

CAT III 600V compatible High-Voltage and True-RMS Measurements

High-speed High-Voltage
Isolated 4 channel Data Logger

mini LOGGER HV GL2000

CAT III
600V

High speed 1 MS/s simultaneous sampling
with voltage and temperature measurement

| | | | |
|-----------------|-------------------------------------------------------|--------------|----------------------------------------------------|
| Voltage | 20 mV to 1000 V DC, 1-5 V DC 10 mV to 1000 V rms | Pulse | 4 channels (*1) Accumulating, instant or RPM |
| Temp | Thermocouples: K, J, E, T, R, S, B, N, W (WRe5-26) | Logic | 4 channels (*1) |
| Humidity | 0 to 100% (the B-530 option is required) | | |

Safer input terminal

Isolated BNC and screw terminal for each channel



Available input signal cable



*1: Select either Pulse input or Logic input, and use the optional input/output cable for GL (B-513 option).
 *2: Use with RIC-147.
 *3: Max. rated safety voltage: ± 600 V DC or 600 V rms
 *4: Numbers are approximate and under the following conditions.
 - Using 4 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 4 GB.



Thermal Printer

DP-581H Supported!

Ideal for on-site & Real-time printing!



Corresponds to CAT III 600 V
and 600 V rms measurement

Supports CAT III 600 V measurement category and can measure voltage fluctuation on power line for peak to peak and RMS measurements. Voltage range up to 1000 V at DC and rms value (*3)

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 (*4) | 1MS/s (1 μ s) | 100kS/s (10 μ s) | 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 | 3 days 19 hrs | Over 1 year |
| External memory (SD/USB Flash memory) | N/A | N/A | 4 days 3 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.

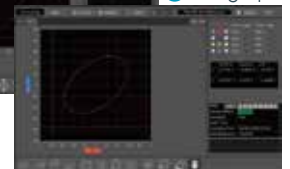
Functions

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

Y-T graph (waveform) display



X-Y graph



| Main unit specifications | | |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Item | Description | |
| Number of analog input channels | 4 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 |
| Alarm function | Threshold | High or Low in level mode, Rising or Falling in edge mode, Window-in (*3), Window-out (*3) |
| | Alarm action | Display and outputs a signal when alarm is detected |
| | Combination | OR (Source channel can be assigned with OR condition to output port) |
| 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 block, 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 : 4GB) |
| | External SD card | Support SDHC memory card (up to 32 GB) by SD Card slot (Max single file size : 4GB) |
| 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 |
| Data backup | 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 |
| | 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 |
| Display (LCD) | Data format | GBD (binary) or CSV (text) |
| | Hot-swapping | USB Flash memory device or SD Flash memory with key operation |
| Interface to PC | 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 |
| Operating environment | 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) |
| Power source | 0 to 40 °C when driven by AC adapter or battery, 5 to 85 % RH (non condensed) 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. 59 VA (using the AC adapter at 240 V, with LCD display on, and battery packs being charged) | |
| External dimensions [WxHxD] | Approx. 260 x 161 x 83 mm (with the cover) | |
| Weight | Approx. 1.7 kg (the cover is attached, AC adapter and battery packs 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, 1000 V, and 1-5V F.S. (Max. rated safety voltage: ± 600 V DC) |
| | Voltage (DC-RMS) (*9) | 10, 25, 50, 100, 250, 500 mV rms, 1, 2.5, 5, 10, 25, 50, 100, 250, 500, 1000 V rms F.S. (Frequency response: 20 Hz to 10 kHz) (Crest Factor : up to 1.4 at 1000 V rms range, up to 2 in other range) |
| | Temperature Humidity | Thermocouple: K, J, E, T, R, S, B, N (WRε5-26) 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 DC/AC, 5 V to 1000 V range: 600 V DC/AC |
| | Between channels | 600 V DC/AC (CAT III) |
| Maximum voltage (withstand) | channel - GND | 600 V DC/AC (CAT III) |
| | Between channels - GND | 5400V DC/AC (1 minute) 5400V DC/AC (1 minute) |

| External input/output specifications | | |
|--------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|
| Item | Description | |
| Input signal specification for Logic/Pulse | Voltage range : +5 to +30 V (common ground) and 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 | Measurement mode | • Rotation : Counts pulses and converts 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 count |
| 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 GL2000 | 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 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 Peak-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 (GL2000 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 • CAT III) |
| Input cable, Banana - BNC | RIC-143 | Insulated, 1.6 m long, 600 V DC, CAT II(300V • CAT III) |
| 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 | 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 III(600V • CAT III) |
| Input terminal adapter | SMA-102 | Banana (receptacle) to BNC (plug), Insulated |
| AC Adapter | ACADP-20 | Input: 100 - 240 V AC, Output: 24 V DC |

⚠ 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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