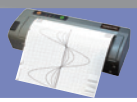
GRAPHTEC

High speed 1 MS/s Datalogger with Voltage and Temperature Measurements

Isolated simultaneous 8 channel data logger midi LOGGER GL980

Thermal Printer
DP-581H Supported!
Ideal for on-site & Real-time printing!



Multifunction input on 8 isolated channels including true-RMS value measurement

Voltage	20 mV to 500 V DC, 1-5 V DC 10 mV to 250 V rms	Pulse	4 channels (*1) Accumulating, instant or RPM
Temp	Thermocouples: K, J, E, T, R, S, B, N, W (WRe5-26)		
Humidity	0 to 100% (the B-530 option is required)	Logic	4 channels (*1)

Safer input terminal

Isolated BNC and screw terminal for each channel.

Screw terminal
Suitable for thermocouple connection

Isolated BNC connector
Safety measure for high voltage input

Available input signal cable

Isolated Banana - BNC
RIC-143

Clip, Alligator (small)
RIC-144A (*2)

Clip, Alligator (middle)
RIC-145 (*2,4)

Clip, Grabber
RIC-146 (*2)

Input/Output cable for GL series
B-513

Humidity sensor
B-530

*1: Select either Pulse input or Logic input, and use the optional input/output cable for GL (B-513 option).
*2: Used with RIC-143.
*3: Numbers are approximate and under the following conditions.
· Using 8 channels of analog input only and data is saved as a GBD file.
· External memory device is set to SD flash memory card or USB flash memory with 8 GB or more data capacity.
· File size of captured data is up to 4GB.
*4: Sales discontinued in the US. and EU.

Additional memory function

Long term recording capability
4 M sample/ch built-in RAM and 4 GB built-in Flash memory. Continuous measurement supports up to 4 GB per file.

Memory type (*3)	1MS/s (1µs)	100kS/s (10µs)	1kS/s (1ms)	1S/s (1s)
Built-in RAM (4 M samples/ch)	4 seconds	40 seconds	66 minutes	46 days
Built-in Flash memory (3.9 GB)	N/A	N/A	2 days 6 hrs	Over 1 year
External memory (SD/USB Flash memory)	N/A	N/A	2 days 11 hrs	Over 1 year

Large built-in RAM (4 million samples per channel)
Built-in RAM can divide into 1, 2, 4, or 8 blocks supporting continuous high-speed recording measurement with auto backup on the internal Flash memory or USB.

Dual external recording available through USB and SD Card Flash memory
Both the USB Flash memory device and the SD Flash memory card can be used as external storage device for captured data.

High performance and easy to use software for PC

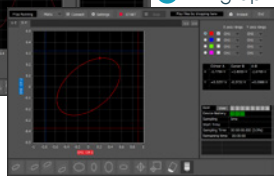
Standard software: GL980_2000-APS

- Easy connection made possible with automatic search function for connected device.
- Multiple display format using Y-T graph, X-Y graph and digital values.
- Supports real time data transfer up to 1 ms sampling interval. Captured data from the built-in RAM can also be displayed.
- Captured data saved in binary format can convert to CSV format.

Functions
- Configure GL unit
- Control GL unit
- Real-time data display
- Replay saved data
- Data format conversion

Y-T graph (waveform) display

X-Y graph



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Main unit specifications

Item		Description
Number of analog input channels		8 channels
External input/output	Input (*1)	Logic or Pulse (4 channels), Trigger or Sampling (1 channel)
	Output (*2)	Alarm (4 channels) or Trigger (1 channel) with Alarm (3 channels)
Trigger function	Trigger action	Start or stop capturing data by triggering
	Repeat action	Off, On (Re-armed automatically)
	Trigger source	Start/Stop: Off, Measured signal, Alarm, External, Scheduled time, Scheduled day, Elapsed time
	Combination	Level OR, Level AND, Edge OR, Edge AND
	Threshold	High or Low in level mode, Rising or Falling in edge mode, Window-in (*3), Window-out (*3)
Alarm function	Alarm action	Display and outputs a signal when alarm is detected
	Combination	OR (Source channel can be assigned with OR condition to output port)
	Threshold	• Analog input : High, Low, Window-in, Window-out • Logic input : H or L • Pulse input : High/Rising, Low/Falling, Window-in, Window-out
Calculation function	Between channels	Addition, subtraction, multiplication and division for two analog inputs (only in GBD format)
	Statistical	Real-time or between cursors in replay captured data • Function : Max., Min., Peak-to-Peak, Average, RMS (only for replay)
Scaling (Engineering unit) function		Measured value can be converted to the specified engineering unit
Storage device	Built-in RAM	Four million samples for each channel (Memory partition: 4 M samples x 1 block, 2 M sample x 2 blocks, 1 M samples x 4 blocks, 512 k samples x 8 blocks)
	Built-in Flash	4 GB (for capacity of data: approx. 3.9 GB)
	External USB	Support USB Flash memory device by USB2.0 Type A port, No memory capacity limit (Max single file size : 4 GB)
	External SD card	Support SDHC memory card (up to 32 GB) by SD Card slot (Max single file size : 4 GB)
Capturing mode	Mode	Off (Normal), Ring, Relay
	Off (Normal)	Save data between start to stop
	Ring(*4)	Save most recent data of specified number • Destination : Built-in RAM, Built-in Flash, USB or SD • Number of capturing data: 1000 to 10000000 points (*5) • Sampling : 1 MS/s (interval 1 µs) in built-in RAM, 1 kS/s (interval 1 ms) with GBD format in other device, 100 S/s (interval 10 ms) with CSV format in other device
	Relay	Save data to multiple files with specified capturing time or file size (up to 4 GB) until recording data is stopped • Destination of data : Built-in Flash, USB or SD • Sampling : 1 kS/s (interval 1 ms) with GBD format, 100 S/s (interval 10 ms) with CSV format
Data backup	Interval	Off, 1, 2, 6, 12, 24 hrs., specific time, or any time with key operation •Sampling : up to 1 kS/s(interval 1 ms)with GBD format, up to 100 S/s (interval 10 ms)with CSV format
	Data destination	Built-in Flash memory, USB memory device, SD Flash memory card,FTP
	Data format	GBD (binary) or CSV (text)
	Hot-swapping	USB Flash memory device or SD Flash memory with key operation
Display (LCD)	Size	7-inch TFT color LCD (WVGA: 800 x 480 dots)
	Information	Waveform in Y-T with digital values, Enlarged waveforms, Digital values and statistics values, X-Y graph
Interface to PC	Type	Ethernet (10 BASE-T/100 BASE-TX), USB2.0
	Ethernet functions	Web server function, FTP server function, NTP client function, DHCP client function, Email send function
	USB function	USB mode (File transfer and deletion from internal GL980 memory)
Operating environment		0 to 40 ºC when driven by AC adapter or battery, 5 to 85 % RH (non condensed)
Power source		AC adapter : 100 to 240 V AC, 50/60 Hz DC power : 8.5 to 24 V DC Battery pack : Mountable two battery packs (*6)
Power consumption		Approx. 66 VA (using the AC adapter at 240 V, with LCD display on, and battery packs being charged)
External dimensions [W×H×D]		Approx. 260 x 161 x 83 mm (with the cover)
Weight		Approx. 1.7 kg (the cover is attached, AC adapter and batterys are not included)
Vibration resistance		Compatible with JIS Vibration test method for automobile Type 1 Class A (Vibration durability test: 5 m/s^2)

*1: Select either Logic input (4 channels) or Pulse input (4 channels), select either external Trigger input or Sampling input. Required Input/Output cable for GL series (B-513) option for connecting signal.
*2: Select either Trigger output (1 channel) or Alarm output (1 channel). Available 3 channels Alarm output always. Required Input/Output cable for GL series (B-513) option for connecting signal.
*3: Not available with logic input.
*4: Required minimum capturing time is 15 seconds in GBD format, 30 seconds with CSV format.
*5: When using built-in RAM, 10 to 4000000 points
*6: Required two batteries (B-569) packs when in battery mode.
*7: Connections can be made individually to BNC terminal or M3.5 screw terminal. Those are connected to the same channel.
*8: When using built-in Flash, SD memory card and USB memory, sampling is 1 kS/s to 1 S/m (1 ms to 60 s). When using the External, required Input/Output cable for GL series (B-513) option for connecting signal.
*9: Measures the accumulated value of the DC and AC components in effective value, that is a true-RMS.
*10: Graphtec does not support software/driver used with operating systems that have become obsolete and are no longer supported by the OS developer. In the Windows 7, edition of Ultimate, Enterprise, Professional and Home Premium are supported.

- Due to the possibility of equipment or PC failure, the data files on the instrument will not be guaranteed to be held on the memory. Please make a backup of data whenever possible to avoid data loss.
- Brand names and product names listed in this brochure are the trademarks or registered trademarks of their respective owners.
- Items mentioned are subject to change without notice.

For more information about product, please check the web site or contact your local representative.

Analog input specifications

Item		Description
Type of input terminal		Isolated BNC connector and Screw terminal (M3.5 screw) (*7)
Input method		All channels isolated unbalanced input, Simultaneous sampling
Sampling speed (interval) (*8)		1 M Samples/s to 1 Sample/min (1 µs to 1 min) and External
Frequency response		DC to 200 kHz (within +1/-4 dB)
Measurement range	Voltage (DC)	20, 50, 100, 200, 500 mV, 1, 2, 5, 10, 20, 50, 100, 200, 500 V, and 1-5V F.S.
	Voltage (DC-RMS) (*9)	10, 25, 50, 100, 250, 500 mV rms, 1, 2.5, 5, 10, 25, 50, 100, 250 V rms F.S. • Crest Factor: up to 2
	Temperature	Thermocouple: K, J, E, T, R, S, B, N, W (WRe5-26)
	Humidity	0 to 100 % RH - using the humidity sensor (option B-530)
Filter (Low pass)		Off, Line (1.5 Hz), 5, 50, 500 Hz, 5, 50 kHz (at -3dB, -6dB/oct)
A/D converter		16-bit (effective resolution: 1/40000 of the measuring full range)
Maximum input voltage	(+) to (-) terminal	20 mv to 2 V range: ± 30 V, 5 V to 500 V range: ± 500 V
	Between channels	60 Vp-p
	channel - GND	60 Vp-p
Maximum voltage (withstand)	Between channels	1000 Vp-p (1 minute)
	channel - GND	1000 Vp-p (1 minute)

External input/output specifications

Item		Description
Input signal specification for Logic/Pulse and		Voltage range : +5 to +30 V (common ground) In Logic/Pulse, Threshold : Approx. +2.5 V In Trigger/Sampling, Threshold : Approx. +1.9 V
Logic measurement		Measures the status (H or L) of the signal input to each channel
Pulse measurement	Measurement	Counts pulse signals input to each channel
	Max. pulse input	Max. input frequency : 100 kHz, Maxi. count number : 15 M count
	Count detection	10 µs to 1 hr. (Set separately from analog signal sampling interval)
	Measurement mode	• Rotation : Counts pulses and convers to rotation in rms, span is up to 500 M rpm
		• Accumulating : Accumulates pulses counted from the start, span is up to 20 M counts (it is set automatically)
		• Instant : Counts pulses per detection cycle, span is up to 20 M counts
External trigger input (*8)		Executes specified trigger action
External sampling input (*8)		Executes sampling of measurement signal with each external sampling signal, max. input frequency is 100 kHz
Output signal	Alarm output	Open collector (pull-up to 5 V with 10 kΩ resistor), maximum load is the 24 V and 100 mA
	Trigger output	When a trigger is detected, 500 µs width pulse is released

Software specifications

Item		Description
Model name		GL980_2000-APS
Supported OS (*10)		Windows10, 8.1, 7 (SP1 or later)
Functions		Control the GL series, Real-time data capture, Replay data, and Data format conversion
Supported device		1 unit of GL980 or GL2000
Settings control		Input condition, Capturing condition, Trigger/Alarm condition, etc.
Transfer of captured data from GL980	In memory capturing	Transfer the captured data to a PC sequentially while data is being saved in built-in RAM, sampling interval is 1 µs to 60 s
	In real time capturing	Transfer the captured data to a PC while data is being saved in built-in flash memory, SD memory card or USB memory In GBD and CSV format, sampling interval is 1 ms to 60 s
Displayed information		Analog, Logic, Pulse count waveform, and Digital value
Display mode		waveform Y-T with digital values, Enlarged waveforms, Statistical calculation result values and history, XY graph
File operation		Converting data format to CSV from GBD binary with data between cursors or all data
Past data screen function		Displays the current data or past part of data by switching. Available at sampling speed 1 kS/s to 1 S/m (1 ms to 1 min sampling interval)
Statistical calculation		Max., Min., Average and Pack-to-Peak value during data capturing

Standard accessories

- AC adapter with power cable
- CD-ROM (PC application software, User manual)
- Tilt stand set (including mounting screws M4)
- Ferrite core (attach to cable for radiation reduction)
- Quick start guide and Safety guide
- Cover (attached to the main body)
- Screws (M3.5) for input terminal

Options and Accessories

Item	Model No.	Description
Input/Output cable for GL	B-513	2 m long (no clip on end of cable)
DC drive cable	B-514	2 m long (no clip on end of cable)
Humidity sensor	B-530	With 3 m long signal cable (with power plug)
Shunt resistor	B-551	250 ohms (Converts signal from "4-20mA" to "1-5V".)
Battery pack	B-569	Rechargeable Lithium-ion battery (7.2 V, 2900mAh)
Bracket for DIN rail	B-570	Bracket for DIN rail (GL980 main body), Build-to-order
Carrying case	B-581	Used with GL980, GL2000 (Comming soon)
Input cable, Safe probe - BNC	RIC-141A	Insulated, 1:1 (42pf), 1.2 m long, 300 V DC, CAT II
Input cable, BNC - BNC	RIC-142	Insulated, 1.5 m long, 1000 V DC, CAT II(600V・CATIII)
Input cable, Banana - BNC	RIC-143	Insulated, 1.6 m long, 600 V DC, CAT II(300V・CATIII)
Clip, Alligator (small size)	RIC-144A	For RIC-143,147 Aperture 11 mm, 300 V DC, CAT II, Max. 15 A
Clip, Alligator (middle size)	RIC-145(*11)	For RIC-143,147 Aperture 20 mm, 1000 V DC, CAT II, Max. 32 A
Clip, Grabber	RIC-146	For RIC-143,147 Aperture 5 mm, 1000 V DC, CAT III, Max. 1 A
Input cable, Banana - BNC	RIC-147	Insulated, 1.6 m long, 1000 V DC, CAT II(600V・CATIII)
Input terminal adapter	SMA-102	Banana (receptacle) to BNC (plug), Insulated
AC Adapter	ACADP-20	Input: 100 - 240 V AC, Output: 24 V DC

*11: Sales discontinued in the U.S. and EU.

⚠ 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.

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