-N	Monitor Notes
Ctrl-T	Trigger Setup
Ctrl-P	Monitor Review Parameters

Monitor Actions:

|	
F12	Run/Arm/Record
F11	Stop
F10	Pause
F9	Reset (and save)

Basic Operation

This section is to acquaint you with the basics of using **InterACQ for Windows**. It will take you through the steps of starting up the program, establishing a connection with the PMS, making changes to the Adjust Tables (the same adjustments you can make via the PMS's own hand held data terminal), and saving those changes. It also includes a brief explanation for using the Monitor/Data Acquisition features of the program. More advanced uses of **InterACQ for Windows** are covered under **Advanced Features, page 28.)**
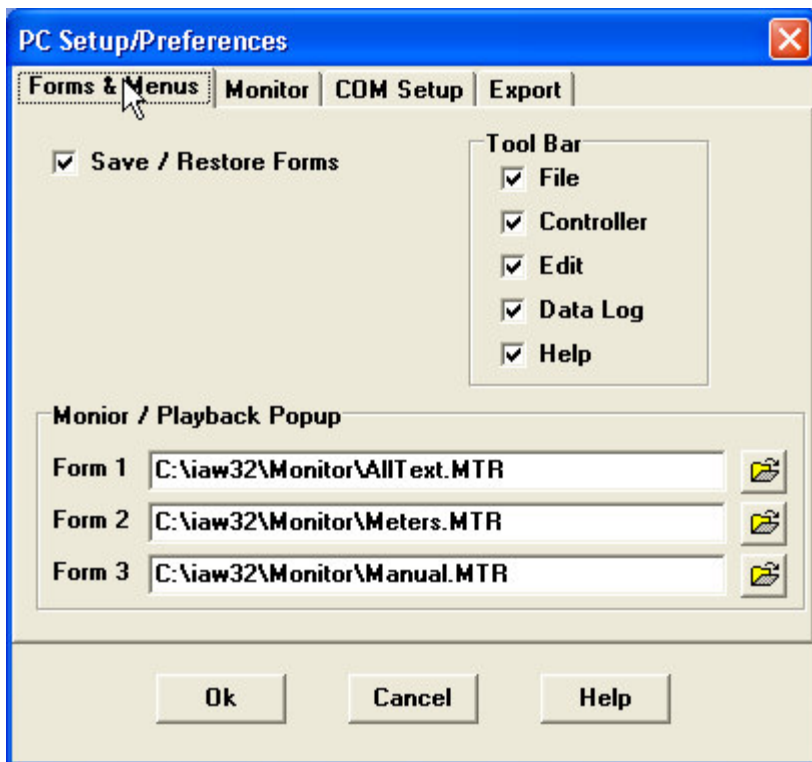
PC Setup / Preferences
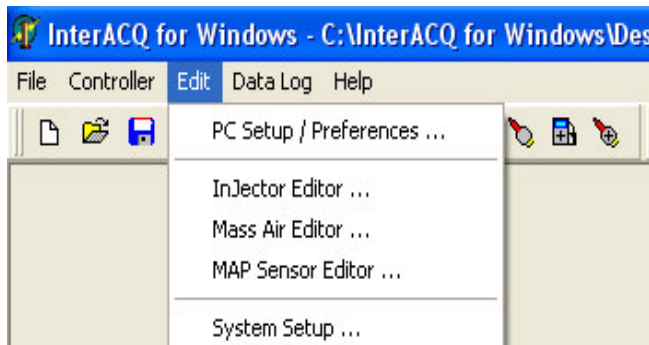
Go to the "**Edit**" menu and select "**PC Setup/Preferences.**" Set-up is normally necessary only when using the program for the first time, although you may decide to change the Monitor tab options and the new Auto Connect option under COM Setup tab occasionally. The PC Setup/Preferences dialog box will be displayed.
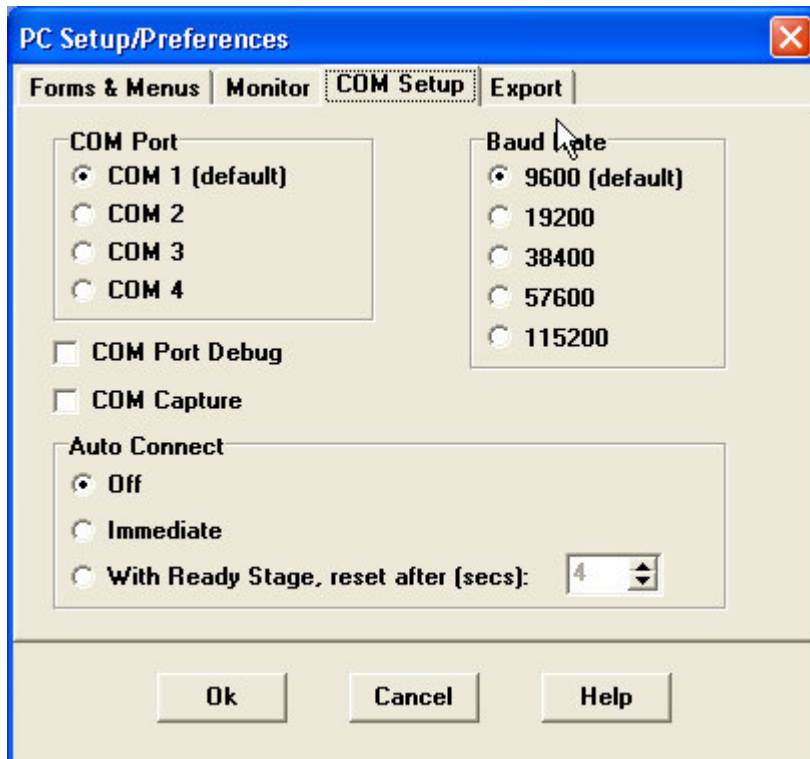
Select the **COM Setup** tab and then select the **COM Port** and **Baud Rate** (data transfer rate) desired. The default settings of **COM 1** and **9600 Baud** are recommended unless there is a specific need to change it. The new **Auto Connect** is more fully explained below. The choices here are **Off**, **Immediate** and **With Ready Stage**. Select **Off** for now. The **Ready again after** selection box is also more fully explained below and only impacts the With Ready Stage option.

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While in the **PC Setup/Preferences** Setup, you may want to select the Monitor Forms to be used by the Monitor and Playback speed button Popup Menu. Click on the **Menus & Forms** tab. To the right of each Form text box, click on the File Folder speed button. Select a form file and click OK. The form file name appears in the text box. **Note:** At least one Monitor Form file must be selected in order to use the Monitor or Playback functions. Also on this page is a check box to cause **InterACQ** to "remember" the size and position of all the forms when you exit the program. The next time you start the program, and open a particular form, it will be placed in the location, with the same size. This will also cause the main program form to do the same. On the right is where you can turn on or off the different Tool Bar groups.

There are two other Tabs in this dialog: **Monitor** and **Export**, which contain parameters for each and are described on pages 49 and 55 respectively.

Connecting

Attach the PC to the PMS Controller via the same serial cable used for the PMS hand held data terminal. The COM Port should have already been established in **PC Setup/Preferences**, **COM Setup** tab described above.
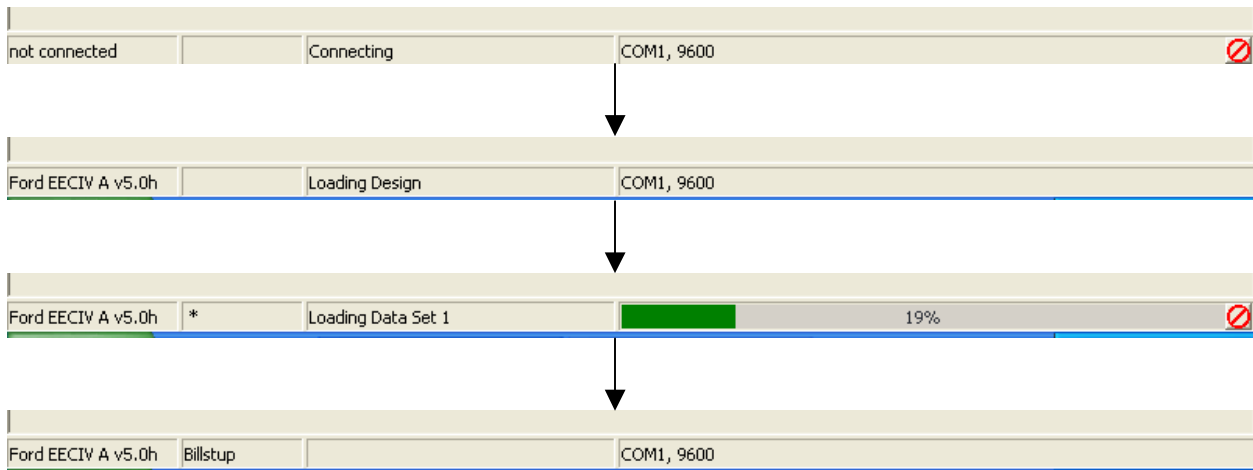
> **Note:** If using one of the supported USB to Serial Port adapters, please follow the manufacturer's instructions for installing the drivers for the adapter and establishing a new COM Port. The adapter instructions should also explain how to find which COM Port the adapter is using. Set the InterACQ software to use the same COM Port as your USB adapter in the **PC Setup/Preferences**, **COM Setup** tab described above.

Turn on the ignition to power up the PMS; it is not necessary to start the engine. If you selected **Off** under the **Auto Connect** options, go to the **Controller** menu and select

"**Connect**" to connect **InterACQ for Windows** to the PMS. You can also click on the **"Connect"** button on the toolbar.. either will start the connection sequence.

> **Note:** If this is the first connection to the PMS after installing **InterACQ for Windows**, you will be asked to continue the installation and registration of the program. See Installation & Setup.

The connection process will now begin. The status and progress will be displayed in the status line at the bottom of the main window and will show the connection data (controller type and ID, Design File name and date/time stamp, etc.) as it is being downloaded from the PMS Controller.

| not connected | | Connecting | COM1, 9600 | ⊘ |

| Ford EECIV A v5.0h | | Loading Design | COM1, 9600 | |

| Ford EECIV A v5.0h | * | Loading Data Set 1 | � 19% | ⊘ |

| Ford EECIV A v5.0h | Billstup | | COM1, 9600 | |

If there is a Design File previously saved on the PC, InterACQ for Windows will load it from the hard drive. However, if the Design File on the PC is newer or older than the data stored in the PMS's memory a **"Warning"** dialog box will appear and notify you that InterACQ will use the input data stored in the PMS's memory instead. This will not happen if the Design File and the data in the PMS have the same time/date stamp.

Data will now be transferred from the PMS to the PC. The status bar will show "**Connecting**", followed by "**Loading Design**", followed by "**Loading Data Set**". An **"Abort"** button ⊘ will appear at the far right end of the status bar and may be used to stop the connect sequence should you change your mind. When the Connect sequence is finished InterACQ for Windows is ready to use.

System Setup
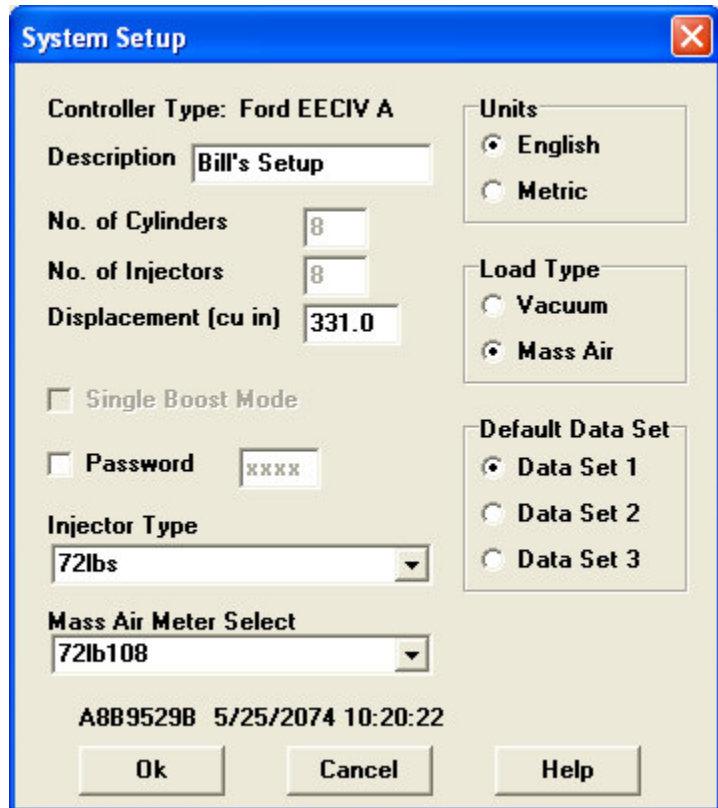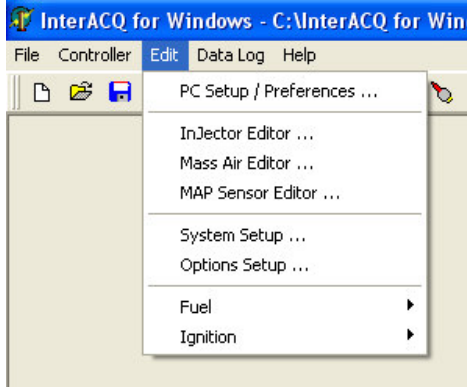
After making a connection to the PMS, select "**System Setup**, from the "**Edit**" menu. This dialog box will show the engine's defaults from the PMS. Typically, you will only need to access or modify these settings when you first setup the program or when you change your injectors or mass air meter. You may also use this screen to change the default Data Set, Password or display Units for the monitoring functions. After typing in a name for your setup in the **Description** box, click **Ok**.

Options Setup

From the "**Edit**" menu select "**Options Setup**." This will bring up the dialog box "**Options for Data Set X**" ("X" being the Default Data Set number you selected under System Setup). This box allows you to select the options and setups shown at the right.

Not all of the options are available for every vehicle type; where the option is not available it will be disabled (grayed out). The **Setup** buttons for each selection will also be disabled unless the corresponding check box for that selection is checked.

For information regarding all the options that are available, see the Options topic in Advanced Features.
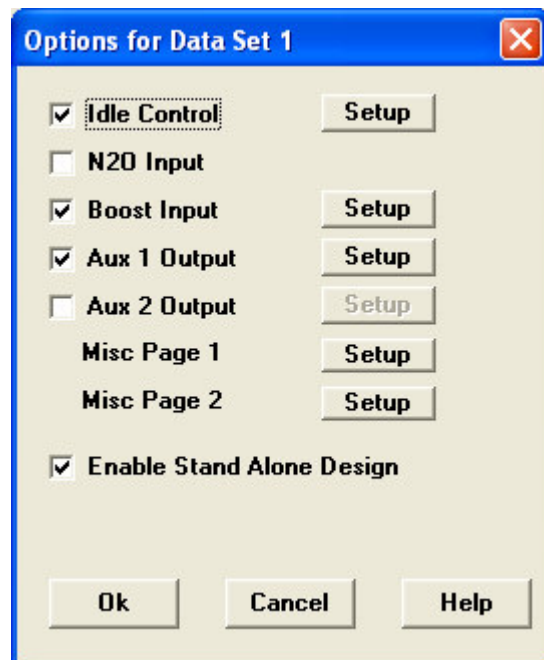
Adjust Table Edit

InterACQ for Windows offers more detailed editing of the Adjust Tables than is available with the PMS hand held data terminal. As stated earlier, the Adjust Tables (Fuel or Timing) are the same tables you adjust when you use the PMS hand held data terminal, but in greater detail. The screen initially comes up in the "**Anchor Edit**" mode, which means you can edit only the points editable by the PMS hand held terminal. **Note**: The PMS must be connected in order to access the Adjust Tables.

Go to the "**Edit**" menu, drag down to "**Fuel**," move sideways to the "**Input/Adjust**" submenu, and select "**Adjust**". This will bring up the "**Fuel +/- % Adjust**" screen. Also from the "**Edit**" menu, select "**Timing**" and move sideways to the "**Input/Adjust**" submenu, and select "**Adjust**". Note that either the "**Fuel**" or "**Timing**" or **both** windows can be open at the same time so you can move between them quickly and easily. (Both the Fuel and Ignition Adjust Tables are shown below, similar to the way they would be shown on the screen.) Other than the data units being different (percent for fuel and degrees for timing), both windows operate the same way and have identical controls.
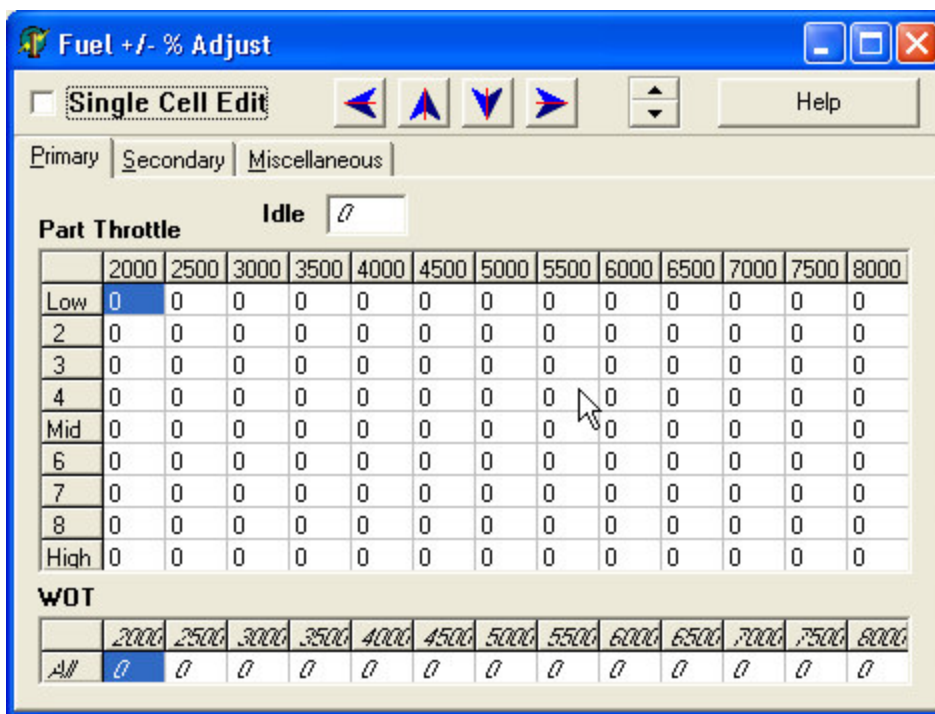
The Fuel and Timing Adjust windows are divided into three sub-screens or tables: **Primary**, **Secondary**, and **Miscellaneous**. You can access the tables on each sub-screen by clicking the "tabs" (like file folders; ref. screen images bottom of previous page) at the top. **These are the same fuel and ignition data tables adjusted by the PMS hand held data terminal** except that they are in greater detail. Note that in addition to the 2000, 4000, 6000, and 8000 rpm points (and in the case of the Part Throttle Table the Low, Medium, and High load points) there are intermediate points for

both RPM and Load. A "0" in an Adjust Table means **no change is being made** to the output of the stock ECM at that point, **not that there's no output**. This is true for both the Fuel and Ignition Adjust Tables. **A "0" means that the unaltered, stock fuel or timing values will be used at that point.** It is worth mentioning at this point that these same Adjust values are applied to the Stand Alone (Design) fuel and timing values.

Anchor Cell Edit

The cells that can be edited with the PMS hand held data terminal (and also by **InterACQ for Windows**) are called **Anchor Points**. For practice, place the cursor on one of the Anchor Points (for example, 4000 rpm/mid load) and click. Note that the cell is highlighted, indicating that you can change it. Now move the cursor to a point other than an Anchor Point. For example, pick a cell in the 3500 RPM column.

Note that when you attempt to click on the non-anchor cell it **does not highlight**, but instead the highlight jumps to the Low Load and 2000 rpm cell, one of the main anchor points. The initial Fuel and Ignition Adjust screens **always** come up in the **Anchor Edit** mode, meaning that **only the Anchor Points can be edited**. Typically there is an anchor point for each four (4) data points in the table, so each data point is only two (2) cells away from an anchor point.
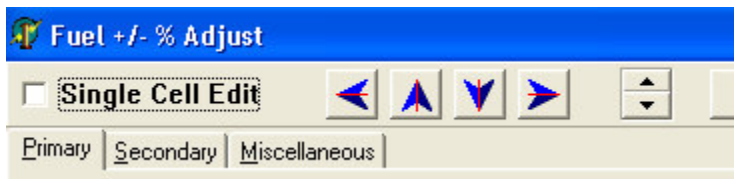

In addition to the cursor, there is another way to move from cell to cell. The blue "**Left,**" "**Up,**" "**Down,**" and "**Right**" arrows to the right of the "**Single Edit**" button towards the top of the screen can be used to move from cell to cell by clicking the arrow in the direction you want to move. Go back to an anchor point cell and click on it. The value in the cell can be changed by clicking one of the "**Up**" or "**Down**" arrows immediately to the left of the "**Help**" button. Clicking an Up or Down arrow changes the fuel adjustment in 2 percent increments, or timing in 1 degree increments, in the direction indicated. Notice as you do so that some cells all around the altered cell also change, to "curve" the output. (Actually this is not so much a curve as it is a straight line drawn between the surrounding anchor points.) This demonstrates how anchor points can alter many cells with a single edit.

The **Secondary** and **Miscellaneous** Adjust Tables make **further** adjustments to any changes the Primary Adjust Tables. Changes are additive. For example if the you hold the throttle at about 50%, the current value in the Part Throttle table may specify a +4° timing change at a the current RPM and load cell, and an -8° change is specified for Boost Ignition at that corresponding cell in the Secondary Adjust Table, then the total timing change at that point would be +4° - 8°, or -4° change in timing.

Single Cell Edit

With **InterACQ for Windows** you can also **individually edit** the intermediate cells between the Anchor Points. To do so, click the "**Single Edit**" button at the upper right corner of the Adjust Table windows (see Adjust Tables Edit screen above).   A confirmation dialog box will appear when you enter the Single Edit mode.
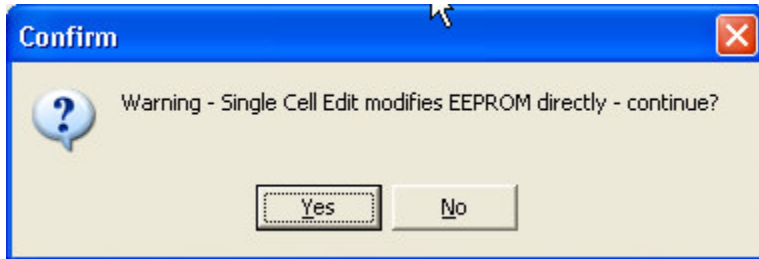
CAUTION - Unlike editing the Anchor Points, where no change is made in the EEPROM until the change is saved, changes made in the Single Edit mode **alter EEPROM immediately.**   This must occur to maintain the "line" or "curve" between the Anchor points, as discussed in Adjust Table Edit. When you alter an intermediate data point you are in effect creating your own "curve" between the anchor points. Keep this in mind and use caution when making changes in the Single Edit mode.

When you are not Single Edit Cell mode, the four **Blue** arrow buttons (like VCR buttons) next to the Anchor Edit/Single Edit Button will jump you to the next anchor point in the direction indicated. They are not active in the Single Edit mode. The Up and Down arrow buttons (next to the Help button) adjust the fuel in the selected cell up or down. Fuel is increased or decreased in 2 percent increments.   Timing is increased or decreased in 1 degree increments.

If the vehicle is running any changes made in an Adjust Table (either Fuel or Ignition) will change the PMS Controller's random access memory (RAM) at the same time, but just as with the PMS hand held data terminal **it will not change** the PMS's EEPROM (i.e. its "permanent memory") **unless the changes are saved**. The engine uses the PMS's RAM data any time it is running, so any changes made in an Adjust Tables will have an immediate effect. However **the changes will not be saved when the ignition is turned off** unless you specifically save them as covered in Data Set Operations. When you are finished experimenting with the Adjust tables, close it. If you made any changes, return those cells to their initial settings before closing.

Note: Whenever intermediate data points have data in it and the anchor points on either side are changed, the intermediate data point still represent an offset in the curve. This offset is maintained as the anchor point is changed.

In the "**Single Edit**" mode you can select **any specific cell**, regardless of whether it's an Anchor Point or not, and change that cell. The Up/Down arrows for changing cell values no longer function in the Single Edit mode; to change a value in the Single Edit
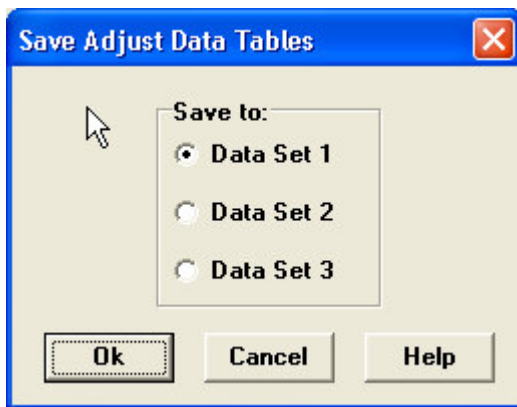
mode you enter the number directly. Note that when you change an individual cell the surrounding cells are not changed. In other words in this mode the PMS is not creating a "curve" between the cells; in the Single Edit mode you are (or must) create this yourself.

Data Set Operations

There are 3 Data Sets (Adjust Tables) in the PMS. You can only work on one at a time, and it is loaded into PMS's RAM area while you do so. While you are working in a Data Set, the adjustments you make occur only in RAM in the PMS. It's not until you perform a Save Data Set operation are the adjustments saved into the more permanent EEPROM.

Save Data Set

To Save changes made in the Adjust Tables (from RAM to permanent EEPROM), go to the **"Controller"** menu and select "**Save Adjust Tables**." This will bring up the "**Save Adjust Data Tables**" dialog box. This dialog box allows you to select the PMS Data Set (1, 2, or 3) that you want to save to, just as with the PMS hand held data terminal. To save to a Data Set, select the Data Set number. You may also load a different Data Set as with the Hand Held Terminal. From the "**Controller**" menu, select "**Load Adjust Tables**". The dialog box shown at right will appear where you can choose the Data Set (1,2, or 3).

Load Data Set
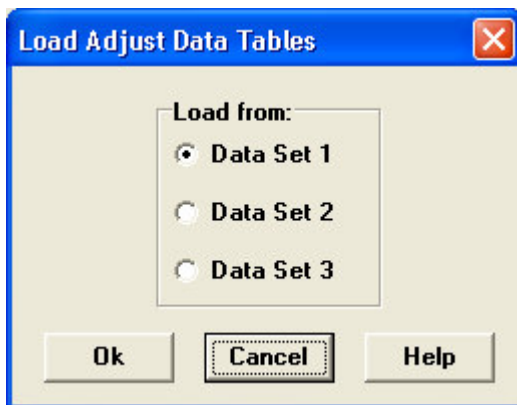
If you want to work on a different Data set, go to the **"Controller"** menu and select "**Load Adjust Tables**." This will bring up the "**Load Adjust Data Tables**" dialog box. This dialog box allows you to select the PMS Data Set (1, 2, or 3) that you want to load.   Once you click **OK**, the program will then re-read the Adjust Table data from the PMS (similar to what happens when you Connect).

Monitor / Data Acquisition

Ok, you've made some simple Adjustments to the fuel and/or timing, and you'd like to see what effect they had. From the "**Data Log**" menu, select "**Monitor**", or click on the Monitor Speed Button in the Tool Bar. This will bring up the list one of three possible Monitor Forms.
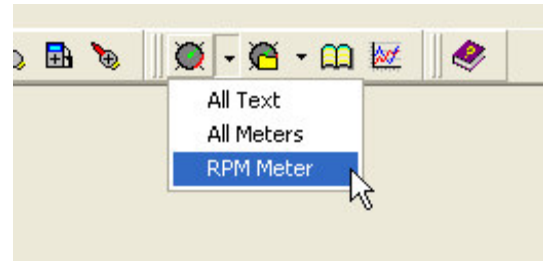

The Monitor screen displays graphically or as text RPM, Timing, Fuel, Throttle Position, Oxygen Sensor Voltage(s), Mass Air Flow or Vacuum Manifold Pressure, Water Temperature, and Air Temperature, plus other data. If the Stand Alone feature has been enabled and set up, then Load, Volumetric Efficiency, and Estimated Horsepower may also be displayed. There are several ways to use the Monitor feature.
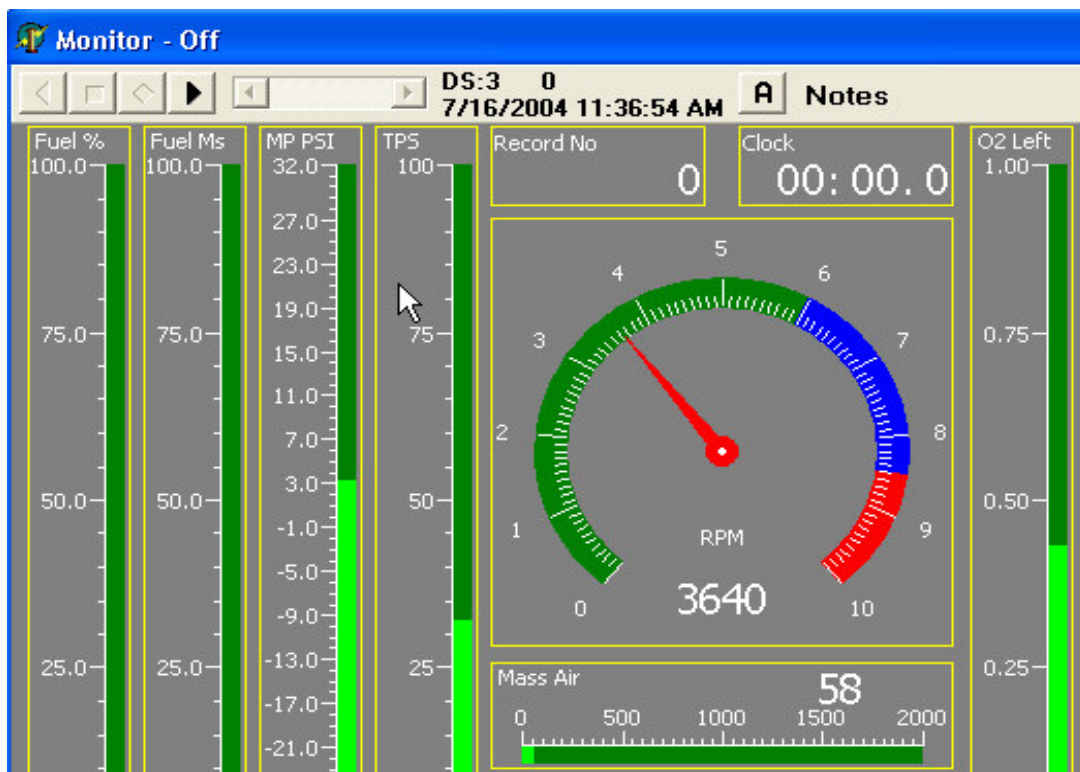
Shown above is a portion of a typical Monitor Screen or Form. All Monitor and Playback screens have the same controls across the top used to control the Monitor process, playback navigation, and to display useful information. At the upper left, there's a set of buttons (some are grayed out) similar to those on a VCR, to **Start** / **Play, Stop, Pause, and Rewind** the monitoring sequence. Next to the buttons is a scroll bar for navigating

through data logged. The current Data Set (DS) is shown, as well as the current date and time of day. Next on the right is a speed button used to edit the text notes. Under the control area are the meters showing an example of each format they can take.
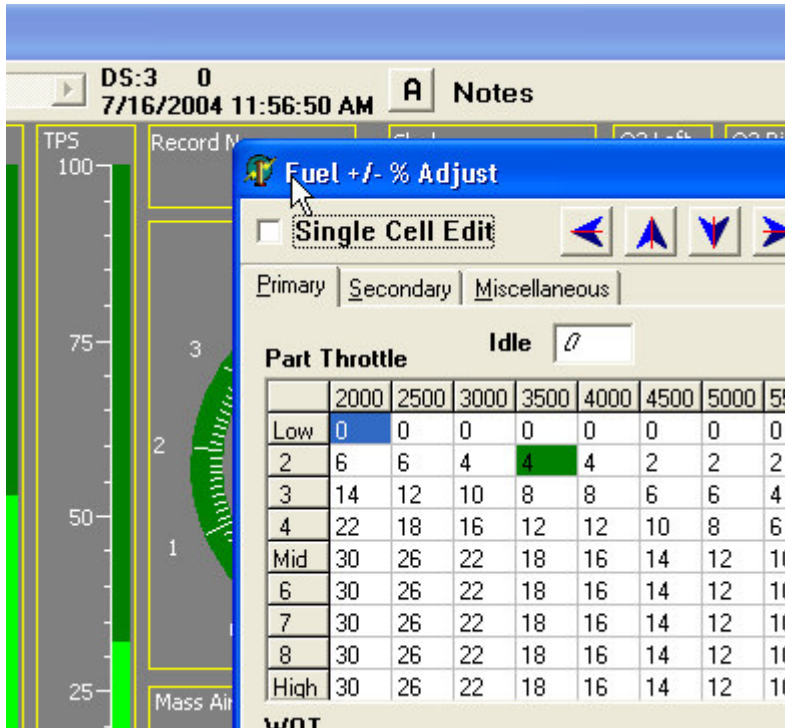

A particularly useful feature of **InterACQ** is that the Monitor may be used in conjunction with the Adjust and Stand Alone (Input) Tables. They can be open and on the screen at the same time monitoring is active. When they are open the **specific** Fuel and/or Ignition table cell that is active at a given time will be highlighted in **Green**, showing in real time the point in the tables from which the engine is operating. This is a great diagnostic tool, showing you the specific place a change should be made at the same time monitoring may be indicating a problem. **Note,** however that you **cannot edit** while the Monitor is running; you must **Pause** it first. The Stand Alone Tables may be used in conjunction with monitoring in the same manner.

The following steps or modes depict how the Monitor/Replay process flows:

Monitor Off
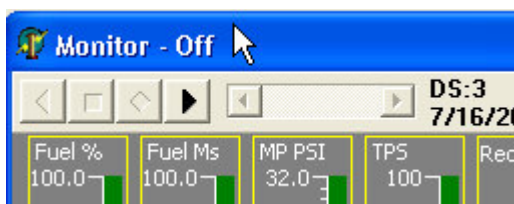
The header bar is titled "**Monitor Off**" when the Monitor screen first comes up. Note that nothing is happening; to begin monitoring, click the **"Start"** VCR button (arrowhead at far right). If you want to have recording start automatically based on RPM and Throttle position, now is the time to set up the conditions by clicking on the "**Triggers**" button. (See also "**Monitor Triggers**," below.) Try out both the manual and trigger methods of starting and stopping monitoring in your vehicle to better familiarize yourself with them. In the "**Monitor Off**" mode only the "**Forward**" VCR type button is active.
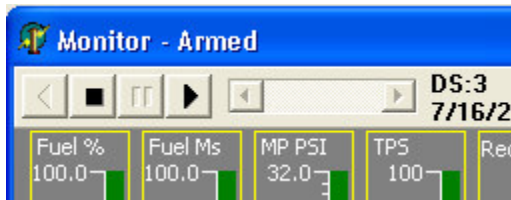
Monitor On
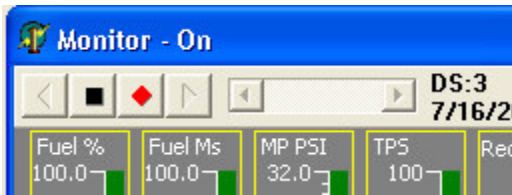
Monitor data is now active and the various meters should be showing actual value in real time (or as close to it as possible). Note that the data is **NOT** being recorded yet. Two VCR type buttons are active: "**Stop**" (square button) which inactivates Monitor Data and changes the screen to the Monitor Off mode, and "**Arm**" (the red diamond button) which causes the monitor to go to Paused/Armed mode.

Paused/Armed

Monitor data is still active but still **NOT** being recorded yet. The purpose of this intermediate mode is to provide a "staging phase" before the Triggers start the recording. When the Trigger conditions are met, recording starts automatically. Alternatively, you can manually begin recording by clicking on the "**Forward**" VCR button. The "**Stop**" button will cause the monitor to go to Review (stop) mode.

Recording
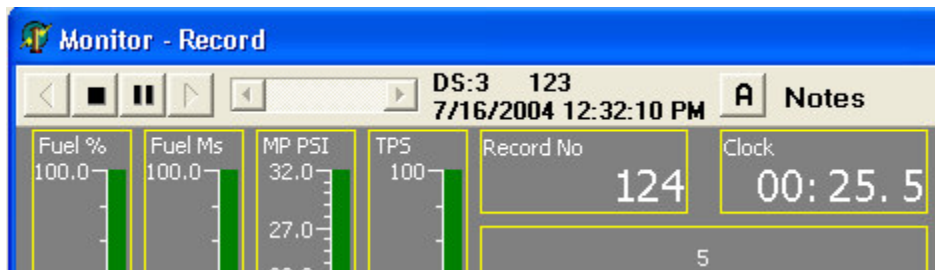
Data is now being recorded, along with updating the information in the graphical or text displays. Notice that "Clock" and "Record No" displays are counting up. Monitor recording can be Paused again in two ways - either the Triggers conditions will change and be outside the values specified, or you can click on the "Pause" button. Note that if you do the latter, and Trigger conditions are still true, data recording will resume immediately. Pushing the "Stop" button will place Monitoring in the Review (stop) mode.

Review
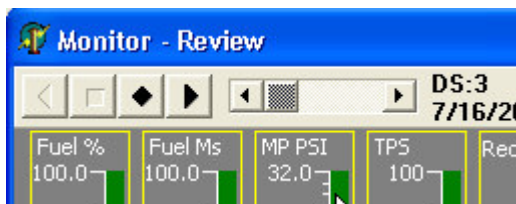
When you are finished recording you can elect to play back the logged data, save it, or discard it This mode allows you to review or "playback" what was recorded. The active monitor data has ceased, and the display shows the data from the

23

first record. Clicking on the "**Forward**" or "**Reverse**" VCR buttons will move forward or backwards through the records, displaying the meter values for each record and effectively "animating" the recording. The "**Stop**" button will cancel the animated playback. In addition, the scroll bar is now active. You can use this control to scroll through the entire recording, either one record at a time, or a group at a time. Using the "**thumb**" control, you can move to any record number very quickly. Watch the graphic display as you move the thumb control. **Note:** This is similar to fast forward or reverse on a VCR and allows repositioning forward or backwards in the data set to a point of interest.

Notes
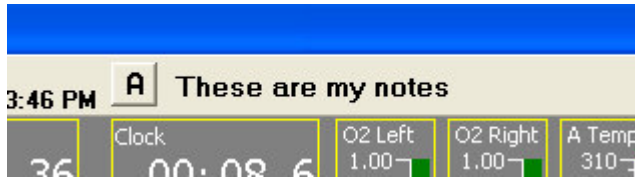
Before you save the data, you may want to edit the text notes that will be associated with the logged data file. By pressing the button with the "**A**", you can edit the notes. The default text will have already been placed there from whatever text you specified in the Notes menu option. The notes will also be display for each data log file listed in the in the **Log Book.**

Save / Reset

The logged data has not been saved yet; it's in the PC's RAM to allow you to review it before you decide to save it. To Save the record as a file, click the "**Save/Reset**" button (black diamond button). This will bring up the normal Windows "**Save As**" dialog box. You will then be prompted to Reset the current logging session. If you have Monitor Auto Save enabled, then the file will be saved automatically; you will not be asked to save the data.

Triggers
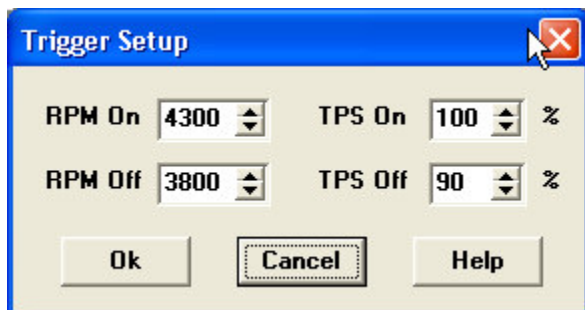
To setup the data monitoring triggers select **Triggers** from the **Data Log** menu, to type **CTRL-T.** This brings up the Triggers dialog box shown at right. Here you can enter the **RPM and Throttle Positions** where you want recording to begin and end. Enter the desired parameters and click "**Ok.**" With the triggers set monitoring will begin automatically when the **"On"** conditions are reached, and cease when the **"Off"** conditions are reached. The triggers can be used in either a hysteresis situation, where the **"Off"** conditions are lower than the **"On"** conditions, or they will work in the Band Pass mode where the **"Off"** triggers are set higher than the **"On"** triggers.

Review Parameters
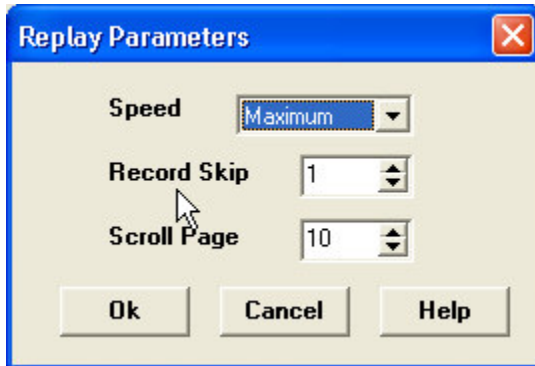
These parameters control the how the Review and Playback of the monitor data is displayed. Type CTRL-P to bring up the Replay Parameter dialog, or you can access via the **Parameters** options in the **Data Log** menu.

Speed:
> This parameter affects how fast the replay progresses through the data records when either Forward Review or Reverse Review VCR buttons are clicked.

Record Skip:
> The number of records to skip when playing back the data. "1" will display every record, "2" will display only every other record, "3" will display every third record, etc.

Scroll Page:
> When the "page" area is clicked in the replay Scroll Bar, this sets how may records to jump.

RePlay

All saved logged file may be viewed again via the RePlay (also termed Playback) From the "**Data Log**" menu, select "**Replay**", or click on the Monitor Replay Speed Button in the Tool Bar. This will bring up a similar Popup Menu showing a list of three possible Monitor screens available to use for replaying data files.
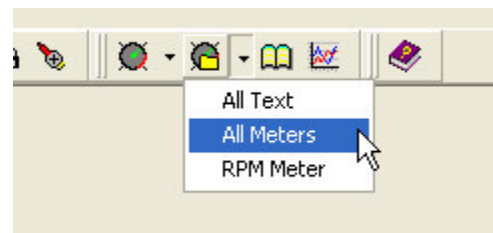
Below is a partial screen shot of what a typical Replay form would look like – pretty much identical to the Monitor form, except the file name is displayed in the caption. All of the VCR buttons work just like the Monitor Review and you can also change the text notes the same way.
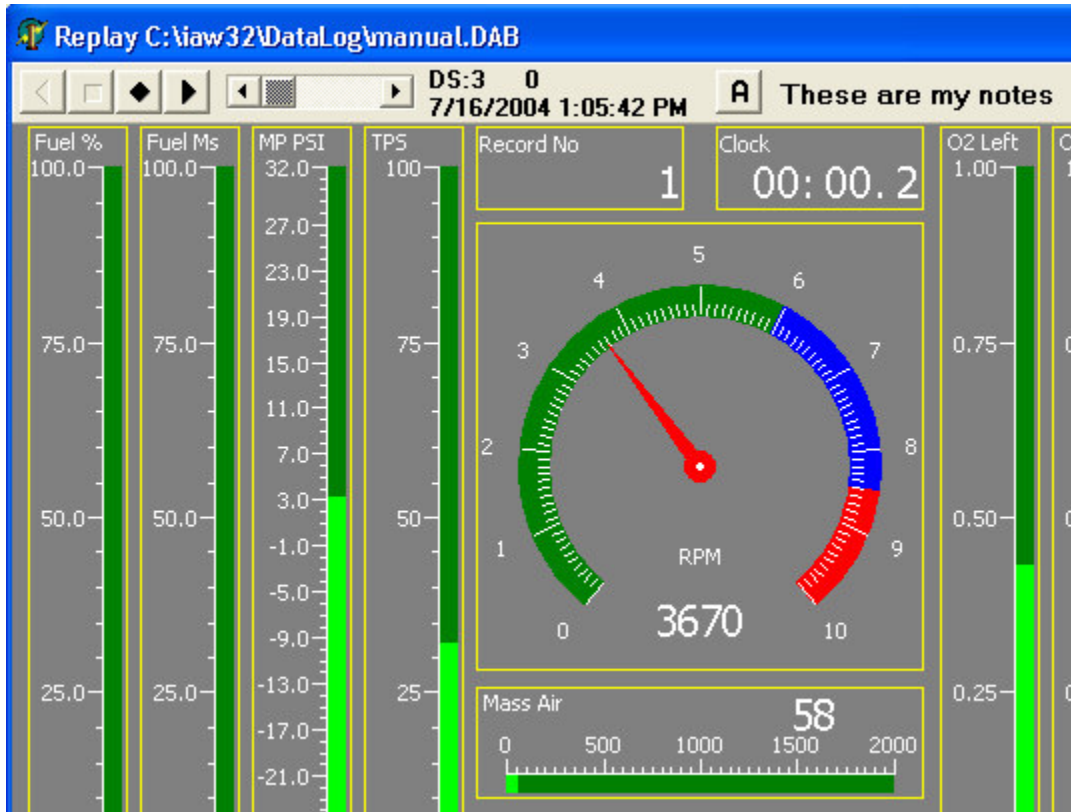
Advanced Features

The advanced features available to PMS users through **InterACQ for Windows** greatly enhance the flexibility of the PMS, allowing the user to tailor it to a variety of uses and situations unavailable when using only the PMS hand held terminal, including:

> **Options**
> **Stand Alone**
> **Injector Editor**
> **Mass Air Meter Editor**
> **MAP Sensor Editor**
> **Fuel Input Setup - Mass Air**
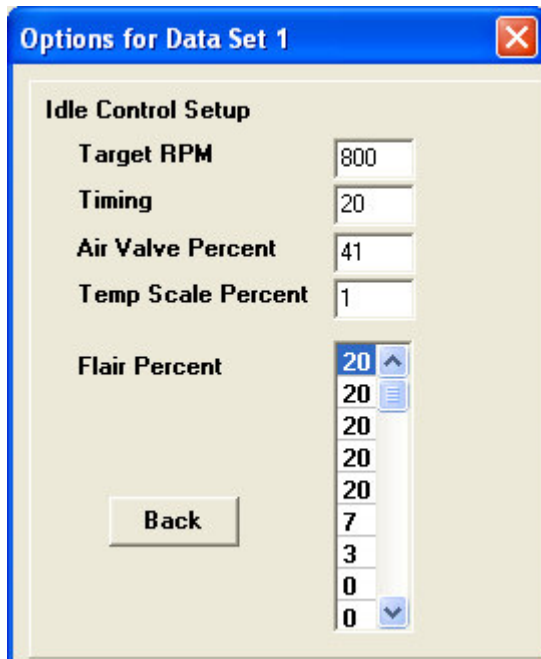> **Fuel Input Setup - Speed Density**
> **Ignition Setup**
> **Input (Stand Alone) Tables**
> **Monitor Form Setup**
> **Custom Monitor Data**
> **Automatic Operation**
> **Log Book**
> **Graphics**
> **EEPROM Operations**
> **Exporting Data**

Options

Idle Control Setup

When the check box for **Idle Control** is checked, you may select **Setup** to define the Idle Control settings for the selected Data Set. The Idle Control function allows the PMS to take over idle control from the stock ECM. These settings can be used to smooth out a loopy idle that may be caused by your stock ECM being unable to properly manage changes you've made to the stock engine configuration. **Note:** For these settings to take effect, your Throttle Position Sensor needs to be properly set.

Use the **Target RPM** box to select the Idle RPM. Use the **Timing** box to select the total degrees of timing at idle.

Use the **Air Valve Percent** box to increase or decrease the responsiveness of the Idle Air

Control Valve to changes in RPM. A higher value will cause the Idle Air Control Valve to be more responsive, but may also cause the idle to settle at a higher RPM than targeted.

Use the **Temp Scale Percent** settings to set amount of RPM increase (flair) over the **Target RPM** setting when the engine is cold. You can use these settings to gradually reduce the idle RPM as the engine warms up. Each box represents ___degree increments, beginning at ___degrees F.

Use the **Flair Percent** table to set the "profile" of the flair itself. These are the base numbers which control how high the idle RPM is over the base RPM during starting and for temperature compensation.
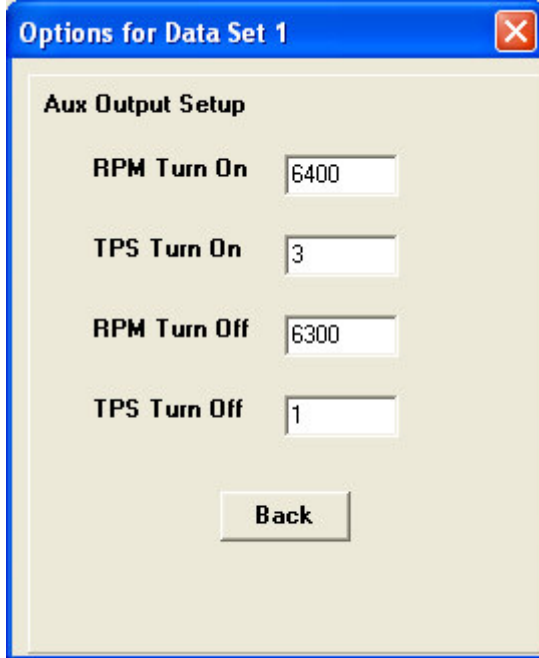
Boost Input Setup

InterACQ for Windows allows for parameters (profiles) specific to turbo and supercharged boost to be maintained and used in the data set. When the check box for **Boost Input** is checked, the **Setup** button is activated.   Clicking **"Setup"** allows the additional Boost Input parameters of **Table Max PSI**, **Fuel cut at PSI**, **Target Boost**, and **Vent Percent** to be set.

In supercharged applications, the only value that needs to be set here is **Table Max PSI**. Use this setting to control amount of boost at which fuel and timing adjustments for High Boost take effect in the **Fuel Adjust Table** and **Timing Adjust Table**.   (For information on using the Adjust Tables, see page 18.)

In turbocharged applications, the remaining settings can be used to help prevent a potentially engine damaging overboost condition.   The **Fuel cut at PSI** setting will cause the PMS to shut off the injectors if the boost exceeds the setting. The **Target Boost** and **Vent Percent** settings are used together to give the PMS control of the turbo wastegate to establish a targeted level of boost. The **Vent Percent** settings are used in all three Data Sets to view or set the wastegate values, if one chooses to do so, automatic Vent Self Adjust can be turned off, and the Vent Percents set manually.
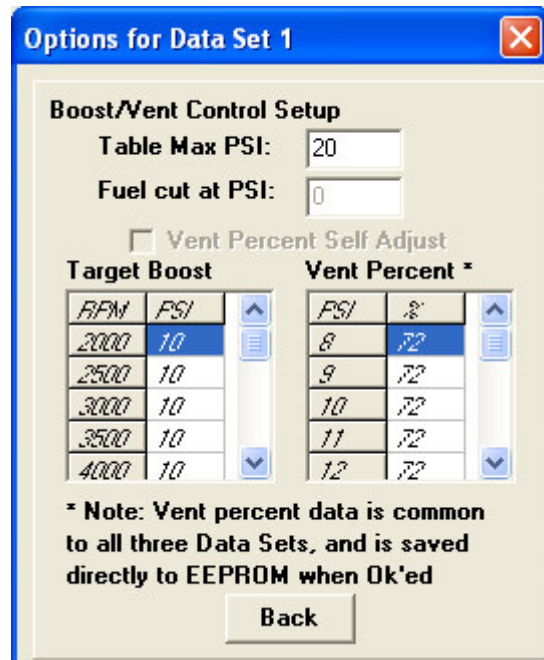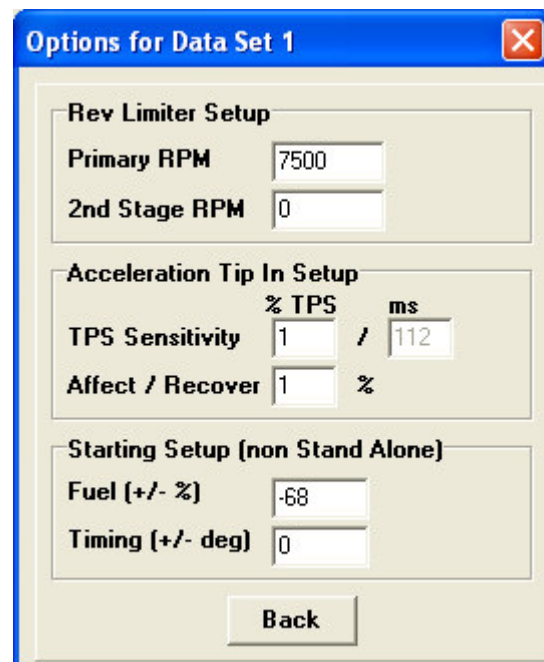
Aux Output Setup

The **Aux 1** and **Aux 2 Output** settings allow you to select the RPM and throttle positions at which the Aux 1 and Aux 2 switches on the PMS are turned on and off. To use these switches, you will need to follow the wiring instructions set forth in your PMS manual. The **On** settings may be greater than the **Off** settings or vice versa. For these settings to be effective, however, the TPS settings must be greater than zero.

Misc Page 1 Setup

The **Misc Page 1 Setup** allows the user to make changes to the settings shown at the right. To make use of the **2nd Stage RPM** setting, you will need to follow the wiring instructions set forth in your PMS manual.

The **Acceleration Tip In Setup** settings can be used to alter the stock ECM acceleration enrichment programming. These settings can be used to smooth out any hesitation on acceleration that may be caused by your changes to the stock engine configuration. TPS Sensivitity has two parameters – it tells the PMS to look for a certain change in TPS position (%TPS), over a given period of time (ms). A lower %TPS is more sensitive, as well as a shorter time period. Affect/Recover tells the PMS how to apply the change, and how long to gradually remove the change.

The **Starting Setup** settings can be used to prevent flooding on startup when using larger than stock injectors. Since the stock ECM will ignore the mass air readings when the starter is engaged, it will pulse the injectors during

startup for the amount of time appropriate for stock injectors. If larger than stock injectors are used, however, a shorter pulse width will be appropriate to deliver the right amount of fuel. Experiment with this setting when the engine is cold and when it is warm to see what works best for your combination.

Misc Page 2 Setup

The **Misc Page 2 Setup** allows the user to make changes to the settings shown at the left. Not all applications support all of the adjustments.

The **TPS Setup** can be used to modify and/or correct the calibration of your Throttle Position Sensor. These settings can also be used to alter the throttle position at which the Idle and WOT Fuel and Timing Adjust Tables are triggered.

On applications where the stock ECM controls an electric radiator fan, the **Fan Control** settings allow the user to set the temperatures at which the fan is turned on and off.

The **Global Fuel Adjust** setting allows the user to make a global fuel adjustment (+/-) for all TPS and RPM values. This value has a similar global effect on fuel delivery as does a change in the base fuel pressure setting using an adjustable fuel pressure regulator, but allows for much finer adjustments than are possible with fuel pressure alone. This setting should be used in conjunction with, not as a substitute for, correctly setting the base fuel pressure for the type of injectors and fuel pump you are using.

In applications with electronic speed sensor type speedometers, the **Speedometer Cal**ibration setting can be used to help reduce or eliminate speedometer error caused by changes in tire size and rear end gear ratios. Increasing the value will cause the speedometer to read faster for a given amount of tire speed. When making your adjustment, keep in mind that tire diameters greater than stock will cause the speedometer to read slower than the vehicle is actually traveling—in this instance you will want to increase the speedometer indication by putting a positive value in the box. Also keep in mind that gear ratios numerically higher than stock will cause the speedometer to read faster than the vehicle is actually traveling—in this instance you will want to decrease the speedometer indication by either reducing or putting a negative value in the box.

Stand Alone

Overview

The **"Stand Alone"** feature of **InterACQ for Windows** enables the PMS to take over almost entirely the functions of the stock engine management system, particularly in the performance areas that most PMS users are concerned. By "almost entirely," it is meant that although the **PMS** (in conjunction with **InterACQ**) can completely take over the **performance** aspects of engine management. It **does not** mean you can remove the stock computer from the vehicle. The stock computer is **still required** for starting, warm-up, and non engine-related vehicle functions.

The stand alone data in effect replaces the stock fuel and timing, which is why it's sometimes called "input" data. All timing and fuel adjust tables are then added to these values, exactly in the same manner as the stock fuel and timing data.

When Stand Alone has been turned On from the Options dialog, engine management functions will be transferred totally to the **PMS** at the transition points set when setting up the Stand Alone feature.

To use the Stand Alone feature:

Step 1:
Be sure that Stand Alone is turned on via the Options dialog.

Step 2:
Select the Injector and Mass Air Meter types you vehicle has in **System Setup**, if you have not already done so.

Step3:
Go to **"Fuel"** under the **"Edit"** menu; drag sideways to **"Input,"** and select **"Setup."** Fill in the Fuel Input Setup form (see page 34).
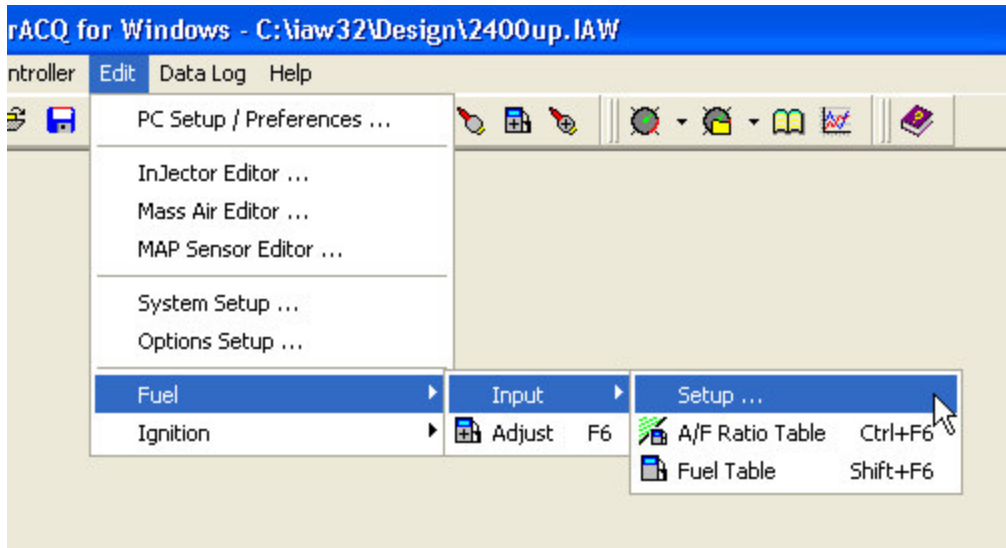
Step 4:
Close out of the Fuel Tables and go to **"Ignition"** under the **"Edit"** menu; drag sideways to **"Input"** and select **"Setup."** Fill in the Ignition Input Setup form (see page 35).
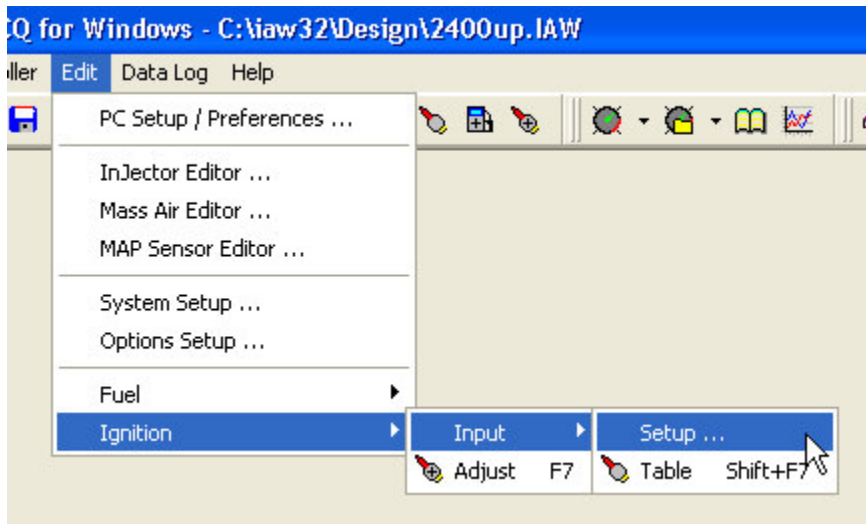
General Note: Any of the tables, either Fuel or Ignition, can be created by hand and/or edited by hand. However where **InterACQ** can create the initial tables, there is little point in doing so. (Refer to sections on Air Fuel Ratio Table, Fuel Input Table, and Ignition Input Table.)

Step 5:
At this point the new Fuel and Ignition Input tables exist only in the PC; the tables in the PMS CPU **have not** been updated. You can "fine tune" the fuel and timing data via the Input Tables forms. When you are satisfied with the tables, go to the **"Controller"** menu and select **"Update Input Tables."** **InterACQ for Windows** will ask you if you

want to create a new Design file. Clicking **"Yes"** will bring up the normal Windows dialog box asking you to name and save the file. When the file has been named and saved InterACQ for Windows will begin downloading the new design file into the PMS CPU.

Note: Unlike the Adjust tables (where data changes are immediately sent to the PMS), data in the Input tables is not sent to the PMS until done so explicitly with the **Update Input Tables** function.

Rarely is the need to use **"Retrieve Input Tables."** Since the Design data is saved in the PC, you may need to do this only if that file gets lost or corrupted. If you wish to save the Input Tables shipped in the PMS, use the **"Retrieve Input Tables** function. That way you can reload them at some point in the future, if desired.

Fuel Input Setup (Mass Air)

Mass Air

Select the **RPM** and **Throttle Position Turn On** points (that is, where you wish the Stand Alone feature to take over), the **Starting Fuel** (in milliseconds) and **Fuel Pressure**, and whether or not you want to use a **Base Ratio** or the **Ratio Table** ("Ratio Table" is the default and is suggested for ease of use). When this is done click **"Create Fuel Table"** and **InterACQ** will create the Fuel Input Table and Air Fuel Ratio Table.

Speed Density

Select the **RPM** and **Throttle Position Turn On** points (that is, where you wish the Stand Alone feature to take over). When this is done click **"Create Fuel Table"** and **InterACQ** will create the Fuel Input Table. **Note:** If working with a Speed Density system **InterACQ** will not create a Air Fuel Ratio Table; the fuel millisecond values must be entered by hand in the Fuel Input Table. This will be easier if the points are entered with the table in the **"Zoom In"** mode (i.e. the "Zoom Out" button is showing). The number of points to be entered will be reduced by a factor of eight, and when you select the "Zoom Out" mode the values will be filled into the intermediate points.

Ignition Input Setup

The ignition Input set up menu selection brings up the screen shown at right, where you may select the parameters where the PMS will begin using the Ignition Input Tables (see page 27). Select the RPM and Throttle Position turn on points, the Initial, Base, and the Starting timing. Click the **"Create Ignition Table"** button and **InterACQ** will create the ignition table.

Ignition Input Setup

RPM turn on   2000

TPS % turn on   25

Initial Timing   10

                 +

Base Table Timing   16   =   26

Starting Timing   0   =   10

Create Ignition Table

Ok   Cancel   Help

Input/Stand Alone Tables

There are three types of Input or Stand Alone tables:

> **Air Fuel Ratio Table** (Mass Air systems only)
> **Fuel Input Table**
> **Ignition Input Table**

Air Flow is displayed down the side in the units selected in System Setup. RPM is displayed across the top. Since these tables are usually too big for the screen scroll bars are provided for access to all of the points. In all three tables the "**Expand**" button expands the table to include more intermediate points. When the **Expand** button is clicked it also changes to **Condense**, (and vice-versa). To return to a table with only major points shown, click **Condense**. When the tables are Condensed, each point represents 16 values, a 4x4 grid of data points. Values in the cells can be modified directly by highlighting the box and entering the desired value. The dark gray cells represents the theoretical 100% Volumetric Efficiency. That is to say, only data to the right and above the "line" is possible with the given load and RPM.

Air Fuel Ratio Table

The Air Fuel Ratio Table (above) allows you to specify the **Air Fuel Ratio** for each specific cell in the table. It is used **ONLY** in Mass Air designs and applications. This table can be used in two ways: If you enter values before creating the fuel Input table and you select "Use Ratio Table" (see Mass Air Fuel Input Setup), the program will fill in the Fuel Input table using individual ratio values. Or, after the Fuel Table has been created, there is a mathematical link between this table and the Fuel Input table. Any change you make in this table will automatically update the Fuel Input Table and vice - versa. In this table, there is a check box allowing you to select whether the Air/Fuel ratio is the value entered (target) or the actual Air/Fuel Ratio as calculated from the input fuel ms value. Also, when this option is turned, the Air Fuel display item in the Monitor will display the actual Air/Fuel Ratios.

Fuel Input Table

The Fuel Input Table allows you to specify the Fuel Input in milliseconds. For Mass Air Designs **only,** after the Fuel Input table has been created there is a mathematical link between this table and the Air Fuel Ratio Input table. Any change you make in the Fuel Input table will automatically update the Air Fuel Ratio Input Table and vice-versa.

Ignition Input Table

The Ignition Input Table allows you to specify the Ignition Input in absolute degrees BTDC in 1° increments.

Injector Editor

The Injector Edit function allows you to create or edit the parameters the Fuel Injector available to **InterACQ**.
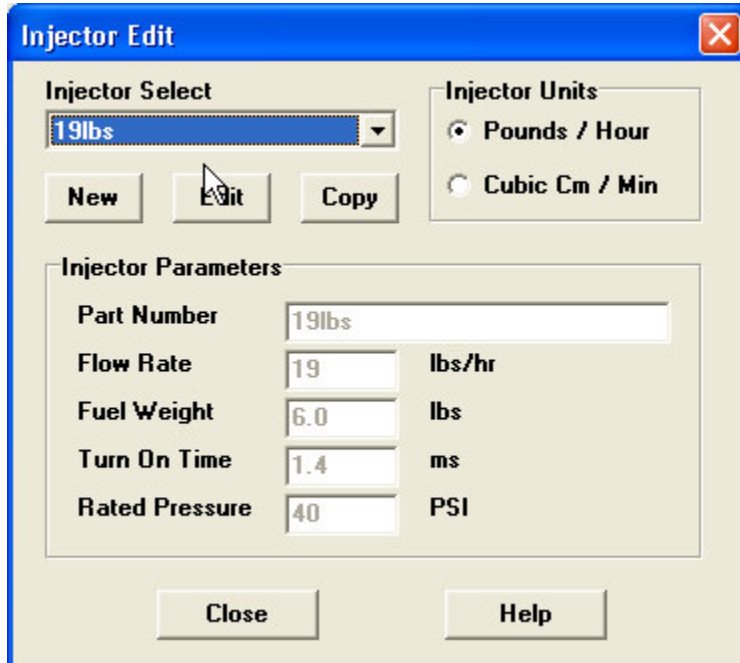
1. Select "**Injector Editor...**" from the "**Edit**" menu. When the dialog box is displayed, click on the small arrow at the right side of the **"Injector Select"** box to bring up a list of injector models. Select the injector model wanted by clicking on that selection in the list.

2. **Injector Units** allows you to select the data units for the injector selected in either **Pound/Hour** or **Cubic Cm/Min.** Note that selecting an injector automatically brings up the injector data in units appropriate for that injector. However, if you wish to see the parameters for a Pounds/Hour injector in Cubic Cm/Minute, or vice-versa, you can select the desired units under "**Injector Units.**" The data displayed in Injector Parameters will convert to those units.

3. You can also **edit** the parameters for a listed injector. Clicking the "**Edit**" button brings up the "**Confirm**" dialog box asking "**Edit this Injector Record?**" Clicking "**Yes**" activates the data entry boxes under Injector Parameters so you can edit the information in them. To save your changes, click "**Save.**" Clicking "**Close,**" will return you to the basic **InterACQ** screen.

4. If you want to use an injector that is **not** listed you can add it to the list by clicking the "**New**" button. This will bring up a "**Confirm**" screen asking "**Create a new Injector record?**" Clicking "**Yes**" will present a new Injector Parameters screen where you can supply a name/part number for the new injector and then fill in its operating parameters. To save the new injector model, click "**Save.**" Clicking "**Close**" will return you to the basic **InterACQ** screen.

5. You may also **delete** an Injector model. To do so enter the "**Edit**" mode, blank out (delete) the injector model name, and click "**Save.**" This will bring up the prompt "**Do you want to delete that model?**" If you select "**Yes**," that model is deleted. If you click "**No**," you will receive a prompt asking you to provide a valid name for the Injector model.

6. When you are finished, click "**Save**". This will save the deletion and return you to the **Injector Edit** screen.

7. Click "**Close**" to return to the I**nterACQ** main screen.

Mass Air Meter Editor

Like Injector Edit the **Mass Air Meter Edi**t function allows you to edit or create parameters of the Mass Air Meters available to **InterACQ**.
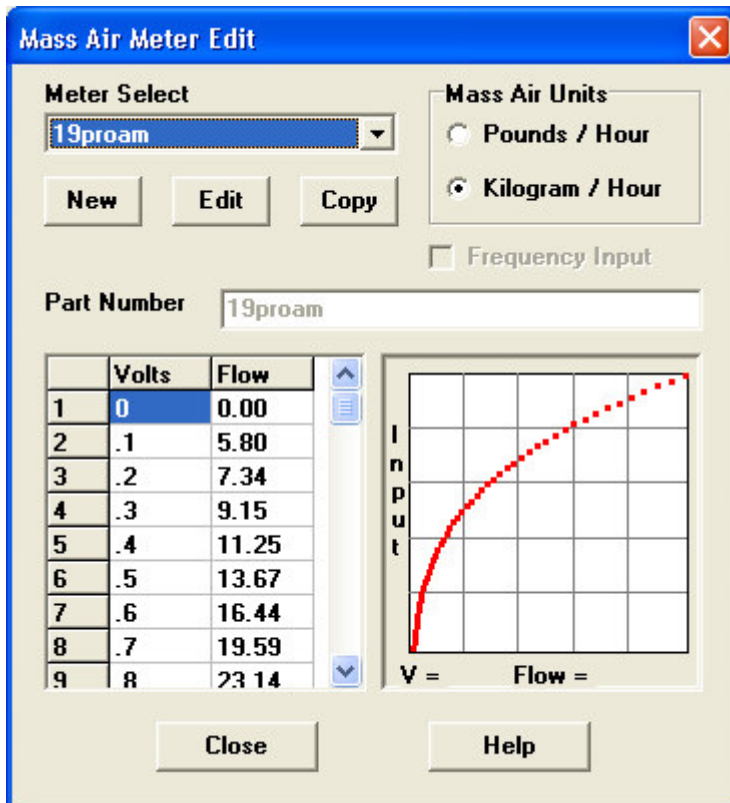
1. Select "**Mass Air Editor...**" from the "**Edit**" menu. When the dialog box is displayed select the mass air meter being used from the list provided. Clicking on the small arrow at the right side of the "**Meter Select**" box brings up a list of mass air meters from which to choose. Select the meter you want by clicking on the appropriate name.

2. '**Mass Air Units**' allows you to view the data for the meter selected in either **Pounds/Hour** or **Kilograms/Hour.** Selecting a listed meter will bring up the operating parameters for the meter in units appropriate for that meter. However, once a meter has been selected you can change the units of the operating parameters by making a selection in the "**Mass Air Units**" box.

3. You can also edit the parameters for a listed meter. Clicking the "**Edit**" button brings up the "**Confirm**" dialog box asking "**Edit this Mass Air Meter Record?"** Clicking "**Yes**" activates the data entry boxes in the data table at the lower left of the window so you can edit the information in them. When you are finished, click "**Save.**" This will save your changes and return you to the **Mass Air Meter Edit** screen. Clicking "**Close**" will return you to the main **InterACQ** screen. The only time **"Frequency Input"** will be active and user selectable is when your are editing or adding a new MAF meter (see below). When adding a new meter you will need to select frequency Input or voltage Input, as appropriate for the meter, when creating the Voltage (Frequency)/Flow table (lower left of the window).
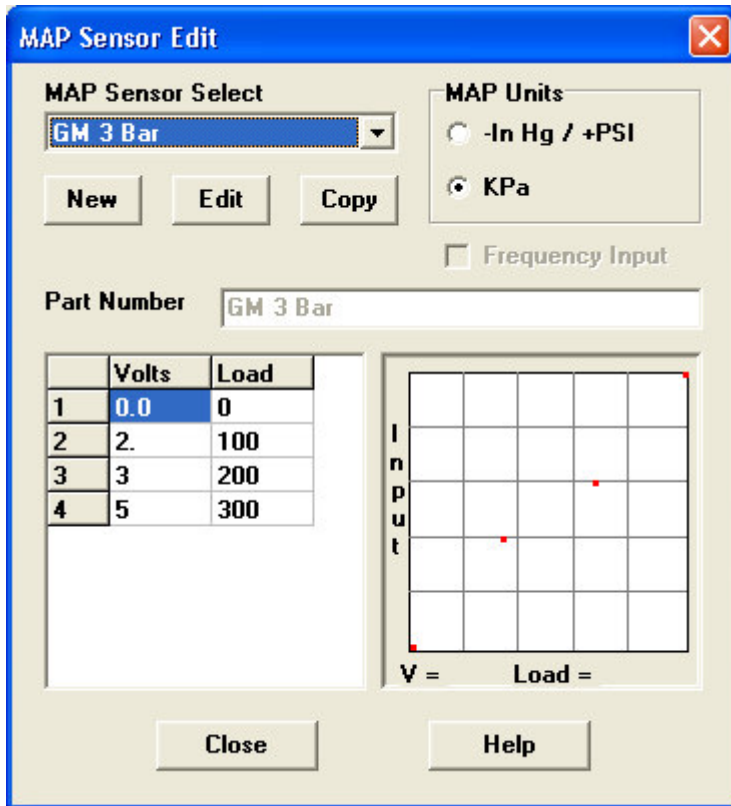
4. If you want to use an MAF meter not listed you can add it to the list by clicking the "**New**" button. This will bring up a "**Confirm**" screen asking **"Create a new Mass Air Meter?**" Clicking "**Yes**" present a new data table at the left bottom of the screen where you can fill in the name/part number of the new meter and its operating parameters (Voltage/Flow or Frequency/Flow). Note that **"Frequency Input**" is no longer grayed out and is active so you can make that selection, if required, before creating the operating parameter data table. **Note**: When the new data table is first presented it will have cells for Volts (or frequency) and Flow at only one point. Additional points can be added by using the **Insert** keys to insert points, and the **Delete** keys to remove points. When you are finished, click "**Save**". This will add the new Mass Air Meter to the list and return you to the **Mass Air Meter Edit** screen with the new meter as the active one.

5. You may also **delete** an MAF model. To do so enter the "**Edit**" mode, blank out (delete) the meter name, and click "**Save.**" This will bring up the prompt "**Do you want to delete that MAF meter?**" If you select "**Yes,**" that model is deleted. If you click "**No,**" you will receive a prompt asking you to provide a valid name for the MAF meter.

6. When you are finished, click "**Save.**" This will save the deletion and return you to the **Mass Air Meter Edi**t screen with the new meter as the active one.

7. When you are finished, click "**Close**" to return you to the main **InterACQ** screen.

MAP Sensor Editor

Like Injector Edit the **MAP Sensor Edit** function allows you to edit or create parameters of the Mass Air Meters available to **InterACQ**.

1. Select "**MAP Sensor Editor...**" from the "**Edit**" menu. When the dialog box is displayed select the MAP sensor being used from the list provided. Clicking on the small arrow at the right side of the "**MAP Sensor Select**" box brings up a list of MAP sensors from which to choose. Select the sensor you want by clicking on the appropriate name.

2. "**MAP Units**" allows you to view the data for the sensor selected in either **PSI** or **Kpa**. Selecting a listed sensor will bring up the operating parameters in units appropriate for that sensor. However, once a sensor has been selected you can change the units of the operating parameters by making a selection in the MAP Units box.

3. You can also edit the parameters for a listed sensor. Clicking the "**Edit**" button brings up the "**Confirm**" dialog box asking "**Edit this MAP Sensor Record?**" Clicking "**Yes**" activates the data entry boxes in the data table at the lower left of the window so you can change the information in them. When you are finished, click "**Save**" to save your changes. Clicking "**Close**" will return you to the main **InterACQ** screen.

4. If you want to use an MAP sensor not listed you can add it to the list by clicking the "**New**" button. This will bring up a "**Confirm**" screen asking "**Create a new MAP**

Sensor?" Clicking "**Yes**" present a new data table at the left bottom of the screen where you can fill in the name/part number of the new sensor and its operating parameters (Voltage/Load or Frequency/Load). **Note:** When the new data table is first presented it will have cells for Volt (or frequency) and Load at only one point. Additional points can be added by using the **Insert** keys to insert points, and the **Delete** keys to remove points. When you are finished click "**Save**." This will add the new MAP sensor to the list and return you to the **MAP Sensor Edit** screen with the new sensor as the active one.

5. You may also delete an MAP sensor from the list. To do so enter the "**Edit**" mode, blank out (delete) the sensor name, and click "**Save**." This will bring up the prompt "**Do you want to delete that sensor?**" If you select "**Yes**," the sensor is deleted. If you click "**No**," you will receive a prompt asking you to provide a valid name for the sensor.

6. When you are finished, click "**Save**." This will save the deletion and return you to the **MAP Sensor Edit** screen with the new sensor as the active one.

7. When you are finished, click "**Close**" to return you to the **InterACQ** screen**.**

Monitor Forms

The biggest added feature to InterACQ with Version 3 is the ability for you to create and modify your own custom Monitor Screens, sometimes called a Dashboard. (Screens and Forms are names for the same thing - i.e. the Monitor or Playback "Window" which shows all the meters, text data, etc of the Monitor).

Although there are virtually an unlimited number of Monitor Forms that can be created, only three can be accessed from the program at any given time. These are available from the Monitor and Playback Speed Button Popup Menu. To establish which Forms you want in the popup menu, you'll need to go to **PC Setup/Preferences**.

Processed Meters

There are 16 "virtual" meters that can be "assigned" to a specific analog port and converted to display data in a meaningful format. The fields correspond to the list that can be found in Configuration Files, and use the exact same conversion, scaling, etc as that used in the Monitor and Graphs. You can change or customize the assignment to suit your particular setup. The Processed Meters can be assigned the following data:

....**Load**

                      Air/Fuel Ratio
Volumetric Efficiency
Estimated Horse Power
TPS
Mass Air (Ford Stock Mass Air Meter only)
Vacuum
Water Temperature
Air Temperature
Left O2 (standard)
Right O2 (standard)
Pressure
Vent
User Custom Data (8)

Monitor Form Setup

From the **Data Log** menu, select **Setup**, which opens a submenu. Select **Monitor** to open the main Monitor Form Editor. The following steps below describe the basic operations for creating and modifying a Monitor Screen.
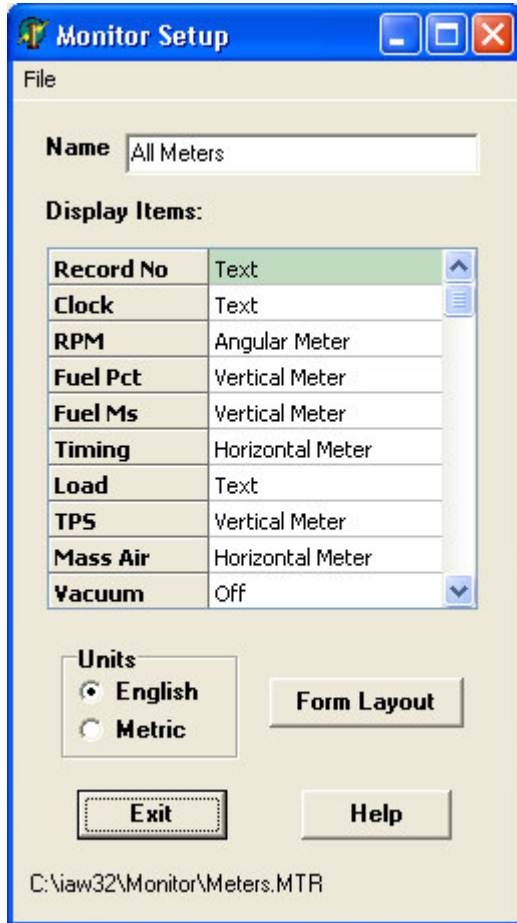
Step 1:
From the File Menu (in the Editor, not the Main File Menu), select "New" or "Open". The latter will display an Open File dialog from which you can select which Monitor Form you wish to edit.

Step 2:
Enter the Name of the Form. Make sure you type something here as this is what is displayed in the Popup Menus of the Monitor and Playback Speed Buttons. Select the Units type.

Step 3:
Select what items you would like to have included in the form in the Display Items list.   Highlight each item by clicking the right hand column. Click again on the green cell, and a drop down menu will appear. Select from the menu how you want the item to be displayed.   Depending on the particular item will decide what your choices are. In the example shown below, a Horizontal Meter is being selected for Fuel Pct.
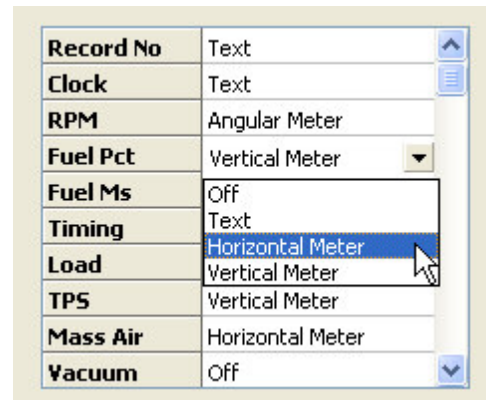
Step 4:
Click in the **Form Layout** button. This brings up the Monitor Layout Form (described in the next section), which allows you to change the position, size, and many other properties of each of the display items. When you're done with the Layout, you'll return to this dialog.

Step 5:
Save the Monitor Form. From the File Menu, select **Save** or **Save As**.

Monitor Layout and Properties

This is where you'll spend the majority of time customizing the Monitor Screens. Two windows should be visible - the Monitor Layout Form, and a Properties form. Using these two windows is very simple - you select an item in the Layout Form. The item selected will be "outlined" with small black anchor points. For example, Fuel Ms is selected below. The properties of that Item appear in an "exploding" list in the Properties window. You click on the Property you'd like to change, and if required, type the change. Included in the Properties Window is a hint which helps explain what each property does.

You can also move and re-size all the items in the Layout Form. Click on an item, but while holding the left mouse button down, move the mouse. The item will follow the mouse. To re-size, click on one of the anchors (little black squares) and again while holding the left mouse button down, move the mouse.

The best way to learn how the layout interface works, and what each property does is to experiment. Most of the properties are WYSISWYG.

When you're done, you *must close the Layout Form.* Do not minimize the form or click back on the Monitor Setup. Close the Layout form by clicking on the X box in the upper right hand corner of the window. This will save all the changes you've made to the layout, and returns control back to Monitor Screen Setup Editor.

Custom Monitor Data

Those who are observant would have noticed that in the Monitor Form Setup, there were display items called Custom 1 through Custom 8. These provide a means for custom display data to be displayed in the Monitor and Graphs. For example, if you have a Wide Band O2 Sensor, you would use a Custom Display item, along with the following two part discussion on how to set it up.

Part 1: Conversion Files

Most sensors are not linear with voltage, and almost always have different units than "volts". Conversion Files (or CNV files) are used to take a linear or non-linear sensor and translate the input voltage to units that make sense to humans in the Monitor.

To access the Conversion File Editor, go to the **Data Log** menu, and click on **Setup**. From the submenu, click on **Conversion Files**. The following steps describe how to create or modify Conversion Files.

Step 1:
From the File menu in the Editor, select click New or Open (which displays an open file dialog).

Step 2:
Fill in all the text data in the top. The Units field is what will be used in the Monitor and Graph displays, so make sure you at least fill that field with the appropriate text.
Also set the Precision. This is the number of digits to the right of the decimal point when displaying the data.

Step 3:
Next click on the Set Points Table. Use the Insert key to create as many rows of data set points you need. Each Set Point consists of *two* numbers: Volts, the input seen by hardware, and Value, what that input translates to. Use the Delete key to remove the rows. The Insert/Delete Rows work only if not editing a cell (i.e. the cell is lime green) To Edit a

cell either press F2, or click twice on a cell. A caret will appear which shows that the cell is on Edit mode. The Insert and Delete keys now apply to characters in the cell. To exit the edit mode, click on another cell, or press Tab. The left side of the table is Volts, the right side is the value you wish to be displayed in the Monitor or Graph.

Step 4:
Once all the data set points are entered, click on the Values Table. This sorts the Set Points Table, and then fills in the Values table with all values, based on the Set Points.

Step 5:
Click on **File|Save** or **File|SaveAs** to save the file. You'll need to remember the file name later as it's used in Part 2.

Part 2: Configuration

The second part of creating custom displays is to tell the program where the data comes from. For each PMS, there is a configuration file which in part describes the hardware configuration of the analog inputs, and how they relate to the rest of the program. While the Monitor Form Setup allows you to set up how the Monitor Screen looks, it does not specify its relationship to the actual PMS hardware. For the vast majority of data items, the default source of the data from the PMS is fixed. However, there are occasions where some customization is needed. This editor allows you to enter information that would override the default parameters of the data source. Only the analog ports can be configured in this manner, and only 8 physical analog ports exist, even though 16 lines are shown. This allows you to display the same physical port in more than one manner. For example, you may want to display the Mass Air input both as Lbs/Hr, and as Volts.

Editing the Configuration files can be summarized in the following steps:

Step 1:
From the File Menu, select Open. This displays a dialog that allows you to select the configuration file to edit. Each PMS type has a separate configuration file; you would normally choose the one for your PMS.

Step 2:
Select a row in the table. This represents a data "port". The ports you have access to are not actual hardware ports, but are used to assign configuration data to the hardware.
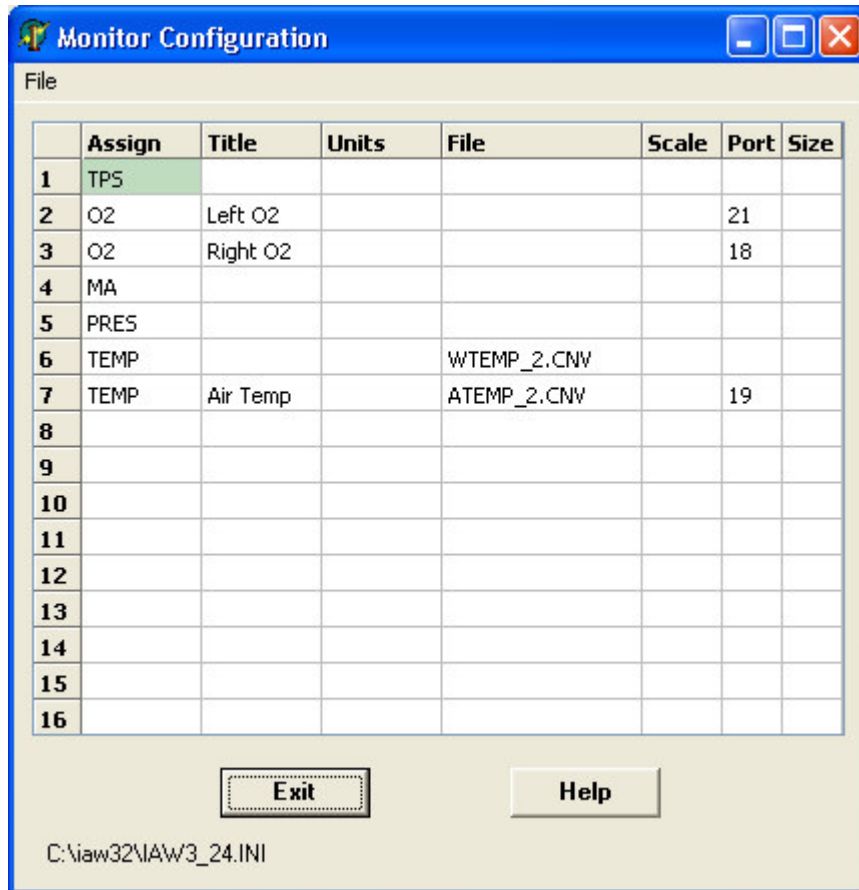
Step 3:
Edit the fields in the row. Fields include: Assign, Title, Units, File, Scale, Port and Size. The fields are described below.

Step 4:

From the File Menu, click Save.

Configuration Fields

You can edit each field by clicking on the cell. Some cells have down menus (e.g. Assign) while others allow direct text input. The six fields in each configuration file row are described below:

	Assign	Title	Units	File	Scale	Port	Size
1	TPS						
2	O2	Left O2				21	
3	O2	Right O2				18	
4	MA						
5	PRES						
6	TEMP			WTEMP_2.CNV			
7	TEMP	Air Temp		ATEMP_2.CNV		19	
8							
9							
10							
11							
12							
13							
14							
15							
16							

Monitor Configuration — Exit — Help — C:\iaw32\IAW3_24.INI

Assign:
Each line needs to be assigned to a physical analog port of the PMS. These include TPS, Mass Air, O2, etc. Note that these correspond to some of the Items listed in the Monitor Screen Setup.

Title:
The title will be displayed where appropriate in the Monitor and Graphs.

Units:
The units will be displayed where appropriate in the Monitor and Graphs.

File:
If you wish the port to use a conversion file, click on the ellipses button to open the file select dialog. This will be the file discussed in Part 1.

Scale:
If CNV files are not used, you can enter a simple linear scale factor for the data input.

Port:
This specifies the physical port in the PMS to use as the source of the data. This will vary for different vehicles. Contact Plus 1 Micro, Inc for details. Some ports are listed in Exporting Data on page 55.

Size:

This sets the size of the data, either 1 or 2 bytes, and is based on the port. Contact **Plus 1 Micro, Inc.** for details.

Automatic Operation

In the **PCSetup/Preferences** dialog, there are some additional parameters which can be use to customize the behavior of the program relating to connecting and the Monitor.

With the options described below, the program can be configured for many different recording scenarios. For example, with Auto Connect On, Auto Monitor On, Action After Open set to Run/Arm, and Auto Save On becomes a very useful setting to make a run. After the program start, the staging Go button is visible. When you're ready, just hit the space bar, and the program handles the rest. When the run is over, the data is saved automatically, and the program resets itself for the next run. This means you can make several data runs with the PMS (even if the PMS is turned off), and only have to touch the space bar between runs. **InterACQ** does all the rest automatically.

Auto Connect

In the COM tab, you can select 2 options for connecting to the PMS automatically. This means that whenever **InterACQ** is started, it will automatically attempt to connect to the PMS, based on the following choices:

Off
   No special Auto Connect is in effect

Immediate
   Attempts to Connect to the PMS as soon as the **InterACQ** starts

Ready Stage
   When **InterACQ** start, it enters a "Ready" Stage. A large "**Go**" button appears in the center of the main screen, and the program waits until you're ready to Connect. When you're ready for the Connect to start, click on the **Go** button, or press the Space bar. Press **ESC** to abort the Ready Stage. Also in this mode, when you click on the normal Connect button, the program enters the Ready stage, displaying the **Go** button.

Press the Space Bar or Click Go to start

Go

Press ESC to cancel
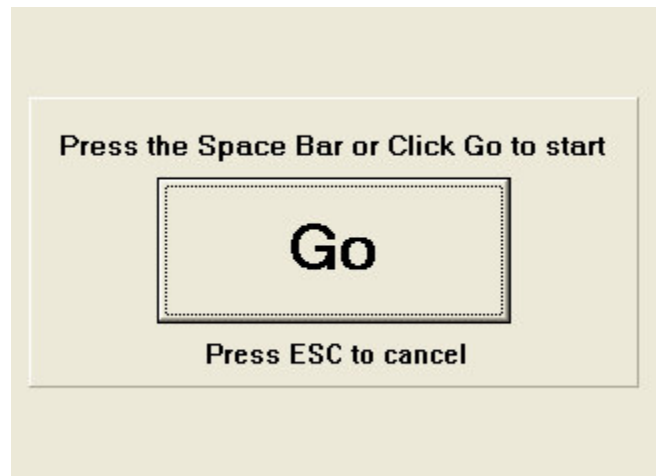
Reset After (secs)

If this value is set to a number greater that 0, **InterACQ** will continually monitor the PMS connection. If the connection is lost for any reason (i.e. ignition turned off, cable disconnected) a waiting period is entered. If the connection is restored in this time, the program continues. If after the time period specified passes, **InterACQ** assumes the connection is lo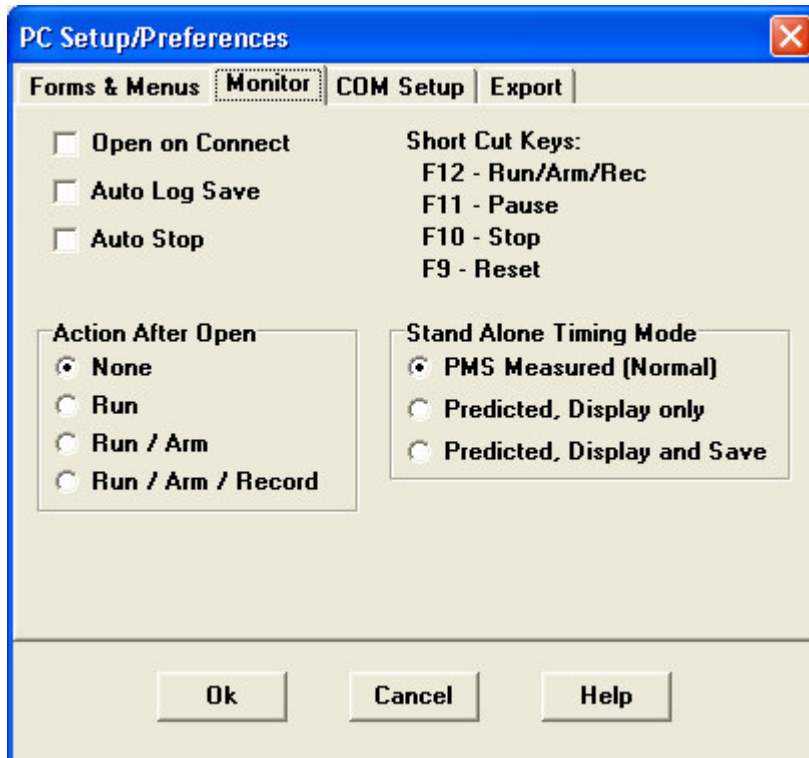st, and will reset itself to start over with a new connection. If the Monitor was recording during this time, the data will be saved (based on the options set in Automatic Monitor Options).

Automatic Monitor

In the Monitor tab, there are various options which determine the behavior of the Monitor screen.

Auto Monitor
As soon as a valid connection is established, the Monitor Screen is opened.

Auto Save
When the Monitor stops recording (either with the triggers, manually, or lost connection) the data is saved automatically, using a self generating file name. This file name is displayed in the Status Bar.

Auto Stop
When the Monitor is running, armed, or recording, this determines what happens when some other action requiring communication with the PMS is initiated (e.g.Save Data Set). If Auto Stop is Off, you will get a message which states that the "Monitor Is Running". You'll need to manually stop the monitor, and then retry the action desired. If Auto Stop is On, then the Monitor stops automatically (saving data as specified with Auto Save) and then the action desired is performed.

Action After Open
This tells the **InterACQ** what to as soon as the Monitor is opened:
None - Do nothing.
Run - Start the monitor up.
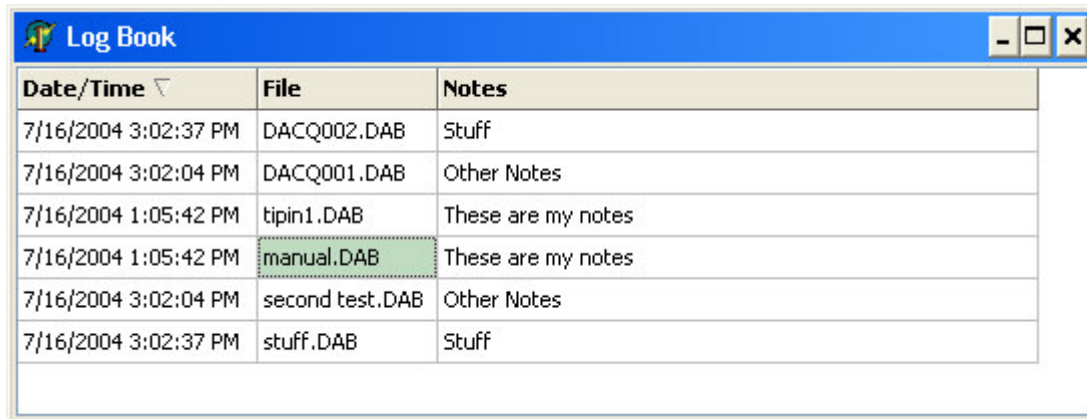
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Run/Arm - Start the monitor, and arm it for record. If triggers are "true", recording will start.

Run/Arm/Rec - Start the monitor, go right to recording.

Log Book

The Log Book allows you to easily review all the Log files created. The form shows three columns: Date/Time, Filename, and Notes. Things you can do in the Log Book window:

Double click on a row in the list, the program will open the **RePlay** form and load that data so you can review it.

Click on the column's Header will sort on that column.

Clicking on the row's Notes cell allows you to edit the text.

Press the **Delete** key on a row if you wish to delete the Log file. **Warning** - this deletes the file from the disk; once deleted, you cannot restore it unless you've made a copy of it elsewhere.

Graphics

This feature provides a means to review previously logged (and saved) monitor data. This line graph display allows a more detailed examination of the engine parameters. Two parameters may be displayed simultaneously from up to three separate logged files.

Graph Setup
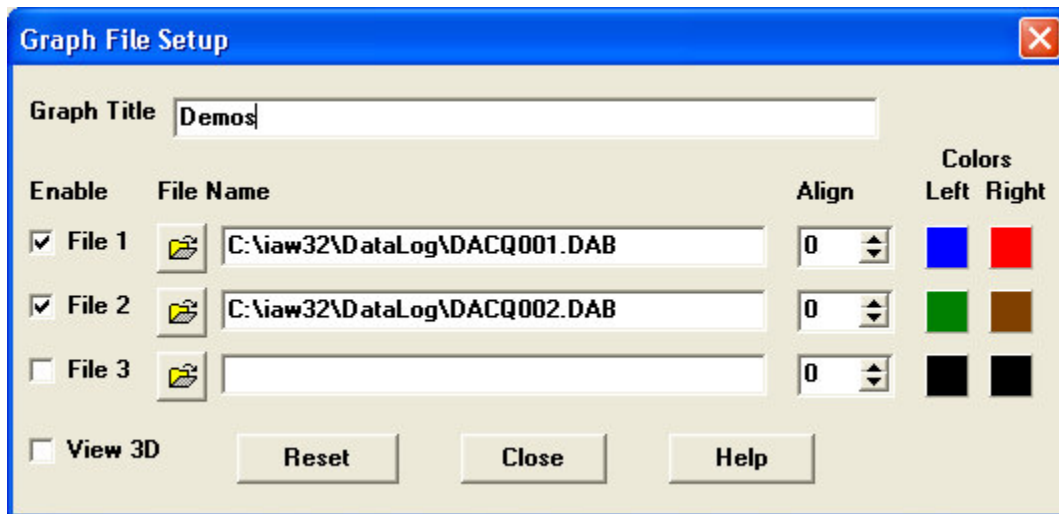
The Setup button will display the Graph Setup dialog, used to select and load the monitor data files. This dialog is used to load the files for graphical display. Up to three files can be selected simultaneously.

The check boxes on the left enable each file. The File speed button next to it brings up a File Open browse dialog. When a file has been opened, its name is displayed in the next field, as well as on the main graph.

The spin edit field on the right allows you to "line up" each file in relation to the others. This is necessary for comparing similar data logs that are slightly offset in time. The increments are 1/10 seconds increments. The title field provides you a means to display a custom graph title.

The 3-D check boxes gives depth to the graph.

Along the right are colors you select for lines in the graph. Just click right on the colored box and a Color Select dialog is shown.

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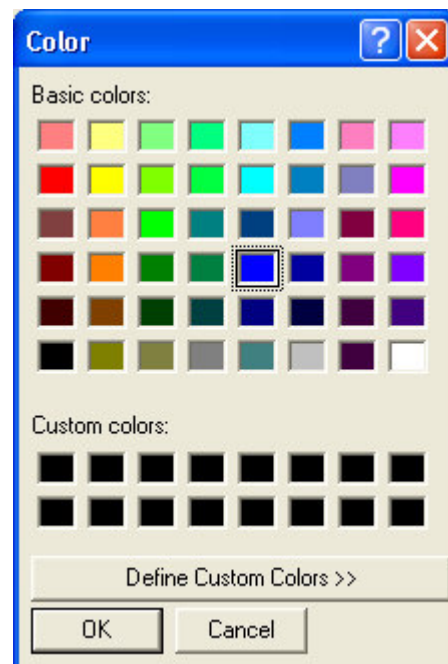
The **Reset** button clears the graph, file names, offsets and title.

Graph Screen
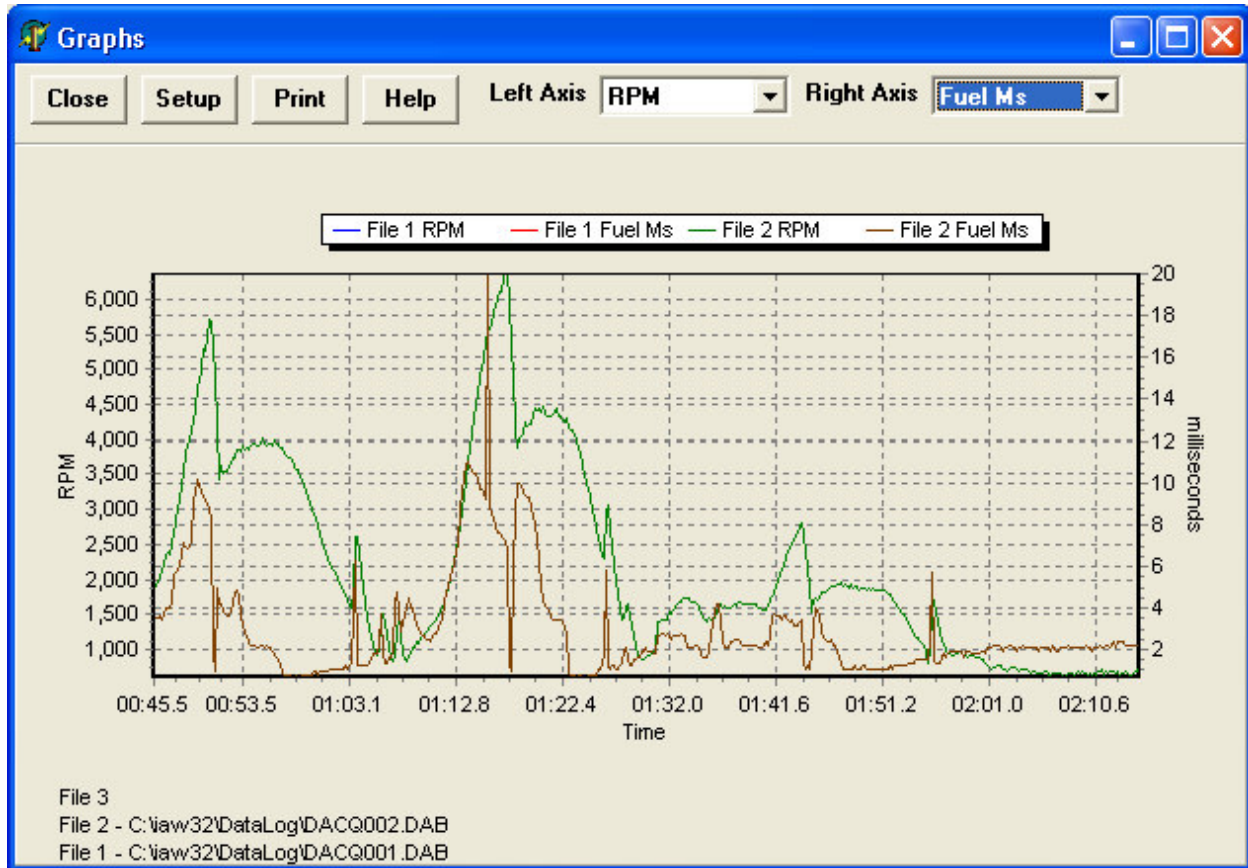
The Left/Right Axis combo boxes lets you select what parameter to graph using the left/right axis. Selections include RPM, Timing, Fuel Pulse Width, Fuel Percentage, Load, and all the analog inputs (TPS, O2, etc)

The bottom axis is in time, using the format <**mm:ss:x**> where **mm** is minutes, **ss** is seconds, and **x** is 1/10 second.

To Zoom in on a particular section of the graph, use the mouse, hold down the left button to "draw" and box around the area of interest. Draw from upper left to lower right. When you release the button, the graph will redraw. To Un-Zoom, use the same technique, except draw from lower right to upper left.

The Print button displaying a Print Preview Screen, from which the Page layout and other Printer parameters can be modified. It is recommended to start with the default margin values, and modify them only a little at a time in order to achieve the best output quality.

EEPROM Operations
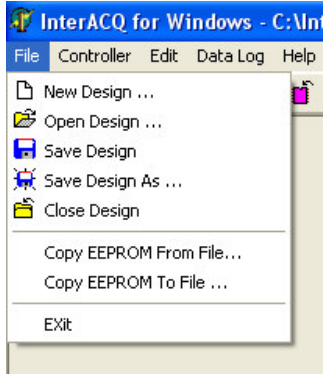
To save the PMS's **EEPROM** data onto your PC or Laptop, go to the **File** menu and select **Copy EEPROM To File**. This will bring up a normal Windows **Save As** dialog box where you can name the new file and select the file type, directory location, and disk drive. After making these selections and clicking **Save**, a progress screen titled "**Copy EEPROM to File**" will appear and show the data as it is being downloaded similarly to the Connect procedure. There is an **"Abort"** button should you change your mind. When downloading data from the EEPROM is finished, an **"Information"** window will appear, verifying completion of the Save operation.

Conversely, you can load previously saved **EEPROM** data in the **PMS**. Select "**Copy File To EEPROM**" from the "**File**" menu. This will bring up a normal Windows file selection dialog box with a list of files with "E2P" file extensions. One of these files should be the file that was created automatically when you first connected your Laptop or PC to the PMS during the Installation/Registration process. **Note:** This is not a common thing to do, as it replaces *all* of the data in the **EEPROM**, including the Stand Alone fuel and timing Data. One should use this function judiciously.

Exporting Data

Note For Interacq Version 2 Users: There are additional fields included in each detail line for exported files created with **InterACQ** Version 3. If you are using the exports files as input to other programs, you must account for the additional fields.

Sometimes more detailed analysis of Monitor data is required. For this purpose, the data saved can be exported into a text file, and then subsequently read by a Spreadsheet or other program. Two file format options are provided via **PC Setup/Preferences**.

Following is a description of the records and fields in the file. All numbers are decimal unless otherwise stated. At the beginning of each file is one Header line, followed by multiple Detail lines. The fields are separated by either a comma or spaces. The field title (and units) is shown below for each item in the Header or Detail line. The Port numbers listed are used in the Configuration Editor.

Note: The format shown below pertains to Ford PMS's only.

Header Line:
        Title (Currently always "RUN0")
        Number of records in the run
        Controller Type (hex)
        Vehicle Type (text)

Detail Line:
        Record #
        Time (mm:ss:t)
        RPM
        Input Timing
        Output Timing
        Input Fuel %
        Input Fuel Pulse Width (ms)
        Output Fuel %
        Output Fuel Pulse Width (ms)
        Processed Meters:
                Load
                Air/Fuel Ratio
                Volumetric Efficiency
                Estimated Horse Power

....**TPS**

                Mass Air (Ford Stock Mass Air Meter only)
                Vacuum
                Water Temperature
                Air Temperature
                Left O2 (standard)
                Right O2 (standard)
                Pressure
                Vent

Custom 1
Custom 2
Custom 3
Custom 4
Custom 5
Custom 6
Custom 7
Custom 8
Indicators (I/O, etc)
3 Fuel Adjust Values: Final, Miscellaneous, Secondary (X2 actual % amount)
3 Timing Adjust Values: Final, Miscellaneous, Secondary
Raw Analog Inputs:

Mass Air Analog Input	(Port 14)
Water Temp Analog Input	(Port 15)
Boost Analog Input	(Port 16)
TPS Analog Input	(Port 17)
Right O2 Analog Input	(Port 18)
Air Temp Analog Input	(Port 19)
Battery Voltage Analog Input	(Port 20)
Left O2 Analog Input	(Port 21)

4 PMS Internal Values
6 PMS Internal Indices
6 PMS Internal Flags (hex)
Trouble Code (hex)

Glossary

Adjust Fuel - Adjust Fuel is the percentage change made to either the stock ECM fuel signals or the Stand Alone fuel values. **Note:** This percentage is not the same as Fuel Percentage used in the Monitor.

Adjust Tables - Adjust tables are the fuel and timing tables which modify the stock ECM Input signals or Stand Alone data values. There are three distinct groups tables, each called a Data Set. The PMS uses only one data set at a time, loaded into temporary memory, or RAM.

Adjust Timing - Adjust Timing is the change in degrees made to either the stock ECM timing signals or the Stand Alone timing values.

Anchor Points - Anchor points refer to the cells in the Adjust tables that control surrounding cells, thus allowing a single cell edit to modify a group of cells. The Hand Held Terminal can only edit Anchor Points.

CNV - Short for **Conv**ersion File. Used to convert raw data from a port to data humans can make sense of.

Connect - Describes the remote computer (laptop, desktop) system's use of the serial port, to establish a communications channel with the PMS Controller in your vehicle over a serial cable.

Controller - The term used by this program that refers to the PMS box that goes between the engine and the Stock ECM in your vehicle. Sometimes called the Brain.

Controller Type - Each **PMS** has an identifier specifying what kind of vehicle for which it's designed for. This value is hard coded in the **PMS** and cannot be changed.

Data Set - Refers to one of three collections of Adjust Tables which include fuel and ignition timing percentage adjustments for idle, part throttle, WOT, etc.

Dashboard - Another term for Monitor Screen, or Monitor Form. Shows typical meters you would see on your car's dashboard.

Design - A Design refers to all the of Stand Alone parameters and data; injectors, mass air meter, air flow ratios, fuel milliseconds values, absolute timing values, etc. which represent a performance model, from the perspective of the vehicle's controller. It also includes all the Adjust Tables.

ECM - The engine's **E**lectronic **C**ontrol **M**odule - also known as "the Brain."

EPROM - **E**rasable **P**rogrammable **R**ead-**O**nly-**M**emory is non-volatile memory, characterized by its fast read time, high reliability and long data retention. The PMS

uses this memory device for permanent storage of Operating Software, sometimes known as Firmware. Also, some factory specified data is stored in the EPROM.

EEPROM - Electrically **E**rasable **P**rogrammable **R**ead-**O**nly-**M**emory is non-volatile memory, characterized by its fast read time, high reliability and long data retention. The PMS uses this memory device for permanent storage of Adjust Tables and Stand Alone fuel and timing signals. Not all Design parameters are saved in here.

File Extension - The file extension (three character suffix to file name, proceeded by a ".") for all InterACQ for Windows, saved designs or designs you would like to open, should be .IAW. **Note:** In this case, IAW is known as the default, design file extension.

Fuel Percentage - The term "Fuel %" is used in two different in ways in **InterACQ for Windows.** As used in the Adjust Tables it means that the specified percentage will be added or subtracted from the fuel command being issued from the stock computer, i.e. the stock value will be adjusted up or down by the specified percentage. For example, +50% entered in the Fuel Adjust table would make the fuel pulse 50% longer than the stock computer was asking for. **Note**: "Fuel %" means something entirely different in the "Monitor mode", however. There the percent shown is the duty-cycle percentage of the injector, not the percent adjust that you may have entered at that point.

Hand Held Data Terminal - Consisting of a small keypad and LCD display, this device is usually attached to the Controller via a serial cable. It provides the only other way to make changes to the Adjust Tables. It is not possible to setup and modify the Stand Alone tables with the hand held data terminal; this can be accomplished only with **InterACQ for Windows.**

Input - Refers to either the Fuel and Timing signals received from the Stock ECM or the fuel and timing values entered in the Stand Alone tables. They are always absolute values (ms for Fuel, and degrees for Timing). Adjust tables are used to modify the Input signals.

Miscellaneous Adjust Tables - Miscellaneous tables include Water and Air Temperature Enrichment tables. The PMS adds the values in both of these tables to the current value obtained from the Primary and Secondary tables. **Note:** Not all vehicles support all the Miscellaneous tables.

Monitor - A real time view of engine parameters, including RPM, fuel, and timing, etc.

Primary Adjust Tables - The Primary Adjust Tables are just that; they are the primary, or basic, tables from which the PMS operates from. Depending on the where the throttle is, the PMS will pick a value (fuel percent or timing) from one of these three tables: Idle, Part Throttle, and WOT (Wide-Open Throttle). Values from the Secondary and Miscellaneous are added resulting in the final Adjust Fuel and Adjust Timing values.

PMS Code - A four character code which is part of the Registration process. This code is generated the first time you connect to your PMS.

RAM - Random **A**ccess **M**emory**.** A fast loading, memory device that the Controller uses for temporary storage of data tables. All Adjust Table edits are made in RAM (except Single Edit Mode) and will be lost when the vehicle is turned off unless saved.

Registration Code – The final 16 character code which is part of the registration process. This number is given to you by Plus 1 Micro, Inc or authorized agent once you have submitted the Registration Form. On the form should be the Serial Number, Unlock Key and PMS Code.

Secondary Adjust Tables - Secondary tables include Boost, N2O, and Acceleration Enrichment tables. The PMS adds the values in all three of these tables to the current value from one of the three Primary tables. **Note**: Not all vehicles support the all the Secondary Adjust Tables.

Stand Alone - This refers to the PMS's capability to operate the vehicle without using the stock computer's Input Fuel and Timing signals as a base. Note that this occurs on the fly at a user specified RPM and Throttle position. This DOES NOT infer that the stock computer can be removed!

Status - Any messages pertaining to the status of the system are displayed here.

Triggers - Triggers are the RPM and Throttle position values to start and stop recording of monitor data.

Unlock Key - This unique key unlocks the software, and allows the Trial Registration Period to begin.

WYSIWYG - What **Y**ou **S**ee **I**s **W**hat **Y**ou **G**et