Model GL7000 Multi-function Data Logger and Data Acquisition System

- ✓ Modular construction. A selection of amplifiers tailors the system to address any application.
- ✓ A range of isolated analog amplifiers support millivolts to hundreds of volts, thermocouple- and RTD-based , bridge, resistance, and accelerometer measurements.
- ✓ A logic and pulse input amplifier module provides 16 channels of discrete and/or pulse inputs for state, counting, and rotational rate recording along with analog data.
- ✓ An included alarm module allows ten alarm outputs that may be triggered by any combination of measured analog or discrete channel levels.
- ✓ Programmable sample intervals address the full spectrum of high- and low-speed measurements, from one sample per microsecond to one sample per hour.
- ✓ Stand-alone or PC-connected operation using included PC side software.
- ✓ Stand-alone recording to built-in RAM memory for speed, removable SD memory, USB thumb drive, and flash memory for non-volatile recordings.
- ✓ Optional 64 GB, high-speed SSD memory for non-volatile recording sessions as fast as 1 MHz per channel and file sizes up to 2 GB.
- ✓ Built-in USB and Ethernet interfaces allow operation as a direct-connected PC-based instrument or a remote Web-based server.
- ✓ Optional, detachable touch-screen allows local instrument configuration and real time display.
- ✓ Flexible pre- and post-triggering options give you complete control over when and how data is recorded.
- ✓ Unique backup feature allows measurements to be automatically backed up over definable intervals to non-volatile SD and SSD memory, or pushed to a local or remote FTP file server.
- ✓ Multiple GL7000 instruments may be daisy-chained to provide expanded and synchronous operation.

DATAQ® INSTRUMENTS

GL7000 Product Description

The GL7000 is a modular data acquisition instrument that provides an array of configuration options to allow virtually any industrial measurement. Its most basic form consists of the GL7000 processing module and an attached Alarm module (included). The addition of one or more analog and/or discrete modules completes the configuration and allows the GL7000 to acquire data either to its own internal memory or directly to an Ethernet- or USB-connected PC. When used as a stand-alone instrument the GL7000 can record data to fast, non-volatile RAM (up to 2,000,000 samples), built-in flash memory, SD memory, or a USB thumb drive (251,000,000 samples each). An optional solid state disk module (SSD) is available that provides up to 64 GB of fast, non-volatile storage space with a maximum file size of 2 GB.

Sample rate and measurement range is defined by the optional analog modules that may be attached to the GL7000 processing unit. Some modules support a sample interval as low as one sample every microsecond and a full scale range of 100V. Others support various special measurement functions like direct-connected thermocouples and RTDs for temperature measurements. Another module supports discrete and pulsed-discrete inputs allowing state, count, and rotational rate measurements to be acquired along with analog data. As many as ten modules may be connected to a GL7000 processing unit. A complete list of modules is included in this datasheet.

The optional touch-screen display is detachable and allows local data logger and data acquisition configuration without a PC. The display also provides real time feedback during data recording in the form of a multi-channel, real time graphical display of acquired data, alarm states, and much more. The display may be attached to the GL7000 processor, or tethered up to 10 meters away from the processor using a standard CAT-5 cable.

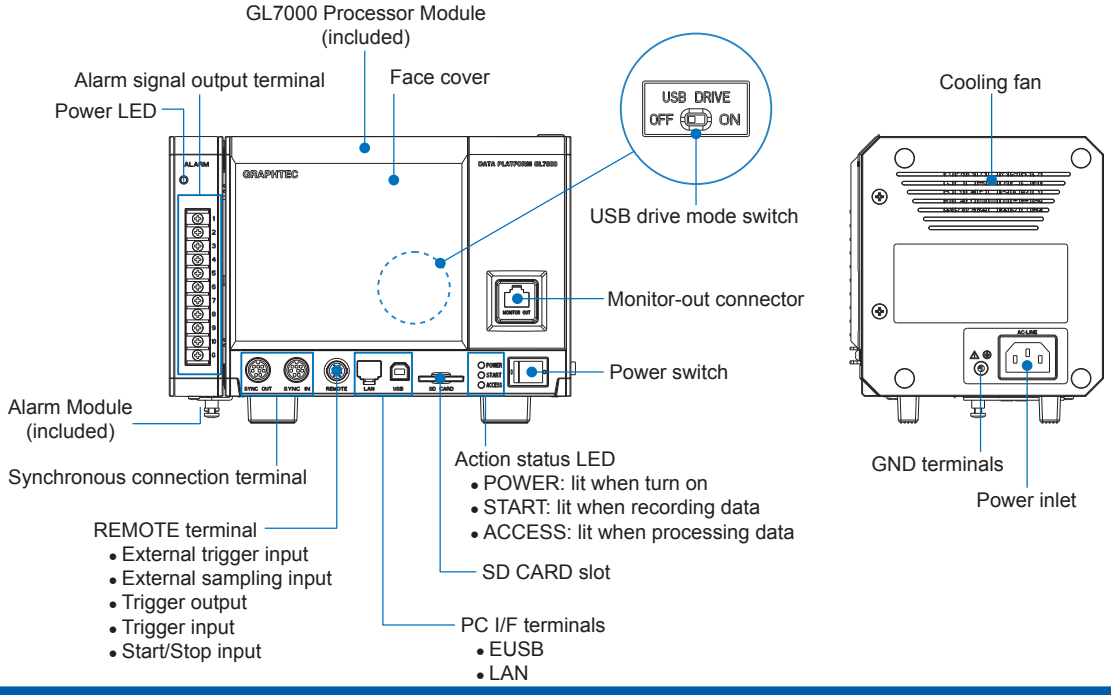
The GL7000's data acquisition and data logging characteristics may also be configured by a remote PC connected to the instrument's Ethernet port, or locally using its USB port. Software is provided to allow real time data acquisition, stream-to-disk, playback, and export to other applications like Excel.

Like other data logger and data acquisition products in the GL line, the GL7000 provides extreme triggering flexibility that allows it to adapt to virtually any recording application. Of course, data acquisition operations to a connected PC, or data logging operations in a stand-alone mode may be manually started and stopped. When enabled, the triggering features of the GL7000 automate this process and allow recording processes to be initiated and terminated based upon signal level settings, date and time, and external events. 0-100% pre-trigger information may be stored when recording to the instrument's built-in 2,000,000 storage points (per analog module) RAM memory. Trigger level conditions include settings for edge triggering, level-only tests, and dual level settings to allow inside/outside window triggering. Recording can also be initiated and terminated as Boolean functions of multiple input channels using logical AND/OR combinations.

Finally, up to ten alarm outputs are available with the included Alarm Module. Alarms can be initiated based upon any trigger condition previously described, as well as upon TC burnout, and alarm states may be held or automatically reset when the alarm condition no longer exists.

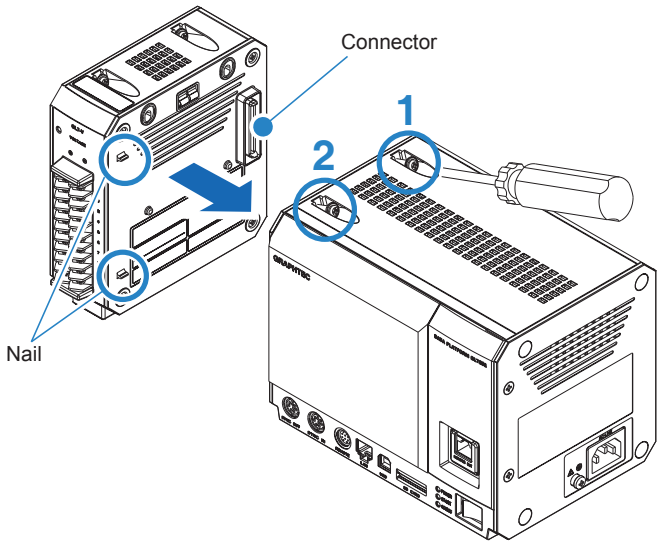
The GL7000 is a total solution instrument that is easily expanded to meet growing measurement requirements for high- and low-speed applications, and stand-alone or PC-connected implementations.

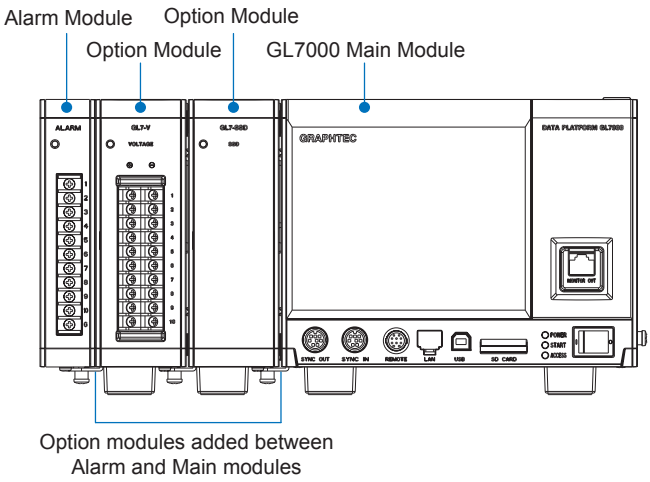
GL7000 Close-up (basic configuration)



Expanding the Basic GL7000 Configuration

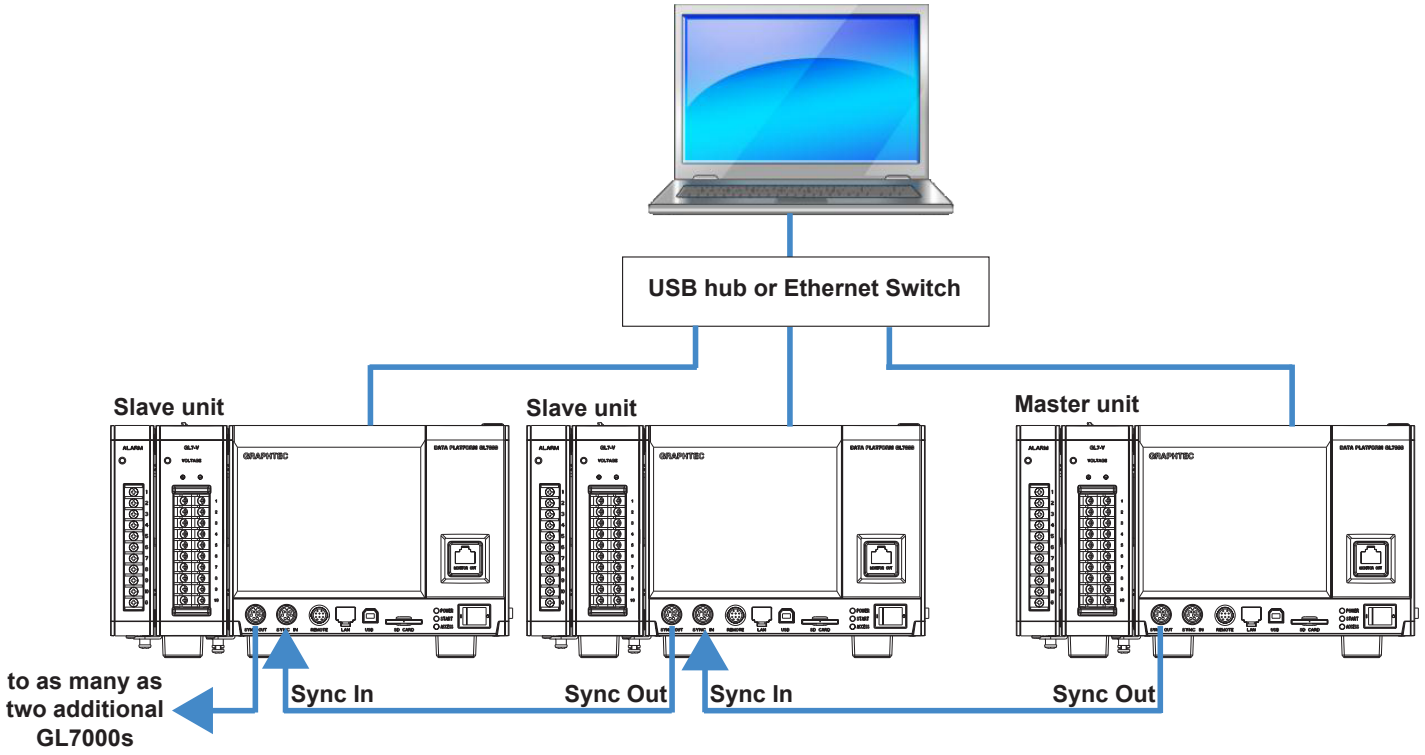
The GL7000 is a modular system that allows you to add analog input, discrete input, and other modules as needed for your application using a only a Phillips screwdriver. When joined together, a GL7000 system with multiple modules forms a ridged, monolithic block. Incremental modules are always added between the basic GL7000 Main and Alarm modules as shown below.





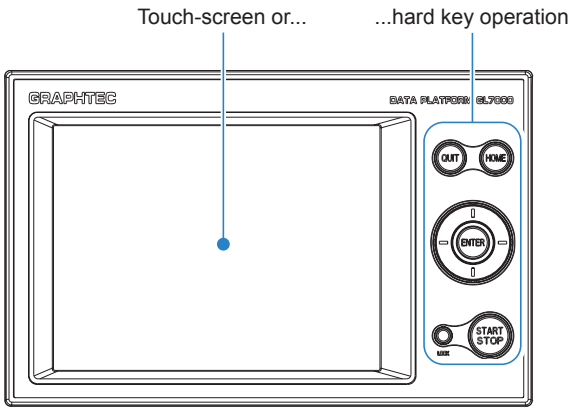
Synchronizing Multiple GL7000 Units

Up to five GL7000 units may be daisy-chained together to form a single measurement system with synchronized sampling rates, triggers, and stop/start control. One unit acts as the master, while as many as four attached GL7000s operate as slave units.

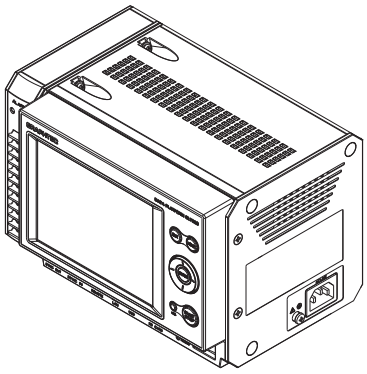


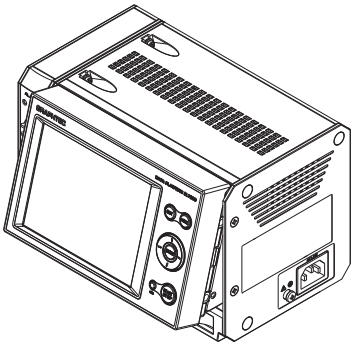
GL7-DISP Optional Touch Display

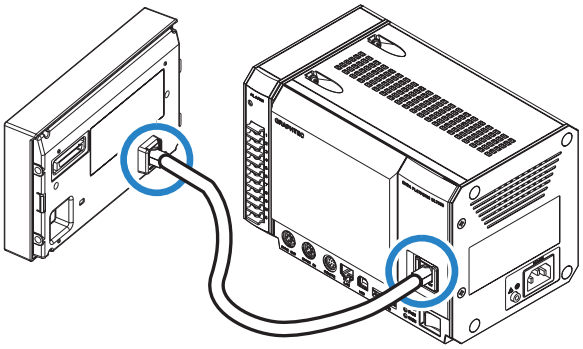
Besides adding data acquisition and data logging modules to the GL7000, an optional touch display is available to allow local configuration of the GL7000 along with real time graphical waveform display and status while recording. The optional display can be mounted directly to the GL7000 Main Module. Mounting options are flush or tilted for easier access with a supplied tilt bracket. Alternatively the display may be located up to 10 m away from the instrument using any standard LAN cable as a tether.



Optional GL7000 Display

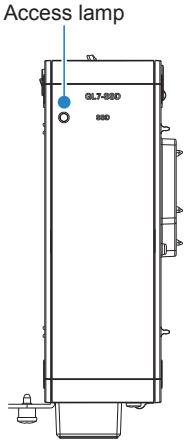

Flush-mounted display


Tilt-mounted display


A standard LAN cable connects the Main module to the display for the remote display configuration.

GL7-SSD Solid-state Drive (SSD) Storage Module Option

Module model GL7-SSD offers memory expansion in the form of a non-volatile, high-speed solid-state drive. Record-to-disk speed is defined by the number of active modules in a system, but speeds up to 1 MHz per channel for as many as eight channels can be achieved. One SSD module is supported per GL7000 unit, and the module must be installed directly adjacent to the GL7000 main unit.



Item	Specification
Recording capacity	Approx. 64 GB (max 2 GB per file)
Minimum record interval	1 to 2 modules: 1 µs 3 to 4 modules: 2 µs 5 to 10 modules: 5 µs

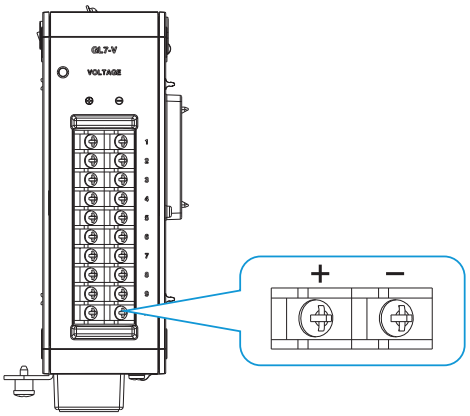
Optional Amplifier Module Overview

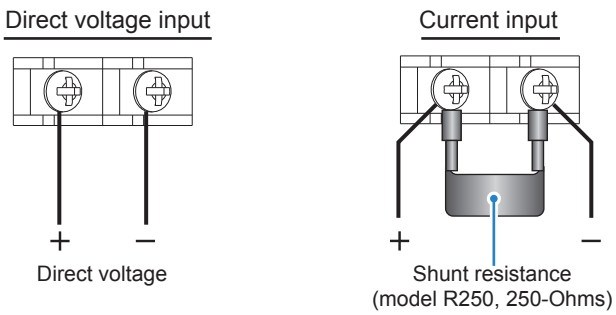
At least one analog input or logic/pulse module is required to make a GL7000 system functional. These modules form the conduit through which measured parameters enter the GL7000 system for acquisition, display, and recording. Each module is provided with a built-in, high-speed 2 mega-sample RAM buffer that can accommodate the fastest sample rates. And since each module has its own memory, sample throughput rate remains constant as modules are added to the system. Various modules address a wide spectrum of industrial measurements and all may be duplicated as well as mixed and matched to conform to measurement requirements.

	Voltage	Voltage/temp	High-speed voltage	Logic/pulse	High Voltage	Strain	High Voltage	Charge
Model	**GL7-V**	**GL7-M**	**GL7-HSV**	**GL7-L/P**	**GL7-HV**	**GL7-DCB**	**GL7-HV**	**GL7-CHA**
Channels	10	10	4	16	2	4	2	4
Input connector	Screw terminal	Screw terminal	BNC	Special DIN	BNC	DSUB 9-pin	BNC	SMC/BNC
Isolation	Channel-to-channel	Channel-to-channel	Channel-to-channel	None	Channel-to-channel	Channel-to-channel	Channel-to-channel	Channel-to-channel
Max sampling rate	1 kHz	100 Hz	1 MHz	Logic: 1 MHz Pulse: 10 kHz	1 MHz	100 kHz	1 MHz	100 kHz
Measurement range	100 mV to 100 V	20mV-50 V TC: J,E,T,R,S,B,N RTD: Pt100/1000`	100 mV to 100 V	Logic: Pattern match Pulse: Rotation rate Count: Resettable	2V to 1000 V	Strain: 400-20000µ€ Voltage: 1mv-5V Resistance:1Ω-50 kΩ	2V to 1000 V	1-50kg 50mV to 10V 20mVrms to 5Vrms
Resolution	16-bit	16-bit	16-bit	15 million counts	16-bit	16-bit	16-bit	16-bit
Built-in RAM	2 million samples	2 million samples	2 million samples	2 million samples	2 million samples	2 million samples	2 million samples	2 million samples

GL7-V Voltage Module Option

Module GL7-V is a general-purpose voltage module. It has a measurement range of 100 mV to 100 V full scale across 11 programmable settings, and supports sample intervals of 1 mS to 1 hour across 24 programmable settings.

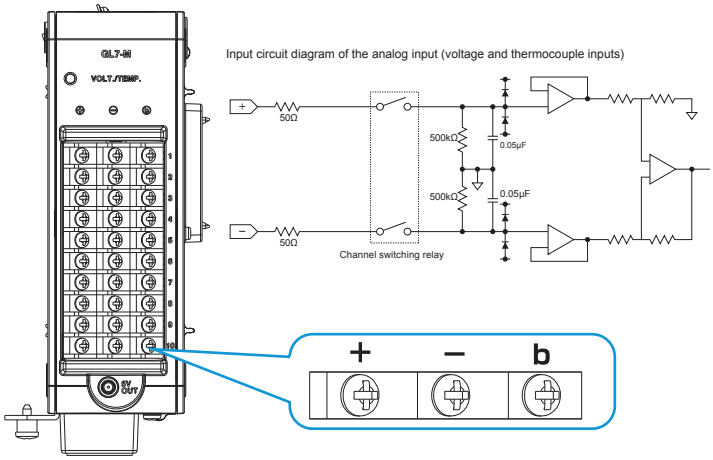




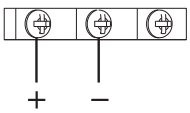
Item	Specification
Input channels	10
Input configuration	Isolated per channel, simultaneous sampling
Sampling intervals	1, 2, 5, 10 ,20, 50, 100, 125, 200, 250, 500 msec 1, 2, 5, 10, 20, 30 sec, 1, 2, 5, 10, 20, 30 min, 1 hour
Measurement ranges	100, 200, 500 mV, 1, 2, 5, 10, 20, 50, 100 V, 1-5 Volts full scale
Input impedance	1 MΩ
Maximum input	100 mV to 1 V range: 60 Vp-p 2 V to 100 V range: 100 Vp-p
Maximum common mode voltage	60 Vp-p
Freq response	DC to 1 kHz (-3 dB)
Low pass filter	Off, Line, 5, 50, 500 Hz

GL7-M Voltage/Temperature Module Option

Module GL7-M allows simultaneous voltage and temperature measurements, programmable per channel on each of its 10 channels. Voltage measurements may range from 20 mV to 50 V and temperature measurements may be derived from either thermocouples or 3-wire RTDs. Sample intervals for this module range from 10 mS to 1 hour.

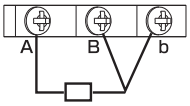


Voltage and TC inputs

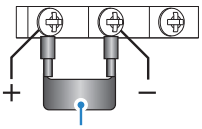


Direct voltage

3-wire RTD input



4-20mA current input

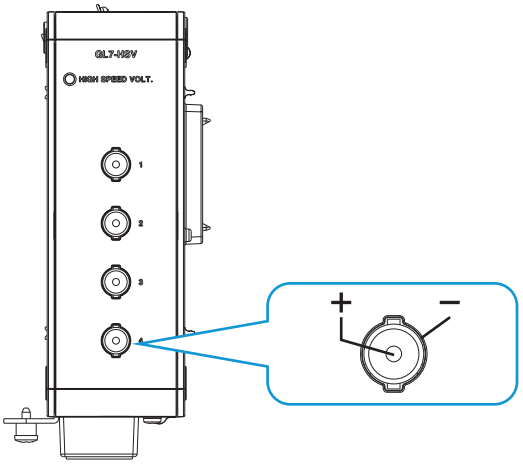


Shunt resistance
(Model R250, 250 Ohms)

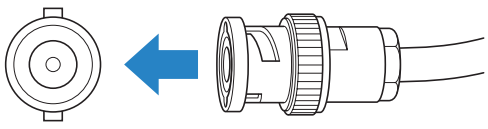
Item	Specification
Input channels	10
Input configuration	Isolated per channel, scan sampling, differential
Sampling intervals	10 ,20, 50, 100, 125, 200, 250, 500 msec 1, 2, 5, 10, 20, 30 sec 1, 2, 5, 10, 20, 30 min, 1 hour
Measurement ranges	20, 50 100, 200, 500 mV, 1, 2, 5, 10, 20, 50 V, 1-5VFS Thermocouple: K, J, E, T, R, S, B, N, W (WRe5-26) Resistance Temp Detector: PT100, JPt100, Pt1000 Humidity (with optional B-530 sensor): 0-100%
Input impedance	1 MΩ
Max input	Between ± inputs: 60 Vp-p
Max common mode voltage	60 Vp-p
Moving average filter	Off/2/5/10/20/40 samples

GL7-HSV High Speed Voltage Module Option

Module GL7-HSV offers four high-speed measurement channels. Sampling speeds as fast as 1 MHz (1 μS interval) are supported per channel. The GL7-HSV also offers a wide measurement range that may be programmed per channel from 100 mV to 100 V. Input access is via a standard BNC connector and isolation per channel is supported.



Voltage input

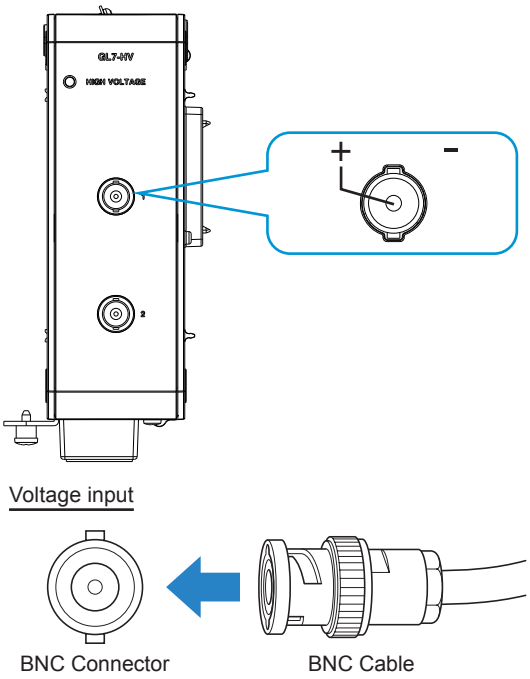


BNC Connector BNC Cable

Item	Specification
Input channels	4
Input configuration	Isolated per channel, simultaneous sampling, unbalanced
Sampling intervals	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, 1hour
Measurement ranges	100, 200, 500 mV, 1, 2, 5, 10, 20, 50, 100 V, 1-5 V F.S.
Input impedance	1 MΩ
Max input	100 mV to 1 V range: 60 Vp-p 2 V to 100 V range: 100 Vp-p
Max common mode voltage	60 Vp-p
Frequency response	DC to 200 kHz (-3 dB)
Low pass filter	OFF, Line (1.5 Hz), 5 Hz, 50 Hz, 500 Hz

GL7-HV High Voltage Module Option

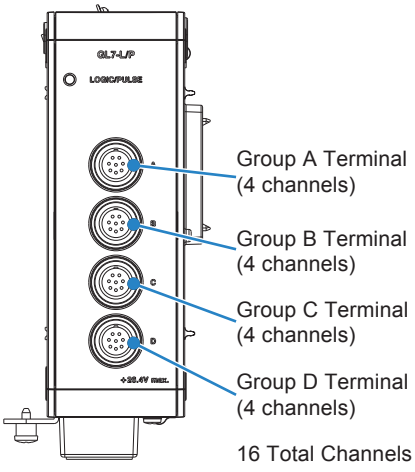
Module GL7-HV offers two high-voltage measurement channels. It has a measurement range of 2 V to 1000 V full scale across 9 programmable settings, and supports sample intervals of 1 µS to 1 hour across 24 programmable settings.

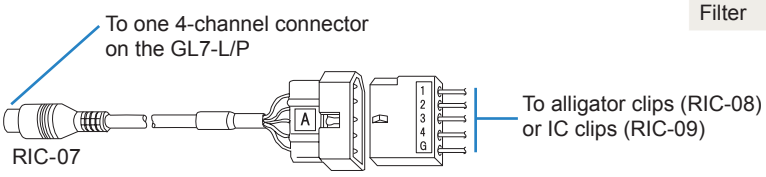


Item	Specification
Input channels	2
Input configuration	Isolated per channel, simultaneous sampling, unbalanced
Sampling intervals	1, 2, 5, 10, 20, 50, 100, 200, 500 µsec, 1, 2, 5, 10, 20, 50, 100, 125, 200, 250, 500 msec, 1, 2, 5, 10, 20, 30 sec, 1, 2, 5, 10, 20, 30 min, 1hour
Measurement ranges	DC, AC : 2, 5, 10, 20, 50, 100, 200, 500, 1000V F.S. DC-RMS, AC-RMS : 1, 2, 5, 10, 20, 50, 100, 200, 500Vrms F.S. Crest Factor: (Range between 1and 200Vrms) 4 or less (Range of 500Vrms) 2 or less
Input Resistance	1 MΩ ±5%
Max input	Input terminal(+) /Input terminal (-) interval : 1000 Vp-p Input terminal(-) /Input terminal (-) interval : 300 VACrms Input terminal (-)/GND terminal interval: 300 VACrms
Withstand voltage	Input terminal(+) /Input terminal (-) interval: 2300 VACrms/1 minute Input terminal (-)/GND terminal interval: 2300 VACrms/1 minute
Measurement accuracy	DC, AC : ±0.25% of F.S.
Filter	(Attenuation) -3 dB (-5.2 dB to -1.4 dB) /6 dB oct

GL7-L/P Logic/Pulse Module Option

Module GL7-L/P conditions and acquires discrete input signals in the form of logic levels or pulse streams. Channels are allocated four per connector or 16 per GL7-L/P module. Either logic or pulse operation is selected for all 16 channels, but multiple GL7-L/P modules may be added to a GL7000 system for mixed discrete operations. A total of 7 modules (112 channels) may be deployed if all are programmed for the logic function, and a maximum of 2 modules (32 channels) may be deployed as pulse inputs. Optional cable RIC-07 connects to one GL7-L/P channel set on one end, and to either cable RIC-08 or RIC-09 on the other. RIC-08 breaks out the four discrete channels to alligator clips, and RIC-09 terminates in mini IC clips.



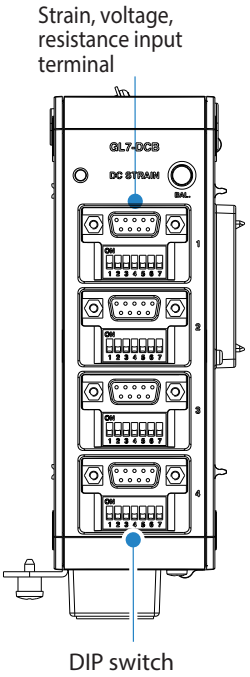


Item	Specification
Input channels	16
Input configuration	Non-isolated, simultaneous sampling
Highest sampling rate	Logic: 1 MHz (1 µS) Pulse: 10 kHz (100 µS)
Functions	Logic/Pulse
Input specifications	Input voltage range: 0 to +24 V Input types: NO/NC contact closure, voltage Threshold level: +2.5 V Hysteresis: 0.5 V (approx. +2.5 V to 3 V)
Max input	26.4 V
Pulse modes	Rotation, accumulate, instantaneous
Maximum input frequency	1 MHz
Filter	OFF, ON (50 Hz -3 db)

GL7-DCB Strain and Resistance Module Option (with TEDS support)

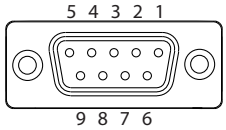
Module GL7-DCB is a 4-channel strain gauge amplifier and ADC plug-in module for the GL7000 data logger and data acquisition system. Each channel of the module may be independently programmed to make a voltage, strain, or resistance (potentiometer) measurement. Fully programmable voltage measurements range from 1 mV to 5 V full-scale; strain measurements range from 400 to 20,000 microstrain; and resistance measurements from 1 Ω to 50 kΩ. The module supports differential and isolated inputs, each with its own excitation source. Further, each GL7-DBC channel may be configured for variety of accuracy-enhancing lead wire selections (2- to 6-wire configurations), with built-in bridge completion for ¼ and ½ bridge configurations. These are selected via a set of front-panel DIP switches per channel. Finally, a range of low-pass corner frequencies may be applied per channel, as well as an anti-alias filter selection that automatically limits passed frequencies to twice the selected sample rate.

All four channels are backed up by a 16-bit (1:40,000) ADC that is simultaneously sampled with a minimum sampling interval of 10 µs, and with 2 Mb of built-in, high-speed RAM.



Item	Specification
Input channels	4
Input configuration	Isolated per channel, simultaneous sampling
Sampling interval	10 µs to 1 hour
Built-in RAM	2,000,000 samples
Input types	Strain, voltage, resistance (per channel)
A/D converter	Approx. ±40,000 ADC counts
Measurement ranges	Strain: 400, 500, 800, 1000, 2000, 4000, 5000, 8000, 10000, 20000 µЄ; 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
Excitation voltage	1, 2, 2.5, 5, 10 VDC
Bridge configurations (per channel)	¼: 2-, 3-, 4-wire (built-in bridge completion) ½: 3-, 4-, 5-wire (built-in bridge completion) Full: 4-, 6-wire
Freq response	DC to 20 kHz (-3 dB)
Filters	LP: Line, 1.5, 3, 6, 10, 30, 50, 60 Hz, 1, 3, 5, 10 kHz @-30 dB/oct
Anti-Alias filter	On/off

9-pin DSUB Connections

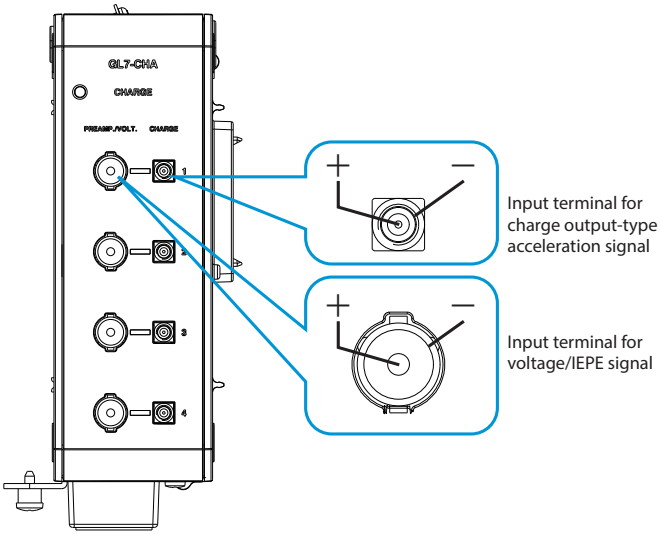


Pin	Function
1	Excitation -
2	Input -
3	Sense +
4	TEDS -
5	Shunt Resistance
6	Sense -
7	Input +
8	Excitation +
9	TEDS +

GL7-CHA Voltage, Charge, and IEPE Module (with TEDS support)

Module GL7-CHA is a versatile 4-channel amplifier for general-purpose voltage, as well as accelerometer-based measurements. Each channel features a dual input connector arrangement: an SMC type for use with unamplified sensors and a BNC type for IEPE sensors and general-purpose voltage measurements. Measurement mode is selectable per channel, and includes the ability to pass either a continuous waveform or its RMS equivalent. The rms method is convenient for long term trending of applied waveforms at lower sample rates and greater memory efficiencies. Rounding out the GL7-CHA is a wide array of selectable measurement ranges, and high-and low-pass filter selections all on a per channel basis. An anti-alias filter selection automatically limits passed frequencies to twice the selected sample rate.

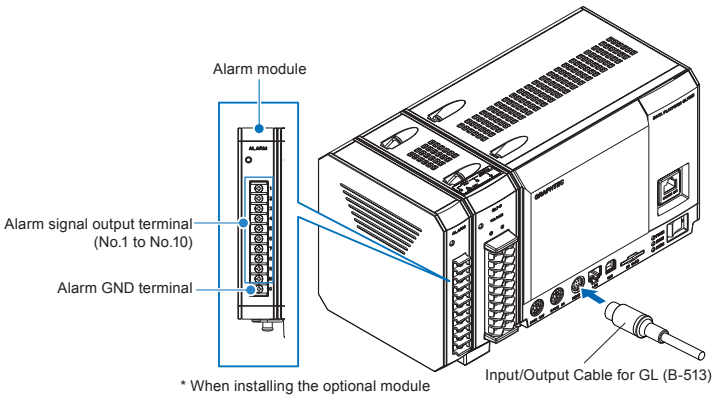
All four channels are backed up by a 16-bit (1:40,000) ADC that is simultaneously sampled with a minimum sampling interval of 10 µs, and with 2 Mb of built-in, high-speed RAM.



Item	Specification
Input channels	4
Input configuration	Isolated per channel, simultaneous sampling
Sampling interval	10 µs to 1 hour
Built-in RAM	2,000,000 samples
Input types	Off, Charge, IEPE, DC, AC, Charge-rms, IEPE-rms, DC-rms, AC-rms
A/D converter	Approx. ±40,000 ADC counts
Measurement ranges	Accelerometer 1,2,5,10,20,50,100,200,500,1000,2000,5000,10000,20000,50000 m/s2 AC/DC voltage 50,100,200,500 mV 1,2,5,10 V RMS voltage 20,50,100,200,500 mVrms, 1,2,5 Vrms
Input resistance	100 kΩ ±5%
IEPE power supply	22 V ±5%, 4/8 mA ±20%
Freq response	Charge type: 1.5 Hz to 45 kHz IEPE: 1 Hz to 45 kHz
Filters	High-pass off, 0.15, 1, 10 Hz Low-pass (-30 dB/oct) Off, Line (1.5 Hz), 3,6,10,30,50,60,100,300,500 Hz, 1,3,5,10 kHz Anti-alias Off, on

Alarm and Remote Cable Connections

In its standard configuration (without optional modules) the GL7000 is provided with a 10-channel Alarm module and the GL7000 Main module. Alarm outputs are accessible from the Alarm Module via a terminal strip on the module's panel. Remote features are accessible from the GL7000 Main Unit via optional cable B-513 and include access to the following:



Signal Name	Description
External stop/start input	Controls stop/start measurement
External trigger input	Triggers recording based upon external event
External sampling input	Allows sampling to be synchronous with an external process
External trigger output	Assumes a true state when a trigger is detected.
Others (future)	More remote features will be added as required in the future

Sampling Rate vs. Number and Type of Modules

Modules	Channels per Module	Max module sampling speed (per channel)	Storage Destination	Max GL7000 sampling speed (per channel)		
				Attached to 1-2 modules	Attached to 3-4 modules	Attached to 5-10 modules
Voltage (GL7-V)	10	1 kHz	Built-in RAM	1 kHz		
			Built-in Flash			
			SD Card			
			SSD module			
Voltage/Temp (GL7-M)	10	100 Hz	Built-in RAM	100 Hz		
			Built-in Flash			
			SD Card			
			SSD module			
High-speed voltage (GL7-HSV)	4	1 MHz	Built-in RAM	1 MHz		
			Built-in Flash	1 kHz		
			SD Card			
			SSD module	1 MHz	500 kHz	200 kHz
High-voltage (GL7-HV)	2	1 MHz	Built-in RAM	1 MHz		
			Built-in Flash	1 kHz		
			SD Card			
			SSD module	1 MHz	500 kHz	200 kHz
Logic/Pulse (GL7-L/P)	16	Logic Mode: 1 MHz	Built-in RAM	1 MHz		
			Built-in Flash	1 kHz		
			SD Card			
			SSD module	1 MHz	500 kHz	200 kHz
		Pulse mode: 10 kHz	Built-in RAM	10 kHz	Not Available	
			Built-in Flash	1 kHz		
			SD Card			
			SSD module	10 kHz		
Bridge and Charge (GL7-DCB and -CHA)	4	100 kHz	Built-in RAM	100 kHz		
			Built-in Flash	1 kHz		
			SD Card			
			SSD module	100 kHz		

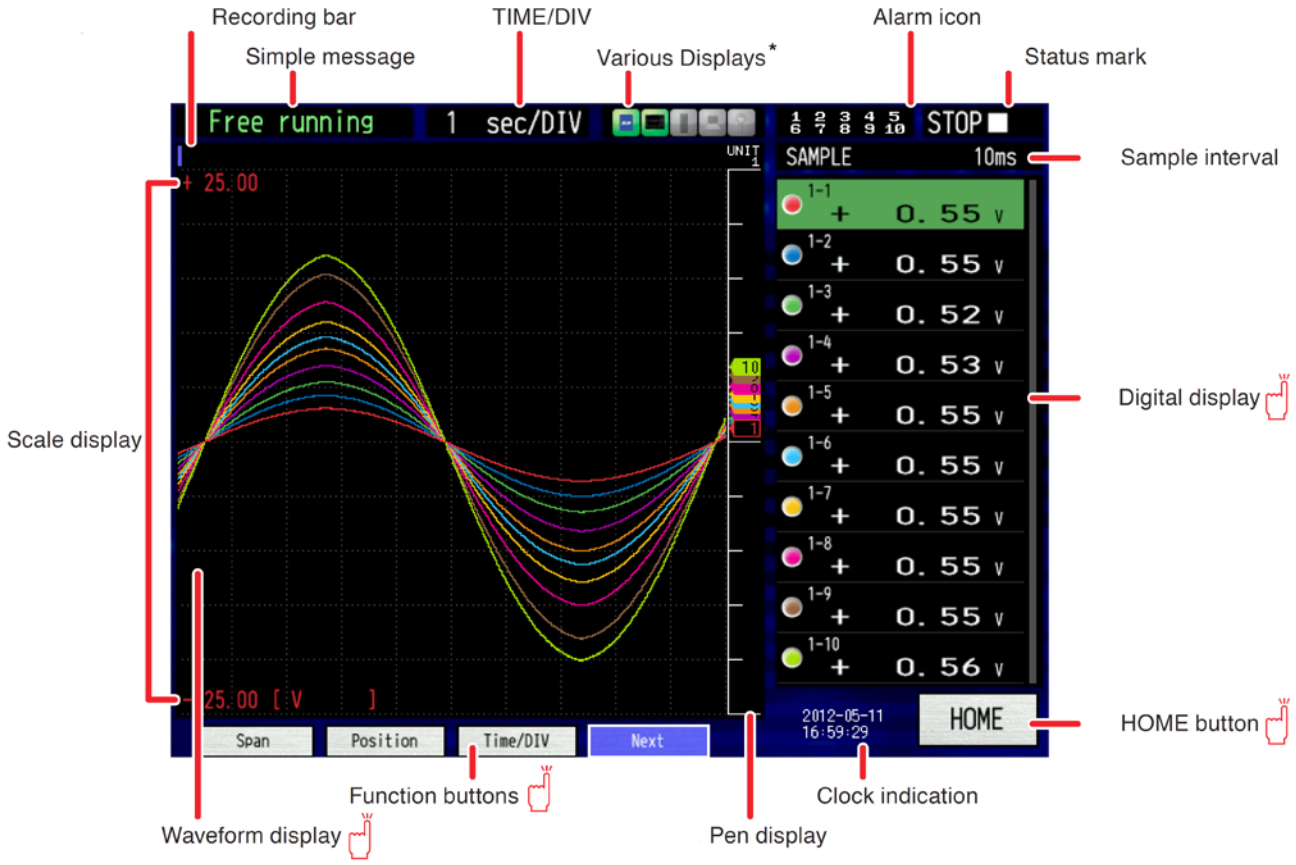
Record Times vs. Storage Destination (one and ten modules)

Amplifier Module	Storage Device	Device Capacity	One Unit							
			Input Channels	Capturing time and Sampling Rate						
				1 MHz	500 kHz	200 kHz	100 kHz	1 kHz	100 Hz	1 Hz
GL7-V	RAM	2,000,000	10	n/a	n/a	n/a	n/a	33 min	5 hrs	23 days
	Internal Flash	2 GB						21 hrs	8 days	893 days
	SD Card	32 GB						22 hrs	9 days	956 days
	SSD	64 GB								
GL7-M	RAM	2,000,000	10	n/a	n/a	n/a	n/a	n/a	5 hrs	23 days
	Internal Flash	2 GB							8 days	893 days
	SD Card	32 GB							9 days	956 days
	SSD	64 GB								
GL7-HSV	RAM	2,000,000	4	2 sec	4 sec	10 sec	20 sec	33 min	5 hrs	23 days
	Internal Flash	2 GB		n/a	n/a	n/a	n/a	39 hrs	16 days	1660 days
	SD Card	32 GB						42 hrs	17 days	1775 days
	SSD	64 GB		134 sec	286 sec	671 sec	22 min			
GL7-HV	RAM	2,000,000	2	4 sec	8 sec	20 sec	40 sec	66 min	10 hrs	46 days
	Internal Flash	2 GB		n/a	n/a	n/a	n/a	78 hrs	32 days	3320 days
	SD Card	32 GB						84 hrs	34 days	3550 days
	SSD	64 GB		268 sec	572 sec	1342 sec	44 min			
GL7-CHA and -DCB	RAM	2,000,000	4	n/a	n/a	n/a	20 sec	33 min	5 hrs	23 days
	Internal Flash	2 GB					n/a	39 hrs	16 days	1660 days
	SD Card	32 GB						42 hrs	17 days	1775 days
	SSD	64 GB					22 min			

Amplifier Module	Storage Device	Device Capacity	Ten Units						
			Input Channels	Capturing time and Sampling Rate					
				1 MHz	500 kHz	200 kHz	1 kHz	100 Hz	1 Hz
GL7-V	RAM	2,000,000	10	n/a	n/a	n/a	33 min	5 hrs	23 days
	Internal Flash	2 GB					2 hrs	24 hrs	105 days
	SD Card	32 GB					2 hrs	26 hrs	111 days
	SSD	64 GB							
GL7-M	RAM	2,000,000	10	n/a	n/a	n/a	n/a	5 hrs	23 days
	Internal Flash	2 GB						24 hrs	103 days
	SD Card	32 GB						26 hrs	111 days
	SSD	64 GB							
GL7-HSV	RAM	2,000,000	4	2 sec	4 sec	6 sec	33 min	5 hrs	23 days
	Internal Flash	2 GB		n/a	n/a	n/a	5 hrs	53 hrs	233 days
	SD Card	32 GB					5 hrs	57 hrs	239 days
	SSD	64 GB				95 sec	3 min		
GL7-HV	RAM	2,000,000	2	4 sec	8 sec	12 sec	66 min	10 hrs	46 days
	Internal Flash	2 GB		n/a	n/a	n/a	10 hrs	106 hrs	466 days
	SD Card	32 GB					10 hrs	114 hrs	478 days
	SSD	64 GB				190 sec	6 min		
GL7-CHA and -DCB	RAM	2,000,000	4	n/a	n/a	n/a	12 sec	33 min	5 hrs	23 days
	Internal Flash	2 GB					n/a	5 hrs	53 hrs	233 days
	SD Card	32 GB					5 hrs	57 hrs	239 days
	SSD	64 GB					3 min		

Display Overview

Whether you use the optional built-in display (shown below) or the provided PC-side software, you have access to all of the GL7000's powerful features. The built-in display provides a quick-look summary screen of all connected signals that communicates in a glance the status of your measurements and the instrument. While recording in the binary format, it even allows you to simultaneously review previously recorded data while you continue to record to the same file at the same time. The extensive menu system that lies beneath the summary screen allows local access to amplifier module configuration, file storage system, data storage format, data replay and review, and much more. Complete virtual access to, and control of, the GL7000 and connected modules is available through the optional display or included PC software.

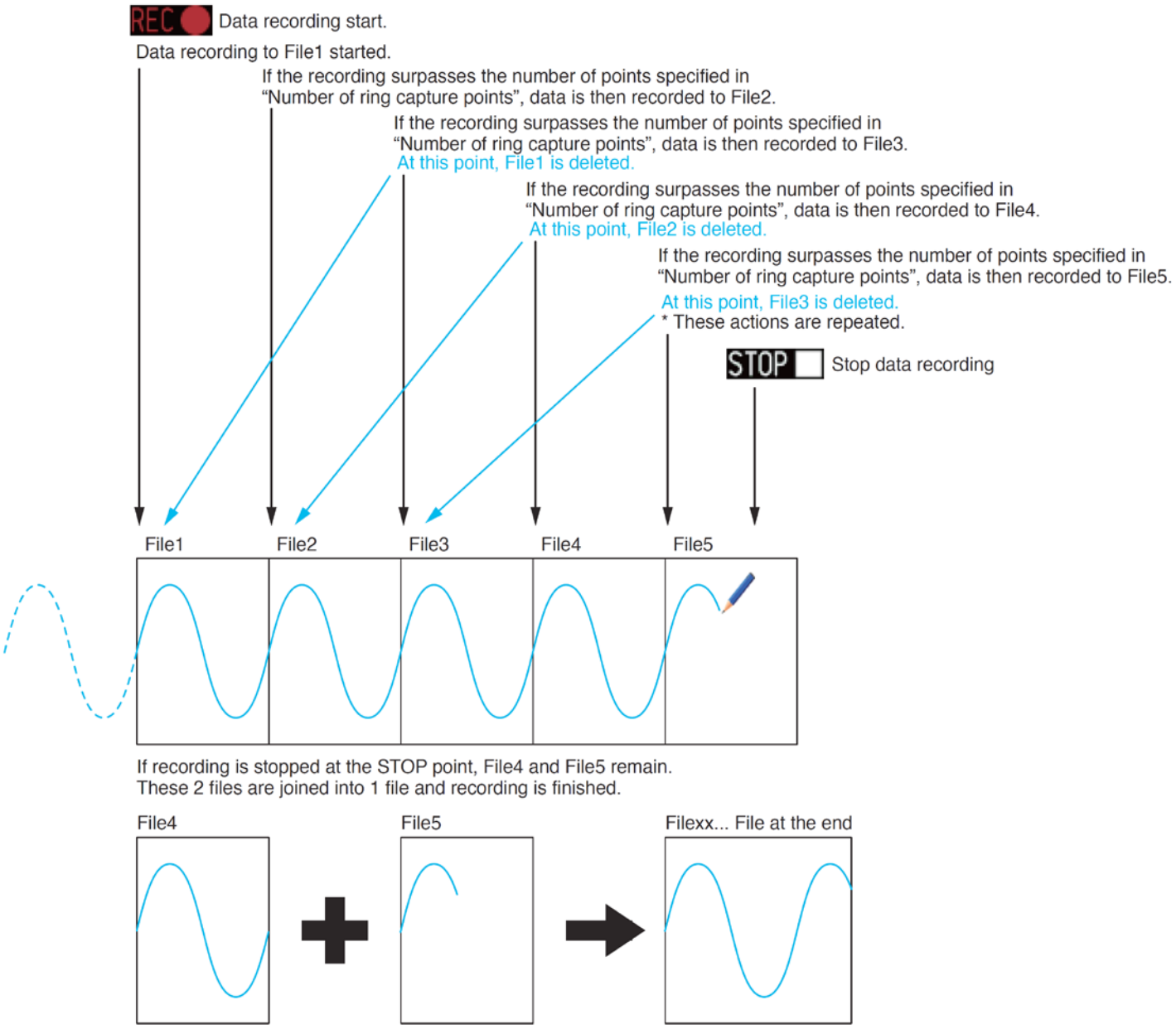


= enabled by touching the display

* Icons indicate the status of built-in memory, SD and SSD memory, and more.

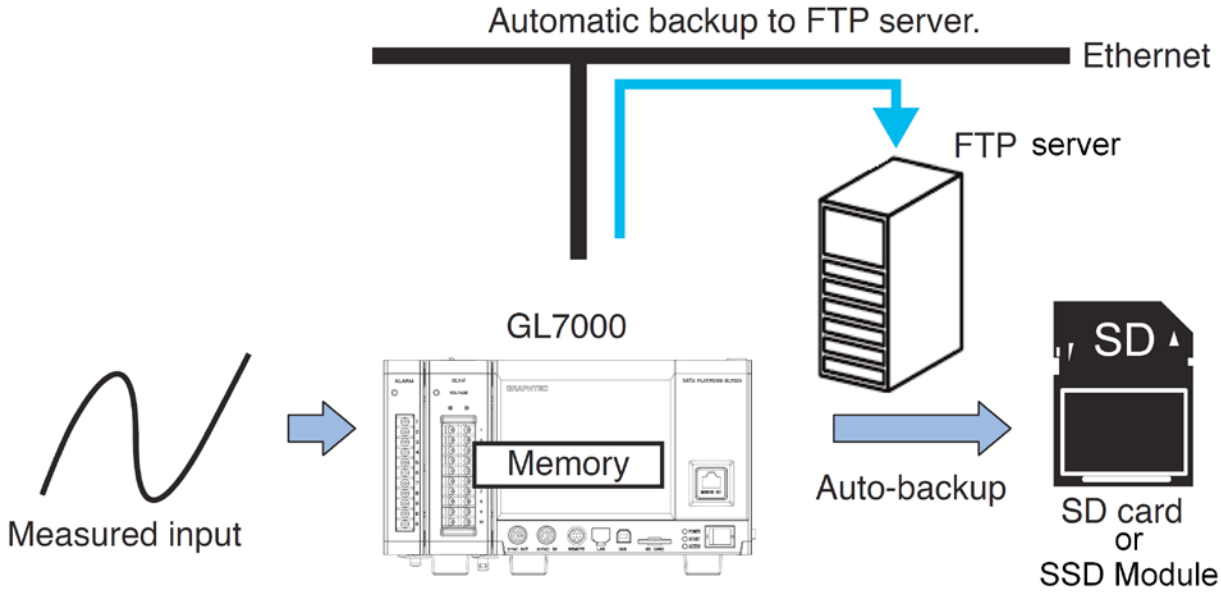
Ring Capture Recording

The GL7000 provides a Ring Capture system that allows memory to fold back on itself in a circular manner that simulates continuous recording. When the memory is filled with recorded data, recording continues by overwriting the oldest data. Otherwise, with Ring Capture disabled, recording stops when the end data memory is reached. Ring Capture to RAM that is built into each module operates across the entire 2,000,000 sample memory. If the storage destination is a memory other than RAM, multiple files are created with a definable size of 1,000 to 2,000,000 samples as follows:



Automatic Data Backup

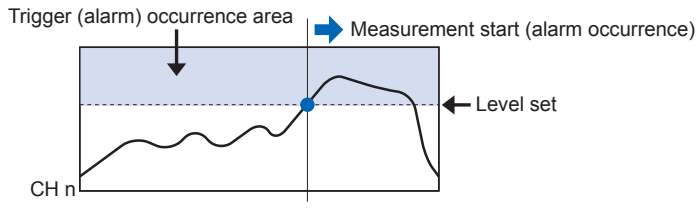
Data loss, or the potential for it, is the great fear for any data acquisition or data logger system. For this reason the GL7000 offers a novel approach to the problem that automatically backs up acquired data to one of multiple destinations: A LAN-connected FTP file server, the SD memory card, or the optional SSD modules. Backups can be programmed to occur automatically at pre-programmed intervals of 1, 2, 6, 12, or 24 hours.



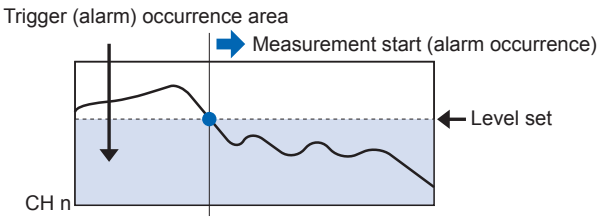
Trigger and Pre-trigger Options

Few data acquisition or data logger products can match the alarm and measurement triggering flexibility of the GL7000. Alarms can be programmed differently per channel, and Boolean combinations (AND, OR) may also be applied on an edge or level basis. Alarm threshold levels may be defined as above or below a definable value, or dual levels may be defined to allow window in/out triggering definitions. Data acquisition and data logging can be started or stopped based upon alarm states as defined, channel levels, on a specified date, on a specified day of the week, or time of day. You can also select an external event as the trigger source. So you can see events leading up to a trigger event, recorded data can consist of 100% post-trigger, 100% pre-trigger, or any combination of the two when recording to built-in RAM.

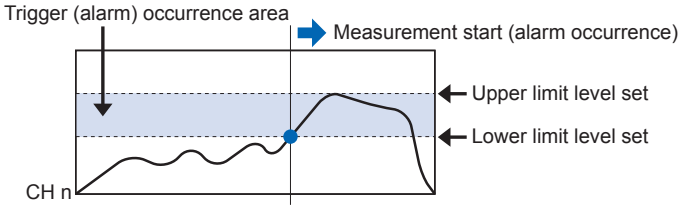
Above level:



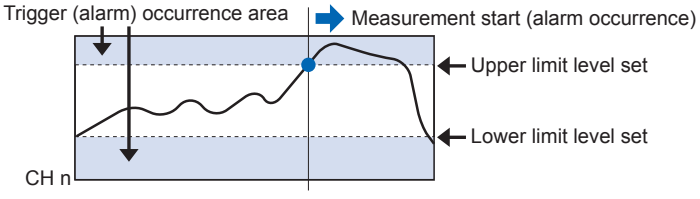
Below level:



Inside window:

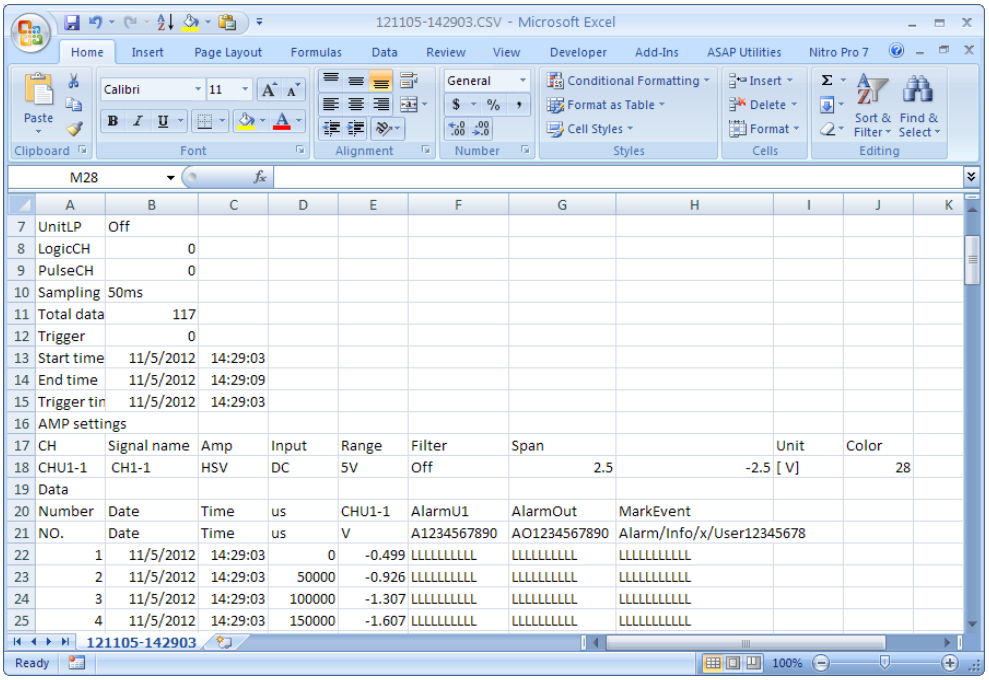


Outside window:



Data Storage Formats

The GL7000 allows you to select between memory-efficient binary or Excel-compatible CSV file formats. Data recorded in the binary format may be reviewed using software provided with the GL7000. Binary-encoded files may be reviewed by the GL7000 itself, or by using playback software included with the GL7000. Regardless of the format, acquired data values are recorded, as well as alarm states, date and time of acquisition, amplifier settings, and event markers.

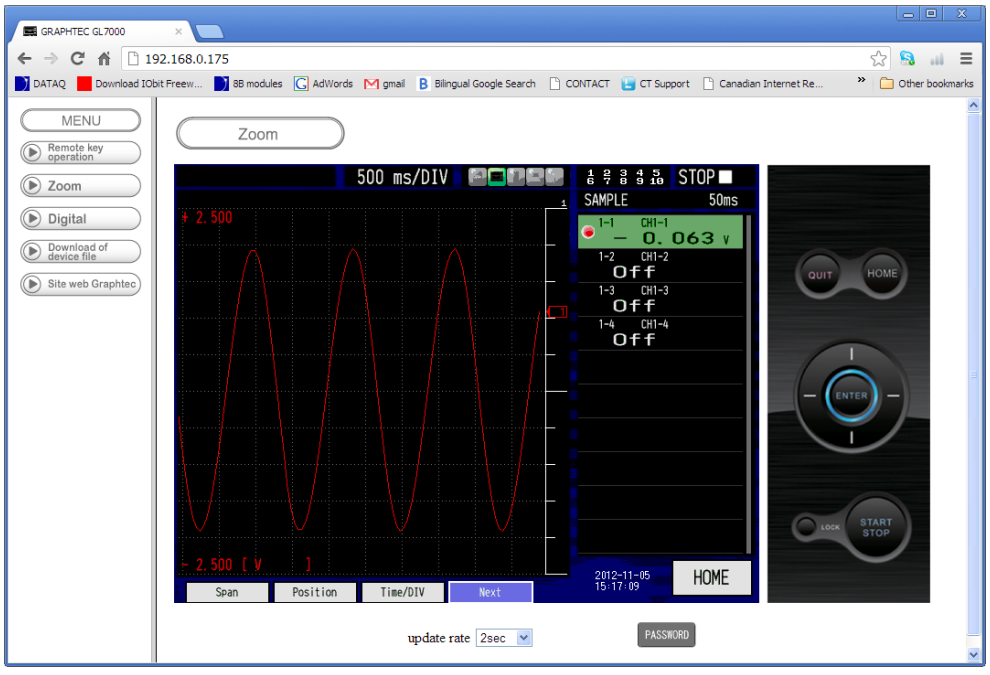


	A	B	C	D	E	F	G	H	I	J	K
7	UnitLP	Off									
8	LogicCH	0									
9	PulseCH	0									
10	Sampling	50ms									
11	Total data	117									
12	Trigger	0									
13	Start time	11/5/2012	14:29:03								
14	End time	11/5/2012	14:29:09								
15	Trigger tir	11/5/2012	14:29:03								
16	AMP settings										
17	CH	Signal name	Amp	Input	Range	Filter	Span		Unit	Color	
18	CHU1-1	CH1-1	HSV	DC	5V	Off	2.5	-2.5	[V]	28	
19	Data										
20	Number	Date	Time	us	CHU1-1	AlarmU1	AlarmOut	MarkEvent			
21	NO.	Date	Time	us	V	A1234567890	AO1234567890	Alarm/Info/x/User12345678			
22	1	11/5/2012	14:29:03	0	-0.499	LLLLLLLLLL	LLLLLLLLLL	LLLLLLLLLL			
23	2	11/5/2012	14:29:03	50000	-0.926	LLLLLLLLLL	LLLLLLLLLL	LLLLLLLLLL			
24	3	11/5/2012	14:29:03	100000	-1.307	LLLLLLLLLL	LLLLLLLLLL	LLLLLLLLLL			
25	4	11/5/2012	14:29:03	150000	-1.607	LLLLLLLLLL	LLLLLLLLLL	LLLLLLLLLL			

A typical Excel display of recorded data

Built-in Web Server

The GL7000 provides a built-in web server, which means that you can access and control it from any standard Web browser that has access to the device. Use Chrome, Firefox, Internet Explorer, or any other preferred browser. Plug in the IP address that you assigned to the GL7000, and instantly see a virtual picture of the GL7000 on your browser screen. Click with the mouse on the GL7000's screen and buttons as you would using your finger if the instrument was in your hands for complete virtual control over the display, parameters, and even direct access to stored data files. You can even configure a password to control access to the GL7000.

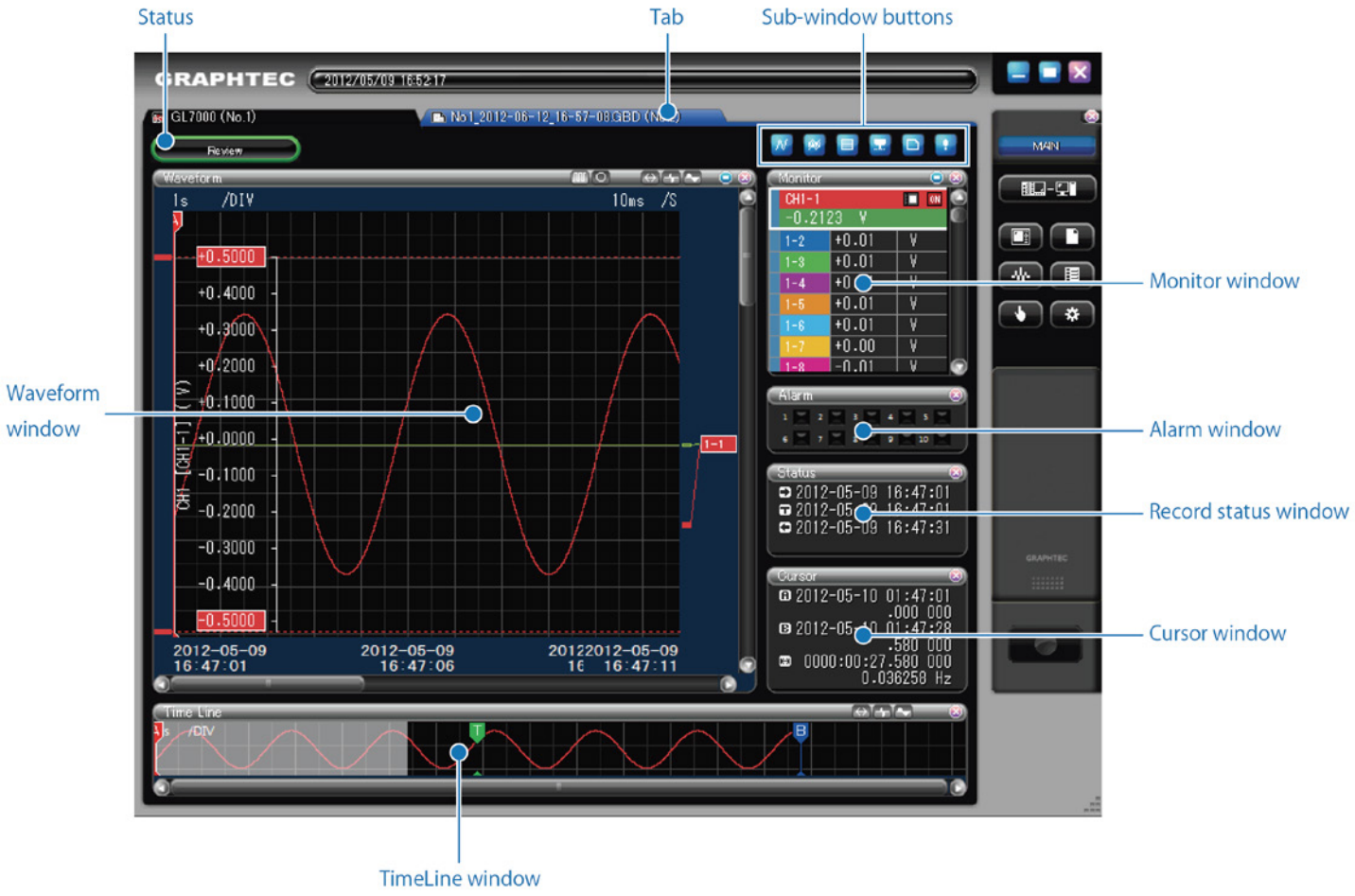


A typical virtual instrument display of the GL7000 using the Chrome browser

Included, PC-based GL7000 Software

GL-Connection Software for any Windows PC is included with GL7000 hardware. It allows USB and LAN connections with the GL7000 to configure the instrument's settings, and to carry out data recording, data playback and real-time display of input signals. The software's main features are:

- Allows connection to multiple GL7000 devices: Connect up to 10 instruments using a mixture of USB and LAN connections.
- Waveform and digital displays: There are diverse display options including digital values, and Y-T and X-Y configurations.
- Records in real time to the PC- drive with sampling of up to 1 kHz in the binary or CSV formats.
- Plays back recorded GBD (binary) and CSV (text) formatted files.
- Statistical calculations in real time and during playback include maximum value, minimum value, average value, and peak value. Root mean squared calculations are supported during playback.
- Programmable email notifications on an alarm condition.
- A function that transfers data recorded in the binary format directly to Excel.
- Much more.



Ordering Guide

Order No.	Description
GL7000	Data logger and data acquisition system including Alarm Output module, CD-ROM with GL-Connection software, and AC power cable. Requires at least one amplifier module.
Amplifier Modules (at least one is required)	
GL7-V	10-channel voltage measurements in the range of 100 mV to 100 V full-scale and a maximum sample rate per channel of 1 kHz.
GL7-M	10-channel voltage/temperature measurements in the range of 10 mV to 50 V full-scale. Supports direct-connected thermo-couple and RTDs. Maximum sample rate of 100 Hz per channel.
GL7-HSV	4-channel voltage measurements in the range of 100 mV to 100 V full-scale. Maximum sample rate of 1 MHz per channel.
GL7-HV	2-channel voltage measurements in the range of 2V to 1000V full-scale. Maximum sample rate of 1 MHz per channel.
GL7-L/P	16-channel logic and pulse measurements for data acquisition and data logging of discrete and pulse train inputs.
GL7-DCB	4-channel strain, voltage, and resistance measurements in the range of 400 to 20000 µ€; 1mV to 5V; and 1Ω to 50 kΩ
GL7-CHA	4-channel voltage and accelerometer based measurements in the range of 1 to 50000 m/s2; 50mV to 10V; and 20mVrms to 5Vrms
Optional Function Modules	
GL7-DISP	Detachable 5.7” TFT color, touch-screen. Includes tilting table mount.
GL7-SSD	64 GB solid-state disk hard disk drive.
Optional Accessories	
B-559	Sync cable used to daisy-chain two GL7000 for synchronous operation.
B-513	I/O cable for remote operations, 2-meter.
B-530	Humidity sensor with a 3-meter cable and dedicated power connector
R250	250Ω shunt resistor for 4-20 mA process current measurements.
RIC-07	Connects to one of four inputs on the GL7-L/P amplifier module on one end, and the other end accommodates one of either RIC-08 alligator-clip or RIC-07 IC clip adaptor cables.
RIC-08	Alligator-clip adaptor cable. Requires (1) RIC-07.
RIC-09	IC clip adaptor cable. Requires (1) RIC-07
RIC-10	Probe set for GL7-L/P consisting of (1) RIC-7 for connecting to any one of four GL7-L/P inputs; (1) RIC-08 alligator-clip adaptor cable; and (1) RIC-09 IC clip adaptor cable.
RIC-143	Isolated, 6-ft BNC to protected banana jack cable (600 V max)
RIC-145	Banana-to-alligator adaptor for RIC-143 (one pair red/black)
RIC-146	Banana-to-clip test plunger adaptor for RIC-143 (one pair red/black)

Click here for detailed specifications (pdf)

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