GRAPHTEC

Modular Data Acquisition PLATFORM

DATA PLATFORM
GL7000

On-Demand Signal Acquisition, Monitoring and Data logging Solution

Next Generation Data Acquisition Unit with Touch Panel Control

Sampling Speed

1S/h to 1MS/s

Multiple Modules

Number of Channels,
112ch Max. per GL7000

www.graphteccorp.com

Next Generation Data Acquisition Platform - GL7000.

Touch Panel Display for stand-alone operation or embedded systems

Max 10 modules can be attached for measuring various signals

10 ch. Alarm output terminal
(included with GL7000 control unit)

128GB SSD module
(optional)

8 module options support various signal Inputs
Max 10 modules (112 channels) for each GL7000 control unit. (*1)

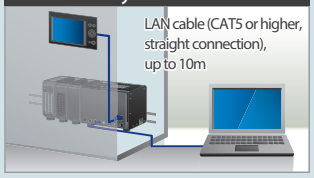
REMOTE input and output terminal
(ext. trigger, ext sampling, start, stop, trigger out)

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

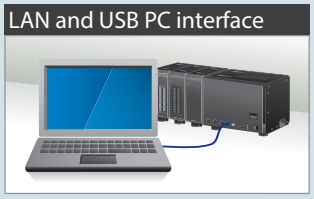
Touch Panel Display (optional)

LAN straight cable (CAT5 or higher , 10m max length) allows extended display operation

Embedded systems environment



LAN and USB PC interface



Measurement setup and monitoring via PC is available even when display module is connected with GL7000.

Intuitive operation using touch panel display or front panel keys.

User friendly operation with icon menus

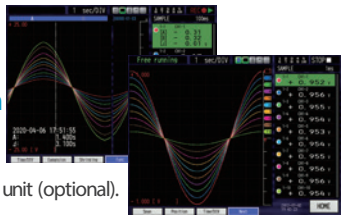
Set the range, trigger, and alarm conditions	Direct touch of the designated icon.
Set the sampling speed and memory destination	Easy access to each function from listed icons.
User defined function key for quick access	Display short-cut icon on function menu.

Four Different Display Modes

Y-T display

Measurement data files can be displayed in double-screen mode while recording

* Available when memory destination is flash memory /SD memory card / SSD unit (optional).
* Sampling intervals 100ms or longer.



Digital display

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

* Select two from Avg / Max. / Min. / Peak and Off
* Sampling intervals 100ms or longer.

X-Y display

Four types of X-Y graphs can be displayed

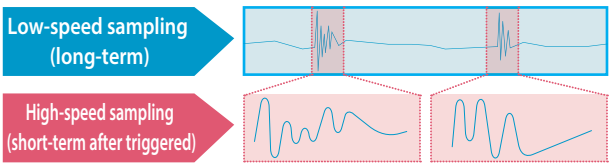
FFTdisplay

Two types of FFT can be displayed

Configurable Dual/Single sampling supports a wide variety of applications.

Dual-Sampling Feature

Record long durations at slow sample rates, preserving memory and reducing file size.
Use dual sample trigger to capture dynamic transient signals at fast sample rates.



<Dual Sampling memory destinations (Low speed)>
Built-in flash memory
SD memory card

<Dual Sampling speed (Low speed)>
1ms～1hour

<Dual Sampling memory destinations (High speed)(*2)>
Built-in RAM SSD module

<Dual Sampling speed (High speed)D13>
1μs～500μs

Single sampling function

<Memory destinations>
Built-in RAM/ Built-in Flash memory / SD memory card/ SSD module

<Dual Sampling speed (Low speed)>
1MS/s(1μs)～1hour

Max sampling speed is maintained even as the number of modules is increased

Max.sampling speed is maintained even as the number of modules is increased.
When data is recorded on SSD, sampling speed will change by the number of channels.

*2 Built-in RAM: for recording once
SD module: for recording multiple times (Max. 100 files can be made)

Multiple recording media covers both instantaneous measurement and long-term recording

Built-in RAM

Maxi sampling speed 1MS/s

Dynamic sampling

2 million samples / channel in each module

Max. sampling speed is maintained even as the number of modules is increased

Built-in Flash memory

Max. sample rate is 1KS/s

Long term recording

4GB of Flash memory in the main module

Up to 4GB of continuous data can be recorded.

SD memory card slot

Max. sample rate is 1KS/s

Long term recording

SD card slot is standard on the main module

SDHC up to 32GB

128GB SSD module

Option

Max. sample rate is 1MS/s

Long term recording

SSD module must be attached next to the main module

Up to 4GB can be recorded as a continous data without relay mode.

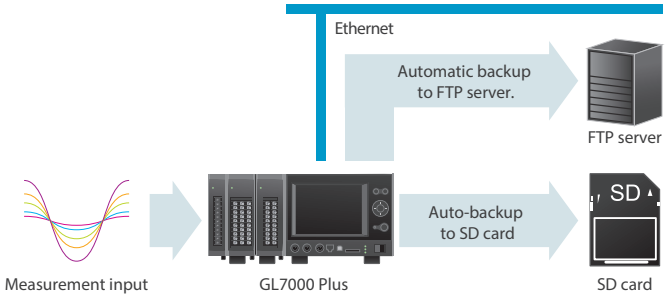
Maximum Sampling Speed and Maximum Data Capturing Time

Data capturing time stated in a box below is recorded by GL7-HSV in GBD file format.
Data capturing time depends on the selection of modules.

Storage Device	Number of units, Max. sampling speed (interval)			Capturing Time When Single Module is Attached (When 10 Modules are Attached)			
	1 or 2 modules Attached	3 or 4 modules Attached	5, 6, 7, 8, 9 or 10 modules Attached	1MS/s (1μs)	100KS/s (10μs)	1KS/s (1ms)	100S/s (10ms)
Built-in RAM	1MS/s(1μs)			2sec. (2sec.)	20sec. (20sec.)	33min. (33min.)	5hrs. (5hrs.)
Built-in Flash memory	1KS/s(1ms)			N/A	N/A	72hrs. (10hrs.)	32days (4days)
SD memory card	1KS/s(1ms)			N/A	N/A	83hrs. (11hrs.)	34days (4days)
SSD	1MS/s(1μs)	500KS/s(2μs)	200KS/s(5μs)	4min. (N/A)	44min. (6min.)	83hrs. (11hrs.)	34days (4days)

Useful Functions

● Backup Function ・・・・・・・・・・ GL7000 has a function of periodically backing up recording data



Storage Device	Backup destination		
	SD memory card	SSD module	FTP server
Built-in flash memory	○	○	○
SD memory card	×	○	○
SSD module	○	×	○

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

File format GBD・CSV

* Recording destination and backup destination must be different memory locations.
* When ring recording function is set On, backup function is not available.
* Backing up measurement data in "CSV" file format is available with GL7000's firmware Ver.210 or later.

● USB Drive mode ・・・・ USB drive mode function enables the main module's flash memory to be recognized as an external drive by your PC.

● SD Memory Card Exchange ・・・・・・・・・ SD Card can be exchanged during recording.This function is available when recording at 100ms or slower sampling rate.
● Ring Capture ・・・・・・・・・・・・・・・・・ User defined data points for capture are overwritten when data points exceed defined size,preserving only the most recent data in memory.
● Relay Capture ・・・・・・・・・・・・・・・・・ Allows continuous, long-term recording in 4GB file increments without loss of data until memory destination is full.
● Data Search ・・・・・・・・・・・・・・・・・・ Specific values (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 between Cursors ・・・ Statistical calculation function (average, max, min, P-P, effective value) can be determined in between the recorded data specified by the cursor.

*1. ・ If different types of modules are attached,the effective sampling speed of the system depends on the fastest samplingspeed of 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.)
If recording pulse signal, the maximum sampling speed is 100μs. The data will be updated every 100μs.

DC Strain Module GL7-DCB

4ch /unit

Strain, Voltage, Resistance

Max. 100kS/s (10µs)

Main Features

- Easy connection with strain gauges by built-in bridge circuit for both 120 and 350 ohm gauges
- Excitation power for bridge circuit is supported in constant voltage or current
- TEDS sensors are supported
- Low-pass and anti-aliasing filters
- Remote sensing and shunt calibration function for high-precision measurement

*DC Strain module (GL7-DCB): up to 8 modules per 1 main unit

【Supported Sensors】

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

TEDS Supported

Standard: IEEE 1451.4 Class2 (Template No.33)
Support: Reading information from the sensor and setting it to module

Connector for Input

Standard Accessory

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

Standard Accessory Option

Input cable with NDIS type connector (B-561)

Option

Screw terminal adapter (B-560A)

Option

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

Charge Module GL7-CHA

4ch /unit

Charge, IEPE sensor

Max. 100kS/s (10µs)

TEDS Available!

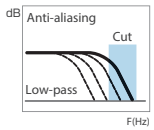
Standard: IEEE 1451.4 Class1
(Temperate No.25 for sensor, Temperate No.27 for microphone)
Support: Reading information from the sensor and setting it to module

Main Features

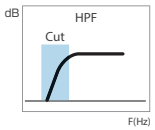
- Charge and voltage output type sensors are supported
- Compatibility with microphones
- TEDS sensors are supported
- High-pass, low-pass, and anti-aliasing filter can be used when capturing
- RMS (effective value) measurement is supported

Wide variety of filter functions allows high-precision measurement

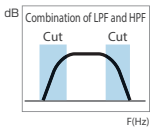
Low-pass, Anti-aliasing filter



High-pass



Band-pass

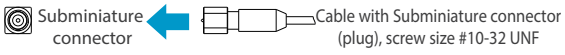


【Supported Sensors】

Various types of the charge or IEPE type sensors can be applied to GL7000 by setting their sensitivity and using an engineering scaling function in the main device.

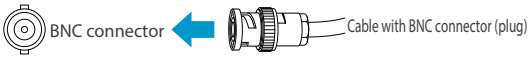
Charge Output Type Sensor

Example of Supported Acceleration Sensor：
0.01pC/(m/s2) to 999.9pC/(m/s2)



Voltage output (IEPE) type sensor

Example of Supported Acceleration Sensor：
0.01pC/(m/s2) to 999.9pC/(m/s2)



Voltage Output Module GL7-DCO

8ch /unit

Voltage, Output

Max. 100kS/s (10µs)

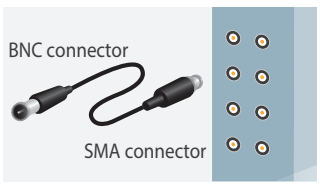
Main Features

- Recorded measurement data can be output in an analog voltage
  (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

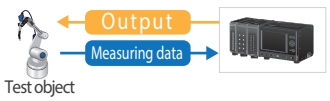
Option

Output cable with BNC connector B-562



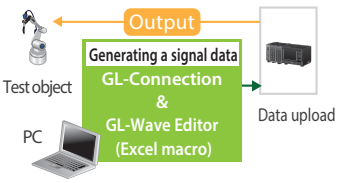
【Procedure of Analog Voltage Output】 *GL-Connection and GL-Wave Editor software are standard accessories.

1 Outputs the stored measuring data
Outputs a signal without a PC

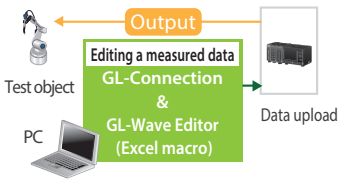


*Data that is being recorded cannot be output from the DCO module simultaneously.
GL7000 cannot generate arbitrary data by itself.

2 Outputs the generated signal
Outputs a signal (Arbitrary, Sine, pulse, ramp, triangle, or DC) using the module and the PC software



3 Outputs the edited measuring data
Outputs an edited signal using the module and the PC software



High Voltage Module GL7-HV

2ch /unit

Voltage

Max. 1MS/s (1µs)

Main Features

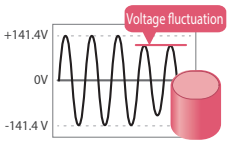
- High input voltage (Maximum: 1000V)
- Input coupling of DC and AC
- Real-time RMS measurement

Input coupling of DC and AC

By using DC and AC coupling feature, superimposed small voltage and the absolute voltage can be recorded.

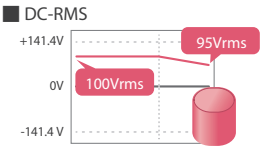
Measuring in RMS (effective value)

Normal mode



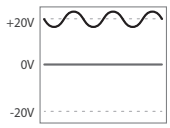
Volume of recorded data becomes large, because the sampling speed needs to be fast enough to recognize the waveform.

RMS measurement mode



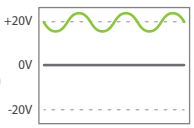
Volume of recorded data becomes small, because the sampling speed does not need to be set fast by recording the RMS value.

Signal



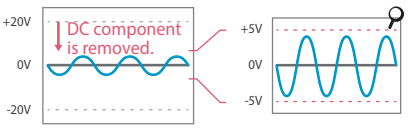
DC Coupling

Measured Value of the DC and AC components (Absolute voltage of signal.) are captured.



AC Coupling

Remove superimposed DC components from the coupled AC signal, allowing only the small AC components to be measured.



High Speed Voltage Module GL7-HSV

4ch /unit

Voltage

Max. 1MS/s (1µs)

Main Features

- All isolated input channels
- Simultaneous sampling
- Maximum input voltage 100V
- Low-pass filters

Voltage Module GL7-V

10ch /unit

Voltage

Max. 1kS/s (1ms)

Main Features

- All isolated input channels
- Simultaneous sampling
- Maximum input voltage 100V
- Low-pass filters

Voltage/Temperature Module GL7-M

10ch /unit

Voltage /Temp. /Humidity

Max. 100S/s (10ms)

Main Features

- All isolated input channels
- Scan method
- Voltage : max. 50V
  Temperature : Thermocouple and RTD
  Humidity : optional sensor (B-530)

Option

humidity sensor B-530

* Supports one humidity sensor per module (B-530).

Logic/Pulse Module GL7-L/P

16ch /unit

Logic Pulse

Logic mode: 1MS/s sampling

Pulse mode: 10kS/s sampling

Main Features

- Switching mode between logic or pulse
- Pulse : Rotation/Accumulating/Instant

Option

Probe set for Optional Logic input (RIC-10A)

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

Sensors and signal input cables

Input cable, Safe probe - BNC

Insulated 1:1, (42pf), 1.2m long, 300V DC, CATII

RIC-141A

Input cable, BNC - BNC

Insulated, 1.5 m long, 1000 V, CATII(600V･CATⅢ)

RIC-142

Selection of Clips

For RIC-143/147

RIC-146

RIC-145

RIC-144A

Input cable, Banana - BNC

Insulated, 1.6 m long, 600 V, CATII (300V･CATⅢ)

RIC-143

Input cable, Banana - BNC(Hi-voltage)

Insulated, 1.6 m long, 1000 V, CAT II (600V･CATⅢ)

RIC-147

Humidity sensor

With 3 m long signal cable (with power plug)

B-530

Shunt resistor 250Ω

10 pcs/set
±250 Ω (0.1%),
Rated power of 1 W

B-551-10

High performance User Interface software, "GL-Connection" can display data in various formats that are not available in stand-alone operation.

Data recording both on the GL7000 and on the PC to secure your test file.

Data can be saved to both the PC
while also being saved to the GL7000

Storage on GL7000	Transfer method to the PC
RAM/SSD	Captured data is transferred and saved to the PC after a recording is completed. During the measurement, real time data will be transferred and shown on GL-Connection (Real-time recording is not available when using the built-in RAM as the recording destination.).
Built-in flash memory SD memory card	Captured data will be saved to selected storage media and the PC simultaneously. Max sampling speed: 1ms/5 units in GBD and CSV*

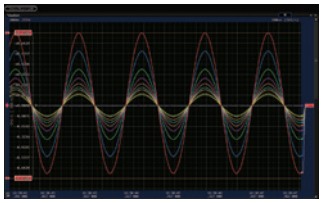
* It is possible when CSV is selected as the data format for PC recording while GBD is selected as data format for the main unit of GL7000. Maximum sampling speed for this feature is 10ms if CSV is selected as the file format in the main unit of GL7000.

Easy connection and settings

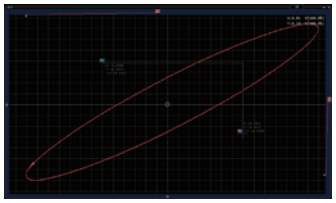
Setup screen
Intuitive operation
with graphical images.

Setting menu screen
Similar layout to the setting menu of GL7000's screen.

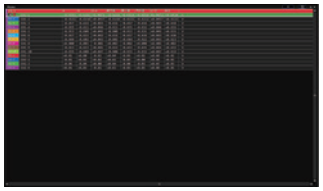
Variety of display formats



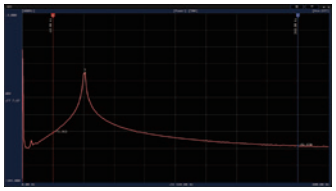
Y-T waveform format



X-Y waveform format



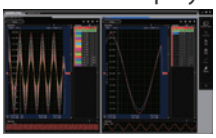
Digital monitoring format



FFT mode

Multi-window to display the waveform in maximum 4 windows

It allows to display in different format at the same time.



Dual windows

Quad windows

Quad windows displaying different formats

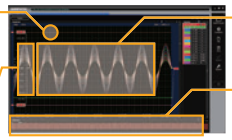
- **Cursor Synchronization**
  Positon of cursors are synchronized between windows.
- **Module Settings List**
  Setting conditions of multiple modules can be displayed simultaneously and can be saved as CSV data.
- **Disable to save the data to PC**
  Disables to record on the PC in order to save the data to GL7000 in higher sampling speed.
- **Remote Lock ON/OFF**
  Setting operation is available on GL7000 under control of GL-Connection.

Useful functions for GL-Connection Software

User-friendly and intuitive operation by mouse actions.

Display size change by dragging action on the dot line.

Scale change of waveform by mouse wheel movement.



Position change of waveform by dragging and shifting up or down the mouse.

Time division change by mouse wheel movement.

Other Useful Features

Additional functions for data processing.

- **Statistics** ..... The maximum, minimum, peak, and average values are displayed while data recording. The maximum, minimum, peak, average, and RMS between cursors will be displayed when recorded data is replayed.
- **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 function** ..... Search option by level, alarm or time (beginning, middle, end of data, trigger point, specific time, instruction time and specific point)
- **Send mail** ..... An email can be automatically sent as alarm warning.

More than one system (112ch) of GL7000 can be monitored by GL-Connection.

Up to 1120ch can be measured

Up to 20 units of the GL7000 can be connected to a GL-Connection by using the LAN or the USB hub.

Up to 5 units of the GL7000 can be fully synchronized using B-559 sync. cable.

The start/stop trigger, and sampling can be synchronized in the GL7000 when they are connected by B-559 sync. cable. The master and slave units are automatically identified. Data is stored in each main unit individually.

Compatible with midi LOGGER series and up to 2000ch can be monitored.

GL2000, GL980,GL900-4, GL900-8, GL840, GL820, GL240, GL220 are supported and can be monitored in real time.

SDK (Software Development Kit) is available for free.

Software Development Kit (SDK) is available for real time data transfer and for customized software development for your needs.

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

Input / Output Module Specifications

Voltage Module Specifications		Voltage Module (GL7-V)	High Speed Voltage (GL7-HSV)
Number of input channels		10 channels	4 channels
Input method		All channels isolated unbalanced input, All channels isolated unbalanced input, Simultaneous sampling	
Input terminal		Screw terminal (M3 screw)	BNC connector
Sampling speed (interval)		1ms(1kS/s)～1h	1μs(1MS/s)～1h
Measurement range		100, 200, 500 mV, 1, 2, 5, 10, 20, 50, 100 V, and 1-5 V Full Scale	
A/D converter		Successive approximation type, 16 bits (effective resolution: 1/40000 of the measuring full range)	
Maximum input voltage		[Between (+)/(-) terminal] 100 mV to 1 V range: 60 Vp-p 2 V to 100 V range: 100 Vp-p	
		[Between channels ((-) terminals)] 60 Vp-p	
		[Between channel/GND] 60 Vp-p	
Frequency response		DC to 1 kHz (+1/-3 dB)	DC to 200 kHz (+1/-3 dB)
Filter (L.P.F.)		Off, Line(1.5 Hz), 5Hz, 50Hz, 500Hz	Off, Line(1.5 Hz), 5Hz, 50Hz, 500Hz, 5kHz, 50kHz
		(Attenuation) -3dB(-5.2dB～-1.4dB)/6dB oct	
External dimensions (W×D×H)		Approx. 49 x 136 x 160 mm (Excluding projections)	
Weight		Approx. 840 g	Approx. 740 g

Voltage/Temperature Input Module Specifications (GL7-M)		
Number of input channels		10 channels
Input method		All channels isolated balanced input, Scans channels for sampling
Input terminal		Screw terminal (M3 screw)
Sampling speed (interval)		100 Samples/s at 10ch to 1 Sample/h (10 ms at 10ch to 1 hr.)
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	0 to 100 % RH, using optional humidity sensor (B-530) (*1)
A/D converter		Sigma-Delta type, 16 bits (effective resolution: 1/40000 of the measuring full range)
Maximum input voltage		[Between (+)/(-) terminal] 60 Vp-p [Between channels ((-) terminals)] 60 Vp-p [Between channel/GND] 60 Vp-p
Filter (Moving average)(*2)		Off, 2, 5, 10, 20, 40
External dimensions (W×D×H)		Approx. 49 x 136 x 160 mm (Excluding projections)
Weight		Approx. 770 g

High Voltage Input Module Specifications (GL7-HV)		
Number of input channels		2 channels
Input terminal		Isolated BNC connector
Input method		All channels isolated unbalanced input, Simultaneous sampling,
Sampling speed (interval)		1 μs (1MS/s) to 1 hr.
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)
A/D converter		Successive Approximation type, 16 bits (effective resolution: 1/40000 of the measuring full range in the DC and AC)
Maximum input voltage		[Between (+)/(-) terminal] 1000 Vp-p [Between channels ((-) terminals)] 300Vrms AC [Between channel/GND] 300 Vrms AC
Frequency response		DC Coupling: DC to 200 kHz (+1/-3 dB) AC Coupling: 4Hz to 200 kHz (+1/-4.5 dB)
Filter (L.P.F)		OFF, Line (1.5 Hz), 5, 50, 500, 5k, 50k Hz (at -3 dB, 6dB/oct)
External dimensions (W×D×H)		Approx. 49 x 136 x 160mm (Excluding projections)
Weight		Approx. 740 g

DC Strain Input Module Specifications (GL7-DCB)		
Number of input channels		4 channels
Input terminal		D-SUB type connector (9 pins, receptacle)(*3)
Input method		All channels isolated, Simultaneous sampling, balanced input
Sampling speed (interval)		10 μs (100kS/s) to 1 hr.
Measurement range	Strain (*4)	400, 500, 800, 1000, 2000, 4000, 5000, 8000, 10000, 20000 με (με: 10-6 strain)0.2, 0.25, 0.4, 0.5, 1, 2, 2.5, 4, 5, 10 mV/V
	Voltage	1, 2, 5, 10, 20, 50, 100, 200, 500 mV, 1, 2, 5 V
	Resistance	1, 2, 5, 10, 20, 50, 100, 200, 500 Ω, 1, 2, 5, 10, 20, 50 kΩ
A/D converter		Successive Approximation type, 16 bits (effective resolution: 1/40000 of the measuring full range)
Gauge ratio		2.0 constant
Bridge resistance		50 Ω to 10 kΩ
Built-in element of the bridge (*5)		120 or 350 Ω for the quarter- and half-bridge
Excitation Voltage		1, 2, 2.5, 5, 10 V DC
Constant current		0.1 to 20 mA (supported voltage is up to 10 V.)
Zero Adjust for Strain gauge		Method: Fully automatic, Range: ±10,000με (με:10-6 Strain)
Maximum input voltage		[Between (+) / (-) terminal] DC10V [Common-mode voltage] 10 Vrms AC [Between channels ((-) terminals] 10 Vp-p [Between channel / GND] 60 Vp-p
Frequency response		DC to 20 kHz
Filter	L.P.F.	Off、Line(1.5Hz)、3Hz、6Hz、10Hz、30Hz、50Hz、60Hz、100Hz、300Hz、500Hz、1kHz、3kHz、5kHz、10kHz at -30dB/oct
	A.A.F.	Off、On
External dimensions (W x D x H)		Approx. 49 x 136 x 160mm (Excluding Protection)
Weight		Approx. 840 g

Charge Input Module Specifications (GL7-CHA)		
Number of input channels		4 channels
Input terminal		BNC and Miniature connector (#10-32UNF)
Input method		All channels isolated unbalanced input, Simultaneous sampling,
Sampling speed (interval)		10μs(100kS/s)～1h
Input coupling		Charge, IEPE, Charge-RMS, IEPE-RMS, DC, AC, DC-RMS, AC-RMS, Microphone
Measurement range	Acceleration sensor input	1, 2, 5, 10, 20, 50, 100, 200, 500, 1000, 2000, 5000, 10000, 20000, 50000 m/s2
	Voltage input	DC, AC: 50, 100, 200, 500 mV, 1, 2, 5, 10 V RMS: 20, 50, 100, 200, 500 mVrms, 1, 2, 5 Vrms (Crest Factor in RMS measurement: up to 4 in 20 mVrms to 2 Vrms range, up to 2 in 5 Vrms range)
	Microphone(*8)	200, 400, 500mPa, 1, 2, 4, 5, 10, 20, 40, 50, 100, 400, 500Pa
Supported sensor 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)
	Microphone	0.2mV/Pa to 100mV/Pa
A/D converter		Successive approximation type, 16 bits (effective resolution: 1/40000 of the measuring full range)
Excitation power		4 or 8 mA (supported voltage: 22 V ±10%)
Maximum input charge signal		Max. 50000 pC
Maximum input voltage		[Between (+) / (-) terminal] 25Vp-p [Between channels ((-) terminals)] 25Vp-p [Between channel / GND] 25Vp-p
Frequency response	Charge type	1.5 Hz to 45 kHz
	IEPE type	1 Hz to 45 kHz
Filter	H.P.F.	Off、0.15Hz、1Hz、10Hz
	L.P.F.	Off、Line(1.5Hz)、3Hz、6Hz、10Hz、30Hz、50Hz、60Hz、100Hz、300Hz、500Hz、1kHz、3kHz、5kHz、10kHz at -30dB/oct
	A.A.F.	Off、On
Calculation function		Integration (convert measurement to velocity), Double Integration (convert measurement to displacement)
External dimensions (W x D x H)		Approx. 49 x 136 x 160mm (Excluding projections)
Weight		Approx. 850 g

Voltage Output Module Specification (GL7-DCO)		
Number of output channels		8 channels
Output terminal		SMA (Sub-miniature version A) connector
Output method		All channels common ground
Sampling speed (interval)		10 μs
Output condition	Source of data	Measurement data, Edited measurement data, Generated arbitrary data(*6), condition Generated simple waveform (DC voltage and sine, triangle, ramp, pulse waveform)
	Output condition	Output sampling interval must be 10μs or slower
Output range	Voltage	± 1, 2, 5, 10 V Full Scale
D/A converter		Resolution 16 bits (effective resolution: 1/20000 of the output full range)
Maximum output current		Up to ± 10 mA in each channel (total output current of unit is up to 40 mA.)
Filter (L.P.F)		OFF, Line(1.5 Hz), 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 x 136 x 160mm (Excluding projections
Weight		Approx. 770g

Logic/Pulse Input Module specifications (GL7-L/P)		
Logic/Pulse Input Module specifications		16 channels(*7)
Input method		All channels common ground, Simultaneous sampling
Input terminal		Circular connector (4ch/connector) RIC-10A
Sampling speed (interval)		Logic mode: 1 μs(1MS/s) to 1 hr. Pulse mode: 100 μs (10kS/s) to 1 hr.
Measurement		Logic input mode or Pulse input mode (*8)
Pulse input mode		Rotation count (RPM), Accumulating count, Instant count
	Rotation count (RPM)	Counting the number of pulses per sampling interval and then it is converted to RPM
	Accumulating count	Accumulating the number of pulses from the start of measurement
	Instant count	Counting the number of pulses per sampling interval (count is reset at each sampling)
Maximum input frequency		1MHz
Maximum number of count		15 M counts (24 bits counter is used)
Input signal	Voltage range	0 to 24 V (common ground)
	Signal type	Contact (Relay), Open collector, Voltage
	Threshold	Approx. 2.5 V
	Hysteresis	Approx. 0.5 V (2.5 V to 3 V)
Filter		Off or On (-3 dB at 50 Hz)
External dimensions (W×D×H)		Approx. 49 x 136 x 160 mm (Excluding projections)
Weight		Approx. 700 g

*1 Using optional humidity sensor (B-530).
*2 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.
*3 Standard: DSUB (male) connector : 4
*4 Available ranges vary by the excitation power for the bridge.
*5 When the built-in resistor 120Ω is used for bridge, the available excitation voltage is 1V, 2V, or 2.5V.
*6 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.
*7 Input prove (RIC-10A) is required to connect signals.
*8 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.

GL7000 specifications		
Item		Description
Number of module		Attached to up to 10 modules (*1), Max. 112 channels in 1 of GL7000
External Input/Output signal (*2)	Input	Start/Stop, External trigger, External sampling, Auto balance (*3) Output Signal type: Contact (relay), Open collector, Voltage signals (*2) Output
	Output	Trigger, Busy (*3), Alarm (10 channels) (*4) Signal type: Open collector (pulled-up by resistor 10 kΩ)
Trigger, Alarm function	Trigger repeat	Start・Previous start to next start, Stop・previous stop to next start
	Trigger source	Start, Stop, off
	Trigger condition	Level, Alarm, External Input, Clock, Week or Time
	Trigger/Alarm determination condition	Combination: OR or AND condition at the level of signal or edge of signal. Analog: Higher/Rising, Lower/Falling, Window-in, Window-ou Logic (*5): Higher/Rising, Lower/Falling Pulse (*5): Higher/Rising, Lower/Falling, Window-in, Window-out
	Alarm output	10ch
	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 (100 ms 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)
Interface to PC		Ethernet (10 BASE-T/100 BASE-TX), USB 2.0 (High speed)
Storage device	Built-in	RAM (2 million samples, built-in amplifier module) Flash memory (4 GB, built-in the main module)
	External (*8)	SD card (Support SDHC, up to 32GB) slot, SSD (Approx. 128GB) The file for capturing data is limited up to 4GB.
Data saving function (*8)		Mode: Off, Normal, Ring, Relay Ring (*9): 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 (*10)(*15): 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 (*11)		Displaying information in two windows, Hot-swapping the SD memory card, Saving data in between cursors.
Auto save		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
Backup (*8)		Backup interval (*12): Off, 1, 2, 6, 12, 24 hrs. Data destination (*12): SD memory card, SSD, FTP server Data format (*12): GBD (binary) or CSV (test) Data destination for backup cannot be specified to the same storage for destination of capturing data.
Dual sampling function (*13)	Current (low-speed) sampling Event	Recording media：Built-in flash memory or SD card Sampling interval：1, 2, 5, 10, 20, 50, 100, 125, 200, 250, 500ms, 1, 2, 5, 10, 20, 30s, 1, 2, 5, 10, 20, 30min, 1h Trigger timer feature: Starting time, Stopping time, Repeat recording
	Event(high-speed) sampling	Recording media：Built-in RAM or SSD (optional) Sampling interval：1, 2, 5, 10, 20, 50, 100, 200, 500us
Operating environment		0 to 40°C, 5 to 85% RH
Power source		100 to 240 V AC, 50 to 60Hz
Power consumption		110VA
Standard accessories		Quick guide, CD-ROM, AC power cable
External dimensions (W x D x H)		Main module: Approx. 193 x 141 x 160 mm (Excluding Projection) 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
Vibration-tested conditions		Equivalent to automobile parts Type 1 Category A classification
Software specifications (GL-Connection)		
Supported OS (*14)		Windows 10 / 8.1/ 7 (32/64-bit edition)
Functions		Control GL7000, Real-time data capture, Replay data, Data format conversion
Controlled unit (ch)		Up to 20 units GL7000 only: max. 1120 channels, Mixing with GL series: max. 2000 channels
Displayed information		Analog waveform, Logic waveform, Pulse waveform, Digital values
Measurement mode		Y-T waveform, XY graph, FFT
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
Release of remote lock of GL7000		It allows to make setting operation using control panel on GL7000 even when GL7000 is under the control of software.
Operation lock		Operation screen can be locked (It is unlocked with a password.)
Disable saving data to PC		Added selection for enabling or disabling data recording on the PC and only to the main unit GL7000.

Display module specification (GL7-DISP)	
Display device	5.7-inch TFT color LCD monitor (VGA: 640 x 480 dots)
Operation	Touch panel and Cursor keys
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 back-light by 10, 30 sec., 1, 2, 5, 10, 30, 60 min.
Connection cable	LAN cable (CAT5 class, Straight connection, Up to 10 m) (*15)
Standard accessories	Bracket for slanted mount, Connection cable (40 cm), 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 specification (GL7-SSD)	
SSD module	2.5 inch SSD hard disc drive (SATA I/F)
Capacity	Approx. 128GB (The file size of the recorded data is limited up to 4GB.)
External dimensions (W x D x H)	Approx. 49 x 136 x 180 mm (Excluding projection)
Weight	Approx. 770 g
Vibration-tested conditions	Equivalent to automobile parts Type 1 Category A classification

Options & accessories		
Item	Model Number	Description
Sync. Cable	B-559	1 m long, Synchronizing between GL7000
Carrying tool	B-585	Can carry GL7000 (*16)
Storage case	B-586	Can store GL7000 (*16)
Probe set for Logic input	RIC-10A	4 channels, Cable with Alligator clip and IC clip
Input/Output cable for GL	B-513	2 m long, Bare wire for signal connection - Connector for GL series
Input connector, screw terminal	B-560A	For DC Strain module (GL7-DCB)
Input cable, NDIS - D-SUB	B-561	For DC Strain module (GL7-DCB)
Output cable, BNC - SMA	B-562	For Voltage Output module (GL7-DCO)

*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 It is available when GL7-DCB is applied.

*4 The alarm signals are outputted on the terminal block attached to the main module as standard accessory.

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

*6 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 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.

*9 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.

*10 The file for recording data is limited up to 4GB.
If the memory destination is flash memory or SD card, the maximum sampling speed will be 10ms.
If the memory destination is SSD, the maximum sampling speed will be 20µs.

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

*12 The CSV format is available with firmware version 2.10 or rater.
- When the RING mode or external pulse synchronization sampling is selected for recording, the backup function is not available.
- When there are meany number of active channels, the sampling time is fast, or the backup interval is long, it may take time to closing the data file after recording stops because the size of the data to be backed up becomes large.
- Available sampling speed is the 10 ms or slower when using the CSV format.
- When backup is enabled and data file format is specified with CSV format, SD memory card exchange (hot-swapping) and RELAY recording are not available.

*13 Both slow and high speed sampling can only be recorded in GBD format.
When event (high-speed) capturing destination is extended SSD unit, it takes a few seconds for event capturing.
Following actions are not available:
- External sampling
- Ring / Relay recording
- Back up feature
- Dual screen feature (playback while recording)
- XY / FFT function
- Synchronization operating with multiple GL7000
- Configuring with only Voltage module (GL7-V) or Voltage/Temperature module (GL7-M)

*14 We only support OS Ver. which is still serviced by OS maker.

*15 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.

*16 up to 3 modules. (GL7000 + 3 modules OR GL7000 + 2 modules & SSD)

⚠ Important safety instructions
• Before using it, please read the user manual and then please use it properly in accordance with the description.
• To avoid malfunction or electric shock, 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
Website http://www.graphteccorp.com

RoHS compliant product

GL7000_KE10740_3D