GRAPHTEC

Isolated input, multi-channel logger
midi LOGGER
GL820

GL820 main unit specifications

Item		Description
Number of analog input channels		20 ch, Expandable up to 200 ch by unit of 20 ch
External input output	Input [*9]	Trigger or Sampling input 1 ch, Logic or Pulse input 4 ch
	Output [*8]	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 triggerr
	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, 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
	Alarm output [*8]	4 channels, Output type: Open collector (pulled-up to 5 V by resistor 10 kΩ)
Pulse input function [*9]	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.
	Max. input pulse rate	50 k pulses/sec or 50k counts per sampling interval (16 bits counter is used)
Calculation function	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		Ethernet (10 BASE-T/100 BASE-TX), USB (Full speed)
Storage device		Built-in Flash memory (2 giga-bytes), USB memory device [*9]
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 when in Ring Mode)
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	5.7 inch TFT color LCD (VGA: 640 x 480 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) [*10], Battery pack [*10]
Power consumption		32 VA or lower (when operating with AC adapter, displaying LCD, charging battery pack)
External dimensions (W×D×H)		approx. 232 x 152 x 50 mm
Weight		approx. 900 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 GL820, Real-time data capture, Replay data, Data format conversion
GL820 settings control	Input settings, Memory settings, Alarm settings, Trigger settings
Controlled units	Up to 10 units or 500 channels
Captured data	Transfers data in real-time (in binary or CSV format), saved data in GL820 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 reply only)
Warning functions	Sends E-mail to the specified address when the alarms occur
File format conversions	Converts the specified period data or all data to the CSV format (thinning function is available)
Report functions	Creates the daily or monthly report automatically (can also export directly to Excel)

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 [*12]	B-530	3 m long (with power plug)
Extension terminal base kit	B-537	Terminal base, cable
20 ch extension terminal set	B-538	Terminal base, terminal unit (20 ch), fixing plate

Logic alarm cable (B-513) | DC drive cable (B-514) | Battery pack (B-517) | Humidity sensor (B-530) [*12] | Extension terminal base kit (B-537) | 20ch extension terminal set (B-538)
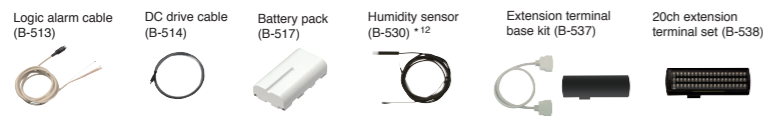
[*12]: Operating environment : -25°C to 80°C

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)
		Resistance Temperature Detectors (RTDs): Pt100, JPt100(JIS), Pt1000(IEC751)
	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 [*11]	Voltage	0.1 % of F.S.

		Thermocouple	Measurement range	Measurement accuracy
Temperature		R/S	0 °C ≤ TS ≤ 100 °C	± 5.2 °C
			100 °C ≤ TS ≤ 300 °C	± 3.0 °C
			R: 300 °C < TS ≤ 1600 °C	± (0.05 % of reading + 2.0 °C)
			S: 300 °C < TS ≤ 1760 °C	± (0.05 % of reading + 2.0 °C)
		B	400 °C ≤ TS ≤ 600 °C	± 3.5 °C
			600 °C < TS ≤ 1820 °C	± (0.05 % of reading + 2.0 °C)
		K	-200 °C ≤ TS ≤ -100 °C	± (0.05 % of reading + 2.0 °C)
			-100 °C < TS ≤ 1370 °C	± (0.05 % of reading + 1.0 °C)
		E	-200 °C ≤ TS ≤ -100 °C	± (0.05 % of reading + 2.0 °C)
			-100 °C < TS ≤ 800 °C	± (0.05 % of reading + 1.0 °C)
		T	-200 °C ≤ TS ≤ -100 °C	± (0.1 % of reading + 1.5 °C)
			-100 °C < TS ≤ 400 °C	± (0.1 % of reading + 0.5 °C)
		J	-200 °C ≤ TS ≤ -100 °C	± 2.7 °C
			-100 °C < TS ≤ 100 °C	± 1.7 °C
			100 °C < TS ≤ 1100 °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	
		RTD	Measurement range	Measurement accuracy
		Pt100	-200 °C to 850 °C (FS = 1050 °C)	±1.0 °C
		JPt100	-200 °C to 500 °C (FS = 700 °C)	±0.8 °C
		Pt1000	-200 °C to 500 °C (FS = 700 °C)	±0.8 °C

Item		Description
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)

[*8] : 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
[*9] : Size of the USB memory device is unlimited. Maximum file size is limited to 2GB.
[*10]: DC drive cable (B-514) or battery pack (B-517) option is required.
[*11]: Subject to the following conditions;
• Room Temperature is 23°C ±5°C.
• When 30 minutes or more have elapsed after power was turned on.
• Filter is set to 10.
• Sampling rate is set to 1s with 20 channels.
• GND terminal is connected to ground.

GRAPHTEC
Graphtec Corporation

CE

ER131006 Vol.1

Voltage | Temp. | Humidity | Pulse | Logic

- Modular system allows expansion up to 200 channels
- All channels are isolated, each with multifunction input
- Huge built-in 2GB Flash memory
- Large easy-to-read 5.7-inch TFT colour LCD
- PC-friendly, supports USB memory stick, has USB and LAN ports

http://www.graphteccorp.com

NEW

Huge 2GB Flash Memory, modular system allows expansion up to 200 channels

NEW

Isolated channels, each with multifunction input

It contains an isolated input system which ensures that signals are not corrupted by inputs to other channels, thus eliminating wiring concerns. The GL820s multi-type inputs are suitable for voltage, temperature, humidity, pulse, and logic signals, enabling combined measurements of different phenomena like temperature/humidity and voltage.
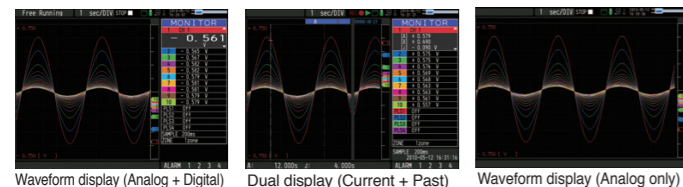
Voltage	▶ Ranges from 20 mV to 50 V
Temp.	▶ Thermocouple types: K, J, E, T, R, S, B, N, W (WRe5-26) RTD types: Pt100(IEC751), JPt100(JIS), Pt1000(IEC751)
Humidity	▶ 0 to 100%RH using the optional humidity sensor(B-530 option)
Pulse	▶ 4 channels[1] Accumulating, Instant or RPM
Logic	▶ 4 channels[1]

*1: Select either Pulse input or Logic input, and use the optional Logic/Alarm cable (B-513 option)

Screw type input terminals (M3 screws) are used

5.7-inch VGA TFT colour LCD

Utilises a bright clear 5.7-inch wide TFT color LCD monitor (VGA: 640 x 480 dots). Makes it easy to read data in waveform or digital form and to check your measurement parameter settings.

Digital display

Waveform display (Analog + Digital) Dual display (Current + Past) Waveform display (Analog only)

Standard unit has 20 analogue input channels, expandable up to 200 channels

The standard configuration has 20 analogue input channels. It can be expanded up to 200 channels by adding optional 20 channel extension terminal kits.

The following shows how a standard configuration is expanded to 60 channels.

1. The terminal unit is removed from the GL820.

Terminal unit

2. The extension terminal base (B-537) is connected to the GL820 using the cable.

Extension terminal base kit (B-537 option)

3. The terminal unit that was removed from the GL820 is connected to the extension terminal base (B-537).

Terminal unit

4. Two additional 20ch extension terminal sets (B-538) are also connected to the extension terminal base (B-537).

20ch extension terminal set (B-538 option)
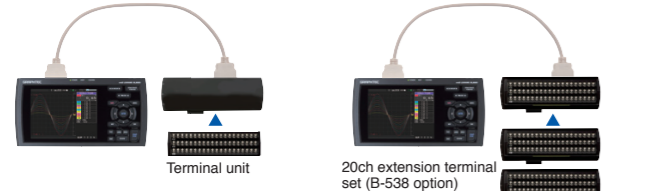
Configuration for additional channels

Number of channels	20ch	40ch	100ch	200ch
GL820 unit	1set	1set	1set	1set
Extension terminal base kit (B-537)	N/A	1set	1set	1set
20ch extension terminal set (B-538)	N/A	1set	4sets	9sets

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	200ms	500ms	1s	2s
Number of channel		1	2	5	10	20	50	100	200
Measuring[2]	Voltage	X	X	X	X	X	X	X	X
	Temp.	N/A	N/A	N/A	X	X	X	X	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 GL820 saves measured data directly to USB memory sticks. USB memory sticks can be replaced during measurement without data loss.

Capturing time[3] (20 Analogue channels being used.)

| Sampling interval	10ms[4]	50ms[4]	100ms[4]	200ms	500ms	1s	10s
Built-in 2GB Flash Memory	29 days	72 days	89 days	101 days	253 days	506 days	5068 days
512MB USB memory stick[5]	7 days	18 days	22 days	25 days	64 days	129 days	1294 days

*3: The above figures are approximate. *4: The sampling rate is limited by the number of channels in use. (10ms: 1ch, 50ms: 5ch, 100ms: 10ch) *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.)

Supports USB memory devices, Easy connection to PC via USB or Ethernet

Captured data can be saved directly to USB memory sticks when these are chosen for external storage. In addition, the GL820 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 GL820 can emulate an external USB drive for quick data transfer. The WEB & FTP server function, FTP client-server function and NTP client function are supported when the GL820 is connected to the LAN via the Ethernet port.
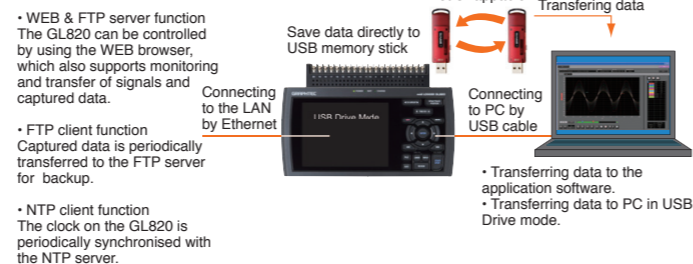
• WEB & FTP server function
The GL820 can be controlled by using the WEB browser, which also supports monitoring and transfer of signals and captured data.

• FTP client function
Captured data is periodically transferred to the FTP server for backup.

• NTP client function
The clock on the GL820 is periodically synchronised with the NTP server.

Save data directly to USB memory stick
Hot-swappable Transfering data
Connecting to the LAN by Ethernet
Connecting to PC by USB cable

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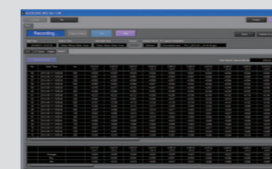
Alarm output function

Alarm signals can be output when alarm conditions occur.[6] Four alarm output ports are fitted.

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

Easy application software
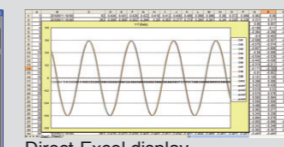
Various measurement screens

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.
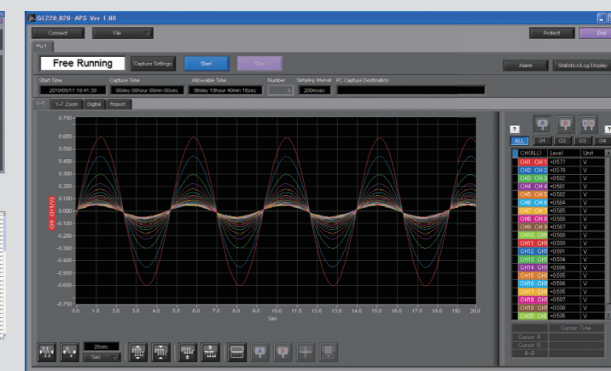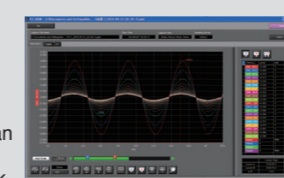
Digital display
Report display
Direct-Excel display
Waveform (Y-T) display

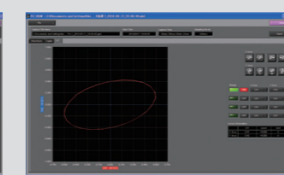### Informative data replay screens

Three screens are available to view measurements in replay mode. The Y-T (waveform) display, the digital display and the X-Y graph can be selected to show your specified data. The maximum, minimum, average and peak-to-peak values between cursors are shown when using the digital display screen.

Waveform (Y-T) display
Digital display
X-Y (specified data) display
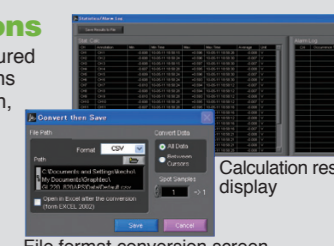
Simple configuration screens

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 500 channels can be controlled from one PC

Up to 500 channels or 10 units[7] can be connected to 1 PC through LAN or USB.
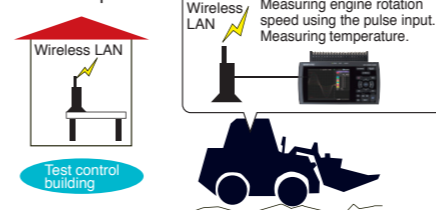Measurements can be performed simultaneously or independently.

*7: Display data and create data files from individual GL820s in either simultaneous measurement mode or individual measurement mode.

HUB LAN/USB cable LAN
Alarm warnings can be sent via E-mail.
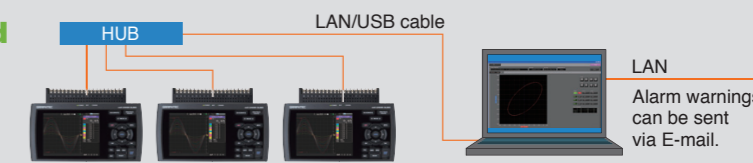
## Typical applications for the GL820 midi LOGGER

Site testing of construction vehicles

Temperature and rotation speed of the engine on the bulldozer are measured. A wireless LAN is used for remote operation.

Test control building
Wireless LAN
Wireless LAN Measuring engine rotation speed using the pulse input. Measuring temperature.

Evaluation testing of office equipment

Temperature and humidity of critical parts on the photocopy machine are measured.

Humidity
Thermocouples
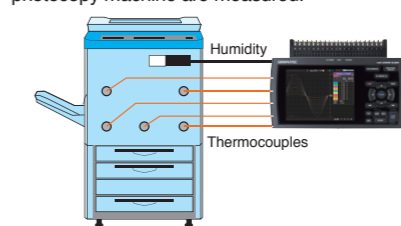
Evaluation test of household equipment

Temperatures and flow rates on the water heater are measured.

Flow & Temperature
Connecting by LAN
Measurement is controlled by PC
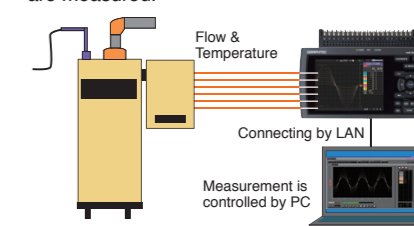
midi LOGGER series

Voltage | Temp. | Humidity | Pulse | Logic

Suitable for measurement of up to 10 channels

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

midi LOGGER GL220

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

midi LOGGER GL900 series