
**User's
Manual**

**Application Software
WTViewerE**

This user's manual explains the handling precautions, features, and operating procedures of WTVIEWER. To ensure correct use, please read this manual thoroughly before beginning operation.

After reading this manual, keep it in a safe place.

For the handling precautions, features, and operating procedures of the WT, see the user's manual that came with the instrument.

For information on how to use Windows, see the relevant manuals.

Notes

- The contents of this manual are subject to change without prior notice as a result of continuing improvements to the instrument's performance and functionality. The figures given in this manual may differ from those that actually appear on your screen.
- Every effort has been made in the preparation of this manual to ensure the accuracy of its contents. However, should you have any questions or find any errors, please contact your nearest YOKOGAWA dealer.
- 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, MS-DOS, Windows 8.1, Windows 10, and Excel are registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries.
- Adobe and Acrobat are registered trademarks or trademarks of Adobe Systems Incorporated.
- In this manual, the © and TM symbols do not accompany their respective registered trademark or trademark names.
- Other company and product names are registered trademarks or trademarks of their respective holders.

Revisions

- May 2017 1st Edition
- February 2018 2nd Edition
- March 2019 3rd Edition
- May 2020 4th Edition
- May 2021 5th Edition

Notes about Using This Software

Notes on Using the Software

- To allow a WT to communicate with a PC through the WT's USB interface, a USB driver must be installed in the PC. When you install the software in the PC, the USB driver can also be installed.
- You can connect one WT or multiple WTs to a PC and use the software to control the them.
- When you connect a WT to the PC and use the software to control the WT, you cannot use multiple types of communication interface at the same time.
- Do not perform the following operations while using the software. Doing so may cause errors.
 - Use another software application to operate the WT
 - Operate the WT directly
- The software may not be able to continue if the PC enters standby or hibernation mode. Disable standby and hibernation modes when you use the software.
- If a connection error occurs, turn off the WT and then turn it back on.

How to Use This Manual

Structure

This manual contains 11 chapters and an index.

Chapter	Title	Description
1	Product Overview	Describes the features of the product and the system requirements for using the product.
2	Configuring WT's Communication Control Settings	Describes how to connect the WT to a PC.
3	Installation and Starting and Exiting the Software	Describes how to install and start the software.
4	WT-PC Communication	Describes how to configure the settings for WT-PC communication.
5	WT Configuration	Describes how to configure the WT measurement conditions and other settings.
6	Displaying Measured Data	Describes how to display measured data.
7	Displaying Analysis Data	Describes how to display analysis data.
8	Saving and Loading Setup Parameters	Describes how to save and load setup parameters.
9	Other Features	Describes the help feature and how to view the software version information.
10	Troubleshooting	Describes error messages.
11	Specifications	Provides the software specifications.
	Index	

Description

The display example, setting items, and setting range of this user's manual vary depending on the following factors.

- The WT model
- The number of elements installed in the WT and the presence or absence of options

Units

k: Denotes 1000. Example: 100 kHz (frequency)

K: Denotes 1024. Example: 720 KB (file size)

Software Version That This Manual Covers

This manual describes WTVIEWER software version 1.61.
For instructions on how to view the software version, see section 9.2.

Terms and Conditions of the Software License

Yokogawa Test & Measurement Corporation, a Japanese corporation (hereinafter called "Yokogawa"), grants permission to use this Yokogawa Software Program (hereinafter called the "Licensed Software") to the Licensee on the conditions that the Licensee agrees to the terms and conditions stipulated in Article 1 hereof.

You, as the Licensee (hereinafter called "Licensee"), shall agree to the following terms and conditions for the software license (hereinafter called the "Agreement") based on the use intended for the Licensed Software.

Please note that Yokogawa grants the Licensee permission to use the Licensed Software under the terms and conditions herein and in no event shall Yokogawa intend to sell or transfer the Licensed Software to the Licensee.

Licensed Software Name: Application Software WTViewerE
Number of Client License: 1

Article 1 (Scope Covered by these Terms and Conditions)

- 1.1 The terms and conditions stipulated herein shall be applied to any Licensee who purchases the Licensed Software on the condition that the Licensee consents to agree to the terms and conditions stipulated herein.
- 1.2 The "Licensed Software" herein shall mean and include all applicable programs and documentation, without limitation, all proprietary technology, algorithms, and know-how such as a factor, invariant or process contained therein.

Article 2 (Grant of License)

- 2.1 Yokogawa grants the Licensee, for the purpose of single use, non-exclusive and non-transferable license of the Licensed Software with the license fee separately agreed upon by both parties. Yokogawa allows the Licensee to use only one instance of the software for use on one device, whether that device is physical or virtual. If the Licensee want to use the software on more than one virtual device, the Licensee must obtain a separate Licensed Software for each instance.
- 2.2 The Licensee is, unless otherwise agreed in writing by Yokogawa, not entitled to copy, change, sell, distribute, transfer, or sublicense the Licensed Software.
- 2.3 The Licensed Software shall not be copied in whole or in part except for keeping one (1) copy for back-up purposes. The Licensee shall secure or supervise the copy of the Licensed Software by the Licensee itself with great, strict, and due care.
- 2.4 In no event shall the Licensee dump, reverse assemble, reverse compile, or reverse engineer the Licensed Software so that the Licensee may translate the Licensed Software into other programs or change it into a man-readable form from the source code of the Licensed Software. Unless otherwise separately agreed by Yokogawa, Yokogawa shall not provide the Licensee the source code for the Licensed Software.
- 2.5 The Licensed Software and its related documentation shall be the proprietary property or trade secret of Yokogawa or a third party which grants Yokogawa the rights. In no event shall the Licensee be transferred, leased, sublicensed, or assigned any rights relating to the Licensed Software.
- 2.6 Yokogawa may use or add copy protection in or onto the Licensed Software. In no event shall the Licensee remove or attempt to remove such copy protection.
- 2.7 The Licensed Software may include a software program licensed for re-use by a third party (hereinafter called "Third Party Software", which may include any software program from affiliates of Yokogawa made or coded by themselves.) In the case that Yokogawa is granted permission to sublicense to third parties by any licensors (sub-licensor) of the Third Party Software pursuant to different terms and conditions than those stipulated in this Agreement, the Licensee shall observe such terms and conditions of which Yokogawa notifies the Licensee in writing separately.
- 2.8 Yokogawa software products may contain open source software (hereafter referred to as OSS). For the OSS, terms and conditions provided separately apply with higher precedence than those of this agreement.

Article 3 (Restriction of Specific Use)

- 3.1 The Licensed Software shall not be intended specifically to be designed, developed, constructed, manufactured, distributed or maintained for the purpose of the following events:
 - a) Operation of any aviation, vessel, or support of those operations from the ground,;
 - b) Operation of nuclear products and/or facilities,;
 - c) Operation of nuclear weapons and/or chemical weapons and/or biological weapons; or
 - d) Operation of medical instrumentation directly utilized for humankind or the human body.
- 3.2 Even if the Licensee uses the Licensed Software for the purposes in the preceding Paragraph 3.1, Yokogawa has no liability to or responsibility for any demand or damage arising out of the use or operations of the Licensed Software, and the Licensee agrees, on its own responsibility, to solve and settle the claims and damages and to defend, indemnify or hold Yokogawa totally harmless, from or against any liabilities, losses, damages and expenses (including fees for recalling the Products and reasonable attorney's fees and court costs), or claims arising out of and related to the above-said claims and damages.

Article 4 (Warranty)

- 4.1 The Licensee shall agree that the Licensed Software shall be provided to the Licensee on an "as is" basis when delivered. If defect(s), such as damage to the medium of the Licensed Software, attributable to Yokogawa is found, Yokogawa agrees to replace, free of charge, any Licensed Software on condition that the defective Licensed Software shall be returned to Yokogawa's specified authorized service facility within seven (7) days after opening the Package at the Licensee's expense. As the Licensed Software is provided to the Licensee on an "as is" basis when delivered, in no event shall Yokogawa warrant that any information on or in the Licensed Software, including without limitation, data on computer programs and program listings, be completely accurate, correct, reliable, or the most updated.
- 4.2 Notwithstanding the preceding Paragraph 4.1, when third party software is included in the Licensed Software, the warranty period and terms and conditions that apply shall be those established by the provider of the third party software.
- 4.3 When Yokogawa decides in its own judgement that it is necessary, Yokogawa may from time to time provide the Licensee with Revision upgrades and Version upgrades separately specified by Yokogawa (hereinafter called "Updates").
- 4.4 Notwithstanding the preceding Paragraph 4.3, in no event shall Yokogawa provide Updates where the Licensee or any third party conducted renovation or improvement of the Licensed Software.
- 4.5 THE FOREGOING WARRANTIES ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES OF QUALITY AND PERFORMANCE, WRITTEN, ORAL, OR IMPLIED, AND ALL OTHER WARRANTIES INCLUDING ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED BY YOKOGAWA AND ALL THIRD PARTIES LICENSING THIRD PARTY SOFTWARE TO YOKOGAWA.
- 4.6 Correction of nonconformity in the manner and for the period of time provided above shall be the Licensee's sole and exclusive remedy for any failure of Yokogawa to comply with its obligations and shall constitute fulfillment of all liabilities of Yokogawa and any third party licensing the Third Party Software to Yokogawa (including any liability for direct, indirect, special, incidental or consequential damages) whether in warranty, contract, tort (including negligence but excluding willful conduct or gross negligence by Yokogawa) or otherwise with respect to or arising out of the use of the Licensed Software.

Article 5 (Infringement)

- 5.1 If and when any third party should demand injunction, initiate a law suit, or demand compensation for damages against the Licensee under patent right (including utility model right, design patent, and trade mark), copy right, and any other rights relating to any of the Licensed Software, the Licensee shall notify Yokogawa in writing to that effect without delay.
- 5.2 In the case of the preceding Paragraph 5.1, the Licensee shall assign to Yokogawa all of the rights to defend the Licensee and to negotiate with the claiming party. Furthermore, the Licensee shall provide Yokogawa with necessary information or any other assistance for Yokogawa's defense and negotiation. If and when such a claim should be attributable to Yokogawa, subject to the written notice to Yokogawa stated in the preceding Paragraph 5.1, Yokogawa shall defend the Licensee and negotiate with the claiming party at Yokogawa's cost and expense and be responsible for the final settlement or judgment granted to the claiming party in the preceding Paragraph 5.1.
- 5.3 When any assertion or allegation of the infringement of the third party's rights defined in Paragraph 5.1 is made, or when at Yokogawa's judgment there is possibility of such assertion or allegation, Yokogawa will, at its own discretion, take any of the following countermeasures at Yokogawa's cost and expense.
 - a) To acquire the necessary right from a third party which has lawful ownership of the right so that the Licensee will be able to continue to use the Licensed Software;
 - b) To replace the Licensed Software with an alternative one which avoids the infringement; or
 - c) To remodel the Licensed Software so that the Licensed Software can avoid the infringement of such third party's right.
- 5.4 If and when Yokogawa fails to take either of the countermeasures as set forth in the preceding subparagraphs of Paragraph 5.3, Yokogawa shall indemnify the Licensee only by paying back the price amount of the Licensed Software which Yokogawa has received from the Licensee. THE FOREGOING PARAGRAPHS STATE THE ENTIRE LIABILITY OF YOKOGAWA AND ANY THIRD PARTY LICENSING THIRD PARTY SOFTWARE TO YOKOGAWA WITH RESPECT TO INFRINGEMENT OF THE INTELLECTUAL PROPERTY RIGHTS INCLUDING BUT NOT LIMITED TO, PATENT AND COPYRIGHT.
- 5.5 Regardless of this article, the terms and conditions provided separately apply to demands for compensation or the like arising from the use of the Third-Party Software or OSS.

Terms and Conditions of the Software License

Article 6 (Liabilities)

6.1 If and when the Licensee should incur any damage relating to or arising out of the Licensed Software or service that Yokogawa has provided to the Licensee under the conditions herein due to a reason attributable to Yokogawa, Yokogawa shall take actions in accordance with this Agreement. However, in no event shall Yokogawa be liable or responsible for any special, incidental, consequential and/or indirect damage, whether in contract, warranty, tort, negligence, strict liability, or otherwise, including, without limitation, loss of operational profit or revenue, loss of use of the Licensed Software, or any associated products or equipment, cost of capital, loss or cost of interruption of the Licensee's business, substitute equipment, facilities or services, downtime costs, delays, and loss of business information, or claims of customers of Licensee or other third parties for such or other damages. Even if Yokogawa is liable or responsible for the damages attributable to Yokogawa and to the extent of this Article 6, Yokogawa's liability for the Licensee's damage shall not exceed the price amount of the Licensed Software or service fee which Yokogawa has received. Please note that Yokogawa shall be released or discharged from part or all of the liability under this Agreement if the Licensee modifies, remodels, combines with other software or products, or causes any deviation from the basic specifications or functional specifications, without Yokogawa's prior written consent.

6.2 All causes of action against Yokogawa arising out of or relating to this Agreement or the performance or breach hereof shall expire unless Yokogawa is notified of the claim within one (1) year of its occurrence.

6.3 In no event, regardless of cause, shall Yokogawa assume responsibility for or be liable for penalties or penalty clauses in any contracts between the Licensee and its customers.

Article 7 (Limit of Export)

Unless otherwise agreed by Yokogawa, the Licensee shall not directly or indirectly export or transfer the Licensed Software to any countries other than those where Yokogawa permits export in advance.

Article 8 (Term)

This Agreement shall become effective on the date when the Licensee receives the Licensed Software and continues in effect unless or until terminated as provided herein, or the Licensee ceases using the Licensed Software by itself or with Yokogawa's thirty (30) days prior written notice to the Licensee.

Article 9 (Injunction for Use)

During the term of this Agreement, Yokogawa may, at its own discretion, demand injunction against the Licensee in case that Yokogawa deems that the Licensed Software is used improperly or under severer environments other than those where Yokogawa has first approved, or any other condition which Yokogawa may not permit.

Article 10 (Termination)

Yokogawa, at its sole discretion, may terminate this Agreement without any notice or reminder to the Licensee if the Licensee violates or fails to perform this Agreement. However, Articles 5, 6, and 11 shall survive even after the termination.

Article 11 (Jurisdiction)

Any dispute, controversies, or differences between the parties hereto as to interpretation or execution of this Agreement shall be resolved amicably through negotiation between the parties upon the basis of mutual trust. Should the parties fail to agree within ninety (90) days after notice from one of the parties to the other, both parties hereby irrevocably submit to the exclusive jurisdiction of the Tokyo District Court (main office) in Japan for settlement of the dispute.

Article 12 (Governing Law)

This Agreement shall be governed by and construed in accordance with the laws of Japan. The Licensee expressly agrees to waive absolutely and irrevocably and to the fullest extent permissible under applicable law any rights against the laws of Japan which it may have pursuant to the Licensee's local law.

Article 13 (Severability)

In the event that any provision hereof is declared or found to be illegal by any court or tribunal of competent jurisdiction, such provision shall be null and void with respect to the jurisdiction of that court or tribunal and all the remaining provisions hereof shall remain in full force and effect.

Article 14 (Change in Agreement)

The contents of this contract, contents of this product, specifications of the licensed software, related support and other related services can be changed at Yokogawa's discretion.

Contents

Notes about Using This Software	ii
How to Use This Manual.....	iii
Software Version That This Manual Covers.....	iv
Terms and Conditions of the Software License.....	v
Chapter 1 Product Overview	
1.1 Product Overview	1-1
1.2 Workflow.....	1-8
1.3 System Requirements	1-9
Chapter 2 Configuring WT's Communication Control Settings	
2.1 Connecting the WT to a PC.....	2-1
2.2 Setting USB Control Parameters.....	2-2
2.3 Setting GP-IB Control Parameters	2-3
2.4 Setting RS-232 Control Parameters.....	2-4
2.5 Setting Ethernet Control Parameters	2-5
Chapter 3 Installation and Starting and Exiting the Software	
3.1 Installation and Uninstallation.....	3-1
3.2 Starting and Exiting the Software	3-9
Chapter 4 WT-PC Communication	
4.1 Configuring a New Set of WT-PC Communication Parameters (New connection)	4-1
4.2 Making the Communication Settings and Device Settings the Same as Those of the Loaded File.....	4-6
4.3 Using the Same Communication Settings as the Last Time	4-7
4.4 Switching to Offline.....	4-8
Chapter 5 WT Configuration	
5.1 WT Configuration.....	5-1
Chapter 6 Displaying Measured Data	
6.1 Measurement Screen	6-1
6.2 Numeric Display	6-15
6.3 Numeric List Display.....	6-22
6.4 Numeric Matrix Display	6-24
6.5 Waveform Display	6-26
6.6 Trend Display	6-29
6.7 Bar Graph Display	6-33
6.8 Vector Display	6-35

1

2

3

4

5

6

7

8

9

10

11

Index

Chapter 7 Displaying Analysis Data

7.1	Analysis Screen.....	7-1
7.2	Numeric Display	7-11
7.3	Numeric List Display.....	7-12
7.4	Numeric Matrix Display	7-13
7.5	Waveform Display	7-14
7.6	Trend Display	7-16
7.7	Bar Graph Display	7-18
7.8	Vector Display	7-20

Chapter 8 Saving and Loading Setup Parameters

8.1	Saving and Loading Setup Parameters.....	8-1
-----	--	-----

Chapter 9 Other Features

9.1	Help Feature.....	9-1
9.2	Viewing the Version Information	9-3
9.3	Setting the Displayed Language	9-4
9.4	Editing the Displayed Language.....	9-5
9.5	Displaying Equipment Properties	9-6

Chapter 10 Troubleshooting

10.1	If a Problem Occurs.....	10-1
10.2	Error Messages	10-2

Chapter 11 Specifications

11.1	Specifications	11-1
------	----------------------	------

Index

1.1 Product Overview

You can use the software to connect the WT series (hereafter referred to as the WT) to a PC and use the following features.

- Retrieve, display, and save data that the WT has measured and setup parameters.
- Remotely control the WT.

You can connect one WT or multiple WTs to a PC and use the software to control the them.

Compatible Measuring Instruments

You can use the software with the following YOKOGAWA measuring instruments.

- Precision Power Analyzer WT5000
(Must be firmware version 2.01 or later)
- Precision Power Analyzer WT3001E/WT3002E/WT3003E/WT3004E
- Precision Power Analyzer WT3000 (760301/760302/760303/760304)
(Must be firmware version 6.11 or later and in advanced mode)
- Precision Power Analyzer WT1801E/WT1802E/WT1803E/WT1804E/WT1805E/WT1806E
- Precision Power Analyzer WT1800 (WT1801/WT1802/WT1803/WT1804/WT1805/WT1806)
(Must be firmware version 2.31 or later)
- Power Analyzer WT500 (760201/760202/760203)
(Must be firmware version 1.21 or later)
- Digital Power Meter WT310E/WT310EH/WT332E/WT333E
- Digital Power Meter WT310/WT310HC/WT332/WT333

For the handling precautions, features, and operating procedures of the WT, see the relevant user's manuals.

Menus

The software has the following menus.



Connection: Used to configure the communication between the WT and PC.



Setting: Used to set WT's measurement conditions.



Measure: Used to display measured results in bar graphs, trend graphs, etc.



Analyze: Used to display analysis results in bar graphs, trend graphs, etc.



Load/Save: Used to save and load setup parameters and measurement data.



Exit: Used to close the software.

1.1 Product Overview

You can use the following menus of the software to process data.
The details of each feature are provided below.

Connection



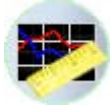
You can connect a WT to the PC in which the software is installed through a communication interface. You can select any of the four available interfaces and search for devices to view the WTs that you can connect to.

Setting



You can configure the WT settings, such as the voltage range, current range, and wiring system.

Measure



Use this menu to display data that the WT has measured in the following manner.

Types of Display Screens

The following types of display screens are available.

Numeric

Displays WT's measurement data or harmonic measurement data* numerically.

Numeric List*¹

Lists harmonic measurement data for each harmonic order.

Numeric Matrix

Displays WT's measurement data for each element.

Waveform*²

Displays waveform display data that has been collected from the WT.

Trend

Displays changes in measured data over time on a trend graph.

Bar Graph*¹

Displays measured harmonic components for each harmonic order.

Vector*¹

Displays vectors of the phase differences and amplitudes (rms values) of the fundamental signals, U(1) and I(1), in each element in the wiring unit.

*1 Can be displayed when the WT is equipped with the following option

- Harmonic measurement (/G5)
- Simultaneous dual harmonic measurement (/G6)
- Advanced computation (/G6)

On the WT5000, this can be displayed on the standard model.

- *2 Can be displayed when the harmonic measurement (/G5) is equipped with the following models
- WT310E/WT310EH/WT332E/WT333E
 - WT310/WT310HC/WT332/WT333
- *3 The vector window cannot be displayed on the following models.
- WT310E/WT310EH/WT332E/WT333E
 - WT310/WT310HC/WT332/WT333

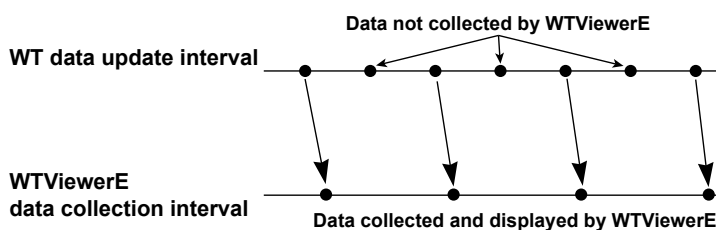
WT Data Update Interval and the Software's Data Collection Interval

The operation window of the software has a start button for starting measured data collection, a stop button, and an update button for updating measured data.

When you click the start button, the software starts collecting measured data. When it finishes collecting the data, it waits for data to be updated on the WT. When the WT finishes updating the data, the software starts collecting data from the WT again. The software repeats this operation until you click the stop button.

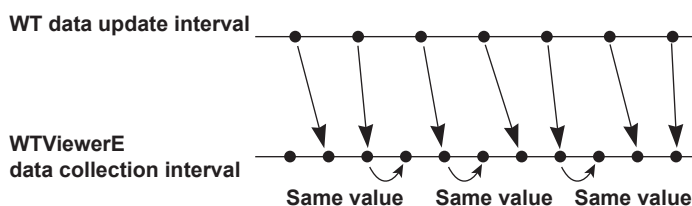
WT Data Update Interval < Software's Data Collection Interval

When the WT data update interval is shorter than the time it takes for the software to collect one set of measured data, there will be pieces of data that the software will not collect.



WT Data Update Interval > Software's Data Collection Interval

When the WT data update interval is longer than the time it takes for the software to collect one set of measured data, the software collects data after the data on the WT is updated, so the data displayed on the software will appear to be in sync with the WT data update interval.



If you click the stop button while data is being collected, the software will collect the entire data before it stops. Therefore, there will be a time lag until the display on the software stops after you click the stop button.

If you click the update button, the software will update the measured data once. The measured data is collected when the displayed data on the PC is updated. It is not when the data on the WT is updated. The display update interval on the PC depends on the CPU, memory, and the number of data values you want to display.

Continuity of This Software's Waveform Data depending on the Combination of the WT Data Update Interval and Waveform Observation Period

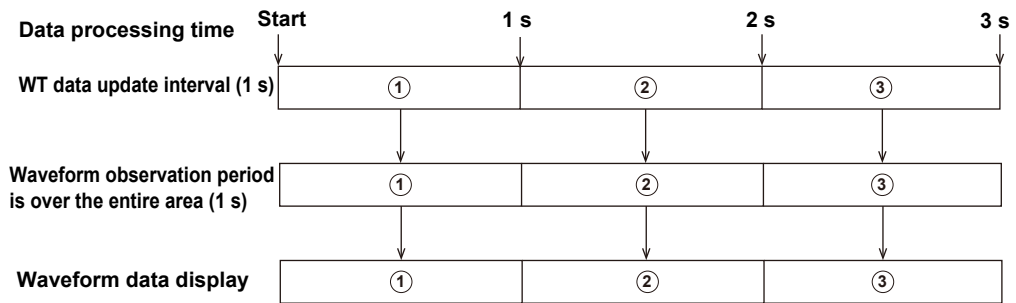
Continuous waveform data can be acquired depending on the combination of the WT data update interval and waveform observation period. For details on the combination, see below.

Assumption Waveform trigger: OFF

Integration status: Reset, Start, Stop, Ready state (Start, Stop, Ready state on the WT500)

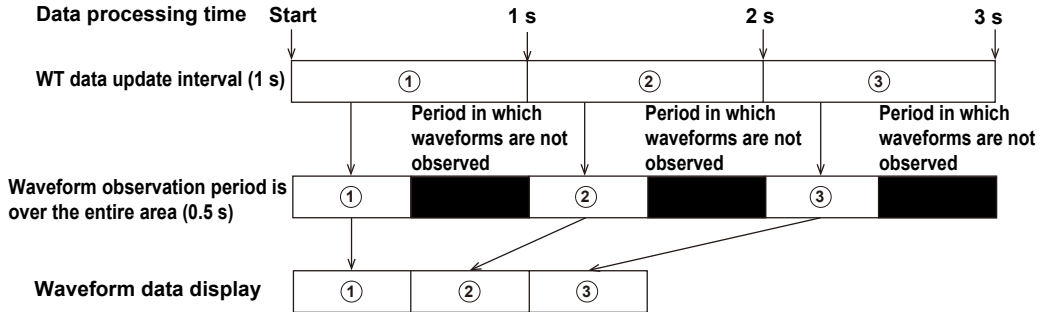
WT Update Interval	Waveform Observation Period	
	Entire Area (Same as the WT Update Interval)	Other than Entire Area (Shorter Than the WT Update Interval)
1 s or more	Waveform data is continuous.	Waveform data is not continuous.
Less than 1 s	Waveform data is not continuous.	Waveform data is not continuous.

- When the WT update interval is 1 second and the waveform observation period is over the entire area (1 s)
Continuous waveform data cannot be acquired from the WT300/WT300E due to the product's specifications.



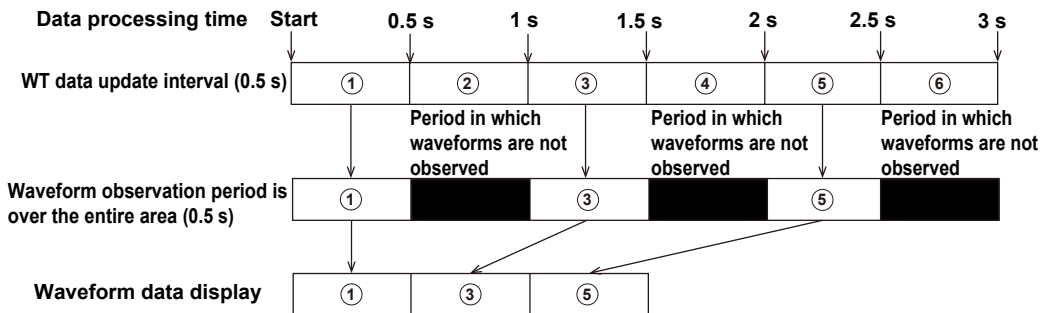
The same waveform data as the WT can be displayed (continuity is retained).

- When the WT update interval is 1 second and the waveform observation period is over the half the area (0.5 s)



The same waveform as the WT is displayed, but because there are periods in which waveforms are not observed, the data will be discontinuous.

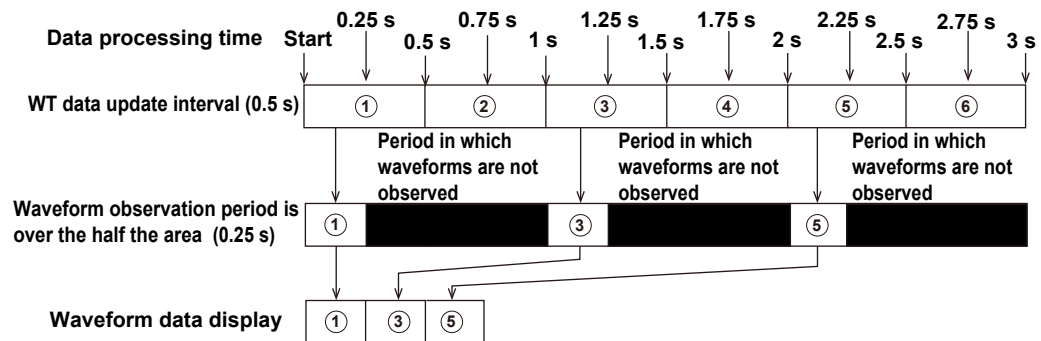
- When the WT update interval is 0.5 second and the waveform observation period is over the entire area (0.5 s)



Because the waveform data update is 1 second, the following data points will be lost. As such, a waveform different from the WT is displayed (discontinuous).

Data : ② ④ ⑥

- When the WT update interval is 0.5 second and the waveform observation period is over the half the area (0.25 s)

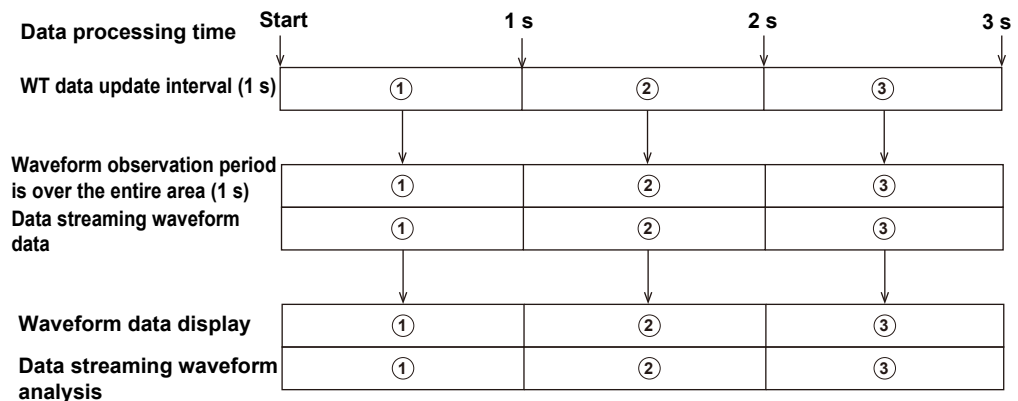


Because the waveform data update is 1 second, the following data points will be lost. As such, a waveform different from the WT is displayed (discontinuous).

Data : ② ④ ⑥

- When Data Streaming Waveform Acquisition Is in Progress

When the WT5000 is equipped with a /DS option, data streaming waveform data can be acquired.



The same waveform data as the WT can be displayed (continuity is retained).

Note

- When waveform data is arranged in a time series, if the waveform observation period is set over the entire area (the same update interval), the data can be analyzed as continuous waveform data on this software.
- Because waveform data is not updated at an interval less than 1 second, if the update interval is less than 1 second, the waveform data will be discontinuous (the measured data is continuous in each update interval).
- When connected to the WT500, waveform is displayed when integration has been started or stopped. It is not displayed when integration has been reset.
- Continuous data cannot be acquired from the WT300/WT300E due to the product's specifications.

Saving Measured Data

You can save numeric data and waveform display data to a CSV file.

To save WT setup parameters and the software setup parameters, use the Save menu, which is described later.

Analyze



If you load measured data acquired on the Measure screen or measured data that you saved, the analysis of WT's measurement data is displayed in the following manner.

Analysis Graph

The entire measured data is displayed. From the analysis source measurement data, the measured data at the cursor or zoom range is displayed.

Types of Display Screens

The following types of display screens are available.

Numeric

Displays WT's measurement data and harmonic measurement data* numerically.

Numeric list*¹

Lists harmonic measurement data for each harmonic order.

Numeric Matrix

Displays WT's measurement data for each element.

Waveform*²

Displays waveform display data that has been collected from the WT.

Trend

Displays changes in measured data over time on a trend graph.

Bar Graph*¹

Displays measured harmonic components for each harmonic order.

Vector*^{1*3}

Displays using vectors the relationship of the phase difference and magnitude (rms value) between the fundamental waves U(1) and I(1) of each element assigned to the selected wiring unit.

*1 Can be displayed when the WT is equipped with the following options.

- Harmonic measurement (/G5)
- Simultaneous dual harmonic measurement (/G6)
- Advanced computation (/G6)

On the WT5000, this can be displayed on the standard model.

*2 Can be displayed when the harmonic measurement (/G5) is equipped with the following models

- WT310E/WT310EH/WT332E/WT333E
- WT310/WT310HC/WT332/WT333

*3 The vector window cannot be displayed on the following models.

- WT310E/WT310EH/WT332E/WT333E
- WT310/WT310HC/WT332/WT333

Load/Save



You can save and load WT setup parameters, the software setup parameters, and measurement data.

Exit

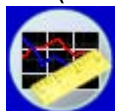


Use this menu to close the software.

Icon Activation/Deactivation

Some icons are not available depending on the connection status with the WT or the availability of waveform data. These icons are grayed out.

Selectable (activated)



Not selectable (deactivated)



For example, the Measure icon cannot be selected when the Connection menu has been set such that the software is in offline mode. Icons such as Connection and Setting cannot be selected during measurement.

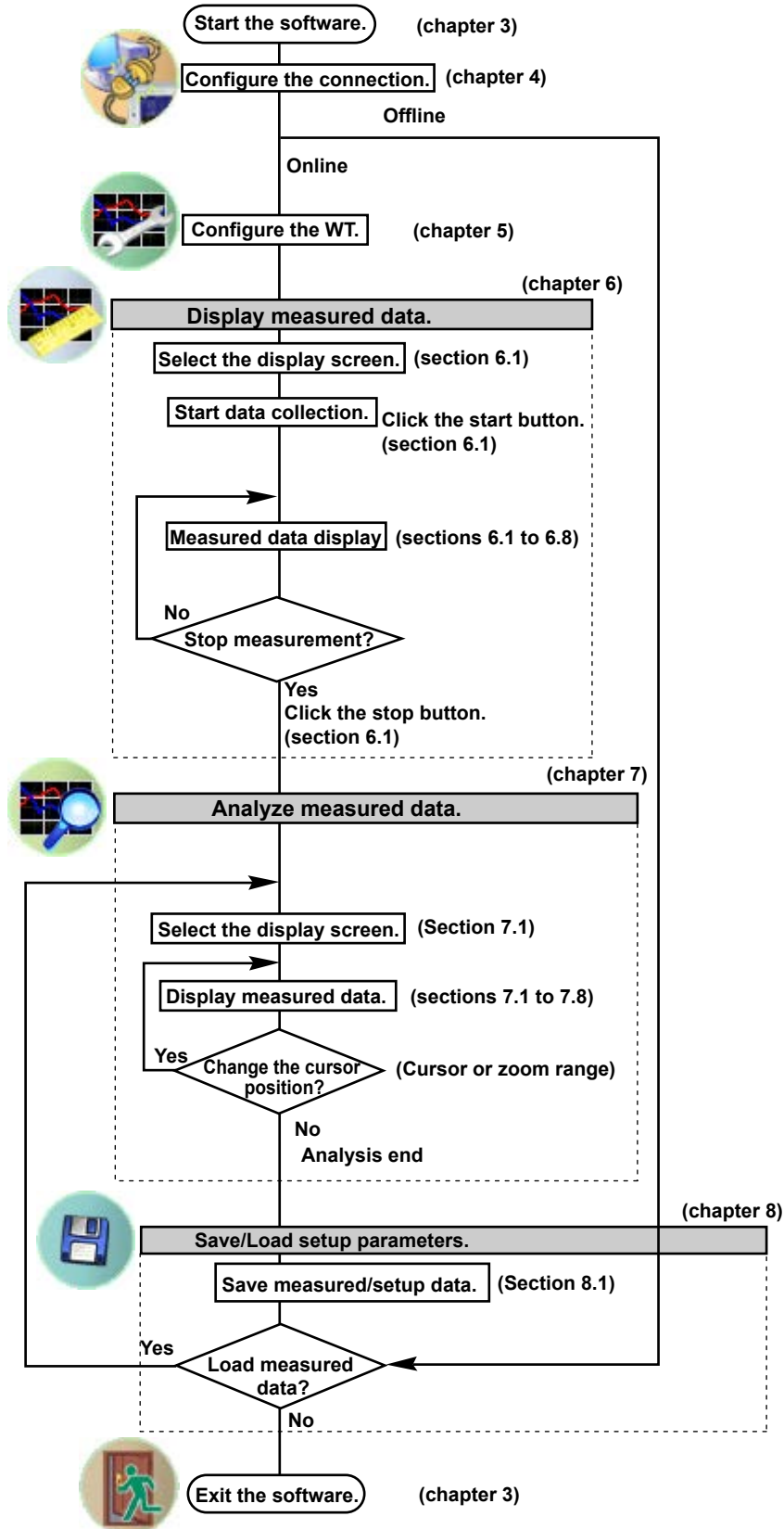
The following is a list of each icon and when it cannot be selected.

	Offline mode		Online mode		
	Data not available	Data available	Data not available	Measuring	Data available
Connection	activated	activated	activated	deactivated	activated
Setting	deactivated	deactivated	activated	deactivated	activated
Measurement	deactivated	deactivated	activated	activated	activated
Analysis	deactivated	activated	deactivated	deactivated	activated
Stop	activated	activated	activated	deactivated	activated
Save/Load	activated	activated	activated	deactivated	activated
Help	activated ¹	activated	activated	activated	activated

¹ "Equipment Property" on the shortcut menu is unavailable.

1.2 Workflow

The following figure shows the software workflow.



1.3 System Requirements

PC

- CPU: Equivalent to Intel Core i5-2430M or better
- Memory: 4 GB or more recommended
- Storage: 1 TB free space or more

- **Storage Capacity**

This software saves all displayed measured data. Depending on the combination of settings that affect the data size, the data may exceed 1 TB.

Measurement Conditions That Affect the Data Size

- Measurement data acquisition time (time from measurement start to measurement stop)
- Number of connected devices
- Update interval
- Number of waveform display functions
- Number of numeric list display functions
- Number of bar display functions

Reference: Measurement data size

Measurement time	Normal Measurement Data	Data Streaming Waveform Data
10 minutes	Approx. 15 MB	Approx. 5 GB
1 hour	Approx. 88 MB	Approx. 288 GB
1 day	Approx. 2.1 GB	Approx. 7 TB
1 month	Approx. 63 GB	---

Measurement conditions:	Normal Measurement Data	Data Streaming Waveform Data
• Model	WT1806/G6/DT/MTR	WT5000/DS
• Number of connected devices	1	1
• Update interval	1 s	1 s
• Number of waveform display functions	2	2
• Number of numeric list display functions	3	3
• Number of bar display functions	1	1
• Data streaming waveform	None	Present
		Sample rate: 1 MS/s

As the file size increases, the processing load for analyzing measured data may become extremely heavy.

The situation may improve by changing the storage medium.

(Slower) HDD < SSD < M.2.SSD (Faster)

Operating System

English version of Windows 8.1, or Windows 10

Communication Card

- **GP-IB**

NI (National Instruments) (but, Windows 10 is not supported)

	OS	
	Windows 8.1	Windows 10
	Version of the driver NI-488.2	
PCI-GPIB	3.1.0 or later	15.5.0 or later
PCI-GPIB+		
PCIe-GPIB		
PCIe-GPIB+		
GPIB-USB-HS		
GPIB-USB-HS+	14.0 or later	

- **RS-232**

An available PC COM port

- **Ethernet**

An Ethernet port that supports 10BASE-T, 100BASE-TX, or 1000BASE-T

- **USB**

A USB port that supports USB Revision 1.1 or higher

Display, Printer, and Mouse

- Screen Resolution: 1366×768 dots or higher
- Operating System: Operating system mentioned above

WT Main Unit

- Precision Power Analyzer WT5000
(Must be firmware version 2.01 or later)
- Precision Power Analyzer WT3001E/WT3002E/WT3003E/WT3004E
- Precision Power Analyzer WT3000 (760301/760302/760303/760304)
(Must be firmware version 6.11 or later and in advanced mode)
- Precision Power Analyzer WT1801E/WT1802E/WT1803E/WT1804E/WT1805E/WT1806E
- Precision Power Analyzer WT1800 (WT1801/WT1802/WT1803/WT1804/WT1805/WT1806)
(Must be firmware version 2.31 or later)
- Power Analyzer WT500 (760201/760202/760203)
(Must be firmware version 1.21 or later)
- Digital Power Meter WT310E/WT310EH/WT332E/WT333E
- Digital Power Meter WT310/WT310HC/WT332/WT333

WT5000 Data Streaming (/DS)

Conditions of Use

- This software version: 1.51 or later
- WT5000 firmware version: 2.01 or later
- Online connection: USB3 or later or Gigabit Ethernet or later

Sample Rate during Data Streaming Waveform Acquisition and Maximum Number of Waveforms That Can Be Acquired

Sample Rate [S/s]	Maximum Number of Waveforms	
	USB3	Gigabit Ethernet
10 k	22	22
20 k	22	22
50 k	22	22
100 k	22	22
200 k	22	22
500 k	14	6
1 M	6	4
2 M	2	2

- Use the data streaming waveform acquisition feature by connecting a single unit.
- The update interval is fixed at 1 second during data streaming waveform acquisition.
- The on/off state of the data streaming waveform function is synchronized to that of the waveform display.
- Under Data Size Information, the required free storage size is displayed depending on the data acquisition time (hour/minute/second), which is based on the sample rate and number of waveform channels.
- Prepare enough free storage according to the acquisition time.

2.1 Connecting the WT to a PC

CAUTION

Be sure to turn off the PC and the WT before you connect or remove communication cables. Otherwise, erroneous operation may result, or the internal circuitry may break.

French

ATTENTION

Veiller à mettre le PC et le WT hors tension avant de brancher ou de débrancher les câbles de communication, pour éviter de provoquer des dysfonctionnements ou des courts-circuits internes.

When Using the USB Interface

Connect the USB port for PCs (type B connector) on the rear panel of the WT to the PC.

When Using the GP-IB Interface

The WT is equipped with an IEEE St'd 488-1978 24-pin GP-IB connector. Use a GP-IB cable that conforms to this standard.

Connect the cable to the GP-IB connector on the rear panel of the WT.

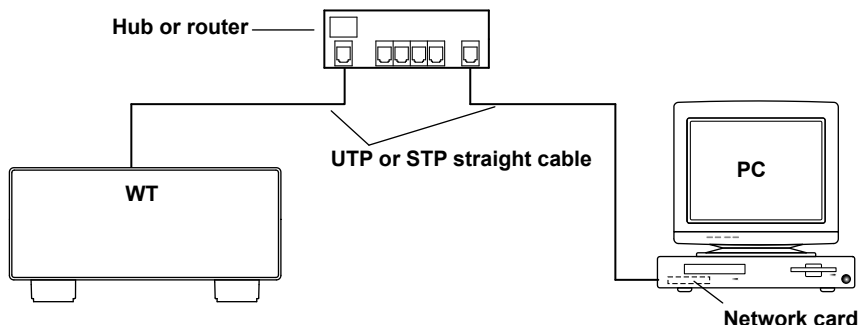
Use an appropriate connector to connect the other end of the cable to the PC.

When Using the Serial (RS-232) Interface

Before connecting the WT to the PC using a cable, open Device Manager on your PC to check the communication port that you can use. Connect the interface cable to the COM port that you can use. Use an appropriate connector to connect the cable to the PC.

When Using the Ethernet Interface

To connect the WT to the PC, use a straight UTP (Unshielded Twisted-Pair) or STP (Shielded Twisted-Pair) cable through a hub or similar device. Connect the cable to the ETHERNET port on the rear panel of the WT. The data rate varies depending on the product. Use a hub, cables, and network card that are appropriate for the data rate.



Note

- Use a cable, hub, or router that supports the data rate of your network.
- Do not connect the WT to the PC directly. Direct communication is not guaranteed to work.

2.2 Setting USB Control Parameters

Procedure

Set the USB control according to the procedures given in following manuals.

With the WT3001E/WT3002E/WT3003E/WT3004E

(for Products with the /C12 Suffix Code)

- Section 3.4 in the Communication Interface User's Manual (IM WT3001E-17EN)

With the WT3000 (760301/760302/760303/760304)

(for Products with the /C12 Suffix Code)

- Section 3.4 in the Communication Interface User's Manual (IM 760301-17E)

With the WT5000,

WT1801E/WT1802E/WT1803E/WT1804E/WT1805E/WT1806E,

WT1800 (WT1801/WT1802/WT1803/WT1804/WT1805/WT1806),

WT500 (760201/760202/760203),

WT310E/WT310EH/WT332E/WT333E,

or WT310/WT310HC/WT332/WT333

The USB control setting item is not present.

Explanation

Each device that is connected through USB has its own unique ID in the USB system. This ID is used to distinguish between different devices. When you connect the WT to the PC, make sure that the WT ID does not overlap with those of other devices.

Note

- When you connect a WT to the PC and use the software to control the WT, you cannot use multiple types of communication interface at the same time.
 - You can connect one WT or multiple WTs to a PC and use the software to control the them.
 - The WT may not operate properly if the WT is connected to the PC through converters (such as a GP-IB to USB converter or RS-232 to USB converter). For more details, contact your nearest YOKOGAWA dealer.
-

2.3 Setting GP-IB Control Parameters

Procedure

Set the GP-IB control according to the procedures given in following manuals.

With the WT5000

- Section 3.4 in the Communication Interface User's Manual (IM WT5000-17EN)

With the WT3001E/WT3002E/WT3003E/WT3004E

- Section 1.5 in the Communication Interface User's Manual (IM WT3001E-17EN)

With the WT3000 (760301/760302/760303/760304)

- Section 1.5 in the Communication Interface User's Manual (IM 760301-17E)

With the WT1801E/WT1802E/WT1803E/WT1804E/WT1805E/WT1806E

- Section 3.4 in the Communication Interface User's Manual (IM WT1801E-17EN)

With the WT1800 (WT1801/WT1802/WT1803/WT1804/WT1805/WT1806)

- Section 3.4 in the Communication Interface User's Manual (IM WT1801-17EN)

With the WT500 (760201/760202/760203)

(for Products with the /C1 Suffix Code)

- Section 2.5 in the Communication Interface User's Manual (IM 760201-17E)

With the WT310E/WT310EH/WT332E/WT333E

(for Products with the /C1 Suffix Code)

- Section 2.4 in the Communication Interface User's Manual (IMWT310E-17EN)

With the WT310/WT310HC/WT330(WT332/WT333)

(for Products with the /C1 Suffix Code)

- Section 2.4 in the Communication Interface User's Manual (IMWT310-17EN)

Explanation

Setting the Address

Set the WT address within the following range.

1 to 30

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 WT when you connect it to a PC or other device.

Note

- When the controller (PC) is using the GP-IB bus, do not change the address of any connected devices.
- When you connect a WT to the PC and use the software to control the WT, you cannot use multiple types of communication interface at the same time.
- You can connect one WT or multiple WTs to a PC and use the software to control the them.
- On the PC end, use a GP-IB board (or card) made by NI (National Instruments). For details, see section 1.3.
- The WT may not operate properly if the WT is connected to the PC through converters (such as a GP-IB to USB converter or RS-232 to USB converter). For more details, contact your nearest YOKOGAWA dealer.

2.4 Setting RS-232 Control Parameters

Procedure

Set the RS-232 control according to the procedures given in following manuals.

With the WT3001E/WT3002E/WT3003E/WT3004E

(for Products with the /C2 Suffix Code)

- Section 2.6 in the Communication Interface User's Manual (IM WT3001E-17EN)

With the WT3000 (760301/760302/760303/760304)

(for Products with the /C2 Suffix Code)

- Section 2.6 in the Communication Interface User's Manual (IM 760301-17E)

With the WT310E/WT310EH/WT332E/WT333E

(for Products with the /C2 Suffix Code)

- Section 3.4 in the Communication Interface User's Manual (IMWT310E-17EN)

With the WT310/WT310HC/WT330(WT332/WT333)

(for Products with the /C2 Suffix Code)

- Section 3.4 in the Communication Interface User's Manual (IMWT310-17EN)

Explanation

Setting RS-232 Control Parameters

To use the software through the RS-232 interface, set the handshaking method, data format, baud rate, and terminator.

Recommended settings

- Handshaking method: CTS-RTS
- Data format: 8-NO-1
- Baud rate: 38400
- Terminator: Lf

If the handshaking method, data format, and terminator are not set as shown above, online connection will not be possible with the software.

Note

- When the controller (PC) is using the RS-232 interface, do not change the above settings of any connected devices.
 - When you connect a WT to the PC and use the software to control the WT, you cannot use multiple types of communication interface at the same time.
 - You can connect one WT or multiple WTs to a PC and use the software to control the them. Do not connect multiple WTs to the PC.
 - The WT may not operate properly if the WT is connected to the PC through converters (such as a GP-IB to USB converter or RS-232 to USB converter). For more details, contact your nearest YOKOGAWA dealer.
-

2.5 Setting Ethernet Control Parameters

Procedure

Set the ethernet control according to the procedures given in following manuals.

With the WT5000

- Section 13.2 in the User's Manual (IM WT5000-02EN)
- Section 1.4 in the Communication Interface User's Manual (IM WT5000-17EN)

With the WT3001E/WT3002E/WT3003E/WT3004E

(for Products with the /C7 Suffix Code)

- Section 5.2 in the Expansion Function User's Manual (IM WT3001E1-51EN)
- Section 4.3 in the Communication Interface User's Manual (IM WT3001E-17EN)

With the WT3000 (760301/760302/760303/760304)

(for Products with the /C7 Suffix Code)

- Section 5.2 in the Expansion Function User's Manual (IM 760301-51E)
- Section 4.3 in the Communication Interface User's Manual (IM 760301-17E)

With the WT1801E/WT1802E/WT1803E/WT1804E/WT1805E/WT1806E

- Section 20.2 in the User's Manual (IM WT1801E-02EN)
- Section 1.4 in the Communication Interface User's Manual (IM WT1801E-17EN)

With the WT1800 (WT1801/WT1802/WT1803/WT1804/WT1805/WT1806)

- Section 20.2 in the User's Manual (IM WT1801-02EN)
- Section 1.4 in the Communication Interface User's Manual (IM WT1801-17EN)

With the WT500 (760201/760202/760203)

(for Products with the /C7 Suffix Code)

- Section 11.3 and 11.4 in the User's Manual (IM 760201-17E)

With the WT310E/WT310EH/WT332E/WT333E

(for Products with the /C7 Suffix Code)

- Section 4.4 in the Communication Interface User's Manual (IMWT310E-17EN)

With the WT310/WT310HC/WT330(WT332/WT333)

(for Products with the /C7 Suffix Code)

- Section 4.4 in the Communication Interface User's Manual (IMWT310-17EN)

Explanation

Setting Ethernet Control Parameters

To use the software over a network, set the TCP/IP parameters.

Note

- When the controller (PC) is using the Ethernet interface, do not change the TCP/IP settings of any connected devices.
- When you connect a WT to the PC and use the software to control the WT, you cannot use multiple types of communication interface at the same time.
- You can connect one WT or multiple WTs to a PC and use the software to control the them.
- The WT may not operate properly if the WT is connected to the PC through converters (such as a GP-IB to USB converter or RS-232 to USB converter). For more details, contact your nearest YOKOGAWA dealer.

3.1 Installation and Uninstallation

Installation

Before installing the software, close all programs that are currently running.

If an older version of WTVIEWER is installed, uninstall it from Control Panel (see page 3-8).

The following procedure explains how to install the software on Windows 10. The windows that appear will vary depending on the operating system.

Note

A dialog box regarding administrator privileges may appear during the installation. If this happens, follow the message in the dialog box.

1. Turn on the PC and start Windows.
2. Insert the installation disk that contains this software into the CD drive.
3. On the PC, select the CD drive.

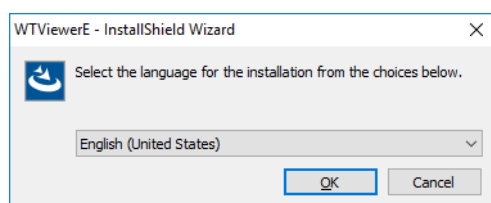
Installing WTVIEWER

4. Double-click WTVIEWERSetup.exe. The installer starts.

If the “User Account Control” window appears during the installation, click **Allow** or **Yes** to continue the installation.

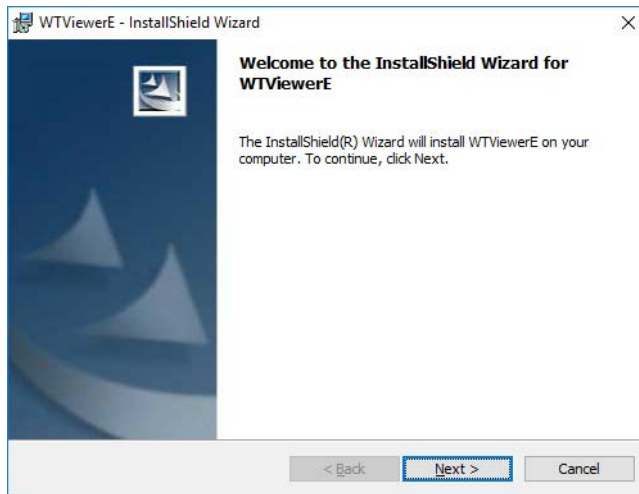


5. Select the language to use during the installation, and click **OK**.

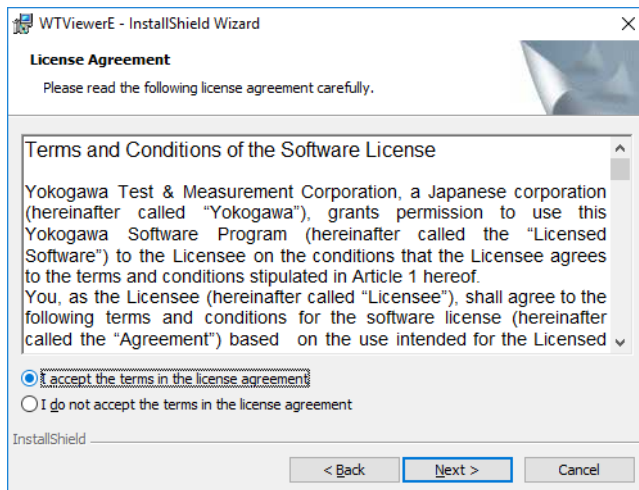


3.1 Installation and Uninstallation

6. Follow the instructions on the screen, and then click **Next**.

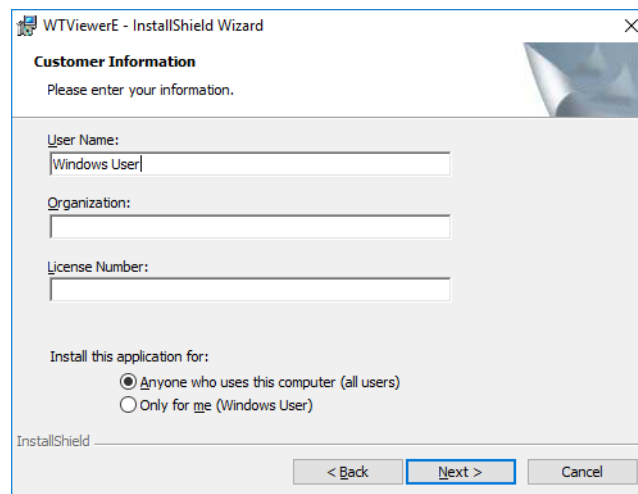


7. If you agree with the license agreement, select **I Agree**, and click **Next**. Otherwise, select **I Do Not Agree**. The installation will be canceled.



8. Enter the user name and organization.

Select the user installing this application, enter the license number included with the product, and then click **Next**.

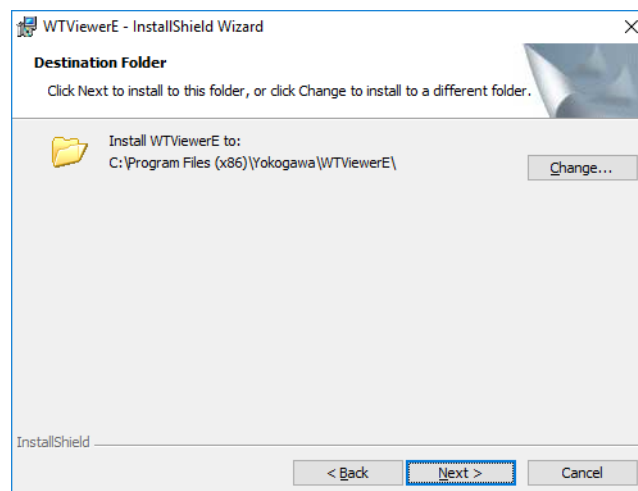


The screenshot shows the 'Customer Information' dialog box of the WTVIEWERE - InstallShield Wizard. The title bar reads 'WTVIEWERE - InstallShield Wizard'. The main heading is 'Customer Information' with the instruction 'Please enter your information.' Below this are three text input fields: 'User Name:' containing 'Windows User', 'Organization:', and 'License Number:'. At the bottom, there are two radio buttons under the heading 'Install this application for:'. The first is selected and labeled 'Anyone who uses this computer (all users)'. The second is labeled 'Only for me (Windows User)'. At the very bottom, there are three buttons: '< Back', 'Next >', and 'Cancel'. The 'Next >' button is highlighted with a blue border.

9. Select the installation destination, and click **Next**.

Click **Browse** to specify the destination. The default installation destination is as follows:

- Windows 32-bit version
C:\Program Files\Yokogawa\WTVIEWERE
- Windows 64-bit version
C:\Program Files(x86)\Yokogawa\WTVIEWERE



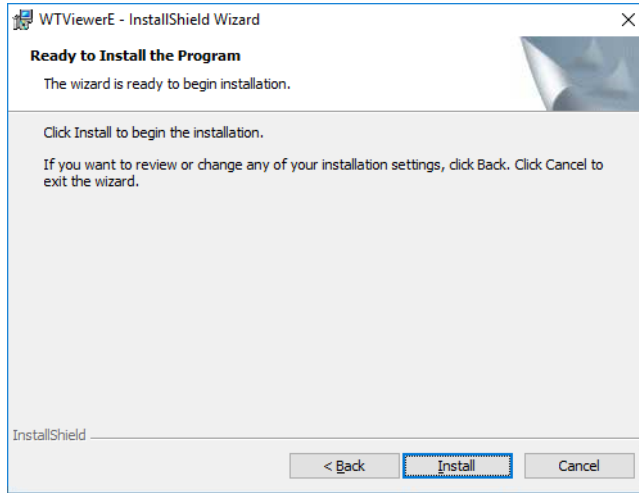
The screenshot shows the 'Destination Folder' dialog box of the WTVIEWERE - InstallShield Wizard. The title bar reads 'WTVIEWERE - InstallShield Wizard'. The main heading is 'Destination Folder' with the instruction 'Click Next to install to this folder, or click Change to install to a different folder.' Below this is a folder icon and the text 'Install WTVIEWERE to: C:\Program Files (x86)\Yokogawa\WTVIEWERE'. To the right of this text is a 'Change...' button. At the bottom, there are three buttons: '< Back', 'Next >', and 'Cancel'. The 'Next >' button is highlighted with a blue border.

3.1 Installation and Uninstallation

10. A screen prompting you to start the installation appears. If the installation settings are okay, click **Next**. The software is installed.

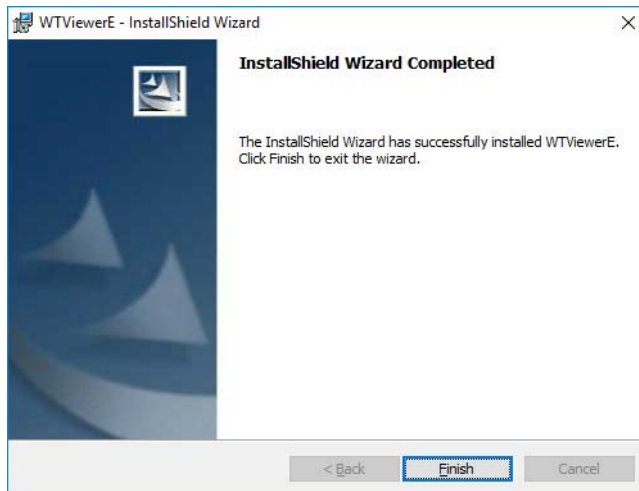
Click **Back** if you want to change the installation settings.

Click **Cancel** to cancel the installation.



11. When the software installation finishes normally, the following screen appears. WTVIEWER E will be added to the Windows Start menu.

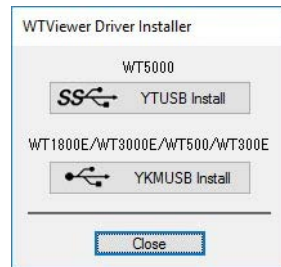
Click **Finish** to complete the installation.



Next, the USB driver (YTUSB/YKMUSB) installation wizard starts automatically.

Installing USB driver (YTUSB/YKMUSB)

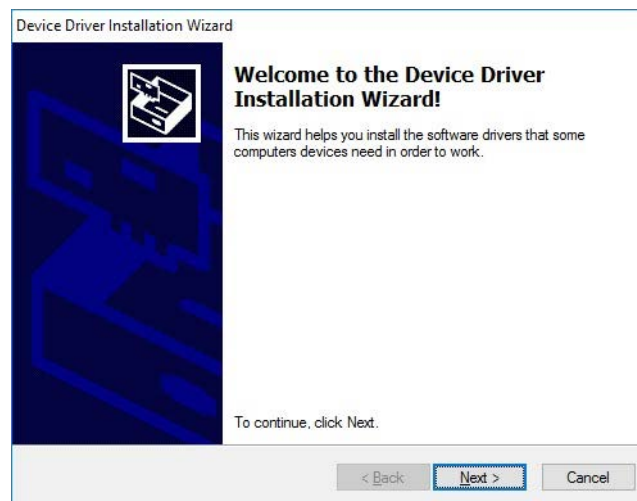
1. Click the USB driver to install according to the WT model you will connect to. You can also install both.



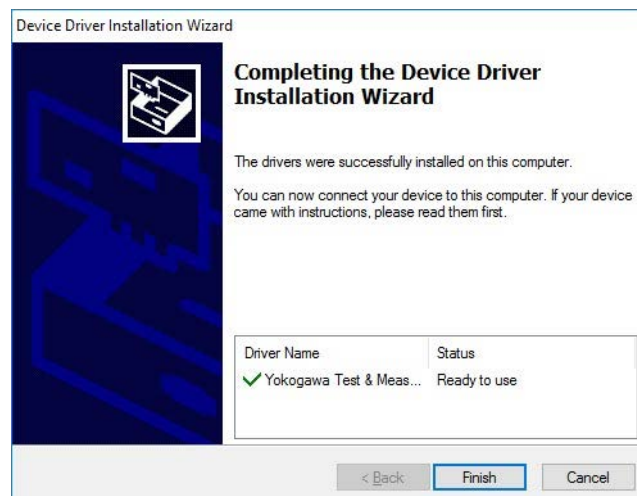
If the “User Account Control” window appears during the installation, click **Allow** or **Yes** to continue the installation.

Installing YTUSB

1. Follow the instructions on the screen, and then click **Next**.



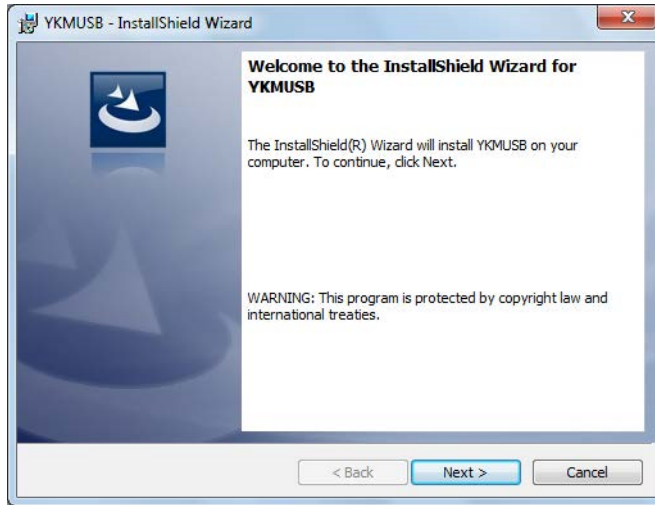
2. When the software installation finishes normally, the following screen appears. Click Finish to complete the installation.



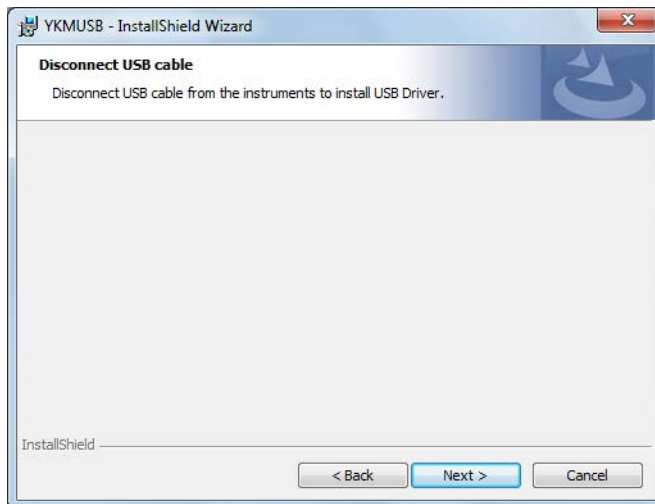
3.1 Installation and Uninstallation

Installing YKMUSB

1. Follow the instructions on the screen, and then click **Next**.



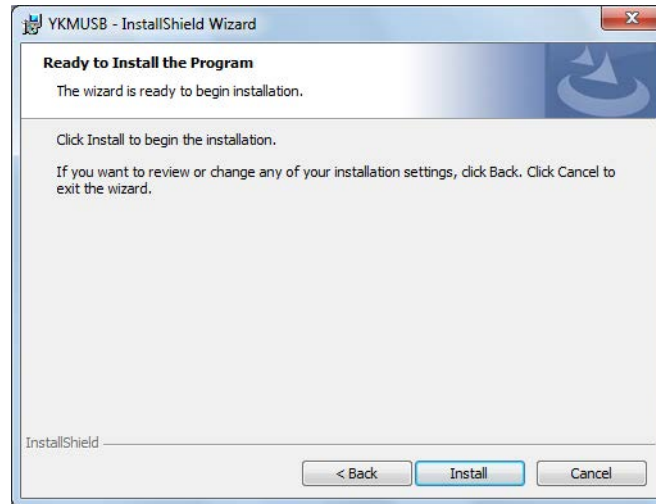
2. If the USB cable is connected to the PC, remove the cable, and click **Next**.



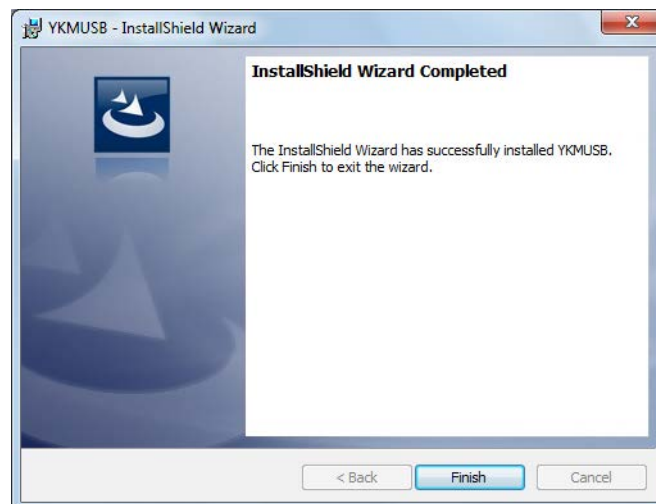
3. A screen prompting you to start the installation appears. If the installation settings are okay, click **Install**. The software is installed.

Click **Back** if you want to change the installation settings.

Click **Cancel** to cancel the installation.



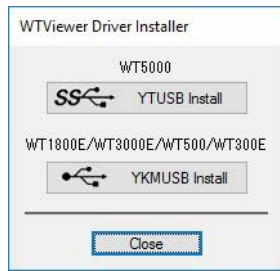
4. When the software installation finishes normally, the following screen appears. Click Finish to complete the installation.



3.1 Installation and Uninstallation

Closing the USB Driver (YTUSB/YKMUSB) Installer

1. Click **Close** to complete the installation.



Uninstallation

This section explains how to uninstall the software on Windows 10.

1. On the Windows Start menu, click **System Tools** and then **Control Panel**.
2. Click **Programs and Features** in the Control Panel.

Uninstalling WViewerE

3. Right-click **WViewerE**, and then click **Uninstall**.
4. A uninstallation confirmation screen appears.
Click **Yes** to uninstall WViewerE.
Click **No** to cancel.
5. If the "User Account Control" window appears during the uninstallation, click **Allow** or **Yes** to continue the uninstallation.

Uninstalling YTUSB (USB Driver)

6. On the Programs and Features window, select **Windows Driver Package - Yokogawa Test & Measurement Corporation (WinUSB) YTUSB (mm/dd/yyyy x.x.x.x)**, right-click it, and click **Uninstall/Change**. The uninstallation will proceed in a similar manner as described above.

Uninstalling YKMUSB (USB Driver)

7. On the Programs and Features window, select **YKMUSB64**, right-click it, and select **Uninstall/Change**. The uninstallation will proceed in a similar manner as described above.

3.2 Starting and Exiting the Software

Preparation before Starting the Software

Do the following before you start the software.

- Turn on the WT.
- Connect communication cables, and set communication interface parameters. (See chapter 2.)

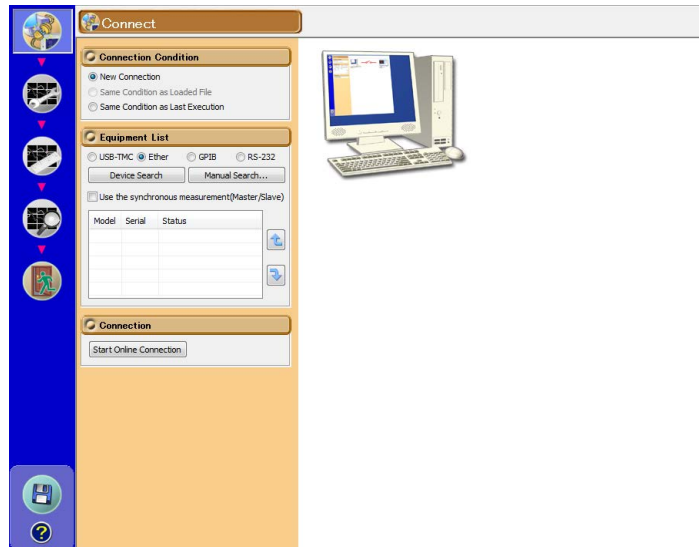
Starting the Software

The following procedure explains how to start the software on Windows 10.


1. To start the software, click the **Start** button, **Yokogawa**, and then **WTViewerE**.

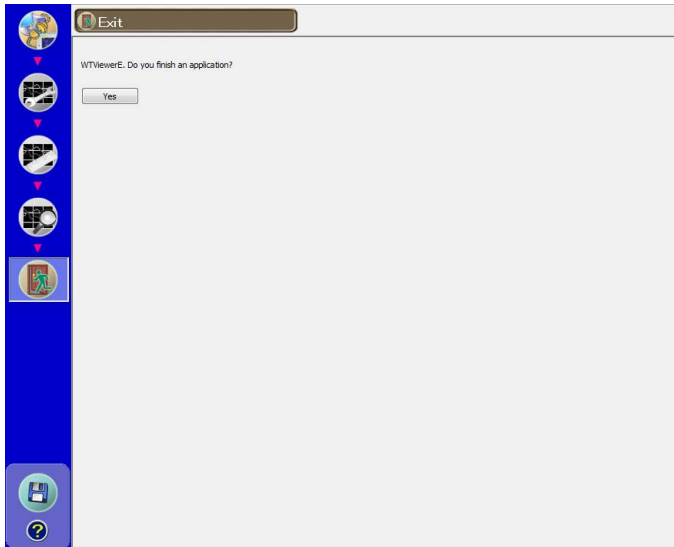
When the software starts, the Connection menu will appear.

Proceed to chapter 4, "WT-PC Communication."



Exiting the Software


1. Click  in the menu area. The exit screen appears.



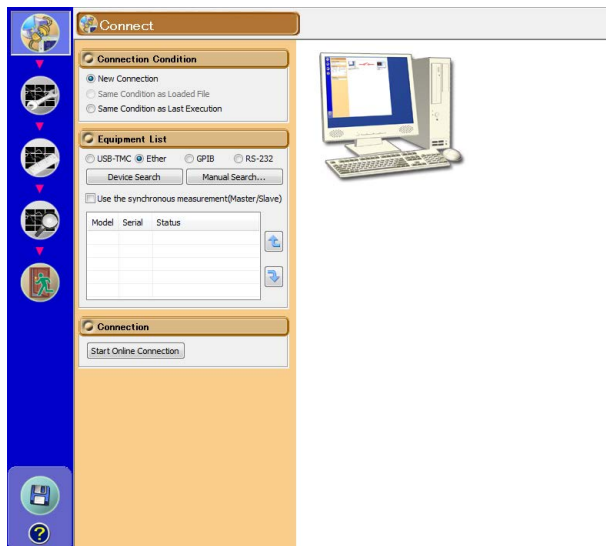
2. Click **Yes**. The software will close.



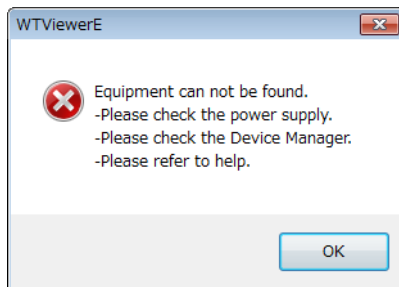
4.1 Configuring a New Set of WT-PC Communication Parameters (New connection)

1. Click  in the menu area. The Connection screen appears.

When you start the software, this screen appears automatically.



If no connectable WT is found, the following message appears. Use manual search on the next page to perform another search.

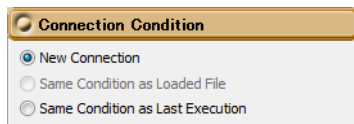


If the above message appears even after the manual search, check the following items.

- Is the WT turned on?
- Is the communication interface cable connected?
- Are the communication settings (GP-IB address, IP address, etc.) of each WT unique?

Connection Condition

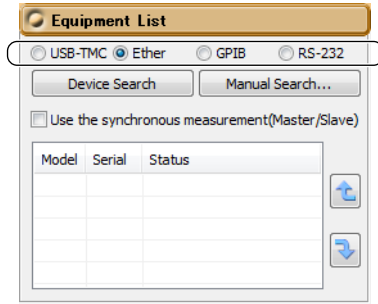
2. To create a new connection, click **New Connection**.



4.1 Configuring a New Set of WT-PC Communication Parameters (New connection)

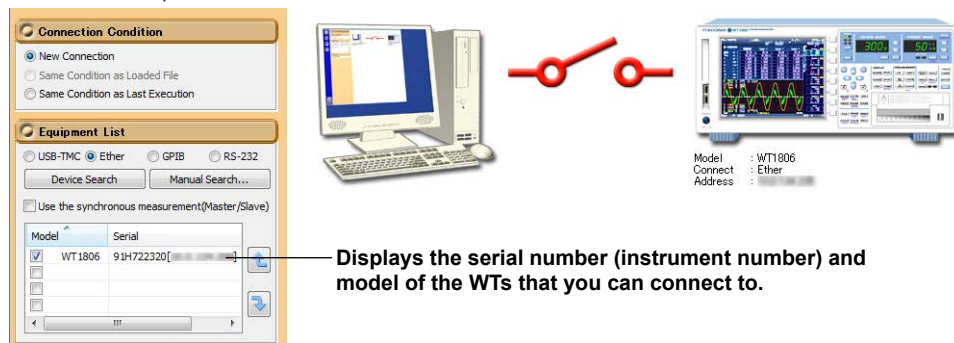
Equipment List

3. Select how to connect the WT to the PC from USB-TMC, Ether, GPIB, and RS-232.



4. Click **Device Search**.

The serial number (instrument number) and model of the WTs that you can connect to appear. Proceed to step 7.



Note

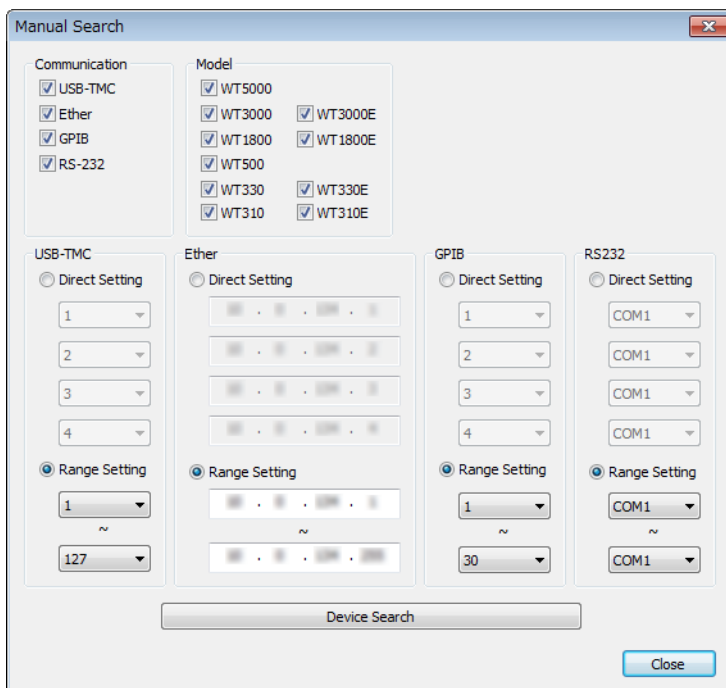
If you connect the WT to the PC through the USB, GP-IB, or ethernet interface, turn on the WT, and then start the software, a list of connectable WTs will appear.

- For a USB connection, device ID 1 to 4 can be connected through device search. For ID 5 to 127, manual search is used to make the connection.
- For a GP-IB connection, WTs whose GPIB address is 1 to 30 are searched for.
- For an Ethernet connection, WTs whose IP address is xxx.xxx.xxx.1 to xxx.xxx.xxx.255 are searched for. xxx.xxx.xxx. denotes the IP address of the PC in which this software is running. However, with the WT3000/WT3000E when an Ethernet connection is in use, connect using a manual search explained later.
- If a connectable WT is found, searching is not performed on other interfaces.

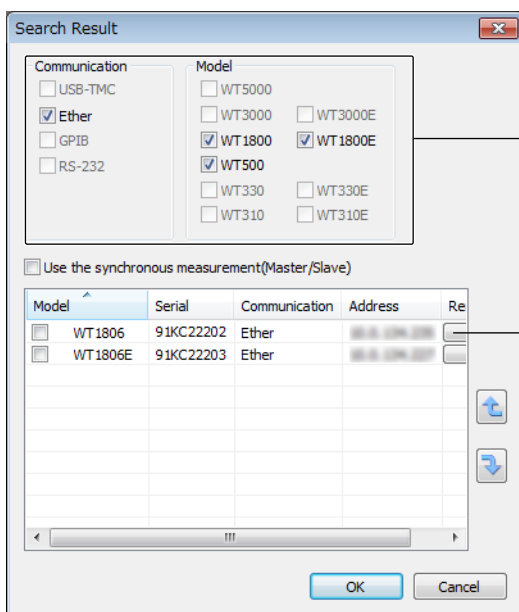
Manual Search

You can also specify conditions to search for the WT you want to connect to.

5. Click **Manual Search**. A Manual Search dialog box appears.



6. Set the search conditions, and click **Device Search**. A Search Result dialog box appears.



Select the display conditions of the search results.

WT remote on/off button
When remote is set to ON, the WT remote LED (green) lights.
This enables you to determine and check the WT that you are trying to establish an online connection with.

7. Select the check box of the WT you want to connect to, and click **OK**.

4.1 Configuring a New Set of WT-PC Communication Parameters (New connection)

Using Synchronous Measurement (Master/Slave)

Synchronous measurement can be used on the WT5000, WT3000/3000E, WT1800/1800E, and WT500.

8. Select the Use the synchronous measurement (Master/Slave) check box. A Master icon appears by the first model listed in the equipment list.

Master icon

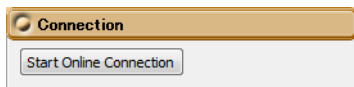
**Changes the order of the equipment list.
The model displayed at the top is automatically assigned as the master.**

Note

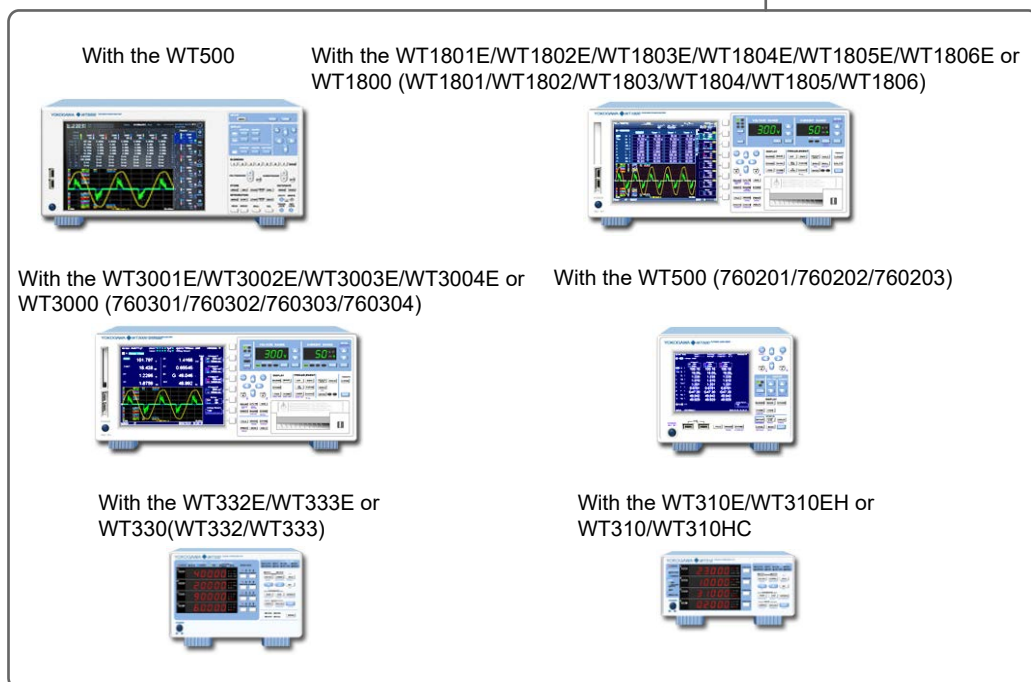
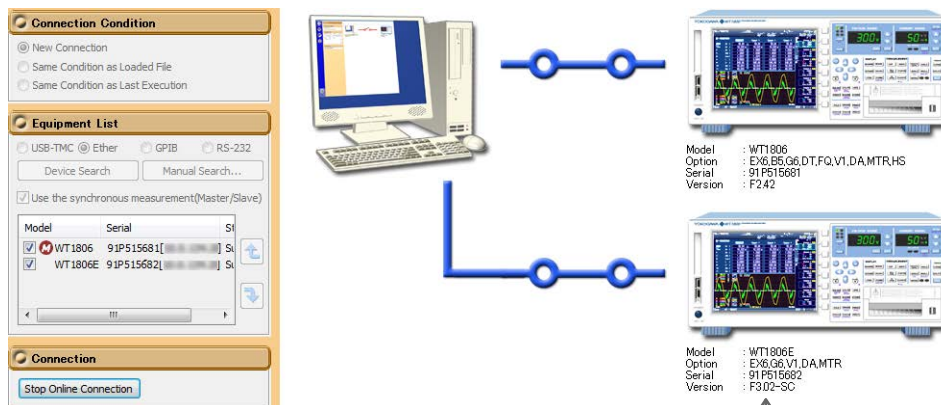
- To maintain synchronicity between data of multiple WTs in synchronous measurement, link the WTs using the master/slave synchronous measurement function. For details on the function, see the WT User's Manual.
- Synchronous measurement can be performed by connecting several WTs. The WT displayed at the top of the equipment list in the device search is automatically assigned as the master. By rearranging the list, you can select which WT is to be the master. In synchronous measurement, measurement can be performed by using the trigger conditions of the master WT to simultaneously control the other slave WTs. A Master icon is displayed next to the model name of the master WT in the Equipment list.

Starting the Connection

9. Click **Start Online Connection**. The communication with the peer WT begins.




When the connection is established and the WT and PC are online, an illustration indicating this state appears.



Note

- If any of the following circumstances apply when you click Start Online Connection, a communication error will occur.
 - The peer WT is not ready to measure.
 - The GP-IB address, IP address, user name, or password is incorrect.
 - There is no response from the peer WT.

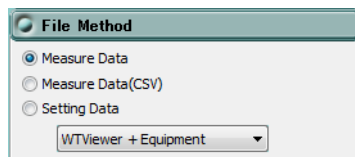
4.2 Making the Communication Settings and Device Settings the Same as Those of the Loaded File

1. Click  in the menu area. The File screen appears.

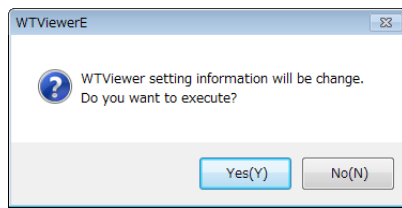
Note


For details on how to use the File screen, see section 8.1.

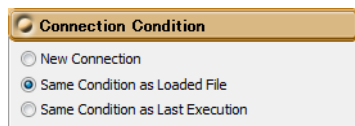
2. From the saved-date list, select the file to load communication settings and device settings from.
3. Under Setting Data in the File Method dialog box, select **WtViewer + Equipment**.



4. In the File Information dialog box, click **Load**. The following message appears.



5. Click **Yes**.
6. Click  in the menu area. The Connection screen appears.
7. In the Connection Condition dialog box, select **Same Condition as Loaded File**.

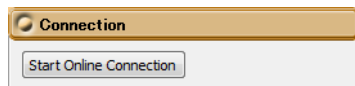


Note

You cannot select "Same Condition as Loaded File" until you start the software and load a file.

Starting the Connection

8. Click **Start Online Connection**. The communication with the peer WT begins.




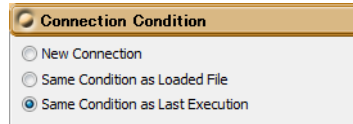
Note

If any of the following circumstances apply when you click Start Online Connection, a communication error will occur.

- The peer WT is not ready to measure.
- The GP-IB address, IP address, user name, or password is incorrect.
- There is no response from the peer WT.
- You are trying to connect to a different WT from the last time.

4.3 Using the Same Communication Settings as the Last Time

1. Click  in the menu area. The Connection screen appears.
2. In the Connection Condition dialog box, click **Same Condition as Last Execution**.

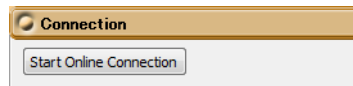


Note

You cannot select "Same Condition as Last Execution" the first time you start the software.

Starting the Connection

3. Click **Start Online Connection**. The communication with the peer WT begins.




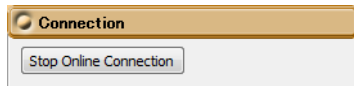
Note

If any of the following circumstances apply when you click Start Online Connection, a communication error will occur.

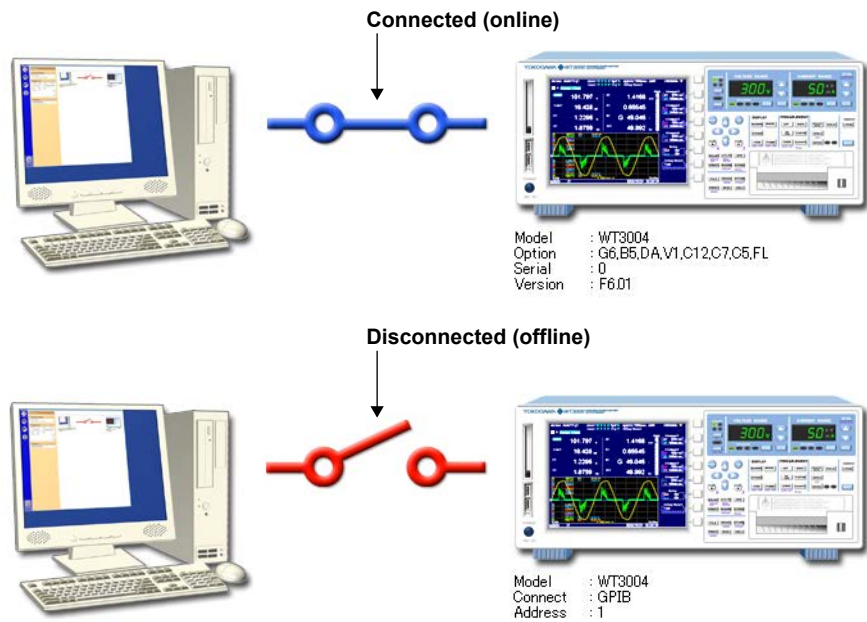
- The peer WT is not ready to measure.
- The GP-IB address, IP address, user name, or password is incorrect.
- There is no response from the peer WT.
- You are trying to connect to a different WT from the last time.

4.4 Switching to Offline


1. Click  in the menu area. The Connection screen appears.
2. While online, click **Stop Online Connection**. The connection between the WT and PC is disconnected.



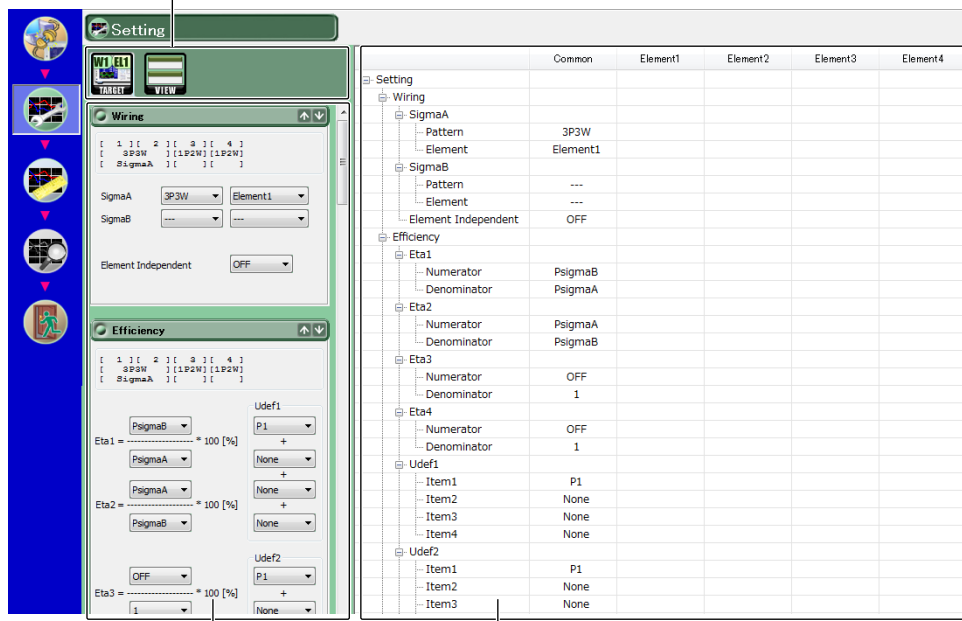
When the connection is cut and the WT and PC are offline, an illustration indicating this state appears.



5.1 WT Configuration

1. Click  in the menu area. The Setting screen appears.

Setting toolbar



Setting display area **List of settings**

Notes on Operation

Note the following points when you use the software to configure the WT.

- For details on settings, see the WT User’s Manual.

WT5000

- Features Guide IM WT5000-01EN*
- User’s Manual IM WT5000-02EN*

WT3001E/WT3002E/WT3003E/WT3004E

- User’s Manual IM WT3001E-01EN*
- Expansion Function User’s Manual IM WT3001E-51EN*

WT3000 (760301/760302/760303/760304)

- User’s Manual IM 760301-01E
- Expansion Function User’s Manual IM 760301-51E

WT1801E/WT1802E/WT1803E/WT1804E/WT1805E/WT1806E

- Features Guide IM WT1801E-01EN*
- User’s Manual IM WT1801E-02EN*

WT1800 (WT1801/WT1802/WT1803/WT1804/WT1805/WT1806)

- Features Guide IM WT1801-01EN
- User’s Manual IM WT1801-02EN

5.1 WT Configuration

WT500 (760201/760202/760203)

- User's Manual IM 760201-01E*

WT310E/WT310EH/WT332E/WT333E

- User's Manual IM WT310E-01EN*

WT310/WT310HC/WT330(WT332/WT333)

- User's Manual IM WT310-01EN

* The above user's manuals can be viewed using the help function (see section 9.1).

- To display the waveform, bar graph, or trend display, set the measurement function and element on the numeric or harmonic list screen beforehand.

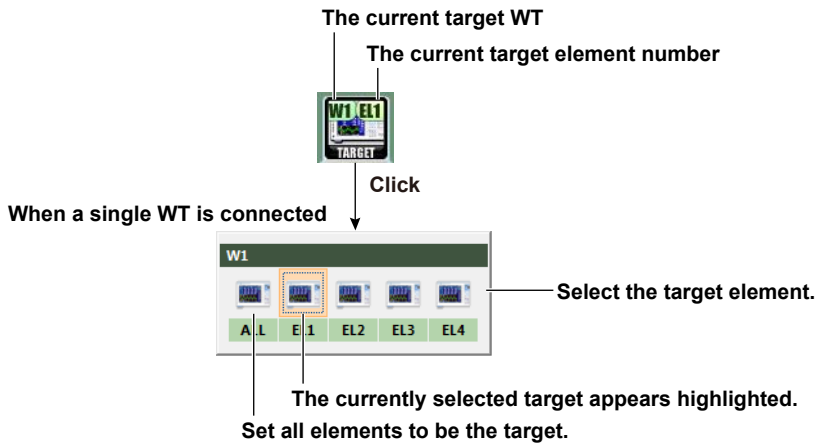
Examples of Setting screens are provided in the remainder of this section.

Setting Toolbar

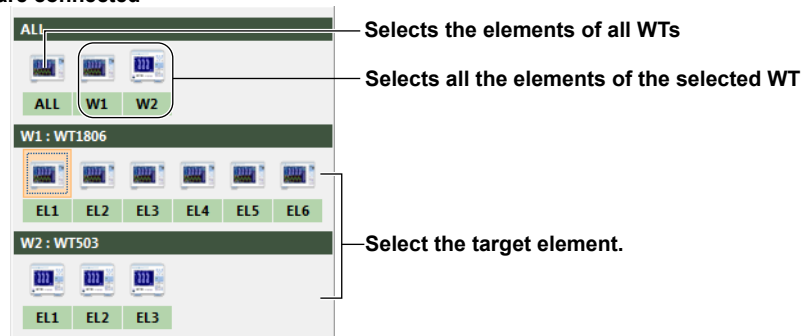


Selecting the Target Element

Click the TARGET icon to select the element that you want to change the settings on.



When several WTs are connected



Selecting the Display Format of the Setting Display Area

Click the VIEW icon, and select the display format of the setting display area (see the next page).

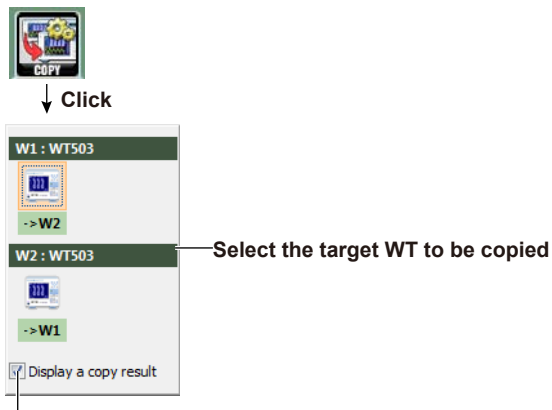


Note

If no favorites are registered, nothing is displayed for favorites.

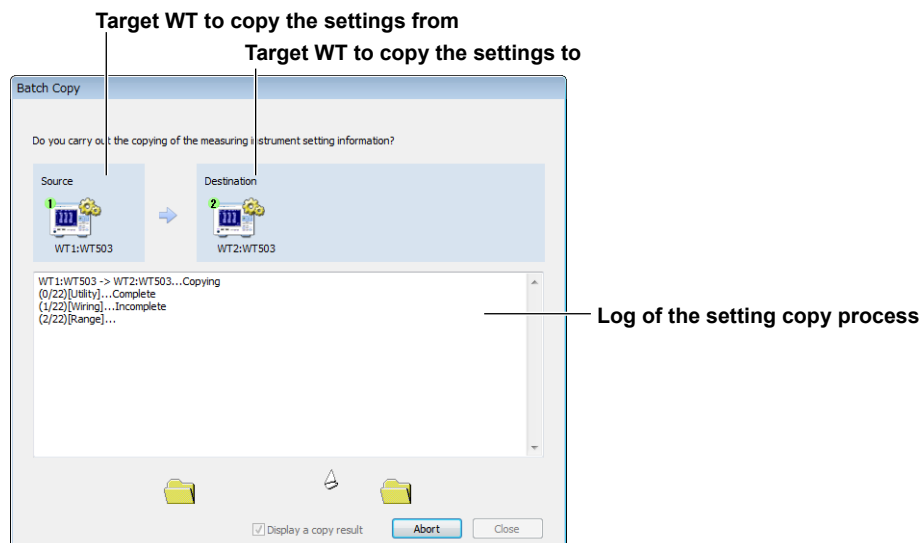
Select the target WT to copy the settings.

Click the COPY icon to select the target WT to copy the settings.



Displays the copy results in the list of settings.

The following screen is displayed while copying is in progress.



5.1 WT Configuration

When copying is complete, the list of settings (see page 5-6) shows the results using four colors.

Copy source

Green: Copied

Gray: Not copied

Copy destination

Blue: Normal copy

Red: Abnormal copy

Gray: Not copied

	WT1 Common	WT1 Element1	WT1 Element2	WT1 Element3	WT2 Common	WT2 Element1	WT2 Element2	WT2 Element3
Setting								
Wiring								
Efficiency								
Range								
Voltage								
Auto Range		OFF	OFF	OFF		OFF	OFF	OFF
Voltage		600V	600V	600V		600V	600V	600V
Current								
Auto Range		OFF	OFF	OFF		OFF	OFF	OFF
Current		Ext 2V	Ext 2V	Ext 2V		Ext 2V	Ext 2V	Ext 2V
Ext Sensor		ON	ON	ON		ON	ON	ON
Sensor Ratio(mV/A)		1.0000	1.0000	1.0000		1.0000	1.0000	1.0000
Scaling								

Copy source

Copy destination

Note

The COPY icon does not appear if there is only a single WT connection.


If the Display a copy result check box is not selected, the current list of settings are displayed without displaying the copy results.

Setting display area

The display format of the setting display area can be set as follows.

Favorites button

Switch whether to register or remove from favorites.

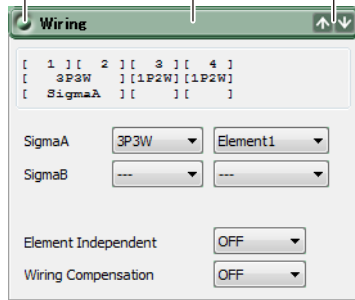
 is displayed when it is registered in favorites.

Title bar

Click to show or hide detailed setting information.

Jump button

Jumps to the next setting above or the next setting below.



Detailed setting information

Change settings using radio buttons and drop-down menus.

Favorites appear in the top half of the setting display area.



Favorites display area

Setting display area

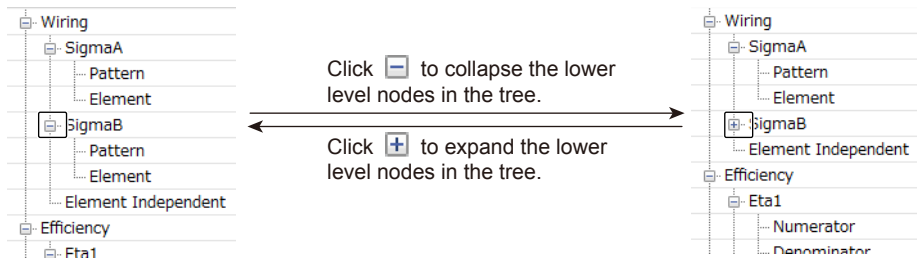
List of settings

The current settings are listed in a tree structure. When you change a setting in the setting display area, the change is reflected for the target element in the list of settings.

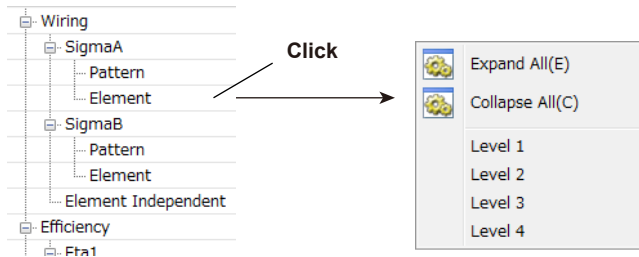
You can also change the settings from the list. However, you cannot collectively change the settings from the list. Change them individually.

Setting	Description				
	Common	Element1	Element2	Element3	Element4
Wiring					
SigmaA					
Pattern	3P3W				
Element	Element1				
SigmaB					
Pattern	3P3W				
Element	Element3				
Element Independent	OFF				
Wiring Compensation					
Efficiency					
η1		PsigmaB			
Numerator		PsigmaA			
Denominator					
η2		PsigmaA			
Numerator		PsigmaB			

Expanding and Collapsing the List of Settings

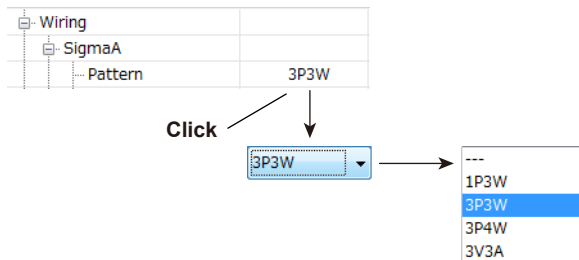


You can also right-click on the list of settings, and use the shortcut menu to expand and collapse the list.



Changing Settings

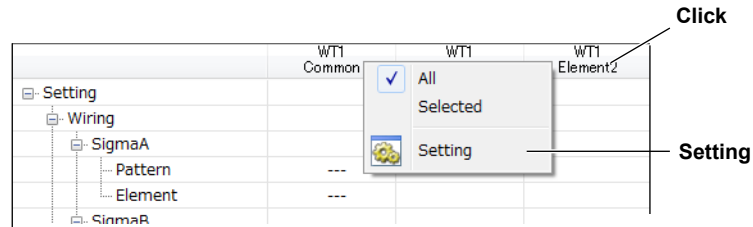
1. Click the cell containing the setting you want to change.
2. Change the setting in the box that appears or type the value.



Showing and Hiding Settings

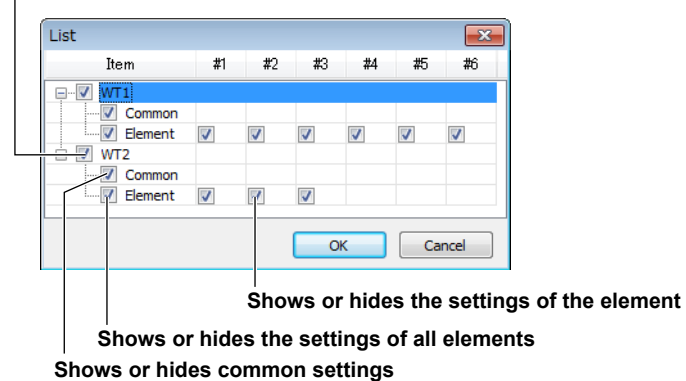
The settings shown in the list of settings can be shown or hidden at the column level. This function is useful when several WTs are connected and you want to fit the list of settings in a single screen.

1. Right-click the title row of the list of settings to show a shortcut menu.



2. Click **Setting**. The List screen appears.
3. Select the check boxes of the columns you want to show.

Shows or hides all settings of the WT



Note

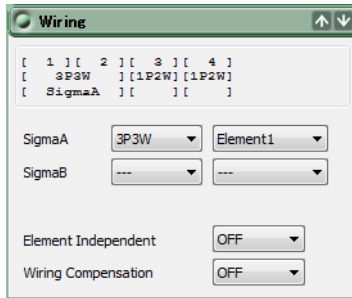
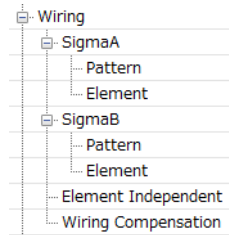
Showing and hiding settings are not available when only a single WT is connected.

Details of Settings

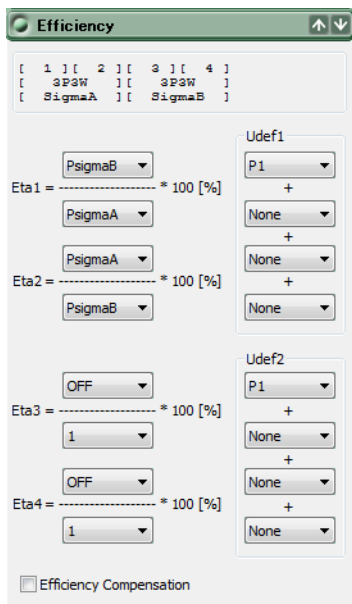
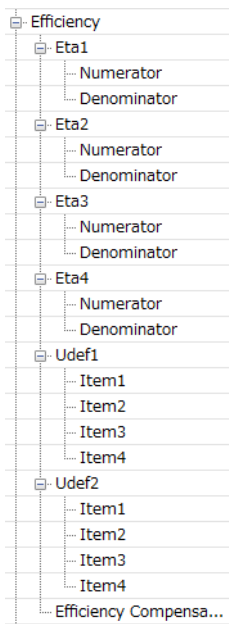
Examples of the various settings in setting display areas and the corresponding settings in the list of settings are provided below. The settings and the contents in the list of settings vary depending on the following factors.

- The WT model
- The number of elements installed in the WT and the presence or absence of options

Wiring System

Efficiency Equation

Measurement Range

Sets the maximum available range.

Increases the range by one level.

Lists the available ranges for direct entry.

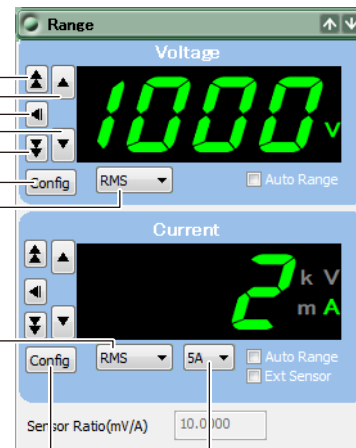
Decreases the range by one level.

Sets the minimum available range.

Sets the valid voltage measurement range.

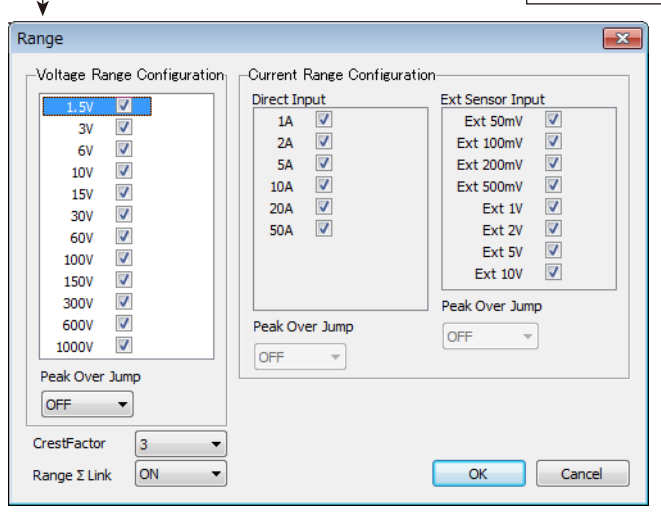
Voltage mode

Current mode

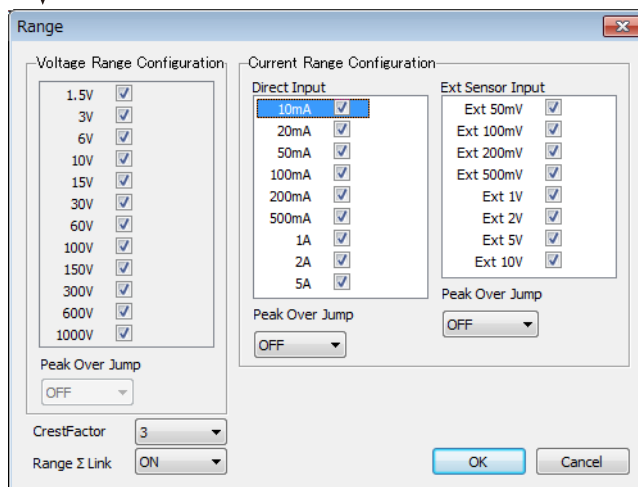


- Range
 - Voltage
 - Voltage Mode
 - Auto Range
 - Voltage
 - Current
 - Current Mode
 - Auto Range
 - Current
 - Ext Sensor
 - Sensor Ratio(mV/...

Appears when elements with different input ranges are installed and the target element is ALL

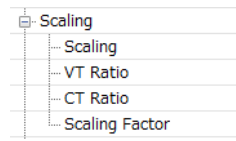
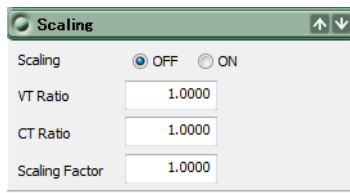


Sets the valid current measurement range.

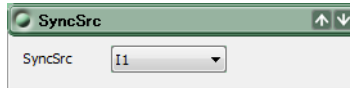


- Range Configuration
 - Voltage Range
 - 1000V
 - 600V
 - 300V
 - 150V
 - 100V
 - 60V
 - 30V
 - 15V
 - 10V
 - 6V
 - 3V
 - 1.5V
 - Peak Over Jump
 - Current Range
 - Input Element(50A)
 - 50A
 - 20A
 - 10A
 - 5A
 - 2A
 - 1A
 - Peak Over Jump
 - Input Element(5A)
 - 5A
 - 2A
 - 1A
 - 500mA
 - 200mA
 - 100mA
 - 50mA
 - 20mA
 - 10mA
 - Peak Over Jump
 - Input Element(Ext)
 - 10V
 - 5V
 - 2V
 - 1V
 - 500mV
 - 200mV
 - 100mV
 - 50mV
 - Peak Over Jump

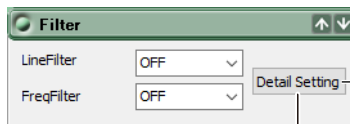
Scaling



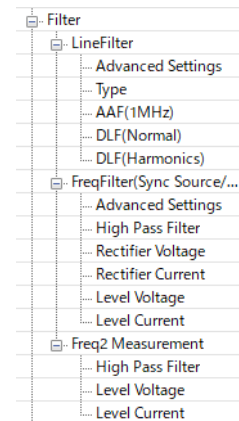
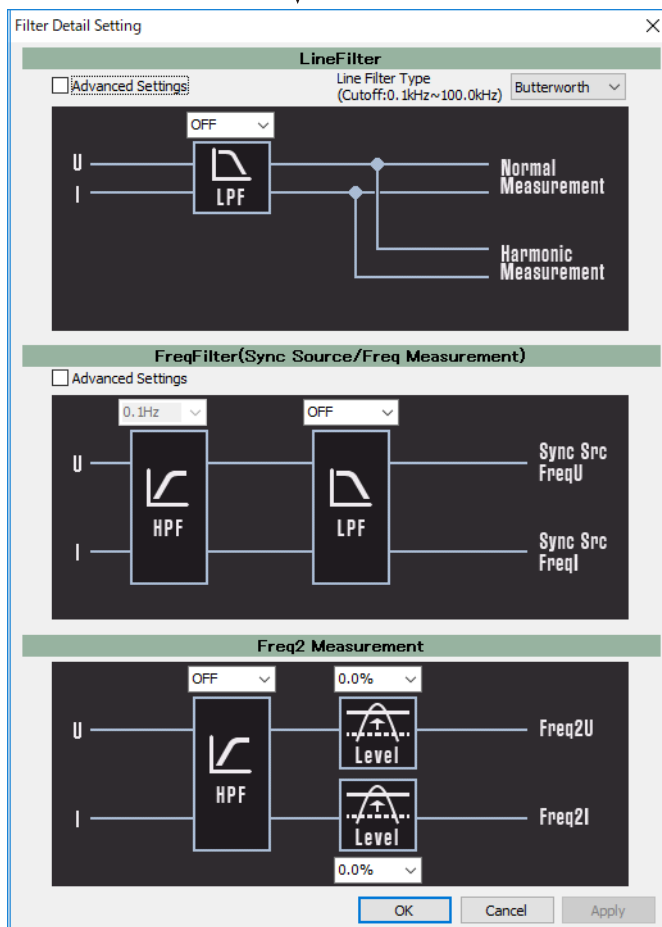
Synchronization Source



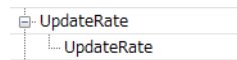
Filter



Appears only for the WT5000



Data Update Interval



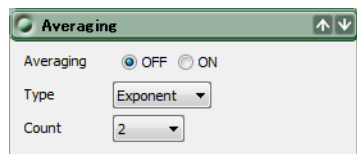
Note

For the WT5000, the setting range in this application is 50 ms to 20 s. Even when the value can be set outside this range on the WT, the range is changed to this setting range in this application.*

* The update interval setting range on the WT5000 varies depending on the firmware version.

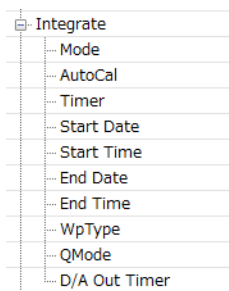
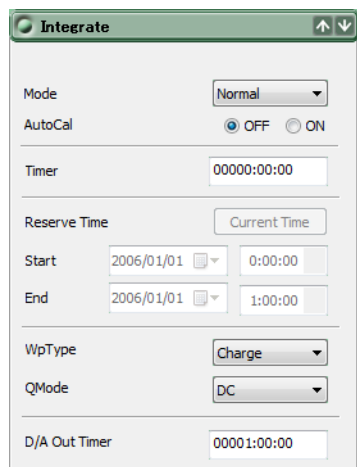
For details, see the WT5000 user's manual.

Averaging



Integration

- WT3001E/WT3002E/WT3003E/WT3004E
- WT3000 (760301/760302/760303/760304)
- WT500 (760201/760202/760203)



5.1 WT Configuration

- WT5000
- WT1801E/WT1802E/WT1803E/WT1804E/WT1805E/WT1806E
- WT1800 (WT1801/WT1802/WT1803/WT1804/WT1805/WT1806)

Integration can be controlled individually on each element (when Individual Control is set to ON).

Integration

Independent Control: OFF ON

Mode: Normal

AutoCal: OFF ON

Timer: 00000:00:00

Reserve Time: Current Time

Start: 2011/01/01 0:00:00

End: 2011/01/01 1:00:00

WpType: Charge

QMode: DC

D/A Output Rated Time: 00001:00:00

When Individual Control is set to OFF

	WT1 Common	WT1 Element1	WT1 Element2	WT1 Element3	WT1 Element4	WT1 Element5	WT1 Element6
Integration							
Independent Control	OFF						
Mode	Normal						
AutoCal	OFF						
Timer	00000:00:00						
Start Date	2017/04/26						
Start Time	10:09:00						
End Date	2017/04/26						
End Time	10:09:00						
WpType		Charge	Charge	Charge	Charge	Charge	Charge
QMode		DC	DC	DC	DC	DC	DC
D/A Output Rated Ti...	00001:00:00						

All elements are controlled simultaneously.

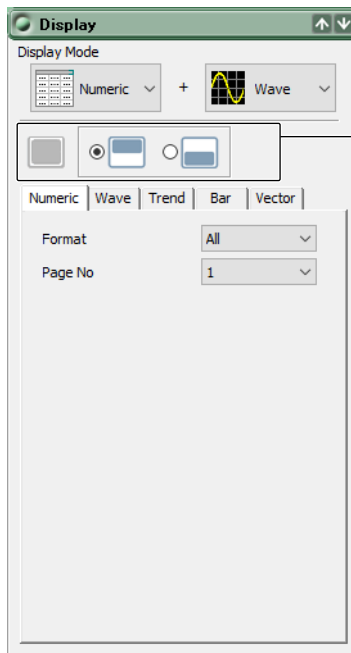
When Individual Control is set to ON

	WT1 Common	WT1 Element1	WT1 Element2	WT1 Element3	WT1 Element4	WT1 Element5	WT1 Element6
Integration							
Independent Control	ON						
Mode	Normal						
AutoCal	OFF						
Timer	00000:00:00	00000:00:00	00000:00:00	00000:00:00	00000:00:00	00000:00:00	00000:00:00
Start Date	2017/04/26	2011/01/01	2011/01/01	2011/01/01	2011/01/01	2011/01/01	2011/01/01
Start Time	10:09:00	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00
End Date	2017/04/26	2011/01/01	2011/01/01	2011/01/01	2011/01/01	2011/01/01	2011/01/01
End Time	10:09:00	1:00:00	1:00:00	1:00:00	1:00:00	1:00:00	1:00:00
WpType		Charge	Charge	Charge	Charge	Charge	Charge
QMode		DC	DC	DC	DC	DC	DC
D/A Output Rated Ti...	00001:00:00						

Each element is controlled individually.

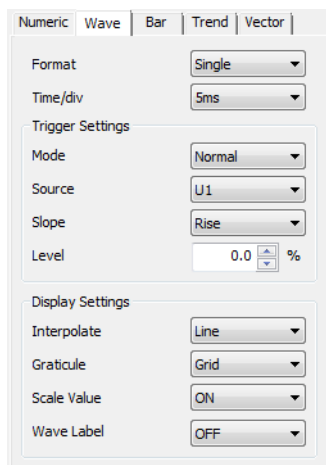
Display

Display with the
 WT5000,
 WT3001E/WT3002E/WT3003E/WT3004E,
 WT3000 (760301/760302/760303/760304),
 WT1801E/WT1802E/WT1803E/WT1804E/WT1805E/WT1806E,
 WT1800 (WT1801/WT1802/WT1803/WT1804/WT1805/WT1806),
 WT500 (760201/760202/760203)

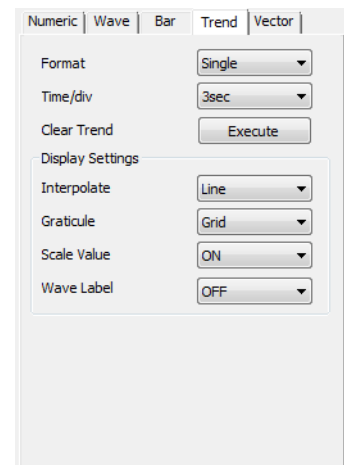


Appears only for the WT5000
 Set the target to single screen, top half of the split screen, or bottom half of the split screen

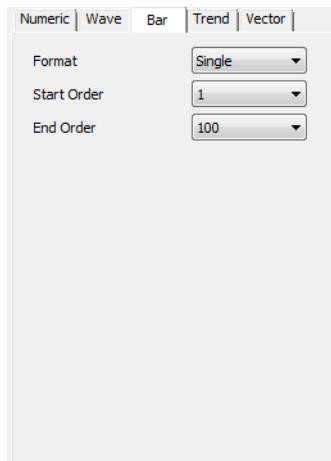
Numeric data



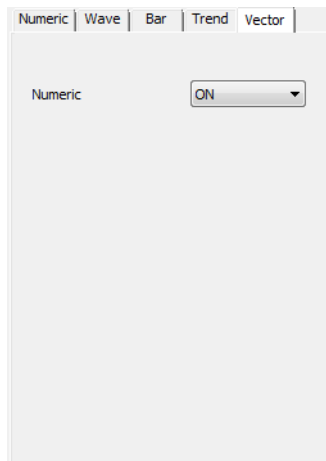
Waveform



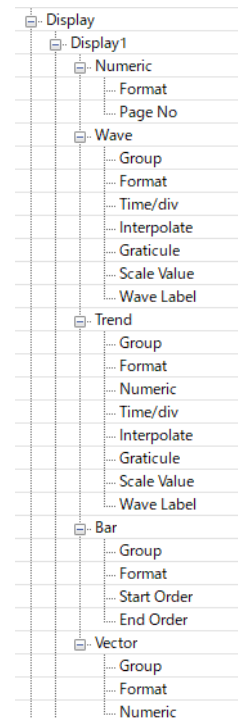
Trend



Bar graph

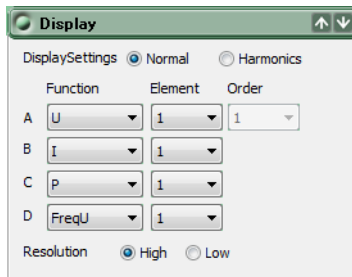


Vector

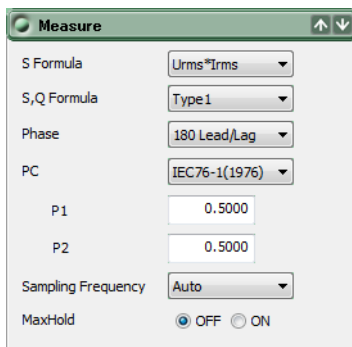


5.1 WT Configuration

Display with the
WT310E/WT310EH/WT332E/WT333E or
WT310/WT310HC/WT330(WT332/WT333)



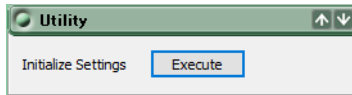
Numeric Measurement



Measure
S Formula
S,Q Formula
Phase
PC
P1
P2
Sampling Frequency
MaxHold

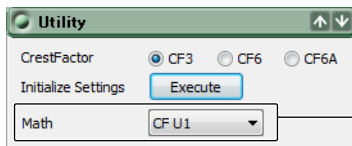
Utility

Display with the WT5000



The crest factor is set in the range configuration described earlier.

Display with the
WT3001E/WT3002E/WT3003E/WT3004E,
WT3000 (760301/760302/760303/760304),
WT1801E/WT1802E/WT1803E/WT1804E/WT1805E/WT1806E,
WT1800 (WT1801/WT1802/WT1803/WT1804/WT1805/WT1806),
WT500 (760201/760202/760203),
WT310E/WT310EH/WT332E/WT333E, or
WT310/WT310HC/WT330(WT332/WT333)



Utility
CrestFactor
Math

Appears only for the
WT310E/WT310EH/WT332E/WT333E or
WT310/WT310HC/WT330(WT332/WT333)

User-Defined Function

The first screenshot shows the 'User Define Function' dialog box. It contains a list of functions and their corresponding expressions:

Function	Expression
Function1	WH(E1)/(ITIME(E1)/3600)
Function2	P(E1)-P(E2)
Function3	(UPPK(E1)-IMPKE(E1))/2/UDC(E1)*
Function4	(IPPK(E1)-IMPKE(E1))/2/IDC(E1)*10
Function5	DELTAU1RMS(SA)
Function6	DELTAU2RMS(SA)
Function7	DELTAU3RMS(SA)
Function8	DELTAU1MN(SA)
Function9	DELTAU2MN(SA)
Function10	DELTAU3MN(SA)
Function11	360-PHIU1U3(SA)+PHIU1U2(SA)
Function12	PHIU1I2(SA)-PHIU1I1(SA)
Function13	PHIU3I3(SA)-PHIU2I2(SA)-F11()
Function14	(360-PHIU3I3(SA))+PHIU1I1(SA)+
Function15	PPPK(E1)-PMPK(E1)
Function16	DELTAU1RMN(SA)
Function17	DELTAU2RMN(SA)
Function18	DELTAU3RMN(SA)
Function19	DELTAU1DC(SA)
Function20	DELTAU2DC(SA)

The second screenshot shows a 'Calculator' window with the expression $WH(E1)/(ITIME(E1)/3600)$ entered in the input field. The calculator interface includes a numeric keypad, parentheses, a clear button, and a function selection area with 'Item', 'Function', and 'K' options.

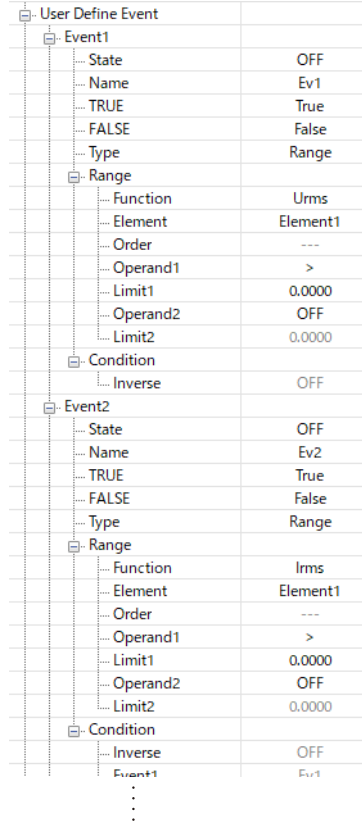
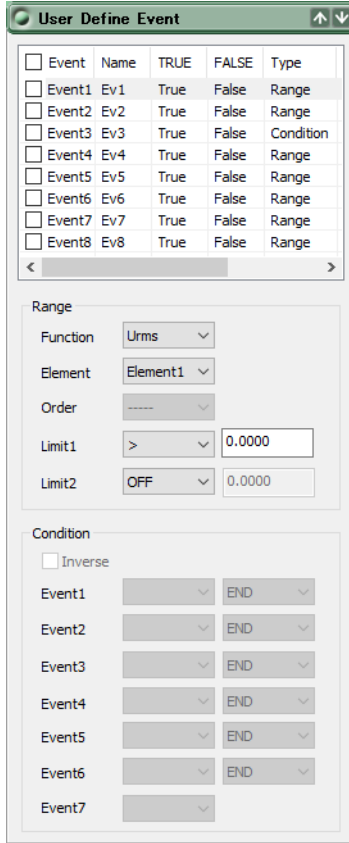
The third screenshot shows a 'Detail Setting' dialog box with a table of constant values:

Property	Value
Detail Setting	
Constant	
K1	1
K2	1
K3	1
K4	1
K5	1

User Defined Event

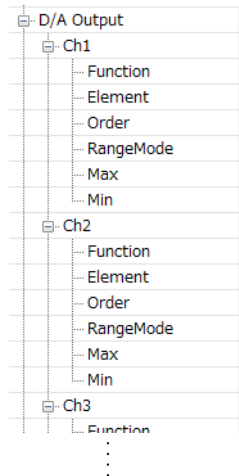
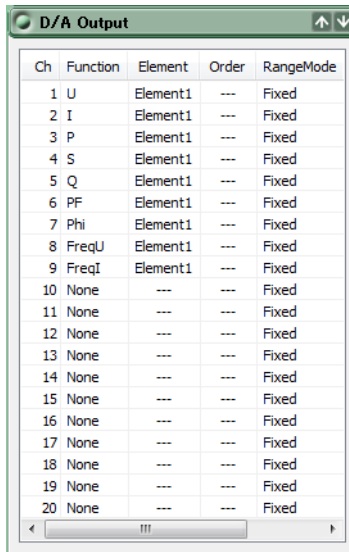
You can configure user defined event in the following situations.

- WT5000
- The /G6 option is installed in the WT1801E/WT1802E/WT1803E/WT1804E/WT1805E/WT1806E.
- The /G6 option is installed in the WT1800(WT1801/WT1802/WT1803/WT1804/WT1805/WT1806).

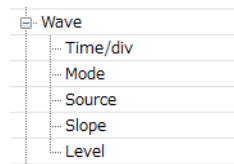
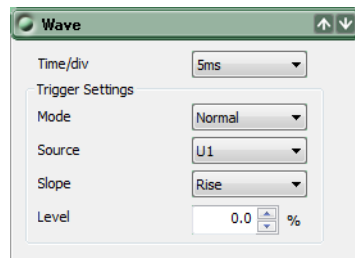


D/A Output

You can configure the D/A output if the /DA option is installed in the WT.



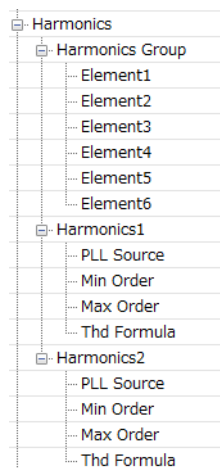
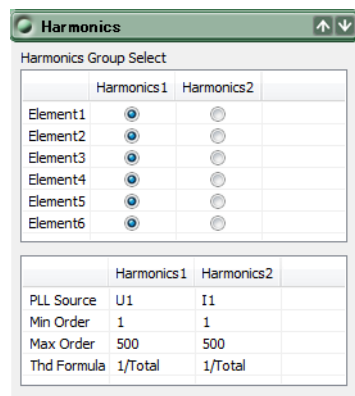
Waveform



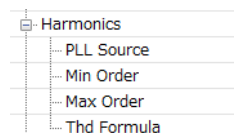
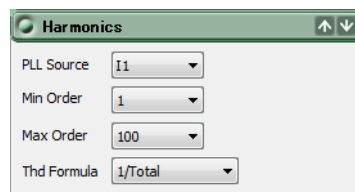
Harmonic Measurement

You can configure harmonics in the following situations.

- WT5000
- The /G6 option is installed in the WT1801E/WT1802E/WT1803E/WT1804E/WT1805E/WT1806E.
- The /G6 option is installed in the WT1800(WT1801/WT1802/WT1803/WT1804/WT1805/WT1806).



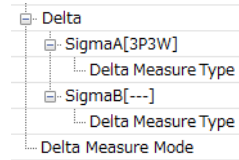
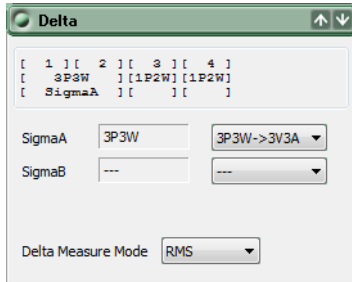
- The /G5 or /G6 option is installed in a model other than the above.



Delta Computation

You can set delta computation in the following cases.

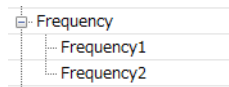
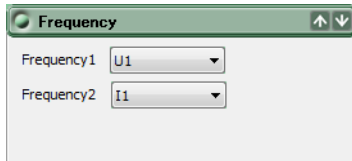
- WT5000
- The /DT option is installed in any of the following models.
 - WT3000 (760301/760302/760303/760304)
 - WT1800 (WT1801/WT1802/WT1803/WT1804/WT1805/WT1806)
 - WT500 (760201/760202/760203)



Frequency Measurement

On the following models, you can configure frequency measurement if the /FQ option is not installed.

- WT3001E/WT3002E/WT3003E/WT3004E
- WT3000 (760301/760302/760303/760304)
- WT1800 (WT1801/WT1802/WT1803/WT1804/WT1805/WT1806)
- WT500 (760201/760202/760203)



Motor

You can configure motor settings in the following situations.

- An /MTR option is installed in the WT3001E/WT3002E/WT3003E/WT3004E.
- The WT3000 (760301/760302/760303/760304) suffix code is -MV.
- An /MTR option is installed in the WT1801E/WT1802E/WT1803E/WT1804E/WT1805E/WT1806E.
- An /MTR option is installed in the WT1800 (WT1801/WT1802/WT1803/WT1804/WT1805/WT1806).

The screenshot shows the 'Motor' configuration window with the following settings:

- Speed:** Scaling: 1.0000, Unit: rpm
- Torque:** Scaling: 1.0000, Unit: Nm
- PM:** Scaling: 1.0000, Unit: W
- SenseType:** Analog (for both Speed and Torque)
- Range:** 20V (for both Speed and Torque)
- LineFilter:** OFF
- SyncSource:** None

	Speed	Torque
SyncSpeed-Pole	2	
SyncSpeed-Source	11	
Pulse N	60	
Pulse Rated Upper		50.0000
Pulse Rated Upper Freq		15000Hz
Pulse Rated Lower		-50.0000
Pulse Rated Lower Freq		5000Hz
Pulse Range Upper	10000.0000	50.0000
Pulse Range Lower	0.0000	-50.0000

The screenshot shows the Motor configuration tree view with the following structure:

- Motor
 - PM Scaling
 - PM Unit
 - LineFilter
 - SyncSource
 - Speed
 - Scaling
 - Unit
 - SenseType
 - Range
 - SyncSpeed-Pole
 - SyncSpeed-Source
 - PulseRangeUpper
 - PulseRangeLower
 - Pulse N
 - Torque
 - Scaling
 - Unit
 - SenseType
 - Range
 - PulseRangeUpper
 - PulseRangeLower
 - PulseRatedUpper
 - PulseRatedLower
 - PulseRatedFreqU...
 - PulseRatedFreqL...

Note

On the WT5000, set the motor using Motor/AUX explained later.

5.1 WT Configuration

AUX

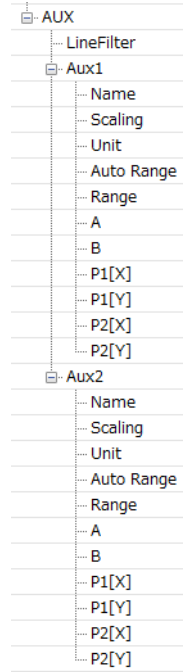
You can configure AUX settings in the following situations.

- An /AUX option is installed in the WT1801E/WT1802E/WT1803E/WT1804E/WT1805E/WT1806E.
- An /AUX option is installed in the WT1800 (WT1801/WT1802/WT1803/WT1804/WT1805/WT1806).

AUX
↑ ↓

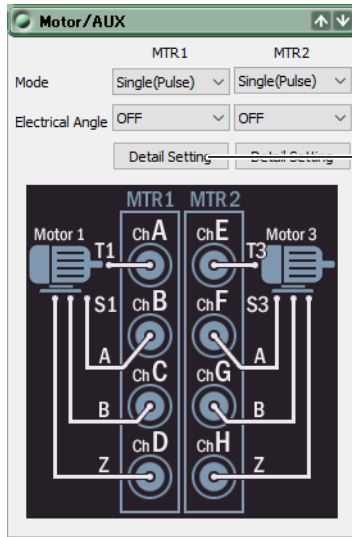
	Aux1	Aux2
Name	AUX1	AUX2
Scaling	1.0000	1.0000
Unit	kW/m2	kW/m2
Auto Range	OFF	OFF
Range	20V	20V
LineFilter	OFF	

	Aux1	Aux2
A	1.000E+00	1.000E+00
B	0.000E+00	0.000E+00
P1[X]	1.000E+00	1.000E+00
P1[Y]	1.000E+00	1.000E+00
P2[X]	-1.000E+00	-1.000E+00
P2[Y]	-1.000E+00	-1.000E+00



Motor/AUX

If the /MTR1 or /MTR2 option is installed in the WT5000, you can set Motor/AUX.



Motor/AUX
MTR1
Mode
Motor1
Speed
Scaling
Unit
SenseType
Analog Aut...
Analog Range
LineFilter
NoiseFilter
SyncSpeed...
SyncSpeed...
A
B
P1[X]
P1[Y]
P2[X]
P2[Y]
Pulse N
PulseRange...
PulseRange...
Torque
Scaling
Unit
SenseType
Analog Aut...
Analog Ran...
LineFilter
NoiseFilter
A
B
P1[X]
P1[Y]
P2[X]
P2[Y]
PulseRatedU...
PulseRatedF...
PulseRatedL...
PulseRatedF...
PulseRange...
PulseRange...
PM
PM Scaling
PM Unit
SyncSource
Motor2

5.1 WT Configuration

Ch Settings

MTR Detail Setting

Ch Settings | Electrical Angle

Motor1

Speed: Scaling 1.0000, Unit rpm

Torque: Scaling 1.0000, Unit Nm

PM: Scaling 1.0000, Unit W

SenseType: Speed Pulse, Torque Analog

Analog Auto Range: OFF, OFF

Analog Range: 20V, 20V

LineFilter: OFF, OFF

NoiseFilter: OFF, OFF

SyncSource: None

	Speed	Torque	Speed	Torque
SyncSpeed-Pole	2		----	----
SyncSpeed-Sou...	11		----	----
A	----	1.000E+0	----	----
B	----	0.000E+0	----	----
P1[X]	----	1.000E+0	----	----
P1[Y]	----	1.000E+0	----	----
P2[X]	----	-1.000E+0	----	----
P2[Y]	----	-1.000E+0	----	----
Pulse N	60		----	----
PulseRatedUpper		----	----	----
PulseRatedFreq...		----	----	----
PulseRatedLower		----	----	----
PulseRatedFreq...		----	----	----
PulseRangeUpper	10000.0000	----	----	----
PulseRangeLower	0.0000	----	----	----

Motor2

Speed: Scaling 1.0000, Unit rpm

Torque: Scaling 1.0000, Unit Nm

PM: Scaling 1.0000, Unit W

SenseType: Speed Pulse, Torque Analog

Analog Auto Range: OFF, OFF

Analog Range: 20V, 20V

LineFilter: OFF, OFF

NoiseFilter: OFF, OFF

SyncSource: None

	Speed	Torque	Speed	Torque
SyncSpeed-Pole	2		----	----
SyncSpeed-Sou...	11		----	----
A	----	1.000E+0	----	----
B	----	0.000E+0	----	----
P1[X]	----	1.000E+0	----	----
P1[Y]	----	1.000E+0	----	----
P2[X]	----	-1.000E+0	----	----
P2[Y]	----	-1.000E+0	----	----
Pulse N	60		----	----
PulseRatedUpper		----	----	----
PulseRatedFreq...		----	----	----
PulseRatedLower		----	----	----
PulseRatedFreq...		----	----	----
PulseRangeUpper	10000.0000	----	----	----
PulseRangeLower	0.0000	----	----	----

Motor3

Speed: Scaling 1.0000, Unit rpm

Torque: Scaling 1.0000, Unit Nm

PM: Scaling 1.0000, Unit W

SenseType: Speed Pulse, Torque Analog

Analog Auto Range: OFF, OFF

Analog Range: 20V, 20V

LineFilter: OFF, OFF

NoiseFilter: OFF, OFF

SyncSource: None

	Speed	Torque	Speed	Torque
SyncSpeed-Pole	2		----	----
SyncSpeed-Sou...	11		----	----
A	----	1.000E+0	----	----
B	----	0.000E+0	----	----
P1[X]	----	1.000E+0	----	----
P1[Y]	----	1.000E+0	----	----
P2[X]	----	-1.000E+0	----	----
P2[Y]	----	-1.000E+0	----	----
Pulse N	60		----	----
PulseRatedUpper		----	----	----
PulseRatedFreq...		----	----	----
PulseRatedLower		----	----	----
PulseRatedFreq...		----	----	----
PulseRangeUpper	10000.0000	----	----	----
PulseRangeLower	0.0000	----	----	----

Motor4

Speed: Scaling 1.0000, Unit rpm

Torque: Scaling 1.0000, Unit Nm

PM: Scaling 1.0000, Unit W

SenseType: Speed Pulse, Torque Analog

Analog Auto Range: OFF, OFF

Analog Range: 20V, 20V

LineFilter: OFF, OFF

NoiseFilter: OFF, OFF

SyncSource: None

	Speed	Torque	Speed	Torque
SyncSpeed-Pole	2		----	----
SyncSpeed-Sou...	11		----	----
A	----	1.000E+0	----	----
B	----	0.000E+0	----	----
P1[X]	----	1.000E+0	----	----
P1[Y]	----	1.000E+0	----	----
P2[X]	----	-1.000E+0	----	----
P2[Y]	----	-1.000E+0	----	----
Pulse N	60		----	----
PulseRatedUpper		----	----	----
PulseRatedFreq...		----	----	----
PulseRatedLower		----	----	----
PulseRatedFreq...		----	----	----
PulseRangeUpper	10000.0000	----	----	----
PulseRangeLower	0.0000	----	----	----

Electrical Angle

MTR Detail Setting

Ch Settings | Electrical Angle

Electrical Angle Correction

Electrical Angle Measurement: Motor1 OFF, Motor3 OFF

Correction Value: Motor1 0.00, Motor3 0.00

Auto Enter Target: Motor1 U1, Motor3 U1

Auto Enter Correction:

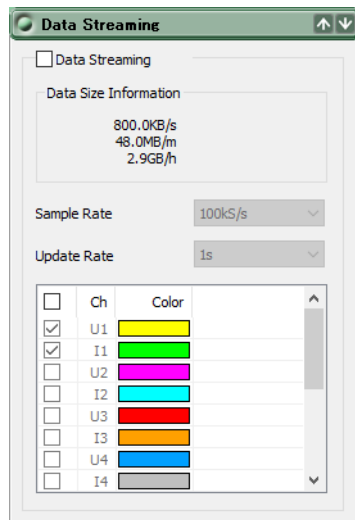
Harmonics Trigger

Hrm 1:Z Phase1(CHD)
Hrm 2:Z Phase1(CHD)

	Hrm Element Group	Valid EA Items
Element1	Hrm 1	
Element2	Hrm 1	

Data Streaming

You can set data streaming when the WT5000 has the /DS option and the WT5000 is connected through USB3 or better or Gigabit Ethernet or better.



Data Streaming	ON
Sample Rate	100kS/s
Update Rate	1s

Note

Even when the update interval can be set to a value less than 1 s on the WT5000, the update interval in this application is fixed to 1 s.*

* The update interval setting range on the WT5000 varies depending on the firmware version.

For details, see the WT5000 user's manual.

Extended User-Defined Function

The extended user-defined function expands the user-defined function on the WT. It can be used to compute numeric data by using expressions that combine the measured values of several WTs in this software.

The first screenshot, titled "Ex User Define Function", displays a table with the following data:

Function	Expression	Unit
WF01	URMS(WT1,E1)	V
WF02	URMS(WT1,E1)	V
WF03	URMS(WT1,E1)	V
WF04	URMS(WT1,E1)	V
WF05	URMS(WT1,E1)	V
WF06	URMS(WT1,E1)	V
WF07	URMS(WT1,E1)	V
WF08	URMS(WT1,E1)	V
WF09	URMS(WT1,E1)	V
WF10	URMS(WT1,E1)	V
WF11	URMS(WT1,E1)	V
WF12	URMS(WT1,E1)	V
WF13	URMS(WT1,E1)	V
WF14	URMS(WT1,E1)	V
WF15	URMS(WT1,E1)	V
WF16	URMS(WT1,E1)	V
WF17	URMS(WT1,E1)	V
WF18	URMS(WT1,E1)	V
WF19	URMS(WT1,E1)	V
WF20	URMS(WT1,E1)	V

The second screenshot, titled "Calculator", shows the expression $URMS(WT1,E1)$ entered into the calculator interface. The interface includes a numeric keypad, a function keypad with "Item", "Function", "K", and "WF" options, and a "Detail Setting" button.

The third screenshot, titled "Detail Setting", shows a table for configuring constants:

Property	Value
Detail Setting	
Constant	
K1	1
K2	1
K3	1
K4	1
K5	1

Setting the Operand Parameters

Set the operand parameters using (,).

- **(,) Notation**

Set the symbol indicating the WT main unit on the left side and the symbol indicating the element on the right side. For example, write (WT1, E1).

- Symbols indicating the WT main units
WT1 to WT4 : WT main unit 1 to 4
- Symbols indicating the elements
E1 to E9: Element 1 to Element 9

Operators

Operators	Expression Examples	Description
SIN	SIN(URMS(WT1,E1))	sine
COS	COS(URMS(WT1,E1))	cosine
TAN	TAN(URMS(WT1,E1))	Tangent


Note

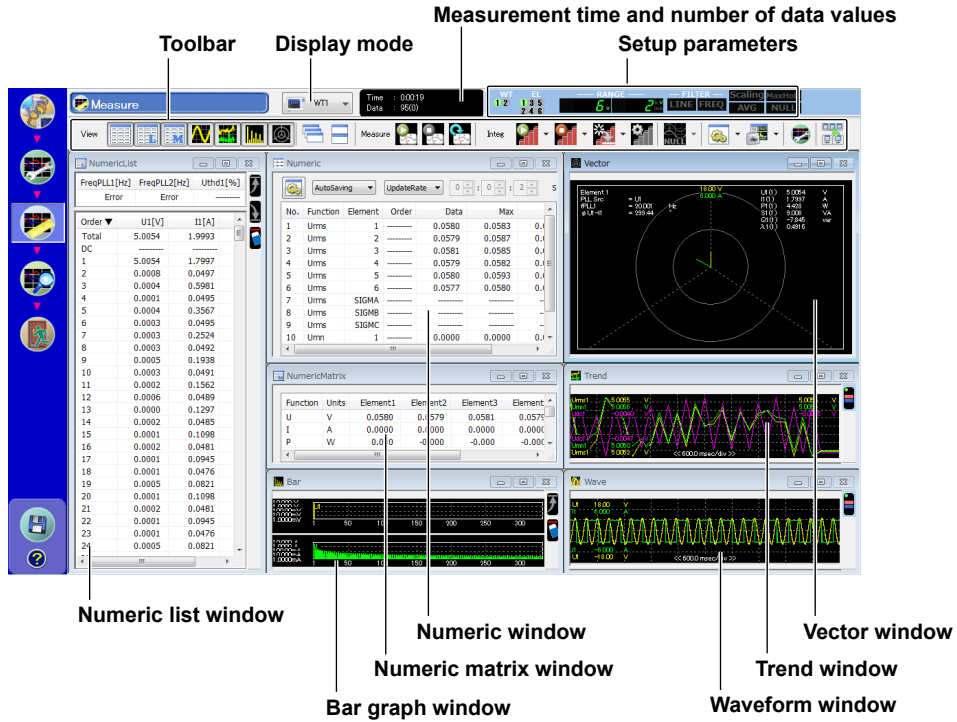
- For details on the user-defined function, see the WT User's Manual.
- Unit of the trigonometric function (SIN, COS, TAN) parameters
 - If the software version is 1.39 or earlier, the unit of trigonometric function parameters is radians.
 - If the software version is 1.42 or later, the unit of trigonometric function parameters is degrees.

6.1 Measurement Screen

The display example, setting items, and setting range of the description vary depending on the following factors.

- The WT model
- The number of elements installed in the WT and the presence or absence of options

1. Click  in the menu area. The measurement screen appears.

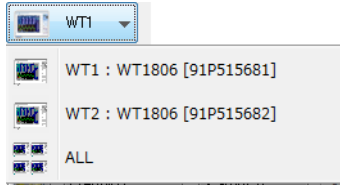


The screenshot shows the Measurement Screen interface with several components labeled:

- Toolbar**: Located at the top left, containing various measurement and display icons.
- Display mode**: Located at the top center, showing the current measurement mode (WT1).
- Measurement time and number of data values**: Located at the top right, showing time (00:19) and data values (12, 13, 5, 2, 4, 6).
- Setup parameters**: Located at the top right, showing scaling and other settings.
- Numeric list window**: Located on the left side, displaying a table of measurement data.
- Numeric window**: Located in the center, displaying a table of measurement data.
- Numeric matrix window**: Located in the center, displaying a table of measurement data.
- Bar graph window**: Located at the bottom left, displaying a bar graph of measurement data.
- Vector window**: Located on the right side, displaying a vector plot.
- Trend window**: Located in the center, displaying a trend plot of measurement data.
- Waveform window**: Located at the bottom right, displaying a waveform plot of measurement data.

Unavailable icons, setting boxes, and setup parameters appear dimmed.

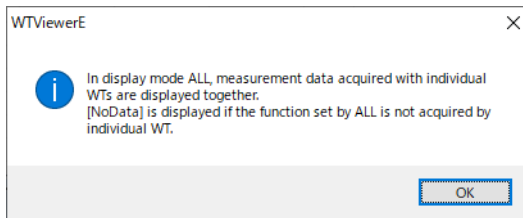
Display Mode



You can select the WT of which to display the measured data.

- ALL: Measured data of all WTs is displayed. This is useful in collectively comparing the measured data of individual WTs (WT1, WT2, etc.). Note that measured data not loaded into this software will not be displayed.
- WT: Measured data of individual WTs (WT1, WT2, etc.) is displayed.

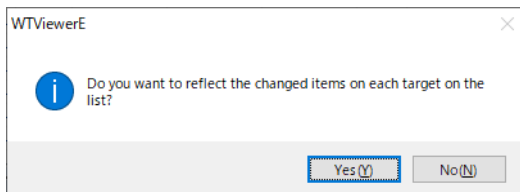
After an online connection is established, when the display mode is switch to ALL the first time, the Numeric - Item Setting of each WT is automatically reflected to the ALL Numeric - Item Setting. The following message appears.



Then, if you switch from ALL to each WT, change the Numeric - Item Setting of each WT, and change to ALL again, the Numeric - Item Setting of each WT will not be automatically reflected to the ALL Numeric - Item Setting.

To reflect the Numeric - Item Setting of each WT to the ALL Numeric - Item Setting, select Numeric - Item Setting in the detail setting dialog box in the numeric data display area.

The following message appears.

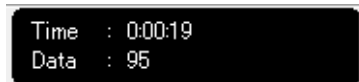


Select whether to reflect the changed Numeric - Item Setting of each WT (target) to the ALL Numeric - Item Setting.

Yes: The Numeric - Item Setting of each WT is synchronized with the ALL Numeric - Item Setting.

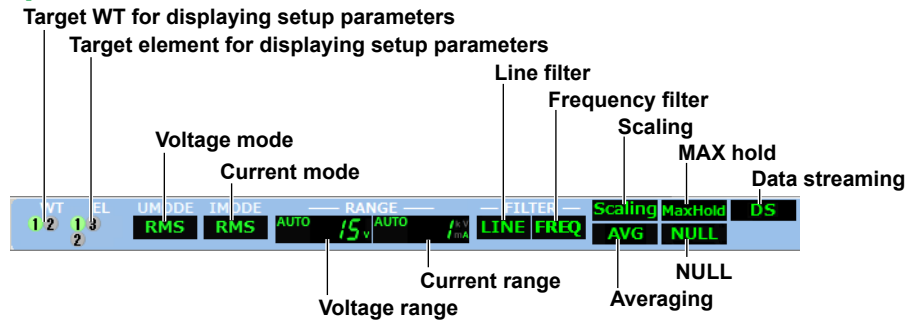
No: The Numeric - Item Setting of each WT is kept separate from the ALL Numeric - Item Setting.

Elapsed Time of Measurement and Number of Data Values

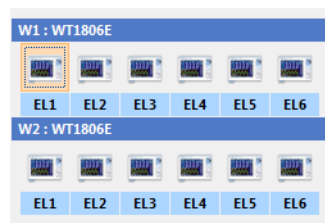


Elapsed time from the start of measurement and the number of data values are displayed.

Setup Parameters



Target WT or target element for displaying setup parameters



You can select the target WT or the target element for displaying setup parameters.

Voltage Mode, Current Mode, Voltage Range, and Current Range

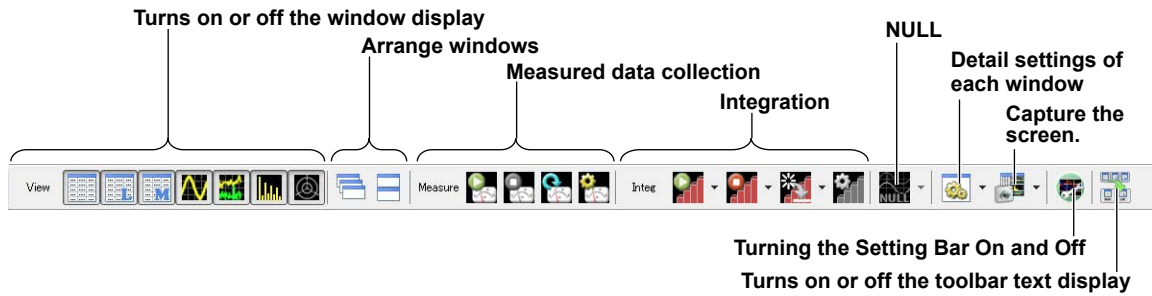
The current settings are displayed. For details on changing the settings, see chapter 5.

Line Filter, Frequency Filter, Scaling, MAX Hold, Averaging, NULL, and Data Streaming

- ON: Displayed in green
- OFF: Displayed in gray

For details on changing the settings, see chapter 5.

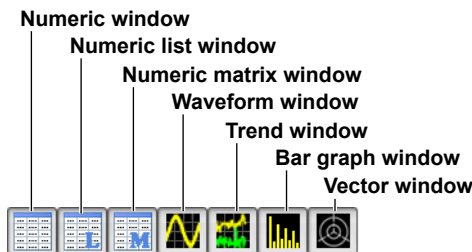
Toolbar



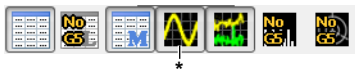
Turning On and Off the Window Display (View Icons)

Turns on or off each window display.

- Models with the harmonic measurement (/G5), simultaneous dual harmonic measurement (/G6), or advanced computation (/G6) option



- Models without the harmonic measurement (/G5), simultaneous dual harmonic measurement (/G6), and advanced computation (/G6) option



- If harmonic measurement (/G5) is not installed in the following models, a “No G5” icon is displayed in place of the waveform window icon, and the waveform window cannot be displayed.
 - WT310E/WT310EH/WT332E/WT333E
 - WT310/WT310HC/WT330(WT332/WT333)

Arranging Windows



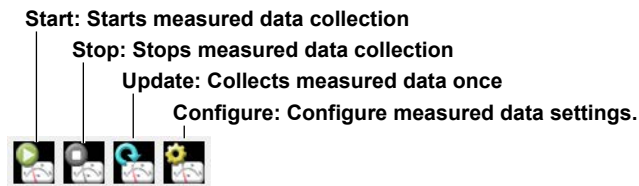
Cascade

- Displayed windows are cascaded so that all the window titles can be seen.
- The active window will be shown in front of all cascaded windows.
- The order in which the windows are cascaded varies depending on the types of windows that are being displayed.

Tile

- All displayed windows are tiled.
- The order in which the windows are arranged varies depending on the types of windows that are being displayed. The numeric list window is always shown vertically in the left edge.

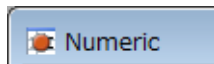
Collecting Measured Data (Measurement Icons)



Starting Measured Data Collection


The software collects data from the WT after the data on the WT is updated and then displays the data. While data is being collected, the Integ-Setup icon, View-Set icon, and Snapshot icon are unavailable.

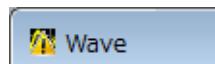
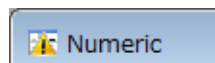
While data is being acquired from the WT, a  icon blinks in the title bar of the numeric window.



Note

Low measured data communication performance icon

If the communication performance declines and there is a possibility that problems are occurring in the acquisition of measured data, a  icon appears. The icon appears on the title bar of the numeric window and waveform window.



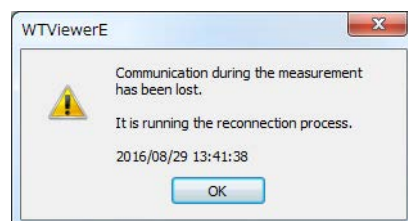
If this icon appears, the measured data acquired from the WT and saved in a CSV file may have dropouts. To avoid this problem, the following measures can be taken.

- Change to a high-speed interface (see section 10.1).
- Make the update rate longer. (See section 5.1.)
- Turn the waveform display off. (See section 6.5.)
- Increase the PC performance (specs).
- Decrease the number of multiple connections.

Cutoff and resume action of communication

While acquiring data, if there is no response from the peer WT for the following reasons, a message will be displayed.

- The power to the peer WT or hub is cut off (e.g., power failure).
- The communication cable is disconnected.



If communication is restored after the message is displayed, the software automatically resumes waveform data acquisition.

On the following models, the integration resume action that is taken when the power recovers can be selected with the “integration resume function at power failure recovery” setting.

- WT1801E/WT1802E/WT1803E/WT1804E/WT1805E/WT1806E
 - See chapter 9 of features guide IM WT1801E-01EN.
 - See section 8.4 of user’s manual IM WT1801E-02EN.
- WT1800 (WT1801/WT1802/WT1803/WT1804/WT1805/WT1806)

6.1 Measurement Screen

Collecting Measured Data Once

The software collects data from the WT once and then displays the data.

Before collection is started or when Stop is clicked



When Start is clicked



When Update is clicked



All icons are unavailable until the data collection is complete.

Note

To collect measured data for windows other than those that are currently shown, click the relevant viewer icons to show the windows, and then start data collection.

Stopping Measured Data Collection

Stops collecting measured data from the WT.

Configuring Measured Data Settings

Set the conditions for using WT5000 data streaming.

For details on the conditions for using data streaming, see section 1.3.



Measurement Setup

Data Streaming

Data Size Information
1.6MB/s
96.0MB/m
5.8GB/h

Sample Rate: 200kS/s

Update Rate: 1s

<input type="checkbox"/>	Ch	Color
<input checked="" type="checkbox"/>	U1	Yellow
<input checked="" type="checkbox"/>	I1	Green
<input type="checkbox"/>	U2	Magenta
<input type="checkbox"/>	I2	Cyan
<input type="checkbox"/>	U3	Red
<input type="checkbox"/>	I3	Orange
<input type="checkbox"/>	U4	Blue
<input type="checkbox"/>	I4	Grey
<input type="checkbox"/>	U5	Dark Blue
<input type="checkbox"/>	I5	Teal
<input type="checkbox"/>	U6	Purple
<input type="checkbox"/>	I6	Dark Blue
<input type="checkbox"/>	U7	Olive
<input type="checkbox"/>	I7	Dark Red
<input type="checkbox"/>	Speed1	Grey
<input type="checkbox"/>	Torque1	White
<input type="checkbox"/>	Speed2	Yellow
<input type="checkbox"/>	Torque2	Green
<input type="checkbox"/>	Speed3	Magenta
<input type="checkbox"/>	Torque3	Cyan
<input type="checkbox"/>	Speed4	Red
<input type="checkbox"/>	Torque4	Orange

OK Cancel Apply

Turns data streaming on or off

Select the waveform to acquire using data streaming and the display color.

These settings are shared with those of the Detail Setting dialog box in section 6.5, "Waveform Display."

Integration



Starting Integration

Integration on all elements installed in the WT will start.

Check the following points before starting integration.

- Set measurement functions and elements so that integrated values appear in the numeric window.
- The software must collect values integrated on the WT; otherwise integrated values will not appear even if you start integration. Therefore, start data collection first, and then start integration.

Pausing and Stopping Integration

Integration on all elements installed in the WT will be paused.

- If you click Stop before the specified integration time is reached, integration is paused. If you click Start in this condition, integration will resume.
- If integration is paused or if the specified integration time has been reached and integration is finished, click Reset and then Start to reset and start integration from the beginning.

Resetting Integration

Integration on all elements installed in the WT will be reset.

- If you click Reset, the integrated data in the WT will be cleared, but the integrated values of this software will remain.
- If integrated values are displayed in the numeric window of the software, the integrated values will remain displayed. If you start integration again, the integrated values will be updated.

6.1 Measurement Screen

Setting Integration Parameters

The integration setting dialog box appears.



Click

Item	Setting	Element1	Element2	Element3	Element4	Element5	Element6
WP type	All	Charge	Charge	Charge	Charge	Charge	Charge
Q mode	All	DC	DC	DC	DC	DC	DC

Turns individual control on and off

- WT5000
- WT1801E/WT1802E/WT1803E/WT1804E/WT1805E/WT1806E
- WT1800(WT1801/WT1802/WT1803/WT1804/WT1805/WT1806)

Integration mode

Integration timer (hour:minute:second)

Scheduled times for real-time integration

For each element, set the

- Watt hours for each polarity
- Current integration mode

Integration D/A output timer

All: If any of the items from Element 1 to Element 7 is changed, the items of all elements are set collectively.

Each: The element whose item is changed is set.

When Individual Control Is Set to ON

For each element, set the

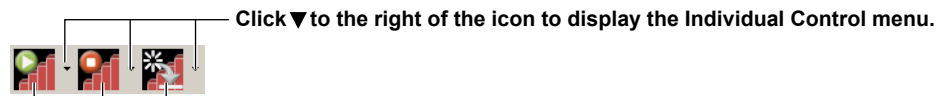
- Watt hours for each polarity
- Current integration mode

All: If any of the items from Element 1 to Element 7 is changed, the items of all elements are set collectively.

Each: The element whose item is changed is set.

Individual Integration of Each Element

When Individual Control is set to ON, the selected element can be controlled individually (start, stop, reset).



Toolbar

When Individual Control is set to ON, elements with the Object check box selected on the Individual Control screen will be controlled.

Selects all elements to be controlled.

Start, stop, or reset all elements.

Start, stop, or reset Element 1 to Element 7 individually.

Select the element you want to control.

Individual control (start, stop, reset) through the toolbar is executed on the Objects with the check box selected.

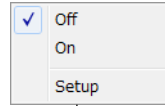
Integration status of each element

NULL

Click here to switch between NULL On and Off.



Click here to show a menu for setting NULL On and Off.



Click here to show the Null Setup screen.

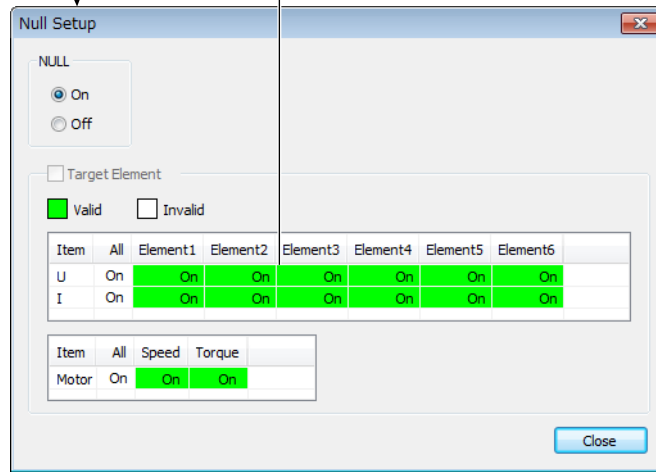
- WT5000
- WT1801E/WT1802E/WT1803E/WT1804E/WT1805E/WT1806E
- WT1800(WT1801/WT1802/WT1803/WT1804/WT1805/WT1806)

All:

On, hold, or off is set on all elements collectively.

Element 1 to Element 7:

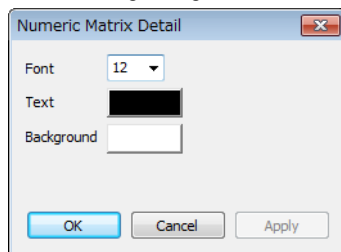
On, hold, or off is set on the controlled element.



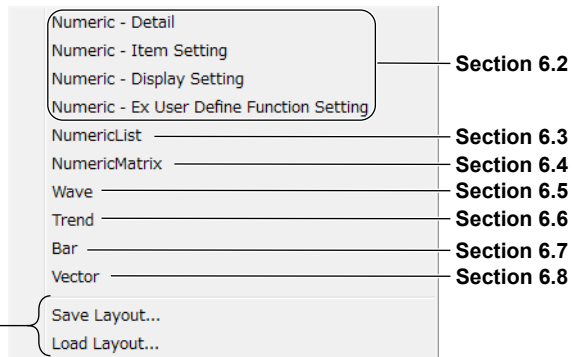
Detail Settings of Each Window (View-Set icon)



Click here to show the detail setting dialog box for the active window. The example below is the numeric matrix setting dialog box.



Click here to show a menu for selecting the detail setting dialog box.



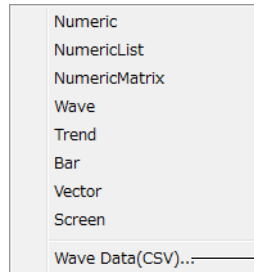
Save the layout of each measurement window to a file. File name extension: mvl
Saved layout information can also be loaded.

Capturing the Screen (Snapshot icon)



Click here to capture the entire screen in BMP format.

Click here to select the window to capture in BMP format.



Save waveform display data in CSV format.

Location Where Files Are Saved In

The files are saved to the following folder. You cannot change the location.

C:\Users\\My Documents\YOKOGAWA\WTVviewerE\DATA

File Names

The following file names are used. You cannot change them.

- Entire screen
Screen_All_yyyymmddhhmmss.bmp
- A specific window

Numeric:	Screen_Numeric_yyyymmddhhmmss.bmp
Numeric list:	Screen_NumericList_yyyymmddhhmmss.bmp
Numeric matrix:	Screen_NumericMatrix_yyyymmddhhmmss.bmp
Waveform:	Screen_Wave_yyyymmddhhmmss.bmp
Trend:	Screen_Trend_yyyymmddhhmmss.bmp
Bar graph:	Screen_Bar_yyyymmddhhmmss.bmp
Vector:	Screen_Vector_yyyymmddhhmmss.bmp

yyymmddhhmmss is a 14-digit number consisting of the year, month, day, hour, minute, and second. The year is four digits; the hour is based on a 24-hour clock.

Saving Waveform Data (CSV)

You can export the waveform data shown in the waveform window to a CSV file.

After selecting an item from the menu, you can set the file save destination folder and file name as you like.

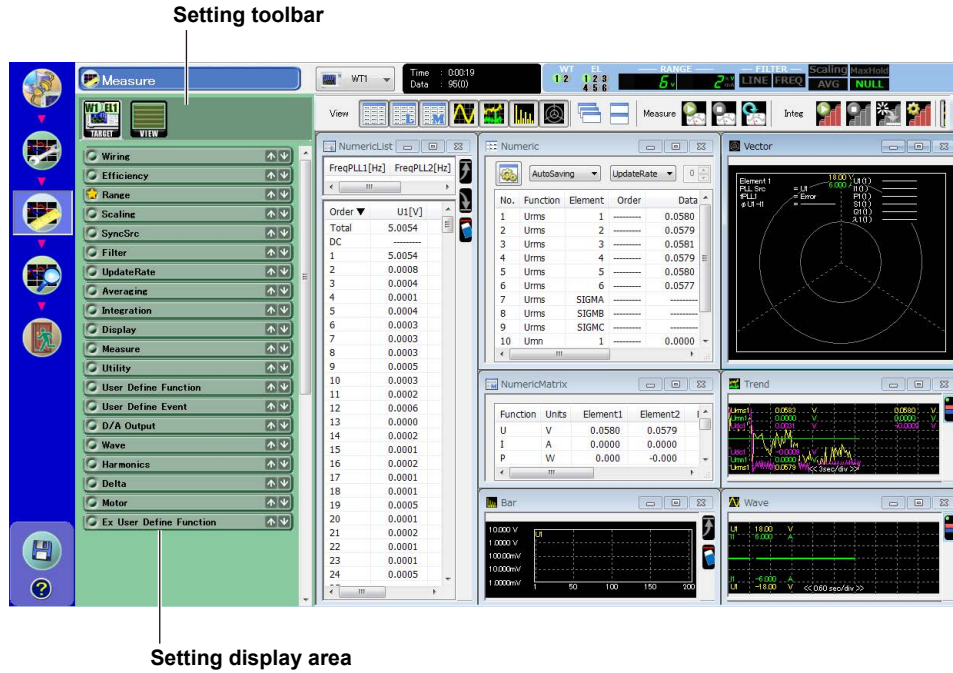
Turning the Setting Bar On and Off



The setting bar consisting of the setting toolbar and setting display area turns on and off every time you click the icon.

The setting bar allows you to change the WT main unit settings from the Measure screen.

For the operating procedure, see section 5.1.



Note

Analysis data is not acquired while the setting bar is shown.

To acquire analysis data, you need to perform measurements with the setting bar hidden.

If you change settings from the setting bar while a measurement is in progress, the continuity of measured data may be lost, and data may be cut off.

When the WT5000 data streaming is set to on, if you start a measurement with the setting bar displayed, the setting bar disappears.

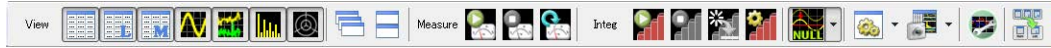
When the WT5000 data streaming setting is changed from off to on, the setting bar is hidden.

Turning On or Off the Toolbar Text Display (Toolbar icon)

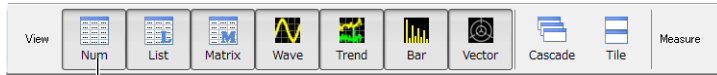


The toolbar text display toggles on and off every time you click the icon.

Text display: OFF

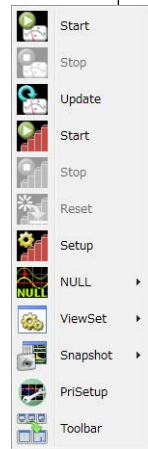


Text display: ON



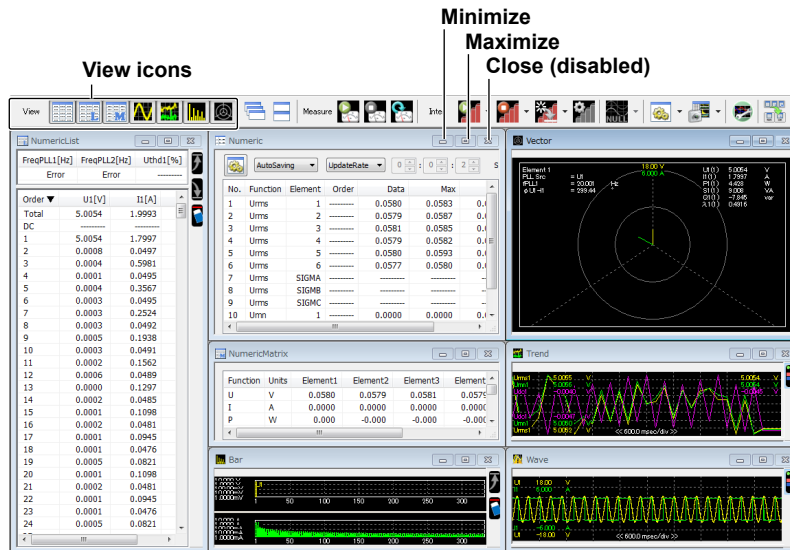
Toolbar text

Click here to show the icons that do not fit on the screen.



Measurement Screen

When you start the software for the first time, all possible windows are displayed tiled.



- You can maximize or minimize any measurement window.
- After you maximize a window, you can click a window arrange icon (Cascade or Tile) to clear the maximization and arrange the windows as specified.
- To close a measurement window, click the corresponding view icon. The close button at the upper right of each measurement window is disabled.
- Right-click the measurement window to display the detail setting dialog box of the window. This is not possible when measured data collection is in progress.
- Numeric list window, bar graph window, and vector window can be displayed when the WT is equipped with the following option.
 - Harmonic measurement (/G5)
 - Simultaneous dual harmonic measurement (/G6)
 - Advanced computation (/G6)
- The following models can display a waveform window if the harmonic measurement (/G5) option is installed.
 - WT310E/WT310EH/WT332E/WT333E
 - WT310/WT310HC/WT330(WT332/WT333)
- The vector window cannot be displayed on the following models.
 - WT310E/WT310EH/WT332E/WT333E
 - WT310/WT310HC/WT330(WT332/WT333)

Note

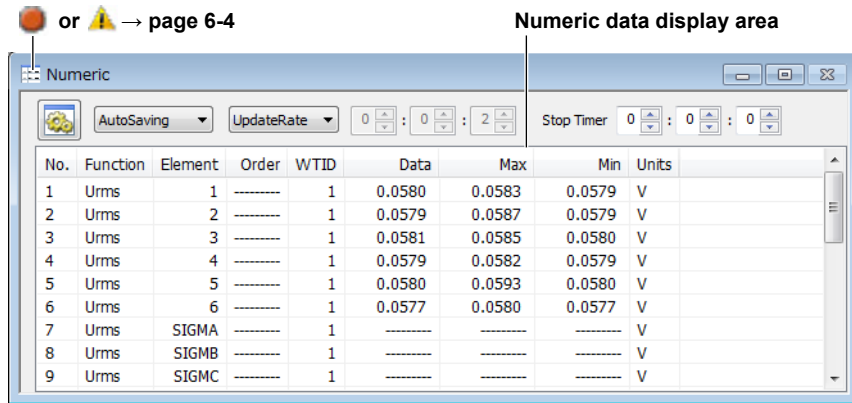
Display Sampling on the Measurement Screen

This software adjusts the display updating of the PC screen by automatically changing the display update interval between 100 ms and 1 s. This is to prevent hindering the acquisition of measured data through communication as a result of high load placed on the CPU when the PC screen update interval is too short. For example, if the data update interval on the WT is 50 ms, measured data is acquired from the WT every 50 ms, but the PC screen update interval is 100 ms.

6.2 Numeric Display

The numeric display shows measured data numerically. You can customize the types of functions to display, the display order, the font size, the color, and so on.

Numeric Data Display Area



Function

Displays the functions.

For the function symbols and definitions, see the WT User's Manual.

Element

Displays the elements.

WTID

When the display mode is ALL, the ID of the WT from which data was collected is displayed.

Order

Displays the harmonic order of numeric data.

"-----" is displayed for functions that harmonic orders cannot be specified.

Max and Min

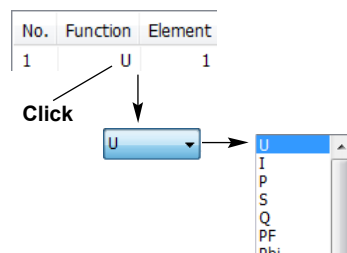
Displays the maximum and minimum values of each display item, obtained through the comparison of numeric data that has been collected from the WT. When a measurement is started, these values are initialized with the first measured data.

Setting the Display Items

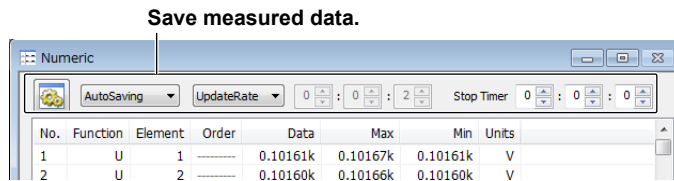
You can change the function, element, and harmonic order display items by following the procedure below. You cannot change them while measured data collection is in progress.

You can also set the display items using the item setting dialog box, which is described on page 6-17.

1. Click the target cell. A combo box appears.
2. Select the item you want to display.



Saving Measured Data

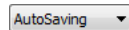


The items set in the numeric display are saved.

You cannot save measured data on the numeric list display, numeric matrix display, trend display, bar graph display, or vector display. To do so, use this window (numeric display window).

Save Method

Set how to save measured data.

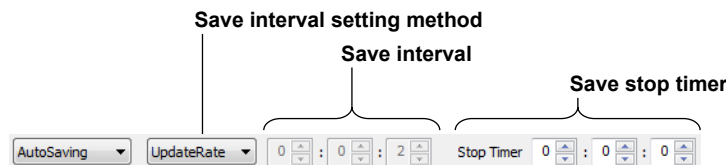


- OFF: Measure data is not saved.
- AutoSaving: Measured data is saved automatically at a fixed period.
- ManualSaving: Save measured data manually.

If you select AutoSaving or ManualSaving, the displayed measured data are saved to CSV files. You can open these files using a spreadsheet program (such as Excel).

Set the save destination and file name using the detail setting dialog box (see next page).

AutoSaving



Save Interval Mode

- UpdateRate: Measured data is saved at the WT data update interval.
 - This function operates in the following manner depending on the waveform trigger setting.
 - When waveform trigger is set to off, measured data is saved continuously every update interval.
 - When waveform trigger is set to Auto or Normal, one update interval of measured data is saved after a trigger detection. When waveform trigger is set to Normal and no trigger is detected, data saving does not take place, and save operation remains paused.
- Custom: Measured data is saved at the interval that you specify.

Save Interval

This setting is enabled if you set the save interval mode to Custom.

Selectable range: 2 seconds to 23 hours 59 minutes 59 seconds

Save Stop Timer

Set the length of time to run auto saving.

- **When the Timer Is Set to 0:0:0**
 - Auto saving of measured data continues until you stop the collection of measured data.
- **When the Timer Is Not Set to 0:0:0**
 - Auto saving of measured data continues for the specified length of time. The timer counts down as time elapses. When the save stop timer reaches 0:0:0, auto saving of measured data stops.

Manual Saving



Saving Data


While measured data collection is in progress, click this button to save measured data.

Number of Times Data Has Been Saved

Shows the number of times data has been saved.

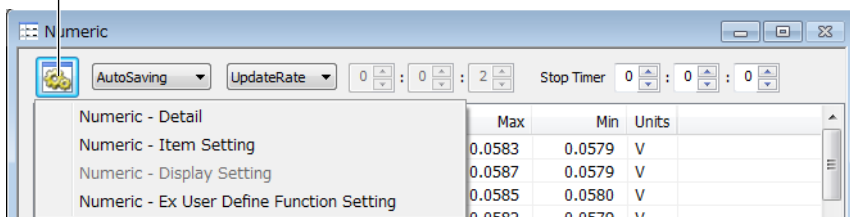
Comment

Set a comment that you want to include in the saved files.

If ManualSaving is selected when you click the measurement icon's update button (), the measured data is not saved in CSV format. Data can be saved in CSV format according to the update rate setting of auto saving.

Detail Setting Dialog Box

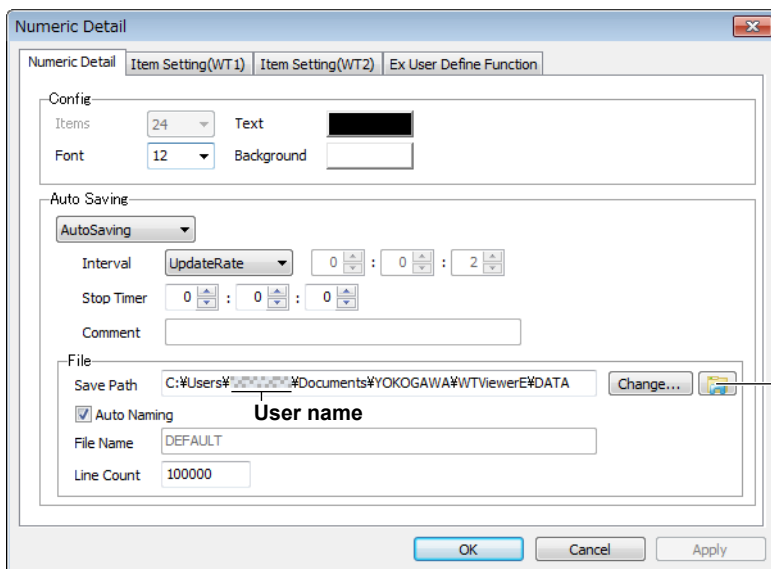
Detail setting dialog box display button



A detail setting dialog box appears when you perform any of the following operations.

- Click the detail setting dialog box display button at the upper left of the numeric window.
- Right-click the numeric window.
- Click the window detail setting button when the numeric window is selected (active).
- Select Numeric-Detail, Numeric-Item Setting, Numeric-Display Setting or Numeric-Ex User Define Function Setting in the shortcut menu of the window detail setting button.

This is not possible when measured data collection is in progress.



Opens the save path using Explorer

6.2 Numeric Display

Items

Select the number of numeric data items to display from 12, 24, 48, 200 and 900.*

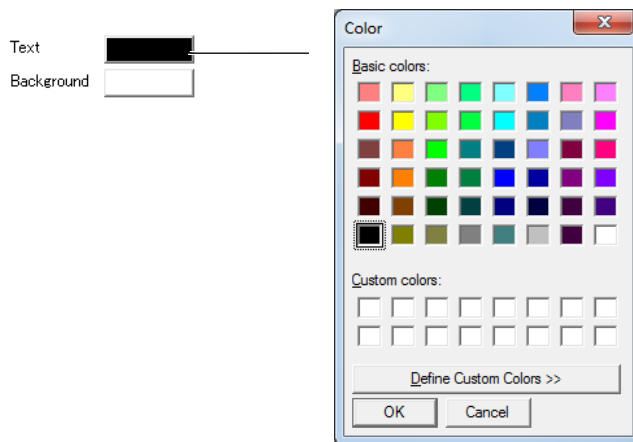
- * The number 900 can be selected when connected to any of the following models.
 - WT1801E/WT1802E/WT1803E/WT1804E/WT1805E/WT1806E
 - WT1800 (WT1801/WT1802/WT1803/WT1804/WT1805/WT1806)
(Must be firmware version 2.33 or later)

Font

Set the font size to a value between 6 to 40 in steps of 2.

Text and Background

Select the text and background colors.



Auto Naming

If you select the Auto Naming check box, files are saved with the name Auto_yyyymmddhhmmss.csv. yyyymmddhhmmss is a 14-digit number consisting of the year, month, day, hour, minute, and second. The year is four digits; the hour is based on a 24-hour clock.

File Name

To specify the file name, clear the Auto Naming check box, and enter the file name.

- File Name: You can assign any name that is allowed on your PC.
- Extension: .csv

Line Count

If the number of numeric data entries saved to a file reaches the number specified by Line Count, a new file is created with a name whose number at the end of the name is incremented. This process is repeated (e.g., DEFAULT_0001.csv, DEFAULT_0002.csv, . . ., DEFAULT_9999.csv).

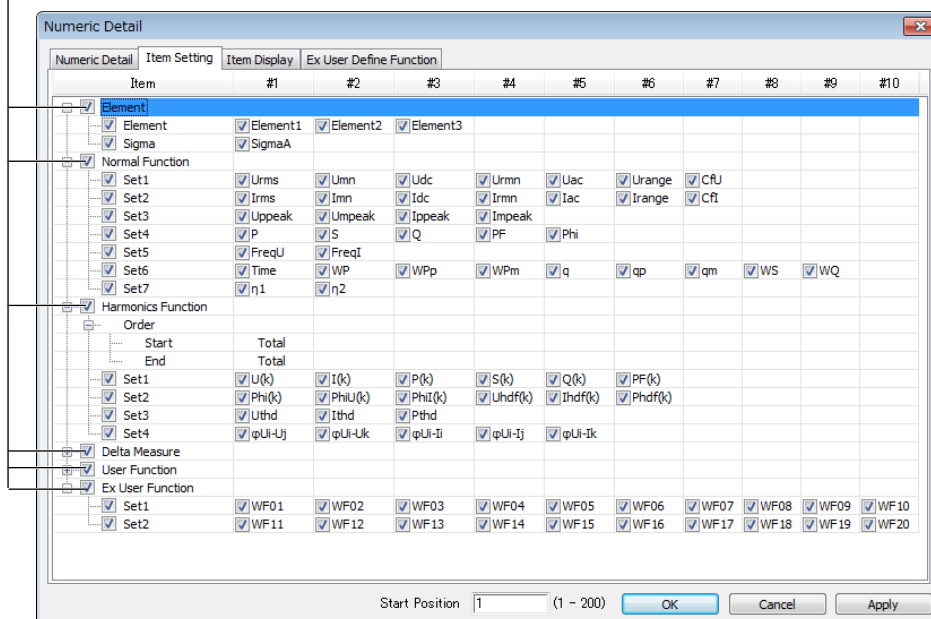
Item Setting Dialog Box

This dialog box allows you to collectively set functions of measured data to be acquired on the numeric window. You can set a function individually when you click a function column in the numeric display screen. The functions that you want to change the settings of are listed in a tree structure.

If several WTs are connected and the display mode is ALL, a tab is displayed for each WT, and the tab name is ?Item Setting (WT1).

- Click to collapse the lower level nodes in the tree.
- Click to expand the lower level nodes in the tree.

ALL



Element

- If you select **All**, allelements will be selected. The check boxes of each elements will remain unchanged and will appear dimmed.
- If you select the left most check box of each line, the all the elements in that line are selected. Click it again, to unselect all the elements in that line.
- You can also select individual check boxes to select each element separately.

Normal Function / Harmonics Function / Motor / AUX / Delta Computation / WT Time / User-defined Function

- If you select **All**, all functions will be selected. The check boxes of each function will remain unchanged and will appear dimmed.
- If you select the left most check box of each line, the all the functions in that line are selected. Click it again, to unselect all the functions in that line.
- You can also select individual check boxes to select each function separately.

Order

You can select the start and end harmonic orders.

Note

Functions, elements, and harmonic orders that cannot be selected depending on the WT specifications, options, or other conditions will not be displayed.

Start Position

Set the line number in the numeric data display that you want to start applying the above settings to. Selectable range: 1 to the value specified in the Items box.

Applying the Settings

Click **OK** or **Apply** to apply the settings to the numeric display. Items that cannot be set are not displayed (skipped).

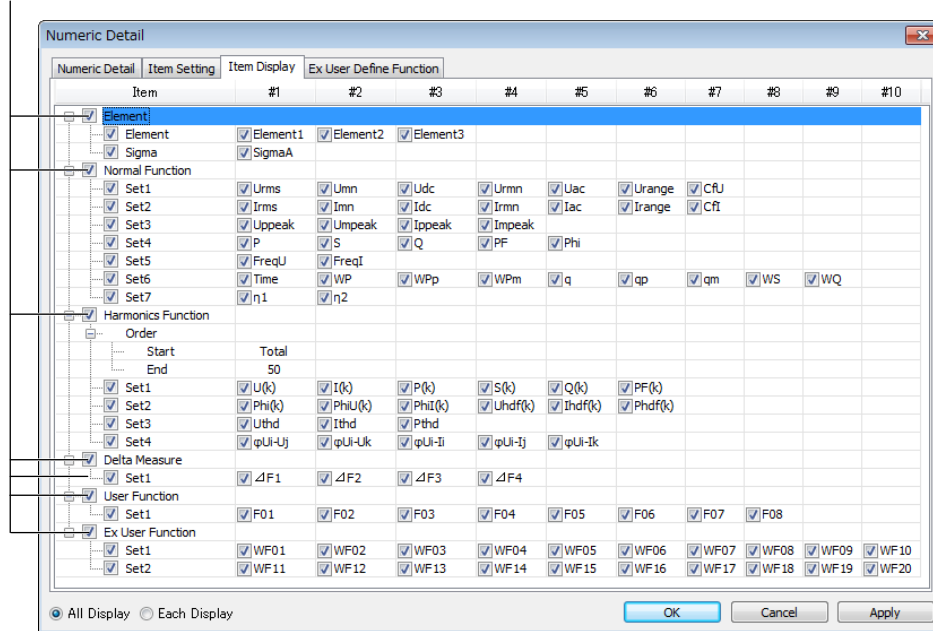
Item Display Setting Dialog Box

This dialog box allows you to collectively show or hide measured data to be acquired on the numeric window. The functions that you want to change the settings of are listed in a tree structure.

If several WTs are connected and the display mode is ALL, this tab is hidden.

- Click to collapse the lower level nodes in the tree.
- Click to expand the lower level nodes in the tree.

ALL



Element, Normal Function / Harmonics Function / Motor / AUX / Delta Computation / User-defined Function, Order, Start Position, and Applying the Settings

These are the same as those of the “Item Setting Dialog Box” on the previous page.

All Display

All items are displayed in the numeric window.

Individual Display

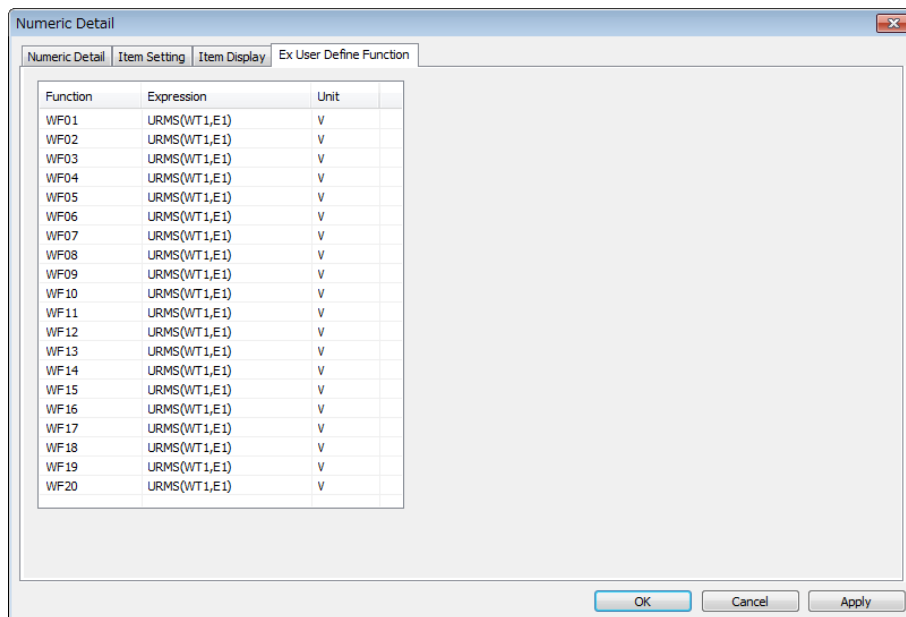
Only the items selected in Item Display are displayed in the numeric window.

Note

Functions, elements, and harmonic orders that cannot be selected depending on the WT specifications or options are not displayed.

Extended User-Defined Function Setting

The extended user-defined function expands the user-defined function on the WT. It can be used to compute numeric data by using expressions that combine the measured values of several WTs in this software.



Note

The same operations described in “Extended User-Defined Function” of section 5.1 can be performed. For a description of operators, see section 5.1.

6.3 Numeric List Display

The numeric list display lists harmonic measurement data for each harmonic order.

The numeric list window can be displayed when the WT is equipped with the following option.

- Harmonic measurement (/G5)
- Simultaneous dual harmonic measurement (/G6)
- Advanced computation (/G6)

Function data display area

Switch the display (Order, Hrm)

Harmonic data display area

Harmonic order

Measured data of each harmonic order

Shows the maximum value of the measured data

Shows the minimum value of the measured data

Clears the maximum and minimum values of the current measured data

Order	U1[V]	I1[A]
Total	100.561	0.64185
DC	-----	-----
1	100.466	0.61913
2	0.005	0.00008
3	2.331	0.16017
4	0.007	0.00002
5	1.862	0.04366
6	0.024	0.00027
7	2.163	0.01877
8	0.003	0.00010
9	0.889	0.02177

- * If several WTs are connected and the display mode is ALL, a WTID (WT1 to WT4) is displayed to the left of each function name.

Detail Setting Dialog Box

A detail setting dialog box appears when you perform any of the following operations.

- Right-click the numeric list window.
- Click the window detail setting button when the numeric list window is selected (active).
- Select Numeric List in the shortcut menu of the window detail setting button.

This is not possible when measured data collection is in progress.

Font: see page 6-18.

Text color and background color: see page 6-18.

Select all/clear all

Font: 2

Text: [Color selection]

Background: [Color selection]

Order Filter:

Harmonics Data

Function	Element
<input checked="" type="checkbox"/> FreqPLL	-----
<input checked="" type="checkbox"/> Uthd	1
<input checked="" type="checkbox"/> Ithd	1
<input type="checkbox"/> Pthd	1
<input type="checkbox"/> FreqPLL	-----

Harmonics List

Function	Element	
<input checked="" type="checkbox"/> U	1	
<input checked="" type="checkbox"/> I	1	
<input checked="" type="checkbox"/> P	1	
<input type="checkbox"/> S	1	
<input type="checkbox"/> Q	1	
<input type="checkbox"/> PF	1	

OK Cancel Apply

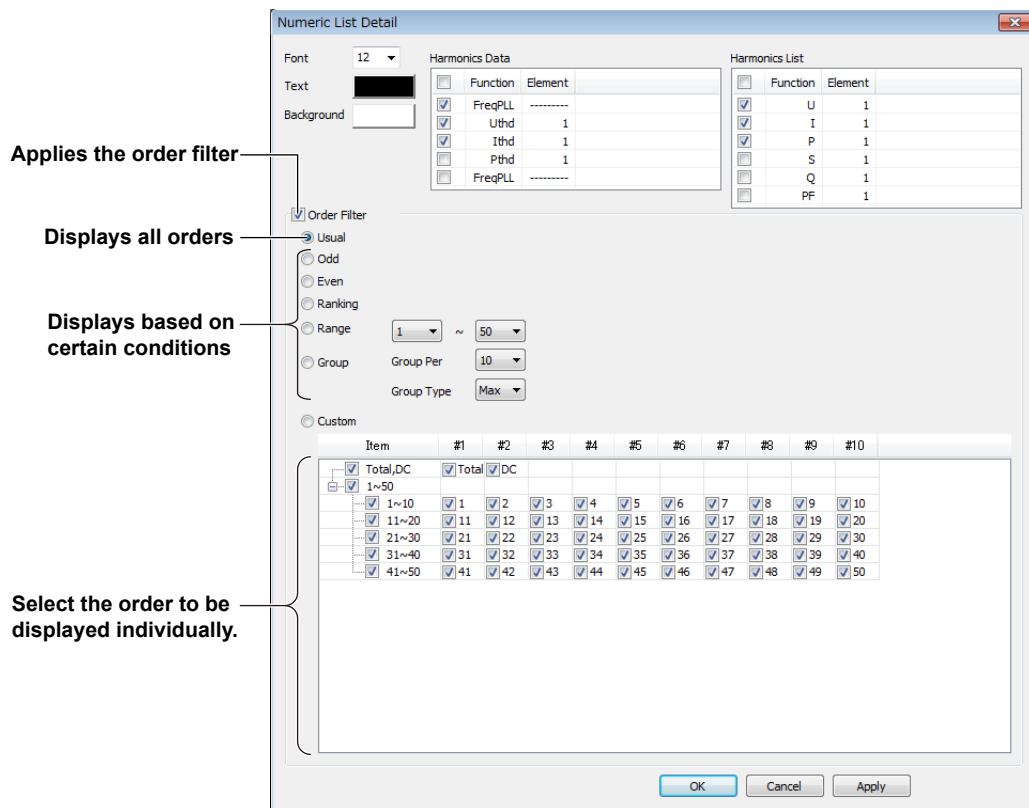
Setting the Display Items

Click the Function, Element and WTID* cells, and set each item using the combo box that appears. You cannot change them while measured data collection is in progress.

- * These can be changed only when several WTs are connected and the display mode is ALL.

Setting the Order Filter

If harmonic data with orders is set to a function, you can set the order of the harmonic data to be displayed.



Display Conditions of Orders

- **Usual**
All orders are displayed.
- **Odd**
Only odd orders are displayed in the numeric list.
- **Even**
Only even orders are displayed in the numeric list.
- **Ranking**
Among the functions that are listed, orders are sorted in descending order by measured values in the numeric list.
- **Range**
The specified range of orders are displayed in the numeric list.
- **Group**
The first order and higher orders are displayed in groups in the numeric list. You can select Max, Min, or Ave for the displayed data.
- **Custom**
Orders selected from a list are displayed in the numeric list.

Saving Measured Data

You can save measured data on the numeric display window. See section 6.2, "Numeric Display."

6.4 Numeric Matrix Display

The numeric matrix display shows measured data of each element in a matrix.

When the display mode is WT

Function	Units	Element1	Element2	Element3
U	V	0.0000k	0.0000k	0.0000k
I	A	0.0000	0.0000	0.0000
P	W	-0.0000k	0.0000k	-0.0000k
S	VA	0.0000k	0.0000k	0.0000k
Q	var	0.0000k	0.0000k	0.0000k
PF		---O F---	---O F---	---O F---
Phi	deg	---O F---	---O F---	---O F---
FreqU	Hz	Error	Error	Error
FreqI	Hz	Error	Error	Error

When the display mode is ALL

Function	Units	WT1:Element1	WT1:Element2	WT1:Element3	WT2:Element1	WT2:Element2	WT2:Element3	WT3:Element1
U	V	0.0580	0.0579	0.0581	0.0579	0.0580	0.0577	0.0000k
I	A	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

WT1 elements
 WT2 elements

Function

The functions are displayed in the following fixed order.

U, I, P, S, Q, λ , ϕ , FreqU, FreqI

Detail Setting Dialog Box

A detail setting dialog box appears when you perform any of the following operations.

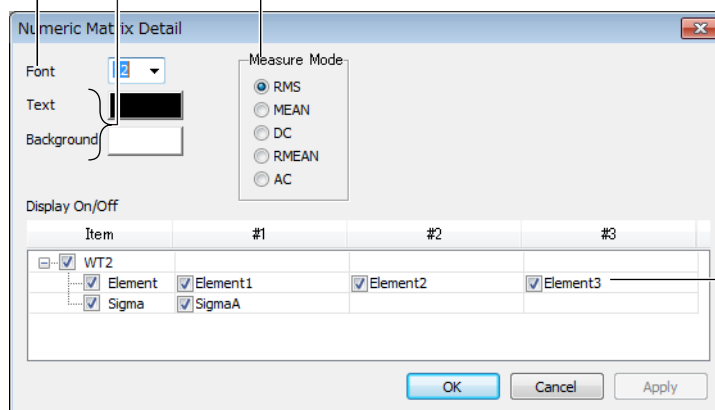
- Right-click the numeric matrix window.
- Click the window detail setting button when the numeric matrix window is selected (active).
- Select Numeric Matrix in the shortcut menu of the window detail setting button.

This is not possible when measured data collection is in progress.

Font: see page 6-18.

Text color and background color: see page 6-18.

Measurement mode of the U and I to be displayed



Select the items to display in the numeric matrix window.

Turning the Display On and Off

Select the elements and SIGMA to display in the numeric matrix window.

When the display mode is ALL, you can also select at the WT level in addition to elements and SIGMA.

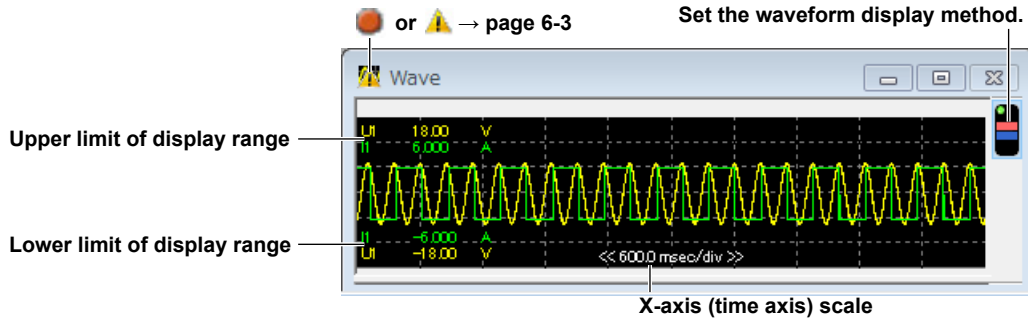
Saving Measured Data

You can save measured data on the numeric display window. See section 6.2, "Numeric Display."

6.5 Waveform Display

The waveform display shows waveform display data that has been collected from the WT. The following models can display a waveform window if the harmonic measurement (/G5) option is installed.

- WT310E/WT310EH/WT332E/WT333E
- WT310/WT310HC/WT330(WT332/WT333)



Note

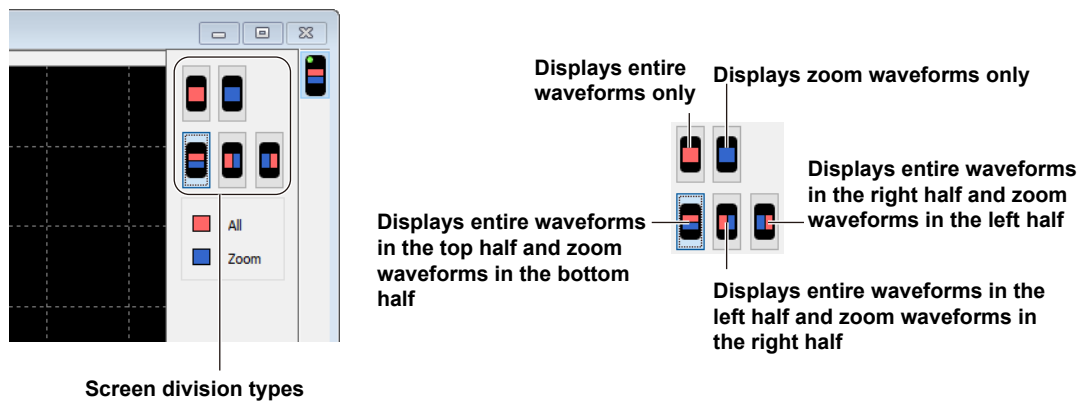
When connected to the WT500, waveform is displayed when the integration has been started or stopped. It is not displayed when the integration has been reset.

Waveform Display Method (Layout)

Select how to divide the display screen for displaying waveforms.

- Clicking the mouse turns the layout on or off.
 - OFF: Entire display
 - ON: Displays the waveforms according to the division method selected with the following operation
- Right-click to select the division method used when layout is set to ON. Select from the options in the following diagram.

If layout is set to OFF at this point, it is changed to ON.

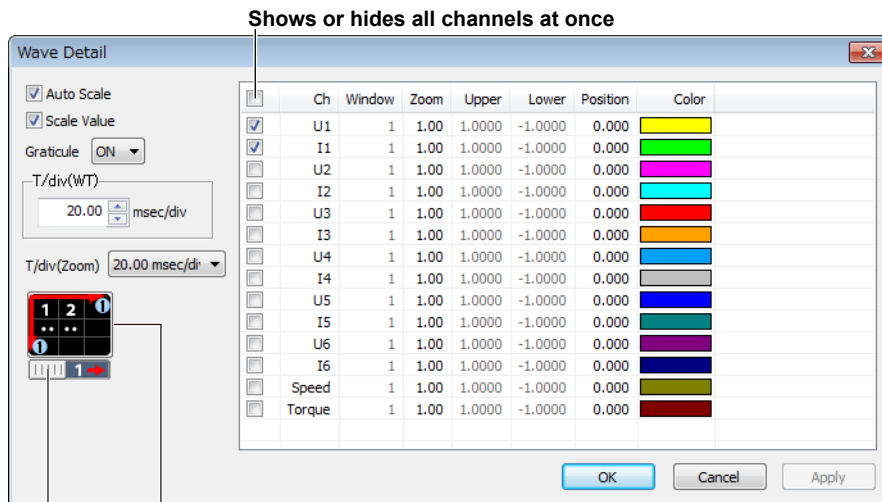


Detail Setting Dialog Box

A detail setting dialog box appears when you perform any of the following operations.

- Right-click the wave window.
- Click the window detail setting button when the wave window is selected (active).
- Select Wave in the shortcut menu of the window detail setting button.

This is not possible when measured data collection is in progress.



Set the combination of rows and columns.

Set the screen division method.

Drag to slide the bar display.

1↓: Vertical

1→: Horizontal

Auto Scale

- When the check box is selected, the scale values change automatically.
- When the check box is not selected, you can click upper or lower limit cells to set the upper and lower limits of the display range for each channel.

Scale Value

Select whether to show the upper and lower limits on the left edge of the waveform display area.

Graticule

Select whether to show the graticule in the waveform display area.

Tdiv(WT)

Set the T/div of the ALL display (entire waveform) side of the waveform window.

Tdiv(Zoom)

Set the T/div of the Zoom display (zoom waveform) side of the waveform window.

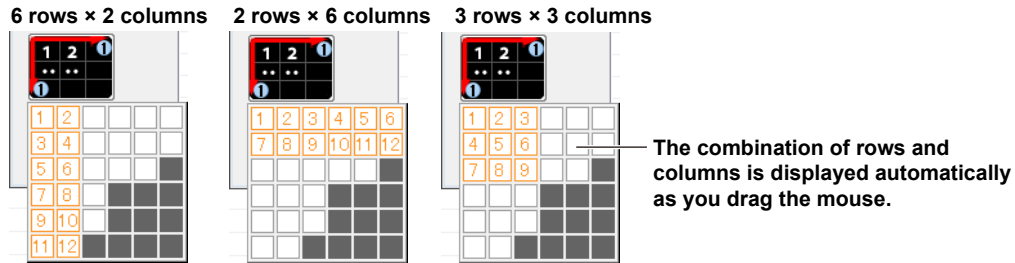
Setting the Combination of Rows and Columns

The waveform display screen can be divided.

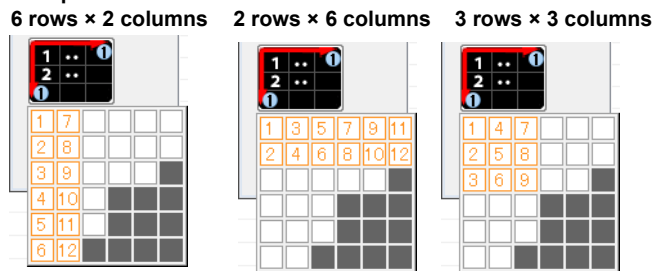
When the display mode is WT1, WT2, WT3, or WT4: Up to 12 areas

When the display mode is ALL: Up to 24 areas

Example of horizontal direction



Example of vertical direction



Ch

Select the waveforms to display using the check boxes.

Window

When you divide the waveform display into windows, select which area (counted from the top) to display the waveform in.

WTID

When the display mode is ALL, the ID of the WT from which data was collected is displayed.

Zoom

Set the vertical zoom factor of the waveform.

Upper and Lower

If the Auto Scale check box is not selected, set the upper and lower limits of the display range.

Position

Set the vertical display position of the waveform in the waveform display area. The vertical center of the window is 0. The upper limit is 100%; the lower limit is -100%.

Color

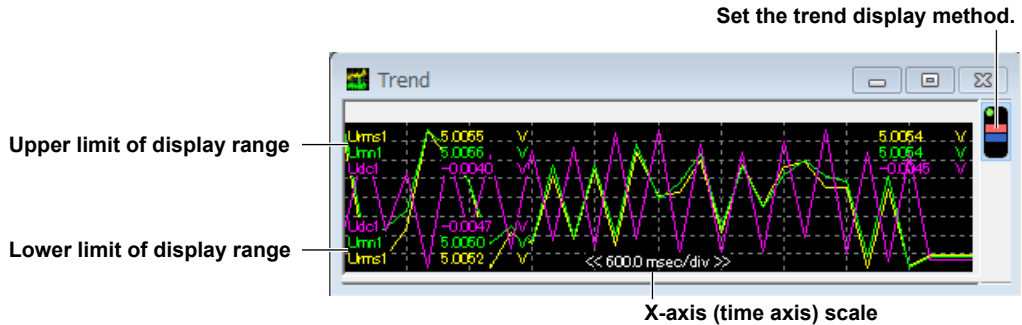
Select the waveform color.

Configuring Settings

- Window, Zoom, and Color
Click the cells, and set each item using the combo box that appears.
- Upper, Lower, and Position
Click the cells, and set each item.

6.6 Trend Display

The trend display shows changes in measured data over time on a trend graph.

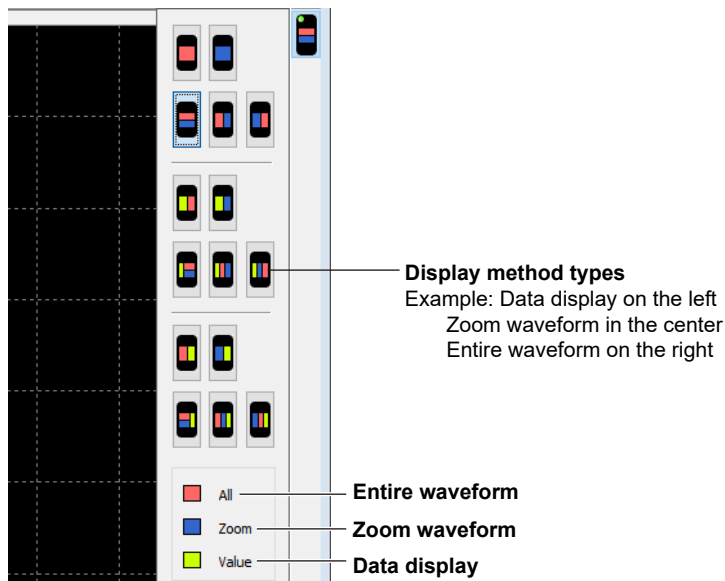


Trend Display Method

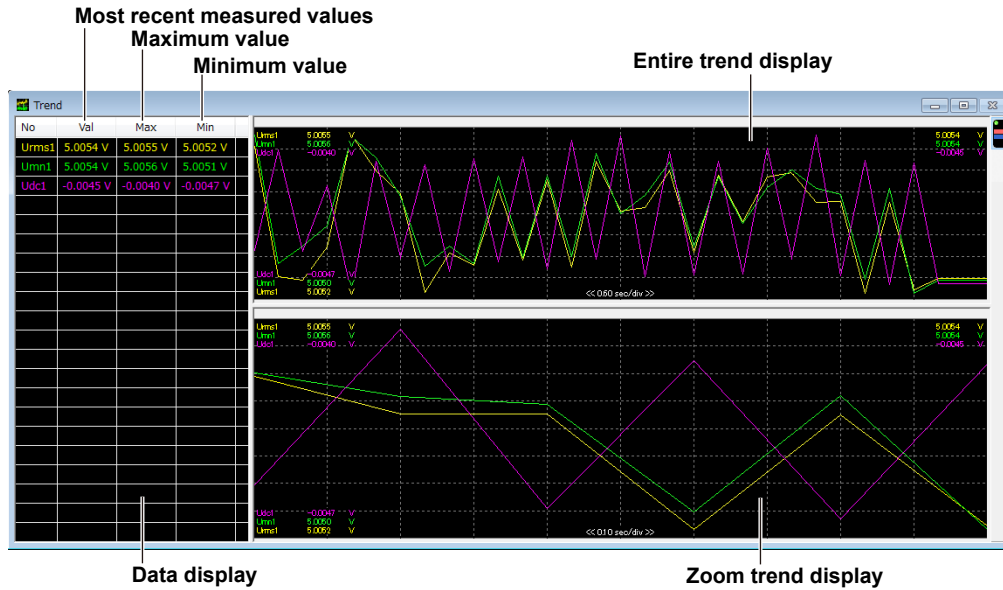
Select how to divide the display screen for displaying trends.

- Clicking the mouse turns the layout on or off.
 - OFF: Entire display
 - ON: Displays the trend according to the division method selected with the following operation
- Right-click to select the division method used when layout is set to ON. Select from the options in the following diagram.

If layout is set to OFF at this point, it is changed to ON.



6.6 Trend Display



Detail Setting Dialog Box

A detail setting dialog box appears when you perform any of the following operations.

- Right-click the trend window.
- Click the window detail setting button when the trend window is selected (active).
- Select Trend in the shortcut menu of the window detail setting button.

This is not possible when measured data collection is in progress.

Set the screen division method.

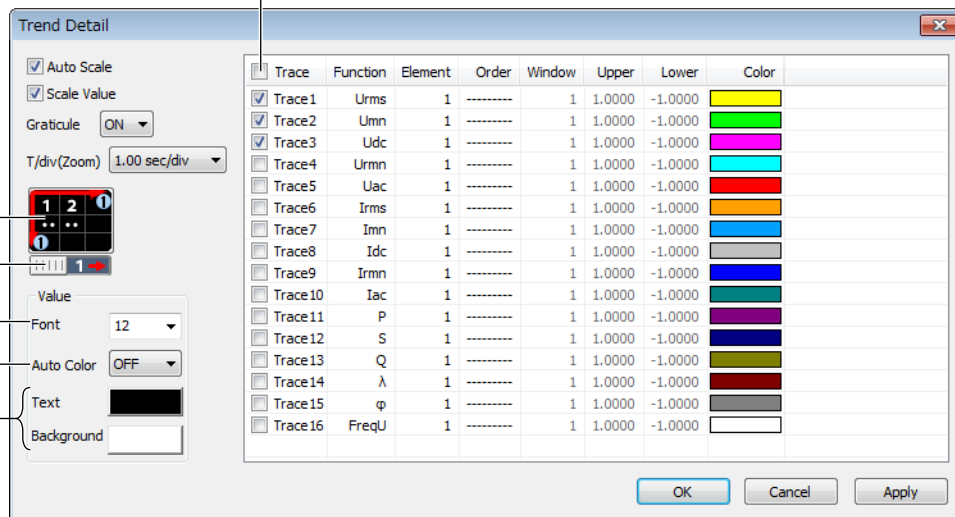
Drag to slide the bar display.

1↓: Vertical

1→: Horizontal

Set the combination of rows and columns.

Shows or hides all trends at once



Text color and background color: see page 6-18.

You can set this when the auto color is set to OFF.

Set auto color.

Font: see page 6-18.

Auto Scale

- When the check box is selected, the scale values change automatically.
- When the check box is not selected, you can click upper or lower limit cells to set the upper and lower limits of the display range for each channel.

Scale Value

Select whether to show the upper and lower limits on the left edge of the trend display area.

Graticule

Select whether to show the graticule in the trend display area.

Trace

Select the trends to display using the check boxes.

T/div

Select the time axis.

Setting the Combination of Rows and Columns

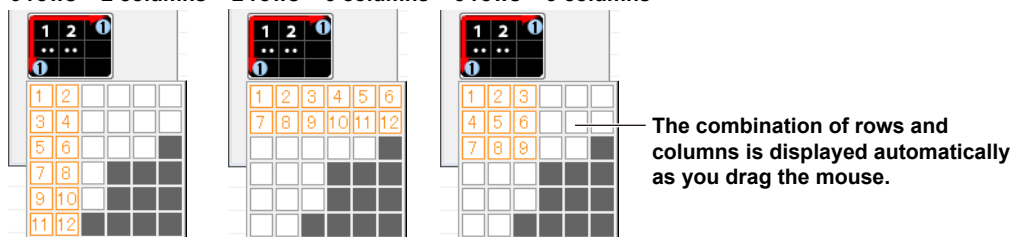
The trend display screen can be divided.

When the display mode is WT1, WT2, WT3, or WT4: Up to 12 areas

When the display mode is ALL: Up to 24 areas

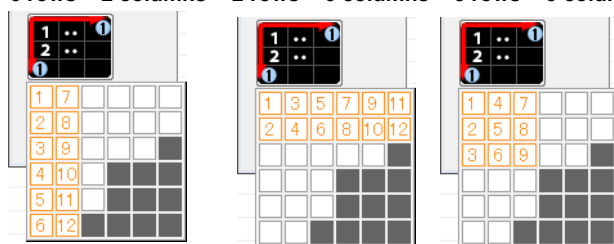
Example of horizontal direction

6 rows × 2 columns 2 rows × 6 columns 3 rows × 3 columns



Example of vertical direction

6 rows × 2 columns 2 rows × 6 columns 3 rows × 3 columns



Function

Select which function to display the trend of.

However, you cannot select an extended user-defined function (WF01 to WF20) for the trend display function.

Element

Select which element to display the trend of.

Order

Select the harmonic order of numeric data to display the trend of.

“-----” is displayed for functions that harmonic orders cannot be specified.

WTID

When the display mode is ALL, the ID of the WT from which data was collected is displayed.

Window

When you divide the trend display into windows, select which area (counted from the top) to display the trend in.

Upper and Lower

If the Auto Scale check box is not selected, set the upper and lower limits of the display range.

Color

Select the trend color.

Configuring Settings

- Function, Element, Order, Window, and Color
Click the cells, and set each item using the combo box that appears.
- Upper and Lower
Click the cells, and set each item.

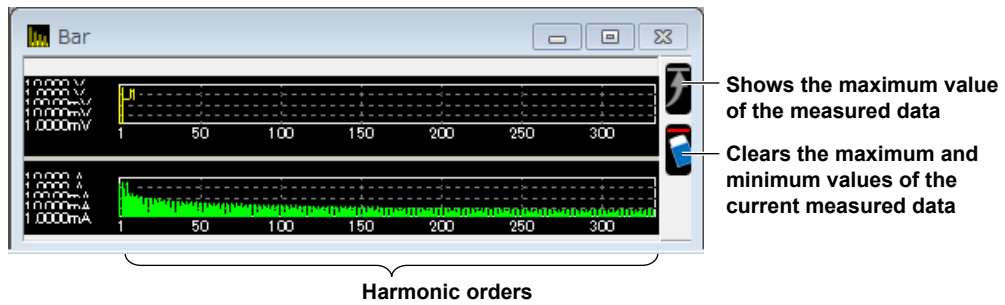
Saving Measured Data

You can save measured data on the numeric display window. See section 6.2, “Numeric Display.”

6.7 Bar Graph Display

The bar graph display shows harmonic measurement data for each harmonic order in a bar graph. The bar graph window can be displayed when the WT is equipped with the following option.

- Harmonic measurement (/G5)
- Simultaneous dual harmonic measurement (/G6)
- Advanced computation (/G6)



Note

When logarithmic coordinates are used (Log Scale), if a value is negative, its absolute value is displayed with a red bar graph.

Detail Setting Dialog Box

A detail setting dialog box appears when you perform any of the following operations.

- Right-click the bar graph window.
- Click the window detail setting button when the bar graph window is selected (active).
- Select Bar in the shortcut menu of the window detail setting button.

This is not possible when measured data collection is in progress.

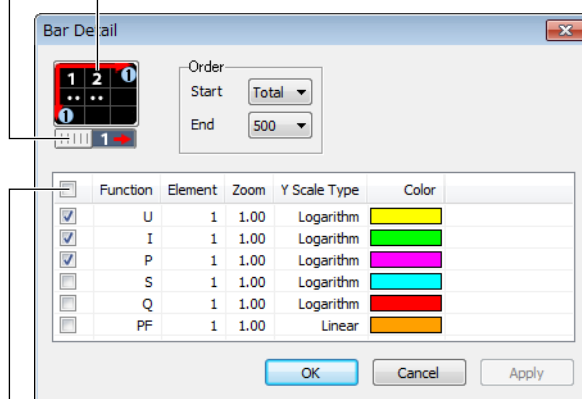
Set the screen division method.

Drag to slide the bar display.

1↓: Vertical

1→: Horizontal

Set the combination of rows and columns.



Shows or hides all bar graphs at once

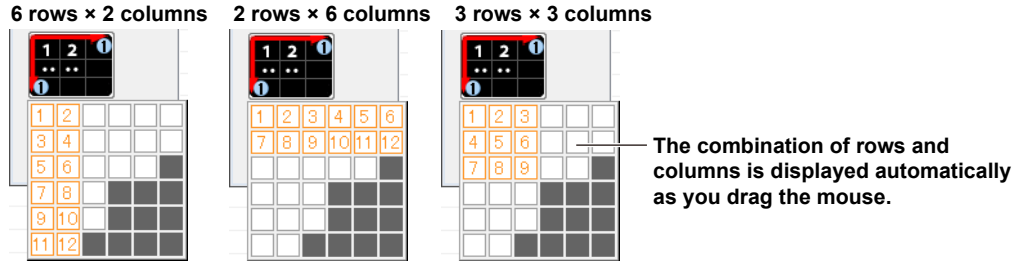
Setting the Combination of Rows and Columns

The bar graph display screen can be divided.

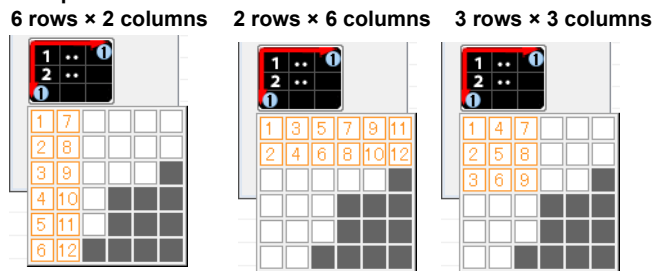
When the display mode is WT1, WT2, WT3, or WT4: Up to 6 areas

When the display mode is ALL: Up to 12 areas

Example of horizontal direction



Example of vertical direction



Start and End

Select the harmonic order of the numeric data to display.

The difference between the start and end harmonic orders must at least be 10.

Function

Select the bar graph to display using the check boxes.

The bar graph is displayed for the combination of the functions and elements that you select.

Up to three bar graphs can be displayed.

Element

Select which element to display the bar graph of.

WTID

When the display mode is ALL, the ID of the WT from which data was collected is displayed.

Zoom

Set the vertical zoom factor of the bar graph.

Y Scale Type

The vertical scale of the bar graph is automatically set depending on the function.

Function	Y Scale Type
U, I, P, S, Q	Log
PF (λ), Phi (ϕ), PhiU (ϕU), Phil (ϕI), Z, Rs, Xs, Rp, Xp	Linear

Configuring Settings

Click the Function, Element, and Zoom cells, and set each item using the combo box that appears.

Saving Measured Data

You can save measured data on the numeric display window. See section 6.2, "Numeric Display."

6.8 Vector Display

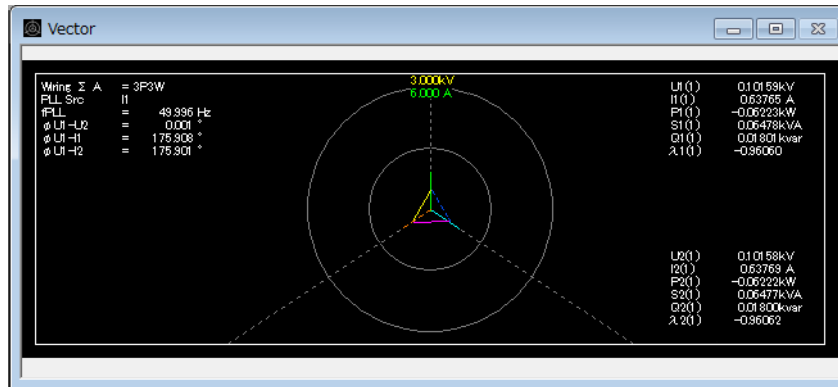
You can select a wiring unit to display vectors of the phase differences and amplitudes (rms values) of the fundamental signals, U(1) and I(1), in each element in the unit. The positive vertical axis is set to zero (angle zero), and the vector of each input signal is displayed.

The vector window can be displayed when the WT is equipped with the following option.

- Harmonic measurement (/G5)
- Simultaneous dual harmonic measurement (/G6)
- Advanced computation (/G4)

The vector window cannot be displayed on the following models.

- WT310E/WT310EH/WT332E/WT333E
- WT310/WT310HC/WT330(WT332/WT333)

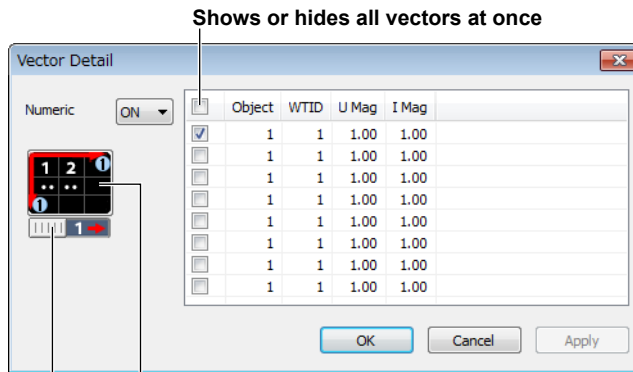


Detail Setting Dialog Box

A detail setting dialog box appears when you perform any of the following operations.

- Right-click the vector window.
- Click the window detail setting button when the vector window is selected (active).
- Select Vector in the shortcut menu of the window detail setting button.

This is not possible when measured data collection is in progress.



Shows or hides all vectors at once
Set the combination of rows and columns.
You can set this when the display mode is ALL.

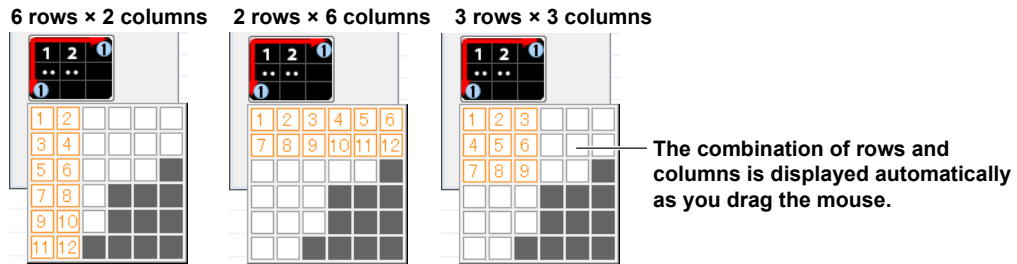
Set the screen division method.
Drag to slide the bar display.
You can set this when the display mode is ALL.
1↓: Vertical
1→: Horizontal

Setting the Combination of Rows and Columns

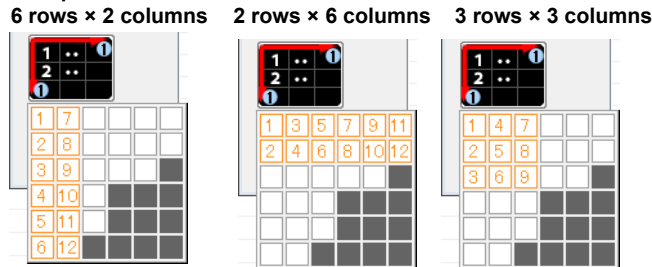
The vector display screen can be divided into up to eight areas.

- If several WTs are connected and the display mode is ALL, the screen can be divided into up to eight areas.
- If several WTs are connected and the display mode is WT1, WT2, WT3, or WT4, the screen can be divided horizontally into two areas by selecting or clearing a check box. Note that when the display mode is WT1, WT2, WT3, or WT4, the following icons for dividing the screen do not appear.

Example of horizontal direction



Example of vertical direction



Numeric

Select whether to show numeric data (on or off).

Object

Select the wiring unit to display.

WTID

When the display mode is ALL, the ID of the WT from which data was collected is displayed.

U Mag/I Mag

Set the zoom factor of fundamental wave U(1) and I(1). When you zoom the vectors, the value that indicates the size of the vector display's peripheral circle changes according to the zoom factor.

Configuring Settings

- Object
Click the cells, and set each item using the combo box that appears.
- U Mag and I Mag
Click the cells, and set each item.


Saving Measured Data

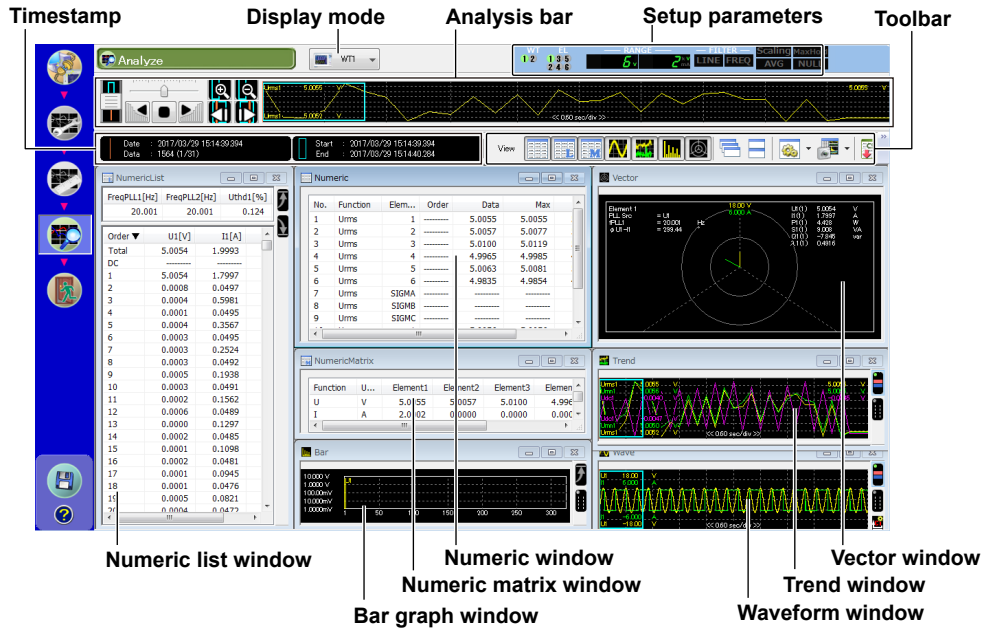
You can save measured data on the numeric display window. See section 6.2, "Numeric Display."

7.1 Analysis Screen

The display example, setting items, and setting range of the description vary depending on the following factors.

- The WT model
- The number of elements installed in the WT and the presence or absence of options

1. Click  in the menu area. The analysis screen appears.



The screenshot shows the Analysis Screen interface with several components labeled:

- Timestamp**: Located at the top left of the interface.
- Display mode**: Located at the top center, showing 'WT1'.
- Analysis bar**: Located at the top right, containing numerical values and analysis options like 'LINE', 'FREQ', 'SCALE', 'UNIT', 'MODE'.
- Setup parameters**: Located at the top right, below the analysis bar.
- Toolbar**: Located at the top right, containing various analysis and display icons.
- Numeric list window**: A table on the left side showing data for 'U1[V]' and 'I1[A]' across various orders.
- Numeric window**: A table in the center showing 'No.', 'Function', 'Elem...', 'Order', 'Data', and 'Max' for various elements.
- Numeric matrix window**: A table below the numeric window showing 'Function', 'U...', 'Element1', 'Element2', 'Element3', and 'Element4'.
- Bar graph window**: A window at the bottom left showing a bar chart with values on the y-axis.
- Vector window**: A window on the right showing a vector diagram with axes and a point.
- Trend window**: A window on the right showing a trend graph with multiple data series over time.
- Waveform window**: A window at the bottom right showing a waveform graph with multiple data series over time.

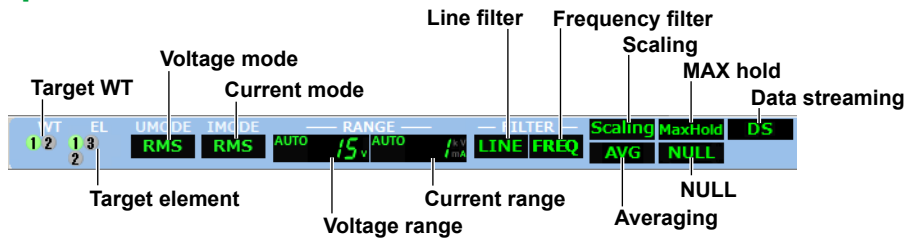
Note

- Analysis screen cannot be displayed if there is no measured data.
- Measured data saved in a PC can be loaded to display the analysis screen (offline analysis). For instructions on how to load files, see chapter 8.
- Unavailable icons, setting boxes, and setup parameters appear dimmed.

Display Mode

You can select the WT of which to display the measured data.

Setup Parameters



Target WT or target element for displaying setup parameters

You can select the target WT or the target element for displaying setup parameters.

Voltage Mode, Current Mode, Voltage Range, and Current Range

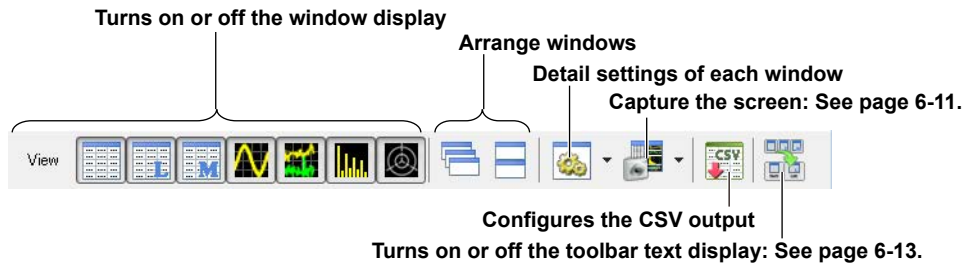
The settings that were in use when the data was acquired are displayed.

Line Filter, Frequency Filter, Scaling, MAX Hold, Averaging, NULL, and Data Streaming

- ON: Displayed in green
- OFF: Displayed in gray

For details on changing the settings, see chapter 5.

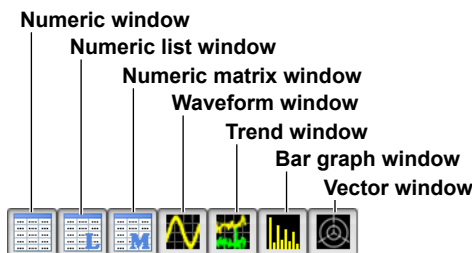
Toolbar



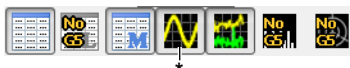
Turning On and Off the Window Display (View Icons)

Turns on or off each window display.

- WT5000
- Models with the harmonic measurement (/G5), simultaneous dual harmonic measurement (/G6), or advanced computation (/G6) option



- Models without the harmonic measurement (/G5), simultaneous dual harmonic measurement (/G6), and advanced computation (/G6) option



- If harmonic measurement (/G5) is not installed in the following models, a “No G5” icon is displayed in place of the waveform window icon, and the waveform window cannot be displayed.
 - WT310E/WT310EH/WT332E/WT333E
 - WT310/WT310HC/WT330(WT332/WT333)

Arranging Windows



Cascade

- Displayed windows are cascaded so that all the window titles can be seen.
- The active window will be shown in front of all cascaded windows.
- The order in which the windows are cascaded varies depending on the types of windows that are being displayed.

Tile

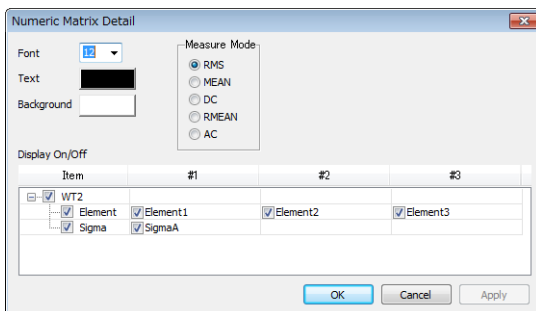
- All displayed windows are tiled.
- The order in which the windows are arranged varies depending on the types of windows that are being displayed. The numeric list window is always shown vertically in the left edge.

Detail Settings of Each Window (View-Set icon)

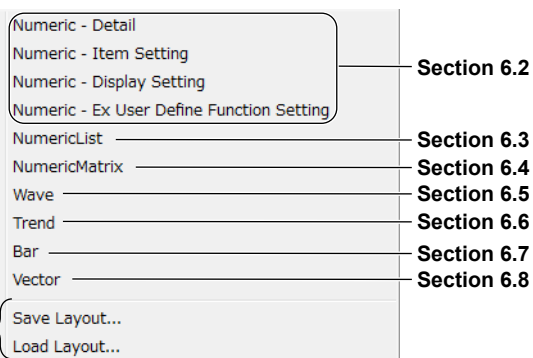


Click here to show the detail setting dialog box for the active window.

The example below is the numeric matrix setting dialog box.



Click here to show a menu for selecting the detail setting dialog box.

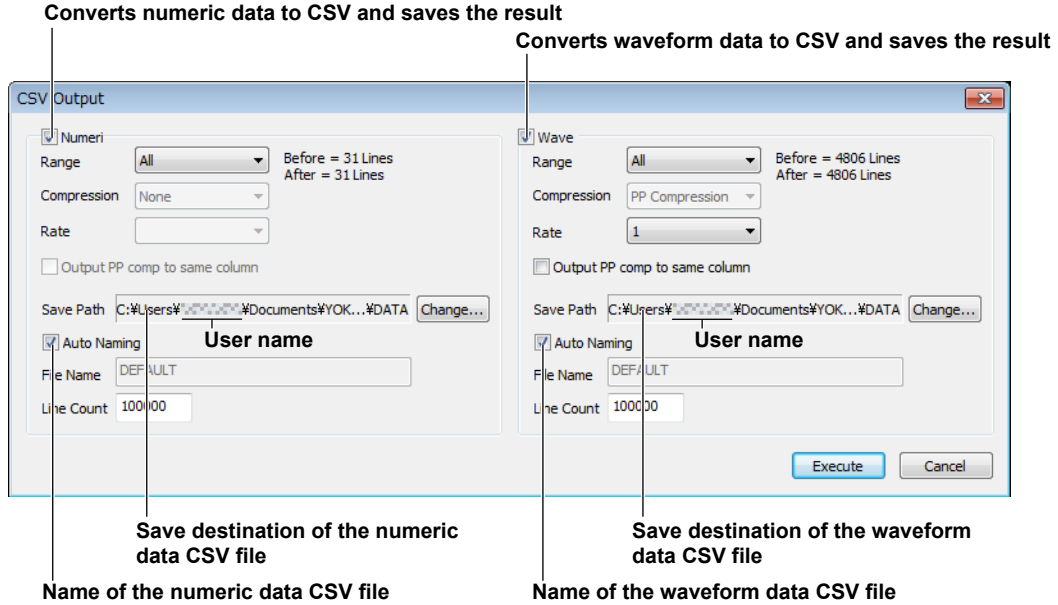


Save the layout of each measurement window to a file.
File name extension: .avl
Saved layout information can also be loaded.

Configuring the CSV Output

Analysis data can be saved to CSV files. Data is converted into CSV format according to the conditions set in the CSV Output screen.

Normal Analysis Screen



Auto Naming

If you select the Auto Naming check box, files are saved with the name Auto_yyyymmddhhmmss.csv. yyyymmddhhmmss is a 14-digit number consisting of the year, month, day, hour, minute, and second. The year is four digits; the hour is based on a 24-hour clock.

File Name

To specify the file name, clear the Auto Naming check box, and enter the file name.

- File Name: You can assign any name that is allowed on your PC.
- Extension: .csv

If the numeric and waveform file names are the same, “_Numeric” or “_Wave” is appended automatically to the file name.

Auto_20170425102939_Numeric.csv
 Auto_20170425102939_Wave.csv

Line Count

If the number of numeric data entries saved to a file reaches the number specified by Line Count, a new file is created with a name whose number at the end of the name is incremented. This process is repeated (e.g., DEFAULT_0001.csv, DEFAULT_0002.csv, . . . , DEFAULT_9999.csv).

Note

If the number of lines before the conversion is large, conversion may take some time. In such cases, you may be able to reduce the conversion time by changing the target range from All to Zoom or use compression and compression ratio to reduce the number of lines after the conversion.

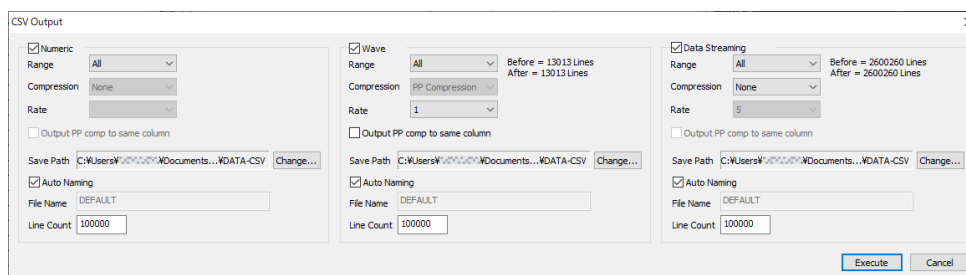
Expanded Screen for Data Streaming Waveform Analysis

For details on how to acquire data streaming waveforms, see section 6.1.

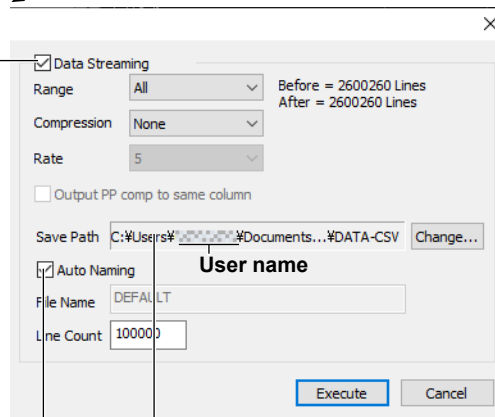
When the Analysis Screen Switch Is Set to Normal Analysis Screen



To the right of the numeric and waveform setting boxes, a setting box appears for exporting data streaming waveforms in CSV format.



Converts and saves data streaming waveform data to CSV format



Save destination of the CSV file containing data streaming waveform
Name of the CSV file containing data streaming waveform data

When the Analysis Screen Switch Is Set to Expanded Screen for Data Streaming Waveform Analysis



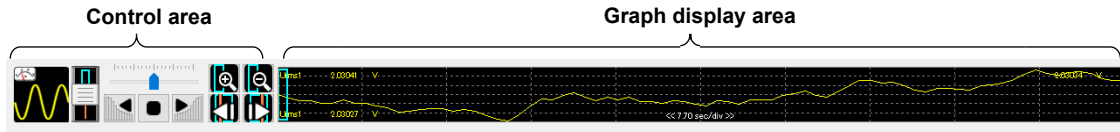
A setting box appears only for exporting data streaming waveforms in CSV format.

Note

If the number of lines before the conversion is large, conversion may take some time.

In such cases, you may be able to reduce the conversion time by changing the target range from All to Zoom or use compression and compression ratio to reduce the number of lines after the conversion.

Analysis Bar



Control area

Normal Analysis Screen

Scroll direction and speed
 Drag the knob horizontally.
 Further you drag the knob outward, the faster the scrolling becomes.

Change the zoom range. Moves the cursor and zoom range

The appearance of "move" icons vary depending on what is to be scrolled.

Scrolls to the right

Stops scrolling

Scrolls to the left

Horizontal scroll
 The speed can be adjusted (10 levels) each time you click.
 The speed is displayed with a bar within the displayed button.

Analysis screen switch
 Displayed when data streaming waveform data is acquired on the WT5000

Normal analysis screen

Expanded screen for data streaming waveform analysis

Switches what to scroll
 Drag the mouse to switch.

Cursor Zoom range Cursor and zoom range

The diagram shows the control area with several icons: a waveform icon, a list icon, a play/pause icon, a stop icon, a horizontal scroll knob, and zoom in/out icons. Arrows point from these icons to their respective descriptions. The zoom icons are shown in three variations: a simple left/right arrow for cursor movement, a left/right arrow with a magnifying glass for zoom range, and a left/right arrow with a magnifying glass and a vertical bar for cursor and zoom range movement.

Expanded Screen for Data Streaming Waveform Analysis

Analysis screen switch

Change the zoom range.

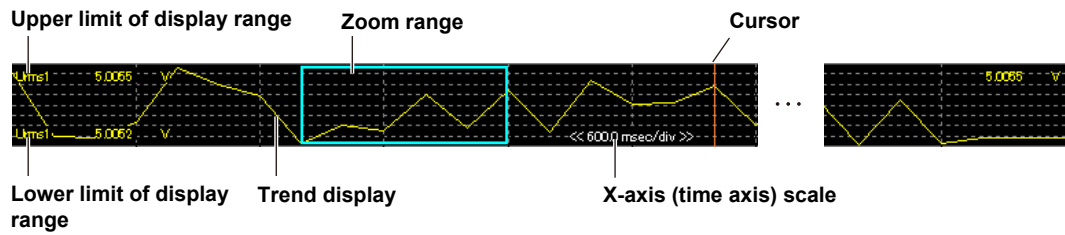
Moves the data streaming
 The data to be displayed can be moved ± 1 seco at a time.
 The data that is currently displayed is shown bel the timestamp.

Switches what to scroll
 The scroll range is fixed to the zoom range.

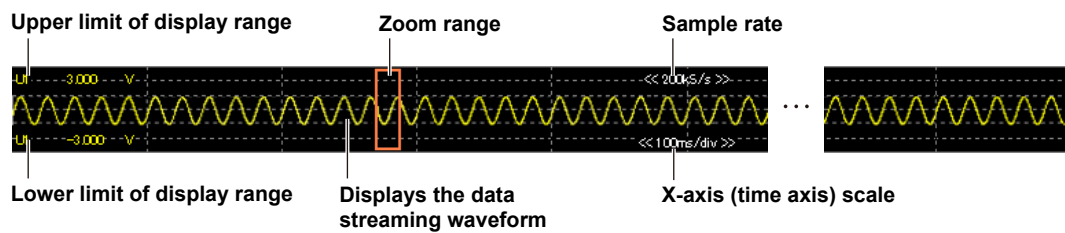
The diagram shows the control area in the expanded mode. It includes a waveform icon with a magnifying glass, a list icon, a play/pause icon, a stop icon, a horizontal scroll knob, and zoom in/out icons. A timestamp box is shown at the bottom right, displaying 'Date : 2020/03/18 15:54:57.779' and 'Data : 47.0'.

Graph Display Area

Normal Analysis Screen



Expanded Screen for Data Streaming Waveform Analysis

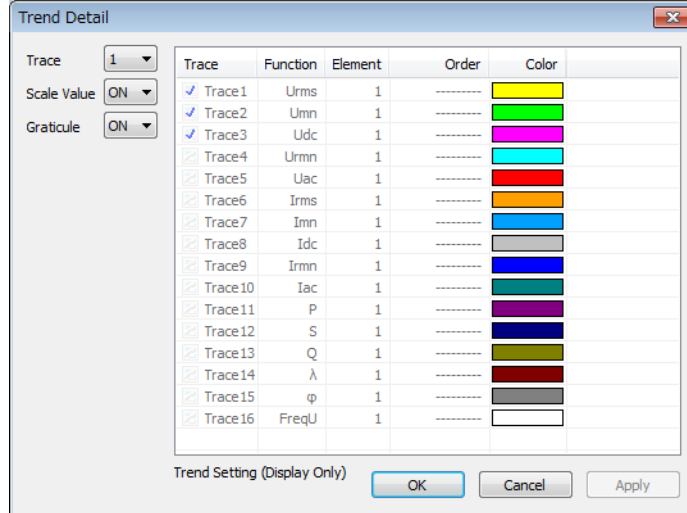


Trend Detail Dialog Box

The Trend Detail dialog box appears when you perform any of the following operations.

- Right-click the graph display area.

Normal Analysis Screen



* If several WT's are connected and the display mode is ALL, you can set the WTID.

Trace

Select the traces to show in the graph display area among the traces whose check boxes are selected on the Trend Setting (Display Only) screen.

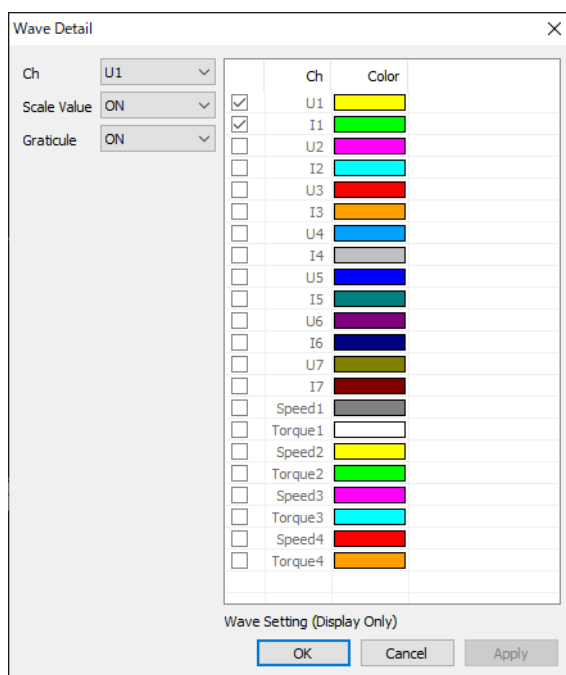
Scale Value

Set whether to show or hide the X-axis scale in the graph display area.

Graticule

Set whether to show or hide the graticule in the graph display area.

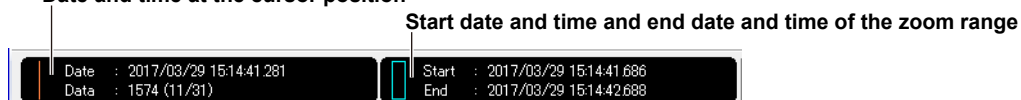
Expanded Screen for Data Streaming Waveform Analysis

**Ch**

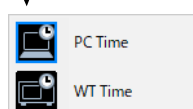
Select the traces to show in the graph display area among the traces whose check boxes are selected on the Wave Setting (Display Only) screen.

Timestamp

The following position information is displayed for the graph display area.

Normal Analysis Screen**Date and time at the cursor position****Expanded Screen for Data Streaming Waveform Analysis****Displays the acquisition date/time and data position of the data streaming waveform**

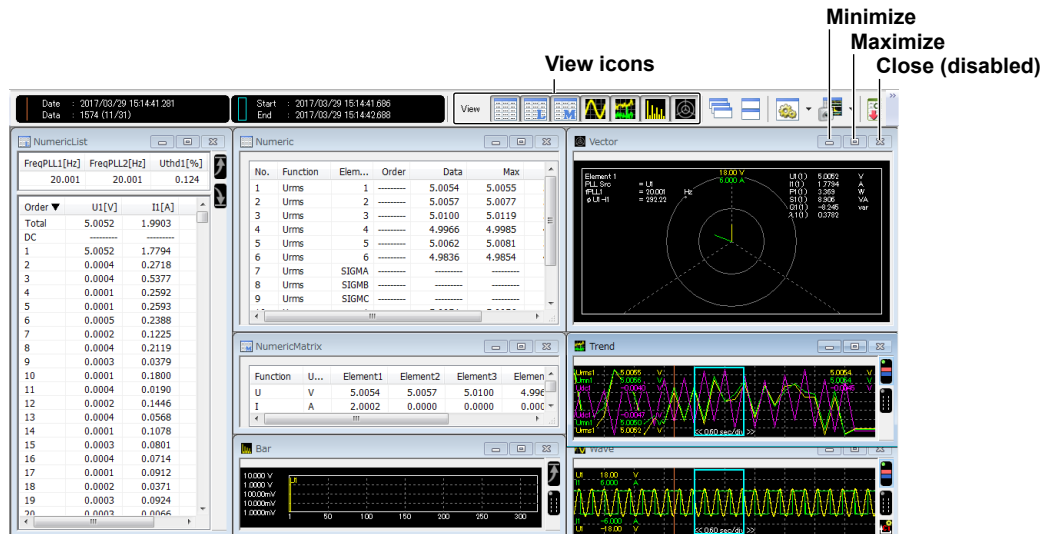
Right-click



Time switch (WT5000 only)
This setting also changes the time of the first data value in the CSV output file.

Analysis Screen

When you start the software for the first time, all possible windows are displayed tiled.



- You can maximize or minimize any analysis window.
- After you maximize a window, you can click a window arrange icon (Cascade or Tile) to clear the maximization and arrange the windows as specified.
- To close a analysis window, click the corresponding view icon. The close button at the upper right of each analysis window is disabled.
- Right-click the analysis window to display the detail setting dialog box of the window.
- The numeric list window, bar graph window, and vector window can be displayed in any of the following cases.
 - WT5000
 - When any of the following options is installed in the WT
 - Harmonic measurement (/G5)
 - Simultaneous dual harmonic measurement (/G6)
 - Advanced computation (/G6)
- The following models can display a waveform window if the harmonic measurement (/G5) option is installed.
 - WT310E/WT310EH/WT332E/WT333E
 - WT310/WT310HC/WT330(WT332/WT333)
- The vector window cannot be displayed on the following models.
 - WT310E/WT310EH/WT332E/WT333E
 - WT310/WT310HC/WT330(WT332/WT333)

7.2 Numeric Display

The numeric display shows the data at the cursor position on the trend display numerically. You can customize the types of functions to display, the display order, the font size, the color, and so on.

Numeric Data Display Area

Numeric data display area: See section 6.2.

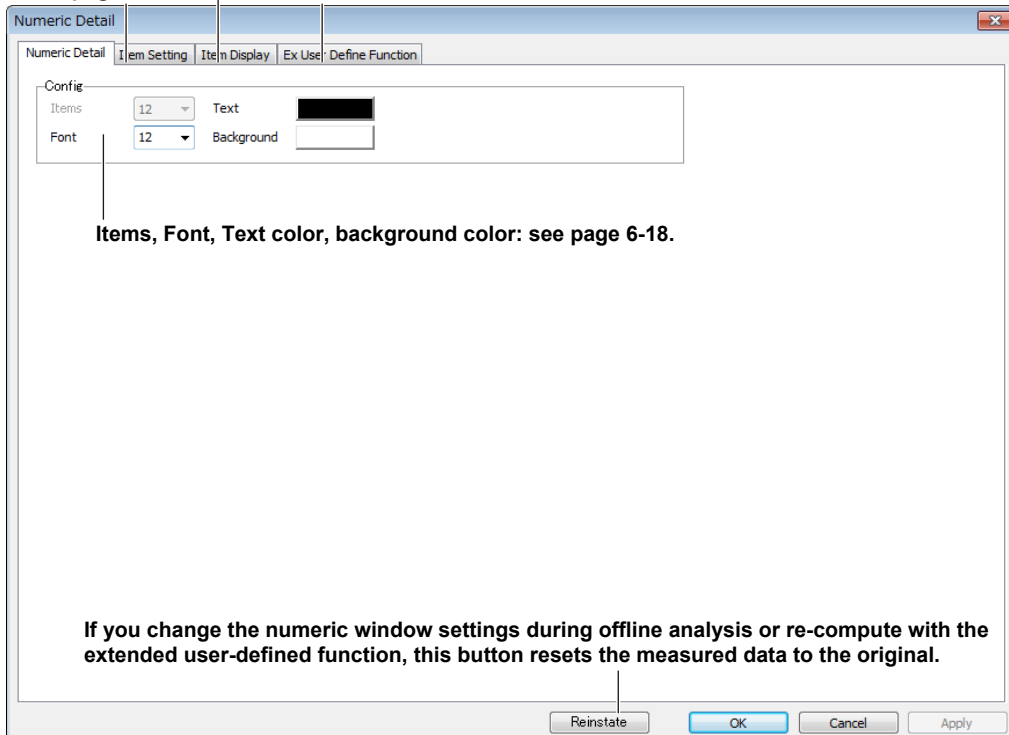
No.	Function	Elem...	Order	Data	Max	Min	Units
1	Urms		1	5.0054	5.0055	5.0052	V
2	Urms		2	5.0057	5.0077	5.0057	V
3	Urms		3	5.0100	5.0119	5.0100	V
4	Urms		4	4.9966	4.9985	4.9965	V
5	Urms		5	5.0062	5.0081	5.0062	V
6	Urms		6	4.9836	4.9854	4.9835	V
7	Urms	SIGMA					V
8	Urms	SIGMB					V
9	Urms	SIGMC					V
10	Umn		1	5.0054	5.0056	5.0050	V

Detail Setting Dialog Box

A detail setting dialog box appears when you perform any of the following operations.

- Right-click the numeric window.
- Click the window detail setting button when the numeric window is selected (active).
- Select Numeric-Detail, Numeric-Item Setting, Numeric-Display Setting or Numeric-Ex User Define Function Setting in the shortcut menu of the window detail setting button.

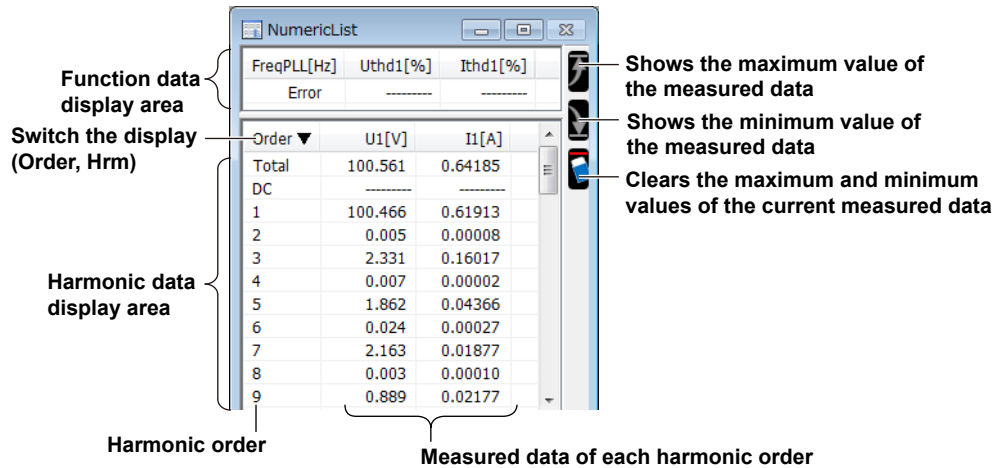
Item Setting: See page 6-19. **Item Display:** See page 6-20.
Ex User Define Function: See page 6-21.



7.3 Numeric List Display

The numeric list display lists harmonic measurement data for each harmonic order. The numeric list window can be displayed in any of the following cases.

- WT5000
- When any of the following options is installed in the WT
 - Harmonic measurement (/G5)
 - Simultaneous dual harmonic measurement (/G6)
 - Advanced computation (/G6)



Detail Setting Dialog Box

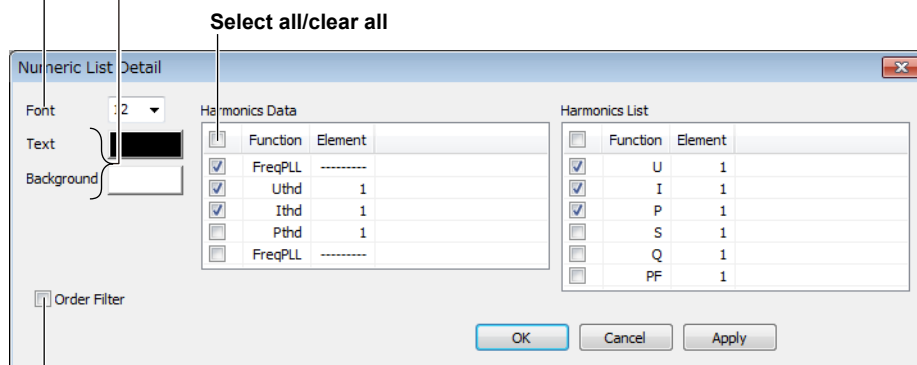
A detail setting dialog box appears when you perform any of the following operations.

- Right-click the numeric list window.
- Click the window detail setting button when the numeric list window is selected (active).
- Select Numeric List in the shortcut menu of the window detail setting button.

This is not possible when measured data collection is in progress.

Font: see page 6-18.

Text color and background color: see page 6-18.



Order filter: See page 6-23.

Setting the Display Items

Click the Function, Element and WTID cells, and set each item using the combo box that appears. You cannot change them while measured data collection is in progress.

7.4 Numeric Matrix Display

The numeric matrix display shows measured data of each element in a matrix.

When the display mode is WT

Function	Units	Element1	Element2	Element3
U	V	0.0000k	0.0000k	0.0000k
I	A	0.0000	0.0000	0.0000
P	W	-0.0000k	0.0000k	-0.0000k
S	VA	0.0000k	0.0000k	0.0000k
Q	var	0.0000k	0.0000k	0.0000k
PF	---O F---	---O F---	---O F---	---O F---
Phi	deg	---O F---	---O F---	---O F---
FreqU	Hz	Error	Error	Error
FreqI	Hz	Error	Error	Error

When the display mode is ALL

Function	Units	WT1:Element1	WT1:Element2	WT1:Element3	WT2:Element1	WT2:Element2	WT2:Element3	WT3:Element1
U	V	0.0580	0.0579	0.0581	0.0579	0.0580	0.0577	0.0000k
I	A	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

WT1 elements
WT2 elements

Function

The functions are displayed in the following fixed order.

U, I, P, S, Q, λ , ϕ , FreqU, FreqI

Detail Setting Dialog Box

A detail setting dialog box appears when you perform any of the following operations.

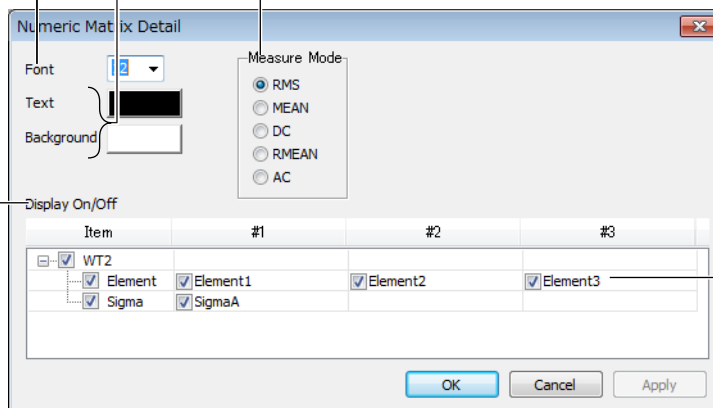
- Right-click the numeric matrix window.
- Click the window detail setting button when the numeric matrix window is selected (active).
- Select Numeric Matrix in the shortcut menu of the window detail setting button.

This is not possible when measured data collection is in progress.

Font: see page 6-18.

Text color and background color: see page 6-18.

Measurement mode of the U and I to be displayed



Select the items to display in the numeric matrix window.

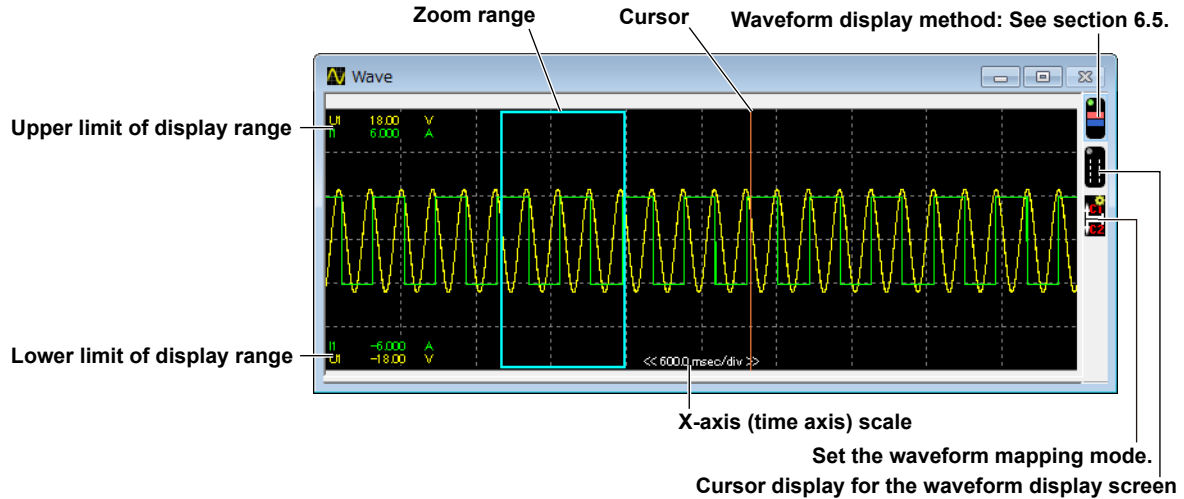
Display On/Off: See page 6-25.

7.5 Waveform Display

The waveform display shows waveform display data.

The following models can display a waveform window if the harmonic measurement (/G5) option is installed.

- WT310E/WT310EH/WT332E/WT333E
- WT310/WT310HC/WT330(WT332/WT333)



Note

When connected to the WT500 during measurement data acquisition (see section 6.5), waveform is displayed in sections where integration has been started or stopped.

It is not displayed in sections where integration has been reset.

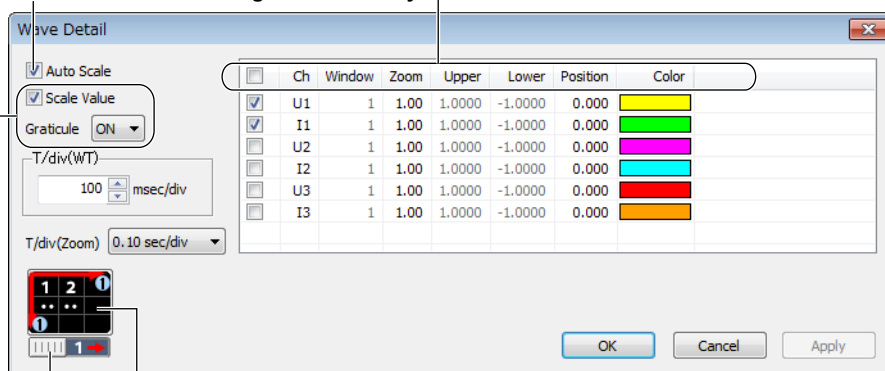
Detail Setting Dialog Box

A detail setting dialog box appears when you perform any of the following operations.

- Right-click the wave window.
- Click the window detail setting button when the wave window is selected (active).
- Select Wave in the shortcut menu of the window detail setting button.

For details, see section 6.5.

The scale values change automatically



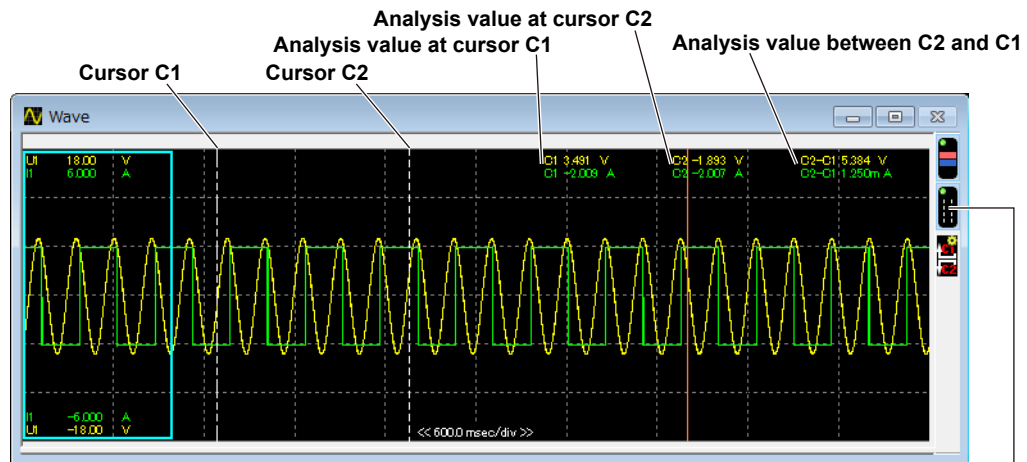
Combination of rows and columns: See section 6.5.

Screen division method: See section 6.5.

Scale and graticule display: See section 6.5.

Cursor Display for the Waveform Display Screen

In addition to the cursor display using the control bar, you can use two individual cursors (C1 and C2) to display the analysis data on the waveform display screen.



Turns on and off the C1 and C2 cursor operation function.

Controlling Cursors C1 and C2

Cursor C1

The cursor appears at (moves to) the location you click on the waveform display screen.

Cursor C2

The cursor appears at (moves to) the location you right-click on the waveform display screen.

Cursors C1 and C2

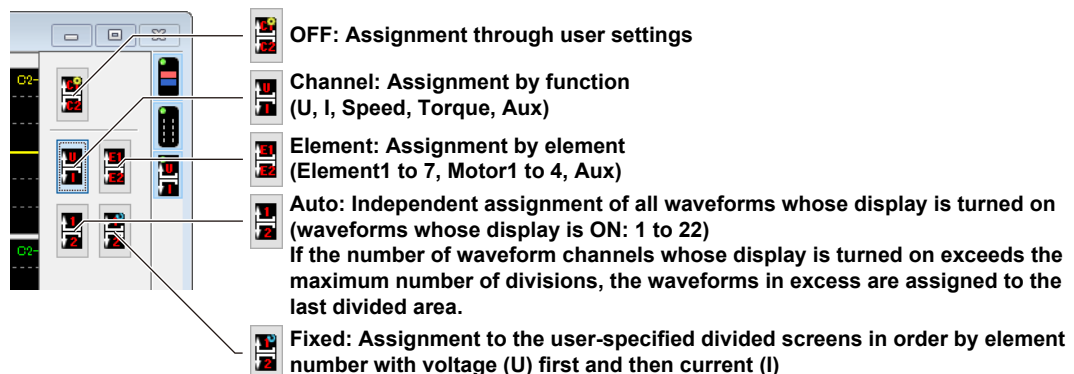
Click or drag while holding the Ctrl key on the PC keyboard to move cursors C1 and C2 simultaneously while maintaining the spacing between the two cursors.

Note

If the cursor display for the waveform display screen is turned on, because the cursor or zoom range cannot be controlled in the waveform window, turn the display off or use the analysis bar.

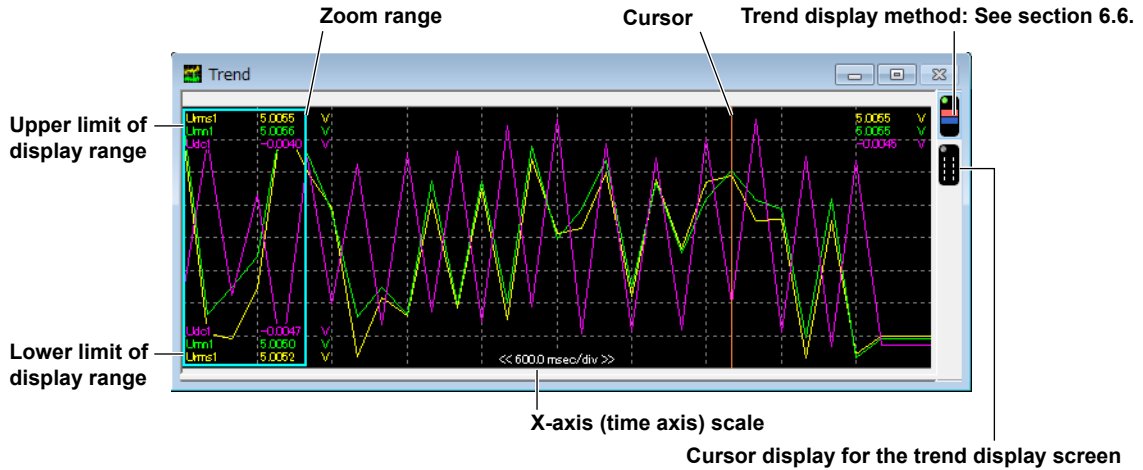
Waveform Mapping Mode

- Clicking the mouse turns the automatic waveform assignment on or off.
 - OFF: Waveforms of your choice can be assigned to the divided screens.
 - ON: Displays the waveforms according to the assignment method selected through the following operation
- Right-click to select the assignment method used when automatic waveform assignment is set to ON. Select from the options in the following diagram.



7.6 Trend Display

The trend display shows changes in measured data over time on a trend graph.



Detail Setting Dialog Box

A detail setting dialog box appears when you perform any of the following operations.

- Right-click the trend window.
- Click the window detail setting button when the trend window is selected (active).
- Select Trend in the shortcut menu of the window detail setting button.

This is not possible when measured data collection is in progress.

Screen division method: See section 6.5.

Combination of rows and columns: See section 6.5.

The 'Trend Detail' dialog box is shown with various settings. On the left, there are checkboxes for 'Auto Scale' and 'Scale Value', a 'Graticule' dropdown set to 'ON', and a 'T/div(Zoom)' dropdown set to '1.00 sec/div'. Below these are buttons for 'Value', 'Font' (set to 12), 'Auto Color' (set to OFF), 'Text' (black), and 'Background' (white). On the right, there is a table of traces:

Trace	Function	Element	Order	Window	Upper	Lower	Color	
<input checked="" type="checkbox"/>	Trace1	Urms	1	-----	1	1.0000	-1.0000	Yellow
<input checked="" type="checkbox"/>	Trace2	Umn	1	-----	1	1.0000	-1.0000	Green
<input checked="" type="checkbox"/>	Trace3	Udc	1	-----	1	1.0000	-1.0000	Magenta
<input type="checkbox"/>	Trace4	Urmn	1	-----	1	1.0000	-1.0000	Cyan
<input type="checkbox"/>	Trace5	Uac	1	-----	1	1.0000	-1.0000	Red
<input type="checkbox"/>	Trace6	Irms	1	-----	1	1.0000	-1.0000	Orange
<input type="checkbox"/>	Trace7	Imn	1	-----	1	1.0000	-1.0000	Blue
<input type="checkbox"/>	Trace8	Idc	1	-----	1	1.0000	-1.0000	Grey
<input type="checkbox"/>	Trace9	Imn	1	-----	1	1.0000	-1.0000	Dark Blue
<input type="checkbox"/>	Trace10	Iac	1	-----	1	1.0000	-1.0000	Teal
<input type="checkbox"/>	Trace11	P	1	-----	1	1.0000	-1.0000	Purple
<input type="checkbox"/>	Trace12	S	1	-----	1	1.0000	-1.0000	Dark Blue
<input type="checkbox"/>	Trace13	Q	1	-----	1	1.0000	-1.0000	Olive
<input type="checkbox"/>	Trace14	λ	1	-----	1	1.0000	-1.0000	Brown
<input type="checkbox"/>	Trace15	φ	1	-----	1	1.0000	-1.0000	Grey
<input type="checkbox"/>	Trace16	FreqU	1	-----	1	1.0000	-1.0000	White

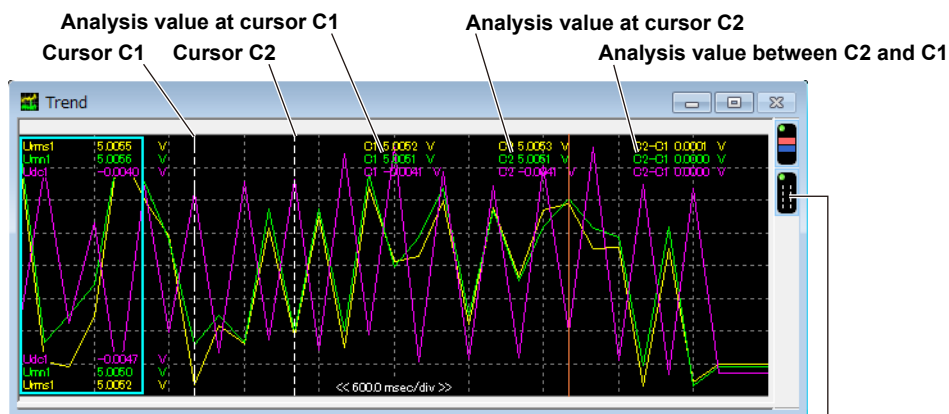
Labels in the image point to various parts of the dialog box: 'Shows or hides all trends at once' points to the table, 'For details, see section 6.5.' points to the table, 'Set the numeric display screen.' points to the 'Value' button, 'Text color and background color: see page 6-18. You can set this when the auto color is set to OFF.' points to the 'Text' and 'Background' settings, 'Set auto color.' points to the 'Auto Color' dropdown, and 'Font: see page 6-18.' points to the 'Font' dropdown.

Setting the Trend Display Method

You can set the display method of the entire waveform, zoom waveform, and data. For the procedure, see section 6.6.

Cursor Display for the Trend Display Screen

In addition to the cursor display using the control bar, you can use two individual cursors (C1 and C2) to display the analysis data on the trend display screen.



Turns on and off the C1 and C2 cursor operation function.

Controlling Cursors C1 and C2

Cursor C1

The cursor appears at (moves to) the location you click on the trend display screen.

Cursor C2

The cursor appears at (moves to) the location you right-click on the trend display screen.

Cursors C1 and C2

Click or drag while holding the Ctrl key on the PC keyboard to move cursors C1 and C2 simultaneously while maintaining the spacing between the two cursors.

Note

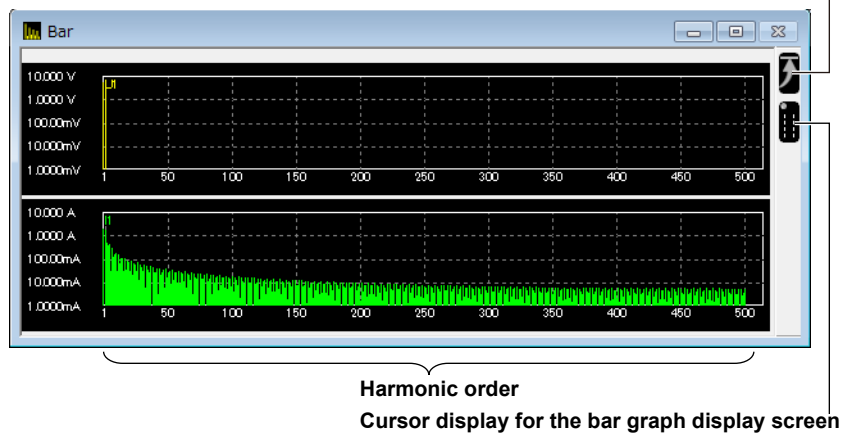
If the cursor display for the display screen is turned on, because the cursor or zoom range cannot be controlled in the trend window, turn the display off or use the analysis bar.

7.7 Bar Graph Display

The bar graph display shows harmonic measurement data for each harmonic order in a bar graph. The bar graph window can be displayed in any of the following cases.

- WT5000
- When any of the following options is installed in the WT
 - Harmonic measurement (/G5)
 - Simultaneous dual harmonic measurement (/G6)
 - Advanced computation (/G6)

Shows the maximum value of the measured data



Detail Setting Dialog Box

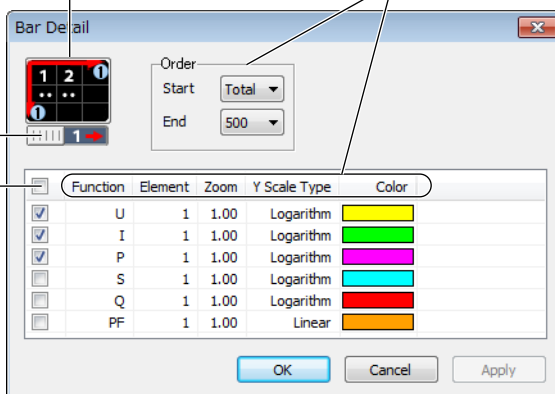
A detail setting dialog box appears when you perform any of the following operations.

- Right-click the bar graph window.
- Click the window detail setting button when the bar graph window is selected (active).
- Select Bar in the shortcut menu of the window detail setting button.

Screen division method: See section 6.7.

Combination of rows and columns: See section 6.7.

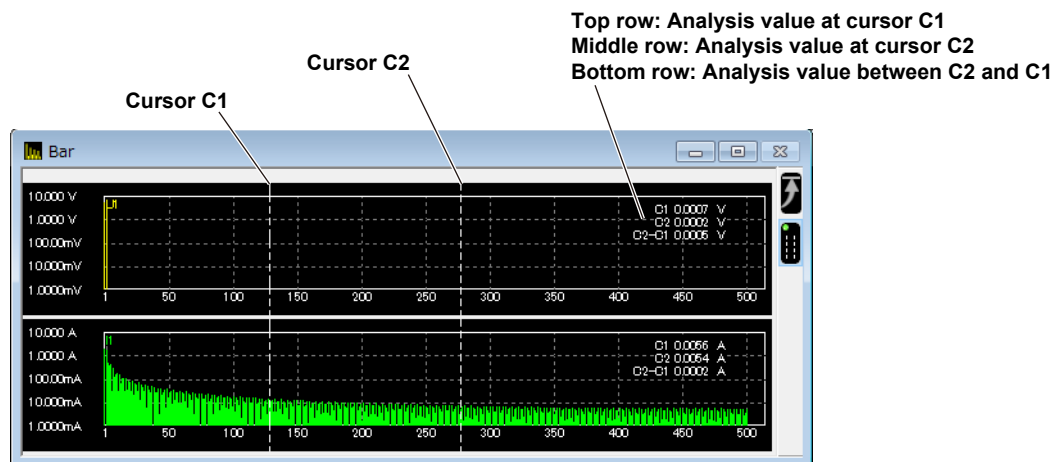
For details, see section 6.7.



Shows or hides all bar graphs at once

Cursor Display for the Bar Graph Display Screen

In addition to the cursor display using the analysis bar, you can use two individual cursors (C1 and C2) to display the analysis data on the bar graph display screen.



Controlling Cursors C1 and C2

Cursor C1

The cursor appears at (moves to) the location you click on the bar graph display screen.

Cursor C2

The cursor appears at (moves to) the location you right-click on the bar graph display screen.

Cursors C1 and C2

Click or drag while holding the Ctrl key on the PC keyboard to move cursors C1 and C2 simultaneously while maintaining the spacing between the two cursors.

7.8 Vector Display

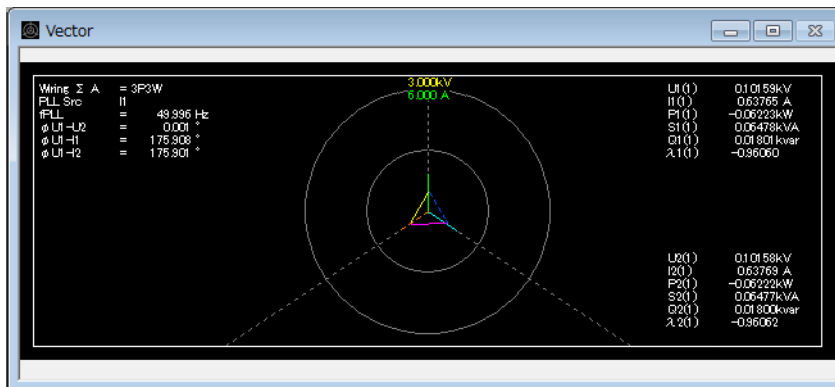
You can select a wiring unit to display vectors of the phase differences and amplitudes (rms values) of the fundamental signals, U(1) and I(1), in each element in the unit. The positive vertical axis is set to zero (angle zero), and the vector of each input signal is displayed.

The vector window can be displayed in any of the following cases.

- WT5000
- When any of the following options is installed in the WT
 - Harmonic measurement (/G5)
 - Simultaneous dual harmonic measurement (/G6)
 - Advanced computation (/G6)

The vector window cannot be displayed on the following models.

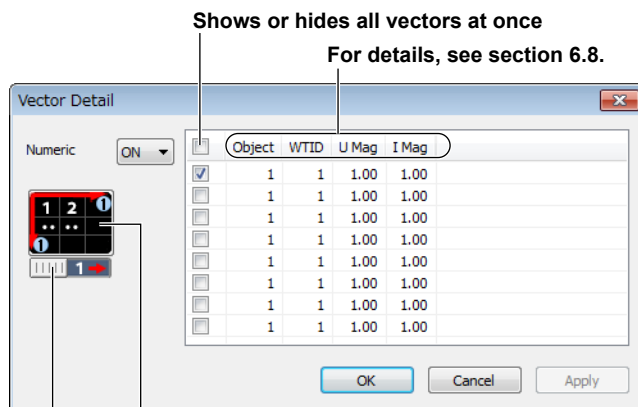
- WT310E/WT310EH/WT332E/WT333E
- WT310/WT310HC/WT330(WT332/WT333)



Detail Setting Dialog Box

A detail setting dialog box appears when you perform any of the following operations.


- Right-click the vector window.
- Click the window detail setting button when the vector window is selected (active).
- Select Vector in the shortcut menu of the window detail setting button.

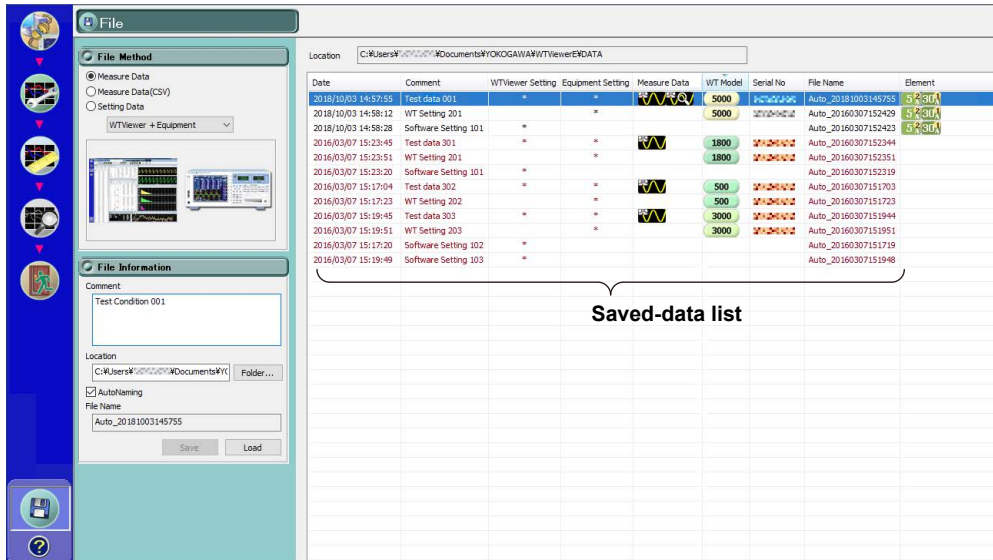


Combination of rows and columns: See section 6.8.

Screen division method: See section 6.8.

8.1 Saving and Loading Setup Parameters

1. Click  in the menu area. The File screen appears.

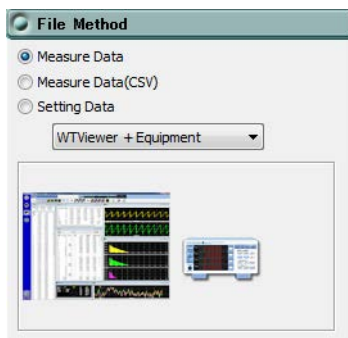


Selecting the Type of File to Save

Select the type of data to save from the following:

- Measure Data: Data measured on the WT will be saved. The device and this software's settings are also saved.
- Measure Data(CSV): Data measured on the WT will be saved in CSV format. For details on the dialog box that appears when saving the data, see "Configuring the CSV Output" in section 7.1.
- Setting Data
 - WTViewer + Equipment: Both of the WT and software setup parameters will be saved.
 - WTViewer: The software setup parameters will be saved.
 - Equipment: The WT setup parameters will be saved.

The illustration will change depending on the item that you select.



Setting the Save Conditions

The screenshot shows a dialog box titled "File Information". It has a "Comment" field containing "Test Condition 001". Below that is a "Location" section with a "User name" label, a text box containing "C:\Users\%USER%\Documents\%USER%", and a "Folder..." button. There is a checked "AutoNaming" checkbox. Below that is a "Name" text box containing "WT_Setting_001". At the bottom are "Save" and "Load" buttons.

Comment

You can enter a comment if you like. You can enter up to 100 characters.

Location

Specify the folder to save the file.

AutoNaming

If you select the Auto Naming check box, files are saved with the name Auto_yyyymmddhhmmss.csv. yyyymmddhhmmss is a 14-digit number consisting of the year, month, day, hour, minute, and second. The year is four digits; the hour is based on a 24-hour clock.

Name

To specify the file name, clear the Auto Naming check box, and enter the file name.

- File Name: You can assign any name that is allowed on your PC.
- Extension: Setting data .cfg
Measure data .fdp, .fdv, .fdw, .fds, .cdt, .cdw

Save Button

Executes the saving of data.

Load Button

Loads the data that is selected in the saved-file list.

If the loaded data is a setup file and the following conditions apply, a warning will be displayed.


Condition in which a warning is displayed

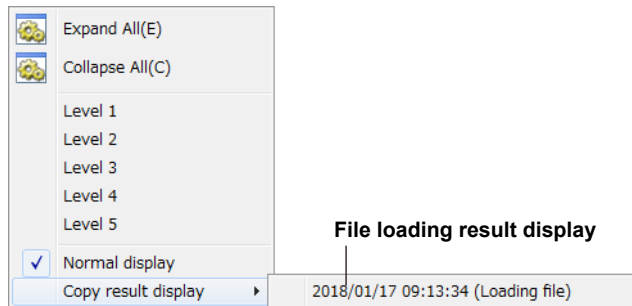
WT in which the following conditions are not aligned

- Number of connected devices
- Model
- Suffix code
- Element configuration

If this occurs, all possible settings will be restored in the connected device.

You can view the details of the restored results by following the procedure below.

1. Click  in the menu area. A setup menu appears.
2. Right-click the list of settings.
3. Select **Copy result display** from the menu. You can view the details of the file loading results.



Saved-File List

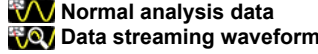
Date and time when the file was saved

Path to the file save destination folder

An asterisk appears when the file data type is set to WTViewer Setting.

An asterisk appears when the file data type is set to Equipment Setting.
If multiple WTs are connected, an asterisk is displayed for each WT.

The following icons are displayed when the file data type is set to Measure Data.



Model of the WT that was connected when the file was saved

Instrument number of the WT that was connected when the file was saved

Appears for the WT5000 The WT5000 element configuration is displayed in order from the left end starting with element 1.

User name

Location C:\Users\%*#\Documents\%YOKO\AWA\WTViewer\E#DATA

Date	Comment	WTViewer Setting	Equipment Setting	Measure Data	WT Model	Serial No	File Name	Element
2018/10/03 14:57:55	Test data 001	*	*		5000		Auto_20181003145755	
2018/10/03 14:58:12	WT Setting 201	*	*		5000		Auto_20160307152429	
2018/10/03 14:58:28	Software Setting 101	*					Auto_20160307152423	
2016/03/07 15:23:45	Test data 301	*	*		1800		Auto_20160307152344	
2016/03/07 15:23:51	WT Setting 201	*	*		1800		Auto_20160307152351	
2016/03/07 15:23:20	Software Setting 101	*					Auto_20160307152319	
2016/03/07 15:17:04	Test data 302	*	*		500		Auto_20160307151703	
2016/03/07 15:17:23	WT Setting 202	*	*		500		Auto_20160307151723	
2016/03/07 15:19:45	Test data 303	*	*		3000		Auto_20160307151944	
2016/03/07 15:19:51	WT Setting 203	*	*		3000		Auto_20160307151951	
2016/03/07 15:17:20	Software Setting 102	*					Auto_20160307151719	
2016/03/07 15:19:49	Software Setting 103	*					Auto_20160307151948	

In the saved-file list, files that cannot be loaded are displayed in red.

Moving the mouse pointer over a line in the element configuration shows the detailed element information (model, instrument number).



Element configuration

Element1 : 760902, "7609020000"
Element2 : 760901, "7609010000"

WT ID

The WT ID is displayed using WT1 to WT4 icons to the left of the element configuration icon, according to the number of WT5000s included in the WT connected to the PC.


- If the WT connected to the PC does not include even a single WT5000
The WT ID icon and element configuration are not displayed.
- If the WT connected to the PC includes a single WT5000
The WT ID icon is not displayed. The WT5000 element configuration is displayed.
- If the WT connected to the PC includes two or more WT5000s
The WT ID icon is displayed to the left of the element configuration of each WT5000.

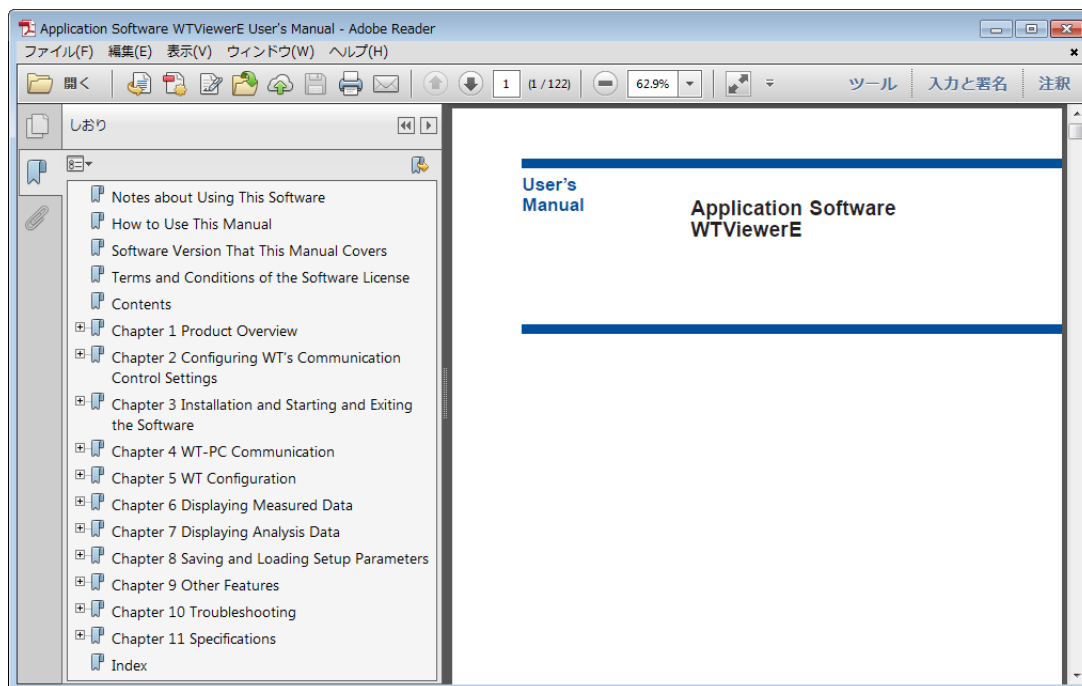
Note

- To align the connected device information with the saved file during online connection, set the file type to Setting Data - Equipment when loading the data.
- By loading a setup file when offline, you can reproduce the state that the device was in when the setup file was saved and establish a connection. For details, see section 4.2.

9.1 Help Feature


Displaying Help

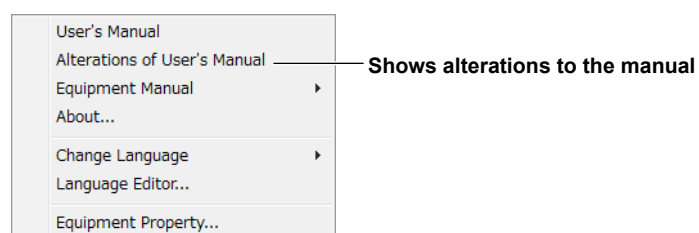
Click the help  button. If Adobe Acrobat Reader is installed on your PC, it will start, and the PDF of the software user's manual will open. You can look up how to use the software and terminology.



Displaying Alteration Notices

If alteration notices are available, you can view them by following the procedure below.

1. Right-click the help  button.
2. Click **Alterations of User's Manual**.



Obtaining the Latest User's Manual and Alteration Notices

To obtain the PDFs of the latest user's manual and alteration notices, visit the YOKOGAWA website indicated below, click **Y-LINK** to show the manual download page. Download the user's manual and alteration notices for the software from this page.

<https://tmi.yokogawa.com/support/download-software-drivers-firmware/>


Change the file name of the manual or alteration notice to that shown below, and overwrite the existing file in the Manuals folder in the software installation folder that you specified in the procedure described on page 3-2. Then, you will be able to view the file by clicking User's Manual or Alteration of User's Manual on the Help menu.

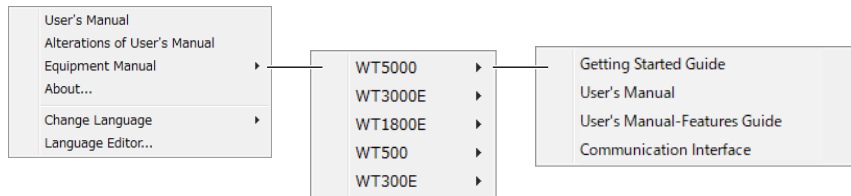
- User's manual file name: EN_WTViewerE Users Manual.pdf
- Alteration notice file name: EN_WTViewerE Alterations.pdf

Note

- You can download Adobe Reader from the Adobe website.
 - The latest user's manual and alteration notice that you can download from the YOKOGAWA website correspond to the latest version of this software. If necessary, update the software. You can download updates to the software from the YOKOGAWA website indicated above.
-

View the WT User's Manual

1. Right-click the help  button.
2. Click **Equipment Manual**.
3. Click the WT you want to view.
3. Click the manual you want to view.




Note

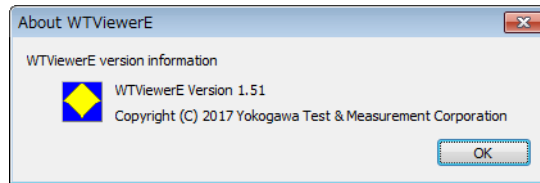
The help function does not show the user's manual for the following models.

View the user's manuals that are included with the instrument.


- WT3000 (760301/760302/760303/760304)
 - WT1800 (WT1801/WT1802/WT1803/WT1804/WT1805/WT1806)
 - WT310/WT310HC/WT332/WT333
-

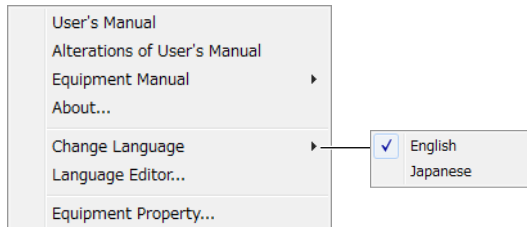
9.2 Viewing the Version Information

1. Right-click the help  button.
2. Click **About**.



9.3 Setting the Displayed Language

1. Right-click the help  button.
2. Click **Change Language**.
3. Select the language you want to use.



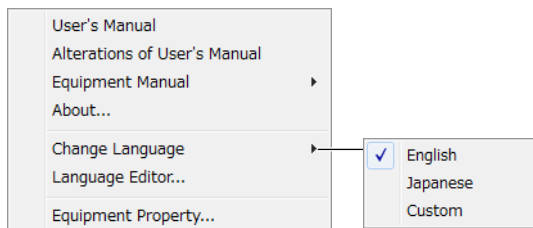
Note

Depending on the operating system, some language fonts may not be installed. In such cases, if you change the language, text will not be displayed properly. To display the text properly, you need to install appropriate fonts in the operating system.

Customizing the Displayed Language

To customize the displayed language, edit the language file by following the procedure in section 9.4.

If there is a language file that you create (custom file), the submenu will appear as follows:




Select **Custom** to load the custom file.

9.4 Editing the Displayed Language

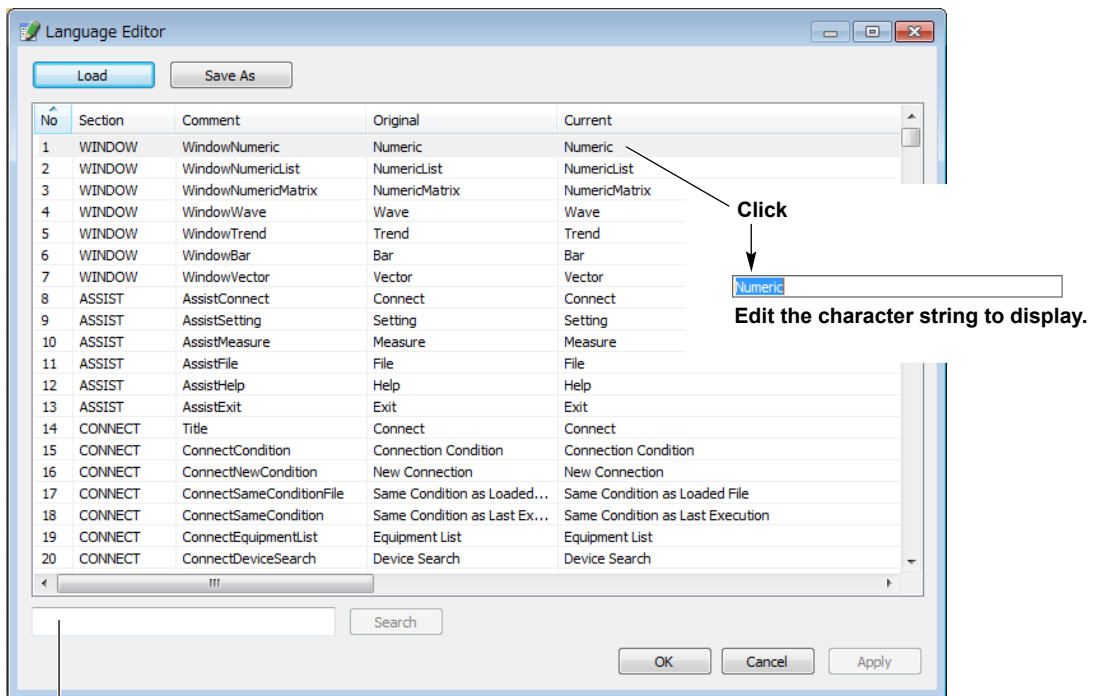
You can edit the text that is displayed in the dialog boxes and windows of the software.

Editing the Displayed Language

1. Right-click the help  button.
2. Click **Language Editor**.



3. In the Language Editor dialog box, click the cells in the Current column to edit the text to display.



You can search for a character string by entering the string here and clicking Search.

Saving the Edited Language Information

Click **Save As** to save the edited language information to a file. The file name extension is .lang.

Note

The English and Japanese language information files are in the following folder.


C:\Users\\My Documents\YOKOGAWA\WTVviewerE\Language

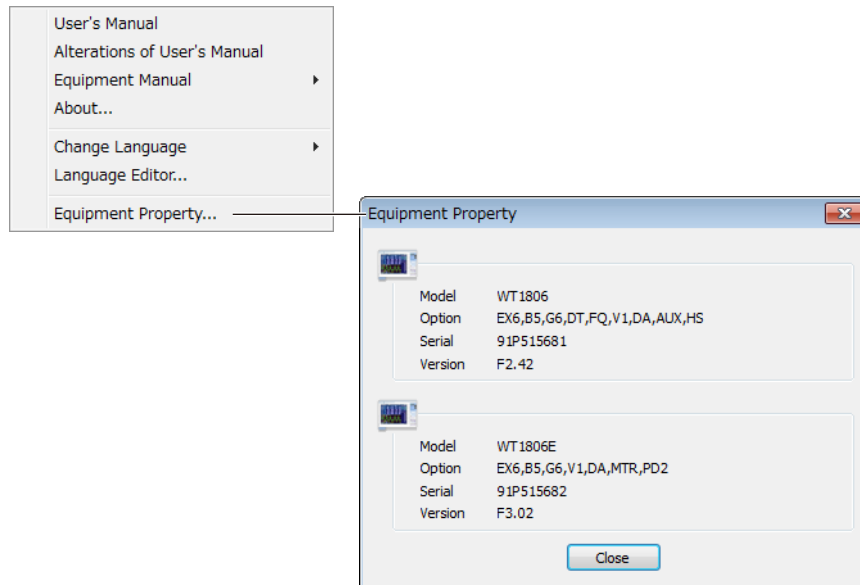
Loading Saved Language Information

Click **Load** to load a language information file into the Language Editor dialog box.

9.5 Displaying Equipment Properties

Displaying Equipment Properties

1. Right-click the help  button.
2. Click Equipment Property.



The model names and option information of all connected devices will be displayed.

In the case of the WT5000, element configuration information is also displayed.

```
Element1 : 760902, ""  
Element2 : 760902, ""  
Element3 : 760901, ""  
Element4 : 760901, ""  
Element5 : 760901, ""  
Element6 : 760901, ""  
Element7 : [None]
```

When the data streaming feature is in use on the WT5000, the data streaming state is also displayed.

USB connection

```
DS Measure Information  
USBTMC3 : True , USB3.0 : True  
DS Measure : True
```

Ethernet connection

```
DS Measure Information  
Ether(>=1Gbps) : True  
DS Measure : True
```

Note

When DS Measure: False is displayed, the data streaming feature cannot be used on this software.

Check the following:

- The presence of the WT5000 /DS option
- Connected interface type

For details, see the user's manuals that are included with the WT.

10.1 If a Problem Occurs

If a message appears on the screen, see section 10.2, “Error Messages.” If servicing is necessary, or if the instrument does not operate properly even after you have attempted to deal with the problem according to the instructions in this section, contact your nearest YOKOGAWA dealer.

Problems and Solutions

Unable to communicate with the WT using USB.

Using Device Manager, check whether the USB driver is appropriate for the WT series. If the driver is not appropriate, switch to the appropriate USB driver (see page 3-6).

Unable to communicate with the WT using GP-IB.

Communication may not work properly on GP-IB cards other than those of NI (National Instruments). Use a GP-IB card by NI (see section 1.3).

Unable to change the Function, Element, and Order settings in the dialog boxes.

Click a Function, Element, or Order cell to show a combo box.
Then select the appropriate item.

Waveforms, bar graphs, or trends do not appear even when data collection is started.

Stop data collection (see section 6.1), select the items you want to show using the view buttons on the toolbar, open the relevant windows, and start data collection.

Waveforms are not displayed.

Change the **VZoom** and **Position** values in the detail setting dialog box (see section 6.5).

Waveform or trend traces overflow from the screen.

In the detail setting dialog box, select the **Auto Scale** check box, or change the **Upper**, **Lower**, and **VZoom** values to appropriate values (see section 6.5 or 6.6).

Even when the **UpdateRate** on the Setting screen is changed, the display update interval of the software does not change.

The display update interval of the software is not synchronized to the display update interval of the WT. It is dependent on the performance of your PC and the communication interface (USB, GP-IB, RS-232, or Ethernet). If the WT data update interval is set to a short value such as 100 ms, the software cannot keep up, and some of the data points that the WT is measuring will not be collected. If you want to synchronize the display update interval between the WT and software, configure your environment by referring to the items below.

- The less number of data points that the software has to collect from the WT, the shorter the display update interval.
- The communication interfaces listed in descending order by data rate are as follows.
 - WT5000
Ethernet = USB > GP-IB
 - WT3001E/WT3002E/WT3003E/WT3004E, WT3000 (760301/760302/760303/760304)
Ethernet > GP-IB > USB > RS-232
 - WT1801E/WT1802E/WT1803E/WT1804E/WT1805E/WT1806E, WT1800 (WT1801/WT1802/WT1803/WT1804/WT1805/WT1806)
Ethernet = USB > GP-IB
 - WT500 (760201/760202/760203)
Ethernet = USB = GP-IB
 - WT310E/WT310EH/WT332E/WT333E, WT310/WT310HC/WT332/WT333
Ethernet = USB > GP-IB > RS-232
- Use a faster PC.

Example:

The display update interval of the WT and that of the software may match if you use the GP-IB, Ethernet, or USB interface and set the WT display update interval to 100 ms.

Continuous measured data for each display update interval cannot be saved.

Set the save interval (see section 6.2) to UpdateRate and waveform trigger (see section 5.1) to OFF. If the save destination is formatted to FAT and the number of files in the same folder increases, the performance may degrade drastically. Change the formatting to a format other than FAT.

10.2 Error Messages

Message	Corrective Action
<p>Equipment can not be found.</p> <ul style="list-style-type: none"> • Please check the power supply. • Please check the Device Manager. • Please refer to help. 	<p>Check the following items.</p> <ul style="list-style-type: none"> • Is the WT turned on? • Is the GP-IB, RS-232, Ethernet, or USB cable connected properly? • If you are using GP-IB, are the GP-IB addresses in the same system all unique? Is the GP-IB address set on the WT the same as the GP-IB address set in WTVIEWER? Is the GP-IB driver installed correctly in your PC? • If you are using RS-232, are the communication parameters, such as the baud rate, set to the same values on the WT and WTVIEWER? • If you are using Ethernet, are the IP address, user name, and password set to the same values on the WT and WTVIEWER? • If you are using USB, are the ID used in the same system all unique? Is the ID set on the WT the same as the ID set in WTVIEWER? Is the USB driver installed correctly in your PC? • If you are using USB, is the USB driver is appropriate for the WT series?
<p>Integrate timer is out of range Updaterate is out of range Stop timer is out of range Rated time is out of range Wave observe is out of range Please input a value from 0.001 to 9999.</p>	<p>The value that you tried to set is outside the allowed range. Set a value within the allowed range.</p>
<p>Data Streaming settings cannot be made because the Data Streaming measurement connection status is not satisfied.</p>	<p>Check the following items.</p> <ul style="list-style-type: none"> • The /DS (data streaming) option is available on the WT5000. • In the case of USB, all components (PC port, USB cable, etc.) are USB3.0 compatible. • In the case of Ethernet, all components (PC's network adapter, Ethernet cable, switching hub, etc.) between the WT and WTVIEWER are Gigabit Ethernet compatible. <p>You can view the current status in the Equipment Properties explained in Section 9.5.</p>

11.1 Specifications

Item	Specifications																		
Data formats that the software can save to	<p>The following table lists the data formats (extensions) that the software can save to. Note that CSV files cannot be loaded into the software.</p> <table border="1"> <tr> <td>Setup parameters¹</td> <td>CFG format (.cfg)</td> </tr> <tr> <td>Numeric data</td> <td>CSV format (.csv), FDP format (.fdp, measurement numeric data) FDV format (.fdv; numeric data for analysis)</td> </tr> <tr> <td>Waveform display data</td> <td>CSV format (.csv), FDW format (.fdw; measured waveform data) FDS (.fds; data streaming waveform data for analysis) CDW format (.cdw; waveform data for analysis)</td> </tr> <tr> <td>Trend data</td> <td>CSV format (.csv), CDT format (.cdt; trend data for analysis)</td> </tr> </table> <p>¹ Setup parameters cannot be saved to CSV files.</p>	Setup parameters ¹	CFG format (.cfg)	Numeric data	CSV format (.csv), FDP format (.fdp, measurement numeric data) FDV format (.fdv; numeric data for analysis)	Waveform display data	CSV format (.csv), FDW format (.fdw; measured waveform data) FDS (.fds; data streaming waveform data for analysis) CDW format (.cdw; waveform data for analysis)	Trend data	CSV format (.csv), CDT format (.cdt; trend data for analysis)										
Setup parameters ¹	CFG format (.cfg)																		
Numeric data	CSV format (.csv), FDP format (.fdp, measurement numeric data) FDV format (.fdv; numeric data for analysis)																		
Waveform display data	CSV format (.csv), FDW format (.fdw; measured waveform data) FDS (.fds; data streaming waveform data for analysis) CDW format (.cdw; waveform data for analysis)																		
Trend data	CSV format (.csv), CDT format (.cdt; trend data for analysis)																		
Data formats that the software can load from	<p>The following table lists the data formats that the software can load from. Data saved with the auto saving feature explained in section 6.2 cannot be loaded into the software.</p> <table border="1"> <tr> <td>Model</td> <td>WT5000 WT3001E/WT3002E/WT3003E/WT3004E WT3000 (760301/760302/760303/760304) WT1801E/WT1802E/WT1803E/WT1804E/WT1805E/WT1806E WT1800 (WT1801/WT1802/WT1803/WT1804/WT1805/WT1806) WT500 (760201/760202/760203) WT310E/WT310EH/WT332E/WT333E WT310/WT310HC/WT332/WT333</td> </tr> <tr> <td>Setup Parameters</td> <td>CFG format (.cfg)</td> </tr> <tr> <td>Numeric data</td> <td>FDP format (.fdp, measurement numeric data) FDV format (.fdv; numeric data for analysis)</td> </tr> <tr> <td>Waveform display data</td> <td>FDW format (.fdw; measured waveform data) FDS (.fds; data streaming waveform data for analysis) CDW format (.cdw; waveform data for analysis)</td> </tr> <tr> <td>Trend data</td> <td>CDT format (.cdt; trend data for analysis)</td> </tr> </table>	Model	WT5000 WT3001E/WT3002E/WT3003E/WT3004E WT3000 (760301/760302/760303/760304) WT1801E/WT1802E/WT1803E/WT1804E/WT1805E/WT1806E WT1800 (WT1801/WT1802/WT1803/WT1804/WT1805/WT1806) WT500 (760201/760202/760203) WT310E/WT310EH/WT332E/WT333E WT310/WT310HC/WT332/WT333	Setup Parameters	CFG format (.cfg)	Numeric data	FDP format (.fdp, measurement numeric data) FDV format (.fdv; numeric data for analysis)	Waveform display data	FDW format (.fdw; measured waveform data) FDS (.fds; data streaming waveform data for analysis) CDW format (.cdw; waveform data for analysis)	Trend data	CDT format (.cdt; trend data for analysis)								
Model	WT5000 WT3001E/WT3002E/WT3003E/WT3004E WT3000 (760301/760302/760303/760304) WT1801E/WT1802E/WT1803E/WT1804E/WT1805E/WT1806E WT1800 (WT1801/WT1802/WT1803/WT1804/WT1805/WT1806) WT500 (760201/760202/760203) WT310E/WT310EH/WT332E/WT333E WT310/WT310HC/WT332/WT333																		
Setup Parameters	CFG format (.cfg)																		
Numeric data	FDP format (.fdp, measurement numeric data) FDV format (.fdv; numeric data for analysis)																		
Waveform display data	FDW format (.fdw; measured waveform data) FDS (.fds; data streaming waveform data for analysis) CDW format (.cdw; waveform data for analysis)																		
Trend data	CDT format (.cdt; trend data for analysis)																		
Data display update interval	Depends on the PC processing speed, the communication interface in use, and the number of data points that the software is collecting from the WT.																		
Screens	<table border="1"> <tr> <td>Numeric</td> <td>Displays the numeric data that the software collects from the WT</td> </tr> <tr> <td>Numeric list²</td> <td>Lists the harmonic data that the software collects from the WT</td> </tr> <tr> <td>Numeric Matrix</td> <td>Displays the numeric data that the software collects from the WT for each element in a table</td> </tr> <tr> <td>Waveform³</td> <td>Displays the waveform display data that the software collects from the WT</td> </tr> <tr> <td>Data streaming waveform⁴</td> <td>Displays the data streaming waveform data that the software collects from the WT</td> </tr> <tr> <td>Bar Graph²</td> <td>Displays bar graphs of the harmonic components for each harmonic order during harmonic measurement</td> </tr> <tr> <td>Trend</td> <td>Displays the numeric data that the software collects from the WT as trend graphs</td> </tr> <tr> <td>Vector^{2,5}</td> <td>Displays vectors of the phase differences and amplitudes (rms values) of the fundamental signals, U(1) and I(1), in each element in the wiring unit</td> </tr> <tr> <td>Analysis graph</td> <td>Analysis screen only. Set a cursor and zoom range in the entire measured data and display the corresponding data in other screens.</td> </tr> </table> <p>² Harmonic measurement option must be installed in the WT. (Can be displayed on the standard model for the WT5000)</p> <p>³ Harmonic measurement option must be installed in the WT310E/WT310EH/WT332E/WT333E or WT310/WT310HC/WT332/WT333.</p> <p>⁴ The data streaming option must be installed in the WT5000 (section 1.3).</p> <p>⁵ A vector window cannot be displayed on the WT310E/WT310EH/WT332E/WT333E or WT310/WT310HC/WT332/WT333.</p>	Numeric	Displays the numeric data that the software collects from the WT	Numeric list ²	Lists the harmonic data that the software collects from the WT	Numeric Matrix	Displays the numeric data that the software collects from the WT for each element in a table	Waveform ³	Displays the waveform display data that the software collects from the WT	Data streaming waveform ⁴	Displays the data streaming waveform data that the software collects from the WT	Bar Graph ²	Displays bar graphs of the harmonic components for each harmonic order during harmonic measurement	Trend	Displays the numeric data that the software collects from the WT as trend graphs	Vector ^{2,5}	Displays vectors of the phase differences and amplitudes (rms values) of the fundamental signals, U(1) and I(1), in each element in the wiring unit	Analysis graph	Analysis screen only. Set a cursor and zoom range in the entire measured data and display the corresponding data in other screens.
Numeric	Displays the numeric data that the software collects from the WT																		
Numeric list ²	Lists the harmonic data that the software collects from the WT																		
Numeric Matrix	Displays the numeric data that the software collects from the WT for each element in a table																		
Waveform ³	Displays the waveform display data that the software collects from the WT																		
Data streaming waveform ⁴	Displays the data streaming waveform data that the software collects from the WT																		
Bar Graph ²	Displays bar graphs of the harmonic components for each harmonic order during harmonic measurement																		
Trend	Displays the numeric data that the software collects from the WT as trend graphs																		
Vector ^{2,5}	Displays vectors of the phase differences and amplitudes (rms values) of the fundamental signals, U(1) and I(1), in each element in the wiring unit																		
Analysis graph	Analysis screen only. Set a cursor and zoom range in the entire measured data and display the corresponding data in other screens.																		
WT Configuration	All functions that are available as communication commands																		
System Requirements	See section 1.3.																		

Index

A	Page	L	Page
about.....	9-3	language.....	9-4
address.....	2-3	language editor.....	9-5
alteration notice.....	9-1	License.....	v
auto naming.....	6-18, 7-4, 7-4	load.....	8-2
Auto Saving.....	6-16	location.....	8-2
auto scale.....	6-27, 6-31	lower limit.....	6-28, 6-32
B	Page	M	Page
Bar Graph.....	6-33, 7-18	ManualSaving.....	6-17
baud rate.....	2-4	measure data, saving.....	6-16
C	Page	measurement screen.....	6-1, 7-1
cascade.....	6-4, 7-3	Memory.....	1-9
channel.....	6-28	menus.....	1-1
collection interval.....	1-3	messages.....	10-2
color.....	6-28, 6-32	mouse.....	1-10
comment.....	8-2	N	Page
communication board.....	1-10	new connection.....	4-1
connection condition.....	4-1	Number of License.....	v
connection, starting.....	4-5	numeric display.....	6-15, 7-11
corrective action.....	10-2	numeric list.....	6-22, 7-12
CPU.....	1-9	numeric matrix.....	6-24, 7-13
D	Page	O	Page
data collection interval.....	1-3	offline.....	4-8
data format.....	2-4	OS.....	1-9
data streaming.....	1-11, 7-5	P	Page
data update interval.....	1-3	PC.....	1-9
display.....	1-10	PC and WT, connection.....	2-1
display screens, types.....	1-2	position.....	6-28
E	Page	printer.....	1-10
end harmonic order.....	6-34	problems.....	10-1
equipment list.....	4-2	problems and solutions.....	10-1
error messages.....	10-2	R	Page
Ethernet.....	1-10	revisions.....	i
Ethernet Control.....	2-5	RS-232.....	1-10
exiting.....	3-9	RS-232 Control.....	2-4
F	Page	S	Page
file menu.....	8-1	sample rate.....	1-11
file names.....	6-11, 6-18, 7-4	save conditions.....	8-2
file type.....	8-1	saved-file list.....	8-4
G	Page	save interval.....	6-16
GP-IB.....	1-10	scale value.....	6-27, 6-31
GP-IB Control.....	2-3	screen capture.....	6-11
graticule.....	6-27, 6-31	setup parameters, saving.....	8-1
H	Page	software, starting.....	3-9
handshaking.....	2-4	Software Version.....	iv
help feature.....	9-1	specifications.....	11-1
I	Page	Start.....	6-6
integration.....	6-7	start harmonic order.....	6-34
		Stop.....	6-6
		Storage.....	1-9
		system requirements.....	1-9

Index

T	Page
terminator	2-4
tile	6-4, 7-3
toolbar.....	6-4, 7-2
toolbar text.....	6-13
trace.....	6-31
trademarks.....	i
trend display	6-29, 7-16

U	Page
Update.....	6-6
update interval.....	1-3
upper limit.....	6-28, 6-32
USB	1-10
USB Control.....	2-2
USB driver.....	3-5

W	Page
waveform display.....	6-26, 7-14
window.....	6-28, 6-32
window, arrangement	6-4, 7-3
workflow.....	1-8
WT main unit	1-10

Z	Page
Zoom	6-28, 6-34