GRAPHTEC

Modula Type Data Acquisition Platform

DATA PLATFORM
GL7000

Next Generation Data Acquisition Unit with Touch Panel Control

On-Demand Signal Acquisition

Embedded Monitoring and Datalogging Solution

Attach up to 10 input/output modules in a mixed condition environment

Corresponds to various measurement types (physical, mechanical, and electrical)

Supports a variety of storage media including a SSD module with a capacity of 64GB

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New Generation Data Acquisition Platform - GL7000 - Display module allows a stand-alone operation or an embedded systems environment with touch-panel control

Input/output module has capacity to attach up to 10 units with mixed signals (temp, high voltage, high speed, strain, vibration, etc.)

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 bre used in a stand-alone platform or to be embedded into the acquisition system.
Control and monitoring via the PC or display module may be done independtnly or in conjuctions with one another.

SSD module (Option)

Alarm output terminal (included in the main module)

Main module

Input/Output modules

Display module (optional)

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

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

Embedded systems environment
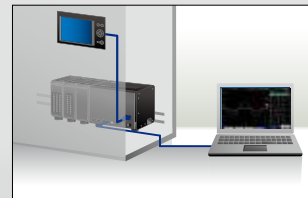
PC connected environment

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

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)

Maintains high speed with expanded channels.

Up to 10 input/output modules can be attached to one main unit [2]

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

Example

Voltage output module | High voltage module | Volt./Temp. module | Voltage module

Alarm output terminal

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

Example

Volt./Temp. module

Alarm output terminal

[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 is to up to 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.
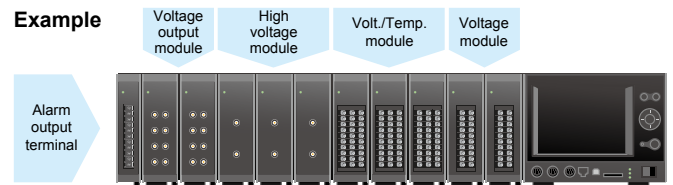1μs sampling interval: up to 8 channels
2μs sampling interval: up to 16 channels (If two modules are attached, channel #1 to #8 in each unit can be used.)
When pulse mode is used, the maximum sampling speed is the 100μs. The data will be updated every 100μs.
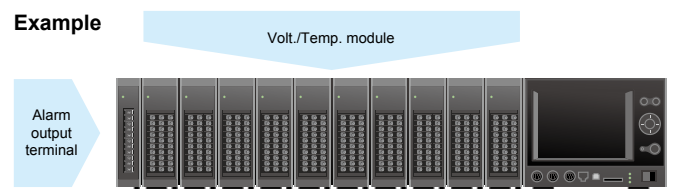
The display unit incorporates a touch panel system to provide convenient on-site operation

The display unit incorporates a touch panel system to provide convenient on-site operation
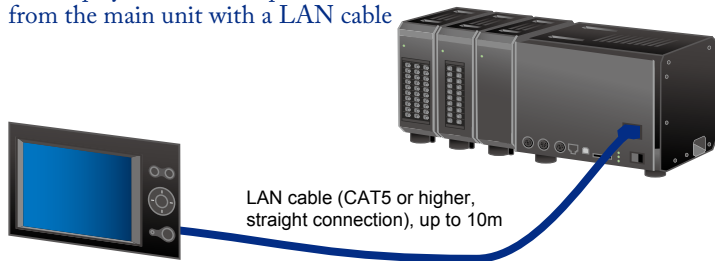
Touch the icon, move to the next setting menu screen.

The display waveform is able to expand or shrink.

Four Different Display Methods
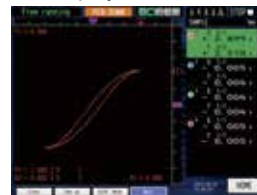
Y-T display

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.

X-Y display

FFT display

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

LAN cable (CAT5 or higher, straight connection), up to 10m

Supports multiple types of storage, 64GB SSD is available as an option

1 Built-in RAM

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

2 Built-in Flash memory

2GB 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).

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 (64GB) `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.*
* The number of modules are limited.

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

Maximum sampling speed and the data capturing time *1

Input Module	Storage 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 (2 M samples)	1MS/s (1µs)			2sec. (2sec.)	20sec. (20sec.)	Approx. 33min. (33min.)	Approx. 5hrs. (5hrs.)	Approx. 23days (23days)
	Built-in Flash memory (2GB)	1kS/s (1ms)			N/A	N/A	Approx. 39hrs. (5hrs.)	Approx. 16days (2days)	Approx. 1659days (223days)
	SD memory card (32GB) *2						Approx. 42hrs. (5hrs.)	Approx. 17days (2days)	Approx. 1775days (238days)
	SSD (64GB) *2	1MS/s (1µs)	500KS/s (2µs)	200KS/s (5µs)	Approx. 134sec. (N/A)	Approx. 22min. (3min.)			
High Voltage Module	Built-in RAM (2 M samples)	1MS/s (1µs)			2sec. (2sec.)	20sec. (20sec.)	Approx. 33min. (33min.)	Approx. 5hrs. (5hrs.)	Approx. 23days (23days)
	Built-in Flash memory (2GB)	1kS/s (1ms)			N/A	N/A	Approx. 55hrs. (8hrs.)	Approx. 23days (3days)	Approx. 2323days (363days)
	SD memory card (32GB) *2						Approx. 59hrs. (9hrs.)	Approx. 24days (3days)	Approx. 2485days (388days)
	SSD (64GB) *2	1MS/s (1µs)	500KS/s (2µs)	200KS/s (5µs)	Approx. 134sec. (N/A)	Approx. 22min. (5min.)			
DC Strain *3 & Charge Module	Built-in RAM (2 M samples)	100kS/s (10µs)				20sec. (20sec.)	Approx. 33min. (33min.)	Approx. 5hrs. (5hrs.)	Approx. 23days (23days)
	Built-in Flash memory (2GB)	1kS/s (1ms)			N/A	N/A	Approx. 39hrs. (6hrs.)	Approx. 16days (2days)	Approx. 1659days (276days)
	SD memory card (32GB) *2						Approx. 42hrs. (7hrs.)	Approx. 17days (2days)	Approx. 1775days (295days) (In Charge module: 238days)
	SSD (64GB) *2	100kS/s (10µs)				Approx. 22min. (3min.)			
Voltage Module	Built-in RAM (2 M samples)	1kS/s (1ms)			N/A	N/A	Approx. 33min. (33min.)	Approx. 5hrs. (5hrs.)	Approx. 23days (23days)
	Built-in Flash memory (2GB)						Approx. 21hrs. (2hrs.)	Approx. 8days (24hrs.)	Approx. 893days (103days)
	SD memory card (32GB) *2						Approx. 22hrs. (2hrs.)	Approx. 9days (26hrs.)	Approx. 956days (110days)
	SSD (64GB) *2								
Volt./Temp. Module	Built-in RAM (2 M samples)	100S/s (10ms)			N/A	N/A	N/A	Approx. 5hrs. (5hrs.)	Approx. 23days (23days)
	Built-in Flash memory (2GB)							Approx. 8days (24hrs.)	Approx. 893days (103days)
	SD memory card (32GB) *2							Approx. 9days (26hrs.)	Approx. 956days (110days)
	SSD (64GB) *2								

*1 Captured time values ar esaved 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 different from above. (Data cannot be saved to built-in RAM using the CSV format.) *2 The file size of the captured data is limited to 2GB. *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 exchange	The SD card can be replaced during recording when the sampling interval is 100ms or slower.
● Ring capture	When data capturing stops, the most recent data is stored in the memory.
● Relay capture	Creates data file up to 2GB continously without losing any recording. (It is required firmware version 1.45 or later.)
● 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 simulation testing by outputting the measured data from signals recorded from various input modules and outputs the data through the voltage output module (GL7-DCO).

1 Captures the abnormal signal

Measure signal

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

Driven by the voltage output

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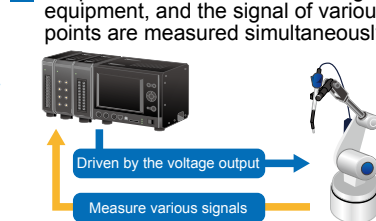
* Signals that are being captured may not be output at the same time.
  The output current is max 10mA for each channel. Total output current of the unit is 40mA. If the target object needs to be driven by external power, than a power amplifier may be needed.

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

Supports TEDS
Setting sensor calibration value is unnecessary!

D-SUB (9-pin plug)
D-SUB (9-pin receptacle)
Built-in bridge circuit
120 ohms
350 ohms
Load cell, Acceleration sensor
NDIS
Strain gauge

Supported sensor

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

■ Compensations for High-precision measurement

Remote Sense: Eliminates the influence from the lead wire resistance
Shunt calibration: Gain compensation of strain measurement

Connector for input

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

* Attachable number of unit: up to 8 units

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

Option
Screw terminal adapter (B-560)

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

Charge Module GL7-CHA

Main features

- Supports charge and voltage output type sensors
- Supports TEDS sensors
- Wide variety of filter functions allows high-precision measurements
- Support RMS (effective value) measurement

Supports TEDS
Setting sensor calibration value is unnecessary!

Voltage output (IEPE) type sensor
Charge output type sensor
Excitation power
Max. 22V
4mA
8mA

Sensors and input connector type

■ Charge output type sensor

Subminiature connector (receptacle)
Cable with Subminiature connector (plug), screw size #10-32 UNF
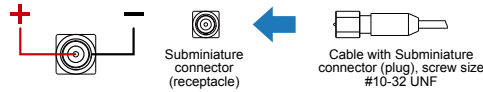
Supported acceleration sensor: $0.01pC/(m/s^2)$ to $999.9pC/(m/s^2)$

■ Voltage output (IEPE) type sensor

BNC connector (receptacle)
Cable with BNC connector (plug)
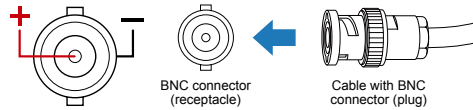
Supported acceleration sensor: $0.01mV/(m/s^2)$ to $999.9mV/(m/s^2)$

* There are various types of the charge or IEPE type sensors which can be measured by setting the sensor sensitivity and an engineering scaling function.
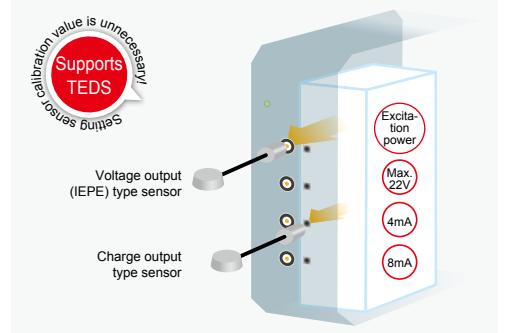
■ High-precision measurement using various filters

High-precision signal is able to be captured by the high-pass, low-pass, and anti-aliasing filter.

Low-pass, Anti-aliasing filter	High-pass filter	Band-pass filter
Anti-aliasing / Low-pass	Cut	Cut Cut

| Charge, Voltage 4ch/unit | Charge, IEPE sensor | Max. 100kS/s (10µs) |
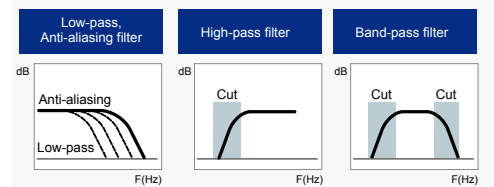
Voltage Output Module GL7-DCO

Main features

- Recorded measurement 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 terminal and conversion cable

Output terminal: SMA (SubMiniature version A) connector

Option
Output cable with BNC connector (B-562)

BNC connector
SMA connector
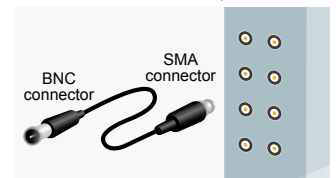
Method of analog voltage output

Three functions

1 Outputs the stored 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

Output
Measuring data
Test object
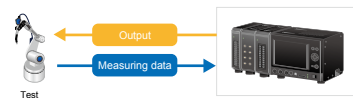
2 Outputs the generated signal

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

Output
GL-Connection
Converting data (GBD ⇒ CSV)
Generating a signal data
GL-Wave Editor (EXCEL macro)
Data for generated signal
Test object
PC
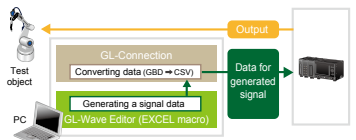
3 Outputs the edited measuring data

Case 3 Outputs an edited signal using the module and the PC software
Data: Edited measuring data
Waveform: Sine, pulse, ramp, triangle, or DC

Output
GL-Connection
Converting data (GBD ⇔ CSV)
Editing a measured data
GL-Wave Editor (EXCEL macro)
Data for edited signal
Test object
PC

| Output voltage 8ch/unit | Max. 100kS/s (10µs) | Captured data, Arbitrary waveform |
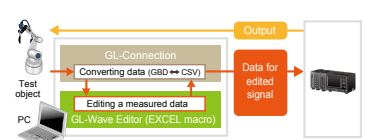
* Data that is currently recording cannot be output to the DCO module.

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

High Voltage Module   GL7-HV

Main features

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

Measuring in RMS (effective value)

Normal mode

+141.4V
0V
-141.4 V

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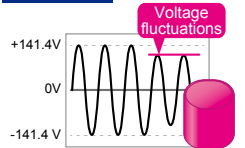
Volume of data to be recorded becomes large because the sampling speed needs to be fast to recognize the waveform.

RMS measurement

■ DC-RMS mode

+141.4V
0V
-141.4 V

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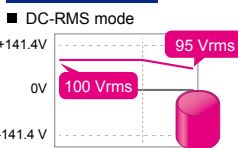
Volume of data recorded becomes small because the sampling speed does not need to be as fast recording the RMS value.

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

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
+20V
0V
-20V

DC coupling
+20V
0V
-20V

Measures the accumulated value of the DC and AC components. (Absolute voltage of signal.)
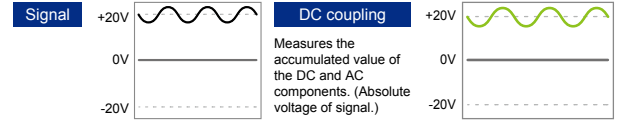
Small AC component is superimposed on the DC component.

AC coupling
+20V
0V
-20V

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

DC component is removed.
+5V
0V
-5V

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

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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 cable

Option

Probe set for Logic input (RIC-10)

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.

Alarm output terminal unit
Alarm signal output terminal (No.1 to No.10)
Alarm GND terminal
Input/Output cable for GL (B-513)

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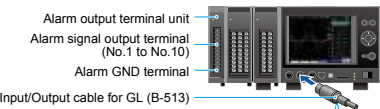
Input: • Start/Stop control (1ch) • External trigger (1ch)
       • External sampling (1ch) • Executing auto balance (1ch)
Output: • Trigger status (1ch)

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
LAN connection

USB drive mode
USB connection

Backup settings

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

Backup Image

Ethernet

Automatic backup to FTP server.
FTP server

Measured signal
GL7000

Memory

Auto-backup to SD memory card.
SD
SD memory card

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
It is able to display in the format that cannot be displayed in the GL7000

Recording safety measures include backing up the data on to 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.

LAN / USB cable

Built-in memory
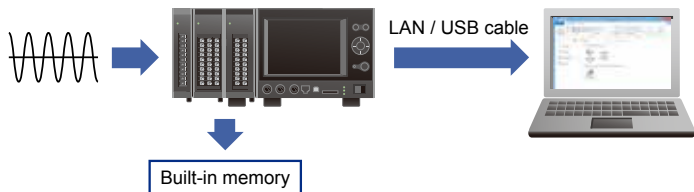
Storage on GL7000	Transferred data to the PC
Built-in RAM	Captured data is transferred and saved to the PC after the completion of the measurement. During the measurement, free-running mode allows the display of the real time data but not the recording. (Real-time recording is not available using the 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 10ms.

Display options

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

Y-T waveform monitor screen

X-Y waveform monitor screen

Digital monitoring screen
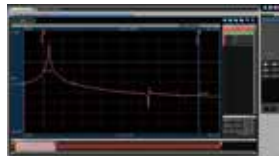
FFT measurement screen

Customized screens for Data Acquisition Professionals

Various control and setting screens for simplified operation

Setup screen
It is easily recognize the unit to be connected 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.

Setting menu for the voltage output module

GL-Wave Editor (EXCEL macro)

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.

Multiple window option allows waveforms to be displayed in various forms

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

Dual windows

Quad windows

Quad windows displaying mixed format

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

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

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 recording 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.
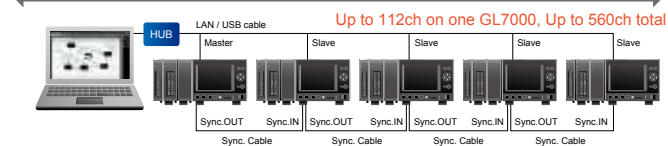
Allows connections of Graphtec's midi LOGGER series
Maximum channel is up to 2000 when 10 units of GL820 is connected
midi LOGGER series - GL220, GL820, GL900-4 and GL900-8 - can all be viewed in real time.

HUB
LAN / USB cable
Up to 112ch on one GL7000, Up to 1120ch total
Up to 10 units allowed

HUB
LAN / USB cable
Up to 112ch on one GL7000, Up to 560ch total
Master Slave Slave Slave Slave
Sync.OUT Sync.IN Sync.OUT Sync.IN Sync.OUT Sync.IN Sync.OUT Sync.IN
Sync. Cable Sync. Cable Sync. Cable Sync. Cable

Sync.OUT Sync.IN

HUB
LAN / USB cable
Up to 2000 channels
Up to 10 units allowed

Input / Output Module Specifications

Voltage 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 (1ms to 1hr.)	1 M Samples/s to 1 Sample/h (1µs to 1hr.)
Built in RAM		2 million samples for each channel	
Measurement range		100, 200, 500 mV, 1, 2, 5, 10, 20, 50, 100 V, and 1-5V 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	100mV to 1V range: 60 Vp-p, 2V to 100V 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 -3dB, 6dB/oct)	Off, Line(1.5 Hz), 5, 50, 500, 5k, 50k Hz (at -3dB, 6dB/oct)
External dimensions (W×D×H)		Approx. 49.2 x 136 x 160 mm (Excluding projections)	
Weight		Approx. 840 g	Approx. 740 g

Voltage/Temperature Input Module Specifications

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 with 1-10ch to 1 Sample/h (10 ms with 1-10ch 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 1-5 V Full Scale	
	Temperature	Thermocouple: K, J, E, T, R, S, B, N, and W (WRe5-26) RTD: Pt100, JPt100 (JIS), Pt1000 (IEC751)	
	Humidity *2	0 to 100 % RH (using 1 V range and scaling functon)	

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
* Wire size of thermocouple used is 0.32mm diameter in the T type and 0.65mm diameter in other types.

RTD	Measurement range	Driving current	Accuracy
Pt100	-200 to 850 (F.S. = 1050 °C)	1 mA	± 1.0 °C
JPt100	-200 to 500 (F.S. = 700 °C)	1 mA	± 0.8 °C
Pt1000	-200 to 500 (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 (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 sensor *2, 1 channel	
External dimensions (W×D×H)		Approx. 49.2 x 136 x 160 mm (Excluding projections)	
Weight		Approx. 770 g	

High Voltage Input Module Specifications

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 (1µs to 1hr.)
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 (Crest Factor: up to 4 in 1 to 200 Vrms range, up to 2 in 500 Vrms range)
Measurement accuracy *3	DC, AC	± 0.25 % of Full Scale
	DC-RMS	Sine wave measurement ± 0.5 % of Full Scale (at 20Hz ≤ F ≤ 1kHz) ± 1.5 % of Full Scale (at 1kHz < F ≤ 20kHz) Response time: 500ms (Crest Factor is up to 4)
	AC-RMS	Sine wave measurement ± 0.5 % of Full Scale (at 100Hz ≤ F ≤ 1kHz) ± 1.5 % of Full Scale (at 1kHz < F ≤ 20kHz) Response time: 500ms (Crest Factor is up to 4)
A/D converter		Successive approximation type, 16 bits (effective resolution: 1/40000 of the measuring full range in the DC and AC coupling., 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) AC Coupling: 4Hz to 200 kHz (+1/-4.5 dB)
Filter	Low pass	OFF, Line (1.5Hz), 5, 50, 500, 5k, 50k Hz (at -3dB, 6dB/oct)
External dimensions (W×D×H)		Approx. 49.2 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. Available ranges vary by the excitation power for the bridge.
*5. ● 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.
*6. 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.
*7. 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.
*8. Subject to the conditions. ● Room temperature is 23 °C ± 5 °C.
*9. Input prove (RIC-10) 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. 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

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 (10µs to 1hr.)	
Built in RAM		2 million samples for each channel	
Input type		Voltage, Strain, Resistance value (including potentiometer)	
Measurement range	Strain *4	400, 500, 800, 1000, 2000, 4000, 5000, 8000, 10000, 20000 µε (µε: 10-6 strain)	
	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 *3	Strain	± (0.2 % of Full Scale + 10 µε)	
	Voltage	± (0.2 % of Full Scale + 10 µV)	
	Resistance	± 0.5 % of Full Scale	
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 *5	Strain gauge Quarter bridge (single gauge) in 2-, 3- or 4-wire (supports remote sensing in 3- or 4-wire) Half bridge (dual gauge) in 3-, 4-, 5-wire (supports remote sensing in 4- or 5-wire) Full bridge (quad gauge) in 4- or 6-wire (supports remote sensing in 6-wire)	
		Transducer/sensor based on strain gauge 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 *6		120 or 350 Ω for the quarter- and half-bridge * Available excitation power varies by selection of element.	
Excitation power	Voltage mode	1, 2, 2.5, 5, 10 V DC * 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	Method	Fully automatic (via push button or setting the condition menu)	
Strain gauge	Max. Range	±10000 µε (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. 60kΩ (120Ω gauge), Approx. 175kΩ (350Ω 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(1.5Hz), 3, 6, 10, 30, 50, 60, 100, 300, 500 Hz, 1k, 3k, 5k, 10k Hz (in -30dB/oct)	
	Anti-aliasing	Off, On	
Support TEDS	Standard	IEEE 1451.4 Class2 (Temperate No.33)	
	Support	Reading information from the sensor and setting it to module	
External dimensions (W x D x H)		Approx. 49.2 x 136 x 160mm (Excluding Protection)	
Weight		Approx. 840 g	

Charge Input Module Specifications

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 (10µs to 1hr.)	
Built in RAM		2 million samples for each channel	
Input type		Sensor in charge output type, Sensor in IEPE type, Voltage	
Input coupling		Sensor: Charge, IEPE, Charge-RMS, IEPE-RMS Voltage: DC, AC, DC-RMS, AC-RMS	
Measurement range	Acceleration sensor	1, 2, 5, 10, 20, 50, 100, 200, 500, 1000, 2000, 5000, 10000, 20000, 50000 m/s2	
	Voltage input	DC, AC coupling: 50, 100, 200, 500 mV, 1, 2, 5, 10V RMS measurement: 50, 100, 200, 500 mVrms, 1, 2, 5 Vrms (Crest Factor in RMS measurement: up to 4 in 20mVrms to 2 Vrms range, up to 2 in 5 Vrms range)	
Supported sensitivity	Charge output type	0.01 pC/(m/s2) to 999.9 pC/(m/s2)	
	IEPE type	0.01 mV/(m/s2) to 999.9 mV/(m/s2)	
Measuring accuracy*3	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] ≥ 200mV)	
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 is up to 22 V.)	
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 channel/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	
	Low pass	Off, Line(1.5Hz), 3, 6, 10, 30, 50, 60, 100, 300, 500 Hz, 1k, 3k, 5k, 10k Hz (in -30dB/oct)	
	Anti-aliasing	Off, On	
Support TEDS	Standard	IEEE 1451.4 Class1 (Temperate No.25)	
	Support	Reading information from the sensor and setting it to module	
Calculation function		Integration (convert measurement to velocity), Double Integration (convert measurement to displacement)	
External dimensions (W x D x H)		Approx. 49.2 x 136 x 160mm (Excluding projections)	
Weight		Approx. 850g	

Voltage Output Module Specification

Voltage Output Module Specification			
Model number		GL7-DCO	
Number of output channels		8 channels	
Output method		All channels common ground, SMA (SubMiniature version A) connector	
Sampling speed (interval)		Up to 100 k Samples/s (10µs)	
Output condition	Source of data	Measurement data, Edited measurement data, Generated arbitrary data *7, 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), 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. 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 *8		± 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(1.5Hz), 5, 50, 500, 5k, 50k Hz * 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. 49.2 x 136 x 160mm (Excluding projections)	
Weight		Approx. 770g	

Logic/Pulse Input Module specifications

Logic/Pulse Input Module specifications			
Model number		GL7-L/P	
Number of input channels		16 channels	
Input method		All channels common ground, Simultaneous sampling, Circular connector (4ch/connector) *9	
Sampling speed	Logic mode	1 M Samples/s to 1 Sample/h (1µs to 1hr. interval)	
	Pulse mode	10 k Samples/s to 1 Sample/h (100µs to 1hr. interval)	
Built-in RAM		2 million samples for each channel	
Measurement mode		Logic input mode or Pulse input mode *9	
Pulse input mode		Rotation count (RPM), Accumulating count, Instant count	
Rotation count (RPM)	Function	Counting the number of pulses per sampling interval and then it is converted to RPM	
	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 counts 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	
Max. input frequency and count		Frequency: 1 MHz, Count: 15 M counts (24 bits counter is used)	
Input signal	Voltage	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 50 Hz)	
External dimensions (W×D×H)		Approx. 49.2 x 136 x 160 mm (Excluding projections)	
Weight		Approx. 700 g	

GL7000 specifications

Item		Description
Number of module		Attached to up to 10 modules *1
Number of input channels		Max. 112 channels in 1 of GL7000
External Input/Output signals *2	Input	Start/Stop, External trigger, External sampling, Auto balance Signal type: Contact (relay), Open collector, Voltage
	Output	Trigger, Busy, Alarm (10 channels) *3 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 Disabled (OFF): Data capture is completed in a single trigger
	Trigger source	Start: Off, Measured signal, Alarm, External signal, Clock, Week or Time Stop: Off, Measured signal, Alarm, External signal, Clock, Week or Time
	Trigger determination conditions for measured signal	Combination: OR or AND condition at the level of signal or edge of signal Analog: Higher/Rising, Lower/Falling, Window-in, Window-out Logic *4: Higher/Rising, Lower/Falling Pulse *4: Higher/Rising, Lower/Falling, Window-in, Window-out
	Alarm determination condition *5	Combination: OR or AND condition at the level of signal or edge of signal Analog: Higher/Rising, Lower/Falling, Window-in, Window-out Logic *4: Higher/Rising, Lower/Falling Pulse *4: Higher/Rising, Lower/Falling, Window-in, Window-out
	Alarm output	10 channels
	Pre-trigger *6	Number of data before trigger: Up to specified number of captured data
Calculation function	Between channels	Addition, Subtraction, Multiplication and Division for two analog inputs (Sampling speed is limited up to 10 Samples/s (100ms interval). 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 *7
Move function of the display range		Beginning, center or end of the data, Trigger point, Specific time (absolute, relative), Call cursor
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. 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 as when the power failure occurred during data capture *8
Interface to PC		Ethernet (10 BASE-T/100 BASE-TX), USB 2.0 (High speed)
Network function		WEB server, FTP server, FTP client, NTP client, DHCP client
USB drive mode		Emulate the USB memory device *9
Storage device	Built-in	RAM (2 million samples for each channels, built-in amplifier module), Flash memory (2 GB, built-in the main module)
	External *10	SD card (Support SDHC, up to 32 GB) slot, SSD (Approx. 64 GB) The file for capturing data is limited up to 2 GB.
Data saving function	Captured data*10	Built-in RAM, Built-in Flash, SD memory card, SSD (Data is saved directly to it.)
	Data in built-in RAM	Specified number of data up 2 million samples in increments of 1
	Auto save *10	Available for the built-in RAM Enabled (ON): Data in the RAM is saved automatically to the built-in Flash, SD memory card, SSD Disabled (OFF): Data in the RAM is not maintained after power is turned off
	Capturing mode *10	Mode: Off, Normal, Ring, Realy Ring*11: Saved most recent data (Number of capturing data: 1000 to 2000000 points, Destination of data: Built-in RAM, Built-in Flash, SD memory card, SSD) Relay*12: Saved data to multiple file without losing data until capturing data is stopped (Destination of data: Built-in Flash, SD memory card, SSD)
	During data capture *13	Displaying information in two windows, Hot-swapping the SD memory card, Saving data in between cursors.
	Backup *10	Backup interval: Off, 1, 2, 6, 12, 24 hrs. Data destination: SD memory card, SSD, FTP server
Engineering Scale function		Measured value can be converted to the engineering unit Analog voltage: Converts by four reference points (gain, offset) Temperature: Converts by two reference points (offset) Pulse count: Converts by two reference points (gain)
Synchronization between units		Start and Trigger *14
Accuracy of clock (at 23°C)		± 0.002 % (Monthly deviation approx. 50 sec.)
Operating environment		0 to 45 °C, 5 to 85 % RH (non condensed)
Power source		100 to 240 V AC, 50 to 60Hz
Power consumption		85 VA
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), 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

Software specifications

Item		Description
Model name		GL-Connection
Supported OS		Windows 10 / 8.1 / 8 / 7 / Vista
Functions		Control GL7000, Real-time data capture, Replay data, Data format conversion
Controlled unit		Up to 10 units (Max. 1120 channels), (Max. 2000 channels when the GL series are included.)
GL7000 Settings control		Input settings, Memory settings, Trigger and Alarm settings, Other settings
Captued data *15		Built-in RAM (Binary format), Built-in Flash memory (Binary, CSV format), SD memory card (Binary, CSV format), SSD (Binary, CSV format) 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.)
Displayed information		Analog waveforms, Logic waveforms, Digital values
Display mode		Y-T waveform with digital values, X-Y graph in real time, FFT analysis, Cursor information, Capture condition, Alarm information
File operation		Converts binary data to the CSV data (specific period, all data in one file, multiple files), Creates a new file with compression or by consolidating multiple files.
Warning Function		Send e-mail to the specified address when the alarms occur
Statistical calculation		Capturing data: Maximum, Minimum, Peak or Average Replaying data: Maximum, Minimum, Peak, Average or RMS in between cursors
Search function	Level	Specific level in any channels
	Alarm	Occurred alarm in any channel
	Time	Beginning, center, end of the data, Trigger point, Specific time (absolute, relative), Specific number
Operation lock		Operation screen can be locked (It is unlocked with a password.)

Display module specification

Model number	GL7-DISP
Display device	5.7-inch TFT color LCD monitor (VGA: 640 x 480 dots)
Operation section	Touch panel and Cursor keys*16
Touch panel	Capacitive type touch panel, Operated by finger or the proprietary pen
Displayed language	English, French, German, Chinese, Korean, Japanese
Screen saver	Turns off backlight by 10, 30 sec., 1, 2, 5, 10, 30, 60 min.
Displayed information	Waveform in Y-T with digital values, Waveform only, Digital value, Waveform in X-Y, FFT
Connection cable	LAN cable (CAT5 class, Straight connection, Up to 10m) *17
Standard accessories	Bracket for slanted mount, Connection cable (40cm), Ground cable, Screws
External dimensions (W x D x H)	Approx. 187 x 34.5 x 119 mm (Excluding projection)
Weight	Approx. 530 g

SSD module specifications

Model number		GL7-SSD
Storage device		Solid state disk (SSD), Form factor: 2.5-inch HDD
Capacity		Approx. 64 GB (The file size of the captured data is limited up to 2 GB.)
Sampling speed*18	Attached to 1 or 2 modules	Max. 1 M Samples/s (1µs)
	Attached to 3 or 4 modules	Max. 500 k Samples/s (2µs)
	Attached to 5 to 10 modules	Max. 200 k Samples/s (5µs)
External dimensions (W x D x H)		Approx. 49.2 x 136 x 160 mm (Excluding projection)
Weight		Approx. 770 g

Options and accessories

Item	Model number	Remarks
Input/Output cable	B-513	2 m long, Bare wire for signal connection - Connector for GL7000
Humidity sensor	B-530	3 m cables for signal and power
Sync. Cable	B-559	1 m long, Synchronizing between GL7000
Input connector, screw terminal	B-560	For DC Strain module (GL7-DCB), Screw terminal for sensor - D-SUB (rectangular connector) for GL7-DCB module
Input cable, NDIS - D-SUB	B-561	For DC Strain module (GL7-DCB), NDIS (round connector) for sensor - D-SUB (rectangular connector) for GL7-DCB module
Output cable, BNC - SMA	B-562	For Voltage Output module (GL7-DCO), 2 m long, BNC (pulg) for output - SMA (plug) for GL7-DCO module
Probe set for Logic input	RIC-10	For Logic/Pulse module (GL7-L/P), 4 channels, Cable with Alligator clip and IC clip
Input cable, BNC - BNC	RIC-112	1.5 m long, Max. 60 V DC
Input cable, Banana - BNC	RIC-113	1.5 m long, Max. 60 V DC
Input cable, Alligator clip - BNC	RIC-114	1.5 m long, Max. 60 V DC
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
Clip, Alligator (small size)	RIC-144A	For RIC-143, Aperture 11 mm, 300 V DC, CAT II, Max. 15 A
Clip, Alligator (middle size)	RIC-145	For RIC-143, Aperture 20 mm, 1000 V DC, CAT II, Max. 32 A
Clip, Grabber	RIC-146	For RIC-143, Aperture 5 mm, 1000 V DC, CAT III, Max. 1 A

*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 when the module is used in the logic mode, up to 2 modules when the module is used in the pluse 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. The alarm signals are output on the terminal block attached to the main module as standard accessory.

*4. It is available on the Logic/Pulse (GL7-L/P) module.

*5. 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.

*6. 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.

*7. The result of real time calculation is displayed in the digital display mode. Available sampling speed is the 10 samples/s (100 ms interval).

*8. 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 mnodule (GL7-DCO) is used.

*9. The USB drive mode is started by setting of the switch on the main module. It can also be started when the power is turned on while pressing the START/STOP key on the display module.

*10. 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.

*11. 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).

*12. The file size of captured data is limited up to 2 GB. When the captured data distination 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 in limited up to 50 thousand samples/s (20 µs interval) when 1 or 2 modules are attached.(It is required firmware version 1.45 or later.)

*13. This function is able to be available when sampling speed is set up to 10 samples/s (100 ms interval).

*14. The Sync cable (B-559) is required when this function is used. The GL-Connection software is required when the synchronizing function is used.

*15. The captured data that is saved to the built-in-RAM or SSD cannot be saved to the PC in real time. The data in the built-in-RAM or SSD needs to be transferred to the PC after data capture is completed.

*16. Most operations can be selected by both the touch panel and keys.

*17. When the display module is mounted at an angle using the bracket, the display module is connected to the main module by a LAN cable that is attached to the display module as standard accessory.

*18. The sampling speed in the GL7000 is limited to the fastest sampling speed of attached amplifier 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.

● We cannot guarantee any problems of data generated by the malfunction of equipment or PC. Please make a backup of data to avoid it.

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● Specifications are subject to change without notice. For more information about product, please check the web site or contact your local representative.

⚠ For using equipment in correctly and safely
· The 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 it in specified power source.