

# Introduction (Graph Viewer)

The Graph Viewer is used to display or print graphs of test data that has been generated by the Test Executive. In addition to test data graphs, test data values, energy and other computed values determined from test data, and test conditions can be displayed allowing you to analyze the data comprehensively.

The Graph Viewer can display multiple graphs overlapped.

## ■Product version covered

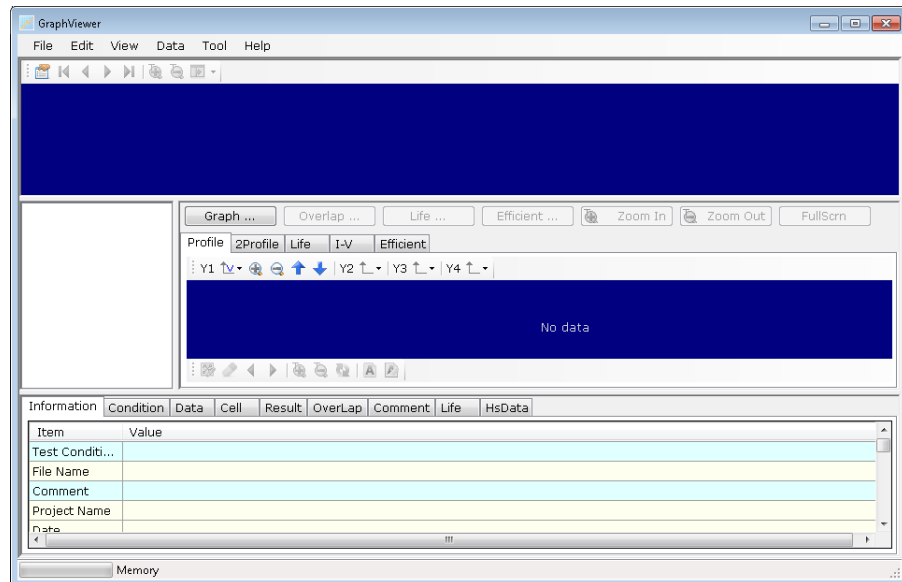
This guide covers Graph Viewer version 1.x. You can check the version by clicking About Graph Viewer on the Help menu.

## ■Notations used in this manual

- In the interest of brevity, the PFX2512 Charge/Discharge System Controller shall be hereafter referred to as the "PFX2512 Series".
- The term "PC" is used to refer generally to both personal computers and workstations.

# Starting the Graph Viewer

To start the Graph Viewer, on the taskbar, click Start, All Programs, Kikusui BPChecker3000, and Graph Viewer.

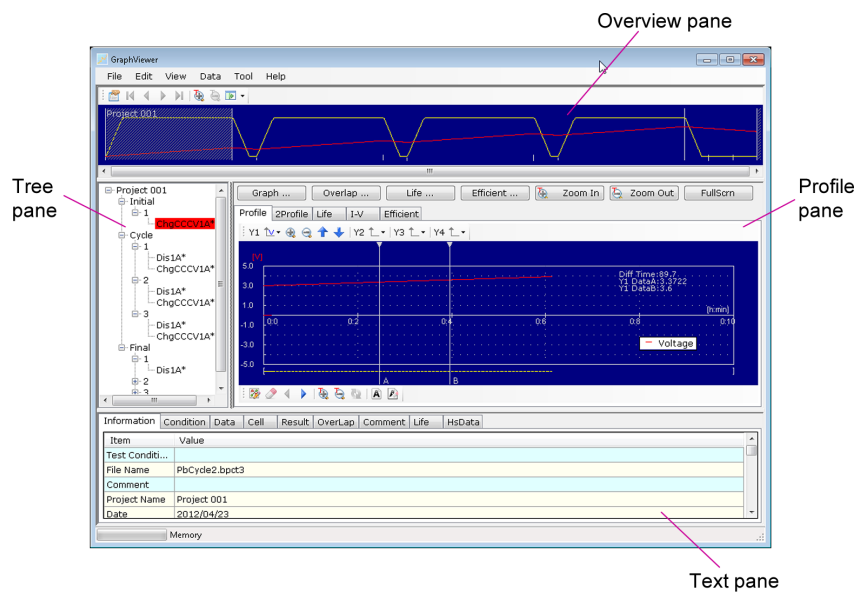


# Displaying Graphs


To display graphs, on the File menu, click Open. Then, select a life file (.BPCL3 extension) that the Test Executive has generated.

## Parts of the screen

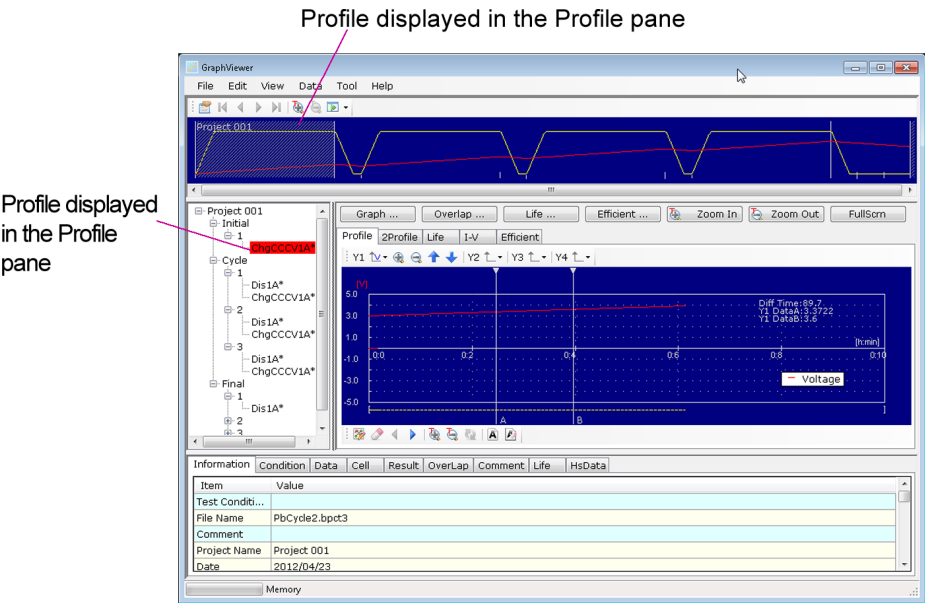
The Graph Viewer consists of four panes.



Pane	Description
Overview pane	Displays the entire test results on a graph.
Tree pane	Displays the configuration of the loaded test result file.
Profile pane	Displays the graphs of test results of the profiles selected in the overview pane or tree pane.
Text pane	Displays the details of the loaded file or the profile that is being displayed (test information, test conditions, test data, cell voltages, test results, overlap settings, comments, life, and high sampling) in text format.

You can move the cursor over the boundaries of the panes (the cursor changes to ) to change the pane sizes.

Select the profile to display in the Profile Pane from the Overview Pane or Tree Pane.

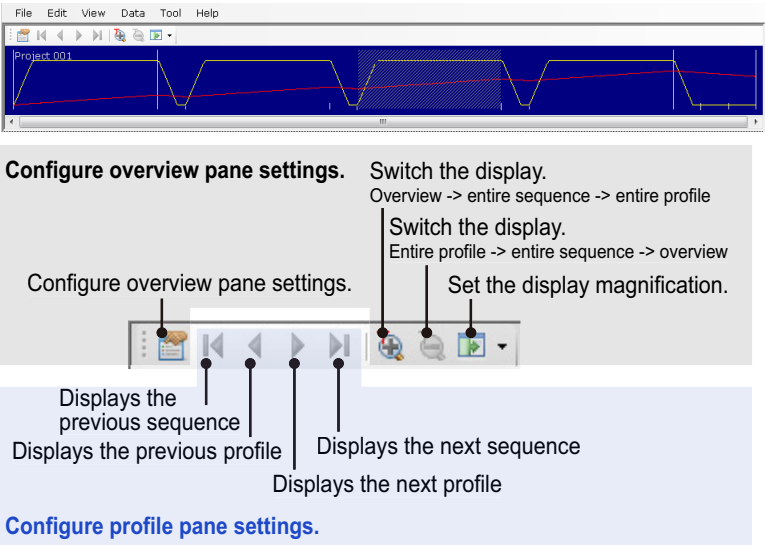


## Overview pane

The overview pane displays three types of graphs.

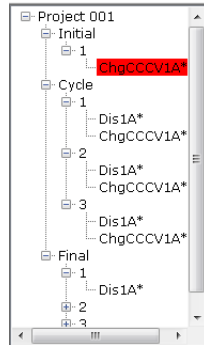
Displayed graph	Description	Indication in the upper left of the screen
Entire test	Displays the entire test.	Project name
Entire sequence	Displays the entire sequence.	Sequence name
Entire profile	Displays specific repetitions of a sequence.	Sequence name and repeat count

You can select the profile to display in the profile pane.



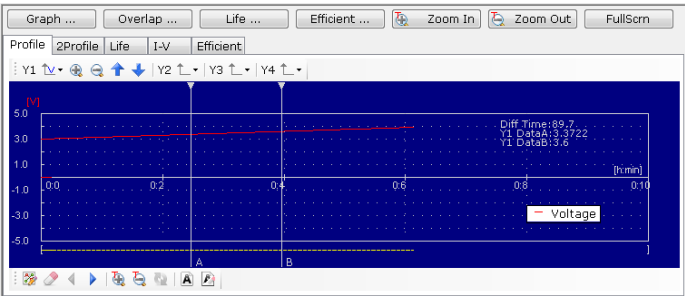
## Tree pane

Displays the configuration of the loaded test result file in a tree structure. You can select the profile to display in the profile pane.



# Profile pane

The test result of a profile is displayed in a graph. You can set up to four items on the Y axis.



Y1 axis setting

Change the item to display on the Y1 axis.

Expand and reduce the Y1 axis.

Move the Y1 axis up and down.

Y1

Y2

Y3

Y4

Y2 axis setting

Y3 axis setting

Y4 axis setting

Display overlapped graphs.

Clear overlapped graphs.

Move to the next or previous profile.

Expand between A and B.

Reduce.

Delete history.

Add a comment.

Delete the comment.

You can change the type of profile to display using tabs.

Tab	Description
Profile	Displays a single profile.
2Profile	Displays two consecutive profiles. This is useful when you want to view a pair of charge and discharge graphs.
Life	Displays four types of life graphs. You can set one display condition.
I-V	Displays an I-V characteristic graph.
Efficient	Displays two types of life graphs. You can set display conditions. Since you can display a life graph of another test, it is useful for comparing graphs.

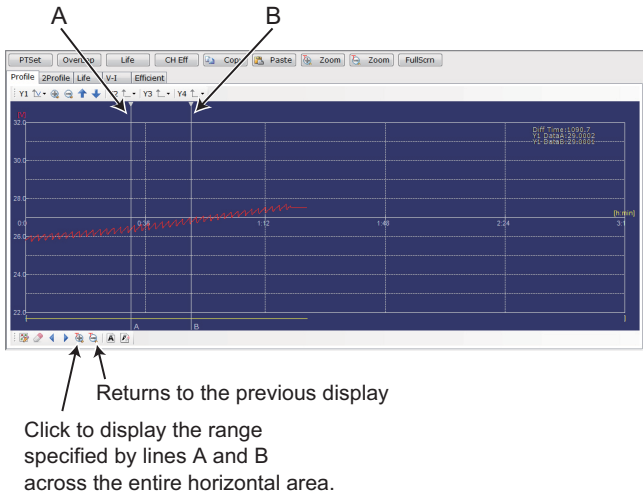
You can change display settings and display overlapped graphs.



Item	Description
Graph	Set the values to display on the X and Y axes, change colors, and configure other settings.
Overlap	Configure overlapped graphs.
Life	Configure life graphs.
Efficient	Configure the comparison of life graphs.
Zoom In	Zooms the display.
Zoom Out	Zooms out from the display.
FullScr	Displays the profile pane in full screen.


■Expanding and reducing the display

You can expand the profile pane by specifying a range. The previous expansion setting is retained, so you can easily return to the previous display.



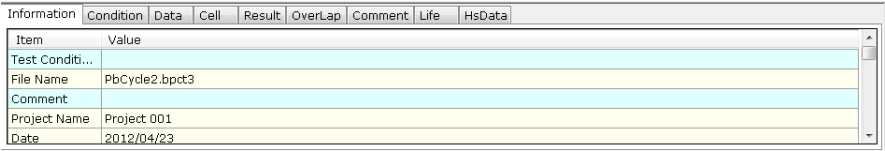
You can drag A and B. Hold down SHIFT and drag to move A and B at the same time.

On the Data tab of the text pane, you can view and change the A and B positions. The default magnification is 1/2.

You can clear the retained expansion setting by clicking  .

# Text pane

The text pane displays overall test information, information of the profile that is being displayed, and overlapped graph information in text format.



Tab	Description
Information	Displays information.
Condition	Displays test conditions.
Data	Displays profile's test results.
Cell	Displays cell information.
Result	Displays test results.
OverLap	Displays overlapped graph information. You can change the graph colors and add comments.
Comment	Displays comments.
Life	Displays life graph information.
HsData	Displays high-speed sampling data.



# Displaying Overlapped Graphs


See p. 19

If you are using the Profile, 2Profile, or I-V tab, you can overlap graphs of multiple profiles. Overlapped graphs can be saved.

## Displaying overlapped graphs

There are two ways to configure overlapped graphs. One way is to specify another graph to overlap over the profile graph that is being displayed. The other way is to specify conditions to overlap graphs. You can view the information of overlapped graphs on the OverLap tab of the text pane.

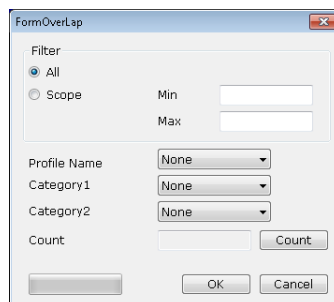
### Overlapping another graph over the present graph

Click  to lock the graph that is being displayed. Once locked, the graph will remain when you select another profile. Select the profile to overlap over the present graph.

Select the profile to overlap in the overview pane or tree pane. You can also use the ◀▶ icons to select the profile. Click ◀ to display the previous profile and ▶ to display the next profile.

### Specifying conditions to overlap graphs

Click the Overlap icon. Or on the Data menu, click Over Lap. Then, specify conditions to create overlapped graphs.

The image shows a dialog box titled "FormOverLap". It contains a "Filter" section with two radio buttons: "All" (selected) and "Scope". To the right of "Scope" are two input fields labeled "Min" and "Max". Below this are three dropdown menus labeled "Profile Name", "Category1", and "Category2", each with "None" selected. At the bottom left is a "Count" label next to an empty text box. To the right of the text box is a "Count" button. At the very bottom are "OK" and "Cancel" buttons.

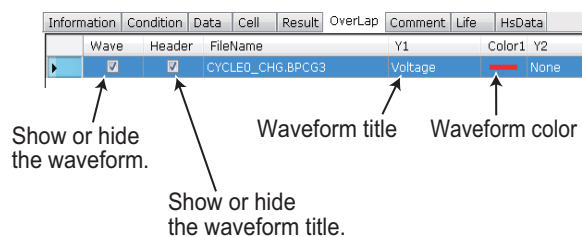
You can use the following items to search.

- Filter (All or Scope. If you select Scope, specify the minimum and maximum profile numbers.)
- Keywords (Profile Name, Category1, and Category2. Keywords are created when you create test conditions.)

Click Count to display the number of search results.

Click OK to overlap the graphs of the profiles that matched the specified conditions.

On the Overlap tab in the text pane, you can change the display colors and assign titles to waveforms.



## Removing graphs from overlapped graphs

On the Overlap tab of the text pane, select the profile that you want to delete and right-click. Click Delete to delete the specified profile.

## Overlapping profiles of different tests

You can overlap profiles of different tests.

Display the test results of the profile that you want to overlap in the Graph Viewer. On the Edit menu, click Copy OverLap.

Display the present profile. On the Edit menu, click Paste OverLap. The graph of the different test is overlapped over the present graph.

# Displaying Life Graphs

Life graphs can be displayed on the Life and Efficient tabs. Life graphs show changes in the DUT (battery) capacity. You can set display conditions.

## Displaying specific items on life graphs

Four types of life graphs can be displayed. You can set one display condition.

Click the Life icon. Or on the Data menu, click Condition of Analyze. The axis setting can be saved as a search condition.

FormLifeOverLap

Axis Setting

Name: [dropdown]

No: [dropdown] [Save]

Axis

X Axis: [Cycle No]

Y1 Axis: [Capacity[Ah]]

Y2 Axis: [None]

Y3 Axis: [None]

Y4 Axis: [None]

Filter

☒ All

☐ Profile OverLap

☐ Scope

Min: [input]

Max: [input]

Profile Name: [None]

Category1: [None]

Category2: [None]

[OK] [Cancel]

You can use the following items to search.

- A saved axis
- Filter (All, Profile OverLap, or Scope. If you select Scope, specify the minimum and maximum profile numbers.)
- Keywords (Profile Name, Category1, and Category2. Keywords are created when you create test conditions.)

Click OK to display on the Life tab the life graph that matched the specified conditions.

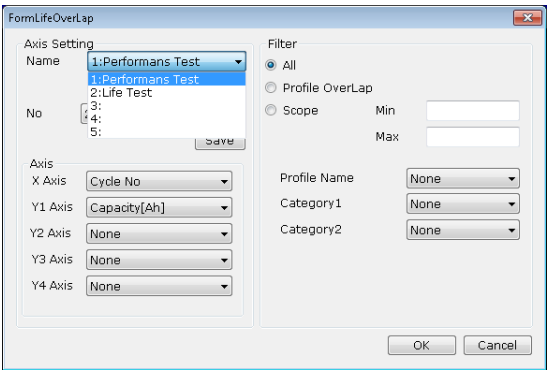
## Saving and recalling X-axis and Y-axis setting conditions

The setting conditions can be saved to files with specified names (up to 5).

### ■ Saving

- 1 Configure the X-axis and Y-axis settings.**
- 2 Select a number from the No. list to assign to the axis settings, and enter the file name.**
- 3 Click Save to save the axis settings.**

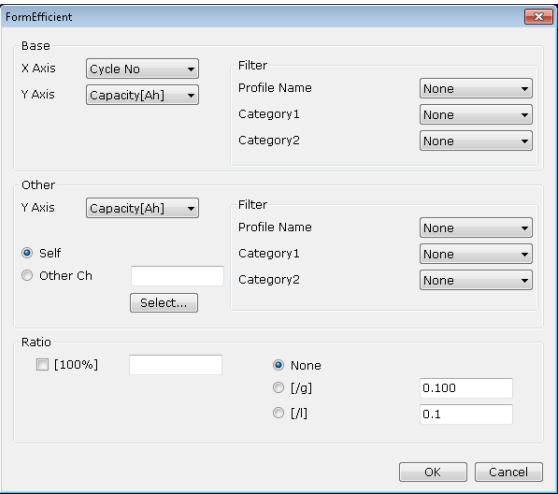
■Recalling



Select the axis settings you want to recall from the Name list to recall the saved information.

Comparing life graphs

Two types of life graphs can be displayed. You can set display conditions. A life graph of another test can be displayed.  
Click the Efficient icon. Or on the Data menu, click Efficient.



- You can use the following items to search.
- X-axis and Y-axis settings
  - Keywords (Profile Name, Category1, and Category2. Keywords are created when you create test conditions.)

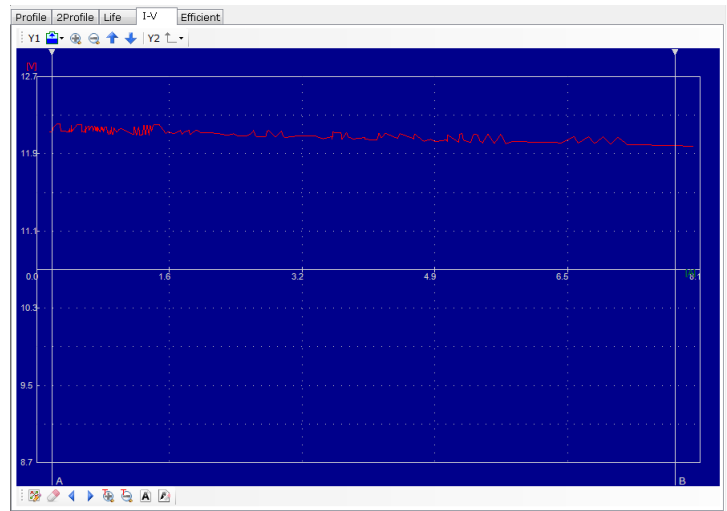
Comparison is useful for comparing batteries of different sizes.

- 1 Set the conditions for displaying the reference life graph (Base).**
- 2 Set the conditions for displaying the life graph to compare (Other).**  
To compare with the result of another test, select Other Ch. Click Select to select the life graph data to compare.
- 3 Click OK.**  
Life graphs that match the specified conditions are displayed on the Efficient tab.

# Displaying I-V Characteristic Graphs

I-V characteristic graphs can be displayed in the profile pane.

I-V characteristic graphs are automatically generated on the basis of battery output voltage and discharge current measurements when the discharge current is varied in step increments.

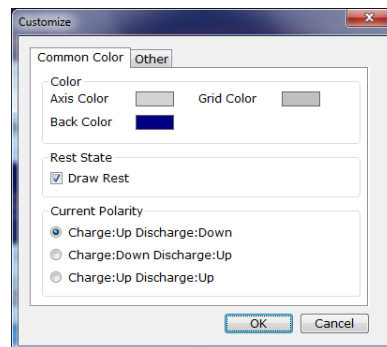


# Changing the Graph Display Settings

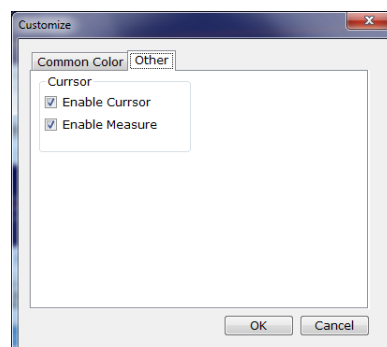
## Graph Viewer settings

To change general Graph Viewer settings, click Option on the Tool menu.

On the Common Color tab, configure the Color, Rest State, and Current Polarity settings.

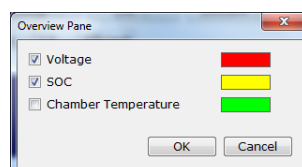


On the Other tab, select the cursor and unit of measurement.



## Overview pane settings

On the View menu, click All Pane. You can change the display colors of the overview pane.



Click the color of an item that you want to change to open a color setting dialog box. Select the color you want, and click OK.

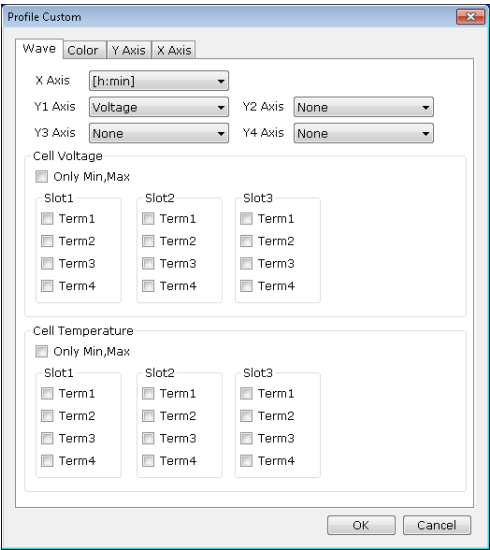
# Profile pane settings

On the View menu, click Profile Pane Custom. You can change the display items and colors of the profile pane.

The Wave, Color, Y Axis, and X Axis tabs are available.

To save the graph settings, on the File menu, click Save and then Customize. To load saved information, on the File menu, click Load and then Customize.

## Wave



### ■X Axis, Y1 Axis, Y2 Axis, Y3 Axis, and Y4 Axis

Select the items to display on the X and Y axes. You can assign up to four items to the Y axis. Displayable items vary depending on the test settings.

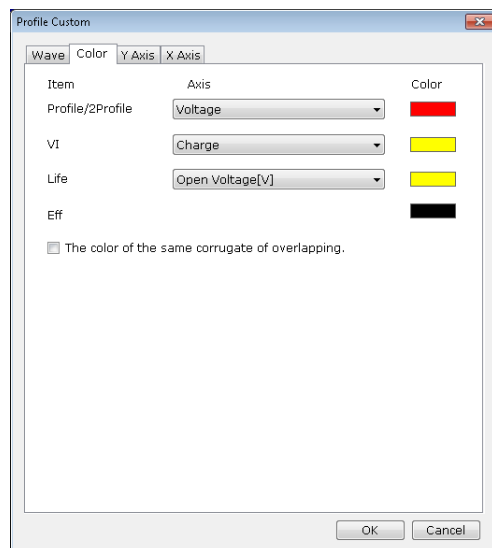
### ■Cell Voltage and Cell Temperature

These settings are valid when you are using the optional board in the test conditions.

Click the cell terminals that you want to display. If you select the Only Min,Max check box, only the maximum and minimum values of the selected terminals will be displayed.

The waveforms of the selected terminals will be displayed.

## Color

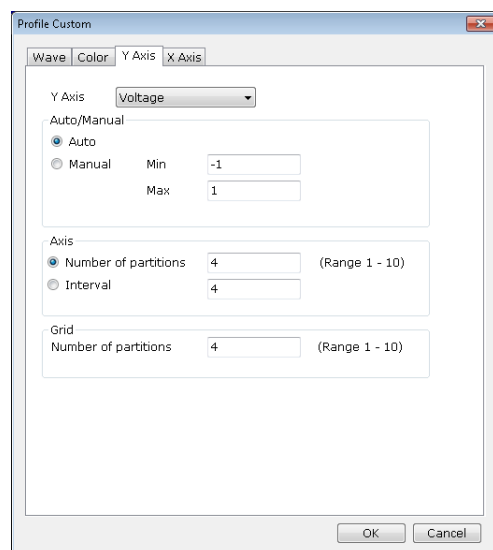


You can select the waveform colors to display in the profile pane.

Click the color of an item that you want to change to open a color setting dialog box. Select the colors you want, and click OK.

To display overlapped waveforms using different shades of the same colors, select the “The color of the same corrugate of overlapping” check box. This feature is useful to distinguish the graphs of the same items of overlapped profiles.

## Y Axis



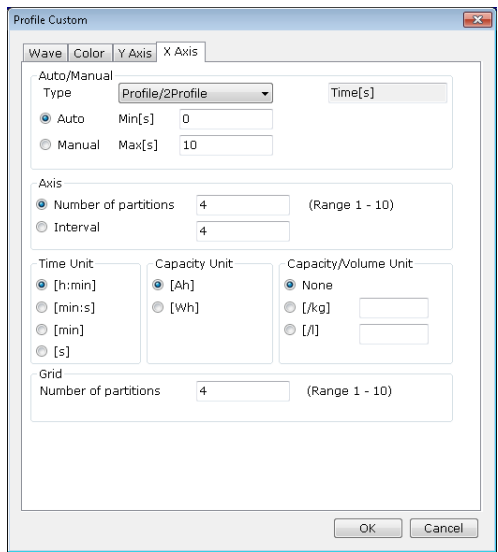
You can change the draw range of Y axis.

Select the Y axis item that you want to change, and select whether to draw the waveforms in Auto or Manual mode. If you select Manual, enter the Min and Max values.

You can also set the number of divisions and interval of the axis as well as the number of grid divisions.



## X Axis



You can change the draw range of X axis.

Select the graph type, and select whether to draw the waveforms in Auto or Manual mode. If you select Manual, enter the Min and Max values.

You can also set the number of divisions and interval of the axis as well as the number of grid divisions.

You can select the unit of time for displaying time information on the X axis. You can select the unit of capacity and volume measurement for displaying capacities.

## Full screen mode

To display the profile pane in full screen, on the View menu, click Full Screen. In Full screen mode, you cannot use the mouse.

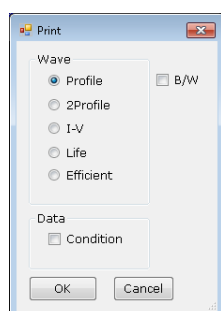
Press ESC to return to the normal screen.

# Printing Graphs

To print graphs, activate the graph window that you want to print, and on the File menu, click Print. If you want to view the print preview, on the File menu, click Print Preview.

## Changing the print conditions

To change the print conditions, on the File menu, click Print Setup.



# Saving Graphs

## Saving selected graphs (overlap conditions) of overlapped graphs

For overlapped graphs, you can save the graph overlap conditions to files with specified names.

To save overlap conditions, activate the graph window that you want to save. Then, on the File menu, click Save and then Over Lap.

To open a saved graph, on the File menu, click Load and then OverLap. Then specify the file name.

## Copying graph snapshots

You can use the clipboard to copy graph snapshots to other documents. To copy snapshots of graphs to the clipboard, activate the graph window that you want to copy, and on the File menu, click Save and then SnapShot.

## Saving graphs to Excel files

The numeric data of graph data can be saved in Excel files.

On the File menu, click Save and then Excel. A Save dialog box will appear. Enter the file name.

The exported file can be opened in Excel 2003 and later.

# Menu Reference

Menu		Description	
File	Open	Open graphs from a test result file (life).	
	Close	Closes graphs.	
	Save	Excel	Export graph data to Excel.
		SnapShot	Copies graphs to the clipboard.
		Over Lap	Save overlap conditions.
		Customize	Save graph settings.
	Load	Over Lap	Save overlap conditions.
		Customize	Load graph settings.
	Print	Print graphs.	
	Print Setup	Set the printer type.	
	Print Preview	Displays a graph print preview.	
	Resent File	Open a recent file.	
	Exit	Closes the Graph Viewer.	
Edit	Copy OverLap	Copy test result to overlap with another test result.	
	Paste OverLap	Overlaps another test result.	
View	All Pane	Configure overview pane settings.	
	Profile Pane Custom	Configure profile pane settings.	
	Full Screen	Displays the profile pane in full screen.	
Data	Over Lap	Configure overlapped graphs.	
	Condition of Analyze	Configure life graphs.	
	Efficient	Configure the comparison of life graphs.	
Tool	Option	Configure the Graph Viewer settings.	
Help	About Graph Viewer	Displays the Graph Viewer information.	
	Help	Displays a help file.	