DL850E/DL850EV
ScopeCorder
USER'S MANUAL

YOKOGAWA
Yokogawa Test & Measurement Corporation

IM DL850E-02EN
7th Edition

Thank you for purchasing the DL850E ScopeCorder or DL850EV ScopeCorder Vehicle Edition (hereinafter, “DL850E/DL850EV” will refer to both of these products).
This User’s Manual explains how to use the DL850E/DL850EV. To ensure correct use, please read this manual thoroughly before beginning operation.
Keep this manual in a safe place for quick reference in the event a question arises.

List of Manuals

The following manuals, including this one, are provided as manuals for the DL850E/DL850EV. Please read all manuals.

Manual Title	Manual No.	Description
DL850E/DL850EV ScopeCorder Features Guide	IM DL850E-01EN	The supplied CD contains the PDF file of this manual. This manual explains all the DL850E/DL850EV features other than the communication interface features.
DL850E/DL850EV ScopeCorder User’s Manual	IM DL850E-02EN	This manual. The supplied CD contains the PDF file of this manual. The manual explains how to operate the DL850E/DL850EV.
DL850E/DL850EV ScopeCorder Getting Started Guide	IM DL850E-03EN	This guide explains the handling precautions and basic operations of the DL850E/DL850EV.
DL850E/DL850EV ScopeCorder Communication Interface User’s Manual	IM DL850E-17EN	The supplied CD contains the PDF file of this manual. This manual explains the DL850E/DL850EV communication interface features and how to use them.
DL850E/DL850EV ScopeCorder Real Time Math/Power Math User’s Manual	IM DL850E-51EN	The supplied CD contains the PDF file of this manual. This manual explains the features of the DL850E/DL850EV Real Time Math/Power Math option and how to use them.
DL850E/DL850EV ScopeCorder Acquisition Software User’s Manual	IM DL850E-61EN	The supplied CD contains the PDF file of this manual. This manual explains all the features of the acquisition software, which records and displays data measured with the DL850E/DL850EV on a PC.
Precautions Concerning the Modules	IM 701250-04E	The manual explains the precautions concerning the modules. This manual is included if you ordered modules.
Model DL850E ScopeCorder, Model DL850EV ScopeCorder Vehicle Edition, User’s Manual	IM DL850E-92Z1	Document for China

The “EN”, “E”, and “Z1” in the manual numbers are the language codes.

Contact information of Yokogawa offices worldwide is provided on the following sheet.

Document No.	Description
PIM 113-01Z2	List of worldwide contacts

Regarding the Conventional DL850 and DL850V

The DL850E/DL850EV manuals also cover how to use the conventional DL850/DL850V (firmware version 3.0 and later).
In the explanations, the model is indicated as DL850E/DL850EV, but if you are using the DL850/DL850V, read “DL850E” as “DL850” and “DL850EV” as “DL850V.” The following options are available only for the DL850E/DL850EV. They cannot be used with the DL850 or DL850V.

- Power math (/G5 option)
- GPS interface (/C30 option)

7th Edition: April 2018 (YMI)

Notes

- The contents of this manual are subject to change without prior notice as a result of continuing improvements to the instrument's performance and functionality. The figures given in this manual may differ from those that actually appear on your screen.
- Every effort has been made in the preparation of this manual to ensure the accuracy of its contents. However, should you have any questions or find any errors, please contact your nearest YOKOGAWA dealer.
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Revisions

- 1st Edition: December 2013
- 2nd Edition: July 2014
- 3rd Edition: March 2015
- 4th Edition: October 2015
- 5th Edition: July 2017
- 6th Edition: November 2017
- 7th Edition: April 2018

Conventions Used in This Manual

Notes and Cautions

The notes and cautions in this manual are categorized using the following symbols.

Improper handling or use can lead to injury to the user or damage to the instrument. This symbol appears on the instrument to indicate that the user must refer to the user's manual for special instructions. The same symbol appears in the corresponding place in the user's manual to identify those instructions. In the manual, the symbol is used in conjunction with the word "WARNING" or "CAUTION."

WARNING Calls attention to actions or conditions that could cause serious or fatal injury to the user, and precautions that can be taken to prevent such occurrences.

CAUTION Calls attention to actions or conditions that could cause light injury to the user or damage to the instrument or user's data, and precautions that can be taken to prevent such occurrences.

French

AVERTISSEMENT Attire l'attention sur des gestes ou des conditions susceptibles de provoquer des blessures graves (voire mortelles), et sur les précautions de sécurité pouvant prévenir de tels accidents.

ATTENTION Attire l'attention sur des gestes ou des conditions susceptibles de provoquer des blessures légères ou d'endommager l'instrument ou les données de l'utilisateur, et sur les précautions de sécurité susceptibles de prévenir de tels accidents.

Note Calls attention to information that is important for proper operation of the instrument.

Unit

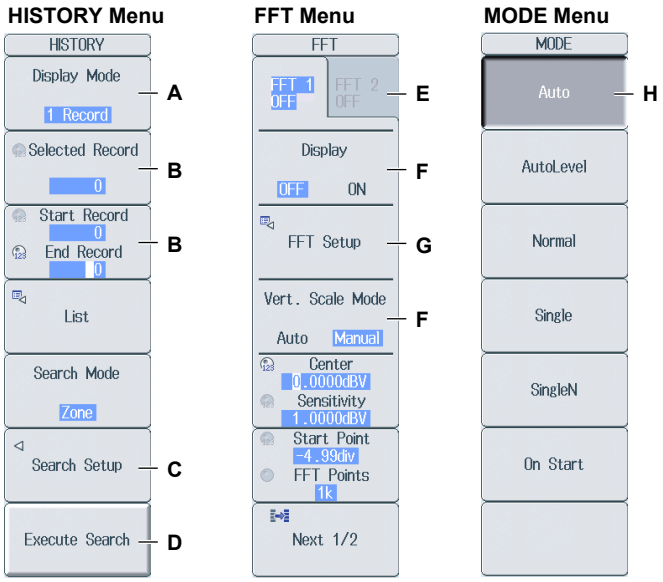
k	Denotes 1000. Example: 100 kS/s (sample rate)
K	Denotes 1024. Example: 720 KB (file size)

Key and Jog Shuttle Operations

Key Operations

How to Use Setup Menus That Appear When Keys Are Pressed

The operation after you press a key varies depending on the key that you press.



A: Press the soft key to display a selection menu.
Press the soft key that corresponds to the appropriate setting.

B: Press the soft key to use the jog shuttle to configure this setting. Use the jog shuttle or the arrow keys to set the value or select an item.
To set a value, press NUM LOCK, and then use the CH1 to CH16 keys.

C: A related setup menu appears when you press the soft key.

D: Press the soft key to execute the specified feature.

E: Selects which item to configure when configuring a feature that consists of two items that operate with different settings, such as the FFT1 and FFT2 features.

F: The selected setting switches each time you press the soft key.

G: Displays a dialog box or a keyboard.
Use the jog shuttle, SET key, and arrow keys to configure the settings in the dialog box or operate the keyboard.

H: Pressing a key sets the item to the setting that corresponds to that key.

How to Display the Setup Menus That Are Written in Purple below the Keys

In the explanations in this manual, “SHIFT+key name (written in purple)” is used to indicate the following operation.

1. Press **SHIFT**. The SHIFT key illuminates to indicate that the keys are shifted.
   Now you can select the setup menus written in purple below the keys.
2. Press the key that you want to display the setup menu of.

ESC Key Operation

If you press the **ESC** key when a setup menu or available settings are displayed, the screen returns to the menu level above the current one. If you press the **ESC** key when the highest level menu is displayed, the setup menu disappears.

RESET Key Operation

If you press **RESET** when you are using the jog shuttle to set a value or select an item, the setting is reset to its default value (depending on the operating state of the DL850E/DL850EV, the setting may not be reset).

SET Key Operations

The operation varies depending on what you are setting.

- For a soft key menu that has two values that you use the jog shuttle to adjust
  Press **SET** to switch the value that the jog shuttle adjusts.
- For a menu that has the jog shuttle + SET mark (◯+SET) displayed on it.
  Press **SET** to confirm the selected item.

Arrow Key Operations

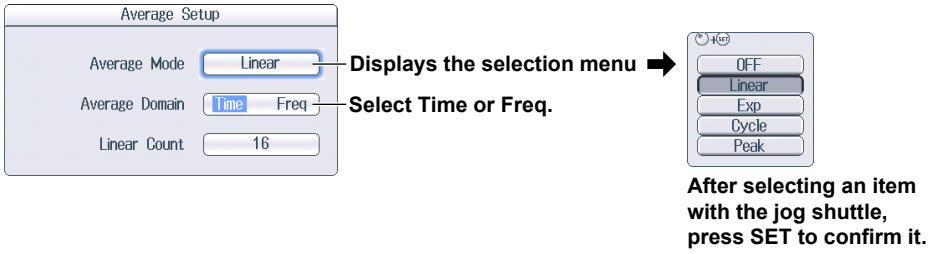
The operation varies depending on what you are setting.

- When setting a value
  Up and down **arrow** keys: Increases and decreases the value
  Left and right **arrow** keys: Changes which digit to set
- When selecting the item to set
  You can use the up and down **arrow** keys.

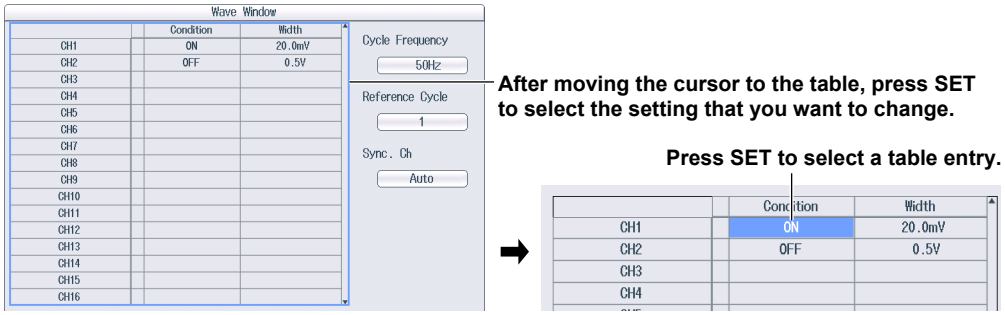
How to Enter Values in Setup Dialog Boxes

1. Use the keys to display the appropriate setup dialog box.
2. Use the **jog shuttle** or the **arrow** keys to move the cursor to the setting that you want to set.
3. Press **SET**. The operation varies as indicated below depending on what you are setting.
   - A selection menu appears.
   - A check box is selected or cleared.
   - An item is selected.
   - A table of settings is selected.

Displaying a Selection Menu and Selecting an Item



Setting Items in a Table



How to Clear Setup Dialog Boxes

Press **ESC** to clear the setup dialog box from the screen.

Entering Values and Strings

Entering Values

Using Dedicated Knobs

You can use the following dedicated knobs to enter values directly.

- Vertical POSITION knob
- SCALE knob
- TIME/DIV knob
- ZOOM magnification knob (MAG)
- Zoom POSITION knob (for scrolling zoom waveforms)

Using the Jog Shuttle

Select the appropriate item using the soft keys, and change the value using the jog shuttle and the SET key or using the arrow keys and the SET key. This manual sometimes describes this operation simply as “using the jog shuttle.”

Using the Keypad

Press **NUM LOCK** to illuminate the NUM LOCK key, and use the **CH1** to **CH16** keys to enter a value. After you enter the value, press **ENTER** to confirm it.

Use the keypad to enter the value.

Note

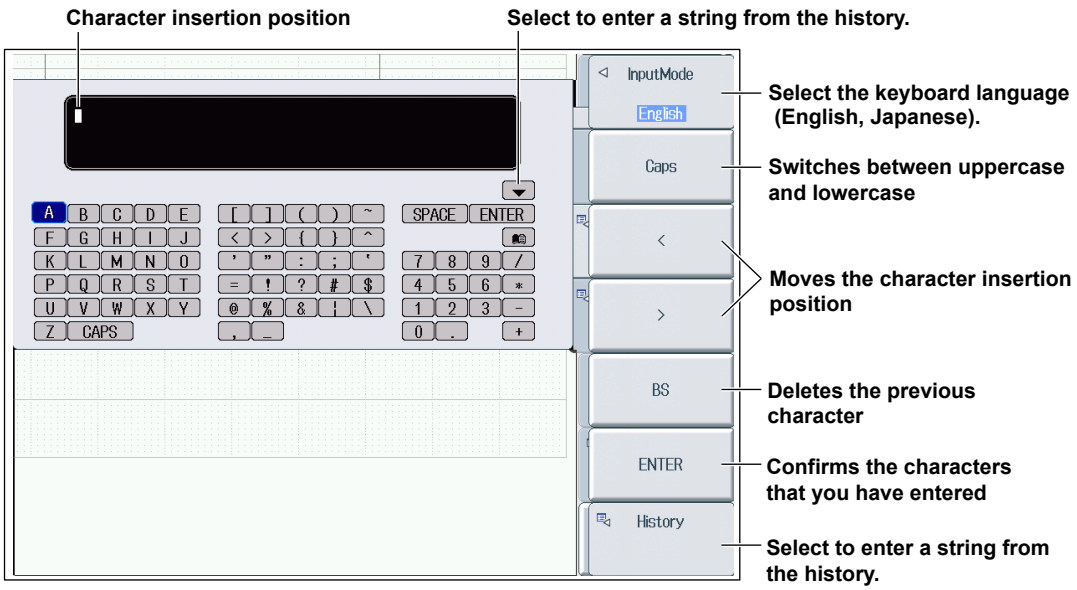
Some items that you can set using the jog shuttle can be reset to their default values when you press the RESET key.

Entering Character Strings

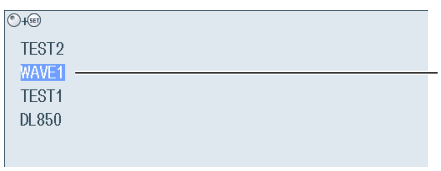
Use the keyboard that appears on the screen to enter file names and comments. Use the jog shuttle and the SET key or use the arrow keys and the SET key to operate the keyboard and enter a character string.

How to Operate the Keyboard

1. Press the **InputMode** soft key and then the **English** soft key.
2. After bringing up the keyboard, use the **jog shuttle** to move the cursor to the character that you want to enter. You can also move the cursor using the up, down, left, and right **arrow** keys.
3. Press **SET** to enter the character.
   - If a character string has already been entered, use the **arrow** soft keys (< and >) to move the cursor to the position you want to insert characters into.
   - To switch between uppercase and lowercase letters, press the **Caps** soft key.
   - To delete the previous character, press the **BS** soft key.
4. Repeat steps 1 and 3 to enter all of the characters in the string.
   Select ▼ on the keyboard or press the **History** soft key to display a list of character strings that you have entered previously.
   Use the jog shuttle to select a character string, and press **SET** to enter the selected character string.
5. Press the **ENTER** soft key, or move the cursor to ENTER on the keyboard, and press **SET** to confirm the character string and clear the keyboard.



List of previously entered strings



Note

- @ cannot be entered consecutively.
- File names are not case-sensitive. Comments are case-sensitive. The following file names cannot be used due to MS-DOS limitations:
  AUX, CON, PRN, NUL, CLOCK, COM1 to COM9, and LPT1 to LPT9

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Chapter 18 Other Operations

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1.1 Configuring Voltage Measurements

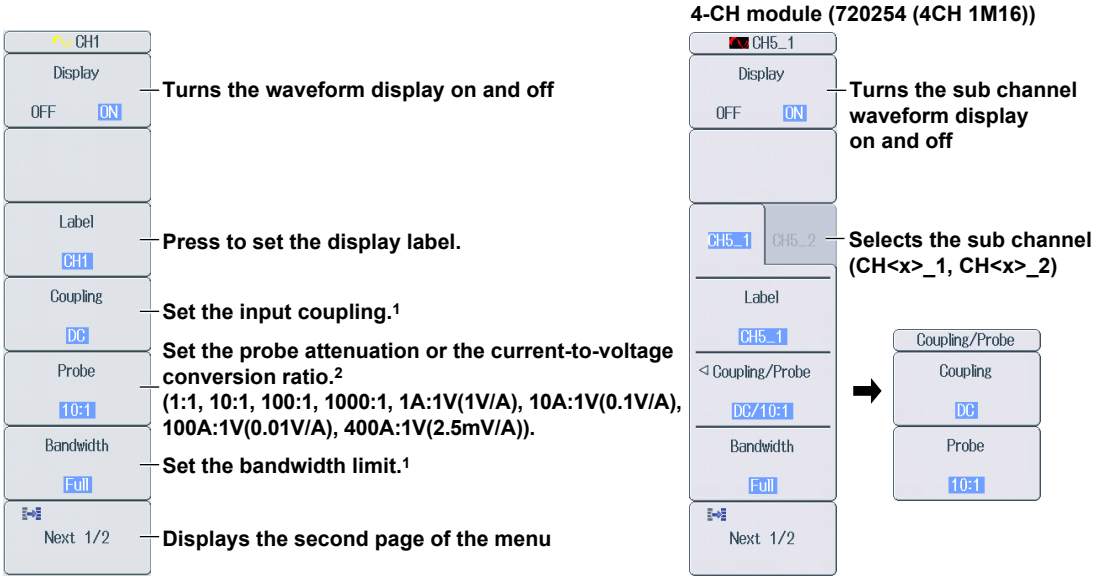
This section explains the following settings (which are related to the vertical axis for voltage measurements):

- Waveform display on and off
- Display labels
- Input coupling
- Probe attenuation or current-to-voltage conversion ratio
- Bandwidth limit
- The zoom method
- The zoom percentage
- The upper and lower display limits for zooming waveforms
- Offset
- Trace settings (input channel assignment)
- Inverted waveform display on and off
- Linear scaling
- Vertical scale
- Vertical position

► **"Voltage Measurement" in the Features Guide**

CH Menu

Press a key from **CH1** to **CH16** to display the following menu.



1 The available settings vary depending on the module.
2 For the 701267, use the 1:1 probe attenuation setting.

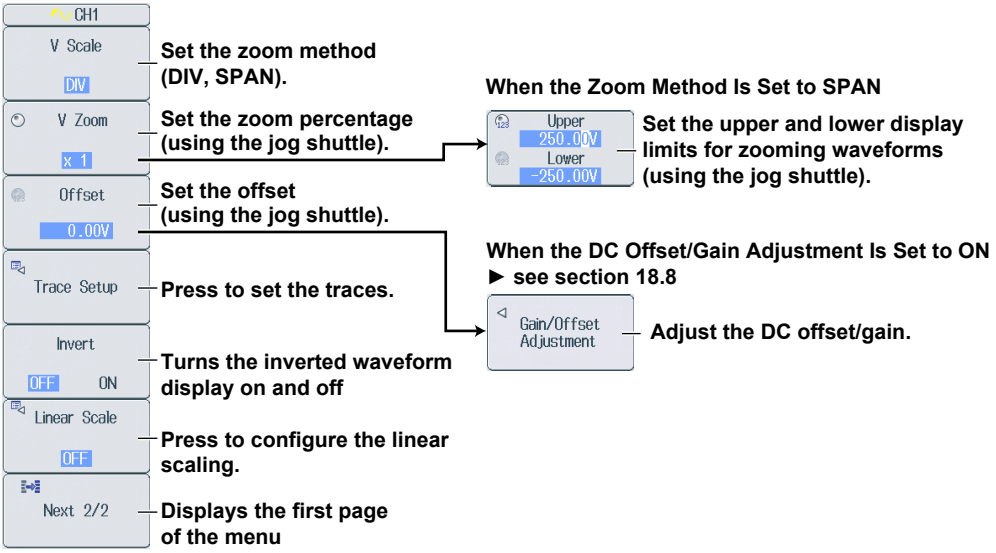
Note

Channel keys (from CH1 to CH16) whose waveforms are displayed are illuminated. You can press channel keys that are not illuminated to turn the waveform display on. You can press channel keys that are illuminated to turn the waveform display off.

4-CH module (720254 (4CH 1M16))

Each channel has two sub channels. If the waveform display on either sub channel is turned on, the channel key illuminates. You can turn on or off the waveform display of the channel selected in the soft key menu by pressing the channel key.

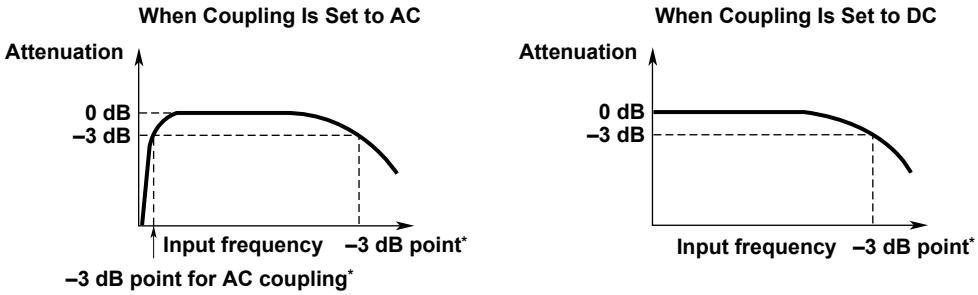
Press the **Next** soft key to display the second page of the menu.



Setting the Input Coupling (Coupling)

Input Coupling Settings and Frequency Response

The frequency responses for the AC and DC input coupling methods are shown below.
Please note that when set to AC, the DL850E/DL850EV does not acquire low frequency signals or low frequency components, as seen in the following figure.



* This value differs depending on the input module. For details, see “6.13 Module Specifications” in the *getting started guide* (IM DL850E-03EN).

CAUTION

If the input coupling is AC, in accordance with the frequency response, the input signal is attenuated more in lower frequencies. As a result, even when a high voltage signal is actually applied, it may not be measured as a high voltage signal. Furthermore, the over-range indicator may not be displayed on the screen. As necessary, switch the input coupling to DC to check the input signal voltage.
Applying an input signal whose voltage exceeds the maximum input voltage of the input module may damage the input section.

French

ATTENTION

Si le courant du couplage d'entrée est alternatif (CA), conforme à la réponse en fréquence, le signal d'entrée est davantage atténué aux fréquences plus basses. Par conséquent, même si vous appliqué un signal de tension élevée, ce dernier risque de ne pas être mesuré comme tel. De plus, le voyant de dépassement de plage risque de ne pas s'afficher à l'écran. Le cas échéant, basculez le couplage d'entrée sur CC (courant continu) afin de vérifier la tension du signal d'entrée.

Si la tension du signal d'entrée dépasse la tension d'entrée maximale du module d'entrée, la section d'entrée risque d'être endommagée.

Setting the Probe Attenuation or the Current-to-Voltage Conversion Ratio (Probe)

1:1, 10:1, 100:1, 1000:1

Displays the voltage probe attenuation

1 A:1 V (1 V/A), 10 A:1 V (0.1 V/A), 100 A:1 V (0.01 V/A), 400 A:1 V (2.5 mV/A)

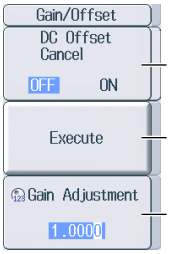
Displays the current probe's output voltage rate

Note

The DL850E/DL850EV can only display input signal voltage values and scale values correctly if you set the correct probe attenuation or current-to-voltage conversion ratio. For example, if you use a 10:1 voltage probe but set the probe type to 1:1, the automatically measured amplitude of the waveform will be 1/10 the real value.

Adjusting the DC Offset/Gain (Gain/Offset Adjustment)

Press the **Gain/Offset Adjustment** soft key to display the following screen.



Turns DC offset canceling on and off

Acquires the DC offset value

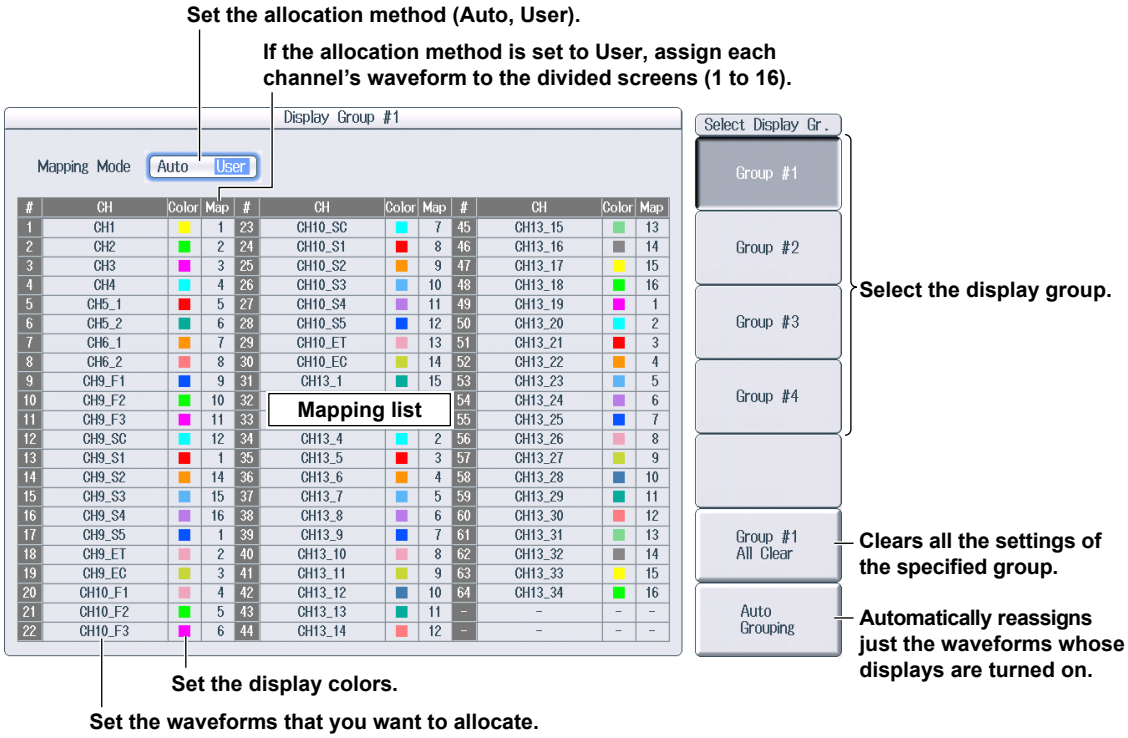
Adjust the gain (using the jog shuttle).

Note

- When DC offset canceling is set to ON, you cannot adjust the gain.
- When gain adjustment is enabled, DC offset canceling cannot be set to ON.
  If you acquire the DC offset value when gain adjustment is enabled, gain adjustment will be disabled, and DC offset canceling will be set to ON.

Setting the Traces (Trace Setup)

Press the **Trace Setup** soft key to display the following screen.

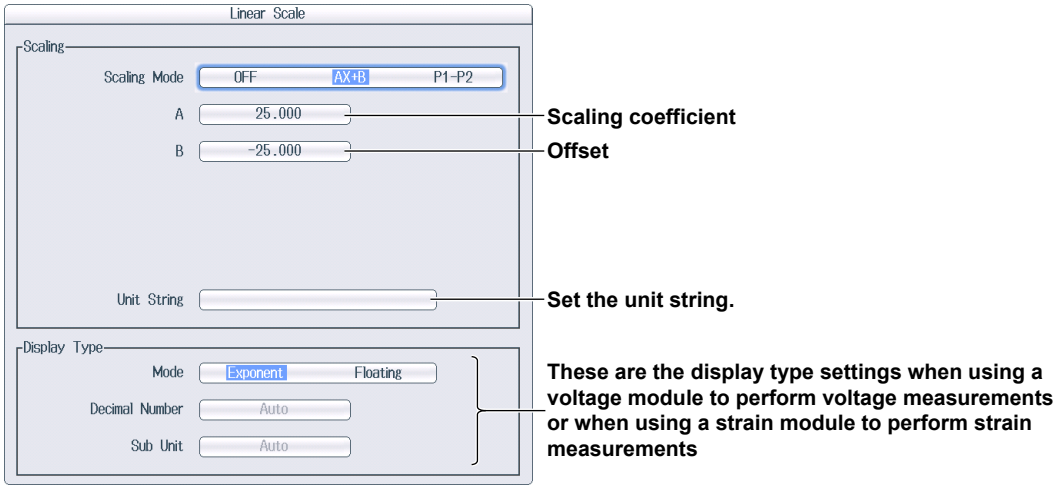


#	CH	Color	Map	#	CH	Color	Map	#	CH	Color	Map
1	CH1		1	23	CH10_SC		7	45	CH13_15		13
2	CH2		2	24	CH10_S1		8	46	CH13_16		14
3	CH3		3	25	CH10_S2		9	47	CH13_17		15
4	CH4		4	26	CH10_S3		10	48	CH13_18		16
5	CH5_1		5	27	CH10_S4		11	49	CH13_19		1
6	CH5_2		6	28	CH10_S5		12	50	CH13_20		2
7	CH6_1		7	29	CH10_ET		13	51	CH13_21		3
8	CH6_2		8	30	CH10_EC		14	52	CH13_22		4
9	CH9_F1		9	31	CH13_1		15	53	CH13_23		5
10	CH9_F2		10	32				54	CH13_24		6
11	CH9_F3		11	33				55	CH13_25		7
12	CH9_SC		12	34	CH13_4		2	56	CH13_26		8
13	CH9_S1		1	35	CH13_5		3	57	CH13_27		9
14	CH9_S2		14	36	CH13_6		4	58	CH13_28		10
15	CH9_S3		15	37	CH13_7		5	59	CH13_29		11
16	CH9_S4		16	38	CH13_8		6	60	CH13_30		12
17	CH9_S5		1	39	CH13_9		7	61	CH13_31		13
18	CH9_ET		2	40	CH13_10		8	62	CH13_32		14
19	CH9_EC		3	41	CH13_11		9	63	CH13_33		15
20	CH10_F1		4	42	CH13_12		10	64	CH13_34		16
21	CH10_F2		5	43	CH13_13		11	-	-	-	-
22	CH10_F3		6	44	CH13_14		12	-	-	-	-

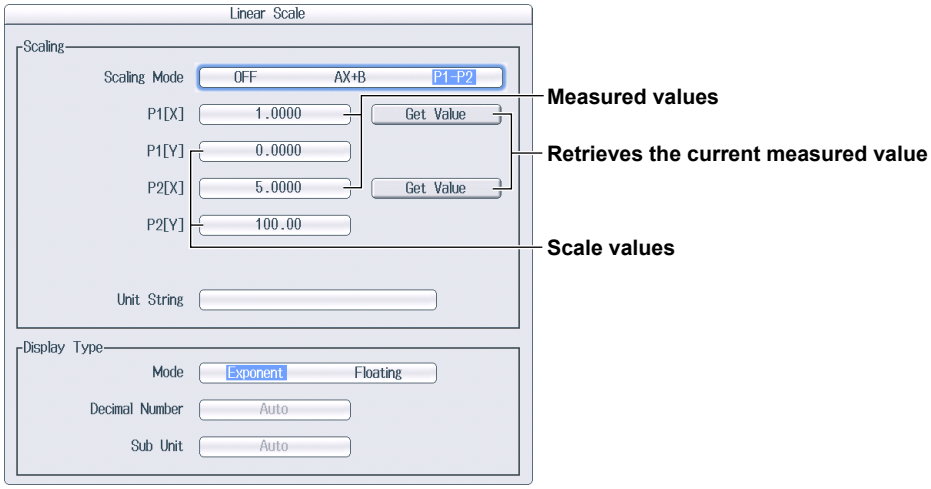
Configuring the Linear Scaling (Linear Scale)

Press the **Linear Scale** soft key to display the following screen.

- **When Scaling Mode Is Set to AX+B**

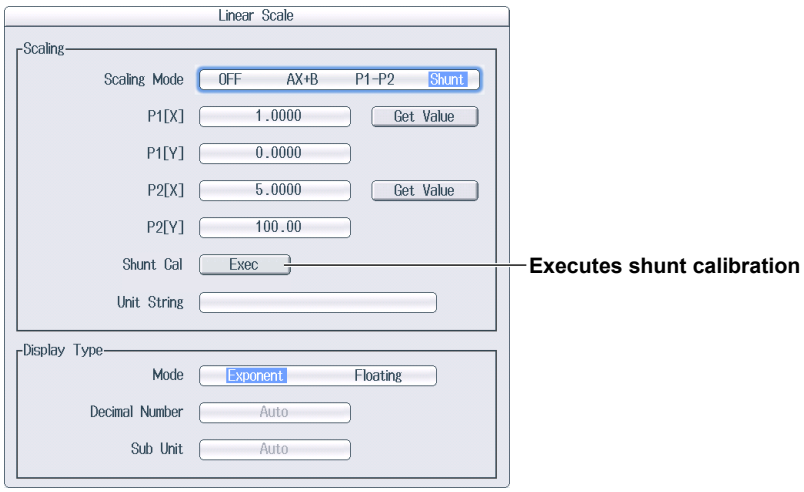


- **When Scaling Mode Is Set to P1–P2**



- **When Mode Is Set to Shunt**

  Selectable only when using the Strain Module (701271 (STRAIN_DSUB)).



Setting the Vertical Scale (SCALE knob)

1. Press one of the **CH1** to **CH16** keys to select the channel that you want to set the vertical scale for.
2. Turn the **SCALE** knob to set the vertical scale.

   If you turn the SCALE knob when waveform acquisition is stopped, two values are shown on the vertical scale screen. The upper value is the vertical scale for the displayed waveforms. The lower value is the vertical scale that you have set. This value will be applied the next time that waveform acquisition is started.

Upper value: Vertical scale for the displayed waveform
Lower value: Vertical scale that you have set

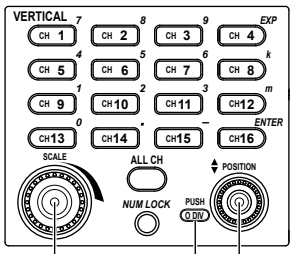
While the vertical scale is being set, its value is displayed here.

* When the displayed waveform's vertical scale and the vertical scale that you have set are the same, only the lower value is displayed.

Setting the Waveform Vertical Position (Vertical POSITION knob)

1. Press one of the **CH1** to **CH16** keys to select the channel that you want to set the vertical position for.
2. Turn the vertical **POSITION** knob to set the vertical position.

   You can set the vertical position to 0 div by pressing the knob.



SCALE knob **Vertical POSITION knob**

This indicates that you can press the vertical POSITION knob to set the vertical position to 0 div.

1.2 Configuring Voltage Measurements (For 16-CH Voltage Input Modules)

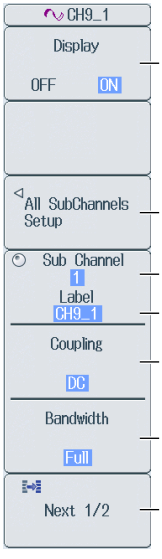
This section explains the following settings for the 16-CH voltage input module:

- Waveform display on and off
- Settings for all sub channels
- Number of the sub channel to be configured, Sub channel's display label
- Input coupling
- Bandwidth limit
- The zoom method
- The zoom percentage
- The upper and lower display limits for zooming waveforms
- Offset
- Trace settings (input channel assignment)
- Inverted waveform display on and off
- Linear scaling
- Vertical scale
- Vertical position

► **"Voltage Measurement (For the 16-CH Voltage Input Module)" in the Features Guide**

CH Menu

Press a key from **CH1** to **CH16** to display the following menu.



Turns the waveform display on and off

Press to set all sub channels.

Select the number of the sub channel to be configured (using the jog shuttle).

Press to set the sub channel's display label.

Set the sub channel's input coupling (DC, GND, OFF*).
► section 1.1

Set the sub channel's bandwidth limit (500Hz, Full).

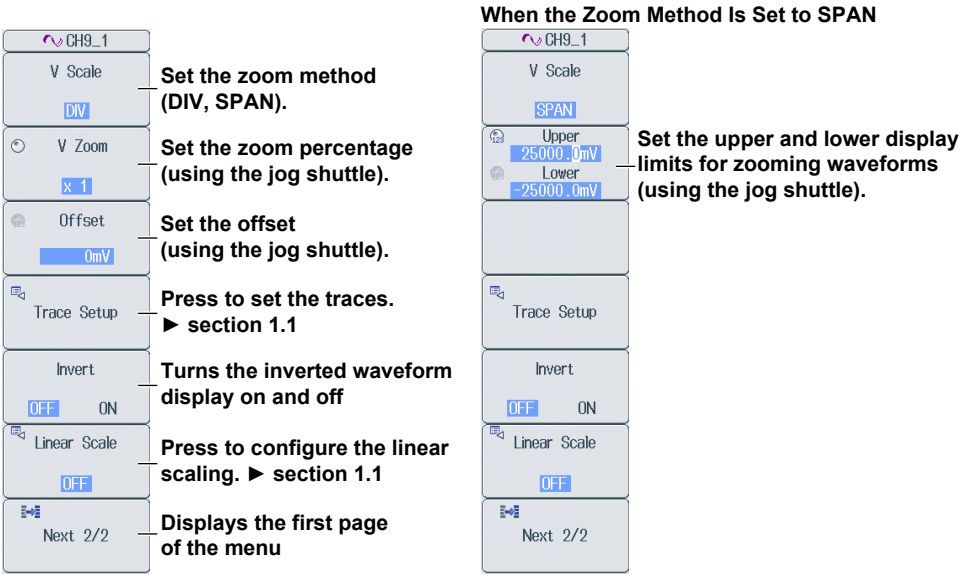
Displays the second page of the menu

* If you do not want to measure the selected sub channel, set its input coupling to OFF.

Note

Channel keys (from CH1 to CH16) whose waveforms are displayed are illuminated. You can press channel keys that are not illuminated to turn the waveform display on. You can press channel keys that are illuminated to turn the waveform display off.

Press the **Next** soft key to display the second page of the menu.



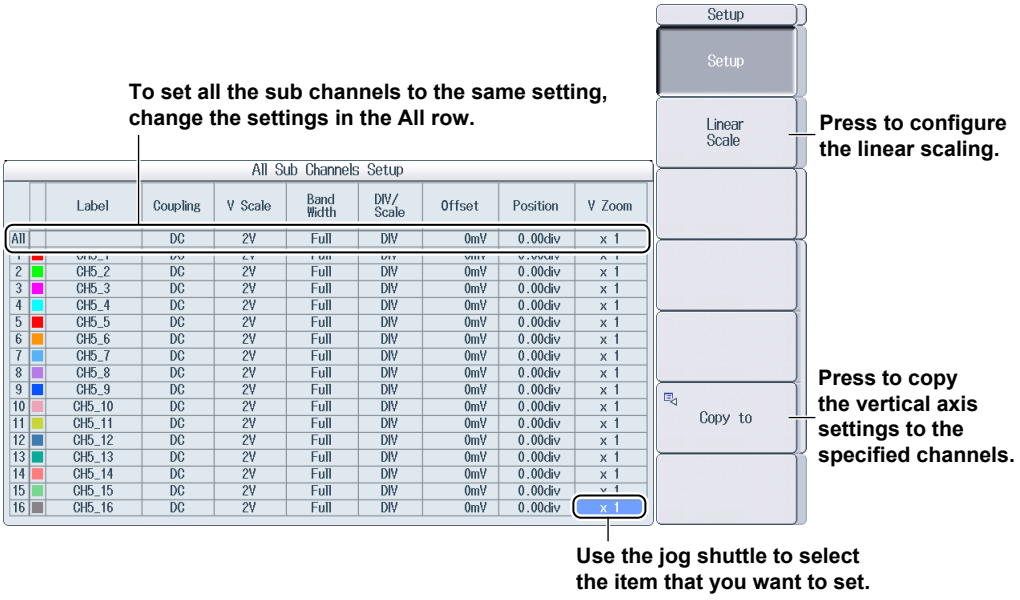
Configuring All Sub Channels (All SubChannels Setup)

Press the **All SubChannels Setup** soft key to display the following Sub Channel Setup screen or Linear Scaling Setup screen.

Sub Channel Setup (Setup)

Press the **Setup** soft key to display the following screen.

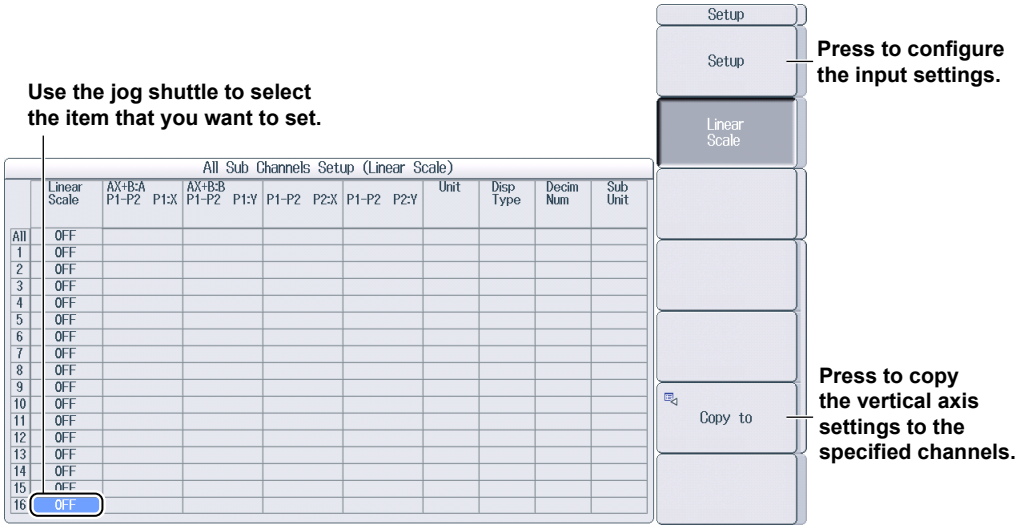
Use the **jog shuttle** to select the setting that you want to change, and then press **SET** to display a menu of the items that can be selected for the setting.



Linear Scaling Setup (Linear Scale)

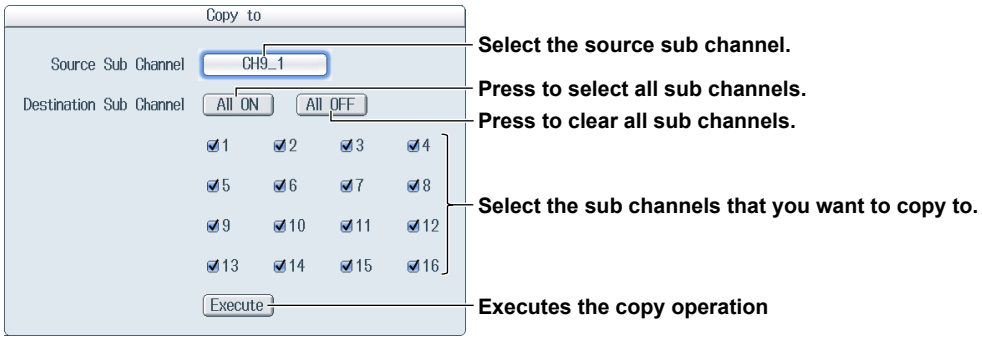
Press the **Linear Scale** soft key to display the following screen.

Use the **jog shuttle** to select the setting that you want to change, and then press **SET** to display a menu of the items that can be selected for the setting.



Copying Settings (Copy to)

Press the **Copy to** soft key to display the following screen.



Setting the Vertical Scale (SCALE knob)

► section 1.1

Setting the Waveform Vertical Position (Vertical POSITION knob)

► section 1.1

1.3 Configuring Temperature Measurements

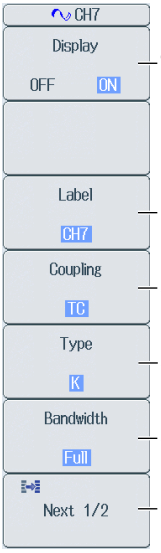
This section explains the following settings for temperature measurements:

- Waveform display on and off
- Display labels
- Input coupling
- Thermocouple type
- Bandwidth limit
- Display range
- Temperature unit
- Trace settings (input channel assignment)
- RJC and burnout on and off

► "Temperature Measurement" in the Features Guide

CH Menu

Press a key from **CH1** to **CH16** to display the following menu.



Turns the waveform display on and off

Press to set the display label.

Set Coupling to TC.

Set the thermocouple type (K, E, J, T, L, U, R, S, B, N, W, Au7Fe).

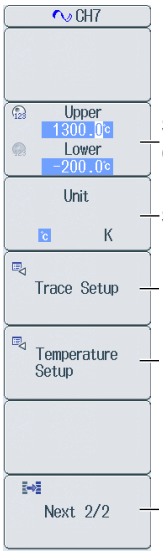
Set the bandwidth limit (2Hz, 8Hz, 30Hz, Full).

Displays the second page of the menu

Note

Channel keys (from CH1 to CH16) whose waveforms are displayed are illuminated. You can press channel keys that are not illuminated to turn the waveform display on. You can press channel keys that are illuminated to turn the waveform display off.

Press the **Next** soft key to display the second page of the menu.



Set the upper and lower limits of the display range (using the jog shuttle).

Set the temperature unit (°C, K).*

Press to set the traces. ► section 1.1

Press to set the RJC and burnout settings.

Displays the first page of the menu

* On models with a language suffix code other than -HJ (Japanese), you can also select Fahrenheit (°F) for the unit.

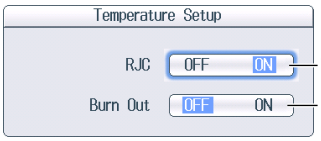
Setting the Input Coupling (Coupling)

To measure temperature, set the input coupling to TC.

To measure voltage, set the input coupling to an appropriate voltage measurement setting. ► section 1.1

Turning the RJC and Burnout On and Off (Temperature Setup)

Press the **Temperature Setup** soft key to display the following screen.



Turns reference junction compensation on and off

Turns burnout detection on and off

1.4 Configuring Temperature Measurements (For 16-CH Temperature/Voltage Input Module)

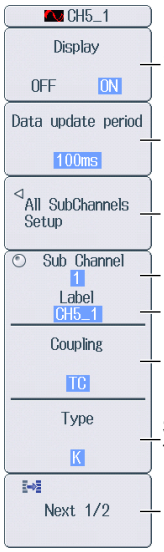
This section explains the following settings for 16-CH temperature/voltage input module:

- Waveform display on and off
- Data update period
- Settings for all sub channels
- Number of the sub channel to be configured, Sub channel's display label
- Input coupling
- Thermocouple type
- Display range
- Temperature unit
- Trace settings (input channel assignment)
- RJC and burnout on and off
- The zoom method
- The zoom percentage
- The upper and lower display limits for zooming waveforms
- Offset
- Inverted waveform display on and off
- Linear scaling
- Vertical scale
- Vertical position

► **"Temperature Measurement (For the 16-CH Temperature/Voltage Input Module)" in the Features Guide**

CH Menu

Press a key from **CH1** to **CH16** to display the following menu.



Turns the waveform display on and off

Set the data update period (100ms, 300ms, 1s, 3s).

Press to set all sub channels.

Select the number of the sub channel to be configured (using the jog shuttle).

Press to set the sub channel's display label.

Set the sub channel's input coupling (TC, DC, GND, OFF*).

Set the thermocouple type (K, E, J, T, L, U, R, S, B, N, W, Au7Fe).
This can only be set when Coupling is set to TC.

Displays the second page of the menu

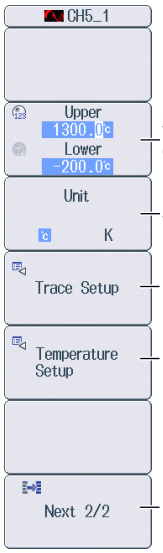
* If you do not want to measure the selected sub channel, set its input coupling to OFF.

Note

Channel keys (from CH1 to CH16) whose waveforms are displayed are illuminated. You can press channel keys that are not illuminated to turn the waveform display on. You can press channel keys that are illuminated to turn the waveform display off.

Press the **Next** soft key to display the second page of the menu.

- **When Coupling Is Set to TC**



Set the upper and lower limits of the display range (using the jog shuttle).

Set the temperature unit (°C, K).*

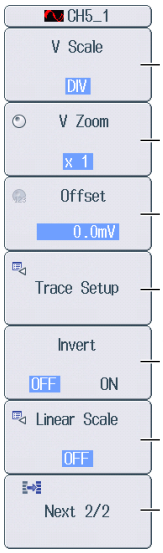
Press to set the traces. ► section 1.1

Press to set the RJC and burnout settings.

Displays the first page of the menu

* On models with a language suffix code other than -HJ (Japanese), you can also select Fahrenheit (°F) for the unit.

- **When Coupling Is Set to DC, GND, or OFF**



Set the zoom method (DIV, SPAN).

Set the zoom percentage (using the jog shuttle).

Set the offset (using the jog shuttle).

Press to set the traces. ► section 1.1

Turns the inverted waveform display on and off

Press to configure the linear scaling. ► section 1.1

Displays the first page of the menu

When the Zoom Method Is Set to SPAN

Set the upper and lower display limits for zooming waveforms (using the jog shuttle).

Configuring All Sub Channels (All SubChannels Setup)

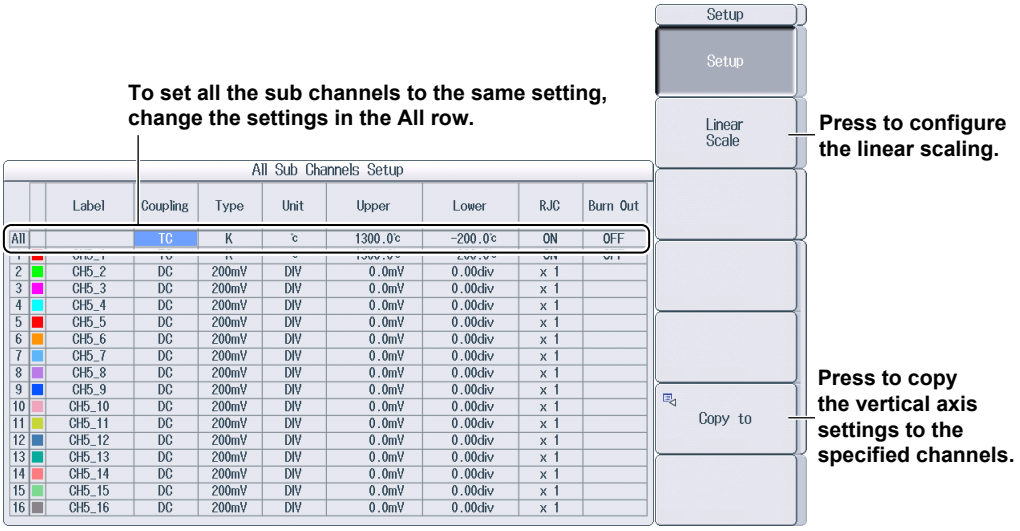
Press the **All SubChannels Setup** soft key to display the following Sub Channel Setup screen or Linear Scaling Setup screen.

Sub Channel Setup (Setup)

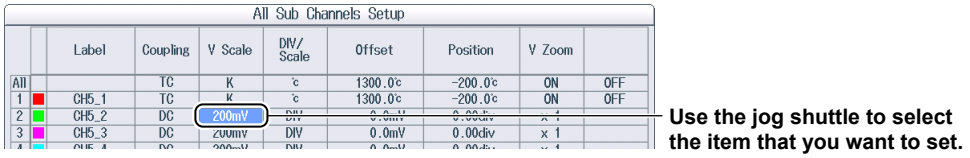
Press the **Setup** soft key to display the following screen.

Use the **jog shuttle** to select the setting that you want to change, and then press **SET** to display a menu of the items that can be selected for the setting.

- **When the Selected Sub Channel's Input Coupling Is Set to TC**



- **When the Selected Sub Channel's Input Coupling Is Set to DC, GND, or OFF**

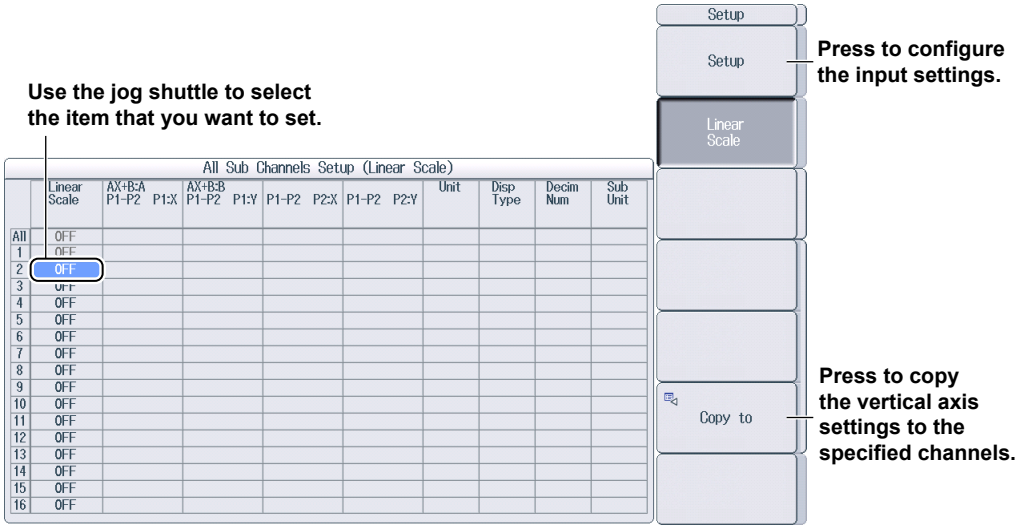


Linear Scaling Setup (Linear Scale)

This can be set when input coupling is set to DC, GND, or OFF.

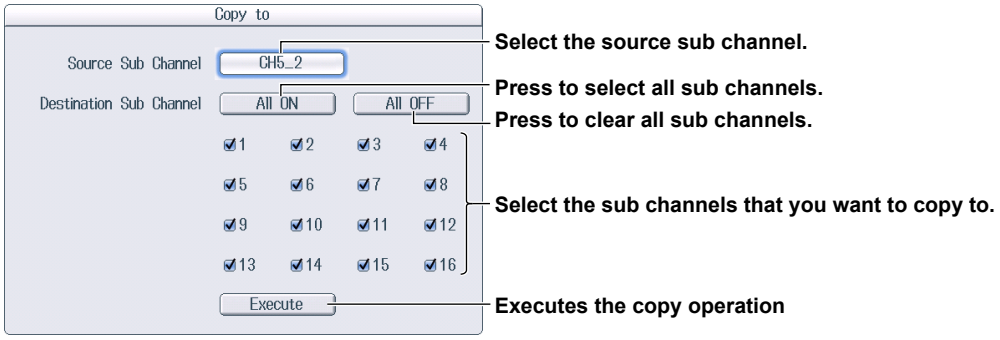
Press the **Linear Scale** soft key to display the following screen.

Use the **jog shuttle** to select the setting that you want to change, and then press **SET** to display a menu of the items that can be selected for the setting.



Copying Settings (Copy to)

Press the **Copy to** soft key to display the following screen.



Setting the Vertical Scale (SCALE knob)

This can be set when input coupling is set to DC or GND.

► section 1.1

Setting the Waveform Vertical Position (Vertical POSITION knob)

This can be set when input coupling is set to DC or GND.

► section 1.1

1.5 Configuring Strain Measurements

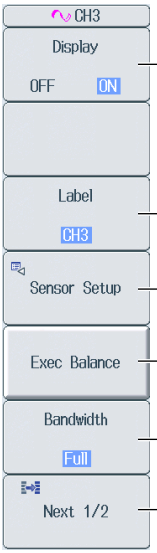
This section explains the following settings for strain measurements:

- Waveform display on and off
- Display labels
- Sensor settings
- Strain balance execution
- Bandwidth limit
- Display range
- Range unit
- Trace settings
- Inverted waveform display
- Linear scaling
- Measurement range
- Vertical scale

► “Strain Measurement” in the Features Guide

CH Menu

Press a key from **CH1** to **CH16** to display the following menu.



Turns the waveform display on and off

Press to set the display label.

Press to configure the sensor settings.

Executes the strain balance

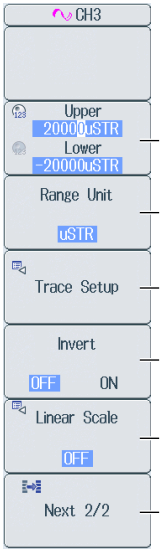
Set the bandwidth limit (10Hz, 100Hz, 1kHz, Full).

Displays the second page of the menu

Note

Channel keys (from CH1 to CH16) whose waveforms are displayed are illuminated. You can press channel keys that are not illuminated to turn the waveform display on. You can press channel keys that are illuminated to turn the waveform display off.

Press the **Next** soft key to display the second page of the menu.



Set the display range (using the jog shuttle).

Set the range unit (uSTR, mV/V).

Press to set the traces. ► section 1.1

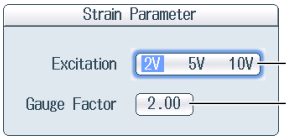
Turns the inverted waveform display on and off

Press to configure the linear scaling. ► section 1.1

Displays the first page of the menu

Configuring the Sensor (Sensor Setup)

Press the **Sensor Setup** soft key to display the following screen.



Set the bridge voltage.

Set the gauge factor.

Setting the Range Unit (Range Unit)

- μSTR: A unit that represents the amount of strain (×10-6 strain)
- mV/V: Strain-gauge-converter output unit
  The mV/V range is calculated from the following equation.
  mV/V = 0.5 × (μSTR/1000)

Setting the Vertical Scale (SCALE knob)

1. Press one of the **CH1** to **CH16** keys to select the channel that you want to set the vertical scale for.
2. Turn the **SCALE** knob to set the vertical scale.

Upper value: Vertical scale for the displayed waveform
Lower value: Vertical scale that you have set

While the vertical scale is being set, its value is displayed here.

1.6 Configuring Acceleration Measurements

This section explains the following settings for acceleration measurements:

- Waveform display on and off
- Display labels
- Input coupling
- Bias current supply
- Bias current supply to the acceleration sensor on and off
- Bandwidth limit
- The zoom method
- The zoom percentage
- The upper and lower display limits for zooming waveforms
- Gain
- Trace settings (input channel assignment)
- Acceleration sensor sensitivity
- Acceleration unit
- Vertical position

► “Acceleration Measurement” in the Features Guide

CH Menu

Press a key from **CH1** to **CH16** to display the following menu.

Turns the waveform display on and off

Press to set the display label.

Set Coupling to ACCEL.

Turns the bias current supply on and off

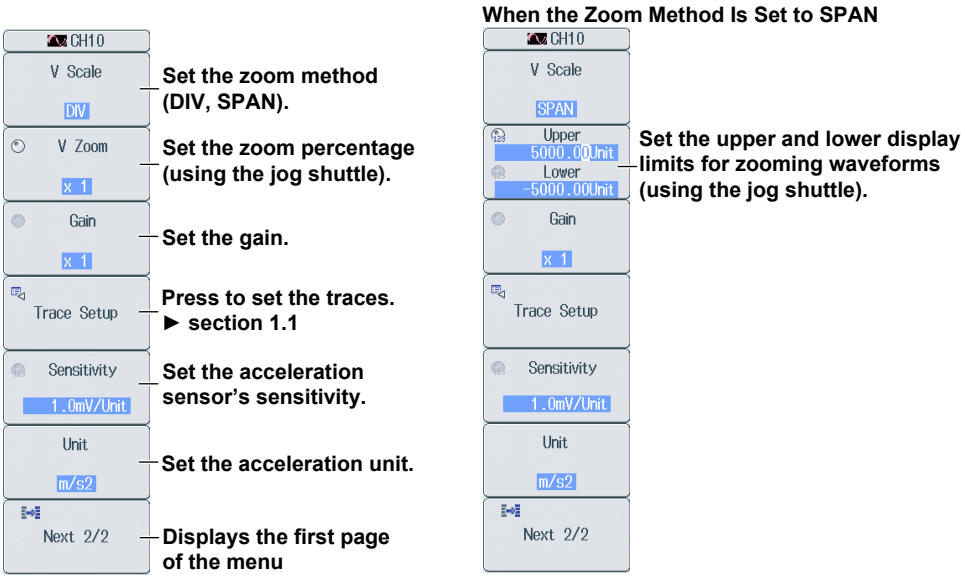
Set the bandwidth limit (40Hz, 400Hz, 4kHz, Auto, Full).

Displays the second page of the menu

Note

Channel keys (from CH1 to CH16) whose waveforms are displayed are illuminated. You can press channel keys that are not illuminated to turn the waveform display on. You can press channel keys that are illuminated to turn the waveform display off.

Press the **Next** soft key to display the second page of the menu.



Setting the Input Coupling (Coupling)

To measure acceleration, set the input coupling to ACCEL.

To measure voltage, set the input coupling to an appropriate voltage measurement setting. ► section 1.1

Setting the Waveform Vertical Position (Vertical POSITION knob)

► section 1.1

1.7 Configuring Frequency, Revolution, Period, Duty Cycle, Power Supply Frequency, Pulse Width, Pulse Integration, and Velocity Measurements

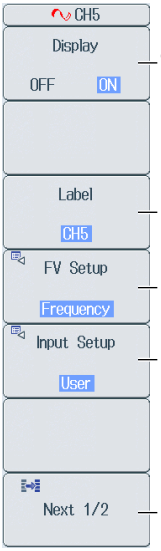
This section explains the following settings for frequency, revolution, period, duty cycle, power supply frequency, pulse width, pulse integration, and velocity measurements:

- Waveform display on and off
- Display labels
- Measurement items
- Input conditions
- The zoom method
- The zoom percentage
- The upper and lower display limits for zooming waveforms
- Offset
- Trace settings (input channel assignment)
- Linear scaling
- Vertical scale
- Vertical position

► “Frequency Measurement” in the Features Guide

CH Menu

Press a key from **CH1** to **CH16** to display the following menu.



Turns the waveform display on and off

Press to set the display label.

Press to configure the measurement items.

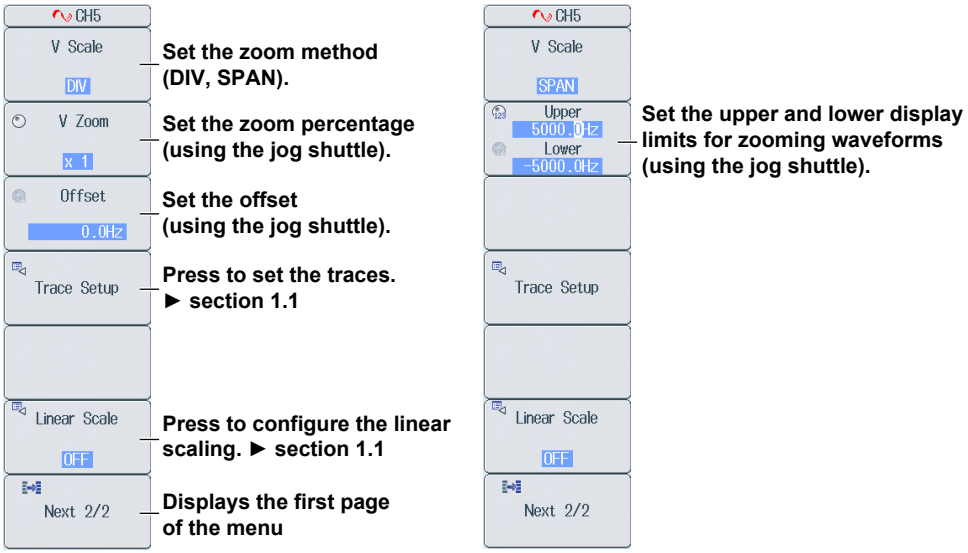
Set the input condition.

Displays the second page of the menu

Note

Channel keys (from CH1 to CH16) whose waveforms are displayed are illuminated. You can press channel keys that are not illuminated to turn the waveform display on. You can press channel keys that are illuminated to turn the waveform display off.

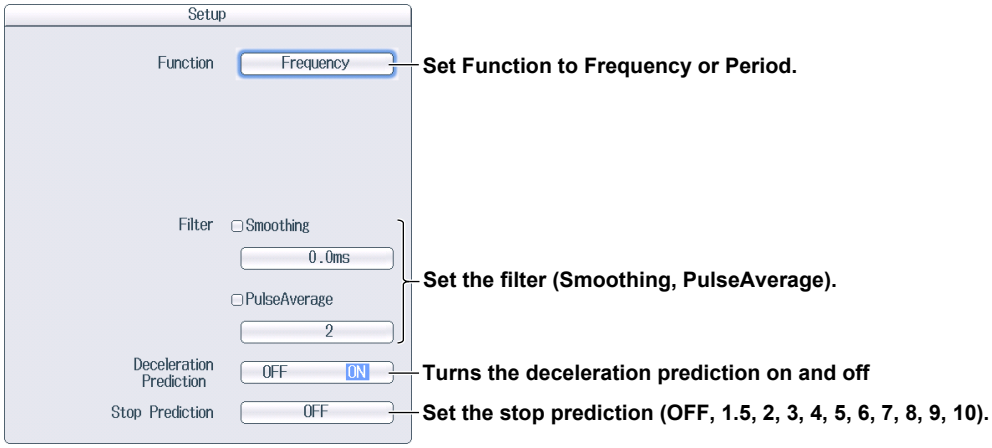
Press the **Next** soft key to display the second page of the menu.



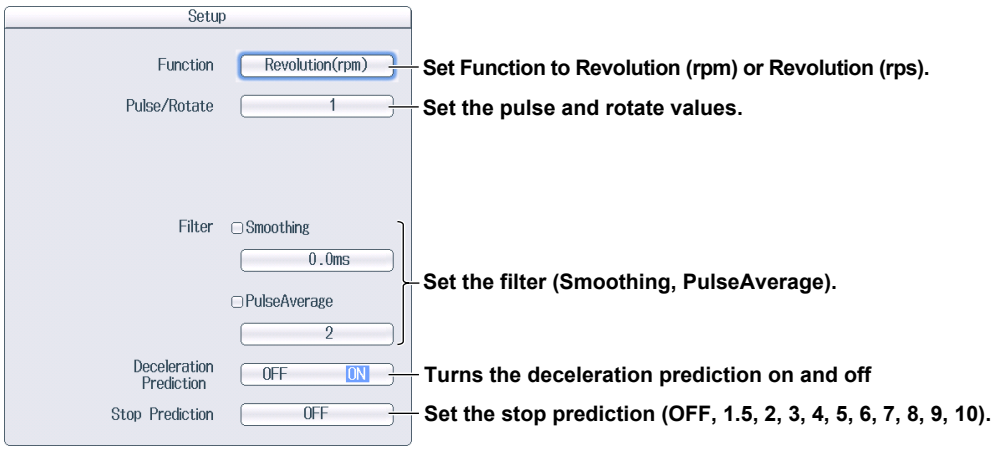
Configuring Measurement Items (FV Setup)

Press the **FV Setup** soft key to display the following screen.

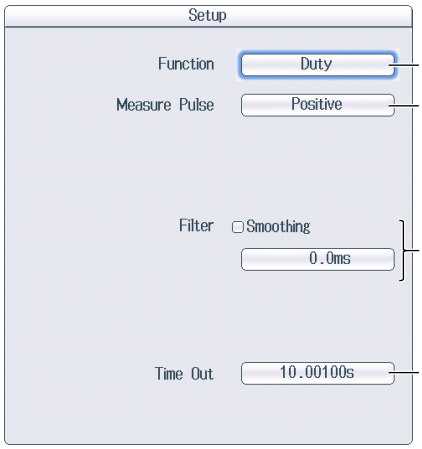
- **When Performing Frequency or Period Measurements**



- **When Performing Revolution Measurements**



- **When Performing Duty Cycle or Pulse Width Measurements**



Set Function to Duty or Pulse Width.

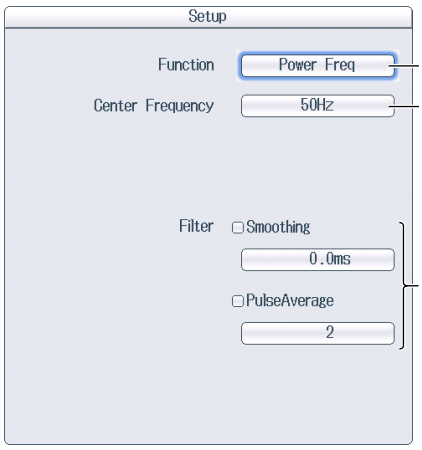
Set the pulse to measure (Positive, Negative).

Set the filter (Smoothing).

Set the timeout period (0.00001 to 80s)* only when Function is set to Duty

* You can set this value when the frequency module is the 720281 or the 701281 (module version 0x04 or later).

- **When Performing Power Supply Frequency Measurements**

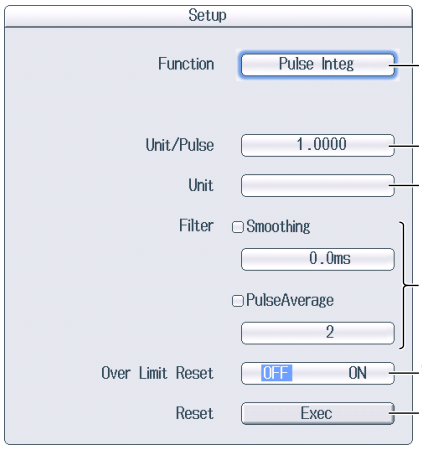


Set Function to Power Freq.

Set the center frequency (50Hz, 60Hz, 400Hz).

Set the filter (Smoothing, PulseAverage).

- **When Performing Pulse Integration Measurements**



Set Function to Pulse Integ.

Set the unit or pulse value.

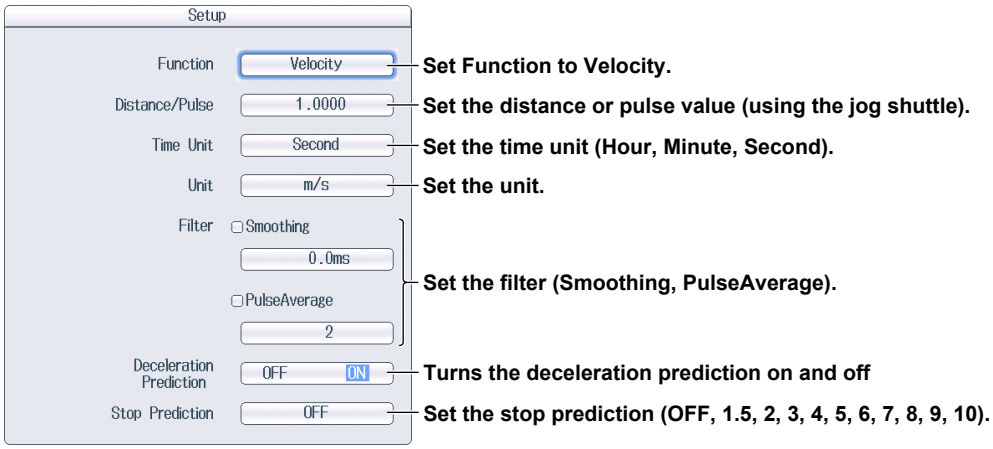
Set the unit.

Set the filter (Smoothing, PulseAverage).

Turns over-limit reset on and off

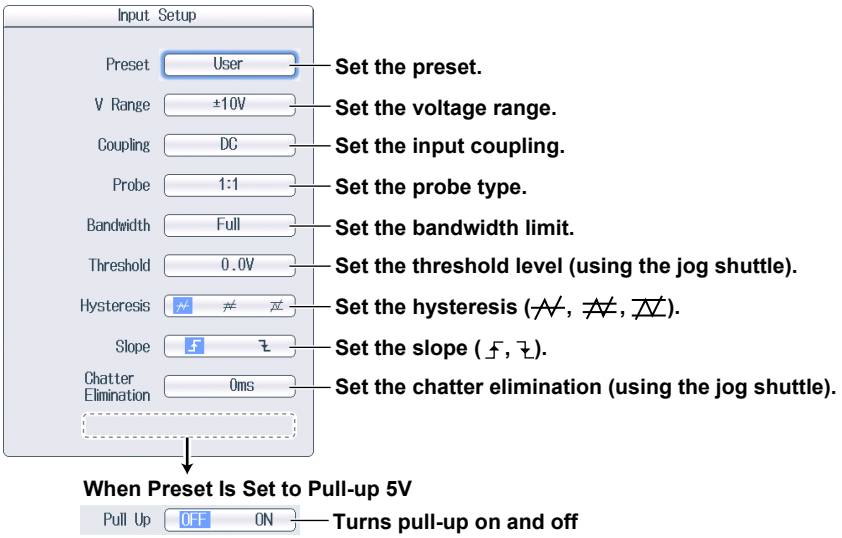
Executes the manual reset of the pulse count

- **When Performing Velocity Measurements**



Setting Input Conditions (Input Setup)

Press the **Input Setup** soft key to display the following screen.



Setting the Preset

You can set the preset to one of the following 10 options: Logic 5V, Logic 3V, Logic 12V, Logic 24V, Pull-up 5V, ZeroCross, AC100V, AC200V, EM Pickup, or User (user-defined).

The settable input items differ depending on the preset that you set. You can only turn pull-up on and off when the preset is set to Pull-up 5V.

Setting the Vertical Scale (SCALE knob)

► section 1.1

Setting the Waveform Vertical Position (Vertical POSITION knob)

► section 1.1

1.8 Configuring Logic Signal Measurements

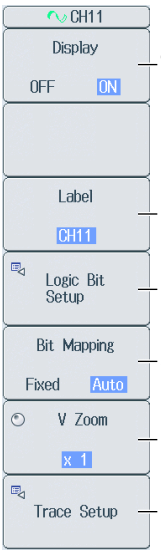
This section explains the following settings for logic measurements:

- Waveform display on and off
- Display labels
- Logic bits
- Bit mapping
- The zoom percentage
- Trace settings (input channel assignment)
- Vertical scale
- Vertical position

► “Logic Measurement” in the Features Guide

CH Menu

Press a key from **CH1** to **CH16** to display the following menu.



Turns the waveform display on and off

Press to set the display label.

Press to set the logic bits.

Set the bit mapping.

Set the zoom percentage (using the jog shuttle).

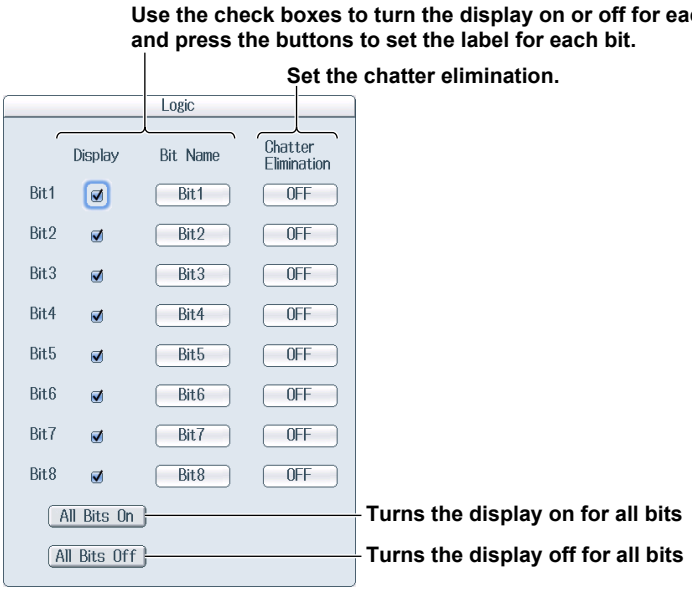
Press to set the traces. ► section 1.1

Note

Channel keys (from CH1 to CH16) whose waveforms are displayed are illuminated. You can press channel keys that are not illuminated to turn the waveform display on. You can press channel keys that are illuminated to turn the waveform display off.

Setting Logic Bits (Logic Bit Setup)

Press the **Logic Bit Setup** soft key to display the following screen.



Setting the Vertical Scale (SCALE knob)

► section 1.1

Setting the Waveform Vertical Position (Vertical POSITION knob)

► section 1.1

1.9 Configuring the Monitoring of CAN and CAN FD Bus Signals (Applies to the DL850EV)

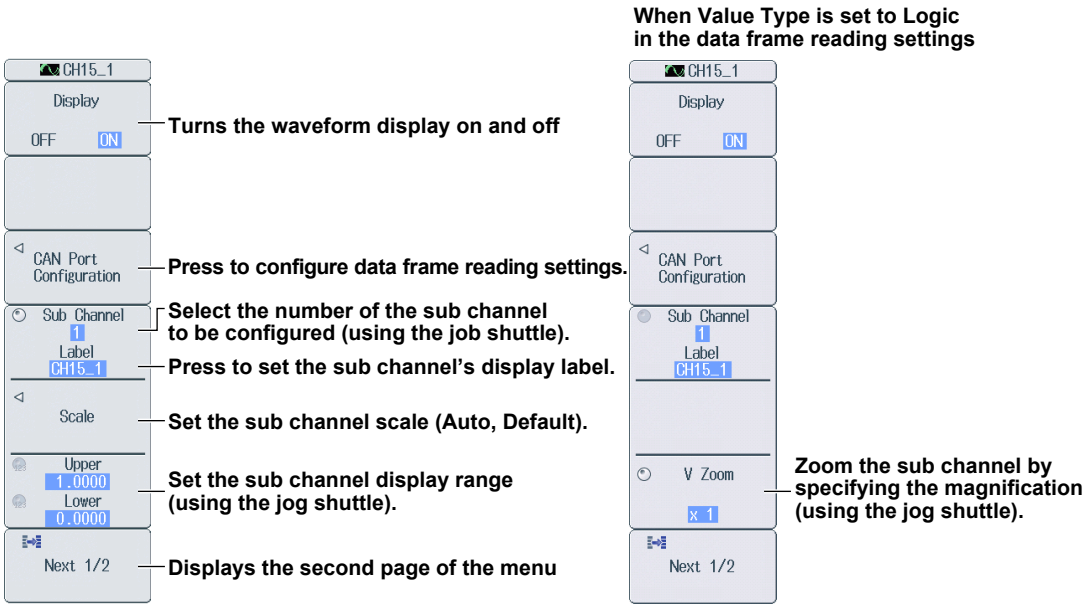
This section explains the following settings for monitoring CAN and CAN FD bus signals:

- Waveform display on and off
- Data frame reading settings
  Port settings, loading of definition files, and CAN or CAN FD data extraction conditions
- Number of the sub channel to be configured, Sub channel's display label
- Individual sub channel scale
- Zooming by specifying the magnification of each sub channel
- Display range
- One shot output
- Trace settings (input channel assignment)
- All sub channel scales

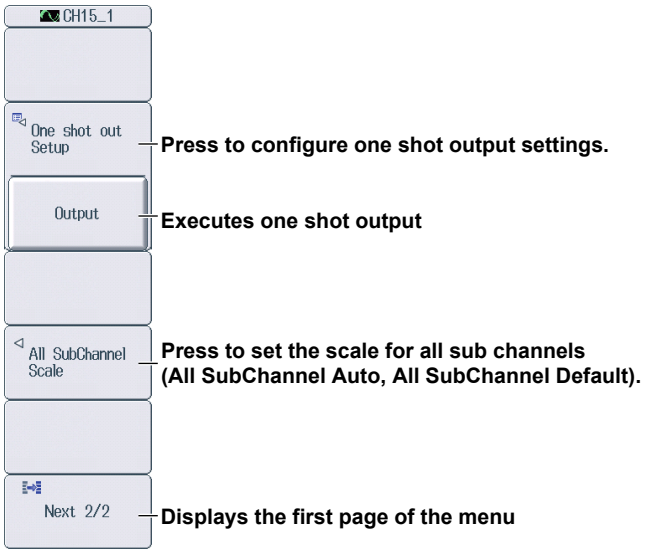
► "CAN and CAN FD Bus Signal Monitoring (Applies to the DL850EV)" in the Features Guide

CH Menu

Press a key from **CH13** to **CH16** to display the following menu.



Press the **Next** soft key to display the second page of the menu.

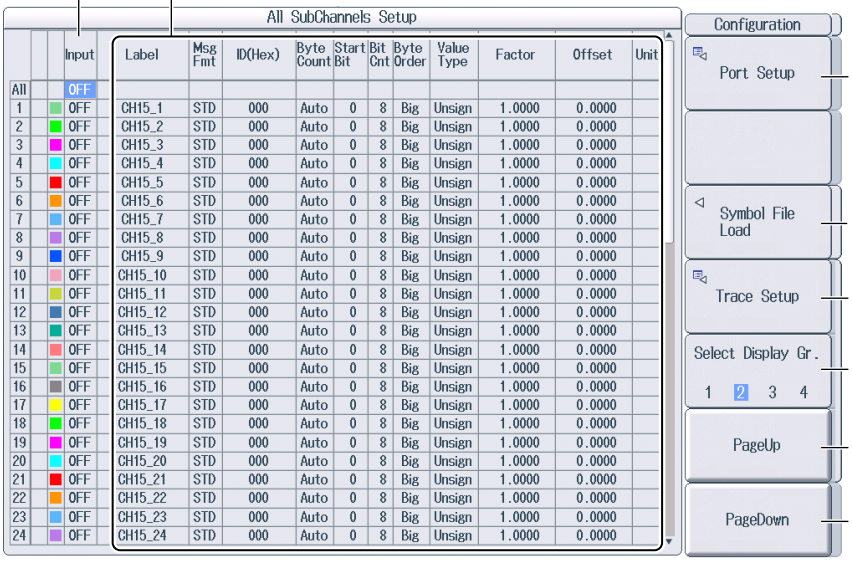


Configuring Data Frame Reading Settings (CAN Port Configuration)

Press the **CAN Port Configuration** soft key to display the following screen.

Set sub channels to ON or OFF.
Set the input of each sub channel to ON or OFF.

Set CAN or CAN FD data extraction conditions.
Use the **jog shuttle** to select the setting that you want to change, and then press **SET** to display a menu of the items that can be selected for the setting. Configure the settings for each sub channel.



Set the Port.

Loads a definition (.sbl) file

Press to set the traces. ► section 1.1

Set the display group (1, 2, 3, 4)

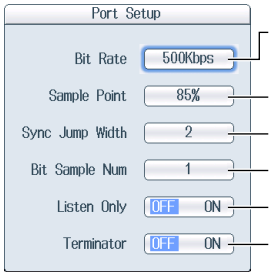
Moves up a page.

Moves down a page.

Port Settings (Port Setup)

Press the **Port Setup** soft key to display the following screen.

- **CAN Bus Signal Monitoring (for the 720240 (CAN MONITOR), 720241 (CAN & LIN) modules)**



Set the bit rate (10k, 20k, 33.3k, 50k, 62.5k, 66.7k, 83.3k, 100k, 125k, 200k, 250k, 400k, 500k, 800k, 1Mbps).

Set the sample point (71%, 78%, 85%).

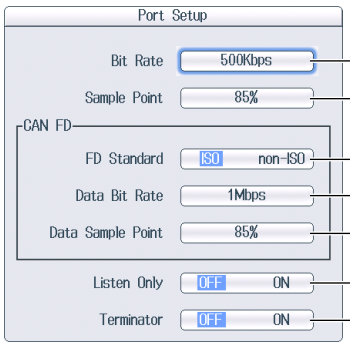
Set the sync jump width (1 to 4).

Set the number of sample (1, 3).

Turns listen only on and off

Turns the terminator on and off

- **CAN and CAN FD Bus Signal Monitoring (for the 720242 (CAN/CAN FD) module)**



Set the bit rate (10k, 20k, 33.3k, 50k, 62.5k, 66.7k, 83.3k, 100k, 125k, 200k, 250k, 400k, 500k, 800k, 1Mbps)

Set the sample point (65% to 90%)

Set the CAN FD standard (ISO, non-ISO)

Set the data bit rate (10k, 20k, 33.3k, 50k, 62.5k, 66.7k, 83.3k, 100k, 125k, 200k, 250k, 400k, 500k, 800k, 1M, 2M, 3M, 4M, 5Mbps)

Set the data sample point (65% to 90%)

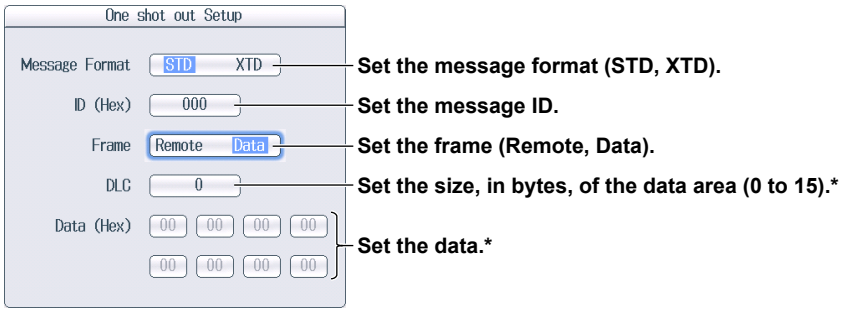
Turns listen only on and off

Turns the terminator on and off

One Shot Output Settings (One shot out Setup)

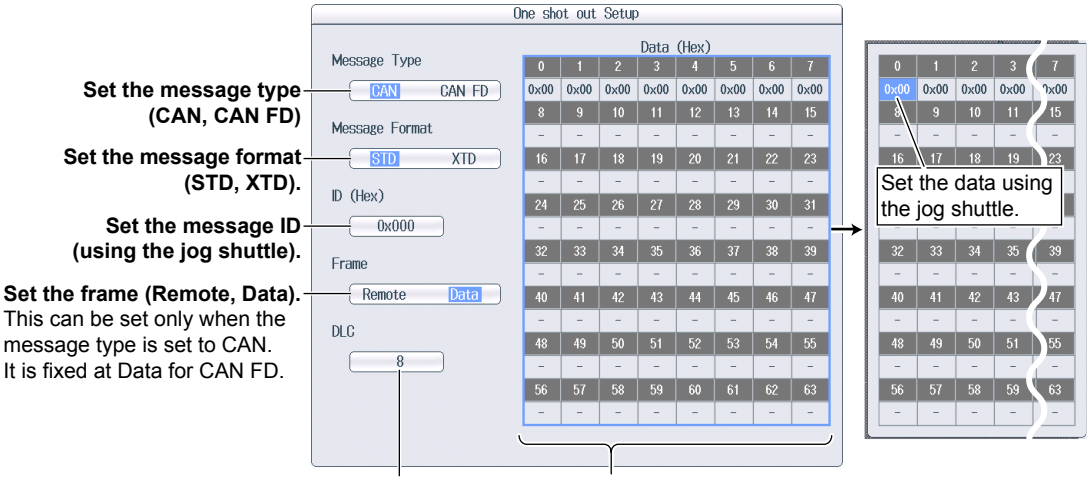
Press the **One shot out Setup** soft key to display the following screen.

CAN Frame One-Shot Output (for the 720240 (CAN MONITOR), 720241 (CAN & LIN) modules)



* Can only be set when Frame is set to Data.

CAN or CAN FD Frame One-Shot Output (for the 720242 (CAN/CAN FD) module)



Set the data.*
If you select the list of data settings and press **SET**, you can set the data bytes individually.
The number of transmission data bytes that can be set varies depending on the message type and DLC settings.
► See the next page.

* Can only be set when Frame is set to Data.

DLC value and the number of transmission data bytes

When DLC = 0 to 8

DLC	Number of Data Bytes	
	CAN	CAN FD
0	0	0
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8

When DLC ≥ 9

- When the message type is CAN

DLC	Number of Data Bytes
9 to 15	8

- When the message type is CAN FD

DLC	Number of Data Bytes
9	12
10	16
11	20
12	24
13	32
14	48
15	64

1.10 Configuring the Monitoring of LIN Bus Signals (Applies to the DL850EV)

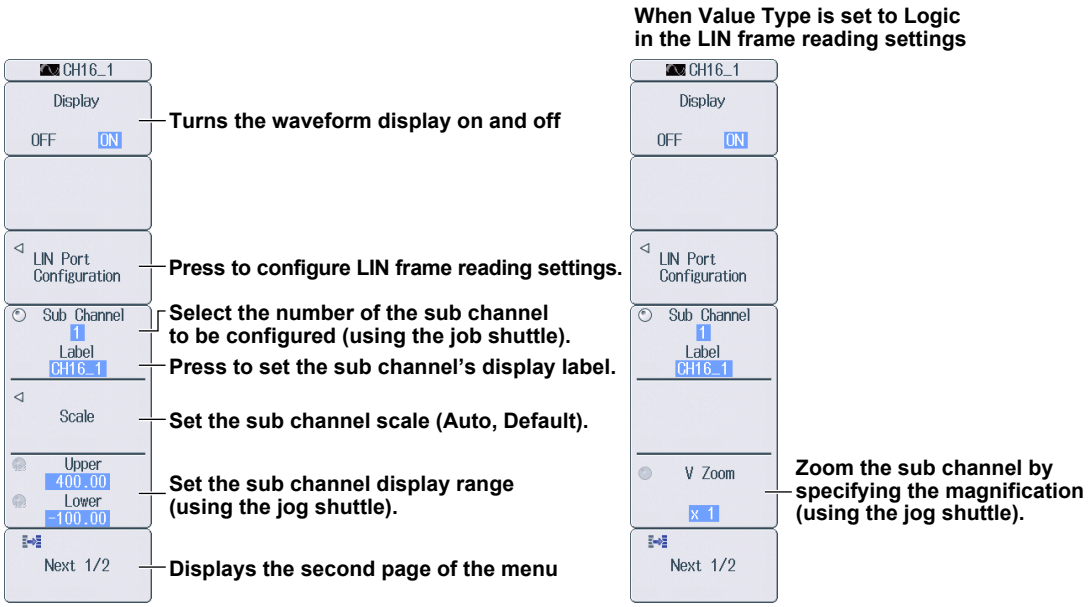
This section explains the following settings for monitoring LIN bus signals:

- Waveform display on and off
- LIN frame reading settings
  Port settings, Frame settings,
  loading of definition files,
  and LIN data extraction conditions
- Number of the sub channel to be configured,
  Sub channel's display label
- Individual sub channel scale
- Zooming by specifying the magnification of each sub channel
- Display range
- Trace settings (input channel assignment)
- All sub channel scales

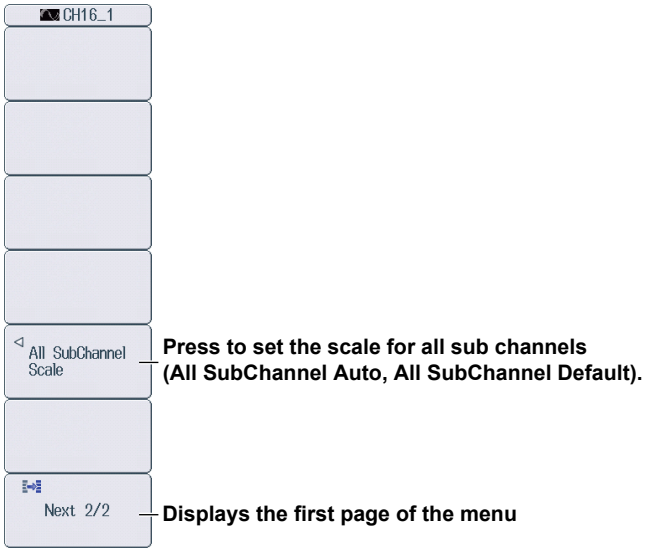
► "LIN Bus Signal Monitoring (Applies to the DL850EV)" in the Features Guide

CH Menu

Press a key from **CH13** to **CH16** to display the following menu.



Press the **Next** soft key to display the second page of the menu.

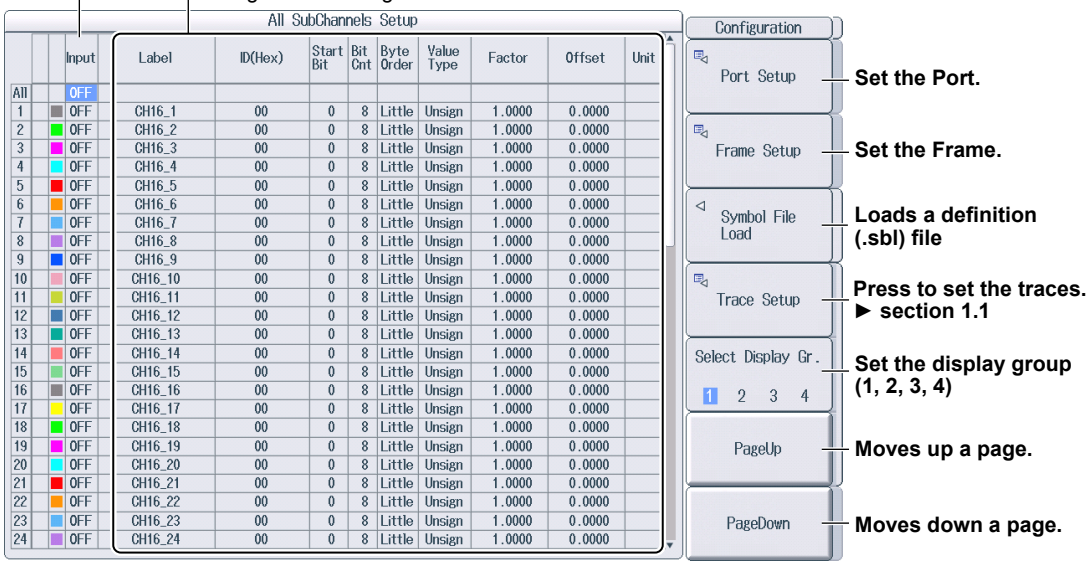


Configuring LIN Frame Reading Settings (LIN Port Configuration)

Press the **LIN Port Configuration** soft key to display the following screen.

Set sub channels to ON or OFF.
Set the input of each sub channel to ON or OFF.

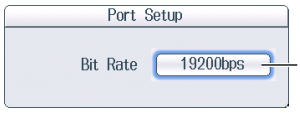
Set LIN data extraction conditions.
Use the **jog shuttle** to select the setting that you want to change, and then press **SET** to display a menu of the items that can be selected for the setting. Configure the settings for each sub channel.



Set the Port.
Set the Frame.
Loads a definition (.sbl) file
Press to set the traces. ► section 1.1
Set the display group (1, 2, 3, 4)
Moves up a page.
Moves down a page.

Port Settings (Port Setup)

Press the **Port Setup** soft key to display the following screen.



Set the bit rate (2400bps, 9600bps, 19200bps)

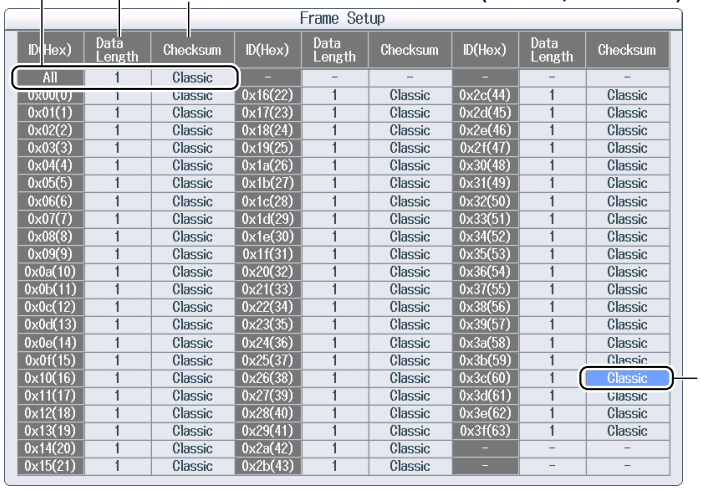
Frame Settings (Frame Setup)

Press the **Frame Setup** soft key to display the following screen.

To set frames 0 to 59 to the same setting at once, change the settings in the All row.
You cannot change the settings for frames 60 or above at once.

Set the data length (using the jog shuttle).

Select the checksum method (Classic, Enhanced).



Use the jog shuttle to select the item that you want to set.

Note

All IDs are displayed. Only the settings for the frames that have IDs that data will be read for will be enabled. The settings for frames that have other IDs will be ignored.

1.11 Configuring the Monitoring of SENT Signals (Applies to the DL850EV)

This section explains the following settings for monitoring SENT signals:

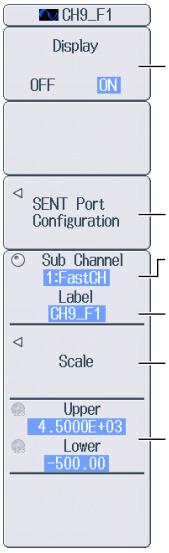
- Waveform display on and off
- SENT frame reading
  SENT format, error channel, input, SENT data extraction conditions
- Sub channel to be configured, Sub channel's display label
- Individual sub channel scale
- Zooming by specifying the magnification of each sub channel
- Display range
- Error count reset
- Trace (input channel assignment)

► "SENT Signal Monitoring (Applies to the DL850EV)" in the Features Guide

CH Menu

Press a key from **CH9** to **CH16** to display the following menu.

When the sub channel is
1 to 3: FastCH, 5 to 9: SlowCH, or 5 to 9: SlowCH/FastCH



Turns the waveform display on and off

Press to configure SENT frame reading settings.

Select the sub channel to be configured (using the job shuttle).

Press to set the sub channel's display label.

Set the sub channel scale (Auto, Default).

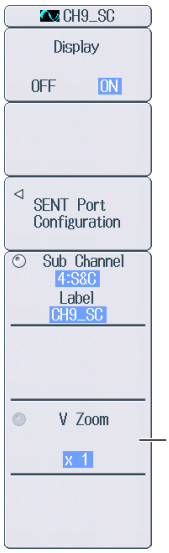
Set the sub channel display range (using the jog shuttle).

The types of data acquired in sub channels are as follows.

Sub Channel	Data Type		
1:FastCH			
2:FastCH	FastCH		
3:FastCH			
4:S&C	S&C (Stauts & Communication)		
		When Fast Channel Multiplexing is set to ON*	
5:SlowCH		**5:SlowCH/FastCH**	
6:SlowCH		**6:SlowCH/FastCH**	
7:SlowCH	SlowCH	**7:SlowCH/FastCH**	SlowCH or FastCH
8:SlowCH		**8:SlowCH/FastCH**	
9:SlowCH		**9:SlowCH/FastCH**	
10:Error Trigger	Error Trigger		
11:Error Count	Error Count		

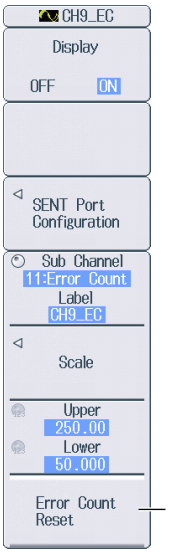
* For details on Fast Channel Multiplexing, see "Setting the SENT Format (SENT Format Setup)."

When the sub channel is 4:S&C or 10:Error Trigger



Zoom the sub channel by specifying the magnification (using the jog shuttle).

When the sub channel is 11:Error Count



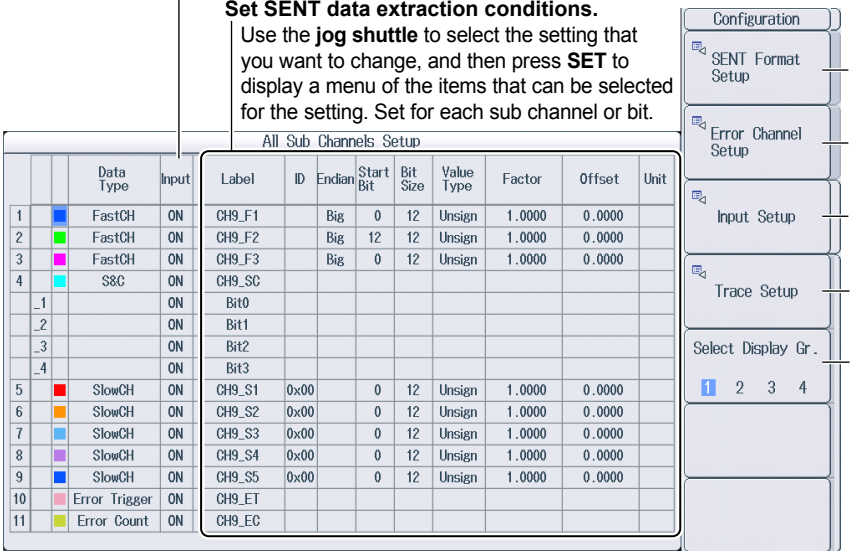
Executes the manual resetting of the error count

Configuring SENT Frame Reading Settings (SENT Format Configuration)

Press the **SENT Format Configuration** soft key to display the following screen.

Set sub channels to ON or OFF.
Set the input of each sub channel to ON or OFF.
If the data type is S&C, turn the display on or off for each bit.

Set SENT data extraction conditions.
Use the **jog shuttle** to select the setting that you want to change, and then press **SET** to display a menu of the items that can be selected for the setting. Set for each sub channel or bit.



			Data Type	Input	Label	ID	Endian	Start Bit	Bit Size	Value Type	Factor	Offset	Unit
1			FastCH	ON	CH9_F1		Big	0	12	Unsign	1.0000	0.0000	
2			FastCH	ON	CH9_F2		Big	12	12	Unsign	1.0000	0.0000	
3			FastCH	ON	CH9_F3		Big	0	12	Unsign	1.0000	0.0000	
4			S&C	ON	CH9_SC								
	_1			ON	Bit0								
	_2			ON	Bit1								
	_3			ON	Bit2								
	_4			ON	Bit3								
5			SlowCH	ON	CH9_S1	0x00		0	12	Unsign	1.0000	0.0000	
6			SlowCH	ON	CH9_S2	0x00		0	12	Unsign	1.0000	0.0000	
7			SlowCH	ON	CH9_S3	0x00		0	12	Unsign	1.0000	0.0000	
8			SlowCH	ON	CH9_S4	0x00		0	12	Unsign	1.0000	0.0000	
9			SlowCH	ON	CH9_S5	0x00		0	12	Unsign	1.0000	0.0000	
10			Error Trigger	ON	CH9_ET								
11			Error Count	ON	CH9_EC								

Set the SENT Format.

Set the Error Channels.

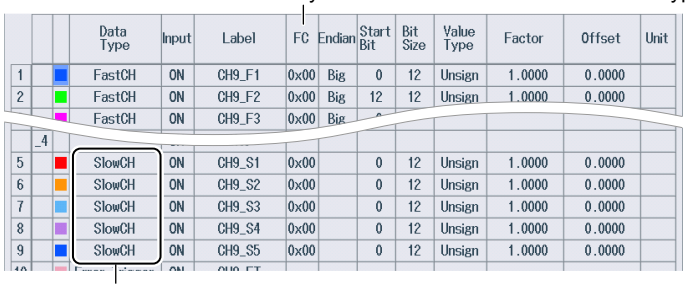
Set the input.

Press to set the traces. ► section 1.1

Set the display group (1, 2, 3, 4)

- **When Fast Channel Multiplexing is set to ON**

If you select a sub channel whose data type (Data Type) is set to FastCH, the ID column changes to an FC column, and you can set FC (Frame Control).
If you select a sub channel whose data type is set to SlowCH, you can set ID.

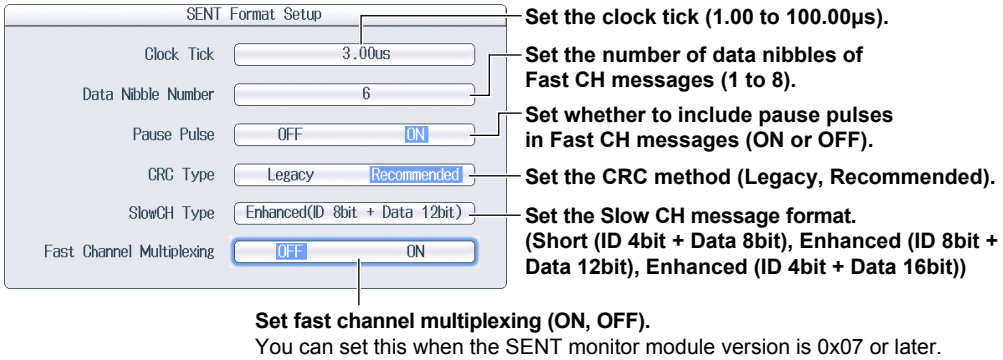


			Data Type	Input	Label	FC	Endian	Start Bit	Bit Size	Value Type	Factor	Offset	Unit
1			FastCH	ON	CH9_F1	0x00	Big	0	12	Unsign	1.0000	0.0000	
2			FastCH	ON	CH9_F2	0x00	Big	12	12	Unsign	1.0000	0.0000	
			FastCH	ON	CH9_F3	0x00	Big						
	_4												
5			SlowCH	ON	CH9_S1	0x00		0	12	Unsign	1.0000	0.0000	
6			SlowCH	ON	CH9_S2	0x00		0	12	Unsign	1.0000	0.0000	
7			SlowCH	ON	CH9_S3	0x00		0	12	Unsign	1.0000	0.0000	
8			SlowCH	ON	CH9_S4	0x00		0	12	Unsign	1.0000	0.0000	
9			SlowCH	ON	CH9_S5	0x00		0	12	Unsign	1.0000	0.0000	

Switch the data type (FastCH, SlowCH).

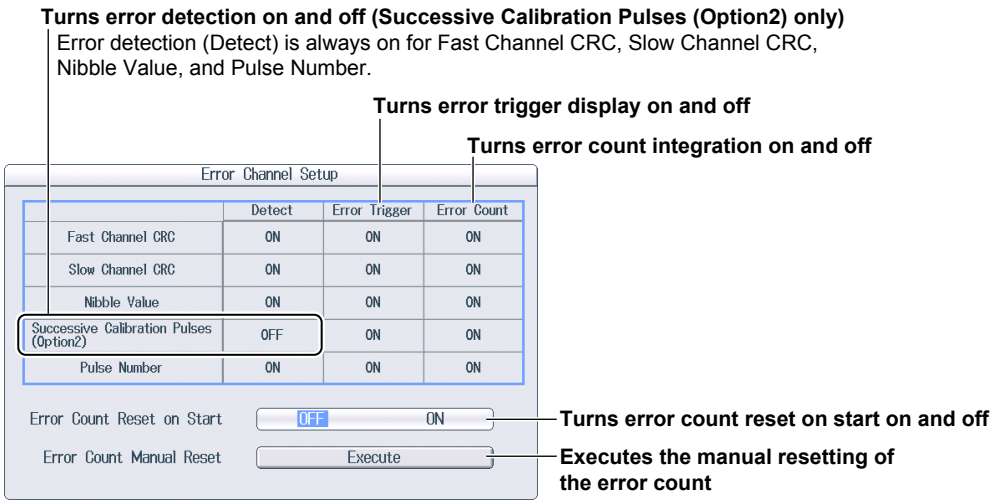
Setting the SENT Format (SENT Format Setup)

Press the **SENT Format Setup** soft key to display the following screen.



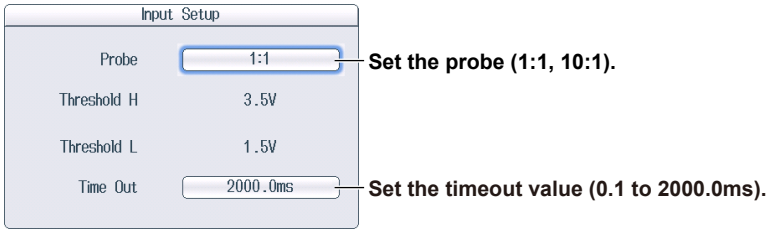
Setting Error Channels (Error Channel Setup)

Press the **Error Channel Setup** soft key to display the following screen.



Setting the Input (Input Setup)

Press the **Input Setup** soft key to display the following screen.



1.12 Displaying the Menu for Configuring All Channels

This section explains the following settings (which are used when configuring all channels):

- Input
- Linear scaling
- Copying
- Strain balance (strain module)

► "Displaying the Menu for Configuring All Channels (ALL CH)" in the Features Guide

ALL CH Menu

Press **ALL CH** to display the following menu.

Press to configure the input settings.

Press to configure the linear scaling.

Press to copy the vertical axis settings to the specified channels.

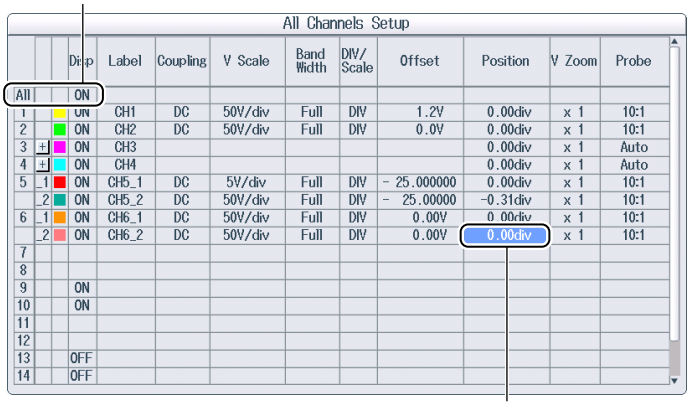
Press to configure the strain balance.

Configuring Input Settings (Setup)

Press the **Setup** soft key to display the following screen.

Use the **jog shuttle** to select the setting that you want to change, and then press **SET** to display a menu of the items that can be selected for the setting.

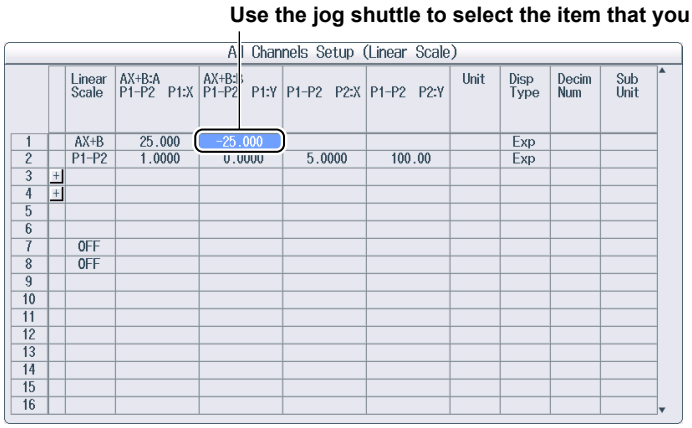
Use this item to turn all channels on and off.



Use the jog shuttle to select the item that you want to set.

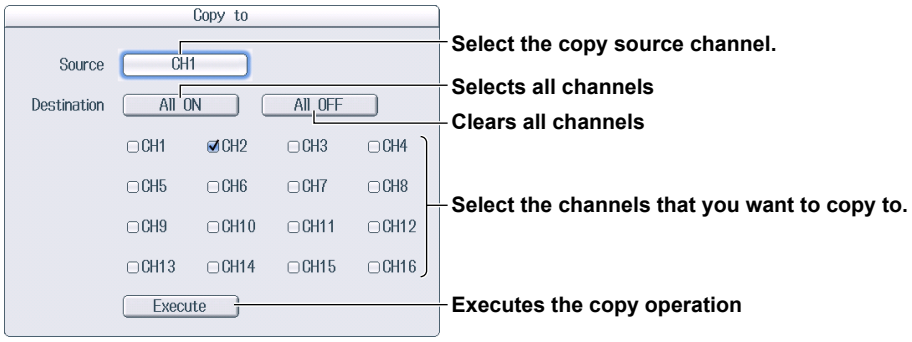
Configuring the Linear Scaling (Linear Scale)

Press the **Linear Scale** soft key to display the following screen.



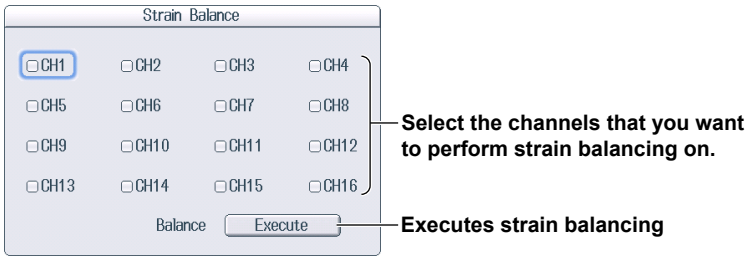
Copying the Vertical Axis Settings to the Specified Channels (Copy to)

Press the **Copy to** soft key to display the following screen.



Configuring the Strain Balance (Strain Balance)

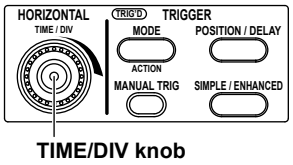
Press the **Strain Balance** soft key to display the following screen.



1.13 Configuring the Horizontal Axis (Time axis)

Set the time per grid (1 div) displayed on the screen.
Turn the **TIME/DIV** knob to set the value.

► “Horizontal Axis” in the Features Guide



TIME/DIV knob

Display of the TIME/DIV Screen

If you turn the TIME/DIV knob when waveform acquisition is stopped, two values are shown on the TIME/DIV screen. The upper value is the current TIME/DIV value for the displayed waveforms. The lower value is the changed TIME/DIV value. The changed TIME/DIV value will be applied the next time that waveform acquisition is started.

Upper value: The acquisition mode
Lower value: The current TIME/DIV value for the displayed waveform

Turn the TIME/DIV knob.

Upper value: The current TIME/DIV value for the displayed waveform
Lower value: The TIME/DIV value that will be applied the next time that waveform acquisition is started

2.1 Setting the Trigger Mode

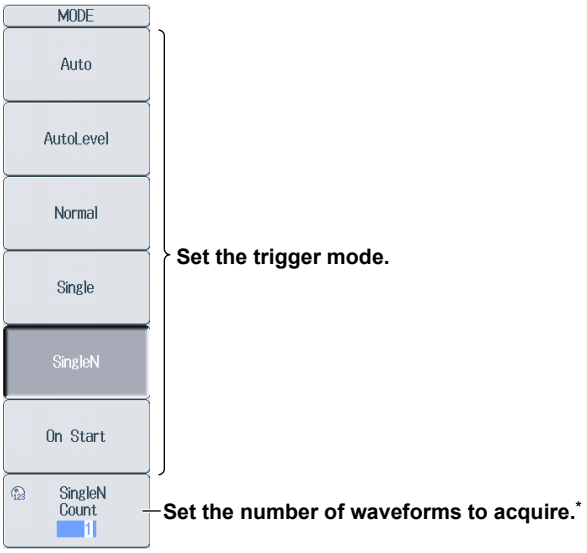
This section explains the following setting (which is used when updating the displayed waveform):

- Trigger mode

► "Trigger Mode (Mode)" in the Features Guide

MODE Menu

Press **MODE** to display the following menu.



*** Displayed when the trigger mode is set to SingleN.**

Setting the Trigger Mode (Mode)

Auto: If the trigger conditions are met within 50 ms, the DL850E/DL850EV updates the displayed waveforms on each trigger occurrence. If not, the DL850E/DL850EV automatically updates the displayed waveforms. If the time axis is set to a value that would cause the display to switch to roll mode, the roll mode display will be enabled.

Auto Level: If a trigger occurs before a timeout (which is approximately 1 second), the DL850E/DL850EV updates the waveform in the same way that it does in Auto mode. If a trigger does not occur before a timeout, the DL850E/DL850EV automatically changes the trigger level to the center value of the trigger source amplitude, triggers on that value, and updates the displayed waveform.

Normal: The DL850E/DL850EV only updates the waveform display when the trigger conditions are met.

Single: When the trigger conditions are met, the DL850E/DL850EV updates the displayed waveform once and stops signal acquisition. If the time axis is set to a range that causes the display to switch to roll mode, the roll mode display will be enabled. When the DL850E/DL850EV triggers, it begins recording data. When data has been acquired up to the amount specified by the set record length, the waveform display stops.

SingleN: The DL850E/DL850EV acquires signals each time the trigger conditions are met until a specified number of signals have been acquired, and then displays all of the acquired signals. If no triggers occur, the display is not updated.

On Start: Regardless of the trigger settings, when you press the START key, the DL850E/DL850EV updates the displayed waveforms once and stops signal acquisition. If the time axis is set to a value that would cause the display to switch to roll mode, the roll mode display will be enabled. When data has been acquired up to the amount specified by the set record length, the waveform display stops.

2.2 Setting the Trigger Position and Trigger Delay

This section explains the following settings (which are used when updating the displayed waveform):

- Trigger position
- Trigger delay

► **"Trigger Position (Position)" and "Trigger Delay (Delay)" in the Features Guide.**

POSITION/DELAY Menu

Press **POSITION/DELAY** to display the following menu.

Set the trigger position (using the jog shuttle).

Set the trigger position to 10%.

Set the trigger position to 50%.

Set the trigger position to 90%.

Set the trigger delay (using the jog shuttle).

2.3 Setting the Trigger Hold-Off

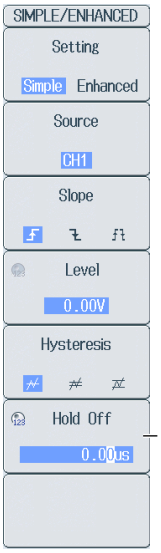
This section explains the following setting (which is used when updating the displayed waveform):

- Hold-off time

► "Trigger Hold-Off (Hold Off)" in the Features Guide

SIMPLE/ENHANCED Menu

Press **SIMPLE/ENHANCED** to display the following menu.



Set the trigger hold-off (using the jog shuttle).

Setting the Hold-off Time (Hold off)

The trigger hold-off feature temporarily stops the detection of the next trigger once a trigger has occurred.

2.4 Triggering on an Edge Trigger (Simple)

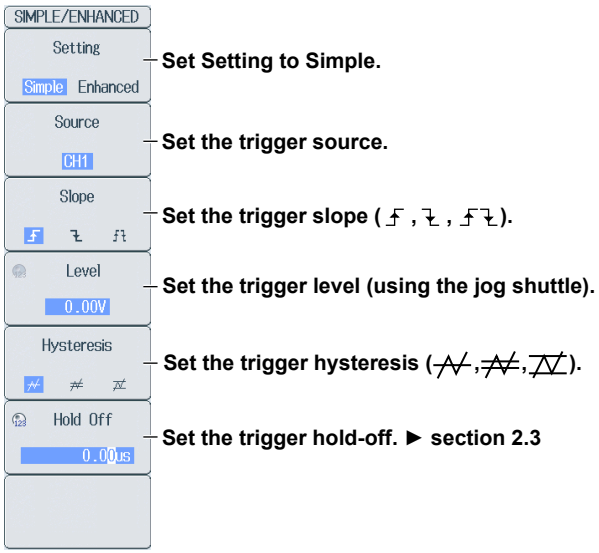
This section explains the following settings (which are used when triggering on the edges of an analog-signal trigger source):

- Trigger source
- Trigger slope
- Trigger level
- Trigger hysteresis

► **"Simple Trigger (Simple)," "Trigger Source (Source)," "Trigger Slope (Slope)," "Trigger Level (Level)," and "Trigger Hysteresis (Hysteresis)" in the Features Guide.**

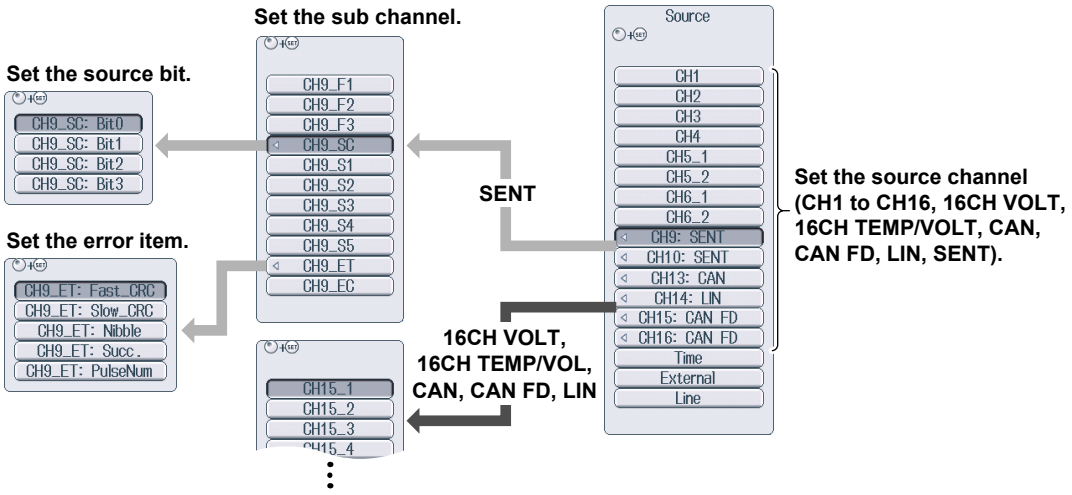
SIMPLE CH Menu

Press **SIMPLE/ENHANCED** and then the **Setting** soft key to select Simple to display the following menu.



Setting the Trigger Source (Source)

Press the **Source** soft key to display the following menu.



* The displayed options vary depending on the installed module, waveform display (Display) on/off state, and waveform label settings. For CAN, CAN FD, LIN, and SENT, sub channel whose input (Input) is set to OFF cannot be selected.

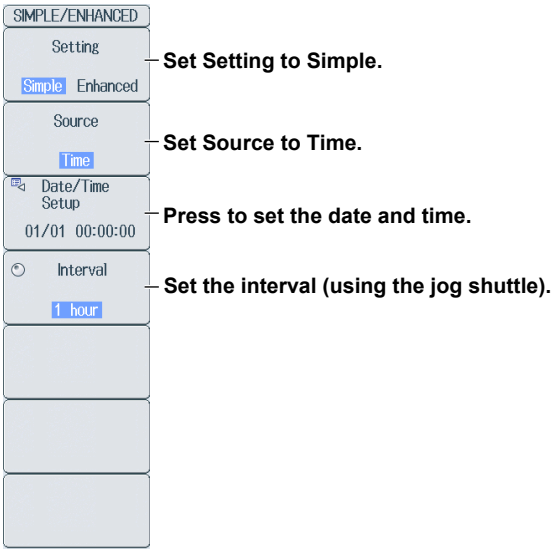
2.5 Triggering on a Timer Trigger (Simple)

This section explains the settings that are used when triggering on a date and time.

► “Time (Time)” and “Trigger Source (Source)” in the Features Guide.

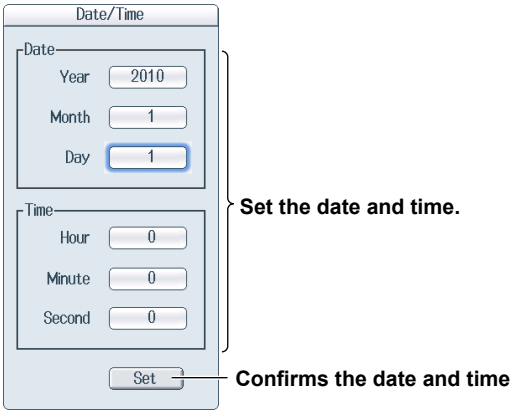
SIMPLE Time Menu

Press **SIMPLE/ENHANCED** and then the **Setting** soft key to select Simple to display the following menu.



Setting the Date and Time (Date/Time Setting)

Press the **Date/Time Setting** soft key to display the following screen.



2.6 Triggering on an External Trigger (Simple)

This section explains the settings that are used when triggering on an external signal.

► **"External Signal (External)," "Trigger Source (Source)," and "Trigger Slope (Slope)" in the Features Guide.**

SIMPLE External Menu

Press **SIMPLE/ENHANCED** and then the **Setting** soft key to select Simple to display the following menu.

Set Setting to Simple.

Set Source to External.

Set the trigger slope (⊥, ⊤).

Set the trigger hold-off. ► section 2.3

2.7 Triggering on a Power Line Signal (Simple)

This section explains the settings that are used when triggering on a power line signal.

► **"Power Line Signal (Line)" and "Trigger Source (Source)" in the Features Guide.**

SIMPLE Line Menu

Press **SIMPLE/ENHANCED** and then the **Setting** soft key to select Simple to display the following menu.

Set Setting to Simple.

Set Source to Line.

Set the trigger hold-off. ► section 2.3

2.8 Triggering on a Logic Trigger (Simple)

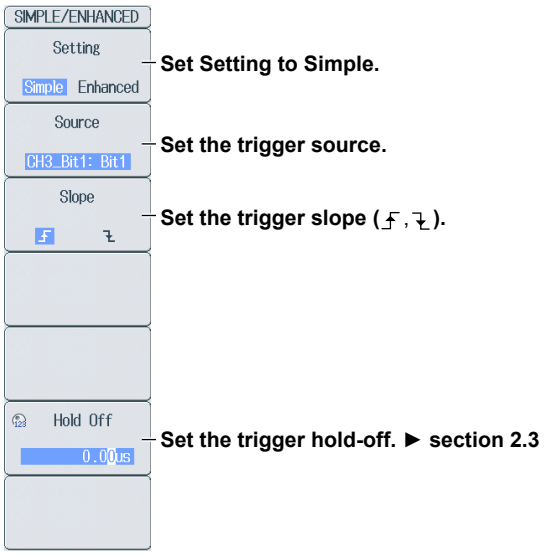
This section explains the following settings (which are used when triggering on the edges of a logic-signal trigger source):

- Trigger source
  Source bit
- Trigger slope

► **"Simple Trigger (Simple)," "Trigger Source (Source)," and "Trigger Slope (Slope)" in the Features Guide.**

SIMPLE CH Menu

Press **SIMPLE/ENHANCED** and then the **Setting** soft key to select Simple to display the following menu.



Set Setting to Simple.

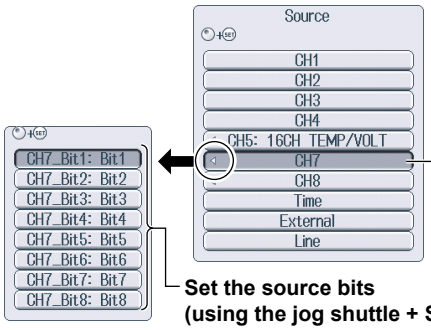
Set the trigger source.

Set the trigger slope (↑, ↓).

Set the trigger hold-off. ► section 2.3

Setting the Trigger Source (Source)

Press the **Source** soft key to display the following menu.



Set the source channel (using the jog shuttle + SET).

Set the source bits (using the jog shuttle + SET).

2.9 Triggering on an A -> B(N) Trigger (Enhanced)

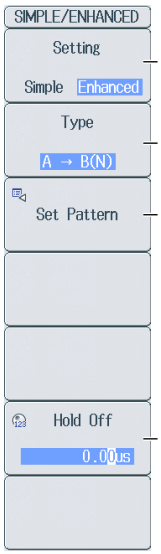
This section explains the following settings (which are used when triggering on an A -> B(N) trigger):

- Trigger source
- State condition
- State condition achievement condition
- Number of times state condition B must be met
- Trigger condition

► "A -> B(N) Trigger (Enhanced)" in the Features Guide

ENHANCED A -> B(N) Trigger Menu

Press **SIMPLE/ENHANCED** and then the **Setting** soft key to select Enhanced to display the following menu.



Set Setting to Enhanced.

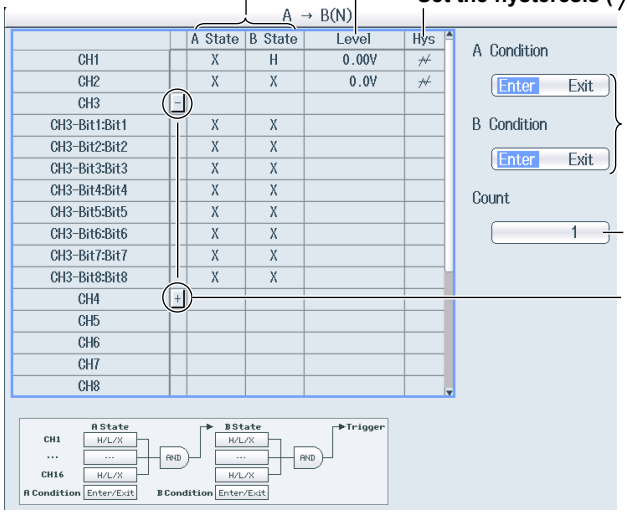
Set Type to A -> B(N).

Press to set the state and trigger conditions.

Set the trigger hold-off. ► section 2.3

Setting the State and Trigger Conditions (Set Pattern)

Press the **Set Pattern** soft key to display the following menu.



Set the state condition (H, L, or X (do not use as a trigger source)).

Set the trigger level.

Set the hysteresis (, ,).

Set the state condition achievement conditions (Enter, Exit).

Set the number of times state condition B must be met.

On a module with logic inputs or sub channels, expand the menu, and set each bit or sub channel.

2.10 Triggering on an A Delay B Trigger (Enhanced)

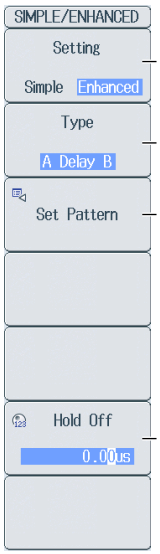
This section explains the following settings (which are used when triggering on an A Delay B trigger):

- Trigger source
- State condition
- State condition achievement condition
- Delay time
- Trigger condition

► "A Delay B Trigger (Enhanced)" in the Features Guide

ENHANCED A Delay B Trigger Menu

Press **SIMPLE/ENHANCED** and then the **Setting** soft key to select Enhanced to display the following menu.



Set Setting to Enhanced.

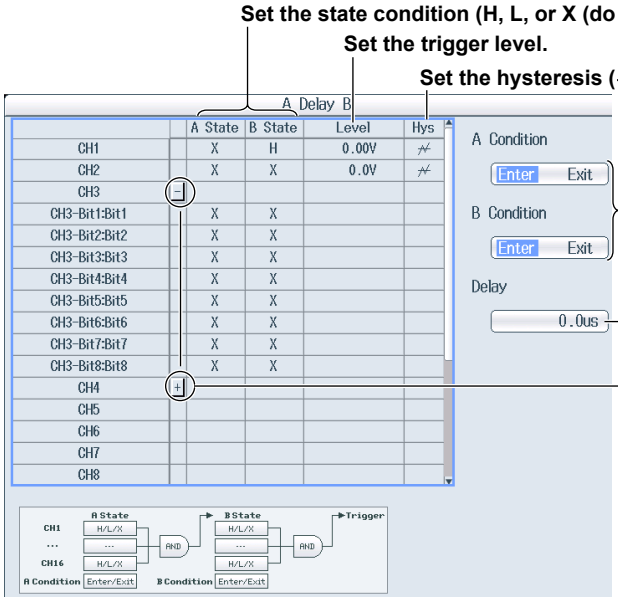
Set Type to A Delay B.

Press to set the state and trigger conditions.

Set the trigger hold-off. ► section 2.3

Setting the State and Trigger Conditions (Set Pattern)

Press the **Set Pattern** soft key to display the following menu.



Set the state condition (H, L, or X (do not use as a trigger source)).

Set the trigger level.

Set the hysteresis (⩘, ⩘, ⩘).

Set the state condition achievement conditions (Enter, Exit).

Set the delay time.

On a module with logic inputs or sub channels, expand the menu, and set each bit or sub channel.

2.11 Triggering on an Edge On A Trigger (Enhanced)

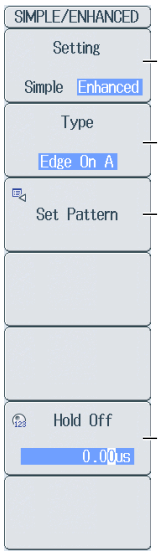
This section explains the following settings (which are used when triggering on an Edge On A trigger):

- Trigger source
- State condition
- State condition achievement condition
- Edge detection condition
- Trigger condition

► "Edge On A Trigger (Enhanced)" in the Features Guide

ENHANCED Edge On A Trigger Menu

Press **SIMPLE/ENHANCED** and then the **Setting** soft key to select Enhanced to display the following menu.



Set Setting to Enhanced.

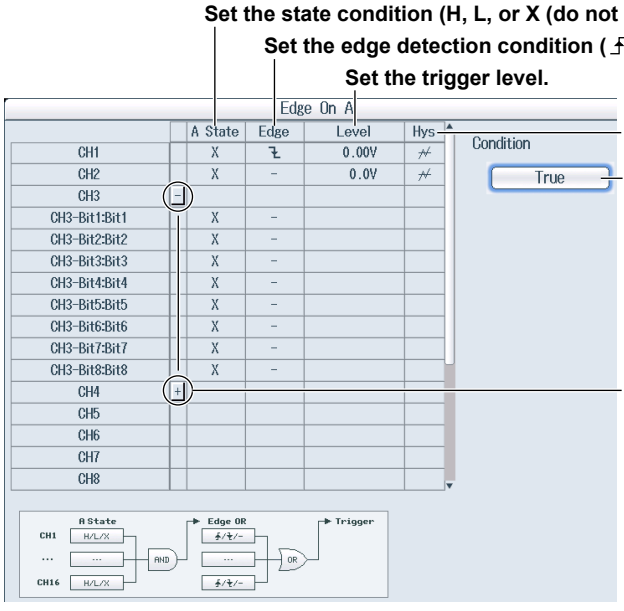
Set Type to Edge On A.

Press to set the state and trigger conditions.

Set the trigger hold-off. ► section 2.3

Setting the State and Trigger Conditions (Set Pattern)

Press the **Set Pattern** soft key to display the following menu.



Set the state condition (H, L, or X (do not use as a trigger source)).

Set the edge detection condition (, , —).

Set the trigger level.

Set the hysteresis (, ,).

Set the state condition achievement conditions (True, False).

On a module with logic inputs or sub channels, expand the menu, and set each bit or sub channel.

2.12 Triggering on an OR or AND Trigger (Enhanced)

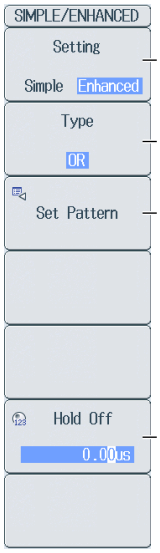
This section explains the following settings (which are used when triggering on an OR or AND trigger):

- Trigger source
- Edge detection condition (OR trigger)
- Achievement condition (AND trigger)
- Trigger condition

► "OR Trigger (Enhanced)" and "AND Trigger (Enhanced)" in the Features Guide

ENHANCED OR Trigger Menu

Press **SIMPLE/ENHANCED** and then the **Setting** soft key to select Enhanced to display the following menu.



Set Setting to Enhanced.

Set Type to OR.

Press to set the state and trigger conditions.

Set the trigger hold-off. ► section 2.3

Setting the State and Trigger Conditions (Set Pattern)

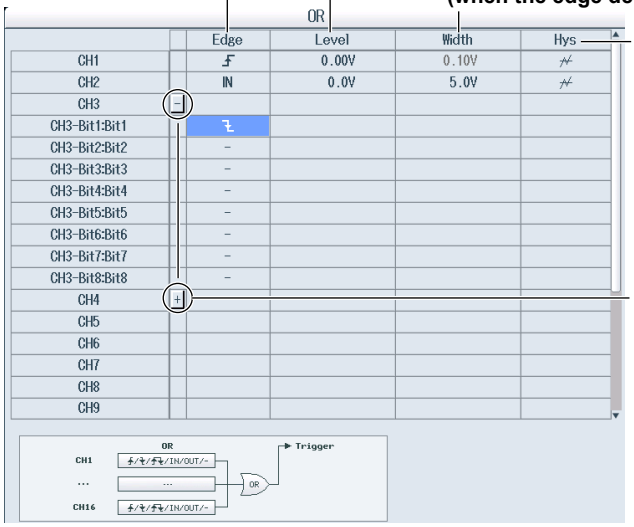
Press the **Set Pattern** soft key to display the following menu.

Set the edge detection condition (, , IN, OUT, —).

Set the trigger level.

Set the level width (when the edge detection condition is set to IN or OUT).

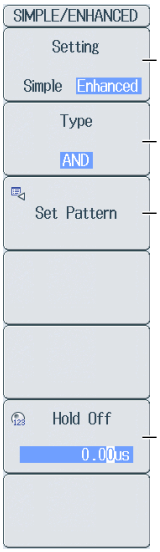
Set the hysteresis (, ,).



On a module with logic inputs or sub channels, expand the menu, and set each bit or sub channel.

ENHANCED AND Trigger Menu

Press **SIMPLE/ENHANCED** and then the **Setting** soft key to select Enhanced to display the following menu.



Set Setting to Enhanced.

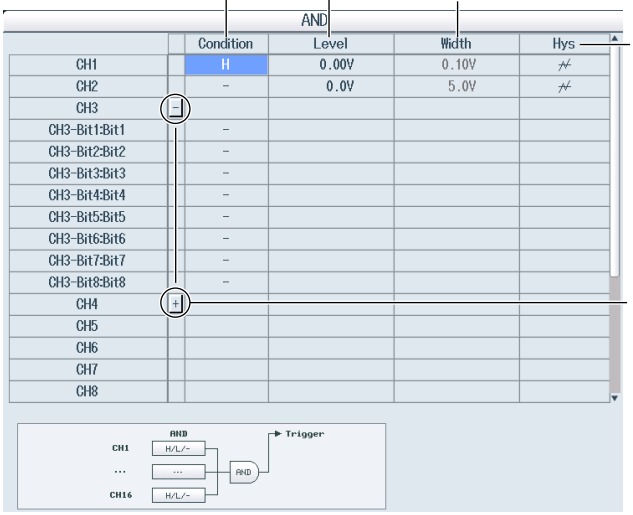
Set Type to AND.

Press to set the state and trigger conditions.

Set the trigger hold-off. ► section 2.3

Setting the State and Trigger Conditions (Set Pattern)

Press the **Set Pattern** soft key to display the following menu.



Set the achievement condition (H, L, IN, OUT, —).

Set the trigger level.

Set the level width (when the achievement condition is set to IN or OUT).

Set the hysteresis (, ,).

On a module with logic inputs or sub channels, expand the menu, and set each bit or sub channel.

2.13 Triggering on a Period Trigger (Enhanced)

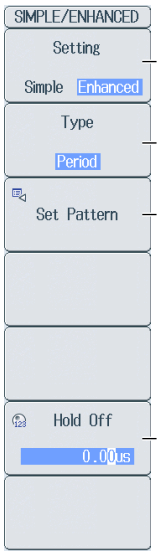
This section explains the following settings (which are used when triggering on a period trigger):

- Trigger source
- State condition
- Reference mode
- Reference time
- Trigger condition

► "Period Trigger (Enhanced)" in the Features Guide

ENHANCED Period Trigger

Press **SIMPLE/ENHANCED** and then the **Setting** soft key to select Enhanced to display the following menu.



Set Setting to Enhanced.

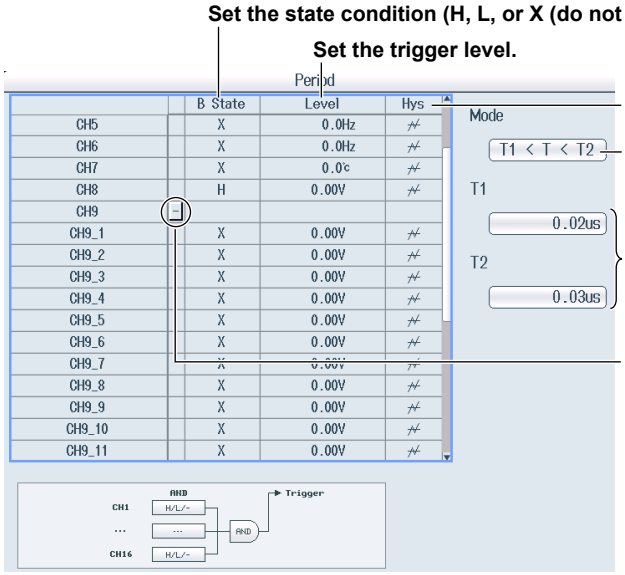
Set Type to Period.

Press to set the state and trigger conditions.

Set the trigger hold-off. ► section 2.3

Setting the State and Trigger Conditions (Set Pattern)

Press the **Set Pattern** soft key to display the following menu.



Set the state condition (H, L, or X (do not use as a trigger source)).

Set the trigger level.

Set the hysteresis (⩘, ⩘, ⩘).

Set the reference mode.

Set the reference time.*

On a module with logic inputs or sub channels, expand the menu, and set each bit or sub channel.

*** Set T1 and T2 when the reference mode is T1 < T < T2 or T <T1, T2 < T.**
Set Time when the reference mode is T < Time or T > Time.

Setting the Reference Mode (Mode)

Set what kind of relationship must be established between period T and the specified reference times (Time or T1 and T2) for the DL850E/DL850EV to trigger.

T < Time	Period T must be shorter than the reference time (Time).
T > Time	Period T must be longer than the reference time (Time).
T1 < T < T2	Period T must be longer than reference time T1 and shorter than reference time T2.
T < T1, T2 <T	Period T must be shorter than reference time T1 or longer than reference time T2.

2.14 Triggering on a Pulse Width Trigger (Enhanced)

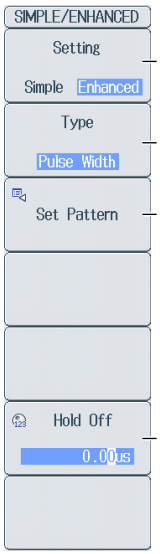
This section explains the following settings (which are used when triggering on a pulse width trigger):

- Trigger source
- State condition
- Reference mode
- Reference time
- Trigger condition

► "Pulse Width Trigger (Enhanced)" in the Features Guide

ENHANCED Pulse Width Trigger Menu

Press **SIMPLE/ENHANCED** and then the **Setting** soft key to select **Enhanced** to display the following menu.



Set Setting to Enhanced.

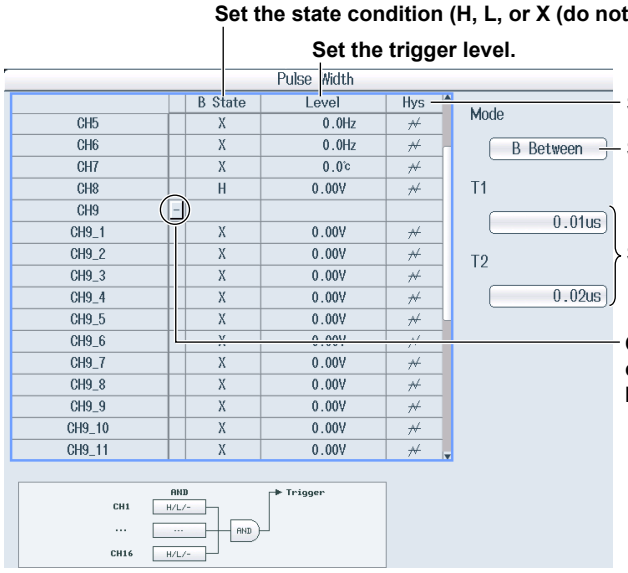
Set Type to Pulse Width.

Press to set the state and trigger conditions.

Set the trigger hold-off. ► section 2.3

Setting the State and Trigger Conditions (Set Pattern)

Press the **Set Pattern** soft key to display the following menu.



Set the state condition (H, L, or X (do not use as a trigger source)).

Set the trigger level.

Set the hysteresis (, ,).

Set the reference mode.

Set the reference time.*

On a module with logic inputs or sub channels, expand the menu, and set each bit or sub channel.

*** Set T1 and T2 when the reference mode is B Between.**
Set Time when the reference mode is B < Time, B > Time, or B TimeOut.

Setting the Reference Mode (Mode)

Set what kind of relationship must be established between the state condition B achievement time and the specified reference times (Time or T1 and T2) for the DL850E/DL850EV to trigger.

B < Time	The DL850E/DL850EV triggers when the achievement time is shorter than the reference time (Time), and the state condition changes from being met to not being met.
B > Time	The DL850E/DL850EV triggers when the achievement time is longer than the reference time (Time), and the state condition changes from being met to not being met.
B TimeOut	The DL850E/DL850EV triggers when the achievement time is longer than the reference time (Time).
B Between	The DL850E/DL850EV triggers when the achievement time is longer than reference time T1 and shorter than reference time T2, and the state condition changes from being met to not being met.

2.15 Triggering on a Wave Window Trigger (Enhanced)

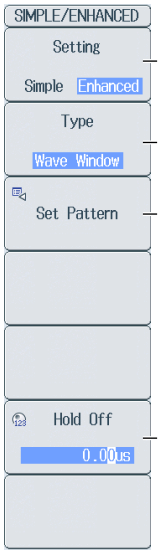
This section explains the following settings (which are used when triggering on a wave window trigger):

- Target channel
  Tolerance width, cycle frequency, and reference cycle
- Synchronization channel
- Trigger condition

► "Wave Window Trigger (Enhanced)" in the Features Guide

ENHANCED Wave Window Trigger Menu

Press **SIMPLE/ENHANCED** and then the **Setting** soft key to select **Enhanced** to display the following menu.



Set Setting to Enhanced.

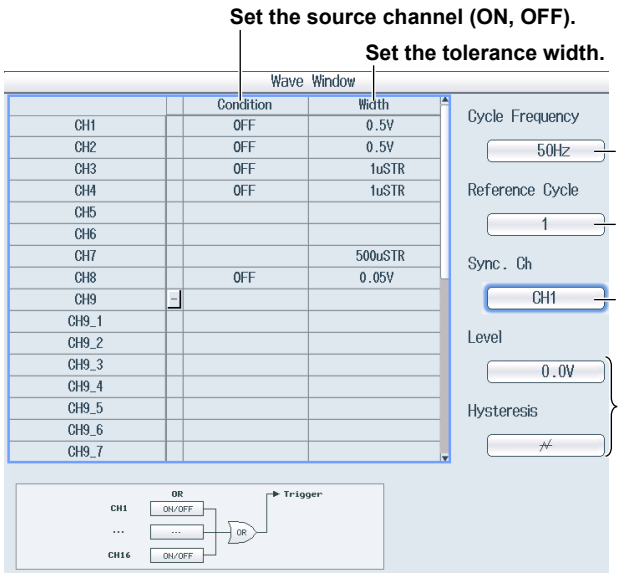
Set Type to Wave Window.

Press to set the trigger conditions

Set the trigger hold-off. ► section 2.3

Setting the Trigger Conditions (Set Pattern)

Press the **Set Pattern** soft key to display the following menu.



Set the cycle frequency.

Set the reference cycle.

Set the synchronization channel (Auto, CH1 to CH16).

Set the level for detecting the start and end points, and set the detection hysteresis.*

* When the synchronization channel is not set to Auto.

2.16 Triggering the DL850E/DL850EV Manually (Manual Trigger)

► “Trigger Type (Type)” in the Features Guide

Press **MANUAL TRIG**.

3.1 Setting Conditions for Waveform Acquisition

This section explains the following settings (which are used when acquiring waveforms):

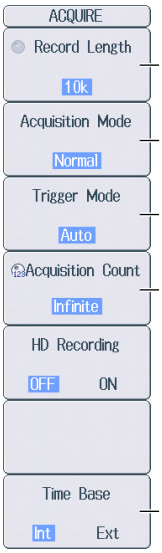
- Record length
- Acquisition mode
- Trigger mode
- Number of times to acquire waveforms
- Time base

► "Waveform Acquisition" in the Features Guide

ACQUIRE Menu

Press **ACQUIRE** to display the following menu.

- **When Acquisition Mode Is Set to Normal, Envelope, or BoxAverage**



Set the record length (using the jog shuttle).

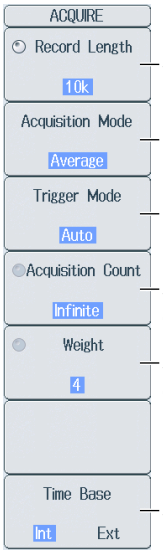
Set Acquisition Mode to Normal, Envelope, or BoxAverage.

Set the trigger mode.

Set the number of times to acquire waveforms (using the jog shuttle).

Set the time base (Int, Ext).

- **When Acquisition Mode Is Set to Average**



Set the record length (using the jog shuttle).

Set Acquisition Mode to Average.

Set the trigger mode.

Set the number of times to acquire waveforms (using the jog shuttle).

Set the attenuation constant (using the jog shuttle).

Set the time base (Int, Ext).

Setting the Acquisition Mode (Mode)

Normal: Displays waveforms without processing the sampled data. You can set the number of waveforms to acquire with the jog shuttle.

Envelope: Displays waveforms in envelope mode. You can set the number of waveforms to acquire with the jog shuttle.

BoxAverage: Displays box-averaged waveforms. You can set the number of waveforms to acquire with the jog shuttle.

Average: Displays averaged waveforms. You can set the attenuation constant and the number of times to average with the jog shuttle.

Setting the Trigger Mode (Trigger Mode)

The trigger mode determines the conditions for updating the displayed waveforms. You can also set the trigger mode by pressing the MODE key. ► section 2.1

You can set the trigger mode to one of the settings below.

Auto, Auto Level, Normal, Single, SingleN, or On Start

3.2 Starting and Stopping Waveform Acquisition

Waveform Acquisition (START/STOP)

Press **START/STOP** to start or stop waveform acquisition.

The key illuminates while the DL850E/DL850EV is acquiring waveforms.

► **"Waveform Acquisition (START/STOP)" in the Features Guide.**

3.3 Using the Dual Capture Feature

This section explains the following waveform settings (which are used when using the dual capture feature):

- Dual capture feature on and off
- Captured waveform settings
  Record length and trigger mode to use to capture waveforms, horizontal axis, and the action to perform after the waveform is acquired
- Specifying and displaying acquired waveforms
- Specifying and displaying waveforms from the list of acquired waveforms
- Zoom factor
- Captured waveform display area on and off
- Percentage of the screen that the main waveform takes up
- Display area layout
- Format of the captured waveform display
- Event waveform display on and off
- Channels that are displayed in the captured waveform display area

► **"Turning Dual Capturing On and Off (Mode)" in the Features Guide.**

DUAL CAPTURE Menu

Press **SHIFT+ACQUIRE** (DUAL CAPTURE) and then the **Mode** soft key to select ON to display the following menu.

Set Mode to ON.

Press to set the conditions for capturing waveforms.

Set the number of the displayed captured waveform (using the jog shuttle).

Displays the list of captured waveforms

Set the zoom factor and the position (using the jog shuttle).

Turns the captured waveform display on and off

Displays the second page of the menu

Note

You cannot use the dual capture feature when the acquisition mode is set to Average.

Press the **Next** soft key to display the second page of the menu.

Set the main waveform's display percentage (50%, 20%, 0%).

Set the screen layout (Side, Vertical).

Set the display format of the capture screen (Main, 1, 2, 3, 4, 5, 6, 8, 12, 16; set using the jog shuttle)

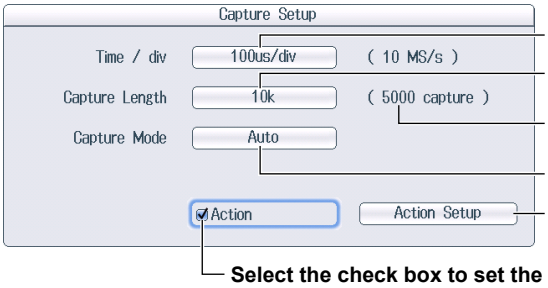
Turns the event display on and off

Press to allocate the channels to display on the capture screen.

Displays the first page of the menu

Setting Waveform Captures (Capture Setup)

Press the **Capture Setup** soft key to display the following screen.



Set the horizontal axis.

Set the capture length (5k, 10k, 25k, 50k, 100k, 250k, 500k).

Maximum number of waveforms that can be captured*

Set the capture mode (Auto, On Start).

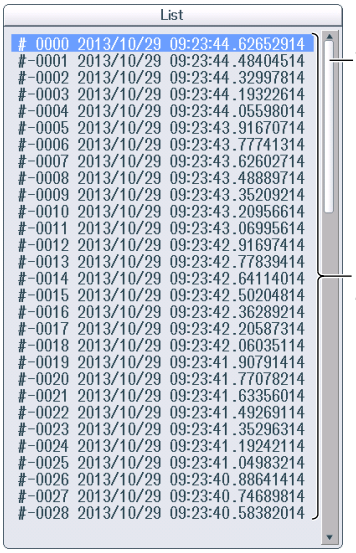
Set the action to perform after waveforms are acquired. ► section 12.1

Select the check box to set the action.

* This differs depending on whether an external memory device or the optional internal HDD is present.

Displaying a List of Captured Waveforms (List)

Press the **List** soft key to display the following screen.

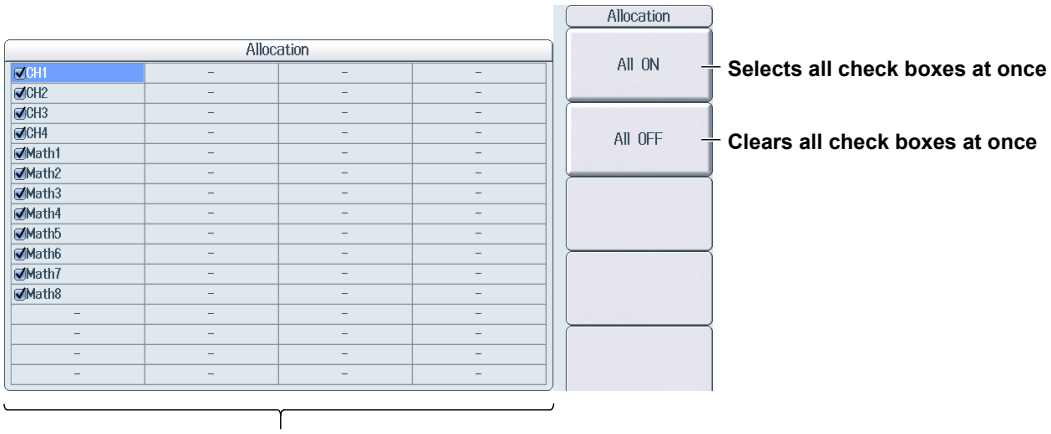


You can use the jog shuttle to scroll the list.

Captured waveforms are displayed in order of their timestamps, starting with the newest capture.

Allocating the Waveforms That You Want to Capture (Allocation)

Press the **Allocation** soft key to display the following screen.



3.4 Recording Data to the Optional Hard Disk

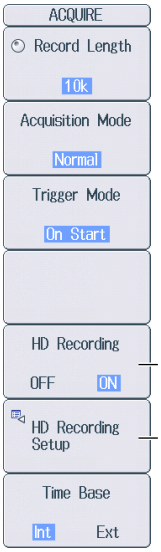
This section explains the following settings (which are used when saving data to the optional hard disk):

- Hard disk recording on and off
- Save destination and file name for recorded data
- File division

► **"Waveform Acquisition" and "Hard Disk Recording (HD RecordCondition; optional)" in the Features Guide**

ACQUIRE Menu

Press **ACQUIRE** and then the **HD Recording** soft key to select ON to display the following menu. (The front-panel HDD RECORDING LED illuminates, and the DL850E/DL850EV can then record data to the hard disk.)

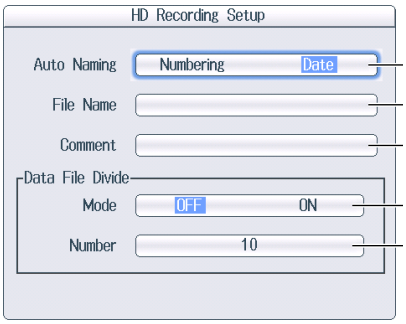


Set HD Recording to ON.

Press to set the recorded data file.

Setting the Recorded Data File (HD Recording Setup)

Press the **HD Recording Setup** soft key to display the following menu.



Set the auto naming (Numbering, Date). ► section 16.4

Set the file name.

Set a comment.

Turns file division on and off

Set the number of divisions.

Recording to the Hard Disk (START/STOP)

Press **START/STOP** to start waveform acquisition and hard disk recording. Press **START/STOP** again to stop waveform acquisition hard disk recording. Even if the set recording time has not been exceeded, the recording will stop.

CAUTION

- If the power supply is interrupted during hard disk recording, the hard disk may be damaged. If this occurs, make a backup of any important data that is stored on the hard disk, and then format it.
- During hard disk recording, do not apply vibration to the DL850E/DL850EV or the hard disk. Doing so may damage the hard disk or may cause errors in hard disk recording.
- During hard disk recording, the  icon blinks in the center of the screen. While this icon is blinking, do not connect the USB storage media to the USB ports for connecting peripheral devices. Doing so may cause the DL850E/DL850EV to malfunction or may corrupt the data that is being recorded to the hard disk.

French

ATTENTION

- Si l'alimentation est coupée pendant l'enregistrement du disque dur, ce dernier risque d'être endommagé. Dans ce cas, effectuez une sauvegarde des données importantes stockées sur le disque dur, puis formatez ce dernier.
- Pendant l'enregistrement du disque dur, n'appliquez aucune vibration à ce dernier ou au DL850E/DL850EV. Vous risqueriez d'endommager le disque dur ou de créer des erreurs lors de l'enregistrement de ce dernier.
- Pendant l'enregistrement du disque dur, l'icône clignote au centre de l'écran. Lorsque cette  icône clignote, ne connectez pas le support de stockage USB aux ports USB prévus à cet effet. Vous risqueriez de causer un dysfonctionnement du DL850E/DL850EV ou d'endommager les données en cours d'enregistrement sur le disque dur.

Note

For information about how to save data, see chapter 16.

4.1 Setting Display Conditions

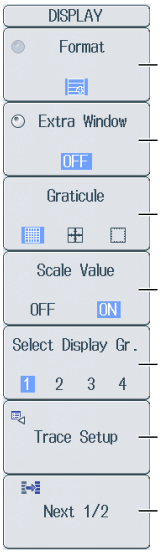
This section explains the following settings (which are used when viewing the display):

- Display format
- Extra window
- Graticule
- Scale value display on and off
- Waveform arrangement and color
- Labels on and off
- Display interpolation

► "Display" in the Features Guide

DISPLAY Menu

Press **DISPLAY** to display the following menu.



Set the display format (Group 1,* 1 (no divisions), 2, 3, 4, 5, 6, 8, 12, 16).

Set the extra window (OFF, 1, 2, 3, 4, 5, 6, 7, 8, Auto).

Set the graticule (dotted line, crosshairs, frame).

Turns the scale value display on and off

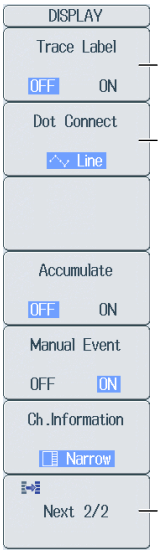
Set the display group (1, 2, 3, 4)

Press to arrange waveforms and set their colors.

Displays the second page of the menu

* The Group 1 option appears when display groups #2 to #4 are selected.

Press the **Next** soft key to display the second page of the menu.



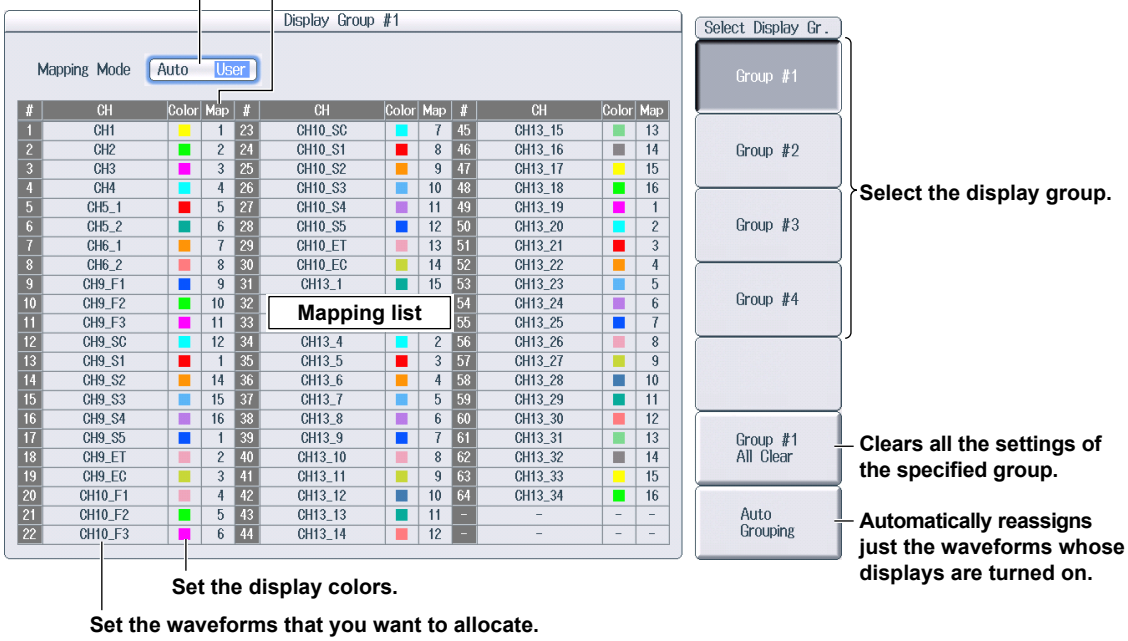
Turns trace labels on and off

Set the display interpolation (OFF, Sine, Line, Pulse).

Displays the first page of the menu

Arranging Waveforms and Setting Their Colors (Trace Setup)

Press the **Trace Setup** soft key to display the following screen.



#	CH	Color	Map	#	CH	Color	Map	#	CH	Color	Map
1	CH1		1	23	CH10_SC		7	45	CH13_15		13
2	CH2		2	24	CH10_S1		8	46	CH13_16		14
3	CH3		3	25	CH10_S2		9	47	CH13_17		15
4	CH4		4	26	CH10_S3		10	48	CH13_18		16
5	CH5_1		5	27	CH10_S4		11	49	CH13_19		1
6	CH5_2		6	28	CH10_S5		12	50	CH13_20		2
7	CH6_1		7	29	CH10_ET		13	51	CH13_21		3
8	CH6_2		8	30	CH10_EC		14	52	CH13_22		4
9	CH9_F1		9	31	CH13_1		15	53	CH13_23		5
10	CH9_F2		10	32				54	CH13_24		6
11	CH9_F3		11	33				55	CH13_25		7
12	CH9_SC		12	34	CH13_4		2	56	CH13_26		8
13	CH9_S1		1	35	CH13_5		3	57	CH13_27		9
14	CH9_S2		14	36	CH13_6		4	58	CH13_28		10
15	CH9_S3		15	37	CH13_7		5	59	CH13_29		11
16	CH9_S4		16	38	CH13_8		6	60	CH13_30		12
17	CH9_S5		1	39	CH13_9		7	61	CH13_31		13
18	CH9_ET		2	40	CH13_10		8	62	CH13_32		14
19	CH9_EC		3	41	CH13_11		9	63	CH13_33		15
20	CH10_F1		4	42	CH13_12		10	64	CH13_34		16
21	CH10_F2		5	43	CH13_13		11	–	–	–	–
22	CH10_F3		6	44	CH13_14		12	–	–	–	–

4.2 Displaying Accumulated Waveforms

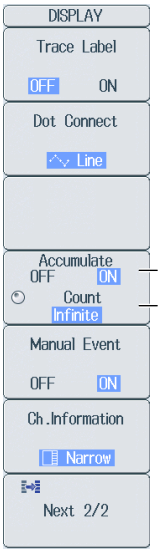
This section explains the following settings (which are used when using the accumulate feature):

- Accumulated display on and off
- Number of times to accumulate waveforms

► **"Accumulate (Accumulate)" in the Features Guide**

DISPLAY Menu

Press **DISPLAY** and then the **Next** soft key to display the second page of the menu.



Set Accumulate to ON.

Set the number of times to accumulate waveforms (Infinite, 2, 4, 8, 16, 32, 64, 128).

4.3 Displaying Manual Events

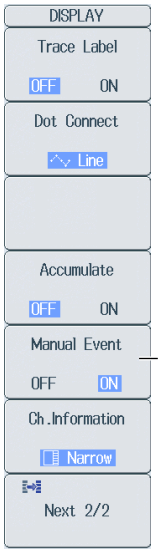
This section explains the following setting (which is used when displaying manual events):

- Manual event display on and off

► “Manual Event (Manual Event)” in the Features Guide

DISPLAY Menu

Press **DISPLAY** and then the **Next** soft key to display the second page of the menu.



Turns the manual event display on and off

4.4 Displaying the Channel Information and the Numeric Monitor

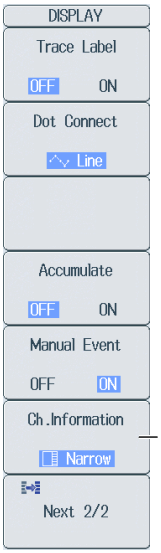
This section explains the following settings (which are used when displaying the channel information and the numeric monitor):

- Size of the channel-information and numeric-monitor display areas
- Displaying the channel information
- Displaying the numeric monitor
- Expanding the waveform display area

► **"Size of the Channel-Information and Numeric-Monitor Display Area (Ch. Information)" in the Features Guide**

DISPLAY Menu

Press **DISPLAY** and then the **Next** soft key to display the second page of the menu.



Set the size of the channel-information and numeric-monitor display area (Full, Narrow, Wide).

Size of the Channel-Information and Numeric-Monitor Display Area

Full: The whole screen is used to display the channel information.
Narrow: The channel information display area is the same width as the setup menu.
Wide: The right half of the screen is used to display the channel information.

Displaying the Channel Information

While the setup menu is displayed, press the **ESC** key twice. The setup menu on the right side of the screen disappears, and the main information for the channels that are being displayed appears.

Displaying the Numeric Monitor

While the channel information is displayed, press the **ESC** key. The channel information disappears, and the numeric monitor for the channels that are being displayed appears.

Expanding the Waveform Display Area

While the numeric monitor is displayed, press the **ESC** key. The numeric monitor disappears, and the waveform display area expands horizontally.
Press the ESC key again to display the channel information.

4.5 Taking Snapshots and Clearing Traces

► “Snapshot (SNAPSHOT)” and “Clear Trace (CLEAR TRACE)” in the Features Guide

Press **SNAPSHOT** to retain the currently displayed waveform on the screen as a snapshot displayed in white. Snapshot waveforms remain on the screen until you execute a clear trace operation.

Press **CLEAR TRACE** to clear all the waveforms that are displayed on the screen.

Note

You can press **SHIFT+SNAPSHOT** to only clear snapshot waveforms.

5.1 Displaying XY Waveforms

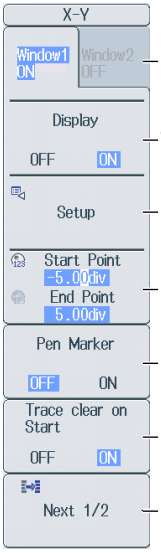
This section explains the following settings (which are used when displaying XY waveforms):

- XY waveform display on and off and source waveforms
- Display range
- Pen markers on and off.
- Trace-clear-on-start on and off
- Main window display
- Screen layout
- Combining displays on and off
- Interpolation
- The number of data points that are used to display waveforms

► "Displaying X-Y Waveforms" in the Features Guide

X-Y Menu

Press **SHIFT+DISPLAY** (X-Y) to display the following menu.



Select whether to set Window1 or Window2.

Turns the X-Y window display on and off

Press to turn the display of XY1 to XY4 (XY5 to XY8) waveforms on and off and set the source waveforms.

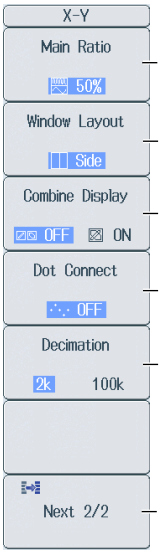
Set the start and end points.

Turns pen markers on and off

Turns the trace-clear-on-start on and off

Displays the second page of the menu

Press the **Next** soft key to display the second page of the menu.



Set the main screen's display percentage (50%, 20%, 0%).

Set the screen layout (Side, Vertical).

Select whether to combine the displays of Window1 and Window2 (ON) or not (OFF).

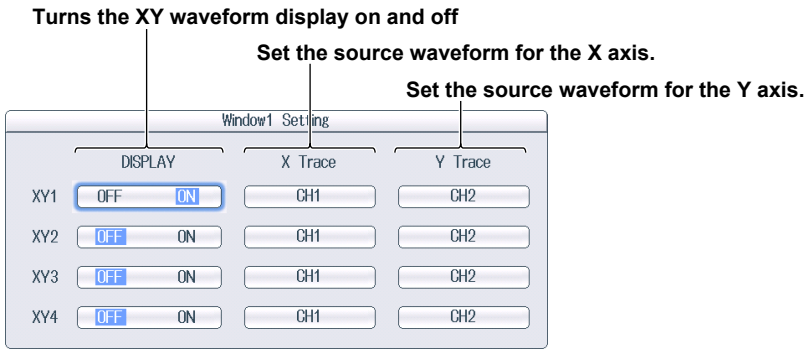
Set the display interpolation (OFF, Line).

Set the number of data points that are used to display waveforms (2k, 100k).

Displays the first page of the menu

Turning the Display of XY1 to XY4 (XY5 to XY8) Waveforms On and Off and Setting the Source Waveforms (Setup)

Press the **Setup** soft key to display the following menu.



6.1 Zooming in on or out of Waveforms

This section explains the following settings (which are used when zooming in on or out of waveforms):

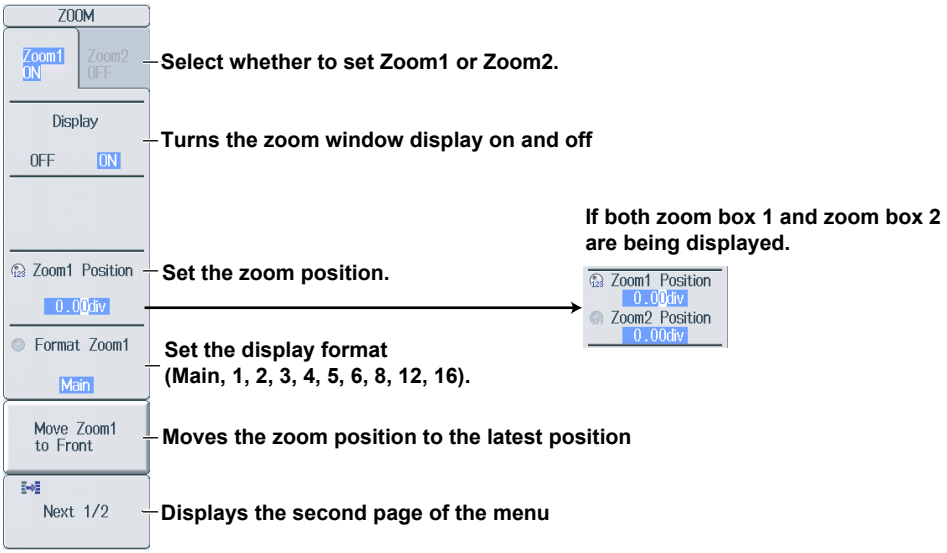
- Zoom box
- Zooming on and off
- Zoom position
- Main window display
- Screen layout
- Display format
- Auto scrolling
- Zoom source waveform
- Adjustment of the range to perform automated measurement of waveform parameters on
- Zoom factor

► "Zooming in on Waveforms" in the Features Guide

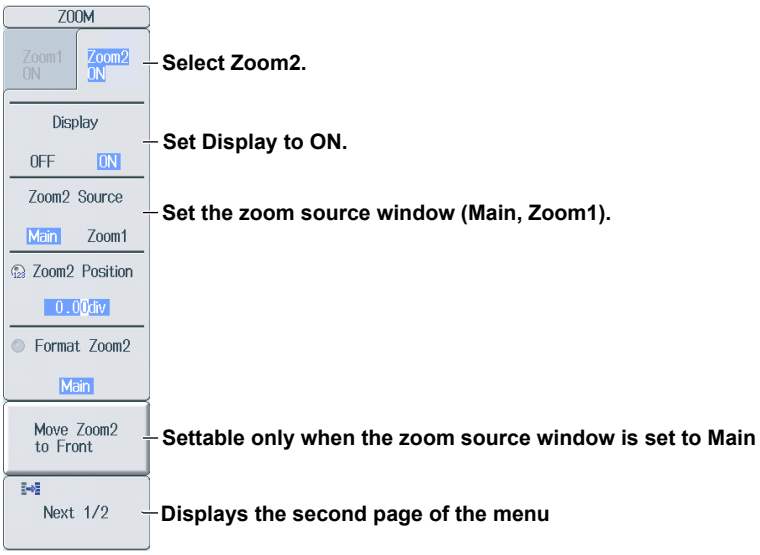
ZOOM Menu

Press **ZOOM** to display the following menu.

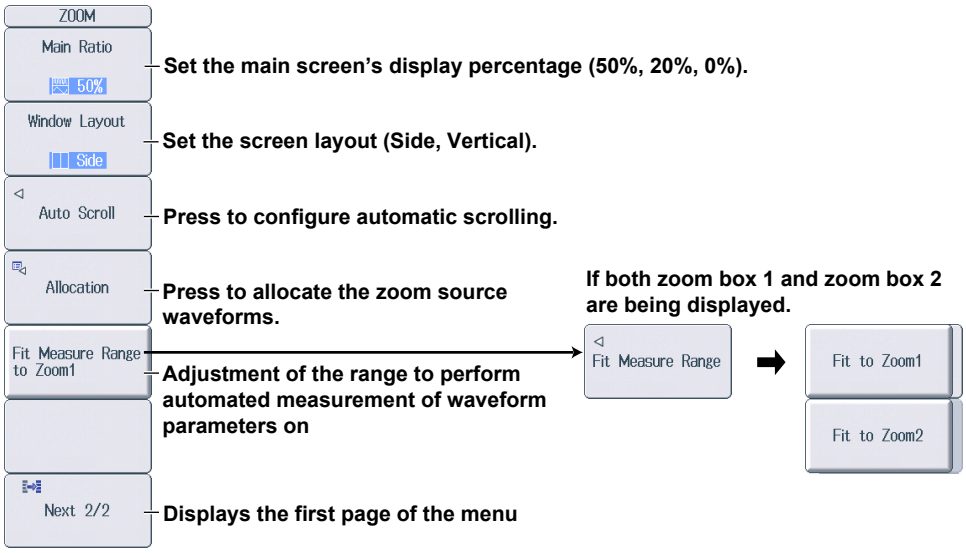
If you press **ZOOM** while no zoom window is displayed on the screen, zoom box 1 is automatically turned on.



When Zoom2 Is Set to ON

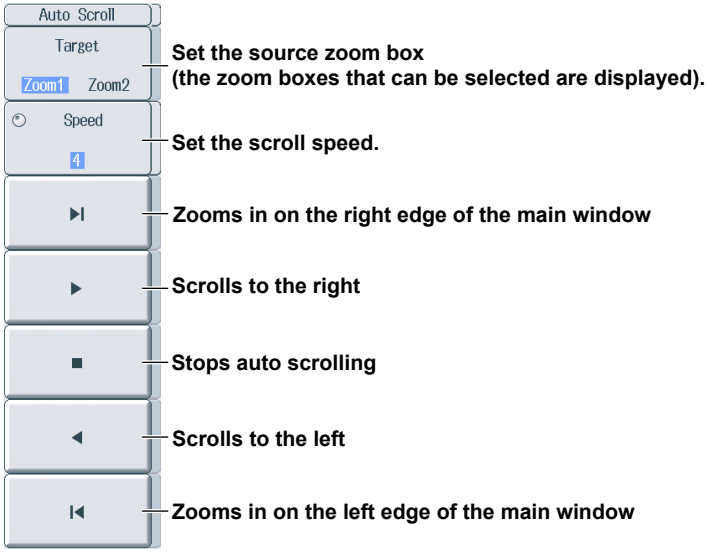


Press the **Next** soft key to display the second page of the menu.



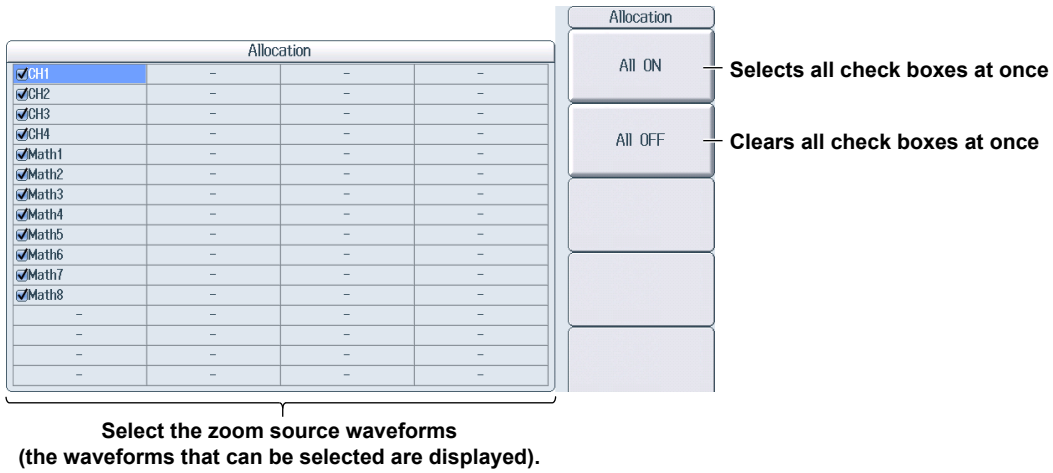
Configuring Automatic Scrolling (Auto Scroll)

Press the **Auto Scroll** soft key to display the following menu.



Allocating Zoom Source Waveforms (Allocation)

Press the **Allocation** soft key to display the following screen.

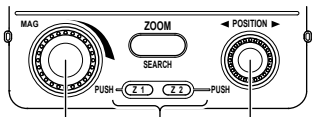


Zoom Factor (MAG knob)

Use the **MAG** knob to set the zoom factor.

The **MAG** knob controls the waveforms in the window whose corresponding indicator, Z1 or Z2, is illuminated.

The **MAG** knob has a push switch. Push the knob to illuminate the Z1 indicator, Z2 indicator, or both indicators. When both the Z1 and Z2 indicators are illuminated, you can set both windows to the same zoom ratio at the same time.



Zoom POSITION knob

Zoom window indicators

MAG knob

Setting the Zoom Position (Zoom POSITION knob)

Use the **Zoom POSITION** knob to set the zoom position.

The **Zoom POSITION** knob controls the waveforms in the window whose corresponding indicator, Z1 or Z2, is illuminated.

The **Zoom POSITION** knob has a push switch. Push the knob to illuminate the Z1 indicator, Z2 indicator, or both indicators. When both the Z1 and Z2 indicators are illuminated, you can set both windows to the same zoom position at the same time.

7.1 Measuring with Horizontal Cursors

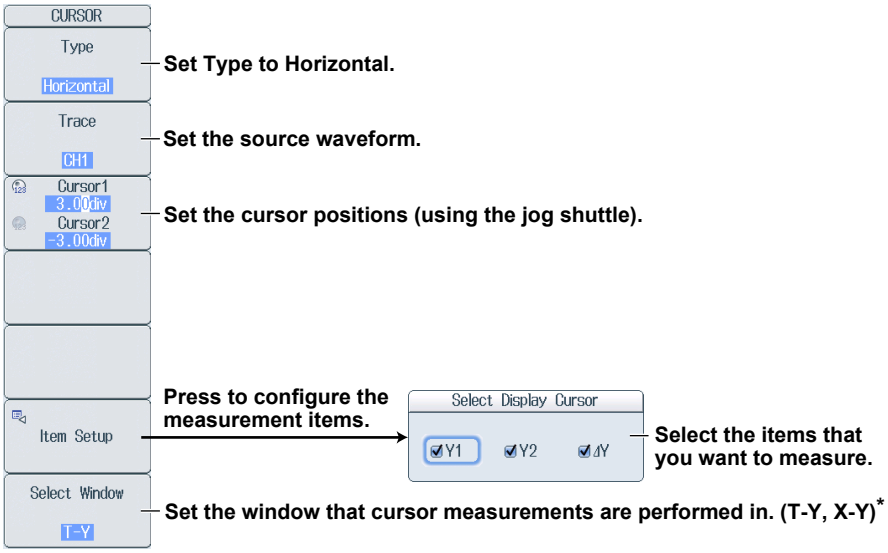
This section explains the following settings (which are used when measuring with horizontal cursors):

- Cursor type
- Source waveform
- Cursor position
- Measurement items
- Measurement source window

► "Horizontal Cursors (Horizontal) - T-Y waveforms,"
"Horizontal Cursors (Horizontal; X-Y)," and
"Turning the X-Y Window Display On and Off (Display)" in the Features Guide.

CURSOR Horizontal Menu

Press **CURSOR**, the **Type** soft key, and then the **Horizontal** soft key to display the following menu.



* This can only be selected when the X-Y window display is turned on.

Setting the Source Waveform (Trace)

The waveforms that you can select differ depending on the cursor-measurement source window.

- T-Y: CH1 to CH16, 16CH VOLT, 16CH TEMP/VOLT, CAN, CAN FD, LIN, SENT, Math1 to Math8
- X-Y: XY1 to XY8

7.2 Measuring with Vertical Cursors

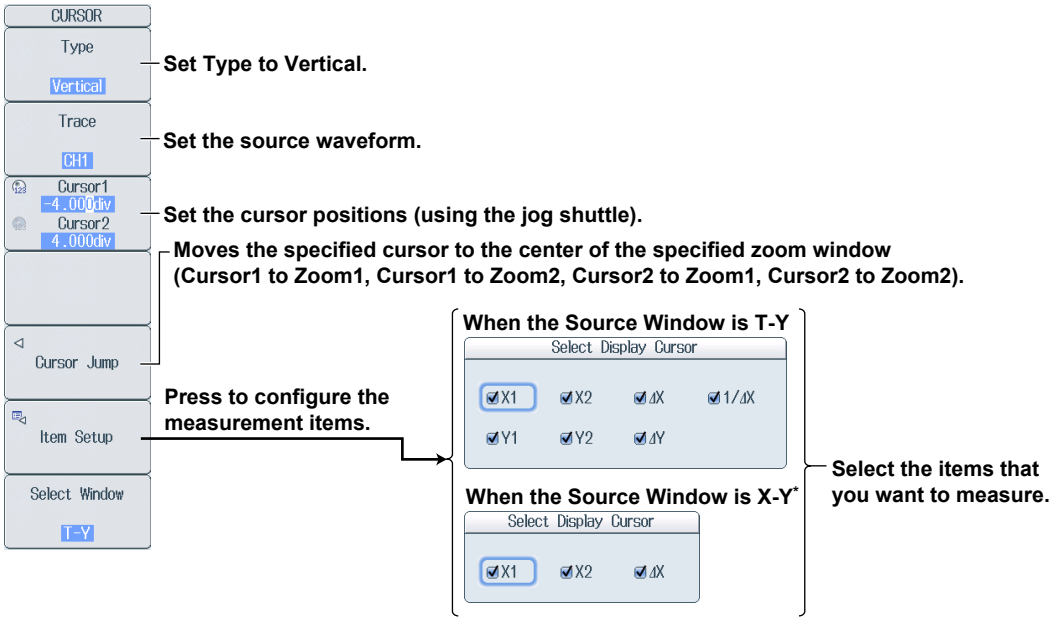
This section explains the following settings (which are used when measuring with vertical cursors):

- Cursor type
- Source waveform
- Cursor position
- Measurement items
- Measurement source window

► **"Vertical Cursors (Vertical) - T-Y waveforms," "Vertical Cursors (Vertical; X-Y)," and "Turning the X-Y Window Display On and Off (Display)" in the Features Guide.**

CURSOR Vertical Menu

Press **CURSOR**, the **Type** soft key, and then the **Vertical** soft key to display the following menu.



* This can only be selected when the X-Y window display is turned on.

Setting the Source Waveform (Trace)

The waveforms that you can select differ depending on the cursor-measurement source window.

- T-Y: All, CH1 to CH16, 16CH VOLT, 16CH TEMP/VOLT, CAN, CAN FD, LIN, SENT, Math1 to Math8
- X-Y: XY1 to XY8

7.3 Measuring with Marker Cursors (Marker)

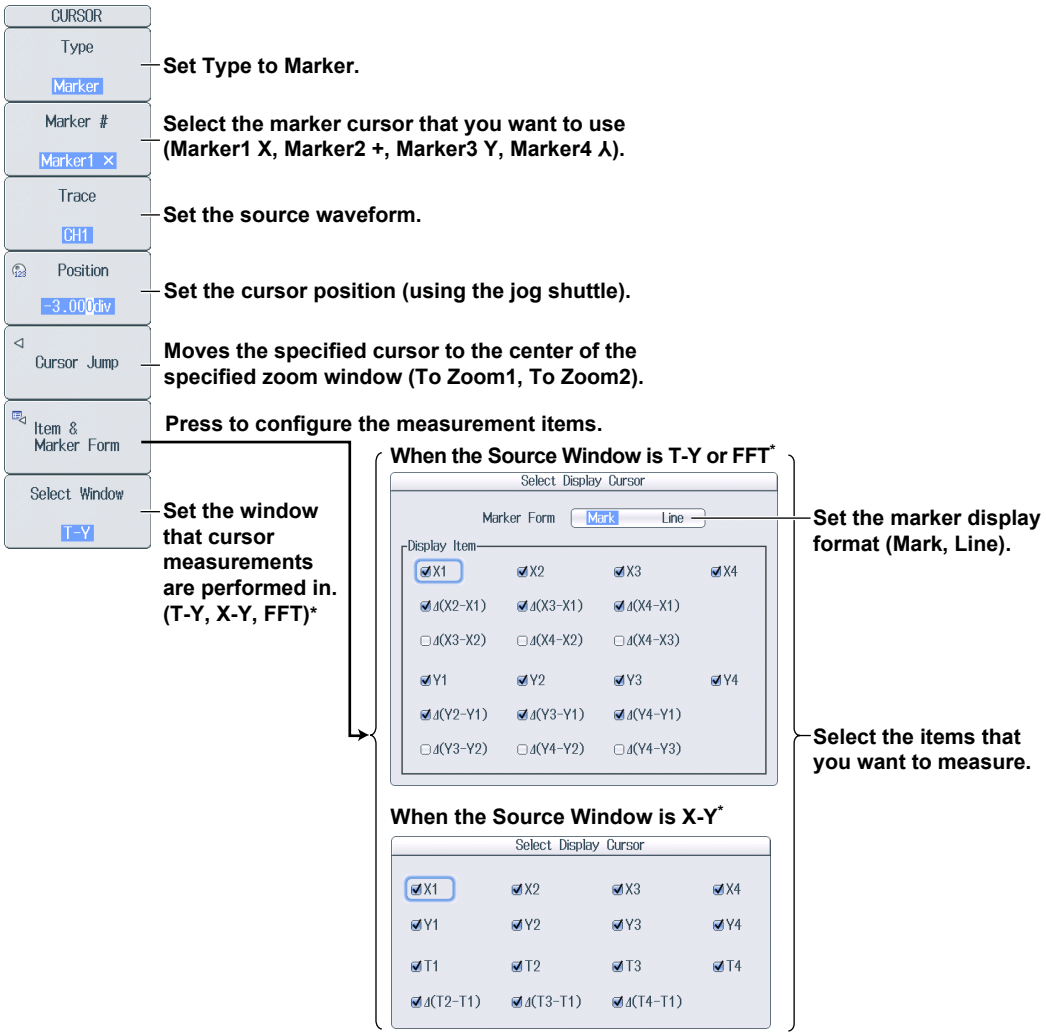
This section explains the following settings (which are used when measuring with marker cursors):

- Cursor type
- Source waveform
- Cursor position
- Marker display format
- Measurement items
- Measurement source window

► **"Marker Cursors (Marker) - T-Y waveforms," "Marker Cursors (Marker; X-Y)," "Marker Cursors (Marker; FFT)," "Turning the X-Y Window Display On and Off (Display)," and "Turning the FFT On and Off (Display)" in the Features Guide.**

CURSOR Marker Menu

Press **CURSOR**, the **Type** soft key, and then the **Marker** soft key to display the following menu.



* This can only be selected when the X-Y window display or FFT window display is turned on.

Setting the Source Waveform (Trace)

The waveforms that you can select differ depending on the cursor-measurement source window.

- T-Y: OFF, CH1 to CH16, 16CH VOLT, 16CH TEMP/VOLT, CAN, CAN FD, LIN, SENT, Math1 to Math8
- X-Y: OFF, XY1 to XY8
- FFT: OFF, FFT1, FFT2

7.4 Measuring with Angle Cursors (Degree)

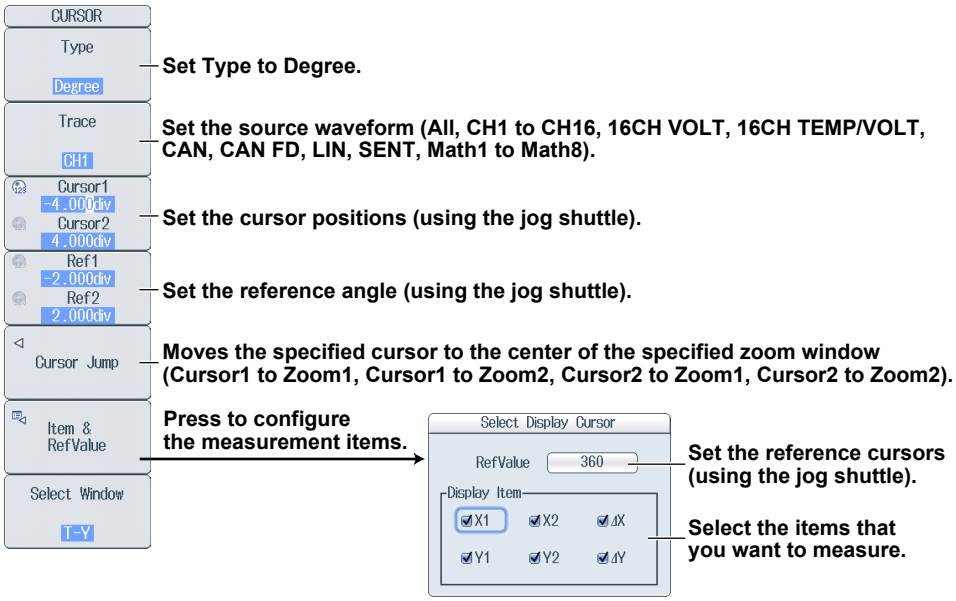
This section explains the following settings (which are used when measuring with angle cursors):

- Cursor type
- Source waveform
- Cursor position
- Reference angle
- Reference cursor
- Measurement items

► “Angle Cursors (Degree) - T-Y waveforms” in the Features Guide

CURSOR Degree Menu

Press **CURSOR**, the **Type** soft key, and then the **Degree** soft key to display the following menu.



7.5 Measuring with Horizontal and Vertical Cursors (H & V)

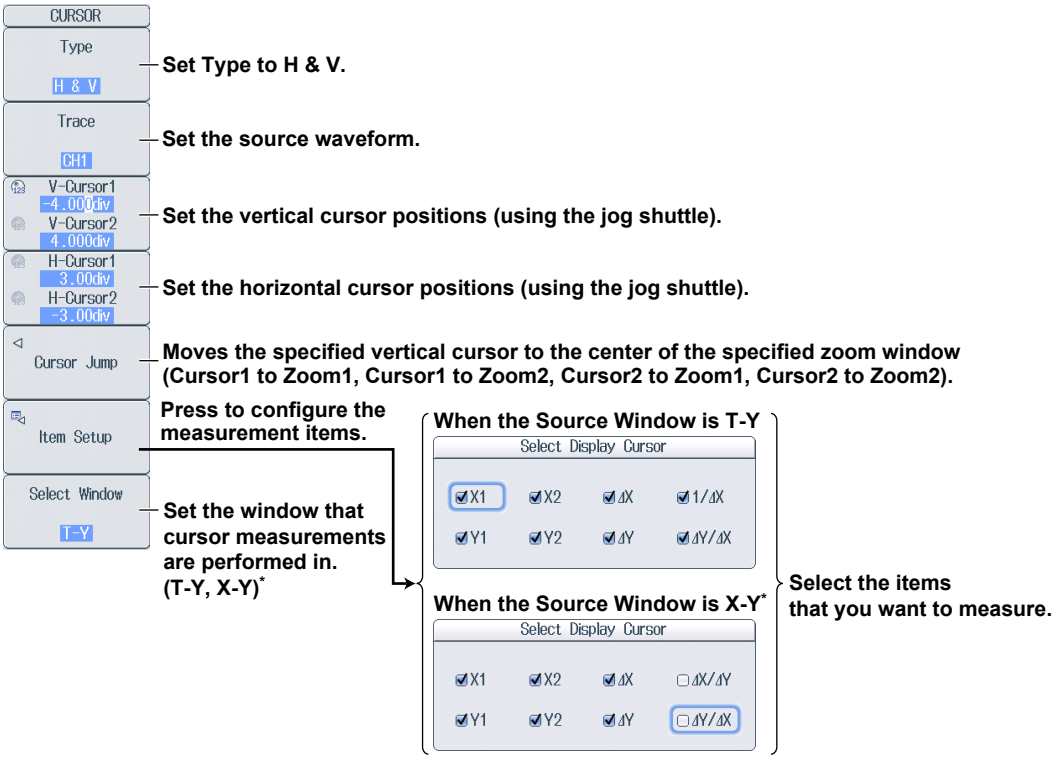
This section explains the following settings (which are used when measuring with horizontal and vertical cursors):

- Cursor type
- Source waveform
- Vertical cursor position
- Horizontal cursor position
- Measurement items
- Measurement source window

► "Horizontal and Vertical Cursors (H & V) - T-Y waveforms,"
"Horizontal and Vertical Cursors (H & V; X-Y)," and
"Turning the X-Y Window Display On and Off (Display)" in the Features Guide.

CURSOR H & V Menu

Press **CURSOR**, the **Type** soft key, and then the **H & V** soft key to display the following menu.



* This can only be selected when the X-Y window display is turned on.

Setting the Source Waveform (Trace)

The waveforms that you can select differ depending on the cursor-measurement source window.

- T-Y: CH1 to CH16, 16CH VOLT, 16CH TEMP/VOLT, CAN, CAN FD, LIN, SENT, Math1 to Math8
- X-Y: XY1 to XY8

7.6 Measuring with Peak Cursors (Peak)

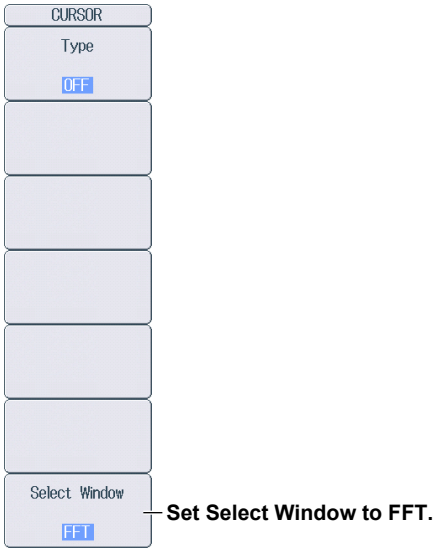
This section explains the following settings (which are used when measuring with peak cursors). You can use peak cursors when the FFT window is displayed.

- Measurement source window
- Cursor type
- Measurement range
- Measurement items

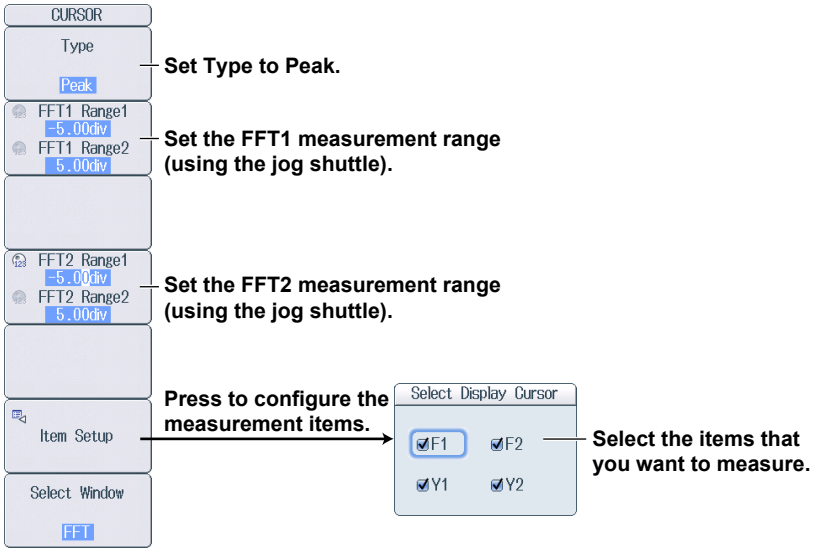
► “Peak Cursors (Peak)” and “Turning the FFT On and Off (Display)” in the Features Guide.

CURSOR Peak Menu

1. Press **CURSOR**, the **Select Window** soft key, and then the **FFT** soft key to display the following menu.



2. Press the **Type** soft key, and then the **Peak** soft key to display the following menu.



Note

On models that do not have the user-defined computation option, the measurement range settings for FFT2 (FFT2 Range 1 and FFT2 Range 2) and measurement items F2 and Y2 do not appear.

8.1 Automatically Measuring Waveform Parameters

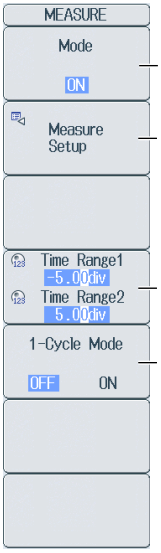
This section explains the following settings (which are used when automatically measuring waveform parameters):

- Automated measurement on and off
- Source waveform and measurement items
- Delay settings
- Period measurement on and off
- Time-measurement reference level
- Measurement source window and measurement time period

► “Automated Measurement of Waveform Parameters” in the Features Guide

MEASURE Menu

Press **MEASURE**, the **Mode** soft key, and then the **ON** soft key to display the following menu.



Turns automated measurement on and off

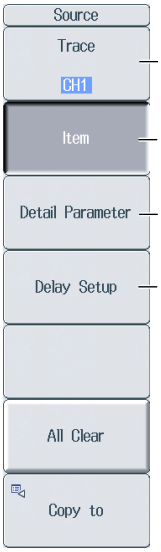
Press to set the source waveform and configure the measurement items.

Set the measurement time period.

Turns cycle mode on and off

Setting the Source Waveform and Configuring the Measurement Items (Measure Setup)

Press the **Measure Setup** soft key to display the following menu.



Set the source waveform*
(CH1 to CH16, 16CH VOLT, 16CH TEMP/VOLT, CAN, CAN FD, LIN, SENT, Math1 to Math8, XY1 to XY8).

Press to configure the measurement items.

Press to configure the time-measurement reference level settings.

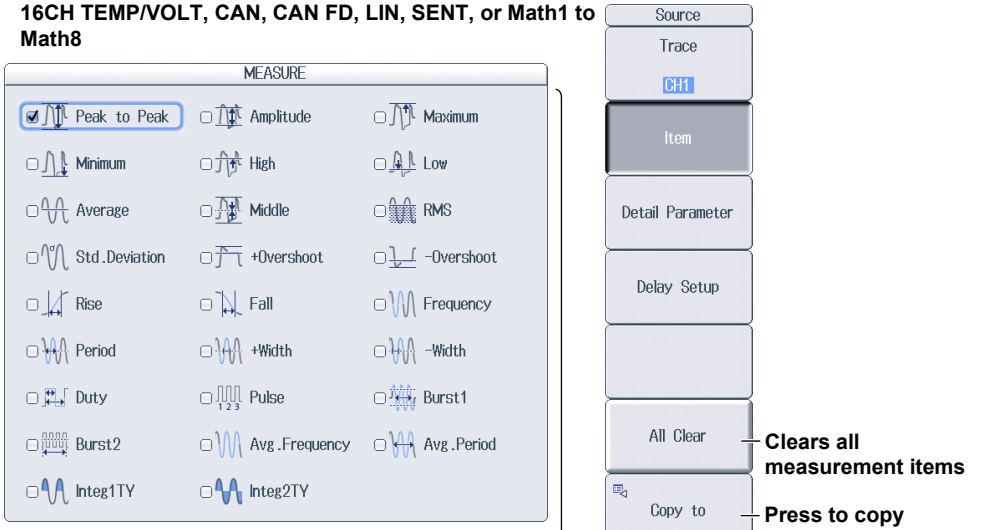
Press to configure the delay settings.

* If you select a logic waveform for Trace, a menu for selecting the source bit or sub channel appears. Select the bit or sub channel to assign to Trace.

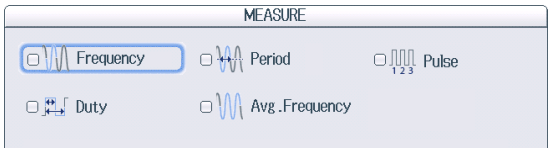
Configuring the Measurement Items (Item)

Press the **Item** soft key to display the following screen.

- **When the Source Waveform is CH1 to CH16, 16CH VOLT, 16CH TEMP/VOLT, CAN, CAN FD, LIN, SENT, or Math1 to Math8**



- **When the Source Waveform is a logic waveform**

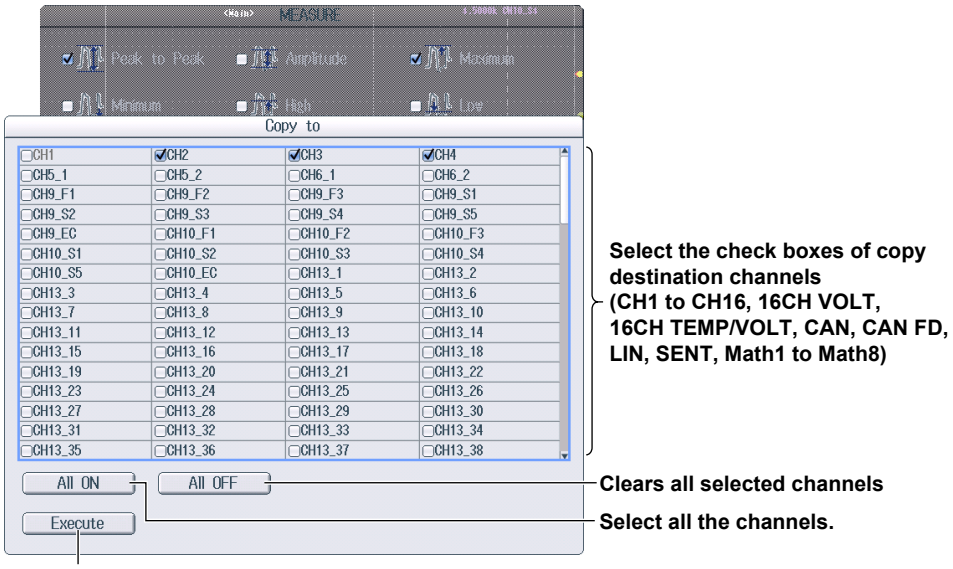


- **When the Source Waveform is XY1 to XY8**

Select the items that you want to measure.

Copying Measurement Items to the Specified Channels (Copy to)

Press the **Copy** soft key to display the following screen.



Select the check boxes of copy destination channels (CH1 to CH16, 16CH VOLT, 16CH TEMP/VOLT, CAN, CAN FD, LIN, SENT, Math1 to Math8)

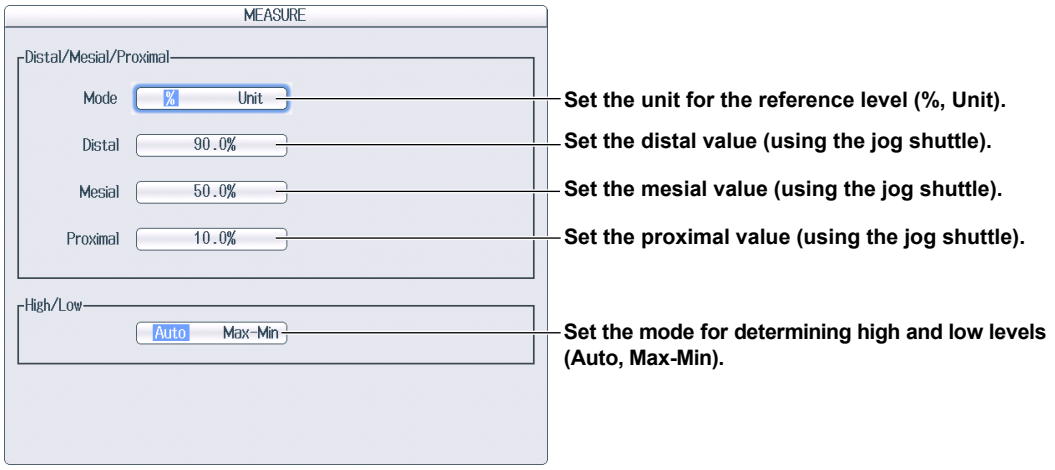
Clears all selected channels

Select all the channels.

Copies the content specified with Item

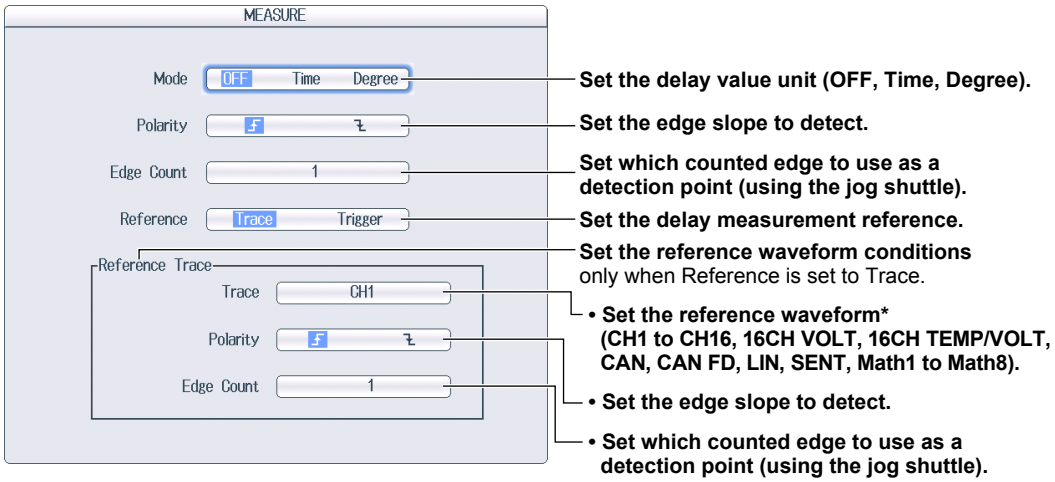
Configuring the Time-Measurement Reference Level Settings (Detail Parameter)

Press the **Detail Parameter** soft key to display the following screen.



Configuring the Delay Items (Delay Setup)

Press the **Delay Setup** soft key to display the following screen.



* If you select a logic waveform for Reference Trace, a menu for selecting the source bit or sub channel appears. Select the bit or sub channel to assign to Reference Trace.

Setting the Measurement Time Period (Time Range1 and Time Range2)

Set the measurement time period within the window specified by **Time Range1** and **Time Range2**.

Note

For hard disk recording waveforms, up to 100 Mpoint from the measurement start point (Time Range1) are measured.

Setting the Cycle Mode (1-Cycle Mode)

- OFF: 1-cycle mode is disabled.
- ON: 1-cycle mode is enabled.

Note

If the interval between Time Range1 and Time Range2 is less than one period, "*****" is displayed for the measured value.

8.2 Performing Normal Statistic Processing

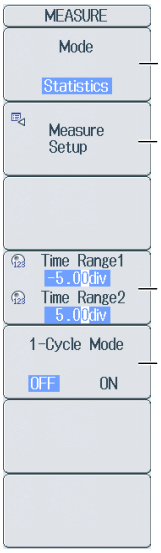
This section explains the following setting (which is used when performing normal statistic processing on the displayed waveforms):

- Turning statistical processing on

► “Normal Statistical Processing (Statistics)” in the Features Guide

MEASURE Menu

Press **MEASURE**, the **Mode** soft key, and then the **Statistics** soft key to display the following menu.



Set Mode to Statistics.

Press to set the source waveform and configure the measurement items. ► section 8.1

Set the measurement time period. ► section 8.1

Turns cycle mode on and off ► section 8.1

8.3 Performing Cycle Statistic Processing

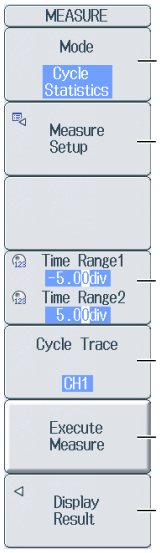
This section explains the following settings (which are used when performing cycle statistic processing on the displayed waveforms):

- Turning cycle statistics on
- Source waveforms that are used to determine the period
- Displaying results

► “Cyclic Statistical Processing (Cycle Statistics)” in the Features Guide

MEASURE Menu

Press **MEASURE**, the **Mode** soft key, and then the **Cycle Statistics** soft key to display the following menu.



Set Mode to Cycle Statistics.

Press to set the source waveform and configure the measurement items. ► section 8.1

Set the measurement time period. ► section 8.1

Set the cycle trace.*

Executes the measurement

Displays the measured results

* If you select a logic waveform for Cycle Trace, a menu for selecting the source bit or sub channel appears. Select the bit or sub channel to assign to Cycle Trace.

Setting the Cycle Trace (Cycle Trace)

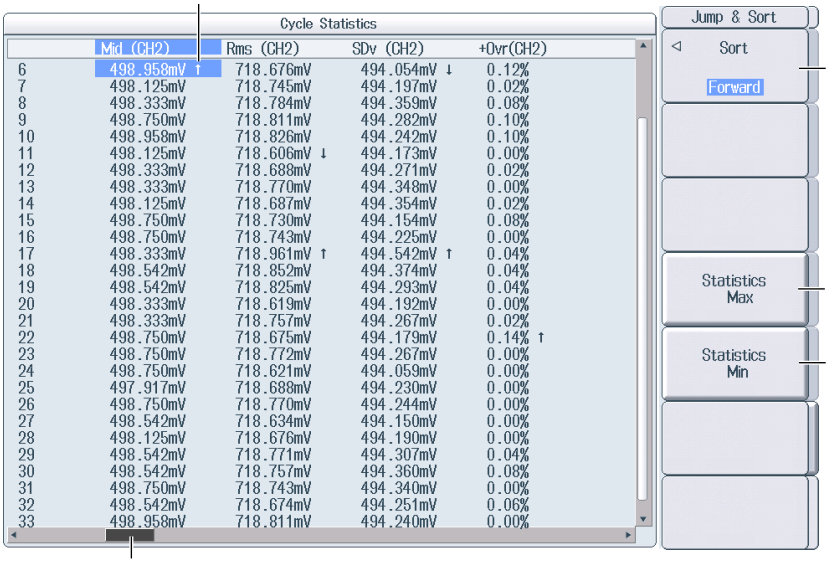
Own: The DL850E/DL850EV determines the period of each source waveform. It then automatically measures the waveform parameters and performs statistical processing once per period. However, if signals that have different periods are applied to multiple channels, the number of iterations of automated measurement and statistical processing for each signal is equal to the number of periods in the slowest signal.

CH1 to CH16, 16CH VOLT, 16CH TEMP/VOLT, CAN, CAN FD, LIN, SENT, Math1 to Math8: The DL850E/DL850EV automatically measures the waveform parameters of all the source waveforms and performs statistical processing on the measured values once per period of the specified channel.

Displaying the Measured Results (Display Result)

Press **MEASURE** and then the **Display Result** soft key to display the following screen.

↑: Displayed by the maximum value of each measurement item.
↓: Displayed by the minimum value of each measurement item.



Select the sort method (Forward, Reverse).

The maximum value

The minimum value

When this scroll bar is displayed, you can use the arrow keys (◄►) to scroll the display.

8.4 Performing Statistic Processing on History Waveforms

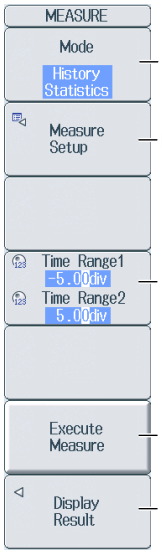
This section explains the following settings (which are used when performing statistic processing on the history waveforms):

- Turning history waveform statistics on
- Displaying results

► **"Statistical Processing of History Waveforms (History Statistics)" in the Features Guide**

MEASURE Menu

Press **MEASURE**, the **Mode** soft key, and then the **History Statistics** soft key to display the following menu.



Set Mode to History Statistics.

Press to set the source waveform and configure the measurement items. ► section 8.1

Set the measurement time period. ► section 8.1

Executes the measurement

Displays the measured results ► section 8.3

9.1 Performing Addition, Subtraction, Multiplication, and Division

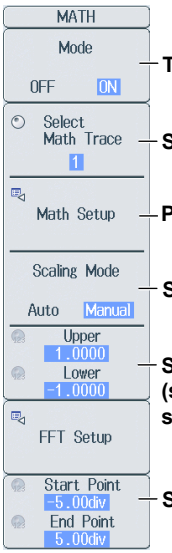
This section explains the following settings (which are used when performing addition, subtraction, multiplication, and division):

- Operators (+, –, *, /)
- Computation source waveform
- Unit
- Label
- Scaling mode

► "Basic Arithmetic (S1+S2, S1–S2, S1*S2, and S1/S2)" in the Features Guide

MATH Menu

Press **MATH** and then the **Mode** soft key to select ON to display the following menu.



Turns computations on and off

Select the computed trace (using the jog shuttle).

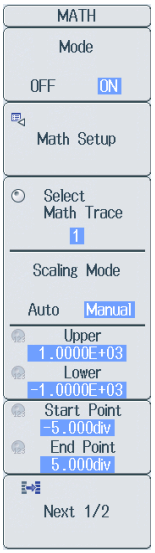
Press to configure the computation.

Set the scaling mode (Auto, Manual).

Set the display range of the computed waveform (set using the jog shuttle when Scaling Mode is set to Manual).

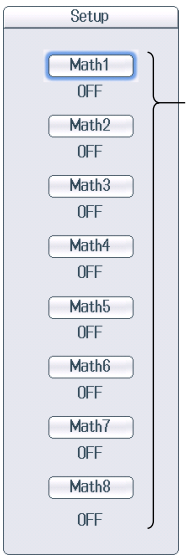
Set the start and end points (using the jog shuttle).

On Models with the User-Defined Computation Option

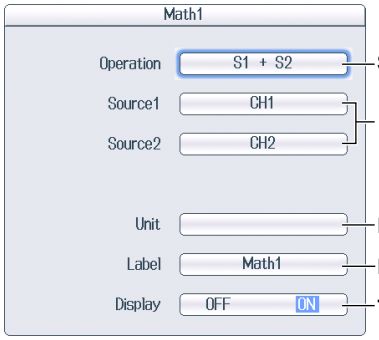


Configuring Computations (Math Setup)

Press the **Math Setup** soft key to display the following screen.



Specify the computed waveform from among Math1 to Math8 that you want to configure.



Select the operation (S1+S2, S1–S2, S1*S2, S1/S2).

Select the computation source waveform (CH1 to CH16, 16CH VOLT, 16CH TEMP/VOLT, CAN, CAN FD, LIN, SENT, Math1 to Math7).

Press to set the unit.

Press to set the label.

Turns the waveform display on and off

Setting the Scaling Mode (Scaling Mode)

Auto: The upper and lower limits are set automatically.

Manual: You can set the upper and lower limits. The selectable range is –9.9999E+30 to 9.9999E+30.

Note

If you set Scaling Mode to Auto, you cannot set Upper and Lower.

9.2 Performing Binary Computations

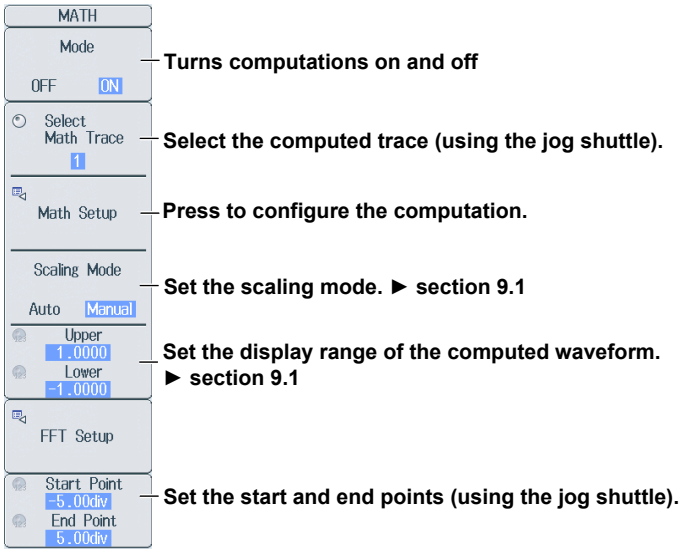
This section explains the following settings (which are used when performing binary computations):

- Function (Bin(S1))
- Computation source waveform
- Threshold level
- Unit
- Label
- Scaling mode

► "Binary Conversion (Bin (S1))" in the Features Guide

MATH Menu

Press **MATH** and then the **Mode** soft key to select ON to display the following menu.



Turns computations on and off

Select the computed trace (using the jog shuttle).

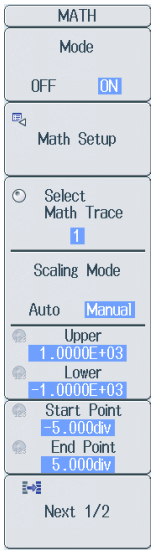
Press to configure the computation.

Set the scaling mode. ► section 9.1

Set the display range of the computed waveform. ► section 9.1

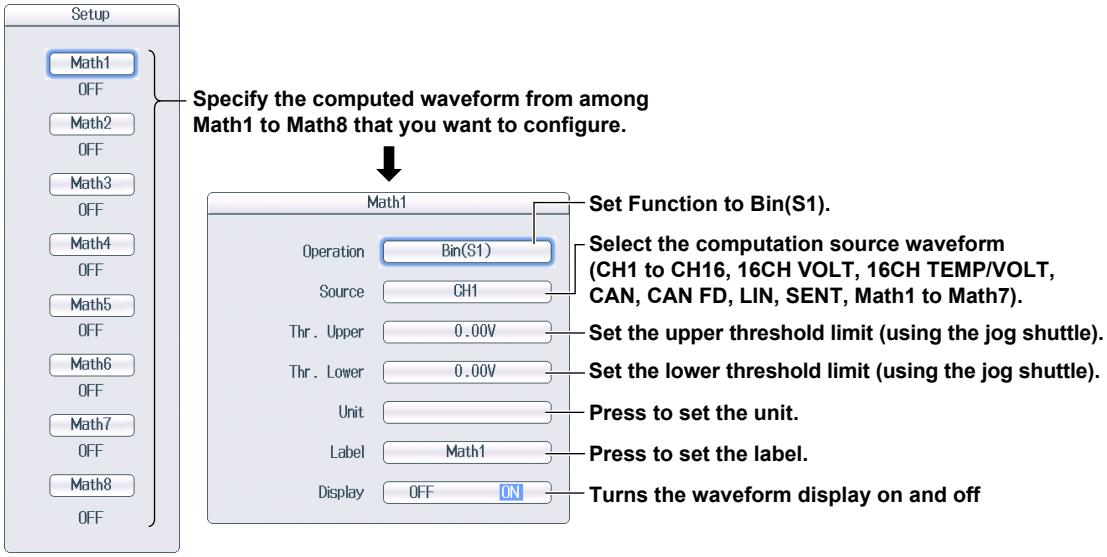
Set the start and end points (using the jog shuttle).

On Models with the User-Defined Computation Option



Configuring Computations (Math Setup)

Press the **Math Setup** soft key to display the following screen.



Specify the computed waveform from among Math1 to Math8 that you want to configure.

Set Function to Bin(S1).

Select the computation source waveform (CH1 to CH16, 16CH VOLT, 16CH TEMP/VOLT, CAN, CAN FD, LIN, SENT, Math1 to Math7).

Set the upper threshold limit (using the jog shuttle).

Set the lower threshold limit (using the jog shuttle).

Press to set the unit.

Press to set the label.

Turns the waveform display on and off

9.3 Shifting the Phase

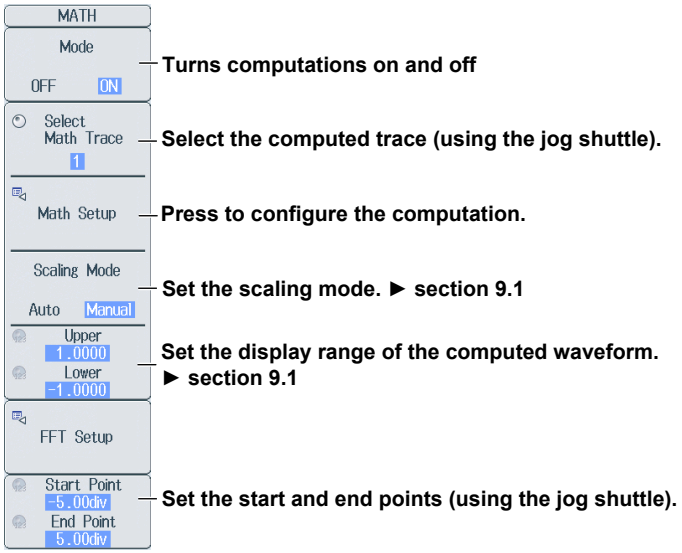
This section explains the following settings (which are used when shifting the phase):

- Function (Shift(S1))
- Computation source waveform
- Shift range
- Unit
- Label
- Scaling mode

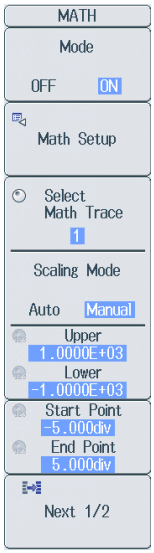
► "Phase Shift (Shift (S1))" in the Features Guide

MATH Menu

Press **MATH** and then the **Mode** soft key to select ON to display the following menu.

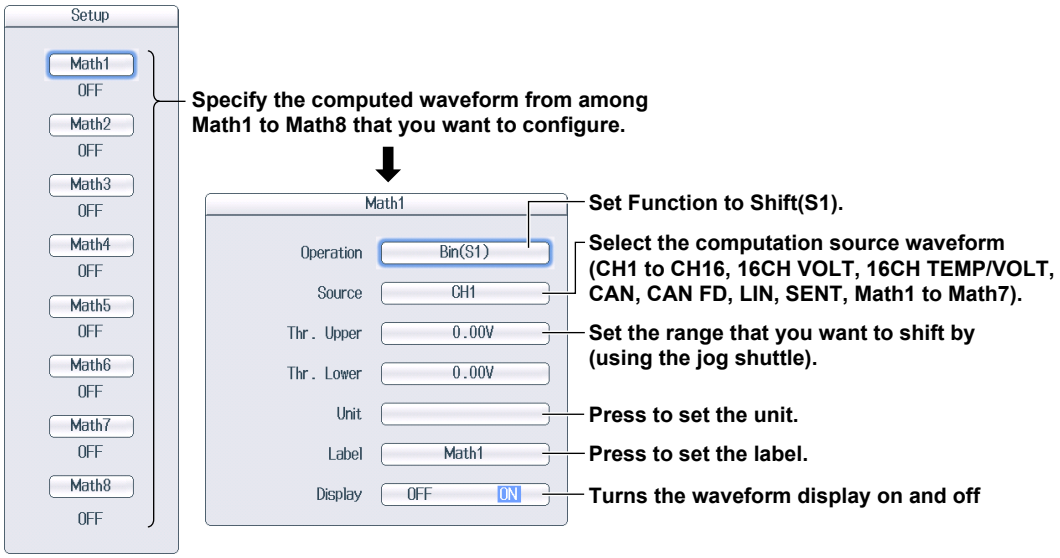


On Models with the User-Defined Computation Option



Configuring Computations (Math Setup)

Press the **Math Setup** soft key to display the following screen.



9.4 Displaying the Power Spectrum

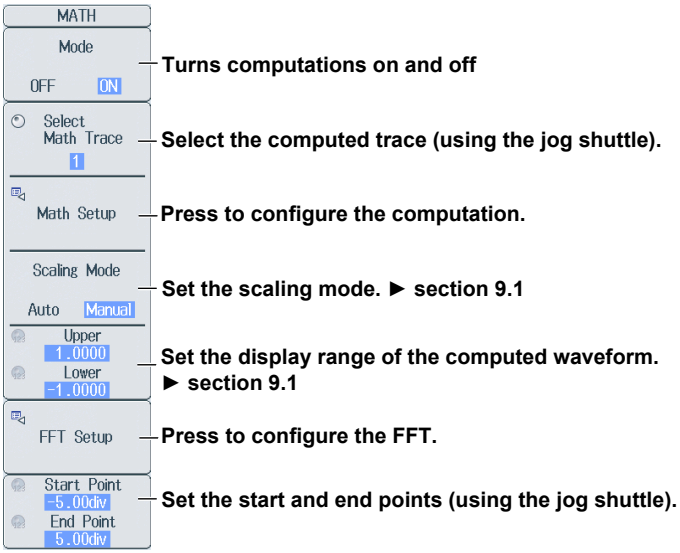
This section explains the following settings (which are used when displaying the power spectrum during FFT computations):

- Function (PS(S1))
- Computation source waveform
- Unit
- Label
- Scaling mode
- The number of FFT points
- Window function

► "Power Spectrum (PS (S1))" in the Features Guide

MATH Menu

Press **MATH** and then the **Mode** soft key to select ON to display the following menu.



Turns computations on and off

Select the computed trace (using the jog shuttle).

Press to configure the computation.

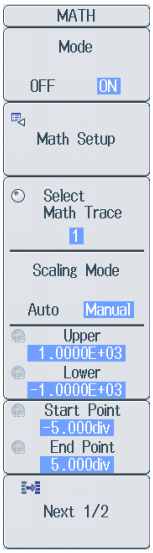
Set the scaling mode. ► section 9.1

Set the display range of the computed waveform. ► section 9.1

Press to configure the FFT.

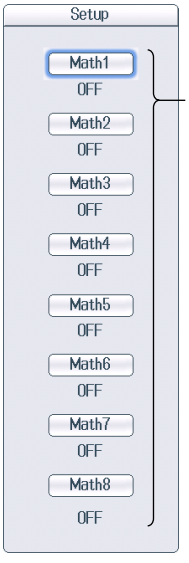
Set the start and end points (using the jog shuttle).

On Models with the User-Defined Computation Option

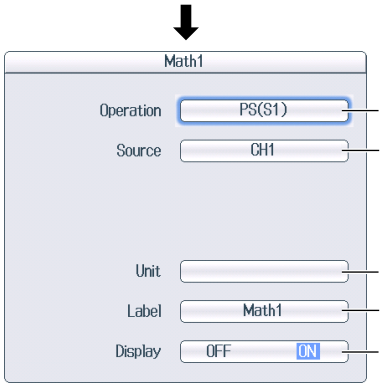


Configuring Computations (Math Setup)

Press the **Math Setup** soft key to display the following screen.



Specify the computed waveform from among Math1 to Math8 that you want to configure.



Set Function to PS(S1).

Select the computation source waveform (CH1 to CH16, 16CH VOLT, 16CH TEMP/VOLT, CAN, CAN FD, LIN, SENT, Math1 to Math7).

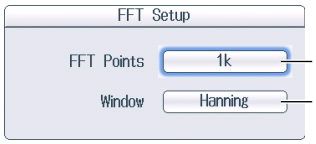
Press to set the unit.

Press to set the label.

Turns the waveform display on and off

Configuring FFT Computations (FFT Setup)

Press the **FFT Setup** soft key to display the following screen.



Set the number of FFT points (1k, 2k, 5k, 10k, 20k, 50k, 100k).

Set the window function (Rect, Hanning, Flat Top, Hamming).

9.5 Performing User-Defined Computations (Optional)

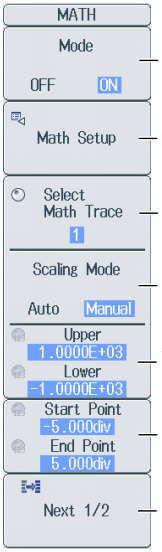
This section explains the following settings (which are used when performing user-defined computations):

- Operation or Function (User Define)
- Expressions
- Unit
- Label
- Scaling mode
- Averaging, FFT, filters, and constants

► "User-Defined Computation (Optional)" in the Features Guide

MATH Menu

Press **MATH** and then the **Mode** soft key to select ON to display the following menu.



Turns computations on and off

Press to configure the computation.

Select the computed trace (using the jog shuttle).

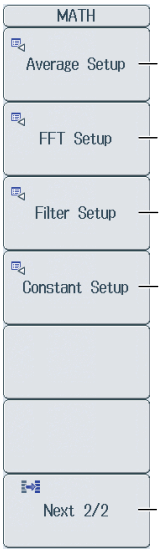
Set the scaling mode. ► section 9.1

Set the display range of the computed waveform. ► section 9.1

Set the start and end points (using the jog shuttle).

Displays the second page of the menu

Press the **Next** soft key to display the second page of the menu.



Press to configure averaging.

Press to configure the FFT.

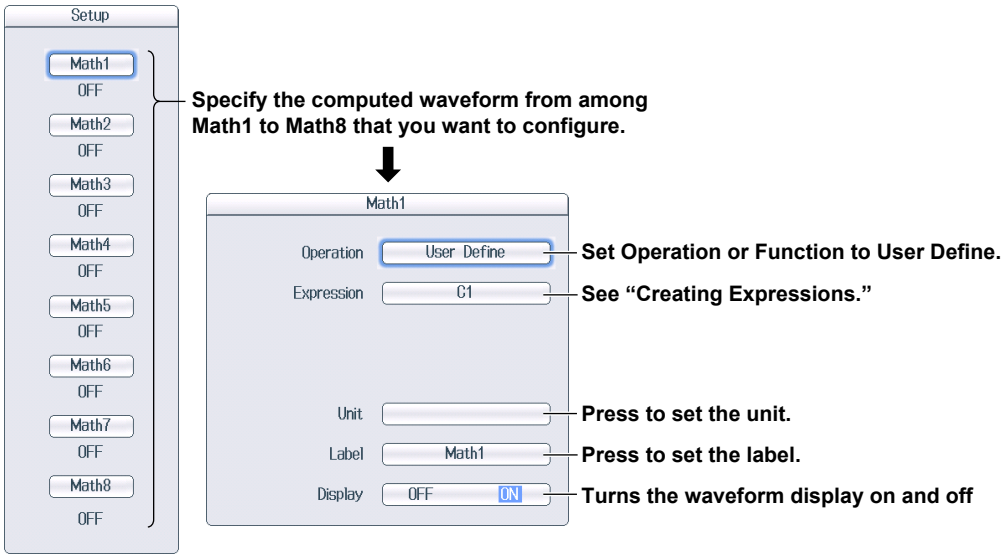
Press to configure filters.

Press to define constants.

Displays the first page of the menu

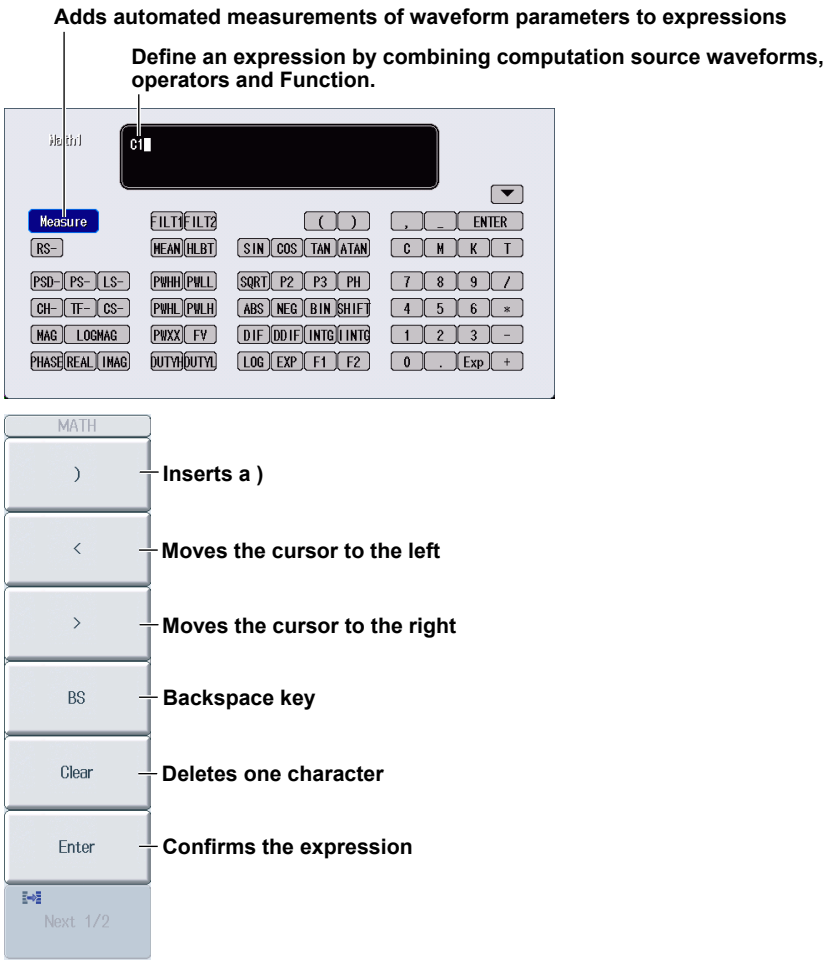
Configuring Computations (Math Setup)

Press the **Math Setup** soft key to display the following screen.



Creating Expressions (Expression)

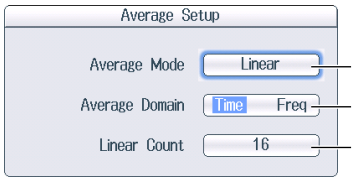
Select **Expression** to display the following screen.



Configuring Averaging (Average Setup)

Press the **Average Setup** soft key to display the following screen.

Linear Averaging (Linear)



Set Average Mode to Linear.

Select the domain to average over (Time, Freq).

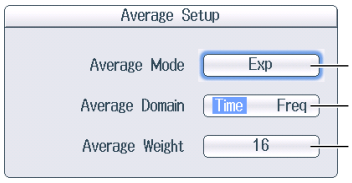
Set the number of times to average (the number of waveforms to acquire).

- **Average Domain**

  Time: The DL850E/DL850EV performs averaging on time-domain waveforms.

  Freq: The DL850E/DL850EV performs averaging on frequency-domain waveforms.

Exponential Averaging (Exp)



Set Average Mode to Exp.

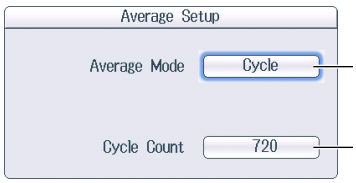
Select the domain to average over (Time, Freq).

Set the attenuation constant.

- **Average Domain**

  The settings are the same as in linear averaging.

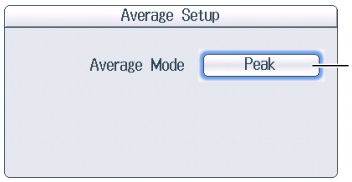
Cycle Averaging (Cycle)



Set Average Mode to Cycle.

Set the number of data points in one period.

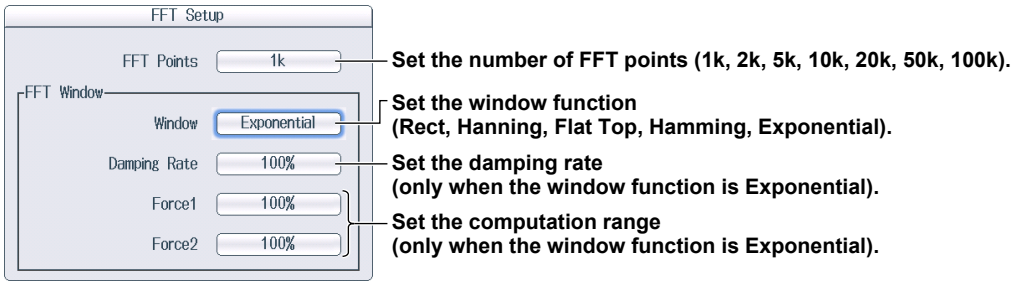
Peak Computation (Peak)



Set Average Mode to Peak.

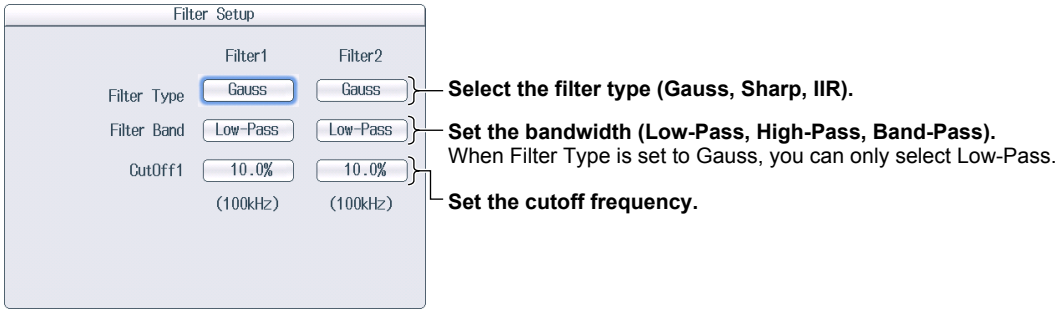
Configuring FFT Computations (FFT Setup)

Press the **FFT Setup** soft key to display the following screen.



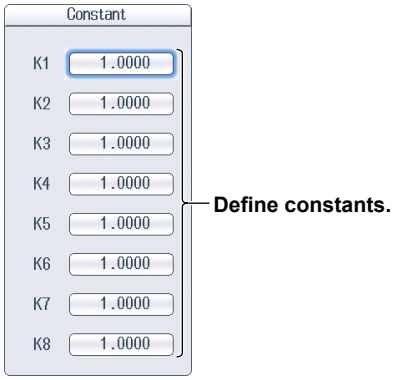
Configuring Filters (Filter Setup)

Press the **Filter Setup** soft key to display the following screen.



Defining Constants (Constant Setup)

Press the **Constant Setup** soft key to display the following screen.



10.1 Displaying FFT Waveforms

This section explains the following settings (which are used when displaying power-spectrum waveforms in the FFT window):

- FFT waveform display on and off
- Vertical and horizontal scale values

On models with the user-defined computation option, you can display up to two FFT waveforms, and you can analyze the following spectrums in addition to the power spectrum (PS).

- LS (linear spectrum)
- RS (RMS power spectrum)
- PSD (power spectrum density)
- CS (cross spectrum of two waveforms)
- TF (transfer function of two waveforms)
- CH (coherence function of two waveforms)

► "FFT" in the Features Guide

FFT Menu

Press **SHIFT+MATH** (FFT) to display the following menu.

Turns the FFT waveform display on and off

Select the analysis source waveform. (CH1 to CH16, 16CH VOLT, 16CH TEMP/VOLT, CAN, CAN FD, LIN, SENT, Math1 to Math6)

Set the analysis start point (using the jog shuttle).

Set the number of FFT points (1k, 2k, 5k, 10k, 20k, 50k, 100k).

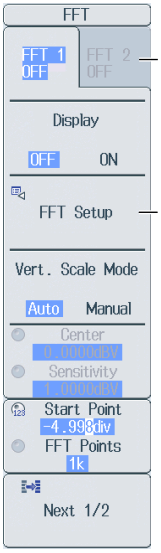
Set the FFT window (Rect, Hanning, Flat Top, Hamming).

Set the vertical scale mode (Auto, Manual).

Set the vertical-axis center point and the sensitivity (using the jog shuttle).
These can only be set when Vert. Scale Mode is set to Manual.

Displays the second page of the menu

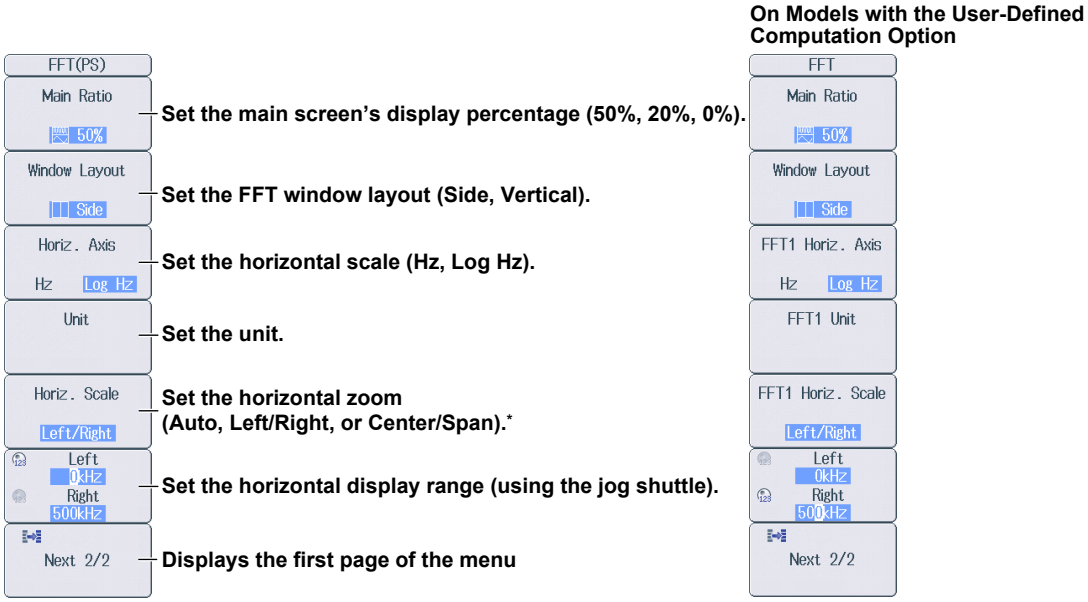
On Models with the User-Defined Computation Option



Select whether to set FFT1 or FFT2.

Press to configure the FFT.

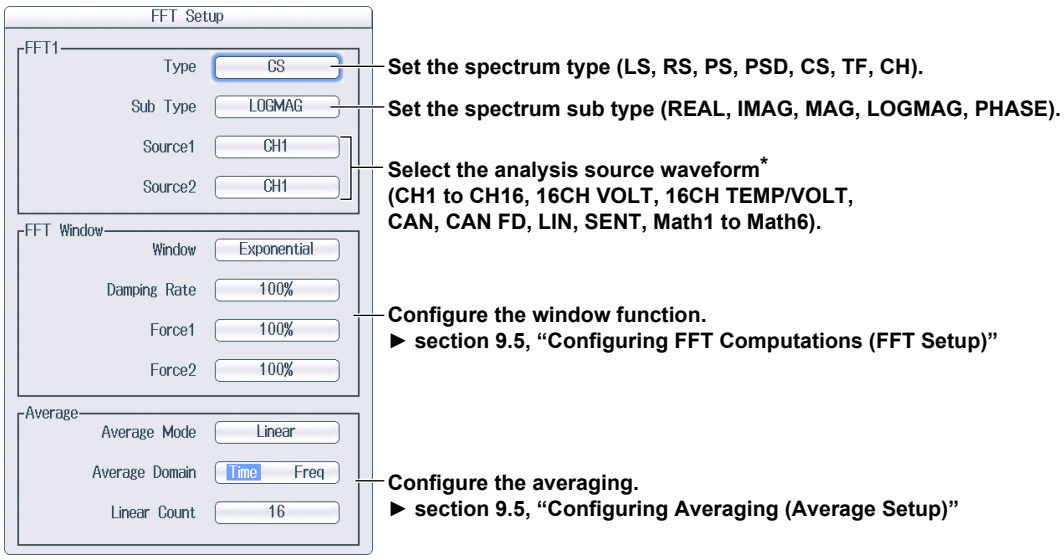
Press the **Next** soft key to display the second page of the menu.



* You cannot select Center/Span when the horizontal scale is set to Log Hz.

Configuring FFT Conditions (FFT Setup)

Press the **FFT Setup** soft key to display the following screen.



* You can set Source 2 when the spectrum type is CS, TF, or CH.

11.1 Performing GO/NO-GO Determination with Waveform Zones

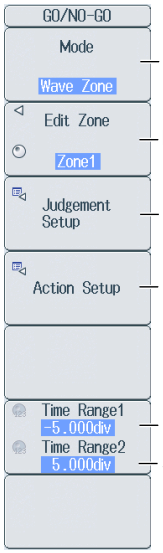
This section explains the following settings (which are used when performing GO/NO-GO determination with waveform zones):

- Selecting the mode
- Creating and editing waveform zones
- Reference conditions
- Action execution

► "Waveform Zone (Wave Zone)" in the Features Guide

GO/NO-GO Menu

Press **SHIFT+MEASURE** (GO/NO-GO) to display the following menu.



Set Mode to Wave Zone.

Press to edit the waveform zone.

Press to configure the determination conditions.

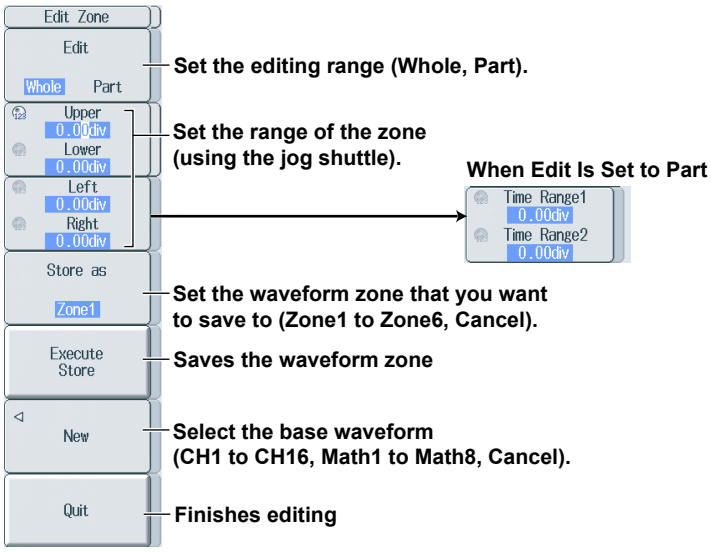
Press to configure the actions.

Set the determination start point (using the jog shuttle).

Set the determination end point (using the jog shuttle).

Editing Zones (Edit Zone)

1. Press the **Edit Zone** soft key to use the jog shuttle to adjust this setting.
2. Use the **jog shuttle** to set the number of the zone that you want to edit (Zone1 to Zone6).
3. Press the **Edit Zone** soft key to display the following menu.



Set the editing range (Whole, Part).

Set the range of the zone (using the jog shuttle).

When Edit Is Set to Part

Set the waveform zone that you want to save to (Zone1 to Zone6, Cancel).

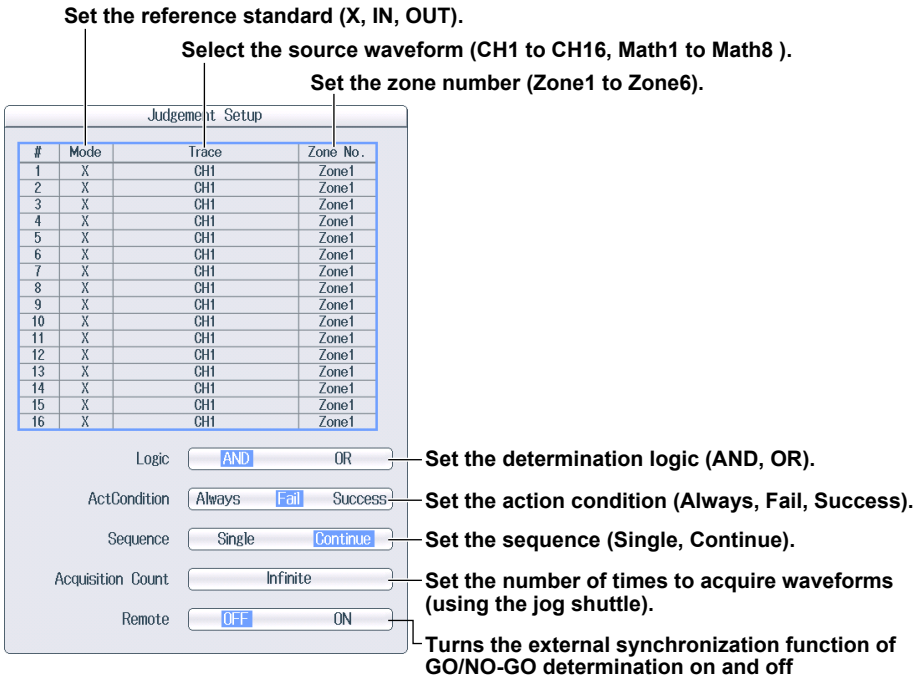
Saves the waveform zone

Select the base waveform (CH1 to CH16, Math1 to Math8, Cancel).

Finishes editing

Configuring Determination Conditions (Judgement Setup)

Press the **Judgement Setup** soft key to display the following screen.



Action Condition (Act Condition)

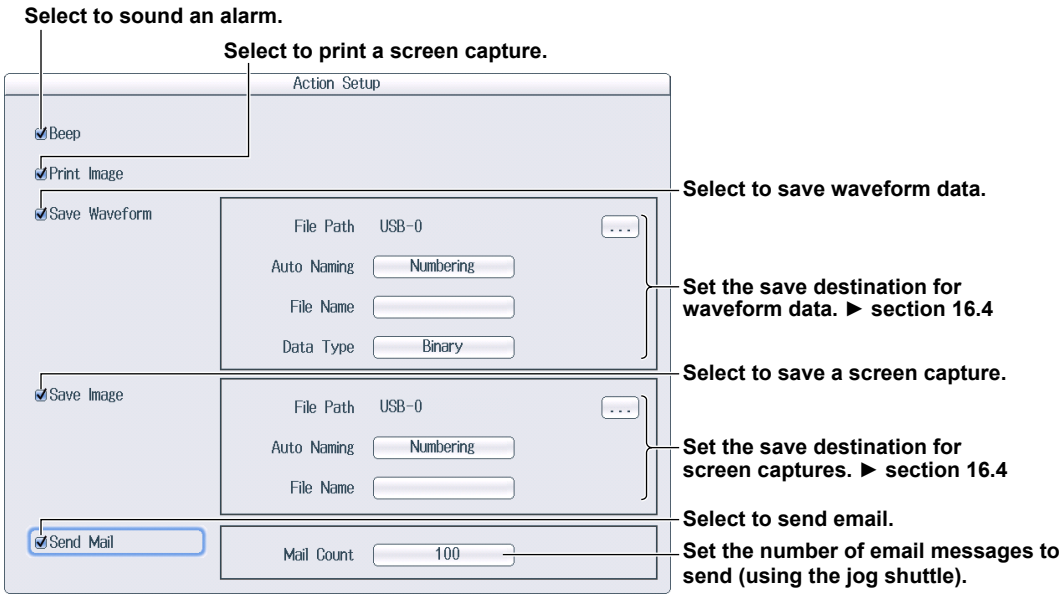
Always: The set actions are always executed.
Fail: The set actions are executed when the GO conditions are not met.
Success: The set actions are executed when the GO conditions are met.

Sequence (Sequence)

Single: The set actions are executed once.
Continue: The set actions are executed repeatedly. The set actions are executed until the number of acquisitions specified by Acquisition Count is reached. If Acquisition Count is set to Infinite, the set actions are executed until waveform acquisition is stopped.

Configuring Actions (Action Setup)

Press the **Action Setup** soft key to display the following screen.



11.2 Performing GO/NO-GO Determination with Waveform Parameters

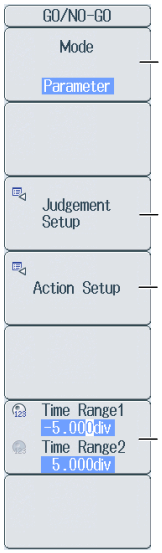
This section explains the following settings (which are used when performing GO/NO-GO determination with waveform parameters):

- Selecting the mode
- Determination conditions
- Action execution

► "Waveform Parameters (Parameter)" and
"Automated Measurement of Waveform Parameters" in the Features Guide

GO/NO-GO Menu

Press **SHIFT+MEASURE** (GO/NO-GO) to display the following menu.



Set Mode to Parameter.

Press to configure the determination conditions.

Press to configure the actions ► section 11.1

Set the determination start and end points (using the jog shuttle).

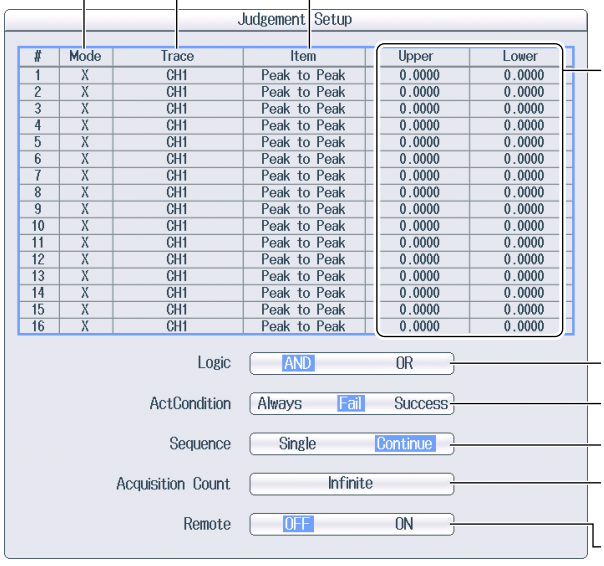
Configuring Determination Conditions (Judgement Setup)

Press the **Judgement Setup** soft key to display the following screen.

Set the reference standard (X, IN, OUT).

Select the source waveform (CH1 to CH16, Math1 to Math8).

Set the waveform parameters.



Set the upper and lower limits of the parameters (using the jog shuttle).

Set the determination logic (AND, OR).

Set the action condition (Always, Fail, Success).

Set the sequence (Single, Continue).

Set the number of times to acquire waveforms (using the jog shuttle).

Turns the external synchronization function of GO/NO-GO determination on and off

Setting Waveform Parameters (Item)

You can use all 29 automatically measured waveform parameters as reference conditions. You can perform GO/NO-GO determination on up to 16 parameters at the same time. ► section 8.1

12.1 Setting the Action

This section explains the following settings (which are used when executing the action function):

- Action mode
- The actions to execute

► "Action" in the Features Guide

ACTION Menu

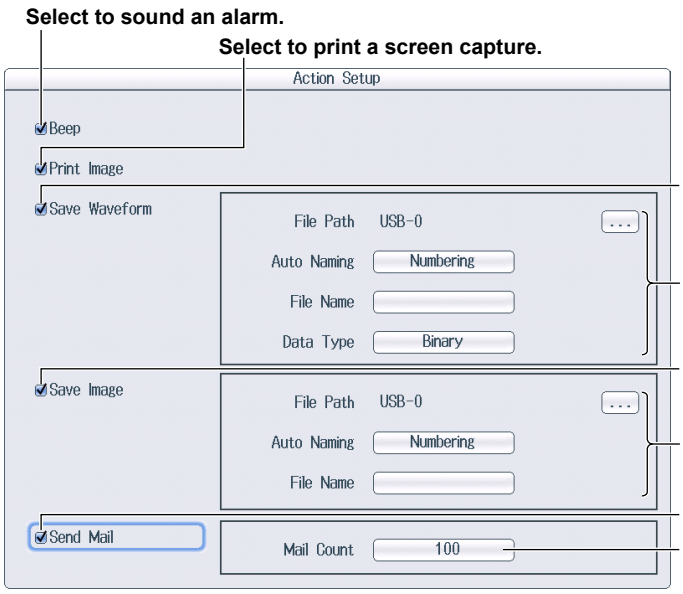
Press **SHIFT+MODE (ACTION)** to display the following menu.

Set Mode to ON.

Press to configure the actions to execute.

Configuring Actions to Execute (Action Setup)

Press the **Action Setup** soft key to display the following screen.



Select to sound an alarm.

Select to print a screen capture.

Select to save waveform data.

Set the save destination for waveform data. ► section 16.4

Select to save a screen capture.

Set the save destination for screen captures. ► section 16.4

Select to send email.

Set the number of email messages to send (using the jog shuttle).

Executing Actions

After you set the action mode, the actions to execute, and the number of times to execute the actions, press **START/STOP**. The actions will be executed each time that the DL850E/DL850EV triggers.

An icon () centered at the top of the screen indicates when actions are being executed. To stop executing actions, press **START/STOP**.

Note

When one of the actions to execute is email transmission, the DL850E/DL850EV sends the number of messages specified by either the number of times to execute the actions or Mail Count, whichever is lower.

13.1 Searching for Edges

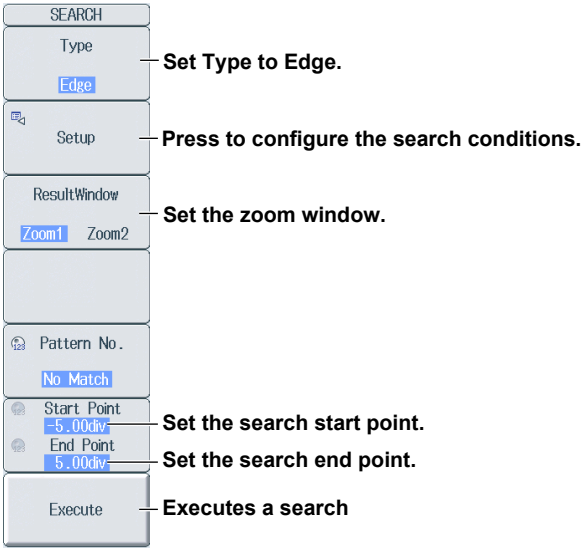
This section explains the following settings (which are used when searching for edges):

- Search type
- Search conditions
  The source waveform, level for determining the state of the source waveform, edge polarity, hysteresis, and the number of times to detect the conditions
- Detected waveform display
  Zoom window
- Pattern number
- Search range
  Search start and end points
- Executing searches

►"Edge Search (Edge)" in the Features Guide

SEARCH Edge Menu

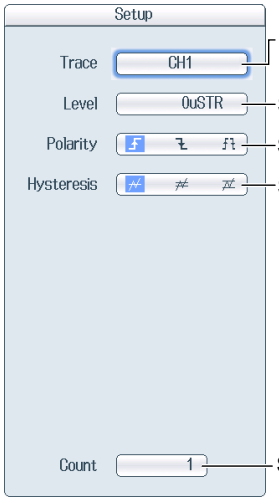
Press **SHIFT+ZOOM** (SEARCH), the **Type** soft key, and then the **Edge** soft key to display the following menu.



Configuring Search Conditions (Setup)

Press the **Setup** soft key to display one of the menus shown below. The menu that is displayed varies depending on the search source waveform that you have set.

If the Search Source Waveform Is CH1 to CH16, 16chVOLT, 16chTEMP/VOLT, CAN,* CAN FD,* LIN,* or SENT*



Set the search source waveform (CH1 to CH16, 16CH VOLT, 16CH TEMP/VOLT, CAN, CAN FD, LIN, SENT).

Set the level.

Set the edge polarity (, ,).

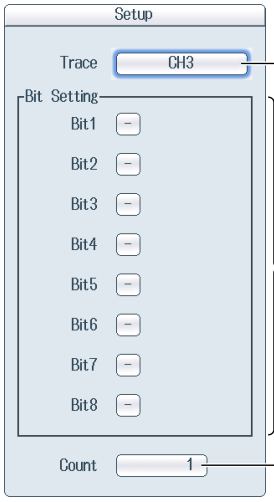
Set the hysteresis (, ,).

Set the number of times to detect the conditions.

* Use this menu for waveforms whose sub channel Value Type on the CAN bus monitor, CAN/CAN FD monitor, or CAN & LIN bus monitor is Unsigned, Signed, or Float and waveforms whose sub channel on the SENT monitor is FastCH, SlowCH, or Error Count.

If the Search Source Waveform Is a Logic Channel (When a logic input module is installed)

- **Waveforms of logic input modules**
- **Waveforms whose sub channel Value Type on the CAN bus monitor, CAN/CAN FD monitor, or CAN & LIN bus monitor is Logic**
- **Waveforms whose sub channel on the SENT monitor is S&C or Error Trigger**



Set the search source waveform (a logic channel).

Set the polarity of each bit (, , , - (don't use as a search condition)).

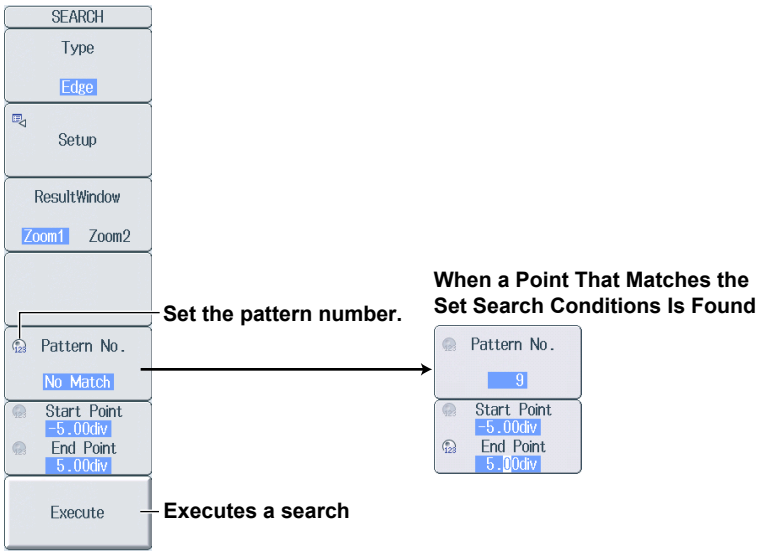
Set the number of times to detect the conditions.

Setting the Zoom Window (ResultWindow)

Set which zoom window, Z1 or Z2, to display the searched waveform in. You can set zoom windows Z1 and Z2 when they are displayed. If both Z1 and Z2 are not displayed, Z1 will be displayed when you press **SHIFT+ZOOM** (SEARCH) to display the SEARCH menu.

Executing a Search (Execute)

Press the **Execute** soft key to execute the search.



- Executing Searches
  After setting the search conditions, press the **Execute** soft key to execute the search. If the DL850E/DL850EV finds points that match the search conditions (detected points), it shows numbers (0, 1, 2, etc.) from the left of the waveform display in the order that the points were detected.
- Setting the Pattern Number
  After setting the pattern number, you can display the detected point centered on its corresponding waveform in the zoom window.

13.2 Searching for Events

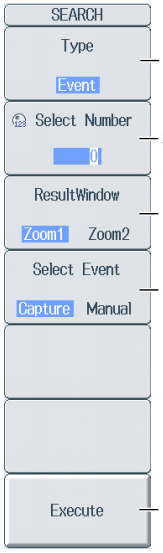
This section explains the following settings (which are used when searching for events):

- Search type
- Search source
  Event number

► “Event Search (Event)” in the Features Guide

SEARCH Event Menu

Press **SHIFT+ZOOM** (SEARCH), the **Type** soft key, and then the **Event** soft key to display the following menu.



Set Type to Event.

Set the event number (1 to 100).

Set the zoom window. ► section 13.1

Set the event that you want to search for (Capture, Manual).

Executes a search

Executing a Search (Execute)

Press the **Execute** soft key to execute a search. The specified event number is displayed centered on its corresponding waveform in the zoom window.

13.3 Searching for Logic Patterns

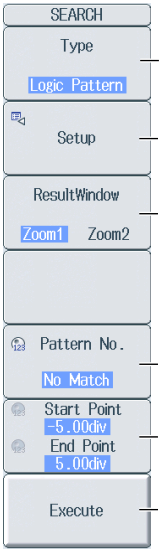
This section explains the following settings (which are used when searching for logic patterns):

- Search type
- Search conditions
  Source waveform, source bits, and the number of times to detect the conditions

► “Logic Pattern Search (Logic Pattern)” in the Features Guide

SEARCH Logic Pattern Menu

Press **SHIFT+ZOOM** (SEARCH), the **Type** soft key, and then the **Logic Pattern** soft key to display the following menu.



Set Type to Logic Pattern.

Press to configure the search conditions.

Set the zoom window. ► section 13.1

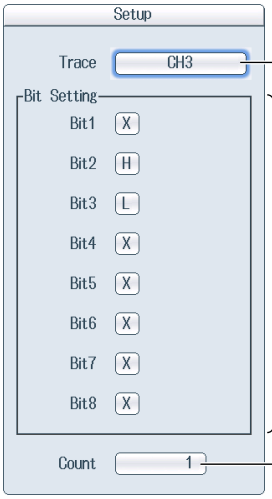
Set the pattern number. ► section 13.1

Set the search start and end points. ► section 13.1

Executes a search ► section 13.1

Configuring Search Conditions (Setup)

Press the **Setup** soft key to display the following screen.



Set the search source waveform (a logic channel).

- **Waveforms of logic input modules**
- **Waveforms whose sub channel Value Type on the CAN bus monitor, CAN/CAN FD monitor, or CAN & LIN bus monitor is Logic**
- **Waveforms whose sub channel on the SENT monitor is S&C or Error Trigger**

Set each source bit (X, H, L).

Set the number of times to detect the conditions.

13.4 Searching for Specific Times

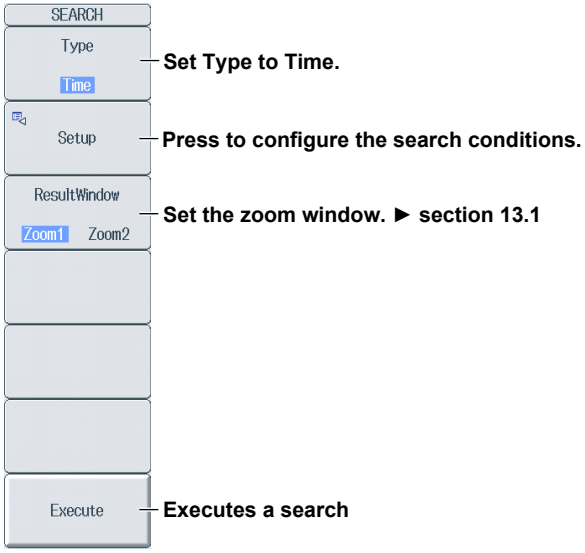
This section explains the following settings (which are used when searching for specific times):

- Search type
- Search source
  Time

► “Time Search (Time)” in the Features Guide

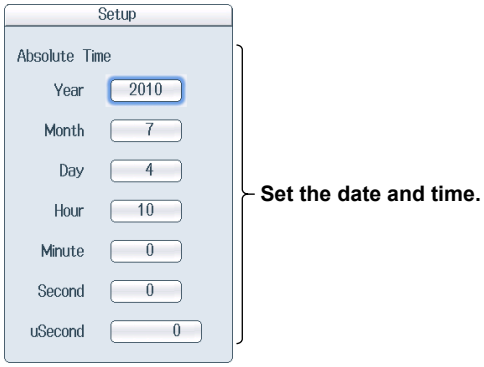
SEARCH Time Menu

Press **SHIFT+ZOOM** (SEARCH), the **Type** soft key, and then the **Time** soft key to display the following menu.



Configuring Search Conditions (Setup)

Press the **Setup** soft key to display the following screen.



Executing a Search (Execute)

Press the **Execute** soft key to execute a search. The specified date and time is displayed centered on its corresponding waveform in the zoom window.

14.1 Displaying History Waveforms

This section explains the following settings (which are used when displaying history waveforms, waveforms that were previously saved to acquisition memory):

- Display mode
- Highlighting of the selected record number
- Display range (start and end record numbers)
- Displaying the list of waveform timestamps
- Deleting all history waveforms

► "Displaying and Searching History Waveforms" in the Features Guide

HISTORY Menu

Press **HISTORY** to display the following menu.

Set the display mode (1 Record, All Record, Average Record).

Set the waveform to display highlighted* (using the jog shuttle).

Set the display range (using the jog shuttle).

Displays a list of history waveforms

Deletes all the history waveforms

* This setting only appears when Display Mode is set to 1 Record or All Record.

Setting the Display Mode (Display Mode)

1 Record: Only displays the waveform corresponding to the selected record number.[1]

All Record: Overlays all selected waveforms.[2] All waveforms except the waveform corresponding to the selected record number[1] are displayed in an intermediate color.

Average Record: Computes the linear average of all the selected waveforms[2] and displays the result.

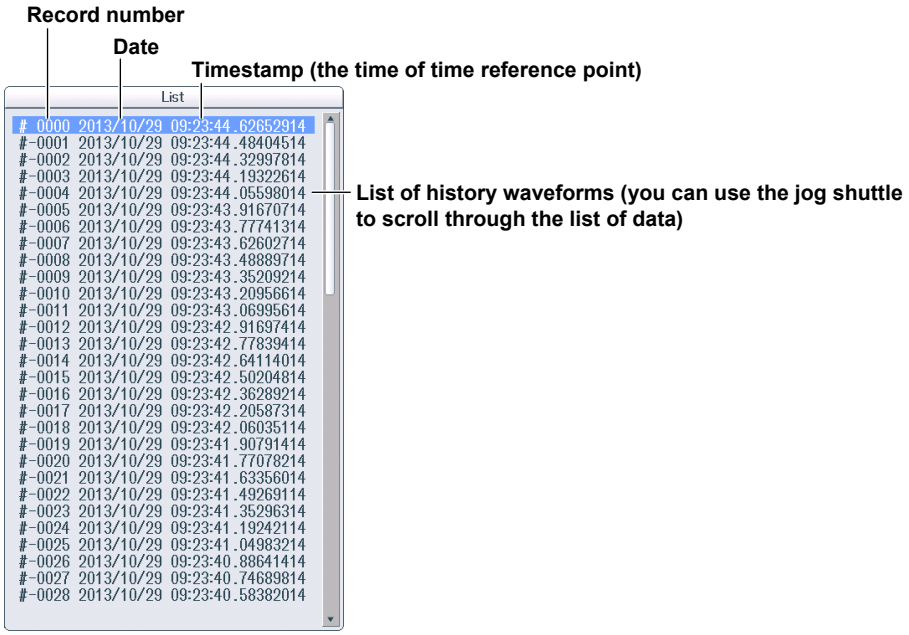
1 Specify the highlighted waveform with Select Record.
2 Specify with Start Record and End Record.

Note

- After you execute a search on the history waveforms, the only waveforms that are displayed are those that met the search conditions. To display all the history waveforms in acquisition memory again, turn the history waveform search feature off.
- Average Record feature requires a certain amount of acquisition memory. If this is not available, you will not be able to display the Average Record.

Displaying a List of History Waveforms (List)

Press the **List** soft key to display the following screen.



Note

Notes about Using the History Feature

- When the acquisition mode is set to Average, you cannot use the history feature.
- If you stop waveform acquisition, even if one complete screen's worth of waveform data has not been acquired, the waveform at which the trigger occurred is displayed as a single history waveform.
- You can start waveform acquisition when the History menu is displayed. However, you cannot change the history feature settings while waveform acquisition is in progress.
- The settings are restricted so that the following relationship is retained: Last record (End Record) ≤ Selected Record ≤ first record (Start Record).
- When you load waveform data from the specified storage medium, history waveforms up to that point are cleared. The loaded waveform data is placed in record number zero. If you load a file containing multiple history waveforms, the latest waveform is placed in zero, and earlier waveforms are placed in order to record numbers –1, –2, and so on.
- Computation and automated measurement of waveform parameters are performed on the waveform of the record number specified by Selected No. You can analyze old data as long as you do not overwrite the acquisition memory contents by restarting waveform acquisition. If Display Mode is set to Average Record, analysis is performed on the averaged waveform.
- History waveforms are cleared when you turn the power off.

14.2 Searching History Waveforms

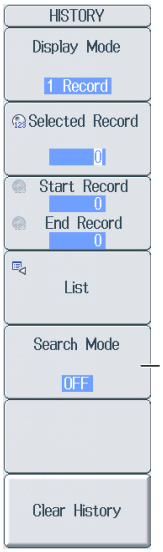
This section explains the following settings (which are used when searching history waveforms):

- Search mode
  Zone and parameters
- Search conditions
  Search zone and parameter registration, search condition, source waveform, selectable range of the search window (upper and lower limits and left and right edges), search logic, and measurement range of the parameters
- Executing searches

► “Displaying and Searching History Waveforms” in the Features Guide

HISTORY Menu

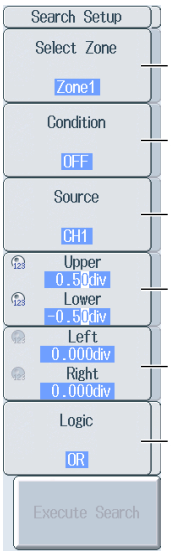
Press **HISTORY** to display the following menu.



Set the search mode (OFF, Zone, Parameter).

Searching by Zone (Search Setup)

Press the **Search Mode** soft key, the **Zone** soft key, and then the **Search Setup** soft key to display the following menu.



Register the search zone (Zone1 to Zone4).

Set the search condition (OFF, IN, OUT).

Select the source waveform (CH1 to CH16).

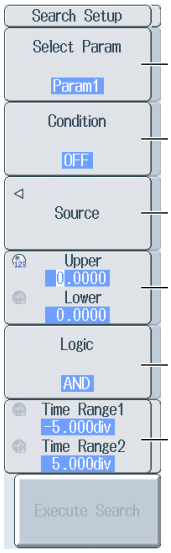
Set the upper and lower limits of the search window (using the jog shuttle).

Set the left and right edges of the search window (using the jog shuttle).

Set the search logic (AND, OR).

Searching by Automatically Measured Parameter (Search Setup)

Press the **Search Mode** soft key, the **Parameter** soft key, and then the **Search Setup** soft key to display the following menu.



Register the search parameter (Param1 to Param4).

Set the search condition (OFF, IN, OUT).

Set the waveform to search and the parameter.

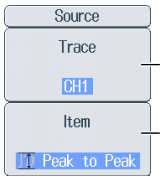
Set the upper and lower limits of the search condition (using the jog shuttle).

Set the search logic (AND, OR).

Use the jog shuttle to set the measurement time period of the parameter (left edge – Time Range1; right edge – Time Range2).

Setting the Waveform to Search and the Parameter (Source)

Press the **Source** soft key to display the following menu.

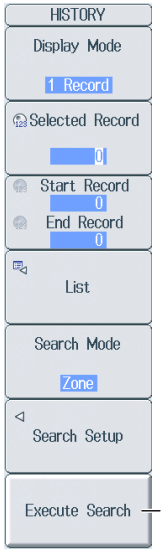


Select the source channel (CH1 to CH16).

Set the waveform parameter type. ► section 8.1

Searching History Waveforms (Execute Search)

After you finish setting all the search conditions, press the **ESC** key to display the following menu.



Execute the history waveform search.

15.1 Loading Roll Paper into the Built-In Printer (Optional)

This section explains how to load roll paper into the optional built-in printer.

Printer Roll Paper

Only use roll paper specifically made for use with the DL850E/DL850EV series. The DL850E/DL850EV comes with one set of roll paper included. Use this when you first load roll paper into the built-in printer. When you need a new supply of roll paper, please contact your nearest YOKOGAWA dealer.

Part Number: B9988AE
Specifications: Heat sensitive paper, 10 m
Minimum Quantity: 10 rolls

Handling Roll Paper

The roll paper is made of heat sensitive paper that changes color thermochemically. Please read the following information carefully.

Storage Precautions

The heat-sensitive paper changes color gradually at temperatures of approximately 70°C or higher. The paper can be affected by heat, humidity, light, and chemicals, whether something has been recorded on it. As such, please follow the guidelines listed below.

- Store the paper in a cool, dry, and dark place.
- Use the paper as quickly as possible after you break its protective seal.
- If you attach a plastic film that contains plasticizing material, such as vinyl chloride film or cellophane tape, to the paper for a long time, the recorded sections will fade due to the effect of the plasticizing material. Use a holder made of polypropylene to store the roll paper.
- When pasting the record paper to another material, do not use paste that contains organic solvents such as alcohol or ether. Doing so will change the paper's color.
- We recommend that you make copies of the recordings if you intend to store them for a long period of time. Because of the nature of heat-sensitive paper, the recorded sections may fade.

Handling Precautions

- Only use genuine, YOKOGAWA-supplied roll paper.
- If you touch the roll paper with sweaty hands, there is a chance that you will leave fingerprints on the paper, or blur the recorded sections.
- If you rub something hard against the surface of the roll paper, the paper may change color due to frictional heat.
- If the roll paper comes into contact with products such as chemicals or oil, the paper may change color or the recorded sections may disappear.

Attaching the Roll Paper

CAUTION

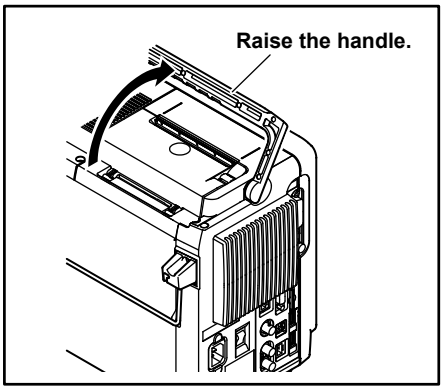
- Do not touch the print head. If you do, you may burn yourself.
- Do not touch the roll paper cutter section at the front end of the printer cover. Doing so may cause injury.

French

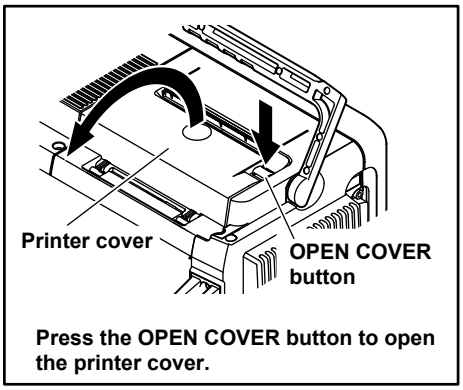
ATTENTION

- Ne pas toucher la tête d'impression. Vous pourriez vous brûler.
- Ne pas toucher la section du coupe-papier à l'extrémité du cache de l'imprimante. Vous pourriez vous blesser.

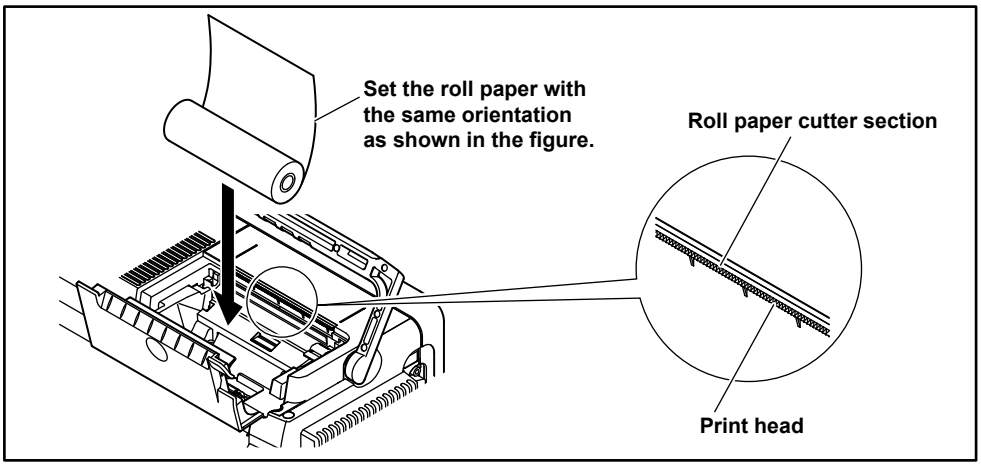
1.



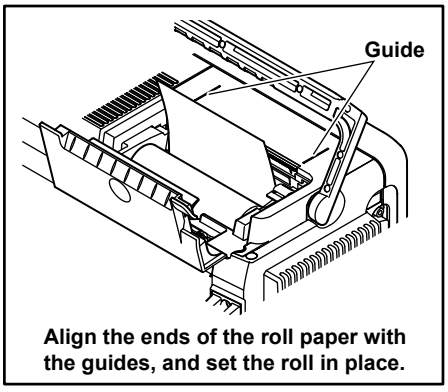
2.



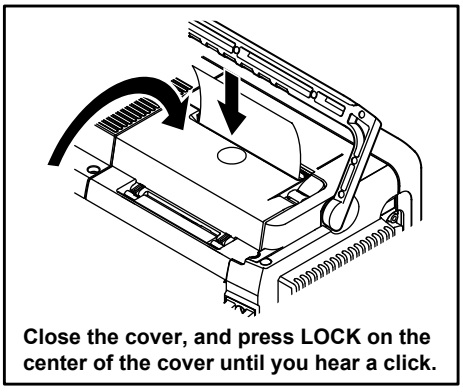
3.



4.



5.



15.2 Printing Using the Built-in Printer (Optional)

This section explains the following settings (which are used when printing the image that is displayed on the DL850E/DL850EV using the optional built-in printer):

- Print destination
- Comment

► **"Printing from the Built-In Printer (BuiltIn; option)" in the Features Guide**

PRINT MENU Menu

Press **PRINT MENU**, the **Print To** soft key, and then the **BuiltIn** soft key to display the following menu.

Set Print To to BuiltIn.

Press to set a comment. ► section 16.4

Printing

Press **PRINT** to print the image that is displayed on the screen using the built-in printer.

15.3 Printing on a Network Printer

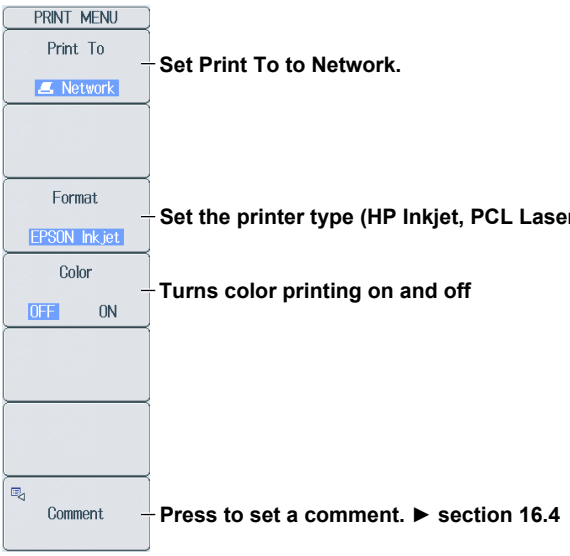
This section explains the following settings (which are used when printing the image that is displayed on the DL850E/DL850EV using a network printer):

- Print destination
- Printer type
- Color printing
- Comment

► “Printing from a Network Printer (Network)” in the Features Guide

PRINT MENU Menu

Press **PRINT MENU**, the **Print To** soft key, and then the **Network** soft key to display the following menu.



Note

You must configure the network printer in advance by following the instructions in section 17.8.

Printing

Press **PRINT** to print the image that is displayed on the screen using a network printer.

15.4 Printing on a USB Printer

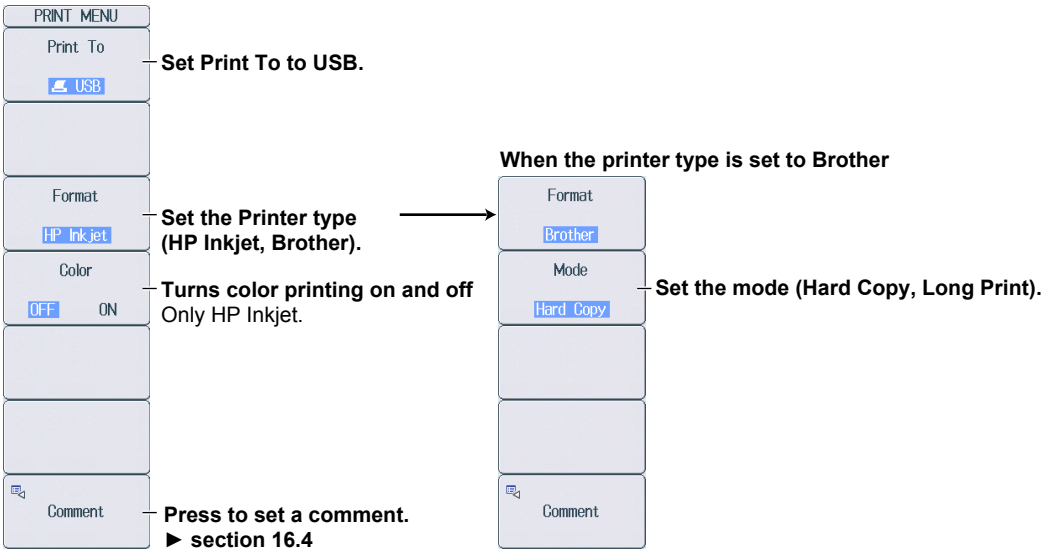
This section explains the following settings (which are used when printing the image that is displayed on the DL850E/DL850EV using a USB printer):

- Print destination
- Printer type
- Color printing
- Comment
- Long Print
  Print time range (output start point and output end point)
  Print magnification
  Print details

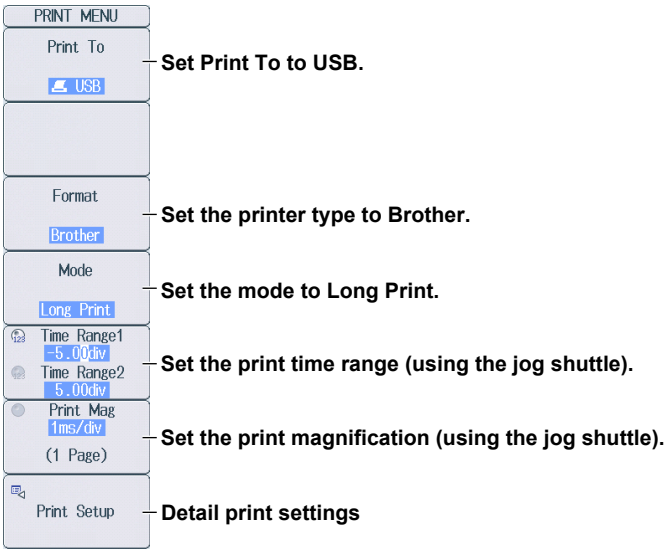
► "Printing from a USB Printer" in the Features Guide

PRINT MENU Menu

Press **PRINT MENU**, the **Print To** soft key, and then the **USB** soft key to display the following menu.



Long Print (Long Print)



Setting the Print Magnification (Print Mag)

Use the jog shuttle to set the print time magnification. The number of pages* is displayed on the soft key according to the print time range and print magnification.

* 1 page = 10 div (10 cm)

Note

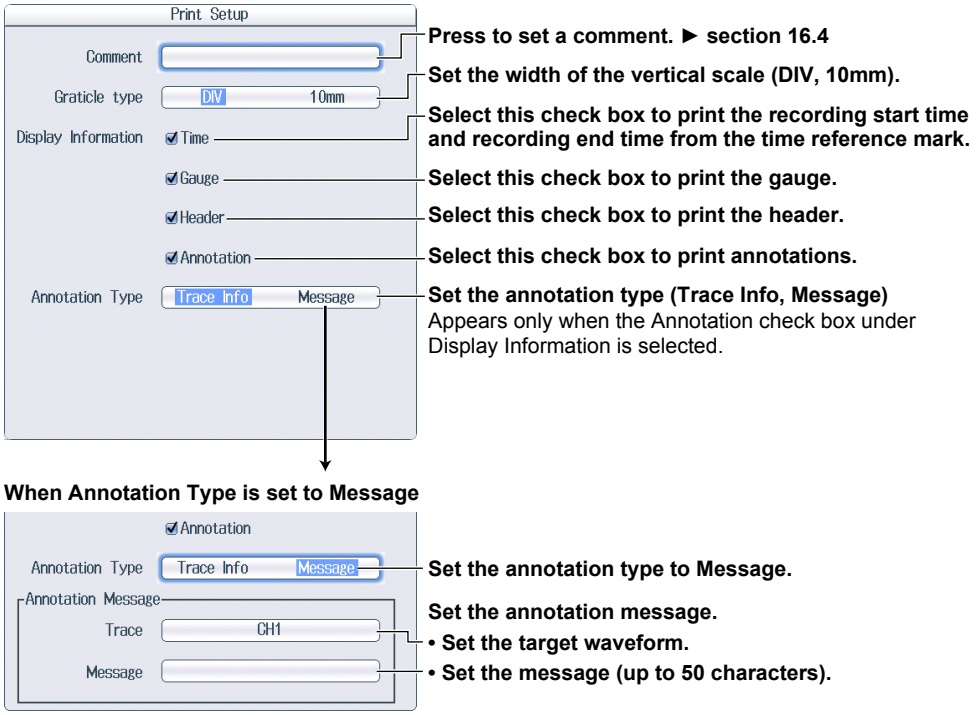
The maximum number of pages that can be printed at once is 25. If the maximum number of print pages is exceeded, an error message will appear when printing is executed.

The method to set the magnification varies depending on whether the waveforms to be printed are sampled using the internal clock or sampled using an external clock.

- **For waveforms sampled with the internal clock**
  Set using the time per division (T/div).
  The selectable range varies depending on the T/div value and record length (in 1-2-5 steps).
- **For waveforms sampled with an external clock**
  Set using the magnification.
  The selectable range varies depending on the record length.

Configuring Print Settings (Print Setup)

Press the **Print Setup** soft key to display the following screen.

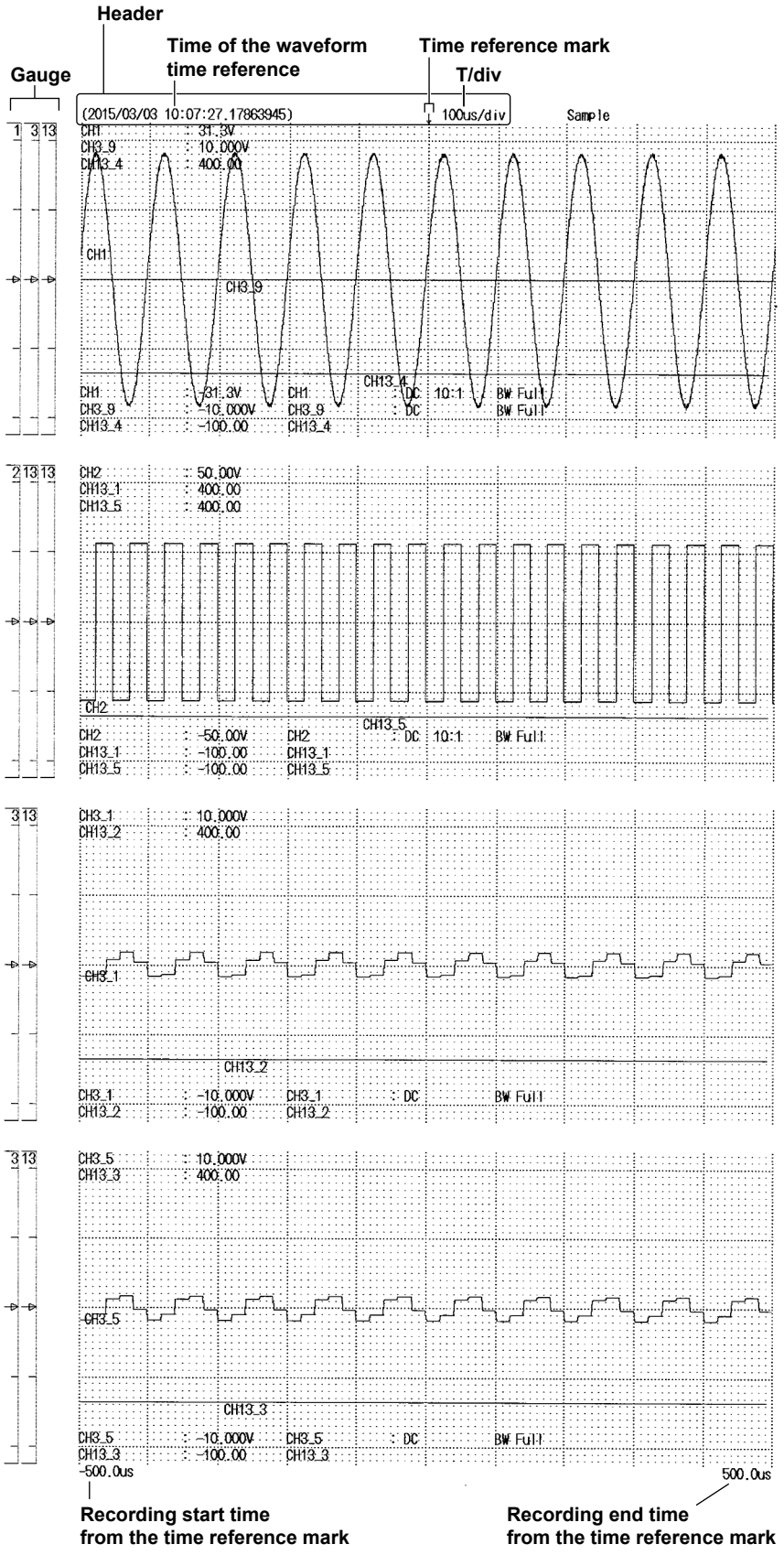


When Annotation Type is set to Message

Printing

Press **PRINT** to print the image that is displayed on the screen using a USB printer.

Long Print Example



15.5 Saving Screen Captures to Files

This section explains the following settings (which are used when saving screen captures to files). You can use the PRINT MENU menu or the SAVE menu to set how files are saved.

- Save destination
- Data format
- Color data
- Background transparency (opaque or transparent)
- Save destination and the file name

► "Saving Screen Captures to Files (File)" in the Features Guide

PRINT MENU Menu

Press **PRINT MENU**, the **Print To** soft key, and then the **File** soft key to display the following menu.

Set Print To to File.

Set the data format (PNG, BMP, JPEG).

Set the color data (ON, ON(Gray), ON(Reverse), OFF).

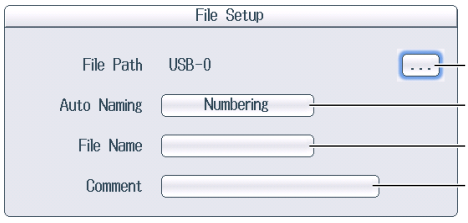
Set the background to opaque (Normal) or transparent (Transparent).*

Press to set the save destination and the file name.

* This appears when the data format is set to PNG.
When the data format is JPEG, a setup menu for turning the frame on and off appears.

Setting the Save Destination and the File Name (File Setup)

Press the **File Setup** soft key to display the following screen.



Displays the file list. ► section 16.10

Set auto naming. ► section 16.4

Set the file name. ► section 16.4

Set a comment. ► section 16.4

Saving

Press **PRINT** to save the screen capture file to the specified folder.

SAVE Menu

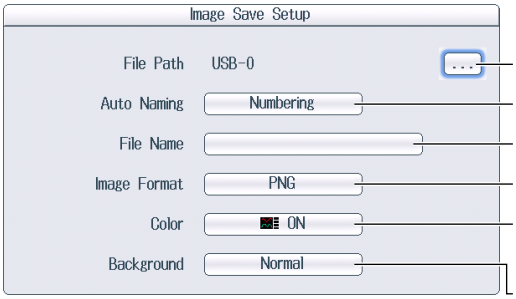
Press **SHIFT+SAVE** (MENU) to display the following menu.

Turns the screen capture save feature on and off

Press to set the save destination and the file name for screen captures.

Setting the Save Destination and the File Name of the Screen Capture (Image Save Setup)

Press the **Image Save Setup** soft key to display the following screen.



Displays the file list ► section 16.10

Set auto naming. ► section 16.4

Set the file name. ► section 16.4

Set the data format (PNG, BMP, JPEG).

Set the color data (ON, ON(Gray), ON(Reverse), OFF).

Set the background to opaque (Normal) or transparent (Transparent).*

* This appears when the data format is set to PNG.
When the data format is JPEG, a setup menu for turning the frame on and off appears.

Saving

Press **SAVE** to save the screen capture file to the specified folder. If **Waveform Save** on the **SAVE** menu is set to ON, the waveform data is also saved.

16.1 Connecting Storage Media

This section explains how to connect the following storage media (which are used when saving and loading data) to the DL850E/DL850EV:

- SD memory cards
- USB storage devices
- External hard disks (optional)

SD Memory Cards

CAUTION

- Do not orient the SD memory card in the wrong direction, and force it into the DL850E/DL850EV. Doing so may damage the SD memory card and the DL850E/DL850EV.
- Inserting and removing the SD memory card quickly (within the span of a second) may damage the DL850E/DL850EV.
- Removing the SD memory card from the DL850E/DL850EV while the card is being accessed may corrupt the data on the SD memory card.
- An icon ( ) centered at the top of the screen indicates when the SD memory card is being accessed.

French

ATTENTION

- Ne placez pas la carte mémoire SD dans le mauvais sens et ne l'insérez pas en forçant dans le DL850E/DL850EV. Vous risqueriez d'endommager la carte mémoire SD et le DL850E/DL850EV.
- Le fait d'insérer et de retirer la carte mémoire SD rapidement (en une seconde) peut endommager le DL850E/DL850EV.
- Le fait de retirer la carte mémoire SD du DL850E/DL850EV pendant que le dispositif accède à cette carte risque d'endommager les données qu'elle contient.
- Une icône ( ) au centre de la partie supérieure de l'écran indique que le dispositif est en train d'accéder à la carte mémoire SD.

SD Memory Cards That Can Be Used

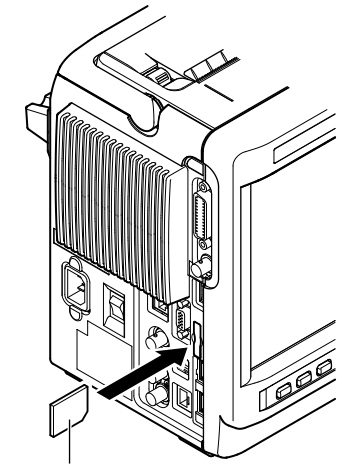
You can use memory cards that conform to the SD or SDHC standard with the DL850E/DL850EV. For details, contact your nearest YOKOGAWA dealer.

Note

When using an SD memory card with a PC, make sure that the PC is compatible with the SD memory card. Also, depending on the type of PC, some of the cards that you have checked by contacting YOKOGAWA may not function properly. Make sure that the card that you intend to use is compatible with your PC.

How to Insert an SD Memory Card

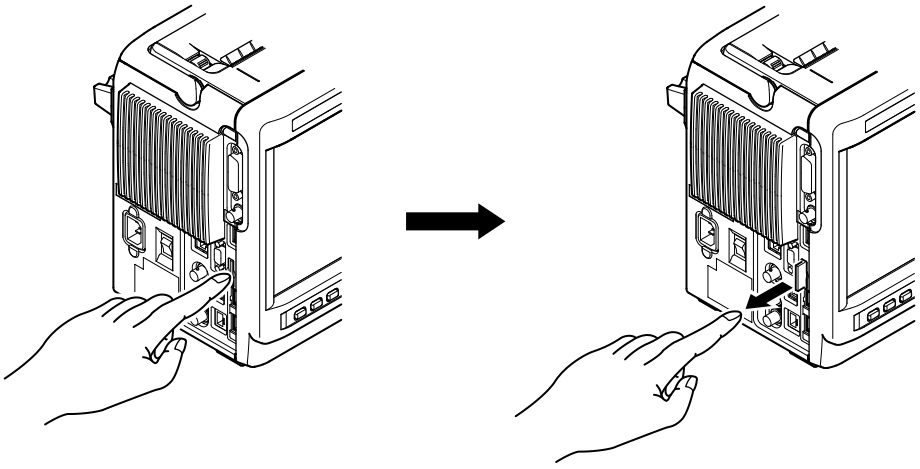
Insert the SD memory card into the slot with the front of the card facing the front panel.
The SD memory card slot is on the left side panel of the DL850E/DL850EV.
If you are using an SD memory card that has a write-protection feature and you want to save data to or format the card, disable the write-protection feature before you insert the SD memory card into the DL850E/DL850EV.



SD memory card

How to Remove the SD Memory Card

Press the end of the SD memory card into the slot, and then release the card to eject it from the DL850E/DL850EV.
Remove the SD memory card.



Press the memory card into the slot.

Release the SD memory card to eject .

General SD Memory Card Handling Precautions

Follow the general handling precautions that are included with your SD memory card.

USB Storage Media

CAUTION

- During hard disk recording, the  icon blinks in the center of the screen. While this icon is blinking, do not connect the USB storage media to the USB ports for connecting peripheral devices. Doing so may cause the DL850E/DL850EV to malfunction or may corrupt the data that is being recorded to the hard disk.
- Do not remove the USB storage medium or turn off the power when the medium is being accessed. If you do so, the data on the USB storage medium may be corrupted.
- An icon () centered at the top of the screen indicates when the USB storage medium is being accessed.

French

ATTENTION

- Pendant l’enregistrement du disque dur, l’icône clignote au centre de l’écran. Lorsque cette  icône clignote, ne connectez pas le support de stockage USB aux ports USB prévus à cet effet. Vous risqueriez de causer un dysfonctionnement du DL850E/DL850EV ou d’endommager les données en cours d’enregistrement sur le disque dur.
- Pendant que le dispositif accède au support de stockage USB, ne retirez pas ce dernier et ne mettez pas l’alimentation hors tension. Vous risqueriez d’endommager les données sur le support de stockage USB.
- Une icône () au centre de la partie supérieure de l’écran indique que le dispositif est en train d’accéder au support de stockage USB.

USB Storage Media That Can Be Used

You can use USB storage media that are compatible with USB Mass Storage Class version 1.1.

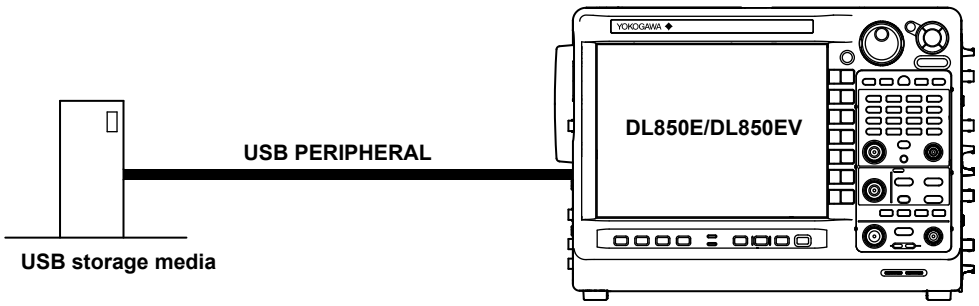
Note

- Only connect USB keyboards, USB mouse devices, and USB storage media to the USB port for connecting peripheral devices.
- The DL850E/DL850EV can handle up to four storage media. If the connected medium is partitioned, the DL850E/DL850EV treats each partition as a separate storage medium.
- Connect USB storage devices directly, not through a USB hub.
- Do not connect and disconnect the two USB devices repetitively. Allow at least 10 seconds between removal and connection.

How to Connect USB Storage Media

When connecting a USB storage medium to a DL850E/DL850EV USB port, connect the USB cable directly as shown in the figure below. You can connect or disconnect a USB cable at any time whether the DL850E/DL850EV is on or off (hot-plugging is supported). Connect the type A connector of the USB cable to the DL850E/DL850EV, and connect the type B connector to the USB storage medium. If you connect a USB storage medium when the power switch is on, the medium becomes available for use after the DL850E/DL850EV detects it.

The DL850E/DL850EV has two USB ports: USB-0 and USB-1. The port numbers are not fixed. The port at which the first USB storage medium is detected becomes USB-0. The port at which the second USB storage medium is detected becomes USB-1.



General USB Storage Media Handling Precautions

Follow the general handling precautions that are included with your USB storage media.

External Hard Disks (Optional)

CAUTION

- Do not orient the cable's connector in the wrong direction, and force it into the DL850E/DL850EV. Doing so may damage the external hard disk and the DL850E/DL850EV.
- Do not remove the cable or turn off the power when the external hard disk (the hard disk that is connected to the EXT HDD connector) is being accessed. If you do so, the data on the external hard disk may be corrupted.
- An icon ( ) centered at the top of the screen indicates when the external hard disk is being accessed.
- Connect the external hard disk to the DL850E/DL850EV when the DL850E/DL850EV is off.

French

ATTENTION

- Ne placez pas le connecteur du câble dans le mauvais sens et ne l'insérez pas en forçant dans le DL850E/DL850EV. Vous risqueriez d'endommager le disque dur externe et le DL850E/DL850EV.
- Pendant que le dispositif accède au disque dur externe (disque dur branché sur le connecteur EXT HDD), ne retirez pas le câble et ne mettez pas l'alimentation hors tension. Vous risqueriez d'endommager les données sur le disque dur externe.
- Une icône ( ) au centre de la partie supérieure de l'écran indique que le dispositif est en train d'accéder au disque dur externe.
- Connectez le disque dur externe au DL850E/DL850EV lorsque ce dernier est hors tension.

eSATA Cable

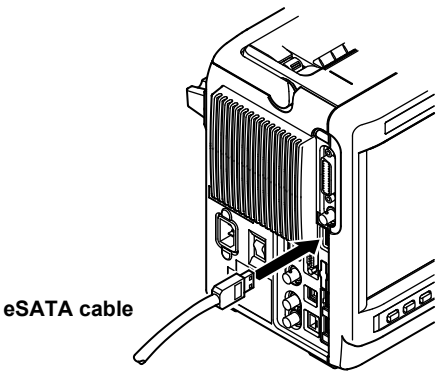
Use a commercially available eSATA (External Serial ATA) cable whose length is 2 m or less.

Connection Procedure

1. Connect the eSATA cable to the EXT HDD connector on the left side panel.
2. Turn the external hard disk on.
3. Turn the DL850E/DL850EV on.

Note

- Wait approximately 10 seconds after you turn the external hard disk on before you turn the DL850E/DL850EV on.
- For details on formatting the external hard disk, see section 16.3.



External Hard Disks That You Can Connect to the DL850E/DL850EV

The eSATA peripheral devices that you can connect to the DL850E/DL850EV are hard disks only. Note that hard disks that can be used are those whose disk partition is in MBR format and whose format is FAT32.

For details on the hard disks that you can connect to the DL850E/DL850EV, contact your nearest YOKOGAWA dealer.

General External Hard Disk Handling Precautions

Follow the general handling precautions that are included with your external hard disk.

16.2 Internal Hard Disk (Optional)

This section explains about handling the internal hard disk.

CAUTION

Do not store more than 512 files in the root directory of the internal hard disk. Doing so will slow the file access operations to all files. In addition, we cannot guarantee the operation of the hard disk recording feature when the DL850E/DL850EV is in this state.

French

ATTENTION

Ne pas stocker plus de 512 fichiers dans le répertoire racine du disque dur interne. Ceci ralentit les opérations d'accès à tous les fichiers. En outre, nous ne pouvons pas garantir le fonctionnement de la fonction d'enregistrement sur disque dur lorsque le DL850E/DL850EV est dans cet état.

16.3 Formatting Storage Media

This section explains how to format storage media.

- Storage management
- Formatting storage media

► “Formatting Storage Media (Storage Manager)” in the Features Guide

CAUTION

- When you format a storage medium, all the data that is stored on the medium is deleted.
- If a formatted storage medium cannot be detected by the DL850E/DL850EV, use the DL850E/DL850EV to format the storage medium again.

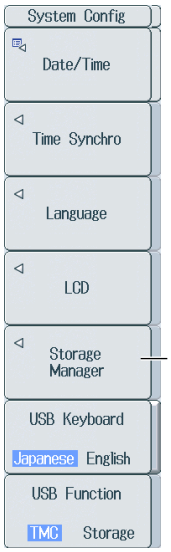
French

ATTENTION

- Lorsque vous formatez un support de stockage, toutes les données qu’il contient sont supprimées.
- Si le DL850E/DL850EV ne détecte pas un support de stockage formaté, utilisez le DL850E/DL850EV pour formater de nouveau le support de stockage.

UTILITY System Config Menu

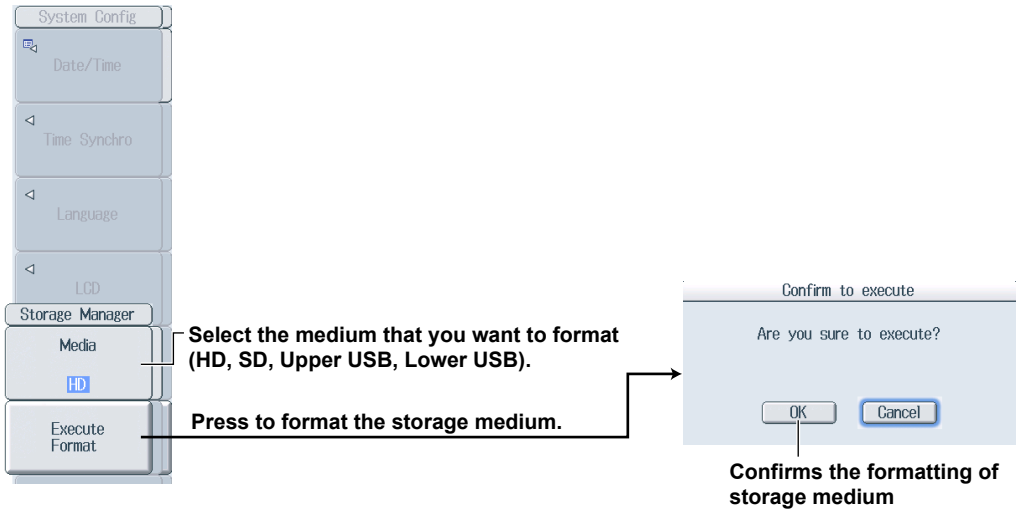
Press **UTILITY** and then the **System Config** soft key to display the following menu.



Press to configure the storage management settings.

Configuring Storage Management (Storage Manager)

Press the **Storage Manager** soft key to display the following menu.



Storage Medium That Will Be Formatted (Media)

HD: External or internal hard disk
On models with the /HD0 option, this is the external hard disk.
On models with the /HD1 option, this is the internal hard disk.

SD: SD memory card

Upper USB: The USB storage device that is connected to the DL850E/DL850EV's upper USB port (type A) for connecting peripheral devices.

Lower USB: The USB storage device that is connected to the DL850E/DL850EV's lower USB port (type A) for connecting peripheral devices.

16.4 Saving Waveform Data

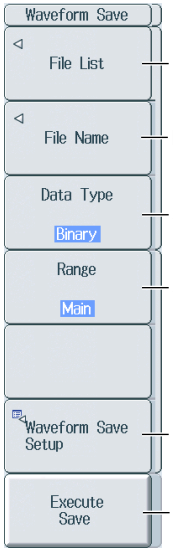
This section explains the following settings (which are used when saving waveform data).
You can use the FILE Waveform (Save) menu or the SAVE menu to set how files are saved.

- Save destination
- File name
- Data format
- Save range
- Waveform to save
- Saving waveform data

► "Saving Waveform Data (Waveform)" in the Features Guide

FILE Waveform (Save) Menu

Press **FILE** and then the **Waveform (Save)** soft key to display the following menu.



Press to set the save destination.

Press to configure the file name settings.

Select the data format (Binary, ASCII, Float, MATLAB).

Select the waveform save range (Main, Zoom1, Zoom2, Cursor Range).

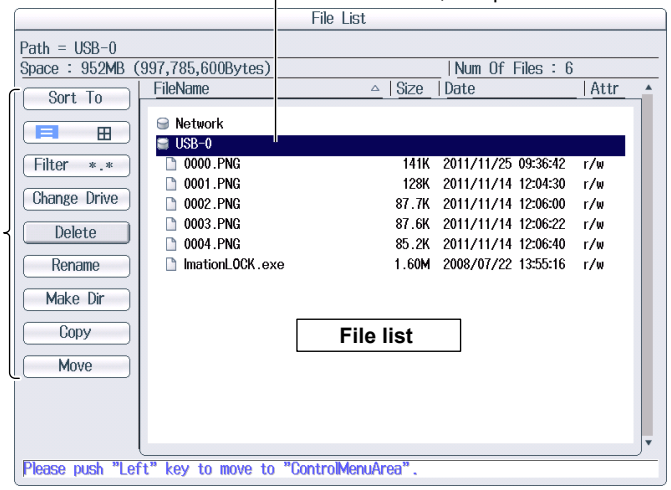
Press to configure the waveform save conditions.

Saves waveform data

Setting the Save Destination (File List)

Press the **File List** soft key to display the following screen.

The destination storage medium (drive) or folder
Use the jog shuttle or the up and down **arrow** keys (▲▼) to move the cursor, and press **SET** to select the destination.



Operation menu

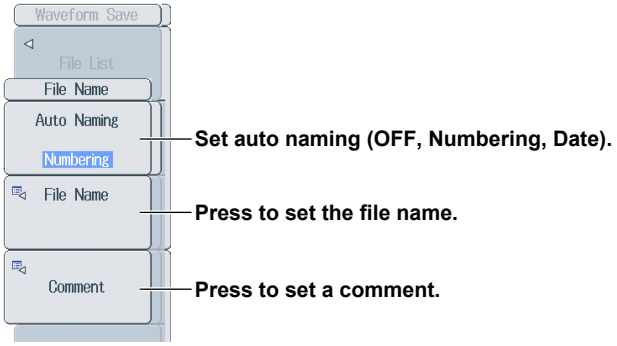
For more information on file operations, see section 16.10.

Note

You can also set the save destination drive by using the Change Drive item on the operations menu.

Configuring File Name Settings (File Name)

Press the **File Name** soft key to display the following menu.

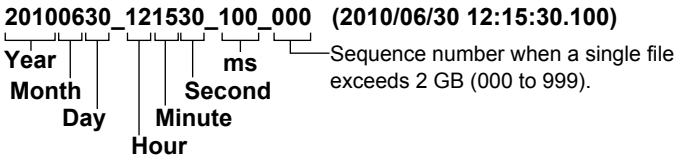


Setting Auto Naming (Auto Naming)

OFF: Disables the auto naming feature. The name that you specify using the File Name setting is used. If there is a file with the same name in the save destination folder, you cannot save the data.

Numbering: The DL850E/DL850EV automatically adds a four-digit number (0000 to 9999) after the common name specified using the File Name setting (up to 32 characters).

Date: The file name is the date and time (down to ms) when the file is saved. The file name specified using the File Name setting is not used.



Regardless of whether the auto naming feature is set to OFF, Numbering, or Date, if the data size of a single file exceeds 2 GB, an underscore and a three-digit sequence number (000 to 999) is appended to the file name. The sequence number is incremented by one each time a file is added. This is appended only if the file exceeds 2 GB.

Setting a Comment (Comment)

You can add a comment that consists of up to 120 characters when you save a file. You do not have to enter a comment. All characters, including spaces, can be used in comments.

Selecting the Data Type (Data Type)

You can save the sampling data stored in the acquisition memory in the following data formats.

Data Type	Extension	
Binary	.WDF	Data is saved in binary format. You can load this type of data into the DL850E/DL850EV. ► section 16.7 Data can be saved in compressed form. For details, see the next page.
ASCII	.CSV	Data is scaled using the specified range and saved to a file in ASCII format. You cannot load the data using the DL850E/DL850EV.
Float	.FLD	Data is scaled using the specified range and saved to a file in 32-bit IEEE floating format. You cannot load the data using the DL850E/DL850EV.
MATLAB	.MAT	Data is saved in MATLAB format. You cannot load the data using the DL850E/DL850EV. Waveforms measured using the dual capture feature cannot be saved.

Note

If the data format is ASCII, Float, or MATLAB and the combination of the record length and the number of channels causes the file size to exceed 2 GB, the file cannot be saved.

Selecting the Waveform Save Range (Range)

You can select the waveform save range (area) from one of the choices below. The DL850E/DL850EV can only load binary data (data that was saved with the Data Type set to Binary as described previously in “Selecting the Data Type”).

Main: This is the normal waveform range. Waveforms are saved up to the displayed record length (the range that is displayed on the screen).

Zoom1: This is the range of zoom waveform Zoom1.

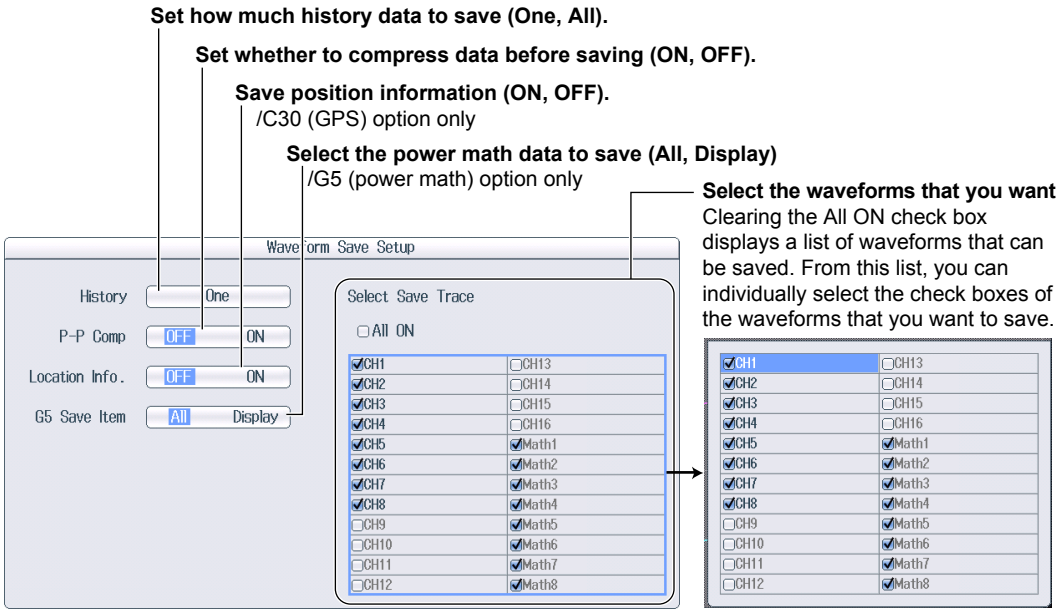
Zoom2: This is the range of zoom waveform Zoom2.

Cursor Range: This is the range that is bounded by Cursor1 and Cursor2.

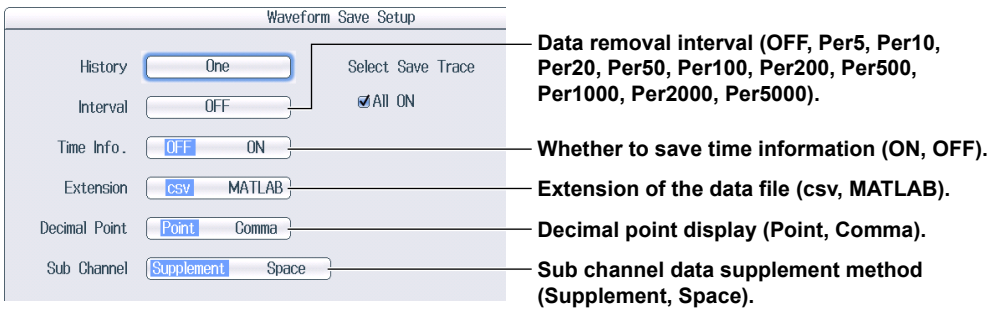
Configuring Waveform Save Conditions (Waveform Save Setup)

Press the **Waveform Save Setup** soft key to display the following screen.

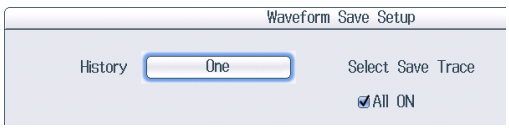
- **When Data Type is set to Binary**



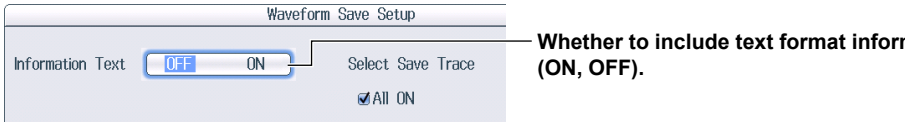
- **When Data Type is set to ASCII**



- **When Data Type is set to Float**



- **When Data Type is set to MATLAB**



Saving History Data (History)

One: The one waveform that is selected with Select Record on the HISTORY menu will be saved.

All: All waveforms within the range bounded by Start Record and End Record on the HISTORY menu will be saved. If you search for history waveforms, and then select All, only the detected waveforms will be saved.

* If the data type is set to MATLAB, the single waveform selected with Select Record in the HISTORY menu is saved.

Note

Average waveforms of history waveforms cannot be saved. Save the necessary range of history waveforms using All, load the saved history waveforms, and then select Average Record of the HISTORY menu to display the average waveform.

Compressing and Saving Data (P-P Comp; when Data Type is set to Binary)

- If you set P-P Comp to ON, and then save data, the DL850E/DL850EV saves just the maximum and minimum values from the multiple measured data points on the same time axis. This decreases the size of the saved file.
- You cannot perform P-P compression when saving power-spectrum computed data.
- If you set P-P Comp to ON, you cannot use Range to select the save range.

Selecting the Waveform to Save (Select Save Trace)

- You can select All ON, CH1 to CH16, 16CH VOLT, 16CH TEMP/VOLT, CAN, CAN FD, LIN, SENT, and the Math waveforms. The waveforms you select that are displayed are saved.
- If you set History to All, the Math waveforms will not be saved. If you want to save the Math data, set History to One.
  If you set History to All, all waveforms within the range bounded by Start Record and End Record on the HISTORY menu will be saved. If you want to select which waveform will be saved, do not select All.

SAVE Menu

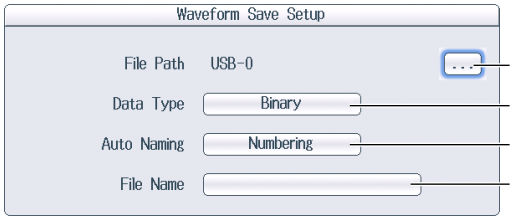
Press **SHIFT+SAVE** (MENU) to display the following menu.

Turns the saving of waveform data on and off

Press to set the save destination and the file name for waveform data.

Setting the Save Destination and the File Name of the Waveform Data (Waveform Save Setup)

Press the **Waveform Save Setup** soft key to display the following screen.



Displays the file list ► section 16.10

Set the data format (Binary, ASCII, Float, MATLAB).

Set auto naming (OFF, Numbering, Date).

Press to set the file name.

Saving

Press **SAVE** to save the waveform data file to the specified folder. If **Image Save** on the **SAVE** menu is set to ON, the screen capture data is also saved.

Save Destination for Hard Disk Recording and Action Execution

In the specified drive, a folder is automatically created with the date (year, month, and day) as its name, and data is saved to files in that folder whose names are specified by the auto naming feature. If the number of files in the save destination folder exceeds 1000, a new folder is automatically created with the date and an incremented sequence number (000 to 999) as its name, and the data continues to be saved in the new folder.

You can configure the DL850E/DL850EV so that data is saved to the specified folder when an action is executed, not to the folder that is automatically created with the date. ► section 18.8

16.5 Saving Setup Data

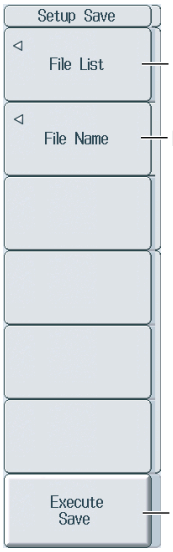
This section explains the following settings (which are used when saving setup data). You can save setup data to a file.

- Save destination
- File name
- Saving setup data

► "Saving Setup Data (Setup)" in the Features Guide

FILE Setup (Save) Menu

Press **FILE** and then the **Setup (Save)** soft key to display the following menu.



Press to set the save destination for the file. ► section 16.4

Press to configure the file name settings. ► section 16.4

Saves setup data to a file

Saving Setup Data (Execute Save)

- Press the Execute Save soft key to save the setup data (the setup information of each key at the time that the file is saved) to a file. The extension is .SET.
- The date, time, and communication setup parameters are not saved.
- You cannot save setup data during waveform acquisition. Press START/STOP to stop the waveform acquisition.

16.6 Saving Other Types of Data

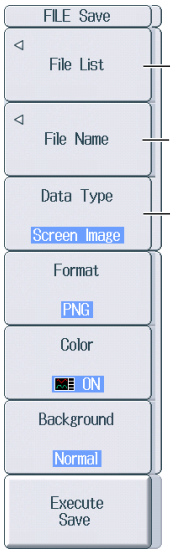
This section explains the following settings (which are used when saving screen captures, snapshot waveform data, the results of automated measurement of waveform parameters, and the FFT analysis results):

- Save destination
- File name
- Data type to save
- Data format (for screen captures)
- Color data (for screen captures)
- Saving data

► “Saving Other Types of Data (Others)” in the Features Guide

FILE Others (Save) Menu

Press **FILE** and then the **Others (Save)** soft key to display the following menu.



Press to set the save destination. ► section 16.4

Press to configure the file name settings. ► section 16.4

Set the type of data to save (Screen Image, Snap, Measure, FFT).

Setting the Data Type to Save (Data Type)

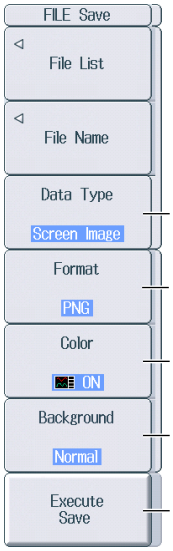
Screen Image: Save the display to a PNG, BMP, or JPEG file.

Snap: Save the waveform data captured in a snapshot to a file with .SNP extension.

Measure: Save the results of automated measurement of waveform parameters to a file in CSV format.

FFT: Save the FFT analysis results to a file in CSV format.

When Data Type Is Screen Image



Set Data Type to Screen Image.

Set the data format (PNG, BMP, JPEG).

Set the color data (ON, ON(Gray), ON(Reverse), OFF).

Set the background to opaque (Normal) or transparent (Transparent).*

Saves a screen capture

* This appears when the data format is set to PNG.
When the data format is JPEG, a setup menu for turning the frame on and off appears.

Setting the Data Format (Format)

You can save the following types of files to the specified storage medium. The table below shows the extensions that are automatically assigned to each format and the approximate sizes of files in each format.

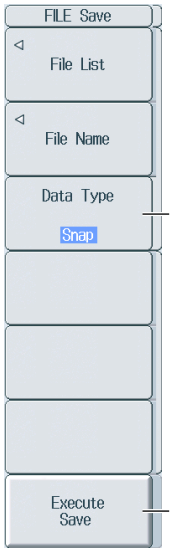
Output Data Format	Extension	File Size[1]
PNG	*.PNG	Approx. 100 KB (approx. 50 KB)[2]
BMP	*.BMP	Approx. 2 MB (approx. 150 KB)[2]
JPEG	*.JPG	Approx. 250 KB

1 When Color is set to ON.
2 The file sizes in parentheses indicate the file size when Color is set to OFF.

Setting the Color

ON: An image is produced with a 65536-color palette.
ON(Gray): An image is produced with a 16-color grayscale palette.
ON(Reverse): The screen background is not produced in color.
OFF: A black-and-white image is produced.

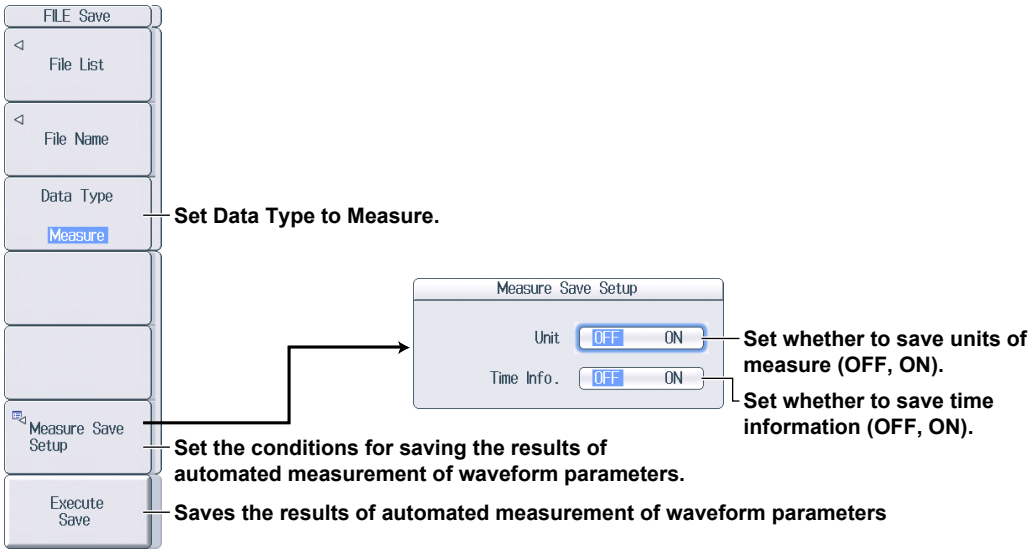
When Data Type Is Snap



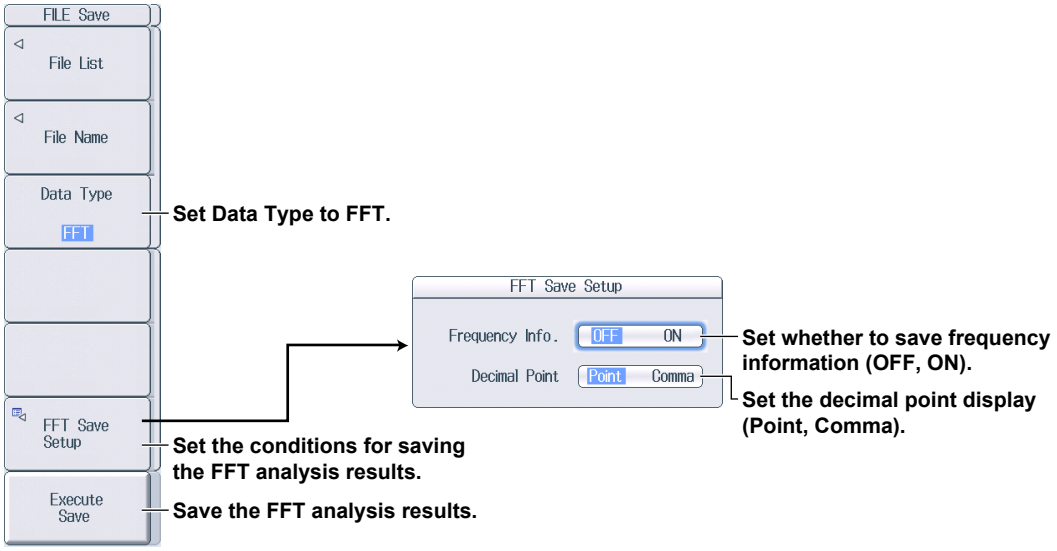
Set Data Type to Snap.

Saves a snapshot waveform

When Data Type Is Measure



When saving FFT analysis results



16.7 Loading Waveform Data

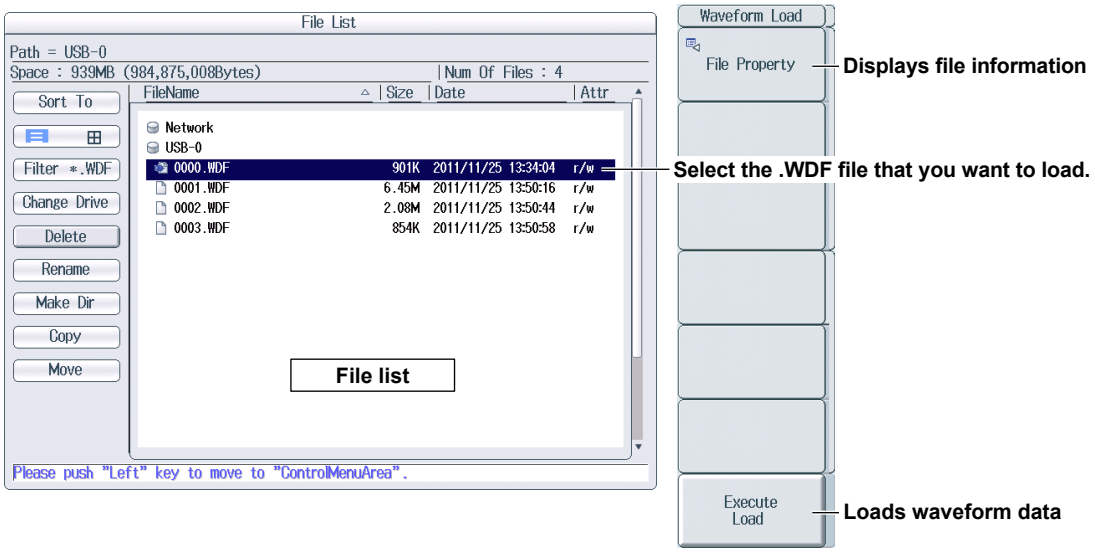
This section explains the following settings (which are used when loading waveform data):

- Displaying file information
- Loading waveform data into channels

► “Loading Waveform Data (Waveform)” in the Features Guide

FILE Waveform (Load) Menu

Press **FILE** and then the **Waveform (Load)** soft key to display the following menu.



Selecting Files

Select the file to load from the file list. ► section 16.10

Loading Waveform Data (Execute Load)

- The selected waveform data file (.WDF extension) is loaded together with the setup file. Loaded data is cleared when you start measurement.
- If the module configuration when the waveform data is saved and that when the data is loaded are different, only the waveform data of modules that match is loaded. When loading is complete, a message indicating the channel numbers that were not loaded is displayed.

16.8 Loading Setup Data

This section explains the following settings (which are used when loading setup data):

- Displaying file information
- Loading setup data

► “Loading Setup Data (Setup)” in the Features Guide

FILE Setup (Load) Menu

Press **FILE** and then the **Setup (Load)** soft key to display the following menu.

Displays file information

Loads the setup data

Selecting Files

Select the file to load from the file list. ► section 16.10

Loading Setup Data (Execute Load)

- Select the setup data (.SET extension) that you want to load.
- If the module configuration when the setup data is saved and that when the data is loaded are different, only the setup data of modules that match is loaded. When loading is complete, a message indicating the channel numbers that were not loaded is displayed.

16.9 Loading Other Types of Data

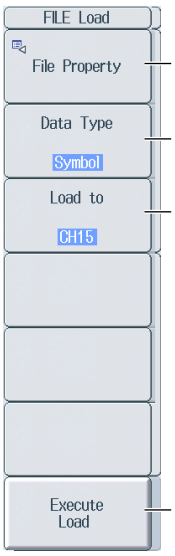
This section explains the following settings (which are used when loading snapshot waveforms):

- Displaying file information
- Type of data to load
- Loading data

► **"Loading Other Types of Data (Others)",**
"Loading a CAN/CAN FD Data Definition File (Symbol File Load)" and
"Loading a LIN Data Definition File (Symbol File Load)" in the Features Guide

FILE Others (Load) Menu

Press **FILE** and then the **Others (Load)** soft key to display the following menu.



Displays file information

Set the data type (Snap, Symbol)

Set the location to which you want to load the data (CH13 to CH16)*

Loads the data

* Only when the type of data to load is set to Symbol.

Setting the Type of Data to Load (Data Type)

Snap: Load snapshot waveform files (.SNP extension) that you have saved.
Symbol: Load CAN/CAN FD or LIN data definition files (.SBL extension).

Clearing the Waveform

To clear the snapshot waveform that you have loaded, press **CLEAR TRACE**, or initialize the DL850E/DL850EV.

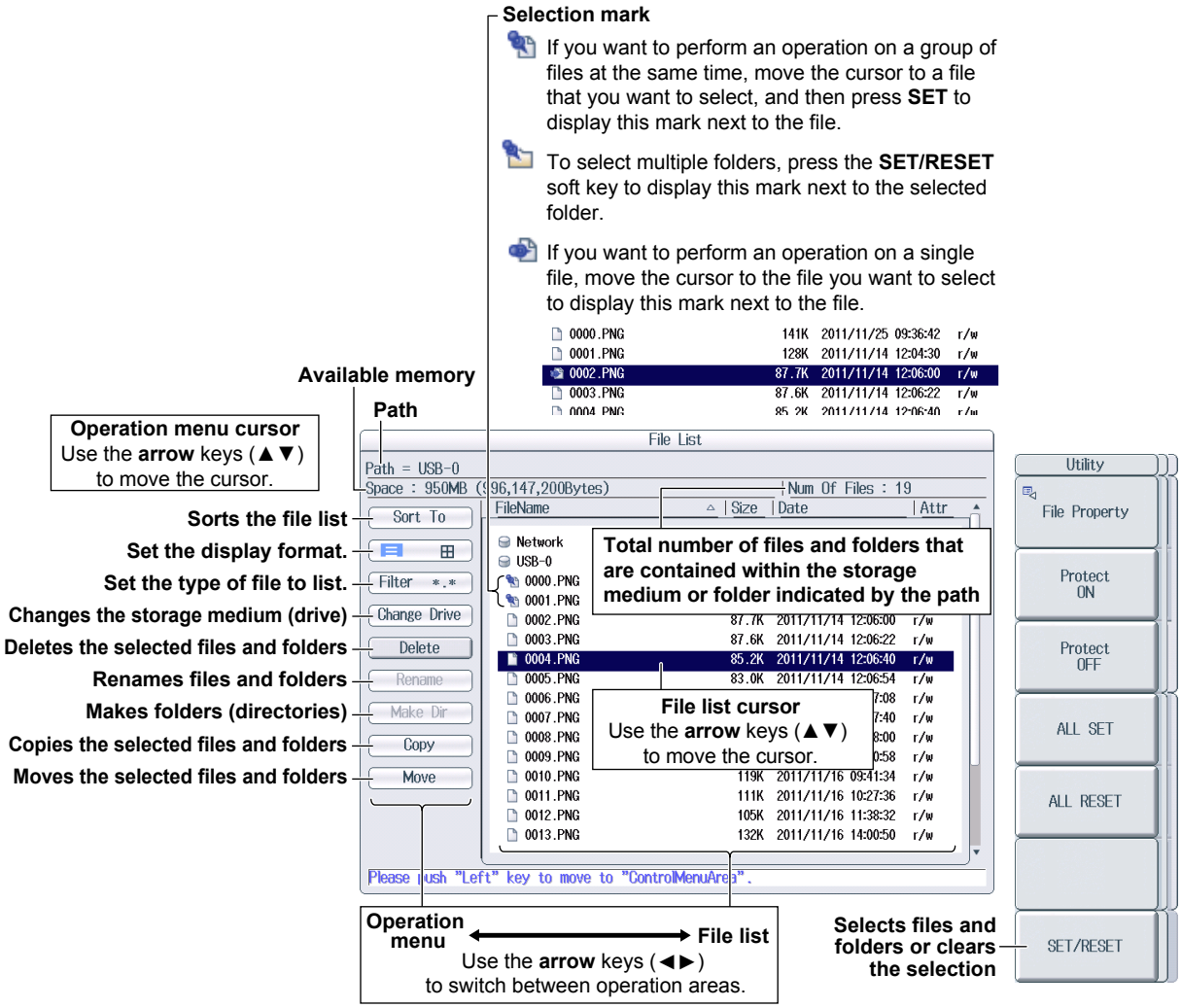
16.10 File Operations

This section explains the following settings (which are used when performing various file operations from the file list or the FILE Utility menu):

- Sorting the file list
- Display format
- Selecting the type of file to list
- Changing the storage medium
- Deleting files and folders
- Renaming files and folders
- Creating folders (directories)
- Copying files
- Moving files
- Displaying file information
- File protection on and off
- Selecting files (ALL SET, ALL RESET, SET/RESET)

► "File Operations (Utility)" in the Features Guide

The File List (File List)

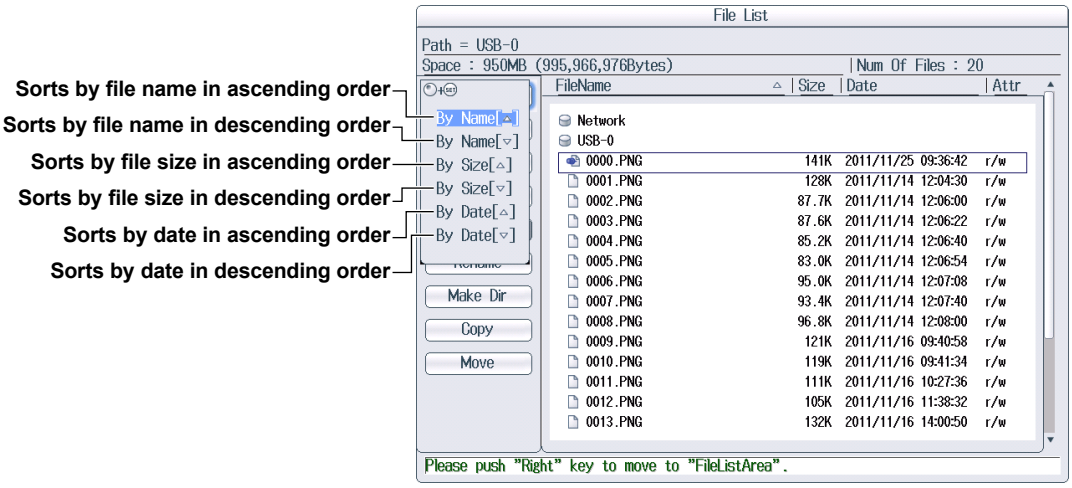


Note

The maximum number of files that can be shown in the file list is about 1000. This number varies depending on the storage media connection status and folder structure. It is possible to save files in a folder that contains more than 1000 files, but they may not appear in the file list. If this happens, delete some files or move them to another folder so that the number of files in the folder is less than about 1000 files.

Sorting the File List (Sort To)

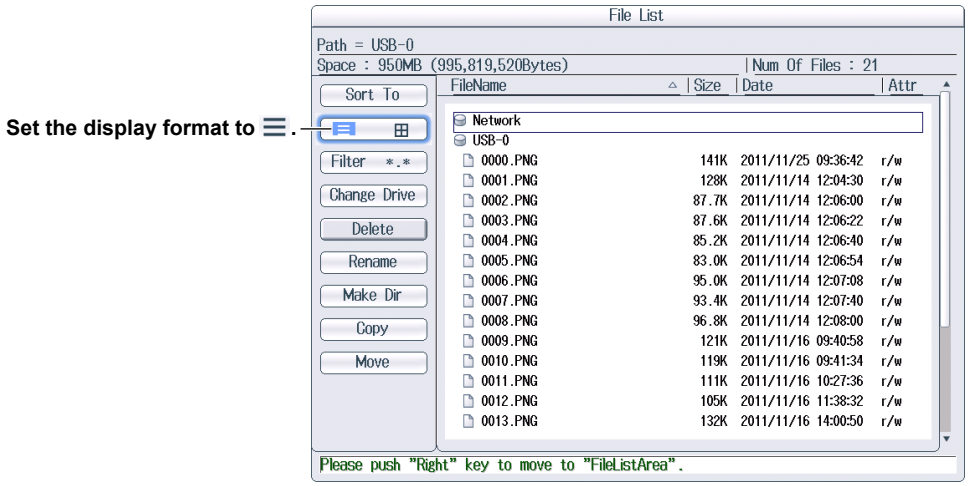
Select **Sort To** on the operation menu to display the following screen.



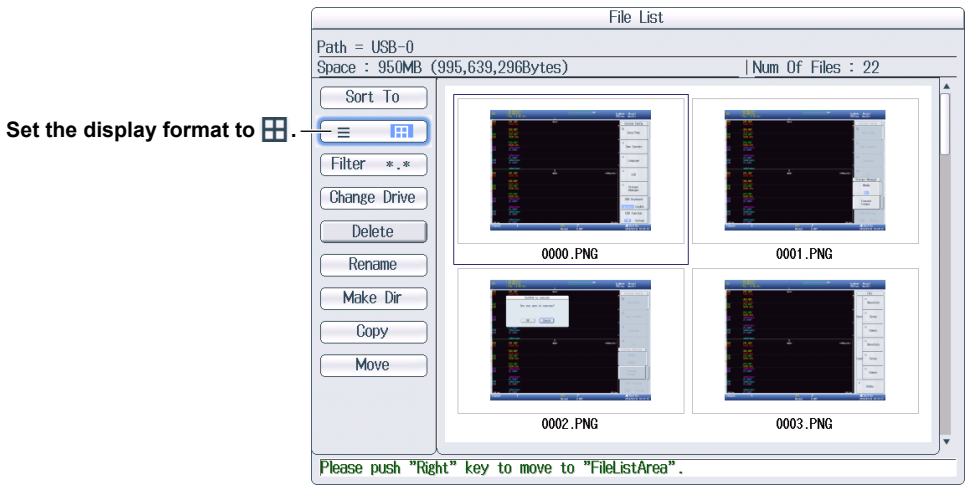
Switching the Display Format

1. Select **a display format** on the operation menu.
2. Press **SET** to switch between display formats.

- **List Display (☰)**

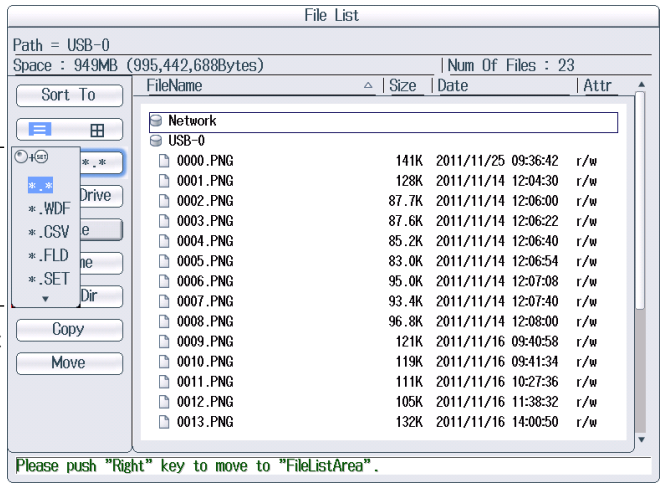


- **Thumbnail Display (⊞)**



Selecting the Type of File to List (Filter)

Select **Filter** on the operation menu to display the following screen.

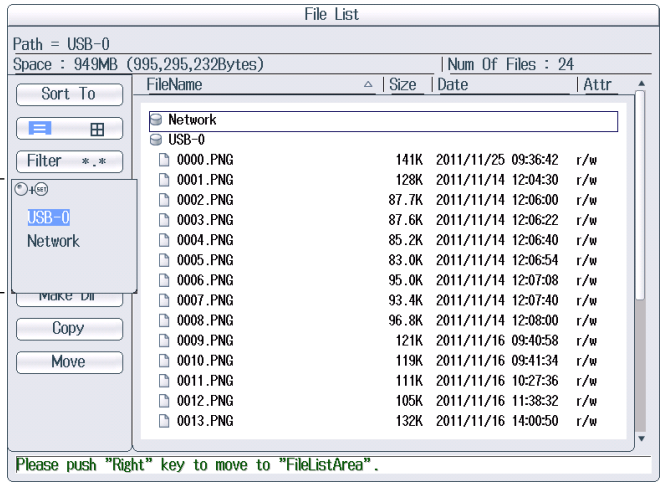


Select the type of file to list.

.: All files
*.WDF: Waveform file in binary format
*.CSV: Waveform file in ASCII format
*.FLD: Waveform file in floating-point format
*.SET: Setup file
*.BMP: Image file in BMP format
*.PNG: Image file in PNG format
*.JPG: Image file in JPEG format
*.SNP: Snapshot waveform file
*.SBL: SBL file (CAN/CAN FD or LIN data definition file)
*.MAT: Waveform file in MATLAB format

Changing the Storage Medium or Drive (Change Drive)

Select **Change Drive** on the operation menu to display the following screen.



Select the storage medium (drive).

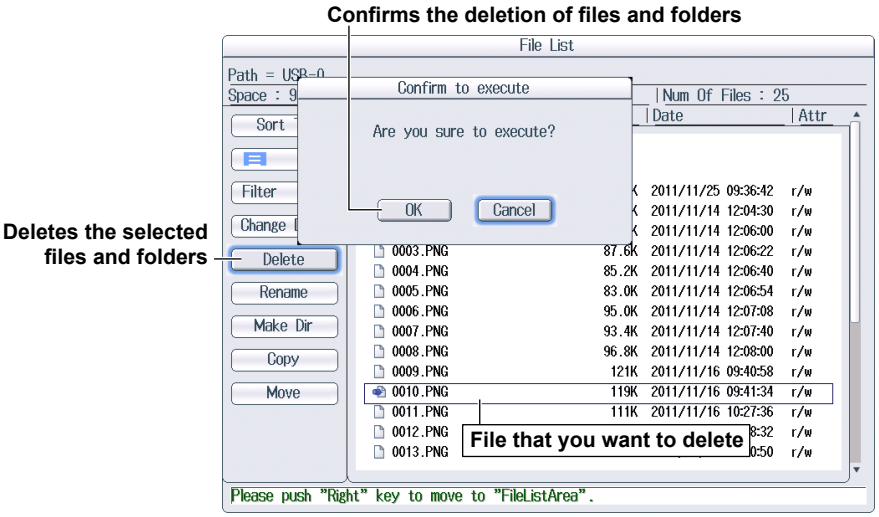
HD-0: Hard disk
SD-1: SD memory card
USB-0: The first USB storage medium that the DL850E/DL850EV detected
USB-1: The second USB storage medium that the DL850E/DL850EV detected
Network: Network drive

Note

You can also change the storage medium by highlighting the storage medium (drive) you want to change to in the file list and pressing **SET**.

Deleting Files and Folders (Delete)

1. Select the file or folder that you want to delete from the file list.
2. Select **Delete** on the operation menu to display the following screen.

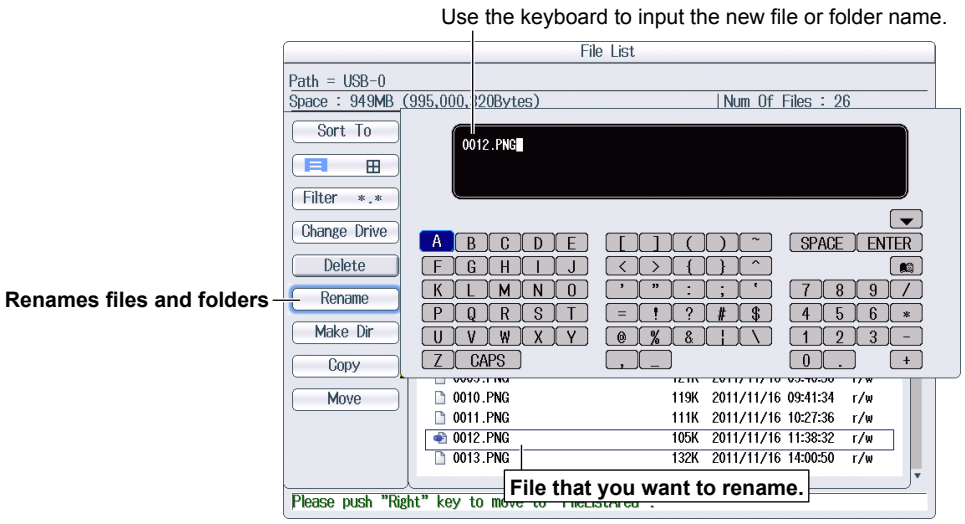


Note

- To delete multiple files or folders that are in the file list at the same time, move the cursor to the file or folder that you want to delete, and then carry out the following operations.
  Files: Press **SET** or the **SET/RESET** soft key on the Utility menu.
  Folders: Press the **SET/RESET** soft key on the Utility menu. If you press **SET**, all the files and folders that you have selected up to that point will be cleared.
- You can abort the file delete operation, except for the file that is being processed at the time.

Renaming Files and Folders (Rename)

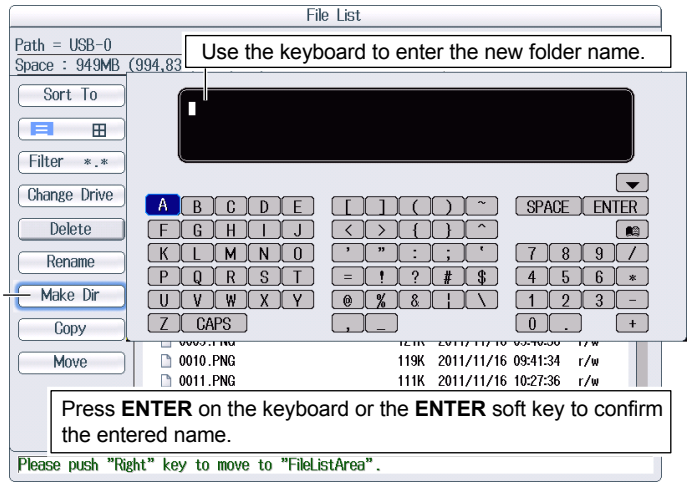
1. Select the file or folder that you want to rename from the file list.
2. Select **Rename** on the operation menu to display the following screen.



Press **ENTER** on the keyboard or the **ENTER** soft key to confirm the entered name.

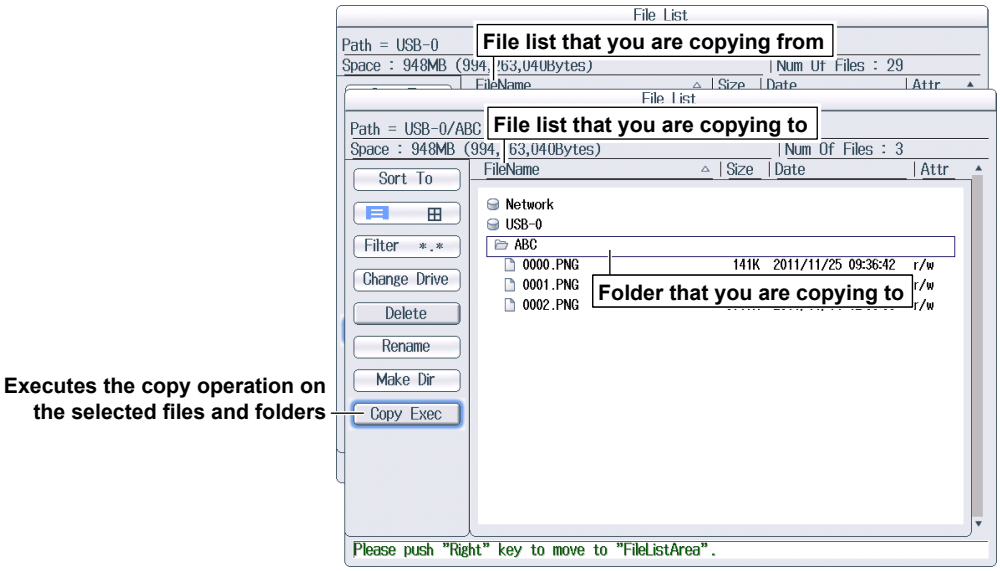
Making Folders (Make Dir)

1. Select the drive or folder that you want to create the new folder in from the file list.
2. Select **Make Dir** on the operation menu to display the following screen.

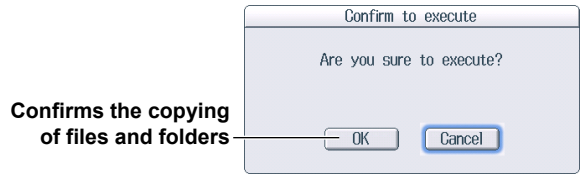


Copying Files (Copy)

1. Select the file that you want to copy from the file list.
2. Select **Copy** on the operation menu to display the following screen.



3. Select the drive and folder on the file list that you are copying to.
4. Select **Copy Exec** on the operation menu to display the following screen.

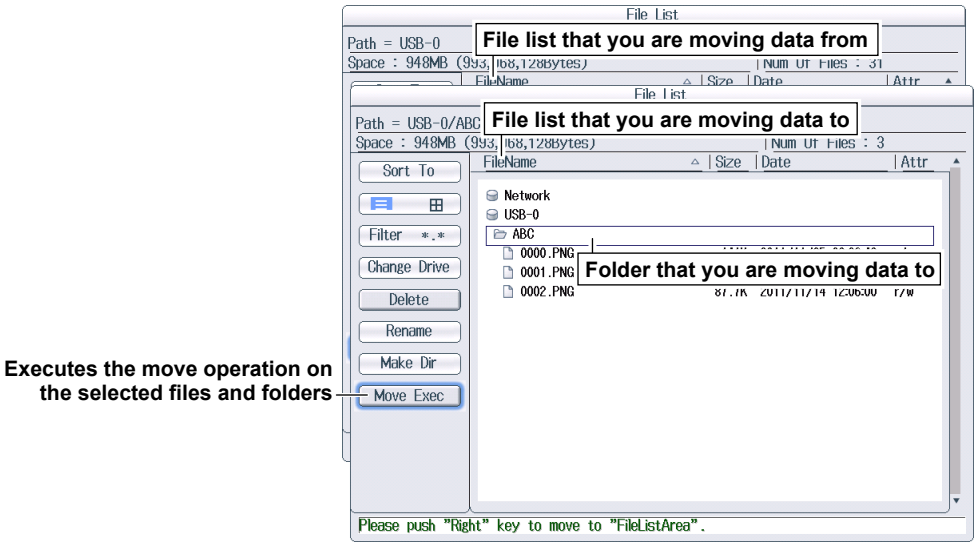


Note

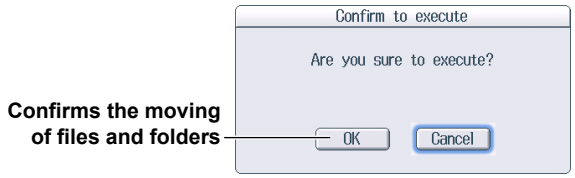
- The procedure for selecting multiple files or folders at the same time to copy them is the same as the procedure for selecting multiple files or folders at the same time to delete them. For more details, see the note on page 16-25.
- You can abort the file copy operation.
- You can perform file operations on the file list that you are copying to as well.

Moving Files (Move)

1. Select the file that you want to move from the file list.
2. Select **Move** on the operation menu to display the following screen.



3. Select the drive and folder on the file list that you are moving to.
4. Select **Move Exec** on the operation menu to display the following screen.

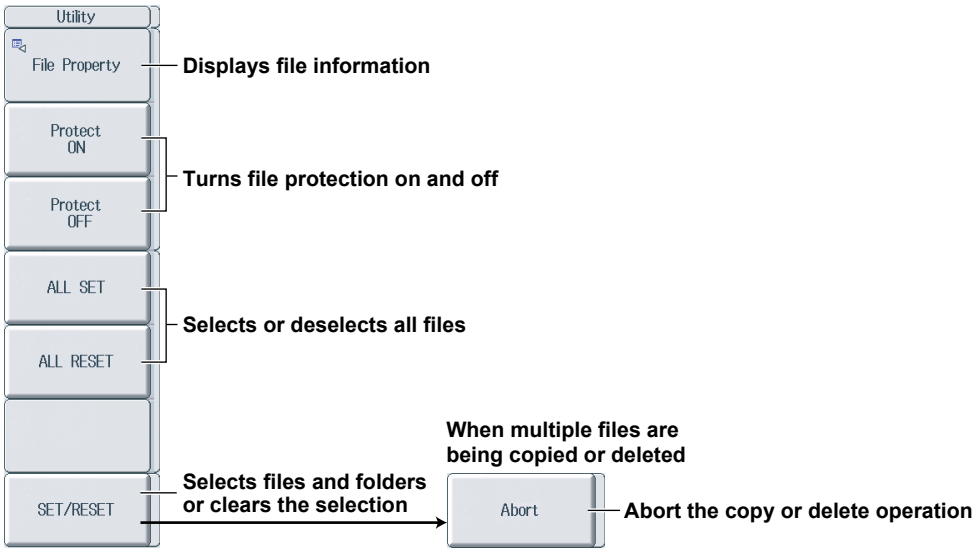


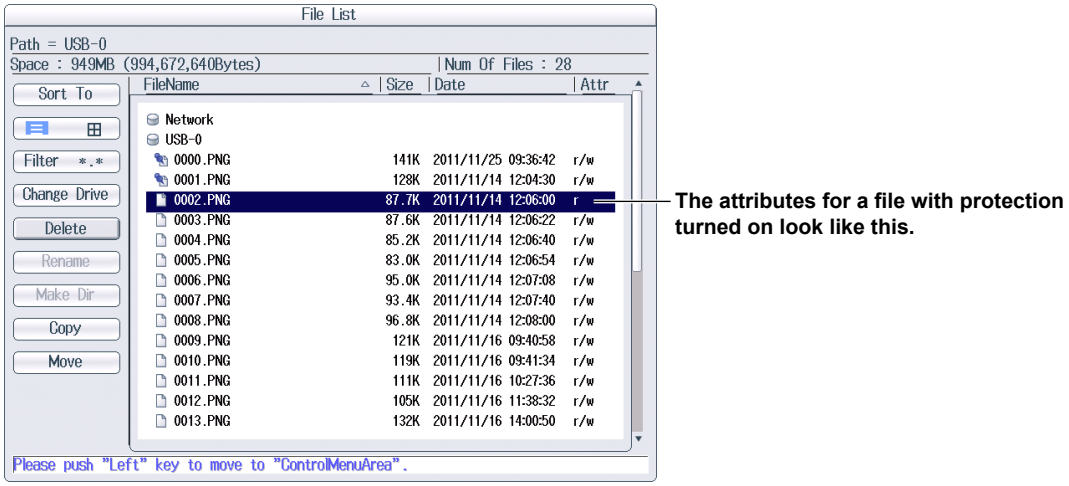
Note

- The procedure for selecting multiple files or folders at the same time to copy them is the same as the procedure for selecting multiple files or folders at the same time to delete them. For more details, see the note on page 16-25.
- You can perform file operations on the file list that you are moving files to as well.

FILE Utility Menu

Press **FILE** and then the **Utility** soft key to display the following menu.





Turning File Protection On and Off (Protect ON and OFF)

These soft keys turn protection on and off for the selected file. The change is reflected in the file attributes, displayed under the Attr column in the file list.

Protection	File Attribute	Description
ON	r	File protection is on for the selected file. The file can only be read. The file cannot be written to or deleted.
OFF	r/w	File protection is off for the selected file. The file can be read and written to.

Select All and Clear All (ALL SET and ALL RESET)

ALL SET: In the file list, when a drive is highlighted or a file or folder in a drive or folder is highlighted, pressing this soft key selects all the files and folders in the corresponding drive or folder. The selection marks (see page 16-20) are displayed to the left of the selected files and folders.

All RESET: Pressing this soft key clears all the selected files and folders.

Select/Deselect (SET/RESET)

This soft key selects the file or folder in the file list that is highlighted or clears the selection. The selection marks (see page 16-20) are displayed to the left of the selected files.

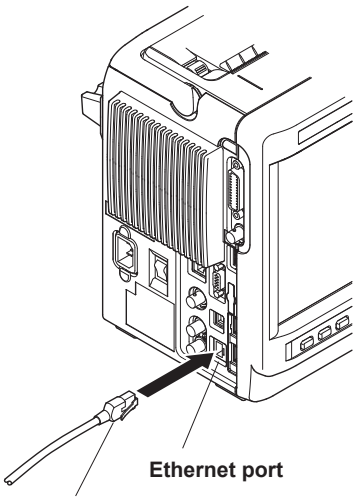
17.1 Connecting the DL850E/DL850EV to a Network

This section explains how to connect the DL850E/DL850EV to a network.

Ethernet Interface Specifications

There is a 1000BASE-T port located on the side panel of the DL850E/DL850EV.

Item	Specifications
Ports	1
Electrical and mechanical specifications	IEEE802.3
Transmission system	Ethernet (1000BASE-T, 100BASE-TX, 10BASE-T)
Communication protocol	TCP/IP
Supported services	Server: FTP, HTTP (Web), and VXI-11 Client: FTP (Net Drive), SMTP (Mail), SNTP, LPR (Net Print), DHCP, and DNS
Connector type	RJ-45



Items Required to Connect the DL850E/DL850EV to a Network

Cable

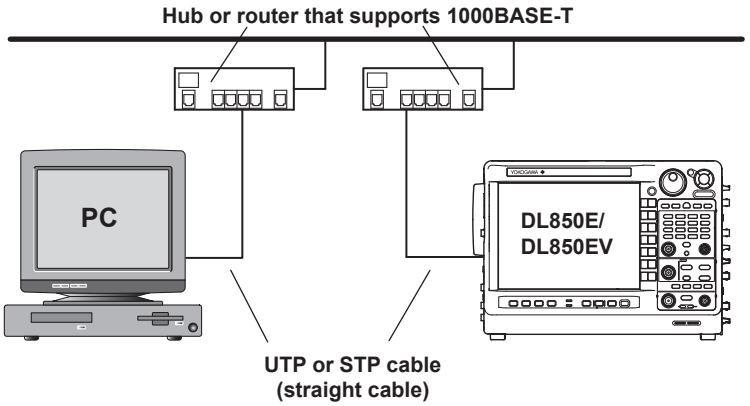
Use one of the following types of network cables that support the data rate of your network.

- A UTP (Unshielded Twisted-Pair) cable
- An STP (Shielded Twisted-Pair) cable

Connection Procedure

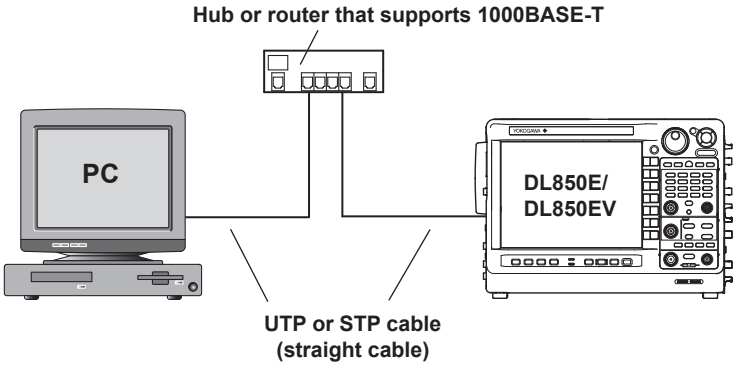
To Connect to a PC over a Network

1. Turn the DL850E/DL850EV off.
2. Connect one end of a UTP (or STP) cable to the ETHERNET 1000BASE-T port on the side panel.
3. Connect the other end of the UTP (or STP) cable to a hub or router.
4. Turn the DL850E/DL850EV on.



To Connect to a PC through a Hub or Router

1. Turn off the DL850E/DL850EV and the PC.
2. Connect one end of a UTP (or STP) cable to the ETHERNET 1000BASE-T port on the side panel.
3. Connect the other end of the UTP (or STP) cable to a hub or router.
4. Connect the PC to the hub or router in the same way.
5. Turn the DL850E/DL850EV on.



Note

- Use a hub or router that conforms to your network environment (for example, the data rate).
- When you connect a PC to the DL850E/DL850EV through a hub or router, the PC must be equipped with an auto switching 1000BASE-T/100BASE-TX/10BASE-T network card.
- Do not connect the DL850E/DL850EV to a PC directly. Direct communication without a hub or router is not guaranteed to work.
- If you specify a fixed IP address or network drive, be sure to use the DL850E/DL850EV in an environment where it can be accessed. If it cannot be accessed, you may not be able to operate the DL850E/DL850EV for the specified timeout period.

17.2 Configuring TCP/IP Settings

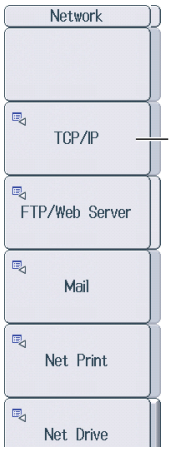
This section explains the following TCP/IP settings (which are used when connecting to a network):

- DHCP (IP address, subnet mask, and default gateway)
- DNS (domain name, DNS server IP address, and domain suffix)

► "TCP/IP (TCP/IP)" in the Features Guide

UTILITY Network Menu

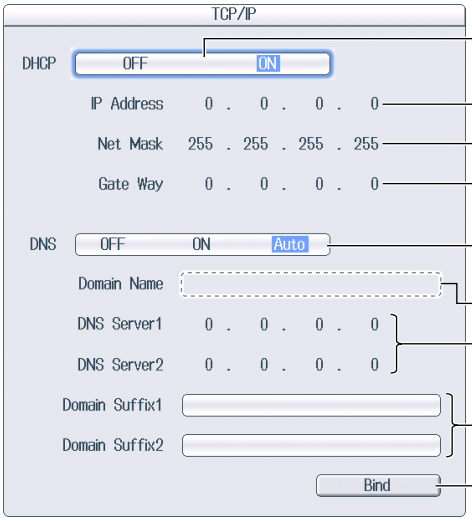
Press **UTILITY** and then the **Network** soft key to display the following menu.



Press to configure the TCP/IP settings.

Configuring TCP/IP Settings (TCP/IP)

Press the **TCP/IP** soft key to display the following screen.



Set the DHCP (OFF, ON).
Set these when DHCP is turned off.
• IP address
• Subnet mask
• Default gateway
Set the DNS (OFF, ON, Auto).*
These are displayed when DNS is set to ON.
• Domain name.
• DNS server IP addresses (primary and secondary).
These are displayed when DNS is set to ON or Auto.
• Domain suffixes (primary and secondary).
Applies the settings

* Auto is displayed when DHCP is turned on.

Setting the DNS (DNS)

OFF: Disables the DNS.

ON: Enables the DNS. Set the domain name, and the DNS server's primary and secondary IP addresses and domain suffixes.

Auto: Enables the DNS. After you set the domain suffixes, the domain name and the DNS server IP addresses are set automatically. This option can only be selected when DHCP is turned on.

17.3 Accessing the DL850E/DL850EV from a PC (FTP Server)

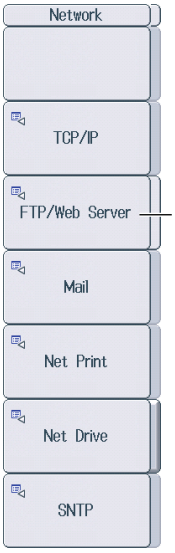
This section explains the following settings (which are used when accessing the DL850E/DL850EV from a PC on a network):

- User name
- Password
- Timeout
- Starting an FTP client

► “FTP Server (FTP/Web Server)” in the Features Guide

UTILITY Network Menu

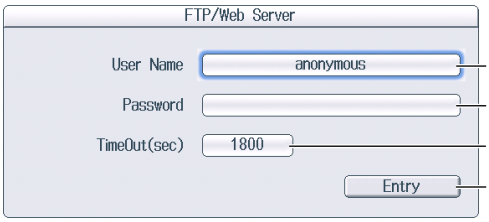
Press **UTILITY** and then the **Network** soft key to display the following menu.



Press to configure the FTP server settings.

Configuring FTP Server Settings (FTP/Web Server)

Press the **FTP/Web Server** soft key to display the following screen.



Settings for accessing the DL850E/DL850EV from a PC

- **Set the user name using up to 15 characters.**
- **Set the password using up to 15 characters.**
- **Set the timeout value (30 to 3600 s).**

Applies the settings

Starting an FTP Client

Start an FTP client on a PC.

Enter the user name and password that you have set on the DL850E/DL850EV’s FTP/Web Server screen shown above, and connect to the DL850E/DL850EV.

Note

If you set the user name to “anonymous,” you can connect to the DL850E/DL850EV without entering a password.

17.4 Monitoring the DL850E/DL850EV Display from a PC (Web Server)

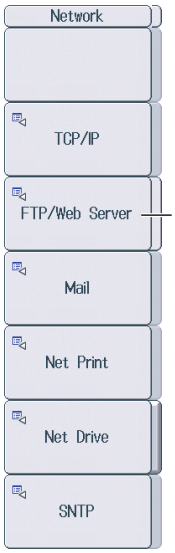
This section explains the following settings (which are used when accessing the DL850E/DL850EV from a PC on a network to show the DL850E/DL850EV's display on the PC and to start and stop waveform acquisition from the PC):

- User name
- Password
- Timeout
- Connecting to the DL850E/DL850EV from a PC

► "Web Server (FTP/Web Server)" in the Features Guide

UTILITY Network Menu

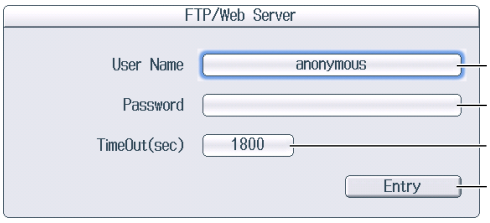
Press **UTILITY** and then the **Network** soft key to display the following menu.



Press to configure the Web server settings.

Configuring Web Server Settings (FTP/Web Server)

Press the **FTP/Web Server** soft key to display the following screen.



Settings for accessing the DL850E/DL850EV from a PC

- **Set the user name using up to 15 characters.**
- **Set the password using up to 15 characters.**
- **Set the timeout value (30 to 3600 s).**

Applies the settings

17.5 Connecting to a Network Drive

This section explains the following settings (which are used when accessing a network drive (Net Drive) through an Ethernet connection to load or save various DL850E/DL850EV data):

- FTP server (file server)
- Login name
- Password
- FTP passive mode on and off
- Timeout
- Connecting to and disconnecting from network drives

► “Network Drive (Net Drive)” in the Features Guide

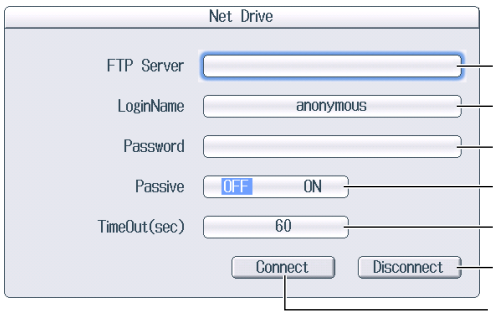
UTILITY Network Menu

Press **UTILITY** and then the **Network** soft key to display the following menu.

Press to configure and connect to a network drive.

Configuring Network Drive (Net Drive) Settings and Connecting to It

Press the **Net Drive** soft key to display the following screen.



Settings used to connect to a network drive

- **Set the FTP server’s host name.**
- **Set the login name.**
- **Set the password using up to 15 characters.**
- **Turns FTP passive mode on and off**
- **Set the timeout value (1 to 60 s).**

Disconnects from the network drive

Connects to the network drive

17.6 Configuring Email Transmission (SMTP client function)

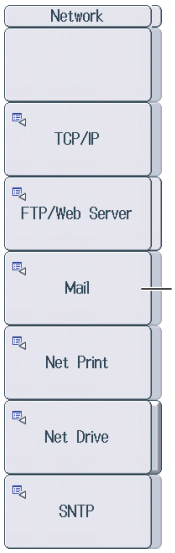
This section explains the following settings (which are used when transmitting mail to a specified mail address on a network):

- Mail server
- Mail address
- Comment
- Attaching image files
- Timeout
- Sending a test mail

► “Mail (Mail)” in the Features Guide

UTILITY Network Menu

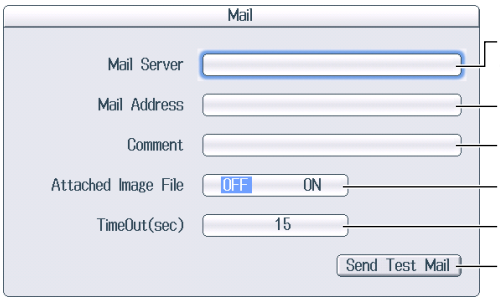
Press **UTILITY** and then the **Network** soft key to display the following menu.



Press to configure the mail settings.

Configuring Mail Settings (Mail)

Press the **Mail** soft key to display the following screen.



Set the mail server (IP address, or when DNS is enabled, the host name and domain name).

Set the destination email address.

Set a comment.

Set whether to attach an image file (OFF, ON).

Set the timeout value (1 to 60 s).

Sends a test email

17.7 Using SNTP to Set the Date and Time

This section explains how to use SNTP to set the date and time of the DL850E/DL850EV.

- SNTP server
- Timeout
- Executing time adjustment
- Automatic adjustment

► “SNTP (SNTP)” in the Features Guide

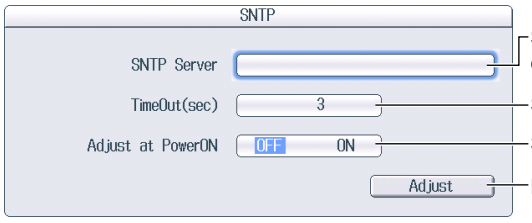
UTILITY Network Menu

Press **UTILITY** and then the **Network** soft key to display the following menu.

Press to configure the SNTP settings.

Configuring SNTP Settings (SNTP)

Press the **SNTP** soft key to display the following screen.



Set the SNTP server (IP address, or when DNS is enabled, the host name and domain name).

Set the timeout value (1 to 60 s).

Set automatic adjustment (OFF, ON).

Executes time adjustment

17.8 Configuring a Network Printer

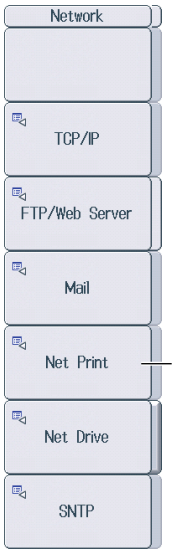
This section explains the following settings (which are used when printing screen captures to a network printer):

- LPR server
- LPR name
- Timeout

► “Network Printer (Net Print)” in the Features Guide

UTILITY Network Menu

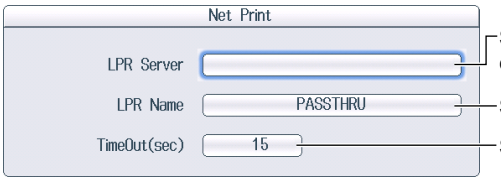
Press **UTILITY** and then the **Network** soft key to display the following menu.



Press to configure the network printer settings.

Configuring Network Printer Settings (Net Print)

Press the **Net Print** soft key to display the following screen.



Set the LPR server (IP address, or when DNS is enabled, the host name and domain name).

Set the LPR name (the name of the shared printer).

Set the timeout value (1 to 60 s).

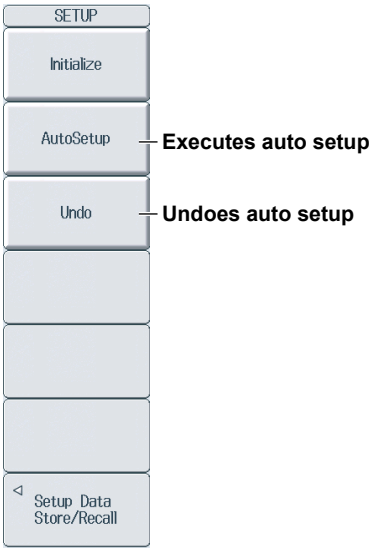
18.1 Performing Auto Setup

This section explains how to perform auto setup, which automatically sets the DL850E/DL850EV settings to the values that are most suitable for the input signals.

► “Auto Setup (Auto Setup)” in the Features Guide

SETUP Menu

Press **SETUP** to display the following menu.



18.2 Initializing Settings

This section explains how to initialize the DL850E/DL850EV settings to their factory default values.

► “Initializing Settings (Initialize)” in the Features Guide

SETUP Menu

Press **SETUP** to display the following menu.

To Reset All Settings to Their Factory Default Settings

For details, see section 4.6 in the getting started guide (IM DL850E-03EN).

18.3 Storing and Recalling Setup Data

This section explains how to save the DL850E/DL850EV settings to the internal memory and how to load settings from the internal memory.

► **"Storing and Recalling Setup Data (Setup Data Store and Recall)" in the Features Guide**

SETUP Store/Recall Menu

Press **SETUP** and then the **Setup Data Store/Recall** soft key to display the following menu.

Set the number to store or recall setup data from (using the jog shuttle).

The date and time when the setup data was stored in internal memory.

Press to set a comment.

Stores the setup data

Recalls the setup data

Clears the setup data stored in internal memory.
Appears when data is stored in internal memory.

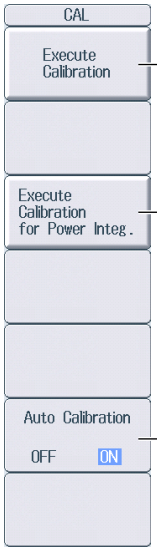
18.4 Calibrating the DL850E/DL850EV

This section explains how to calibrate the DL850E/DL850EV. You should do when you want to make accurate measurements.

► **"Calibration (CAL)" and "Power Integration Calibration (On Models with the /G5 Option)" in the Features Guide**

CAL Menu

Press **SHIFT+SETUP** (CAL) to display the following menu.



Executes calibration

Executes power integration calibration (/G5 option only)

Turns the auto calibration on and off

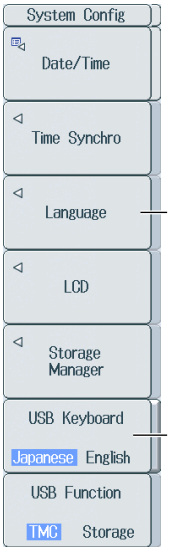
18.5 Changing the Message, Menu, and USB Keyboard Languages

This section explains the settings that you can use to change the message, menu, and USB keyboard languages.

► "System Configuration (System Configuration)" in the Features Guide

UTILITY System Config Menu

Press **UTILITY** and then the **System Config** soft key to display the following menu.



Press to configure the language settings.

Set the USB keyboard language.

Configuring Language Settings (Language)

Press the **Language** soft key to display the following menu.

Set the menu language (Japanese, English, Chinese, Korean, Italian, French, German, Spanish, Russian).

Set the message language (Japanese, English, Chinese, Korean, Italian, French, German, Spanish, Russian).

Note

Some terminology is always displayed in English.

Setting the USB Keyboard Language (USB Keyboard)

You can use the following keyboards that conform to USB Human Interface Devices (HID) Class Ver. 1.1.

English: 104-key keyboards

Japanese: 109-key keyboards

For details on how DL850E/DL850EV keys are mapped to the keys on a USB keyboard, see appendix 5 in the *getting started guide*, IM DL850E-03EN.

18.6 Setting Time Synchronization (Optional)

This section explains the following settings (which are used when you synchronize the DL850E/DL850EV to GPS time):

- IRIG format
- Modulation
- Impedance

► "Time Synchronization Feature (Time Synchro; /C20 option)" and "Time Synchronization Feature (Time Synchro; /C30 option)" in the Features Guide

UTILITY System Config Menu

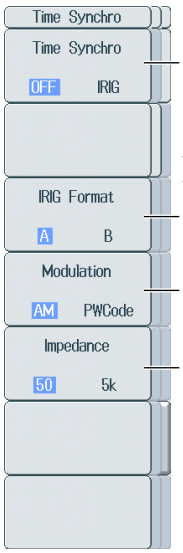
Press **UTILITY** and then the **System Config** soft key to display the following menu.

Press to configure the time synchronization settings.

Configuring Time Synchronization (Time Synchro)

Press the **Time Synchro** soft key to display the following menu.

/C20 option

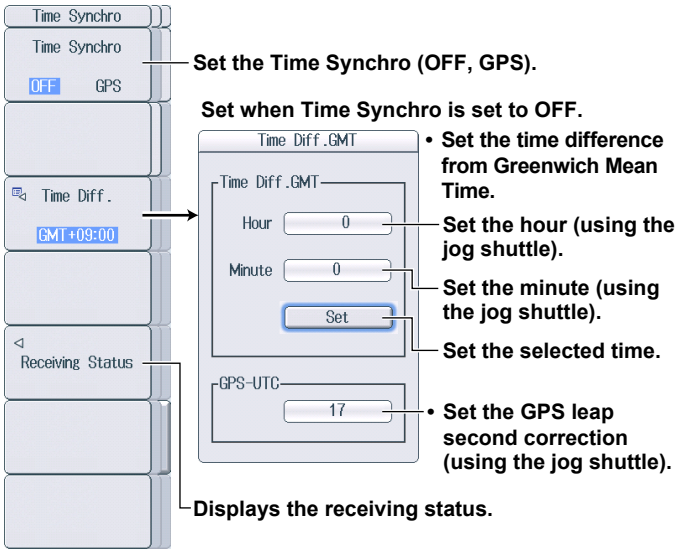


Set the Time Synchro (OFF, IRIG).

Set when Time Synchro is set to OFF.

- **Set the IRIG format (A, B).**
- **Set the modulation (AM, PWCode).**
- **Set the impedance (50, 5k).**

/C30 option



Set the Time Synchro (OFF, GPS).

Set when Time Synchro is set to OFF.

- **Set the time difference from Greenwich Mean Time.**
- **Set the hour (using the jog shuttle).**
- **Set the minute (using the jog shuttle).**
- **Set the selected time.**
- **Set the GPS leap second correction (using the jog shuttle).**

Displays the receiving status.

Note

To enable the changes that you have made to the time synchronization settings, restart the DL850E/DL850EV.

18.7 Adjusting the Backlight

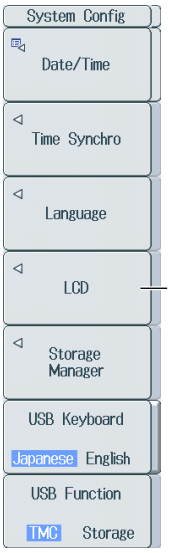
This section explains the following settings (which are used when adjusting the backlight):

- Turning off the backlight
- Automatically turning off the backlight
- Adjusting the brightness

► “Adjusting the LCD (LCD)” in the Features Guide

UTILITY System Config Menu

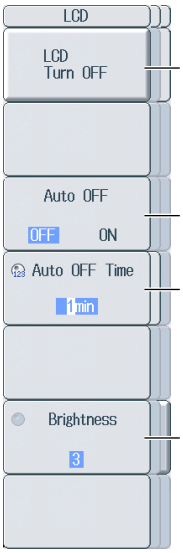
Press **UTILITY** and then the **System Config** soft key to display the following menu.



Press to adjust the backlight.

Adjusting the Backlight (LCD)

Press the **LCD** soft key to display the following menu.



Turns off the backlight (you can turn on the backlight by pressing any key)

Set the automatic turning off of the backlight (ON, OFF).

Set the time value for automatically turning the backlight off (using the jog shuttle).

Set the backlight brightness (using the jog shuttle).

18.8 Configuring the Environment Settings

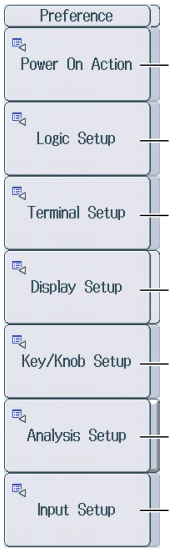
This section explains the following environment settings:

- Action to perform at power on
- Logic
- External I/O terminal
- Font size, screen color, and intensity
- Click sound on and off and key-lock
- Cursor read mode and data save destination upon action execution
- Turning DC offset/gain adjustment on and off

► "Environment Settings (Preference)" in the Features Guide

UTILITY Preference Menu

Press **UTILITY** and then the **Preference** soft key to display the following menu.



Press to configure the power-on action.

Press to set the numerical format, the direction to read cursor data, and the direction to read bit data of logic signals.

Press to configure the external I/O terminal settings.

Press to set the font sizes, screen color, and intensities.

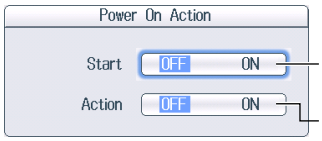
Press to turn the click sound on and off, to set the start and stop response time, and to configure the key-lock settings.

Set the cursor read mode.

Turns DC offset/gain adjustment on and off

Configuring Power-on Actions (Power On Action)

Press the **Power On Action** soft key to display the following screen.

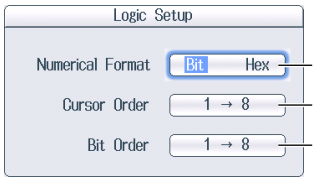


Select whether to start waveform acquisition at power on (ON), or not (OFF).

Select whether to enable the previous action's settings at power on (ON), or not (OFF).

Configuring the Logic Settings (Logic Setup)

Press the **Logic Setup** soft key to display the following screen.



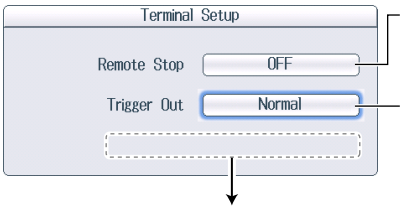
Set the numerical format (Bit, Hex).

Set the direction to read cursor data (1→8, 8→1).

Set the direction to read bit data (1→8, 8→1).

Configuring the External I/O Terminal Settings (Terminal Setup)

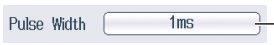
Press the **Terminal Setup** soft key to display the following screen.



Set the remote stop feature.
- **ON: Enables the STOP signal**
- **OFF: Disables the STOP signal**

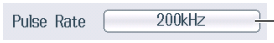
Set the trigger output (Normal, Pulse, Sample Pulse, Start/Stop).

- **When the Trigger Output Is Set to Pulse**



Set the pulse width (1ms, 50ms, 100ms, 500ms).

- **When the Trigger Output Is Set to Sample Pulse**

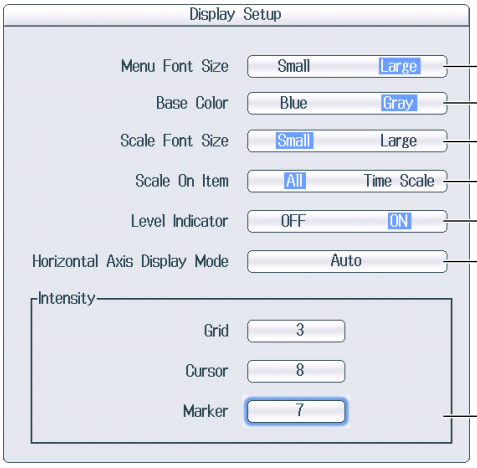


Set the pulse rate (5Hz, 10Hz, 20Hz, 50Hz, 100Hz, 200Hz, 500Hz, 1kHz, 2kHz, 5kHz, 10kHz, 20kHz, 50kHz, 100kHz, 200kHz).

* You cannot specify a rate that is faster than the DL850E/DL850EV sample rate (main channel sample rate). The pulse rate must be set so that the DL850E/DL850EV sample rate is an integer multiple of the pulse rate.
You may not be able to use the pulse rate that you select depending on the combination of the pulse rate and the DL850E/DL850EV sample rate.

Setting the Font Sizes, Screen Color, and Intensities (Display Setup)

Press the **Display Setup** soft key to display the following screen.



Set the menu font size (Small, Large).

Set the screen background color (Blue, Gray).

Set the scale font size (Small, Large).

Set the scale value's display item.
Set the item that is displayed if Scale Value is set to ON on the DISPLAY menu (►section 4.1).
- **All: Displays all scale values**
- **Time Scale: Only displays scale values on the time axis**

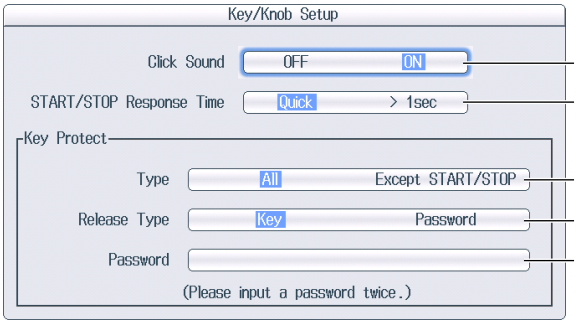
Turns the level indicator on and off

Set the horizontal axis display format (Auto, Relative, Absolute).

Set the screen intensities.
- **Grid (1 to 8)**
- **Cursor (1 to 8)**
- **Marker (1 to 8)**

Turning the Click Sound On and Off and Configuring the Key Lock Settings (Key/Knob Setup)

Press the **Key/Knob Setup** soft key to display the following screen.



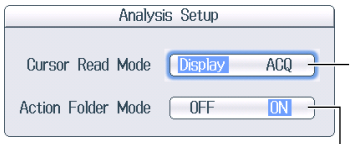
Turns the click sound on and off

Set the start/stop response time (Quick, > 1sec).

Set the key lock.
- **Set the key-lock type (All, Except START/STOP).**
- **Set the key-lock-release type (Key, Password).**
- **Set the password (up to 8 characters).**

Setting the Cursor Read Mode and the Data Save Destination upon Action Execution (Analysis Setup)

Press the **Analysis Setup** soft key to display the following screen.



Set the cursor read mode.
- **Display: Performs cursor measurements on the P-P compressed data on the screen.**
- **ACQ: Performs cursor measurements on the sampled data in the acquisition memory.**

Set the data save destination upon action execution.
- **ON: A folder is automatically created with the date, and the data is saved in this folder.**
- **OFF: Data is saved in the folder that you have specified.**

Turning DC Offset/Gain Adjustment On and Off (Input Setup)

Press the Input Setup soft key to display the following screen.

Select whether to use DC offset/gain adjustment (ON, OFF).

18.9 Using the DL850E/DL850EV as a USB Storage Device

This section explains the setting that enables you to use the DL850E/DL850EV as a USB storage device through a USB connection made between the USB port on the DL850E/DL850EV side panel and a PC.

► “USB Communication (USB Function)” in the Features Guide

UTILITY System Config Menu

Press **UTILITY** and then the **System Config** soft key to display the following menu.

Set USB Function to Storage.

Note

- When USB Function is set to Storage, only the internal hard disk of the DL850E/DL850EV can be used as a storage device. You cannot access any other storage media that are connected to the DL850E/DL850EV.
- When you access the internal hard disk of the DL850E/DL850EV from a PC, only perform read operation. Doing otherwise may damage the DL850E/DL850EV.
- When USB Function is set to Storage and files are being accessed, do not remove the USB cable or turn off the DL850E/DL850EV. Doing so may damage the DL850E/DL850EV.
- When USB Function is set to Storage, never access the DL850E/DL850EV internal hard disk from the DL850E/DL850EV menu.

18.10 Locking the Keys

This section explains how to lock the panel keys, which prevents you from unintentionally changing the current state of the DL850E/DL850EV.

► “Key Lock (KEY PROTECT)” in the Features Guide

Key Lock (KEY PROTECT)

Press **KEY PROTECT** to lock the panel keys. The KEY PROTECT key illuminates. When the keys are locked, pressing any keys other than **KEY PROTECT** has no effect. Press **KEY PROTECT** again to release the key lock and enable the panel keys. The KEY PROTECT key turns off.

Note

When the keys are locked, you cannot use a USB mouse or keyboard to operate the DL850E/DL850EV either.

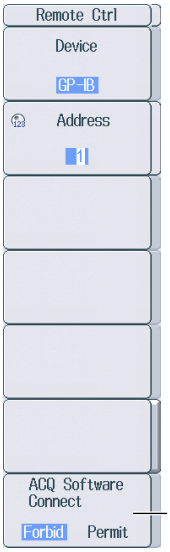
18.11 Rejecting Connection Requests from the Acquisition Software

This section explains how to prohibit connections from a PC's Acquisition Software when the DL850E/DL850EV is connected to a PC through the USB or Ethernet interface.

► "Remote Control (Remote Ctrl)" in the Features Guide

UTILITY Remote Ctrl Menu

Press **UTILITY** and then the **Remote Ctrl** soft key to display the following menu.



Set ACQ Software Connect to Forbid.

Note

- The DL850E/DL850EV keys are disabled while a PC's Acquisition Software is connected to the DL850E/DL850EV. If you want to control the DL850E/DL850EV using its keys, on the PC, disconnect the Acquisition Software from the DL850E/DL850EV.
- For details on the Acquisition Software, see the Acquisition Software User's Manual, IM DL850E-61EN.

19.1 If a Problem Occurs

Faults and Corrective Actions

- If a message appears on the screen, see the following pages for reference.
- If servicing is necessary, or if the instrument does not operate properly even after you have attempted to deal with the problem according to the instructions in this section, contact your nearest YOKOGAWA dealer.

Description	Probable Cause	Corrective Action	Reference
The instrument does not power on.	Using a power supply outside the ratings.	Use a correct power supply.	3.4*
Nothing is displayed.	The backlight is turned off.	Press any key.	18.7
	The screen is displayed with inappropriate colors.	Turn the power off, and then turn the power on again while pressing **RESET**.	4.6*
The display is odd.	The system is not operating properly.	Turn off the instrument, and then turn it back on.	3.4*
Channels and MATH waveforms whose displays are turned on do not appear on the screen.	The display group containing the waveforms that you want to display is not selected.	Press **DISPLAY** and then the **Select Display Gr.** soft key to select a display group (1 to 4).	4.1, 1.9, 1.10
Keys do not work.	The instrument is in remote mode.	Press **SHIFT+CLEAR TRACE** to switch the instrument to local mode.	—
	The keys are locked.	Press **KEY PROTECT**.	18.10
	Other causes.	Perform a key test. If the test fails, servicing is required.	19.3
Triggering does not work.	The trigger settings are not appropriate.	Set the trigger conditions correctly.	Chapter 2
The measured values are not correct.	Insufficient warm-up.	Warm up the instrument for 30 minutes after turning on the power.	—
	The instrument has not been calibrated.	Calibrate the instrument.	18.4
	The probe's phase has not been corrected.	Perform phase correction properly.	3.6*
	The probe attenuation is not correct.	Set it to an appropriate value.	1.1
	Other causes.	Calibrate the instrument. If the measured values are still not correct, servicing is required.	18.4 19.3
Cannot print to the built-in printer.	The printer head is damaged or worn out.	Servicing is necessary.	—
Cannot save to the specified storage medium.	The storage medium is not formatted.	Format the storage medium.	16.3
	The storage medium is read-only.	Set the storage medium so that it is not read-only.	—
	No more free space on the storage medium.	Delete unneeded files or use another storage medium.	16.10
Unable to configure or control the instrument through the communication interface.	The instrument's address used by the program is different from the specified address.	Match the address used in the program to the instrument's address.	*Communication interface user's manual*, IM DL850E-17EN
	The interface is not used in a way that conforms to the electrical or mechanical specifications.	Use the interface in a way that conforms to the specifications.	

* *Getting Started Guide*, IM DL850E-03EN

19.2 Messages and Corrective Actions

Messages

Messages may appear on the screen during operation. This section describes the error messages and how to respond to them. You can display the messages in the language that you specify through the operations explained in section 18.5. If servicing is necessary to solve the problem indicated by a message, contact your nearest YOKOGAWA dealer.

In addition to the following error messages, there are also communication error messages. These messages are explained in the *Communication Interface User's Manual*, IM DL850E-17EN.

Information

Code	Message	Chapter or Section
51	Autosetup is running.	—
53	Initializing is in progress.	—
55	Undo is in progress.	18.1
57	Automatic balancing is running…	1.5
58	Automatic balancing is complete.	1.5
59	Calibration is running...	18.4
61	Media format is running.	16.3
62	Media format is complete.	16.3
63	A strain module is installed. Carry out automatic balancing before use.	—
64	File access is aborted.	—
65	Executed the firmware overwriting of the frequency module.	19.6
66	Overwriting firmware of the frequency module…	19.6
67	Key response time is more than 1 second. Push it more than 1 second.	18.8
68	Executed the firmware overwriting of the built-in part. Part :	19.6
69	Overwriting the built-in parts firmware. Part :	19.6
70	Exit from GO/NO-GO mode.	Chapter 11
71	Image printing was aborted.	Chapter 15
72	Completed action.	12.1
73	Aborted the search.	Chapter 13
74	Executed the search, but no record was found that matched the conditions.	Chapter 13
75	Executed the search, but no record was found that matched the pattern.	Chapter 13
77	Aborted the statistical measurement.	8.2
78	Turned on pressing the Utility key. Will be service mode.	—
80	Input module configuration was changed. Relevant settings have been initialized.	Chapter 1
81	This model does not have computation option installed.	—
82	This model does not have the HDD option installed.	—
84	Turned on pressing the RESET key. Will initialize.	—
85	The instrument is set to remote mode by the communication control. Press the SHIFT + CLEAR TRACE key to change to local mode.	—
86	Push 'Zoom Mag' knob or 'Zoom Position' knob when change a target window.	6.1
88	Post processing of Hard disk Record. Wait a while.	—
89	Connot disply XY waveforms under these conditions. -Defferent sample rate between X & Y. -HD Recording waves	—
90	Executed the Autosetup, but no effective channel was found.	—
91	Some signals were not loaded due to the following problems. Check the symbol file. -The Number of signals is too many. -"Value Type" is not supported. -"Bit Count" is too many.	—
93	Following sub channel was set to Off due to limit of memory capacity.	1.9, 1.10, 1.11
94	Executing abort process. It takes a few seconds.	13.1
95	Cannot set all sub-channels input to on due to limit of memory capacity.	1.9, 1.10, 1.11

File Errors

Code	Message	Chapter or Section
500	File access failure.	—
501	Invalid file name. The name contains prohibited characters, or file name is duplicated.	16.4
502	Pass name over maximum number of characters. Full pass name should under 255 characters.	16.4
504	Out of disk space.	—
505	File not found. Check the file.	—
506	Duplicate file or directory name. Change the name.	—
507	The file name is not set. Set the file name.	16.4
508	Save data not found. Check for presence of data and channel.	Chapter 16
509	File system failure.	Chapter 16
510	Cannot load this file format. Files stored on other models cannot be loaded.	—
511	File is now being accessed. Execute after access is made.	—
512	Cannot be executed while running. Press the START/STOP key to stop acquisition.	—
513	The specified file cannot be loaded on this Firmware version or this model.	—
514	No ch is displayed. Turn ON the display of the appropriate channel.	Chapter 1
516	HDD overrun error. Due to spare sectors, the recording could not be finished within assigned time. The operation is aborted.	—
517	Unknown file format.	Chapter 16
518	Writing prohibited in the media. Unlock write protection of the media.	—
519	Cannot save in this format at the current record length. Specify a range and save a section of the data. * Cannot create a file of size 2 GB or larger.	16.4
520	Media error.	—
521	Directory can not be deleted.	16.1
522	Cannot load these files on a network drive. The File which larger than 50 Mbyte. Copy the file to the local drive before loading it.	17.3
530	Assigned path does not exist. Check the network setting and configulation.	Chapter 17
531	Assigned file does not exist. Check the network setting and configulation.	Chapter 17
532	Assigned path does not exist. Check the network setting and configulation.	Chapter 17
533	Writing prohibited in this file.	—
534	An error occurred while network access. Confirm network conditions.	Chapter 17
535	Current path is not suitable. Set other path while use action on trigger.	—
536	Destination path is same as source path, or sub folder of source path.	—
537	Confirm a connection with External HDD.	Chapter 17
538	Module configuration is not matched, so it couldn't loaded. Configuration of saved data can see by File property.	Chapter 16, Chapter 18*
539	Module configuration is not matched, so it couldn't loaded. Configuration of saved data can see by File property.	Chapter 16, Chapter 18*
540	Cannot re-save from HD recording data.	—
541	Cannot detect the medium. Check the presence of the medium.	—
542	Cannot start HD recording while disk space shortage.	—
544	Cannot file access, litialize, and autosetup while measure is in progress. Wait measure end, or OFF it.	18.1

* *Features Guide*, IM DL850E-01EN

Code	Message	Chapter or Section
550	The number of the files in the root of the HDD exceeds 512 of the upper limit or approaches. Please delete the unnecessary files or make a folder, and save files in the folder.	16.2
552	File loading completed normally. However, because the loaded module is different from the current module configuration, the following channel settings and data are not loaded.	16.7, 16.8

Printer Errors

Code	Message	Chapter or Section
570	Close the printer cover.	15.1
571	Paper empty. Load a roll chart.	15.1
572	The printer head temperature is abnormality. Printing will be aborted. Printing will not be possible until the printer head temperature comes normal.	—
573	Printer over heat. Power off immediately.	—
574	Printer power supply error. Maintenance service is required.	—
575	Printer time out. Maintenance service is required.	—
576	Printer error.	—
577	The length of the print has more than 25 pages. As will be less than 25 pages, please set the “Print Mag” and “Time Range”.	15.4

Network Errors

Code	Message	Chapter or Section
600	Unable to connect to the server. Check the network settings and configuration.	Chapter 17
601	Has not connect with ftp server yet. Confirm the network settings and connection.	Chapter 17
602	This ftp function in not supported.	—
603	FTP Error: Client Handle Confirm the network settings and connection.	Chapter 17
604	Cannot send data to a network printer. Confirm the network settings and connection.	Chapter 17
605	Cannot send a mail. Confirm the network settings and connection.	Chapter 17
608	Failed to acquire time from SNTP server. Confirm the network settings and connection.	Chapter 17

Execution Errors (650 to 799)

Code	Message	Chapter or Section
650	Data is invalid.	—
651	The option is not equiped, so it cannot execute.	—
652	Undo is not possible since data that existed immediately before initialization or auto setup is not available.	—
653	Can not be executed while running. Press START/STOP key to stop acquisition.	—
654	Cannot manipulate files while image printing is in progress. Wait until image printing is complete.	—
656	Calibration failure. Disconnect the input and execute again. If it fails again, servicing is necessary. CH :	—
657	Hard disk recording is valid when the sampling rate is slower than the values shown below. 1CH : 1MS/s, 2 to 3CH : 500kS/s, 4 to 8CH : 200kS/s, 9 to 16CH : 100kS/s The number of CH is the number that LED turns on of CH Keys.	—

Code	Message	Chapter or Section
658	Too many channels for the current T/div setting to hard disk recording. Decrease the number of channels by turning them OFF.	—
659	Cannnot start Dual Capture under these conditions. • Sample rate of Dual Caputre is slower than Main, or equal. • T/Div of Dual Capture is slower than Main, or equal.	—
660	Can not operate while data out. Wait until output is completed.	—
661	Balancing failed. CH :	—
663	Cannot start.	—
664	Go-Nogo is available while Trigger Mode is - 'Single' or 'Normal' - 'Auto' or 'AutoLevel' (Faster than 50ms/div)	2.1, chapter 11
666	Failed to measure statistics. Waveform data may be missing. If Cycle Statistics is specified, the instrument may be configured in a way that fails to detect the cycle.	8.3
667	Executing file access. Abort or wait until it is complete.	—
668	Image is being printed or saved. Wait until the execution of the command is complete.	—
669	Cannot be executed when the action mode is ON.	12.1
670	Cannot be executed when the dual capture setting is ON.	3.3
671	Cannot be executed when a hard disk recording is ON.	3.4
672	Cannot be executed when the time base setting is to be an External clock.	3.1
673	Because there are too many channels, it can't start in the length of the present record.	Chapter 1
674	Average practice can't be done because the record length of the history exceeds the record length that it can be carried out.	Chapter 14
675	Average practice can't be done because the record length of the history exceeds the record length that it can be carried out.	Chapter 14
676	Set the trigger mode and capture mode to On Start for hard disk recording.	2.1, 3.3
677	Cannot do while selftest is executing.	19.3
678	Dual capture is not possible if the main sample rate is faster than 100 ks/S or T/div is faster than 100 msec/div. Meet either of the conditions below. * Shorten the record length (slower sample rate). * Decrease T/Div.	1.13, 3.1
679	Cannot start at the current record length. Shorten the record length or meet the following condition. * Set the trigger mode to Auto, decrease T/Div to less than 100 msec/div to enable roll mode. * Set the trigger mode to Single or On Start.	1.13, 2.1
680	Averaging mode is not possible when the trigger mode is Single, SingleN, or On Start. Change the trigger mode.	2.1
681	Dual capture is not possible when set to average. Change the acquisition mode.	3.1
684	Cannot start when the time base set to external clock while Acq. Mode set to envelope or box average.	3.1
685	Cannot start when roll mode display while accumurate mode set to ON. Turn Off accumulate.	4.2
686	Cannot be executed when the acquisition mode is set to average. Change the mode.	3.1
688	Hard disk recording to the internal hard disk is valid when the record length is longer than 1M.	3.1, 3.4
689	Cannot be executed on hard disk recorded waveforms.	—
690	Cannot be executed on waveforms in dual capture mode.	—
691	File recorded in hard disk is currently being analyzed. Files being analyzed cannot be deleted, or renamed.	—
692	The file which failed in the hard disk record can't be read.	—
693	Cannot be executed when GO/NO-GO Mode is Zone.	—
694	The measuring range is up to 100M points from measure start (TimeRange1).	8.3
695	Set acquisition mode to Normal when using a wave window trigger.	3.1
696	The wave window trigger cannot be used if the sampling rate is faster than 500 kS/s or slower than 10 kS/s. When a record length is shorter than 25k, set a T/div slower than 10ms/div.	1.13
697	Range over. Change to an appropriate range then retry shunt calibration.	1.5

19.2 Messages and Corrective Actions

Code	Message	Chapter or Section
698	Statistical processing cannot be performed on HD recording waveforms.	8.2
699	Firmware was not overwritten in the following slots, since the version of the firmware in the module and that of the replacement firmware were the same. (Check the versions on the overview screen.) SLOT:	19.6
700	Cannot be carried out during recording. Press the START/STOP key to stop the waveform acquisition first.	3.4
702	All search conditions are off. At least one condition should on.	13.1
703	Display setting of search source is off. Set it to on.	13.1
704	Cannot execute Time search while T/div is faster than 100msec/div.	1.13, 13.4
705	Cannot start Action mode while Trigger mode is SingleN.	2.1, 12.1
706	Cannot be executed when Go-Nogo Mode is On. Set the Go-Nogo Mode to OFF	Chapter 11
707	Cannot execute search while searched No. reached Maximum(1000).	—
708	Cannot execute or set while AutoScroll processing. Stop AutoScroll.	6.1
710	Cannot do these operations on HD Recording waveforms. - Search - WAVeform:SEND?	—
712	Cannot start while No GO/NO-GO condition.	Chapter 11
713	Cannot make wave zone from less than 2,000 points data, from more than 10,000,000 points data, or from less than 10division data.	—
714	Cannot start Action mode while PrintImage target is “File”. Change target to “printer”.	Chapter 15
715	Cannot start while USB Function setting is Storage. Cannot change USB Function setting while HD Recording.	18.9
716	Set the Math and FFT Window to Off to Start GO-Nogo.	Chapter 9, 10
717	Cannot abort this process.	—
718	Cannot start while time of one file is less than 10sec.	3.4
719	Cannot execute Time search when the time base setting is to be an External clock.	13.4
720	Cannot execute search when RecordLength setting is over 10G points.	—
723	Cannot start action, when action folder mode is off and acquisition count is more than 1000.	18.8
724	Cannot start dual capture with action, when action folder mode is off and image save mode is on. Turn on action folder mode.	18.8
725	Cannot set because types of the harmonic analysis are different. Set a right analysis type.	Appendix 2*
726	Cannot set display to OFF on realtime analysis channel.	—
727	Only in the case of 2 wiring systems, the setting of the efficiency is possible.	—
729	Cannot set because of different realtime analysis mode. Please set right mode.	Appendix 2*
730	Cannot be executed when Freerun Mode is On.	—
731	This is invalid items. Confirm settings on RealTime Analysis.	Appendix 2*
732	Cannot open channel menu because of all items are display off.	—
733	Cannot set to ON because of sample rate will be less than 1S/sec.	—
734	Cannot set gain adjustment while DC Offset cancel is ON.	1.1
735	Cannot press any key because of connecting from Acquisition software.	—
736	Cannot press any key because of running from Acquisition software. Press START/STOP key to release running from Acquisition software.	—
737	Cannot set Realtime Analysis mode to ON. 2ch Volt module or 4ch Volt module must exist Slot 1 to 6 to set Realtime Analysis to ON.	Chapter 1
738	Cannot set Pm and ETA to ON when an efficiency mode is OFF. Cannot set Pm to ON when an efficiency mode is Power. Please confirm an efficiency mode.	—
739	Cannot set Graph Window to Vector when harmonics type is Line RMS.	—
740	Cannot format HD while USB Function setting is Storage.	16.3
741	Cannot set in the case as follows - The value is more than sample rate. - The ratio of sample rate is not integer.	—
742	Cannot start dual capture with action, when file data type is MATLAB.	—

* *Real Time Math/Power Math User’s Manual*, IM DL850E-51EN

Code	Message	Chapter or Section
743	Cannot start dual capture with action, when printer mode is “Long Print”.	—
744	Cannot Start GO/NO-GO, when data points is less than 2,000.	—
745	It is not possible to set 17 or more BitSize to the 3rd FastCH. Please use 1st or 2nd FastCH to get 17 or more bits data.	1.11
746	If the input of the next FastCH is set to ON, it can not set 17 or more BitSize. Please OFF the input of the next FasCH to get the 17 or more bits data.	1.11
747	If the bit size of the previous FastCH is 17 or more, it is not possible to get this FastCH. Please set 16 or less BitSize to the previous FastCH.	1.11

Setup Errors (800 to 899)

Code	Message	Chapter or Section
800	Illegal date-time. Set the correct date and time.	—
801	Cannot set these file name. - Over 32 characters. - Contains character which are not allowed. - Inhibit MS-DOS file name. Enter an other file name.	16.4
802	Cannot set while recording.	3.4
803	Cannot change this parameter while running. Press the START/STOP key to stop acquisition.	—
804	Cannot change settings during GO/NO-GO. Stop the GO/NO-GO (Stop the Acquire).	Chapter 11
805	Can not change display points with this T/div setting.	—
806	Cannot be changed when trigger A is not X. Set the state of the channel corresponding to condition A to ‘X’.	2.9 to 2.15
807	Cannot set while TimeSynchro setting not Off.	18.6
808	Cannot change when Channel Display is OFF or Math settings are invalid. Set the channel display ON or make appropriate Math settings.	Chapter 1, chapter 9
809	Cannot change when External Clock is active.	3.1
810	Cannot change while running.	—
811	Illegal math expression. Input a correct computing equation.	9.5
812	Cannot set this model	—
813	Cannot set anything other than Low Pass for a Gaussian filter. Change the Filter Type to another filter besides Gaussian.	9.4
814	Cannot change settings while hard disk recording. Stop hard disk recording.	—
815	Cannot change settings during Action mode. Stop the Action.	12.1
816	Cannot set the channels which do not have modules installed.	Chapter 1, section 19.6
817	Cannot Set or Execute.	—
818	If the trigger mode is set to Single, Single(N), or OnStart, the acquisition mode cannot be set to Average.	3.1
819	If the acquisition mode is Average, the trigger mode cannot be set to Single, Single (N), or OnStart.	2.1
820	The acquisition mode cannot be set in the current record length.	—
822	Cannot be configured or executed during the search operation.	Chapter 13
823	Cannot be configured or executed during the history search operation.	14.2
824	The record cannot be selected.	Chapter 14
825	History record does not exist.	Chapter 14
826	Cannot be configured or executed while computation is in progress. Aborted when history display mode is set to One.	14.1
827	Cannot be configured or executed while updating the history all display. Aborted when history display mode is set to One.	14.1
829	Zones cannot be edited in the following cases: * When the main window is not displayed. * When the relevant waveform is not displayed.	11.1
830	The zone waveform does not exist.	11.1
831	The zone is being edited. To perform other operations, select Quit to exit zone editing.	11.1

19.2 Messages and Corrective Actions

Code	Message	Chapter or Section
832	Zones determination is not possible in the following cases: * When the main window is not displayed. * When the relevant waveform is not displayed. * When the zone waveform does not exist.	Chapter 1, sections 5.1, 6.1, 10.1
833	Processing statistics. To perform other operations, abort the statistical processing.	8.2
834	The channel which couldn't be set up was specified.	—
835	Cannot be set when the acquisition mode is set to average.	3.1
836	Cannot be changed when VScale is SPAN.	1.1
837	Cannot be set during hard disk recording.	—
839	It can't be set up during the dual capture practice or set to on.	3.3
840	Cannot be set to a range of 20 sec/div to 20 day/div during roll display.	1.13
841	Cannot be set because there are too many display channels at the current record length. Shorten the record length.	3.1
842	Zooming is not available when the number of displayed points of the FFT waveform is less than 50 in the Zoom window.	Chapter 6, 9.4
844	Cannot change this setting during hard disk recording.	3.4
845	Cannot change the History parameter when accumulate is ON. Turn OFF accumulate first.	4.2
846	P-P compression cannot be used to save when a record length is 1K.	—
847	Cannot set On this module.	—
848	Settings can not be entered for channels on which no strain module is mounted.	—
852	Cannot set Math to OFF while FFT Window ON.	10.1
853	Cannot select this trace because it already selected.	—
854	Because a record length is too long, it can't be set up by the present number of indication channels.	Chapter 1, 3.1
855	Cannot change to such Record length while running. Set the trigger mode to Auto and decrease T/Div to less than 100 msec/div to enable roll mode, or set the trigger mode to Single or On Start.	—
856	Cannot Display setting to On. This CH didn't acqisition to memory.	Chapter 5*
857	Cannot set while DualCapture mode on.	3.3
858	Cannot set while action mode is on.	12.1
867	Cannot be specified when the print style is Numeric.	—
868	Cannot be specified because characters in the JIS level-2 kanji set are included. Create the file on the local drive, and then copy it to the network drive.	—
869	Cannot set while Go-Nogo mode. Turn Off Go-Nogo mode first.	Chapter 11
870	All sub-channel inputs are off. At least one inputs should on.	1.2, 1.4
871	No effective channel for Math Setup.	—
872	No effective channel for History Search Setup.	—
873	The capture window cannot be changed while the dual capture is in progress, and while the measuring is in progress.	—
874	Cannot set Save Range except 'Main' while PP-Comp save mode.	—
875	Cannot change or START when accumulate is ON. Turn OFF accumulate first.	4.2
876	Cannot frame setting to ON, except Image format on JPEG.	15.4
877	Cannot set to display points under 100.	—
878	Cannot set Trigger mode while dual capture mode On.	—
879	Cannot set GoNogo mode while Math or FFT Window is On.	Chapter 9, 10
880	Cannot set Action mode to On, while hard disk recording and dual capture mode On.	—
881	Cannot set for CH which ValueType is Float while running.	—
882	Cannot set while Single-N running.	1.9, 1.10
883	Cannot set Input to ON with limit of memory capacity.	1.9, 1.10
886	Cannot set RealTime Math mode to ON due to the following problems. -The slot is installed 720220, 720221, 720240, 720241, 720242 or 720243. -There are not any input which can be set to source for RealTime Math.	Chapter 2*
887	There are not any modules which can be set to source for this operation.	Chapter 2*
889	Cannot change RealTime Math mode during roll display.	Chapter 1*
890	LIN Monitor does not support Float data.	1.10
891	Cannot set Math mode to ON while FFT points is set over 50k. Set to under 20k points.	10.1

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Code	Message	Chapter or Section
892	Cannot set Math to OFF while FFT Window is open.	10.1
893	Cannot set that item. It cannot be measured for Logic module.	8.1
894	Cannot set DC Offset Cancel to ON due to following case. - DC Offset & Gain Adjust is OFF. - Coupling is not DC. - Not execute DC Offset Cancel. - Not 701250, 720250, 701255, 701251, 720210, 720211, 720254.	1.1, 18.1
895	The password entered the first time is different from the password entered the second time. Reenter the password for the second time.	—
896	Cannot set T/Div that sample rate for sub-channels will be less than 1S/sec.	1.13

System Errors (900 to 999)

Code	Message	Chapter or Section
900	No module installed. Install the module.	—
901	Failed to backup setup data. Will initialize. Backup battery may be low.	—
902	The firmware is not suitable for this system. Install the proper firmware.	—
903	The USB device's power consumption exceeded the capacity of the USB hub.	—
904	Lower the sample rate or reduce the number of measuring channels.	Chapter 1
905	Lower the sample rate or reduce the number of measuring channels.	Chapter 1
906	Fan stopped. Maintenance service is required.	—
907	Internal temperature is too high. Maintenance service is required. It will shutdown automatically.	—
908	Check the measured current and the number of probes that you are using.	3.6*
909	Hard disk is full.	16.10
910	Key protect is enabled. To release the protection, press the PROTECT key or enter the password.	18.10
911	Fan for Input modules stopped. Cannot start. Maintenance service is required.	—
912	Fan for CPU stopped. Maintenance service is required. It will shutdown automatically.	—
913	LCD BackLight Failure. Maintenance service is required.	—
914	Cannot start while this module configuration. 720210 should use in CH1 - CH8. 720240, 720241, 70242 should use in CH13 - CH16. 720243 should use in CH9 - CH16.	—
915	It installed the module which cannot support by this machine. CH :	—
916	It installed 701250/701255 which cannot use by this machine. Maintenance service is required. CH :	—
917	Hardware configuration error occurred. Restart this machine. If it occurred again, maintenance service is required.	—
918	Error occurred while ImageFile process.	—
919	Key operate not available while system error occurred	—
920	Firmware overwriting error occurred.	—

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Note

If servicing is required, first see if initializing the instrument fixes the problem.

19.3 Carrying Out Self-Tests

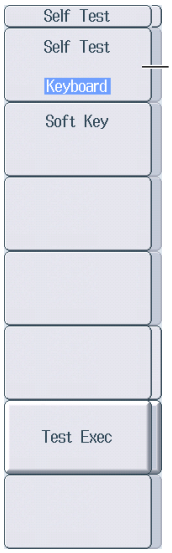
This section explains the following settings (which are used when testing whether the DL850E/DL850EV's keyboard, memory, SD card interface, internal hard disk, and printer are functioning properly):

- Test type
- Executing tests

► "Self-Test (Self Test)" in the Features Guide

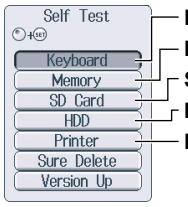
UTILITY Self Test Menu

Press **UTILITY** and then the **Self Test** soft key to display the following menu.



Setting the Self-Test Type (Self Test)

Press the **Self Test** soft key to display the following menu.



Keyboard: Tests to determine whether the front panel keys are operating correctly and whether the keyboard that is displayed on the screen accepts input properly. The front panel keys are operating properly if the names of the keys that you press are highlighted. The keyboard is operating properly if you can enter the specified characters.

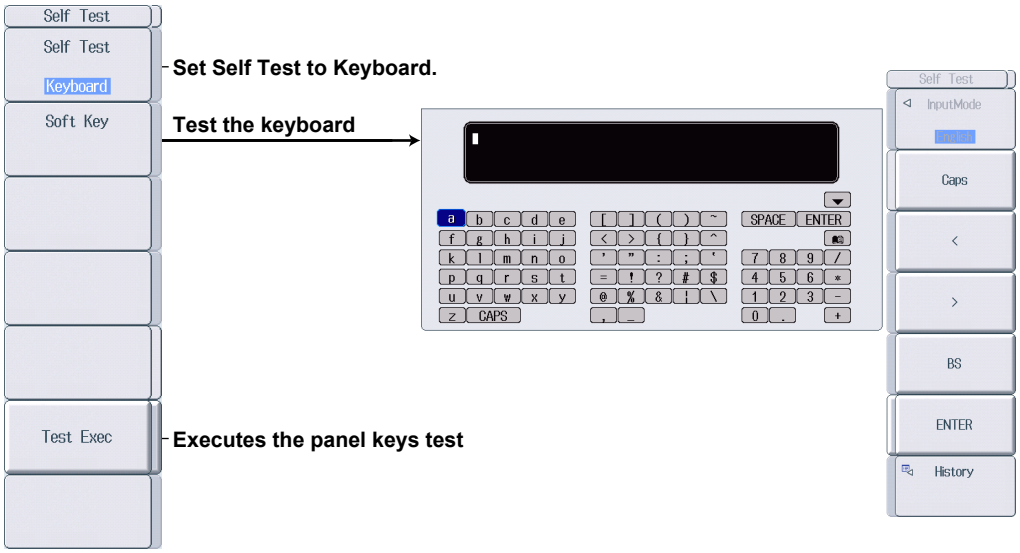
Memory: A test to determine whether the internal CPU board RAM and ROM are operating properly. If "Pass" appears, they are operating properly. If an error occurs, "Error" appears.

SD Card: A test to determine whether the SD card interface is operating properly. If an error occurs, "Error" appears.

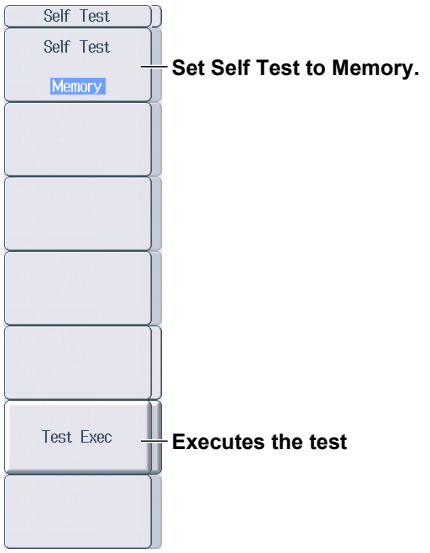
HDD: A test to determine whether the internal hard disk is operating properly. If an error occurs, "Error" appears.

Printer: A test to determine whether the optional built-in printer is operating properly. If the print density is correct, the built-in printer is operating properly. If an error occurs, the built-in printer does not print properly.

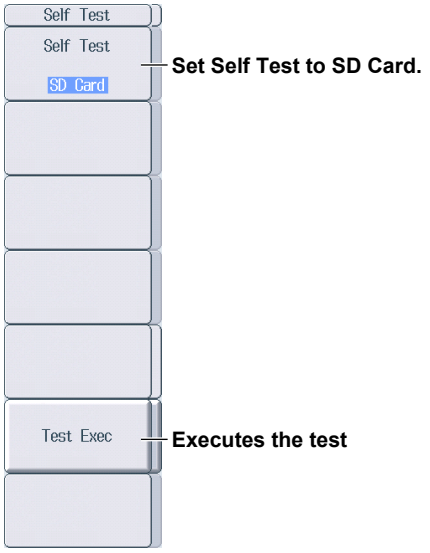
Executing the Keyboard Tests



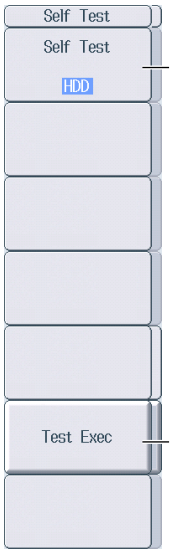
Executing the Memory Test



Executing the SD Card Test



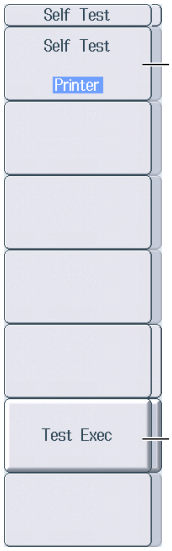
Executing the Internal Hard Disk Test



Set Self Test to HDD.

Executes the test

Executing the Printer Test



Set Self Test to Printer.

Executes the test

If an Error Occurs during a Self-Test

If an error occurs even after you carry out the following procedure, contact your nearest YOKOGAWA dealer.

- Execute the self-test again several times.
- Check whether the media being tested is properly inserted.
- Check that the paper is set properly in the built-in printer and that paper is not jammed.

19.4 Clearing all Deletable Information (Sure Delete)

This section explains how to clear information in all deletable areas of the L850E/DL850EV.
Use this function only when you need to delete all the data for security reasons, such as when disposing of the DL850E/DL850EV. Refrain from using it on a regular basis. For models with a hard disk, it may take up to 6 hours to complete this process.

► “Clearing all Deletable Information (Sure Delete)” in the Features Guide

CAUTION

- Executing Sure Delete will clear information in all deletable areas of the L850E/DL850EV.
- While Sure Delete is in progress, you cannot cancel it or perform any other operation. Never turn off the power while Sure Delete is in progress. Doing so may permanently damage the hard disk.

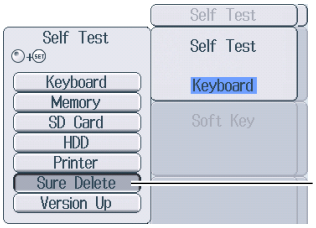
French

ATTENTION

- Exécutez la fonction de suppression en toute sécurité (Sure Delete) pour effacer les informations sur toutes les zones du L850E/DL850EV pouvant être supprimées.
- Pendant qu’elle est en cours d’exécution, vous ne pouvez pas annuler la fonction de suppression en toute sécurité (Sure Delete) ou effectuer d’autre opération. Ne mettez jamais l’alimentation hors tension pendant que la fonction de suppression en toute sécurité (Sure Delete) est en cours d’exécution. Cela pourrait endommager définitivement le disque dur.

UTILITY_Self Test Menu

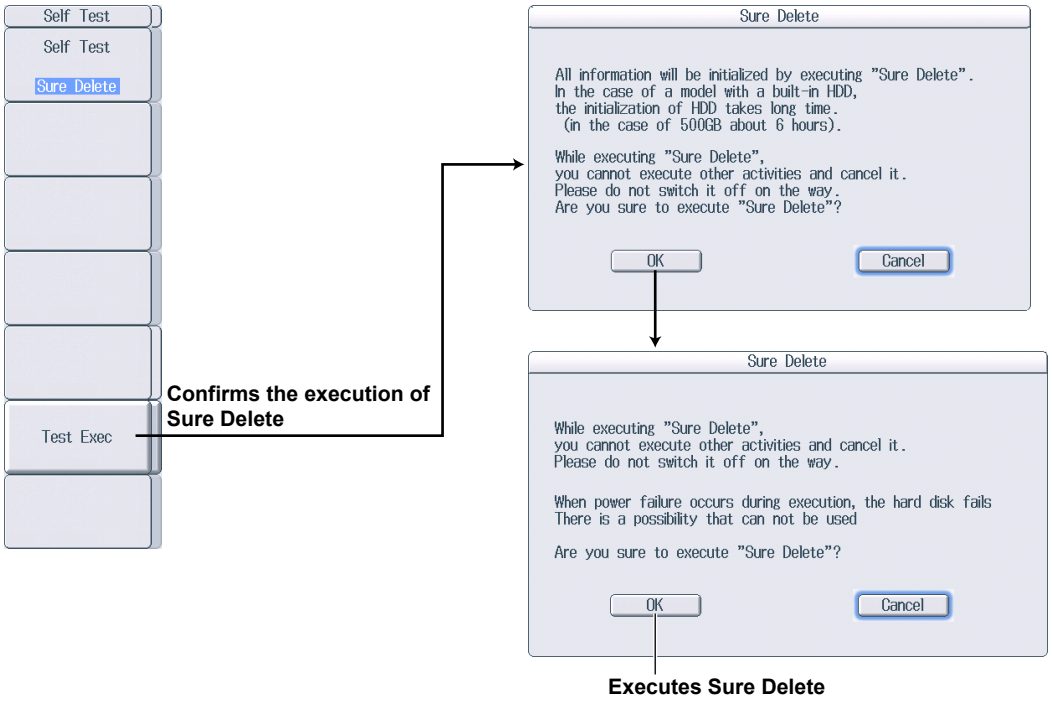
Press **UTILITY**, and then press the **Self Test** soft key and then the **Self Test** soft key again. The following menu appears.



Clear all deletable information (using the jog shuttle).

Clearing all Deletable Information (Sure Delete)

Use the jog shuttle to select Sure Delete, and then press SET to display the following menu.



Note

You cannot use Sure Delete to clear setup data. To initialize the settings to their factory default values, perform initialization. For details, see section 4.6 in the Getting Started Guide (IM DL850E-03EN).

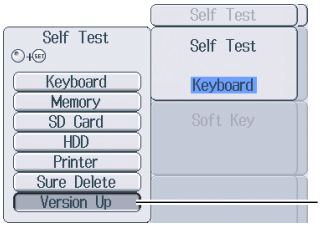
19.5 Updating the Module Firmware

This section explains how to update the firmware of modules installed in the DL850E/DL850EV.
This is a maintenance feature. Use it only when you receive instruction to do so from YOKOGAWA.

► "Self-Test (Self Test)" in the Features Guide

UTILITY Self Test Menu

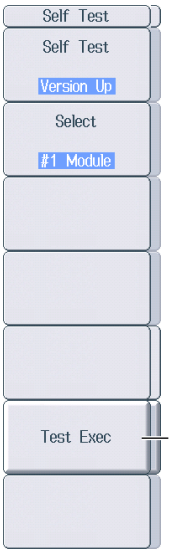
Press **UTILITY**, and then press the **Self Test** soft key and then the **Self Test** soft key again. The following menu appears.



Updates the module firmware (using the jog shuttle)

Updating the Module Firmware

Use the jog shuttle to select Version Up, and then press **SET** to display the following menu.



Executes the updating of the module firmware

If you execute Version Up, the firmware of installed modules that can be updated will be updated.

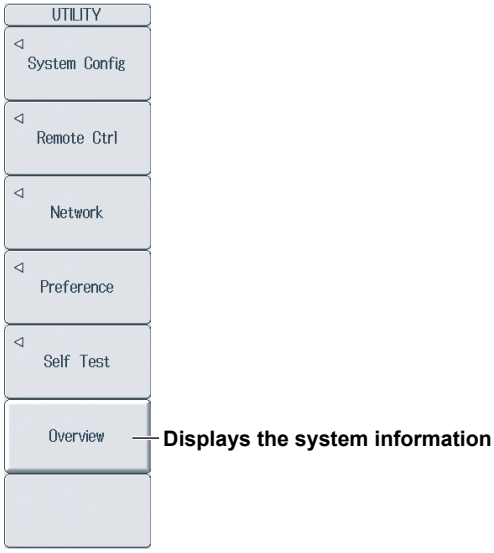
19.6 Viewing System Information (Overview)

This section explains how to view the DL850E/DL850EV system information.

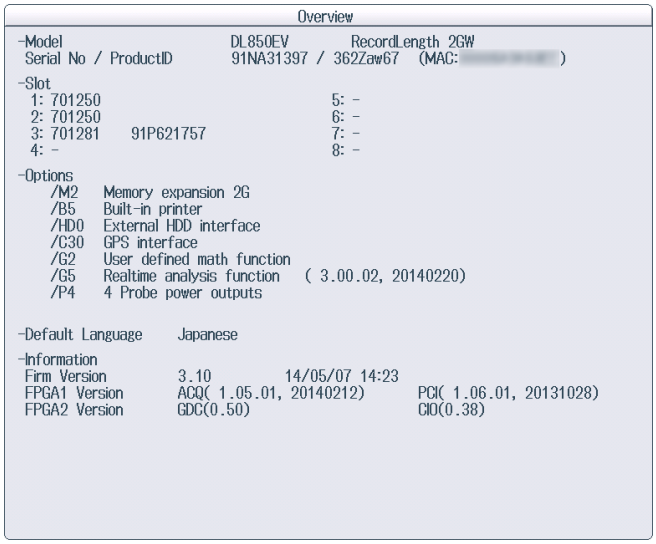
► “Overview (Overview)” in the Features Guide

UTILITY Overview Menu

Press **UTILITY** and then the **Overview** soft key to display the following screen.



Viewing System Information (Overview)



Displayed Contents

Model, Record Length	
Serial No / ProductID	The instrument, product numbers, and MAC address
Slot	The module models and the instrument numbers that are installed in each slot[1, 2]
Options	The options installed in the DL850E/DL850EV
Default Language	The default language
Information	Information such as the firmware version and the date

1 For slots that have the 701260 or 701267 module installed, the module model 701260/701267 is displayed.
2 If the following modules are installed, their instrument numbers are also displayed at the corresponding slots.
701281, 720211, 720221, 720241, 720242, 720243, 720254, 720250, 720266, 720268, 720281
The instrument numbers of other modules are not displayed.

19.7 Recommended Replacement Parts

The life and replacement period for expendable items varies depending on the conditions of use. Refer to the table below as a general guideline.
For part replacement and purchase, contact your nearest YOKOGAWA dealer.

Parts with Limited Service Life

Part Name	Service Life
Built-in printer	Under normal conditions of use, equivalent of 500 rolls of printer paper (part number: B9988AE)
LCD backlight	Under normal conditions of use, approximately 25,000 hours

Consumable Parts

We recommend replacing them at the following intervals.

Part Name	Recommended Replacement Interval
Cooling fan	3 years
Backup battery (lithium battery)	5 years

Warranty on the Internal Hard Disk

Part Name	Warranty Period
Internal hard disk	One year after the DL850E/DL850EV is purchased (however, the data that is stored on the hard disk is not included in this warranty).

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