midi LOGGER

GL200

GL200-UM-251

SERVICE MANUAL

GL200-UM-251-03-9370

GRAPHTEC

HISTORY OF REVISIONS

No.	Date issued	Description of revision	Page	Edition
1	06.02.14	First Printing	All	01
2	06.03.29	Information for the connector of narrow LCD flexible was added.	3-3	02
3	07.05.10	Part number for LCD was corrected.	6-1,6-4	03

TO ENSURE SAFETY

This Service Manual has been compiled for the purpose of facilitating repair and maintenance of the GL200 midi LOGGER by Graphtec service personnel and other persons who have undergone equivalent technical training.

Maintenance or repair by unauthorized service personnel is to be strictly avoided. Because the GL200 contains numerous internal components with a high electric potential, such work by unauthorized service personnel could cause human injury or serious damage to the GL200 midi LOGGER.

CONTENTS

1. CONFIGURATION

1.1 Model Configuration

GL200 : 10-channel model with color monitor and internal memory

1.2 Accessories and Options

GL200

Unit name	Model name	Description
Humidity Sensor	B-530	Same as GL450/500
Battery Pack	B-517	Same as GL450/500
DC Drive Cable	B-514	Same as GL450/500

2. UPGRADING THE FIRMWARE

The version of your GL200's firmware can be upgraded by rewriting the flash ROM on the pertinent circuit boards. You can upgrade the firmware by loading the update program to a USB memory device.

2.1 How to Upgrade the GL200 Flash ROM from the USB memory device

Preparations for the upgrade

Firmware :Mxxxa001.G20← Main Program file for GL200
:Mxxxa002.G20← Main Program file for GL200

(1) Connect the AC adapter for the GL200.

(2) Turn on the GL200.

(3) Copy the two main program files to a USB memory device from the computer.

How to upgrade

(1) Insert the USB memory device containing the main upgrade program into the GL200's USB port.

(2) Turn on the GL200 to automatically execute the upgrade program.

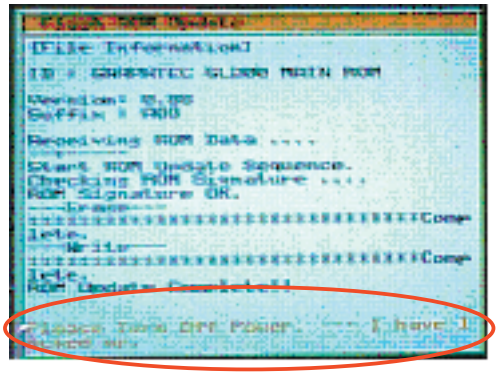
(3) Wait until the display shown below appears or until the beeper sound stops.

Note:

Don't turn off the GL200 until this process is finished.

GL200

The following message will appear on the GL200 display in yellow characters when the upgrade is complete. Also the beeper will sound for 5 seconds.
"Please Turn Off the Power. I have locked up."



(4) Turn off the power to the GL200 when the above message is displayed or when the beeper sound stops.

(5) Delete the two main program files from the USB memory device.
This is to avoid upgrading the firmware by mistake.

3. DISASSEMBLY AND REASSEMBLY

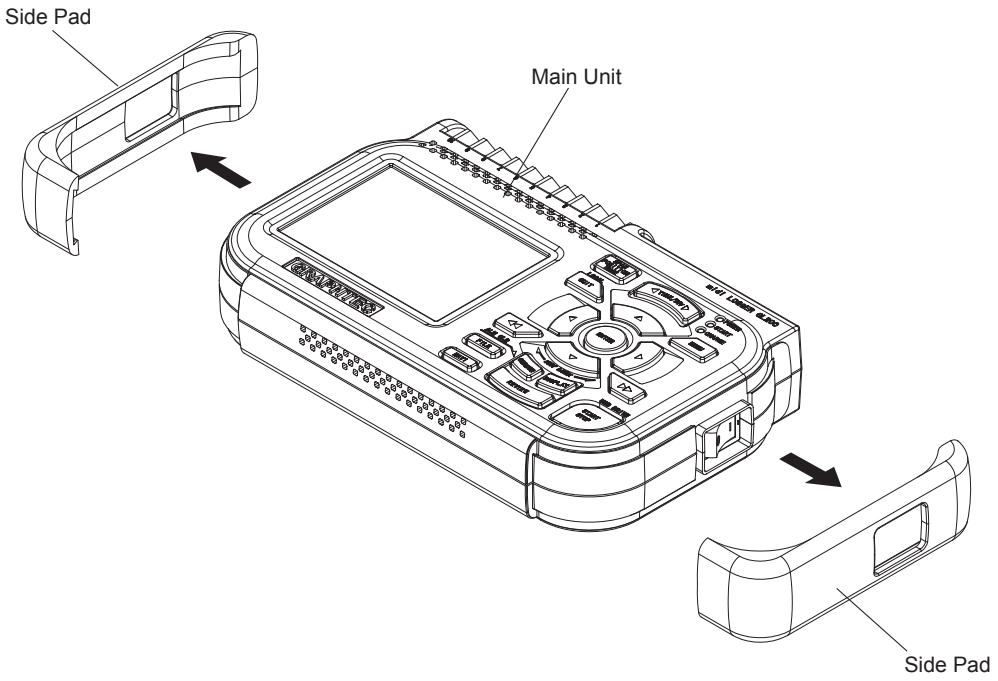
3.1 Notes on Disassembly and Reassembly

- During disassembly, disconnect the cables from the specified connectors as necessary.
- During reassembly, double-check to ensure that the proper cables have been correctly re-connected to the pertinent connectors.
- Some areas of the control panel unit possess a high electrical potential, so exercise caution to avoid an electrical shock.
- When handling the LCD shield and LCD protective plate, be careful not to leave fingerprints or other marks on them.

3.2 Removing the Side Pads

Disassembly

(1) Peel off the left and right side pads from the main unit.



Re-assembly

(1) Push the left and right side pads against the main unit and then install them on the main unit.

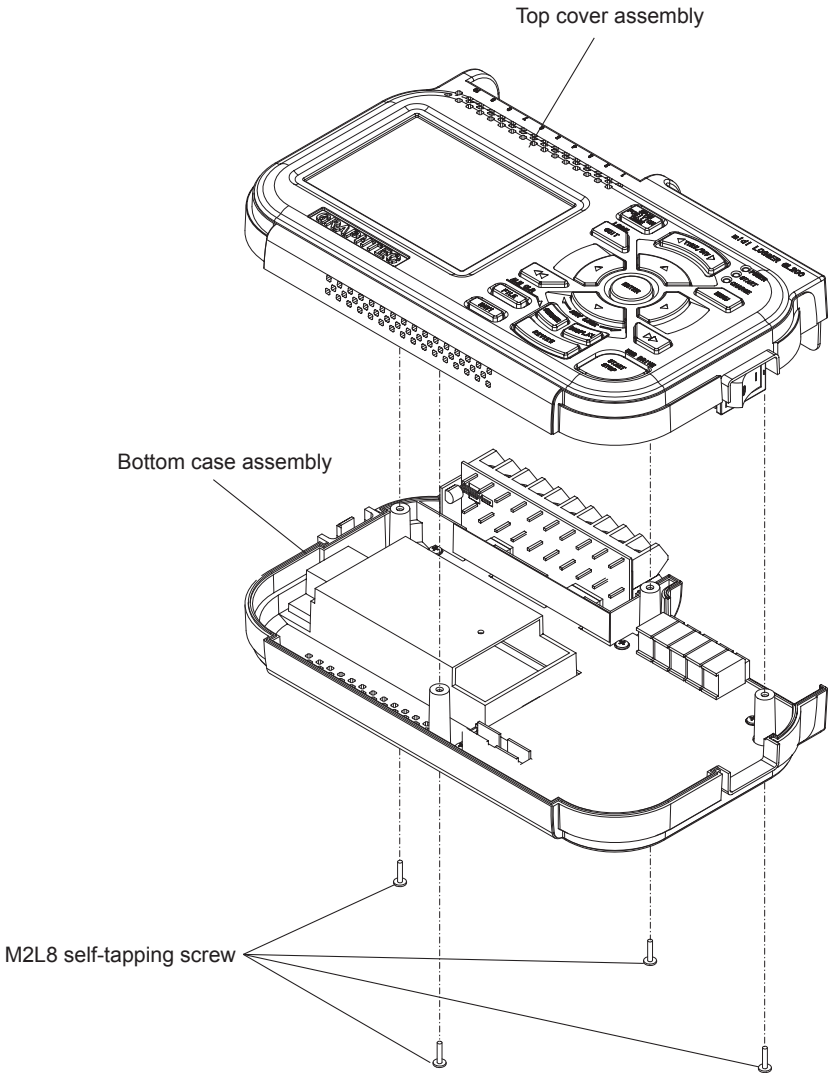
3.3 Disassembling the Top Cover and the Bottom Case Assembly

Disassembly

(1) Remove the side pads from the main unit (See Section 3.2).

(2) Remove the four M2L8 self-tapping screws from the bottom cover.

(3) Disconnect the connector between the main control board and the AMP board and then remove the top cover assembly.



Re-assembly

(1) Re-assemble the top cover assembly and the bottom case assembly in the reverse order in which they were disassembled.

3.4 Replacing the Main Control Board

Disassembly

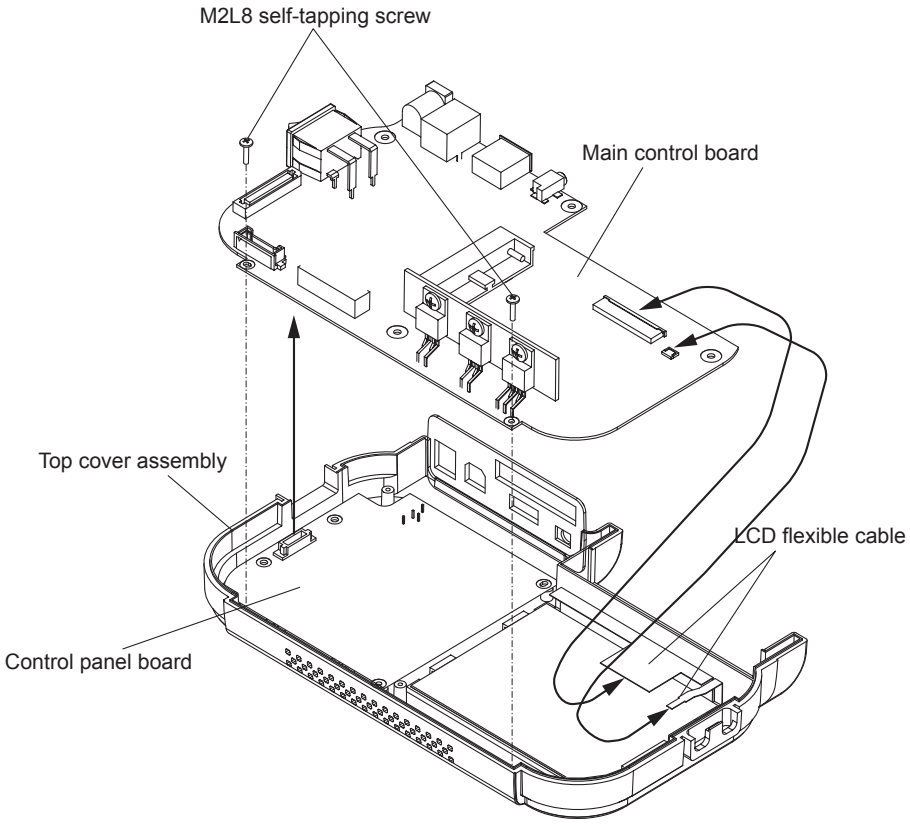
(1) Remove the side pads from the main unit (See Section 3.2).

(2) Disassemble the top cover assembly and the bottom case assembly (See Section 3.3).

(3) Disconnect the LCD flexible cable from the main control board.

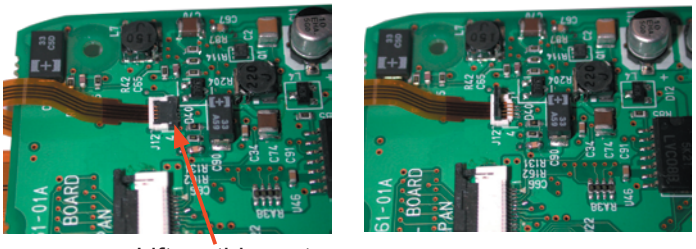
(4) Remove the two M2L8 self-tapping screws holding the main control board from the top cover assembly.

(5) Disconnect the connector between the main control board and the control panel board and then remove the top cover assembly.



How to release the narrow LCD flexible cable from the connector

Lift up the black part of the connector using the small flat-head screwdriver.



Lift up this part

Re-assembly

(1) Re-assemble the main board in the reverse order in which it was disassembled.

(2) Perform the Setup operations for the GL200 when you replace the main control board.

3.5 Replacing the Control Panel Board

Disassembly

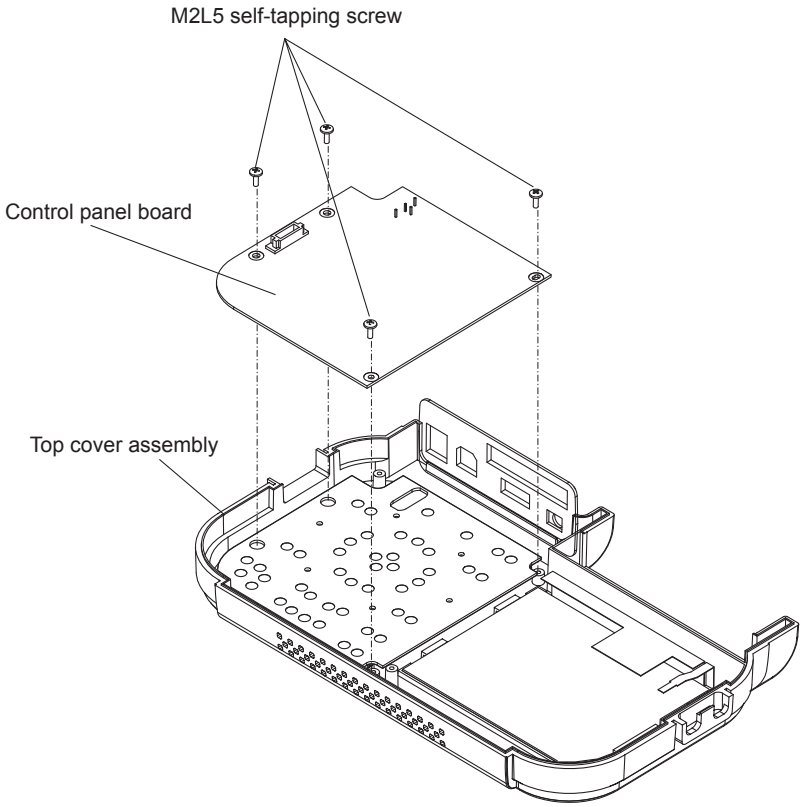
(1) Remove the side pads from the main unit (See Section 3.2).

(2) Disassemble the top cover assembly and the bottom case assembly (See Section 3.3).

(3) Remove the main control board (See Section 3.4).

(4) Remove the four M2L5 self-tapping screws holding the control panel board from the top cover assembly.

(5) Remove the control panel board from the top cover assembly.



Re-assembly

(1) Re-assemble the control panel board in the reverse order in which it was disassembled.

3.6 Replacing the LCD

Disassembly

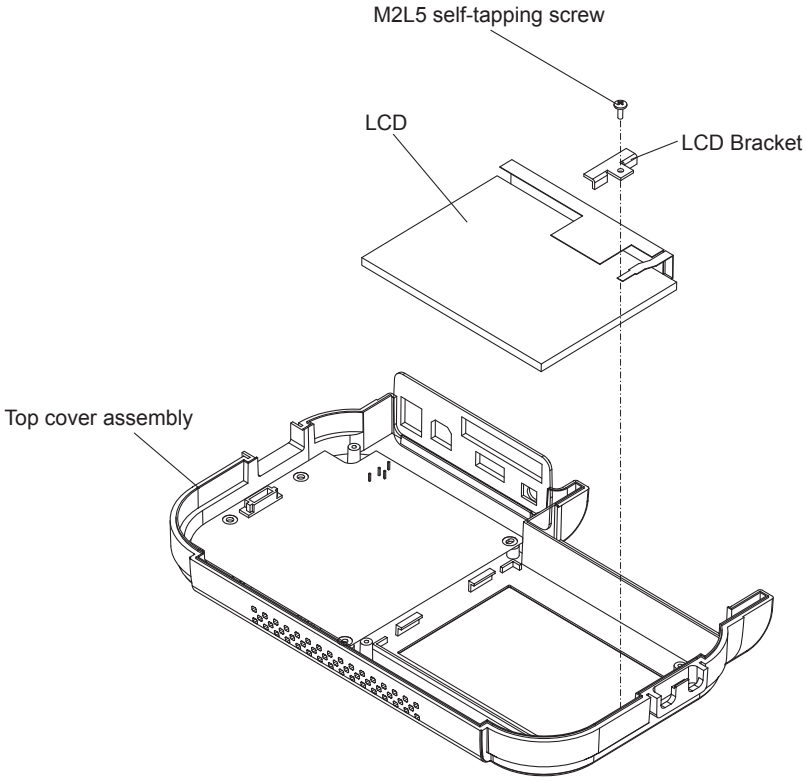
(1) Remove the side pads from the main unit (See Section 3.2).

(2) Disassemble the top cover assembly and the bottom case assembly (See Section 3.3).

(3) Remove the main control board (See Section 3.4).

(4) Remove the M2L5 self-tapping screw holding the LCD bracket and the LCD from the top cover assembly.

(5) Remove the LCD from the top cover assembly.



Re-assembly

(1) Re-assemble the LCD in the reverse order in which it was disassembled.

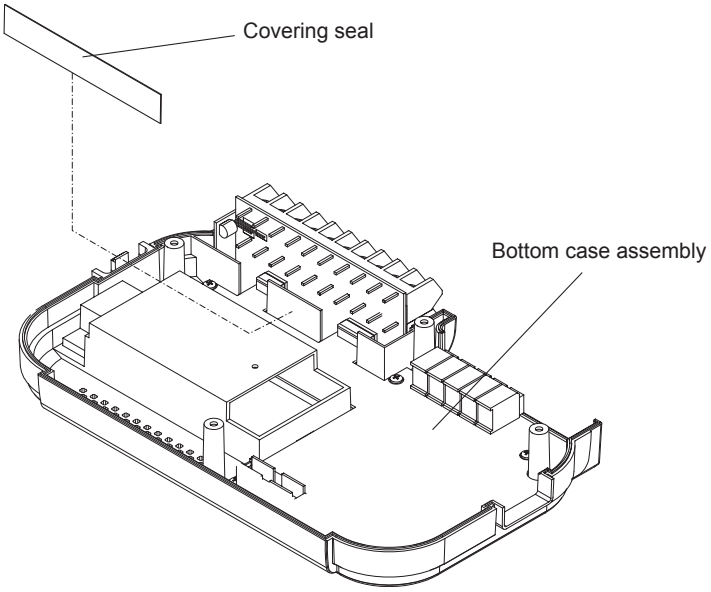
3.7 Replacing the AMP Board

Disassembly

(1) Remove the side pads from the main unit (See Section 3.2).

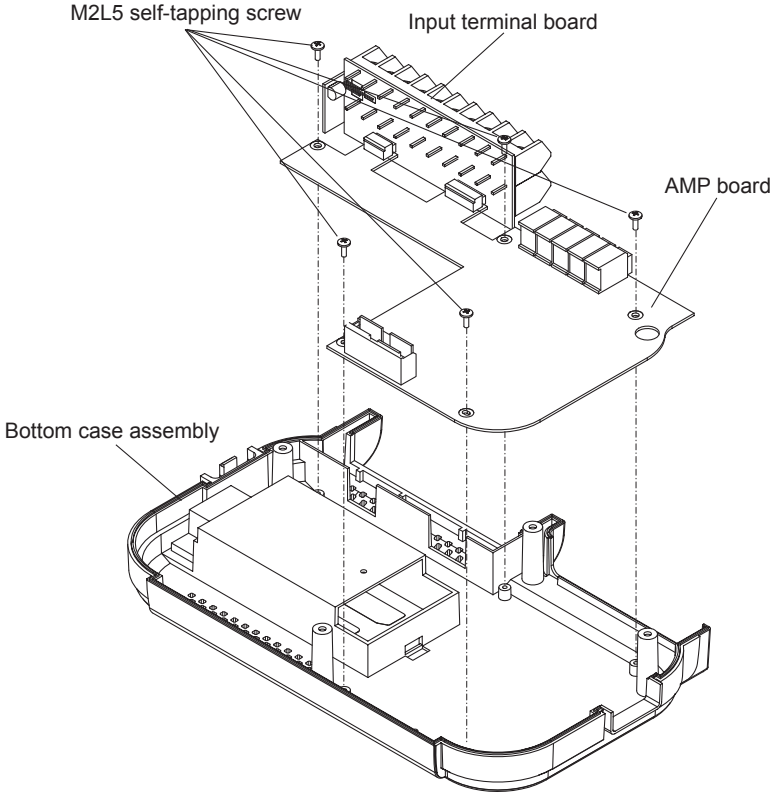
(2) Disassemble the top cover assembly and the bottom case assembly (See Section 3.3).

(3) Remove the covering seal from the bottom case assembly.

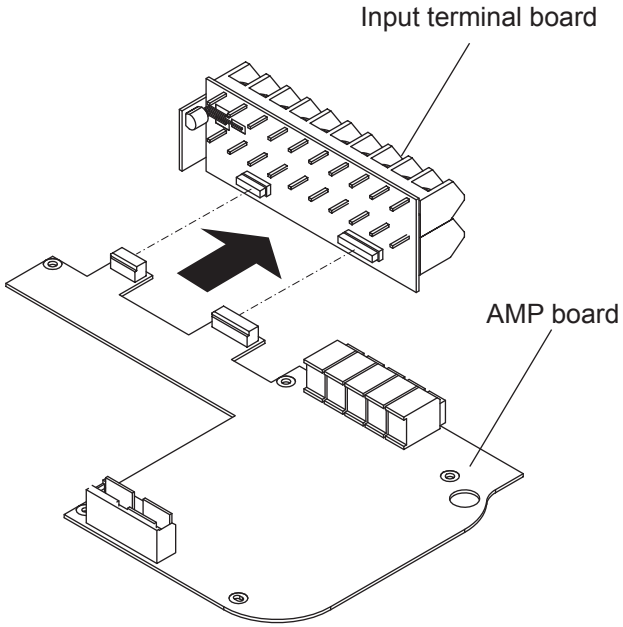


(4) Remove the five M2L5 self-tapping screws holding the AMP board from the bottom case assembly.

(5) Remove the AMP board and the input terminal board from the bottom case assembly.



(6) Remove the input terminal board from the AMP board.



Re-assembly

(1) Re-assemble the AMP board in the reverse order in which it was disassembled.

(2) Perform the Setup operations for the GL200 when you replace the AMP board.

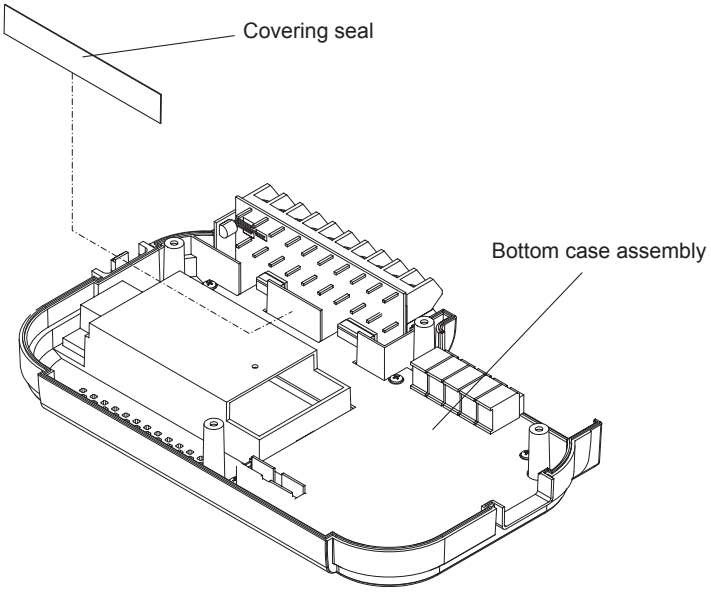
3.8 Replacing the Input Terminal Board

Disassembly

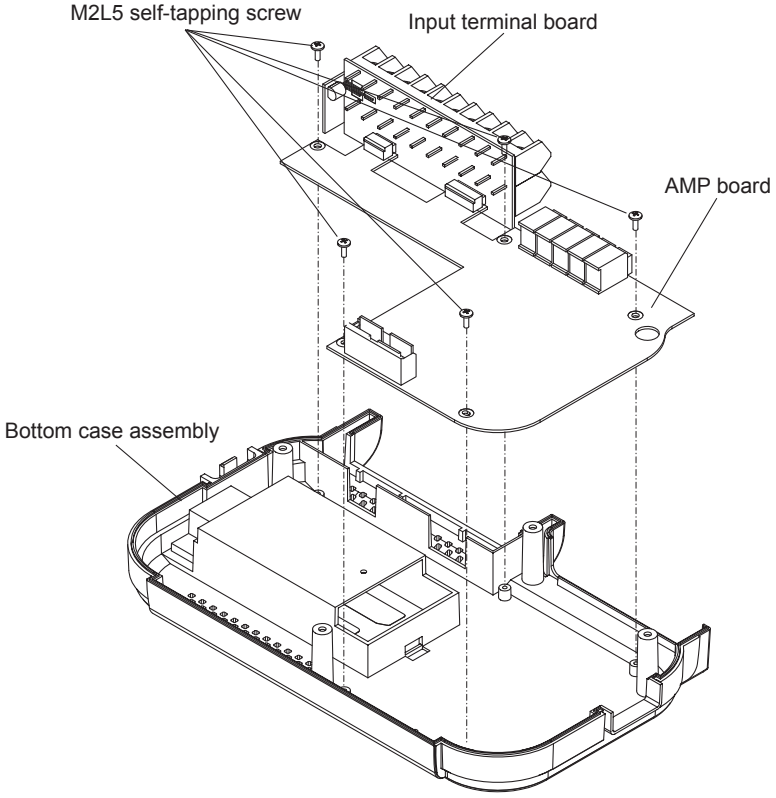
(1) Remove the side pads from the main unit (See Section 3.2).

(2) Disassemble the top cover assembly and the bottom case assembly (See Section 3.3).

(3) Remove the covering seal from the bottom case assembly.

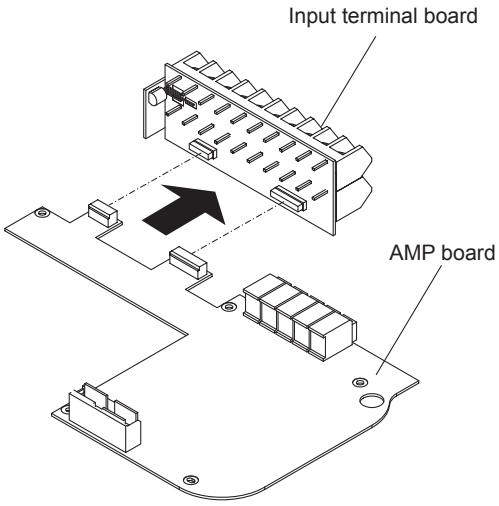


(4) Remove the five M2L5 self-tapping screws holding the AMP board from the bottom case assembly.



(5) Remove the AMP board and the input terminal board from the bottom case assembly.

(6) Remove the input terminal board from the AMP board.



Re-assembly

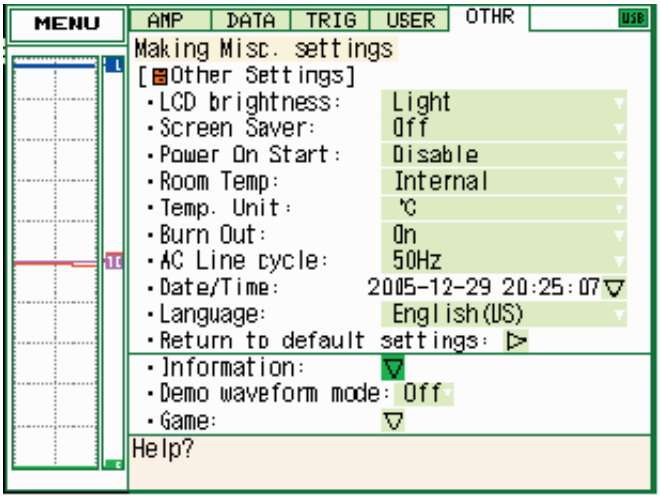
(1) Re-assemble the input terminal board in the reverse order in which it was disassembled.

(2) Perform the Setup operations for the GL200 when you replace the input terminal board.

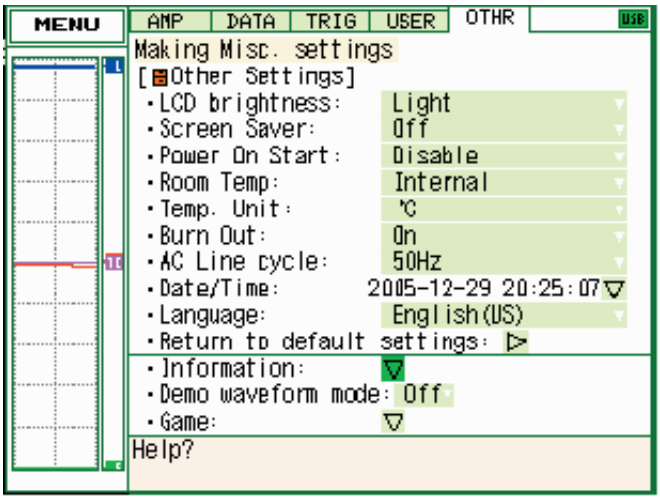
4. SETUP PROCEDURES

4.1 Entering the System Setup Menu

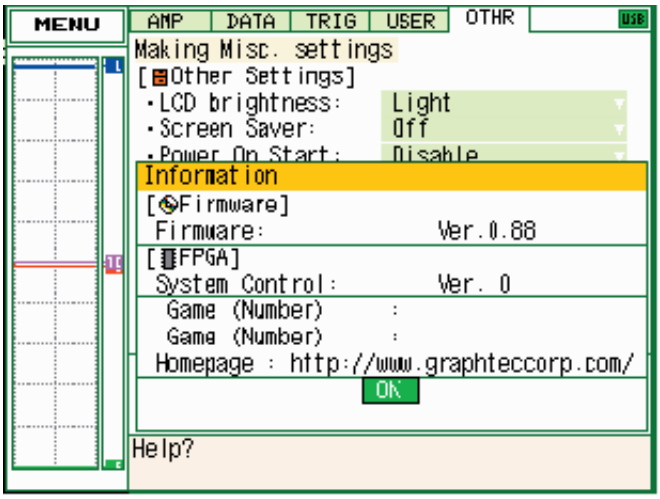
(1) Press the [MENU] key until the “OTHR” menu shown below appears.



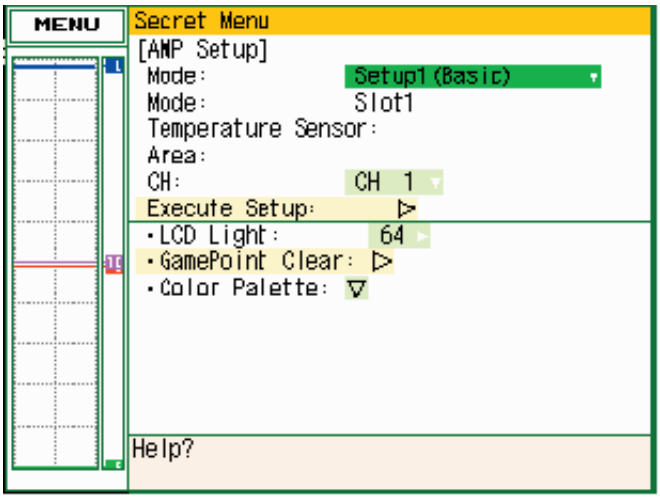
(2) Move the cursor to the “Information” position using the [Direction] keys.



(3) Press the [ENTER] key to display the “Information” menu shown below.



(4) Press the [LEFT DOUBLE ARROW Direction] key 10 times in order to display the “Setup” menu shown below.



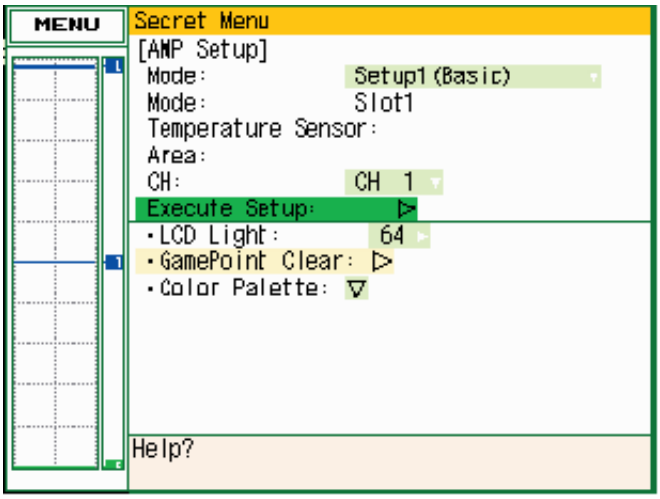
(5) Move the cursor to the “Mode” position using the [Direction] keys.

(6) Press the [ENTER] key to display the menu from which you can execute the various Setup operations.

Setup mode
Setup1 (Basic)
Setup2 (Room temp.)

(7) Select the Setup mode using the [Direction] keys, and then press the [ENTER] key.

(8) Move the cursor to the “Execute Setup” position as shown below.



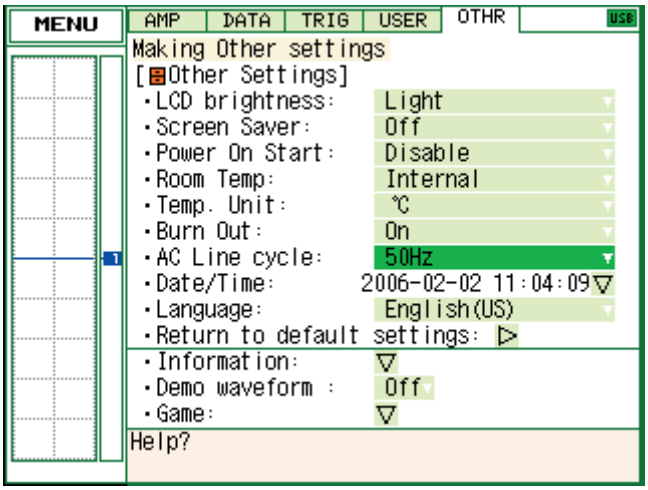
(9) Press the [ENTER] key to start the selected Setup operation.

4.2 AC Line cycle Setting

You must set the AC Line cycle setting of the GL200 to the same cycle as that of your AC line before you perform the Setup1 and Setup2 operations.

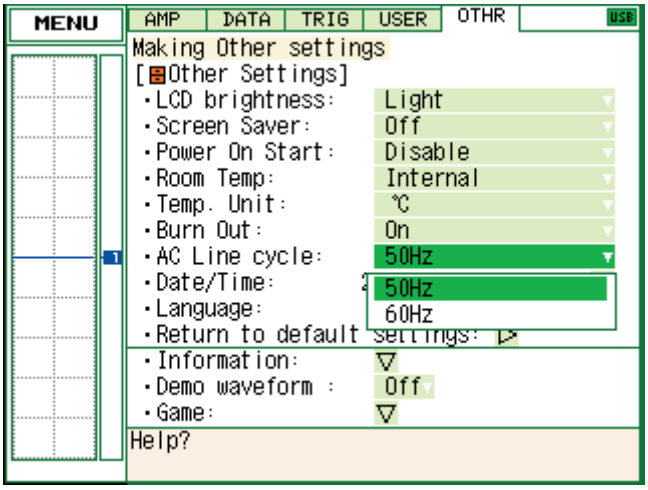
How to set the AC line cycle

(1) Press the [MENU] key until the "OTHR" menu shown below appears.



(2) Move the cursor to the "AC Line cycle" position using the [Direction] keys.

(3) Press the [ENTER] key to display the "AC Line cycle" selection menu shown below.



(4) Select the appropriate cycle for your AC line.

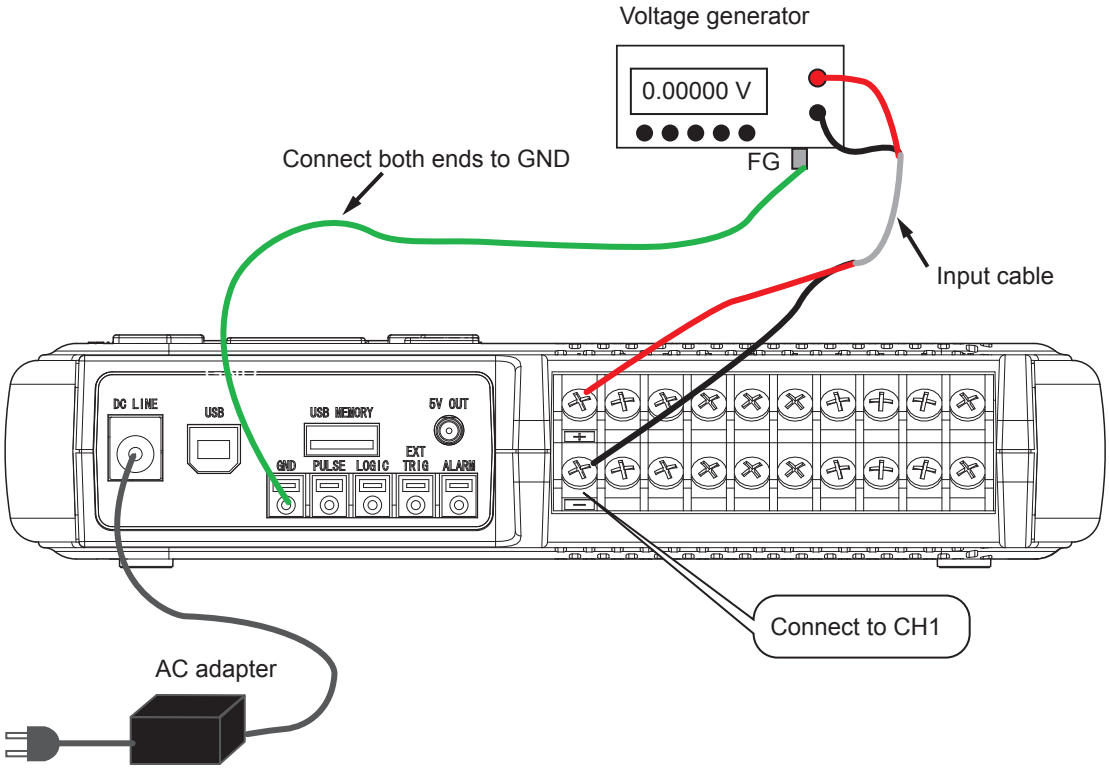
4.3 Performing Setup1 (Voltage Input)

This procedure is required when any part of the AMP board is replaced.

Preparation

- Have a voltage generator on hand that can output voltage up to 50 VDC (four-digit output).
- Mutually connect the ground terminals of the voltage generator and the GL200.
- Set the AC Line cycle setting of the GL200 to the same cycle as that of your AC line.

Wiring connection

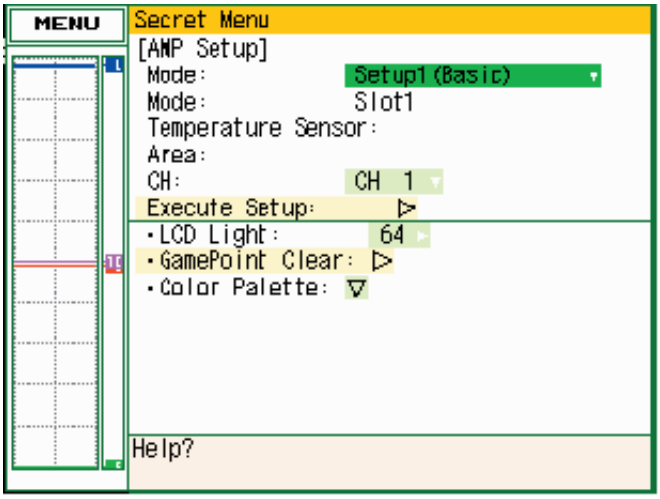


Setup procedure

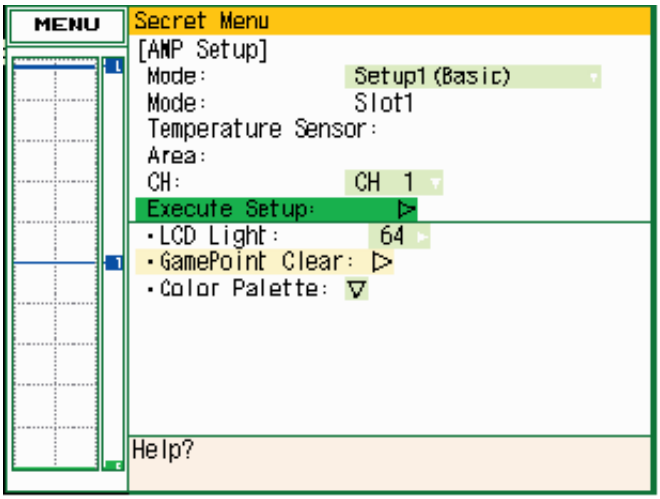
(1) As shown in the figure above, connect the output of the voltage generator to the GL200's CH1 input terminal.

(2) Leave the GL200 turned on for at least 30 minutes.

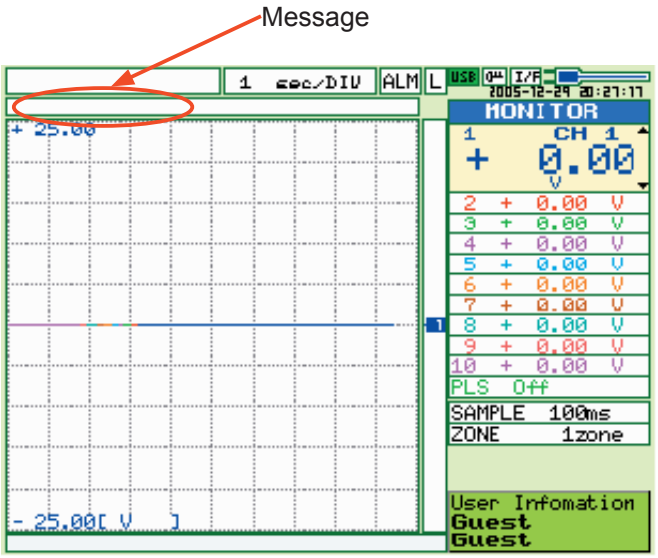
(3) After entering the System Setup mode, open the Setup menu as shown below.
Specify the AMP Setup conditions as shown below.
Mode :Setup1 (Basic)
CH :CH 1



(4) Move the cursor to the "Execute Setup" position as shown below.



(5) Press the [ENTER] key to start the Setup1 (Basic) operation.



(6) The “GND : [START]” message is displayed at the location shown above.

(7) Input “0.000mV” to the input terminals of channel 1.

(8) Press the [START] key and then wait until the "20 mV : [START]" message appears.
Specify the voltage generator's output voltage setting to correspond to one of the displayed voltage ranges in the following table, and then input that voltage to the GL200.

Message	Input Voltage
GND	0.000 mV
20 mV	20.000 mV
50 mV	50.000 mV
100 mV	100.000 mV
200 mV	200.000 mV
500 mV	500.000 mV
1 V	1.000 V
2 V	2.000 V
5 V	5.000 V
10 V	10.000 V
20 V	20.000 V
50 V	50.000 V

(9) Repeat step (8) by sequentially setting the Measure parameter to 50 mV, 100 mV, 200 mV, 500 mV, 1 V, 2 V, 5 V, 10 V, 20 V and 50 V, and then inputting the corresponding voltage.

(10) When you have finished the Setup operation for 50 V, the "EEPROM : [ENTER]" message appears. Press the [ENTER] key to begin writing the new Setup data to the EEPROM.

(11) After the setup parameters have been registered to the EEPROM, the display closes and returns to normal mode.

(12) Turn off the GL200.

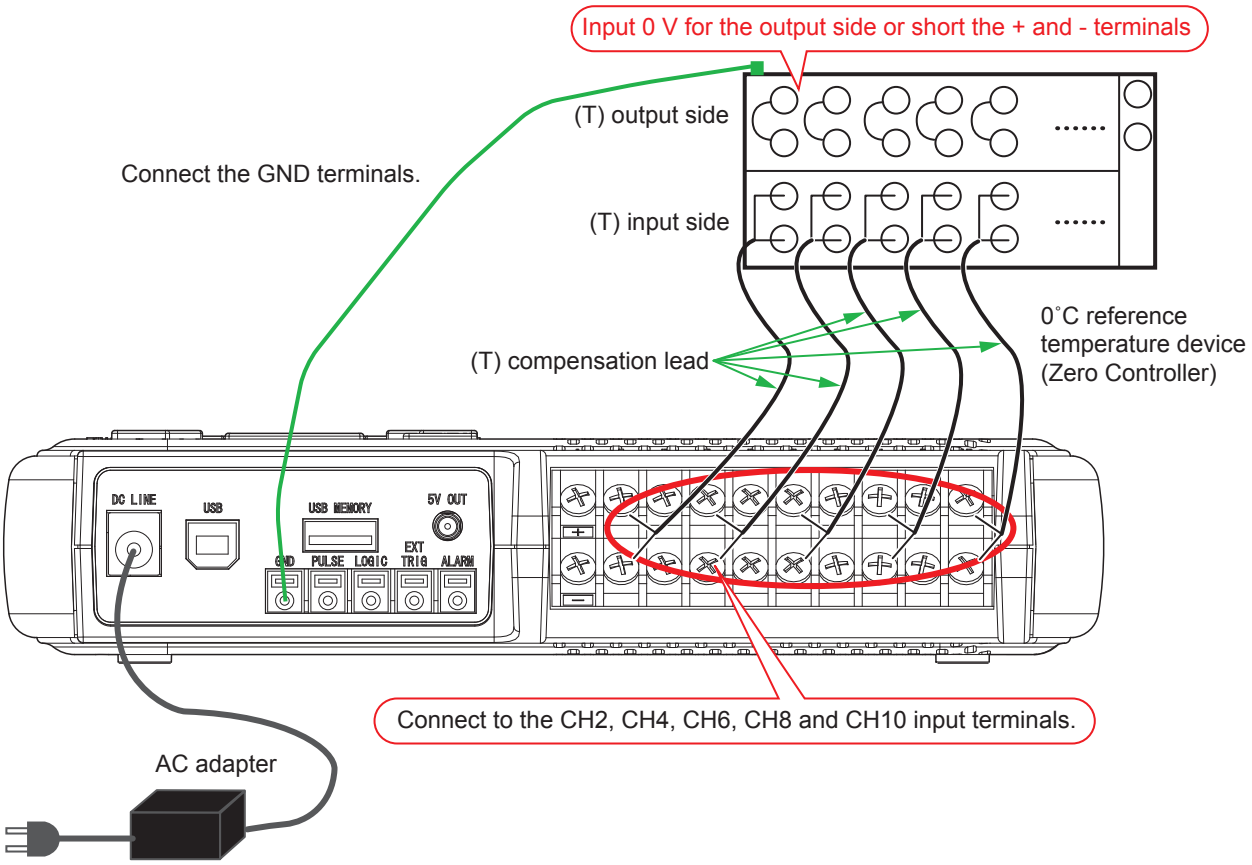
This completes the voltage amp setup.

4.4 Performing Setup2 (Room Temperature Compensation)

Preparation

- As shown below, use (T, ø0.32 mm) temperature compensation leads to connect the input terminals to the 0˚C reference temperature device (Zero controller).
- Set the AC Line cycle setting of the GL200 to the same cycle as that of your AC line.

Wiring connection



CAUTION

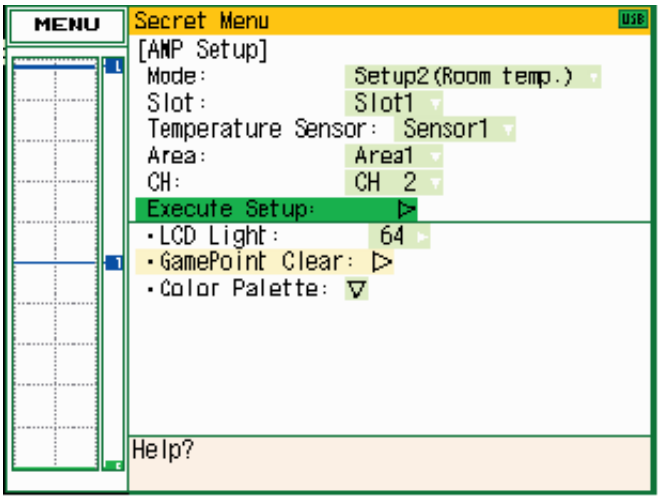
Connect each compensation copper lead to a single terminal as shown in the above diagram (parallel wiring is not permitted).

(1) As shown in the figure above, connect the inputs of the zero controller to the GL200's input terminals.

(2) Leave the GL200 turned on for at least 30 minutes.

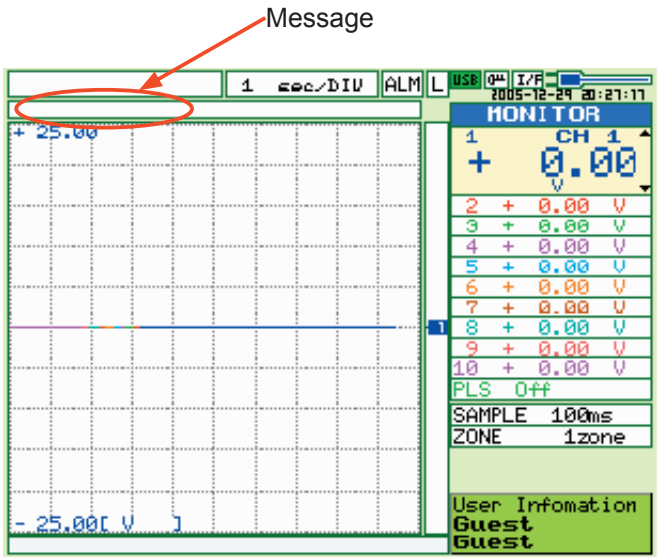
(3) After entering the System Setup mode, open the Setup menu as shown below.
Specify the AMP Setup conditions as shown below.

Mode :Setup2 (Room temp.)
Area :Area1
CH :CH 2



(4) Move the cursor to the “Execute Setup” position as shown above.

(5) Press the [ENTER] key to start the Setup2 (Room temp.) operation.



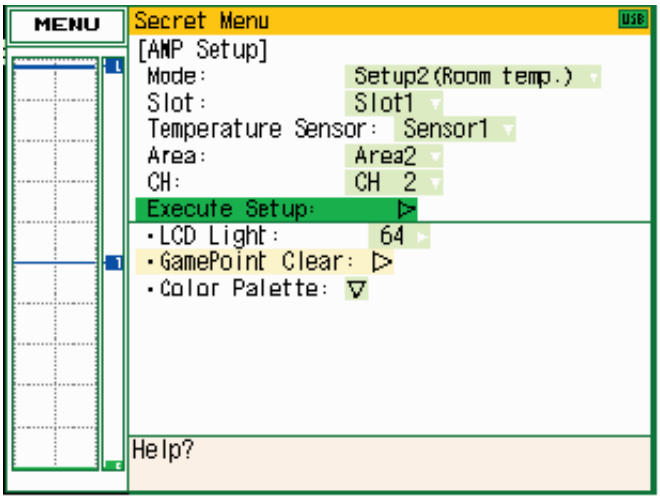
(6) The “rTemp : [START]” message is displayed at the location shown above.

(7) Press the [START] key and then wait until the "EEPROM : [ENTER]" message appears.

(8) Press the [ENTER] key to begin writing the new Setup data to the EEPROM.

(9) After the setup parameters have been registered to the EEPROM, the display closes and returns to normal mode.

(10) Re-open the Setup menu as shown below.
Specify the AMP Setup conditions as shown below.
Mode :Setup2 (Room temp.)
Area :Area2
CH :CH 2



(11) Repeat steps (4) to (8) for all the areas up to Area5.

(12) Turn off the GL200.

This completes the Room temp. setup.

Setup flow for the Room temp.

Procedure	Selected area
1	Area 1
2	Area 2
3	Area 3
4	Area 4
5	Area 5

5. INSPECTION AND CHECK PROCEDURES

5.1 Inspection and Check Methods

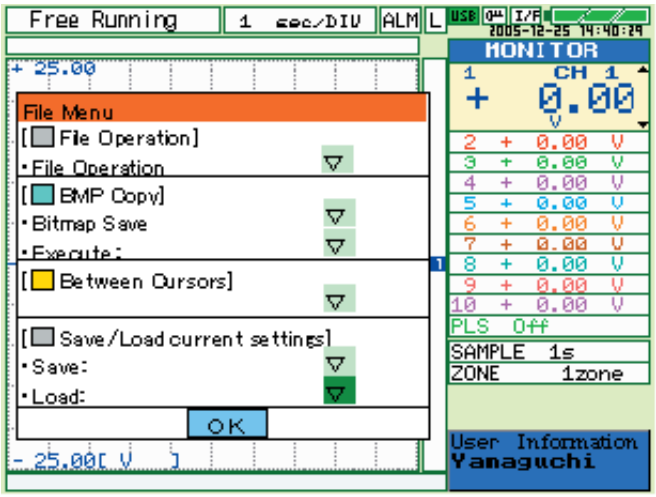
Preparations for inspections and checks

Condition settings file :GL2CondVT.CND ← Condition settings for measurement accuracy

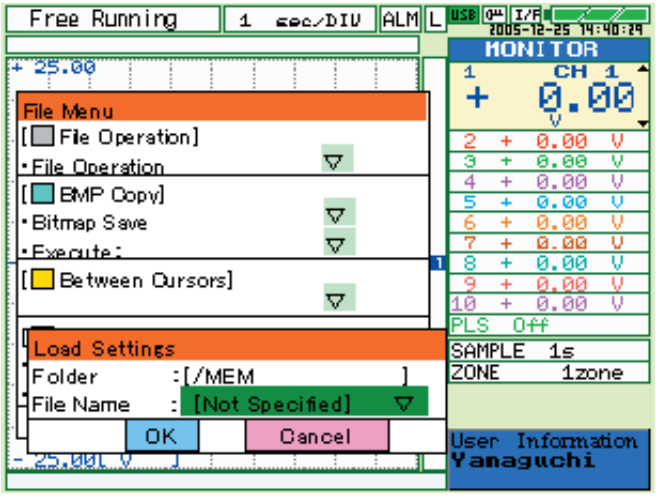
(1) Copy the condition settings file to a USB memory device from the computer.

How to load the condition settings file to the GL200 from a USB memory device

(1) Press the [FILE] key, and then move the cursor to the “Load” position using the [Direction] keys.

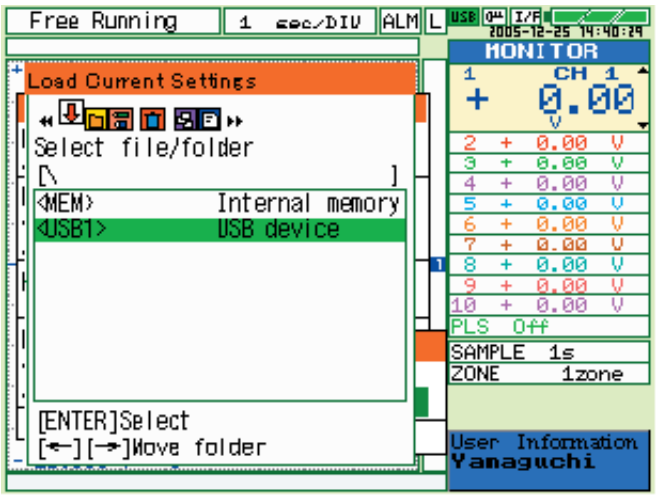


(2) Press the [ENTER] key to display the menu below.



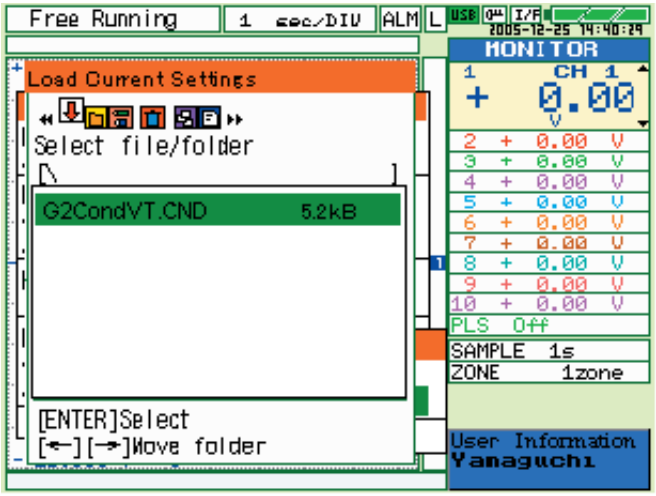
(3) Move the cursor to the “File Name” position using the [Direction] keys.

(4) Press the [ENTER] key to display the menu shown below.

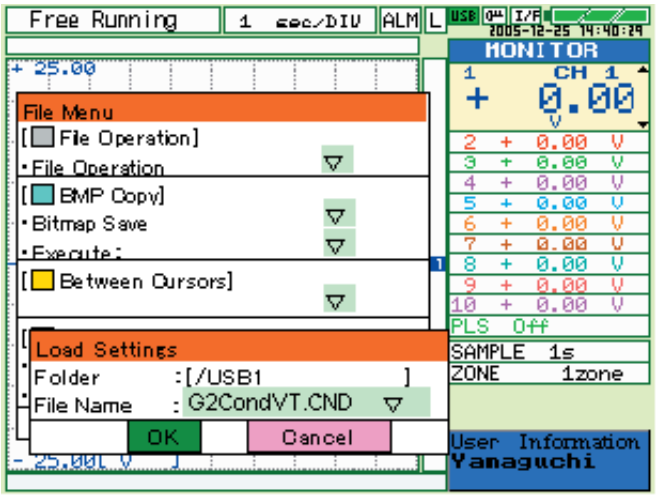


(5) Move the cursor to the “USB device” position using the [Direction] keys.

(6) Press the [ENTER] key to display the menu shown below.



(7) Specify the condition settings file to execute the various inspection operations.



(8) Move the cursor to the “OK” position using the [Direction] keys.

(9) Press the [ENTER] key to load the condition settings file.

5.1.1 Measurement Accuracy

Supply the reference voltage or frequency determined for each measurement range, and then check the voltage accuracy.

Preparation

- Have a voltage generator on hand that can output voltage up to 50 VDC (using four-digit output).
- Mutually connect the ground terminals of the voltage generator and the GL200 prior to initiating measurement.

Wiring connection

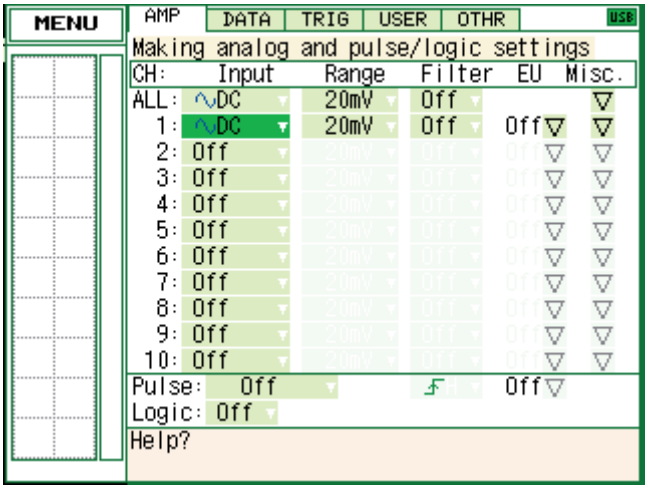
Same wiring connection as Setup1. (See Setup1 procedure)

Setting procedure

(1) Load the condition settings file "GL2CondVT.CND" from the USB memory device.

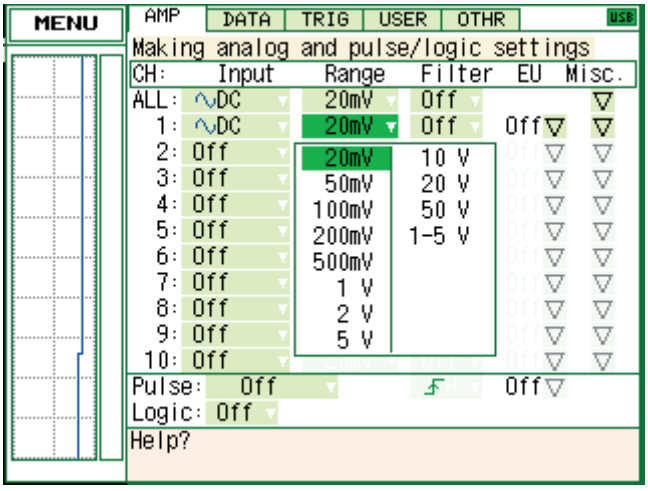
Measurement procedure

(1) Press the [MENU] key to display the menu shown below.

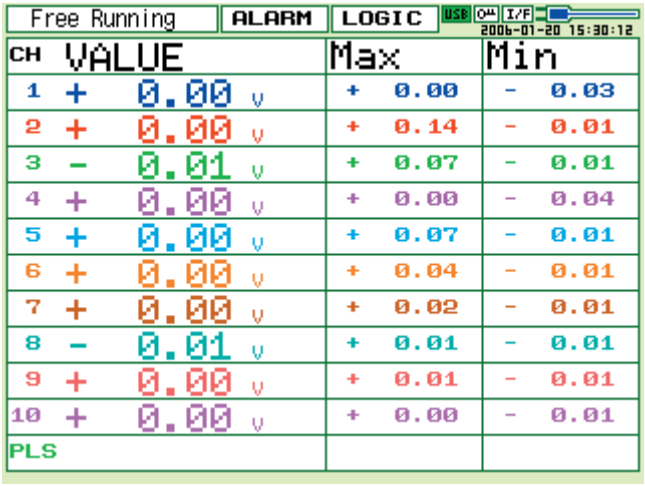


(2) Move the cursor to the Range position of channel 1.

(3) Press the [ENTER] key to display the menu shown below, and then select the reference voltage range.



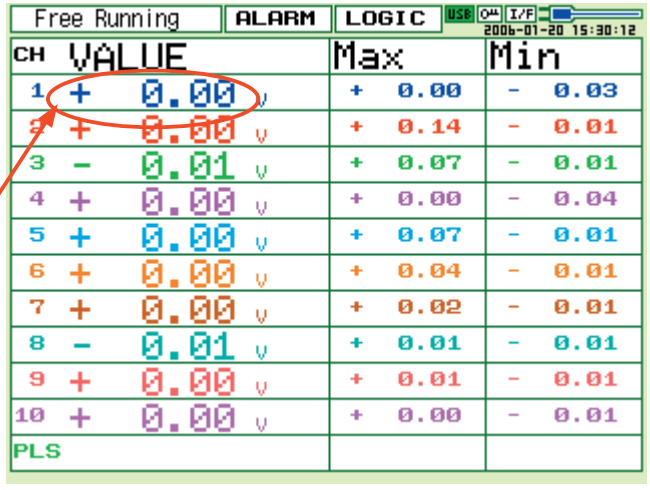
(4) Press the [DISPLAY] key until the menu shown below appears.



(5) Input the reference voltage for each range according to the table below, and then check that the level of measurement is within the rating.

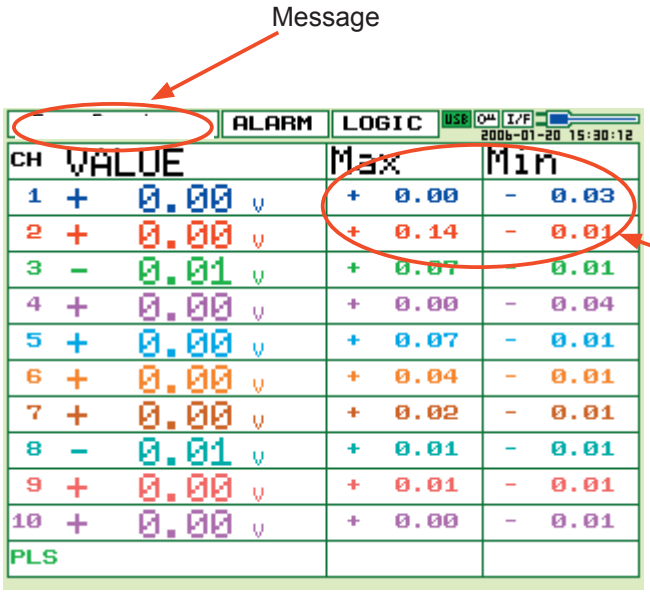
Voltage precision ratings		
Range	Input voltage	Rating (±0.08%)
20 mV	+20.000 mV	+19.984 mV to +20.016 mV
50 mV	+50.000 mV	+49.96 mV to +50.04 mV
100 mV	+100.00 mV	+99.92 mV to +100.08 mV
200 mV	+200.00 mV	+199.84 mV to +200.16 mV
500 mV	+500.00 mV	+499.6 mV to +500.4 mV
1 V	+1.0000 V	+0.9992 V to +1.0008 V
2 V	+2.0000 V	+1.9984 V to +2.0016 V
5 V	+5.0000 V	+4.996 V to +5.004 V
10 V	+10.0000 V	+9.992 V to +10.008 V
20 V	+20.0000V	+19.984 V to +20.016 V
50 V	+50.000 V	+49.96 V to +50.04 V

This value will change when the reference voltage is input from the voltage generator.



(6) Press the [START/STOP] key when the input voltage stabilizes.

(7) Wait until the "Finished" message is displayed, and then display the values as shown below.



Confirm that this value is within the above ratings after data has been captured.

The data with an automatically generated file name is captured to the memory.

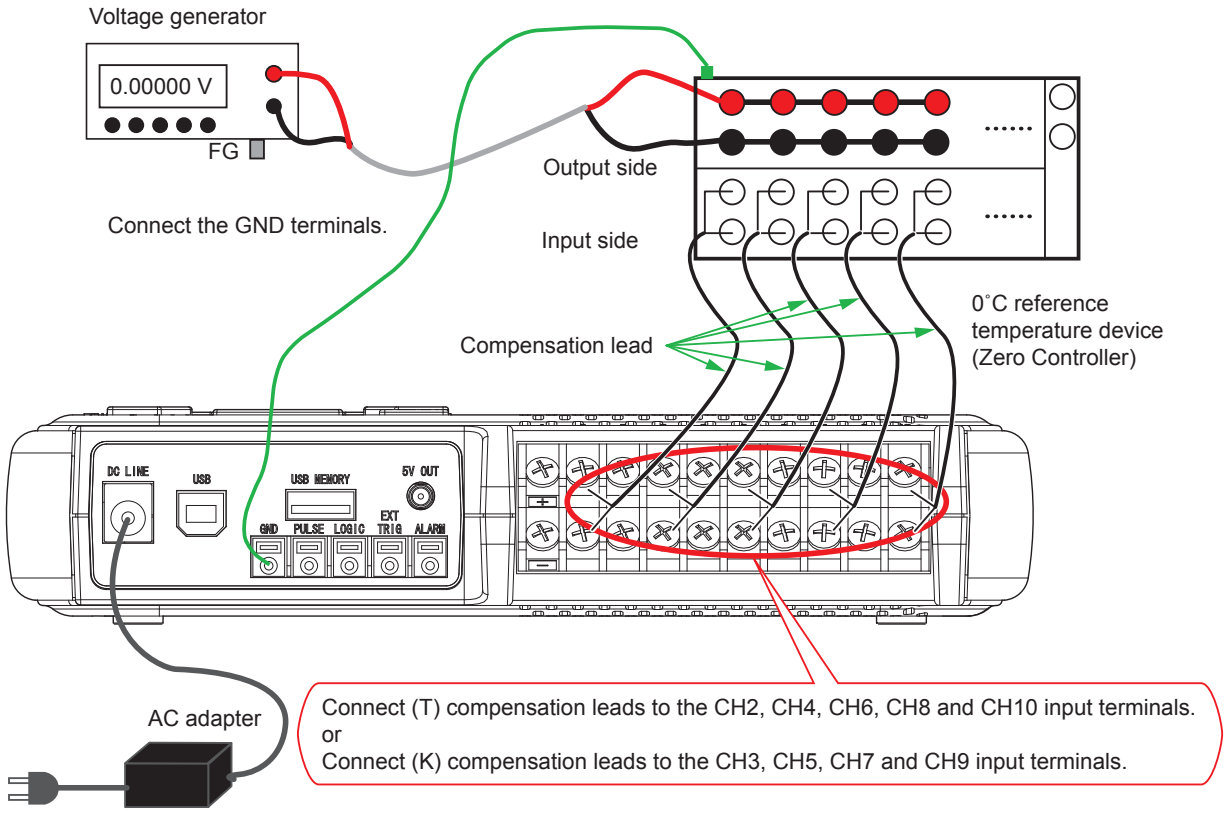
(8) Repeat steps (1) to (7), and then confirm that each value is within the above ratings.

5.1.2 Temperature Accuracy

Preparation

- Use (T) and (K) temperature compensation leads to connect a 0˚C reference temperature device (zero controller) to the GL200 input terminals as shown below.
- As shown below, use copper leads to connect the 0˚C reference temperature device (zero controller) to a voltage generator that can specify output up to 1μV.

Wiring connection



Note : The compensation leads should be connected individually. Do not connect in parallel. Connect the FG of the voltage generator and the AC adapter.

Setting procedure

(1) Load the condition settings file GL2CondVT.CND from the USB memory device.

Measurement procedure (temperature accuracy)

(1) Connect to the zero controller with the (T) compensation leads.

Connect the (T) compensation leads to the CH2, CH4, CH6, CH8 and CH10 input terminals.

(2) Use the voltage generator to successively input the reference voltage signal for the 0˚C reference temperature device (zero controller) according to the table below, then check that the level of measurement is within the rating.

Input voltage precision ratings (Type T)		
Temperature	Input voltage	Standard
0 ˚C	0.000 mV	-0.8 ˚C to +0.8 ˚C

(3) Connect to the zero controller with the (K) compensation leads.

Connect the (K) compensation leads to the CH3, CH5, CH7 and CH9 input terminals.

(4) Input the reference voltage signal for the 0˚C reference temperature device (zero controller) according to the table below, then check that the level of measurement is within the rating.

Input voltage precision ratings (Type K)		
Temperature	Input voltage	Standard
0 ˚C	0.000 mV	-1.0 ˚C to +1.0 ˚C

6. PARTS LISTS

6.1 Recommended Parts List

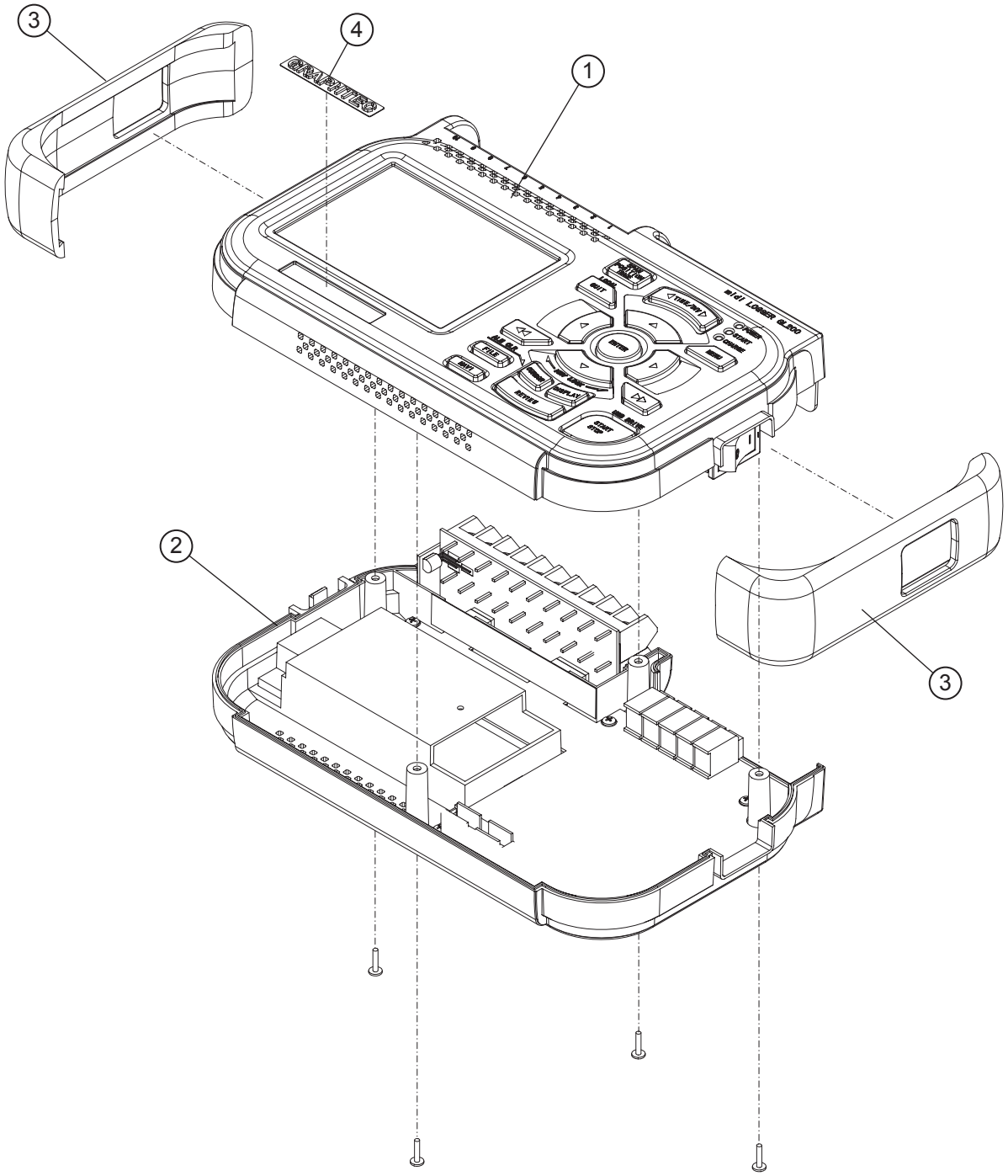
Part No.	Part Name	Description	Q'ty	Remarks
790420700	Main Control Board for GL200		1	
790420701	AMP Board for GL200		1	
790420702	Input Terminal Board for GL200		1	
790420703	Control Panel Board for GL200		1	
500051951	AC Adapter JP	YC-1048GRC1209P	1	Japan
500052392	AC Adapter UL	YC-1048GRC1208P	1	UL
500052390	AC Adapter CEE	YC-1048GRC1175P	1	CEE
500052418	AC Adapter BS	YC-1048GRC1247P	1	BS
795450004	Battery Pack		1	Same as GL450
562060005	LCD, COM35H3125XL		1	

6.2 Parts Lists

6.2.1 Outer Casing

No.	Part No.	Part Name	Description	Q'ty	Remarks
1	604100004	Top Cover		1	
2	604100014	Bottom Case		1	
3	604100043	Side Pad		2	
4	604100082	Emblem Plate 200 "GRAPHTEC"		1	

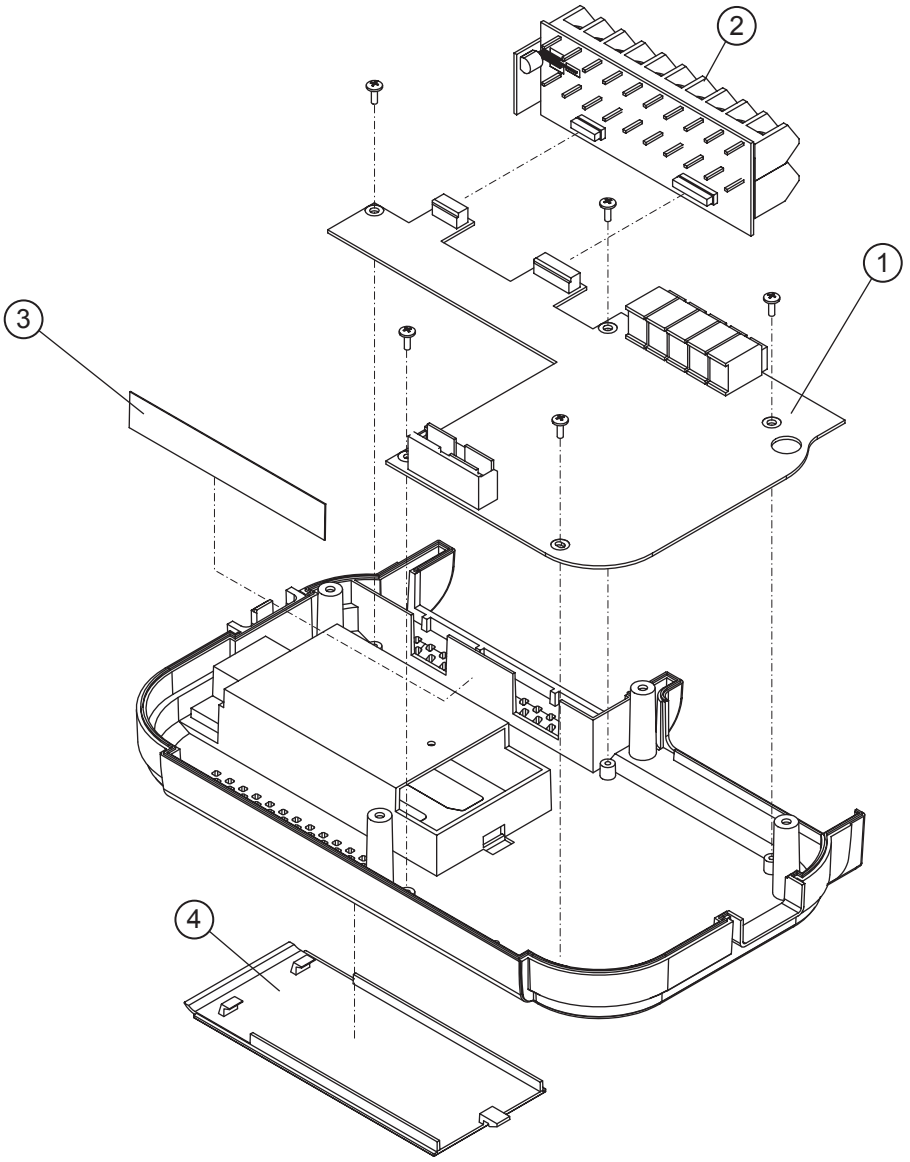
Outer Casing



6.2.2 Bottom Parts

No.	Part No.	Part Name	Description	Q'ty	Remarks
1	790420701	AMP Board		1	
2	790420702	Input Terminal Board		1	
3	604100090	Covering Seal		1	
4	604100023	Battery Cover		1	

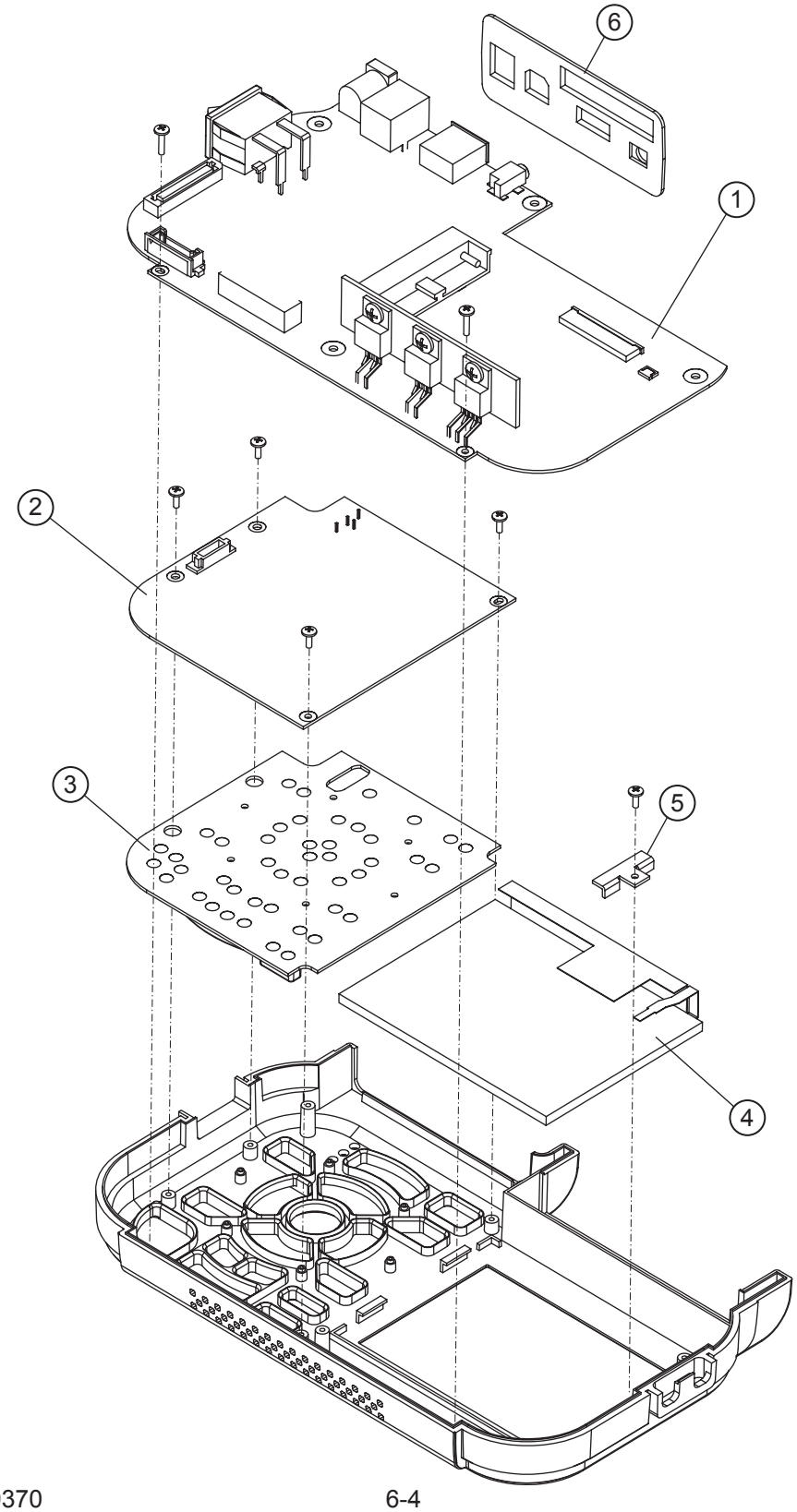
Bottom Parts



6.2.3 Top Parts

No.	Part No.	Part Name	Description	Q'ty	Remarks
1	790420700	Main Control Board		1	
2	790420703	Control Panel Board		1	
3	604100053	Key Switch		1	
4	562060005	LCD, COM35H3125XL		1	
5	604100070	LCD Bracket		1	
6	604100033	IO Panel		1	

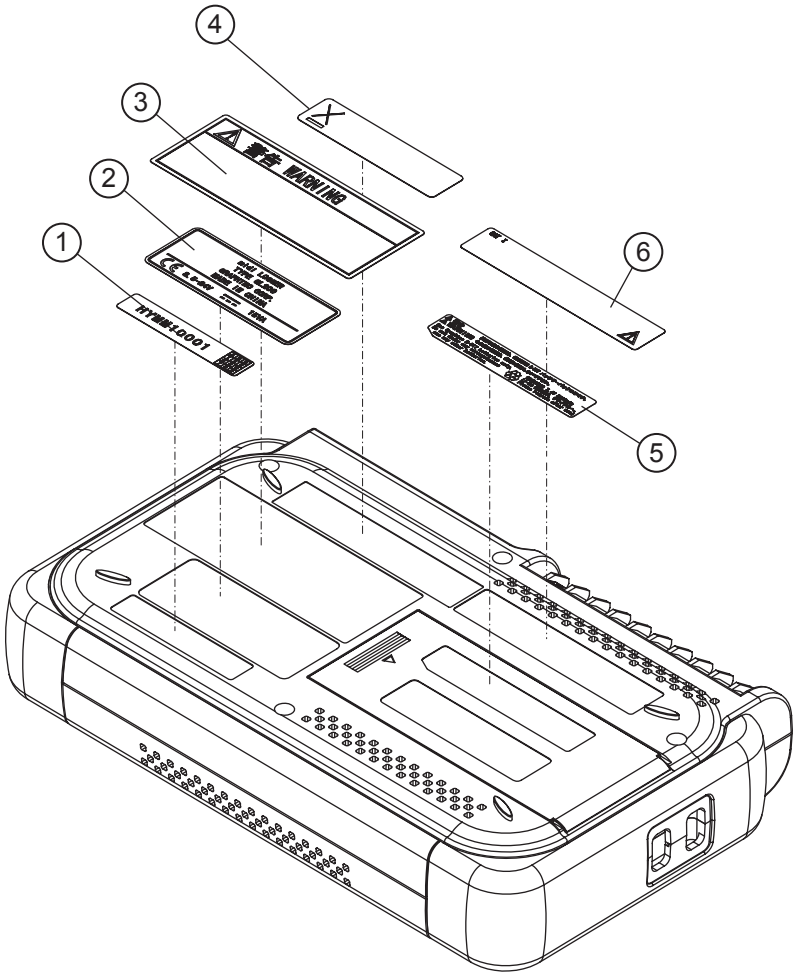
Top Parts



6.2.4 Labels

No.	Part No.	Part Name	Description	Q'ty	Remarks
1	604100132	Serial Number Label		1	
2	604100113	Model Name Label GL200		1	
3	604350801	Warning Label		1	
4	910990020	WEEE Label		1	
5	604350860	Warning Label, Battery		1	
6	604250801	CAT Label		1	

Labels



6.2.5 Standard Accessories

No.	Part No.	Part Name	Description	Q'ty	Remarks
1	604109101	GL200-CDM01M	CD Manual, Software	1	
2	604109140	GL200-UM-851	Quick Start Manual	1	
3	604109121	GL200-UM-901	Installation Manual	1	
4	500051951	AC Adapter JP	YC-1048GRC1209P	1	Japan
5	500052392	AC Adapter UL	YC-1048GRC1208P	1	UL
6	500052390	AC Adapter CEE	YC-1048GRC1175P	1	CEE
7	500052418	AC Adapter BS	YC-1048GRC1247P	1	BS

7. Block Diagram