

Universal Probe

Software Users Manual

Pattern Generator

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No. E090959-02

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NOTES

Thank you for purchasing the “Universal Probe” from Sohwa & Sophia Technologies. Correctly understand notes and other information in this document before using this product.

1. Permission from the Japanese government is required when exporting the product and technologies described in this document to which the “Foreign Exchange and Foreign Trade Act” applies or bringing them out of Japan.
2. The product described in this manual is intended to be used for general electronic equipment, such as office equipment, communication equipment, measuring instruments and home electric appliances. Do not use this product for automobile, railway, marine, aeronautical or space equipment, traffic equipment, combustion equipment, safety devices, medical devices, infrastructure equipment, nuclear power equipment or other types of equipment designed for a specific application that requires special quality and reliability and can directly threaten human life or cause damage to human body when it gets out of order or malfunctions. The customer should be responsible for using this product in such equipment.
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5. The specifications in this document may lead to different results depending on your environment or measurement conditions.
6. Note that we bear no responsibility for consequence of operating this product.
7. “Operating Precautions” in this document are important notes to prevent damage on users and third parties as well as assets and to use the product safely and correctly. Be sure to read these precautions before using this product.
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URL > <http://www.ss-technologies.co.jp/en/index.html>

Operating Precautions



Failure to observe the following precautions may lead to human death or severe injury.



Do

Avoid supplying voltage out of the range specified in the specifications of this product. Supplying the voltage out of the range may cause damage or fire.



Do

When using the target equipped with the ground terminal, ensure that the ground terminals of the target and peripheral equipment are connected. Failure to do so may cause an equipment failure or electric shock.

Avoid connecting the ground terminal to the gas pipe. This causes a fire or explosion.



Don't

Do not transport this product with equipment connected.

In particular, hold the plug when removing or inserting the cable. Failure to do so may damage the cable, causing a fire or electric shock.



Don't

Observe the following points when handling the cable. Do not damage, process, forcibly bend, twist, pull, putting any object on or heat the cable, moving the cable close to the heating device, or touch the cable with a wet hand.

Failure to observe these precautions may cause a fire or electric shock.

If the cable is damaged, stop using it.



Don't

When you hear thunders, do not touch the power plug. This causes an electric shock. If the product seems to be damaged by lightning strike, stop using it.



Don't

Do not let a staple, clip or other metal item enter into the product. This may cause a fire or failure.



Don't

Do not use or leave the product in direct sunlight, near heating devices, in an extremely hot or cold environment, under hard vibrations, in dusty area with a large amount of metal dust or oily dust, or noisy area full of spike noise.

Do not apply a strong shock to the product.



Do not disassemble

Do not disassemble, alter or repair the product. This may cause a fire or electric shock.



No wetting

Do not use the product at a place where there is liquid or a humid place such as in the bathroom or in vicinity to glasses. This may cause an electric shock.

If liquid enters into this product, immediately turn it off and stop using it.



Caution

Touching the energized product for a long time may cause low-temperature burns. Do not use this product covering with comforter or other cloth.



Pull out the plug.

Immediately turn the power off if unusual smell, noise, smoke or fire is detected or if the product is or may be damaged due to a fall or strong shock. Continuing to use it may lead to a serious accident. Stop using the product.

Abbreviations, Terms and Conventions

This section describes the abbreviations, terms and conventions used in this document.

- About numeric values ... All the numeric values are positive unless otherwise specified.
- K (capital letter) ... Represents $2^{10}=1024$. (Example: 16K=16384)
- k (small letter) ... Represents 1000. (Example: 1kHz=1000Hz)
- [xxxxx] ... Represents the window title, xxxxx.
- <xxxxx> ... Represents the item named xxxxx in the window.

The annotations and notes used in this document are as shown in Figure 1.

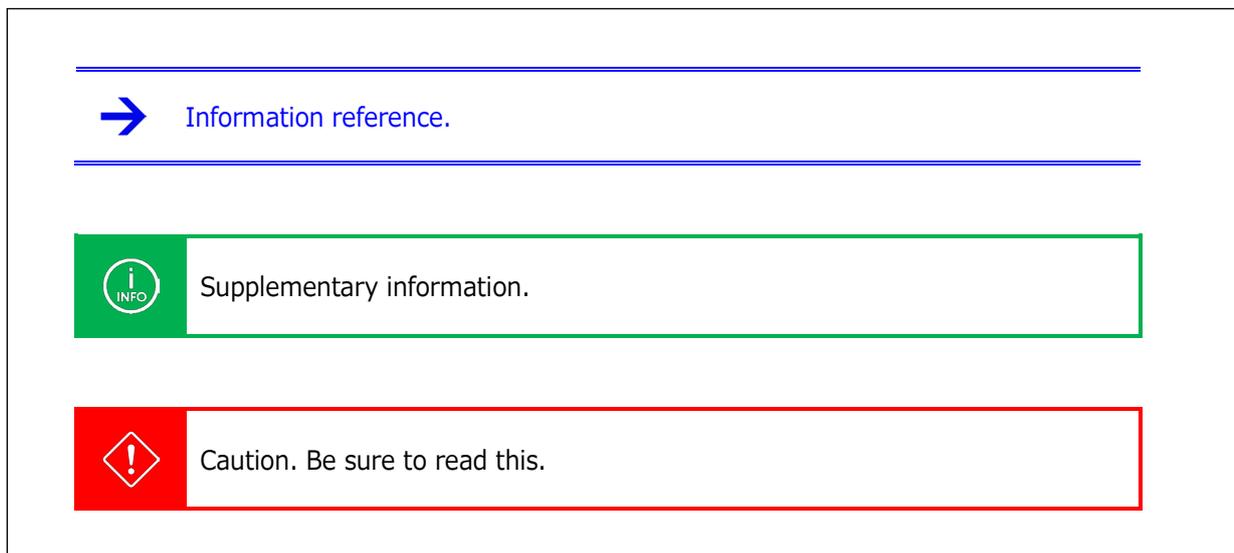


Figure 1

The abbreviations and terms are as shown in Table 1.

Table 1

Abbreviations and terms	Description
This product	Universal Probe including accessories.
Probe	Universal Probe itself.
This software	Pattern Generator.
Serial No.	Stands for the serial number. Probe ID.
License Code	License code for using this product.
Software Code	Code required to issue the License Code for each software.
Host PC	PC where this software runs.
Target	Object to be controlled or measured with the Universal Probe.
PGSX format	Format of a waveform settings file designed for this software.
Paste buffer	Buffer in the application used to store data cut or copied when editing waveforms.
Single signal	1-bit signal.
Bus	A collection of single signals.
PTN(s)	Unit of output data. 1 PTN corresponds to output of a single signal.
Start position	Position at which output starts.
End position	Position at which output stops.

1. Overview of This Software

This chapter provides an overview of this software. This software can be used to create waveform data and control output of the waveform data from the probe.

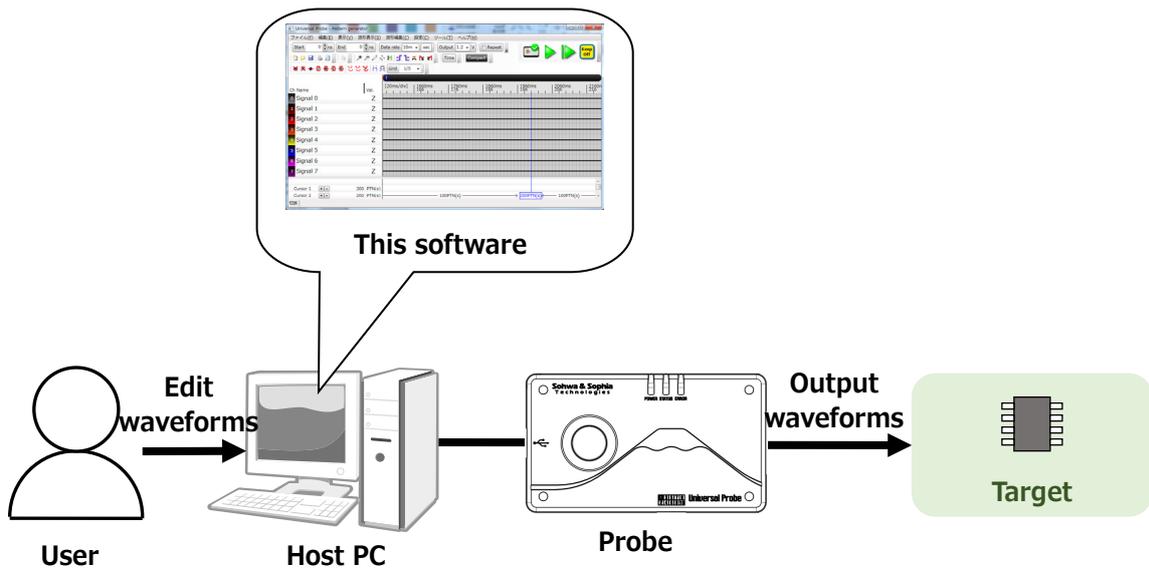


Figure 2

1.1. System Requirements

The following system is required to run this software.

- PC running Microsoft Windows 7 or later
- CPU: 1GHz or faster (depending on the requirements of the used OS)
- Memory: 1GB or larger (depending on the requirements of the used OS)
- HDD: 500MB or larger free hard disk space
- OS: Windows 7 or later (32bit or 64bit versions are supported)
- One or more empty USB 2.0 ports

1.2. Hardware Specifications

For details about the hardware specifications, refer to the "Hardware Users Manual."

1.3. Turning on or off the Power

1.3.1. Connecting to the Target and Turning on the Power

Connect the probe and the target with the following procedure:

- 1) Confirm that the target is turned off.
- 2) Connect the USB cable of the probe.
- 3) Connect the target and the probe.
- 4) Turn on the target.
- 5) Start this software and edit or output waveform data.

1.3.2. Turning off the Power and Disconnecting from the Target

Disconnect the probe from the target with the following procedure:

- 1) Exit this software.
- 2) Turn off the target.
- 3) Remove the probe from the target.



For details on the hardware specifications of the probe, target restrictions, connection and other items, refer to the "Hardware Users Manual."

2. How to Operate

This chapter explains how to operate this software.

2.1. Workflow

The main processes from starting this software are shown in Figure 3. For the operations not described here, refer to "3. Menu Bar and Toolbar" or "4. Windows."

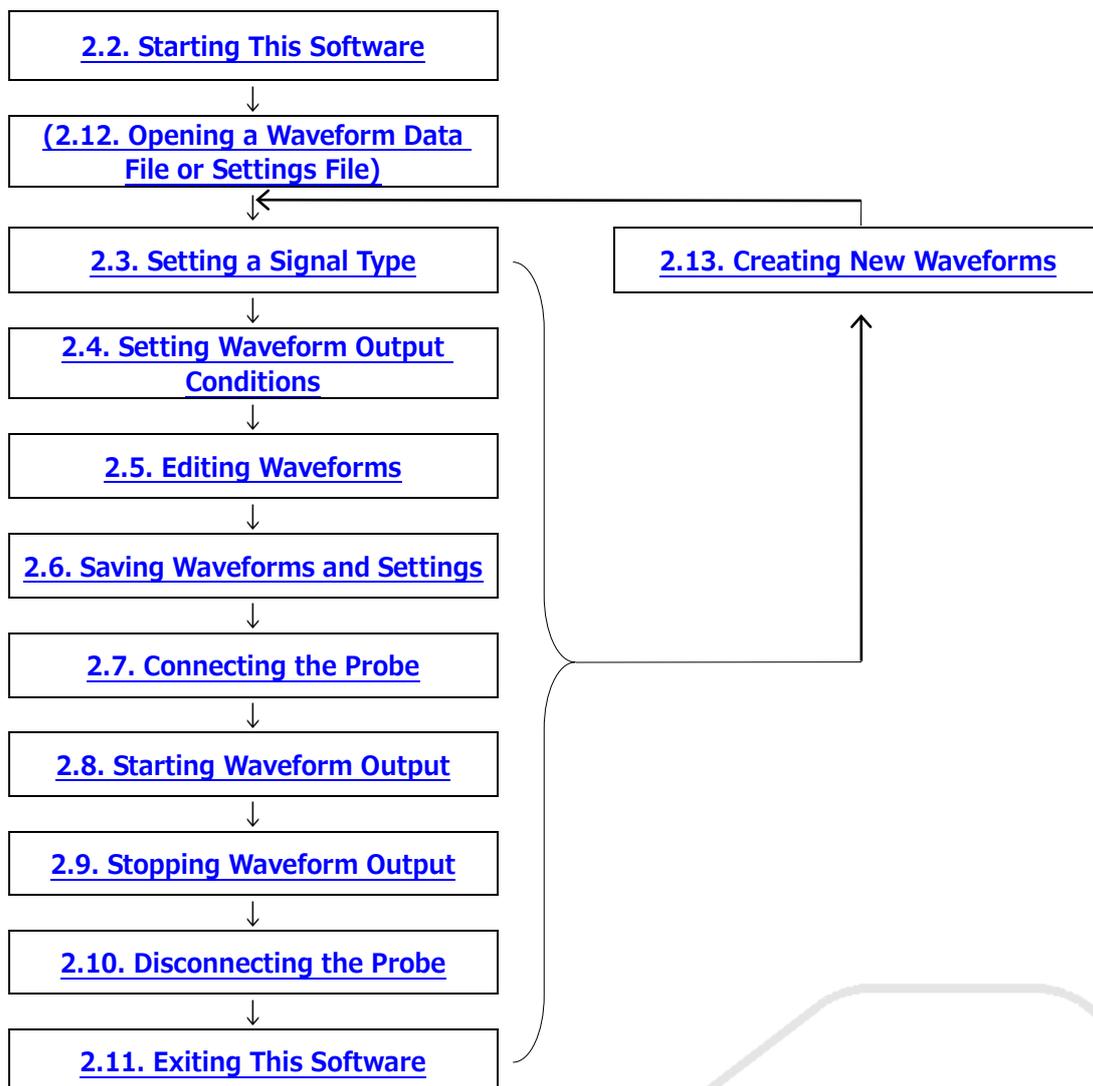


Figure 3

2.2. Starting This Software

- **Starting operation 1**

Double-click the icon for this software on the desktop.

- **Starting operation 2**

Select "All Programs" → "Universal Probe" → "Pattern Generator" from the "Start" menu.

The window as shown below will appear:

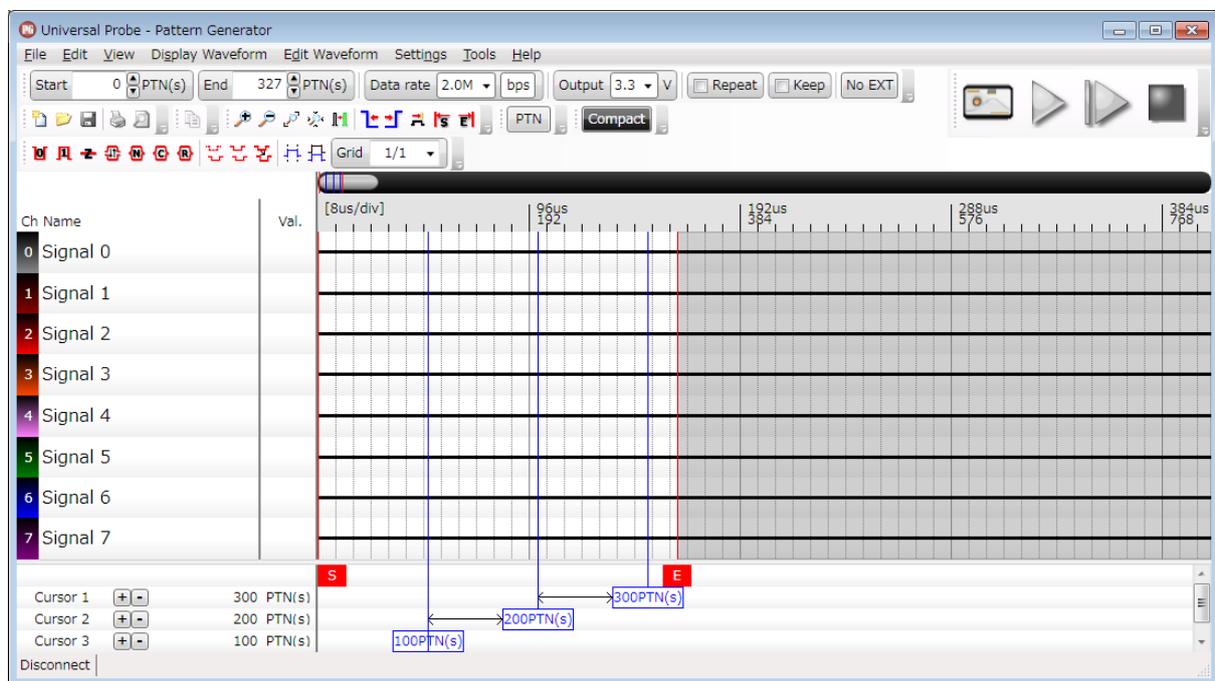


Figure 4

2.3. Setting a Signal Type

A signal type can be selected from between "single signal" and "bus." The signal type of a new waveform created is single signal.

Select a signal type in the Waveform window.

- Set a signal name: Clicking the Name column in the Waveform window allows you to edit the signal name.
- Create a bus: Double-clicking a signal name changes the signal into a bus. A signal can be added to a bus by dragging and dropping it on the bus.

➔ For details, refer to "[4.2. Waveform area.](#)"

2.4. Setting Waveform Output Conditions

Waveform output conditions must be set before waveforms can be output.

Set output conditions on the toolbar.

- Set a data rate: Set a data rate in units of "bps" or "sec" (time).
- Set an output voltage: Set a signal voltage to be output.
- Operation mode: Set whether to repeat output (Repeat) or keep the final output value.
- Trigger to start waveform output: Set whether to output waveforms manually or use an external trigger.
- Waveform output start and end positions: Set positions at which waveform output is to be started (Start) and ended (End).

➔ For details, refer to "[3.9. Waveform Output Settings.](#)"

2.5. Editing Waveforms

Edit waveform data to be output.

Select an area to be edited in the waveform area with the mouse, and set a value from the menu bar or the toolbar.

➔ For details about how to select an area, refer to "[4.2.2. Edition Area.](#)"

➔ For details about how to set data from the menu bar or the toolbar, refer to "[3.5. Edit Waveform.](#)"

2.6. Saving Waveforms and Settings

2.6.1. Save a Waveform

To save waveform data, perform the following operations.

These operations do not save the signal names, the output range, the data rate or other settings but only save the channel and waveform data.

Tool button	Operation on the menu bar	Shortcut key
	File → Save Waveform	Ctrl + S
---	File → Save Waveform As	---

→ For more details, refer to "[3.1.4. Save Waveform As.](#)"

2.6.2. Saving Settings

To save waveform output settings, perform the following operations.

These operations do not save the waveform data but only save the signal names, the output range, the data rate and other output settings.

Tool button	Operation on the menu bar	Shortcut key
---	File → Save Settings	---

→ For more details, refer to "[3.1.7. Save Settings.](#)"

2.7. Connecting the Probe

To output waveforms, connect the probe.

Connect the probe to the host PC and perform the following operations:

Tool button	Operation on the menu bar	Shortcut key
	Tools → Connect	Ctrl + L

→ For more details, refer to "[3.7.1. Connection.](#)"

2.8. Starting Waveform Output

2.8.1. Standard Output

To output a range of created waveform data specified by the Start and End positions, perform the following operations.

If the "Repeat" mode is selected, the range between the Start and End positions is output repeatedly.

Tool button	Operation on the menu bar	Shortcut key
	Tools → Start Waveform Output	F5

→ For more details, refer to "[3.7.2. Start Waveform Output.](#)"

2.8.2. Step-by-Step Output

To output created waveform data on a PTN-by-PTN basis, perform the following operations.

If the "Repeat" mode is selected, the range between the Start and End positions is output repeatedly.

Tool button	Operation on the menu bar	Shortcut key
	Tools → Start Waveform Output	F12

→ For more details, refer to "[3.7.3. Step-by-Step Output.](#)"

2.9. Stopping Waveform Output

To stop waveform output, perform the following operations.

Stopping waveform output puts the probe terminal into Hi-Z state.

If waveform data is being output on a step-by-step basis, these operations do not immediately stop waveform output.

Tool button	Operation on the menu bar	Shortcut key
	Tools → Stop Waveform Output	Shift + F5

→ For more details, refer to "[3.7.4. Stoppage of Waveform Output.](#)"

2.10. Disconnecting the Probe

To disconnect the probe, perform the following operations:

Tool button	Operation on the menu bar	Shortcut key
	Tools → Disconnect	Ctrl + L

2.11. Exiting This Software

To exit this software, perform the following operations or click the X button at the right top of the window.

Tool button	Operation on the menu bar	Shortcut key
---	File → Exit Application	---

 For more details, refer to "[3.1.12. Exit Application.](#)"

2.12. Opening a Waveform Data File or Settings File

To open an existing waveform data file or waveform settings file, perform the following operations:

Tool button	Operation on the menu bar	Shortcut key
	File → Open Waveform	Ctrl + O
---	File → Open Settings	---

2.13. Creating New Waveforms

To create new waveforms, perform the following operations:

Tool button	Operation on the menu bar	Shortcut key
	File → Create New Waveform	Ctrl + N



Creating new waveforms clears the waveform data and waveform settings. Before creating new waveforms, save the current waveform data and waveform settings.

3. Menu Bar and Toolbar

This chapter explains the different groups of the menu bar and the toolbar of this software.

● Restrictions in the compact mode

In the compact mode, the following menus are disabled:

- Edit
- Waveform Display
- Edit Waveform
- File → Create New Waveform
- File → Save Waveform in Image File
- File → Print
- File → Preview Print
- File → Set Printer

➔ For details about the compact mode, refer to "[4.1. Main Window.](#)"

3.1. File

3.1.1. Create New Waveform

Clears the current window for creating new waveforms.

If the current waveform data has not been saved, a confirmation message dialog box appears before new waveforms are created.

Tool button	Operation on the menu bar	Shortcut key
	File → Create New Waveform	Ctrl + N

Table 2

Message	Description
The waveform data has not been saved. Do you want to save it?	Appears when the current waveform data has not been saved.
	<input type="button" value="Yes"/> Saves waveform data under a new name ("3.1.4. Save Waveform As") and creates new waveforms.
	<input type="button" value="No"/> Creates new waveforms without saving the current waveforms.
	<input type="button" value="Cancel"/> Cancels the operation of creating new waveforms.



This menu item cannot be selected while waveforms are being output. Stop waveform output before selecting this menu item.

3.1.2. Open Waveform

Opens a waveform data file.

The waveform settings are retained.

Select a desired file on the file dialog box displayed.

Files in CSV, VCD or binary formats can be opened.

If the current waveform data has not been saved, a confirmation message dialog box appears before a waveform file is opened.

Tool button	Operation on the menu bar	Shortcut key
	File → Open Waveform	Ctrl + O

Table 3

Message	Description
The waveform data has not been saved. Do you want to save it?	Appears when the current waveform data has not been saved.
	<input type="button" value="Yes"/> Saves waveform data under a new name ("3.1.4. Save Waveform As") and opens another waveform data.
	<input type="button" value="No"/> Opens waveform data without saving the current waveforms.
	<input type="button" value="Cancel"/> Cancels the operation of opening waveform data.



This menu item cannot be selected while waveforms are being output. Stop waveform output before selecting this menu item.



If you load a VCD file, please sure you have pre-selected the data rate faster than the timescale that is written in the VCD file within.

3.1.3. Save Waveform

Overwrites the current file with the current waveform data.

When you are creating new waveform data, specify a file name on the file dialog box displayed.

Waveform data is saved in CSV format.

Tool button	Operation on the menu bar	Shortcut key
	File → Save Waveform	Ctrl + S



These operations do not save the waveform settings but only save the waveform data. Save the waveform settings according to "[3.1.7. Save Settings](#)."

3.1.4. Save Waveform As

Saves waveform data in a file.
Specify a file name on the file dialog box displayed.
Waveform data is saved in CSV format.

The waveform settings can also be saved by checking <Save settings file too> in the file dialog box. The waveform settings file is saved under the name of "**specified file name.pgsx**" (PGSX format) (refer to Figure 5).

Tool button	Operation on the menu bar	Shortcut key
---	File → Save Waveform As	---

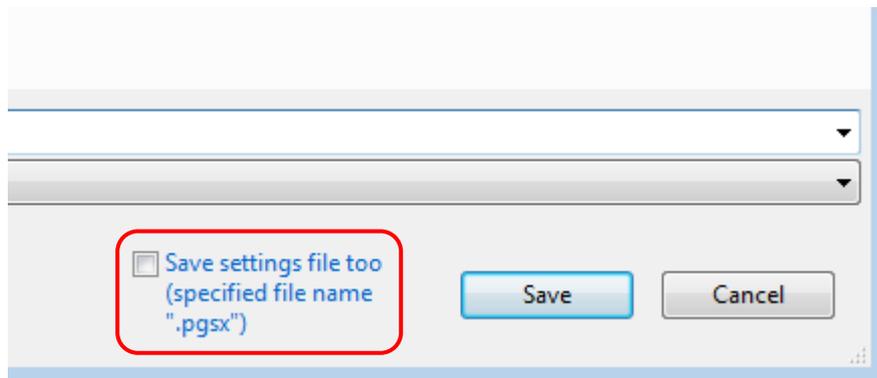


Figure 5



These operations do not save the waveform settings when <Save settings file too> is not checked. Only save the waveform data.
Save the waveform settings according to "[3.1.7. Save Settings.](#)"

3.1.5. Save Waveform in Image File

Saves the current waveform area as a PNG image file.
Specify a file name on the file dialog box displayed.
Figure 6 shows an example of a saved image.

Tool button	Operation on the menu bar	Shortcut key
---	File → Save Waveform in Image File	---

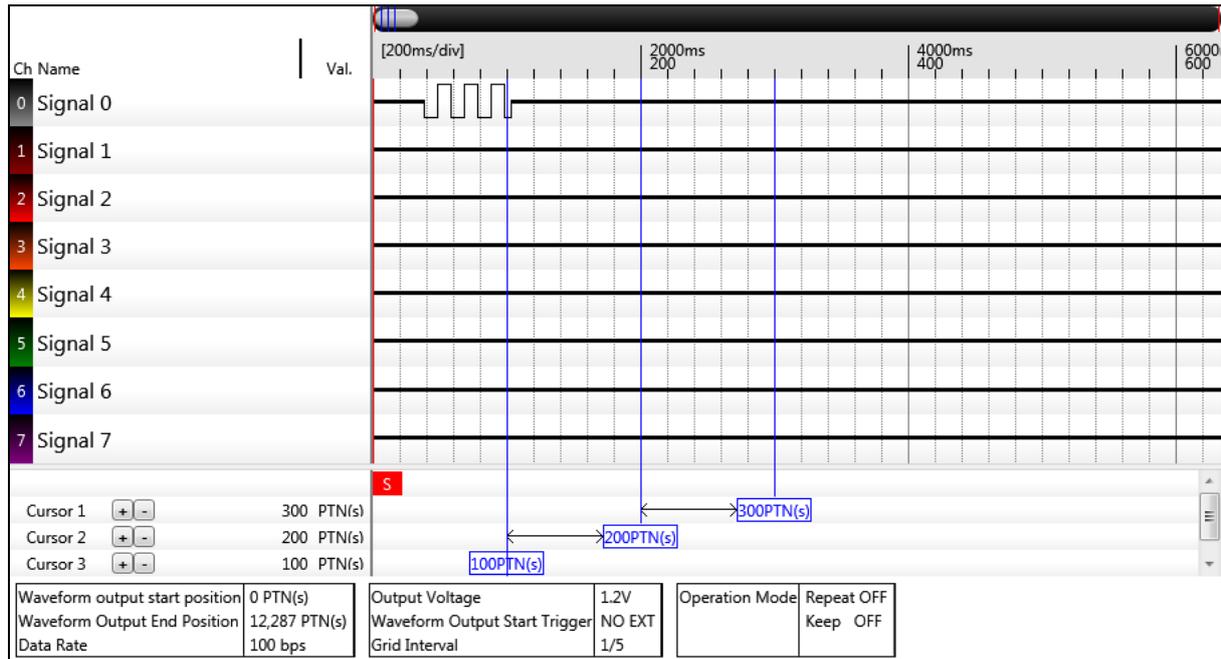


Figure 6

3.1.6. Open Settings

Opens a waveform settings file.
 The waveform data is retained.
 Select a desired PGSX file on the file dialog box displayed.

Tool button	Operation on the menu bar	Shortcut key
---	File → Open Settings	---

3.1.7. Save Settings

Saves waveform settings.
 Specify a file name to be saved on the file dialog box displayed.
 The file is saved in PGSX format.

Tool button	Operation on the menu bar	Shortcut key
---	File → Save Settings	---



These operations do not save the waveform data but only save the waveform settings.
 Save the waveform data according to "[3.1.3. Save Waveform](#)" or "[3.1.4. Save Waveform As.](#)"

3.1.8. Print

Prints the waveform data and waveform settings.

Make print settings in the Print dialog box opened and click the  button.

Tool button	Operation on the menu bar	Shortcut key
	File → Print	Ctrl + P

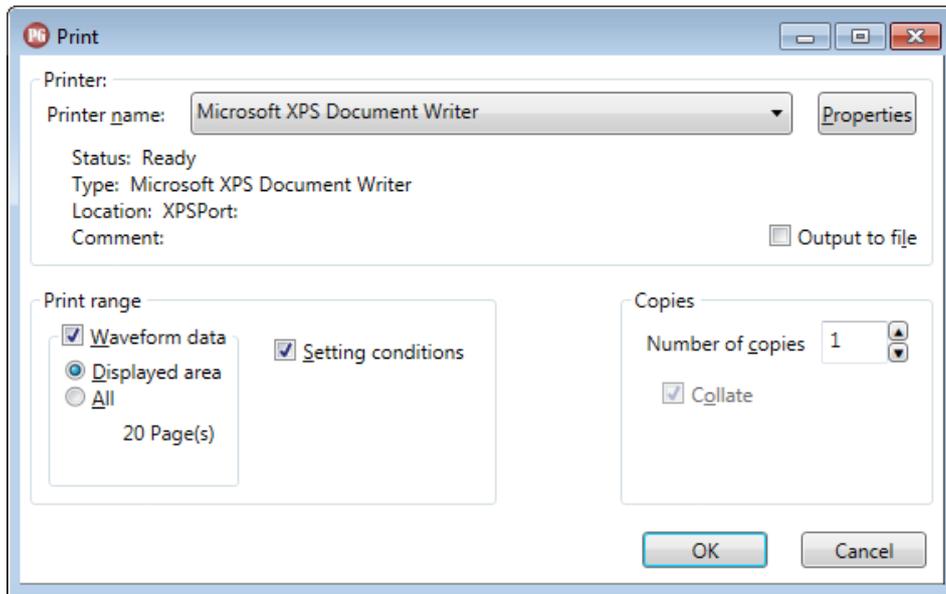


Figure 7

Table 4

Printer name	Select a printer.
Properties	Shows the printer properties.
Waveform data	Select this checkbox to print the waveform data.
Print range	<p>Displayed area: Prints the waveform data in the displayed range.</p> <p>All: Prints all the waveform data at the current enlargement/reduction ratio.</p> <p>The number of pages to be printed is displayed in the right portion of the section.</p>
Setting conditions	Select this checkbox to print the waveform settings.
Number of copies	Set the number of copies to be printed.



When "All" of "Print range" is chosen, "memory shortage" may be caused depend on the state of the host PC.
In that case, please print after having chosen "Displayed area" of "Print range" or having reduced "the current enlargement/reduction ratio", to reduce pages.

3.1.9. Preview Print

Displays a print preview. (refer to Figure 8).

Tool button	Operation on the menu bar	Shortcut key
	File → Preview Print	---

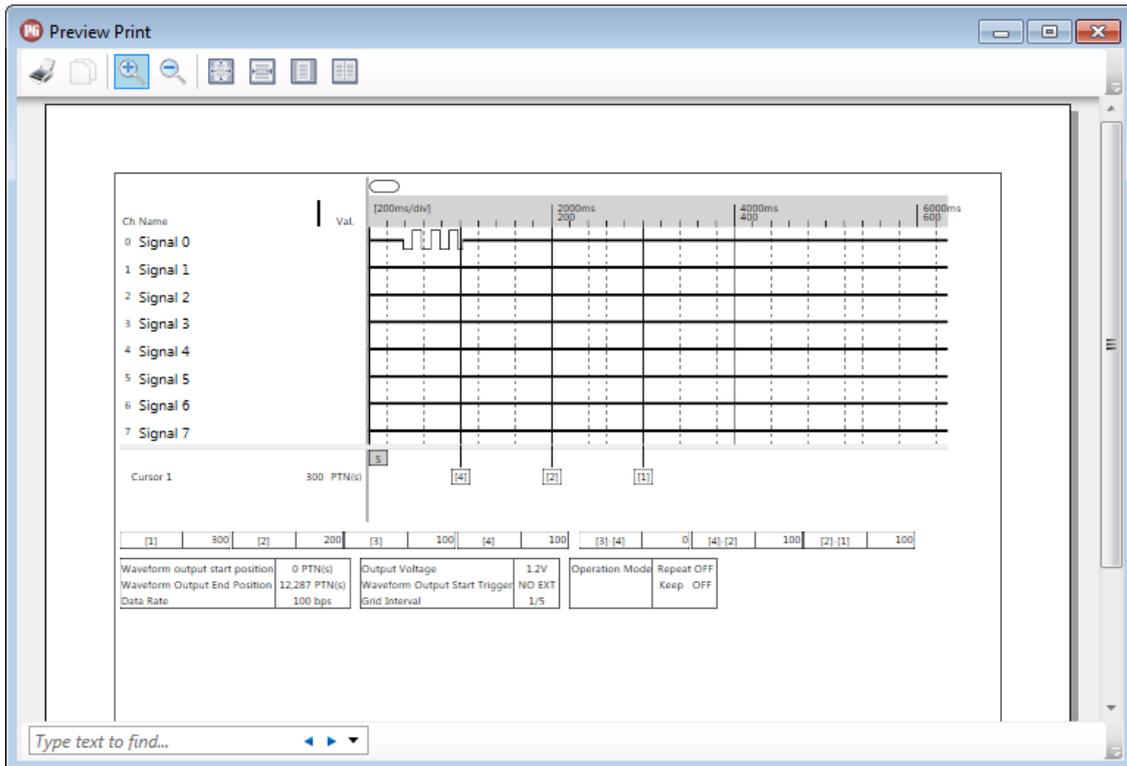


Figure 8

3.1.10. Set Printer

Shows the settings of the printer to be used. This command has the same function as the Properties button in "3.1.8. Print." (refer to Figure 9).

Tool button	Operation on the menu bar	Shortcut key
---	File → Set Printer	---

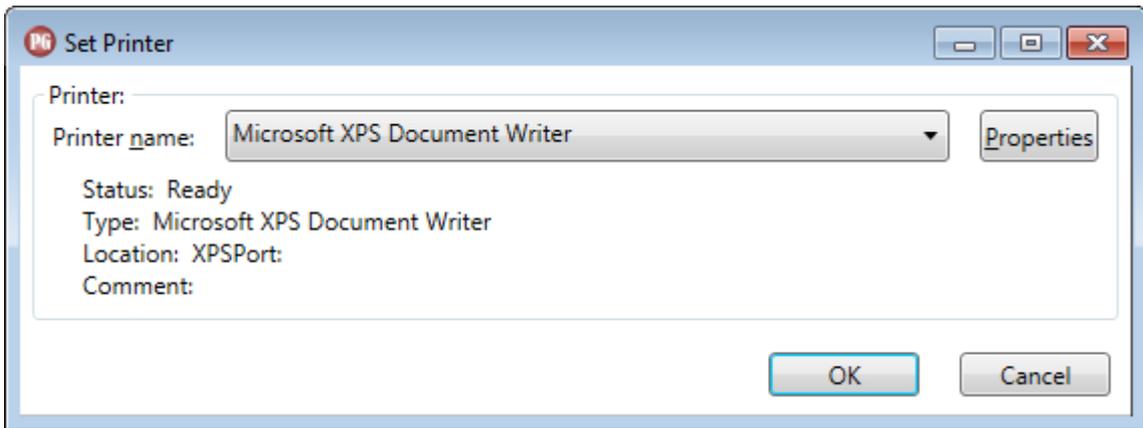


Figure 9

3.1.11. Showing File History

Shows up to 4 waveform data files opened in the past.

3.1.12. Exit Application

Exit this software.

Checks whether or not the waveform data and waveform settings have been saved and whether or not waveforms are being output, and shows a message dialog box accordingly.

This software is exited after your confirmation.

The same operation can be performed by clicking the X button at the right top of the main window.

Tool button	Operation on the menu bar	Shortcut key
---	File → Exit Application	---

Table 5

Message	Description
Do you want to save waveform data?	Appears when the waveform data has not been saved.
	<input type="button" value="Yes"/> Saves the waveform data under a new name ("3.1.4. Save Waveform As").
	<input type="button" value="No"/> Exits the software without saving the waveform data.
Do you want to save waveform output settings?	<input type="button" value="Cancel"/> Cancels the operation of exiting the software.
	Appears when the waveform settings have not been saved.
	<input type="button" value="Yes"/> Saves the settings ("3.1.7. Save Settings").
Waveforms are being output. Do you want to stop?	<input type="button" value="No"/> Exits the software without saving the settings.
	<input type="button" value="Cancel"/> Cancels the operation of exiting the software.
	Appears when waveforms are being output.
	<input type="button" value="Yes"/> Stops outputting waveforms.
	<input type="button" value="No"/> Cancels the operation of exiting the software.

3.2. Edit

3.2.1. Copy to Clipboard

Copies the current waveform data and waveform settings to the clipboard as an image.

Tool button	Operation on the menu bar	Shortcut key
	Edit → Copy to Clipboard	---

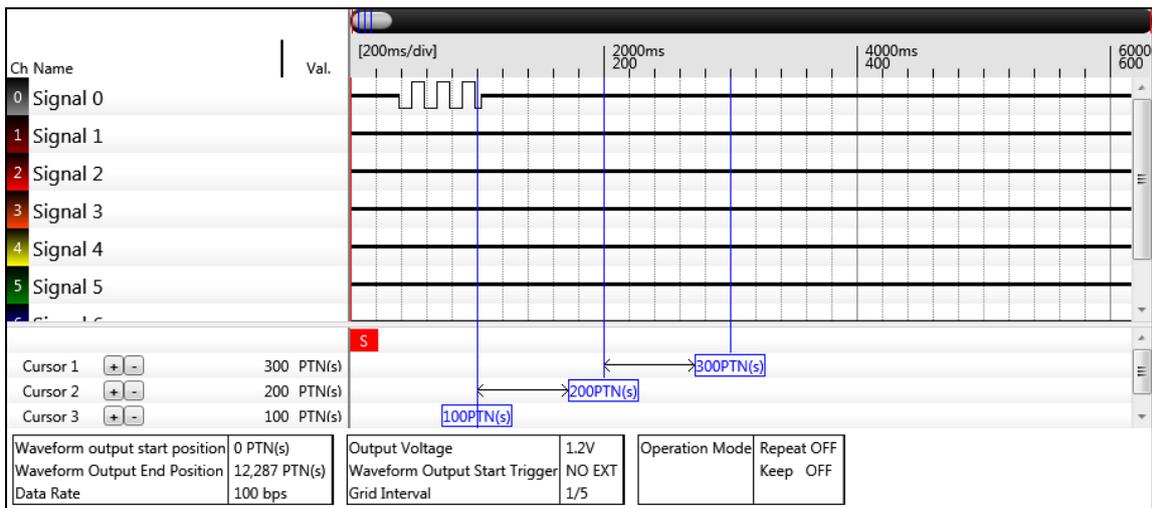


Figure 10

3.2.2. Copy Only Waveform to Clipboard

Copies only the current waveform data to the clipboard as an image.

Tool button	Operation on the menu bar	Shortcut key
---	Edit → Copy Only Waveform to Clipboard	---

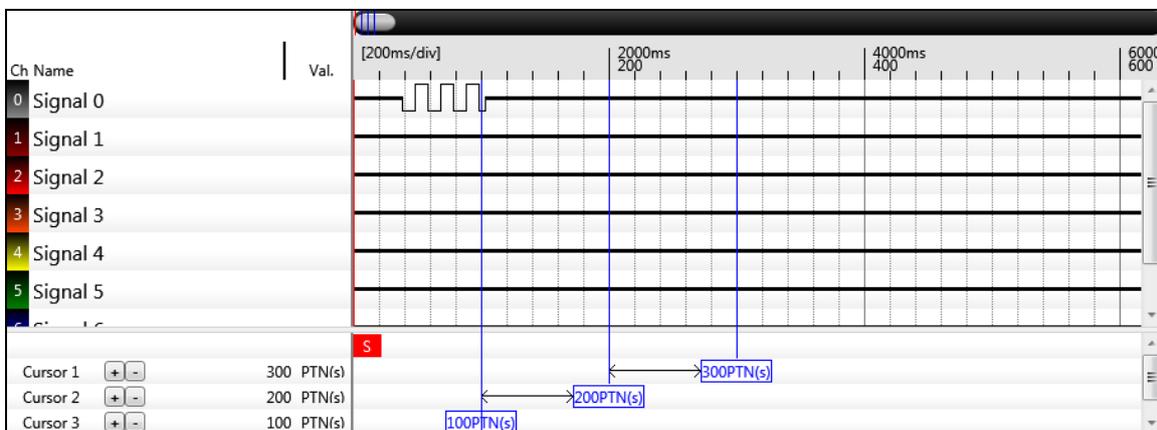


Figure 11

3.3. View

3.3.1. Showing/Hiding the Toolbar Items

Shows/hides the toolbar items.

A check () at the head of a menu indicates that the corresponding menu items are shown on the toolbar.

Tool button	Operation on the menu bar	Shortcut key
---	View → Toolbar → File	---
---	View → Toolbar → Edit	---
---	View → Toolbar → Display Waveform	---
---	View → Toolbar → Edit Waveform	---
---	View → Toolbar → Tools	---
---	View → Toolbar → Set Waveform Output	---



At the time of "Compact" mode, the display switching function of "Edit", "Display Waveform", "Edit Waveform" is disabled.

3.3.2. Customize

Sets the way in which to show the toolbar and keyboard shortcuts.
The Customize window appears.

Tool button	Operation on the menu bar	Shortcut key
---	View → Toolbar → Customize	---

(1) Keyboard tab

Set keyboard shortcuts.

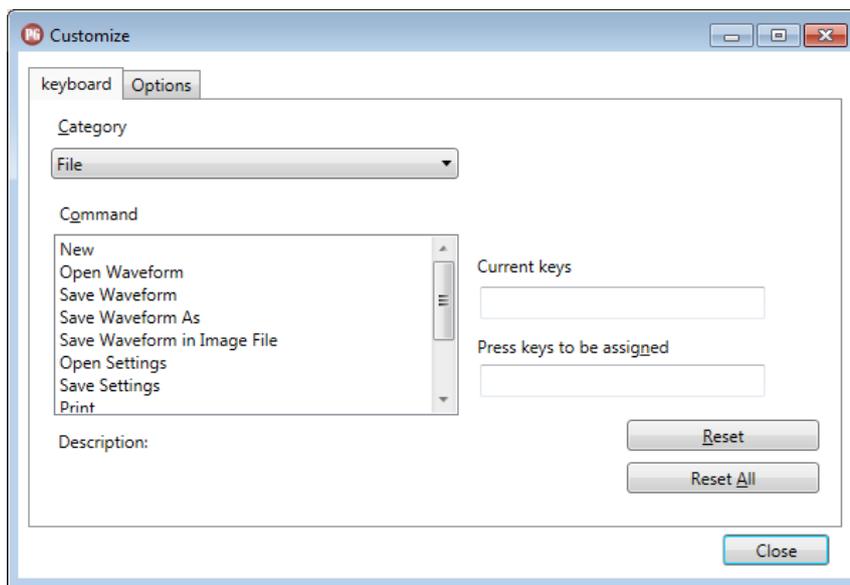


Figure 12

Table 6

Category	Select a command category. Commands listed in the Command field are changed depending on the category selected.
Command	Lists commands classified into the category selected.
Current keys	Shows the keys currently assigned to the command selected in the Command field.
Press keys to be assigned.	Enter keys to be assigned to the command selected in the Command field. Enter keys directly from the keyboard. If the same keys have already been assigned, a message dialog box (Table 7) appears.
	Resets changes made after the Customize dialog box is opened. Before they are reset, a message dialog box (Table 8) appears to ask you to confirm the operation.
	Resets all the key settings to the factory default. Before they are reset, a message dialog box (Table 9) appears to ask you to confirm the operation.

Table 7

Message	Description
The keys have already been used as shortcut keys. Enter other keys.	Appears when the same keys have been assigned to another command. Assign other keys or change the assignment of the keys to that command.

Table 8

Message	Description
All the changes will be lost. Do you want to reset?	Appears when you click the Reset button. <input type="button" value="Yes"/> Executes Reset. <input type="button" value="No"/> Does not execute Reset.

Table 9

Message	Description
Key settings will be reset to the factory default. Do you want to reset?	Appears when you click the Reset All button. <input type="button" value="Yes"/> Executes Reset All. <input type="button" value="No"/> Does not execute Reset All.

(2) Options tab

Set the way in which to show the toolbar.

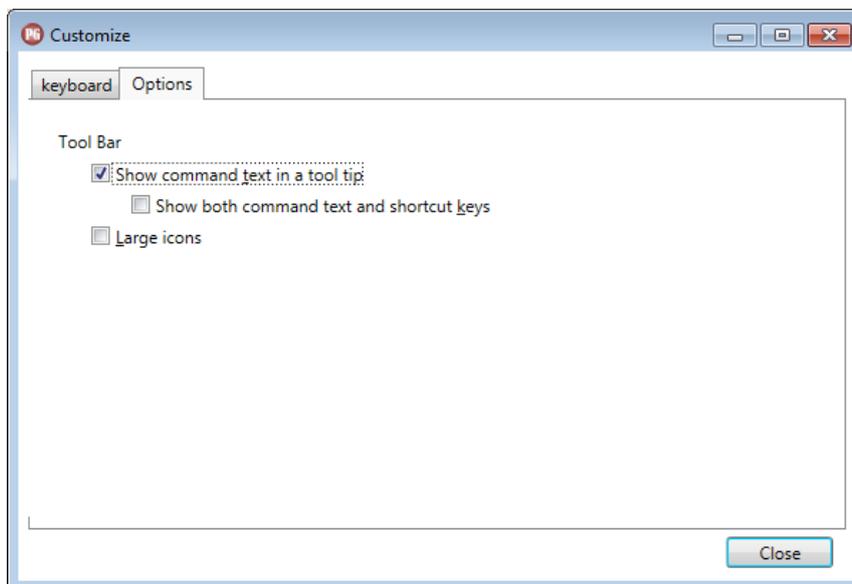


Figure 13

Table 10

Show command text in a tool tip	Selecting this checkbox shows the command text when you place the mouse cursor on an icon on the toolbar (refer to Figure 14).
Show both command text and shortcut keys	Selecting this checkbox shows both the command text and the shortcut keys in a tool tip.
Large icons	Selecting this checkbox enlarges the icons on the toolbar.

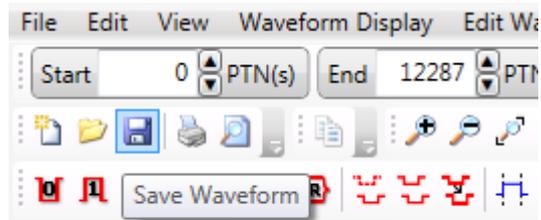


Figure 14

3.4. Waveform Display

3.4.1. Zoom In

Zooms in the waveforms on the Waveform window.

Tool button	Operation on the menu bar	Shortcut key
	Display Waveform → Zoom In	Ctrl + PageDown

3.4.2. Zoom Out

Zooms out the waveforms on the Waveform window.

Tool button	Operation on the menu bar	Shortcut key
	Display Waveform → Zoom Out	Ctrl + PageUp

3.4.3. Enlarge Selected Area

Enables/disables the enlarge selected area mode (toggle).

In the enlarge selected area mode, a portion in the waveform area can be enlarged by selecting the portion (range) by the mouse.

By pressing the **ESC** key with a range selected, that range can be deselected.

Tool button	Operation on the menu bar	Shortcut key
	Display Waveform → Enlarge Selected Area	---

3.4.4. Show Whole

Shows the entire waveforms.

Tool button	Operation on the menu bar	Shortcut key
	Display Waveform → Show Whole	---

3.4.5. Channel Color Mode

Switches the waveform display color (toggle).

When this mode is disabled, waveforms of all channels are displayed in black.

When this mode is enabled, waveforms are displayed in colors set for the respective channels.

Tool button	Operation on the menu bar	Shortcut key
	Display Waveform → Channel Color Mode	---

 Buses are displayed in black regardless of whether this mode is enabled or disabled.

3.4.6. Cursor → Move to Left Edge

Moves the selected cursor to the next left change point of the selected signal.

If no signal is selected, the selected cursor is moved to the next left change point of a signal that comes first.

Refer to Figure 15 and Figure 16 although the cursor is moved differently from these.

Tool button	Operation on the menu bar	Shortcut key
	Display Waveform → Cursor → Move to Left Edge	---

 For a bus, the cursor is moved to the point where a value change occurs.

- (1) Selecting Move to Right Edge with a signal (Sig2) selected moves the cursor to the next change point of Sig2.

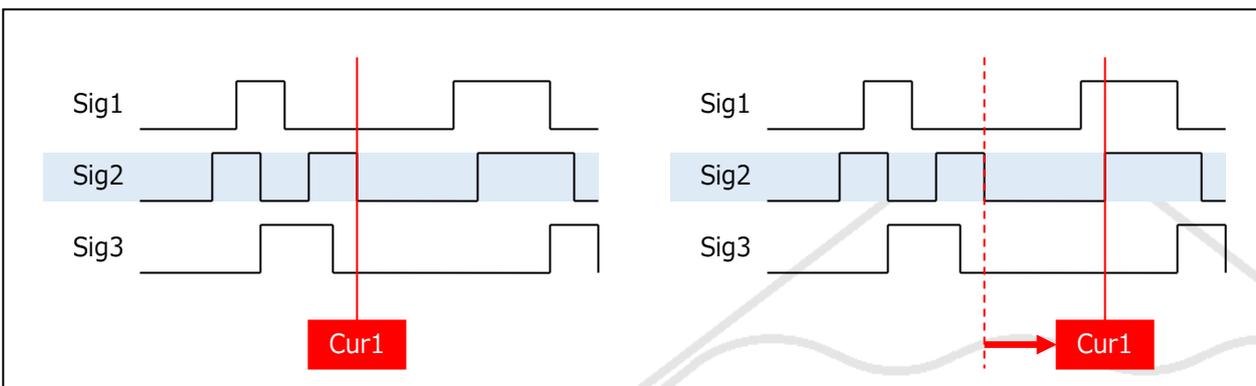


Figure 15

(2) Selecting Move to Right Edge with no signal selected moves the cursor to the next change point of Sig1, which comes first.

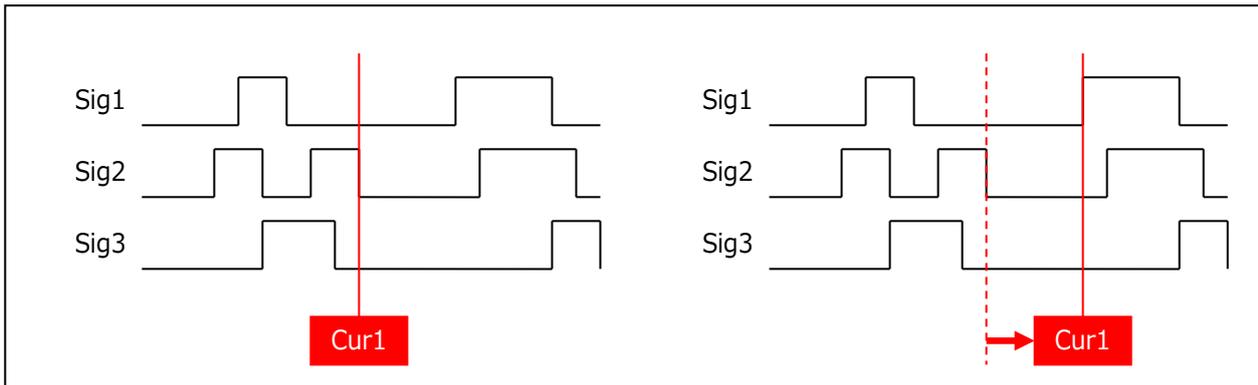


Figure 16

3.4.7. Cursor → Move to Right Edge

Moves the selected cursor to the next right change point of the selected signal. If no signal is selected, the selected cursor is moved to the next right change point of a signal that comes first.

Figure 15 and Figure 16 are examples showing how the cursor is moved.

Tool button	Operation on the menu bar	Shortcut key
	Display Waveform → Cursor → Move to Right Edge	---

 For a bus, the cursor is moved to the point where a value change occurs.

3.4.8. Move to Edge

Switches whether to move the cursor to an edge in the Waveform window (toggle). When this mode is disabled, the cursor is moved to the position to which it is moved. When this mode is enabled, the cursor is moved to the change point that comes first in the direction in which it is moved. If a signal is selected, the cursor is moved to the next change point of that signal. If no signal is selected, the cursor is moved to the change point that comes first of all signals.

Tool button	Operation on the menu bar	Shortcut key
	Display Waveform → Move to Edge	---

 For a bus, the cursor is moved to the point where a value change occurs.

3.4.9. Start Waveform Output ← Cursor Position

Moves the waveform output start position to the position of the cursor currently selected on the Waveform window.

If the cursor is placed to the right of the waveform output end position, it is moved to the end position.

Tool button	Operation on the menu bar	Shortcut key
	Display Waveform → Start Waveform Output ← Cursor Position	---

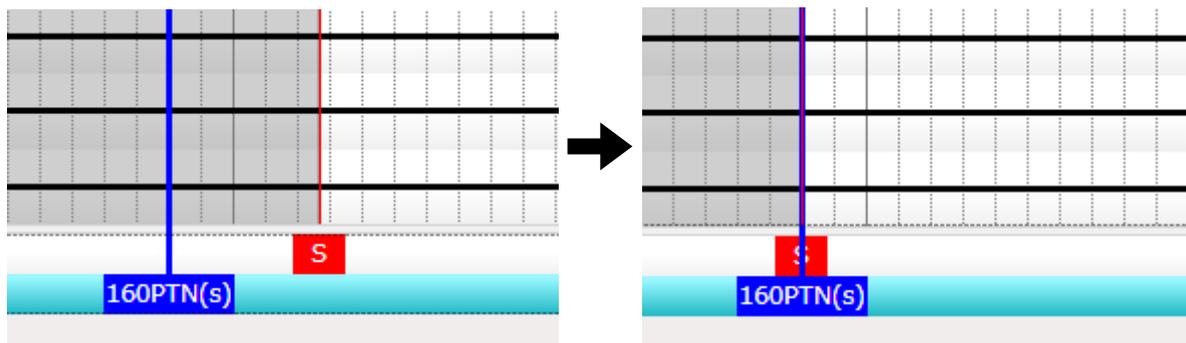


Figure 17

3.4.10. End Waveform Output ← Cursor Position

Moves the waveform output end position to the position of the cursor currently selected on the Waveform window.

If the cursor is placed to the left of the waveform output start position, it is moved to the start position.

Tool button	Operation on the menu bar	Shortcut key
	Display Waveform → End Waveform Output ← Cursor Position	---

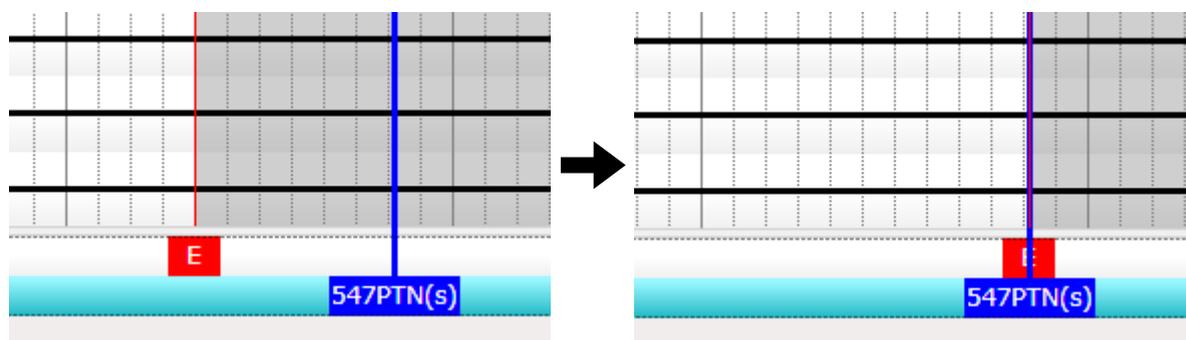


Figure 18

3.5. Edit Waveform

3.5.1. Input "0" (Low Level)

Sets the values in an area selected in the waveform area to 0 (Low Level).

If the selected area contains bus signals, the values of all the signals included in the bus are set to 0.

Tool button	Operation on the menu bar	Shortcut key
	Edit Waveform → Input "0" (Low Level)	---

3.5.2. Input "1" (High Level)

Sets the values in an area selected in the waveform area to 1 (High Level).

If the selected area contains bus signals, the values of all the signals included in the bus are set to 1.

Tool button	Operation on the menu bar	Shortcut key
	Edit Waveform → Input "1" (High Level)	---

3.5.3. Input "Hi-Z" (High Impedance)

Sets the values in an area selected in the waveform area to Hi-Z.

If the selected area contains bus signals, the values of all the signals included in the bus are set to Hi-Z.

Tool button	Operation on the menu bar	Shortcut key
	Edit Waveform → Input "Hi-Z" (High Impedance)	---

3.5.4. Reverse Level

Reverses value levels in an area selected in the waveform area (changes 0 to 1 and 1 to 0).

If the selected area contains bus signals, the levels of all the signals included in the bus are reversed.

Tool button	Operation on the menu bar	Shortcut key
	Edit Waveform → Reverse Level	---


Hi-Z is not changed.

3.5.5. Input Value

Sets an area selected in the waveform area at a specified value

Tool button	Operation on the menu bar	Shortcut key
	Edit Waveform → Input Value	---

 This command only affects buses.

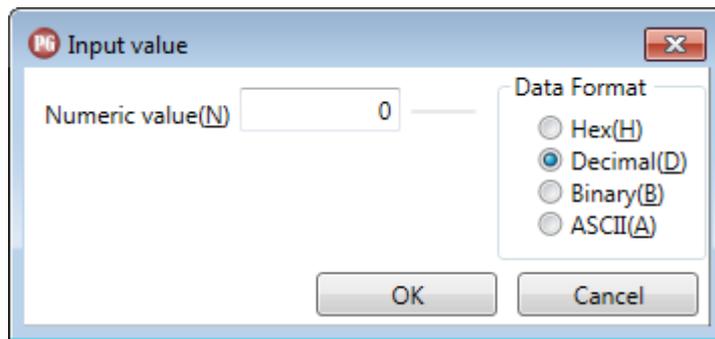


Figure 19

Table 11

Numeric value	Enter a value to be set in the area selected in the waveform area. If an incorrect value is entered, a message dialog box (Table 12) appears.
Data Format	<p>Specify the format of data to be entered.</p> <p>Hex (hexadecimal number): Enter a hexadecimal number directly. There is no need to put a symbol to indicate that the value is a hexadecimal number. Example: 7F</p> <p>Decimal (decimal number): Enter a numerical value directly. Example: 12</p> <p>Binary (binary number): Enter a pattern of 0's and 1's. There is no need to put a symbol to indicate that the value is a binary number. Example: 0101</p> <p>ASCII (character code): Enter a character. There is no need to enclose characters in double quotation marks. Example: A</p>

Table 12

Message	Description
The entered value is incorrect.	Appears when a value entered cannot be represented by the bus bit width.  Click OK and enter a correct value.

3.5.6. Input Count Value

Sets an area selected in the waveform area at the count value.

Sets the count increased (or decreased) with time according to the specified start value and increment value.

Tool button	Operation on the menu bar	Shortcut key
	Edit Waveform → Input Count Value	---

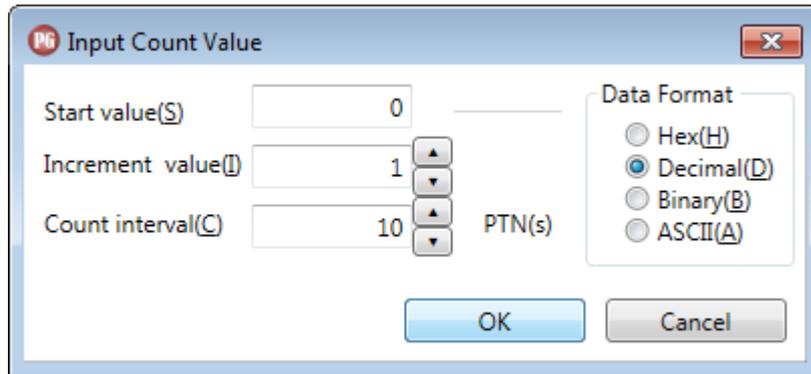


Figure 20

Table 13

Start value	Enter an initial count data value. Only a positive value can be entered. If an incorrect value is entered, a message dialog box (Table 14) appears.
Increment value	Enter a count data increment. If the count value is exceeds the minimum or maximum value is more than the width of the signal, it will wrap-around.
Count interval	Enter a count interval. If the waveform unit on the Waveform window is PTN(s), enter an interval in units of PTNs. If the waveform unit is Time, select a unit for the count interval from among ns (nanosecond), us (microsecond), ms (millisecond), and sec (second) in the combo box.
Data Format	Specify the format of data to be entered. Hex (hexadecimal number): Enter a hexadecimal number directly. There is no need to put a symbol to indicate that the value is a hexadecimal number. Example: 7F Decimal (decimal number): Enter a numerical value directly. Example: 12 Binary (binary number): Enter a pattern of 0's and 1's. There is no need to put a symbol to indicate that the value is a binary number. Example: 0101 ASCII (character code): Enter a character. There is no need to enclose characters in double quotation marks. Example: A

Table 14

Message	Description
The entered value is incorrect	Appears when a value entered cannot be represented by the bus bit width or a negative value is entered. <div style="display: flex; align-items: center; margin-top: 5px;"> <div style="border: 1px solid gray; padding: 2px 5px; margin-right: 5px;">OK</div> Click OK and enter a correct value. </div>

 The Input Count Value command can be used to generate a clock with 1 bit. By setting the increment value at 1, a waveform that repeats 0 and 1 can be created.

3.5.7. Input Random Value

Sets an area selected in the waveform area at a random value.

Tool button	Operation on the menu bar	Shortcut key
	Edit Waveform → Input Random Value	---

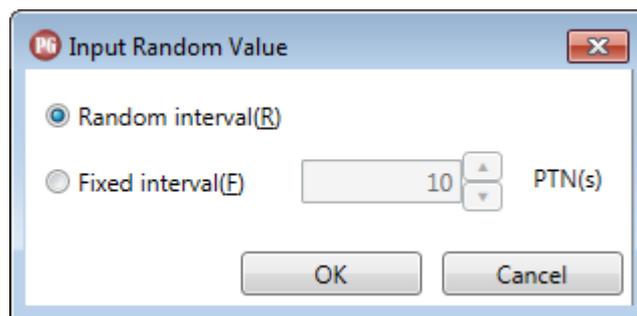


Figure 21

Table 15

Random interval	Select this radio button to create random data at random intervals. The maximum random interval is 50 PTN(s).
Fixed interval	Select this radio button to create random data at a fixed interval. If the waveform unit on the Waveform window is PTN(s), enter an interval in units of PTNs. If the waveform unit is Time, select a unit for the interval from among ns (nanosecond), us (microsecond), ms (millisecond), and sec (second) in the combo box.

3.5.8. Cut

Cuts the waveform in an area selected in the waveform area and copies it to the buffer. After a portion of a waveform is cut, the whole waveform is shifted leftward. If there is no data to be shifted in the right edge, the cut portion is filled with Hi-Z.

Tool button	Operation on the menu bar	Shortcut key
	Edit Waveform → Cut	Ctrl + X

3.5.9. Copy

Copies the waveform in an area selected in the waveform area to the paste buffer.

Tool button	Operation on the menu bar	Shortcut key
	Edit Waveform → Copy	Ctrl + C

3.5.10. Paste

Pastes a waveform in the paste buffer into the waveform area.

Follow the procedure below to paste a waveform:

- 1) Select Paste, and the area from which waveform data is to be pasted (the paste area) will be enclosed by a dotted line (light blue area in Figure 22).
- 2) Move the paste area to a position into which the waveform data is to be pasted by dragging it with the mouse or using the direction keys in the keyboard.
- 3) Click the mouse outside the paste area or press the Enter key, and the waveform will be pasted.

By pressing the **ESC** key with a paste area selected, the operation of pasting waveform data can be canceled.

If the waveform to be pasted has an edge(s), the Paste command operates differently depending on whether Align to Grid and Align to Edge are enabled as follows:

- When only Align to Grid is enabled, the waveform is pasted in such a way that the leftmost edge is aligned to the nearest grid. (Figure 23)
- When only Align to Edge is enabled, the waveform is pasted in such a way that the leftmost edge is aligned to the nearest edge. (Figure 24)
- When both Align to Grid and Align to Edge are enabled, the waveform is pasted in such a way that the leftmost edge is aligned to the grid or the nearest edge of another signal, whichever is nearer.

Tool button	Operation on the menu bar	Shortcut key
	Edit Waveform → Paste	Ctrl + V

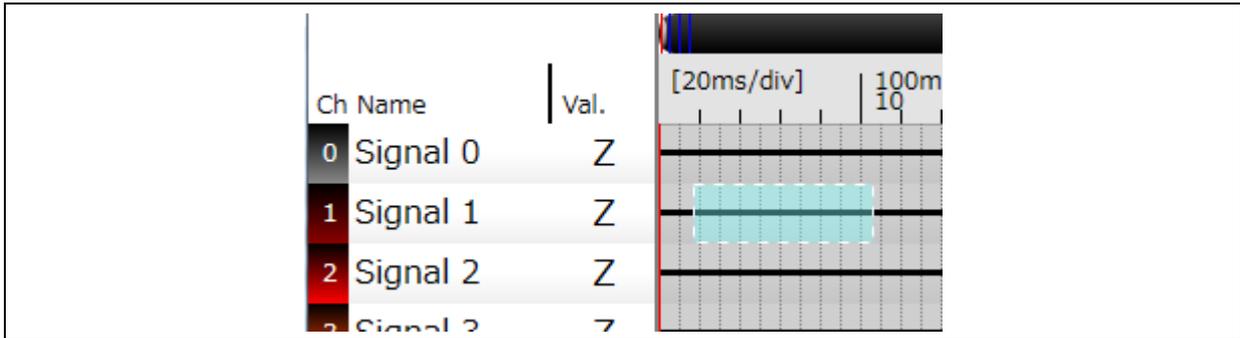


Figure 22

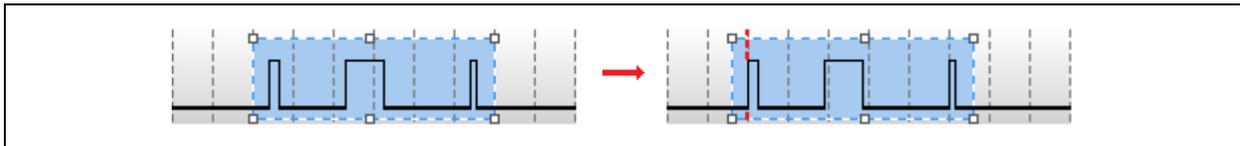


Figure 23

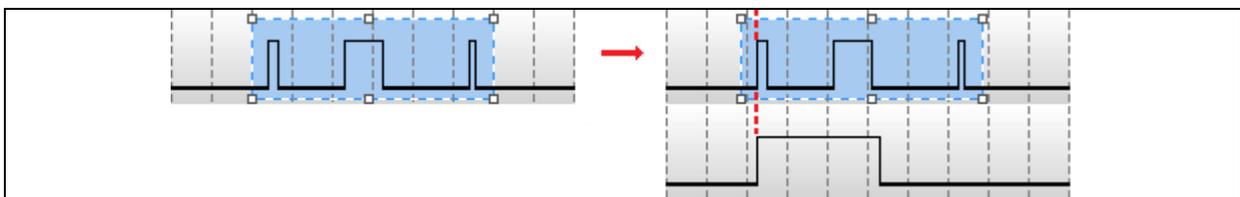


Figure 24

3.5.11. Align to Grid

Switches whether to align a range selected and pasted in the waveform area to the grid (toggle).

Tool button	Operation on the menu bar	Shortcut key
	Edit Waveform → Align to Grid	---

3.5.12. Align to Edge

Switches whether to align a range selected and pasted in the waveform area to an edge (toggle).

Tool button	Operation on the menu bar	Shortcut key
	Edit Waveform → Align to Edge	---

➔ Refer to "[3.5.10. Paste](#)" in Figure 24 for how these commands work.

3.5.13. Grid Interval

Set the grid interval in the waveform area.

Specify how many PTNs constitute an interval between two grid lines.

If "1/10" is specified, grid lines are displayed at intervals of 10 PTNs.

The interval can be selected from among 1/1, 1/5, 1/10, 1/20, 1/30, 1/50, 1/100, 1/200, 1/300, and 1/500.

Toolbar	Shortcut key
	Shift + F11

3.6. Setting

3.6.1. Save Current Settings as Default

Saves the current settings in the initial setting file. The values saved here are set when the software is started next time.

The following settings are saved:

- Settings of unit selection

Before the settings are saved, a message dialog box appears (Table 16)

Tool button	Operation on the menu bar	Shortcut key
---	Setting → Save Current Settings as Default	---

Table 16

Message	Description
Do you want to save the current settings as the default?	<input type="button" value="Yes"/> Saves the current settings as the default. <input type="button" value="No"/> Cancels the operation of saving the current settings.

3.6.2. Initialize Settings

Initializes all of the current settings and resets the initial setting file to the settings when the software was installed.

Before the settings are initialized, a message dialog box appears. (Table 17)

Tool button	Operation on the menu bar	Shortcut key
---	Setting → Initialize Settings	---

Table 17

Message	Description
Do you want to initialize the current settings and the default settings?	<input type="button" value="Yes"/> Initializes the settings. <input type="button" value="No"/> Cancels the operation of initializing the settings.

3.7. Tools

3.7.1. Connection

Connect between this software and the probe or disconnect them. (toggle).

In a disconnected state, pressing this tool button displays the Select Unit dialog box (Figure 25), where you can select the unit to connect to.

From the Select Unit dialog box, you can also register the license.

Tool button	Operation on the menu bar	Shortcut key
	Tool → Connect	Ctrl + L

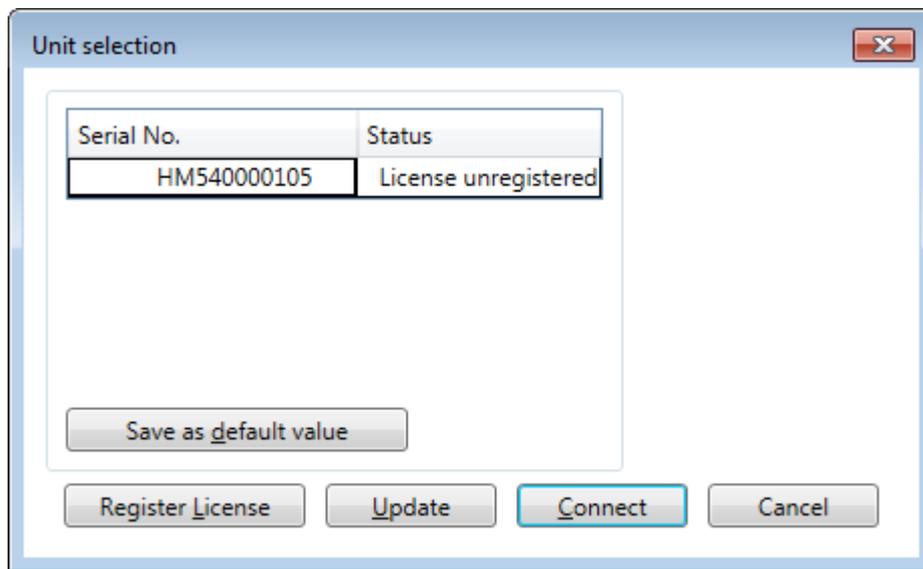


Figure 25

➔ For license registration, refer to "[5. License Registration.](#)"

Table 18

Serial No.	<p>Displays serial numbers of all probes that are connected to the host PC. For each probe that can be connected, a checkbox is displayed. Check the checkbox for the desired probe. With this software, you can select only one probe.</p> <p>If a probe cannot be connected because, for example, the license is not registered or the probe is being used for other function, the corresponding serial number and the checkbox are grayed out.</p>
Status	<p>Displays the status of the probe.</p> <p>Available : the probe can be connected.</p> <p>Used : the probe is used for other function.</p> <p>License unregistered : The license is not registered.</p>
<input type="button" value="Save as default value"/>	<p>Saves the current probe selection status as the default value. When this software is started up next time, this setting is restored as the default value.</p> <p>Before saving the setting, a message dialog (Table 19) prompts you to confirm the setting.</p>
<input type="button" value="Register License"/>	<p>Registers the license for the selected probe.</p> <hr/> <p> For details, refer to "5. License Registration."</p> <hr/>
<input type="button" value="Update"/>	<p>Searches again for probes that are connected to the host PC.</p>
<input type="button" value="Connect"/>	<p>Connects to the probe with a checked checkbox.</p> <p>When an error occurs during connection process, a message dialog is displayed. (Table 20)</p>
<input type="button" value="Cancel"/>	<p>Cancels probe connection process.</p>

Table 19

Message	Description
Do you want to save the current settings as the default?	<p><input type="button" value="Yes"/> Saves the current settings as the default.</p> <p><input type="button" value="No"/> Cancels the operation of saving the current settings.</p>

Table 20

Message	Description
Could not find unit to connect to.	<p>This message is displayed when the desired probe cannot be found. Check if the probe is connected properly.</p>
Failed to connect. (XXX)	<p>This message is displayed when connection has failed. In the place of XXX, the cause of the failure is displayed.</p> <p>For the content of "XXX" (cause), refer to "A.1. HW Connection Errors."</p>

3.7.2. Start Waveform Output

Start output of the waveform that is between 'Start Waveform Output Position' and 'End Waveform Output Position' in the waveform area.

This function cannot be selected if the host PC is not connected to a probe.

When waveform output fails, a dialog message is displayed. (Table 21)

Tool button	Operation on the menu bar	Shortcut key
	Tool → Start Waveform Output	F5

Table 21

Message	Description
Failed to output waveform. (XXX)	This message is displayed when waveform output has failed. In the place of XXX, the cause of the failure is displayed. For the content of "XXX" (cause), refer to "A.1. HW Connection Errors."

Restriction imposed on waveform output
Depending on the data rate, a restriction is imposed on the Hi-Z data output

 **If the data rate is 1 Mbps or higher (1 us or below) and the waveform data in the output range has Hi-Z data, the Hi-Z data cannot be output.**
The message as shown in Table 22 is displayed and output is not started.
Lower the data rate or delete Hi-Z data from the output range.

Table 22

Message	Description
At this Data Rate, it is not possible to output Hi-Z data. Delete Hi-Z data from the output range or set Data Rate to XX or below.	Delete Hi-Z data from the output range or lower the data rate. Even if you do not actually delete Hi-Z data, output is possible as long as there is no Hi-Z data in the output range. In the place of XX, the following is displayed depending on the waveform unit. When waveform unit is PTN → 1Mbps, when waveform unit is Time → 1usec

● Indications on tool bar

When output is started by an external trigger, the indication on the Waveform output start button changes depending on the status of the probe. (Table 23)

During waveform output, the button can not click.

Table 23

	Outputting waveform.
---	----------------------

3.7.3. Step-by-Step Output

Output waveform from 'Start Waveform Output Position' that is edited in the waveform area in a step-by-step manner.

Regardless of whether the operation mode is Keep mode, the outputting state is retained until the end of the waveform output range is reached.

This function cannot be selected if the host PC is not connected to a probe.

When waveform output fails, a dialog message is displayed. (Table 21)

Tool button	Operation on the menu bar	Shortcut key
	Tool → Step-by-Step Output	F12



While step-by-step output is performed, the output position is displayed as a green dashed line on the Waveform window.
For details, refer to "[4.2.2. Edition Area.](#)"



Restriction imposed on waveform output

Depending on the data rate, a restriction is imposed on the Hi-Z data output

If the data rate is 1 Mbps or higher (1 us or below) and the waveform data in the output range has Hi-Z data, the Hi-Z data cannot be output.

The message as shown in Table 22 is displayed and output is not started.
Lower the data rate or delete Hi-Z data from the output range.

● Indications on tool bar

When step-by-step output is started by an external trigger, the indication on the Waveform output start button changes depending on the status of the trigger. (Table 24)

During step-by-step output, the button is displayed in a recessed manner and disabled.

Table 24

	Outputting waveform.
---	----------------------



Even when step-by-step output is performed, the indication on the Waveform output start button changes.

● Step-by-step output action when external trigger is used

A figure in below is sequence of the step-by-step output action with external trigger.

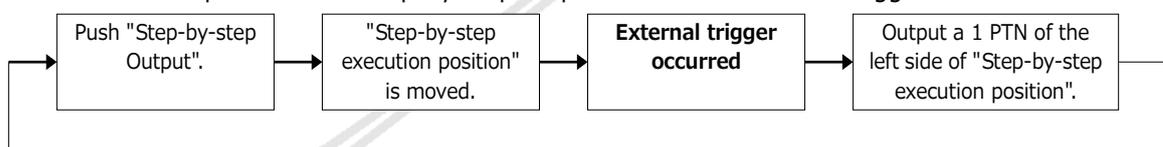


Figure 26

3.7.4. Stoppage of Waveform Output

Stop waveform output and set the output to Hi-Z.

When the waveform is not output, this function cannot be selected.

Tool button	Operation on the menu bar	Shortcut key
	Tool → Stop Waveform Output	Shft + F5

While step-by-step output is performed, the output is retained and the "Stop Waveform Output" in the menu or the tool bar changes to "Keep off."

If waveforms are output with the "Keep mode" operation mode enabled, a message dialog box (Table 25) prompts you to confirm your command and then the waveform output stops.

Table 25

Message	Description
Waveform is being output in Keep mode.	<input type="button" value="Yes"/> Stops outputting waveforms.
Do you stop (Hi-Z)?	<input type="button" value="No"/> Cancels output stop process.

3.7.5. Keep off

Stop retention of the outputting state and set the output to Hi-Z.

Tool button	Operation on the menu bar	Shortcut key
	Tool → Keep off	---



When "Keep" operation mode is enabled and "Repeat" operation mode is disabled, once the end of the waveform output is reached, the [Stop Waveform Output](#) button automatically changes to Keep off button.

3.7.6. Control using Run button on probe

Switch to enable or disable control using Run button on the probe.

If a checkmark (✓) is shown at the beginning of the menu, control using Run button is enabled.

When enabled, by pressing the Run button on the probe, you can [start waveform output](#) while waveform output is being stopped or you can [stop waveform output](#) while waveform output is in progress.

Tool button	Operation on the menu bar	Shortcut key
---	Tool → Control by Run Button on Probe	---



Even when this setting is enabled, it is possible to start/stop waveform output from the menu bar or the tool bar.

3.8. Help

3.8.1. Help Display

Display the Universal Probe product page on our web site.
Please download the instruction manual from there.

Tool button	Operation on the menu bar	Shortcut key
---	Help → Help	---

3.8.2. Version Information

Display the version of this software and the information of the connected hardware.
These pieces of information can be copied.

Tool button	Operation on the menu bar	Shortcut key
---	Help → About	---

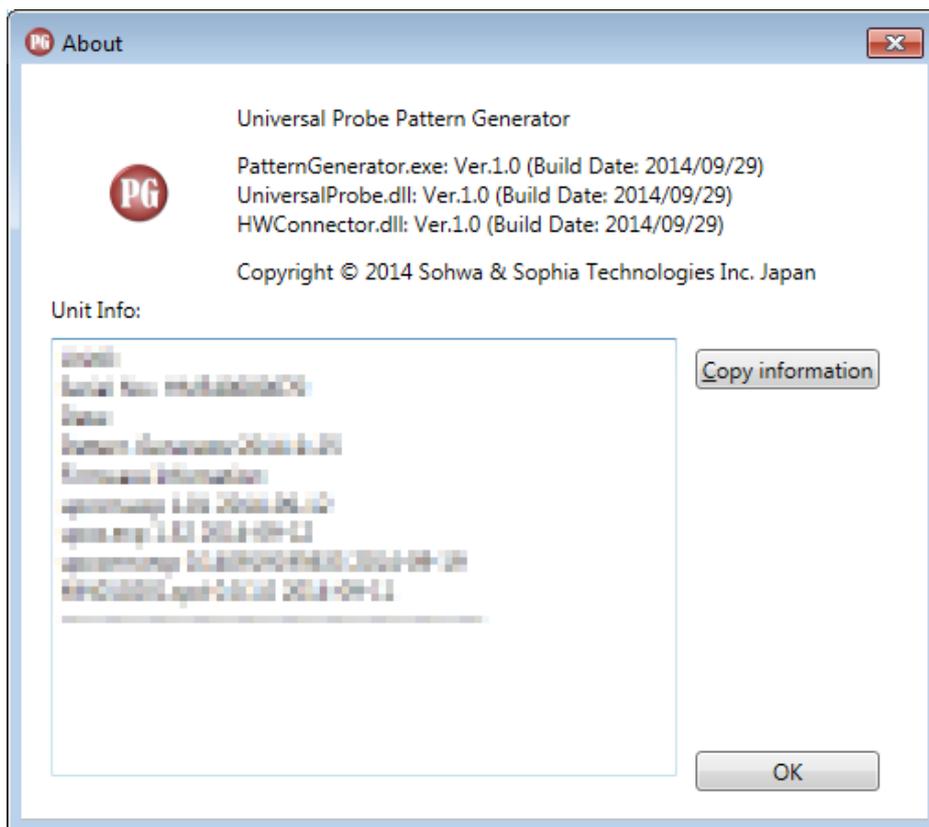


Figure 27

3.8.3. Demo Mode

Discard the current waveform data and waveform output settings and display the waveform data for demonstration.

Tool button	Operation on the menu bar	Shortcut key
---	Help → Demo Mode	---



In Demo mode, you cannot save data to file or perform waveform output.



The waveform data being edited and waveform output settings are discarded. Select this command after saving data.

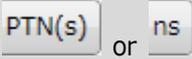
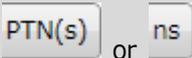
3.9. Waveform Output Settings

3.9.1. Waveform Output Start Position/End Position

Set the waveform output start position/end position.

Toolbar	Shortcut key
	Shift + F1

Table 26

<p>Start position</p> 	<p>Sets waveform output start position.</p> <p>When the waveform unit button is displayed as PTN(s), the waveform unit is set to PTN(s).</p> <p>When the waveform unit button is displayed as Time, the waveform unit is set to time.</p> <p>The possible setting range is 0 to 12,287 in PTN(s).</p> <p>In time unit, the start position can be set in the range of 0 to 12,287 x data rate (time per 1PTN(s)).</p> <p>You can increase and decrease a numeric value with the spin button or directly enter a numeric value.</p>
<p>Start unit</p> 	<p>Sets the unit for waveform output start.</p> <p>When the waveform unit button is displayed as PTN(s), the waveform unit is fixed to PTN(s).</p> <p>When the waveform unit button is displayed as Time, the waveform unit is set to time.</p> <p>Every time you press the unit display section, the unit indication changes in the sequence of ns (nanosecond) → us (microsecond) → ms (millisecond) → sec (second).</p>
<p>End position</p> 	<p>Sets waveform output end position.</p> <p>The unit and range are same as those for waveform output start position.</p>
<p>End Unit</p> 	<p>Sets the unit for waveform output end.</p> <p>The indication and unit switching sequence are same as those for unit for waveform output start.</p>



Every time you press the corresponding shortcut key, the focus moves in the sequence of "Start position" → "Start unit^{*1}" → "End position" → "End unit^{*1}". The setting of the focused position can be changed using UP/DOWN arrow keys (↑/↓).

*1: It will not focus when Waveform Unit is 'PTN'.

3.9.2. Data Rate

Set the data rate at which waveforms are output. Set the data rate in bps or time per 1PTN (s).

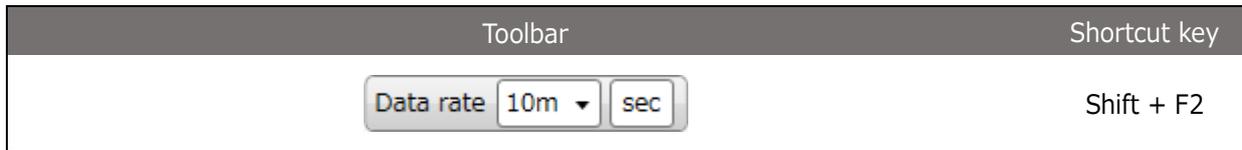


Table 27

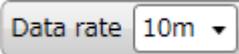
<p>Data rate</p> 	<p>Sets the data rate at which waveforms are output. For the possible setting range, refer to Table 28 below. It is not possible to output Hi-Z data at a data rate at which Hi-Z data cannot be output, but as long as Hi-Z data does not exist in the output range, you can output data without changing the data rate or deleting Hi-Z data. At a data rate at which Hi-Z data cannot be output, if a waveform data in the output range contains Hi-Z data, a message dialog (Table 22) is displayed and output is disabled.</p>
<p>Data rate unit</p> 	<p>Set the unit of data rate. Every time you click here, the indication switches between sec (time per 1PTN) and bps.</p>

Table 28

Data rate (bps)	Data rate (sec)	Hi-Z output	Data rate (bps)	Data rate (sec)	Hi-Z output
100	10m	Allowed	50K	20u	Allowed
200	5m	Allowed	100K	10u	Allowed
250	4.0m	Allowed	200K	5.0u	Allowed
400	2.5m	Allowed	250K	4.0u	Allowed
500	2.0m	Allowed	400K	2.5u	Allowed
1.0K	1.0m	Allowed	500K	2.0u	Allowed
2.0K	500u	Allowed	1.0M	1.0u	Allowed
2.5K	400u	Allowed	2.0M	500n	Not allowed
4.0K	250u	Allowed	2.5M	400n	Not allowed
5.0K	200u	Allowed	4.0M	250n	Not allowed
10K	100u	Allowed	5.0M	200n	Not allowed
20K	50u	Allowed	10M	100n	Not allowed
25K	40u	Allowed	20M	50n	Not allowed
40K	25u	Allowed			

 Every time you press the corresponding short cut key, the focus moves to "Data Rate" → "Data Rate Unit" in this order.
The setting of the focused position can be changed using UP/DOWN arrow keys (↑/↓).

3.9.3. Output Voltage

Set the voltage at which waveforms are output.

Toolbar	Shortcut key
	Shift + F3

Table 29

Output	Select the voltage at which waveforms are output from 1.2, 1.5, 1.8, 2.5, and 3.3 (V).
--------	--

3.9.4. Operation Mode

Set the operation mode (Repeat mode or Keep mode) in which waveforms are output. The Repeat mode and Keep mode are set exclusively. They cannot be set at the same time.

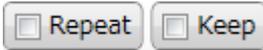
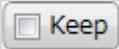
Toolbar	Shortcut key
	Shift + F6

Table 30

<p>Repeat</p> 	<p>Checking this checkbox enables the Repeat mode. This checkbox cannot be selected when the Keep mode is enabled.</p> <p>When Repeat mode is disabled: If you press the Waveform output start button, the waveform between Start and End is output once. When an external trigger is specified, the waveform is output once when a trigger occurs.</p> <p>When Repeat mode is enabled: If you press the Waveform output start button, the waveforms between Start and End are output repeatedly. When an external trigger is specified, the waveforms are output repeatedly after a trigger occurs.</p>
<p>Keep</p> 	<p>Checking this checkbox enables the Keep mode. This checkbox cannot be selected when the Repeat mode is enabled.</p> <p>When Keep mode is disabled: After the final data is output, the output from the probe becomes Hi-Z data.</p> <p>When Keep mode is enabled: After the final data is output, the output is retained.</p>



Every time you press the corresponding shortcut key, the focus moves to "Repeat" → "Keep" in this order.
When the focus is on either of the above buttons, pressing the Space key changes the selection status.

3.9.5. Waveform Output Start Trigger

Set the trigger condition for waveform output start.

The button indicates the current setting status.

Every time you press this button, the indication changes to "No EXT" → "EXT ↑" → "EXT ↓" in this order.

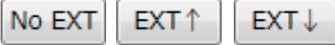
Toolbar		Shortcut key
		Shift + F7

Table 31

No EXT	External trigger is disabled. Output of waveform can be started only via the Waveform output start button.
EXT ↑	Rise of external trigger signal starts output of waveform.
EXT ↓	Fall of external trigger signal starts output of waveform.

3.10. Waveform Unit Setting

Set the minimum unit of waveform.

The button indicates the current setting status.

Pressing this button switches the indication between "PTN" and "Time."

Toolbar		Shortcut key
		Shift + F8

Table 32

PTN	Sets the unit for waveform output start/end positions and the cursor to PTN.
Time	Sets the unit for waveform output start/end positions and the cursor to time (ns/us/ms/sec).

3.11. Waveform Edit Mode Setting

Set the waveform edit mode.

The indication on the button represents the mode to be switched to after pressing this button.

Pressing this button switches the mode between "Compact" and "Edit."

Toolbar		Shortcut key
		Shift + F9

Table 33

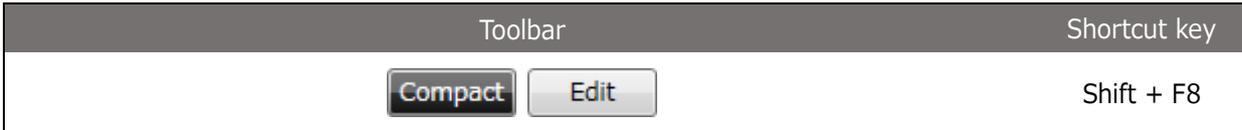
Compact	If you press this button while it is displayed this way, the mode is switched to the Compact mode.
Edit	If you press this button while it is displayed this way, the mode is switched to the Edit mode.

→ For details of each mode, refer to "[4.1. Main Window.](#)"

4. Windows

4.1. Main Window

The main window can be displayed in two modes: Edit mode and Compact mode. The mode can be switched by using the following buttons.



4.1.1. Edit Mode

This is the mode in which waveforms are edited. You can use all the functions.

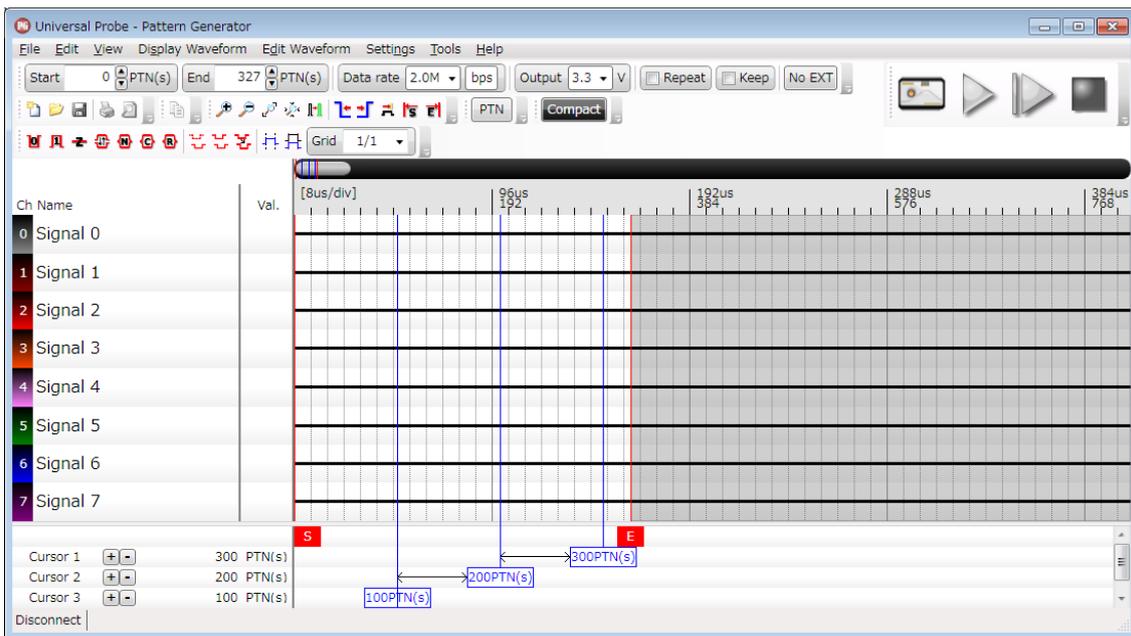


Figure 28

4.1.2. Compact Mode

This is a mode dedicated to waveform output operations. The menu and tool bar related to edition are not displayed.



Figure 29

4.2. Waveform area

The waveform areas can be roughly classified as follows.

Each green line represents the border between areas, and by dragging the green line, you can change the size of the corresponding area.

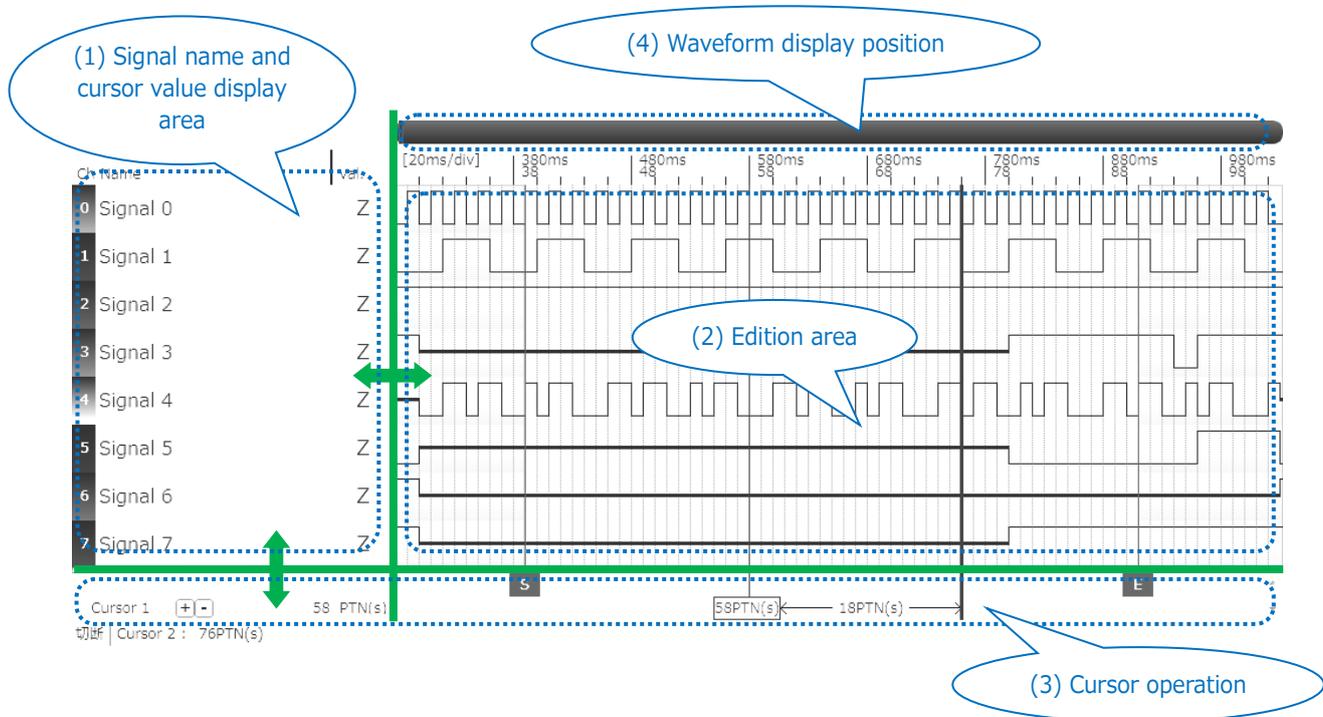


Figure 30

A single line represents a single signal, and the selected signal is indicated with a light-blue background. Figure 31 shows an example in which Signal 1 is selected.

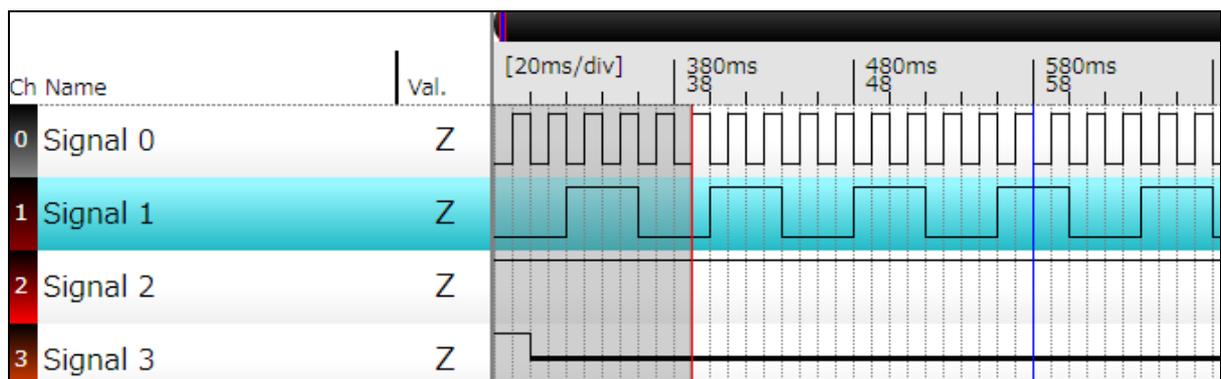
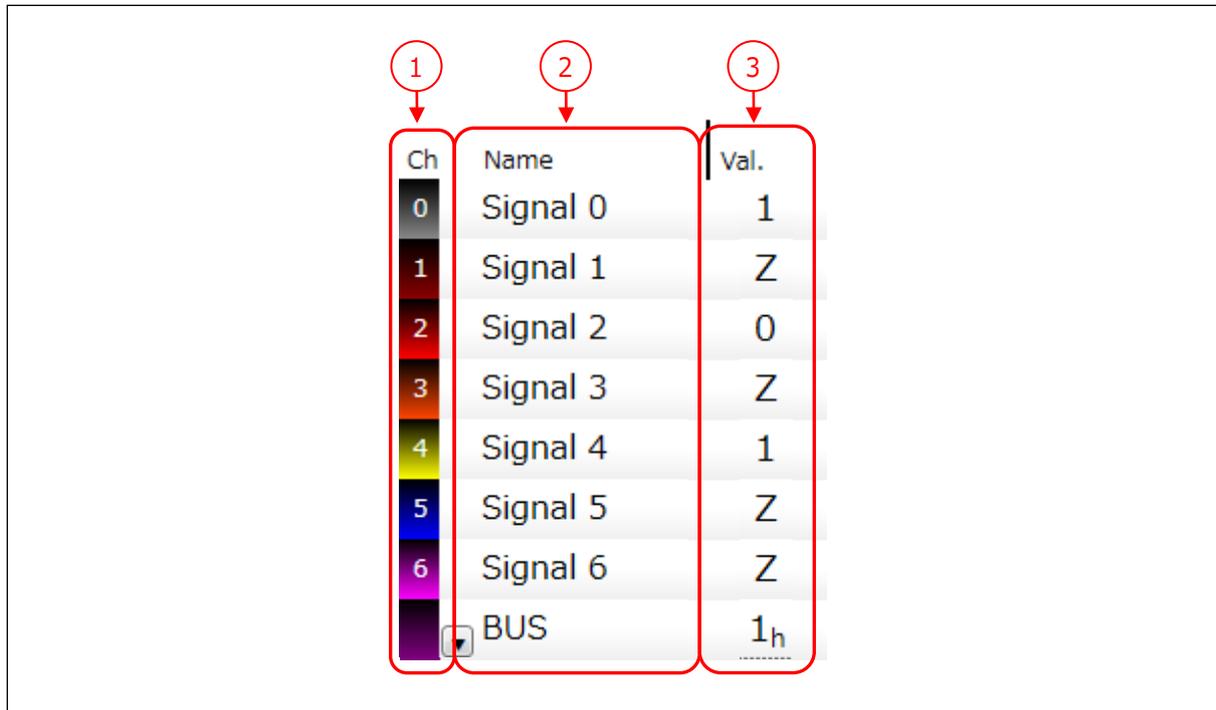


Figure 31

4.2.1. Signal Name/Cursor Value Display Area

The signal name/cursor value display area displays signal names and values of signals at the position indicated by the cursor.



Ch	Name	Val.
0	Signal 0	1
1	Signal 1	Z
2	Signal 2	0
3	Signal 3	Z
4	Signal 4	1
5	Signal 5	Z
6	Signal 6	Z
<input type="checkbox"/>	BUS	1h

Figure 32

Table 34

(1) Channel No.	<p>Displays channel numbers.</p> <p>By dragging and dropping the channel number indication, you can switch the order of signals.</p> <p>Clicking a signal number puts it into a selected state.</p>
(2) Signal name	<p>Displays signal names.</p> <p>Clicking a character string puts the signal name into an editable state, allowing you to change the signal name.</p> <p>When a signal is a bus or a bus element, right-clicking it displays the context menu. (For context menu, refer to Figure 37.)</p> <p>Double-clicking a signal name for single signal turns it to a bus.</p>
(3) Cursor value	<p>Displays the values of signals at the position selected by the cursor.</p> <p>During step-by-step output, this section displays the signal values at the position where the step-by-step output is performed. In this case, the numeric values are displayed in green.</p> <p>When a bus is displayed, its numeric value is appended with "h" at its end if the value is a hexadecimal number and appended with "b" if the value is a binary number. For a decimal value, the numeric value only is displayed.</p> <p>The display unit of bus can be changed from the context menu for signal name.</p> <p>When the number of digits is too large to fit in the display area, "#" is displayed.</p>

→ To extend the cursor value display area (3), extend "(1) Signal name and cursor value display area" in Figure 30.

● **Change method of signal name display size**

By dragging the splitter (Figure 33) at the label position in the signal name/cursor value display area to right and left, you can change the size of the signal name display area.

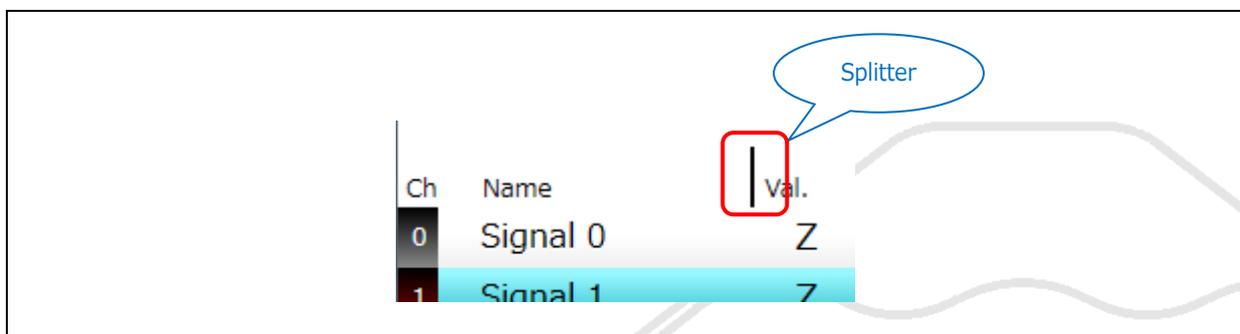


Figure 33

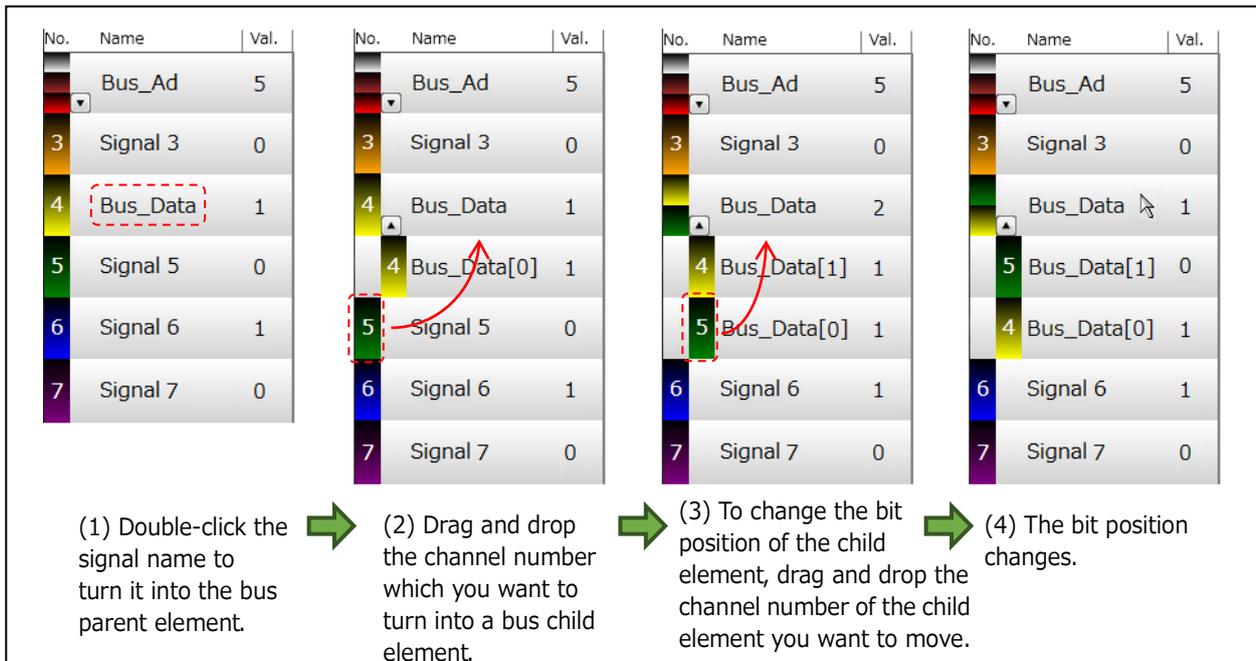
● Bus creation method

Bus can be created by operating the mouse.

Figure 34 shows its procedures.

The signal name of a signal (= child element) added to the bus will be changed to "signal name of parent element + {bit position}." Even if you change the bit position, the signal name will be automatically changed.

However, it is not replaced when the signal name is changed even if a bit position is changed.



No.	Name	Val.
5	Bus_Ad	5
3	Signal 3	0
4	Bus_Data	1
5	Signal 5	0
6	Signal 6	1
7	Signal 7	0

(1) Double-click the signal name to turn it into the bus parent element.

No.	Name	Val.
5	Bus_Ad	5
3	Signal 3	0
4	Bus_Data	1
4	Bus_Data[0]	1
5	Signal 5	0
6	Signal 6	1
7	Signal 7	0

(2) Drag and drop the channel number which you want to turn into a bus child element.

No.	Name	Val.
5	Bus_Ad	5
3	Signal 3	0
4	Bus_Data	2
4	Bus_Data[1]	1
5	Bus_Data[0]	1
6	Signal 6	1
7	Signal 7	0

(3) To change the bit position of the child element, drag and drop the channel number of the child element you want to move.

No.	Name	Val.
5	Bus_Ad	5
3	Signal 3	0
4	Bus_Data	1
5	Bus_Data[1]	0
4	Bus_Data[0]	1
6	Signal 6	1
7	Signal 7	0

(4) The bit position changes.

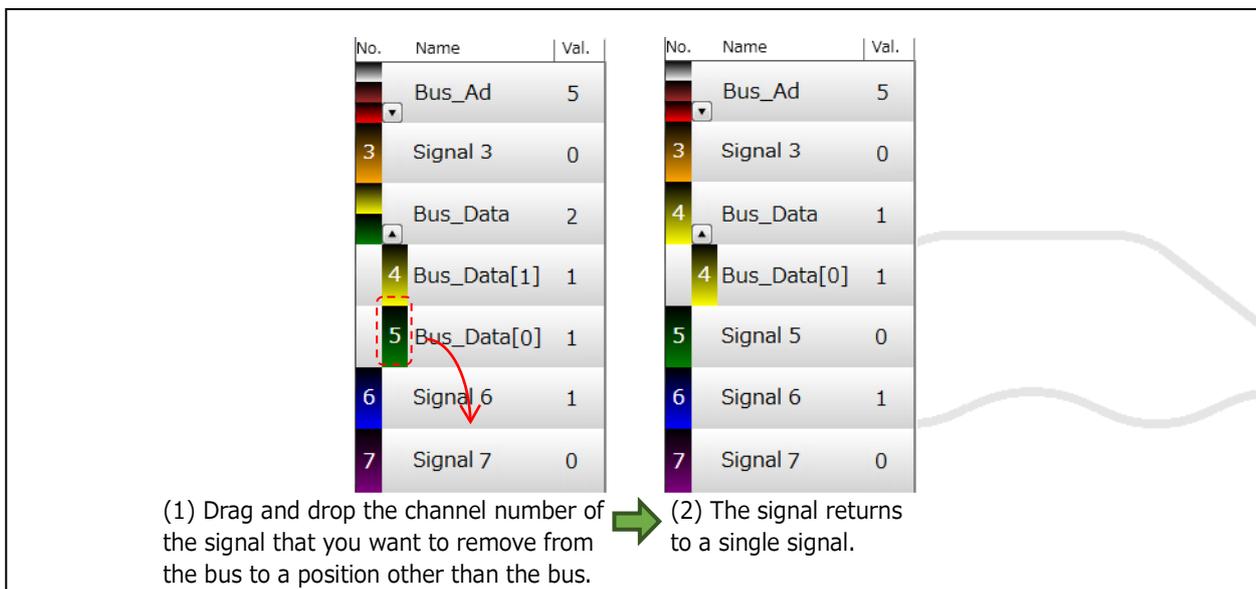
Figure 34

● Method for canceling bus state

Bus state can be canceled by operating the mouse.

Figure 35 shows its procedures.

By dragging and dropping a signal (= child element) that has been added to the bus to a position other than the bus, you can return it to a single signal.



No.	Name	Val.
5	Bus_Ad	5
3	Signal 3	0
4	Bus_Data	2
4	Bus_Data[1]	1
5	Bus_Data[0]	1
6	Signal 6	1
7	Signal 7	0

(1) Drag and drop the channel number of the signal that you want to remove from the bus to a position other than the bus.

No.	Name	Val.
5	Bus_Ad	5
3	Signal 3	0
4	Bus_Data	1
4	Bus_Data[0]	1
5	Signal 5	0
6	Signal 6	1
7	Signal 7	0

(2) The signal returns to a single signal.

Figure 35

INFO You can also cancel the bus state from the context menu that is displayed by right-clicking the channel number.

● **Switching of bus expansion/folding**

By using  and  buttons displayed in the bus signal name section, you can switch between the expanded state and folded state of bus child element.

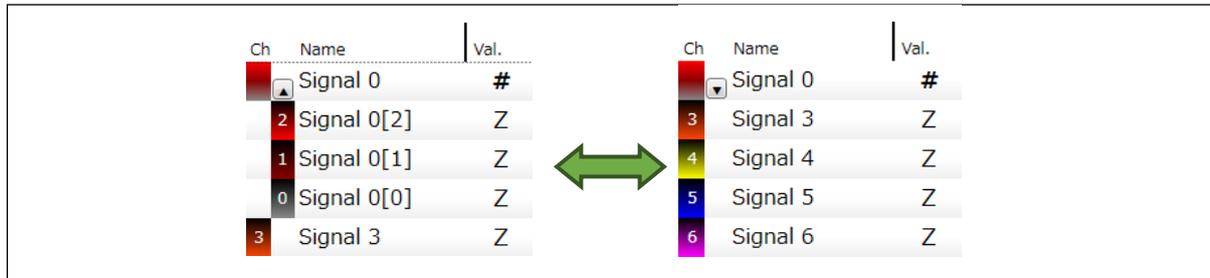


Figure 36

Table 35

	Expands (displayed state) the bus child element.
	Folds (hidden state) the bus child element.

● **Context menu**

When a signal is a bus or a bus element, right-clicking the corresponding signal name portion displays the context menu.

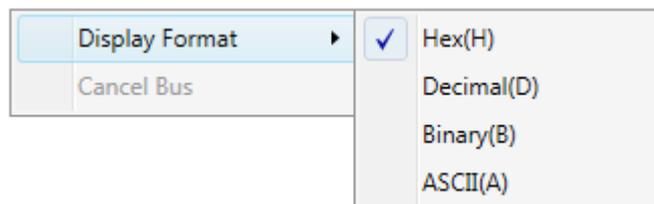


Figure 37

Table 36

Bus Display Format	Changes the bus display format. This setting can be specified for parent element only. Hex : Displays the bus value in hexadecimal notation. Decimal : Displays the bus value in decimal notation. Binary : Displays the bus value in binary notation. ASCII : Displays the bus value in ASCII notation.
Cancel Bus	Removes the selected bus child element from the bus. This function can be selected for bus child elements only.

INFO The bus display format will be reflected to the cursor value and the signal display in the waveform area.

4.2.2. Edition Area

In the edition area, display and edit waveforms.

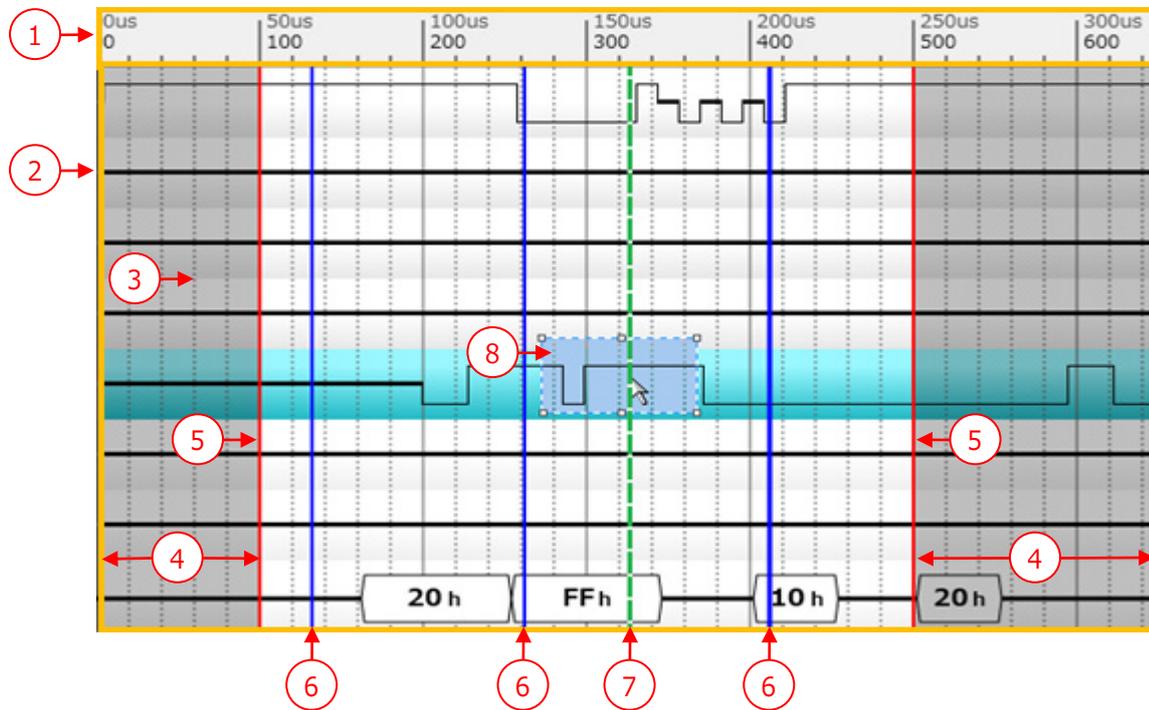


Figure 38

Table 37

(1) Scale display	Scale for waveform display position/time.
(2) Waveform display area	Display area of waveform.
(3) Grid	In the edition area, dotted lines are displayed at specified grid intervals. → For setting of grid, refer to " 3.5.13. Grid Interval. "
(4) Outside of output range	The area to the left of the waveform output start and the area to the right of the waveform output end are grayed out as areas outside the output range.
(5) Output start/end positions	The red lines represent cursors indicating the waveform output start/end positions. → For setting of waveform output start/end positions using cursor, refer to " 4.2.3. Cursor. "
(6) Cursor	The blue line represents the cursor.
(7) Step-by-step output position	While step-by-step output is being performed, the output position is indicated by a green dashed line.
(8) Range selection	By dragging the mouse on the waveform display area, you can select a desired area. The details of the selection are described later in this section.

● **Movement of display position**

By dragging the edition area while holding down the Shift key, you can move the display position in the dragging direction.

● **Signal display in waveform display area**

In the waveform display area, signals are displayed as shown in Table 38.



Figure 39

Table 38

(1) Single signal display	<p>The upper line indicates that the value is 1 (= High Level). The lower line indicates that the value is 0 (= Low Level). The middle line indicates that the value is Hi-Z.</p> <p>In a reduced display, when a single dot contains multiple data, the dot is displayed in the following color:</p> <p>The rate of value 1 is 50% or below:  (light gray) The rate of value 1 is 50% or above:  (dark gray)</p>
(2) Bus display	<p>For the bus, values are displayed in hexagons.</p> <p>If the bus child element signals contain any Hi-Z value, the bus value in each hexagon is indicated with "X."</p>

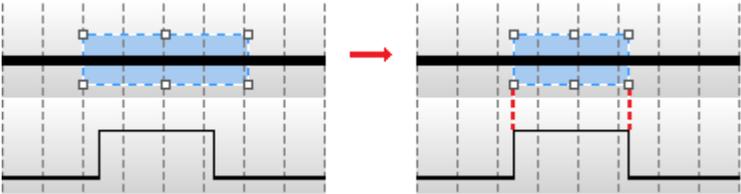
● **Range selection in edition area**

During edition of waveform, you can select the range to edit by using the mouse.

Depending on the selection status of "Align to Grid" and "Align to Edge," the selection result is made differently.

Regardless of "Align to Grid" and "Align to Edge" settings, the selection range in the vertical direction is corrected in units of signal (units of line).

Table 39

Align to Grid = disabled Align to Edge = disabled	The range dragged by the mouse is selected as is.
Align to Grid = enabled Align to Edge = disabled	Corrects the selection range to the position of the nearest grid as shown below. 
Align to Grid = disabled Align to Edge = enabled	Corrects the selection range to the position of the nearest edge of another signal as shown below. 
Align to Grid = enabled Align to Edge = enabled	Corrects the selection range to the position of grid or edge, whichever nearer.



For setting of Align to Grid, refer to "[3.5.11. Align to Grid](#)" and for setting of Align to Edge, refer to "[3.5.12. Align to Edge](#)."

4.2.3. Cursor Operation

The cursor operations include movement of cursor, addition and deletion of cursor, and others.

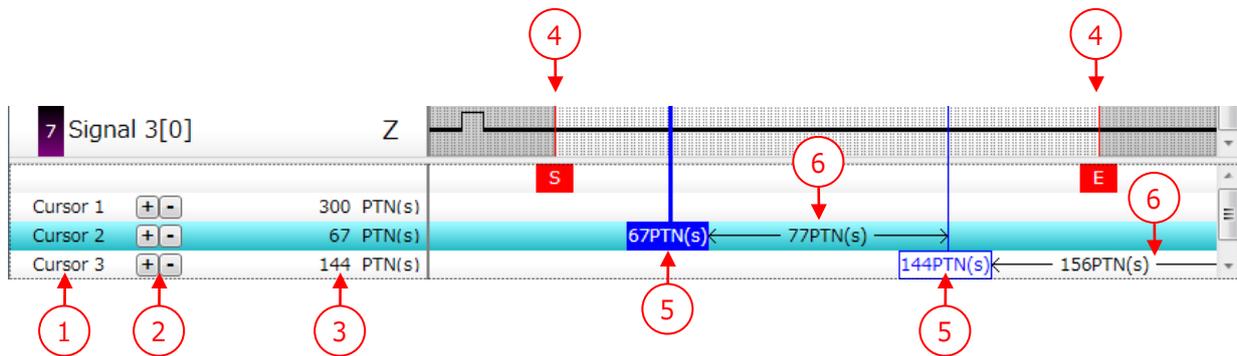


Figure 40

Table 40

(1) Cursor number	<p>Displays cursor numbers. The numbers are automatically set.</p> <p>The cursor of the clicked line turns into a selected state.</p> <p>The background color of a line changes to light blue when it is selected.</p> <p>Also, the color of the cursor tag is inverted.</p>
(2) Cursor addition/deletion 	<p>Clicking the "+" button adds a cursor to below the selected line. To the added cursor, the subsequent number is automatically assigned. The cursor numbers below the added line increases by 1.</p> <p>Clicking the "-" button deletes the selected cursor. The cursor numbers below the deleted line decreases by 1. The maximum number of cursors is 20.</p>
(3) Cursor position	<p>Displays the position of the cursor.</p> <p>If you click the cursor position, you will be able to enter a numeric value.</p>
(4) Waveform output start/end positions	<p>These marks indicate the start position (S mark) and the end position (E mark) of waveform output.</p> <p>Dragging the rectangle portion changes the start/end position.</p> <hr/> <p> For setting of waveform output start/end positions using tool bar, refer to "3.9.1. Waveform Output Start Position/End ."</p>
(5) Cursor	<p>Clicking the rectangle portion turns the clicked cursor into a selected state.</p> <p>By dragging the cursor, its position can be changed.</p>
(6) Cursor-to-cursor distance display	<p>Displays the distance from the next cursor.</p>

 The cursor position can be moved by using the menu bar or tool bar. Refer to "[3.4.7. Cursor → Move to Right Edge](#)," "[3.4.6. Cursor → Move to Left Edge](#)," "[3.4.7. Cursor → Move to Right Edge](#)"

Moves the selected cursor to the next right change point of the selected signal.
 If no signal is selected, the selected cursor is moved to the next right change point of a signal

that comes first.

Figure 15 and Figure 16 are examples showing how the cursor is moved.

Tool button	Operation on the menu bar	Shortcut key
	Display Waveform → Cursor → Move to Right Edge	---


 For a bus, the cursor is moved to the point where a value change occurs.

[3.4.8. Move to Edge](#), "[3.4.9. Start Waveform Output ← Cursor Position](#)," and "[3.4.10. End Waveform Output ← Cursor Position](#)."

4.2.4. Waveform Display Position

The waveform display position displays the position of the waveform area in the whole waveform, change of waveform area position, cursor position in the whole waveform, and other information.



Figure 41

Table 41

(1) Waveform display position	Indicates the range displayed in the waveform area and its rate to the whole wave form as a gray bar. By dragging the bar, you can move the waveform display position.
(2) Cursor position	The blue line represents the cursor position in the whole waveform.
(3) Waveform output start/end positions	The red lines represent the waveform output start/end positions.
(4) Background	The black background represents the whole waveform. If you click a position other than the bar, the display position is moved to the position centering around the clicked position.

4.3. Status Bar

The status bar displays the operation status.

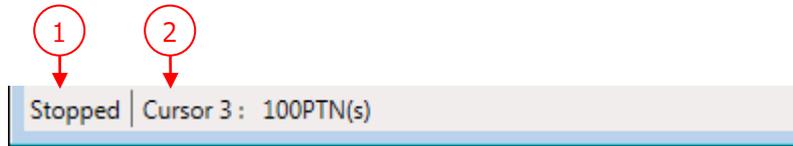


Figure 42

Table 42

<p>(1) Operation status display</p>	<p>Displays the operation status of the probe.</p> <p>Outputting Waveform : Indicates that the probe is outputting waveform.</p> <p>Stopped : Indicates the state in which waveform is not output.</p> <p>Disconnected : Indicates the state in which the probe is disconnected.</p>
<p>(2) Cursor position display</p>	<p>Displays the position of the cursor that is currently selected.</p>

5. License Registration

To use this product, its license needs to be registered. If you select a probe whose license has not been registered yet and press the "Register License" button in the Select Unit dialog box shown in "3.7.1. Connection," the following dialog box is displayed.

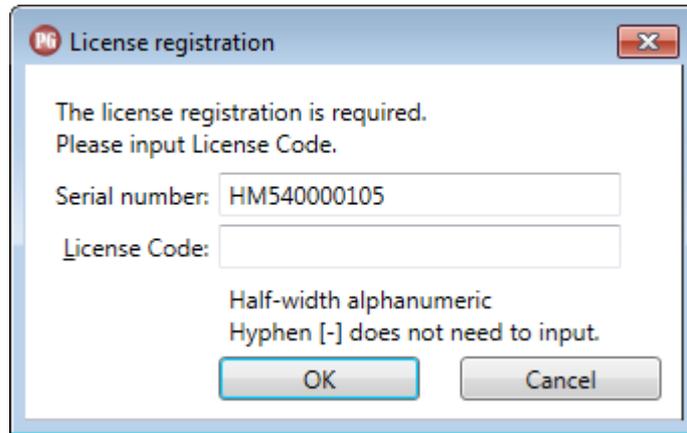


Figure 43

Table 43

Serial number	Displays the serial number of the probe whose license you are going to register.
License Code	Enter the License Code.

If the License Code contains any error, an error message is displayed. Check if License Code is correctly entered.

A. Appendix

A.1. HW Connection Errors

These are errors that occur at the time of connection, start of waveform output, and step-by-step output.

Message	Description
Internal Error	Internal error of this software.
Incorrect argument	Internal error of this software.
Interface is not initialized.	Internal error of this software.
Communication error	Failed to communicate with probe.
Invalid device ID	Internal error of this software.
Device is not initialized.	Internal error of this software.
Function is different.	Already initialized by another function.
Device is running.	Internal error of this software.
Canceled.	Internal error of this software.
No license.	License is unregistered or invalid. Register the license again.
Memory shortage	Memory is running short. Check the memory consumption status with Task Manager or the like, exit unnecessary software, and restart this software.
Number of connected units does not match.	After connection, probe(s) may have been removed before starting output. Check the probe connection.

Revision History

Ver. No.	Revision date	Content of revision
01	09/30/2014	Initial Release.
02	11/17/2014	Correction of typographical errors.

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