DATA PLATFORM

GL7000 Quick Start Guide

GL7000-UM-852

Thank you very much for buying the DATA PLATFORM GL7000. This quick manual provides easy to understand instructions for the basic operations. For detailed instructions, see the instruction manual on the CD-ROM (PDF format) attached to every module.

Confirmation of the exterior

After unpacking, confirm that there are no problems (scratches and dirt) on the exterior before use.

Confirmation of the attached items

- Quick start guide: 1
- CD-ROM: 1
- AC power cord : 1

Setting and confirming the AC line frequency (When using Voltage/Temperature Module(GL7-M)

In OTHER menu, set AC line frequency (50Hz or 60Hz).
This affects the noise removal.

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1. GL7000 operating precautions

1−1. CE marked equipment precautions

This instrument conforms to the EN61326-1 Class A based on the EMC Directive (2004/108/EC). Further, it also conforms to the EN61010-1 based on the LV Directive (2006/95/EC). This instrument follows the above standards, but when using it, follow the precautions in the instructions manual (PDF) found on the attached CD-ROM and use it correctly. Furthermore, because there is a possibility of breakdown and of the protection of safety measures having no effect if the device has been used in the wrong way, confirm the operating precautions and use it correctly.

1−2. Point of use precautions

Do not use this instrument in places like the ones mentioned below.

- Places causing high temperatures or high humidity, like direct sunlight and heaters.
- Places exposed to salty air and places with lots of corrosive gas, as well as places with an organic solvent atmosphere.
- Places where surge voltage and jamming, such as lightning and electrical furnaces etc., easily enter.
- Places with lots of dust.
- Places where there are lots of vibrations and shocks.

1−3. Precautions for maximum input voltage

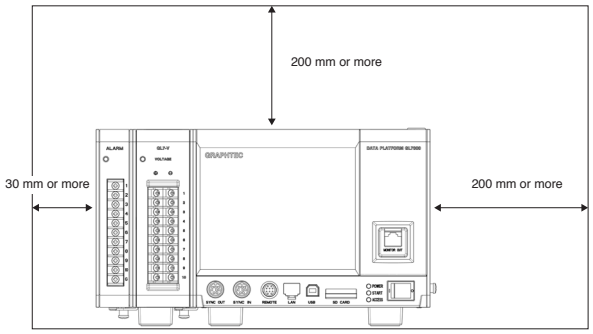
Because every Amplifier Module has a specified maximum voltage input, do not hook up the device even for an instant if the voltage exceeds the specification. For details, see the instructions attached with every module.

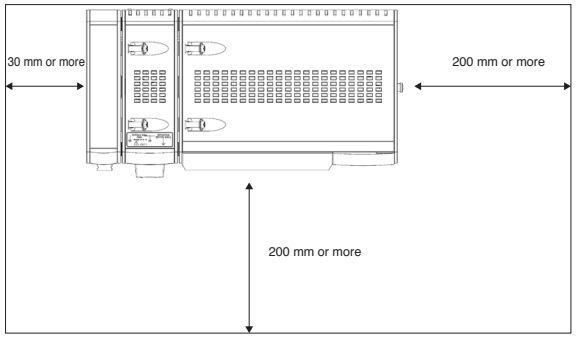
1−4. Precautions for module installation/removal

For every module, perform installations/removals while the GL7000 is turned off (power distribution OFF).

1−5. Installation space

This instrument has ventilators and cooling fan exhaust vents. So as not to block these ventilators and exhaust vents, ensure an installation space as shown in the chart below.



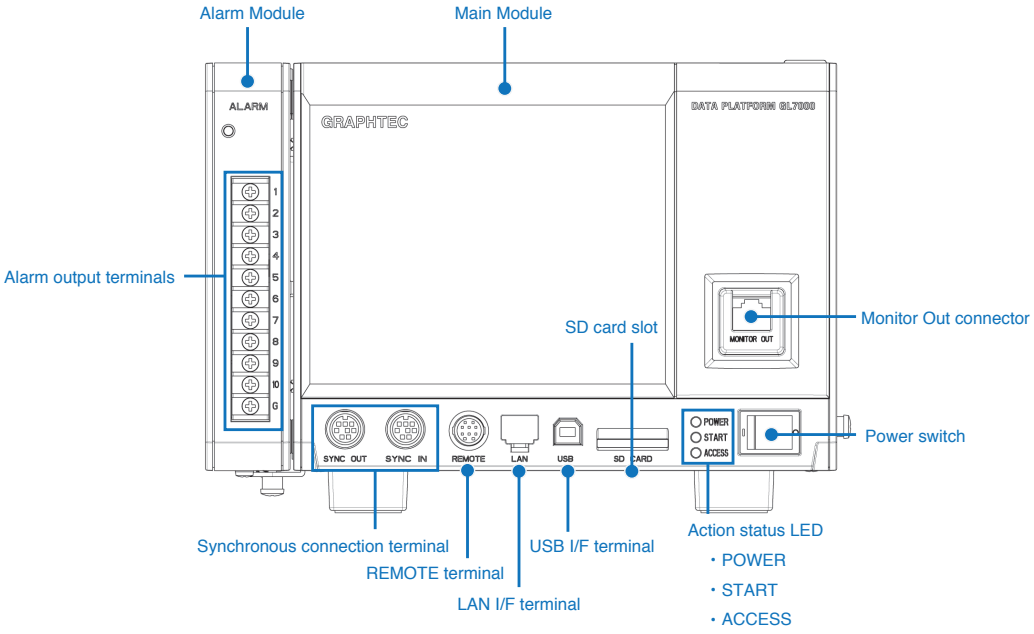


1−6. Warming up

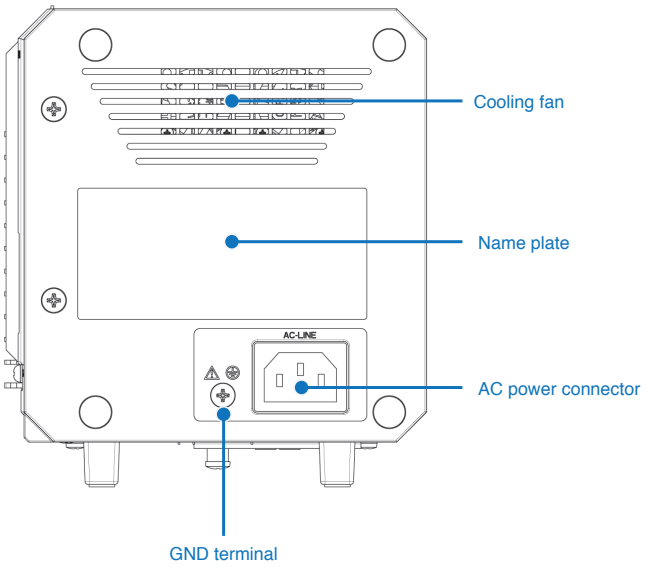
In order to satisfy this instrument's performance specifications, a 30 minute warming-up is recommended. This is especially necessary if temperature is to be measured.

2. Part Names

2−1. Front view

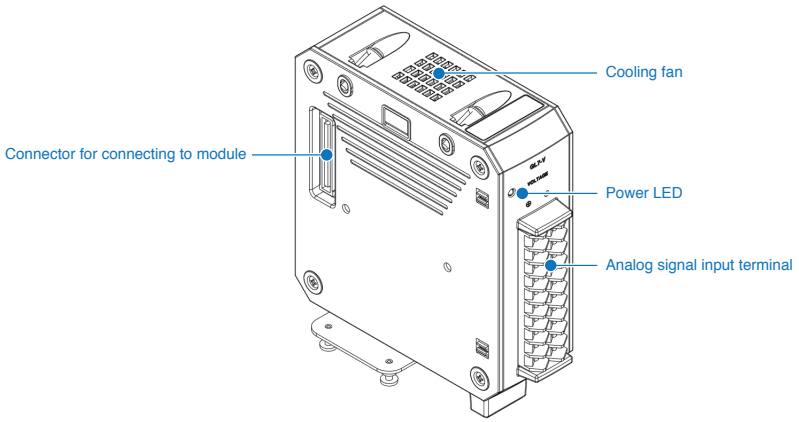


2−2. Side view

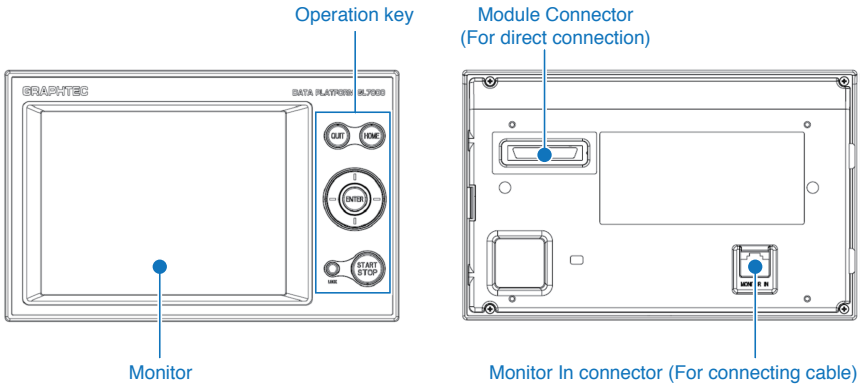


This describes typical optional modules.

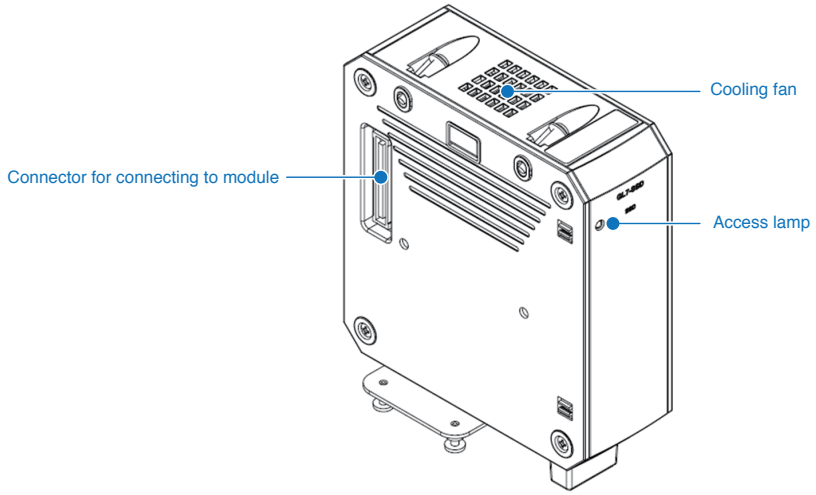
2-3. Voltage Module (optional)



2-4. Display Module (optional)



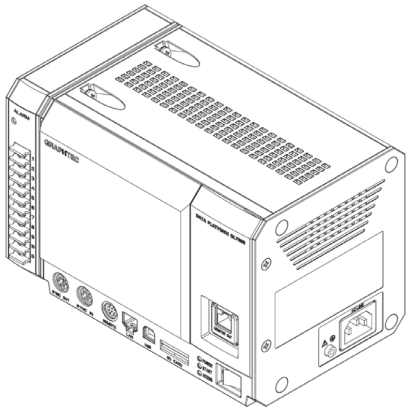
2-5. SSD Module (optional)



3. Usage position

When this GL7000 is to be used, use the position shown in the chart below.

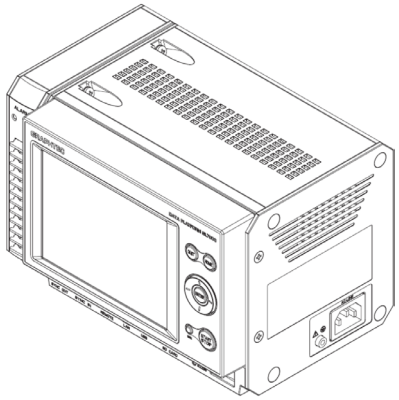
3−1. Standard main module only



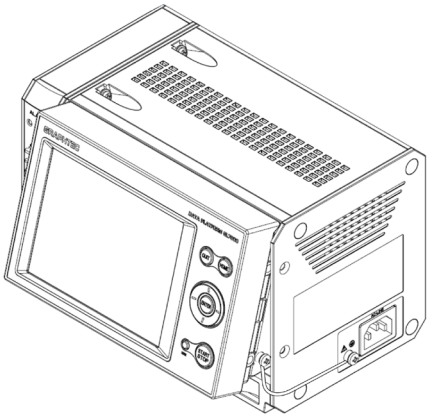
3−2. Installing the Display Module (optional)

For details on installing the optional Display Module, see the instruction manual supplied with the Display Module.

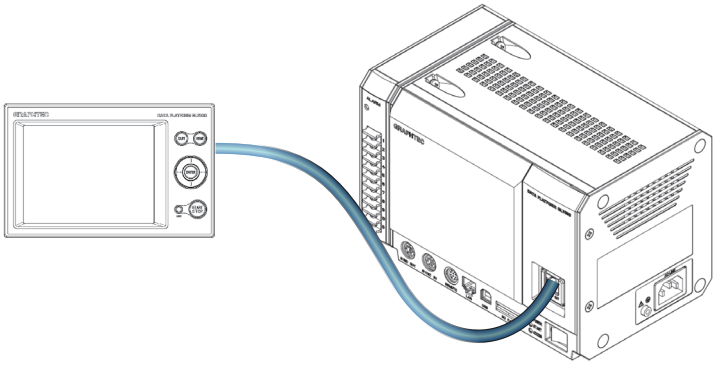
<When installing to GL7000 >



< When using the tilting table >



<When using the extension cable >

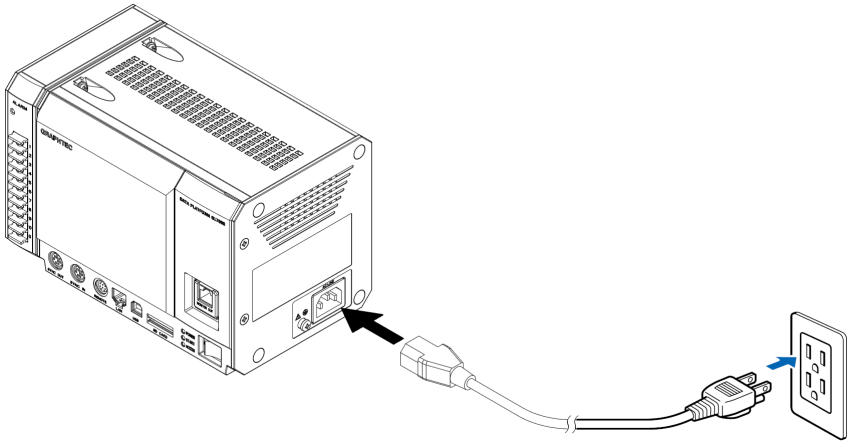


*** For the connection cable, use a commercially available LAN cable (straight, CAT5 or above, cable length 10m or less)**

4. How to connect the various items to the GL7000

4−1. Connecting the AC power cord

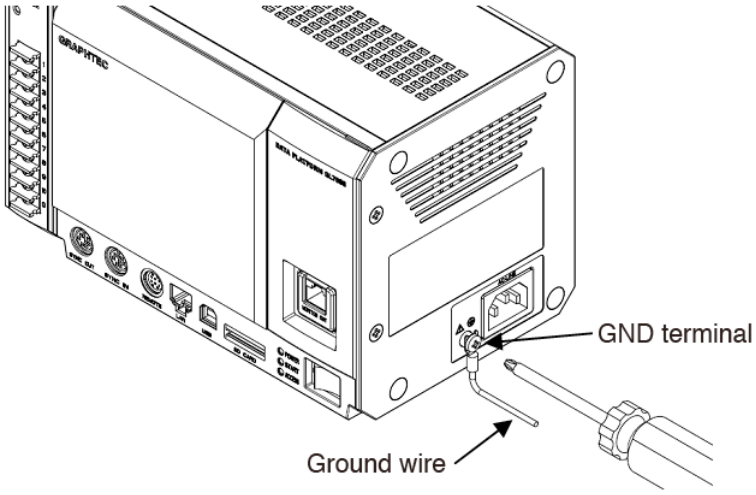
Insert the power cable into the AC power connector and the other side into an electrical outlet.



***AC power cord changes with destination countries.**

4−2. Connecting to the GND terminal

The GND terminal is used when the power cord cannot be grounded and when the GND level is shared with other equipment.
For details on the GND terminal, see the “Safety Precautions” of the instruction manual (PDF format) on the attached CD-ROM.

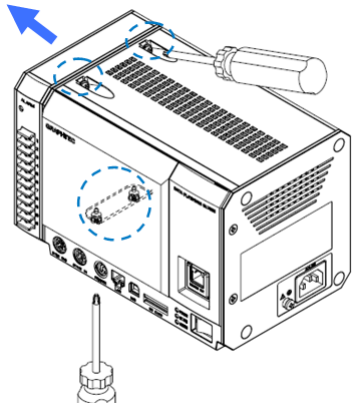


***In order to prevent an electric shock and a fire, please be sure to ground using a GND terminal.For grounding, use a ground wire with a diameter of at least 0.75 mm2.**

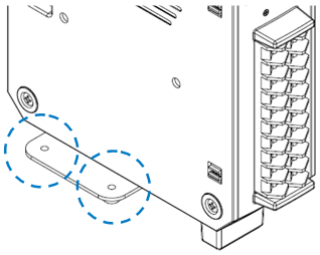
5. How to install the modules to GL7000

Measuring requires a separately sold Amplifier Module. Here we provide explanations using a Voltage Amplifier Module as an example.
For other Amplifier Modules, see the attached instructions.

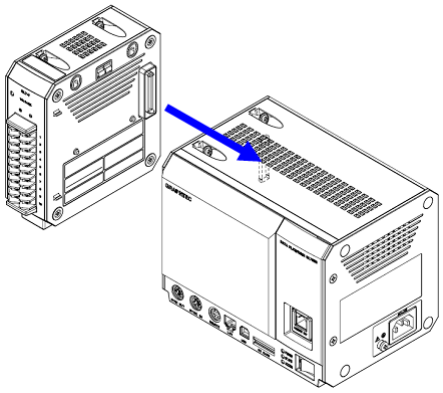
1) Remove the fixation screws (4 places on the upper part and lower part), place the Alarm Module parallel to the GL7000 and slide it in the direction of the arrow



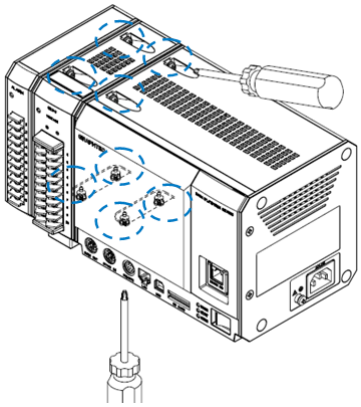
2) Remove the fixation screws on the side of the Amplifier Module. (2 places on the chart below)



3) Slide the Amplifier Module parallel to the GL7000 and connect the connector.



4) Similarly, install the Alarm Module on the last part and fix with screws (Recommended tightening torque: 4kgf/cm). Tighten the lower part after first tightening the upper part.



*** When installing multiple modules, install only one at a time. Make sure to fasten with screws before installing the next module.**

By expanding/joining amplifier Modules to this instrument, various measuring objects as well as the expandability of the channels will be extended.
A maximum of 10 Amplifier Modules can be expanded, with a maximum of 112ch possible.
The Logic/Pulse can be switched for each module (16ch/module).
The maximum use of the Logic function is 7 modules (112ch).
The maximum use of the Pulse function is 2 modules (32ch).
The maximum connection of every type of Amplifier Module is 10 modules (112ch maximum).
For external memory installation, an SD card slot (SDHC equivalent, maximum approx. 32GB) is included as standard equipment (* SD cards should be prepared by the customer). An SSD 64GB is optionally available. (However, 1 file cannot exceed 2GB)

6. GL-Connection software

The GL-Connection is PC software for managing the GL7000. The GL-Connection (supplied as standard) can do the following:

- Managing the GL7000 (settings reference, recording start, recording stop etc.)
- Recording of real time data (Real time data recording is possible at 1 ms at the fastest). * Depends on the settings
- Playback of recorded data

This chapter describes the basic parts of the GL-Connection.
For details, see the GL-Connection instructions on the CD-ROM.

6-1. Necessary requirements

To install the software, use a PC that satisfies the conditions mentioned below.

OS	: Windows XP (SP2 or above), Windows Vista (32/64-bit), Windows 7 (32/64- bit) (* Starter Edition is not supported)
CPU	: Pentium 4 1.7 GHz or above
Memory	: 512MB or above (1GB or above is recommended)
HDD	: 200MB (1GB recommended) of empty hard drive space is needed to install the software.
Display	: 800x600 resolution or above, 65,535 colors or more (16-bit or above)
Other	: CD-ROM drive (when installing from CD), USB port and LAN port are required

6-2. Installing the USB driver

When connecting this instrument to a PC via USB, a USB driver must be installed on the PC.
By selecting the automatic program “USB Driver Install” on the attached CD-ROM, the USB driver installation will start. For details, see the “Read the USB driver installation instructions” in the instructions.

Installing the USB driver
Read the instruction manual for installing the driver.

6-3. Installing the GL-Connection

This describes how to install the GL-Connection application software.

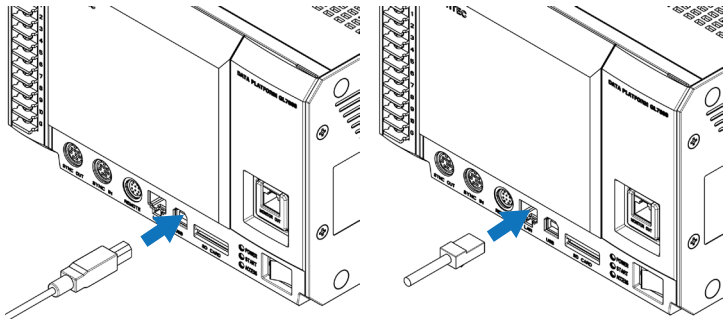
By selecting the automatic program “GLConnection Install” on the attached CD-ROM, the GLConnection will launch and the installation will start. From this point, follow the instructions and continue the operation.

Installing GL-Connection

6-4. Connecting between GL7000 and PC

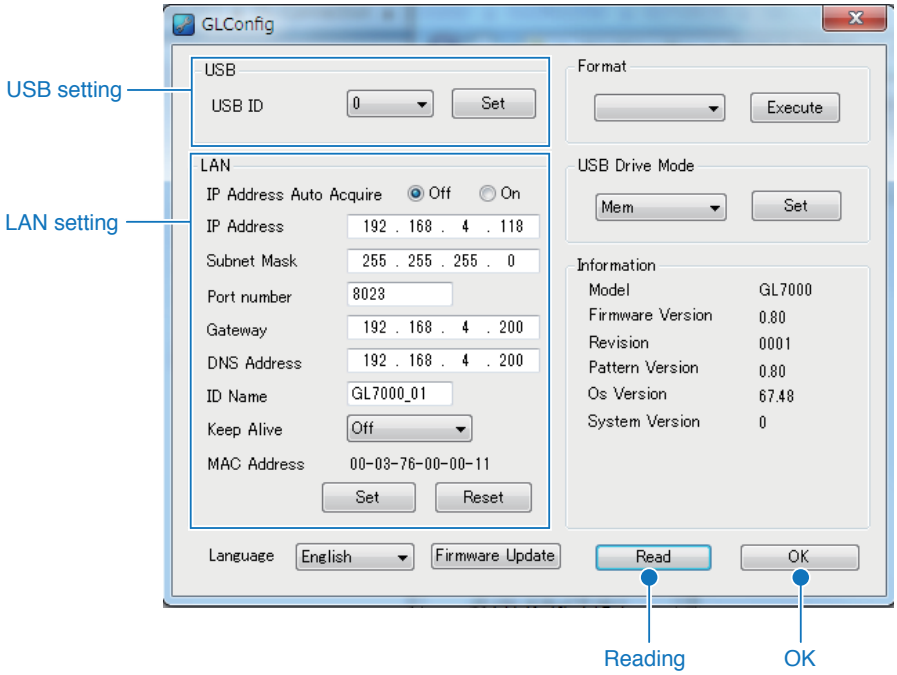
Using either A-B cable for USB or LAN cable, connect between GL7000 and PC.
After connecting, turn on the power of the GL7000.

< USB connection> **< LAN connection>**



6-5. GL7000 Interface Settings

Carries out USB and LAN settings for the GL7000. The settings can be found in the Config program that came with the installation. From the Windows Start button select “Start” → ”Programs (All Programs)” → ”Graphtec” → ”GL-Connection” → ”GLConfig” and the software will launch.
GLConfig can only be managed when the USB is connected. After it's started, press the “Read” button and the information will be read from the GL7000 and displayed on the screen.



6-5-1. When using USB connection

Set the equipment ID between 0 and 9, and press the “Set” button. If multiple pieces of equipment are connected via USB, use different numbers.

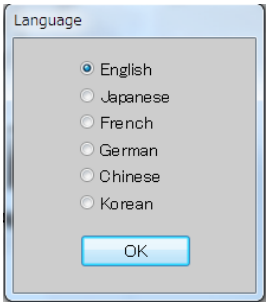
6-5-2. When using LAN connection

Adhere to the network environment in use, set the IP address and port number and press the “Set” button. For details, see the instruction manual on the CD-ROM.

For details on GLConfig, see the instruction manual in the CD-ROM.

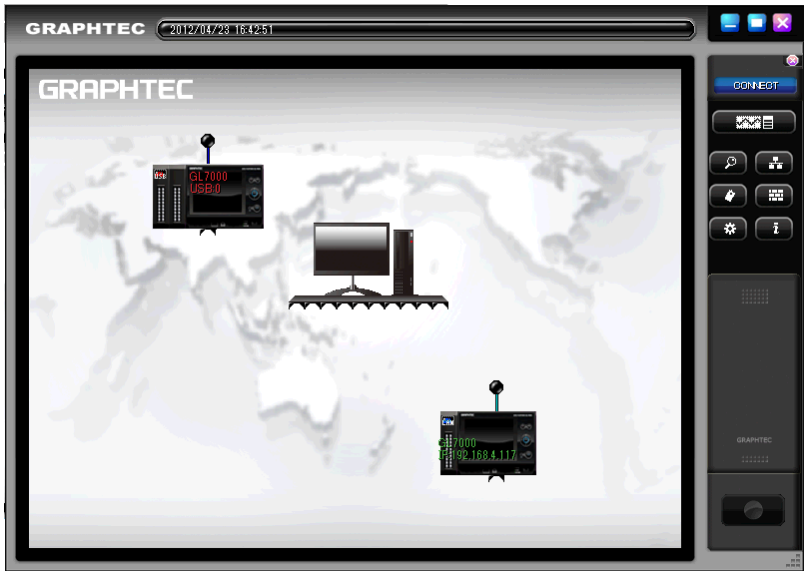
6-6. Starting the GL-Connection

Using “Start” on the Windows OS, select “All Programs” → Graphtec → GL-Connection → GL-Connection to start the GL-Connection software.
When you start the software first, LANGUAGE SELECTION screen is displayed. Select the desired language.



6−7. Connecting the GL-Connection

When staring up the GL-Connection, CONNECTION screen is displayed.



When the GL7000 and the PC are connected correctly, and when the power to the GL7000 is turned on, the GL7000 should be automatically recognized and the GL7000 equipment icon should be displayed. If the equipment icon isn't displayed correctly, see “6.5 GL7000 Interface Settings.”

PC icon

By clicking the icon that displays a PC, you can perform an equipment search.

GL device icon

This icon is displayed if there exists a connected GL. Click it to connect.

File icon

An icon for performing file playback and display. Click this icon to start playback of the file.

6-7-1. How to connect

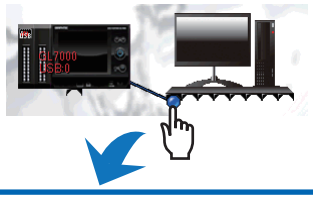
Click the displayed equipment icon to initiate the connection. During connection, configuration information is read from the GL7000. When done, the equipment icon and the PC icon will be in a connected state.

Connection in progress icon status

Connection completed status

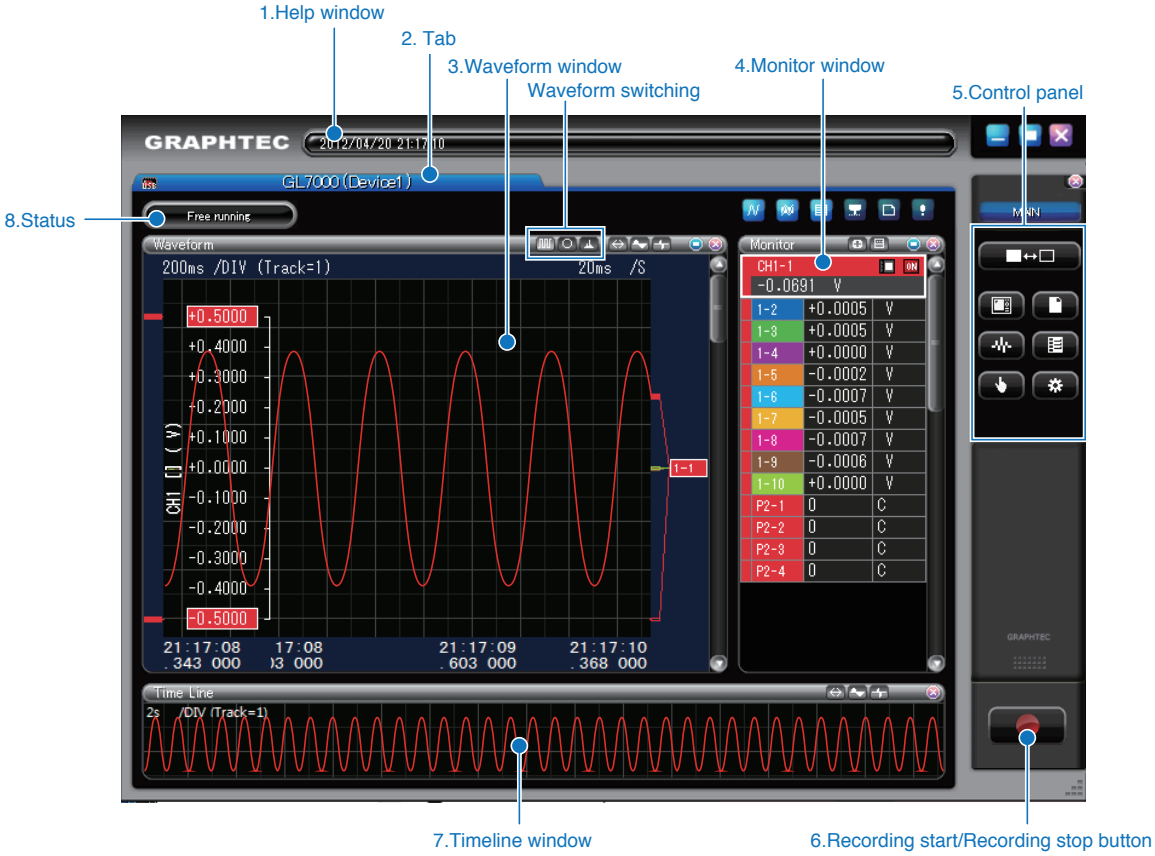
6-7-2. How to disconnect

Remove the connection plug of the device icon to disconnect.



6−8. Description of MAIN screen in GL-Connection

Press the screen change button on the control panel to change to the main screen. It's possible to change between the connection screen and the main screen at any time.



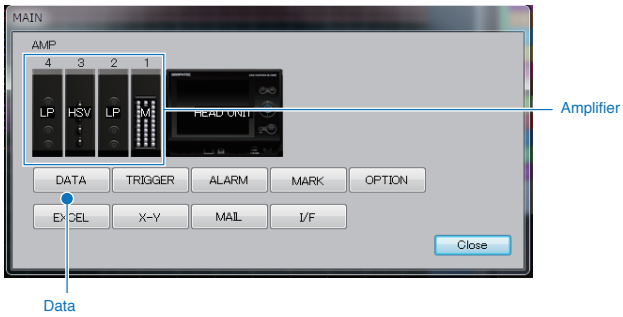
No.	Items	Description
1	Help window	The help about the buttons on the mouse is displayed
2	Tab	Creates 1 tab for 1 connection device, file and group. A maximum of 20 tabs can be created. Also, by dragging a tab it can be placed on a multi-screen.
3	Waveform window	Displays the waveform. From the waveform change button on the upper part of the waveform window it is possible to change the waveform mode to Y-T, X-Y etc.
4	Monitor window	Displays the digital value. Click this to display a white border around the active channel. The active channel is displayed together with the waveform.
5	Control panel	A group of buttons for performing various operations.
6	Recording start/Recording stop button	Button for starting and stopping recording.
7	Timeline window	Sets the waveform window and different Time/DIV and is used for grasping the whole. Only the channel that is the active channel on the monitor window will be displayed in waveform.
8	Status	Displays current action status.

6-9. SETTING screen in GL-Connection

WPress the setting button on the control panel to open the SETTING screen. GL7000 setting items are displayed.

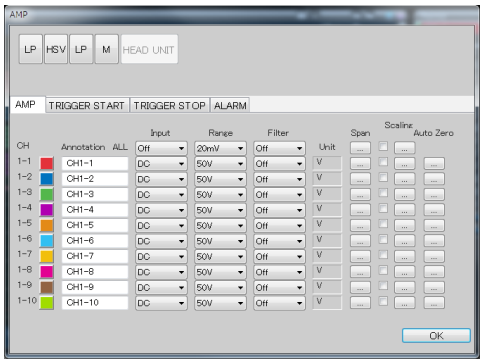
6-9-1. Main menu

On this screen, various main module settings are performed. By pressing the displayed Amplifier Module button, each module's settings screen is opened. Settings screens for data settings and trigger settings can be opened by pressing their respective buttons. For detailed settings methods, see the applications manual.



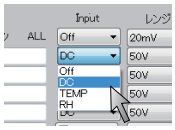
6-9-2. Setting the amplifier

Set the input signal.

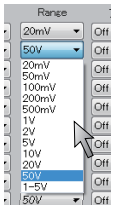


Input and range can be changed by clicking with the mouse to select an item. When selecting an item, the settings are sent to the main module.

Changing the input

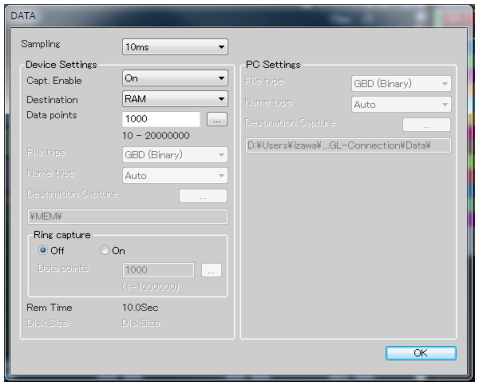


Changing the range



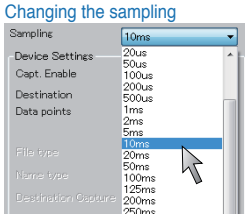
6-9-3. Setting the data

Carries out recording-related settings.

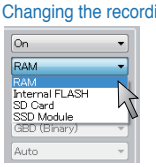


Sampling and recording devices can be changed by clicking with the mouse to select an item. When selecting an item, the settings are sent to the main module.

Changing the sampling



Changing the recording device



6−10. Recording of GL-Connection

6-10-1. Recording start button

Press the recording start/recording stop button on the control panel to start recording.

The recording method will differ depending on whether it is recorded on the built-in RAM of the GL7000 or on a disk.

Built-in RAM	Record to the built-in RAM of the main module. The built-in RAM is erased if the power to the main module is turned off. It can be used with high speed recording of 1ms sampling or above. In the case of performing playback of data on a PC, transfer the data to the main module playback or the PC after the recording has finished.
Disk	Record data to the built-in flash memory, the expanded SD card, and to the extended SSD Module. When setting built-in flash memory and the external SD card, PC recording can be performed at the same time.

6-10-2. Compressed file

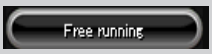
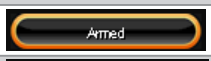
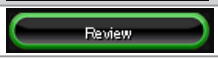
To speed up the reading of data during playback, this software automatically creates 3 compressed files of the recorded data during PC recording. (The 3 files created are, filename_T1.GMD, filename_T2.GMD, filename_T3.GMD)

* There will be no loss of the signal peak for the compressed file, because the sub-sampling process is based on the signal peak value.
  Furthermore, if the compressed files are deleted, the data playback response will worsen, but data playback is possible. There is no effect on the actual data.

For details, see the application manual on the CD-ROM.

6-10-3. Status display

Depending on the status display, the current action status can be understood.
Contents of the status display

Free running		Connected to the GL instrument, not recording.
Armed		In recording state, waiting for trigger detection.
Recording...		In recording state, data recording is being performed.
Review		Playing file, playing main module data.

6-10-4. Playback of data file during recording

It is possible to play a data file during recording. Data files that can be played are files in their final state, of which the recording has already finished. play the recorded file in the same manner as in “6.12 GL-Connection playback.”

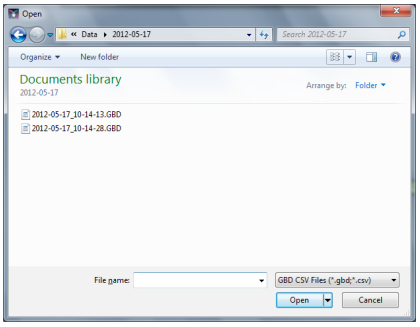
6−11. Stop GL-Connection

By pressing the Awaiting Trigger or the recording start/stop button during recording, the recording can be stopped.

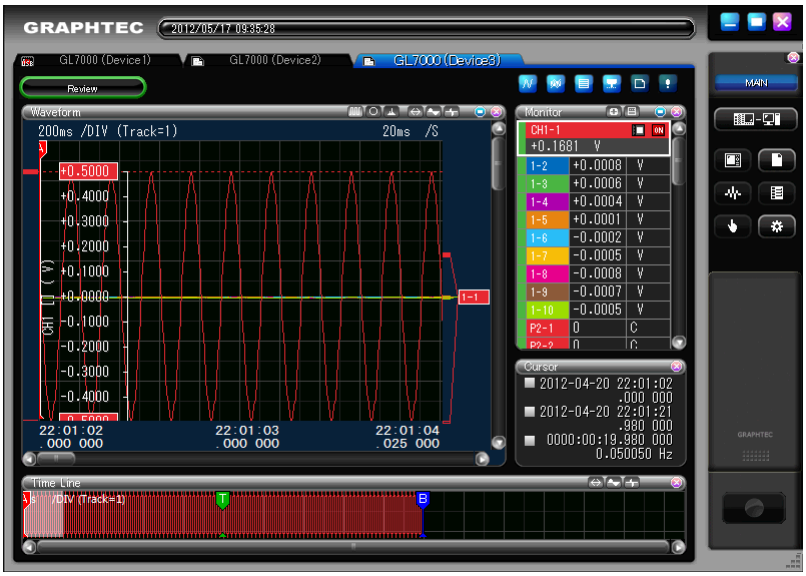
6-12. Playback on GL-Connection

Data files recorded on the PC, and main module data saved on the GL7000 can be played and confirmed. For data playback, any signal level value can be displayed by using the cursor, and data can be searched by moving to a specified time.

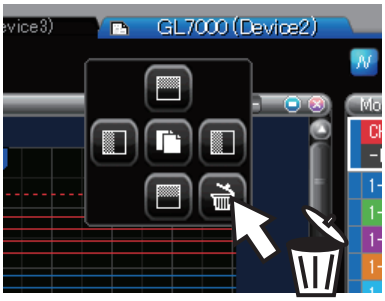
Press [Control Panel] > [File] > [File Replay] button. Select any file in FILE SELECT dialog.



Data playback in progress window



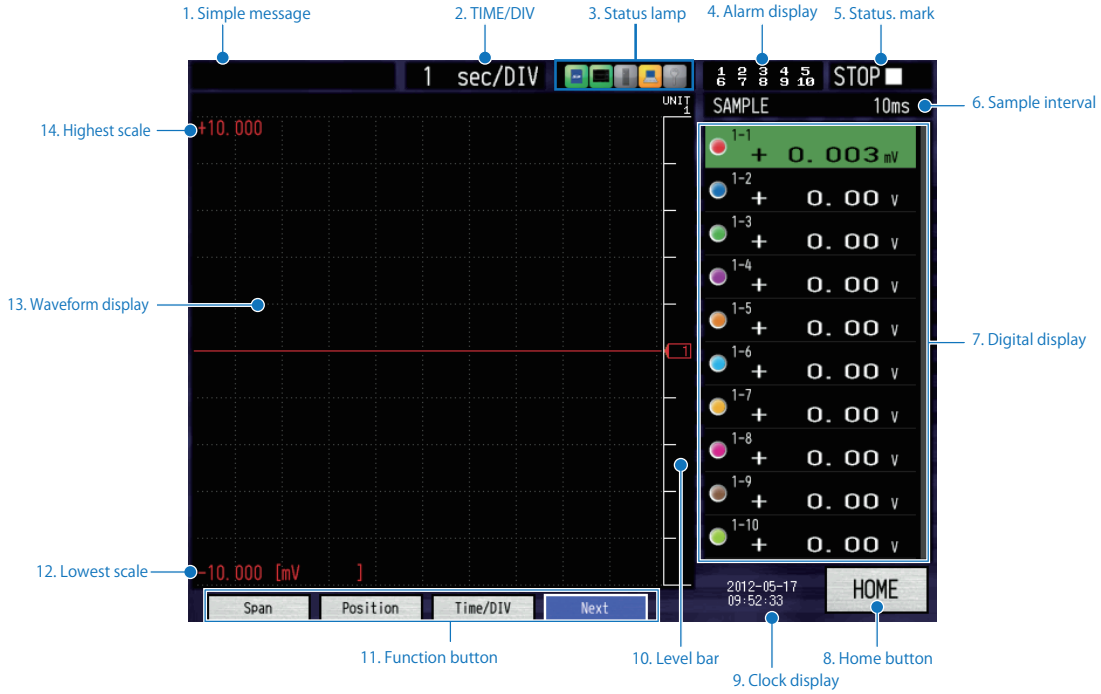
To terminate playback, drag the tab and place it in the recycle bin.



7. Display Module

Use the Display Module (optional), to enable stand-alone measurement. This chapter describes operation examples for using the Display Module.

7−1. Screen operating instructions

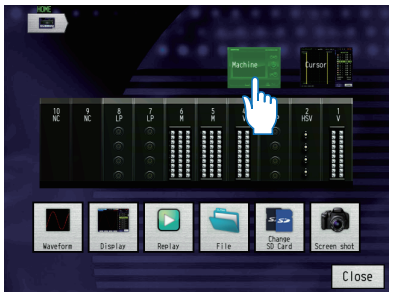


No	Name	Description
1	Simple message	Displays the action status.
2	TIME/DIV	Displays the currently set time scale.
3	Status lamp	Displays all access status.
4	Alarm display	Displays the alarm output terminal status (red = alarm)
5	Status. mark	Displays the recording or playing status.
6	Sample interval	Displays the currently set sample interval.
7	Digital display	Displays the input value of every CH. Annotations and waveform colors are also displayed.
8	HOME button	Displays the HOME menu.
9	Clock display	Displays the current time.
10	Level bar	Displays a bar at the position of the signal.
11	Function buttons	Displays the button for every status.
12	Lowest scale	Displays the lowest scale of the currently active CH.
13	Waveform display	Displays the input signal waveform.
14	Highest scale	Displays the highest scale of the currently active CH.

7−2. Touch-screen operations

This device is equipped with a touch-screen. Here you can learn the basic operation methods for the Touch-screen. As an example, a change in the sample interval is performed.

7-2-1. Pressing a button



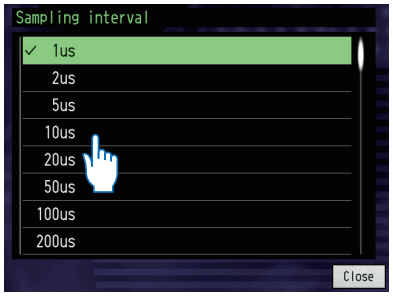
Touch an icon button with your finger to execute it.

Since this is a capacitive touch-screen, touching it with a pen or the like will yield no response. Remove gloves etc. and operate it with your fingers.

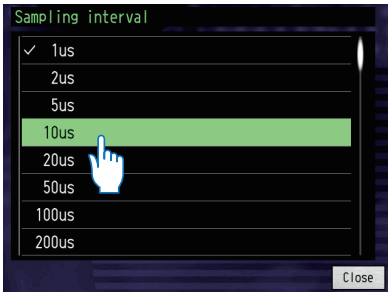
*** Note that operating the touch-screen with a pointed object may damage it.**

*** Do not use it with wet hands.**

7-2-2. Selecting an item



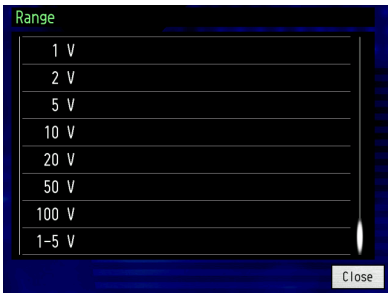
Once touched, it will be selected and the color will change.



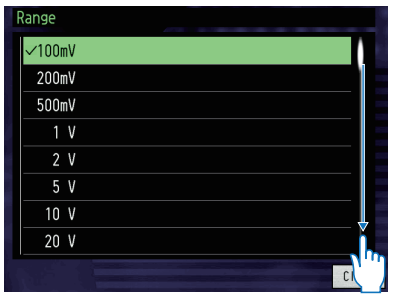
Touch again to confirm.

7-2-3. Moving the slide bar

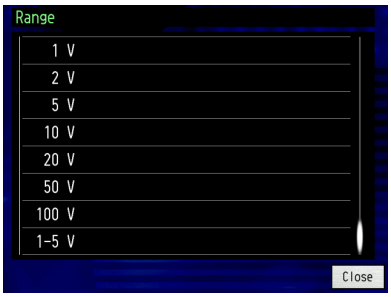
Touch a spot where there is no slide bar.



Touch again to confirm.

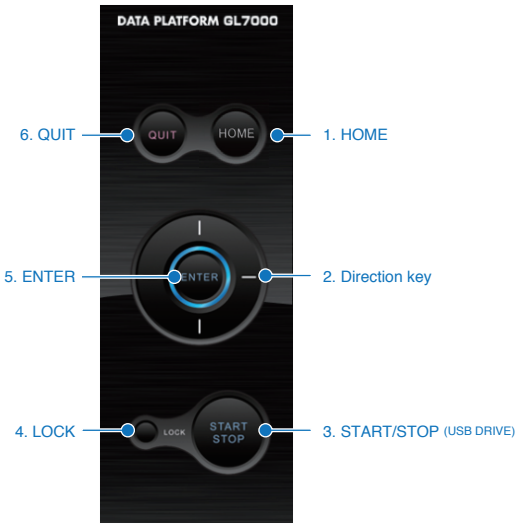


Drag the slide bar (keeping the finger pressed down and move by tracing your finger)



For details on the settings, see the instruction manual on the CD-ROM.

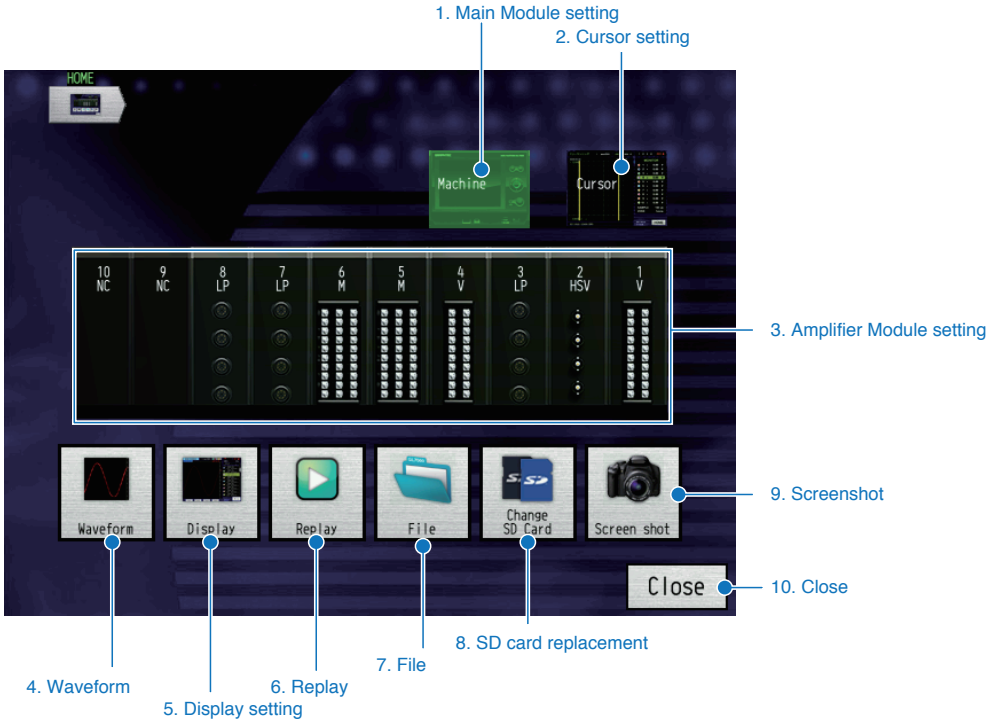
7−3. Description of the operation keys



No	Name	Description
1	HOME	Press the main key to display the home menu.
2	Direction key	Used for item selection during setup and cursor movement during playback.
3	START/STOP (USB DRIVE)	Performs a recording start action during free-running, and performs a recording stop action during recording. If this instrument is connected to a PC via a USB cable and the key is pressed during boot-up when the power is turned on, it goes into USB Drive Mode, allowing the built-in driver to be used as mass storage.
4	LOCK	Hold down this button for at least 3 seconds to set/release the key lock.
5	ENTER	Carries out decisions during setup and confirmed process.
6	QUIT(LOCAL)	Press this key to cancel the settings, and press it when the device is set to remote (key lock), its external operation state, to return to the normal state (local).

7−4. Description of the HOME screen

Press “Home” on the screen or the HOME key, to display the home menu. (Chart below) Press the icons to perform the following settings. Here we explain the icons displayed on the home menu.



No	Name	Description
1	Main Module setting	Performs data settings (sampling speed and recording point etc.), network settings, date/time settings, factory settings, trigger alarm settings, I/F USB settings and other settings.
2	Cursor setting	Performs settings for cursor movement, data retrieval, executing operations, and statistical calculations.
3	Amplifier Module setting	Performs settings for channel settings (range and filter etc.), trigger level settings and alarm settings.
4	Waveform	Performs settings for waveform span, zone settings and Time/DIV.
5	Display setting	Performs display mode and operation settings.
6	Replay	Sets the playback origin and executes the playback.
7	File	Performs file operations (formatting etc.), data save, settings save/read.
8	SD card replacement	Replaces the SD card during recording. (Can be used when the sampling speed is slower than 100ms)
9	Screenshot	Saves the waveform screen as a bitmap.
10	Close	Closes the HOME menu.

For details on the settings, see the instruction manual on the CD-ROM.

8. Specifications

8−1. Standard specifications

Items	Description
The number of Amplifier Modules installed	Maximum 10 modules * The Logic/Pulse Amplifier Module can be set to select logical amplifier or pulse amplifier, but the pulse amplifier can only be set for up to 2 modules (16ch/1 module).
External input/output	Start/Stop input, external trigger input, external sample input, trigger output, auto balance input, busy output per 1ch. * When using the external input/output function, you will need the input/output cable B-513 (optional) for the GL.
Alarm output	10ch * The Alarm Output Module is a different module included with the main module.
PC I/F	Ethernet (10BASE-T/100BASE-TX), USB2.0 (High-Speed) Standard equipment
Built-in memory device	Built-in flash memory: approx. 2GB * Comes standard equipped with built-in RAM memory of 2,000,000 data for every Amplifier Module.
External memory device	SD card (SDHC equivalent, maximum approx. 32GB) slot standard-included SSD Module (optional) 64GB * 1 file cannot exceed 2GB
Backup function	Setup conditions: EEPROM/Clock: Lithium battery
Clock accuracy (23°C environment)	± 0.002% (lunar equation approx. 50 seconds)
Measuring synchronization between modules	Start and trigger synchronizing function * When using the synchronizing function, you will need the sync cable B-559 (optional). * The synchronizing function can only be used with the GL-Connection. * A maximum of 5 modules can be connected at the same time.
Time base accuracy	± 100 ppm (23°C ± 2°C)
Usage environment	0 to 45°C, 5 to 85% R.H.
Dielectric strength voltage	Between AC power and housing: 1500V AC for 1 minute
Insulation resistance	Between AC power and housing: 20MΩ or more at 500 V DC
Power supply	AC input: 100 to 240 V AC/50 to 60 Hz
Power consumption	85VA
External dimensions (approx.)	225 x 141 x 160 mm (GL7000 + Alarm Module, not including protruding parts)
Weight (approx.)	2.55 kg (GL7000 + Alarm Module)
Others	Vibration proof: Automobile parts Type 1 Class A equivalent

8−2. External input/output function

Items	Description
Input specifications (External input/output)	Maximum input voltage: 0 to +24 V (one line ground input) Input signal: No-voltage contact (a contact, b contact, NO, NC), Open collector, voltage input Input threshold voltage: approx. +2.5 V Hysteresis: approx. 0.5 V (approx. +2.5 V to approx, +3 V)
Output specifications (External input/output , Alarm output)	Output form: Open collector output (pull-up resistor 10kΩ) * For the output circuit, see the instruction manual on the CD-ROM.
External sampling input	Maximum input frequency for built-in RAM recording: 1MHz SSD recording (optional): 1 kHz Built-in flash recording: 1 kHz SD card recording: 1 kHz Temporal error: The fastest sampling interval for every Amplifier Module or less. * For every amplifier's fastest sampling interval, see the instruction manual on the CD-ROM.

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● Specifications are subject to change without notice.

GL7000 Quick Start Guide July 1, 2012
(GL7000-UM-852) 1st edition-01

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