# PX8000 Precision Power Scope USER'S MANUAL



IM PX8000-02EN 6th Edition Thank you for purchasing the PX8000 Precision Power Scope (hereafter referred to as the PX8000). This User's Manual explains how to use the PX8000. 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. The following manuals, including this one, are provided as manuals for the PX8000. Please read all manuals.

## **List of Manuals**

The following four manuals, including this one, are provided as manuals for the PX8000. Read them along with this manual.

Manual No.	Description
IM PX8000-01EN	This manual explains all the PX8000 features other than
	the communication interface features.
IM PX8000-02EN	This manual. The manual explains how to operate the PX8000.
IM PX8000-03EN	Provided as a printed manual. This guide explains the handling precautions, basic operations, and specifications of the PX8000.
IM PX8000-17EN	This manual explains the PX8000 communication interface features and how to use them.
IMPX8000-92Z1	Document for China
	Manual No.           IM PX8000-01EN           IM PX8000-02EN           IM PX8000-03EN           IM PX8000-17EN           IMPX8000-92Z1

The "EN" and "Z1" in the manual numbers are the language codes.

The pdf data of all the manuals listed in the above table is in the supplied manual CD.

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

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

#### **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**

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- December 2015 4th Edition
- June 2017 5th Edition
- October 2017 6th Edition

## **Conventions Used in This Manual**

### **Notes**

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 user's manual, the symbol is used in conjunction with the word "WARNING" or "CAUTION."



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.



Calls attentions 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

AVERTISSE	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 the proper operation of the instrument.

## Unit

k	Denotes 1000. Example: 100 kHz (frequency)
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.
 For a numeric setting, you can press NUM LOCK to use the ELEM 1 to P 4 keys to enter

For a numeric setting, you can press NUM LOCK to use the ELEM 1 to P 4 keys to enter numbers.

- 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: A dialog box or the keyboard appears when you press the soft key.
   Use the jog shuttle, SET key, and arrow keys to configure the settings in the dialog box or operate the keyboard.
- H: Press the soft key to apply the value assigned to the 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 **ESC** when a setup menu or available options are displayed, the screen returns to the menu level above the current one. If you press **ESC** 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 PX8000, the setting may not be reset).

#### **SET Key Operations**

The operation varies as indicated below 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 (<sup>(</sup>)+<sup>(</sup>⊕)) displayed on it Press SET to confirm the selected item.

#### **Arrow Key Operations**

The operation varies as indicated below 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, down, left, and right 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

			Judgement Setup							
# 1 2 3 4 5 6 7 8 9 10 11 12 12 12 12 12 12 12 12 12	Mode IN X X X X X X X X X X X X X X X X	Trace UI UI UI UI UI UI UI UI UI UI	Item Peak to Peak Peak to Peak	Upper 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000	Lower 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000	— <b>After</b> i select To exi	<b>moving</b> t <b>the set</b> t from th	<b>the cursor</b> ting in the e list, press	to the table, j table that you ESC.	press SET to I want to change
13	X	01	Peak to Peak	0.0000	0.0000					
14	X	U1	Peak to Peak	0.0000	0.0000		Mode	Trace	Item	
15	X	01	Peak to Peak	0.0000	0.0000	1	IN	114	Poak to Poak	
16	X	01	Peak to Peak	0.0000	0.0000		V		Peak to Peak	
		Logic ActCondition	Always 📷	Success		2	V	Press	SET to selec	t the item
		Actuondition	Always 🛅	SUCCESS				that y	ou want to se	t.

#### 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.

- \$POSITION knob (vertical POSITION knob)
- RANGE knob
- TIME/DIV knob
- MAG knob (magnification knob)

#### 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. 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 ELEM1 to P4 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 are reset to their default values when you press the RESET key.

## Entering Character Strings

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

### How to Operate the Keyboard

- **1.** 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.
- 2. 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 or move the cursor to **CAPS** on the keyboard, and then press **SET**.
  - To delete the previous character, press the **Back Space** soft key.
  - To delete all the characters, press the All Clear soft key.
- 3. Repeat steps 1 and 2 to enter all of the characters in the string.

Select  $\checkmark$  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.

**4.** Press the **Enter** soft key, or move the cursor to ENTER on the keyboard, and press **SET**. The character string is confirmed, and the keyboard disappears.

Character insertion position	inter a character string from the history.			
	All Clear — Deletes all characters			
	Caps — Switches between uppercase and lowercase			
A         B         C         D         E         T         SPACE         ENTER           F         G         H         J         <>         : <td:< td="">         :         :         :</td:<>				
P Q R S T       = ! ? # \$ 456 *         U V W X Y       0 % & ! \         Z GAPS				
	Back Space — Deletes the previous character			
	Enter Confirms the characters that you have entered			
	Enter a character string from the history			

#### History (a list of character strings that you have entered previously)

CHE!	
Waveform	-After selecting an item with the log shuttle or up and
Vector	down arrow keys press SET to confirm it
WIRING	
Basic	
All	
<b>v</b>	

#### 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

For details on file name limitations, see the Features Guide, IM PX8000-01EN.

• When a character string is confirmed, it is stored in a list of previously entered strings. Up to 50 character strings are stored. The new character string appears at the top of the list of previously entered strings.

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## 1.1 Configuring Wiring System Settings

This section explains the following wiring system settings.

- Wiring system
- Efficiency equation
- · Turning independent element configuration on and off
- · Delta computation
- Display format of external current sensor range
- Deskewing (correcting the transfer time difference between input signals)

Features Guide: "Wiring System Settings (WIRING)"

## **WIRING Menu**

Press WIRING to display the following menu.

-Set the wiring system.
-Set the efficiency equation.
Turns independent element configuration on and off
-Set delta computation.
<ul> <li>Set the display format of external current sensor range (Direct, Measure).</li> </ul>
-Set deskewing.

### Setting the Wiring System

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

Set the wiring system (1P2W, 1P3W, 3P3W, 3P4W, 3P3W(3V3A)).

When you select an element, the wiring systems that you can select are displayed. Select the wiring system from those displayed.

		Wiring				
Element	[ 1P2W ]	1P2W           1P3W           3P3W           3P4W           3P3W(3V3A)	] [ 3P3W:Σ A	4	]	

#### Wiring System Combination

- If you select 1P3W, 3P4W, or 3P3W(3V3A) for the wiring system, the wiring unit is set with the two
  or three elements adjacent to the selected element whose element numbers are larger than the selected
  element.
- On models that have four elements installed, up to two wiring units (ΣA and ΣB) are automatically set. The wiring unit symbols ΣA and ΣB are attached to the element numbers in order, starting with the smallest number.

#### Note.

- Because the wiring system with the largest element number is automatically determined according to the settings of the wiring system with the smallest element number, the element with the largest element number cannot be selected.
- You cannot set the wiring units for larger element numbers before the wiring units for smaller element numbers.

## Setting the Efficiency Equation (η Formula)

Press the  $\eta$  Formula soft key to display the following screen.

» E 1

7 Formula	
Element [ 1 ] [ 2 ] [ 3 ] [ 4 ]	Installed elements
[ 3P3W:5 A ] [ 1P3W:5 B ] —	The set wiring systems
$\eta_1 = * 100[\%]  \eta_2 = * 100[\%]$	-Set the denominator and numerator of the efficiency equation to the active power and motor power measurement functions. (P1-P4 <sup>1</sup> , ΡΣΑ-ΡΣΒ <sup>2</sup> , Pm2-Pm4 <sup>3</sup> , Udef1, Udef2)
OFF         OFF           73 =	You can set up to four equations: η1 to η4.
Udef1 =     P1     +     None     +     None       Udef2 =     P1     +     None     +     None	Define Udef1 and Udef2 (P1-P4 <sup>1</sup> , ΡΣΑ-ΡΣΒ <sup>2</sup> , Pm2-Pm4 <sup>3</sup> ).

To add active powers and motor output and use them in efficiency equations, use Udef1 and Udef2.

- 1 P1 to P4 can be set within the range of the installed elements.
- 2 PΣA to PΣB can be set within the range of the wiring unit that is automatically determined by the installed elements.
- 3 Pm2, Pm3, and Pm4 can be set when AUX modules are installed in slots 3, 5, and 7, respectively.

### Setting Delta Computation (Δ Measure)

Press the  $\Delta$  Measure soft key to display the following screen.

⊿ Measure	
Element [ 1 ] [ 2 ] [ 3 ] [ 4 ]	Installed elements
[ 3P3W:Σ A ] [ 1P3W:Σ B ] —	The set wiring systems
⊿Measure Type 3P3W>3V3A Difference -	Set the delta computation type.
⊿Measure Mode [mms] mean dc r-mean ac	The available options vary depending on the set wiring systems.
•	Wiring System Dolto Computation Ty

Set the delta computation mode (rms, mean, dc, r-mean, ac).

the set wiring sys	stems.
Wiring System	Delta Computation Type
1P3W	Difference, 3P3W>3V3A
3P3W	Difference, 3P3W>3V3A
3P4W	Star>Delta
3P3W(3V3A)	Delta>Star

### Setting Deskewing (Deskew Setup)

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

All	U1/I1	U2/12	U3/I3	U4/I4
	0.000 ns	0.000 ns	0.000 ns	0.000 ns
Diff Time I	0.000 ns	0.000 ns	0.000 ns	0.000 ns
iff Time Sen	0.000 ns	0.000 ns	0.000 ns	0.000 ns

Voltage (U) or current (I) of the installed elements

Manual deskewing

• Set the correction value for voltage signals.

- Set the correction value for current signals.
- Set the correction value for external current sensor signals.

To set or execute on all channels, set or execute the items in the All row.

## 1.2 Configuring Power Measurement Element Settings

This section explains the following element settings.

- · Line filter
- Frequency filter
- · Turning the scaling feature on and off
- VT ratio
- CT ratio
- · Power coefficient
- · Synchronization source

► Features Guide: "Power Measurement Element Settings (ELEM1 to 4)"

Check that a voltage module and current module are installed in appropriate slots.

## **ELEM Menu**

Of the **ELEM1 to ELEM4** keys, press the key corresponding to the element in which the voltage and current modules are installed. The following menu appears.

ELEMENT1		
Line Filter		
OFF	- Set the line filter (OFF, 500HZ, 2KHZ, 20KHZ, 1MHZ).	
Freq Filter		
OFF	- Set the frequency filter (OFF, 100Hz, 500Hz, 2KHz, 20KHz).	
Scaling	Turns the scaling feature on and off*	
OFF ON	······································	
VT Scaling		
1.0000	Set the VI ratio.	
CT Scaling	Set the OT retio	
1.0000	- Set the CT ratio.	
SF Scaling		
1.0000	Set the power coefficient.	
Sync Source	Set the symphycenization course (114,114,14,14,14, External Name)	
11	Set the synchronization source (01-04, 11-14, External, None).	

\* When you are trying to read the current of the circuit under measurement directly by multiplying the external current sensor output by the conversion ratio, if the scaling feature is set to ON, the CT ratio will end up being multiplied on top of the result. To avoid the influence of the CT ratio, set the CT ratio to 1.0000.

## 1.3 Setting the Motor Mode

This section explains the following motor mode settings.

- · Turning motor mode on and off
- Function name
- Scaling
- Unit
- Synchronization source

Features Guide: "Turning Motor Mode On and Off (Motor Mode)" "Function Name (Name)" "Scaling (Scaling)" "Unit (Unit)" "Synchronization Source (Sync Source), AUX Module"

Check that an AUX module is installed in slot 3, 5, or 7.

## Pm Menu

Of the **ELEM 2 to ELEM 4** keys, press the key corresponding to the slot in which the AUX module is installed. The following menu appears.



## 2.1 Configuring Voltage Measurements

This section explains the following settings for the vertical axis of voltage measurements.

- · Waveform display on and off
- · Display labels
- Zoom method DIV: Magnification for zooming waveforms, offset SPAN: Upper and lower display limits for zooming waveforms
- Auto range on and off
- Voltage measurement range (vertical scale)
- Voltage waveform vertical position

#### Features Guide: "Voltage Measurement (U)"

Check that a voltage module and current module are installed in appropriate slots.

## **U** Menu

Of the **U1 to U4** keys, press the key corresponding to the element in which the module is installed. The following menu appears.

When the zoom method is set to DIV		When the zoom method is set to SPAN		
🕰 U1 (CH1)		🕰 U1 (CH1)		
Display	-Turns the waveform display on	Display	-Turns the waveform display on	
OFF ON	and off	OFF ON	and off	
Label	-Set the display label.	Label	-Set the display label.	
<u>U1</u>		<u>U1</u>		
Vertical Scale	Set the zoom method to DIV.	Vertical Scale	-Set the zoom method to SPAN.	
DIV SPAN		DIV SPAN		
<ul> <li>Vertical Zoom</li> <li>x 1</li> <li>Offect</li> </ul>	Set the zoom magnification.		-Set the upper and lower limits of	
0.0V -	Set the offset.	-250.0V	the display range.	
Auto Range	Turns the auto range on and off	Auto Range	Turns the auto range on and off	
UFF UN				
•				

#### Note.

The U key whose display setting is ON illuminates. If the U key is not illuminated, you can press it to turn on the waveform display and the key. If the U key is illuminated, you can press it to turn off the waveform display and the key.

# Setting the Voltage Measurement Range (Vertical Scale, RANGE Knob)

This section explains how to set a fixed range.

(If Auto Range in the U menu is set to ON, the measurement range changes depending on the amplitude of the input signal.)

Turn the **RANGE** knob to set the voltage measurement range.

- Select from 1.5V, 3V, 6V, 10V, 15V, 30V, 60V, 100V, 150V, 300V, 600V, and 1000V.
- · Auto Range in the U menu is set to OFF.
- If you turn the RANGE knob when waveform acquisition is stopped, two values are shown on the measurement range screen. The upper value is the measurement range for the displayed waveforms. The lower value is the measurement range that you have specified. The new range will be applied the next time waveform acquisition is started.
- If you do not operate the RANGE knob for approximately 3 seconds, the measurement range that you
  are setting with the knob will disappear from the screen.

#### Top row: Measurement range for the displayed waveforms Bottom row: Measurement range that you have specified

When the displayed waveform's measurement range and the measurement range that you have set are the same, only the bottom row is displayed.



 If independent element configuration (see section 1.1) to ON, you need to set the measurement range for each element.

## Setting the Voltage Waveform Vertical Position When the Zoom Method is Set to DIV (Vertical POSITION Knob)

Turn the vertical POSITION knob to set the waveform vertical position.

- Set in the range of –5.00 div to 5.00 div.
  - If you do not operate the vertical POSITION knob for approximately 3 seconds, the vertical position that you are setting with the knob will disappear from the screen.

#### Vertical position of the displayed waveform



Use the vertical POSITION knob to display the vertical position that is currently being set.

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



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

### When the Zoom Method is Set to SPAN (Upper and Lower Limits)

Using the **Upper/Lower** soft key and the **jog shuttle**, set the voltage at the top edge of the waveform screen (upper limit) and the voltage at the bottom edge of the screen (lower limit) to set the waveform vertical position.



## 2.2 Configuring Current Measurements

This section explains the following settings for the vertical axis of current measurements.

- · Waveform display on and off
- · Display labels
- Zoom method DIV: Magnification for zooming waveforms, offset SPAN: Upper and lower display limits for zooming waveforms
- · Auto range on and off
- Current measurement range (vertical scale)
   Direct input, external current sensor (conversion ratio, input coupling)
- Current waveform vertical position

Features Guide: "Current Measurement (I)"

Check that a voltage module and current module are installed in appropriate slots.

## I Menu

Of the **I1 to I4** keys, press the key corresponding to the element in which the module is installed. The following menu appears.



• In the case of a 760813 (current module), Ext Sensor and Sensor Ratio do not appear.

#### Note\_

The I key whose display setting is ON illuminates. If the I key is not illuminated, you can press it to turn on the waveform display and the key. If the I key is illuminated, you can press it to turn off the waveform display and the key.

### Setting the Current Measurement Range (Vertical Scale, RANGE Knob)

This section explains how to set a fixed range.

(If Auto Range in the I menu is set to ON, the measurement range changes depending on the amplitude of the input signal.)

## Direct Input Measurement Range Settings

### (When Ext Sensor is set to OFF)

Turn the **RANGE** knob to set the current measurement range.

- Select from 10mA, 20mA, 50mA, 100mA, 200mA, 500mA, 1A, 2A, and 5A.
- · Auto Range in the I menu is set to OFF.
- If you turn the RANGE knob when waveform acquisition is stopped, two values are shown on the measurement range screen. The upper value is the measurement range for the displayed waveforms. The lower value is the measurement range that you have specified. The new range will be applied the next time waveform acquisition is started.
- If you do not operate the RANGE knob for approximately 3 seconds, the measurement range that you are setting with the knob will disappear from the screen.

#### Top row: Measurement range for the displayed waveforms Bottom row: Measurement range that you have specified

When the displayed waveform's measurement range and the measurement range that you have set are the same, only the bottom row is displayed.

I1 Position : 0.00 div	RangeStatus CIII CIII CIII CIII	Scaling : Off Averaging : Off LineFilter : Off FreqFilter : Off		Ma
<u>P</u>		11:	2 A	

—Use the RANGE knob to display the measurement range that is currently being set.

#### Range status

Indicates the wiring units.

Display example

When the wiring system is 1P2W

RangeStatus Because the wiring unit is separate for each element, set the measurement range of each element.

When the wiring system is 1P3W or 3P3W



RangeStatus Element 1 (CH1, CH2) and element 2 (CH3, CH4) are grouped into a single wiring unit. Changing the measurement range of one element will change that of the other element to the same value.\*

> If independent element configuration (see section 1.1) to ON, you need to set the measurement range for each element.

## External Current Sensor Input Measurement Range Settings (When Ext Sensor is set to ON)

#### When the External Current Sensor Range Display Format (see section 1.1) Is Direct

Turn the RANGE knob to set the current measurement range.

- Select from 50mV, 100mV, 200mV, 500mV, 1V, 2V, 5V, and 10V.
- Auto Range in the I menu is set to OFF.
- If you turn the RANGE knob when waveform acquisition is stopped, two values are shown on the measurement range screen. The upper value is the measurement range for the displayed waveforms. The lower value is the measurement range that you have specified. The new range will be applied the next time waveform acquisition is started.
- If you do not operate the RANGE knob for approximately 3 seconds, the measurement range that you are setting with the knob will disappear from the screen.



## When the External Current Sensor Range Display Format (see section 1.1) Is Measure

Turn the **RANGE** knob to set the current measurement range.

- Select from 50mV, 100mV, 200mV, 500mV, 1V, 2V, 5V, and 10V.
- Auto Range in the I menu is set to OFF.
- If you turn the RANGE knob when waveform acquisition is stopped, two values are shown on the measurement range screen. The upper value is the measurement range for the displayed waveforms. The lower value is the measurement range that you have specified. The new range will be applied the next time waveform acquisition is started.
- If you do not operate the RANGE knob for approximately 3 seconds, the measurement range that you are setting with the knob will disappear from the screen.

## Top row: Measurement range for the displayed waveforms Bottom row: Measurement range that you have specified

- The measurement range is set to the value that results when the measurement range set with the RANGE knob is divided by the external current sensor conversion ratio (see page 2-4).
- When the displayed waveform's measurement range and the measurement range that you



Use the RANGE knob to display the measurement range that is currently being set.

## Setting the Current Waveform Vertical Position

## When the Zoom Method is Set to DIV (Vertical POSITION Knob)

Turn the vertical POSITION knob to set the waveform vertical position.

- Set in the range of –5.00 div to 5.00 div.
  - If you do not operate the vertical POSITION knob for approximately 3 seconds, the vertical position that you are setting with the knob will disappear from the screen.

#### Vertical position of the displayed waveform



Use the vertical POSITION knob to display the vertica position that is currently being set.

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



#### Vertical POSITION knob

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

### When the Zoom Method is Set to SPAN (Upper and Lower Limits)

Using the **Upper/Lower** soft key and the **jog shuttle**, set the current at the top edge of the waveform screen (upper limit) and the current at the bottom edge of the screen (lower limit) to set the waveform vertical position.



## 2.3 Configuring Power Measurements

This section explains the following settings for the vertical axis of power measurements.

- · Waveform display on and off
- · Display labels
- Zoom method DIV: Magnification for zooming waveforms, offset SPAN: Upper and lower display limits for zooming waveforms
- · Power waveform vertical position

#### ► Features Guide: "Power Measurement (P)"

Check that a voltage module and current module are installed in appropriate slots.

## **POWER Menu**

Of the **P1 to P4** keys, press the key corresponding to the element in which the module is installed. The following menu appears.

When the zoom method is When the zoom method is set to DIV set to SPAN Now Power1 Rev POWER1 Display Display Turns the waveform display on Turns the waveform display on OFF OFF ON and off and off Label Label Set the display label. Set the display label. P1 P1 Vertical Scale Vertical Scale Set the zoom method to DIV. Set the zoom method to SPAN. SPAN DIV DIV SPAN Upper 1000.0W O Vertical Zoom 0 Set the zoom magnification. Set the upper and lower limits of 0 Offset Lower the display range. Set the offset.

#### Note

The P key whose display setting is ON illuminates. If the P key is not illuminated, you can press it to turn on the waveform display and the key. If the P key is illuminated, you can press it to turn off the waveform display and the key.

## Setting the Power Waveform Vertical Position

## When the Zoom Method is Set to DIV (Vertical POSITION Knob)

Turn the vertical POSITION knob to set the waveform vertical position.

- Set in the range of –5.00 div to 5.00 div.
  - If you do not operate the vertical POSITION knob for approximately 3 seconds, the vertical position that you are setting with the knob will disappear from the screen.

#### Vertical position of the displayed waveform



## Use the vertical POSITION knob to display the vertical position that is currently being set.

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



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

### When the Zoom Method is Set to SPAN (Upper and Lower Limits)

Using the **Upper/Lower** soft key and the **jog shuttle**, set the power at the top edge of the waveform screen (upper limit) and the power at the bottom edge of the screen (lower limit) to set the waveform vertical position.



Set the upper and lower limits of the display range.

## 2.4 Configuring Sensor Input Voltage Measurements

This section explains the following settings for the vertical axis of sensor input voltage measurements.

- · Waveform display on and off
- · Display labels
- Zoom method DIV: Magnification for zooming waveforms, offset SPAN: Upper and lower display limits for zooming waveforms
- · Auto range on and off
- AUX settings
   Input signal type, linear scaling, display format
- Input coupling
- Probe attenuation
- Bandwidth limit
- Upper and lower pulse reference levels
- Sensor input voltage measurement range
- · Sensor input voltage waveform vertical position

#### ► Features Guide: "Sensor Input Voltage Measurement (AUX)"

Check that an AUX module is installed in slot 3, 5, or 7.

## Pm Menu

Of the **ELEM 2 to ELEM 4** keys, press the key corresponding to the slot in which the AUX module is installed. On the menu that appears, set Motor Mode to OFF.



## **AUX Menu**

1. Press U2(CH3), I2(CH4), U3(CH5), I3(CH6), U4(CH7), or I4(CH8) to select a channel on an installed AUX module. The following menu appears.

#### When the zoom method is When the zoom method is set to DIV set to SPAN AUX5 (CH5) AUX5 (CH5) Display Display Turns the waveform display on Turns the waveform display on OFF ON OFF ON and off and off Label Label Set the display label. Set the display label. AUX5 AUX5 Vertical Scale Vertical Scale Set the zoom method to DIV. Set the zoom method to SPAN. DIV SPAN SPAN DIV O Vertical Zoom Upper 500.0V Set the zoom magnification. Set the upper and lower limits of Lower Offset Set the offset. the display range. Auto Range Auto Range Turns the auto range on and off\* Turns the auto range on and off\* OFF ON OFF ON Aux Settings (Analog/Pulse) Aux Settings (Analog/Pulse) AUX settings AUX settings Analog Analog [->] Next 1/2 **Displays the second** Next 1/2 **Displays the second** page of the menu page of the menu You can turn auto range on and off when the AUX input signal type is set to Analog. If the type is set to

You can turn auto range on and off when the AUX input signal type is set to Analog. If the type is set to Pulse, auto range is fixed to OFF.

#### Note.

The U or I key whose display setting is ON illuminates. If the U or I key is not illuminated, you can press it to turn on the waveform display and the key. If the U or I key is illuminated, you can press it to turn off the waveform display and the key.

When the AUX input signal

2. Press the Next 1/2 soft key to display the 2/2 menu.

#### When the AUX input signal

type is Analog		type is Pulse	
🔼 AUX5 (CH5)		AUX5 (CH5)	
Coupling DC	-Set the input coupling (AC, DC, GND).	Coupling	
Probe	-Set the probe attenuation (1:1, 10:1, 100:1, 1000:1).	Probe	<sub>Γ</sub> Set the bandwidth limit (10kHz,
Bandwidth	-Set the bandwidth limit (10kHz, 20kHz, 40kHz, 80kHz, 160kHz,	Bandwidth	20kHz, 40kHz, 80kHz, 160kHz, 320kHz, 640kHz, 1.28MHz, 2MHz, Full).
Pulse Level High	320kHz, 640kHz, 1.28MHz, 2MHz, Full).	©Pulse Level High     2.4V     ©Pulse Level Low     0.4V	Set the upper and lower pulse reference levels.
₩ Next 2/2 -	-Displays the first page of the menu	₩ Next 2/2 -	Displays the first page of the menu

### Setting the Input Coupling (Coupling)

AC: Only displays the waveform produced from the input signal's AC component.

DC: Displays the waveform produced from both the DC and AC components of the input signal. GND:Displays the ground level.



#### Input Coupling and Frequency Response

The frequency responses when the input coupling is set to AC and DC are shown below. Note that the PX8000 does not acquire low-frequency signals or signal components if the input coupling is set to AC as indicated in the figure below.



## 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 PEAK OVER message 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 AUX 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 appliquez un signal de tension élevée, ce dernier risque de ne pas être mesuré comme tel. De plus, le message de dépassement de plage (PEAK OVER) 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 AUX, la section d'entrée risque d'être endommagée.

### Setting the Probe Attenuation (Probe)

1:1, 10:1, 100:1, 1000:1: Displays the voltage probe attenuation

#### Note\_

If the probe attenuation is not set correctly, the input signal voltage will not be displayed correctly. 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.

## **AUX Settings (Aux Settings)**

Press the Aux Settings soft key to display the following screen.

When t	the i	nput si	ignal type is	5 A	nal	og		
					-		_	

When the input signal type is Pulse

• When the linear scaling mode is AX+B

· When the linear scaling mode is AX+B Set the input signal type to Pulse.

Set the input signal type to Analog.

000 110 11		9	
	Auxili ries Settings		Auxiliaries Settings
Sense Type	Analog Pulse Set 1	the linear scaling mode to AX+B	Sense Type Analog Pulse
Scaling Scaling Mode	OFF AX+B P1-	P2	Scaling Mode AX+B P1-P2
A	1.0000	<ul> <li>Set the scaling coefficient.</li> </ul>	A 1.0000
В	0.0000	Set the offset.	B 0.0000
Unit String		Set the unit string.	Unit String
Display Type			Туре
Mode	Exponent Floating	— Select the display mode. —	Mode Exponent Floating
Decimal Number	Auto	<ul> <li>Select the decimal place.</li> </ul>	- Decimal Number Auto
Sub Unit	Auto	— Select the unit prefix.	Sub Unit Auto

- When the linear scaling mode is P1-P2
- When the linear scaling mode is P1-P2

Set the input signal type to Analog.

Set the input signal type to Pulse.

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# Setting the Sensor Input Voltage Measurement Range (Vertical Scale, RANGE Knob)

This section explains how to set a fixed range.

(If Auto Range in the AUX menu is set to ON, the measurement range changes depending on the amplitude of the input signal.)

Turn the **RANGE** knob to set the sensor input voltage measurement range.

- Auto Range in the AUX menu is set to OFF.
- If you turn the RANGE knob when waveform acquisition is stopped, two values are shown on the measurement range screen. The upper value is the measurement range for the displayed waveforms. The lower value is the measurement range that you have specified. The new range will be applied the next time waveform acquisition is started.
- If you do not operate the RANGE knob for approximately 3 seconds, the measurement range that you are setting with the knob will disappear from the screen.

#### Top row: Measurement range for the displayed waveforms Bottom row: Measurement range that you have specified

When the displayed waveform's measurement range and the measurement range that you have set are the same, only the bottom row is displayed.



# Use the RANGE knob to display the measurement range that is currently being set.

#### **Measurement Range Options and Units**

Below are the available options for the RANGE knob, measurement range values, and measurement range units that appear on the screen for when the zoom method is set to DIV and the zoom magnification is set to ×1. If you change the zoom method or zoom magnification, what appears on the screen will change accordingly.

Input Signal Type	Linear Scaling Mode	Available Options for the RANGE Knob	Measurement Range Values (that appear on the screen)	Measurement Range Units (that appear on the screen)
Analog	OFF	(When the probe attenuation is 10:1) 500.0mV, 1.000V, 2.500V, 5.000V, 10.00V, 25.00V,	Upper value: RANGE knob value for the displayed waveform Lower value: Available option value of the RANGE knob	Upper unit value: Same unit as the available options for the RANGE knob Lower unit value: Same unit as the available options for the RANGE knob
AX+B, P1–P2 50.00V, 250.0V, 500.0V, 1.000kV The available options vary depending on the probe attenuation setting.	Upper value: Value obtained by multiplying the available option value of the RANGE knob by the linear scaling coefficient. Lower value: Available option value of the RANGE knob	Upper unit value: Unit specified on the AUX setting screen Lower unit value: Same unit as the available options for the RANGE knob		
Pulse		1, 2, 5, 10, 20, 50, 100, 200, 500, 1k, 2k, 5k, 10k, 20k, 50k, 100k, 200k, 500k, 1M	Upper value: No display Lower value: Available option value of the RANGE knob	Upper unit value: No display Lower unit value: Unit specified on the AUX setting screen

#### When Waveform Acquisition Is Stopped

#### 2.4 Configuring Sensor Input Voltage Measurements

Input	Linear	Available Options	Measurement Range	Measurement Range Units
Signal	Scaling Mode	for the RANGE Knob	Values	(that appear on the screen)
Туре			(that appear on the screen)	
Analog	OFF	(When the probe	Upper value:	Upper unit value:
		attenuation is 10:1)	No display	No display
		500.0mV,	Lower value:	Lower unit value:
		1.000V,	Available option value of	Same unit as the
		2.500V,	the RANGE knob	available options for the
		5.000V,		RANGE knob
	AX+B, P1–P2	10.00V, 25.00V, 50.00V, 100.0V, 250.0V, 500.0V, 1.000kV The available options vary depending on the probe attenuation setting	Upper value: Value obtained by multiplying the available option value of the RANGE knob by the linear scaling coefficient. Lower value: Available option value of the RANGE knob	Upper unit value: Unit specified on the AUX setting screen Lower unit value: Same unit as the available options for the RANGE knob
Pulse	_	1, 2, 5, 10, 20, 50, 100, 200, 500, 1k, 2k, 5k, 10k, 20k, 50k, 100k, 200k, 500k, 1M	Upper value: No display Lower value: Available option value of the RANGE knob	Upper unit value: No display Lower unit value: Unit specified on the AUX setting screen

#### When Waveform Acquisition Is Running

## Setting the Sensor Input Voltage Waveform Vertical Position When the Zoom Method is Set to DIV (Vertical POSITION Knob)

Turn the vertical POSITION knob to set the waveform vertical position.

- Set in the range of -5.00 div to 5.00 div.
  - If you do not operate the vertical POSITION knob for approximately 3 seconds, the vertical position that you are setting with the knob will disappear from the screen.

vertical position of the displayed wavero
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• You can set the vertical position to 0 div by pressing the knob.



## When the Zoom Method is Set to SPAN (Upper and Lower Limits)

Using the **Upper/Lower** soft key and the **jog shuttle**, set the voltage at the top edge of the waveform screen (upper limit) and the voltage at the bottom edge of the screen (lower limit) to set the waveform vertical position.



## 2.5 Configuring Rotating Speed Measurements

This section explains the following settings for the vertical axis of rotating speed measurements.

- · Waveform display on and off
- · Display labels
- Zoom method DIV: Magnification for zooming waveforms, offset SPAN: Upper and lower display limits for zooming waveforms
- · Auto range on and off
- Rotating speed measurement Input signal type, linear scaling, display format
- Input coupling
- Bandwidth limit
- Upper and lower pulse reference levels
- · Rotating speed measurement range
- · Rotating speed waveform vertical position

#### Features Guide: "Sensor Input Voltage Measurement (AUX)" "Rotating Speed Settings (Speed Settings)"

Check that an AUX module is installed in slot 3, 5, or 7.

## Pm Menu

Of the **ELEM 2 to ELEM 4** keys, press the key corresponding to the slot in which the AUX module is installed. On the menu that appears, set Motor Mode to ON.

Pm3	
Motor Mode	-Set Motor Mode to ON.
OFF ON	
Name	-Set the function name
Pm3	
Scaling	- Set the scaling coefficient
1.0000	Set the scaling coefficient.
Unit	- Set the unit
W	Oet the diff.
Sync Source	Set the synchronization source. Neostion 1.3
None	- Set the synchronization source. P section 1.3

## AUX Menu

1. Press U2(CH3), U3(CH5), or U4(CH7) to select a channel on an installed AUX module. The following menu appears.



<sup>1</sup> You can turn auto range on and off when the rotating-speed input signal type is set to Analog. If the type is set to Pulse, auto range is fixed to OFF.

#### Note.

The U key whose display setting is ON illuminates. If the U key is not illuminated, you can press it to turn on the waveform display and the key. If the U key is illuminated, you can press it to turn off the waveform display and the key.

2. Press the Next 1/2 soft key to display the 2/2 menu.



## Setting the Input Coupling (Coupling)

This is the same feature as the input coupling of sensor input voltage measurement. > section 2.4

## **Configuring Rotating Speed Measurements (Speed Settings)**

Press the **Speed Settings** soft key to display the following screen.

#### When the input signal type is Analog

#### • When the linear scaling mode is AX+B

Motor Speed Settings	
Sense Type (Aralog Pulse)	Set the input signal type to Analog.
Unit (rps rpm rph)	Select the rotating speed unit (rps, rpm, rph).
Analog Scaling Mode OFF AX4B P1 A 1.000 B 0.0000	Set the linear scaling mode to AX+B. Set the scaling coefficient. Set the offset.
Mode Exponent Floating	Select the display mode.
Decimal Number Auto	Select the number of decimal places.
Sub Unit Auto	Select the unit prefix.

#### • When the linear scaling mode is P1-P2

Motor Speed Settings	]
Sense Type Analog Pulse	Set the input signal type to Analog.
Unit rps rpm rph	Select the rotating speed unit (rps, rpm, rph).
r Analog-	
Scaling Mode OFF AX+B P1-P2	Set the linear scaling mode P1-P2.
P1[X] 1.0000 Get Value	Retrieve the current measured values.
P1[Y] 1.000	Set the measured values.
P2[X] 5.0000 Get Value	
P2[Y] 5.000	Set the scale values.
Display Type	
Mode Exponent Floating	
Decimal Number Auto	Same feature as when linear scaling mode is
Sub Unit Auto	set to AX+B

#### When the input signal type is Pulse

Sub Unit

Auto

[	Motor Speed Settings	
	Sense Type Analog Pulse	Set the input signal type to Pulse.
	Unit (rps rpm rph)	Select the rotating speed unit (rps, rpm, rph).
	Pulse N 60 Pulses/Revolution	Set the number of pulses per rotation (1-9999).
	Display Type	
	Decimal Number Auto	- Same feature as when the input signal type

Same feature as when the input signal type is set to Analog
# Setting the Rotating Speed Measurement Range (Vertical Scale, RANGE Knob)

This section explains how to set a fixed range.

(If Auto Range in the AUX menu is set to ON, the measurement range changes depending on the amplitude of the input signal.)

Turn the **RANGE** knob to set the rotating speed measurement range.

- Auto Range in the AUX menu is set to OFF.
- If the input signal type is analog and you turn the RANGE knob when waveform acquisition is stopped, two values are shown on the measurement range screen. The upper value is the measurement range for the displayed waveforms. The lower value is the measurement range that you have specified. The new range will be applied the next time waveform acquisition is started.
- If you do not operate the RANGE knob for approximately 3 seconds, the measurement range that you are setting with the knob will disappear from the screen.

#### Top row: Measurement range for the displayed waveforms Bottom row: Measurement range that you have specified



#### **Measurement Range Options and Units**

Below are the available options for the RANGE knob, measurement range values, and measurement range units that appear on the screen for when the zoom method is set to DIV and the zoom magnification is set to ×1. If you change the zoom method or zoom magnification, what appears on the screen will change accordingly.

Input	Linear	Available Options	Measurement Range	Measurement Range Units
Signal	Scaling	for the RANGE Knob	Values	(that appear on the screen)
Туре	Mode		(that appear on the screen)	
Analog	OFF	50.00mV, 100.0mV, 250.0mV, 500.0mV, 1.000V, 2.500V, 5.000V,	Upper value: RANGE knob value for the displayed waveform Lower value: Available option value of the RANGE knob	Upper unit value: Unit selected on the rotating speed measurement setting screen Lower unit value: Same unit as the available options for the RANGE knob
	AX+B, P1–P2	10.00V, 25.00V, 50.00V, 100.0V	Upper value: Value obtained by multiplying the available option value of the RANGE knob by the linear scaling coefficient. Lower value: Available option value of the RANGE knob	Upper unit value: Unit selected on the rotating speed measurement setting screen Lower unit value: Same unit as the available options for the RANGE knob
Pulse		1, 2, 5, 10, 20, 50, 100, 200, 500, 1k, 2k, 5k, 10k, 20k, 50k, 100k, 200k, 500k, 1M	Upper value: No display Lower value: Available option value of the RANGE knob	Upper unit value: No display Lower unit value: Unit selected on the rotating speed measurement setting screen

#### When Waveform Acquisition Is Stopped

Input	Linoar	Available Ontions	Measurement Pange	Measurement Pange Units
Signal	Scaling	for the RANGE Knob	Values	(that appear on the screen)
Туре	Mode		(that appear on the screen)	
Analog	OFF	50.00mV, 100.0mV, 250.0mV, 500.0mV, 1.000V, 2.500V, 5.000V,	Upper value: Available option value of the RANGE knob Lower value: Available option value of the RANGE knob	Upper unit value: Unit selected on the rotating speed measurement setting screen Lower unit value: Same unit as the available options for the RANGE knob
	AX+B, P1–P2	10.00V, 25.00V, 50.00V, 100.0V	Upper value: Value obtained by multiplying the available option value of the RANGE knob by the linear scaling coefficient. Lower value: Available option value of the RANGE knob	Upper unit value: Unit selected on the rotating speed measurement setting screen Lower unit value: Same unit as the available options for the RANGE knob
Pulse	_	1, 2, 5, 10, 20, 50, 100, 200, 500, 1k, 2k, 5k, 10k, 20k, 50k, 100k, 200k, 500k, 1M	Upper value: No display Lower value: Available option value of the RANGE knob	Upper unit value: No display Lower unit value: Unit selected on the rotating speed measurement setting screen

• When Waveform Acquisition Is Running

## Setting the Rotating Speed Waveform Vertical Position When the Zoom Method is Set to DIV (Vertical POSITION Knob)

Turn the vertical POSITION knob to set the waveform vertical position.

- Set in the range of -5.00 div to 5.00 div.
  - If you do not operate the vertical POSITION knob for approximately 3 seconds, the vertical position that
    you are setting with the knob will disappear from the screen.

	osition of the displayed waveform	m
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Use the vertical POSITION knob to display the vertical position that is currently being set.

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



## This indicates that you can press the vertical POSITION knob

to set the vertical position to 0 div.

### When the Zoom Method is Set to SPAN (Upper and Lower Limits)

Using the **Upper/Lower** soft key and the **jog shuttle**, set the number of rotations at the top edge of the waveform screen (upper limit) and the number of rotations at the bottom edge of the screen (lower limit) to set the waveform vertical position.



# 2.6 Configuring Torque Measurements

This section explains the following settings for the vertical axis of torque measurements.

- · Waveform display on and off
- · Display labels
- Zoom method DIV: Magnification for zooming waveforms, offset SPAN: Upper and lower display limits for zooming waveforms
- · Auto range on and off
- Torque measurement Input signal type, linear scaling, display format
- Input coupling
- Bandwidth limit
- Upper and lower pulse reference levels
- Torque measurement range
- Torque waveform vertical position

### Features Guide: "Sensor Input Voltage Measurement (AUX)" "Torque Settings (Torque Settings)"

Check that an AUX module is installed in slot 3, 5, or 7.

### **Pm Menu**

Of the **ELEM 2 to ELEM 4** keys, press the key corresponding to the slot in which the AUX module is installed. On the menu that appears, set Motor Mode to ON.

Pm3	
Motor Mode	-Set Motor Mode to ON.
OFF ON	
Name	-Set the function name
Pm3	
Scaling	- Set the scaling coefficient
1.0000	Set the scaling coencient.
Unit	- Set the unit
W	Oet the diff.
Sync Source	Set the synchronization source. Neostion 1.3
None	- Set the synchronization source. P section 1.3

### **AUX Menu**

1. Press I2(CH4), I3(CH6), or I4(CH8) to select a channel on an installed AUX module. The following menu appears.



\* You can turn auto range on and off when the torque input signal type is set to Analog. If the type is set to Pulse, auto range is fixed to OFF.

#### Note.

The I key whose display setting is ON illuminates. If the I key is not illuminated, you can press it to turn on the waveform display and the key. If the I key is illuminated, you can press it to turn off the waveform display and the key.

2. Press the Next 1/2 soft key to display the 2/2 menu.



### Setting the Input Coupling (Coupling)

This is the same feature as the input coupling of sensor input voltage measurement. ► section 2.4

### **Configuring Torque Measurements (Torque Settings)**

Press the Torque Settings soft key to display the following screen.

#### When the input signal type is Analog

#### • When the linear scaling mode is AX+B

Motor Torque Settings	
Sense Type (Analog Pulse ) Unit (	Set the input signal type to Analog. Set the torque unit.
CAnalog         Scaling Mode         OFF         AX+B         P1-P2           A         1.0000	-Set the linear scaling mode to AX+B. -Set the scaling coefficient. -Set the offset.
Display Type     Mode Exponent Floating     Decimal Number Auto     Sub Unit Auto	Select the display mode. Select the number of decimal places. Select the unit prefix.

#### • When the linear scaling mode is P1-P2

		Motor Torque Settings	]
	Sense Type	Analog Pulse	Set the input signal type to Analog.
	Unit		Set the torque unit.
	_Analog		
	Scaling Mode	OFF AX+B P1-P2	Set the linear scaling mode P1-P2.
	P1[X]	1.0000 Get Value	Retrieve the current measured values.
	P1[Y]	1.0000	Set the measured values.
	P2[X]	5.0000 Get Value	
	P2[Y]	5.0000	Set the scale values.
	-Display Type		
	Mode	Exponent Floating	
	Decimal Number	Auto	Same feature as when linear scaling mode is
	Sub Unit.	Auto	set to AX+B
1			

#### When the input signal type is Pulse

Motor Torque Settings	
Sense Type Analog Pulse	Set the input signal type to Pulse.
Unit	Set the torque unit.
Pulse         Rated Upper         50.0000         :         15000Hz           Rated Lower         -50.0000         :         5000Hz         .	Set the positive and negative rated torque signal values (-10000.0000 to 10000.0000).
Display Type Mode Exponent Floating	signals' pulse signal values (1Hz-100000000Hz).
Decimal Number Auto Sub Unit Auto	Same feature as when the input signal type is set to Analog

# Setting the Torque Measurement Range (Vertical Scale, RANGE Knob)

This section explains how to set a fixed range.

(If Auto Range in the AUX menu is set to ON, the measurement range changes depending on the amplitude of the input signal.)

Turn the RANGE knob to set the torque measurement range.

- Auto Range in the AUX menu is set to OFF.
- If the input signal type is analog and you turn the RANGE knob when waveform acquisition is stopped, two values are shown on the measurement range screen. The upper value is the measurement range for the displayed waveforms. The lower value is the measurement range that you have specified. The new range will be applied the next time waveform acquisition is started.
- If you do not operate the RANGE knob for approximately 3 seconds, the measurement range that you are setting with the knob will disappear from the screen.

# Top row: Measurement range for the displayed waveforms Bottom row: Measurement range that you have specified

Use the RANGE knob to display the measurement range that is currently being set.

#### **Measurement Range Options and Units**

Below are the available options for the RANGE knob, measurement range values, and measurement range units that appear on the screen for when the zoom method is set to DIV and the zoom magnification is set to ×1. If you change the zoom method or zoom magnification, what appears on the screen will change accordingly.

Input	Linear	Available Options	Measurement Range	Measurement Range Units
Signal	Scaling	for the RANGE	Values	(that appear on the screen)
Туре	Mode	Knob	(that appear on the screen)	
Analog	OFF	50.00mV, 100.0mV, 250.0mV, 500.0mV, 1.000V, 2.500V/	Upper value: RANGE knob value for the displayed waveform Lower value: Available option value of the RANGE knob	Upper unit value: Unit selected on the torque speed measurement setting screen Lower unit value: Same unit as the available options for the RANGE knob
	AX+B, P1–P2	5.000V, 10.00V, 25.00V, 50.00V, 100.0V	Upper value: Value obtained by multiplying the available option value of the RANGE knob by the linear scaling coefficient. Lower value: Available option value of the RANGE knob	Upper unit value: Unit selected on the torque speed measurement setting screen Lower unit value: Same unit as the available options for the RANGE knob
Pulse		1, 2, 5, 10, 20, 50, 100, 200, 500, 1k, 2k, 5k, 10k, 20k, 50k, 100k, 200k, 500k, 1M	Upper value: No display Lower value: Available option value of the RANGE knob	Upper unit value: No display Lower unit value: Unit selected on the torque speed measurement setting screen

• When Waveform Acquisition Is Stopped

Input	Linear	Available Options	Measurement Range	Measurement Range Units
Signal	Scaling	for the RANGE	Values	(that appear on the screen)
Туре	Mode	Knob	(that appear on the screen)	
Analog	OFF	50.00mV,	Upper value:	Upper unit value:
		100.0mV,	Available option value of	Unit selected on the torque speed
		250.0mV,	the RANGE knob	measurement setting screen
		500.0mV,	Lower value:	Lower unit value:
		1.000V,	Available option value of	Same unit as the available
		2.500V,	the RANGE knob	options for the RANGE knob
	AX+B,	5.000V,	Upper value:	Upper unit value:
	P1–P2	10.00V,	Value obtained by	Unit selected on the torque speed
		25.00V,	multiplying the available	measurement setting screen
		50.00V,	option value of the	Lower unit value:
		100.0V	RANGE knob by the linear	Same unit as the available
			scaling coefficient.	options for the RANGE knob
			Lower value:	
			Available option value of	
			the RANGE knob	
Pulse	—	1, 2, 5, 10, 20, 50,	Upper value:	Upper unit value:
		100, 200, 500, 1k,	No display	No display
		2k, 5k, 10k, 20k, 50k,	Lower value:	Lower unit value:
		100k, 200k, 500k,	Available option value of	Unit selected on the torque speed
		1M	the RANGE knob	measurement setting screen

#### When Waveform Acquisition Is Running

## Setting the Torque Waveform Vertical Position When the Zoom Method is Set to DIV (Vertical POSITION Knob)

- Turn the vertical POSITION knob to set the waveform vertical position.
  - Set in the range of -5.00 div to 5.00 div.
    - If you do not operate the vertical POSITION knob for approximately 3 seconds, the vertical position that you are setting with the knob will disappear from the screen.

#### Vertical position of the displayed waveform

AUX6 50 00 Nm Position 0.04 div	RangeStatus CH1 CH3 CH5 CH2 CH4 CH6	Scaling : Dff Averaging : Off LineFilter : Dff FreqFilter : Dff	Ma
H		TI	
		AUX6: 0.04div	
		101	

# Use the vertical POSITION knob to display the vertical position that is currently being set.

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



#### Vertical POSITION knob

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

### When the Zoom Method is Set to SPAN (Upper and Lower Limits)

Using the **Upper/Lower** soft key and the **jog shuttle**, set the torque at the top edge of the waveform screen (upper limit) and the torque at the bottom edge of the screen (lower limit) to set the waveform vertical position.



2.7 Displaying the Menu for Configuring All Channels

This section explains the following settings for configuring all channels.

- Settings of all elements
- Settings of all AUX channels
- Copying setup data

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

### ALL CH menu

Press ALL CH to display the following menu.

All Auvilaries	settings of all elements - Press the All Elements soft key.	All Auviliation	settings of all AUX channels
Element Independent CFE ON Sensor Range Display Type Direct Measure	-Turns independent element configuration on and off - Set the display format of external current sensor range (Direct, Measure).	Element Independent OFF ON Sensor Range Display Type Direct Measure	key.
Elements Copy to	-Copies element setup data	©⊲ Auxiliaries _ Copy to	-Copies AUX channel setup data

### **Settings of All Elements (All Elements)**

Press the All Elements 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 the available options or an input box.

To set all elements to the same setting at once, change the settings in the All column.

	Al	l Elements Setup	
all	Element 1	Element 2	
Wiring	1P2₩	1P2₩	
U Auto Range	0FF	0FF	
U Range	100V	100V	
Ext Sensor	0FF	0FF	
I Auto Range	0FF	OFF	
l Range	5A	5A 👌	
Sensor Rreset	Preset	Preset	
Sensor Ratio	10.0000mV/A(mΩ)	10.0000m∀/A(mΩ)	
CT Rreset	Preset	Preset	
Scaling	0FF	0FF	
VT Scaling	1.0000		
CT Scaling	1.0000	1.0000	
SF Scaling	1.0000	1.0000	
Sync Source	11	12	
Line Filter	0FF	0FF	
Freq Filter	0FF	0FF	

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

#### Copying Element Setup Data (Elements Copy to)

2. Press the Elements Copy to soft key to display the following screen.

Copy to	
Source Element 1 Destination All ON All OFF Element 1	Set the copy source element. Selects all elements except the copy source to be copy destinations - Clears all elements from being copy destinations
ØElement 2	Select the element check boxes separately to set the copy destination.
Execute	-Starts copying

### **Settings of All AUX Channels**

Press the All Auxiliaries 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 the available options or an input box.

	All Auxiliaries Setup					
	CH5 AUX 5	CH6 AUX 6				
Motor Mode	OFF					
Pm Name	Pm3					
Pm Scaling	1.0000					
Pm Unit	W					
Sync Source	None					
Sense Type	Analog	Analog				
Unit						
Auto Range	0FF	OFF				
Range	250V	2500				
Scaling Mode	0FF	UFF				
A	1.0000	1.0000				
В	0.0000	0.0000				
P1[X]	1.0000	1.0000				
P1[Y]	1.0000	1.0000				
P2[X]	5.0000	5.0000				
P2[Y]	5.0000	5.0000				
Pulse N	60					
Rated Upper		50.0000				
Rated Freq Upper		15000Hz				
Rated Lower		-50.0000				
Rated Freq Lower		5000Hz				
Bandwidth	Full	Full				
Coupling	DC	DC				
Probe	10:1	10:1				
Pulse Level High	2.4V	2.4V				
Pulse Level Low	0.4V	0.4V				

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

### Copying AUX Channel Setup Data (Auxiliaries Copy to)

2. Press the Auxiliaries Copy to soft key to display the following screen.

Copy to	
Source AUX5 Destination All ON All OFF	Set the copy source channel. Selects all channels except the copy source to be copy destinations Clears all channels from being copy destinations
□ AUX5 @ AUX6	Select the channel check boxes separately to set the copy destination.
Execute	-Starts copying

# 2.8 Configuring the Horizontal Axis (Time axis)

This section explains how to set the time scale (the time per grid (1 div) displayed on the screen).

► Features Guide: "Horizontal Axis"

### Configuring the Horizontal Axis (Time axis)

Turn the **TIME/DIV** knob to set the time scale.



### Time Scale (TIME/DIV) Display

- If you turn the TIME/DIV knob when waveform acquisition is stopped, the time scale display shows
  the time scale for the currently displayed waveform in the upper row and the changed time scale in
  the lower row. The new time scale will be applied the next time waveform acquisition is started.
- If you do not operate the TIME/DIV knob for approximately 3 seconds, the time scale that you are setting with the knob will disappear from the screen.



Use the TIME/DIV knob to display the time scale that is currently being set.

# 3.1 Setting the Trigger Mode

This section explains the following setting for updating the displayed waveform.

Trigger mode

► Features Guide: "Trigger Mode (MODE)"

### 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 PX8000 updates the displayed waveforms on each trigger occurrence. If not, the PX8000 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.
- AutoLevel:If a trigger occurs before a timeout (which is approximately 1 second), the PX8000 updates the waveform in the same way that it does in Auto mode. If a trigger does not occur before a timeout, the PX8000 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 PX8000 only updates the waveform display when the trigger conditions are met.
- Single: When the trigger conditions are met, the PX8000 updates the displayed waveform 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 the PX8000 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 PX8000 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 PX8000 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.

# 3.2 Setting the Trigger Position and Trigger Delay

This section explains the following settings for updating the displayed waveform.

- Trigger position
- Trigger delay

Features Guide: "Trigger Position (Position)" "Trigger Delay (Delay)"

### **POSITION/DELAY Menu**

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



# 3.3 Setting the Trigger Hold Off

This section explains the following setting for updating the displayed waveform.

· Hold-off time

► Features Guide: "Trigger Hold Off (Hold Off)"

### SIMPLE/ENHANCED Menu

Press SIMPLE/ENHANCED to display the following menu.



### 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.

# 3.4 Triggering on an Edge Trigger (Simple)

This section explains the following settings for triggering on the edges of a signal applied to an installed module.

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

Features Guide: "Simple Trigger (Simple)," "Trigger Source (Source)," "Trigger Slope (Slope)," "Trigger Level (Level)," and "Trigger Hysteresis (Hysteresis)"

### **SIMPLE Menu**

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

SIMPLE/ENHANCED	
Setting	- Set Setting to Simple.
Simple Enhanced	
Source	
UI	U1-U4, I1-I4, P1-P4, AUX3-AUX8).
Slope	$\mathbf{C}$ of the formula $\mathbf{C}$ ( $\mathbf{C}$ , $\mathbf{C}$ )
<b>F 1</b> ft	- Set the trigger slope $( \pm, \pm, \pm \pm)$ .
🕼 Level	Sot the trigger level
0. <mark>0</mark> V	- Set the trigger level.
Hysteresis	Set the trigger by storagin $(-\Delta/-\Delta/-\Delta/)$
<u>₩</u> # ¤	- Set the trigger hysteresis ( $77^{\circ}$ , $77^{\circ}$ , $77^{\circ}$ ).
Hold Off	Set the trigger hold off $\mathbf{N}$ existing 2.2
0.00us	Set the mgger hold on. F section 3.3

# 3.5 Triggering on a Timer Trigger (Simple)

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

► Features Guide: "Time (Time)"

### **SIMPLE Time Menu**

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

SIMPLE/ENHANCED	
Setting	-Set Setting to Simple.
Simple Enhanced	J
Source	
Time	- Set Source to Time.
Date/Time Setup	• · · · · · · · · ·
01/01 00:00:00	-Set the date and time.
Interval	- Set the time interval
1 hour	

### Setting the Date and Time (Date/Time Setup)

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

Date/Time	
Date	
Year 2013	
Month 1	
Day 1	
Timo	Set the date and time
Hour 0	
Minute 0	
Second 0	
Set -	Confirms the date and time

# 3.6 Triggering on an External Trigger (Simple)

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

Features Guide: "External Signal (External)" "Trigger Slope (Slope)"

### **SIMPLE External Menu**

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

SIMPLE/ENHANCED Setting Simple Enhanced Source	- Set Setting to Simple.
External Slope F 2	-Set Source to External. -Set the trigger slope (
ි Hold Off 0.00jus	-Set the trigger hold off. ► section 3.3

# 3.7 Triggering on a Power Line Signal (Simple)

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

► Features Guide: "Power Line Signal (Line)"

### **SIMPLE Line Menu**

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

SIMPLE/ENHANCED Setting Simple Enhanced	- Set Setting to Simple.
Source	- Set Source to Line.
⊕ Hold Off 0.00us	- Set the trigger hold off. ► section 3.3

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

This section explains the following settings for 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

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

### ENHANCED\_A->B(N) Trigger Menu

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

SIMPLE/ENHANCED	
Setting	-Set Setting to Enhanced.
Simple Enhanced	
Туре	
$A \rightarrow B(N)$	-Set Type to A -> B(N).
Set Pattern -	-Set the state and trigger conditions.
🚇 Hold Off	
0.0 <mark>0</mark> us	-Set the trigger hold off. ► section 3.3

### Setting the State and Trigger Conditions (Set Pattern)

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



# 3.9 Triggering on an A Delay B Trigger (Enhanced)

This section explains the following settings for triggering on an A Delay B trigger.

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

#### ► Features Guide: "A Delay B Trigger (Enhanced)"

### **ENHANCED A Delay B Trigger Menu**

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

SIMPLE/ENHANCED Setting Simple Enhanced	- Set Setting to Enhanced.
Type A Delay B	- Set Type to A Delay B.
©⊲ Set Pattern –	- Set the state and trigger conditions.
ක Hold Off 0.00ාය	- Set the trigger hold off. ► section 3.3

### Setting the State and Trigger Conditions (Set Pattern)

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



# 3.10 Triggering on an Edge On A Trigger (Enhanced)

This section explains the following settings for triggering on an Edge On A trigger.

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

► Features Guide: "Edge On A Trigger (Enhanced)"

### **ENHANCED Edge On A Trigger Menu**

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

SIMPLE/ENHANCED	
Setting	- Set Setting to Enhanced.
Simple Enhanced	
l ype	- Set Type to Edge On A.
Edge On A	
©⊲ Set Pattern –	Set the state and trigger conditions.
💮 Hold Off	Sat the trigger hold off $\mathbf{b}$ section 3.3
0.0 <mark>0</mark> us	

### Setting the State and Trigger Conditions (Set Pattern)

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



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# 3.11 Triggering on an OR or AND Trigger (Enhanced)

This section explains the following settings for triggering on an OR or AND trigger.

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

► Features Guide: "OR Trigger (Enhanced)" and "AND Trigger (Enhanced)"

### **ENHANCED OR Trigger Menu**

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



### Setting the State and Trigger Conditions (Set Pattern)

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

Set the edge detection condition (f, f, N, OUT, —).

Set the trigger level (set to the center value of the level width if the edge detection condition is set to IN or OUT).

		00	Set th (when	e level w the edg	idth e detection condition is set to IN or OUT) —
	Edge		Width	Hvs	Set the hysteresis $($
U1	5	0.0V	4.0V	#	-
11	-	0.00A	0.20A	, *	
P1	-	OW	40₩	*	
U2	-	V0.0	4.0V	#	
12	-	0.00A	0.20A	#	
P2	-	0₩	40₩	#	
AUX5	-	0.0V	5.07	++	
AUX6	-	0.0V	5.0V	₩	
Ext	-				<b>v</b>

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### **ENHANCED AND Trigger Menu**

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

SIMPLE/ENHANCED	
Setting _	- Set Setting to Enhanced.
Simple Enhanced	
Туре	
AND	-Set Type to AND.
©⊲ Set Pattern –	Set the state and trigger conditions.
⊕ Hold Off	-Set the trigger hold off. ► section 3.3
0.00us	

### 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 th (when	e level v the ach	idtl ieve	h ement condition is set to IN or OL
			AND				
	0	Condition	Level	Width	Hys		– Set the hysteresis ( <del>∧/</del> . <del>本/</del> . 7
U1		-	0.0V	4.0V	*		······································
11		-	0.00A	0.20A	*		
P1		-	OW	40₩	#		
U2		-	0.0V	4.0V	*		
12		-	0.00A	0.20A	#		
P2		-	0₩	40₩	*		
AUX5		-	0.0V	5.0V	*		
AUX6		-	0.0V	5.0V	₩	_	

# 3.12 Triggering on a Period Trigger (Enhanced)

This section explains the following settings for triggering on a period trigger.

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

#### ► Features Guide: "Period Trigger (Enhanced)"

### **ENHANCED** Period Trigger Menu

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

SIMPLE/ENHANCED Setting	- Sat Satting to Enhanced
Simple Enhanced	Set Setting to Emanced.
Туре	-Set Type to Period
Period	Set Type to Feriod.
©⊲ Set Pattern –	-Set the state and trigger conditions.
🗟 Hold Off	Set the trigger hold off $\mathbf{b}$ section 3.3
0.0 <mark>0</mark> us	Section angger hold on. P Section 3.5

### Setting the State and Trigger Conditions (Set Pattern)

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

	Set th	le state co	ndition	ı (H, L, or X (do not	t use as a trigger source)).
		Set th	e trigg	er level.	
r					
		Period			
	B State	Level	Hys ·	A	Set the hysteresis $(-\mathcal{N}, -\mathcal{N})$ .
U1	Н	0.0V	*	Mode	
11	X	0.00A	₩		Set the determination mode
P1	X	OW	₩		Set the determination mode.
U2	Х	0.0V	#	T1	
12	Х	0.00A	#	· · · · · · · · · · · · · · · · · · ·	
P2	X	0₩	₩	[ 0.02us]	
AUX5	Х	0.0V	₩		Sot the reference time *
AUX6	X	0.0V	₩	T2	Set the reference time.
				0.03us	
Met	Met			,	
D Deference	time T . D	] . Trianan			
D Reference		→ I liggei			

Set T1 and T2 when the determination mode is T1 < T < T2 or T <T1, T2 < T. Set Time when the determination 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 PX8000 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< th=""><th>Period T must be shorter than reference time T1 or longer than reference time T2.</th></t<>	Period T must be shorter than reference time T1 or longer than reference time T2.

#### Triggering on a Pulse Width Trigger (Enhanced) 3.13

This section explains the following settings for triggering on a pulse width trigger.

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

► Features Guide: "Pulse Width Trigger (Enhanced)"

### ENHANCED Pulse Width Trigger Menu

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

SIMPLE/ENHANCED	
Setting	-Set Setting to Enhanced
Simple Enhanced	
Туре	
Pulse Width	-Set the trigger type to Pulse Width.
Sot Pattorn	- Sat the state and trigger conditions
Jet l'attern	Set the state and trigger conditions.
🕼 Hold Off	
0.0 <mark>0</mark> us	- Set the trigger hold off. ► section 3.3
•	

### Setting the State and Trigger Conditions (Set Pattern)

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

	Set th	e state co	nditio	n (H, L, or X (do no	t use as a trigger source)).
		Set th	ne trigg	ger level.	
		Pulse Width			1
	B State	Level	Hys	A Marila	Set the hysteresis ( $\overline{\mathcal{M}}, \overline{\mathcal{M}}, \overline{\mathcal{M}}$ ).
U1	H	V0.0	*	Mode	, , , , , , , , , , , , , , , , , , ,
11	X	0.00A	*	B Between	Sot the determination mode
P1	X	OW	*		Set the determination mode.
U2	X	0.0V	*	T1	
12	X	0.00A	₩	]	
P2	X	0₩	*	0.01us	
AUX5	X	0.0V	₩		Set the reference time *
AUX6	X	0.0V	*	v 12	
Achievement time	→Trigger			0.02us	

Set T1 and T2 when the determination mode is B Between.

\*

### 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 PX8000 to trigger.

B < Time	The PX8000 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 PX8000 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 PX8000 triggers when the achievement time is longer than the reference time (Time).			
B Between	The PX8000 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.			

# 3.14 Triggering on a Wave Window Trigger (Enhanced)

This section explains the following settings for triggering on a wave window trigger.

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

► Features Guide: "Wave Window Trigger (Enhanced)"

### **ENHANCED Wave Window Trigger Menu**

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

SIMPLE/ENHANCED	
Setting	- Set Setting to Enhanced.
Simple Enhanced	
Туре	
Wave Window	-Set Type to Wave Window.
	- Set the trigger conditions.
© Hold Off _	- Set the trigger hold off. ► section 3.3
0.0 <mark>0</mark> us	

### Setting the Trigger Conditions (Set Pattern)

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



\* Set when the synchronization channel is U1 to U4, I1 to I4, P1 to P4, or AUX3 to AUX8.

# 3.15 Triggering the PX8000 Manually (Manual Trigger)

This section explains how to trigger the PX8000 manually.

► Features Guide: "Trigger Types (Type)"

Press MANUAL TRIG.

# 4.1 Setting Conditions for Waveform Acquisition

This section explains the following settings for acquiring waveforms.

- · Record length
- · Acquisition mode
- · Number of waveforms to acquire and attenuation constant
- Time base
- Executing logger setup

► Features Guide: "Waveform Acquisition"

### **ACQUIRE Menu**

Press ACQUIRE to display the following menu.

#### When the Acquisition Mode Is Set to Normal or Envelope

ACQUIRE			
Record Length	-Set the record length		
<u>1M</u>			
Acquisition Mode	Set the acquisition mode to		
Normal	Normal or Envelope.		
Trigger Mode	Sat the trigger made. Section 3.1		
Auto	Set the trigger mode. F section 3.1		
Acquisition Count	Sat the number of waveform acquir	itiono	
Infinite	- Set the number of waveform acquis	suons.	
		When the time	base is Ext
Time Base	Set the time has a (let Fut)	Time Base Int Ext	
Int Ext	- Set the time base (int, Ext).	Pulse/Rotate	Set the pulse/rotation.
Execute	Execute Logger Setup *	Execute	1
Logger Setup			
	•		

\* A confirmation message will appear.

#### When the Acquisition Mode Is Set to Average

ACQUIRE			
③ Record Length	Cot the uppend low oth		
<u>1M</u>	- Set the record length.		
Acquisition Mode	Sat the convicition mode to		
Average	Average.		
Trigger Mode	Set the trigger mode $\blacktriangleright$ section 2		
Auto	- Set the trigger mode. ► section 3.1		
Acquisition Count	0.44		
- Infinite	-Set the number of waveform acqui	sitions.	
<ul> <li>Weight</li> </ul>		When the time	base is Ext
-	-Set the attenuation constant.		
		Time Base	•
Time Base	Set the time base (Int, Ext).	Int Ext	
Int Ext		Puise/Rotate	Set the pulse/rotation.
Execute Logger Setup	-Execute Logger Setup.*	Execute	
-	1		

\* A confirmation message will appear.

### Setting the Acquisition Mode (Acquisition 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.
- Average: Displays averaged waveforms. You can set the attenuation constant and the number of times to average with the jog shuttle.

# 4.2 Starting and Stopping Waveform Acquisition

This section explains how to start and stop waveform acquisition.

► Features Guide: "Waveform Acquisition (START/STOP)"

## Waveform Acquisition (START/STOP)

Press **START/STOP** to start or stop waveform acquisition. When the START/STOP key is illuminated, the PX8000 is acquiring waveforms.

#### Note\_\_\_\_

lf	If every numeric data (see chapter 6) is displayed as no data () even when you start waveform				
ac	acquisition, check the following items.				
•	Is the numeric measurement setting set to ON?	section 7.1			
•					
	Trigger mode	section 3.1			
	Trigger position and trigger delay	section 3.2			
	Trigger hold off	► section 3.3			
	Trigger conditions according to trigger type	► sections 3.4 to 3.15			

# 5.1 Selecting the Display Mode

This section explains how to set the type of display to show.

· Display mode

► Features Guide: "Display Mode and Display Settings"

### **DISPLAY MODE menu**

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



\* These settings are available on models with the harmonic measurement (/G5) option.

### **DISPLAY SETTING Menu**

Press **DISPLAY SETTING**. The SETTING menu of the display you specified on the DISPLAY MODE menu appears.

If you specified a split display in which the half of the screen is set to Numeric or Wave on the DISPLAY MODE menu, the SETTING menu for the top half of the screen and that of the bottom half of the screen toggles each time you press DISPLAY SETTING.

For details on the different SETTING menus, see the following sections.

NUMERIC SETTING menu	section 6.1
WAVE SETTING menu	section 8.1
BAR SETTING menu	section 9.1
VECTOR SETTING menu	► section 10.1

# 6.1 Switching the Displayed Page

This section explains how to switch the displayed numeric data page.

Features Guide: "Numeric Data Display Settings" "Switching the Displayed Page"

### NUMERIC SETTING menu

1. Use the **DISPLAY MODE** and **DISPLAY SETTING** keys as explained in section 5.1 to display the NUMERIC SETTING menu.

NUMERIC SETTING	
Format	Sat the display format
4 Items	(4 Items, 8 Items, 16 Items, Matrix, All Items, Hrm Single List,*
Item No	Hrm Dual List,* Custom).
1	
Function	
Urms	
Element/ $\Sigma$	
Element 1	
🙊 Order	
Total	
⊲ Reset Items	

These settings are available on models with the harmonic measurement (/G5) option.

2. Set the display format, and then press **ESC** to clear the menu.

#### Note\_\_\_\_

\*

If every numeric data is displayed as no data (), check the following items.			
•	Is waveform acquisition running?	section 4.2	
•	Is the numeric measurement setting set to ON?	section 7.1	
•	Is the trigger set properly?		
	Trigger mode	section 3.1	
	Trigger position and trigger delay	► section 3.2	
	Trigger hold off	► section 3.3	
	Trigger conditions according to trigger type	sections 3.4 to 3.15	

# When the Display Format Is 4 Items, 8 Items, 16 Items, Matrix, All Items, or Custom

Press the up and down **arrow** keys  $(\blacktriangle, \triangledown)$  to switch the page.

- You can switch the displayed page separately for the 4 Items, 8 Items, 16 Items, Matrix, All Items, and Custom displays.
- If the display format is set to All Items in single display mode (see section 5.1), the top half of the display of page 1 is constantly displayed, and the bottom half of the display changes for subsequent pages. In split display mode (see section 5.1), the entire numeric data displayed in the top or bottom half of the screen switches.

In addition, if the display format is set to All Items, you can switch pages using soft keys without clearing the menu as explained in step 2 on the previous page.

For the Custom display, you can switch between pages when the display is set so that the total number
of displayed items is more than the number of items that can be displayed on one page (see section 6.6).



# When the Display Format Is Hrm Single List or Hrm Dual List (/G5 Option)

- Press the left and right arrow keys (◄,►) to select either the measurement function side (the left side of the screen) or the harmonic order data side (the right side of the screen).
- **2.** Press the up and down **arrow** keys  $(\blacktriangle, \triangledown)$  to switch the page.


# 6.2 Changing the Displayed Items on the 4-, 8-, and 16-Value Displays

This section explains the following settings for the displayed items on the 4-, 8-, and 16-value displays.

- Item number
- Measurement function
- · Element and wiring unit
- Order (harmonic order, /G5 option)
- · Resetting the displayed items

▶ Features Guide: "4-, 8-, and 16-Value Displays (4 Items/8 Items/16 Items)."

# **NUMERIC SETTING Menu**

Use the **DISPLAY MODE** and **DISPLAY SETTING** keys as explained in section 5.1 to display the NUMERIC SETTING menu.

NUMERIC SETTING			
Format -	-Set the display format to 4 Items, 8 Items, or 1	l6 Items.	
• Item No	-Select the item number that you want to set.	For 4 Items: For 8 Items: For 16 Items:	1-48 1-96 1-192
Function _	Set the measurement function (None, other fu various measurement functions, see "Items T in the Features Guide).	Inctions—for de That This Instrum	tails on the ıent Can Measure"
Element 72	-Set the element and wiring unit (Element 1-Ele	ement 4, ΣΑ, ΣΒ	).
Order	- Set the harmonic order (Total, 0-500).* You can set this setting only when you have sele includes a harmonic order.	cted a measurem	ent function that
⊲ Reset Items -	-Set the resetting of displayed items.		

\* These settings are available on models with the harmonic measurement (/G5) option.

## Example of the 4 Items Display

Urms1	0.00	V
Irms1	0.0000	Α
P1	0.00	W
Umn1	0.00	V

### Note

If every numeric data is displayed as no data (-----), check the referenced sections under "Note" in section 6.1.

# NUMERC SETTING Format Items Items Function Ums Element/Z Reset Items Reset Items The arrangement of the displayed items on all pages The arrangement pattern varies depending on the number of installed elements. Clear All Pages Sets all displayed measurement functions to None\*

# **Resetting the Displayed Items (Reset Items)**

Press the **Reset Items** soft key to display the following menu.

<sup>\*</sup> The measurement functions displayed on the screen are cleared, and every numeric data is displayed as no data.

# **Switching the Page**

To set items on pages that are not currently shown, switch to these pages. For details on how to switch pages, see section 6.1.

# 6.3 Changing the Displayed Items on the Matrix Display

This section explains the following settings for the displayed items on the Matrix display.

- Item number
- Measurement function
- Order (harmonic order, /G5 option)
- Display column
   Number of columns, element and wiring unit
- Resetting the displayed items

► Features Guide: "Matrix Display (Matrix)"

# **NUMERIC SETTING Menu**

Use the **DISPLAY MODE** and **DISPLAY SETTING** keys as explained in section 5.1 to display the NUMERIC SETTING menu.

NUMERIC SETTING	
Format	Set the display format to Matrix
Matrix	
Item No	Select the item number that you want to set (1-81)
1	
Function	Sat the measurement function (None other functions—for details on the various
Urms	measurement functions, see "Items That This Instrument Can Measure" in the Features Guide).
Order _	Set the harmonic order (Total, 0-500).*
Total	You can set this setting only when you have selected a measurement function that includes
⊲ Column Cottingo	
GUIUIIII Settings -	Configure the columns to display.
⊲ Reset Items –	-Set the resetting of displayed items.

\* These settings are available on models with the harmonic measurement (/G5) option.

### **Matrix Display Example**

		Element 1	Element 2	Σ A(3P3₩)		
Urms	[V ]	0.00	0.00	0.00		
lrms	[A ]	0.084m	0.159m	0.122m		
Р	[W ]	-0.0000	-0.0000	-0.0000		
S	[VA ]	0.0000	0.0000	0.0000		
Q	[var]	0.0000	0.0000	0.0000		
λ	[ ]	Error	Error	Error		
φ	[* ]	Error	Error	Error		
Umn	[V ]	0.00	0.00	0.00		
lac	[A ]	0.083m	0.103m	0.093m		

### Note.

If every numeric data is displayed as no data (-----), check the referenced sections under "Note" in section 6.1.

# Setting the Columns to Display (Column Settings) Press the Column Settings soft key to display the following menu.

Column Settings Columns 4 6	- Set the number of columns (4, 6).
© Column No [1] Element/Σ Element 1	– Set the column number (1-6). – Set the element and wiring unit (None, Element 1-Element 4, ΣΑ, ΣΒ).
Reset Columns	<ul> <li>Resets the element and wiring unit settings of each column</li> </ul>

# **Resetting the Displayed Items (Reset Items)**

Press the **Reset Items** soft key to display the following menu.

NUMERIC SETTING	
Matrix	
O Item No	
1	
Function	
Urms	
Reset Items	
Reset Items Exec	<ul> <li>Resets the arrangement of the displayed items on all pages</li> <li>The arrangement pattern varies depending on the number of installed elements.</li> </ul>
Clear Current Page	-Sets all displayed measurement functions to None*
Clear All Pages	-Sets all measurement functions on all pages to None*

\* The measurement functions displayed on the screen are cleared, and every numeric data is displayed as no data.

# **Switching the Page**

To set items on pages that are not currently shown, switch to these pages. For details on how to switch pages, see section 6.1.

# 6.4 Changing the All Items Display

This section explains the following All Items display settings.

- Order (harmonic order, /G5 option)
- · Switching the Page

► Features Guide: "All Items Display (All Items)"

# NUMERIC SETTING Menu

Use the **DISPLAY MODE** and **DISPLAY SETTING** keys as explained in section 5.1 to display the NUMERIC SETTING menu.

Format – Set the display format to All Items.	
Order(k) – Set the harmonic order (Total, 0-500).*	
You can set this setting only when you have selected the page of a measurement function	on
that includes a harmonic order.	
Page To the previous page	
Switching the Page	
Page To the next page	

\* These settings are available on models with the harmonic measurement (/G5) option.

### All Items Display example

Voltage Current	_Element 1 100V 10mA	Element 2 100V 10mA	_ΣA(3P3W)_
Urms [V ]	0.00	0.00	0.00
lrms [A ]	0.084m	0.165m	0.125m
P [W]	-0.0000	-0.0000	-0.0000
S [VA ]	0.0000	0.0000	0.0000
Q [var]	0.0000	0.0000	0.0000
λ [ ]	Error	Error	Error
φ [°]	Error	Error	Error
fU [Hz]	Error	Error	
fl [Hz]	Error	Error	

### Note\_

- On the All Items display, you cannot select individual display items and change their measurement function, element, or wiring unit. If you switch to the Matrix display, you can change the measurement functions, elements, and wiring units using the displayed table (see section 6.3).
- If every numeric data is displayed as no data (-----), check the referenced sections under "Note" in section 6.1.

# 6.5 Changing the Harmonics List Display (Option)

This section explains the following settings for the harmonics list display (Hrm List). These settings are available on models with the harmonic measurement (/G5) option.

- · List number
- Measurement function
- · Element and wiring unit
  - ► Features Guide: "Single Harmonics and Dual Harmonics Lists (Hrm Single List/Hrm Dual List; option)"

# NUMERIC SETTING Menu

Use the **DISPLAY MODE** and **DISPLAY SETTING** keys as explained in section 5.1 to display the NUMERIC SETTING menu.

NUMERIC SETTING	
Format	- Sat the display format to Hrm Single List or Hrm Dual List
Hrm Single List	-Set the display format to mini Single List of mini Dual List.
Item No	Select the list number that you want to get (4, 2)
[1]	Function, element, and wiring unit settings that you make for list number 2 are also
Function	reflected in the right column of the harmonic order data of the dual harmonics list.
U	-Set the measurement function (U, I, P, S, Q, λ, Φ, ΦU, ΦΙ, Ζ, Rs, Xs, Rp, Xp).
Element/ $\Sigma$	October alement and minimum it (Element 4 Element 4 EA ED)
Element 1	- Set the element and wiring unit (Element 1-Element 4, $\Sigma A$ , $\Sigma B$ ).

### Hrm Single List Display Example

Measurement function side				Harmonic order data side			
fPLL:U1	60.001 Hz	Order Total 1 3	U1 [V] 3.545 2.706 0.670	hdf[%] 76.316	Order dc 2 4	U1 [V]  1.786 0.229	hdf[%]  50.377 6 472
Urms1 Irms1 P1 S1 Q1 λ1 Φ1	3.956 V 349.58 A 0.7715 k₩ 1.3831 kVA 1.1479 kvar 0.5578 656.10 °	5 7 9 11 13 15 17 19	0.644 0.169 0.392 0.025 0.277 0.043 0.202 0.080	18.173 4.760 11.048 0.702 7.807 1.219 5.703 2.268	6 8 10 12 14 16 18 20	0.556 0.222 0.288 0.210 0.160 0.193 0.080 0.173	15.676 6.256 8.121 5.913 4.504 5.443 2.258 4.875
PAGE	1/14		: change fo	cus			IGE 1/25

### Note.

If every numeric data is displayed as no data (-----), check the referenced sections under "Note" in section 6.1.

### Hrm Dual List Display Example

Measurement function side			Harm	onic c	order data	a side
	Order	U1 [V]	hdf[%]	Order	I1 [A]	hdf[%]
	Total	3.545		Total [	348.77	
fPLL:U1 60.001 Hz	dc			dc		
	1	2.706	76.316	1	314.64	90.212
	2 [	1.786	50.377	2	0.01	0.004
Urme1 2 956 V	3	0.670	18.893	3	104.88	30.070
Irme1 349 58 A	4	0.229	6.472	4	0.01	0.002
P1 0 7715 LW	5	0.644	18.173	5	62.92	18.039
S1 1 2821 LVA	6	0.556	15.676	6	0.01	0.003
01 1 1479 kyar	7	0.169	4.760	7	44.93	12.883
λ1 0 5578	8	0.222	6.256	8	0.01	0.002
h1 C56 10 °	9	0.392	11.048	9	34.95	10.021
¢1000.10	10	0.288	8.121	10	0.01	0.002
PAGE 1/14		⊲⊳:change fr	ncus		<b>A</b> 2	AGE 1/50

### Note\_

On the harmonics list displays, you can change the measurement function, element, and wiring unit for the selected list, but you cannot change these settings for each individual display item.

# **Switching the Page**

You can switch the page to display other items. For details on how to switch pages, see section 6.1.

# 6.6 Setting the Custom Display

This section explains the following Custom display settings.

- · Loading display configuration files
- Loading background files
- · Display configuration

Total items, items per page, custom items (item number, measurement function, element and wiring unit, harmonic order, display position, font size, font color), saving custom display configuration files

► Features Guide: "Custom Display (Custom)"

# **NUMERIC SETTING Menu**

Use the **DISPLAY MODE** and **DISPLAY SETTING** keys as explained in section 5.1 to display the NUMERIC SETTING menu.



# Setting the Display Configuration (Edit Items)

1. Press the Edit Items soft key to display the following menu.



### **Customizing Display Items (Custom Items)**

2. Press the Custom Items soft key to display the following screen.



### Note\_

If every numeric data is displayed as no data (-----), check the referenced sections under "Note" in section 6.1.

### Saving Display Configuration Files (Save Custom Items)

2. Press the Save Custom Items soft key to display the following menu.



# Loading Display Configuration and Background Files at the Same Time (Load Items & Bmp)

On the NUMERIC SETTING menu on page 6-10, click the **Items & Bmp** soft key to display the following screen.



To load both a display configuration file and background file at the same time, load the display configuration file.

However, an error will occur if a background file that has the same name as the display configuration file is not present in the save destination folder of the display configuration file.

For the operating procedure, see section 22.10.

### Example of Loading a File for the Custom Display



### Note

After you properly load a display configuration file and a background file, if you restart the PX8000 and the same background file is not in the same location, the background will return to its default.

## Switching the Page

You can switch between pages when the display is set so that the total number of displayed items is more than the number of items that can be displayed on one page. For details on how to switch pages, see section 6.1.

# 7.1 Turning Numeric Measurement On and Off

This section explains how to turn numeric measurement on and off.

► Features Guide: "Turning Numeric Measurement On and Off (Numeric Measure)"

# **NUMERIC Menu**

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

NUMERIC	
Numeric Measure	
OFF ON	Turns numeric measurement on and off
Period	If this is set to OFF, none of the measurement functions will be measured, and every
Zero Cross	numeric data will be displayed as no data ().
Harmonics	
Next 1/2	
Note	

-						
	If every numeric data (see chapter 6) is displayed as no data () even when you turn numeric					
	measurement on, check the following items.					
	<ul> <li>Is waveform acquisition running?</li> <li>section 4.2</li> </ul>					
	<ul> <li>Is the trigger set properly?</li> </ul>					
	Trigger mode	► section 3.1				
	Trigger position and trigger delay	► section 3.2				
	Trigger hold off	► section 3.3				
	Trigger conditions according to trigger type	sections 3.4 to 3.15				

# 7.2 Setting the Calculation Period

This section explains the following settings for measuring and computing measurement functions of normal measurement.

- · Calculation period
- · External signal status
- · Cursor start and end points
- · Search zero cross

► Features Guide: "Calculation Period (Period)"

# **NUMERIC Menu**

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



# Setting Search Zero Cross (Search Zero Cross)

Press the **Search Zero Cross** soft key to display the following menu.

When Start Position is selected for the cursor start and end point setting Search Zero Cross 1 Start Position Set the cursor start and end points. When End Position is selected for the cursor End Position start and end point setting Source Set the zero-crossing search Moves to the nearest zero-crossing Search Next Move End position after the End Position source. U1 Edge Moves to the nearest zero-crossing Search Previous Set the edge. Move End position before the End Position F £ fł Moves to the nearest zero-crossing Search Next Move Start position after the Start Position When both Start Position and End Position are selected for the cursor start and end point setting Moves to the nearest zero-crossing Search Previous Moves to the nearest zero-crossing Search Next Move Start position before the Start Position Move Start Link position after the Start Position while maintaining the cursor span

Search Previous

Move Start Link

while maintaining the cursor span Moves to the nearest zero-crossing position before the Start Position while maintaining the cursor span

# 7.3 Setting Numeric Data Averaging

This section explains the following settings for exponential averaging (Exp) and moving averaging (Lin) of numeric data.

- Averaging type
- Attenuation constant
- Averaging count

► Features Guide: "Averaging (Averaging)"

# **NUMERIC Menu**

1. Press NUMERIC to display the following menu.

NUMERIC	
Numeric Measure	Sat Numeric Measure to ON
OFF ON	-Set Numeric Measure to ON.
Period	
Zero Cross	
4	
Harmonics	
₩.	Displays the second page of the many
Next 1/2 -	-Displays the second page of the menu

2. Press the Next 1/2 soft key to display the 2/2 menu.

Averaging OFF Stop Lin © Count Quer Defined	−Set the averaging type (OFF, Exp, Lin).	When averaging type is Exp Pattern Averaging OFF EXP Count C
Function		When averaging type is Lin
180 degrees ₩ Next 2/2		User Defined

# 7.4 Setting User-Defined Functions

This section explains the following settings for user-defined functions.

- · Turning computation on and off
- Computation name
- Unit
- Equation

► Features Guide: "User-Defined Functions (User Defined Function)"

# **NUMERIC Menu**

1. Press NUMERIC to display the following menu.

 NUMERIC

 Numeric Measure

 OFF

 Period

 Zero Cross

Harmonics

 Image: Next 1/2

Displays the second page of the menu

2. Press the Next 1/2 soft key to display the 2/2 menu.



# **Setting User-Defined Functions (User Defined Function)**

Press the User Defined Function soft key to display the following screen.



# 7.5 Setting Apparent Power, Reactive Power, and Corrected Power Equations

This section explains the following settings for the apparent power, reactive power, and corrected power equations.

- · Apparent power equation
- · Apparent power and reactive power computation types
- Corrected power equation
   Applicable standard and coefficients

Features Guide: "Apparent Power, Reactive Power, and Corrected Power Equations (Formula)"

# **NUMERIC Menu**

1. Press NUMERIC to display the following menu.

NUMERIC	
Numeric Measure	- Set Numeric Measure to ON.
OFF ON	
Period	
Zero Cross	
⊲ Harmonics	
Harmonica	
Novt 1/0 -	Displays the second name of the menu
Next 172 -	- Displays the second page of the menu

2. Press the Next 1/2 soft key to display the 2/2 menu.



# Setting Apparent Power, Reactive Power, and Corrected Power Equations (Formula)

Press the Formula soft key to display the following screen.

### Set the apparent power equation (Urms\*Irms, Umean\*Imean, Udc\*Idc, Umean\*Irms, Urmean\*Irmean). Formula S Formula Urms\*rms S,Q Formula Type 1 Type 2 Type 3 🖯 Set the apparent power and reactive power computation types (Type 1, Type 2, Type $3^{\dagger}$ ). $P\Sigma = P1+P2+P3$ $S\Sigma = S1+S2+S3$ $0\Sigma = 01+02+03$ For 3P4W Pc Formula-Corrected power equation Here Set the applicable standard Select standard [EC76-1(1976)] IEC76-1(1993) (IEC76-1(1976), IEC76-1(1993)). 0.5000 P1 = Set the coefficients (0.0001-9.9999). P2 = 0.5000 When Select standard is IEC76-1(1976), set coefficients P1 and P2.

† These settings are available on models with the harmonic measurement (/G5) option.

# 7.6 Setting the Phase Difference Display Format

This section explains how to set the phase difference display format.

► Features Guide: "Phase Difference Display Format (Phase)"

# **NUMERIC Menu**

1. Press NUMERIC to display the following menu.

NUMERIC	
Numeric Measure	Cat Numaria Magazina (a. ON
OFF ON	- Set numeric measure to ON.
Period	
Zero Cross	
narmunics	
Next 172 -	-Displays the second page of the menu

2. Press the Next 1/2 soft key to display the 2/2 menu.



# 7.7 Setting Harmonic Measurement Conditions

This section explains the following settings for harmonic measurement conditions. These settings are available on models with the harmonic measurement (/G5) option.

- · Turning harmonic measurement on and off
- PLL source
- · Measured harmonic order
- · Distortion factor equation
- · Harmonic measurement start point

Features Guide: "Harmonic Measurement Conditions (Harmonics; option)"

# NUMERIC Menu

Press NUMERIC to display the following menu.



# Harmonics Menu

Press the Harmonics soft key to display the following menu.



# 8.1 Setting the Waveform Display

This section explains the following settings for displaying waveforms.

- · Waveform display format
- Detailed settings of the waveform display
- Turning waveform display on and off, waveform color, waveform mapping, waveform label, vertical zoom

DIV: Offset value, waveform's vertical position, magnification

SPAN: Upper and lower limits of the display range

Horizontal (time scale) zoom ► chapter 12

- · Interpolation method
- Grid
- · Turning the display of scale values on and off
- · Turning the trace label display on and off
- · Extra window

► Features Guide: "Waveform Display Settings"

# **WAVE SETTING Menu**

Use the **DISPLAY MODE** and **DISPLAY SETTING** keys as explained in section 5.1 to display the WAVE SETTING menu.

WAVE SETTING	
O Format	-Set the display format (1 (no windows) 2 3 4 6 8 12 16)
®⊲ Wave Setup —	-Configure the detailed settings of the waveform display.
Dot Connect	
Sine	Set the interpolation method (OFF, Sine, Line, Pulse).
Graticule	
	- Set the grid (▦, 逊, ).
Scale Value	
OFF	Turns the display of scale values on and off
Trace Label	Towns the twee label disclose an end off
OFF ON	- I urns the trace label display on and off
Extra Window	Set the extremindent (OEE $4, 2, 3, 4, 5, 6, 7, 9, Auto)$
OFF	- Set the extra window (OFF, 1, 2, 3, 4, 5, 6, 7, 8, Auto).

# Configuring Detailed Settings of the Waveform Display (Wave Setup)

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



# 8.2 Using the Snapshot and Clear Trace Features

This section explains how to use the snapshot feature (which retains the currently displayed waveforms on the screen) and the clear trace feature (which clears all displayed waveforms).

Features Guide: "Snapshot (SNAPSHOT)" "Clear Trace (CLEAR TRACE)"

# **Snapshot (SNAPSHOT)**

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

# **Clear Trace (CLEAR TRACE)**

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

### Note\_

Click SHIFT+SNAPSHOT to clear only the snapshot waveforms.

# 9.1 Configuring the Bar Graph Display

This section explains the following settings for displaying bar graphs. These settings are available on models with the harmonic measurement (/G5) option.

- · Bar graph display format
- Bar graph number
- Measurement function
- Element
- Bar graph display range (displayed harmonics)
- · Turning the numeric data display on and off
- Marker position (harmonic)

► Features Guide: "Bar Graph Display (Option)"

# **BAR SETTING Menu**

Use the **DISPLAY MODE** and **DISPLAY SETTING** keys as explained in section 5.1 to display the BAR SETTING menu.

E	BAR SETTING	
0	Format -	-Set the display format (1 (no windows), 2, 3).
	8	
0	Item No	-Set the bar graph number (1-3)
	1	
	Function	Set the measurement function (II   $P \in \Omega$ ) $\Phi$ $\Phi$   $\Phi$   7 Rs Xs Rn Xn)
	U	
	Element	-Set the element (Element 1-Element 4)
	Element 1	Set the bar graph display range
Ø	Start Order	• The display's starting harmonic order (0-490)
	End Order	r • The display's ending harmonic order (10-500)
-	100	You can set the range to any value provided that the end harmonic order is
	Numeric -	larger than the start harmonic order by 10 or more.
	IFF ON	<sup>L</sup> Turns the numeric data display on and off
0	× Order	
0	+ Order	Set the harmonic order of the bar graph to measure with markers x and + (0-500).
	15	If you press this soft key and select both × Order and + Order, you can change
		both orders while maintaining the relationship between the two.

# **10.1 Configuring the Vector Display**

This section explains the following settings for displaying vectors. These settings are available on models with the harmonic measurement (/G5) option.

- Vector display format
- Vector number
- · Element and wiring unit
- · Zooming vectors
- · Turning the numeric data display on and off

► Features Guide: "Vector Display (Option)"

# **VECTOR SETTING Menu**

Use the **DISPLAY MODE** and **DISPLAY SETTING** keys as explained in section 5.1 to display the VECTOR SETTING menu.

VEC	CTOR SETTING	
0	Format	-Set the display format (1 (no windows), 2).
	a	
0	Item No	-Set the vector number (1, 2)
	1	
Ve	ector Object	Set the element and wiring unit (Element 1 Element 4 $\Sigma \Lambda \Sigma B$ )
	ΣΑ	
<b>Q</b>	U Mag 1.000 I Mag 1.000	-Set the magnification of vectors of the fundamental waves U(1) and I(1) (0.100-100.000).
		The value that indicates the size of the vector display's peripheral circle changes according to the zoom factor, and the size of the vectors that indicate U (1) and I (1) change accordingly as well. If you press this soft key to select both U Mag and I Mag,
	Numeric	you can change both magnifications while maintaining the relationship between the two.
0	FF ON	Turns the numeric data display on and off

# 11.1 Displaying X-Y Waveforms

This section explains the following settings for displaying X-Y waveforms.

- Turning the X-Y window display on and off
- · Turning the X-Y waveform on and off and X-axis and Y-axis source waveforms
- Start and end points
- Turning the trace-clear-on-start on and off
- Main window's display ratio
- · Window layout
- · Turning combine display on and off
- Interpolation method
- The number of data points that are used to display waveforms

► Features Guide: "Displaying X-Y Waveforms"

# X-Y Menu

1. Press SHIFT+SETTING (X-Y) to display the following menu.

X-Y	
Window1 ON OFF	-Select whether to set X-Y Window 1 or Window 2.
Display OFF <u>ON</u>	-Turns the X-Y window display on and off
©⊲ Setup –	-Turn the X-Y waveform on and off and set X-axis and Y-axis source waveforms.
<ul> <li>Bart Point</li> <li>-5.00div</li> <li>End Point</li> <li>5.00div</li> </ul>	- <b>Set the start and end points (~5.00div to 5.00div).</b> The end point must be greater than or equal to the start point.
Trace clear on Start OFF ON	-Turns the trace-clear-on-start on and off
₩ Next 1/2 -	-Displays the second page of the menu

2. Press the Next 1/2 soft key to display the 2/2 menu.

X-Y	
Main Ratio	Set the main window's display ratio (50%, 0%)
8 50%	
Window Layout	Set the window layout (Side, Vertical).
Side	· · · · · · · · · · · · · · · · · · ·
Combine Display	Turns combine display on and off
ZS OFF Ø ON	Select whether to combine the displays of the X-Y windows (Window1 and Window2)
Dot Connect	(ON, OFF).
- Line	Set the display interpolation (OFF, Line).
Decimation	Set the number of data points that are used to display waveforms $(2k, 100k)$
2k 100k	- Set the humber of data points that are used to display waveforms (2k, 100k).
l-1	
Next 2/2 -	Displays the first page of the menu

# Turning the X-Y Waveform On and Off and Setting X-Axis and Y-Axis Source Waveforms

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

### When X-Y Window 1 is selected, Set the X-Y waveforms of XY1 to XY4

•		Window1 Setting				
	DISPLAY	X Trace		Y Trace		
XY1	OFF ON	U1	) [	11	$\supset$	
XY2	OFF ON	U1		11		
XY3	OFF ON	U1		11		for the Y axis.
XY4	OFF ON	U1		11		
-			Set	the sour	ce w	vaveform for the X axis.

Turns the XY waveform display on and off

### When X-Y Window 2 is selected, Set the X-Y waveforms of XY5 to XY8.

		Window2 Setting					
	DISPLAY	X Trace	Y Trace				
XY5	OFF ON	U1					
XY6	OFF ON (	U1	11	Cot the course			
XY7		U1		- Set the source waveform for the Y axis.			
XY8	OFF ON	U1					
	Set the source waveform for the X axis.						
	Turns the XY waveform display on and off						

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# 12.1 Zooming in on or out of Waveforms

This section explains the following settings for zooming in on or out of waveforms horizontally (time scale). For details on vertical zoom settings, see sections 2.1 to 2.6 or section 8.1.

- · Turning the zoom window display on and off
- Zoom position and zoom box
- Zoom display format
- Zoom 2 source window
- Main window's display ratio
- Window layout
- Auto scrolling
- Zoom source waveform
- · Changing the range for performing automated measurement of waveform parameters
- Zoom position using the zoom POSITION knob and magnification

### ► Features Guide: "Zooming in on Waveforms"

# **ZOOM Menu**

- 1. 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 (Z1 ON).
  - Set the menu items separately for zoom windows Zoom 1 and Zoom2.

### Setting the Zoom 1 window

ZOOM	
Zoom1 ON OFF	-Select Zoom 1.
Display	
	<ul> <li>Turns the Zoom 1 window display on and off</li> </ul>
	-Set the zoom position of Zoom 1.
Zoom1 Position	Zoom box 1 that is displayed in the Main window moves to the specified zoom position.
0.00div	The waveforms in zoom box 1 are displayed in the Zoom 1 window.
Sormat Zoom1	- Set the display format (Main, 1, 2, 3, 4, 6, 8, 12, 16).
Move Zoom1 to Front	-Moves zoom box 1 to the right edge of the screen (most recent data position)
₩ Next 1/2 -	-Displays the second page of the menu
When both Z	oom 1 and Zoom 2 window displays are on
Zoom1 Position	Oct the second providence of Zecond and Zecond
Zoom2 Position	Set the zoom positions of 200m1 and 200m2.
0.00div	specified zoom positions. The waveforms in zoom box 1 are displayed in the Zoom 1

window; the waveforms in zoom box 2 are displayed in the Zoom 2 window.

### 12.1 Zooming in on or out of Waveforms

Setting the Zo	om 2 window
ZOOM	
Zoom1 Zoom2 - ON ON -	-Select Zoom 2.
Display	
OFF ON	<ul> <li>Turns the Zoom 2 window display on and off</li> </ul>
Zoom2 Source	Calent the second course window for Zeens 0 (Nain, Zeens 1)
Main Zoom1	When Zoom 1 window is on, select Main or Zoom 1.
$\sc line \label{eq:line line line line \label{eq:line line line line line line line line $	Set the zoom position of Zoom 2.
0.00div	Zoom box 2 that is displayed in the Main window moves to the specified zoom position.
⊙ Format Zoom2	The waveforms in zoom box 2 are displayed in the zoom 2 window.
a	– Set the display format (Main, 1, 2, 3, 4, 6, 8, 12, 16).
Move Zoom2	Moves zoom how 2 to the right edge of the screen (most recent data position)
to Front	This is available when Zoom 2 Source (shown above) is set to Main.
[+3]	
Next 1/2 -	Displays the second page of the menu

### 2. Press the Next 1/2 soft key to display the 2/2 menu.

ZOOM						
Main Ratio	- Set the main window's display ratio (E0% 0%)					
🗮 <b>50%</b>	- Set the main window's display fatio (50 %, 0 %).					
Window Layout	Set the window leveut (Side Vertical)					
Side	- Set the window layout (Side, Vertical).					
⊲ Auto Scroll –	-Configure auto scrolling.					
🖳 Allocation –	- Set the zoom source waveforms.					
Fit Measure Range_ to Zoom1	- Change the range for performing automated measurement of waveform parameters. The range over which automated measurement of waveform parameters is performed is set to the zoom range of Zoom1 when the Zoom 1 window is on and the zoom range of Zoom2 when the Zoom 2 window is on.					
₩ Next 2/2 -	-Displays the first page of the menu					
When both Z	oom 1 and Zoom 2 window displays are on					
✓ Fit Measure Rang	Fit to Zoom1 Fit to Zoom2					

# Setting Auto Scrolling (Auto Scroll) Press the Auto Scroll soft key to display the following menu.

Auto Scr	oll	
Target Zoom1 Zo	pom2	Select the zoom box to auto scroll. When both Zoom 1 and Zoom 2 window displays are on, select Zoom 1 or Zoom 2.
Speed	ł	Set the scroll speed (1-10).
►		Moves to the right edge of the Main window
•		Starts scrolling to the right
•		Stops auto scrolling
•		Starts scrolling to the left
I		—Moves to the left edge of the Main window

# Allocating Zoom Source Waveforms (Allocation)

Press the Allocation soft key to display the following screen.

Allocation				
<b>⊘</b> U1	-	-	-	
<b>⊘</b> I1	-	-	-	
<b>⊘</b> P1	-	-	-	
<b>V</b> U2	-	-	-	
<b>1</b> 2	-	-	-	
✓P2	-	-	-	
✓AUX5	-	-	-	
✓AUX6	-	-	-	
✓Math1	-	-	-	
✓Math2	-	-	-	
✓Math3	-	-	-	
✓Math4	-	-	-	
✓Math5	-	-	-	
✓Math6	-	-	-	
✓Math7	-	-	-	
✓Math8	-	-	-	

Select the zoom source waveforms. The waveforms that can be selected are displayed.

# Setting the Magnification (MAG knob)

Use the **MAG** knob to set the magnification.

- The MAG knob controls the waveforms in the zoom 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 zoom windows to the same magnification at the same time.



# Setting the Zoom Position (zoom POSITION knob)

Turn the zoom **POSITION** knob to set the zoom position.

- The zoom POSITION knob controls the waveforms in the zoom 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 zoom windows to the same zoom position at the same time.

# 13.1 Measuring with Horizontal Cursors

This section explains the following settings for measuring with horizontal cursors:

- Cursor type
- Source waveform
- · Moving the cursors
- Measurement items
- · Windows that cursor measurements will be performed in

Features Guide: "Horizontal Cursors (Horizontal) - T-Y waveforms" "Horizontal Cursors (Horizontal) (X-Y)" "Turning the X-Y Window Display On and Off (Display)"

# **CURSOR Horizontal Menu**

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

CURSOR	
Туре	Set Type to Horizontal.
Horizontal	
Trace	Set the source waveform.
U1	
	−Move the cursors (−5.00div to 5.00div).
	Select Display Cursor
ltem Setun -	Set measurement items.
item octop	you want to use.
Select Window	
T-Y	-Set the window in which cursor measurements will be performed (1-Y, X-Y).*

\* This is available when the X-Y window display is turned on.

## Setting the Source Waveform (Trace)

The waveforms that you can select differ depending on the window that cursor measurements will be performed in.

- T-Y: U1 to U4, I1 to I4, P1 to P4, AUX3 to AUX8, Math1 to Math8
- X-Y: XY1 to XY8

# 13.2 Measuring with Vertical Cursors

This section explains the following settings for measuring with vertical cursors:

- Cursor type
- Source waveform
- Moving the cursors
- Jumping the cursors
- Measurement items
- · Windows that cursor measurements will be performed in

Features Guide: "Vertical Cursors (Vertical) - T-Y waveforms" "Vertical Cursors (Vertical) (X-Y)" "Turning the X-Y Window Display On and Off (Display)" "Record Length (Record Length)"

# **CURSOR Vertical Menu**

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

CURSOR			
Туре	Set Type to Vertical.		
Vertical			
Trace	-Set the source waveform	1.	
UI			
Cursor1     -4.000div     Cursor2     4.000div	Move the cursors (-5div the display record length.	to 5div). The setting resolution varie	s depending on
	Moves the specified curs (Cursor1 to Zoom1, Curs	sor to the center of the specified zo sor1 to Zoom2, Cursor2 to Zoom1,	oom window Cursor2 to Zoom2)
⊲ Cursor Jump		When the window is T-Y	
		Select Display Cursor	
Item Setup •	Set measurement items.	☑X1 ☑X2 ☑ 4X ☑ 1/4X	
Select Window	-	odY1 odY2 ođ⊿Y	Soloct the measurement
T-Y	Set the window in	When the window is X-Y*	items that you want to use.
L	measurements will	Select Display Cursor	
	be performed (T-Y, X-Y).*	ſ€X1 €X2 €AX	

\* This is available when the X-Y window display is turned on.

## Setting the Source Waveform (Trace)

The waveforms that you can select differ depending on the window that cursor measurements will be performed in.

- T-Y: All, U1 to U4, I1 to I4, P1 to P4, AUX3 to AUX8, Math1 to Math8
- X-Y: XY1 to XY8

# 13.3 Measuring with Marker Cursors (Marker)

This section explains the following settings for measuring with marker cursors.

- · Cursor type
- Source waveform
- Moving the cursors
- Jumping the cursors
- Marker display format
- Measurement items
- · Windows that cursor measurements will be performed in

▶ Features Guide: "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)" "Turning FFT On and Off (Display)" "Record Length (Record Length)" "Start Point and Number of FFT Points (Start Point and FFT Points)"

# **CURSOR Marker Menu**

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

CURSOR								
Туре	Set the cursor type to Ma	arkor						
Marker		irker.						
Marker #	Select the marker cursor	to use (Mark	or1 X Mark	or2 + Mark	or3 V Ma	rkor4 V)		
Marker1 ×		- Select the marker cursor to use (Marker'l X, Marker2 +, Marker3 Y, Marker4 Y).						
Trace	-Set the source waveform	l.						
U1	Move the cursors (-5div	to 5div).						
Position	The setting resolution varies of the window is FFT varies of	es depending ( lepending on f	on the displa he number o	iy record ler	igth. The s s	setting resolution when		
-3.00 <mark>0</mark> div	Moves the specified curs	or to the cen	ter of the sp	pecified zoo	om windo	w (to Zoom1, to Zoom2)		
		When the So	ource Winde	ow is T-Y o	r FFT*	)		
Cursor Julip	Ţ		Select Displa	iy Cursor				
∎⊲ Item &	Set measurement items.	Ma	arkerForm 🔲	Mark Linc				
Marker Form		C <sup>Display</sup> Item			_	display format		
Select Window		I I X1	<b>⊠</b> X2	<b>⊠</b> X3	<b>⊘</b> X4	(Wark, Line).		
T-Y	which cursor	₫⊿(X2-X1)	<b>⊠</b> ⊿(X3-X1)	<b>⊠</b> ⊿(X4-X1)				
	measurements will	□ 4(X3-X2)	□⊿(X4-X2)	□⊿(X4-X3)				
	be performed (T-Y, X-Y_FFT) *	<b></b> <i>∎</i> Y1	<b>⊠</b> ¥2	<b>⊠</b> Y3	<b>⊠</b> Y4			
		<b>■</b> <i>A</i> (Y2-Y1)	<b>⊠</b> 4(Y3-Y1)	<b>⊠</b> ⊿(Y4-Y1)				
		□ 4(V3-V2)	□ 4(V4-V2)	□ 4(V4-V3)		Select the		
			04(14-12)	02(14-15)		that you want to use.		
		When the wi	indow is X-	<b>ŕ</b> *				
	Select Display Cursor							
		☑X1	<b>⊠</b> X2	<b>⊠</b> X3	<b>⊠</b> X4			
		<b>⊘</b> Y1	<b>⊠</b> Y2	<b>⊘</b> Y3	<b>⊠</b> Y4			
		<b>⊠</b> ⊺1	<b>⊠</b> T2	<b>☑</b> T3	<b>⊠</b> T4			
		<b>愛</b> ⊿(T2-T1)	<b>愛</b> ⊿(T3-T1)	<b>愛</b> ⊿(T4-T1)				

\* This is available 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 window that cursor measurements will be performed in.

- T-Y: OFF, U1 to U4, I1 to I4, P1 to P4, AUX3 to AUX8, Math1 to Math8
- X-Y: OFF, XY1 to XY8
- FFT: OFF, FFT1, FFT2

# 13.4 Measuring with Angle Cursors (Degree)

This section explains the following settings for measuring with angle cursors. You can use angle cursors when the T-Y window is displayed.

- Cursor type
- Source waveform
- · Moving the cursors
- Zero and end reference angles
- Jumping the cursors
- Measurement items
- Reference angle
- · Windows that cursor measurements will be performed in

► Features Guide: "Angle Cursors (Degree) - T-Y waveforms" "Record Length (Record Length)"

# **CURSOR Degree Menu**

- 1. Press CURSOR, the Select Window soft key, and then the T-Y soft key.
- 2. Press the **Type** soft key and then the **Degree** soft key to display the following menu.

-Set the cursor type to De	aree.				
	5.000				
Set the source waveform		VIIX3_VIIX8_Math1_Math8)			
	(All, 01-04, 11-14, F 1-F 4, <i>F</i>				
Move the cursors (-5div the display record length.	to 5div). The setting resolut	tion varies depending on			
Set the zero and end reference angles (-5div to 5div). The setting resolution varies depending on the display record length.					
Moves the specified curs (Cursor1 to Zoom1, Curs	or to the center of the spe or1 to Zoom2, Cursor2 to	ecified zoom window Zoom1, Cursor2 to Zoom2)			
Set measurement items.	Select Display Cursor				
	RefValue 360	Set the reference angle (1-720).			
Set the window in which cursor measurements will be performed to T-Y.	Display Item       ØX1     ØX2       ØY1     ØY2	Select the measurement items that you want to use.			
	Set the cursor type to De Set the source waveform Move the cursors (-5div the display record length. Set the zero and end refe depending on the display r Moves the specified curs (Cursor1 to Zoom1, Curs Set measurement items. Set the window in which cursor measurements will be performed to T-Y.	Set the cursor type to Degree. Set the source waveform (All, U1-U4, I1-I4, P1-P4, A Move the cursors (-5div to 5div). The setting resolut the display record length. Set the zero and end reference angles (-5div to 5d depending on the display record length. Moves the specified cursor to the center of the spec (Cursor1 to Zoom1, Cursor1 to Zoom2, Cursor2 to Set measurement items. Set the window in which cursor measurements will be performed to T-Y.			

# 13.5 Measuring with Horizontal and Vertical Cursors (H & V)

This section explains the following settings for measuring with horizontal and vertical cursors:

- Cursor type
- Source waveform
- Moving the vertical cursors
- Moving the horizontal cursors
- Jumping the cursors
- Measurement items
- · Windows that cursor measurements will be performed in

```
Features Guide: "Horizontal and Vertical Cursors (H & V) - T-Y waveforms"
"Horizontal and Vertical Cursors (H & V) (X-Y)"
"Turning the X-Y Window Display On and Off (Display)"
"Record Length (Record Length)"
```

# CURSOR H & V Menu

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

CURSOR					
Туре	Set Type to H & V				
H & V					
Trace	-Set the source waveform				
U1					
V-Cursor1     -4.000div     V-Cursor2     4.000div     H-Cursor1	-Move the vertical cursors the display record length.	; (−5div to 5div).	The setting	g resoluti	on varies depending on
<ul> <li>3.00div</li> <li>H-Cursor2</li> <li>-3.00div</li> </ul>	-Move the horizontal curs	ors (−5.00div-5.0	00div).		
⊲ Cursor Jump –	Moves the specified curs (Cursor1 to Zoom1, Curs	or to the center or1 to Zoom2, C	of the spec ursor2 to 2	cified zo Zoom1, C	om window Cursor2 to Zoom2)
Ban Catum	Set measurement items.	When the wind	ow is T-Y	٦	
item setup -		Select Dis	splay Cursor		
Select Window	-Window in which	<b>⊘</b> X1 <b>⊘</b> X2	✔ 4X ✔	1/ <i>4</i> X	
I-Y	cursor measurements	<b>⊠</b> Y1 <b>⊠</b> Y2	<b>₫</b> 4Y		
	(T-Y, X-Y)*	When the window is	<b>X-Y</b> *		<ul> <li>Select the measurement items that you want to use.</li> </ul>
		Select Display	UUTSOF		
		<b>Ø</b> X1 <b>Ø</b> X2	<b>⊠</b> ∆X		
		<b>⊠</b> Y1 <b>⊠</b> Y2	<b>⊠</b> ∆Y		

\* This is available when the X-Y window display is turned on.

# Setting the Source Waveform (Trace)

The waveforms that you can select differ depending on the window that cursor measurements will be performed in.

- T-Y: U1 to U4, I1 to I4, P1 to P4, AUX3 to AUX8, Math1 to Math8
- X-Y: XY1 to XY8
### 13.6 Measuring with Peak Cursors (Peak)

This section explains the following settings for measuring with peak cursors. You can use peak cursors when the FFT window is displayed.

- Cursor type
- Two measurement ranges
- Measurement items
- · Windows that cursor measurements will be performed in

#### ► Features Guide: "Peak Cursors (Peak)" "Turning FFT On and Off (Display)" "Start Point and Number of FFT Points (Start Point and FFT Points)"

#### **CURSOR Peak Menu**

- 1. Press CURSOR, and then press the Select Window soft key and then the FFT soft key.
- 2. Press the **Type** soft key and then the Peak soft key to display the following menu.

CURSOR			
Type Peak	-Set Type to Peak.		
FFT1 Range1     -5.00div     FFT1 Range2     5.00div	-Set the FFT1 measurement depending on the number	ent time period (−5 of FFT points.	div to 5div). The setting resolution varies
<ul> <li>FFT2 Range1         <ul> <li>-5.00div</li> <li>FFT2 Range2</li> <li>5.00div</li> </ul> </li> </ul>	-Set the FFT2 measurement depending on the number	e <b>nt time period (−5</b> of FFT points.	div to 5div). The setting resolution varies
🖳 Item Setup 🗕	Set measurement items. →	Select Display Cursor	
·		ØF1 ØF2	Select the measurement items that
Select Window	-Set Select Window	<b>∞</b> 1¥1 <b>∞</b> 1¥2	vou want to use.
FFT	to FFT.		······

### 14.1 Automatically Measuring Waveform Parameters

This section explains the following settings for automatically measuring waveform parameters.

- Turning automated measurement on and off
- Source waveform and measurement items
- · Measurement time period
- · Turning cycle mode on and off
- Parameter details
- · Delay settings

#### ► Features Guide: "Automated Measurement of Waveform Parameters" "Record Length (Record Length)"

#### MEASURE Menu

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

MEASURE Mode ON Measure Setup	–Set Mode to ON. –Set the source waveform and measurement items.
Time Range1 Time Range1 Time Range2 Time Range2 To Oddy T-Cycle Mode OFF ON -	Set the measurement time period (-5div to 5div). The setting resolution varies depending on the display record length. Time period 2 (Time Range2) must be greater than or equal to Time period 1 (Time Range1). The maximum number of data points that are measured is 100 Mpoint from Time Range 1. -Turns cycle mode on and off If the measurement time period (the spacing between Time Range1 and Time Range2) is less than 1 cycle, the measured value will be "*****."

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

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

Source	
Trace	Set the source waveform
U1	U1-U4, I1-I4, P1-P4, AUX3-AUX8, Math1-Math8, XY1-XY8).
ltem –	-Set measurement items.
Detail Parameter —	- Parameter details
Delay Setup —	-Set the delay.
All Clear —	-Clears all measurement items
Copy to -	-Copies measurement items to the specified channels

#### Setting Measurement Items (Item)

- 2. Press the Item soft key to display the following screen.
- When the Source Waveform Is U1 to U4, I1 to I4, P1 to P4, AUX3 to AUX8, Math1 to Math8

	MEASURE	_	
□ ⚠️ Peak to Peak	□ <u>Î</u> Amplitude	□ <u>\</u> Maximum	
□ <u>∫</u> ]↓ Minimum	□ ʃ͡͡͡ʃ High	□ <u>A</u> Low	
□ <u>↑ ↑</u> Average	□ 🕂 Middle	D ♠ RMS	
□ \ Std . Deviation	□ <u>}</u> +0vershoot	$\Box \underline{}_{}$ -Overshoot	
C Rise	□ ͡ [↓ Fall	□ ∭ Frequency	Select the measurement items
□\\\\\\\\\\ Period	□\Aî\ +Width	⊡\∰{ -Width	that you want to use.
□ J∰ Duty	D III Pulse	□ <sup>1</sup> ∰7 Burst1	
□ □ □ Burst2	□ M Avg.Frequency	□\\ Avg.Period	
□ <b>\ Integ1</b> TY	□ <b>\ I</b> nteg2TY		

• When the Source Waveform Is XY1 to XY8



Setting the Parameter Details (Detail Parameter)

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

MEASURE	
Distal/Mesial/Proximal	Set the unit for the reference level (%, Unit).
Mode Mode Unit	Reference level
Distal 90.0%	Set the distal value.
Mesial 50.0%	Set the mesial value.
Proximal 10.0%	Set the proximal value. When set to %: 0.0%-100.0% When set to Unit: Within ±5 div of the source waveform
High/Low-	Set the mode for determining high and low levels (Auto, Max-Min).
Integ Mode	Set the integration mode (Normal, Hour). Set this when the source waveform (Trace) is set to I1-I4 or P1-P4.

#### Setting the Delay (Delay Setup)

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

MEASURE	
Mode OFF Time Degree-	Set the delay value unit (OFF, Time, Degree).
Polarity <b>E</b>	Set the slope of the edge to be detected.
Edge Count	Set which counted edge to use as a detected point (measured point) (1-9).
Reference Trigger	Set the delay measurement reference (Trace, Trigger).
Reference Trace	Set the reference waveform conditions. (Set this when Reference is set to Trace.)
Polarity	• Set the reference waveform (U1-U4, I1-I4, P1-P4, AUX3-AUX8, Math1-Math8).
	• Set the slope of the edge to be detected.
	Set which counted edge to use as a detected point (reference point) (1-9).

#### Copying Measurement Items to the Specified Channels (Copy to)

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

		Copy to		
J1	<b>⊘</b> 11	<b>⊘</b> P1	<b>⊘</b> U2	<b>A</b>
2	✓P2	✓AUX5	✓AUX6	
Math1	✓Math2	✓Math3	✓Math4	
Math5	✓Math6	✓Math7	⊡Math8	
-	-	-	-	
-	-	-	-	
-	-	-	-	
-	-	-	-	
-	-	-	-	
-	-	-	-	
-	-	-	-	
-	-	-	-	
-	-	-	-	
-	-	-	-	
-	-	-	-	Solocts all waveforms
-	-	-	-	
All ON	All OFF	<u>)</u>		Inselects all wavefor

### 14.2 Performing Normal Statistical Processing

This section explains the following settings for performing normal statistical processing on automatically measured waveform parameters.

· Normal statistical processing

► Features Guide: "Normal Statistical Processing (Statistics)"

#### **MEASURE Menu**

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

MEASURE Mode Statistics	– Set automated measurement to Statistics.
✓ Measure Setup	Set the source waveform and configure the measurement items. ► section 14.1
🕼 Time Range1	•
─2.8div Time Range2 2.0div 1-Cycle Mode	Set the measurement time period. ► section 14.1
OFF ON	-Turns cycle mode on and off ► section 14.1
	•

### 14.3 Performing Cyclic Statistical Processing

This section explains the following settings for performing cyclic statistical processing on automatically measured waveform parameters.

- · Cyclic statistical processing
- · Cycle trace (source waveform for determining the cycle)
- Result display

► Features Guide: "Cyclic Statistical Processing (Cycle Statistics)"

#### **MEASURE Menu**

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

	MEASURE	
	Mode	Out out on the day of the country of the Country Other the c
	Cycle Statistics	- Set automated measurement to Cycle Statistics.
4	Measure Setup	-Set the source waveform and configure the measurement items. ► section 14.1
@ @	Time Range1 -5.00div Time Range2 5.00div	-Set the measurement time period. ► section 14.1
	Cycle Trace Own	-Set the cycle trace.
	Execute Measure	-Executes measurement
4	Display Result	– Display the measured results.

#### Setting the Cycle Trace (Cycle Trace)

U1 to U4, I1 to I4, P1 to P4, AUX3 to AUX8, Math1 to Math8:

The PX8000 automatically measures the waveform parameters of all the source waveforms and performs statistical processing on the measured values once per cycle of the specified waveform.

Own:

The PX8000 determines the cycle of each source waveform. It then automatically measures the waveform parameters and performs statistical processing once per cycle of each waveform. However, if multiple waveforms with different cycles are measured, the number of iterations of automated measurement of waveform parameters and statistical processing performed on all waveforms is equal to the number of cycles in the slowest waveform.

### Displaying the Measured Results (Display Result) Press the Display Result soft key to display the following screen.

	↓:	Displayed ne	xt to the mi	nimum value o	r each	me	asurement	tem.
		Cycle Sta	atistics				Jump & Sort	
	Min(AUX5)	High(AUX5)	Low(AUX5)	Avg(AUX5)		$\triangleleft$	Sort	
3	-1.33333mV	994.667mV	2.00000mV	498.805mV				<ul> <li>Sorts the display</li> </ul>
4	0.00000V 1	994.667mV	2.00000mV	498.897mV			Forward	(Forward, Reverse)
5	-2.66667mV	993.333mV +	2.00000mV	498.862mV		-		(
5	-1.33333mV	994.667mV	2.00000mV	498.813mV				
6	-2.66667MV	994.007mV	2.00000mV	499.126MV				
0	-9 66667mV	994.007IIIV 004.667mV	2.0000000V	499.100mV 400.007mV				
10	-4 00000mW	994 667mV	2.000000mV 3.333332mV t	499 148mV		-		•
11	-1.33333mV	993_333mV	2 00000mV	499 110mV				
12	-2.66667mV	994.667mV	2.00000mV	499.092mV				
13	-1.33333mV	996.000mV t	2.00000mV	499.123mV				
14	-2.66667mV	994.667mV	2.00000mV	499.216mV		-		•
15	-1.33333mV	994.667mV	2.00000mV	499.269mV			Otatiotica	
16	-5.33333mV	994.667mV	3.33333mV	499.067mV			Statistics	Displays the maximum value
17	0.00000V	996.000mV	2.00000mV	499.063mV			MOX	
18	-2.66667mV	994.667mV	666.667uV +	498.896mV		-		•
19	-1.33333mV	994.667mV	3.33333mV	499.128mV			0	
20	-2.0000/MV	994.667mV	2.00000mV	498.854MV			Statistics	<ul> <li>Displays the minimum value</li> </ul>
21	-0.00007111V +	994.007111V 994.667mV	2 000.00/UV	438.82800V			Min	
22	-1 33333mV	994 667mV	666 667uV	498 941mV		-		•
24	-2 66667mV	994 667mV	2 00000mV	498 888mV				
25	-1.33333mV	993.333mV	666.667uV	498.885mV				
26	-1.33333mV	993.333mV	3.33333mV	499.135mV				
27	-2.66667mV	994.667mV	2.00000mV	499.066mV		-		-
28	-4.0000mV	994.667mV	666.667uV	498.890mV				
29	-1.33333mV	993.333mV	2.00000mV	499.077mV				
30	0.00000V	994.667mV	2.00000mV	499.372mV ↑	<b>•</b>			
					-			

 $\ensuremath{\uparrow}$  : Displayed next to the maximum value of each measurement item.

If scroll bars are displayed, you can press the arrow keys  $(\blacktriangle, \lor, \triangleleft, \triangleright)$  to scroll the list. You can scroll vertically also using the jog shuttle.

### 15.1 Performing Addition, Subtraction, Multiplication, and Division

This section explains the following settings for performing addition, subtraction, multiplication, and division.

- Computation
   Operator (+, -, \*, /), computation source waveform, unit, label, turning the waveform display on and off
- Scaling

Math waveform to scale (computed waveform), scaling mode, upper and lower limits of the display range

· Computation start and end points

```
Features Guide: "Basic Arithmetic (S1+S2, S1-S2, S1*S2, and S1/S2)"
"Scaling Mode (Scaling Mode)"
"Record Length (Record Length)"
```

#### MATH Menu

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

MATH		Setup
Mode	Set Made to ON	
OFF ON	-Set mode to ON.	OFF
No. 1. Octor	Set the computation.	Math2
Math Setup -		OFF
© Salact	Set the scaling.	Math3
Math Trace -	<ul> <li>Select the Math waveform (computed waveform) to scale (1-8).</li> </ul>	OFF
1		Math4
Scaling Mode	Ortific and line words (Artic Manual)	OFF
- Auto Manual	-• Set the scaling mode (Auto, Manual).	Math5
Upper		OFF
2.5000 _	<ul> <li>Set the upper and lower limits of the display range</li> </ul>	Math6
-2.5000	(-9.9999E+30-9.9999E+30).	OFF
Start Point	Set this when the scaling mode is Manual.	Math7
End Point	-Set the computation start and end points (-5div to 5div).	OFF
5.00div	The setting resolution varies depending on the display record length.	Matho
Novt 1/9	I ne end point must be greater than or equal to the start point.	Matilo
NGAL 172	Note that there is a limitation in the number of data points that is used	OFF
	depending on the number of equations to be computed.	
	Not all the data points may be used.	

#### **Configuring Computations (Math Setup)**

- 1. Press the Math Setup soft key.
- 2. Press a soft key from Math1 to Math8 to display the following screen.

N	flath1	
Operation Source1 Source2	S1 + S2       U1       I1	- Select the operation (S1+S2, S1–S2, S1*S2, S1/S2). - Select the computation source waveform (U1-U4, I1-I4, P1-P4, AUX3-AUX8, Math1-Math7).
Unit		Set the unit.
Label	Math1	Set the label.
Display	OFF ON	-Turns the waveform display on and off

### 15.2 Performing Binary Conversion

This section explains the following settings for performing binary conversions:

Computation

Function (Bin(S1)), computation source waveform, threshold level, unit, label, turning the waveform display on and off

- Scaling
- · Computation start and end points

► Features Guide: "Binary Conversion (Bin (S1))"

#### **MATH Menu**

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

MATH		Setup
Mode OFF ON	-Set Mode to ON.	Math1
Math Setup -	Set the computation.	Math2
© Select Math Trace		Math3 OFF
Scaling Mode	Set the scaling. ► section 15.1	Math4 OFF
Auto Manual Outo Upper 2.5000		Math5 OFF
<ul> <li>Lower</li> <li>-2.5000</li> <li>Start Point</li> </ul>		OFF
End Point 5.00div	Set the computation start and end points. ► section 15.1	0FF
₩ Next 1/2		0FF

#### **Configuring Computations (Math Setup)**

- 1. Press the Math Setup soft key.
- 2. Press a soft key from Math1 to Math8 to display the following screen.

Math1		
Operation	Bin(S1)	Selection function Bin(S1).
Source	U1	Select the computation source waveform (U1-U4, I1-I4, P1-P4, AUX3-AUX8, Math1-Math7).
Thr. Upper	0.0	Set the upper and lower limits of the threshold. (Within ±5 div of the computation source waveform)
Unit		– Set the unit.
Label	Math1	Set the label.
Display 0	FF ON	Turns the waveform display on and off

### 15.3 Shifting the Phase

This section explains the following settings for shifting the phase:

- Computation
  - Function (Shift(S1)), computation source waveform, shift range, unit, label, turning the waveform display on and off
- Scaling
- · Computation start and end points

#### Features Guide: "Phase Shift (Shift (S1))" "Record Length (Record Length)"

#### **MATH Menu**

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

MATH		Setup
Mode	Set Mode to ON.	Math1
OFF ON		OFF
■ Math Setup -	Set the computation.	Math2 OFF
<ul> <li>Select Math Trace</li> </ul>		Math3 0FF
Scaling Mode	Set the scaling ► section 15.1	Math4 0FF
Auto Manual		Math5 0FF
Lower     _2.5000		(Math6) OFF
End Point 5.00div 5.00div	Set the computation start and end points. ► section 15.1	Math7 OFF
₩ Next 1/2		Math8 OFF

### **Configuring Computations (Math Setup)**

- 1. Press the Math Setup soft key.
- 2. Press a soft key from Math1 to Math8 to display the following screen.

Mi	ath1	
Operation	Shift(S1)	Select function Shift(S1).
Source		─Select the computation source waveform (U1-U4, I1-I4, P1-P4, AUX3-AUX8, Math1-Math7).
Shift	0.0us	-Set the shift range (within ±(record length/2) of the computation source waveform).
Unit		-Set the unit.
Label	Math1	Set the label.
Display	OFF ON	-Turns the waveform display on and off

### 15.4 Displaying the Power Spectrum

This section explains the following settings for performing FFT and displaying the power spectrum.

- Computation
- Function (PS(S1)), computation source waveform, unit, label, turning the waveform display on and off
- Scaling
- Computation start point
- FFT

#### ► Features Guide: "Power Spectrum (PS (S1))"

#### **MATH Menu**

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

MATH	Setup
Mode Set Mode to ON.	Math1 OFF
Set the computation.	Math2
Math Setup	OFF
© Select Math Trace	Math3 OFF
Scaling Mode Set the scaling. ► section 15.1	Math4 OFF
Auto Manual Upper 2,5000	Math5 OFF
Lower     -2.500     Start Point	Math6 OFF
-Set the computation start point. ► section 15.1	Math7
End Point Set the start point of the FFT. The number of data points to use in the	OFF
Next 1/2 FFT (FFT points) is set on another menu. Set the number of FFT points. ► section 15.5	Math8
Displays the second page of the menu ► section 15.5	UFF

#### **Configuring Computations (Math Setup)**

- 1. Press the Math Setup soft key.
- 2. Press a soft key from Math1 to Math8 to display the following screen.

Aath1	
PS(\$1)	– Select function PS(S1). – Select the computation source waveform (U1-U4, I1-I4, P1-P4, AUX3-AUX8, Math1-Math7).
<del>_</del>	Set the unit.
Math1	Set the label.
OFF ON	Turns the waveform display on and off
	Image: PS(S1)         Image: PS(S1)           U1         Image: PS(S1)           Image: Math 1         Image: PS(S1)           Image: OFF         Image: PS(S1)

#### **Configuring the FFT**

Set the number of FFT points and window function. ► section 15.5

### **15.5 Performing User-Defined Computations**

This section explains the following settings for performing user-defined computations.

- Computation
  - User definition (User Define), expression, unit, label, turning the waveform display on and off
- Scaling
- · Computation start and end points
- FFT
- Filter
- Constant

► Features Guide: "User-Defined Computation"

#### **MATH Menu**

1. Press MATH to display the following menu.

MATH		Setup
Mode OFF ON	-Set Mode to ON.	Math1 OFF
Math Setup -	Set the computation.	Math2
<ul> <li>Select Math Trace</li> </ul>		Math3 OFF
Scaling Mode	Set the scaling b section 15.1	Math4 OFF
Auto Manual		Math5 OFF
Lower     -2.5000     Start Point		Math6 OFF
End Point 5.00div	-Set the computation start and end points. ► sections 15.1 and 15.4	Math7 OFF
₩ Next 1/2 -	–Displays the second page of the menu	Math8 0FF

2. Press the Next 1/2 soft key to display the 2/2 menu.



#### **Configuring Computations (Math Setup)**

- 1. Press the Math Setup soft key.
- 2. Press a soft key from Math1 to Math8 to display the following screen.

Math1		lath1	
	Operation	User Define	-Set Operation to User Define.
	Expression	C1	Set the equation.
	Unit	<u> </u>	-Set the unit.
	Label	Math1	Set the label.
	Display	OFF ON	Turns the waveform display on and off

#### Setting the Expression (Expression)

3. Select Expression to display the following screen.

Add the results of automated measurement of waveform parameters to the expression. Define an expression by combining computation source waveforms, operators, and functions. Enter a character string from the history. Character insertion position All Clear Deletes all characters Alsithi C1 ) Inserts a) Measure FILTIFILT2 () , \_ TENTER RS-(MEAN)(HLBT) SIN COS TAN ATAN C P M K < PSD-PS-LS-SQRT SQR CUBE PH 7 8 9 / PWHH) PWLL (CH-)(TF-)(CS-) (PWHL)(PWLH) (ABS) NEG (BIN SHIFT) (4 5 6 \* Move the character insertion position MAG LOGMAG PWXX FV DIF DDIF INTGI INTG 1 2 3 -> PHASE REAL IMAG DUTYHDUTYI LOG EXP F1 F2 0 . Exp + TREND TRENDM TRENDD TRENDF \_\_HH \_\_LL \_\_XX ZC ZCEXT Back Space Deletes the previous character Enter Confirms the expression you defined 5-65

#### **Configuring the FFT (FFT Setup)**

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

FFT Setup	
FFT Points 1k	Set the number of FFT points (1k, 2k, 5k, 10k, 20k, 50k, 100k).
Window Exponential	Set the window function (Rect. Hanning, Flat Top, Hamming, Exponential).
Damping Rate 100%	
Force1 100%	Set the attenuation (1%-100%). Set this when the window function is Exponential.
Force2 100%	Set the calculation period (1%-100%). Set this when the window function is Exponential.

#### **Configuring Filters (Filter Setup)**

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

Filt	ter Setup	
	Filter1	Filter2
Filter Type	Gauss	Sharp
Filter Band	Low-Pass	Band-Pass
Cut0ff1	10.0%	10.0%
	$\Gamma^{(200 \text{kHz})}$	(200kHz)
Cut0ff2		10.0%
		—(200kHz)
•		

Select the filter type (Gauss, Sharp, IIR).

-Set the filter band (Low-Pass, Band-Pass, High-Pass). When the filter type is Gauss, you can only select Low-Pass.

Set cutoff frequency 1 (2.0%-30.0%). Set this when the bandwidth is Low-Pass, Band-Pass, or High-Pass.

Set cutoff frequency 2 (2.0%-30.0%). Set this when the filter band is Band-Pass.

Displays the cutoff frequency as a percentage of the sample rate in use.

#### **Defining Constants (Constant Setup)**

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



Set the constant (-9.9999E+30-9.9999E+30).

### 16.1 Displaying FFT Waveforms

This section explains the following settings for displaying power spectrum waveforms in the FFT window.

- · FFT waveform display
- FFT
  - Spectrum type and sub type, analysis source waveform, window function
- · Vertical scale
- Computation start point
- FFT points
- · Main window's display ratio
- Window layout
- Horizontal axis
   Scale, unit, zoom (display range)

► Features Guide: "FFT"

#### **FFT Menu**

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

FFT	
FFT1 FFT2 - OFF OFF	-Select whether to set FFT1 or FFT2.
Display 	-Turns the FFT display on and off
©⊲ FFT Setup -	-Set the FFT.
Vert. Scale Mode	-Set the vertical scaling mode (Auto, Manual).
Center Conter Sensitivity	<ul> <li>Set the vertical axis center and sensitivity.</li> <li>Center (-9.9999E+30 to 9.9999E+30)</li> <li>Sensitivity (1E-30 to 1 9999E+30)</li> </ul>
Start Point	Set this when the vertical scale is Manual.
<ul> <li>FFT Points</li> <li>1k</li> </ul>	Set the computation start point (-5div to -5div). The setting resolution varies depending on the display record length.
Novt 1/9	Set the number of FFT points (1k, 2k, 5k, 10k, 20k, 50k, 100k).
-	Displays the second page of the menu

2. Press the Next 1/2 soft key to display the following menu.

FFT			
Main Ratio	– Set the main window's display ratio (50%, 0%).		
8 50%			
Window Layout	-Set the window layout (Side, Vertica	n)	
Side			
FFT1 Horiz. Axis	Sat the horizontal scale (Hz, Log Hz)		
Hz Log Hz			
FFT1 Unit -	-Set the vertical scale unit.		
FFT1 Horiz. Scale	Set the horizontal zoom mode (Auto, Left/Right, Center/Span). Center/Span cannot be selected when the horizontal scale is set to Log Hz.		
Left/Right B Left	Set the display range of the	💿 Center	Set the display range of the
0 <mark>.0kHz</mark> Right –	- When horizontal zoom is set to	25 <mark>0.0kHz</mark>	When horizontal zoom is set to
250.0kHz	Left/Right	250kHz	Center/Span
Next 2/2	Set the left and right edges		Set the center
-	(0Hz to maximum frequency).		(0Hz to maximum frequency).
	I ne setting resolution varies		Set the Span     ((frequency resolutionx10) to
	points		maximum frequency).
	The following relationship must be		The setting resolution varies
	satisfied: (right edge – left edge) ≥		depending on the number of FFT
	(10×setting resolution).		points.
	Displays the first page of the menu		

### Configuring the FFT (FFT Setup)

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

FFT Setup	
rEET1	
Type CS	-Set the spectrum type (LS, RS, PS, PSD, CS, TF, or CH).
Sub Type REAL	-Set the spectrum sub type
Source1 U1	(REAL, IMAG, MAG, LOGMAG, PHASE).*
Source2	- Set the analysis source waveform (U1-U4, I1-I4, P1-P4, AUX3-AUX8, Math1-Math6).
FFT Window-	You can set Source 2 when the spectrum type is CS, TF, or CH.
Window Exponential	
Damping Rate 100%	Set the window function (Rect, Hanning, Flat Top, Hamming, Exponential).
Force1 100%	Set the attenuation (1%-100%)
Force2 100%	Set the calculation period (1% 100%).
	Set this when the window function is Exponential

\* The available sub types vary depending on the spectrum type.

Type Avai		Available Sub Types
LS,	CS, TF	REAL, IMAG, MAG, LOGMAG, PHASE
RS, PS, PSD		MAG, LOGMAG
СН		MAG

### 17.1 Performing GO/NO-GO Determination with Waveform Zones

This section explains the following settings for performing GO/NO-GO determination with waveform zones:

- GO/NO-GO determination mode
- · Editing the waveform zone
- Judgment condition
- Action
- Determination period

#### ► Features Guide: "Waveform Zone (Wave Zone)"

#### GO/NO-GO Menu

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

	G0/N0-G0	
	Mode _	-Set the GO/NO-GO determination mode to Wave Zone.
	Wave Zone	
Ø	Edit Zone -	Edit the waveform zone.
٥	Zone1 -	-Select the number of the zone to edit.
P	Judgement _ Setup	-Set the judgment conditions.
Ð	Action Setup -	-Set the actions.
	Time Range1 -5.00tiv Time Range2 5.00tiv	-Set the determination period (-5div to 5div). The setting resolution varies depending on the display record length. Time period 2 (Time Range2) must be greater than or equal to Time period 1 (Time Range1).

#### Editing Waveform Zones (Edit Zone)

1. Press the Edit Zone soft key described on the previous page to use the jog shuttle to adjust this setting.

If the jog shuttle is already controlling the Edit Zone soft key, proceed to step 2.

- 2. Use the jog shuttle to select 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.



#### Setting the Judgment Conditions (Judgement Setup)

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



#### Setting Action Conditions (ActCondition)

- Always: The action is always executed. The specified action, explained later, is executed each time a trigger occurs.
- Fail: The action is executed when the GO conditions are not met.
- Success: The action is executed when the GO conditions are met.

#### Setting the Sequence (Sequence)

- Single: The action is executed once.
- Continue: The action is executed repeatedly. It is repeated until the waveform is acquired the number of times specified by Acquisition Count. If Acquisition Count is set to Infinite, the action is repeated until waveform acquisition is stopped with the START/STOP key.

#### **Setting Actions (Action Setup)**

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

### Select the actions to execute (Beep, Print Image, Save Waveform, Save Numeric, Save Image).

Action Setup					
	ØBeep ØPrint Image ØSave Waveform	Save <sup>r</sup> Waveform File Path Auto Naming File Name	USB-0 Numbering		Set the waveform data save destination. ▶ section 22.3 Set this when Save Waveform is selected for the action.
	Save Image	Data Type Save Numeric File Path Auto Naming File Name	Binary USB-0 Numbering		Set the numeric data save destination. ▶ section 22.3 Set this when Save Numeric is selected for the action.
		Save Image File Path Auto Naming File Name	USB-0		<ul> <li>Set the screen capture save destination.</li> <li>▶ section 22.3</li> <li>Set this when Save Image is selected for the action.</li> </ul>

# 17.2 Performing GO/NO-GO Determination with Waveform Parameters

This section explains the following settings for performing GO/NO-GO determination with waveform parameters.

- GO/NO-GO determination mode
- Judgment condition
- Action
- · Determination period

Features Guide: "Waveform Parameters (Parameter)" "Automated Measurement of Waveform Parameters"

#### GO/NO-GO Menu

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

GO/NO-GO Mode Parameter	-Set the GO/NO-GO determination mode to Parameter
<sup>™</sup> Judgement _ Setup	-Set the judgment conditions.
Action Setup -	-Set the actions. ► section 17.1
<ul> <li>Time Range1         <ul> <li>5.00div</li> <li>Time Range2</li> <li>5.00div</li> </ul> </li> </ul>	-Set the determination period. ► section 17.1

#### Setting the Judgment Conditions (Judgement Setup)

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



#### **Setting Waveform Parameters (Item)**

You can use all automatically measured waveform parameters as judgment conditions. Up to 16 parameters set as judgment conditions can be determined simultaneously. ► section 14.1

## **18.1 Setting Actions**

This section explains the following settings for executing the action function.

- Action mode
- Action

► Features Guide: "Action"

#### **ACTION Menu**

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

ACTION	
Mode -	-Set Mode to ON.
Action Setup -	-Set the actions.

#### **Setting Actions (Action Setup)**

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

Select the actions to execute (Beep, Print Image, Save Waveform, Save Numeric, Save Image).

	Action Set	up	]
ØBeep ØPrint Image ØSave Waveform	-Save <sup>r</sup> Waveform File Path Auto Naming File Name	USB-0 Numbering	 Set the waveform data save destination. ▶ section 22.3 Set this when Save Waveform is selected for the action.
⊠Save Numeric ⊠Save Image	Data Type -Save Numeric File Path Auto Naming File Name	Binary USB-0 Numbering	 Set the numeric data save destination. ▶ section 22.3 Set this when Save Numeric is selected for the action.
	-Save <sup>-</sup> Image File Path Auto Naming File Name	USB-0 Numbering	 <ul> <li>Set the screen capture save destination.</li> <li>▶ section 22.3</li> <li>Set this when Save Image is selected for the action.</li> </ul>

#### **Executing Actions**

#### Starting

1. Set the following functions, and press START/STOP. The actions are executed according to the settings.

An icon  $\frac{\text{M}}{2}$  appears in the top center of the screen when actions are being executed.

- Trigger
- chapter 3 GO/NO-GO determination ► chapter 17

#### Stopping

- 2. Actions stop in the following conditions.
  - · When the specified number of measurement count (waveform acquisition count) is reached Measurement count (waveform acquisition count) Section 4.1 or chapter 17
  - When waveform acquisition is stopped with the **START/STOP** key When waveform acquisition is stopped with the START/STOP key, actions are executed once.

### **19.1 Searching for Edges**

This section explains the following settings for searching for edges.

- Search type
- Search conditions Source waveform, reference level to detect, edge polarity, hysteresis, and detection count
- · Detected waveform display
- · Detected point number
- · Search start and end points
- · Executing the search

Features Guide: "Edge Search (Edge)"

#### **SEARCH Edge Menu**

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

SEARCH	
Туре	Sat the energy type to Edge
Edge	- Set the search type to Edge.
¤⊲ Setup -	-Set the search conditions.
ResultWindow	Sat the detected waveform diaplay (Zeem1, Zeem2)
Zoom1 Zoom2	If both the Zoom1 and Zoom2 windows are displayed, select which one to operate.
Pattern No.	
No Match	
Start Point     Start Point     Start Point     Start     Start	Sat the energy start and and points (-Ediv to Ediv)
End Point 5.00div	The setting resolution varies depending on the display record length.
	The end point must be greater than or equal to the start point.
Execute	-Starts searching

#### **Setting Search Conditions (Setup)**

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

	Setup	
Trace	U1 -	Set the waveform to search (U1-U4, I1-I4, P1-P4, AUX3-AUX8).
Level	0.0	Set the reference level.
Polarity	ft ft	Set the edge polarity (チ, そ,チそ ).
Hysteresis	(₩ # ⊉)	Set the hysteresis ( $ earrow, earrow,$
Count	<u> </u>	Set the number of times to detect the conditions.

#### Setting the Detected Waveform Display (Result Window)

Press the **Result Window** soft key to select which zoom window displaying the search waveform to operate.

The search waveform that includes the search point specified by the detected point number (Pattern No.) described later is displayed in the zoom windows. If both the Zoom1 and Zoom2 windows are displayed, select which one to operate.

- · If only one of the two zoom windows is displayed, you do not have to select the window.
- If both Zoom1 and Zoom2 are not displayed, Zoom1 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.

If the PX8000 finds points that match the search conditions (detected points), it shows detected point number numbers (0, 1, 2, etc.) from the left of the waveform display in the order that the points were detected.



#### **Setting the Detected Point Number**

Set the detected point number. The detected waveform appears in the zoom window with the detected point corresponding to the specified detected point number at the center.

### **19.2 Searching for a Specific Time**

This section explains the following settings for searching for a specific time.

- Search type
- Search conditions Year, month, day, time
- · Executing the search

► Features Guide: "Time Search (Time)"

#### **SEARCH Time Menu**

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

SEARCH	
Туре	-Set Type to Time.
Time	
🖳 Setup –	-Set the search conditions.
ResultWindow	Configure the display for detected waveforms. No continue 10.1
Zoom1 Zoom2	- Configure the display for detected waveforms. F section 19.1
Execute -	-Starts searching

#### Setting Search Conditions (Setup)

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

	Setup	
Absolute Tin	ne	J
Year	2013	
Month	10	
Day	18	
Hour	13	≻Set t (Yea
Minute	52	
Second	58	
uSecond	558773	J

Set the date and time Year, Month, Day, Hour, Minute, Second, μSecond).

#### **Executing a Search (Execute)**

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

The detected waveform appears in the zoom window with the specified time at the center.

### 20.1 Displaying Waveform History Waveforms

This section explains the following settings for displaying history waveforms, which are waveforms that were previously saved to acquisition memory.

- · Display mode
- Highlight display
- · Display range
- · List of history waveforms
- · Clearing all the history waveforms

► Features Guide: "Displaying and Searching History Waveforms"

#### **HISTORY Menu**

Press SHIFT+NUMERIC (HISTORY) to display the following menu.

HISTORY	
Display Mode	-Set the display mode (1 Record, All Record, Average Record).
All Record	
Belected Record	Set the highlight display (display range start number and number) 1
	- Set the highlight display (display lange start humber-end humber).
Start Record	Set the display range start number and end number
End Record	(0 to –(number of waveform acquisitions –1)). <sup>2</sup>
-5	The start number must be greater than or equal to the end number.
List -	List of history waveforms
Search Mode	
OFF	
Clear History -	Clears all the history waveforms

- 1 This setting appears when Display Mode is set to 1 Record or All Record.
- 2 The number of waveform acquisitions that can be specified is up to the number of history waveforms that can be held in the acquisition memory.

#### Setting the Display Mode (Display Mode)

1 Record: Only the waveform corresponding to the selected record number is displayed.<sup>1</sup>

All Record: All selected waveforms are superimposed on each other.<sup>2</sup> All other waveforms<sup>1</sup> are displayed in the normal color.

Average Record: All selected waveforms<sup>2</sup> are linearly averaged and displayed.

- 1 Waveforms specified by Selected Record for highlighting
- 2 Waveforms in the display range specified by Start Record and End Record

#### Note.

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

#### List of History Waveforms (List)

Press the List soft key to display the following screen.

Record number		
Timestamp (time reference time information of each history waveform)		
List # 0000 12:50:25.572753 #-0001 12:50:25.254756 #-0002 12:50:24.576763 #-0003 12:50:22.58766 #-0005 12:50:23.940769	History waveform list You can use the jog shuttle to scroll the list and specify the data to highlight.	

#### Note.

#### Notes on Using the History Feature

- 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.
- 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.
- 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 Record. 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.
- If many history waveforms are selected, it may take a long time to display all waveforms or average waveforms. If this happens, the right icon appears at the top of the screen. To cancel the operation, set Display Mode to 1 Record.
- · History waveforms are cleared when you turn the power off.

### 20.2 Searching History Waveforms

This section explains the following settings for searching history waveforms.

- · Search mode
- Search conditions Search zone, search parameters, search condition, source waveform, search window (upper and lower limits and left and right edges), search logic, and measurement time period of the parameters
  - · Executing the search

Features Guide: "Search Condition Settings for Zone Searching (Search Setup)" "Search Condition Settings for Waveform Parameter Searching (Search Setup)"

#### **HISTORY Menu**

Press SHIFT+NUMERIC (HISTORY) to display the following menu.



#### Setting the Zone Search (Search Setup)

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

Search Setup	
Select Zone	– Select the search zone (Zone1-Zone4).
Zone1	· · · · · · · · · · · · · · · · · · ·
Condition	-Set the search condition (OFF. IN. OUT).
OFF	,
Source	Set the source waveform (U1-U4, I1-I4, P1-P4, AUX3-AUX8).
	· · · · · · · · · · · · · · · · · · ·
Upper     O.50div	Set the upper and lower limits of the search window (-5.00div to 5.00div).
-0.50div	The upper limit must be greater than or equal to the lower limit.
-3.00div	−Set the left edge and right edge of the search window (−5div to 5div).
-2.50div	The setting resolution varies depending on the display record length.
Logic	The fight edge must be greater than of equal to the left edge.
	Set the search logic (AND, OR).
Execute Search	

Proceed to executing the search on the next page.

#### Setting the Waveform Parameter Search (Search Setup)

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

	Search Setup	
	Select Param	Select the search parameter (Param1-Param4).
-	Param1	
	Condition	Set the search condition (OFF. IN. OUT).
-	OFF	
•	⊲ Source –	-Set the waveform to search and parameters.
9	Upper           0.0000           Lower           0.0000	−Set the upper and lower limits of the search condition (−9.9999E+30 to 9.9999E+30).
	Logic	- Set the search logic (AND, OR).
0	Time Range1	Set the parameter measurement time period (-5div to 5div). The setting resolution varies depending on the display record length.
	Execute Search	Time period 2 (Time Range2) must be greater than or equal to Time period 1 (Time Range The maximum number of data points that are measured is 100 Mpoint from Time Range 1.

#### Setting the Waveform to Search and the Parameter (Source)

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

Source	
Trace	Set the course weyeform (14 14 14 14 14 D4 D4 AUV2 AUV2)
	- Set the source waveform (01-04, 11-14, P1-P4, AUX3-AUX8).
Item	Cattle ways forms a summation to make by a setting 44.4
I Peak to Peak	Set the waveform parameter type. ► section 14.1

**Executing a Search (Execute Search)** After setting the search conditions, press **ESC** to return to the HISTORY menu.



## 21.1 Loading Roll Paper Into the Built-In Printer (Optional)

This section explains how to load roll paper into the built-in printer (/B5 option).

#### **Printer Roll Paper**

Only use YOKOGAWA roll paper for the PX8000. When using the printer for the first time, use the roll paper supplied with the PX8000. When you need extra 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, or chemicals, whether something has been recorded on it or not. 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 starching the record paper, do not use starches containing 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 roll paper.
- If you touch the roll paper with sweaty hands, there is a chance that you will leave fingerprints on the paper or smudge the recorded sections.
- If you rub the surface of the roll paper against something hard, there is a chance that the paper will change color due to frictional heat.
- If the roll paper comes into contact with chemicals, oil, and the like, there is a chance that the paper will change color or that the recorded sections will disappear.

#### Loading 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 end of the printer cover. Doing so may cause injury.

#### 21.1 Loading Roll Paper Into the Built-In Printer (Optional)



#### 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.



### 21.2 Printing on the Built-in Printer (Option)

This section explains the following settings for printing the image that is displayed on the PX8000 using the built-in printer (/B5 option).

- Print destination
- Comment

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

#### PRINT MENU Menu

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

PRINT MENU Print To	
	-Set the print destination to BuiltIn
©⊲ Comment –	-Set comments.

### **Starting to Print**

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

### 21.3 Saving Screen Captures to Files

This section explains the following settings for saving screen captures to files.

- Print destination
- Data format
- Color
- Background transparency, frame on/off
- · Save destination and file name

You can save screen captures from the PRINT MENU menu, SAVE menu, and FILE Others Save menu. The screen capture settings are shared among these menus.

This section describes how to save screen captures from the PRINT MENU menu and SAVE menu. For instructions on how to save from the FILE Others Save menu, see section 22.6.

► Features Guide: "Saving Screen Captures (File)"

#### **PRINT MENU Menu**

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

PRINT MENU Print To	-Set the print destination to File.
Format	- Set the data format (PNG, BMP, JPEG).
	-Set the color (ON, ON(Gray), ON(Reverse), OFF).
Background Normal	_Sets the background to opaque (Normal) or transparent (Transparent).*
File Setup -	Set the save destination and the file name.

\* This appears when the data format is set to PNG. When the data format is set to JPEG, the frame on/off setting appears.

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

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

► section 22.10
section 22.3
section 22.3
ection 22.3
•

#### **Starting to Save**

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

#### **SAVE Menu**

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

SAVE	
Waveform Save	-Set waveform data saving to OFF* ► section 22.3
OFF ON	
Waveform Save Setup	
Numeric Save	Set numeric data saving to OFE*  section 22.4
OFF ON	Set numeric data saving to OFT P Section 22.4
■ Numeric Save Setup	
Image Save	Turns the screen capture save feature on and off
OFF ON	runis the screen capture save reature on and on
¤⊲ Image Save Setup -	-Set the save destination and the file name for screen captures.

\* If the saving of waveform data and numeric data is turned on, the corresponding data will also be saved according to the specified save destinations and file names. Here, the settings for saving only the screen capture are shown.

### 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.

I	mage Save Setup		
File Path	USB-0	<u></u>	Displays the file list ► section 22.10
Auto Naming	Numbering	3	-Set auto naming. ► section 22.3
File Name			-Set the file name. ► section 22.3
Image Format	PNG	3	Set the data format (PNG, BMP, JPEG).
Color		3	Set the color (ON, ON(Gray), ON(Reverse), OFF).
Background	Normal	3	Sets the background to opaque (Normal) or transparent (Transparent)*

\* This appears when the data format is set to PNG. When the data format is set to JPEG, the frame on/off setting appears.

#### **Starting to Save**

Press **SAVE** to save the screen capture file to the specified folder.
# 22.1 Connecting Storage Media

This section explains how to connect the following types of storage media for saving and loading data from the PX8000.

- SD memory card
- · USB storage device

# **SD Memory Card**



### CAUTION

- Do not orient the SD memory card in the wrong direction, and force it into the PX8000.
   Doing so may damage the SD memory card and the PX8000.
- Inserting and removing the SD memory card quickly (within the span of a second) may damage the PX8000.
- Removing the SD memory card from the PX8000 while the card is being accessed may corrupt the data on the SD memory card.
- An icon is 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 PX8000. Vous risqueriez d'endommager la carte mémoire SD et le PX8000.
- Le fait d'insérer et de retirer la carte mémoire SD rapidement (en une seconde) peut endommager le PX8000.
- Le fait de retirer la carte mémoire SD du PX8000 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 PX8000. 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 SD cards listed above 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. The front of the card should be facing you.

The SD memory card slot is on the left side panel of the PX8000.

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 PX8000.



SD memory card

### **Removing the SD Memory Card**

Push the SD memory card with your finger and release to eject the card. Remove the SD memory card.



Release the SD memory card to eject.

# **General SD Memory Card Handling Precautions**

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

## **USB Storage Device**

### CAUTION

- Do not remove the USB storage device or turn off the power when the device is being accessed. If you do so, the data on the USB storage device may be corrupted.
- An icon c centered at the top of the screen indicates when the USB storage medium is being accessed.

#### French

## ATTENTION

- 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.

### **Compatible USB Storage Devices**

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

#### Note

- Only connect a USB keyboard, mouse, printer, or storage device to the USB connector for peripherals.
- The PX8000 can handle up to four storage devices. If the connected device is partitioned, the PX8000 treats each partition as a separate storage device.
- · Connect USB storages device directly, not through a USB hub.
- Do not connect and disconnect the two USB devices repetitively. Provide a 10-second interval between removal and connection.

### How to Connect a USB Storage Device

When connecting a USB storage device to the PX8000 USB port, connect the USB cable directly as shown in the figure below. You can connect/disconnect a USB cable at any time regardless of whether the PX8000 is on or off (hot-plugging is supported). Connect the type A connector of the USB cable to the PX8000, and connect the type B connector to the USB storage device. If you connect a USB storage device when the power switch is on, the device becomes available for use after the PX8000 identifies it. The PX8000 has two USB ports: USB-0 and USB-1. The port numbers are not fixed. The port at which the first USB storage device is detected becomes USB-0. The second detected USB storage device becomes USB-1.



### General USB Storage Device Handling Precautions

Follow the general handling precautions that are provided with your USB storage device.

# 22.2 Formatting Storage Media

This section explains how to format storage media. Storage management

- · Selecting the storage medium to format
- · Executing the format

# 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 PX8000, use the PX8000 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 PX8000 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.



# Setting Storage Management (Storage Manager) Press the Storage Manager soft key to display the following menu.

System Config Date/Time		
⊲ Language Storage Manager		
14.15		
Media SD	Select the storage medium to format (SD,	Upper USB, Lower USB).
Media SD Execute Format	Select the storage medium to format (SD,	Upper USB, Lower USB). Confirm to execute Are you sure to execute?

## Storage Medium to Format (Media)

SD:	SD memory card
Upper USB:	The USB storage device that is connected to the PX8000's upper USB port (type A)
	for connecting peripheral devices.
Lower USB:	The USB storage device that is connected to the PX8000's lower USB port (type A)
	for connecting peripheral devices.

# 22.3 Saving Waveform Data

This section explains the following settings for saving waveform data.

Save destination

Drive (medium), folder

File name

Auto naming, file name, comment

- Data type
- Save range
- Save conditions

Waveforms to save, history data range of waveforms to be saved, data removal interval, etc.

· Starting to Save

You can save waveform data from the FILE Waveform Save menu and SAVE menu. The settings for saving waveform data are shared among these menus.

### ► Features Guide: "Saving Waveform Data (Waveform)"

# **FILE Waveform Save Menu**

Press FILE and then the Waveform soft key next to Save to display the following menu.



### Selecting the Data Type (Data Type)

Binary:

The sampled data stored in the acquisition memory is saved to a file in binary format. The extension is .WPF. You can load this type of data into the PX8000.

ASCII:

The sampled data stored in the acquisition memory is converted using the specified range and saved to a file in ASCII format. The extension is .CSV. To save the data for MATLAB (numeric analysis software), the extension is .TXT. You cannot load either of these types of data into the PX8000.

### Float:

The sampled data stored in the acquisition memory is converted using the specified range and saved to a file in 32-bit IEEE floating format. The extension is .FLD. You cannot load this type of data into the PX8000. If the file size would exceed 2 GB to create the file, it cannot be saved.

#### WDF Binary:

- The sampled data stored in the acquisition memory is saved to a file in binary format. The extension is .WDF. This file is used to analyze waveforms using NI DIAdem.
- · You cannot load this type of data into the PX8000.
- If the combination of the record length and the number of channels causes the file size to exceed 2 GB, the file cannot be created.

### Selecting the Waveform Save Range (Range)

Main:	The range of data displayed in the main window is saved.
Zoom1:	The range data displayed in the Zoom1 window is saved.
Zoom2:	The range of data displayed in the Zoom2 window is saved.
Cursor Range:	The range of data specified by Cursor1 and Cursor2 is saved.

### Setting the Save Destination (File List)

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

#### Operation menu ► section 22.10



#### Note

You can also set the save destination drive by using the Change Drive item on the operations menu.

#### Save Destination (Save Path) Display Box

The save destination box appears at the bottom of the screen when the FILE Save menu is displayed. This box displays the file save destination, file name, and so on.

	Save Path	
	Save destination	Extension
	Specified file name	Auto naming type
Press the File Name sof	ft key to display the following me	enu.
Press the File Name sof	t key to display the following me	וומנ
Waveform Save		
⊲ File List		
File Name		
Auto Naming		
Set the a	auto naming method (OFF, Numb	ering, Date).

 Numbering

 Image: Set the file name.

 Image: Set the file name.

 Image: Set the file name.

 Image: Set comments.

### Setting Auto Naming (Auto Naming)

- OFF: The auto naming feature is disabled. 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 PX8000 automatically adds a four-digit number between 0000 to 9999 after the common name specified using the File Name setting (up to four characters) when it saves files.
- Date: The file name is the date and time (down to ms) when the file is saved. The file name specified for the File Name setting is ignored.



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 the 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.

### Setting the Waveform Save Conditions (Waveform Save Setup)

Press the Waveform Save Setup soft key to display the following screen.



#### Set these when Data Type is set to ASCII.

Interval (data removal interval): OFF, Per5, Per10, Per20, Per50, Per100, Per200, Per500, Per1000, Per2000, Per5000

Time Info. (whether to save time information): OFF, ON Extension (file name extension): csv, MATLAB\* Decimal Point (decimal point): Point, Comma

\* If MATLAB is selected, the extension will be set to .TXT.

### History Data Range of Waveforms to Be Saved (History)

- One: The one waveform that is specified with Selected Record on the HISTORY menu will be saved. To save an averaged history waveform, set the history feature's display mode to Average Record, and then select One.
- All: All history 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. All waveforms (All) cannot be used to save waveforms when the data format is WDF Binary.

#### Selecting the Waveforms to Save (Select Save Trace)

You can select All ON, U1 to U4, I1 to I4, P1 to P4, AUX3 to AUX8, and Math1 to Math8 waveforms. The displayed waveforms that you select are saved. The setup data for the saved waveforms are also saved.

- Waveforms that are not displayed will not be saved even if you select them.
- Math1 to Math8 are available when the data type (Data Type) is ASCII or Float.
  - If the computation mode on the MATH menu is set to OFF, Math1 to Math8 cannot be selected.
  - Any computation channels (Math1 to Math8) whose operation is set to OFF on the MATH menu cannot be selected.
  - Any computation channels (Math1 to Math8) whose display is set to OFF on the MATH menu will not be displayed. Therefore, they will not be saved.
- If the data type is set to Binary, source waveforms for waveform computation on the MATH menu are saved even if they are not displayed. Therefore, even though Math1 to Math8 are cannot be specified to be saved when the data type is set to Binary, when binary data is loaded, Math1 to Math8 may appear depending on the setup data of the MATH menu.
- If the data type is set to ASCII or Float and you select All for saving history waveforms, Math1 to Math8 will not be saved. If you want to save Math1 to Math8, set History to One.

### Starting to Save (Execute Save)

Press the Execute Save soft key to save the waveform data file to the specified folder.

### SAVE Menu

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

SAVE	
Waveform Save	- Set waveform data saving to ON
OFF ON	oet wavelolm data saving to oly.
Waveform Save Setup	-Set the save destination, file name, and data type for waveform data.
Numeric Save	
OFF ON	
<sup>■</sup> Numeric Save Setup	
Image Save	
OFF ON	
⊫_ Image Save Setup	
-	

# Setting the Save Destination, File Name, and Data Type for Waveform Data (Data Save Setup)

Press the Waveform Save Setup soft key to display the following screen.

		aveform Save Setup	Wa
-Dis	···-	USB-0	File Path
-Set		Numbering -	Auto Naming
-Set			File Name
-Set		Binary	Data Type

Displays the file list ► section 22.10 Set the auto naming method (OFF, Numbering, Date). Set the file name.

Set the data format (Binary, ASCII, Float, WDF Binary).

### **Starting to Save**

Press **SAVE** to save the waveform data file to the specified folder.

If Numeric Save or Image Save on the SAVE menu is set to ON, the numeric data or screen capture data will also be saved.

## **Save Destination for 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 using names that 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.

# 22.4 Saving Numeric Data

This section explains the following settings for saving numeric data.

- Save destination
- File name
- Data to save
- Decimal point
- Starting to Save

You can save numeric data from the FILE Numeric Save menu and SAVE menu. The settings for saving numeric data are shared among these menus.

► Features Guide "Saving Numeric Data (Numeric)"

# **FILE Numeric Save Menu**

Press FILE and then the Numeric soft key next to Save to display the following menu.

	FILE		Numeric Save	
	⊲ Waveform		⊲ File List -	Set the save destination. ► section 22.3
Paulo	⊲ Numeric	⇒	⊲ File Name -	Set the file name. ► section 22.3
odve	⊲ Setup		Target Displayed <u>Selected</u>	Select what to save (Displayed, Selected).
	⊲ Others		©⊲ Select Items -	Select items. Select this when Target is set to Selected.
	⊲ Waveform			
Load	⊲ Setup		Decimal Point for CSV File Point Comma	Select the decimal point (Point, Comma).
	⊲ Others		Execute Save	Starts saving

### Save Destination (Save Path) Display Box

The save destination box appears at the bottom of the screen when the FILE Save menu is displayed. This box displays the file save destination, file name, and so on.



### **Selecting an Item**

Press the Select Items soft key to display the following screen.

			FLORE S	ottinge			
				Jerunga			
Preset	All ON	All OFF	Preset				
lement	✓ Element1	🗹 Element2	✓ Element3				
	Ο Σ Α						
unction	🗹 Urms	🗆 Umn		🗆 Urmn	🗆 Uac	🗹 FreqU	🗆 CfU
	🗹 Irms	🗆 lmn		🗆 Irmn	🗆 lac	🗹 Freql	🗆 Cfl
	Ø P	🗹 S	<b>₫</b> Q	🗹 λ	🗹 🖗	🗆 Pc	
	🗆 U+peak	🗆 U-peak	🗆 I+peak	🗆 I-peak	P+peak	🗆 P-peak	
	□ η1	□ <b>1</b> /2	$\square \eta_3$	□ <b>ग</b> 4			
	F1	🗆 F2	🗆 F3	🗆 F4	🗆 F5	🗆 F6	🗆 F7
	🗆 F8	🗆 F9	🗆 F10	F11	F12	🗆 F13	F14
	F15	F16	🗆 F17	🗆 F18	🗆 F19	🗆 F20	
	FreqPLL1						
	🗆 U(k)	🗆 l(k)	🗆 P(k)	🗆 \$(k)	🗆 Q(k)	□ λ(k)	□ <b>¢</b> (k)
	□ \$U(k)	□ \$1(k)	🗆 Z(k)	🗆 Rs(k)	🗆 Xs(k)	🗆 Rp(k)	🗆 Xp(k)
	Uthd	🗆 Ithd	Pthd	🗆 Uhdf(k)	🗆 Ihdf(k)	Phdf(k)	
	Uthf	🗆 Ithf	🗆 Utif	🗆 ltif	🗆 hvf	🗆 hcf	C K-factor
	🗆 ¢Ui-Uj	🗆 ØUi-Uk	□ ¢Ui-li	🗆 🕸 j-lj	🗆 ØUk-Ik		
	⊡ ¢li-lj	🗆 Ølj-lk	□ Øli-lk				
	□ ⊿01	□ /102	□ ⊿03	_ ΔυΣ	<u>□</u>		
	□ <u>/</u> P1	□ <u>/</u> P2	□ <u>/</u> P3	Ο ΔΡΣ			

Select the numeric items that you want to save.

## **Starting to Save (Execute Save)**

Press the **Execute Save** soft key to save the numeric data file to the specified folder.

## **SAVE Menu**

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



# Setting the Save Destination, File Name, and Data to Save for Numeric Data (Data Save Setup)

Press the Numeric Save Setup soft key to display the following screen.

Numeric Save S	etup	
File Path USB-0	<del>.</del>	Displays the file list ► section 22.10
Auto Naming Numbe	ring <u>)</u>	Set auto naming. ► section 22.3
File Name		Set the file name. ► section 22.3
Target Selecte	d Select Items	Select items (shared with the FILE Numeric Save setting).
	leat what to save (Die	anlawad Calastad)

Select what to save (Displayed, Selected).

### **Starting to Save**

Press **SAVE** to save the numeric data file to the specified folder.

If Waveform Save or Image Save on the SAVE menu is set to ON, the waveform data or screen capture data will also be saved.

# 22.5 Saving Setup Data

This section explains the following settings for saving setup data. You can save setup data to a file.

- · Save destination
- File name
- · Starting to Save

► Features Guide: "Saving Setup Data (setup)"

# **FILE Setup Save Menu**

Press FILE and then the Setup soft key next to Save to display the following menu.



### Save Destination (Save Path) Display Box

The save destination box appears at the bottom of the screen when the FILE Save menu is displayed. This box displays the file save destination, file name, and so on.



## Starting to Save (Execute Save)

Press the Execute Save soft key to save the setup data file to the specified folder.

# 22.6 Saving Other Types of Data

This section explains the following settings for saving screen captures, snapshot waveforms, results of automated measurement of waveform parameters, and results of FFT.

- Save destination
- File name
- · Data type to save
- Data format (for screen captures)
- Color (for screen captures)
- Starting to Save

You can save screen captures from the FILE Others Save, PRINT MENU menu, and SAVE menu. The screen capture settings are shared among these menus.

This section describes how to save screen captures from the FILE Others Save menu. For instructions on how to save from the PRINT MENU menu and SAVE menu, see section 21.3.

► Features Guide: "Saving Other Types of Data (Others)"

# **FILE Others Save Menu**

Press FILE and then the Others soft key next to Save to display the following menu.



### Save Destination (Save Path) Display Box

The save destination box appears at the bottom of the screen when the FILE Save menu is displayed. This box displays the file save destination, file name, and so on.



## Setting the Data Type to Save (Data Type)

- 1. Press the Data Type soft key.
- 2. Set the type of data to save.

Screen Image: The displayed screen image is saved to a PNG, BMP, or JPEG file.

Snap: Waveform data captured in a snapshot is saved to an .SNP file.

- Measure: The results of automated measurement of waveform parameters are saved to a CSV file.
- FFT: The FFT analysis results are saved to a CSV file.

### When Data Type Is Set to Screen Image

FILE Save	
⊲ File List	
⊲ File Name	
Data Type Screen Image	Set Data Type to Screen Image.
Format	Set the data format (PNG, BMP, JPEG).
Color	Set the color (ON, ON(Gray), ON(Reverse), OFF).
Background	Sets the background to opaque (Normal) or transparent (Transparent).*
Execute Save	Starts saving

This appears when the data format is set to PNG. When the data format is set to JPEG, the frame on/off setting appears.

### • Setting the Data Format (Format)

Screen captures can be saved in the following data formats. The table below shows the extensions that are automatically assigned to each format and the approximate sizes of files in each format.

Data Format	Extension	File Size <sup>1</sup>
PNG	*.PNG	Approx. 100 KB (approx. 50 KB) <sup>2</sup>
BMP	*.BMP	Approx. 2 MB (approx. 150 KB) <sup>2</sup>
JPEG	*.JPG	Approx. 250 KB
1 When Color i	s set to ON	

2 The file sizes in parentheses indicate the file size when Color is set to OFF.

### • Setting the Color (Color)

ON	An screen capture is produced with a 65536-color palette.
ON(Gray)	An screen capture is produced with a 16-color grayscale palette.
ON(Reverse)	The screen background is not produced in color.
OFF	A black-and-white screen capture is produced.

## When Data Type Is Snap



## When Data Type Is Measure

FILE Save	
⊲ File List	
⊲ File Name	
Data Type	
Measure	Set Data Type to Measure.
	Measure Save Setup
	Unit Unit Sets whether to save the unit (ON, OFF).
	Time Info. ON Sets whether to save time
	Decimal Point Point Comma Set the decimal point (Paint Comma)
Setup	Set the save conditions for the results of
	automated measurement of waveform parameters.
Execute Save	Starts saving

When Data Type Is FFT



# Starting to Save (Execute Save)

Press the Execute Save soft key to save the appropriate data file to the specified folder.

# 22.7 Loading Waveform Data

This section explains the following settings for loading waveform data.

- File to load
- Displaying file information
- · Starting to load
- · Clearing loaded waveforms

#### ► Features Guide: "Loading Waveform Data (Waveform)"

# **FILE Waveform Load Menu**

Press FILE and then the Waveform soft key next to Load to display the following screen and menu.



## Selecting the File to Load

Select the waveform data file (.WPF extension) to load from the file list. ► section 22.10

## Starting to Load (Execute Load)

Press the Execute Load soft key to load the waveform data file from the specified file.

- The setup data in the waveform data file is also loaded. When you start measurement, the loaded waveform data will cleared, but the setup data that was loaded with the waveform data will remain.
- If the current PX8000 module configuration is different from the modules configuration in the waveform data, you cannot load the waveform data.
- Waveform data saved with a PX8000 model with large memory capacity cannot be loaded in to a model with small memory capacity.

# **Clearing Loaded Waveforms**

Loaded waveforms are cleared in the following situations.

- · When waveform acquisition is started with the START/STOP key
- · When the Clear History soft key on the HISTORY menu is pressed
- · When the PX8000 is initialized

# 22.8 Loading Setup Data

This section explains the following settings for loading setup data.

- · File to load
- · Displaying file information
- · Starting to load

► Features Guide: "Loading Setup Data (Setup)"

# FILE Setup Load Menu

Press FILE and then the Setup soft key next to Load to display the following screen and menu.



### Selecting the File to Load

Select the setup data file (.SET extension) to load from the file list. ▶ section 22.10

## Starting to Load (Execute Load)

Press the Execute Load soft key to load the setup data file from the specified file.

If the current PX8000 module configuration is different from the modules configuration in the setup data, you cannot load the setup data.

# 22.9 Loading Other Types of Data

This section explains the following settings for loading snapshot waveforms.

- File to load
- Displaying file information
- Starting to load
- Clearing Loaded Waveforms

► Features Guide: "Loading Other Types of Data (Others)"

# **FILE Others Load Menu**

Press FILE and then the Others soft key next to Load to display the following screen and menu.

File List	FILE Load
Path = USB-0	
Space : 907MB (950,800,384Bytes)	information
Sort To	
	Data Type
	Snap
FITTER *.SNP	
Change Drive WATTO002 SNP 438K 2013/11/06 13:35:50 r/w	Select the file to load
Deloto	(.SNP extension).
Delete	
Rename	
Make Dir	
Copy	
Move File list	
The second se	
Please push "Left" key to move to "ControlMenuárea"	
Freude positi Letti Key to move to outri olimendhi ed .	
	Execute Starts loading
	Loui

## Selecting the File to Load

Select the snapshot data file (.SNP extension) to load from the file list. ► section 22.10

### Starting to Load (Execute Load)

Press the Execute Load soft key to load the snapshot waveform data file from the specified file.

### **Clearing Loaded Waveforms**

Loaded waveforms are cleared when you press CLEAR TRACE or when you initialize the PX8000.

# 22.10 Performing File Operations

This section explains the following settings for performing various file operations from the file list or the file utility menu.

#### File list

- Sorting
- Display format
- Type of file to list
- Changing the storage medium (drive)
- Deleting files and folders
- · Renaming files and folders
- Creating folders (directories)

- · Copying files
- Moving files

#### **FILE Utility Menu**

- Displaying file information
- · Turning file protection on and off
- · Selecting files (All Set/All Reset and Set/Reset)

#### ► Features Guide: "File Operations (Utility)"

# File List and FILE Utility Menu

- 1. Press FILE and then the Waveform, Numeric, Setup, or Others soft key next to Save.
- 2. Press the File List soft key to display the file list and FILE Utility menu. For details on the FILE Utility menu, see page 22-28.

## File List (File List)



### Sorting the File List (Sort To)

Select **Sort To** on the operation menu to display the following screen.



### **Display Format**

Select **display format** on the operation menu to display the following screens. Press **SET** to switch between display formats.

#### List Display ( $\equiv$ )

			File List		
	Path = USB-0				
	Space : 900MB (	944,173,056Bytes)		Num Of Files : 1	6
	Sort To	FileName	_ Size	Date	Attr
Display format -		Setwork SB-0			
	Filter *.*	D 0000.PNG	62.2K	2013/11/06 13:37:54	r/w
		D000.SET	381K	2013/11/06 14:07:00	r/w
	Change Drive	🗋 0000.WPF	6.03M	2013/11/06 14:08:34	r/w
	Delete	0000N.CSV	2.74K	2013/11/06 14:08:34	r/w
		D 0001.PNG	147K	2013/11/06 14:08:58	r/w
	[ Rename ]	0001.SET	381K	2013/11/06 14:07:34	r/w
	Mal a Dia	🗋 0001.\#PF	6.03M	2013/11/06 16:16:42	r/w
	Make Dir	0002.PNG	150K	2013/11/06 14:09:24	r/w
	Copy	0003.PNG	146K	2013/11/06 16:55:44	r/w
		WATTOOOD.CSV	35.8 <b>M</b>	2013/11/05 18:21:14	r/w
	Move	WATTOOOD.SNP	438K	2013/11/06 13:34:10	r/w
		🗋 WATTOOOO.WPF	10.8M	2013/11/05 18:09:54	r/w
		WATTOO01.SNP	438K	2013/11/06 13:34:52	r/w
		🗅 WATTOOO1.WPF	10.8M	2013/11/05 18:12:34	r/w
	Disease much 2014	18 Law As many 15 80	1-1		
	mease push "Rigi	nt" key to move to "Fi	ielistarea".		

#### Thumbnail Display ( 田 )



### Selecting the Type of File to List (Filter)

Select **Filter** on the operation menu to display the following screen.

		File L	ist		
	Path = USB-0				
	Space : 900MB (	943,812,608Bytes)		Num Of Files : 1	8
	Sort To	FileName	_ Size	Date	Attr
Select the type of files to list. *.*: All files *.WPF: Binary waveform files *.CSV: ASCII waveform files *.FLD: Floating-point waveform files *.SET: Setup files *.BMP: Bitmap image files * BNC: BNC image files	Sort 10	Network           USB-0           0000.PNG           0000.SET           0000.WPF           00001.PNG           0001.PNG           0001.PNG           0001.PNG           0001.PNG           0001.PNG           0002.PNG           0004.PNG           0004.PNG           0005.PNG           0005.PNG           WATT0000.SNP           WATT0000.WPF	62.2K 381K 6.03M 2.74K 147K 381K 6.03M 150K 146K 174K 173K 35.8M 438K 10.8M	2013/11/06 13:37:54 2013/11/06 14:07:30 2013/11/06 14:08:34 2013/11/06 14:08:58 2013/11/06 14:08:58 2013/11/06 14:09:24 2013/11/06 16:55:44 2013/11/06 16:57:08 2013/11/06 16:57:30 2013/11/06 18:21:14 2013/11/06 18:21:14 2013/11/06 18:21:14	r/w r/w r/w r/w r/w r/w r/w r/w r/w r/w
*.JPG: JPEG image files	Please push "Rig	ht"key to move to "FileListA	rea".		
+ OND: One and a transformer file a	h				

\*.SNP: Snapshot waveform files

\*.TXT: Text files, custom display configuration files for numeric data, MATLAB waveform files

\*.WDF: WDF binary waveform files

### Changing the Storage Medium or Drive (Change Drive)

Select Change Drive on the operation menu to display the following screen.

Path = USB-0         Space : 900MB (943,661,0568ytes)       Num Of Files : 19         Sort To       FileName       Size Date       Attr         Image: Sort To       Image: Sort To       Image: Sort To       Image: Sort To         Image: Sort To       Image: Sort To       Image: Sort To       Image: Sort To       Image: Sort To         Image: Sort To       Image: Sort To       Image: Sort To       Image: Sort To       Image: Sort To       Image: Sort To         Image: Sort To       Image: Sort To       Image: Sort To       Image: Sort To       Image: Sort To       Image: Sort To       Image: Sort To         Select the storage medium       USB-0       0000.PNG       62.84       2013/11/06 14308:34       r/w         USB-0:       The first detected USB storage medium       0001.PNG       137K 2013/11/06 163544       r/w         USB-1:       The second detected USB storage medium				File List				
Space : 900MB (943,661,056Bytes)       Num 0f Files : 19         Sort To       FileName       Size         Plate       Attr         Sort To       FileName       Size         Date       Attr         Work       USB-0       62.2K         Sort To       0000.PNG       62.2K         O000.WFF       6.03M       2013/11/06 1430534         Sort To       O001.PNG       147K         O001.PNG       147K       2013/11/06 1430534         USB-0:       The first detected USB storage medium       0001.PNG         USB-1:       The second detected USB storage medium       0002.PNG         USB-1:       The second detected USB storage medium       146K         Move       0005.PNG       146K       2013/11/06 165574         USB-1:       The second detected USB storage medium       146K       2013/11/06 165574 <t< td=""><td></td><td></td><td>Path = USB-0</td><td colspan="5">Path = USB-0</td></t<>			Path = USB-0	Path = USB-0				
Select the storage medium (drive).       Sort To       FileName       Size       Date       Attr         Select the storage medium (drive).       Image: Select the storage medium (drive).         SD-1:       SD card       Image: Select the storage medium (drive).       Image: Select the storage medium (drive).       Image: Select the storage medium (drive).         SD-1:       SD card       Image: Select the storage medium (drive).       Image: Select the storage medium (drive).       Image: Select the storage medium (drive).         SD-1:       SD card       Image: Select the storage medium (drive).       Image: Select the storage medium (drive).       Image: Select the storage medium (drive).         USB-0:       The first detected USB storage medium       Image: Select the storage medium (drive).       Image: Select the storage medium (drive).       Image: Select the storage medium (drive).         USB-1:       The second detected USB storage medium       Image: Select the storage medium (drive).       Image: Select the storage medium (drive).       Image: Select the selected the selected USB storage medium         Network:       Network Drive       Image: Select the selected the selected USB storage medium       Image: Select the selected the selected USB storage medium       Image: Select the selected the selected the selected the selected the selected the selected			Space : 900MB (	943,661,056Bytes)		Num Of Files : 1	9	
Select the storage medium (drive).         SD-1:       SD card         USB-0:       The first detected USB storage medium         Work:       0001.PNG         61.1:       The second detected USB storage medium         Copy       0001.PNG         0001.PNG       146K         0001.PNG       147K         0001.PNG       147K         0001.PNG       147K         0001.PNG       147K         0001.PNG       150K         0005.PNG       174K         0005.PNG       174K			Sort To	FileName	<u>Size</u>	Date	Attr	
Please push "Right" key to move to "Filel istArea".	Select the s SD-1: SI USB-0: Th m USB-1: Th st Network: Net	storage medium (drive). —— D card he first detected USB storage ledium he second detected USB orage medium etwork Drive	Surt 10       Filter *.*       Chee       USB-0       Network       More	Network           USB-0           0000.PNG           0000.SET           0000.GSV           0001.PNG           0001.PNG           0000.CSV           0001.PNG           0000.PNG           0000.PNG           0001.PNG           0001.PNG           0002.PNG           0003.PNG           0005.PNG           0005.PNG           0005.PNG           0005.PNG           WATT0000.CSV           WATT0000.SNP	62.2K 381K 6.03M 2.74K 147K 381K 6.03M 150K 146K 174K 174K 174K 174K 35.8M 438K	2013/11/06 13:37:54 2013/11/06 14:08:34 2013/11/06 14:08:34 2013/11/06 14:08:34 2013/11/06 14:08:58 2013/11/06 14:08:58 2013/11/06 16:16:42 2013/11/06 16:57:08 2013/11/06 16:57:08 2013/11/06 16:57:03 2013/11/06 16:57:03 2013/11/06 16:57:03	Г/W Г/W Г/W Г/W Г/W Г/W Г/W Г/W Г/W Г/W	
rease pair right roy to more to rischering r			Please push "Rig	ht" key to move to "FileListArea"	'			

#### 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.



Confirm execution.

#### 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  $\ensuremath{\text{SET}}$  or the  $\ensuremath{\text{SET}/\text{RESET}}$  soft key on the Utility menu.

- Folders: Press the **SET/RESET** soft key on the FILE Utility menu. If the cursor is on a folder, pressing **SET** will open the folder. All the files and folders that you have selected up to that point will be canceled.
- You can abort file deleting. However, files that are already being processed are not applicable.

#### **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 name you entered.

### Making Folders (Make Dir)

- 1. Select the drive or folder in the file list that you want to make the new folder in.
- 2. Select Make Dir on the operation menu to display the following screen.

		File List			
	Path = USB-0	Use the keybo	ard to enter the new	/ folder name.	
	Space : 901MB (944,64	t10 JODY 165/		1169 • 11	
	Sort To				
	Filter *.*				
	Change Drive	BCDE		SPACE ENTER	
	Delete F	<u>G</u> HIJ	$\overline{\langle \rangle}$		
	Rename		, <u>, , , , , , , , , , , , , , , , , , </u>	789/	
Create folders (directories)	Make Dir	QRST		4 5 6 *	
Create folders (directories)					
	Copy	CAPS			
	Move	002.PNG	150K 2013/11/06	14:09:24 r/w	
		14TT0000 09V	25 OM 2012/11/05	10-21-11 -/W	
Press ENTER on the keyboard or the Enter soft key to			t key to 🖉		
	confirm the name you entered.			/w	
	Please push "Right" key	' to move to "FileLis	tArea".		

### **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.

		File List			
	Path = USB-0	ile list you	are copying from	n	
	Space : 895MB (937,	184,000Bytes)		Num Of Files : 1	7
	Eile	eName	_ Size	Date	Attr 🔺
			File List	-	
	Path = USB-0/F3	File list yo	u are copying to		
	Space : 895MB (937	7, 84,000Bytes	)	Num Of Files :	3
	Sort To	ileName	△ Size	Date	Attr
		Network USB-0			
	Filter *.*	⇒ F3	62.28	2013/11/06 13:37:5/	
	Change Drive	0000.SET	Folder that you a	re conving t	
	Delete	🗋 0000.WPF l			≌r/w
	Rename				_
	Make Dir				
Copies the selected files and folders -	Copy Exec				
					•
	Please push "Right"	key to move	to "FileListArea".		

- 3. Select the drive or folder on the file list that you are copying to.
- 4. Select Copy Exec on the operation menu to display the following screen.

	Confirm to execute		
	Are you sure to execute?		
Confirm execution	Yes No		

#### 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 22-25.
- You can abort file copying.

### 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 or folder in the file list that you are moving to.
- 4. Select Move Exec on the operation menu to display the following screen.

	Confirm to execute		
	Are you sure to execute?		
Confirm execution	- Yes No		

#### Note.

The procedure for selecting multiple files or folders at the same time to move 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 22-25.



381K 2013/11/06 14:07:34 r -

r/v

r/w

r∕w

r/w

r/w

r/w

r/w

r∕w

r/w

2013/11/06 16:16:42

2013/11/05 18:21:14

2013/11/05 18:09:54

2013/11/06 13:34:52

2013/11/05 18:12:34

2013/11/06 13:35:50

2013/11/05 18:17:28

150K 2013/11/06 14:09:24

156K 2013/11/07 14:53:34

6.03M

35.8M

10.8M

438K

10.8M

438K

6.03M

Protected file

### Turning Protection On or Off (Protect ON/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 be read from. Writing
		is not allowed. Deleting is also not allowed.
OFF	r/w	File protection is off for the selected file. The file has read and write access.

### ALL SET and ALL RESET

🕸 0001.SET

0002.PNG

P

0001.\PF

0003.PNG

WATT0000.CSV

WATT0000.WPF

WATTOOO1.SNP

WATTOO01.WPF

WATT0002.WPF

Please push "Left" key to move to "ControlMenuArea"

WATTO002.SNP

ALL SET: When a medium, folder, or file is highlighted in the file list, pressing this soft key selects all the files and folders in the corresponding medium or folder. Selection marks (see page 16-19) are displayed to the left of the selected files and folders.

ALL RESET: Pressing this soft key clears all the selected files and folders.

### SET/RESET

Delete

Rename

Make Dir

Copy

Move

This soft key selects the file or folder in the file list that is highlighted or clears the selection. Selection marks (see page 22-22) are displayed to the left of the selected files.

# 23.1 Connecting the PX8000 to a Network

This section explains how to connect the PX8000 to a network.

# **Ethernet Interface Specifications**

There is a 1000BASE-T port located on the side panel of the PX8000.

Item	Specifications
Ports	1
Electrical and mechanical specifications	IEEE802.3 compliant
Transmission system	Ethernet (1000BASE-T, 100BASE-TX, 10BASE-T)
Communication protocol	TCP/IP
Supported services	Server: FTP and VXI-11
	Client: FTP (Net Drive), SNTP, DHCP, and DNS
Connector type	RJ-45



# Items Required to Connect the PX8000 to a Network

### Cable

Use one of the following types of network cable that conforms to the transfer speed 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 off the PX8000.
- 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 on the PX8000.





## To Connect to a PC through a Hub or Router

- 1. Turn off the PX8000.
- 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 on the PX8000.



#### Note.

- Use a hub or router that conforms to the transfer speed of your network.
- When you connect a PC to the PX8000 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 PX8000 to a PC directly. Direct communication without a hub or router is not guaranteed to work.

# 23.2 Configuring TCP/IP Settings

This section explains the following TCP/IP settings for connecting to a network.

- DHCP (IP address, subnet mask, and default gateway)
- DNS (domain name, DNS server IP address, and domain suffix)

► Features Guide: "TCP/IP (TCP/IP)"

# **UTILITY Network Menu**

Press UTILITY and then the Network soft key to display the following menu.



# Configuring TCP/IP Settings (TCP/IP)

Press the TCP/IP soft key to display the following screen.

Network	
Press the Bind button to apply the changes.	Turns DHCP on and off
DHCP OFF ON	Set these when DHCP is set to OFF.
IP Address 0 . 0 . 0 . 0	• IP address
Net Mask 255 . 255 . 255 . 255 .	Subnet mask
Gate Way 0 . 0 . 0 . 0	Default gateway
DNS OFF ON Auto	Set the DNS (OFF, ON, Auto).*
Domain Name	Set these when DNS is set to ON.
DNS Server1 0 0 0 0	└∙ Domain name
	<ul> <li>DNS server IP address</li> </ul>
DNS Server2 U.U.U.U.J	(1: primary, 2: secondary)
Domain Suffix1	Set these when DNS is set to ON or Auto.
Domain Suffix2	• Domain suffix
Bind	(1: primary, 2: secondary)
	<sup>L</sup> Apply the settings.
	J

\* Auto is displayed when DHCP is on.

### DNS Settings (DNS)

- OFF: DNS is disabled.
- ON: DNS is enabled. Set the domain name, and the DNS server's primary and secondary IP addresses and domain suffixes.
- Auto: DNS is enabled. Set the domain suffix. The domain name and the DNS server IP addresses are set automatically. This option can only be selected when DHCP is on.

# 23.3 Accessing the PX8000 from a PC (FTP Server)

This section explains the following settings for accessing the PX8000 from a PC on a network.

- User name
- Password
- Timeout
- Starting an FTP Client

► Features Guide: "FTP Server (FTP Server)"

# **UTILITY Network Menu**

Press UTILITY an then the Network soft key to display the following menu.

UTILITY J System Config	
TCP/IP	
FTP Server	-Configure the FTP server settings.
Net Drive	
SNTP	

## **Configuring FTP Server Settings (FTP Server)**

Press the FTP Server soft key to display the following screen.



# **Starting an FTP Client**

Start an FTP client on a PC.

Enter the user name and password that you entered on the screen shown above to connect to the PX8000.

### Note.

If you set the user name to "anonymous," you can connect to the PX8000 without entering a password.

# 23.4 Connecting to a Network Drive

This section explains the following settings for accessing a network drive through an Ethernet connection to load or save various PX8000 data.

- FTP server (file server)
- Login name
- Password
- · Turning FTP passive mode on and off
- Timeout
- · Connecting to and disconnecting from network drives

► Features Guide: "Network Drive (Net Drive)"

## **UTILITY Network Menu**

Press UTILITY an then the Network soft key to display the following menu.

UTILITY J System Config	
TCP/IP	
FTP Server	
Net Drive	-Configure the network drive settings
SNTP	

## **Configuring a Network Drive and Connecting to It (Net Drive)**

Press the Net Drive soft key to display the following screen.

	Network	Settings used to connect to a network drive
FTP Server		• Configure the FTP server settings (IP address; host name and domain name can be set when DNS is enabled).
LoginName	anonymous	<ul> <li>Login name (up to 15 characters)</li> </ul>
Password	· · · · · · · · · · · · · · · · · · ·	<ul> <li>Password (up to 15 characters)</li> </ul>
Passive	OFF ON	<ul> <li>Turns FTP passive mode on and off</li> </ul>
TimeOut(sec)	15	-• Set the timeout value (1-3600 s).
	Connect Disconnect	Disconnects from the network drive
		Connects to the network drive

# 23.5 Using SNTP to Set the Date and Time

This section explains how to use SNTP to set the PX8000's date and time.

- SNTP server
- Timeout
- · Executing time adjustment
- Automatic adjustment

► Features Guide: "SNTP (SNTP)"

# **UTILITY Network Menu**

Press UTILITY and then the Network soft key to display the following menu.



# **Configuring SNTP Settings (SNTP)**

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

Network	Configure the SNTP server settings
SNTP Server	set when DNS is enabled).
TimeOut(sec) 3	Set the timeout value (1-60 s).
Adjust at PowerON	
OFF ON	-Turns automatic adjustment on and off
Adjust	Executes time adjustment

# 24.1 Calibrating the PX8000

This section explains how to calibrate the PX8000. Execute calibration when you want to make accurate measurements.

► Features Guide: "Calibration (Zero-level compensation, CAL)"

## CAL Menu

Press SHIFT+DISPLAY MODE (CAL) to display the following menu.

CAL Execute Calibration	-Executes calibration
Cal at End for Elements OFF ON	-Turns on and off the calibration that is performed when a measurement is completed on an element
Cal on Start for Auxiliaries OFF <u>AUTO</u>	- Set the calibration that is performed after starting signal acquisition on AUX modules (OFF, AUTO). This command does not appear if AUX modules are not installed.

# 24.2 Using the NULL Feature

This section explains the following settings for the NULL feature.

- Turning NULL value subtraction on and off
   Turning on and off at once, setting each channel separately
- Turning NULL value updating on and off Turning on and off at once, setting each channel separately
- Enabling and Disabling the NULL Feature

► Features Guide: "NULL Feature (NULL SET)"

# **Configuring NULL Feature Settings**

Press SHIFT+NULL (NULL SET) to display the following screen.

To collectively set all the channels of installed modules, set the items in the All row.



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

# **Enabling and Disabling the NULL Feature**

Press **NULL**. The NULL feature is executed, and a NULL indicator appears in the element information display area on the right side of the screen.

- The NULL value of each signal is used for those channel signals whose NULL feature is set to ON.
- If you press the NULL key again, the NULL feature is disabled, and the NULL indicator disappears.



### NULL indicators



To see the information, press ESC to clear the menu.

### Note\_

If the measured value of the input signal used as a NULL value is not available (no measured value or measurement error), even if "NULL value updating" of the signal is set to ON, an error will occur because the NULL value will not be updated.
## 24.3 Setting Time Synchronization (Option)

This section explains the following settings for synchronizing the PX8000 to GPS time.

- IRIG format
- Modulation type
- Input impedance

► Features Guide: "Time Synchronization Feature (Time Synchro; optional)"

### UTILITY System Config Time Synchro Menu

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

Time Synchro	
Time Synchro	Sat the time synchronization feature (OEE IDIG)
OFF IRIG	Set the time synchronization realtire (OFF, ING).
IRIG Format	Sat the IPIG format (A_B)
АВ	
Modulation	Sat the modulation type (AM DWCode)
AM PWCode	Set the modulation type (AM, PWCode).
Impedance	Set the input impedance (50, 5k)
50 5k	
	-

#### Note.

To enable the changes that you have made to the time synchronization settings, restart the PX8000.

# 24.4 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.

► Features Guide: "Language (Language)" "USB Keyboard Language (USB Keyboard)"

### **UTILITY System Config Menu**

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



### Setting the Language (Language)

Press the Language soft key to display the following menu.



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 PX8000 keys are mapped to the keys on a USB keyboard, see appendix 10 in the Features Guide, IM PX8000-01EN.

### 24.5 Adjusting the Backlight

This section explains the following settings for adjusting the backlight. Turning off the backlight Automatically turning off the backlight Adjusting the brightness

► Features Guide: "Adjusting the LCD (LCD)"

### UTILITY System Config LCD Menu

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

LCD Turn OFF	Turns off the backlight
	Tou can turn on the backlight by pressing any key.
Auto OFF	Enable or disable the automatic turning off of the backlight
OFF ON	- Enable of disable the automatic turning on of the backlight.
Auto OFF Time	Cat the amount of time before the bealdight is sufematically turned off (4min 60min)
<ul> <li>Brightness</li> </ul>	- Set the backlight brightness (1.10)
3	

## 24.6 Initializing the Settings

This section explains how to initialize the PX8000 settings to their factory default values.

► Features Guide: "Initializing Settings (Initialize)"

### **UTILITY System Config All Setup Menu**

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



### 24.7 Configuring the Environment Settings

This section explains the following environment settings.

- · Action to perform at power on
- Terminal (external I/O terminal) signal
- Display settings
   Font size, menu background color, scale value display, numeric display frame, number of digits to display for numeric data, intensity
- Key and knob control settings Turning the click sound on and off, start and stop response time, key lock type and release type
- Frequency display when the measured frequency is less than the lower limit
- · AUX display when the measured pulse frequency is less than the lower limit
- Analysis settings
   Cursor read mode

► Features Guide: "Environment Settings (Preference)"

### **UTILITY Preference menu**

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

Preference	
©⊲ Power On Action -	Configure the action to perform at power on.
Terminal Setup -	Set the terminal (external I/O terminal) signal.
©⊲ Display Setup -	Configure the display settings.
Rey/Knob Setup -	Configure key and knob control settings.
Freq Display at Frequency Low Zero Error	Set the frequency value that is displayed when the measured frequency is less than the lower limit (Zero, Error).
Aux Display at Pulse Freq Low Zero Error	Set the AUX value that is displayed when the measured pulse frequency is less than the lower limit (Zero, Error).
¤⊲ Analysis Setup -	Analysis settings

### Setting the Action to Perform at Power On (Power On Action)

Press the **Power On Action** soft key to display the following screen.



Sets whether to start waveform acquisition at power on (ON/OFF).

Sets the action mode at power on to the setting that was used when the power was turned off (ON) or sets the action mode to off (OFF)

## Setting the Terminal (External I/O Terminal) Signal Settings (Terminal Setup)

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

Terminal Remote Stop	Setup	Set the remote stop feature. • ON: Enables the STOP signal • OFF: Disables the STOP signal
Trigger Out	Normal -	Set the trigger output (Normal, Pulse).
Pulse Width		Set the pulse width (1ms, 50ms, 100ms, 500ms)

### Configuring the Display Settings (Display Setup)

(Font size, menu background color, scale value display, numeric display frame, number of digits to display for numeric data, intensity)

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

Displ	ay Setup	
Menu Font Size Base Color	Small Large	Sets the menu font size (Small, Large) Sets the menu background color (Blue, Grav)
Scale Font Size	Small Large	Sets the scale font size (Small, Large)
Scale On Item	All Time Scale	Sets the scale value display
Numeric Frame Numeric Resolution	OFF ON	<ul> <li>All: Displays vertical and horizontal scale values</li> <li>Time Scale: Displays horizontal scale values</li> <li>Set the scale values to display when Scale Value on the WAVE</li> <li>SETTING menu (► section 8.1) is set to ON.</li> </ul>
-Intensity		<sup>L</sup> Turns the numeric display frame on and off
Grid	3	Sets the number of digits of numeric data to display (5dgts, 6dgts)
Cursor	8	Set the intensity.
Marker		• Grid (1-8) • Cursor (1-8) • Marker (1-8)

### Configuring Key and Knob Control Settings (Key/Knob Setup)

(Turning the click sound on and off, start and stop response time, key lock type and release type)

Press the Key/Knob Setup soft key to display the following screen.

Key/Knob Setup	
Click Sound OFF IN START/STOP Response Time Use > 1sec	−Turns the click sound on and off <sub>∫</sub> Sets the start/stop response time (Quick, > 1sec)
Type All Except START/STOP	Set the key lock type and release method. -• Type (All, Except START/STOP)
Release Type Key Password	<ul> <li>Release method (Key, Password)</li> </ul>
Password	<ul> <li>Password (up to 8 characters)</li> </ul>

### **Configuring Analysis Settings (Analysis Setup)**

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

Analysis	Setup		
Cursor Read Mode	Display	ACQ }	Sets • Dis
			• AC

#### the cursor read mode

play: Performs cursor measurement on P-P compressed display data Q: Performs cursor measurements on sampled data in acquisition

memory

### 24.8 Storing and Recalling Setup Data

This section explains how to store the PX8000 settings to the internal memory and how to recall settings from the internal memory.

► Features Guide: "Storing and Recalling Setup Data (Setup Data Store and Recall)"

### **UTILITY Store/Recall Menu**

Press UTILITY and then the Setup Data Store/Recall soft key to display the following menu.

Store/Recall	
No.	Specify the store/recall number (1-16)
2	specify the store/recail number (1-10).
2013/11/11 11:57:02	Date and time when the data was stored*
Comment	- Set comments.
Store Exec	Starts storing
Recall Exec	Starts recalling*
Clear	Clears the stored setup data*

\* This appears when data is stored in the internal memory at the specified store/recall number.

### 24.9 Locking the Keys

This section explains how to lock the panel keys, which prevents you from unintentionally changing the current state of the PX8000.

► Features Guide: "Key Lock (KEY PROTECT)"

### 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 PX8000 either.

### Message

Messages may appear on the screen during operation. This section describes the error messages and how to respond to them. With a few exceptions, you can display the messages in the language that you specify through the operations explained in section 24.4. 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 communications error messages. These messages are explained in the Communication Interface User's Manual (IM PX8000-17EN).

### Information

Code	Message	Chapter or Section
53	Initializing is in progress.	24.6
54	Initializing has been completed.	24.6
55	Undo is in progress.	24.6
56	Undo has been completed.	24.6
59	Calibration is running	24.1
60	Calibration is complete.	24.1
61	Media format is running.	22.2
62	Media format is complete.	22.2
64	File access is aborted.	_
65	Executed the firmware overwriting of the frequency module.	25.3
66	Overwriting firmware of the frequency module	25.3
67	Key response time is more than 1 second.	24.7
	Push it more than 1 second.	
68	Executed the firmware overwriting of the built-in parts.	25.3
69	Overwriting the built-in parts firmware.	25.3
70	Exit from GO/NO-GO mode.	Chapter 17
71	Image printing was aborted.	21.2
72	Completed action.	18.1
73	Aborted the search.	Chapter 19,
		section 20.2
74	Executed the search, but no record was found that matched the conditions.	Chapter 19,
-		section 20.2
75	Executed the search, but no record was found that matched the pattern.	Chapter 19,
		section 20.2
77	Aborted the statistical measurement.	14.2, 14.3
80	Input module configuration was changed. Relevant settings have been initialized.	Appendix 11*
84	Turned on pressing the RESET key. Will initialize.	Appendix 11*
85	The instrument is set to remote mode by the communication control. Press the SHIET + CLEAR TRACE key to change to local mode	_
86	Push 'Zoom Mag' knob or 'Zoom Position' knob when change a target window	12 1
87	Sensed the firmware version change	Appendix 11*
01	Will initialize.	
92	Be careful not to exceed a current supply limit value to use the power supply for a current sensor.	2.11**
94	Executing abort process. It takes a few seconds.	
96	Calibration failure of power measurement element has occurred.	24.1
	Power-supply frequency exceeded acceptable range for calibration.	

\* Features Guide, IM PX8000-01EN

\*\*Getting Started Guide, IM PX8000-03EN

Code	Message	Chapter or Section
97	The history has been cleared due to one of the following reasons.	1.1, 2.2, 2.4,
	- vuring was changed. - Element Independent was changed.	2.7
	<ul> <li>Ext Sensor for Current Module or sense type for Aux Module was changed.</li> <li>Executed "Elements Copy to" or "Aux Copy to".</li> </ul>	
98	A module, which accuracy is not guaranteed, is installed. Or pairs of modules, which accuracy is not	25.3
	guaranteed, is installed. Check modules on the overview display (UTILITY-Overview).	

### **File Errors**

Code	Message	Chapter or Section
500	File access failure.	
501	Invalid file name.	22.3,
	The name contains prohibited characters, or file name is duplicated.	chapter 24*
502	Pass name over maximum number of characters.	—
	Full pass name should under 255 characters.	
504	Out of disk space.	22.10
505	File not found. Check the file.	22.10
506	Duplicate file or directory name.	22.10
	Change the name.	
507	The file name is not set.	22.3
	Set the file name.	
508	Save data not found.	22.3, 22.6
	Check for presence of data and channel.	
509	File system failure.	<u> </u>
510	Cannot load this file format.	22.7
	Files stored on other models cannot be loaded.	
511	File is now being accessed.	—
512	Cappet be executed while running	4.2
512	Press the START/STOP key to stop acquisition	4.2
513	The specified file cannot be loaded on this Firmware version or this model	22.7
514	No ch is displayed.	22.3
	Turn ON the display of the appropriate channel.	
517	Unknown file format.	Chapter 22
518	Writing prohibited in the media.	_
	Unlock write protection of the media.	
519	Cannot save in this format at the current record length.	22.3
	Specify a range and save a section of the data.	
	* Cannot create a file of size 2 GB or larger.	
520	Media error.	22.1
521	Directory can not be deleted.	22.1
522	- The File which larger than 50 Mbyte	23.3
	- The File which is saved by HistoryAll format	
	Copy the file to the local drive before loading it.	
530	Assigned path does not exist.	Chapter 23
	Check the network setting and configuration.	
531	Assigned file does not exist.	Chapter 23
	Check the network setting and configuration.	
532	Assigned path does not exist.	Chapter 23
	Check the network setting and configuration.	
533	Writing prohibited in this file.	22.10
534	An error occurred while network access.	Chapter 23
525	Current net work conditions.	22.2
555	Set other nath while use action on trigger	22.3
	octourer paur while use action on trigger.	

\* Features Guide, IM PX8000-01EN

Code	Message	Chapter or Section
536	Destination path is same as source path, or sub folder of source path.	_
538	Module configuration is not matched, so it couldn't loaded.	22.7
	Configuration of saved data can see by File property.	
539	Module configuration is not matched, so it couldn't loaded.	22.7
	Configuration of saved data can see by File property.	
541	Cannot detect the medium.	22.1
	Check the presence of the medium.	
544	Cannot execute file operations or initialization while measure is in progress.	14.1
	To execute, wait for the end of measure or turn measure off.	
545	Data read error.	_
547	Cannot execute file operations or initialization while numeric calculations are in progress.	7.1
	To execute, wait for the end of numeric calculation or turn numeric off.	
548	Cannot load this bitmap file.	6.6, chapter 8*
	Use file of 16-bit color or 24-bit color mode with less or equal size 800x654.	
549	Cannot load this text file.	6.6, chapter 8*

\* Features Guide, IM PX8000-01EN

### **Printer Errors**

Code	Message	Chapter or Section
570	Close the printer cover.	21.1
571	Paper empty.	21.1
	Load a roll chart.	
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.	

### **Network Errors**

Code	Message	Chapter or
		Section
600	Unable to connect to the server.	Chapter 23
	Check the network settings and configuration.	
601	Has not connect with ftp server yet.	Chapter 23
	Confirm the network settings and connection.	
602	This ftp function in not supported.	_
603	FTP Error: Client Handle	Chapter 23
	Confirm the network settings and connection.	
604	Cannot send data to a network printer.	Chapter 23
	Confirm the network settings and connection.	
608	Failed to acquire time from SNTP server.	Chapter 23
	Confirm the network settings and connection.	

### Execution Errors (650 to 799)

Code	Message	Chapter or Section
650	Data is invalid.	_
651	The option is not equipped, so it cannot execute.	_
652	Undo is not possible since data that existed immediately before initialization is not available.	_
653	Can not be executed while running. Press START/STOP key to stop acquisition.	4.2
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.	24.1
660	If it fails again, servicing is necessary.	
000	Wait until output is completed.	
663	Cannot start.	
664	GO/NO-GO is available while trigger mode is - 'Single' or 'Normal'	3.1
000	- 'Auto' or 'AutoLevel' (Faster than 50ms/div)	44.0.44.0
000	Waveform data may be missing. If Cycle Statistics is specified, the instrument may be configured in a way that fails to detect the cycle.	14.2, 14.3
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.	—
672	Cannot be executed when the time base setting is to be an External clock.	4.1
674	Average practice can't be done because the record length of the history exceeds the record length that it can be carried out.	20.1
675	Average practice can't be done because the record length of the history exceeds the record length that it can be carried out.	20.1
677	Cannot do while selftest is executing.	25.2
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.	2.8, 3.1
680	Averaging mode is not possible when the trigger mode is Single, SingleN, or On Start. Change the trigger mode.	3.1
684	Cannot start when the time base set to external clock while the acquisition mode set to envelope.	4.1
686	Cannot be executed when the acquisition mode is set to average. Change the mode.	4.1
693	Cannot be executed when GO/NO-GO mode is Zone.	17.1
695	Set acquisition mode to Normal when using a wave window trigger.	4.1
696	The wave window trigger cannot be used if the sampling rate is faster than 500 kS/s or slower than 10 kS/s.	2.8
702	All search conditions are OFF. At least one condition should ON.	Chapter 19, section 20.2
703	Display setting of search source is OFF. Set it to ON.	8.1
704	Cannot execute Time search while T/div is faster than 100msec/div.	2.8
705	Cannot start Action mode while trigger mode is SingleN.	3.1
706	Cannot be executed when GO/NO-GO mode is ON. Set the GO/NO-GO mode to OFF.	Chapter 17
707	Cannot execute search while searched No. reached Maximum(1000).	
708	Cannot execute or set while AutoScroll processing. Stop AutoScroll.	12.1
712	Cannot start while No GO/NO-GO condition.	Chapter 17
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".	21.2
716	Set the Math and FFT Window to OFF to Start GO/NO-GO.	Chapter 15, section 16.1
717	Cannot abort this process.	

Code	Message	Chapter or Section
719	Cannot execute Time search when the time base setting is to be an External clock.	4.1
723	Cannot update null value.	24.2
	No measured value, calculated by numeric, is available to set.	
724	Calibration error occurred.	_
	Restart this machine.	
	If it occurred again, maintenance service is required.	
725	Cannot execute when GO/NO-GO traces contain an AUX channel with the sense type set to pulse.	2.4 to 2.6
726	Cannot execute when search trace contains an AUX channel with the sense type set to pulse.	2.4 to 2.6
727	Cannot execute when trigger sources contain an AUX channel with the sense type set to pulse.	2.4 to 2.6
728	Cannot execute or change while running.	4.2
	Press the START/STOP key to stop acquisition.	
729	No measurable channel.	_

### 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.	22.3
	- Over 32 characters.	
	- Include inhibit characters.	
	- Inhibit MS-DOS file name.	
	Enter an other file name.	
803	Cannot change this parameter while running.	4.2
	Press the START/STOP key to stop acquisition.	
804	Cannot change settings during GO/NO-GO.	Chapter 17
	Stop the GO/NO-GO (Stop the Acquire).	
805	Can not change display points with this T/div setting.	2.8
806	Cannot be changed when trigger A is not X.	3.8 to 3.10
	Set the state of the channel corresponding to condition A to 'X'.	
807	Cannot set while TimeSynchro setting not Off.	24.3
808	Cannot change when Channel Display is OFF or Math settings are invalid.	8.1, chapter
	Set the channel display ON or make appropriate Math settings.	15
809	Cannot change when External Clock is active.	4.1
810	Cannot change while running.	4.2
811	Illegal math expression.	15.5
	Input a correct computing equation.	
812	Cannot set this model	_
813	Cannot set anything other than Low Pass for a Gaussian filter.	15.5
	Change the Filter Type to another filter besides Gaussian.	
815	Cannot change settings during Action mode.	18.1
	Stop the Action.	
816	Cannot set the channels which do not have modules installed.	Chapter 2,
		section 25.3
81/	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.	4.1
820	The acquisition mode cannot be set in the current record length.	4.1
822	Cannot be configured or executed during the search operation.	Chapter 19
823	Cannot be configured or executed during the history search operation.	20.2
824	The record cannot be selected.	Chapter 20
825	History record does not exist.	Chapter 20
826	Cannot be configured or executed while computation is in progress.	20.1
	Aborted when history display mode is set to One.	
827	Cannot be configured or executed while updating the history all display.	20.1
	Aborted when history display mode is set to One.	

Code	Message	Chapter or Section
829	Zones cannot be edited in the following cases:	5.1, 8.1, 11.1,
	- When the main window is not displayed.	12.1, 16.1,
	- When the relevant waveform is not displayed.	17.1
830	The zone waveform does not exist.	17.1
832	Zones determination is not possible in the following cases:	5.1, 8.1, 11.1,
	- When the main window is not displayed.	12.1, 16.1,
	- When the relevant waveform is not displayed.	17.1
	- When the zone waveform does not exist.	
833	Processing statistics.	14.2
	To perform other operations, abort the statistical processing.	
834	The channel which couldn't be set up was specified.	_
835	Cannot be set when the acquisition mode is set to average.	4.1
836	Cannot be changed when VScale is SPAN.	8.1
838	It is an unacceptable parameter to set up to the present module.	*
840	Cannot be set to a range of 20 sec/div to 2 min/div during roll display.	2.8
842	Zooming is not available when the number of displayed points of the FFT waveform is less than 50 in the Zoom window.	12.1, 15.5, 16.1
846	P-P compression cannot be used to save when a record length is 1K.	_
852	Cannot set Math to OFE while FFT Window ON	16 1
853	Cannot select this trace because it already selected	_
855	Cannot change to such Record length while running	28.31
000	Set the trigger mode to Auto, decrease T/Div to less than 100 msec/div to enable roll mode, or set the	2.0, 0.1
050	trigger mode to Single or On Start.	
856	Cannot Display setting to ON.	_
050	This CH dian't acquisition to memory.	10.1
858	Cannot set while action mode is ON.	18.1
867	Cannot be specified when the print style is Numeric.	_
869	Cannot set while GO/NO-GO mode.	Chapter 17
	Turn OFF GO/NO-GO mode first.	
871	No effective channel for Math Setup.	_
872	No effective channel for History Search Setup.	_
874	Cannot set Save Range except 'Main' while PP-Comp save mode.	_
876	Cannot frame setting to ON, except Image format on JPEG.	21.3
877	Cannot set to display points under 100.	12.1
879	Cannot set GO/NO-GO mode while Math or FFT Window is ON.	Chapter 15, section 16.1
882	Cannot set while Single-N running.	3.1
890	Illegal math expression.	7.4
	Input a correct computing equation.	
891	Cannot simultaneously set current range when sense types differ.	2.2
	To copy or set ranges to other current channels, first unify sense type.	
892	Cannot set when current module types differ.	2.2
893	Cannot execute.	2.7
	Select copy destination channels(elements).	

\* Communication Interface User's Manual, IM PX8000-17EN

### System Errors (900 to 999)

Chapter or Section
2.3*
2.4*
_
7.9*
_

Code	Message	Chapter or Section
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.	2.12*
910	Key protect is enabled.	24.9
	To release the protection, press the PROTECT key or enter the password.	
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.	2.3*
	760811 should use in Slot 1,Slot 3,Slot 5,Slot 7.	
	760812 should use in Slot 2,Slot 4,Slot 6,Slot 8.	
	760813 should use in Slot 2, Slot 4, Slot 6, Slot 8.	
	760851 should use in Slot 3,Slot 5,Slot 7.	
	Slot 1 and slot 2 must be installed.	
915	It installed the module which cannot support by this machine. Or it installed the module which cannot be	2.3*
	used in the slot.	
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.	_
922	Internal hardware communication error has occurred.	_
923	An error has occurred in the power measurement element.	_
	Power off immediately.	
	Maintenance service is required.	
924	Unable to start because there is an error in the suffix code.	_
	Maintenance service is required.	

\* Getting Started Guide, IM PX8000-03EN

### Note\_

If servicing is required, first see if initializing the instrument fixes the problem.

### 25.2 Carrying Out Self-Tests (Selftest)

This section explains the following settings for testing whether the PX8000's keyboard, memory, SD card interface, and printer are functioning properly.

- Test type
- Executing tests

► Features Guide: "Self-Test (Self Test)"

### **UTILITY Self Test Menu**

Press UTILITY and then the Self Test soft key to display the following menu.

Self Test	
Self Test	-Sot the test type
Keyboard	Set the test type
Soft Key	
	1
Í	1
Test Exec	
	1

### Setting the Test Type (Self Test)

Press the Self Test soft key to display the following menu.



- Keyboard: Tests whether or not the front panel keys are operating correctly and whether or not the soft keyboard accepts input properly. They are operating properly if the background color of the keys that you press changes from red to another color. The soft keyboard is operating properly if you can enter the specified characters.
- Memory: Tests whether or not the internal CPU board RAM and ROM are operating properly. If they are operating properly, "Pass" appears. If an error occurs, "Error" appears.

SD Card:Tests whether the SD card interface is operating properly. If an error occurs, "Error" appears.Printer:Tests whether or not the optional built-in printer is operating properly. The built-in printer is

operating properly if the print density is correct. If an error occurs, the print density will not be correct.

### Keyboard Test

Self Test		
Set the test type to Keyboard	rd.	
Soft Key Soft keyboard test		Self Test All Clear
		Caps
,	A         B         C         D         E         []         (`) ~ SPACE         ENTER           F         G         H         J         <>         []         ^         ``         SPACE         ENTER           F         G         H         J         <>         []         ^`         ``         SPACE         ENTER           K         L         M         N         0         ''         ``         ``         7         8         7           N         D	<
	Image: Constraint of the second sec	>
		Back Space
Test Exec Execute a panel key test.		Enter
		🗟 History

### **Memory Test**

Self Test	
Self Test	Set the test type to Memory
Memory	Set the test type to memory.
Test Exec	Starts testing

**SD Card Test** 

# Self Test Self Test So Cerd Test Exec Starts testing

### **Printer Test**

Self Test	
Self Test	Set the test type to Printer
Printer	Set the test type to Printer.
Test Exec	- Starts testing
	1

### 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.
- Confirm whether or not 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.

### 25.3 Viewing System Information (Overview)

This section explains how to view the PX8000 system information.

► Features Guide: "Overview (Overview)"

### **Viewing System Information (Overview)**

Press UTILITY and then the Overview soft key to display the following screen.

	Overview	
-Model Serial No / Productl[	PX8000 RecordLe 91NA16947 / 7WGBCS2Z	ength 100Mpts/CH (MAC: <b>000664946084</b> )
-Slot Model 1: 760811 2: 760812 3: 760811 4: 760812 5: 760811 6: 760812 7: 760851 8: -	Serial No //Pair Serial No 91NA16819/91NA16867 91NA16867/91NA16919 91NA16921/91NA16869 91NA16921/91NA16869 91NA16822/91NA16870 91NA16822/91NA16870 91NA16870/91NA16922	Adjustment Date 2013/12/25 19:28:34 2013/12/25 19:28:34 2013/12/25 19:28:36 2013/12/25 19:28:36 2013/12/25 19:28:40 2013/12/25 19:28:40
-Options /M2 Memory e /B5 Built-in p /C20 IRIG interl /G5 Harmonic /P4 4 Probe 1 /PD 4ch Sensi -Default Language	xpansion 100Mpts/CH rinter ace Measurement sower outputs or Power Supply English	
-Information Firm Version FPGA1 Version FPGA2 Version	2.11 15/06/16 11:24 ACQ( 1.00.01, 20131209) WATT[260]( 0.00.20)	PCI( 1.00.01, 20131212) GDC(0.50) GD(0.38)

#### **Displayed Information**

Model, Record Length	Model and record length
Serial No / ProductID	Serial number and product number
Slot	Model and serial number of the module installed in each slot
Options	Installed options
Default Language	Default language
Information	Firmware and FPGA versions and other information

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