

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)

You can use in GL7000 firmware (V1.20) and GL-Connection(V1.20) or later.

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.

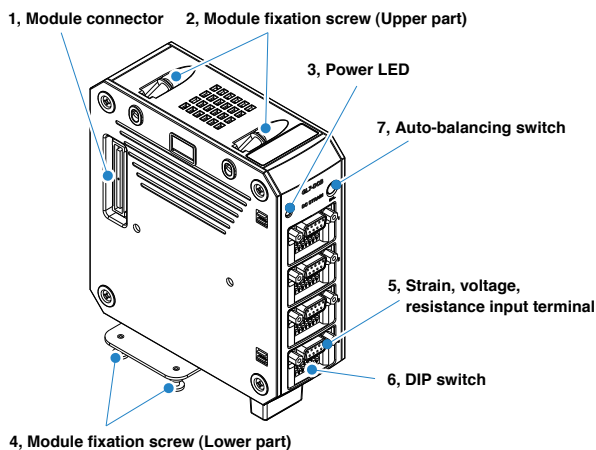
- User's manual (this book): 1
- DSUB (male) connector : 4
- Upgrade CD-ROM: 1

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.



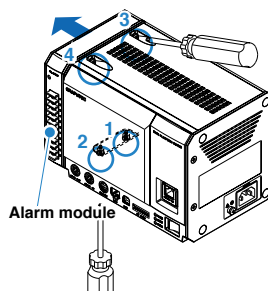
- | | |
|--|---|
| 1, Module connector..... | Connector for connecting all kinds of modules. |
| 2, Module fixation screw.....
(Upper part) | Fixation screw for the adjoining module.
To prevent drop off, do not remove from the module. |
| 3, Power LED..... | The Power LED will light up green when the power has been turned on and the module has been recognized.
However, this LED flashes during auto-balancing. |
| 4, Module fixation screw.....
(Lower part) | Fixation screw for the adjoining module. |
| 5, Strain, voltage,
resistance input terminal.. | Terminal for inputting analog measurements. |
| 6, DIP switch..... | This is used to switch to strain, voltage or resistance. |
| 7, Auto-balancing switch..... | This is used to set the initial value of the strain to 0 (zero). |

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.

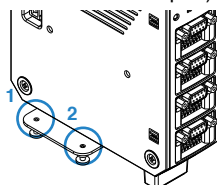


- (1) Remove the fixation screws from the 2 places on the lower part.
- (2) Loosen the drop-off prevention screws on the upper part in 2 places.
- (3) Removing the alarm module.

CAUTION

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

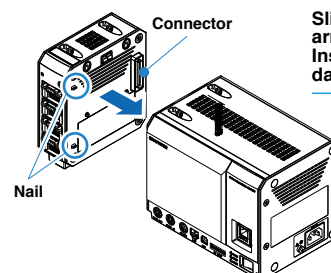
- 2, Remove the strain module's fixation screws (2 places on the lower part).



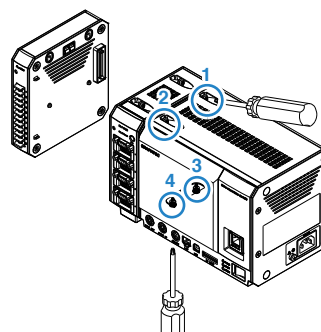
- 3, Slide the strain module parallel to the main module and connect the connector.

CAUTION

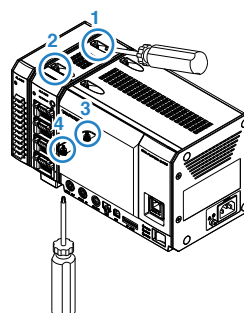
Slide it in the direction of the arrow. Inserting it at an angle may cause damage to the nails.



- 4, Fix the strain 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 section describes the signal input terminal and how to set the DIP switch.

1. Input terminal arrangement and descriptions

Strain, voltage, resistance input terminal

DSUB (male)

(Soldering side) (5)(4)(3)(2)(1)

When connecting the connector, please be careful not to over-tighten the screw. Recommended tightening torque : 4 kgf·cm or less

(9)(8)(7)(6)

DIP switch

DSUB Connector No.	Notation	Descriptions	DSUB-NDIS Conversion cable	Conversion connector between DSUB and screw terminal
(1)	B-	Excitation voltage (-)	C	1
(2)	IN-	Input signal (-)	B	2
(3)	S+	Sense (+)	-	3
(4)	T-	TEDS (-)	G	4
(5)	R+	Shunt resistance	-	5
(6)	S-	Sense (-)	-	6
(7)	IN+	Input signal (+)	D	7
(8)	B+	Excitation voltage (+)	A	8
(9)	T+	TEDS (+)	F	9
Connector chassis	-	Shield	E	FG

Options

Conversion connector between DSUB and screw terminal (B-560)

Conversion cable between DSUB and NDIS (B-561) NDIS Pin (female)

2. Depending on the input method, set the switch (See Table below).



Table below shows the settings of DIP switch.

For the numbers in the table, 0 (zero) is OFF and 1 is ON.

Input method		Strain gauge 120Ω							Strain gauge 350Ω						
		1	2	3	4	5	6	7	1	2	3	4	5	6	7
Strain input	2-wire 1/4bridge	1	1	1	1	1	1	1	1	1	1	1	1	0	0
	3-wire 1/4bridge	1	1	0	0	1	1	1	1	1	0	0	0	1	0
	4-wire 1/4bridge	1	1	0	0	1	1	1	1	1	0	0	1	0	0
	3-wire 1/2bridge	0	1	0	1	1	1	1	0	1	0	1	1	0	0
	4-wire 1/2bridge	0	1	0	1	0	1	1	0	1	0	1	0	0	0
	5-wire 1/2bridge	0	1	1	1	0	1	1	0	1	1	1	0	0	0
Strain sensor input	4-wire	0	0	0	1	1	1	1	Set the DIP switch as shown in the left table						
	6-wire	0	0	0	1	1	0	1							
Voltage input/Resistance input		0	0	0	1	1	1	1	* Voltage and resistance inputs do not affect the strain gauge.						

This explains how to connect the input cable.

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

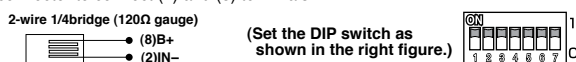
Strain input

1. When connecting the strain sensor (acceleration, load cell, etc.)

Connect with either the DSUB (male) Connector supplied as standard or the optional DSUB-Screw terminals conversion cable (B-560).

(For the settings of DIP switch, refer to the table above.)

2. When connecting the strain gauge (Figure below shows an example of 2-wire 1/4bridge (120Ω gauge) connection.), use the supplied DSUB (male) connector to connect (2) and (8) terminals.



Voltage and resistance inputs

1. Voltage input

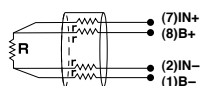
Use the supplied DSUB (male) connector to connect to (2) and (7) terminals.

Direct voltage (7) IN+ IN+...High potential terminal (2) IN- IN-...Low potential terminal

(Set the DIP switch as shown in the right figure.)

2. Resistance input

When measuring the resistance, as shown in Figure below, wire using the following 4-wire, or short between (1) and (2), and (7) and (8).



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. Please don't input it.

<Input terminal (+)/Input terminal (-) interval>

Maximum input voltage : DC10Vp-p

<Input terminal (-)/Input terminal (-) interval>

Maximum input voltage : 10Vp-p

<Input terminal (-)/GND terminal interval>

Maximum input voltage : 60Vp-p Withstand voltage : 1000Vp-p/1minute

5 Noise Countermeasures

In case the measured values fluctuate due to exogenous noise, the following measures are recommended.

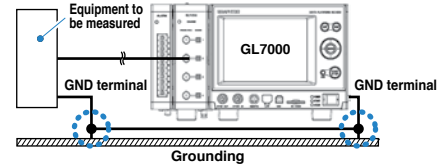
(Depending on the type of noise, the result may change.)

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.

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

6 Specifications

GL7-DCB (Strain Module) specifications

Item	Contents
Input ch number	4 ch/1 module
Input terminal shape	DSUB 9-pin (female)
Input system	All ch insulation, simultaneous sampling, balanced input
Sampling interval	10 μs to 1 hour
Built-in RAM	2,000,000 data
Input type	Strain, voltage, resistance values (including potentiometer)
Measurement range	Strain 400, 500, 800, 1000, 2000, 4000, 5000, 8000, 10000, 20000 με (με : 10° Strain) 0.2, 0.25, 0.4, 0.5, 1, 2, 2.5, 4, 5, 10 mV/V * The range depends on the bridge voltage.
Voltage	1, 2, 5, 10, 20, 50, 100, 200, 500 mV, 1, 2, 5 V
Resistance	1, 2, 5, 10, 20, 50, 100, 200, 500 Ω, 1, 2, 5, 10, 20, 50 kΩ
Measurement accuracy*1 (23°C±5°C)	Strain ±(0.2% of F.S. +10με) Voltage ±(0.2% of F.S. +10μV) Resistance ±0.5%
*1 After power-on, more than 30 minutes, sampling 1 sec., filter line, GND	
A/D converter	System: sequential comparison system Resolution: 16-bit (Effective Resolution : Approx. ±Range 1/40,000)
Gauge factor	2.0 constant
Sensor supported	Strain [Strain gauge transducer] 4-wire full bridge, 6-wire full bridge (Available for remote sensing) [Strain gauge] 4-wire full bridge, 6-wire full bridge (3/4-wire: available for remote sensing) 3 or 4 or 5-wire 1/2bridge (4/5-wire: available for remote sensing) 4 or 6-wire full bridge (6-wire: available for remote sensing) Resistance Potentiometer, resistance
Internal gauge resistance	50 to 10kΩ (Excitation voltage 1V : 50Ω to 10kΩ, 2V : 100Ω to 10kΩ, 2.5V : 120Ω to 10kΩ, 5V/10V : 350Ω to 10kΩ)
Internal gauge resistor	1/4bridge or 1/2bridge: (available for 120Ω and 350Ω gauges) * When the internal gauge resistance is 120Ω, the Excitation voltage 1, 2, 2.5 V are available.
Excitation voltage	DC 1, 2, 2.5, 5, 10 V * When the Excitation voltage is 5 V or more, 350Ω or more gauge is available.
Constant current bridge power supply	0.1 to 20 mA (Voltage supported : Max.10V)
Balancing	Method: Auto-balancing (Range: ±10,000 με)*Strain input only
Remote Sensing	3 or 4-wire 1/4bridge, 4 or 5-wire 1/2bridge, and 6-wire full bridge are available.
Shunt calibration	Internal approximate 60kΩ (120Ω gauge), approximate 175kΩ (350Ω gauge)
Temperature coefficient	Gain: ±0.02% of F.S./°C 0 point : ±1.2με/°C
Input resistance	10 MΩ ±5%
Maximum input voltage	Differential input : DC10V Common-mode voltage : 10VACrms Input terminal(-) /Input terminal (-) interval : 10 Vp-p Input terminal (-)/GND interval : 60Vp-p
Withstand voltage	Input terminal (-)/GND interval : 1000Vp-p 1 minute
Insulation resistance	Input terminal (-)/GND interval : 100MΩ or more (at DC500 V)
Common mode rejection ratio	80 dB or more (50/60 Hz signal source 300Ω or less)
Noise	50με or less (DC2V, 350Ω)
Frequency response	DC to 20 kHz
Filter	L.P.F. OFF, Line (1.5 Hz) 3, 6, 10, 30, 50, 60 Hz, 100, 300, 500 Hz, 1, 3, 5, 10kHz at -30 dB/oct A.A.F. OFF/ON (Anti-aliasing filter)
TEDS	Standards: Conforms to IEEE1451.4 Class2 (Template No. 33) Information: Readout and auto-set for sensor data
External dimensions [WxDxH] (approximate)	49.2 × 136 × 160 mm (not including protruding parts)
Weight (approximate)	840 g