GRAPHTEC
GL7-M-UM-151

GL7-M

GL7000 Voltage/Temperature Module
USER'S MANUAL

Thank you very much for buying this GRAPHTEC product.

This item is a standalone measuring module. Please use it by installing it on the main module.

These directions describe preparations and cautions before measurement.

For safe use, please make sure to read "4 Regarding Maximum Input Voltage"

For the details concerning operation procedures etc., read the User's manual recorded on the CD-ROM (included with the main module)

Confirmation of the exterior
After opening the package, please confirm that there are no problems (scratches and dirt) on the exterior before use.
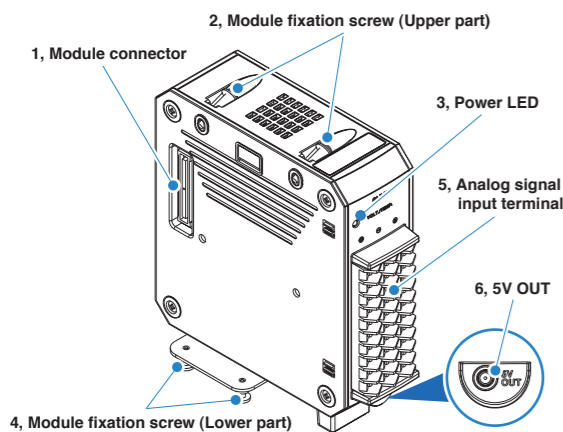
Confirmation of the attached items.
● User's manual (this book): 1

If by any chance faults are found, please contact the store where you bought the item.

* Please note that items mentioned in this book may change without prior notice.

1 Part Names

Explanation of the module's part names and functions.

1, Module connector.............. Connector for connecting all kinds of modules.

2, Module fixation screw....... Fixation screw for the adjoining module.
(Upper part) To prevent drop off, do not remove from the module.

3, Power LED.......................... The Power LED will light up green when the power has been turned on and the module has been recognized.

4, Module fixation screw....... Fixation screw for the adjoining module.
(Lower part)

5, Analog signal input terminal.. Terminal for inputting analog measurements.

6, 5V OUT................................ This is a power supply for the humidity sensor (Option: B-530).

2 How to Install Module

This explains how to attach the module to the main module.

⚠ **CAUTION** When installing or removing the module, please make sure that the power is off.

1, Remove the fixation screws (4 places on the upper part and lower parts), place the alarm module parallel to the main module and slide it in the direction of the arrow.
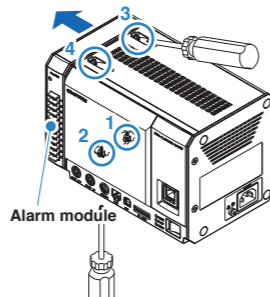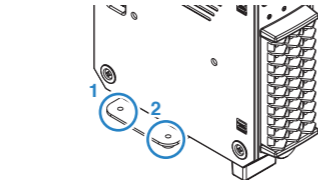

(1) Remove the fixation screws from the 2 places on the lower part.
(2) Loosen the drop-off prevention screws on the upper part in 2 places.
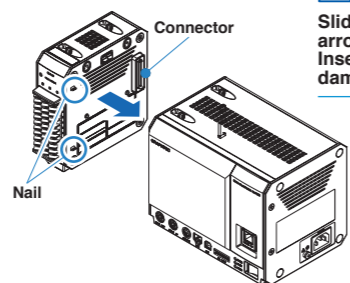(3) Removing the alarm module.

⚠ **CAUTION**
Slide it in the direction of the arrow. If you pry it at an angle there is a risk of damaging the connector.

2, Remove the voltage/temperature module's fixation screws (2 places on the lower part).

3, Slide the voltage/temperature module parallel to the main module and connect the connector.

⚠ **CAUTION**
Slide it in the direction of the arrow.
Inserting it at an angle may cause damage to the nails.

4, Fix the voltage/temperature module and the main module in place with the screws. (4 places on the upper and lower parts)
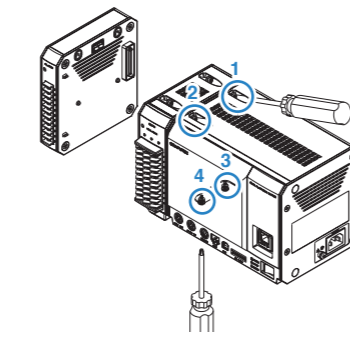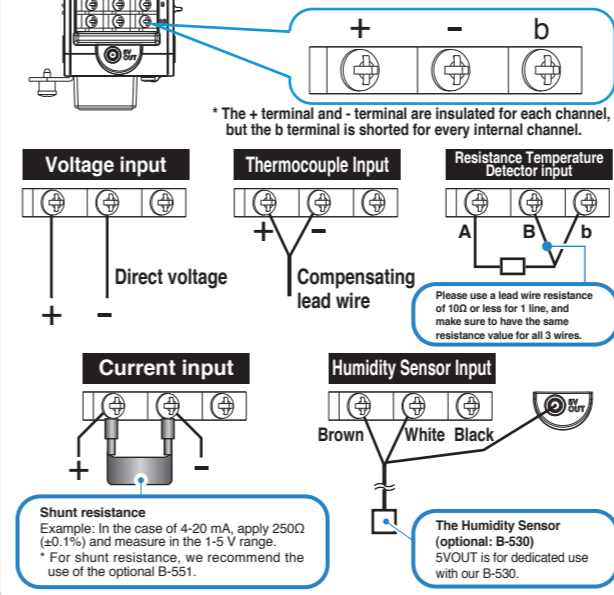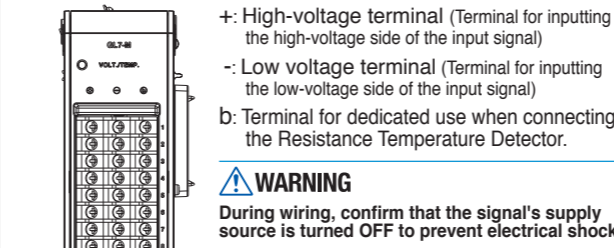

5, Similarly, install the alarm module on the last part and fix it with screws.
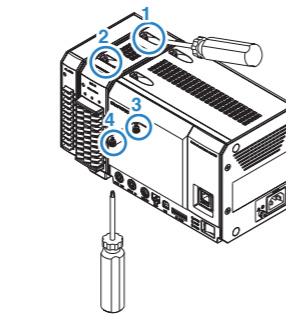
During installation, a 4kgf.cm screw tightening torque is recommended.

3 How to Connect to Analog Signal Terminal

This explains how to connect the input cable.

+: High-voltage terminal (Terminal for inputting the high-voltage side of the input signal)

-: Low voltage terminal (Terminal for inputting the low-voltage side of the input signal)

b: Terminal for dedicated use when connecting the Resistance Temperature Detector.

⚠ **WARNING**
During wiring, confirm that the signal's supply source is turned OFF to prevent electrical shocks.

* The + terminal and - terminal are insulated for each channel, but the b terminal is shorted for every internal channel.

Voltage input — Direct voltage

Thermocouple Input — Compensating lead wire

Resistance Temperature Detector input
Please use a lead wire resistance of 10Ω or less for 1 line, and make sure to have the same resistance value for all 3 wires.

Current input
Shunt resistance
Example: In the case of 4-20 mA, apply 250Ω (±0.1%) and measure in the 1-5 V range.
* For shunt resistance, we recommend the use of the optional B-551.

Humidity Sensor Input
Brown White Black
The Humidity Sensor (optional: B-530)
5VOUT is for dedicated use with our B-530.

4 Regarding Maximum Input Voltage

To avoid break-downs or short-circuiting accidents, please make sure to abide by the items written below.

● **Maximum input voltage**
● In case the input voltage exceeds the specifications, the circuit at the input part will break down so even if the input voltage exceeds the specifications only for an instant, please don't input.
● Please take care that no static electricity is applied on the analog signal input terminal.

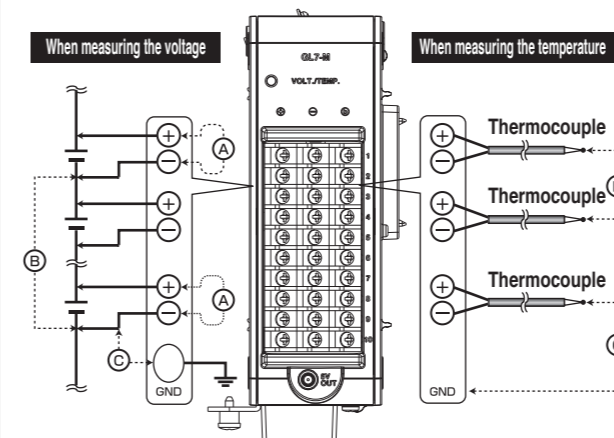**<Input terminal +/- terminal interval (A etc. on the figure below)>**
Maximum input voltage : 60Vp-p

<Input terminal (-)/Input terminal (-) interval (B etc. on the figure below)>
Maximum input voltage: 60Vp-p
Withstand voltage: 350Vp-p/1minute

<Input terminal/GND terminal interval C etc. on the figure below)>
Maximum input voltage: 60Vp-p
Withstand voltage: 350Vp-p/1 minute

When measuring the voltage | When measuring the temperature

Thermocouple

5 Noise Countermeasures

In case the measured values fluctuate due to exogenous noise, the following measures are recommended.
(Depending on the type of noise, the result may change.)

● **Make absolutely sure to ground the chassis GND of the measuring object**
Absolutely making sure to ground the chassis GND of the measuring object to a favorable ground may have an effect.

● **Connecting the chassis GNDs of the measuring object and the instrument**
Connecting the chassis GND of the measuring object and the GND terminal of the main module with an electrical cable as short and thick as possible, and further gaining potential equalization by grounding it may have an effect.

● **Using the filter function of the instrument**
Setting the filter to anything but OFF on the main body's input settings menu.

● **Use the sample interval where this module's digital filter becomes effective**
On the Recording settings menu of the main module, set the sample interval to 500 ms or above.
Set your commercial power-supply frequency from "Other Settings" in this module.

For details, please refer to the User's manual recorded on the CD-ROM (included with the main module)

6 Specifications

GL7-M (Voltage/Temperature Module) Specifications

Item	Contents
Input ch number	10 channels/1 module
Input terminal shape	M3 screw type terminal
System	All-ch insulation, Scan method, Balanced input
Sampling interval	10, 20, 50, 100, 125, 200, 250, 500 msec, 1, 2, 5, 10, 20, 30 sec, 1, 2, 5, 10, 20, 30 min, 1hour
Built-in RAM	2,000,000 data
Measurement range — Voltage	20, 50, 100, 200, 500 mV, 1, 2, 5, 10, 20, 50 V, 1-5 V F.S.
Temperature	Thermocouple: K, J, E, T, R, S, B, N, W (WRe5-26)
	Resistance Temperature Detector: Pt 100, JPt 100, Pt 1000 (IEC751)
Humidity	0 to 100% (Voltage 0 to 1V scaling conversion) * B-530 (optional) use
A/D converter	System: ⊿∑ system
	Resolution: 16-bit (Effective ability: Approximate ± range 1/40,000)
Input resistance	1MΩ±5%
Allowable signal source resistance	300Ω or less
Measurement accuracy (23°C±5°C)	● **Voltage** ±0.1% of F.S.

● Thermocouple

Type	Measurement temperature range	Measurement accuracy
	0≤ T S ≤100	±5.2 °C
	100< T S ≤300	±3.0 °C
R/S	R .3R:00< T S ≤1600	± (0.05 % of rdg +2.0 °C)
	S :300< T S ≤1760	± (0.05 % of rdg +2.0 °C)
B	400≤ T S ≤600	±3.5 °C
	600< T S ≤1820	± (0.05% of rdg +2.0 °C)
K	-200≤ T S ≤-100	± (0.05% of rdg +2.0 °C)
	-100< T S ≤1370	± (0.05% of rdg +1.0 °C)
E	-200≤ T S ≤-100	± (0.05% of rdg +2.0 °C)
	-100< T S ≤800	± (0.05% of rdg +1.0 °C)
T	-200≤ T S ≤-100	± (0.1 % of rdg +1.5 °C)
	-100< T S ≤400	± (0.1 % of rdg +0.5 °C)
J	-200≤ T S ≤-100	±2.7 °C
	-100< T S ≤100	±2.7 °C
	100< T S ≤1100	± (0.05% of rdg +1.0 °C)
N	0≤ T S ≤1300	± (0.1 % of rdg +1.0 °C)
W	0≤ T S ≤2000	± (0.1 % of rdg +1.5)
Reference compensation accuracy		±0.5°C

* When using T: φ0.32 or others: φ0.65 for specifications of the thermocouple

● Resistance bulb

Type	Measurement temperature range	Applied current	Measurement accuracy
Pt100	-200 to 850 °C (FS=1050 °C)	1 mA	±1.0 °C
JPt100	-200 to 500 °C (FS=700 °C)	1 mA	±0.8 °C
Pt1000	-200 to 500 °C (FS=700 °C)	0.2 mA	±0.8 °C

● 30 minutes or more after the power on
● Sampling 1s
● Filter 10 (average)
● GND ground

Reference junction compensation	Switching internal/external
Temperature coefficient	Gain: 0.01% of F.S./°C
	Zero: 0.02% of F.S./°C * Zero occurs at a 10/20/50 ms sampling speed
Maximum input voltage	Between each input (+) and (-) terminal interval: 60Vp-p
	Between each input terminal and input terminal interval: 60Cp-p
	Between each input terminal and GND terminal interval: 60Vp-p
Withstand voltage	Between each input terminal and input terminal interval: 350 Vp-p/1 minute
	Between each input terminal and GND terminal interval: 350 Vp-p/1 minute
Insulation resistance	Between each input terminal and GND terminal interval: 50 MΩ or more (at DC500 V)
Common mode rejection	90 dB or more (50/60 Hz signal source 300Ω or less)
S/N (Noise)	48 db or more (+/- at short)
Filter	OFF/2/5/10/20/40 The filter has a moving average. The measured value is the average value of the number of samples set. If the sample is longer than 5 seconds, the average value is obtained from data of the sub-sample (5 seconds)
5V-OUT	1ch for the humidity sensor
External dimensions [W×D×H] (approximate)	49.2 × 136 × 160 mm (not including protruding parts)
Weight	770g