Voltech™

VPA Slite

VISUAL POWER ANALYSIS SOFTWARE USER MANUAL

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1. INSTALLATION

HARDWARE REQUIREMENTS

Math coprocessor

- DX CPU or installed math coprocessor
- SX CPU will not run VPAS

Memory

- 8MBytes minimum, 16MBytes recommended

Hard Disk Drive

- 4MBytes free minimum

Video

- VGA 640x480 DPI resolution minimum, 800x600 recommended

Operating System

Supported

- Windows 3.1
- Windows 3.11 for Workgroups
- Windows 95

Untested

- Windows NT
- OS/2

Power Analyzer

- PM100
- PM300

Power Analyzer to Computer interface

RS232

- Comm. ports 1-4

IEEE-488

- All current Windows compatible National Instruments cards supporting 488.2 protocols

VPAS Lite can be installed on any hard disk drive. To install VPAS Lite, please follow these simple instructions;

1. Insert the disk labeled ‘1 of 2’ into the computer's floppy disk drive.

   If you are not currently running Windows, run it by typing ‘WIN’ at the DOS command prompt.

2. Select ‘RUN’ from the ‘File’ menu then choose ‘SETUP’ on the VPAS Lite disk to start the installation process.

   During installation, VPAS Lite will prompt you to specify 2 directories, one for the CVI Run-Time executable and one for VPAS Lite.

   If you have other programs that were written in LabWindows/CVI, you should choose the same Run-Time directory.

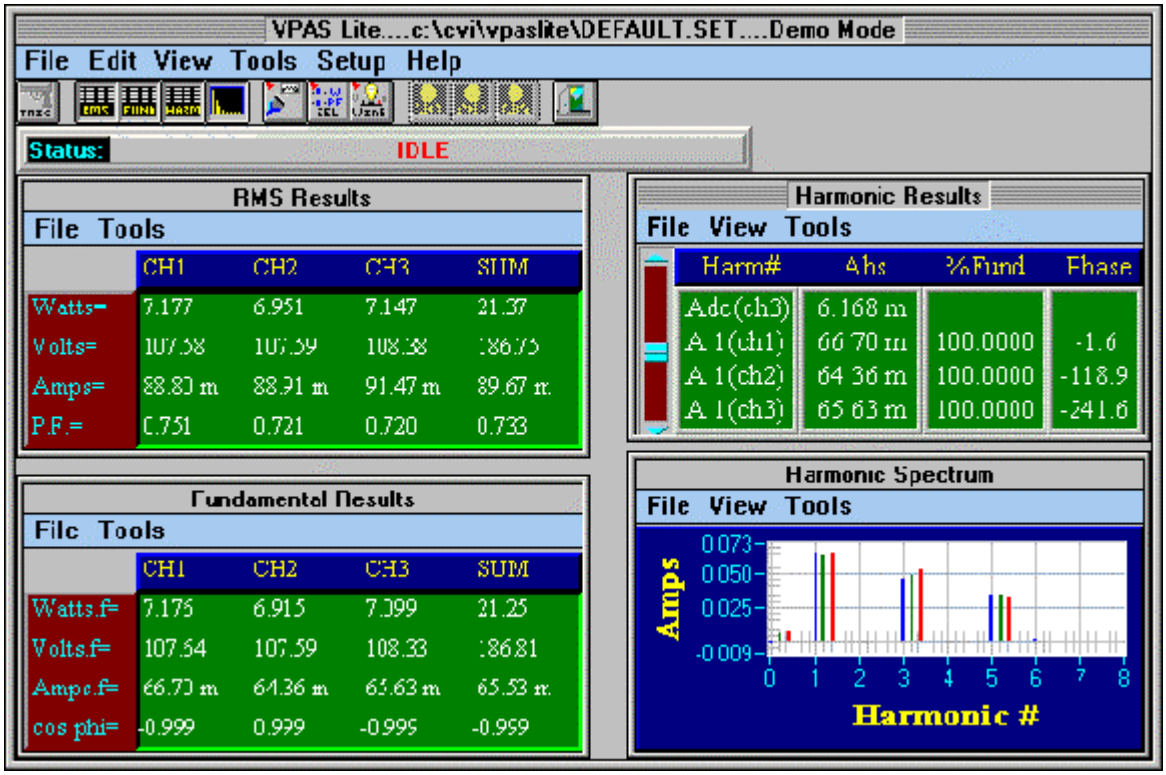
3. When the installation process is complete, a VPAS Lite icon will appear on your desktop.

4. To run VPAS Lite, double click on the VPAS Lite icon.

   Due to the complexity of VPAS Lite it is not recommended to run any other applications while VPAS Lite is running. It is also not recommended to run VPAS Lite while logged on to a network.

Note: To communicate with a Power Analyzer, you must have a signal connected.

2. RUNNING VPAS FOR THE FIRST TIME



(Main screen in VPAS Lite)

After installing VPAS Lite, run it by double clicking on the VPAS Lite Icon on your desktop.

If the message 'Initializing DEF_LOAD.INI' is displayed, this is OK. Click on the OK button to let VPAS Lite search for its run-time directory. If this message continues to be displayed, you should try re-installing or contacting Voltech for further assistance.

In this section, you will learn how the software can be configured to run connected to a Power Analyzer, or by itself in DEMO mode. (DEMO mode is recommended for this tutorial.)

SET COMMUNICATIONS

Click on the 'Setup → Communications Wizard' menu or click on the  button on the toolbar with the mouse.

In this wizard, the user chooses the type of interface to the Power Analyzer. For now, select 'Set Demonstration Mode'. Even if there is a Power Analyzer connected to the computer, you should select DEMO mode since the software will run faster for the purpose of this demonstration. DEMO mode will simulate a Power Analyzer as though you had one connected to the computer.

Additional information on setting communication parameters can be found in the section titled 'Setup → Communications Wizard.'

Click on 'FINISH' to accept the currently shown settings.

SET INPUT CONFIGURATION

Click on the 'Setup → Input Configuration Wizard' menu or click on the  button on the toolbar with the mouse.

In this wizard you will set up the various possible input connections. Choose normal for the 'Operating Mode' then click 'NEXT'. Choose the desired 'Wiring Mode'; for the demo any wiring mode is acceptable. Although there are other settings, at this time click on 'FINISH'. We will investigate the other possible settings in the section titled 'Input Configuration Wizard.'

SELECT PARAMETERS

Click on the 'Setup → Parameter Selection Wizard' menu or click on the  button on the toolbar with the mouse.

In this wizard you will select the parameters you wish to measure. There is no limit to the number of parameters that can be selected but keep in mind, the more items selected, the longer it will take the Power Analyzer to respond with its results, especially with a large number of harmonics and/or a Series THD formula. In depth information on this wizard can be found in the section titled 'Parameter Selection Wizard.'

VIEWING WINDOWS

At any time, you can toggle the windows shown using the 'View' menu or the following toolbar buttons:

RMS Results window

Fundamental Results window

Harmonic Results in a numeric table format


Harmonic Results in a bar spectrum format

TAKING A MEASUREMENT

To take a reading, click on the 'Tools → Trigger Now' menu, or click on the  button on the toolbar with the mouse.

In addition, while the PM300 wiring mode is single phase two wire, the buttons below can be clicked to display single phase readings on independent channels.

This is useful when measuring the input and output of a single phase device. Measurements of multiple single phase channels can not be made simultaneously.

By now you should be familiar enough with the VPAS Lite software to be able to display the appropriate windows in addition to the steps required to setup the communications and parameters desired.

The remaining sections in this manual describe all features of the VPAS Lite software in depth.

3. THE FILE MENU

1. EXPORT RESULTS

This feature is used to save all results returned from the power analyzer in either an ASCII or a CSV (Comma Separated Variable) format.

The term Export is used since the results CANNOT be loaded back into VPAS Lite. The comma separated variable format is a comma delimited format and is typically used with programs that can import a text (TXT) delimited file such as Microsoft Excel. Upon selecting this menu item, the user will be prompted with a message box allowing them to enter a description of the test results to be included at the top of the file. The file will also be stamped with the time and date from the time of the measurement.

2. PRINT RESULTS

This print feature is used to print all results returned from the 'Measurement Mode.'

Upon selecting this menu item, the user will be prompted with a message box, allowing them to enter a description of the test results, which will be printed at the top of the results printout. The printout will also be stamped with the time and date from the time that the measurement was taken.

3. PRINT FULL SCREEN

At any time, this menu can be selected to graphically print the current VPAS Lite screen.

Graphic prints can be time consuming and cause the VPAS Lite to be slow at recognizing keystrokes and button clicks until the print is finished. This is due to the way in which the development platform allows printing which is via bitmaps.

4. EXIT VPAS LITE

As it implies this menu item exits VPAS Lite.

If the Power Analyzer is running and data has not been stored, this selection will immediately initialize the Power Analyzer and will exit VPAS Lite

without saving the data. Be sure to 'Export Results', if desired, before selecting this item.

4. THE EDIT MENU

1. COPY ACTIVE WINDOW TO CLIPBOARD

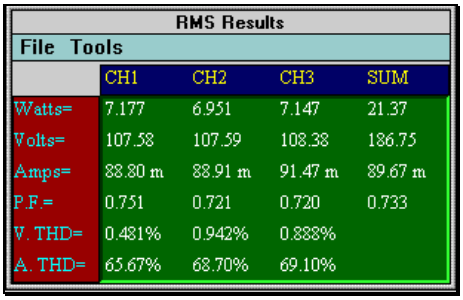
This menu item is used to copy the selected, eg. RMS Results, window to the clipboard. The selected window is identified by a line texture across the title-bar. Once copied, the window can be pasted (Edit menu or CTRL+V) in virtually any Windows program, such as Word, Excel, etc. Upon clicking the menu item another window pops up asking whether you want the border. The border is the frame of the window including the title bar and menu bar.

2. COPY FULL VPAS LITE WINDOW TO CLIPBOARD

This menu item is used to copy the entire VPAS Lite (main) window to the clipboard. Once copied, the window can be pasted (Edit menu or CTRL+V) in virtually any Windows program, eg. Word, Excel, etc. Upon clicking the menu item another window pops up asking whether you want the border. The border is the frame of the window including the title bar and menu bar.

5. THE VIEW MENU

1. RMS RESULTS



This menu item toggles the window for the RMS results.

It can also be toggled with the RMS button on the toolbar. The RMS Results window will show all of the 'total' values (as opposed to the fundamentals). The window will be initially sized based on the parameters and channels selected in the Parameter and Input Configuration Wizards.

SIZING

To size the window, with the left mouse button click and hold the left or right edge of the window and drag it open or closed.

When you release the mouse button the window will be resized which includes the font sizes. Sizing the top or bottom of the window has no effect since they are automatically calculated based on the font size and number of parameters.

The window will not always size exactly where you have selected. This is due to the available font sizes. Some fonts have only a few point sizes available, which will restrict the available sizes of the window. In these instances it is recommended that you choose a different font type. 'Times New Roman' is typically a good font to use.

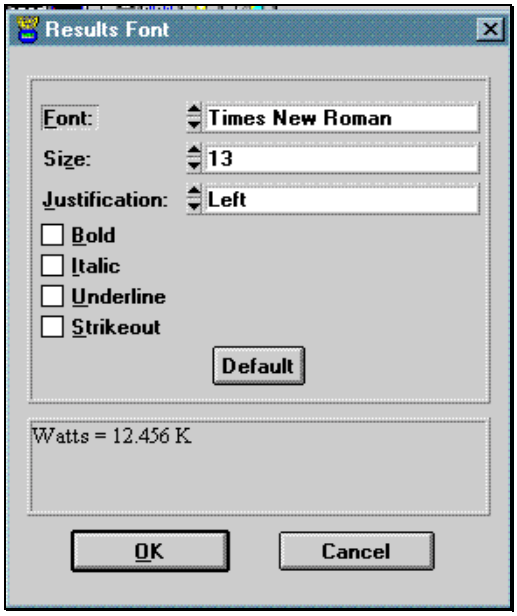
FILE MENU

Close

This menu item will close the RMS Results window (same as the RMS toolbar button).

TOOLS MENU

Font



This menu item will allow the user to change the font and other parameters used for the characters and backgrounds in the RMS Results window.

When the font type is changed, all applicable text in the RMS Results window is changed to the new font type.

The font size can be changed, however, the point size of the font is also changed when the RMS Results window is sized.

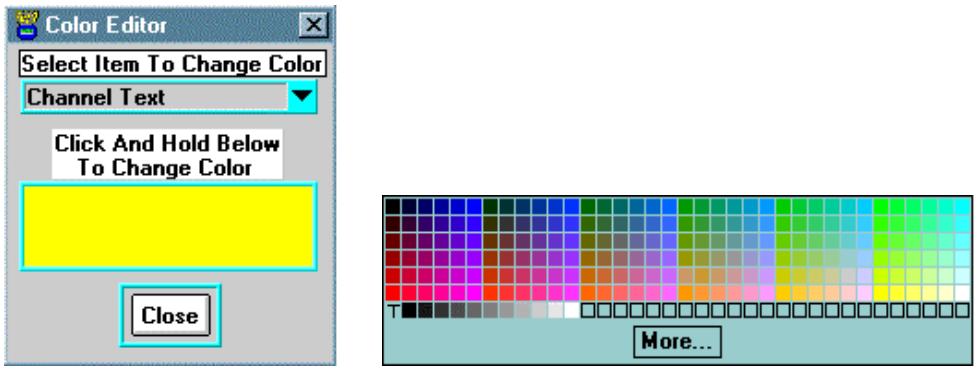
COLOR

Copy Color Scheme

This will copy all the color attributes from one window to another window. This is handy when you create your own preferred color scheme since you can then go to a different window and copy your new color scheme to it.

Edit Colors

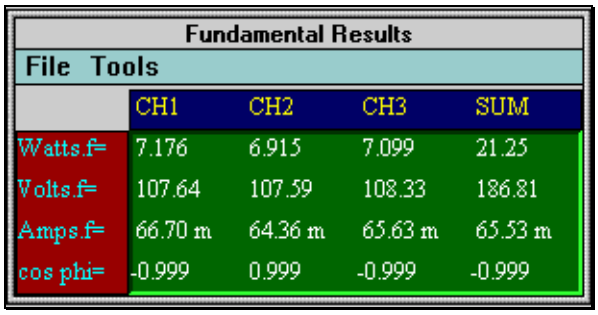
This will display the color box shown below. Click on the 'Select Item To Change Color' drop down box to select the desired item to change. Click and hold the left mouse button on the colored box, which will open the color palette to the right. Drag the mouse pointer to the desired color and release the mouse button to modify the color setting. Clicking 'More' on the palette box will let you choose the color by entering the RGB spectrum colors directly.



Set Factory Default Colors

If after modifying colors you decide that you wish to return to the factory default colors, click on this menu item.

2. FUNDAMENTAL RESULTS



This menu item toggles the window for the Fundamental results.

It can also be toggled with the FUND button on the toolbar. The Fundamental Results window will show all of the fundamental values (as opposed to the total/RMS values). The window will be initially sized based on the parameters and channels selected in the Parameter and Input Configuration Wizards.

SIZING

To size the window, with the left mouse button, click and hold the left or right edge of the window and drag it open or closed. When you release the mouse button the window will be resized which includes the font sizes. Sizing the top or bottom of the window has no effect since they are automatically calculated based on the font size and number of parameters. The window will not always size exactly where you have selected. This is due to the available font sizes. Some fonts have only a few point sizes available, which will restrict the available sizes of the window. In these instances it is

recommended that you choose a different font type. 'Times New Roman' is typically a good font to use.

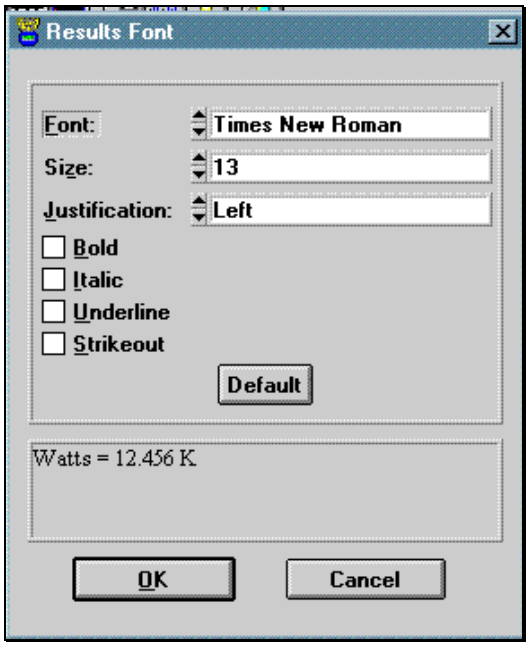
FILE MENU

Close

This menu item will close the Fundamental Results window (same as the FUND toolbar button).

TOOLS MENU

Font



This menu item will allow the user to change the font and other parameters used for the characters and backgrounds in the Fundamental Results window.

When the font type is changed, all applicable text in the Fundamental Results window is changed to the new font type.

The font size can be changed, however, the point size of the font is also changed when the Fundamental Results window is sized.

COLOR

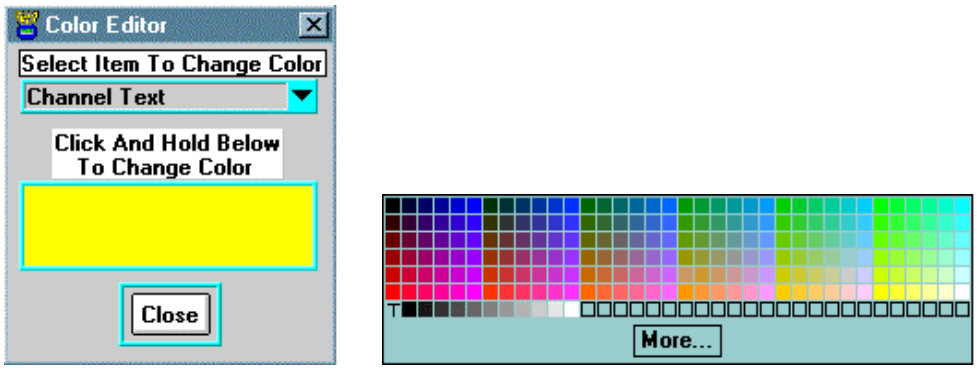
Copy Color Scheme

This will copy all the color attributes from one window to another window. This is handy when you create your own preferred color

scheme since you can then go to a different window and copy your new color scheme to it.

Edit Colors

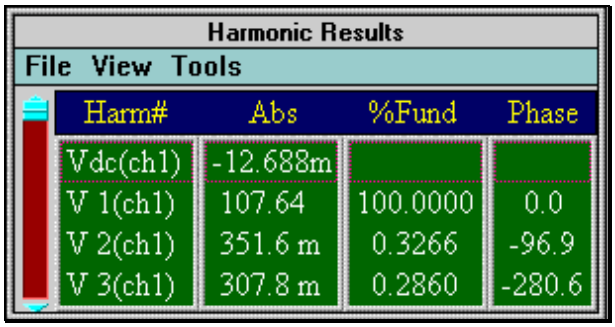
This will display the color box shown below. Click on the 'Select Item To Change Color' drop down box to select the desired item to change. Click and hold the left mouse button on the colored box which will open the color palette to the right. Drag the mouse pointer to the desired color and release the mouse button to modify the color setting. Clicking 'More' on the palette box will let you choose the color by entering the RGB spectrum colors directly.



Set Factory Default Colors

If after modifying colors you decide that you wish to return to the factory default colors, click on this menu item.

3. HARMONIC RESULTS (TABLE)



This menu item toggles the window for the Harmonic Results.

It can also be toggled with the  button on the toolbar. The Harmonic Results window will show all of the harmonic results in a table format including the percent of fundamental, the absolute value, and the phase of the

individual harmonics. Keep in mind that harmonic 0 is the DC value and harmonic 1 is the fundamental. The window will be sized based on the number of harmonics selected in the Parameter Wizard.

SIZING

To size the window, with the left mouse button, click and hold the right or left edge of the window and drag it open or closed. When you release the mouse button the window will be resized which includes the font sizes. Sizing the top or bottom of the window changes the number of harmonics shown. The window will not always size exactly where you have selected. This is due to the available font sizes. Some fonts have only a few point sizes available which will restrict the available size of the window. In this instance it is recommended that you choose a different font type. 'Times New Roman' is typically a good font to use.

FILE MENU

Close

This menu item will close the RMS Results window (same as the toolbar button).

VIEW MENU

This menu allows the user to customize the view of the harmonics in the table.

Show All Channels

This menu item will enable (add) all channels to the window.

Hide All Channels:

This menu item will disable (remove) all channels from the window.

Show Channel 1:

This menu item will add channel 1 to the window.

Show Channel 2:

This menu item will add channel 2 to the window.

Show Channel 3:

This menu item will add channel 3 to the window.

Show Neutral:

This menu item will add the Neutral to the window.

Sort By Channel:

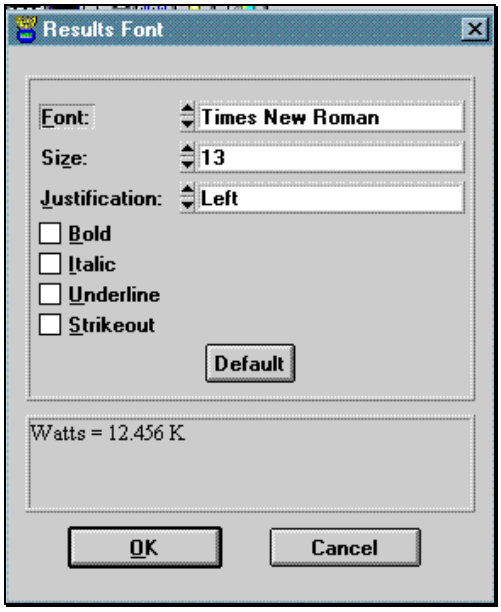
All harmonics in the window will be sorted by the channel number.

Sort By Harmonic:

All harmonics in the window will be sorted by the harmonic number.

TOOLS MENU

Font



This menu item will allow the user to change the font and other parameters used for the characters and backgrounds in the Harmonic Results window.

When the font type is changed, all applicable text in the Harmonic Results window is changed to the new font type.

The font size can be changed, however, the point size of the font is also changed when the Harmonic Results window is sized.

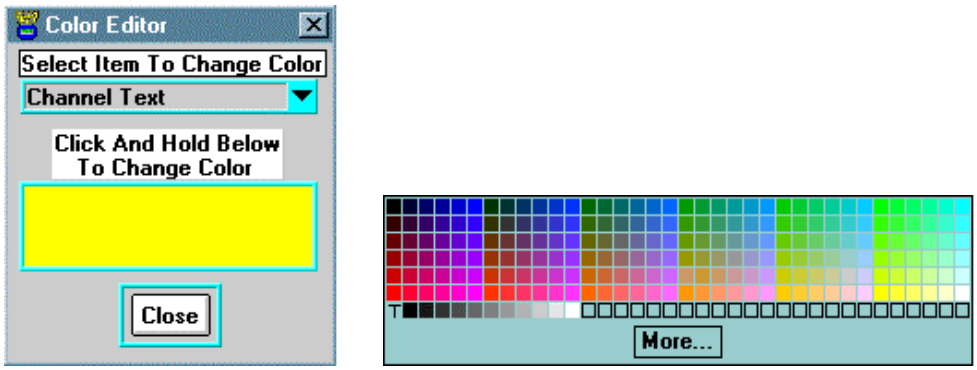
COLOR

Copy Color Scheme

This will copy all the color attributes from one window to another window. This is handy when you create your own preferred color scheme since you can then go to a different window and copy your new color scheme to it.

Edit Colors

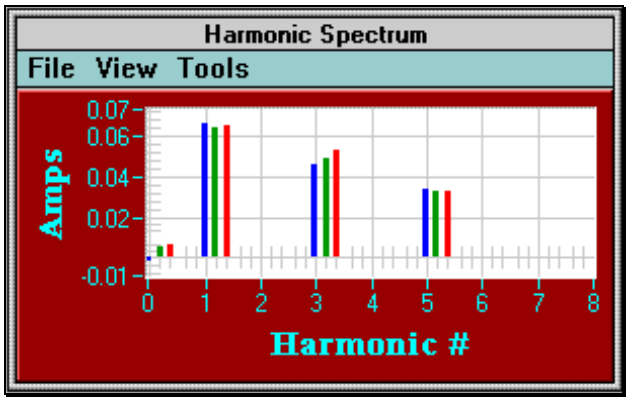
This will display the color box shown below. Click on the 'Select Item To Change Color' drop down box to select the desired item to change. Click and hold the left mouse button on the colored box which will open the color palette to the right. Drag the mouse pointer to the desired color and release the mouse button to modify the color setting. Clicking 'More' on the palette box will let you choose the color by entering the RGB spectrum colors directly.



Set Factory Default Colors

If after modifying colors you decide that you wish to return to the factory default colors, click on this menu item.

4. HARMONIC BAR SPECTRUM



This menu item toggles the window for the Harmonic Bar Spectrum.

It can also be toggled with the  button on the toolbar. The Harmonic Spectrum window will show all of the harmonics in the form of a bar chart with the Y axis being the amplitude and the X axis being the harmonic number.

SIZING

To size the window, with the left mouse button click and hold the any edge of the window and drag it open or closed. When you release the mouse button the window will be resized.

ZOOMING AND PANNING

You can zoom in and out on the graph by holding the 'Ctrl' key and simultaneously pressing the left mouse button to zoom in and the right mouse button to zoom out. Moving the mouse while zooming will cause the graph to be zoomed and panned at the same time. To pan only, press and hold the 'Ctrl' & 'Shift' keys then simultaneously press the left mouse key and move the mouse. While in Logarithmic mode, the zooming and panning of the Y axis is disabled. Press CTRL + SPACE to restore the 1:1 zoom ratio.

FILE MENU

Print

This menu item allows the user to print the harmonic bar spectrum.

Upon selecting it, another window will open requesting the title of the printout that will be printed at the top of the page. The last window that opens will allow the user to customize the printer settings. Typically these settings should be left as is, however, adjusting them can change the position and size of the graph on the paper as well as other attributes.

Be warned that if you start to modify these settings, changing the position and size of the graph will be a tedious process.

The -1 setting tells VPAS to use the current printer configuration. Be patient since printing can take a long time. Controls will be sluggish during this time.

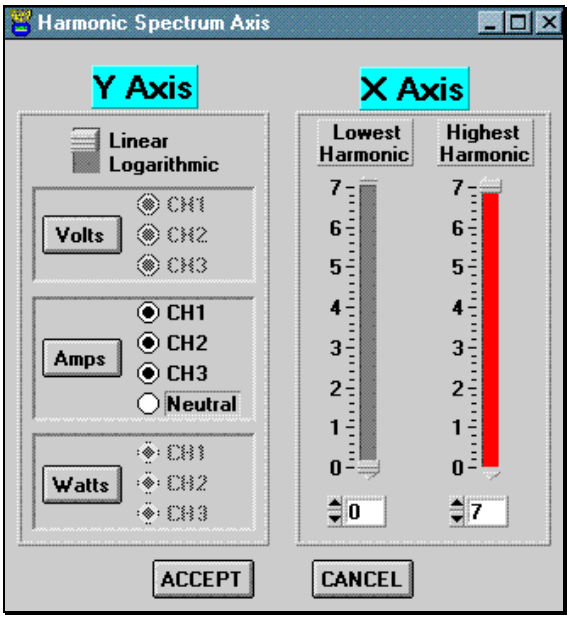
Close

This menu item will close the Harmonic Spectrum window (same as the toolbar button).

VIEW MENU

Axis

This menu item will open the box shown below:



In this box the user can select the type of Y axis (linear or logarithmic), the parameter of the Y axis along with the channels to be displayed and the range of harmonics. While in Logarithmic mode, the zooming and panning of the Y axis is disabled.

Full Screen

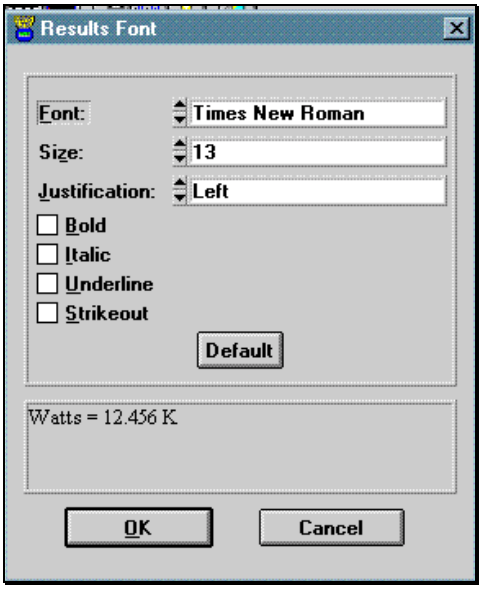
This menu item sizes the harmonic bar spectrum window to cover the entire PC screen. **THE ONLY WAY TO EXIT THIS MODE OF DISPLAY IS TO SELECT THE FULL SCREEN MENU ITEM AGAIN, WHICH WILL RESTORE THE WINDOW TO ITS ORIGINAL SIZE**.

Reset Window

This menu item will reset the window of any zooming or panning adjustments made.

TOOLS MENU

Font



This menu item will allow the user to change the font and other parameters used for the characters and backgrounds in the Harmonic Bar Spectrum window.

When the font type is changed, all applicable text in the Harmonic Bar Spectrum window is changed to the new font type.

The font size can be changed, however, the point size of the font is also changed when the RMS Results window is sized.

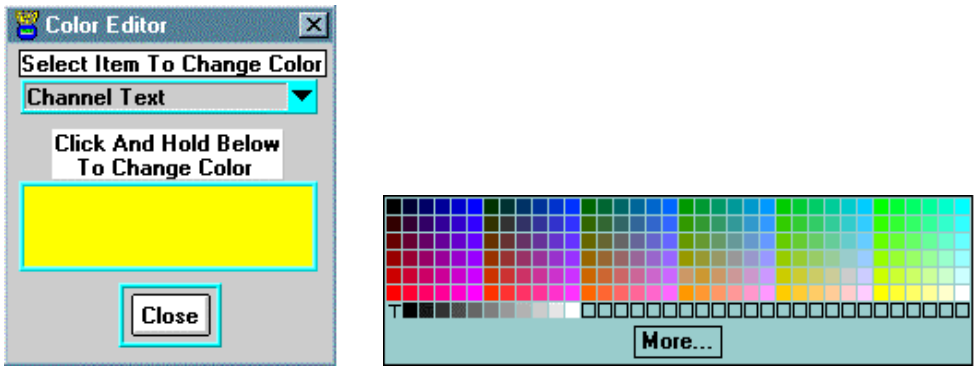
COLOR

Copy Color Scheme

This will copy all the color attributes from one window to another window. This is handy when you create your own preferred color scheme since you can then go to a different window and copy your new color scheme to it.

Edit Colors

This will display the color box shown on the next page. Click on the 'Select Item To Change Color' drop down box to select the desired item to change. Click and hold the left mouse button on the colored box, which will open the color palette to the right. Drag the mouse pointer to the desired color and release the mouse button to modify the color setting. Clicking 'More' on the palette box will let you choose the color by entering the RGB spectrum colors directly.



Set Factory Default Colors

If after modifying colors you decide that you wish to return to the factory default colors, click on this menu item.

5. TOOLBAR

The 'View → Toolbar' menu item will toggle the visibility of the toolbar. It is convenient to have the toolbar displayed at all times, however, with a low display resolution such as 640 x 480 you may want to disable the toolbar to have more room on the display for the results windows.

The toolbar buttons are described in order as follows (from left to right):

Trigger: Take a new measurement

RMS Results: Toggle the RMS Results window

Fundamental Results: Toggle the Fundamental Results window

Harmonic Results in Table format: Toggle the Harmonic Results Table window

Harmonic Results in Bar Spectrum format: Toggle the Harmonic Bar Spectrum window

Communications Wizard: Display the Communications Wizard

Parameter Selection Wizard: Display the Parameter Selection Wizard

Input Configuration Wizard: Display the Input Configuration Wizard

Trigger & Select Channel 1

Trigger & Select Channel 2

Trigger & Select Channel 3

Exit VPAS Lite: Quit and Exit VPAS Lite

6. STATUS BOX

The 'View → Status Box' menu item will toggle the status box in the top left corner of the VPAS Lite window. The status box is used to inform the user of the current action being performed. The status box can be disabled so that more space is available on the display for the result windows.

7. SCROLLING DESKTOP

The 'View → Scrolling Desktop' menu item will toggle the scroll bars on the edges of the main VPAS Lite window. These scroll bars can be used to 'Pan' the main VPAS Lite window to create a larger desktop area. An example would be to widen a single channel RMS Results window to the full width of the VPAS Lite window. Depending on the number of parameters chosen, some parameters will likely fall below the bottom of the VPAS Lite window. Using the scroll bar on the right side of the window, the user can pan down to see the rest of the results.

6. THE TOOLS MENU

1. TRIGGER

This menu item initiates the trigger function to take a new measurement.

The  button has the same function. Depending on various parameters, it may take anywhere from 2 to 20 seconds to read back a new set of data.

2. TRIGGER CHANNEL 1

This menu item can only be used with the PM300 configured to the single phase two wire wiring mode.

It selects channel 1 then automatically initiates the trigger function to take a new measurement. This would be useful when measuring the input and output of a single phase device with two dramatically different signals.

In three phase four wire the sample rate is derived from channel 1 and the ranging is fixed the same for all channels dependent on which channel has the highest amplitude. If you have a 120v signal on channel one and a 5v signal on channel two, for instance, channel 2 will likely read zero. In this case single phase two wire is ideal.

You **CANNOT** make simultaneous measurements with this method.

The  button has the same function. Depending on various parameters, it may take anywhere from 2 to 20 seconds to read back a new set of data.

3. TRIGGER CHANNEL 2

This menu item can only be used with the PM300 configured to the single phase two wire mode.

It selects channel 1 then automatically initiates the trigger function to take a new measurement. This would be useful when measuring the input and output of a single phase device with two dramatically different signals.

In three phase four wire the sample rate is derived from channel 1 and the ranging is fixed the same for all channels dependent on which channel has the highest amplitude. If you have a 120v signal on channel one and a 5v signal on channel two, for instance, channel 2 will likely read zero. In this case single phase two wire is ideal.

You **CANNOT** make simultaneous measurements with this method.

The  button has the same function. Depending on various parameters, it may take anywhere from 2 to 20 seconds to read back a new set of data.

4. TRIGGER CHANNEL 3

This menu item can only be used with the PM300 configured to the single phase two wire wiring mode. It selects channel 1 then automatically initiates the trigger function to take a new measurement. This would be useful when measuring the input and output of a single phase device with two dramatically different signals.

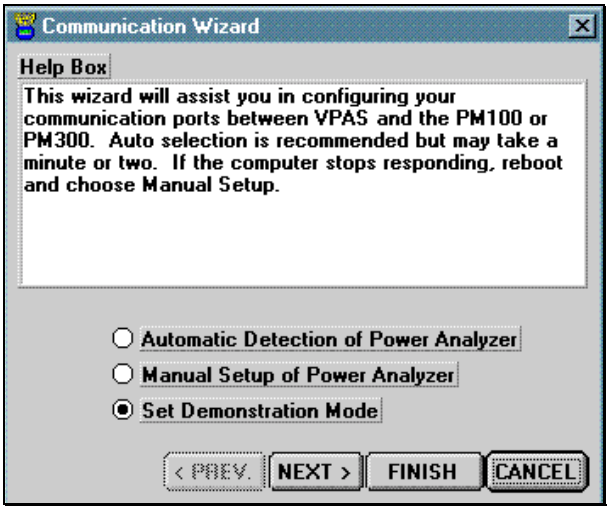
In three phase four wire the sample rate is derived from channel 1 and the ranging is fixed the same for all channels dependent on which channel has the highest amplitude. If you have a 120v signal on channel one and a 5v signal on channel two, for instance, channel 2 will likely read zero. In this case single phase two wire is ideal.

You **CANNOT** make simultaneous measurements with this method.

The  button has the same function. Depending on various parameters, it may take anywhere between 2 and 20 seconds to read back a new set of data.

7. THE SETUP MENU

1. COMMUNICATIONS WIZARD



This menu item opens the Communication Wizard.

The  button has the same function. Before proceeding you should be aware of the current communication settings of the power analyzer. This is done via menu 0 on the front panel of the power analyzer.

Automatic Detection of Power Analyzer

If you are unsure which serial (RS232) port you are connected to on the PC or unsure of the IEEE settings, click on 'Automatic Detection of Power Analyzer.' After a number of seconds, VPAS Lite will find any PM100s or PM300s connected to the PC. Upon finding a power analyzer VPAS Lite will query it and display the type and serial number of the unit. It will then ask if you want to 'Use' the analyzer or 'Continue' to search for additional analyzers. In most cases you would choose to 'Use' the analyzer VPAS Lite found. If you have multiple analyzers connected to the PC then you can choose 'Continue' and VPAS Lite will search for additional power analyzers, which it will add to the list at the bottom of the window. Once all power analyzers have been found you can choose the one you wish to use from the list.

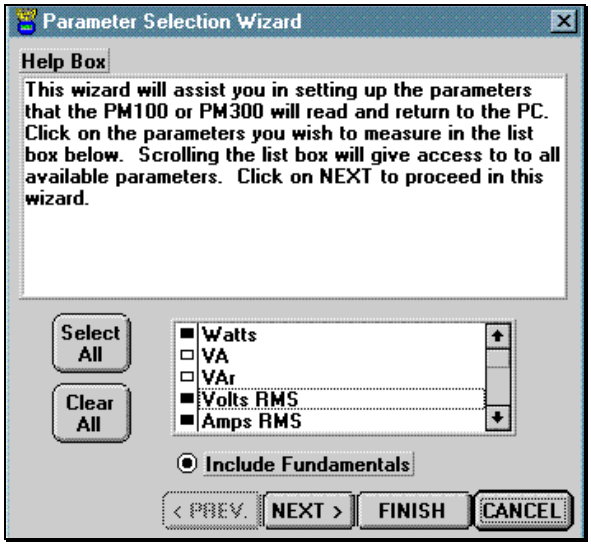
Manual Setup of Power Analyzer

This selection can be used to configure the communication settings manually. Use this setting only if you are positive of what your communication settings are. Upon 'Finishing' this wizard you will be given the opportunity to 'Test' and 'Save' the new settings.

Set Demonstration Mode

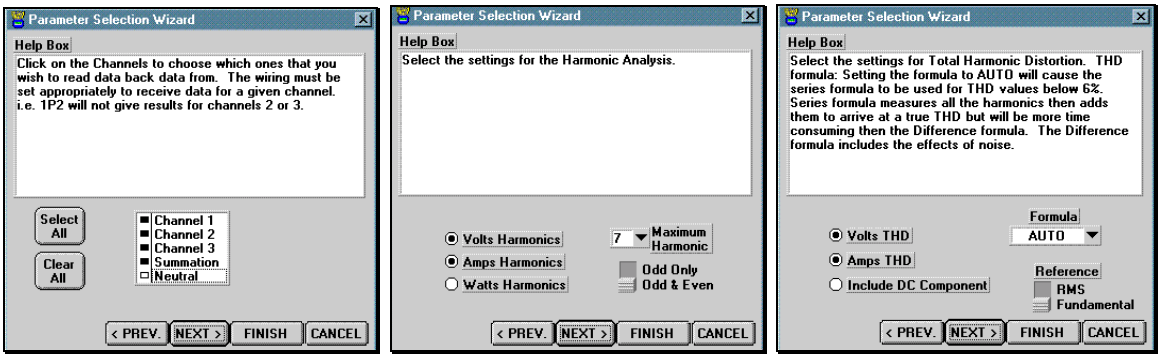
This mode has been provided to allow VPAS Lite to simulate the connection of a power analyzer measuring a switcher power supply.

2. PARAMETER SELECTION WIZARD



This menu item opens the Parameter Selection Wizard.

The  button has the same function. Darken the square next to the parameters to be measured in the list box. Clicking on 'Select All' or 'Clear All' will either select or clear all parameters in the list. Selecting 'Include Fundamentals' will cause the power analyzer to return fundamental values for Volts, Amps, Watts, etc. Using the 'Next' and 'Prev.' buttons, this wizard will guide you through the remaining selections.



Channel Selection

Darkening the boxes next to the channels will tell VPAS Lite to request data for these channels. With a PM100, only Channel 1 should be selected. If you select additional Channels with a PM100, when some of the windows are

drawn, they will initially be drawn with multiple channels but when the data is being taken, all channels except channel 1 will vanish from the window.

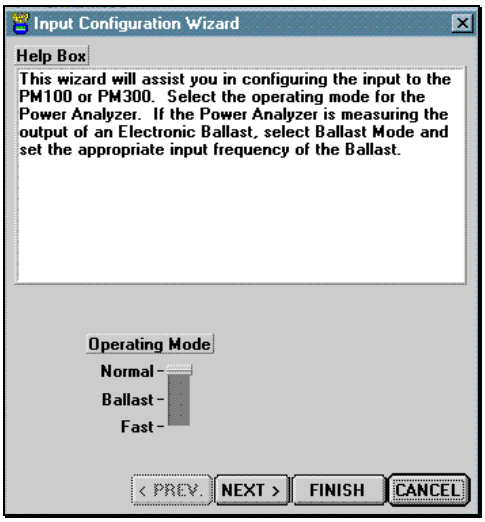
Harmonic Selections

If you have selected 'Harmonics' in the parameter list in the first window, you can select which types of harmonics you want. The Maximum Harmonic and Odd and Even can also be selected in this window. If the Maximum Harmonic is 7 and Odd & Even is set, the power analyzer will return all harmonics 0-7. If Odd only was set then it would return 0, 1, 3, 5, and 7.

THD Selections

If you have selected 'THD' in the parameter list in the first window, you can select which types of THD you want and the type of formula used. If the formula is set to AUTO, the sum of the actual harmonics is used for THD measurements of 6% and lower, otherwise the difference formula is used. The difference formula takes the total RMS value then subtracts the fundamental and considers everything else to be Total Harmonic Distortion. This would include random noise, sub-harmonics, etc. The contribution of these components is typically very small so with 6% of THD and above their contribution is negligible. The Series formula is always the most accurate.

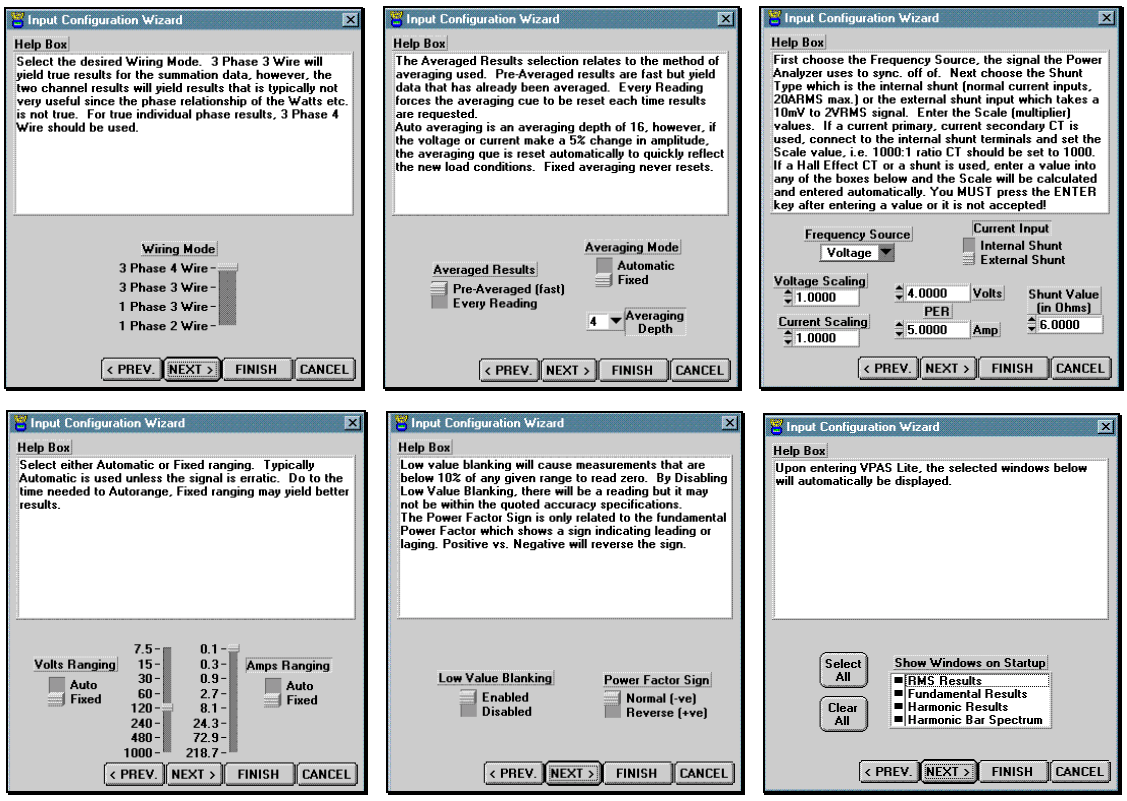
3. INPUT CONFIGURATION WIZARD



This menu item opens the Input Configuration Wizard.

The  button has the same function. Move the slider to configure your operating mode. If you are measuring the output of an electronic ballast,

select ‘Ballast’. To allow quicker display update, select ‘Fast’ but be aware that the published accuracy specifications are no longer valid. Any other application should be set to the ‘Normal’ operating mode. Using the ‘Next’ and ‘Prev.’ buttons, this wizard will guide you through the remaining selections.



Wiring Mode

The wiring mode has four selections (Only 1 phase 2 wire is valid with the PM100). 3 phase 3 wire uses only two channels and uses vector calculations to arrive at the correct SUM results. In this mode the individual channels do not show data that is very useful. If you need to analyze the results for each channel then you must connect the load for a 3 phase 4 wire measurement.

Averaging

Each value displayed is the result of a number of measurements that are averaged together.

In the recommended ‘Auto’ mode the averaging queue is reset automatically if there is a large change to either the voltage or current. This ensures that the analyzer responds quickly to changing values.

In applications where the voltage or current is continuously changing and the displayed values do not stabilize, select fixed mode.

The recommended averaging queue length is eight, decreasing the averaging depth will reduce the response time of the analyzer, increasing the averaging depth will improve the stability of the displayed values

Frequency Source / Shunt Selection / Scaling

The frequency source (sync signal) can be set to Voltage, Current, or Auto. If set to Auto mode, the analyzer will attempt to choose the most sinusoidal signal. In rare cases, the analyzer is not able to pick the most sinusoidal signal and may jump back and forth between Voltage and Current which will make the analyzer appear locked up or sporadic. In these cases you should force the frequency source and choose the signal that you know is the most sinusoidal. From the front panel, only Auto is available for the frequency source.

The current can be input via the internal shunt or a voltage signal read across an external shunt or a hall effect transducer. Set the shunt selection appropriately. To scale the shunt, fill in the appropriate entries. If you are using a CT with a current in = current out then calculate the ratio and enter it as though it were a multiplier; eg. if the CT is a 1000:1 ratio then 500 amps through the primary would equate to 0.500 amps through the secondary (which is seen by the analyzer). In this case the scaling would be 1000. For the external shunt input, you can enter a ratio in volts per amps or enter a resistance value. With a hall effect transducer, you might use a 'sense' resistor which would give you a fixed voltage output for a fixed current.

Alternatively, you might be using a 100 ohm coaxial shunt with sense wires across it. Enter this value into the 'Ohms' box followed by the enter key and the appropriate current scaling will be calculated automatically.

Ranging

The ranging can be set to 'Fixed' or 'Auto'. If 'Auto' is selected, the range will change based on the input signal which is the typical setting. In some applications the current will drop out for a very short time. In these instances it can be time intensive to have 'Auto' ranging set since the analyzer will range down then back up. When setting 'Manual' ranging keep in mind that it is PEAK RANGING NOT RMS. You are able to measure a signal down to about 10% of the set range. Below 10%, the accuracy is reduced so the value is 'blanked' to zero (see the next section to disable zero blanking).

Low Value Blanking / Power Factor Sign

As stated in the last paragraph, below 10% of the set range the readings will be blanked to zero to inform the user that the measurement is out of the published specifications. If there is a requirement to read the results at this

low level, you can disable the zero blanking and get a reading. When viewing the fundamental power factor, you will see a sign notation, which indicates whether the current is leading or lagging the voltage. This sign can be inverted depending on the preference of the user.

Show Windows on Startup

Upon starting VPAS Lite all the windows with a darkened square next to them will open. For example, if you do not require the Fundamental results window to be displayed, clear the box and it will not be displayed when VPAS Lite is opened.

8. THE HELP MENU

About

This menu item will display the version of VPAS Lite and various Voltech phone numbers.

On-Line Manual

This menu item will display an on-line version of the VPAS Lite manual.