WT5000 Precision Power Analyzer USER'SMANUAL



IM WT5000-02EN 4th Edition

List of Manuals

Thank you for purchasing the WT5000 Precision Power Analyzer. This User's Manual explains how to use the WT5000. To ensure correct use, please read this manual thoroughly before operation. After reading this manual, keep it in a safe place. The following manuals, including this one, are provided as manuals for the WT5000. Please read all manuals.

Manual Title	Manual No.	Description
WT5000	IM WT5000-01EN	The supplied CD contains the PDF file of this manual.
Precision Power Analyzer		This manual explains all the instrument's features other
Features Guide		than the communication interface features.
WT5000	IM WT5000-02EN	This document. The supplied CD contains the PDF file
Precision Power Analyzer		of this manual. The manual explains how to operate
User's Manual		this instrument.
WT5000	IM WT5000-03EN	This guide explains the handling precautions and basic
Precision Power Analyzer		operations of this instrument.
Getting Started Guide		
WT5000	IM WT5000-17EN	The supplied CD contains the PDF file of this manual.
Precision Power Analyzer		The manual explains the instrument's communication
Communication Interface		interface features and instructions on how to use them.
User's Manual		
Model WT5000	IM WT5000-92Z1	Document for China
Precision Power Analyzer		

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

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

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

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 functions. 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.
- Copying or reproducing all or any part of the contents of this manual without the permission of YOKOGAWA is strictly prohibited.
- The TCP/IP software of this product and the documents concerning it have been developed/created by YOKOGAWA based on the BSD Networking Software, Release 1 that has been licensed from the Regents of the University of California.

Trademarks

- Microsoft and Windows are registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries.
- · Adobe and Acrobat are either registered trademarks or trademarks of Adobe Systems Incorporated.
- In this manual, the
 ß and TM symbols do not accompany their respective registered trademark or trademark names.
- Other company and product names are trademarks or registered trademarks of their respective holders.

Revisions

- 1st Edition: September 2018
- 2nd Edition: January 2020
- 3rd Edition: February 2021
- 4th Edition: September 2021

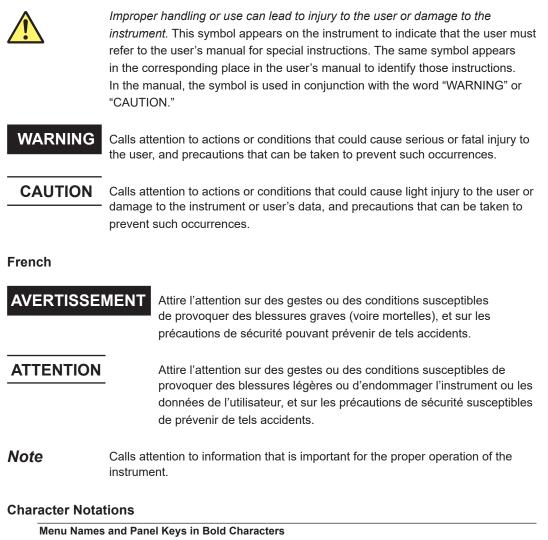
All Rights Reserved, Copyright © 2018 Yokogawa Test & Measurement Corporation

⁴th Edition: September 2021 (YMI)

Conventions Used in This Manual

Notes

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



Indicate controls such as menu commands, tabs, and buttons that appear on the screen and front panel keys

Prefixes k and K

Prefixes k and K used before units are distinguished as follows:

k	Denotes 1000. Example: 100 kHz
К	Denotes 1024. Example: 720 KB (file size)

Menu Icons

Menu Icon Types

You can control all the settings of this instrument using the *setup menu*, which is explained in chapter 1. Separate from the setup menu, dedicated icons are displayed for settings that are particularly used often. These icons are referred to as *menu icons* in this manual.

When you tap a menu icon, related settings are displayed in the sub menu area (Small menu*). Therefore, when you use a menu icon, you can change the settings while viewing the measurement.

* The Small menu is displayed on the right side of the screen. It can be used to configure or execute operations while viewing the measurement results on the screen.

Setup Display	 Setup icon Use this icon to display the setup menu. This is the same operation as the SETUP key. (See chapter 1.) Display icon Use this icon to change the display format of the screen.
<u>∓</u> Range	- Range icon Use this icon to set the voltage range and current range (including the external current sensor).
UpdateRate Averaging	 Update Rate/Averaging icon Use this icon to set the data update interval and averaging.
Filter	Filter icon Use this icon to set the line filter and frequency filter.
Store Data Save	Store/Data Save icon Use this icon to store data and save data.
Integration	Integration icon Use this icon to control the integration feature and set the integration conditions. When you set the measurement mode (see section 1.1) to "IEC Flicker (voltage fluctuation/flicker measurement)," the icon changes to Flicker.
Misc	 Misc icon Use this icon to execute measurement hold, single measurement, null feature, and zero-level compensation. For the null feature and sensor correction, you can set the conditions.

Note.

Some features are disabled when the measurement mode (see section 1.1) is set to IEC harmonic measurement (IEC Harmonic) or voltage fluctuation/flicker measurement (IEC Flicker). The menu icons of disabled features appear dimmed. Menus will not appear even if you tap dimmed icons.

Display Icon Use this icon to change the display format of the screen.



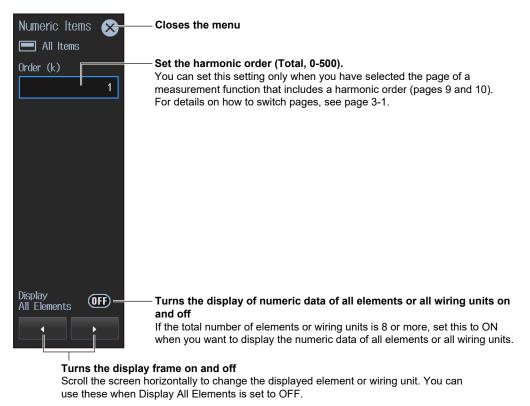
Display Menu

⁻Closes the menu
Shows only the numeric or graphic screen in a single screen or splits the screen
into top and bottom halves and shows the selected screen in each half. (See sections 3.1 or 6.1.)
-Set the numeric display format (All Items, 4 Items, 8 Items, 16 Items, Matrix, Hrm List Single, Hrm List Dual, User).
Set how many measurement results to display in a single screen. Hrm List Single and Hrm List Dual are harmonic list displays (see section 5.2). If you select User, set the numeric value position, color, and so on according to the loaded background
-Switches the displayed page (Page Up/Page Down)
Switches the numeric data screen shown in each display format.
This is the same as tapping \blacktriangle and \blacktriangledown on the measurement display screen (see section 3.2).
- Switches the displayed items Switch the measured values (measurement function) shown in the screen.
Selects the display page to switch (Hrm List Single or Hrm List Dual)
Header: Switches the pages in the measurement function display area
List: Switches the pages in the harmonic data display area (See section 3.1.)
Set the graph display format (Wave, Trend, Bar, Vector) (see sections 6.2 to 6.5).
-Switch the displayed group (Group1 to Group4)(see sections 6.2 to 6.5).
-Switches the graph display items (see sections 6.2 to 6.5)
Select the voltage, current, or other graph to show on the screen.
-Set the display format (see sections 6.2 to 6.5). Set the divisions and time scale of the graph screen.
Displays trend values (see section 6.3)
Displays the current trend values. You can set this when the graph display format is Trend.
Cursor measurement (see chapter 12)

Register the custom display (see section 3.8).

Switching the Displayed Items (Item)

On the All Items Display



Note.

On the All Items display, you cannot select individual displayed 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 the previous page).

On the 4-, 8-, and 16-Value Displays

Numeric Items 🗙	— Closes the menu
💻 4 Items	
Item No.	 Select the displayed item number. On the 4-, 8-, and 16-value displays, the number increases from the upper left to the lower right of the screen. You can also tap the measurement display screen (see page vii).
Urms 🔫	— Set the displayed item.
Element/S	Set the displayed measurement function (see section 3.1).
Element 1 🔫	— Selects the input element or wiring unit to be configured
Order (k)	
Total	Selects the harmonic order to be set This is for the harmonic display (see section 5.2).
🗹 Reset Items 🗕	Resets the displayed items. (See page vii.)

On the Matrix Display

Numeric Items 🗴	– Closes the menu
Matrix	
Item No.	 Select the displayed item number (displayed row). The number increases from top to bottom on the matrix display. Example: If you select 3, the third row from the top is displayed. You can also tap the measurement display screen (see page vii).
Urms 🖛	 Set the displayed item. Set the displayed measurement function (see section 3.1).
Order (k)	
Total	 Selects the harmonic order to be set This is for the harmonic display (see section 5.2).
🗗 Reset Items 🗕	— Resets the displayed items. (See page vii.)
🛃 Column 🗕	 Configure the columns to display. Set the number of columns to display the matrix. (See section 3.1.)

On the Hrm List Single or Hrm List Dual Display

Numeric Items 🗙	– Closes the menu
Hrm List	
List Item No.	 Select the displayed harmonic data column. This is for Hrm List Dual. Select 1 (left column) or 2 (right column). You can also tap the measurement display screen (see page vii).
U 🗲 Element/S	- Set the displayed item. Set the displayed measurement function (see section 3.1).
Element 1 💌	[–] Selects the input element (Element1 to Element7) or wiring unit (ΣΑ, ΣΒ, ΣC) to be configured

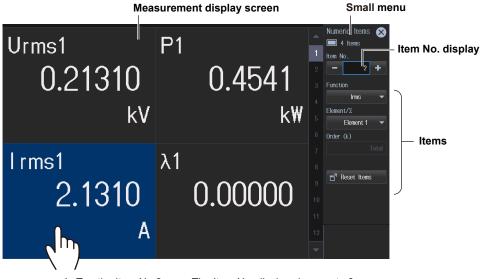
Note_

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 displayed item.

Selecting the Displayed Item Number or Displayed Harmonic Data Column

While you are changing the displayed items, you can select the displayed item or displayed harmonic data column you want shown by tapping the measurement display screen directly with an Small menu shown.

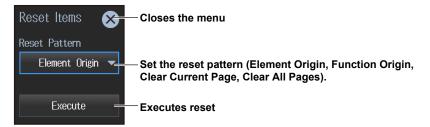
This is the same operation as selecting the displayed item number (on the 4-, 8-, and 16-value displays and matrix display) and selecting the displayed harmonic data column (on the Hrm List Single or Hrm List Dual display).



1. Tap the Item No.2 area. The Item No. display changes to 2.

2. Set the items (e.g., function).

Resetting the Displayed Items



Range Icon

Use this icon to set the voltage range and current range (including the external current sensor).



Range Menu

Range 🔀	– Closes the menu	
ΣA ΣB No Wiring ΣC		
Elements 1 2 3		
4 5 6	Selects the element to be configured in the select selects the element to be configured in the select se	red
7		
Voltage Range Auto 1000V (1500Vdc) OFF	 Selects the voltage range (see section 2.2) 	When the input element is a 760903 current sensor element
Current Range Auto 30A OFF Ext Sensor OFF	 Selects the current range (see section 2.2) 	Current Range Auto
🗗 Sensor 🗕	 Configure the external current set 	nsor.
🛃 Advanced —	 Advanced measurement range se 	ttings (see section 2.5)

Configuring the External Current Sensor

Т	Turns the external current sensor on and off Closes the menu					menu		
Sensor			e input eler 1 or 760902		When is 760	the input e 903	lement 🛞	
	Element 1 30A	Element 2 30A	Element 3 30A	Element 4 5A	Element 5 5A	Element 6 CS	Element 7 CS	
Ext Sensor		(IFF)	OFF	OFF	(OFF)			
Sensor Preset	🗕 Others 🔻					be connec measurem	rrent sensor to cted to the curr nent terminal (s	ent
Sensor Ratio [mV/A (mQ)]	L 10.0000	10.0000	10.0000	10.0000	10.0000	section 2.	2).	
Terminal	Set the sen	sor convers		1		Sensor 🔻	Probe 🔻	
CT Preset Th	ne sensor cor	version ratio	preset is cu	irrently not a	vailable.	Custom 🔻	-	
Input Resistance					_	1Ω ~	-	
Probe Preset					-		Custom 🔻	
Output Voltage Rate [V/A]	_	_	_	_	_		1.0000	

Update Rate/Averaging Icon Use this icon to set the data update interval and averaging.



Update Rate/Averaging Menu

Update Rate menu

Update Rate	– Closes the menu
Fast Slow ■ 500ms ▼ ■	- Set the data update interval (for the parameters, see section 2.10).
Measurement Method Digital Filter Average Response	- Set the measurement method (for the parameters, see section 2.10).
Mid (≥ 10Hz) –	 Set the response (for the parameters, see section 2.10). You can use this when the computing method is set to digital filter average.
⊡ 1 Advanced —	 Advanced data update interval and averaging settings For details on the data update interval, see section 2.10. For details on averaging, see section 2.13.
Averaging (IFF) =	– Turns averaging on and off
Averaging Type Exp Averaging Count	- Set the averaging type (for the parameters, see section 2.13).
	 Set the attenuation constant or average count (for the parameters, see section 2.13).

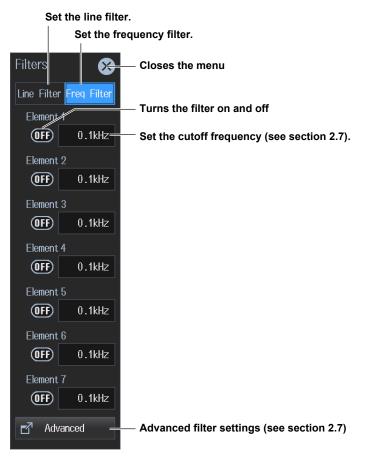
Averaging menu

Filter Icon

Use this icon to set the line filter and frequency filter.



Filter Menu



This instrument has three measurement modes (see section 1.1). A filter menu is displayed according to the measurement mode. Shown above is the menu for normal measurement mode.

Store/Data Save Icon

Use this icon to store data and save data.



Store/Data Save Menu

Store menu	
Store 🔀	– Closes the menu
User	 Storage destination drive
Rec	 Starts storage Storage starts according to the specified storage mode (see section 7.1).
🔢 Pause —	 Pauses storage Storage is temporarily paused. Tap REC to resume storage.
End -	 Ends storage Storage stops, and the storage state is reset. Writing the stored data to the file is completed, and the file is closed.
Advanced	Configure storage (see sections 7.1 to 7.3).
Data Save	
Vumeric	- Save destination drive
🖌 Wave	- Select the data you want to save.
Mage	Data whose check box is selected will be saved.
Save Exec	- Starts saving
Advanced	- Configure data saving (see sections 8.2 to 8.4).

bata Save menu

Integration Icon

Use this icon to set integration conditions.



Integration Menu

Integration 🔀	- Closes the menu
Independent ON	- Turns independent computation on and off
Element Objects 🔽 1 🔽 2 🔽 3	 Select the input elements that you want independent computation to be performed on. You can set this when independent computation is set to on.
<mark>✓</mark> 4 <mark>✓</mark> 5 <mark>✓</mark> 6	
7	 Collectively selects input elements to perform independent computation on. All ON: All input elements will be selected. All OFF: All input elements will be unselected.
🕨 Start 🗕	 Starts integration Integration starts according to the specified integration conditions (see section 4.1). The START key in the INTEGRATION area turns on.
II Stop —	 Stops integration Integration stops automatically according to the specified integration conditions. The START key in the INTEGRATION area turns off, and the STOP key turns on.
Reset —	 Resets the integration time and integrated value. All integration data is deleted, and the no-data display, "," appears. The STOP key in the INTEGRATION area turns off.
🛃 Advanced 🗕	Set integration conditions (see section 4.1).

When you set the measurement mode (see section 1.1) to "IEC Flicker," the Integration icon changes to the Flicker icon. See the next page.

Measurement of dmax caused by manual switching

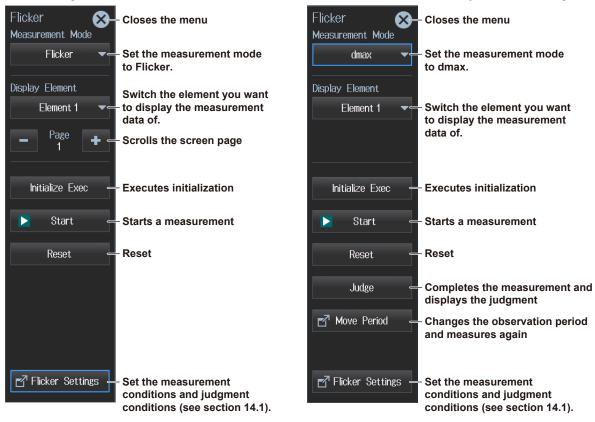
Flicker Icon

Use this icon to execute voltage fluctuations/flicker measurements.



Flicker Menu

Normal voltage fluctuation/flicker measurement



IM WT5000-02EN

Misc Icon

Use this icon to execute measurement hold, single measurement, null feature, and zero-level compensation. For the null feature and sensor correction, you can set the conditions.



Misc Menu

8	- Closes the menu
Hold OFF Single	 Executes the holding of measured values (OFF, ON) When holding is in progress, the HOLD key illuminates.
Execute —	 Executes single measurement You can execute this once while holding is in progress.
Null OFF	 Enables or disables the null feature (OFF, ON) While the null feature is enabled, the NULL key illuminates.
Advanced —	⁻ Configure the null feature (see section 11.1).
Cal Execute	- Executes zero-level compensation (Cal) (see section 11.2)
Sensor Correction	- Set the sensor correction (see section 2.6).

Contents

List of Manuals	i
Conventions Used in This Manual	. ii
Menu Icons	iii

Chapter 1 Setup Menu

1.1	Setting the Measurement Mode	1-1
1.2	Input Settings Overview	1-2
1.3	Computation and Output Settings Overview	1-9
1.4	Utility Settings Overview	1-15
1.5	Saving, Loading, and Initializing Setup Data	1-21
1.6	Current Sensor Setup Menu	1-24

Chapter 2 Setting Basic Measurement Conditions

2.1	Setting the Wiring System	2-1
2.2	Setting the Voltage Range and Current Range	2-3
2.3	Configuring the Current Sensor	2-9
2.4	Setting the Voltage Transformer (VT) and Current Transformer (CT) Ratios	2-13
2.5	Setting the Valid Measurement Range	2-15
2.6	Setting the Sensor Correction	2-20
2.7	Setting the Line Filter and Frequency Filter	2-21
2.8	Set the Measurement Period	2-27
2.9	Setting the Crest Factor	2-29
2.10	Setting the Data Update Interval	2-30
2.11	Setting the Efficiency Equation	
2.12	Setting the Delta Computation	2-33
2.13	Setting Averaging	
2.14	Master/slave Synchronous Measurement	2-35

Chapter 3 Power Display (Numeric Display)

3.1	Setting the Display Format	3-1
3.2	Displaying the Voltage, Current, Active Power, and Power Factor	3-9
3.3	Displaying Apparent Power, Reactive Power, and Corrected Power	3-11
3.4	Displaying the Phase Difference And Frequency (Voltage and Current)	3-14
3.5	Displaying Computed Values (Values and Events)	3-17
3.6	Holding the Maximum Values	3-22
3.7	User Display	3-25
3.8	Custom Display	3-28

Chapter 4 Integrated Value Measurement (watt hours and ampere hours) 4.1 Setting Integration Conditions

	i i	 ,
4.1	Setting Integration Conditions	 4-1
4.2	Displaying Integrated Values (numeric display)	 4-6

Chapter 5 Harmonic Measurement

5.1	Setting Harmonic Measurement Conditions	5-1	1
5.2	Displaying Harmonic Measurements (numeric display)	5-3	3

Contents			
Chapter 6	Grap	oh Display	
•	6.1	Setting the Display Format	6-1
	6.2	Waveform Display	
	6.3	Trend display	
	6.4	Bar Graph Display	6-11
	6.5	Vector Display	
Chapter 7	Stor	ing Numeric Data	
	7.1	Setting the Storage Operation	7-1
	7.2	Setting Stored Items	7-6
	7.3	Setting the Data Storage Destination	7-8
	7.4	Starting (Rec), Pausing (Pause), and Ending (End) Storage	
Chapter 8	Savi	ng Numeric Data, Waveform Data, and Screen Images	
	8.1	Connecting a USB Memory Device	8-1
	8.2	Setting the Save Destination for Numeric Data, Waveform Data, and Screen Im	ages 8-3
	8.3	Setting the Numeric Data Items to Save	8-6
	8.4	Setting the Format of Saved Screen Images	8-8
	8.5	Saving Numeric Data, Waveform Data, and Screen Images	8-10
	8.6	File Operations	8-12
Chapter 9	Moto	or Evaluation and Auxiliary Input (Option)	
	9.1	Configuring Motor Evaluation and Auxiliary Input Settings	
	9.2	Displaying the Motor Evaluation (numeric display)	
Chapter 10	Hold	ling Measured Values and Performing Single Measureme	nts
	10.1	Holding Measured Values	
	10.1	Single Measurement	
Chapter 11	Null (Cal) 11.1 11.2	Feature (DC offset cancelation) and Zero-Level Compense Configuring, Enabling, and Disabling the Null Feature Zero-Level Compensation (Cal)	11-1
Chaptor 12	Cure	sor Measurement	
Chapter 12	12.1	Cursor Measurement on Waveforms	12_1
	12.1	Cursor Measurement on Trends	
	12.3	Cursor Measurement on Bar Graphs	
			12-0
Chapter 13		orming IEC Harmonic Measurements (Option)	12.1
	13.1	Setting IEC Harmonic Measurement Conditions	
Chapter 14		Voltage Fluctuation/Flicker Measurement (Option)	
	14.1	Configuring IEC Voltage Fluctuation/Flicker Measurements	
	14.2	Executing IEC Voltage Fluctuation/Flicker Measurements	14-3
Chapter 15	Ethe	rnet Communication	
	15.1	Connecting the Instrument to a Network	
	15.2	Configuring the TCP/IP Settings	
	15.3	Accessing the Instrument from a PC (FTP Server)	
	15.4	Web Server Feature	
	15.5	Connecting to a Network Drive	
	15.6	Setting the Date and Time via SNTP	15-9

Contents

Chapter 16	Utilit	y .	
-	16.1	Remote Control	16-1
	16.2	Configuring the D/A Output (option)	16-3
	16.3	Configuring the IEEE 1588 Time Synchronization	16-4
	16.4	Setting the Message, Menu, and USB Keyboard Languages	16-6
	16.5	Setting the Screen Brightness and Turning the Screen Off	16-7
	16.6	Environment Settings (Preference)	16-8
	16.7	Self-Test	16-9
	16.8	Displaying the Message Log	.16-11
	16.9	Viewing the Instrument Information and Current Sensor Status	16-12
	16.10	Locking the Touch Panel and Front Panel Operations	. 16-14
Appendix			
	Appen	dix 1 Messages and Corrective Actions	App-1

Index

1.1 Setting the Measurement Mode

This instrument has the following measurement modes. Configure various settings according to the measurement mode.

Normal measurement (Normal)

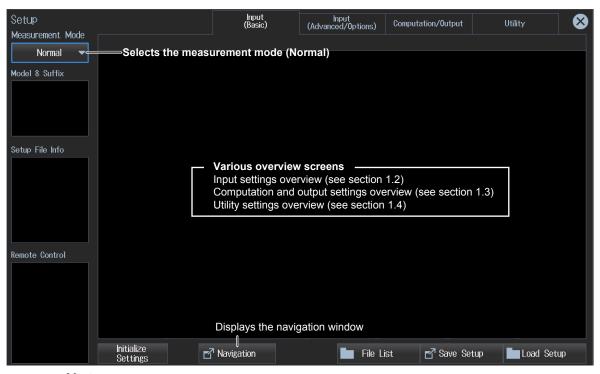
This mode has settings required for normal power measurements and a setup menu for common features. The settings required for power measurements are also used in IEC harmonic and voltage fluctuations/flicker measurements when necessary.

- IEC Harmonic measurement (IEC Harmonic) This mode has a setup menu for IEC harmonic measurements. See chapter 13.
- IEC Voltage fluctuation/flicker measurement (Flicker)
 This mode has a setup menu for IEC voltage fluctuation/flicker measurements. See chapter 14.



Measurement Mode (Measurement Mode)

1. Tap the Setup icon 🔅, or press MENU under SETUP. The setup menu screen appears.



Note.

You can also display the setup menu screen from the navigation window that appears immediately after power-on.

Navigation window



1.2 Input Settings Overview

The settings applied to the input elements and wiring units that are installed in this instrument are shown in table format. You can control all the settings from this overview screen.

SETUP	
MENU	SAVE LOAD

Input Settings (Basic) Overview (Input (Basic))

- 1. Tap the Setup icon 🔅 , or press MENU under SETUP.
- 2. Tap the Input (Basic) tab. An input settings (basic measurement conditions) overview screen appears.

Pressing ESC closes the overview screen.

Input (Basic) tab Input (Basic) \otimes Input (Advanced/Options) Computation/Output Utility Element 2 30A Element 3 30A Element 4 5A Element 5 5A Element 6 CS Element 7 Element 1 30A CS Wiring Wiring Wiring Wiring Wiring Wiring Wiring 1P2W 1P2W 1P2W 1P2W 1P2W 1P2₩ 1P2W Voltage Voltage Range Voltage Rar Voltage Rang Voltage Voltage Range Voltage Range Range 1000V 1000V 1000V 1000V 1000V 1000V 1000V Current Range 30A Current Range Current Range Current Range Current Range Current Range Current Range 5A 5A 30A 30A 1A 1A CT Preset Ratio [mV/A] Ratio [mV/A] Ratio [m∀/A] Ratio [mV/A] Ratio [m∀/A] Custom Custom Scaling Scaling Scaling Scaling Scaling Scaling Scaling ON ON ON ON ON ON VT Ratio 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 CT Ratio 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 SF Ratio 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 Line Filter 🛛 🛛 🔊 Line Filter 🛛 💽 Line Filter **ON** Cutoff Line Filter OFF Line Filter Line Filter 🛛 Line Filter 🛛 💽 Cutoff Cutoff Cutoff Cutoff Cutoff Cutoff 0.5kHz 0.5kHz 0.5kHz 0.5kHz 0.5kHz 0.5kHz Freq Filter 🛛 Freq Filter 🛛 Freq Filter 💽 Freq Filter 🛛 Freq Filter 🛛 Freq Filter 🛛 Freq Filter Cutoff Cutoff Cutoff Cutoff Cutoff Cutoff Cutoff 0.1kHz 0.1kHz 0.1kHz 0.1kHz 0.1kHz 0.1kHz 0.1kHz Sync Source 14

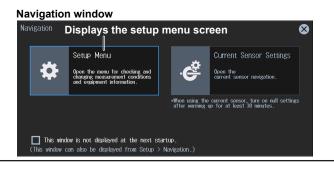
When the input element is 760901 or 760902

When the input element is 760903

Shows the settings of Element1 to Element7 You can also set the input element items.

Note.

- You can also display the input settings overview screen by moving the cursor on the Input (Basic) tab using the arrow keys and then pressing SET.
- You can also display the setup menu screen from the navigation window that appears immediately after power-on.



Configuring Input Elements

You can edit settings by tapping the setting buttons in each input element area of the overview screen.

When the input el	lement is 760901 or 760902	When the input element is 760903
Element 1 30A		Element 6 CS
Wiring 1P2W	Set the wiring system (see section 2.1)	Wiring 1P2W
Voltage Range 1000V	Set the voltage range (see section 2.2)	Voltage Range 1000V
Current Range 30A	Set the current range (see section 2.2).	Current Range
Ratio [m∀/A]	Configure the current sensor (see section 2.2). — • "Current Measurement Terminal (Terminal)" in the	CT Preset Custom
Scaling ON VT Ratio 1.0000	Configure the external current sensor (see section 2.3). • "External Current Sensor On/Off (Ext Sensor)" in the	e features guide
CT Ratio 1.0000 SF Ratio 1.0000	Set the voltage transformer (VT) and current transformer (C (see section 2.4). ► "Scaling (Scaling)" in the features g	
Line Filter ON Cutoff0.5kHz	Configure the line filter and frequency filter settings (see se • "Line Filter (Line Filter)" in the features guide	ction 2.7). Ction 2.7). Ction 2.7).
Freq Filter OK Cutoff0.1kHz	Configure the line filter and frequency filter settings (see se • "Frequency Filter (Freq Filter)" in the features guide	0.1kHz
Sync Source	Set the sync source (see section 2.8). • "Measurement Period (Sync Source)" in the features	_Sync Source

Note.

You can also edit the settings by moving the cursor on each setting button using the arrow keys and then pressing SET.

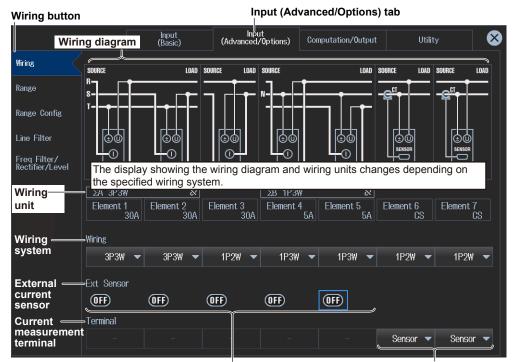
Input Settings (Advanced) Overview (Input (Advanced/Options))

- 1. Tap the Setup icon 🔅 , or press MENU under SETUP.
- 2. Tap the Input (Advanced/Options) tab. An input settings (advanced/options) overview screen appears.

Pressing **ESC** closes the overview screen.

Advanced Wiring System Settings (Wiring) **b** section 2.1

3. Tap Wiring. An advanced wiring system setup screen appears.



When the input element is 760901 or 760902

When the input element is 760903

Common Measurement Range Settings (Range)

▶ section 2.1, 2.3, 2.9

3. Tap Range. A setup screen appears for common measurement range items.

Range button			ivanced/Options) tai)	
	Input (Basic)	Input (Advanced/Options)	Computation/Output	Utility	
at t	Crest factor	Range	Σlink		
Wiring	(see section 2.9)	(see sec	tion 2.1)		
Range	Crest Factor	Range Σ Link	_		
Range Config	CF3 👻	⊗ OFF •			
Line Filter	Current Range Display Format				
Freq Filter/ Rectifier/Level	Direct 👻				
Null	Current range display fo (see section 2.3)	ormat			
Motor/Aux					
Sensor Correction					

In must (A duran a a d)(Omtion a) tak

Measurement Range Configuration Settings (Range Config) section 2.5

ange config button			Input (A	dvanced	/Options) t	ab	
Switches between	Input (Basic)	(Ad	Input vanced/0ptions)) Computa	ation/Output	Utility	
voltage and current							
Voltage	ΣΑ 3Ρ3₩	8] [∑B 1P3₩	8		
ange	Element 1	Element 2		Element 4	Element 5	Element 6	Element 7
Current	30A	30A Current	30A Iy specified	5A Lvalid me		CS tranges	CS
ange Config			iy specified		asuremen	t ranges	
	1000V	1000V	1000V	1000V	1000V	1000V	1000V
ine Filter	600V	600V	600V	600V	600V	600V	600V
reg Filter/	300V	300V	300V	300V	300V	300V	300V
ectifier/Level	150V	150V	150V	150V	150V	150V	150V
ull 🖊 🔑	100V	100V	100V	100V	100V	100V	100V
Valid	. 60V		60V				
lotor/Aux Measuremen Range	[30V The	305	und of the s	- <u>3</u> UV		308	
ensor Button for			ek over-rar	ige occur	s (Peak Ov	ver Jump)	is 15V
displaying the	valid ov	played in					
measurement		Measu	rement rang	101	104	101	
setup screen	3V	3V	3V	3∀	3V	3V	34
Specify the measurer when a peak over-ran		to switch	to ^{1.5V}				
Peak Over Jump	OFF 🖵	OFF 🔻	300V 🗸	OFF 🔻	OFF 🔻	OFF 🔻	OFF ·

3. Tap Range Config. A measurement range configuration setup screen appears.

Line Filter Settings (Line Filter) **>** section 2.7

3. Tap Line Filter. A line filter setup screen appears. The following screen is an example when Advanced Settings are on. You can set the HFR, AAF, DLF (N) and DLF (H) filters separately.

ine Filter but	tton		In	put (Advance	d/Options)) tab	
		Input (Basic)	Inpu (Advanced,	/Options) Compu	itation/Output	Utility	E E
ni ilg Cange	rns the adva Line Filter Advanced S Iter type — Line Filter	ettings 🧿	e filter settings	on and off	AAF		Normal Measurement Harmonic Measurement
_ine Filter		HFR	A AF		F(N)		F(H)
Freq Filter/ Rectifier/Level	All	HF Rejection	Anti-Aliasing Filter (1MHz/Bessel)	Digital Line Filter (Normal)	Cutoff	Digital Line Filter (Harmonics)	Cutoff
lull	Element 1				0.5kHz		0.5kHz
otor/Aux	Element 2				0.5kHz		0.5kHz
ensor orrection	Element 3				0.5kHz		0.5kHz
	Element 4				0.5kHz		0.5kHz
	Element 5				0.5kHz		0.5kHz
	Element 6				0.5kHz		0.5kHz
	Element 7				0.5kHz		0.5kHz
	HF Rej	ection	Anti-aliasing filter	Digital line f (for normal measureme		Digital line (for harmo measurem	nic

Frequency Filter, Rectifier, and Cross Level Settings (Freq Filter/ **Rectifier/Level**) sections 2.7, 2.8

3. Tap Freq Filter/Rectifier/Level. A frequency filter setup screen appears.

Frequency Measurement Filter Settings for the Sync Source (Voltage/Current Signal) (Sync Source/Freq Measurement)

The following screen is an example when Freq Filter Advanced Settings are on. You can set the HPF, Rectifier, LPF, and Level separately.

ur	ce/Frea	Input (Basic)		Input					
ur	ce/Frea		(A)	dvanced/0pt	ions) C	omputation/Ou	tput	Utility	
	1	Measurei	nent buti	ton					Owne One
		Source/ asurement	Freq2 Me	asurement	U —				Sync Src FreqU
	Freq Filter		n frequ	ency filt	er । —			Level	Sync Src Freql
			HPF				LPF	. <u>,/f\</u> .	Level
	All	Freq Filter	Cutoff	Voltage	Current	Freq Filter	Cutoff	Voltage	Current
A	Element 1		0.1Hz				0.1kHz	0.0%	0.0%
	Element 2		0.1Hz				0.1kHz	0.0%	0.0%
	Element 3		0.1Hz				0.1kHz	0.0%	0.0%
в	Element 4		0.1Hz				0.1kHz	0.0%	0.0%
	Element 5		0.1Hz				0.1kHz	0.0%	0.0%
	Element 6		0.1Hz				0.1kHz	0.0%	0.0%
	Element 7		0.1Hz			, 💽	0.1kHz	0.0%	0.0%
	ΣA	Freq Mea Freq Filter Advanced S All Element 1 Element 2 Element 3 Element 4 Element 5 Element 6	Freq Measurement Advanced Settings Advanced Settings Advanced Settings All Freq Filter Freq Filter Freq Filter Element 1 ON Element 2 ON Element 3 ON Element 4 ON Element 5 ON Element 6 ON	Freq Measurement Freq 2 Merger Freq Filter Turn freque Advanced Settings Settings All Image: Constraint of the setting setting Settings All Image: Constraint of the setting setting Setting setting All Image: Constraint of the setting setting Setting setting Element 1 Image: Constraint of the setting setting Setting setting Element 2 Image: Constraint of the setting setting Setting setting Element 3 Image: Constraint of the setting setting setting Setting setting Element 4 Image: Constraint of the setting setting setting Setting setting Element 5 Image: Constraint of the setting set	Freq Measurement Freq2 Measurement Freq Filter Advanced Settings Turns the adv frequency filt settings on an interpretent settings All Image: Constraint setting setti	Freq Measurement Freq2 Measurement Freq Filter Turns the advanced frequency filter I settings on and off Advanced Element 1 All Freq Filter Freq Filter Cutoff Voltage Current Element 1 ON Element 2 ON Element 3 ON Element 4 ON Element 5 ON Element 6 ON	Freq Measurement Freq Z Measurement Freq Z Measurement Freq Filter Advanced Freq Filter Advanced Settings Turns the advanced frequency filter I advanced Settings on and off All L HPF Rectifier Rectifier All Freq Filter Cutoff Voltage Current Freq Filter Element 1 ON 0.1Hz ON ON ON ON Element 3 ON 0.1Hz ON ON ON ON Element 4 ON 0.1Hz ON ON ON ON Element 5 ON 0.1Hz ON ON ON ON Element 6 ON 0.1Hz ON ON ON ON	Freq Measurement Freq Pilter Advanced Settings Rectifier I PF Turns the advanced Advanced Settings on and off Freq Filter Advanced Settings on and off All Image: Colspan="4">Image: Colspan="4">Rectifier Image: Colspan="4">Image: Colspan="4">Image: Colspan="4">Image: Colspan="4">Image: Colspan="4">Image: Colspan="4">Rectifier Image: Colspan="4">Image: Colspan="4" Image: Colspan="4" Image: Colspan="4" <t< td=""><td>Freq Measurement Freq 2 Measurement i erei Turns the advanced HPF i erei i erei All Image: colspan="4">Image: colspan="4">i erei i erei All Image: colspan="4">Image: colspan="4">i erei i erei All Image: colspan="4">i erei i erei Image: colspan="4">i erei i erei i erei All Image: colspan="4">i erei i erei i erei All Image: colspan="4">i erei i erei i erei Element 1 ON 0.1Hz ON ON ON 0.1KHz 0.0% Element 2 ON 0.1Hz ON ON ON ON 0.1KHz 0.0% Element 3 ON 0.1Hz ON ON ON ON 0.1KHz 0.0% Element 4 ON 0.1Hz ON ON ON ON 0.1KHz 0.0% Element 5 ON 0.1Hz ON ON ON ON</td></t<>	Freq Measurement Freq 2 Measurement i erei Turns the advanced HPF i erei i erei All Image: colspan="4">Image: colspan="4">i erei i erei All Image: colspan="4">Image: colspan="4">i erei i erei All Image: colspan="4">i erei i erei Image: colspan="4">i erei i erei i erei All Image: colspan="4">i erei i erei i erei All Image: colspan="4">i erei i erei i erei Element 1 ON 0.1Hz ON ON ON 0.1KHz 0.0% Element 2 ON 0.1Hz ON ON ON ON 0.1KHz 0.0% Element 3 ON 0.1Hz ON ON ON ON 0.1KHz 0.0% Element 4 ON 0.1Hz ON ON ON ON 0.1KHz 0.0% Element 5 ON 0.1Hz ON ON ON ON

Frequency filter Voltage/current Frequency filter (HPF)

signal rectifier (LPF) Voltage/current cross level

Second Frequency Measurement Filter Settings (Freq2 Measurement)

Freq Filter/Rectifier/Level button Freq2 Measurement button

Wiring Range Range Config		Sync S Freq Mea		asurement U		1 Freg21
Line Filter				HPF		Level
Freq Filter/ Rectifier/Level		All	Freq Filter (Freq2)	Cutoff	Voltage Level (Freq2)	Current Level (Freq2)
Null	ΣA	Element 1		0.1Hz		
Motor/Aux		Element 2		0.1Hz		
Sensor Correction		Element 3		0.1Hz		
	ΣB	Element 4	OFF		0.0%	0.0%
		Element 5	OFF		0.0%	0.0%
		Element 6	OFF		0.0%	0.0%
		Element 7	OFF	0.1Hz	0.0%	0.0%

Second frequency filter (HPF)

Cross level of the second voltage/current frequency

Null Feature Settings (Null) Section 11.1

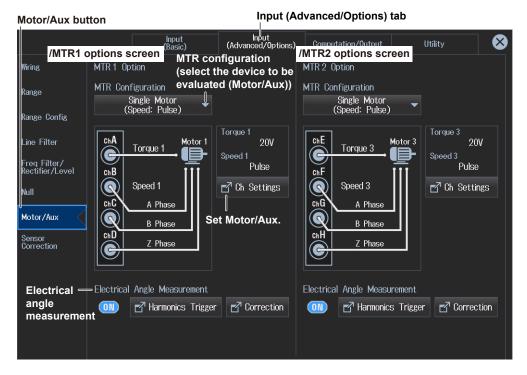
3. Tap Null. A null feature setup screen appears.

Null button		Input (Advanced/Opti	ons) tab
	Input (Basic)	Input (Advanced/Options) Computation/O	For motor/Aux
Wiring	Voltage For voltage	Current For current	Options (option)
Range	Control Null Value Target Update	Control Null Value Target Update	Control Null Value Target Update
Range Config	All OFF ON New Hold	All OFF ON New Hold	All OFF ON New Hold
Line Filter	o <mark>V</mark> U1 New Hold	• 🗹 l1 🛛 New Hold	 Spd1 New Hold
Freq Filter/ Rectifier/Level	• ✔ U2 🛛 New Hold	∘ <mark>✓</mark> 12 New Hold	• 🗹 Trq1 🛛 New Hold
Null		es or disables the Null features or holds the Null value	'e 🔉 🗹 Spd2 🛛 New Hold
Motor/Aux Sensor	• 🗹 U4 🛛 New Hold	• 🖌 14 New Hold	• 🗹 Trq2 🛛 New Hold
Correction	 V5 New Hold 	• 🗹 15 New Hold	• ✔ Spd3 🛛 New Hold
	 U6 New Hold 	• 🗹 16 New Hold	• 🗹 Trq3 🛛 New Hold
	• 🔽 U7 🛛 New Hold	o 🔽 17 New Hold	• <mark> Spd4 New</mark> Hold
	Null Notification	Null Power-on time/warm-up co	ompletion time

Motor Evaluation and Auxiliary Input Settings (Motor/Aux) section 9.1

3. Tap **Motor/Au**x. A Motor/Aux screen (MTR1/MTR2) appears.

The following screen is an example for a model with both the /MTR1 and /MTR2 options.



Sensor Correction Settings (Sensor Correction) **>** section 2.6

3. Tap Sensor Correction. A sensor correction screen appears.

ensor Correc	tion button			Input (Advanced/Options) tab					
		Input (Basic)	Ini (Advanced	out d/Options)	Computation,	/Output	Utility		
Curren									
ampliti correc		Element 1 30A	Element 2 30A	Element 3 30A	Element 4 5A	Element 5 5A	Element 6 CS	Element 7 CS	
Range Config	Current Amplitude Correction		OFF		OFF	OFF		OFF	
ine Filter	Correction Ratio	1.000000		1.000000			1.000000		
req Filter/ ectifier/Level	Current Phase Correction			OFF	(OFF)	OFF		(OFF)	
ull	Frequency	60 Hz	60 Hz				60 Hz		
lotor/Aux	Phase Difference Between I/O	0.000°	0.000°				0.000°		
ensor correction	Time Difference Between I/O	0.000s	0.000s				0.000s		
Currer correc	nt phase tion								

1.3 Computation and Output Settings Overview

The overview screen shows in a table the various settings related to the input signal computing method, harmonic measurement, integration conditions, numeric and graphic screen displays, data saving, DA output, and so on. You can control all the settings from this overview screen.

SETUP	
MENU	SAVE LOAD

Computation and Output Settings Overview (Computation/ Output)

- 1. Tap the Setup icon 🔅 , or press MENU under SETUP.
- **2.** Tap **Computation/Output** tab. A computation and output settings overview screen appears. Pressing **ESC** closes the overview screen.

Setting the Efficiency Equation (Efficiency) **Section 2.11**

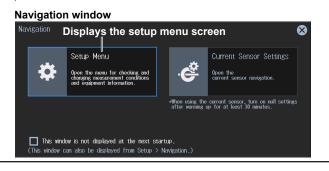
3. Tap Efficiency. An efficiency equation setup screen appears.

Efficiency button			Compu	tation/Output tab	
ļ	Inpu (Bas	t Input ic) Wiring inform	Computation/Outp	out Utility	×
Efficiency		ΣΑ	ΣB	ΣC	
<u>⊿</u> Measure	Elements	1234567	1 2 3 4 5 6 7	1234567	
Update Rate/ Averaging	Wiring	3P4₩	1P3W	1P3W	
		E	fficiency equation		
Harmonics		P∑B ▼		ΡΣΑ 🔻	
Measure	7 1 =	* 100[%	3] 9 2 = -]
Display		PZA 🔻		ΡΣΒ 🔻	
Store					
Data Save	20	OFF -	<i>ه</i> در 1/	OFF -	
	η 3 =	* 100[% 0FF ▼	ζ] η4 = ·	* 100[%] OFF ▼	1
Integration Definition to D/A Output	use whe	ו you want to add a	ctive power or moto	or output to the equat	tion
	Udef1 =	P1 🔻 + Nor	ne 🕶 + None 🕶 +	None 🗸	
	Udef2 =	P1 🔻 + Nor	ne 🕶 + None 🕶 +	None 🔻	

1.3 Computation and Output Settings Overview

Note_

- You can also display the input settings overview screen by moving the cursor on the Computation/Output tab using the arrow keys and then pressing SET.
- You can also display the setup menu screen from the navigation window that appears immediately after power-on.



Setting the Delta Computation (ΔMeasure) **>** section 2.12

3. Tap **ΔMeasure**. A delta computation setup screen appears.

∆Measure but	tton		Computa	tion/Output tab	
	Inpu (Bas	t Input ic) Wiring inform	Computation/Output	Utility	8
Efficiency		ΣΑ	ΣΒ	ΣC	
⊿ Measure	Elements	1 2 3 4 5 6 7	1 2 3 4 5 6 7	1234567	
Update Rate/ Averaging	Wiring	3P3W	3P3₩	1P3₩	
	Delta computation	type			
	∽⊿ Measure Type	3P3₩ ▷ 3V3A 🔻	3P3₩ ▷ 3V3A 👻	Difference 🔻	
Measure	Delta computation	mode			
Display	↓ Measure Mode	inicae	rms	_	
Store					
Data Save					
Integration					
D/A Output					
	I				

Setting the Data Update Interval and Averaging (Update Rate/ Averaging) Sections 2.10, 2.13

3. Tap Update Rate/Averaging. A data update interval/averaging setup screen appears.

Update Rate/A	Averaging button		Computatio	on/Output tab	
	Input (Basic)	Input (Advanced/Options)	Computation/Output	Utility	
Efficiency	Data update interval		Averaging		
	Update Mode		Averaging		
₫ Measure	Constant 🔻		(OFF)		
Update Rate/ Averaging	Update Rate		Averaging Type		
Harmonics	500ms 🔻		Exp 🔻		
Measure	Measurement Method		Averaging Count		
Display	Digital Filter Average		2		
Store	Response				
Data Save	Mid (≧ 10Hz) ▼				
Integration					
D/A Output					

Setting the Harmonic Measurement (Harmonics) **>** section 5.1

3. Tap Harmonics. A harmonic measurement setup screen appears.

Harmonics bu	itton		Computati	on/Output tab
	Harmor	ut Input hic measurement group	Computation/Output	Utility 🔀
Efficiency		Hrm 1	Hrm ②	
/ Measure	Input element	1234567	1 2 3 4 5 6 7	
Update Rate/ Averaging	PLL source			
Harmonics	PLL Source	U1 🔫	U1 ·	-
Measure	Minimum harmo	nic order to be measure	ed	
Display	Min Order	1 🕶	1 .	-
Store	Maximum harmo	nic order to be measur	ed	
Data Save	Max Order	100	10	
Integration	Distortion factor	equation		
D/A Output	Thd Formula	1/Total 🔻	1/Total	
	Number of FFT p	ooints		
	FFT Points	102	24	-

Setting the measurement (Measure) **b** sections 2.14, 3.3, 3.4, 3.5

3. Tap **Measure**. A setup screen appears for the user-defined functions, apparent power formula, master/slave, and phase difference.

Measure butt	on	Computation/Output tab
Efficiency	Computed value Basic) user-defined function (see section 3.5)	(Apparentiand reactive power computation (see section 3.3)
/ Measure	∎ User Defined Functions	S Formula Urms * Irms Vrms * Irms
Update Rate/ Averaging	Max Hold	Phase polarity (see section 3.4) S,Q Formula
Harmonics Measure	OFF	Type 1 Ty
Display	Computed value, user-defined events	Corrected power Sync Measure computation (see section 3.3)
Store Data Save	(see section 3.5)	Pc Formula Type 1
Integration		P1
D/A Output		0.5000
		P2 0.5000

Configuring the Numeric, Custom, and Graphic Displays (Display) ► sections 3.1, 3.8, 6.1

3. Tap **Display**. A setup screen appears for the screen display format.

Display butto	n				Computati	on/Output tab	
		Input (Basic)	Inp (Advanced	ut I/Options)	Computation/Output	Utility	⊗
Efficiency / Measure Update Rate/ Averaging	123 Numeric VVV. Graph] _ S	creen disp	olay, sing	le/split (see sect	ion 3.1, 6.1)	
Harmonics Measure Display	Numeric All Items	•	Page 1	►	ımeric display (se	ee section 3.1)	
Store Data Save Integration D/A Output	Graph Wave tems Cursors	• 2	Group 1 Form	Gr	aph display (see	section 6.1)	
			Custom		egister the custor ction 3.8).	n screen (see	

Configuring the Storage (Store) ► section 7.1, 7.2, 7.3

3. Tap Store. A storage setup screen appears.

Store button		Computation/Output tab					
Efficiency // Measure	Storage operation (see section 7.1)	Input (Advanced/Options) Computation/Ou Stored items (see section 7.2) Stored Items	tput Storage destination (see section 7.3)				
Update Rate/ Averaging	Manual 🔻	Selected Items 🔻	File List				
Harmonics Measure	Store Count 100 Count	⊠ Select Stored Items	Auto Naming Numbering				
Display Store	Interval 🗹 0:00:00	Store Time Stamp Store 🔻	File Name File Name				
Data Save			Comment				
Integration D/A Output			Auto CSV Conversion				

Configuring the Data Save Feature (Data Save)

▶ section 8.2, 8.3, 8.4, 8.5

3. Tap Data Save. A data save setup screen appears.

Data Save button

Computation/Output tab	

Efficiency	Input (Basic) Data to save	(techespeed / Orytions) Computation/ Numeric data items to save (see section 8.3)	
⊿ Measure	Saved Objects	Saved Numeric Items	User
Update Rate/	Vumeric	Selected Items 🔻	File List
Averaging	✓ Wave		Auto Naming
Harmonics	🔽 Image	Select Saved Numeric Items	Numbering -
Measure			
Display		Format/color of screen	File Name
νισμιαγ		images to save	
Store		(see section 8.4)	
J		Image File Format	Comment
Data Save		BMP 🔫	
Integration			
		Image Color	
		Black & White 🔻	

Setting the Integration Conditions (Integration) **>** section 4.1

3. Tap Integration. An integration condition setup screen appears.

Integration bu	utton		Computation/C	Dutput tab
	Input (Basic)	Input (Advanced/Options)	Computation/Output	Utility 😣
Efficiency	Integration Mode	mode	Independent Control	
/ Measure	R-Normal 🗸		OFF	
Update Rate/ Averaging				
Harmonics	Integration timer	<u>,</u>		
	Integration Timer		Auto Cal	
Measure	0:00:00		OFF	
Display	Start Time			
Store	2018/01/01 00:00:00		🗗 WP± Type	
Data Save	End Time			
Integration	2018/01/01 01:00:00		🗹 q Mode	
D/A Output			Resume Action	
			Start Stop <mark>Error</mark>	

Configuring the D/A Output (D/A Output) **Section 16.2**

3. Tap D/A Output. A D/A output setup screen appears.

D/A Output b	utton						Computati	on/Output	tab	
		ln (B	put asic)	Input (Advanced/Opti		Compu	l Itation/Output	Utility		8
Efficiency		D/A output channels								
/ Measure	C	h 1-Ch 5	Ch 6-Ch 10	Ch 11-0	Ch 15	Ch	16-Ch 20			
Update Rate Averaging			Οι	Itput items	of eac	h ch	annel			
Harmonics	Ch	Item	Function	Element/∑	Orde		Range Mode	Мах	Min	
Measure		Urms1	Urms	Element 1			Fixed			
Display		irms1	Irms	Element 1			Fixed			
Store		P1	Р	Element 1			Fixed			
Data Save		\$1	s	Element 1			Fixed			
Integration	5	U1(Total)	U(k)	Element 1	Tota	al	Manual	100.0	-100.0	
D/A Output		Rated Time //	— Rated ti	me of integ	rated	D/A	output		1	

1.4 Utility Settings Overview

The system settings of this instrument are displayed in table format. You can control all the settings from this overview screen.

SETUP	
MENU	SAVE LOAD

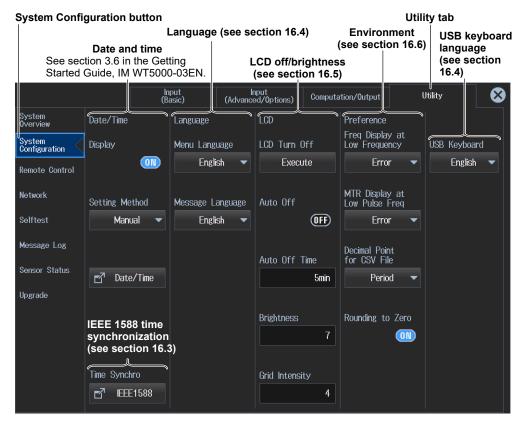
Utility Settings Overview (Utility)

- 1. Tap the Setup icon 🔅 , or press MENU under SETUP.
- 2. Tap the Utility tab. The utility settings overview screen appears. Pressing ESC closes the overview screen.

System Configuration (System Configuration)

section 16.3, 16.4, 16.5, 16.6

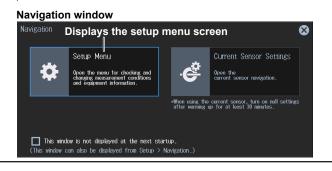
3. Tap System Configuration. A system settings overview appears.



1.4 Utility Settings Overview

Note_

- You can also display the input settings overview screen by moving the cursor on the Utility tab using the arrow keys and then pressing SET.
- You can also display the setup menu screen from the navigation window that appears immediately after power-on.



Remote Control Settings (Remote Control) ► section 16.1

3. Tap Remote Control.

A remote control setup screen (Network(VXI-11/GP-IB/USB(USB-TMC)) appears.

Remote Contr	rol button			Utility tab
	Input (Basic)	Input (Advanced/Options)	Computation/Output	Utility 😣
System Overview	Network (VXI-11)	GP-IB	USB (USB-TMC)	
System Configuration	IP address display	Address	Serial No.	Command Type
Remote Control	0. 0. 0. 0	1	12345678901	WT5000 🗸
Network	Time Out	GP-IB address	USB (USB-TMC)	Communication
Selftest	Infinite		Serial number	commands (WT-compatible
Message Log	Network timeout			commands)
Sensor Status				
Upgrade				

Ethernet Communication Settings (Network)

▶ section 15.2, 15.3, 15.4, 15.5, 15.6

- 3. Tap Network. A network setup screen appears.
- TCP/IP Settings (see section 15.2)

Input (Basic) Input (Advanced/Options) Computation/Output System Overview Shows the TCP/IP setup screen	Utility 🚫
System Shows the TCP/IP setup screen	
System TCP/IP FTP/Web Server Net Drive SNTP	
DHCP DNS	
DHCP ON DNS OFF ON Auto	
Network IP Address Domain Name	
Selftest 192.168. 0.100 Domain Name	
Message Log Net Mask DNS Server 1	
Sensor Status 255.255.255.0 2 0.0.0.0	
Upgrade Gate Way DNS Server 2	
☐ 192.168. 0. 1 ☐ 0. 0. 0. 0	
Domain Suffix 1	
Domain Suffix 2	
	Bind

• FTP Server Settings (see section 15.3), Web Server Settings (see section 15.4)

Network butto	n					Utility tab	
	Inpu (Basi	t Ing c) (Advanced	out d/Options)	Computation/0	utput	Utility	⊗
System Overview	Shows th	e FTP/Web serv	er setup s	screen			
System Configuration	TCP/IP	FTP/Web Server	Net	Drive	SNTP		
Remote Control	User Name						
Network		anonymous — U	lser name	;			
Selftest	Password						
Message Log		Password — P	assword				
Sensor Status	Time Out 900s		Entry				
Upgrade							
F	TP server timeout						

1.4 Utility Settings Overview

- Utility tab Network button U Utility Input (Basic) Input (Advanced/Options) \otimes Computation/Output System Overview Shows the network drive setup screen System Configuration TCP/IP FTP/Web Server SNTP Net Drive Remote Control FTP Server FTP Server Network Login Name Selftest anonymous -– User name Message Log Password Sensor Status -Password Upgrade FTP Passive OFF Time Out Connect Disconnect I **Network drive** timeout
- Network Drive Settings (see section 15.5)

• SNTP (date and time) settings (see section 15.6)

Network butto	on				Utility tab	
	lnpu (Basi	it Inp ic) (Advanced	out 1/Options) Comput	ation/Output	Utility	8
System Overview			Show	vs the SNTP se	etup screen	
System Configuration	TCP/IP	FTP/Web Server	Net Drive	SNTP		
Remote Control	SNTP Server					
Network		SNTP Server S	NTP server's ho	ost name		
Selftest	Time Out					
Message Log	35	SNTP server tin	neout			
Sensor Status	Adjust at Power On					
Upgrade	Time Difference from	GMT		ist the instrum e Greenwich I		alative
	Hour Minu	ite		le Greenwich i	wean rime.	
	9	0	Adjust			

Self-test (Selftest) ► section 16.7

3. Tap Selftest. A self-test setup screen appears.

Selftest button					Utility tab
		Input (Basic)	Input (Advanced/Options)	Computation/Output	Utility
System Overview	Test Item				
System Configuration	Mem		est item		Test Exec
Remote Control			<<<<< Memory Test >>>>	>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>	
Network					
Selftest					
Message Log					
Sensor Status					
Upgrade					

Message Log Display(Message Log) > section 16.8

3. Tap Message Log. A message log screen appears.

Message Log b	outton					Utility tab
			Input (Basic)	Input (Advanced/Option	₅₎ Computation/Output	Utility 😣
System Overview						
System Configuration				Messa	ge log	Clear <u>All Messages</u>
Remote Control	No.	Code	Time	Category	Message	
Network Selftest	2	95	09/17 16:33:52	Information	Please enable the "Null Setti	ngs".
Selftest			00/00 00:00:00	Information	Turned on pressing the ESC The system has been initialize	key. ed.
Message Log						
Sensor Status						
Upgrade						

System Overview and Upgrade (System Overview/Upgrade) section 16.9

Tap System Overview to display a table of instrument information.
 Tap Upgrade to display the Upgrade screen.

System Overvie	ew button (see section 1	6.9)		Utility tab
	Input (Basic)	Input (Advanced/Options)	Computation/Output	Utility 🔇
System Overview System Configuration	Hodel : WT5000 Suffix : -HE/M1/MTR1/DA2 No. : (MA Version : 1.1 (Boot Ver.:		Certa Composition	
Remote Control				aired Sensor
Network	1: 760901(30A) C3UG25003E 2: 760901(30A) C3UG13007E 3: 760901(30A) C3UG25031E	[1.00_30,1.00_30] 2010/	08/16 20:17:40	
Selftest	5: 760902(5A) C3UG23019E	[1.00 m, 1.00 m] 20 m/ [1.00 m, 1.00 m] 20 m/ [1.00 m, 1.00 m] 20 m/	08/20 16:40:02	
Message Log	7: 760903(CS) C3UG23024E			
Sensor Status	Options 32GB Built-in Memory [/M1] Motor Evaluation 1 [/MTR1]		20 200/45 10-25-12	
Upgrade	20-CH D/A Output [/DA20] Motor Evaluation 2 [/MTR2]	: Yes [11,100,30] : No : Yes	20 //08/15 19:35:12 20 //08/15 19:35:14	
	Link Date : Aug 23 20 20: Product ID:	57:14		

Upgrade button

Current Sensor Status Display (Sensor Status) **Section 16.9**

3. Tap Sensor Status. The current sensor statuses are listed.

Sensor Status	button					Uti	lity tab
		Input (Basic)	Inpu (Advanced,	ut /Options) (Computation/Output	t Utili	ty 🚺
System Overview							
System Configuration	Element 1 30A	Element 2 30A		Element 4 5		Element 6 CS	Element 7 CS
Remote Control	Non- CS Element	⊠ Non- CS Element	⊠ Non- CS Element	Non- CS Element	t ^{Non-} CS Element	□ Non- Connection	□ Non- Connection
letwork							
Selftest							
Message Log							
Sensor Status							
Jpgrade							

1.5 Saving, Loading, and Initializing Setup Data

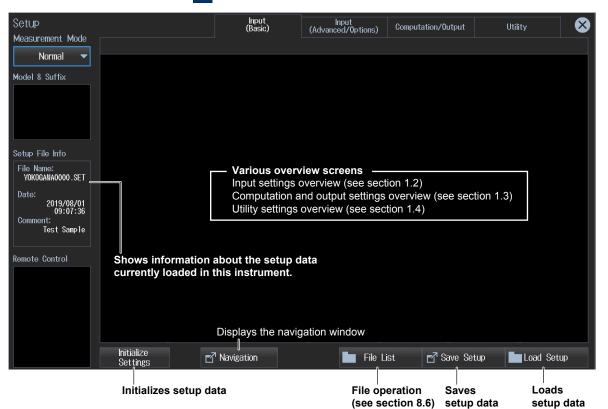
"Saving Setup Data (Save Setup)" in the features guide
 "Loading Setup Data (Load Setup)" in the features guide
 "Initialize Settings (Initialize Settings)" in the features guide

You can load, save, and initialize the system settings of this instrument.



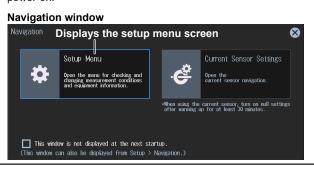
Saving, Loading, and Initializing Setup Data (Save Setup/Load Setup/Initialize Settings))

1. Tap the Setup icon 🔅 , or press MENU under SETUP. The setup menu screen appears.



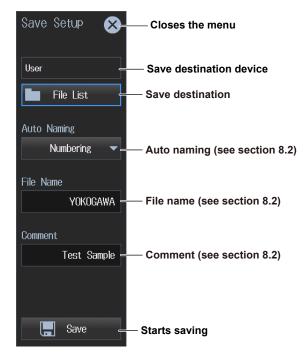
Note.

You can also display the setup menu screen from the navigation window that appears immediately after power-on.



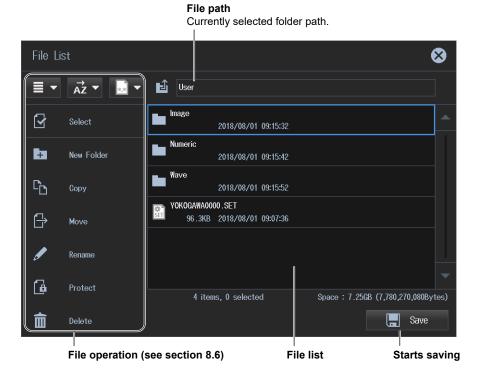
Saving Setup Data

2. Tap Save Setup. A Save Setup screen appears. Pressing ESC closes the Save Setup screen.



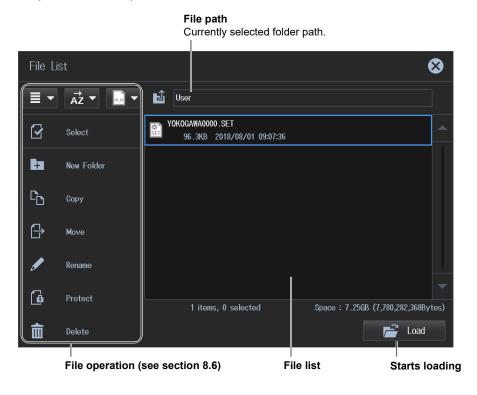
Setting the Save Destination

- **3.** Tap **File List**. A file list appears. Pressing **ESC** closes the file list.
- 4. Select the save destination from the file list.
- 5. Tap Save. The setup data is saved in the save destination folder.



Loading Setup Data

- 2. Tap Load Setup. A file list appears. Pressing ESC closes the file list.
- 3. Select the setup data you want to load from the file list. The extension for setup data is .set.
- 4. Tap Load. The setup data is loaded into the instrument.



Initializing the Setup Data

- 2. Tap Initialize Settings. A confirmation screen appears for executing the initialization.
- 3. Tap OK. The setup data of this instrument will be initialized.

1.6 Current Sensor Setup Menu

• "Current Sensor Menu (Current Sensor Settings)" in the features guide

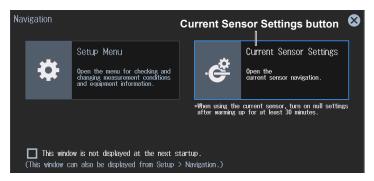
This section explains how to display only the current sensor settings and how to use the menu screen for specifying the settings.

Displaying the Current Sensor Setup Menu

You can display the current sensor setup menu by performing the following procedure.

At Instrument Startup

1. On the navigation window that appears when the instrument starts, tap **Current Sensor Settings**. The current sensor setup menu screen appears.



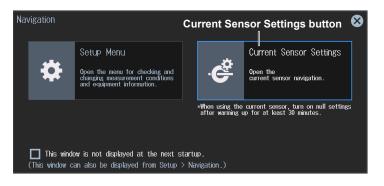
From the Setup Menu after Instrument Startup

- 1. Tap the Setup icon (😭), or press MENU under SETUP. The setup menu screen appears.
- 2. Tap Navigation at the bottom of the setup menu screen. A navigation window appears.

Setup Measurement Mode	Input (Basic)	Input (Advanced/Options)	Computation/Output	Utility 😣
Normal 🔻				
Initialize Settings	∎7 Navigation	File Lis	st ⊡ ª Save Se	tup Load Setup

Navigation button

3. Tap Current Sensor Settings. The current sensor setup menu screen appears.



Configuring the Current Sensor

section 2.1, 2.2, 2.3, 2.5, 2.6, 2.9

 Tap Start Setup on the current sensor setup menu screen. The button changes to "View Settings", and a screen appears for setting the Terminal/CT Sensor items. Tapping View Settings, which changed from the Start Setup button, causes the screen to return to the first setup menu screen.

Start Setup button

Current Sensor Se	ttings						8
🔑 Start Setup	∑A 3P3W Element 1 30A	≳ Element 2 30A] Element 3 30A	∑B 1P3W Element 4 5A	≳ Element 5 5A] Element 6 CS	Element 7 CS
Terminal/ CT Sensor	30A	30A	30A	5A	5A	Custom	Custom
- Input Resistance	- Current meas (see section 2		inals/CT sens	or, input resi	stance	1Ω	1Ω
Wiring =	 Wiring systen (see section 2) 		k 1₽2₩	1P3₩	1P3₩	1P2₩	1P2₩
CT Ratio							
Output Voltage _ Rate [V/A] Sensor Ratio [mV/A (mQ)]	 Scaling on/of external curre (see section 2 	ent sensor cor					
Current Amplitude Correction	1.000000		1.000000			1.000000	
Current Phase Correction	Current ampl phase correc (0.000ms)	itude correction tion (see section (0.000ms)				60 Hz 0.000° (0.000ms)	
Current Range =		e, Current Rar ement Range, 2.2, 2.3, 2.5, 2.	Crest Factor		5A	1A	1A

For details on the individual settings, see the respective references.

2. Tap **Next** or **Back** that appears at the bottom of the Terminal/CT Sensor and subsequent setup screens. The screen will switch to the next setup screen or previous setup screen.

	Next	
Back	Next	

You can also tap each setting (Terminal/CT Sensor, Wiring, CT Ratio, etc.) to switch to the corresponding setup screen.

- 3. On the screen that you switched to, set the items.
- 4. Tap Close at the bottom of the Current Range setup screen to switch from the current sensor setup menu screen to the measurement result display screen.To display the first screen of the current sensor setup menu again, perform steps 1 to 3 on the previous page.



2.1 Setting the Wiring System

This section explains operating procedures using the following setup methods.

- · Procedure Using the Setup Menu (see chapter 1)
 - "Wiring System (Wiring)" in the features guide
 - "Range Σ link (Range Σ Link)" in the features guide

Procedure Using the Setup Menu

- 1. Tap the Setup icon 🔅 , or press MENU under SETUP.
- 2. Tap the Input (Basic) tab. An input settings (basic measurement conditions) overview screen appears.

Pressing **ESC** closes the overview screen.

Set the wir	ring system.	Input (Bas	ic) tab			
		Input (Basic)	Input (Advanced/Options)	Computation/Ou	itput Utili	ty 😣
Element 1 30A	Element 2 30A	Element 3 30A	Element 4 5A		Element 6 CS	Element 7 CS
Wiring 1P2W) ^{Wiring} 1P2W	^{₩iring} 1P2₩	^{Wiring} 1P2W	^{Wiring} 1P2W	^{Wiring} 1P2W	^{₩iring} 1P2₩
Voltage Range 1000V						
Current Range 30A	Current Range 30A	Current Range 30A	Current Range 5A	Current Range 5A	Current Range 1A	Current Range 1A
Ratio [mV/A] 10.0000	CT Preset Custom	CT Preset Custom				
Scaling OFF VT Ratio 1.0000 CT Ratio 1.0000 SF Ratio 1.0000	Scaling OFF VT Ratio 1.0000 CT Ratio 1.0000 SF Ratio 1.0000	Scaling DFF VT Ratio 1.0000 CT Ratio 1.0000 SF Ratio 1.0000	Scaling OFF VT Ratio 1.0000 CT Ratio 1.0000 SF Ratio 1.0000	Scaling OFF VT Ratio 1.0000 CT Ratio 1.0000 SF Ratio 1.0000	Scaling OFF VT Ratio 1.0000 CT Ratio 1.0000 SF Ratio 1.0000	Scaling OFF VT Ratio 1.0000 CT Ratio 1.0000 SF Ratio 1.0000
Line Filter OFF Cutoff 0.5kHz						
Freq Filter OFF Cutoff 0.1kHz						
Sync Source						
		γ				

When the input element is 760901 or 760902

When the input element is 760903

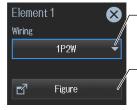
Note.

You can also display the input settings (basic measurement conditions) overview screen by moving the cursor on the Input (Basic) tab using the arrow keys and then pressing SET.

Setting the Wiring System

3. Tap **Wiring** of the input element number you want to configure. A wiring system setup menu appears.

Wiring system (example of element 1)



Select the wiring system (1P2W, 1P3W, 3P3W, 3P4W, 3P3W(3V3A), 3P3W(3V3AR)). When you select an input element, the wiring systems that you can select are displayed. Select the wiring system from those displayed. Shows the advanced wiring system setup screen Displays a screen containing wiring system selection buttons, wiring diagram, wiring units, etc. (see section 1.2)

Wiring System Combination

- If you select 1P3W, 3P3W, 3P4W, 3P3W(3V3A), or 3P3W(3V3AR) for the wiring system, the wiring unit is set with the two or three input elements adjacent to the selected element whose element numbers are larger than the selected element.
- On models that have six or more input elements installed, up to three wiring units (ΣA, ΣB, and ΣC) are automatically set. The wiring unit symbols ΣA, ΣB, and ΣC are attached to the element numbers in order, starting with the smallest number.

Note.

- You cannot set the wiring units for larger element numbers before the wiring units for smaller element numbers.
- · You cannot assign different types of input element to a wiring unit.
- For the 760903 current sensor input element, when Range Σ Link is set to ON, the wiring unit cannot be set among elements whose CT Type or Input Resistance setting is different.

Range Σ Link Settings (Range Σ Link)

2. Tap the Input (Advanced/Options) tab. An input settings (advanced/options) overview screen appears.

Pressing ESC closes the overview screen.

3. Tap Range. A setup screen appears for common measurement range items.

Range button		Input (Ad	vanced/Options) t	ab	
	Input (Basic)	Input (Advanced/Options)	Computation/Output	Utility	
Wiring	Crest factor	_			
	(see section 2.9)	Turns ran	ge Σ Link on or off		
Range	Crest Factor	Range Σ Link			
	CF3 🚽	୪ OFF 🚽			
Range Config					
	Current Range Display Format				
Line Filter					
Freq Filter/	Direct 🔻				
Rectifier/Level		. .			
Null	Current range display	format			
Hall	(see section 2.3)				
Motor/Aux					
Sensor Correction					

Note.

- When range Σ link is set to on, the measurement ranges of the input elements assigned to the same wiring unit are set to the same range. When range Σ link is set to off, the measurement ranges of the input elements can be set independently even when they are assigned to the same wiring unit.
- For the 760903 current sensor input element, when any of the wiring units is set among the elements whose CT Type or Input Resistance setting is different, Range Σ Link cannot be set to ON.

2.2 Setting the Voltage Range and Current Range

- "Voltage Range (Voltage, VOLTAGE RANGE)" in the features guide
- ► "Auto Voltage Range (Auto (Voltage), AUTO)" in the features guide
- "Current Range (Current, CURRENT RANGE)" in the features guide
- ▶ "Auto Current Range (Auto (Current), AUTO)" in the features guide
 - Current Measurement Terminal (Terminal)" in the features guide

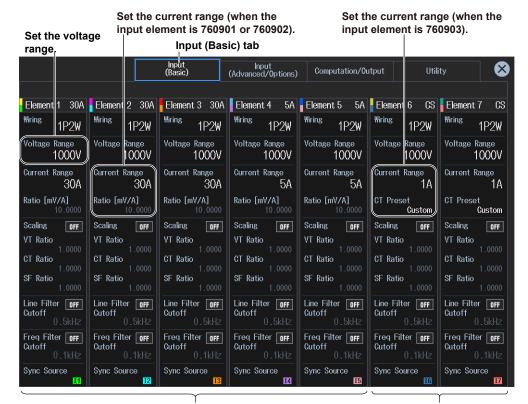
This section explains operating procedures using the following setup methods.

- · Procedure Using the Setup Menu (see chapter 1)
- Procedure Using the Menu Icons (see page iii)
- Procedure Using the Keys (other than SETUP) (see section 1.2 in IM WT5000-03EN)

Procedure Using the Setup Menu

- 1. Tap the Setup icon 🔅 , or press MENU under SETUP.
- Tap the Input (Basic) tab. An input settings (basic measurement conditions) overview screen appears.

Pressing ESC closes the overview screen.



When the input element is 760901 or 760902

When the input element is 760903

Note.

You can also display the input settings (basic measurement conditions) overview screen by moving the cursor on the Input (Basic) tab using the arrow keys and then pressing SET.

Setting the Voltage Range (Voltage Range)

- **3.** Tap **Voltage Range** of the input element number you want to configure. A voltage range setup menu appears.
- 4. Follow the instructions below to set the voltage range.
- Sets auto range mode
 - 3. Tap Auto. The AUTO key illuminates.
- Setting the Fixed Range

Tap **Voltage Range**. A voltage menu appears. Tap a voltage range on the menu to set the voltage range.

Voltage range (example of element 1)



Select the voltage range (1000V, 600V, 300V, 150V, 100V, 60V, 30V, 15V, 10V, 6V, 3V, 1.5V).

Operations in the Input Information Area

See page 2-8.

Available voltage range options

When the Crest Factor Is Set to CF3	When the Crest Factor Is Set to CF6 or CF6A
1.5 V, 3 V, 6 V, 10 V, 15 V, 30 V, 60 V, 100 V,	0.75 V, 1.5 V, 3 V, 5 V, 7.5 V, 15 V, 30 V, 50 V,
150 V, 300 V, 600 V, 1000 V	75 V, 150 V, 300 V, 500 V

Note.

- When range Σ link (see section 2.1) is set to on, the voltage ranges of the input elements assigned to the same wiring unit are set to the same range. When range Σ link is set to off, the voltage ranges of the input elements can be set independently even when they are assigned to the same wiring unit.
- When the setup menu screen is overlapped on the range display of each element, press ESC. The setup menu screen will close.

Setting the Current Range (Current Range) When the Input Element Is 760901 or 760902

- **3.** Tap **Current Range** of the input element number you want to configure. A current range setup menu appears.
- 4. Follow the instructions below to set the current range.
- · Sets auto range mode

Tap Auto. The AUTO key illuminates.

• Setting the Fixed Range

Tap **Current Range**. A current range menu appears. Tap a current range on the menu to set the current range.

Current range (example of element 1)

Element 1		
Current Range	Auto	
30A 🖷	() () () () () () () () () () () () () (- Set the current range to auto.
Ext Sensor		- Select the current range.
	()FF	- Turns the external current sensor on or off (see section 2.3).
Sensor Preset Others Sensor Ratio [mV/A 10.0000	(mΩ)]	- Configure the current sensor (see section 2.3).

Operations in the Input Information Area See page 2-8.

occ page 2-0.

Available current range options

• 30 A Input Element 760901

When the Crest Factor Is Set to CF3	When the Crest Factor Is Set to CF6 or CF6A
500 mA, 1 A, 2 A, 5 A, 10 A, 20 A, 30 A	250 mA, 500 mA, 1 A, 2.5 A, 5 A, 10 A, 15 A

• 5 A Input Element 760902

When the Crest Factor Is Set to CF3	When the Crest Factor Is Set to CF6 or CF6A
5 mA, 10 mA, 20 mA, 50 mA, 100 mA,	2.5 mA, 5 mA, 10 mA, 25 mA, 50 mA, 100 mA,
200 mA, 500 mA, 1 A, 2 A, 5 A	250 mA, 500 mA, 1 A, 2.5 A

Note.

When range Σ link (see section 2.1) is set to on, the current ranges of the input elements assigned to the same wiring unit are set to the same range. When range Σ link is set to off, the current ranges of the input elements can be set independently even when they are assigned to the same wiring unit.

Setting the Current Range (Current Range) When the Input Element Is 760903

3. Tap **Current Range** of the input element number you want to configure. A current range setup menu appears.

Current Measurement Terminal (Terminal)

- 4. Tap Terminal. The Terminal menu appears.
- 5. Tap CT Series or Probe to select Terminal.

If Terminal is set to CT Series, proceed to step 6. If it is set to Probe, proceed to step 11 on the next page.

Current Range (Current Range) When Terminal Is Set to CT Series

When Terminal is set to Sensor, Scaling is set to ON, and CT Ratio is set to the default value according to CT Type. Change these settings if necessary.

After selecting CT Type and input resistance, set the current range. Then, in step 16, set the CT ratio.

- 6. Tap CT Preset. The CT Preset menu appears.
- 7. Select the CT type.

When you change the CT type, the input resistance is set accordingly. Further, Scaling is set to ON, and CT Ratio is set to the default value according to CT Type. Change these settings if necessary.

If CT Type is set to Custom, proceed to step 8. If you do not want to change the input resistance, proceed to step 10.

- 8. Tap Input Resistance. The Input Resistance menu appears.
- 9. Select the input resistance.

10. Follow the instructions below to set the current range.

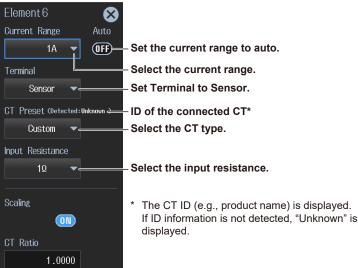
• Enabling Auto Range

Tap Auto. The AUTO key illuminates.

• Setting a Fixed Range

Tap **Current Range**. A current range menu appears. Tap a current range on the menu to set the current range.

Current range (example of element 6)



Main Current Range Options

The options vary depending on the CT type. For the current range options, see "Current Range (Current, CURRENT RANGE)" in the features guide.

Current Range (Current Range) When Terminal Is Set to Probe

When Terminal is set to Probe, the CT ratio is set to 1.0000. The scaling setting will not change. Change it if necessary.

- **11.** Follow the instructions below to set the current range.
- Enabling Auto Range Tap Auto. The AUTO key illuminates.
- Setting a Fixed Range

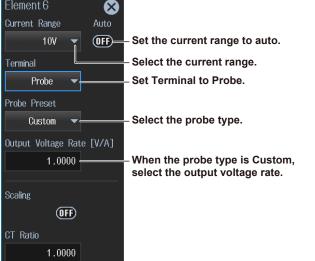
Tap **Current Range**. A current range menu appears. Tap a current range on the menu to set the current range.

- 12. Tap Probe Preset. A Probe Preset menu appears.
- 13. Select the probe type.

If you change the probe type, the output voltage rate is set to its default value according to the probe type. If necessary, change the settings in step 14.

14. Tap Output Voltage Rate [V/A], and set the output voltage rate.

Current range (example of element 6)



Available current range options

For the current range options, see "Current Range (Current, CURRENT RANGE)" in the features guide.

Note.

When range Σ link (see section 2.1) is set to on, the current ranges and current measurement terminal settings of the input elements assigned to the same wiring unit are set to the same settings. When range Σ link is set to off, the current ranges and current measurement terminal settings of the input elements can be set independently even when they are assigned to the same wiring unit.

Operations in the Input Information Area See page 2-8.

Scaling Feature

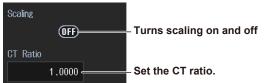
This setting is linked to the scaling setting of section 2.4.

Turning Scaling On or Off

15. Tap Scaling to select ON or OFF.

Setting the CT Ratio

16. Tap **CT Ratio** to set the CT ratio (or the conversion ratio of the current sensor that produces current).



Procedure Using the Menu Icons

You can also use the menu icons shown on the right side of the screen to set the voltage range and current range.

1. Tap the **Range** menu icon **1**. A Range menu appears in the sub menu area on the right side of the screen.

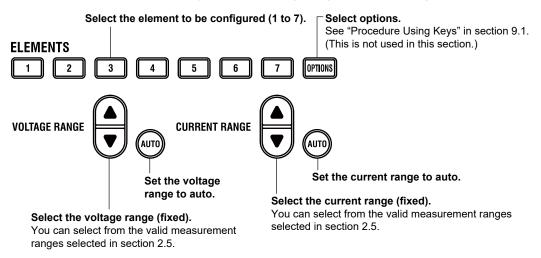
By tapping the displayed items, you can specify the same settings as when using the screen explained earlier.

Note.

For details on the Range menu, see page viii.

Procedure Using Keys

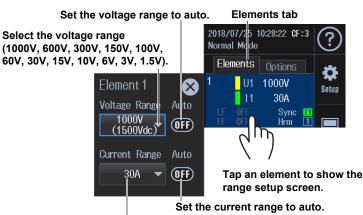
You can also use the front panel keys to set the voltage range and current range.



Procedure Using the Input Information Area (Elements tab)

If you use the input information area shown on the right side of the screen, you can set the voltage range and current range while viewing the measurements. The input information area is displayed when you close the overview screen.

- 1. Tap the Elements tab. An Elements menu appears in the input information area.
- 2. Tap the element (1 to 7) you want to configure. A range setup screen for the element appears.



Select the current range.

Depending on the external current sensor on/off state, the current range or external current sensor range appears automatically, and you can set the range. For the selectable values, see "Setting the Current Range (Current Range)" or "Setting the External Current Sensor Range (Ext Sensor)."

2.3 Configuring the Current Sensor

"External Current Sensor On/Off (Ext Sensor)" in the features guide
 "External Current Sensor Conversion Ratio (Sensor Ratio)" in the features guide
 "Display Format of Current Range (Current Range Display Format)" in the features guide

This section explains operating procedures using the following setup methods.

- Procedure Using the Setup Menu (see chapter 1)
- Procedure Using the Menu Icons (see page iii)

Procedure Using the Setup Menu

Tap the Setup icon in the input (Basic) tab. An input settings (basic measurement conditions) overview screen appears.
 Pressing ESC closes the overview screen.

Set the c	urrent r	ange.					
			Input (Basic)	Input (Advanced/Options)	Computation/Ou	itput Utili	ty 😣
Element 1 30A	Element	2 30A	Element 3 30A	Element 4 5A	Element 5 5A	Element 6 CS	Element 7 CS
^{Wiring} 1P2W	Wiring	1P2₩	Wiring 1P2W	^{Wiring} 1P2W	^{Wiring} 1P2W	wiring 1P2W	^{₩iring} 1P2₩
Voltage Range 1000V	Voltage	_{Range} 1000V	Voltage Range 1000V				
Current Range 30A	Current I	^{Range} 30A	Current Range 30A	Current Range 5A	Current Range 5A	Current Range 1A	Current Range 1A
Ratio [mV/A] 10.0000	Ratio [m ¹	V/A] 10.0000	Ratio [mV/A] 10.0000	Ratio [mV/A] 10.0000	Ratio [mV/A] 10.0000	CT Preset Custom	CT Preset Custom
Scaling OFF	Scaling	OFF	Scaling OFF	Scaling OFF	Scaling OFF	Scaling OFF	Scaling OFF
VT Ratio	VT Ratio		VT Ratio				
1.0000 CT Ratio 1.0000	CT Ratio	1.0000	1.0000 CT Ratio 1.0000				
SF Ratio 1.0000	SF Ratio		SF Ratio 1.0000				
Line Filter OFF Cutoff 0.5kHz	Line Filte Cutoff	er OFF 0.5kHz	Line Filter OFF Cutoff 0.5kHz				
Freq Filter OFF Cutoff 0.1kHz	Freq Filt Cutoff	er off 0.1kHz	Freq Filter OFF Cutoff 0.1kHz				
Sync Source	Sync Soi	urce <mark>12</mark>	Sync Source				

Input (Basic) tab

Note.

You can also display the input settings (basic measurement conditions) overview screen by moving the cursor on the Input (Basic) tab using the arrow keys and then pressing SET.

IM WT5000-02EN

2-9

Setting the External Current Sensor Range (Ext Sensor)

- **3.** Tap **Current Range** of the input element number you want to configure. An current range setup menu appears.
- Tap Ext Sensor to select ON. The current range display changes to the external current sensor range display.
- 5. Follow the instructions below to set the external current sensor range.
- Sets auto range mode Tap Auto. The AUTO key illuminates.
- · Setting the Fixed Range

Tap **Current Range**. An external current sensor range menu appears. Tap the external current sensor range on the menu, and set the range.

Current range (example of element 1)

Element 1	\mathbf{x}	
Current Range	Auto	
10V 👕	() () () () () () () () () () () () () (– Set the external current sensor range to auto.
Ext Sensor		– Select the external current sensor range.
		– Set the external current sensor to ON.
Sensor Preset		
Others 🗸		Set the sensor conversion ratio preset.
		The sensor conversion ratio preset is currently not available.
Sensor Ratio [mV/A	(mΩ)]	
10.0000		- Set the sensor conversion ratio (0.0001 to 99999.9999).

Operations in the Input Information Area

As explained in "Current Range" of section 2.2, the external current sensor range can also be set in the input information area (see page 2-8).

Available External Current Sensor Range Options

When the display format of the external current sensor range is set to Direct (see the next page), you can select the range from the available options shown in the following table (the unit is mV or V). When the display format is set to Measure, the setup range is set to the value from the following table divided by the external current sensor conversion ratio (the unit is A).

When the Crest Factor Is Set to CF3	When the Crest Factor Is Set to CF6 or CF6A
50 mV, 100 mV, 200 mV, 500 mV, 1 V, 2 V, 5 V, 10 V	25 mV, 50 mV, 100 mV, 250 mV, 500 mV, 1 V, 2.5 V, 5 V

Note.

When range Σ link (see section 2.1) is set to on, the external current sensor ranges of the input elements assigned to the same wiring unit are set to the same range. When range Σ link is set to off, the external current sensor ranges of the input elements can be set independently even when they are assigned to the same wiring unit.

External Current Sensor Range and Conversion Ratio Configuration Example

When you measure a current with a maximum value of 100 A using a current sensor that produces 10 mV when 1 A of current is flowing, the maximum voltage that the current sensor produces is $10 \text{ mV/A} \times 100 \text{ A} = 1 \text{ V}$. Therefore, configure the settings as indicated below.

- External current sensor range: 1 V
- External current sensor conversion ratio: 10 mV/A

Setting the Current Range Display Format (Current Range Display Format)

3. Tap the Input (Advanced/Options) tab. An input settings (advanced/options) overview screen appears.

 $\label{eq:pressing_expansion} \ensuremath{\mathsf{Pressing}}\xspace \ensuremath{\mathsf{ESC}}\xspace$ closes the overview screen.

4. Tap Range. A setup screen appears for common measurement range items.

Range button			Input (Ad	vanced/Options)	tab	
Wiring		Input (Basic)	Input (Advanced/Options)	Computation/Output	Utility	
Wiring						
Range	Crest Factor		Range & Link			
Range Config	CF3	•	& OFF ▼			
Line Filter		Display Format				
Freq Filter/ Rectifier/Level	Direct					
Null	Set the curre	ent range disp	olay format (Direc	t, Measure).		
Motor/Aux						
Sensor Correction						

Procedure Using the Menu Icons

You can also use the menu icons shown on the right side of the screen to set the external current sensor range.

1. Tap the **Range** menu icon **1**. A Range menu appears in the sub menu area on the right side of the screen.

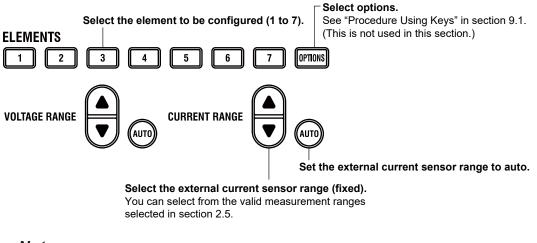
By tapping the displayed items, you can specify the same settings as when using the keys explained earlier.

Note.

For details on the Range menu, see page viii.

Procedure Using Keys

You can also use the front panel keys to set the external current sensor range.



Note.

To turn the external current sensor on and off or set the sensor conversion ratio and other details, use the Setup menu.

2.4 Setting the Voltage Transformer (VT) and Current Transformer (CT) Ratios

"Scaling (Scaling)" in the features guide

This section explains operating procedures using the following setup methods.

• Procedure Using the Setup Menu (see chapter 1)

Procedure Using the Setup Menu

- 1. Tap the Setup icon 🔅 , or press MENU under SETUP.
- 2. Tap the Input (Basic) tab. An input settings (basic measurement conditions) overview screen appears.

Pressing **ESC** closes the overview screen.

Input (Basic) tab

		Input (Basic)	Input (Advanced/Options)	Computation/Ou	ıtput Utili	ty 🗴
Element 1 30A	Element 2 30A	Element 3 30A	Element 4 5A	Element 5 5A	Element 6 CS	Element 7 CS
Wiring 1P2W	^{Wiring} 1P2W	^{₩iring} 1P2₩	^{Wiring} 1P2W	^{Wiring} 1P2W	^{₩iring} 1P2₩	^{Wiring} 1P2W
Voltage Range	Voltage Range	Voltage Range	Voltage Range	Voltage Range	Voltage Range	Voltage Range
1000V	1000V	1000V	1000V	1000V	1000V	1000V
Current Range	Current Range	Current Range	Current Range	Current Range	Current Range	Current Range
30A	30A	30A	5A	5A	1A	1A
Ratio [mV/A]	Ratio [mV/A]	Ratio [m∀/A]	Ratio [mV/A]	Ratio [mV/A]	CT Preset	CT Preset
10.0000	10.0000	10.0000	10.0000	10.0000	Custom	Custom
Scaling OFF VT Ratio	Scaling OFF VT Ratio 1.0000	Scaling OFF VT Ratio	Scaling OFF VT Ratio	Scaling OFF VT Ratio	Scaling OFF VT Ratio	Scaling OFF VT Ratio 1.0000
CT Ratio	CT Ratio	CT Ratio	CT Ratio	CT Ratio	CT Ratio	CT Ratio
1.0000	1.0000	1.0000	1.0000	1.0000	1500.0000	1.0000
SF Ratio	SF Ratio	SF Ratio	SF Ratio	SF Ratio	SF Ratio	SF Ratio
1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Line Filter OFF	Line Filter OFF	Line Filter OFF	Line Filter OFF	Line Filter OFF	Line Filter OFF	Line Filter OFF
Cutoff	Cutoff	Cutoff	Cutoff	Cutoff	Cutoff	Cutoff
0.5kHz	D.5kHz	0.5kHz	0.5kHz	0.5kHz	0.5kHz	0.5kHz
Freq Filter OFF	Freq Filter OFF	Freq Filter OFF	Freq Filter OFF	Freq Filter OFF	Freq Filter OFF	Freq Filter OFF
Cutoff	Cutoff	Cutoff	Cutoff	Cutoff	Cutoff	Cutoff
0.1kHz	D.1kHz	0.1kHz	0.1kHz	0.1kHz	0.1kHz	0.1kHz
Sync Source	Sync Source 11	Sync Source 13	Sync Source	Sync Source	Sync Source	Sync Source 17

Set the VT ratio, CT ratio, and power coefficient.

Note_

You can also display the input settings (basic measurement conditions) overview screen by moving the cursor on the Input (Basic) tab using the arrow keys and then pressing SET.

Setting the VT Ratio, CT Ratio, and Power Coefficient (Scaling)

3. Tap Scaling of the input element number you want to configure. A scaling setup menu appears.

VT ratio, CT ratio, and power coefficient	Innut clement 760002
Input element 760901 or 760902	Input element 760903
Element 1 🛛 🗙	Element 6 🛛 🗙
Scaling	Scaling
VT Ratio	VT Ratio
1.0000 measurement directly, turn the VT/CT scaling feature off. If it turned on, the value will be further multiplied by the CT ratio.	
CT Preset Set the VT ratio (0.0001 to 99999.9999).	CT Ratio
Others Set the CT ratio preset (CT2000A, CT1000A, CT1000A, CT1000, CT200, CT60, Others). CT Ratio Set this when using the dedicated CT.	1.0000 SF Ratio
1.0000 — Set the CT ratio (0.0001 to 99999.9999).	1.0000
SF Ratio	
1.0000 — Set the power coefficient (scaling factor) — (0.0001 to 99999.9999).	Οοργ Σ
Copy Σ — Copies the coefficients —	

Copying VT Ratio, CT Ratio, and Power Coefficient (Exec Copy Σ)

You can copy the ratio or coefficient of the input element that is indicated by the cursor to all the input elements in that element's wiring unit.

Сору Σ	\otimes	
VT Ratio		
Copy Exec	Copies the VT ratio	
CT Ratio		
Copy Exec	Copies the CT ratio	
SF Ratio		
Сору Ехес	Copies the power coeffic	ients

2.5 Setting the Valid Measurement Range

"Range Configuration (Range Config)" in the features guide
 "Valid Measurement Range (Valid Measurement Range)" in the features guide

This section explains operating procedures using the following setup methods.

• Procedure Using the Setup Menu (see chapter 1)

This section explains how to set the measurement range when the crest factor (see section 2.9) is set to CF3. When the crest factor is CF6 or CF6A, set the valid measurement ranges from the available options.

Procedure Using the Setup Menu

- 1. Tap the Setup icon , or press MENU under SETUP.
- 2. Tap the Input (Advanced/Options) tab. An input settings (advanced/options) overview screen appears.

Pressing **ESC** closes the overview screen.

3. Tap Range Config. A measurement range configuration setup screen appears.

Range Config button

Input (Advanced/Options) tab

Set the valid current measurement range. Set the valid voltage measurement range.

		Input (Basic)		(Adv	Input anced/0ptions) Computa	tion/Output	Utility	
Wiring Range	Voltage Current	Element 1 30A	Element	2 30A	Element 3 30A	Element 4 5A	Element 5 5A	Element 6 CS	Element 7 CS
Range Config Line Filter Freq Filter/ Rectifier/Level Null Motor/Aux Sensor Correction	¥alid Yalid Measurement Range	1000V 600V 300V 150V 100V 60V 30V 15V 10V 6V 3V	1000 600 300 150 100 60 30 15 10 6 33		1000V 600V 300V 150V 100V 60V 30V 15V 10V 6V 3V	1000V 600V 300V 150V 100V 60V 30V 15V 10V 6V 3V	1000V 600V 300V 150V 100V 60V 30V 15V 15V 10V 6V 3V	1000V 600V 300V 150V 100V 60V 30V 15V 10V 6V 3V	1000V 600V 300V 150V 100V 60V 30V 15V 10V 6V 3V
	Peak Over Jump	1.5V 0FF ▼	1.5		1.5V 0FF ▼	1.5V 0FF ▼	1.5V 0FF ▼	1.5V 0FF ▼	1.5V 0FF ▼

Note.

You can also display the input settings (advanced/options) overview screen by moving the cursor on the Input (Advanced/Options) tab using the arrow keys and then pressing SET.

Setting the Valid Voltage Measurement Range (Voltage)

4. Tap Voltage. A valid voltage measurement range setup screen appears.

		Input (Basic)	(Ac	Input dvanced/0ption	s) Comput	ation/Output	Utility	
Wiring		ΣA 3P3W	<u>ــــــــــــــــــــــــــــــــــــ</u>	?	<u>Σ</u> Β 1Ρ3₩	8		
lange	Voltage	Element 1	Element 2	 Element 3	Element 4	Element 5	Element 6	Element 7
	Current	30A		∖ 30A tly specifie				CS
ange Config 🧹			Curren	ily specifie		asuremen	it ranges	
	1	1000V	1000V	1000V	1000V	1000V	1000V	1000V [°]
ine Filter		600V	600V	600V	600V	600V	600V	600V
Freq Filter/		300V	300A	300A	300V	300V	300V	300A
lectifier/Level		150V	150V	150V	150V	150V	150V	150V
lull		100V	100V	100V	100V	100V	100V	100V
	Valid Measurement	60V		60V	60V			
lotor/Aux	Range			ound of the				
ensor Butt	on for	15V dis	splayed in	ek over-ra	inge occui 15V	S (Peak O	ver Jump) 15V	15V
	laying the	valid 0V	<u>107</u>	10V	10V	10V	10V	10V
disp	curomont	range _{6V}	Measu	urement rar	iges that ai	e not valid	appear din	nmed. _{6V}
disp mea								
disp mea	p screen		3V	3V				
disp mea			3V 1.5V	3V 1.5V				
disp mea								

Specify the measurement range to switch to when a peak over-range occurs. (OFF, 1000V, 600V, 300V, 150V, 100V, 60V, 30V, 15V, 10V, 6V, 3V, 1.5V)

- When Range Σ Link is set to on (see section 2.1), the input elements that are assigned to the same wiring unit are set to the same range.
- If auto range is on (you can turn it on by pressing AUTO), the instrument operates as follows:
 - When a peak over-range occurs, the measurement range increases to the range specified here, skipping the ranges in between.
 - When the measurement range to switch to when a peak over-range occurs has not been selected, the measurement range increases in the order of the specified valid measurement ranges.

Setting a Valid Measurement Range for Voltage

5. Tap Valid Measurement Range. A valid voltage range setup screen appears.

By tapping an input element or wiring unit, you can set all ranges as valid measurement ranges (All ON).

If the measurement range to switch to when a peak over-range occurs has been selected, the range background is displayed in gray.

Valid Voltage Meas	surement	Range						⊗
All	Element 1 30A	Element 2 30A	Element 3 30A	Element 4 5A	Element 5 5A	Element 6 CS	Element 7 CS	
1000V			\checkmark					
600V			\checkmark					
300V								
150V								
100V	\checkmark							
60V								
30V								
15V								
101								
A11 ON								
All OFF								
1.5V								

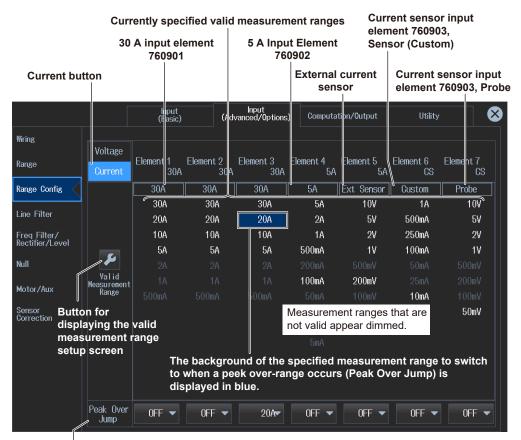
Valid measurement range

- The measurement range switches (in order) between the selected ranges.
- Ranges that are not selected are skipped.
- When Range Σ Link (see section 2.1) is set to ON, the input elements that are assigned to the same wiring unit are set to the same status.

By tapping each range display, you can collectively set or not set the applicable ranges of all input elements or wiring units as valid measurement ranges (All ON or All OFF).

Setting the Valid Current Measurement Range (Current)

4. Tap Current. A valid current measurement range setup screen appears.



Specify the measurement range to switch to when a peak over-range occurs. 30 A input element 760901

- (OFF, 30A, 20A, 10A, 5A, 2A, 1A, 500mA)
- 5 A input element 760902
- (OFF, 5A, 2A, 1A, 500mA, 200mA, 100mA, 50mA, 20mA, 10mA, 5mA)
- Input element 760901 or 760902 with external current sensor:
- (OFF, 10V, 5V, 2V, 1V, 500mV, 200mV, 100mV, 50mV)
- Current sensor input element 760903:

When Terminal (see section 2.2) is set to Sensor, the options vary depending on the CT type. For the current range options, see "Current Range (Current, CURRENT RANGE)" in the features guide. When Terminal is set to Probe,

- (OFF, 10V, 5V, 2V, 1V, 500mV, 200mV, 100mV, 50mV)
- When Range Σ Link is set to on (see section 2.1), the input elements that are assigned to the same wiring unit are set to the same range.
- · If auto range is on (you can turn it on by pressing AUTO), the instrument operates as follows: · When a peak over-range occurs, the measurement range increases to the range specified here,
 - skipping the ranges in between.
 - When the measurement range to switch to when a peak over-range occurs has not been selected, the measurement range increases in the order of the specified valid measurement ranges.

Setting Valid Measurement Ranges for Current (30 A input element example)

5. Tap Valid Measurement Range. A valid current range setup screen appears.

Select the item to set the current range of (Terminal in Use, Direct/Sensor, Ext Sensor/Probe).

If the measurement range to switch to when a peak over-range occurs has been selected, the range background is displayed in gray.

		30A		30A		30A		5A		5A		Custom)thers
		t Sensor	Ext	Sensor	Ext	Senso	Ex1	t Sensor	Ext	: Sensor		Probe		Probe
All	EI	lement 1 30A	Ele	ement 2 30A	Ele	ement 3 30A	El	ement 4 5A	Eŀ	ement 5 5A	El	ement 6 CS	Ele	ement 7 CS
	\checkmark	30A		30A		30A	\checkmark	5A	\checkmark	107	\checkmark	1A		107
	\checkmark	20A		20A				2A	~	5¥	\checkmark	500mA	\checkmark	5¥
		10A		10A		10A		1A		2V	\checkmark	250mA		2V
		5A		5A		5A		500mA		1V	\checkmark	100mA		1V
								100mA		200m∀				
*		500mA									\checkmark	10mA		100mV
All ON														50m¥
All OFF														
*														

Valid measurement range

• The measurement range switches (in order) between the selected ranges.

• Ranges that are not selected are skipped.

• When Range Σ Link (see section 2.1) is set to ON, the input elements that are assigned to the same wiring unit are set to the same status.

By tapping the asterisk of each range, you can collectively set or not set the applicable ranges of all input elements or wiring units as valid measurement ranges (All ON or All OFF).

Setting the Sensor Correction 2.6

Sensor Correction (Sensor Correction)" in the features guide

This section explains operating procedures using the following setup methods.

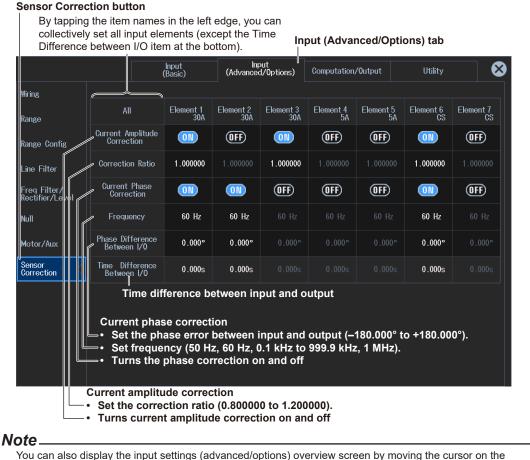
- Procedure Using the Setup Menu (see chapter 1)
- Procedure Using the Menu Icons (see page xiv)

Procedure Using the Setup Menu

- 1. Tap the Setup icon 👬, or press MENU under SETUP.
- 2. Tap the Input (Advanced/Options) tab. An input settings (advanced/options) overview screen appears.

Pressing ESC closes the overview screen.

3. Tap Sensor Correction. A sensor correction setup screen appears.



Input (Advanced/Options) tab using the arrow keys and then pressing SET.

Procedure Using the Menu Icons

You can also use the menu icons shown on the right side of the screen to set the sensor correction.

1. Tap the Misc menu icon 🚆 A Misc menu appears in the sub menu area on the right side of the screen.

By tapping the displayed items, you can specify the same settings as when using the screen explained earlier.

Note

For details on the Misc menu, see page xiv.

2.7

Setting the Line Filter and Frequency Filter

"Line Filter (Line Filter)" in the features guide "Frequency Filter, Rectifier, Level (Freq Filter/Rectifier/Level)" in the features guide

This section explains operating procedures using the following setup methods.

- Procedure Using the Setup Menu (see chapter 1)
- · Procedure Using the Menu Icons (see page iii)

Depending on the measurement mode or the method of computing measurement values (computing method), the settings may be different from the description in this section, the settings may be invalid, or the settings may not be configurable. For details, see the features guide.

Procedure Using the Setup Menu

1. Tap the Setup icon , or press MENU under SETUP.

Setting the Line Filter and Frequency Filter (Cutoff)

 Tap the Input (Basic) tab. An input settings (basic measurement conditions) overview screen appears.

Pressing **ESC** closes the overview screen.

Input (Basic) tab

		Input (Basic)	Input (Advanced/Options)	Computation/O	utput Util	ity 😣
Element 1 30A	Element 2 30A	Element 3 30A	Element 4 5A	Element 5 5A	Element 6 CS	Element 7 CS
Wiring 1P2W	^{Wiring} 1P2W	Wiring 1P2W				
Voltage Range 1000V						
Current Range 30A	Current Range 30A	Current Range 30A	Current Range 5A	Current Range 5A	Current Range 1A	Current Range 1A
Ratio [mV/A] 10.0000	CT Preset Custom	CT Preset Custom				
Scaling OFF						
¥T Ratio	VT Ratio					
1.0000 CT Ratio						
SF Ratio 1.0000						
Line Filter OFF Cutoff 0.5kHz						
Freq Filter OFF						
Cutoff 0.1kHz						
Sync Source		Sync Source		Sync Source		Sync Source
I1	I1	I 3	14	14	16	17

Set the line filter.

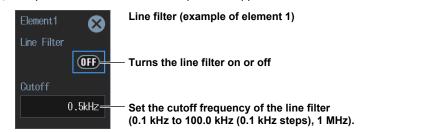
Set the frequency filter.

Note.

You can also display the input settings (basic measurement conditions) overview screen by moving the cursor on the Input (Basic) tab using the arrow keys and then pressing SET.

Setting the Line Filter (Line Filter)

3. Tap Line Filter. A line filter setup screen appears.



Setting the Frequency Filter (Freq Filter)

3. Tap Freq Filter. A frequency filter setup screen appears.

Frequency filter (example of element 1) X (OFF)-Turns the frequency filter on or off 0.1kHz= Set the cutoff frequency of the frequency filter (0.1 kHz to 100.0 kHz (0.1 kHz steps)).

Setting the Line Filter and Frequency Filter (Advanced Settings)

2. Tap the Input (Advanced/Options) tab. An input settings (advanced/options) overview screen appears.

Pressing **ESC** closes the overview screen.

Setting the Line Filter (Line Filter)

- 3. Tap Line Filter. A line filter setup screen appears.
- · When Line Filter Advanced Settings Is Set to OFF

You can set the cutoff frequency and filter type.

Turns line on or off	filter advanced settings	Input (Advanced/Options) tab			
	Input (Basic)	Input (Advanced/Options) Computation/Output Utility 🔇			
Wiring	Line Filter	U Normal			
Range	Advanced Settings				
Range Config	Line Filter Type Buttery	worth - Harmonic Measurement			
Line Filter		By tapping Cutoff, you can set the value collectively for all elements.			
Freq Filter/ Rectifier/Level	All OFF	Cutoff			
Null	All ON	0.5kHz			
Motor/Aux		0.5kHz			
Sensor Correction		0.5kHz			
	Element4	0.5kHz			
	Elenent5 ON	0.5kHz Set the cutoff frequency (0.1 kHz to 100.0 kHz (0.1 kHz (0.1 kHz steps), 1 MHz).			
	flement6	0.5kHz			
	Element7	0.5kHz			

Turne line filter advanced cottings

Set the filter type (Butterworth, Bessel).

Turns the line filter on or off

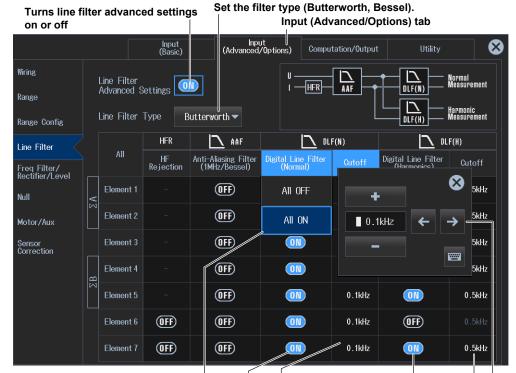
By tapping Line Filter, you can turn on or off the feature

on all elements collectively.

When Line Filter Advanced Settings Is Set to ON

You can set the following filters separately.

- AAF (anti-aliasing filter)
- DLF (N) (normal measurement line filter)
- DLF(H) (harmonics line filter)



By tapping HF Rejection (input element 760903 only), Anti-Aliasing Filter, Digital Line Filter (Normal), or Digital Line Filter (Harmonics), you can turn on or off the function on all elements collectively.

Turns the digital line filter (for harmonic measurement) on and off

Set the cutoff frequency of the digital line filter (for harmonic measurement) (0.1 kHz to 100.0 kHz (0.1 kHz steps)).

Turns the digital line filter (for normal measurement) on and off

Set the cutoff frequency of the digital line filter (for normal measurement) (0.1 kHz to 100.0 kHz (0.1 kHz steps)).

By tapping Cutoff, you can set the value collectively for all elements.

Setting the Frequency Filter (Sync Source/Freq Measurement)

- 3. Tap Freq Filter/Rectifier/Level. A frequency filter setup screen appears.
- 4. Tap Sync Source/Freq Measurement. A Sync Source/Freq Measurement (sync source/ frequency measurement) screen appears.

· When Freq Filter Advanced Settings Is Set to OFF

You can set the cutoff frequency of the low-pass filter (LPF).

Set sync sourc frequency mea		rns freq filter advanced settings on or off Input (Advanced/Options) tab					
	Input (Basic)	Input (Advanced/Option	ns) Computation/Output	Utility 🔀			
Wiring	Sync Source/ Fred Measurement	eq2 Measurement		Sync Src FreqU			
Range	Freq Filter			Sync Src Freqi			
Range Config	Advanced Settings						
Line Filter			PF				
Freq Filter/ Rectifier/Level	Freq Eiltor (A	DFF	Cutoff				
Null	Element1	OFF	0.				
Motor/Aux	Element2	ON OFF	0. // 🗋.1kHz 🗲	→			
Sensor Correction	Element3	OFF	0				
	Element4 ON	OFF					
	Element5 ON		y täpping Cutoff, you c alue collectively for all				
	Element6	OFF	0.1kHz				
	Element7		0.1kHz				
The high-p	ass filter (HPF) —		Set the cutoff frequence	cy of the low-pass filter			

is fixed to on.

Set the cutoff frequency of the low-pass filter (LPF) (0.1 kHz to 100.0 kHz (0.1 kHz steps)).

By tapping Freq Filter, you can turn on or off the feature on all elements collectively.

Turns the low-pass filter (LPF) on or off

When Freq Filter Advanced Settings Is Set to ON

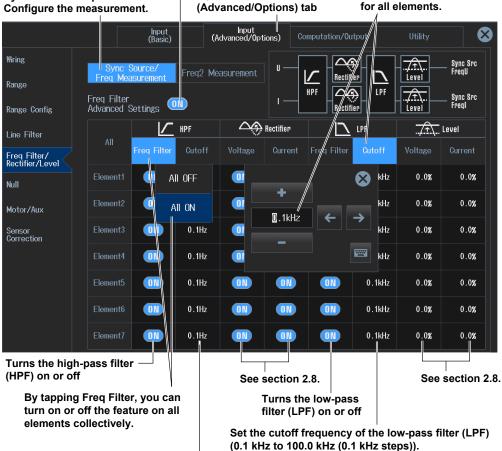
- You can set the following filters and items separately.
- High-pass filter (HPF)
- Rectifier (Rectifier)
- Low-pass filter (LPF)
- Cross level (Level)

Sync Source/Freq

Turns freq filter advanced settings on or off

Input

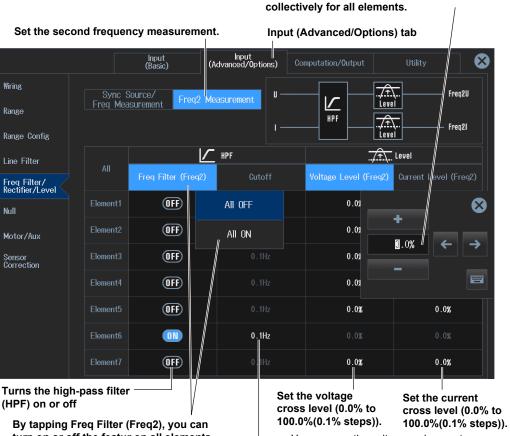
By tapping Cutoff, you can set the value collectively for all elements.



Set the cutoff frequency of the high-pass filter (HPF) (0.1 Hz, 1 Hz, 10 Hz, 0.1 kHz to 100.0 kHz (0.1 kHz steps)).

Second Frequency Measurement Settings (Freq2 Measurement)

- 3. Tap Freq Filter/Rectifier/Level. A frequency filter setup screen appears.
- Tap Freq2 Measurement. A Freq2 Measurement (second frequency measurement) screen appears.



turn on or off the featur on all elements collectively.

Set the cutoff frequency of the high-pass filter (HPF) (0.1 Hz, 1 Hz, 10 Hz, 0.1 kHz to 100.0 kHz (0.1 kHz steps)).

You can use the voltage and current cross level settings when the high-pass filter (HPF) is set to OFF.

By tapping Cutoff, Voltage Level (Freq2), or Current Level (Freq2), you can set the value

Procedure Using the Menu Icons

You can also use the menu icons shown on the right side of the screen to set the line filter and frequency filter.

1. Tap the Filter menu icon []. A Filter menu appears in the sub menu area on the right side of the screen.

By tapping the displayed items, you can specify the same settings as when using the keys explained earlier.

Note.

For details on the Filter menu, see page x.

2.8 Set the Measurement Period

"Measurement Period (Sync Source)" in the features guide

- This section explains operating procedures using the following setup methods.
- Procedure Using the Setup Menu (see chapter 1)

Depending on the measurement mode or the method of computing measurement values (computing method), the settings may be different from the description in this section, the settings may be invalid, or the settings may not be configurable. For details, see the features guide.

Procedure Using the Setup Menu

- 1. Tap the Setup icon 🔅 , or press MENU under SETUP.
- 2. Tap the Input (Basic) tab. An input settings (basic measurement conditions) overview screen appears.

Pressing **ESC** closes the overview screen.

Input (Basic) tab Input (Basic) \otimes Input (Advanced/Options) Computation/Output Utility Element 1 30A Element 2 30A Element 3 30A Element 4 5A Element 5 5A Element 6 CS Element 7 CS Wiring Wiring Wiring Wiring Wiring Wiring Wiring 1P2W 1P2W 1P2W 1P2W 1P2W 1P2W 1P2W Voltage Range 1000V 1000V 1000V 1000V 1000V 1000V 1000V Current Range 5A Current Range Current Range Current Range Current Range Current Range Current Range 1A 30A 30A 30A 5A 1A Ratio [mV/A] Ratio [mV/A] Ratio [mV/A] Ratio [mV/A] Ratio [mV/A] CT Preset CT Preset Custom Custom Scaling OFF Scaling Scaling Scaling Scaling Scaling Scaling OFF OFF OFF OFF OFF OFF VT Ratio CT Ratio 1 0000 1 0000 SF Ratio Line Filter OFF Cutoff Cutoff Cutoff Cutoff Cutoff Cutoff Cutoff Freq Filter OFF Cutoff Cutoff Cutoff Cutoff Cutoff Cutoff Cutoff Sync Source Sync Source Sync Source Sync Source Sync Source Sync Source Sync Source

Set the Sync Source.

If the computing method (Measurement Method) of the data update interval setup screen (see section 2.10) is set to Digital Filter Average, the menu appears dimmed as shown in the following figure and cannot be used.

| Sync Source |
|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| II | 12 | 13 | 14 | 15 | 16 | 17 |

Note

You can also display the input settings (basic measurement conditions) overview screen by moving the cursor on the Input (Basic) tab using the arrow keys and then pressing SET.

Setting the Sync Source (Sync Source)

3. Tap Sync Source. A sync source setup screen appears.

S	ync source (example of	element 1)
	Element 1 🛛 🗙	
	Sync Source (for Sync Source Period Average)	
	11 🚽	— Set the
		Z Phase

Set the sync source (U1 to U7, I1 to I7, Ext Clk, Z Phase1 (Ch D), Z Phase3 (Ch H), None).

Setting the Cross Level (Level)

 Tap the Input (Advanced/Options) tab. An input settings (advanced/options) overview screen appears.

Pressing **ESC** closes the overview screen.

- 5. Tap Freq Filter/Rectifier/Level. A frequency filter setup screen appears.
- 6. Tap Sync Source/Freq Measurement. A Sync Source/Freq Measurement (sync source/ frequency measurement) screen appears.

Turns freq f Sync Source the measure	ľ	Input (Advanced/ ca			y tapping Voltage or Current, you an set the value collectively for lelements.				
		Input (Basic)	(4	Input dvanced/0p	tions) Co	omputation	Itput	Utility	
Wiring	Sync S		Frea2 Me	asurement) u —			ŢŢ,	Sync Src FreqU
Range	Freq Mea Freq Filter					HPF			Sync Src
Range Config	Advanced S	Settings 🤇					ier	Level	Freql
Line Filter	All		HPF		Rectifier		LPF	. <u>,7. î.</u> ,	Level
Freq Filter/ Rectifier/Level		Freq Filter	Cutoff	Voltage	Current	Freq Filter	Cutoff	Voltage	Current
Null	Element1	OFF	All OFF		_ ا		E	30.0%	0.0%
Motor/Aux	Element2	OFF	All ON			+ •		0.0%	0.0%
Sensor Correction	Element3	OFF	0.1H			0% [°]	← →	0.0%	0.0%
	Element4	OFF	0./Hz					0.0%	0.0%
	Element5	OFF	. 1Hz			0FF		0.0%	0.0%
	Element6	(OFF)	0.1Hz			OFF		0.0%	0.0%
	Element7	0FF	0.1Hz			OFF		0.0%	0.0%
By tapping Vo	oltage or C	urrent,	Turns	the volta	ge				

By tapping Voltage or Current you can turn on or off the feature on all elements collectively. Turns the voltage rectifier on or off Turns the current-

rectifier on or off

Set the voltage or current cross level. -

When the rectifier feature is off: -100.0% to 100.0%, in 0.1% steps When the rectifier feature is on: 0.0% to 100.0%, in 0.1% steps

You can use the voltage and current cross level settings when the high-pass filter (HPF) is set to OFF or when the rectifier feature is set to ON.

2.9 Setting the Crest Factor

Crest Factor (Crest Factor)" in the features guide

- This section explains operating procedures using the following setup methods.
- Procedure Using the Setup Menu (see chapter 1)

Procedure Using the Setup Menu

- 1. Tap the Setup icon , or press MENU under SETUP.
- 2. Tap the Input (Advanced/Options) tab. An input settings (advanced/options) overview screen appears.

Pressing **ESC** closes the overview screen.

Crest factor (Crest Factor)

3. Tap Range. A setup screen appears for common measurement range items.

Range button			Input (Ad	vanced/Options)	tab	
		Input (Basic)	Input (Advanced/Options)	Computation/Output	Utility	\otimes
Wiring	Set the cre	est factor (CF:	3, CF6, CF6A).			
Range	Crest Factor		Range Σ Link			
Range Config	CF3	-	⊗ OFF ◄	·		
Line Filter		Display Format				
Freq Filter/ Rectifier/Level	Direct	•				
Null						
Motor/Aux						
Sensor Correction						

Note.

You can also display the input settings (advanced/options) overview screen by moving the cursor on the Input (Advanced/Options) tab using the arrow keys and then pressing SET.

2.10 Setting the Data Update Interval

"Data Update Interval (Update Rate)" in the features guide

- This section explains operating procedures using the following setup methods.
- Procedure Using the Setup Menu (see chapter 1)
- Procedure Using the Menu Icons (see page iii)

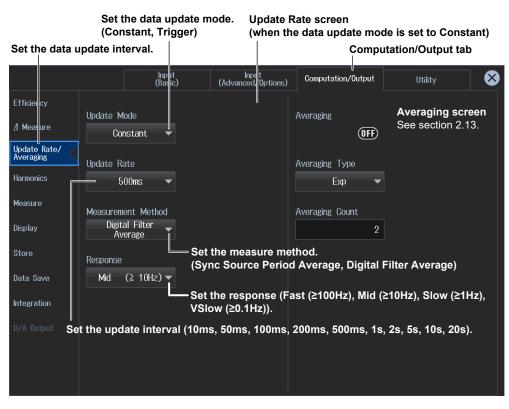
Depending on the measurement mode or the method of computing measurement values (computing method), the settings may be different from the description in this section, the settings may be invalid, or the settings may not be configurable. For details, see the features guide.

Procedure Using the Setup Menu

- 1. Tap the Setup icon 🔅 , or press MENU under SETUP.
- 2. Tap **Computation/Output** tab. A computation and output settings overview screen appears. Pressing **ESC** closes the overview screen.

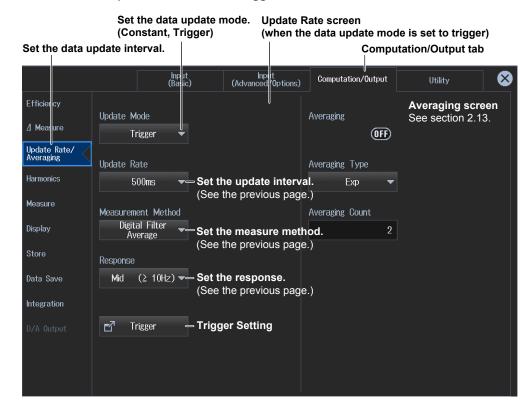
Setting the Data Update Interval (Update Rate)

3. Tap Update Rate/Averaging. A drop-down list for setting the interval appears.



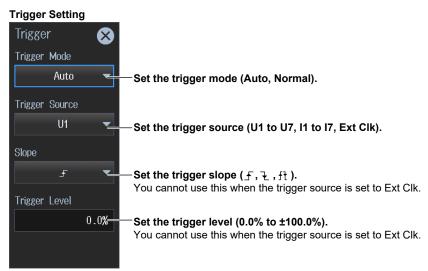
• When the Data Update Mode Is Set to Constant

Note



· When the Data Update Mode Is Set to Trigger

Trigger Setting



Procedure Using the Menu Icons

You can also use the menu icons shown on the right side of the screen to set the data update interval.

 Tap the Update Rate/Averaging menu icon . An Update Rate./Averaging menu appears in the sub menu area on the right side of the screen. By tapping the displayed items, you can specify the same settings as when using the keys explained earlier.

Note_

- · For details on the Update Rate/Averaging menu, see page ix.
- When the trigger source is set to Ext Clk, you cannot set the trigger slope (₹ fixed to falling).

2.11 Setting the Efficiency Equation

"Efficiency Equation (Efficiency)" in the features guide

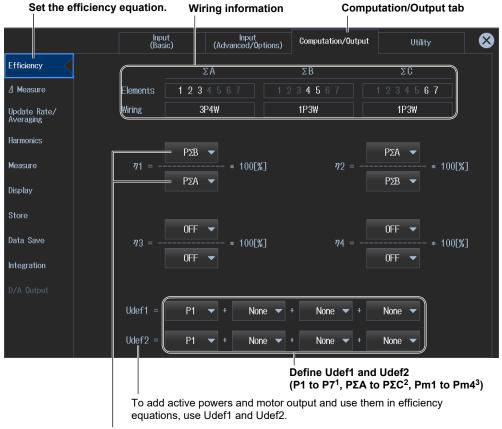
- This section explains operating procedures using the following setup methods.
- Procedure Using the Setup Menu (see chapter 1)

Procedure Using the Setup Menu

- 1. Tap the Setup icon , or press MENU under SETUP.
- 2. Tap **Computation/Output** tab. A computation and output settings overview screen appears. Pressing **ESC** closes the overview screen.

Setting the Efficiency Equation (Efficiency)

3. Tap Efficiency. An efficiency equation setup screen appears.



Set the denominator and numerator of the efficiency equation to the active power and motor power measurement functions. (P1 to P7¹, PΣA to PΣC², Pm1 to Pm4³, Udef1, Udef2) You can set up to four equations: η 1 to η 4.

- 1 Can be set within the range of the installed input elements.
- 2 Can be set within the range of the wiring unit that is automatically determined by the installed input elements.
- 3 You can set this on models with the /MTR1 or /MTR2 option.

Note.

2.12 Setting the Delta Computation

► "Delta Computation (△ Measure)" in the features guide

This section explains operating procedures using the following setup methods.

• Procedure Using the Setup Menu (see chapter 1)

Procedure Using the Setup Menu

- 1. Tap the Setup icon , or press MENU under SETUP.
- 2. Tap **Computation/Output** tab. A computation and output settings overview screen appears. Pressing **ESC** closes the overview screen.

Setting Delta Computation (ΔMeasure)

3. Tap Δ Measure. A delta computation setup screen appears.

Set the de equation.	elta computation	Wiring informat	ion Com _i	putation/Output ta	b
	Input (Basic)	Input (Advanced/0pti	ons) Computation/Output	Utility	
Efficiercy		ΣΑ	ΣΒ	ΣC	
/ Measure	Elements 🥂	1234567	1234567	1234567	
Update Rate/ Averaging	Wiring	3P4₩	1P3₩	1P3₩	
Harmonics	⊿ Measure Type	Star ▷ Delta	3P3₩ ▷ 3V3A 👻	Difference 🔻	
Measure					
Display	⊿ Measure Mode		rms	-	
Store					
Data Save				computation mode c, r-mean, ac).	
Integration	Set the delta compu			1	
D/A Output	The available options	vary depending or	n the set wiring system	ıs. '	

1 Delta computation type

Wiring System	Delta Computation Type
1P3W	Difference, 3P3W>3V3A
3P3W	Difference, 3P3W>3V3A
3P4W	Star>Delta
3P3W(3V3A)	Delta>Star
3P3W(3V3AR)	Delta>Star

Note.

2.13 Setting Averaging

"Averaging (Averaging)" in the features guide

This section explains operating procedures using the following setup methods.Procedure Using the Setup Menu (see chapter 1)

Depending on the measurement mode or the method of computing measurement values (computing method), the settings may be different from the description in this section, the settings may be invalid, or the settings may not be configurable. For details, see the features guide.

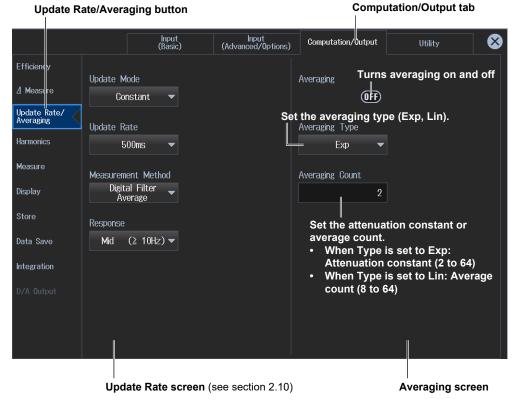
Procedure Using the Setup Menu

- 1. Tap the Setup icon 🔅, or press MENU under SETUP.
- 2. Tap **Computation/Output** tab. A computation and output settings overview screen appears. Pressing **ESC** closes the overview screen.

Setting Averaging (Averaging)

3. Tap Update Rate/Averaging.

A data update interval/averaging setup screen appears.



Note.

2.14 Master/slave Synchronous Measurement

▶ "Master/Slave Synchronous Measurement (Sync Measure)" in the features guide

- This section explains operating procedures using the following setup methods.
- Procedure Using the Setup Menu (see chapter 1)

Procedure Using the Setup Menu

- 1. Tap the Setup icon , or press MENU under SETUP.
- 2. Tap **Computation/Output** tab. A computation and output settings overview screen appears. Pressing **ESC** closes the overview screen.

Setting the Master and Slave (Sync Measure)

3. Tap Measure.

An equation (computation) setup screen appears.

Set the ed	quation (mea	surement).		с 	ompu	tation/Output tab
		Input (Basic)	Input (Advanced/Options)	Computation/O	utput	Utility 😣
Efficiency / Measure Update Rate/ Averaging Harmonics	🛃 User Def Max Hold	ined Functions	S Formula Urms * Irms S,Q Formula Type 1	• •	L	e Polarity ead(-)/Lag(+) ▼ e Angle 180° ▼
Measure Display Store					Sync	Measure Master
Data Save Integration D/A Output	🗗 User Def	ined Events	Pc Formula Type 1 P1 0.50	•		ct master or slave ter, Slave).
			P2 0.50	000		

Note.

3.1 Setting the Display Format

"Display (Display)" in the features guide
 "Numeric Data Display (NUMERIC)" in the features guide
 "Switching the Displayed Page (Page Scroll)" in the features guide
 "All display (All Items)" in the features guide
 "4-, 8-, and 16-Value Displays (4 Items/8 Items/16 Items)" in the features guide
 "Matrix display (Matrix)" in the features guide
 "Display Items (Items, Numeric)" in the features guide

This section explains operating procedures using the following setup methods.

- Procedure Using the Setup Menu (see chapter 1)
- · Procedure Using the Menu Icons (see page iii)
- Procedure Using the Keys (other than SETUP) (see section 1.2 in IM WT5000-03EN)

Depending on the measurement mode or the method of computing measurement values (computing method), the settings may be different from the description in this section, the settings may be invalid, or the settings may not be configurable. For details, see the features guide.

Procedure Using the Setup Menu

- 1. Tap the Setup icon 🔅 , or press MENU under SETUP.
- 2. Tap **Computation/Output** tab. A computation and output settings overview screen appears. Pressing **ESC** closes the overview screen.

Setting the Display Format (Display)

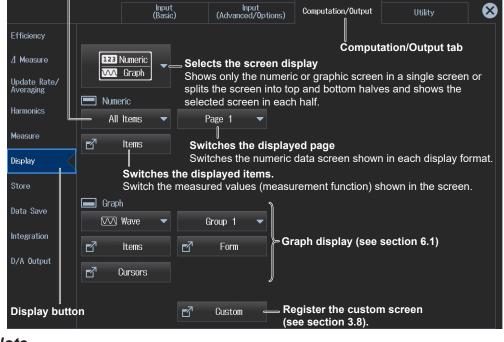
3. Tap Display.

A display format setup screen appears.

Set the numeric display format

(All Items, 4 Items, 8 Items, 16 Items, Matrix, Hrm List Single, Hrm List Dual, User). Set how many measurement results to display in a single screen.

For Hrm List Single and Hrm List Dual, see section 5.2. For User, see section 3.7.



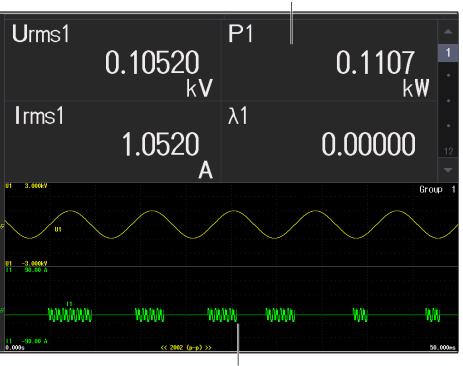
Note

Setting the Screen Display

You can switch the display format of the Numeric (numeric display) and Graph (graph display) screens.

123 Numeric -	
123 Numeric	Numeric (numeric display) Shows only numeric data in a single screen
Graph	Graph (graph display) Shows only graphs in a single screen For details on the graph display, see chapter 6.
123 Numeric 123 Numeric	_ Numeric (numeric display)/Numeric (numeric display) Shows numeric data in the top and bottom halves of the screen
123 Numeric Ⅳ√ Graph	Numeric (numeric display)/Graph(graph display) — Show numeric data in the top half of the screen and graphs (see chapter 6) in the bottom half
Graph	Graph (graph display)/Numeric (numeric display) Shows graphs (see chapter 6) in the top half of the screen and numeric data in the bottom half
√√ Graph √√ Graph	— Graph (graph display)/Graph (graph display) Shows graphs (see chapter 6) in the top and bottom halves of the screen
Custom	Custom (custom display, see section 3.8) Select one of the registered screen configurations (up to five configurations) to display the screen.

Example of Numeric (numeric display)/Graph(graph display)



Numeric (numeric display) in the top half

Graph (waveform display) in the bottom half For display formats, see section 6.2.

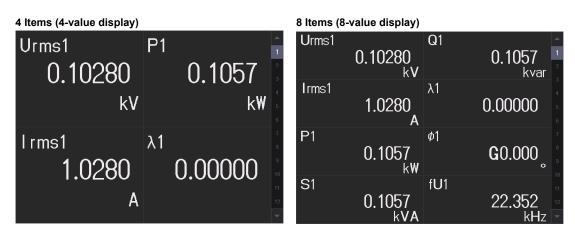
Setting the Numeric Display Format

Set how to display the measurement items on a single screen.

All Items (shows all values)

	Element				4		6		
	Voltage Current	1000V 30A	1						
Urm	s [V]	0.10860k	0.10960k	0.11060k	0.11160k	0.11260k	0.11360k	0.11460k	
Irm	6 [A]	1.0860	2.0860	3.0860	4.0860	5.0860	6.0860	7.0860	2
Р	[₩]	0.1179k	0.2286k	0.3413k	0.4560k	0.5727k	0.6914k	0.8121k	3
S	[VA]	0.1179k	0.2286k	0.3413k	0.4560k	0.5727k	0.6914k	0.8121k	
Q	[var]	0.1179k	0.2286k	0.3413k	0.4560k	0.5727k	0.6914k	0.8121k	
λ		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	
φ	[°]	G0.000							
fU	[Hz]	13.277k	13.279k	13.281k	13.283k	13.285k	13.287k	13.289k	
f١	[Hz]	13.278k	13.280k	13.282k	13.284k	13.286k	13.288k	13.290k	
<i>(</i>	EU 7		0 100001	0.440001	0.444001	0.440001	0.110001	0.444001	7
Urm		0.10860k	0.10960k	0.11060k	0.11160k	0.11260k	0.11360k	0.11460k	
Umn	[V]	0.10960k	0.11060k	0.11160k	0.11260k	0.11360k	0.11460k	0.11560k	8
Udc	[V]	0.11060k	0.11160k	0.11260k	0.11360k	0.11460k	0.11560k	0.11660k	ľ
Urm		0.11160k	0.11260k	0.11360k	0.11460k	0.11560k	0.11660k	0.11760k	9
Uac	[V]	0.11260k	0.11360k	0.11460k	0.11560k	0.11660k	0.11760k	0.11860k	
Ufno	1 [V]								10
U+p	< [V]	0.00000k							
U-pl	< [V]	0.00000k	11						
CfU		0.000	0.000	0.000	0.000	0.000	0.000	0.000	
Рс	[W]	0.0000k	12						
P+p	< [W]	0.0000k							
₽-pl	< [W]	0.0000k							

Switching the displayed page shows other items in this display area.



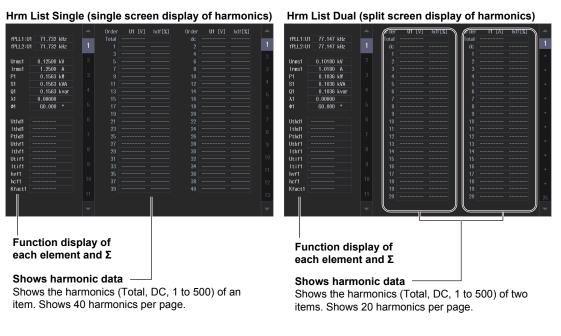
16 Items (16-value display)

•		• ·		
Urms1	Q1	fU1	I+pk1	-
0.10200	0.1040	26.762	0.0000	1
kV	kvar	kHz	A	2
lrms1	λ1	fI1	I-pk1	3
1.0200	0.00000	26.763	0.0000	5
А		kHz	А	6
P1	Ø1	U+pk1	CfU1	7
0.1040	G 0.000	0.00000	0.000	8
kW		kV		9 10
S1	Pc1	U-pk1	CfI1	10
0.1040	0.0000	0.00000	0.000	12
kVA	k₩	kV		-

Matrix (matrix display)

	Shows the measured Measurement function values of each element						
f	I (Hz]	30.558 k	30.560 k	30.562 k	30.564 k	8
f	υc	Hz]	30.557 k	30.559 k	30.561 k	30.563 k	7
¢		•]	G0.000	G0.000	G0.000	G0.000	6
x		1	0.00000	0.00000	0.00000	0.00000	5
Q		var]	0.1084 k	0.2145 k	0.3227 k	0.4328 k	4
s		VA]	0.1084 k	0.2145 k	0.3227 k	0.4328 k	3
Р		w]	0.1084 k	0.2145 k	0.3227 k	0.4328 k	
lr	ms [A]	1.0410	2.0410	3.0410	4.0410	2
	lrms _E	v J)	0.10410 k	0.10510 k	0.10610 k	0.10710 k	1
			Element 1	Element 2	Element 3	Element 4	-

3.1 Setting the Display Format



Switching the Displayed Items (Items)

You can switch the measured value (measurement function) shown in the screen.

On the All Items Display

Numeric Items 🗙	– Closes the menu
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 that includes a harmonic order. For details on how to switch pages, see page 3-1.
Display All Elements	– Turns the display of numeric data of all elements or all wiring units on and off If the total number of elements or wiring units is 8 or more, set this to ON when you want to display the numeric data of all elements or all wiring units.
-	ay frame on and off n horizontally to change the displayed element or wiring unit. You can

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 the previous page).

use these when Display All Elements is set to OFF.

Numeric Items 🔀	— Closes the menu
 4 Items Item No. 1 + 	— Select the displayed item number. The number increases from the upper left to the lower right of the screen.
Function Urms Element/S Element 1 Order (k) Total	 Set the displayed items. You can set the following items for displaying measurement functions. Voltage, current, active power, power factor: See section 3.2 Apparent power, reactive power, corrected power: See section 3.3 Phase difference, frequency (voltage, current): See section 3.4 Computed values (numeric, event): See section 3.5 Integrated value: See section 4.2 Harmonics: See section 5.2 Motor evaluation: See section 9.2 External signal: See section 10.2
■ Reset Items	 Selects the input element or wiring unit to be configured Input element options When the displayed item is set to something other than motor evaluation: Element1 to Element7 When the displayed item is set to motor evaluation: Motor1 to Motor4 Wiring unit options: ΣΑ, ΣΒ, ΣC Selects the harmonic order to be set This is for the harmonic orders display (see section 5.2). Resets the displayed items.

On the 4-, 8-, and 16-Value Displays

On the Matrix Display

Numeric Items 🛞	– Closes the menu
Matrix Item No.	 Select the displayed item number (displayed row). The number increases from top to bottom on the matrix display. Example: If you select 3, the third row from the top is displayed.
Function Urms	— Set the displayed item. See "On the 4-, 8-, and 16-Value Displays."
Order (k) Total	 Selects the harmonic order to be set This is for the harmonic orders display (see section 5.2).
🛃 Reset Items 🗕	 Resets the displayed items.
rz7 Column —	[—] Configure the columns to display.

Numeric Items 🔀	– Closes the menu
Hrm List List Item No.	 Select the displayed harmonic data column. This is for Hrm List Dual. Select 1 (left column) or 2 (right column).
U Telement/S	 Set the displayed items. You can set the following items for displaying measurement functions. Harmonics: See section 5.2
Element 1 🔫	 Selects the input element or wiring unit to be configured Input element options When the displayed item is set to something other than motor evaluation: Element1 to Element7 When the displayed item is set to motor evaluation: Motor1 to Motor4 Wiring unit options: ΣΑ, ΣΒ, ΣC

On the Hrm List Single or Hrm List Dual Display

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.

Function Origin pattern (1 function on 1 page)

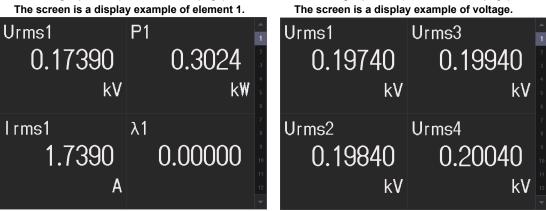
Resetting the Displayed Items

You can clear the displayed items (no data "----") or return them to the preset displayed items.

Reset Items 🛛 🗙	— Closes the menu
Reset Pattern	
Element Origin 🔫	— Set the reset pattern (Element Origin, Function Origin, Clear Current Page, Clear All Pages).
Execute -	Executes reset

Reset Patterns

Element Origin pattern (1 element on 1 page) The screen is a display example of element 1.



Configuring the Columns to Display

You can configure this on the Matrix display.

Column 🔀	– Closes the menu
Column Num 4	– Set the number of columns (4, 7).
Column No. - 1 + Element/Σ	Select the displayed item number (displayed column). The number increases from left to right on the matrix display. Example: If you select 3, the third column from the left is displayed.
Element 1 👻	– Selects the input element (Element1 to Element7) or wiring unit (ΣA, ΣB, ΣC) to be configured
Reset Column Items —	 Resets displayed items

Procedure Using the Menu Icons

You can also use the menu icons shown on the right side of the screen to set the display format.

1. Tap the **Display** menu icon . A Display menu appears in the sub menu area on the right side of the screen.

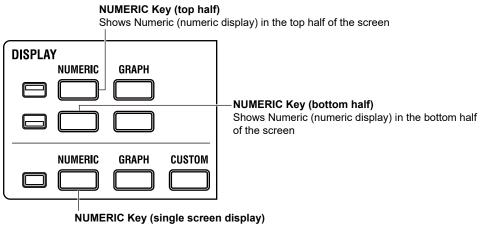
By tapping the displayed items, you can specify the same settings as when using the screen explained earlier.

Note_

For details on the Display menu, see page iv.

Switching the Display Format (NUMERIC key)

You can also use keys to perform "Setting the Screen Display" and "Setting the Numeric Display Format" described earlier.



Shows Numeric (numeric display) in a single screen

Each time you press NUMERIC, the display format switches, in order, between All Items, 4 Items, 8 Items, 16 Items, Matrix, Hrm List Single, Hrm List Dual, and User.

3.2

Displaying the Voltage, Current, Active Power, and Power Factor

This instrument shows on the screen the measurements (measurement functions) of the voltage and current applied to the input elements or wiring units.

"Measurement Functions Used in Normal Measurement" in the features guide

The measurements of voltage, current, active power, and power factor do not require you to set equations. The measurements are simply shown on the screen. Using an example, this section explains how to display measurement results numerically.

In addition, this section explains operating procedures using the following setup methods.

- Procedure Using the Setup Menu (see chapter 1)
- Procedure Using the Menu Icons (see page iii)

Measurement Display Screen (Example of a 4 items display)

Measurement display of input element 1



If you hold your finger down on the 4-, 8-, 16-value, matrix or harmonics display for at least 1 second, you can perform the operations described in "Switching the Displayed Items (Items)," provided later. Switches the displayed page (Page Up/Page Down) Switches to the measurement display of another input element Tap \blacktriangle or \blacktriangledown to change the displayed page in order from the current number. Tap the number directly to change to the number display page.

Note.

Voltage, current, active power, and power factor values can be shown graphically.

- The waveform display feature (see section 6.2) shows voltage and current waveforms.
- The trend display (see section 6.3) shows voltage, current, active power, and power factor values graphically.

Procedure Using the Setup Menu

- 1. Tap the Setup icon 🔅 , or press MENU under SETUP.
- 2. Tap **Computation/Output** tab. A computation and output settings overview screen appears. Pressing **ESC** closes the overview screen.

Switching the Displayed Items (Items)

You can switch the measured value (measurement function) shown in the screen.

3. Tap Display.

A display format setup screen (Numeric/Graph) appears. For details, see section 3.1.

4. Tap Items. The following screen appears.

Numeric Items 🗙	— Closes the menu
💻 4 Items	
Item No.	
- 1 +	
Function	
Urms 🔻	— Set the displayed item.
Element/Σ	You can set the following items for displaying voltage, current, power, and power
	factor. Voltage measurement (Voltage group):
Element 1 🛛 🔫	Urms (true rms value), Umn (rectified mean value calibrated to the rms value),
Order (k)	Udc (simple average), Urmn (current rectified mean value),
	Uac (AC component), Ufnd (fundamental component),
Total	U+peak (maximum value), U-peak (minimum value), CfU (crest factor)
	Current measurement (Current group): Irms (true rms value), Imn (rectified mean value calibrated to the rms value),
	Idc (simple average), Irmn (current rectified mean value), Iac (AC component),
🗹 Reset Items	Ifnd (fundamental component), I+peak (maximum value),
	I-peak (minimum value), CfU (crest factor)
	Measured power and power factor (Power group):
	P (active power), Pfnd (fundamental active power), P+peak (maximum value),
	P-peak (minimum value),
	λ (power factor), $λ$ fnd (fundamental power factor)

Procedure Using the Menu Icons

You can also use the menu icons shown on the right side of the screen to switch the displayed items.

1. Tap the **Display** menu icon . A Display menu appears in the sub menu area on the right side of the screen.

By tapping the displayed items, you can specify the same settings as when using the screen explained earlier.

Note.

For details on the Display menu, see page iv.

3.3

Displaying Apparent Power, Reactive Power, and Corrected Power

This instrument calculates, based on equations that are defined, apparent power (S), reactive power (Q), and corrected power (Pc) from the measurements of the voltage and current applied to the input elements or wiring units and shows calculated results on the screen.

"Equation for Apparent Power (S Formula)" in the features guide
 "Apparent Power and Reactive Power Computation Types (S,Q Formula)" in the features guide
 "Equation for Corrected Power (Pc Formula)" in the features guide

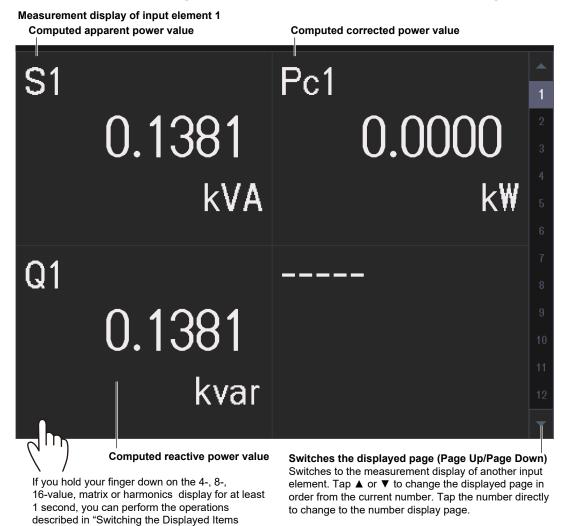
To determine apparent power (S), reactive power (Q), and corrected power (Pc) values, you need to set equations.

Using an example, this section explains how to display computation results numerically.

In addition, this section explains operating procedures using the following setup methods.

- Procedure Using the Setup Menu (see chapter 1)
- Procedure Using the Menu Icons (see page iii)

Measurement Display Screen (Example of a 4 items display)



(Items)," provided later.

Apparent power, reactive power, and corrected power values can be shown graphically.

 The trend display(see section 6.3) shows apparent power, reactive power, and corrected power values graphically.

Procedure Using the Setup Menu

- 1. Tap the Setup icon , or press MENU under SETUP.
- 2. Tap **Computation/Output** tab. A computation and output settings overview screen appears. Pressing **ESC** closes the overview screen.

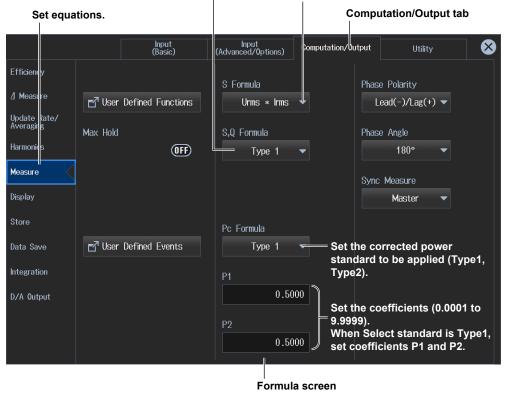
Setting Measurement Equations (Measure)

3. Tap Measure.

An equation setup screen appears.

Set the apparent power and reactive power computation type (Type 1, Type 2, Type 3).

Set the apparent power equation (Urms*Irms, Umean*Imean, Udc*Idc, Umean*Irms, Urmean*Irmean).



Note.

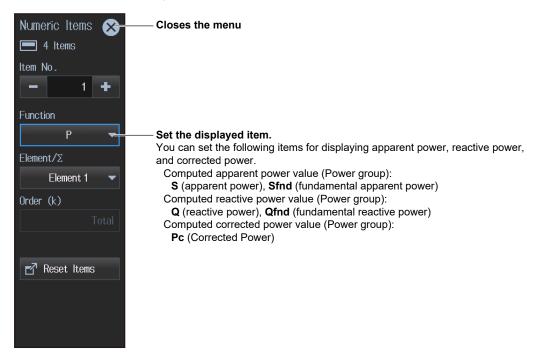
Switching the Displayed Items (Items)

You can switch the measured value (measurement function) shown in the screen.

3. Tap Display.

A display format setup screen (Numeric/Graph) appears. For details, see section 3.1.

4. Tap Items. The following screen appears.



Procedure Using the Menu Icons

You can also use the menu icons shown on the right side of the screen to switch the displayed items.

1. Tap the **Display** menu icon . A Display menu appears in the sub menu area on the right side of the screen.

By tapping the displayed items, you can specify the same operation as explained in "Switching the Displayed Items" described earlier.

Note

For details on the Display menu, see page iv.

3.4

Displaying the Phase Difference And Frequency (Voltage and Current)

This instrument shows on the screen the measurements of the phase differences and frequencies of the voltage and current applied to the input elements or wiring units.

"Phase Difference Polarity (Phase Polarity)" in the features guide
 "Phase Difference Display Format (Phase Angle)" in the features guide

The measurements of phase difference and frequency do not require you to set equations. The measurements are simply shown on the screen. Using an example, this section explains how to display measurement results numerically.

In addition, this section explains operating procedures using the following setup methods.

- Procedure Using the Setup Menu (see chapter 1)
- · Procedure Using the Menu Icons (see page iii)

Measurement Display Screen (Example of a 4 items display)

Measurement display of input element 1 Measured phase difference between Measured frequency (current) voltage and current മ 25.248 GO.000kH7 0 fU1 25.247 kHz []]F Measured frequency (voltage) If you hold your finger down on the 4-, Switches the displayed page (Page Up/Page Down) 8-, 16-value, matrix or harmonics Switches to the measurement display of another input element display for at least 1 second, you can Tap \blacktriangle or \checkmark to change the displayed page in order from the

Note_

provided later.

perform the operations described in

"Switching the Displayed Items (Items),"

Phase difference and frequency (voltage and current) values can be shown graphically.

 The trend display (see section 6.3) shows phase difference and frequency (voltage and current) values graphically.

number display page.

current number. Tap the number directly to change to the

Procedure Using the Setup Menu

- 1. Tap the Setup icon 🔅 , or press MENU under SETUP.
- 2. Tap **Computation/Output** tab. A computation and output settings overview screen appears. Pressing **ESC** closes the overview screen.

Phase Difference Display Mode (Phase)

3. Tap Measure.

An equation setup screen appears.

Set equa	tions.		Computatio	n/Outp	ut tab			
		Input (Basic)	Input (Advanced/Options	5J	nputation/Output	Utility		8
Efficiency			S Formula	Set (Le	the phase p ad(-)/Lag(+),	, Lead(+)/Laç se Polarity	g(-))	
<u>⊿</u> Measure	🛃 User	Defined Functions	Urms * In	ms 🔻		Lead(-)/Lag(+)	-	
Update Rate/ Averaging	Max Hold		Set the ph S,Q Formula	iase di	fference disp	o lay format (se Angle	180°,	360°).
Harmonies		OFF	Туре 1	-		180°	-	
Measure					Svn	ic Measure		
Display						Master	•	
Store			Pc Formula					
Data Save	🛃 User	Defined Events	Туре 1	-				
Integration			P1					
D/A Output			0	.5000				
			P2 0	.5000				

Note.

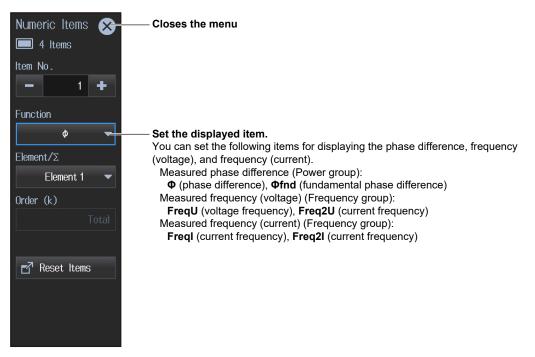
Switching the Displayed Items (Items)

You can switch the measured value (measurement function) shown in the screen.

3. Tap Display.

A display format setup screen (Numeric/Graph) appears. For details, see section 3.1.

4. Tap Items. The following screen appears.



Procedure Using the Menu Icons

You can also use the menu icons shown on the right side of the screen to switch the displayed items.

1. Tap the **Display** menu icon . A Display menu appears in the sub menu area on the right side of the screen.

By tapping the displayed items, you can specify the same operation as explained in "Switching the Displayed Items" described earlier.

Note

For details on the Display menu, see page iv.

3.5

Displaying Computed Values (Values and Events)

You can combine function symbols to create equations and use the numeric data of the combined functions to determine the numeric data (value) of the equation. You can also define events that are used to make judgments when measurement values are compared to the range or reference value. These numeric data and the judgment results of events (true or false) are shown on the screen.

"User-Defined Functions (User Defined Functions)" in the features guide "Measuring the Average Active Power" in the features guide "User-Defined Events (User Defined Event)" in the features guide

Using an example, this section explains how to display computation results.

The following computed values are displayed as an example.

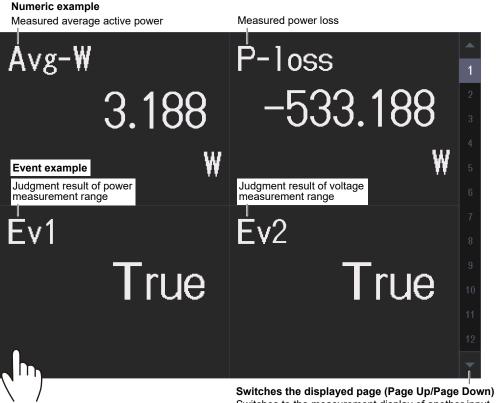
- Average active power measurement (Avg-W) and power loss (P-loss): Value example (user-defined function)
- Power measurement range (Ev1) and voltage measurement range (Ev2): Event example (userdefined event)

In addition, this section explains operating procedures using the following setup methods.

- Procedure Using the Setup Menu (see chapter 1)
- Procedure Using the Menu Icons (see page iii)

Measurement Display Screen (Example of a 4 items display)

Measurement display of input element



If you hold your finger down on the 4-, 8-, 16-value, matrix or harmonics display for at least 1 second, you can perform the operations described in "Switching the Displayed Items (Items)," provided later. Switches the displayed page (Page Up/Page Down) Switches to the measurement display of another input element. Tap ▲ or ▼ to change the displayed page in order from the current number. Tap the number directly to change to the number display page.

Note.

Computed values (values and events) can be shown graphically.

The trend display (see section 6.3) shows computed values (values and events) graphically.

Procedure Using the Setup Menu

- 1. Tap the Setup icon , or press MENU under SETUP.
- 2. Tap **Computation/Output** tab. A computation and output settings overview screen appears. Pressing **ESC** closes the overview screen.

Computed Value (Value) Display Mode (User Defined Function Settings)

3. Tap Measure.

An equation setup screen appears.

Set equa	tions.	Set comput	ted values (numer	ric). Com	putation/O	utput tab	
		Input Basic)	Input (Advanced/Options)	Computation/O	ıtput	Utility	8
Efficiency 1 Measure Update Rate/ Averaging Harmonics	∎ User Defin Max Hold	ed Functions OFF	S Formula Urms * Irms S,Q Formula Type 1	•	Phase Polar Lead(-). Phase Angle 18	/Lag(+) ▼	
Measure Display					Sync Measu Mas		
Store Data Save	∎ User Defin	ed Events	Pc Formula Type 1	•			
Integration D/A Output	Set com values (r		P1 0.50	100			
			P2 0.50	00			

4. Tap User Defined Functions.

The following screen appears.

Displays the setup screen for user-defined functions (F1 to F5, F6 to F10, F11 to F15, F16 to F20)

User	. Defin	ed Function:	S				\bigotimes
	F1-I	F5	F6-F10	F11-F15	F10 s (16 terms,	F20 Enter the	unit using
	Set th	ne computat Name	tion (OFF, ON). Expression	up to 60 cha		up to 8 ch	0
F1	OFF	Avg-W			WH(E1)/(ITIN	Æ(E1)/3600)	Ŵ
			-Set the comput	ation name (up	to 8 charact	ers).	
F2	OFF	P-loss				P(E1)-P(E2)	W
							·
F3	OFF	U-ripple		(UPPK(E1	I)-UMPK(E1))/2/	′UDC(E1)*100	%
F4	() OFF	l-ripple		(IPPK(e1)- IM PK(e1))/2	/IDC(E1)*100	%
					Load user-de	fined functio	ons.
F5		- 4 -	Sa	ve user-define	d functions.		
Loa	d pres	ets.					
	Prese	et			🗹 Save UserDe	f 🖢 Load	ÚserDef

Set judgment conditions

The user-defined function setup screen shows five functions per screen. Up to 20 functions can be defined. In the setup example, the computed value of average active power is set in F1 and the computed value of power loss is set in F2.

- F1: Average active power Avg-W = Integrated power of element 1 WH(E1)/Elapsed integration time of element 1 ITIME(E1)/3600
- F2: Power loss P-loss = Active power of element 1 P(E1) Active power of element 2 P(E2)

If you set the computation setting to on, computed values are shown on the measurement display screen.

Note

- By default, the computed values of user definitions contain samples. Change them as necessary.
- You can also display the computation/output settings overview screen by moving the cursor on the Computation/Output tab using the arrow keys and then pressing SET.

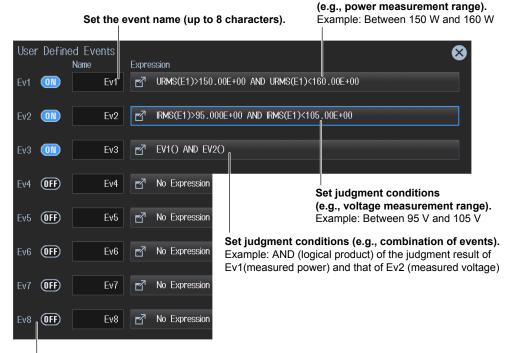
Computed Value (Event) Display Mode (User Defined Event)

3. Tap Measure.

An equation setup screen appears.

4. Tap User Defined Events.

The following screen appears.



Set the events (OFF, ON).

Set the judgment conditions.

5. Tap Expression. The following screen appears.

Select the judgment method (Range, Condition).

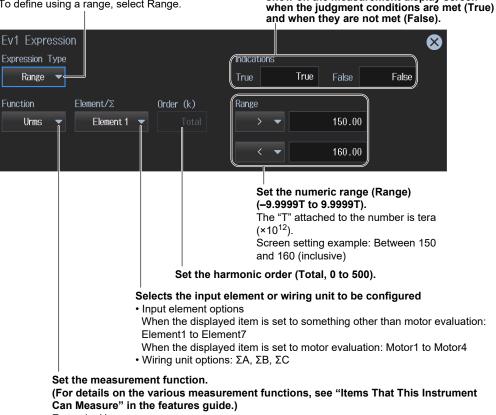
To define using a range, select Range.

· Setting Judgment Conditions (example: power measurement range)

This is an explanation for defining judgment conditions using a measurement range.

Set the characters (up to 6 characters) to

show on the measurement display screen

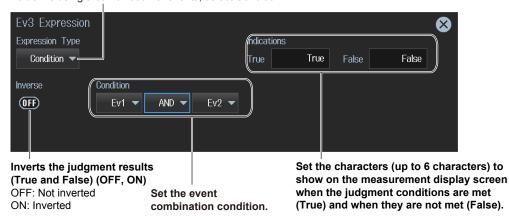


Example: Urms

• Setting Judgment Conditions (example: combination of events)

This is an explanation for defining judgment conditions using a combination of events.

Select the judgment method (Range, Condition). To define using a combination of events, select Condition.



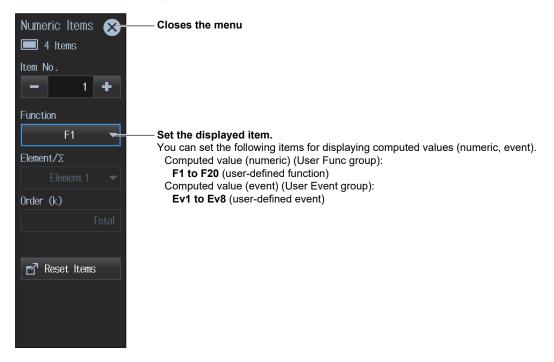
Switching the Displayed Items (Items)

You can switch the measured value (measurement function) shown in the screen.

3. Tap Display.

A display format setup screen (Numeric/Graph) appears. For details, see section 3.1.

4. Tap Items. The following screen appears.



Procedure Using the Menu Icons

You can also use the menu icons shown on the right side of the screen to switch the displayed items.

1. Tap the **Display** menu icon . A Display menu appears in the sub menu area on the right side of the screen.

By tapping the displayed items, you can specify the same operation as explained in "Switching the Displayed Items" described earlier.

Note

For details on the Display menu, see page iv.

3.6 Holding the Maximum Values

This instrument shows on the screen the maximum values of measurements (measurement functions) of the voltage, current, power, and the like applied to the input elements or wiring units.

"MAX Hold (Max Hold)" in the features guide

Using an example, this section explains how to display the maximum values of measurements. The following maximum values are displayed as an example.

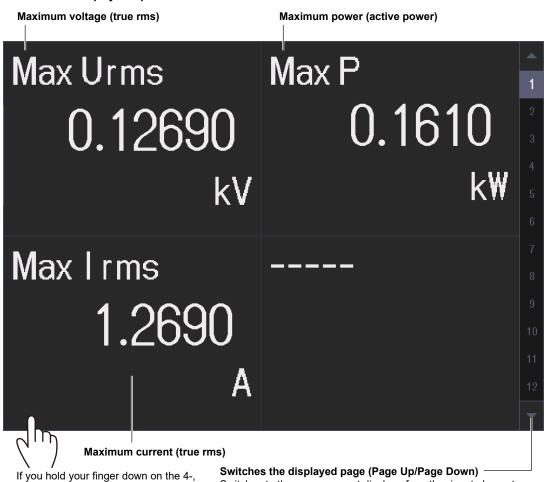
- Maximum value of the true rms voltage (Max Urms)
- Maximum value of the true rms current (Max Irms)
- · Maximum value of the active power (Max P)

In addition, this section explains operating procedures using the following setup methods.

- Procedure Using the Setup Menu (see chapter 1)
- · Procedure Using the Menu Icons (see page iii)

Measurement display of input element 1

Measurement Display Screen (Example of a 4 items display)



If you hold your finger down on the 4-, 8-, 16-value, matrix or harmonics display for at least 1 second, you can perform the operations described in "Switching the Displayed Items (Items)," provided later. Switches the displayed page (Page Up/Page Down) Switches to the measurement display of another input element Tap ▲ or ▼ to change the displayed page in order from the current number. Tap the number directly to change to the number display page.

Procedure Using the Setup Menu

- 1. Tap the Setup icon , or press MENU under SETUP.
- 2. Tap **Computation/Output** tab. A computation and output settings overview screen appears. Pressing **ESC** closes the overview screen.

Maximum Value Display Mode (Max Hold)

- 3. Tap Measure.
 - An equation setup screen appears.
- 4. Tap Max Hold to select ON.

Set computed values (numeric).					
Set equa	tions.		Computa	tion/Output tab)
	Input (Basic)	Input (Advanced/Options)	Computation/Output	Utility	
Efficiency		S Formula	Phas	se Polarity	
⊿ Measure	🗗 User Defined Functions	Urms * Irms	-	Lead(-)/Lag(+) 🔻	
Update Rate/ Averaging	Max Hold	S,Q Formula	Pha	se Angle	
Harmonics	OFF	Type 1	-	180° 🔻	
Measure	Maximum value		Syn	c Measure	
Display	display (OFF, ON)			Master 🔻	
Store		Pc Formula			
Data Save	🗗 User Defined Events	Type 1	~		
Integration		P1			
D/A Output		0.50	00		
		P2			
		0.50	00		

5. Tap User Defined Functions.

The following screen appears.

Displays the setup screen for user-defined functions (F1 to F5, F6 to F10, F11 to F15, F16 to F20)

Use	r Defin	ed Functions					8
	F1-	F5	F6-F10	F11-F15	F	16-F20	
	Set ti	h e computat i Name	i on (OFF, ON). Expression	Enter th	e unit u	sing up to 8 c	characters.
F1		Max Urms				MAXURMS(E1)	kV kV
F2		Max Irms	Set the comput (up to 8 charac			Maxirms(E1)	A
F3		Max P				MAXP(E1)	k₩
F4	(IFF)	I-ripple		MAXIRMS	S(E1): M (E1): Ma	laximum Urm aximum Irms c	of element 1
F5	() OFF	D-UrmsR		MAXP(E1)		um P of eleme	ent i

The user-defined function setup screen shows five functions per screen. Up to 20 functions can be defined. In the setup example, the maximum value of the true rms voltage is set in F1, the maximum value of the true rms current is set in F2, and the maximum value of the active power is set in F3.

- F1: Maximum value of the true rms voltage (element 1) Max Urms1 = MAXURMS(E1)
- F2: Maximum value of the true rms current (element 1) Max Irms1 = MAXIRMS(E1)
- F3: Maximum value of the active power (element 1) Max P1 = MAXP(E1)

If you set the computation setting to on, maximum values are shown on the measurement display screen.

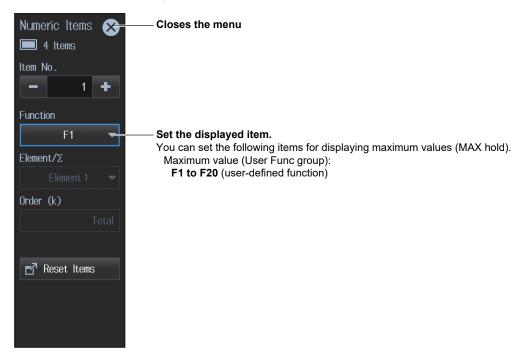
Note.

- By default, the computed values of user definitions contain samples. Change them as necessary.
- You can also display the computation/output settings overview screen by moving the cursor on the Computation/Output tab using the arrow keys and then pressing SET.

Switching the Displayed Items (Items)

You can switch the measured value (measurement function) shown in the screen.

- 3. Tap Display.
 - A display format setup screen (Display/Numeric/Graph) appears. For details, see section 3.1.
- 4. Tap Items. The following screen appears.



Procedure Using the Menu Icons

You can also use the menu icons shown on the right side of the screen to switch the displayed items.

1. Tap the **Display** menu icon . A Display menu appears in the sub menu area on the right side of the screen.

By tapping the displayed items, you can specify the same operation as explained in "Switching the Displayed Items" described earlier.

Note

For details on the Display menu, see page iv.

3.7 User Display

You can display an illustration (.bmp) that you created on a PC or the like or a photo (.bmp) as a background of the screen and arrange numeric data boxes on top of the background to configure the screen.

"User Display (User)" in the features guide

This section explains operating procedures using the following setup methods.

- Procedure Using the Setup Menu (see chapter 1)
- · Procedure Using the Menu Icons (see page iii)
- Procedure Using the Keys (other than SETUP) (see section 1.2 in IM WT5000-03EN)

Procedure Using the Setup Menu

- 1. Tap the Setup icon , or press MENU under SETUP.
- 2. Tap the **Computation/Output** tab. A computation and output settings overview screen appears. Pressing **ESC** closes the overview screen.

Setting the Display Format (Display)

3. Tap Display.

A display format setting screen appears.

Set the numeric display format to User.

	Input (Basio) Input (Advanced/Options)	Computation/Output	Utility 😣
Efficiency			Comput	ation/Output tab
▲ Measure		—Configure the display	v (see section 3.1)	
Update Rate/ Averaging	Graph	Switches the display		
Harmonics	Numeric	Switches the numeric	data screen shown	in each display format.
Measure	🔪 User 🔻	Page 1 🔻		
	Items		ad the backgroun	d and display numeric display screen.
Display		play configuration.		
Store	size, character co		stion) to display, die	
Data Save	Graph			
Integration		Group 1 -	raph display (see	section 6 1)
D/A Output	⊡ 7 ltems	Form		
	Cursors	J		
Display but	ton		egister the custor ection 3.8).	n display (see

Note.

Setting and Saving the Display Configuration (Items)

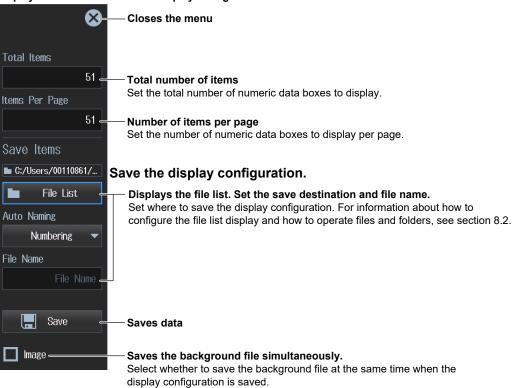
4. Tap Item. A Numeric Item menu appears.

Set the title, measured value (measurement function), display position, character size, character color, and so on.

Numeric Items 🗙	Closes the menu
User Item No.	— Select the displayed item number. The number increases from the upper left to the right and lower of the screen. Use Position to change the display position.
Function	
Urmn ▼ Element/Σ	— Set the displayed item (function). Set the items of the measurement function. See "On the 4-, 8-, and 16-Value Displays" in section 3.1.
Element 1 ▼← Order (k)	 Selects the input element or wiring unit to be configured See "On the 4-, 8-, and 16-Value Displays" in section 3.1. When Function is set to None, set the text to display in the numeric data box.
Total -	 Harmonic to be configured Use this to specify the harmonic (see section 5.2).
X 145 Y 30 Font Size	Set the X and Y display positions. Set the horizontal (X) position and vertical (Y) position of the displayed item.
32 ▼ Font Color	 Selects the character size Select the character size to display.
■ White -	- Selects the text color Select the text color to display.
⊡ ⁷ General	

Tap General.

Displays an overview. Save the display configuration.



Loading the Background and Display Configuration of the Numeric Display Screen (Load)

4. Tap Load. A Load User menu appears.

You can load a display configuration data file or background file that you specify on the file list. For information about how to configure the file list display and how to operate files and folders, see section 8.2.

Load User 🔀	– Closes the menu
🖿 Load Items 🗕	[—] Loads a numeric display configuration file (.txt).
Load Bmp	– Loads a numeric display screen background file (.bmp)
Load Items & Bmp -	-Loads the numeric display configuration file and background file simultaneously.
	If you select and load a display configuration file (.txt) from the file list, a background file with the same name as the display configuration file but with a .bmp extension will be loaded at the same time.
	* 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.

Procedure Using the Menu Icons

You can also use the menu icons shown on the right side of the screen to set the display format.

1. Tap the **Display** menu icon . A Display menu appears in the sub menu area on the right side of the screen.

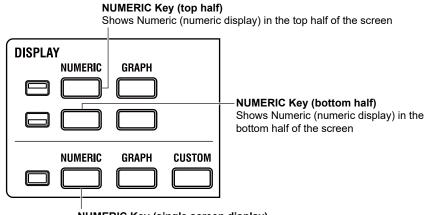
By tapping the displayed items, you can specify the same settings as when using the screen explained earlier.

Note

For details on the Display menu, see page iv.

Switching the Display Format (NUMERIC key)

You can also use keys to perform "Setting the Screen Display" and "Setting the Numeric Display Format" described in section 3.1.



NUMERIC Key (single screen display) Shows Numeric (numeric display) in a single screen

Each time you press **NUMERIC**, the display format switches, in order, between All Items, 4 Items, 8 Items, 16 Items, Matrix, Hrm List Single, Hrm List Dual, and User.

3.8 Custom Display

You can register up to five screen configurations in advance and use them as you like.

▶ "Custom Display (CUSTOM)" in the features guide

This section explains operating procedures using the following setup methods.

- Procedure Using the Setup Menu (see chapter 1)
- Procedure Using the Menu Icons (see page iii)
- Procedure Using the Keys (other than SETUP) (see section 1.2 in IM WT5000-03EN)

Depending on the measurement mode, the settings may be different from the description in this section, the settings may be invalid, or the settings may not be configurable. For details, see the features guide.

Procedure Using the Setup Menu

1. Tap the Setup icon 🔅, or press MENU under SETUP.

Set the display to Custom

2. Tap the **Computation/Output** tab. A computation and output settings overview screen appears. Pressing **ESC** closes the overview screen.

Setting the Display Format (Display)

3. Tap Display.

A display format setting screen appears.

Input (Basic	Input) (Advanced/Options)	Computation/Output	Utility 😣
Efficiency		Comput	ation/Output tab
	1:Custom 1 Mode : Nornal Numeric : 16 Items Graph : Wave 2:Custom 2 Mode : Nornal		
Measure Display	Numeric : Matrix 3:Custom 3 Mode : Normal	1	
Store Data Save		reens.	registered custom
Integration D/A Output	Graph : Bar Numeric : Single		
by A output	Data None		
Display button	🗗 Custom — Cu	istom Screen Reg	istration

Note_

Registering Custom Screens (Custom)

- 4. Tap Custom. A CUSTOM menu appears.
- 5. Select a registration tab. The setup menu is display for the selected tab.

Custom Closes the menu	Custom 1 🛛 🛞	Closes the menu
1:Custom 1 Mode : Normal Image: Numeric : 16 Items Graph : Wave Tap a registered	1:Custom 1 Image: State	- Displays the registered information.
tab. 2:Custom 2 Mode : Normal Numeric : Matrix	Name Custom 1 -	Set the registration name of the screen configuration. For instructions on how to enter characters, see section 3.3 in the Getting Started Guide, IM WT5000-03EN.
3:Custom 3 Mode : Norma1 Graph : Trend	OverWrite = Clear =	Overwrite The old configuration is overwritten with the current screen configuration. Delete The registered contents are deleted.
4:Custom 4 Mode : Normal Graph : Bar Mumeric : Single 5:Custom 5	Custom 5 5:Custom 5 Data None	-Closes the menu
Data None Tap an unregistered tab.	Name Custom 5 -	Set the registration name of the screen configuration. For instructions on how to enter characters, see section 3.3 in the Getting Started Guide, IM WT5000-03EN.
	Register -	 New registration The current screen configuration is registered as a new configuration.

Procedure Using the Menu Icons

You can also use the menu icons shown on the right side of the screen to set the display.

1. Tap the **Display** menu icon . A Display menu appears in the sub menu area on the right side of the screen.

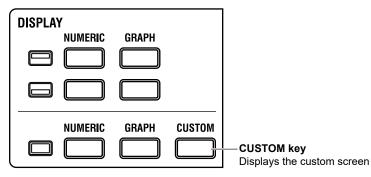
By tapping the displayed items, you can specify the same settings as when using the screen explained earlier.

Note.

For details on the Display menu, see page iv.

Switching the Custom Screen (CUSTOM key)

You can also use keys to switch the custom screen.



Each time you press **CUSTOM**, the screen configuration changes in order between registration tabs 1, 2, 3, 4, and 5. Unregistered tabs are skipped. If there are no screen configurations registered in any of the registration tabs, the screen does not switch to the custom screen.

Chapter 4

4.1 Setting Integration Conditions

- "Enabling or Disabling Independent Integration (Independent Control)" in the features guide
 "Integration Auto Calibration On/Off (Auto Cal)" in the features guide
 - "Integration Mode (Integration Mode)" in the features guide
 - "Integration Timer (Integration Timer)" in the features guide
 - Scheduled Times for Real-Time Integration (Start Time/End Time)" in the features guide
 - Watt Hour Integration Method for Each Polarity (WP ± Type)" in the features guide
 - "Current Mode for Current Integration (q Mode)" in the features guide

"Rated Time for Integrated D/A Output (Integration Rated Time)" in the features guide
 "Integration resume action at power failure recovery (Resume Action)" in the features guide

This section explains operating procedures using the following setup methods.

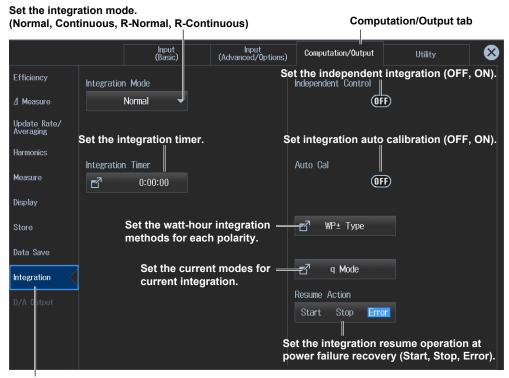
- Procedure Using the Setup Menu (see chapter 1)
- · Procedure Using the Menu Icons (see page iii)
- Procedure Using the Keys (other than SETUP) (see section 1.2 in IM WT5000-03EN)

Procedure Using the Setup Menu

- 1. Tap the Setup icon , or press MENU under SETUP.
- 2. Tap **Computation/Output** tab. A computation and output settings overview screen appears. Pressing **ESC** closes the overview screen.

Setting Integration Conditions (Integration)

- 3. Tap Integration. An integration condition setup screen appears.
- When the Integration Mode Is Set to Normal or Continuous



Set the integration conditions.

4.1 Setting Integration Conditions

· When the Integration Mode Is Set to R-Normal or R-Continuous

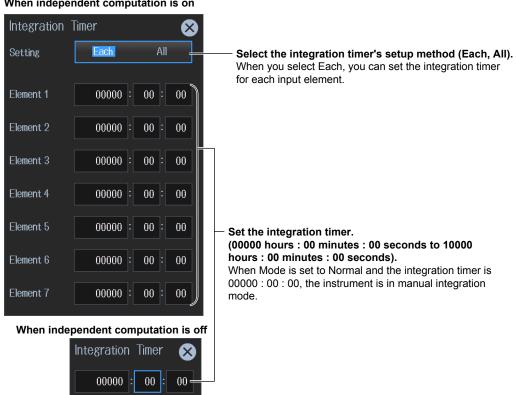
Set the integration (Normal, Cont	ation mode. tinuous, R-Normal, R-Conti	Computation/Output tab				
	Input (Basic)	Input (Advanced/Options)	Computation/Output	Utility 🔀		
Efficiency	Integration Mode		Independent Control			
⊿ Measure	R-Normal 🗸		OFF			
Update Rate/ Averaging						
Harmonics	The second line The sec	`	A.u 0-1			
Measure	(Integration Timer 1 0:00:00		Auto Cal			
Display	Start Time					
Store			🗗 WP± Type			
Data Save	End Time					
Integration			🗗 q Mode			
D/A Output	Set the scheduled	times for	Resume Action			
	real-time integrati		Start Stop Error			
Set the int	tegration conditions.					

Note_

You can also display the computation/output settings overview screen by moving the cursor on the Computation/Output tab using the arrow keys and then pressing SET.

Setting the Integration Timer (Timer)

4. Tap Integration Timer. The following screen appears.



When independent computation is on

Setting Scheduled Times for Real-Time Integration (Real-time Control)

- 4. Tap Real-time Control. The following screen appears.The Real-time Control button appears when the integration mode is set to R-Normal or R-Continuous.
- When Independent Integration Is Disabled

Set the scheduled start and stop times

(Year/month/day, 00 hours : 00 minutes : 00 seconds to 23 hours : 59 minutes : 59 seconds).

Scheduled integration start time	
Start Time	
2018/01/01 00:00:00	Set the scheduled time
Tap Start.	to the current time.
Real-time Control	
Start 2018 / 01 / 01 00 : 00 :	00 Copy Current Time
End 2018 / 01 / 01 01 : 00 :	00 Copy Start Time
Tap End.	Set the scheduled time to
End Time	the integration start time.
Z ¹ 2018/01/01 01:00:00	
Scheduled integration end time	

• When Independent Integration Is Enabled

Cor	-time htrol Tap Rea Control.							method (Each, All). can set the schedule for each input element.
Real-time Setting	Control Each	All						$\mathbf{\otimes}$
Element 1	Start	2018 /	01	01	00	00	00	Copy Current Time Set the scheduled
	End	2018 /	01	01	01	00	00	Copy Start Time current time.
Element 2	Start	2018 /	01	01	01	00	00	Copy Current Time
	End	2018 /	01	01	02	00	00	Copy Start Time time to the integration start
Element 3	Start	2018 /	01	01	02	00	00	Copy Current Time
	End	2018 /	01	01	03	00	00	Copy Start Time
Element 4	Start	2018 /	01	01	03	00	00	Copy Current Time
	End	2018 /	01	01	04	00	00	Copy Start Time
Element 5	Start	2018 /	01	01	04	00	00	Copy Current Time
	End	2018 /	01	01	05	00	00	Copy Start Time
Element 6	Start	2018 /	01	01	05	00	00	Copy Current Time
	End	2018 /	01	01	06	00	00	Copy Start Time
Element 7	Start	2018 /	01	01	06	00	00	Copy Current Time
	End	2018 /	01	01	07	00	00	Copy Start Time

Set the scheduled start time and scheduled end time (year/month/day, 00 hours : 00 minutes : 00 seconds-23 hours : 59 minutes : 59 seconds).

Setting Independent Integration (Independent Control)

- 4. Tap Independent Control. Element numbers appear.
- 5. Tap within the element number display frame. The following screen appears.

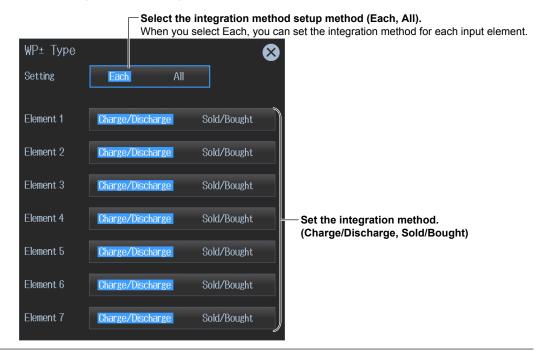
	out elements that you w integration to be perfor		E tation/Output tab	Element number d	isplay
	Input (Basic)	Input (Advanced/Options)	Computation/Output	Utility	⊗
Efficiency	Integration Mode		Independent Control		
/ Measure	R-Normal 🔻			Þ	
Update Rate/ Averaging			Element Objects		
Harmonics		Element Objec	te		
Measure	🛃 Integration Timer		··> ✓ 3 ✓ 4 ✓ 5	✓ 6 ✓ 7	
Display					
Store	rral-time Control	All ON	All OFF		
Data Save	Selects all input	elements			
Integration		all input elements	🗗 q Mode		
D/A Output			Resume Action		
			Start Stop Erro		

Set the integration conditions.

* Even if you select input elements that independent integration will be performed on, independent integration may not be performed due to the wiring system setting or the independent input element configuration (see the features guide).

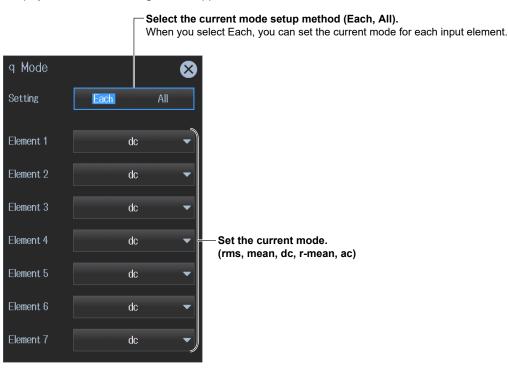
Setting the Watt-Hour Integration Method for Each Polarity (WP± Type)

4. Tap WP± Type. The following screen appears.



Setting the Current Mode for Current Integration (q Mode)

4. Tap q Mode. The following screen appears.



Procedure Using the Menu Icons

You can also use the menu icons shown on the right side of the screen to set the integration conditions.

1. Tap the Integration menu icon . An Integration menu appears in the sub menu area on the right side of the screen.

By tapping the displayed items, you can specify the same settings as when using the screen explained earlier.

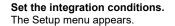
Note.

For details on the Integration menu, see page xii.

Procedure Using Keys

You can also use the front panel keys to set integration.





4.2 Displaying Integrated Values (numeric display)

This instrument calculates the integrated value of power (watt hours) and the integrated value of current (ampere hours) from the voltage and current applied to the input elements or wiring units and shows the measurements (measurement functions) on the screen.

▶ "Starting, Stopping, and Resetting Integration" in the features guide

Watt hours (WP, WP+, WP-) and ampere hours (q, q+, q-) do not require you to set equations. The values are simply shown on the screen when integration is started.

To determine the volt-ampere hours (WS) and var hours (WQ), you need to set the equations for apparent power (S) and reactive power (Q). For the setup procedure, see section 3.3. Using an example, this section explains how to display integrated values numerically.

In addition, this section explains operating procedures using the following setup methods.

- Procedure Using the Setup Menu (see chapter 1)
- · Procedure Using the Menu Icons (see page iii)
- Procedure Using the Keys (other than SETUP) (see section 1.2 in IM WT5000-03EN)

Measurement Display Screen (Example of a 4 items display)

Measurement display of input element 1 Measured sum of positive and negative watt hours Measured volt-ampere hours WS1<u>69.8619</u> 5.00000 Wh mVAh q1 WQ1 69.8619 5.00000Ah mvarh Measured sum of positive Measured var hours and negative ampere hours Switches the displayed page (Page Up/Page Down) Switches to the measurement display of another input

If you hold your finger down on the 4-, 8-, 16-value, matrix or harmonics display for at least 1 second, you can perform the operations described in "Switching the Displayed Items (Items)," provided later.

Note_

Integrated values can be shown graphically.

• The trend display (see section 6.3) shows integrated values graphically.

element. Tap ▲ or ▼ to change the displayed page in

order from the current number. Tap the number directly

to change to the number display page.

Procedure Using the Setup Menu

- 1. Tap the Setup icon 🔅 , or press MENU under SETUP.
- 2. Tap **Computation/Output** tab. A computation and output settings overview screen appears. Pressing **ESC** closes the overview screen.

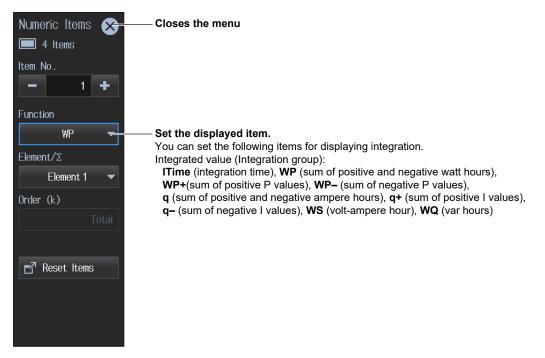
Switching the Displayed Items (Item)

You can switch the measured value (measurement function) shown in the screen.

3. Tap Display.

A display format setup screen (Numeric/Graph) appears. For details, see section 3.1.

4. Tap Items. The following screen appears.



Procedure Using the Menu Icons

You can also use the menu icons shown on the right side of the screen to switch the displayed items.

1. Tap the **Display** menu icon . A Display menu appears in the sub menu area on the right side of the screen.

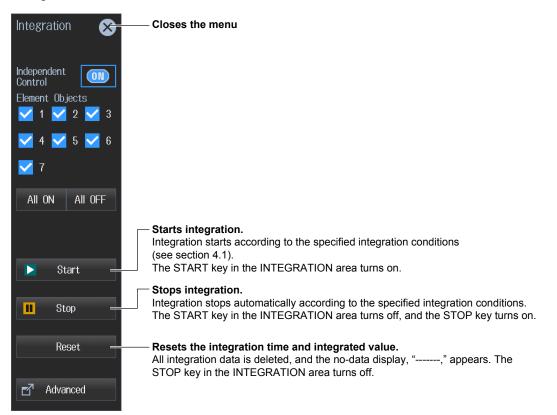
By tapping the displayed items, you can specify the same settings as when using the screen explained earlier.

Note.

For details on the Display menu, see page iv.

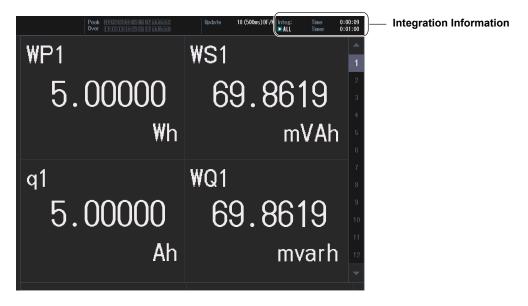
Starting, Stopping, and Resetting Integration (Start/Stop/Reset)

1. Tap the Integration menu icon . An Integration menu appears in the sub menu area on the right side of the screen.



Integration Status Display

The integration status (running, paused, end), independent integration on/off state, integration time, and so on are shown at the top of the screen.



Integration Information

When Independent Integration Is Disabled



Elapsed time, timer ,etc.

All elements are controlled simultaneously, and shared information (e.g., elapsed time, timer) are shown.

Integration status display (running, paused, ended)

This is the same display as when independent integration is off (see below).

When independent integration is enabled



Selected elements are controlled independently (e.g., elapsed time, start time), and integration information (e.g., elapsed time, timer) is shown for each element. Press ELEMENTS (appropriate number) in the ELEMENTS/RANGE area to switch the displayed integration information of each element.

Example: Integration running on elements 1 to 3

When integration starts, the elements selected for integration execution show START icons.

II II II 4 5 6 7 Example: Integration paused on elements 1 to 3

When integration stops, the elements selected for integration execution show STOP icons. If you start it again, the icons change to START, and integration resumes.



(00) 4 5 6 7 Example: Integration ended on elements 1 to 3

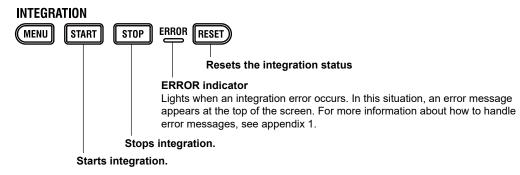
When integration ends after the specified timer value elapses or when the scheduled real-time integration time is reached, the elements selected for integration execution show STOP icons. Unlike pausing, you need to reset the integration after it ends to start the integration again.



When you execute reset, the integration information is cleared, and the STOP icons return to displaying numbers.

Procedure Using Keys

You can also use the front panel keys to start, end, and reset integration.



5.1 Setting Harmonic Measurement Conditions

"Input Element Group (Elements)" in the features guide
 "PLL Source (PLL Source)" in the features guide
 "Measured Harmonic Orders (Min Order/Max Order)" in the features guide
 "Distortion Factor Equation (Thd Formula)" in the features guide
 "Number of FFT Points (FFT Points)" in the features guide
 "Anti-Aliasing Filter" in the features guide
 This section explains operating procedures using the following setup methods.

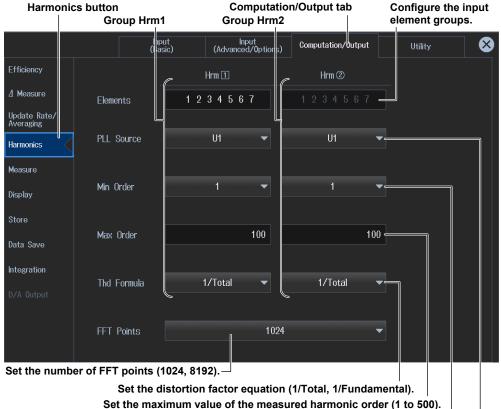
• Procedure Using the Setup Menu (see chapter 1)

 For the operation to perform harmonic measurements in accordance with IEC 61000-4-7, see chapter 13. In IEC Harmonic measurement, there is a limitation on the measurement functions that can be measured. See the appendix in the Getting Started Guide, IM WT5000-03EN.

Procedure Using the Setup Menu

- 1. Tap the Setup icon 🔅 , or press MENU under SETUP.
- 2. Tap **Computation/Output** tab. A computation and output settings overview screen appears. Pressing **ESC** closes the overview screen.

Setting the Harmonic Measurement (Harmonics)



3. Tap Harmonics. A harmonic measurement setup screen appears.

set the maximum value of the measured harmonic order (1 to 500).

Set the minimum value of the measured harmonic order (0, 1).

Set the PLL source (U1 to U7, I1 to I7, Ext Clk).

Note_

You can also display the computation/output settings overview screen by moving the cursor on the Computation/Output tab using the arrow keys and then pressing SET.

Setting the Input Element Group (Element Set)

4. Tap Elements. The Element Settings screen appears.



— Configure the input element groups (Hrm 1, Hrm 2). Input elements that are assigned to the same wiring unit are set to the same group. 5.2

Displaying Harmonic Measurements (numeric display)

This instrument shows on the screen the harmonic measurements (measurement functions) of the voltage and current applied to the input elements or wiring units. Using an example, this section explains how to display harmonic measurements numerically.

In addition, this section explains operating procedures using the following setup methods.

- Procedure Using the Setup Menu (see chapter 1)
- Procedure Using the Menu Icons (see page iii)

Measurement Display Screen (Example of a 4 items display)

Measurement display of input element 1

 Measured harmonic voltage (50th harmonic)

 Wasured harmonic power (50th harmonic)

 U1 (50)

 0.29081

 kV

 0.84457

 kW

 11 (50)

 2.9080

 A

 0.000000

 A

 Measured harmonic power (50th harmonic)

If you hold your finger down on the 4-, 8-, 16-value, matrix or harmonics display for at least 1 second, you can perform the operations described in "Switching the Displayed Items (Items)," provided later. Switches the displayed page (Page Up/Page Down) Switches to the measurement display of another input element Tap ▲ or ▼ to change the displayed page in order from the current number. Tap the number directly to change to the

Note.

Harmonic measurements can be shown graphically.

- The trend display (see section 6.3) shows harmonic measurements graphically.
- The bar graph display (see section 6.4) shows the magnitude of each harmonic graphically.
- The vector display (see section 6.5) shows the phase difference and the magnitude relationship between fundamental waves U(1) and I(1) of each element in the wiring unit.

number display page.

Procedure Using the Setup Menu

- 1. Tap the Setup icon 🔅 , or press MENU under SETUP.
- 2. Tap **Computation/Output** tab. A computation and output settings overview screen appears.

Pressing **ESC** closes the overview screen.

Switching the Displayed Items (Items)

You can switch the measured value (measurement function) shown in the screen.

3. Tap Display.

A display format setup screen (Numeric/Graph) appears. For details, see section 3.1.

4. Tap Items. The following screen appears.

Numeric Items Closes the menu 🔲 4 Items Set the displayed item. Set the displayed harmonic items. Scroll the display list, and select the displayed items from ltem No. the following available items. Harmonic order k (Harmonics(k) Group): -U (k) (rms voltage of harmonic order k), I (k) (rms current of harmonic order k), P (k) (active power of harmonic order k), S (k) (apparent power of harmonic orderk), Function Q (k) (reactive power of harmonic order k), $\lambda(k)$ (power factor of harmonic order k), U(k) $\Phi(\mathbf{k})$ (phase difference between the voltage and current of harmonic order k), **ΦU(k)** (phase difference between harmonic voltage U(k) and the fundamental wave U(1)), Element/S **ΦI(k)** (phase difference between harmonic current I(k) and the fundamental wave I(1)), Z (k) (load circuit impedance), Rs (k) (load circuit series resistance), Element 1 Xs (k) (load circuit series reactance), Rp (k) (load circuit parallel resistance), Xp (k) (load circuit parallel reactance), Uhdf (k) (harmonic voltage distortion factor), Order (k) Ihdf (k) (harmonic current distortion factor), Total= Phdf (k) (harmonic active power distortion factor), Harmonics (Harmonics Group): Uthd (total harmonic voltage distortion), Ithd (total harmonic current distortion), Pthd (total harmonic active power distortion), ► Reset Items Uthf (voltage telephone harmonic factor), **Ithf** (current telephone harmonic factor) Utif (voltage telephone influence factor), Itif (current telephone influence factor), hvf (harmonic voltage factor), hcf (harmonic current factor), K-factor (K factor), **ΦUi-Uj** (phase difference between the fundamental voltage of element i, Ui(1), and the fundamental voltage of element j, Uj(1)), **\PhiUi-Uk** (phase difference between Ui(1) and the fundamental voltage of element k, Uk(1)), **ΦUi-li** (phase difference between Ui(1) and the fundamental current of element i, li(1)), Φ Uj-Ij (phase difference between Uj(1) and the fundamental current of element j, lj(1)), Φ Uk-lk (phase difference between Uk(1) and the fundamental current of element k, lk(1)), • PLL source frequency (Frequency group):

FreqPLL1 (PLL1 frequency), FreqPLL2 (PLL2 frequency)

– Set the harmonic order (Total, 0, 1 to 500).

Procedure Using the Menu Icons

You can also use the menu icons shown on the right side of the screen to switch the displayed items.

1. Tap the **Display** menu icon . A Display menu appears in the sub menu area on the right side of the screen.

By tapping the displayed items, you can specify the same settings as when using the screen explained earlier.

Note.

For details on the Display menu, see page iv.

6.1 Setting the Display Format

Switching the Displayed Page (Page Scroll)" in the features guide

This section explains operating procedures using the following setup methods.

- Procedure Using the Setup Menu (see chapter 1)
- · Procedure Using the Menu Icons (see page iii)
- Procedure Using the Keys (other than SETUP) (see section 1.2 in IM WT5000-03EN)

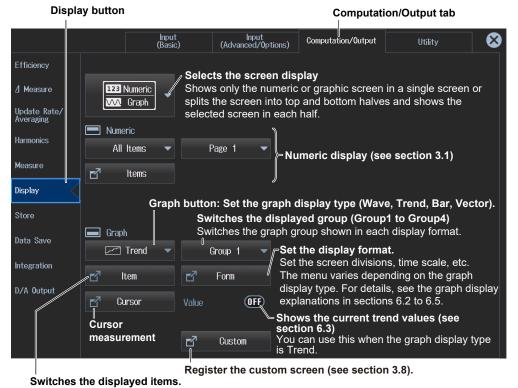
Procedure Using the Setup Menu

- 1. Tap the Setup icon , or press MENU under SETUP.
- 2. Tap **Computation/Output** tab. A computation and output settings overview screen appears. Pressing **ESC** closes the overview screen.

Setting the Display Format (Display)

3. Tap Display.

A display format setup screen (Numeric/Graph) appears.



Select the measured values you want to graph. The menu varies depending on the graph display type. For details, see the graph display explanations in sections 6.2 to 6.5.

Note

You can also display the computation/output settings overview screen by moving the cursor on the Computation/Output tab using the arrow keys and then pressing SET.

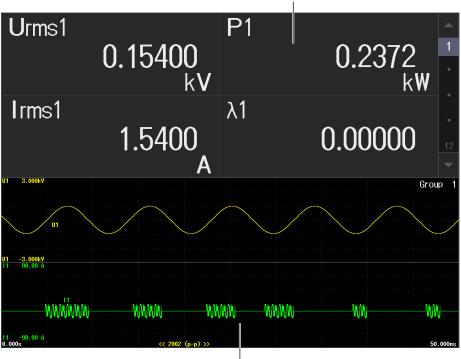
Display settings

You can switch the display format of the Numeric (numeric display) and Graph (graph display) screens.

EEE Numeric 💌	
122 Numeric	Numeric (numeric display) Shows only numeric data in a single screen For details on the numeric display, see chapter 3.
₩ Graph	Graph (graph display) Shows only graphs in a single screen
123 Numeric 123 Numeric	Numeric (numeric display)/Numeric (numeric display) Shows numeric data (see chapter 3) in the top and bottom halves of the screen
123 Numeric √√√ Graph	Numeric (numeric display)/Graph(graph display) Shows numeric data (see chapter 3) in the top half of the screen and graphs in the bottom half
VVA Graph 123 Numeric	Graph (graph display)/Numeric (numeric display) Show graphs in the top half of the screen and numeric data (see chapter 3) in the bottom half
₩ Graph ₩ Graph	Graph (graph display)/Graph (graph display) Shows graphs in the top and bottom halves of the screen

Example of Numeric (numeric display)/Graph(graph display)

Numeric (numeric display) in the top half For details on the numeric display, see chapter 3.



Graph (waveform display) in the bottom half

Procedure Using the Menu Icons

You can also use the menu icons shown on the right side of the screen to set the voltage range and current range.

1. Tap the **Display** menu icon . A Display menu appears in the sub menu area on the right side of the screen.

By tapping the displayed items, you can specify the same settings as when using the screen explained earlier.

Note.

For details on the Display menu, see page iv.

Switching the Display Format (GRAPH key)

You can also use keys to perform "Setting the Screen Display" described earlier and "Setting the Graph Display Type."

DISPLAY NUMERIC GRAPH	 GRAPH key (top half of the screen) Shows graphs in the top half of the screen GRAPH key (bottom half of the screen) Shows graphs in the bottom half of the screen
NUMERIC GRAPH CUSTOM	

GRAPH key (single screen display) Shows graphs in a single screen

Each time you press GRAPH, the graph type switches, in order, between waveform, trend, bar graph, and vector.

6.2 Waveform Display

This instrument shows on the screen the waveforms of the voltage and current applied to the input elements or wiring units.

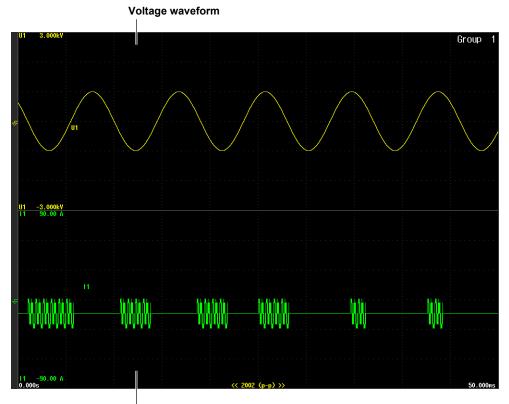
"Waveform Display (Wave)" in the features guide
 "Display Format (Form, Wave)" in the features guide
 "Number of Windows (Format)" in the features guide
 "Time Axis (Time/div)" in the features guide
 "Vertical Axis (Amplitude)" in the features guide
 "Advanced Waveform Display Settings (Advanced)" in the features guide
 "Display Items (Items, Wave)" in the features guide

Using an example, this section explains how to display measurement results with waveforms. In addition, this section explains operating procedures using the following setup methods.

- Procedure Using the Setup Menu (see chapter 1)
- Procedure Using the Menu Icons (see page iii)

Waveform Display Screen (Example of group1 dual display)

Waveform display of input element 1



Current waveform

Procedure Using the Setup Menu

- 1. Tap the Setup icon 🔅 , or press MENU under SETUP.
- 2. Tap **Computation/Output** tab. A computation and output settings overview screen appears. Pressing **ESC** closes the overview screen.
- 3. Tap Display.

A display format setup screen (Numeric/Graph) appears. For details, see section 6.1.

Setting the Graph Display Type (Graph)

4. Tap Graph to select Wave.

Switching the Displayed Group (Group)

Tap Group to select a group from Group1 to Group4.
 You can select up to four groups. The Item and Form settings, explained later, are applied to the group numbers you select in this step.

Switching the Display Group When Displaying Graphs

Flick the Graph screen up or down to switch the display group.

The group number after switching is shown highlighted for a few seconds in the group display area in the upper right of the Graph screen.



Switching the Displayed Items (Items)

Select the voltages and currents of the input elements to be displayed with waveforms.

- 6. Tap Items. A Wave Items screen appears.
- 7. Tap the **Display/Mapping** tab. Turn the display on or off, and map waveforms.

Displayed item preset buttons

		t item display on						
Wave Items 🔲 Group 1			\bigotimes					
Display/Mapping Zoom/Pos	ition							
Displayed Item Preset		Mapping Mode Set waveform mappin						
All on All OFF U I	ΣΑ Σ	B ΣC l	User Viser Viser	d, User).				
Item Display Map Item	Display Map	Item Display	Мар					
U1 OFF 1 U5	OFF 5	Spd1 OFF	2					
∎ I1 0FF 1 ∎ 15	OFF 5	Trq1 OFF	2					
	6	Spd2 OFF	3					
The display can be turned on or off for each item.		rm can be mapp	ed for each					

7. Tap the Zoom/Position tab. Set the vertical zoom factor and vertical position.

item (windows 1 to 6).

	Zoom/P	osition tab				
Wave	ltems 💻	Group 1			8	
Displa	iy/Mapping	J Zoom/Position				
Item	Vertical Zoom	Vertical Position	ltem	Vertical Zoom	Vertical Position	
<mark>0</mark> 1	× 1	0.000%	<mark>0</mark> 5	× 1	0.000%	- Set the vertical position (0.000% to ±130.000%).
I 1	x 1	0.000%	I 5	x 1	0.000%	(0.000 /0 to ±100.000 /0).
112	× 4	A-0000	U6	x 1	0.000%	l

Set the vertical zoom factor.

(x 0.1, x 0.2, x 0.25, x 0.4, x 0.5, x 0.75, x 0.8, x 1, x 1.14, x 1.25, x 1.33, x 1.41, x 1.5, x 1.6, x 1.77, x 2, x 2.28, x 2.66, x 2.83, x 3.2, x 3.54, x 4, x 5, x 8, x 10, x 12.5, x 16, x 20, x 25, x 40, x 50, x 100)

Setting the Display Format (Form)

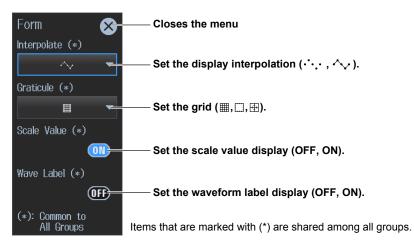
Set the division of the waveform display screen and time scale (Time/div).

6. Tap Form. A Wave Form screen appears.

Wave Form 🛛 🗙 🗕	——— Closes the menu
Group 1	
Format	
a Single ▼	—— Set the number of divisions of the waveform screen (Single, Dual, Triad, Quad, Hexa).
Time/div (*)	Set the time coole /0.04 ms to specified data update interval ¹
5ms ▼⊂	Set the time scale (0.01 ms to $0.00000000000000000000000000000000000$
🛃 Advanced 🗕	If you pinch in or pinched out on the Graph screen, the time scale setting changes stepwise according to the amount of pinching. The time scale after switching is shown highlighted for a few seconds in the group display area in the upper right of the Graph screen.
	Configure the detailed settings of the waveform display.
	1 For information on how to set the data update interval, see section 2.10.
(*): Common to All Groups	Items that are marked with (*) are shared among all groups.

Advanced Waveform Display (Advanced)

7. Tap Advanced. A Form screen appears.



Procedure Using the Menu Icons

You can also use the menu icons shown on the right side of the screen to switch the displayed items.

1. Tap the **Display** menu icon . A Display menu appears in the sub menu area on the right side of the screen.

By tapping the displayed items, you can specify the same operation as explained in "Switching the Displayed Items" described earlier.

Note.

For details on the Display menu, see page iv.

6.3 Trend display

This instrument shows on the screen the trend graphs of the voltage, current, and the like applied to the input elements or wiring units.

"Trend Display (Trend)" in the features guide

"Display Format (Form, Trend)" in the features guide

"Display Items (Items, Trend)" in the features guide

Using an example, this section explains how to display measurement results with trend graphs. In addition, this section explains operating procedures using the following setup methods.

- Procedure Using the Setup Menu (see chapter 1)
- Procedure Using the Menu Icons (see page iii)

Trend Display Screen (Example of group1 dual display)

Trend display of input element 1



Current trend

Procedure Using the Setup Menu

- 1. Tap the Setup icon 🔅 , or press MENU under SETUP.
- 2. Tap **Computation/Output** tab. A computation and output settings overview screen appears. Pressing **ESC** closes the overview screen.
- 3. Tap Display.

A display format setup screen (Numeric/Graph) appears. For details, see section 6.1.

Setting the Graph Display Type (Graph)

4. Tap Graph to select Trend.

Switching the Displayed Group (Group)

5. Tap Group to select a group from Group1 to Group4.

You can select up to four groups. The Item and Form settings, explained later, are applied to the group numbers you select in this step.

Switching the Display Group When Displaying Trends

Like the graph display, flick to switch the display group (see section 6.2).

Switching the Displayed Items (Items)

Select the voltages and currents of the input elements to be displayed with trends.

6. Tap Items. A Trend Items screen appears.

Set the graphs of trend 1 to trend 8.

Set the graphs of trend 1 to trend 8. Turns the display of all waveforms on

Turns the display of all waveforms off

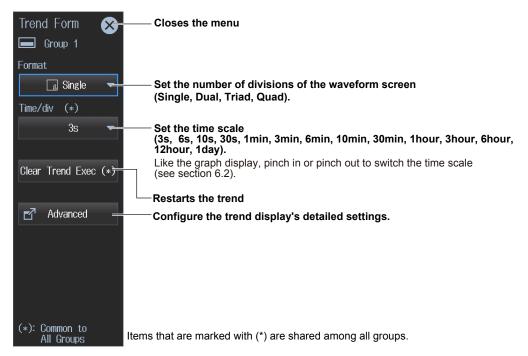
Trend I:e	ms 🗖	Grpup 1				\bigotimes	
T1-T	8	T9-T16	All	on all	OFF		
				(*): Common to	o All Groups	Items that are marked with (*) are
Display	Function (*)	Element/ ∑/Motor (*)	0rder (k) (*)	Scaling	Upper Scale	Lower Scale	shared among all groups.
V T1	Urms	Element 1		Auto			
V T2	Irms	Element 1		Auto			
🔽 ТЗ	Р	Element 1		Auto			
V T4	S	Element 1		Auto			
🔽 Т5	Q	Element 1		Auto			
🔽 Тб	λ	Element 1		Auto			
77 🔽	Φ	Element 1		Auto			
Т8	U(k)	Element 1	Total	Manual	100.0	-100.0	
							er limits (–9.999 T to 9.999 T).
				Tł	nese setting	gs can be s	set when vertical scale mode is set to Manual.
							setup method (Auto, Manual).
						(Total, 0 to	
					0		easurement function includes a harmonic order.
			s the in element		ient or wir	ing unit to	be configured
				•	em is set to	something	other than motor evaluation: Element1 to Element7
							luation: Motor1 to Motor4
		• Wirin	g unit op	tions: ΣA	Α, ΣΒ, ΣC		
							ous measurement functions, see "Items
I	That This	s Instrum	ent Can	Measur	e" in the fe	eatures gui	ide).

Select the trends that you want to display.

Setting the Display Format (Form)

Set the division of the trend display screen and time scale (Time/div).

6. Tap Form. A Trend Form screen appears.



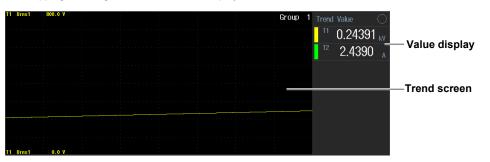
Advanced Waveform Display (Advanced)

7. Tap Advanced. A Form screen appears.

Form 🔀	Closes the menu
Interpolate (*)	—— Set the display interpolation ($\cdot \cdot \cdot \cdot$, $\wedge \checkmark$).
Graticule (*)	——— Set the grid (⊞,⊡ ,⊞).
Scale Value (*)	Set the scale value display (OFF, ON).
Wave Label (*)	——— Set the waveform label display (OFF, ON).
(*): Common to All Groups	Items that are marked with (*) are shared among all groups.

Displaying the Current Trend Values (Value)

6. Tap **Value**. The current value is displayed on the trend display. Tapping Value again clears the Value display.



Procedure Using the Menu Icons

You can also use the menu icons shown on the right side of the screen to switch the displayed items.

1. Tap the **Display** menu icon . A Display menu appears in the sub menu area on the right side of the screen.

By tapping the displayed items, you can specify the same operation as explained in "Switching the Displayed Items" described earlier.

Note.

For details on the Display menu, see page iv.

6.4 Bar Graph Display

This instrument shows on the screen the harmonic orders and magnitudes of the voltage, current, and the like applied to the input elements with bar graphs.

- "Bar Graph Display (Bar)" in the features guide
- "Display Format (Form, Bar)" in the features guide
- ▶ "Display Items (Items, Bar)" in the features guide

Using an example, this section explains how to display measurement results with bar graphs. In addition, this section explains operating procedures using the following setup methods.

- Procedure Using the Setup Menu (see chapter 1)
- Procedure Using the Menu Icons (see page iii)

Bar Graph Display Screen (example of Group1 Triad display)



Bar graph display of input element 1

Bar graph of power P1 Item No.3 display

Procedure Using the Setup Menu

- 1. Tap the Setup icon 🔅 , or press MENU under SETUP.
- 2. Tap **Computation/Output** tab. A computation and output settings overview screen appears. Pressing **ESC** closes the overview screen.
- 3. Tap Display.

A display format setup screen (Numeric/Graph) appears. For details, see section 6.1.

Setting the Bar Graph Display Type (Graph)

4. Tap Graph to select Bar.

Switching the Displayed Group (Group)

Tap Group to select a group from Group1 to Group4.
 You can select up to four groups. The Item and Form settings, explained later, are applied to the group numbers you select in this step.

Switching the Display Group When Displaying Bar Graphs

Like the graph display, flick to switch the display group (see section 6.2).

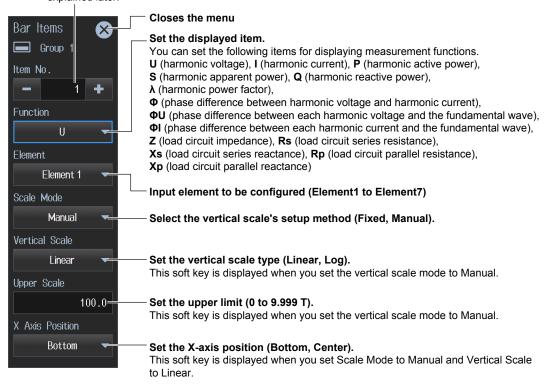
Switching the Displayed Items (Items)

Select the voltages and currents of the input elements to be displayed with bar graphs.

6. Tap Items. The following screen appears.

Select the displayed item number.

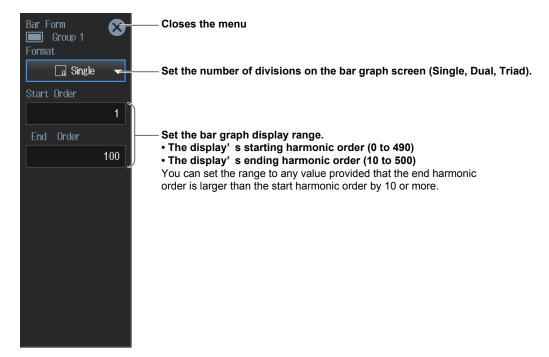
The number increases from top to bottom on the bar graph screen. To show the No.2 and No.3 item numbers on the bar graph display, set the screen division to Dual or triad in the display format settings explained later.



Setting the Display Format (Form)

Set the divisions of the bar graph screen and the range of harmonic orders to display (Start Order, End Order).

6. Tap Form. A Bar Form screen appears.



Procedure Using the Menu Icons

You can also use the menu icons shown on the right side of the screen to switch the displayed items.

1. Tap the **Display** menu icon . A Display menu appears in the sub menu area on the right side of the screen.

By tapping the displayed items, you can specify the same operation as explained in "Switching the Displayed Items" described earlier.

Note

For details on the Display menu, see page iv.

6.5 Vector Display

This instrument shows on the vector screen the phase difference and the magnitude relationship between fundamental waves and harmonic waves of the voltage, current, and the like applied to wiring units.

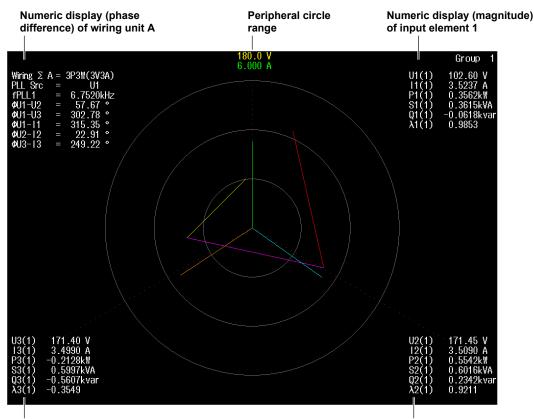
"Vector Display (Vector)" in the features guide
 "Display Format (Form, Vector)" in the features guide
 "Display Items (Items, Vector)" in the features guide

Using an example, this section explains how to display measurement results with vectors. In addition, this section explains operating procedures using the following setup methods.

- Procedure Using the Setup Menu (see chapter 1)
- Procedure Using the Menu Icons (see page iii)

Vector display of wiring unit A

Vector Display Screen (example of Group1 ΣA display)



Numeric display (magnitude) of input element 3

Numeric display (magnitude) of input element 2

Procedure Using the Setup Menu

- 1. Tap the Setup icon 🔅, or press MENU under SETUP.
- 2. Tap **Computation/Output** tab. A computation and output settings overview screen appears. Pressing **ESC** closes the overview screen.
- 3. Tap Display.

A display format setup screen (Numeric/Graph) appears. For details, see section 6.1.

Setting the Graph Display Type (Graph)

4. Tap Graph to select Vector.

Switching the Displayed Page (Group)

Tap Group to select a group from Group1 to Group4.
 You can select up to four groups. The Item and Form settings, explained later, are applied to the group numbers you select in this step.

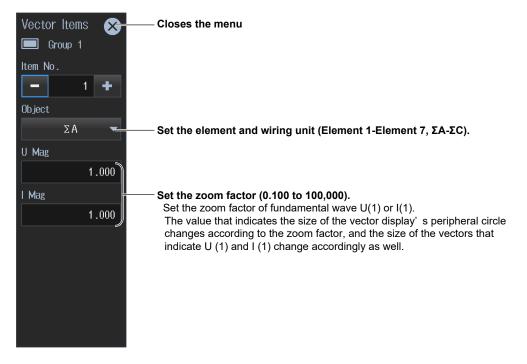
Switching the Display Group When Displaying Vectors

Like the graph display, flick to switch the display group (see section 6.2).

Switching the Displayed Items (Items)

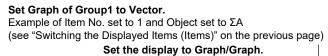
Select the input element or wiring unit to display the vectors of.

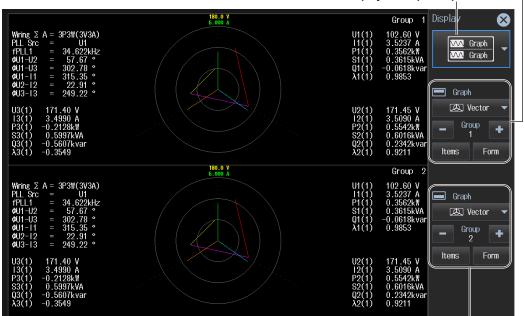
6. Tap Items. A Vector Items screen appears.



Example of a Vector Split Display

Select Graph/Graph according to "Setting the Screen Display" in section 6.1. On the split display, only the vectors of Item No.1 are displayed, so select the vectors to show in the second screen according to the group settings described earlier. If you select single screen display for Graph in "Setting the Screen Display" in section 6.1, you can also show the same split display by performing the procedure in "Setting the Display Format (Form)" described below.



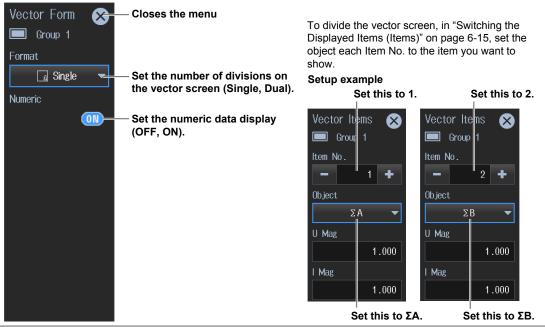


Set Graph of Group2 to Vector. Example of Item No. set to 1 and Object set to ΣB (see "Switching the Displayed Items (Items)" on the previous page)

Setting the Display Format (Form)

Set whether to show numeric data on the Graph screen.

6. Tap Form. A Vector Form screen appears.



IM WT5000-02EN

Procedure Using the Menu Icons

You can also use the menu icons shown on the right side of the screen to switch the displayed items.

1. Tap the **Display** menu icon . A Display menu appears in the sub menu area on the right side of the screen.

By tapping the displayed items, you can specify the same operation as explained in "Switching the Displayed Items" described earlier.

Note.

For details on the Display menu, see page iv.

7.1 Setting the Storage Operation

"Data Storage (Store, MENU (STORE))" in the features guide
 "Storage Control" in the features guide

This section explains operating procedures using the following setup methods.

- · Procedure Using the Setup Menu (see chapter 1)
- Procedure Using the Menu Icons (see page iii)
- Procedure Using the Keys (other than SETUP) (see section 1.2 in IM WT5000-03EN)

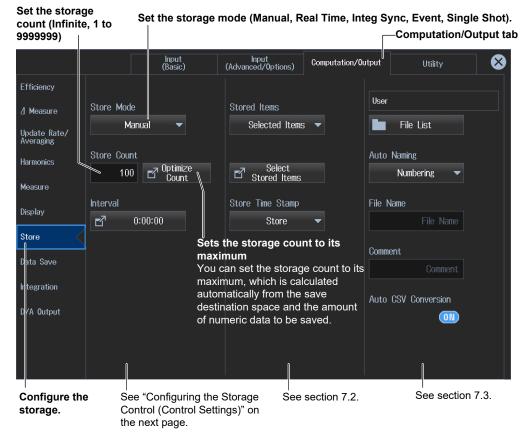
Procedure Using the Setup Menu

- 1. Tap the Setup icon 🔅 , or press MENU under SETUP.
- 2. Tap **Computation/Output** tab. A computation and output settings overview screen appears. Pressing **ESC** closes the overview screen.

Configuring the Storage (Store)

3. Tap Store.

A Store screen appears.



Note

You can also display the computation/output settings overview screen by moving the cursor on the Computation/Output tab using the arrow keys and then pressing SET.

Setting the Maximum Storage Count

Tap **Optimize Count**, which is used to set the maximum storage count. An Optimize Count screen appears.

Confirms and optimizes the maximum storage count



Sets the storage count

The storage count is set to the maximum storage count displayed to the left.

Maximum storage count (0-the maximum number of times that data can be stored to the save destination)

If the save destination is set to a USB memory device (drive) and you remove it, the save destination automatically changes to internal memory. If you close this screen, tap Optimize Count, and reopen this screen, the maximum storage count is changed to a value determined from the free space of the internal memory.

Note.

The maximum number of times that storage can be performed depends on the number of stored items that you have set and the free space at the save destination.

For details on how to set the stored items, see section 7.2. For details on how to set the save destination, see section 7.3.

Setting the Storage Control

When the Storage Mode Is Manual

 Set the storage interval (00 hours : 00 minutes : 00 seconds-99 hours : 59 minutes : 59 seconds).

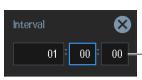
 Configure the storage.
 Computation/Output tab

		Input (Basic)		Input (Advanced/Options)	Computation/Ou	Itput	Utility	\bigotimes
Efficier	су							
∐ Meas	ure	Store Mode		Stored Items		User		
Update Averag		Manual 🔻		Selected Items	; 🔻		File List	
Harmon	cs	Store Count		Select		Auto	Naming	
Measur	9	100 Double Count		Stored Items			Numbering 🔻	
Display		Interval		Store Time Stamp		File M	Name	
	ļ	1:00:00		Store	-			
Store		Store at Start				Comm	ent	
Data Sa	ave	(IFF)					Comment	
Integra	tion	Set whether	r to sa	ve (store) nume	eric			
		data at the s OFF: Not be ON: Saved				Auto	CSV Conversion	
			set thi	s when the stora	ge interva <u>l is</u>	set to	o 00:00:00.	
					<u>.</u>			

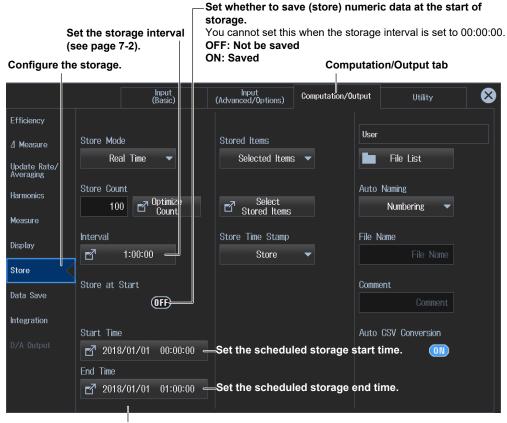
Storage control setup screen (when the storage mode is Manual)

Setting the Storage Interval

Tap Interval. An Interval screen appears.



Set the storage interval (00 hours : 00 minutes : 00 seconds-99 hours : 59 minutes : 59 seconds).



• When the Storage Mode Is Real Time

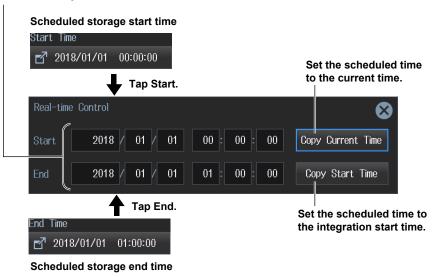
Storage control setup screen (when the storage mode is Real Time)

Setting the Scheduled Start Time

Tap Start Time or End Time. A Real-time Control screen appears.

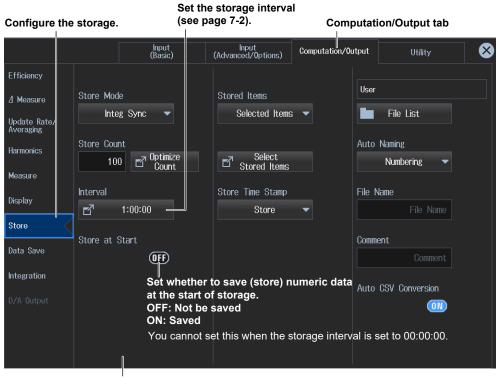
Set the scheduled start and stop times

(Year/month/day, 00 hours : 00 minutes : 00 seconds to 23 hours : 59 minutes : 59 seconds).



7.1 Setting the Storage Operation

• When the Storage Mode Is Integ Sync (integration synchronization)



Storage control setup screen (when the storage mode is Integ Sync)

Computation/Output tab

• When the Storage Mode Is Event

Configure the storage.

	Input (Basic)	Input (Advanced/Options)	Computation/Output	Utility	8
Efficiency					
⊿ Measure	Store Mode	Stored Items	Use	r	
Update Rate/ Averaging	Event 🔻	Selected Items		File List	
Harmonics	Store Count	0-1	Auto	Naming	
Measure	100 Doptimize Count	Select Stored Items		Numbering 🔻	
Display	Trigger Event	Store Time Stamp	File	Name	
	Ev1 -	Store	-		
Store			Com	nont	
Data Save	Select the trigger event (Ev1 to Ev8). When measured data is updated, storage is started			Commont	
Integration	if the conditions of the spe				
Integration	are met.		Auto) CSV Conversion	
				01	

Storage control setup screen (when the storage mode is Event)

Note.

When the storage mode is set to Single Shot, there are no storage control settings.

Procedure Using the Menu Icons

You can also use the menu icons shown on the right side of the screen to set the storage.

1. Tap the **Store Data Save** menu icon . A Store-Save menu appears in the sub menu area on the right side of the screen.

By tapping the displayed items, you can specify the same settings as when using the screen explained earlier.

Note.

For details on the Store/Data Save menu, see page xi.

Procedure Using Keys

You can also use the front panel keys to set storage.

STORE



Configure the storage. The Setup menu appears.

7.2 Setting Stored Items

Stored Items" in the features guide

This section explains operating procedures using the following setup methods.

- Procedure Using the Setup Menu (see chapter 1)
- Procedure Using the Menu Icons (see page iii)
- Procedure Using the Keys (other than SETUP) (see section 1.2 in IM WT5000-03EN)

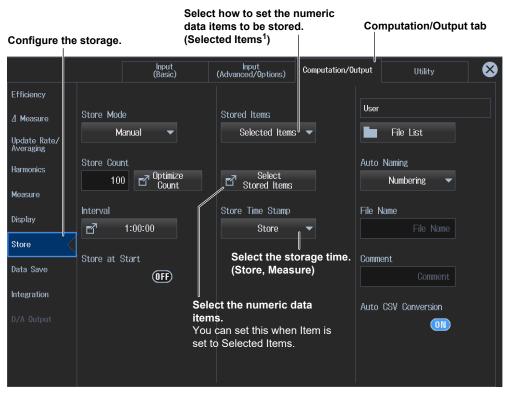
Procedure Using the Setup Menu

- 1. Tap the Setup icon 🔅 , or press MENU under SETUP.
- 2. Tap **Computation/Output** tab. A computation and output settings overview screen appears. Pressing **ESC** closes the overview screen.

Configuring the Storage (Store)

3. Tap Store.

A storage setup screen appears.



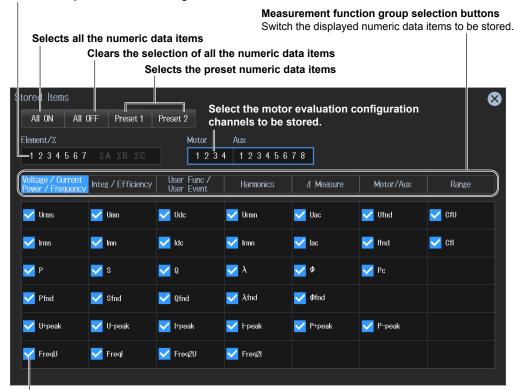
1 The selected numeric data items are stored.

Note.

You can also display the computation/output settings overview screen by moving the cursor on the Computation/Output tab using the arrow keys and then pressing SET.

Selecting the Numeric Data Items (Selected Stored Items)

Tap **Selected Stored Items** for selecting the numeric data items. A Stored Items screen appears.



Select the input elements or wiring units to be stored.

Select the numeric items that you want to store.

Procedure Using the Menu Icons

You can also use the menu icons shown on the right side of the screen to set the storage.

1. Tap the Store Data Save menu icon . A Store-Save menu appears in the sub menu area on the right side of the screen.

By tapping the displayed items, you can specify the same settings as when using the screen explained earlier.

Note

For details on the Store/Data Save menu, see page xi.

Procedure Using Keys

You can also use the front panel keys to set storage.



Configure the storage. The Setup menu appears.

7.3 Setting the Data Storage Destination

▶ "File Save Conditions" in the features guide

This section explains operating procedures using the following setup methods.

- Procedure Using the Setup Menu (see chapter 1)
- Procedure Using the Menu Icons (see page iii)
- Procedure Using the Keys (other than SETUP) (see section 1.2 in IM WT5000-03EN)

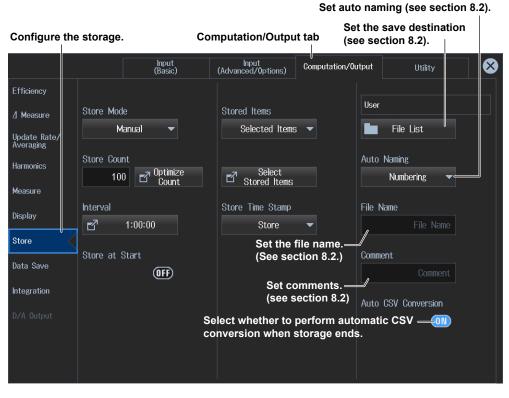
Procedure Using the Setup Menu

- 1. Tap the Setup icon , or press MENU under SETUP.
- 2. Tap **Computation/Output** tab. A computation and output settings overview screen appears. Pressing **ESC** closes the overview screen.

Configuring the Storage (Store)

3. Tap Store.

A storage setup screen appears.



Note.

You can also display the computation/output settings overview screen by moving the cursor on the Computation/Output tab using the arrow keys and then pressing SET.

Procedure Using the Menu Icons

You can also use the menu icons shown on the right side of the screen to set the storage.

1. Tap the Store/Data Save menu icon A Store/Data Save menu appears in the sub menu area on the right side of the screen.

By tapping the displayed items, you can specify the same settings as when using the screen explained earlier.

Note.

For details on the Store/Data Save menu, see page xi.

Procedure Using Keys

You can also use the front panel keys to set storage.

STORE



Configure the storage. The Setup menu appears.

7.4 Starting (Rec), Pausing (Pause), and Ending (End) Storage

► "Starting, Pausing, and Ending Storage Recording" in the features guide

This section explains operating procedures using the following setup methods.

- Procedure Using the Menu Icons (see page iii)
- Procedure Using the Keys (other than SETUP) (see section 1.2 in IM WT5000-03EN)

CAUTION

During storage, the storage device is constantly being accessed, even though the icon that indicates this is not displayed. Do not remove the USB memory device or turn the power off. Doing so may damage the storage device or corrupt its data.

Storage in progress: While the REC key or PAUSE key is illuminated

French

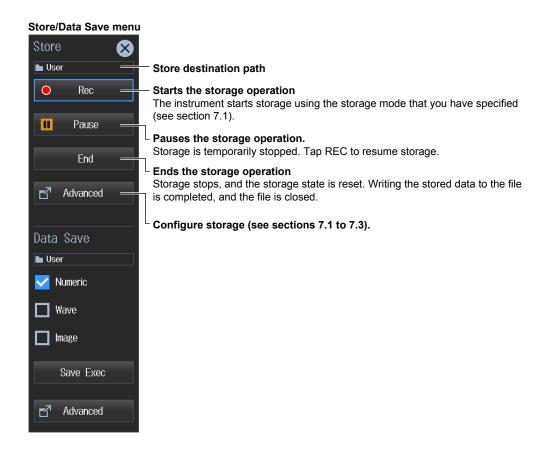
ATTENTION

Pendant la collecte, le système a constamment accès au support de stockage, même si l'icône qui l'indique n'est pas affichée. Ne retirez pas le support de stockage USB et ne coupez pas l'alimentation. Vous risqueriez d'endommager le support de stockage ou les données qu'il contient.

Le stockage est en cours quand la touche STORE START est éclairée ou quand elle clignote, ou bien quand la touche STORE STOP clignote.

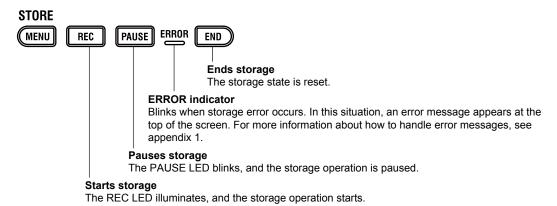
Procedure Using the Menu Icons

1. Tap the Store/Data Save menu icon A Store/Data Save menu appears in the sub menu area on the right side of the screen.



Procedure Using Keys

You can also use the front panel keys to start, pause, and end storage.



8.1 Connecting a USB Memory Device

This section explains how to connect USB memory devices to save and load data.

If you want to use a storage device on your network (a network drive), you have to use an Ethernet cable to connect the instrument to the network. For details, see section 15.5.

Storage Device" in the features guide

CAUTION

- Do not remove the USB storage device or turn off the power when the device is being accessed. Doing so may damage the storage device or corrupt its data.
- When the USB memory device is being accessed, an access indicator is displayed in the top center the screen and the USB memory device indicator blinks.

French

ATTENTION

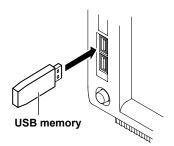
- Lorsque le dispositif accède au support de stockage USB, ne retirez pas ce dernier et ne mettez pas l'alimentation hors tension. Vous risqueriez d'endommager le support de stockage ou les données qu'il contient.
- Quand le système accède au support de stockage USB, s'affiche au centre, dans la partie supérieure de l'écran, et le voyant du support de stockage USB clignote.

USB Memory Devices That Can Be Used and How to Connect USB Memory Devices

Use portable USB memory devices that are compatible with USB Mass Storage Class version 1.1. Connect USB memory devices directly to the USB ports (type A) for connecting peripheral devices on the instrument's front panel.

Hot-plugging is supported: you can connect or disconnect the USB device at any time, regardless of whether the instrument is on or off. When the power is on, the instrument automatically detects the USB memory device after it is connected.

This instrument has two USB ports: USB-0 and USB-1. The port numbers are not fixed. The port at which the first USB memory device is detected becomes USB-0. The port at which the second USB memory device is detected becomes USB-1.



Note.

- Connect USB memory devices directly to the USB ports (type A) for connecting peripheral devices. Do
 not connect them through a hub.
- Use portable USB memory devices that are compatible with USB Mass Storage Class version 1.1. Do not connect incompatible USB memory devices.
- · You cannot use protected USB memory devices (such as those that contain encrypted content).
- Do not connect and disconnect the two USB devices repetitively. Provide at least a 10-second interval between removal and connection.

General USB Memory Handling Precautions

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

8.2 Setting the Save Destination for Numeric Data, Waveform Data, and Screen Images

"File Save Conditions" in the features guide
 "Conditions for Saving Numeric Data" in the features guide

Conditions for Saving Screen Images" in the features guide

This section explains operating procedures using the following setup methods.

- Procedure Using the Setup Menu (see chapter 1)
- · Procedure Using the Menu Icons (see page iii)
- Procedure Using the Keys (other than SETUP) (see section 1.2 in IM WT5000-03EN)

Procedure Using the Setup Menu

- 1. Tap the Setup icon 🔅 , or press MENU under SETUP.
- 2. Tap **Computation/Output** tab. A computation and output settings overview screen appears. Pressing **ESC** closes the overview screen.

Setting the Save Conditions (Data Save)

3. Tap Data Save.

An save condition setup screen appears.

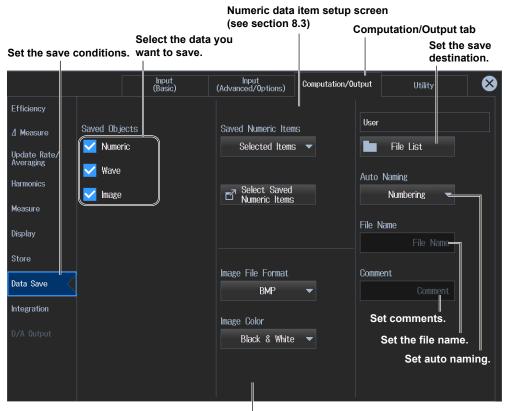


Image screen (see section 8.4)

Note.

You can also display the computation/output settings overview screen by moving the cursor on the Computation/Output tab using the arrow keys and then pressing SET.

Setting the Save Destination

4. Tap File List. A file list appears.

		File path	
		The path to the currently selected save destination	
		Select the save destination (User, U	SB, Network).
File	Dialog		\bigotimes
	AZ -		
	Select		
Ŀ	New folder	USB-0	
	Сору	Petwork	
₿	Move		
ø	Rename		
6	Protect		
	Delete	0 items, 0 selected Space : _GB (Bytes)

File operation (see section 8.6)

Save destination free space

Setting Auto Naming (Auto Naming)

- OFF: The auto naming feature is disabled. The name that you specified for 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 instrument automatically adds a four-digit number from 0000 to 0999 after the common name that you specified for the File Name setting and saves the file.
- Date: The file name is the date and time (down to seconds) when the file is saved. The file name that you specified for the File Name setting is ignored.

The sequence number that comes after the date and time is appended if a file name with the exact same date and time (down to seconds) exists.

The sequence number is incremented by one (0 to 9 and then A to Z) each time a file is added.

Assigning File Names (File Name)

You can set the file name that is used when Auto Naming is set to OFF. This is also used as the common file name when Auto Naming is set to Numbering. The maximum number of characters that you can use for file names and folder names is 32 characters. However, there are limitations on the type of characters and the character strings that you can use.

For instructions on how to enter text, see section 3.3 in the Getting Started Guide, IM WT5000-03EN.

Setting a Comment (Comment)

You can add a comment that consists of up to 30 characters when you save a file. You do not have to enter a comment.

All characters, including spaces, can be used in comments.

For instructions on how to enter text, see section 3.3 in the Getting Started Guide, IM WT5000-03EN.

Procedure Using the Menu Icons

You can also use the menu icons shown on the right side of the screen to set data saving.

1. Tap the Store/Data Save menu icon A Store/Data Save menu appears in the sub menu area on the right side of the screen.

By tapping the displayed items, you can specify the same settings as when using the screen explained earlier.

Note.

For details on the Store/Data Save menu, see page xi.

Procedure Using Keys

You can also use the front panel keys to set data saving.



Set the save destination. The Setup menu appears.

8.3 Setting the Numeric Data Items to Save

"Saved Numeric Items (Saved Numeric Items)" in the features guide

This section explains operating procedures using the following setup methods.

- Procedure Using the Setup Menu (see chapter 1)
- · Procedure Using the Menu Icons (see page iii)
- Procedure Using the Keys (other than SETUP) (see section 1.2 in IM WT5000-03EN)

Procedure Using the Setup Menu

- 1. Tap the Setup icon , or press MENU under SETUP.
- 2. Tap Computation/Output tab. A computation and output settings overview screen appears. Pressing ESC closes the overview screen.

Setting the Save Conditions (Data Save)

3. Tap Data Save.

An save condition setup screen appears.

Select how to set the numeric data items to be saved. (Displayed Numeric Items¹, Selected Items²) Numeric data item setup screen

Set the save conditions.

Input (Basic) liput (Advanc∌d∕Options) Computation/Output \mathbf{X} Utility Efficiency User Saved Objects Saved Numeric Items / Measure Numeric Selected Items File List Update Rate/ Averaging Wave Auto Naming Harmonics Select Saved Numbering Image ď Numeric Items Measure Select the numeric data items. File Name You can set this when Item is set to Selected Items. Display Image File Format Comment Data Save RMP Integration Image Color Black & White

1 The numeric data items shown on the screen are saved.

2 The selected numeric data items are saved.

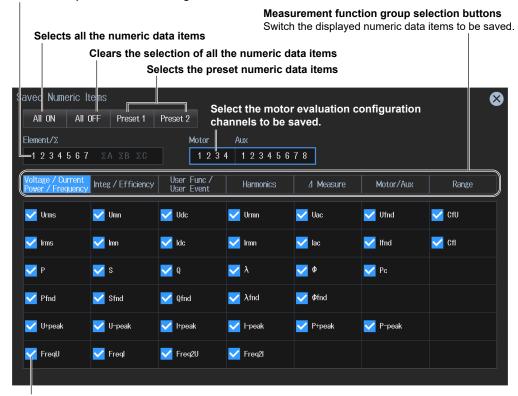
Note.

You can also display the computation/output settings overview screen by moving the cursor on the Computation/Output tab using the arrow keys and then pressing SET.

Computation/Output tab

Selecting Numeric Data Items (Select Saved Numeric Items)

Tap **Select Saved Numeric Items** for selecting the numeric data items. A Saved Numeric Items screen appears.



Select the input elements or wiring units to be saved.

Select the numeric items that you want to save.

Procedure Using the Menu Icons

You can also use the menu icons shown on the right side of the screen to set numeric data saving.

1. Tap the Store/Data Save menu icon A Store/Data Save menu appears in the sub menu area on the right side of the screen.

By tapping the displayed items, you can specify the same settings as when using the screen explained earlier.

Note

For details on the Store/Data Save menu, see page xi.

Procedure Using Keys

You can also use the front panel keys to set numeric data saving.



Set the save destination. The Setup menu appears.

8.4 Setting the Format of Saved Screen Images

Conditions for Saving Screen Images" in the features guide

This section explains operating procedures using the following setup methods.

- Procedure Using the Setup Menu (see chapter 1)
- · Procedure Using the Menu Icons (see page iii)
- Procedure Using the Keys (other than SETUP) (see section 1.2 in IM WT5000-03EN)

Procedure Using the Setup Menu

- 1. Tap the Setup icon , or press MENU under SETUP.
- 2. Tap Computation/Output tab. A computation and output settings overview screen appears. Pressing ESC closes the overview screen.

Setting the Save Conditions (Data Save)

3. Tap Data Save.

An save condition setup screen appears.

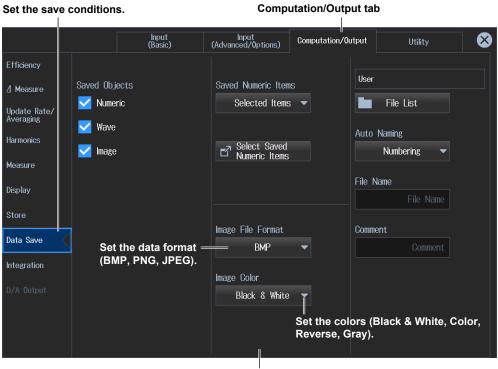


Image setup screen

Note.

You can also display the computation/output settings overview screen by moving the cursor on the Computation/Output tab using the arrow keys and then pressing SET.

Procedure Using the Menu Icons

You can also use the menu icons shown on the right side of the screen to set screen image saving.

1. Tap the Store/Data Save menu icon A Store/Data Save menu appears in the sub menu area on the right side of the screen.

By tapping the displayed items, you can specify the same settings as when using the screen explained earlier.

Note.

For details on the Store/Data Save menu, see page xi.

Procedure Using Keys

You can also use the front panel keys to set screen image saving.

DATA SAVE



Set the save destination. The Setup menu appears.

8.5 Saving Numeric Data, Waveform Data, and Screen Images

"Conditions for Saving Numeric Data" in the features guide
 "Conditions for Saving Screen Images" in the features guide
 "Saving (Save Exec, EXEC)" in the features guide

This section explains operating procedures using the following setup methods.

- Procedure Using the Menu Icons (see page iii)
- Procedure Using the Keys (other than SETUP) (see section 1.2 in IM WT5000-03EN)

CAUTION

While data is being save, the storage device is constantly being accessed, even though the icon that indicates this is not displayed. Do not remove the USB memory device or turn the power off. Doing so may damage the storage device or corrupt its data.

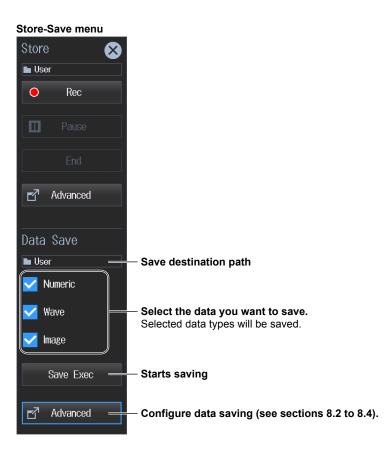
French

ATTENTION

Pendant la collecte, le système a constamment accès au support de stockage, même si l'icône qui l'indique n'est pas affichée. Ne retirez pas le support de stockage USB et ne coupez pas l'alimentation. Vous risqueriez d'endommager le support de stockage ou les données qu'il contient.

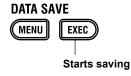
Procedure Using the Menu Icons

1. Tap the Store/Data Save menu icon . A Store/Data Save menu appears in the sub menu area on the right side of the screen.



Procedure Using Keys

You can also use the front panel keys to save data.



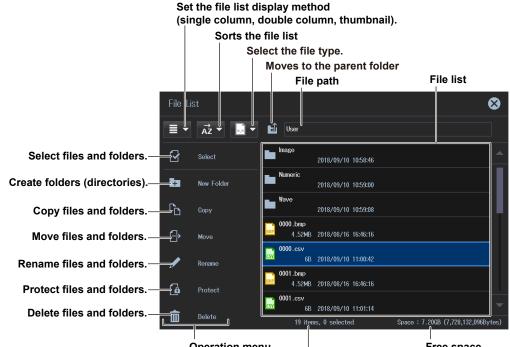
File Operations 8.6

"File List (File List)" in the features guide

This section will explain how to operate the file list.

The file list is a feature used to manage files as explained in chapter 7, "Storing Numeric Data," and section 8.2.

File List (File List)



Operation menu

Free space

Total number of files and folders that are contained within the storage device or folder indicated by the path

Sorting the File List (\overrightarrow{Az})

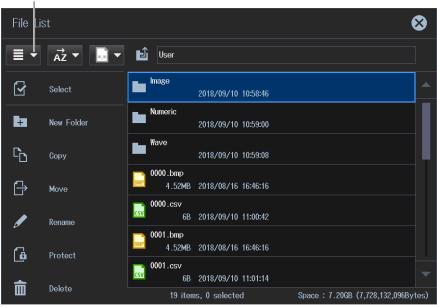
Tap \overrightarrow{AZ} on the operation menu. The following screen appears.

	File Li					$\boldsymbol{\otimes}$
		AZ ▼	*.*	🕹 User		
Sort by file name in ascending order.—		az	sort fro	m A	2018/09/10 10:58:46	
Sort by file name in descending order.—		— zà	sort fro	m Z	2018/09/10 10:59:00	
Sort by date in ascending order.—		— Or	sort fro	m old date		
Sort by date in descending order. —	С <u>ъ</u>	- 6	sort fro	m new date	2018/09/10 10:59:08	1
Sort by file size in ascending order.—		- 1	sort fro	m small size	MB 2018/08/16 16:46:16	
Sort by file size in descending order.—	ſ	— I ì	sort fro	m big size	6B 2018/09/10 11:00:42	
	6	Protect		4.52		
	俞	Delete		<mark>csv</mark>	6B 2018/09/10 11:01:14	
				19	items, 0 selected Space : 7	.20GB (7,728,132,096Bytes)

Setting the Display Format (≡ , ≡ , ■)

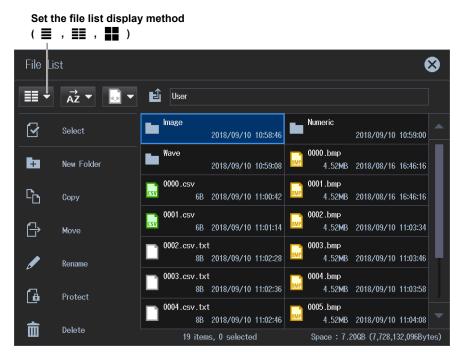
The file list is shown in a single column.

Set the file list display method



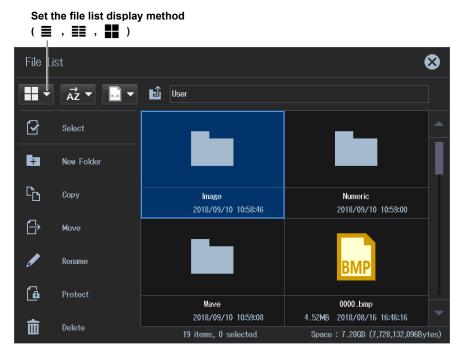
Double Column Display (■)

The file list is shown in two columns.



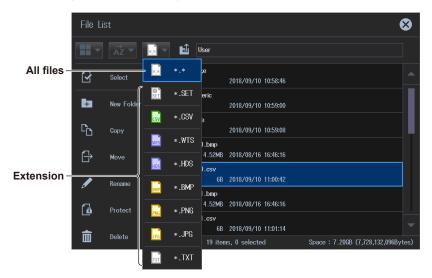
Thumbnail Display (🖬)

The file list is shown as thumbnails.



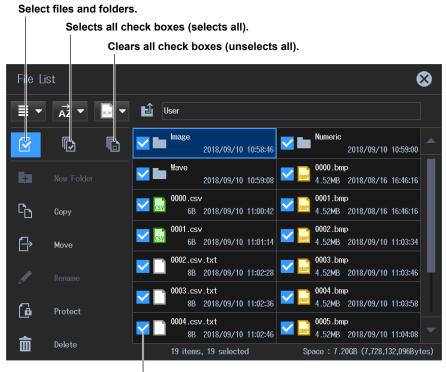
Selecting the File Type

Select the type of files to display in the file list.



Selecting Files and Folders (Select)

To select multiple files or folders, tap **Select** on the operation menu. The following screen appears. You can return to the original screen by tapping Select again.



A check mark appears when you tap the check box. Tap it again to clear it.

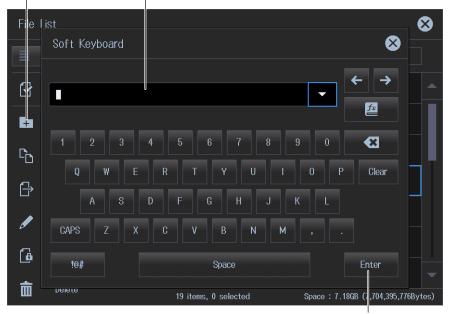
Making Folders (New folder)

Tap **New folder** on the operation menu. The following screen appears.

To make a new folder within a folder, tap the appropriate folder on the file list, and then tap New folder.

Create folders (directories).

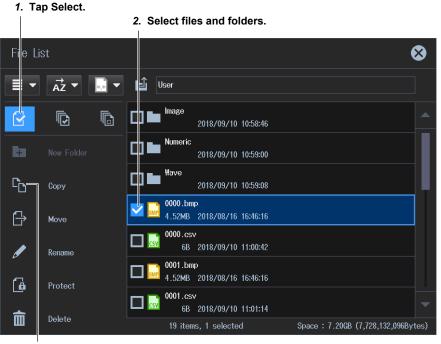
Use the keyboard to enter the new folder name (up to 32 characters).



Confirms the folder name you entered.

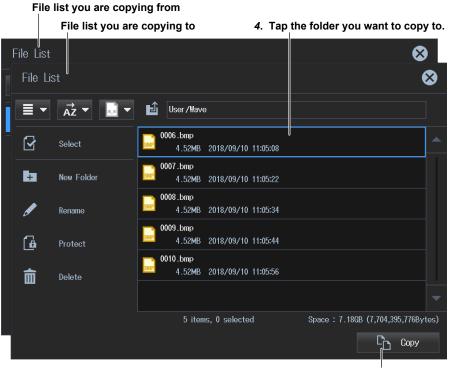
Copying Files and Folders (Copy)

- Tap Select on the operation menu. This menu is used when copying multiple files or folders.
- Tap the files and folders in the file list that you want to copy.
 For the selection procedure, see "Selecting Files and Folders (Select)" on the previous page.
- 3. Tap Copy on the operation menu. A copy destination file list appears.



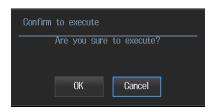
3. Тар Сору.

4. On this list, tap the copy destination folder. The contents of the folder appear.



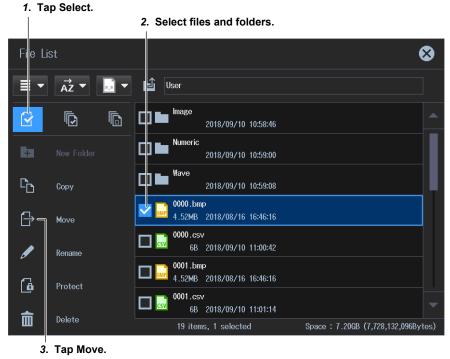
5. Executes the copy operation.

5. Tap **Copy** in the lower right of the screen. The following screen appears. Tap OK to copy the files and folders.



Moving Files and Folders (Move)

- Tap Select on the operation menu. This menu is used when moving multiple files or folders.
- **2.** Tap the files and folders in the file list that you want to move. For the selection procedure, see "Selecting Files and Folders (Select)" on the previous page.
- 3. Tap Move on the operation menu. A move destination file list appears.



8.6 File Operations

4. On this list, tap the move destination folder. The contents of the folder appear.

	File	e list you are mo	oving from	
		File list you a	are moving to 4 . Select the folder you want to co	opy to.
	File Lis ⁻	t		$\mathbf{\hat{s}}$
	File L	ist		⊗
		► AZ ▼	User /Wave	
-		Select	0006.bmp 4.52MB 2018/09/10 11:05:08	
	ŧ	New Folder	0007.bmp 4.52MB 2018/09/10 11:05:22	
	ø	Rename	0008.bmp 4.52MB 2018/09/10 11:05:34	
	6	Protect	0009.bmp 4.52MB 2018/09/10 11:05:44	
	亩	Delete	0010.bmp 4.52MB 2018/09/10 11:05:56	
				-
			5 items, 0 selected Space : 7.18GB (7,704,395,776	Bytes)
				e

5. Executes the move operation.

5. Tap **Move** in the lower right of the screen. The following screen appears. Tap OK to move the files and folders.

Confirm to) execute		
Ar	e you sure	to execute?	
	ОК	Gancel	
		Ouncer	

Renaming Files and Folders (Rename)

- 1. Tap the file or folder in the file list that you want to rename.
- 2. Tap Rename on the operation menu. The following screen appears.

File	list	
	Soft Keyboard	
	0000.bmp	
₽ C	1 2 3 4	
	Q W E	R T Y U I O P Clear
	A S D	F G H J K L
<i>s</i>	CAPS Z X	C V B N M , .
6	!@#	Space Enter
面	neiere	19 items, 0 selected Space : 7.186B (7,704, 95,776Bytes)

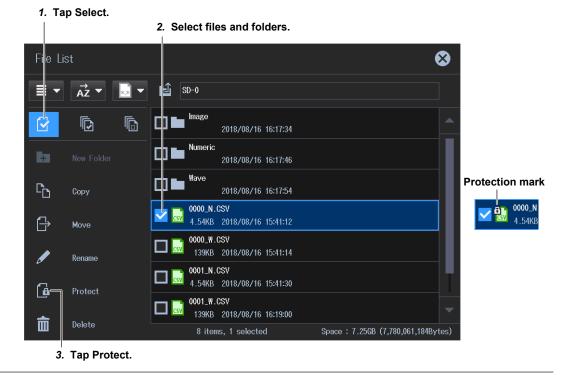
Use the keyboard to enter the new folder name.

Rename files and folders.

Confirms the file or folder name you entered.

Protecting Files and Folders (Protect)

- Tap Select on the operation menu. This menu is used when moving multiple files or folders.
- **2.** Tap the files and folders that you want to protect on the file list. For the selection procedure, see "Selecting Files and Folders (Select)" on page 8-14.
- 3. Tap Protect on the operation menu. Protection appears on the file or folder icons.



Deleting Files and Folders (Delete)

- **1.** Tap Select on the operation menu. This menu is used when deleting multiple files or folders.
- Tap the files and folders that you want to delete on the file list.
 For the selection procedure, see "Selecting Files and Folders (Select)" on the previous page.
- **3.** Tap **Delete** on the operation menu. A delete confirmation screen appears. Tap OK to delete the files and folders.

1. T	ap Select.	Delete confirmation screen	
Fie l	list		⊗
	Confirm to execut	ie	
	Are you a	sure to execute? 10 10:58:46	
÷	ОК	Cancel 10 10:59:00	
C _D	Сору	2018/09/10 10:59:08	
₿	Move	0000.bmp 4.52MB 2018/08/16 16:46:16	
ø	Rename	6B 2018/09/10 11:00:42	
þ	Protect	0001.bmp 4.52MB 2018/08/16 16:46:16	
命	Delete	6B 2018/09/10 11:01:14	
	ap Delete.	19 items, 1 selected Space : 7.20GB (7,728,132 2. Select files and folders.	(,096Bytes)

9.1 Configuring Motor Evaluation and Auxiliary Input Settings

"Motor Evaluation/Auxiliary Inputs (Motor/Aux)" in the features guide

This section explains operating procedures using the following setup methods.

Procedure Using the Setup Menu (see chapter 1)

Procedure Using the Setup Menu

- 1. Tap the Setup icon 🔅 , or press MENU under SETUP.
- 2. Tap the Input (Advanced/Options) tab. An input settings (advanced/options) overview screen appears.

Pressing ESC closes the overview screen.

Configuring Motor Evaluation and Auxiliary Input Settings (Motor/ Aux)

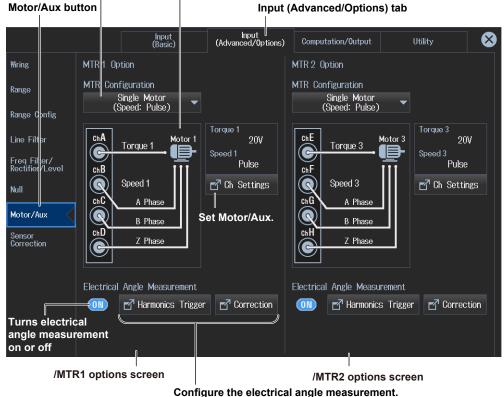
3. Tap Motor/Aux. A motor evaluation/auxiliary input setup screen appears.

The following screen is an example for a model with the /MTR2 option.

Set the MTR configuration (device to be evaluated).

(Single Motor (Speed: Pulse), Single Motor (Speed: Analog), Double Motor, Auxiliary)

A connection diagram of revolution signal and torque signals appears according to the MTR configuration.



Configure the electrical angle measurement. You can use these when the electrical angle measurement is on.

Note

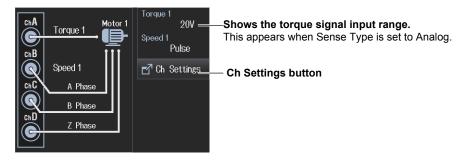
- You can configure the Motor1 and Motor2 settings on models with the /MTR1 option and the Motor1 to Motor4 settings on models with the /MTR2 option.
- You can also display the input settings overview screen by moving the cursor on the Input (Advanced/ Options) tab using the arrow keys and then pressing SET.

Configuring Motor/Aux Settings (Ch Settings)

The following four types of setup screens are available depending on the motor evaluation configuration setting.

Single Motor (Speed:Pulse)

4. Tap Ch Settings. A single motor (revolution signal: pulse) setup screen appears.



Single motor (revolution signal: pulse) setup screen

Set the unit (up to 8 characters).

- Set the speed, torque, and Pm units.
 - Set the scaling factor (0.0001 to 99999.9999).

Set the scaling factor that is used to convert the signal from the revolution sensor or torque meter to speed (rotating speed), torque, and Pm (motor output).

Ch Settings	Ch A: Torque 1	Ch B: Speed 1	Pm 1	⊗
Scaling	- 1.0000	1.0000	1.0000	
Unit	Nm	rpm	₩	
Sense Type	Analog 🔫 -		signal type (Anal	log, Pulse). pplied from the torque meter.
Analog Auto Range	OFF 🔫		ange on and off	
Analog Range	20V 🔫	—— Set the fixed	range (20V, 10V,	5V, 2V, 1V).
Linear Scale A	1.000	Set the linea (A: 1.000 m t	r scale o 1.000 M; B: −1.0	000 M to 1.000M).
В	0.000	Set A (the slo	pe) and B (the offs	eet).
	🗗 Calculation 🚽	— Computes A	and B	
Line Filter (Butterworth)	OFF 🔫 🖛	Set the line fi	ilter (OFF, 1kHz, 5	600Hz, 100Hz).

You can set these when Sense Type is set to Analog.

9.1 Configuring Motor Evaluation and Auxiliary Input Settings

		V	
	(Torque column)	(Speed column)	(Pm column)
(Pulse Noise Filter)	OFF 🔻	OFF 🔫	— Set the pulse noise filter (OFF, 1MHz, 100kHz, 10kHz).
Sync Source	Nor	ne 🗸	 Set the sync source (U1 to U7, I1 to I7, Ext Clk, Z Phase1 (ch D),
Pulse Range Upper	50.0000	10000.0000	Z Phase3 (ch H), None).
Pulse Range Lower	-50.0000	0.0000	— Set the upper and lower limits of the torque or rotating speed. Torque: -10000.0000 to 10000.0000 [N•m]
Rated Upper	50.0000		Rotating speed: –99999.9999 to 99999.9999 [rpm] * You can set the torque when Sense Type is set to Pulse.
🗆 Rated Freq Upper	15000Hz		
Rated Lower	-50.0000		— Set the upper limit of the torque signal. Rated value : -10000.0000 to 10000.0000 [N•m] Positive rated pulse frequency: 1 to 100000000 [Hz]
Rated Freq Lower	5000Hz		
	You can set th	Rated value : –1 Negative rated p	mit of the torque signal. 10000.0000 to 10000.0000 [N•m] pulse frequency: 1 to 1000000000 [Hz] ype is set to Pulse.

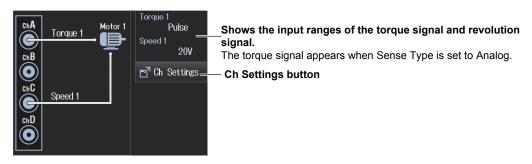
Drag the screen to display the bottom area of the setup screen.

Drag the screen to display the bottom area of the setup screen.

		•		
	(Torque column)	(Speed column)	(Pm column)	
Pulse N		60	Pole	Source
Sync Speed			2	11
(1 to 9999). Se	of pulses per revolu et the number of more e synchronous spee	tor poles that wil		ute
		e or current whos ous speed (U1 to		be measured to compute

Single Motor (Speed:Analog)

4. Tap Ch Settings. A single motor (revolution signal: analog) setup screen appears.



9.1 Configuring Motor Evaluation and Auxiliary Input Settings

Single motor (revolution signal: analog) setup screen

Set the unit (up to 8 characters).

Set the speed, torque, and Pm units.

Set the scaling factor (0.0001 to 99999.9999).

Set the scaling factor that is used to convert the signal from the revolution sensor or torque meter to speed (rotating speed), torque, and Pm (motor output).

Ch Settings	Ch A: Torque 1	Ch C: Speed 1	Pm 1
Scaling	1.0000	1.0000	1.0000
Unit	- Nm	rpm	₩
Sense Type	Analog 🔫 –	Analog	Set the input signal type (Analog, Pulse). Set the type of signal (Torque) applied from
Analog Auto Range	OFF 🔻	OFF 🔫	the torque meter. Turns auto range on and off
Analog Range	20V 🔻	20V 🕶	—— Set the fixed range (20V, 10V, 5V, 2V, 1V).
Linear Scale A	1.000	1.000	Set the linear scale — (A: 1.000 m to 1.000 M; B: −1.000 M to 1.000M).
В	0.000	0.000	Set A (the slope) and B (the offset).
	🗗 Calculation	🗗 Calculation 🗧	—— Computes A and B
Line Filter (Butterworth)		OFF 🔫	—— Set the line filter. (OFF, 1kHz, 500Hz, 100Hz)

You can set the range, scale, filter, and the like of the torque signal when Sense Type is set to Analog.

Drag the screen to display the bottom area of the setup screen.

	(Torque column) (Speed column)	(Pm column)
Pulse Noise Filter	OFF None	— Set the pulse noise filter (OFF, 1MHz, 100kHz, 10kHz).
Sync Source Pulse Range Upper	50.0000 -	 Set the sync source (U1 to U7, I1 to I7, Ext Clk, Z Phase1 (Ch D), Z Phase3 (Ch H), None).
Pulse Range Lower	-50.0000	Set the upper and lower limits of the — torque or rotating speed. Torque: –10000.0000 to 10000.0000 [N•m]
Rated Upper	50.0000 15000Hz	— Set the upper limit of the torque signal. Rated value : -10000.0000 to 10000.0000 [N•m]
Rated Lower	-50.0000	Positive rated pulse frequency: 1 to 100000000 [Hz] — Set the lower limit of the torque signal.
-Rated Freq Lower	5000Hz	Rated value : -10000.0000 to 10000.0000 [N•m] Negative rated pulse frequency: 1 to 100000000 [Hz]

You can set these when SenseType is set to Pulse.

Drag the screen to display the bottom area of the setup screen.

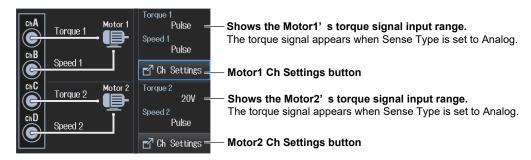
	(Torque column)	(Speed column)	(Pm column)	
Pulse N				
Sync Speed			Pole	Source
			I	

Set the number of motor poles that will be used to compute the synchronous speed (1 to 99).

Set the voltage or current whose frequency will be measured to compute the synchronous speed (U1 to U7, I1 to I7).

Double Motor

4. Tap Ch Settings. A double motor setup screen appears.



Double motor setup screen

Set the unit (up to 8 characters).

Set the speed, torque, and Pm units.

Set the scaling factor (0.0001 to 99999.9999).

Set the scaling factor that is used to convert the signal from the revolution sensor or torque meter to speed (rotating speed), torque, and Pm (motor output).

Ch Settings	Ch A: Torque 1	Ch B: Speed 1	Pm 1	8
Scaling	1.0000	1.0000	1.0000	
Unit	Nm	rpm	W	
Sense Type	Analog 🗲	•	signal type (Anal	og, Pulse). pplied from the torque mete
Analog Auto Rang	e OFF 🖛		inge on and off	
Analog Range	20V 🗨	—— Set the fixed	range (20V, 10V,	5V, 2V, 1V).
Linear Scale A B	1.000	•	r scale o 1.000 M; B: −1.0 pe) and B (the offs	
	🗗 Calculation 🗕	— Computes A	and B	
Line Filter (Butterworth)	OFF 🗨	Set the line fi	lter (OFF, 1kHz, 5	00Hz, 100Hz).

You can set these when Sense Type is set to Analog.

9.1 Configuring Motor Evaluation and Auxiliary Input Settings

		V	
	(Torque column)	(Speed column)	(Pm column)
Pulse Noise Filter	OFF 🔻	OFF 🖛	— Set the pulse noise filter (OFF, 1MHz, 100kHz, 10kHz).
Sync Source	Nor		— Set the sync source (U1 to U7, I1 to I7, Ext Clk, Z Phase1 (Ch D), Z Phase3 (Ch H), None).
Pulse Range Upper	50.0000	10000.0000	
Pulse Range Lower	-50.0000	0.0000	 Set the upper and lower limits of the torque or rotating speed. Torque: -10000.0000 to 10000.0000 [N•m]
Rated Upper	50.0000		Rotating speed: 0.0000 to 99999.9999 [rpm]
-Rated Freq Upper	15000Hz		* You can set the torque when Sense Type is set to Pulse. Set the upper limit of the torque signal.
Rated Lower	-50.0000		Rated value : -10000.0000 to 10000.0000 [N•m]
			Positive rated pulse frequency: 1 to 100000000 [Hz]
LRated Freq Lower	5000Hz		
	You can set fi	Rated value : – Negative rated	limit of the torque signal. -10000.0000 to 10000.0000 [N•m] pulse frequency: 1 to 100000000 [Hz]
You can set these when SenseType is set to Pulse.			

Drag the screen to display the bottom area of the setup screen.

Drag the screen to display the bottom area of the setup screen. $\hfill \nabla$

		•					
(1	Forque column)	(Speed colur	mn)	(Pm column)		
Pulse N			60	Pole		Source	
Sync Speed					2	11	
Set the number of pulses per revolution of the revolution signal (1 to 9999).							
Set the number of motor poles that will be used to compute the synchronous speed (1 to 99).							

Set the voltage or current whose frequency will be measured to compute the synchronous speed (U1 to U7, I1 to I7).

Auxiliary

4. Tap Ch Settings. An auxiliary input setup screen appears.

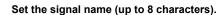
ChA Aux 1	Aux 1 Aux 2	20V – Shows the auxiliary signal input range. This appears when Sense Type is set to Analog.
ChB Aux 2	Aux 3	20V
ChC Aux 3	Aux 4	Pulse
chD Aux 4		Pulse
	🗗 Ch	h Settings — Ch Settings button

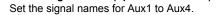
9.1 Configuring Motor Evaluation and Auxiliary Input Settings

Auxiliary input setup screen

Set the scaling factor (0.0001 to 99999.9999).

Set the scaling factor for scaling or computing auxiliary signals.





	j			
Ch Setings	Ch A: Aux 1	Ch C: Aux 2	Ch B: Aux 3	Ch D: Aux 4
Name	AUX1	AUX2	AUX3	AUX4
Scaling	1.0000	1.0000	1.0000	1.0000
Unit			up to 8 characters	5).
Sense Type	Analog 🖛	•	signal type (Analary signal type.	og, Pulse).
Analog Auto Ran,	ge OFF 🖛	Turns auto ra	ange on and off	
Analog Range	20V -	—— Set the fixed	range (20V, 10V,	5V, 2V, 1V).
Linear Scale A	1.000	· ·	o 1.000M and -0.0	01m to –1.000M,
В	0.000	B: –1.000M t Set A (the slo	o 1.000M). pe) and B (the offs	et).
	Calculation -	— Computes A	and B	

You can set these when Sense Type is set to Analog.

Drag the screen to display the bottom area of the setup screen.

	(Ch A: Aux 1 colu	mn) (Ch I	B: Aux 3 column)
		(Ch C: Aux 2 column)	(ChD: Aux 4 column)
Line Filter (Butterworth)	-	OFF 🚽 Se	et the line filter (OFF, 1kHz, 500Hz, 100Hz). ¹
Pulse Noise Filter	0FF 🔫		et the pulse noise filter PFF, 1MHz, 100kHz, 10kHz).
Pulse Range Upper	- 10.00k=		et the upper limit of the auxiliary signal 10.00M to 10.00M).
Pulse Range Lower	0.000		et the lower limit of the auxiliary signal 10.00M to 10.00M).

You can set these when SenseType is set to Pulse.

1 You can set this when SenseType is set to Analog.

Computing A and B (Calculation)

Compute A (slope) and B (offset) from two points on the characteristics graph of the input signal.

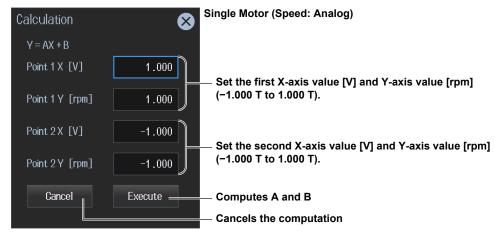
Torque A and B

On the Motor/Aux setup screen, tap Calculation under Torque. The following screen appears.

Calculat	ion	\otimes	
Y = AX	+ B		
Point 1	X [V]	1.000	– Set the first X-axis value [V] and Y-axis value [Nm]
Point 1	Y [Nm]	1.000	(−1.000 T to 1.000 T).
Point 2	X [V]	-1.000	– Set the second X-axis value [V] and Y-axis value [Nm]
Point 2	Y [Nm]	-1.000	(−1.000 T to 1.000 T).
Ca	ncel	Execute	– Computes A and B
			– Cancels the computation

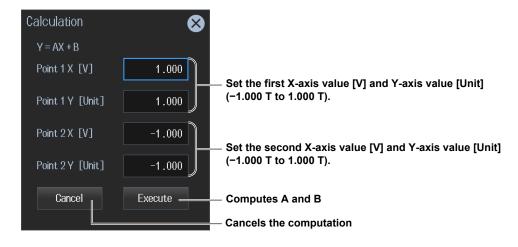
Rotating Speed A and B

On the Motor/Aux setup screen, tap Calculation under Speed. The following screen appears.



External Signal Input A and B

On the Motor/Aux setup screen, tap Calculation under Aux1 to Aux4. The following screen appears.



Setting the Electrical Angle Measurement (Electrical Angle Measurement)

Selecting the Harmonic Group (Harmonics Trigger)

- **5.** Tap **ON/OFF** under Electrical Angle Measurement. The button changes to ON. The Harmonics and Correction buttons next to the ON/OFF button become available (step 7).
- 6. Tap Harmonics Trigger. A Harmonics Trigger screen appears.

Set the harmonic analysis trigger.

	rm1: Z Phase 1 (Ch D) rm2: None ,	Hrm1: None Hrm2: Z Phase 1 (Ch D)		
Harmonics Trigger		\otimes		
" Hrm 1: Z Phase 1 (Ch D) ↓ Hrm 2: Z Phase 1 (Ch D) ↓				
Hrm Element Group Va	lid Electrical Angle Items			
Element 1 Hrm ① Hrm ②	EaM1U1 EaM1I1 EaM3U1 E	aM311		
	EaM1U2 EaM1I2 EaM3U2 E	aM312		
	EaM1U3 EaM1I3 EaM3U3 E	aM313		
Element 4 Hrm 1 Hrm ② 1 Element 5	EaM1U4 EaM1I4 EaM3U4 E	aM314		
	EaM1U5 EaM1I5 EaM3U5 E	aM315		
	EaM1U6 EaM1I6 EaM3U6 E	aM316		
	EaM1U7 EaM1I7 EaM3U7 E	aM317		
Shows harmonic element grouping Electrical angle measurement items These are determined and shown automatically depending on the configuration.				
Hrm1: Z Phase 1 (Ch D) Hrm2: Z Phase 1 (Ch D)		rs to the Z phase of motor 1.		
Hrm1: Z Phase 1 (Ch D) Hrm2: None	t the Hrm1 trigger to the Z p	hase of motor 1.		
Hrm①: None Hrm②: Z Phase 1 (Ch D) : Set the Hrm2 trigger to the Z phase of motor 1.				
lote				

Note_

The harmonic analysis trigger parameters vary depending on the /MTR1 option and /MTR2 option.

- Electrical angle measurement of motor 1 set to on and Electrical angle measurement of motor 2 set to off
 Hrm1: Z Phase1 and Hrm2: Z Phase1
 Hrm1: Z Phase1 and Hrm2: None
 Hrm1: None and Hrm2: Z Phase1

 Electrical angle measurement of both motor 1 and motor 2 set to on
 Hrm1: Z Phase1 and Hrm2: Z Phase3
 Hrm1: Z Phase3 and Hrm2: Z Phase1

 Electrical angle measurement of motor 1 set to off and electrical angle measurement of motor 2 set to on
 Hrm1: Z Phase3 and Hrm2: Z Phase3
 Hrm1: Z Phase3 and Hrm2: Z Phase3
 - Hrm1: Z Phase3 and Hrm2: None
 - Hrm1: None and Hrm2: Z Phase3

Setting the Electrical Angle Correction Value (Electric Angle Correction)

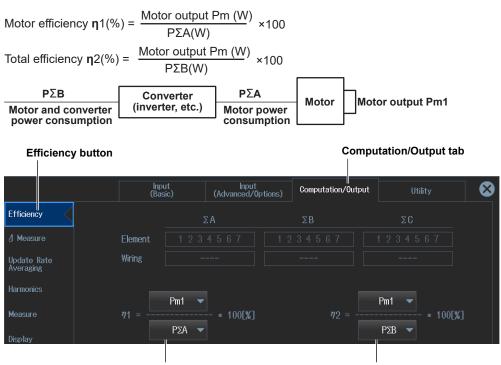
7. Tap Correction. An Electric Angle Correction screen appears.

Set the correction value	(-180.00 to 180.00).
	Can be set on models with the /MTR2 option.
Electric Angle Correction	Motor 3
Electric Angle Correction	Electric Angle Correction
	Auto Enter Correction Target U1 Execute tically computes the correction value on Value is set to the computed value.
Set the voltage or curre (U1 to U7, I1 to I7).	ent to automatically compute the correction value of

Setting the Motor Efficiency Computation

This instrument can compute the motor efficiency (the ratio of power consumption to motor output) and total efficiency from the active power and motor output that it measures.* For information on how to set expressions, see section 2.11.

- Example in which motor efficiency is set to $\eta 1$ and total efficiency to $\eta 2$



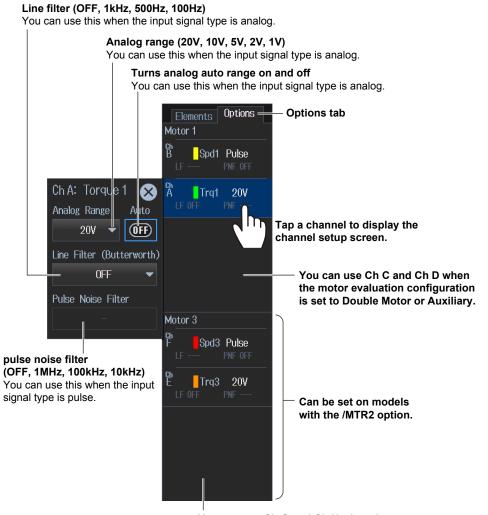
Motor efficiency setup example

Total efficiency setup example

Procedure Using the Input Information Area (Options tab)

If you use the input information area shown on the right side of the screen, you can set the analog range, line filter, and pulse noise filter while viewing the measurements. These settings are the same as those in "Configuring the Channels (Ch Settings)" described earlier.

- 1. Tap the Options tab. An Options menu appears in the input information area.
- Tap the channel (Ch A to Ch H) you want to control. A channel setup screen appears. The channel display and channel setup screen vary depending on the motor evaluation configuration setting.

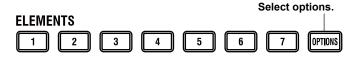


You can use Ch G and Ch H when the motor evaluation configuration is set to Double Motor or Auxiliary.

Procedure Using Keys

You can use the front panel keys to display the input information area and the motor evaluation condition setup screen.

- 1. Press OPTIONS. The input information area display changes to Options tab.
- Press OPTIONS again. A motor evaluation condition setup screen appears. Press OPTIONS yet again to return to the input information area (Options tab) display.



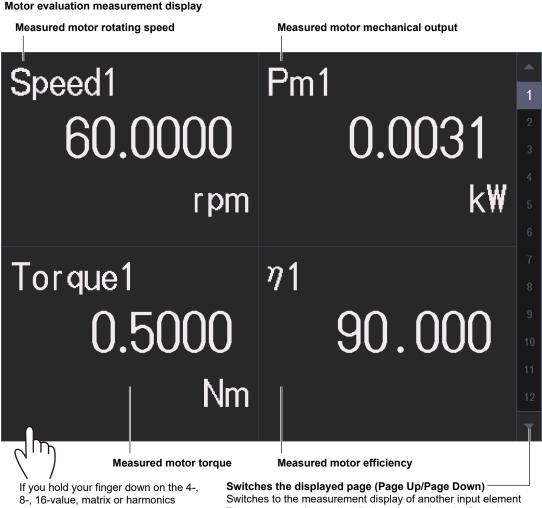
9.2 Displaying the Motor Evaluation (numeric display)

This instrument shows on the screen the measurements (measurement functions) of motor evaluation based on the revolution sensor or torque meter signals applied to Ch A to Ch H on the rear panel. In addition, this instrument shows on the screen the measurements (measurement functions) of the motor power consumption based on the voltage or current applied to the wiring units. Using an example, this section explains how to display motor evaluation measurements numerically. Note that to determine the motor efficiency or total efficiency values (η), you need to set equations (see sections 2.11 and 9.1).

In addition, this section explains operating procedures using the following setup methods.

- Procedure Using the Setup Menu (see chapter 1)
- · Procedure Using the Menu Icons (see page iii)

Measurement Display Screen (Example of a 4 items display)



8-, 16-value, matrix or harmonics display for at least 1 second, you can perform the operations described in "Switching the Displayed Items (Items)," provided later. Switches the displayed page (Page Up/Page Down) Switches to the measurement display of another input element Tap \blacktriangle or \lor to change the displayed page in order from the current number. Tap the number directly to change to the number display page.

Procedure Using the Setup Menu

- 1. Tap the Setup icon 🔅 , or press MENU under SETUP.
- 2. Tap **Computation/Output** tab. A computation and output settings overview screen appears. Pressing **ESC** closes the overview screen.

Switching the Displayed Items (Items)

You can switch the measured value (measurement function) shown in the screen.

3. Tap Display.

A display format setup screen (Numeric/Graph) appears. For details, see section 3.1.

4. Tap Items. The following screen appears.

Numeric Items 🔀	— Closes the menu
🔲 4 Items	
ltem No.	
- 1 +	
Function	
Speed 🗸	— Set the displayed item.
Motor	You can set the following items for displaying motor evaluation.
MULUI	Motor evaluation (Motor group):
Motor 1 🛛 🔫	Speed (motor rotating speed), Torque (motor torque),
	SyncSP (sync speed), Slip (slip (%)),
Order (k)	Pm (Motor mechanical output (mechanical power)), EaM1U1 to EaM1U7
Total	(electrical angle: phase angles of U1 to U7 relative to the falling edge of the
	Speed1 signal's Z phase input),
	EaM3U1 to EaM3U7
	(electrical angle: phase angles of U1 to U7 relative to the falling edge of the
🗹 Reset Items	Speed3 signal' s Z phase input),
	EaM111 to EaM117
	(electrical angle: phase angles of 11 to 17 relative to the falling edge of the
	Speed1 signal's Z phase input),
	EaM3I1 to EaM3I7
	(electrical angle: phase angles of I1 to I7 relative to the falling edge of the
	Speed3 signal's Z phase input)
	Efficiency (Efficiency group):

η1 to η4 (efficiency)

Procedure Using the Menu Icons

You can also use the menu icons shown on the right side of the screen to switch the displayed items.

1. Tap the **Display** menu icon . A Display menu appears in the sub menu area on the right side of the screen.

By tapping the displayed items, you can specify the same settings as when using the screen explained earlier.

Note_

For details on the Display menu, see page iv.

10.1 Holding Measured Values

"Holding Measured Values (Hold, HOLD)" in the features guide

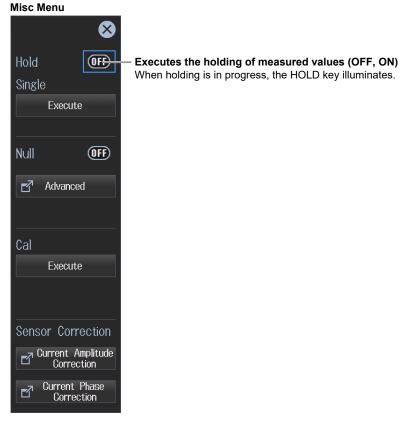
This section explains operating procedures using the following setup methods.

- Procedure Using the Menu Icons (see page iii)
- · Procedure Using the Keys (other than SETUP) (see section 1.2 in IM WT5000-03EN)

Procedure Using the Menu Icons

- 1. Tap the Misc menu icon 🚔. A Misc menu appears in the sub menu area on the right side of the screen.
- 2. Tap the Hold **ON/OFF** button to select ON. The HOLD key illuminates, and the displayed measured value is held.

Tap the Hold **ON/OFF** button to select OFF. This releases the held measured values. The measured data is then updated at the specified data update interval (see section 2.10).



 \Box If you hold the measured value, the data update counter at the top of the screen stops.

Update 94	4 (500ms) SP	Integ:	Time	:		2018/07/19 10:11:20 Normal Mode	CF:3	\bigcirc
							8	
r i					1	Hold		Setup

Note.

Values in the numeric data list of D/A output, communication output, and the like as well as the graph display are put on hold.

Procedure Using Keys You can also use the front panel keys to hold the measured values.



Holding Measured Values

The HOLD key LED illuminates, and the measure values are put on hold.

10.2 Single Measurement

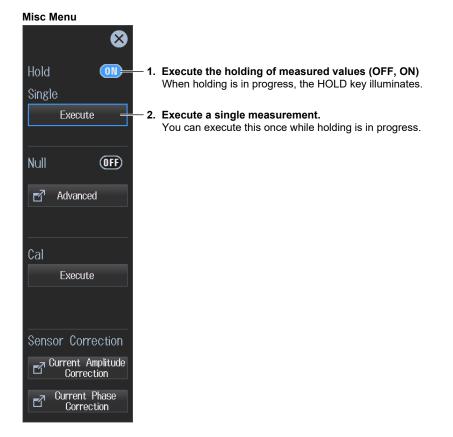
▶ "Single Measurement (Single Execute, SINGLE)" in the features guide

This section explains operating procedures using the following setup methods.

- Procedure Using the Menu Icons (see page iii)
- Procedure Using the Keys (other than SETUP) (see section 1.2 in IM WT5000-03EN)

Procedure Using the Menu Icons

- 1. Tap the Misc menu icon 🚔. A Misc menu appears in the sub menu area on the right side of the screen.
- 2. Tap the Hold **ON/OFF** button to select ON. The HOLD key illuminates, and the displayed measured value is held.
- **3.** Tap **Execute** under Single. A single measurement is performed at the specified data update rate, and the instrument then holds the measured value.



Note

If, while the HOLD key is illuminated, you tap Hold again, the HOLD key will turn off, and the held measured values will be released. If you tap Single Execute while the hold feature is released, the measured value is updated (re-measured) when the time specified by the data update rate elapses after you tap the key.

Procedure Using Keys You can also use the front panel keys to perform single measurements. HOLD SINGLE NULL CAL HOLD/SINGLE/NULL/CAL Area **Single measurement** While the HOLD key LED is illuminated, a measurement is executed once, and the display is updated.

11.1 Configuring, Enabling, and Disabling the Null Feature

"Null Feature (Null)" in the features guide "Enabling and Disabling the Null Feature (Null, NULL)" in the features guide

This section explains operating procedures using the following setup methods.

- · Procedure Using the Setup Menu (see chapter 1)
- · Procedure Using the Menu Icons (see page iii)
- Procedure Using the Keys (other than SETUP) (see section 1.2 in IM WT5000-03EN)

Procedure Using the Setup Menu

- 1. Tap the Setup icon , or press MENU under SETUP.
- Tap the Input (Advanced/Options) tab. An input settings (advanced/options) overview screen appears.

 $\label{eq:pressing_expansion} \ensuremath{\mathsf{Pressing}}\xspace \ensuremath{\mathsf{ESC}}\xspace$ closes the overview screen.

3. Tap Null. The null feature setup screen appears.

Using the menu icon or the front panel keys on the next page, enable and disable the null feature.

Sets all the signals of input elements collectively Input (Advanced/Options) tab Null button Input (Advanced/Options) Input (Basic) (\mathbf{X}) Computation/Output For motor/Aux Options (option) For voltage For current Hiring Voltage Current Control Null Value Update Control Null Value Control Null Value Update Range Target Target Undate Target Hold OFF ON OFF ON OFF ON All New Hold New Hold All New Range Config 🗸 U1 Hold I1 Spd1 \checkmark Line Filter Freq Filter/ Rectifier/Level 🗸 U2 Hold Hold 12 New Trq1 Enables or disables the Null feature Null Hold 🗸 U3 Spd2 Updates or holds the Null value Motor/Aux 🗸 U4 14 Tra₂ Sensor Correction **V** U5 15 Spd3 Set each input signal. 🗸 U6 **V** 16 Trq3 17 **V** U7 New New \checkmark Spd4 Hold Null notification Null Notification Hold Power-on time/warm-up completion time

Note

You can also display the input settings (advanced/options) overview screen by moving the cursor on the Input (Advanced/Options) tab using the arrow keys and then pressing SET.

Procedure Using the Menu Icons

You can use the menu icons shown on the right side of the screen to configure, enable, and disable the null feature.

1. Tap the Misc menu icon 🚔. A Misc menu appears in the sub menu area on the right side of the screen.

By tapping the displayed items, you can specify the same settings as when using the tap operation explained earlier.

Configuring, Enabling, and Disabling the Null Feature

- 2. Tap Advanced under Null. The same null feature setup screen appears as shown on the previous page.
- 3. After configuring the feature, close the screen.
- Tap the Null ON/OFF button to select ON. The NULL key illuminates, and the null feature is enabled.
 - The null value of each input signal is used for those signals whose null feature mode is set to ON.
 - If you tap the Null ON/OFF button and select OFF, the NULL key turns off, and the null feature is disabled.



Procedure Using Keys

You can use the front panel keys to enable and disable the null feature.



Enables or disables the null feature

While the null feature is enabled, the NULL key LED illuminates.

11.2 Zero-Level Compensation (Cal)

▶ "Zero-Level Compensation (Cal Execute, CAL)" in the features guide

This section explains operating procedures using the following setup methods.

- Procedure Using the Menu Icons (see page iii)
- Procedure Using the Keys (other than SETUP) (see section 1.2 in IM WT5000-03EN)

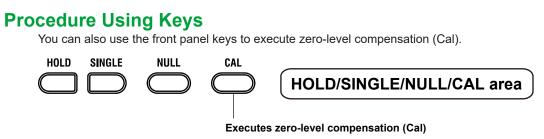
Procedure Using the Menu Icons

- 1. Tap the Misc menu icon . A Misc menu appears in the sub menu area on the right side of the screen.
- 2. Tap the Execute under Cal. Zero-level compensation is executed.

Misc menu	
\bigotimes	
Hold OFF	
Single	
Execute	
Null OFF	
Advanced	
Cal	
Execute	 Executes zero-level compensation (Cal)
Sensor Correction	
Current Amplitude Correction	
Current Phase Correction	

Note.

- The instrument automatically performs zero-level compensation after you change the measurement range
 or input filter.
- To make accurate measurements, we recommend that you execute zero-level compensation after warming up the instrument for at least 30 minutes.
- If the measurement range and input filter remain the same for a long period of time, the zero level may change due to the changes in the instrument's environment. If this happens, we recommend that you execute zero-level compensation.
- The integration feature includes an auto calibration feature that automatically performs zero-level compensation.



12.1 Cursor Measurement on Waveforms

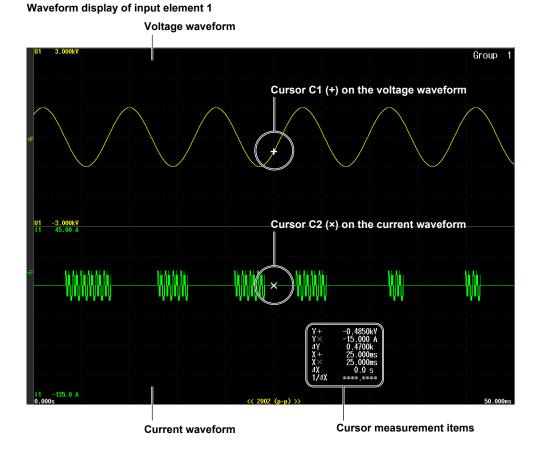
This instrument shows on the screen the waveforms of the voltage and current applied to the input elements or wiring units. When you place cursors on the waveforms, the instrument shows the measured values at the cursor positions.

"Cursor Measurement (Cursors)" in the features guide

Using an example, this section explains how to display waveform cursor measurement results. In addition, this section explains operating procedures using the following setup methods.

- Procedure Using the Setup Menu (see chapter 1)
- · Procedure Using the Menu Icons (see page iii)

Cursor Measurement on Waveforms (Example of voltage and current)



Procedure Using the Setup Menu

- 1. Tap the Setup icon 🔅 , or press MENU under SETUP.
- 2. Tap **Computation/Output** tab. A computation and output settings overview screen appears. Pressing **ESC** closes the overview screen.
- 3. Tap Display.

A display format setup screen (Numeric/Graph) appears. For details, see section 6.1.

Setting the Graph Display Type (Graph)

4. Tap Graph to select Wave.

Note.

For instructions on how to display the waveforms, see sections 6.1 and 6.2.

Displaying the Cursors (Cursors)

5. Tap Cursors. A Wave Cursors screen appears.

Wave Cursors 🗙	–Closes the menu
Group 1	
Cursors	
	–Cursor display (OFF, ON)
C1 + Trace	─Set the waveform to measure using cursor 1(+).
	(U1 to U7, I1 to I7, Spd1 to Spd2, ¹ Spd3 to Spd4, ² Trq1 to Trq2, ¹ Trq3 to Trq4. ² Aux1 to Aux4, ³ Aux5 to Aux8 ⁴)
C1 + Position	
200	—Set the cursor 1 (+) position (0, which is the left edge of the screen to 1000, which is the right edge of the screen)
C2× Trace	-Set the waveform to measure using cursor 2(×).
l1 -	(U1 to U7, I1 to I7, Spd1 to Spd2, ¹ Spd3 to Spd4, ² Trq1 to Trq2, ¹ Trq3 to Trq4, ² Aux1 to Aux4, ³ Aux5 to Aux8 ⁴)
C2× Position	
800	Set the cursor 2 (×) position (0, which is the left edge of the screen to 1000, which is the right edge of the screen)
Cursor Path	
Max 🔫	-Set the cursor movement path (Max, Min, Mid).
Linkage	
0FF—	-Cursor movement linking (OFF, ON)

- 1 You can set this on models with the /MTR1 option when MTR Configuration is set to Single Motor or Double Motor (see section 9.1).
- 2 You can set this on models with the /MTR2 option when MTR Configuration is set to Single Motor or Double Motor (see section 9.1).
- 3 You can set this on models with the /MTR1 option when MTR Configuration is set to Auxiliary (see section 9.1).
- 4 You can set this on models with the /MTR2 option when MTR Configuration is set to Auxiliary (see section 9.1).

Procedure Using the Menu Icons

You can also use the menu icons shown on the right side of the screen to switch the displayed items.

1. Tap the **Display** menu icon . A Display menu appears in the sub menu area on the right side of the screen.

By tapping the displayed items, you can specify the same operation as explained in "Switching the Displayed Items" described earlier.

Note.

For details on the Display menu, see page iv.

12.2 Cursor Measurement on Trends

This instrument shows on the screen the trends of the voltage and current applied to the input elements or wiring units. When you place cursors on the trends, the instrument shows the measured values at the cursor positions.

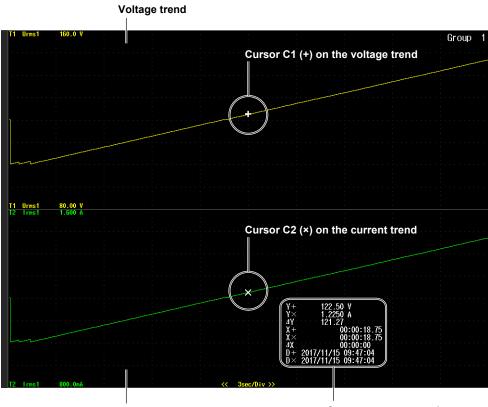
"Cursor Measurement (Cursors)" in the features guide

Using an example, this section explains how to display trend cursor measurement results. In addition, this section explains operating procedures using the following setup methods.

- Procedure Using the Setup Menu (see chapter 1)
- · Procedure Using the Menu Icons (see page iii)

Trend display of input element 1

Cursor Measurement on Trends (Example of voltage and current)



Current trend

Cursor measurement items

Procedure Using the Setup Menu

- 1. Tap the Setup icon 🔅 , or press MENU under SETUP.
- 2. Tap **Computation/Output** tab. A computation and output settings overview screen appears. Pressing **ESC** closes the overview screen.
- 3. Tap Display.
 - A display format setup screen (Numeric/Graph) appears. For details, see section 6.1.

Setting the Graph Display Type (Graph)

4. Tap Graph to select Trend.

Note.

For instructions on how to display the waveforms, see sections 6.1 and 6.3.

Displaying the Cursors (Cursors)

5. Tap Cursors. A Trend Cursors screen appears.

Trend Cursors	Closes the menu
🔲 Group 1	
Cursors	
	Cursor display (OFF, ON)
C1 + Trace	
T1	Set the trend to measure with cursor 1 (+) (T1 to T16).
C1 + Position	
	200 Set the cursor 1 (+) position (0, which is the left edge of the screen to 2001, which is the right edge of the screen)
C2× Trace	
T2	Set the trend to measure with cursor 2 (×) (T1 to T16).
C2× Position	
1	Set the cursor 2 (×) position (0, which is the left edge of the screen to 2001, which is the right edge of the screen)
Linkage	
(Cursor movement linking (OFF, ON)

Procedure Using the Menu Icons

You can also use the menu icons shown on the right side of the screen to switch the displayed items.

1. Tap the **Display** menu icon . A Display menu appears in the sub menu area on the right side of the screen.

By tapping the displayed items, you can specify the same operation as explained in "Switching the Displayed Items" described earlier.

Note.

For details on the Display menu, see page iv.

12.3 Cursor Measurement on Bar Graphs

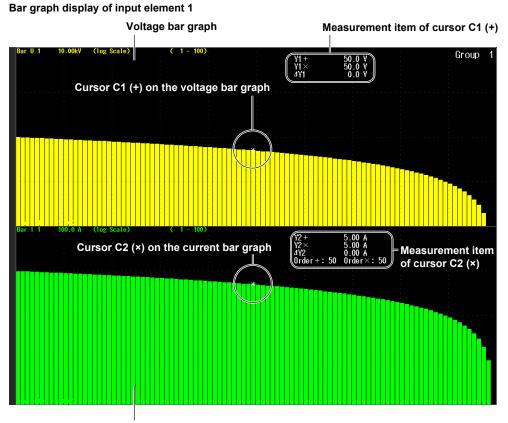
This instrument shows on the screen the harmonic orders and magnitudes of the voltage, current, and the like applied to the input elements with bar graphs. When you place cursors on the bar graphs, the instrument shows the measured values at the cursor positions.

"Cursor Measurement (Cursors)" in the features guide

Using an example, this section explains how to display bar graph cursor measurement results. In addition, this section explains operating procedures using the following setup methods.

- Procedure Using the Setup Menu (see chapter 1)
- · Procedure Using the Menu Icons (see page iii)

Cursor Measurement on Bar Graphs (Example of voltage and current)



Current bar graph

Procedure Using the Setup Menu

- 1. Tap the Setup icon 🔅 , or press MENU under SETUP.
- 2. Tap **Computation/Output** tab. A computation and output settings overview screen appears. Pressing **ESC** closes the overview screen.
- 3. Tap Display.

A display format setup screen (Numeric/Graph) appears. For details, see section 6.1.

Setting the Graph Display Type (Graph)

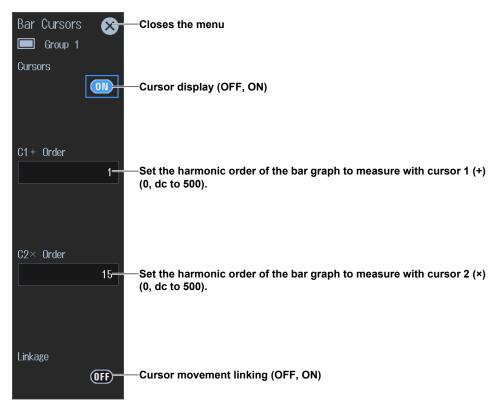
4. Tap Graph to select Bar.

Note.

For instructions on how to display the waveforms, see sections 6.1 and 6.4.

Displaying the Cursors (Cursors)

5. Tap Cursors. The following screen appears.



Procedure Using the Menu Icons

You can also use the menu icons shown on the right side of the screen to switch the displayed items.

1. Tap the **Display** menu icon . A Display menu appears in the sub menu area on the right side of the screen.

By tapping the displayed items, you can specify the same operation as explained in "Switching the Displayed Items" described earlier.

Note.

For details on the Display menu, see page iv.

13.1 Setting IEC Harmonic Measurement Conditions

"IEC Harmonic Measurement (Option)" in the features guide "Harmonic Measurement Conditions (Harmonics)" in the features guide

Set the object under measurement (Element 1 to Element 7^1 , ΣA to ΣC^2).

Set the PLL source (II1 to II7 ¹ I1 to I7 ¹ Evt Clk)

This section explains how to perform harmonic measurements in accordance with IEC 61000-4-7. Harmonic measurement and judgment can be performed in accordance with IEC 61000-3-2 by controlling this instrument using the Harmonic/Flicker Measurement Software (sold separately). This section explains operating procedures using the following setup methods.

• Procedure Using the Setup Menu (see chapter 1)

Note_

- In IEC Harmonic measurement, there is a limitation on the instrument functions and measurement functions that can be measured. See the appendix in the *Getting Started Guide*, IM WT5000-03EN.
- While controlling this instrument with the Harmonic/Flicker Measurement Software, do not release the
 instrument's remote mode and change the instrument's settings. If you do, the instrument may not be able
 to perform harmonic measurement in accordance with the IEC standard. If you release the instrument's
 remote mode, close the Harmonic/Flicker Measurement Software.

Procedure Using the Setup Menu

- 1. Tap the Setup icon 🔅 , or press MENU under SETUP.
- From the Measurement Mode pull-down menu, select IEC Harmonic. An IEC harmonic measurement setup screen appears.
 Pressing ESC closes the setup screen.

					,	
				et the edition number		
S	et this to IEC F	larmonic.	(E	dition 1.0, Edition 2.0	, Edition 2.0 A1)
Setup		Input (Basic) (Advanced/Options)	Computation/Output	Utility	
Measurement Mode	J		(Auvanceu/ op uons)			
IEC Harmonic 🚽	Efficiency	Object		IEC 61000-4-7		
Model & Suffix	△ Measure	Element 1		Edition 2.0		
	Update Rate/ Averaging	PLL Source		Set the	voltage groupi vpe 1, Type 2).	•
	Harmonics	U1 🗲		OFF		
Setup File Info	Measure	Min Order			current groupi ype 1, Type 2).	•
	Display	1 🕶	-Set the minimum	OFF ↓		
	Store	Max Order	value of the measure harmonic order (0, 1)			
	Data Save	100 -	Set the maximum val harmonic order (1 to			
Remote Control	Integration	Thd Formula				
	D/A Output	1/Total ▼=	[≕] Set the distortion fac	tor equation (1/Total,	1/Fundamenta	I).

- 1 Can be set within the range of the installed input elements.
- 2 Can be set within the range of the wiring unit that is automatically determined by the installed input elements.

14.1 Configuring IEC Voltage Fluctuation/Flicker Measurements

"IEC Voltage Fluctuation and Flicker Measurement (Option)" in the features guide
 "Measurement Conditions (Measured Settings)" in the features guide
 "Judgment Conditions (Limit Settings)" in the features guide

This section explains how to perform IEC voltage fluctuation/flicker measurements. Operating procedures are explained using the following setup methods.

• Procedure Using the Setup Menu (see chapter 1)

Note.

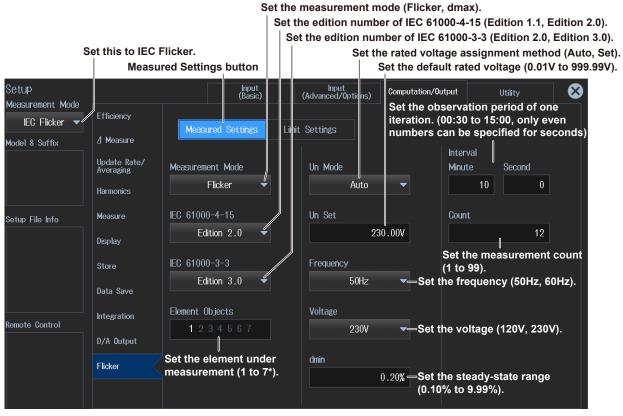
- In IEC voltage fluctuation/flicker measurement, there is a limitation on the instrument functions and measurement functions that can be measured. See the appendix in the *Getting Started Guide*, IM WT5000-03EN.
- While controlling this instrument with the Harmonic/Flicker Measurement Software, do not release the instrument's remote mode and change the instrument's settings. If you do, the instrument may not be able to perform voltage fluctuation/flicker measurement in accordance with the IEC standard. If you release the instrument's remote mode, close the Harmonic/Flicker Measurement Software.

Procedure Using the Setup Menu

- 1. Tap the Setup icon (💭), or press MENU under SETUP.
- From the Measurement Mode pull-down menu, select IEC Flicker. A voltage fluctuation/flicker measurement setup screen appears.
 Pressing ESC closes the setup screen.

Setting Measurement Conditions (Measured Settings)

3. Tap the Measured Settings tab. An measurement condition setup screen appears.



Can be set within the range of the installed input elements.

Setting Judgment Conditions (Limit Settings)

3. Tap the Limit Settings tab. A judgment condition setup screen appears.

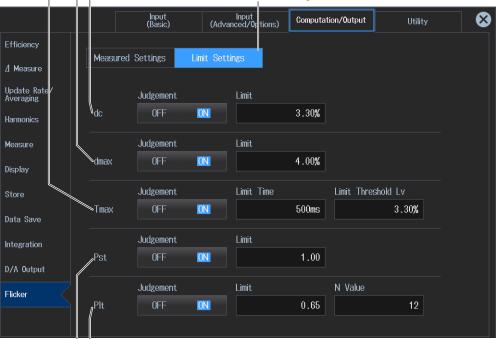
Turn on or off the judgment of the period during which relative voltage change exceeds the threshold level Tmax, set the Tmax limit value (1 ms to 99999 ms), and set the threshold level (1.00% to 99.99%).

"d(t)" is displayed here when the IEC 61000-4-15 edition number is set to Edition 1.1 or the IEC 61000-3-3 edition number is set to Edition 2.0.

Turn on or off the judgment of the maximum relative voltage change dmax, and set the dmax limit value (1.00% to 99.99%).

Turn on or off the judgment of the relative steady-state voltage change dc, and set the dc limit value (1.00% to 99.99%).

Limit Settings button



Turn on or off the judgment of the long-term flicker value Plt, set the Plt limit value (0.10 to 99.99), and set constant N of the calculation equation for long-term flicker value Plt (1 to 99).

Turn on or off the judgment of the short-term flicker value Pst, and set the Pst limit value (0.10 to 99.99).

14.2 Executing IEC Voltage Fluctuation/Flicker Measurements

"Executing the Normal Voltage Fluctuation and Flicker Measurements" in the features guide
 "Executing the Measurement of dmax Caused by Manual Switching" in the features guide

This section explains how to perform IEC voltage fluctuation/flicker measurements. Operating procedures are explained using the following setup methods.

Procedure Using the Menu Icons (see page iii)

For the relationships between measurement operation (transition of the flicker measurement status) and initializing, starting, and resetting, see the execution workflow of each measurement in the Features Guide.

- **1.** Set the measurement mode to IEC Flicker according to steps 1 and 2 in section 14.1. The Integration icon at the right edge of the screen changes to the Flicker icon.
- 2. Tap the Flicker menu icon . A Flicker menu appears in the sub menu area on the right side of the screen.
- **3.** Set the voltage fluctuation/flicker measurement mode to Flicker or dmax. A menu is displayed according to the selected measurement mode.
- 4. Tap Initialize Exec to perform initialization.

Initialization takes about 30 seconds. When the flicker measurement status in the upper center of the screen changes to "Ready," the **Start** button is enabled.

5. Tap Start to start measuring.

In dmax measurement mode, when the measurement of a single observation period is completed, the measurement operation stops, and the flicker measurement status changes to "Ready." To perform dmax measurement 24 times, tap **Start** every time the status becomes "Ready."

Normal voltage fluctuation/flicker measurement

· · · · · · · · · · · · · · · · · · ·	····· · · · · · · · · · · · · · · · ·
Flicker Closes the menu	Flicker Closes the menu
Measurement Mode	Measurement Mode
Flicker Set the measurement mode to Flicker.	dmax V Set the measurement mode to dmax.
Display Element	Display Element
Element 1	Element 1 Switch the element you want to display the measurement data of.
Page 1 Scrolls the screen page	
Initialize Exec	Initialize Exec – Executes initialization
Start - Starts a measurement	► Start - Starts a measurement
Reset - Reset	Reset - Reset
	Judge Completes the measurement and displays the judgment
	Move Period Changes the observation period and measures again
Flicker Settings Set the measurement conditions and judgment conditions (see section 14.1).	Flicker Settings Set the measurement conditions and judgment conditions (see section 14.1).

Measurement of dmax caused by manual switching

Display Example; Normal Voltage Fluctuation/Flicker Measurement (Measurement mode: Flicker) **Display during Measurement**

Number of the element whose measured data is displayed Flicker measurement status: Start

	234567			16 U7 ChACh 16 I7 ChBCh		Update Flicker	1902 Start	1:03:24	IEC61000-4- IEC61000-3-3	
	Element Volt Rang Un1 FreqU1	102)V (120V, 2.798 V).973 Hz				Judgen	ient:		- Numk obser comp - Elaps obser - "d(t)" i 61000 Editio
	dc[%]	dmax	:[%]	Tmax	x[ms]	Ps	st	Plt	numb
Limit	3.30		4.00		500 3.30((%)	1.00		0.65 N:12	– Limit For ite
11 12	0.60 0.62 0.46 0.62 0.08 0.51 Observa d(t)) o period every	terisk is f that rov . The va 2 secon	0.64 0.68 0.54 0.64 0.52 0.58 displayet v displayet v displayet s exce	y the ma e update eds the r	0 0 0 ement right of xximum d when maximu	✓ Pass ✓ Vilues Mo., and Vilues Mo. → Vilues	0.25 0.28 0.22 0.27 0.15 d dc, dm vithin the intaneous s up to t	e observ us value hat poin	Tmax (or ation s at t.	 OFF value. Obse comp The com judg the Sho and judg

Total elapsed measurement time Edition number of the standard

ber and bar graph of the ervation periods that have pleted measurements sed time and bar graph within one

ervation period

is displayed here when the IEC 0-4-15 edition number is set to on 1.1 or the IEC 61000-3-3 edition ber is set to Edition 2.0.

t value

tems whose judgment is set to OFF, F> is displayed to the right of the limit Э.

ervation periods that have pleted measurements

- he last dc, dmax, and Tmax values are impared to their limit values, and the dgments (Pass/Fail) are displayed to e right of the last values.
- ort-term flicker value Pst is calculated d compared to its limit value, and the Igment (Pass/Fail) is displayed.

Judge Display When the Measurement Is Complete

Flicker measurement status: Complete

) U2 U3 U4 U5 U6 U7 ChACh) I2 I3 I4 I5 I6 I7 ChBCh		3600 ■ Cmpl 2:00:00	IEC61000-4-15 Ed2.0 IEC61000-3-3 Ed3.0
			10		Pass Pass Pass
	FreqU1 dc[%]	49.973 Hz dmax[%]	(Element Tmax[ms]		Total judg The judgn Plt all elemen
Limit	3.30	4.00	500 3.30(%)	1.00	0.65 N:12 Element
No. 1 2 3 4 5 6 7 8 9	0.48 ✓ Pass 0.60 ✓ Pass 0.62 ✓ Pass 0.46 ✓ Pass 0.62 ✓ Pass 0.62 ✓ Pass 0.56 ✓ Pass 0.68 ✓ Pass 0.63 ✓ Pass 0.32 ✓ Pass	0.64 VPass 0.68 VPass 0.54 VPass 0.64 VPass 0.52 VPass 0.60 VPass 0.70 VPass	0 ✓ Pass 0 ✓ Pass	0.37 	Long-term its limit va is displaye
9 10 11 12 Result	0.32 V Pass 0.42 V Pass 0.54 V Pass 0.51 V Pass V Pass	0.60 V Pass 0.62 V Pass 0.64 V Pass	0 VPass 0 VPass 0 VPass 0 VPass 0 VPass	0.20 VPass 0.21 VPass 0.32 VPass 0.32 VPass VPass	0.27 VPass

judgment

ents whose measured data is d, the judgment is Pass if the ts of all items whose judgment is N are Pass; otherwise it is Fail.

Igment

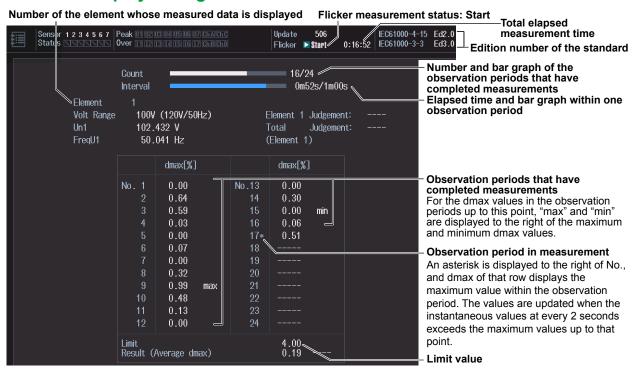
ment is Pass if the judgments of ents under measurement are herwise it is Fail.

under measurement

m flicker value Plt is compared to alue, and the judgment (Pass/Fail) ed.

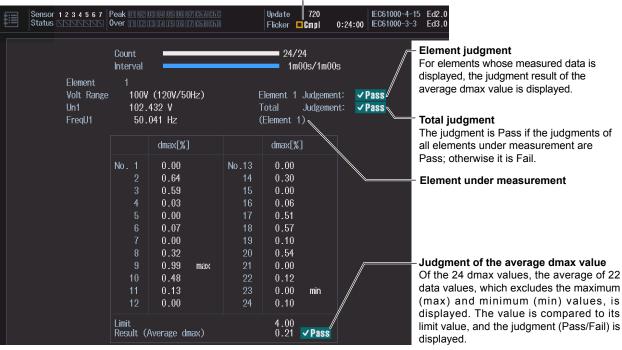
For dc, dmax, Tmax (or d(t)), and Pst, the judgment is Pass if the judgments of all observation periods are Pass; otherwise it is Fail.

Display Example; Measurement of dmax Caused by Manual Switching (Measurement mode: dmax) Display during Measurement



Judge Display When the Measurement Is Complete

Flicker measurement status: Complete



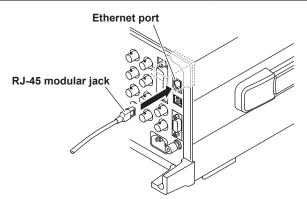
15.1 Connecting the Instrument to a Network

This section explains how to connect the instrument to a network.

Ethernet Interface Specifications

There is a 1000BASE-T port located on the rear panel of this instrument.

Item	Specifications
Ports	1
Electrical and mechanical specifications	IEEE802.3 compliant, Auto-MDIX
Transmission system	Ethernet(1000BASE-T/100BASE-TX/10BASE-T)
Communication protocol	TCP/IP
Supported services	Server: FTP, remote control (VXI-11, Socket), Modbus/TCP, and Web
	Client: DHCP, DNS, SNTP, FTP (Net Drive)
Connector type	RJ-45 connector



Items Required to Connect the Instrument to a Network

Cable

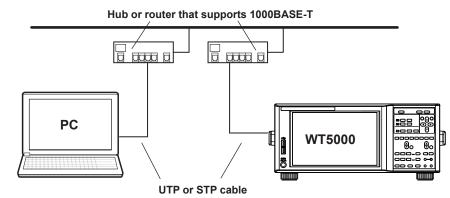
Use one of the following types of network cable that conforms to the transfer speed of your network.

- A UTP (Unshielded Twisted-Pair) cable
- An STP (Shielded Twisted-Pair) cable

Connection Procedure

To Connect to a PC over a Network

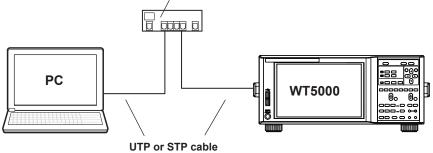
- 1. Turn off the instrument.
- Connect one end of a UTP (or STP) cable to the ETHERNET 1000BASE-T port on the rear panel.
- 3. Connect the other end of the UTP (or STP) cable to a hub or router.
- 4. Turn on the instrument.



To Connect to a PC through a Hub or Router

- 1. Turn off the instrument and the PC.
- 2. Connect one end of a UTP (or STP) cable to the ETHERNET 1000BASE-T port on the rear 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 instrument.





Note.

- Use a hub or router that conforms to the transfer speed of your network.
- When you connect a PC to the instrument 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 instrument to a PC directly. Direct communication without a hub or router is not guaranteed to work.

15.2 Configuring the TCP/IP Settings

▶ "TCP/IP (TCP/IP)" in the features guide

This section explains operating procedures using the following setup methods.

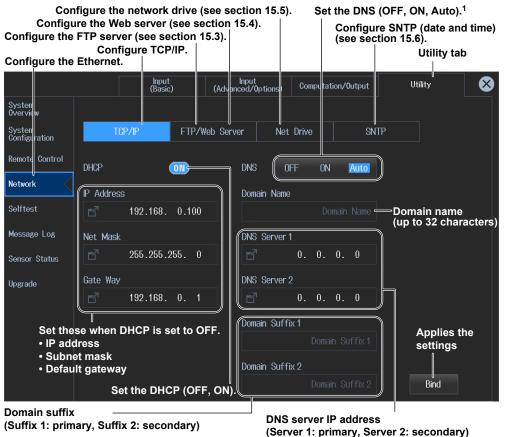
- Procedure Using the Setup Menu (see chapter 1)
- Procedure Using the Keys (other than SETUP) (see section 1.2 in IM WT5000-03EN)

Procedure Using the Setup Menu

- 1. Tap the Setup icon 🔅 , or press MENU under SETUP.
- 2. Tap the Utility tab. The utility settings overview screen appears. Pressing ESC closes the overview screen.
- 3. Tap Network. An Ethernet setup screen (TCP/IP, FTP/Web Server, Net Drive, SNTP) appears.

Configuring the TCP/IP Settings (TCP/IP)

4. Tap **TCP/IP**. A TCP/IP screen appears.



1 Configure 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. The Auto option is only displayed when DHCP is set to ON.

15.2 Configuring the TCP/IP Settings

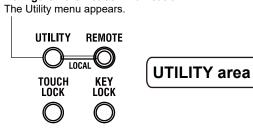
Note_

You can also display the utility settings overview screen by moving the cursor on the Utility tab using the arrow keys and then pressing SET.

Procedure Using Keys

You can also use the front panel keys to configure Ethernet communication.

Configure Ethernet communication.



15.3 Accessing the Instrument from a PC (FTP Server)

► "FTP Server (FTP/Web Server)" in the features guide This section explains operating procedures using the following setup methods.

- Procedure Using the Setup Menu (see chapter 1)
- Procedure Using the Keys (other than SETUP) (see section 1.2 in IM WT5000-03EN)

Procedure Using the Setup Menu

- 1. Tap the Setup icon , or press MENU under SETUP.
- 2. Tap the Utility tab. The utility settings overview screen appears. Pressing ESC closes the overview screen.
- 3. Tap Network. An Ethernet setup screen (TCP/IP, FTP/Web Server, Net Drive, SNTP) appears.

Configuring the FTP Server (FTP Server)

4. Tap FTP/Web Server. An FTP/Web Server screen appears.

Config	gure the Ethernet.	Configure the	FTP server.	Utility tab
	Input (Basic)	Input Advanced/Options) Computation/Output	Utility 🚫
System Overview				
System Configuratior	TCP/IP	FTP/Web Server N	let Drive SN	TP
Remote Control	User Name			
Network	an	onymous—— Set the u	ser name (up to 32	characters).
Selftest	Password			
Message Log		Password Set the p	assword (up to 32 c	characters).
Sensor Status	Time Out	Falme	A surfloor diverse	- 44
Upgrade	900s	Entry	—— Applies the s	ettings
	Set the timeo	out (30s to 3600s).		

Note.

• If you set the user name to "anonymous," you can connect to the instrument without entering a password.

 You can also display the utility settings overview screen by moving the cursor on the Utility tab using the arrow keys and then pressing SET.

FTP Client Software

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 instrument.

Procedure Using Keys

See section 15.2.

15.4 Web Server Feature

"Web Server (FTP/Web Server)" in the features guide

- This section explains operating procedures using the following setup methods.
- Procedure Using the Setup Menu (see chapter 1)
- Procedure Using the Keys (other than SETUP) (see section 1.2 in IM WT5000-03EN)

Procedure Using the Setup Menu

- 1. Tap the Setup icon 🔅 , or press MENU under SETUP.
- 2. Tap the Utility tab. The utility settings overview screen appears. Pressing ESC closes the overview screen.
- 3. Tap Network. An Ethernet setup screen (TCP/IP, FTP/Web Server, Net Drive, SNTP) appears.

Configuring the Web Server (Web Server)

- 4. Tap FTP/Web Server. An FTP/Web Server screen appears.
 - Time Out is a setting used by the FTP server feature. You do not have to set it for the Web server feature.

Config	gure the Etherne	t. C	onfigure the	FTP serve	r.	Utility	tab
	(1	nput Basic) (Input Advanced/Options)	Computat	ion/Output	Utility	⊗
System Overview							
System Configuratior	TCP/IP	FTP/Web	Server N	et Drive	SNTP		
Remote Control	User Name						
Network		anonymous=	— Set the us	ser name (up to 32 ch	aracters).	
Selftest	Password						
Message Log		Password=	— Set the pa	assword (ı	up to 32 cha	aracters).	
Sensor Status	Time Out 900s		Entry	—— Арр	lies the sett	lings	
Upgrade							

Note.

You can also display the utility settings overview screen by moving the cursor on the Utility tab using the arrow keys and then pressing SET.

Procedure Using Keys

See section 15.2.

Operations on the PC

- 1. Open a Web browser on a PC that is connected to the network.
- Specify the following address. http://xxx.xxx.xxx/ (Type this instrument's IP address for xxx.xxx.xxx.xxx.)
- **3.** Enter the user name and password that you entered on the screen shown on the previous page to connect to the instrument. The instrument's home screen appears.

If you set the user name to "anonymous," you can connect to the instrument without entering a password.

4. Click a side navigation item. The corresponding screen appears.

YOKOGAWA 🔶	Precision Power An	alyzer WT5000						
navigation								
Home	Instrument Home							
LAN Configuration Remote View	L L L L L L L L L L L L L L L L L L L							
	Device Model	WT5000						
Remote Control	Manufacturer	Yokogawa Test & Measurement Corporation						
File download Link	Serial Number	TEMPO						
	Description	Precision Power Analyzer WT5000						
	Hostname	10.0.000						
	MAC Address	10.001.00.00						
	IP Address	1.55						
	Firmware Revision VISA Resource String TCPIP:::::::::::::::::::::::::::::::::::							
	100 000 100,100 67,540 100 0,000,00 -4,000 100 -22,301 0100,000,100 100 100,100,100 -4,000 100 100,100,100 -4,000 100 100,100,100 -4,000 100 100,100,100 -4,000 100 100,100,100 -4,000 100 100,100,100 -4,000 100 100,100,100 -4,000 100 100,100,100 -4,000 100 100,100,100 -4,000 100 100,100,100 -4,000 100 100,100,100 -4,000 100 100,100,100 -4,000 100 100,100,100 -4,000 100 100,100,100 -4,000 100 100,100,100 -4,000 100 100,100,100 -4,000 100 100,100,100 -4,000 100 100,100,100 -4,000 100 100,100,100 </th <th></th>							

The instrument's IP address

Note_

- Disable the pop-up blocker feature on your Web browser when you want to capture the screen image.
- While using the Web server feature, there may be a delay in response or no response depending on the network environment.

15.5 Connecting to a Network Drive

"Network Drive (Net Drive)" in the features guide

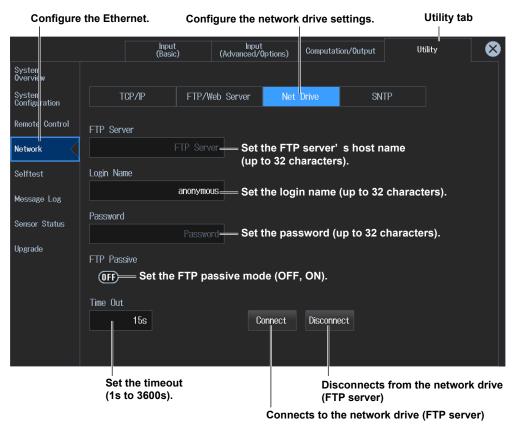
- This section explains operating procedures using the following setup methods.
- Procedure Using the Setup Menu (see chapter 1)
- Procedure Using the Keys (other than SETUP) (see section 1.2 in IM WT5000-03EN)

Procedure Using the Setup Menu

- 1. Tap the Setup icon 🔅, or press MENU under SETUP.
- 2. Tap the Utility tab. The utility settings overview screen appears. Pressing ESC closes the overview screen.
- 3. Tap Network. An Ethernet setup screen (TCP/IP, FTP/Web Server, Net Drive, SNTP) appears.

Configuring the Network Drive (Net Drive)

4. Tap Net Drive. A Net Drive screen appears.



Note.

You can also display the utility settings overview screen by moving the cursor on the Utility tab using the arrow keys and then pressing SET.

Procedure Using Keys

See section 15.2.

15.6 Setting the Date and Time via SNTP

▶ "SNTP (SNTP)" in the features guide

- This section explains operating procedures using the following setup methods.
- Procedure Using the Setup Menu (see chapter 1)
- Procedure Using the Keys (other than SETUP) (see section 1.2 in IM WT5000-03EN)

Procedure Using the Setup Menu

- 1. Tap the Setup icon 🔅 , or press MENU under SETUP.
- 2. Tap the Utility tab. The utility settings overview screen appears. Pressing ESC closes the overview screen.
- 3. Tap Network. An Ethernet setup screen (TCP/IP, FTP/Web Server, Net Drive, SNTP) appears.

Configuring the SNTP Settings (SNTP)

4. Tap SNTP. An SNTP screen appears.

Configure	the Ethe	ernet.			C	onfigure	the SNTP.	Utility tab	
		Input (Basio	; ;) (,	Inpu /Advanced	t 'Options)	Computat	ion/Output	Utility	⊗
Systen Overview									
Systen Configuration	Т	CP/IP	FTP/Web	Server	Net	Drive	SNTP		
Remote Control	SNTP Se	rver							
Network			NTP Server=					ddress; host set when DNS	;
Selftest	Time Out			is e	nabled	(up to 32	2 characters)).	
Message Log		3s —Se	t the time	out (1s	to 60s).				
Sensor Status		t Power On — Set aut	o adjustm	ient (Of	⁼F, ON).				
Upgrade	Time Diff	erence from	GMT						
	Hour	Minut	te						
		9	0)	Adjust —	— Ехесι	ıtes time adjı	ustment	
)	,					
		Sot th	o timo dif	foronco	from G	roonwie	h Moon Timo		

Set the time difference from Greenwich Mean Time (-12 hours 0 minutes to 13 hours 0 minutes).

Note

You can also display the utility settings overview screen by moving the cursor on the Utility tab using the arrow keys and then pressing SET.

Procedure Using Keys

See section 15.2.

16.1 Remote Control

"Remote Control (Remote Control)" in the features guide

This section explains operating procedures using the following setup methods.

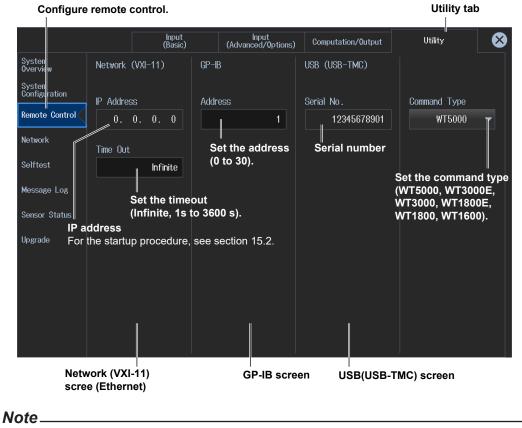
- Procedure Using the Setup Menu (see chapter 1)
- Procedure Using the Keys (other than SETUP) (see section 1.2 in IM WT5000-03EN)

Procedure Using the Setup Menu

- 1. Tap the Setup icon 🔅 , or press MENU under SETUP.
- Tap the Utility tab. The utility settings overview screen appears. Pressing ESC closes the overview screen.

Remote Control Settings (Remote Control)

3. Tap Remote Control. A remote control setup screen (Network(VXI-11/GP-IB/USB(USB-TMC)) appears.



- Only use one communication interface: GP-IB, USB, or Network. If you send commands simultaneously from more than one communication interface, the instrument will not execute the commands properly.
- You can also display the utility settings overview screen by moving the cursor on the Utility tab using the arrow keys and then pressing SET.

Network (VXI-11)

To use the Ethernet interface, you must specify the following TCP/IP settings.

- IP address
- Subnet mask
- Default gateway

For details on setting these parameters, see section 15.2.

USB Settings

- Install the YOKOGAWA USB driver on your PC. For information about how to obtain the YOKOGAWA USB driver, contact your nearest YOKOGAWA dealer. You can also access the YOKOGAWA USB driver download web page and download the driver. http://www.yokogawa.com/jp-ymi/tm/F-SOFT/
- Do not use USB drivers (or software) supplied by other companies.

GP-IB Settings

- When the controller is communicating with the instrument or with other devices through GP-IB, do not change the address.
- Each device that is connected in a GP-IB system has its own unique address. This address is used to distinguish between different devices. Therefore, you must assign a unique address to the instrument when connecting it to a PC or other device.

Command Type

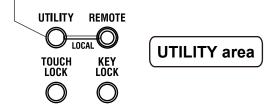
Specify the command type compatible with this instrument or legacy models (WT3000E, WT3000, WT1800E, WT1800, WT1600).

The response to the *IDN? and *OPT? commands will be according to the model of the specified command type.

Procedure Using Keys

You can also press UTILITY on the front panel to display the utility settings overview screen.

The utility settings overview screen appears.



16.2 Configuring the D/A Output (option)

"D/A Output (D/A Output, option)" in the features guide

This section explains operating procedures using the following setup methods.

• Procedure Using the Setup Menu (see chapter 1)

Procedure Using the Setup Menu

- 1. Tap the Setup icon 🔅 , or press MENU under SETUP.
- 2. Tap **Computation/Output** tab. A computation and output settings overview screen appears. Pressing **ESC** closes the overview screen.

Configuring the D/A Output (D/A Output)

3. Tap D/A Output. A DA output setup screen appears.

D/A output signal name

For details on the connector pinout and the D/A output signal assignment, see section 4.5 in the Getting Started Guide, IM WT5000-03EN.

Set the measurement function (None, other functions—for details on the various measurement functions, see "Items That This Instrument Can Measure" in the Features Guide).

Switches the channel display group

Ch 1-Ch 5: Displays Ch1 to Ch5,

Ch 6-Ch 10: Displays Ch 6 to Ch 10

Ch 11-Ch 15: Displays Ch11 to Ch15

Output items

This display changes according to the Function, Element/Σ, and Order settings.

	settings.				Ch 16-Ch 20: Displays Ch 16 to Ch 20						
			lnı (Ba	out sic)	Input (Advanced/0)	tions)	Compu	itation/Output ∬	Utility	, 🛛 😣	
Efficiency								□ Co	mputation/C	Dutput tab	
<u>⊿</u> Measure		Ch	1-Ch §	Ch 6-Ch 10	Ch 11	Ch 15	Ch	16-Ch 20			
Update Rate/ Averaging					S	elect	the D//	A output r	ange mode	(Fix, Manual).	
Harmonics		Ch	ltem	Function	Element/∑	Orde	er (k)	Range Mode	Max	Min	
Measure			Urms1	Urms	Element 1			_{Fixed} S	et the maxin	mum and ues of the	
Display			lrms1	Irms	Element 1			Tixed	range (-9.999T to 9.999T These can be set when		
Store			P1	Р	Element 1				range mode is set to Manual.		
Data Save		4	S1	S	Element 1			Fixed	-		
Integration			U1(Total)	U(k)	Element 1	1	lotal ∥	Manual	100.0	-100.0	
D/A Output Configure f D/A output items.						Set the harmonic order (Total, 0 to 500). You can set this setting when the measurement function includes a harmonic order.					
Set the rated time of integrated Selects the input element or wiring unit to be configured											

D/A output (00000 h : 00 min : 00 s to 10000 h : 00 min : 00 s). Selects the input element or wiring unit to be configured • Input element options When the displayed item is set to something other than more

When the displayed item is set to something other than motor evaluation: Element1 to Element7

When the displayed item is set to motor evaluation: Motor1 to Motor4 \bullet Wiring unit options: SA, SB, SC

Note.

You can also display the computation/output settings overview screen by moving the cursor on the Computation/Output tab using the arrow keys and then pressing SET.

16.3 Configuring the IEEE 1588 Time Synchronization

▶ "IEEE 1588 Time Synchronization Feature (IEEE 1588)" in the features guide

This section explains operating procedures using the following setup methods.

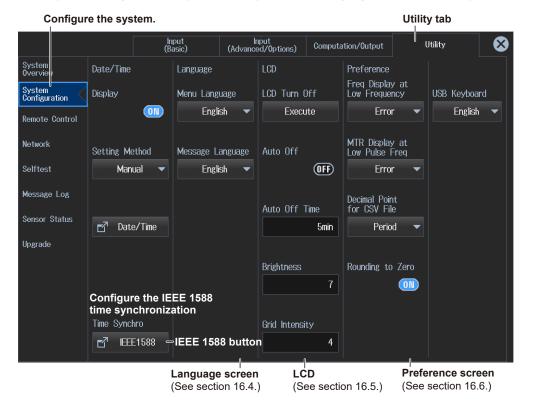
- Procedure Using the Setup Menu (see chapter 1)
- Procedure Using the Keys (other than SETUP) (see section 1.2 in IM WT5000-03EN)

Procedure Using the Setup Menu

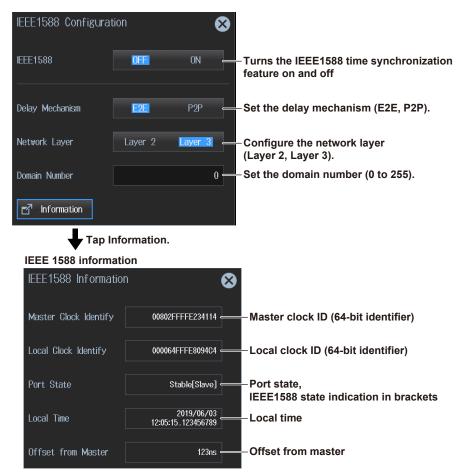
- 1. Tap the Setup icon 🔅 , or press MENU under SETUP.
- 2. Tap the Utility tab. The utility settings overview screen appears. Pressing ESC closes the overview screen.

Configuring the IEEE 1588 Time Synchronization

3. Tap System Configuration. A system setup (Date/Time, Language, LCD, Preference) appears.



IEEE 1588 Configuration Screen



Note.

You can also display the utility settings overview screen by moving the cursor on the Utility tab using the arrow keys and then pressing SET.

Procedure Using Keys

See section 16.1.

16.4 Setting the Message, Menu, and USB Keyboard Languages

System Configuration (System Configuration)" in the features guide

This section explains operating procedures using the following setup methods.

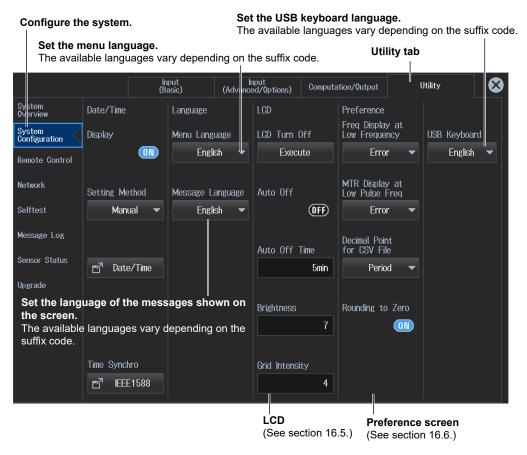
- Procedure Using the Setup Menu (see chapter 1)
- Procedure Using the Keys (other than SETUP) (see section 1.2 in IM WT5000-03EN)

Procedure Using the Setup Menu

- 1. Tap the Setup icon 🔅 , or press MENU under SETUP.
- Tap the Utility tab. The utility settings overview screen appears. Pressing ESC closes the overview screen.

Setting the Language and USB Keyboard (Language, USB Keyboard)

3. Tap System Configuration. A system setup (Date/Time, Language, LCD, Preference) appears.



Note

You can also display the utility settings overview screen by moving the cursor on the Utility tab using the arrow keys and then pressing SET.

Procedure Using Keys

16.5 Setting the Screen Brightness and Turning the Screen Off

"LCD (LCD)" in the features guide

This section explains operating procedures using the following setup methods.

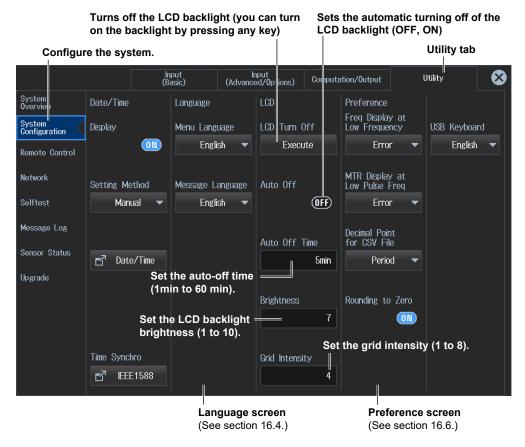
- Procedure Using the Setup Menu (see chapter 1)
- Procedure Using the Keys (other than SETUP) (see section 1.2 in IM WT5000-03EN)

Procedure Using the Setup Menu

- 1. Tap the Setup icon 🔅 , or press MENU under SETUP.
- 2. Tap the Utility tab. The utility settings overview screen appears. Pressing ESC closes the overview screen.

Setting the Screen Brightness and Turning the Screen Off (LCD)

3. Tap System Configuration. A system setup (Date/Time, Language, LCD, Preference) appears.



Note

You can also display the utility settings overview screen by moving the cursor on the Utility tab using the arrow keys and then pressing SET.

Procedure Using Keys

16.6 Environment Settings (Preference)

• "Environment Settings (Preference)" in the features guide

This section explains operating procedures using the following setup methods.

- Procedure Using the Setup Menu (see chapter 1)
- Procedure Using the Keys (other than SETUP) (see section 1.2 in IM WT5000-03EN)

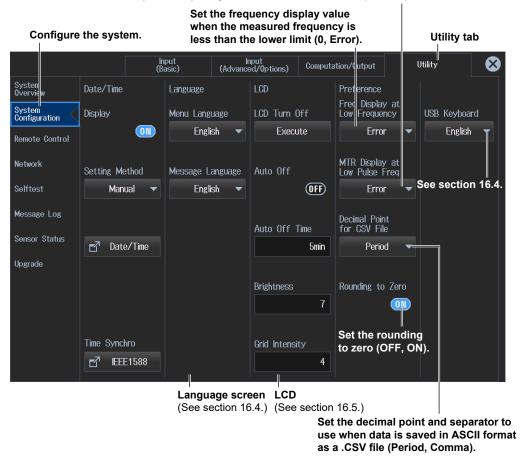
Procedure Using the Setup Menu

- 1. Tap the Setup icon 🔅 , or press MENU under SETUP.
- Tap the Utility tab. The utility settings overview screen appears. Pressing ESC closes the overview screen.

Environment Settings (Preference)

3. Tap System Configuration. A system setup (Date/Time, Language, LCD, Preference) appears.

On models with the /MTR option, set the motor display value when the measured pulse frequency is less than the lower limit (0, Error).



Note.

You can also display the utility settings overview screen by moving the cursor on the Utility tab using the arrow keys and then pressing SET.

Procedure Using Keys

16.7 Self-Test

"Self-test (Selftest)" in the Features Guide

This section explains operating procedures using the following setup methods.

- Procedure Using the Setup Menu (see chapter 1)
- Procedure Using the Keys (other than SETUP) (see section 1.2 in IM WT5000-03EN)

Procedure Using the Setup Menu

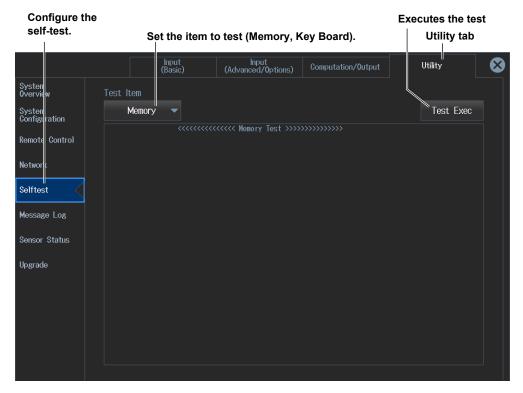
- 1. Tap the Setup icon , or press MENU under SETUP.
- 2. Tap the Utility tab. The utility settings overview screen appears. Pressing ESC closes the overview screen.

Self-test (Selftest)

3. Tap Selftest. A self-test screen appears.

Memory Test

4. Tap Test Item to select Memory.



Executing the Soft Keyboard Test

- 4. Tap Test Item to select Key Board.
- Front Panel Key Test
- 5. Tap Test Exec. A front panel key test and indicator test will be executed.

		Executes the t	test
		This self-test te	ests the panel keys and
		indicators.	
Configure the	self-test. Set the item	to test (Memory, Key Board).	Utility tab
	Input (Baric)	Input (Advanced/Options) Computation/Output	Utility 🛛 😸
Systen Overview	Test Item Soft	Кеу	
System Configuration	Key Board 🗸	Soft KeyDisplays the keyboard	Test Exec
Remote Control	Soft Keyboard	<< KeyBoard Test >>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>	$\mathbf{\otimes}$
Network			
Selftest			\leftarrow \rightarrow
Message Log			<u>f</u> x
Sensor Status			0
Upgrade			
	QWE	R T Y U I O	P Clear
		D F G H J K	L
	CAPS Z	K C V B N M ,	
	!@#	Space	Enter

- Onscreen Soft Keyboard Test
- 5. Tap Soft Key. A soft keyboard appears.
- 6. Tap Test Exec. A soft keyboard test will be executed.

Note_

You can also display the utility settings overview screen by moving the cursor on the Utility tab using the arrow keys and then pressing SET.

Procedure Using Keys

Displaying the Message Log 16.8

"Message Log Display (Message Log)" in the features guide

This section explains operating procedures using the following setup methods.

- Procedure Using the Setup Menu (see chapter 1)
- ٠ Procedure Using the Keys (other than SETUP) (see section 1.2 in IM WT5000-03EN)

Procedure Using the Setup Menu

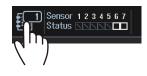
- 1. Tap the Setup icon 🔅 , or press MENU under SETUP.
- 2. Tap the Utility tab. The utility settings overview screen appears. Pressing ESC closes the overview screen.

Message Log Display (Message Log)

3. Tap Message Log. A list is displayed containing all the messages that were indicated on the screen since the instrument was started.

Displays the m	nessage	e log				Utility tab
			Input (Basic)	Input (Advanced/Options) Computation/Output	Utility 😣
System Overview					Clea	ars the message log
System Configuration				Messag	e log	Clear " All Messages
Remote Control	No.	Code	Time	Category	Messa	age
Network	2	95	09/17 16:33:52	Information	Please enable the "Null Se	ttings".
Selftest			00/00 00:00:00	Information	Turned on pressing the ES The system has been initia	C key. lized.
Message Log						
Sensor Status						
Upgrade						

You can also tap the message log indicator in the upper left of the screen to display the list of messages.



Note

You can also display the utility settings overview screen by moving the cursor on the Utility tab using the arrow keys and then pressing SET.

Procedure Using Keys

16.9 Viewing the Instrument Information and Current Sensor Status

"Instrument Information (System Overview)" in the features guide
 "Current Sensor Status Display (Sensor Status)" in the features guide

This section explains operating procedures using the following setup methods.

- Procedure Using the Setup Menu (see chapter 1)
- Procedure Using the Keys (other than SETUP) (see section 1.2 in IM WT5000-03EN)

Procedure Using the Setup Menu

- 1. Tap the Setup icon , or press MENU under SETUP.
- 2. Tap the Utility tab. The utility settings overview screen appears. Pressing ESC closes the overview screen.

Viewing the Instrument Information (System Overview)

3. Tap System Overview. A instrument information overview appears.

Displays	the instrument information		Utility tab
	Input Input (Basic) (Advanced/Options) Computation/	'Output	Utility 🚫
System Overview System Configuration	Model : WT5000 Suffix : -HE/M1/MTR1/DA20/DS/G7 No. : (HAC:) Version : (Boot Ver.:	1000) (C. D.C	0
Remote Control Network	Element Configuration Type No. Revision Adjustment Date 1: 760901(30A) C3U625003E [1.00] 20 /08/15 22:04:52 2: 760901(30A) C3U613007E [1.00] 20 /08/16 20:17:40)	red Sensor
Selftest Message Log	3: 760901(30A) C3U625031E [] 20 /08/17 15:05:32 4: 760902(5A) C3U625032E [] 20 /08/17 15:05:33 5: 760902(5A) C3U623019E [] 20 /08/20 16:40:02 6: 760903(CS) C3U623024E [] 20 /08/20 16:40:02 7: 760903(CS) C3U623024E [] 20 /08/20 16:40:04	2	
Sensor Status	Options 32GB Built-in Memory [/H1] : Yes		
Upgrade	Motor Evaluation 1 [/MTR1]: Yes [11.00,20] 20 /08/15 20-CH D/A Output [/DA20]: Yes [11.00,20] 20 /08/15 Motor Evaluation 2 [/MTR2]: No Data Streaming [/DS]: Yes IEC Harmonic/Flicker [/67]: Yes		
	Link Date : Aug 23 20 20:57:14 Product ID:		

Upgrade

A screen appears for upgrading the instrument firmware and adding options. For the procedure, see the manual provided when upgrading the firmware or adding options.

Displayed Information

Model	The model number
Suffix	The suffix code
No.	The instrument number and MAC address
Version	The firmware version
Boot Ver.	The boot program version
Element Configuration	The input element types
Options	The options
Link Date	The date and time that the firmware was created
Product ID	A unique number assigned to each instrument

Current Sensor Status Display (Sensor Status)

3. Tap Sensor Status. The current sensor statuses are listed.

Current s	ensor status	display				Ut	ility tab
		Input (Basic)	Inpu (Advanced,	ut /Options) Co	omputation/Output	Utili	ty 🗧
Systen Overview							
Systen Configuration	Element 1 30A	Element 2 30A	Element 3 30A	Element 4 5A	Element 5 5A	Element 6 CS	Element 7 CS
Remote Control	Non- CS Element	⊠ Non- CS Element	⊠ Non- CS Element	⊠ Non- CS Element	Non- CS Element	□ Non- Connection	□ Non- Connection
Vetwork							
Selftest							
Message Log							
Sensor Status							
Jpgrade							

You can also tap the sensor status indicator in the upper left of the screen to display the list of current sensor statuses.



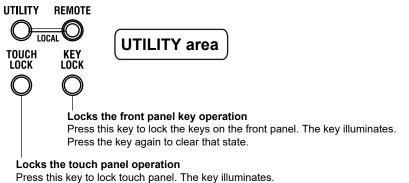
Note.

You can also display the utility settings overview screen by moving the cursor on the Utility tab using the arrow keys and then pressing SET.

Procedure Using Keys

16.10 Locking the Touch Panel and Front Panel Operations

You can lock the operation of the instrument to prevent affecting the measurement operation as a result of accidentally tapping the touch panel or pressing the front panel keys.



Press the key again to clear that state.

Note.

In remote mode (REMOTE LED lit), the front panel nor the touch panel can be used. To release remote mode, press UTILITY. For details on remote mode, see the communication interface user's manual, IM WT5000-17EN.

Appendix 1 Messages and Corrective Actions

Messages

Messages may appear on the screen while you are using this instrument. This section describes the error messages and how to respond to them. You can display the messages in the language that you specify through the operations explained in section 16.4. 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 WT5000-17EN.

Warning Messages (1 to 99)

Message	Chapter or Section
Turned on pressing the ESC key.	3.7 ¹
The system has been initialized.	
Cannot measure PLL frequency.	5.1
Check input level.	
File access slow. Too many files in directory or medium read/write speed slow.	8.6
File access is aborted.	_
System Configuration was changed.	_
The system has been initialized.	
Input element configuration was changed. The system has been initialized.	—
Key lock is enabled.	1.2 ¹
To release the lock, press the KEY LOCK key.	
In remote control mode, all keys are locked except LOCAL (UTILITY) key.	Chapters 1 to 3 ²
Please hit LOCAL (UTILITY) key to exit the remote control mode.	
In Local Lockout mode, all keys are locked.	Chapters 1 to 3 ²
Please cancel the local lockout.	
Firmware was changed.	_
The system has been initialized.	
Integration has started and	2.2, 2.3
measurement ranges are switched to fixed ranges.	
Processing system settings change.	_
Please wait for a moment.	
This model has neither motor evaluation function or auxiliary input.	16.9
Check the specifications to see whether or not the optional motor evaluation function and	
the optional auxiliary input are provided.	
Null setting is OFF. When using the current sensor, please enable the null settings.	11.1
	Turned on pressing the ESC key. The system has been initialized. Cannot measure PLL frequency. Check input level. File access slow. Too many files in directory or medium read/write speed slow. File access is aborted. System Configuration was changed. The system has been initialized. Input element configuration was changed. The system has been initialized. Key lock is enabled. To release the lock, press the KEY LOCK key. In remote control mode, all keys are locked except LOCAL (UTILITY) key. Please hit LOCAL (UTILITY) key to exit the remote control mode. In Local Lockout mode, all keys are locked. Please cancel the local lockout. Firmware was changed. The system has been initialized. Integration has started and measurement ranges are switched to fixed ranges. Processing system settings change. Please wait for a moment. This model has neither motor evaluation function or auxiliary input. Check the specifications to see whether or not the optional motor evaluation function and the optional auxiliary input are provided.

1 Getting Started Guide, IM WT5000-03EN 2 Communication Interface User's Manual, IM WT5000-17EN

Setup Error Messages (500 to 899)

Code	Message	Chapter or Section
600	File access failure.	_
601	Invalid file name. Check the file name.	8.2
602, 603	No USB device or no storage media inserted. Check the USB device connection, and the existence of a storage medium in the drive.	8.1
604	Media failure. Check the storage medium.	8.1
605	File not found.	
00	Check the filename and the storage medium.	
606	Media is protected.	_
~	Set the disk's(medium's) write protect switch to OFF.	0.4
607	Media was removed while accessing.	8.1
000 000	Check the storage medium.	
608, 609	File already exists.	
610 611 612	Contains invalid characters. Media full.	8.2
612, 612		8.6
513	Delete unnecessary file(s) or use another disk. Cannot delete a directory if there are files in the directory.	8.6
613	File is protected.	0.0
15	Physical format error.	
010	Reformat the medium. If the same error occurs, the instrument is probably unable to	
	execute a format on this medium.	
516 to 620,	File system failure.	_
622 to 641	Check using another disk. If the same message still appears, maintenance service is	
	required.	
621	File is damaged.	
	Check the file.	
43 to 653.	Media failure.	_
59, 660	Check the medium.	
656	Cannot save more than 256 item to the root directory. Change save destination or delete	8.2
	files/directories from the root directory.	
662	File operation is interrupted.	_
63	File unknown format.	1.5
	Check the file format.	
665	Cannot load this file format.	_
	File was stored on other models or other versions.	
666	File is now being accessed.	_
	Execute after access is made.	
668	Cannot load this bitmap file. Use file of 16bit Color or 24bit Color Mode with less or equal size 1000x720.	3.7
69	Cannot load this text file.	1.5
	Confirm the contents of file.	
675	Cannot load this file.	
	Model/options do not conform.	
676	Writing prohibited in this file.	_
677	An error occurred while network access.	Chapter 15
	Confirm network conditions.	1
690	Cannot execute for the directory depth is 10 or more.	_
591	Cannot execute because of source and destination are over lapped.	_
592	Cannot execute for the media itself.	_
593	Cannot store at Network Drive.	7.3
594	Trigger Event is Off.	3.5
95	File version is new. Update firmware.	_
596 596	The file may be damaged or an unsuccessful file close could have occurred.	
500 597	Abnormal data file. Unsuccessful finish of file save is detected.	
705	Can not operate while accessing medium.	_
	Wait until access has completed.	
706	Can not operate during hard copy.	_
	Wait until output has completed.	
713	Cannot execute for All or User display mode.	
714	Cannot execute for All display mode.	

Appendix 1 Messages and Corrective Actions

Code	Message	Chapter or Section
720	Over Run had occurred.	
721	Can not set or execute because store is processing. Try Again.	—
722	No target Element for integration execution.	4.1
723	Can not set or execute when Integ Independent Control is on.	4.1
724	Can not set or execute because recording is processing. Try again.	_
725	File creation stopped. File size exceeded 2G bytes.	_
726	Cannot start integration. In order to start, set Time/div for wave bigger than 0.01 ms.	6.2
750, 751	Unable to connect to the server.	Chapter 15
	Check the network settings and configuration.	
752	This ftp function in not supported.	_
753	FTP Error: Client Handle	Chapter 15
	Confirm the network settings and connection.	
758	Failed to acquire time from SNTP server.	15.6
	Confirm the network settings and connection.	
759	Failed to initialize network.	Chapter 15
	Confirm the network settings.	
760	Cannot execute or set when IEEE 1588 is on. To execute or change this setting, turn off	16.3
	IEEE 1588.	
761	Cannot execute or set when SNTPs "Adjust at Power On" is on. To execute or change the	15.6
	setting, turn off "Adjust at Power On".	
762	Cannot execute when IEEE 1588 is not in the "Stable" state. To execute, wait until the state	16.3
	becomes "Stable" or turn off IEEE 1588.	
800	Illegal date-time.	3.6*
	Set the correct date and time.	
801	Illegal file name.	8.2
	The file name contains characters which are not allowed or the file name is not a valid MS-	
	DOS file name. Enter another file name.	
802	Cannot be set or executed in the Normal measurement mode.	_
303	Cannot be set or executed in the IEC Harmonic measurement mode	13.1
812	Cannot be set or executed while storing data.	_
813	Cannot be set while integration is running.	4.2
010	Reset Integration.	
814	Cannot be set or executed when NULL is on.	11.1
011	Please turn NULL off.	
820	Cannot be set or executed in the Flicker measurement mode.	14.1
821	Attempt made to start flicker measurement while flicker initialization is not finished.	_
822	Attempt made to start flicker measurement while flicker measurement is in progress or	_
022	result of flicker judgement is displayed.	
823	Cannot change during CAL.	11.2
020	Wait until CAL is completed.	11.2
824	Attempt made to initialize flicker measurement while flicker measurement is in progress or	
024	result of flicker judgement is displayed.	
825	Cannot change limit settings while flicker measurement is in progress.	
826	Cannot be set or executed when flicker measurement is not reset.	14.2
827	Illegal math expression.	4.1
021	Input a correct computing equation.	4.1
000		
828	Cannot start flicker measurement when all periods of dmax measurement are finished.	_
829	Cannot judge flicker measurement untill all periods of dmax measurement are finished.	—
830	Cannot move period while dmax measurement is not ready.	_
331	Processing now.	_
244	Retry setting or execution again.	4.0
841	Attempted to start integration after integration time has reached its preset value.	4.2
342	Attempted to start integration while integration is in progress.	4.2
343	Measurement stopped due to overflow during integration or due to a power failure.	4.2
344	Attempted to stop integration even though integration was not in progress.	4.2
845	Attempted to reset integration even though integration was in progress or integration mode	4.2
	was not selected.	
846	Attempted to start integration while measurement of peak overflow was in progress.	
847	Attempted to start integration in continuous integration mode when integration preset time	4.1
	was set to "0".	
848	Attempted made to start integration in real time counting integration mode when the end	4.1
	time had already passed.	

Appendix 1 Messages and Corrective Actions

Code	Message	Chapter or Section
849	Attempted made to start storing in real time counting storing mode when the end time had	7.1
	already passed.	
850	Cannot be set or executed at current store state.	7.4
	To set or execute, reset store.	
852	Stored file is illegal.	7.4
	Initialize memory before storing.	
854	Waveform display data not found.	_
855	Data destination memory is full.	_
	Saving has been stopped.	
856	An error has occurred while storing.	_
	Storing has been stopped.	
857	Cannot be set while Master/Slave Synchronized	2.14
	Measurement is set to Slave.	
858	Store process is in progress now.	—
	Execute or set setting again.	
859	Cannot convert selected file.	7.3
	Select a file with an extension of WTS or HDS.	
862	Numeric data not found.	_
863	Cannot be set or executed when different types of elements are installed.	_
364	This wiring cannot be set as the first selected element.	2.1
865	Cannot be set while integration is running.	4.2
	Stop or reset Integration.	
874	Sync source, PLL source or trigger source cannot be set to Ext Clk, while Master/Slave	2.14
	Synchronization Measurement is set to Slave.	
875	Master/Slave Synchronization Measurement cannot be set to Slave, while sync source,	2.14
	PLL source or trigger source is set to Ext Clk.	
876	Can not calculate from present point value.	9.1
877	Can not set 0 to count.	7.1
878	Can not set 0. Set to a value other than 0.	_
880	Cannot be set or executed while initialization.	_
	Wait until status changes to "Ready".	
881	Cannot be set or executed while measurement is in progress.	—
	To set or execute, "Stop" measurement.	
882	Stopped measurement. Detection error of measuring interval signal. Check External Sync	4.3*
	(MEAS START) input.	
885	Cannot be set or executed in Current Measurement Mode.	1.1
	Set or execute in Normal Measurement Mode.	
889	Setting and execution is not. available when auto-ranging is set to ON.	
893	Invalid cutoff frequency setup. Set the cutoff frequencies so that the low pass filter's (LPF)	2.7
	cutoff frequency is higher than the high pass filter (HPF).	
894	Cannot be executed/set in current condition.	2.1
	For all current inputs with in the same wiring, "CT Type" or "Input Resistance" must have	
	the same setup.	

* Getting Started Guide, IM WT5000-03EN

System Error Messages (900 to 999)

Code	Message	Chapter or Section
901	Failed to backup setup data.	_
	The system has been initialized.	
	Maintenance service is required.	
02	System RAM failure.	
	Maintenance service is required.	
03	System ROM failure.	_
	Maintenance service is required.	
04	Internal temperature is too high. Maintenance service is required.	
•	It will shutdown automatically.	
905	Detected Sensed disconnection of input element. Turn Off the instrument and reinsert the	_
.00	input element. If this error continues or frequently occurs, maintenance service is required.	
006	Fan stopped.	
00	Power off immediately.	
	Maintenance service is required.	
07	Backup battery is flat.	
01	Maintenance service is required to replace the back-up battery.	
09	Illegal SUM value.	
09	Maintenance service is required.	—
44		
11	Software exception has occurred. A firmware update may be required.	—
45	Notify maintenance service the Service No. below.	
15	EEPROM SUM error.	_
	EEPROM may be damaged.	
	Maintenance service is required.	
18	Input element1 is not installed.	—
	Turn Off the instrument and insert an input element to element1.	
19	Option board cannot be detected. Maintenance service is required.	_
21	Failed in communication with devices.	—
	Maintenance service is required.	
22	Failed in communication with devices.	_
	Maintenance service is required.	
923	Transmit data abnormality from devices.	_
	Maintenance service is required.	
925	Error while synchronizing to IEEE 1588. Please turn IEEE 1588 off once to reset state.	16.3
26	The USB device's power consumption exceeded the capacity of the USB hub.	_
27	Disconnected USB device port 1, because overcurrent was detected.	
28	Disconnected USB device port 2, because overcurrent was detected.	
20	A USB mass storage device that is greater than 137 GB in capacity has been connected.	
29		_
	Be careful in using this device.	
0.4	If an area exceeding 137 GB is accessed, the storage device may break.	
31	Hardware configuration error occurred. Restart this machine.	—
	If it occurred again, maintenance service is required.	
32	Error occurred while ImageFile process.	_
40	An element with an old version has been installed. The firmware may require an element	—
	version upgrade for correct measurement. Contact maintenance service for element	
	update instructions.	
941	A new element version or type has been installed. In order to make correct measurements	_
	or to measure with the new element types, upgrade the instrument's firmware.	
942	Hardware mismatch error occurred.	
	Maintenance service is required.	
943	An overcurrent of internal shunts has been detected.	_
	The measured data is incorrect.	
44	An overcurrent of the CT sensors or the current probes has been detected.	_
	The power of devices has been shutdown.	
	Power off immediately.	
45	An overcurrent has been detected. The power of sensors has been shutdown.	
.0	Power off immediately.	
46	The connection with CT series has been detected.	
-+0		
	The CT Type settings are different from the detected sensors. Please confirm them.	
17	Detected changes in insertion and removal with the CT sensors. Please confirm them.	_
47 48	An Error of the sensor power supply was detected. The power to the device has been shutdown. Power off immediately.	_

Index

Symbols	Page
ΔMeasure	

Numerics	Page
4-value display	3-5
8-value display	3-5
16-value display	3-5

Α	Page
All Items Display	3-4
auto naming	8-4
auxiliary input (Aux)	1-7
averaging	2-34
Averaging menu	ix

В	Page
background (load, of user display)	3-27

С	Page
Cal Execute	11-3
Cal menu	xiv
Ch Settings (Auxiliary)	
Ch Settings (Double Motor)	
Ch Settings (Single Motor (Speed:Analog))	
Ch Settings (Single Motor (Speed:Pulse))	
column settings (displayed columns)	
command type	16-2
comment	
Computation/Output	
сору	
crest factor	
cross level	1-6
CT ratio	2-14
current range (760901 or 760902)	
current range (760903)	
Current Range Display Format	
cursors (bar graph)	12-6
cursors (trend)	
cursors (waveform)	
custom display	
CUSTOM key	
custom screen	3-29

D	Page
D/A output	1-14, 16-3
Data Save	1-13
Data Save (data format)	
Data Save (items)	
Data Save menu	xi
Data Save (save destination)	
delete	
delta computation	
Delta computation	
display	1-12
display configuration (load)	
display configuration (user display)	

displayed items, resetting	3-7
display format (file list)	
display format (screen)	
display (graph)	6-1
Display (graph)	3-28
Display icon	iv
Display menu	iv
display (numeric)	3-1, 3-25
Display (numeric)	3-25

Ε Page Element Set...... 5-2

<u>F</u>	Page
File List	. 1-22, 8-4, 8-12
file list, sorting	8-12
file name	8-4
Filter icon	X
Filter menu	X
flicker	
Flicker Icon	xiii
Flicker Menu	xiii
Form (bar graph)	6-13
Form (trend)	6-9
Form (vector)	6-16
Form (waveform)	6-6
Freq2 Measurement	
Freq2 Measurement (Advanced Settings)	
Freq Filter	
Freq Filter/Rectifier/Level	1-6
frequency filter for sync source (voltage/current)	1-6
FTP server	1-17, 15-5

<u>G</u>	Page
GP-IB	16-2
Graph (graph display)	
GRAPH key	

<u>H</u>	Page
harmonics	
hold	
Hold menu	xiv
hot-plugging	8-2
Hrm List Dual	
Hrm List Single	

	Page
IEC flicker	14-1
IEC harmonic measurement	13-1
IEC voltage fluctuation	14-1
IEEE 1588	16-4
independent control	4-4
Initialize Settings	1-23
Input (Advanced/Options)	1-4

Index

Input (Pagio)	2
Input (Basic)	
integration1-14, 4-1	
Integration iconxi	
Integration menuxi	ii
integration status display 4-8	8
integration timer	2
Item (integrated value) 4-7	7
Items (apparent power, reactive power, corrected power) 3-13	3
Items (bar graph)6-12	2
Items (computed value (numeric/event))	1
Items (display format)	4
Items (harmonic measurement)5-4	4
Items (maximum value (user defined)) 3-24	4
Items (motor evaluation)	3
Items (phase difference, frequency (voltage/current))	ô
Items (trend)	8
Items (user display)	
Items (vector)	
Items (voltage, current, active power, power factor)	0
Items (waveform)	5

Κ

keyboard test	16-10

Page
1-6
1-5
1-23

Μ

	i uge
master and slave	
matrix display	
Max Hold	
measure	1-12
measure (apparent power, reactive power, corre	ected power)
	3-12
measurement mode	1-1
measurement range configuration	1-5
measuring range	1-4
memory test	
menu icon	iii
message log	1-19
Message Log	
Misc icon	
Misc menu	xiv
Motor/Aux	
motor efficiency computation	
motor evaluation	
move	

Ν

Net Drive	
network	1-17
network drive	1-18
new folder	8-15
null	1-7, 11-1
null feature	1-7
Null menu	xiv
NUMERIC key	

NUMERIC key (user display)	
Numeric (numeric display)	

0	Page
OPTIONS key	9-11
Options tab	9-11

F	Tage
Pause	7-10
phase	3-15
power coefficient	
preference	
protect	8-19

Page

Page

D

Q

R

Page

Page

Page

Page

Range Config	1-5
range configuration	1-5
Range icon	viii
Range menu	viii
Range Σ Link	
real-time control	4-3
Rec	7-10
Rectifier	1-6
register (custom display)	3-29
remote control	1-16, 16-1
rename	8-19
reset (integration)	4-8

S Page Save Setup......1-22 save (user display) 3-26 screen brightness 16-7 second frequency filter 1-6 Selected Stored Items 7-7 Select Saved Numeric Items 8-7 Sensor Correction menu.....xiv Sensor Status 1-20, 16-13 Single menu......xiv start (integration) 4-8 storage mode (Event).....7-4 storage mode (manual)7-2 storage mode (real time)7-3 Store/Data Save icon.....xi Store menu.....xi Store (save destination)......7-8 storge mode (Integ Sync)7-4 Sync Source/Freq Measurement(Advanced Settings) 2-24 system configuration..... 1-15 system overview 1-20, 16-12

<u>T</u>	Page
TCP/IP	
time synchronization (IEEE 1588)	
trend values	
trigger	

U	Page
update rate	
Update Rate/Averaging	
Update Rate/Averaging icon	ix
Update Rate menu	
Upgrade	1-20
USB	16-2
USB-0	8-2
USB-1	8-2
USB driver	
USB keyboard	16-6
USB memory	
USB ports (type A)	8-2
User Defined Events	3-19
User Defined Functions	3-18
user display	3-25
utility	1-15

V	Page
valid measurement range (current)	
valid measurement range (voltage)	2-16
value	6-9
voltage fluctuation	14-1
voltage range	
VT ratio	
VXI-11	

W	Page
Web server	1-17, 15-6
Wiring	
wiring system	
WP± Type	