

DATA PLATFORM GL7000

Quick Start Guide

GL7000-UM-855



Thank you for purchasing Graphtec DATA PLATFORM GL7000. The Quick Start Guide is to assist you with the basic operations. For detailed instructions, please refer to the instruction manual on the CD-ROM (PDF format) enclosed.

Check the outer casing first

Check the exterior of the unit to ensure that there are no cracks, defects or any other damages before use.

Accessories

- Alarm Module: 1
- Quick start guide: 1
- CD-ROM: 1
- Face cover: 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 to (50Hz or 60Hz) to reduce noise level.

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1. GL7000 operating guide

1-1. CE marked equipment guide

GL7000 conforms to the EN61326-1 Class A based on the EMC Directive (2014/30/EU) Additionally, it conforms to the EN61010-1:2010 3rd based on the LV Directive (2014/35/EU). The instrument meets both the standards. When operating the instrument, follow the safety guide in the instructions manual (PDF) found on the attached CD-ROM. To avoid possible damage or injury due to mishandling of the instrument, please follow the operating safety guide and ensure correct usage of the equipment.

1-2. Location recommendation

Do not use GL7000 in locations noted below.

- Avoid places with high temperatures or high humidity, as in direct sunlight or near heaters.
- Avoid environment with salty air, corrosive gas, as well as places with an organic solvent in the atmosphere.
- Avoid places with possible surge in voltage and jamming, as lightning and near electrical furnaces.
- Avoid places with lots of dust.
- Avoid places with vibrations and shocks.

1-3. Warning for maximum input voltage

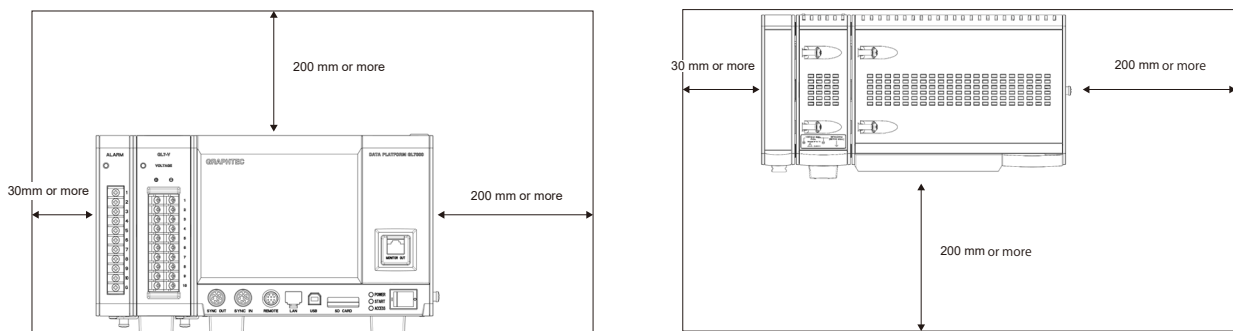
Every Amplifier Module has a specified maximum voltage input, do not input voltage levels exceeding the specified value at any moment. For details, see the instructions attached with each module.

1-4. Warning for module installation/removal

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

1-5. Installation space recommendation

The instrument is equipped with ventilators and exhaust vents for cooling fan. Do not block the vents and give allowance for installment space as shown in the chart below.

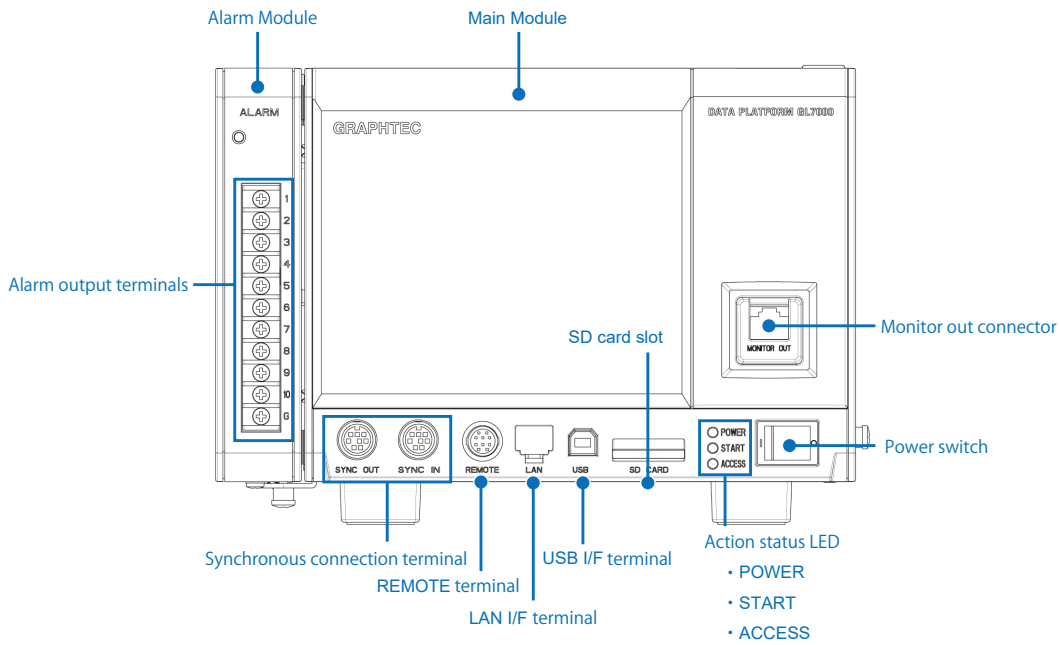


1-6. Warm-up

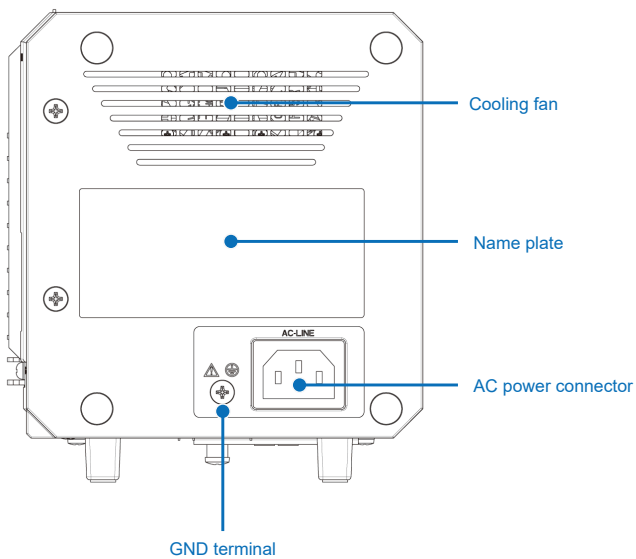
GL7000 requires approximately 30 minutes to warm-up in order to deliver the optimum performance. This is especially true if temperature is being measured.

2. Part Names

2-1. Front view

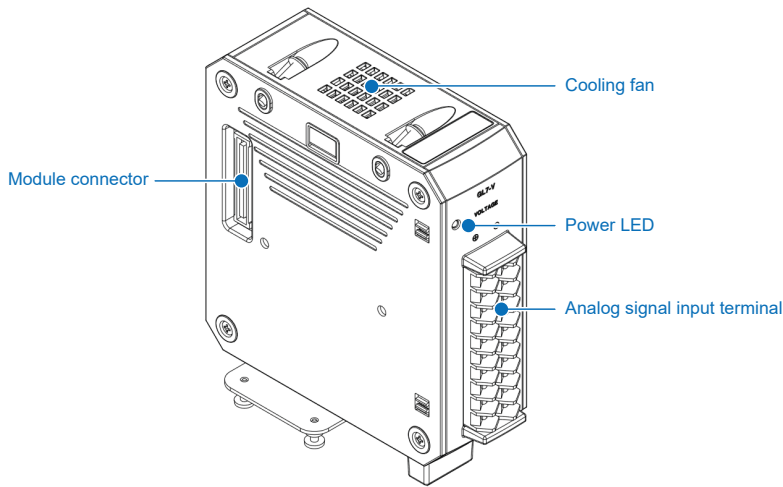


2-2. Side view

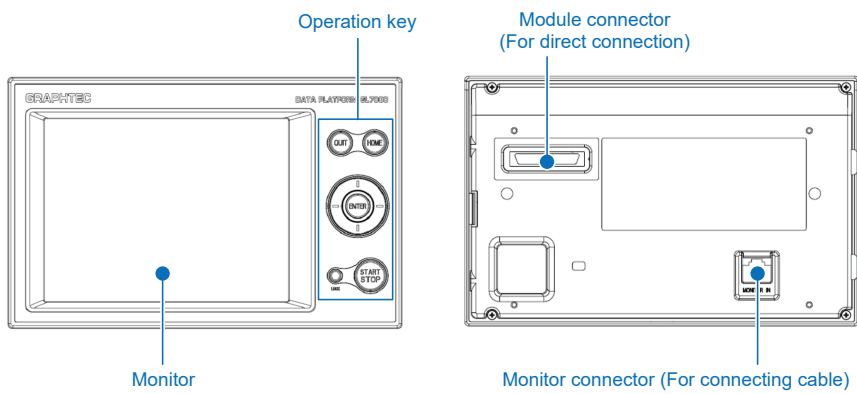


Available optional modules.

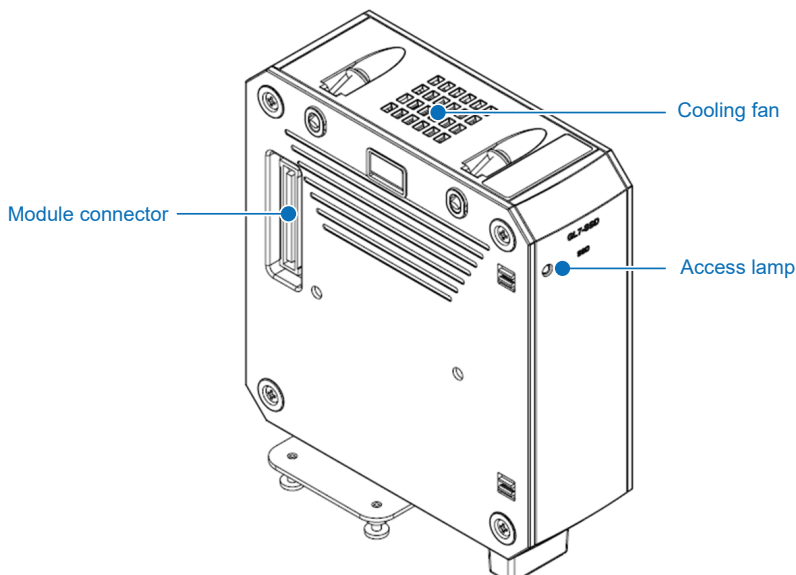
2-3. Voltage Module (optional)



2-4. Display Module (optional)



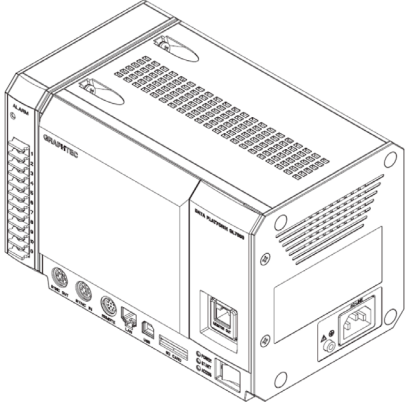
2-5. SSD Module (optional)



3. Set-up position

To use GL7000, use it in an upright position as shown below.

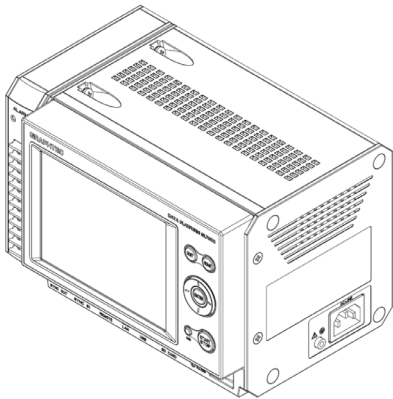
3-1. Standard main module only



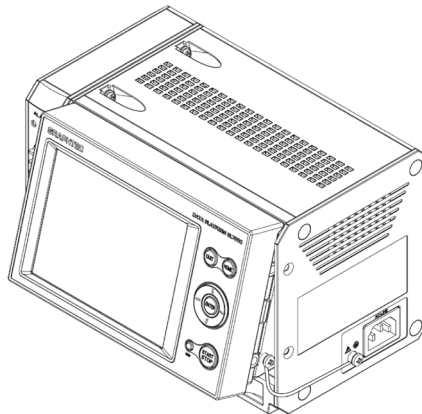
3-2. Installing the Display Module (optional)

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

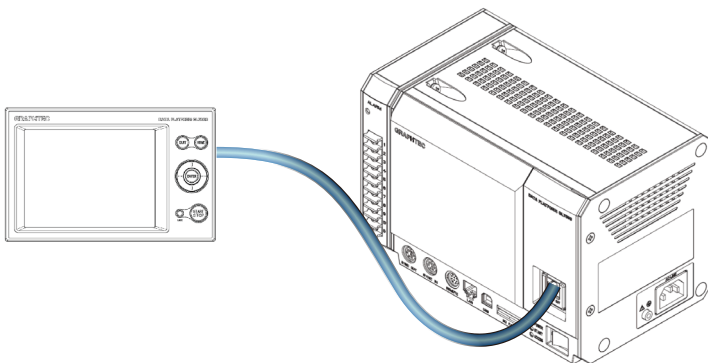
<Install to GL7000 >



< Install with the tilting table >



<Install with the extension cable >

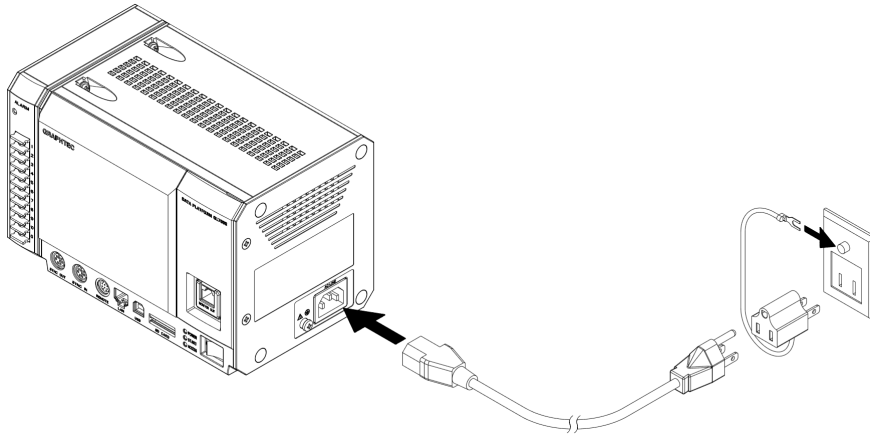


* Use a commercially available LAN cable for connecting the display module to the main unit(straight, CAT5 or above, cable length 10m or less)

4. How to power the GL7000

4-1. Connecting the AC power cord

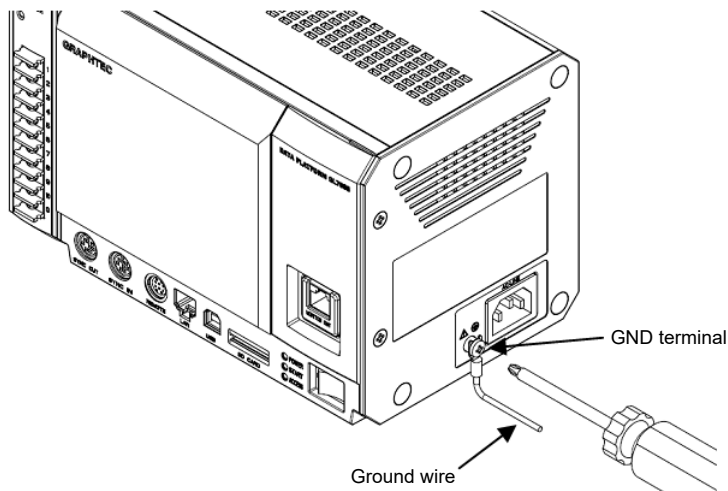
Insert the AC power cable into the GL7000 and the other end into an electrical outlet.



*AC power cord may differ depending on your country designation.

4-2. Connecting to the GND terminal

Use the GND terminal 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.



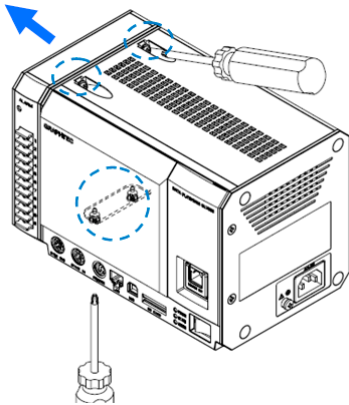
* In order to prevent an electric shock and a fire, please ground the instrument using a GND terminal. For grounding, use a ground wire with a diameter of at least 0.75 mm².

5. How to install the modules to the GL7000

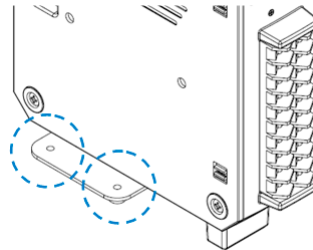
To measure with GL7000 requires installation of Amplifier Module sold separately.

Example: This section describes the direction to install a Voltage Amplifier Module as an example. (For other Amplifier Modules, see the instructions attached with the each module.)

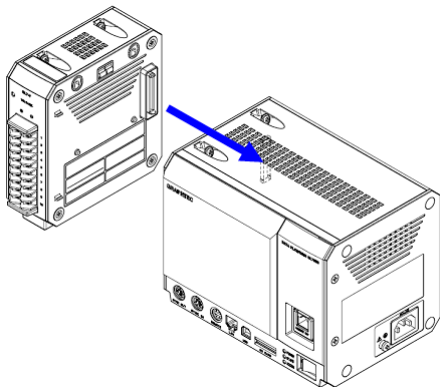
- 1) Remove the fixed screws (2 each from the top and the bottom of the unit), place the Alarm Module parallel to the GL7000 and slide it in the direction of the arrow to remove the module.



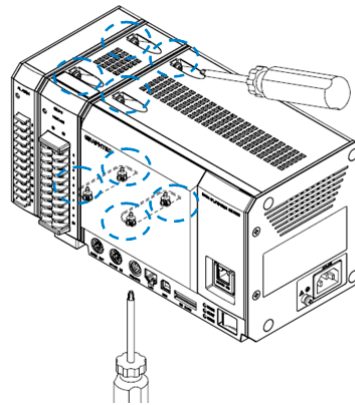
- 2) Remove the fixed screws from the side of the Amplifier Module. (2 places on the chart below)



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



- 4) In the same manner, return the Alarm Module and attach to the end and fasten the center down with screws. (Recommended tightening torque: 4kgf/cm). Tighten the upper screws first then the lower screws.



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

GL7000 offers wide variety of measuring objects by adding amplifier modules to the instruments. A maximum of 10 Amplifier Modules can be added, up to 112ch possible channels. The Logic/Pulse can be selected individually 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 not provided by Graphtec). An SSD 128GB is available as an option. (However, 1 file cannot exceed 4GB)

6. GL-Connection software

The GL-Connection is a PC software for managing and measuring on the GL7000.

The GL-Connection (included as standard) will do the following:

- Operate the GL7000 (settings reference, recording start, recording stop etc.)
- Record real time data (Real time data recording is possible at 1 ms at the fastest). *
- Plays back recorded data

Following information lists 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 7 (32/64bit) (* Starter Edition is not supported)
Windows 8 / 8.1 (32/64bit)
Windows 10 (32/64bit)
- CPU: Intel Core 2 Duo or higher is recommended
- Memory: 1GB or higher is recommended
- HDD: 32GB 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 the 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 link guides how to install the GL-Connection application software.

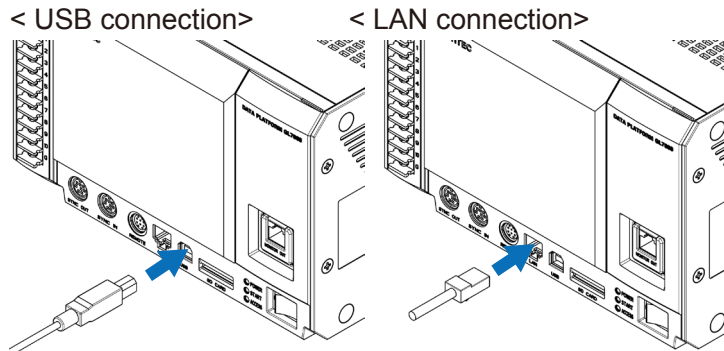
By selecting the automatic program “GL-Connection Install” on the attached CD-ROM, the GL-Connection will launch and the installation will start. Follow the instructions and continue with the installation.



Installing GL-Connection

6-4. Connecting GL7000 and PC

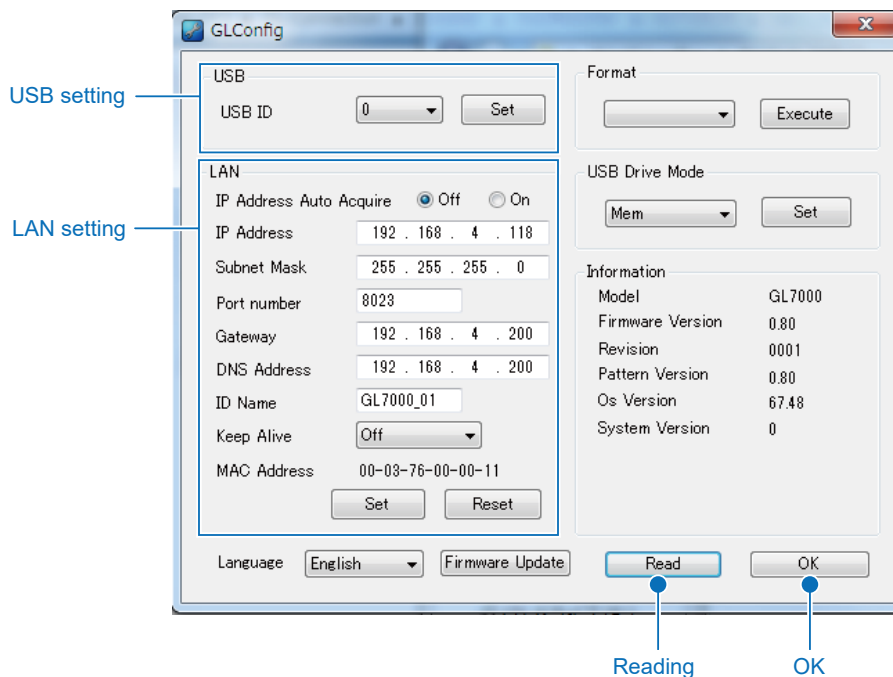
Using either A-B cable for USB or LAN cable, connect GL7000 and PC. After connection is made, turn on the power to the GL7000.



6-5. GL7000 Interface Settings

The instrument has USB and LAN interface settings. Settings can be found on the Config program included in the installation software. From the Windows select “Start” → “Programs (All Programs)” → “Graphtec” → “GL-Connection” → “GLConfig” to launch the software.

USB must be connected to manage GLConfig. Start and select the “Read” button and the information will be accessed and displayed on the screen from the GL7000.



6-5-1. 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 number for each equipment.

6-5-2. 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

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

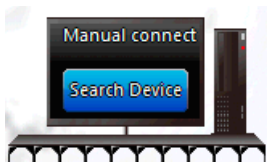


6-7. Connecting the GL-Connection

Start the GL-Connection.



When GL7000 and PC are correctly linked, and when the power to the GL7000 is turned on, your PC will automatically recognize the GL7000 and display the GL7000 icon. If the icon is not displayed, see section “6.5 GL7000 Interface Settings.” for more details.



PC icon

By clicking on the PC icon, software will search for the GL equipment.



GL device icon

The icon is displayed when there is a connection with GL. Click the blue button to link or drag and drop the dot to the PC to connect.



File icon

An icon to access file playback and display. Click the icon to start playback of the file.

6-7-1. To connect

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



Connection in progress icon status



Connection completed status

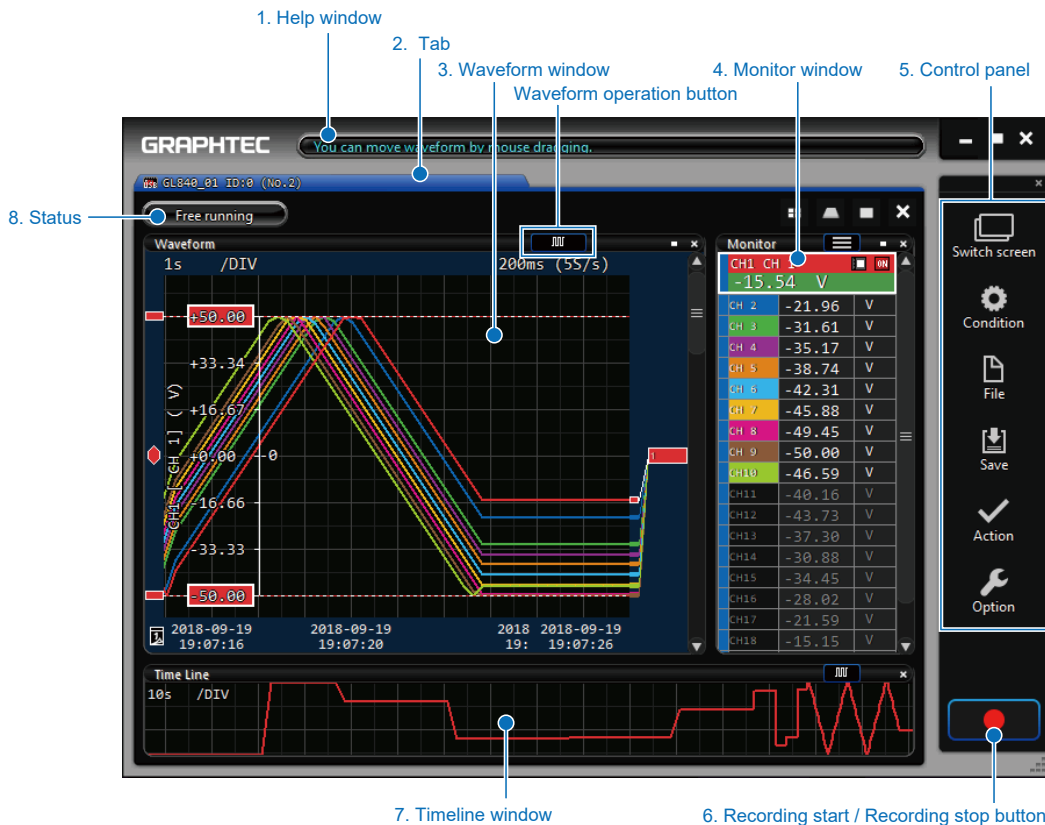
6-7-2. To disconnect

Remove the connection plug of the device icon to disconnect.



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

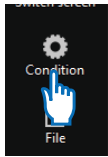
Press the screen change button on the control panel to change to the main screen. The connection screen and the main screen can be changed at any time.



No.	Items	Description
1	Help window	Help window will pop up where the mouse is placed.
2	Tab	Creates 1 tab for 1 connection device, file and group. A maximum of 20 tabs can be created. Dragging and moving a tab can combine screens.
3	Waveform window	Displays the waveform. Using the waveform change button on the upper right corner of the window, the waveform mode can be change to Y-T, X-Y etc.
4	Monitor window	Displays the digital value. Click on a channel and the selected channel will be highlighted with white border and the waveform window for that channel will be displayed.
5	Control panel	A group of buttons for performing various operations.
6	Recording start/Recording stop button	Start and Stop 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.

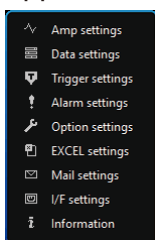
6-9. SETTING screen in GL-Connection

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



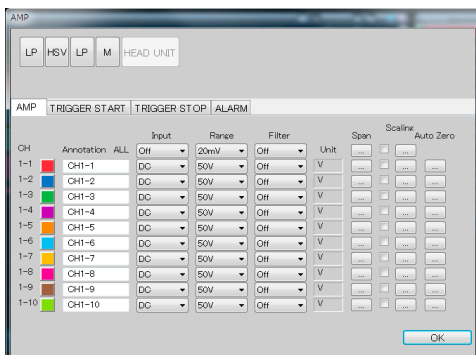
6-9-1. Main menu

The menu screen allows access to various main module settings. By pressing the displayed Amplifier Module, each module's setting screen comes up. The screens for data setting and trigger setting are available below as push buttons. For detailed setting methods, see the applications manual.



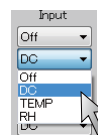
6-9-2. Setting the amplifier

Set the input signal.

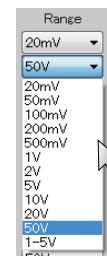


Input and range can be changed by clicking the mouse on the select item. Any change will be sent to the main module.

Changing the input

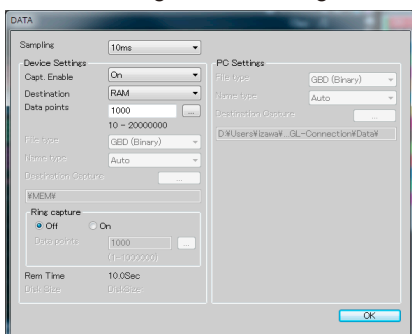


Changing the range



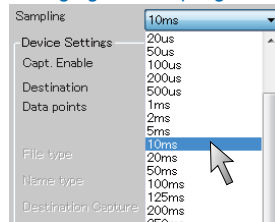
6-9-3. Changing the Data settings

For recording-related settings.

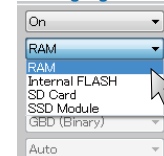


Sampling speed and recording destinations can be changed by clicking the mouse on the select item. When any of the set ups are changed, the new conditions are sent to the main module.

Changing the sampling



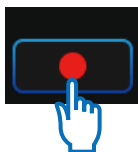
Changing the recording device



6-10. Recording with GL-Connection software

6-10-1. Record start button

Press the record start/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 or on the internal or external disks.

Built-in RAM	Records to the built-in RAM of the main module. The built-in RAM will be erased if the power to the main module is turned off volatile memory. Use with high speed recording of 1ms sampling or above. To playback data on a PC, transfer the data to the main module playback or the PC after the recording has finished.
Disk	Records 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 done at the same time.

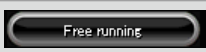

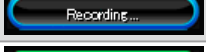

6-10-2. Compressed file

To speed up the reading of data during playback, the 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, as the sub-sampling process is based on the signal peak value. Furthermore, if the compressed files are deleted, the data playback response will decline, 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

Screen display of instrument status.

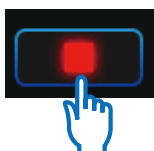
Free running		Connected to the GL instrument, not recording.
Armed		In recording state, waiting for trigger detection.
Recording		In recording state, data is recording.
Review		Playing file, playing main module data.

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

Recorded data can be reviewed while the instrument is recording. Data files that have finished recording can be replayed. More information is available in “6.12 GL-Connection playback.”

6-11. To Stop GL-Connection

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

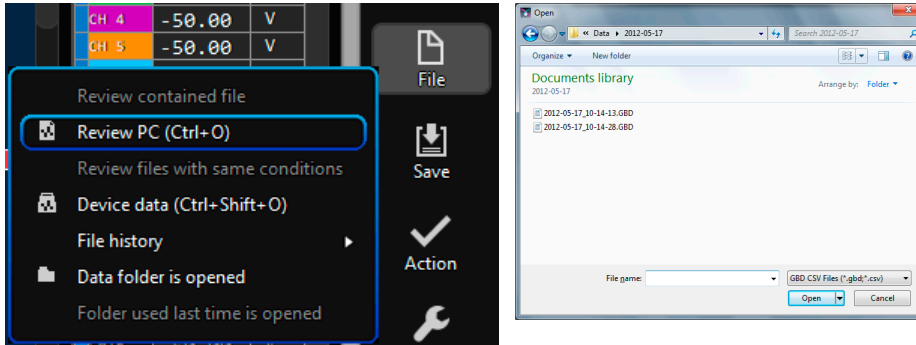


6-12. Replay on GL-Connection

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



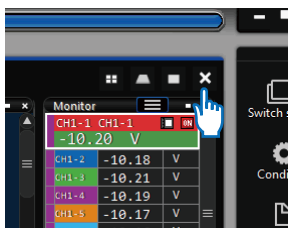
Press [Control Panel] > [File] button > [Review PC (Ctrl + O)]. Select any file in FILE SELECT dialog.



Data replay in progress window



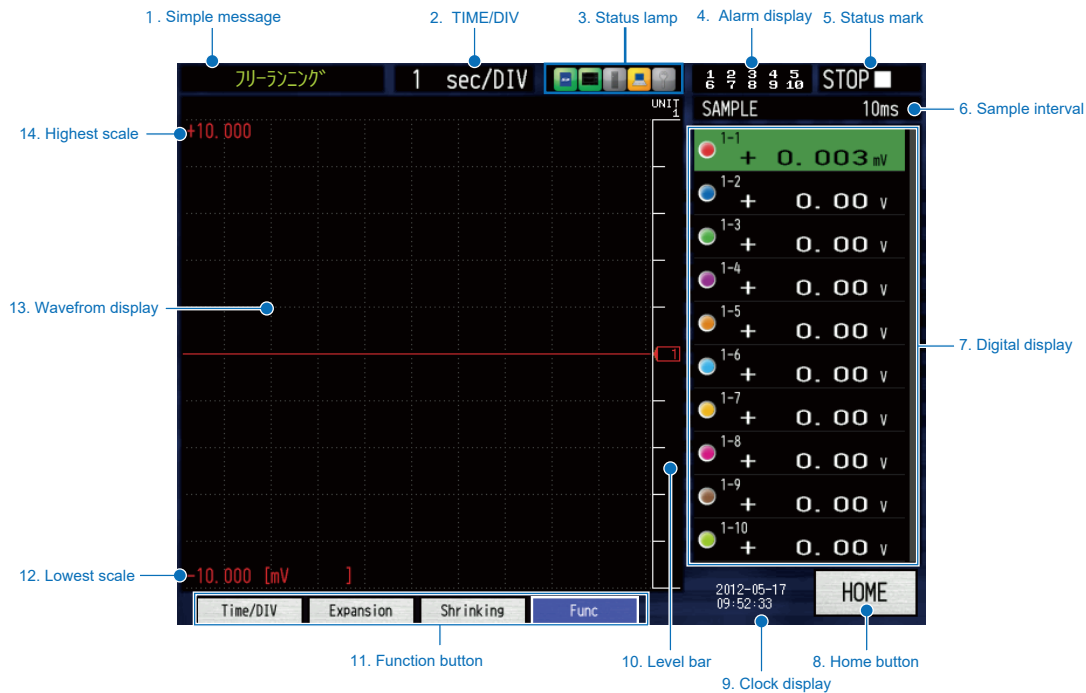
To terminate replay, drag the tab and place the tab into in the recycle bin.



7. Display Module (GL7-DISP)

Use the optional Display Module, to allow stand-alone measurement. This chapter explains operation using the Display Module.

7-1. Screen operating instructions

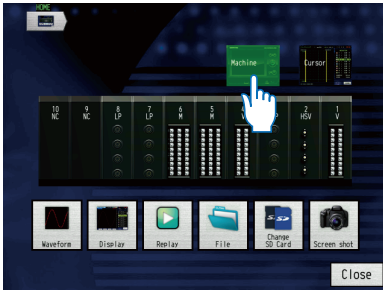


No	Name	Description
1	Simple message	Displays the action status.
2	TIME/DIV	Displays the currently set time scale.
3	Status lamp	Displays all access status.
4	Alarm display	Displays the alarm output terminal status (red = alarm)
5	Status. mark	Displays the recording or playing status.
6	Sample interval	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. Press the FUNC button to select from the list.
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

The display option is equipped with a touch-screen function. Following are the basic operations for using the Touch-screen feature. Example: change the sample interval.

7-2-1. Pressing a button



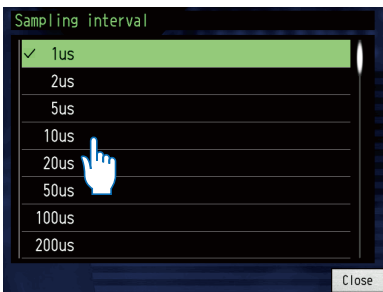
Touch an icon button with your finger to execute it.

Since this is a capacitive touch-screen, mechanical device such as a pen or pencil will not work. Remove gloves etc. and operate it with your fingers.

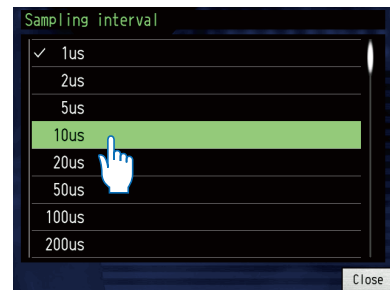
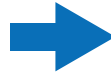
* Note that operating the touch-screen with a pointed object may damage the screen.

* Do not use with wet hands.

7-2-2. Selecting an item

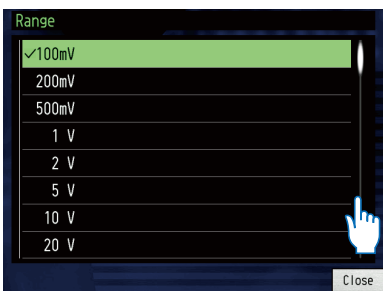


Once touched, highlighted area will change colors

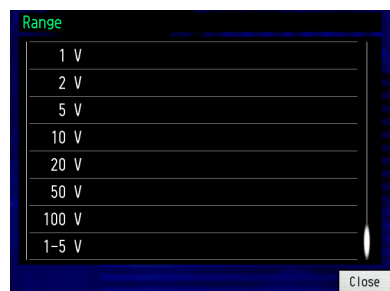


Touch again or double click to confirm.

7-2-3. Moving the slide bar



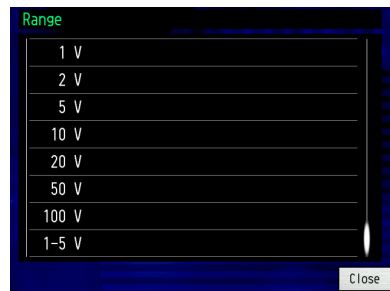
Touch a spot where there is no slide bar.



Touch again to confirm.

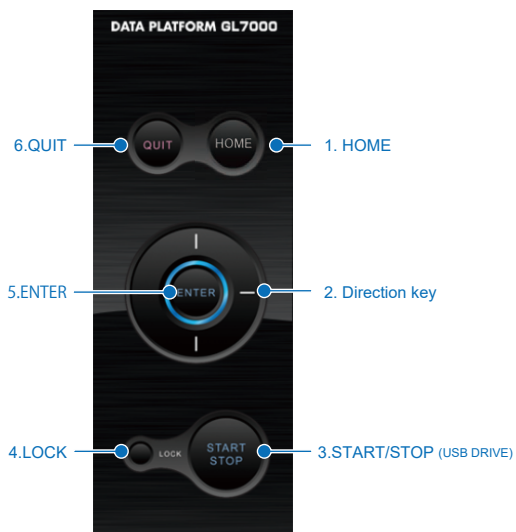


Drag the slide bar (keeping the finger pressed down and move the bar by tracing your finger)



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

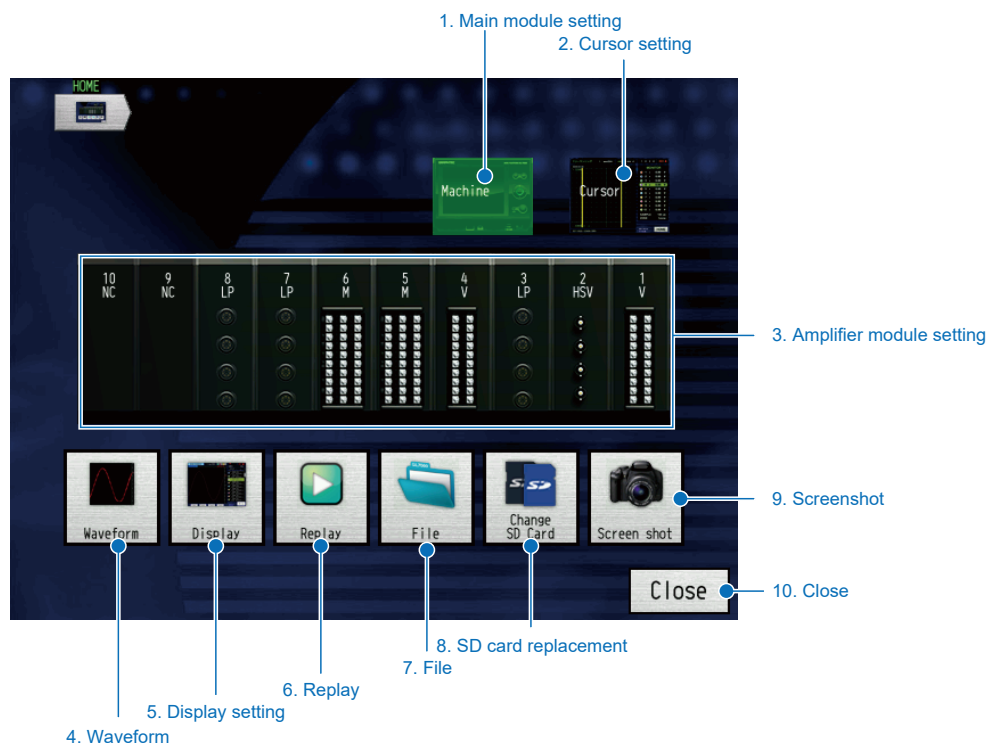
7-3. Description of the operation keys



No	Name	Description
1	HOME	Press the main key to return to the home menu.
2	Direction key	Used for item selection during setup and cursor movement during playback.
3	START/STOP (USB DRIVE)	Press to start recording during free-running, and press to stop recording. If the instrument is connected to a PC via a USB cable and the key is pressed during boot-up while the power is turned on, the instrument 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 when the device is set to remote (key lock), its external operation state, and 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	Set data (sampling speed and recording point etc.), network, date/ time, factory, trigger alarm, I/F USB and other settings.
2	Cursor setting	Set cursor movement, data retrieval, execute and statistical calculations.
3	Amplifier Module setting	Set channel range and filter, trigger level and alarm settings.
4	Waveform	Set waveform span, zone and Time/DIV ranges.
5	Display setting	Display mode and operation settings.
6	Replay	Set the playback origin and execute the playback.
7	File	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	Save the waveform screen as a bitmap.
10	Close	Close 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 logic amplifier or pulse amplifier, but the pulse amplifier can only be set for up to 2modules (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. 4GB * 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) 128GB * 1 file cannot exceed 4GB
Backup function	Setup conditions: EEPROM/Clock: Lithium battery
Clock accuracy (23°C environment)	± 0.002% (approx. 50 seconds per month)
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	Max 110VA (AC240V)
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.

Items	Description
External sampling input	Maximum input frequency for built-in RAM recording: 1MHz SSD recording (optional): 1 kHz Build-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.

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