Detailed Specifications:
GL7000 Mainframe, Amplifier, and Function Module

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DATAQ® INSTRUMENTS

GL7000 Detailed Specifications

Standard Specifications

Item	Specification
Number of Amplifier Modules	Max. 10 modules * Function Modules like the Display Module and the SSD Module are not included in the 10 Modules mentioned above. * The Logic/Pulse amplifier can be set to either logical amplifier or pulse amplifier. The pulse amplifier can only be set for up to 2 modules (16ch/1 module).
External input/output	Start/Stop input, External trigger input, External sampling input, Trigger output. * When using the external input/output function, the I/O cable B-513 (optional) for GL series is required.
Alarm input/output	10ch * The Alarm Module is a separate module from the main module.
PC I/F	Ethernet (10BASE-T/100BASE-TX), USB2.0 (compatible with high-speed), standard - included
Internal memory device	Built-in flash memory: approx. 2GB * The built-in RAM is equipped with standard in each Amplifier Module, which can be stored 2,000,000 data. Synchronization function is available in GL-Connection only.
External memory device	SD card (SDHC equivalent, maximum approx. 32GB) slot standard-included
Backup function	Setting Conditions: EEPROM/Clock: Lithium secondary battery
Clock accuracy (23ºC environment)	±0.002% (Lunar equation: approx. 50 seconds)
Synchronization between measurement modules	With Start and Trigger synchronizing functions * When using the synchronizing function, the optional coaxial cable B-559 is required. The synchronizing function is available in the GL-Connection only.
Time base accuracy	±100ppm (23ºC±2ºC)
Usage environment	0 to 45ºC, 5 to 85% R.H.
Withstand voltage	Between AC power and housing: 1500 VAC at 1 minute
Insulation resistance	Between AC power and housing: 500 VDC at 20MΩ or more
Power supply	AC input: 100 to 240 V AC/50 to 60Hz
Power consumption	85 VA
External dimension (approx.) [W × H × D]	Main modle: 193 × 141 × 160 mm (not including protruding parts) Alarm Module: 30 × 136 × 145 mm (not including protruding parts)
Weight (approx.)	Main modle: 2.2 kg Alarm Module: 350 g
Others	Vibration proof: Automobile parts Type 1 Class A equivalent

Internal memory devices

Item	Specification
Memory capacity	Built-in RAM: SD-RAM, 2,000,000 data (equipped with each Amplifier Module) SSD*1: approx. 64GB (However, one file must be 2GB at the maximum.) Built-in flash memory: Flash memory, approx. 32GB SD card: * Depending on the recording destination there is a limit to the sampling interval.
Memory contents	Built-in RAM: Measured data SSD*1: Measured data, main module setting Conditions, Screen copy Built-in flash memory: Measured data, main module setting Conditions, Screen copy SD card: Measured data, main module setting Conditions, Screen copy

*1: SSD Module (sold separately), GL7-SSD (optional) are required.
There is a limit to the highest sampling rate can be set for the number of modules to be used.
When using the High Speed Voltage module and Logic/Pulse module at the same time, there is a limit to the number of pulse input channels.

PC Interface

Item	Specification
Interface types	Ethernet (10BASE-T/100BASE-TX); USB (High-speed)
Software functions	Data transfer to the PC (real-time memory); PC control of the main module
Ethernet functions (10BASE-T/100BASE-TX)	Web server functions: Displays the screen images of main module FTP server functions: SSD*1, Built-in flash memory, Transfers and deletes files from the SD card memory FTP client functions: Backup captured data to FTP server NTP client functions: Time synchronization with the NTP server. DHCP client functions: IP address automatic acquisition
USB functions	USB drive mode: SSD*1, Built-in flash memory, Transfers and deletes of files from the SD card memory * By flipping the machine slide switch, or turning on the power while pressing the [Start/Stop] key on the Display Module, it goes into USB Drive Mode.
Real-time data transfer speed*2	1 msec/10ch fastest

*1: SSD Module (sold separately), GL7-SSD (optional) are required.
*2: This depends on the number of transferred CH.

Data Recording Functions

Item	Specification
Sampling interval	1, 2, 5, 10, 20, 50, 100, 200, 500 µsec 1, 2, 5, 10, 20, 50, 100, 125, 200, 250, 500 msec 1, 2, 5, 10, 20, 30 sec 1, 2, 5, 10, 20, 30 min 1 hour External * The fastest sample interval varies according to the connected module type. * If a sampling interval that exceeds the fastest is set for every Amplifier Module, every amplifier is set to the fastest speed and during that time the same data is received. For information on using a high-speed amplifier and a low-speed amplifier at the same time, see the manual * Depending on the recording destination there is a limit to the sampling interval. Built-in RAM: 1 µsec fastest (No limit number of modules) SSD*1, *2: 1 to 2 modules: 1 µsec fastest; 3 to 4 modules: 2 µsec fastest; 5 to 10 modules: 5 µsec fastest Built-in flash memory: 1 msec fastest (No limit number of modules) SD card: 1 msec fastest (No limit number of modules)
Built-in RAM recording settings	Number of recording points: 1 to 2,000,000 Input increment: 1 point increment
Auto-save feature	Function: ON/OFF ON: Auto-save the data in built-in RAM to SSD*1 Built-in flash memory, or SD card OFF: Only temporarily stored in Built-in RAM (Data is lost when the power is turned OFF) * This function is only possible when the recording destination is the built-in RAM.
Ring capture*3	Function: ON/OFF Number of recording points: 1,000 to 2,000,000 Recording destination: SSD*1, built-in flash memory, SD card Recording destination is the built-in RAM: Even if the number of recordings is exceeded, recording continues, backwards calculation is done from when the recording stopped, and the specified number of recordings is saved on the memory. Other recording destinations: If the number of recordings is exceeded, recording will continue on another file. If the number of files exceeds 2 deleting the oldest one can prevent the recording destination becoming full. * When the recording destination is somewhere other than the built-in RAM, the possible recording time becomes less than 1/3 of the free space available.
Functions during capture*3	Double-screen display Exchange of SD card Saving of data between cursors
Data save functions	Capture to built-in RAM; Capture to SSD*1 (Limited to sampling interval); Capture to built-in flash memory (Limited to sampling interval); Capture to SD card (SSD*1, built-in flash memory, SD card); Save setting data (SSD*1, built-in flash memory, SD card); Copy of data screen can be saved (SSD*1, built-in flash memory, SD card)
Data backup function	Backup interval: OFF, 1, 2, 6, 12, 24 hours Backup destination: SD card, SSD*1, FTP * The recording destination and backup destination cannot be specified to the same location.

*1: SSD Module (sold separately), GL7-SSD (optional) are required.
*2: There is a limit to the highest sampling rate can be set for the number of modules to be used. When using the High Speed Voltage module and Logic/Pulse module at the same time, there is a limit to the number of pulse input channels.
*3: When the sampling interval is less than 100 ms, this function is not available. This function cannot be used in recording with the built-in RAM. When recording in CSV format, this function is not available.

Trigger and Alarm functions

Item	Specification
Repeat Trigger	OFF, ON
Trigger types	Start: Data capture starts when a trigger is generated. Stop: Data capture stops when a trigger is generated.
Trigger conditions	Start: Off, Level, Alarm, External, Time, Date, Weekly Stop: Off, Level, Alarm, External, Time, Date, Weekly
Level trigger judgment modes	Combination: Level OR, Level AND, Edge OR, Edge AND Analog channel judgment mode: H (↑), L (↓), Window In, Window Out Logic channel judgment mode: H (↑), L (↓) Pulse channel judgment mode: H (↑), L (↓), Window In, Window Out
Alarm judgment modes	Detection method: Level OR, Level AND, Edge OR, Edge AND Analog channel judgment mode: H (↑), L (↓), Window In, Window Out Logic channel judgment mode: H (↑), L (↓) Pulse channel judgment mode: H (↑), L (↓), Window In, Window Out Detection cycle Voltage/Temperature amplifier: when the sampling speed is 5 seconds or more, the alarm is detected in 5 second intervals. When the sampling interval is less than 5 seconds, the alarm is detected at the sampling speed. Other amplifiers: The sampling rate is detected in 1 ms intervals for less than 1 ms. The sampling rate is detected in sampling rate between 2 ms and 5 sec. The sampling rate is detected in 5 sec. intervals for 5 sec. or more.
Pre-trigger	Number of specified points: 0 to the number of recordings. * This function is only possible when the recording destination is the built-in RAM. * Depending on the trigger combination, there may be cases where the pre-trigger cannot be used.

Various functions

Item	Specification
EU (Scaling function)	Analog ch (Voltage Channel): Each ch, 4-point setting Analog ch (temperature ch): Each ch, 2-point setting (offset setting) Pulse ch: Each ch, 2-point setting (gain setting) Characters available: Alphabet, numbers, and other (μ and ε, etc.)
Calculation between Channels	Calculation type: Addition, subtraction, multiplication, and division Input target: Analog channels 1 through 100 Output target: Analog channels 1 through 100 * The fastest sampling interval that can be used for the Calculation between Channels function is 100 ms.
Statistical calculation	Types of operation: Average value, peak value, maximum value, minimum value Number of operations: Maximum of 2 can be set simultaneously Calculation method: Real-time calculation and calculation between cursors (during replay) * Real-time calculation results are displayed in the Digital + Calculation Display screen.
Move functions	Type of moving: Move to the top, Move to the last, Move to the center, Move to the trigger point, Move to the specified position, Move to the relative position, Call the cursor.
Search functions	Function: Search the captured data for the required number of points Search Channel: Analog, Pulse, Logic, Alarm
Annotation input function	Function: A comment can be input for each channel Inputtable characters: Alphanumerics Number of characters: 31 half-width characters
Message/Marker functions	Function: The registered messages are recorded for any timing. Number of registration messages: Max. 8 Message: Unspecified message is input before or during recording Marker: alarm, blackout
Resume functions	Function: If the power goes off and is returned during data recording, recording will start again from the conditions that were present before the power went off.

External Input/Output functions

Item	Specification
Input/output types	• Start/Stop input (1ch) • External trigger input (1ch) • External sampling input (1ch) • Trigger input (1ch) • Alarm output (10ch) * The Start/Stop input is performed at a level action. * For input/output other than alarm output, the output cable B-513 (optional) for GL series is necessary. * The alarm output is attached to the included Alarm Module.
Input specifications	Max. input voltage: 0 to +24 V (single-ended ground input) Input signal: Non-voltage contact (a contact, b contact, NO, NC), Open collector, Voltage input Input threshold voltage: approx. +2.5 V Hysteresis: approx. 0.5 V (+2.5 to + 3 V) * For more information about the output circuit, see the hardware manual
Alarm output specifications	<Maximum rating of the output transistor> • Voltage between collector and GND: 50 V • Collector current: 2.0 A • Collector dissipation: 0.6 W * This specification is a maximum rating of the transistor used in the output circuit. When using this, ensure that the margin is sufficient. For details on the output circuit, see the hardware manual
External sampling input	Max. input frequency Built-in RAM: 1 MHz SSD*1 recording: 1 kHz Built-in flash memory recording: 1 kHz SD card recording: 1 kHz Temporal error: Depending on each amplifier specifications * Until the maximum sampling interval is reached for each amplifier errors may appear.

*1: SSD Module (sold separately), GL7-SSD (optional) are required.
There is a limit to the highest sampling rate can be set for the number of modules to be used.
When using the High Speed Voltage module and Logic/Pulse module at the same time, there is a limit to the number of pulse input channels.

Synchronization function

Item	Specification
Synchronization function	• Synchronizes the Start/Stop, trigger, and sampling between multiple units. • By connecting a sync cable, Master/Slave is automatically identified. • Part of the function for the Start/Stop switch and trigger combination etc. are only valid for the master unit. • The number of Amplifier Modules that can be connected to the master and slave unit conform to the basic specifications.
Number of synchronization	Max. 5 units
Cable	Sync cable, B-559 (optional)

* Synchronization function is available in GL-Connection only.

Display Module (GL-DISP: optional)

Item	Specification
Monitor	5.7” TFT color liquid crystal display (VGA: 640 × 480 dot)
Operating portion	Capacitive touch-panel and key shared use * Almost all operations can be performed by either the touch-panel or the keys.
Touch-panel	Input method: Finger or “electrostatic” special pen
Display character	Japanese, English, French, German, Chinese, Korean
Backlight life	50.000 hours (when brightness has decreased to 40%), changes according to use environment
Backlight	Screen saver function (10, 30 sec.; 1, 2, 5, 10, 30, 60 min.)
Display screen	Waveform + digital screen, full waveform screen, digital + operation screen, X-Y display
Connection cable	LAN cable (Straight, CAT5 or above, Cable length:10 m or less) * Please purchase a commercially available product
Accessories	Tilting table: 1 unit, Monitor connection cable (40 cm): 1 pc., Screws (M4 × 6): 3 pcs. Flat head screws (M4 × 10): 2 pcs. (Spare), Ground cable: 1 pc.

External dimensions (approx.) [W × D × H]	187 × 34.5 × 119 mm (Not including protruding parts)
Weight (approx.)	530 g

* Since the touch-panel in this main unit is a capacitive touch-panel, it does not respond by touching it with a pen. Touch with your fingers without glove.
* Please note that if the touch-panel is operated with an object with a sharp edge, it may scratch and damage the touch-panel.
* Do not touch when your hands are wet.

SSD Module (GL7-SSD: optional)

Item	Specification
SSD	2.5-inch SSD HDD (SATA I/F)
Recording capacity	Approx. 64GB (However, 1 file can be up to 2GB in size)
Sampling interval	Module 1 to 2: 1 µsec fastest Module 3 to 4: 2 µsec fastest Module 5 to 10: 5 µsec fastest * Depending on the amplifier in use, there may be limitations to the sampling interval. It is limited to the furthest amplifier in use. * There is a limit to the highest sampling rate can be set for the number of modules to be used. When using the High Speed Voltage module and Logic/Pulse module at the same time, there is a limit to the number of pulse input channels. (For details, see “(1)-1 Sampling Interval” in page 3-46 in the hardware manual.)
External dimensions (approx.) [W × D × H]	49.2 × 136 × 160 mm (Not including protruding parts)
Weight (approx.)	770 g
Vibration proof	Automobile parts Type 1 Class A equivalent

Voltage Module (For voltage measurement) (GL7-V: optional)

Item	Specification
Number of input channels	10 channels/1 module
Input terminal shape	M3 screw type terminal
System	All-ch insulation, simultaneous sampling, unbalanced input
Sampling interval	1 ms fastest
Built-in RAM	2,000,000 data
Measurement range	Voltage: 100, 200, 500 mV, 1, 2, 5, 10, 20, 50, 100, 1-5VF.S.
Measurement accuracy (23 ±5°C)	Voltage: ±0.25% of F.S. • 30 minutes or more after power-up • Sampling 1s • Filter Line • GND connection
A/D converter	System: Sequential comparison system Resolution: 16-bit (Effective ability: approximate ± range 1/40,000)
Temperature coefficient	Gain: ±0.01% of F.S./°C Zero: ±0.02% of F.S./°C
Input resistance	1 MΩ ±5%
Input signal source resistance	1 kΩ or less
Maximum input voltage	Input terminal +/– interval: 100 mv to 1 V range 60 Vp-p: 2 V to 100 V range 100 Vp-p Input terminal (–)/Input terminal (–) interval: 60 Vp-p Input terminal (–)/GND interval: 60 Vp-p * For details, see page 2-25 in the hardware manual.
Withstand voltage	Input terminal (–)/Input terminal interval: 1000Vp-p for 1 minute Input terminal (–)/GND interval: 1000Vp-p for 1 minute * For details, see page 2-26 in the hardware manual.
Insulation resistance	Input terminal (–)/GND interval: 50 MΩ or more (at 500 VDC)
Common mode rejection	90 dB or more (50/60 Hz signal source 300 Ω or less)
S/N (Noise)	48 dB or more (+/– at short)

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Frequency response	DC to 1 kHz (+1, –3 dB)
Filter	LPF: OFF, Line (1.5 Hz), 5 Hz, 50 Hz, 500 Hz Attenuation: −3 dB (−5.2 dB to −1.4 dB)/6dB oct
External dimensions (approx.) [W × D × H]	49.2 × 136 × 160 mm (Not including protruding parts)
Weight (approx.)	840 g

Voltage/Temperature Module (For temperature measurement) (GL7-M: optional)

Item	Specification
Number of input channels	10 channels/1 module
Input terminal shape	M3 screw type terminal
System	All-ch insulation, Scan method, Balanced input * All CH of the b terminal used when using the resistance bulb are all connected internally.
Sampling interval	10 ms fastest
Built-in RAM	2,000,000 data
Measurement range	• Voltage: 20, 50, 100, 200, 500 mV, 1, 2, 5, 10, 20, 50, 1-5VF.S. • Thermocouple: K, J, E, T, R, S, B, N, W (We5-26) • Resistance Temperature Detector: Pt100, JPt100, Pt1000 (IEC751) • Humidity: 0 to 100% R.H. (Voltage 0 to 1 V scaling conversion) * See B-530 (optional)
Measurement accuracy (23 ±5ºC) • 30 minutes or more after power-up • Sampling 1 s • Filter ON (10) • GND connection	• Voltage: ±0.1% of F.S. • Thermocouple:

Thermocouple	Measurement temperature range (ºC)	Measurement accuracy
R/S	0 ≤ TS ≤ 100 100 < TS ≤ 300 R: 300 < TS ≤ 1600ºC S: 300 < TS ≤ 1760ºC	±5.2ºC ±3.0ºC ± (0.05% of rdg +2.0ºC) ± (0.05% of rdg +2.0ºC)
B	400 ≤ TS ≤ 600 600 < TS ≤ 1820ºC	±3.5ºC ± (0.05% of rdg +2.0ºC)
K	–200 ≤ TS ≤ –100 –100 < TS ≤ 1370ºC	± (0.05% of rdg +2.0ºC) ± (0.05% of rdg +1.0ºC)
E	–200 ≤ TS ≤ –100 –100 < TS v 800ºC	± (0.05% of rdg +2.0ºC) ± (0.05% of rdg +1.0ºC)
T	–200 ≤ TS ≤ –100 –100 < TS ≤ 400ºC	± (0.1% of rdg +1.5ºC) ± (0.1% of rdgv0.5ºC)
J	–200 ≤ TS ≤ –100 –100 < TS ≤ 100 100 < TS ≤ 1100ºC	±2.7ºC ±1.7ºC ± (0.05% of rdg +1.0ºC)
N	0 ≤ TS ≤ 1300ºC –200 ≤ TS ≤ 0ºC	± (0.1% of rdg +1.0ºC) ± (0.1% of rdg +2.0ºC)
W	0 ≤ TS ≤ 2000ºC	± (0.1% of rdgv1.5ºC)
Reference junction compensation accuracy		±0.5ºC

* Use the thermocouple (T: 0.32φ), otherwise use 0.65φ
• Resistance Temperature Detector:

Types	Measurement temperature range (ºC)	Impressed current	Measurement accuracy
Pt100	–200 to 850ºC (F.S.=1050ºC)	1mA	±1.0ºC
JPt100	–200 to 500ºC (F.S.=700ºC)	1mA	±0.8ºC
Pt1000	–200 to 500ºC (F.S.=700ºC)	0.2mA	±0.8ºC

Reference junction compensation	Internal/External switching
A/D converter	System: ΔΣsystem Resolution: 16-bit (Effective ability: approximate ± range 1/40,000)
Temperature coefficient	Gain: 0.01% of F.S./ºC Zero: 0.02% of F.S./ºC * Zero is generated when using the sampling 10, 20, or 50 ms.

Input resistance	1 MΩ±5%
Input signal source resistance	300 Ω or less
Maximum input voltage	Input terminal +/– interval: 60 Vp-p Input terminal/ Input terminal interval: 60 Vp-p Input terminal/ GND interval: 60 Vp-p * For details, see “(2) Voltage/Temperature module” in page 2-28 in the hardware manual.
Withstand voltage	Input terminal/ Input terminal interval: 350 Vp-p for 1 minute Input terminal/ GND interval: 350 Vp-p for 1 minute * For details, see “(2) Voltage/Temperature module” in page 2-28 in the hardware manual.
Insulation resistance	Input terminal/ GND interval: 50 MΩ or more (at 500 VDC)
Common mode rejection	90 dB or more (50/60 Hz signal source 300 Ω or less)
S/N (Noise)	48 dB or more (+/– at short)
Filter	OFF, 2, 5, 10, 20, 40 The filter is a moving average. The measured value is the average value of the number of samples set. If the sampling interval is longer than 5 seconds, the average value is obtained from data of the sub-sample.
5 V OUT	Humidity sensor, 1ch for B-530 (optional)
External dimensions (approx.) [W × D × H]	49.2 × 136 × 160 mm (Not including protruding parts)
Weight (approx.)	770 g

High Speed Voltage Amplifier Module (For high speed voltage measurement) (GL7-HSV: optional)

Item	Specification
Number of input channels	4 channels/1 module
Input terminal shape	BNC terminal (Non-isolated)
System	All-ch insulation, simultaneous sampling, unbalanced input
Sampling interval	1 µsec fastest
Built-in RAM	2,000,000 data
Measurement range	Voltage: 100, 200, 500 mV, 1, 2, 5, 10, 20, 50, 100, 1-5V F.S.
Measurement accuracy (23 ±5ºC) • 30 minutes or more after power-up • Sampling 1s •Filter Line • GND connection	±0.25% of F.S.
A/D converter	System: sequential comparison system Resolution: 16-bit (Effective ability: approximate ±range 1/40,000)
Temperature coefficient	Gain: 0.01% of F.S./ºC Zero: 0.02% of F.S./ºC
Input resistance	1 MΩ ±5%
Input signal source resistance	1kΩ or less
Maximum input voltage	Input terminal +/– interval: 100 mv to 1 V range 60 Vp-p: 2 V to 100 V range 100 Vp-p Input terminal (–)/Input terminal (–) interval: 60 Vp-p Input terminal(–)/GND interval: 60 Vp-p * For details, see page 2-29 in the hardware manual.
Withstand voltage	Input terminal(–)/Input terminal (–) interval: 1000Vp-p for 1 minute Input terminal/(–)GND interval: 1000Vp-p for 1 minute * For details, see page 2-29 in the hardware manual.
Insulation resistance	Input terminal/GND interval: 50 MΩ or more (at 500 VDC)
Common mode rejection	90 dB or more (50/60 Hz signal source 300 Ω or less)
S/N (Noise)	48 dB or more (+/– at short)
Frequency response	DC to 200kHz (+1, –3dB)
Filter	LPF: OFF, Line (1.5Hz) , 5Hz, 50Hz, 500Hz, 5kHz, 50kHz Attenuation: −3 dB (−5.2 dB to −1.4 dB)/6dB oct

External dimensions (approx.) [W × D × H]	49.2 × 136 × 160 mm (Not including protruding parts)
Weight (approx.)	740 g

High Voltage Amplifier Module (GL7-HV: optional)

Item	Specification
Number of input channels	2 channels/1 module
Input connector	BNC terminal (Non-isolated)
Input method	All channels isolated unbalanced input, Simultaneous sampling
Sampling Speed	1M samples/s (Maximum)
Built in RAM	2M words
Input coupling	AC, DC, AC-RMS, DC-RMS
Measurement range (DC, AC)	2, 5, 10, 20, 50, 100, 200, 500, 1000 F.S.
Measurement range (RMS)	1, 2, 5, 10, 20, 50, 100, 200, 500 rms F.S. Crest Factor: 1-200Vrms (C.F4), 500Vrms (C.F2)
A/D Convertor	Successive Approximation type, 16bits Effective Resolution: AC, DC coupling 1/40000 of measuring full range AC-RMS, DC-RMS coupling 1/20000 of measuring full range
Maximum Input voltage Between (+)/(-) terminal	1000Vp-p
Maximum Input voltage Between channels ((-)/(-) terminal	300VACrms
Maximum Input voltage Between channel ((-) terminal)/ GND	300VACrms
Maximum voltage Between channels ((-)/(-) terminal)	2300VACrms (1 minute)
Maximum voltage Between channel ((-) terminal) / GND	2300VACrms (1 minute)
External dimensions (W x D x H)	49×136×160mm (Excluding Protection)
Weight	Approx. 740g

Logic/Pulse Amplifier Module (Logic/Pulse) (GL7-L/P: optional)

Item	Specification
Number of input channels	16 channels/1 module
Input terminal shape	Dedicated connector (1 group per 4-ch)
System	Non-isolated, All-ch insulation, simultaneous sampling, unbalanced input
Sampling interval	Logic: 1 µsec fastest Pulse: 100 µsec fastest
Built-in RAM	2,000,000 data
Functions	Logic/Pulse * Switching logic/pulse for each unit The maximum use of the Logic function is 7 modules (112ch). The maximum use of the Pulse function is 2 modules (32ch). The maximum number of connections for each type of amplifier module to the GL7000 is up to 10 modules (112ch maximum).
Mode	Pulse: Rotation/Accumulating/Instant
Revolve mode	Function: This mode counts the pulses for every sampling interval, and then converts them to the RPM Span: 50, 500, 5000, 50 k, 500 k, 5 M, 50 M, 500 M .RPM/F.S.
Counts mode	Function: Mode for displaying the number of pulses accumulated for every sample interval from the beginning of the recording. Span: 50, 500, 5000, 50 k, 500 k, 5 M, 50 M, 500 M C/F.S.
Instant mode	Function: Mode for displaying the pulse count for every sampling interval. The pulse count is reset for every sampling interval. Span: 50, 500, 5000, 50 k, 500 k, 5 M, 50 M, 500 M C/F.S.
Maximum input frequency	1 MHz
Maximum number of counts	15 MC (24-bit counter)

GL7000 Detailed Specifications (continued)

Input specifications	Max. input voltage: 0 to +24 V (single-ended ground input) Input signal: Non-voltage contact (a contact, b contact, NO, NC), Open collector, Voltage input Input threshold voltage: approx. +2.5 V Hysteresis: approx. 0.5 V (approx. +2.5 V to +3 V)
Filter	OFF, ON (50 Hz, approx. –3dB)
External dimensions (approx.) [W × D × H]	49.2 × 136 × 160 mm (Not including protruding parts)
Weight (approx.)	700 g

Strain Gauge Amplifier Module (GL7-DCB: optional)

Item	Specification
Number of input channels	4 ch/1 module
Input terminal shape	DSUB 9-pin (female)
System	All ch insulation, simultaneous sampling, balanced input
Sampling interval	10 µs to 1 hour
Built-in RAM	2,000,000 data
Functions	Strain, voltage, resistance values (including potentiometer)
Measurement range	Strain: 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 * The range depends on the bridge voltage. 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
Measurement accuracy* (23ºC±5ºC)	Strain: ±(0.2% of F.S. +10µε) Voltage: ±(0.2% of F.S. +10µV) Resistance: ±0.5% * After power-on, more than 30 minutes, sampling 1 sec., filter line, GND
A/D converter	System: sequential comparison system Resolution: 16-bit (Effective Resolution : Approx. ±Range 1/40,000)
Gauge factor	2.0 constant
Sensor supported	Strain: [Strain gauge transducer] 4-wire full bridge, 6-wire full bridge (Available for remote sensing) [Strain gauge] 4-wire full bridge, 6-wire full bridge (3/4-wire: available for remote sensing) 3 or 4 or 5-wire 1/2bridge (4/5-wire: available for remote sensing) 4 or 6-wire full bridge (6-wire: available for remote sensing) Resistance: Potentiometer, resistance
Internal gauge resistance	50 to 10kΩ (Excitation voltage 1V : 50Ω to 10kΩ, 2V : 100Ω to 10kΩ, 2.5V : 120Ω to 10kΩ, 5V/10V : 350Ω to 10kΩ)
Internal gauge resistor	1/4bridge or 1/2bridge: (available for 120Ω and 350Ω gauges) * When the internal gauge resistance is 120Ω, the Excitation voltage 1, 2, 2.5 V are available.
Excitation voltage	DC 1, 2, 2.5, 5, 10 V * When the Excitation voltage is 5 V or more, 350Ω or more gauge is available.
Constant current bridge power supply	0.1 to 20 mA (Voltage supported : Max.10V)
Balancing	Method: Auto-balancing (Range: ±10,000 µε)*Strain input only
Remote Sensing	3 or 4-wire 1/4bridge, 4 or 5-wire 1/2bridge, and 6-wire full bridge are available.
Shunt calibration	Internal approximate 60kΩ (120Ω gauge), approximate 175kΩ (350Ω gauge)
Temperature coefficient	Gain: ±0.02% of F.S./ºC; 0 point : ±1.2µε/ºC
Input resistance	10 MΩ ±5%
Maximum input voltage	Differential input : DC10V Common-mode voltage : 10VACrms Input terminal(-) /Input terminal (-) interval : 10 Vp-p Input terminal (-)/GND interval : 60Vp-p
Withstand voltage	Input terminal (-)/GND interval : 1000Vp-p 1 minute
Insulation resistance	Input terminal (-)/GND interval : 100MΩ or more (at DC500 V)
Common mode rejection ratio	80 dB or more (50/60 Hz signal source 300Ω or less)

GL7000 Detailed Specifications (continued)

Noise	50με or less (DC2V, 350Ω)
Frequency response	DC to 20 kHz
Filter	L.P.F.: OFF, Line (1.5 Hz) 3, 6, 10, 30, 50, 60 Hz, 100, 300, 500 Hz, 1, 3, 5, 10kHz at -30 dB/oct A.A.F.: OFF/ON (Anti-aliasing filter)
TEDS	Standards: Conforms to IEEE1451.4 Class2 (Template No. 33); Information: Readout and auto-set for sensor data
External dimensions [W×D×H] (approximate)	49.2 × 136 × 160 mm (not including protruding parts)
Weight (approximate)	840 g

Acceleration Amplifier Module (GL7-CHA: optional)

Item	Specification
Number of input channels	4 ch/1 module
Input terminal shape	BNC terminal; Miniature connector (#10-32UNF) *Only one terminal is available for each channel.
System	Insulation, simultaneous sampling, unbalanced input
Sampling interval	10 μs to 1 hour
Built-in RAM	2,000,000 data
Input coupling	Off, Charge, IEPE, DC, AC, Charge-RMS, IEPE-RMS, DC -RMS, AC-RMS
Measurement range	Acceleration sensor input: 1, 2, 5, 10, 20, 50, 100, 200, 500, 1000, 2000, 5000, 10000, 20000, 50000 m/s^2 Voltage: AC, DC : 50, 100, 200, 500 mV, 1, 2, 5, 10 V RMS : 20, 50, 100, 200, 500 mVrms, 1, 2, 5 Vrms Crest Factor : (2 Vrms range or less) 4 or less, (5 Vrms range) 2 or less
Sensor sensitivity	Charge input: 0.01 pC/(m/s2)~999.9 pC/(m/s2) IEPE input: 0.01 mV/(m/s2)~999.9 mV/(m/s2)
Measurement accuracy* (23ºC±5ºC)	Charge input: ±0.9% of F.S. [Sensor sensitivity] x [Setting range] ≥ 20 pC IEPE input: ±0.25% of F.S. [Sensor sensitivity] x [Setting range] ≥ 200 mV *After power-on, more than 30 minutes, sampling 1 sec., filter line, GND
A/D converter	System: sequential comparison system Resolution: 16-bit (Effective Resolution : Approx. ±Range 1/40,000)
Temperature coefficient	Gain: ±0.01% of F.S./ºC Zero: ±0.02% of F.S./ºC
Input resistance	100 kΩ ±5%
Power supply	22 V ±10%, 4 mA, 8 mA±20%
Max. input charge	50,000 pC
Maximum input voltage	Input terminal(+) / Input terminal (-) interval : 25 Vp-p Input terminal(-) /Input terminal (-) interval : 25 Vp-p Input terminal (-)/GND terminal interval : 25 Vp-p
Withstand voltage	Input terminal(+) /Input terminal (-) interval : 300Vp-p 1 minute Input terminal (-)/GND terminal interval: 300Vp-p 1 minute
Insulation resistance	Input terminal (-)/GND terminal interval: 50 MΩ or more (at DC500 V)
Common mode rejection ratio	80 dB or more (50/60 Hz signal source 300 Ω or less)
S/N (Noise)	48 dB or more (+/- at short)
Frequency response	Charge-type: 1.5 Hz to 45 kHz IEPE: 1 Hz to 45 kHz
Filter	H.P.F.: OFF, 0.15, 1, 10 Hz L.P.F.: OFF, Line (1.5 Hz) 3, 6, 10, 30, 50, 60 Hz, 100, 300, 500 Hz, 1, 3, 5, 10 kHz at -30 dB/oct A.A.F.: OFF, ON (Anti-aliasing filter)
TEDS	Standards: Conforms to IEEE1451.4 Class1 (Template No. 25) Information: Readout and auto-set for sensor data
External dimensions [W×D×H] (approximate)	49.2 × 136 × 160 mm (not including protruding parts)
Weight (approximate)	850g

Control software (GL-Connection)

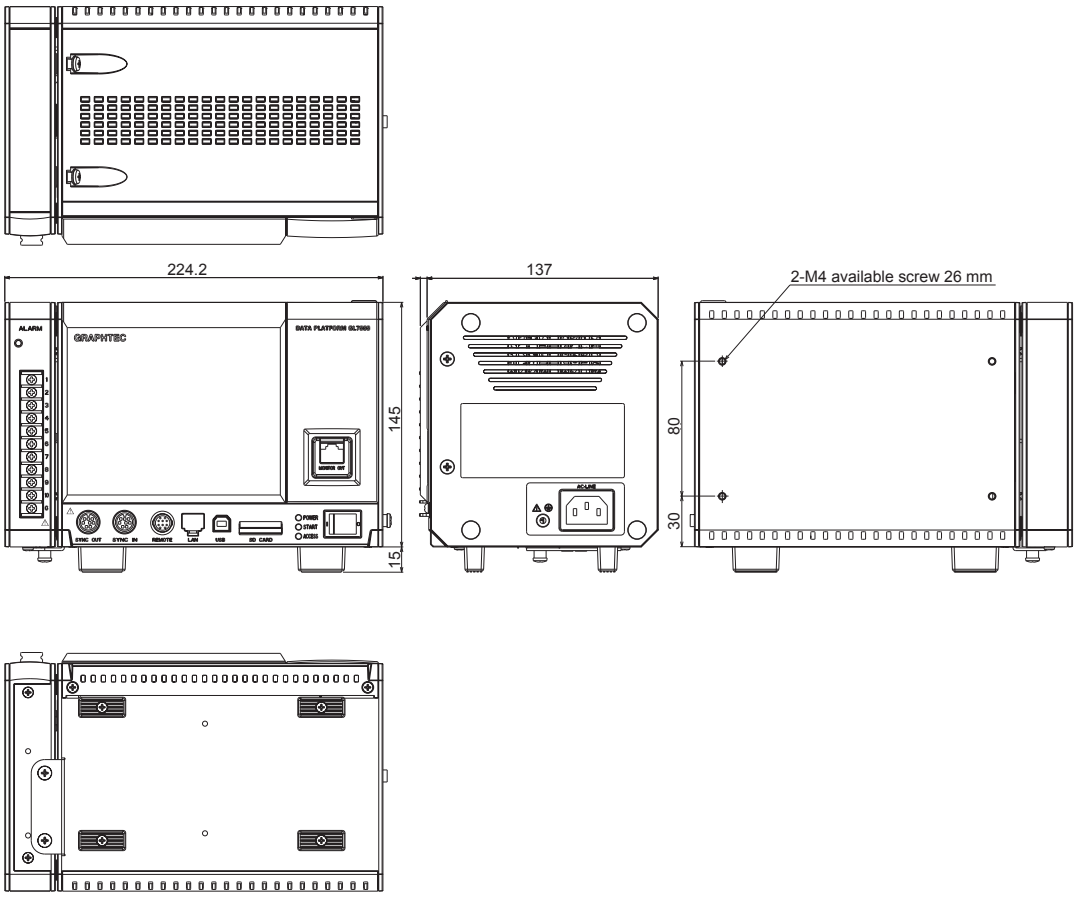
Item	Specification
OS supported	Windows 7/8 (32/64-Bit) (StarterEdition not available) / Vista (32/64-Bit) / XP (SP2 or higher)
Functions	Controlling main module, real-time recording data, conversion, data replay
Number of main module connected	Max. 10 unit*1
Number of channels per one main module	Max. 112 channels*1
Max. number of channels	1120 channels*1
Setting range	Amplifier settings, recording settings, trigger/alarm settings, report settings, others
Captured data	Built-in RAM (binary) SSD (CSV, binary) Built-in flash memory (CSV, binary) SD card (CSV, binary) * For CSV data, the corresponding high speed sampling interval will be up to 1 msec. (For 1CH) * The recorded data cannot save the built-in RAM or SSD in real time. After recorded, the data is saved in PC while replaying on the GL7000.
Display	Analog waveforms, logic waveforms, pulse waveforms, digital values
Display modes	Y-T View (displayed in the digital value), X-Y View (in real time), Cursor Information View, Recorded Data View, Alarm Information View * Digital display can be attained by maximizing the digital part of the Y-T.
File conversion	Between cursors, All data, Thinning function
Mailing functionality	A mail is sent to a specified address when an alarm occurs
Statistics display	During recording: maximum value, minimum value, Average value, peak value During replaying: maximum value, minimum value, Average value, peak value, RMS
Search function	Level search: Searches at any channel or any level Alarm search: Searches at any channel or any alarm Time move: Move to the top, Move to the last, Move to the center, Move to the trigger point, Move to absolute position, Move to the relative position, Move to the number of specified points
Screen lock function	Locks the operation (with arbitrary password setting function)

*1: There are limitations to real-time transfer. The more the number of channels increases, the more limited the real-time display of the sampling interval becomes.

Humidity sensor: B-530 (optional)

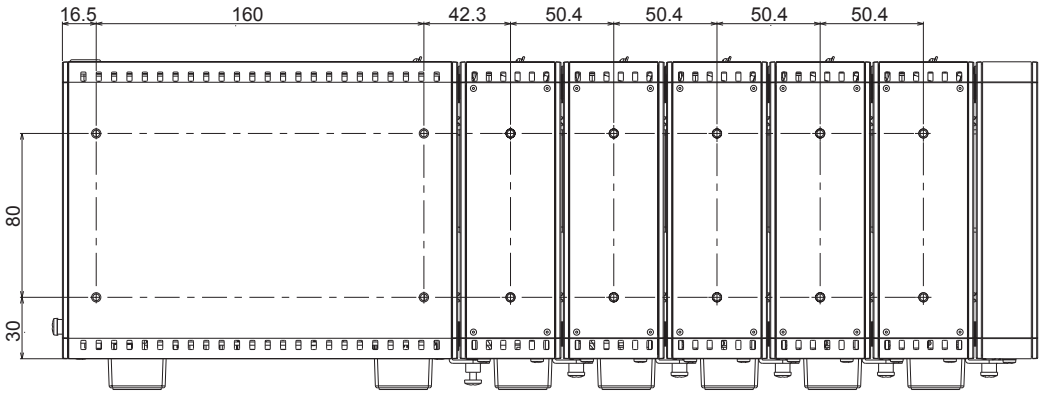
Item	Specification
Allowable temperature range	–25 to +80ºC
Allowable humidity range	0 to 100% R.H.
System	Electric capacity type
Relative humidity measurement accuracy (5 to 98% R.H.)	Measurement environment / Measurement accuracy 0 to 10ºC / ±5%R.H. 10 to 20ºC / ±4%R.H. 20 to 30ºC / ±3%R.H. 30 to 40ºC / ±4%R.H. 40 to 50ºC / ±5%R.H. 50 to 60ºC / ±6%R.H. 60 to 70ºC / ±7%R.H. 70 to 80ºC / ±8%R.H.
Response time	15 sec. (90% response when membrane filter installed)
Sensor output	0 to 1 V DC
Outside diameter	φ14 mm×80 mm (excluding cable)
Cable Length	3 m
Sensor power	+5 to 16 VDC
Consumption current	Approx. 4 mA

GL7000 Main Module + Alarm Module



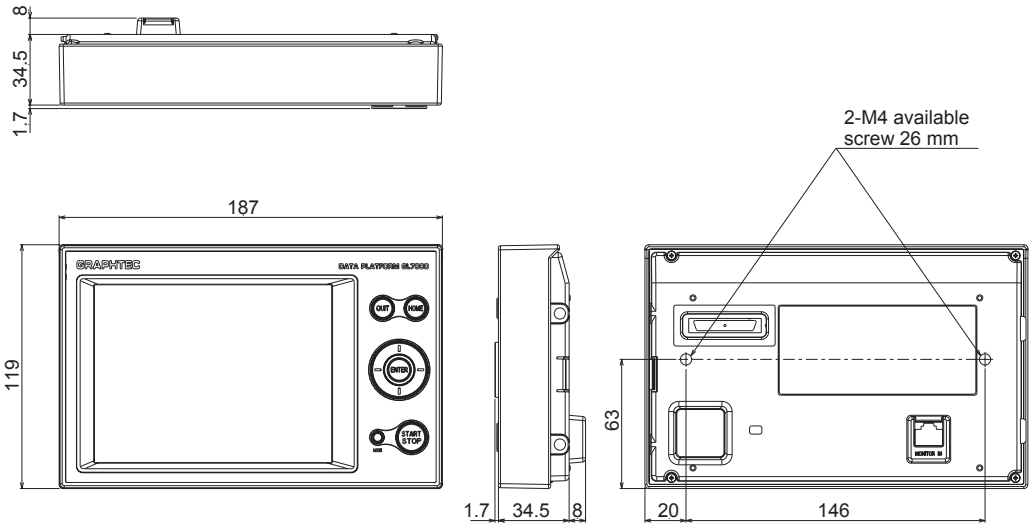
Unit: mm
Dimensional accuracy: ±5 mm

Rear view when an optional module is mounted



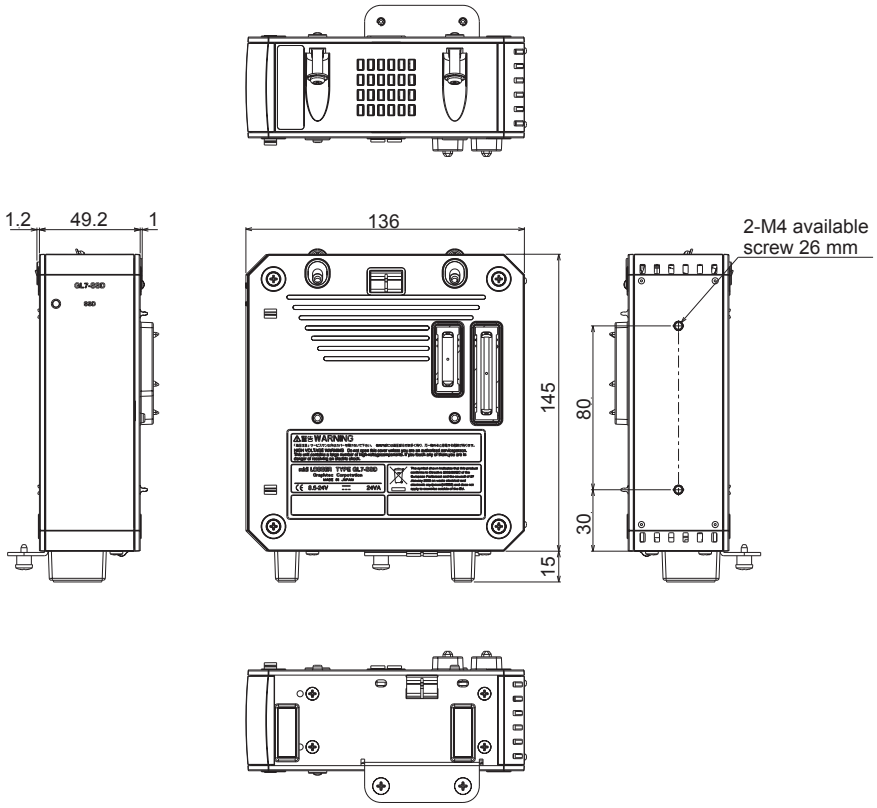
Unit: mm
Dimensional accuracy: ±5 mm

Display Module (GL7-DISP): Optional



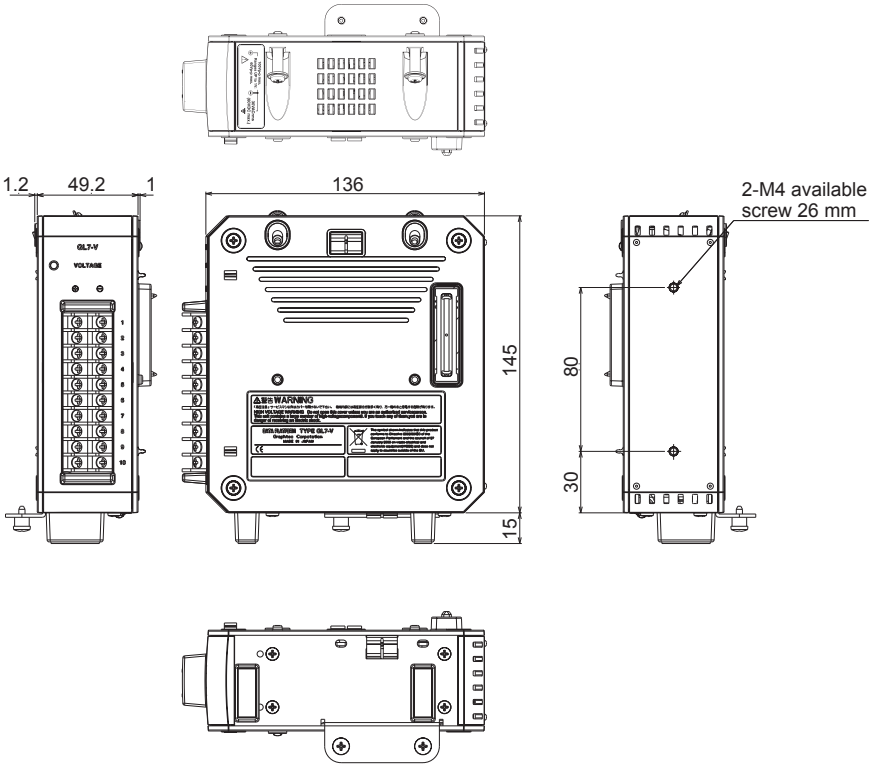
Unit: mm
Dimensional accuracy: ±5 mm

SSD Module: (GL7-SSD): Optional



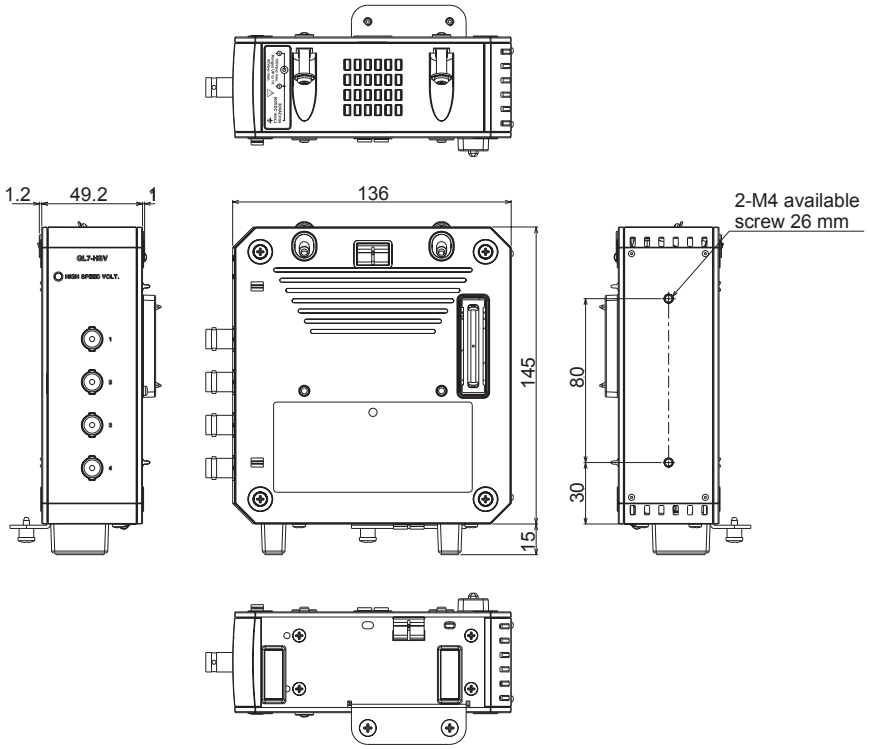
Unit: mm
Dimensional accuracy: ±5 mm

Voltage Module: (GL7-V): Optional



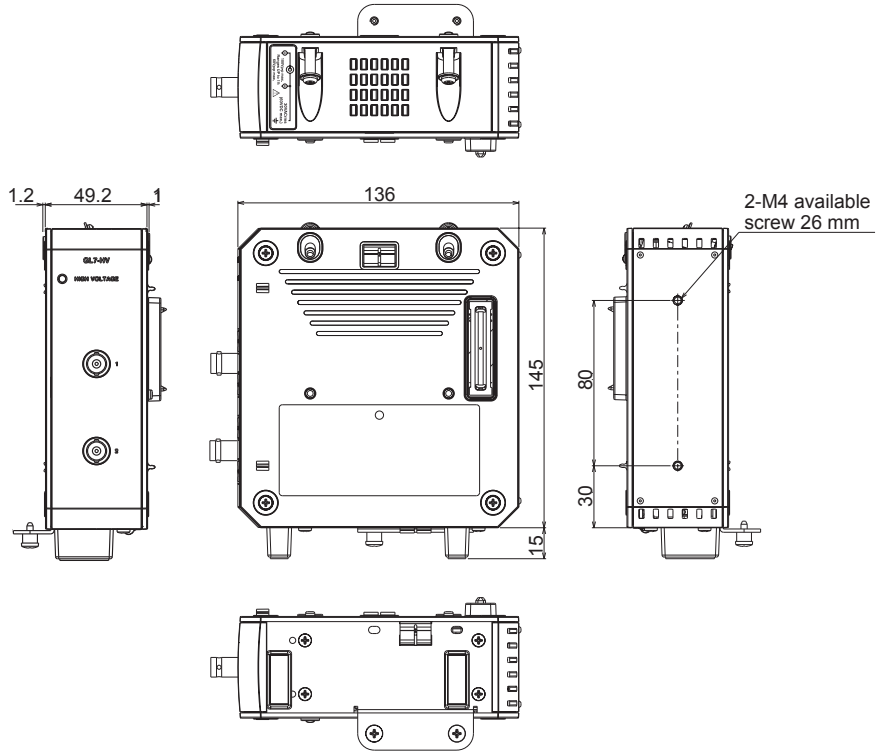
Unit: mm
Dimensional accuracy: ±5 mm

High Speed Voltage Module: (GL7-HSV): Optional



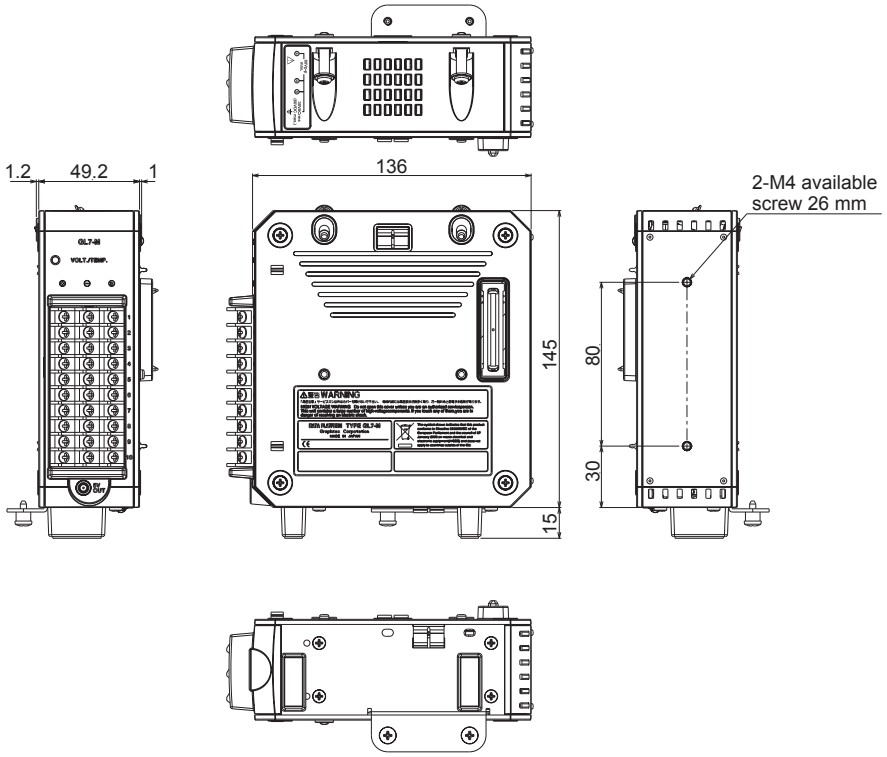
Unit: mm
Dimensional accuracy: ±5 mm

High Voltage Module: (GL7-HV): Optional



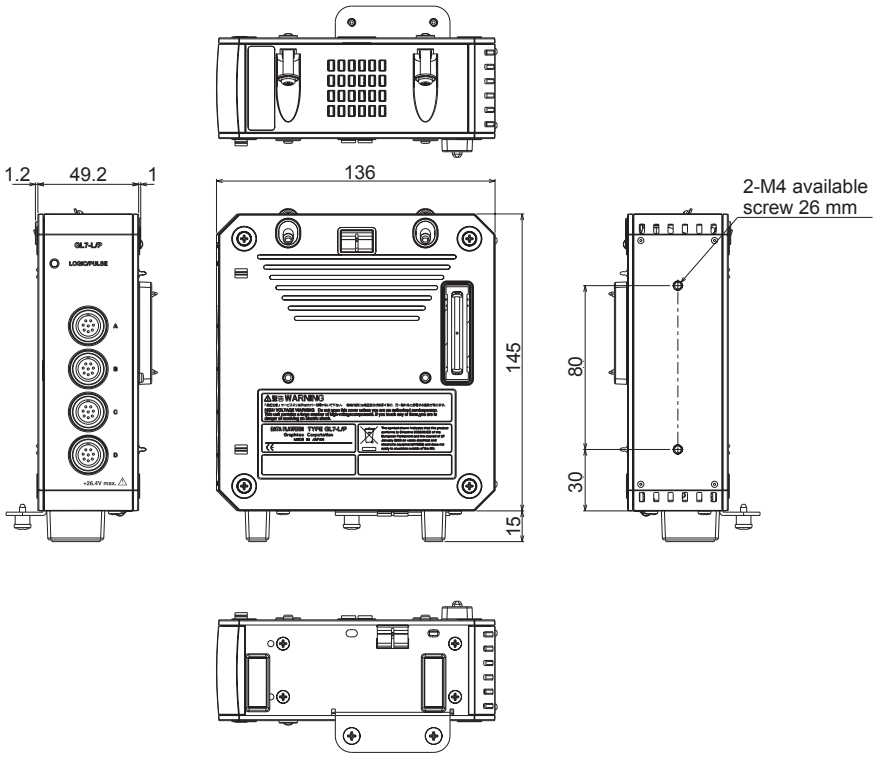
Unit: mm
Dimensional accuracy: ±5 mm

Voltage/Temperature Module: (GL7-M): Optional



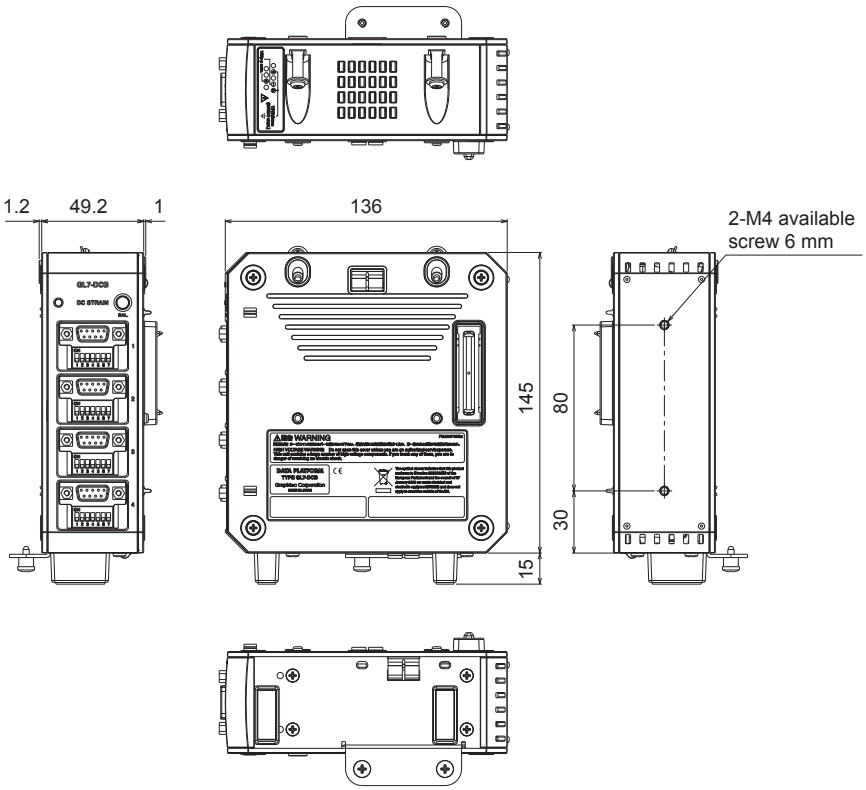
Unit: mm
Dimensional accuracy: ±5 mm

Logic/Pulse Module: (GL7-L/P): Optional



Unit: mm
Dimensional accuracy: ±5 mm

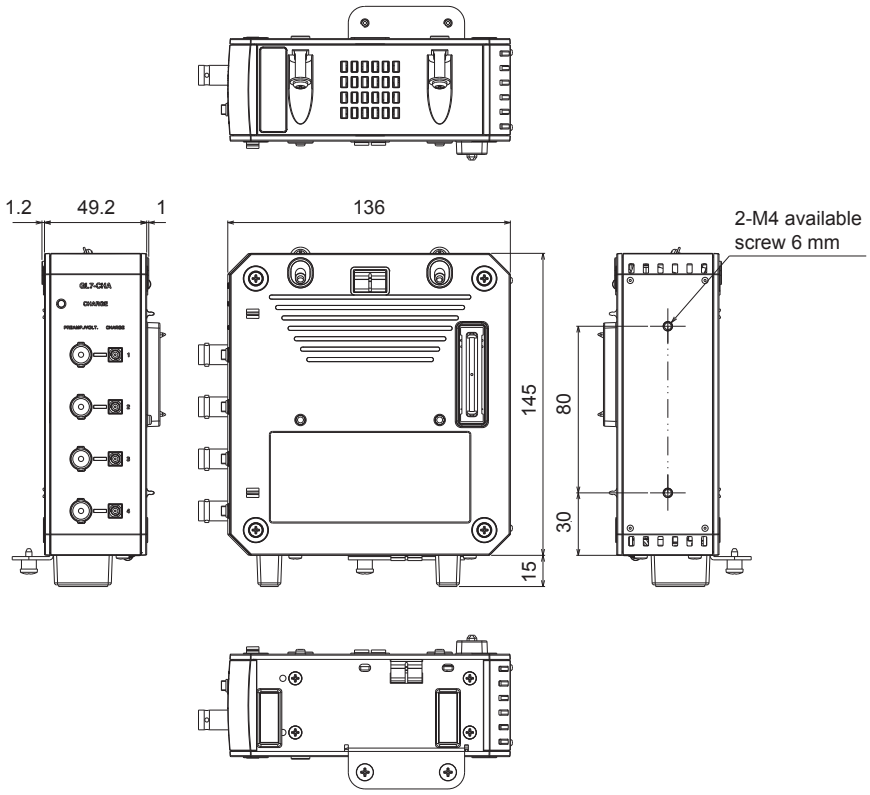
Strain Module: (GL7-DCB): Optional



Unit: mm
Dimensional accuracy: ±5 mm

GL7000 Dimensional Drawings (continued)

Acceleration Module: (GL7-CHA): Optional



Unit: mm
Dimensional accuracy: ±5 mm

241 Springside Drive
Akron, Ohio 44333
Phone: 330-668-1444
Fax: 330-666-5434

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