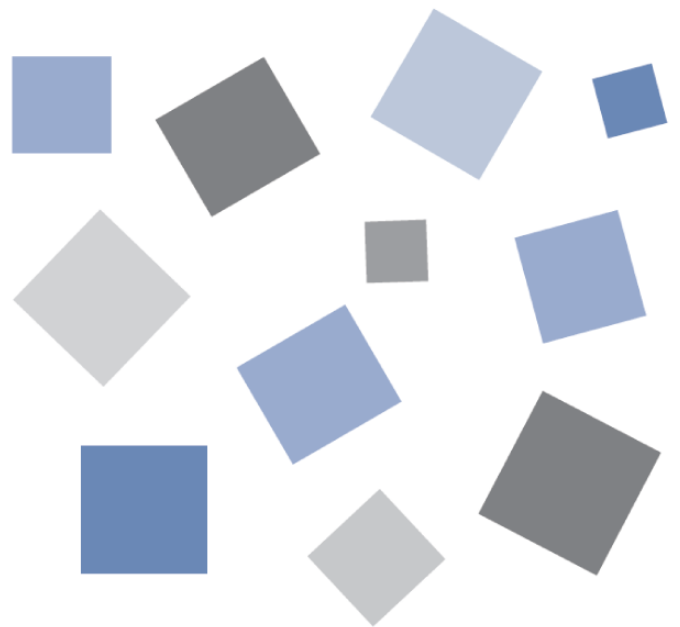


GL-PRINTER



Thermal Printer Function Manual

MANUAL No. GL-PRINTER-UM-151



GRAPHTEC

Introduction

Thank you for purchasing the DP-581H thermal printer. This document explains the printer functions of the midi LOGGER series. For details on the standard functions of the midi LOGGER, see the instruction manual of each product. Please read this document carefully, and use the product properly.

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CAPTER 1 General Description

This chapter provides an overview.

1.1 Overview

When you connect a DP-581H thermal printer to the midi LOGGER series, the logger signals can be printed on the printer. The waveforms of the input signals can be printed in real time, numeric values can be printed as a log, and the displayed screen can be printed.

1.2 Features

Portability

By combining the DP-581H thermal printer and the compact midi LOGGER series, you can create a mobile print environment.

Wireless LAN Connection

The GL840/GL240 midi LOGGER can be connected to a printer through wireless LAN using the optional wireless LAN unit (B-568).

A variety of print features

Direct Y-T printing can be used to print input signals in real time. Further, the print timing can be synchronized to triggers.

Data recorded in the past can be played back and printed. The period in which you want to print can be specified with cursors.

The logging print function allows printing of numeric values such as those in CSV data.

1.3 Operating Environment

The following table shows the midi LOGGER series instruments that can connect to the printer. If you are already using a midi LOGGER series instrument, you need to update the firmware. You can download the firmware from the Graphtec website.

Download page

<http://www.graphteccorp.com/support/software/instruments.html>

Compatible model	Compatible firmware version	Connection method
GL980	Ver.1.30 or later	USB connection, Wired LAN connection
GL2000	Ver.1.30 or later	USB connection, Wired LAN connection
GL840-M/WV	Ver.1.50 or later	Wireless LAN connection, Wired LAN connection
GL240	Ver.1.50 or later	Wireless LAN connection

- ※ Do not use a USB hub or the like when making a USB connection.
- ※ To use wired LAN, you need a separate off-the-shelf wireless LAN access point.
- ※ Only a single logger can be connected to a printer.

CAPTER 2 Preparation

This chapter explains the procedure to connect a printer to the midi LOGGER series. For the preparation of the printer itself, see the instruction manual or setup guide for the printer. The method of connecting a midi LOGGER series and printer varies depending on the interface that you will use.

USB connection

Connect the printer to the logger using a USB cable. This connection is possible on the GL980/GL2000.

Required items

- DP-581H printer
- GL980 or GL2000 midi LOGGER
- USB cable (Type-A to Type-C) for connecting the printer to the GL980/GL2000

Connection procedure

1. Printer configuration

1-1. Turn the printer on.

2. Logger configuration

2-1. Turn the logger on.

3. USB connection

3-1. Connect the Type-A end of the included USB cable to the GL980/GL2000 USB host port and the Type-C end to the printer.

4. Printer registration

4-1. Press the MENU key on the logger to open the OTHER menu.

4-2. Under the printer function, set the interface to use to USB.

5. Test print

5-1. Perform a test print, and check that it is printed properly.

※ Do not use a USB hub or the like when making a USB connection.

Wireless LAN connection

To use wireless LAN connection, a B-568 wireless LAN unit must be connected to the GL840 or GL240.

Required items

- DP-581H printer
- GL840 or GL240 midi LOGGER
- B-568 wireless LAN option
- Remote Network Driver Interface Specification (RNDIS) driver
 - * A PC driver for making a Web connection to the printer
- USB cable (Type-A to Type-C) for connecting the printer to the PC
- Windows PC (Windows 7, Windows 8/8.1, Windows 10)

Connection procedure

1. Logger configuration

1-1. Connect the B-568 wireless LAN unit.

For the connection procedure, see the B-568 instruction manual.

1-2. Turn the power on.

1-3. Set the wireless LAN setting to access point.

For the procedure to change to the access point mode, see the instruction manual of the logger.

2. Printer configuration

2-1. Install the RNDIS driver in the PC.

For the installation procedure, see the printer instruction manual.

2-2. Turn the printer on.

2-3. Connect the printer to the PC using a USB cable.

Connect the Type-A end of the included USB cable to the PC and the Type-C end to the printer.

2-4. Make a Web connection to the printer, and configure the wireless LAN function of the printer.

For the procedure to make a Web connection to the printer and that to change the printer settings through the Web connection, see the printer instruction manual. For the SSID and key, set the same SSID and key as the logger access point set in step 1-3.

3. Printer registration

3-1. Press the MENU key on the logger to open the OTHER menu.

3-2. Under the printer registration, set the interface to use to wireless LAN.

The logger needs to be set to access point mode in advance in step 1-3.

3-3. The printer name will be displayed when you perform a printer search. Press ENTER to select the printer and complete the registration.

※ *Check*

If the printer name does not appear, check the SSID, encryption method, encryption key, and so on set in "2. Printer configuration." Moreover, check the IP address and network mask to verify that the printer is in the same segment as the logger's wireless LAN.

4. Test print

4-1. Perform a test print, and check that it is printed properly.

※ *Check*

If the test print fails, check the following.

- Check that the wireless connection between the logger and printer is established. You can check whether a wireless connection is established with the WIFI setting of the printer.

- Check the printer's IP address and network mask to verify that the printer is in the same segment as the logger's wireless LAN.

- Turn the logger and printer off and then back on.

- ※ If the communication speed decreases due to the communication environment, print data may be lost.
- ※ When the printer is connected with the logger's wireless LAN setting set to access point mode, the WL sensor (GL100-WL) cannot be connected.
- ※ If you want to connect the logger as a client to an off-the-shelf wireless LAN router, set the wireless LAN setting to station, and set the same SSID and key as the off-the-shelf wireless LAN router. Then, refer to the procedure for the wired LAN connection.
- ※ Only a single logger can be connected to a printer.

Wired LAN connection

To use a wired LAN connection, you need an off-the-shelf wireless LAN router. Obtain it in advance. Make sure that the off-the-shelf wireless LAN router meets the following specifications.

- IEEE802.11n compatible
- Has a wired LAN port
- Has a router mode (RT mode)
- ※ Graphtec will not guarantee the operation of the off-the-shelf wireless LAN router or answer any questions about it.

Required items

- DP-581H printer
- GL840 or GL980/GL2000 midi LOGGER
- Off-the-shelf wireless LAN router
- Remote Network Driver Interface Specification (RNDIS) driver
 - * A PC driver for making a Web connection to the printer
- USB cable (Type-A to Type-C) for connecting the printer to the PC
- LAN cable for connecting the logger to the wireless LAN router
- Windows PC (Windows 7, Windows 8/8.1, Windows 10)

Connection procedure

1. Off-the-shelf wireless LAN router configuration

1-1. Set the router to router mode.

For the procedure to change the mode, see the instruction manual for the wireless LAN router.

2. Logger configuration

2-1. Connect the off-the-shelf wireless LAN host to the logger using a LAN cable.

2-2. Turn the logger on.

2-3. Press the MENU key on the logger to open the I/F menu.

2-4. Set the network addresses according to the off-the-shelf wireless LAN router settings.

Normally, an off-the-shelf wireless LAN router has an auto network address assignment function (DHCP), so you can set the "Auto IP address assignment" of the logger to "Enabled" to automatically obtain the addresses. If the DHCP on the wireless LAN router is disabled, set the "Auto IP address assignment" of the logger to "Disabled" and set the addresses.

3. Printer configuration

3-1. Install an RNDIS driver in the PC.

For the installation procedure, see the printer instruction manual.

3-2. Turn the printer on.

3-3. Connect the printer to the PC using a USB cable.

Connect the Type-A end of the included USB cable to the PC and the Type-C end to the printer.

3-4. Make a Web connection to the printer, and configure the wireless LAN function of the printer.

For the procedure to make a Web connection to the printer and that to change the printer settings through the Web connection, see the printer instruction manual. Set the same SSID and key as those of the wireless LAN router.

4. Printer registration

4-1. Press the MENU key on the logger to open the OTHER menu.

4-2. Under the printer registration, set the interface to use to LAN.

4-3. The printer name will be displayed when you perform a printer search. Press ENTER to select the printer and complete the registration.

If the printer cannot be found, check that the settings are correct according to the configuration procedure.

※ *Check*

If the printer name does not appear, check the SSID, encryption method, encryption key, and so on set in "2. Printer configuration." Moreover, check the IP address and network mask to verify that the printer is in the same segment as the logger's wireless LAN.

5. Test print

5-1. Perform a test print, and check that it is printed properly.

※ *Check*

If the test print fails, check the following.

- Check that the wireless connection between the logger and printer is established.

You can check whether a wireless connection is established with the WIFI setting of the printer.

- Check the printer's IP address and network mask to verify that the printer is in the same segment as the logger's wireless LAN.

- Turn the logger and printer off and then back on.

※ Only a single logger can be connected to a printer.

※ If the communication speed decreases due to the communication environment, print data may be lost.

CAPTER 3 Print Functions

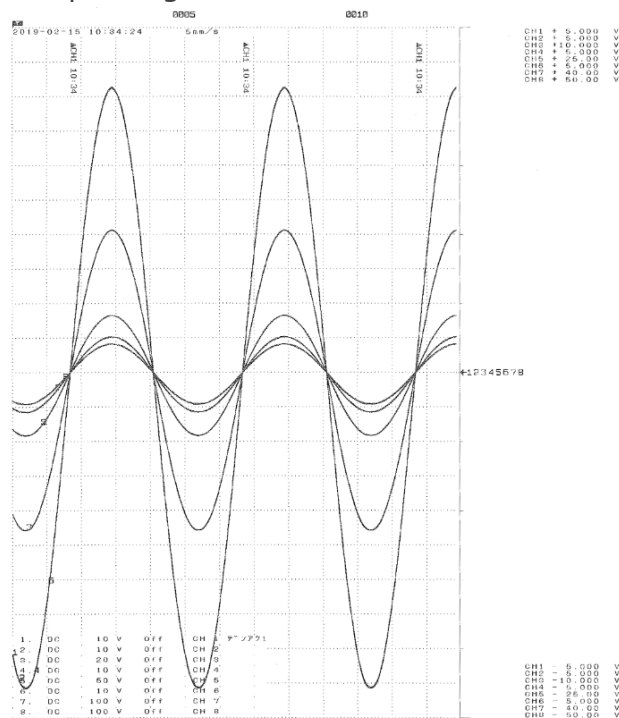
The following main print functions are available.

- Direct Y-T printing
- Hard copy printing
- Memory out printing
- List printing
- Logging printing

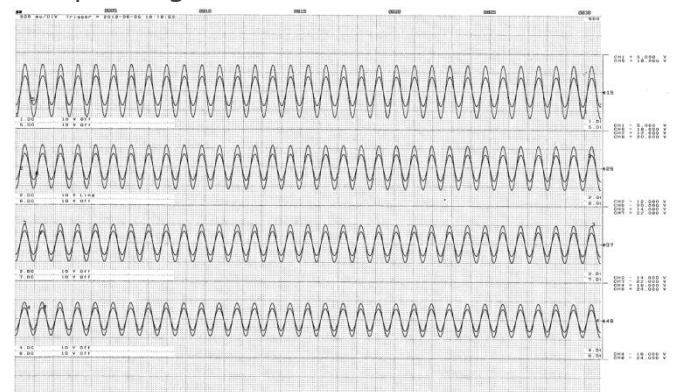
3.1 Direct Y-T Printing

Signals applied to the data logger are printed in real time in the form of waveforms. You can adjust the chart speed, print in sync with a trigger function, and print comments as you like. Further, printing is divided into zones according to the logger setting.

Y-T printing without division



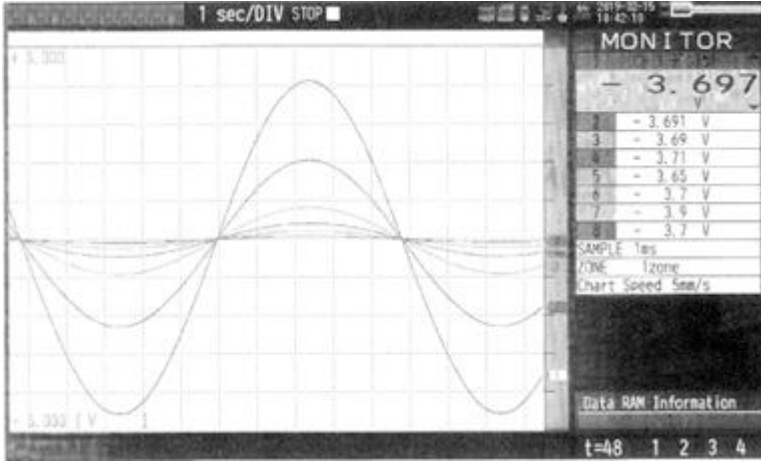
Y-T printing with divisions



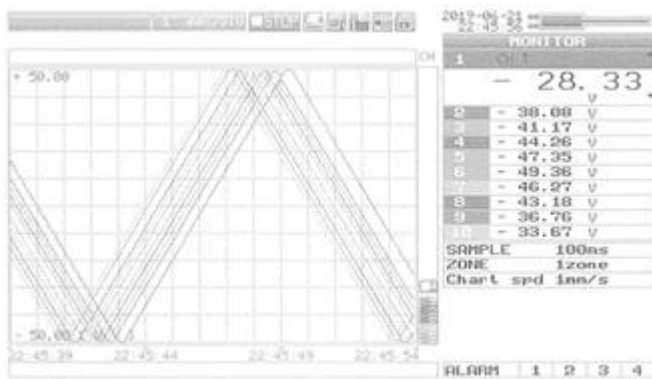
3.2 Hard Copy Printing

The contents displayed on the screen are printed on the printer. The color screen is converted into black-and-white with the dither method and output.

Y-T printing

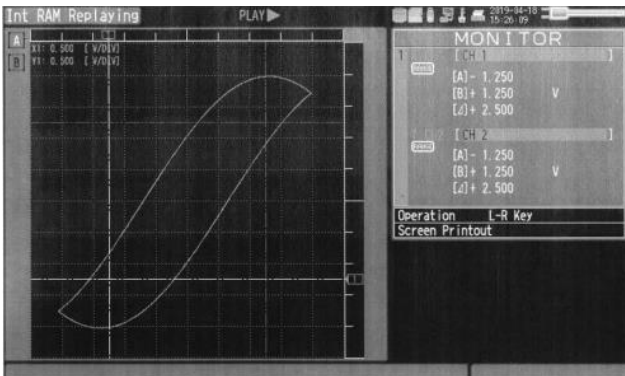


GL240 Y-T printing In case of black and white reversal
GL240 prints 90 degrees inverted.

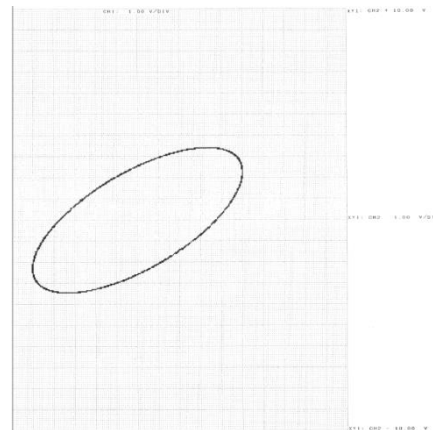


XY waveform printing (GL980/GL2000 only)

All screens

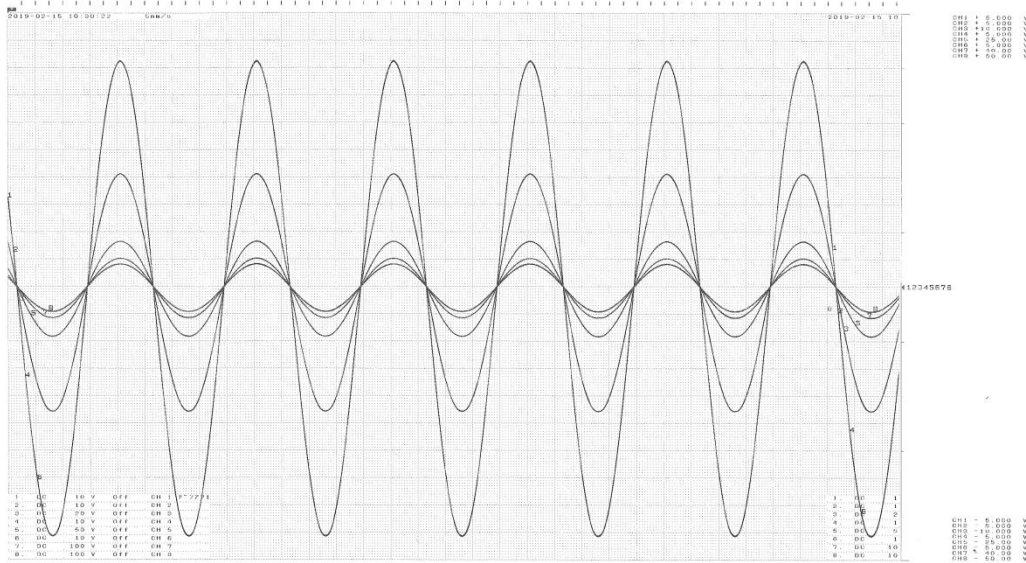


Waveform screen



3.3 Memory Out Printing

A specified period of the recorded data can be printed after the data is played back. Settings specific to memory out printing are available, so you can adjust them as necessary without returning to the normal printer settings.



3.4 List Printing

The configuration status of the data logger is printed. The following information is mainly included.

- Model name, firmware version, and other specifications
- Data timestamp
- Various data settings
- Annotation settings, etc.

```
GL2000 Measuring conditions
-----
Model name                : GL2000
Number of channels        : 4CH
Firmware                  : Ver.
Chart speed               : 5mm/s

[Memory Settings]
Sampling                  : 1ms
Pulse sampling intervals : 10ms
Capture Destination      : Internal RAM
Memory block division    : None
Overwrite mode           : Off
Data Points              : 10000
Ring/Relay capture       : Off
Backup Intervals         : Off
Backup Destination       : Internal memory
Save Folder              : Backup

[Amp Settings]
CH:  Input      Range  Filter  EU
1:  DC          1000 V  Off    Off
2:  DC          1000 V  Off    Off
3:  DC          1000 V  Off    Off
4:  DC          1000 V  Off    Off

CH:  Lower----Span----Upper  Unit
1:  -0.5000  +0.5000  kV
2:  -0.5000  +0.5000  kV
3:  -0.5000  +0.5000  kV
4:  -0.5000  +0.5000  kV
```


3.5 Logging Printing

Numeric values are printed with the channels in columns and the times in rows in the form of CSV data. The maximum, minimum, and average values are printed in the last row. The print direction is different between direct logging and memory out logging.

During direct logging

Direct logging printing is only supported on the GL240 and GL840. Direct logging printing is performed when data is printed with the screen mode set to digital display. The fastest print sampling speed is 1 second. Decimation is performed at data sampling settings faster than 1 second. Logic nor pulse signals cannot be printed.

On the GL840, the channel set on the information channel is printed. For the information channel setting, see "Information channel setting" in chapter 4, "Configuration."

AVE.	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000
MAX.	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000
MIN.	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000
00:00:07	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000
00:00:06	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000
00:00:05	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000
00:00:04	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000
00:00:03	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000
00:00:02	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000
00:00:01	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000
00:00:00	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000
2018/Jan/01	(Unit1234) [Anot01] Chxxx	(Unit1234) [Anot02] Chxxx	(Unit1234) [Anot03] Chxxx	(Unit1234) [Anot04] Chxxx	(Unit1234) [Anot05] Chxxx	(Unit1234) [Anot06] Chxxx	(Unit1234) [Anot07] Chxxx	(Unit1234) [Anot08] Chxxx	(Unit1234) [Anot09] Chxxx	(Unit1234) [Anot10] Chxxx

A "T" mark is printed next to the time in the row in which a trigger occurs. Moreover, an "A" mark is printed in the channel of the row in which an alarm occurs.

Trigger Mark						
12 : 23 : 56	T	1.2345	1.2345	12.345	123.45	1234. 5
12 : 23 : 55		1.2345	1.2345	12.345	A	23.45 1234. 5
		: Alarm Mark				

- ※ If Trigger Sync is set to off and the sampling interval is set slower than 30 seconds, the sampling interval will be offset near the start trigger because trigger detection is performed at 30-second intervals.

During memory out logging

Memory out logging printing is supported on the GL980, GL2000, GL240, and GL840.

During memory out logging, up to 1000 points can be output. A header is printed every 100 points. If you set full-width characters in annotations from the software, they will appear as blanks. Logic nor pulse signals cannot be printed.

Time	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8	AVG.	MAX.	MIN.
13:48:07.001000T	+0.2711	+0.1445	+0.477	+0.272	+0.141	+0.47	+0.24	+0.12	+0.0002	+0.2711	-0.1057
13:48:07.002000	+0.2330	+0.1242	+0.410	+0.234	+0.123	+0.40	+0.19	+0.06	+0.0002	+0.2711	-0.1057
13:48:07.003000	+0.1939	+0.1034	+0.344	+0.196	+0.101	+0.34	+0.17	+0.08	+0.0002	+0.2711	-0.1057
13:48:07.004000	+0.1532	+0.0815	+0.265	+0.153	+0.078	+0.26	+0.10	+0.06	+0.0002	+0.2711	-0.1057
13:48:07.005000	+0.1094	+0.0581	+0.188	+0.113	+0.057	+0.20	+0.08	+0.03	+0.0002	+0.2711	-0.1057
13:48:07.006000	+0.0677	+0.0362	+0.113	+0.070	+0.034	+0.11	+0.06	+0.02	+0.0002	+0.2711	-0.1057
13:48:07.007000	+0.0253	+0.0132	+0.039	+0.026	+0.009	+0.02	+0.02	+0.01	+0.0002	+0.2711	-0.1057
13:48:07.008000	-0.0213	-0.0118	-0.045	-0.021	-0.015	-0.05	-0.06	-0.03	+0.0002	+0.2711	-0.1057
13:48:07.009000	-0.0639	-0.0343	-0.119	-0.065	-0.037	-0.12	-0.10	-0.09	+0.0002	+0.2711	-0.1057
13:48:07.010000	-0.1057	-0.0566	-0.194	-0.108	-0.058	-0.20	-0.16	-0.07	+0.0002	+0.2711	-0.1057

A "T" mark is printed next to the time in the row in which a trigger occurs. Moreover, an "A" mark is printed in the channel of the row in which an alarm occurs.

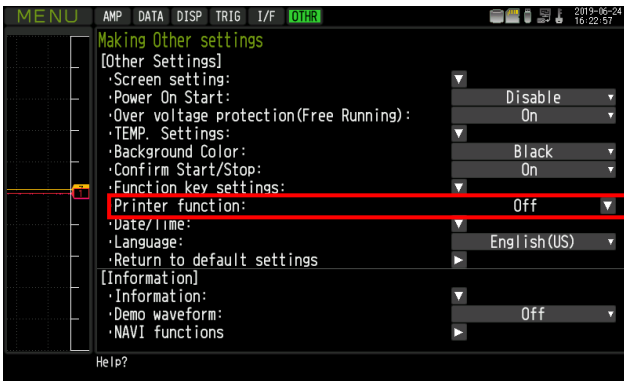
Time	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8
12:34:56.100000T	+1.2345	+1.2345	+1.2345	+1.2345				
12:34:56.200000	+1.2345	+1.2345	A 2.3456	+1.2345				

CAPTER 4 Configuration

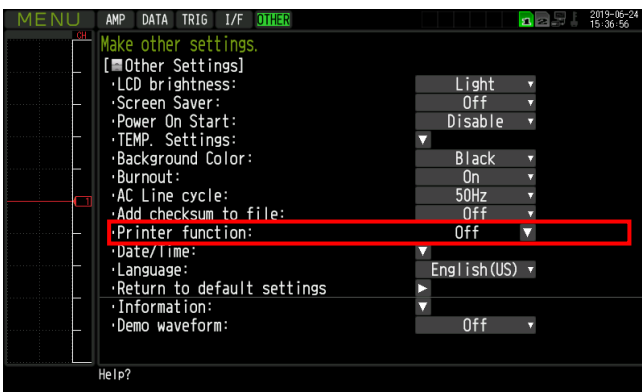
4.1 OTHER menu

You can enable or disable the print function using the “Printer function” setting in the OTHER (“OTH” on the GL240) menu. By default, the printer function is disabled. If you want to use it, change this setting.

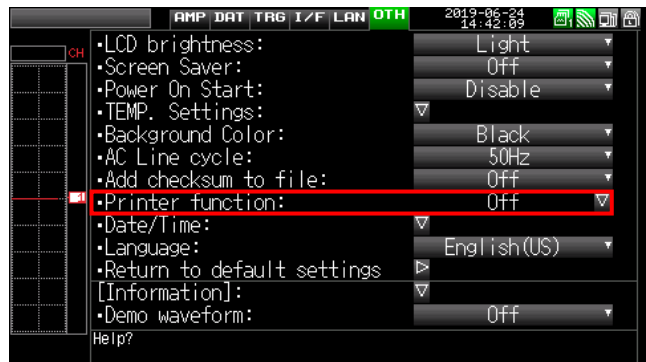
GL980/GL2000



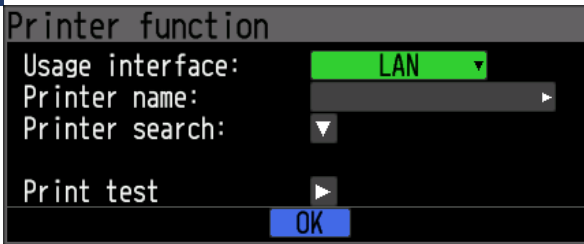
GL840



GL240



Printer function

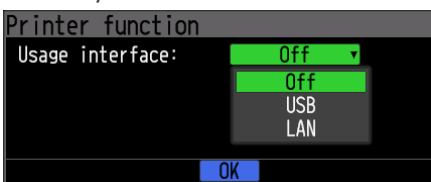


Usage interface

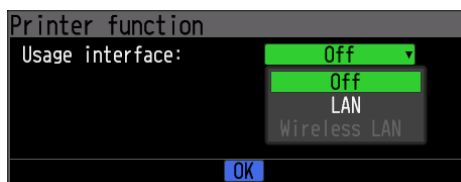
Set the interface (I/F) that the printer will use.

Options	Description
Off	The printer function is disabled. Printer parameters will be hidden.
USB	The printer is used with a USB connection. (GL980/GL2000 only)
LAN	The printer is used with a wired LAN connection. (GL980/GL2000/GL840 only) * To use a wired LAN connection, you need an off-the-shelf wireless LAN router.
Wireless LAN	The printer is used with a wireless LAN connection. (GL840/GL240 only) * To use a wireless LAN connection, you need a GL wireless LAN unit (B-568). To enable the setting, you need to specify "Access point" or "Station" on the WLAN menu.

GL980/GL2000



GL840



GL240



When you switch to an option other than Off, the printer menu appears.



Printer name

Enter the printer name or printer's IP address.

The default printer name is "H-" followed by a serial number string. The printer and logger must be connected within the same network.

Example: If the serial number is "123456789012", the printer name is "H-123456789012".

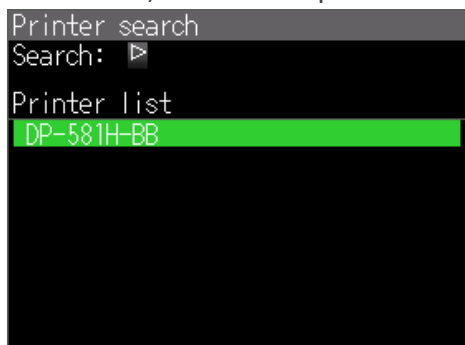
If you want to use an IP address, enter the printer's IP address.

Example: If the IP address is IP "192.168.0.100", enter "192.168.0.100".



Printer search

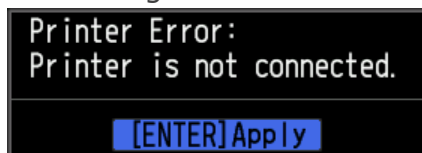
A search is made for printers existing in the same network. When printers are found, they are shown in the printer list. When you select a printer, a connection is established. If no printers are found, check the printer or network settings.



Print test

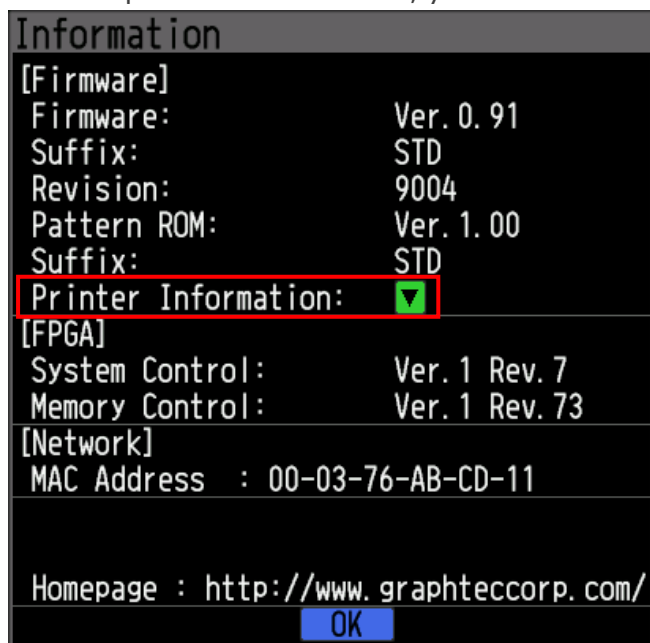
Printer tests can be performed to check whether the printer is connected properly.

If the printer is not connected properly, the following message appears in which case check the settings.



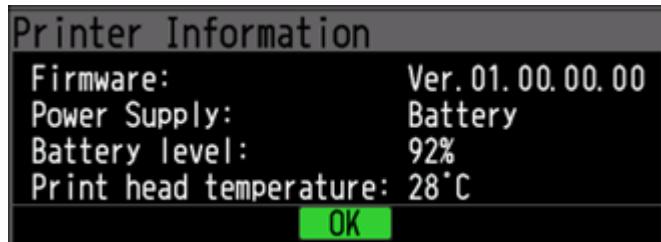
Information

When a printer is connected, you can view the printer information from the Information menu.



Printer information

You can view the printer firmware version, Power Supply, Battery level, and Print head temperature.



4.2 Printer Menu (Y-T)

Printer

You can turn on or off the printer use. This setting can be changed only when the printer is free running.

Options	Description
Off	The printer function is disabled.
On	The printer function is enabled.



Trigger Sync

You can turn on or off the Trigger Sync mode. For details on the print timing, see the next section (Print timing).

Options	Description
Off	Printing is not synchronized to the trigger function. Printing starts when recording starts.
On	Printing is performed in sync with sugar start and trigger stop.

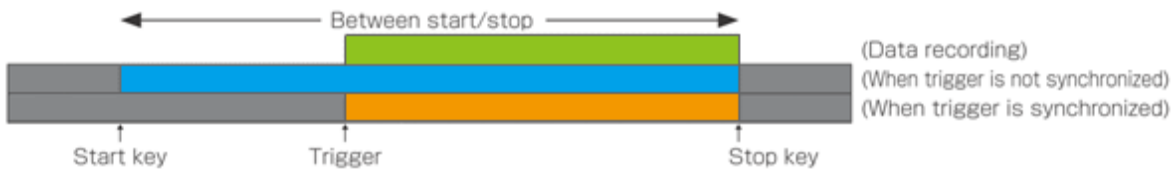
Print timing

◆ Print timing during Y-T recording

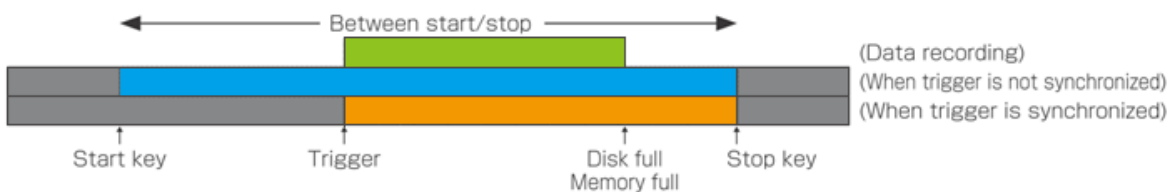
The print timing varies depending on the Trigger Sync setting. The following figure shows the timings.

- Printing stops.
- Print section (when trigger is not synchronized)
- Print section (when trigger is synchronized)
- Data recording

• Start trigger only

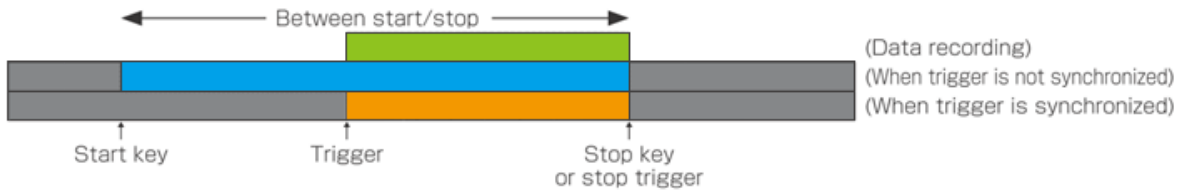


When Trigger Sync is set to off, printing is performed during the period from when recording is started until it is stopped. When Trigger Sync is set to on, printing is performed during the period from when the trigger condition is established until recording is stopped.



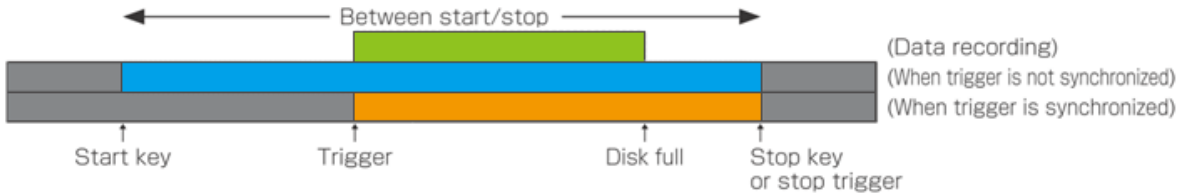
Even if recording stops in the middle the recording due to the disk or memory becoming full, printing continues until you stop it. If stop trigger is specified when recording to internal RAM (GL980/GL2000 only), see "Memory full (internal RAM)" under "In the case of start/stop trigger."

In the case of start/stop trigger



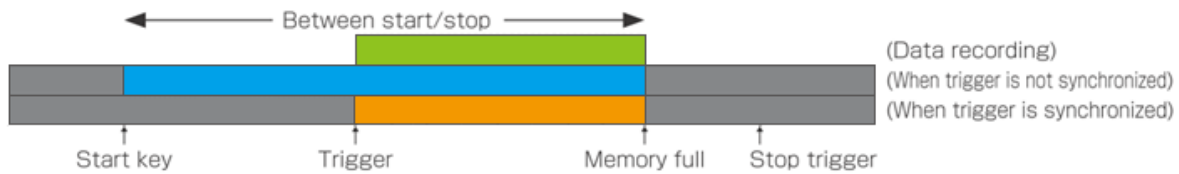
In the case of start/stop trigger, the start timing is same as the start trigger. The stop key or stop trigger stops not only the recording but also the printing. The following is a description of what happens when the disk or memory becomes full.

<Disk full (extra memory, internal memory)>



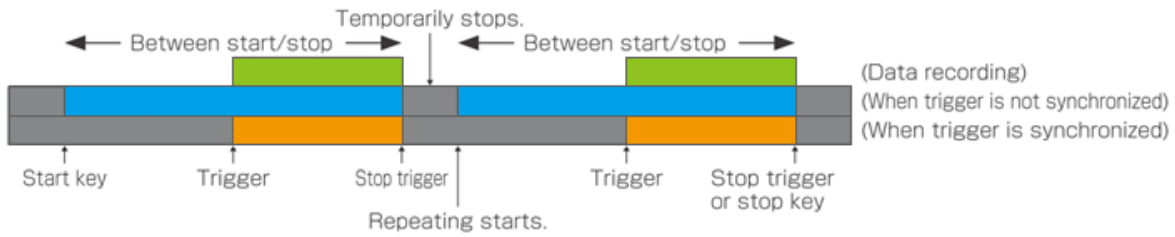
If an external memory or internal memory is used, printing continues until the start key is pressed or a stop trigger is received even if the recording stops due to the disk becoming full between start and stop. During this period, the measuring instrument status shows that data has been recorded.

<Memory full (internal RAM GL980/GL2000 only)>



If the recording destination is set to internal RAM and recording stops due to the memory becoming full, printing also stops. Note that printing stops before the stop trigger point. This is due to a limitation of the instrument.

- When the start/stop trigger is set to repeat



Basically, start/stop trigger is repeated. Printing is paused before repeating starts. A few milliseconds is inserted between the old recording and new recording, and printing is started again from the beginning. Scale print and list print are not performed during a repeat period but when printing finally stops.

- ◆ Print timing during XY recording (GL980/GL2000 only)

On the XY screen when the printer set on, a hard copy is automatically made according to the XY output format when recording stops.

Chart speed

You can set the chart speed. There are restrictions on the chart speed depending on the sampling interval. See the following table. You can change the chart speed even while printing is in progress, but the printed waveforms will be discontinuous. During battery operation, the maximum charge speed is limited to 5 mm/s. Set this parameter again if a switch is made between AC operation and battery operation.

The charge speed can also be set from the monitor display.

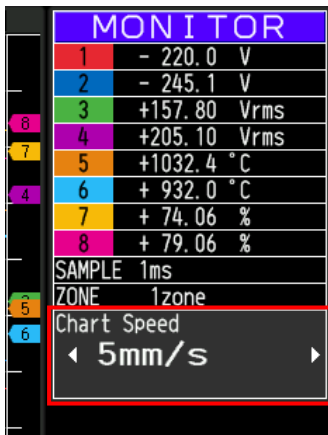


Table of chart speeds and sampling limitations

Sampling interval	Chart speed limitation
5 ms or less	25mm/s
10ms	10mm/s
20ms	5mm/s
50ms	2mm/s
100ms	1mm/s
200ms	30mm/min
500ms	10mm/min
1s	5mm/min
2s	2mm/min

Sampling interval	Chart speed limitation
5s	1mm/min
10s	30mm/h
20s	20mm/h
30s	10mm/h
1min	5mm/h
2min	2mm/h
5min	1mm/h
10min	10mm/day
-	External feeding

External feeding

When this setting is enabled, the external sampling function nor the external trigger function can be used. For every external feeding clock cycle, the paper is fed by 0.125 mm. Chart speed is limited by the sampling interval setting. Please refer to the "Table of chart speeds and sampling limitations" for details.

When the sampling interval is 1 ms: Up to 200 pulses/s (25[mm/s] / 0.125[mm])
When the sampling interval is 200 ms: Up to 4 pulses/s (30[mm/min] / 0.125[mm])

The external feeding clock must be input to the trigger I/O sampling terminal. For the input procedure, see the description of how to connect the GL I/O cable (B-513) and the function in the instrument instruction manual.

Division function

When external feeding is specified, the division function is displayed. You can select Off, 1/2, or 1/4. If you set the division to 1/4, the chart is fed 0.125 mm or four clocks.

Fit to the screen Time/DIV

The following table shows the relationship between the Time/DIV settings and chart speeds. However, the chart speed may be limited by the specified sampling interval. The function does not work if chart speed is set to External.

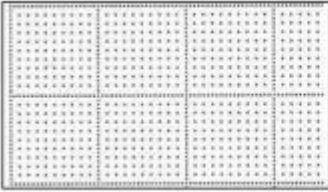
Table for setting the chart speed according to the Time/DIV setting of the screen

Time/DIV	Chart speed	Time/DIV	Chart speed
500ms/DIV	20mm/s	5min/DIV	2mm/min
1s/DIV	10mm/s	10min/DIV	1mm/min
2s/DIV	5mm/s	20min/DIV	30mm/h
5s/DIV	2mm/s	30min/DIV	20mm/h
10s/DIV	1mm/s	1hour/DIV	10mm/h
20s/DIV	30mm/min	2hour/DIV	5mm/h
30s/DIV	20mm/min	5hour/DIV	2mm/h
1min/DIV	10mm/min	10hour/DIV	1mm/h
2min/DIV	5mm/min	12hour/DIV	20mm/day
		24hour/DIV	10mm/day

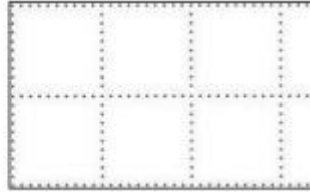
Grid type

The available print grid types are 5mm/10mm, fine, coarse, and Off.

10 mm fine grid



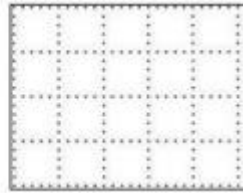
10 mm coarse grid



5 mm fine grid



5 mm coarse grid

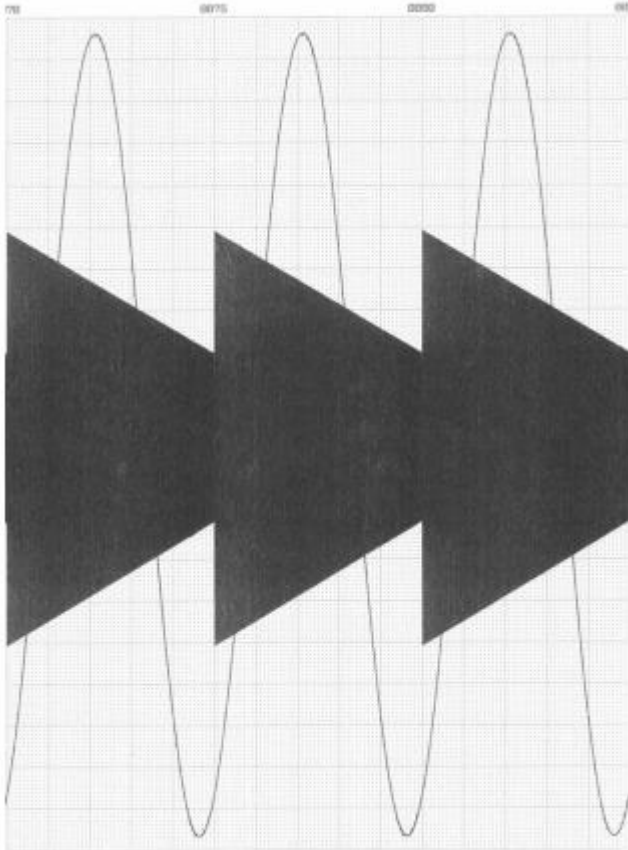


Envelope mode

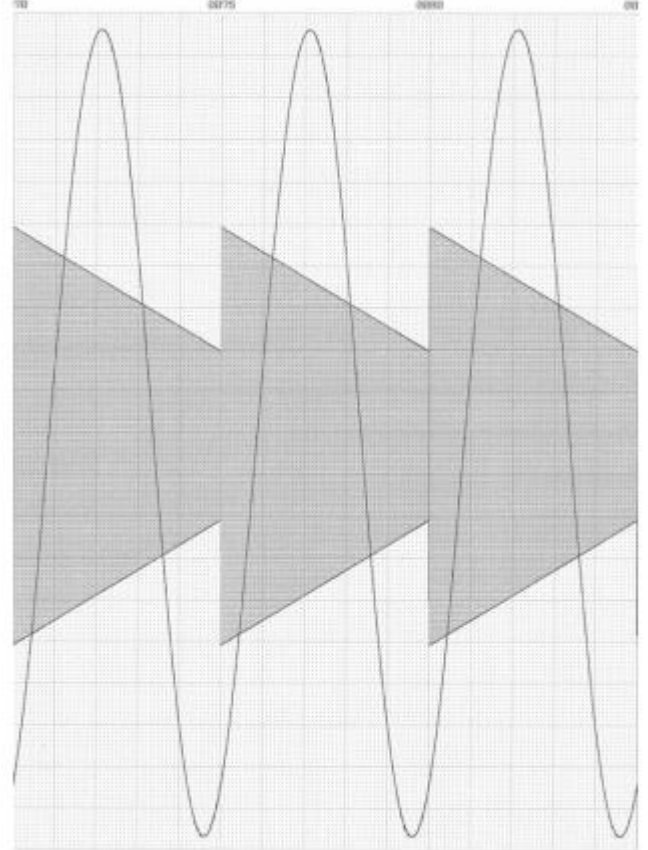
Turning the envelope mode on and off

Envelope processing decreases the waveform printing rate in the fill areas to make other waveforms easier to view as well as reduce the power consumption and increase the lifespan of the thermal head.

Envelope mode off



Envelope mode on



Forced envelope mode

Envelope processing is forcibly performed according to the printing rate of the waveform data, regardless of the envelope mode on/off setting, in order to protect the printer power supply and thermal head. In this case, waveforms with high printing rate may be printed lightly, and the vertical lines of square waves may not be printed. As a countermeasure, increase the range on the instrument or increase the span to reduce the printer chart speed, thereby decreasing the printing rate per unit time.

Information channel settings

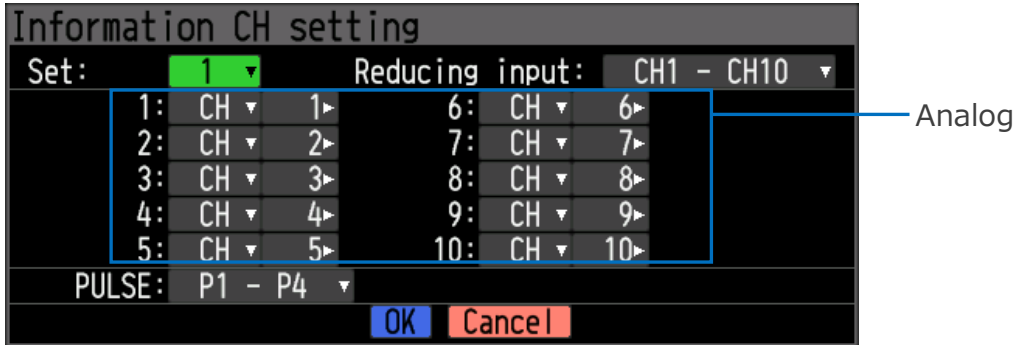
The GL840 can print up to maximum 10 analog channels + 4 pulses.

Only on the GL840, select the channels to be printed using the information channel settings.

The settings apply to logging print, annotation print, scale print, and list print.

Logic nor pulse signals cannot be printed in logging printing.

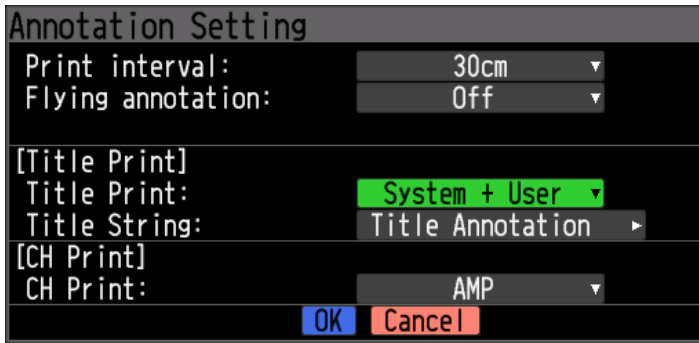
The initial value is CH1 to CH10.



Parameter	Description
Set	You can specify up to 10 sets of channel settings.
Reducing input	As a way of simplifying setup, the selected channel range is applied to the analog channel column.
Analog	Select the analog channels to be printed. CH: analog input GS: GS sensor WL: WL sensor
Pulse	Select the pulse channels to be printed. The pulse menu is displayed only when pulse CH is enabled. The pulse of the WL sensor of GL100 is set here.
OK	Applies the settings and closes the window.
Cancel	Closes the window without applying the settings.

Annotation settings

Specify the annotation settings.

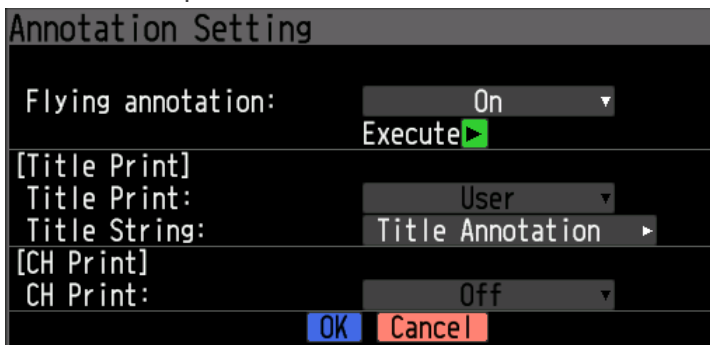


Print interval

Set the annotation print interval. Set the print interval between 10 cm and 100 cm.

Flying annotation

This function performs annotation title printing at the timing of your choice through a command button from the menu or remote command. For a description of how to use remote commands, see "Flying annotation I/F commands," provided later. For further details, see the I/F Command Specifications.



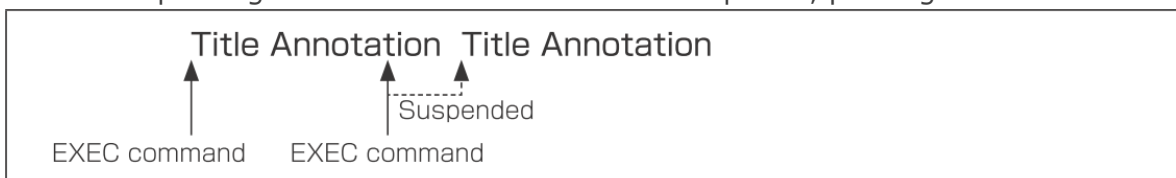
◆ Flying annotation print example 1

When flying annotation is executed, printing starts.



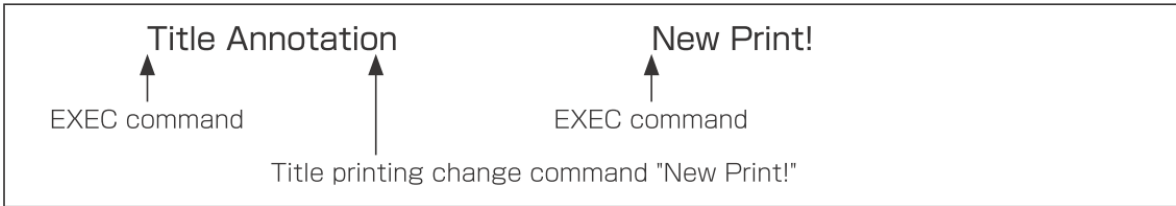
◆ Flying annotation print example 2

If flying annotation is executed while annotation printing is in progress, the printing is paused. When the printing of the current annotation is completed, printing is resumed.



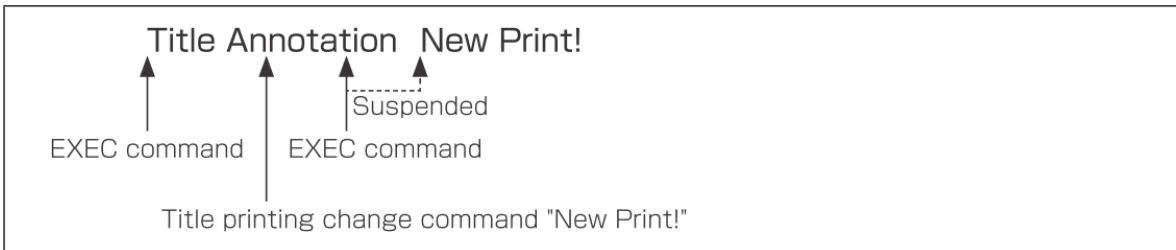
◆ Flying annotation print example 3

If the title print is changed while annotation printing is in progress, the change is applied from the next print.

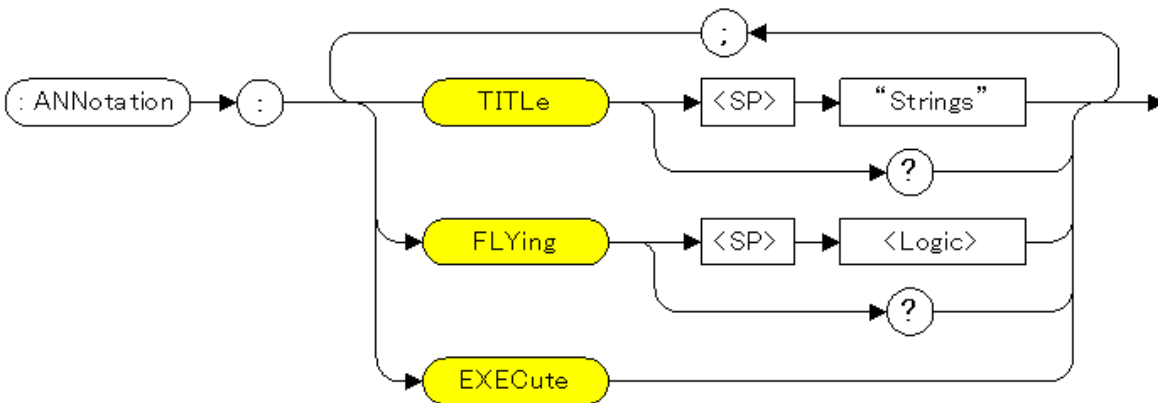


◆ Flying annotation print example 4

If title print is changed and flying annotation is executed while annotation printing is in progress, the change and printing are paused. When the printing of the current annotation is completed, printing is resumed with the new title.



◆ Flying annotation I/F commands



Title print

Date and time, chart speed character string, and user-defined character string can be printed.

Setting	Printed content
System	The date and time and chart speed for annotation printing are printed.
User	The user-defined character string (up to 31 characters) is printed.
System + user	The date and time, chart speed, and user-defined character string are printed.

◆ Title print printout example

```

2019-02-21 14:22:51          1mm/s
  
```

Channel print

AMP setting, user-defined character string, measured values, and the like can be printed.

Pulse channel annotation print is available only on the GL980/GL2000.

Setting	Printed content
AMP	The amp setting, input, range, and filter of the target channel are printed.
User	The user-defined character string (up to 31 characters) specified using AMP settings > Others > Annotation is printed.
AMP + user	The user-defined character string is printed after AMP printing.
Measured values	The measure values during annotation printing are printed.

◆ Channel print printout example

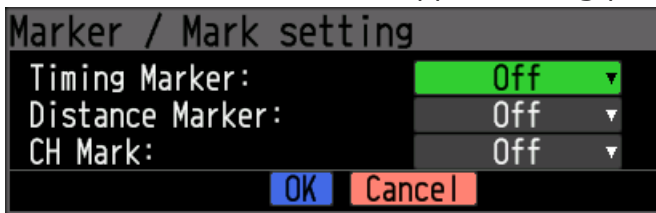
```

1.DC      10 V Off      CH 1
2.DC      10 V Line    CH 2
3.RMS     5 Vrms Off   CH 3
4.RMS     5 Vrms Off   CH 4
5.TEMP    TC-K Off    CH 5
6.TEMP    TC-K Off    CH 6
7.RH      100% Off    CH 7
8.RH      100% Off    CH 8
  
```

※ On the GL840, only the channel set on the information channel is printed.

Marker/mark settings

Set the mark function for supplementing printouts.



Timing marker

This function prints time lines according to the specified time interval. This cannot be enabled simultaneously with the distance marker.

Parameter	Description
Off	Timing markers are not printed.
1sec, 10sec, 1min, 10min, 1h, 10h	Timing markers are printed according to the specified time interval.

◆ Print example



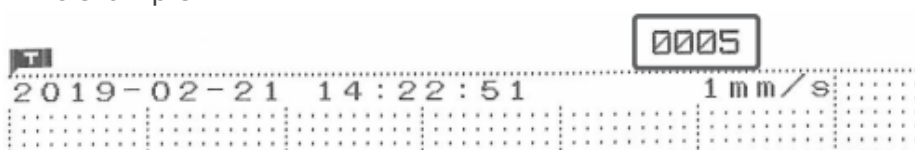
Distance marker

The distances (cm) are printed every 5 cm from the start of printing. This cannot be enabled simultaneously with the timing marker.

This is always printed during memory out printing.

Parameter	Description
Off	Distance markers are not printed.
On	Distance markers are printed.

◆ Print example

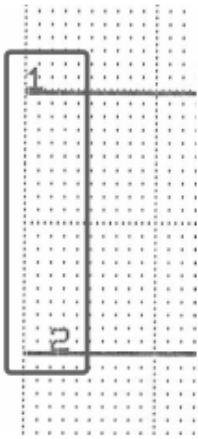


Channel marks

This function prints channel numbers above the Y-T waveform. They are printed only on channels whose amp setting is enabled.

Parameter	Description
Off	Channel marks are not printed.
On	Channel marks are printed.

◆ Print example

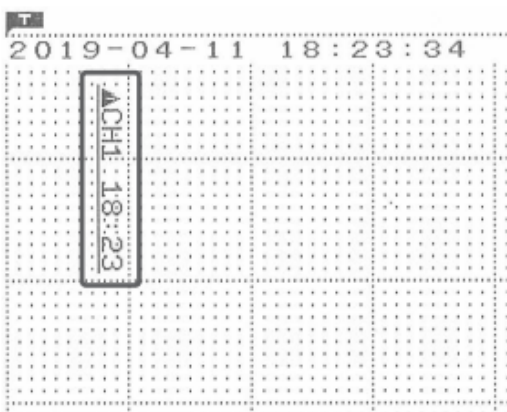


Alarm printing

This is printed when an alarm occurs. If alarms overlap, the alarm printing in progress is canceled, and the printing of the alarm that occurred later overwrites the printing of the older alarm. If alarms occur on multiple channels simultaneously, printing is performed only for the channel with the smallest channel number. Further, the ▲ mark is replaced with an overlap mark.

Parameter	Description
Off	Alarm printing is not performed.
On	Alarm printing is performed.

◆ Print example

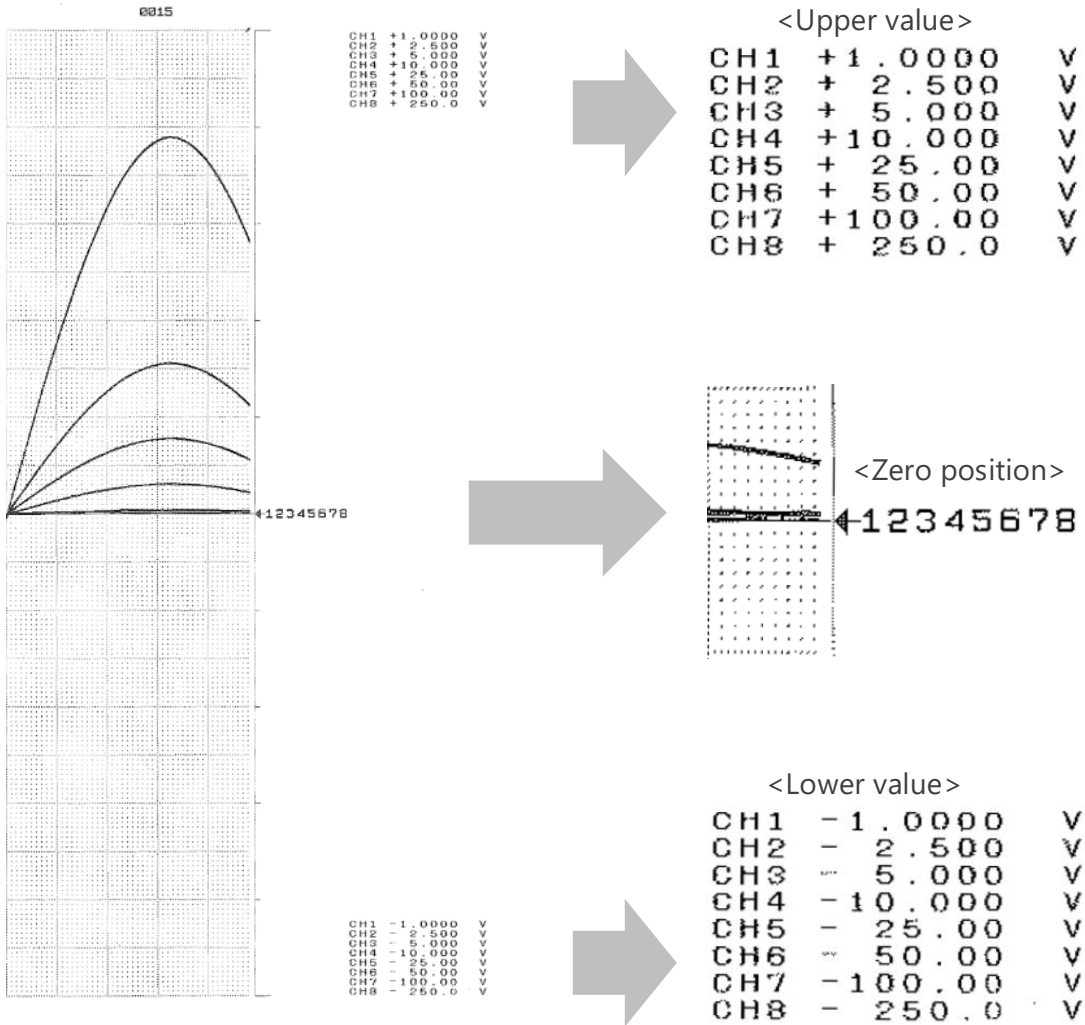


Scale printing

The scale of each channel is printed after Y-T printing. On the GL840, the channel specified in the information channel settings is printed.

Parameter	Description
Off	Scale printing is not performed.
On	Scale printing is performed.

◆ Print example



List printing

Set whether to perform list printing after Y-T printing is complete. When you press the execute button, list printing is performed immediately.

Parameter	Description
Off	List printing is not performed after Y-T printing is complete.
On	List printing is performed after Y-T printing is complete.

◆ Print example

```
GL2000 Measuring conditions
-----
Model name           : GL2000
Number of channels   : 4CH
Firmware             : Ver.
Chart speed          : 5mm/s

[Memory Settings]
Sampling             : 1ms
Pulse sampling intervals : 10ms
Capture Destination : Internal RAM
Memory block division : None
Overwrite mode      : Off
Data Points         : 10000
Ring/Relay capture  : Off
Backup Intervals    : Off
Backup Destination  : Internal memory
Save Folder         : Backup

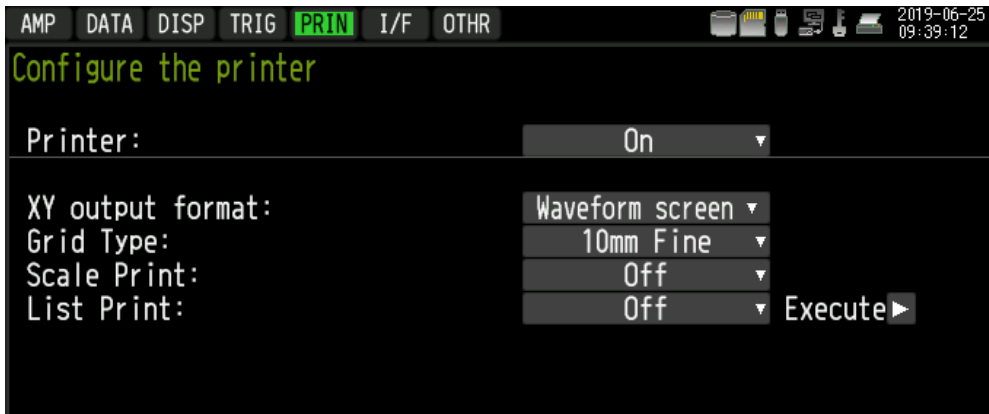
[Amp Settings]
CH:  Input      Range  Filter  EU
1:  DC          1000 V  Off    Off
2:  DC          1000 V  Off    Off
3:  DC          1000 V  Off    Off
4:  DC          1000 V  Off    Off

CH:  Lower----Span----Upper  Unit
1:  -0.5000    +0.5000  kV
2:  -0.5000    +0.5000  kV
3:  -0.5000    +0.5000  kV
4:  -0.5000    +0.5000  kV
```

4.3 Printer Menu (XY)

GL980/GL2000 only

You can set this when the display mode is XY.



Printer settings

You can turn on or off the printer.

Options	Description
Off	The printer function is disabled.
On	The printer function is enabled.

XY output format

Set the output format of the screen printout.

Options	Description
Waveform screen	Only the waveform area is printed.
All screens	The entire screen is printed just like a normal screen printout.
All Screens (B/W reverse)	The black and white of the entire screen is reversed and printed.

Grid type

The available print grid types are 5mm/10mm, fine, coarse, and Off. This is the same as the Y-T display.

Scale printing

This can be enabled only when the XY output format is set to Waveform only.

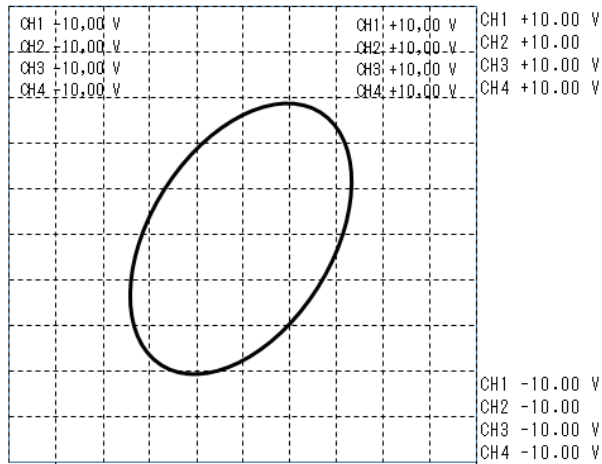
Set whether to print the scale (numeric values and axis channels).

Options	Description
Off	Scale printing is not performed.

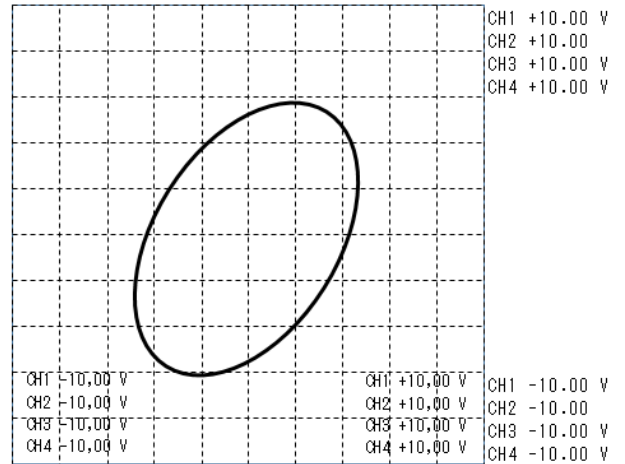
On (top)	Scale printing is performed at the top of the screen.
On (bottom)	Scale printing is performed at the bottom of the screen.

◆ Print example

On (top)



On (bottom)



List printing

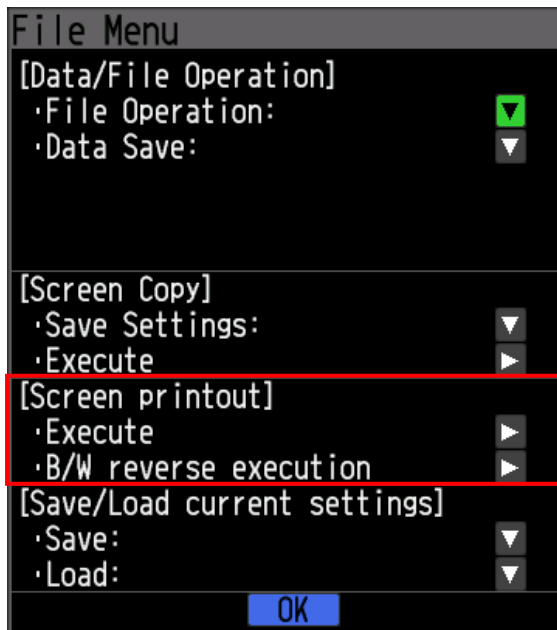
Set whether to perform list printing after XY printing is complete. When you press the execute button, list printing is performed immediately.

Parameter	Description
Off	List printing is not performed after XY printing is complete.
On	List printing is performed after XY printing is complete.

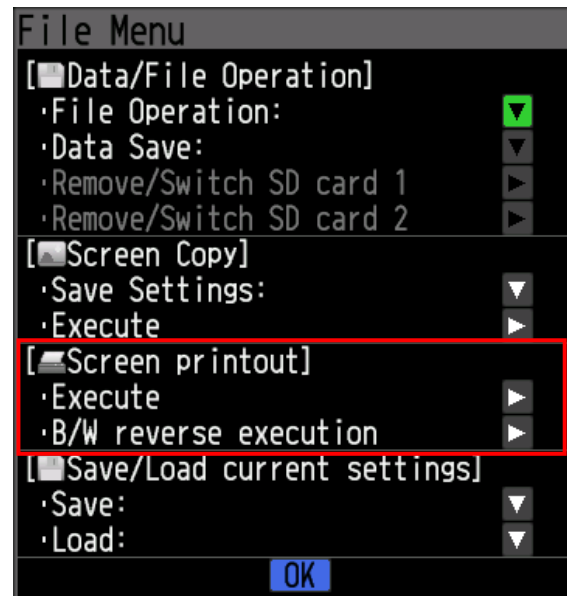
4.4 File Menu

This section describes the printer settings in the file menu.

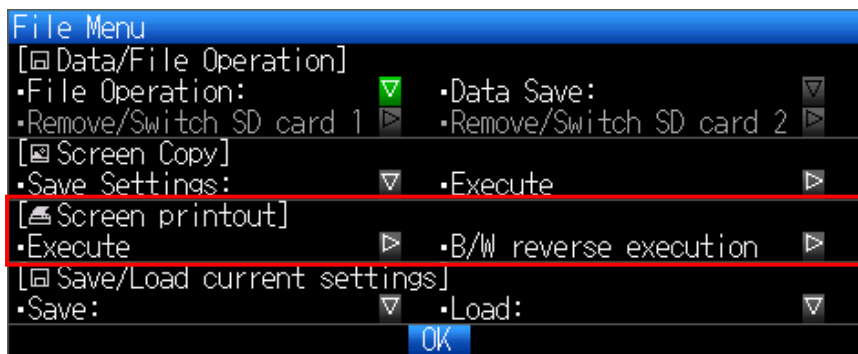
GL980/GL2000



GL840



GL240



Screen printout

The contents displayed on the screen are printed on the printer.

The color information is converted into black-and-white and output.

When you press the execute button, printing starts. This cannot be executed while printing is already in progress.

Printing in XY mode is the XY output format setting in the printer menu. (GL980/GL2000 only).

If you execute black-and-white inversion, printing is performed with white and black inverted.

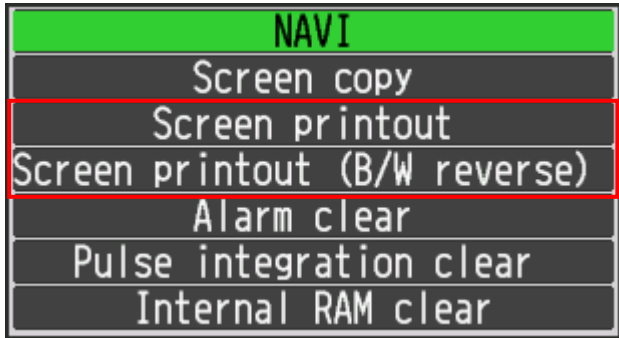
4.5 Function Key (GL980/GL2000 only)

This section describes the printer functions that can be used with the FUNC key.

Screen printout

When you press the FUNC key when the printer is enabled, a function menu is displayed, and you can print the screen.

The printed content is the same as the screen printing of the file menu.

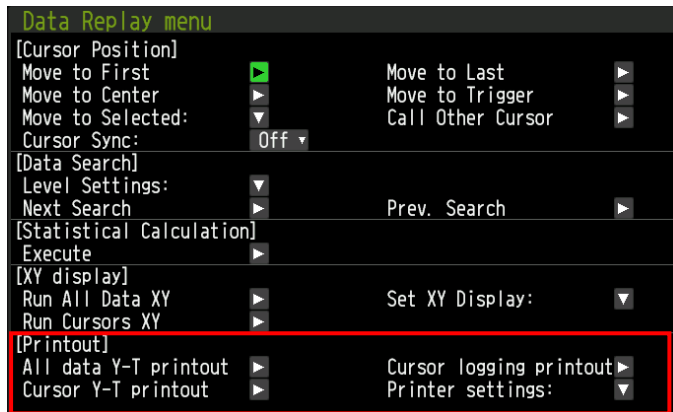


4.6 Menu during Data Playback

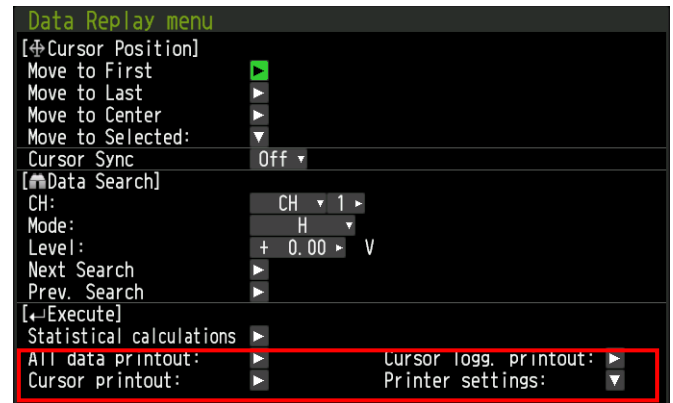
Y-T

This section describes the printer menu during recorded data playback. Unlike the Y-T printing during recording, during playback, printing is performed by expanding or reducing the waveforms according to the Time/DIV setting of the screen. Each mark print can be changed with the printer settings.

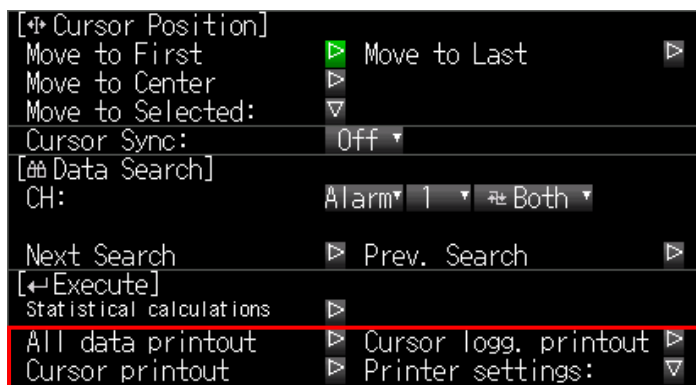
GL980/GL2000



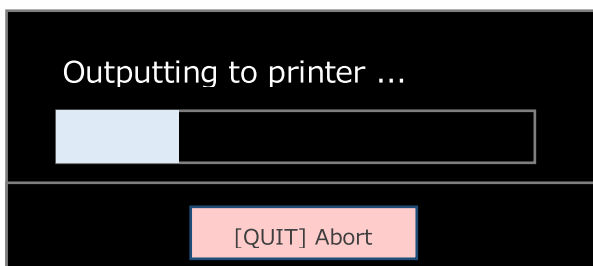
GL840



GL240



While print data is being output to the printer, a dialog box appears showing the progress. If you press the QUIT button to cancel printing, printing is performed up to that point. Data already transmitted to the printer is printed even after you cancel printing.



All data Y-T printout

The entire data being played back is printed.

Cursor Y-T printout

Data between the cursors being played back is printed.

Cursor logging printout

Logging printout is performed on the data between the cursors being played back.

- ※ You cannot control the logger while the print data is being transmitted to the printer.
- ※ If you attempt to perform the next printout while printing is in progress, the following message appears, and you cannot print.

Waiting for printer output to finish...

Printer settings

The changes to the settings you make while printing is in progress are not applied immediately. There are applied to the next print.



Same as direct mode. Grid type, envelope mode, channel mark, alarm print, scale print, list print

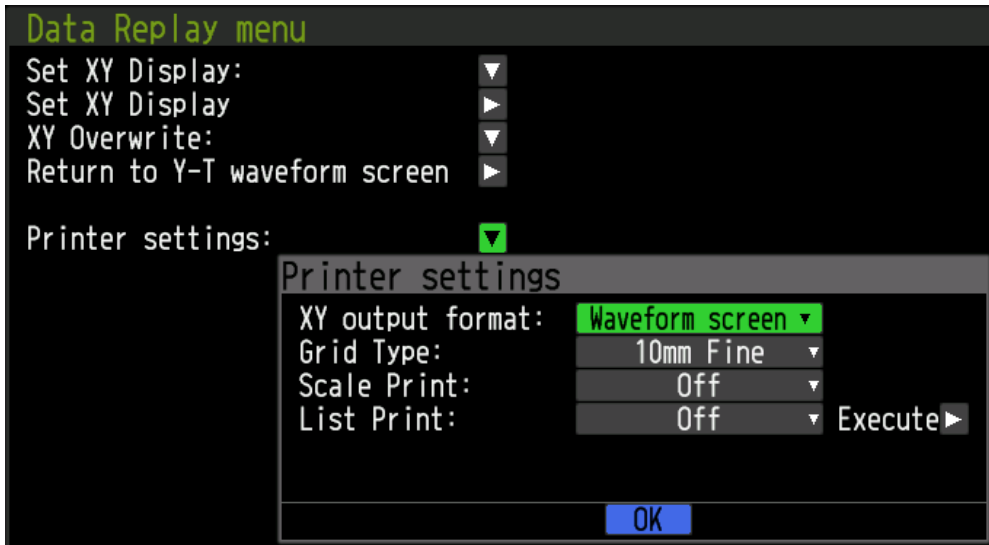
※ Check

Annotations are not printed when a CSV data file recorded with the printer function turned off is played back. If you want to print annotations also during playback, turn the printer function on and then perform data recording. Annotations are always printed with GBD data files.

XY print

GL980/GL2000 only

You can set this when the display mode is XY.

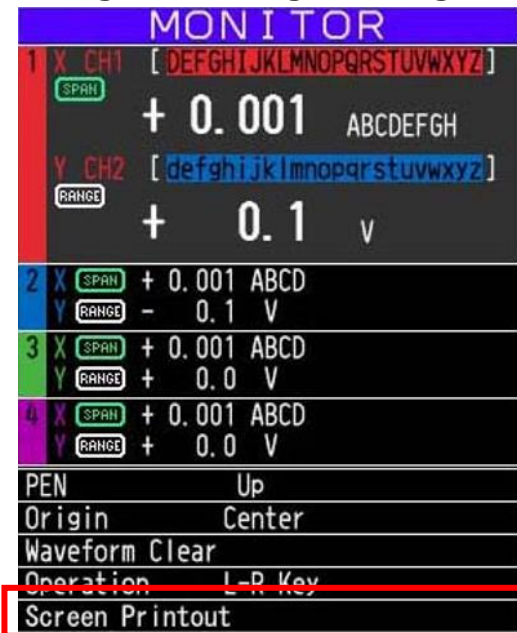


This is the same function as Direct XY.

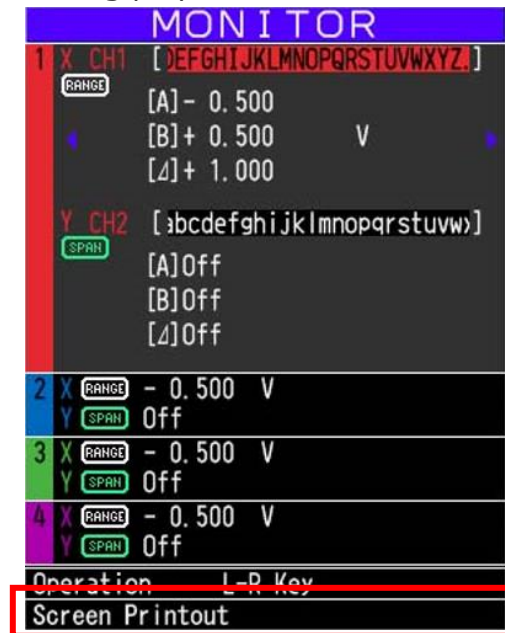
Screen printout

Screen printouts are possible from the monitor display during XY display. Printing starts by moving the cursor to "Screen Printout" and pressing the Enter key.

During free running recording



During playback



CAPTER 5 Specifications

5.1 Connection Specification

Item		Specifications
Compatible model		midi LOGGER GL980 midi LOGGER GL2000 midi LOGGER GL840 midi LOGGER GL240
Printer-compatible firmware version	GL980/GL2000	Ver.1.30 or later
	GL840	Ver.1.50 or later
	GL240	Ver.1.50 or later
Connection method	GL980/GL2000	USB connection, Wired LAN connection
	GL840	Wireless LAN connection, Wired LAN connection
	GL240	Wireless LAN connection

- ※ Do not use a USB hub or the like when making a USB connection.
- ※ To use a wired LAN connection, you need a separate off-the-shelf wireless LAN router.
- ※ Only a single logger can be connected to a printer.

5.2 Print Functions

Item		Specifications
Y-T waveform	Chart speed	1, 2, 5, 10, 20, 25 mm/s 1, 2, 5, 10, 20, 25, 30, 50, 100 mm/min 1, 2, 5, 10, 20, 25, 30, 50, 100 mm/h 10, 20 mm/day, external <ul style="list-style-type: none"> • Asynchronous to the TIME/DIV setting of the GL screen. • Limitations present due to sampling. • A function available for setting the chart speed to that equivalent to the TIME/DIV setting of the GL screen. * On the GL240/GL840, the fastest speed is 10 mm/s during AC operation. * The fastest speed is 5 mm/s on all models during printer battery operation.

	Trigger Sync	Off/On
	Record format	Fix to 200 mm x 1
	Zone function	Follows the zone function setting of the GL screen. However, during printout, the 10 DIV full-scale display on the screen is output at 20 DIV.
	Grid	10mm fine/coarse, 5mm fine/coarse, OFF
	Span/position	According to the GL
	Annotation	Title print: prints the date and time, chart speed, and user-defined character string. Channel print: prints channel annotation, amp setting, and measured values. In addition, flying annotation is supported. * Only the characters that can be input from the setting menu can be printed. *Double-byte characters are printed as spaces. * The GL840 prints up to 10 channels that you specify.
	Channel marks	On/Off
	Distance mark	On/Off (every cumulative display/5cm from start) Select either the distance mark or timing marker.
	Timing marker	Off, 1sec, 10sec, 1min, 10min, 1h, 10h Select either the timing marker or distance mark.
	Alarm printing	On/Off *Prints perpendicular to the feed direction.
	Envelope mode	On/Off
	Trigger mark	On/Off
	Scale printing	On/Off * The GL840 prints up to 10 channels that you specify.
Logging printing		Direct logging printing, memory out logging printing. * Direct logging printing is available only on the GL840/GL240. Direct logging printing is performed when data is printed with the GL840/GL240 screen is set the digital. * For direct logging, the fastest print sampling interval is 1 second. If the data sampling interval is set faster than 1 second, the data is decimated. * The GL840 prints up to 10 channels that you specify.

		* Logic nor pulse signals cannot be printed.
XY print (GL980/GL2000 only)	Function	Hard copy of the GL screen
	Output type	Waveform screen / All screens / All screens (B/W reverse)
Screen printout	Gradation	Dither method
	Function	Hard copy of the GL screen
	Black-and-white inversion	Follows the background color setting of the GL screen.
List printing		Available
Print timing	Direct Y-T printing	When the GL screen is set to Y-T. Between start and stop, trigger sync/async mode. (with trigger marks)
	Y-T memory out printing	Specify all data or between cursors from the execution menu during Y-T playback. (Not supported during the dual screen playback)
	Direct logging printing (GL240/GL840 only)	When the GL screen is set to digital display. Between start and stop, trigger sync/async mode.
	Memory out logging printing	Specify the range between cursors from the execution menu during Y-T playback (up to 1000 points).
	XY printing (GL980/GL2000 only)	Hard copy of the GL screen
	Integration bar graph printing (GL240/GL840 only)	Hard copy of the GL screen
External feed function		Available Select external sampling, external trigger, or external feeding. * A clock signal must be applied to the trigger input/external sampling terminal of the GL.

Specifications are subject to change without notice.

Thermal Printer Function Manual

GL-PRINTER-UM-151

July 12, 2019 1st edition-01

GRAPHTEC