ComFire Combustion Analysis Tool

For use with Fireye Nexus controllers using Windows 3.1, 95, 98 or NT software

DESCRIPTION

ComFire software is a Windows based program designed to expand on the capabilities of the Fireye Nexus and PPC5000 products. The software program requires an IBM compatible PC and allows the user to communicate with the controllers to provide the following capabilities:

- Communicate with up to 10 Nexus or PPC5000 controllers wired in a multi-drop wiring configuration via RS485
- Upload/ download Nexus parameter or profile files to/from an IBM compatible PC
- Create “Watch” windows or graphical plant mimic panels to display data
- Provide logging and graph trending functions of multiple controller values
- Create plant switching stations for adjusting set-points and unit values
- Review fault history and current faults

To assist the user in the operation of this software program, the technical bulletins for both the Nexus and the PPC5000 Controller should be reviewed.

Table of Contents

This manual (NEX-1501) describes the operation of the ComFire combustion analysis software for a PC. It may be used in conjunction with the following other manuals:

- NEX-1001 - Nexus integrated burner controller bulletin
- NEX-5000 - PPC5000 fuel / air ratio controller bulletin

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THE BASICS

Introduction

ComFire is a windows based application for monitoring a network of Fireye PPC5000 / Nexus fuel/ air ratio controllers. It allows the reading and writing of option parameters and profiles, the reading of faults (alarms) and live values from a network of units, into one application. It also allows a degree of remote control of these units and is totally configurable to match each installation.

IMPORTANT This guide covers two different products, hence the parameters to be entered and connector terminal references are different depending on the product used. Where such information is given, it will be given for both types of units in the following format:

…. option parameter 12.0^{Nexus} / 25.0^{PPC5000} must be set to ….

where the required parameter is 12.0 on a Nexus unit, and 25.0 on a PPC5000 unit.

INSTALLATION

The software is generally supplied in a zip format or as a download from the fireye web site: **www.fireye.com.** If using the software in this format, unzip it to the computer hard drive and then use the Install.bat file to install the software onto the hard disk. If the software is supplied as a disk then for….

WINDOWS 3.1 - from the *File* menu in 'Program Manager', choose *Run.* Type "A:\Install.bat" (if the floppy disk drive is A:), and press OK.

WINDOWS 95 - from the start button, choose *Run*..., then type "A:\install.bat" (if the floppy disk drive is A:), and press OK

The software should now install.

When it has finished installing, the software can be run by double clicking the icon "ComFire" in the program group "ComFire", or from the start button 'Programs' menu in Windows 95.

ComFire is, by default, configured to use COM2 for communicating with the Units.

If COM2 cannot be opened, it will attempt to open COM1.

If the Fireye units(s) are to be connected to a different communications port, then the configuration will have to be changed. From the menu bar at the top, choose Setup, then Communications (if this is not present, choose Menu first). The correct port can now be chosen, then select OK. See configuration section.

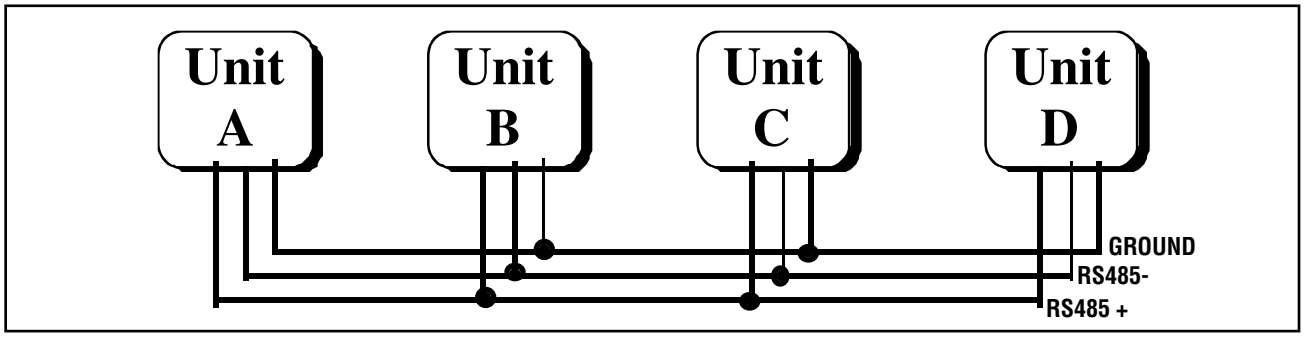
When the correct Comm port has been selected, from the File menu, choose Save Site File. The change will now be permanent.

CONNECTION

Overview

The Fireye equipment communicates over a link known as RS485. This allows many devices to be connected together, by a data link with a maximum cable length of 1200m, without the use of a modem.

The units must be connected together via their RS485 interfaces. The connection is a simple 'daisy chain', requiring the RS485+ terminals (PD8^{Nexus} / PB1^{PPC5000}) of all units to be connected together, the RS485- terminals (PD9^{Nexus} / PB2^{PPC5000}) of all units to be connected together and the grounds of all units to be connected together (PD7^{Nexus} / PB5^{PPC5000}). Note if the expanded functions of Nexus are used with the NX280HW then use terminals PD10, 11 AND 12 respectively.



The units at each end of the chain (A and D in this example) should have their RS485 TERM jumpers in the IN position (these are labelled on the WIRING BASE^{Nexus} or BURNER INTERFACE BOARD^{PPC5000}). The other units should have these jumpers in the 'OUT' position.

Personal Computers mostly have two serial ports (COM 1, COM 2), one of which is commonly used for the mouse. These ports are RS232 and usually are in the form of a 9-way 'D' connector (although they may use a 25 way connector). RS232 is a different standard that only allows two devices to be connected together, and the specified maximum cable length is only 15 meters.

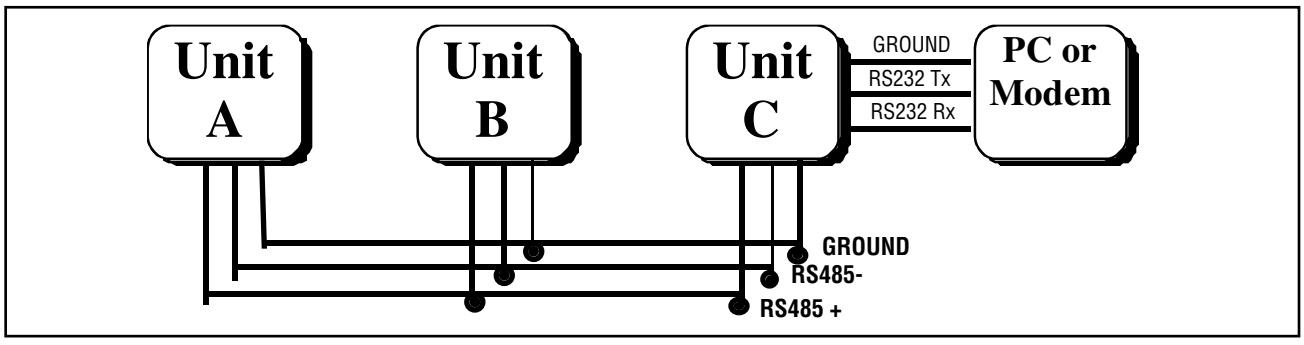
To connect a PC (or a modem) RS232 signals to the Fireye network requires a converter to change the RS485 signals to RS232, and vice versa. This may be the first Fireye device on the network (providing that it is an Fireye PPC5000, or, where the PC / modem is more than 15 meters from the Fireye PPC5000 or if the units connected are Nexus controllers then a converter (EC485) must be used.

Using 'Direct' RS232 connection (Fireye PPC5000 only)

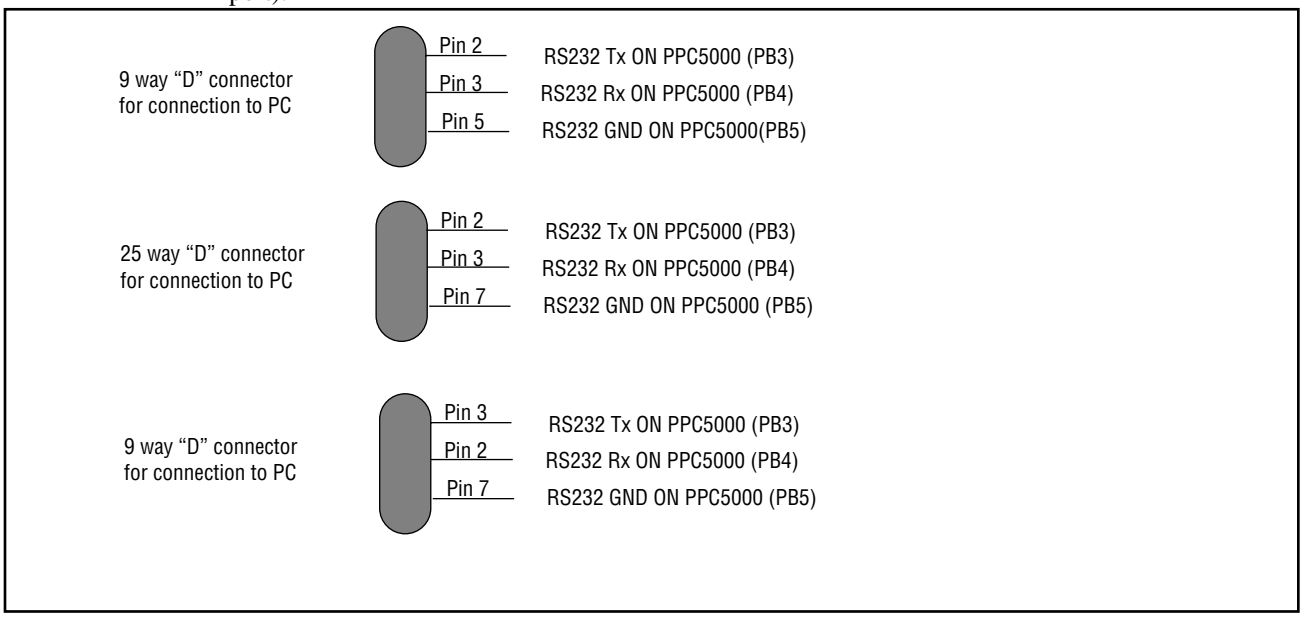
Where the PC / modem is to be within approximately 15 meters of an Fireye PPC5000, the PPC5000's RS232 interface can be connected directly to the PC / modem, provided the unit has standard communications software such that the RS232 interface is not being used for anything else.

The unit itself effectively performs the conversion, and the PC / modem can communicate through the unit it is connected to, to any other units on the RS485 network. However, since the Fireye PPC5000 takes time to perform the conversion, the performance will not be as good as using a discrete converter.

This method of connection is useful if a laptop computer is to be temporarily connected to download information by an engineer, for example. Note that the Fireye Nexus does not have an RS232 port.



The connections should be as follows (depending on whether the PC has a 9 way or 25 way COM port):



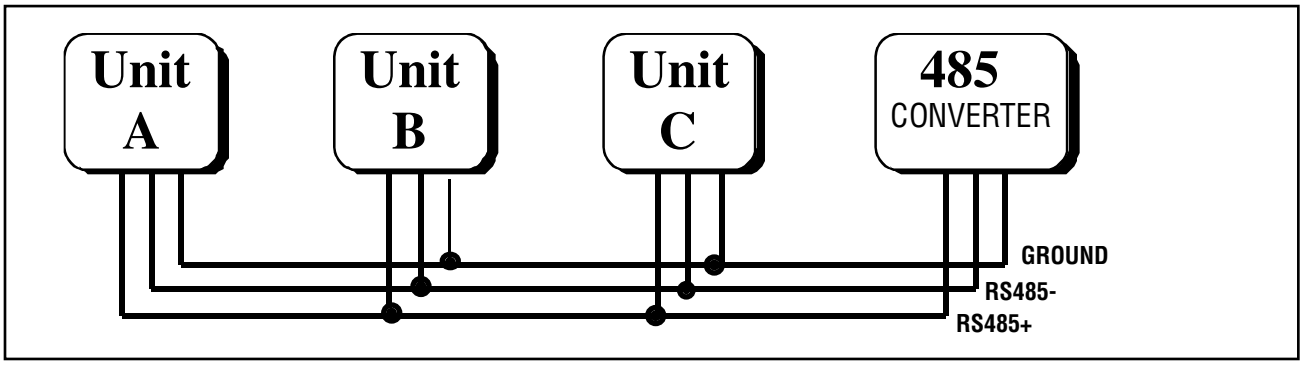
Using an RS232 to RS485 converter

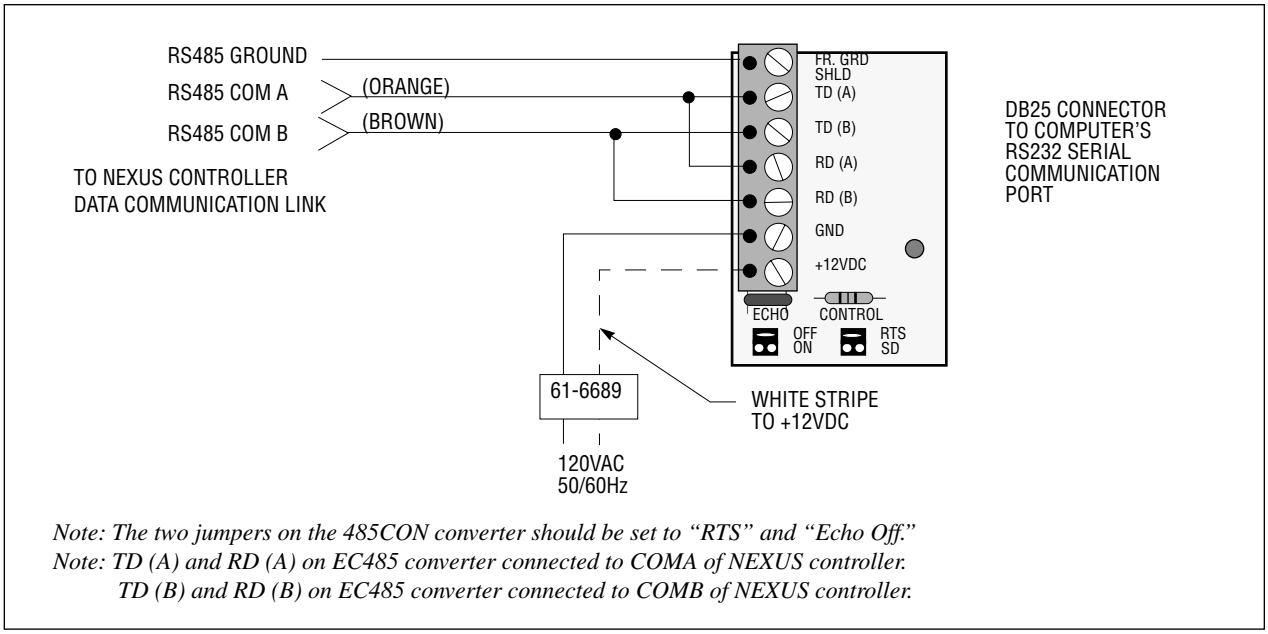
If the direct RS232 connection cannot be used, or the device is a Fireye Nexus, which does not have an RS232 port, a converter is needed to enable the two different systems to communicate.

Important: If the PC is to be connected to the unit(s) via a modem, an EC485 converter must be used since it contains extra circuitry to enable it to handle the modem correctly.

If the unit(s) are to be directly connected to the PC, an EC485 converter may also be used.

A standard 9 way to 25 way serial lead will be required to connect from the PC RS232 socket* (most PC’s have a 9 way plug*) to 25 way for the EC485 converter. The EC485 also requires a local power outlet for powering the 12volt DC power supply supplied with it.





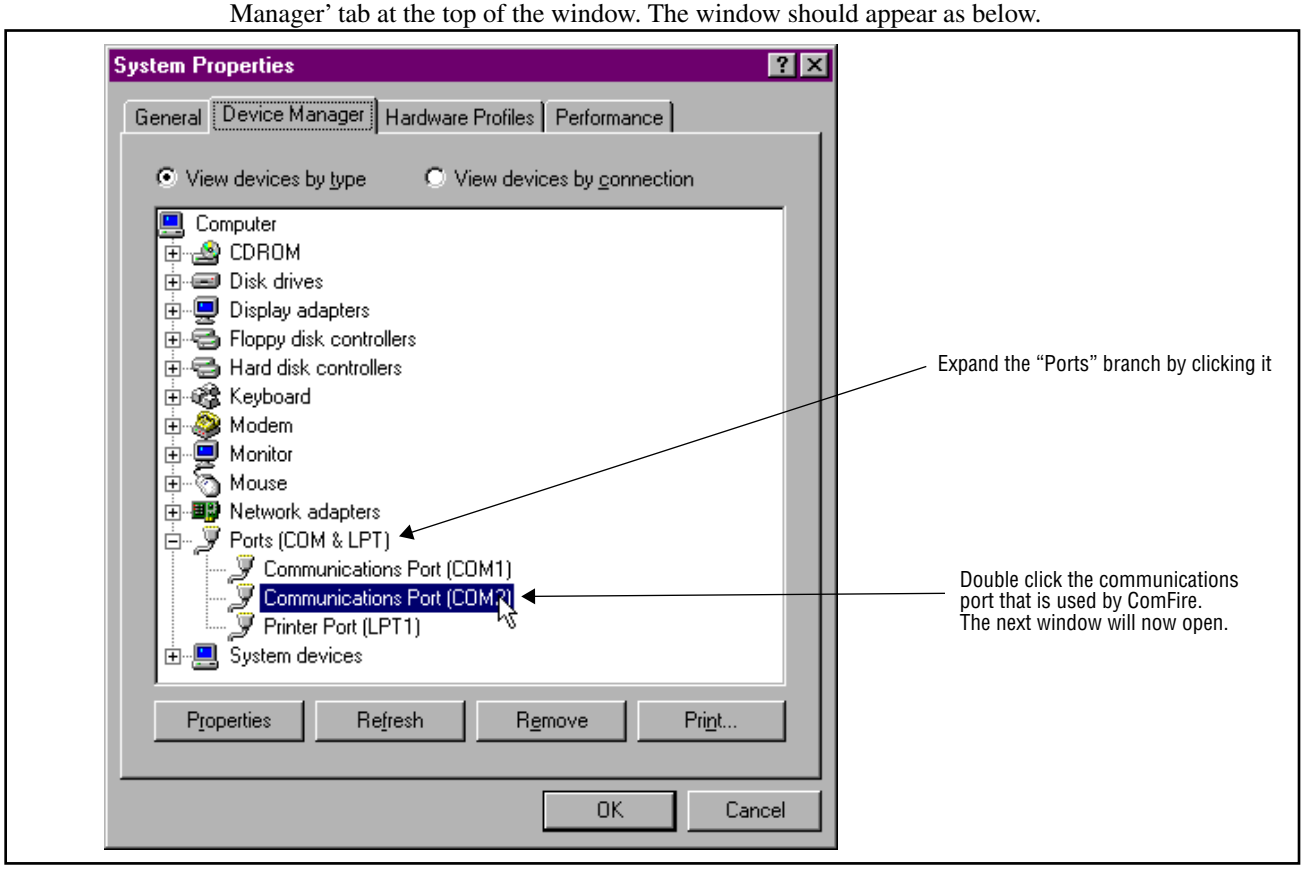
Note: The two jumpers on the 485CON converter should be set to "RTS" and "Echo Off."
Note: TD (A) and RD (A) on EC485 converter connected to COMA of NEXUS controller.
TD (B) and RD (B) on EC485 converter connected to COMB of NEXUS controller.

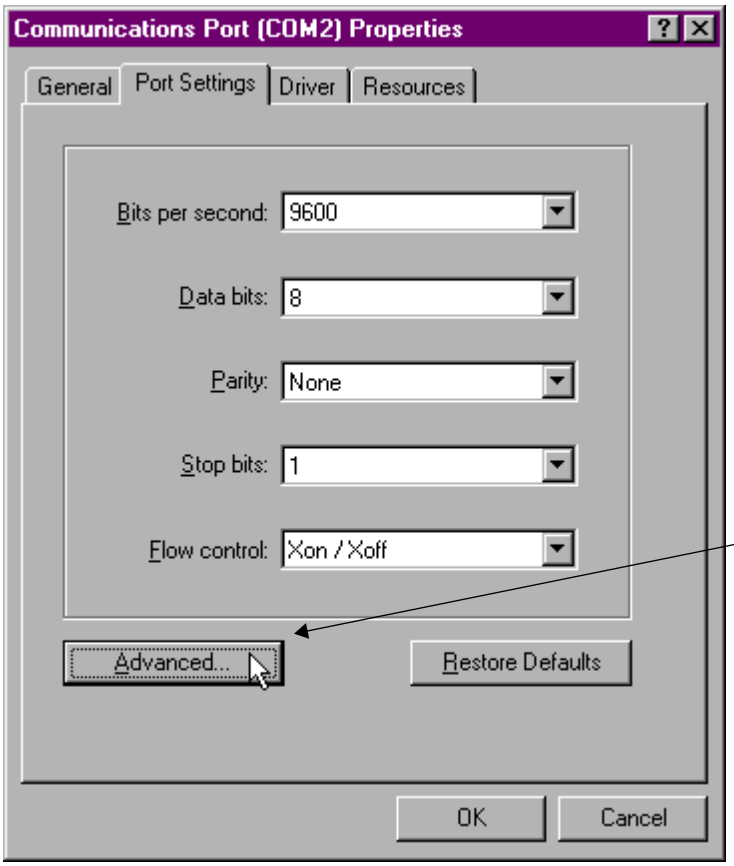
If the converter doesn't appear to work…

The "TD" LED should flash when the COMFIRE program is started. This indicates the PC is requesting data from the Nexus controllers. If this does not occur check the following:

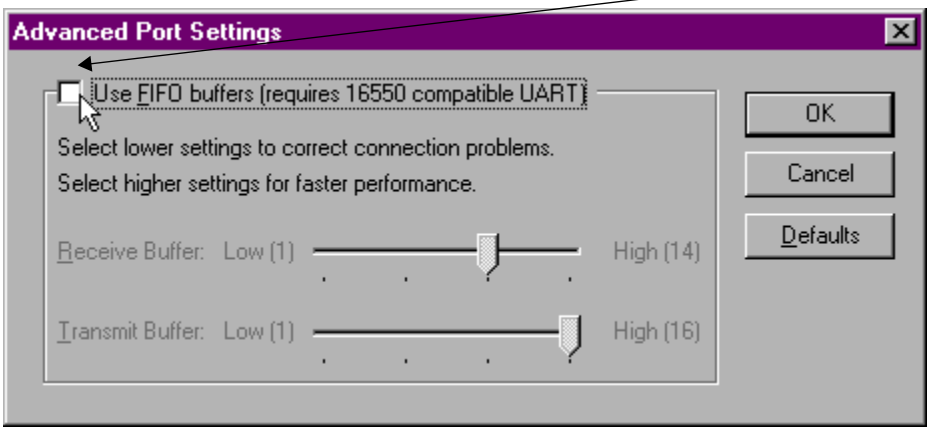
Control Panel Settings

In Windows 95, try disabling 'FIFO buffers' since these interfere with the operation of the converter. To do this, first exit ComFire. Then from the Windows 95 'Start' menu, choose 'Settings', then 'Control Panel'. From the control panel, double-click the 'System' icon, and then click the 'Device Manager' tab at the top of the window. The window should appear as below.





Click the Advanced Button

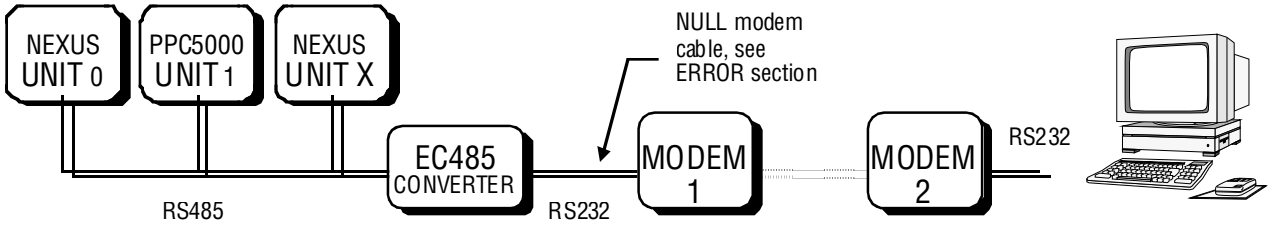


Clear this check box and click “OK” to close

MODEM OPERATION

Overview

The use of a pair of modems allows the PC to communicate with a network of units over an internal or public telephone system. The modem must be capable of communication at 9600 baud, and can be connected via a converter (as below), or directly to an RS232 port of a PPC5000 unit with standard comms software.



The modem labelled 'Modem 1' must be configured during installation to behave in the required way on power up. This is usually done by setting to set it's registers for the required operation, then storing this configuration as a 'configuration profile', then selecting this profile to be used on power up. All these functions are performer via 'AT' commands.

Modem 1 must be initialized as follows:

STEP	BEHAVIOR	COMMAND
1	DTE baud rate = 9600	When configuring the modem from a PC, select the PC baud rate to be 9600. The modem will automatically switch its baud rate to match.
2	Auto Answer after 5 rings (recommended)	ATS0=5 + ENTER The modem should answer automatically after several (e.g. 5) rings. The modem should not answer immediately on the first ring.
3	Commands Echo Disabled	ATE0 + ENTER The modem must not echo data se to it.
4	Dumb Mode (Optional)	AT%D1 + ENTER Dumb mode may be set only if none of the units on the network are set to dial out, as sit prevents the modem from receiving commands. The advantage of dumb mode is that there will be no disruption to the coms when the modem is dialled up from outside. If dumb mode is not set, sequencing may de-activate for a short while when a connection is being established.
5	Store as profile 0	AT&W0 + ENTER Save these settings in the modems non-volatile memory.
6	Select profile 0 on power up	AT&Y0 + ENTER Select these settings on power up.

The modem will then need to be switched off then back on again to enter dumb mode, if selected. If further commands are to be issued, dumb mode can be exited by sending AT*** + ENTER.

Note: *Some of these commands may vary with different modems. If in doubt, consult the Users Manual for the modem concerned.*

PASSCODES

The communications feature of both types of unit is enabled by a six-digit passcode. In addition, the Fireye PPC5000 needs a RAM chip to be inserted into the socket labelled IC17 on the CPU board. This device MUST be supplied by Fireye Inc.

The comms passcodes have three levels:

- Sequencing only (NX-S0),
- Communications (for ComFire) only (NXAM),
- Both Sequencing and Communications (NXAMS).

For ComFire to work, the passcode for either 'Communications' or 'Both' must be entered. For units ordered with these options, the appropriate passcode will be supplied with the unit.

For retrofit, the engineer must telephone Fireye with the six digit CPU identification number. This can be found on the front of the controller or using engineers keys 65 & 66 Nexus or 83 & 84 PPC5000. He will then be given the numbers to be entered into option parameters 0.5 & 0.6. The unit will need to be powered down then back up again for the passcodes to register.

If the passcodes were correct, the engineers key number 23^{Nexus} / $8^{2PPC5000}$ should show 2, 3, 6, or 7. If it does not, communications will not work. Don't worry if the number changes up and down by one number as long as both numbers are in the above range.

Unit Address

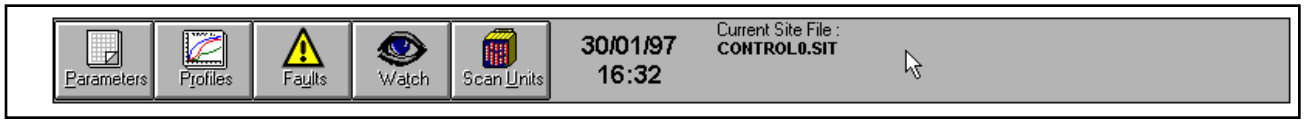
Communication between multiple units is made possible by each unit having it's own unique address, such that unit 7 can send a message to unit 3, then unit 3 can send a reply to unit 7.

The unit address for each unit must be entered as option parameter 1.2, and must be a different number for each unit. The range is 0 to 15, but the choice of number is arbitrary. It will have no effect on the operation of ComFire, except that ComFire also needs it's own unique address.

OVERVIEW

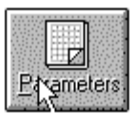
Command / Status Box

At the top of the screen, there is a large status box with command buttons inside.



This box provides useful information (such as the time, configuration details). It also accesses the functionality of ComFire via the command buttons. Each command button will cause a different type of window to open.

Parameters



When this button is pushed, a dialogue box will appear asking the operator to select a unit from the list of currently attached units. If the list is empty, see Scan Units.

When OK is clicked, a new window will open up, and over the next few seconds a list of all the NON-ZERO option parameters for the unit concerned will be displayed. The list also shows information about what the numbers represent.

Profiles

When this button is pushed, a dialogue box will appear asking the operator to select a unit and a set of profiles to download (note: more than one profile may be selected). When OK is pushed, a number of windows will open up and over the next few seconds, the tables inside will fill up with numbers showing the ratios of the different drives, and oxygen monitoring / trim information if applicable.

When the download has completed, there are two graph buttons shown - fuel/air and trim (if operative). If either of these buttons is pushed, a new window will open up with a graph of the desired information. This graph again has a menu that will give you different display options for the current graph.
Note that the 'graph' menu on the profiles menu can be used to remove unwanted items from the fuel/air graph.

Watches

When this button is pushed for the first time, the data watches are set to run mode.

A data watch is a window with a set of graphics in it which show current values of different variables for any of the Fireye unit's on the network. Each window is totally configurable by the user and can contain charts, dials, gauges, pictures and labels that change to show the state of selected parameters. Sliders and buttons can be set up to control units remotely from the PC.
The 'Action' menu can be used to set the watches to 'design mode' where the pictures can be moved by dragging them and double clicked to display their set up parameters.
Run mode causes the pictures to update.
Subsequent pushes of this button will cycle through all the current data watches.

Scan Units

This button causes the system to scan the network to see which units are connected. This is done automatically on start-up, but if a new unit is connected, this button may be pushed to enable the system to recognize it. When a unit responds, a window will open up showing the units connected. If this does not happen, see Connection section.

Menu System

Each window opened by the command buttons will, when it is active, have it's own specific menu which will appear above the command / status box. There is also a 'top level menu', which can be selected at any time by clicking 'menu' on one of the window specific menu's. This menu is also displayed when there are no currently active windows.

The 'Site File'

The configuration of ComFire is held in a file called a 'site file', with the extension '.SIT'. Using different site files, many different configurations may be used simply by loading up the appropriate one. This is done from the 'Top Level Menu'.

Note: *If a site file is copied (for backup, for instance), the associated '.WAT' file must also be copied. This file will have the same name as the site file, and contains the data for the 'watch' window(s).*

On Start-up…

On start-up, if the use of a modem hasn't been specified in the communications set-up (see 3.3.1), the system sends out a message for all units connected to identify themselves. After a couple of seconds, the computer knows which units are connected and when the user requests information, he is given the choice of which unit to read from.

If the use of a modem has been specified, but not the 'answer incoming calls' facility, the Communications Set-up dialogue box will be displayed (see 3.3.1), to allow the user to dial out.

If the 'answer incoming calls' facility has been selected, ComFire will attempt to initialize it's modem, and if successful it will wait for a call and display 'ANSWER' in the command / status box at the top of the screen.

Also on start-up, the 'data watches' (see above) are loaded and set into 'stop mode'.

Command Line Options

When ComFire is invoked, certain options can be specified in the command line, for example:

comFire.exe /l

This will run the 'locked' version of ComFire, where changes cannot be made to the configuration.

When ComFire loads, it usually automatically opens the last site file that was in use. This behavior can be overridden using the /s option:

comFire.exe /s=c:\ComFire\site2.sit

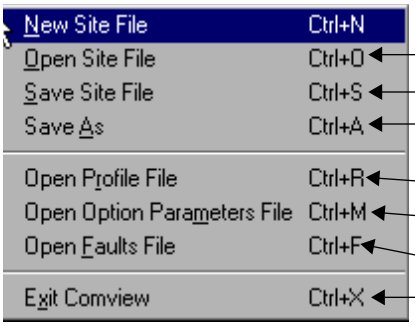
will cause ComFire to automatically open site2.sit which might show a different site.

CONFIGURATION – TOP LEVEL MENU

Overview

Configuration of ComFire is achieved from the 'Top Level Menu'. This is the menu that is displayed when there is no currently active window, and can be displayed at any time by selecting 'menu' from one of the other menus.

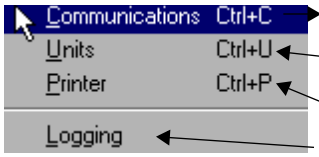
File Menu (top level menu)



Select to make a new, blank configuration (site file).
Open a previously saved site file (.SIT).
Save changes to the current site file.
Rename and save the current site file.
Open a previously saved profiles (.PRO) file for examination.
Open a previously saved Option Parameters (.PAR) file.
Open a previously saved Fault List (.FLT) file.
Use to exit (the same as closing main ComFire window).

All these commands open standard windows dialogue boxes for Open / Save, except for 'New Site File' which will open the 'Set-up Units' dialogue box, see section Set-up Units.

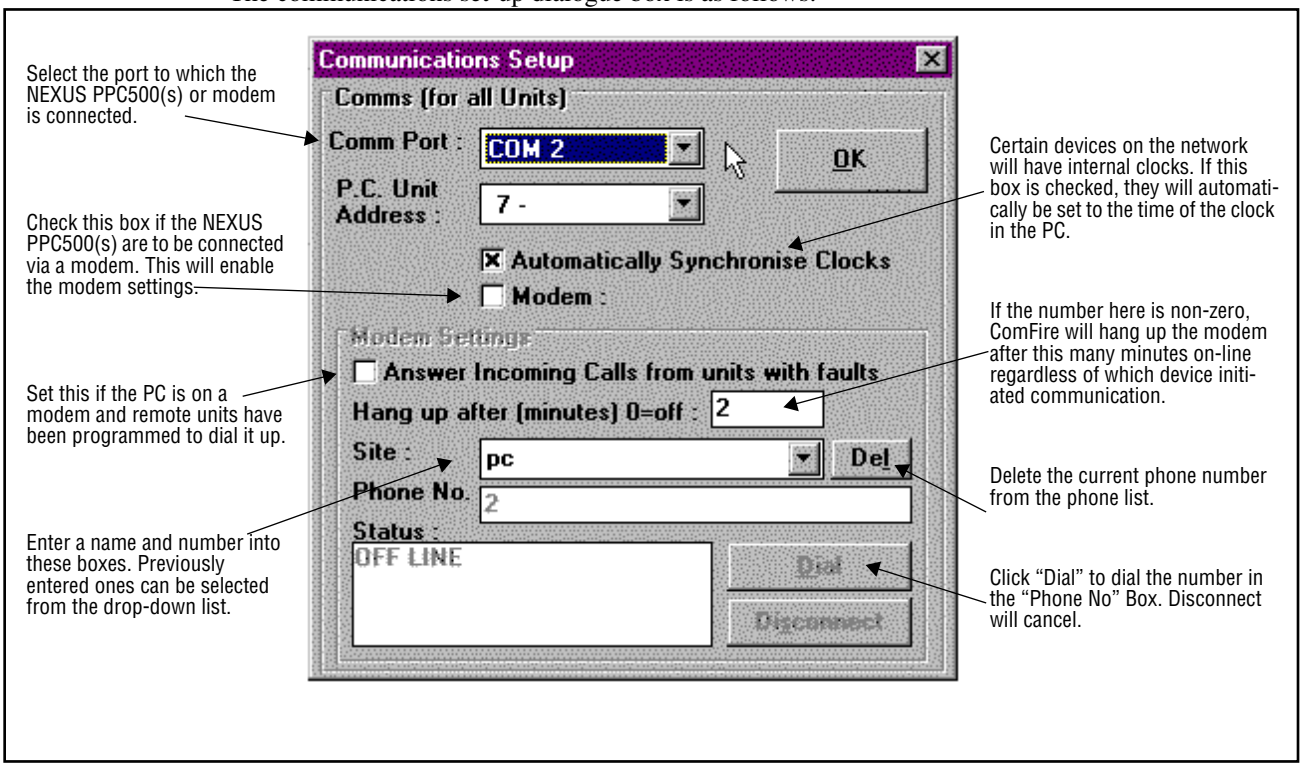
Set-up Menu (top level menu)



Open the Communications Set-up dialogue box.
Open the Set-up Units dialogue box.
Adjust default printer settings (standard windows dialogue box).
Set-up ComFire's data logging facilities.

Communications Set-up

The communications set-up dialogue box is as follows:



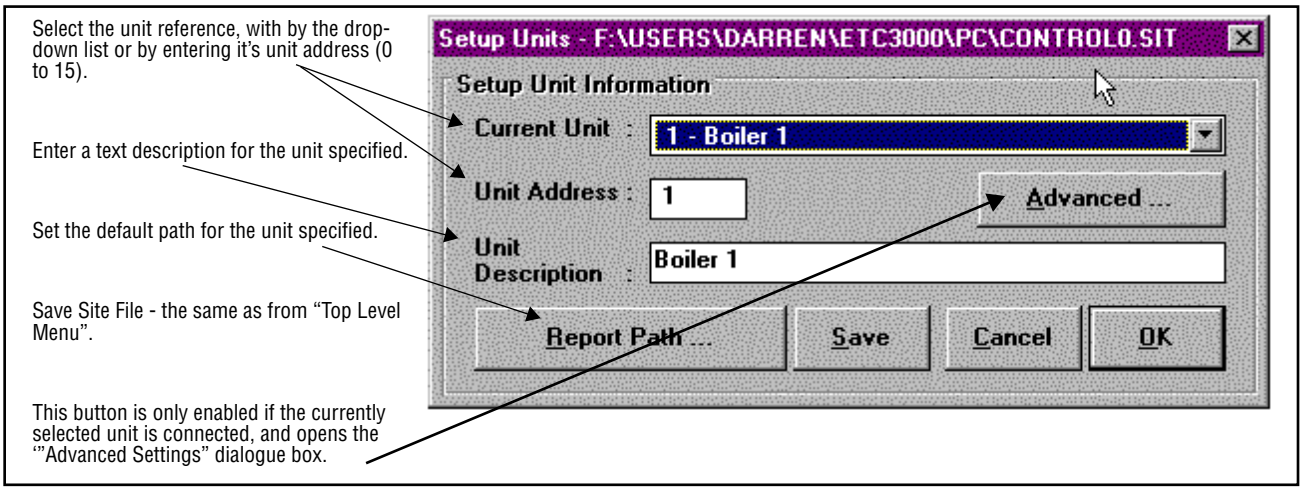
After 'OK' is selected, the comms will be re-initialized, and the computer will scan for connected units (unless there is a modem present, and no connection has been established).

Important: If remote units are programmed to dial back to this PC when a fault is detected, the 'Hang up after (minutes) box should always have a non-zero value entered since this is the only way which the phone call will be terminated if the user does not choose 'Disconnect' himself. See the Advanced Settings Dialogue Box.

Set-up Units

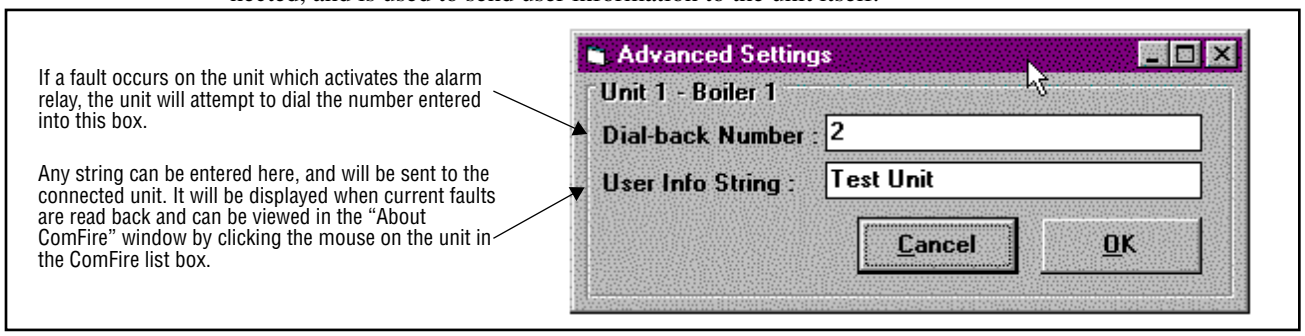
This dialogue box lets you enter a name for each unit connected, for instance, you could name unit 1 to be 'Main Boiler'. This text will then be used by ComFire to describe that unit.

You can also specify a default path for loading and saving files associated with that unit.



Advanced Settings Dialogue Box

This dialogue box is only available if the selected unit is of the appropriate type and currently connected, and is used to send user information to the unit itself.



Obviously, a modem must be present for the remote dialling to work. The unit will try to dial a maximum of three times, five minutes apart, regardless of whether the fault is reset. See Communications Set-up section.

When ComFire receives a call from a unit with a fault, it will automatically read back the current fault list for that unit with the 'user information' entered into the 'Title / Description' box of the faults window.

Logging Set-up Dialogue Box

This dialogue box allows data logging to be set-up. The data is written to text files in the following format.

DATE / TIME <TAB> Value1 <TAB> Value2 <TAB> Value3 <RETURN>

For example:

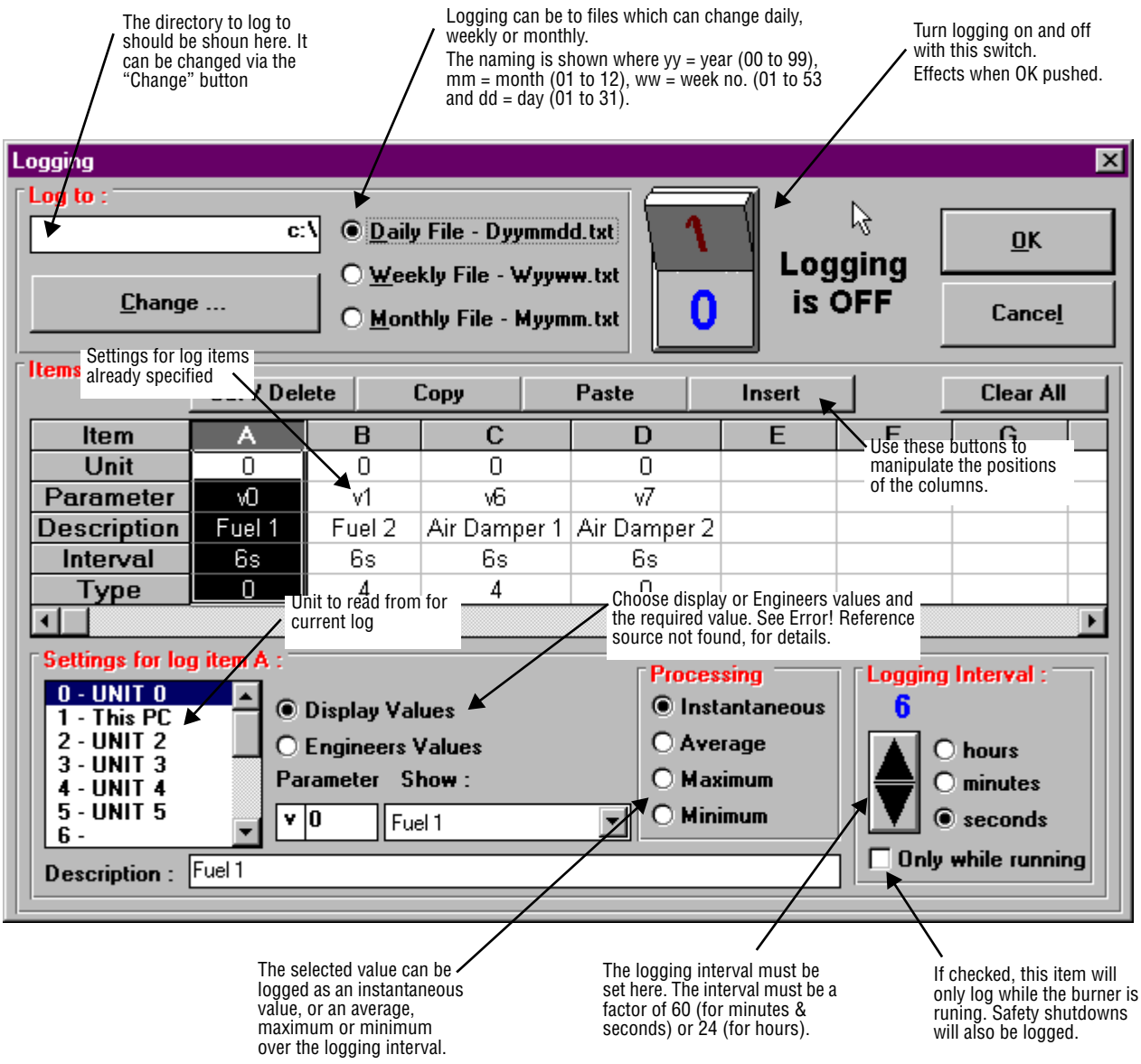
03/04/97 16:36:39 7.52 56.7 12.3

This format is known as 'Tab Delimited', and is easily loaded into spreadsheets etc. for analysis.

The logging can be quickly set-up by selecting a column in the table shown, and then defining the item to be logged by choosing appropriate settings from the 'Settings for log item …' frame.

1.1 Watch Menu (Top Level Menu)

From this menu, 'New Watch' can be selected. This will open up a new, empty 'Watch' window, to which the user may add mimics to display live values read back from devices on the RS485 network. See Section 7 - Watch Windows.



Watch Menu (Top Level Menu)

From this menu, 'New Watch' can be selected. This will open up a new, empty 'Watch' window, to which the user may add mimics to display live values read back from devices on the RS485 network.

Window Menu (Top Level Menu)

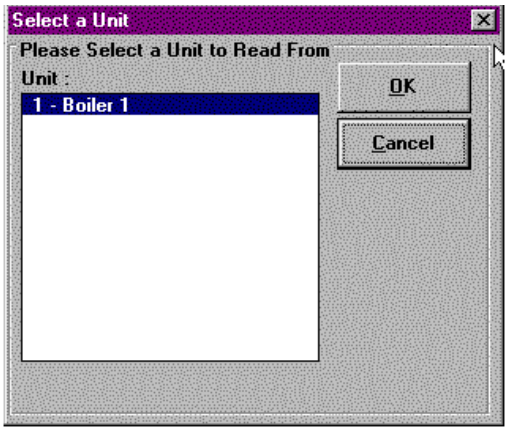
This is the standard window control menu which controls the appearance of the windows currently loaded (i.e. Cascade, Tile, Arrange icons etc.).

PARAMETERS

Overview

By pushing this button, the complete list of non-zero option parameters can be read back from any unit on the network.

Select a Unit



When the 'Parameters' button is pushed, this dialogue box will open, and a list of all the currently selected units will be displayed.

A particular unit can then be selected by clicking to highlight it.

Press 'OK' to read from the unit specified.

The Parameters Window

This window displays the option parameters that are read back from a unit.

Alternative Close button

Upload button for use in commission n mode.

Title/description (user editable)

Display table-
The non-zero parameters are listed here, along with their values and a description of what both the parameter and the value it represents.

If scroll bars are required, they will appear when the user clicks inside the table.

TEST.PAR

Close | Upload | UNIT 0 - Non Zero Option Parameters

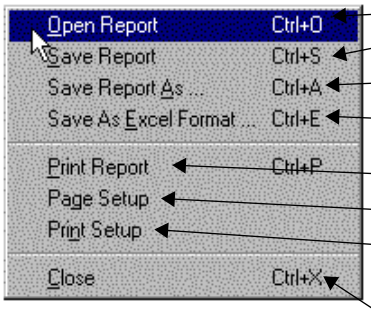
OPTION NO.	VALUE	DESCRIPTION	DETAILS
1.1	50	Power supply frequency	in Hz
1.5	1	Basic drive board type	1 = High Voltage
2.1	1	Enable keyboard auto/manual	1 = Available from keyboard
2.5	2	Display brightness	2 = Maximum brightness
3.5	100	Modulation speed	25 - 100%
4.1	1	Fuel 1 output mapping	0 - 12
4.2	2	Fuel 2 output mapping	0 - 12
5.1	3	Air damper 1 output mapping	0 - 12
5.2	4	Air damper 2 output mapping	0 - 12
8.1	10	Ignition time	0 - 999 seconds
10.1	7	Alarm relay level	7 = All faults

The user can highlight cells, rows, columns etc. with the mouse by clicking and dragging, as with a spreadsheet.

Menu System (Parameters Window)

This menu will be visible when the active window is a 'Parameters' window. It replaces the 'Top Level Menu' which is used for configuration, however, this can be re-displayed at any time by selecting 'Menu'

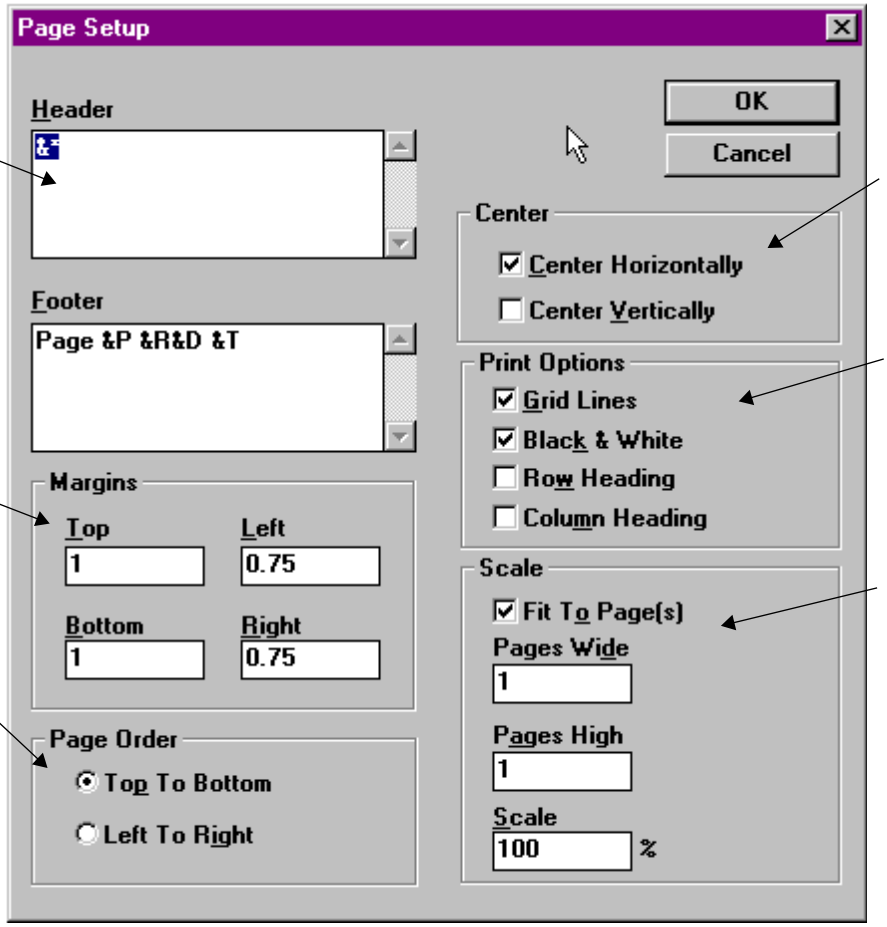
File Menu (Parameters Window)



Use to open a previously saved 'parameters'(.PAR) file.
Use to save the current 'parameters' file.
Use to save the current 'parameters' file with a different file name.
Use to save as an XLS file, which can be loaded into MS Excel.
This will immediately print the table, using the current settings
This will open the 'Page Set-up' dialogue box See "Page Setup" below.
This will open the standard windows printer set-up dialogue box.
Use to close the active parameters window.

Page Set-up Dialogue Box

This box allows the user to control how the print out of the table is displayed.



Enter the text for the header and footer in here."&" is a special character - see table (next page) for codes.

Placement of table on the page.

Display options - experiment to achieve the desired look. If black & white is not specified, gray cells will appear gray on the printout.

Margin sizes (units are as defined in Windows Control panel).

The printout can easily be scaled to the users desired size. If "Fit To Page(s)" is clicked, the first 2 boxes give the size. Otherwise, the scaling is determined by the bottom box.

Page order for printouts that are more than one page wide and more than one page long.

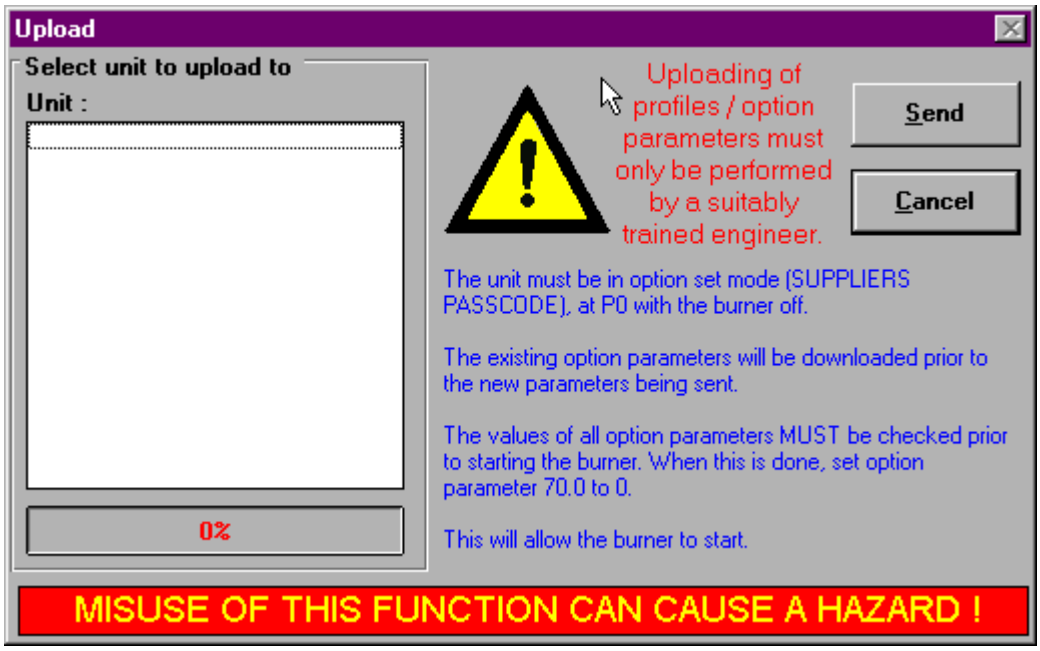
The text entered into the header and footer boxes may contain special control codes:

Format Code	Description
&L	Left aligns the characters that follow
&R	Right aligns the characters that follow
&C	Centers the characters that follow (default)
&D	Prints the current date
&T	Prints the current time
&F	Prints the sheet name
&P	Prints the page number
&P + number, &P- number	Prints the page number + or - the specified number
&&	Prints the ampersand (&)
&N	Prints the total number of pages
&*	Prints the title of the report (in the box above the table).
	Font Codes (below) must appear before other codes or text but can appear after alignment codes (&L, &R, &C)
&B	Use a BOLD font
&I	Use an ITALIC font
&U	Underline the header
&S	Strikeout the header
&"fontname"	Use the specified font
&nn	Use font size nn (2 digit number)

Edit Menu (parameters window)

There is only one command on the edit menu for the parameters window, and that is 'Copy'. This copies the currently selected cells from the spreadsheet to the windows clipboard. This data can then be pasted into other windows applications.

Upload of Option parameters



The set of option parameters currently displayed can be uploaded to a unit to save them from having to be entered manually. For this to work, the unit must be in commission mode (having had its supplier's passcode entered). The burner must be off, and the 'option set' mode entered. See the relevant commissioning manual for details. The unit to receive the new option parameters must be selected from the list of connected units, and once the 'send' button is pushed, ComFire will first read back the current option parameters from the unit into another window. These are labelled as having been replaced. The new option parameter list is then sent over. There is a progress indicator at the bottom left of the dialogue window.

WARNING: Every effort has been made to prevent, as much as possible, dangerous misuse of this function. However, it is ultimately down to the engineer to ensure that the list of options sent matches the installation. If this is not the case, a potential hazard can arise.

The following constraints have been added

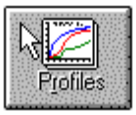
- Burner off
- Suppliers passcode entered (to prevent unauthorized access)
- Option set mode
- Manual intervention required (see below)

The upload process will set option parameter $70.0^{PPC5000}$ / 15.0^{Nexus} to 2. This is an illegal value for this option parameter, and will generate a fault $F66^{PPC5000}$ / $F13^{Nexus}$ which will prevent the burner from firing.

The engineer **MUST** review each option parameter from 0.1 up to this option parameter and ensure that it is correctly set. Only then should this option parameter be set to zero (manually) which will allow the burner to fire.

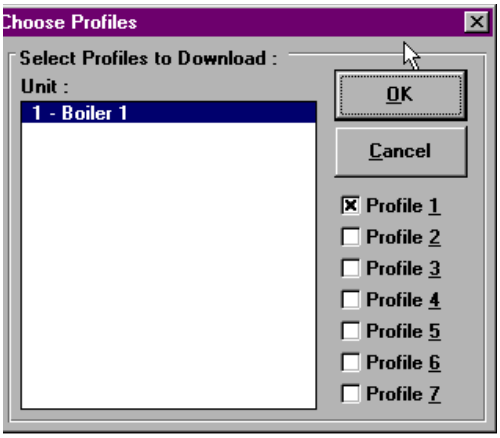
PROFILES

Overview



By pushing this button, selected profiles can be read back from any unit on the network.

Select a Unit and Profiles



When the 'Profiles' button is pushed, this dialogue box will open, and a list of all the currently selected units will be displayed.

A particular unit can then be selected by clicking to highlight it.

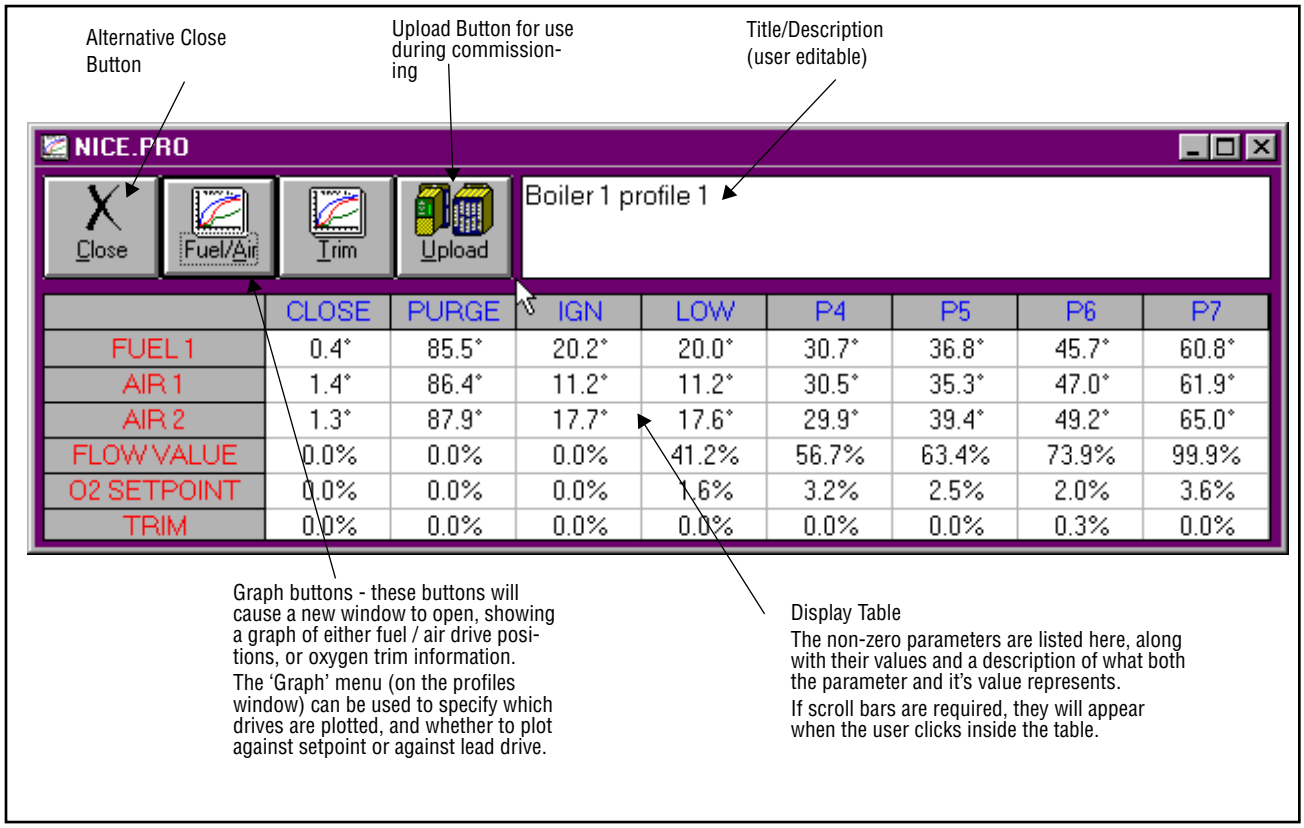
The profiles that are to be read can be selected via the check boxes.

Note - each profile selected will be read into a different 'Profiles' window. Hence, selecting all seven profiles will cause seven windows to open.

Press 'OK' to read.

The Profiles Window

This window will display desired profile information.



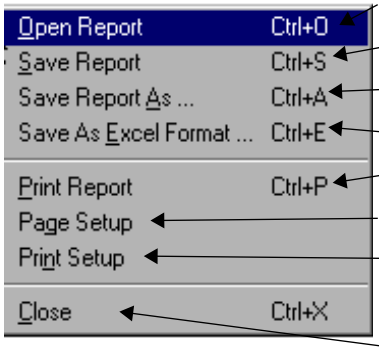
	CLOSE	PURGE	IGN	LOW	P4	P5	P6	P7
FUEL 1	0.4°	85.5°	20.2°	20.0°	30.7°	36.8°	45.7°	60.8°
AIR 1	1.4°	86.4°	11.2°	11.2°	30.5°	35.3°	47.0°	61.9°
AIR 2	1.3°	87.9°	17.7°	17.6°	29.9°	39.4°	49.2°	65.0°
FLOW VALUE	0.0%	0.0%	0.0%	41.2%	56.7%	63.4%	73.9%	99.9%
O2 SETPOINT	0.0%	0.0%	0.0%	1.6%	3.2%	2.5%	2.0%	3.6%
TRIM	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	0.0%

The user can select (highlight) cells by clicking and dragging the mouse, as with a spreadsheet.

Menu System - (Profiles Window)

This menu will be visible when the active window is a 'Profiles' window. It replaces the 'Top Level Menu' which is used for configuration, however, this can be re-displayed at any time by selecting 'Menu'

File Menu (Profiles Window)



Use to open a previously saved 'profiles'(.PRO) file.

Use to save the current 'profiles' file.

Use to save the current 'profiles' file with a different file name.

Use to save as an XLS file, which can be loaded into MS Excel.

This will immediately print the table, using the current settings

This will open the 'Page Set-up' dialogue box

This will open the standard windows printer set-up dialogue box.

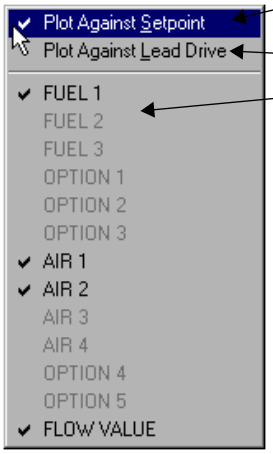
Use to close the active profiles window.

Edit Menu (profiles window)

There is only one command on the edit menu for the profiles window, and that is 'Copy'. This copies the currently selected cells from the spreadsheet to the windows clipboard. This data can then be pasted into other windows applications.

Graph Menu (Profiles Window)

This menu is used to specify the content and format of the graphs produced by the two graph buttons. The settings will be stored with the profiles window, and saved with the.PRO file.



Causes graphs to be plotted as drive pos. against setpoint no.

Causes graphs to be plotted as drive pos. against lead drive pos.

For the Fuel / Air graphs only, the user may exclude certain drives from the plot by clicking them here so that the tick disappears. Clicking them again will re - enable them once more.

Note: *Unused drives are displayed in light grey, and cannot be selected.*

Menu System - (Profile Graph Window)

When either of the graphs buttons is pushed, a new window will open up with a graph in it. If this window is re-sized, the graph will shrink or grow with it. Again, there is a new menu.

This menu will be visible when the active window is a 'Graph' window. It replaces the 'Top Level Menu' which is used for configuration, however, this can be re-displayed at any time by selecting 'Menu'

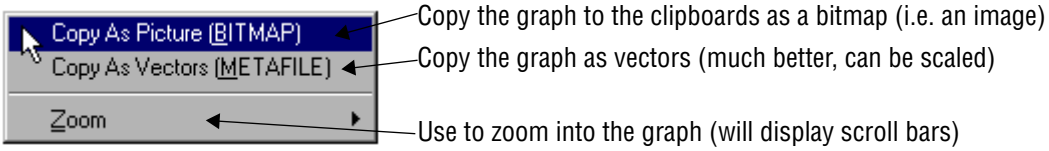
File Menu (Profile Graph Window)

This menu only contains two options, close and print.

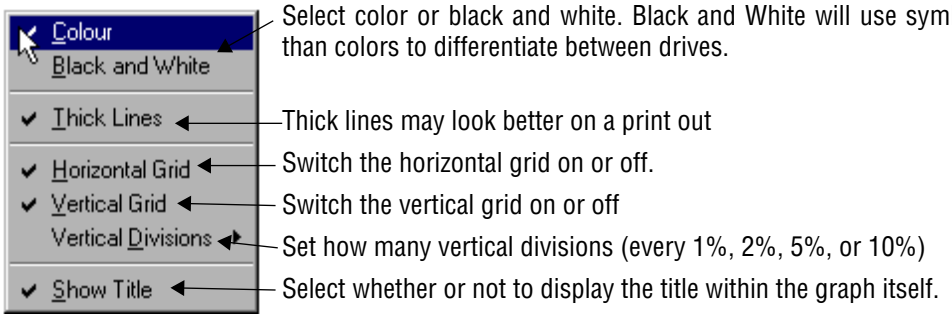
There is no need to load or save the graphs themselves because all the information required to build them is stored in the profiles file. The printout will go to the currently selected printer, and will automatically be scaled to fit the paper size and orientation (landscape is usually best). Note that the whole graph is always printed, regardless of any zoom applied.

If the graph is in color, and printed to a black and white printer, grey scales will be used. If this does not give satisfactory results, then try selecting 'Black and White' or 'Thick Lines' from the 'Style' menu.

Edit Menu (Profile Graph Window)



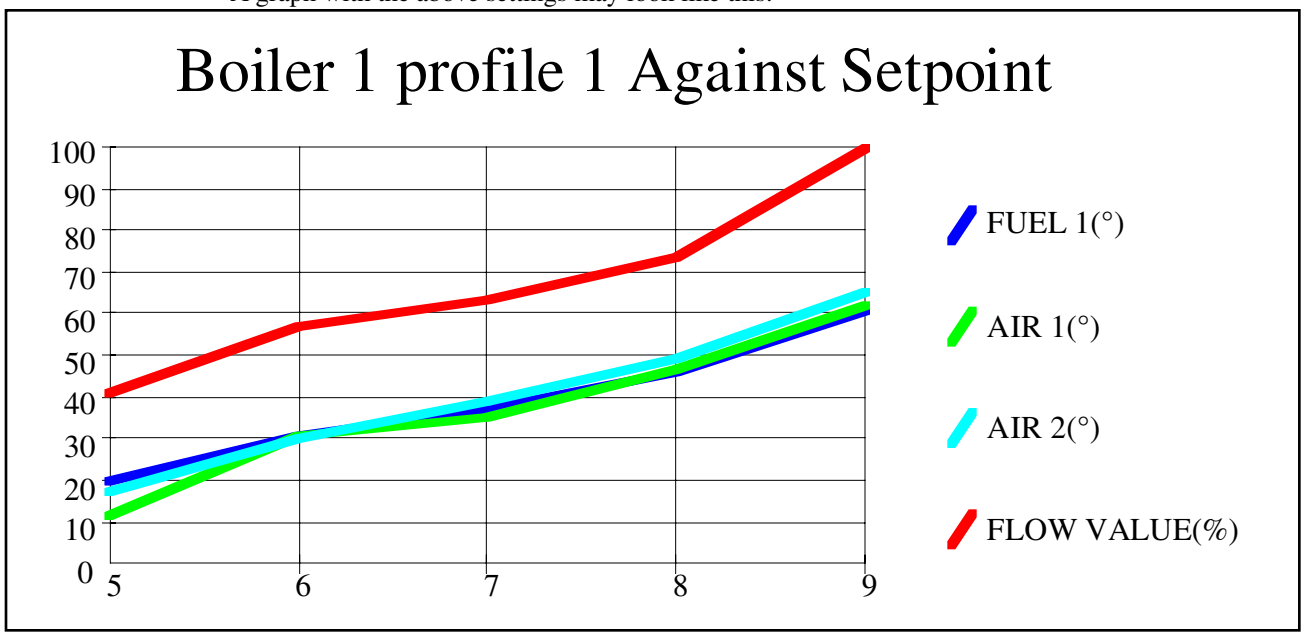
Style Menu (Profile Graph Window)



Having many vertical divisions may be useful if you are using the zoom function.

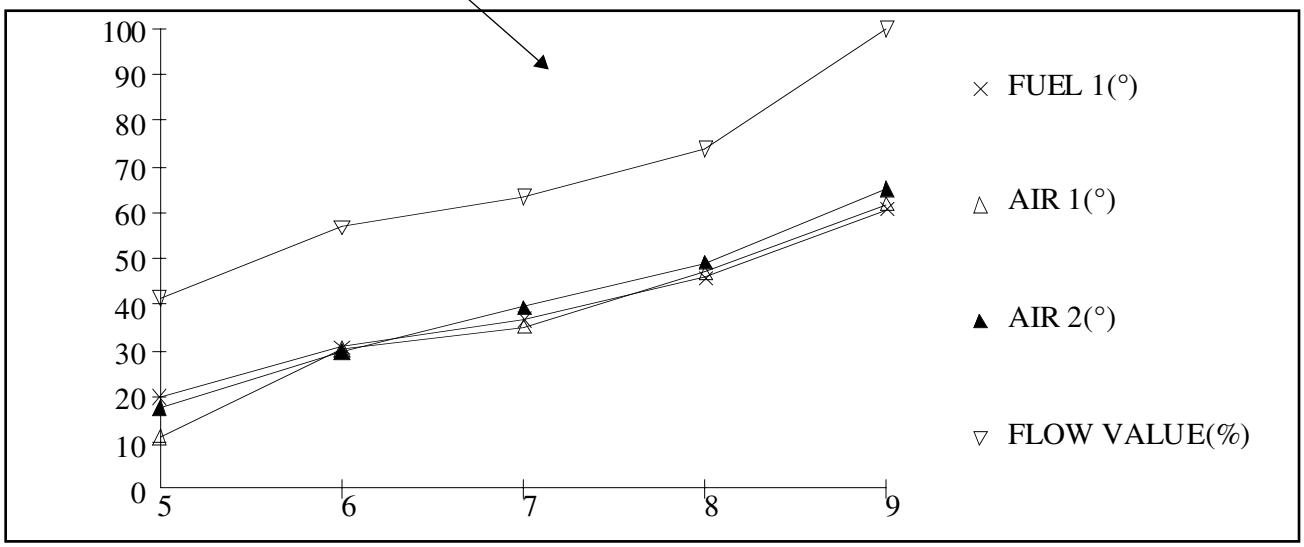
These settings are remembered and will be used for subsequent graphs. If the site file is saved, these settings will be saved along with it.

A graph with the above settings may look like this:

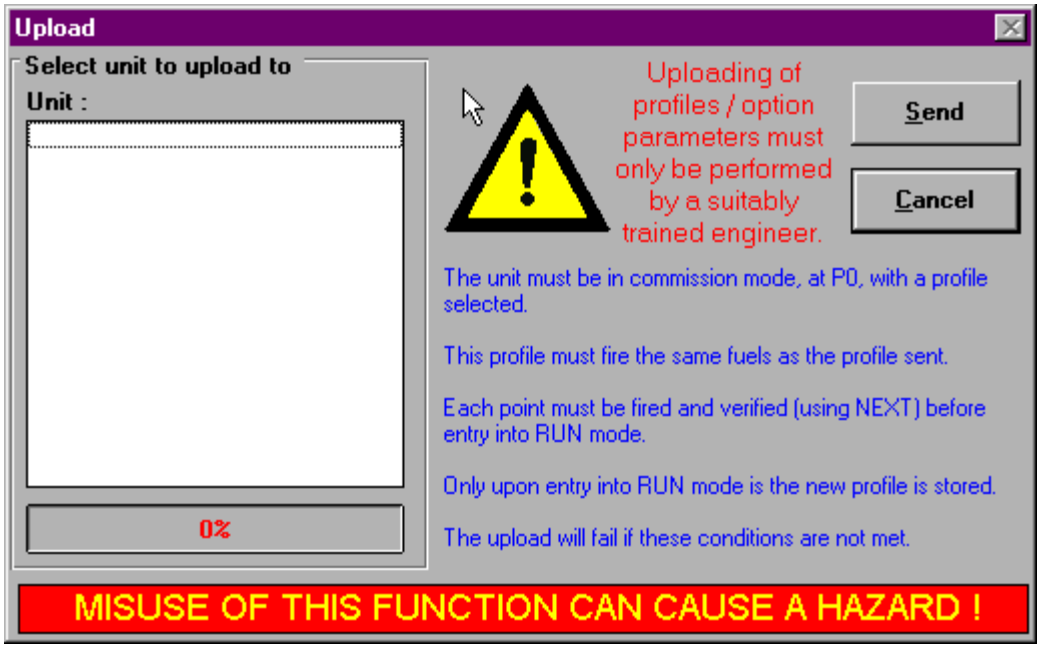


The same graph with these settings

will look like this:



Upload of Profiles



The set of profile points currently displayed can be uploaded to a unit to save them from having to be entered manually. For this to work, the unit must be in commission mode (having had its supplier's

passcode entered). The burner must be off, with commission ratio mode showing P0. See the relevant commissioning manual for details. In addition, the fuel(s) currently selected must match the fuels shown on the profile.

The address number of unit to receive the profile set-points must be selected from the list of connected units, and once the'send' button is pushed, the profile is uploaded to the unit. There is a progress indicator at the bottom left of the dialogue window.

The close and purge points (P0 and P1) are not sent. After the upload, these points must be entered in the usual way. Then the NEXT key must be pushed to fire and step through each point in the combustion range. At any time, the engineer may alter the current point.

When the last point has been reached, NEXT must be pushed once more to confirm this point, then RUN / ENTER must be pushed to accept the new profile.

When the last point has been reached, NEXT must be pushed once more to confirm this point, then RUN / ENTER must be pushed to accept the new profile.

WARNING: Every effort has been made to prevent, as much as possible, dangerous misuse of this function. However, it is ultimately the responsibility of the engineer to ensure that the profile included matches the installation. If this is not the case, a potential hazard can arise.

The following constraints have been added:

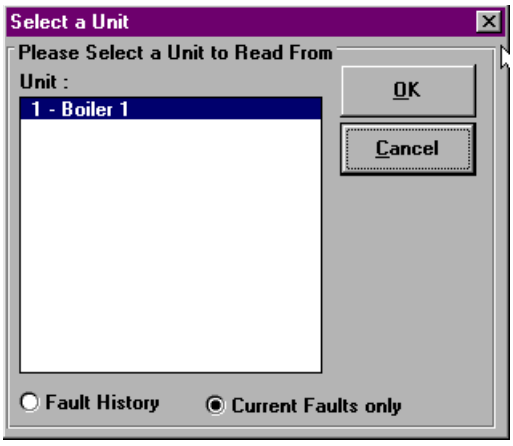
- Burner off
- Suppliers passcode entered (to prevent unauthorized access)
- Correct fuels selected, P0 showing
- P0 and P1 to be entered manually
- Manual confirmation of each point in the firing range.

FAULTS

Overview

By pushing this button, current or historical faults can be read back from any unit on the network.

Select a Unit and Fault Type



When the ‘Faults’ button is pushed, this dialogue box will open, and a list of all the currently selected units will be displayed.

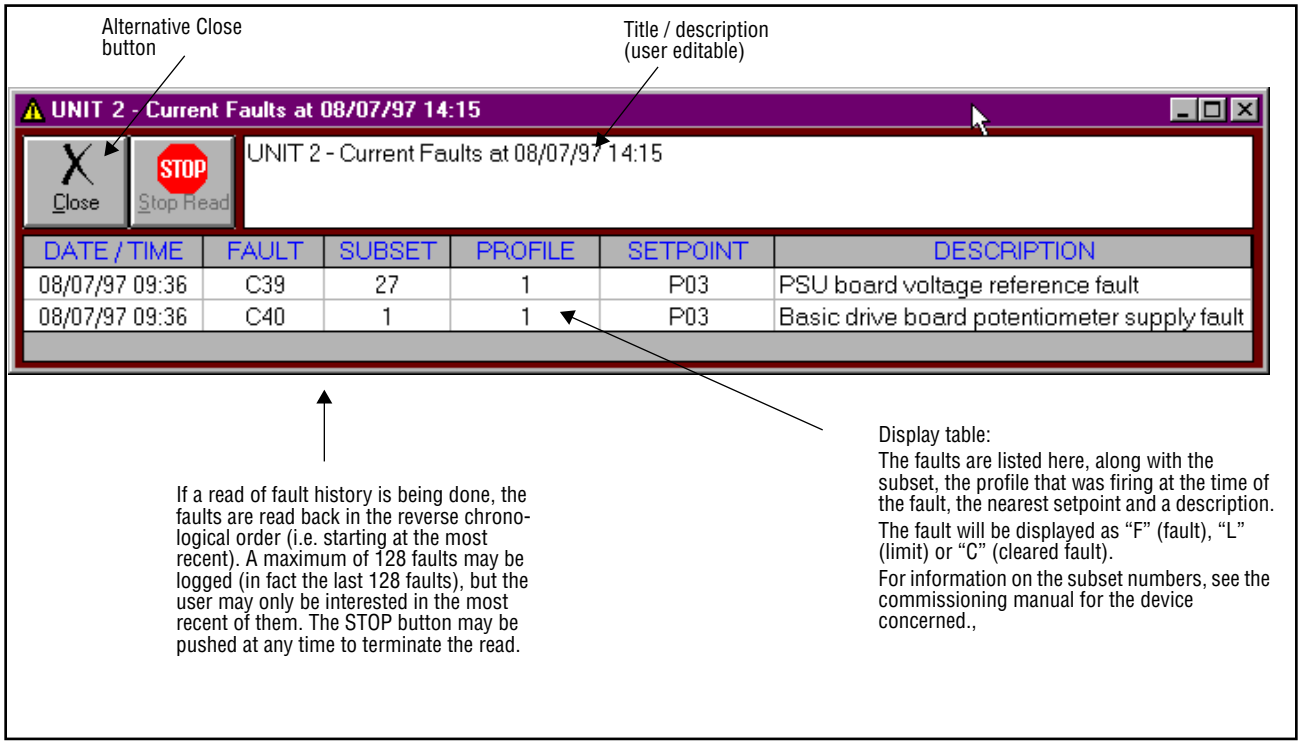
A particular unit can then be selected by clicking to highlight it.

The option buttons specify whether only current faults are read back, or whether historic faults that were logged are read back.

Press ‘OK’ to read.

The Faults Window

This window will display desired fault information.

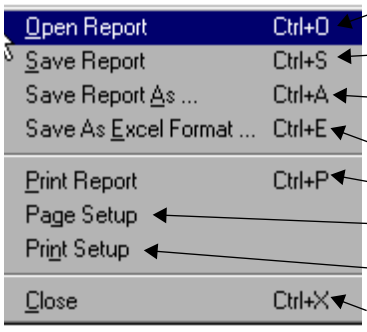


The user can select (highlight) cells by clicking and dragging the mouse, as with a spreadsheet.

Menu System - (Faults Window)

This menu will be visible when the active window is a 'Faults' window. It replaces the 'Top Level Menu' which is used for configuration, however, this can be re-displayed at any time by selecting 'Menu'.

File Menu (Faults Window)



- Use to open a previously saved 'faults'(.FLT) file.
- Use to save the current 'faults' file.
- Use to save the current 'faults' file with a different file name.
- Use to save as an XLS file, which can be loaded into MS Excel.
- This will immediately print the table, using the current setting
- This will open the 'Page Set-up' dialogue box See page 17.
- This will open the standard windows printer set-up dialogue box.
- Use to close the active faults window.

Edit Menu (Faults window)

There is only one command on the edit menu for the faults window, and that is 'Copy'. This copies the currently selected cells from the spreadsheet to the windows clipboard. This data can then be pasted into other windows applications.

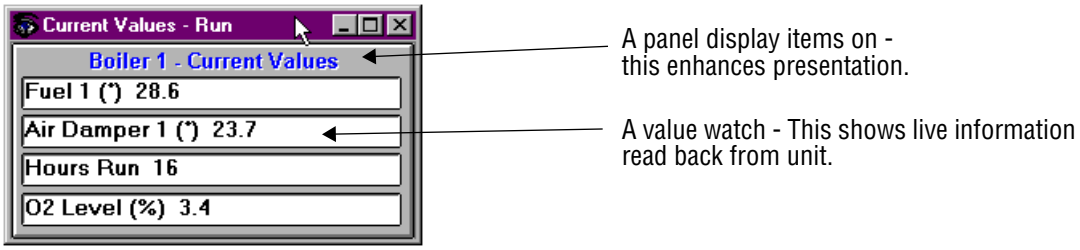
WATCH WINDOWS

Overview

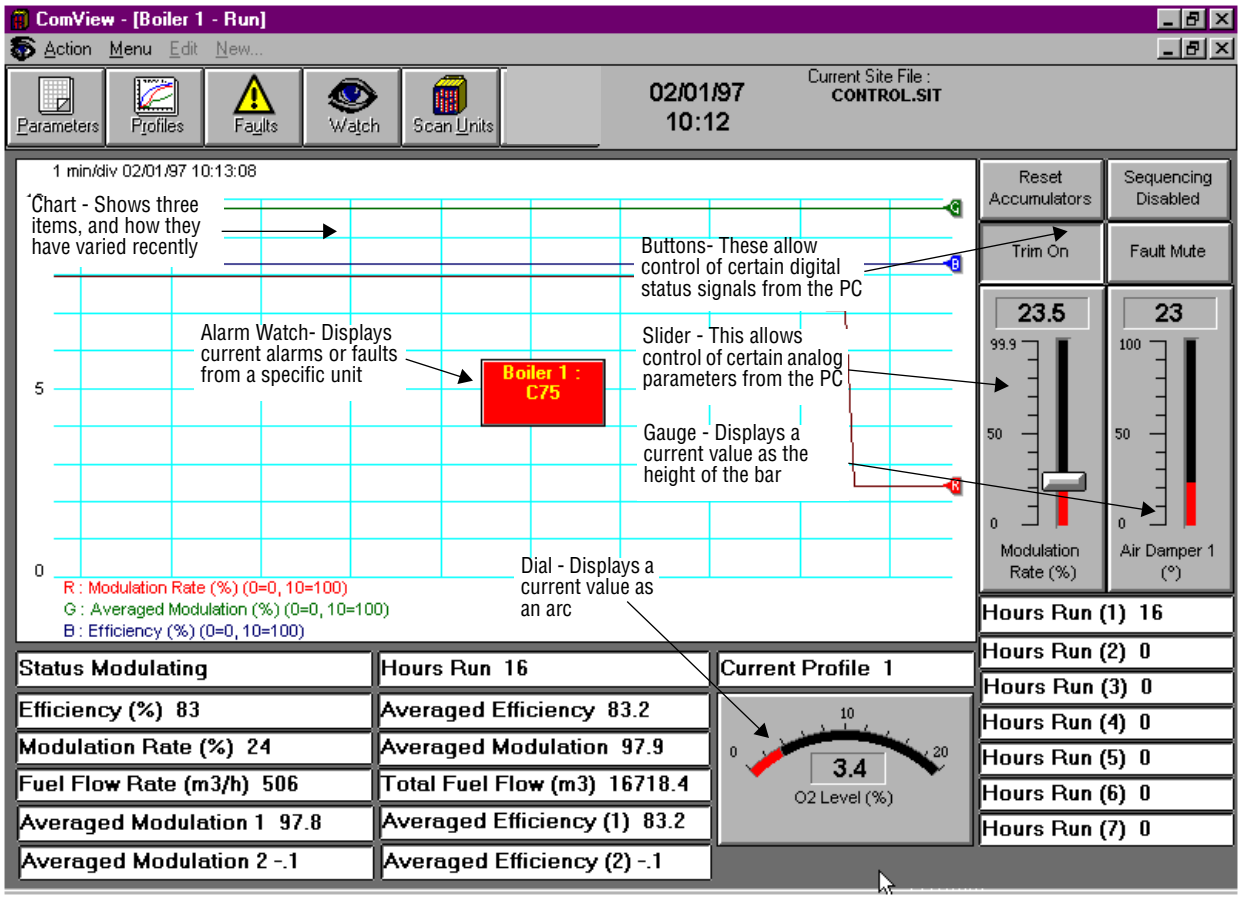
When this button is pushed, all the data watch windows will be set to 'RUN' mode. Subsequent pushes will cycle through each watch window, displaying it as the current window. A watch window is totally user configurable, it can display a number of different mimics, and can allow a degree of control of the burners.

The Watch Window

A watch window can be a small window, showing a few values:



or, a maximized window showing many different items, and allowing control of burners:



There are three operating modes for the watch windows.

In 'Stop' mode, the mimics are not updated, and cannot be changed by the user.

In 'Go' mode, the mimics are updated as live values are read back from the unit(s). The sliders and buttons which send control information to the remote units will be active, but can be disabled during run mode by clicking the right hand mouse button over them. The left-hand mouse button will alter their values.

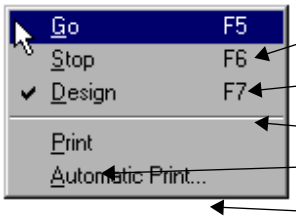
In 'Design' mode, the individual mimics themselves may be selected (by clicking the mouse), moved (by dragging the mouse) and can have their properties changed (by double-clicking the mouse, or from the 'Edit' menu). Also the size of the window itself can be changed in design mode.

In addition, the Charts, Panels, Buttons and Value labels may be re-sized by dragging the mouse from their bottom right corner, or by holding down the 'Shift' key and dragging the mouse from anywhere within the shape.

Menu System - (Watch Window)

This menu will be visible when the active window is a 'Watch' window. It replaces the 'Top Level Menu' which is used for configuration, however, this can be re-displayed at any time by selecting 'Menu'

Action Menu (Watch Window)



Sets all the watch windows to Run (Go) mode.

Freeze all the watch windows (stop mode). This is default.

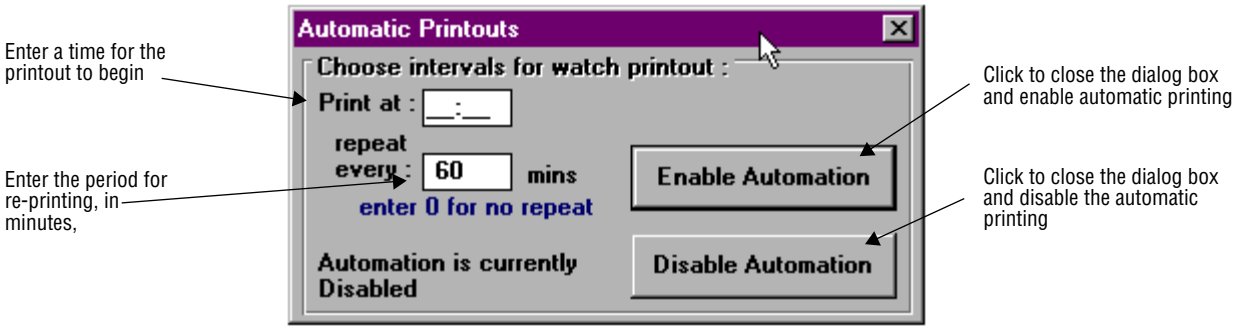
Sets all the watch windows to design mode so they can be edited.

This will immediately print the window, using the current settings.

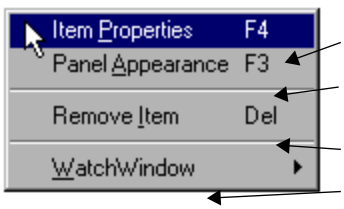
This will open the 'Automatic Print' dialogue box. See below.

Automatic Print Dialogue Box

Using this window, printouts of the current watch window can be scheduled. This is particularly useful if the window contains a chart. If the chart runs for an hour, and a printout is scheduled for every hour, then a complete record is obtained on paper.



Edit Menu (Watch Window)



Configures the current item (same as double clicking it). See 0

Opens panel appearance dialogue if item is a panel. See Watch window, previous page

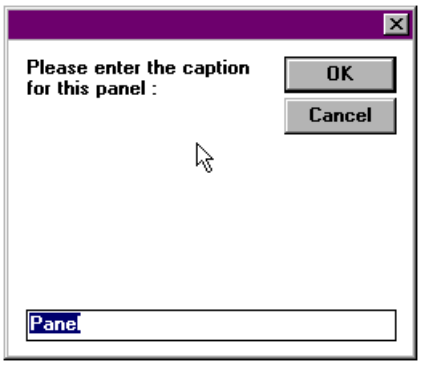
Deletes the currently selected item.

Menu to configure the watch window itself. See Menu System (Watch Window)

Item Properties Dialogue Boxes

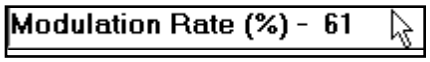
When 'Item Properties' is selected, or an item is double clicked, one of several dialogue boxes will open, depending on what the current item is.

Item Properties - Panel

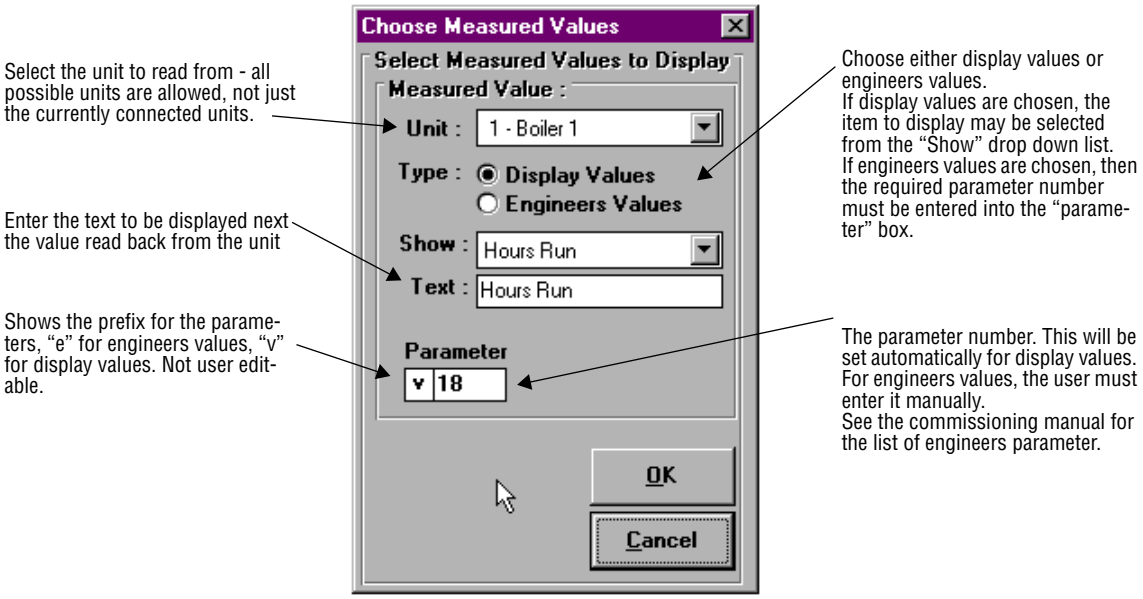


A panel can have text (a caption) displayed in it. This dialogue box is used to enter the text to be displayed.
If no text is required, enter a single space.

Item Properties - Value Watch (label)



A value watch is a label that displays information read back from a unit.



The table below shows the validity of each parameter for Fireye NX3000, -3100, -4000. -4100 and PPC5000 units. Some values depend on options that may or may not be fitted and enabled. They will return zero if not valid.

PARAMETER NUMBER	DESCRIPTION	VALID FOR FIREYE NEXUS	VALID FOR FIREYE PPC5000
0	Fuel 1	√ (Gas)	√
1	Fuel 2	√ ((Oil)	√
2	Fuel 3		√
3	Option 1		√
4	Option 2		√
5	Option 3		√
6	Air Damper 1	√	√

PARAMETER NUMBER	DESCRIPTION	VALID FOR FIREYE NEXUS	VALID FOR FIREYE PPC5000
7	Air Damper 2	√	√
8	Air Damper 3		√
9	Air Damper 4		√
10	Option 4		√
11	Option 5		√
12	Measured Value	√	√
13	Efficiency		√
14	Inlet Temp		√
15	O_2 Level		√
16	CO_2 Level		√
17	CO Level		√
18*	Hours Run	√	√
19	Status	√	√
20	Trim		√
21	Setpoint	√	√
22	Flue Temp		√
23	Fault Number	√	√
24	Smoke Level		√
25	SOx Level		√
26	NOx Level		√
27	Fuel	√	√
28	Profile Set	√	√
29	Option Set	√	√
30	Modulation Rate	√	√
31	Fuel Flow Rate		√
32	Averaged Efficiency		√
33	Averaged Modulation	√	√
34	Total Fuel Flow		√
35	Gas Pressure	√	
36	Valve Prove Status	√	
37	Flame Signal	√	

Note, many other values not shown above may be accessible if using an expanded Nexus System eg. O2, CO2, Exhaust temperature etc.

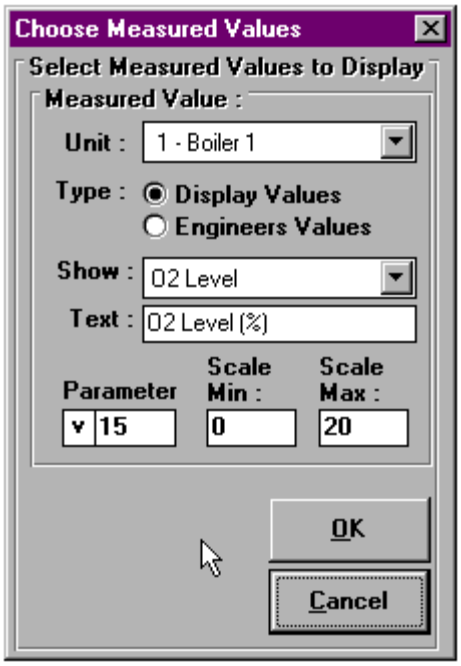
* These items are long term accumulators and they are stored for each fuel. A request for ‘v33’, or ‘v34,0’ will read the average modulation for the currently selected fuel. A request for ‘v34,2’ will read the same for the fuel (or fuel combination) which is selected by profile 2.

Note, these accumulators (except hours run) only run on a Fireye PPC5000 if:

a - The Flue Monitor Interface (FMI) board is present.

b - The burner is firing on only one fuel at a time.

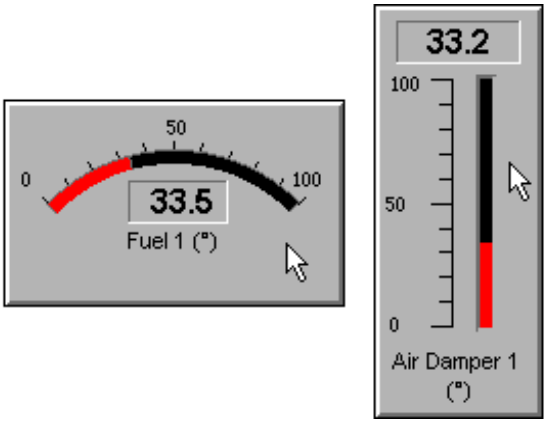
Item Properties - Dial and Gauge.



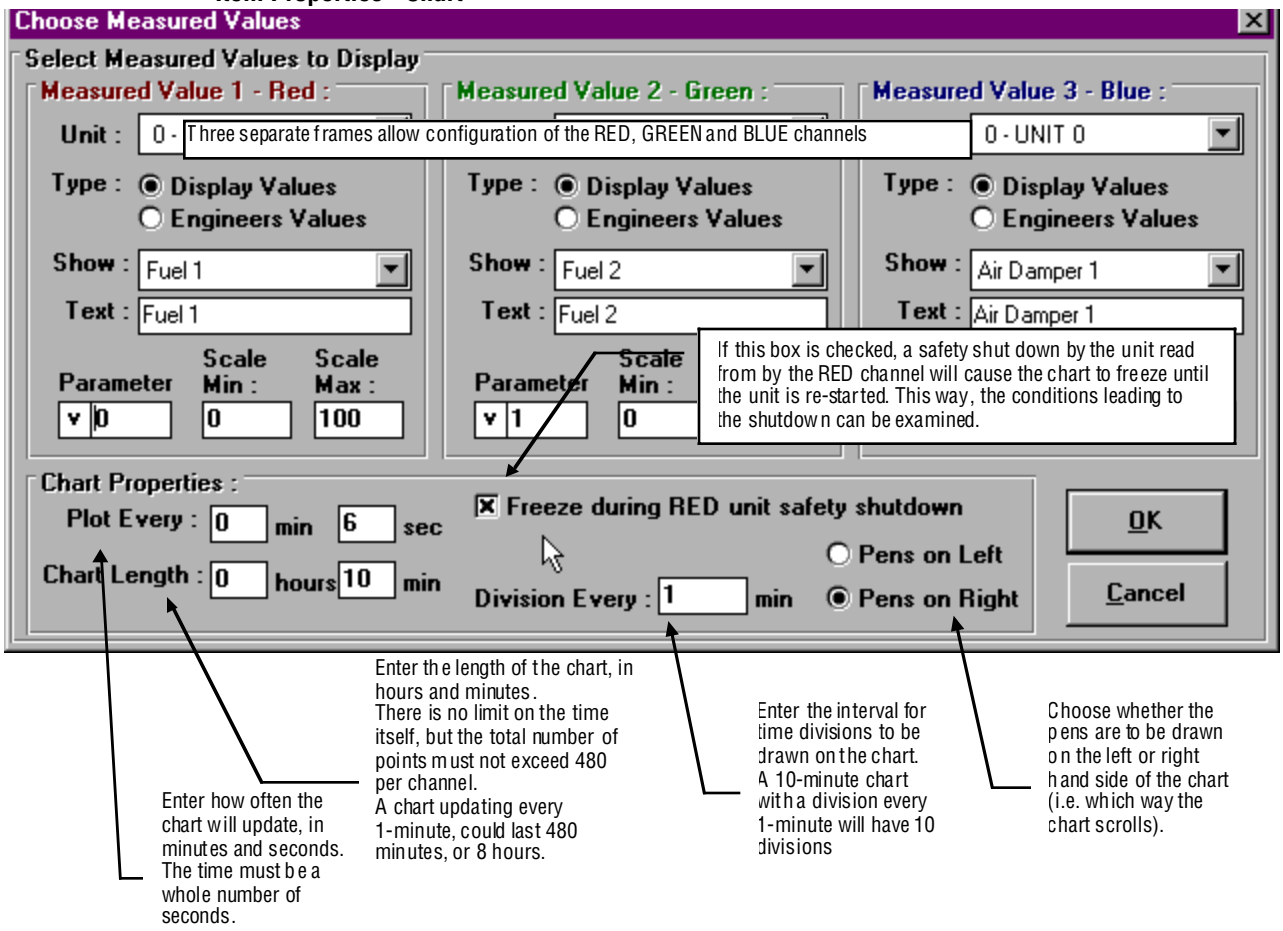
This dialogue is very similar to the above dialogue, except that it has two extra parameters to enter, 'Scale Min' and 'Scale Max'.

These are required because the dial and gauge items present the value in a graphical form against a scale.

By entering different scale values, it is possible to 'zoom in' on the reading so that a small change in the reading will be very noticeable on the screen.



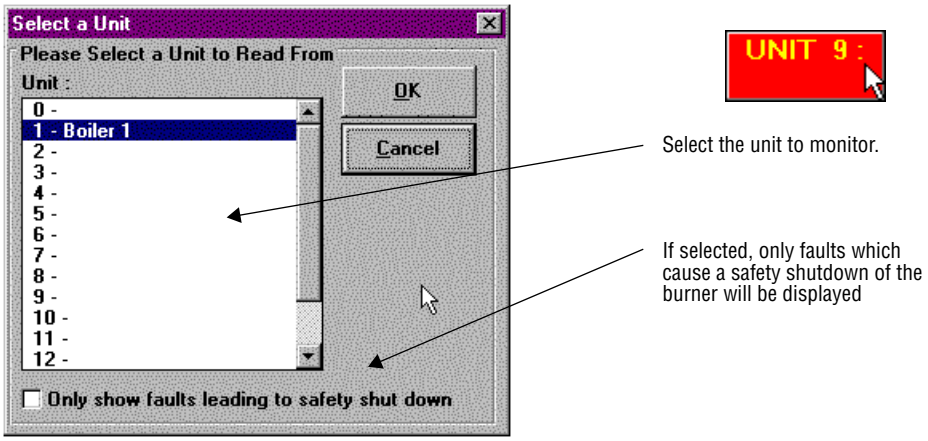
Item Properties - Chart



The dialogue for the chart is more complex, but based upon the dialogue for the gauge / dial. It

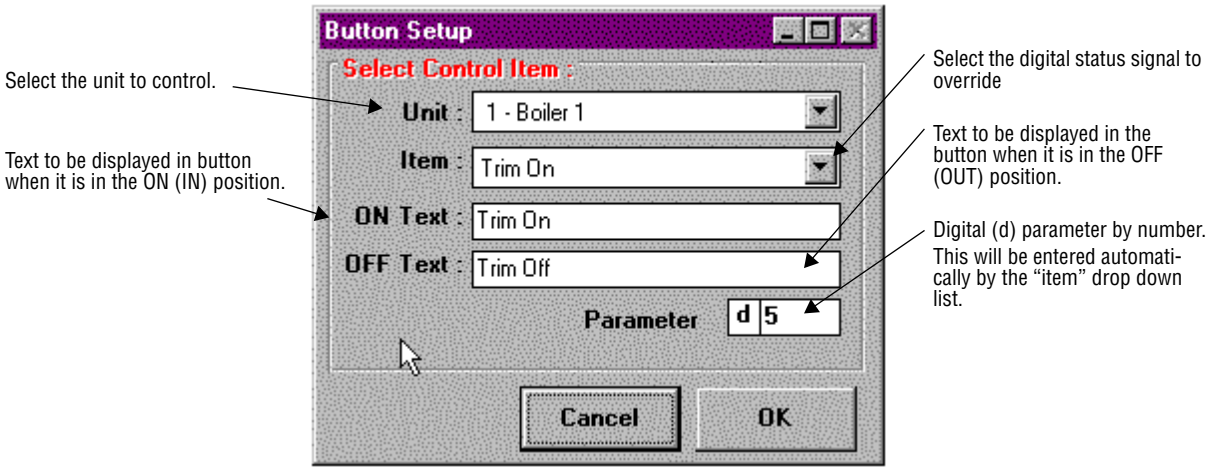
allows the configuration of three values (instead of one), and the properties of the chart itself.

Item Properties - Alarm Watch



Item Properties - Button

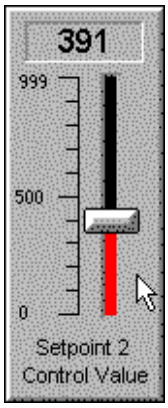
The 'buttons' allow control of digital status signals from the PC. The values sent by the PC override the values that the Fireye controller unit would otherwise use. If communications are lost, or the watch is stopped, the Fireye controller unit will revert to using its own values after a 60-second time out period. If a button is being used for resetting hours run etc., or fault mute, the button must be left in the 'ON' position until the desired change has happened. This may be 10 or more seconds if the communications are very busy.



PARAMETER NUMBER	DESCRIPTION	VALID FOR FIREYE NEXUS	VALID FOR FIREYE PPC5000
0	Setpoint Select (0 = SP1, 1 = SP2)	√	√
1	Release to Ignite	√	√
2	Release to Modulate	√	√
3	Lead Boiler Select	√	√
4	Fault Mute (Reset)	√	√
5	Trim ON		√

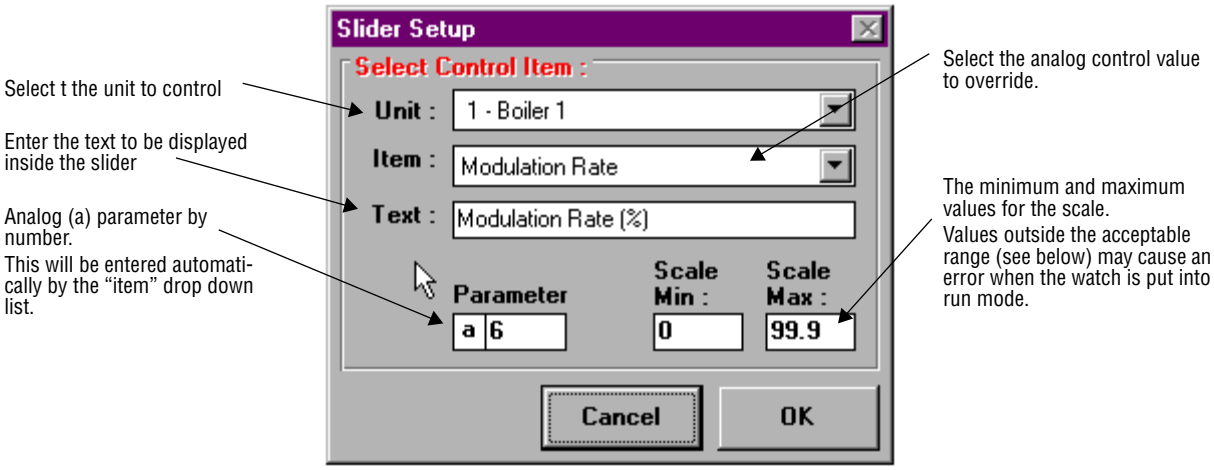
PARAMETER NUMBER	DESCRIPTION	VALID FOR FIREYE NEXUS	VALID FOR FIREYE PPC5000
6	Sequencing Enable	√	√
7	Burner ON/OFF	√	√
8	Reset Hours Run and Averages	√	√
9	Profile Select	√	
10	Forced Lockout	√	

Item Properties - Slider



The 'sliders' allow control of analog control values from the PC. The values sent by the PC override the values that the Fireye unit would otherwise use. If communications are lost, or the watch is stopped, the Fireye controller will revert to using its own values after a 60-second time-out period.

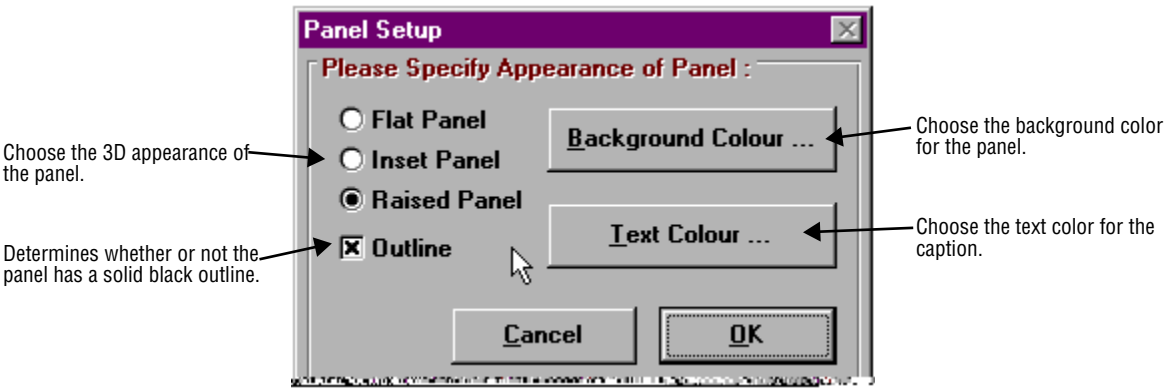
It may take several seconds for the unit to respond to the new value. The more items being updated, the slower the communication will be.



The acceptable range for the scale varies with each parameter, and all parameters are valid for both NEXUS and PPC5000 controllers.

PARAMETER NUMBER	DESCRIPTION	RANGE
0	Setpoint 1 Control Value	Determined by option parameter 11.0
1	Setpoint 2 Control Value	Determined by option parameter 13.0
2	Setpoint 1 Low Limit Control	Determined by option parameter 11.0
3	Setpoint 2 Low Limit Control	Determined by option parameter 13.0
4	Setpoint 1 High Limit Control	Determined by option parameter 11.0
5	Setpoint 2 High Limit Control	Determined by option parameter 13.0
6	Modulation Rate	00.0 -99.9

Panel Appearance Dialogue Box

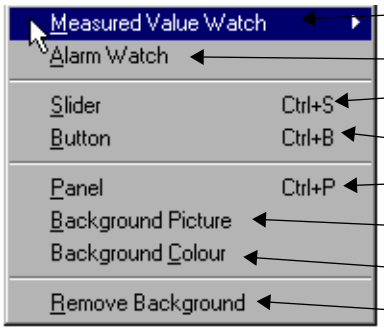


WatchWindow Menu (Watch Window)

Use to give the current watch window a name (e.g. Boiler 1).

This will, after confirmation, delete the whole watch window.

New... Menu (Watch Window)



Use to add a new value watch, gauge, dial or chart.

Use to add a new alarm watch.

Use to add a new slider (to override analog control values).

Use to add a new button (to override digital status signals).

Use to add a new panel to place items on to.

Use to specify a background picture (.WMF or .BMP files only).

Use to change the background color of the watch window.

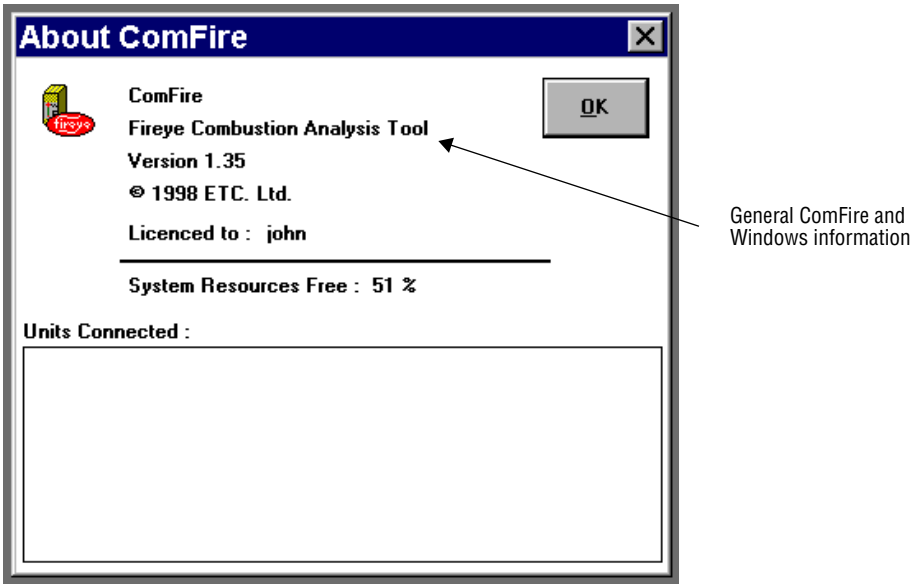
Use to remove the background picture (if there is one).

Overview

When this button is pushed, a message is broadcast for all units to identify themselves. Most, if not all, of the units should respond immediately. Any unit addresses that did not respond are interrogated individually, after a few seconds. This button is effectively pushed on ComFire start-up.

The About ComFire Window

If the 'user information' for a unit has been set, this information can be viewed by clicking the unit in the 'Units Connected' box. Note that this information may not be available immediately after a unit-scan so the user may have to wait for a few seconds before clicking. See the Advanced Settings Dialogue Box.



NOTICE

When Fireye products are combined with equipment manufactured by others and/or integrated into systems designed or manufactured by others, the Fireye warranty, as stated in its General Terms and Conditions of Sale, pertains only to the Fireye products and not to any other equipment or to the combined system or its overall performance.

WARRANTIES

FIREYE guarantees for *one year from the date of installation or 18 months from date of manufacture* of its products to replace, or, at its option, to repair any product or part thereof (except lamps, electronic tubes and photocells) which is found defective in material or workmanship or which otherwise fails to conform to the description of the product on the face of its sales order. **THE FOREGOING IS IN LIEU OF ALL OTHER WARRANTIES AND FIREYE MAKES NO WARRANTY OF MERCHANTABILITY OR ANY OTHER WARRANTY, EXPRESS OR IMPLIED.** Except as specifically stated in these general terms and conditions of sale, remedies with respect to any product or part number manufactured or sold by Fireye shall be limited exclusively to the right to replacement or repair as above provided. In no event shall Fireye be liable for consequential or special damages of any nature that may arise in connection with such product or part.

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