# GRAPHTEC

*General Purpose Data Acquisition System*

Modular

# DATA PLATFORM GL7000

Touch Panel Control
On-Demand Signal Acquisition
Embedded Monitoring and Datalogging Solution

## Relaunches with New Features


- ☑ *Attach up to 10 input/outport modules in a mixed signal environment*
- ☑ *Corresponds to various measurement types (physical, mechanical, and electrical)*
- ☑ *Supports a variety of storage media including an SSD module with a capacity of 128GB*

Website WWW.GRAPHTEC.NL / WWW.GRAPHTEC.BE

# Standalone Data Acquisition Platform with Embedded Option

Allows up to 112 channels in one main unit by attaching up to 10 units of the input / output modules.*1
Detachable display module enables the GL7000 to be used in a stand-alone platform or to be embedded in a test system.
Control and monitor via the PC or display module may be done independently.


LAN straight cable (CAT5 or higher class, length up to 10m) allows an extended display option for:

Embedded systems environment

PC connected environment

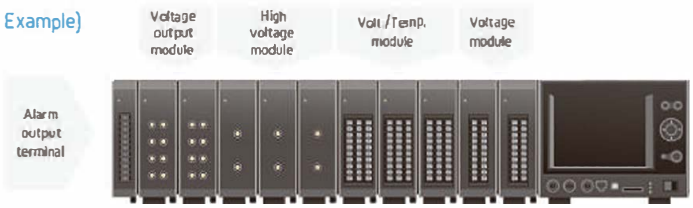
## MODULE OPTIONS (8 TOTAL) - Compatible with various electrical, mechanical, and physical measurement needs.

| | | | |
|---|---|---|---|
| Voltage Module GL7-V | Volt./Temp. Module GL7-M | High-speed Voltage Module GL7-HSV | High Voltage Module GL7-HV |
| DC Strain Module GL7-DCB | Charge Module GL7-CHA | Voltage Output Module GL7-DCO | Logic/Pulse Module GL7-L/P |

## Maintains the maximum sampling speed even when the number of input/output modules are increased *1

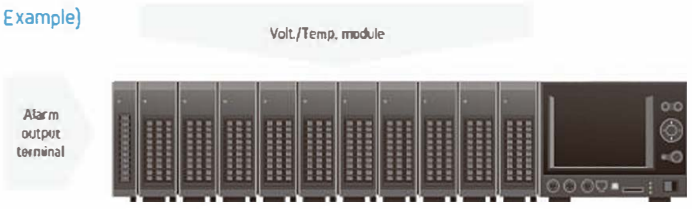
- Each of the 10 units can include a different input/output module *2

Example)



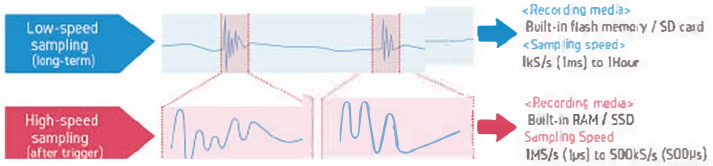

- Up to 10 input/output modules of the same kind can be attached to one main unit *2

Example)




## Dual-Sampling Feature (Firmware version 2.0 or later)

Dual sampling speed can now be configured at the same time.
While recording long intervals on the slow sampling speed, trigger set can start recording dynamic transient signals at a fast sampling speed.




## Up to 10 input/output modules can be attached to one main unit *2

Example)

Using Volt/Temp Module

10 ch being used,
Max. sampling speed
100S/s
(10ms interval)

20 ch being used,
Max. sampling speed
100S/s
(10ms interval)

40 ch being used,
Max. sampling speed
100S/s
(10ms interval)


*1. Maximum sampling speed will depend on the data destination.
(RAM and optional SSD module is the fastest, Flash memory, SD Card will be slower.)

*2. · If different types of modules are attached,
the effective sampling speed of the system meets the fastest sampling speed among the installed modules.
When the maximum sampling speed of the module is slower than the maximum sampling speed of the fastest amplifier, signal will be sampled with maximum sampling speed of the module.
The same data is saved with the system sampling speed until new data is captured on the slower units.
· The number of modules that can be attached is limited by the type of module.
Up to 10 modules (maximum 112ch with 7 GL7-L/P module, max 100ch with GL7-V or GL7-M module).
For Logic/Pulse module (GL7-L/P):
Maximum 7 units allowed using logic option (112ch).
Maximum 2 units allowed using pulse option (32ch).(The mode for logic or pulse can be set for each unit.)
For Strain module (GL7-DCB):
Maximum 8 units allowed with additional two other amplifier units. (Number of channels is limited to 112ch.)
· For the logic/pulse module, the number of channels can be limited by the selected sampling speed when the module is attached together with other amplifier modules.
1µs sampling interval : up to 8 channels
2µs sampling interval : up to 16 channels (If two modules are attached, channel #1 to #8 in each unit can be used.)
When pulse mode is used, the maximum sampling speed is the 100µs. The data will be updated every 100µs.

# Touch Panel Display Option (GL7-DISP)

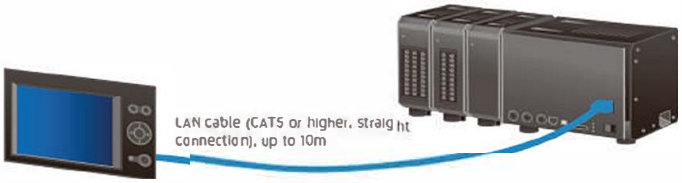
## The display unit incorporates a touch panel system to provide convenient on-site operation

Touch the icon, move to the next setting menu screen.

The display waveform is able to expand or shrink.

## Function menu icons *(Firmware version 2.0 or later)*

## The display unit can be separated from the main unit with a LAN cable




## Four Different Display Methods

Each of the 10 units can include a different input/output module *2

Y-T display

*Stored recording can be displayed in double-screen mode even while the current recording is on-going.*

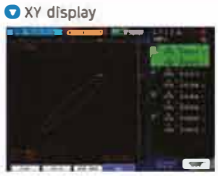
* Available when the destination of data file is the Built-in flash memory / SD memory card / SSD unit (optional).
* Sampling interval should be the 100ms or longer.

Digital display

*Both digital and statistical values can be displayed at the same time.*

* Select two functions from the Ave. / Max. / Min. / Peak value and Off.
* Sampling interval should be 100ms or longer.

XY display



FFT display

# Supports multiple types of storage

## 1 Built-in RAM

RAM is built into each of the amplifier modules to allow recording of up to 2 million samples. Increasing the number of channels does not decrease the data capture duration.

## 2 Built-in Flash memory

4GB of Flash memory is built into the main module. Captured data can be saved directly to the flash memory when sampling speed is less than 1ms (1k Samples/s). Non-volatile memory (saved data is retained even if the power is turned off).

* The storage capacity might differ by its production date.

## 3 SD memory card

SD card slot (supports SDHC, up to 32GB) is standard on the main module. Captured data can be saved directly on the SD card when sampling speed is slower than 1ms (sampling speed: 1 k Samples/s). Supports hot-swap where SD memory card can be replaced during recording without any data loss.*
The captured data can be transferred easily to the PC during offline condition.

* The hot-swap is possible when the sampling is slower than 100ms.

## 4 SSD module (128GB)

Option

Allows multiple recording of large amount of data to be saved when optional SSD module is used. It has a high vibration resistance and the captured data can be saved directly to the SSD when sampling is not faster than 1µs.

**GL7-SSD**
SSD module needs to be set next to the main module.

Advantage of SSD • Retain the data even when power is off • High vibration resistance • High-speed access

* The number of modules are limited.

## Maximum sampling speed and the data capturing time *1

| Input Module | Strage Device | Number of units. Max. sampling speed (interval) | | | Capturing time when single module is attached (when 10 modules are attached) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Attached to 1 or 2 modules | Attached to 3 or 4 modules | Attached to 5 to 10 modules | 1MS/s (1µs) | 100kS/s (10µs) | 1kS/s (1ms) | 100S/s (10ms) | 1S/s (1s) |
| High-speed Voltage Module | Built-in RAM (2Msamples) | 1MS/s (1µs) | | | 2sec. (2sec.) | 20sec. (20sec.) | 33min. (33min.) | 5hrs. (5hrs.) | 23days (23days) |
| | Built-in Flash memory (4GB) | 1kS/s (1ms) | | | N/A | N/A | 72hrs. (10hrs.) | 32days (4days) | 3269days (440days) |
| | SD memory card (32GB)*2 | | | | | | 83hrs. (11hrs.) | 34days (4days) | 3495days (470days) |
| | SSD (128GB)*2 | 1MS/s (1µs) | 500KS/s (2µs) | 200KS/s (5µs) | 4min. (N/A) | 44min. (6min.) | | | |
| High Voltage Module | Built-in RAM (2Msamples) | 1MS/s (1µs) | | | 2sec. (2sec.) | 20sec. (20sec.) | 33min. (33min.) | 5hrs. (5hrs.) | 23days (23days) |
| | Built-in Flash memory (4GB) | 1kS/s (1ms) | | | N/A | N/A | 109hrs. (17hrs.) | 45days (7days) | 4577days (715days) |
| | SD memory card (32GB)*2 | | | | | | 117hrs. (18hrs.) | 48days (7days) | 4893days (764days) |
| | SSD (128GB)*2 | 1MS/s (1µs) | 500KS/s (2µs) | 200KS/s (5µs) | 4min. (N/A) | 44min. (11min.) | | | |
| DCStrain*3 &Charge Module | Built-in RAM (2Msamples) | 100kS/s (10µs) | | | N/A | 20sec. (20sec.) | 33min. (33min.) | 5hrs. (5hrs.) | 23days (23days) |
| | Built-in Flash memory (4GB) | 1kS/s (1ms) | | | | N/A | 72hrs. (13hrs.) | 32days (5days) | 3269days (544days) |
| | SD memory card (3GB)*2 | | | | | | 83hrs. (13hrs.) | 34days (5days) | 3495days (582days) |
| | SSD (128GB)*2 | 100kS/s (10µs) | | | 44min. (6min.) | | | | |
| Voltage Module | Built-in RAM (2M samples) | 1kS/s (1ms) | | | N/A | N/A | 33min. (33min.) | 5hrs. (5hrs.) | 23days (23days) |
| | Built-in Flashmemory (4GB) | | | | | | 42hrs. (4hrs.) | 17days (2days) | 1760days (204days) |
| | SD memory card (32GB)*2 | | | | | | 45hrs. (5hrs.) | 18days (2days) | 1882days (218days) |
| | SSD (128GB)*2 | | | | | | | | |
| Volt./Temp. Module | Built-in RAM (2Msamples) | 100S/s (10ms) | | | N/A | N/A | N/A | 5hrs. (5hrs.) | 23days (23days) |
| | Built-in Flash memory (4GB) | | | | | | | 17days (2days) | 1760days (204days) |
| | SD memory card (32GB)*2 | | | | | | | 18days (2days) | 1882days (218days) |
| | SSD (128GB)*2 | | | | | | | | |

*1 **Capturing time values (approximate data) are saved as GBD format files.** When data is saved in CSV format, maximum sampling speed will be 10ms regardless of the captured destination and module type. Value of the capturing time is also diffe,ent from above. (Data cannot be saved to built-in RAM using the CSV format.)
*2 The file size of the captured data is limited up to 4GB on firmware version 2.0 or later. 2GB on firmware version 1.6 or before.
*3 Reference recording time is for up to 8 modules. (max GL7-DCB and GL7-CHA modules is 8.)

## Useful functions for data saving and replay

| | |
|---|---|
| • SD memory card hot swap | The SD card can be replaced during recording when the sampling interval is 100ms or slower. |
| • Ring capture | When data capturing stops, most recent data is stored in the memory. |
| • Relay capture | Creates data file up to 4GB continously without losing any recording. (Firmware version 2.0 or later : up to 4GB, Firmware version 1.6 or before : 2GB) *In firmware version 2.0 or later, data capacity or capturing time can be set flexibly by users. |
| • Data search | Specific value (measured value, alarm point) of a particular channel in the recorded data can be searched and found automatically. |
| • Movement by cursor | The cursor can be moved automatically to a specified time in the recorded data. |
| • Statistical calculation with cursor | The statistical calculation (average, max, min. P-P, effective value) can be determined in between the recorded data specified by the cursor. |

# Supports measurement and simulation testing using the voltage output module (GL7-DCO)

Allows a simulated testing by outputting the measured data from signals recorded from various input modules and outputs the data through the voltage output module (GL7-DCO).

* Signals that are being captured may not be output at the same time.
The output current is max 10mA for each channel.
Total output current of the unit is 40mA.
If the target object needs to be driven by external power, than a power amplifier may be needed.

1 Captures the abnormal signal


2 Outputs the saved data for driving equipment, and the signal of various points are measured simultaneously

# DC Strain Module GL7-DCB


## Main features

- Easily measure strain gauges using built-in bridge circuit for both 120 and 350 ohm gauges
- Supports excitation power for bridge circuit in constant voltage or current
- Supports TEDS sensors
- Supports a low-pass and anti-aliasing filter
- Enable high-precision measurement in remote sensing and shunt calibration function

Strain, Voltage, Res. 4ch/unit | Strain gauge, TEDS sensor | Max. 100kS/s (10µs)

## Supported sensors

Strain gauge : 1 gauge in 2-wire, 3-wire, or 4-wire
2 gauges in 3-wire, 4-wire, or 5-wire
4 gauges in 4-wire, or 6-wire

Strain type sensor : 4-wire or 6-wire

## Connector for input

Standard accessory
D-SUB type connector (standard accessory : 4pcs)

Standard accessory | Option
Input cable with NDIS type connector (B-561)

Option
Screw terminal adapter (B-560A)

* It can be used without connector cover by using included terminal hold bracket. The terminal holding bracket can be purchased for replacement as option B-560AP.

Option
Extension cable for B-560 / B-560A (B-560-05)

## Compensations for High-precision measurement

Remote Sense :
Eliminates the influence from the lead wire resistance

Shunt calibration :
Gain compensation of strain measurement

# Charge Module GL7-CHA

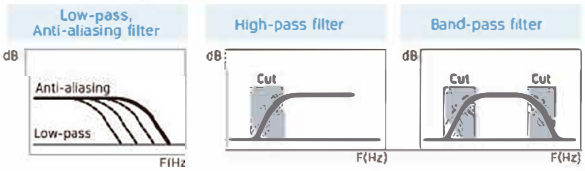

## Main features

- Supports charge and voltage output type sensors
- Now compatible with microphones (Firmware version 2.0 or later)
- Supports TEDS sensors
- Wide variety of filter functions allows high-precision measurements
- Support RMS (effective value) measurement

Charge, Voltage 4ch/unit | Charge, IEPE sensor | Max. 100kS/s (10µs)

## High-precision measurement using various filters

High-precision signal is captured using high-pass, low-pass, and anti-aliasing filter.

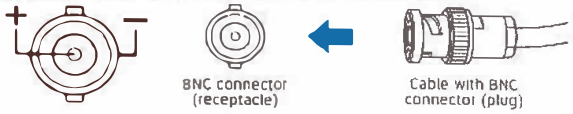



## Sensors and input connector type

Change or IEPE type sensors can be measured by setting the sensor sensitivity and using the engineering scaling function.

Charge output type sensor
Supported acceleration sensor : 0.01pC/(m/s2) to 999.9pC/(m/s2)


Voltage Output (IEPE) type sensor
Supported acceleration sensor : 0.01mV/(m/s2) to 999.9mV/(m/s2)
Supported microphone sensor : 0.2mV/Pa to 100mV/Pa




# Voltage Output Module GL7-DCO

## Main features

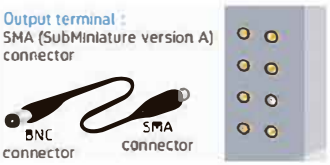
- Recorded data can be output as an analog voltage, and reproduce the measured anomalies and recorded data (Temperature, humidity, logic/pulse data is excluded.)
- The reference signal for the test created by the GL-Wave Editor (EXCEL macro) can be output into an analog voltage (Signal: Sine wave, pulse wave (any duty ratio), ramp, triangle wave, simple arbitrary waveform, DC.)
- Output voltage: Max. 10V (Output current: Max ±10mA/ch or ±40mA/unit.)

Output voltage 8ch/unit | Max. 100kS/s (10µs) | Captured data, Arbitrary waveform

## Output terminal and conversion cable

Option
Output cable with BNC connector (B-562)

Output terminal :
SMA (SubMiniature version A) connector




## Method of analog voltage output

* GL-Connection and GL-Wave Editor software are standard accessories.
* GBD is an abbreviation for Graphtec Binary Data.

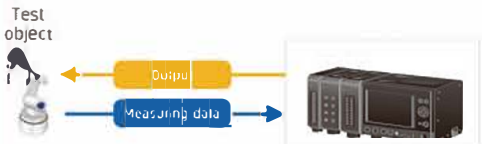
Three functions 1 Outputs the stored measuring data 2 Outputs the generated signal 3 Outputs the edited measuring data

**Case 1**

*Outputs a signal without a PC*

* The GL7000 cannot generate arbitrary data by itself.

Data : Saved measurement data
Waveform : Sine, pulse, ramp, triangle, or DC

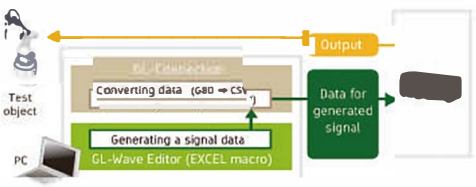



* Data that is currently recording cannot be output to the DCO module.

**Case 2**

*Outputs a signal using the module and the PC software*

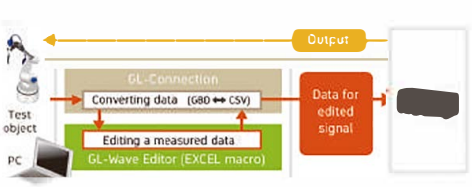
Data : Arbitrary data generated by the software
Waveform : Sine, pulse, ramp, triangle, or DC




**Case 3**

*Outputs an edited signal using the module and the PC software*

Data : Edited measuring data
Waveform : Sine, pulse, ramp, triangle, or DC



## High Voltage Module GL7-HV

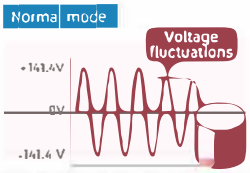
### Main features

- High input voltage (Maximum: 1000V)
- Input coupling of DC and AC
- Real-time RMS measurement

Voltage 2ch/unit | Max. 1000V input | Max. 1MS/s (1µs)

### Measuring in RMS (effective value)

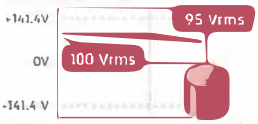
Normal mode




Volume of data to be recorded becomes large because the sampling speed needs to be fast to recognize the waveform.

RMS measurement

■ DC-RMS mode

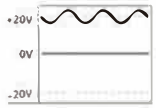



Volume of data recorded becomes small because the sampling speed does not need to be as fast recording the RMS value.

### DC- or AC-coupling

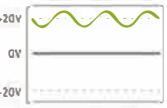
By using the DC and AC coupling feature, the voltage signal of a small signal superimposed on the input signals or the absolute voltage value can be recorded.

Signal




Small AC component is superimposed on the DC component.

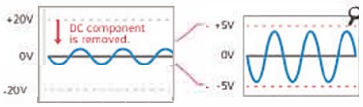
DC coupling




Measures the accumulated value of the DC and AC components. (Absolute voltage of signal.)

AC coupling

It is possible to remove the superimposed DC components from the coupled AC signal allowing only the small AC components to be measured.




## High Speed Voltage Module GL7-HSV

### Main features

- All isolated input channels (4ch/unit)
- 1MS/s high speed simultaneous sampling
- Maximum input voltage 100V
- Supports low-pass filter

High speed voltage 4ch/unit | Max. 1MS/s (1µs) | Simultaneous sampling Isolated

## Voltage Module GL7-V

### Main features

- All isolated input channels (10ch/unit)
- 1kS/s Simultaneous sampling
- Maximum input voltage 100V
- Supports low-pass filter

Voltage 10ch/unit | Max. 1kS/s (1ms) | Simultaneous sampling Isolated

## Voltage/Temperature Module GL7-M

### Main features

- All isolated input channels (10ch/unit)
- Supports multiple input types
  (4-20mA current loop using 250 ohms shunt)
  Voltage : max. 50V
  Temperature : Thermocouple and RTD
  Humidity : optional sensor (B-530)

Voltage /Temp. 10ch/unit | Max. 100S/s (10ms)

Supports one humidity sensor per module (B-530).
Additional humidity sensors require an external power supply for the sensors..

## Logic/Pulse Module GL7-L/P

### Main features

- Switching mode between logic or pulse 16ch/unit
- Logic mode: 1MS/s sampling,
  Pulse mode: 10kS/s sampling
- Available dedicated cabler

Probe set for Logic input (RIC-10A)

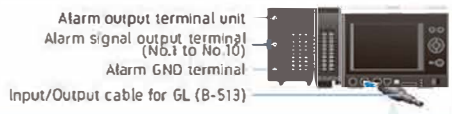
Logic /Pulse 16ch/unit | In Logic, Max. 1MS/s (1µs) | In Pulse, Max. 10kS/s (100µs)

Attachable number of modules: up to 7 modules using Logic mode, up to 2 modules using Pulse mode.
In the Pulse mode, there is a limitation of the sampling speed by the number of channels used.

# Reliable measurement with useful functions

## External I / O (Input/Output) and Alarm output

Output module is used for triggering, external sampling, start/stop, and auto-balance for input and output using the Input/Output cable for GL (B-513 optional). The signals related to the status of alarms are output from the terminal on the alarm output module.




Input • Start/Stop control (1ch) • External trigger (1ch)
• External sampling (1ch) • Executing auto balance (1ch)
Output • Trigger status (1ch)

**Alarm output signal specifications**

Open collector output
(pull-up resistance 10KΩ)
< Rating of the output element >
- Max. voltage: 50V
- Max. current: 2.0 A
- Max. dissipation: 0.6W

## WEB and FTP server for remote control and data transfer / Direct USB connection to the main unit

**WEB server** Web browser function allows remote control and remote monitoring of waveform analysis.

**FTP server** Data can be transferred between the server and GL7000.

**USB drive mode** The USB drive mode function enables data to be transferred to the PC from the main module built-in flash memory, SD card memory, or the SSD by drag & drop feature. You can then easily delete the files from the file explorer.

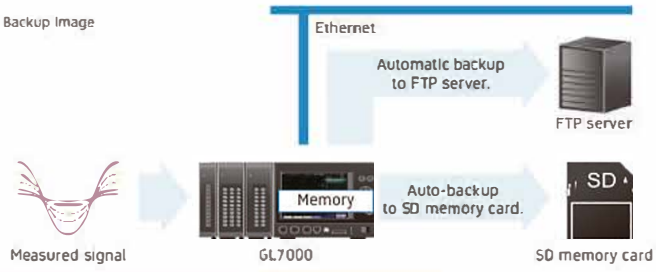
* While using the FTP server or the USB drive mode, data files that are being recorded cannot be transferred to the PC.

- WEB, FTP server function


- USB drive mode


## Backup settings

The GL7000 has a function that periodically backs up recorded data (refer to the chart below). Here, the user can set the conditions for data backup.




| Destination of data | Backup destination | | |
|---|---|---|---|
| | SD card | SSD | FTP |
| Built-in flash memory | Yes | Yes | Yes |
| SD memory card | No | Yes | Yes |
| SSD | Yes | No | Yes |

**Backup intervals** Off, 1, 2, 6, 12, 24 hour(s)

**Backup destination** SD memory card, SSD, FTP

- You can not specify the same location as the backup destination and recording destination.
- When the recording format is "CSV", the backup function is not available.
- When Ring recording is set to on, the backup function is not available.

## NTP client function

The clock on the GL7000 is periodically synchronized with the NTP server.

## DHCP client function

The IP address of the GL7000 is automatically obtained from the DHCP server.

# High performance and useful software GL-Connection

## Safe recording measures include backing up data on the PC

Application software allows a real time saving of the data while the data is being captured on to the memory of the GL7000.


| Storage on GL7000 | Transferred data to the PC |
|---|---|
| Built-in RAM | Captured data is transferred and saved to the PC after the completion of the measurement. During the measurement, free-running mode allows the display of the real time data but not the recording. (Real-time recording is not available using the built-in RAM as the recording destination.) |
| Built-in flash memory /SD memory card | Captured data is stored to the media and also transferred to the PC simultaneously. Max sampling speed: 1ms/unit when it is saved in the GBD format, 1ms/unit when it is in the CSV format. |
| SSD | Captured data is transferred and saved to the PC after the completion of the measurement. During the measurement, free-running mode allows the display of the real time data but not the recording. (Real-time recording is not available using the built-in RAM as the recording destination.) |

•Real time recording on the PC can be saved as a CSV file while the data is saved as a GBD file on the main GL7000. Maximum sampling speed for this feature is 1ms.

## Customized screens for Data Acquisition Professionals

Various control and setting screens for simplified operation

Setup screen
Recognize the unit to connect to the PC by graphical image on the display.

Setting menu screen
Setting menu on the GL Connection software is similar to the setup screen on the GL7000.

GL-Wave Editor (Excel macro

Data analysis with Oscope/Oscope2 (ONO SOKKI)
GL7000 GBD data can be imported directly to Oscope.

Setting menu for the voltage output module
Setup for the output function using the GL7-DCO module is set on the GL-Wave Editor (EXCEL macro) with customized data platform for specified measurement.

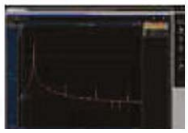
## Display options

Allows YT waveform, XY waveform, digital monitoring and FFT measurement (same as the main GL7000 unit)

Y-T waveform monitor screen

Digital monitoring screen

XY waveform monitor screen



FFT measurement screen

## Multiple window option allows waveforms to be displayed in various forms

* It is required version 2.20

Splits up to 4 windows and each window can display different format (Y-T, XY, FFT, and digits).

Dual windows

Quad windows

Quad windows displaying mixed format

Cursor Synchronization* :
When displaying multiple windows, the cursor positions can be synced

Module Settings List* :
Settings of multiple modules can be displayed simultaneously, and setting conditions can now be saved as CSV data.

Disable saving data to PC* :
selection for enabling or disabling data recording on the PC and only to the main unit GL7000.

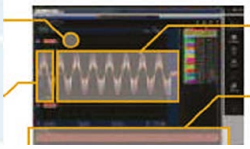
Remote Lock On/Off Feature* :
Setting operation is available on GL7000 under control of GL-Connection.

# Useful functions for GL-Connection Software

## Supports a user-friendly mouse movement that enables changes in the setting and the related display waveform

Display size of the waveform can be changed using a drag feature on the dotted line with the PC controlled mouse.

The position of the waveform can be shifted up or down using the mouse.



The scale of the waveform can be changed using the mouse wheel operation.

Time division can be shifted using the mouse wheel operation.

## Optional Features

Additional functions for data processing.

Statistics :
The maximum, minimum, peak, and average values are displayed while capturing data. The value between the cursors of the maximum, minimum, peak, average, and RMS will be displayed when replaying selected data span.

File operation :
Data can be converted to CSV file format for a specified time period, or complete data, or multiple files. A file can also be created by compressing or consolidating multiple files.

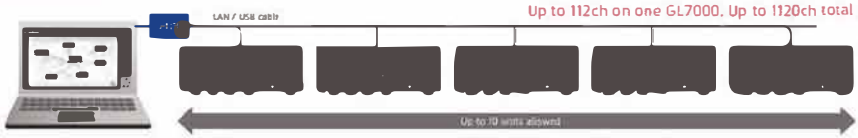
Search :
The search point can be set by the level, alarm, or time (the beginning of the data, center, end, trigger point, the specified time, instruction time, the number specified).

Send mail :
Alarm warnings can be sent via Email.

## Large-scale channel measurements

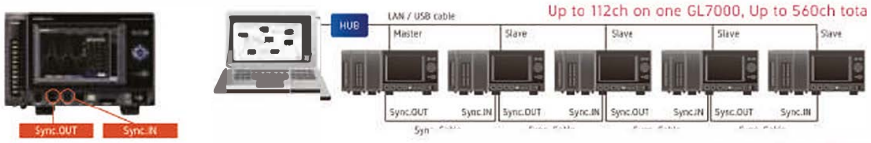
### Up to 1120 channels can be recorded using the PC platform

10 units of the GL7000 can be connected through 1 PC software using the LAN or the USB hub.



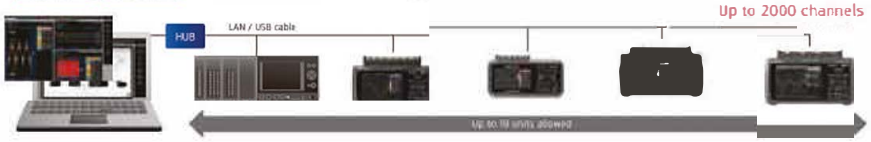

### Up to 5 units of the GL7000 can be fully synchronized using the sync. cable

The start/stop trigger, and sampling can be synchronized in the GL7000 when they are connected by a sync cable. The master and slave units are automatically identified. Data is stored in each main unit individually.




### Allows connections of Graphtec's midi LOGGER series Maximum channel is up to 2000 when 10 units of GL840 is connected

midi LOGGER series
- GL2000, GL980,GL900-4 and GL900-8, GL840, GL820, GL240, GL220
- can all be viewed in real time.




## SDK (Software Development Kit) is offered for free

Software Development Kit (SDK) is available for real time data transfer and beyond for custom application developed for your need.

- USB driver
- Manual (Main unit controls, data communication, data file, etc.)
- Sample program (in Visual C++, Visual Basic, .NET framework)
- Key commands have been set as modules for simpler implementation with LabVIEW. (Connection, Waveform Display, Digital Indicator, CSV conversion, file acquisition)

\ Coming soon /
Higher module has added

# Input / Output Module Specifications

| Voltage Module Specifications | | | Voltage | High Speed Voltage |
|---|---|---|---|---|
| Model number | | | GL7-V | GL7-HSV |
| Number of input channels | | | 10 channels | 4 channels |
| Input method | | | All channels isolated unbalanced input. Simultaneous sampling, Screw terminal (M3 screw) | All channels isolated unbalanced input. Simultaneous sampling, BNC connector |
| Sampling speed (interval) | | | 1 k Samples/s to 1 Sample/h (1 ms to 1 hr.) | 1 M Samples/s to 1 Sample/h (1 µs to 1 hr.) |
| Built in RAM | | | 2 million samples for each channel | |
| Measurement range | | | 100, 200, 500 mV, 1, 2, 5, 10, 20, 50, 100 V, and 1-5 V Full Scale | |
| Measurement accuracy (*1) | | | ±0.25% of Full Scale | |
| A/D converter | | | Successive approximation type, 16 bits (effective resolution: 1/40000 of the measuring full range) | |
| Input impedance | | | 1 MΩ ±5% | |
| Maximum input voltage | Between (+)/(-) terminal | | 100 mV to 1 V range: 60 Vp-p,2 V to 100 V range: 100 Vp-p | |
| | Between channels ((-) terminals) | | 60 Vp-p | |
| | Between channel/GND | | 60 Vp-p | |
| Max. voltage (withstand) | Between channels | | 1000 Vp-p (1 minute) | |
| | Between channel/GND | | 1000 Vp-p (1 minute) | |
| Isolation | Between input/GND | | Min. 50 MΩ (at 500 V DC) | |
| Common-mode rejection ratio | | | Min. 90 dB (50/60 Hz, Signal source impedance: Max. 300 Ω) | |
| Frequency response | | | DC to 1 kHz (+1/-3 dB) | DC to 200 kHz (+1/-3 dB) |
| Filter | Low pass | | Off, Line(1.5 Hz), 5, 50, 500 Hz (at -3 dB, 6dB/oct) | Off, Line(1.5 Hz), 5, 50, 500, 5k, 50k Hz (at -3 dB, 6dB/oct) |
| External dimensions (W×D×H) | | | Approx. 49 x 136 x 160 mm (Excluding projections) | |
| Weight | | | Approx. 840 g | Approx. 740 g |

| Voltage/Temperature Input Module Specifications | | | | | |
|---|---|---|---|---|---|
| Model number | | | GL7-M | | |
| Number of input channels | | | 10 channels | | |
| Input method | | | All channels isolated balanced input, Scans channels for sampling, Screw terminal (M3 screw) | | |
| Sampling speed (interval) | | | 100 Samples/s at 10ch to 1 Sample/h (10 ms at 10ch to 1 hr.) | | |
| Built in RAM | | | 2 million samples for each channel | | |
| Measurement range | Voltage | | 20, 50, 100, 200, 500 mV, 1, 2, 5, 10, 20, 50 V, and 1-5V Full Scale | | |
| | Temperature | | Thermocouple: K, J, E, T, R, S, B, N, and W (WRe5-26)<br>RTD: Pt100, JPt100 (JIS), Pt1000 (IEC751) | | |
| | Humidity (*2) | | 0 to 100 % RH, using optional humidity sensor (B-530). | | |
| Measurement accuracy (*3) | Voltage | | ±0.1% of Full Scale | | |
| | Temperature | Thermocouple | Measurement range | | Measurement accuracy |
| | | R/S | 0 ≤ TS ≤ 100°C | | ± 5.2°C |
| | | | 100 < TS ≤ 300°C | | ± 3.0°C |
| | | | R: 300 < TS ≤ 1600°C | | ± (0.05% of reading + 2.0°C) |
| | | | S: 300 < TS ≤ 1760°C | | ± (0.05% of reading + 2.0°C) |
| | | B | 400 ≤ TS ≤ 600°C | | ± 3.5°C |
| | | | 600 < TS ≤ 1820°C | | ± (0.05% of reading + 2.0°C) |
| | | K | -200 ≤ TS ≤ -100°C | | ± (0.05% of reading + 2.0°C) |
| | | | -100 < TS ≤ 1370°C | | ± (0.05% of reading + 1.0°C) |
| | | E | -200 ≤ TS ≤ -100°C | | ± (0.05% of reading + 2.0°C) |
| | | | -100 < TS ≤ 800°C | | ± (0.05% of reading + 1.0°C) |
| | | T | -200 ≤ TS ≤ -100°C | | ± (0.1% of reading + 1.5°C) |
| | | | -100 < TS ≤ 400°C | | ± (0.1% of reading + 0.5°C) |
| | | J | -200 ≤ TS ≤ -100°C | | ± 2.7°C |
| | | | -100 < TS ≤ 100°C | | ± 1.7°C |
| | | | 100 < TS ≤ 1100°C | | ± (0.05% of reading + 1.0°C) |
| | | N | -200 ≤ TS ≤ 0°C | | ± (0.1% of reading + 2.0°C) |
| | | | 0 ≤ TS ≤ 1300°C | | ± (0.1% of reading + 1.0°C) |
| | | W | 0 ≤ TS ≤ 2000°C | | ± (0.1% of reading + 1.5°C) |
| | | Reference Junction Compensation (R.J.C) accuracy: ±0.5°C<br>* Wire size of thermocouple used is 0.32 mm diameter in the T type and 0.65 mm diameter in other types | | | |
| | | RTD | Measurement range | Driving current | Accuracy |
| | | Pt100 | -200 to 850°C (F.S. = 1050°C) | 1 mA | ±1.0°C |
| | | JPt100 | -200 to 500°C (F.S. = 700°C) | 1 mA | ±0.8°C |
| | | Pt1000 | -200 to 500°C (F.S. = 700°C) | 0.2 mA | ±0.8°C |
| R.J. Compensation | | | Select internal or external | | |
| A/D converter | | | Sigma-Delta type, 16 bits (effective resolution: 1/40000 of the measuring full range) | | |
| Input impedance | | | 1 MΩ ±5% | | |
| Maximum input voltage | Between (+)/(-) terminal | | 60 Vp-p | | |
| | Between channels ((-) terminals) | | 60 Vp-p | | |
| | Between channel/GND | | 60 Vp-p | | |
| Max. voltage (withstand) | Between channels | | 350 Vp-p (1 minute) | | |
| | Between channel/GND | | 350 Vp-p (1 minute) | | |
| Isolation | Between input/GND | | Min. 50 MΩ (at 500 V DC) | | |
| Common-mode rejection ratio | | | Min. 90 dB (50/60 Hz, Signal source impedance: Max. 300 Ω) | | |
| Filter | Moving average | | Off, 2, 5, 10, 20, 40<br>(Moving average in selected number. When the sample is longer than 5 seconds, the data sampled in the sub-sample (5 seconds) will be used for creating the average value.) | | |
| 5 V output | | | Driving the humidity (*2) sensor B-530, 1 channel | | |
| External dimensions (W×D×H) | | | Approx. 49 x 136 x 160 mm (Excluding projections) | | |
| Weight | | | Approx. 770 g | | |

| High Voltage Input Module Specifications | | | |
|---|---|---|---|
| Model number | | | GL7-HV |
| Number of input channels | | | 2 channels |
| Input method | | | All channels isolated unbalanced input, Simultaneous sampling, Isolated BNC connector |
| Sampling speed (interval) | | | 1 M Samples/s to 1 Sample/h (1 µs to 1 hr.) |
| Built in RAM | | | 2 million samples for each channel |
| Input coupling and measurement | | | AC, DC, AC-RMS, DC-RMS |
| Measurement range | DC, AC | | 2, 5, 10, 20, 50, 100, 200, 500, 1000 V Full Scale |
| | DC-RMS, AC-RMS | | 1, 2, 5, 10, 20, 50, 100, 200, 500 Vrms Full Scale<br>(Crest Factor: up to 4 in 1 to 200 Vrms range, up to 2 in 500 Vrms range) |
| Measurement accuracy (*4) | DC, AC | | ±0.25% of Full Scale |
| | DC-RMS | | Sine wave measurement<br>±0.5% of Full Scale (at 20 Hz ≤ F ≤ 1 kHz)<br>±1.5% of Full Scale (at 1 kHz < F ≤ 20 kHz)<br>Response time: 500ms (Crest Factor is up to 4) |
| | AC-RMS | | Sine wave measurement<br>±0.5% of Full Scale (at 100 Hz ≤ F ≤ 1 kHz)<br>±1.5% of Full Scale (at 1 kHz < F ≤ 20 kHz)<br>Response time: 500 ms (Crest Factor is up to 4) |
| A/D converter | | | Successive Approximation type, 16 bits<br>(effective resolution: 1/40000 of the measuring full range in the DC and AC coupling,<br>1/20000 of the measuring full range in the DC-RMS, AC-RMS coupling) |
| Input impedance | | | 1 MΩ ±5% |
| Maximum input voltage | Between (+)/(-) terminal | | 1000 Vp-p |
| | Between channels ((-) terminals) | | 300 Vrms AC |
| | Between channel/GND | | 300 Vrms AC |
| Max. voltage (withstand) | Between channels | | 2300 Vrms AC (1 minute) |
| | Between channel/GND | | 2300 Vrms AC (1 minute) |
| Isolation | Between input/GND | | Min. 50 MΩ (at 500 V DC) |
| Common-mode rejection ratio | | | Min. 90 dB (50/60 Hz, Signal source impedance: Max. 300 Ω) |
| Frequency response | | | DC Coupling: DC to 200 kHz (+1/-3 dB)<br>AC Coupling: 4Hz to 200 kHz (+1/-4.5 dB) |
| Filter | Low pass | | OFF, Line (1.5 Hz), 5, 50, 500, 5k, 50k Hz (at -3 dB, 6dB/oct) |
| External dimensions (W×D×H) | | | Approx. 49 x 136 x 160mm (Excluding projections) |
| Weight | | | Approx. 740 g |

(*1) Subject to the conditions:
- Room temperature is 23 °C ± 5 °C. • When 30 minutes or more have elapsed after power was turned on. • Filter is set to LINE.
- Sampling rate is set to 1 second. • GND terminal is connected to ground.

(*2) Using optional humidity sensor (B-530)

(*3) Subject to the conditions:
- Room temperature is 23 °C ± 5 °C. • When 30 minutes or more have elapsed after power was turned on. • Filter is set to 10.
- Sampling rate is set to 1 second. • GND terminal is connected to ground.

(*4) Subject to the conditions:
- Room temperature is 23 °C ± 5 °C. • When 30 minutes or more have elapsed after power was turned on. • Filter is set to 10.
- GND terminal is connected to ground. • Measurement accracy of RMS is effective for input voltage of 5 to 100% of each measurement range.

(*5) Available ranges vary by the excitation power for the bridge.

(*6)
- Remote sensing is not available when a NDIS connector is used.
- When a bridge box is used, the connection needs to be 4 wire or 6 wire full bridge.
  When connecting with a Half bridge (Opposite side), an additional bridge box is required.
- Bridge excitation: Constant current drives a strain gauge type sensor or a 4-wire full bridge.
- The shunt calibration is available only when the connection is using a 3-wire, 4-wire quarter bridge, 5-wire full bridge, or 6-wire full bridge.

(*7) When the built-in resistor 120Ω is used for bridge, the available excitation voltage is 1V, 2V, or 2.5V.
The gauge type and used built-in resistor for bridge can be set by a DIP-SW which is located on the front panel of the module.

(*8) It is required firmware version 2.0 or later.

(*9) It is required to create the CSV file that is the source for the arbitrary data using the GL-Wave Editor (Excel macro).
The Microsoft Excel 2003 (Office 2003) or later edition is required to use the GL-Wave Editor.

(*10) Subject to the conditions. • Room temperature is 23 °C ± 5 °C.

(*11) Input prove (RIC-10A) is required to connect signals.
The measuring mode is set in each module (16 channels).
In Logic mode, up to 7 modules (Up to 112ch.) can be attached to one main module.
In Pulse mode, up to 2 modules (Up to 32ch.) can be attached to one main modules.

(*12) The maximum number of module and channels are limited to up to 10 units with a mixed condition and 112 channels.

| DC Strain Input Module Specifications | | |
|---|---|---|
| Model number | | GL7-DCB |
| Number of input channels | | 4 channels |
| Input method | | All channels isolated balanced input, Simultaneous sampling, D-SUB type connector (9 pins, receptacle) |
| Sampling speed (interval) | | 100 k Samples/s to 1 Sample/h (10 µs to 1 hr.) |
| Built in RAM | | 2 million samples for each channel |
| Input type | | Strain, Voltage, Resistance value (including potentiometer) |
| Measurement range | Strain (*5) | 500, 1000, 2000, 5000, 10000, 20000 µε (µε: 10-6 strain)/2, 0.25, 0.4, 0.5, 1, 2, 2.5, 4, 5, 10 mV/V |
| | Voltage | 1, 2, 5, 10, 20, 50, 100, 200, 500 mV, 1, 2, 5 V Full Scale |
| | Resistance | 1, 2, 5, 10, 20, 50, 100, 200, 500 Ω, 1, 2, 5, 10, 20, 50 kΩ Full Scale |
| Measurement accuracy (*4) | Strain | ±(0.2% of Full Scale + 10 µε) |
| | Voltage | ±(0.2% of Full Scale + 10 µV) |
| | Resistance | ±0.5% of Full Scale (More than 1 hour elapsed after power-on) |
| A/D converter | | Successive Approximation type, 16 bits (effective resolution: 1/40000 of the measuring full range) |
| Gauge ratio | | 2.0 constant |
| Supported sensor | Strain (*6) | Strain gauge<br>Quarter bridge (single gauge) in 2-, 3- or 4-wire (supports remote sensing in 3- or 4-wire)<br>Half bridge (dual gauge) in 3-, 4-, 5-wire (supports remote sensing in 4- or 5-wire)<br>Full bridge (quad gauge) in 4- or 6-wire (supports remote sensing in 6-wire) |
| | | Transducer/sensor based on a strain gauge<br>Full bridge type in 4-wire, Full bridge type in 6-wire (supports remote sensing) |
| | Resistance | Resistor, Potentiometer |
| Bridge resistance | | 50 Ω to 10 kΩ * Available excitation power varies by selection of element. |
| Built-in element of the bridge (*7) | | 120 or 350 Ω for the quarter- and half-bridge |
| Excitation power | Voltage mode | 1, 2, 2.5, 5, 10 V DC<br>* Excitation voltage 5 and 10 V is available when bridge resistance is the 350 Ω or higher. |
| | Current mode | Constant current: 0.1 to 20 mA (supported voltage is up to 10 V.) |
| Zero Adjust for Strain gauge | Method | Fully automatic (via push button or setting the condition menu) |
| | Max. Range | ±10,000µε (µε: 10-6 Strain) |
| Remote sensing | | 3- or 4-wire in quarter bridge, 4- or 5-wire in half bridge, 6-wire full bridge |
| Shunt Calibration | | Approx. 60 kΩ (120 Ω gauge), Approx. 175 kΩ (350 Ω gauge) |
| Maximum input voltage | Between (+) / (-) terminal | 10 V, Common-mode voltage: 10 Vrms AC |
| | Between channels ((-) terminals) | 10 Vp-p |
| | Between channel / GND | 60 Vp-p |
| Max. voltage (withstand) | Between channels | 1000 Vp-p (1 minute) |
| | Between channel / GND | 1000 Vp-p (1 minute) |
| Isolation | Between channel / GND | Min. 100 MΩ (at 500 V DC) |
| Common-mode rejection ratio | | Min. 80 dB (50/60 Hz, Signal source impedance: Max. 300 Ω) |
| Frequency response | | DC to 20 kHz |
| Filter | Low pass | Off, Line (1.5 Hz), 3, 6, 10, 30, 50, 60, 100, 300, 500 Hz, 1k, 3k, 5k, 10k Hz (in -30dB/oct) |
| | Anti-aliasing | Off, On |
| Support | Standard | IEEE 1451.4 Class2 (Temperate No.33) |
| TEDS | Support | Reading information from the sensor and setting it to module |
| External dimensions (W x D x H) | | Approx. 49 x 136 x 160mm (Excluding Protection) |
| Weight | | Approx. 840 g |

| Charge Input Module Specifications | | |
|---|---|---|
| Model number | | GL7-CHA |
| Number of input channels | | 4 channels |
| Input method | | All channels isolated unbalanced input, Simultaneous sampling, BNC and Miniature connector (#10-32UNF) |
| Sampling speed (interval) | | 100 k Samples/s to 1 sample/h (10 µs to 1 hr.) |
| Built in RAM | | 2 million samples for each channel |
| Input type | | Sensor in charge output type, Sensor in IEPE type, Voltage, Microphone(*8) |
| Input coupling | | Sensor: Charge-RMS, IEPE-RMS<br>Voltage: DC, AC, DC-RMS, AC-RMS |
| Measurement range | Acceleration sensor input | 1, 2, 5, 10, 20, 50, 100, 200, 500, 1000, 2000, 5000, 10000, 20000, 50000 m/s² |
| | Microphone(*8) | 200, 400, 500mPa, 1, 2, 4, 5, 10, 20, 40, 50, 100, 400, 500Pa |
| | Voltage input | DC, AC coupling: 50, 100, 200, 500 mV, 1, 2, 5, 10 V<br>RMS measurement: 20, 50, 100, 200, 500 mVrms, 1, 2, 5 Vrms<br>(Crest Factor in RMS measurement: up to 4 in 20 mVrms to 2 Vrms range, up to 2 in 5 Vrms range) |
| Supported sensor sensitivity | Charge output type | 0.01 pC/(m/s²) to 999.9 pC/(m/s²) Effective range of measurement range varies depending on sensor sensitivity. |
| | IEPE type | 0.01 mV/(m/s²) to 999.9 mV/(m/s²) Effective range of measurement range varies depending on sensor sensitivity. |
| | Microphone(*8) | 0.2mV/Pa to 100mV/Pa |
| Measurement accuracy (*4) | Charge output type | ±0.9% of Full Scale ([sensor sensitivity] × [setting range] ≥ 20 pC) |
| | IEPE type | ±0.25% of Full Scale ([sensor sensitivity] × [setting range] ≥ 200 mV) |
| A/D converter | | Successive approximation type, 16 bits (effective resolution: 1/40000 of the measuring full range) |
| Input impedance | | 100 kΩ ±5% |
| Excitation power | | 4 or 8 mA (supported voltage: 22 V ±10%) |
| Maximum input charge signal | | Max. 50000 pC |
| Maximum input voltage | Between (+) / (-) terminal | 25 Vp-p |
| | Between channels ((-) terminals) | 25 Vp-p |
| | Between channel / GND | 25 Vp-p |
| Max. voltage (withstand) | Between channels | 300 Vp-p (1 minute) |
| | Between channel / GND | 300 Vp-p (1 minute) |
| Isolation | Between input / GND | Min. 50 MΩ (at 500 V DC) |
| Common-mode rejection ratio | | Min. 80 dB (50/60 Hz, Signal source impedance: Max. 300 Ω) |
| Frequency response | Charge type | 1.5 Hz to 45 kHz |
| | IEPE type | 1 Hz to 45 kHz |
| Filter | Hi pass | Off, 0.15, 1, 10 Hz (It depends on input conditions.) |
| | Low pass | Off, Line (1.5 Hz), 3, 6, 10, 30, 50, 60, 100, 300, 500 Hz, 1k, 3k, 5k, 10k Hz (in -30dB/oct) |
| | Anti-aliasing | Off, On |
| Support | Standard | IEEE 1451.4 Class1 (Temperate No. 25 for sensor, Temperate No.27 for microphone) |
| TEDS | Support | Reading information from the sensor and setting it to module (TEDS, IC, MICRO) |
| Calculation function | | Integration (convert measurement to velocity).<br>Double integration (convert measurement to displacement) |
| External dimensions (W x D x H) | | Approx. 49 x 136 x 160mm (Excluding projections) |
| Weight | | Approx. 850 g |

| Voltage Output Module Specification | | |
|---|---|---|
| Model number | | GL7-DCO |
| Number of output channels | | 8 channels |
| Output method | | All channels common ground, SMA (Sub-miniature version A) connector |
| Sampling speed (interval) | | Up to 100 k Samples/s (10 µs) |
| Output condition | Source of data | Measurement data, Edited measurement data, Generated arbitrary data(*9),<br>Generated simple waveform (DC voltage and sine, triangle, ramp, pulse waveform) |
| | Source of measurement data | Module of Voltage (GL7-V), Voltage/Temperature (GL7-M), High speed voltage (GL7-HSV)<br>High voltage (GL7-HV), DC strain (GL7-DCB), and Charge (GL7-CHA) |
| | Output condition | Signal can be measured by the input module even while the signal is output from the DCO module.<br>Measurement data except the temperature, humidity, and logic/pulse are able to output. |
| Output range | Voltage | ± 1, 2, 5, 10 V Full Scale |
| | Current | Up to ± 10 mA in each channel (total output current of unit is up to 40 mA) |
| Output impedance | | Max. 1 Ω |
| Output signal accuracy (*10) | | ±0.25% of Full Scale |
| D/A converter | | Resolution 16 bits (effective resolution: 1/20000 of the output full range) |
| Filter | Low pass | OFF, Line(1.5 Hz), 5, 50, 500, 5k, 50k Hz<br>* This filter is the smoothing filter to remove the noise on output of the D/A converter. |
| External dimensions (W x D x H) | | Approx. 49 x 136 x 160mm (Excluding projections) |
| Weight | | Approx. 770g |

| Logic/Pulse Input Module specifications | | |
|---|---|---|
| Model number | | GL7-L/P |
| Number of input channels | | 16 channels |
| Input method | | All channels common ground, Simultaneous sampling, D-SUB type connector (#4-40UNC) (*11) |
| Sampling speed (interval) | Logic mode | 1 M Samples/s to 1 Sample/h (1 µs to 1 hr.) |
| | Pulse mode | 10 k Samples/s to 1 Sample/h (100 µs to 1 hr.) |
| Built-in RAM | | 2 million samples for each channels |
| Measurement mode | | Logic input mode or Pulse input mode (*12) |
| Pulse input mode | | Rotation count (RPM), Accumulating count, Instant count and then it is converted to RPM |
| Rotation count (RPM) | Function | Counting the number of pulses per sampling interval |
| | Span | 50, 500, 5000, 50 k, 500 k, 5 M, 50 M, 500 M rpm Full Scale |
| Accumulating count | Function | Accumulating the number of pulses from the start of measurement |
| | Span | 50, 500, 5000, 50 k, 500 k, 5 M, 50 M, 500 M count Full Scale |
| Instant count | Function | Counting the number of pulses per sampling interval (count is reset at each sampling) |
| | Span | 50, 500, 5000, 50 k, 500 k, 5 M, 50 M, 500 M counts Full Scale |
| Maximum number of count | | 15 M counts (24 bits counter is used) |
| Input signal | Voltage range | 0 to 24 V (common ground) |
| | Signal type | Contact (Relay), Open collector, Voltage |
| | Threshold | Approx. 2.5 V |
| | Hysteresis | Approx. 0.5 V (2.5 V to 3 V) |
| Filter | | Off or On (±3 dB at 13 kHz) |
| External dimensions (W×D×H) | | Approx. 49 x 136 x 160 mm (Excluding projections) |
| Weight | | Approx. 770 g |

## GL7000 specifications

| Item | | Description |
|---|---|---|
| Number of module | | Attached to up to 10 modules (*1), Max. 112 channels in 1 of GL7000 |
| External Input/ Output signals (*2) | Input | Start/Stop, External trigger, External sampling, Auto balance (*3)<br>Signal type: Contact (relay), Open collector, Voltage |
| | Output | Trigger, Busy (*3), Alarm (10 channels) (*4)<br>Signal type: Open collector (pulled-up by resistor 10 kΩ) |
| Trigger, Alarm function | Trigger action | Start or Stop capturing data by the trigger |
| | Trigger repeat | Enabled (ON): Automatically re-armed for the next data capture function<br>Disabled (OFF): Data capture is completed in a single trigger |
| | Trigger source | Hold o Previous start to next start revious sto to next start<br>Start: 01 signal, Clock, Week or Time<br>Sto : Of al si al, Clock, Week or Time |
| | Trigge determination conditions for measured signal | Combi : level of signal or edge o signal<br>Analog: Higher/Rising, Lower/Falling, Window-in, Window-out<br>Logic (*5): Higher/Rising, Lower/Falling<br>Pulse (*5): Higher/Rising, Lower/Falling, window-in, Window-out |
| | Alarm determination condition (*6) | Combination: OR or AND condition at the level of signal or edge of signal<br>Analog: Higher/Rising, Lower/Falling, Window-in, Window-out<br>Logic (*5): Higher/Rising, Lower/Falling<br>Pulse (*5): Higher/Rising, Lower/Falling, window-in, Window-out |
| | Alarm output | 10 channels |
| | Pre-trigger (*7) | Number of data before trigger: Up to specified number of captured data |
| Calcu tion function | Between channels | Addition, Subtraction, Multiplication and Division for two analog inputs<br>(Sampling speed is limited up to 10 Samples/s (100 ms interval).<br>Available arithmetic element and the output destination is the analog input channel 1 to 100.) |
| | Statistical | Select two calculations from Average, Peak, Max., Min. in real time and replay (*8) |
| Move function of the display range | | Beginning, center or end of the data, Trigger point, Specific time (absolute, relative), Call curso |
| Search function | | Search for analog signal levels, logic signal pattern, pulse signal levels or alarm point in captured data |
| Annotation function | | Comment can be set in each channel (up to 31 alphanumeric characters) |
| Message / Marker functions | | Message: The registered messages or entered message is able to be recorded for any timing.<br>Up to 8 messages can be pre-registered. |
| | | Marker: Marker is able to record for occurring alarm or power failure. |
| Resume | | Resume automatically in the same condition after power is recovered<br>as when the power failure occurred during data capture (*9) |
| FFT analysis function (Firmware ver. 1.20 or later) | Analyzing frequency range | 0.08, 0.2, 0.4, 0.8, 1.6, 2, 3.2, 4, 8, 20, 40, 80, 200, 400, 800 Hz, 2, 4, 8, 20, 40, 80, 200, 400 kHz |
| | Number of points | 500, 1000, 2000, 4000, 10000 |
| | Window function | Rectangular, Hanning, Hamming, Blackman, Flat-top, Exponential |
| | Averaging | Summation average, Exponential average, Peak hold |
| | Channels | 4 channels |
| | Functions | Y-T, Linear, Power, PSD, Cross, Transfer function, Coherence, COP |
| | Display mode | Single display, Dual display, Nyquist |
| Interface to PC | | Ethernet (10 BASE-T/100 BASE-TX), USB 2.0 (High speed) |
| Network function<br>drive mode | | WEB server, FTP server, FTP client, NTP client, DHCP client<br>Emulate the USB memory device (*10) |
| Data saving function | Built-in | RAM (2 million samples. built-in amplifier module), Flash memory (*GB: built-in e main module (*1 |
| | External (*12) | SD card (Support SDHC, up to 32GB) slot, SSD (Approx. 128GB (*11)<br>The file for capturing data is limited up to 4GB. (*13) |
| | Sampling speed (Interval) | 1 MS/s(1 million samples per second) to 1GS/s (1 sample per hour) d synchronized with external sampling signal<br>(Interval: 1, 2, 5, 10, 20, 50, 100, 200, 500 µs, 1, 2, 5, 10, 20, 50, 100, 200, 500 ms,<br>1, 2, 5, 10, 20, 30, 1 , 2, 5, 10, 20, 30 min, 1 hur)<br>* The minimum saping speed (minimum sampling interval) is different depending on the type of module<br>* Sampling can be set up to the fastest speed among multiple type connected modules |
| | | * The maximum sampling speed (minimum sampling interval) varies depending on the specified recording destination. |
| | | Built-in RAM: up to 1 MS/s (1 µs interval) |
| | | SSD module: up to 500 kS/s (2 µs interval) at 1 or 2 modules installed, up to 200 kS/s (5 µs interval) at 3 or 4 modules installed, up to 1 kS/s (1 ms interval) at 5 or 10 modules installed |
| | | Built-in Flash memory: up to 1 MS/s (1 µs interval) |
| | | External SD Flash memory: up to 1 kS/s (1 ms interval) |
| | Ca tured data *1 | Built-in RAM, Built-in Flash, SD memory card, SSD (Data is saved directly to it.) |
| | Data in built-in RAM Auto save (*12) | Specified number of data up 2 million samples in increments of 1 |
| | | Available for the built-in RAM<br>Enabled (ON): Data in the RAM is saved ou tdid tid if to the built-in Flash, SD memory card, SSD<br>Disabled (OFF): Data in the RAM is not ma intained after power is turned off |
| | Capturing mode (*12) | Mode: Off, Normal, Ring, Relay<br>Ring (*14): Saved most recent data (Number of capturing data: 1000 to 2000000 points,<br>Destination of data: Built-in RAM, Built-in Flash SD memory card, SSD)<br>Relay (*13,*15): Saved data to multiple file without losi data until capturing data is stopped<br>(Destination of data: Built-in Flash, SD card. Savin data in between cursors. |
| | During data capture (*17) | Displaying information in two windows, Hot- |
| | Backup (*12) | Backup interval: Off, 1, 2, 6, 12, 24 hrs.<br>Data destination: SD memory card, SSD, FTP server<br>Data destination or ac cannot s ecified to the same stora e for destination of ca |
| | Dual sampling function (*18) | It enables to re ord signal with two sampling speed, while the signal is recorded with low sp n for long term r ording, the transient part is recorded with high speed sampling after the trigger occurs.<br>Current (Low-speed)<br>Recording me ia : Built-in flash memory or SD card<br>Sampling interval : 1, 2, 5, 10, 20, 50, 100, 125, 200, 250, 500ms, 1, 2, 5, 10, 20, 30s, 1, 2, 5, 10, 20, 30min, 1h<br>Trigger timer feature: Start in time, Sto l record<br>Event (High-speed)<br>Recording me ia : Built-in RAM or SSD (optional)<br>Sampling interval : 1, 2, 5, 10, 20, 50, 100, 200, 500 µs |
| Engineering scale function | | Measured value can be converted to the engineering unit<br>Analog voltage: Converts by two reference points (offset and gain)<br>Temperature: Converts by two reference points (offset)<br>Pulse count: Converts by two reference points (gain) |
| Synchronization between units | | Start and Trigger (*16) |
| Operating environment | | 0 to 40°C, 5 to 85% RH (non condensed) |
| Power source | | 100 to 240 V AC, 50 to 60Hz |
| Power consumption | | 110VA |
| Standard accessories | | Quick guide, CD-ROM, AC power cable |
| External dimensions (W x D x H) | | Main module: Approx. 193 x 141 x 160 mm (Excluding Projection),<br>Alarm output terminal: Approx. 30 x 136 x 145 mm (Excluding projection) |
| Weight | | Main module : Approx. 2.2 kg, Alarm output terminal : Approx. 350 g |

(*1) Excluding the function module as the Display module or SSD module. In case of the DC Strain module (GL7-DCB): up to 8 modules. In case of the Logic/Pulse module (GL7-L/P): input mode is selected in the logic or pulse for each module, up to 7 modules wher the module is used in the logic mode, up to 2 modules when the module is used in the pulse mode.
(*2) The Input/Output cable (B-513) is required for connecting the signal. The Auto balance signal input and the Busy signal output are available in the DC Strain module (GL7-DCB).
(*3) It is available on the DC strain module (GL7-DCB).
(*4) The alarm signals are outputted on the terminal block attached to the main module as standard accessory.
(*5) It is available on the Logic/Pulse (GL7-L/P) module.
(*6) Method of detection
Volt./Temp. module:
The alarm is detected every 5 seconds when the sampling interval is longer than 5 seconds and reported.
The alarm is detected in the sampling interval when the sampling interval is shorter than 5 seconds and reported.
Other modules:
The alarm is detected every 1 ms when the sampling interval is shorter than 1ms. The alarm is detected in the sampling interval when the sampling interval is set between 2 ms to 5 seconds and reported. The alarm is detected every 5 seconds when the sampling interval is longer than 5 seconds and reported.
(*7) It is available when the captured data is saved to the built-in RAM.
The pre-trigger function may not available in combination with the trigger settings.
(*8) The result of real time calculation is displayed in the digital display mode.
Available sampling speed is the 10 samples/s (100 ms interval).
(*9) When the captured data destination is set to the built-in-RAM, the captured data is not maintained after a power failure is occurred.
When destination is set to the built-in Flash or the SD memory card, it may have a problem by a power failure if it is being accessed to write data. If the memory device is not damaged, the closed data file is maintained. The file is closed every minute while data is being captured. This function is not available when the FFT mode or the Voltage Output module (GL7-DCO) is used.
(*10) The USB drive mode is started by setting of the switch on the main module. It can be also started when the power is turned on while pressing the START/STOP key on the display module.
(*11) Capacity of memory device may be smaller depending on time of production.
(*12) The SD memory card is not included as a standard accessory. Compatible SD card type: SD, SDHC Speed class 4 or faster.
The SSD module (GL7-SSD) is an option.
(*13) The file for recording data is limited up to 4GB on firmware version 2.0 or later, 2GB on firmware version 1.6 or before.
(*14) The capacity for saving the data is set to one third of available memory when the captured data destination is set to a device other than the built-in-RAM. Available sampling speed is up to 10 samples/s (100ms interval).
(*15) When the captured data destination is set to the built-in Flash or the SD memory card,
sampling speed is limited up to 100 samples/s (10 ms interval). In case of using the SSD module (GL7-SSD),
sampling speed is limited up to 50 thousand samples/s (20 µs interval) when 1 or 2 modules are attached.
(*16) The Sync cable (B-559) is required when this function is used. The synchronizing function is available only with GL-Connection.
(*17) This function is able to be available when sampling speed is set up to 10 samples/s (100 ms interval).
(*18) Both slow and high speed sampling can only be recorded in GBD format.
When Event (high-speed) capturing destination is extended SSD unit, it takes a few seconds for event capturing.
Following actions are not available:
• External sampling • Ring / Relay recording • Back up feature • Dual screen feature (playback while recording)
• XY / FFT function • Synchronization operating with multiple GL7000
• Configuring with only Voltage module (GL7-V) or Voltage/Temperature module (GL7-M)
(*19) When data destination is specified to the RAM or SSD on the GL7000, the captured data can not be saved on the PC in real-time. The data in the RAM or SSD on the GL7000 can be saved to the PC after the data capturing is completed.
(*20) Supports only GL7000 with farmware version 2.0 or later & GL-Connection version 2.2 or later.
(*21) Most operations can be selected by both the touch panel and the cursor keys.
(*22) When the display module is mounted at an angle using the bracket, the display module is connected to the main module

## Software specifications

| | |
|---|---|
| Model name | GL-Connection |
| Supported OS | Windows 10 / 8.1/ 8/ 7 (32/64-bit edition) |
| Functions | Control GL7000, Real-time data capture, Replay data, Data format conversion |
| Controlled unit | Up to 10 units with GL7000, GL2000, GL980, GL900, GL840, GL820, GL240, GL22<br>GL7000 only: max. 1120 channels<br>Mixing with GL series: max. 2000 channe s |
| L js contr Captur data (*19) | er an A arm se ttings, Other settins<br>ul -in inary orma ult-in Flash memory ary. ormat .<br>SD memory card (Binary, CSV format), SSD (Binary, CSV format)<br>The sampling speed is limited by the number of channels used when data is saved in the CSV format (1 ms per channel. When 10 channels are set, sampling is limited to 10 ms.)<br>* When ca tured data is saved to the built-in RAM or SSD, data cannot be saved on the PC in real ime. |
| Dis layed information<br>Display mode | Analo IC waveform, Pulse waveform, D igital values<br>Y-T ital values, XY graph in real ti<br>FFT measurement (ver, 1.20 or later), Cursor information, Capture condition, Alarm information<br>Measuring condition setting list (*20)<br>Content: channel number, line color, annotation, input type, measuring range, filter, unit, span, scaling<br>Function: Out ut in CSV format, Link to detailed settin |
| File operation | Converts binary data (specific period, all data in one file, multiple files).<br>Creates a new file with compres ion or b consolidatin multi files. |
| Warning Function | Send e-mail to the specified address when the alarms occu |
| Statistical calculation | Capturing data: Maximum, Minimum, Peak or Average<br>Replaying data: Maximum, Minimum, Peak, Average or RMS in between cursors |
| Search function | Search specified signal level point, alarm point, and time |
| Cursor sync ronization (*20 | ulti ple screens dis aying different data file<br>From the beginning: Synchronize the cursor position from te beginning of each screen<br>Position from present: Synchronize from the current cursor position of ea screen |
| Release of remote lock of GL7000 (*20 | It allows to make setting operation using control panel on GL7000 even when GL7000 is und the control of software. |
| Operation lock | Operation screen can be locked (It is unlocked with a password.) |
| FFT analysis function (Firmware ver. 1.20 or later) | Analyzing frequency range: 0.08, 0.2, 0.4, 0.8, 1.6, 2, 3.2, 4, 8, 20, 40, 80, 200, 400, 800 Hz, 2, 4, 8, 20, 40, 80, 200, 400 kH<br>Number of points: 500, 1000, 2000, 4000, 10000<br>Window function: Rectangular, Hanning, Hamming, Blackman, Flat-top, Exponential<br>Averaging: Summation average, Exponential average, Peak hold<br>Channels: 4 channels<br>Functions: Y-T, Linear, Power, PSD, Cross, Transfer function, Coherence, COP<br>Display mode: Single display, Dual display, Nyquist |
| Data recording destination selection (*20) | Selecting to record data to GL7000 only or PC together with GL7000 |
| Creating output data function (Version 1.40 or later) | Saved data file (GBD/CSV format) in the PC, Saved data file (GBD format) in th GL7000, Generated simple waveform (DC voltage and sine, triangle, ramp, pulse waveform)<br>* This function is available when the analog voltage output module (GL-DCO) is attached to the GL7000<br>The signal is output from the GL7-DCO module. |

## Display module GL7-DISP (option) specification

| | |
|---|---|
| Model number | GL7-DISP |
| Display device | 5.7-inch TFT color LCD monitor (VGA: 640 x 480 dots) |
| Operation | Touch panel and Cursor keys (*21) |
| Displayed language | English, French, German, Chinese, Korean, Japanese |
| Screen saver | Turns off back-light by 10, 30 sec., 1, 2, 5, 10, 30, 60 min. |
| Displayed information | Waveform in Y-T (digital values, Waveform only, Digital val ave orm in XY |
| Connection cable | LAN cable (CAT5 class, Straight connection, Up to 10 m) (*22) |
| Standard accessories | Bracket for slanted mount, Connection cable (40 cm), Groun cab Screws |
| External dimensions (W x D x H) | Approx. 187 x 34.5 x 119 mm (Excluding projection) |
| Weight | Approx. 530 g |

## SSD module GL7-SSD (option) specification

| | | |
|---|---|---|
| Model number | | GL7-SSD |
| Storage device | | Solid state disk (SSD) |
| Capacity (*23) | | Approx. 128GB (The file size of the recorded data is limited up to 4GB.) |
| Sampling speed (*24)(*25) | Attached to 1 or 2 modules | Max. 1 M Sample/s (1 µs) |
| | Attached to 3 or 4 modules | Max. 500 k Sample/s (2 µs) |
| | Attached to 5 to 10 modules | Max. 200 k Sample/s (5 µs) |
| External dimensions (W x D x H) | | Approx. 49 x 136 x 180 mm (Excluding Projection) |
| Weight | | Approx. 770 g |

## Options and accessories

| Item | Model number | Remarks |
|---|---|---|
| Sync. Cable | B-559 | 1 m long, Synchronizing between GL7000 |
| Carrying tool | B-585 | Can carry GL7000 with up to 3 modules attached. |
| Storage case | B-586 | Can store GL7000 with up to 3 modules.<br>Not for transferring. The caster can work only on smooth surface. |
| Probe set for Logic input | RIC-10A | For Logic/Pulse module (GL7-L/P), 4 channels, Cable with Alligator clip and l |
| Input cable, Safe probe - BNC | RIC-141A | Insulated, 1.2 m long, 300 V DC, CAT II |
| Input cable, BNC - BNC | RIC-142 | Insulated, 1.5 m long, 1000 V DC, CAT II |
| Input cable, Banana - BNC | RIC-143 | Insulated, 1.6 m long, 600 V DC, CAT II |
| Input cable, Banana - BNC | RIC-147 | Insulated, 1.6 m long, 1000 V DC, CAT II |
| Clip, Alligator (small size) (*26) | RIC-144A | For RIC-143, Aperture 11 mm, 300 V DC, CAT II, Max. 15 A |
| Clip, Alligator (middle size) (*26) | RIC-145 | For RIC-143/RIC-147, Aperture 20 mm, 1000 V DC, CAT II, Max. 32 A |
| Clip, Grabber (*26) | RIC-146 | For RIC-143/RIC-147, Aperture 5 mm, 1000 V DC, CAT III, Max. 1 A |
| Input/Output cable for GL | B-513 | 2 m long, Bare wire for signal connection - Connector for GL series |
| Humidity sensor (*27) | B-530 | 3 m cables for signal and power |
| Shunt resistance | B-551 | 250 ohms (Converts signal from "4-20mA" to "1-5V".) |
| Input connector, screw terminal | B-560A | For DC Strain module (GL7-DCB),<br>Screw terminal for sensor - D-SUB (rectangular connect ) for GL7-DCB module<br>* Terminal holding bracket B-560AP included |
| Terminal holding bracket | B-560AP | For replacement use for B-560/B-560A |
| Extension cable | B-560-05 | For B-560/B-560A, 500 mm long |
| Input cable, NDIS - D-SUB | B-561 | For DC Strain module (GL7-DCB),<br>NDIS (round connector) for sensor - D-SUB (rectangular co nector for GL7-DCB module |
| Output cable, BNC - SMA | B-562 | For Voltage Output module (GL7-DCO), 2 m long,<br>BNC (plug) for output - SMA (plug) for GL7-DCO module |

(*23) Capacity of memory device may be smaller than above depending on time of production. The file for recording data is limited up to 4GB on firmware version 2.0 or later, 2GB on firmware version 1.6 or before.
(*24) The sampling speed in the GL7000 is limited to the faster sampling speed of attached input module. When the selected sampling speed in the GL7000 is faster than the module, the sampling is done in fastest sampling on the module. The same value is stored to the memory device in the selected sampling speed until data is renewed by the next sampling
(*25) When the sampling speed in the GL7000 is selected to the 1 MS/s (1 µs) or 500 kS/s (2 µs), the number of available channels in the Logic/Pulse module will be limited.
(*26) Red and black (per 1 unit). Connectable with RIC-143, RIC-147.
(*27) Measurable temperature range: -25 - 80°C



### ⚠ For safe and correct use of equipment

- Before using it, please read the user manual and then please use it properly in accordance with the description.
- To avoid an occurrence of malfunction or an electric shock by leakage, please ensure ground connection and use in specified power source.

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