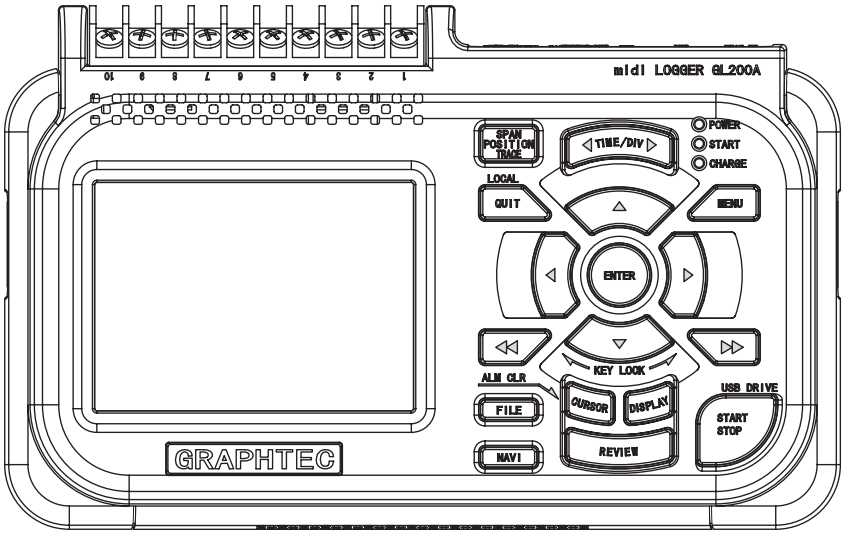
midi LOGGER

GL200A Quick Start Guide

GL200A-UM-851



- **Checking the Outer Casing**

  After unpacking, check the GL200A's outer casing before use to make sure that there are no surface scratches or other flaws such as stains or dirt.

- **Checking the Accessories**

  ☐ Quick Start Guide: 1 ☐ CD-ROM: 1 ☐ AC cable/AC adapter: 1 set

- **Setting and Checking the AC Line Frequency**

  Set the AC line frequency in the "OTHR" menu.
  This setting (50 or 60 Hz) affects the device's noise elimination capability.

Don't forget to check the setting

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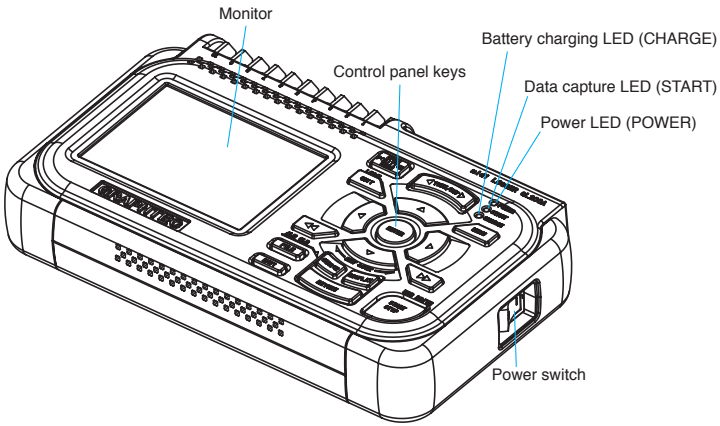
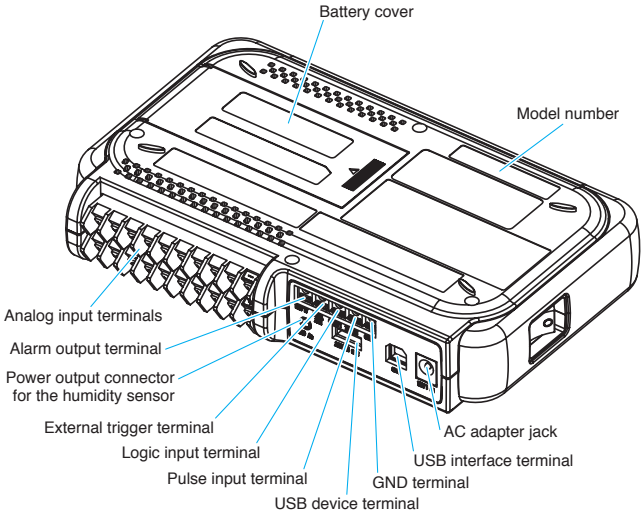
Part Names

Top Panel

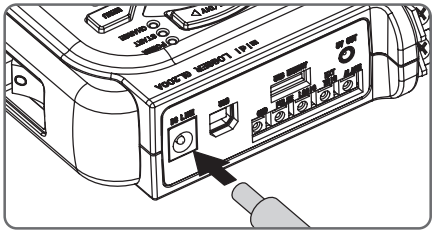


Bottom Panel



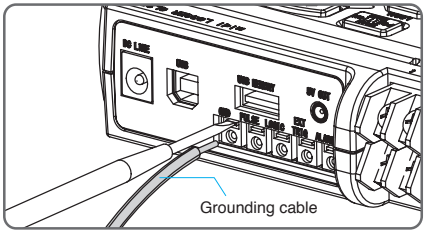
Connection Procedures

Connecting the AC Adapter



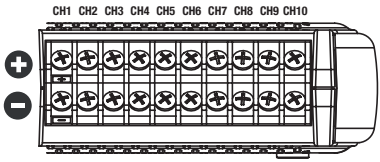
Connect the output side of the AC adapter to the power connector on the GL200A.

Connecting the Grounding Cable

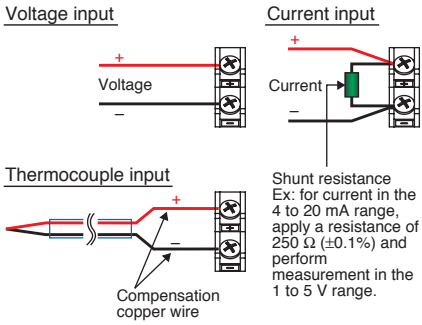


Use a flatblade screwdriver to push in the button above the ground terminal while connecting the grounding cable to the GL200A. Connect the other end of the cable to ground.

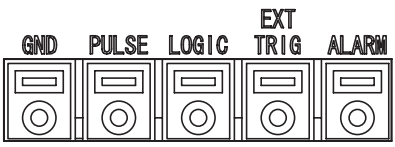
Making Connections to the Analog Input Terminals



Refer to the channel numbers in the above figure to make connections to the desired terminals.



Making Connections to the External Input/Output Terminals



The pulse, logic, external trigger and alarm terminals all have the same configuration as that of the GND terminal. Make connections to these terminals using the procedure described earlier for connecting the grounding cable. Connect each terminal in accordance with the name inscribed above each terminal.

Precautions to Observe When Performing Measurement

•Avoid eleztrical shock and short circuit accidents

- Do not apply voltage of AC33 Vrms or 60 VDC or above between the analog input section and main unit (GND terminal), or to between each analog channel.
- Do not apply voltage of AC33 Vrms or 60 VDC or above to analog input section (between + and - terminals).
- Do not apply radio-frequency signals.

•Warming-up

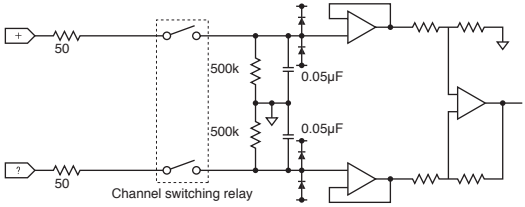
The GL200A should be allowed to warm up with the power turned on for approximately 30 minutes to achieve operation according to the specified performance.

•Unused channels

Capacitors have been incorporated into the analog input circuit to increase the noise elimination capability.

Therefore, if input terminal is open, or signals are not input to the terminal, measured results may be influenced by signals from other channels. In such a case, set input setting to “Off” or short circuit the + and – terminals.

If signals are input correctly, measured results are not influenced by other channels.



•Noise countermeasures

If measured values fluctuate due to extraneous noise, conduct the following countermeasures. (Results may differ according to noise type.)

Ex 1: Connect the GL200A’s GND to ground.

Ex 2: Connect GL200A’s GND to measurement object's GND.

Ex 3: Operate GL200A’s with batteries (B-517).

Ex 4: In the AMP settings menu, set filter to any setting other than “OFF”.

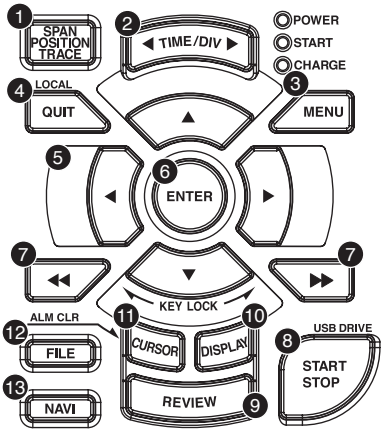
Ex 5: Set the sampling interval which enables GL200A’s digital filter (see table below).

Number of Measuring Channels※1	Allowed Sampling Interval	Sampling Interval That Enables Digital Filter
1 channel	10 ms or above※2	50 ms or above
2 channels or less	20 ms or above※2	125 ms or above
5 channels or less	50 ms or above※2	250 ms or above
10 channels or less	100 ms or above	500 ms or above

*1 "Number of Measuring Channels" indicates 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, 20, or 50 ms.

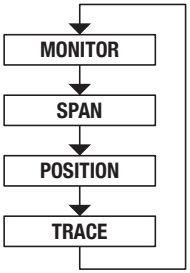
Descriptions of the Control Panel Keys



1. SPAN/POSITION/TRACE
2. TIME/DIV
3. MENU
4. QUIT (LOCAL)
5. △▽◁▷ keys (up, down, left, right)
6. ENTER
7. ◁◁ ▷▷ keys (KEY LOCK)
8. START/STOP (USB DRIVE MODE)
9. REVIEW
10. DISPLAY
11. CURSOR (ALM CLR)
12. FILE
13. NAVI

❶ SPAN/POSITION/TRACE key

This key enables SPAN, POSITION, and TRACE settings to be made independently for each channel. Each time this key is pressed, the mode displayed in the waveform operation display area changes in the sequence shown below. Use the △ and ▽ keys to select the channel, and the ◁ and ▷ keys to change the setting values.



Displays digital values (default).

Used to make span settings (change the waveform amplitude).

Used to make position settings (adjust the upper and lower values of the waveform).

Used to make trace settings (set the waveform display to On or Off).

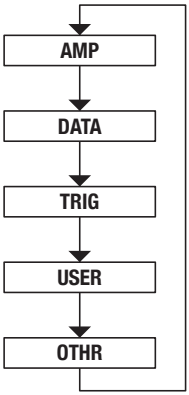
Note: If the QUIT key is pressed when the GL200A is in the SPAN, POSITION, or TRACE mode, the display returns to MONITOR mode.

❷ TIME/DIV key

Press the TIME/DIV key to change the time axis display range on the waveform screen.

❸ MENU key

Press the MENU key to open a setup menu. Each time this key is pressed, the setup screen tabs change in the sequence shown below.



- **AMP Settings**
  Used to make the input, range, filter and other settings.
- **Data Capture Settings**
  Used to make settings such as the sampling interval, data capture destination, and calculations during data capture.
- **Trigger Settings**
  Used to specify the data capture start and stop conditions, and the alarm generation conditions.
- **User Settings**
  Used to set the names of the users of this device, and to change from one user to another.
- **Other Settings**
  Used to make settings such as screen brightness, temperature unit, and so forth.

❹ QUIT (LOCAL) key

Press the QUIT key to cancel the settings and return them to their default status. If the device is in the Remote (Key Lock) status, namely the external operating status via the USB interface, press this key to return the device to the normal operating status (Local).

❺ △▽◁▷ keys

These keys are used to select menu setup items, to make span settings in the digital display area, to move the cursors during a data replay operation, and so forth.

❻ ENTER key

Press the ENTER key to enter the settings made in the setup menus, and to confirm your settings.

❼ ◁◁ ▷▷ keys (KEY LOCK)

These keys are used to move the cursor at high speed during a data replay operation, and to change the operation mode in the file settings box. Hold down both keys simultaneously for at least two seconds to enable key lock status. To cancel key lock status, press them again for at least two seconds. The key lock status can be confirmed by the status of the key lock lamp on the monitor.

❽ START/STOP (USB DRIVE) key

Press the START/STOP key to perform a data capture start operation while the GL200A is in the Free Running status, and a data capture stop operation when data capture has ended. If this key is held down while the power to the GL200A is turned on, the GL200A goes into USB Drive Mode.

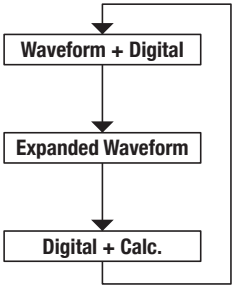
Note: Refer to the User's Manual in the supplied CD-ROM for more information on the setting.

❾ REVIEW key

Press the REVIEW key to replay captured data. If the GL200A is in the Free Running status, data files that have already been captured are replayed. If the GL200A is still capturing data, the data is replayed in a 2-screen format.

Note: A data replay operation will not be performed if data has not been captured.

❿ DISPLAY key



- **Waveform + Digital**
  This is the default screen when the GL200A is turned on, and both waveforms and digital values are displayed. The screen settings can also be changed by using the SPAN/POSITION/TRACE key.
- **Expanded Waveform**
  Displays waveforms only.
- **Digital + Calc.**
  Displays large-size digital values and two types of calculation processing results. The calculation settings are made in the "DATA " menu.

⓫ CURSOR (ALM CLR) key

Press the CURSOR key to switch between the A and B cursors during a data replay operation. If the Alarm setting has been specified as "Alarm Hold", press this key to clear the alarm. The alarm settings are made in the "TRIG" menu.

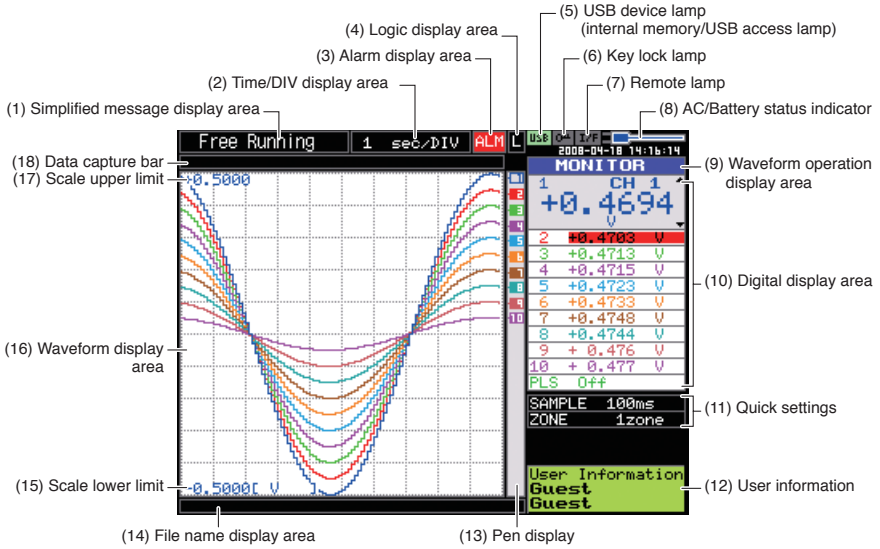
⓬ FILE key

Press the FILE key to save data to the GL200A's internal memory and to a USB memory device.

⓭ NAVI key

Press the NAVI key to display operational descriptions during the Free Running status, and during data capture and data replay operations.

Descriptions of the Menu Screens



(1) Simplified message display area:
Displays the operating status.

(2) Time/DIV display area:
Displays the current time scale.

(3) Alarm display area:
Displays the status of the alarm output terminal. (Red = alarm generated, black = alarm not generated)

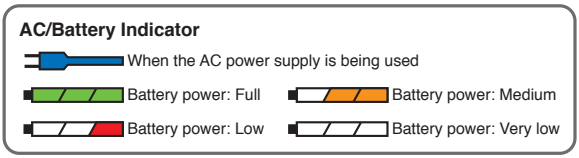
(4) Logic display area:
Displays the status of the logic signal. (Blue = Hi, black = Lo)

(5) USB device lamp (internal memory/USB access lamp):
Turns green when a USB memory device has been inserted. When the GL200A's internal memory or USB memory device is being accessed, this lamp turns red.

(6) Key lock lamp:
Displays the key lock status. (Yellow = keys locked, black = not locked)

(7) Remote lamp:
Displays the remote status. (Yellow = Remote status, black = Local status)

(8) AC/Battery status indicator:
Displays the following icons to indicate the operating status of the AC power supply and the battery.



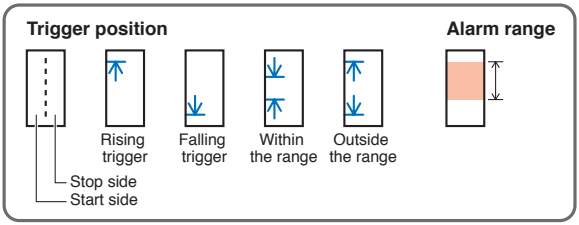
(9) Waveform operation display area:
Displays the mode selected by the SPAN/POSITION/TRACE key.

(10) Digital display area:
Displays the input values for each channel. The △ and ▽ keys can be used to select the active channel (enlarged display). Moreover, the selected active channel is displayed at the very top of the waveform display.

(11) Quick settings:
Displays items that can be easily set. The △ and ▽ keys can be used to make a Quick settings item active, and the ◁ and ▷ keys to change the values.

(12) User information:
Displays the user information for the currently selected user.

(13) Pen display:
Displays the signal positions, trigger positions, and alarm ranges for each channel.



(14) File name display area:
Displays the data capture file name during the data capture operation. During a data replay operation, the name of the data replay file is displayed.

(15) Scale lower limit:
Displays the lower limit of the scale of the currently active channel.

(16) Waveform display area:
The input signal waveforms are displayed here.

(17) Scale upper limit:
Displays the upper limit of the scale of the currently active channel.

(18) Data capture bar:
During a data capture operation, this bar displays the remaining memory capacity of the device used for data capture. When data is being replayed, the display position information is displayed here.

Measurement Procedure

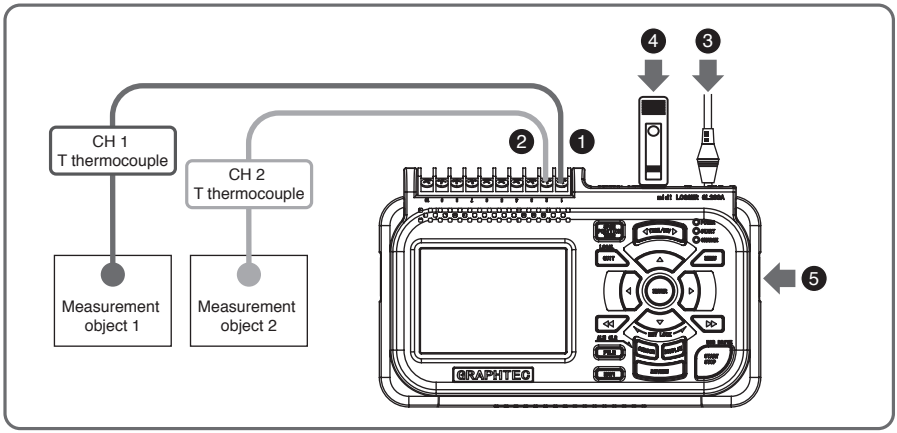
In this section we will provide a simple explanation of the data capture procedure: Preparations → Setup → Data Capture → Data Replay.
T thermocouples will be used here to perform temperature measurement.

- Purpose of data capture: To measure the temperature of the target objects
- Measurement points: 2 locations
- Sampling interval: 1 second
- Data save destination: USB memory device
- Important point: We want to check captured data even during a data capture operation.
- Items that must be supplied: T thermocouples, USB memory device

Note: If you do not have a USB memory device, capture data to the GL200A's internal memory instead.

1. Preparations: How to Make the Preparations Required for Data Capture

❶ Connect measurement object 1 to the CH 1 terminal.
❷ Connect measurement object 2 to the CH 2 terminal.
❸ Connect the AC power supply.
❹ Insert the USB memory device.
❺ Turn on the power supply.



2. Setup: How to Make the Settings for Temperature Measurement

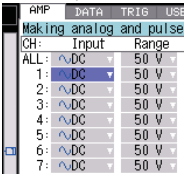
Make the settings required for data capture. Here we will make only those settings that are absolutely necessary. The other settings will be left as the default settings (the settings made prior to shipment from the factory).

Points to Remember **Basic Setup Menu Operation**

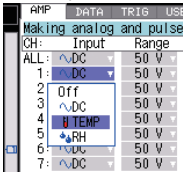
The keys used on the menu screens are the △▽◁▷ keys, the ENTER key, and the QUIT key. The current cursor position is displayed in green. Use the △▽◁▷ keys to move the cursor. If you press the ENTER key at the cursor position, a selection menu or a box for inputting numeric values and so forth is displayed. If you press the QUIT key, the screen closes and the settings are canceled.

Examples of selection menu operations (AMP screen)

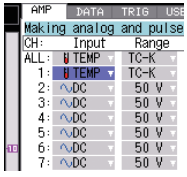
1. Use the △▽◁▷ keys to move the cursor to the Input parameter opposite CH 1 and then press the ENTER key.



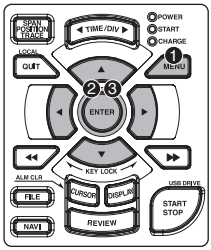
2. A selection menu is displayed when the ENTER key is pressed. Use the △and ▽ keys to select "TEMP."



3. Press the ENTER key to confirm your selection.

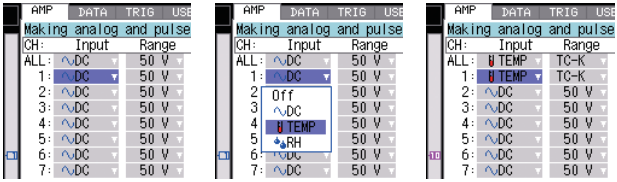


Note: For voltage measurement, select "DC".



❶ Press the MENU key to display the setup menu screen.

❷ Select "TEMP." for the Input parameter for CH 1 and CH 2.



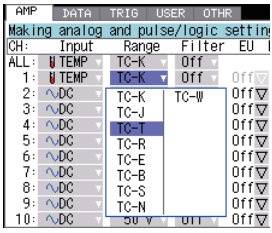
(a) Move the cursor to the input parameter opposite CH 1 and select "TEMP."

(b) Make the same setting for CH 2.

❸ Select "TC-T" for the Range parameter for CH 1 and CH 2.

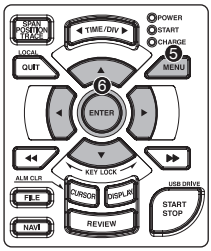
(a) Move the cursor to the Range parameter opposite CH 1 and select "TC-T".

(b) Make the same setting for CH2.



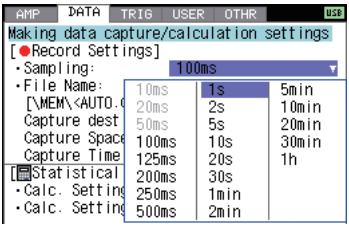
❹ Select "Off" for all the other channels.

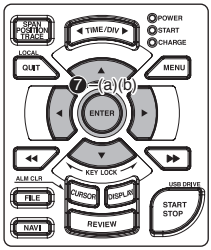
(a) Using the procedure described above, select "Off" for CH 3 to CH 10.



❺ Press the MENU key and open the "DATA" menu.

❻ Set the sampling interval to "1s".
Move the cursor to "Sampling" and then select "1s".

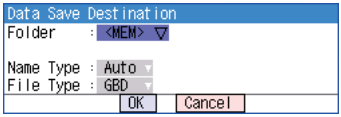


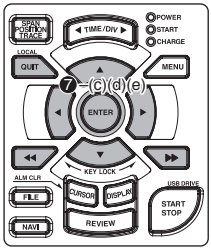


❼ Specify the Capture Destination file name.
Here we will create a folder named "TEST" in the USB memory device, and then make the settings required to enable data to be captured to the TEST folder.

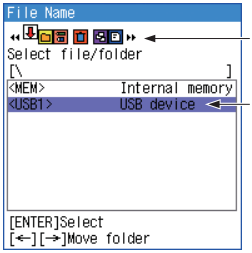
(a) Move the cursor to the File Name parameter and then press the ENTER key.

(b) With the cursor on the <MEM> item in the following screen, press the ENTER key.





(c) The file settings box shown in the following screen opens. This box is used to specify file names for the GL200A's internal memory and for the USB memory device.

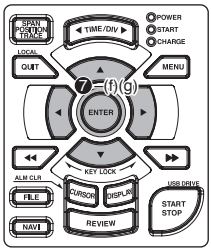


Use the high-speed ◁◁ and ▷▷ keys to change the operation mode.

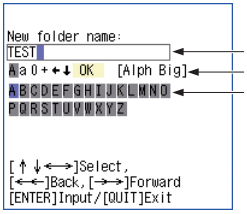
In the Select file/folder screen displayed,
- Use the △ and ▽ keys to move the cursor up or down.
- Use the ◁ and ▷ keys to move to the Folder level.
- Use the ENTER key to confirm your setting.
- Use the QUIT key to cancel your setting.

(d) Move the cursor to <USB1> and then press the ▷ key.

(e) Press the ▷▷ key to move the cursor to "Create new folder" and then press the ENTER key.

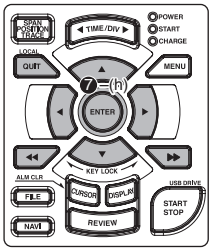


(f) A text input box is displayed. Let's create a folder named "TEST".

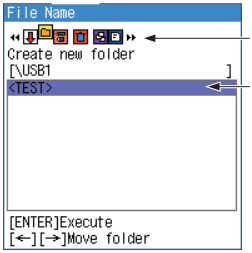


- Text input box
- Select the text type; delete; insert; confirm
- Select the text
- Use the △ and ▽ keys to move the cursor up or down.
- Use the ◁ and ▷ keys to move the cursor to the right or left.
- Use the ENTER key to input the name.

(g) Input "TEST", move the cursor to "OK", and then press the ENTER key to confirm your setting.



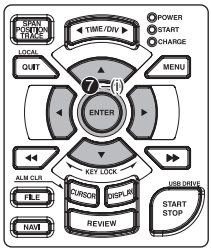
(h) As shown in the following screen, a folder named <TEST> has been created. Press the ◁◁ key to align the cursor with "Select file/folder", use the △ and ▽ keys to align the cursor with the <TEST> folder, and then press the ENTER key.



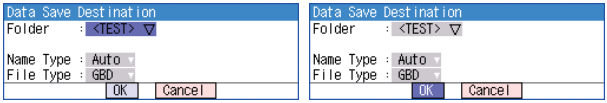
- Use the high speed ◁◁ and ▷▷ keys to change the operation mode.

In the Select file/folder screen displayed,

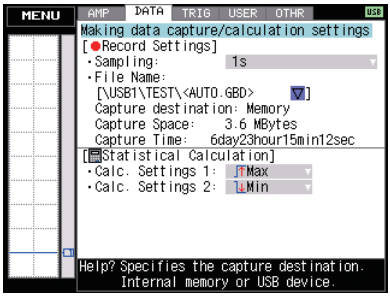
- Use the △ and ▽ keys to move the cursor up or down.
- Use the ◁ and ▷ keys to move to the Folder level.
- Use the ENTER key to confirm your setting.
- Use the QUIT key to cancel your setting.



(i) Check that "<TEST>" appears opposite "Folder", move the cursor to the OK button, and then press the ENTER key.



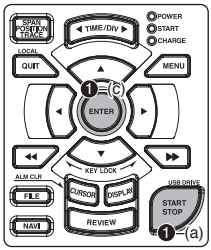
(j) In the screen displayed below, we can check the capture destination, the amount of data that can be captured, and the allowable data capture time.



This completes all the settings required for data capture.

3. Data Capture: How to Measure the Temperature

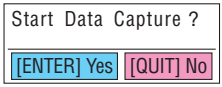
Now that all the data capture settings have been made, we will start actual data capture. During the data capture operation, let's also replay some data that was captured previously.



❶ Starting data capture

(a) Press the START/STOP key.

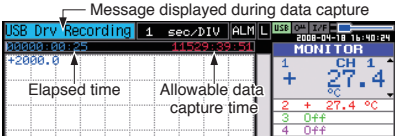
(b) A confirmation message is displayed.

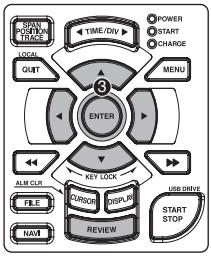


(c) Press the ENTER key to start data capture.

❷ Screen status during data capture

Once data capture has started, the elapsed time and the allowable data capture time are counted.

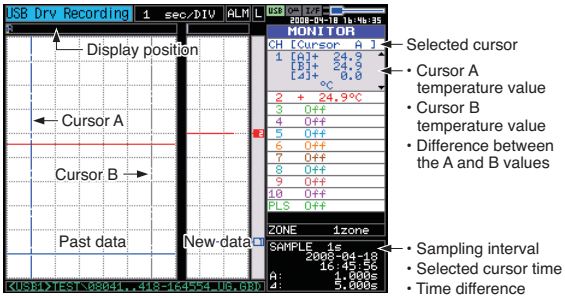




❸ Now, let's replay some data that was captured previously (2-screen replay).

Data that was captured in the past can be replayed while new data is being captured to the GL200A. In addition, the past data can be compared with the current input waveform in a 2-screen format.

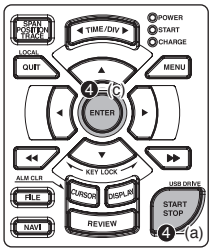
(a) Press the REVIEW key to display the data in a 2-screen format.



<Main operations>

- Use the ◁ and ▷ keys to move the cursor
- Use the ◁◁ and ▷▷ keys to move the cursor at high speed
- Use the CURSOR key to change your cursor selection (A→B→A)

(b) Move the cursor as desired to check the captured waveforms, date/time, and so forth.



❹ Stopping data capture

Press the START/STOP key to end the data capture operation.

(a) Press the START/STOP key.

Stop Data Capture ?	
[ENTER] Yes	[QUIT] No

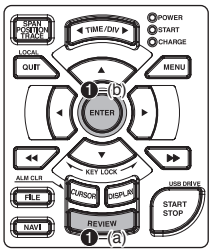
(b) A confirmation message is displayed. Press the ENTER key.

(c) Data capture ends, and the GL200A goes into the Free Running status.

This completes the data capture operation.

4. Data Replay: How to Replay Captured Data

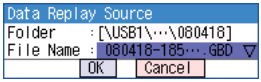
Now that data capture has been completed, let's replay some of that captured data.
The data has been captured to the <TEST> folder that was created in the USB memory device in Step 7 of Section 2, "Setup". The file name is appended automatically, and therefore the name of the file that was created is "Year/month/date-time_UG.gbd". The year/month/date and time are those that were in effect when data capture started.



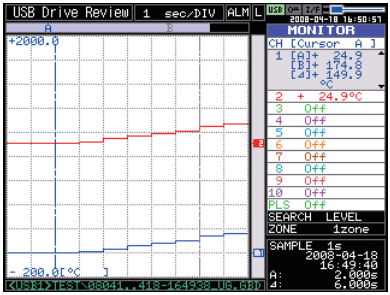
❶ Selecting a file to replay

(a) Press the REVIEW key.

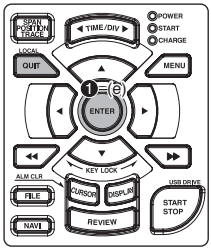
(b) Since the file you want to replay has the file name that was appended automatically when the data was captured, move the cursor to the OK button and then press the ENTER key.



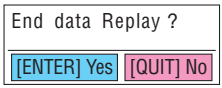
(c) The Replay screen opens.
See Step 3 of Section 3, "Data Capture".



(d) Move the cursor as desired to check the captured waveforms, date/time, and so forth. The SPAN/POSITION/TRACE key can also be used in the Replay screen to change the span, position, trace, zone and other displayed settings.



(e) Press the QUIT key to end the data replay operation.
A confirmation message is displayed. Press the ENTER key.



(f) Data replay ends, and the GL200A goes into the Free Running status.

This completes our simple explanation of how to use the basic GL200A functions.
The GL200A has many other convenient functions. Please see the next five pages for further details.

Convenient Functions

The GL200A is provided with various functions that enable it to be used more effectively. We have selected three of those functions to describe in further detail.

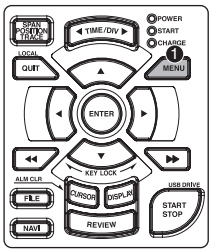
Trigger Functions to Control Data Capture Start/Stop Operations

Trigger functions can be used to control the timing of the start of a data capture operation, and the timing of the end of a data capture operation.

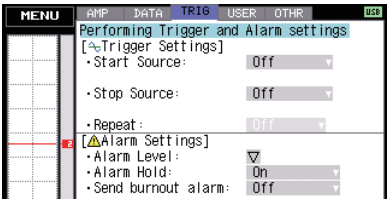
Points to Remember

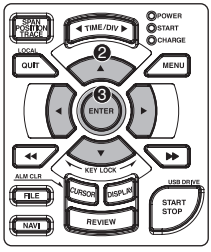
For example...
You can use trigger functions to perform operations such as the following:
- Start data capture when the voltage exceeds 1 V
- Stop data capture at 1:00 pm
- Perform control via external input

Here we will specify the condition as "Start data capture when the CH 1 temperature exceeds 20ºC".

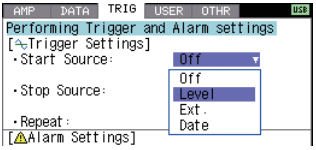


❶ Press the MENU key and open the "TRIG" menu.

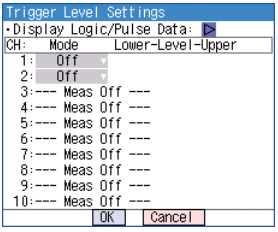


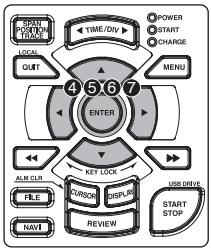


❷ Move the cursor to "Start Source" and select "Level".

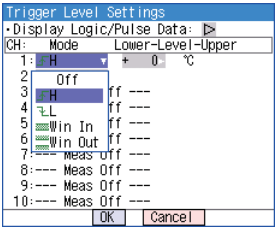


❸ Align the cursor with "Level" and then press the ENTER key to open the "Trigger Level Settings" screen.



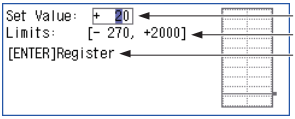


❹ Move the cursor to the "Mode" parameter opposite CH 1, and then select "⊼H".



❺ Move the cursor to the "Level" parameter next to the "Mode" parameter and then press the ENTER key.

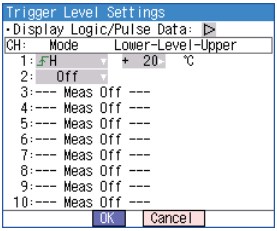
❻ The input box shown in the following screen is displayed. Select "20". Use the ◁ and ▷ keys to move to the cursor to the second digit from the right, and the △ and ▽ keys to change the value. Press the ENTER key.

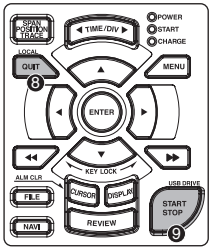


Numerical value input box
Lower limit, upper limit
Waveform area for confirmation

- Use the △ and ▽ keys to change the values.
- Use the ◁ and ▷ keys to move to the next digit.
- Use the ENTER key to input the name.
- Use the QUIT key to cancel your setting.

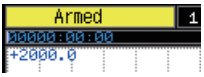
❼ When the screen changes to the following screen, move the cursor to the OK button and then press the ENTER key.





❽ The screen returns to the TRIG menu screen. Press the QUIT key to return the GL200A to the Free Running status.

❾ Now let's press the START/STOP key to start data capture.
If the trigger condition has not been satisfied, the GL200A goes into the "Armed" status as shown on the following screen.



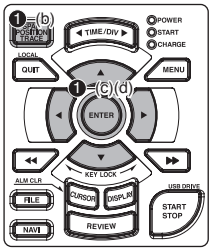
When the trigger condition has been satisfied, data capture starts.

Span, Position and Trace Functions to Adjust the Waveform Display

These functions enable you to make adjustments in order to view individual channels more easily, and to delete waveforms that you do not need to view.

Points to Remember

The span, position and trace operations can be performed while the GL200A is in the Free Running status, while it capturing data, and while it is replaying data. The changes made are applied to the displayed data only, and so the original data is not affected in any way.

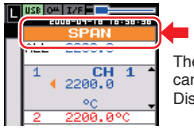


❶ How to Make a Span setting.

The Span parameter is used to adjust the amplitude of the input waveform. This setting is made in the aforementioned Free Running status.

(a) Adjust the span display width for CH 1 to 100ºC.

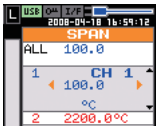
(b) Press the SPAN/POSITION/TRACE key to select the SPAN mode.



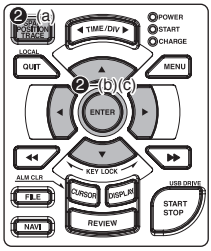
The currently selected mode (SPAN, POSITION or TRACE) can be checked by looking at the "Waveform Operation Display Area".

(c) Use the △ and ▽ keys to make CH 1 active (enlarged display).

(d) Use the ◁ and ▷ keys to change the Span value. Here we will set the value to 100ºC.



When this setting has been made, the waveform screen scale will be set to "+100.0 to +0.0".



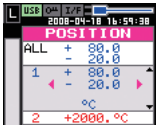
❷ How to make a Position setting.

The Position parameter is used to adjust the zero position's upper and lower positions for the input waveform.

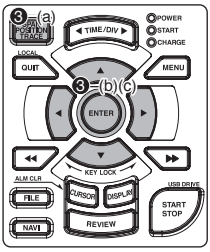
(a) Press the SPAN/POSITION/TRACE key to select the POSITION mode.

(b) Use the △ and ▽ keys to make CH 1 active (enlarged display).

(c) Use the ◁ and ▷ keys to set the Position value to "+80ºC to -20ºC".



When this setting has been made, the waveform screen scale will be set to "+80ºC to -20ºC".



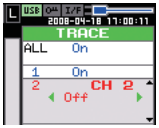
❸ How to make a Trace setting.

The Trace parameter can be used to specify the waveform display of selected channels as On or Off.

(a) Press the SPAN/POSITION/TRACE key to select the TRACE mode.

(b) Use the △ and ▽ keys to make CH 2 active (enlarged display).

(c) Use the ◁ and ▷ keys to select Off.



When this setting has been made, the CH 2 waveform is not displayed.

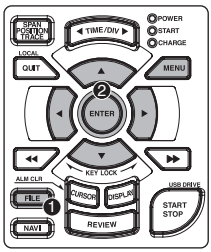
USB Memory Replacing Function to Replace USB Memory Even During Data Capture

You can replace USB memory during data capture.

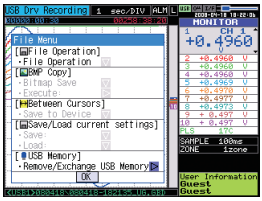
You can confirm the process without stopping data capture even when a long-term measurement is performed.

Points to Remember

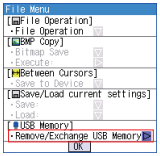
Whenever USB memory is replaced, a file is divided and "_CHG number" is added to the name for each file.
Using the application software provided in CD, you can combine the divided files into one file.



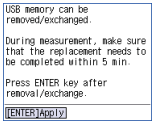
❶ Press the FILE key to open the FILE menu.

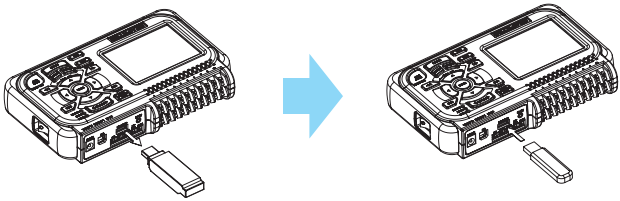


❷ Move the cursor to Remove/Exchange USB Memory and press the ENTER key.



❸ Replace the USB memory when the message below is displayed.





❹ Press ENTER to close the message. Then, press QUIT to close the FILE menu.

CAUTION

The exchange procedure must be conducted within five minutes.
Data will be lost when five minutes have elapsed.

Specifications

Standard Specifications

<table>
<tr><th>Item</th><th>Description</th></tr>
<tr><td>Number of analog channels</td><td>10</td></tr>
<tr><td>External input and output functions</td><td>Trigger input, Logic input, Pulse input, Alarm output</td></tr>
<tr><td>PC interface</td><td>USB (Full speed) is provided as a standard feature</td></tr>
<tr><td>Built-in memory device</td><td>Internal memory: Approx. 3.5 MB</td></tr>
<tr><td>Sampling interval</td><td>10 ms/1 CH MAX
10※, 20※, 50※, 100, 125, 200, 250, 500 ms, 1, 2, 5, 10, 20, 30 sec
1, 2, 5, 10, 20, 30 min, 1 hour
※Interval setting below 50 ms is available depending on the input settings and the number of measurement channels.</td></tr>
<tr><td>Clock accuracy
(23 °C environment)</td><td>±0.005 % (within 130 seconds per month)</td></tr>
<tr><td>Back-up functions</td><td>Setup parameters: EEPROM/Clock: Lithium secondary battery</td></tr>
<tr><td>Operating environment</td><td>0 to 40ºC, 30 to 80% RH</td></tr>
<tr><td>Withstand voltage</td><td>Between each input channel and GND: 1 minute at 350 Vp-p
Between each input channels: 1 minute at 350 Vp-p</td></tr>
<tr><td>Power supply</td><td>• AC adapter: 100 to 240 VAC, 50 to 60 Hz
• DC input: 8.5 to 24 VDC
• Battery pack (option): 7.4 VDC (2200 mAh)</td></tr>
<tr><td>Power consumption</td><td>AC power consumption (when using the AC adapter provided as a standard accessory)
<table>
<tr><th>No.</th><th>Condition</th><th>Normal</th><th>During battery recharge</th></tr>
<tr><td>1</td><td>When the LCD is on</td><td>12 VA</td><td>28 VA</td></tr>
<tr><td>2</td><td>When the screensaver is operating</td><td>11 VA</td><td>27 VA</td></tr>
</table>
DC current consumption
<table>
<tr><th>No.</th><th>DC Voltage</th><th>Condition</th><th>Normal</th><th>During battery recharge</th></tr>
<tr><td>1</td><td rowspan="2">+24 V</td><td>When the LCD is on</td><td>0.18 A</td><td>0.6 A</td></tr>
<tr><td>2</td><td>When the screensaver is operating</td><td>0.15 A</td><td>0.57A</td></tr>
<tr><td>3</td><td rowspan="2">+12 V</td><td>When the LCD is on</td><td>0.30 A</td><td>Recharging not possible</td></tr>
<tr><td>4</td><td>When the screensaver is operating</td><td>0.25 A</td><td>Recharging not possible</td></tr>
<tr><td>5</td><td rowspan="2">+8.5 V</td><td>When the LCD is on</td><td>0.42 A</td><td>Recharging not possible</td></tr>
<tr><td>6</td><td>When the screensaver is operating</td><td>0.35 A</td><td>Recharging not possible</td></tr>
</table></td></tr>
<tr><td>External dimensions</td><td>Approx. 194 x 122 x 41 mm</td></tr>
<tr><td>Weight</td><td>480 g*1</td></tr>
<tr><td>Other</td><td>Beeper (keys, etc.)</td></tr>
</table>

*1: Excluding the AC adapter and battery.

Input Unit Specifications

<table>
<tr><th colspan="2">Item</th><th>Description</th></tr>
<tr><td colspan="2">Number of input channels</td><td>M3 screw type, 10 channels</td></tr>
<tr><td colspan="2">Method</td><td>Photo MOS relay scanning system, all channels isolated, balanced input</td></tr>
<tr><td rowspan="3">Measurement ranges</td><td>Voltage</td><td>20·50·100·200·500mV, 1·2·5·10·20·50, 1-5VF.S.</td></tr>
<tr><td>Temperature</td><td>Thermocouples : K, J, E, T, R, S, B, N, W(WRe5-26)</td></tr>
<tr><td>Humidity</td><td>0 to 100% (voltage 0 V to 1 V scaling conversion) *with B-530 (option)</td></tr>
<tr><td rowspan="2">Measurement accuracy*1 (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</td><td>±0.1% of F.S.</td></tr>
<tr><td>Temperature</td><td>·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</td><td>±5.2˚C</td></tr>
<tr><td>100<TS≤300</td><td>±3.0˚C</td></tr>
<tr><td>R : 300<TS≤1600</td><td>±(0.05% of rdg +2.0˚C)</td></tr>
<tr><td>S : 300<TS≤1760</td><td>±(0.05% of rdg +2.0˚C)</td></tr>
<tr><td rowspan="2">B</td><td>400≤TS≤600</td><td>±3.5˚C</td></tr>
<tr><td>600<TS≤1820</td><td>±(0.05% of rdg +2.0˚C)</td></tr>
<tr><td rowspan="2">K</td><td>-200≤TS≤-100</td><td>±(0.05% of rdg +2.0˚C)</td></tr>
<tr><td>-100<TS≤1370</td><td>±(0.05% of rdg +1.0˚C)</td></tr>
<tr><td rowspan="2">E</td><td>-200≤TS≤-100</td><td>±(0.05% of rdg +2.0˚C)</td></tr>
<tr><td>-100<TS≤800</td><td>±(0.05% of rdg +1.0˚C)</td></tr>
<tr><td rowspan="2">T</td><td>-200≤TS≤-100</td><td>±(0.1% of rdg +1.5˚C)</td></tr>
<tr><td>-100<TS≤400</td><td>±(0.1% of rdg +0.5˚C)</td></tr>
<tr><td rowspan="3">J</td><td>-200≤TS≤-100</td><td>±2.7˚C</td></tr>
<tr><td>-100<TS≤100</td><td>±1.7˚C</td></tr>
<tr><td>100<TS≤1100</td><td>±(0.05% of rdg +1.0˚C)</td></tr>
<tr><td>N</td><td>0≤TS≤1300</td><td>±(0.1% of rdg +1.0˚C)</td></tr>
<tr><td>W</td><td>0≤TS≤2000</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>
*1: Thermocouple diameters T: 0.32 Φ, others: 0.65 Φ</td></tr>
<tr><td colspan="2">A/D converter</td><td>16Bit (out of which 14 bits are internally acknowledged)</td></tr>
<tr><td colspan="2">Temperature coefficient</td><td>Gain: 0.01 % of F.S./°C
Zero*: 0.02 % of F.S./°C
Occurs when sampling speed is 10, 20, or 50 ms.</td></tr>
<tr><td colspan="2">Input resistance</td><td>1MΩ ± 5%</td></tr>
<tr><td colspan="2">Allowable signal source resistance</td><td>Within 300 Ω</td></tr>
<tr><td colspan="2">Maximum input voltage</td><td>Between +/- terminals, each channels, CH-GND : 60 Vp-p</td></tr>
<tr><td colspan="2">Withstand voltage</td><td>Between each input channels, and CH-GND : 1 minute at 350 Vp-p</td></tr>
<tr><td colspan="2">Insulation resistance</td><td>CH-GND : At least 50MΩ (at 500 VDC)</td></tr>
<tr><td colspan="2">Common mode rejection ratio</td><td>At least 90 dB (50/60 Hz; signal source 300Ω or less)</td></tr>
<tr><td colspan="2">Noise</td><td>At least 48 dB (with +/- terminals shorted)</td></tr>
</table>

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Specifications are subject to change without notice.

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GRAPHTEC CORPORATION