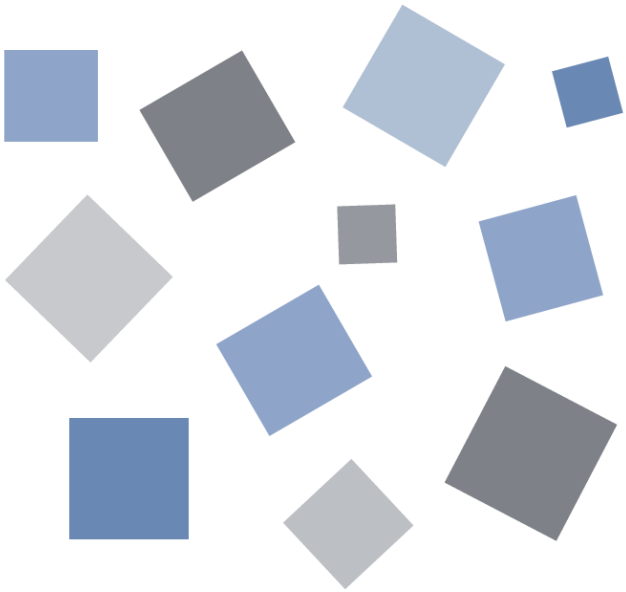
GL900

Application software

# USER'S MANUAL

MANUAL NO. APS(GL900)-UM-151



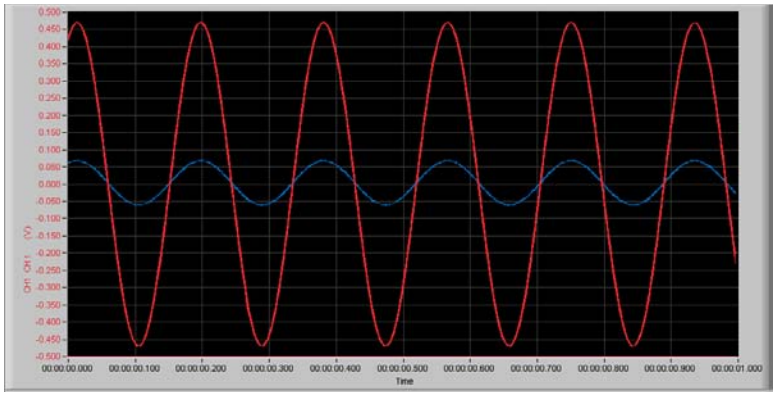
GRAPHTEC

# Contents

# 1. Main Features

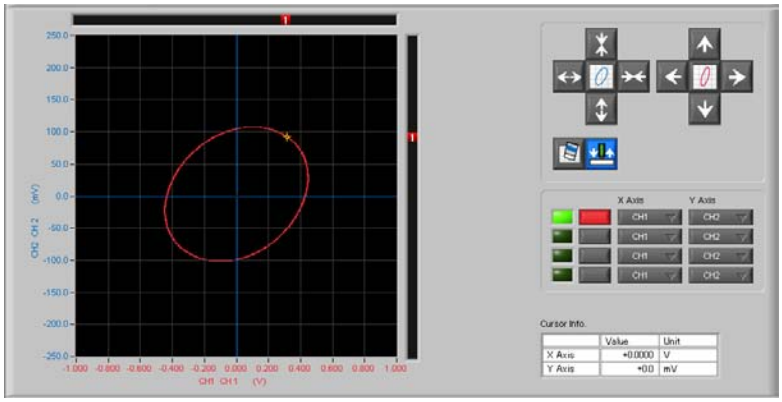
## A Variety of Display Formats

Data can be viewed in Y-T, X-Y, FFT, and Zoom formats, on large, easy-to-read screens.



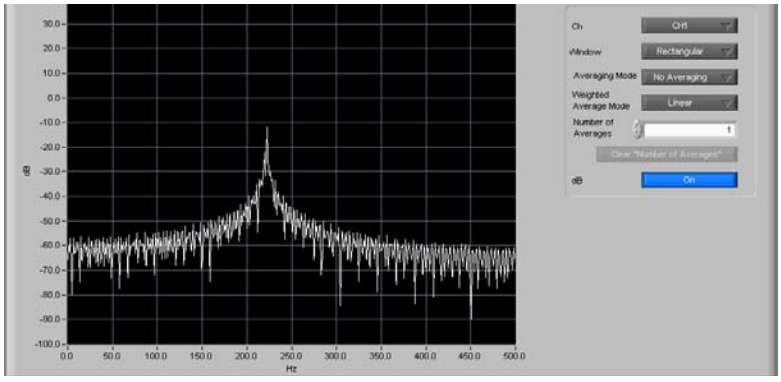
### Y-T

Input signals are displayed in the Y axis, and time axes are displayed in the X axis. With a button, you can expand/shrink time axes and the X axis. Also, a graph can be divided into two or four parts to display each signal.



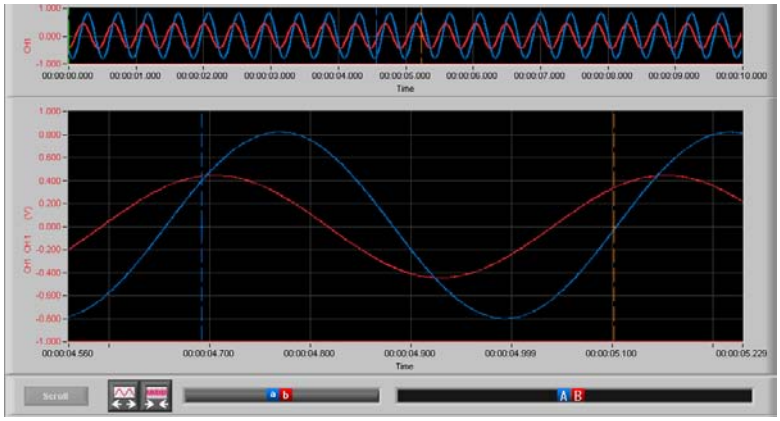
### X-Y

Input channels can be specified to the X and Y axes to check correlated waveforms.
Four channels are provided, and any channels can be specified for the X and Y axes. Also, you can expand/ shrink the span or move positions intuitively.



### FFT

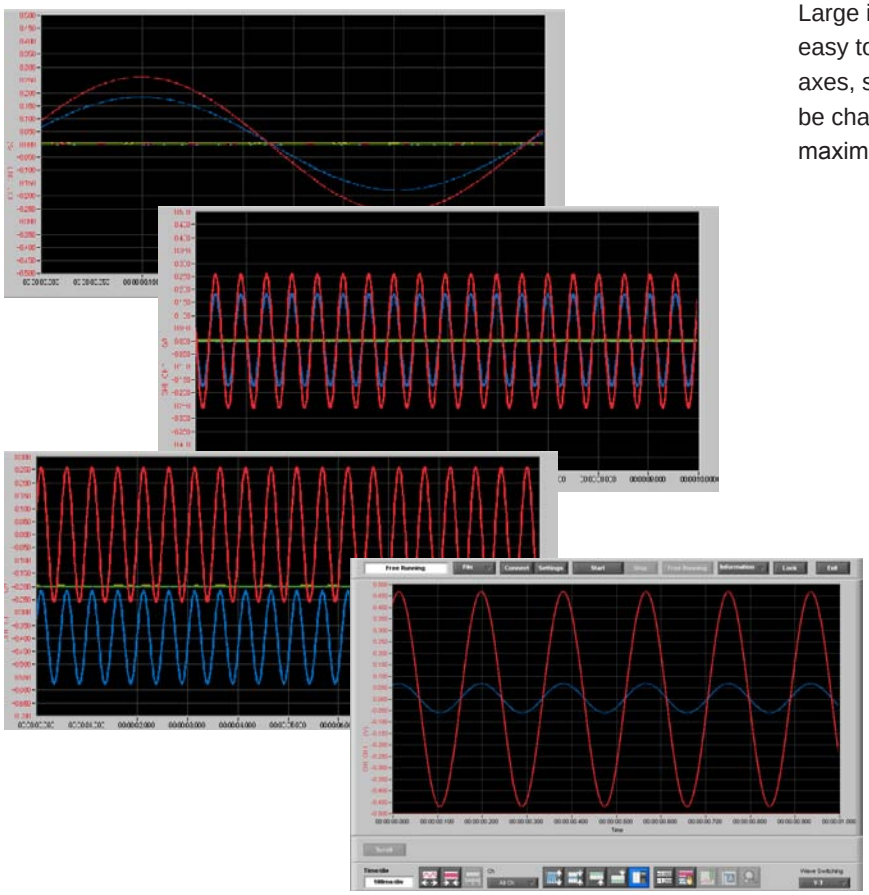
The waveforms are viewed in the Fast Fourier Transform.
The Window or the Averaging Mode can be set.



### Zoom

During data replay, the waveforms are viewed in the two displays that are divided into the upper side and the lower side. The whole waveforms are viewed in the upper display, and the detailed waveforms are viewed in the lower display. You can locate and search any detailed waveforms from the whole waveforms easily.

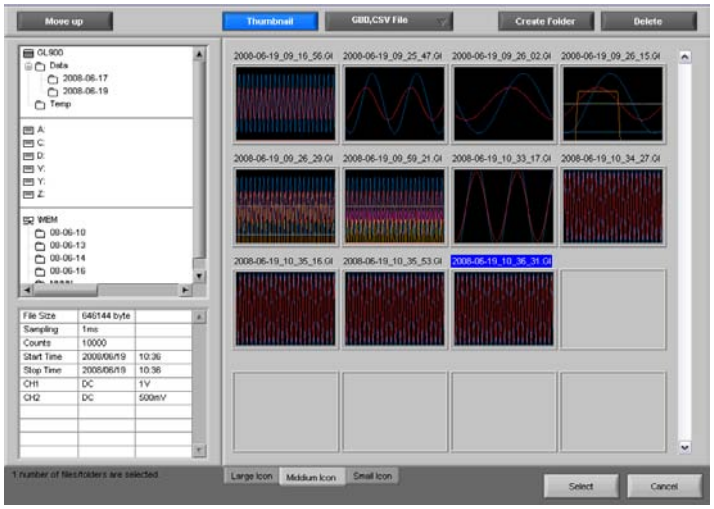
## Simple and Easy to Use



Large icons make it simple and easy to control the waveforms. Time axes, spans, waveform positions can be changed easily. Also, you can maximize a window to fit the screen.

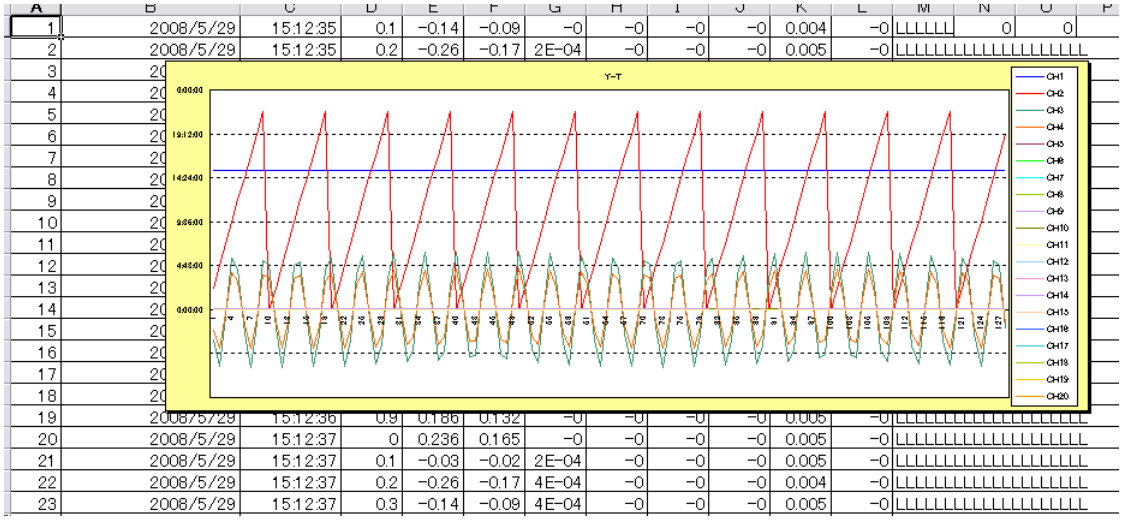
## Thumbnail Waveform Display

Before replaying captured data, the waveforms can be checked by referring to the small images (thumbnails) provided next to each file name. These thumbnails provide easy confirmation of the data before opening the file.



## Export to Direct Excel File Function

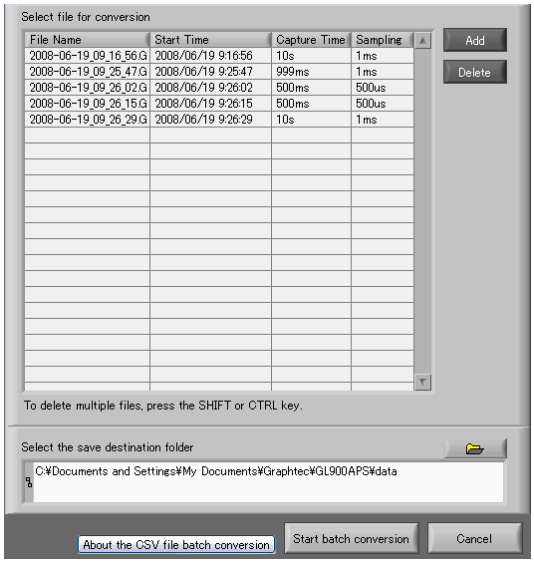
Captured data can be exported directly to an Excel file and displayed as graphs.
Ready-to-use template files are provided as standard for your convenience.
(Note: The Microsoft Excel program must be installed.)




| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2008/5/29 | 15:12:35 | 0.1 | −0.14 | −0.09 | −0 | −0 | −0 | −0 | 0.004 | −0 | LLLLLL | 0 | 0 | |
| 2 | 2008/5/29 | 15:12:35 | 0.2 | −0.26 | −0.17 | 2E−04 | −0 | −0 | −0 | 0.005 | −0 | LLLLLLLLLLLLLLLLLLL | | | |
| 3 | 20 | | | | | | | | | | | | | | |
| 4 | 20 | | | | | | | | | | | | | | |
| 5 | 20 | | | | | | | | | | | | | | |
| 6 | 20 | | | | | | | | | | | | | | |
| 7 | 20 | | | | | | | | | | | | | | |
| 8 | 20 | | | | | | | | | | | | | | |
| 9 | 20 | | | | | | | | | | | | | | |
| 10 | 20 | | | | | | | | | | | | | | |
| 11 | 20 | | | | | | | | | | | | | | |
| 12 | 20 | | | | | | | | | | | | | | |
| 13 | 20 | | | | | | | | | | | | | | |
| 14 | 20 | | | | | | | | | | | | | | |
| 15 | 20 | | | | | | | | | | | | | | |
| 16 | 20 | | | | | | | | | | | | | | |
| 17 | 20 | | | | | | | | | | | | | | |
| 18 | 20 | | | | | | | | | | | | | | |
| 19 | 2008/5/29 | 15:12:36 | 0.9 | 0.186 | 0.132 | −0 | −0 | −0 | −0 | 0.005 | −0 | LLLLLLLLLLLLLLLLLLL | | | |
| 20 | 2008/5/29 | 15:12:37 | 0 | 0.236 | 0.165 | −0 | −0 | −0 | −0 | 0.005 | −0 | LLLLLLLLLLLLLLLLLLL | | | |
| 21 | 2008/5/29 | 15:12:37 | 0.1 | −0.03 | −0.02 | 2E−04 | −0 | −0 | −0 | 0.005 | −0 | LLLLLLLLLLLLLLLLLLL | | | |
| 22 | 2008/5/29 | 15:12:37 | 0.2 | −0.26 | −0.17 | 4E−04 | −0 | −0 | −0 | 0.004 | −0 | LLLLLLLLLLLLLLLLLLL | | | |
| 23 | 2008/5/29 | 15:12:37 | 0.3 | −0.14 | −0.09 | 4E−04 | −0 | −0 | −0 | 0.005 | −0 | LLLLLLLLLLLLLLLLLLL | | | |

## CSV File Batch Conversion

Data captured in binary files is converted in a batch to CSV files.




## Printing Function, Screen Save Function

The waveform screen can be printed out on a printer, and screen copies saved to a file.
(Note: To use the printing function, the device must be connected to a printer.)

## Help Function

Help buttons that provide simple descriptions of the various functions are assigned to each of the menu setting items to provide ease of use.

# 2. System Requirements

Make sure that the computer on which you plan to install the software meets the following requirements.

| Item | System requirements |
|---|---|
| OS | Windows 2000, Windows XP, Windows Vista (32Bit/64Bit) |
| CPU | Pentium 4:  2.0GHz or higher |
| Memory | 512MB or more (1GB or more recommended) |
| HDD | 100MB additional space is required for installing software. |
| Display | 1024 x 768 resolution or higher, 65535 colors or more (16-bit or more) |
| Other | USB2.0 port, TCP-IP port, CD-ROM drive (for installing from CD)<br>Microsoft Excel software (for the Export to Direct Excel File and Display in Excel functions) |

CHECKPOINT

- Even when using a PC that meets the system requirements, measurement data may not be captured correctly depending on the PC status (e.g. running other applications or insufficient memory capacity in the storage media used). Exit all other applications before capturing data to the internal hard disk.
- When using this software, do not start other software and not preferably perform other operations and processes. (Example: the screen saver, anti-virus software, copying, moving, and searching the files, etc.)
- A USB2.0 port is required to take full advantage of the software. When using a USB1.1 port or a TCP-IP, data export or operations may be delayed.

# 3. Installing the USB Driver

This chapter describes how to install the USB driver.

## Checking the version of your USB driver

This section describes how to view the version of the USB driver if it is already installed.

1. Open "Device Manager". Select "Control Panel" → "System" → "Hardware" tab or right-click "My Computer", select "Properties" → "Hardware" tab → "System Properties" window, and then click the "Device Manager" button.
2. In the "Device Manager" window, open "USB (Universal Serial Bus) Controller". Confirm that "Graphtec GL/MT/DM/WR Series USB Driver" is shown. Right-click it and select "Properties".
3. Update the driver. Select the "Driver" tab and click the "Driver Details" button.
4. Select [...¥GTCUSBR.SYS] to view the version of the driver file.

## Installing the USB driver

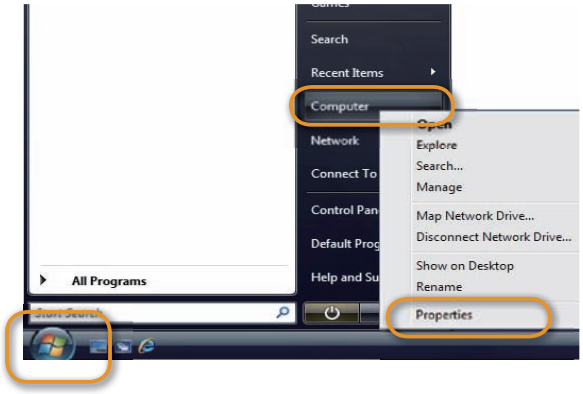
This section describes how to install the USB driver.

1. Insert the User's Guide CD-ROM provided as a standard accessory into the PC's CD-ROM drive.
2. Connect the GL900 to the PC. Connect the GL900 to the PC using the USB cable, and then turn the power on.
3. Install the USB driver. The installation procedure depends on the type of operating system and whether or not you are installing the driver for the first time.

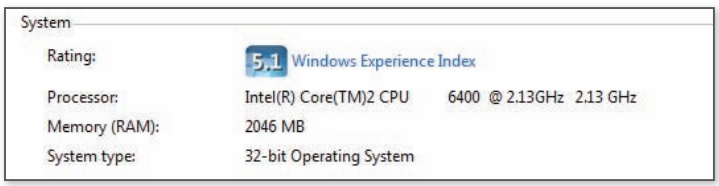
- Windows Vista : Driver software is to be installed for the first time.
  Driver software is already installed.
- Windows XP : Driver software is to be installed for the first time.
  Driver software is already installed.
- Windows 2000 : Driver software is to be installed for the first time.
  Driver software is already installed.

### ● Identifying the 32/64-bit version of Windows Vista

The required USB driver is different between the 32-bit and 64-bit versions of Windows Vista.
Identify the version of Windows Vista in use as follows.



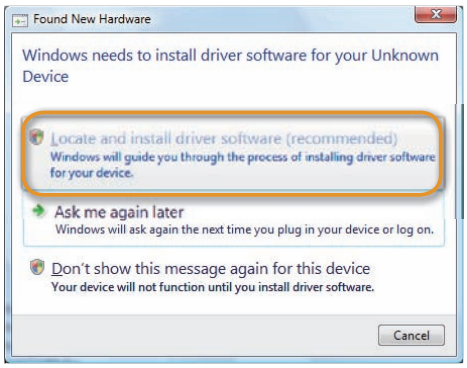

(1) Right-click "Computer" on the "Start Menu", then choose "Properties".



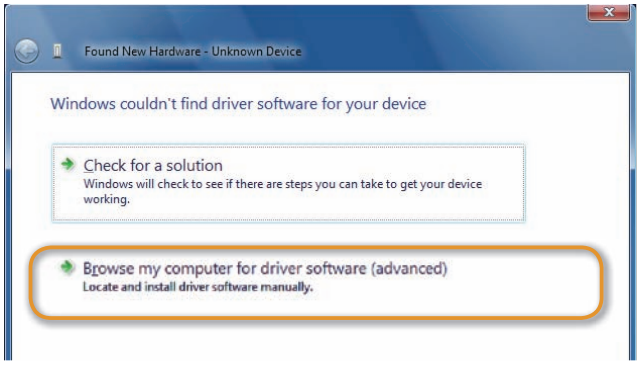

(2) If "System Type" under "System" is "64-bit operating system", the system in use is the 64-bit version.

## ● Windows Vista: Driver software is to be installed for the first time.

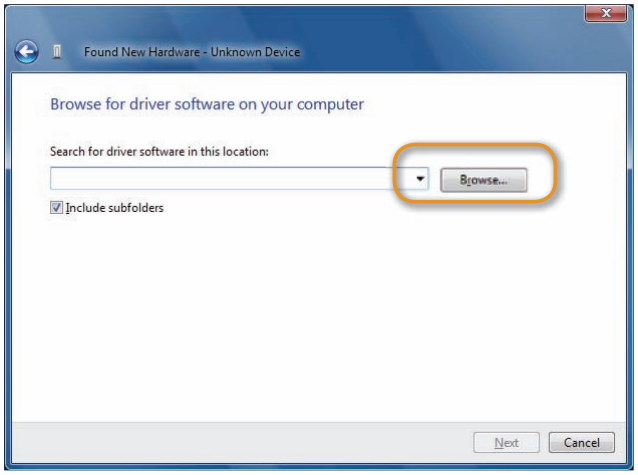
Connect the USB cable to the PC and GL900. The "Found New Hardware" message appears.



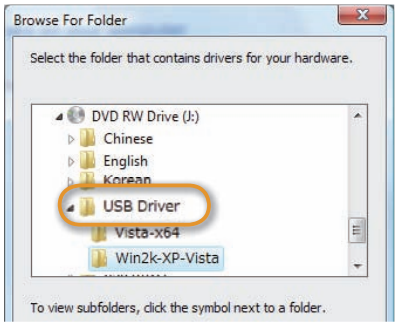

(1) Select "Locate and install driver software (recommended)".




(2) Select browse my computer for driver software.

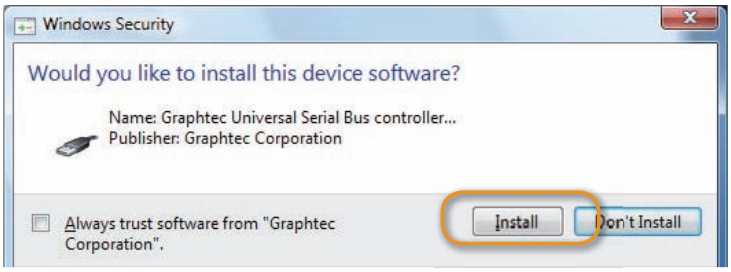



(3) Select "Browse".




(4) In the "Browse" for folder dialog box, select the following from the drive containing the CD-ROM.
32-bit operating system
: USB Driver → Win2K-XP-Vista
64-bit operating system
: USB Driver → Vista-x64

*For checking the number of bits of Windows Vista, see page 8.



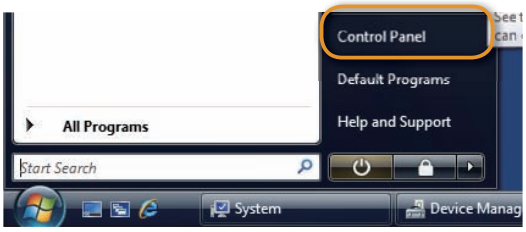

(5) When the following dialog box appears, select Install.


(6) As the installation is completed after a while, press "Close" to exit.

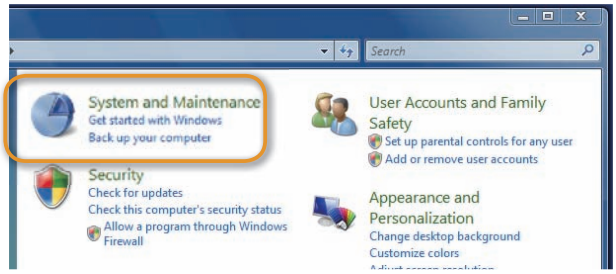
You have now completed the installation of the USB driver.

## ● Windows Vista: Driver software is already installed.

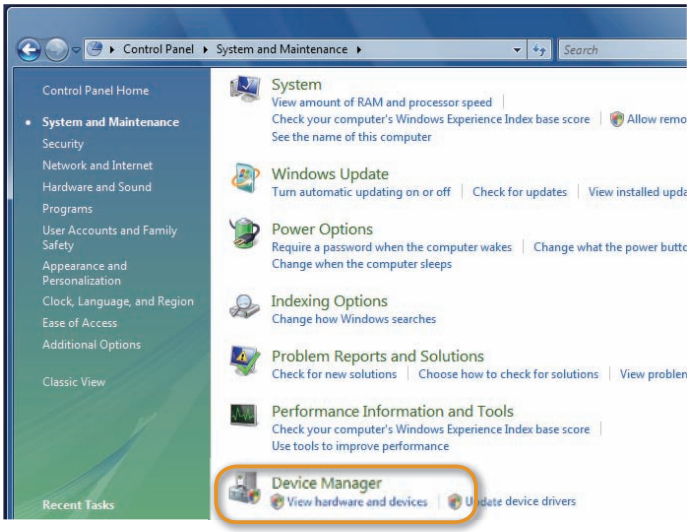
Updating the USB driver



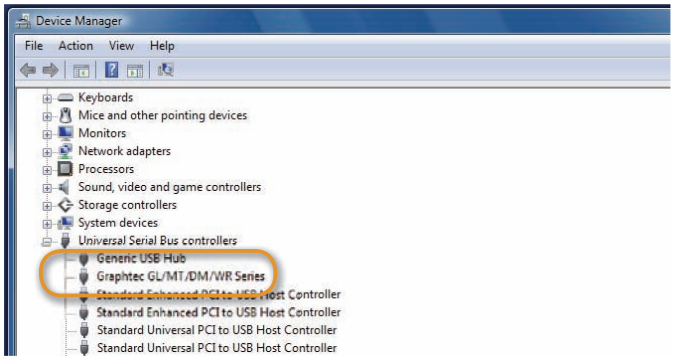

(1) Select "Control Panel" from the "Start Menu".



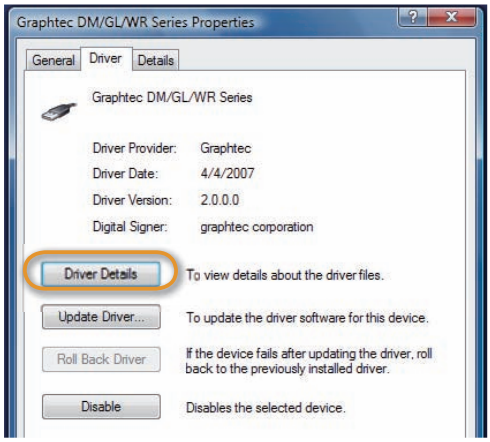

(2) Select "System and Maintenance".




(3) Select "View hardware and devices" from "Device Manager".

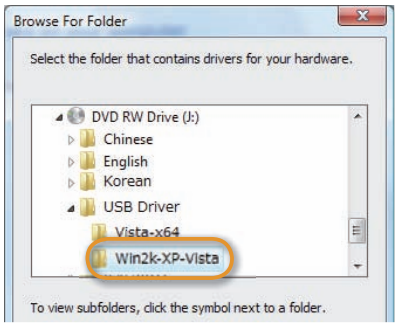



(4) Double-click "Graphtec GL/MT/DM/WR Series".



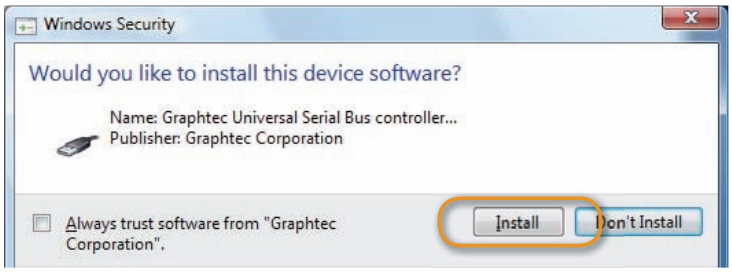

(5) Click the "Driver" tab and select "Update Driver".

(6) Select "Browse my computer for driver software".




(8) In the Browse for folder dialog box, select the following from the drive containing the CD-ROM.
32-bit operating system
: USB Driver → Win2K-XP-Vista
64-bit operating system
: USB Driver → Vista-x64

* For checking the number of bits of Windows Vista, see page 8.




(9) When the following dialog box appears, select "Install".


(10) As the installation is completed after a while, press "Close" to exit.

You have now completed the updating of the USB driver.

## ● Windows XP: Driver software is to be installed for the first time.

Installing the USB driver

1. Detect the hardware: Connect the USB cable to the PC and GL900. The "Found New Hardware" message appears.
2. Start the wizard: In the "Found New Hardware Wizard" window, select "Install from a list or specific location (Advanced)" under "What do you want the wizard to do?" and click "Next".
3. In the "Please choose your search and installation options." window, select "Don't search. I will choose the driver to install." and click "Next".
4. In the "Select the device driver you want to install for this hardware." window, click "Have Disk".
5. In the "Install from Disk" window, browse the CD-ROM under "Copy manufacturer's files from", select "USB DRIVER" → "GTCUSBR.INF" and click "OK".
6. 6. In the "Select the device driver...." window, "Graphtec GL/MT/DM/WR Series USB Driver" appears in the "Model" box. Select it and click "Next".
7. Install the driver: Windows XP starts installing the driver. Depending on the OS settings, error message "The software you are installing for this hardware: GL900 has not passed Windows Logo testing to verify its compatibility with Windows XP." may be displayed. Click the "Continue" button to proceed with the installation.
8. Complete the installation: The "Completing the Found New Hardware Wizard" window appears. Click "Finish" to exit the wizard.

## ● Windows XP: Driver software is already installed.

Updating the USB driver

1. Open "Device Manager": Select "Control Panel" → "System" → "Hardware" tab or right-click "My Computer", select "Properties" → "Hardware" tab → "System Properties" window, then click the "Device Manager" button.
2. In the "Device Manager" window, open "USB (Universal Serial Bus) Controller". Confirm that "Graphtec DM/GL/WR Series USB Driver" is shown. Right-click it and select "Properties".
3. Update the driver: Select the "Driver" tab and click "Update Driver".
4. Start the update wizard: The "Hardware Update Wizard" appears. Select "Install from a list or specific location (Advanced)" under "What do you want the wizard to do?" and click "Next".
5. In the "Please choose your search and installation options." window, select "Don't search. I will choose the driver to install." and click "Next".
6. In the "Select the device driver you want to install for this hardware." window, click "Have Disk".
7. In the "Locate File" window, browse the CD-ROM, select "USB DRIVER" → "GTCUSBR.INF" and click "Open".
8. Return to the "Select the device driver" window and click "Next".
9. Install the driver: Windows XP starts installing the driver. Depending on the OS setting, "The software you are installing for this hardware: GL900 has not passed Windows Logo Testing to verify its compatibility with Windows XP" message may appear. Simply click "Continue Anyway".
10. Complete the installation: The "Completing the Hardware Update Wizard" window appears. Click "Finish" to exit the wizard.

## ● Windows 2000: Driver software is to be installed for the first time.

Installing the USB driver

1. Start the wizard: Connect the USB cable to the PC and the GL900. The "Found New Hardware" wizard appears.
2. In the "Found New Hardware Wizard" window, select "Search for a suitable driver for my device (Recommended)" under "What do you want the wizard to do?" and click "Next".
3. In the "Locate Driver File" window, select "CD-ROM drive" under "Optional search locations" and click "Next".
4. Browse the CD-ROM, select "USB DRIVER" → "Win2K-XP-Vista" → "GTCUSBR.INF" and click "OK".
5. "The wizard found a driver" message appears. Click "Next".
6. Complete the installation: The "Completing Found New Hardware Wizard" window appears. Click "Finish" to exit the wizard.

## ● Windows 2000: Driver software is already installed.

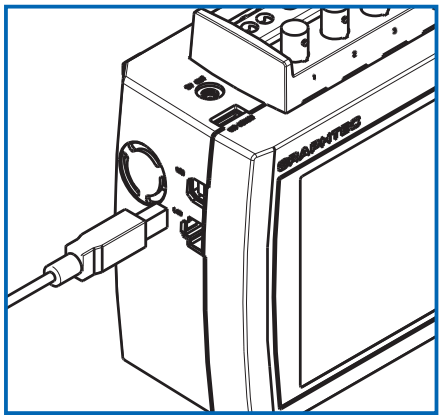
Updating the USB driver

1. Open "Device Manager". Select "Control Panel" → "System" → "Hardware" tab or right-click "My Computer", select "Properties" → "Hardware" tab → "System Properties" window, then click the "Device Manager" button.
2. In the "Device Manager" window, open "USB (Universal Serial Bus) Controller". Confirm that "Graphtec DM/GL/WR Series USB Driver" is shown. Right-click it and select "Properties".
3. Update the driver: Select the "Driver" tab and click "Update Driver".
4. Start the update wizard: "Upgrade Device Driver Wizard" appears. Click "Next".
5. In the "Install Hardware Device Drivers" window, select "Display a list of the known drivers for this device so that I can choose a specific driver." under "What do you want the wizard to do?" and click "Next".
6. In the "Select a Device Driver" window, click "Have Disk".
7. In the "Locate File" window, browse the CD-ROM, select "USB DRIVER" → "Win2K-XP-Vista" → "GTCUSBR.INF" and click "OK".
8. Return to the "Select a Device Driver" window and click "Next".
9. In the "Start Device Driver Installation" window, click "Next".
10. Complete the installation: The "Completing the Upgrade Device Driver Wizard" window appears. Click "Finish" to exit the wizard.

# 4. Connecting to a PC (Personal Computer)

## Connecting via USB

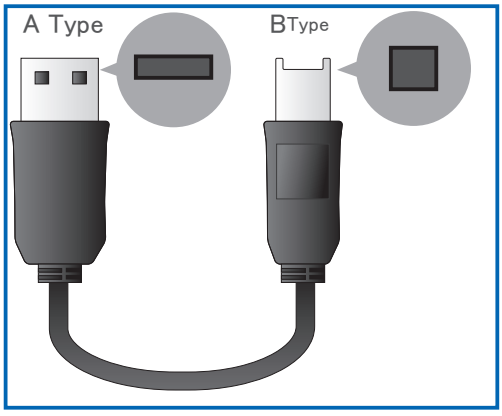
The GL900 is connected to a PC via a USB cable.



CHECKPOINT

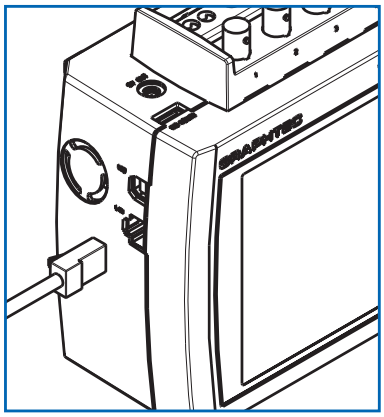
- When using a USB cable, a USB driver must be installed in the PC.
  Please see "Installing the USB Driver" for the installation procedure.
  LAN connector. Make sure the cable is inserted into the correct connector.
- To take full advantage of the software, use a PC with a USB2.0 port.
  You cannot take full advantage of the software when using a PC with a USB1.1 port.

Use an A-B type USB cable to connect the GL900 to a PC.



## Connecting via LAN

It can also be connected via a LAN cable.



CHECKPOINT

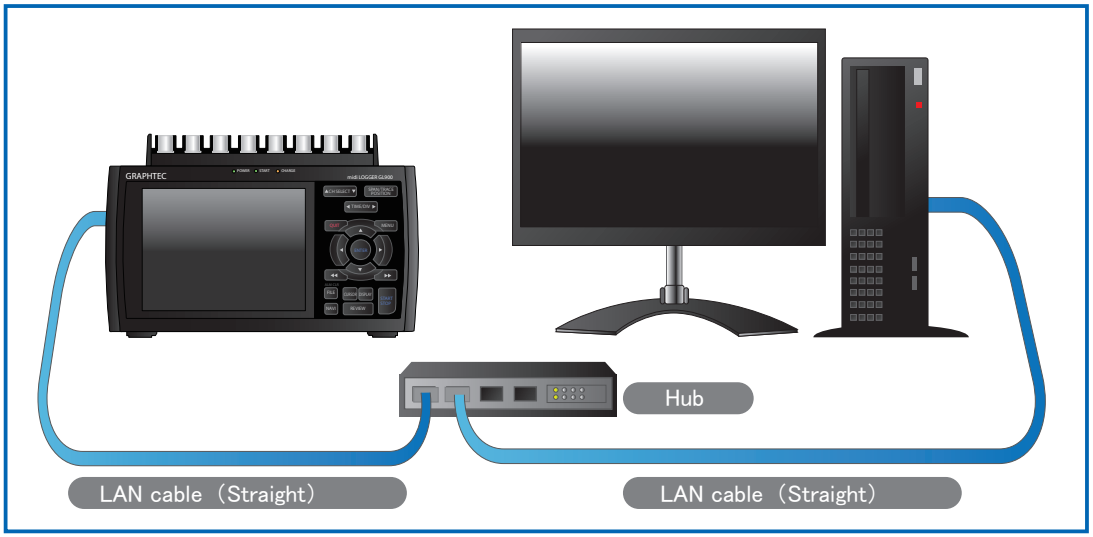
- You cannot take full advantage of the software when using a TCP-IP. Use a USB connection (USB2.0 port).

Depending on your usage, use one of the following types of LAN cables.

lLAN Cable Types

Use a crossing cable when connecting directly to a PC, without using a hub.


Use a straight cable to connect to a PC through a hub.

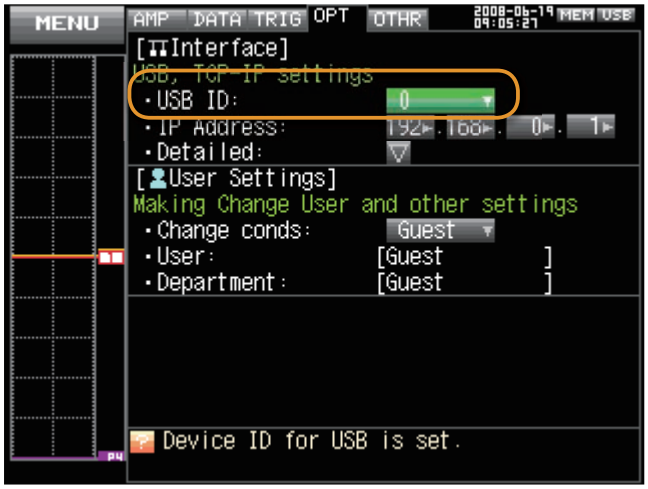


## Setting IP Address or USB ID

To connect to a PC, configure the device's interface settings.

### USB Settings

Press the "MENU" key five times to open "OPT Settings".
Configure "USB ID Settings".
Power off and restart to make the settings take effect.




### TCP-IP Settings

Press the "MENU" key four times to open "OPT Settings".
Configure "Detailed".
Set "IP Address", "Subnet Mask", "Port Number", and "DNS Address". Then power off and restart to make the settings take effect.

## Example of TCP-IP Settings

Connecting one PC and one GL900
Refer to the following settings if you are not connecting to a corporate LAN or other networks.
Connect GL900 to a PC with a crossover cable.

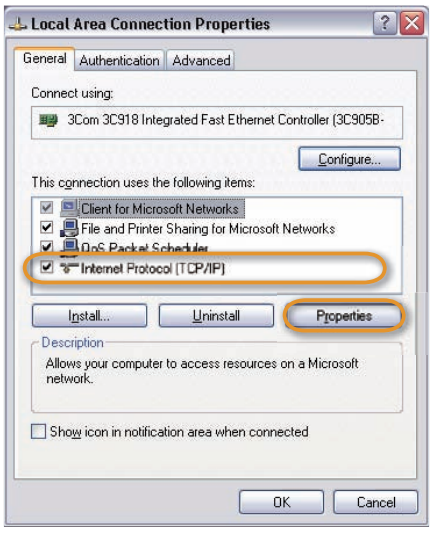
| | |
|---|---|
| PC's IP Address | 192.168.1.1 |
| GL900's IP Address | 192.168.1.2 |

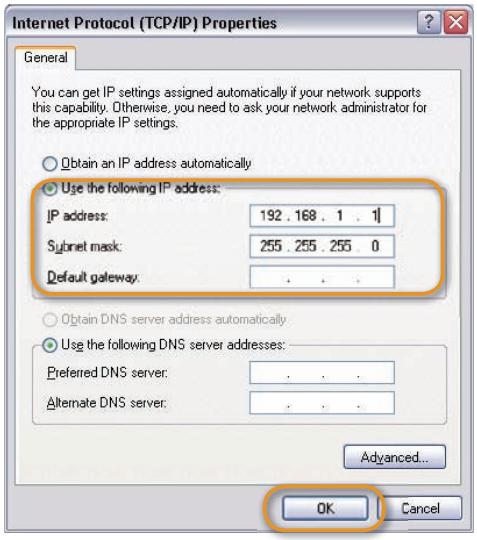
CHECKPOINT

- In this case, always set the subnet mask to "255.255.255.0".
  In this case, always set the port number to "8023"

## Setting PC's IP Address (Windows XP)

Select "Start" button → "Control Panel" → "Network Connections" → "Local Area Connection" → "Properties" → "Internet Protocol (TCP/IP)" → "Properties", click to select "Use the following IP address"check box, set "IP address" and "Subnet mask", and then click "OK".



# 5. Installing the GL900 Application Software

This chapter describes how to install the application software.

1. Insert the User's Guide CD-ROM provided into the PC's CD-ROM drive.
2. Click the Taskbar's Start button, and then click the Run... icon to open the "Run" window.
3. Enter the CD-ROM drive name and ¥English¥GL900-APS¥Setup.exe as the name of the file you wish to open. If the disk is in drive D, for example, enter "D¥English¥GL900-APS¥Setup.exe" in the box and then click "OK" to launch the installer.
4. Follow the instructions on the screen to continue with the installation.
5. When a message to restart your PC appears after the installation, be sure to restart it and then start this software.

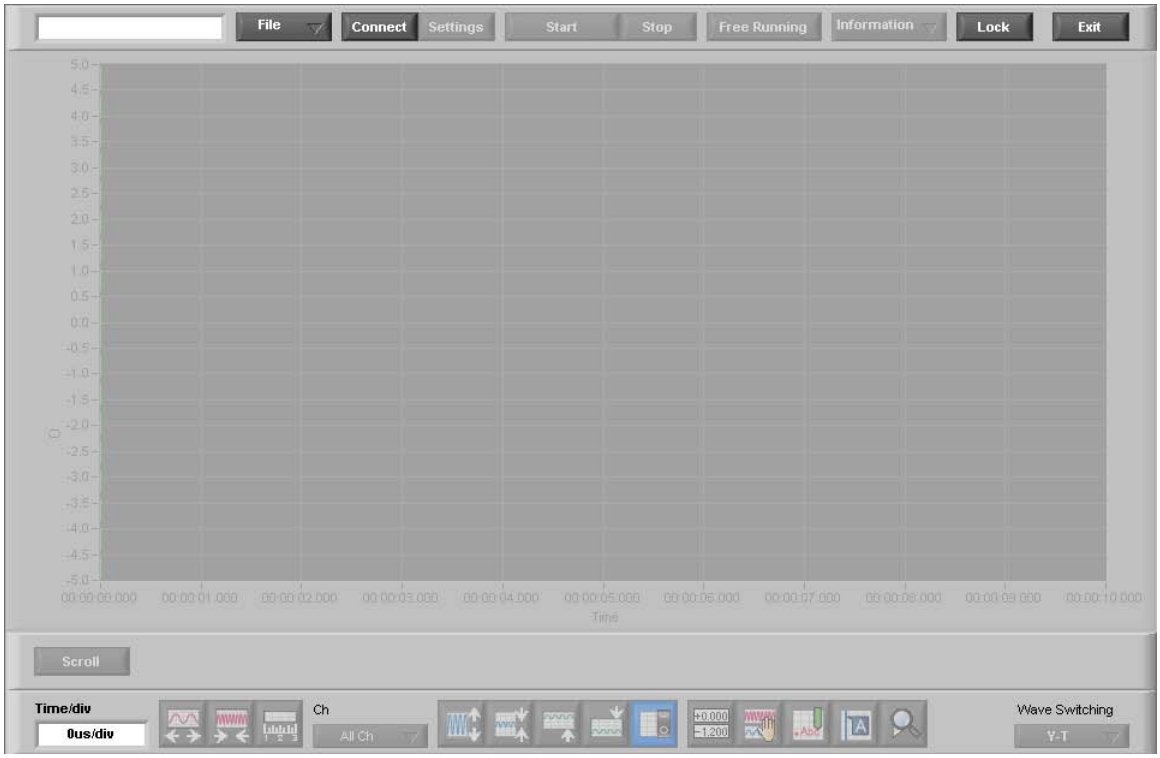
CHECKPOINT

Be sure to observe the following points when connecting the GL900 to a PC.

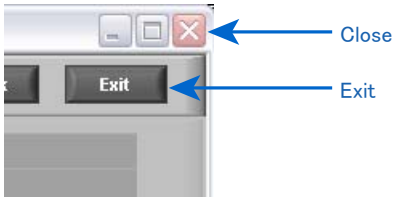
- Do not connect any devices apart from a mouse or a keyboard to any of the other USB terminals on your PC.
- Set the PC's power-saving functions to Off.
- Set the Screen Saver to Off.
- Set the anti-virus software auto update and scan scheduler functions to Off. Also, set the Windows auto update and scheduler functions to Off.

# 6. Launching and Exiting the Software

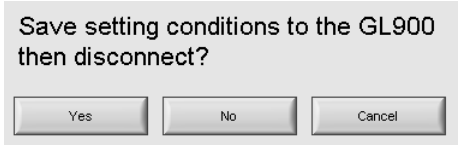
Click the Taskbar's "Start" button → "Programs" → "GL900APS" → "GL900APS" to launch the application software. Once the program has started up, the following screen is displayed.




To exit the software, click the "End" button in the upper right corner of the main screen, or click the "Close" button to close the window.




When you try to exit the software in the connected status, a message appears to confirm if the setting conditions are saved to the device.




| Operation | Description |
|---|---|
| Yes | Click this button to save the setting conditions on this software in the GL900 device and exit. Next time connecting to the device, the last setting conditions are reflected. |
| No | Click this button to exit without saving the setting conditions on this software in the GL900 device. After the power is turned on, the setting conditions on GL900 device returns to the state before connecting to the software. |
| Cancel | This software is not disconnected and it remains active. |

# 7. Basic Operating Procedure

The basic operating procedure of this software consists of the following four operations:

| Operation | Description |
|---|---|
| Controlling the GL900 Device | When the GL900 is connected to a PC via a USB/LAN cable, it can be controlled using this software. The setting conditions can be saved as a configuration file in a PC. This file can be read to reflect the setting conditions. |
| Checking Input Data | When the GL900 is connected to a PC, signals input in the GL900 can be viewed in a graph on this software. They can be also checked in Zoom and FFT formats which are not provided with the GL900. |
| Data Capture | When the GL900 is connected to a PC, data can be exported to a PC and saved. Data can be also saved in the GL900. Either of the saved data can be used as a backup. |
| Replaying Captured Data | Data files captured and saved in a PC can be replayed. When the GL900 is connected to a PC, data saved in the GL900 can be also replayed. You can clip the desired parts from the replayed data or convert it to a different file format and save it. |

## Controlling the GL900 Device

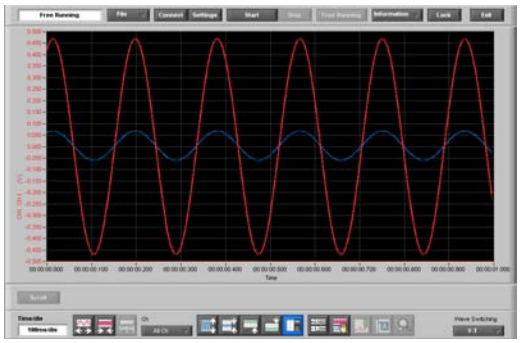
This software can perform the following operations:

- Start/Stop Data Capture
- AMP Settings (Input, Range, Filter, etc.)
- Data Capture Settings (Sampling Interval, Device Data Capture Destination, Data Points, etc.)
- Timer, Trigger Settings (Timer Settings, Trigger Settings, Alarm Settings, etc.)
- Other Settings (Temperature Unit, Factory Default Settings, etc.)

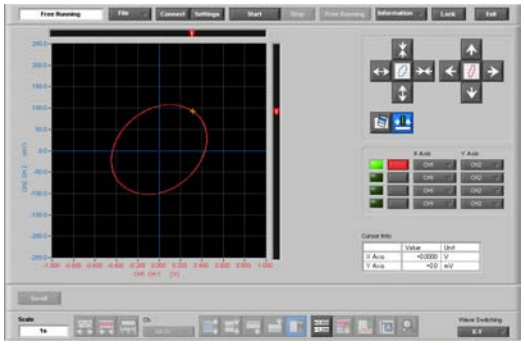
## Checking Input Data

Data can be checked in the following formats on this software:

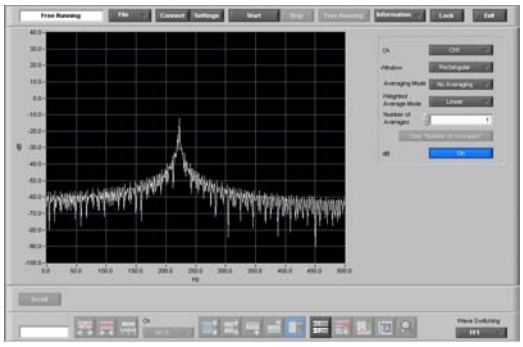
• Y-T Waveform Display



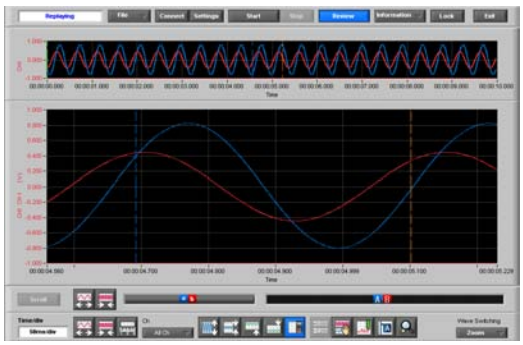
• X-Y Display



• FFT Display



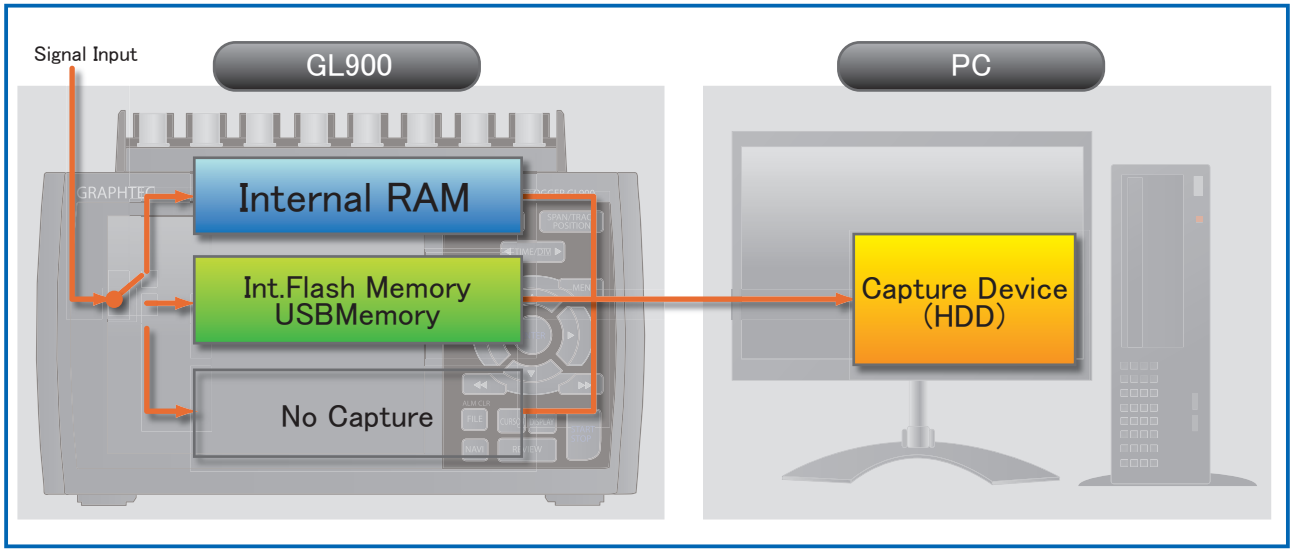
• Zoom (only during data replay) Display



# Data Capture

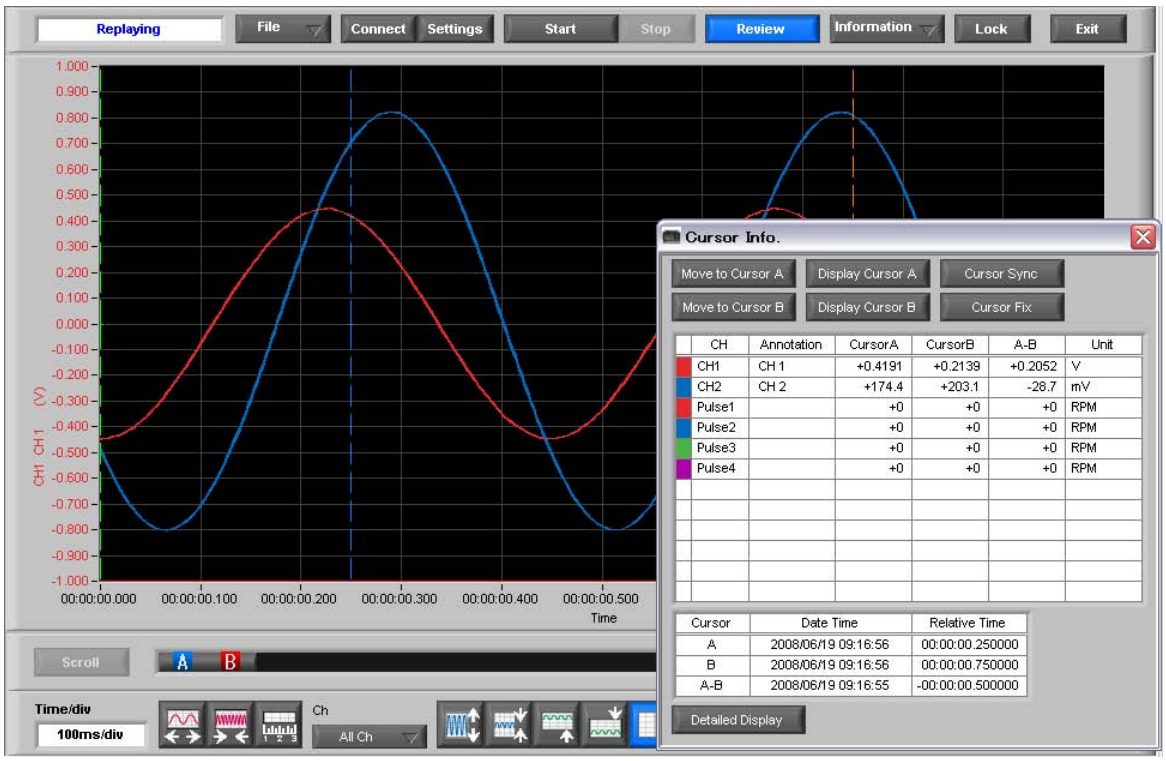
You can select the data capture method on this software depending on the setting of the device data capture destination.

| | Internal RAM | Internal Flash Memory/USB Memory | No Capture |
|---|---|---|---|
| Sampling Interval | 10µs or above | 1ms or above<br>(* When the capture format is a CSV, set to 10ms above) | 1ms or above |
| Allowable Capture Capacity | Up to 64MB (one million data points) | Internal flash memory: Up to 256MB<br>USB memory: depending on its capacity (* up to 2GB for one file) | Depending on your PC's capture device (* up to 2GB for one file) |
| Save to the Device | The captured data will be lost when the power is turned off. When the next data capture starts, data will be overwritten. | The captured data will be saved in a file. The data will be retained even after the power is turned off or during the next data capture starts. | No data is saved. |
| Features | Data can be captured at the fastest sampling interval 10µs. The pre trigger function can be used only when the internal RAM is used. | Data can be directly captured to a PC and to the device concurrently. When there is no limitation such as a timer stop or a trigger stop, data capture will stop at the time 2GB of data is captured to the internal flash memory or USB memory, or at the time they become full. | Data is directly captured to a PC only, not to the GL900. Long-time data capture can be done, because it does not stop due to the GL900 device capacity. |



# Replaying Captured Data

Data captured to a PC and to the GL900 can be also replayed in binary files (*.GBD) and text files (*.CSV) captured in this software.
During data replay, cursor information can be displayed to check the level values and time for the cursor or to search the location above the specified level.
The specified interval can be viewed for the specified range in X-Y or FFT format.



# 8. PC Connection Settings

Configure the communication settings between GL900 and a PC.


1. 1.Click the "Connect" button on the main menu to display the Connect screen.
2. 2.Select the interface to connect.
3. 3Enter "Device Name", "IP Address", "Port Number", and "USB ID", and then click "OK".
4. 4.Click the "Connect" button to perform the connection to enable communication between the devices.
5. 5.Click the "Close" button to close the Connect screen.

CHECKPOINT

To connect the GL900 to a PC, check to see if the device is in the free running status.

CHECKPOINT

When they are connected, the software works with the setting conditions read from the GL900.
When you want to use the PC's settings, press the "Read Setting Conditions" button to read the saved configuration file. To do this, you should save the setting conditions.

HINT

The demo mode works as if the PC is connected to the device.
In this mode, the waveforms are repeatedly viewed by reading a "Data.demo" file in the "DemoFile" folder of the installation folder.
This file can be replaced with GBD data captured in this software. To do this, you must rename the file as "Data.demo" and overwrite it in the same location.

# 9. Display Screens

This chapter describes the various screens used in this software.

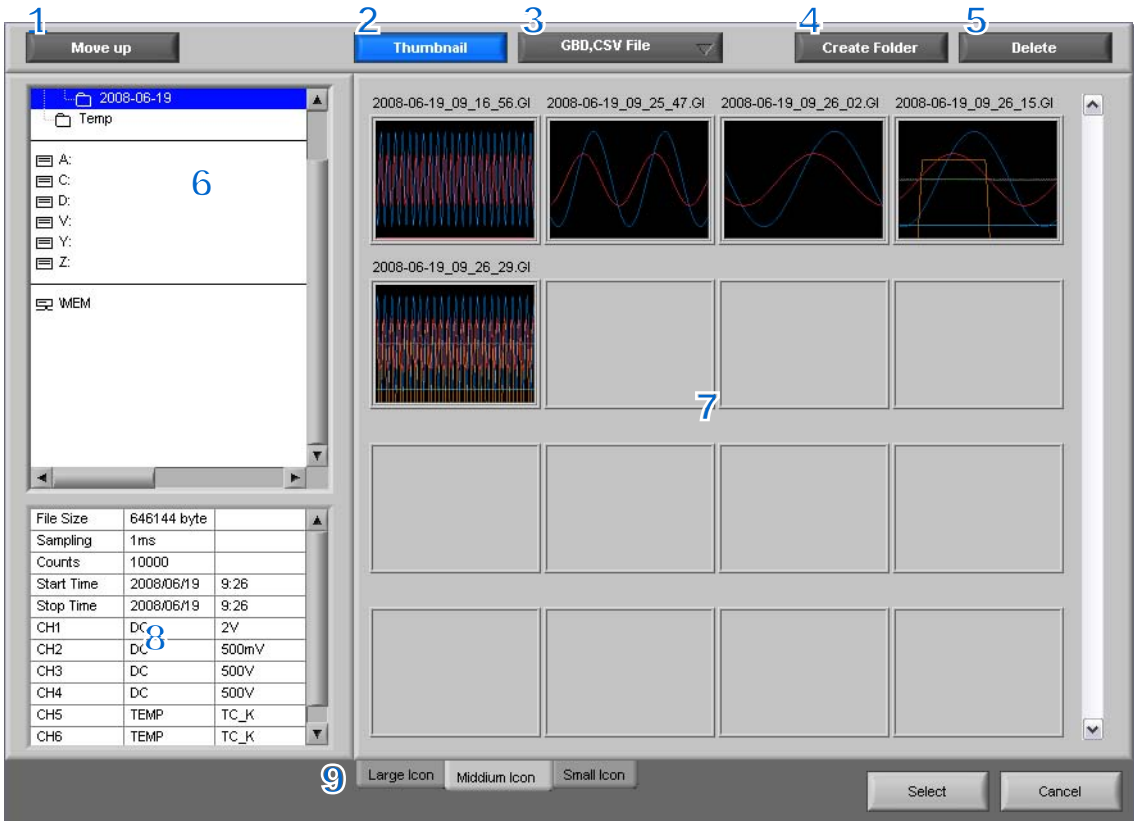
## Y-T (Main Screen)


| No. | Name | Description |
|---|---|---|
| 1 | Status | The status of a PC and the device is displayed here. |
| 2 | File | Operations related to files are performed.<br>Open: Click this button to open the screen for opening files captured to a PC or to the device.<br>Convert then Save: Click this button to convert data being replayed into GBD or CSV files and save them. Data cannot be saved during Free Running.<br>CSV file batch conversion: Click this button to convert GBD data captured to a PC into CSV files in a batch.<br>Print Screen: Click this button to print out a copy of the displayed screen. Printing is performed at the printer that has been selected as the default printer. If you change the printer, set the printer and then restart the software.<br>Save Screen: Click this button to save the displayed screen as a BMP file. |
| 3 | Connect | Click this button to open the screen to connect to the device. |
| 4 | Settings | Click this button to open the screen to make settings to the device. |
| 5 | Start | Click this button to start data capture. |
| 6 | Stop | Click this button to stop data capture. |
| 7 | Free Running/Replay | Click this button to switch between Free Running and Replay.<br>You can switch to Replay after data is captured at least once or when files in a PC or the device are replayed. |

<table>
<tr><th>No.</th><th>Name</th><th>Description</th></tr>
<tr><td>8</td><td>Information</td><td>Various types of information can be viewed and edited.
<table>
<tr><td>Capture Info.</td><td>Capture start time, timer start time and capture time during data capture are displayed here. The status of data capture is also displayed in the status bar.</td></tr>
<tr><td>Trigger Info.</td><td>The status of trigger settings is displayed here.</td></tr>
<tr><td>Alarm Info.</td><td>The status of alarm settings is displayed here. If "Alarm Hold" has been selected, the alarm can be cleared by clicking the "Clear" button.</td></tr>
</table></td></tr>
<tr><td>9</td><td>Lock</td><td>Click this button to set the password to protect the software.</td></tr>
<tr><td>10</td><td>Exit</td><td>Click this button to exit this software.</td></tr>
<tr><td>11</td><td>Waveforms Area</td><td>The waveforms of each status are displayed here.</td></tr>
<tr><td>12</td><td>Scroll</td><td>Click this button to scroll the waveforms during data capture to display the newest waveforms, or select Scroll Off to switch to data that was captured in the past.</td></tr>
<tr><td>13</td><td>Operation Icons</td><td>Click these buttons to perform each operation to display waveforms.</td></tr>
<tr><td>14</td><td>Wave Switching</td><td>Click this button to switch among waveform displays.
<table>
<tr><td>Y-T</td><td>Time is displayed in the X axis, and the input level is displayed in the Y axis.</td></tr>
<tr><td>X-Y</td><td>The input level for the desired channel can be displayed in the X and Y axes.</td></tr>
<tr><td>FFT</td><td>The waveforms are displayed in the Fast Fourier Transform. The power spectrum is used in this software.</td></tr>
<tr><td>Zoom</td><td>The waveforms are displayed in the two graphs indicating the whole and the details.</td></tr>
</table></td></tr>
</table>

## Open

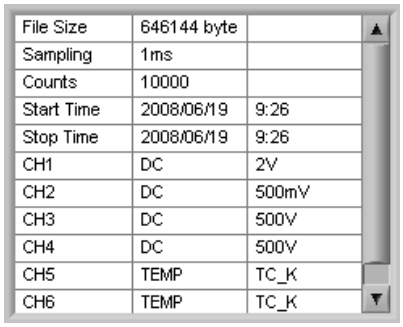
This function is used to open the screen to select files captured to a PC or files in the device when connecting to it.




| No. | Name | Description |
|---|---|---|
| 1 | Move up | Click this button to move up a hierarchy where a file is displayed. |
| 2 | Thumbnail | The waveforms captured in binary or text files are displayed as thumbnails. Data in the device can be also displayed as thumbnails, which takes some time to read the data. |
| 3 | Filter | Click this button to select a format to display a file.<br>Select All: All files are displayed.<br>GBD, CSV File: Binary files (GBD) and text files (CSV) are displayed.<br>GBD File: Only binary files (GBD) are displayed.<br>CSV File: Only text files (CSV) are displayed. |
| 4 | Create Folder | Click this button to create a new folder in the currently displayed hierarchy. |
| 5 | Delete | Click this button to delete the selected files/folders. |
| 6 | File Tree | The hierarchies of the device are displayed in a tree format.<br>The top "GL900" is the default location to save files in this application.<br>This is the GL900APS folder in the user document folder. |
| 7 | Display Files | Files/folders in the current hierarchy are displayed. |
| 8 | File Information | When you put your mouse pointer over binary or text data in the current hierarchy, file information is displayed. |
| 9 | Switch Icon Size | Click these tabs to switch the icon size to display files. |

## File Information

File information is displayed when you put your mouse pointer on binary data (GBD) or text data (CSV) in which a file is displayed.

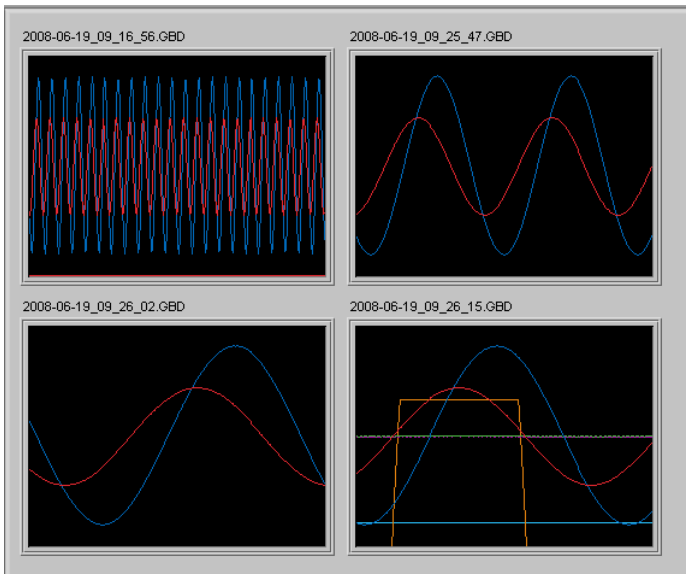


| | | |
|---|---|---|
| File Size | 646144 byte | |
| Sampling | 1ms | |
| Counts | 10000 | |
| Start Time | 2008/06/19 | 9:26 |
| Stop Time | 2008/06/19 | 9:26 |
| CH1 | DC | 2V |
| CH2 | DC | 500mV |
| CH3 | DC | 500V |
| CH4 | DC | 500V |
| CH5 | TEMP | TC_K |
| CH6 | TEMP | TC_K |

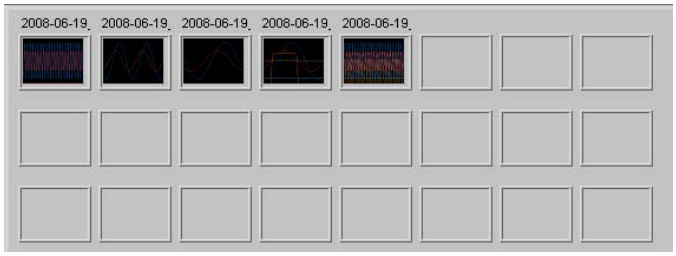
## Switch Icon Size

You can switch the icon size tabs to change the size of file display.

Large Icon

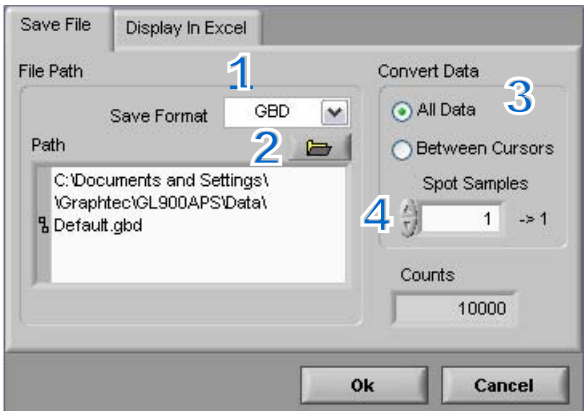



Small Icon



## Convert then Save

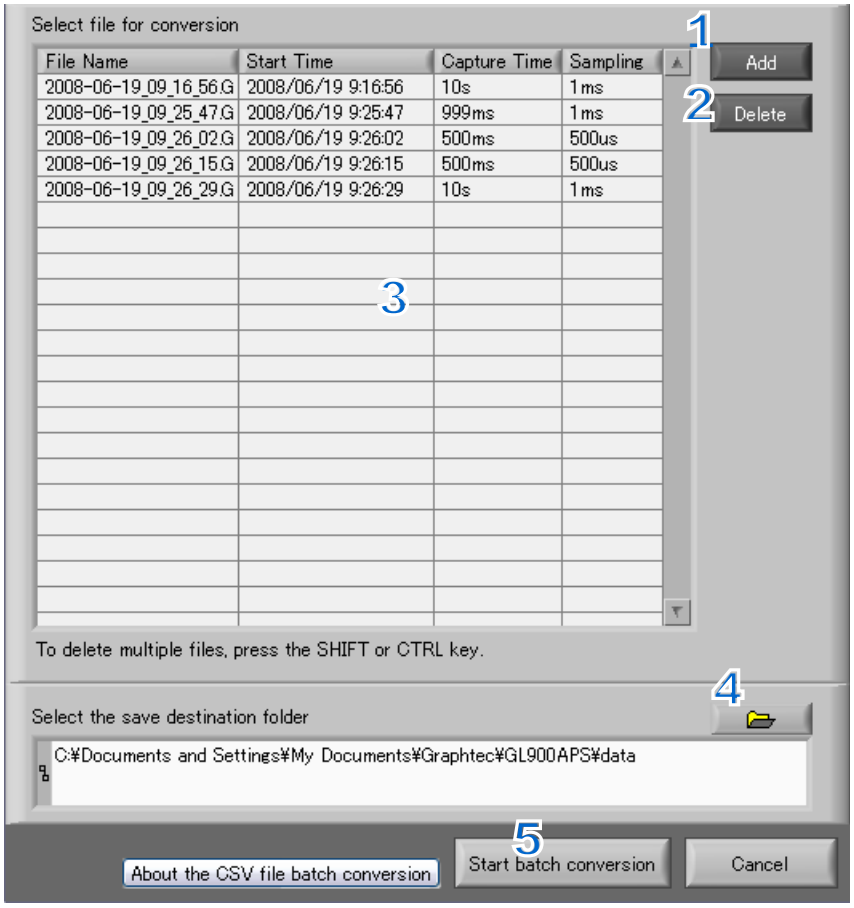
This function is used to convert and save the data being replayed or to display it in Excel format.




| No. | Name | Description |
|---|---|---|
| 1 | Save Format | Select a format to convert and save data.<br>(GBD: binary data/CSV: text data) |
| 2 | Path | Select a location to which you want to save data. |
| 3 | Select data to be converted | Select the range of data to be converted.<br>All Data: All of the data being replayed is saved.<br>Between Cursors: Data between cursors A and B is saved. |
| 4 | Spot Samples | Spot samples are extracted when saving data.<br>Ex) 1 → 1: Spot samples are not extracted.<br>Ex) 2 → 1: One of two data points is extracted. |

## CSV file batch conversion

This function is used to convert multiple binary files (GBD) in a batch to text files (CSV).

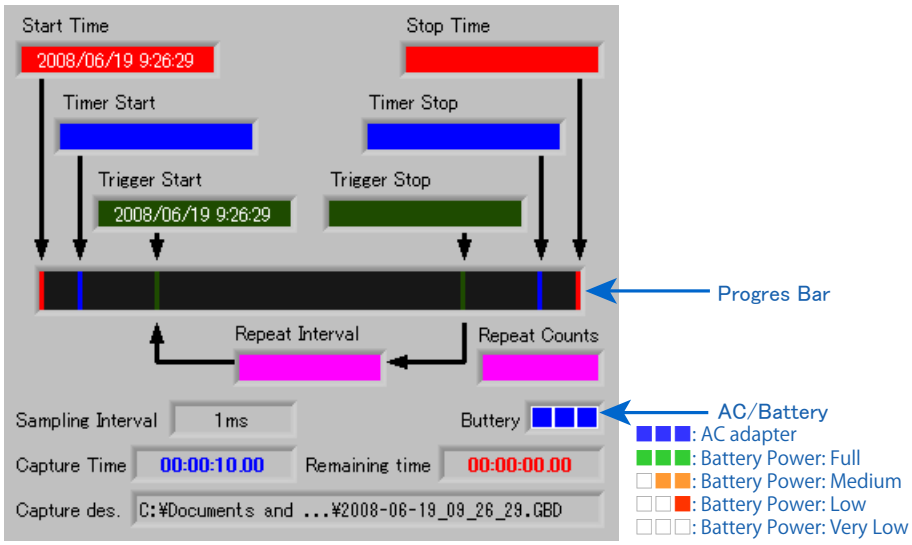



| No. | Name | Description |
|---|---|---|
| 1 | Add | Click this button to add a file to the batch to be converted. |
| 2 | Delete | Click this button to remove a file from the batch to be converted. |
| 3 | List of converted files | The batch-converted files are displayed in a list. |
| 4 | Save destination folder | Select the save destination folder for the batch-converted files here. |
| 5 | Start batch conversion | Click this button to start batch file conversion. |

## Information

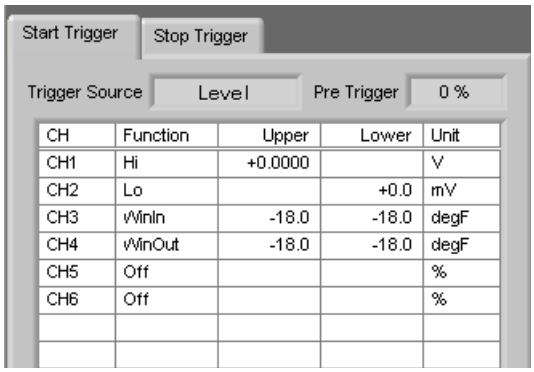
### Capture Info.

Information about time and settings during data capture can be viewed.
The status of data capture can be checked in the status bar.
While connecting to the device, the remaining device battery capacity can be also checked.




### Trigger Info.

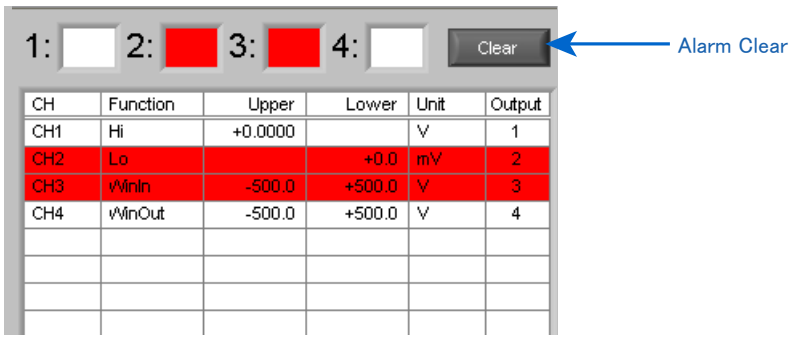
The configured trigger information can be checked.




| CH | Function | Upper | Lower | Unit |
|---|---|---|---|---|
| CH1 | Hi | +0.0000 | | V |
| CH2 | Lo | | +0.0 | mV |
| CH3 | WinIn | -18.0 | -18.0 | degF |
| CH4 | WinOut | -18.0 | -18.0 | degF |
| CH5 | Off | | | % |
| CH6 | Off | | | % |

### Alarm Info.

The configured alarm information can be checked.
The channels for which an alarm has been generated are shown in red.
If "Alarm Hold" has been selected, the alarm can be cleared by clicking the "Clear" button.




| CH | Function | Upper | Lower | Unit | Output |
|---|---|---|---|---|---|
| CH1 | Hi | +0.0000 | | V | 1 |
| CH2 | Lo | | +0.0 | mV | 2 |
| CH3 | WinIn | -500.0 | +500.0 | V | 3 |
| CH4 | WinOut | -500.0 | +500.0 | V | 4 |

## Operation Icons

You can use this software intuitively with the operation icons in the Y-T format (main screen).
Each icon operates as follows:


| No. | Name | Description |
|---|---|---|
| 1 | Display Time/Div | Time/Div of the displayed graph is displayed here. Time/Div is a time scale in the X axis. |
| 2 | Expand/Shrink Time/ Div | Click these icons to expand/shrink the time scale in the time (X) axis. |
| 3 | Switch Scale | Click this icon to switch between a relative time and an absolute time.<br>Relative Time: The time from the start is displayed. It is fixed in the Free Running status.<br>Absolute Time: An absolute time (date and time) is displayed. This function does not exist in the Free Running status. |
| 4 | Ch | Click this icon to set the channel for the operations related to the Y axis. When "All Ch" is selected, operations can be performed for all channels. |
| 5 | Expand/Shrink Y axis span | Click this icon to expand/shrink the Y axis for the selected channel. |
| 6 | Move Y axis position | Click this icon to move up and move down the Y axis position for the selected channel. |
| 7 | Trace | Click this icon to switch between On/Off for waveform displays in a graph. Even if Off is selected, it does not affect the captured data. |
| 8 | Digital | Click this icon to open the screen to display the digital values for each input channel. |
| 9 | Wave Edit | Click this icon to open the screen to edit graph waveforms. |
| 10 | Comment | Click this icon to enable a comment to be input at the position above Cursor A and the desired channel waveform during replaying files saved to a PC. The input comment will be also displayed next time the file is open. Comment information is saved as a "*cfg" file with the same name as the data file in the location where the captured data is saved. When this file is deleted, the information will be lost. |
| 11 | Cursor Info. | During replay, click this icon to open the screen to display the cursors A and B digital values, time between the two cursors, and statistical calculation of the data between the two cursors. |
| 12 | Move/Search | During replay, click this icon to open the screen to move to the desired time or points and to search at any level. |

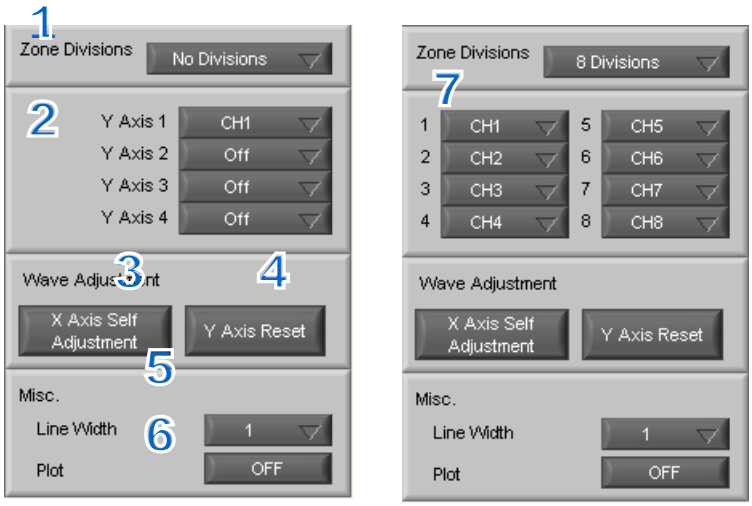
## Digital

The input level values can be checked in the free running status.

| | CH | Annotation | Level | Unit |
|---|---|---|---|---|
| | CH1 | CH 1 | -0.2414 | V |
| | CH2 | CH 2 | +70.0 | mV |
| | CH3 | CH 3 | -0.2 | V |
| | CH4 | CH 4 | -0.1 | V |
| | CH5 | CH 5 | -0.5 | V |
| | CH6 | CH 6 | -0.6 | V |
| | CH7 | CH 7 | -17.0 | % |
| | CH8 | CH 8 | -24.3 | % |

## Wave Edit

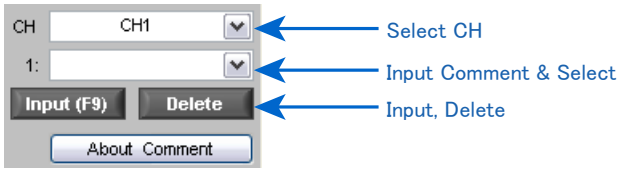
Various types of waveform operations can be performed.




| No. | Name | Description |
|---|---|---|
| 1 | Zone Divisions | Divide the Y-T waveform graph into the upper side and the lower side. (No Divisions/2 Divisions/4 Divisions/8 Divisions) |
| 2 | Y Axis Range | When "Zone Divisions" is set to "No Divisions", up to four Y axis ranges can be displayed. |
| 3 | X Axis Self Adjustment | Click this button to automatically adjust the X axis display width according to the current waveforms. |
| 4 | Y Axis Reset | Click this button to revert the values set in the Y axis span and position to the default values. The default values are the same values as those of when switching the ranges. |
| 5 | Line Width | Change the line width of the waveforms. (1/2/3/4/) |
| 6 | Plot | Click this button to display plot marks at the actual sample points on the waveforms. |
| 7 | Y Axis Range 2 | When "Zone Divisions" is set to other than "No Divisions", one Y axis range can be assigned to each division display. |

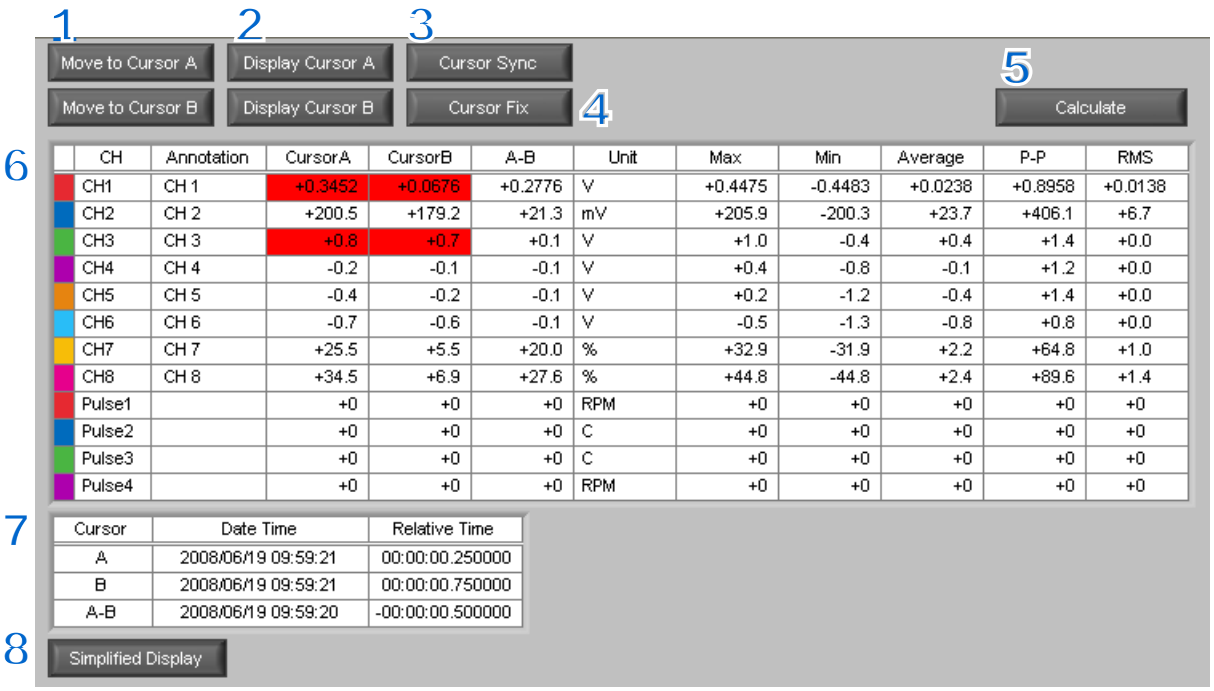
## Comment

During replay, a comment can be input above the waveform.
The comment is input at the position above Cursor A and above the channel that is selected in the Input CH Selection.
Up to 20 comments can be selected and input from the Comment Input/Selection.
To input comments, select any number from the Comment Input/Selection, input the string, and then press the "Input" button.
To delete them, select the number which you want to delete from the Comment Input/Selection, and then press the "Delete" button.
You can also drug the input comment to move its position.




## Cursor Info.

During replay, you can check the level values or time for cursors A and B and calculated values between the two cursors.



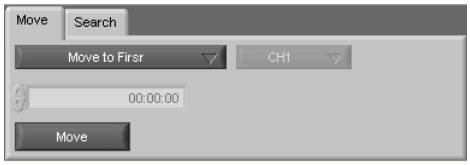

| CH | Annotation | CursorA | CursorB | A-B | Unit | Max | Min | Average | P-P | RMS |
|---|---|---|---|---|---|---|---|---|---|---|
| CH1 | CH 1 | +0.3452 | +0.0676 | +0.2776 | V | +0.4475 | -0.4483 | +0.0238 | +0.8958 | +0.0138 |
| CH2 | CH 2 | +200.5 | +179.2 | +21.3 | mV | +205.9 | -200.3 | +23.7 | +406.1 | +6.7 |
| CH3 | CH 3 | +0.8 | +0.7 | +0.1 | V | +1.0 | -0.4 | +0.4 | +1.4 | +0.0 |
| CH4 | CH 4 | -0.2 | -0.1 | -0.1 | V | +0.4 | -0.8 | -0.1 | +1.2 | +0.0 |
| CH5 | CH 5 | -0.4 | -0.2 | -0.1 | V | +0.2 | -1.2 | -0.4 | +1.4 | +0.0 |
| CH6 | CH 6 | -0.7 | -0.6 | -0.1 | V | -0.5 | -1.3 | -0.8 | +0.8 | +0.0 |
| CH7 | CH 7 | +25.5 | +5.5 | +20.0 | % | +32.9 | -31.9 | +2.2 | +64.8 | +1.0 |
| CH8 | CH 8 | +34.5 | +6.9 | +27.6 | % | +44.8 | -44.8 | +2.4 | +89.6 | +1.4 |
| Pulse1 | | +0 | +0 | +0 | RPM | +0 | +0 | +0 | +0 | +0 |
| Pulse2 | | +0 | +0 | +0 | C | +0 | +0 | +0 | +0 | +0 |
| Pulse3 | | +0 | +0 | +0 | C | +0 | +0 | +0 | +0 | +0 |
| Pulse4 | | +0 | +0 | +0 | RPM | +0 | +0 | +0 | +0 | +0 |

| Cursor | Date Time | Relative Time |
|---|---|---|
| A | 2008/06/19 09:59:21 | 00:00:00.250000 |
| B | 2008/06/19 09:59:21 | 00:00:00.750000 |
| A-B | 2008/06/19 09:59:20 | -00:00:00.500000 |

| No. | Name | Description |
|---|---|---|
| 1 | Move to Cursor A<br>Move to Cursor B | Click these buttons to move the position to display a waveform to cursor A or cursor B. |
| 2 | Display Cursor A<br>Display Cursor B | Click these buttons to move cursor A or cursor B to the waveform display area. |
| 3 | Curcor Sync | Click this button to move cursors A and B concurrently while they are kept distance. |
| 4 | Cursor Fix | Click this button to keep distance between cursors A and B and the relative position on the screen. |
| 5 | Calculate | Click this button to calculate each channel for data between cursors A and B. |
| 6 | Table | The level values for cursors, a level difference between cursors A and B, and calculation results are displayed here. |
| 7 | Cursor Time | The cursor A and B times and a time lag between the two cursors are displayed here. |
| 8 | Switch Display | Click this button to switch between the simplified display and the detailed display. When the simplified display is selected, the calculation area is closed to make the window size smaller. |

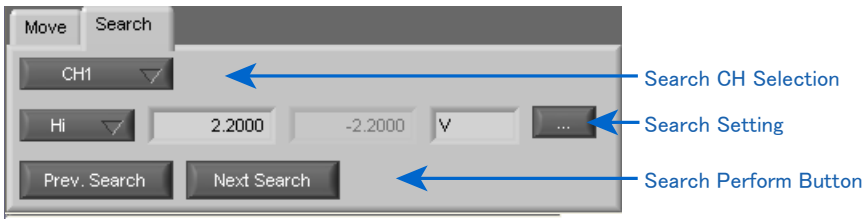
## Move Search

During replay, cursor A and the waveforms can be moved to the desired position.
You select how to move them and perform the operation with the "Move" button.



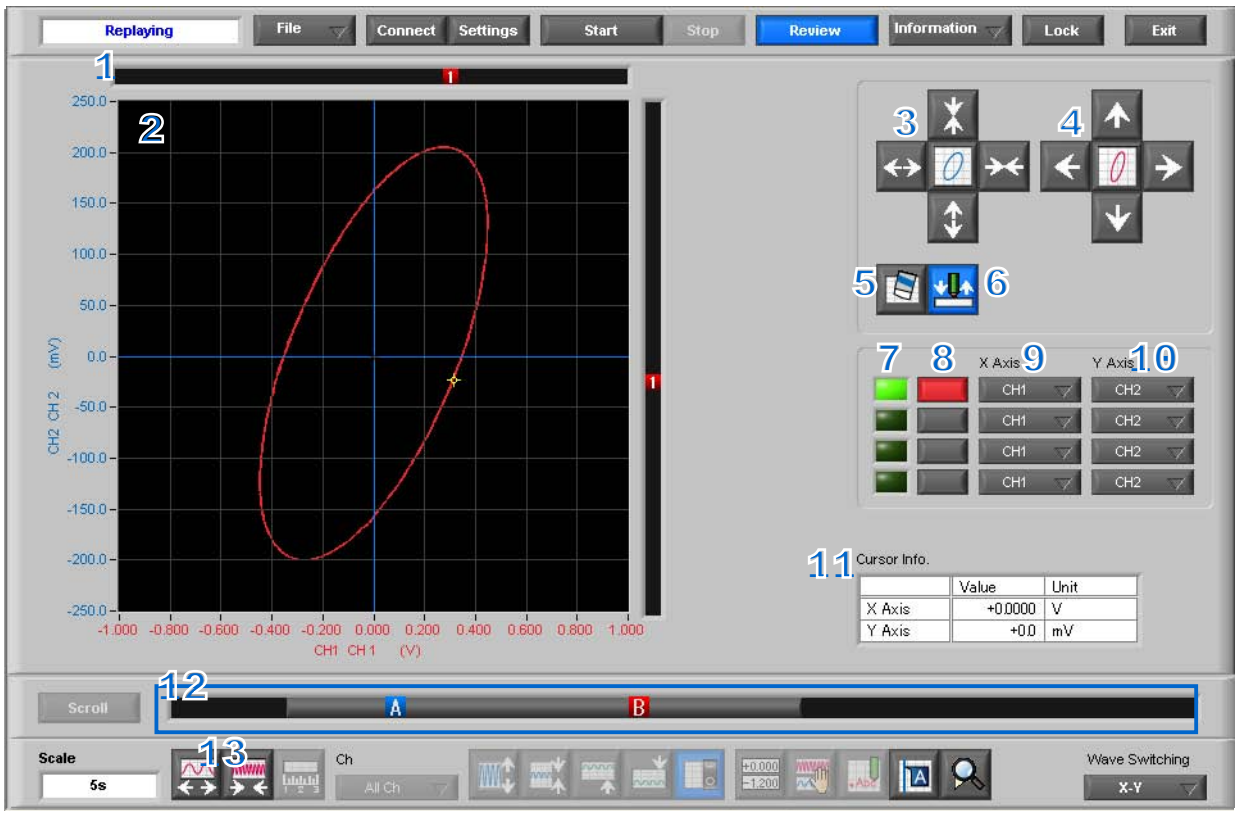

| | |
|---|---|
| Move to First | Move to the start of the data. |
| Move to Last | Move to the end of the data. |
| Move to Trigger Point | Move to a data point where a trigger is generated. |
| Move to Max | Move to a position of max data for any channel. |
| Move to Min | Move to a position of min data for any channel. |
| Move to Specified Point | Move to a specified point from the start. |
| Move to Elapsed Time | Move to an elapsed time from the start. |
| Move to Specified Time | Move to a specified time. |

During replay, search the level value for the desired channel and move to the resulting position.
Search is performed by edge detection.



## X-Y

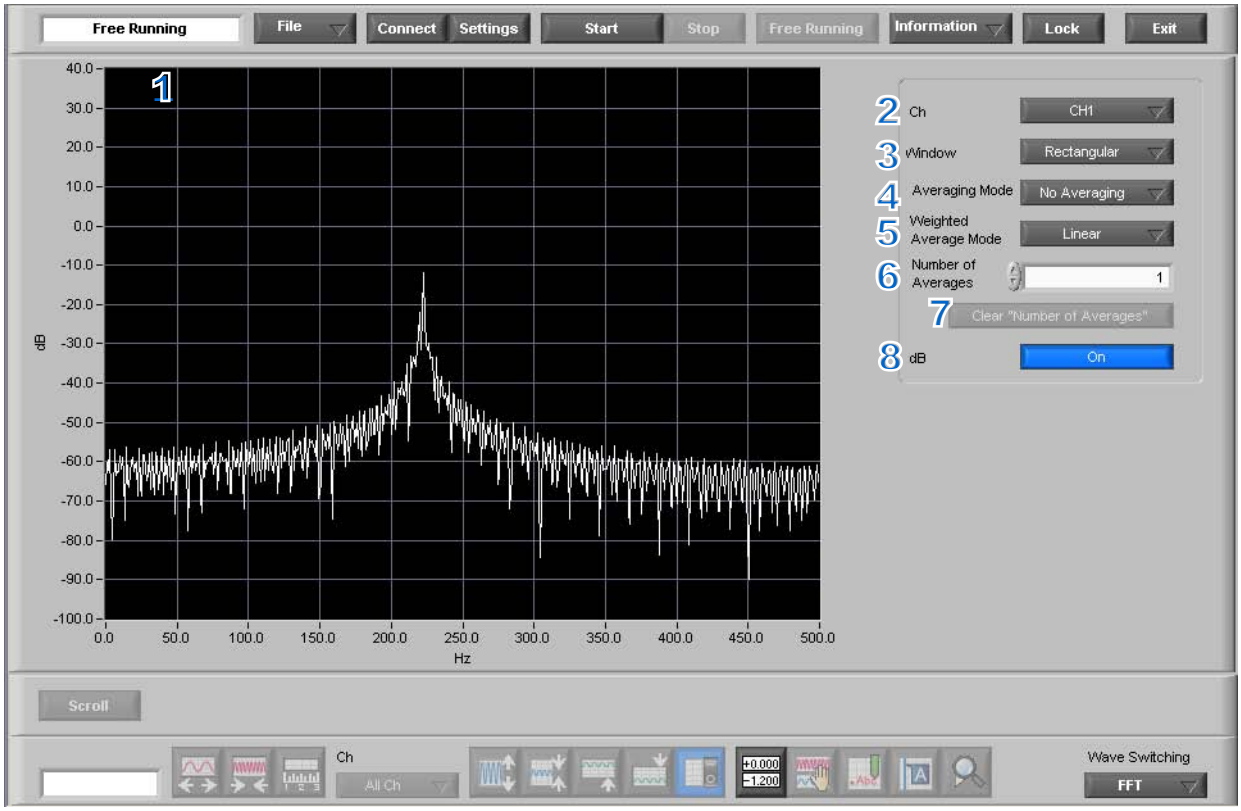
You can select the X-Y format in the "Wave Switching" to switch to the X-Y display screen.
Up to four combinations can be handled in the X-Y display. Any channels can be set.
Behaviors are different between the free running status and the replay status.
During Free Running, the waveforms are always plotted in the X-Y format for the sampling data.
During Replay, the waveforms are viewed in the X-Y format for the data within the interval displayed in the scroll bar.




| No. | Name | Description |
|---|---|---|
| 1 | Pen display | The current input position is displayed in the X-Y display during Free Running.<br>The data position above cursor A is displayed during Replay. |
| 2 | X-Y waveform display | The waveforms are displayed in the X-Y format. |
| 3 | Change Span | The span for the X and Y axes is changed. Click the center button to revert to the default value. |
| 4 | Change Position | The position for the X and Y axes is changed on the left, right, top and bottom. Click the center button to revert to the default value. |
| 5 | Delete Waveforms | This is used during Free Running only. The plotted waveforms are deleted. |
| 6 | Pen Up/Down | This works as if the pen is moving up like the X-Y pen recorder.<br>While the pen is moving up, the waveforms are not plotted. |
| 7 | Switch Range | The scale values for the X and Y axes for the lighted channel are displayed. |
| 8 | On/Off | Select On/Off for each channel in the X-Y. |
| 9 | X axis CH | Select the channel for the X axis. |
| 10 | Y axis CH | Select the channel for the Y axis. |
| 11 | Cursor Info. | The level value for the cursor in the X-Y waveform display is displayed. |
| 12 | Scroll | The range of waveform display is displayed during Replay.<br>The cursor position can be changed to change the range of the X-Y display. |
| 13 | Expand/Shrink | The range of the scroll bar can be changed. |

## FFT

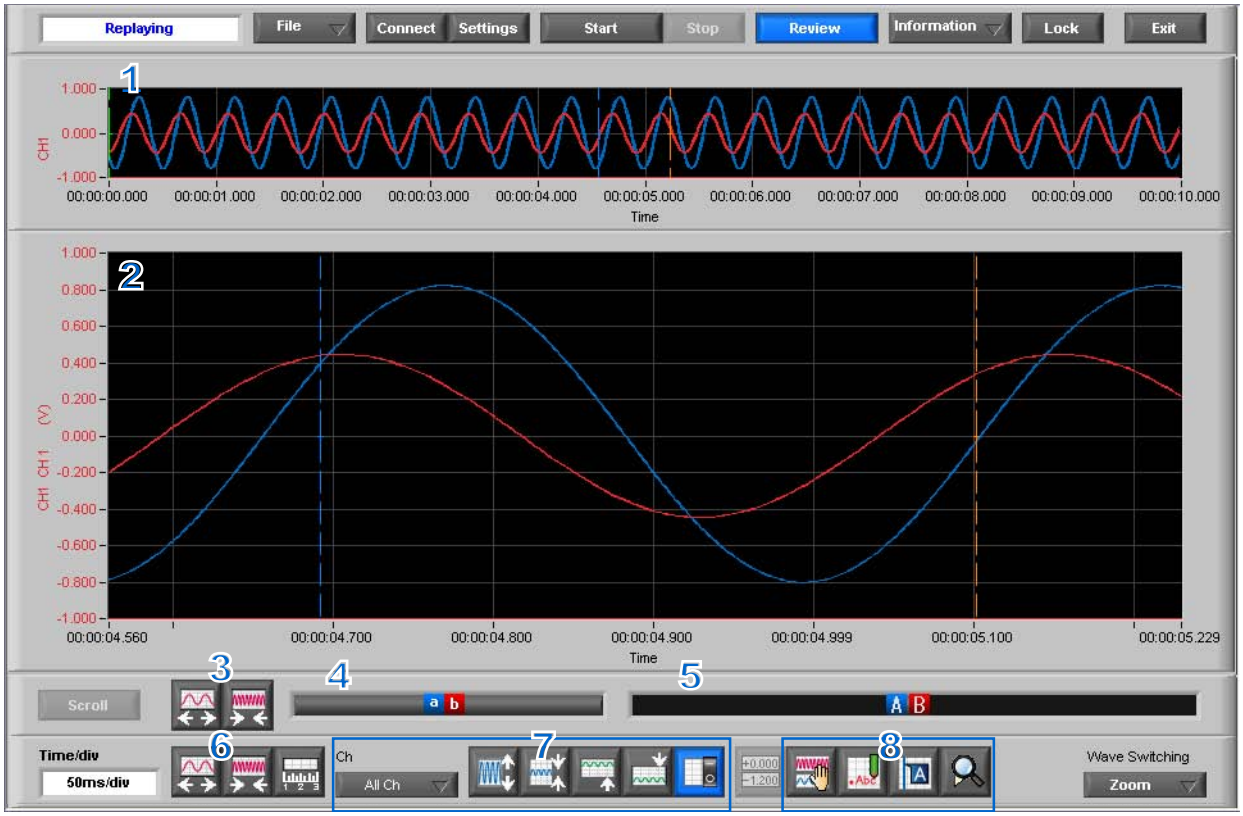
You can select the FFT format in the "Wave Switching" to switch to the FFT display screen.
The waveforms are viewed for a desired channel in the FFT format.
Behaviors are different between the free running status and the replay status.
During Free Running, the waveforms are viewed in the FFT format for the sampling data.
During Replay, up to 1,000 data are viewed in the FFT format for the data displayed in the scroll bar.




| No. | Name | Description |
|---|---|---|
| 1 | FFT | The waveforms are displayed in the FFT format. |
| 2 | Ch | Click this button to select a channel to display FFT waveforms. |
| 3 | Window | Click this button to select a window. |
| 4 | Averaging Mode | Click this button to select an averaging mode. |
| 5 | Weighted Average Mode | Click this button to select a weighted average mode. |
| 6 | Number of Averages | Set data points for averaging. |
| 7 | Clear "Number of Averages" | Click this button to clear averaging. |
| 8 | dB | The Y axis range is displayed in the dB. |

## Zoom

You can select the Zoom format in the "Wave Switching" to switch to the Zoom display during replay.
The waveforms being replayed are divided into the two displays. The whole waveforms are displayed in the upper side, and the detailed waveforms are displayed in the lower side.
The cursors A and B in the upper whole waveforms link with the display area in the lower detailed waveforms.
You can locate the detailed signal position in the whole display, move and expand the waveforms.



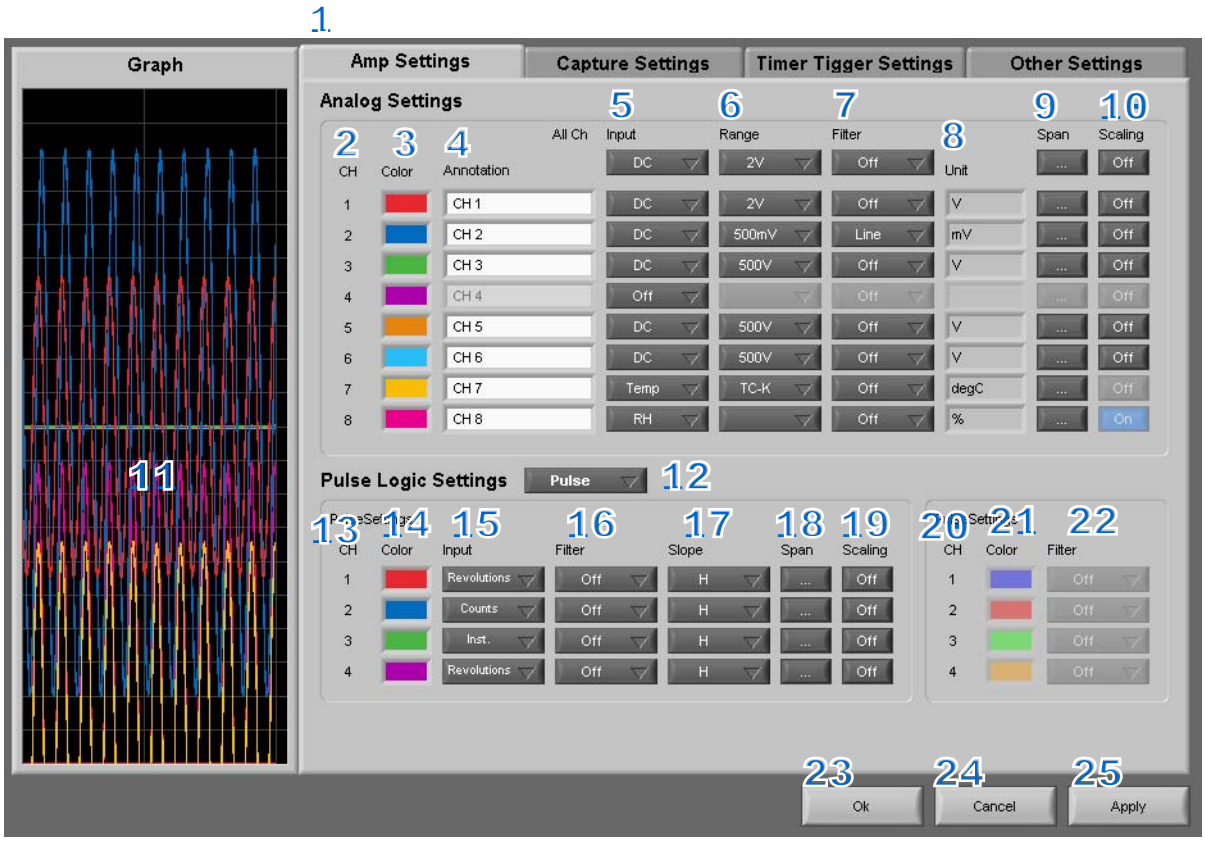

| No. | Name | Description |
|---|---|---|
| 1 | Whole Waveforms | The whole waveforms being replayed can be displayed. Time/Div and the scroll bar enable the detailed waveforms to be viewed. |
| 2 | Detailed Waveforms | The data between cursors A and B displayed in a scroll bar in the whole waveforms is displayed as the range in the detailed display. Cursors are provided to check the level values and time. |
| 3 | Expand/Shrink Time/Div for the whole waveforms | The display width for the X axis can be changed for the whole waveforms. |
| 4 | Scroll bar for the whole waveforms | The display area can be scrolled for the whole waveforms. The range between cursors A and B links with the range of the detailed display. |
| 5 | Scroll bar for the detailed waveforms | The cursors can be moved for the detailed waveform table. |
| 6 | Expand/Shrink Time/Div for the detailed waveforms | The display width for the X axis can be changed for the detailed waveforms. |
| 7 | Y axis operations | For the whole and detailed waveforms, you can expand/shrink the Y axis span, move the Y axis position, or make the tracing. |
| 8 | Other icons | You can edit waveforms, input comments, display cursors, or perform search operations for the detailed waveforms. |

# 10. Settings Screens

This chapter describes the screens used to perform settings related to data capture.

## AMP Settings

This screen is used to make the analog input, logic input, and pulse input settings.

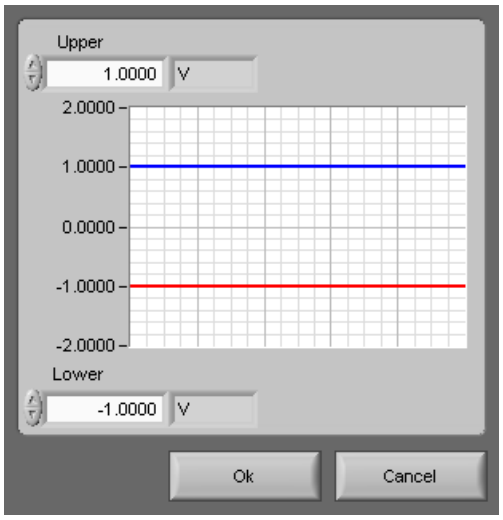



| No. | Name | Description |
|---|---|---|
| 1 | Setting tabs | These tabs are used to change the settings screen.<br>Amp Settings: This tab is used to make input-related settings.<br>Capture Settings: This tab is used to make settings related to data capture.<br>Timer Trigger Settings: This tab is used to make settings related to the trigger and alarm functions.<br>Other Settings: This tab is used to make various other settings, to display information, and so forth. |
| 2 | CH | These are the channel numbers for analog input. |
| 3 | Color | The color used for the waveform for each channel can be specified here. |
| 4 | Annotation | Each channel can be freely annotated (input the signal name etc.). Up to 11 one-byte characters can be input. |
| 5 | Input | Select the input type.<br>Off: Make the input Off.<br>DC: Set to perform voltage measurement.<br>Temp: Set to perform temperature measurement.<br>RH: Set to perform humidity measurement. |

<table>
<tr><th>No.</th><th>Name</th><th>Description</th></tr>
<tr><td>6</td><td>Range</td><td>These buttons are used to select the input range.<table><tr><td>DC</td><td>20, 50, 100, 200, 500(mV), 1, 2, 5, 10, 20, 50, 100, 200, 500(V), 1-5V</td></tr><tr><td>Temp</td><td>TC-K, TC-J, TC-T, TC-R, TC-E, TC-B, TC-S, TC-N, TC-W</td></tr><tr><td>RH</td><td>Fixed to 1V; the unit is converted internally.<br>0V - 0% to 1V - 100%</td></tr></table></td></tr>
<tr><td>7</td><td>Filter</td><td>Use these buttons to set the low-pass filter for each channel.<br>(Off, Line, 5Hz, 50Hz, 500Hz)</td></tr>
<tr><td>8</td><td>Unit</td><td>The unit is displayed here.</td></tr>
<tr><td>9</td><td>Span</td><td>Set the upper limit and lower limit values for the waveforms displayed in the graph.</td></tr>
<tr><td>10</td><td>Scaling</td><td>Convert the unit.</td></tr>
<tr><td>11</td><td>Graph Display</td><td>The waveforms for which settings have been made can be checked here.<br>Click the "Apply" button to apply the settings that have been made.</td></tr>
<tr><td>12</td><td>Pulse Logic Settings</td><td>Use this button to switch the digital input.<br>(Off, Pulse, or Logic).</td></tr>
<tr><td>13</td><td>Pulse CH number</td><td>The channel numbers for pulse input.</td></tr>
<tr><td>14</td><td>Pulse Line Color</td><td>Make the pulse line color setting here.</td></tr>
<tr><td>15</td><td>Pulse Input</td><td>Select the pulse input type.<table><tr><td>Revolutions</td><td>The number of pulses generated in one second is counted, multiplied by 60, and displayed as the number of revolutions (RPM).</td></tr><tr><td>Counts</td><td>A cumulative count is made of the number of pulses generated in one sample.</td></tr><tr><td>Inst</td><td>The number of pulses generated in one sample is counted.</td></tr></table></td></tr>
<tr><td>16</td><td>Pulse Filter</td><td>Make the pulse filter setting here.<br>The filter is about -3dB at about 30Hz.<br>Off, On</td></tr>
<tr><td>17</td><td>Pulse Slope</td><td>Set the pulse detection slope.<table><tr><td>H</td><td>Rising signals are counted.</td></tr><tr><td>L</td><td>Falling signals are counted.</td></tr></table></td></tr>
<tr><td>18</td><td>Pulse Span</td><td>Set the upper limit and lower limit values for the waveforms displayed in the waveform graph.</td></tr>
<tr><td>19</td><td>Pulse Scaling</td><td>Convert the unit.</td></tr>
<tr><td>20</td><td>Logic CH number</td><td>The channel numbers for logic input.</td></tr>
<tr><td>21</td><td>Logic Line Color</td><td>Make the logic waveform color setting here.</td></tr>
<tr><td>22</td><td>Logic Filter</td><td>Make the logic filter setting here.<br>The filter is about -3dB at about 30Hz.<br>Off, On</td></tr>
<tr><td>23</td><td>OK</td><td>Click this button to register your settings and close the screen.</td></tr>
<tr><td>24</td><td>Cancel</td><td>Click this button to close the screen without registering your settings.</td></tr>
<tr><td>25</td><td>Apply</td><td>Click this button to apply the settings made.</td></tr>
</table>

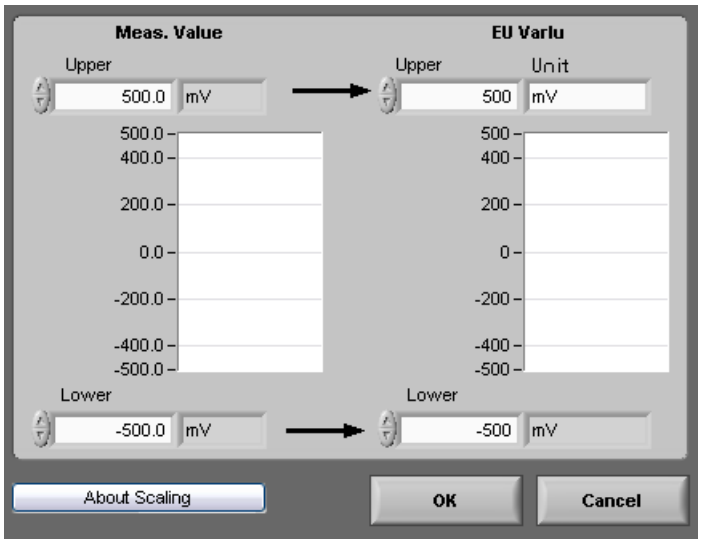
## Span Settings

Span settings are made at this screen.
To make the settings, input numerical values directly or use a cursor to adjust values.



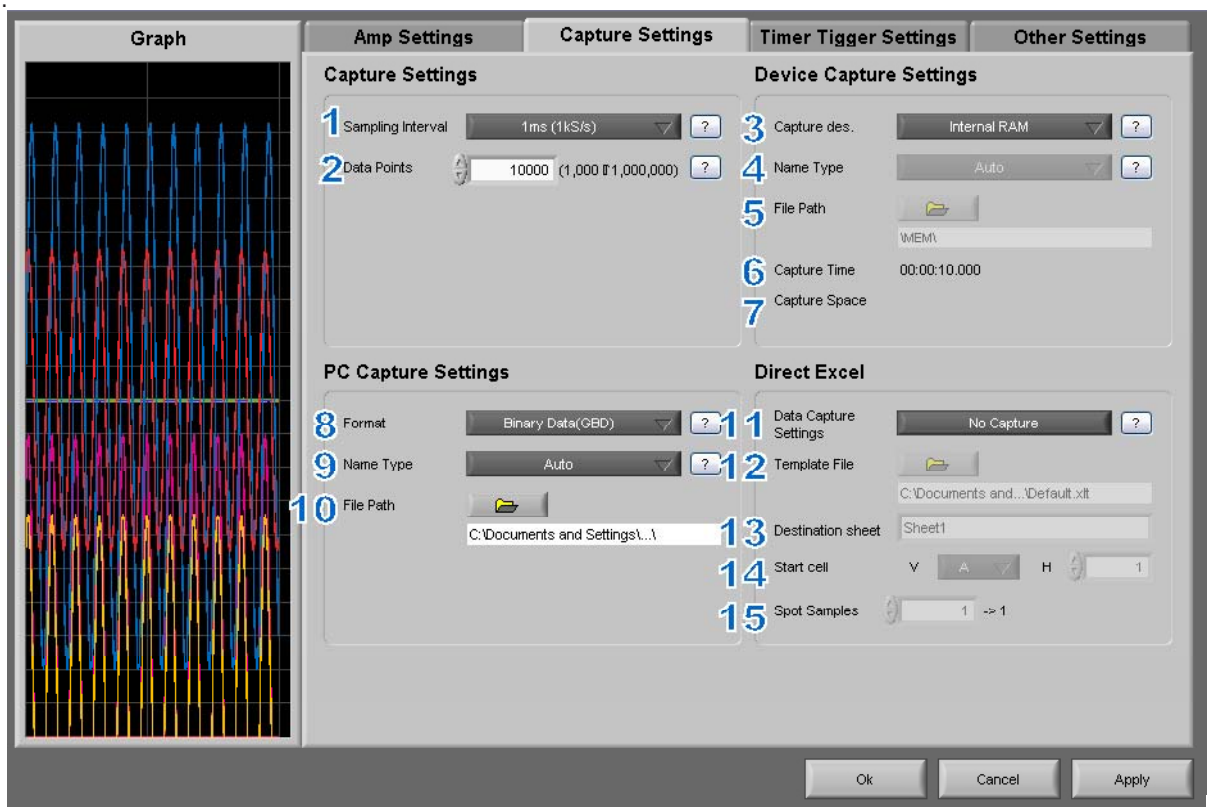

## Scaling Settings

Scaling settings (converting unit) are made at this screen.
To make the settings, input the upper and lower limit values for both input and conversion.



## Data Capture Settings

Settings such as the Sampling Interval, Device Capture Settings and PC Capture Settings are made at this screen.

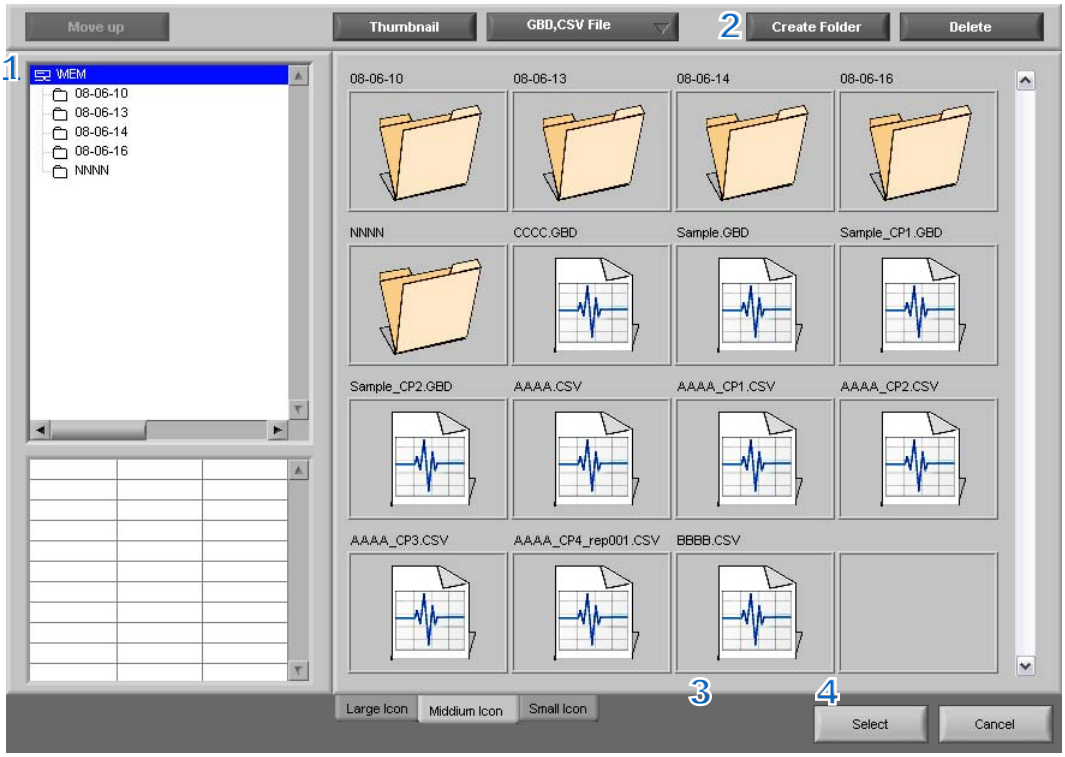



| No. | Name | Description |
|---|---|---|
| 1 | Sampling Interval | Set the interval for data capture.<br>(10, 20, 50, 100, 200, 500(us), 1, 2, 5, 10, 20, 50, 100, 200, 500(ms), 1, 2, 5, 10, 20, 30,60(s)) |
| 2 | Data Points | Set the number of data points to be captured.<br>This can be set only when the device data capture destination is the internal RAM. |
| 3 | Capture des. | Set the device data capture destination.<br>Internal RAM: Data is captured to the device's internal RAM. You can set the sampling interval to more than or equal to 10us.<br>Int. Flash/USB Memory: Data is captured to either the device's internal flash memory or USB memory.<br>No Capture: Data is captured to a PC only, not to the device. Long-time data capture can be done, because it is not affected by the device's capture destination. You can set the sampling interval to more than or equal to 1ms. |
| 4 | Name Type | Set the method for appending the file name.<br>Auto: Create a date folder in the specified folder, and then create a date and time file in it.<br>User: The file name can be freely specified by the user. |
| 5 | File Path | Select the save destination at the device for the captured data. |
| 6 | Capture Time | The amount of time available at the device for data capture is displayed. |
| 7 | Capture Space | The amount of capacity available for data capture at the device is displayed. |

| No. | Name | Description |
|---|---|---|
| 8 | Format | Select the file format to save data to the PC.<br>Binary Data(GBD): The data is saved as our binary data. When compared with a CSV file, the file size is somewhat small.<br>Text Data (CSV): The data can be displayed in Microsoft Excel format. |
| 9 | File Path | Select the save destination at the PC for the captured data. |
| 10 | Capture Settings | Select to enable/disable the export to direct Excel file function.<br>To use the function, a Microsoft EXCEL should be installed. The maximum number of samples that can be displayed in direct Excel is 65535. |
| 11 | Template File | Set the template file for the direct Excel. |
| 12 | Destination sheet | Select the template sheet in the template file. |
| 13 | Start cell | Specify the start position on the sheet from which to transfer data. |
| 14 | Spot Samples Setting | Set the rate of spot data samples to be exported.<br>When "5 - 1" is set, data is exported once a five times. |

## Device Capture Settings

This screen shows the settings for the Device save destination.



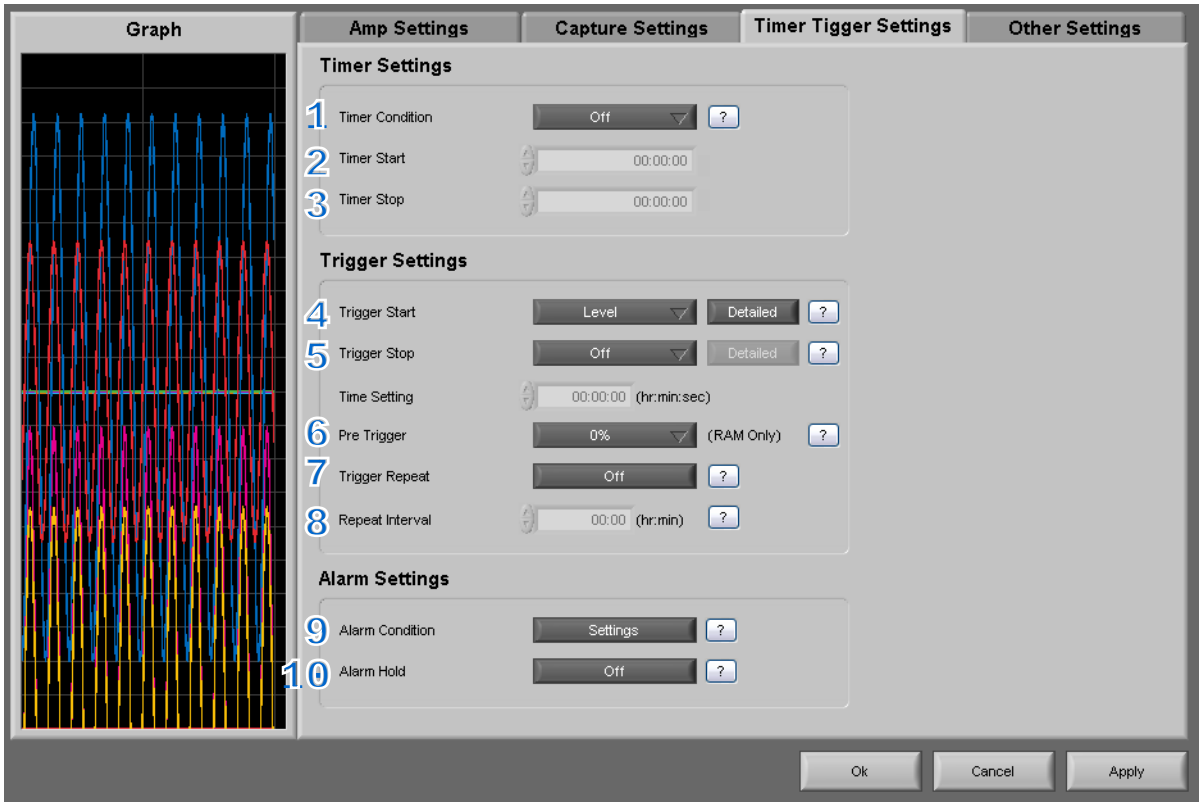

| No. | Name | Description |
|---|---|---|
| 1 | Folder Tree | The device specified as a device save destination is displayed in a tree format. Open the location where you want to save data. |
| 2 | Create Folder | Use this button to create a new folder in the opening path. |
| 3 | Create File | Use this button to create a new file in the opening path. |
| 4 | Select | If "Name Type" is set to "Auto", you can select a folder and press the "Select" button to set the save destination folder.<br>If "Name Type" is set to "User", you can select a new file or the existing file to set the save destination. |

## PC Capture Settings

This screen is the same as Device Capture Settings.

## Trigger/Alarm Settings

Settings such as the timer condition, trigger condition, and alarm settings are made at this screen.

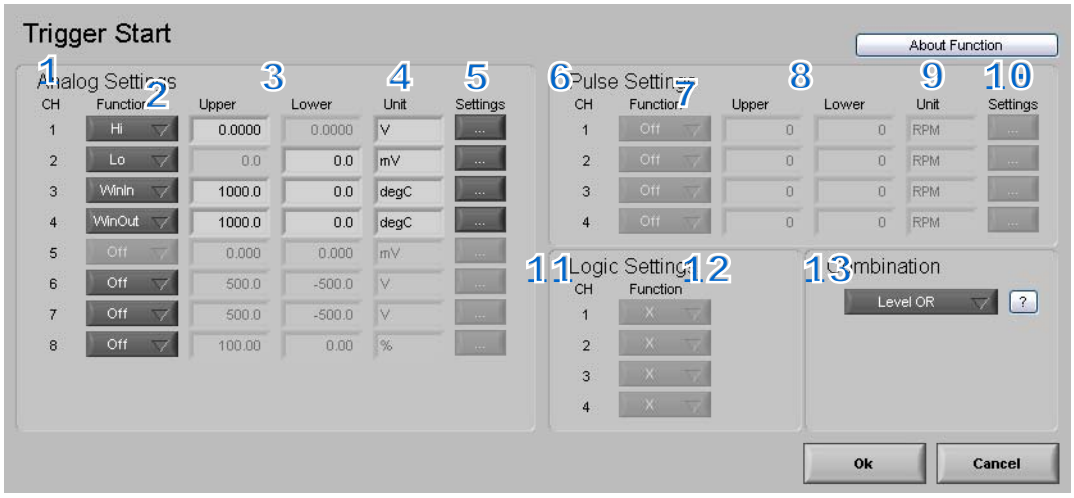



| No. | Name | Description |
|---|---|---|
| 1 | Timer Condition | Select the timer condition.<br>Off: The timer function is not used. Data capture starts according to triggers.<br>Date and Time: Data capture starts when a trigger is generated during the specified date and time.<br>Daily: Data capture starts when a trigger is generated during the specified time. It is repeated every day.<br>Hourly: Data capture starts when a trigger is generated during the specified time. It is repeated every time. |
| 2 | Timer Start | Set data capture start time. |
| 3 | Timer Stop | Set data capture stop time. |
| 4 | Trigger Start | Set the trigger start condition.<br>Off: A trigger is generated unconditionally.<br>Level: A trigger is generated when a condition is met for a specified level value.<br>External: A trigger is generated when an input signal is received from an external trigger terminal. * A trigger is generated when the voltage changes from 5V (open) to 0V (short circuit to GND). |
| 5 | Trigger Stop | Set the trigger stop condition.<br>Off: There is no condition.<br>Level: A trigger is generated when a condition is met for a specified level value.<br>External: A trigger is generated when an input signal is received from an external trigger terminal. * A trigger is generated when the voltage changes from 5V (open) to 0V (short circuit to GND).<br>Time: A trigger is generated after a specified length of time elapses after a start trigger is generated. |

<table>
<tr><th>No.</th><th>Name</th><th>Description</th></tr>
<tr><td>6</td><td>Pre Trigger</td><td>Data is captured before a start trigger is generated. It specifies the percentage of data points to be captured.<br>To use this function, you must set "Trigger Start" to other than "Off".<br>This can be used only when the device data capture destination is set to the internal RAM.</td></tr>
<tr><td>7</td><td>Trigger Repeat</td><td>Set the repeat function for repeated capturing.<table><tr><td>Off</td><td>Data capture is not repeated.</td></tr><tr><td>On</td><td>After a stop trigger has been generated, or after all data points in the internal RAM has been captured, the next data capture starts.<br>If the capture destination is not the internal RAM, you must set "Trigger Stop" to other than "Off".</td></tr></table></td></tr>
<tr><td>8</td><td>Repeat Interval</td><td>Set the interval from the generation of a trigger start to the start of repeated capturing.<br>When the device data capture destination is the internal RAM:<br>Trigger Start: Off<br>Trigger Stop: Off or Time<br>When the device data capture destination is not the internal RAM:<br>Trigger Start: Off<br>Trigger Stop: Time<br>In other cases, the next data capture starts immediately after the Repeat Interval becomes zero and a trigger stop is generated.<br>If a trigger stop is not generated when the Repeat Interval is reached, the next data capture is waiting until a trigger stop is generated and starts immediately after it is generated.</td></tr>
<tr><td>9</td><td>Alarm Condition</td><td>When the specified condition is met, an alarm is output from the alarm output terminal.</td></tr>
<tr><td>10</td><td>Alarm Hold</td><td>When it is enabled, once an alarm occurs, the alarm status is maintained until it is cleared.</td></tr>
</table>

## Level Condition

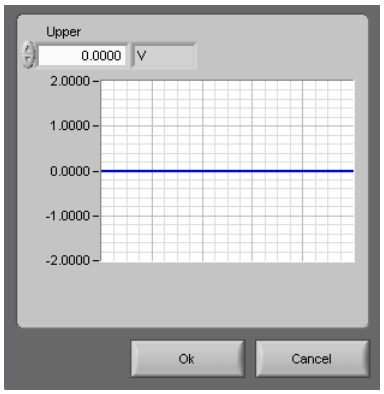
If "Level" has been selected for the Trigger setting, the "Level Condition" settings must be made.




| No. | Name | Description |
|---|---|---|
| 1 | CH | The channel numbers are displayed. |
| 2 | Function | Select the trigger level detection mode.<br>Off: Disabled.<br>Hi: Detection is performed when the signal is rising.<br>Lo: Detection is performed when the signal is falling.<br>Win In: Detection is performed when the value is within the specified range.<br>Win Out: Detection is performed when the value is outside the specified range. |
| 3 | Level Display | The specified level is displayed. |
| 4 | Unit | The unit is displayed. |
| 5 | Settings | Make the level settings. |
| 6 | Pulse CH | The channel numbers for pulses are displayed. |
| 7 | Pulse Function | Select the pulse trigger detection mode (same as analog). |
| 8 | Pulse Level Display | The pulse trigger level settings are displayed. |
| 9 | Pulse Unit | The unit is displayed. |
| 10 | Pulse Settings | Make the pulse trigger level settings. |
| 11 | Logic CH | The channel numbers for logics are displayed. |
| 12 | Logic Function | Set the logic trigger.<br>X: Disabled.<br>H: Detection is performed when the signal is rising.<br>L: Detection is performed when the signal is falling. |
| 13 | Combination | Use this button to set the combination of triggers and the detection method for each channel.<br>Level OR: Detection is performed at the level, and a trigger is generated when at least one of channels detects a trigger.<br>Level AND: Detection is performed at the level, and a trigger is generated when all of the selected channels detect a trigger.<br>Edge OR: Detection is performed at the edge, and a trigger is generated when at least one of channels detects a trigger.<br>Edge AND: Detection is performed at the edge, and a trigger is generated when all of the selected channels detect a trigger. |

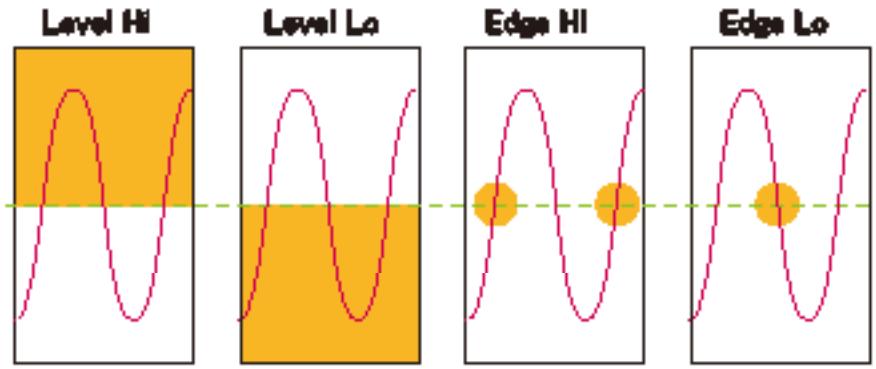
## ● Trigger Level Settings Screen

This screen is used to make the level settings to detect a trigger.
To make the settings, you input numerical values directly or use a cursor.




## ● Level Detection and Edge Detection

To detect a trigger, you can select level detection or edge detection.
In the level detection, a trigger is detected when an input signal is above/below the specified level.
In the edge detection, a trigger is detected when an input signal is above/below the specified level.
Even if an input signal reached the detection level before, a trigger is not detected unless it reaches the level again after it is outside.



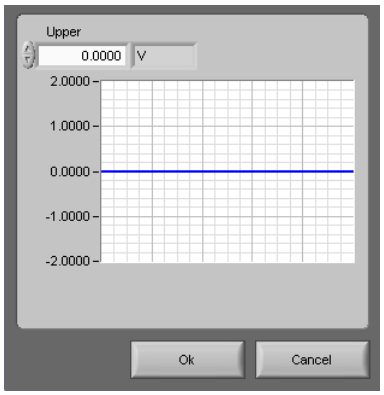
## Alarm Condition

The alarm level settings for each input are made at this screen.


| No. | Name | Description |
|---|---|---|
| 1 | CH | The channel numbers are displayed. |
| 2 | Function | Select the alarm level detection mode.<br>Off: Disabled.<br>Hi: Detection is performed when the signal is rising.<br>Lo: Detection is performed when the signal is falling.<br>Win In: Detection is performed when the value is within the specified range.<br>Win Out: Detection is performed when the value is outside the specified range. |
| 3 | Level Display | The specified level is displayed. |
| 4 | Unit | The unit is displayed. |
| 5 | Settings | Make the level settings. |
| 6 | Output | Set the terminal that outputs an alarm. It is selected out of the device's four alarm output terminals.<br>OR is applied to output of the terminal for each channel. |
| 7 | Pulse CH | The channel numbers for pulses are displayed. |
| 8 | Pulse Function | Select the pulse alarm detection mode (same as analog). |
| 9 | Pulse Level Display | The pulse alarm level settings are displayed. |
| 10 | Pulse Unit | The unit is displayed. |
| 11 | Pulse Settings | Make the pulse alarm level settings. |
| 12 | Pulse Output | Set the terminal that outputs an alarm. It is selected out of the device's four alarm output terminals.<br>OR is applied to output of the terminal for each channel. |
| 13 | Logic CH | The channel numbers for logics are displayed. |
| 14 | Logic Function | Make the logic alarm setting.<br>X: Disabled.<br>H: Detection is performed when the signal is rising.<br>L: Detection is performed when the signal is falling. |
| 15 | Logic Output | Set the terminal that outputs an alarm. It is selected out of the device's four alarm output terminals.<br>OR is applied to output of the terminal for each channel. |

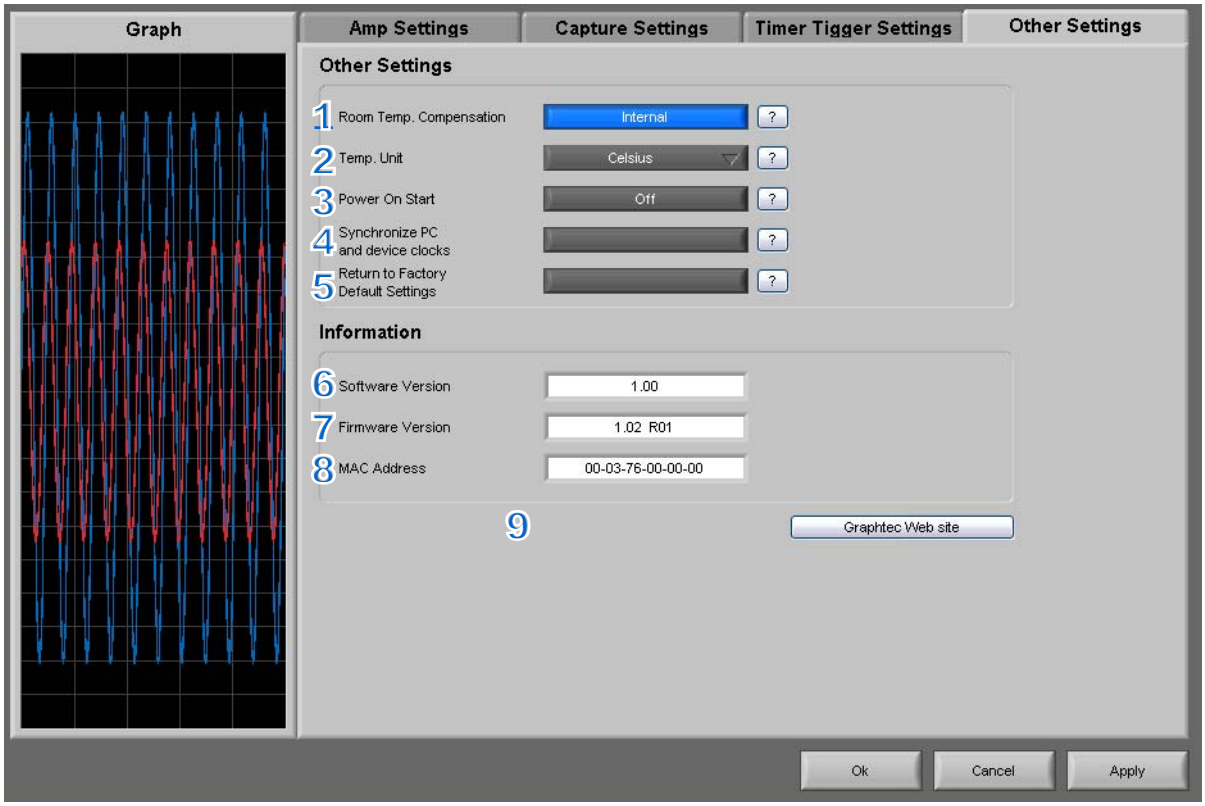
## ● Alarm Level Setting Screen

This screen is used to select a level at which an alarm occurs.
To make the setting, input numerical values directly or use a cursor.
An alarm is detected at the level.



## Other Settings

This screen is used to make various other settings and to display information.




| No. | Name | Description |
|---|---|---|
| 1 | Room Temp. Compensation | This parameter is used when thermocouples are used to perform temperature measurement. Set to On when performing the room temperature compensation on this device. (Always select On for this setting). |
| 2 | Temp. Unit | The display unit can be switched between Celsius and Fahrenheit. |
| 3 | Power On Start | Data capture starts when the power to the device is turned on. This setting can only work for data capture to the device. |
| 4 | Synchronize PC and device clocks | Click this button to send the PC clock to the GL900. |
| 5 | Return to Factory Default Settings | Return the settings to the default values. |
| 6 | Software Version | The software version is displayed here. |
| 7 | Firmware Version | The connected device is displayed here. |
| 8 | MAC Address | The MAC address of the connected device is displayed here. |
| 9 | Graphtec Web site | Click this button to access the Graphtec web site. |

# 11. Data Capture

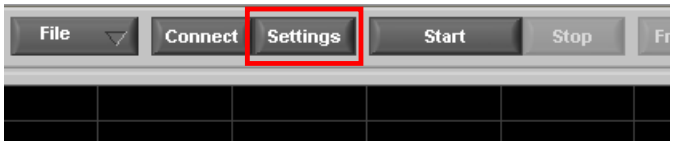
This chapter describes the basic operating procedure.
The operating procedure starts with the software and the device in the connected status. For the connection procedure, refer to Chapter 9. Connection.
The settings that are not addressed in the following sections are the factory default settings.

## Settings

Description

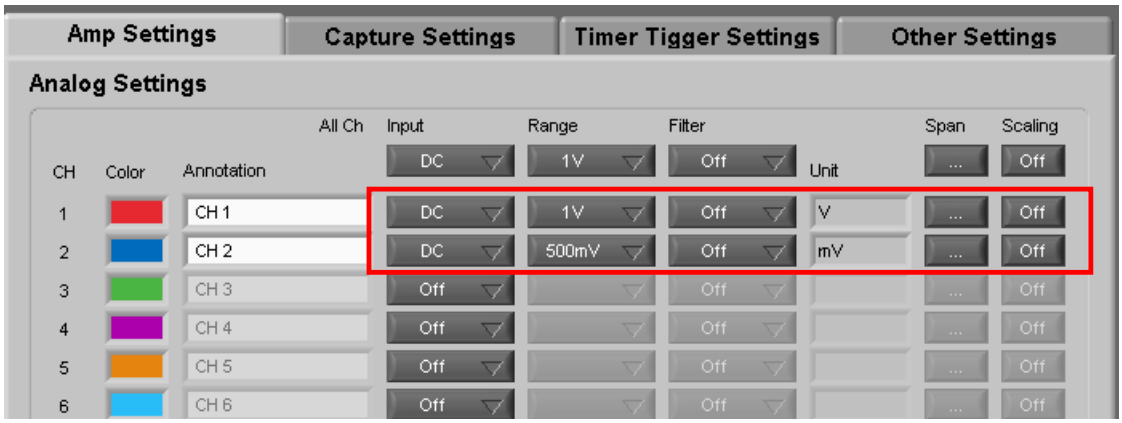
| | | |
|---|---|---|
| 1 | Settings related to AMP | CH1: Input: Voltage, Range: 1V, Filter: Off, Scaling: Off<br>CH2: Input: Voltage, Range: 500mV, Filter: Off, Scaling: Off<br>Set to other channels to Off. |
| 2 | Settings related to data capture | Sampling Interval: 100us<br>Data Points: 10000<br>Device Capture Destination: Internal RAM<br>PC Capture Format: Binary Data |

After connecting to the device, press the "Settings" button on the main screen.




### Settings related to AMP

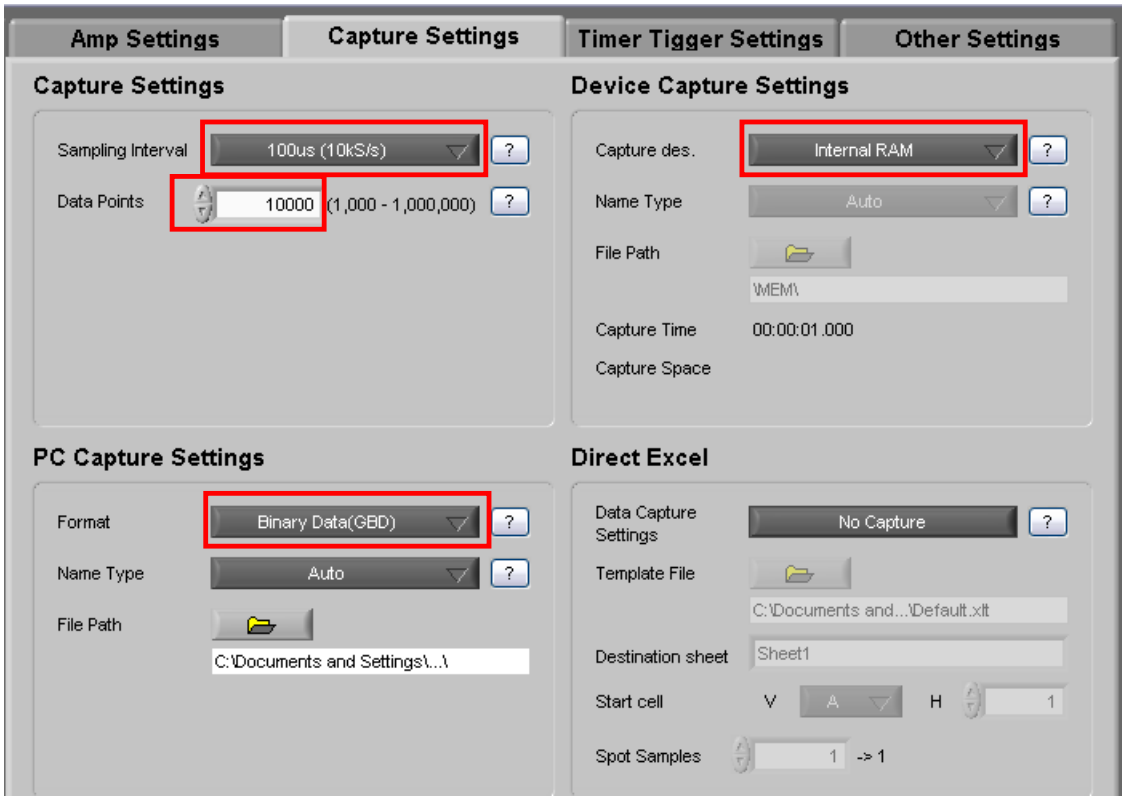
The settings for CH1 and CH2 are made according to the setting options. Set other channels to "Off".



## Settings related to data capture

The settings related to data capture are made according to the setting options.

• Select the "Capture Settings" tab.
• Set "Sampling Interval" to 100us.
• Set "Data Points" to 10000.
• Set "Capture des." of "Device Capture Settings" to "Internal RAM".
• Set "Format" of "PC Capture Settings" to "Binary Data(GBD)".




In the above settings, 10,000 data points are captured to the internal RAM and to the PC at the sampling interval 100us.

## Start

You can press the "Start" button to start data capture.

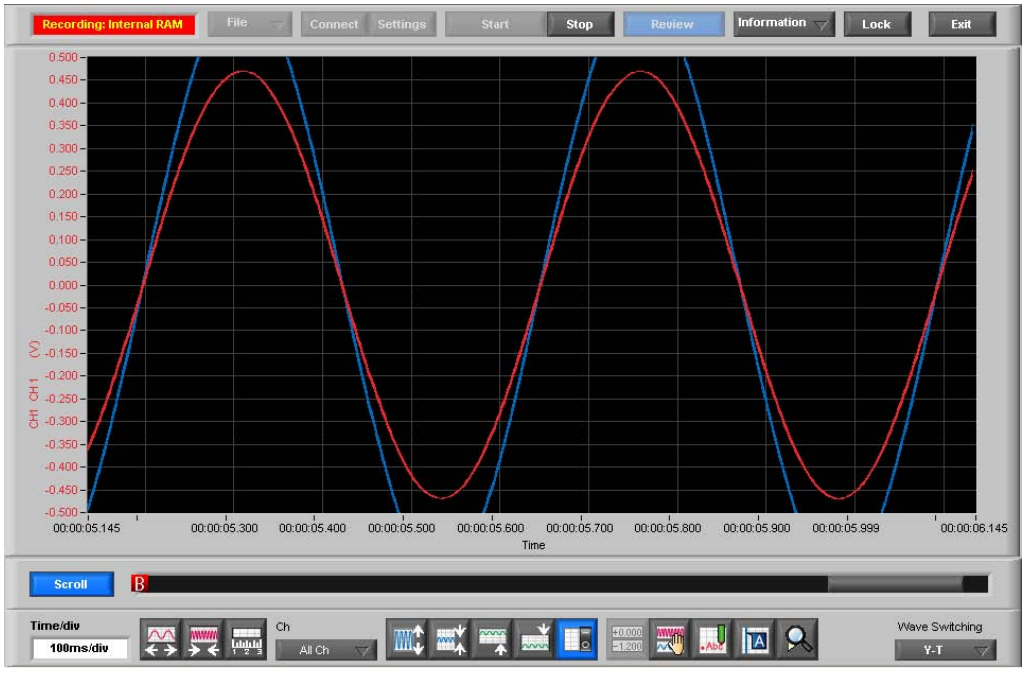

### Behaviors When Using the Internal RAM

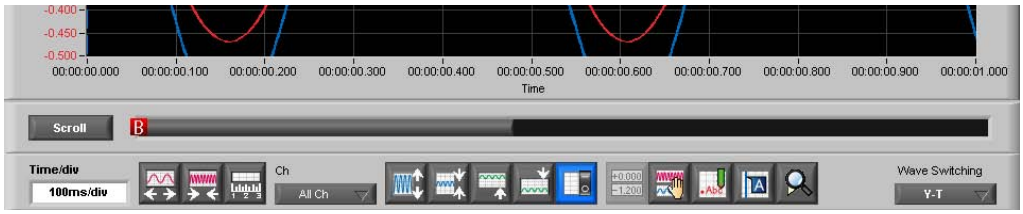
When the device data capture destination is set to the internal RAM, high-speed data capture can be performed at the sampling interval 10us or above.
On this software, the device is capturing data at high speed while exporting it to the PC.
Even after the device ends data capture, all of the data will be exported.

### Behaviors during Data Capture

You can use the "Scroll" button to switch between the scrolling and the data replay operations.
While the "Scroll" button turns blue, the scrolling operation can be performed.


During the scrolling operation, the newest data exported from the device is displayed.
During the data replay operation, data that has been exported from the device can be checked, and cursor operations can be performed.



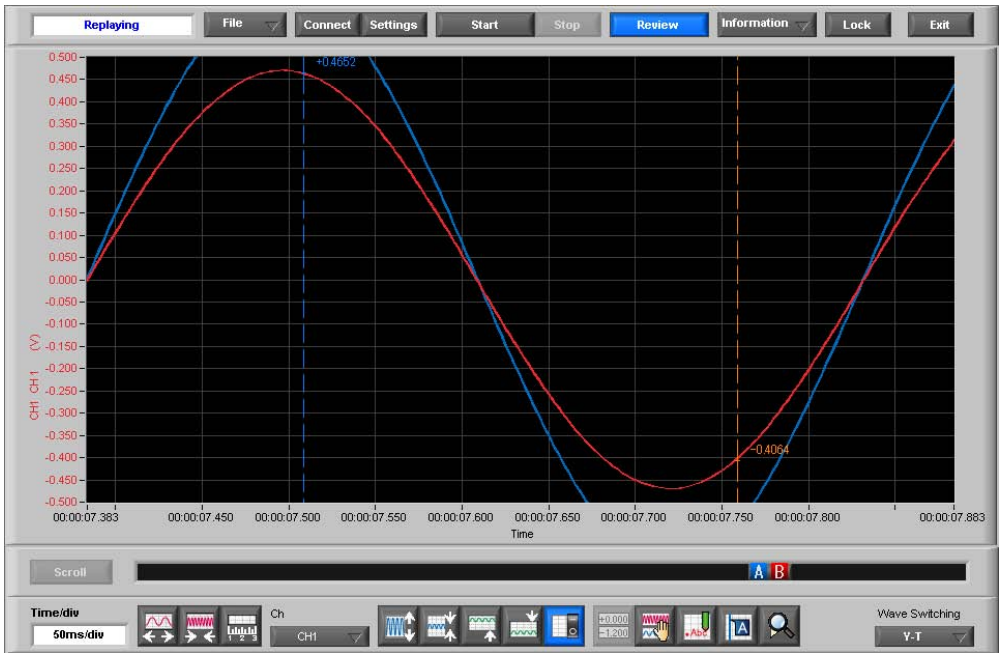



## Stop

Data capture automatically stops when 10,000 data points specified in the data capture setting are captured to the device.
When the software does not complete data export, it continues until all of the data is exported.
After all of the data is exported and saved to the PC, the screen switches to the replay mode.


When you want to stop data capture manually during data capture, use the "Stop" button to stop it.


When capture ends, the screen automatically switches to the replay status.



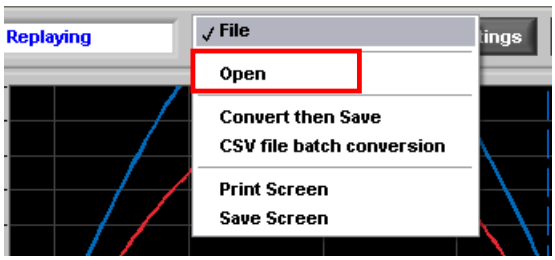
# 12. Replaying Data

Data that has been captured to the PC and the device's internal flash memory or USB memory can be replayed.
Data captured in this software or captured to the device can be replayed.
Data can be replayed as binary data (GBD) or text data (CSV).

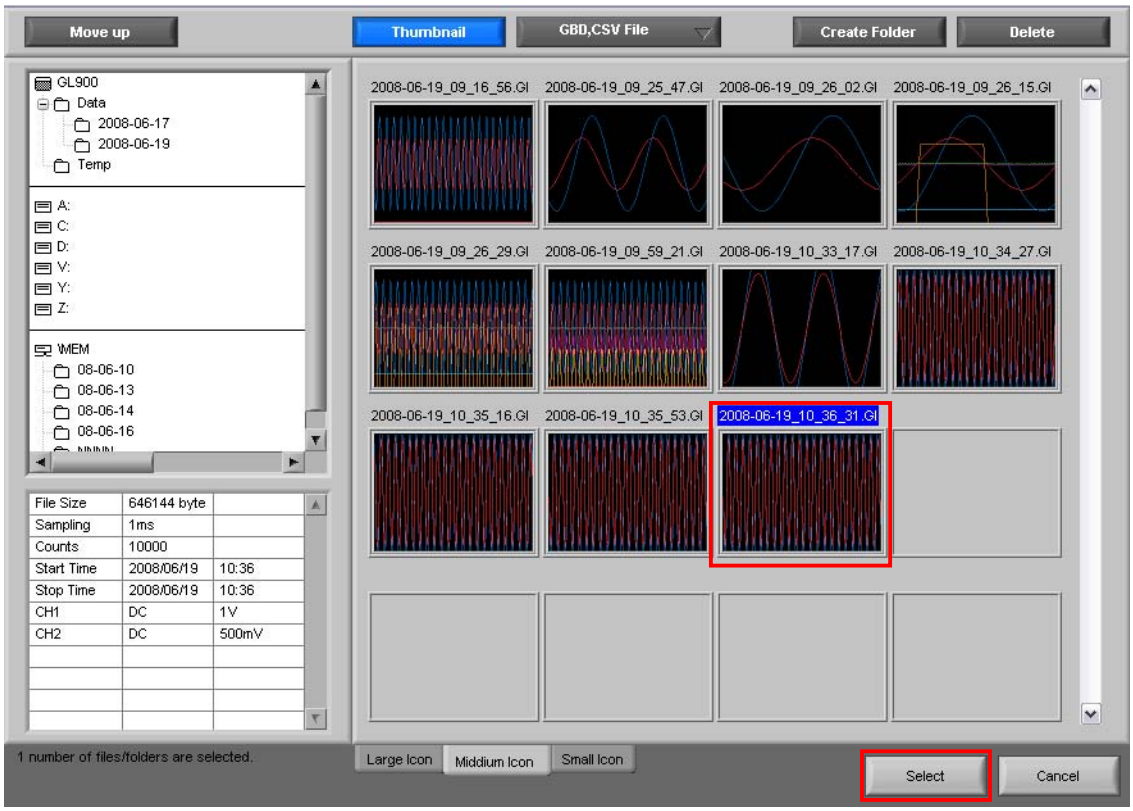
Here, we will replay binary data captured to the PC and perform basic operations.

## Replaying File

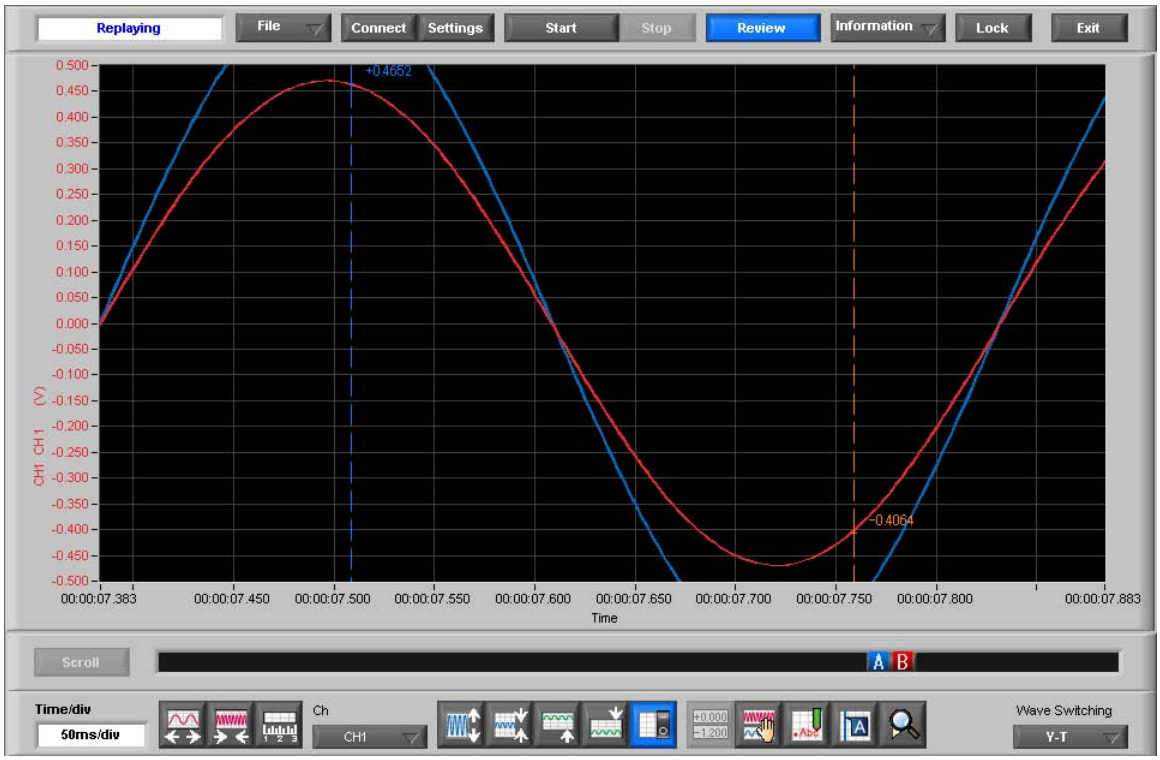
In the "File" on the main screen, select the "Open".




The screen to select a file opens. Select a file from the location where it is saved, and press the "Select".



The selected file is read, and the waveforms are displayed.




## Switching Replay and Free Running

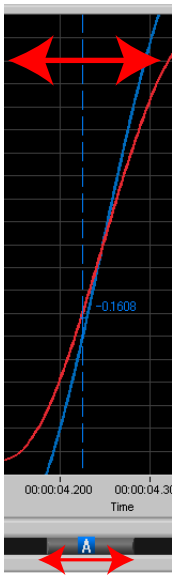
While connecting to the device, you can press the button to switch between the Free Running and the Replay.

During Replay


During Free Running

## Cursor Operations

During replay, two cursors A and B are provided and can be moved to any position in the waveforms.
You can drug the cursors on the waveforms to move them.
Also, you can use the icon of the scroll bar to move them.

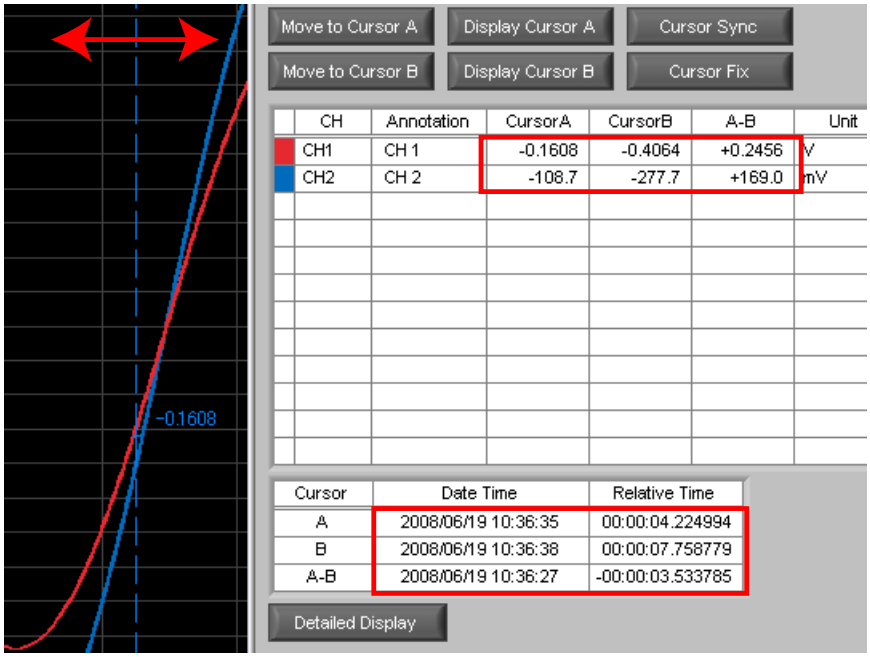



## Checking Cursor Information

The level values and time for the cursors A and B can be checked.

Select the "Cursor Info." icon.

The "Cursor Info." opens. The level values and time for the cursors A and B can be checked.
The cursors can be moved in this status.

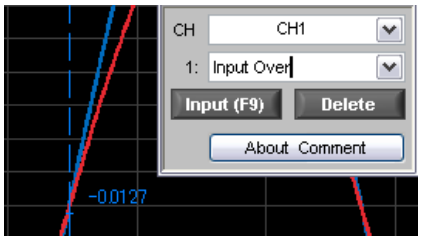


## Input Comments

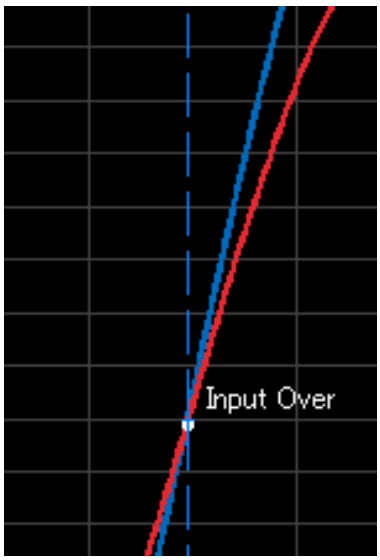
A comment can be input at the position above the desired channel of cursor A.
The input comment will be saved even after a file is closed. Next time the file is open, it is displayed in the same location.
(Only when the data is captured to the PC).

Select the "Comment" icon.

Here, we will input a comment "input over" above the waveform for CH1.
After you input the string, press the "Input" button.



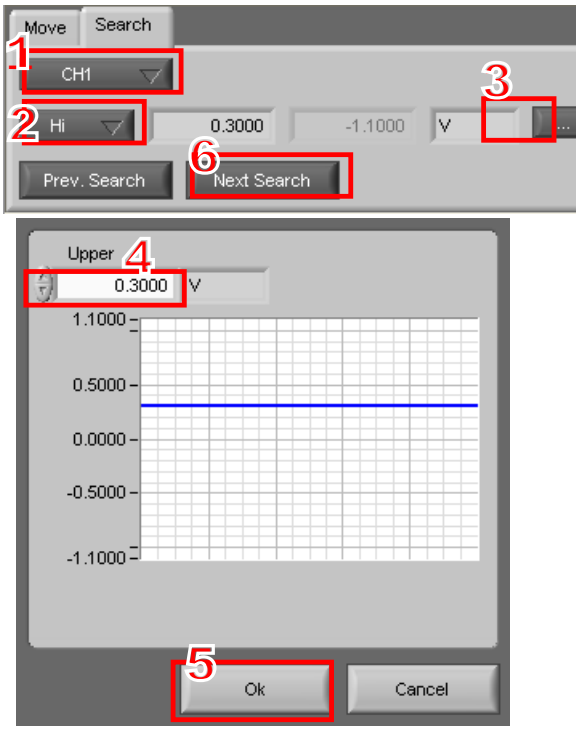

Now, the comment is input.



## Data Search

Search is performed to check the location where data is above/below the specified value. Then, a cursor and waveforms are moved to the location.
Here, we will search for a rising signal and the location above 0.3V for CH1.

Select "Move Search" icon.




1. Set CH to CH1.
2. Set the search conditions to "Hi" (rising signal).
3. Open the level setting screen.
4. Input 0.3V.
5. Press the "OK".
6. Press the "Next Search" to search the current cursor in the forward direction.

The location above 0.3 V is located, and cursor A and the waveform are moved.

GRAPHTEC

●Specifications are subject to change without notice.

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