

# GL220 midi Logger

**Built-in 4.3" WQVGA TFT  
LCD Color Display**

**Stand-alone or PC-  
connected operation**

**10 Analog Channels**

**Input-to-output &  
channel-to-channel  
Isolation**

**USB PC Interface**



With its color monitor and internal memory the GL220 is a compact, lightweight, multi-channel data logger that provides 10 analog measurement channels, in addition to four channels each of discrete logic and pulse inputs. The GL220 also supports one external trigger input and four alarm outputs. The GL220 is equipped with a 2 GB internal flash memory to allow the direct capture of acquired data, and its built-in USB port may be used to connect any standard USB flash drive for incremental capacity. Alternatively, the USB interface may be connected to a PC to allow data upload in real time or from memory, as well as remote configuration and real time data acquisition.

## **Wide Voltage Measurement Range**

Each GL220 analog channel can measure from 20 mV to 50 VFS across eleven programmable measurement ranges.

## **Full Electrical Isolation Per Channel**

Each analog GL220 channel is electrically isolated from all others and from instrument ground to allow accurate and safe measurements in industrial applications where ground potential differences are common.

## **Humidity Measurements**

Use the GL220 to measure humidity with an optional sensor.

## **Voltage, Current, and Temperature Measurements**

Use the GL220 to measure voltages, currents, 4-20 mA process currents, as well as thermocouple-based temperatures.

## **Four Pulse Inputs for Speed and Counting Measurements**

The GL220 provides four discrete input channels that can be used for counting and rotational speed measurement applications.

## **Real Time and Post-recorded Calculations**

The GL220 may be programmed to calculate average value, peak value, minimum value, rms and arithmetic operations.

## **Four Alarm Outputs**

Program the GL220 to trigger its alarm outputs as a function of analog input signal level judgment, pulse judgment, or logic pattern.

## **Wide Sample Interval Selections**

Sample intervals can be programmed to be one of sixteen values ranging from 10 ms to one hour.

## **Bright TFT LCD Color Display**

The focal point of the GL220 is its 4.3" built-in WQVGA color display that allows real time trending, data review, and complete instrument configuration.

## **Engineering Units Scaling**

Each GL220 channel allows up to four break points to be programmed for accurate scaling into meaningful units like psi, grams, newtons, gallons per minute, etc.

## **Features**

## **Total of Four Discrete Inputs for Logic Measurements**

Use the GL220 to measure the binary status of any external system.

## **Flexible Triggering Options**

The GL220 allows data capture to be started or stopped based upon signal level, an external event, date/time, alarm, duration, or Boolean channel combinations. Analog signal triggers can be programmed based upon level and window tests: above threshold, below threshold, inside window, or outside window.

## **Flexible Power Requirements**

Power the GL220 from its provided international AC adaptor, from an optional built-in battery pack, or from any 9 to 24 VDC source using an optional cable.

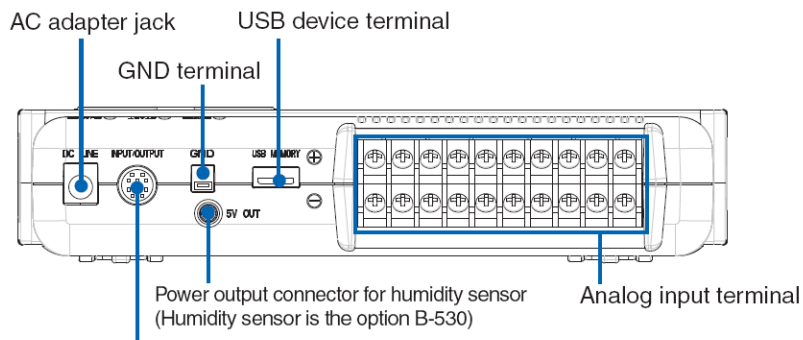
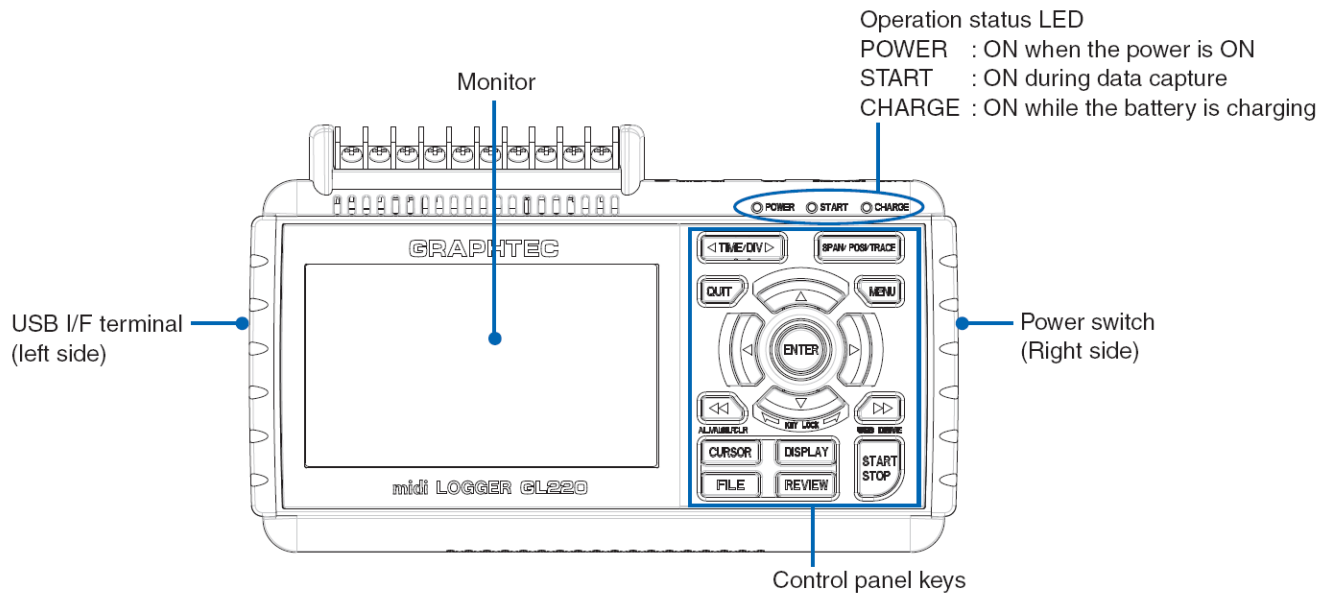
## **PC Connectivity and Memory Expansion via USB Interface**

Allows data transfer to the PC either in real time or from the GL220's memory. Also allows complete configuration of the GL220. Connect any standard USB Flash Drive to the USB port for external memory expansion.

## **PC Software Bundle Included**

The GL220 includes a Windows application for direct capture, measurement, and monitoring of GL220 data. In addition to waveform and data value capture and display, the application can export data to an Excel file for further analysis and report creation. The software includes built-in help for quick reference.

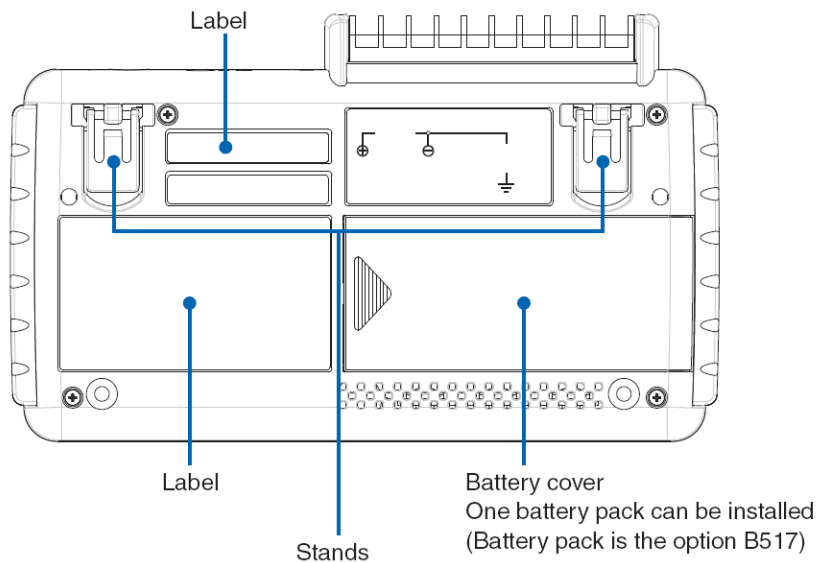
## GL220 Display, I/O, and Control Overview



External input/output terminals

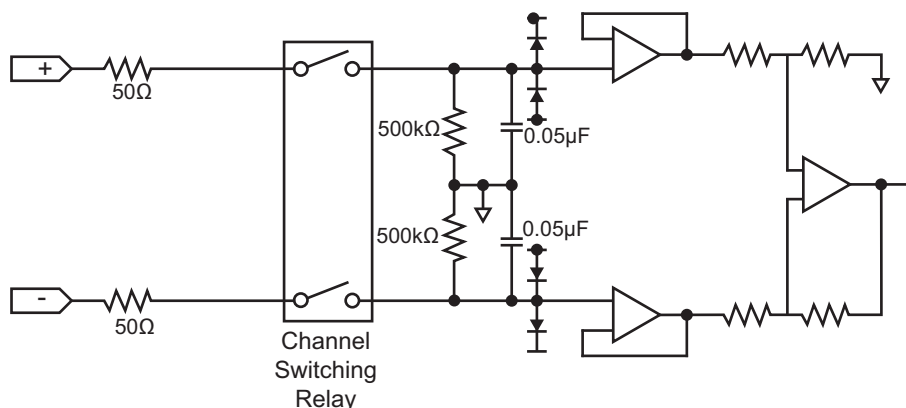
- LOGIC/PULSE
- EXT TRIG/SAMPLE
- ALARM

Logic alarm cable(When using the B-513 option)



## GL220 Analog Input Circuit and Measurement Ranges

Each GL220 analog input channel features electrical isolation using a photo MOS relay switching method to maintain safe and accurate measurements in demanding industrial environments.



### Voltage Measurement Ranges per Channel

| Range | Maximum SPAN         | Minimum SPAN | Minimum Resolution |
|-------|----------------------|--------------|--------------------|
| 20mV  | -22.000 to +22.000mV | 0.200mV      | 0.001mV            |
| 50mV  | -55.00 to +55.00mV   | 0.50mV       | 0.01mV             |
| 100mV | -110.00 to +110.00mV | 1.00mV       | 0.01mV             |
| 200mV | -220.00 to +220.00mV | 2.00mV       | 0.01mV             |
| 500mV | -550.0 to +550.0mV   | 5.0mV        | 0.1mV              |
| 1V    | -1.1000 to +1.1000V  | 0.0100V      | 0.0001V            |
| 2V    | -2.2000 to +2.2000V  | 0.0200V      | 0.0001V            |
| 5V    | -5.500 to +5.500V    | 0.050V       | 0.001V             |
| 10V   | -11.000 to +11.000V  | 0.100V       | 0.001V             |
| 20V   | -22.000 to +22.000V  | 0.200V       | 0.001V             |
| 50V   | -55.00 to +55.00V    | 0.50V        | 0.01V              |

### Process Current Measurement (with external 250-ohm resistor)

| Range | Maximum SPAN      | Minimum SPAN | Minimum Resolution |
|-------|-------------------|--------------|--------------------|
| 1-5 V | -5.500 to +5.500V | 0.050V       | 0.001V             |

### Temperature Measurement Ranges per Channel (note no RTD measurements)

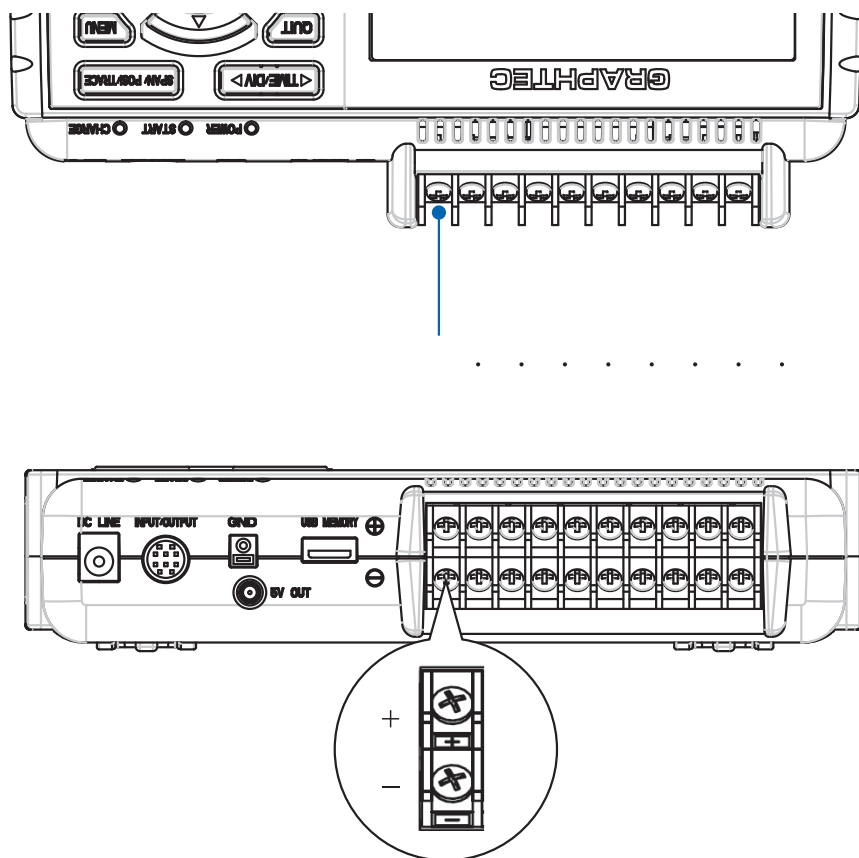
| Range | Maximum SPAN    | Minimum SPAN | Measurement Range | Minimum Resolution |
|-------|-----------------|--------------|-------------------|--------------------|
| K     | -270 to +2000°C | 50°C         | -200 to +1370°C   | 0.1°C              |
| J     |                 |              | -200 to +1100°C   |                    |
| T     |                 |              | -200 to +400°C    |                    |
| R     |                 |              | 0 to +1600°C      |                    |
| E     |                 |              | -200 to +900°C    |                    |
| B     |                 |              | +600 to +1920°C   |                    |
| S     |                 |              | 0 to +1760°C      |                    |
| N     |                 |              | 0 to +1300°C      |                    |
| W     |                 |              | 0 to +2315°C      |                    |

### Optional Humidity Measurement Range

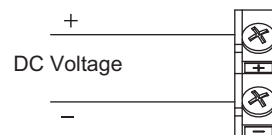
| Range     | Maximum SPAN | Minimum SPAN | Minimum Resolution |
|-----------|--------------|--------------|--------------------|
| 0 to 100% | 0 to +110%   | 1.0%         | 0.1%               |

# Typical GL220 Analog Signal Connections

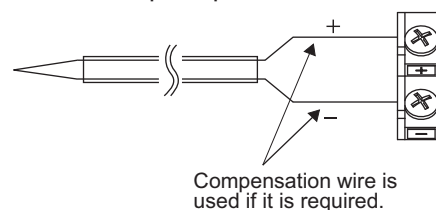
## Analog Input Terminal Configuration



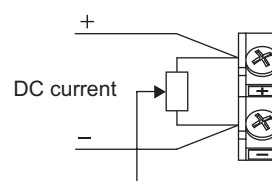
### Voltage input



### Thermocouple input



### Current input



Shunt resistor

Ex: The current is converted to the voltage in the shunt resistor.

For 4 to 20mA current input, installing 250 ohms (0.1%) resistor for converting 1 to 5V.

- + ..... High -voltage terminal (terminal for high voltage signals)
- ..... Low-voltage terminal (terminal for low-voltage input signals)

| Item                | Description   |
|---------------------|---|
| Input configuration | Isolated input, scanning  |
| Analog voltage      | 20, 50, 100, 200, 500 mV/F.S.; 1, 2, 5, 10, 20, 50, V/F.S.; 1-5V  |
| Thermocouples       | K, J, E, T, R, S, B, N, W (WRe 5-26)  |
| A/D resolution      | 16-bit (Effective resolution: About 1/40,000 of the +/- range)  |
| Filter              | Off, 2, 5, 10, 20, 40<br>Filter operation is on a moving average basis.<br>The average value of the set sampling count is used. |

| Usable Channels at Different Sampling Speeds |              |      |      |      |       |    |
|--|--------------|------|------|------|-------|----|
| Sampling Speed:                              |              | 10ms | 20ms | 50ms | 100ms | 1s |
| Number of usable channels:                   |              | 1    | 2    | 5    | 10    | 10 |
| Measurement phenomenon                       | Voltage:     | •    | •    | •    | •     | •  |
|  | Temperature: |      |      |      | •     | •  |

## Program the GL220 for Real-World Trigger Conditions

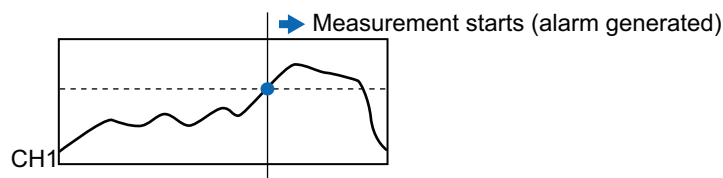
The GL220 can adapt to just about any trigger condition you might encounter. Data recording can be stopped or started as a function of analog signal level, a definable alarm condition, an external event, or specific date and time. Beyond initiating a data capture cycle, the GL220 can also be programmed to set a digital output to flag an external alarm condition. And after a trigger condition is executed you can program the GL220 to automatically rearm itself to wait for another trigger event, or stop entirely. You can even program the GL220 to detect and alarm on a thermocouple burnout condition. Here's a summary of the GL220's trigger and alarm features:

### GL220 Trigger and Alarm Overview

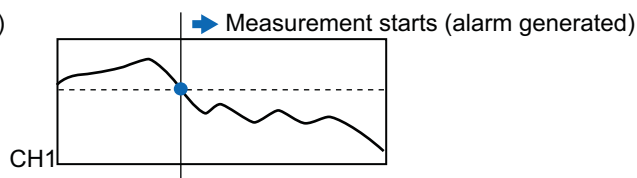
| Setting                   |                    | Selections Available  |
|---------------------------|--------------------|---|
| Start side source setting |                    | Off, Level, Alarm, External Input, Time, Day, Duration  |
|                           | [Level]            | Mode: Analog: Off, ↑H, ↓L, Window In, Window Out; Logic: Off, ↑H, ↓L; Pulse: Off, ↑H, ↓L, Window In, Window Out |
|                           |                    | Combination: Level OR, Level AND, Edge OR, Edge AND   |
|                           |                    | Level: Set numeric value  |
|                           | [Alarm]            | Alarm port #: 1•2•3•4   |
|                           | [Date]             | Date: From 2005.1.1 to 2035.12.31   |
|                           |                    | Time: From 0:0:0 to 23:59:59  |
|                           | [Weekly]           | Day of week: Off or On setting for each of Sunday through Saturday  |
|                           |                    | Time: From 0:0:0 to 23:59:59  |
|                           | [Time]             | From 0:0:1 to 9999:59:59  |
| Stop side source setting  | [Level]            | Mode: Analog: Off, ↑H, ↓L, Window In, Window Out; Logic: Off, ↑H, ↓L; Pulse: Off, ↑H, ↓L, Window In, Window Out |
|                           |                    | Combination: Level OR, Level AND, Edge OR, Edge AND   |
|                           |                    | Level: Set numeric value  |
|                           | [Alarm]            | Alarm port #: 1•2•3•4   |
|                           | [Date]             | Date: From 2005.1.1 to 2035.12.31   |
|                           |                    | Time: From 0:0:0 to 23:59:59  |
|                           | [Weekly]           | Day of week: Off or On setting for each of Sunday through Saturday  |
|                           |                    | Time: From 0:0:0 to 23:59:59  |
|                           | [Time]             | From 0:0:1 to 9999:59:59  |
| Repeated capturing        |                    | Off, On   |
| Alarm level settings      | Mode               | Analog: Off, ↑H, ↓L, Window In, Window Out; Logic: Off, ↑H, ↓L; Pulse: Off, ↑H, ↓L, Window In, Window Out       |
|                           | Level              | Set numeric value   |
|                           | Output             | 1•2•3•4   |
|                           | Detection Method   | Level, Edge   |
|                           | Alarm Hold         | On, Off   |
|                           | Send Burnout Alarm | On, Off   |

### GL220 Trigger Modes

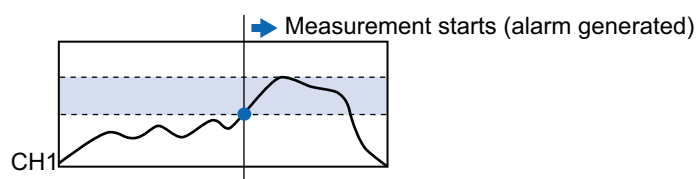
#### Above Threshold



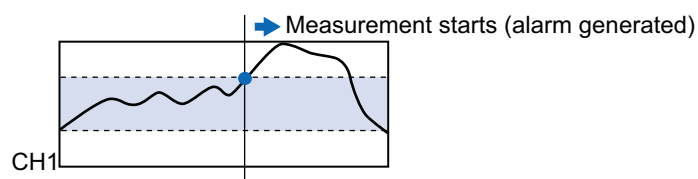
#### Below Threshold



#### Inside Window



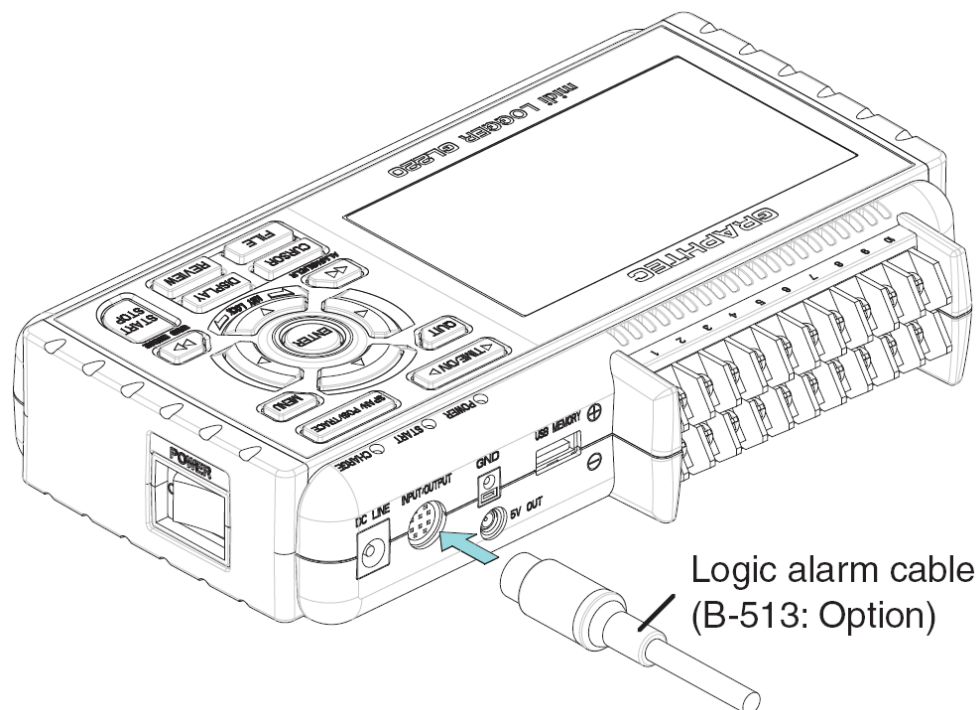
#### Outside Window



## GL220 Logic, Pulse, Alarm, and External Trigger Connections

The logic alarm cable (B-513: Option) allows access to the GL220's logic/pulse input, external trigger input, external sampling input, and alarm signal output.

Connect the logic alarm cable (B-513: Option) to the external input/output terminal as shown below.



### Logic/Pulse Specifications

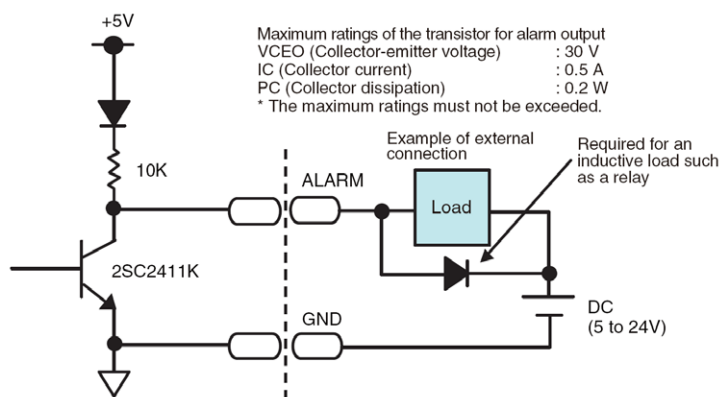
| Item                     | Description                                |
|--------------------------|--|
| Number of input channels | 4  |
| Input voltage range      | 0 to +24V max. (single-ended ground input) |
| Threshold level          | Approx. +2.5V                              |
| Hysteresis               | Approx. 0.5 V (+2.5 to +3 V)               |

### Trigger input/external sampling input specifications

| Item                     | Description                                |
|--------------------------|--|
| Number of input channels | 1  |
| Input voltage range      | 0 to +24V max. (single-ended ground input) |
| Threshold level          | Approx. +2.5V                              |
| Hysteresis               | Approx. 0.5 V (+2.5 to +3 V)               |

### Alarm output specifications and Circuit

| Item                      | Description  |
|---------------------------|--|
| Number of output channels | 4  |
| Output format             | Open collector output<br>+5V, pull-up resistance 10 K $\Omega$ |

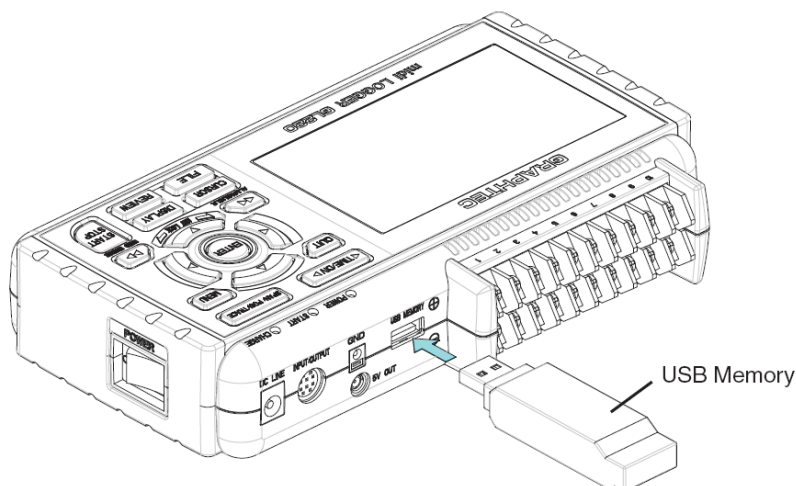




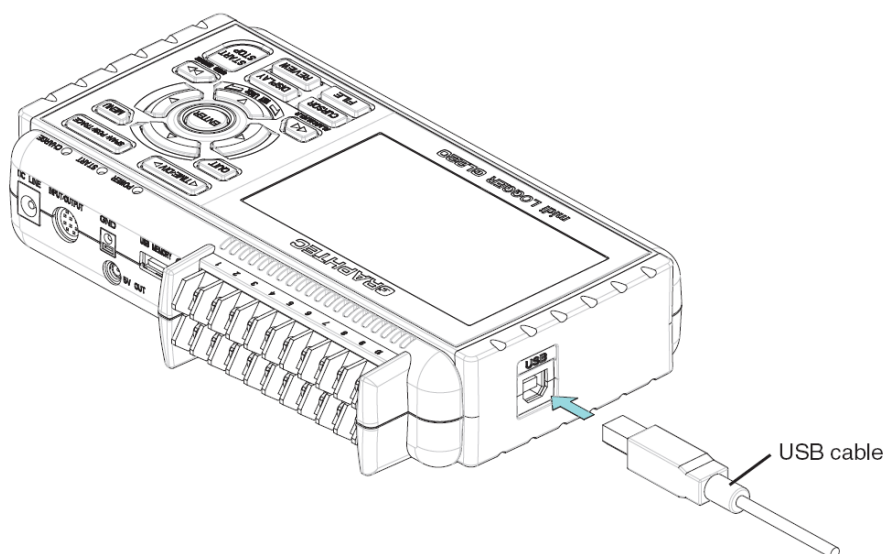
## External Memory and USB Connections, and an Optional Battery Pack

The GL220 provides the added benefit of PC connectivity to its USB port, which doubles as a method to expand the GL220's internal 2 GB memory using standard USB flash memory. Flash drives may be hot-swapped as they fill to accommodate long term measurements. When the USB port is connected to a PC you can upload measurement protocols to the GL220, monitor acquired data in real time, or download previously acquired data. Up to ten GL220's may be simultaneously connected to one PC through USB hubs (there is no synchronization between units). Finally, an optional battery pack may be added to the GL220 to allow power-independent data recording whenever and wherever it's required.

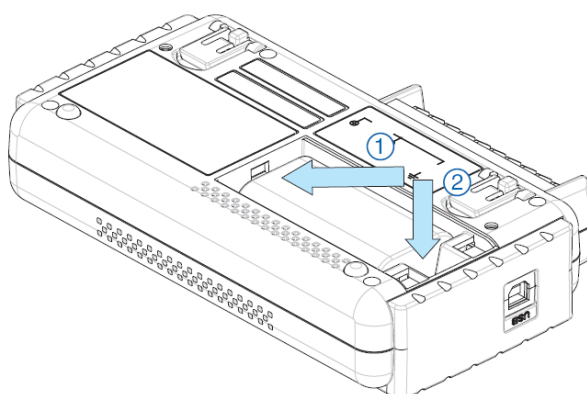
### USB Flash Drive Memory Expansion



### USB-to-PC Interface Connection



### Optional B-517 Battery Pack

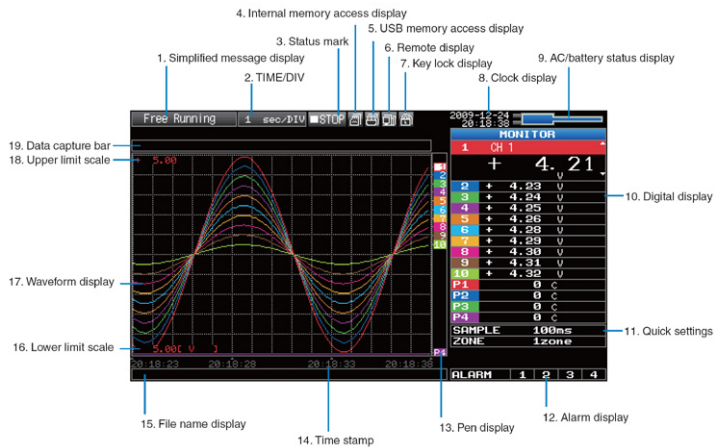


## GL220 Display Quick-look

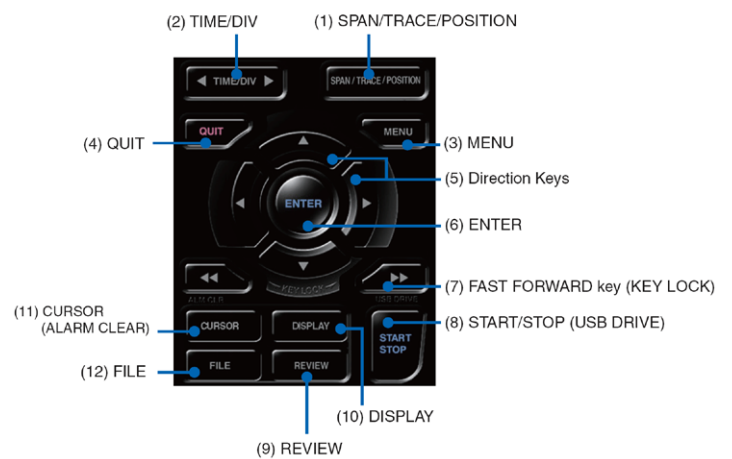
The GL220's keyboard and display are key components you'll use for any typical data recording session. The display is a full color TFT LCD (thin-film transistor liquid crystal display), the same technology used in modern flat-panel televisions. The display measures 4.3 inches diagonally, and offers  $480 \times 272$  pixels of bright, clear, high contrast resolution. The GL220's keyboard allows full access to the instrument's menu system as viewed through its display. Navigation is straightforward and intuitive using the keyboard's navigation and ENTER keys that form the center of the array. Other keys support special operations that are clearly annotated.

### GL220 Display Close-up and Modes

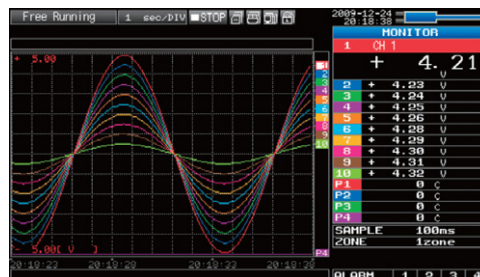
#### Display Close-up



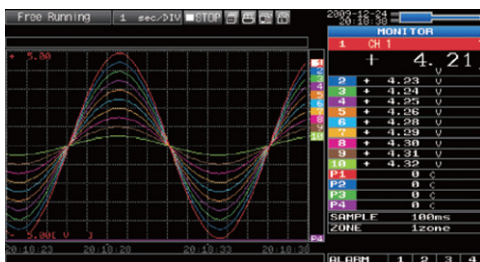
#### Keyboard Close-up



#### MONITOR



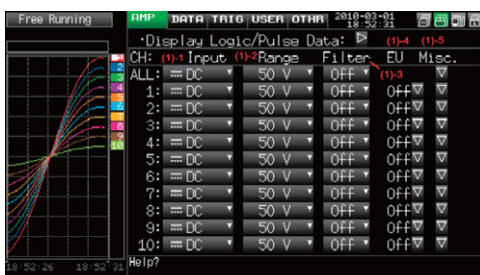
#### Digital Screen



#### Trigger Settings



#### AMP Settings



#### Alarm Settings

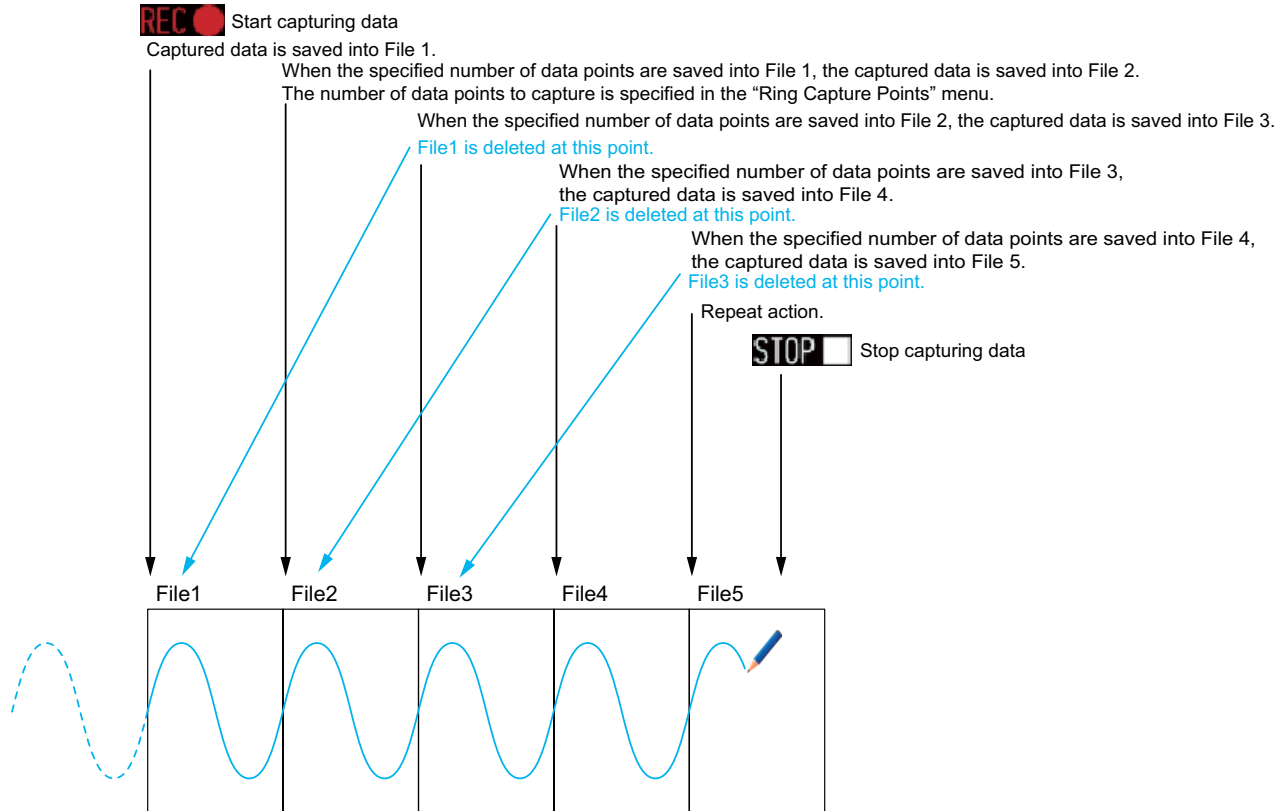




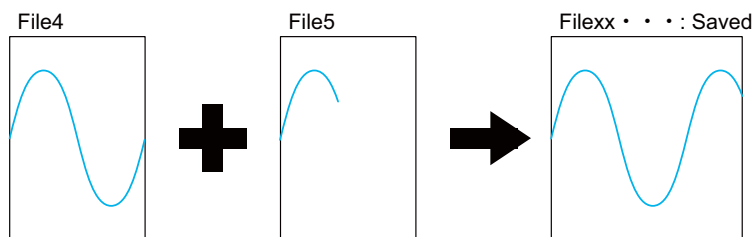
## GL220 “Ring Capture” and External Sampling

The GL220’s ring capture feature provides a continuous recording solution for measurement situations where events need to be recorded, but their occurrence is separated by long and unpredictable time intervals. Ring capture employs a ping-pong memory approach to data recording with a definable memory length, which may be adjusted to ensure that a recorded event is retained long enough for manual intervention to stop recording and allow data retrieval. External sampling allows the GL220 to be marginally synchronized to an external trigger signal.

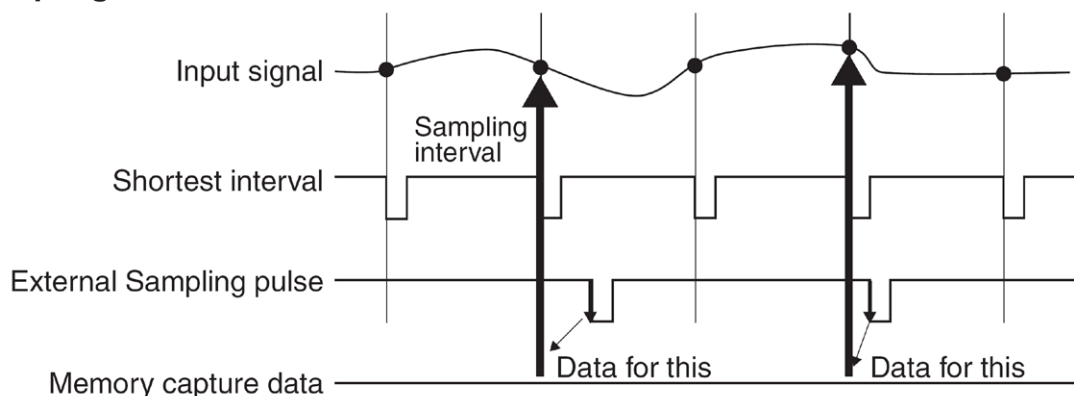
### The Ring Capture Concept



When capturing is stopped at the STOP POINT above, File4 and File 5 remain.  
These files are consolidated into one file and it is saved. The “ring capture” is complete.



### External Sampling



## GL220 Included and Optional Accessories

### Included PC Software

| Item               | Description  |
|--------------------|--|
| Compatible OS      | Windows XP/Vista/Windows 7   |
| Functions          | Main unit control, realtime data capture, data conversion, data replay                       |
| Main unit settings | AMP settings, Data Capture settings, Trigger Alarm settings, Report settings, Other settings |
| Captured data      | Realtime data (CSV, Binary); Internal memory (CSV, Binary); USB memory (CSV, Binary)         |
| Display            | Analog waveforms, logic waveforms, pulse waveforms, digital values                           |
| Display modes      | Y-T View, Digital View, Report View, X-Y View between Cursors (only during replay)           |
| File conversion    | Between cursors, All data, Thinning function   |
| Monitor functions  | Alarm monitor enables sending of email to the specified address                              |
| Report function    | Automatic creation of daily or monthly files   |
| Maximum/Minimum    | The maximum, minimum and current values are displayed during measurement                     |

### Included Accessories

| Item                | Description   |
|---------------------|---|
| Quick Start Guide   | GL220-UM-8 xx   |
| CD-ROM              | GL220-CDM 0 x M (User's Manual, Application software)             |
| AC cable/AC adapter | 100 to 240 VAC, 50/60 Hz, one set of region-specific power cables |

### Optional Accessories

| Item              | Option No. | Description   |
|-------------------|------------|---|
| Battery pack      | B-517      | 7.2V/2200mAh  |
| Logic Alarm Cable | B-513      | Bare tips (2m)  |
| DC power cable    | B-514      | Bare tips (2 m)   |
| Humidity sensor   | B-530      | 3m, with dedicated power connector                        |
| Carrying Case     | B-536      | Durable carrying case designed specifically for the GL220 |

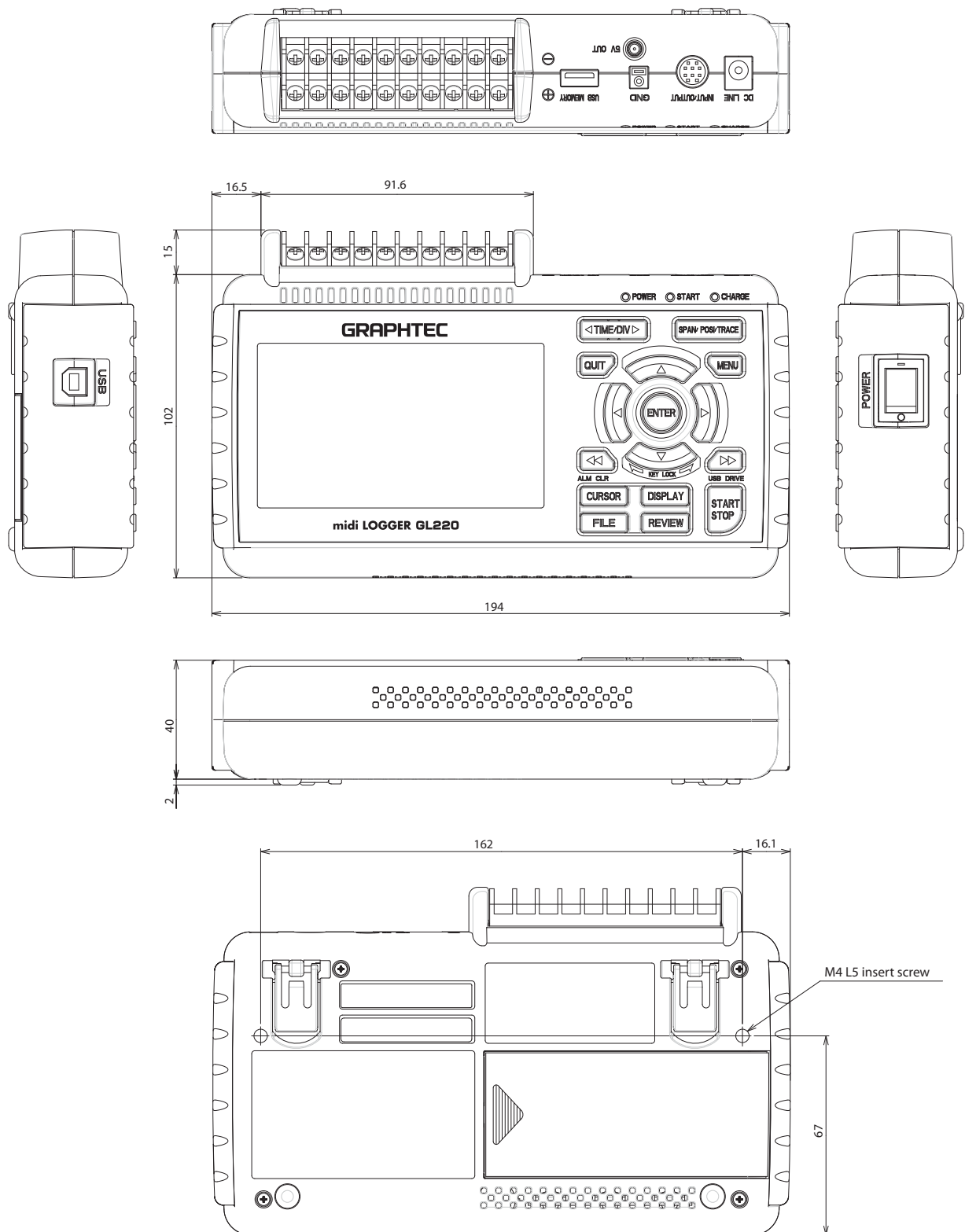
### Optional Battery Pack model B-517

| Item                                    | Description   |
|---|---|
| Capacity                                | 7.4V/2200mAh 17Wh   |
| Battery type                            | Lithium secondary battery   |
| Running time                            | When using the LCD display: approx. 5 hours; When using the screensaver: approx. 6 hours<br>Note: When capturing to internal memory at 1 s, sampling, using new battery packs at +25°C environment.<br>Note: Running time depends on the operating environment, the amount of charge left in the battery and connecting USB memory. |
| Charging method                         | Mount in the main unit, or use a separate battery charger   |
| Time required for charging              | Main unit: approx. 4 hours  |
| Switchover in the case of power failure | Because the battery is used together with the AC adapter, the power supply will be switched automatically to the battery in the event of a power failure. Note: The AC adapter is the primary power source.   |
| Operating environment                   | Running on battery: 0 to 40°C, Battery being charged: 15 to 35°C  |
| Other functions                         | When the battery is running low, measured data is saved and the file is closed automatically (during internal memory and USB memory capture). The remaining battery power is displayed.   |

### Optional Humidity Sensor model B-530

| Item                                   | Description  |
|--|--|
| Allowable temperature range            | -25 to 80°C  |
| Allowable Humidity Range               | 0 to 100%  |
| Relative humidity measurement accuracy | ±3% RH (5 to 98% RH at 25°C)                       |
| Response time                          | 15 s (90% response when membrane filter installed) |
| Sensor output                          | 0 to 1 VDC   |
| Sensor power source                    | 5 to 16 VDC  |
| Power consumption                      | approx. 4mA  |
| External dimensions                    | 14mm × 80 mm (excluding cable)                     |
| Cable length                           | 3m   |

## GL220 External Dimensions



Dimension precision: Error  $\pm 5$  mm  
Unit: mm

# GL220 Specifications

## Overall Specifications

|                                 |  |
|---------------------------------|--|
| <b>Number of analog inputs:</b> | 10 channels  |
| <b>External input/output:</b>   | Trigger input or external sampling pulse/logic input<br>4 channels or pulse input 4 channels, alarm output<br>4 channels   |
| <b>PC interface:</b>            | USB (Full speed) standard  |
| <b>Internal memory devices:</b> | Approx. 2 GB internal memory<br>USB memory slot (Full speed supported) standard  |
| <b>Data backup functions:</b>   | Setup conditions: EEPROM; Clock: lithium battery   |
| <b>Clock accuracy:</b>          | ± 0.002% (approx. 50 seconds per month)<br>(ambient temperature 23°C)  |
| <b>Operating Environment:</b>   | 0 to 45°C, 5 to 85%RH (0 to 40°C when operated<br>in batteries/15 to 35°C when battery is charging)                        |
| <b>Withstand voltage:</b>       | Between each input channel and GND: 1 minute at<br>350 Vp-p; Between each input channels: 1 minute<br>at 350 Vp-p          |
| <b>Power supply:</b>            | AC adapter: 100 to 240 VAC, 50/60 Hz<br>DC input: 8.5 to 24 VDC (max. 26.4 V)<br>Battery pack (option): 7.4 VDC (2200 mAh) |
| <b>Power Consumption:</b>       | AC Power consumption (when AC adapter is<br>used)  |

| Condition      | Normal Consumption | Consumption during battery recharge |
|----------------|--------------------|-------------------------------------|
| LCD on         | 12 VA              | 29 VA                               |
| Screensaver on | 11 VA              | 28 VA                               |

### DC Power consumption

| DC Voltage | Condition      | Normal Consumption | Consumption during battery recharge |
|------------|----------------|--------------------|-------------------------------------|
| +24V       | LCD on         | 0.18 VA            | 0.6 VA                              |
| +24V       | Screensaver on | 0.15 VA            | 0.57 VA                             |
| +12V       | LCD on         | 0.31 VA            | Can't Recharge                      |
| +12V       | Screensaver on | 0.26 VA            | Can't Recharge                      |
| +8.5V      | LCD on         | 0.45 VA            | Can't Recharge                      |
| +8.5V      | Screensaver on | 0.37 VA            | Can't Recharge                      |

|                                     |   |
|-------------------------------------|---|
| <b>External Dimensions:</b>         | 194 × 117 × 42 mm   |
| <b>Weight:</b>                      | 520g (excluding AC adapter and battery)                         |
| <b>Vibration-tested conditions:</b> | Equivalent to automobile parts Type 1 Category A classification |

## PC Interface

|                                       |  |
|---------------------------------------|--|
| <b>Interface types:</b>               | USB (full speed)   |
| <b>Functions:</b>                     | Data transfer to PC (real time, memory)<br>PC control of the GL220 |
| <b>USB functions:</b>                 | USB drive mode: Transfers and deletes file from<br>internal memory |
| <b>Real time data transfer speed:</b> | 10 ms/1ch maximum  |

## Overall Functional Specifications

|                                       |  |
|---------------------------------------|--|
| <b>Display Screen:</b>                | Waveform + Digital screen, All Waveform screen,<br>Digital + Calculation Display screen, Expanded<br>digital screen. (Can be switched using the dedi-<br>cated key (toggle operation). For the Expanded<br>Digital screen, the number of channels and the<br>display channel must be specified.) |
| <b>Sampling interval*:</b>            | 10, 20, 50, 100, 125, 200, 250, 500 ms; 1, 2, 5, 10,<br>20, 30 s; 1, 2, 5, 10, 20, 30 min; 1 h, External<br>(* 50 ms and below can be selected according to<br>input settings and number of measured channels.)  |
| <b>Waveform expansion/contraction</b> | Time axis: 1, 2, 5, 10, 20, 30 sec/Div<br>1, 2, 5, 10, 20, 30 min/Div<br>1, 2, 5, 10, 12, 24 h/Div<br>Voltage axis: variable span  |
| <b>Scaling function:</b>              | 4 points can be set for each channel.  |
| <b>Functions during capture:</b>      | Double-screen display; Exchange of USB memory;<br>Saving of data between cursors   |

|                                      |  |
|--------------------------------------|--|
| <b>Data save functions:</b>          | Capture to internal memory; Capture to USB<br>memory; The setup data can be saved (Main or<br>USB memory); Copy of data screen can be saved<br>(Main or USB memory)  |
| <b>Ring capture:</b>                 | Function: ON, OFF; Number of recording points:<br>1000 to 2000000 (When ring capture is ON, the<br>memory space that can be used for capture is one-<br>third of the free space or less.)  |
| <b>Calculation between Channels:</b> | Calculation type : +, -, ×, ÷; Input target : Analog<br>channels 1 through 10  |
| <b>Statistical Calculation:</b>      | Types of operation : Average value, peak value, max/<br>min value, RMS; Number of operations : 2 max. can<br>be set simultaneously; Calculation method : Realtime<br>calculation and calculation between cursors (during<br>replay) (Realtime calculation results are displayed in<br>the Digital + Calculation Display screen.) |
| <b>Search functions:</b>             | Function: Search the captured data for the required<br>number of points; Search type: Channel Pulse,<br>Logic, Level, Alarm search   |
| <b>Annotation input function:</b>    | Function: A comment can be input for each chan-<br>nel; Inputtable characters: Alphanumerics; Number<br>of characters: 31 (Displayed up to 18 characters in<br>the Waveform + Digital screen or 14 characters in<br>the Digital + Calculation Display screen)  |

## Analog Channel Specifications

|                              |   |
|------------------------------|---|
| <b>Number of inputs:</b>     | 10  |
| <b>Input terminal type:</b>  | M3 screw type terminal  |
| <b>Input method:</b>         | Photo MOS relay scanning system; all channels<br>isolated, balanced input |
| <b>Scan speed</b>            | 10 ms/1 ch maximum  |
| <b>Measurement Ranges</b>    |   |
| <b>Voltage:</b>              | 20, 50, 100, 200, 500 mV; 1, 2, 5, 10, 20, 50 V; 1-5<br>F.S.              |
| <b>Temperature:</b>          | Thermocouples: K, J, E, T, R, S, B, N, W                                  |
| <b>Humidity:</b>             | 0 to 100% (Voltage 0V to 1V scaling conversion)                           |
| <b>Measurement accuracy*</b> |   |
| <b>Voltage:</b>              | 0.1% of Full Scale  |
| <b>Temperature:</b>          |   |

| TC                                      | Measurement Temperature Range (°C) | Measurement Accuracy (°C) |
|---|------------------------------------|---------------------------|
| R/S                                     | 0 ≤ Ts ≤ 100                       | ±5.2                      |
|   | 100 < Ts ≤ 300                     | ±3.0                      |
|   | R: 300 < Ts ≤ 1600                 | ±(0.05% of rdg +2.0)      |
|   | S: 300 < Ts ≤ 1760                 | ±(0.05% of rdg +2.0)      |
| B                                       | 400 ≤ Ts ≤ 600                     | ±3.5                      |
|   | 600 ≤ Ts ≤ 1820                    | ±(0.05% of rdg +2.0)      |
| K                                       | -200 ≤ Ts ≤ -100                   | ±(0.05% of rdg +2.0)      |
|   | -100 < Ts ≤ 1370                   | ±(0.05% of rdg +1.0)      |
| E                                       | -200 ≤ Ts ≤ -100                   | ±(0.05% of rdg +2.0)      |
|   | -100 < Ts ≤ 800                    | ±(0.05% of rdg +1.0)      |
| T                                       | -200 ≤ Ts ≤ -100                   | ±2.7                      |
|   | -100 < Ts ≤ 400                    | ±(0.1% of rdg +0.5)       |
| J                                       | -200 ≤ Ts ≤ -100                   | ±2.7                      |
|   | -100 < Ts ≤ 100                    | ±1.7                      |
|   | 100 < Ts ≤ 1100                    | ±(0.05% of rdg +1.0)      |
| N                                       | 0 ≤ Ts ≤ 1300                      | ±(0.1% of rdg +1.0)       |
| W                                       | 0 ≤ Ts ≤ 2000                      | ±(0.1% of rdg +1.5)       |
| Reference contact compensation accuracy |                                    | ±0.5                      |

|   |   |
|---|---|
| <b>Reference contact compensation accuracy:</b> | Internal/External switching   |
| <b>A/D converter:</b>                           | Method :ΔΣ method; Resolution :16-bit (Effective<br>resolution: About 1/40,000 of the +/- range)                              |
| <b>Temperature coefficient:</b>                 | Gain : 0.01% of F.S./°C; Zero : 0.02% of F.S./°C<br>(Occurs when sampling speed is 10, 20, or 50 ms.)                         |
| <b>Input resistance:</b>                        | 1 MΩ ±5%  |
| <b>Allowable signal source resistance:</b>      | Within 300Ω   |
| <b>Maximum permissible input voltage:</b>       | Between +/- input terminals :60 Vp-p<br>Between input terminal/input terminal :60 Vp-p<br>Between input terminal/GND :60 Vp-p |

## GL220 Specifications (continued)

|  |  |
|--|--|
| <b>Withstand voltage:</b> Between input terminal/input terminal :1 minute at 350 Vp-p; Between input terminal/GND :1 minute at 350 Vp-p<br><b>Insulation resistance:</b> At least 50 MΩ (at 500 VDC)<br><b>Common mode rejection ratio:</b> At least 90 dB (50/60 Hz; signal source 300 Ω or less)<br><b>Noise:</b> At least 48 dB (with +/- terminals shorted)<br><b>Filter:</b> Off, 2, 5, 10, 20, 40; Filter operation is on a moving average basis. The average value of the set sampling count is used. If the sample interval exceeds 5 seconds, the average value of data obtained in a sub-sample (5 seconds) is used.                         | <b>Alarm judgment modes:</b> Detection method : Level, Edge<br>Analog channel judgment mode : H (↑), L (↓), Window In, Window Out<br>Logic channel judgment mode : H (↑), L (↓)<br>Pulse channel judgment mode : H (↑), L (↓), Window In, Window Out   |
| <p>* 23°C ±3°C when 30 minutes have elapsed after the power was switched on (filter On (10), 1 s sampling, GND connected).</p> <b>Integral TFT LCD Display</b><br><b>Display:</b> 4.3-inch TFT color LCD (WQVGA: 480 × 272 dots)<br><b>Displayed languages:</b> English, French, Japanese, German, Chinese, Korean<br><b>Backlight life:</b> 20000 hr (when brightness is down to 50%), depends on operation environment<br><b>Backlight:</b> Screensaver function (10, 30 sec., 1, 2, 5, 10, 30, 60 min.)   | <b>Discrete I/O Specifications</b><br><b>Input/Output types:</b> Trigger input (1 ch) or External sampling input (1 ch); Logic input (4 ch) or Pulse input (4 ch); Alarm output (4 ch); Switch between Logic and Pulse; Switch between Trigger and External sampling; The logic alarm cable B-513 (option) is required to use the external I/O function.<br><b>Input specifications:</b> Input voltage range : 0 to +24V (single-ended ground input); Input signal : No-voltage contact (a-contact, b-contact, NO, NC), Open collector, Voltage input; Input threshold voltage : Approx. +2.5 V; Hysteresis : Approx. 0.5 V (+2.5 to +3 V)<br><b>Alarm output specifications:</b> Output format: Open collector output (5 V, pull-up resistance 10 KΩ)<br><Maximum ratings of output transistor><br>• Collector-GND voltage : 30 V<br>• Collector current : 0.5 A<br>• Collector dissipation : 0.2 W |
| <b>Internal Memory Devices</b><br><b>Memory capacity:</b> Internal memory: Approx. 2GB Flash Memory<br>USB memory: Unlimited (However, one file must be 2GB at the maximum.)<br><b>Memory contents:</b> Setup conditions, measured data, screen copy   | <b>Pulse input</b><br><b>Revolutions mode (engines, etc):</b> Function: Counts the number of pulses per second; enables them to be converted to rpms.<br>Spans: 50, 500, 5000, 50 k, 500 k, 5 M, 50 M, 500 M PRM/F.S.<br><b>Counts mode (electric meters, etc.):</b> Function: Displays a count of the number of pulses for each sampling interval from the start of measurement.<br>Spans: 50, 500, 5000, 50 k, 500 k, 5 M, 50 M, 500 M C/F.S.<br><b>Inst. mode:</b> Function: Counts the number of pulses for each sampling interval. Resets the count value after each sampling interval.<br>Spans: 50, 500, 5000, 50 k, 500 k, 5 M, 50 M, 500 M C/F.S.<br><b>Maximum number of pulse inputs:</b> Maximum input frequency : 50kHz<br>Maximum number of count : 50kC/sampling (16-bit counter)   |
| <b>Trigger Function Specifications</b><br><b>Repeat trigger:</b> Off, On<br><b>Trigger types:</b> Start: Data capture starts when a trigger is generated.<br>Stop: Data capture stops when a trigger is generated.<br><b>Trigger conditions:</b> Start: Off, Level, Alarm, External, Time, Date, Weekly<br>Stop: Off, Level, Alarm, External, Time, Date, Weekly<br><b>Level trigger judgment modes:</b> Combination : Level OR, Level AND, Edge OR, Edge AND<br>Analog channel judgment mode : H (↑), L (↓), Window In, Window Out<br>Logic channel judgment mode : H (↑), L (↓)<br>Pulse channel judgment mode : H (↑), L (↓), Window In, Window Out |  |

## Ordering Guide

| Description  | Order No. | Description   | Order No. |
|--|-----------|---|-----------|
| <b>GL220</b><br>Compact, lightweight, multi-channel data logger with 10 analog measurement channels, 20mV to 50V Full Scale measurement range, and 2 GB internal flash memory. | GL220     | <b>Battery pack</b><br>7.2V/2200mAh lithium battery pack.         | B-517     |
|  |           | <b>DC Power Cable</b><br>2-meter DC power cable, bare tips.       | B-514     |
|  |           | <b>Humidity Sensor</b><br>3-meter with dedicated power connector. | B-530     |
|  |           | <b>Logic/Alarm Cable</b><br>2-meter logic/alarm cable, bare tips. | B-513     |



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