

PZ4000

HIGH FREQUENCY POWER ANALYZER



Product Tutorial

PZ4000 POWER ANALYZER MEASUREMENT LAB

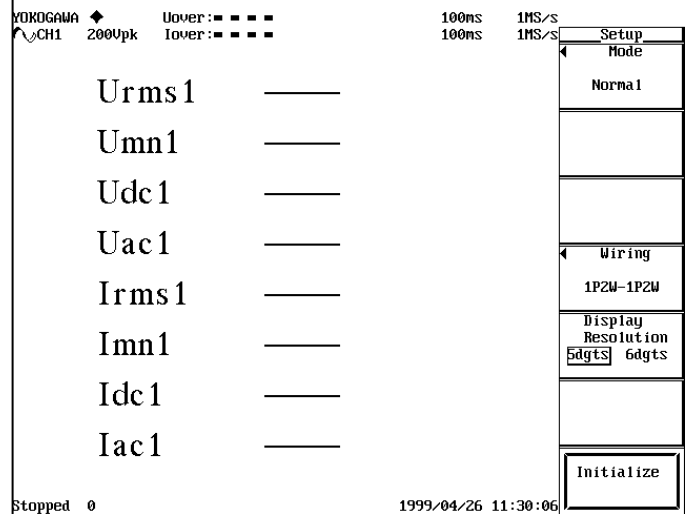
OVERVIEW & OBJECTIVES

The following is a basic demo procedure for the PZ4000 Power Analyzer. This demo uses the power meter's own power supply for the load. This demo can easily be done in a conference room or lab without having to hook up to the customer's load.

POWER METER SET-UP AND CONNECTION

Power Measurements on Switching Power Supply Load

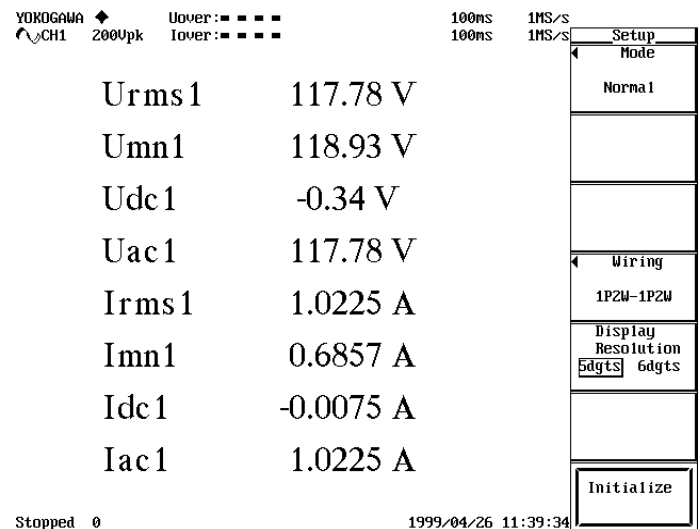
1. Connect the Power Meter using the load cord. Plug the Banana plugs into the Voltage input terminals of Element # 1. Connect the Spade plugs to the 20 Amp current terminals of element # 1. Make sure all connections are tight.
2. Plug the power meter power cord into the load cord.
3. Turn on the power meter.
4. Initialize the Power Meter settings:
 - a. Press <SETUP> then Press <Initialize>.



MEASUREMENT LAB # 1

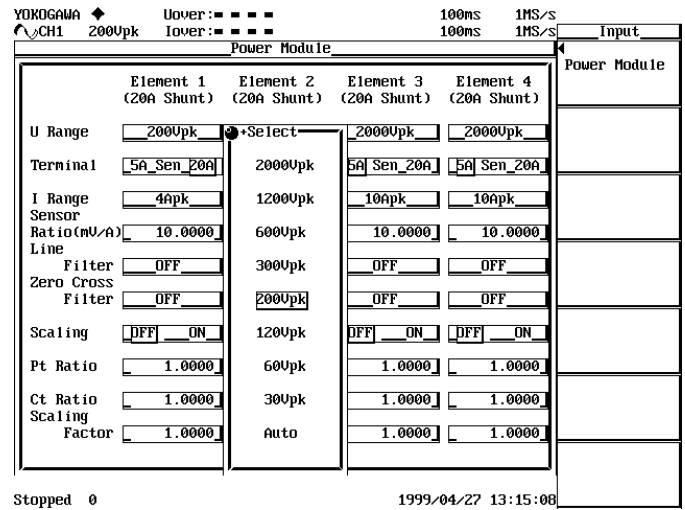
Basic Power Measurements

1. Press <START/STOP> Button. Measurements will start and be displayed.
2. Press <DISPLAY> Button.
3. Press <Format> Soft Key.
4. Turn Rotary Knob to select **Numeric**, then Press <SELECT> Button above rotary knob.
5. Press <CH 1> Button.
6. Press <U Range> Soft Key.
7. Turn Rotary Knob to <200Vpk> range and Press <SELECT>.
8. Press <CH 2> Button.
9. Press <Terminal> Soft Key twice to select **20A**.
10. Press <I Range> Soft Key.
11. Turn Rotary Knob to <4Apk> range and Press <SELECT>.
12. You should have readings similar the example.
13. Press <DISPLAY> Button, then <Item Amount> Soft Key. Use the Soft Keys to select different Display formats.



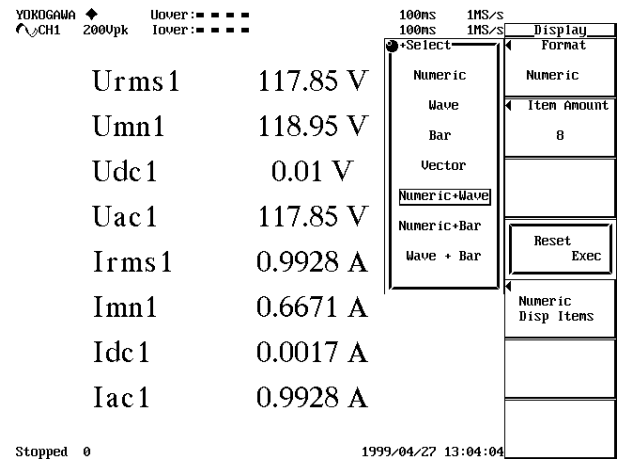
Setting Ranges (Alternate Method)

1. Press <INPUT> Button.
2. Press <Power Module> Soft Key.
3. Turn Rotary Knob to highlight Element 1 U Range. Press <SELECT> Button.
4. Turn Rotary Knob to 200Vpk, and Press <SELECT> Button.
5. Turn to Terminal, and select 20A.
6. Turn to I Range, and select 4Apk.
7. Note in this menu the settings for External Sensor, Filter, CT & PT Ratios for each channel.
8. Press <ESC> Button to exit this menu and return to Measurement Display.



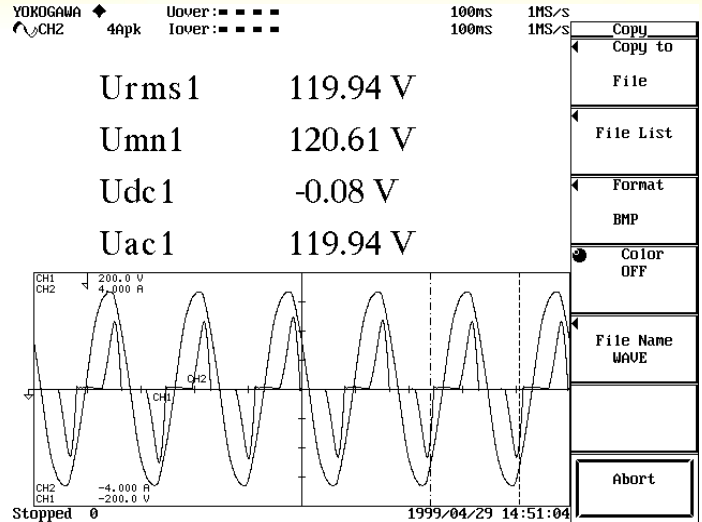
Displaying Measurement Data and Waveforms

1. Press <DISPLAY> Button.
2. Press <Format> Soft Key.
3. Turn Rotary Knob to <Numeric + Wave> and Press <SELECT>.
4. Turn off unused channels by pressing <VOLTAGE> & <CURRENT> Button twice, so green LED is OFF.
5. Or, Press <Wave Setting> Soft Key.
6. Press <Wave Display> Soft Key.
7. Turn Rotary Knob to <All OFF> and Press <SELECT>.
8. Select CH 1 and CH 2. Press <ESC> Button.
9. Press <Wave Format> Soft Key.
10. Use Soft Keys to select type of display.
11. Press <TRIGGER> Button, then <Mode> Soft Key. Press <Auto>.



Printing to the Built-in Printer

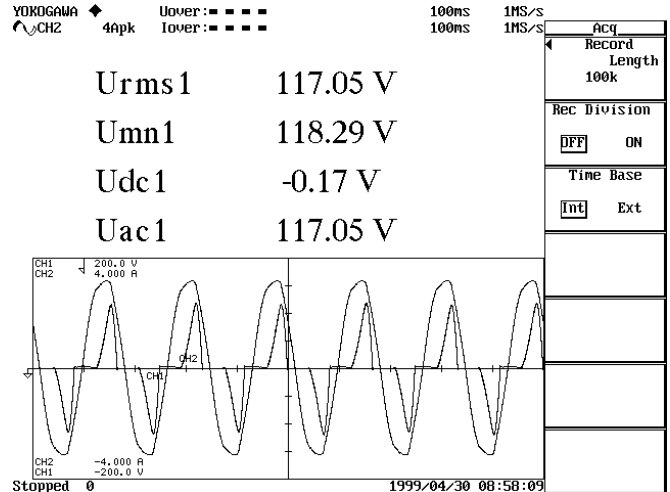
1. A copy of the screen can be printed as follows.
2. Press <START/STOP> Button.
3. Press <COPY> Button.



MEASUREMENT LAB #2

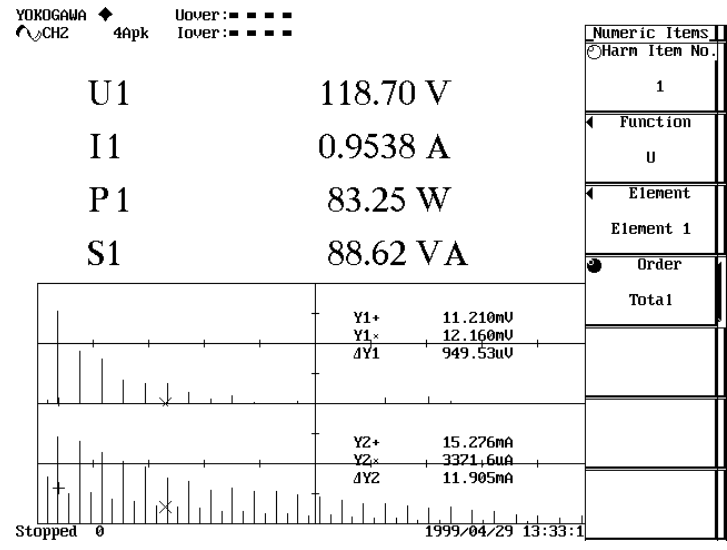
Waveform Display & Observation Time

1. Turn the <OBSERVATION TIME> Rotary Knob to change the displayed time window.
2. Press <SHIFT> then <TRIGGER> (ACQ) Buttons.
3. Press <Record Length> Soft Key, and select Record Length with one of the Soft Keys.
4. Press <Rec Division> Soft Key to ON. This function divides the acquisition memory and sample rate in half.



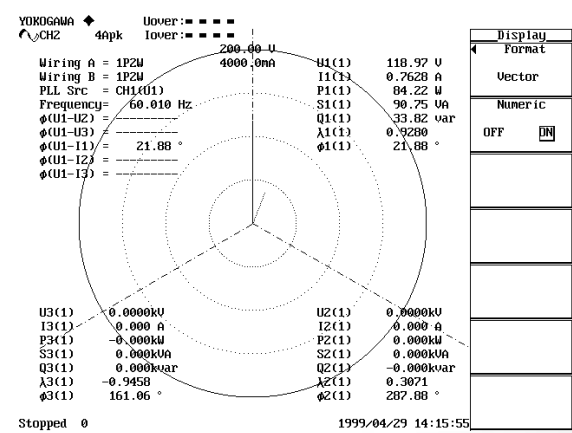
MEASUREMENT LAB #3 Harmonic Measurements

1. Press <START/STOP> Button so Green LED is Off, STOP Mode.
2. Press <SETUP> Button.
3. Press <Mode> Soft Key.
4. Press <Harmonics> Soft Key.
5. Press <DISPLAY> Button, then Press <Format> Soft Key.
6. Select <Numeric + Bar>.
7. Press <START/STOP> Button so Green LED is ON.
8. Press <Bar Setting> Soft Key.
9. Press <Start Order> Soft Key and turn Rotary Knob and set to 0.
10. Press <End Order> Soft Key. Set End Order to 50, or some other value.
11. Press <Bar Marker> Soft Key and turn Rotary Knob to make measurements from the bar Graph.
12. Press <ESC> or <DISPLAY> Button to go back to Display menu.
13. Press <Numeric Disp Items> Soft Key.
14. Set the numeric display like the example using the Harmonic Item No. and Function.
15. Highlight U1, Press <Order> Soft Key. Turn the Rotary Knob to view the measured values for each of the harmonic orders.



Vector Display

1. Press <DISPLAY> Button.
2. Press <Format> Soft Key and select Vector.

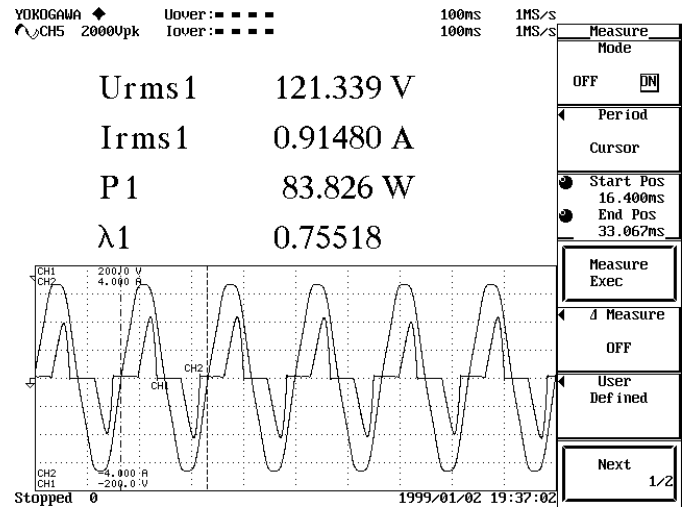


MEASUREMENT LAB #4

MEASURE Function: Cycle-by-Cycle Power

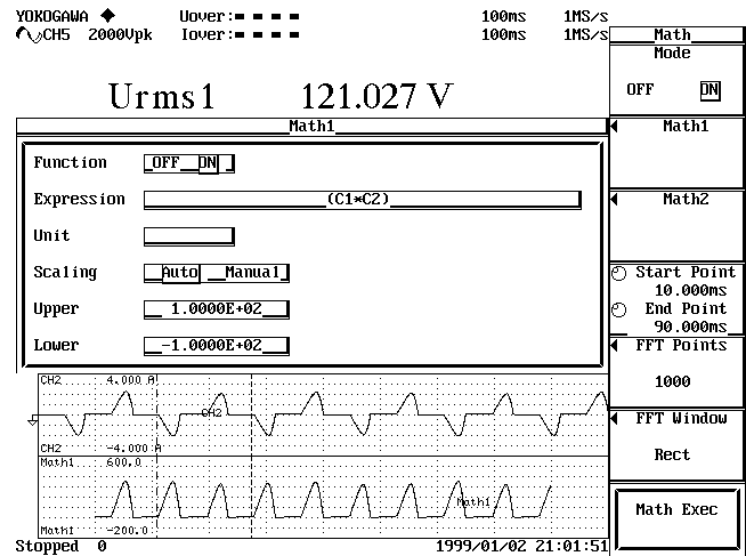
**** PRESS SET UP KEY and change MODE back to NORMAL ****

1. Press <MEASURE> Button. Press <Mode> Soft Key to ON.
2. Press <Period> Soft Key, and then Press <Cursor> Soft Key.
3. Set the Start Pos & End Pos cursors to one cycle. For a 60Hz cycle set the period to 16.667ms.
4. Press <Start Pos> Soft Key. Use Rotary Knob to set to 10.000ms. Use <> keys to select to me resolution position.
5. Press <End Pos> Soft Key. Set to 26.667 ms.
6. Press <End Pos> Soft Key again so that both Knob icons are highlighted. Make sure the time resolution cursor is set to the same position on both the Start & End time. Example at the .1 ms position.
7. Turn Rotary Knob to position the Start Cursor at the beginning of one cycle, or at any position on wave. Press < Measure Exec> Soft Key.
8. Move to another position and Press <Measure Exec>. Note change in readings.
9. Press <MEASURE> Button. Press <Mode> Soft Key to OFF.



MEASUREMENT LAB #5 MATH Functions: Displaying a Power Waveform

1. Press <MATH> Button. Press <Mode> Soft Key to ON.
2. Press <Math1> Soft Key.
3. Turn Rotary Knob to **Function**. Press <SELECT> Button to ON.
4. Turn Rotary Knob to <Expression> and Press <SELECT>.
5. Use keyboard to write expression. Highlight a character and Press <SELECT>. Be sure to **SELECT <ENT>** when done.
6. Enter **Unit** if you want.
7. Set **Scaling** to **Auto**. Press <ESC>.
8. Press <DISPLAY> Button and select type of Format you would like to see.



MEASUREMENT LAB #6 MATH Functions: Displaying a Cycle-by-Cycle Power Trend

1. Press <MEASURE> Button. Press <Mode> Soft Key to ON.
2. Press <Period> Soft Key, then Press <Zero Cross> Soft Key.
3. Press <MATH> Button. Press <Mode> Soft Key to ON.
4. Press <Math2> Soft Key.
5. Turn Rotary Knob to **Function**. Press <SELECT> Button to ON.
6. Turn Rotary Knob to <Expression> and Press <SELECT>.
7. Use keyboard to write expression. Highlight a character and Press <SELECT>. Be sure to **SELECT <ENT>** when done.
8. Enter **Unit** if you want.
9. Set **Scaling** to **Auto**. Press <ESC>.
10. Press <DISPLAY> Button. Press <Wave Setting> Soft Key. Press <Wave Format> Soft Key. Press <Triad> Soft Key.
11. Press <START/STOP> Button to start measurements.

