GL1000/1100
HARD DISK LOGGER
Software

GRAPHTEC

ALTHEN
MESS- UND SENSORTECHNIK

PRÄZISE.
FLEXIBEL.
ERFAHREN.
SEIT 1978.

Contents

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1. Main Features

Real-time waveform display

Compressed data is continually being sent to the PC (personal computer) even while data is being captured to the GL1000/1100 at a high-speed sampling rate. Data waveforms can therefore be checked at any time. Moreover, since raw data has been captured to the GL1000/1100, the compressed data can be used to select only those sections of raw data that are actually required.
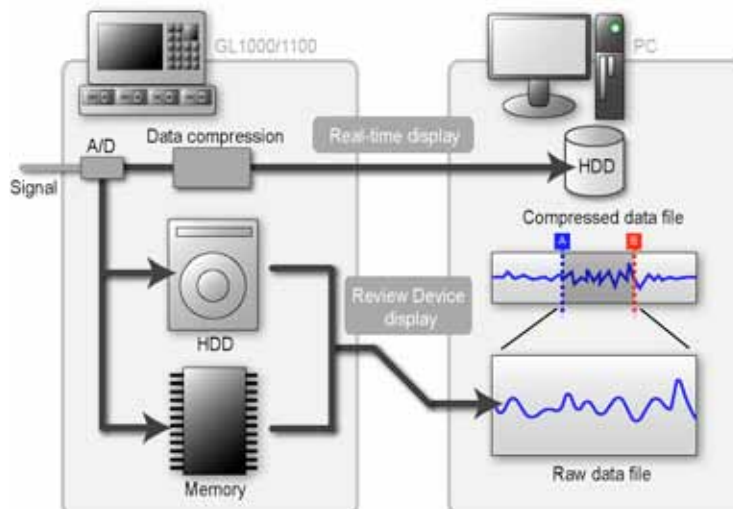
A variety of display formats

Data can be displayed in a variety of formats: Y-T, Digital, XY between cursors and FFT between cursors, on a large, easy-to-read screen.
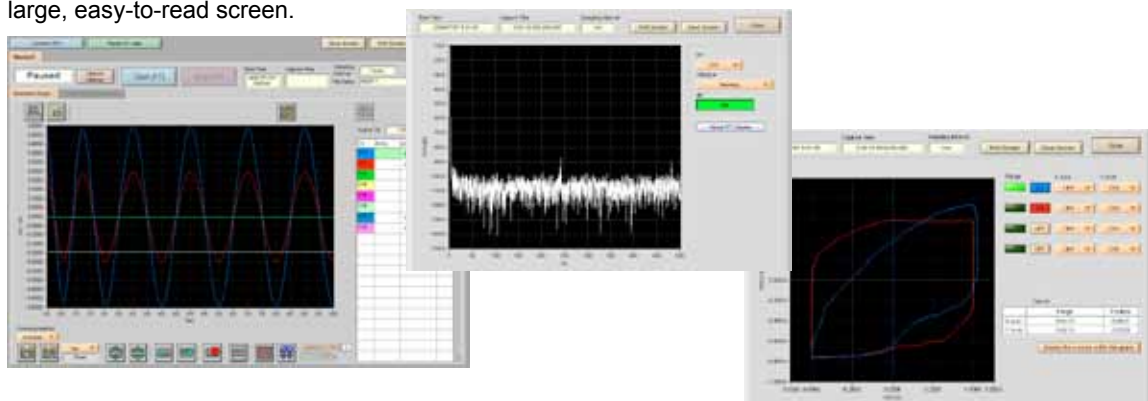
Easy operation

The large-size icons are easy to understand, and waveform operations are simple, even for first-time users. Changing the time axis, enlarging or reducing the span, and changing the waveform position are all functions that are easy to perform.

Max/Min display

The maximum and minimum values of the captured data can be checked at any time by simply clicking on this icon.

Printing function, Screen save function

The displayed waveform screen can be printed out on a printer, and a copy of the screen saved as a bitmap file.

(**Note:** To use the printing function, the device must be connected to a printer.)
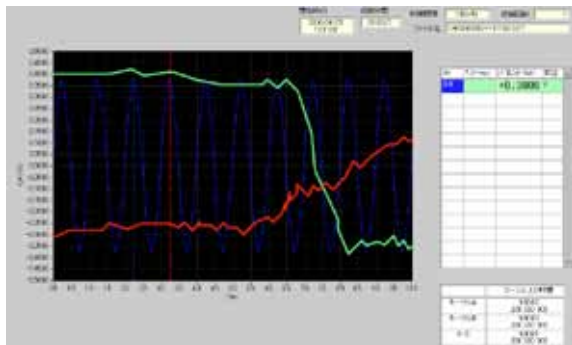
Help function

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

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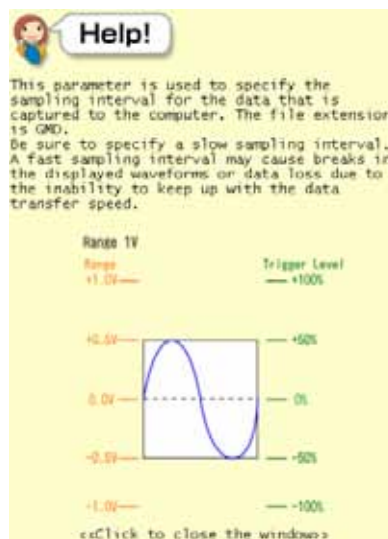
2. System Requirements

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

Item	System requirements
OS	Windows 2000, XP
CPU	Pentium 4: 1.7 GHz or higher
Memory	256 MB or more
HDD	20 MB additional space is required for installing software
Display	1024 × 768 resolution or higher, 65535 colors or more (16-bit or more)
Other	USB port、CD-ROM drive (for installing from CD)

Notes
- 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.
- This software cannot be used to control the 100-mm printer (B-502) that is available separately as an option.

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3. Installing the USB Driver

This chapter describes how to install the USB driver.

- If you are already using a DM Series device

  If you selected a driver that has already been used for a DM Series device, please reinstall the driver according

  the procedure given in the relevant subsection "Driver software is already installed".

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) Opening "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

DM/GL/WR Series USB Driver" is shown. Right-click it and select "Properties".

(3) Updating 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) Connecting the GL1000/1100 to the PC.

Connect the GL1000/1100 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 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.

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

Installing the USB driver

(1) Detecting the hardware

Connect the USB cable to the PC and GL1000/1100. The "Found New Hardware" message appears.

(2) Starting 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) In the "Select the device driver…." window, "Graphtec DM/GL/WR Series USB Driver" appears in the "Model" box. Select it and click "Next".

(7) Installing the driver

Windows XP starts installing the driver. Depending on the OS settings, the following error message may be displayed: "The software you are installing has not passed Windows Logo testing to verify its compatibility with Windows XP." Click the "Continue" button to proceed with the installation.

(8) Completing installation

The "Completing the Found New Hardware Wizard" window appears. Click "Finish" to exit the wizard.

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Windows XP: Driver software is already installed

Updating the USB driver

(1) Opening "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
DM/GL/WR Series USB Driver" is shown. Right-click it and select "Properties".

(3) Updating the driver

Select the "Driver" tab and click "Update Driver".

(4) Starting 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) Installing the driver

Windows XP starts installing the driver. Depending on the OS setting, "The software you are installing has not
passed Windows Logo Testing to verify its compatibility with Windows XP" message may appear. Simply click
"Continue Anyway".

(10) Completing the installation

The "Completing the Hardware Update Wizard" window appears. Click "Finish" to exit the wizard.

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

Installing the USB Driver

(1) Starting the wizard

Connect the USB cable to the PC and the GL1000/1100. 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" → "GTCUSBR.INF" and click "OK".

(5) "The wizard found a driver" message appears. Click "Next".

(6) Completing installation

The "Completing Found New Hardware Wizard" window appears. Click "Finish" to exit the wizard.

Windows 2000: Driver software is already installed

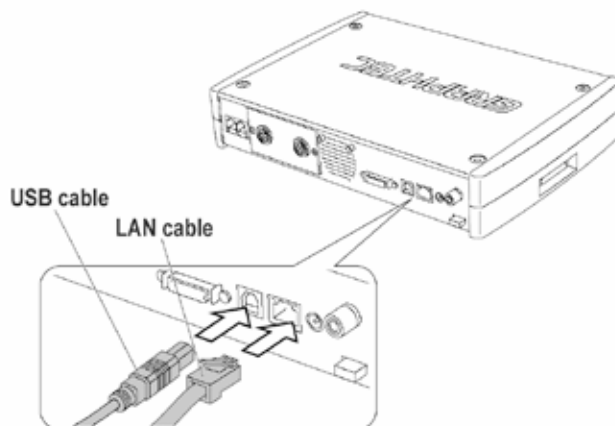Updating the USB driver

(1) Opening "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) Updating the driver

Select the "Driver" tab and click "Update Driver".

(4) Starting 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" → "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) Completing installation

The "Completing the Upgrade Device Driver Wizard" window appears. Click "Finish" to exit the wizard.

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4. Connecting to a PC (Personal Computer)

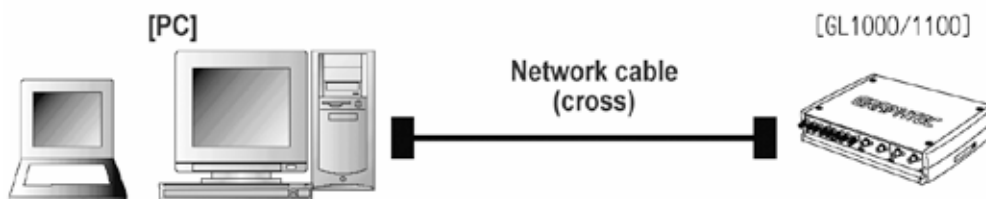The GL1000/1100 is connected to the PC via a USB cable or TCP-IP connection.

Notes
- To use a USB cable, a USB driver must be installed in the PC. Please see Section 3, "Installing the USB Driver" for the installation procedure.
- LAN cables are available as "straight" and "cross" types. Use the correct cable to suit the network configuration.
- When using the TCP-IP connection, do not connect the USB cable to the GL1000/1100.
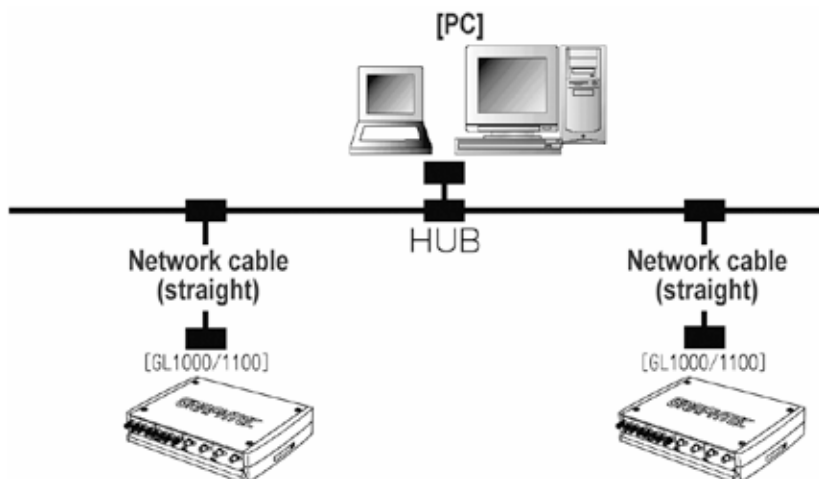
Connection types

Connection using a network cable
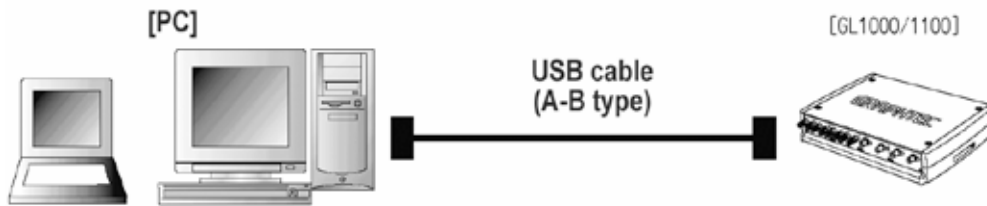
[Connecting the GL1000/1100 directly to the PC]
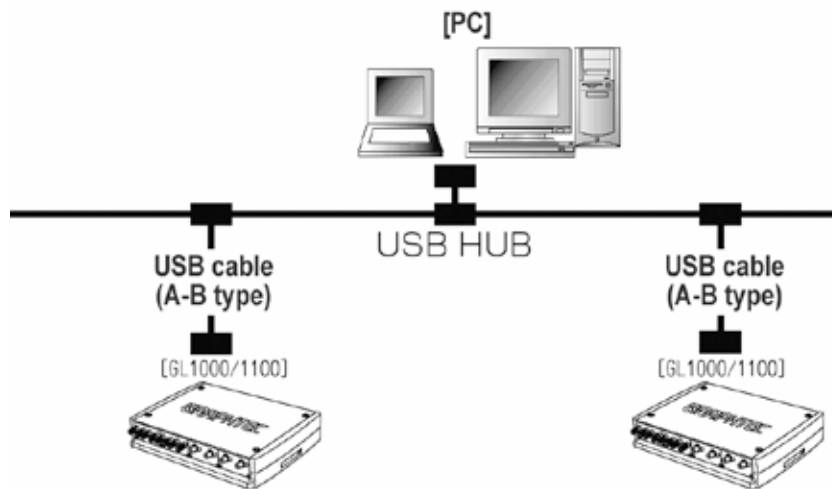

[Using a hub to connect multiple devices]

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Connection using a USB cable

[Connecting the GL1000/1100 directly to the PC]

[PC]

[GL1000/1100]

USB cable
(A-B type)

[Using a USB hub to connect multiple devices]

[PC]

USB HUB

USB cable
(A-B type)

USB cable
(A-B type)

[GL1000/1100]

[GL1000/1100]

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5. Setting the IP Address or USB ID

These settings are performed to connect the GL1000/1100 to the PC. The setting method varies according to whether the device monitor (option) or the PC is used to make the settings. Please select the method that suits your usage environment.
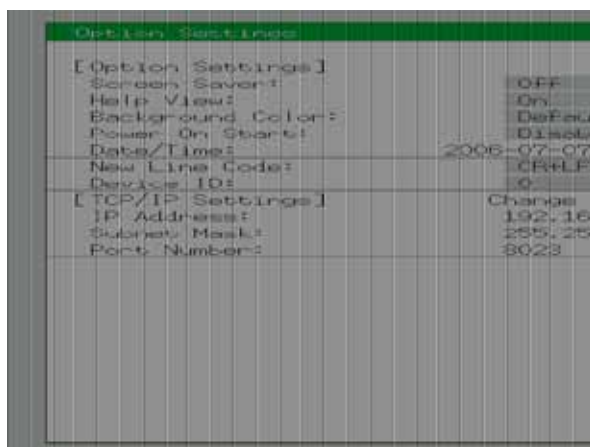
When using the monitor

USB settings

Click the [SYSTEM] key twice to display the [Options] screen.

If the [Device ID] parameter needs to be changed, specify the new ID.

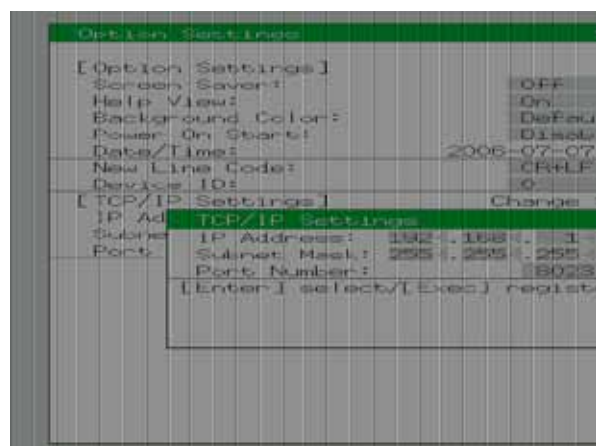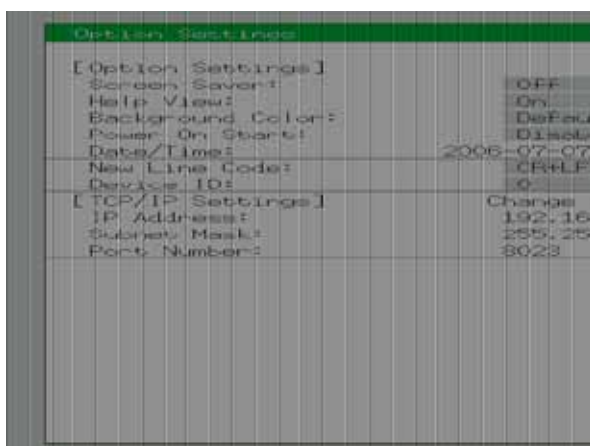Turn off the power supply to the GL1000/1100, and then turn it on again to apply your settings.

TCP-IP settings

Press the [SYSTEM] key twice to display the [Options] screen.

Make any changes required to the ［TCP-IP Settings］ section and then press the [ENTER] key.

Enter the [IP address], [Subnet mask] and [Port no.], and then press the [EXECUTE] key.

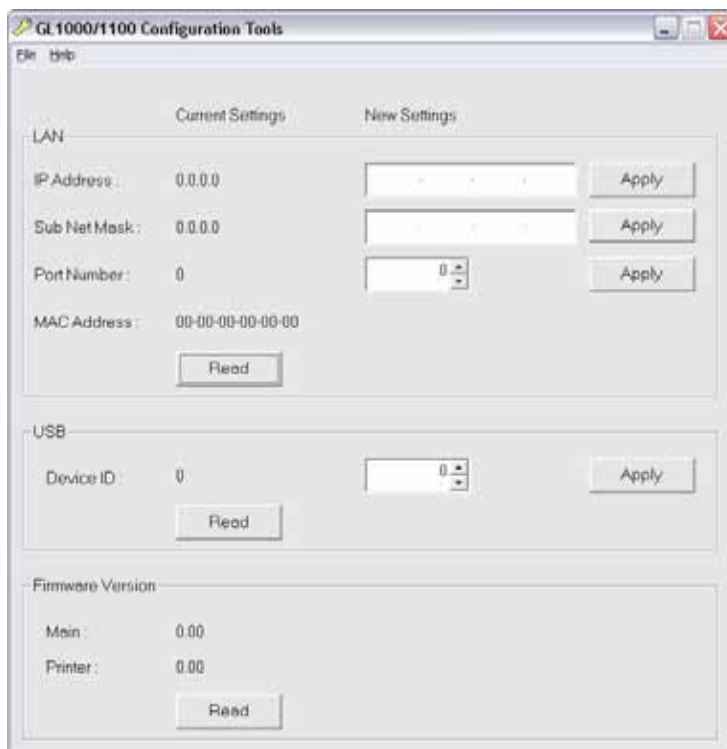Turn off the power supply to the GL1000/1100, and then turn it on again to apply your settings.

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The Configuration Tools utility is used when the PC is used to make the settings.

The Configuration Tools utility is provided together with the software that comes with the GL1000/1100. Please see Chapter 6, "Installing the Software" for the software installation procedure. Before installing the software, make sure that the USB driver has been installed according to the procedures given in Chapter 3, "Installing the USB Driver". Connect the GL1000/1100 to the PC using a USB cable.

Select［Start］→［HARD DISK LOGGER Software］→［GLCOBFIG］.

USB settings

Click the [Read] button in the [USB] section to display the current device ID. To set a new device ID, enter the new device ID in the input box, and then click [Apply].

Turn off the power supply to the GL1000/1100, and then turn it on again to apply your setting.

TCP-IP settings

Click the [Read] button in the [LAN] section to display the current settings.

Enter the new values for each of the setting items, and then click [Apply].

Turn off the power supply to the GL1000/1100, and then turn it on again to apply your settings.

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Examples of TCP-IP settings

When a single GL1000/1100 unit is connected to one PC

Use the following settings as a reference when the GL1000/1100 is not connected to an intra-company LAN.
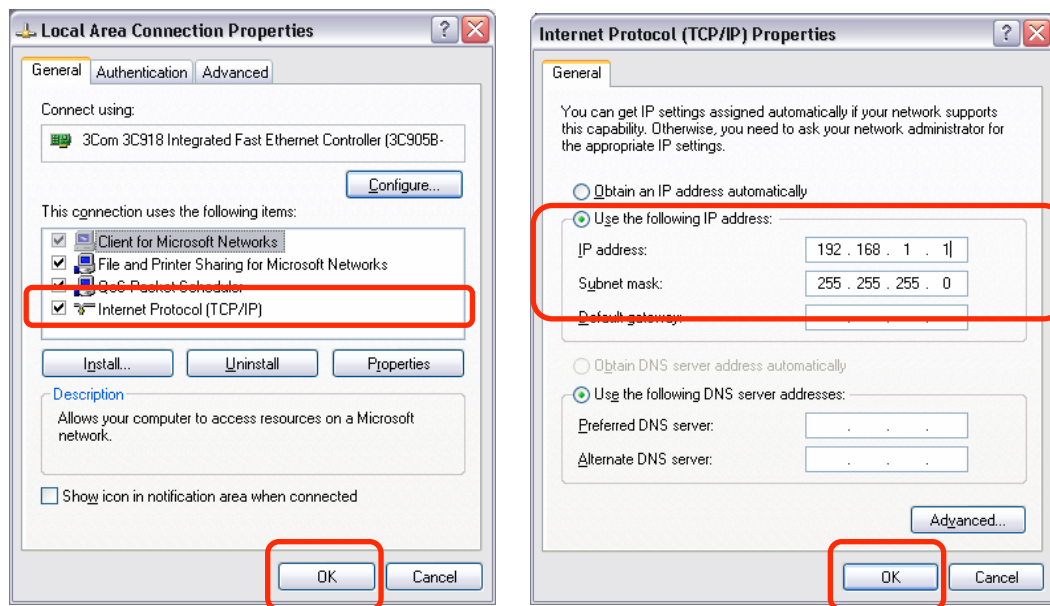
A cross-over cable is used to connect the GL1000/1100 to the PC.

PC IP address	192.168.1.1
GL1000/1100 IP address	192.168.1.2
IP address for the second and subsequent GL1000/1100 models	192.168.1.3 (the last digit, 3, is incremented by one to 4, 5, 6, and so on)

- In this case, the Subnet mask setting is always "255.255.255.0".
- In this case, the Port no. setting is always "8023".

PC IP address setting (Windows XP)

[Start menu] → [Control Panel] → [Network Connections] → [Local Area Connection] → [Properties] →
[Select Internet Protocol（TCP/IP）] → [Properties] → insert check in the "Use next IP address" checkbox →
make the [IP address] and [Subnet mask] settings →[OK]

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6. Installing the 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¥HARD DISK LOGGER Software¥Setup.exe as the name of the file you wish to open. If the disk is in drive D, for example, enter "D: ¥English¥HARD DISK LOGGER Software¥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.

Note

Be sure to observe the following points when connecting the GL1000/1100 to a PC.
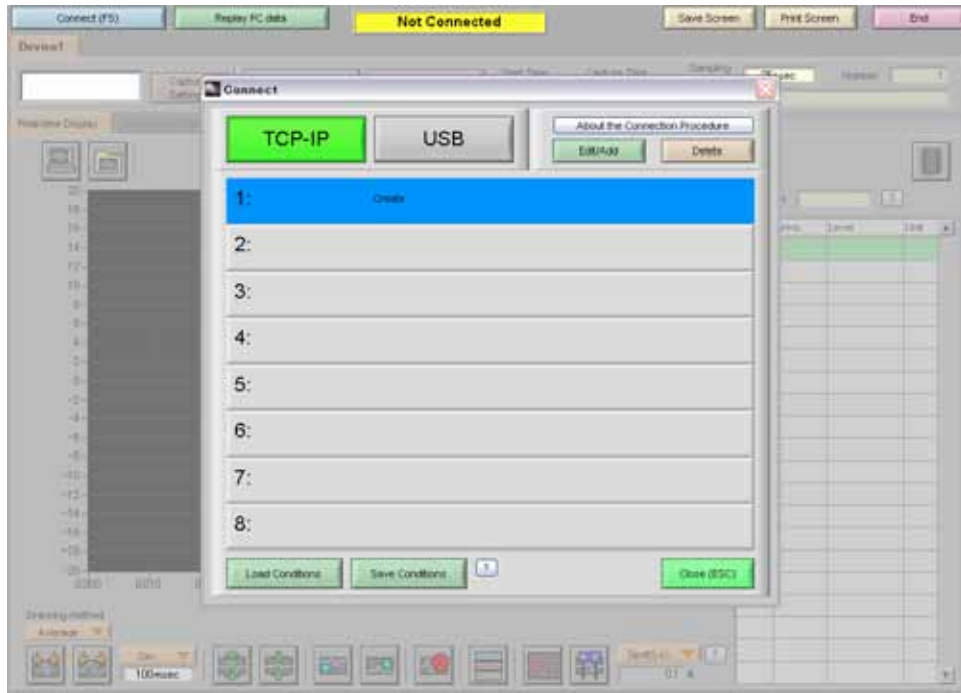
- Do not connect any devices apart from a mouse or a keyboard to any of the other USB terminals on your PC.
- Set the PC's power-saving functions to Off.
- Set the Screen Saver to Off.
- Set the anti-virus software auto update and scan scheduler functions to Off. Also, set the Windows auto update and scheduler functions to Off.

7. Launching the Software

Click the Taskbar's "Start" button → "Programs" → "HARD DISK LOGGER Software" → HARD DISK LOGGER Software" to launch the application software. Once the program has started up, the Connect screen is automatically displayed.
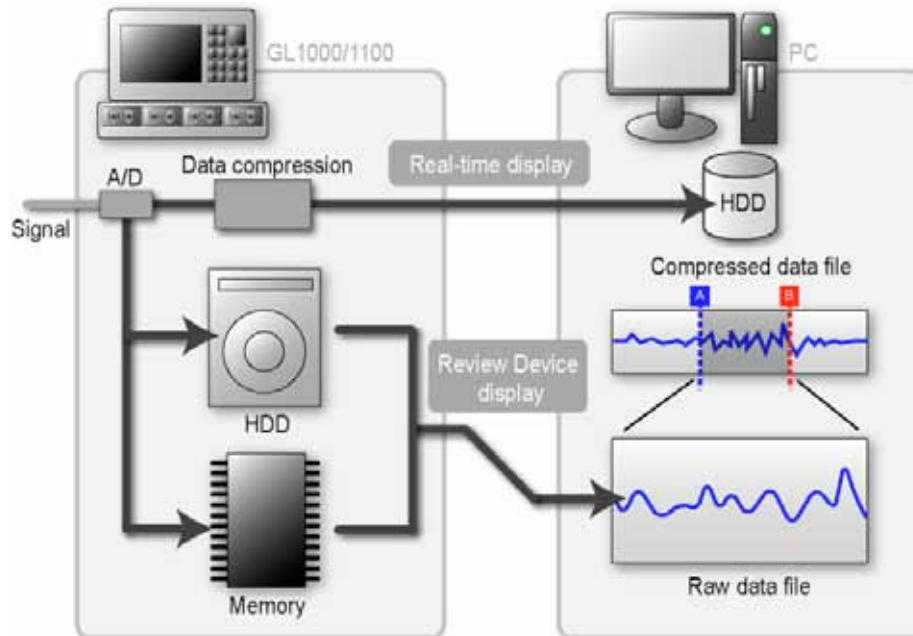
Points to note when launching the software
- If the GL1000/1100 (models fitted with the optional TFT LCD monitor) is in FFT mode, press the [MODE] key to switch the device to RECORDER mode.
- If the GL1000/1100 (models fitted with the optional TFT LCD monitor) is in REPLAY mode, press the [SHIFT] and [EXIT] keys simultaneously to switch the device to RECORDER mode.

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8. Data Flow

The data flow between the GL1000/1100 and the PC is as shown below.

Since data is sampled by the GL1000/1100 at a high speed, compressed data is sent from the device to the PC for display in real time. Accordingly, the data stored in the PC (GMD files) during a data capture operation is compressed data to be used for reference. When data is being displayed during a Review Device operation, sections of the compressed data (data between the cursors) and all the data obtained from the GL1000/1100's hard disk or device memory become raw data. This data can be converted to enable it to be saved to the PC.

Descriptions of the various operations and file types

Operation	File type	Description
Paused	N/A	Compressed data is sent from the device to the PC, and the software is used for waveform display. (Free Running)
Capturing data	Compressed data (GMD data)	Compressed data is captured to the PC.
Loading the data between the cursors from the compressed data	Device memory data HDD data (GDT) PCMCIA card data (GBD)	With the cursor positions in the compressed data used as the reference points, raw data is obtained from the device. The Convert then Save operation is used to save the data to a file in the PC.
Loading all the data from the compressed data	Device memory data HDD data (GDT) PCMCIA card data (GBD)	All the raw data corresponding to the compressed data is obtained from the device. The Convert then Save operation is used to save the data to a file in the PC.
Review Device data	Raw data (GBD data)	The desired section of raw data is obtained from the device. The Convert then Save operation is used to save the data to a file in the PC.

Descriptions of the file extensions

File extension	Description
GMD	This file extension denotes files to which compressed data that has been sent from the device to the PC has been captured. Since it is not raw data, use it for reference only.
GBD	This file extension denotes binary data files that were created by using the Convert then Save operation after a Review Device operation. Data saved to these files can be reviewed on the PC, and waveforms and digital values can be viewed.
GDT	This file extension denotes binary data that has been captured to the device's hard disk.

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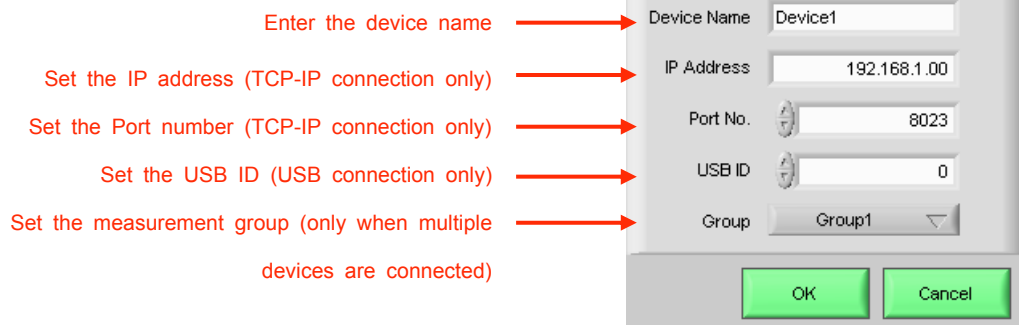
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9. PC Connection Settings

To connect only one device

The GL1000/1100 is connected to a PC via a TCP-IP connection or USB cable to enable communication between the devices.

(1) Click the "Connect (F5)" button on the main menu to display the Connect screen.

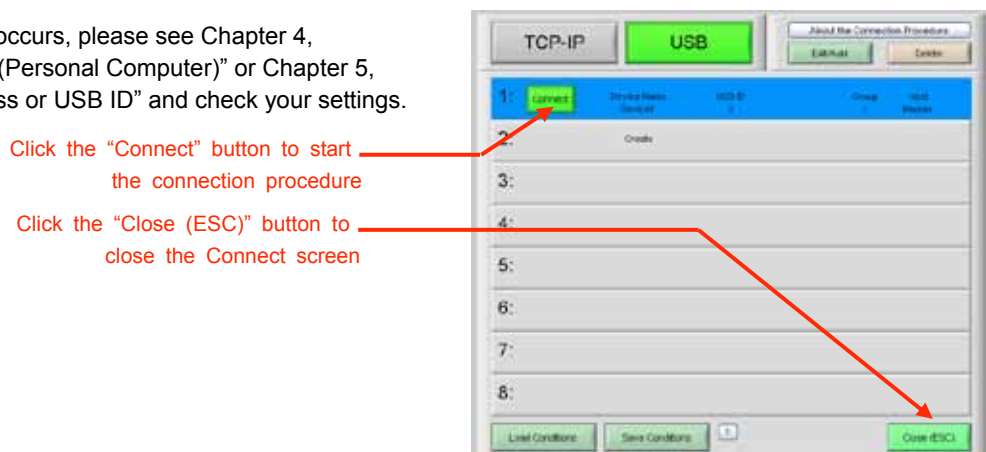(2) Click row "1:" to reverse the display color to blue, and then click the "Edit/Add" button.

Click to reverse the color to blue

Click the "Edit/Add" button

(3) Enter the name of the connected device and the transmission conditions (the conditions that were specified at the device) and then click the "OK" button. If a device name is not entered, it will automatically be assigned the name "Device1".

Enter the device name

Set the IP address (TCP-IP connection only)

Set the Port number (TCP-IP connection only)

Set the USB ID (USB connection only)

Set the measurement group (only when multiple devices are connected)

(4) Click the "Connect" button to make all the connections for transmission.

(5) Click "Close (ESC)" to close the Connect screen.

If a connection error occurs, please see Chapter 4, "Connecting to a PC (Personal Computer)" or Chapter 5, "Setting the IP Address or USB ID" and check your settings.

Click the "Connect" button to start the connection procedure

Click the "Close (ESC)" button to close the Connect screen

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To connect multiple devices

There are two methods of connecting multiple devices: "Linked connection" and "Independent connection".

Linked connection method

Linked connection is a function that enables multiple devices that are linked together using the optional device linking cables (B-515) to be controlled as a single device by the software by specifying the same group number for all the devices. This connection method is suitable for when multiple channels are required.

   Note: The linked connection function is not available for the GL1100 model.

The device with a device linking cable inserted into its OUT connector only becomes the "MASTER" device, and is the device used as the control device. A device with a device linking cable inserted into its IN connector becomes a SLAVE device, and obeys the MASTER device. Specify the same group number for multiple devices that are linked together this way.
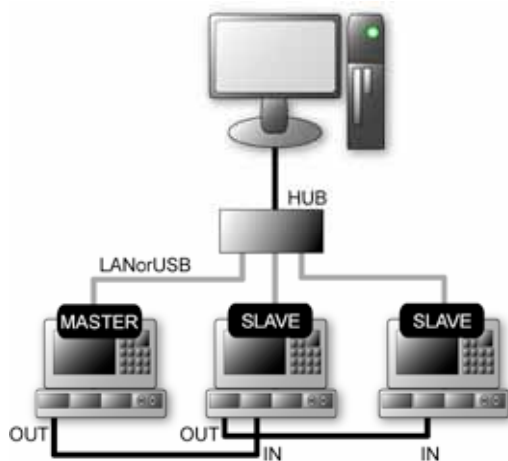
Independent connection method

With the independent connection method, the optional B-515 device linking cable is not used. A different group is specified for each device in the software to enable multiple devices to be controlled independently of each other. Accordingly, this connection method is suitable for when the control of several devices by one PC is required.
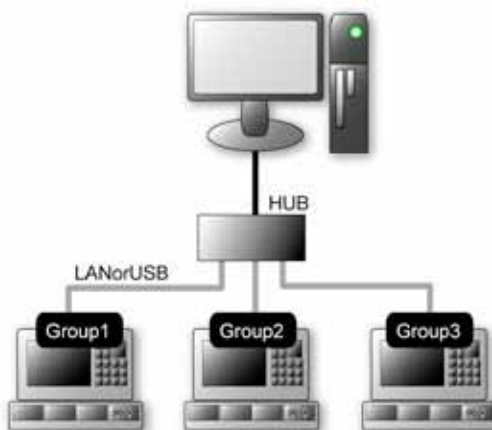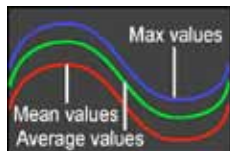
10. Display Screens

This chapter describes the various screens used in this software.

10-1 Real-time Display

No.	Name	Description
1	Connect (F5)	Click this button to open the Connect screen.
2	Replay PC Data	Click this button to replay GBD data that was captured to the PC (personal computer).
3	Save Screen	Click this button to save the waveform display screen as a bitmap file.
4	Print Screen	Click this button to print out a copy of the screen. Printing is performed at the printer that has been selected as the default printer. If you change the printer, relaunch the software.
5	End	Click this button to exit the application.
6	Device selection tab	Use this tab to change the device used as the control device when multiple devices have been connected.
7	Simplified message area	The operating status is displayed here.
8	Screen selection tab	This tab is used to switch between the real-time and compressed data displays.
9	Capture Settings	Click this button to open the data capture settings screen to make settings.
10	Start (F7)	Click this button to start data capture.
11	Stop (F8)	Click this button to stop data capture.

For item 7, the operating status values:

Paused	Free running status where data is not being captured (measurement stopped status)
Armed	Awaiting trigger activation; data has not been captured
Recording	Data capture status
Finished	Data captured has ended. Click the "Stop" button.

For item 8, the screen selection tab values:

Real-time display	Compressed data is displayed
Compressed data display	Captured compressed data is replayed

No.	Name	Description	
12	Capture Information	Information is displayed here during a data capture operation.	
		Start Time	Data capture start time
		Capture Time	The amount of time that has elapsed since the start of data capture
		Number	The number of data capture operations when Repeat Capture has been specified
		Capture Interval	The sampling interval
		Capture File Name	The data capture destination file name
13	Digital	The digital values for each channel are displayed in this area. Clicking the cursor on any of the CH numbers enables that channel to become the active channel. The active channel is displayed in green, and can be used to perform the waveform operations mentioned in item 15 below.	
14	Waveform	The waveforms are displayed in this area.	
15	Waveform Op.	Click on the icons to perform the various waveform operations.	
16	Drawing method	With real-time and compressed data displays, the data sent from the device to the PC is compressed into the maximum and minimum values. Use this button to change the drawing method.	
		Average values	The averages of the maximum and minimum values are displayed.
		Max values	The maximum values are displayed.
		Mean values	The minimum values are displayed.
		Interpolation	A line connecting the maximum and minimum values is displayed.

- During a compressed data review operation, the data may not be displayed if the PC's sampling cycle is shorter than the device's capture time. In such cases, use the Review Device function to check the data.
- When the software status is Free Running status (measurement stopped), the device is operating in RECORDER mode and data capture is not performed.

10.2 Descriptions of the Icons

This software uses icons as visual representations of the file and waveform operations to make these operations easier to understand.
There are two main icon groups: File operations/functions, and Waveform operations.

File operation/function icons

Name	Icon	Description
Review device		Click this icon to replay data has been saved to the device's internal memory or hard disk.
Opening a compressed file		Click this icon to open a compressed file (GMD file) that has been saved to the PC.
Loading the data between the cursors		Click this icon to load and replay data from the device that corresponds to the section of data between the cursors in the currently open compressed data file.
Loading all the data		Click this icon to load and replay data from the device that corresponds to the currently open compressed data file.

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Name	Icon	Description
Cursors A, B		Click this icon to display the cursors within the waveform.
Max/Min		Click this icon to display the maximum and minimum values for each channel.
Comment input		Click this icon to enable a comment to be input at the Cursor A position within the waveform. Up to 20 characters can be input for the comment.
Search		Click this icon to search for the desired level values and the maximum/minimum values.
Display the Cursor A（B, A-B）level		Click this icon to enable selection of the level displayed in the digital area. A： Cursor A level value B： Cursor B level value AB： The difference between the levels for Cursor A and B.
Manual trigger		Click this icon to generate a trigger when Manual Trigger has been specified.
Memory status		Click this icon to browse the memory's data capture status.

Waveform operation icons

Name	Icon	Description
Enlarging the Waveform/Reducing the Waveform		Click the corresponding icon to enlarge or reduce the waveform display in the X-axis direction.
Enlarging the Level/Reducing the Level Axis		Click the corresponding icon to enlarge or reduce the waveform displayed for the active channel in the Y-axis direction.
Moving the Position Up/Moving the Position Down		Click the corresponding icon to move the waveform displayed for the active channel up or down.
Waveform Display On/Off		Click this icon to switch between Waveform Display On and Waveform Display Off for the active channel.
Scale Settings		Click this icon to enable changes to be made to the number of Y-axis ranges and to set the number of display divisions.
Plot		Click this icon to display plot marks for the sampled points on the waveform.
Fixing the Cursors		Click this icon to fix the positions of Cursors A and B with respect to the movement of the scroll bar.

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10-3 Replay Screen

This screen is used to replay data that has been captured to the PC, and to replay data that has been captured to the device.
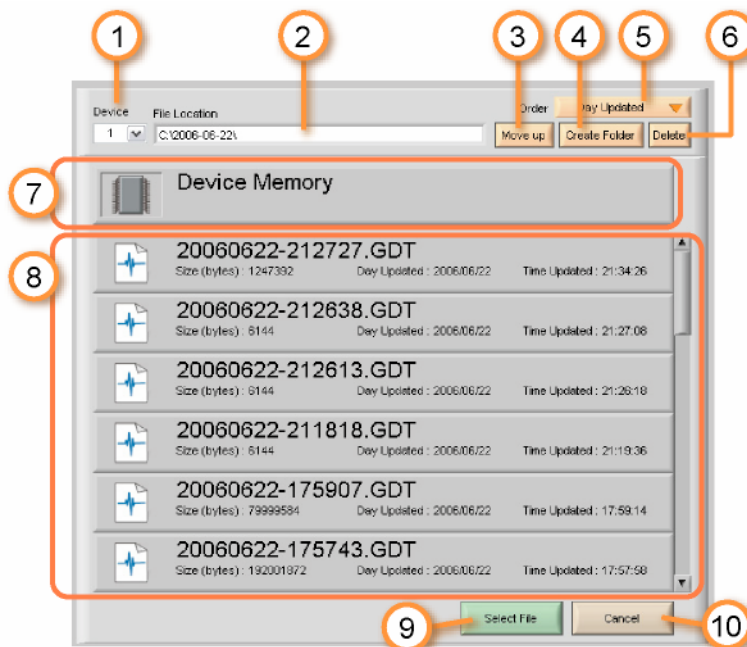

No.	Name	Description
1	Open File	Click this button to open the file that you wish to replay.
2	Superimpose/Link	Click this button to display a screen showing superimposed or linked data from multiple files.
3	FFT between Cursors	Click this button to display the data between the A and B cursors in FFT format.
4	XY between Cursors	Click this button to display the data between the A and B cursors in XY format.
5	Convert then Save	Click this button to convert the file that is being replayed to CSV format or to perform spot sampling of the data.
6	Save Screen	Click this button to save the displayed screen as a BMP file.
7	Print Screen	Click this button to print out a copy of the screen. Printing is performed at the printer that has been selected as the default printer. If you change the printer, relaunch the software.
8	Close	Click this button to close the data replay screen.
9	Displayed Information	The replay file information is displayed here. <table><tr><td>Capture File Name</td><td>The path for the data capture file that is being replayed</td></tr><tr><td>Start Time</td><td>The time at which data capture was started</td></tr><tr><td>Capture Time</td><td>The data capture time</td></tr><tr><td>Sampling Interval</td><td>The sampling interval</td></tr></table>
10	Cursor Time	The Cursor A and Cursor B times, and the difference between them are displayed here.
11	Scroll Bar	Use this scroll bar to scroll the waveform that is displayed on the graph. The blue area is the area that is currently being displayed.

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No.	Name	Description
12	Compressed Data Display selection tab	Use this tab to perform spot sampling of the displayed data.

Spot Sampling（Off）	Data is displayed without any spot sampling performed.
Spot Sampling（Lo）	Spot sampling of the data is performed.
Spot Sampling（Hi）	Spot sampling of the data is performed.

The percentage value (%) indicates the percentage of the data displayed within the graph area with respect to data on which spot sampling has not been performed.

50% → Indicates that half of the actual data is displayed.

The value is automatically linked to the enlargement/reduction ratio of the X axis.

10-4 Open Captured Data Screen

This screen is used to select the captured data.

No.	Name	Description
1	Device	Use this button to select the master device when multiple devices are linked together.
2	File Location	The file path is displayed here.
3	Move up	Click this button to move up to the next level.
4	Create Folder	Click this button to create a new folder.
5	Order	Use this button to change the file order.
6	Delete	Click this button to delete a file or a folder.
7	Device Memory/ Frequently-used Folder	When replaying data that has been saved to the device, click this button to select the device's internal memory. When replaying data that been saved to the PC, this button can be used for registering a frequently–used folder
8	File List	The replay files are displayed in a list format.
9	Select File	Click this button to select a file to replay.
10	Cancel	Click this button to close the screen without replaying any data.

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Review PC Screen
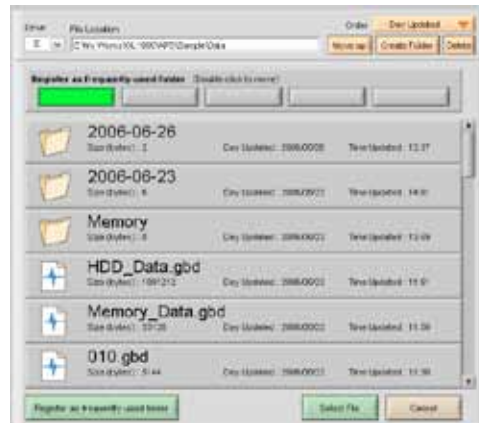
10.5 Superimpose/Link

The Superimpose/Link screen is displayed when the "Superimpose/Link" button described in Section 10-5 is clicked.
The Superimpose function displays multiple data files superimposed on one waveform, and is therefore ideal for comparing the amount of change.
The Link function enables several data files to be linked together and displayed as one file.
Note: Only files that were captured using the same sampling interval can be linked.
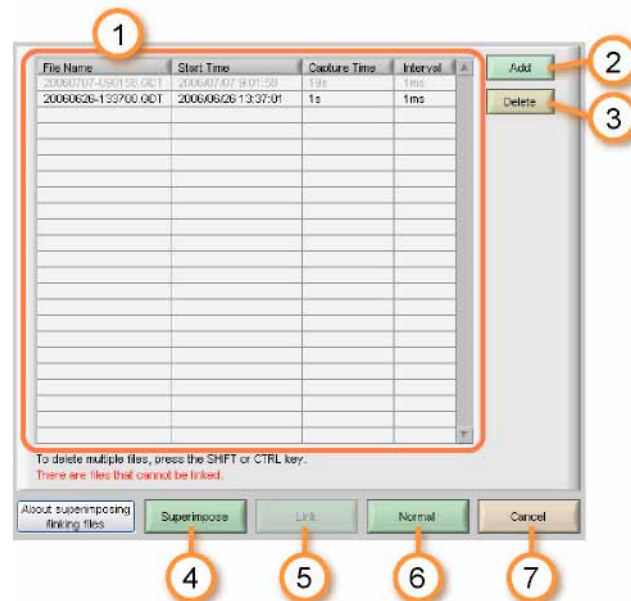
No.	Name	Description
1	File List	The files selected for the superimposing or linking operations are displayed here in a list format.
		Capture File Name — The path for the data capture file that is being replayed
		Start Time — The time at which data capture was started
		Capture Time — The data capture time
		Sampling Interval — The sampling interval
2	Add	Click this button to open a screen for adding a file.
3	Delete	Click this button to delete the selected file from the list.
4	Superimpose	Click this button to display the superimposed files.
5	Link	Click this button to display the linked files
6	Normal	Click this button to display the original file in its normal status.
7	Cancel	Click this button to close the screen without performing any operations.

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10-6 FFT between Cursors

The data replay screen can be used to display the data between the A and B cursors in FFT format.
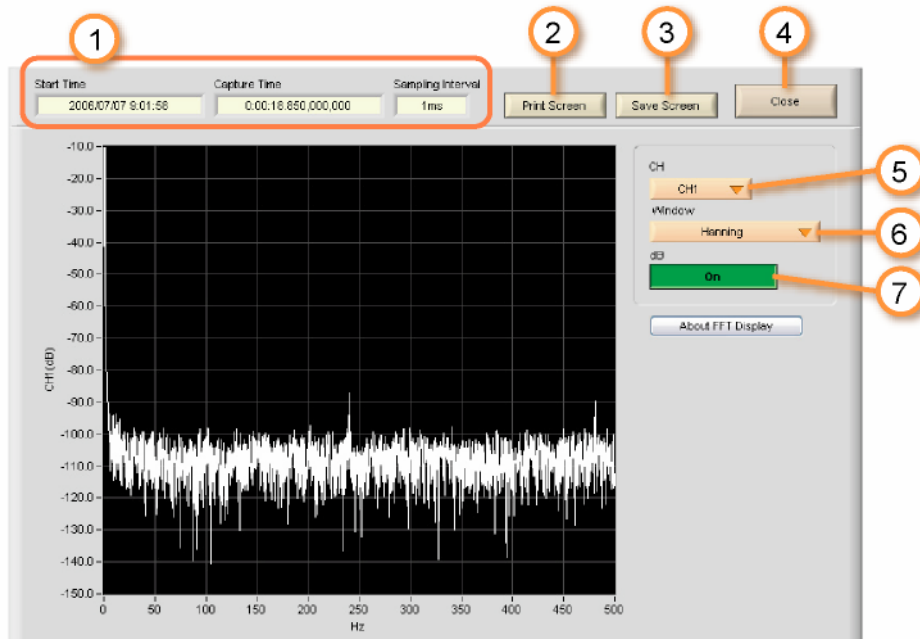
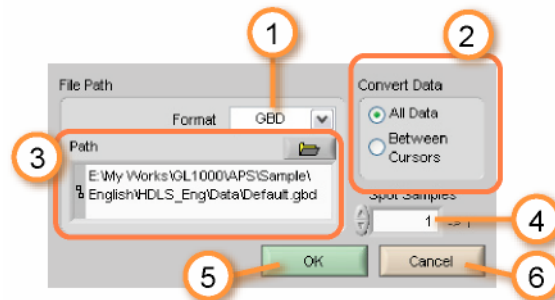| No.	Name	Description
1	Displayed information	The information for the file that is being displayed in FFT format is displayed here.
		Start Time — The time at which data capture was started
		Capture Time — The data capture time
		Sampling Interval — The sampling interval
2	Print Screen	Click this button to print out a copy of the screen. Printing is performed at the printer that has been selected as the default printer. If you change the printer, relaunch the software.
3	Save Screen	Click this button to save the displayed screen as a bitmap file.
4	Close	Click this button to close the screen.
5	CH	Use this button to select the channel for display.
6	Window	Use this button to select the FFT window function.
7	dB	Click this button to specify On for dB.

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10-7 XY between Cursors

The data replay screen can be used to display the data between the A and B cursors in XY format.

No.	Name	Description
1	Displayed information	The information for the file that is being displayed in XY format is displayed here. <table><tr><td>Start Time</td><td>The time at which data capture was started</td></tr><tr><td>Capture Time</td><td>The data capture time</td></tr><tr><td>Sampling Interval</td><td>The sampling interval</td></tr></table>
2	Print Screen	Click this button to print out a copy of the screen. Printing is performed at the printer that has been selected as the default printer. If you change the printer, relaunch the software.
3	Save Screen	Click this button to save the displayed screen as a bitmap file.
4	Close	Click this button to close the screen.
5	CH Settings	XY settings can be made for up to a maximum of four channels. <table><tr><td>Range</td><td>These buttons specify display of the scale values for the channels selected for the X and Y axes.</td></tr><tr><td>Off/On</td><td>Click these buttons to specify each XY display as On or Off.</td></tr><tr><td>X axis</td><td>Use this button to select the channel for the X axis.</td></tr><tr><td>Y axis</td><td>Use this button to select the channels for the Y axis.</td></tr></table>
6	Cursor information	The range and level information for the channels selected using the Range buttons is displayed here.
7	Display Cursor	Click this button to move the cursor to the center of the graph.

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10-8 Convert then Save

This function can be used to convert the data being replayed to a different format such as CSV. All of the data or just the data between the cursors can be specified.

No.	Name	Description	
1	Save format	Use this button to select the data save format.	
		GBD	Dedicated binary data that can be replayed by using this software.
		CSV	Text data that can be displayed in a Microsoft Excel file. Please note that the maximum number of data points that can be replayed in Excel is 64000.
2	Data to be converted	Use this button to select the range of data for conversion.	
3	Path	Use this button to specify the data capture destination and file name.	
4	Spot samples	Use this button to select the interval for performing spot sampling when the data is saved. Example: If 10 has been selected, 1 point out of 10 is sampled (the other 9 points are disregarded).	
5	OK	Click this button to perform the Convert then Save operation.	
6	Cancel	Click this button to close the screen.	

10-9 Max/Min Display

This function is used to display the maximum and minimum values for each of the channels between the cursors during a data capture or data replay operation.
Moreover the results can be saved in the CSV file format
Note: The average and P-P values are not displayed during a data capture operation.

CH	Min	Min Time	Max	Max Time	Average	P-P
CH1	-0.4988	06-07-07 09:01:59	+0.5012	06-07-07 09:02:00	-0.0683	+1.0000
CH2	-0.4998	06-07-07 09:01:59	+0.5009	06-07-07 09:02:00	-0.0689	+1.0007
CH3	-0.0056	06-07-07 09:01:59	+0.0024	06-07-07 09:01:59	-0.0002	+0.0080
CH4	-0.0062	06-07-07 09:01:59	+0.0024	06-07-07 09:01:59	-0.0004	+0.0087
CH5	-16.238	06-07-07 09:02:01	-16.047	06-07-07 09:02:00	-16.131	+0.191
CH6	-3.887	06-07-07 09:02:01	-3.855	06-07-07 09:02:01	-3.871	+0.032
CH7	-0.0002	06-07-07 09:01:59	+0.0014	06-07-07 09:02:00	+0.0006	+0.0016
CH8	-0.0007	06-07-07 09:02:00	+0.0009	06-07-07 09:01:59	+0.0001	+0.0016

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10-10 Comment Input

Use this function to input a comment above the waveform of the desired channel during a data capture operation.
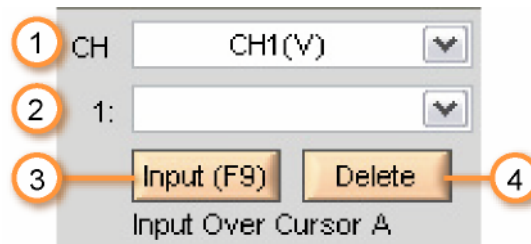
No.	Name	Description
1	CH	Use this button to select the channel for comment input.
2	Comment input field	Input the comment(s) in this field. Up to 20 comments can be input. The location of comments that have already been input can be selected with the pull-down arrow and moved.
3	Input	Click this button to enter the comment. It will be input at the Cursor A position.
4	Delete	Click this button to delete the comment selected from the comment input field.

11. Settings Screens

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

11-1 AMP Settings

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

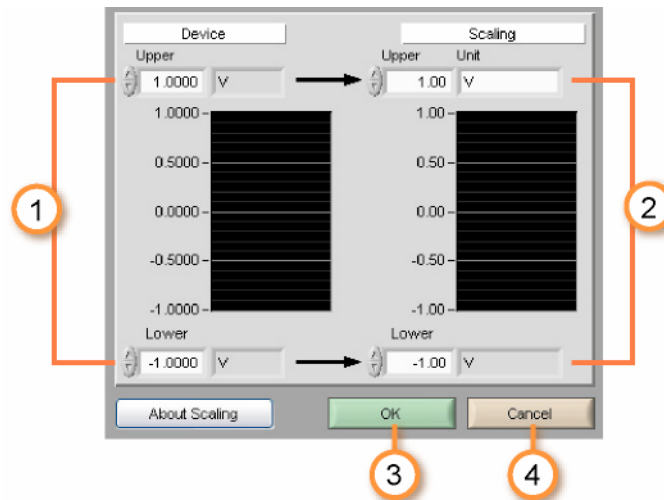| No.	Name	Description	
1	Settings tabs	These tabs are used to change the setting screen.	
		AMP settings	This tab is used to make input-related settings.
		Capture/Trigger settings	This tab is used to make settings related to the data capture and trigger functions.
		Other settings	This tab is used to make various other settings, to display information, and so forth.
2	CH	These are the channel numbers for analog input.	
3	Amp	The amp types that are mounted in the device are displayed here.	
4	Color	The color used for the waveform for each channel can be specified here.	
5	Annotation	Each channel can be freely annotated (input the signal name, etc.)	
6	Input	Use these buttons to select the input type for each channel. Please see the User's Manual for your device for information concerning the input specifications for each amp.	
7	Range	Use these buttons to select the input range for each channel. Please see the User's Manual for your device for information concerning the range specifications for each amp.	
8	Filter	Use these buttons to select the filter for each channel. Please see the User's Manual for your device for information concerning the filter specifications for each amp.	
9	Unit	The selected unit is displayed here.	
10	Span	Use these buttons to set the upper limit and lower limit values for the waveforms displayed in the waveform graph.	

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No.	Name	Description		
11	Scaling	Use these buttons to convert the unit.		
12	CH Group	The CH setting can be changed in 8-channel units.		
13	Logic Settings	Use this button to enable or disable the logic settings.		
14	Color	Make the logic line color setting here.		
15	Threshold value	Specify the threshold value for the logic signals here.		
		TTL (1.4 V)	When a logic signal of approximately 1.4 V or higher is input, the level goes High.	
		CONST (2.5 V)	When a logic signal of approximately 2.5 V or higher is input, the level goes High.	
		Contact (5.0 V)	When a logic signal of approximately 5.0 V or higher is input, the level goes High.	
16	OK	Click this button to apply your settings and close the screen.		
17	Cancel	Click this button to close the screen without applying your settings.		
18	Apply	Click this button to apply the settings made.		

11-1-1 Span Settings
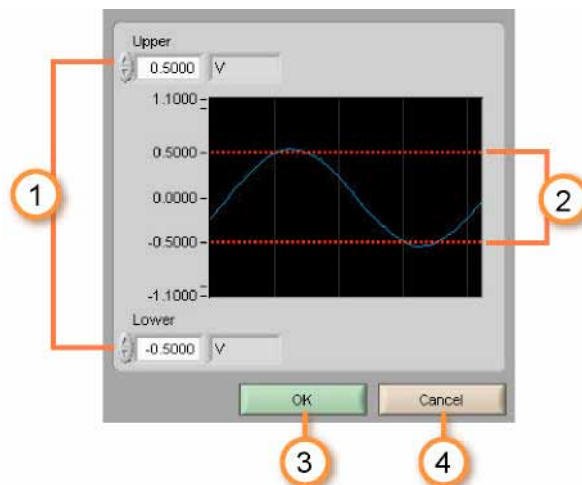
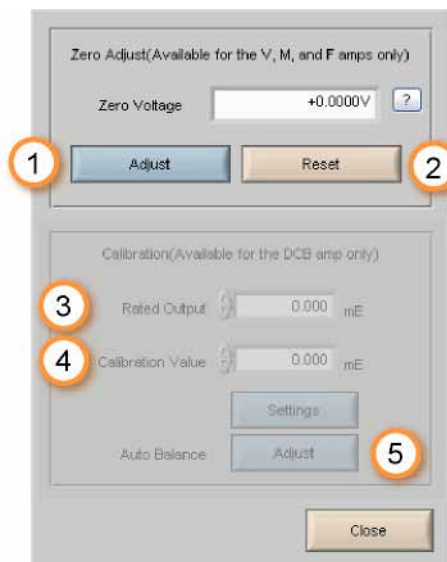| No.	Name	Description
1	Numerical input	Input the upper and lower limit numerical values here.
2	Cursor specification	The upper and lower limits can be set by specifying the cursor range.
3	OK	Click this button to apply your span settings.
4	Cancel	Click this button to cancel your span settings

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11-1-2 Scaling Settings

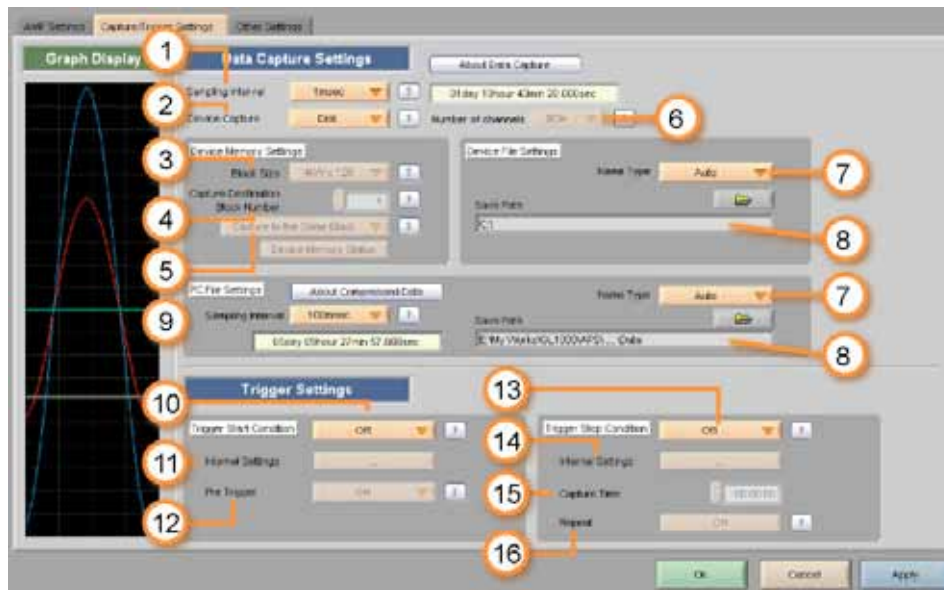| No.	Name	Description
1	Input of measured values	Input the upper and lower limits for the measured values here.
2	Input of scaling unit	Input the upper and lower limits for the scaling values here.
3	OK	Click this button to enable your scaling settings and close the screen.
4	Cancel	Click this button to disable your scaling settings and close the screen.

11-1-3 Other Settings

This screen is used to perform zero adjustment and to make calibration settings for the DCB amp.

No.	Name	Description
1	Perform auto zero adjustment	Click this button to adjust the input signal offset to the zero point position.
2	Reset auto zero adjustment	Click this button to reset the zero point adjustment setting.
3	Rated output/Calibration values	Enter the rated output and calibration values here (enabled for the DCB amp only).
4	Calibration	Click to perform setting of the specified rated output and calibration values (enabled for the DCB amp only).
5	Auto balance	Click to perform auto balance (enabled for the DCB amp only).

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

No.	Name	Description	
1	［Device］ Sampling Interval	Use this button to select the sampling interval for capturing data to the device.	
2	Device Capture	Select the capture destination for the device.	
		Device Memory	Data is captured to the device's internal memory. Data stored to the device memory is deleted when the power to the device is turned off. Be sure to save the data to a disk or other memory device before turning the power off.
		Disk	Data is captured to the hard disk or to a PCMCIA card.
3	Block Size	When the device capture destination is Device Memory, use this button to select the block size. Please note that if the block size is changed, any captured data will be lost.	
4	Capture Destination Block Number	Use this button to specify the block number for data capture.	
5	Capture method	Select the data capture method.	
		Capture to the same block	Data is captured to the specified block number.
		Capture sequentially	After data has been captured to the specified block, it is then captured to the next block.
		Capture to an empty block	After data has been captured to the specified block, it is then captured to the next empty block.
6	Disk capture CH	When the device capture destination is Disk, use this button to specify the number of data capture channels. If the device is an 8-channel model, this setting is always 8CH. If the device is a 16-channel model, either 8CH or 16CH can be selected. If 8 CH is selected, the maximum sampling speed can be specified in a range up to 1 µs. If 16CH is selected for the number of data capture channels, the maximum sampling speed becomes 2µs.	
7	File Type	Select the method for appending the file name.	
		Auto	A folder with the date as the file name is created in the specified folder, and then a file with the date and time as the file name is created within the new folder.
		User	The file name can be freely specified by the user.

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No.	Name	Description
8	Save Path	[**Device File Settings**] Select the save destination at the device for the captured data here. [**PC File Settings**] Select the save destination at the PC for the captured data here
9	[PC] Sampling Interval	Use this button to select the sampling interval for capturing data to the PC.
10	Trigger Start Condition	This parameter specifies the trigger condition for starting data capture. | Off	No condition is required for the start of data capture. | | Internal | Data capture starts when the specified trigger condition is satisfied. | | Manual | Data capture starts when the Manual Trigger button is clicked. |
11	Trigger Level	When Internal has been selected for the trigger start condition, use this button to make the Level condition setting.
12	Pre-trigger	Use this button to capture data prior to the trigger being activated. [If the capture destination is Device Memory] Specify the percentage of the data to be captured prior to the trigger being activated with respect to the capacity of one memory block. [If the capture destination is Disk] Select whether or not to include data prior to the trigger being activated.
13	Trigger Stop Condition	This parameter specifies the trigger condition for stopping data capture. | Off | There is no trigger condition for stopping data capture | | Internal | Data capture stops when the specified trigger condition is satisfied. | | Manual | Data capture stops when the Manual Trigger button is clicked. | | Time | Data capture stops when data capture has been performed for the specified length of time. |
14	Trigger Level	When Internal has been selected for the trigger stop condition, use this button to make the Level condition setting.
15	Capture Time	When Time has been selected for the trigger stop condition, use this button to specify the capture time.
16	Repeat Capture	Use this button to specify repeat capture when the memory becomes full or when a stop trigger has been activated. [When the data capture destination is Device Memory] Data capture is performed repeatedly when the memory becomes full or when a stop trigger has been activated. [When the data capture destination is Disk] Data capture is performed repeatedly when a stop trigger has been activated.

11-2-1 Device Memory Settings

The device memory settings are made at this screen.
Please see the User's Manual for your device for details.

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11-2-2 PC Capture Destination Settings

The screen that is normally used to open Windows is used to make the settings for the PC save destination.

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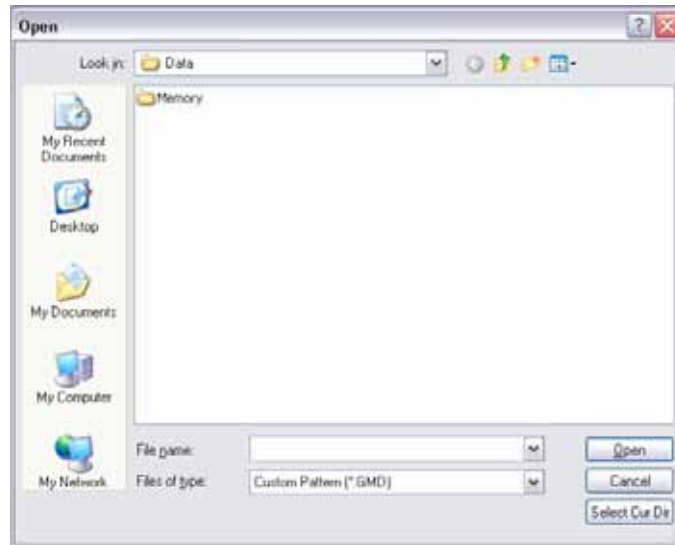
11-2-3 Internal Trigger Settings

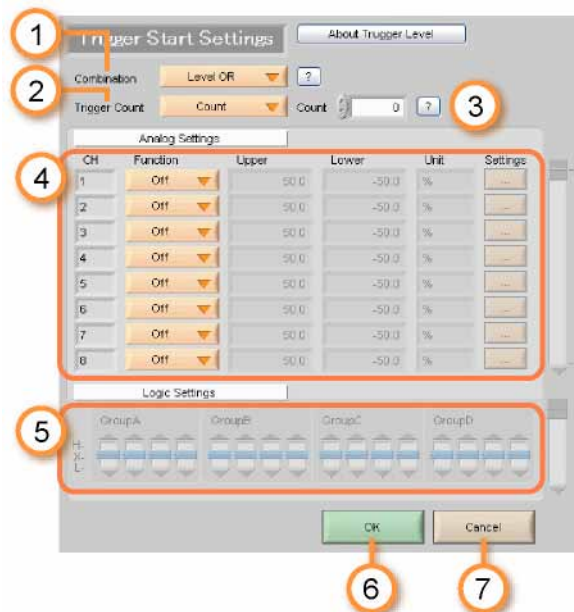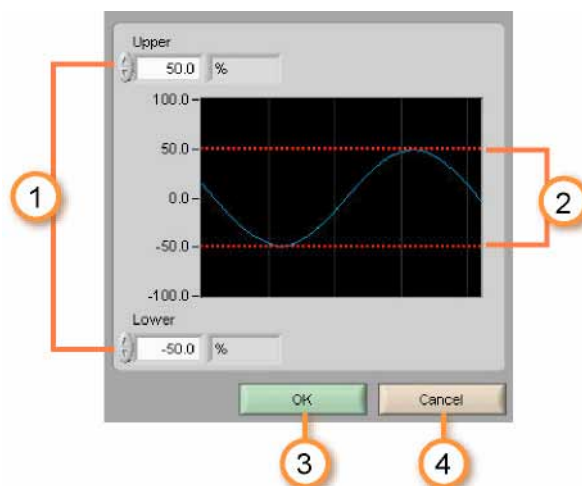| No.	Name	Description	
1	Combination	Use this button to select the trigger combination for each channel.	
		Level OR	The trigger is activated when one of the target channels satisfies the trigger condition.
		Level AND	The trigger is activated when all of the target channels satisfy the trigger condition.
		Edge OR	After all of the target channels have reached a level that does not satisfy the trigger condition, the trigger is activated when any one of the target channels satisfies the trigger condition.
		Edge AND	After all of the target channels have reached a level that does not satisfy the trigger condition, the trigger is activated when all of the target channels satisfy the trigger condition.
2	Trigger Counter	This parameter can be used when the combination setting is Level OR or AND.	
		Count	The trigger is activated when the number of generated triggers reaches the specified number of counts.
		Filter	The trigger is activated when a signal that satisfies the condition that it must exceed the time calculated by multiplying the Sampling Interval Time by the Number of Counts is input.

No.	Name	Description
3	Analog Settings Function	This parameter is used to set the trigger condition.

Off	No target channel has been specified.
Hi	The trigger is activated when the input signal rises to (or exceeds) the specified trigger level.
Lo	The trigger is activated when the input signal falls to (or falls below) the specified trigger level.
WinIn	The lower-limit and upper-limit levels for each channel are set for each channel. The trigger is activated when the input signal is inside (or goes inside) both the specified lower-limit and upper-limit levels.
WinOut	The lower-limit and upper-limit levels for each channel are set for each channel. The trigger is activated when the input signal is outside (or goes outside) both the specified lower-limit and upper-limit levels.

No.	Name	Description
4	Setting	Use these buttons to specify the level.
5	Logic settings	This parameter specifies the logic trigger setting.

X	Trigger detection is not performed.
H	The trigger is activated when the input signal rises to (or exceeds) the specified trigger level.
L	The trigger is activated when the input signal falls to (or falls below) the specified trigger level.

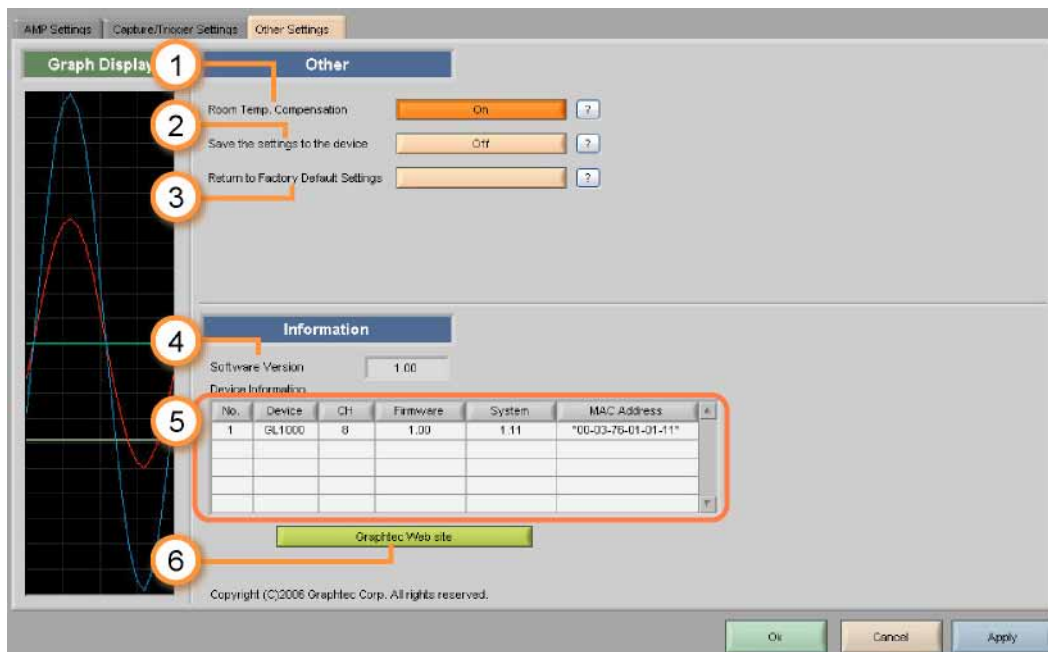| No.	Name	Description
6	OK	Click this button to enable your settings and close the screen.
7	Cancel	Click this button to cancel your settings and close the screen.

11-2-4 Trigger Level Settings

The trigger level conditions for analog channels are specified at this screen.

No.	Name	Description
1	Numerical input	Enter the numerical values for the upper and lower limits and the range.
2	Cursor specification	Use the cursors to specify the range.
3	OK	Click this button to apply your Level settings.
4	Cancel	Click this button to cancel the Level settings and close the screen.

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11-3 Other Settings

This screen is used to make various other settings.

| No.	Name	Description
1	Room Temp. Compensation	This parameter is used when thermocouples are used to perform temperature measurement. After you have selected your setting, turn off the power to the device and then turn it on again. (Always select On for this setting.)
2	Save the settings to the device	Use this button to specify whether or not to save the software settings to the device. If Off has been selected, the device returns to the setup status it was in prior to the software being connected when it is restarted.
3	Return to Factory Default Settings	Click this button to return the settings to the default values.
4	Software Version	The software version is displayed here.
5	Device Information	Information relating to the connected device is displayed here.
6	Web site access	Click this button to access the Graphtec web site.

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12. Operating Procedure (Example)

12-1 System Configuration

GL1000

PC
(with recommended specifications)

USB connection

V amp
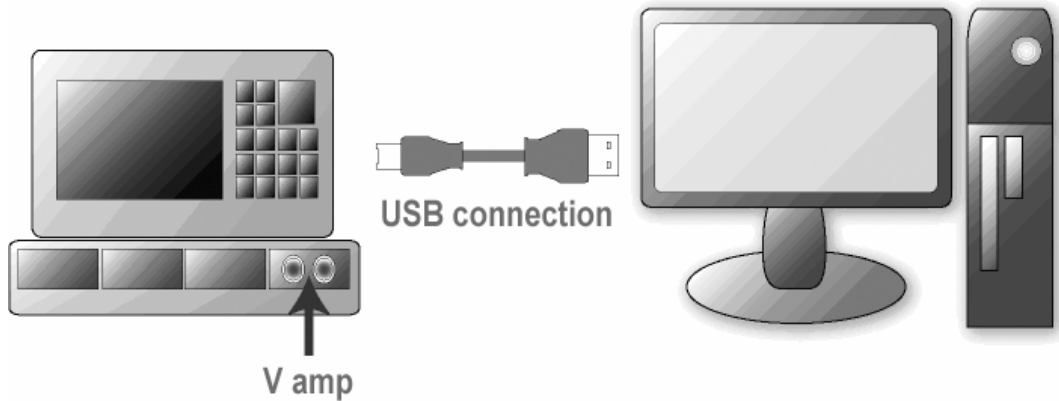
12-2 Connection

Connect the GL1000 to a PC
Use the USB cable to connect the GL1000 to a
PC and then install the USB driver (please see
Chapter 3, "Installing the USB Driver".

Set the USB ID
Follow the instructions given in Chapter 5,
"Setting the IP Address or USB ID" to set the
USB ID.
The default value is 0, and this setting can be
used as is.

Launch the software
Follow the instructions give in Chapter 7,
"Launching the Software" to launch the software
application.

Make the connection settings
Follow the instructions given in Chapter 9, "PC
Connection Settings" to make the connection
settings, and then click the "Connect" button.

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12-3 AMP Settings

Open the Settings Screen
Click the "Capture Settings" button on the main screen.
Open the AMP Settings tab.

Main Window

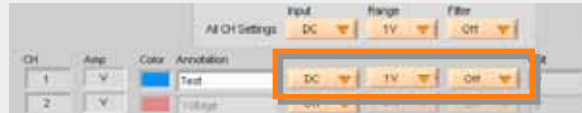**Input/Range/Filter settings**
Make the following settings for CH 1.
・Select "DC" for the Input parameter.
・Select "1V" for the Range parameter.
・Select "Off" for the Filter parameter.
Select "Off" for the Input parameter for CH 2.


12-4 Data Capture/Trigger Settings

Click the Data Capture/Trigger Settings tab to open the "Data Capture/Trigger Settings" screen.

Select the sampling interval for the device
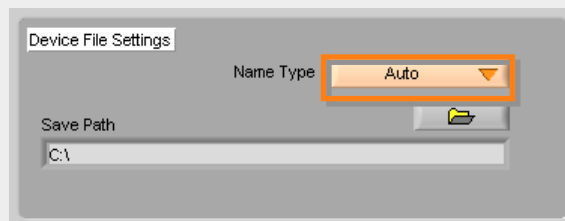Select "1 ms" for the sampling interval.

Select the device capture destination
Select "Disk" for the device capture destination.
If Disk has been selected, data can be captured either to the internal hard disk or to a PCMCIA card.
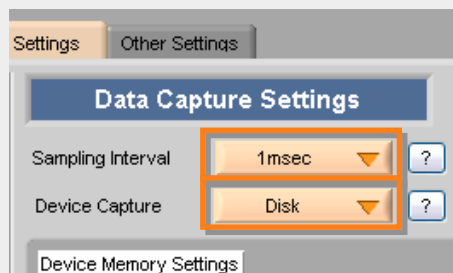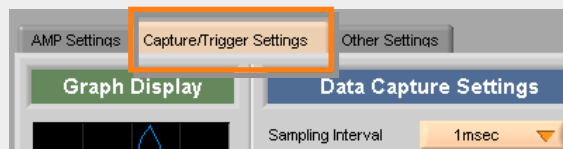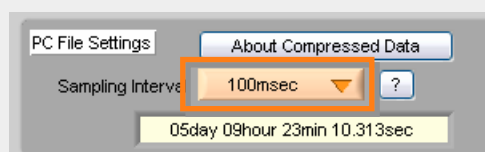

Select the device file save destination
Select "Auto" for File Type. If Auto is selected, a folder with the date as the file name is created in the specified folder, and then a file with the date and time as the file name is created within the new folder.

Select the PC sampling interval
While raw data is being captured to the GL1000, it is also sent to the PC in real time and saved as compressed data. Here, please select the sampling rate for the compressed data.

Select the PC file save destination

Select "Auto" for File Type. If Auto is selected, a folder with the date as the file name is created in the specified folder, and then a file with the date and time as the file name is created within the new folder. The folder in which the software was installed becomes the default save destination, and so we will use this folder.

Complete the setting procedure

Click the "OK" button to apply all the settings that you made and close the Settings Screen.

12-5 Starting Data Capture

Start Data Capture

Click the "Start" button to start data capture.

Check that data is being captured

Data is being captured if "Recording" is flashing in blue on the status display. The other statuses that are displayed are "Armed" when the GL1000 is awaiting a trigger, "Finished" when the data capture operation has been completed, and "Paused" when the GL1000 is in the stopped status.

Waveform operations

The waveform for each channel can be adjusted for easier viewing during a data capture operation.

Select the active channel in the digital display area.
Only one channel can be selected as the active channel. As there is only one channel in this case, CH1 becomes the active channel.
To change the active channel to a different channel, click on the desired channel number. The CH row that is displayed in green is the active channel

The following operations can be performed for the active channel's waveform.
(1) Changing the X axis display width
(2) Changing the X axis scale display method
(3) Enlarging/Reducing the Y axis
(4) Changing the Y-axis position
(5) Waveform Display On/Off
(6) Waveform Graph Divisions
(7) Plot
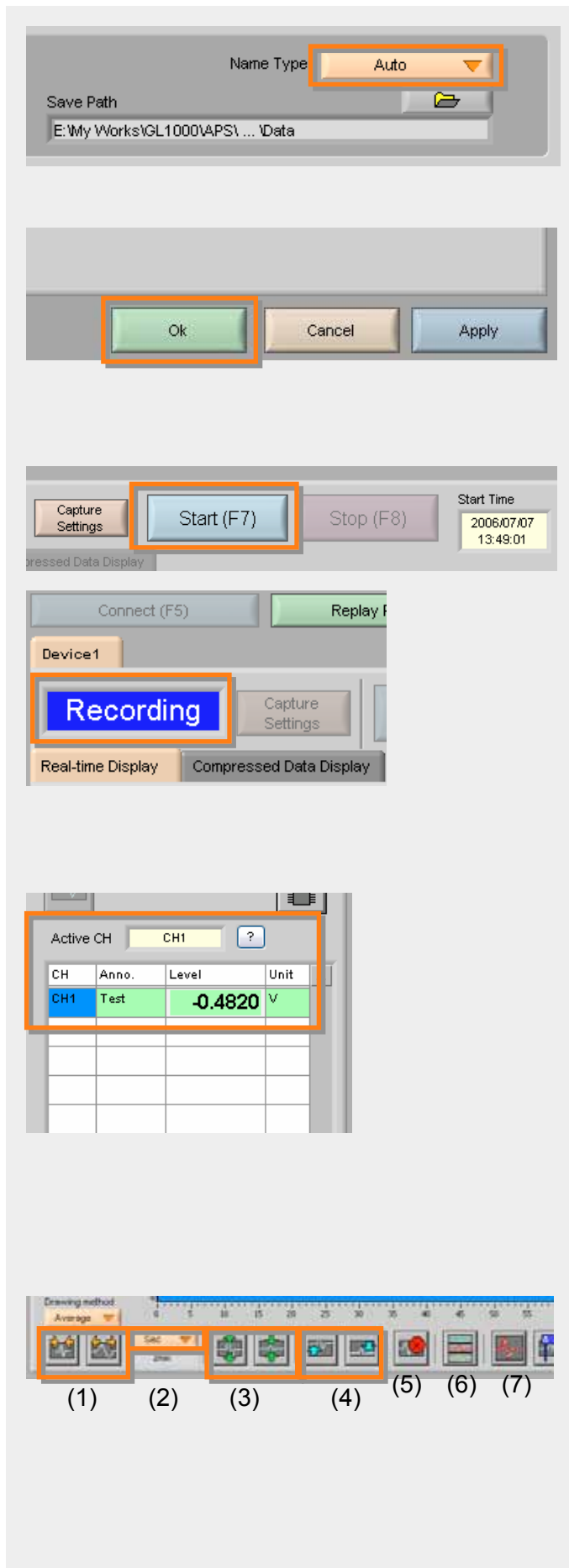
12-6 Stopping Data Capture

Stop data capture
Click the "Stop" button to stop data capture.

Display compressed data
When data capture has stopped, the compressed data that was captured to the PC can be replayed. In the same way as during a data capture operation, waveform operations can be performed and the A and B cursors used to view the numerical data values.
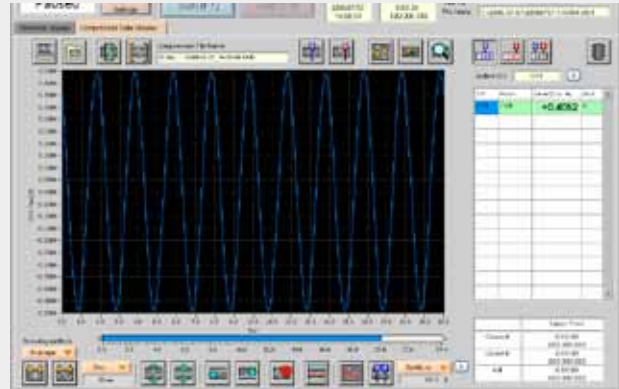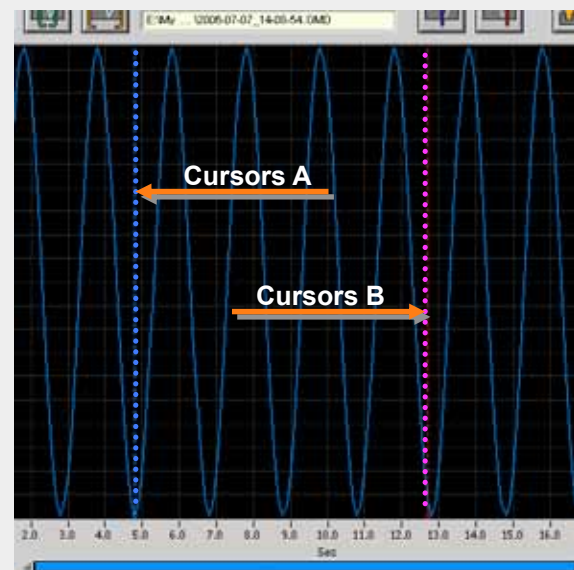

12-7 Replaying Data between the Cursors

The raw data corresponding to the data between the cursors that was selected using the compressed data captured to the PC can be sent to the PC from the GL1000.
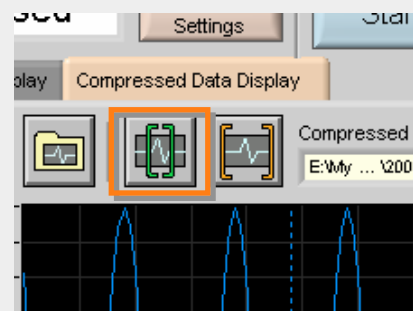
Cursor positions
Use the A and B cursors to select the range for which you wish to obtain the raw data.

Load data between the cursors
Click the "Load data between the cursors" button to load the raw data that has been saved to the GL1000.

12-8 Replaying the Device Data

The raw data for the range specified by the cursors is displayed.
In the same way as during a compressed data replay operation, waveform operations can be performed and the A and B cursors used to view the numerical data values. Files can also be superimposed or linked, and the data between the cursors can be displayed in an FFT or XY format.


Convert then Save

The last step is to save the raw data that was sent from the GL1000 to the PC. Click the "Convert then Save" button.
The data can be saved in either the "GBD" or the "CSV" file format. GBD is a dedicated binary file format, whereas CSV is a text file that can be opened in a Microsoft Excel or similar file.


Here we will simply click the "OK" button. A file with the name "Default.gbd" will then be created in the folder in which the software was installed.

This completes our description of the operating procedure. As we have shown, the GL1000 can be used after making only a few settings.
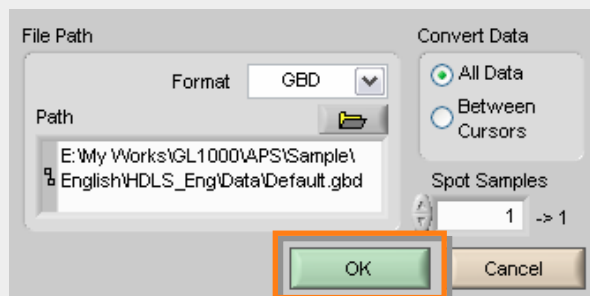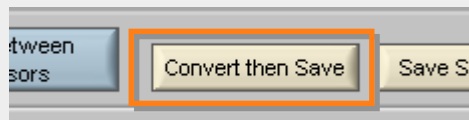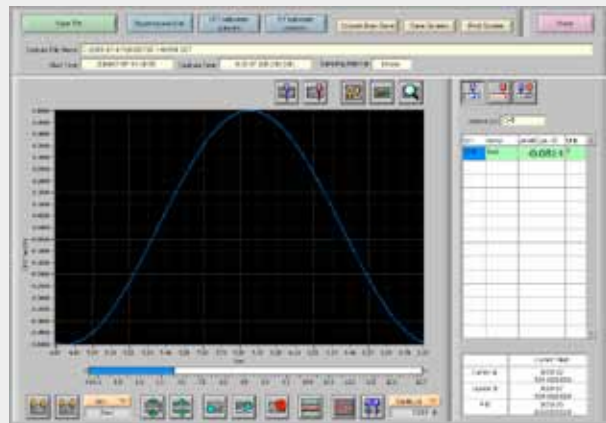
13. FTP Function

When the GL1000/1100 and the PC are connected to a LAN (TCP-IP connection) the FTP (File Transfer Protocol) function can be used to facilitate the sending of data files.
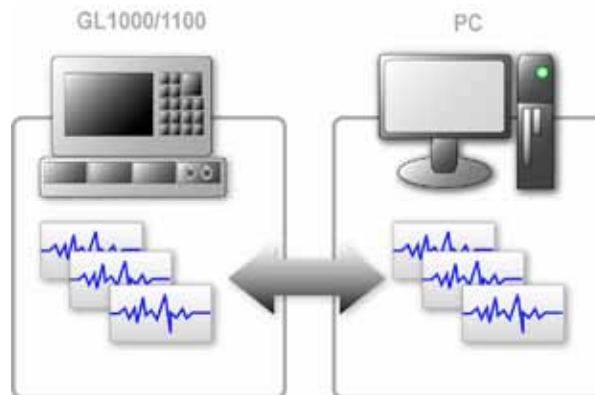

Setting Procedure

Connect the GL1000/1100 and the PC to a LAN (please see Chapter 4, "Connecting to a PC (Personal Computer)" for details).

Make the network settings for the PC.

IP address	192.168.1.1
Subnet mask	255.255.255.0
Default gateway	Setting not required

From your PC's Taskbar select [Start]]→[Control Panel]→[Network Connections]→[Local Area Connection]. Next, right-click on Properties, select [Internet Protocol (TCP-IP)] and then click Properties to open the window shown below. Set the IP address to [192.168.1.1] and the Subnet mask to [255.255.255.0]. Click the OK button and close all the screens.
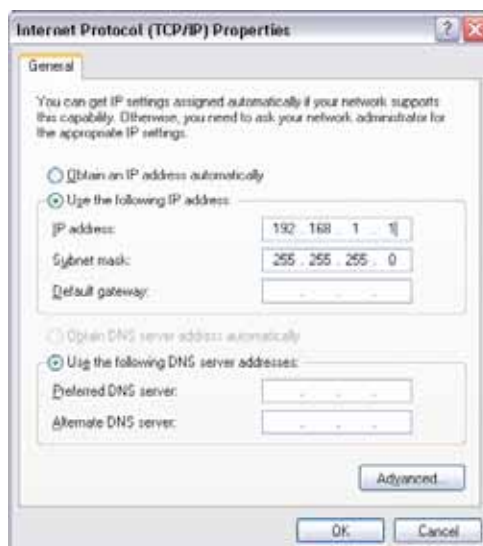

Make the network settings for the GL1000/1100 (please see Chapter 5, "Setting the IP Address or USB ID" for details).

IP address	192.168.1.2
Subnet mask	255.255.255.0
Port no.	8023

Open Internet Explorer, enter ［ftp://192.168.1.2/］in the URL box (the 192.168.1.2 part is the IP address that was used in the GL1000/1100 network settings above) and then press the ENTER key.

A screen similar to the one shown below will be displayed.
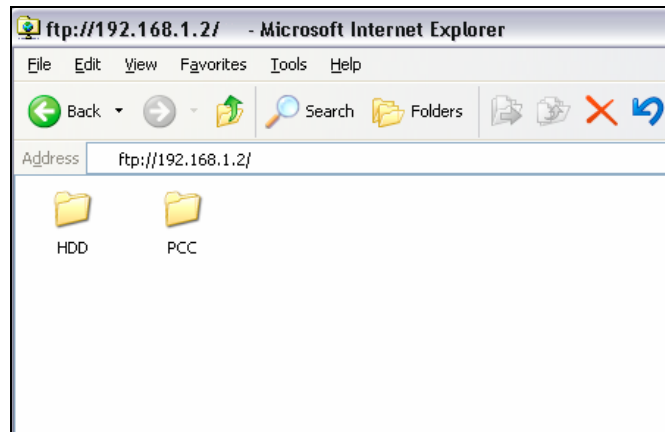
Data can be copied in the same way as for normal files. When an Internet Explorer FTP connection is used, login is automatically performed using an anonymous account and the files become read-only files.

The following operations cannot be performed for read-only files:

● Upload file

● Delete file/folder

● Create file/folder

● Change file name/folder name

To enable data to be written to the GL1000/1100, the login account name must be changed. Please use the following table as a guide.

Account name	Password	Restrictions
gl1000	None	None
gl1100	None	None
Anonymous	Any	Read-only

The following procedure is used to change the Internet Explorer login account.

Go to the [File] menu and select [Login As…] to open the [Login As] dialog box.
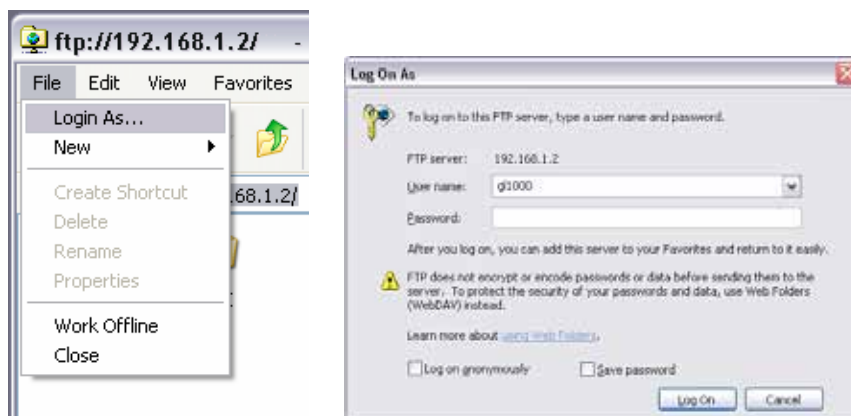
Enter the account name in the User Name box. Leave the Password box blank.

Finally, click the "Login" button.

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14. USB Drive Mode

When the GL1000/1000 and the PC are connected via a USB cable, the USB drive mode function enables the built-in hard disk or PCMCIA drive to be recognized as an external drive by your PC and files to be transferred and copied.

- This function can only be used when the optional TFT LCD monitor (B-501) has been installed in the GL1000/1100.
- This function can only be used when the device is equipped with an HDD (provided as standard with the GL1000/1100) or when a PCMCIA drive is installed.

Procedure

First of all, install the USB Driver (please see Chapter 3, "Installing the USB Driver" for details).
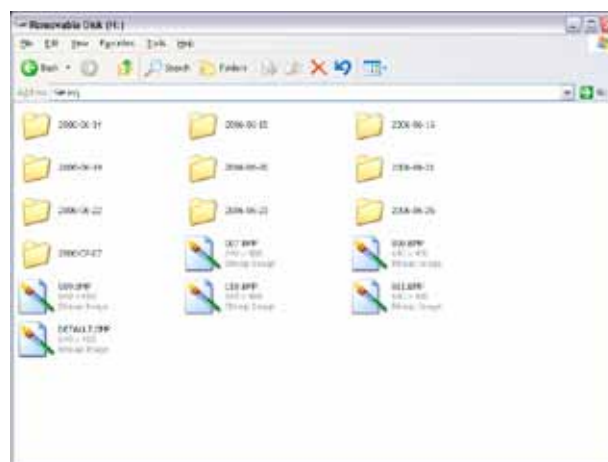
1. Turn on the power supply to the PC.

2. Use the USB cable to connect the GL1000/1100 to the PC.

3. Turn on the power supply to the GL1000/1100 while holding down the [START/STOP] key.

4. The USB Drive Mode screen will be displayed. The illustration will differ according to the installed drive(s).

When both the HDD and PCMCIA drives are installed	When an HDD drive is installed	When a PCMCIA drive is installed
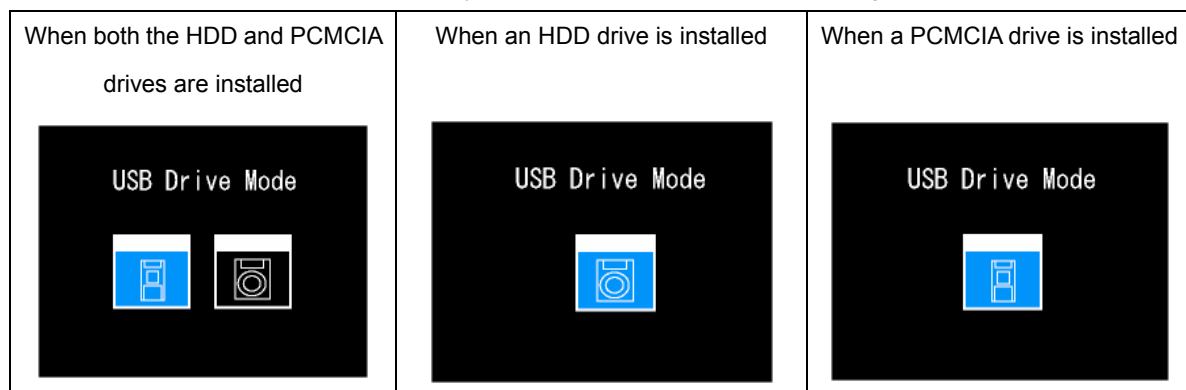
5. If both the HDD and PCMCIA drives are installed, use the [←] and [→] keys to select one and then press the [ENTER key].

   If only one of the drives is installed, no key operations are required. The GL1000/1100 will automatically switch to USB drive mode.

6. When the GL1000/1100 has switched to USB drive mode, a removable disk icon is displayed in your PC's "My Computer" window. The USB drive can now be used in the same way as a normal drive.

7. To exit USB drive mode, turn off the power to the GL1000/1100.

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subject to change without notice.