User's Manual

Power Viewer Software For the PZ4000 Power Analyzer

YOKOGAWA
Yokogawa Electric Corporation

IM 253734-61E
2nd Edition

Forward

Thank you for purchasing the Power Viewer Software (Model 253734) for the PZ4000 Power Analyzer.
This user's manual contains useful information about the precautions, functions, and operating procedures of the software. To ensure correct use, please read this manual thoroughly before beginning operation.
After reading the manual, keep it in a convenient location for quick reference whenever a question arises during operation.
For information about the PZ4000 Power Analyzer (mainly the precautions, functions, and operating procedures), see the following manual that is included with the PZ4000 Power Analyzer.

Manual Title	Manual No.
PZ4000 Power Analyzer User's Manual	IM253710-01E
PZ4000 Power Analyzer Communication Interface User's Manual	IM253710-11E

For the handling and operating procedures of Windows, see the respective manuals.

Notes

- The contents of this manual describe Power Viewer Software Ver. 2.00. The operating procedures and screen contents described in this manual may differ from those in other versions of the software.
- The contents of this manual are subject to change without prior notice as a result of continuing improvements to the instrument's performance and functions.
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Revisions

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- 2nd Edition: July 2002

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Contents

Product Overview and Flow of Operation

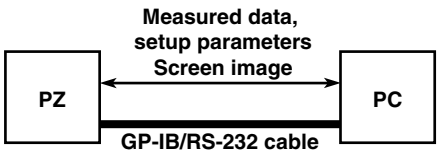
Product Overview

The PZ4000 Power Viewer retrieves measured data from the PZ4000 Power Analyzer (PZ) into your personal computer (PC) via communications (GP-IB or RS-232) or files and analyzes and displays the data. Data can be retrieved from multiple PZs (up to 4 units) into the PC to be analyzed and edited. By combining the file save functions of the software (in CSV or BMP format) and software applications on your PC, you can create reports on the measurement and analysis results.

* Only a single unit if the communication interface is serial (RS-232).

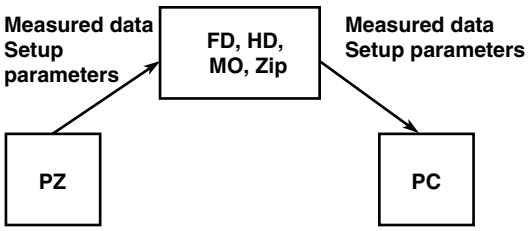
The software can be used in two types of modes: online and offline.
Online mode allows you to change the PZ setup from your PC and retrieve and save setup parameters and measured data of the PZ into your PC via the communication interface (GPIB or serial (RS-232)).
Offline mode allows you to work, without connecting the PZ and the PC, with data that was saved to a floppy disk (FD), hard disk (HD), MO disk, or Zip disk by the PZ or this software program. The data can be loaded for displaying on the PC screen and storing on a storage medium on your PC.

Online mode



Retrieves measured data from the PZ to be displayed on the screen and saved on a storage medium. Setup parameters, waveform data, numeric data, and screen image data can be transferred between the PC and the PZ.

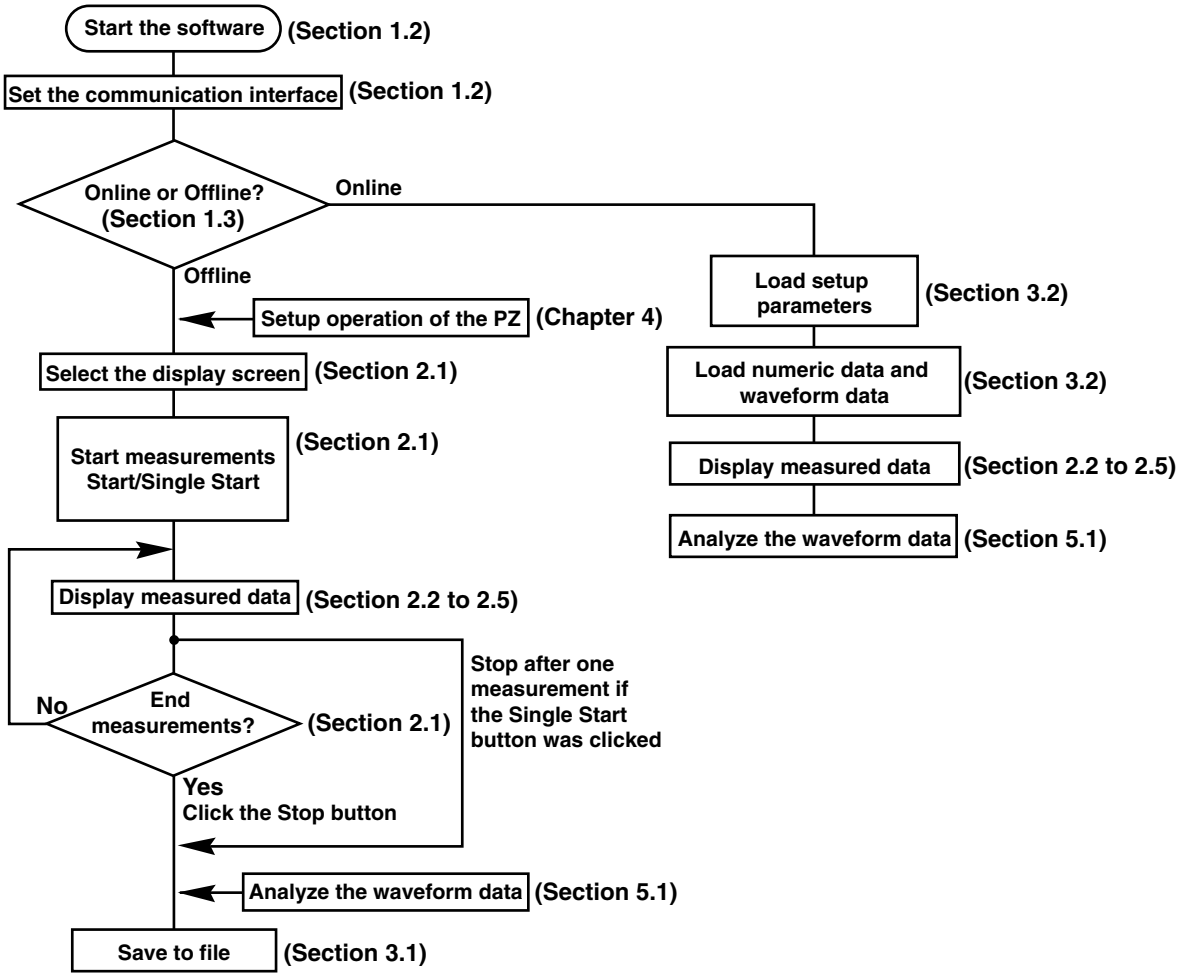
Offline mode



Loads the data measured on the PZ that has been saved to a FD to be displayed on the screen or saved on a storage medium.

Flow of Operation

The following flow chart illustrates the procedure of operation in online mode and offline mode.



Capabilities of the Software

Item	Reference Section
Math computations of up to 4 Mwords.	4.6, “Setting Math”
16 functions of Math computations.	4.6, “Setting Math”
Math computations and X-Y display between different PZ4000 channels.	2.5, “X-Y display”
Display and extraction of zero crossing data.	4.1, “Setting the Input Module”
Trend display of computed values.	2.4, “Trend Display”
Saving and loading of data retrieved from the PZ4000, to and from files.	4.9, “Saving the Data and Creating Directories (File)”
Saving the retrieved data in CSV file format.	3.1, “Saving Waveform Data, Computed Values, and Setup Parameters”
Saving of the screen images to BMP files.	3.1, “Saving Waveform Data, Computed Values, and Setup Parameters”
Loading of waveform binary files that have been saved by the PZ4000.	3.2, “Loading Waveform Data, Numeric Values, and Setup Data”
Control multiple PZ4000s via communications (GP-IB only).	1.2, “Starting the Software and Configuring Communications”

Note

This software does not have functions of harmonic measurement mode.

Types of Files That Can Be Saved/Loaded

The software handles files with .ast, .hdr, .wvf, .fld, .trd, .csv, and .bmp extensions. For the procedure in saving/loading various data, see chapter 3, “Saving and Loading Data.”

Files with .ast Extension
Files containing setup parameters. The data can be transmitted between the PZ and the Power Viewer. The setup parameter file of the PZ with .set extension cannot be loaded into the Power Viewer. Power Viewer requires the setup parameter file when collectively loading all measured items.

Files with .wvf Extension
Files containing waveform data. The file can be saved and loaded using the Power Viewer. However, when loading the file, a header file with a same name as the waveform file must exist in the same directory. The waveform data saved using the PZ can also be loaded and saved.

Files with .hdr Extension
Header files of waveform data. The header file is required when loading the waveform data. It is automatically created when waveform data is saved using the Power Viewer.

Files with .fld Extension
Files containing numeric values. The data can be saved and loaded using the Power Viewer. Computed data (numeric data) saved using the PZ cannot be loaded.

Files with .trd Extension
Files containing trend data. The data can be saved and loaded using the Power Viewer.

Files with .csv Extension
Text data file. The data can be saved using the Power Viewer, but cannot be loaded. The file can be loaded using application software programs such as Excel.

In addition, the screen image of the Power Viewer can be saved to a file in BMP format.

PC System Requirements

PC

CPU: Pentium 3 1 GHz or higher

Memory: At least 128 MB*, 256 MB or more recommended

* If the memory size is less than or equal to 128 MB, some of the functions may not operate.

VRAM: 4 MB or more

HDD: Free space of at least 1 GB (required).

Operating System

Windows 98, Windows Me, Windows NT, Windows 2000, or Windows XP Professional/ Home Edition.

Communication card

RS-232: One open COM port on the PC.

GP-IB (recommended): AT-GPIB/TNT(PnP) by National Instruments and NI-488.2M driver Ver. 1.60 or later.

CRT, printer, and mouse

Those supported by Windows 98, Windows Me, Windows NT, Windows 2000, or Windows XP Professional/Home Edition.

PZ4000

Firmware (ROM) Version 2.01 or later

Number of connectable units: 1 when using serial (RS-232) communications, 1 to 4 when using GP-IB communications

Connecting the PZ4000 to the PC

The following two types of connections are available. Select either one of the connection methods.
For more details, see the *PZ4000 Power Analyzer Communication Interface User's Manual* (IM253710-11E).

- **GP-IB connection**
  Connect the GP-IB card of the PC and the PZ4000 using a GP-IB cable. You can connect up to four PZ4000s via the GP-IB interface using this software.
  Operation is not possible, if the GP-IB board is not installed in the PC.
- **Serial (RS-232) connection**
  Connect the serial port of the PC and the PZ4000 using a serial (RS-232) cable. Use a cross cable for the serial (RS-232) cable. You can only connect a single PZ4000 via the serial (RS-232) interface using this software.

Communication Settings on the PZ4000

For the procedure in setting the communication parameters on the PZ4000, see the *PZ4000 Power Analyzer Communication Interface User's Manual* (IM253710-11E).

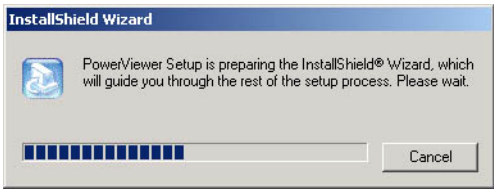
- **For GP-IB connection**
  Set the communication settings on the PZ4000 to "GPIB" and set the address to match that of the software. Make sure to set the address of the GP-IB controller to "0."
- **For serial (RS-232) connection**
  Set the communication settings on the PZ4000 to "RS232" and set the following parameters.

Baud rate:	19200
Data length:	8 bits
Parity:	None
Stop bit:	1 bit
Hardware handshaking:	CTS-RTS
Terminator:	LF

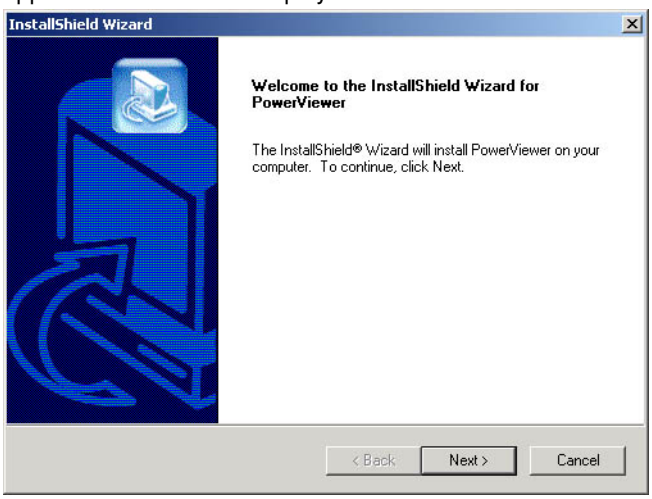
1.1 Installation

Have the system floppy disk (backup copy) containing the software ready. Exit all programs that are currently running before starting the installation.

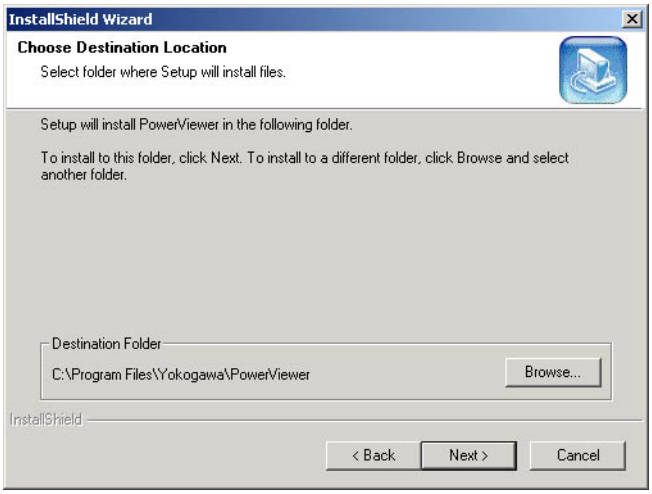
1. Start Windows.
2. Insert the first Power Viewer system floppy disk into the floppy drive.
3. Select **Run** from the **Start** menu, specify **Setup.exe** that is located at the root directory of the system floppy disk for **Open**, and click **OK**. The **InstallShield Wizard** preparation message appears.



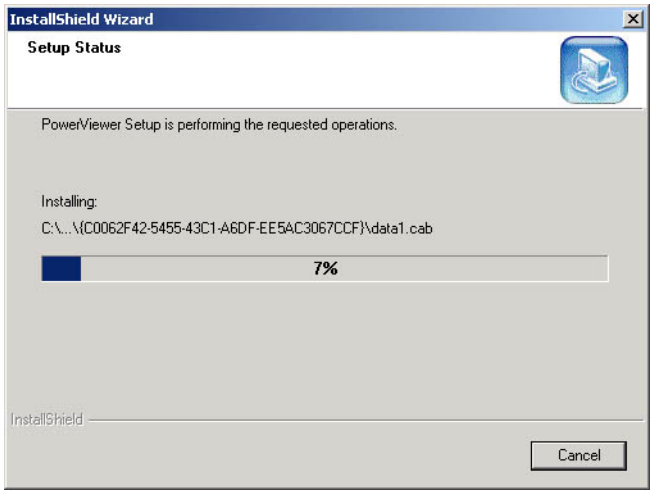
4. When the **InstallShield Wizard** preparation completes, the following screen appears. Click **Next** to display the **Choose Destination Location** dialog box.



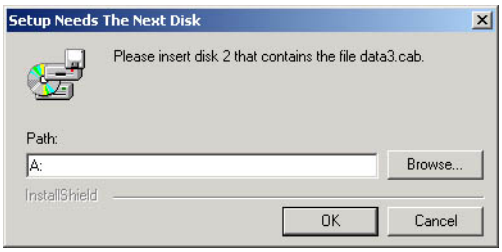
5. The default installation destination is set to “C:\Program Files\Yokogawa\Power Viewer.” Change the destination as necessary. After entering the destination, click the **Next**. The software installation is executed.



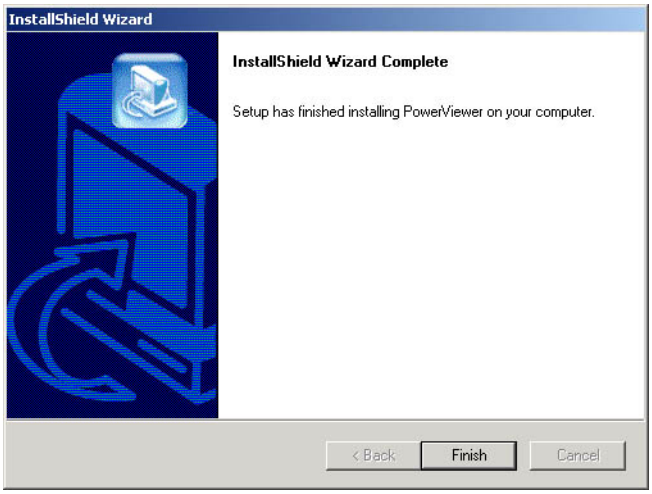
Screen during installation



6. When the message “Please insert the next disk, Disk 2” appears, insert the second system floppy disk into the floppy drive and click **OK**.



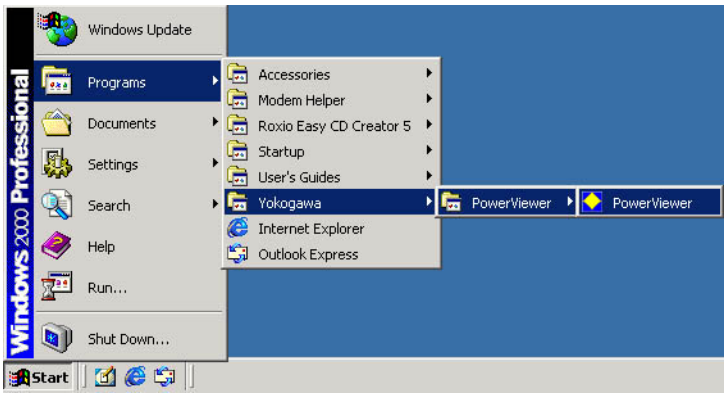
7. When the installation completes successfully, the following screen appears. Click **Finish**.



1.2 Starting the Software and Configuring Communications

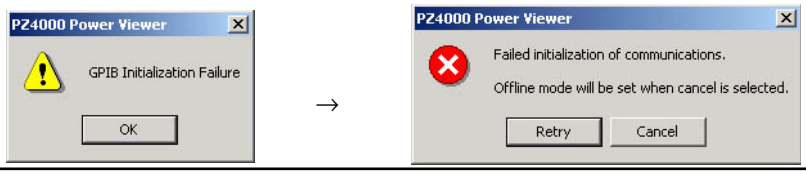
Starting the Software

1. Choose **PowerViewer** from the **Start** menu to start the software.
   If you are running the software for the first time after purchase, the program starts with the communication mode set to offline mode.



Note

The software retains the settings that existed when the software was closed the previous time. If you exit the software in online mode, the software starts in online mode the next time. In this case, if the communication with the PZ fails such as when the PZ is not turned ON, the following dialog box appears. To connect in online mode, click **Retry**; to connect in offline mode, click **Cancel**.

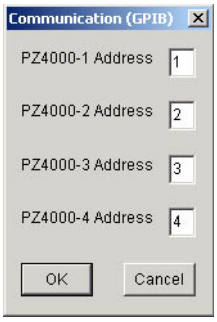


Setting the Connection Method

1. Choose **Connection Method** from the **Communications** menu. The Connection Method dialog box opens.
2. Select **GPIB** or **RS232**.

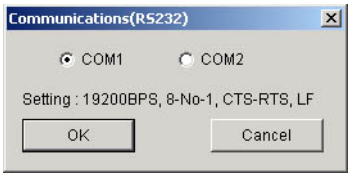
For GP-IB connection

3. If you select GPIB, the **Communication (GPIB)** dialog box used to set the address appears.
   Enter the addresses of PZ4000s that are connected (up to four units). Enter other unused values for addresses of unconnected PZ4000s. Make sure to enter unique addresses for **PZ4000-1** to **PZ4000-4**.



For serial (RS-232) connection

3. If you select RS232, the **Communication (RS232)** dialog box used to set the address appears.
   Select the option button of the port to be connected.



Note

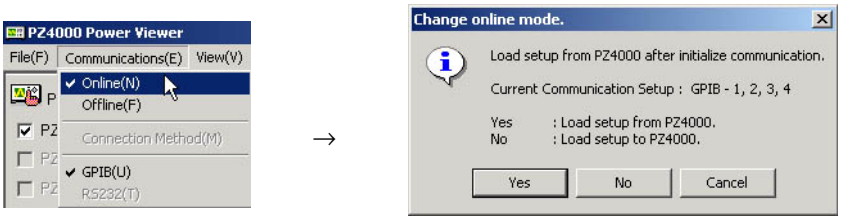
- In GP-IB connection, device triggers for multi-bus line messages are used to send measurement start commands to multiple PZ4000s.
- To perform synchronized measurements among multiple PZ4000s, use the combination of the trigger function of the PZ and the external trigger function. For a description of the trigger function, see section 7.2, “Selecting the Trigger Source” and 14.1, “External Trigger Output” in the *PZ4000 Power Analyzer User’s Manual* (IM253710-01E).

1.3 Switching the Communication Mode (Online/ Offline)

If you are running the software for the first time after purchase, the program starts in offline mode. To retrieve data from the PZ and save the data, you must set the communication to online mode.

Switching from Offline to Online

1. Choose **Online** from the **Communications** menu.
   The Change online mode dialog box appears.



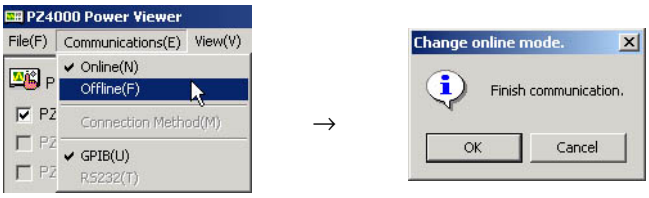
2. Select the handling of the setup parameters when set to online mode from the following:
   Yes: Loads the setup parameters from the PZ into the Power Viewer.
   No: Send setup parameters from the Power Viewer to the PZ.

Note

The software retains the settings that existed when the software was closed the previous time. If you exit the software in online mode, the software starts in online mode the next time.

Switching from Online to Offline

1. Choose **Offline** from the **Communications** menu.
   The Change online mode dialog box appears.



2. Click **OK** to switch the communication mode to offline.

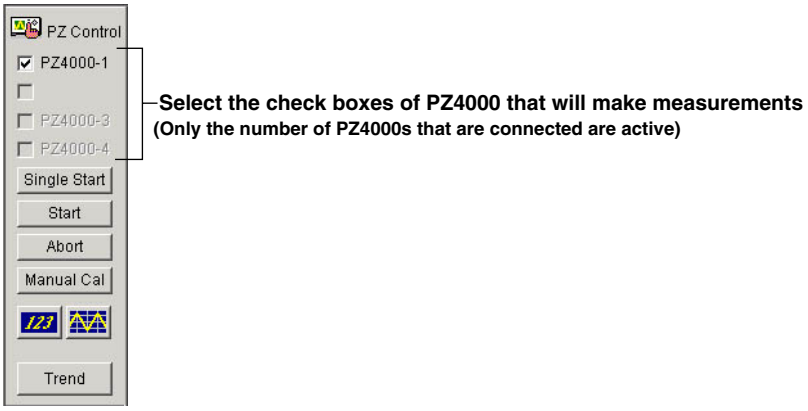
Note

In offline mode, you can load the file and display and analyze the data. You can also set the synchronization source for the zero cross setting. For the procedure in setting the synchronization source, see “When Zero Cross is selected” in section 4.4, “Setting the Measurement/Computation Period (Measure).” For details on the zero cross setting, see section 10.1, “Setting the Measurement/Computation Period, Re-computing” in the *PZ4000 Power Analyzer User’s Manual* (IM253710-01E).

2.1 Preparations before Loading the Data and Performing Measurements

Selecting PZ4000s That Will Make Measurements

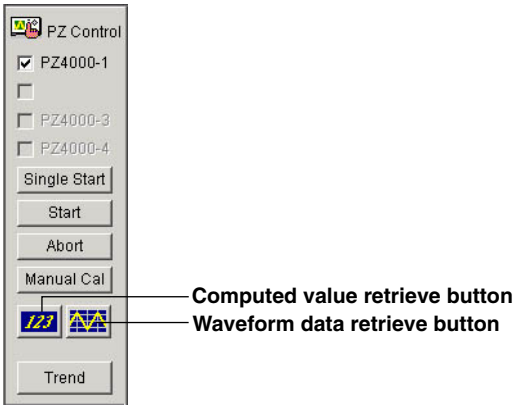
1. On the PZ Control menu, select the check boxes for **PZ4000-1** to **PZ4000-4** that will make measurements. Multiple PZ4000s can make measurements simultaneously.



Selecting the Type of Data to Be Retrieved during Measurement

The types of data that can be retrieved during measurement are computed data and waveform data.

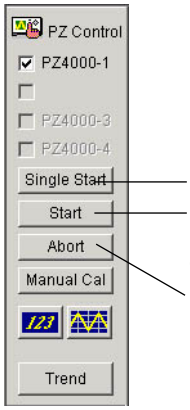
2. Click the computed value retrieve button or waveform data retrieve button on the PZ Control menu. To retrieve both types of data, click both buttons.
   To save the trend data, see “Saving Trend Data to Files” (page 3-4).



Starting/Stopping Measurements

3. Click **Single Start** to make a single measurement and retrieve the data from the PZ.
   Click **Start** to make repetitive measurements. The name of the button changes to Stop.
4. To stop repetitive measurements, click **Stop**. To abort the measurement, click **Abort**.

PZ Control menu

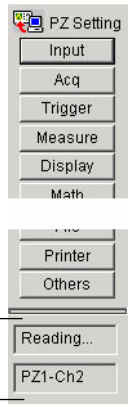


Click to perform measurement once and stop.

Click to change the button to Stop and perform measurements repetitively until the button is clicked again.

Click to abort measurements.

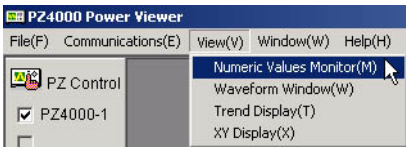
PZ Setting menu



Indicates the data transfer condition

Selecting the Display Screen

5. Select the display screen from the View menu bar. The following four types of screens are available.



Numeric Values Monitor: Displays numeric data that has been computed on the PZ4000.

Waveform Window: Displays the measured waveform that was retrieved from the PZ4000 and the waveform that was analyzed using the software.

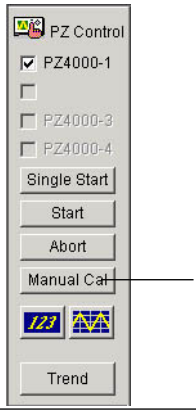
Trend Display: Display the trend of the computed data.

X-Y Display: Assigns one of the traces to the X axis to display the relationship with other traces.

Zero-Level Compensation

For a description of the zero-level compensation, see section 4.4, “Performing Zero-level Compensation” in the *PZ4000 Power Analyzer User’s Manual* (IM253710-01E).

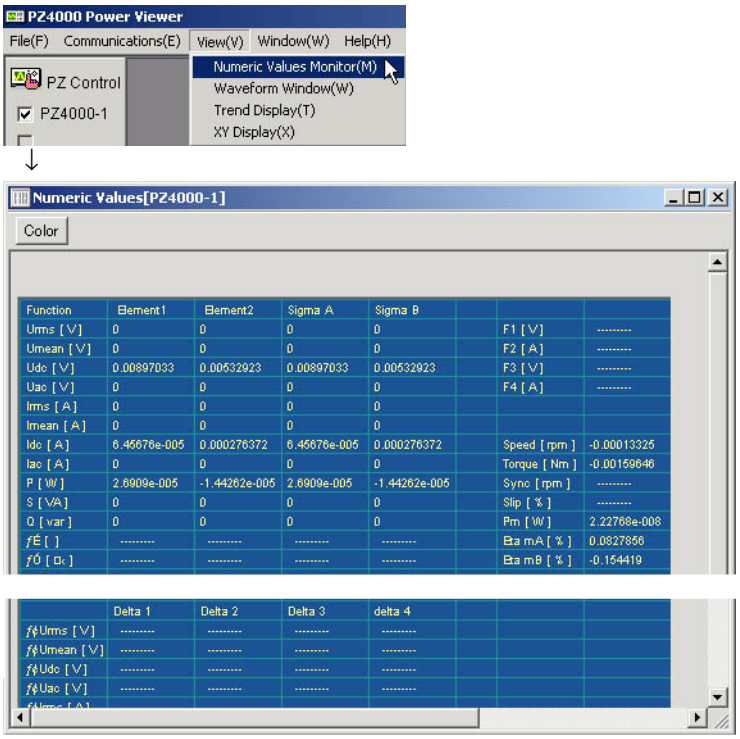
6. Click **Manual Cal** to carry out zero-level compensation of the PZ.



Click to perform zero-level compensation of the PZ.

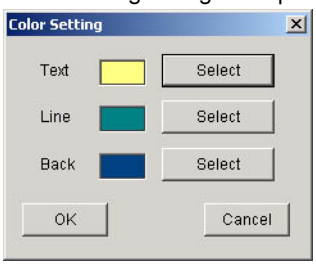
2.2 Numeric Values Monitor

1. Choose **Numeric Values Monitor** from the **View** menu. The **Numeric Values** window opens.



Setting the Text, Line, and Background Colors

2. Click the **Color** button at the upper left corner of the Numeric Values window. The Color Setting dialog box opens.

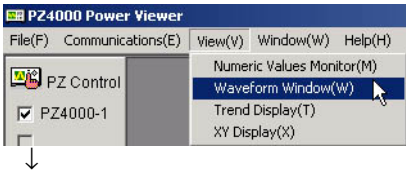


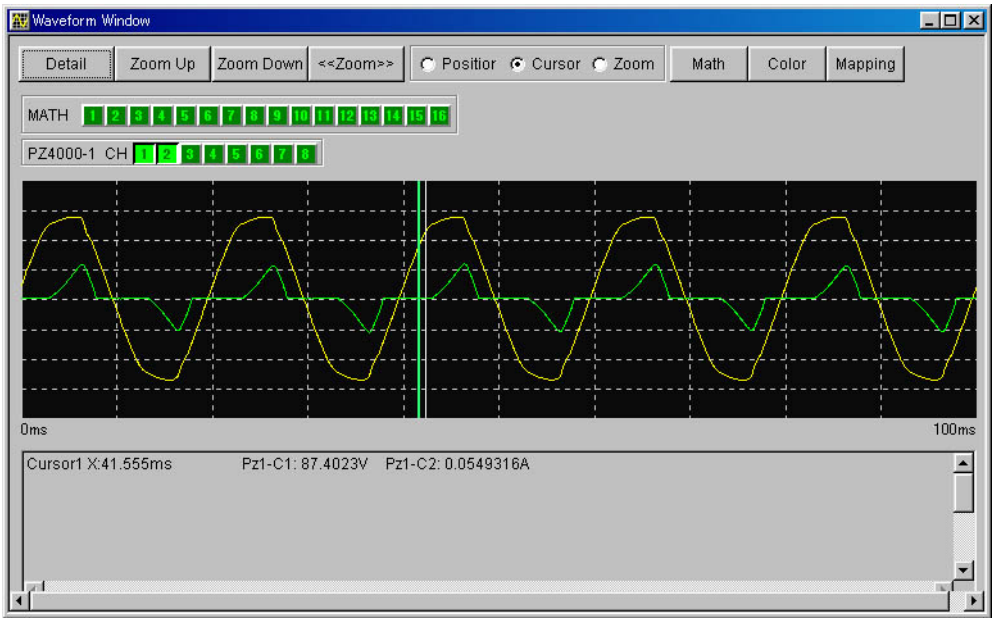
3. Click the **Select** button corresponding to the item you wish to set. The Color dialog box opens.

4. Click the desired color and click **OK**.
5. Click **OK** on the Color Setting dialog box.

2.3 Waveform Window

1. Choose **Waveform Window** from the **View** menu. The Waveform Window opens.





Turning ON/OFF the Waveform Data Display

2. Click the **1** to **8** buttons of PZ4000-* CH to display the corresponding measured waveform. Click the MATH **1** to **16** buttons to display the waveform that was analyzed using the software. The buttons corresponding to the channels of which the waveform data display has been turned ON changes to a brighter green color. If you click the button again, the waveform is cleared and the color of the button returns to its original color.

Moving the Waveform Position

3. Click the **Position** option button.
4. Click the waveform you wish to move to highlight the waveform (shown with thick lines). You can move the position of the waveform vertically by dragging the waveform in this condition. The upper and lower limits are automatically adjusted.

Cursor (Marker) Operation

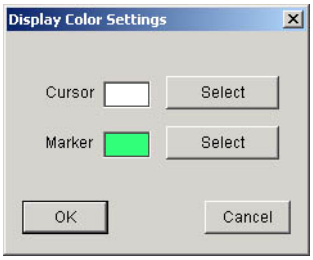
5. Click the **Cursor** option button.
6. On the graph, click the position where you wish to place a marker. A green vertical cursor appears. The value of the channel at the coordinates and the computed value analyzed using the software are displayed in the text box below the graph. Up to two markers can be displayed. To clear a marker, double-click on the graph.

Expanding the Waveform Horizontally

7. Click the **Zoom** option button.
8. Specify the range by dragging the mouse over the waveform display range you wish to expand.
9. Click the **<<Zoom>>** button to zoom in on the waveform.

Setting the Cursor Colors

10. Click **Color** to display the Display Color Settings dialog box.



11. Click the **Select** button by Cursor or Marker and select the color on the Color dialog box.

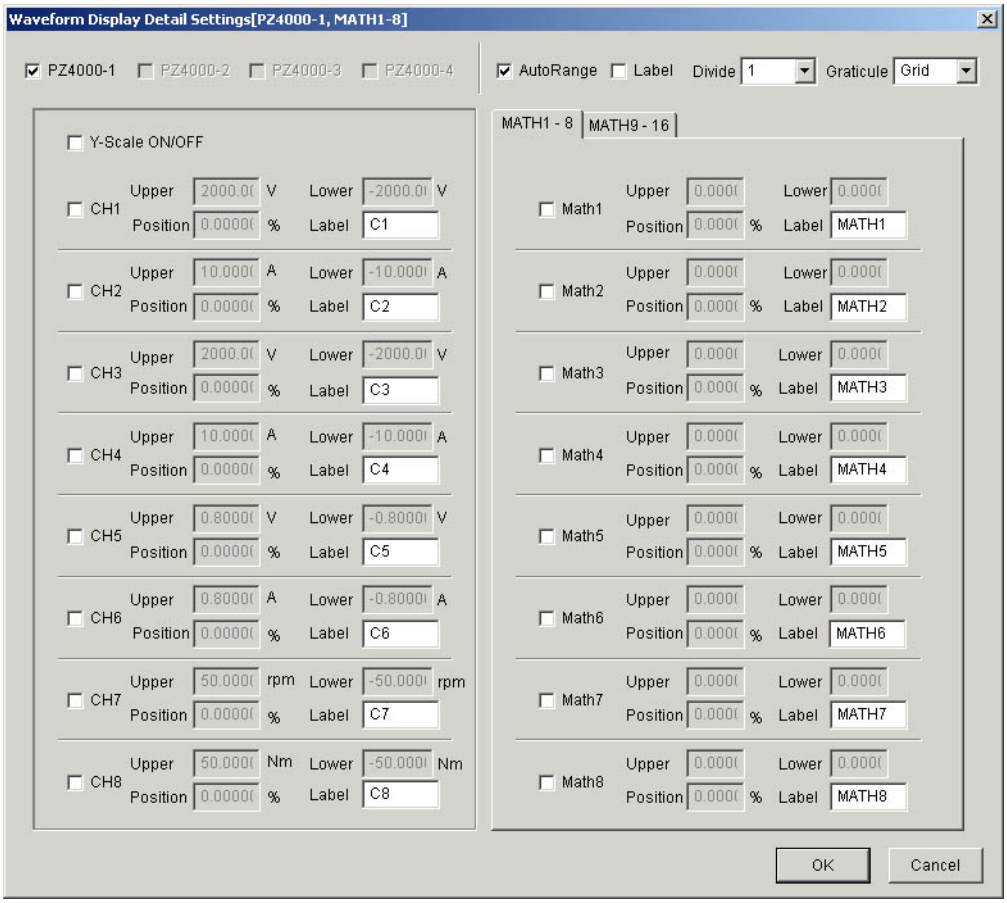
12. Click **OK** to close the Color dialog box.
13. Click **OK** to close the Display Color Setting dialog box.

Expanding/Reducing the Waveform Vertically

14. Click **Zoom Up** to expand the waveform vertically by a factor between 1 to 10000 in 1-2-4 steps. Click **Zoom Down** to reduce the waveform vertically.

Detailed Settings of the Waveform Display

1. Click **Detail** on the **Waveform Window** to display the Waveform Display Detail Settings dialog box on which you can set the waveform display in detail.
   Use the left half of the Waveform Display Detail Settings dialog box to set the waveform display of CH1 through CH8.



2. Select the PZ4000 (PZ4000-1 to PZ4000-4) to be set in detail using the check box.

Turning ON/OFF the Y-axis Scale

3. Select the **Y-Scale ON/OFF** check box to display the upper and lower limits to the left of the graph.

Waveform Display ON/OFF

4. Select the check boxes to the left of **CH1** to **CH8** to turn ON the waveform display.

Setting the Range

5. Enter the upper and lower limits of the graph in the **Upper** and **Lower** boxes, respectively. You cannot set the range, if the AutoRange check box (see step 8) is selected.

Setting the Display Position

6. To move the displayed position of the waveform vertically, specify the position in terms of a percentage from the ground level in the **Position** box. Specify a positive value to move upward, a negative value to move downward. You cannot set the position, if the AutoRange check box (see step 8) is selected.

Setting Waveform Labels and Turning Labels ON/OFF

7. Enter labels for each channel and Math waveforms in the **Label** text box using up to eight characters. Select the **Label** check box to display the entered string on the graph.

Auto Range Mode

8. Check the **AutoRange** check box to enter the auto range mode in which the upper and lower limits of the graph are automatically set.

Note

If computed data does not exist or when an extremely large value exists in the Math waveform, the waveform may not appear if displayed in the auto range mode. In such cases, clear the auto range mode.

Split Screen

9. From the **Divide** box, select the number of divisions of the graph in the range of **1** to **4**.

Grid Style

10. From the **Graticule** list, select **Grid**, **Frame**, or **Cross**.

Selecting Math

The right half of the Waveform Display Detail Settings dialog box is used to set the display of computed waveforms that are to be computed by the software (similar to the waveform settings of CH1 through CH8).

11. Click the **Math1-8** or **Math9-16** tab containing the appropriate Math channel.

Turning ON/OFF the Waveform Display

12. Select the check boxes to the left of **Math1** to **Math8** or **Math9** to **Math16** to turn ON the waveform display.

Then, set other items by carrying out steps 5 to 10 in a similar fashion.

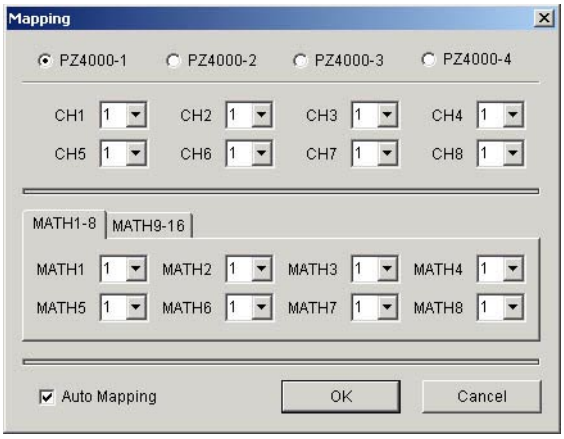
Exiting the Waveform Display Detail Setting dialog box

13. Click the **OK** button to close the Waveform Display Detail Setting dialog box.

Waveform Mapping

Mapping refers to the act of assigning waveforms to each graph when using split screen. By factory default, auto mapping mode is enabled. In auto mapping mode, the waveforms of CH1, CH2, ..., Math1, Math2 are assigned in order from the first divided screen skipping the channels that are turned OFF. You can also clear auto mapping and manually assign the channels.

1. Click **Mapping** on the Waveform Window to display the Mapping dialog box.



Turning ON/OFF Auto Mapping Mode

2. Select the **Auto Mapping** check box to enable auto mapping mode. Clear the check box to disable auto mapping mode allowing you to manually map the channels.

Assigning Graphs (Manual Mapping)

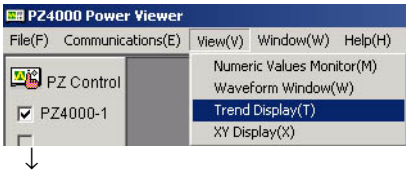
3. Check that auto mapping mode is disabled.
4. Select the number of the graph for displaying each channel from **1** to **4**.

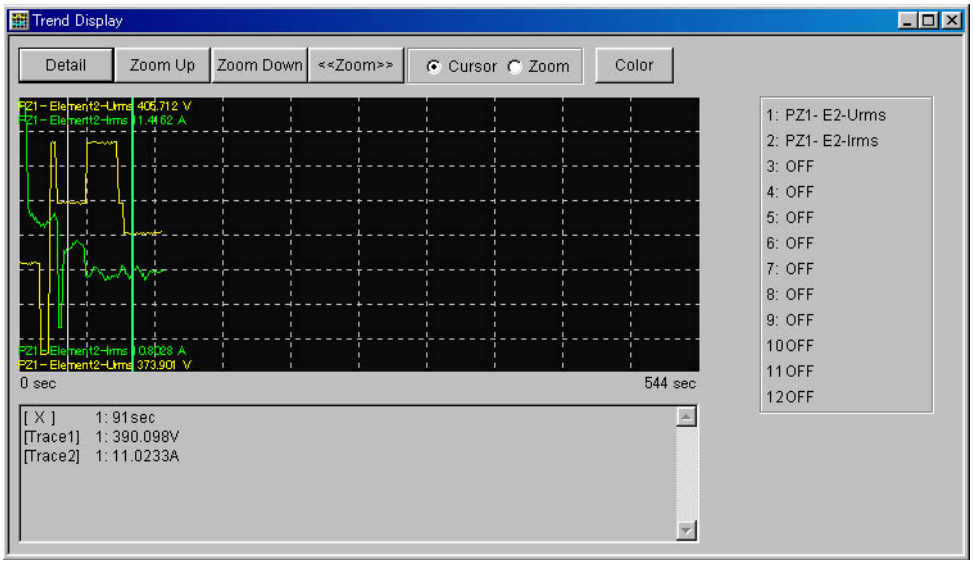
Exiting the Waveform Mapping Settings

5. Click the **OK** button to close the Mapping dialog box.

2.4 Trend Display

1. Choose **Trend Display** from the **View** menu. The **Trend Display** window opens.



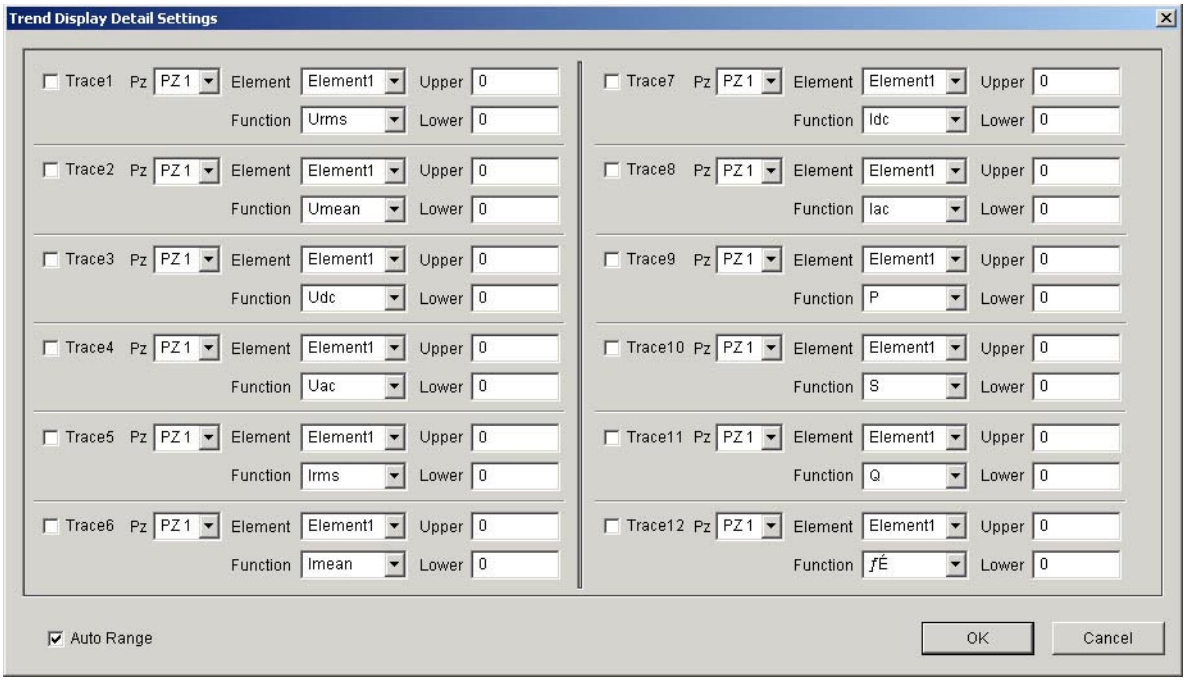


Note

The trend data is stored on the PC's hard disk. If the free space on the PC's hard disk falls below approximately 200 MB, a disk space error occurs, and measurements and display updating are stopped.

Trend Display Detail Settings

2. Click **Detail** to display the Trend Display Detail Settings dialog box. You can assign the trend of numeric values to be displayed on an arbitrary trace.



3. Select the check boxes to the left of **Trace1** to **Trace12** to turn ON the display on the trend display window.
4. From the **Pz** list of each trace, choose the PZ of which the computed value is to be output from **PZ1** to **PZ4**.
5. From the **Element** list of each trace, choose the input element from **Element1** to **Element3**, **Motor**, Σ**A**, and Σ**B**.
6. From the **Function** list of each trace, select the function such as **Urms**, **Irms**, and **λ**.
7. Enter the upper and lower limits of the graph display range in the **Upper** and **Lower** boxes of each trace, respectively. You cannot set the range, if the AutoRange check box (see step 8) is selected.

Auto Range Mode

8. Check the **AutoRange** check box to enter the auto range mode in which the upper and lower limits of the graph are automatically set.

Cursor (Marker) Operation

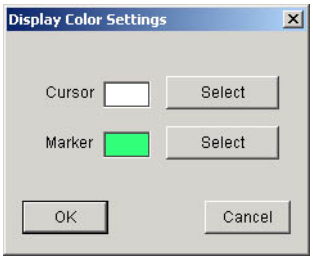
9. Click the **Cursor** option button.
10. On the graph, click the position where you wish to place a marker. A green vertical cursor appears. The value of the channel at the coordinates and the computed value analyzed using the software are displayed in the text box below the graph. Up to two markers can be displayed. To clear a marker, double-click on the graph.

Expanding the Waveform Horizontally

11. Click the **Zoom** option button.
12. Specify the range by dragging the mouse over the waveform display range you wish to expand.
13. Click **<<Zoom>>** to display the selected range in a separate window.

Setting the Cursor Colors

14. Click **Color** to display the Display Color Settings dialog box.



15. Click the **Select** button by Cursor or Marker and select the color on the Color dialog box.

16. Click **OK** to close the Color dialog box.
17. Click **OK** to close the Display Color Setting dialog box.

Expanding/Reducing the Waveform Vertically

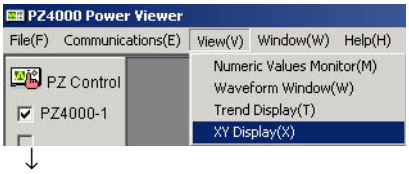
18. Click **Zoom Up** to expand the waveform vertically by a factor between 1 to 10000 in 1-2-4 steps. Click **Zoom Down** to reduce the waveform vertically.

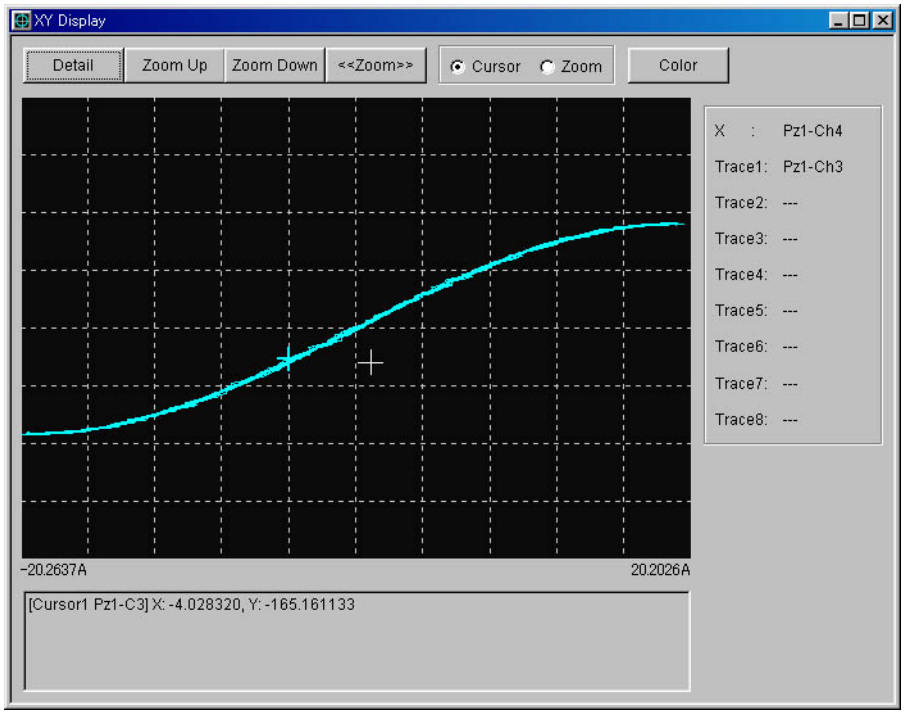
Exiting the Trend Display Detail Settings

19. Click the **OK** button to close the Trend Display Detail Settings dialog box.

2.5 X-Y Display

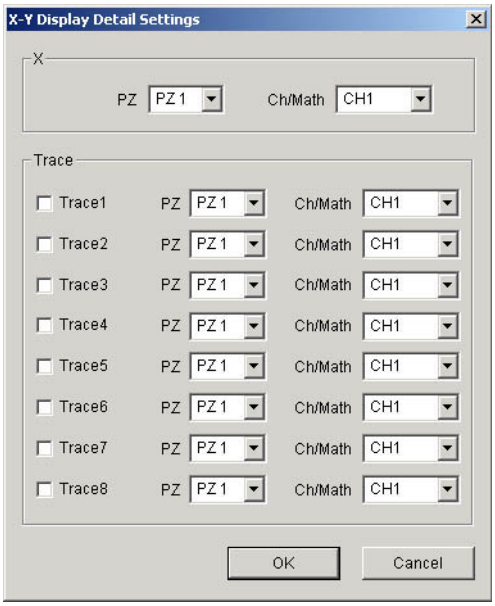
1. Choose **X-Y Display** from the **View** menu. The X-Y Display window opens.





X-Y Display Detail Settings

2. Click **Detail** in the **X-Y Display** window to display the X-Y Display Detail Settings dialog box.



Setting the Waveform Trace of the X-axis

The parameters under X are used to specify the reference trace that is to be assigned to the X-axis.

3. From the **PZ** list, select from **PZ1** to **PZ4** for a PZ channel or **Math** for Math.
   From the **Ch/Math** list, select from **Ch1** to **Ch8** or from **Math1** to **Math16**.

Selecting the Y-axis Traces

The parameters under Y are used to specify the reference traces of the Y-axis. You can select up to eight traces to be displayed on the Y-axis. This excludes the trace that was selected for the X-axis.

4. Select the check boxes to the left of **Trace1** to **Trace8** to turn ON the display on the X-Y display window. The display is turned OFF by clearing the check boxes.
   From the **PZ** list, select from **PZ1** to **PZ4** for a PZ channel or **Math** for Math.
   From the **Ch/Math** list, select from **Ch1** to **Ch8** or from **Math1** to **Math16**.

Exiting the X-Y Display Detail Settings

5. Click the **OK** button to close the X-Y Display Detail Settings dialog box.

Cursor (Marker) Operation

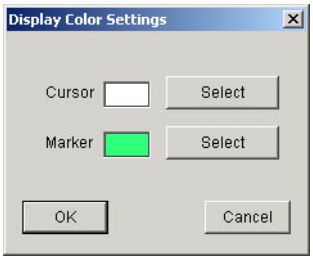
6. Click the **Cursor** option button.
7. On the graph, click the position where you wish to place a marker. A green vertical cursor appears. The value of the channel at the coordinates and the computed value analyzed using the software are displayed in the text box below the graph.
   Up to two markers can be displayed. To clear a marker, double-click on the graph.

Expanding the Waveform Horizontally

8. Click the **Zoom** option button.
9. Specify the range by dragging the mouse over the waveform display range you wish to expand.
10. Click **<<Zoom>>** to display the selected range in a separate window.

Setting the Cursor Colors

11. Click **Color** to display the Display Color Settings dialog box.



12. Click the **Select** button by Cursor or Marker and select the color on the Color dialog box.

13. Click **OK** to close the Color dialog box.
14. Click **OK** to close the Display Color Setting dialog box.

Expanding/Reducing the Waveform Vertically

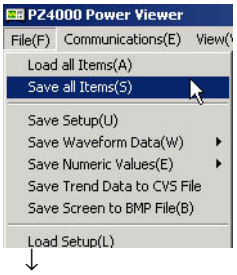
15. Click **Zoom Up** to expand the waveform vertically by a factor between 1 to 10000 in 1-2-4 steps. Click **Zoom Down** to reduce the waveform vertically.

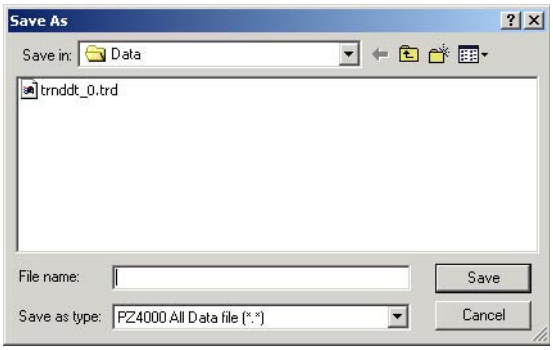
3.1 Saving Waveform Data, Numeric Values, and Setup Parameters

Collectively Saving the Setup Parameters, Waveform Data, and Numeric Values to Files

Saves the setup parameters, waveform data, and numeric values in a single folder.

1. Choose **Save all Items** from the **File** menu.
   The Save As dialog box opens.





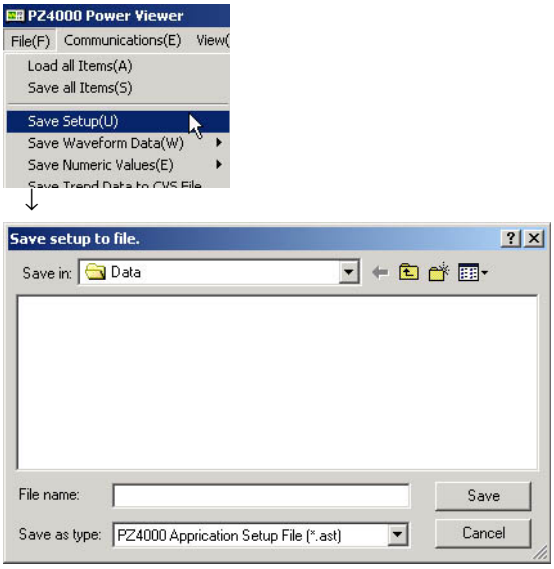
2. Specify the save destination and enter the file name. The extension is not necessary.
3. Click **Save** to save the following files to the specified folder.

Setup parameter file:	sample.ast
Waveform data file name for PZ1:	sample_Unit1.WVF
Waveform header file name for PZ1:	sample_Unit1.HDR
Waveform data file name for PZ2:	sample_Unit2.WVF
Waveform header file name for PZ2:	sample_Unit2.HDR
Waveform data file name for PZ3:	sample_Unit3.WVF
Waveform header file name for PZ3:	sample_Unit3.HDR
Waveform data file name for PZ4:	sample_Unit4.WVF
Waveform header file name for PZ4:	sample_Unit4.HDR
Numeric value file for PZ1:	sample_Unit1.FLD
Numeric value file for PZ2:	sample_Unit2.FLD
Numeric value file for PZ3:	sample_Unit3.FLD
Numeric value file for PZ4:	sample_Unit4.FLD

(The above example assumes that sample was specified for the file name. If there is only a single PZ, the "_Unit*" section of the name is not attached.)

Saving Setup Parameters to a File

1. Choose **Save Setup** from the **File** menu.
   The Save setup to file dialog box opens.



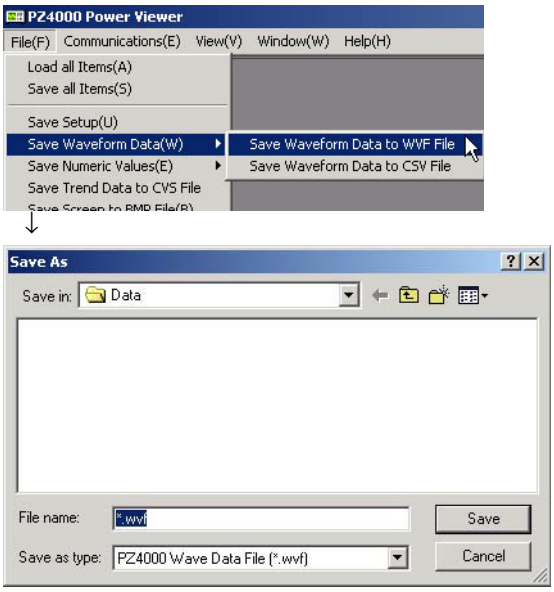
2. Specify the save destination and enter the file name. The extension is not necessary.
3. Click **Save** to create a file with specified name with .ast extension and save the setup parameters.

Note

If you specify the extension for the file name, the extension is discarded, and .ast is added.

Saving Waveform Data to Files

1. From the **File** menu, point to **Save Waveform Data** and then choose **Save Waveform Data to WVF File** or **Save Waveform Data to CSV File**.
   The Save As dialog box opens.



2. Specify the save destination and enter the file name. The extension is not necessary.

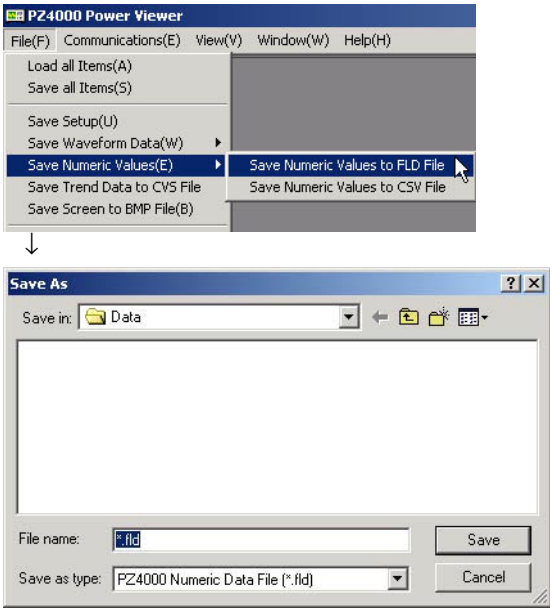
3. If you selected Save Waveform Data to WVF File and click **Save**, the following files are saved to the specified folder.
   Waveform data file name for PZ1: sample_Unit1.WVF
   Waveform header file name for PZ1: sample_Unit1.HDR
   Waveform data file name for PZ2: sample_Unit2.WVF
   Waveform header file name for PZ2: sample_Unit2.HDR
   Waveform data file name for PZ3: sample_Unit3.WVF
   Waveform header file name for PZ3: sample_Unit3.HDR
   Waveform data file name for PZ4: sample_Unit4.WVF
   Waveform header file name for PZ4: sample_Unit4.HDR
   (The above example assumes that sample was specified for the file name. If there is only a single PZ, the "_Unit*" section of the name is not attached.)
4. If you selected Save Waveform Data to CSV File and click **Save**, the waveforms that are shown on the waveform display (if only CH1 is ON, only CH1) are saved to the specified folder. In addition, if the waveform is displayed expanded (zoom function), the waveform in the expanded range is saved to the file. If Math waveforms are displayed, they are saved to a separate file.
   Waveform data file name for PZ1: sample_Unit1.CSV
   Waveform data file name for PZ2: sample_Unit2.CSV
   Waveform data file name for PZ3: sample_Unit3.CSV
   Waveform data file name for PZ4: sample_Unit4.CSV
   Waveform data file name for Math: sample_Analysis.CSV

Note

The waveform data file (.hdr extension) is required when loading the waveform data file (.wvf extension) using this software program. If the waveform header file does not exist in the same directory, the waveform data file cannot be loaded.

Saving Numeric Values to Files

1. From the **File** menu, point to **Save Numeric Values** and then choose **Save Numeric Values to FLD File** or **Save Numeric Values to CSV File**.
   The Save As dialog box opens.



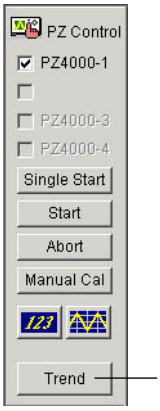
2. Specify the save destination and enter the file name. The extension is not necessary.

3. If you selected Save Numeric Values to FLD File and click **Save**, the following files are saved to the specified folder.
   Numeric value file for PZ1: sample_Unit1.FLD
   Numeric value file for PZ2: sample_Unit2.FLD
   Numeric value file for PZ3: sample_Unit3.FLD
   Numeric value file for PZ4: sample_Unit4.FLD
   (The above example assumes that sample was specified for the file name. If there is only a single PZ, the "_Unit*" section of the name is not attached.)
4. If you selected Save Numeric Values to CSV File and click **Save**, the following files are saved to the specified folder.
   Numeric value file for PZ1: sample_Unit1.CSV
   Numeric value file for PZ2: sample_Unit2.CSV
   Numeric value file for PZ3: sample_Unit3.CSV
   Numeric value file for PZ4: sample_Unit4.CSV

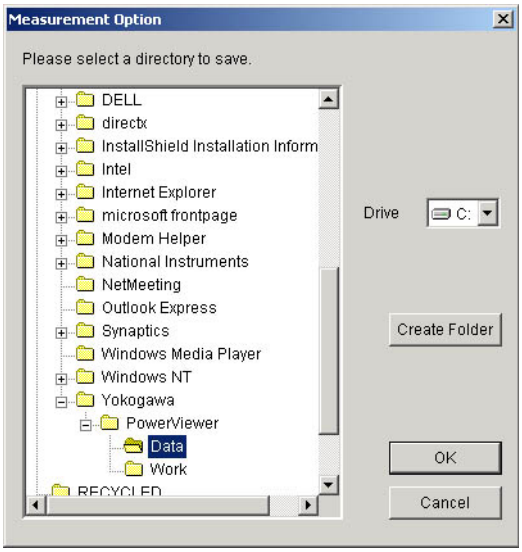
Saving Trend Data to Files

The computed values during measurement are saved. The extension for trend data is .trd.

1. Click the **Trend** button on the PZ Control menu.
   The Measurement Option dialog box opens.



Click to select the drive and directory in which the trend data is to be saved.



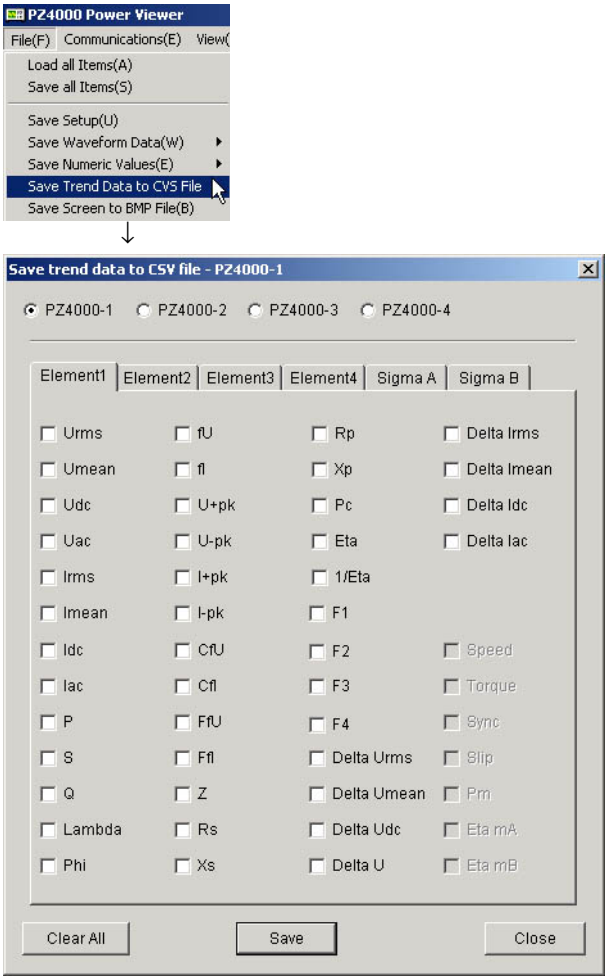
2. Select the destination drive and directory and click **OK**.
   To save to a new directory, click **Create Folder**. A new folder is created. Change the folder name.

3. Click the **Start** button on the PZ Control menu to save the data while making measurements.

Click to save data while performing trend measurements.

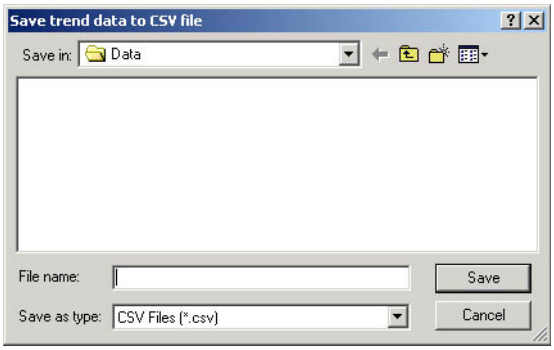
The trend data can also be saved to a CSV file.

1. Choose **Save Trend Data to CSV File** from the **File** menu.
   The Save trend data to CSV file dialog box opens.



2. Select the PZ for saving the data and select the check boxes for the items to be saved.
   Click **Clear All** to clear the check boxes of all items.

3. Click **Save** to open the Save trend data to CSV file dialog box.



4. Select the save destination, enter the file name (the extension is not necessary), and click **Save**.
5. Click **Close** to close the dialog box.

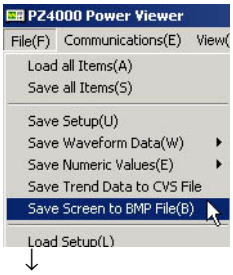
Note

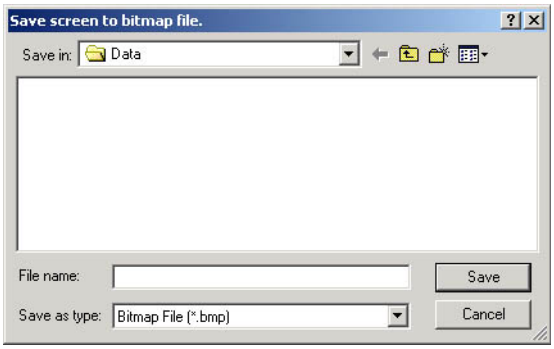
The trend data is stored on the PC's hard disk. If the free space on the PC's hard disk falls below approximately 200 MB, a disk space error occurs, and measurements and display updating are stopped.

Saving the Screen Image to a File

You can save the screen shot to a file in BMP format.

1. Switch to the screen (window) you wish to save (bring to the front).
2. Choose **Save Screen to BMP File** from the **File** menu.
   The Save screen to bitmap file dialog box opens.





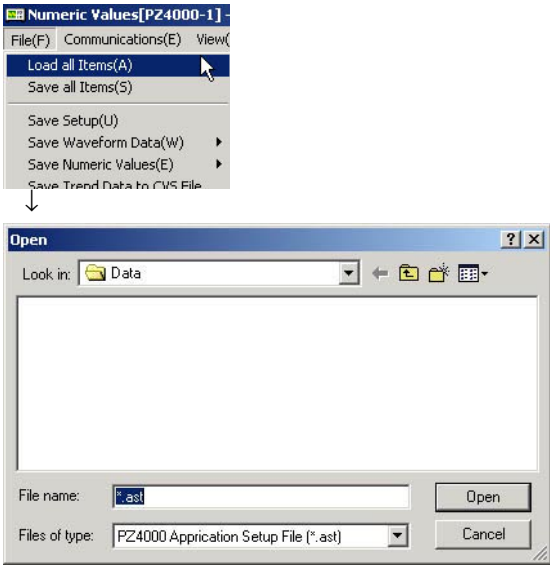
3. Select a file name and click **Save**. The screen image is save to a specified file name with .bmp extension.

3.2 Loading Waveform Data, Numeric Values, and Setup Parameters

Collectively Loading Setup Parameters, Waveform Data, and Numeric Values

All the files containing setup parameters, waveform data, and numeric values of the specified file name are loaded.

1. Choose **Load all Items** from the **File** menu.
   The Open dialog box opens.



2. In the directory containing the files to be loaded, select a file name with .ast extension.
4. Click **Open** to load the following files from the specified directory.

Setup parameter file:	sample.ast
Waveform data file name for PZ1:	sample_Unit1.WVF
Waveform header file name for PZ1:	sample_Unit1.HDR
Waveform data file name for PZ2:	sample_Unit2.WVF
Waveform header file name for PZ2:	sample_Unit2.HDR
Waveform data file name for PZ3:	sample_Unit3.WVF
Waveform header file name for PZ3:	sample_Unit3.HDR
Waveform data file name for PZ4:	sample_Unit4.WVF
Waveform header file name for PZ4:	sample_Unit4.HDR
Numeric value file for PZ1:	sample_Unit1.FLD
Numeric value file for PZ2:	sample_Unit2.FLD
Numeric value file for PZ3:	sample_Unit3.FLD
Numeric value file for PZ4:	sample_Unit4.FLD

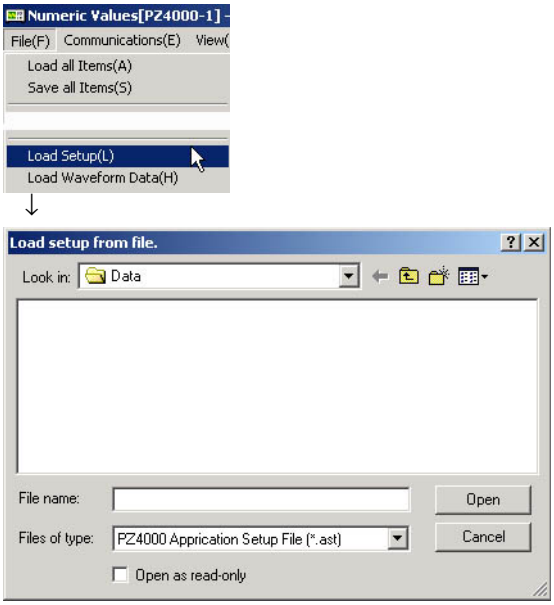
(The above example assumes that sample was specified for the file name. If there is only a single PZ, the "_Unit*" section of the name is not attached.)

Note

- The data of files with the same file name in the directory containing the setup parameter file (.ast extension) is loaded.
- If the setup parameter file does not exist, the data cannot be loaded.

Loading Setup Parameter from a File

1. Choose **Load Setup** from the **File** menu.
   The Load setup from file dialog box opens.



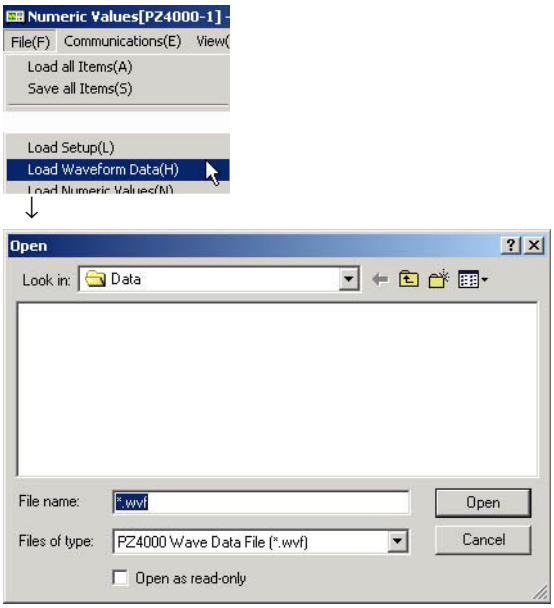
2. Select the directory and the name of the file to be loaded.
3. Click **Open** to load the selected file.
   The setup parameters of the software are set to the contents of the loaded file.

Note

The software can only load setup parameter files with .ast extension. The setup parameter file of the PZ4000 (.set extension) cannot be loaded into the Power Viewer.

Loading Waveform Data from Files

1. Choose **Load Waveform Data** from the **File** menu.
   The Open dialog box opens.



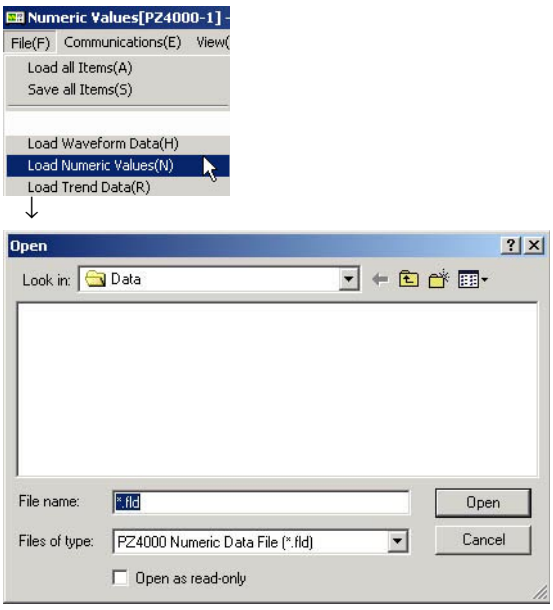
2. In the directory containing the files to be loaded, select a file name with .wvf extension.
3. Click **Open** to load the following files from the specified directory.
   Waveform data file name for PZ1: sample_Unit1.WVF
   Waveform header file name for PZ1: sample_Unit1.HDR
   Waveform data file name for PZ2: sample_Unit2.WVF
   Waveform header file name for PZ2: sample_Unit2.HDR
   Waveform data file name for PZ3: sample_Unit3.WVF
   Waveform header file name for PZ3: sample_Unit3.HDR
   Waveform data file name for PZ4: sample_Unit4.WVF
   Waveform header file name for PZ4: sample_Unit4.HDR
   (The above example assumes that sample was specified for the file name. If there is only a single PZ, the "_Unit*" section of the name is not attached.)

Note

- This software program can load the waveform data files that have been saved using the PZ4000 (.wvf extension). However, the header file with the same name (.hdr extension) must exist in the same directory.
- To load waveform data that has been saved using the PZ4000 into the software, carry out the steps below.
  1. Create a dedicated directory, and copy the files that have been saved using the PZ4000 (.wvf and .hdr extensions) to that directory.
  2. Assign an arbitrary same name to the waveform data file (.wvf extension) and the header file (.hdr extension).
     If you append "_Unit*" to the file name, the data can be loaded as data for the PZ with the specified number. For example, if you wish to load the data as PZ2 data, append "_Unit2" to the file name.

Loading Numeric Values from Files

1. Choose **Load Numeric Values** from the **File** menu.
   The Open dialog box opens.



2. In the directory containing the files to be loaded, select a file name with .fld extension.

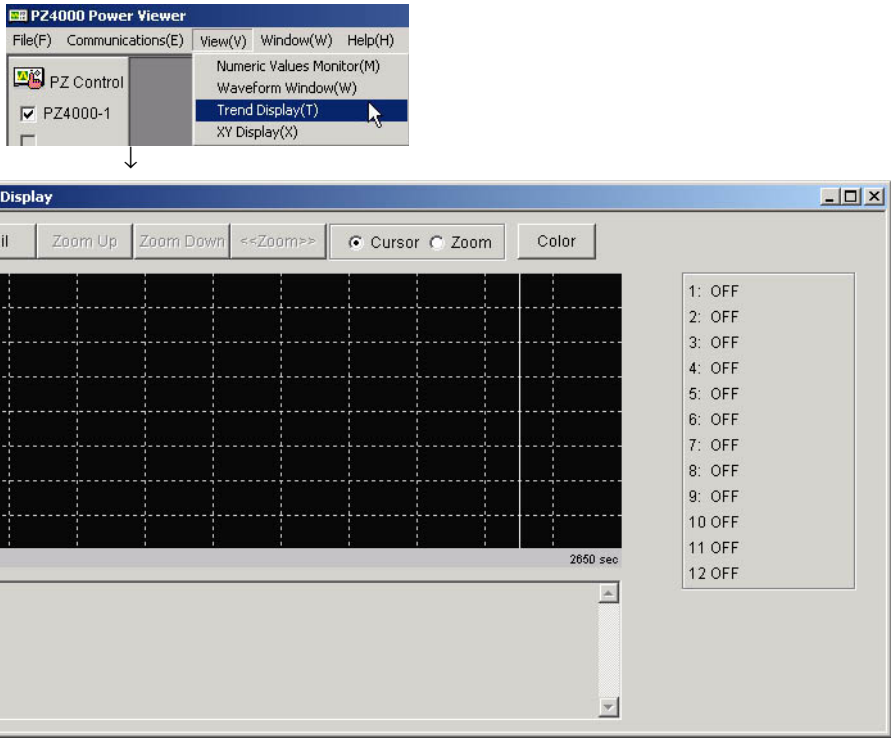
3. Click **Open** to load the following files from the specified directory.
   Numeric value file for PZ1: sample_Unit1.FLD
   Numeric value file for PZ2: sample_Unit2.FLD
   Numeric value file for PZ3: sample_Unit3.FLD
   Numeric value file for PZ4: sample_Unit4.FLD
   (The above example assumes that sample was specified for the file name. If there is only a single PZ, the "_Unit*" section of the name is not attached.)

Note

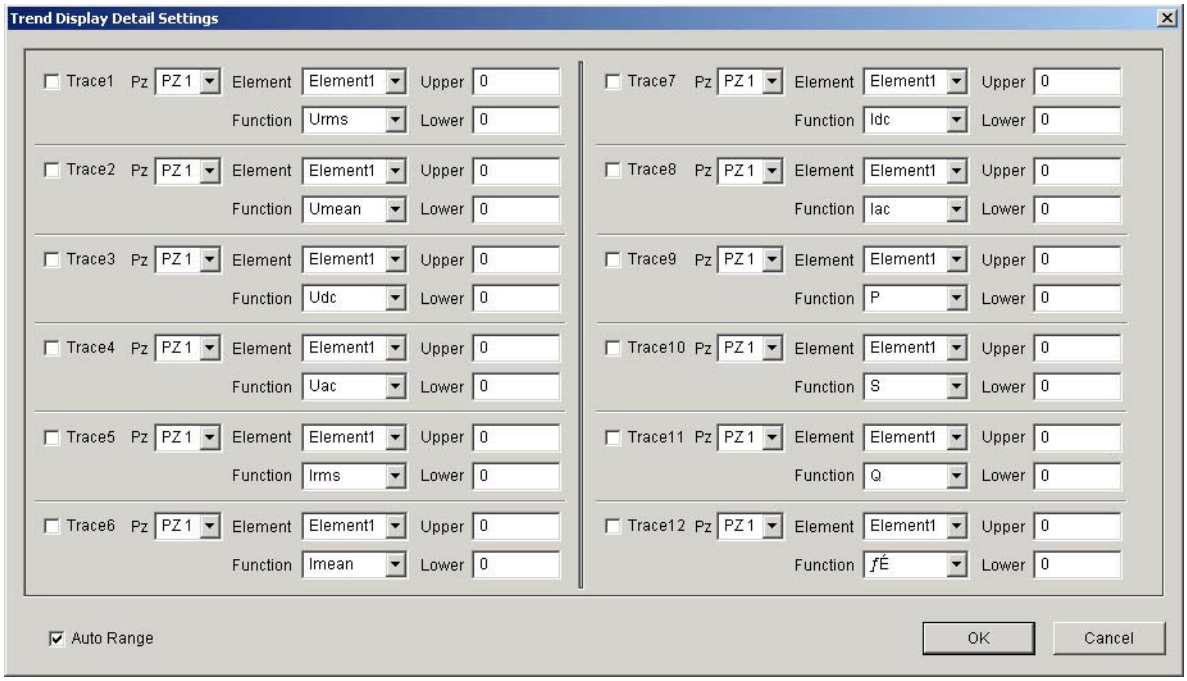
This software program cannot load numeric value files that have been saved using the PZ4000 (.fld extension).

Loading Trend Data from Files

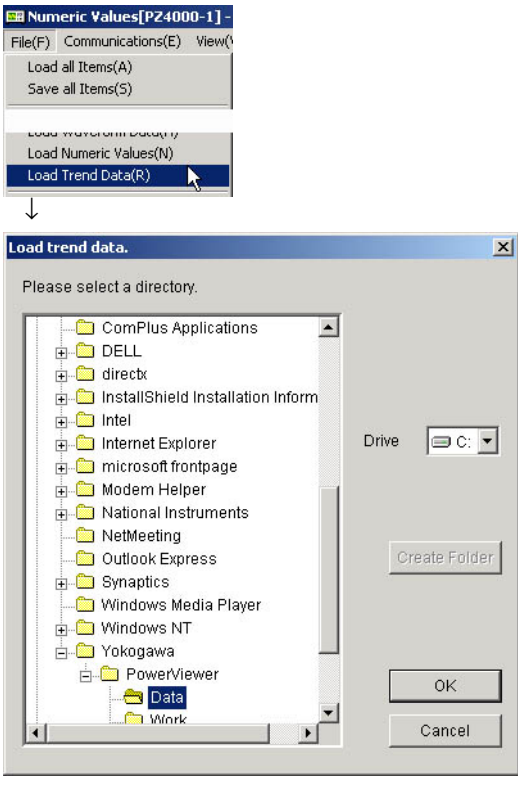
1. Choose **Trend Display** from the **View** menu. The **Trend Display** window opens.



2. Click **Detail** and set the trace on the Trend Display Detail Settings dialog box. For details on the procedure, see section 2.4, “Trend Display.”



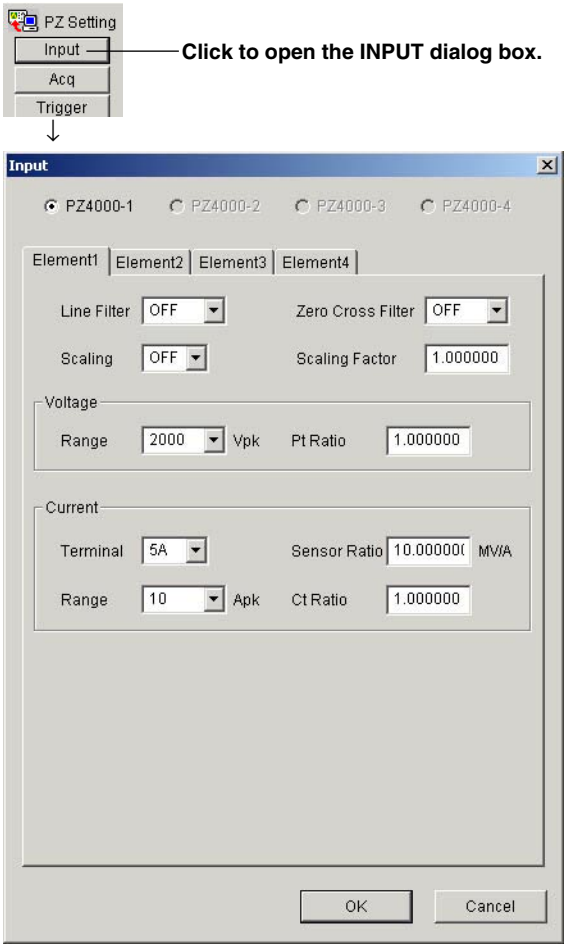
3. Choose **Load Trend Data** from the **File** menu.
The Load trend data dialog box opens.



4. Select the directory containing the file to be loaded and click **OK**. The file in the specified directory is loaded, and the trend display is updated.

4.1 Setting the Input Module

1. Click the **Input** button on the PZ Setting menu. The **INPUT** dialog box opens.



2. Click the option button corresponding to the PZ4000 (**PZ4000-1** to **PZ4000-4**) you wish to set.

Selecting the Element

3. Select the element (**Element1** to **Element4**).
   The setup parameters automatically change depending on the type of input module that you selected.
   If you selected the power measurement module, proceed to step 4; if you selected the motor module, proceed to step 5.

- **For the Power Measurement Module**

4. Set the following parameters.

Line Filter:	Select the input filter from **OFF** and **500Hz** to **1MHz**.
Zero Cross Filter:	Select the zero-crossing filter from **OFF**, **500Hz**, and **20KHz**.
Scaling:	Turn **ON** or **OFF** the scaling function.
Scaling Factor:	Enter the power coefficient (scaling factor).
Voltage Range:	Set the voltage range from **2000** to **30** Vpk and **Auto**.
Pt Rate:	Enter the PT ratio.
Current Terminal:	Set the current input terminal to **5A** or **Sen**. If the input module is 253752, select from **5A**, **20A**, **Sen**.

Current Range: Select the current range.
If Current Terminal is set to 5A, select the range from **10** to **0.1** Apk and **Auto**.
If Current Terminal is set to 20A, select the range from **100** to **0.1** Apk and **Auto**.
If Current Terminal is set to Sen, select the range from **1000** to **100** mVpk and **Auto**.

Sensor Ratio: Enter the current sensor transformation ratio. The unit is MV/A.

Ct Ratio: Enter the CT ratio.

- **For the motor module**

5. Set the following parameters.

Line Filter: Select the input filter from **OFF**, **100Hz**, and **500Hz**.

Zero Cross Filter: Select the zero-crossing filter from **OFF**, **100Hz**, and **500Hz**.

Speed Range: Select the input range of the revolution sensor signal from **50** to **1** Vpk and **Auto**.

Scaling: Enter the scaling coefficient of the revolution sensor signal.

Sensor Type: Set the revolution sensor signal type to **Analog** or **Pulse**.

Pulse N: Enter the pulse count N per rotation when the revolution sensor signal type (Sensor Type) is set to Pulse.

Frequency Range: Select the frequency range from **2k_200kHz** to **1_40Hz** and **Auto** from the drop-down list.

Unit: Enter the unit of the rotating speed using up to eight characters.

Correct: Turn **ON** or **OFF** the offset correction only when the rotation sensor signal type (Sensor Type) is set to Pulse.

Torque Range: Select the input range of the torque meter signal from **50** to **1** Vpk and **Auto**.

Scaling: Enter the scaling coefficient of the torque meter signal in the range from 0.0001 to 99999.9999.

Unit: Enter the unit of the torque using up to eight characters.

Pm Scaling: Enter the scaling coefficient of the motor output (Pm) in the range from 0.0001 to 99999.9999.

Unit: Enter the unit of the motor output (Pm) using up to eight characters.

Pole: Enter the motor's number of poles in the range from 1 to 99.

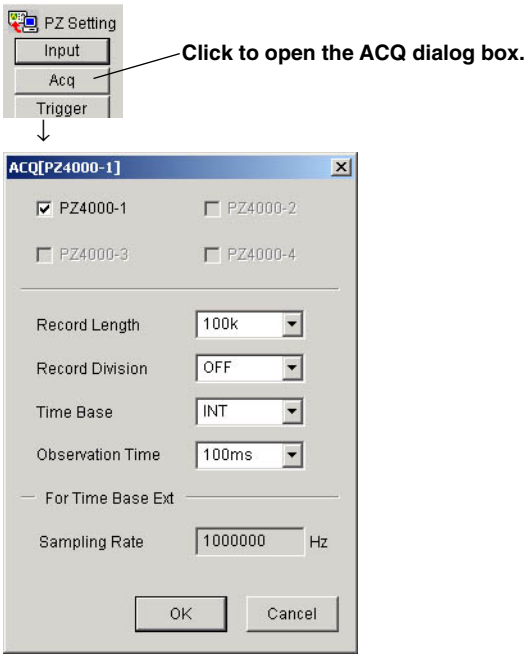
Sync Speed Source: Select the frequency measurement source (input channel for the voltage or current supplied by the motor) from **CH1** to **CH8**.

Sending the Settings

6. After setting all the parameters, click **OK** to close the dialog box.

4.2 Setting the Data Acquisition Method (ACQ)

1. Click the **ACQ** button on the PZ Setting menu. The **ACQ[PZ4000-*]** dialog box opens.



2. Select the PZ4000 (**PZ4000-1** to **PZ4000-4**) using the check box.
   You can select multiple PZs to specify the same settings.
3. Set the following parameters.

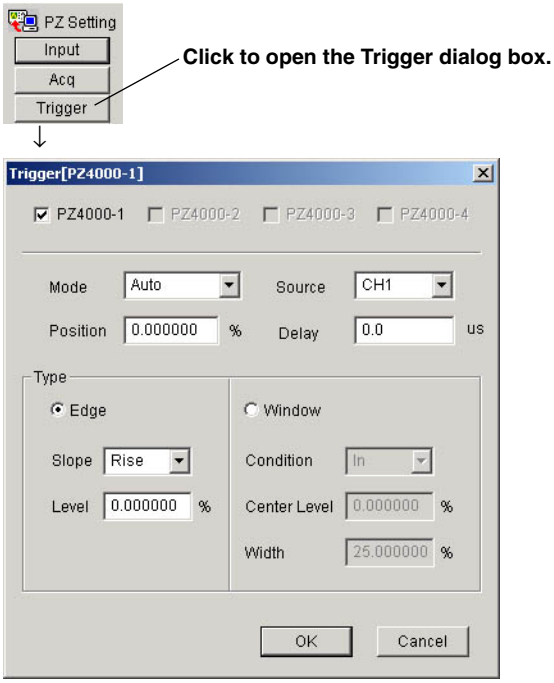
   Record Length: Select the record length to acquire data (ACQ Record Length) from **100k** to **4M**. (The selectable range varies depending on the memory extension option (suffix code /M1 or /M3) of the PZ.)
   Record Division: Select **ON** or **OFF** for the record length division.
   Time Base: Set the time base clock to **INT** (internal clock) or **EXT** (external clock).
   Observation Time: Select the observation time from **10**μ **s** to **1ks**.
   Sampling Rate: Enter the sampling rate. you can enter this value only when Time Base is set to EXT (external clock).

Sending the Settings

4. Click the **OK** button to close the dialog box.

4.3 Setting the Trigger

1. Click the **Trigger** button on the PZ Setting menu. The **Trigger[PZ4000-*]** dialog box opens.



2. Select the PZ4000 (**PZ4000-1** to **PZ4000-4**) using the check box.
   You can select multiple PZs to specify the same settings.
3. Set the following parameters.
   - Mode: Select the trigger mode from **OFF**, **Auto**, **AT-Level**, **Normal**, **HF Auto**, and **HF Normal**.
   - Source: Select the trigger source from **CH1** to **CH8** or **EXT** (external trigger signal).
   - Position: Enter the trigger position in the range of 0.00000 to 100.00000%. The position valid when Mode is not set to OFF.
   - Delay: Enter the trigger delay in the range of 0.0 to 1000000.0 μ s.
   - Type: Set the trigger type to **Edge** or **Window**.
     If you select Edge, proceed to step 4; if you select Window, proceed to step 5.

For Edge Trigger

4. Set the following parameters.
   - Slope: Set the up and down behavior of the trigger signal from **Rise**, **Fall**, amd **Both**.
   - Level: Enter the reference level of the trigger signal in the range from 0.0 to ±100%

For Window Trigger

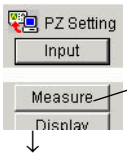
5. Set the following parameters.
   - Condition: Set the trigger condition to **In** (within the range) or **Out** (outside the range).
   - Center Level: Enter the center level of the window in the range from 0.0 to ±100%.
   - Width: Enter the window width in the range from 0.0 to ±200%.

Sending the Settings

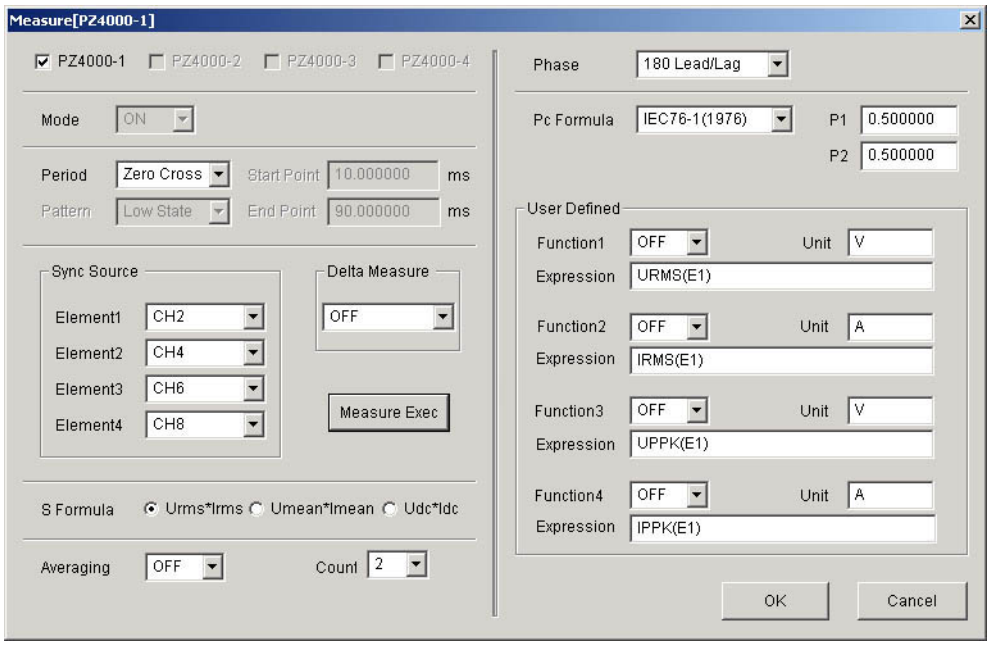
6. Click the **OK** button to close the dialog box.

4.4 Setting the Measurement/Computation Periods (Measure)

1. Click the **Measure** button on the PZ Setting menu. The **Measure[PZ4000-*]** dialog box opens.



Click to open the Measure dialog box.



2. Select the PZ4000 (**PZ4000-1** to **PZ4000-4**) using the check box.
   You can select multiple PZs to specify the same settings.

Setting the computation period

Set the following parameters.

3. Mode: Select **ON** or **OFF** for the computation.
   Period: Select the computation region from **Zero Cross** (zero-crossing region), **Cursor** (set the region using cursors), and **Ext Trigger** (external trigger). If you select Zero Cross, proceed to step 4; if you select Cursor, proceed to step 5; if you select Ext Trigger, proceed to step 6.

- **When Zero Cross is selected**

4. Set the following parameters.
   Sync Source: Set which input signal's zero crossing to synchronize to for each element. Select the target signal (synchronization source) from **CH1** to **CH8** and **Ext** (external clock signal).

Note

You can set the Sync Source even in offline mode. For details on the zero cross setting, see section 10.1, "Setting the Measurement/Computation Period, Re-computing" in the *PZ4000 Power Analyzer User's Manual* (IM253710-01E).

- **When Cursor is selected**

5. Set the following parameters.
   Start Point: Enter the point to start the computation.
   End Point: Enter the point to end computations.
   The selectable range is 0 to observation time.

- **When Ext Trigger is Selected**

6. Set the following parameters.
   Pattern: Select the signal pattern of the external trigger from the following:
   High State (measurement/computation period is the period during which the external trigger is Hi)
   Low State (measurement/computation period is the period during which the external trigger is Lo)

Selecting the Delta Computation

7. Select Delta Measure from the following:
   OFF: Does not perform delta computation.
   u1-u2: Computes the difference between the voltages of element 1 and element 2.
   i1-i2: Computes the difference between the currents of element 1 and element 2.
   3P3W>3V3A: Computes the other data when three-phase, three-wire (3P3W) is changed to three voltage, three current (3V3A)
   Delta>Star: Using the data of three-phase, three-wire system or three voltage, three current system, computes the star wiring data from the triangle wiring data.
   Star>Delt: Using the data of three-phase, four-wire system, computes the triangle wiring data from the star wiring data.

Setting the Equation for Apparent Power

8. Select the equation for apparent power by clicking **Urms*Irms**, **Umean*Imean**, or **Udc*Idc** using the **S Formula** option buttons.

Setting the Averaging Function

9. From the **Averaging** list, select **ON** or **OFF**.
10. From the **Count** list, select the averaging count from **2** to **64**.

Setting the Display Format of the Phase Difference

11. From the **Phase** list, select either of the following:
    180Lead/Lag: Displays ϕusing 180-degree notation by which the counter-clock wise direction indicates a lead and the clockwise direction indicates a lag with the positive vertical axis as a reference.
    360degrees: Displays ϕusing 360-degree notation in the clockwise direction with the positive vertical axis as a reference.

Setting the Equation for Corrected Power

12. From the **PC Formula** list, select **IEC76-1(1976)** or **IEC76-1(1993)**.
    Enter the coefficients P1 and P2 in the range of 0.0001 to 9.9999.

Setting the User-Defined Function

13. You can set up to four user-defined functions. The user-defined functions are entered in **Function1** to **Function4** under **User Defined**.
    Function: Select **ON** (perform computation) or **OFF** (do not perform computation).
    Unit: Enter the unit using up to 8 characters.
    Expression: Enter the equation. For details on equations, see chapter 10, "Numerical Computations" in the *PZ4000 Power Analyzer User's Manual* (IM253710-01E).

Executing Computations

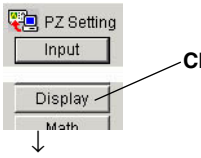
14. Click **Measure Exec** to transmit the computation command to the PZ4000.

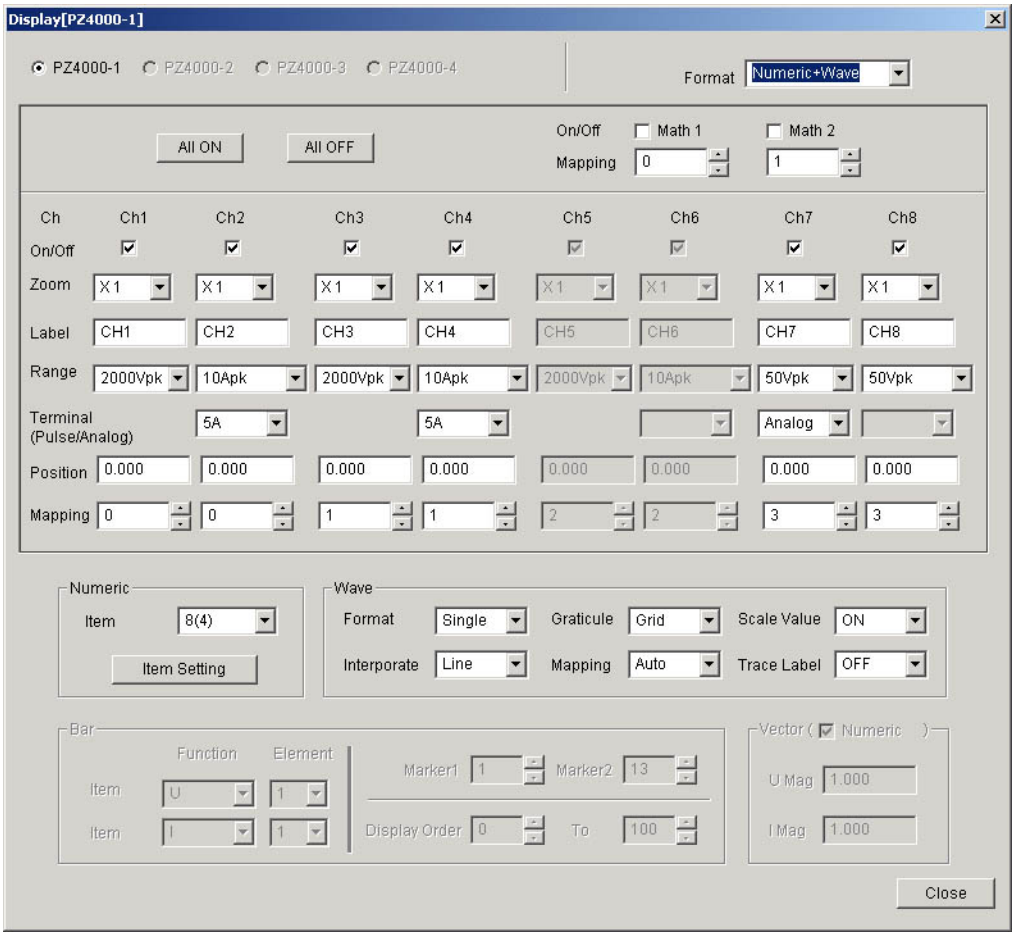
Sending the Settings

15. Click the **OK** button to close the dialog box.

4.5 Setting Numerical Display and Waveform Display

1. Click the **Display** button on the PZ Setting menu. The **Display[PZ4000-*]** dialog box opens.





2. Select the PZ4000 (**PZ4000-1** to **PZ4000-4**) using the check box.
   You can select multiple PZs to specify the same settings.

Setting the Display Mode

3. From the **Format** list, select the display mode from the following modes. The default setting is **Numeric+Wave**.

Numeric:	Numeric display
Wave:	Waveform display
X-Y:	X-Y display
Numeric+Wave:	Numeric display and waveform display
Numeric+X-Y:	Numeric display and X-Y display
Wave+X-Y:	Waveform display and X-Y display

Detailed Settings of the Waveform Display

4. Enter detailed settings for the traces of CH1 through CH8, Math1, and Math2 waveforms.
   - On/Off: Select the check box to turn ON the display of each trace.
   - All ON: Click this button to turn ON the display of all traces.
   - All OFF: Click this button to turn OFF the display of all traces.
   - Zoom: Select the vertical zoom factor of each trace in the range of **×1** to **×100**.
   - Label: Enter the label of each trace.
   - Range: Select the range of each trace.
   - Terminal: Select the current input terminal from the following:
     If the input module is 253752, select from **5A**, **20A**, **Sen**.
     If the input module is 253754, select from **5A**, **20A**, **Sen**, **Analog**, and **Pulse**.
   - Position: Enter the vertical position of each trace in the range of 0.000 to ±130.000%.
   - Mapping: Select the mapping method when the waveforms are displayed using split screens from **0** to **3**. For a description of the waveform mapping method, see section 9.3, “Splitting the Screen and Displaying the Waveforms” in the *PZ4000 Power Analyzer User’s Manual* (IM253710-01E).

Setting Numeric (only when Format is set to Numeric, Numeric+Wave, or Numeric+X-Y)

5. From the **Item** list, select the number of items to display from **8(4)** to **78(39)** and **All**.
6. Click **Item Setting** to display the Item Setting[PZ4000-*] dialog box.
7. Set the following parameters.
   - Item No.: Set the position to display the item.
   - Function: Select the function to be displayed.
   - Element: Select the element to be displayed from **1** to **4**, Σ**A**, and Σ**B**.

Setting Wave (only when Format is set to Wave, Numeric+Wave, or Wave+X-Y)

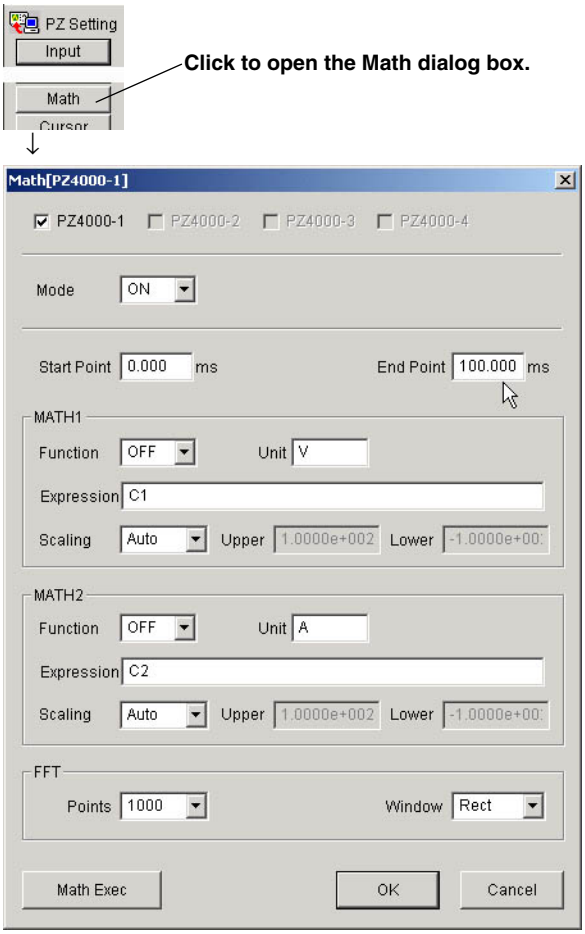
8. Set the waveform display style.
   - Format: Select the number of split screens from **Single**, **Dual**, **Triad**, and **Quad**.
   - Graticule: Select the grid display from **Non**, **Grid**, and **Cross**.
   - Scale Value: Set the scale display to **ON** or **OFF**.
   - Interpolate: Select **Dot** or **Line** for the interpolation method of waveform display.
   - Mapping: Select the mapping method when the waveforms are displayed on split screens (see “Waveform Mapping” (page 2-6)) from **Auto**, **Fixed**, and **User** (enable the mapping settings).
   - Trace Label: Set the label display to **ON** or **OFF**.

Sending the Settings

9. Click **Close** to close the dialog box.

4.6 Setting Math

1. Click the **Math** button on the PZ Setting menu. The **Math[PZ4000-*]** dialog box opens.



2. Select the PZ4000 (**PZ4000-1** to **PZ4000-4**) using the check box.
   You can select multiple PZs to specify the same settings.

Setting the Mode

3. Turn **ON** or **OFF** the waveform computation mode.

Setting the Computation Region

4. Set the computation region.
   Start Point: Enter the start point.
   End Point: Enter the end point.
   The selectable range is 0 to observation time.

Setting the Waveform Equation and Scale Conversion

5. Set the parameters for each waveform of Math1 and Math2.
   Function: Select **ON** (perform) or **OFF** (do not perform) for the computation of the specified expression.
   Expression: Enter the equation. For details on equations, see chapter 11, "Waveform Analysis" in the *PZ4000 Power Analyzer User's Manual* (IM253710-01E).
   Unit: Enter the unit using up to 8 characters.
   Scaling: Set the scaling method to **Auto** (auto scaling) or **Manual** (manual scaling).

Upper: Enter the upper limit during manual scaling in the range of –9.9999E+30 to 9.9999E+30.

Lower: Enter the lower limit during manual scaling in the range of –9.9999E+30 to 9.9999E+30.

Setting the FFT

6. Set the parameters for the FFT.
   Points: Select the number of FFT points in the range of **1000** to **10000**.
   Window: Set the time window of the FFT to **Rect** (rectangular) or **Hanning**.

Executing Computations

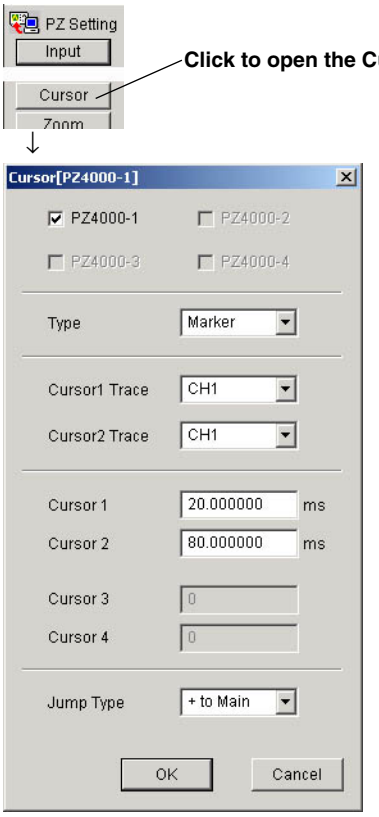
7. Click **Math Exec** to send the computation start command to the PZ.

Sending the Computation Settings

8. Click **OK** to send the setup parameters to the PZ.
   The settings become valid by clicking **OK** and closing the dialog box. Make sure to validate the settings before sending the computation settings.

4.7 Setting Cursor Measurements

1. Click the **Cursor** button on the PZ Setting menu. The **Cursor[PZ4000-*]** dialog box opens.



2. Select the PZ4000 (**PZ4000-1** to **PZ4000-4**) using the check box.
   You can select multiple PZs to specify the same settings.

Setting the Cursor Type

3. From the **Type** list, select the cursor type.
   - OFF: Do not display the cursors.
   - Marker: Markers
   - Horizontal: Horizontal cursors
   - Vertical: Vertical cursors
   - H&V: Horizontal and vertical cursors

Selecting the Target Waveform

4. Select the target waveform.
   - Cursor1 Trace: Select the waveform from **CH1** to **CH8**, **Math1**, or **Math2**.
   - Cursor2 Trace: If the cursor type is set to Marker, select the second target waveform.

Setting the Cursor Position

5. The unit and the number of cursors vary depending on the selected cursor type. Enter the positions of the cursors in the **Cursor1** through **Cursor4** boxes.

Setting the Jump Type (when Type is set to Marker)

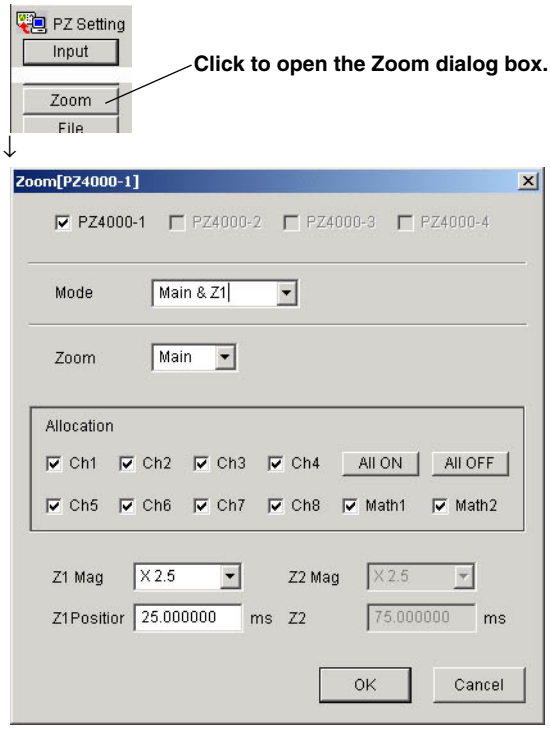
6. Moves the markers (+/x) to the center of the waveform display frame.
   Select the marker you wish to jump and the window from **+ to Main**, **+ to Z1**, **+ to Z2**, **× to Main**, **× to Z1**, and **× to Z2**.

Sending the Settings

7. Click the **OK** button to close the dialog box.

4.8 Setting Waveform Zoom

1. Click the **Zoom** button on the PZ Setting menu. The **Zoom[PZ4000-*]** dialog box opens.



2. Select the PZ4000 (**PZ4000-1** to **PZ4000-4**) using the check box.
   You can select multiple PZs to specify the same settings.

Setting the Mode

3. Select the zoom display type from **Main** (number of divisions specified by Format in "Wave Settings" on page 4-8), **Main&Z1**, **Z1 Only**, **Main&Z1&Z2**, **Main&Z2**, **Z2 Only**, and **Z1&Z2**. For details on the zoom display type, see section 9.8, "Zooming on the Waveform" in the *PZ4000 Power Analyzer User's Manual* (IM253710-01E).

Setting Zoom Format (when Mode is set to something other than Main)

4. Select the number of screen divisions of the zoom display region from **Main** (number of divisions specified by Format in "Wave Settings" on page 4-8), **Single**, **Dual**, **Triad**, and **Quad**.

Setting Allocation

5. Select the target waveform using **Ch1** to **Ch8**, **Math1**, and **Math2** check boxes.
   Click **All ON** to select all waveforms at once.
   Click **All OFF** to deselect all waveforms at once.

Setting the Magnification

6. Set the zoom factor in the range of **×2.5** to **×100000**.

Setting the Position

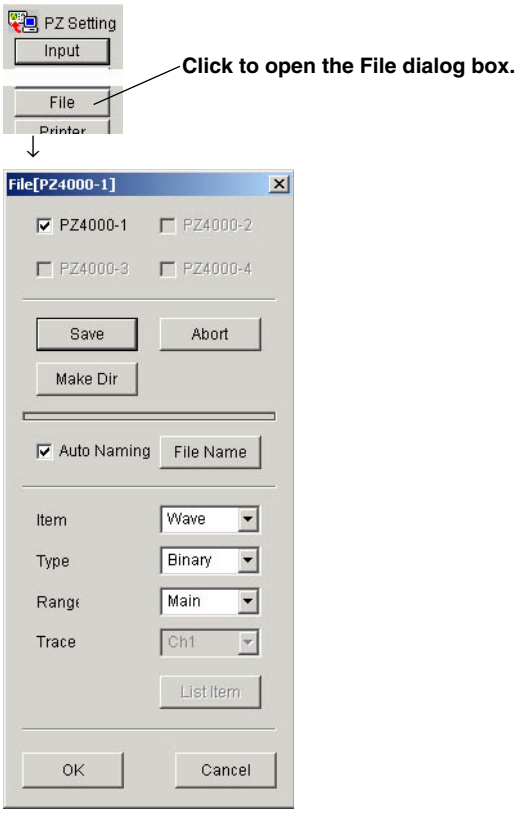
7. Set the zoom position in the range of 0 to observation time. For details, see chapter 9.8, "Waveform Analysis" in the *PZ4000 Power Analyzer User's Manual* (IM253710-01E).

Sending the Settings

8. Click the **OK** button to close the dialog box.

4.9 Saving the Data and Creating Directories (File)

1. Click the **File** button on the PZ Setting menu. The **File[PZ4000-*]** dialog box opens.



2. Select the PZ4000 (**PZ4000-1** to **PZ4000-4**) using the check box.
   You can select multiple PZs to carry out the same operation.

Saving the Data

Setting the File Name

3. Select the **Auto Naming** check box to automatically assign file names.

Note

If a single SCSI device is shared among multiple PZ4000s, duplicate file names may occur. In this case, select the Auto Naming check box.

4. Click **File Name** to open a dialog box used to enter the file name and comment. Enter the file name and comment. Make sure to specify the file name using a full path starting with the device name.
   Example
   Floppy disk drive: /FD0/DAT
   SCSI device: /SC5/DAT
   SCSI device partition 1: /SC5_1/DAT

Setting the Items to Be Saved

5. Select the information to be saved from **Setup** (setup parameters), **Wave** (waveform data), or **Numeric** (numeric values).

Setting the Data Type

6. Select the output format from **Binary**, **ASCII**, and **Float**. If Item is set to Setup, you can only select Binary; if Item is set to Numeric, you can select ASCII or Float.

Setting the Waveform Range to Be Saved (when Item is set to Wave)

7. Select the waveform range to be saved from **Main** (main waveform), **Z1** (zoom waveform Z1), and **Z2** (zoom waveform Z2).

Setting the Target Waveform (Trace) to Be Saved (when Item is set to Wave and Type is set to Float)

8. Select the waveform to be saved from **Ch1** to **Ch8**, **Math1**, and **Math2**.
9. Click the **OK** button to close the dialog box. The settings become valid by clicking OK and closing the dialog box. Make sure to validate the settings before saving the data.

Executing the Data Save Operation

10. Click **Save** to transmit a save command to the PZ4000 to save the data.
    Click **Abort** to transmit an abort command to the PZ4000 to abort the saving of the data.

Note

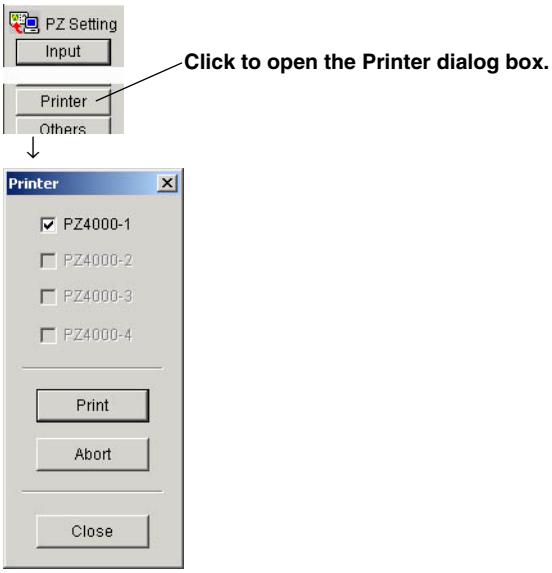
It takes approximately eight minutes to save a file from the PZ4000 directly to a SCSI device (for one PZ4000, 4 Mword/CH, and 8ch).

Creating Directories

1. Click **Make Dir** to display the Set Directory dialog box.
2. Enter the directory name and click **OK**. The create directory command is transmitted to the PZ4000. You can set up to 10 levels of directories.
   Example: /SC5/TEST/DATA

4.10 Printing on the Built-in Printer (Option)

1. Click the **Printer** button on the PZ Setting menu. The **Printer** dialog box opens.



2. Select the PZ4000 (PZ4000-1 to PZ4000-4) on which the screen image will be printed using the check boxes.
   You can select multiple PZs to carry out the same operation.

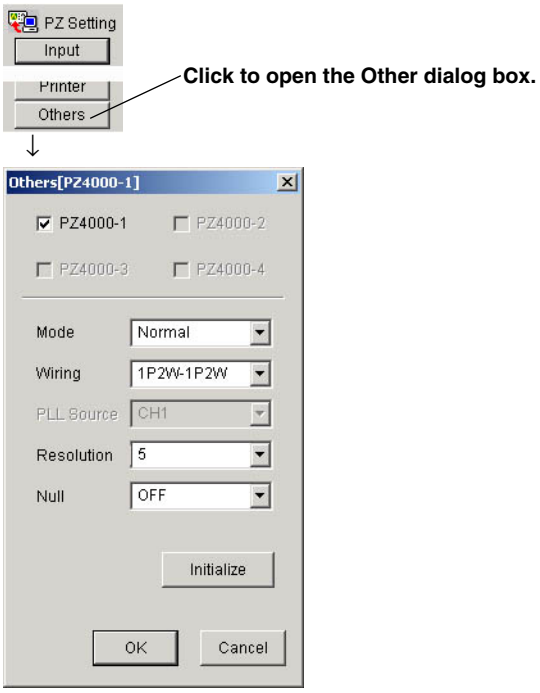
Executing the Print Operation

3. Click **Print** to transmit a print command to the PZ4000 to print the PZ4000 screen.
   Click **Abort** to transmit an abort command to the PZ4000 to abort printing.

4. Click **Close** to close the dialog box.

4.11 Setting the Measurement Mode, the Wiring System, the Number of Displayed Digits, the Null Function and Initializing Settings

1. Click the **Others** button on the PZ Setting menu. The **Others[PZ4000-*]** dialog box opens.



2. Select the PZ4000 (**PZ4000-1** to **PZ4000-4**) using the check box.
   You can select multiple PZs to specify the same settings.

Setting the Mode

3. The measurement mode is fixed to **Normal** (normal measurement mode).

Note

This software is designed for the normal measurement mode. There are no functions for the harmonic measurement mode.

Setting the Wiring System

3. Select the wiring system from **1P2W–1P2W**, **1P2W–1P3W**, **1P2W–3P3W**, **1P3W–1P2W**, **3P3W–1P2W**, **3V3A**, and **3P4W**.
   The meanings of the wiring symbols are shown below.
   1P2W: single-phase, two-wire, 1P3W: single-phase, three-wire, 3P3W: three-phase, three-wire, 3V3A: three-voltage, three-current, and 3P4W: three-phase, four-wire

Setting the Resolution

3. Set the number of displayed digits to **5** (dgts = display resolution 99999) or **6** (dgts = display resolution 999999).

Setting the Null Function

3. Turn **ON** or **OFF** the NULL function.

Initializing Settings

3. Click **Initialize** to initialize the PZ4000 to factory default settings.

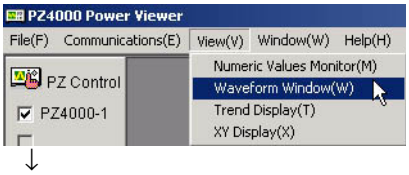
Sending the Settings

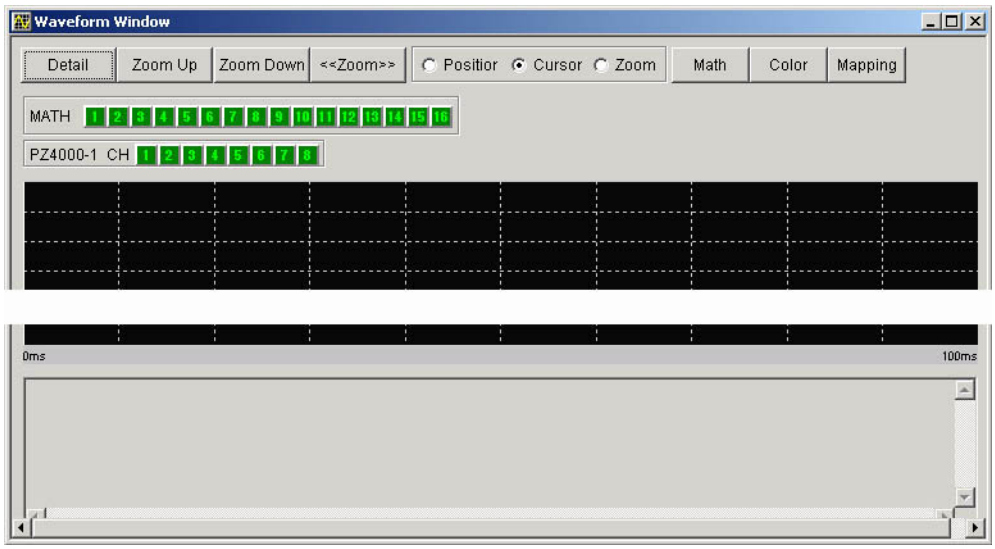
4. Click the **OK** button to close the dialog box. The settings are transmitted to the PZ.

5.1 Analyzing Waveforms

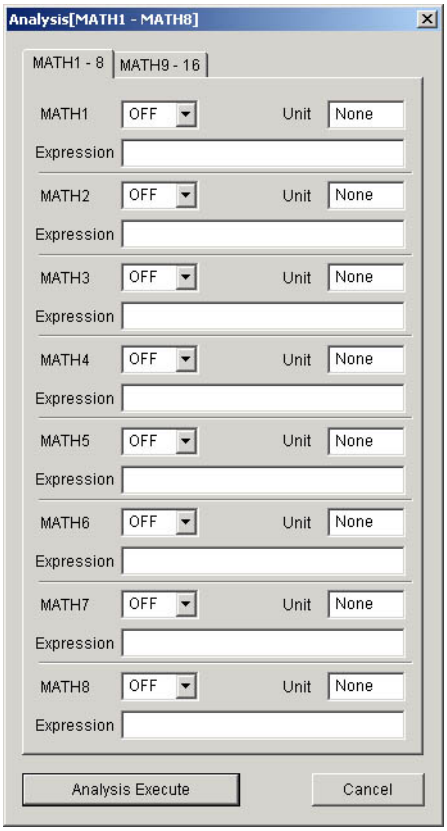
You can specify 1 to 16 computations on the software separate from the Math function of the PZ4000.

1. Choose **Waveform Window** from the **View** menu. The Waveform Window opens.





2. Click **Math** to display the Analysis dialog box.



Selecting Math

2. The dialog box displays eight items of computations (Math) on each tab. Click the **Math1-8** or **Math9-16** tab containing the appropriate computation Math channel.

Setting Math

3. From the **Math*** list, select **ON** or **OFF**.
4. Enter the unit in the **Unit** box.
5. Enter the equation in the **Expression** box.
   If there are multiple PZs, enter PZ1 through PZ4 before the channel as in ABS(PZ1C1).
   Example
   TREND(PZ1C1)/TREND(PZ2C2)
   (PZ1C1: Ch1 of PZ4000-1, PZ2C2: Ch2 of PZ4000-2)
   For details on the expressions, see the following table.

A List of Expressions

Operator	Example	Description
Four arithmetic operation		Four arithmetic operation Four arithmetic operation of the specified channel data.
(+, ×, –, /)	PZ1C1×PZ1C2	If the denominator of a division is 0, the data is set to the upper limit.
ABS	ABS(PZ1C1)	The absolute value of the specified waveform
SQR	SQR(PZ2C1)	The square of the specified waveform
SQRT	SQRT(PZ3C1)	The square root of the specified waveform
LOG	LOG(PZ4C1)	Natural logarithm of the specified waveform
LOG10	LOG10(PZ1C1)	Common logarithm of the specified waveform
EXP	EXP(PZ2C1)	The exponent of the specified waveform
NEG	NEG(PZ3C1)	Negation of the specified waveform
TINTEG	TINTEG(PZ4C1)	The integration of the specified waveform
TREND	TREND(PZ1C1)	The trend of RMS values of the specified waveform
TRENDF	TRENDF(PZ1C1)	The frequency trend of the specified waveform
TRENDM	TRENDM(PZ1C1)	The trend of Mean values of the specified waveform
TRENDD	TRENDD(PZ1C1)	The DC trend of the specified waveform
AVG2	AVG2(PZ1C1*PZ1C2)	The exponential average with an attenuation constant of 2 of the specified waveform
AVG4	AVG4(PZ2C1*PZ2C2)	The exponential average with an attenuation constant of 4 of the specified waveform
AVG16	AVG16(PZ3C1*PZ4C2)	The exponential average with an attenuation constant of 16 of the specified waveform
AVG32	AVG32(PZ1C1*PZ2C2)	The exponential average with an attenuation constant of 32 of the specified waveform
AVG64	AVG64(PZ3C1*PZ4C2)	The exponential average with an attenuation constant of 64 of the specified waveform
FFT	FFT(PZ1C1)	The FFT of the specified waveform
DIF	DIF(PZ1C1)	The differentiation of the specified waveform
ZC	ZC(PZ1C1)	Zero-crossing data of the specified waveform

Executing Computations

6. Click **Analysis Execute** to execute the computations and display the computed waveforms.

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