

I. Main features

GL840 expands to Two models that are "Multi-inputs model" "Withstand-voltage model" for application specific use

Multi-Input Model
GL840-M
Suitable for temperature measurement with multiple channels



All channel isolated.
Analog signal input port

Logic/Pulse signal input port

USB2.0

Ethernet (10BASE-T/100BASE-TX)

High Voltage Withstand Model
GL840-WV
Suitable for stacked high voltage battery application, or high-precision temperature measurement



SDHC card slot 2 for SDHC card or Wireless LAN unit (Optional)

Digital sensor connection port

SDHC card slot 1 * SDHC(4GB)card is standard accessory

Easy operation with control button

Large easy-to-read 7-inch wide color monitor

Three types of input systems enable measurement of various signals

Wireless measurement using wireless LAN (option)

Maximum sampling interval of up to 10ms

Supporting large size SD memory card for reliable long term measurement

Three types of input system enable to measure various phenomena

Input system 1 : Multifunction analog input ports

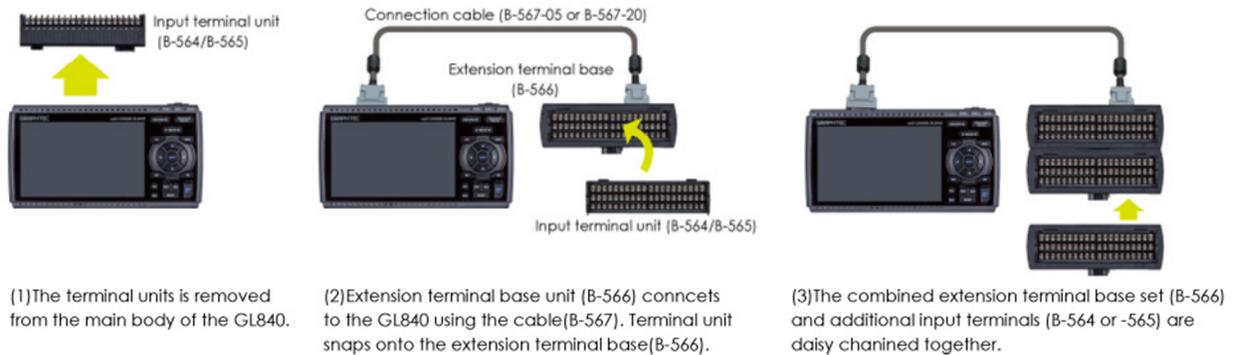
Contains a highly isolated input system which ensures that signals are not corrupted by noise from other channels. The GL840's inputs are suitable for combined measurements from voltage, temperature, humidity, logic, and pulse signals.

The standard configuration has 20 analog input channels. It is expandable to 200 channels by adding optional 20 channels extension terminal base unit(B-566) and input terminal units(B-564 or B-565).

Withstand voltage & Accuracy		Multi-input type (B-564)	Withstand-voltage type (B-565)
Voltage	Input voltage range	20 mV to 100V	20mV to 100V
	Max. voltage (Input - GND)	60 Vp-p	300 Vp-p
Temp.	Thermocouple	R, S, B, K, E, T, J, N, W (WRe5-26)	
	RTD (Resistance Temp. Detector)	Pt100 (IEC751), JPt100 (JIS), Pt1000 (IEC751)	
Accuracy	Voltage	± 0.1% of F.S.	±(0.05% of FS + 10μV)
	Temperature*	± 1.55 °C	± 1.1 °C

* Accuracy rating for K-type thermocouple at 100°C includes reference junction compensation. Accuracy varies by the temperature levels and thermocouple types.

The following shows how a standard configuration is expanded to more than 40 channels



Configuration for additional channels

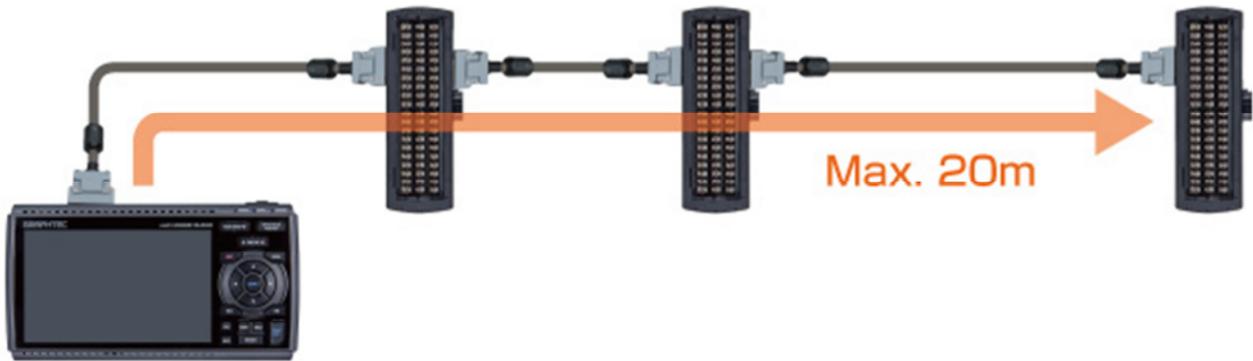
Number of channels	20 channels	40 channels	100 channels	200 channels
GL840 unit (GL840-M or GL840-WV)	1 set	1 set	1 set	1 set
Connection cable (B-567-05 or -20)	N/A	1 pc	1 pc	1 pc
Terminal base (B-566)	N/A	2 sets	5 sets	10 sets
Input terminal (B-564 or B-565)	N/A	1 set	4 sets	9 sets

Offers longer cable for the input terminals

Input terminal blocks can be connected directly (in daisy chain), or using the B-565 cable(s). This allows the input terminals to be placed in separate locations according to the need of the application.

The input terminal unit and the GL840 main body can be extended by using an extended connections cable.

*If the signal is affected by noise, it may be required to use a slower sampling.

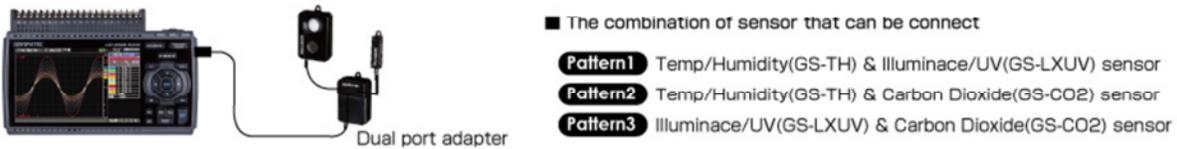


Input system 2 : Support dogotal sensors

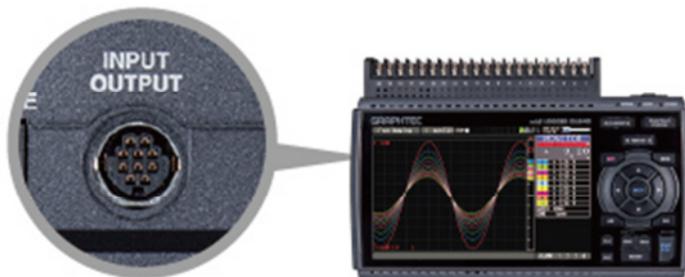
Digital sensors and input terminal/adapters for the GL100 connects to the GL840 directly



Dual ports adapter connects up to two sensors for simultaneous interface



Input system 3 : 4 channels of Logic/Pulse inputs



Supports 4-channels logic or pulse signal inputs. Pulse mode allows cumulative, instant, or rotational values for industrial measurement capability with speed and flow.

Maximum sampling interval of up to 10ms

Provides faster sampling rates for voltage measurements. You are able to achieve up to 10ms sampling speed 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	Voltage	●	●	●	●	●	●	●	●
	Temperature	-	-	-	●	●	●	●	●

Supports large-size SD memory card for reliable long term measurement

New GL840 series carries two SD memory card slots for storage device. The SDHC type SD memory card is supported up to 32GB. 4GB SD memory card comes as a standard accessory installed in the first slot.

the captured data can be stored in GBD(Graphtec binary data) or CSV file format.

Capturing time* (when all 20 analog channels are being used with Logic/Pulse inputs turned off.)

Sampling	10ms	50ms	100ms	200ms	500ms	1s	10s
GBD format	31 days	77 days	95 days	108 days	270 days	Over 365	Over 365
CSV format	3 days	11 days	16 days	21 days	54 days	109 days	Over 365

*Figures are approximate. File size of captured data is 2GB in GBD or CSV file format on this chart.

Sampling interval is limited by the number of channels in use.(10ms:1ch, 50ms:5ch, 100ms:10ch)

Limited sampling speed is available when digital sensors and GL100-WL are used as a remote monitoring device.

Ring capture function



The most recent data is saved when the memory is configured in ring memory mode. (Number of capturing data is 1000 to 2000000 points)

Relay capture function



Data is continuously saved to multiple files up to 2GB without losing any data until capturing is stopped when the memory is configured in the relay mode.

Hot-swapping the SD memory card



SD card can be replaced during data capturing when the sampling interval is 100ms or slower.

Useful functions

Alarm output function



Based on set conditions for each channels, alarm signal can be placed using the four channel alarm out put ports.*

*Input/Output cable(B-513 option) is required to connect the alarm output ports to external buzzer/light mechanism.

USB drive mode



USB drive mode function enables data to be transferred to the PC from GL840 by drag&drop feature.

Navigation function



Simple to use navigation screen allows setting operatin for measurement and wireless LAN adapter.

Large easy-to-read 7-inch wide color LCD



Carries a clear 7-inch wide TFT color LCD screen (WVGA:800x480 dots) for the GL840. Monitoring data are displayed in waveform or digital form option. Parameter settings can be displayed on the screen.

3 Types of power source



Choose from AC power supply, DC supply* or the rechargeable battery pack.*
*DC power drive cable(B-514) and battery pack(B-569) are optional accessories.

Networking features



WEB&FTP server function

GL840 can be controlled externally via a network on 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 GL840 is periodically synchronized with the NTP server.

*The GL840 needs to be connected to a LAN environment using the available Ethernet/WLAN ports for above functions.

II. GL840 Main unit specifications

Item		Description
Model number		GL840-M GL840-WV
Number of analog input channels		20 channels in standard configuration, Expandable up to 200 channels
Number of analog input terminals		Up to 10 terminals (20 channels / terminal), standard config: 1
Type of analog input terminal		Multi-input type, Withstand-voltage type
Port for digital sensor		1 port for the sensor/input terminal/adapter of the GL100
External input/ output *1	Input *2	Trigger or Sampling (1 channel), Logic/Pulse (4 channels)
	Output *3	Alarm (4 channels)
Sampling interval		10 ms to 1 hour (10ms to 50ms: voltage only) *4, External signal
Time scale of waveform display		1 sec. to 24 hour /division
Trigger, Alarm function	Trigger action	Start or stop capturing data by the trigger
	Repeat action	Off, On (auto rearmed)
	Trigger source	Start: Off, Measured signal, Alarm, External, Clock, Week or Time Stop: Off, Measured signal, Alarm, External, Clock, Week or Time
	Condition Setting	Combination: OR or AND Analog signal: Rising (High), Falling (Low), Window-in, Window-out Logic signal: Pattern (combination of each input signal in high or low) Pulse (number of count): Rising (High), Falling (Low), Window-in, Window-out

Item		Description
	Alarm output	Outputs a signal when alarm condition occurs in the input signal *5
Pulse input function	Rotation count (RPM) mode	Counts the number of pulses per sampling interval and converts to rpm (rotations per minute), Number of pulses for one rotation can be set to 50, 500, 5000, 50k, 500k, 5M, 50M, 500M rpm/F.S. (rpm./Full Scale)
	Accumulating count mode	Accumulates the number of pulses from the start of measurement 50, 500, 5000, 50k, 500k, 5M, 50M, 500M C/F.S. (Counts/Full Scale)
	Instant count mode	Counts the number of pulses per sampling interval 50, 500, 5000, 50k, 500k, 5M, 50M, 500M C/F.S. (Counts/Full Scale)
Calculation function	Between channels	Addition, Subtraction, Multiplication, and Division for analog input
	Statistical	Select two calculations from Average, Peak, Maximum, Minimum, 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 (Hi-speed), WLAN (using B-568 option)
Storage device	Media	SD memory card (Support SDHC, up to 32 GB), supports 2 slots *6
	Saved contents	Captured data, Setting conditions, Screen copy
Capturing mode		Mode: Normal, Ring, Relay Ring: Saves most recent data (Number of capturing data: 1000 to 2000000 points) *7

Item		Description
		Relay: Saves data to multiple files without losing data until data capturing is stopped
Replay data		Replays captured data that was saved in the GL840 (in GBD or CSV format)
Scaling (Engineering unit) function		<p>Measured value can be converted to specified engineering unit</p> <ul style="list-style-type: none"> • Analog voltage: Converts using four reference points (gain, offset) • Temperature: Converts using two reference points (offset) • Pulse count: Converts using two reference points (gain)
Action during data capture		<ul style="list-style-type: none"> • Displaying past data (using dual display mode (Current + Past data)) • Hot-swapping the SD memory card • Saving data in between cursors
Display	Size	7-inch TFT color LCD (WVGA: 800 x 480 dots)
	Language	English, French, German, Chinese, Korean, Russian, Spanish, Japanese
	Information *8	Waveform in Y-T with digital values, Waveform only, Digital value, Digital values and statistics values
Operating environment		0 to 45 °C, 5 to 85 % RH (non condensed) (When operating with battery pack 0 to 40 °C, charging battery 15 to 35 °C)
Power source	AC adapter	100 to 240 V AC, 50/60 Hz (1 pc of adapter is attached as standard accessory)
	DC power	8.5 to 24 V DC (DC drive cable (option B-514) is required)
	Battery pack	Mountable two battery packs (battery pack (option B-517): 7.2V DC, 2900mAh)

Item	Description	
Power consumption *9	Max. 38 VA	
External dimensions (W x D x H in mm, Excluding projections)	Approx. 240 x 158 x 52.5	Approx. 240 x 166 x 52.5
Weight *10	Approx. 1010 g	Approx. 1035 g

*1

Input/Output cable for GL (option B-513) is required to connect the signal.

*2

Input signal;

- Voltage range: Up to 24V (common ground)
- Signal type: Voltage, Open collector, Contact (relay)
- Threshold: Approx. + 2.5 V (Hysteresis: Approx. 0.5V (2.5V to 3V))

*3

Output signal: Open collector (pull-up to 5V by 10kΩ resistor)

<Maximum rating of the output transistor>

- Voltage: Max. 30V,
- Current: Max. 0.5A,
- Collector dissipation: Max. 0.2W

*4

Minimum interval varies by number of channels used.

*5

Output port can be specified in each input channel.

*6

4GB SD memory card is installed to slot 1 as standard accessory.

*7

Size of the capture data will be limited to 1/3 of available memory.

*8

Display mode is switched every time the dedicated key is pressed. In magnified digital value mode, the displayed channel number can be specified. In the waveform display mode, the changing of the time scale will be effective from the point of the next displayed data.

*9

Rating under maximum power consumption using the AC adapter, with LCD display on, and battery pack(s) being charged.

*10

Excludes AC adapter and battery pack.

Software specifications for PC

Item	Description
Model name	GL100_240_840-APS
Supported OS	Windows 10, 8.1, 8, 7, Vista (32/64-bit edition)
Supported device	GL840 (USB, Ethernet, WLAN), GL100 (USB, WLAN)
Functions	Control the GL series, Real-time data capture, Replay data, and Data format conversion
Supported units & channels	Up to 1000 channels total, Up to 4 groups (number of units is limited by model)
Settings control	Input condition, Capturing condition, Trigger/Alarm condition, Report, etc.
Capturing data	Saved to PC Saves captured data in real time (in GBD binary or CSV format)
	Saved to GL unit Saves to the SD memory card (in GBD binary or CSV format)
Displayed information	Y-T waveform, Digital values, Report, X-Y graph (specified period of data, data reply only), Two displays for the current and past data, and Statistical calculation
File operation	Converting data format to CSV from GBD binary, merge multiple data files in the time axis or as an additional channel
Warning function	Send e-mail to the specified address when the alarms occur
Statistical calculation	Maximum, Minimum, and Average during data capturing
Report function	Creates the daily or monthly report automatically

Software specifications for Smart device

Item	Description
Model name	GL-Connect
Supported OS	Android 4.1 to 4.4, iOS 7/8
Supported device	GL840 (WLAN), GL100 (WLAN)
Functions	Control the GL series, Display measured data in waveform or digital value
Supported units	Up to 10 units
Settings control	Start/Stop, Sampling interval
Capturing data	Saves captured data in the GL main body (data cannot be saved in the smart device)
Displayed information	Data captured in real time by digital value, Replay the data stored in the GL body by the waveform

Wireless LAN unit (option) specifications

Item	Description
Model number	B-568
Supported device	GL840
Communication method	Wireless communication (using radio waves in the 2.4GHz band)
Supported WLAN system	IEEE802.11b/g/n WPS: Push button or PIN method Security protocols: WEP64, WEP128, WPA-PSK/WPA2-PSK, AKIP/AES Communication distance: Approx. 40m (depending on the conditions of radio communication)
Installed location	Attached to the SD CARD slot number 2 on the GL840 * When the wireless LAN unit is installed, the SD memory card cannot be used in slot number 2
Function	Access Point mode: Communicate with the GL100-WL as a remote sensor (captured data in the GL100-WL is transferred to GL840) Station mode: Communicate with PC or Smart device (control GL840 and transfer the data from GL840)
Connected number of GL100-WL	GL840: Up to 5 units of the GL100-WL

GL840 Analog input specifications

Item		Description	
Model number		GL840-M, Input terminal B-564	GL840-WV, Input terminal B-565
Input method		All channels isolated balanced input *11, Scans channels for sampling	
Type of input terminal		Screw terminal (M3 screw)	
Measurement range	Voltage	20, 50, 100, 200, 500 mV, 1, 2, 5, 10, 20, 50, 100 V, and 1-5V F.S. (Full Scale)	
	Thermocouple	Type: K, J, E, T, R, S, B, N, W (WRe5-26) Range: 100, 500, 2000 °C *12	
	RTD (Resistance Temperature Detector)	Type: Pt100, JPt100 (JIS), Pt1000 (IEC751) Range: 100, 500, 2000 °C *12	
	Humidity	0 to 100 % RH - using the humidity sensor (option B-530)	
Filter		Off, 2, 5, 10, 20, 40 (moving average in selected number)	
Measurement accuracy *13			
Voltage		± 0.1% of F.S. (Full Scale)	± (0.05% of F.S. + 10µV)
Temperature (Thermocouple) *14			
Type	Measurement range (TS: Temp Sense)	Measurement accuracy	Measurement accuracy
R	0 ≤ TS ≤ 100 °C	± 5.2 °C	± 4.5 °C
	100 < TS ≤ 300 °C	± 3.0 °C	± 3.0 °C
	300 < TS ≤ 1600 °C	± (0.05% of rdg. + 2.0 °C)	± 2.2 °C
S	0 ≤ TS ≤ 100 °C	± 5.2 °C	± 4.5 °C
	100 < TS ≤ 300 °C	± 3.0 °C	± 3.0 °C
	300 < TS ≤ 1760 °C	± (0.05% of rdg. + 2.0 °C)	± 2.2 °C

Item		Description	
B	400 ≤ TS ≤ 600 °C	± 3.5 °C	± 3.5 °C
	600 < TS ≤ 1820 °C	± (0.05% of rdg. + 2.0 °C)	± 2.5 °C
K	-200 ≤ TS ≤ -100 °C	± (0.05% of rdg. + 2.0 °C)	± 1.5 °C
	-100 < TS ≤ 1370 °C	± (0.05% of rdg. + 1.0 °C)	± 0.8 °C
E	-200 ≤ TS ≤ -100 °C	± (0.05% of rdg. + 2.0 °C)	± 1.0 °C
	-100 < TS ≤ 800 °C	± (0.05% of rdg. + 1.0 °C)	± 0.8 °C
T	-200 ≤ TS ≤ -100 °C	± (0.1% of rdg. + 1.5 °C)	± 1.5 °C
	-100 < TS ≤ 400 °C	± (0.1% of rdg. + 0.5 °C)	± 0.6 °C
J	-200 ≤ TS ≤ -100 °C	± 2.7 °C	± 1.0 °C
	-100 < TS ≤ 100 °C	± 1.7 °C	± 0.8 °C
	100 < TS ≤ 1100 °C	± (0.05% of rdg. + 1.0 °C)	± 0.6 °C
N	-200 ≤ TS < 0 °C	± (0.1% of rdg. + 2.0 °C)	± 2.2 °C
	0 ≤ TS ≤ 1300 °C	± (0.1% of rdg. + 1.0 °C)	± 1.0 °C
W	0 ≤ TS ≤ 2000 °C	± (0.1% of rdg. + 1.5 °C)	± 1.8 °C
R.J.C.		± 0.5 °C	± 0.3 °C

Temperature (RTD) *15

Type	Measurement range (TS: Temp Sense)	Accuracy	Accuracy
Pt100	-200 ≤ TS ≤ 100 °C	± 1.0 °C	± 0.6 °C
	100 < TS ≤ 500 °C		± 0.8 °C
	500 < TS ≤ 850 °C		± 1.0 °C
JPt100	-200 ≤ TS ≤ 100 °C	± 0.8 °C	± 0.6 °C
	100 < TS ≤ 500 °C		± 0.8 °C

Item		Description	
Pt1000	-200 ≤ TS ≤ 100 °C	± 0.8 °C	± 0.6 °C
	100 < TS ≤ 500 °C		± 0.8 °C
A/D converter		Sigma-Delta type, 16 bits (effective resolution: 1/40000 of the measuring full range)	
Maximum input voltage	Between (+) / (-) terminal	20 mV to 2 V range: 60 Vp-p, 5 V to 100 V range: 110 Vp-p	
	Channels ((-) / (-))	60 Vp-p	600 Vp-p
	Channel / GND	60 Vp-p	300 Vp-p
Max. voltage (withstand)	Between channels	350 Vp-p (1 minute)	600 Vp-p
	Channel / GND	350 Vp-p (1 minute)	2300 Vrms AC (1 minute)

*11

The terminal "b" for using the RTD is connected each other across all channels.

*12

If the specifications of the temperature sensor is lesser or greater than the selected measurement range, GL840 can measure up to the specifications of the sensor.

*13

Subject to the following conditions:

- Room temperature is 23 °C ± 5 °C.
- When 30 minutes or more have elapsed after power has turned on.
- Filter is set to 10.
- Sampling rate is set to 1 sec, using 20-channel in GL840-M and 10-channel in GL840-WV.
- GND terminal is connected to ground.

*14

Wire size of thermocouple used is 0.32mm diameter in the T type and 0.65mm diameter in other types.

*15

Supports 3-wire type sensor.

Options and Accessories

Item	Model number	Description
Input terminal (Multi-inputs)	B-564	20ch input terminal, multi-input type
Input terminal (Withstand voltage)	B-565	20ch input terminal, withstand-high-voltage type
Base unit for input terminal	B-566	Base unit for input terminal (B-564 or 566)
Connection cable for extension terminal	B-567-05	Cable to connect GL840 and B-566, 50 cm long
	B-567-20	Cable to connect GL840 and B-566, 2 m long
Wireless LAN unit	B-568	WLAN adapter, IEEE802.11 b / g / n
Battery pack	B-569	Rechargeable Lithium-ion battery (7.2 V, 2900mAh)
Bracket for DIN rail (GL840 main body)	B-570	Bracket for DIN rail (GL840 main body), Build-to-order
Bracket for DIN rail (extension terminal)	B-540	Bracket for DIN rail (Input terminal), Build-to-order
Input/Output cable for GL series	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-551-10	250 ohms (it converts the signal to the "1-5V" from the "4-20mA".)
AC power adapter	ACADP-20	Input: 100 to 240 V AC, Output: 24 V DC
Temp & Humidity sensor	GS-TH	Temperature and humidity measurement
Illuminance & UV sensor	GS-LXUV	Illuminance and UV intensity measurement, cable 20cm long
Carbon Dioxide (CO2) sensor	GS-CO2	CO2 measurement, cable 20cm long
Acceleration & Temp sensor	GS-3AT	Acceleration and temperature measurement, cable 20cm long

Item	Model number	Description
Thermistor input terminal	GS-4TSR	Temp measurement (using a Thermistor), cable 20cm long
Thermistor sensor (Normal type)	GS-103AT-4P	Temperature sensor (-40 to 105 °C), 3m long, 4pcs/set
Thermistor sensor (Ultrathin type)	GS-103JT-4P	Temperature sensor (-40 to 120 °C), 3m long, 4pcs/set
AC current sensor adapter	GS-DPA-AC	Current measurement (using a CT), cable 20cm long
AC current sensor (50A)	GS-AC50A	Current sensor (CT) 50A, cable 20cm long
AC current sensor (100A)	GS-AC100A	Current sensor (CT) 100A, cable 20cm long
AC current sensor (200A)	GS-AC200A	Current sensor (CT) 200A, cable 20cm long
Voltage & Temp input terminal	GS-4VT	Voltage or Temperature (using a thermocouple), cable 20cm long
Module extension cable	GS-EXC	Extension cable for the sensor / terminal / adapter module, 1.5m long
Dual port adapter	GS-DPA	Connect up to 2 sensor modules