



#61-805
#61-805-2K

800 Series Power Analyzer
Model 805 Instruction Manual



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1. Basic instructions

This manual is intended to familiarize the new owner of the Model 805 Power Analyzer with its features and operations.

IDEAL's 800 series power analyzers are built with components incorporating the most advanced technology in microelectronics, providing features and performance only found in the highest quality power meters and harmonic analyzers. They will provide you with years of accurate and dependable performance.

WARNING - Read this manual completely before connecting and powering the analyzer to avoid damage that may result from improper use of this equipment

1.1 Introduction

After receiving the analyzer, please check the following:

1. Check that the instrument has not been damaged in transit.
2. The power analyzer kit contains all items
 - Model 805 power analyzer
 - 1 Power supply/RS-232 interface
 - 1 Power cord
 - 1 cable for connecting the 805 to the power supply/RS-232 interface
 - 1 RS-232 communication cable.
 - 4 Voltage leads
 - 4 Alligator clips
 - 3 1000AAC current clamp adapters (61-805)
 - 3 200/2000AAC current clamp adapters (61-805-2K)
 - 1 PowerVision™ instruction manual
 - 1 805 Power Analyzer instruction manual
 - CD with the PowerVision™ Analysis Software and Interactive Demo

1.2 Safety

WARNING!

1. Read the instruction manual before using the 805 power analyzer. It contains important information necessary to guarantee proper operation of the instrument.
2. To avoid electrical shock hazards and/or damage to the meter:
 - Do not exceed the voltage ratings for the meter. Use caution when measuring voltage.
 - Do not use during electrical storms. Electrical storms may result in high voltage. High-energy transients can damage meter and present a dangerous shock hazard.
3. Ensure meter is in proper working order before using. Visually inspect meter for damage.
4. Never ground yourself when taking electrical measurements. Do not touch exposed metal pipes, outlets, fixtures etc. Keep your body isolated from ground by using dry clothing, rubber shoes, mats, or any other approved insulating material. Keep your fingers behind the finger guards on the probes. Work with others.
5. When disconnecting from a circuit, disconnect the hot lead first, then the common lead.
6. Disconnect the meter from the circuit before turning off any inductor, including motors, transformers, and solenoids.

If the maximum allowable phase-to-neutral voltage of 500 V has been exceeded during the measuring process, the analyzer will display a warning message **[WARNING MAX 500 V]** at the bottom of the display screen to let the user know that this rating has been exceeded. When measuring phase-to-phase voltages the limit is set at 866V.

2. Model 805 features

The IDEAL Power Analyzer is the most versatile and easy-to-use power quality test instrument on the market. Four programs measure and analyze power quality on both single- and three-phase electrical systems. Instantaneous readouts including tables, bar graphs and even individual waveforms make job site data interpretation easy. With a real-time clock and 1 MB of memory, the Power Analyzer stores data that can be downloaded to a personal computer for in-depth analysis using PowerVision™ software.

The Energy and Harmonics Program comes standard with the IDEAL Power Analyzer. Disturbances, Check-Meter, and Fast-Check Programs are available separately. These programs allow the user to monitor additional facets of power quality with a single test instrument. The details of each program are discussed in section 11 of this instruction manual.

2.1 Product features

Features

- True RMS
- Single- or three-phase measurements
- Data logging (1 MB memory)
- 4-channels for voltage measurements
- 3-channels for current measurements
- Auto ranging
- Min/max
- Energy and Harmonics Program
- PowerVision Software
- Optional Programs:
 - Disturbances
 - Check-Meter
 - Fast-Check
- Lightweight, portable design
- Easy-to-use push button operation
- Password protected on-screen setup
- 160x160 pixel LCD
- Customized data collection
- Real-time clock
- Programmable trigger-points and start/stop time
- Auto display shutoff
- Rechargeable Ni-Cad battery
- Intelligent battery charging system

Power & Energy Measurements

- Kilowatts (kW)
- Volt-amperes (VA)
- Inductive reactive power (kvarL)
- Capacitive reactive power (kvarC)
- Power factor (PF)
- Frequency (Hz)
- Kilowatt hours (kWh)
- Reactive power per hour (kvarhL, kvarhC)

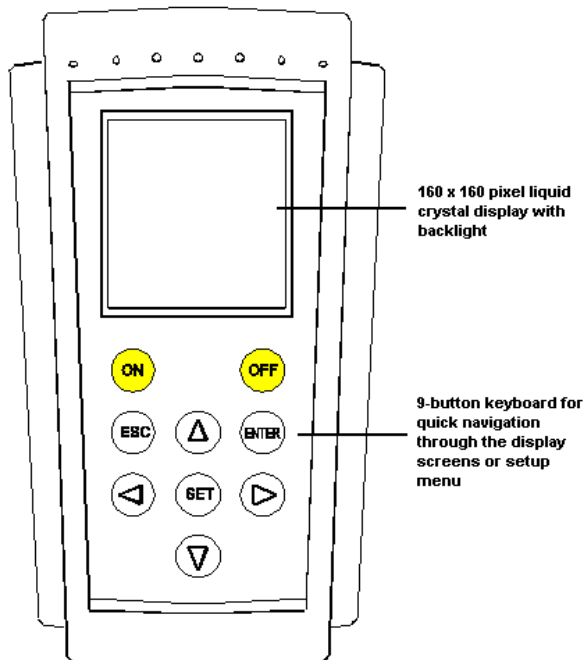
Harmonics Measurements

- Total harmonic distortion (%THD)
- Harmonic factorization (FFT) to 51st harmonic

2.2 Display and keypad

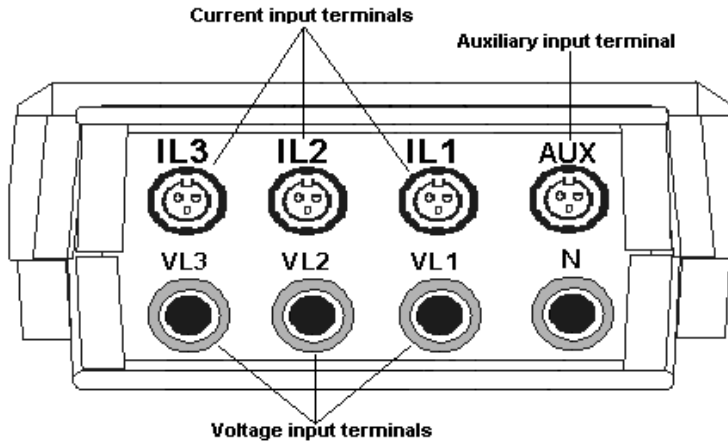
The model 805 has a 160x160 pixel LCD for viewing the analyzer's measurements. There are 5 basic view screens to display the analyzer's information in an easy-to-read format. Detailed information on these screens is found in section 4 of this instruction manual.

The 9-button keypad allows the user to move through the 5 display screens and access the analyzer's programming menu. Detailed information on the programming menu is found in section 5 of this instruction manual.



For best viewing in direct sunlight, or in dark areas, the user can adjust the display contrast. Use the left [◀] and right [▶] arrow buttons to increase or decrease the display contrast. The contrast will change while you are making the adjustment. This can also be changed from the programming menu. See section 5.3.2 of this instruction manual for more information.

2.3 Voltage and current input terminals



3. Startup

The 800 series analyzers come standard with the Energy and Harmonics program loaded onto the analyzer. Optional programs are available to expand the capabilities of your analyzer. More detailed information about these programs is located in section 11 of this instruction manual.

3.1 Selecting a Program

SELECT PROGRAM
HARMONICS 2.14
EMPTY PROGRAM
EMPTY PROGRAM
EMPTY PROGRAM
LOAD PROGRAM

- 1) Press the red on button **<ON>** to power up the analyzer. This brings up the introductory screen of the analyzer, where the user can select a program or load an additional program.
- 2) Use the up [**▲**] and down [**▼**] arrow keys to move cursor through the available programs listed in the introductory screen. The cursor will automatically skip over the spaces that are currently empty and reserved for optional programs.
- 3) To select the Energy and Harmonics program, select HARMONICS and press the enter key [**ENTER**].
- 4) If no program is selected after a few seconds, the analyzer will automatically select the program highlighted by the cursor.

3.2 Loading a new program

The 800 series analyzer can hold up to 4 programs at one time. Optional programs can be loaded onto any of the available spaces on the analyzer, which are labeled as EMPTY PROGRAM on the introductory screen. The programs come loaded onto a cartridge and are downloaded onto the analyzer through the power supply/RS-232 interface.



Note: A cartridge program loader can be used on only one individual analyzer. The download of the program includes an identification step, which prohibits the download of the optional program to other analyzers. The program can be reloaded onto the original analyzer an unlimited number of times. Remember to write the serial number of your power analyzer on the cartridge loader.

To load a new program:

- 1) Turn the analyzer off
- 2) Insert the cartridge loader into the auxiliary input on the 805.



- 3) Press the red on button **[ON]** to power up the analyzer. This brings up the introductory screen of the analyzer, where the user can select a program or load an additional program.
- 4) Use the up **[▲]** and down **[▼]** arrow buttons to move cursor through the available programs listed in the introductory screen. The cursor will automatically skip over the spaces that are currently empty and reserved for optional programs.
- 5) Select LOAD PROGRAM and press enter **<ENTER>**.
- 6) Select one of the available spaces on the analyzer **<EMPTY PROGRAM>** and press enter **<ENTER>**.
- 7) The power analyzer will perform a diagnostic test to ensure that the cartridge has been properly connected.
- 8) If analyzer detects the cartridge, then the program will be loaded.
- 9) Once the loading is completed, press the red off button **<OFF>** to turn the analyzer off.
- 10) When the unit is turned on again, the optional program will appear on the introductory screen.
- 11) If no program was found, or a loading error occurred, cycle the meter off and on again, and repeat the steps above.

Note: If a cartridge has already been loaded on power analyzer, it will not load onto another. In this case, the analyzer will display an error message on the screen.

3.3 Charging the battery

The 800 series power analyzers are equipped with an intelligent energy charging system. The analyzer continuously checks the state of the battery while it is plugged into the power supply. The charging process stops when the battery is at its maximum charge level. This increases the life of the batteries.

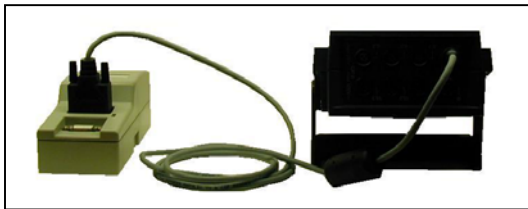
If the battery has been completely discharged, the charging process should last at least 3 hours with no interruption. It is important to allow a new battery a charging period of 16 hours in order to completely charge the battery.



The battery charge indication is located in the lower right-hand corner of the analyzer. The bars indicate how much charge is left in the battery.

To charge the battery:

- 1) Plug the power cord into the power supply/RS-232 interface.
- 2) Connect the analyzer to the power supply/RS-232 interface with the interface cable.
- 3) Turn the analyzer on. The analyzer must be on to charge the battery.



After 5 minutes, if no key is pressed, the display will automatically go blank. The unit is still charging, but the analyzer has automatically shut down the display to conserve energy. For information on this auto power off feature, see section 3.4 of this instruction manual.

Note: The analyzer must be turned on to charge the battery.

3.4 Auto power off

The 800 series power analyzers have an energy saving system to conserve power during data recording. After 5 minutes, if no key is pressed, the display will automatically go blank. The analyzer will continue to record data and update all of the min/max and energy values. To restore the display, press any key except for the on key. The on key is disabled when the display has been turned off to help the user differentiate between the display being off and the analyzer being off.

4. Model 805 display screens

The 800 series analyzer is portable enough to be used as a hand-held power quality meter. There are 5 basic screens to give the user real-time information on the power, energy and harmonics measurement at the power source, in the distribution system, or at the load itself. The 5 basic screens are the table, exploded view, bar graph, scope-view and setup screens. There are two additional screens, the waveform view and harmonic bar graph screens that can be accessed from the scope view screens. Each screen is described in detail in this section of the instruction manual.

To move from screen to screen, press the escape **[ESC]** button.

4.1 Table view screen

In this screen, all available power and energy parameters are displayed in an easy-to-read table. The information provided will depend on the measurement type selected. Specific tables will be created based on the measurement type selected in the programming menu. See section 5.2.1 of this instruction manual for more information. The information displayed is independent of the information that the analyzer is recording. For example, the user does not have to record the frequency to see it displayed in this screen.

The following is a list of the power values displayed in the table view screen:

- Voltage (V): The RMS value measured at each phase (L1, L2 & L3) and the sum of the instantaneous values of the three-phases (III).
- Current (A): The RMS value measured at each phase (L1, L2 & L3) and the sum of the instantaneous values of the three-phases (III).
- Active power (kW): The active power is calculated from instantaneous voltage and current data. The display gives the instantaneous values of the active power of each phase and also the three-phase total instantaneous active power, which is the addition of each phase value.
- Inductive reactive power (kvarL): The inductive reactive power is calculated from instantaneous voltage and current data. The display gives the instantaneous values of the inductive reactive power of each phase and also the three-phase total instantaneous inductive reactive power, which is the addition of each phase value.
- Capacitive reactive power (kvarC): The capacitive reactive power is calculated from instantaneous voltage and current data. The display gives the instantaneous values of the capacitive reactive power of each phase and also the three-phase total instantaneous capacitive reactive power, which is the addition of each phase value.
- Power factor (PF): The power factor is calculated for each phase and the three-phase average value.
- Frequency: Displays the instantaneous value of the frequency (Hz).
- Apparent power: The apparent power is the three-phase total, which is the addition of each phase value.

The energy calculations, kilowatt hour, inductive reactive and capacitive reactive power per hour are calculated based on the accumulated values from the moment that the energy counters were reset to zero. These values can be cleared on the display without affecting what the analyzer is recording. For information on how to reset the energy counters and clear these values, see section 5.6 of this instruction manual.

INST	L1	L2	L3	III
Vp-n	235	233	237	235
A	31.26	30.99	30.70	30.98
kW	7,376	7,247	7,299	21.92
Kvar-L	0.729	0.667	0.768	2.164
Kvar-C	0	0	0	0
P.F.	1.00	1.00	1.00	1.00
Hz	50.0			
kVA				21.92
kwh		450,159		
kvarhL		92,640		
kvarhC		0.029		
05/11/98		17:19:04		

The readings can be changed from real-time (instantaneous) measurements to minimum or maximum values.

To change the values:

- 1) Press the up [**▲**] and down [**▼**] arrow buttons to toggle between the instantaneous [**INST**], minimum [**MIN**], or maximum [**MAX**] values.
- 2) The upper left-hand corner of the table indicates which values are being displayed.
- 3) The minimum and maximum values can be cleared on the display without affecting what the analyzer is recording. For information on how to clear these values, see section 5.6 of this instruction manual.
- 4) Press the escape [**ESC**] button to move to the exploded view screen.

4.2 Exploded view screen

In the exploded view screen, any three parameters can be selected and displayed in large characters for easy viewing. These are instantaneous measurements and will change in real-time as the system changes.

Note: Any three parameters can be selected regardless of the measurement type, or parameters chosen for data recording.

INST	HARMONICS
Vp-n L1	220
Vp-n L2	221
Vp-n L3	224

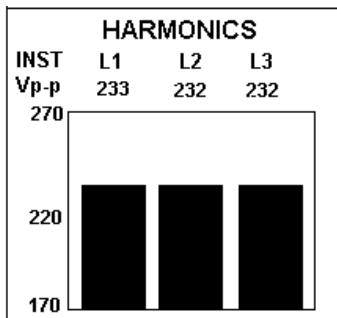
To change these parameters:

- 1) Press the enter button **[ENTER]**. This brings up a grid showing all of the available parameters.
- 2) The selected parameters will be highlighted in black.
- 3) Use the up **[▲]**, down **[▼]**, left **[◀]**, and right **[▶]** arrow buttons to move the cursor through the parameters.
- 4) Pressing the set **[SET]** button selects, or de-selects a parameter. Pressing set while on “CLEAR ALL “ at the bottom of the display clears all parameters.
- 5) Only three parameters may be chosen. If an additional parameter is accidentally selected, the analyzer will display the “OUT OF RANGE” error message at the bottom of the screen. This message will disappear after a few seconds.
- 6) After all three parameters have been selected, press the enter **[ENTER]** button to accept the new parameters. This will return the user to the exploded view screen and the new parameters will be displayed on the screen.
- 7) Pressing the escape **[ESC]** button will return the user to the exploded view screen without modifying the parameters.
- 8) Press the escape **[ESC]** button from the exploded view screen to move to the bar graph screen.

Note: This screen can also be changed from the programming menu. For more information see section 5.3 of this instruction manual.

4.3 Bar graph screen

The bar graph screen gives a graphic representation of a single parameter on all three-phases simultaneously. These are instantaneous measurements and will change in real-time as the system changes.



To change the parameter and the bar graph scale:

- 1) Press the enter button **[ENTER]**. This brings up a selection box with the current selection highlighted.
- 2) Use the up **[▲]** and down **[▼]** arrow buttons to move through the available parameters.
- 3) After the parameter has been selected, press the enter **[ENTER]** button. This brings up the zero-scale selection box. The current zero-scale selection will be highlighted.
- 4) In the lower right-hand corner of the screen is a numerical keypad. Use the up **[▲]**, down **[▼]**, left **[◀]**, and right **[▶]** arrow buttons to move the cursor through the keypad.
- 5) Press the set **[SET]** button to select a new numerical value. You can change the zero-scale to a negative number by selecting the \pm symbol. A decimal point may also be used in the zero-scale by selecting the decimal point **[.]**.
- 6) To delete a number, select the backspace icon **[←]** and press the set button.
- 7) After the zero-scale value has been selected, press the enter **[ENTER]** button. This brings up the full-scale selection box. The current full-scale selection will be highlighted.

- 8) Press the set **[SET]** button to select a new numerical value. You can change the full-scale to a negative number by selecting the \pm symbol. A decimal point may also be used in the full-scale by selecting the decimal point **[.]**.
- 9) After the full-scale value has been selected, press the enter **[ENTER]** button. This will return the user to the bar graph screen and the new scaling will be applied to the graph. If the full-scale value entered is lower than the zero-scale value, the analyzer will display the "ZERO must be lower than FULL SCALE" error message at the bottom of the screen. This message will disappear after a few seconds and return the user to the zero-scale selection.
- 9) Pressing the escape **[ESC]** button any time during this process will return the user to the bar graph screen without modifying the graph.
- 10) Press the escape **[ESC]** button from the bar graph screen to move to the scope view screen.

The readings can be changed from real-time (instantaneous) measurements to minimum or maximum values.

To change the values:

- 1) Press the up **[^]** and down **[v]** arrow buttons to toggle between the instantaneous **[INST]**, minimum **[MIN]**, or maximum **[MAX]** values.
- 2) The upper left-hand corner of the table indicates which values are being displayed.
- 3) The minimum and maximum values can be cleared on the display without affecting what the analyzer is recording. For information on how to clear these values, see section 5.6 of this instruction manual.

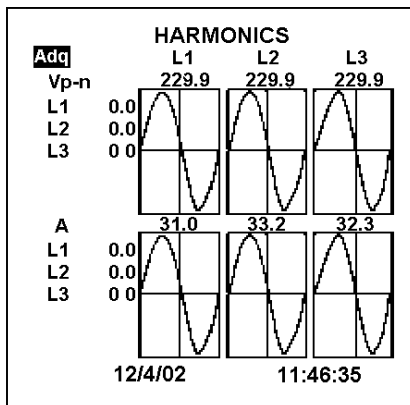
Note: This screen can also be changed from the programming menu. For more information see section 5.3 of this instruction manual.

Press the escape **[ESC]** button to move to the exploded view screen.

4.4 Scope view screen

The scope view screen gives a graphic representation of the voltage and current waveforms on all three-phases simultaneously. These are captured measurements and will not change in real-time as the system changes. To capture a new set of waveforms, use the up **[^]** and down **[v]** arrow buttons to move the cursor to the acquire icon **[Adq]** and press the enter **[ENTER]** button. The graphic representation of the new waveforms will be displayed on the screen.

The left **[◀]**, and right **[▶]** arrow buttons move the cursor along the time axis of the waveform. The measurement value, located directly above each grid, will change based on the position of the cursor as it passes through the waveform.



There are two additional screens that can be accessed from the scope view screen, the waveform zoom and the harmonic bar graph screens. These give additional information on the shape of the distortion and the harmonic content causing the distortion.

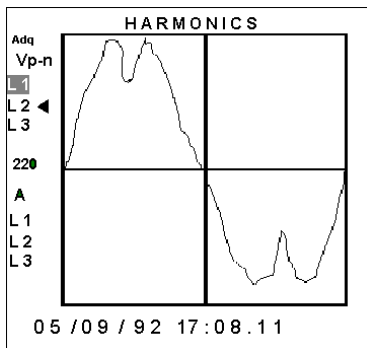
To enter the waveform zoom screen for a closer look at the waveform shape, use the up [▲] and down [▼] arrow buttons to move the cursor to any voltage or current phase, and press the enter [ENTER] button.

Press the escape [ESC] button from the scope view screen to move to the setup screen.

4.4.1 Waveform zoom

The waveform zoom screen gives an exploded view of any voltage or current waveform. This is a captured measurement and will not change in real-time as the system changes. The left arrow [◀] on the display indicates which specific waveform is displayed on the screen.

The left [◀], and right [▶] arrow buttons move the cursor along the time axis of the waveform. The measurement value, located to the left of the grid, will change based on the position of the cursor as it passes through the waveform.



To capture new measurements on the waveform, use the up [▲] and down [▼] arrow buttons to move the cursor to the acquire icon [Adq] and press the enter [ENTER] button. The graphic representation of the new waveform will be displayed on the screen.

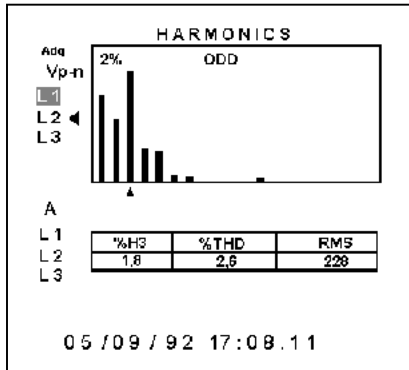
To change to a different voltage or current waveform while remaining in the waveform zoom screen, use the up [▲] and down [▼] arrow buttons to move the cursor to any voltage or current phase, and press the enter [ENTER] button.

To enter the harmonic bar graph screen to breakdown the harmonic content of the distortion, press the enter [ENTER] button.

Press the escape [ESC] button from the waveform zoom screen to move to the setup screen.

4.4.2 Harmonic bar graph

For the harmonic bar graph screen, the analyzer performs an FFT (Fast Fourier Transform) and displays a histogram display to graphically display the harmonic content from the 1st to the 50th Harmonic. The left arrow [◀] on the display indicates which specific voltage or current phase is being broken down. This is a captured measurement and will not change in real-time as the system changes.



To view the percentage of distortion on the individual odd (or even) harmonic, use the left [◀], and right [▶] arrow buttons move the cursor [▲] along the bottom of the histogram.

To capture new harmonic content of the waveform, use the up [▲] and down [▼] arrow buttons to move the cursor to the acquire icon [Adq] and press the enter [ENTER] button. The graphic representation of the new waveform will be displayed on the screen.

To toggle between the even and odd harmonics, [▲] and down [▼] arrow buttons to move the cursor to the top of the display [ODD] and press the enter [ENTER] button. This will change the FFT from the individual odd harmonics to the individual even harmonics. Pressing the enter button again, while the cursor is on [EVEN], will return the FFT to the individual odd harmonics.

To change to a different voltage or current waveform while remaining in the waveform zoom screen, use the up [▲] and down [▼] arrow buttons to move the cursor to any voltage or current phase, and press the enter [ENTER] button.

To return to the scope view screen to get a graphic representation of the voltage and current waveforms on all three-phases simultaneously, press the enter [ENTER] button.

Press the escape [ESC] button from the harmonic bar graph screen to move to the setup screen.

4.5 Setup screen

In the setup screen, the key recording parameters are displayed to let the user know how the analyzer has been setup for data collection. Additional information on these recording parameters is located in the programming menu.

SETUP	
Measure:	Triphasic
1V/1V	1000A
File: TEST	A5I
00:00:05	Harm.50
Trigger:	Auto
0	0
00/00/00	00:00:00
00/00/00	00:00:00
Com:	9600 / NO / 8 / 1

SETUP	
Measure:	<i>Measurement type</i>
<i>Voltage ratio</i>	<i>Clamp ratio</i>
File:	<i>File name Extension</i>
<i>Period</i>	<i>Harmonics</i>
Trigger:	<i>Parameter</i>
<i>Max value</i>	<i>Min value</i>
<i>Date on</i>	<i>Time on</i>
<i>Date off</i>	<i>Time off</i>
<i>Communication parameter</i>	

The following information is displayed on this screen:

- Measurement type: This determines how the system information will be calculated. See section 5.2.1 for more information.
- Voltage ratio: This ratio may be changed in the event a voltage transformer is used. See section 5.2.1 for more information.
- Clamp adapter ratio: These are the values of the phase current clamp. See section 5.2.1 for more information.
- File name: This is the name of the file that us being used for data recording. See section 5.2.2 for more information.
- File extension: This is the file extension of the file that us being used for data recording. See section 5.2.2 for more information.
- Period: This is the user-selected recording period for data collection. See section 5.2.2 for more information.
- Harmonics: This is the level of harmonics that is being recorded by the analyzer for data collection. See section 5.2.2 for more information.
- Trigger parameter: This is the measurement parameter selected to trigger recording by the analyzer. See section 5.2.2 for more information.
- Maximum and minimum trigger values: If a trigger parameter has been set, these are the maximum and minimum value points that will trigger data collection. See section 5.2.2 for more information.
- Trigger date/time on and date/time off: If a trigger date/time has been set, this is the date/time that data collection will begin and end. See section 5.2.2 for more information.
- Communication parameters: This is the communication protocol that has been established for downloading data to the computer. If a trigger parameter has been set, these are the maximum and minimum value points that will trigger data collection. See section 5.2.3 for more information.

Press the escape **[ESC]** button from the setup screen to move to the table view screen.

4.6 Recording messages

The power analyzer will display a variety of messages on the screen of the analyzer to let the user know the status of the data collection. These messages are displayed in the lower left-hand corner of the screen, and will show up on any of the display screens.

- **STOP:** The analyzer is not recording data.
- **TRIG?:** Trigger conditions have not been met. No data is being recorded.
- **M. Full:** The memory is full. No data is being recorded.
- **M.Error:** There is an error in the memory. The memory must be formatted.

5. Programming the 805

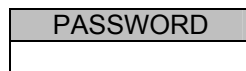
The 800 series analyzer is also powerful enough to be used for in-depth analysis of power quality and energy management issues. Its 1MB of memory is completely customizable, giving the user the option to record any number of parameters for any length of time. Trigger points can also be used to customize the data collection. Setting minimum and maximum threshold values that trigger recording, result in data collection only when a potential problem has been identified. This extends the memory of the analyzer, and makes it easier to sort through the data during the analysis phase.

5.1 Entering the programming menu

The programming menu is password protected to prevent unauthorized access and accidental changes to the analyzer's setup options. The programming menu can be accessed from any display screen.

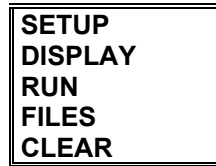
To access the programming menu:

- 1) Press the set button **[SET]**.
- 2) The analyzer will ask for a password to be entered.



- 3) The password is 4 buttons pressed in sequence. The password is left arrow [◀], set [SET], up arrow [▲], set [SET].
- 4) After the password is entered, the analyzer will bring up the programming menu.

The programming menu consists of 5 main menu options, which allow the user to program various aspects of the analyzer's recording parameters. Each menu is discussed separately in the following sections. Section 12 of this instruction manual contains a quick reference guide that shows all menu and sub-menu options, the available selections, and the factory default settings for each menu option. If the factory default settings are satisfactory, you can simply access the run menu and begin recording right away.



☞ Programming Menu

To enter a menu, use the up [▲] and down [▼] arrow buttons to move through the available parameters and press the enter [ENTER] button.

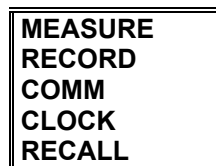
To exit the programming menu:

- 1) Press the escape [ESC] button.
- 2) If nothing has been changed, the analyzer will return to the display screens.
- 3) If a parameter has been changed, the analyzer will ask for a confirmation to verify that the user wished to make a change to the setup.
- 4) Use the left [◀] and right [▶] arrow buttons to choose either yes or no, and press enter.
- 5) If **NO** is selected, the user will be returned to the display screens without making any changes.
- 6) If **YES** is selected, the programming changes will be made, and the user will be returned to the display screens.

5.2 Setup menu

The setup menu consists of 5 main menu options, which allow the user to customize the analyzer's data collection. Each menu is discussed separately in this sections.

To access the setup menu, use the up [▲] and down [▼] arrow buttons to move the cursor through the available parameters of the programming menu, select **SETUP** and press the enter [ENTER] button.



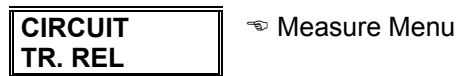
☞ Setup Menu

To enter a menu, use the up [▲] and down [▼] arrow buttons to move through the available parameters and press the enter [ENTER] button.

To return to the main programming menu, press either the left arrow [◀] or escape [ESC] button.

5.2.1 Measure

The measure menu contains the parameters for setting up the voltage and current measurement options.



Circuit: This is the type of circuit being measured. The circuit type determines how the analyzer will calculate the system measurement values.

Circuit options:

- Triph. (Triphasic) – three-phase circuits ☞ Factory default setting
- Aron – two wattmeter method (3PT, 2CT)

To change the wiring type:

- 1) Use the up [▲] and down [▼] arrow buttons to highlight **CIRCUIT** and press the enter [ENTER] button. This brings up a selection box with the existing wiring selection highlighted.
- 2) Use the up [▲] and down [▼] arrow buttons to move through the available options and press the enter [ENTER] button to select an option.
- 3) To return to the measure menu without selecting an option, press the escape [ESC] button.

TR. REL.: These are the ratios for the voltage and current measurements. Setting the voltage ratio (REL V) allows the user to hook the analyzer up to a voltage transformer, stepping down the voltage coming in without changing the actual voltage on the display or in the memory of the analyzer. The current ratio (REL A) allows the user to change the current ratio and use the analyzer with other power clamp adapters supplied by IDEAL.

TR. REL. settings:

- REL. V – Voltage ratios. Set both the primary value (PRIM. V) and secondary value (SEC. V) ☞ Factory default setting is 1/1
- REL. A – Current ratio. Set only the primary value (PRIM. I). The power clamps supplied by IDEAL have a 2V output, so the secondary value is assumed to be 2V. ☞ Factory default setting is 1000

To adjust the TR. REL. settings:

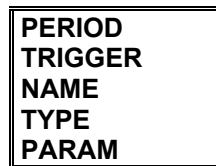
- 1) Use the up [▲] and down [▼] arrow buttons to highlight **TR. REL.** and press the enter [ENTER] button. This brings up a sub-menu with the two ratio options, REL. V and REL. A.
- 2) Use the up [▲] and down [▼] arrow buttons to highlight **REL. V** and press the enter [ENTER] button. This brings up the first voltage ratio setting (Prim. V).
- 3) In the lower right-hand corner of the screen is a numerical keypad. Use the up [▲], down [▼], left [◀], and right [▶] arrow buttons to move the cursor through the keypad.
- 4) Press the set [SET] button to select a new numerical value. You can change to a negative number by selecting the ± symbol. A decimal point may also be used by selecting the decimal point [.] . To delete a number, select the backspace icon [←] and press the set button.
- 5) After the Prim. V value has been selected, press the enter [ENTER] button to save the first voltage ratio setting. This will bring up the second voltage ratio setting (Sec. V).
- 6) Use the up [▲], down [▼], left [◀], and right [▶] arrow buttons to move the cursor through the keypad. Press the set [SET] button to select a new numerical value. You can change to a negative number by selecting the ± symbol. A decimal point may also be used by selecting the decimal point [.] . To delete a number, select the backspace icon [←] and press the set button.
- 7) After the Sec. V value has been selected, press the enter [ENTER] button. This returns the user to the TR REL. sub-menu.
- 8) To skip a setting without changing the value, press either the escape [ESC] or enter [ENTER] button.

- 9) Use the up [▲] and down [▼] arrow buttons to highlight **REL. A** and press the enter [ENTER] button. This brings up the primary current setting (Prim. I)
- 10) Use the up [▲], down [▼], left [◀], and right [▶] arrow buttons to move the cursor through the keypad.
- 11) Press the set [SET] button to select a new numerical value. You can change to a negative number by selecting the ± symbol. A decimal point may also be used by selecting the decimal point [.].
- 12) To delete a number, select the backspace icon [←] and press the set button.
- 13) After the Prim. I. value has been selected, press the enter [ENTER] button. This returns the user to the TR REL. sub-menu.
- 14) To skip a setting without changing the value, press either the escape [ESC] or enter [ENTER] button.
- 15) Press the escape [ESC] button to return to the measure menu.

To return to the setup menu, press either the left arrow [◀] or escape [ESC] button.

5.2.2 Record

Record is the section of the menu for setting up the analyzer's recording options.



☞ Record Menu

Period: This is the recording period for data collection. The analyzer records the average values over the recording period at the end of every period. Harmonics values are captured at the end of every recording period. Throughout the recording period, the analyzer will also monitor the line to capture any minimum and maximum values. These values will be recorded at the end of every recording period and then reset to capture new minimum and maximum values in the next recording period.

Period setting format:

- hour:minute:second – The available recording period is from 5 seconds up to 4 hours ☞ Factory default setting is 15 min.

To change the recording period:

- 1) Use the up [▲] and down [▼] arrow buttons to highlight **PERIOD** and press the enter [ENTER] button. This brings up the existing period setting.
- 2) The hour setting is highlighted. Use the up [▲] and down [▼] arrow buttons to adjust the setting. Chose from 0 to 4 hours.
- 3) Press the right arrow [▶] button to move to the minute setting. Use the up [▲] and down [▼] arrow buttons to adjust the setting. Chose from 0 to 59 minutes.
- 4) Press the right arrow [▶] button to move to the second setting. Use the up [▲] and down [▼] arrow buttons to adjust the setting. Chose from 0 to 59 seconds.
- 5) Press the enter [ENTER] button to save your changes and return to the record menu.
- 6) Press the escape [ESC] button to return to the record menu without saving any changes.

Trigger: This is the measurement values or time values that will trigger data collection to begin. When a level trigger is selected, the analyzer will record data that rises above or falls below the selected maximum and minimum parameter value. When a time trigger is selected, the analyzer will begin recording at the date/time on setting and end recording at the date/time off setting. The trigger can be a level trigger, a time trigger or both.

Level settings:

- Param. – measurement parameter that will trigger data recording
 - Auto – automatic recording, no level trigger ☞ Factory default setting
 - KVA – apparent power
 - Hz - frequency
 - PF – power factor
 - KvarC – capacitive reactive power
 - KvarL – inductive reactive power
 - KW – true power
 - A - current
 - Vp-n – phase-neutral voltage
 - Vp-p – phase-phase voltage
- Max – maximum parameter value, recording begins when measurement rises above this value
- Min - minimum parameter value, recording when measurement falls below this value

To change the level settings:

- 1) Use the up [▲] and down [▼] arrow buttons to highlight **LEVEL** and press the enter [ENTER] button. This brings up a selection box with the existing level selection highlighted.
- 2) Use the up [▲] and down [▼] arrow buttons to move through the available level parameters.
- 3) After the parameter has been selected, press the enter [ENTER] button. This brings up the max selection box. The existing maximum value will be highlighted.
- 4) In the lower right-hand corner of the screen is a numerical keypad. Use the up [▲], down [▼], left [◀], and right [▶] arrow buttons to move the cursor through the keypad.
- 5) Press the set [SET] button to select a new numerical value. You can change the maximum value to a negative number by selecting the ± symbol. A decimal point may also be used by selecting the decimal point [.]
- 6) To delete a number, select the backspace icon [←] and press the set button.
- 7) After the maximum value has been selected, press the enter [ENTER] button. This brings up the min selection box. The existing minimum value will be highlighted.
- 8) Use the up [▲], down [▼], left [◀], and right [▶] arrow buttons to move the cursor through the numerical keypad.
- 9) Press the set [SET] button to select a new numerical value. You can change the minimum value to a negative number by selecting the ± symbol. A decimal point may also be used by selecting the decimal point [.]
- 10) To delete a number, select the backspace icon [←] and press the set button.
- 11) After the minimum value has been selected, press the enter [ENTER] button. This will return the user to the trigger menu.
- 12) To skip a setting without changing the value, press either the escape [ESC] or enter [ENTER] button.

Time settings:

- Time on: day/month/year, hour:minute:second – set the date and time to begin recording, all zeros in the date and time indicate that no time trigger has been selected ☞ Factory default setting is 00/00/00, 00:00:00
- Time off: day/month/year, hour:minute:second – set the date and time to end recording, all zeros in the date and time indicate that no time trigger has been selected ☞ Factory default setting is 00/00/00, 00:00:00

To change the time settings:

- 1) Use the up [▲] and down [▼] arrow buttons to highlight **TIME** and press the enter [ENTER] button. This brings up the time on selection box.
- 2) The day setting is highlighted. Use the up [▲] and down [▼] arrow buttons to adjust the setting. Chose from 0 to 31 days.
- 3) Press the right arrow [▶] button to move to the month setting. Use the up [▲] and down [▼] arrow buttons to adjust the setting. Chose from 0 to 12 months.
- 4) Press the right arrow [▶] button to move to the year setting. Use the up [▲] and down [▼] arrow buttons to adjust the setting. Chose from 00 to 99.
- 5) Press the right arrow [▶] button to move to the hour setting. Use the up [▲] and down [▼] arrow buttons to adjust the setting. The hour setting is a military time format, so chose from 0 to 24 hours.
- 6) Press the right arrow [▶] button to move to the minute setting. Use the up [▲] and down [▼] arrow buttons to adjust the setting. Chose from 0 to 59 minutes.
- 7) Press the right arrow [▶] button to move to the second setting. Use the up [▲] and down [▼] arrow buttons to adjust the setting. Chose from 0 to 59 seconds.
- 8) Press the enter [ENTER] button to save your changes and return to the record menu.
- 9) Press the escape [ESC] button to return to the record menu without saving any changes.

To return to the setup menu, press either the left arrow [◀] or escape [ESC] button.

Name: This is the name of the file created by the user for data recording. Up to 8 alphanumeric characters can be used to describe the contents of the file.

To choose a file name:

- 1) Use the up [▲] and down [▼] arrow buttons to highlight **NAME** and press the enter [ENTER] button. This brings up a selection box with the existing file name highlighted.
- 2) Below the selection box is a keyboard and numerical keypad. Use the up [▲], down [▼], left [◀], and right [▶] arrow buttons to move the cursor through the keypad.
- 3) Press the set [SET] button to select a new alphanumerical value.
- 4) Select caps lock [LOCK] to toggle between upper and lower case letters.
- 5) Insert a space by selecting the space bar [SPAC].
- 6) To delete a character, select the backspace icon [←] and press the set button.
- 7) After the name has been selected, press the enter [ENTER] button. This returns the user to the record menu.

To choose a file name and file type::

- 8) Use the up [▲] and down [▼] arrow buttons to highlight **NAME** and press the enter [ENTER] button. This brings up a selection box with the existing file name highlighted.
- 9) Below the selection box is a keyboard and numerical keypad. Use the up [▲], down [▼], left [◀], and right [▶] arrow buttons to move the cursor through the keypad.
- 10) Press the set [SET] button to select a new alphanumerical value.
- 11) Select caps lock [LOCK] to toggle between upper and lower case letters.
- 12) Insert a space by selecting the space bar [SPAC].
- 13) To delete a character, select the backspace icon [←] and press the set button.
- 14) Press the escape [ESC] button to return to the record menu without saving any changes.

Type: This is the file type created by the user for data recording. The four different available file types determine what measurement parameters will be recorded by the analyzer, determining how the system measurements will be calculated and the available recording time. Each file type has a specific file extension to help the software determine what measurements are available.

File types:

- Standard (.A5M) – automatically captures all power and energy parameters based on a phase to neutral voltage measurement ☞ Factory default setting
- Harm. 50 (.A5I) - automatically captures all power and energy parameters based on a phase to neutral voltage measurement and harmonic measurements to the 50th harmonic
- Harm. 30 (.A5I) - automatically captures all power and energy parameters based on a phase to neutral voltage measurement and harmonic measurements to the 30th harmonic
- Custom (.A5T) – captures measurements selected by the user in the PARAM menu

The available recording time is based on the number of measurement parameters and is different for each file type. The table below lists the file extensions, record length and available recording time (based on a 15 minute recording period).

File Type	Extension	Record Length	Available Recording Time
Standard	.A5M	200 bytes	52 days
Harm. 50	.A5I	1800 bytes	5.9 days
Harm. 30	.A5I	1000 bytes	10.4 days
Custom	.A5T	*	** days

* Based on user-selected parameters. The formula for the record length is 4 x the # of parameters +10 bytes.

** Based on user-selected parameters. The formula for the recording time is 999,808/record length.

To choose the file type:

- 1) Use the up [▲] and down [▼] arrow buttons to highlight **TYPE** and press the enter [ENTER] button. This brings up a selection box with the existing wiring selection highlighted.
- 2) Use the up [▲] and down [▼] arrow buttons to move through the available options and press the enter [ENTER] button to select an option.
- 3) To return to the setup menu without selecting an option, press the escape [ESC] button.

Param: This is where the user can select the measurement parameters for a custom file type. If a standard or harmonic file has been selected, select values in the parameter screen will not change what is recorded by the analyzer. Any number of instantaneous, minimum, maximum and harmonics values can be selected. The factory default values will be based on the measurement type selected.

Available measurement options:

- Instantaneous measurements- all power and energy parameters available for the selected measurement type
- Maximum measurements – all power parameters available for the selected measurement type
- Minimum measurements - all power parameters available for the selected measurement type

To choose the measurement parameters:

- 1) Use the up [▲] and down [▼] arrow buttons to highlight **PARAM** and press the enter [ENTER] button. This brings up a grid showing all of the available instantaneous parameters.
- 2) The selected parameters will be highlighted in black.
- 3) Use the up [▲], down [▼], left [◀], and right [▶] arrow buttons to move the cursor through the parameters.
- 4) Pressing the set [SET] button selects, or de-selects a parameter. Pressing set while on “CLEAR ALL” at the bottom of the display clears all parameters.
- 5) After the desired instantaneous parameters have been selected, move the cursor to the upper left-hand corner [INST] and press set . This will bring up a grid showing all of the available maximum parameters. The selected parameters will be highlighted in black and **MAX** will be displayed in the upper left-hand corner of the screen.
- 6) Use the up [▲], down [▼], left [◀], and right [▶] arrow buttons to move the cursor through the available maximum parameters.
- 7) Pressing the set [SET] button selects, or de-selects a parameter. Pressing set while on “CLEAR ALL” at the bottom of the display clears all parameters.
- 8) After the desired maximum parameters have been selected, move the cursor to the upper left-hand corner [MAX] and press set . This will bring up a grid showing all of the available minimum parameters. The selected parameters will be highlighted in black and **MIN** will be displayed in the upper left-hand corner of the screen.
- 9) Use the up [▲], down [▼], left [◀], and right [▶] arrow buttons to move the cursor through the available minimum parameters.
- 10) Pressing the set [SET] button selects, or de-selects a parameter. Pressing set while on “CLEAR ALL” at the bottom of the display clears all parameters.
- 11) After the desired parameters have been selected, press the enter [ENTER] button to save your changes and return to the record menu.
- 12) Press the escape [ESC] button to return to the record menu without saving any changes.

To return to the setup menu, press either the left arrow [◀] or escape [ESC] button.

5.2.3 Comm

Comm is the section of the menu to set the communication protocols for downloading data. During this process, the PowerVision™ software will auto-detect the analyzer at all possible baud rates, so it is not necessary to change these parameters, however a faster baud rate may be desired.

Communication parameters:

- Baud rate: choose from 1200, 2400, 4800, 9600, 19200, 38400 ↻ Factory default setting is 9600
- Parity: choose from no, odd, even ↻ Factory default setting is no
- Length: this is set at 8 ↻ Factory default setting is 8
- Stop bits: chose from 1, 2 ↻ Factory default setting is 1

To change the communication parameters:

- 1) Use the up [▲] and down [▼] arrow buttons to highlight **COMM** and press the enter [ENTER] button. This brings up the communication parameter selection box.
- 2) The baud rate setting is highlighted. Use the up [▲] and down [▼] arrow buttons to adjust the setting. Chose from 1200 to 38400.
- 3) Press the right arrow [▶] button to move to the parity setting. Use the up [▲] and down [▼] arrow buttons to adjust the setting. Chose either no, odd or even.
- 4) Press the right arrow [▶] button to move to the stop bits setting. The length setting will be skipped, because it cannot be changed.
- 5) Use the up [▲] and down [▼] arrow buttons to adjust the stop bits setting. Chose either 1 or 2.
- 6) Press the enter [ENTER] button to save your changes and return to the setup menu.
- 7) Press the escape [ESC] button to retrun to the setup menu without saving any changes.

NOTE: Nearly every computer uses the fastest speed selectable, which is 38400 baud. A slower speed will substantially increase the time required to download a file to your computer. All modern PCs will support a baud rate of 38400. Try the fastest rate first.

To return to the main programming menu, press either the left arrow [◀] or escape [ESC] button.

5.2.4 Clock

Clock is the section of the menu to set the date and time information.

To change the date/time information:

- 1) Use the up [▲] and down [▼] arrow buttons to highlight **CLOCK** and press the enter [ENTER] button. This brings up the existing date and time settings.
- 2) The day setting will be highlighted. Use the up [▲] and down [▼] arrow buttons to adjust the setting. Chose from 0 to 31 days.
- 3) Press the right arrow [▶] button to move to the month setting. Use the up [▲] and down [▼] arrow buttons to adjust the setting. Chose from 0 to 12 months.
- 4) Press the right arrow [▶] button to move to the year setting. Use the up [▲] and down [▼] arrow buttons to adjust the setting. Chose from 00 to 99.
- 5) Press the right arrow [▶] button to move to the hour setting. Use the up [▲] and down [▼] arrow buttons to adjust the setting. The hour setting is a military time format, so chose from 0 to 24 hours.
- 6) Press the right arrow [▶] button to move to the minute setting. Use the up [▲] and down [▼] arrow buttons to adjust the setting. Chose from 0 to 59 minutes.
- 7) Press the right arrow [▶] button to move to the second setting. Use the up [▲] and down [▼] arrow buttons to adjust the setting. Chose from 0 to 59 seconds.
- 8) Press the enter [ENTER] button to save your changes and return to the setup menu.
- 9) Press the escape [ESC] button to retrun to the setup menu without saving any changes.

To return to the main programming menu, press either the left arrow [◀] or escape [ESC] button.

5.2.5 Recall

Recall is the section of the menu to return the analyzer to the factory default settings.

To restore factory default settings:

- 1) Use the up [▲] and down [▼] arrow buttons to highlight **RECALL** and press the enter [ENTER] button. This brings up the recall setting box.
- 2) The analyzer will prompt the user to set the settings back to the factory standard.
- 3) Use the left [◀] and right [▶] arrow buttons to choose either yes or no, and press enter.
- 4) If **YES** was selected, the user will be returned to the setup menu, and all settings will be returned to the factory default settings.
- 5) If **NO** was selected, the user will be returned to the setup menu without changes.

To return to the main programming menu, press either the left arrow [◀] or escape [ESC] button.

5.3 Display menu

The display menu consists of two menu options, which allow the user to customize the display screens accessed while using the analyzer as a hand-held power quality meter. Each menu is discussed separately in this section.

To access the display menu, use the up [▲] and down [▼] arrow buttons to move the cursor through the available parameters of the programming menu, select **DISPLAY** and press the enter [ENTER] button.



☞ Display Menu

To enter a menu, use the up [▲] and down [▼] arrow buttons to move through the available parameters and press the enter [ENTER] button.

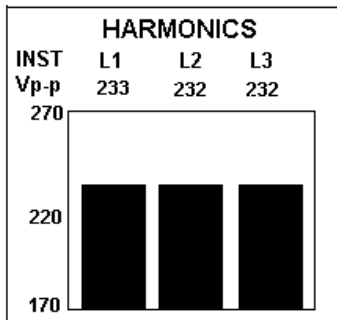
To return to the main programming menu, press either the left arrow [◀] or escape [ESC] button.

5.3.1 Options

Options is the section of the menu to adjust the display screens, and determine how the analyzer calculates power and energy measurements on the display screen. There are two selections in this menu, **MEASURE** and **VOLT**.

Measure: This is the section of the menu to adjust the bar graph and exploded view screens. There are two menu options, Bar Gr. and Expand.

Bar gr. is the section of the menu to adjust the bar graph screen. This screen gives a graphic representation of a single parameter on all three-phases simultaneously. These are instantaneous measurements and will change in real-time as the system changes.



To change the parameter and the bar graph scale:

- 1) Use the up [▲] and down [▼] arrow buttons to highlight **BAR GR.** and press the enter [ENTER] button. This brings up the bar graph parameter selection box with the existing selection highlighted.
- 2) Use the up [▲] and down [▼] arrow buttons to move through the available parameters.
- 3) After the parameter has been selected, press the enter [ENTER] button. This brings up the zero-scale selection box. The existing zero-scale selection will be highlighted.
- 4) In the lower right-hand corner of the screen is a numerical keypad. Use the up [▲], down [▼], left [◀], and right [▶] arrow buttons to move the cursor through the keypad.
- 5) Press the set [SET] button to select a new numerical value. You can change the zero-scale to a negative number by selecting the ± symbol. A decimal point may also be used in the zero-scale by selecting the decimal point [.] .
- 6) To delete a number, select the backspace icon [←] and press the set button.
- 7) After the zero-scale value has been selected, press the enter [ENTER] button. This brings up the full-scale selection box. The existing full-scale selection will be highlighted.
- 8) Press the set [SET] button to select a new numerical value. You can change the full-scale to a negative number by selecting the ± symbol. A decimal point may also be used in the full-scale by selecting the decimal point [.] .
- 9) After the full-scale value has been selected, press the enter [ENTER] button. This will return the user to the bar graph screen and the new scaling will be applied to the graph. If the full-scale value entered is lower than the zero-scale value, the analyzer will display the "ZERO must be lower than FULL SCALE" error message at the bottom of the screen. This message will disappear after a few seconds and return the user to the zero-scale selection.
- 10) Press the enter [ENTER] button to save your changes and return to the display menu.

Note: This screen can also be changed directly from the display while the analyzer is being used as a hand-held power quality meter. (See section 4.3 for more information)

To return to the main programming menu, press either the left arrow [◀] or escape [ESC] button.

Expand is the section of the menu to adjust the exploded view screen. In this screen, any three parameters can be selected and displayed in large characters for easy viewing. These are instantaneous measurements and will change in real-time as the system changes.

Note: Any three parameters can be selected regardless of the measurement type, or parameters chosen for data recording.

INST	HARMONICS
Vp-n L1	220
Vp-n L2	221
Vp-n L3	224

To change these parameters:

- 1) Use the up [▲] and down [▼] arrow buttons to highlight **EXPAND** and press the enter [ENTER] button. This brings up a grid showing all of the available parameters.
- 2) The selected parameters will be highlighted in black.
- 3) Use the up [▲], down [▼], left [◀], and right [▶] arrow buttons to move the cursor through the parameters.
- 4) Pressing the set [SET] button selects, or de-selects a parameter. Pressing set while on "CLEAR ALL " at the bottom of the display clears all parameters.
- 5) Only three parameters may be chosen. If an additional parameter is accidentally selected, the analyzer will display the "OUT OF RANGE" error message at the bottom of the screen. This message will disappear after a few seconds.
- 6) After all three parameters have been selected, press the enter [ENTER] button to accept the new parameters. This will return the user to the exploded view screen and the new parameters will be displayed on the screen.
- 7) Pressing the escape [ESC] button will return the user to the display menu without modifying the parameters.
- 8) Press the enter [ENTER] button to save your changes and return to the display menu.

Note: This screen can also be changed directly from the display while the analyzer is being used as a hand-held power quality meter. (See section 4.2 for more information)

To return to the main programming menu, press either the left arrow [◀] or escape [ESC] button.

Volt: This is the section of the menu to determine how the analyzer will calculate power and energy measurements on the display screen. Calculations will be based on either phase-to-phase voltage or phase-to-neutral voltage measurements.

Note: This will not change how the analyzer records data. Even if phase-to-neutral voltage measurements are selected for the display calculations, a standard file will capture the phase-to-phase voltage values. For phase-to-neutral voltage recordings, the user must select a custom file type.

To choose the voltage setting:

- 1) Use the up [▲] and down [▼] arrow buttons to highlight **VOLT** and press the enter [ENTER] button. This brings up a selection box with the existing wiring selection highlighted.
- 2) Use the up [▲] and down [▼] arrow buttons to move through the available options and press the enter [ENTER] button to select an option.
- 3) To return to the options menu without selecting an option, press the escape [ESC] button.

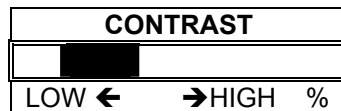
To return to the display menu, press either the left arrow [◀] or escape [ESC] button.

5.3.2 Contrast

Contrast is the section of the menu to adjust the screen contrast. This adjustment helps the user view the display in direct sunlight or dark conditions.

To adjust the contrast:

- 1) Use the up [▲] and down [▼] arrow buttons to highlight **CONTRAST** and press the enter [ENTER] button. This brings up the contrast adjustment box.



- 2) Use the left [◀] and right [▶] arrow buttons to increase or decrease the display contrast. The contrast will change while you are making the adjustment.
- 3) Pressing the escape [ESC] button will return the user to the display menu without modifying the parameters.
- 4) Press the enter [ENTER] button to save your changes and return to the display menu.

Note: The contrast can also be adjusted directly from the display screen. See section 2.2 of this instruction manual for more information.

To return to the main programming menu, press either the left arrow [◀] or escape [ESC] button.

5.4 Run menu

From the run menu, the user can start or stop data collection. The status of data collection is shown on the display screen. If data is being collected, **RECORD** will be displayed at the bottom of the screen. If data collection has been stopped, nothing will be displayed in the lower left-hand corner of the screen. This messages will be displayed on all display screens except for the setup screen.

To change the data collection status:

- 1) Use the up [▲] and down [▼] arrow buttons to move the cursor through the available parameters of the programming menu, select **RUN** and press the enter [ENTER] button.
- 2) Use the up [▲] and down [▼] arrow buttons to toggle between **RUN** and **STOP**. Selecting run will begin/resume data collection and selecting stop will halt data collection.
- 3) Pressing the escape [ESC] button will return the user to the main programming menu without modifying the parameters.
- 4) Press the enter [ENTER] button to save your changes and return to the main programming menu.

5.5 Files menu

The files menu consists of three menu options to view all of the files in the directory, delete old files, and format the memory. Each menu is discussed separately in this section.

To access the files menu, use the up [▲] and down [▼] arrow buttons to move the cursor through the available parameters of the programming menu, select **FILES** and press the enter [ENTER] button.



To enter a menu, use the up [▲] and down [▼] arrow buttons to move through the available parameters and press the enter [ENTER] button.

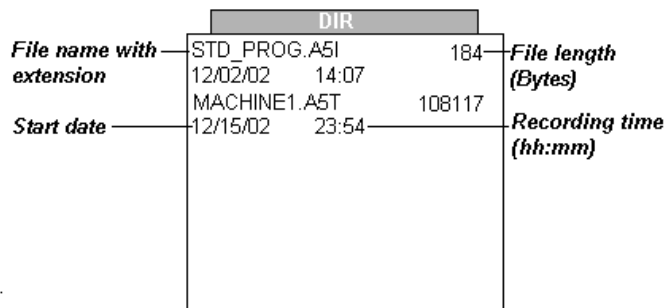
To return to the main programming menu, press either the left arrow [◀] or escape [ESC] button.

5.5.1 DIR

Directory is the section of the menu to access the listing of files that are stored in the analyzer's internal memory.

To view the directory:

- 1) Use the up [▲] and down [▼] arrow buttons to highlight **DIR** and press the enter [ENTER] button. The analyzer will bring up the directory.



The image shows a screenshot of the DIR menu. At the top, the word "DIR" is centered in a grey box. Below it is a table with three columns: "File name with extension", "Start date", and "File length (Bytes)". The first row shows "STD_PROG.A5I" with a file length of "184". The second row shows "12/02/02 14:07" as the start date and "108117" as the file length. The third row shows "MACHINE1.A5T" as the file name with extension and "12/15/02 23:54" as the start date. The table is enclosed in a rectangular box.

File name with extension	Start date	File length (Bytes)
STD_PROG.A5I		184
	12/02/02 14:07	108117
MACHINE1.A5T	12/15/02 23:54	

- 2) The directory displays the file name, file extension, file size, date that the file was started, and the length of time for each file listed in the directory.
- 3) The available memory will also be listed at the bottom of the screen.
- 4) Pressing the escape [ESC] button will return the user to the files menu.

5.5.2 Delete

Delete is the section of the menu to delete specific files that are stored in the analyzer's internal memory.

To delete a file:

- 1) Use the up [▲] and down [▼] arrow buttons to highlight **DELETE** and press the enter [ENTER] button. The analyzer will bring up the directory.

DIR		
STD_PROG.A5I		184
12/02/02	14:07	
MACHINE1.A5T		108117
12/15/02	23:54	
Bytes Free: 925512		

- 2) The directory displays the file name, file extension, and file size for each file listed in the directory.
- 3) The available memory will also be listed at the bottom of the screen.
- 4) Use the up [▲] and down [▼] arrow buttons to move the cursor through the available files and press the enter [ENTER] button.
- 5) The analyzer will ask for a confirmation before deleting the file.
- 6) Use the left [◀] and right [▶] arrow buttons to toggle between **YES** and **NO** and press enter.
- 7) Choosing no will return the analyzer to the directory to select a file for deletion.
- 8) Choosing yes will remove the file from the analyzer's memory and return the analyzer to the directory to select another file for deletion.
- 9) Pressing the escape [ESC] button will return the user to the files menu.

5.5.3 Format

Format is the section of the menu to completely format the analyzers menu. It will erase all files and eliminate any memory errors that may exist.

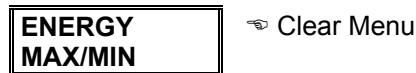
To format the memory:

- 1) Use the up [▲] and down [▼] arrow buttons to highlight **FORMAT** and press the enter [ENTER] button. The analyzer will ask for a confirmation before proceeding.
- 2) Use the left [◀] and right [▶] arrow buttons to toggle between **YES** and **NO** and press enter.
- 3) Choosing no will return the analyzer to the file menu without formatting the memory.
- 4) Choosing yes will format the memory and return the analyzer to the file menu.

5.6 Clear menu

The clear menu consists of 2 menu options to reset the energy counters and maximum and minimum values saved on the display of the analyzer. Clearing these values will only affect the displayed measurements. It will not affect data collected by the analyzer.

To access the clear menu, use the up [▲] and down [▼] arrow buttons to move the cursor through the available parameters of the programming menu, select **CLEAR** and press the enter [ENTER] button.



To enter a menu, use the up [▲] and down [▼] arrow buttons to move through the available parameters and press the enter [ENTER] button.

5.6.1 Energy

Energy is the section of the menu to clear the energy values in the main display screen. These values will begin at zero, and start to accumulate when the analyzer is returned to the display screen.

INST	L1	L2	L3	III
Vp-n	235	233	237	235
A	31.26	30.99	30.70	30.98
kW	7,376	7,247	7,299	21.92
Kvar-L	0.729	0.667	0.768	2.164
Kvar-C	0	0	0	0
P.F.	1.00	1.00	1.00	1.00
Hz	50.0			
kVA				21.92
kwh		450,159		
kvarhL		92.640		
kvarhC		0.029		
05/11/98 17:19:04				

Energy values

To clear the energy values:

- 1) Use the up [▲] and down [▼] arrow buttons to highlight **ENERGY** and press the enter [ENTER] button. The analyzer will ask for a confirmation before proceeding.
- 2) Use the left [◀] and right [▶] arrow buttons to toggle between **YES** and **NO** and press enter.
- 3) Choosing no will return the analyzer to the clear menu without clearing the energy values.
- 4) Choosing yes will clear the energy values and return the analyzer to the clear menu.

5.6.2 Max/min

Max/min is the section of the menu to clear the maximum and minimum values in the main display screen. These values will begin at zero when the analyzer is returned to the display screen.

To clear the maximum and minimum values:

- 1) Use the up [▲] and down [▼] arrow buttons to highlight **MAX/MIN** and press the enter [ENTER] button. The analyzer will ask for a confirmation before proceeding.
- 2) Use the left [◀] and right [▶] arrow buttons to toggle between **YES** and **NO** and press enter.
- 3) Choosing no will return the analyzer to the clear menu without clearing the max and min values.
- 4) Choosing yes will clear the max and min values and return the analyzer to the clear menu.

6. Hooking up the analyzer

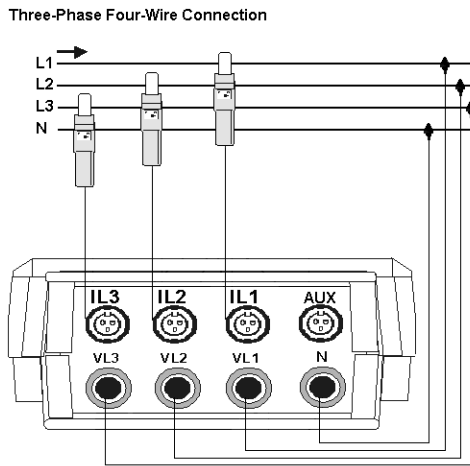
Before hooking up the 800 series power analyzer, please observe the following:

- The unit has sufficient battery life for the duration of the test, or is connected to line power.
- Supply voltage is connected to a properly grounded outlet.
- Maximum input voltage does not exceed analyzer ratings:
 - 500VAC phase to neutral
 - 866VAC phase-phase
- Clamp adapter range sufficient for the measurement circuit
 - Does not exceed maximum current rating of adapter
 - Does not fall below 10% of current rating of adapter
- Voltage leads being used were supplied with the instrument. Replacement leads are available from IDEAL INDUSTRIES
- Power analyzer has been setup for the electrical system under test

To make a measurement with the power analyzer:

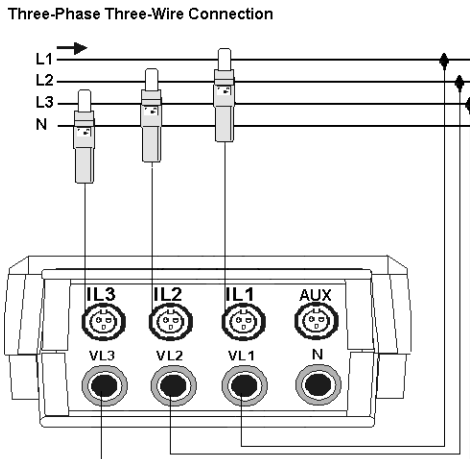
- 1) Connect the power supply to the power analyzer and to a properly grounded outlet using the factory supplied cables. (Section 3.3)
- 2) Insert the voltage leads into the analyzer, and match the color-coded current transformers with the leads to help simplify the connection process. Insert the current transformer leads into the proper input connectors on the Model 805. (Section 2.3)
- 3) Connect the voltage leads and current clamp adapters to the electrical system as shown in the following sections. (Sections 6.1.1 – 6.1.5)
- 4) Turn the instrument on and select the harmonics program. (Section 3.1)
- 5) Verify that the voltage and current ratios are correct on the setup screen (Section 4.5)
- 6) Begin taking measurements

6.1.1 3-phase 4-wire connection diagram



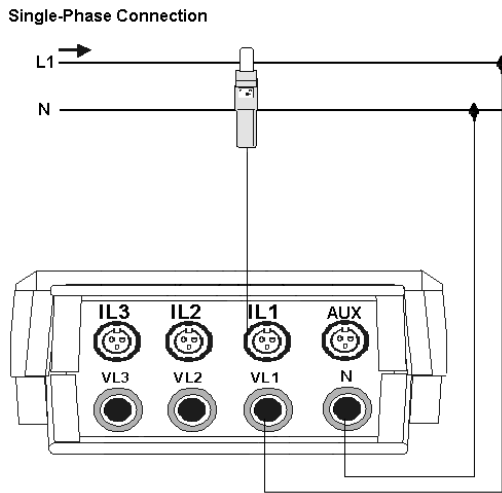
For a 3-phase 4-wire electrical system, select the triphasic measurement type and a Custom file type. Choose phase to neutral voltage (V_{p-n}) in the PARAM menu. See section 5.2 for more information.

6.1.2 3-phase 3-wire connection diagram



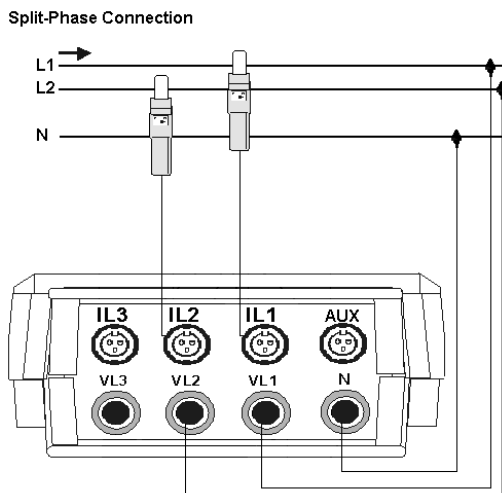
For a 3-phase 3-wire electrical system, select the triphasic measurement type and either a standard or harmonics file type. See section 5.2 for more information.

6.1.3 Single-phase connection diagram



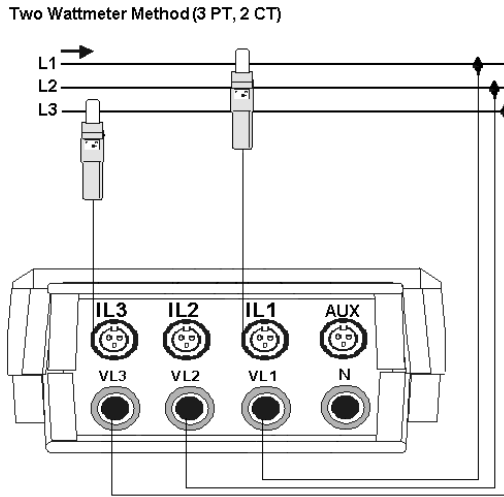
For a single-phase electrical system, select the triphasic measurement type and a Custom file type. Choose phase to neutral voltage (V_{p-n}) in the PARAM menu. See section 5.2 for more information.

6.1.4 Split-phase connection diagram



For a split-phase electrical system, select the triphasic measurement type and a Custom file type. Choose phase to neutral voltage (V_{p-n}) in the PARAM menu. See section 5.2 for more information.

6.1.5 2 wattmeter method (3 PT, 2 CT) connection diagram



For a two-wattmeter measurement, select the aron measurement type and either a standard or harmonic measurement type. See section 5.2 for more information.

7. Recording data

The power analyzer has been pre-configured at the factory to begin recording data immediately. Simply change the analyzer to run mode (Section 5.4) and begin collecting data using the factory default settings. If you are unsure as to what these factory settings are, refer to the quick reference guide, located in section 12 of this instruction manual. It contains a complete listing of all programming parameters and the factory default settings.

If you are using the power analyzer for the first time, we recommend that you follow the following procedure for creating a new file for recording data:

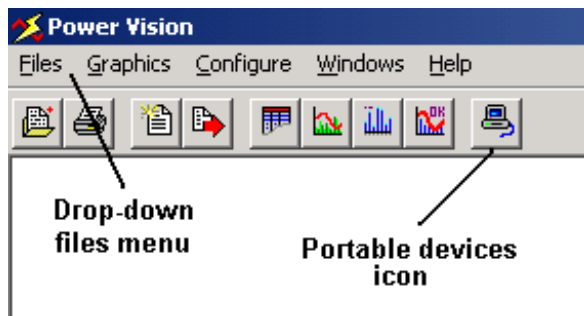
- 1) Turn the instrument on and select the harmonics program. (Section 3.1)
- 2) Verify that the measurement type and voltage and current ratios are correct on the setup screen. (Section 4.5)
- 3) If not correct, change these parameters in the measure menu. (Section 5.2.1)
- 4) Select the desired recording period for the analysis that you are conducting. (Section 5.2.2)
- 5) Create a file name and select the appropriate file type. (Section 5.2.2)
- 6) Choose the desired measurement parameters for the analysis that you are conducting. (Section 5.2.2)

8. Downloading data to your computer

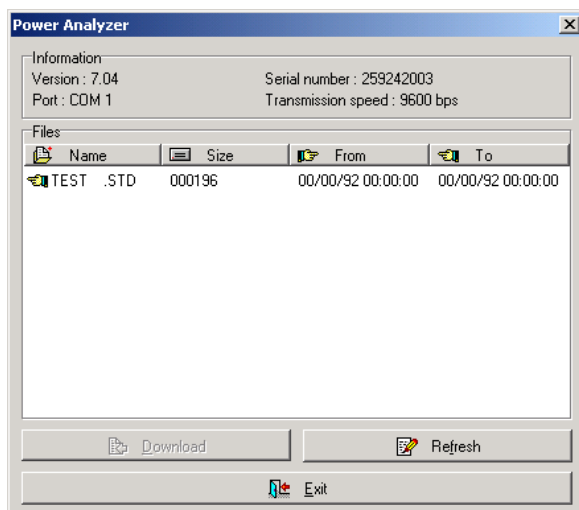
After the power analyzer has successfully recorded the data, then the data needs to be transferred to a computer for analysis. This process is primarily controlled by the PowerVision™ analysis software.

To download data to the PowerVision™ software:

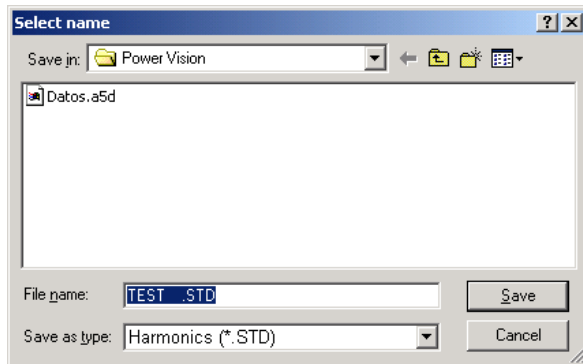
- 1) Plug the power cord into the power supply/RS-232 interface.
- 2) Connect the analyzer to the power supply/RS-232 interface with the interface cable.
- 3) Connect the power supply/RS-232 interface to the serial input on your computer with the RS-232 cable
- 4) Turn the analyzer on.
- 5) Verify that the analyzer is not recording data.
- 6) Verify that the analyzer is not in the programming menu.
- 7) Launch the PowerVision software. If this has not been loaded onto your computer, place the enclosed PowerVision CD into your CD ROM drive. It will automatically launch the interactive demo and give the user the option to load the PowerVision software.
- 8) Go into the drop-down files menu and select portable devices, or press the icon to search for a connected device.



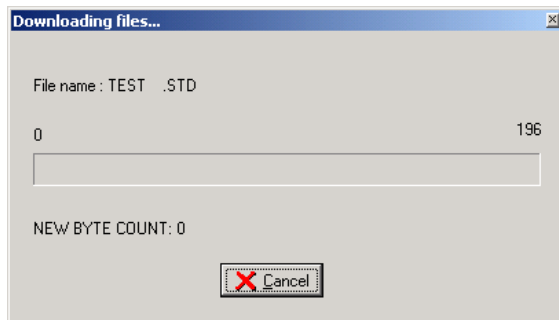
- 9) The software will activate the auto-detect feature and begin scanning all communication ports at all baud rate speeds to find the power analyzer.
- 10) If no devices are detected, the software will give an error message. Re-connect the analyzer and step through this process again.
- 11) Once the connection has been made, the software will display the directory of files in the analyzer's memory.



- 12) Using the mouse, select a file to be downloaded and left-click on the download button.
- 13) The software will bring up the file box, giving the user the opportunity to change the file name or choose the file location.



- 14) To save the file without any changes, left-click on the save button.
- 15) To change the name, highlight the file name and type in a new file name.
- 16) To change the file location, left-click on the down arrow next to the save in: selection box. This brings up a drop-down menu with the entire file directory of your computer.
- 17) Double-left-click on the appropriate file location and left-click on the save button.
- 18) The software will then download the directory to your computer. This may take a few minutes, depending on the size of the file.



- 19) Repeat this process until all available files have been downloaded onto the computer.

If problems exist during the download process, check the following:

- 1) The cables used to connect the power supply/RS-232 interface to the analyzer and computer are the cables supplied with the power analyzer.
- 2) The power supply/RS-232 interface has been connected to a properly grounded receptacle.
- 3) No other devices are on the comm. Port.
- 4) If the device is a laptop computer, check that the infrared port has been disabled.
- 5) The analyzer is not in run mode.
- 6) The file directory of the analyzer has programs to download.
- 7) The analyzer is not in the programming menu. You must be in the display screens to download data.

If problems persist, please contact our Technical Hotline at 877-201-9005 for assistance.

9. PowerVision™ software and interactive demo

A CD with the PowerVision™ Analysis Software and Interactive Demo has been included with the power analyzer. This disk has an interactive demo to help the user get more familiar with the power analyzer and PowerVision software.

The demo has an auto-run feature that will launch the interactive program immediately after it has been inserted into the CD ROM drive. The program has four sections; an introductory section discussing the features and benefits of the power analyzer, a display section that goes through the various display screens and using the power analyzer as a portable hand-held analyzer, a programming section that walks through some of the basic programming setup, and a software section that demonstrates the capabilities of the PowerVision software.

The PowerVision software can be downloaded directly from this demo. It is complete with sample data, allowing the user to try out the software and get a better understanding of what they can do with the data before they take actual measurements.

10. Technical specifications

Supply voltage:	80-265VAC
Frequency:	50-60 Hz
Burden:	8 VA
Operation temperature:	0 to 50 °C
Measuring circuit:	Triphasic, Aron
Safety:	EN 61010
Internal memory:	1 MB
RS-232 output:	Serial type output
Baud rate:	1200, 2400, 4800, 9600, 19200, 38400 (user selectable)

Voltage measurement:

Measuring range:	20-500 VAC (phase-neutral) 20-866 VAC (phases-phase)
Frequency:	45-65 Hz

Current measurement:

Phase current range: 15-1000AAC* (20-2000AAC #61-805-2K)*

Accuracy:

Voltage	0.5 % of readout ± 2 digits
Current	0.5 % of readout ± 2 digits
Active power	1.0 % of readout ± 2 digits
Reactive power.....	1.0 % of readout ± 2 digits

Measuring conditions to assure accuracy:

- Temperature range between 5 °C and 45 °C
- Power factor between 0.5 and 1
- Measuring range between 5 % and 100 %

* Based on supplied clamp adapter. Other clamp adapters available (Section 11)

Mechanical Specifications:

Display: 160 x 160 pixel backlit display
Case dimensions: 220 x 60 x 130 mm
Weight: 0.8 kg.

Relevant Standards:

EN 60664, EN 610110, EN 61036, VDE 110, UL 94

EM EMISSION.

- EN 61000-3-2 (1995), Harmonics.
- EN 61000-3-3 (1995), Fluctuations in voltage
- EN 50081-2 (1993), Industrial emission:
- EN 55011 (1994): Conducted (EN 55022 - Class B).
- EN 55011 (1994): Radiated (EN 55022 - Class A).

EM IMMUNITY.

- EN 50082-2 (1995), Industrial immunity.
- EN 61000-4-2 (1995), ESD.
- ENV 50140 (1993), EM Radiated field of RF.
- EN 61000-4-4 (1995), EFT burst.
- ENV 50141 (1993), RF common mode.
- EN 61000-4-8 (1995), 50 Hz H-field.
- EN 50082-1 (1997), Residential Immunity.
- EN 61000-4-5 (1995), Surges.
- EN 61000-4-11 (1994), Dips, Interruptions.

11. Optional programs and accessories

Expand the capabilities of your 800 series analyzers with one of the optional programs:

**#61-474 Disturbances Program**

- Tracks sags, swells and transients
- Programmable trigger points
- Captures individual waveforms for analysis

#61-475 Check-Meter Program

- Monitors performance of in-line energy meters
- Stores data and provides comparison against mechanical or electrical meters
- Monitors key power and energy measurements

#61-476 Fast-Check Program

- Captures transient waveforms
- Monitors key power and energy measurements

Additional power clamp adapters are available to extend the current capabilities of your 800 series power analyzer:



#61-453 200/2000AAC Power Clamp Adapter

- Selectable 200/2000AAC measurements
- Set of 3



#61-456 5AAC Power Clamp Adapter

- 5AAC measurements
- Set of 1



#61-454 1000AAC Power Clamp Adapter

- 1000AAC measurements
- Set of 3



#61-330 1000AAC Flexible Clamp Adapter

- 1000AAC measurements
- Use with #61-466 power analyzer adapter
- 24" (61cm) sensor length
- Set of 1



#61-455 500AAC Power Clamp Adapter

- 500AAC measurements
- Set of 3



#61-330 300/3000AAC Flexible Clamp Adapter

- Selectable 300/3000AAC measurements
- Use with #61-466 power analyzer adapter
- 36" (91cm) sensor length
- Set of 1

Replacement test leads, carrying cases and power supplies are also available.

#TL-805 Power Analyzer Test Lead Set

- Test leads with alligator clips
- Set of 4

#C-1000 Carrying Case

- Case holds analyzer, 1000AAC clamp adapters, power supply, test leads and all cables.

#PS-351 RS-232 Interface/ Power Supply

- Includes power supply/RS-232 interface, power cord, RS-232 communication cable, analyzer communication cable

#C-2000 Carrying Case

- Case holds analyzer, 200/2000AAC clamp adapters, power supply, test leads and all cables.

12. Quick Reference Guide

Setup Menu	Submenu selections		Description	Options	Default Setting
Measure			This menu is for setting up the voltage and current measurement options		
	Circuit		The circuit type being measured	Triph., Aron	Triph.
	TR. REL		The ratios for PT & CT transformers		
		Rel V - Prim V	The primary value of the voltage ratio	Numerical value	1V, 1V
		Rel V - Sec V	The secondary value of the voltage ratio	Numerical value	1V
		Rel A	The primary value of the current clamps	Numerical value	1000A
Record			This menu is for setting up the recording parameters		
	Period		The recording period for data collection	hh:mm:ss (5s to 4h)	15 minutes
	Trigger		Measurement value or time values that will trigger data collection to begin		
		Level	Setting the maximum and minimum thresholds for the trigger	Measurement parameter and numerical value	Auto
		Time	Setting the on/off date and time thresholds for the trigger	dd/mm/yy, hh:mm:ss	00/00/00, 00:00:00
	Name		Name and file type for the record		
		Name	File name	Alpha/numeric value	STD-PROG
	Type		File type	Standard (A5M), Harm. 50 (A5I), Harm. 30 (A5I), Custom (A5T)	Standard (A5M)
	Param		Select the parameters that will be recoded during data collection		
		Inst	Select the instantaneous values to be recorded	Vp-p, Vp-n, A, kW, kvarL, kvarC, PF, Hz, kVA, A _N , kWh, kvarhL, kvarhC	All
		Max	Select the maximum values to be recorded	Vp-p, Vp-n, A, kW, kvarL, kvarC, PF, Hz, kVA, A _N	All
		Min	Select the minimum values to be recorded	Vp-p, Vp-n, A, kW, kvarL, kvarC, PF, Hz, kVA, A _N	All
Comm			Select the communication protocol for downloading data	Baud rate, parity, length, stop bits	9600, No, 8, 1
Clock			Change date and/or time	dd/mm/yy, hh:mm:ss	
Recall			Return 805 to factory settings	Yes, no	

Display Menu		Description	Options	Default Setting
Options		Set the parameters for the bar graph screen		
	Measure - Bar Gr.	Select the measurement, zero-scale value and full-scale value of the bar graph	Vp-p, Vp-n, A, kW, kvarL, kvarC, PF; zero-scale value; full-scale value	Vp-n; 0; 300
	Measure - Expand	Select three parameters for the exploded view screen	Vp-p, Vp-n, A, kW, kvarL, kvarC, PF, Hz, kVA, A _N , kWh, kvarhL, kvarhC	Vp-n (L1), Vp-n (L2), Vp-n (L3)
	Volt	Set the voltage measurement for the display screen	Vp-p, Vp-n	Vp-p
Contrast		Adjust the display contrast	Decrease/increase contrast	

Run Menu	Description	Options	Default Setting
Run/stop	Start/stop data collection	Run/stop	Stop

Files Menu	Description	Options	Default Setting
Dir	Display the file directory of the power analyzer's memory		
Delete	Delete a file from the analyzer's memory		
Format	Format the power analyzer's memory		

Clear Menu	Description	Options	Default Setting
Energy	Clear all energy counters on the display		
Max/min	Clear all min/max values on the display		

13. Warranty and repair information

This meter is warranted to the original purchaser against defects in material or workmanship for the lifetime of the meter. During this warranty period, IDEAL INDUSTRIES, INC. will, at its option, replace or repair the defective unit, subject to verification of the defect or malfunction.

This warranty does not apply to defects resulting from abuse, neglect, accident, unauthorized repair, alteration, or unreasonable use of the instrument.

Any implied warranties arising out of the sale of an IDEAL product, including but not limited to implied warranties of merchantability and fitness for a particular purpose, are limited to the above. The manufacturer shall not be liable for loss of use of the instrument or other incidental or consequential damages, expenses, or economic loss, or for any claim or claims for such damage, expenses or economic loss.

State laws vary, so the above limitations or exclusions may not apply to you. This warranty gives you specific legal rights, and you may also have other rights, which vary from state to state.

For units in need of repair or warranty repair, please call our Technical Hotline – Toll Free 877-201-9005.



IDEAL INDUSTRIES, INC.

Technical Hotline, toll-free 877-201-9005

Becker Place, Sycamore, IL 60178, USA / 800-435-0705 in USA
33 Fuller Road, Ajax, Ontario L1S 2E1, Canada / 800-527-9105 in Canada
225 Europa Boulevard, Warrington, Cheshire, WA5 7TN, UK / +44-(0) 1925 444446
Gutenbergstrasse 10, 85737 Ismaning, Germany / +49-(0) 89 996860
27 Keene Street, Baulkham Hills, NSW 2153, Australia / +61-(2) 96866923

www.testersandmeters.com

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