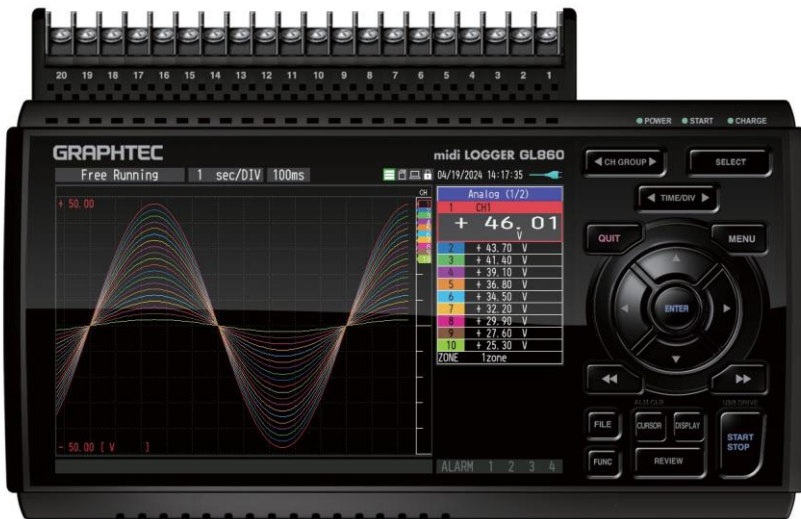# midi LOGGER
GL860

Quick Start Guide

GL860-UM-800-7L

GRAPHTEC

ALTHEN
SENSORS & CONTROLS

First

Thank you for choosing Graphtec midi LOGGER GL860.

The Quick Start Guide is to assist with the basic operations.

Please refer to the USER'S MANUAL (PDF) for more in-depth information.

To make measurements using the GL860, the following terminal blocks are required in addition to the GL860 main unit.

• Standard 20CH screw terminal (B-563)
• Standard 20CH screwless terminal (B-563SL)
• Standard 30CH screwless terminal (B-563SL-30)
  Withstand high-Voltage high-precision terminal (B-565)

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

Files stored in the internal memory

• GL860 User's Manual
• GL28-APS (Windows OS 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

Microsoft and Windows are registered trademarks or brands of the US Microsoft Corporation in the USA and other countries.

.NET Framework is a registered trademark or trademark of US Microsoft Corporation in the USA and other countries.

Contents

ALTHEN
SENSORS & CONTROLS

About the User's Manual and Included Software

The user's manual and accompanying software are stored in the internal memory of the instrument.
Please copy it from the internal memory to your computer. To copy, see the next section.
When you initialize the internal memory, the bundled files are also deleted.
Deleting the included files will not affect the operation of the instrument, but we recommend that you copy the files to your computer beforehand.
If you have deleted the user's manual and attached software from the internal memory, please download them from our website.
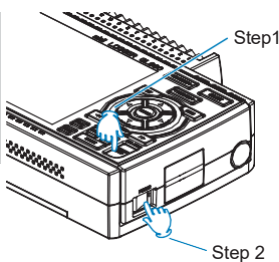GRAPHTEC Website: http://www.graphteccorp.com/

To copy bundled files in USB DRIVE mode
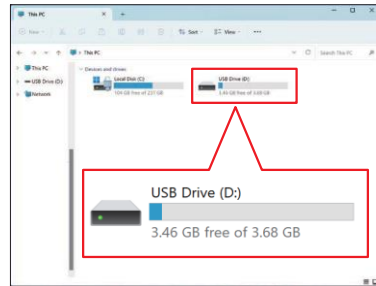
1. Connect the AC adapter cable with the power off, and then connect the PC and the GL860 with the USB cable.
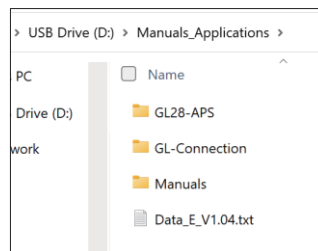

USB cable
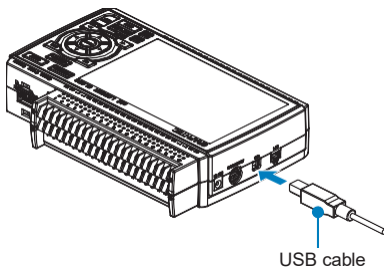
2. While holding down the START/STOP button, turn on the GL860's power switch.

Step1

Step 2

3. The GL860's internal memory is recognized by the PC and can be accessed.

4. Copy the following folders and files to your computer.

ALTHEN
SENSORS & CONTROLS

Nomenclature

Top Panel

Power jack for humidity sensor
Humidity sensor
(Option: when using the B-530)

SD memory card

Analog signal input terminals
• Standard 20CH screw terminal (B-563)
• Standard 20CH screwless terminal (B-563SL)
• Standard 30CH screwless terminal (B-563SL-30)
• Withstand high-Voltage high-precision terminal (B-565)

Wireless LAN connection terminal
Wireless unit
(Option: when using the B-568)

GND terminal

Front Panel

AC adapter jack

External input/output terminals
• LOGIC/PULSE
• EXT TRIG/SAMPLE
• ALARM
Input/output cable for GL
(Cable is the option B-513)

Operation status LED
• POWER
• START
• HARGE

GRAPHTEC   midi LOGGER GL860
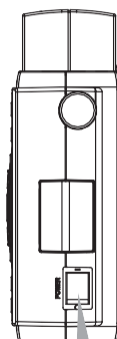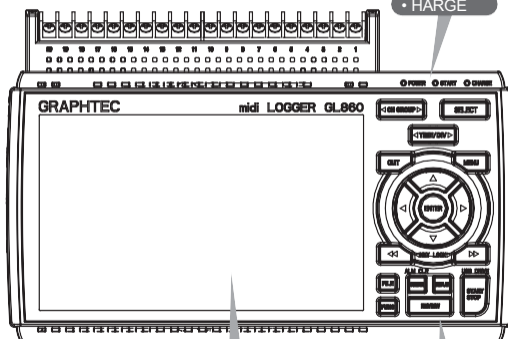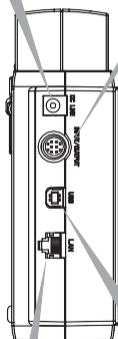
LAN interface terminal

USB interface terminal

Monitor

Control panel keys

Power switch

Bottom Panel
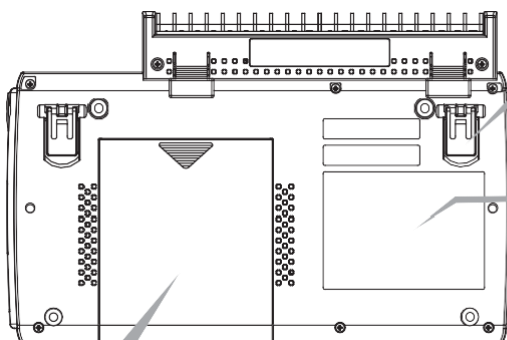
Tilt foot

Label

Battery cover
Battery pack can be installed
(Battery pack is the option B-573)

ALTHEN
SENSORS & CONTROLS

Connection Procedures

Mounting each terminal

1. Insert tabs at the top of the terminal unit into the grooves.

Insert into grooves

2. Press the terminal unit in the direction shown until it is securely locked.

Press
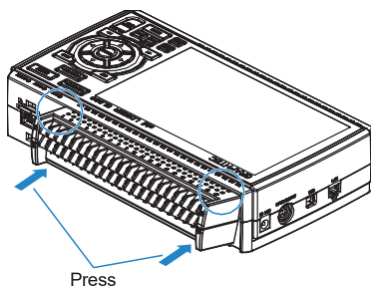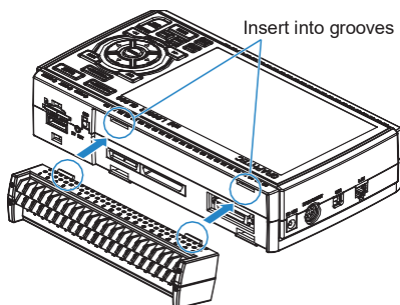
Connecting the AC Adapter
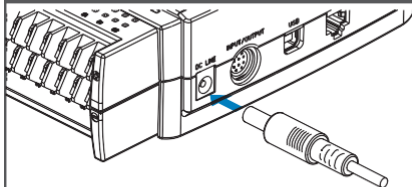
Connect the DC output of the AC adapter to the connector indicated as "DC LINE" on the GL860.

Connecting the Grounding Cable
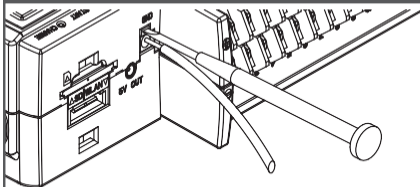
Use a flathead screwdriver to push the button above the GND terminal while connecting the grounding cable to the GL860.
Connect the other end of the cable to ground.

Connect to the Analog Input Terminals

Withstand high-Voltage
high-precision terminal(B-565)
CH1. .... CH20
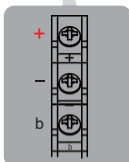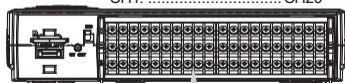
+
−
b

DC voltage input
DC voltage
+
−

Thermocouple input
+
−
Compensation wire is used if it is required.

Resistance bulb input
A
B
b
+
b
Lead wire resistance should be 10 Ω or less per wire, three wires need to be same length.

DC current input
+
Shunt resister
Ex: For 4-20mA, add 250Ω (±0.1%) and measure in the 1-5V range.
* Use B-551 (option) for the shunt resistor.
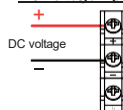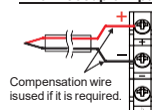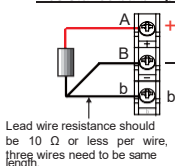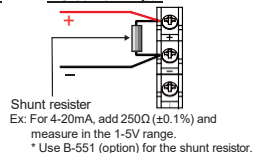
CAUTION
• Connect wire to the designated channel, where individual channels are numbered.
  For the connection to the screwless terminal, refer to the instruction manual (PDF).
• B-563/B-563SL/B-563SL-30 do not support resistance bulb input.

ALTHEN
SENSORS & CONTROLS

Connect the External Input/Output Terminals

< Signal assignment >

Orange with red dotted line : 1
Orange with black dotted line : 2
Grey with red dotted line   3
Grey with black dotted line   4
} Logic/pulse input

White with red dotted line   1
White with black dotted line   2
Yellow with red dotted line   3
Yellow with black dotted line : 4
} Alarm output

Pink with red dotted line   : Trigger input/ external sampling input
Pink with black dotted line   GND

The B-513 input/output cable for GL (sold separately) is required for connecting input/output signals.
(For logic/pulse input, alarm output, trigger input, external sampling pulse input)

Internal memory

• The internal memory is not removable.

Mounting SD Card

< How to mount >
(1) Open the protective cover to SD memory card.
(2) Push the SD memory card until it clicks and is locked.
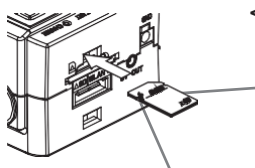
* SD memory card must be unlocked.

< How to remove >
(1) The SD memory card is released by pushing gently on the card. Then, pull to remove the card.
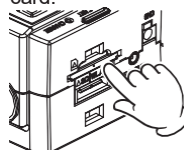
CAUTION
To remove a SD memory card, push in gently to release the card before pulling.
When the optional wireless LAN unit is installed, the SD memory card cannot be mounted.
The POWER LED blinks while accessing the SD memory card.

Safety Guide for using GL860

Warm-up

GL860 requires approximately 30 minutes warm-up time to deliver the optimum performance.

Unused channels

The analog input section can frequently have cases of impedance.
Left open, measured value may fluctuate due to noise.
To rectify, set unused channels to "Off" in the AMP setting menu or short the + and – terminals for better result.

ALTHEN
SENSORS & CONTROLS

5

Maximum input voltage

If a voltage exceeding the specified value goes into the instrument, the electrical relay in the input will be damaged. Never input a voltage exceeding the specified value at any moment.

Standard 20CH screw terminal(B-563)
Standard 20CH screwless terminal(B-563SL)
Standard 30CH screwless terminal(B-563SL-30)

< Between +/– terminals(A) >
• Maximum input voltage:
  60Vp-p (Range of 20mV to 2V)
  110Vp-p (Range of 5V to 100V)
< Between Channel to channel (B) >
• Maximum input voltage: 60Vp-p
• Withstand voltage: 350 Vp-p at 1 minute

< Between Channel to GND (C) >
• Maximum input voltage: 60Vp-p
• Withstand voltage: 350 Vp-p at 1 minute

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 Channel to channel (B) >
• Maximum input voltage: 600Vp-p
• Withstand voltage: 600Vp-p

< Between Channel to GND (C) >
• Maximum input voltage: 300Vp-p
• Withstand voltage: 2300VACrms at 1 minute

Noise countermeasures
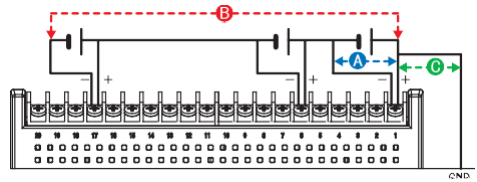
If measured values fluctuate due to extraneous noise, run the following countermeasures. (Results may vary according to noise type.)

Ex 1 : Connect the GL860's GND input to ground.
Ex 2 : Connect GL860's GND input to measurement object's GND.
Ex 3 : Operate GL860 with batteries (Option: B-573).
Ex 4 : In the AMP settings menu, set filter to any setting other than "Off".
Ex 5 : Set the sampling interval which enables GL860's digital filter (see table below).

Number of Measuring Channels [1]	Allowed Sampling Interval	Sampling Interval which enables Digital Filter
1 Channel	5ms or slower [2]	50ms or slower
2 Channel	10ms or slower [2]	125ms or slower
3 to 4 Channel	20ms or slower [2]	250ms or slower
5 Channel	50ms or slower [2]	250ms or slower
6 to 10 Channel	50ms or slower [2]	500ms or slower
11 to 20 Channel	100ms or slower	1s or slower
21 to 40 Channel	200ms or slower	2s or slower
41 to 50 Channel	250ms or slower	2s or slower
51 to 100 Channel	500ms or slower	5s or slower
101 to 200 Channel	1s or slower	10s or slower

[1] Number of Measuring Channels is the number of active channels in which input settings are NOT set to "Off".

[2] Temperature cannot be set when the active sampling interval is set to 10 ms, 20 ms or 50 ms.

In the "OTHER" menu, the commercial power frequency to be used must be set. Set the AC power frequency to be used.

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

ALTHEN
SENSORS & CONTROLS

Descriptions of the Control Panel Keys

AMP
- **AMP Settings**
  Set the input, range, filter, scaling, and other channel based settings.

DATA
- **Record Settings**
  Set sampling interval and data record destination.

TRIG
- **Trigger Settings**
  Set the specify recording start and stop conditions.

ALARM
- **Alarm Settings**
  Set the alarm conditions.

I/F
- **Interface Settings**
  Set the USB ID.
  If the optional wireless unit is installed, configure settings for the wireless LAN connection.

OTHER
- **Other Settings**
  Set the screen brightness, background color, language and etc.

1. CH GROUP
Press this key to switch to the next group consisting of 10 channels.
Press the ◀ key to switch to the previous group.
Press the ▶ key to switch to the next group.

2. SELECT
Switches between analog, logic pulse, and calculation display channels.

3. TIME/DIV
Push the [TIME/DIV] key to change the time axis display range on the waveform screen.

4. MENU
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.
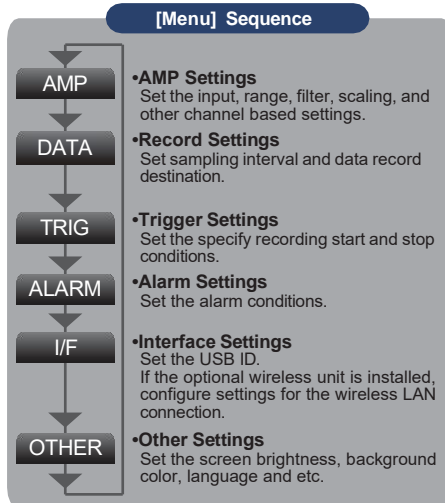
5. QUIT (LOCAL)
Push the [QUIT] key to cancel the settings and return to the default status.
If GL860 is in a Remote (Key Lock) status and is run by a computer via a USB or WLAN interface, push the key to return to a normal operating status. (Local).

6. ⬤ keys (DIRECTION KEYS)
Direction keys are used to select menu setup items, to move the cursors during a data replay operation.

7. ENTER
Push the [ENTER] key to submit the setting and to confirm your settings.

8. ◀◀ ▶▶ keys (KEY LOCK)
Fast forward and rewind keys are used to move the cursor at high speed during replay or change the operation mode in the file box.
Hold down both keys simultaneously for at least two seconds to lock the key buttons. (Orange key at the top right of window indicates locked status).
To cancel key lock status, push both key again for at least two seconds.
* Pushing these keys simultaneously with the
  ◀ key + ENTER + ▶ key enables password protection for the key lock operation.

9. START/STOP (USB DRIVE MODE)

Push the [START/STOP] key to initiate start
and stop of a recording when GL860 is in the
Free Running mode.
If the key is pushed while turning the power to
the GL860 on, the unit will switch from the USB
connection to USB DRIVE mode.
 * For more information about the Drive Mode
   of the USB, refer to the User's Manual.

10. REVIEW

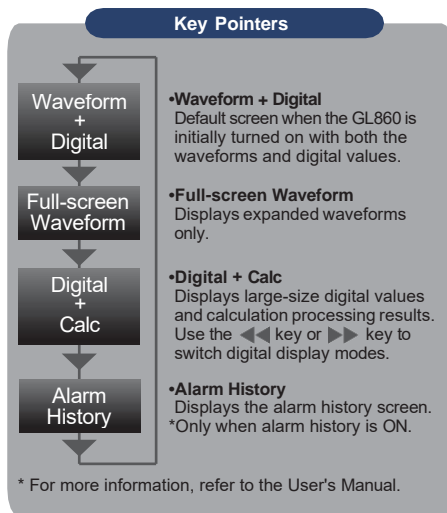Push the [REVIEW] key to replay recorded
data.
If the GL860 is in the Free Running mode, data
files that have already been recorded will be
displayed.
If the GL860 is still recording data, the data is
replayed in a 2-screen format.
* A data replay operation will not be performed
  if data has not been recorded.

11. DISPLAY

Push the [DISPLAY] key.

Key Pointers

Waveform + Digital

•**Waveform + Digital**
 Default screen when the GL860 is
 initially turned on with both the
 waveforms and digital values.

Full-screen Waveform

•**Full-screen Waveform**
 Displays expanded waveforms
 only.

Digital + Calc

•**Digital + Calc**
 Displays large-size digital values
 and calculation processing results.
 Use the ◀◀ key or ▶▶ key to
 switch digital display modes.

Alarm History

•**Alarm History**
 Displays the alarm history screen.
 *Only when alarm history is ON.

* For more information, refer to the User's Manual.

12. CURSOR (ALARM CLEAR)

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 "ALARM"
menu.

12. CURSOR (ALARM CLEAR)

DISPLAYPress 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 "ALARM"
menu.

13. FILE

This is used to operate the internal memory
and SD memory card, or for file operation,
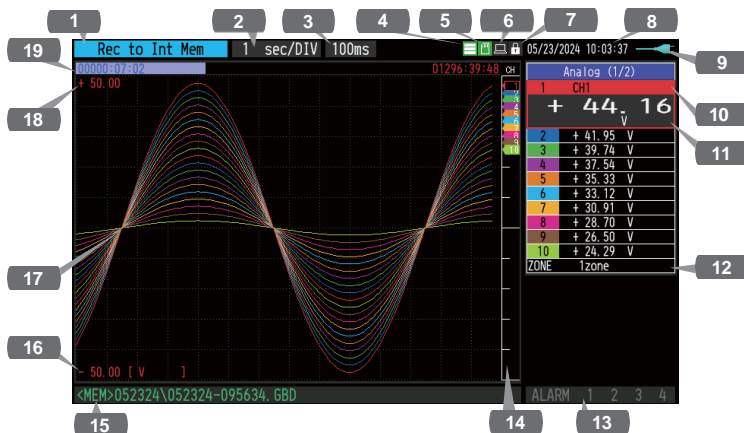screen copy and save/load current settings.

14. FUNC

Functional operations allow you to perform
frequently used functions every time.

ALTHEN
SENSORS & CONTROLS
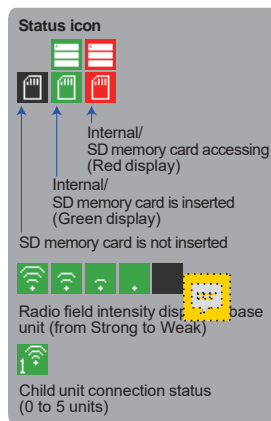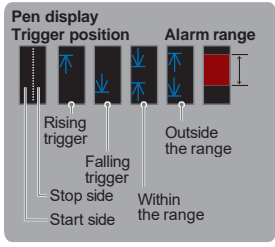
Descriptions of the Menu Screens

1. **Status message display area** : Displays the operating status.

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

3. **Sampling interval display** : Displays the current sampling interval.

4. **Device access display (Internal memory)** : Displayed in red when accessing the internal memory.

5. **Device access display (SD memory card / wireless LAN display)** : Displayed in red when accessing the SD memory card. When the SD memory card is inserted, it is displayed in green. (In station mode, the signal strength of the connected base unit is displayed. Also, in access point mode, the number of connected handsets is displayed. It turns orange when the wireless unit is operating.)

6. **Remote lamp** : Displays the remote status. (Orange = Remote status, white = Local status)

7. **Key lock lamp** : Displays the key lock status. (Orange = keys locked, white = not locked)

8. **Clock display** : Displays the current date and time.

Status icon

Internal/ SD memory card accessing (Red display)

Internal/ SD memory card is inserted (Green display)

SD memory card is not inserted

Radio field intensity display base unit (from Strong to Weak)

Child unit connection status (0 to 5 units)

9. **AC/Battery status indicator** : Displays the following icons to indicate the operating status of the AC power and the battery.
Note: Use this indicator as a guideline because remaining battery power is an estimate. This indicator does not guarantee the operating time with battery.

AC/Battery Indicator	
	When the AC power supply is being used
	Battery power: 100 - 91%
	Battery power: 90 - 71%
	Battery power: 70 - 51%
	Battery power: 50 - 31%
	Battery power: 30% or less

10. **CH select** : Displays analog, logic, pulse, and calculation.

11. **Digital display area** : Displays the input values for each channel. The ▲ and ▼ keys can be used to select the active channel (enlarged display). The selected active channel is displayed at the very top of the waveform display.

12. **Quick settings** : Displays items that can be easily set. The ▲ and ▼ keys can be used to activate a Quick settings item, and the ◄ and ► keys to change the values.

13. **Alarm display area** : Displays the status of the alarm output. (Red = alarm generated, white = alarm not generated)

14. **Pen display** : Displays the signal positions, trigger positions, and alarm ranges for each channel.

Pen display
Trigger position   **Alarm range**

Rising trigger
Falling trigger
Stop side
Start side
Outside the range
Within the range

15. **File name display area** : Displays the recorded file name during the recording operation. When data is being replayed, the display position and cursor information are displayed here.

16. **Scale lower limit** : Displays the lower limit of the scale of the currently active channel.

17. **Waveform display area** : The input signal waveforms are displayed here.

18. **Scale upper limit** : Displays the upper limit of the scale of the currently active channel.

19. **Recording bar** : Indicates the remaining capacity of the recording medium during data record. When data is being replayed, the display position and cursor information are displayed here.

ALTHEN
SENSORS & CONTROLS

GRAPHTEC

ALTHEN
SENSORS & CONTROLS

Specifications are subject to change without notice.

GL860 Quick Start Guide (GL860-UM-800-7L)	July 16, 2024 1st editon-01