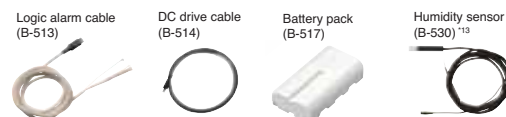


| GL220 main unit specifications | | |
|-----------------------------------|--|---|
| Item | Description | |
| Number of analog input channels | 10 ch | |
| External input/output | Input ⁹ : Trigger or Sampling input 1 ch, Logic or Pulse input 4 ch Output ⁹ : Alarm output 4 ch | |
| Sampling interval | 10 ms to 1 h (in 10ms to 50ms, voltage only and limited channel), External | |
| Time scale | 1 sec to 24 hour /division | |
| Trigger function | Action | Start or stop capturing data by the trigger |
| | Source | Start: Off, Input signal, Alarm, External ⁹ , Clock, Week or Time Stop: Off, Input signal, Alarm, External ⁹ , Clock, Week or Time |
| | Combination | OR or AND condition at the level of signal or edge of signal |
| | Condition | Analog: Rising, Falling, Window-in, Window-out Pulse: Rising, Falling, Window-in, Window-out Logic: Rising or Falling |
| Alarm function | Detecting method | Level or edge of signal |
| | Condition | Analog: Rising, Falling, Window-in, Window-out Pulse: Rising, Falling, Window-in, Window-out Logic: Rising, Falling |
| Pulse input function ⁹ | Alarm output ⁹ | 4 channels, Output type: Open collector (pull-up resistor 10 kΩ) |
| | Accumulating count mode | Accumulating the number of pulses from the start of measurement Range: 50, 500, 5 k, 50 k, 500 k, 5 M, 50 M, 500 M counts/F.S. |
| | Instant count mode | Counting the number of pulses per sampling interval Range: 50, 500, 5 k, 50 k, 500 k, 5 M, 50 M, 500 M counts/F.S. |
| | Rotation count (RPM) mode | Counting the number of pulses per second and then it is converted to RPM Range: 50 rpm, 500 rpm, 5 krpm, 50 krpm, 500 krpm, 5 Mrpm, 50 Mrpm, 500 Mrpm/F.S. |
| Calculation function | Max. input pulse rate | 50 k pulses/sec or 50k counts per sampling interval (16 bits counter is used) |
| | Between channels | Addition, Subtraction, Multiplication and Division for analog input Statistical: Select two calculations from Average, Peak, Max., Min., RMS |
| Search function | Search for analog signal levels, values of logic or pulse or alarm point in captured data | |
| Interface to PC | USB (Full speed) | |
| Storage device | Built-in Flash memory (2 giga-bytes), USB memory device ¹⁰ | |
| Data saving function | Captured data | Direct saving of data into built-in Flash memory or USB memory device |
| | Others | Setting conditions, Screen copy |
| Ring capturing mode | Function: ON/OFF, Number of capturing point: 1000 to 2000000 (size of the capture data will be limited to 1/3 of available memory) | |
| USB memory device emulation | USB Memory emulation mode (Transfer or delete the file in built-in memory) | |
| Engineering scale function | Set based on the reference point of the scaled output and input signal for each channel (Voltage measurement: four points are necessary to scale the output, Temperature measurement: two points are necessary to scale the output). | |
| Display | Size | 4.3 inch TFT color LCD (WQVGA: 480 x 272 dots) |
| | Formats | Waveform + Digital, Waveform only, Calculation + Digital, Expanded digital |
| Operating environment | 0 to 45 °C, 5 to 85 %RH (When operating with battery pack 0 to 40 °C, charging battery 15 to 35 °C) | |
| Power source | AC adapter (100 to 240 V, 50/60 Hz), DC power (8.5 to 24 V DC, max. 26.4 V) ¹¹ , Battery pack ¹¹ | |
| Power consumption | 29 VA or lower (when operating with AC adapter, displaying LCD) | |
| External dimensions (WxDxH) | approx. 194 x 117 x 42 mm | |
| Weight | approx. 520 g (Excluding AC adapter and battery pack) | |

| Software specifications | |
|-------------------------|---|
| Item | Description |
| Supported OS | Windows XP / Vista / 7 (32 bits and 64 bits edition) |
| Functions | Control GL220, Real-time data capture, Replay data, Data format conversion |
| GL220 settings control | Input settings, Memory settings, Alarm settings, Trigger settings |
| Captured data | Transfers data in real-time (in binary or CSV format), saved data in GL220 or the USB memory |
| Displayed information | Analog waveforms, Logic waveforms, Pulse waveforms, Digital values |
| Display modes | Y-T waveforms, Digital values, Report, X-Y graph (specified period of data, data replay only) |
| Warning functions | Sends E-mail to the specified address when the alarm occurred |
| File format conversions | Converts the specified period data or all data to the CSV format (thinning function is available) |
| Report functions | Creates a daily or monthly report automatically (can also export directly to Excel) |
| Displayed Max. Min. | Displays the maximum, minimum and current value in measurement |

| Standard accessories | | |
|----------------------|---|----------|
| Item | Description | Quantity |
| AC adapter | 100 to 240 V AC, 50 / 60 Hz (with specified type of power cord) | 1 set |
| CD-ROM | User's manual (PDF format), Application software | 1 piece |
| Quick Start Guide | | 1 copy |

| Options and accessories | | |
|-------------------------------|--------------|------------------------------------|
| Item | Model number | Remarks |
| Logic alarm cable | 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) |
| Battery pack | B-517 | 1 piece (7.4 V 2200 mAh, 17Wh) |
| Humidity sensor ¹³ | B-530 | 3 m long (with power plug) |



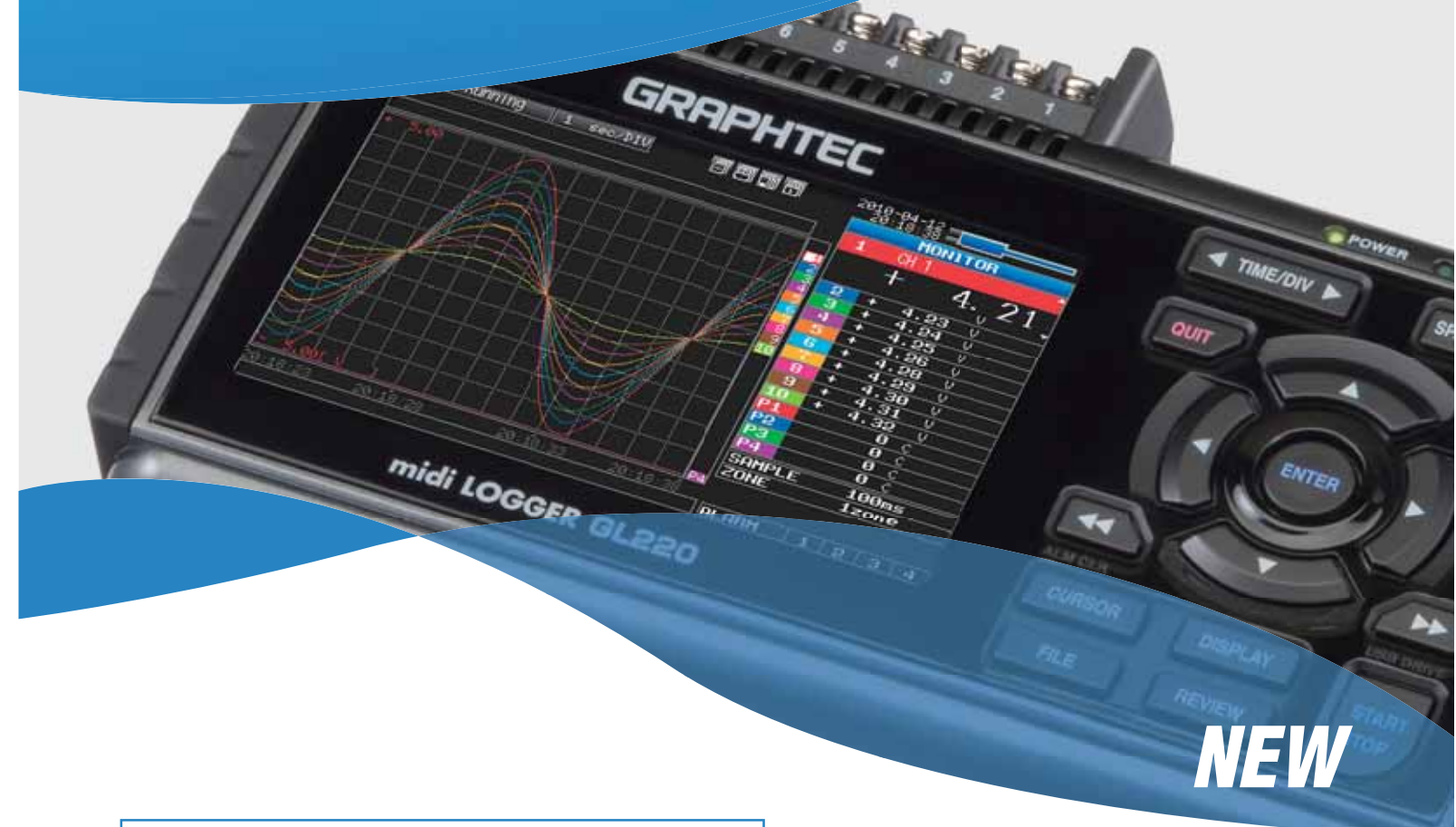
¹³: Operating environment: -25 to 80 °C

| Analog input specifications | | | | |
|------------------------------------|---|--|--|--|
| Item | Description | | | |
| Type of input terminal | Screw terminal (M3 screw) | | | |
| Input method | Scans by the photo-MOS-relay, all channels isolated, balanced input | | | |
| Measurement range | Voltage | 20, 50, 100, 200, 500 mV, 1, 2, 5, 10, 20, 50 V, and 1-5 V /F.S. | | |
| | Temperature | Thermocouple: K, J, E, T, R, S, B, N, and W (WRe5-26) | | |
| | Humidity | 0 to 100% (using humidity sensor (B-530 optional), power is supplied to only one sensor) | | |
| Filter | Off, 2, 5, 10, 20, 40 (moving average in selected number) | | | |
| Measurement accuracy ¹² | Voltage | 0.1 % of F.S. | | |
| | | Temperature | Thermocouple | Measurement range |
| | R/S | | | 0 °C ≤ TS ≤ 100 °C 100 °C ≤ TS ≤ 300 °C R: 300 °C ≤ TS ≤ 1600 °C S: 300 °C ≤ TS ≤ 1760 °C |
| | B | | 400 °C ≤ TS ≤ 600 °C 600 °C ≤ TS ≤ 1820 °C | ± 3.5 °C ± (0.05 % of reading + 2.0 °C) |
| | K | | -200 °C ≤ TS ≤ -100 °C -100 °C ≤ TS ≤ 1370 °C | ± (0.05 % of reading + 2.0 °C) ± (0.05 % of reading + 1.0 °C) |
| | E | | -200 °C ≤ TS ≤ -100 °C -100 °C ≤ TS ≤ 800 °C | ± (0.05 % of reading + 2.0 °C) ± (0.05 % of reading + 1.0 °C) |
| | T | | -200 °C ≤ TS ≤ -100 °C -100 °C ≤ TS ≤ 400 °C | ± (0.1 % of reading + 0.5 °C) ± (0.1 % of reading + 0.5 °C) |
| | J | | -200 °C ≤ TS ≤ -100 °C -100 °C ≤ TS ≤ 100 °C 100 °C ≤ TS ≤ 1100 °C | ± 2.7 °C ± 1.7 °C ± (0.05 % of reading + 1.0 °C) |
| | N | | 0 °C ≤ TS ≤ 1300 °C | ± (0.1 % of reading + 1.0 °C) |
| | W | | 0 °C ≤ TS ≤ 2000 °C | ± (0.1 % of reading + 1.5 °C) |
| | | | Reference Junction Compensation (R.J.C.): ±0.5 °C | |
| | A/D Converter | ΣΔ type, 16 bits (effective resolution: 1/40000 of measuring full range) | | |
| Maximum input voltage | Between + / - terminal | 60 V p-p | | |
| | Between channels | 60 V p-p | | |
| | Between channel / GND | 60 V p-p | | |
| Withstand voltage | Between channels | 350 V p-p (1 minute) | | |
| | Between channel(-) / GND | 350 V p-p (1 minute) | | |

⁹: Logic alarm cable (B-513) option is required.
Input signal of External sampling, Logic, Pulse; Maximum voltage: 24 V, Threshold: approx. 2.5 V, Hysteresis: approx. 0.5 V
¹⁰: Size of the USB memory device is unlimited. Maximum file size is limited to 2GB.
¹¹: DC drive cable (B-514) or battery pack (B-517) option is required.
¹²: Subject to the following conditions:
• Room Temperature is 23°C ± 5°C.
• When 30 minute or more have elapsed after power was turned on.
• Filter is set to 10.
• Sampling rate is set to 1s with 10 channels.
• GND terminal is connected to the ground.

GRAPHTEC

10-channel handy-type logger midi LOGGER GL220



Voltage | Temp. | Humidity | Pulse | Logic

- 10 isolated channels, each with multifunction input
- Maximum sampling rate of up to 10ms
- Large easy-to-read 4.3-inch wide TFT color LCD
- Built-in 2GB Flash memory
- Includes a ring memory function



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GRAPHTEC
Graphtec Corporation

503-10 Shinano-cho, Totsuka-ku, Yokohama 244-8503, Japan
Tel : +81-45-825-6250 Fax : +81-45-825-6396
Email : webinfo@graphtec.co.jp

Website <http://www.graphteccorp.com>



CE
ER121008 Vol.2

<http://www.graphteccorp.com>

Handy-type Logger with huge 2GB Flash Memory



10 isolated channels, each with multifunction input

Its compact size contains an isolated input system which ensures that signals are not corrupted by inputs to other channels, thus eliminating wiring concerns. The GL220s multi-type inputs are suitable for voltage, temperature, humidity, pulse, and logic signals, enabling combined measurements of different phenomena like temperature/humidity and voltage.

- Voltage** ▶ Ranges from 20 mV to 50 V
- Temp.** ▶ Thermocouple types: K, J, E, T, R, S, B, N, W (WRe5-26)
- Humidity** ▶ 0 to 100%RH using the optional humidity sensor (B-530 option)
- Pulse** ▶ 4 channels^{*1}, Accumulating, Instant or RPM
- Logic** ▶ 4 channels^{*1}

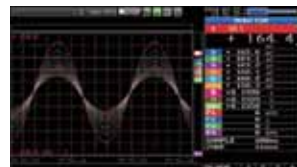


Screw type input terminals (M3 screws) are used

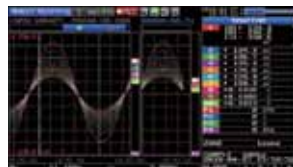
*1: Select either Pulse input or Logic input, and use the optional Logic/Alarm cable (B513 option)

4.3-inch WQVGA TFT colour LCD

Utilises a bright clear 4.3-inch wide TFT color LCD monitor (WQVGA: 480 x 272 dots). Makes it easy to read data in waveform or digital form and to check your measurement parameter settings.



Waveform display (Analog + Digital)



Dual display (Current + Past)



Waveform display (Analog only)



Digital display

Easy operation and device setup

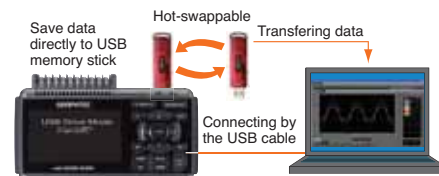
Ergonomically designed and easy to operate, just like a mobile device. The input/output terminals and keyboard layout are arranged so that it can be operated in hands-on mode even when recording data. Parameters in the AMP settings menu can be easily changed whilst viewing the waveform.



Parameters in AMP settings for 10 channels can be set at once using the ALL field.

Supports USB memory device Easy connection to PC

Captured data can be saved directly to USB memory sticks when these are chosen for external storage. In addition, the GL220 can be controlled by a PC if connected by USB cable, allowing transfer of data to a PC in real-time. If you need to move large data files to your PC then the GL220 can emulate an external USB drive for quick data transfer.



• Transferring data to the application software.
• Transferring data to PC in the USB Drive mode.

Can be used with 3 types of power source

Chose from AC supply, DC supply or the optional battery pack which enables 6 hours^{*6} of continuous measurement. The power source is automatically switched to the battery pack when the AC power supply is interrupted. If the capacity of the battery pack goes low then measurement is automatically terminated and the captured data file is closed and protected.

*6: DC power drive cable and battery pack are optional extras. Measuring time by using the battery pack varies on the conditions.

Maximum sampling rate of up to 10ms

Provides faster sampling rates for voltage measurements. Can achieve 10ms sampling interval when limiting the number of channels in use.

| Sampling interval | 10ms | 20ms | 50ms | 100ms | 1s |
|-------------------------|---------|------|------|-------|----|
| Number of channels | 1 | 2 | 5 | 10 | 10 |
| Measuring ^{*2} | Voltage | X | X | X | X |
| | Temp. | N/A | N/A | N/A | X |

X: selection is available, N/A: selection is not available.
*2: For humidity measurements, the 0-1V range and scaling function are used to display results directly in Relative Humidity. Sampling rate limitations are same as those for voltage measurement.

Built-in 2GB Flash Memory for reliable long term measurement

The 2GB Flash Memory enables secure long term data measurement without using an external storage device. Data is retained even when power is turned off because flash memory is used. Also supports popular USB memory sticks for external storage. The GL220 saves measured data directly to USB memory sticks. USB memory sticks can be replaced during measurement without data loss.

Capturing time^{*3} (10 Analogue channels being used.)

| Sampling interval | 10ms ^{*4} | 50ms ^{*4} | 100ms | 200ms | 500ms | 1s | 10s |
|--------------------------------------|--------------------|--------------------|---------|----------|----------|----------|------------|
| Built-in 2GB Flash Memory | 38 days | 83 days | 97 days | 194 days | 485 days | 971 days | 9,714 days |
| 512MB USB memory stick ^{*5} | 9 days | 21 days | 24 days | 49 days | 124 days | 248 days | 2,481 days |

*3: The above figures are approximate. *4: The sampling rate is limited by the number of channels in use. (10ms: 1ch, 50ms: 5ch) *5: Standard USB memory devices without high-end functions such as fingerprint recognition are required.

Ring memory function

The most recent data is saved when internal memory or external memory is configured in ring memory mode. (Captured data size in ring memory mode is limited to 1/3 of available memory.)

Useful functions

Alarm output function

Alarm signals can be output when alarm conditions occur.^{*7} Four alarm output ports are fitted.

External sampling function

Captured data can be synchronized with external timing signals when the external sampling rate function is used.^{*7}

Calculation function

Measured data can be compared with other channels in real-time. Four arithmetic functions can be selected. The calculation result is saved as measured data when the built-in memory or the USB memory stick is selected as the destination for the captured data.

*7: The Logic/Alarm cable, (B-513 option), is needed to connect the alarm output ports.

Easy application software

Various measurement screens

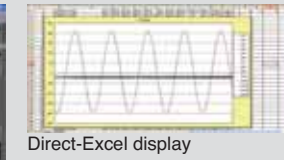
Select from 4 screens such as the Y-T (waveform + digital), Y-T (large waveform), digital view and report view to display measurements in real time. The direct-Excel function enables captured data to be written directly to an Excel file.



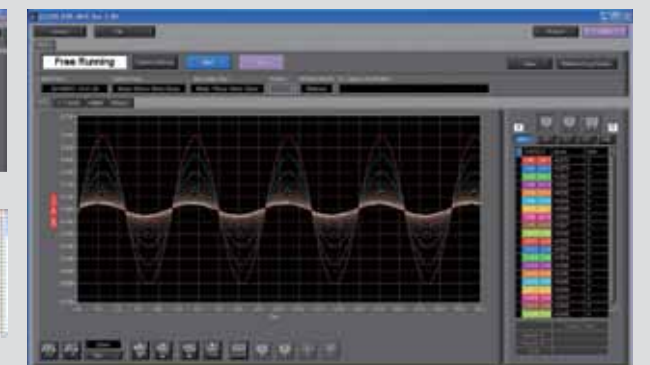
Report display



Digital display



Direct-Excel display



Waveform (Y-T) display

Substantial data replay screens

Three screens such as the Y-T (waveform), digital and the X-Y graph for specified data are available to view measurements in replay mode. The maximum, minimum, average and peak-to-peak values between cursors are indicated in the digital display screen.



Digital display



X-Y (specified data) display

Simple configuration screens

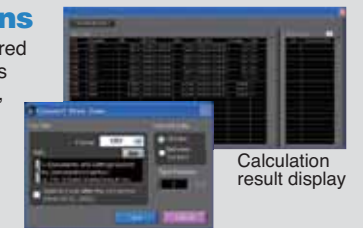
The number of configuration screens has been reduced to five. Parameters can be set easily while viewing measured waveforms.



AMP parameter setting screen

Useful functions

Post-process your captured data with useful functions for arithmetic calculation, statistical calculation, search and file format conversion.



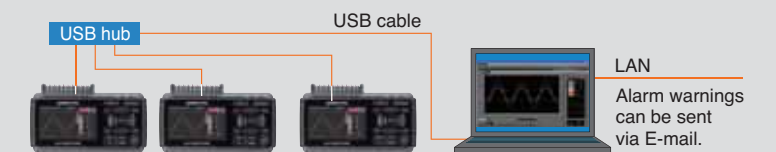
Calculation result display

File format conversion screen

Up to 10 units can be controlled from one PC

Up to 10 units^{*8} can be connected to 1 PC. Measurements can be performed simultaneously or independently.

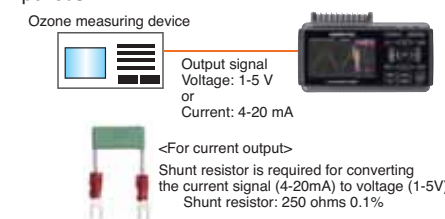
*8: Display data and create data files from individual GL220s in either simultaneous measurement mode or individual measurement mode.



Typical applications for the GL220 midi LOGGER

Recording data from an analyser

Capture signals from an ozone measuring device to record changes in ozone concentration over long periods.



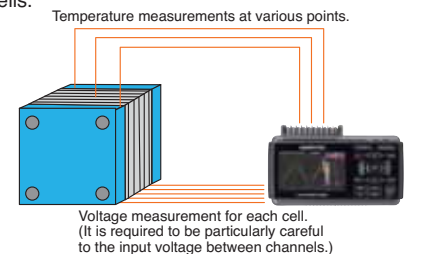
Measuring temperature in an environmental chamber

Recording temperature of electronic components in an environmental chamber during an evaluation test.



Evaluation tests for batteries

Measuring cell voltage and temperatures of fuel cells. (It is required to be particularly careful to the input voltage between channels.)



midi LOGGER series Voltage | Temp. | Humidity | Pulse | Logic

Suitable for multi-channel measurement

- Standard 20ch analog input, expandable up to 200ch
- All isolated channels, each with multifunction input
- Large easy-to-read 5.7-inch VGA TFT color LCD
- Built-in 2GB Flash memory
- Supports USB and LAN



midi LOGGER GL820



midi LOGGER GL900 series

Suitable for measuring high-speed phenomena

- 4 or 8 isolated channels, each with multifunction input
- High-speed simultaneous sampling up to 10μs, 16-bits resolution
- Large easy-to-read 5.7-inch TFT color LCD
- Includes X-Y graph display function in real-time
- Captured data can be saved to PC-friendly USB memory stick