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Operation Manual

Sequence Creation Software

Wavy for PCZ1000A Ver.6

(SPEC70585)

First edition: September 2, 2011

KIKUSUI ELECTRONICS CORP.

Before You Contact Customer Support

Before you contact customer support for repairs, inspection, or adjustments, read over the manual one more time and reinspect the product. If you still have problems or questions, contact your Kikusui distributor or agent.

For Safe Use

Before you use this software application for testing, thoroughly read through the operation manual of the device that you will use, and be sure to make connections and handle the device properly. Improper connections or handling can lead to serious accidents, injury, and fire.

This manual applies to versions 6.x of Wavy for PCZ1000A.

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Chapter1 Introduction

1.1 Overview

Wavy is a sequence creation software application that is used to perform sequence control of Kikusui PCZ1000A AC Electronic Loads.
Wavy enables you to easily create and edit sequences with a mouse. When you execute a sequence, you can view the present position, monitor the voltage and current, and save this information. The monitored data is graphed in real time.
Wavy also lets you directly control a load, without the use of the sequence feature. You can set the current, resistance, and power and turn the load on and off as if you were using a remote. You can also monitor the load.
Wavy Ver. 6 is only compatible with the PCZ1000A.

1.2 System Requirements

PC Requirements

CPU	Pentium 4 HT or better (Core 2 or better recommended)
OS	Windows7 (32 bit version), Windows Vista (32 bit version), Windows XP SP3 (32 bit version)
CD-ROM drive	Necessary to install Wavy
Mouse	Necessary
Display resolution	1024 × 768 dots or higher resolution (DPI: 96)
Memory	Windows7, Windows Vista: 2 GB or more Windows XP SP3: 1 GB or more
Hard disk	10 GB or more of free space

* When you use the software, turn the OS's power-saving mode and screen saver off. Also, avoid using this software at the same time as other applications.
* If you are using a PC that has advanced power management (APM) or sleep mode, disable these features.
* When you change the DPI setting, the display may not appear properly, because of the resolution.
* You will need to add additional memory to perform testing over extended periods.

Interface Specifications

RS232C

* Use a **crossover cable**.for RS232C.
* The software may not function properly if you use a USB serial converter to connect to an RS232C interface.

1.3 Software Specifications

Operation Modes

There are three modes: constant current, constant power, and constant resistance.

For each step in the sequence data, you can set the value (the current, resistance, or power), the time interval, and the transition type (step or ramp) and also turn on and off the load.

The time interval can be set as indicated in the table below.

Seconds	0.5 to 999.5 [s]　(in steps of 0.5)
Minutes	0.1 to 999.9 [min]
Hours	0.1 to 999.9 [h]

For the current and power, you can enter up to three decimal places. For the resistance, you can enter up to four decimal places.
* The actual number of decimal places that you can specify depends on the device's setting range and resolution.

You can create up to seven sequence patterns. A pattern can consist of up to 1440 steps, and the maximum total number of steps is 10080 (1440 × 7).
You can set the number of sequence repetitions a value from 1 to 9999.

* For a ramp transition, you can set the time interval in steps of 0.5 seconds when you are setting the interval in units of seconds and in steps of 1 second when you are setting the interval in units of minutes and hours.
* In constant resistance and constant power modes, the first step must be a step transition.
* The precision of the time interval is determined by the PC operating environment.

Monitoring Feature

You can monitor the input rms current, input voltage, apparent power, and integrated power.
For the apparent power, Wavy displays the product of the input rms current and the input voltage.
For the integrated power, Wavy integrates the product of the apparent power and the monitoring interval.
The monitoring interval ranges from 1000 to 600,000 ms (1 to 600 s).
* The precision of the time interval is determined by the PC operating environment.

Direct Control

You can set the current, resistance, and power and turn the load on and off as if you were using a remote, and you can monitor input rms current, input voltage, and apparent power.

For the apparent power, Wavy displays the product of the input rms current and the input voltage.

* This feature is independent from the sequence feature.

Chapter2 Preparation

This chapter explains how to prepare the product for testing, starting with unpacking.

2.1 Unpacking and Inspecting the Product

After you receive the product, make sure that all its accessories are included and that nothing has been damaged during shipping.
If something is missing or damaged, contact a Kikusui distributor or agent.

Accessories	Quantity	Check
Wavy for PCZ1000A Ver.6　CD-ROM	1	
Operation Manual	1	

2.2 Installing the Software

Log in as an administrator before you perform the installation.

(1) Start Windows.

(2) Insert the setup CD-ROM into the CD-ROM drive.

(3) A setup program window appears momentarily.

* If the setup program window does not appear, use Windows Explorer to run the SETUP.EXE file on the CD-ROM.

(4) Follow the directions that appear on the screen to install Wavy for PCZ1000A Ver.6.

Chapter3 Starting Wavy

To Start the “Wavy for PCZ1000A”, double-click the Wavy for PCZ1000A icon on the desktop.

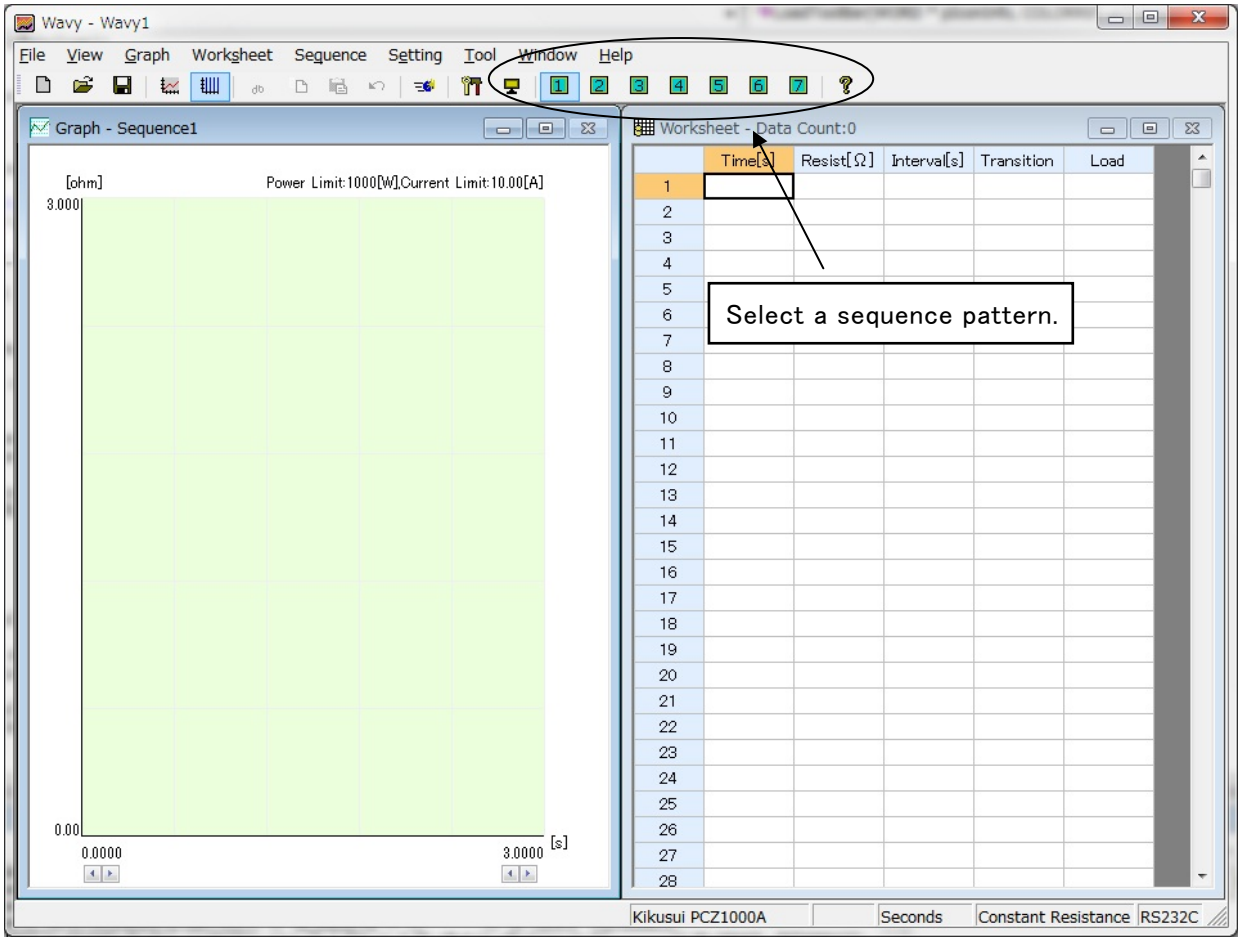


Fig. 3-1 Main window

The general procedure for using Wavy is listed below.

(1)	**Open the Mode dialog box, and configure the operation mode.**
(2)	**Create sequence data in the main window.**
(3)	**Open the Execute window, and execute the sequence.**

* Before you execute the sequence, be sure to configure the interface.

Click a sequence pattern number as shown in Fig. 3-1 to create and edit the sequence data for that number.

Fig. 3-2 shows the display when you load “PczTestData.wvy”. The “PczTestData.wvy” is located in the “WavyPcz” subfolder of the “Public Documents” folder.

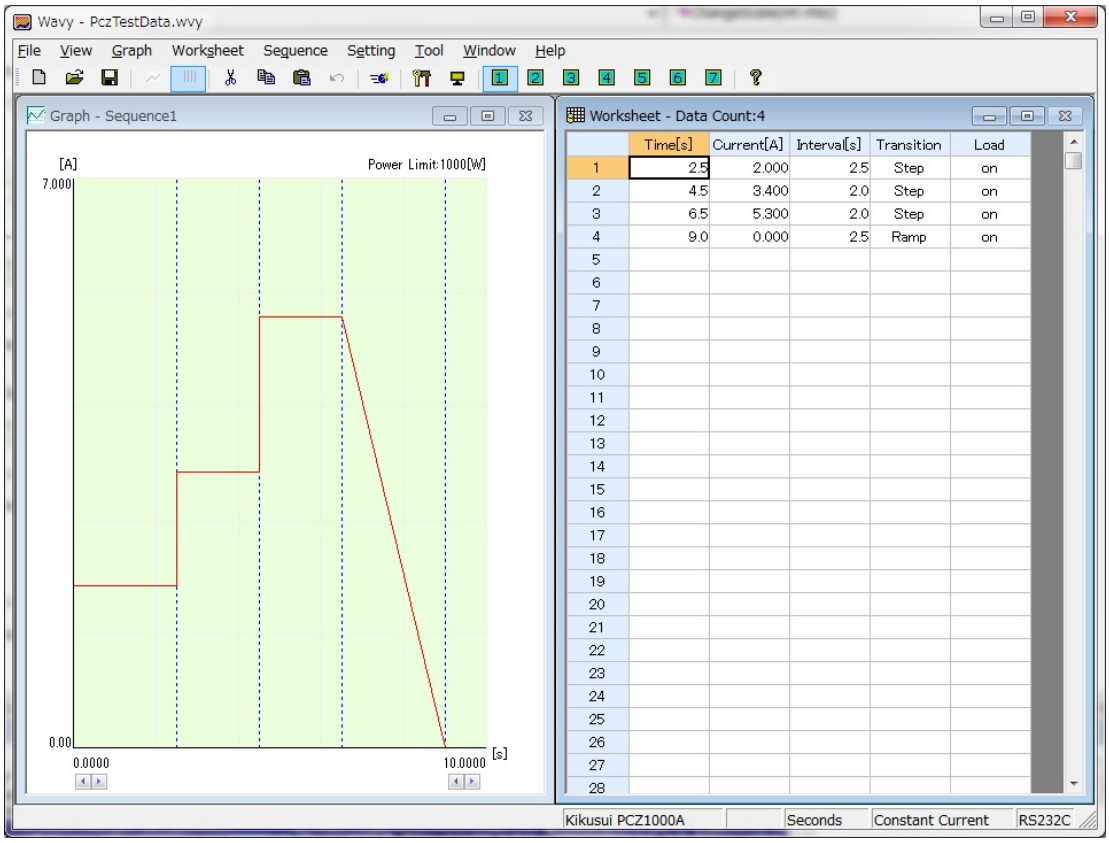


Fig. 3-2 Sample data display

* In Windows 7 and Windows Vista, the “WavyPcz” folder is created in the “Public Documents folder”. In Windows XP, it is created in the folder specified in the setup.

Chapter4 Communication Interface

On the "**Settings**" menu, click "**Interface**" to open the "**Interface**" dialog box.

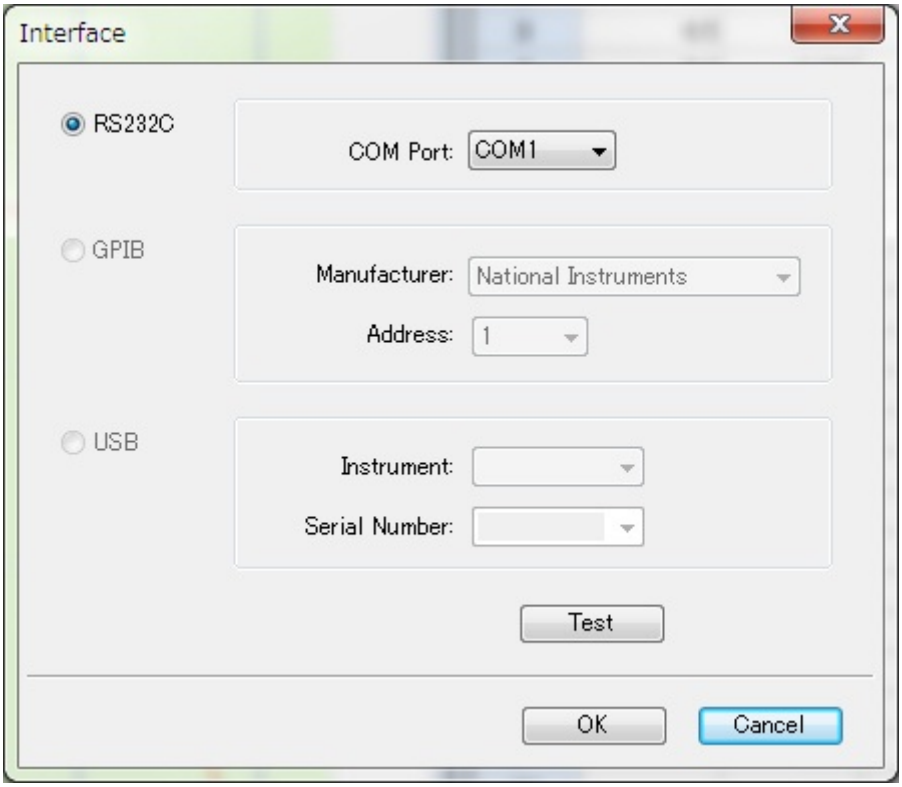


Fig. 4-1 Interface dialog box

Configure the interface settings so that you can connect to the PCZ1000A. Only RS232C is available.
After you configure the settings, click "**Test**" to make sure that Wavy can connect to the device properly. If Wavy connects to the device properly, a message with the device's name and serial number will appear.

RS232C

A device's communication protocol are factory default settings.

Baudrate(Bit rate)	9600 bps
Databits	8 bits
Stopbits	2 bit
Parity bit	NONE
Flow control	XON/XOFF

＊ Use a **crossover cable** for RS232C.

Chapter5 Mode Settings

On the "**Sequence**" menu, click "**Mode**" to open the "**Mode**" dialog box.

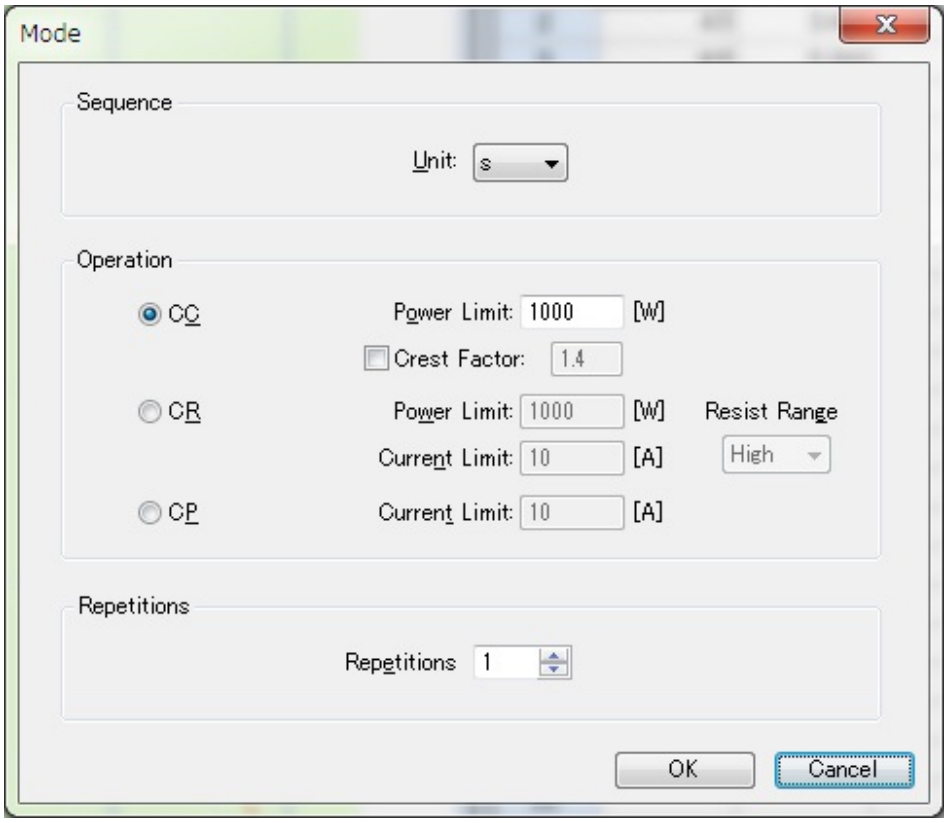


Fig. 5-1 Mode dialog box

Under Sequence, set Unit to the unit of time that you want to use for the sequence data.

s (seconds)	0.5 to 999.5 [s] (in steps of 0.5)
min (minutes)	0.1 to 999.9 [min]
h (hours)	0.1 to 999.9 [h]

For a ramp transition, you can set the time interval in steps of 0.5 seconds when you are setting the interval in units of seconds and in steps of 1 second when you are setting the interval in units of minutes and hours.

There are three modes: constant current, constant resistance, and constant power.
The power limit range is 45 to 1050 [W], and the current limit range is 0.00 to 10.50 [A] (during independent operation).
In constant resistance mode, there are two resistance range settings (during independent operation): High and Low.

High range	0.9000 to 1000.0 [Ω]
Low range	9.0000 to 10,000 [Ω]

The crest factor is only valid in constant current mode (the setting range is 1.4 to 4.0).

* The unit for the limit in constant resistance mode is S (Siemens), so you may not be able to set the desired resistance. For details, see the PCZ1000A operation manual.

You can set the number of repetitions in the range of 1 to 9999. Wavy executes sequence patterns 1 through 7 as one iteration.

* In constant resistance and constant power modes, the first step must be a step transition.

Chapter6 Creating and Editing Sequence Data

When you move the pointer over the Y-axis, it becomes a crosshair (Fig. 6-1).

Then, move the mouse pointer on the crosshair while holding the mouse left button (Fig. 6-2).

The position will be fixed when you release the mouse left button at the desired location (Fig. 6-3).

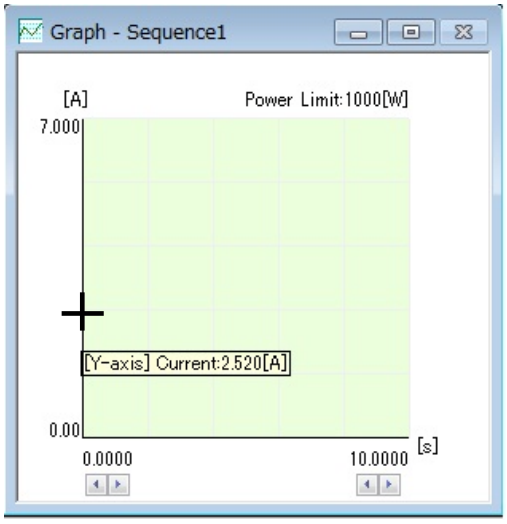


Fig. 6-1 Starting point of the mouse pointer

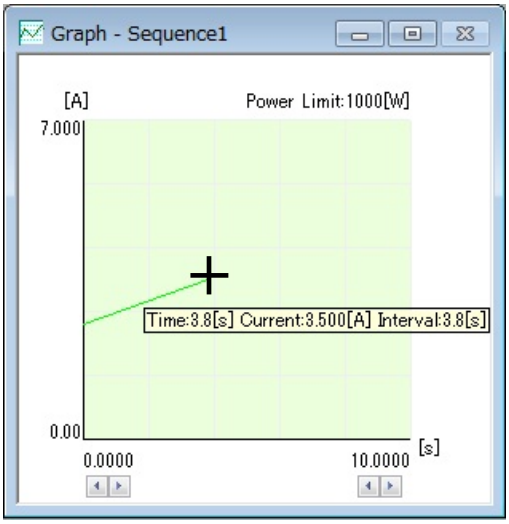


Fig. 6-2 Moving the mouse pointer

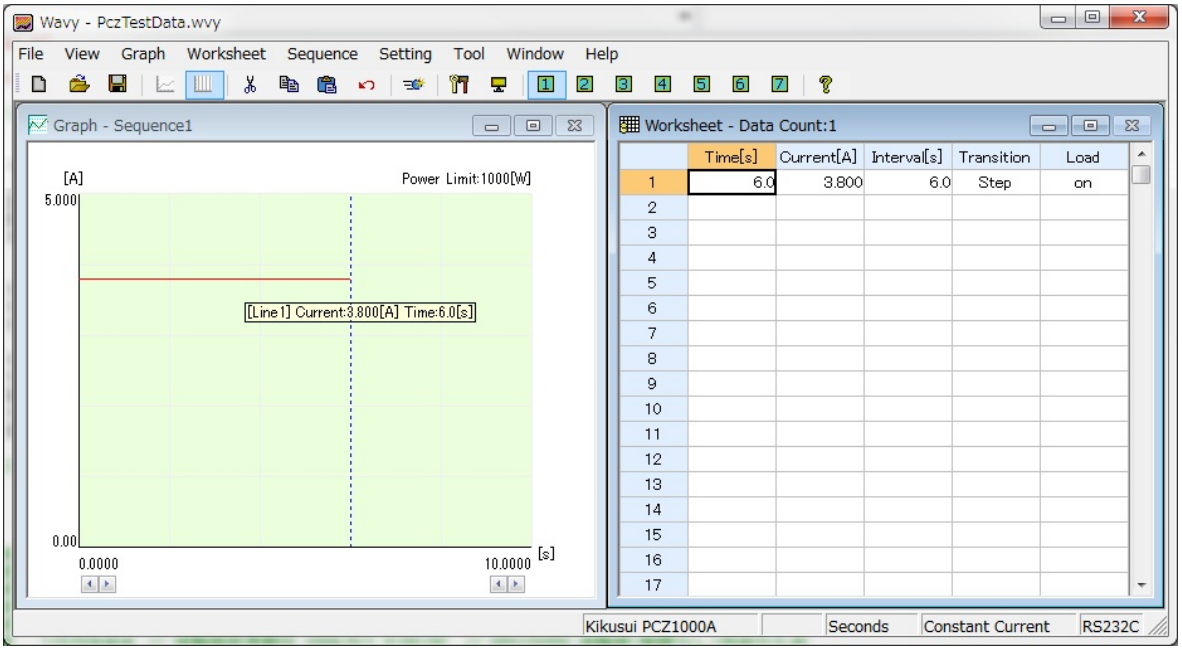


Fig. 6-3 Ending point of the mouse pointer

One step's worth of data is created on the worksheet.

You can also create data directly on the sheet. You can do so by typing directly into the cell (data) whose data you want to create, by selecting a cell and pressing ENTER, or by double-clicking on a cell. To cancel data entry, press ESC.

*** You cannot enter values in the Time column. They are calculated automatically when you enter values in the Interval column.**

To edit a current or power value, double-click on the line that you want to change.

The end of the line becomes a black dot (Fig. 6-4).

Move the pointer over the black dot so that the pointer turns into a double-headed arrow (Fig. 6-5), and then drag the pointer up or down (Fig. 6-6). Drop the pointer in the desired location.

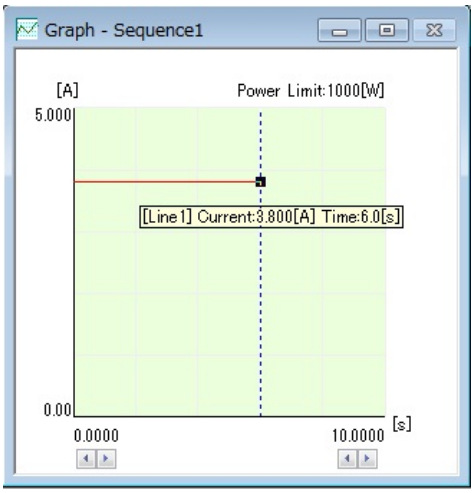


Fig. 6-4 Selecting the value to change

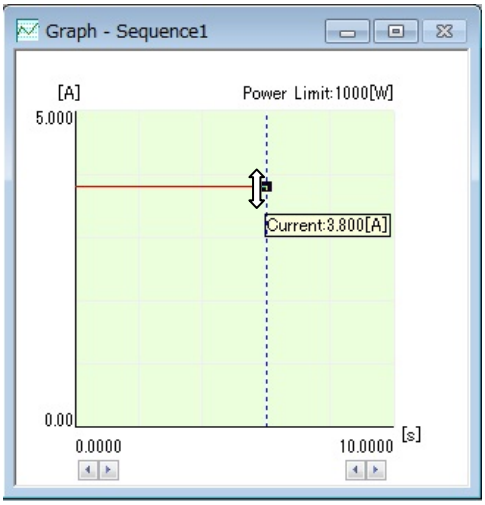


Fig. 6-5 Starting to change

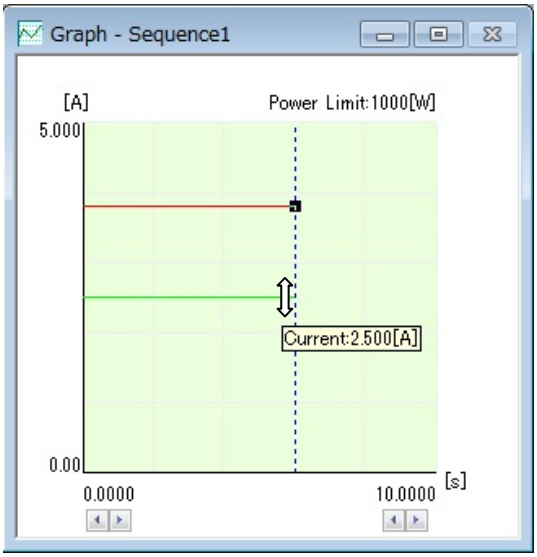


Fig. 6-6 Changing by moving

To change the time interval, double-click the dotted blue (vertical) line.
You can move the line by following the procedure for changing the voltage or current value.

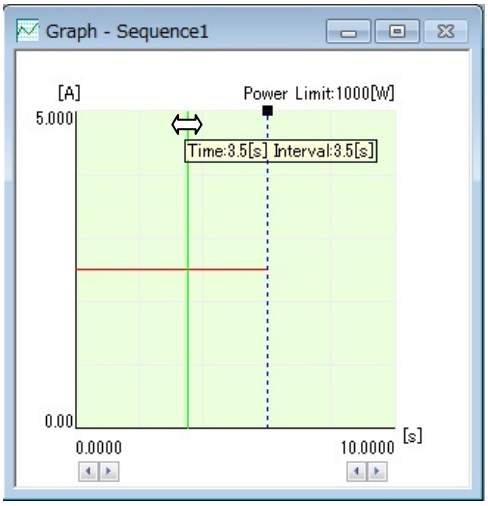


Fig. 6-7 Changing by moving (time)

To edit a transition, double-click the line whose transition you want to edit.
The end of the line becomes a black dot. Right-click on the line, point to Transition, and then click Ramp or Step. Follow the same procedure to delete a transition.

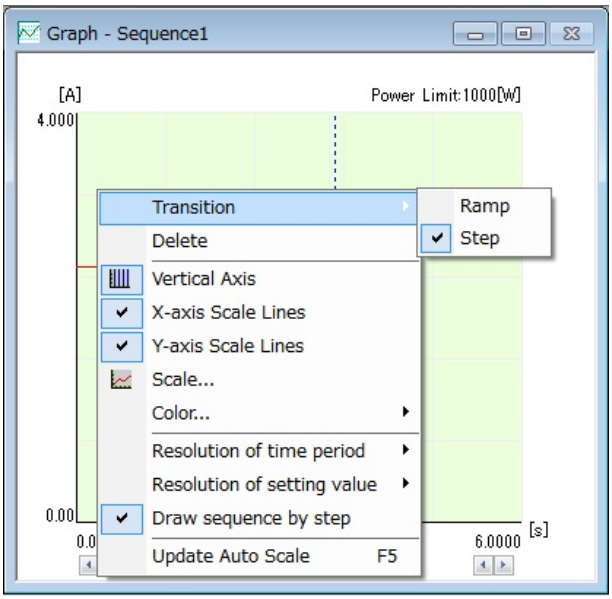


Fig. 6-8 Changing the transition

* In mouse drawing, the decimal place is determined by the Setting of the "Time interval resolution" and "Setting resolution" settings are configured. If you select "Always draw as steps", transitions are always drawn as step transitions, never as ramp transitions.

* If “Display graph” is selected, graph lines are displayed. When the amount of data is large, the amount of system resources used by the process of drawing the graph on the screen increases. If this happens, unselect Display graph so that graph lines are not displayed.

* Create the sequence patterns in order starting from 1. You cannot execute a sequence if there is no data in sequence pattern 1. If there are sequence patterns with no data in the middle of a sequence, the remaining sequence patterns will not be executed.

If you select "**Scale**" in Fig. 6-8, a dialog box for setting the graph scale opens.

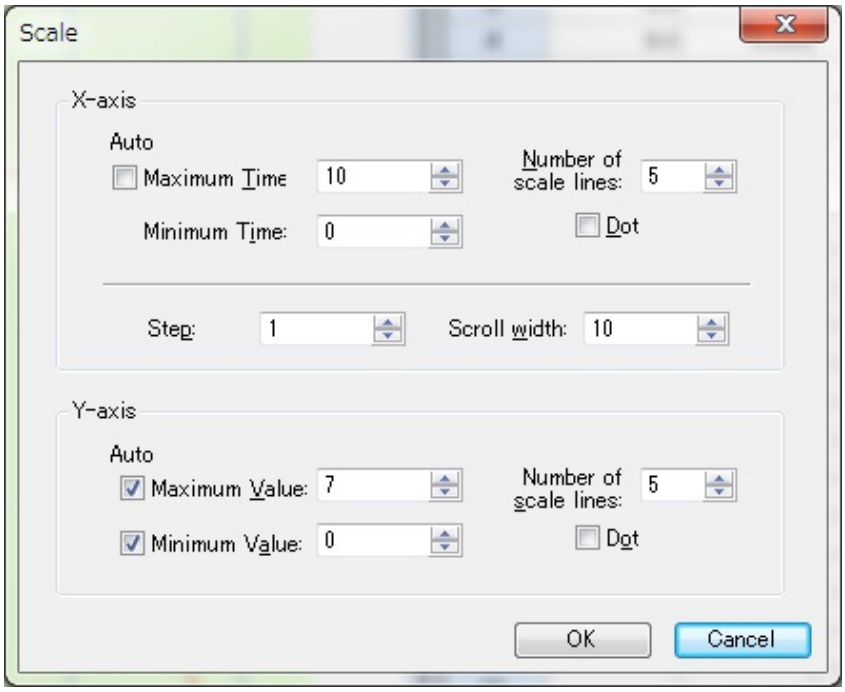


Fig. 6-9 Setting the graph scale

When the "**Auto**" check boxes are selected, the scale changes automatically.
When a file is loaded or sequence data is input, the maximum and minimum values of the graph's X and Y axes are set automatically.

To prevent the values from changing, clear the "**Auto**" check boxes.
When you do so, be aware that values that are outside of the specified range will not be displayed.

The "Scale marks" settings for the X and Y axes determine the number of grid lines that are displayed in the background of the graph.
If you set the value to 1, only a border is displayed.
If you do not want to display grid lines on the graph, on the **Graph** menu, clear the check marks next to **X-axis grid lines** and **Y-axis grid lines**.

When the "**Dotted lines**" check box is selected, the grid lines are dotted instead of solid.

The step value is the amount that values change when you click the arrows in Fig. 6-10. The scroll width is the minimum distance between the minimum and maximum value. In the example in Fig. 6-10, if the minimum value is set to 25, the maximum value will change to 35.

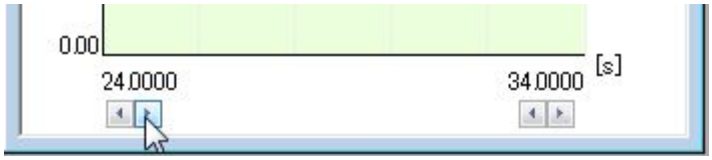


Fig. 6-10 Step value and scroll width

You can copy, insert, and delete lines in the step data sheet. These operations can be performed on multiple lines.

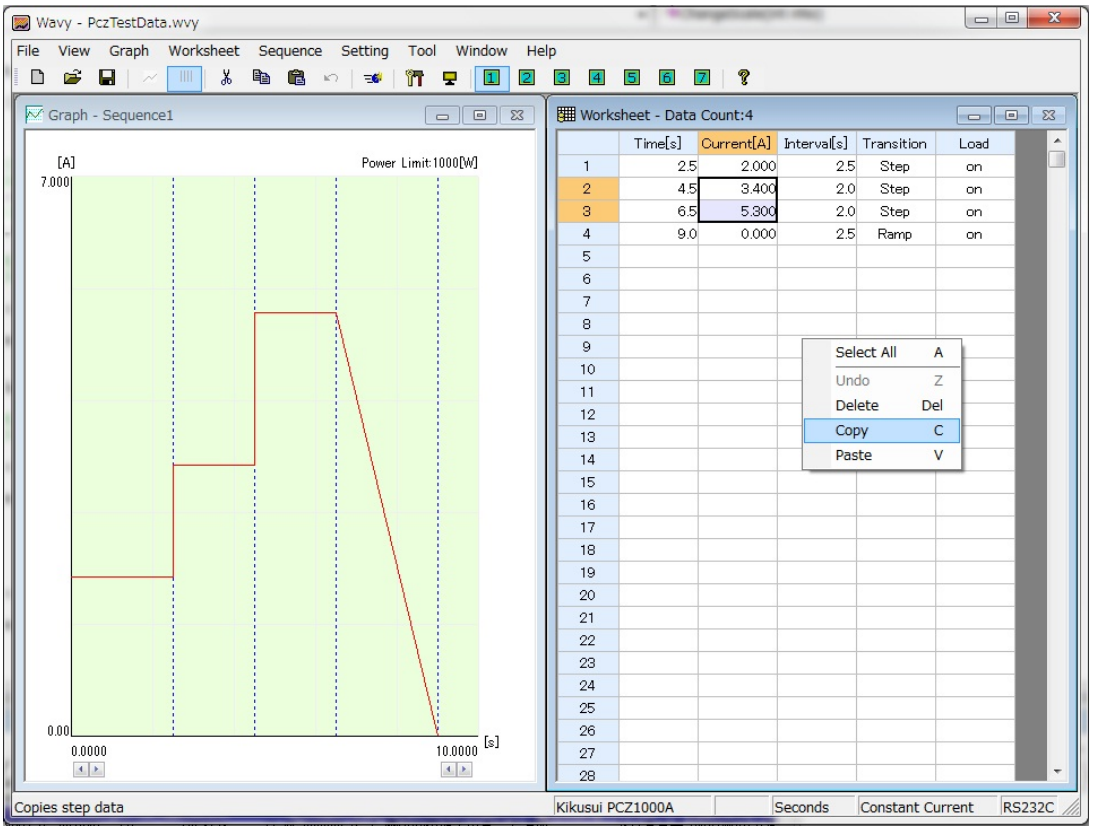


Fig. 6-11 Copying, Inserting, and Deleting Lines

When you enter data directly onto the sheet, do so in order, starting with the first line. You cannot enter data for line 2 (step 2) if no data has been entered for line 1 (step 1).

The shortcut keys in Fig. 6-11 work by themselves and in combination with the CTRL key.

* If you want to insert a new line, copy a line, insert it where you want to insert a new line, and then change the inserted data.

* In constant resistance and constant power modes, the first step must be a step transition.

Caution: Wavy the software writes the data to the device, it does not check the validity of the values that you have entered (whether or not they are within the limits of the device). Therefore, when a sequence is being written, an error may occur on the device. When this happens, the sequence data is incomplete.
Be sure not to specify a current, resistance or power value that is beyond the specifications of the device.

*** For power and resistance, be careful of the minimum values as well.**

Chapter7 Executing a Sequence

On the **Sequence** menu, click **Execute** to open the execute dialog box.

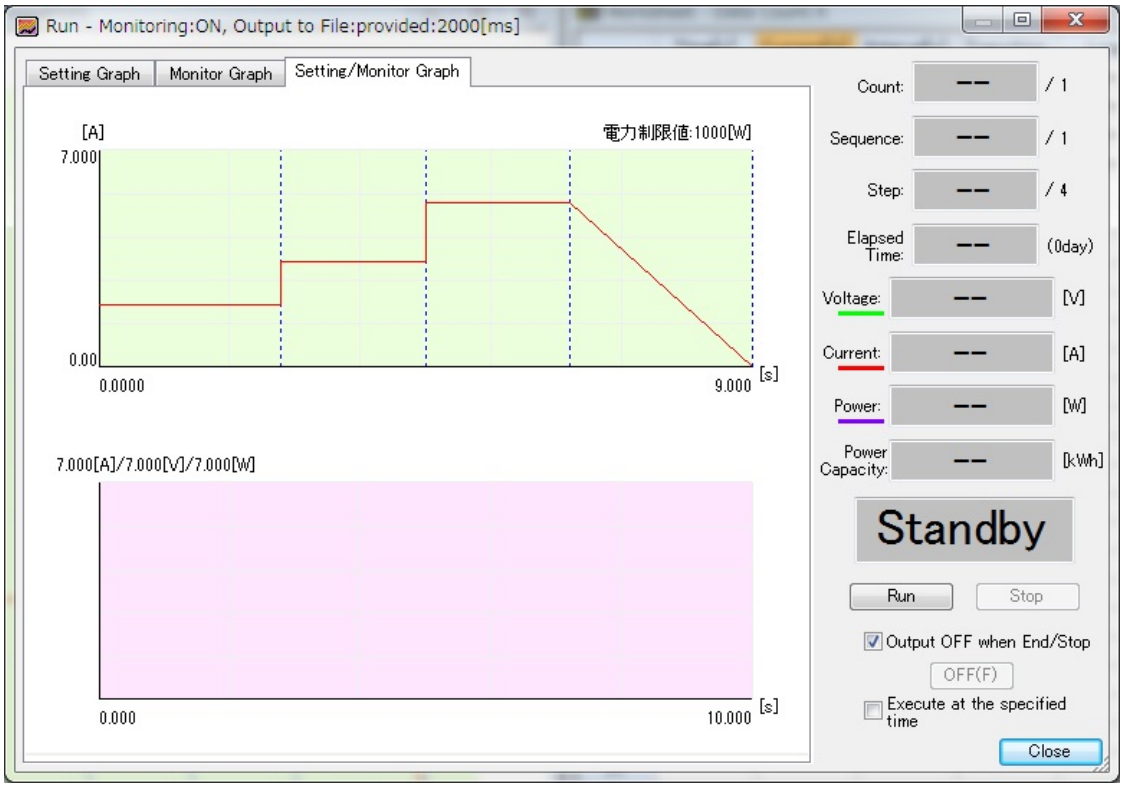


Fig. 7-1 Execute window (ready state)

Click "**Execute**" to execute the sequence.
To stop the sequence before it finishes, click "**Abort**".

The indications that appear in the window are listed in the table below.

State	Background color	Description
Ready	Gray	The device is ready to start.
Finished	Gray	The sequence has finished.
Executing	Green	The **Execute** button has been clicked, and the sequence is being executed.
Canceled	Yellow	The Cancel button has been clicked.
Error	Red	A communication error occurred.
OVP, OCP, OHP, OPP, FB	Orange	The sequence was stopped because of a protection feature on the device.
OVP, UVP, OCP, UCP	Yellow	The sequence was stopped because of a protective feature of the software.
Waiting for execution	Blue	Wavy is waiting for the specified time of execution to arrive.

When the "**Load off after execution**" check box is selected, the load is turned off after the sequence finishes. The load is also turned off when "**Abort**" is clicked.

If the check box is not selected, the OFF button becomes available, and you can turn the load off by clicking it.

* If you want to precisely control the time when the load is turned off, add a step that turns off the load to the end of the sequence.

The figure below below shows the "**Execute**" window during sequence execution.

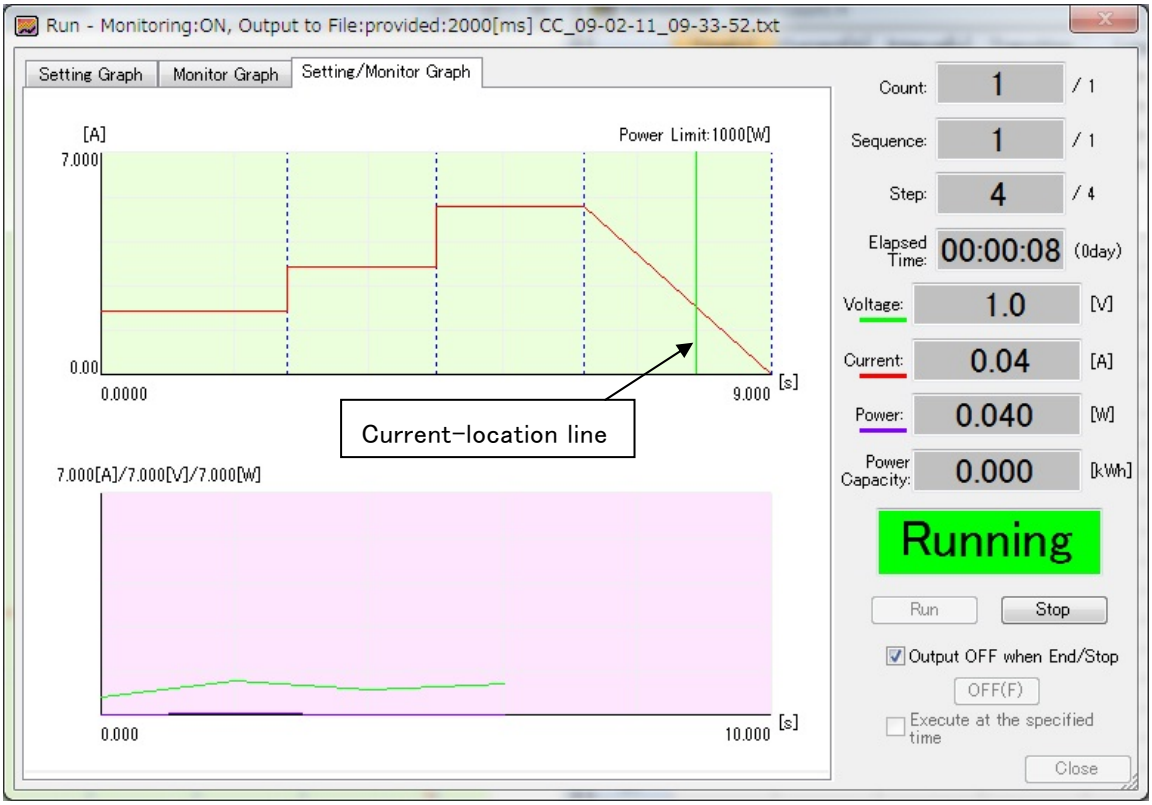


Fig. 7-2 Execute window (executing)

The number of repetitions, sequence number, step number, elapsed time, input voltage, input rms current, apparent power, and integrated power are displayed. For the apparent power, Wavy displays the product of the input voltage and the input rms current. For the integrated power, Wavy displays the integral of the product of the apparent power and the monitoring interval. These indications are updated every 2 seconds.

The present-position line shows the approximate location in the sequence. The line moves every two seconds.

* The monitoring and file information appear in the title of the window.
* During sequence execution, you cannot maximize or resize the window.
* The present-position line shows the approximate location in the sequence (the line may be off by a great amount from the actual location if the number of repetitions is large and the sequence is being executed over a long period of time).

To change the sequence graph's display settings, right-click in it.

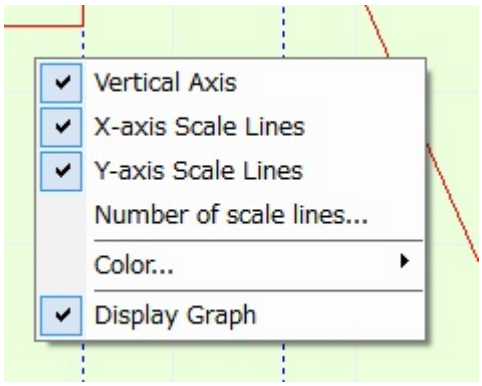


Fig. 7-3 Sequence graph display settings

If "**Display graph**" is selected, graph lines are displayed.
When the amount of data is large, the amount of system resources used by the process of drawing the graph on the screen increases. If this happens, unselect Display graph so that graph lines are not displayed.

To change the monitor graph's display settings, right-click in it.

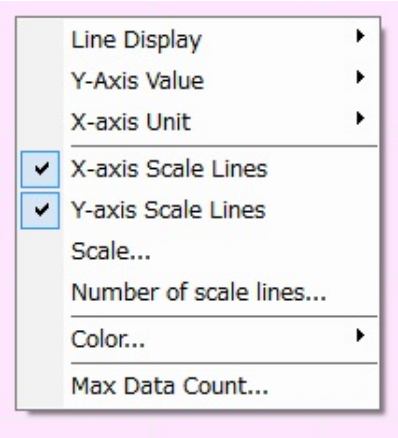


Fig.7-4 Monitor graph display settings

If you select **Scale** in Fig. 7-4, a dialog box for setting the monitor graph scale opens.

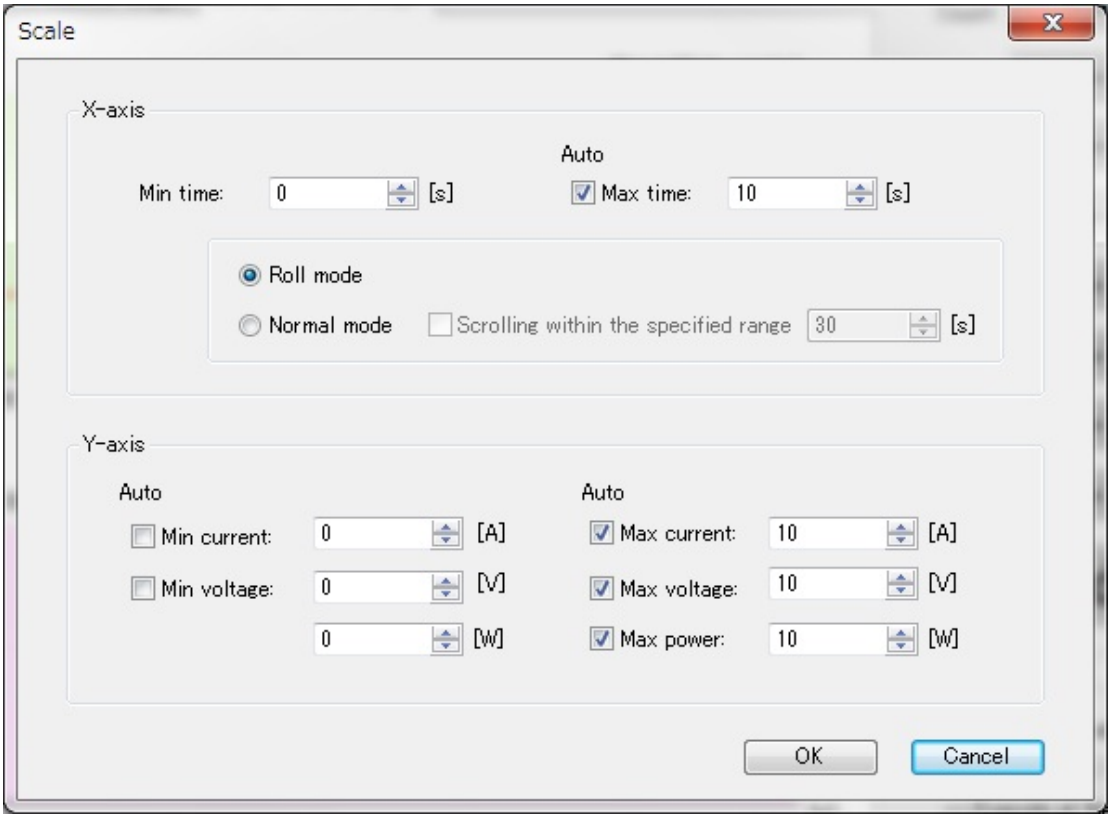


Fig. 7-5 Monitor-graph scale-configuration dialog box

When an "**Auto**" check box is selected, if the maximum value exceeds the monitored value, the maximum value is automatically changed to the most appropriate value (auto scaling). The same is true for minimum values.
To prevent the values from changing, clear the "**Auto**" check boxes.
When you do so, be aware that monitored values that are outside of the specified range will not be displayed.

There are two modes for auto scaling along the X-axis: roll mode and normal mode.
In roll mode, the minimum and maximum X-axis values are scrolled simultaneously (Fig. 7-6). The distance between the two values is always the same as the difference between the specified maximum and minimum values.
In normal mode, the minimum X-axis value is fixed, and only the maximum value changes (Fig. 7-7).

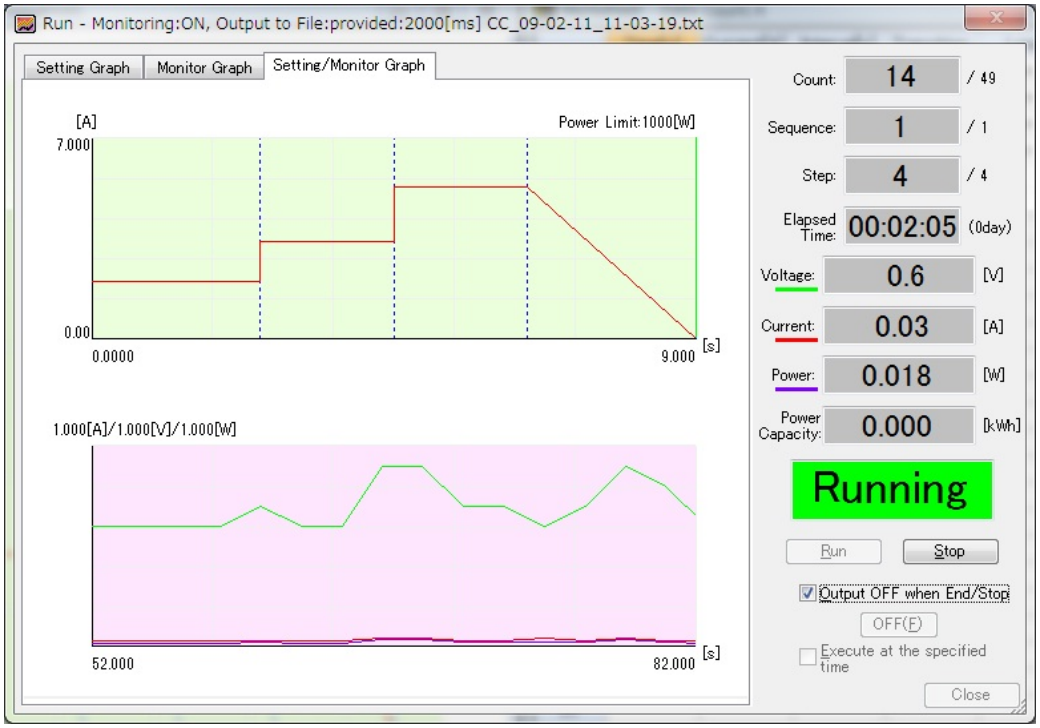


Fig. 7-6 Setting graph and monitor graph (roll mode)

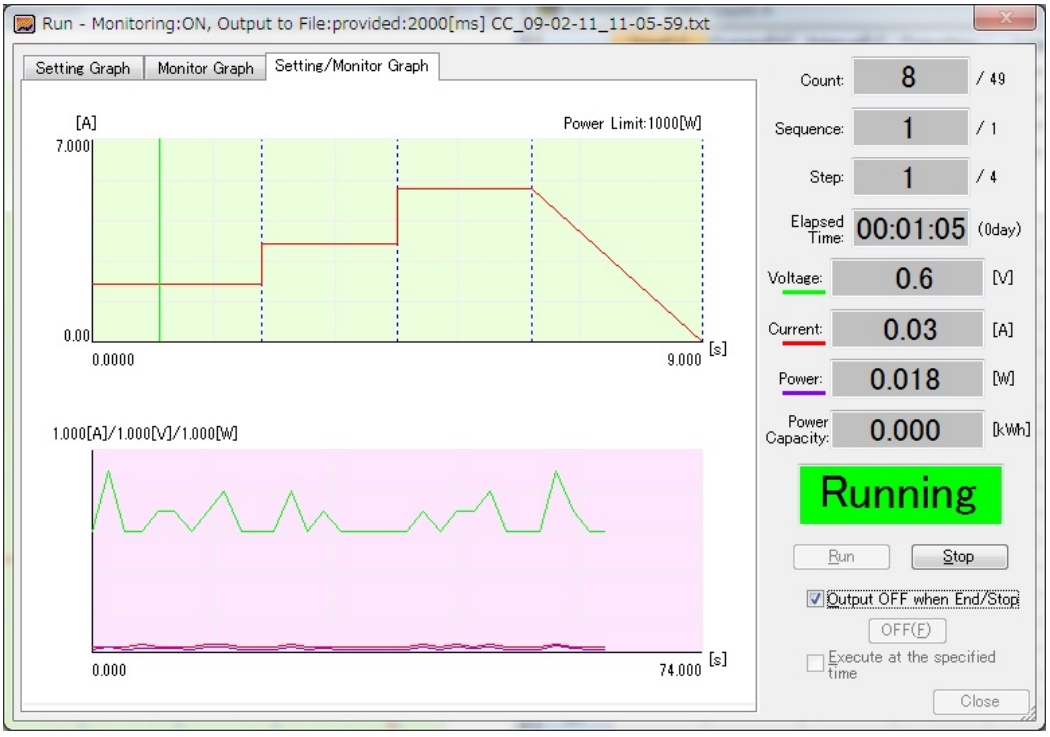


Fig. 7-7 Sequence graph and monitor graph (normal mode)

In normal mode, if you select the "**Scroll with fixed range**" check box, the data for the specified period of time immediately before auto scaling is performed is displayed when the values are scrolled (as if pre-trigger data were being displayed).

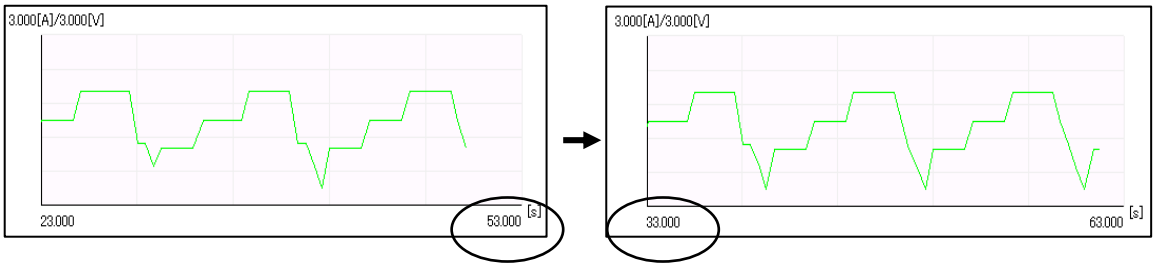


Fig. 7-8 Example of Scrolling with a Fixed Range

In Fig. 7-8, the fixed range is set to 20 s.
If the data exceeds the maximum X-axis value, the minimum X-axis value is 53 - 20 = 33 s.

By moving the cursor to **X-axis Unit** in Fig. 7-4, you can display a submenu for setting the monitor graph X-axis value indications to '[s]' or '[h:m:s]'.

If you click "**Maximum Data Points**" in Fig. 7-4, the dialog box in Fig. 7-9 appears.

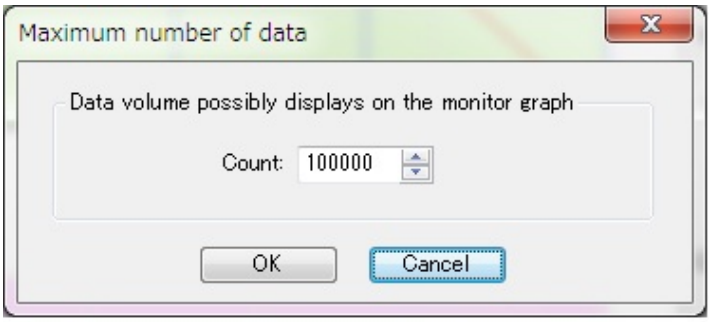


Fig. 7-9 Maximum data points

When you perform testing over a long period of time, the amount of data in the monitor graph may increase to levels that strain your system's memory capacity.
When the amount of memory is insufficient, the PC may become overloaded and unable to function properly.
In this dialog box, you can set the maximum number of data points to display in the monitor graph.
You can set the maximum number of points to a value from 10,000 to 1,000,000. The default value is 100,000.
When the number of data points that you set here is exceeded, older monitored data is deleted.

＊ As a general rule of thumb, one point of monitored data uses approximately 200 bytes of memory (the actual value varies depending on the PC environment).

If Wavy acquires one monitored data point every second, it will have acquired 86,400 points after 24 hours.

86,400 points × 200 bits = 16.5MB.

Set an appropriate value based on the amount of physical memory on your PC.

＊ The maximum number of data points that you set does not affect the data that is saved to monitored data files.

＊ The amount of system resources used by the process of drawing the monitor graph on the screen increases with the amount of data and the displayed range on the graph.

＊ When you perform testing over a long period of time, we recommend that you use Task Manager or some other application to check the amount of physical memory being used.

Chapter8 Executing at the Specified Time

Click the "**Execute at the specified time**" check box shown in Fig. 7-1 to display the Execute at the specified time dialog box.

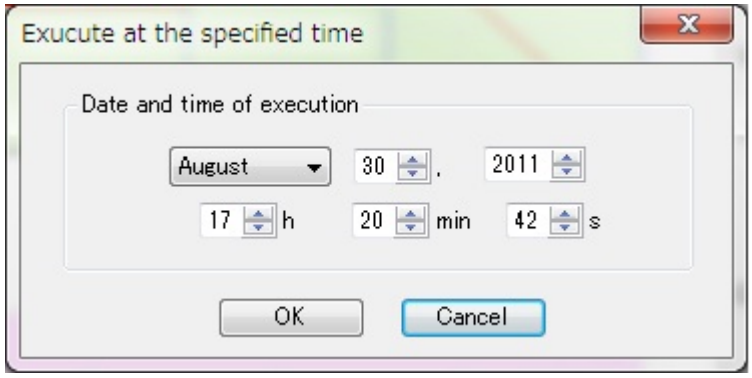


Fig. 8-1 Setting the time of execution

Click **OK** to apply the time of execution.

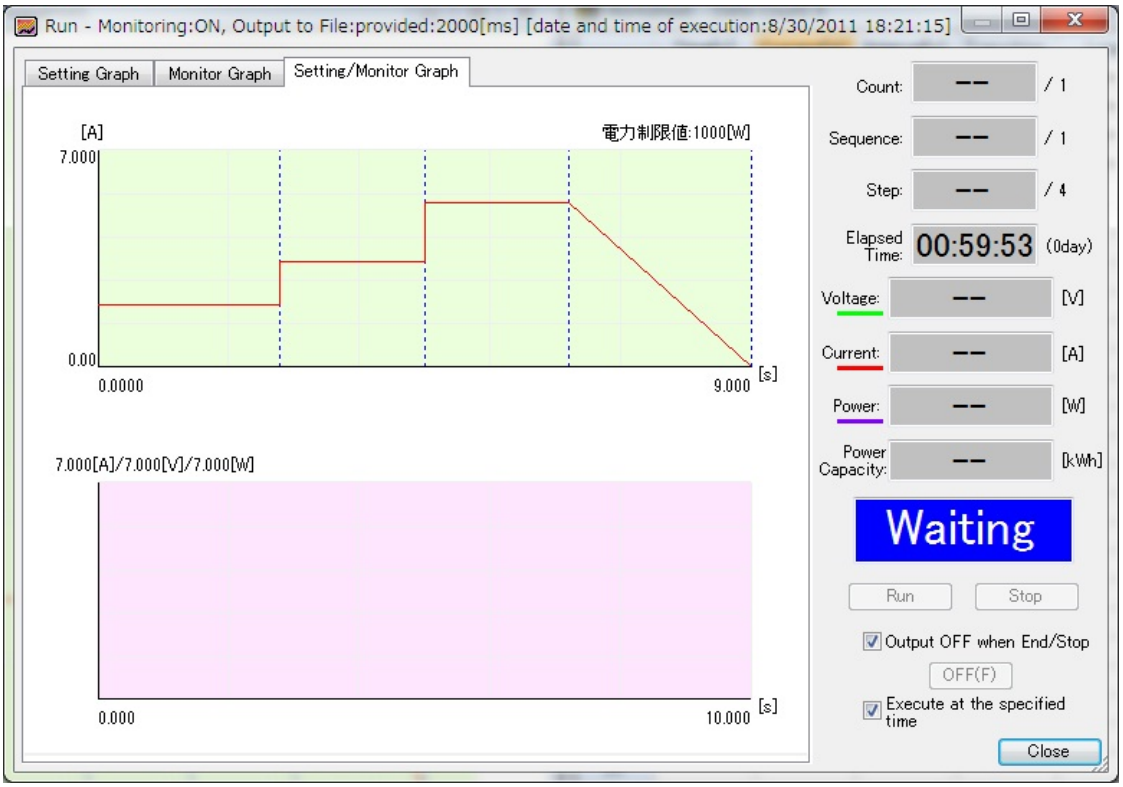


Fig. 8-2 Waiting for execution

The time of execution is displayed in the title bar of the dialog box.
Elapsed time shows the remaining amount of time.

Chapter9 Configuring Monitor Settings

On the “**Sequence**” menu, click “**Monitor Settings**” to open the “**Monitor Settings**” dialog box.

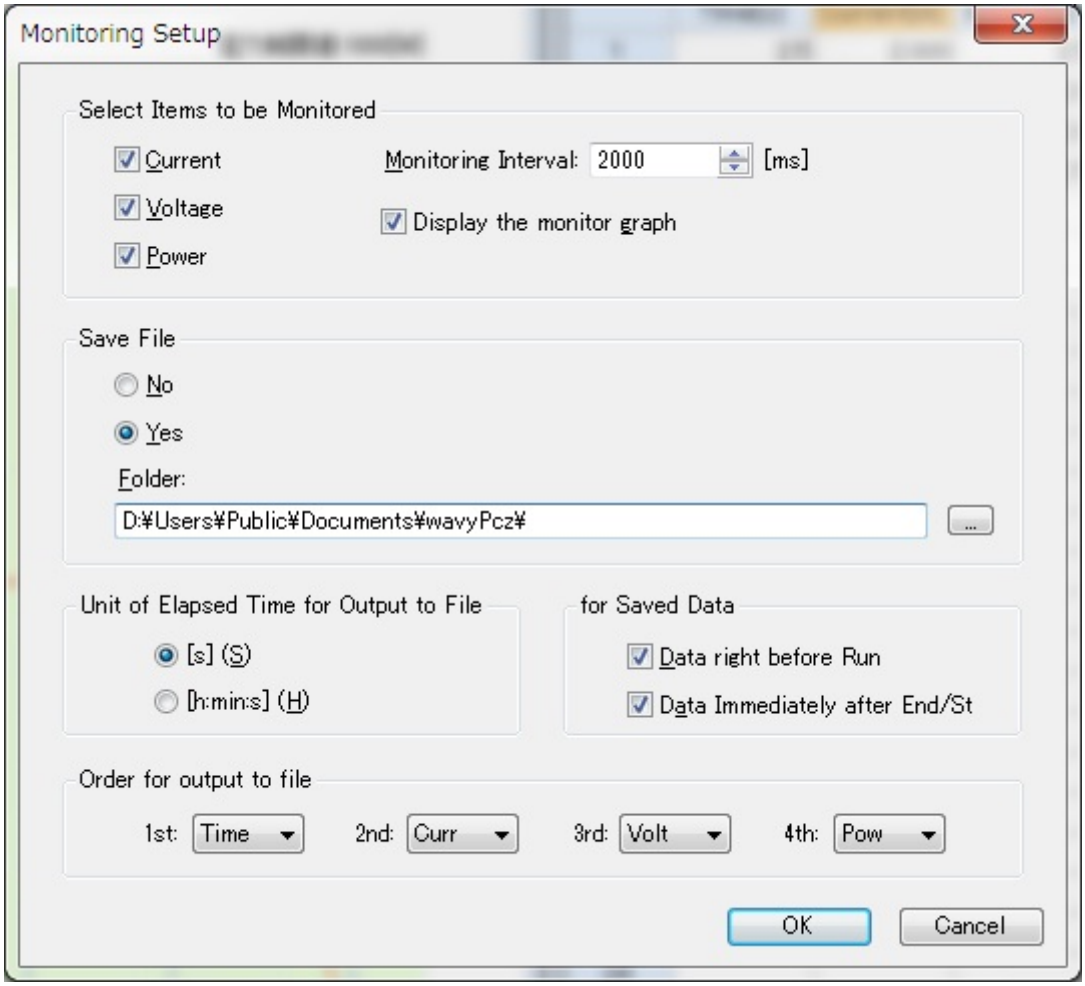


Fig. 9-1 Monitor Settings dialog box

When the “**Curr**” check box is selected, the input rms current is displayed during sequence execution.
When the “**Volt**” check box is selected, the input voltage is displayed during sequence execution.
When the “**Pow**” check box is selected, the apparent power and integrated power are displayed during sequence execution. For the apparent power, Wavy displays the product of the input rms current and the input voltage.
For the integrated power, Wavy displays the integral of the product of the apparent power and the monitoring interval.

The monitoring interval ranges from 1000 to 600,000 ms (1 to 600 s).

If you select "**Yes**" under the "**Save File**", the monitored data is saved to a file in the specified folder.

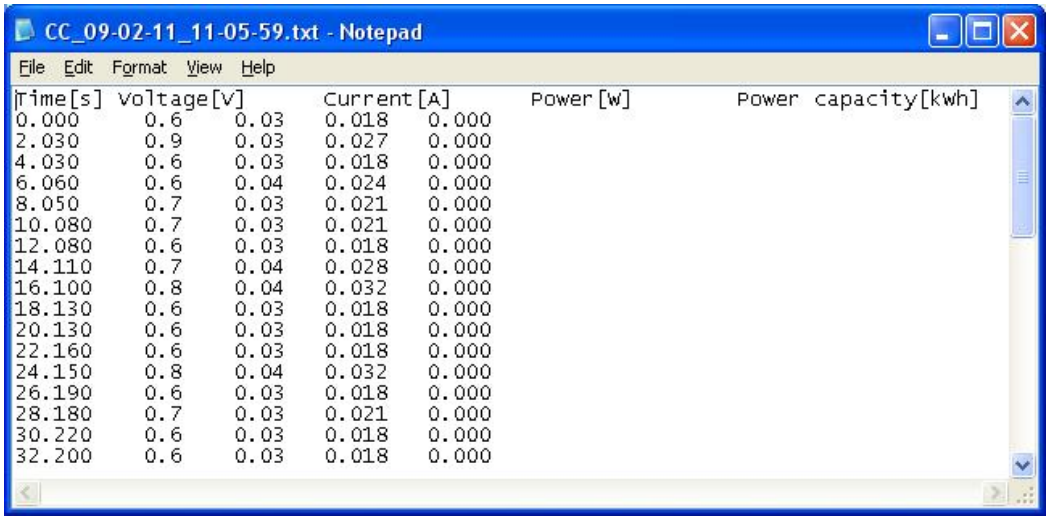


Fig. 9-2 Monitor file

＊ The integrated power is always listed in the file's last column.

How monitor files are named is explained below.

CC_09-02-11_11-05-59. txt
① ②

① CC, CR, or CP (constant current, constant resistance, or constant power)
② Month, day, year, hour, minute, and second when the sequence was executed

You can set the format that the amount of elapsed time is indicated in to [seconds] or to [hours:minutes:seconds].

＊ The precision of the time (monitoring interval) is determined by the PC operating environment.

＊ Data values are separated by tabs, not spaces.
You can switch from tab separation to comma separation. For details, see chapter 11, "Environment Settings."

If you select the "**Data before execution**" check box, the monitored value before the load is turned on is written to the file as 0 s.
If you select the "**Data after execution**" check box, a monitored value is written to the file immediately after the sequence finishes or is stopped (the actual data is acquired within 0 to 2 seconds).

If the "**Display monitor graph**" check box is not selected, the monitor graph is not displayed.

※ The monitor graph display is influenced by your PC operating environment. If the influence is extreme, clear this check box.

Chapter10 Configuring Protection Settings

On the "**Sequence**" menu, click "**Protection Settings**" to open the "**Protection Settings**" dialog box.

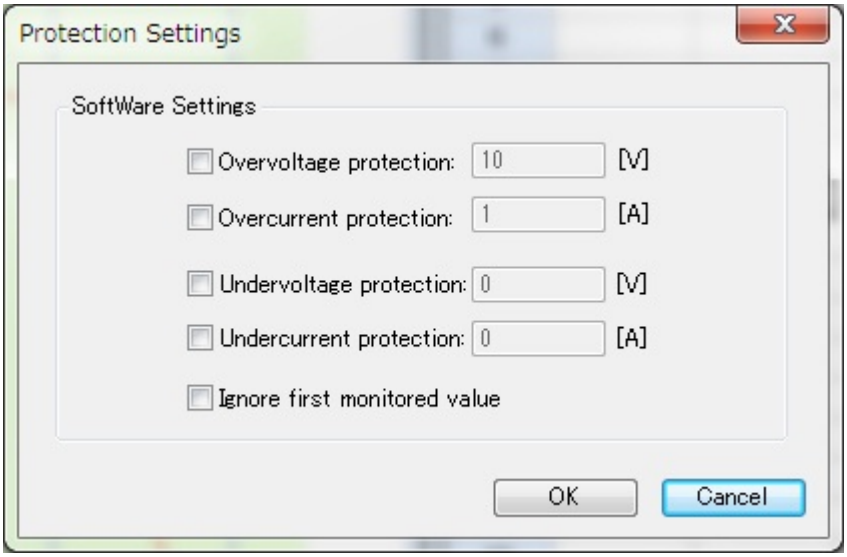


Fig. 10-1 Protection Settings dialog box

The software settings deal with how the software uses the monitored data to protect the hardware.

Software Settings

When the overvoltage or overcurrent protection check box is selected, the software stops sequence execution when the monitored value exceeds the specified value. This protection feature only functions when monitoring is taking place.

When the undervoltage or undercurrent protection check box is selected, the software stops sequence execution when the monitored value falls below the specified value. This protection feature only functions when monitoring is taking place.

If you select the "**Ignore first monitored value**" check box, the first monitored value after sequence execution is ignored.

Chapter11 Environment Settings

On the "**Settings**" menu, click "**Environment**" to open the "**Environment Settings**" dialog box.

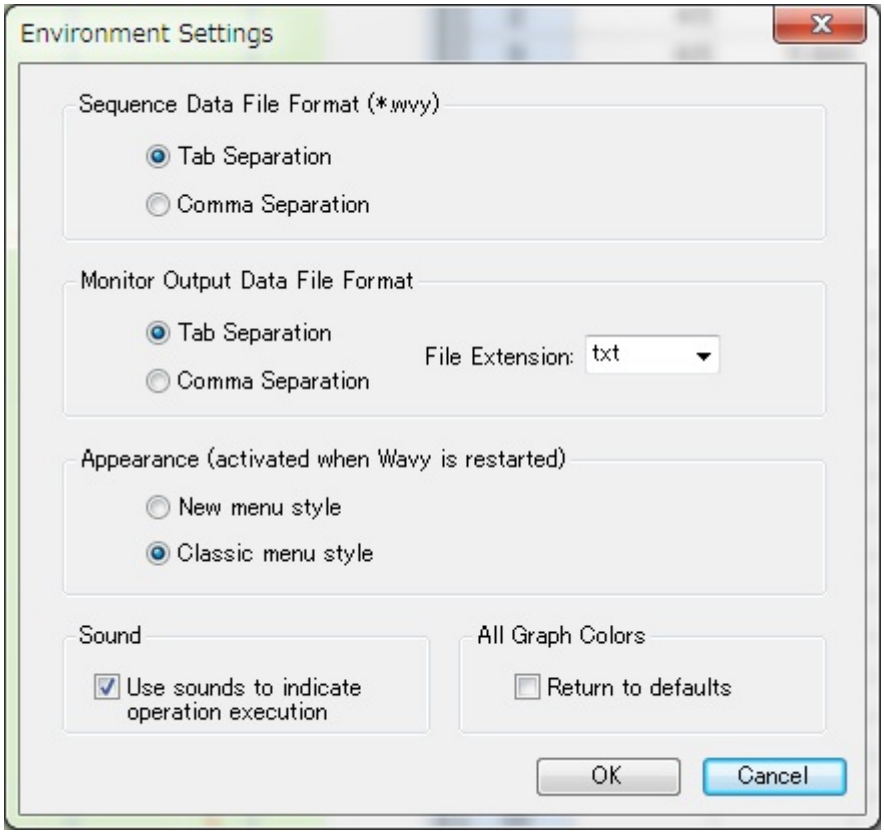


Fig. 11-1 Environment Settings dialog box

The default sequence-data file format is "**Tab separated**" (data values are separated by tabs). To separate data points by commas, select "**Comma separated**".
The same is true for the monitored-data file format.
You can set the monitored-data file name extension.

The appearance setting affects the appearance of the menu bar and toolbar.
When you change this setting, the change is applied after you close and restart the "Wavy".

* If you change the monitored-data file settings so that monitored-data files are comma-separated files with .csv extensions, you can open the files easily using Excel (a conversion wizard does not appear).

Chapter12 Changing the Background color and Line Color

You can change the background color of the graph, line, and other colors as you required.

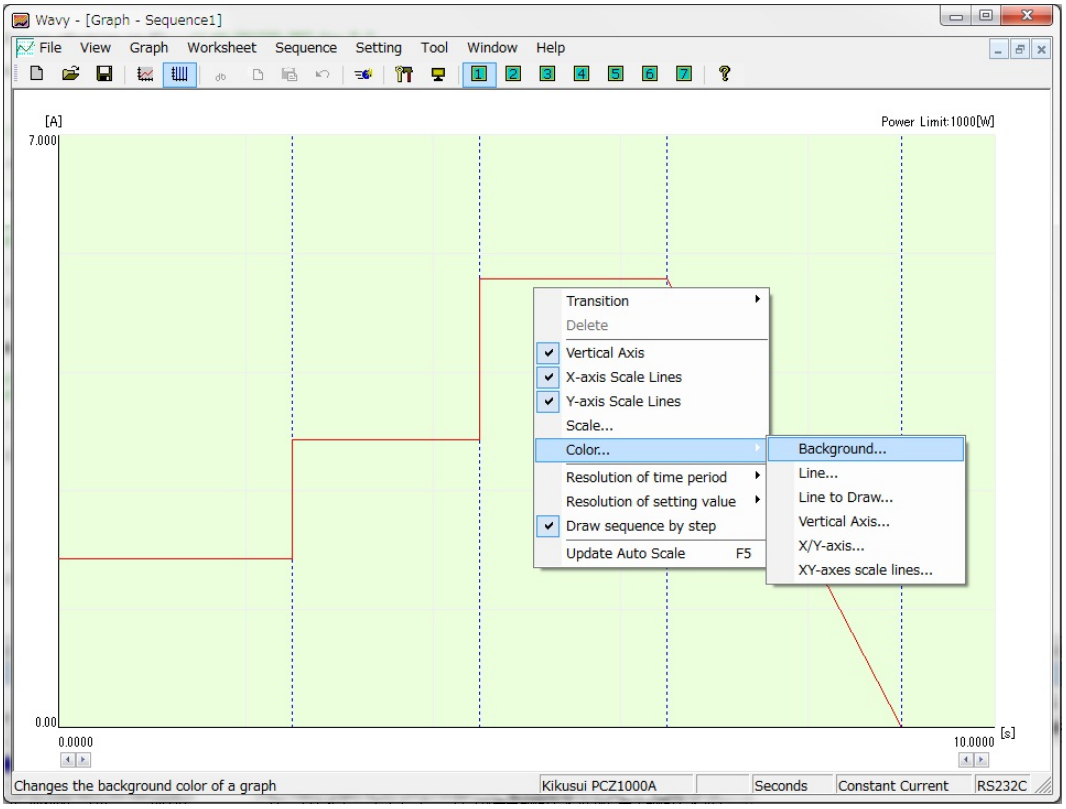


Fig. 12-1 Changing the Background color

* In the environment settings, if you select the "**Return to defaults**" check box under **All Graph Colors**, all the colors that you have changed are returned to the default colors that were displayed immediately after you installed the "Wavy".

Chapter13 Remote Control Panel

You can set the current, power, and resistance and turn the load on and off as if you were using a remote, and you can monitor input voltage, input rms current, and apparent power.
For the apparent power, Wavy displays the product of the input rms current and the input voltage.
This feature is independent from the sequencing feature.
On the "**Tool**" menu, click "**Remote Control Panel**" to open the "**Remote Control Panel**" window.

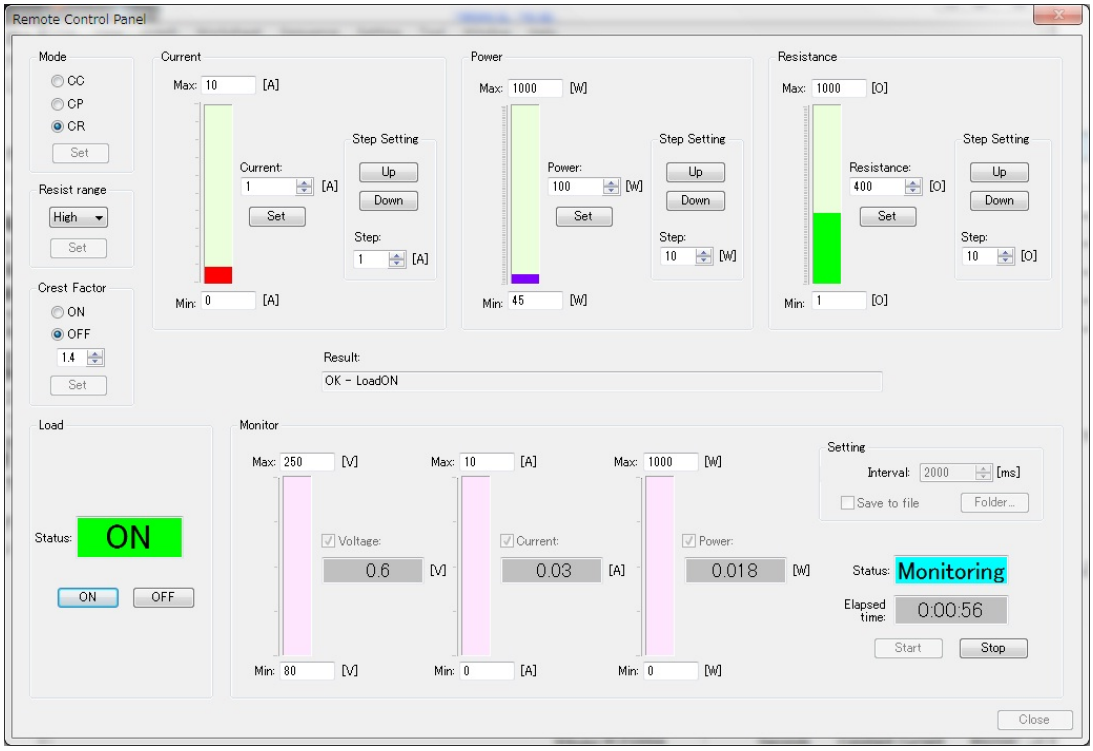


Fig. 13-1 Direct Control window

First, set all the maximum and minimum values to match the ranges that you intend to operate in.

You can set the current, power, and resistance by pressing ENTER after you type them.
When you move up or down a step using the arrow buttons, the step value is added or subtracted from the set value.
In Fig. 13-1, if in the Step Settings under Current, you click the up arrow button, the value becomes 5 + 1 = 6 (A).
The bar scale is determined by the step value.

If in the Monitor settings, the "**Save to file**" check box is selected, the monitored values are saved to a file.

When the check box is selected, you can click **Folder** to specify the folder that the file is saved to.

The file name is Wavy_04-19-10_14-35-03.txt.

* The file format and extension depend on the settings you make in Chapter 11, "Environment Settings."

Chapter14 Command Control

On the "**Tool**" menu, click "**Command Control**" to open the "**Command Control**" window.

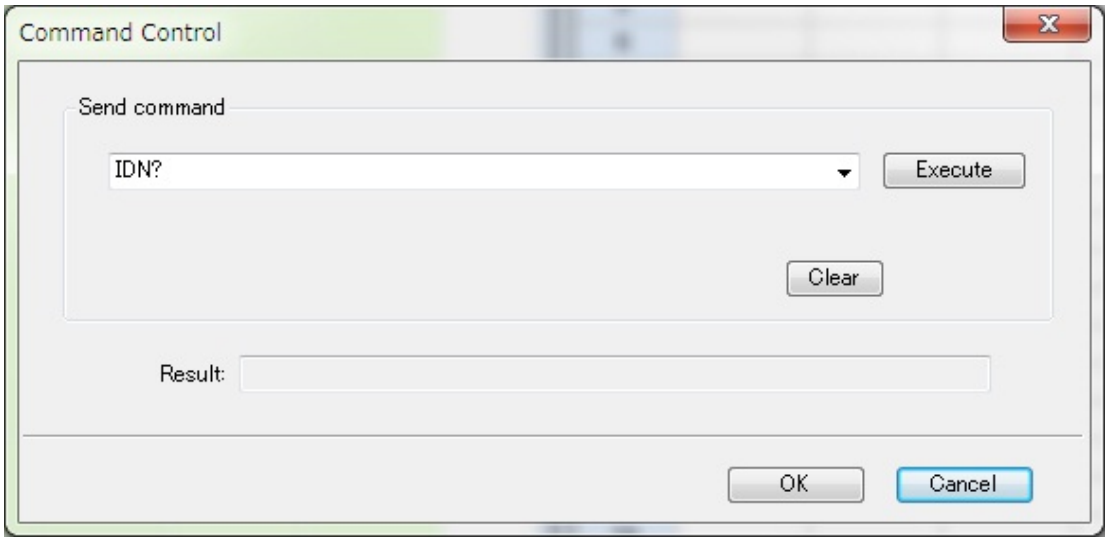


Fig. 14-1 Command Control window

You can use this feature to execute commands independently from the sequencing feature.

When the Command is sent and received correctly (up to 10), it appears in the drop-down list.
To clear the drop-down list, click **Clear**.

＊Multiple commands are not supported.
＊For details about commands, see the PCZ1000A Operation Manual.

Chapter15 Sequence-Data Files

Sequence-data files are text-format files.

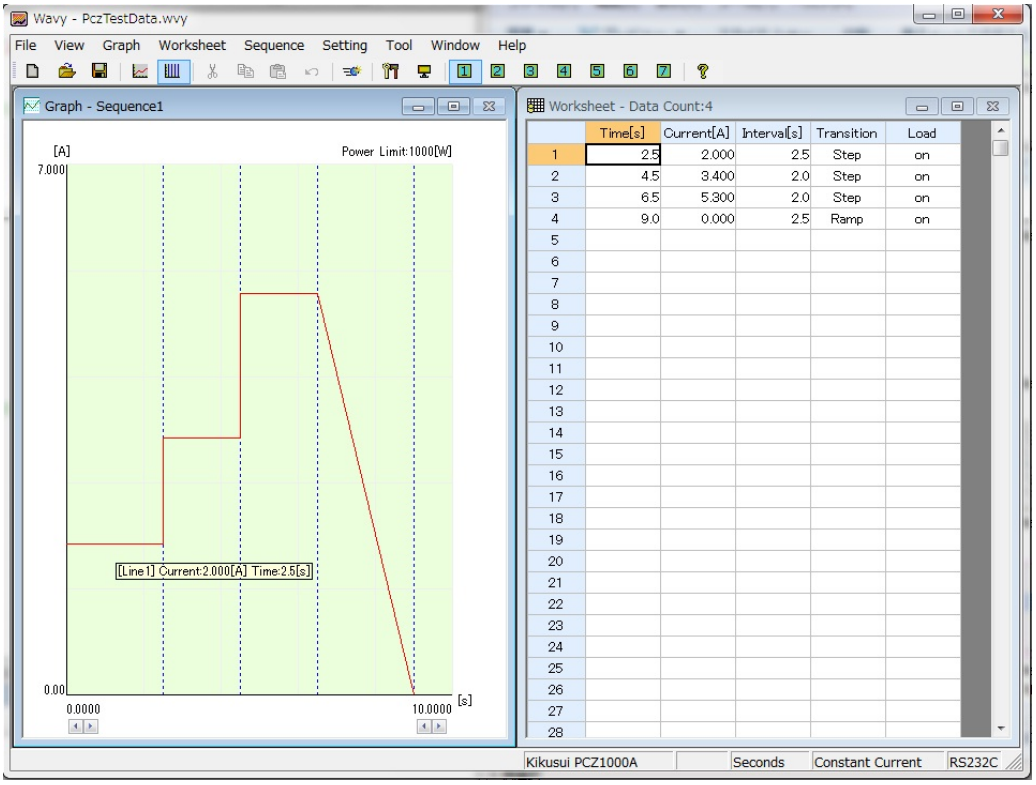


Fig. 15-1 The main window when PczTestData.wvy has been loaded.

When PczTestData.wvy (shown in Fig. 15-1) is opened using Notepad, it looks like Fig. 15-2.

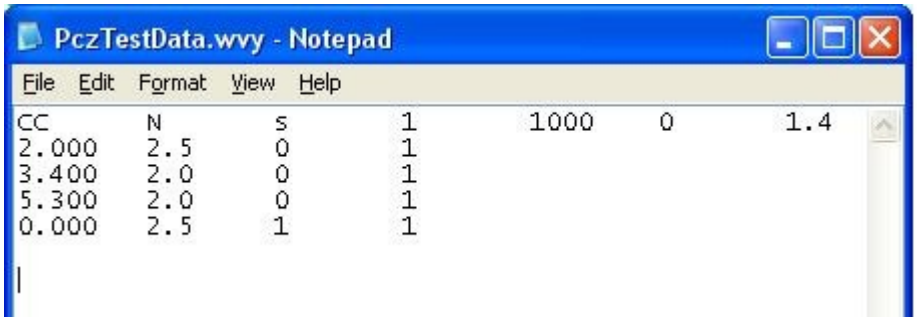


Fig. 15-2 Opening PczTestData.wvy in Notepad

Be aware of the form between the data is **"TAB Separated Values (TSV)"**, not spaces.
You can switch the form from the TSV (Tab Separated Values) to the CSV (Comma Separated Values). For details, see chapter 11, "Environmental Settings."
The first line contains the mode data, and the second to fifth lines contain the sequence data.

The contents of the first line are listed below.

Column	Symbol	Description
First item	CC, CR, or CP	Constant current, constant resistance, or constant power
Second item	N	This is always N (dummy).
Third item	s, min, or h	Seconds, minutes, or hours
Fourth item	1 to 9999	The number of repetitions
Fifth item	Power limit	Current limit in CP mode
Sixth item	Current limit or Crest factor presence	Current limit in CR mode 0: Off, 1: On in CC mode
Seventh item	Resistance range or Crest factor	1: Low, 2: High in CR mode Crest factor in CC mode

The contents of the second line are listed below.

Column	Description
First item	Current, resistance, or power
Second item	Time interval
Third item	Transition type. 0: step. 1: ramp.
Fourth item	Load. 0: off. 1: on.

＊The next set of sequence pattern data follows after one empty line.

You can also open PczTestData.wvy in Excel, as shown in Fig. 15-3.

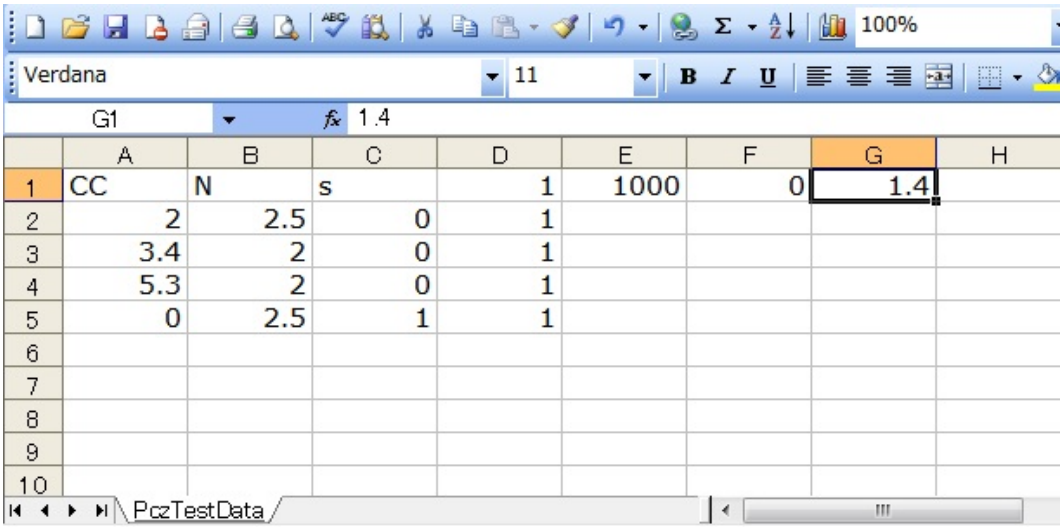


Fig. 15-3 Opening PczTestData.wvy in Excel

If you want to change the current or power, time interval, or other values all at once, use Excel.

Chapter16 Menu Items

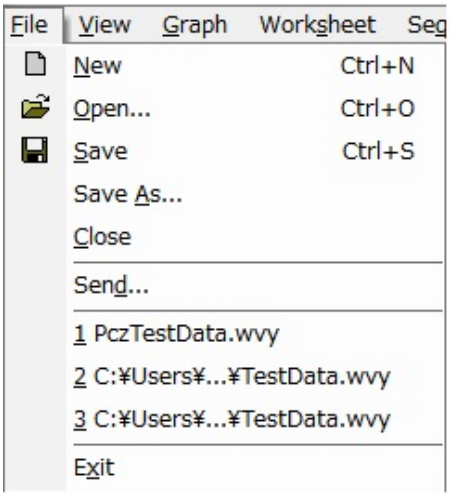


Fig. 16-1 File menu

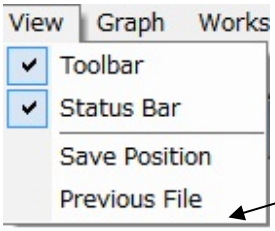


Fig. 16-2 View

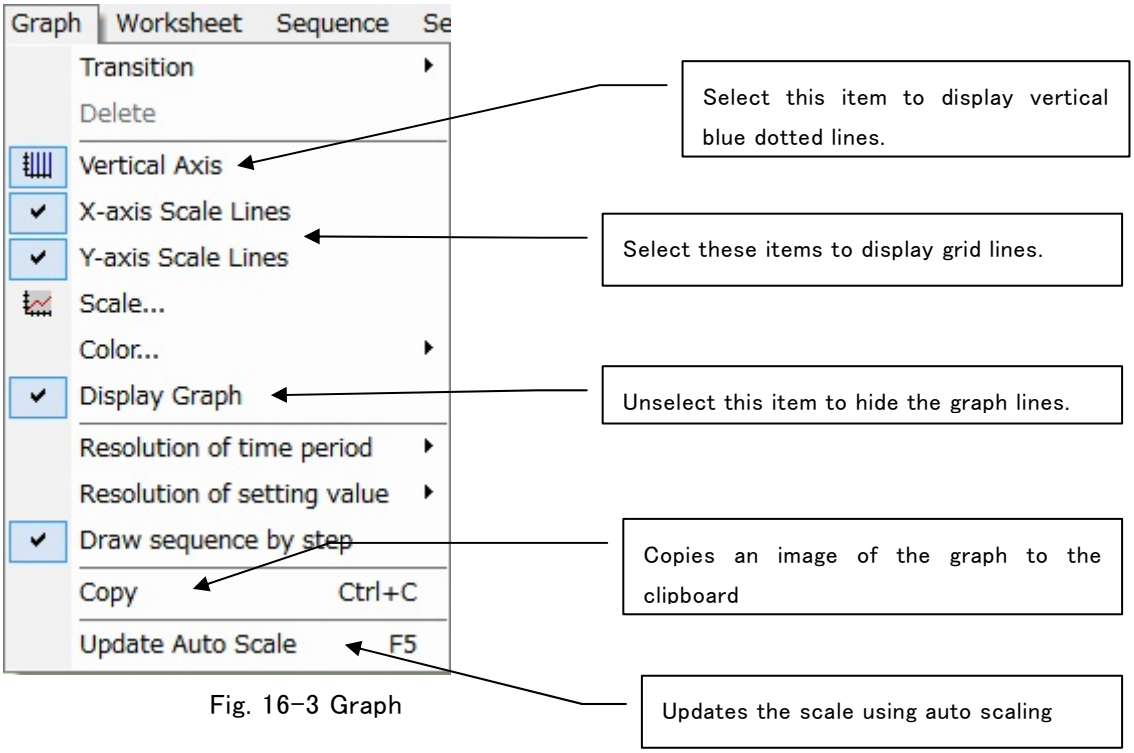
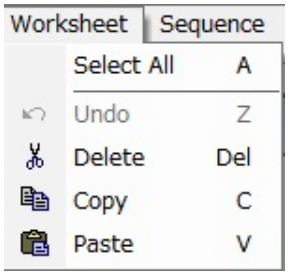
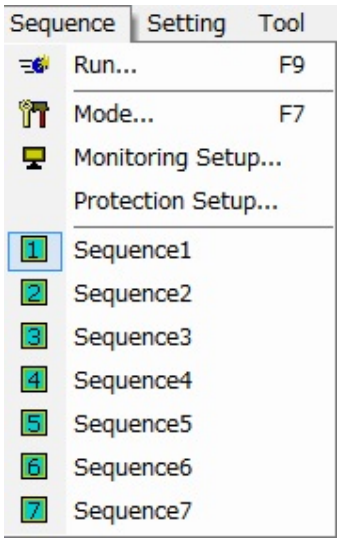


Fig. 16-3 Graph



Use these items to copy, insert, and delete multiple lines of sequence data (step data) that have been

Fig. 16-4 Sheet



Select the sequence pattern to create or

Fig. 16-5 Sequence

Fig. 16-6 Settings

Fig. 16-7 Tools

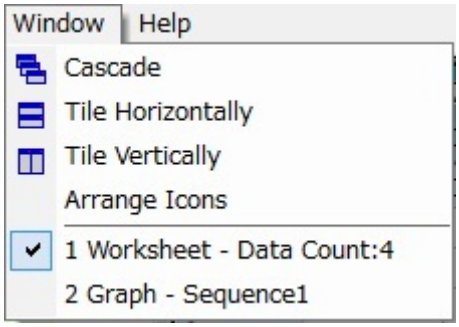


Fig. 16-8 Window

Chapter17 Toolbar and Status Bar

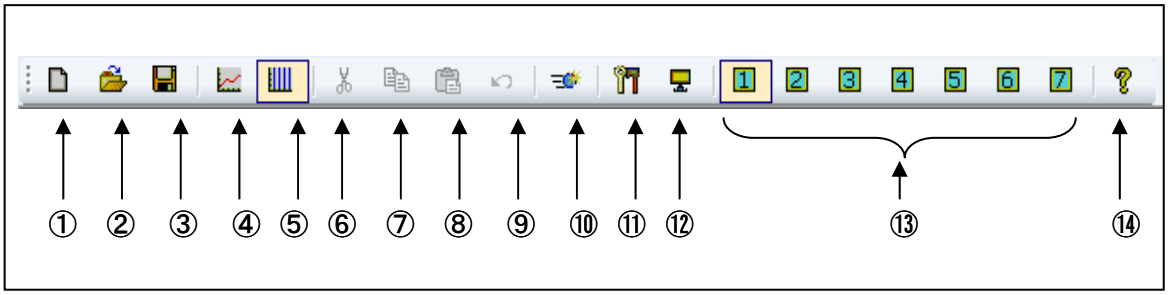


Fig. 17-1 Toolbar

① New File (CTRL+N)
② Open (CTRL+O)
③ Save (CTRL+S)
④ Scale
⑤ Turn Vertical Line Display On/Off
⑥ Delete (DELETE)
⑦ Copy (C)
⑧ Insert (V)
⑨ Undo (Z)
⑩ Execute
⑪ Mode
⑫ Monitor Settings
⑬ Sequence Pattern 1 to 7
⑭ “Wavy” Version Information

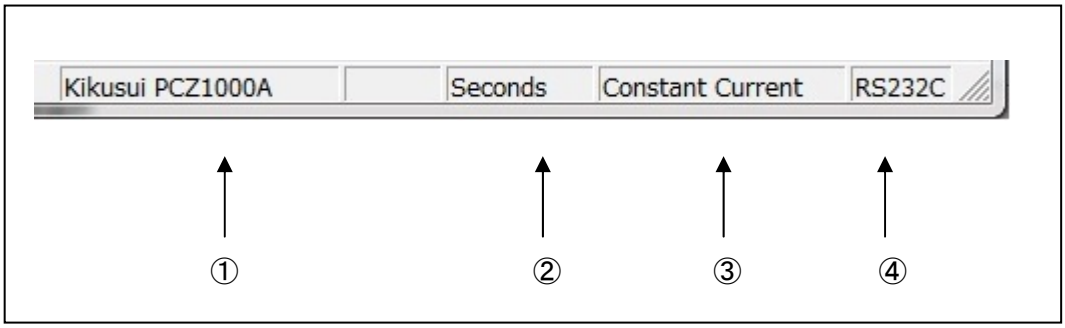


Fig. 17-2 Status bar

① Device name
② Unit of time seconds, minutes, or hours
③ Operation mode constant current, constant current + CF, constant resistance, or constant power (*CF stands for crest factor.)
④ Interface RS232C