TEWBLOG v2.0
Users Guide

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Introduction

Use of this software should be somewhat self-explanatory. I've done my best to make things as simple as they can be in the user interface, but find that it's always best to document how something works (something that made perfect sense to me, might be total gibberish to you!). This guide will attempt to explain the TEWBLOG software and its operation. For details about the TechEdge hardware and its operation, please visit the TechEdge site at http://www.wbo2.com

Requirements

TEWBLOG is a WIN32 application, which means that it *should* run on Windows 95, 98, ME, 2000 and XP. It's a small application, requiring about 300kb of free disk space. It also requires a free COM port which it uses to talk to the Tech Edge hardware. I've done my best to make the application completely self-contained. This should ease installation and create less system dependencies. I've run the software using as little system memory as 32MB, but I'm guessing that it will run with much less. I've also successfully run the software on a PC as slow as an Intel Pentium 90mhz, again, it will probably run on a slower system, but you may need to slow down the display update rate if your PC is having trouble keeping up.

Installing TEWBLOG

Installing the software is a simple process. After downloading and saving the installation program on your PC, simply execute the program (TELOGSETUP.EXE) and you will be guided through the installation.

First, you'll need to select a folder in which to copy the files.
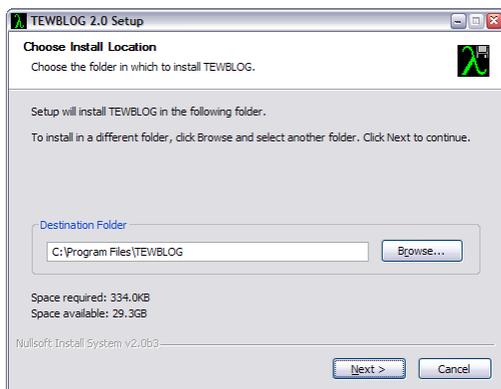
Once the folder has been selected, you'll need to choose the start menu folder that TEWBLOG will be installed to.
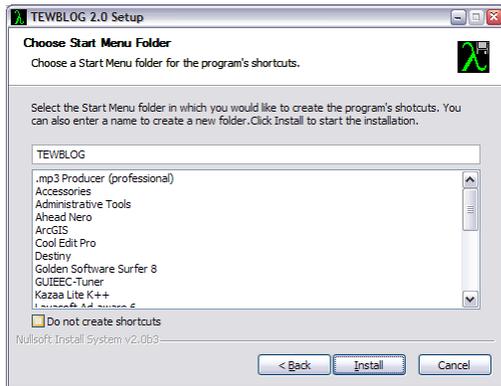
A shortcut will be created on your start menu under the TEWBLOG program group. If at any point you need to uninstall the software, an uninstall program is provided under the TEWBLOG program group that will completely remove the software from your PC.

Starting TEWBLOG

Once the TEWBLOG software has been installed, it will create a shortcut on your start menu under the TEWBLOG program group. To start TEWBLOG simply click on the shortcut under the start menu. I have also found it useful in my tuning experience to have the program automatically start when the computer is started (one less thing to do while you are driving around). If you find this useful, simply copy the TEWBLOG shortcut from the start menu to the "Startup" folder on the start menu. This way, when Windows starts, TEWBLOG will be run automatically.

Once TEWBLOG starts you will be displayed with the TEWBLOG title screen, and be given an option to register the software. If you don't want to register at the moment, wait a couple of seconds and click the "Continue" button when it is displayed.

If you have already registered your copy of TEWBLOG the title screen will not be displayed, and you will immediately be taken to the TEWBLOG main window.

Registering TEWBLOG

If you're feeling generous and find that the TEWBLOG software is useful, please consider registering your software. You'll get a couple of really useful features, and will help motivate me to continue improving the software! :-)

Registration is a simple procedure, when you first start TEWBLOG you are given the option to register for a couple of seconds, if you click the "Register" button during this time the "Enter Registration Code" screen will be displayed. If you already have a code, you can enter your name and the registration code. If not, click the button at the bottom of the dialog to learn how to get a code.

Once you've entered your name, and the registration code (both should be entered exactly as provided in the registration email you will receive), click the "OK" button, and if all is well, you will be prompted that the software has been registered.

Initial Configuration

The first thing that you should do after starting TEWBLOG for the first time is to setup the main configuration options. This is done by selecting the "Configure" button on the main screen. Once the "Configure" button has been selected, you will be presented with the "Configure" screen.
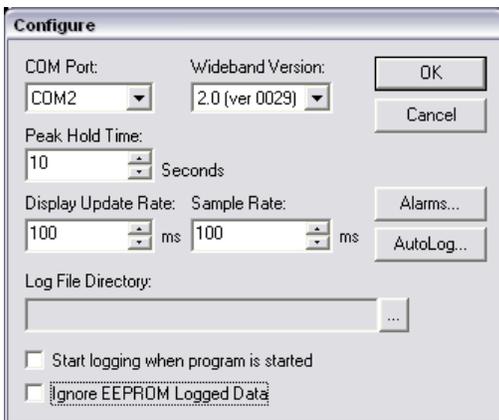
First, select the COM port that will be used with the Tech Edge logging device. The COM ports that are available on your PC will be displayed in the COM ports field.

Next, select the type of wide band lambda device that you will be connecting to. This can currently be one of three devices; the original TE-5301 display, the version 1.5 Lambda meter, and the version 2.0 Lambda meter. Note that the 2.0 Lambda meter must have

version 0029b or later firmware in order to work in 2.0 mode. If your firmware is earlier than version 0029b, you can either upgrade your firmware (please see http://www.wbo2.com for details on upgrading the firmware), or select the 1.5 mode (since 2.0 devices support v1.5 compatibility mode).

Next you can configure the "Peak/Hold" time. This feature allows each of the gauges on the main window to display a small field at the lower right of the gauge. The field is a "Peak/Hold" meter. Basically, the peak and low values for each gauge will be displayed for the specified number of seconds (unless that peak or low is exceeded, then the new value will be displayed). This feature can be useful for glancing at the gauge and seeing what the peak/low values for that gauge were for the last 'n' seconds ('n' being specified by this configuration item)

The display update rate determines how fast the gauges and live graph are updated on the main screen. The default value is 100ms (updates occur 10 times every second). On some slower PC's this value may need to be increased in order to work well on the specific PC. On my P233 I've used down to 20ms with no problems. You'll find that updating too frequently causes the live graph to become less useful (since the data scrolls off the screen so quickly). This setting in no way affects the sample rate of the actual logged data; it only affects how fast it is reflected on the screen. Logged data is always stored at full speed and resolution.

The next item to configure is the Log file directory. Do this by clicking the "…" button next to the Log file directory field. Be sure to select a place that has plenty of space to store log files.

You can also select the "Start Logging When Program Is Started" option. Selecting this Simply causes the logger to start logging whenever the program is started. If you're not using the "AutoLog" feature (for details about AutoLog, please refer to that section further on in this document) this can be handy to make sure that you don't forget to start logging.

For the v2.0 Wide Band, you can also select the sample rate of the Logger. This has no effect on the display update rate, but does increase the rate of data that is stored in the log file (more samples stored in a given amount of time). This can be handy if you require more resolution when reviewing log data. (In order for this option to be enabled, you must have the v2.0 wideband version selected!) If you have an early version of the v2.0 Wide band logger, you *may* not have the logging EEPROM installed (for logging data without a computer being attached). If this is the case, select the Ignore EEPROM logged data option. If this option is not selected, and you do not have the EEPROM installed, you may get messages that logged data is available, even though it is not.

The two last configuration items, Alarms and AutoLog will be discussed further on in the documentation. For now though, we're done with the initial configuration of the software, so click OK to return to the main window.

The TEWBLOG main screen

This is the screen that you'll spend most of your time looking at when using TEWBLOG.

The screen has a few items that we'll discuss.

First, there can be one to eight gauges displayed on screen, depending on which Tech Edge hardware you are using. The gauge will display values from whatever type of sensor that it is connected to. For the TE-5301 logger, only the air/fuel ratio gauge will be displayed. For the others, an RPM gauge and other user defined gauges will also be displayed.

Each gauge contains a few items of interest. In the upper left hand corner of each gauge is a small colored block. This represents the color of the data that is displayed in the live and review graphs below. The large number in the main display is the current reading coming back from the logger. In the bottom right hand corner is the **peak** value for the "Peak/Hold" reading for the gauge. In the top right hand corner is the **low** value for the "Peak/Hold" reading for the gauge. In the bottom left hand corner of the gauge, there may be an "AVG" displayed. If this is displayed, it means that the gauge display is being averaged, and doesn't necessarily represent the actual current value (in order to smooth the display). Note that each gauge can be configured by the user by clicking on the specific gauge with the mouse. For more information on gauge configuration, please see the "Gauge Configuration" section a little further on in this document.

The main window can also be resized to take advantage of having more screen resolution available. Resizing the main window will cause the live and review graphs to take up the additional space. The size of the window will be remembered when you restart the program. Resize the window by dragging the bottom right corner of the window frame.

Below the gauges are three buttons, "Start Logging", "Configure", and "Review Data", and a check box, "Pause Graph".

The "Start Logging" button causes TEWBLOG to being saving the data that comes back from the data logger to a file. By default, TEWBLOG does not log data until this button is clicked (even though the gauges may be displaying data and the live graph is updating, it does not necessarily mean that data is being logged to disk!). Anytime data is being logged to disk, this button will flash, and change to "Stop Logging". To begin logging, simply click the button. A new log file will automatically be created in the directory specified in the configuration menu. The filename for the log file is automatically generated from the current date and time. Log files end in a .txt extension.
When you are done logging data, simply click the "Stop Logging" button, and the log file will be closed and saved. If you have the registered version of the software, the logged data can be reviewed by selected the "Review Data" button, otherwise, the data can be imported into a variety of applications for review and analysis. For more information on the logged data, please see the "Log Files" section further on in this document.

The "Configure" button causes the configuration screen to be displayed. For more information on the configuration screen, please see the "Initial Configuration" section earlier in this document.

The "Review Data" button causes TEWBLOG to switch from "live" mode to "review" mode. Selecting the button can cause one of two things to happen. If you've just logged (or are currently logging) data, you will be prompted to review the last logged data. If you have not yet logged any data (since TEWBLOG was started), you will be prompted to select a log file to review. For more information on reviewing data, please see the "Reviewing Log Data" section further on in this document.

The "Pause Graph" check box causes the live graph to pause its display. Note that even though the graph will pause (no longer scroll), the gauges still update and show the current values being returned from the logger. Unchecking this box will cause the live graph to continue scrolling data. This can be useful if you've done something in the last couple of seconds that you'd like to look at, but don't want to load the entire log for review (or happened to not be logging, but want to look at the data!).

The live graph is the default display at the bottom of the main screen. There are two modes in TEWBLOG, "live" mode and "review" mode. In live mode, the graph displays data as it is received in real time (and scrolls it to the right as more data is received). This data is not saved (unless logging is enabled). The graph display can be temporarily paused by selecting the Pause Graph checkbox, but the live graph cannot be scrolled around or used to review data. To review logged data, the "review" mode must be used (by selecting the "Review Data" button). For more information on reviewing data, please see the "Reviewing Log Data" section further on in this document.

The appearance and settings of the live graph can be modified to suit your needs. Things like graph colors, ranges, and whether or not decimal values (floating point) should be

displayed can be configured for each gauge graph. For more information on configuring graph settings, please refer to the "Gauge and Graph Configuration" section later in this document. Toggling of individual graph displays can be accomplished from the main screen by pressing the 1-8 keys on the keyboard. Once pressed, the respective graph will be either enabled or disabled.

You will also notice a red flashing box in the upper left hand corner of the window. This indicates that data is being received and processed from the logger. Should this box stop blinking, it indicates that data is no longer being received.

Gauge and Graph Configuration

Each of the gauges and its related graph (in the live and review modes) can be configured to best suit your needs. All of the gauges are configured through a common "Gauge Editor" screen. To bring up the configuration for a specific gauge, simply click that gauge on the main screen.
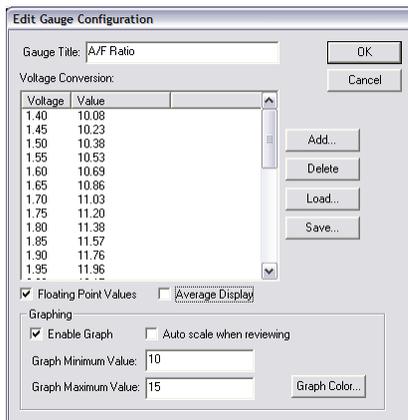
The Gauge editor screen allows you to specify the mapping of your different sensors to the voltages that are input to the logger. This allows you to have friendly gauges that read meaningful values instead of just the sensor voltages.

At the top of each gauge configuration screen is the title field. You should enter the name of each gauge in this field. It will be displayed above each of the gauges in the Main screen, and also in the logged data so that it can be correctly identified.

Below that you'll find the "Voltage Conversion" field. This field contains the mapping from voltages to display values. As many as 255 entries can be made in this field defining the mapping of voltages to display values. Linear interpolation is used to fill in the gaps between voltages. In other words, if you only entered two values, let's say 0v and 5v, everything else in between would be calculated by TEWBLOG in a linear fashion. Let's say 0v = 0 (display) and 5v = 100 (display). A value of 2.5v would result in a display value of 50. (Since it's half way between 0 and 5v, and 0 and 100 display). Unless the response of the sensor is perfectly linear, you are encouraged to supply as much data as you know, doing so will make the conversion more accurate.

Values can be added or deleted from the Voltage Conversion field by selecting the "Add" or "Delete" buttons to the right of the screen. Selecting "Add" will cause another screen to appear prompting you for voltage and its display value.

Insert Table Entry

Voltage:
0

Value:
0

OK

Cancel

This value will then be inserted into the list (sorted automatically). To delete values from the list, simply select one or more of them by highlighting them, and then clicking the delete button.

Since there are going to be some common gauge configurations, you also have the ability to load and save configurations for specific gauges. In fact, a few common gauge configuration files are included with the installation of TEWBLOG. To load a gauge configuration file, simply select the "Load" button and choose the file. To save your own (or modified) gauge configuration, select the "Save" button and specify a filename. Note that you do not need to save the gauge configuration unless you plan on giving it to someone else or just want to back it up. The program automatically saves changes to the gauges in its own internal configuration files.

Below the "Voltage Conversion" field, you'll find the "Floating Point Values" check box. This simply enables or disables floating point values (fractional values) for the display of that specific gauge. This can be useful in saving screen space for both the actual gauge and graph. (For instance, RPM does not need floating point values, 1000rpm is just fine, you probably don't need to know that it's 1000.34 rpm!!!). If you don't need floating point accuracy, I recommend disabling this option.

Next to the floating point option, you'll find the "Average Display" check box. Selecting this option causes the gauge to display an average of all samples that were collected since the last time that the gauge was updated (based on the "Display Update Rate" option in the main configuration). This option can help smooth out jittery displays. This option has no effect on the actual logged data or the live graph.

At the bottom of the screen you find the graphing options, these are options that apply to both the live and review modes of the graph.

First is the Enable Graph checkbox. If this box is checked, the values for this gauge will be plotted in the graph (both live and review). If it is not checked, the data will not be plotted. Occasionally, it's easier to review data by disabling one or more of the gauges to get a clearer picture of what's happening. If a graph becomes too cluttered, disabling one or more of the graphs may help.

Next is the "Auto Scale When Reviewing" check box. Selecting this option will cause the graphs vertical scale to be automatically set so that the minimum and maximum values for the data being reviewed are set to the top and bottom of the graph. This can be helpful if you're looking at a gauge that has a large span, but doesn't actually change much. If this option is disabled, the review mode graph uses the same limits for the gauge as specified in the Graph Minimum and Graph Maximum values (documented below). Note that because this option changes the scale of the display depending on the currently displayed data, scrolling through data can cause the graph to "move" around slightly as the scale changes. (Note that the legend for that graph is also updated to accurately reflect the scale).

Below that are the Graph Minimum and Graph Maximum values. These values limit the range of data that is displayed in the live and review graphs (only effects the review graph if auto scale is not checked). Useable minimum and maximum values should be entered into this field for the gauge. Values that fall outside of the ranges specified are clipped to the limits of the graph. (Note that this has no effect on logged data!).

Finally, the color for each individual graph can be specified by clicking the "Graph Color" button at the bottom of the screen. Selecting the button will cause a color selection screen to be displayed. The current color for the graph will be highlighted in this screen. To change it, simply choose a new color and click the "OK" button.


When you are all done defining your gauge configuration, select the "OK" button to save your changes for that gauge.

Air/Fuel Ratio Gauge

The Air/Fuel gauge is automatically loaded with calibration data from the TechEdge site to calibrate it to the voltages that are returned from the logger. This configuration cannot be changed. Note that if you are more comfortable working in Lambda numbers, you can select the Lambda mode instead of Air/Fuel ratio.

The sweep gauge (the color bar that is below the air/fuel ratio gauge) color can also be configured in this dialog. Clicking on either of the sweep color boxes will allow you to select a color for that setting. The start color is the color that is displayed at the left side of the gauge, the end color is the color that is displayed at the right side of the gauge.
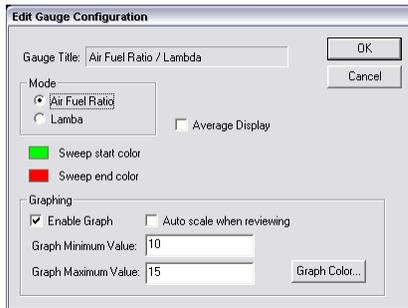
RPM Gauge

The RPM gauge corresponds to the RPM input on the logger (not available with the TE-5301). The RPM gauge is configured similarly to the other gauges, but has a few exceptions. First, like the air/fuel gauge, its name cannot be changed. Unlike the other gauges, the main setting in this gauge is the "Sparks per Revolution" field. Depending on the number of cylinders in your application, and the type of ignition system, this number varies. Some common values can be displayed by clicking the '?' button next to the field. If you don't know this value, try changing the value with the engine running until you get the RPM gauge to match the actual engine RPM.
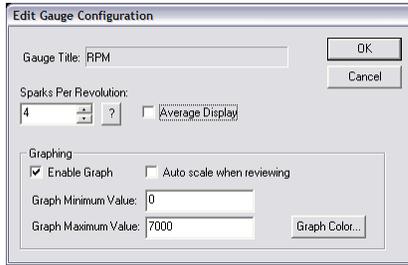
User Gauges

The user gauges correspond to the User Inputs on the logger. (Not available with the TE-5301). The v1.5 logger has two user inputs, and the v2.0 has three. Each of these gauges has a range of 0-5v.

EGT Gauges

The EGT gauges correspond to the three thermocouple inputs available on the v2.0 logger. Note that voltages for these types of inputs are specified in millivolts (not volts like the user gauges). Currently, TechEdge says that the v2.0 logger supports K-Type thermocouples. It's recommended that you use the supplied gauge configuration file for K-Type thermocouples to configure these gauges. (See the section above that talks about loading a gauge configuration).

Reviewing Logged Data

When it comes time to review the data that has been captured by TEWBLOG, you have a couple of options. The first, is to simply open the text file with something like Notepad (or Wordpad if the file is too big). You'll be able to page through all of the data that was saved using these applications. Another option is to import this data into a spreadsheet application like Microsoft Excel, in which the data can be graphed and analyzed in multiple ways. For information on the format of the log file, please see the following section. The final way is to use the built in review mode of TEWBLOG. (See the "Review Data" button section above for information on entering review mode).

Once in review mode the main screen acts slightly differently than live mode. In review mode, the graph displays data from the specified log file. You can use the mouse or cursor keys to move through the data. Clicking on a sample in the graph (or moving to it with the cursor keys) causes the gauges above to display the values for each of the gauges at that instance in time. In addition, the time of the current sample is displayed in the upper right hand corner of the graph. For the TE-5301 and v1.5 units, this is the time that the sample was received by the PC over the COM port. For the v2.0 unit, this is the units internal timer, representing the time that the sample was actually acquired.

Sections of the graph can also be looked at in more detail by "Zooming" into them. This can be done in one of two ways. The first is by selecting an area with the mouse. Click on the start of the area, then drag the mouse to the end of the area that you're interested in. Then right click and a menu will be displayed. Choose the "Zoom To Selection" option and the graph will be zoomed to just that selection. Additionally, you can select the '+' and '-' keys to zoom in and out, when using the keys, the display is zoomed in and out from the center of the currently displayed data. Note that when data has been "Zoomed", the time offset displayed in the upper right corner of the graph becomes the offset from the start of the zoomed area, not from the start of the file.
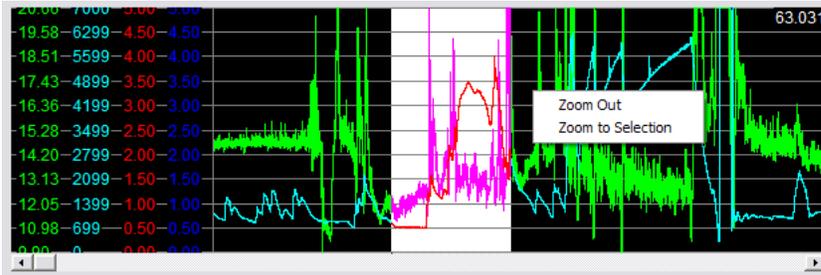
You can also scroll the graph to the left and right when you are zoomed in and not displayed all of the available data. This can be done using the scroll bar at the bottom of the screen, or by clicking the left and right cursor keys.

To zoom back out, either right click and select the Zoom Out option, or repeatedly press the '-' key to zoom out incrementally.

Note that graphs can be enabled/disabled in this display just as they are in the live display. Simply clicking a gauge and clicking the Enable Graph option will enable/disable the graphs during review. Toggling of individual graph displays can also be accomplished directly from the main screen by pressing the 1-8 keys on the keyboard. Once pressed, the respective graph will be either enabled or disabled.

Log Files

Log Files are stored in an ASCII CSV (comma separated values) format. They are stored in the directory specified in the configuration screen. The naming convention for the files is based on the current date and time, with a .txt extension. The names of each of the fields are stored at the top of the file, along with the date and time that the log file was created.

The first field in the export file is always the time offset for the sample. For the TE-5301 and v1.5 units, this is the time that the sample was received by the PC. For the v2.0 unit, this is the units internal timer, representing the time that the sample was actually acquired.

The next field is the Air Fuel Ratio field, followed by the user and EGT inputs (if applicable to your unit).
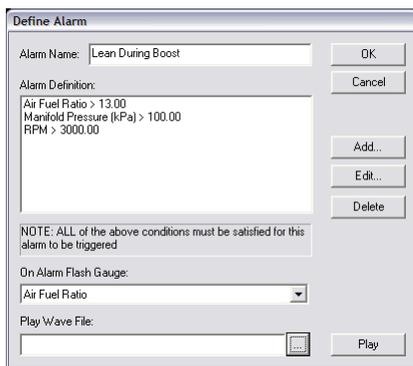
Alarms

The alarms screen allows you to define one or many conditions in which to signal you that some event has occurred. The alarm definition scheme used by TEWBLOG allows you to define an alarm condition with many parameters, allowing you to more accurately describe the condition. (Since the automotive sensor environment can be quite dynamic, usually more than one sensor is required to define an actual alarm condition.) For example, setting an alarm for a "Lean" condition (based on the wide band sensor) might not always make sense. Some engines run very lean in high vacuum "coast" conditions. You may not care about being lean in that situation. Because of that, the alarm configuration allows you to use multiple sensors to define your alarm condition. In our example above, maybe you only care about being lean above 5000RPM, or maybe only care about being lean above 3000RPM, and while you're in boost. This situation can be defined with the alarm editor, and can eliminate most false alarms.

To begin defining an alarm, select the "Configure" button on the main screen. In the configure dialog, select the "Alarms" button.

On the alarm screen is a list of the current alarms that will be monitored. Any one of the items in this list will cause the alarm to be triggered. (Only one of the defined alarm conditions need to be satisfied to trigger an alarm).
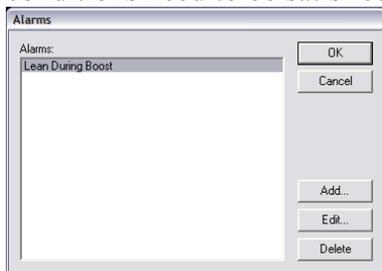

To define a new alarm condition, click the "Add" button. Once the "Add" button has been clicked the "Define Alarm" screen will be displayed.

First, you'll want to give your alarm a name. Do this in the field at the top of the screen. It should be a name that describes the entire alarm condition. In our example above, a good name might be something like "Lean during boost".

Next, you'll add all of the conditions that must be satisfied in order to trigger this alarm. Unlike the main alarm screen, all of the items in this list must be satisfied to trigger the alarm. If one or more of the items specified is not true, this alarm will not be triggered. To add a condition, select the "Add" button, an "Edit Parameter" screen will be displayed.
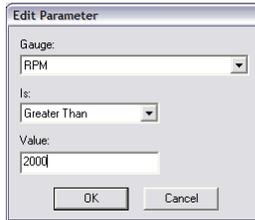
This is where you'll decide what gauge will trigger the alarm and the conditions under which it is triggered. Begin by selecting the gauge that will trigger the alarm. All of the gauges that you've configured will be present in the list. Next in the "Is:" field, choose the type of comparison for the gauge, this is either "Greater Than", "Less Than", or "Equal To". Finally, select a value in the bottom field.

In our example above, we would need to add three conditions to our alarm, first, add a parameter where Air/Fuel Ratio is Greater than 13.00, then add another where RPM is Greater than 3000, and another where Manifold Pressure is greater than 0psi (or 100kPA). Now you would have a definitive alarm that would only trigger when you were in a boost situation, over 3000rpm, and the engine is leaner that 13.00.

Single parameters for the alarm conditions can be edited or deleted by selecting the parameter (or parameters) and clicking the "Edit" or "Delete" buttons.

Obviously, it's nice for you, the user to know that an alarm has been triggered. You have two options at your disposal to knowing that an alarm is triggered. The first is the ability to "Flash" a specific gauge. When the alarm is triggered, the specified gauge will flash red, and stay red for a few seconds. In addition, you can have the PC play a wave file, which may help when you have your eyes on the road. To play a wave file when the alarm is triggered, select a file by clicking the "…" option at the bottom of the screen. To verify the wave file works, you can press the "Play" button at the bottom of the screen to play it immediately.

AutoLog

AutoLog is a feature that allows you to automatically being logging should a specific set of conditions occur. This feature works exactly the same as the "Alarms" documented above, but in the case of AutoLog, instead of sounding an alarm, logging will be automatically started. This is nice if you are driving around trying to simulate a condition, but don't want to log tons of data.
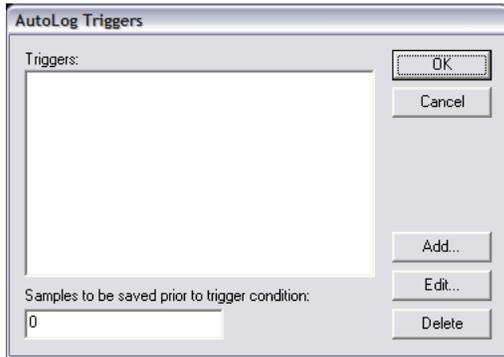
For information on configuring AutoLog, see the Alarms section above (since AutoLog works the same way).

The only additional parameter that AutoLog has over the Alarms is the ability to save samples that were captured prior to the trigger condition. This can be useful in determining what went wrong, i.e. the car goes lean and triggers an autolog, you can see the events that lead up to the trigger). If this value is set to 0, no samples will be saved prior to the trigger condition, and the log file will begin exactly at the sample that caused the trigger to occur.

Note that you are still responsible for disabling logging after AutoLog has started a log file, but at least you won't have missed something, and usually something important if it was triggered by AutoLog!