

PIViewer

A Log Analysis Tool For
PocketLOGGER Log Files

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Introduction

PIViewer is a application designed for analyzing log files generated by Digital Tuning Inc.'s PocketLOGGER™ product – an automotive datalogger for Palm Computing platforms. PIVIEWER provides functions for displaying the PocketLOGGER™ log files graphically, or in table form. It can plot scatter graphs, save graphs as images or print them, and can also directly download log files from your PDA via a serial link.

PIViewer is written in Java, and has been successfully tested on most Windows and Linux PC platforms.

Installation

PIViewer will not work unless you have Java installed on your computer. Java may be downloaded from Sun's Java web site (java.sun.com). Java 2 Standard Edition (J2SE) Runtime Environment (JRE) is recommended.

To install PIVIEWER, you will need to download **PIViewer.jar** to an accessible location, such as the Desktop. Some Windows based browsers rename the file to PIVIEWER.zip – in this case you must rename it back to PIVIEWER.jar.

On Windows systems, assuming that Java was installed successfully, you can now run PIVIEWER simply by double-clicking on the PIVIEWER.jar file.

On Linux systems, PIVIEWER can be started using the command;

```
java -jar PIVIEWER.jar
```

Note that when PIVIEWER terminates, it will create a file 'plviewer.cfg'. This file is used to store configuration options. Removing this file will not prevent PIVIEWER from running, it will simply erase any configuration options you may have set.

Using PIVIEWER

When started, PIVIEWER will show the main window¹;

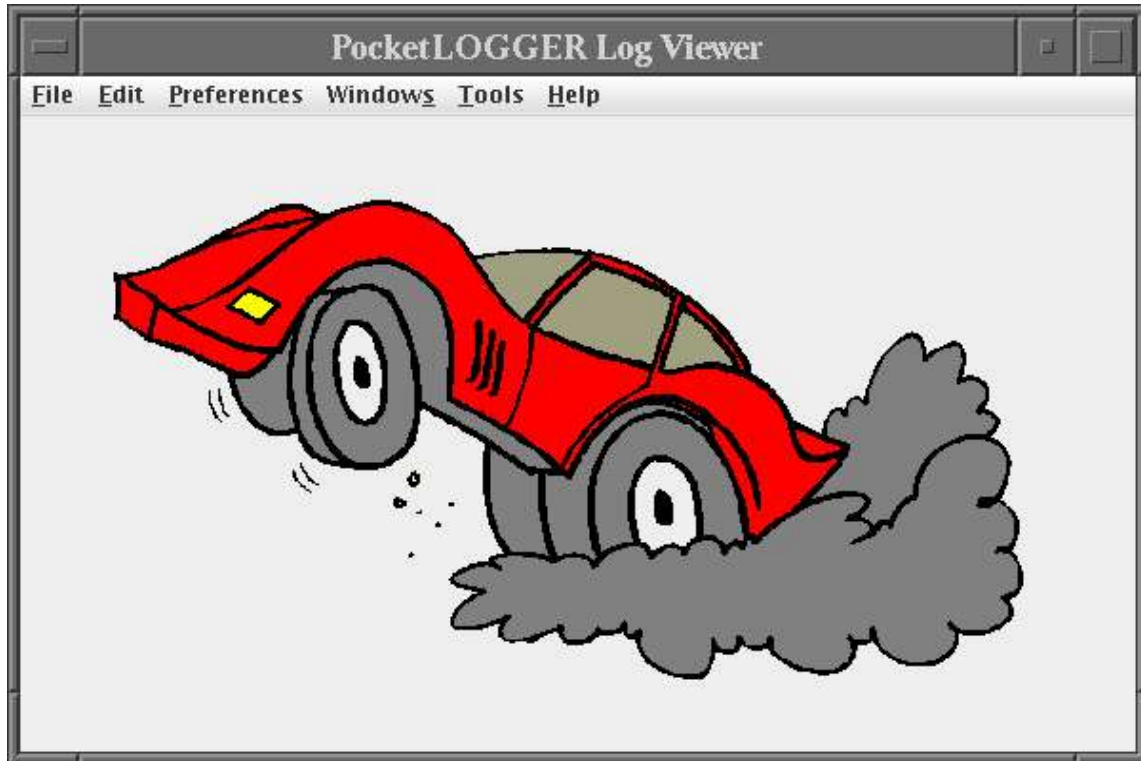


Figure 1 - The main window

The application menu bar contains six drop down menus. The File menu contains options for loading and saving log files, setting print options, and printing graphs. The Edit menu contains options for copying data to the system clipboard. The Preferences menu contains parameter, graph and sensor configuration options. These enable you to set up parameter colors, scaling values, etc. The Windows menu provides extra display options for viewing the log data. The Tools menu is where most viewer extensions add utility commands (such as the PDA download). The Help menu provides information about the current version of PIVIEWER.

¹Note that the exact appearance of the window will vary, depending upon the operating system and window manager.

Loading a log

Loading log files is done via the File->Open... menu option. This will bring up a standard file 'Open' dialog, from which you may navigate the directory hierarchy and select the log file you wish to load.



Figure 2 - The File Open dialog

The file types drop down list displays a list of the supported file types. PIVIEWER currently supports pdb format log files (files created by PocketLOGGER™ f), and CSV (comma separated variables) files which have previously been saved by PIVIEWER.

A log file can be selected for loading by double clicking on it's entry in the file list, or by selecting it with a single click, and then selecting the 'Open' option. Selecting 'Cancel' will return you to the main PIVIEWER window without loading a log.

After selecting a log for loading, PIVIEWER will return to the main application window to display the graphs.

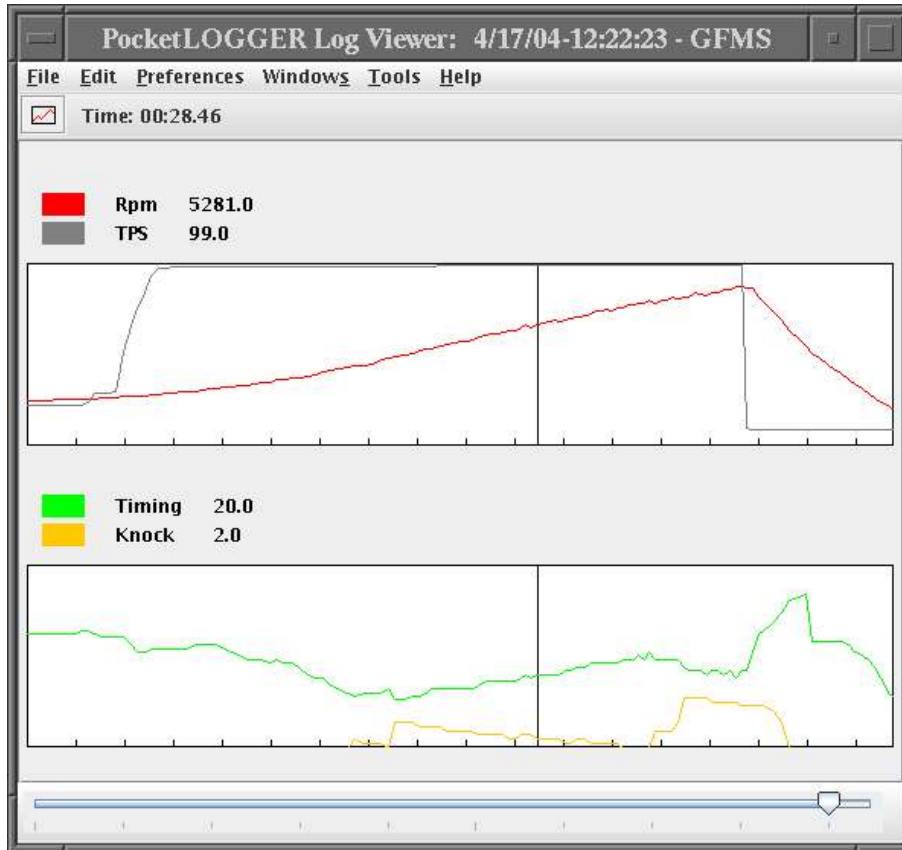


Figure 3 - The graph display

By left clicking on a graph, PIVIEWER will display a vertical line through all the graphs at the nearest sample time. The legends will indicate the sample values for the displayed parameters and the time value below the menu bar will display the actual time stamp of the samples.

The slider bar at the bottom of the window can be used to rapidly scroll forwards and backwards through the sample data.

A region of a graph can be selected by pressing and holding the Shift key while clicking the left mouse button. The toolbar will indicate the size of the selected region in seconds.

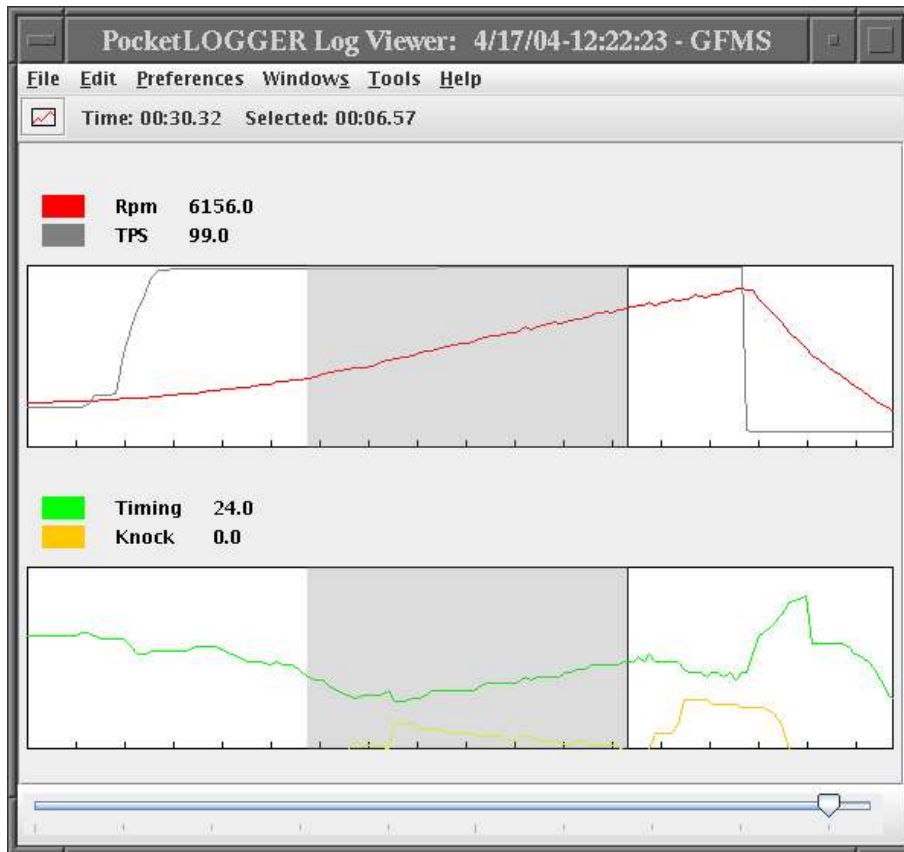


Figure 4 - Selecting a region

Configuring the Graph Display

Adding and removing parameters

PIViewer can display any number of graphs, and each graph may show as many parameters as you wish. Changing the parameters displayed on a graph is done by using a graph's pop-up menu. Right click on a graph to obtain the pop-up menu, and then select the 'parameters' sub menu.

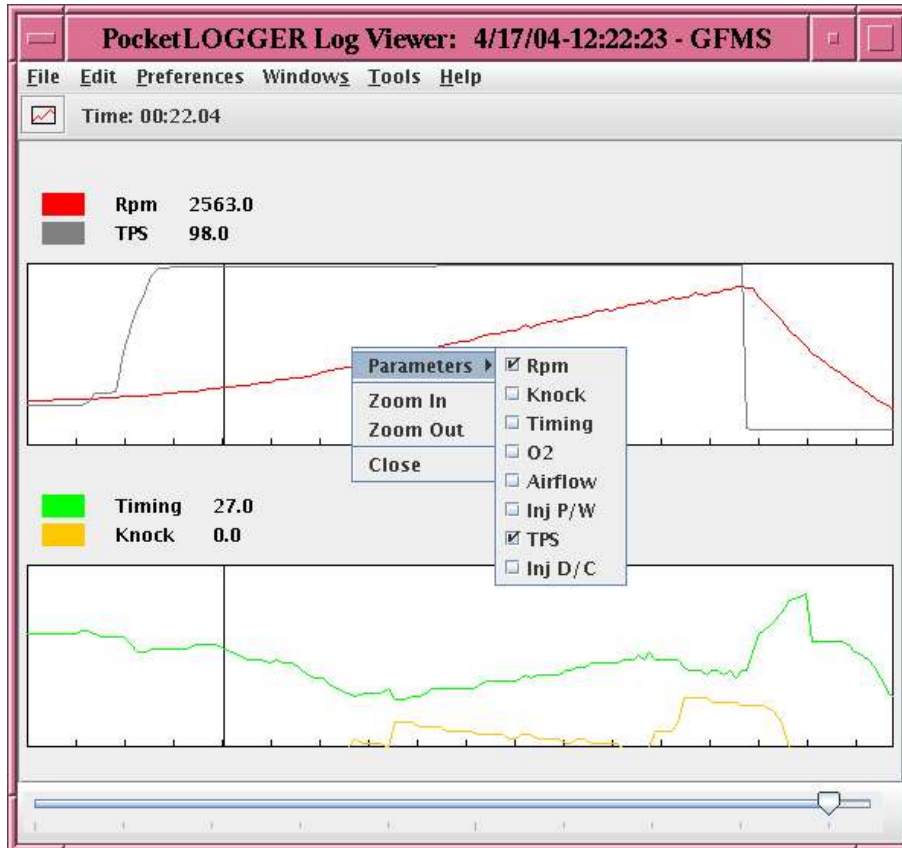


Figure 5 - Graph pop-up menu

The parameters submenu lists all the parameters in the current log with checkboxes. The checkboxes for those parameters already displayed in the graph will be checked. Parameters can be added or removed by toggling a parameters checkbox. Each time a parameter is selected, the submenu will be closed and the graph updated.

Adding and removing graphs

A new, empty graph can be created by using the graph button on the toolbar below the main menu.



Figure 6 - 'New Graph' button

This will create an empty graph below your existing graphs. If the current application window is not large enough to display the extra graph, a vertical scrollbar will appear on the right side of the application window. This allows you to scroll down and view the new graph.

To close a graph, use the 'Close' option on the graphs pop-up menu.

Graph Setup

You can configure other properties of the graph, such as scaling values, height and colors via the 'Graph Setup' option on the 'Preferences' menu. This will open a dialog box which contains a number of options.

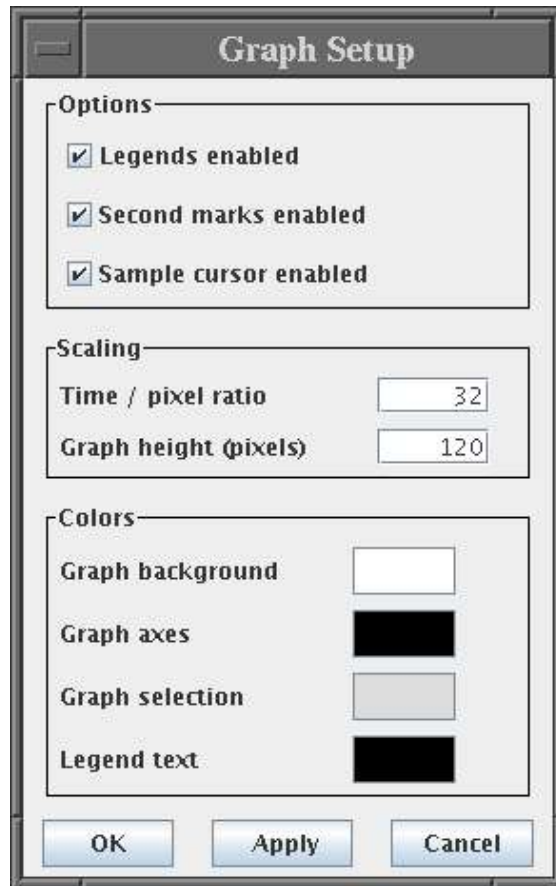


Figure 7 - Graph Setup options

The Options group provides checkboxes for toggling three options;

- The 'Legends enabled' checkbox allows you to enable or disable to display of the parameter legends, which are displayed above each graph. This legend shows the color of each parameter being displayed on the graph and the sample value at the currently selected time sample.
- The 'Seconds marks enabled' checkbox allows you to switch off the tick marks displayed at one second intervals along a graphs horizontal axis.
- The 'Sample cursor enabled' checkbox can be used to enable or disable the drawing of the time cursor – the vertical line displayed on the graphs when you left click with the mouse.

The Scaling group provides two configurable values;

- The 'Time/pixel ratio' value define how many screen pixels correspond to one second on a graphs horizontal axis. You can enter a value here directly, or use the 'Zoom In' and 'Zoom Out' options on a graphs pop-up menu.

- The 'Graph height' value defines the height of the graphs vertical axis in screen pixels.

The Colors group provides four color configuration options. By clicking on the colored rectangular button, a color chooser dialog is displayed. This allows you to configure the colors from a selection grid, as HSB or RGB values.

- The 'Graph background' color is used to paint the graph background.
- The 'Graph axes' color is used to draw the horizontal and vertical axes on the graphs.
- The 'Graph selection' color is used to draw the currently selected region of a graph (to select a region, click-shift-drag with the left mouse button).
- The 'Legend text' color is used to display the parameter sample values in the graph legends (if enabled).

Once you have configured the values, the 'OK' button will accept the new changes and close the Graph Setup window. The 'Apply' button will accept the new values, but leave the dialog displayed. The Cancel button will discard the changes and close the dialog.

Parameter Setup

Parameter configuration options, such as color and scaling values, can be accessed via the 'Parameters' option on the 'Preferences' menu. This opens up the Parameter Configuration dialog box.

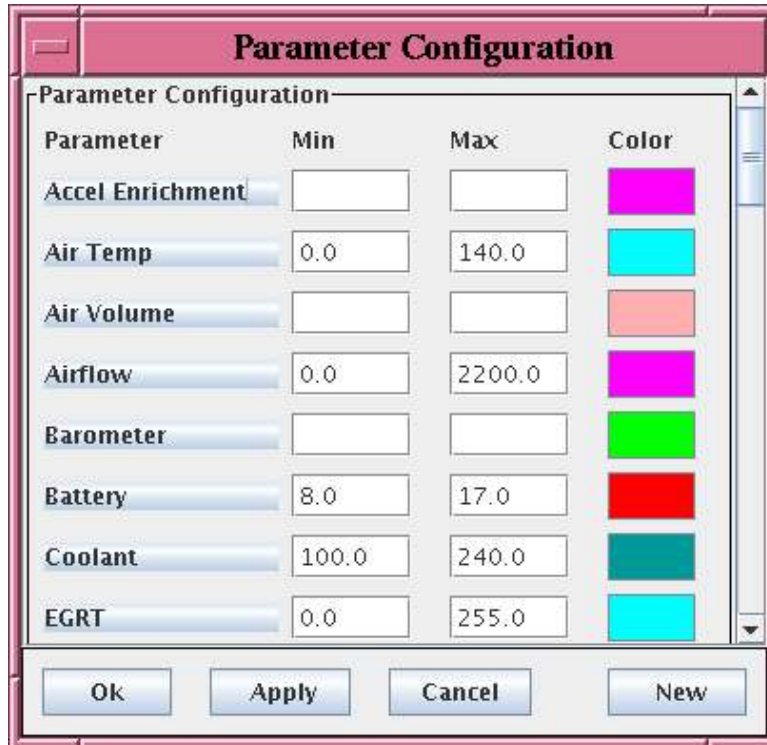


Figure 8 - Parameter Setup options

This dialog displays a scrollable list of all the configured parameters² in alphabetic order. There are four columns;

- The first column gives the parameter name as it is displayed in the graph legends.
- The second column displays the parameter minimum value. This is the value of a parameter at the bottom of a graph's vertical axis. If no value is provided, PIVIEWER will use the minimum value from the current log.
- The third column displays the parameter maximum value. This is the value of a parameter at the top of a graph's vertical axis. If no value is provided, PIVIEWER will use the maximum value from the current log.
- The fourth column is the color used to draw the parameters sample values in a graph. By clicking on the colored rectangular button, a color chooser dialog is displayed. This allows you to configure the colors from a selection grid, as HSB or RGB values.

Once you have configured the values, the 'OK' button will accept the new changes and close the Parameter Configuration window. The 'Apply' button will accept the new values, and leave the dialog displayed. The Cancel button will discard the changes and close the dialog.

² Some parameters will be specific to each of the DSM/OBDII versions of PocketLOGGER™.

By clicking on a parameter name in the first column, an 'Edit Parameter' dialog is displayed.

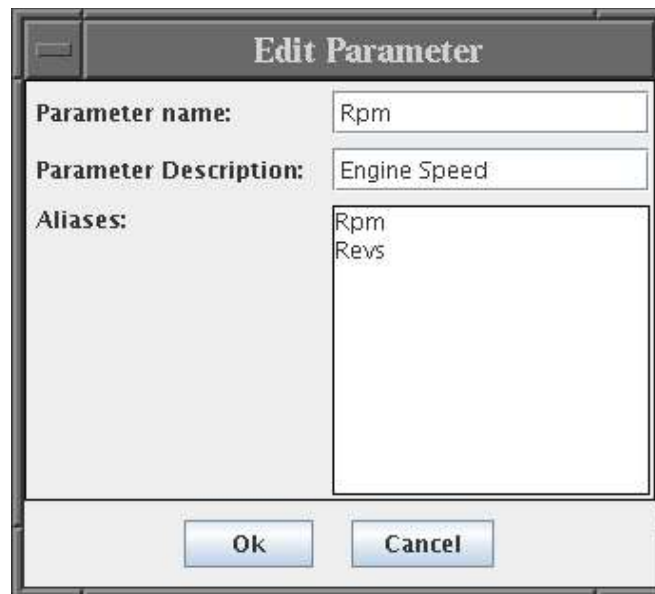


Figure 9 - Edit Parameter dialog

This gives you three further configuration options;

- The 'Parameter Name' is the display name of the parameter. This is used in PIViewer, for example, in the legends, and in a graphs pop-up 'Parameters' submenu.
- The 'Parameter Description' is simply a brief description of the parameter.
- The 'Aliases' is a list of other names (aliases) that represent this parameter. These are used by the input filters to map parameter names (for example, in a CSV log file) into the PIViewer parameters³.

Sensor Setup

Double Hz Feature

The KeyDiver ECU chip with the 'Double Hz' feature changes the way in which the airflow is reported to the logger in order to work around the 1606Hz limit imposed by the standard ECU. To let the log viewer know that you are using this feature, make sure the 'Double Hz' option on the 'Preferences' menu is selected.

³ Change these values with caution – it may affect PIViewer's ability to load log files.

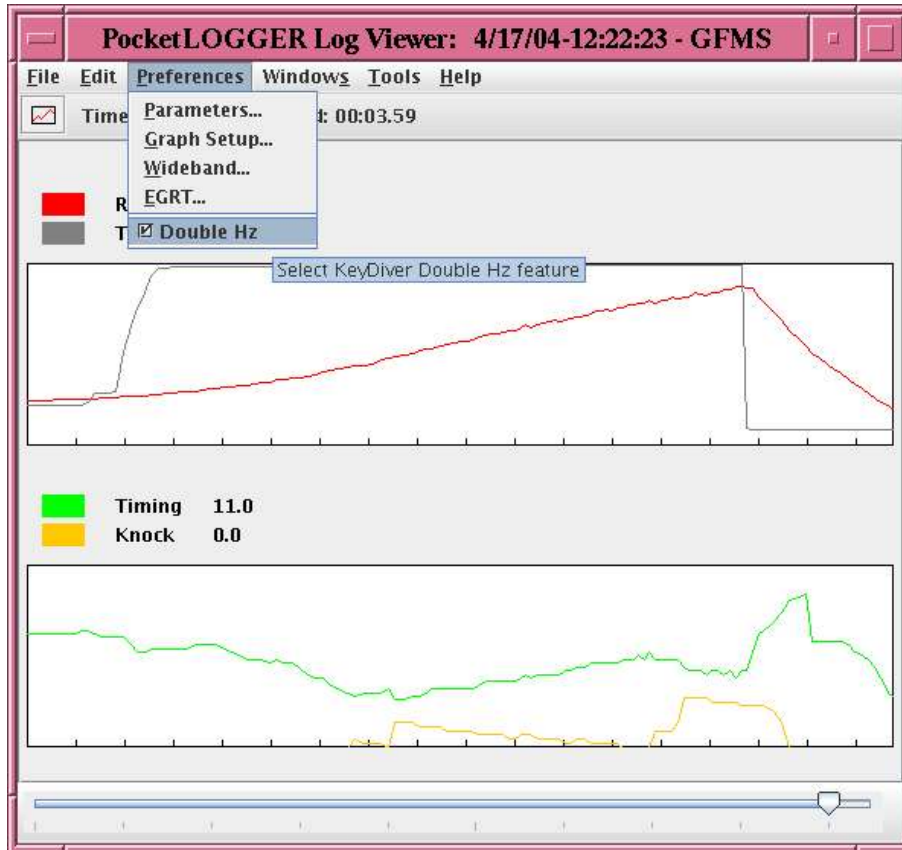
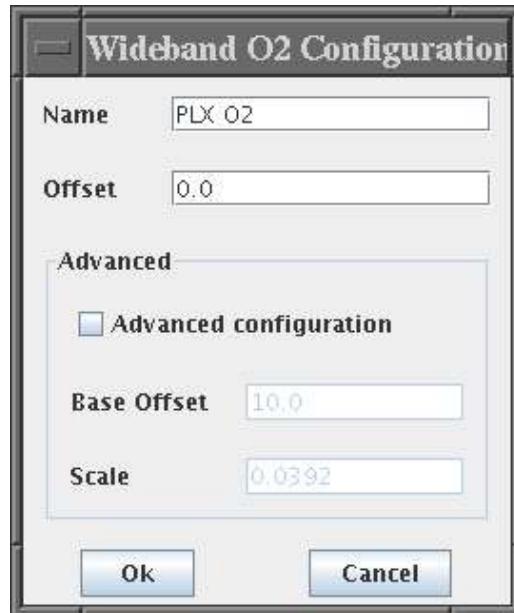


Figure 10 Enabling the Double Hz feature

The viewer will make the appropriate compensation to the airflow readings in order to display it correctly. This setting will only take affect the next time a log is loaded, it will not affect the currently loaded log.

Wideband Sensors

PocketLOGGER supports wideband sensors connected via the EGR Temperature wire (non-California models). PIVIEWER must be configured in order to correctly display the wideband sensor data. To configure a wideband sensor, select 'Wideband...' from the 'Preferences' menu. This will open the wideband sensor configuration dialog.



The image shows a dialog box titled "Wideband O2 Configuration". It contains several input fields and a checkbox. The "Name" field is set to "PLX O2". The "Offset" field is set to "0.0". There is an "Advanced" section with a checkbox labeled "Advanced configuration" which is currently unchecked. Below this, the "Base Offset" field is set to "10.0" and the "Scale" field is set to "0.0392". At the bottom of the dialog are "Ok" and "Cancel" buttons.

Figure 11 The Wideband sensor configuration

The 'Name' is the name that will be displayed on the log graph. In the 'Offset' field you should enter the same value as used in the "WBo2 Setup" on the PocketLOGGER.

Checking the 'Advanced configuration' checkbox will allow you to fine tune the scale and base offset values for the wideband sensor. Do not use this option unless you are sure you know what you are doing, as it will alter the displayed values.

Changes to the Wideband configuration will only take effect the next time a log is loaded. It will not affect the currently loaded log file.

Other Display Options

Legend Window

The legend window can be displayed by selecting the 'Legend' option on the 'Windows' menu.

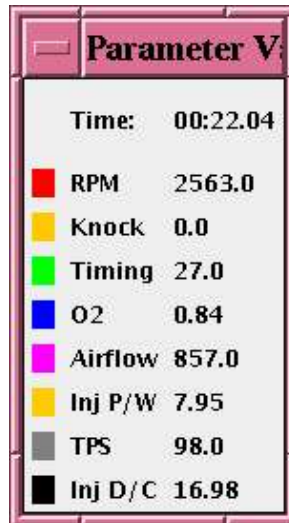


Figure 12 - The graph Legend

This displays the values of all the parameters in the log file at the currently selected time sample. Left clicking on a graph to select a new time sample will cause the legend to be updated with the sample values at the selected time.

Data Window

The data window can be displayed by selecting the 'Data' option on the 'Windows' menu. This provides a direct view of the log data, much like a spreadsheet.

Log Data: 4/17/04-12:22:23 - GFMS								
Time	RPM	Knock	Timing	O2	Airflow	Inj P/W	TPS	Inj D/C
6.07	1313.0	0.0	26.0	0.02	290.0	5.38	24.0	5.89
6.2	1188.0	0.0	23.0	0.06	290.0	5.64	24.0	5.58
6.34	1219.0	0.0	25.0	0.76	328.0	5.13	24.0	5.21
6.47	1438.0	0.0	27.0	0.84	328.0	4.87	24.0	5.84
6.61	1438.0	0.0	27.0	0.78	328.0	4.87	24.0	5.84
6.74	1563.0	0.0	29.0	0.76	353.0	4.62	24.0	6.02
6.89	1719.0	0.0	30.0	0.8	353.0	4.62	24.0	6.62
7.03	1750.0	0.0	31.0	0.76	366.0	4.36	24.0	6.36
7.17	1875.0	0.0	30.0	0.45	378.0	4.36	24.0	6.81
7.31	1969.0	0.0	31.0	0.1	391.0	4.36	24.0	7.15
7.45	2031.0	0.0	31.0	0.06	391.0	4.36	24.0	7.38
7.59	2125.0	0.0	32.0	0.49	403.0	4.1	24.0	7.26
7.74	2219.0	0.0	32.0	0.65	403.0	3.85	24.0	7.12
7.87	2313.0	0.0	32.0	0.51	416.0	3.85	24.0	7.42
8.02	2375.0	0.0	33.0	0.04	416.0	3.85	24.0	7.62
8.16	2469.0	7.0	31.0	0.04	429.0	4.1	24.0	8.44
8.3	2531.0	21.0	27.0	0.08	441.0	4.1	24.0	8.65
8.44	2625.0	27.0	25.0	0.73	441.0	3.85	24.0	8.42
8.59	2688.0	27.0	26.0	0.75	441.0	3.59	24.0	8.04
8.73	2781.0	18.0	31.0	0.55	454.0	3.59	24.0	8.32
8.88	2813.0	4.0	37.0	0.04	454.0	3.59	24.0	8.42
9.03	2938.0	0.0	39.0	0.04	454.0	3.59	24.0	8.79
9.17	2969.0	0.0	39.0	0.65	454.0	3.59	24.0	8.88
9.32	3031.0	0.0	39.0	0.78	454.0	3.33	24.0	8.41
9.47	3125.0	0.0	40.0	0.67	454.0	3.33	24.0	8.67
9.62	3188.0	0.0	40.0	0.14	454.0	3.33	24.0	8.85
9.77	3219.0	0.0	40.0	0.04	454.0	3.33	24.0	8.93
9.92	3250.0	0.0	40.0	0.69	441.0	3.08	9.0	8.34
10.07	3250.0	0.0	42.0	0.9	340.0	2.56	9.0	6.93
10.21	3000.0	0.0	41.0	0.69	366.0	2.82	9.0	7.05
10.35	2781.0	0.0	39.0	0.63	340.0	2.82	9.0	6.54
10.49	2563.0	0.0	36.0	0.61	353.0	3.08	9.0	6.58
10.63	2344.0	0.0	35.0	0.59	315.0	0.0	9.0	0.0
10.76	2188.0	0.0	21.0	0.59	302.0	0.0	10.0	0.0

Figure 13 - The Data window displays the raw sample values

The data window allows a continuous select of one or more rows. Selected data can be copied to the system clipboard using the 'Copy' button. Data copied into the system clipboard may be pasted into other applications. The Copy button will be greyed out if no selection has been made.

Printing

PIViewer provides options to configure and print graphs on your printer. Three print options are available from the File menu, Page Setup, Print Preview and Print.

Page Setup

Selecting 'Page Setup' from the 'File' menu will display the 'Page Setup' dialog.

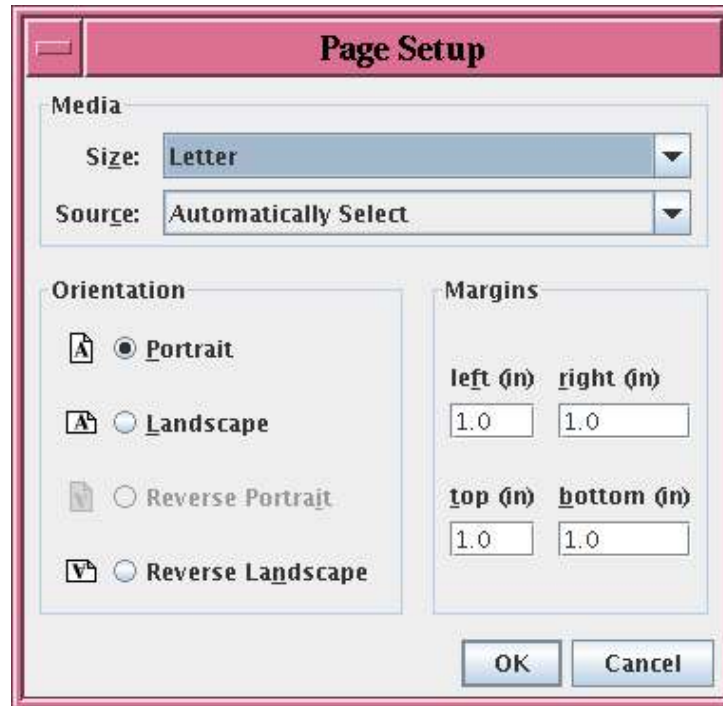


Figure 14 - The Windows 'Page Setup' dialog

This provides configuration options to set the paper size, margins, orientation, etc. The exact format and options available will vary, depending on the operating system.

Print Preview

The 'Print Preview' option on the 'File' menu gives you the opportunity to see what your printed graphs will look like before you print them.

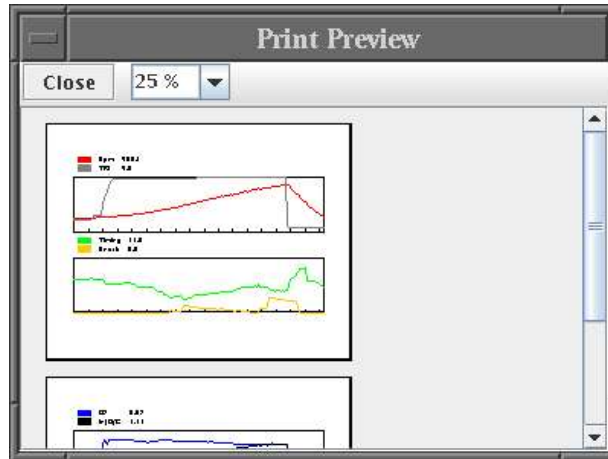


Figure 15 - Previewing graphs before printing

Depending upon the number of graphs displayed and the print options, this may be split into multiple pages. A toolbar contains a drop down list of scaling factors, allowing you to preview the graphs different sizes. You may also enter a custom size directly, by double clicking on the current value and entering a new value. Once you have finished with the 'Print Preview' dialog, select the 'Close' button.

Print

Selecting 'Print' from the 'File' menu will display the 'Print' dialog box. Depending upon the platform, this will provide further options to configure the printer and the number of copies. To print the graphs, select the 'OK' button.

Saving Images

It is possible to save the current graph(s) as an image by selecting the 'Save Image...' option from the 'File' menu. This opens up a file selection dialog which allows you to select the type of image file, and the name under which to save it. The available imageformats will vary, depending upon the platform. Lossy images formats, such as jpeg, are not very suitable for the graphs produced by PViewer. The png format, which should be available on most platforms provides good, lossless compression, and is the recommended image format.

