midi LOGGER

GLT400

Quick Start Guide

604419040 GLT400-UM-851

GRAPHTEC

Thank you for choosing Graphtec midi LOGGER GLT400.
The Quick Start Guide is to assist you with basic operations.
Please refer to the User's Manual (PDF) in the internal memory for more in-depth information.
For details on how to refer to the User's Manual, see the "User's Manual and Supplied Software" section.

Confirmation of the exterior

Check the exterior of the unit to ensure that there are no cracks, defects, or any other damages before use.

Accessories

• Quick Start Guide : 1 • AC cable/AC adapter : 1 • Spacer (Large: 1, Small: 2) : 1set
• Notes for Safe Operation：1

Files stored in the internal memory

• GLT400 User's Manual • GLT400 Setting App (Setting software)
• GL-Connection (Waveform viewer and Control software)

* When the internal memory is initialized, the included files are deleted. If you have deleted the User's Manual and the supplied software from the internal memory, please download them from our website.

Registered trademarks

Contents

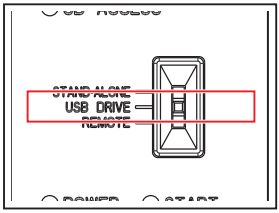
User's Manual and Supplied Software

User's Manual and supplied software are included in the internal memory of the GLT400. Please copy from the internal memory to the PC and use it. Refer to the next section for the copy method.
When the internal memory is initialized, the included files are deleted. Deleting the included files does not affect the unit operation, but it is recommended that you copy the files to your PC in advance.
If you have deleted the User's Manual or supplied software from the internal memory, please download them from our website.

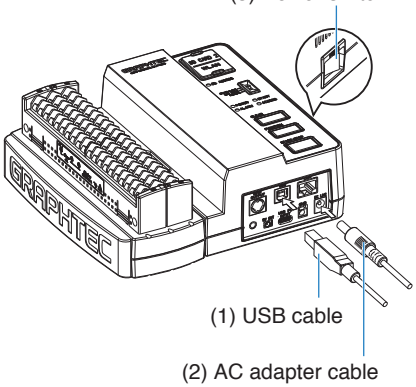
Graphtec website: http://www.graphteccorp.com

How to copy supplied files in USB DRIVE mode

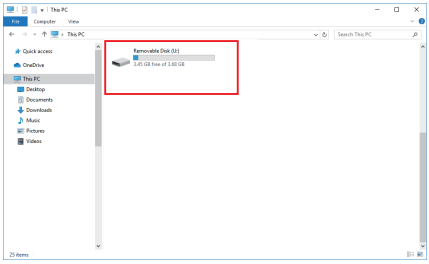
1. Set the Mode switch on the GLT400 to "USB DRIVE" when the power is off.



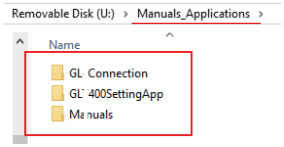
2. Connect the GLT400 to the computer using the USB cable.
Connect the AC adapter cable and then turn on the power switch of the GLT400.



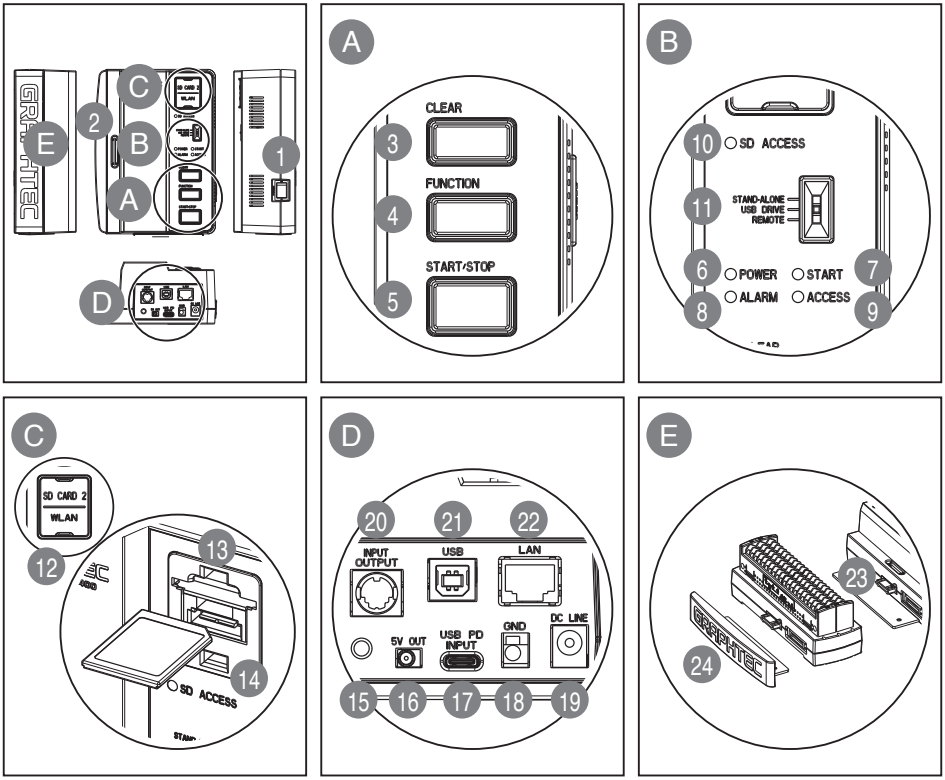
3. When the internal memory of the GLT400 is recognized on the PC, it can be accessed.



4. Copy the following folders and files to the PC.



Nomenclature



1. Power switch

2. Protective cover holder

3. CLEAR key

When you press briefly, the error condition is cleared. When you press and hold for 2 seconds, the alarm generation status is cleared.

4. FUNCITON key

Press and hold for 2 seconds while capturing is stopped to perform wireless LAN easy connection (WPS). (When B-568 is connected) Also, to replace the SD CARD during capturing, press and hold for 2 seconds.

5. START/STOP key

Press and hold for 2 seconds in STAND-ALONE mode to start and stop capturing.

6. POWER LED

This LED is lit in three colors: green, orange, and red. It mainly indicates the power state.

Mode Switch state	Lighting state	Description
STAND-ALONE / REMOTE	Not lit	Power off state
	Flashes in green	Starting up/Reading setting file
		SD CARD replaceable state (during capturing)
	Lit in green	When the GLT400 is started
	Flashes in orange	Preparing for SD CARD replacement
	Lit in red	Error has been occurred
USB DRIVE	Lit in orange	Operating in USB DRIVE mode

7. START LED

This LED is lit in three colors: green, orange and red. It mainly indicates the capturing state.

Mode Switch state	Lighting state	Description
STAND-ALONE / REMOTE	Not lit	Capturing has been stopped (During free running)
	Lit in orange	Waiting for start trigger
	Lit in green	Capturing
	Flashes in orange	Capturing finished (stop trigger is established), Waiting for repeat capturing
USB DRIVE	Always not lit	Not used

8. ALARM LED

This LED is lit in one color: red. It indicates the alarm output state.

Mode Switch state	Lighting state	Description
STAND-ALONE / REMOTE	Not lit	No alarm has occurred
	Lit in red	Alarm has occurred (Alarm is being output.)
USB DRIVE	Always not lit	Not used

9. ACCESS LED

This LED is lit in green when reading/writing to the internal memory.

Mode Switch state	Lighting state	Description
STAND-ALONE / REMOTE /	Not lit	Not accessing (reading/writing) the internal memory
USB DRIVE	Lit in green	Accessing (reading/writing) the internal memory

10. SD ACCESS LED

This LED is lit in one color: green. The operation varies depending on the medium inserted in the SD CARD slot.

Mode Switch state	SD CARD slot state	Lighting state	Description
STAND-ALONE / REMOTE	Not inserted	Not lit	Always not lit
	SD CARD	Not lit	Not accessing (reading/writing) the SD CARD
		Flashes in green	Accessing (reading/writing) the SD CARD
	Wireless LAN unit option (B-568)	Not lit	Wireless LAN unit is not communicating
		Lit in green	Wireless LAN unit is communicating
		Flashes in green	Automatic IP Address Acquisition (DHCP) is being performed during Easy Connection (WPS)
USB DRIVE	Not inserted	Not lit	Always not lit
	SD CARD	Not lit	Not accessing (reading/writing) the SD CARD
		Lit in green	Accessing (reading/writing) the SD CARD

11. Mode switch

The Mode switch is used to switch to one of three modes: STAND-ALONE, USB DRIVE, REMOTE.

Switch the Mode switch when the power of the GLT400 is Off.

The mode is not switched even if the Mode switch is switched when the power of the GLT400 is On. You need to perform the power cycle.

- **STAND-ALONE**

  When using the GLT400 as a single recorder, set to "STAND-ALONE". You can control capturing with the GLT400 alone or with PC software.

- **USB DRIVE**

  Set to "USB DRIVE" when accessing the internal memory and SD CARD from the PC as external drive.

- **REMOTE**

  Set to "REMOTE" when connecting the GLT400 as a Remote Unit of the GL840.
  To connect as a Remote Unit, refer to the GL840 User's Manual.

12. Protective cover

13. SD CARD slot

14. Wireless unit mounting terminal

The wireless unit terminal is used to connect the option B-568. (It cannot be used with SD CARD at the same time.)

15. M4-L5 nut (Use for cable clamp, etc.)

16. Power jack for humidity sensor (B-530 option)

17. USB PD connector (for power supply)

18. GND terminal

19. AC adapter jack

20. External input/output terminals

This is used to connect B-513 (option).
(Input: LOGIC/PULSE, EXT TRIG/SAMPLE Output: ALARM)

21. USB interface terminal

22. LAN interface terminal

LAN LED

Mode Switch state	Lighting state	Description
STAND-ALONE / REMOTE	Not lit	LAN communication is not performing
	Lit in green	LAN communication is performing.
	Flashes in green	Automatic IP Address Acquisition (DHCP) is being performed.
USB DRIVE	Always not lit	Not used

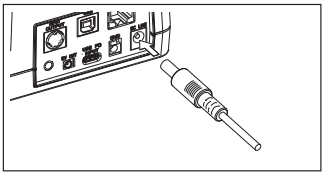
23. Expansion terminal base connection terminal

24. Connector cover

* For details on the operation of other keys, refer to the User's Manual.

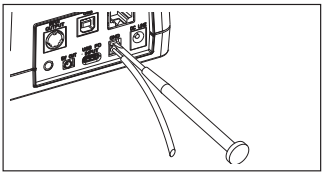
Connection Procedures

Connect the AC adapter



Connect the DC output of the AC adapter to the connector marked "DC LINE" on the GLT400.

Connect the ground cable

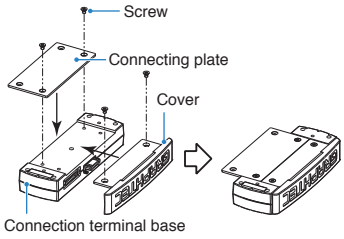


Connect the ground cable to the GLT400 while pushing the button above the GND terminal with a flathead screwdriver. Connect other end of the cable to ground.

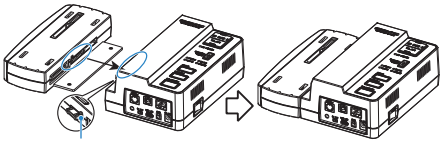
Connect the expansion terminal base connection terminal

* For details, refer to the User's Manual (PDF).

1. Install the connecting plate and the cover to the connection terminal base with the supplied screws.
   * Recommended tightening torque: 14kgf/cm

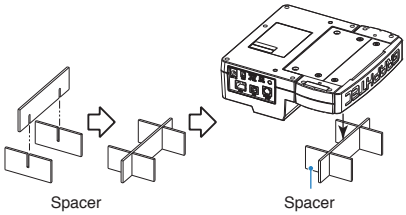


2. Direct-connect the terminal base to the GLT400. It is recommended to direct-connect them on a flat desk. Then, connect the connector cover to the expansion terminal base.

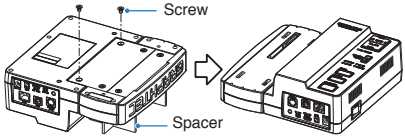


* Pay attention to the protrusions when direct-connecting.

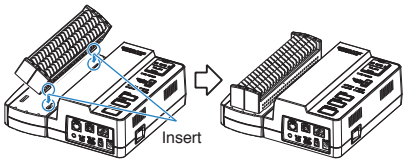
3. Assemble the cardboard contained in the accessory bag to make a spacer.



4. Turn the direct-connected GLT400 over and place it on the spacer as shown in the figure. Tighten the screws without rattling. (When connecting multiple GLT400s, ensure a height of 33.5 mm without rattling.)

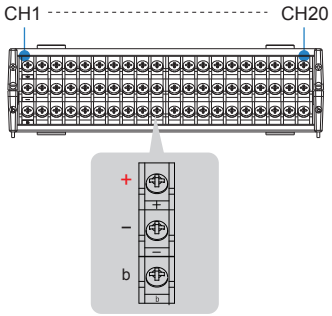


5. Insert the terminal into the terminal base.

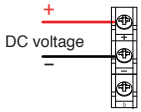


Connect the expansion terminal base connection terminal

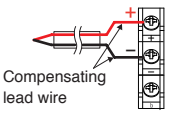
<Screw terminal>



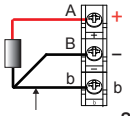
DC voltage input



Thermocouple input

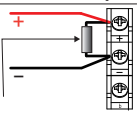


Resistance bulb input



Lead wire resistance for 1 line
Make the resistance of all three lines equal with a value of 10Ω or less.

DC current input



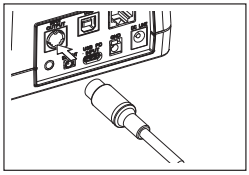
Shunt resistance

Example: In the case of 4-20 mA, apply 250Ω (±0.1%) and measure in the 1-5V range.

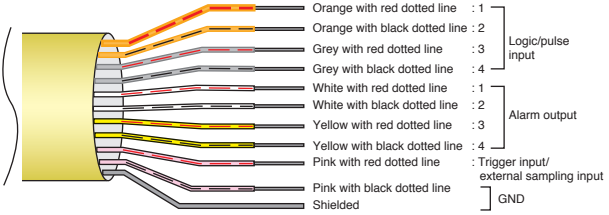
* Please use the shunt resistance B-551 (option).

Note: Connect to any terminal according to the terminal number shown on the top.
For the connection to the screwless terminal, refer to the User's Manual.

Connect to the external input terminal (Use B-513 option)



<Wiring diagram>

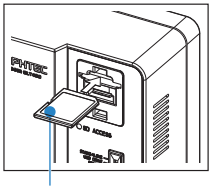


* The B-513 input/output cable for GL (option) is required for connecting external input/output. (Logic/pulse input, alarm output, trigger input)

Internal memory

- The internal memory is displayed as MEM in the application.
- The internal memory is not removable.

Mounting SD CARD

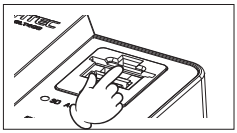


* Confirm that the writing is not locked.

<How to mount>

1. Remove the SD CARD protective cover.
2. Insert the SD CARD until it clicks and is firmly placed inside the slot.

<How to remove>

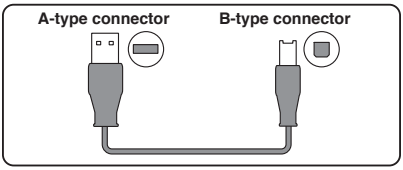


1. The SD CARD is released by pushing gently on the SD CARD. Then, pull to remove the SD CARD.

- To remove the SD CARD, confirm that the "SD ACCESS" LED is not lit and then remove it.
- When replacing the SD CARD during capturing, follow the replacement procedure.

Connect the USB cable

To connect the GLT400 to the PC, use a cable with A-type and B-type connectors.



In USB DRIVE mode, the GLT400 operates as an external drive for internal memory and SD CARD.
If using our application with a USB cable, you need to install the USB driver on the PC. For the installation, refer to the "USB Driver Installation Manual".

Safety Guide for using GLT400

If a voltage exceeding the specified value is input, the semiconductor relay used in the input section is damaged. Never input the voltage exceeding the specified value at any moment.

Maximum input voltage of standard terminal (B-564) and screwless terminal (B-564SL)

< Between +/– terminals(A) >

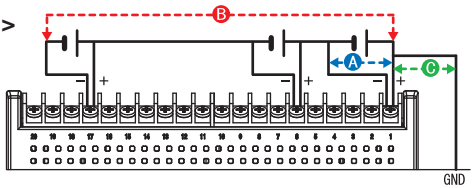
- Maximum input voltage: 60Vp-p (Range of 20mV to 2V)
  110Vp-p (Range of 5V to 100V)

< Between input terminal/input terminal (B) >

- Maximum input voltage: 60Vp-p
- Withstand voltage: 350 Vp-p at 1 minute

< Between input terminal/GND (C) >

- Maximum input voltage: 60Vp-p
- Withstand voltage: 350 Vp-p at 1 minute



Maximum input voltage of withstand high-voltage high-precision terminal (B-565)

< Between +/– terminals(A) >

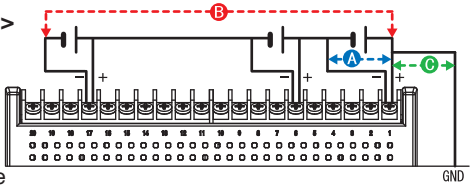
- Maximum input voltage: 60Vp-p (Range of 20mV to 2V)
  110Vp-p (Range of 5V to 100V)

< Between input terminal/input terminal (B) >

- Maximum input voltage: 600Vp-p
- Withstand voltage: 600Vp-p

< Between input terminal/GND (C) >

- Maximum input voltage: 300Vp-p
- Withstand voltage: 2300 VACrms at 1 minute



Warming-up

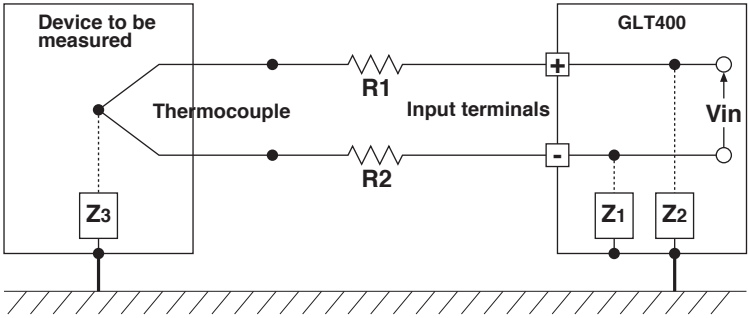
GLT400 requires approximately 30 minutes warm-up time to deliver the optimum performance.

Unused channels

The analog input section of the GLT400 contains a capacitor to improve the noise removal capability.
Therefore, when the input terminal is in open sate, the measurement result may be affected by the signals of other channels. In such a case, set the input to "Off" or short between +/- terminals. When the signal is input properly, there is no influence from other channels.
If the measurement value fluctuates due to external noise, we recommend the following countermeasures. (The effect depends on the noise type.)

Noise countermeasures

Ex 1: Connect the GLT400's GND to ground.



Ex 2: Connect the GLT400's GND to the GND of the device to be measured.

Ex 3: In the AMP setting menu, set the filter to any setting other than “OFF” .

Ex 4: Set the sampling interval which enables GLT400's digital filter (see Table below).

Number of Measuring Channels *1	Allowed Sampling Interval	Sampling Interval which enables Digital Filter
1 channel	10 msec or slower *2	50 msec or slower
2 channels or less	20 msec or slower *2	125 msec or slower
5 channels or less	50 msec or slower *2	250 msec or slower
10 channels or less	100 msec or slower	500 msec or slower
11 to 20 channels	200 msec or slower	1 sec or slower
21 to 50 channels	500 msec or slower	2 sec or slower
51 to 100 channels	1 sec or slower	5 sec or slower
101 to 200 channels	2 sec or slower	10 sec or slower

*1 Number of Measuring Channels is the number of channels in which input settings are NOT set to “OFF” .

*2 Temperature cannot be measured when the sampling interval is set to 10 ms/20 ms or 50 ms.

The commercial power frequency to be used must be set. Set the AC power frequency to be used.

Select items	Description
50 Hz	Area where the power frequency is 50 Hz
60 Hz	Area where the power frequency is 60 Hz

Supplied Software

Two types of software applications for Windows OS are provided on this GLT400.
Please use it according to the purpose.

- Use the "GLT 400 Setting App" to change the settings.
- Use "GL-Connection" to check the waveform of the input signal in real time or to capture the input signal.

Setting software GLT400 Setting App

Using this software, you can connect to the GLT 400 with various interfaces, check and change the settings, acquire the captured files, and monitor from the monitor.

<How to install the GLT400 Setting App>

The GLT400 Setting App can be installed by executing "Setup.exe" in the "Manuals_Application"→"GLT400SettingApp" folder. Follow the installer's instructions to install.

The items that you can set differ depending on the "STAND-ALONE" mode and "REMOTE" mode of this GLT400.

- **STAND-ALONE mode:**
  All items can be set and viewed.
- **REMOTE mode:**
  The network settings only can be set and viewed.

Set the following initial items as necessary using this software.

- Language
- Clock time

For the setting method, refer to the "Chapter 4" in the GLT400 User's Manual.

Waveform viewer GL-Connection

This software has multiple data logger controls and various waveform display functions, and can be used as a GL integrated waveform viewer.

<How to install the GL-Connection>

The GL-Connection can be installed by executing "Setup.exe" in the "Manuals_Application"→"GL-Connection" folder. Follow the installer's instructions to install.

For details on how to use this software, refer to the GL-Connection User's Manual.

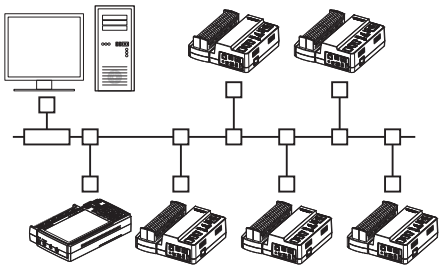
* Installation of .NET Framework
If .NetFramework4.6.1 is not installed, install it online or by executing the included "dotnetfx46_full_x86_x64.exe"

The ability to interface with GL840

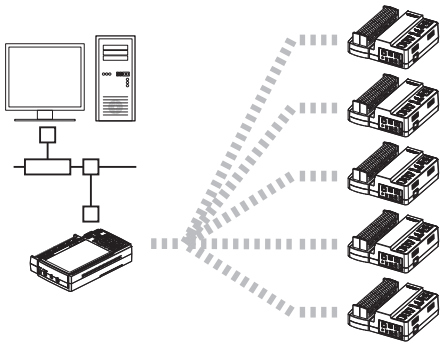
GLT400 Remote Mode

By communicating with the midi LOGGER GL840 series via a wired LAN/wireless LAN connection, you can use the GL840 as the base unit and the GLT400 as the Remote Unit (remote terminal) for batch capturing on the GL840 base unit.
Maximum 5 units, up to a total of 200 channels including the number of channels of GL840, can be captured at the same time.
For details on how to set the Remote Mode, refer to the GL840 User's Manual.

<Wired LAN connection>



<Wireless LAN connection>



* The sampling interval is limited depending on the number of channels used.
* Measured data may be lost depending on the communication environment.

Specifications

<Standard specifications>

<table>
<tr><th>Items</th><th>Description</th></tr>
<tr><td>Number of analog channels</td><td>Up to 200 channels can be used with maximum 10 units
(In REMOTE mode, up to 180 channels can be used with maximum 9 units)</td></tr>
<tr><td>External input and output</td><td>Trigger input or External sample pulse: 1ch
Logic input: 4ch or Pulse input: 4ch (in STAND-ALONE mode only)
Alarm output: 4ch (only 1ch in REMOTE mode)</td></tr>
<tr><td>PC I/F</td><td>Ethernet (10BASE-T/100BASE-TX), USB 2.0 (compatible with high speed)</td></tr>
<tr><td>Built-in memory device</td><td>Internal memory (MEM): approx. 4GB
SD CARD slot: 1 slot (compatible with SDHC, maximum 32GByte memory available)
* Possible to save maximum 2GB for one file</td></tr>
<tr><td>Sampling interval</td><td>10ms/1ch MAX (GBD/CSV format)
10, 20, 50, 100, 125, 200, 250, 500 msec, 1, 2, 5, 10, 20, 30 sec
1, 2, 5, 10, 20, 30 min, 1 hour, External
* Allowable setting varies with the input setting and the number of measuring channels.
* "External" can be selected in STAND-ALONE only.</td></tr>
<tr><td>Back-up functions</td><td>Setup parameters: EEPROM/Clock: Lithium secondary battery</td></tr>
<tr><td>Clock accuracy (ambient temperature 23°C)</td><td>±0.002% (approx. 50 seconds per month)</td></tr>
<tr><td>Operating environment</td><td>-20 to 60°C, 5 to 85%RH (Supplied AC adapter: 0 to 45°C, When USB PD is used as the power supply, it depends on the power supply specifications.)</td></tr>
<tr><td>Power supply</td><td>AC adapter: 100 to 240VAC, 50 to 60 Hz
DC input: 8.5 to 24V DC (26.4V max.)
USB power supply: Compatible with USB PD, external USB PD compatible battery</td></tr>
<tr><td>Power consumption</td><td>AC power consumption * When using the supplied AC adapter.
<table>
<tr><th>No</th><th>Power supply</th><th>Power consumption</th></tr>
<tr><td>1</td><td>AC100V</td><td>24VA</td></tr>
<tr><td>2</td><td>AC240V</td><td>35VA</td></tr>
</table>
DC current consumption
<table>
<tr><th>No</th><th>DC voltage</th><th>Current consumption</th></tr>
<tr><td>1</td><td>+24V</td><td>0.36A</td></tr>
<tr><td>2</td><td>+12V</td><td>0.70A</td></tr>
<tr><td>3</td><td>+8.5V</td><td>1.00A</td></tr>
</table></td></tr>
<tr><td>External dimensions (approx.)
Main unit with terminal</td><td>Standard terminal: 187.5 x 183 x 65.5 mm
High-voltage high-precision terminal: 187.5 x 183 x 73.4 mm
Screwless terminal: 187.5 x 183 x 65.5 mm</td></tr>
<tr><td>Weight (approx.)
Main unit with terminal</td><td>With standard terminal: 1090g/With high-voltage high-precision terminal: 1120g/With screwless terminal: 1020 g</td></tr>
<tr><td>Vibration proof</td><td>Equivalent to Automobile Parts Type 1 Category A Classification</td></tr>
</table>

<External input/output functions>

Items	Description
Input specifications (Pulse/Logic/Trigger/External sampling)	Maximum input voltage: 0 to +30V (single-ended ground input) Input threshold voltage: approx. +2.5V Hysteresis: approx. 0.5V (+2.5V to +3V)
Alarm output specifications	Output format: Open collector output (5V pull-up resistance 10kΩ)

<Common specifications of the terminal in the input section>

Items		Description
Method		Photo MOS relay scanning system, all channels isolated, balanced input
Measurement range	Voltage	20, 50, 100, 200, 500mVF.S., 1, 2, 5, 10, 20, 50, 100VF.S., 1-5VF.S.
	Temperature	Thermocouple: K, J, E, T, R, S, B, N, C (WRe5-26) Resistance bulb: Pt100, JPt100, Pt1000 (IEC751) Measuring range: 100°C, 500°C, 2,000°C
	Humidity	0 to 100% (Voltage 0V to 1V scaling conversion)
A/D converter		16-bit Delta-Sigma A/D converter (Effective resolution: approx. 1/40,000 of ± range)
Temperature coefficient		Gain: 0.01% of F.S./°C Zero: 0.02% of F.S./°C * Zero occurs when sampling speed is 10, 20 or 50 ms
Common mode rejection ratio		At least 90 dB (50/60 Hz, signal source 300Ω or less)
Noise		At least 48 dB (with +/- terminals shorted)

<Specifications of input section (Standard terminal: B-564/Screwless terminal: B-564SL)>

<table>
<tr><th colspan="2">Items</th><th>Description</th></tr>
<tr><td rowspan="2">Number of input channels, Method</td><td>Standard terminal</td><td>20 channels, M3 screw type</td></tr>
<tr><td>Screwless terminal</td><td>20 channels, Screwless terminal</td></tr>
<tr><td>Measurement accuracy (23°C ±5°C)
• When 30 minutes or more have elapsed after power was switched on
• Sampling 1s/20ch
• Filter ON (10)
• GND connected</td><td colspan="2">● Voltage: ±0.1% of F.S.
● Thermocouple
<table>
<tr><th>Type</th><th>Measurement temperature range</th><th>Measurement accuracy</th></tr>
<tr><td rowspan="4">R/S</td><td>0 ≤ TS ≤ 100°C</td><td>±5.2˚C</td></tr>
<tr><td>100 < TS ≤ 300°C</td><td>±3.0˚C</td></tr>
<tr><td>R: 300 < TS ≤ 1600°C</td><td>± (0.05% of rdg +2.0˚C)</td></tr>
<tr><td>S: 300 < TS ≤ 1760°C</td><td>± (0.05% of rdg +2.0˚C)</td></tr>
<tr><td rowspan="2">B</td><td>400 ≤ TS ≤ 600°C</td><td>±3.5˚C</td></tr>
<tr><td>600 < TS ≤ 1820°C</td><td>± (0.05% of rdg +2.0˚C)</td></tr>
<tr><td rowspan="2">K</td><td>-200 ≤ TS ≤ -100°C</td><td>± (0.05% of rdg +2.0˚C)</td></tr>
<tr><td>-100 < TS ≤ 1370°C</td><td>± (0.05% of rdg +1.0˚C)</td></tr>
<tr><td rowspan="2">E</td><td>-200 ≤ TS ≤ -100°C</td><td>± (0.05% of rdg +2.0˚C)</td></tr>
<tr><td>-100 < TS ≤ 800°C</td><td>± (0.05% of rdg +1.0˚C)</td></tr>
<tr><td rowspan="2">T</td><td>-200 ≤ TS ≤ -100°C</td><td>± (0.1% of rdg +1.5˚C)</td></tr>
<tr><td>-100 < TS ≤ 400°C</td><td>± (0.1% of rdg +0.5˚C)</td></tr>
<tr><td rowspan="3">J</td><td>-200 ≤ TS ≤ -100°C</td><td>±2.7˚C</td></tr>
<tr><td>-100 < TS ≤ 100°C</td><td>±1.7˚C</td></tr>
<tr><td>100 < TS ≤ 1100°C</td><td>± (0.05% of rdg +1.0˚C)</td></tr>
<tr><td rowspan="2">N</td><td>-200 ≤ TS < 0°C</td><td>± (0.1% of rdg +2.0˚C)</td></tr>
<tr><td>0 ≤ TS ≤ 1300°C</td><td>± (0.1% of rdg +1.0˚C)</td></tr>
<tr><td>C (W)</td><td>0 ≤ TS ≤ 2000°C</td><td>± (0.1% of rdg +1.5˚C)</td></tr>
<tr><td colspan="2">Reference contact compensation accuracy</td><td>±0.5˚C</td></tr>
</table>
*: Thermocouple diameters T, K: 0.32φ, others: 0.65φ
● Resistance bulb *: 3-wire system
<table>
<tr><th>Type</th><th>Measurement temperature range</th><th>Applied current</th><th>Measurement accuracy</th></tr>
<tr><td>Pt100</td><td>-200 to 850°C</td><td>1mA</td><td>±1.0°C</td></tr>
<tr><td>JPt100</td><td>-200 to 500°C</td><td>1mA</td><td>±0.8°C</td></tr>
<tr><td>Pt1000</td><td>-200 to 500°C</td><td>0.3mA</td><td>±0.8°C</td></tr>
</table></td></tr>
<tr><td>Maximum input voltage</td><td colspan="2">Between +/- input terminals
Range of 20mV to 2V (60Vp-p)
Range of 5V to 100V (110Vp-p)</td></tr>
<tr><td></td><td>Between input terminal and input terminal</td><td>60Vp-p</td></tr>
<tr><td></td><td>Between input terminals and GND terminal</td><td>60Vp-p</td></tr>
<tr><td>Withstand voltage</td><td>Between input terminal and input terminal</td><td>1 minute at 350Vp-p</td></tr>
<tr><td></td><td>Between input terminal and GND terminal</td><td>1 minute at 350Vp-p</td></tr>
</table>

* Even when connected to the GLT400, the range of allowed ambient temperature is -20 to 60°C.

<Specifications of input section (Withstand high-voltage high-precision terminal: B-565)>

<table>
<tr><th>Items</th><th>Description</th></tr>
<tr><td>Number of input channels, Method</td><td>20 channels, M3 screw type</td></tr>
<tr><td>Measurement accuracy
(23°C ±5°C)
• When 30 minutes or more have elapsed after power was switched on
• Sampling 1s/10ch
• Filter ON (10)
• GND connected</td><td>
● Voltage : ± (0.05% of F.S. +10 μV)
● Thermocouple
<table>
<tr><th>Type</th><th>Measurement temperature range</th><th>Measurement accuracy</th></tr>
<tr><td rowspan="4">R/S</td><td>0 ≤ TS ≤ 100°C</td><td>±4.5°C</td></tr>
<tr><td>100 < TS ≤ 300°C</td><td>±3.0°C</td></tr>
<tr><td>R: 300 < TS ≤ 1600°C</td><td>±2.2°C</td></tr>
<tr><td>S: 300 < TS ≤ 1760°C</td><td>±2.2°C</td></tr>
<tr><td rowspan="2">B</td><td>400 ≤ TS ≤ 600°C</td><td>±3.5°C</td></tr>
<tr><td>600 < TS ≤ 1820°C</td><td>±2.5°C</td></tr>
<tr><td rowspan="2">K</td><td>-200 ≤ TS ≤ -100°C</td><td>±1.5°C</td></tr>
<tr><td>-100 < TS ≤ 1370°C</td><td>±0.8°C</td></tr>
<tr><td rowspan="2">E</td><td>-200 ≤ TS ≤ -100°C</td><td>±1.0°C</td></tr>
<tr><td>-100 < TS ≤ 800°C</td><td>±0.8°C</td></tr>
<tr><td rowspan="2">T</td><td>-200 ≤ TS ≤ -100°C</td><td>±1.5°C</td></tr>
<tr><td>-100 < TS ≤ 400°C</td><td>±0.6°C</td></tr>
<tr><td rowspan="3">J</td><td>-200 ≤ TS ≤ -100°C</td><td>±1.0°C</td></tr>
<tr><td>-100 < TS ≤ 100°C</td><td>±0.8°C</td></tr>
<tr><td>100 < TS ≤ 1100°C</td><td>±0.6°C</td></tr>
<tr><td rowspan="2">N</td><td>-200 ≤ TS < 0°C</td><td>±2.2°C</td></tr>
<tr><td>0 ≤ TS ≤ 1300°C</td><td>±1.0°C</td></tr>
<tr><td>C (W)</td><td>0 ≤ TS ≤ 2000°C</td><td>±1.8°C</td></tr>
<tr><td colspan="2">Reference contact compensation accuracy</td><td>±0.3°C</td></tr>
</table>
*: Thermocouple diameters T, K: 0.32φ, others: 0.65φ
● Resistance bulb *: 3-wire system
<table>
<tr><th>Type</th><th>Measurement temperature range</th><th>Applied current</th><th>Measurement accuracy</th></tr>
<tr><td rowspan="3">Pt100</td><td>-200≤TS≤100°C</td><td rowspan="3">1mA</td><td>±0.6°C</td></tr>
<tr><td>100<TS≤500°C</td><td>±0.8°C</td></tr>
<tr><td>500<TS≤850°C</td><td>±1.0°C</td></tr>
<tr><td rowspan="2">JPt100</td><td>-200≤TS≤100°C</td><td rowspan="2">1mA</td><td>±0.6°C</td></tr>
<tr><td>100<TS≤500°C</td><td>±0.8°C</td></tr>
<tr><td rowspan="2">Pt1000</td><td>-200≤TS≤100°C</td><td rowspan="2">0.3mA</td><td>±0.6°C</td></tr>
<tr><td>100<TS≤500°C</td><td>±0.8°C</td></tr>
</table>
</td></tr>
<tr><td rowspan="3">Maximum input voltage</td><td>Between +/- input terminals</td><td>Range of 20mV to 2V (60Vp-p)
Range of 5V to 100V (110Vp-p)</td></tr>
<tr><td>Between input terminal and input terminal</td><td>600Vp-p</td></tr>
<tr><td>Between input terminals and GND terminal</td><td>300Vp-p</td></tr>
<tr><td rowspan="2">Withstand voltage</td><td>Between input terminal and input terminal</td><td>600Vp-p</td></tr>
<tr><td>Between input terminal and GND terminal</td><td>1 minute at 2300VACrms</td></tr>
</table>

* Even when connected to the GLT400, the range of allowed ambient temperature is 0 to 45°C.

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Specifications are subject to change without notice.

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