


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	
Calculation function	Pre-trigger *6	Number of data before trigger: Up to specified number of captured data	
	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			
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
Captured 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, Pulse 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.)



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.

GRAPHTEC
Graphtec Corporation

503-10 Shinano-cho, Totsuka-ku, Yokohama 244-8503, Japan
Tel : +81-45-825-6250 Fax : +81-45-825-6396
Email : webinfo@graphtec.co.jp

Website <http://www.graphteccorp.com>

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 (plug) 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 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. 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 module (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 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 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 a 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.

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



KE10106 GR Vol.2

www.graphteccorp.com

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.)

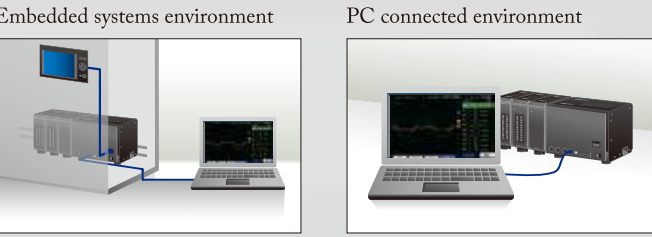
Allows up to 112 channels in one main unit by attaching up to 10 units of the input/output modules.*1
Detachable display module enables the GL7000 to be used in a stand-alone platform or to be embedded into the acquisition system.
Control and monitoring via the PC or display module may be done independently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



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

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



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.

*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 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.
1us sampling interval: up to 8 channels
2us 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 100us. The data will be updated every 100us.

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

Alarm output terminal

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

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

Example

Alarm output terminal

Volt./Temp. module

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

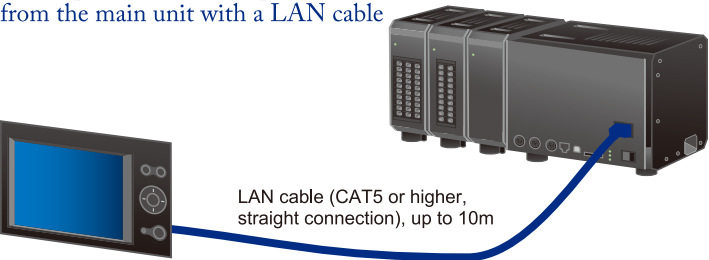
Touch the icon, move to the next setting menu screen.



The display waveform is able to expand or shrink.

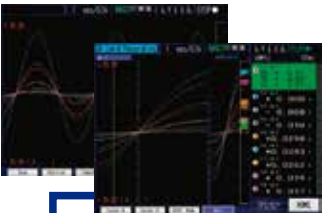


The display unit can be separated from the main unit with a LAN cable



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

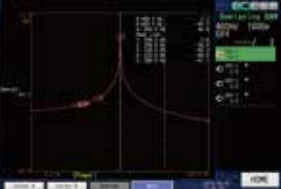


Both digital and statistical values can be displayed at the same time.
* Select two functions from the Ave. / Max. / Min. / Peak value and Off.
* Sampling interval should be 100ms or longer.

X-Y display



FFT display



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.

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.

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).

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

*1 Captured time values 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 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
- Ring capture
- Relay capture
- Data search
- Movement by cursor
- Statistical calculation with cursor

The SD card can be replaced during recording when the sampling interval is 100ms or slower.
When data capturing stops, the most recent data is stored in the memory.
Creates data file up to 2GB continuously without losing any recording. (It is required firmware version 1.45 or later.)
Specific value (measured value, alarm point) of a particular channel in the recorded data can be searched and found automatically.
The cursor can be moved automatically to a specified time in the recorded data.
The statistical calculation (average, max, min, P-P, effective value) can be determined in between the recorded data specified by the cursor.

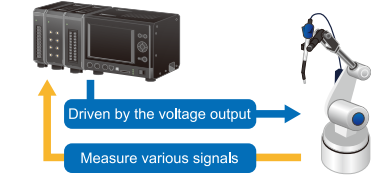
Supports measurement and simulation testing using the voltage output module (GL7-DCO)

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



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



* 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

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

Connector for input

Standard accessory

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



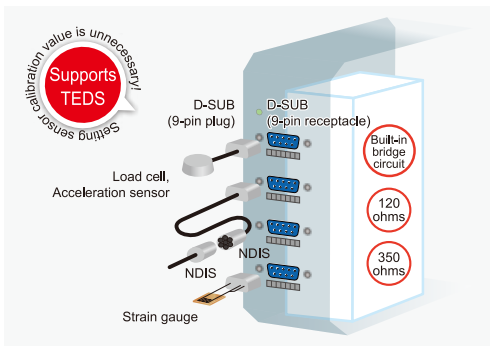
Option

Screw terminal adapter (B-560)



Option

Input cable with NDIS type connector (B-561)



Compensations for High-precision measurement

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

Strain, Voltage, Res.
4ch/unit

Strain gauge, TEDS sensor

Max.
100kS/s
(10μs)

* Attachable number of unit: up to 8 units

Charge Module GL7-CHA

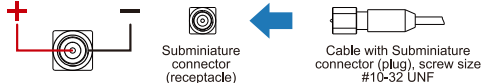


Main features

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

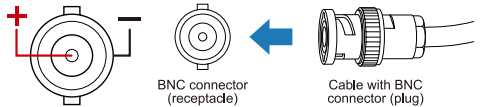
Sensors and input connector type

Charge output type sensor



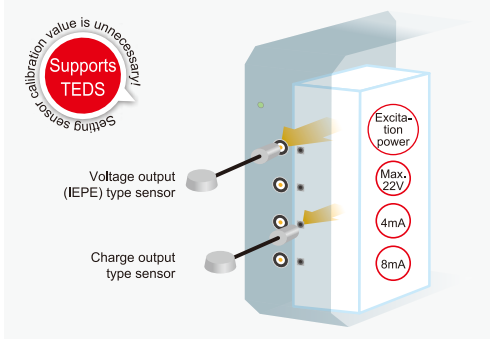
Supported acceleration sensor: 0.01pC/(m/s²) to 999.9pC/(m/s²)

Voltage output (IEPE) type sensor



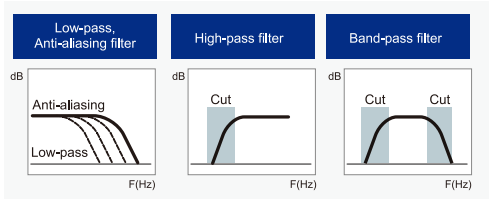
Supported acceleration sensor: 0.01mV/(m/s²) to 999.9mV/(m/s²)

* 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.



Charge, Voltage
4ch/unit

Charge, IEPE sensor

Max.
100kS/s
(10μs)

Voltage Output Module GL7-DCO



Main features

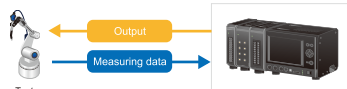
- Recorded measurement data can be output as an analog voltage, and reproduce the measured anomalies and recorded data (Temperature, humidity, logic/pulse data is excluded.)
- The reference signal for the test created by the GL-Wave Editor (EXCEL macro) can be output into an analog voltage (Signal: Sine 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.)

Method of analog voltage output

Three functions

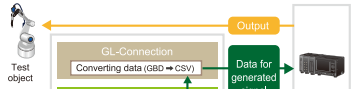
1 Outputs the stored measuring data

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



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



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



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

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

Output voltage
8ch/unit

Max.
100kS/s
(10μs)

Captured data, Arbitrary waveform

High Voltage Module GL7-HV

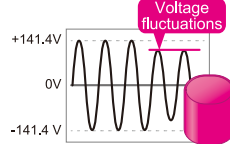


Main features

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

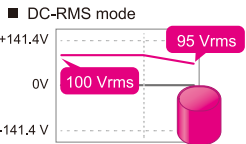
Measuring in RMS (effective value)

Normal mode



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

RMS measurement



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)

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/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

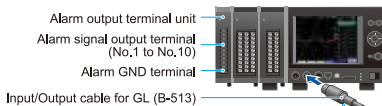
Max.
100S/s
(10ms)

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

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

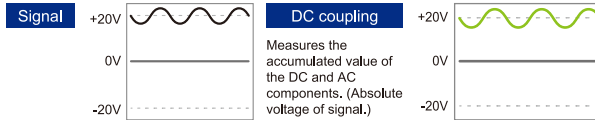


USB drive mode



DC- or AC-coupling

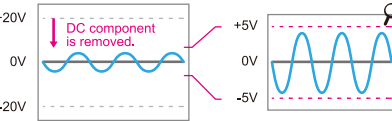
By using the DC and AC coupling feature, the voltage signal of a small signal superimposed on the input signals or the absolute voltage value can be recorded.



Small AC component is superimposed on the DC component.

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.



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

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

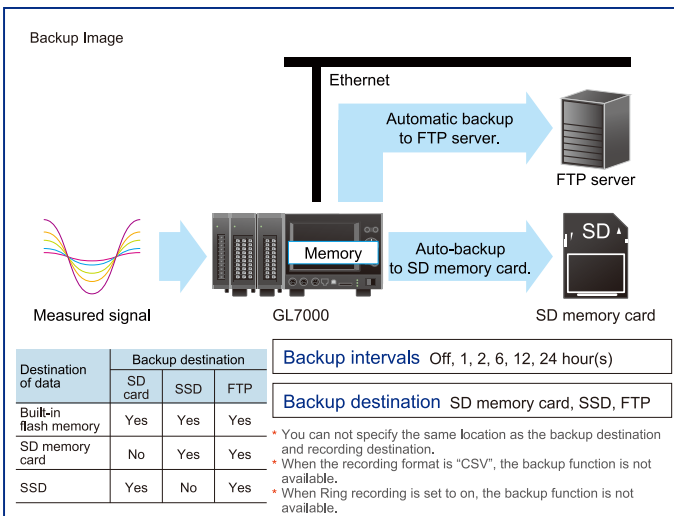
In Logic, Max.
1MS/s
(1μs)

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.

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.



NTP client function

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

DHCP client function

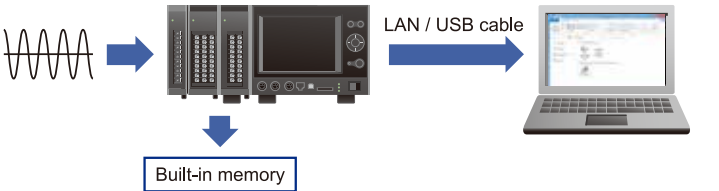
The IP address of the GL7000 is automatically obtained from the DHCP server.

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.



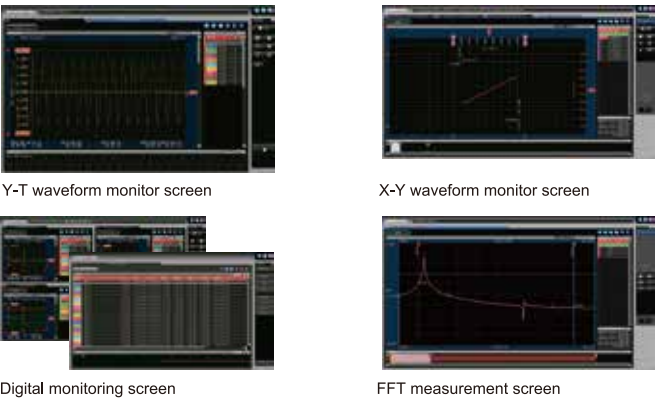
Storage on GL7000 Transferred data to the PC

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)



Useful functions for GL-Connection Software

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



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 Graptec's midi LOGGER series

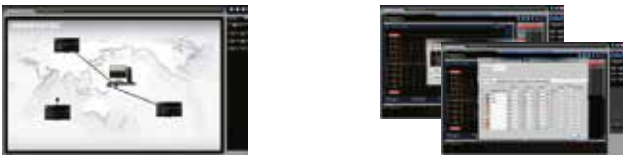
Maximum channel is up to 2000 when 10 units of GL820 is connected

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

Large-scale channel measurements

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.

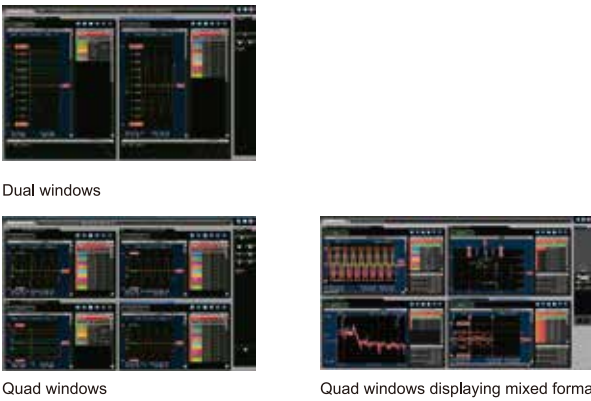


Setting menu for the voltage output module GL-Wave Editor (EXCEL macro)

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

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.

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 (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 -30dB, 6dB/oct)	Off, Line(1.5 Hz), 5, 50, 500, 5k, 50k Hz (at -30dB, 6dB/oct)	
External dimensions (W×D×H)	Approx. 49.2 x 136 x 160 mm (Excluding projections)	Approx. 840 g	
Weight	Approx. 840 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 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 (WR5-26) RTD: Pt100, JPt100 (JIS), Pt1000 (IEC751)		
Humidity *2	0 to 100 % RH (using 1 V range and scaling function)		
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 + 1.0 °C)		
	-100 < TS ≤ 800 °C ± (0.05 % of reading + 1.5 °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 °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 (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			
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 (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 -30dB, 6dB/oct)		
External dimensions (W×D×H)	Approx. 49.2 x 136 x 160mm (Excluding projections)		
Weight	Approx. 740 g		

- 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.
 - Using optional humidity sensor (B-530)
 - 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.
 - Available ranges vary by the excitation power for the bridge.
 - 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.
 - 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.
 - 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.
 - Subject to the conditions. ● Room temperature is 23 °C ± 5 °C.
 - 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			GL7-DCB
Model number	4 channels		
Number of input channels	All channels isolated balanced input, Simultaneous sampling, D-Sub5 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	0.2, 0.25, 0.4, 0.5, 1, 2, 2.5, 4, 5, 10 mV/V	
	Resistance	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	Voltage	± (0.2 % of Full Scale + 10 µε)	
	Resistance	± (0.5 % of Full Scale + 10 µV)	
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 for Strain gauge	Method	Fully automatic (via push button or setting the condition menu)	
Remote sensing	Max. Range	±10000 µε (µε: 10-6 strain)	
Shunt Calibration	Sensor sensing	3- or 4-wire in quarter bridge, 4- or 5-wire in half bridge, 6-wire full bridge	
		Approx. 60kΩ (1200 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	Charge type	DC to 20 kHz	
	IEPE type	Off, On(1.5Hz), 3, 6, 10, 30, 50, 60, 100, 300, 500 Hz, 1k, 3k, 5k, 10k Hz (in -30dB/oct)	
	Filter	Low pass Off, On	
	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			GL7-CHA
Model number	4 channels		
Number of input channels	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/s ²	
	Voltage input	DC, AC coupling: 50, 100, 200, 500 mV, 1, 2, 5, 10V	
		RMS measurement: 20, 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)	
	Charge output type	0.01 pC/(m/s ²) to 999.9 pC/(m/s ²)	
Supported sensitivity	IEPE type	0.01 mV/(m/s ²) to 999.9 mV/(m/s ²)	
Measuring accuracy *2	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			GL7-DCO
Model number	8 channels		
Number of output channels	All channels common ground, SMA (SubMiniature version A) connector		
Output method	Up to 100 k Samples/s (10µs)		
Sampling speed (interval)	Measurement data, Edited measurement data, Generated arbitrary data *7, Generated simple waveform (DC voltage and sine, triangle, ramp, pulse waveform)		
Output condition	Source of 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)	
	Source of measurement data	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 condition	Up to ± 1, 2, 5, 10 V Full Scale	
Output range	Voltage	Up to ± 10 mA in each channel (total output current of unit is up to 40 mA.)	
	current		
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			GL7-L/P
Model number	16 channels		
Number of input channels	All channels common ground, Simultaneous sampling, Circular connector (4ch/connector) *9		
Input method	1 M Samples/s to 1 Sample/h (1µs to 1hr, interval)		
Sampling speed	Logic mode	10 k Samples/s to 1 Sample/h (100µs to 1hr, interval)	
Pulse mode	2 million samples for each channel		
Built-in RAM	Logic input mode or Pulse input mode *9		
Measurement mode	Rotation count (RPM), Accumulating count, Instant count		
Pulse input mode	Counting the number of pulses per sampling interval and then it is converted to RPM		
Rotation count (RPM)	Function	Span	
		50, 500, 5000, 50 k, 500 k, 5 M, 50 M, 500 M rpm Full Scale	
Accumulating count	Function	Span	
		50, 500, 5000, 50 k, 500 k, 5 M, 50 M, 500 M counts Full Scale	
Instant count	Function	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 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)	
		Off or On (-3 dB at 50 kHz)	
Filter	Approx. 0.5 V (2.5 V to 3 V)		
External dimensions (W×D×H)	Approx. 49.2 x 136 x 160 mm (Excluding projections)		
Weight	Approx. 700 g		