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**User's  
Manual**

**Application Software  
WTViewerE**

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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.
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## Revisions

- May 2017            1st Edition
- February 2018    2nd Edition
- March 2019        3rd Edition

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# 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.

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# How to Use This Manual

## Structure

This manual contains 11 chapters and an index.

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

## 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)



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## Software Version That This Manual Covers

This manual describes WTVIEWER software version 1.42.  
For instructions on how to view the software version, see section 9.2.

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## 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
- 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

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

### Connection



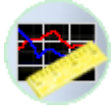
You can connect a WT to the PC in which the software is installed through a communication interface. You can select any of the four available interfaces and search for devices to view the WTs that you can connect to.

### 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\*<sup>1</sup>**

Lists harmonic measurement data for each harmonic order.

#### **Numeric Matrix**

Displays WT's measurement data for each element.

#### **Waveform\*<sup>2</sup>**

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\*<sup>1</sup>**

Displays measured harmonic components for each harmonic order.

#### **Vector\*<sup>1</sup>**

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

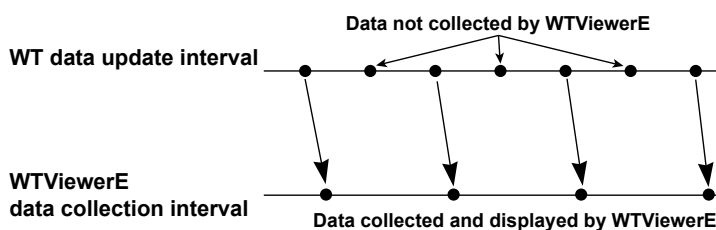
## WT Data Update Interval and the Software's Data Collection Interval

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.

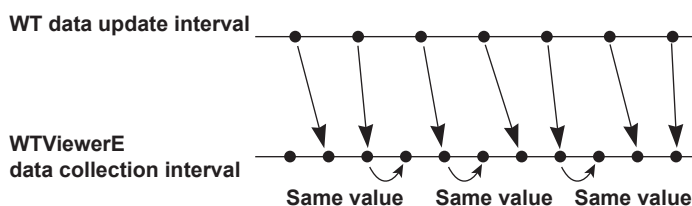
### WT Data Update Interval < Software's Data Collection Interval

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.

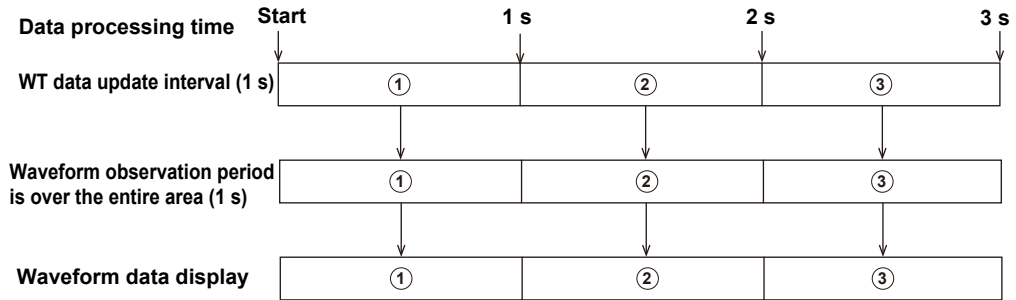
Assumption Waveform trigger: OFF

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.

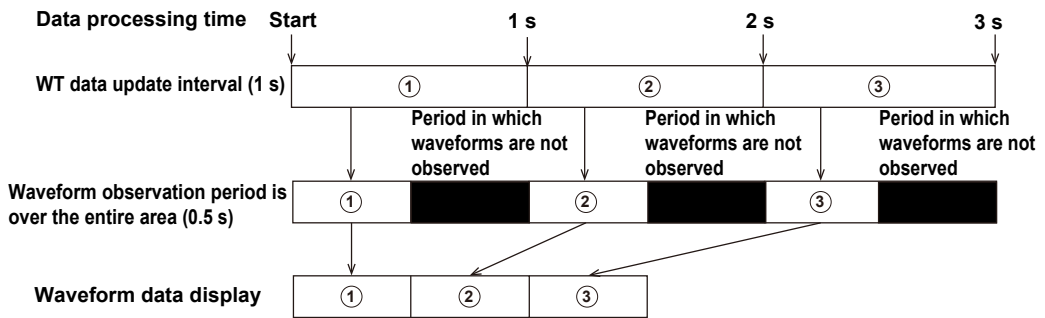
- **When the WT update interval is 1 second and the waveform observation period is over the entire area (1 s)**

Continuous waveform data cannot be acquired from the WT300/WT300E due to the product's specifications.



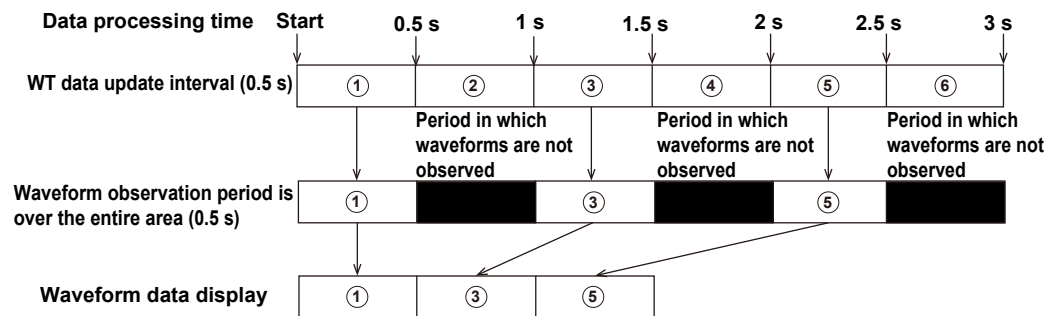
The same waveform data as the WT can be displayed (continuity is retained).

- **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.

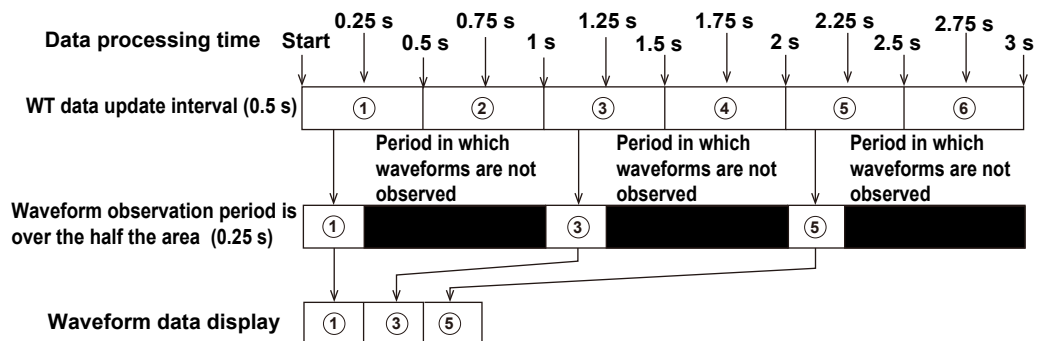
- When the WT update interval is 0.5 second and the waveform observation period is over the entire area (0.5 s)



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

### 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\*<sup>1</sup>**

Lists harmonic measurement data for each harmonic order.

#### **Numeric Matrix**

Displays WT's measurement data for each element.

#### **Waveform\*<sup>2</sup>**

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\*<sup>1</sup>**

Displays measured harmonic components for each harmonic order.

#### **Vector\*<sup>1\*3</sup>**

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

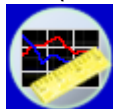


Use this menu to close the software.

### 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.

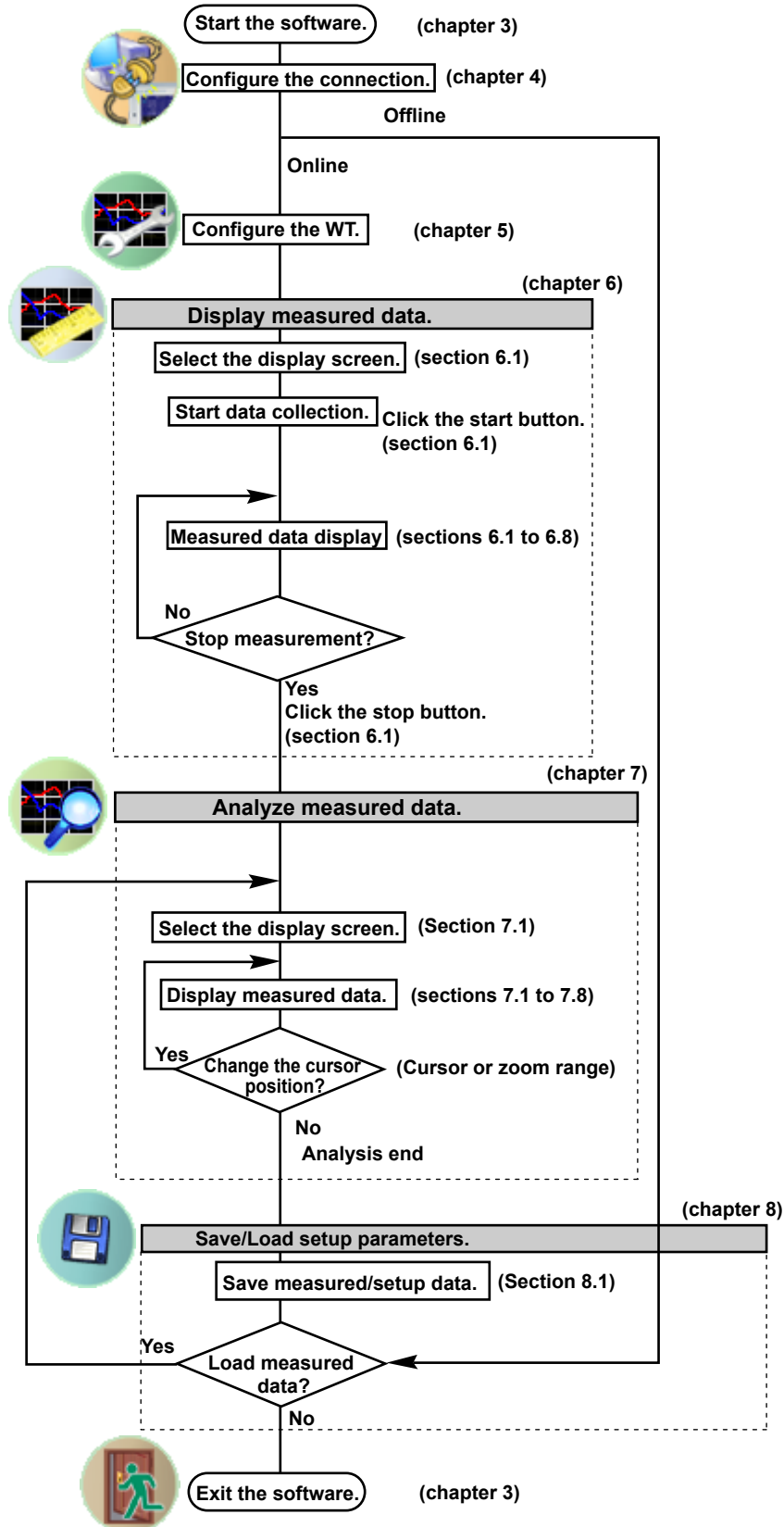
The following is a list of each icon and when it cannot be selected.

	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 <sup>1</sup>	activated	activated	activated	activated

<sup>1</sup> "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 conditions:

- WT1806/G6/DT/MTR
- Number of connected devices: 1
- Update interval: 1 s
- Number of waveform display functions: 2
- Number of numeric list display functions: 3
- Number of bar display functions: 1

Measurement data size:

- 10 minutes: Approx. 15 MB
- 1 hour: Approx. 88 MB
- 1 day: Approx. 2.1 GB
- 1 month: Approx. 63 GB

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 7, Windows 8.1, or Windows 10

## Communication Card

- **GP-IB**

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

	OS		
	Windows 7	Windows 8.1	Windows 10
	Version of the driver NI-488.2		
PCI-GPIB	2.7.2 or later	3.1.0 or later	15.5.0 or later
PCI-GPIB+			
PCIe-GPIB			
PCIe-GPIB+			
GPIB-USB-HS	2.8.1 or later		
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
- 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

## 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.

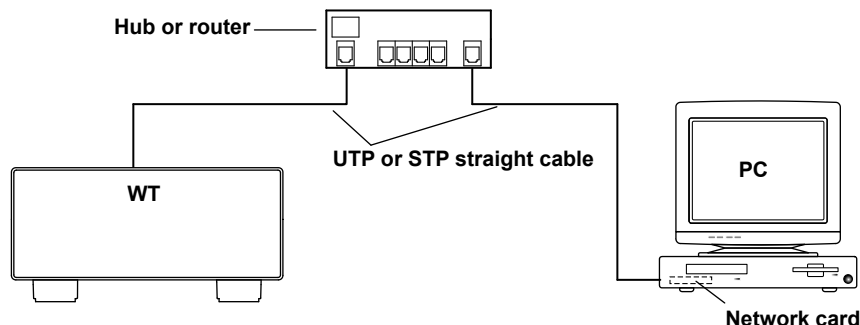
Use an appropriate connector to connect the other end of the cable to the PC.

### 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.

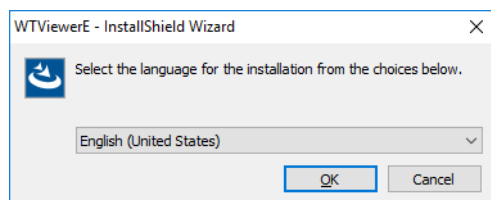
### Installing WTVIEWER

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.



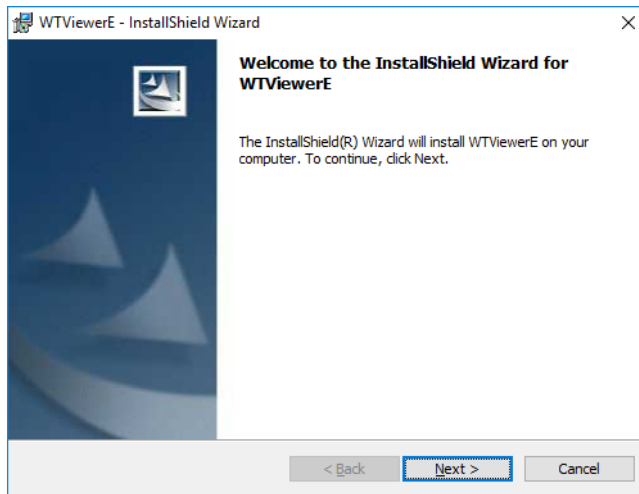
5. Select the language to use during the installation, and click **OK**.



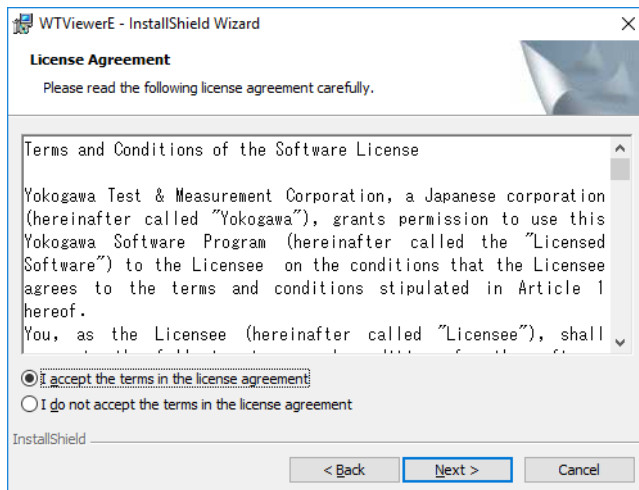
### 3.1 Installation and Uninstallation

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

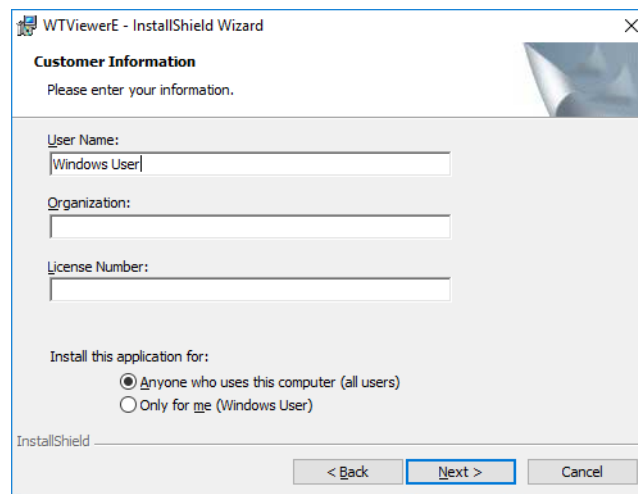


7. If you agree with the license agreement, select **I Agree**, and click **Next**. Otherwise, select **I Do Not Agree**. The installation will be canceled.



**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**.

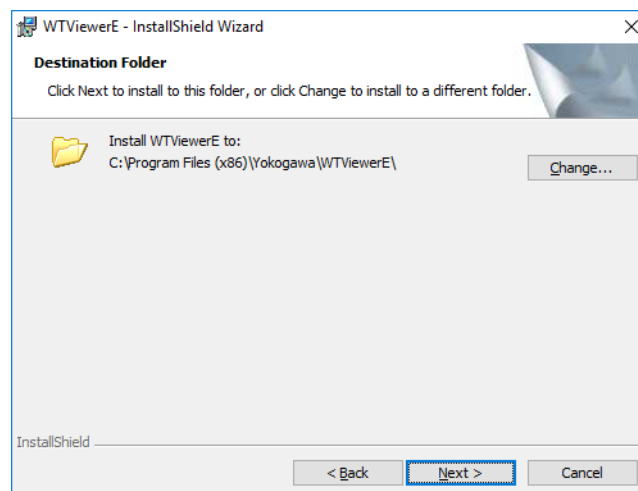


The screenshot shows the 'Customer Information' dialog box of the WTVIEWERE - InstallShield Wizard. The title bar reads 'WTVIEWERE - InstallShield Wizard'. The main heading is 'Customer Information' with the instruction 'Please enter your information.' Below this are three text input fields: 'User Name:' 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.

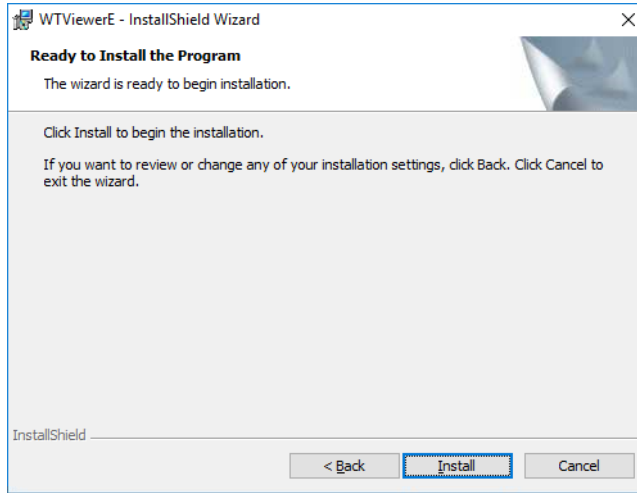
### 3.1 Installation and Uninstallation

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

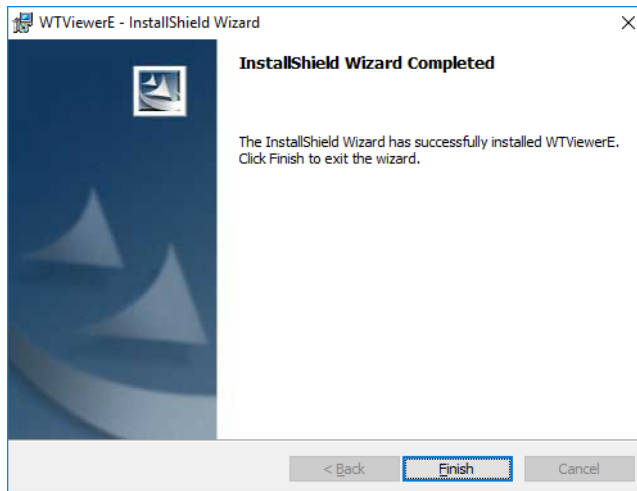
Click **Back** if you want to change the installation settings.

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.

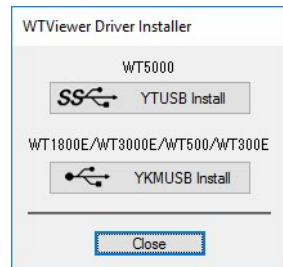


Next, the USB driver (YTUSB/YKMUSB) installation wizard starts automatically.



## 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.

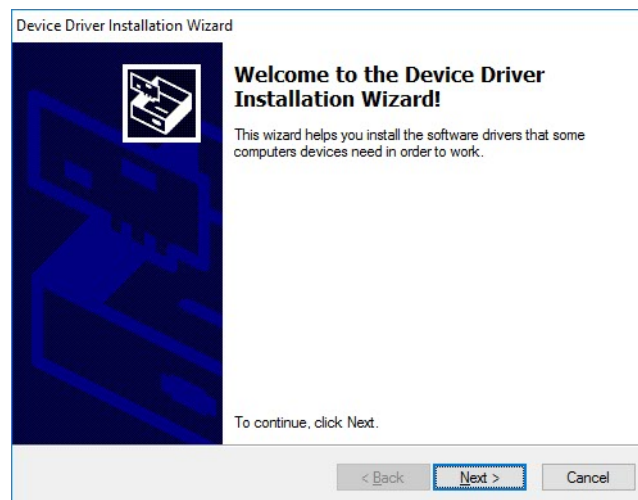


If the “User Account Control” window appears during the installation, click **Allow** or **Yes** to continue the installation.

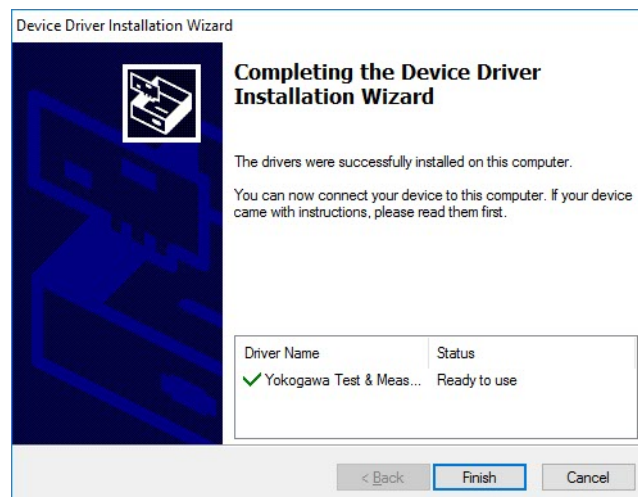
On Windows 7, a “Window Security” window will appear during the installation. Click **Install**. The installation will continue.

### 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.

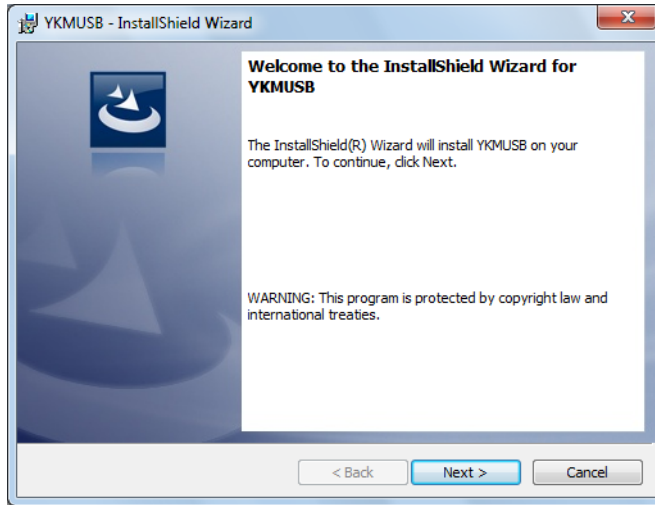


### 3.1 Installation and Uninstallation

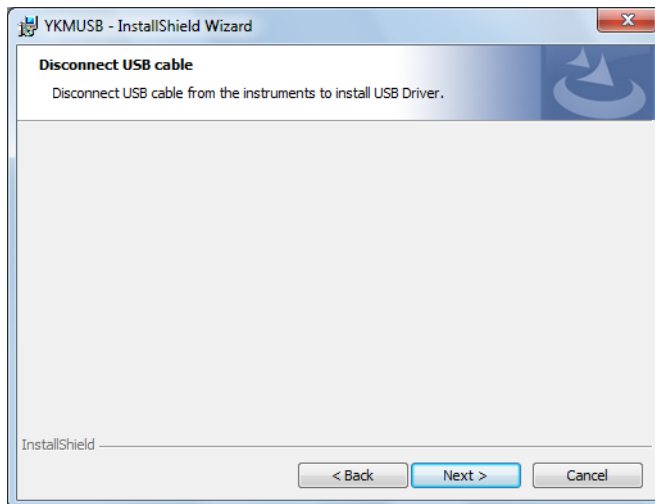
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#### Installing YKMUSB

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



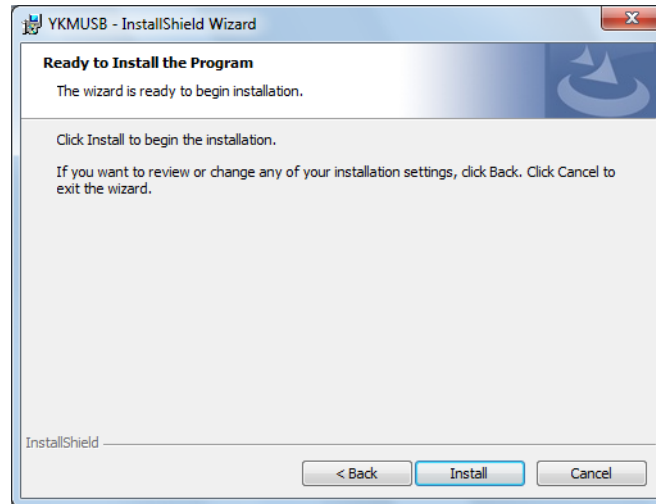
2. If the USB cable is connected to the PC, remove the cable, and click **Next**.



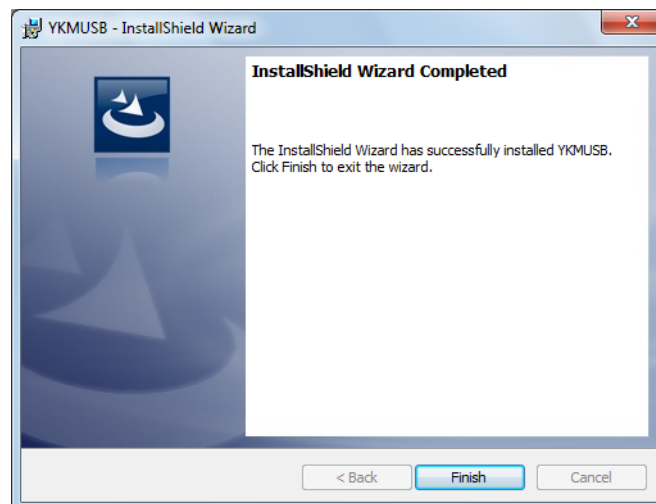
3. A screen prompting you to start the installation appears. If the installation settings are okay, click **Install**. The software is installed.

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.

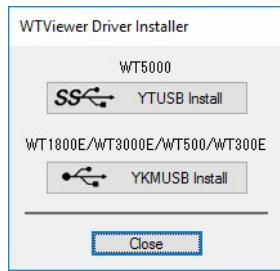


### 3.1 Installation and Uninstallation

---

#### 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.)

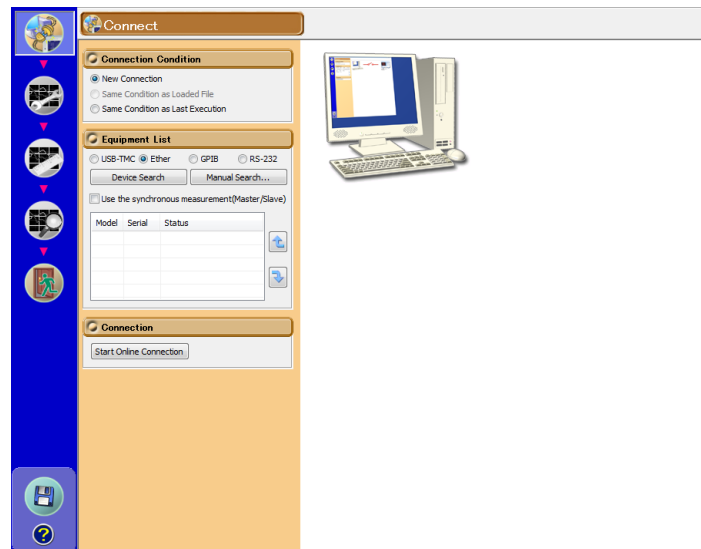
### Starting the Software

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


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

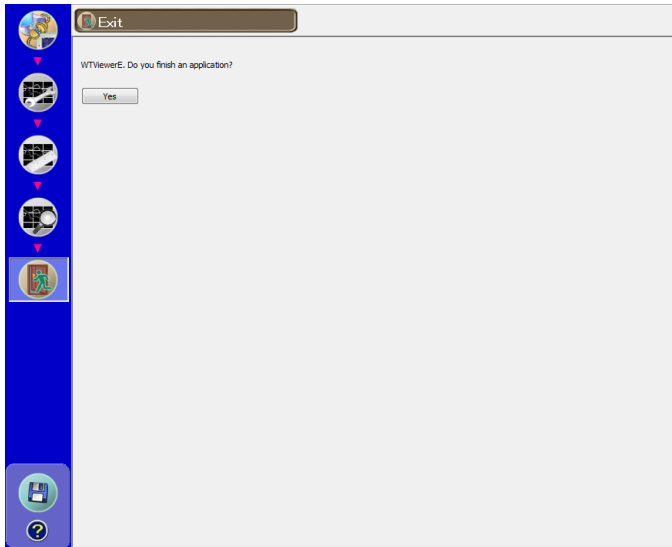
When the software starts, the Connection menu will appear.

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



## Exiting the Software


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



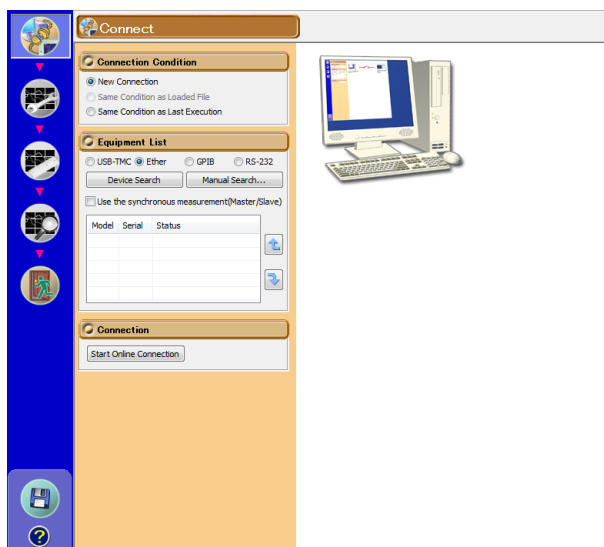
2. Click **Yes**. The software will close.



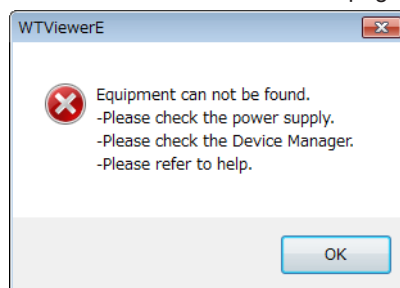
## 4.1 Configuring a New Set of WT-PC Communication Parameters (New connection)

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.

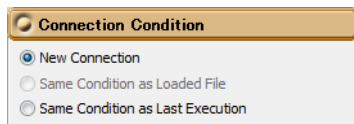


If the above message appears even after the manual search, check the following items.

- 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

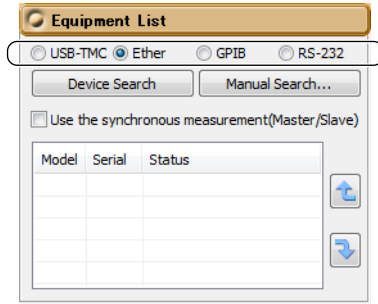
2. To create a new connection, click **New Connection**.



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

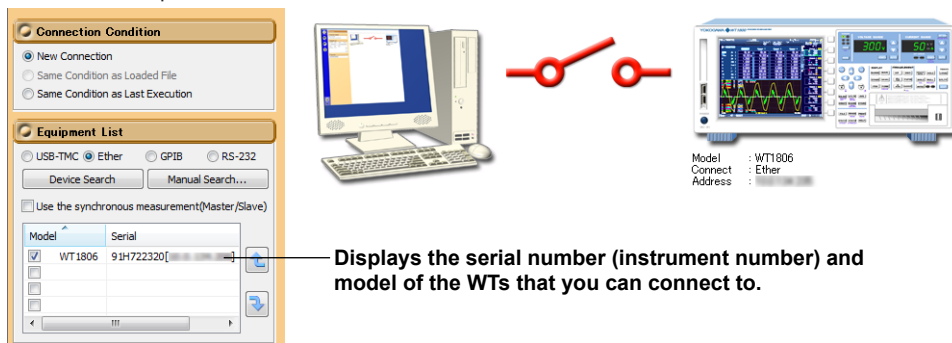
### Equipment List

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.

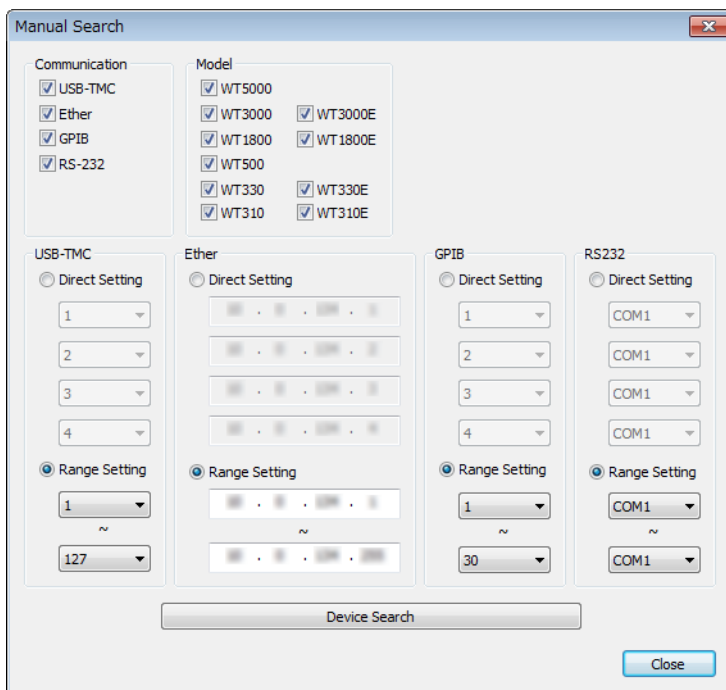
- For a USB connection, device ID 1 to 4 can be connected through device search. For ID 5 to 127, manual search is used to make the connection.
- For a GP-IB connection, WTs whose GPIB address is 1 to 30 are searched for.
- For an Ethernet connection, WTs whose IP address is xxx.xxx.xxx.1 to xxx.xxx.xxx.255 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.



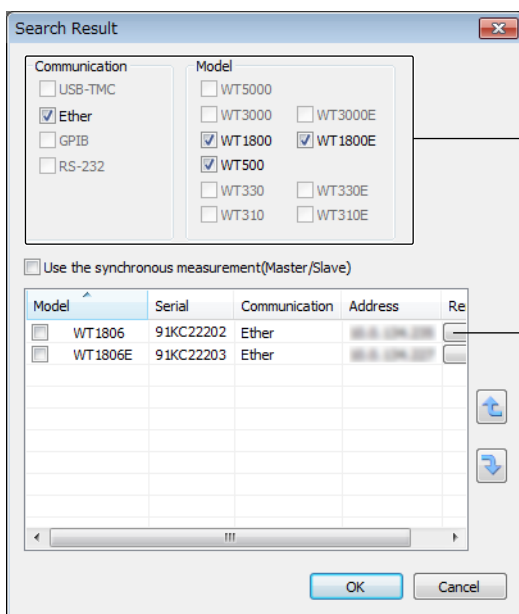
**Manual Search**

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.

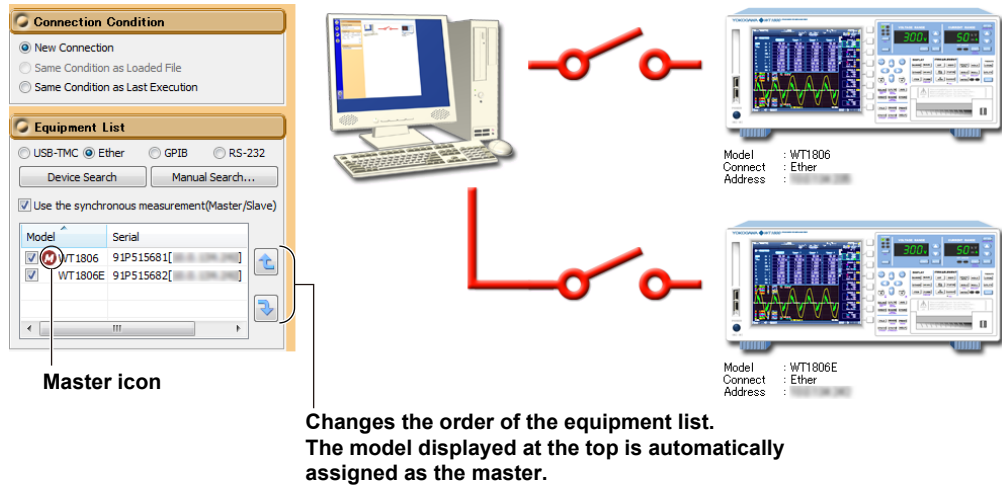
7. Select the check box of the WT you want to connect to, and click **OK**.

## 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.

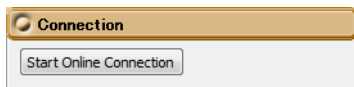


### Note

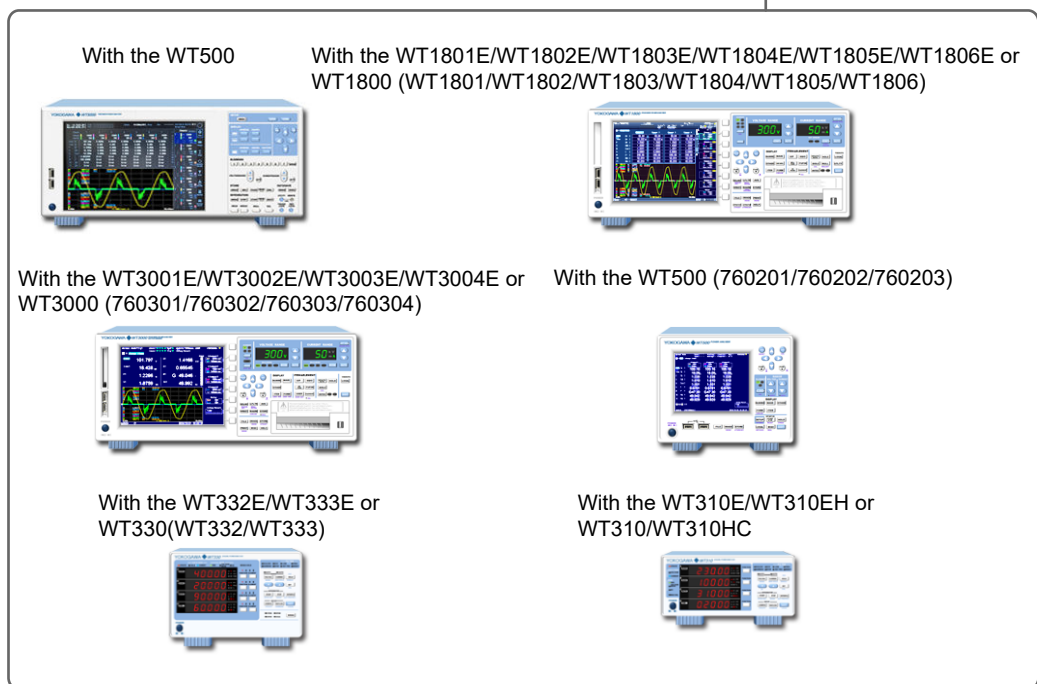
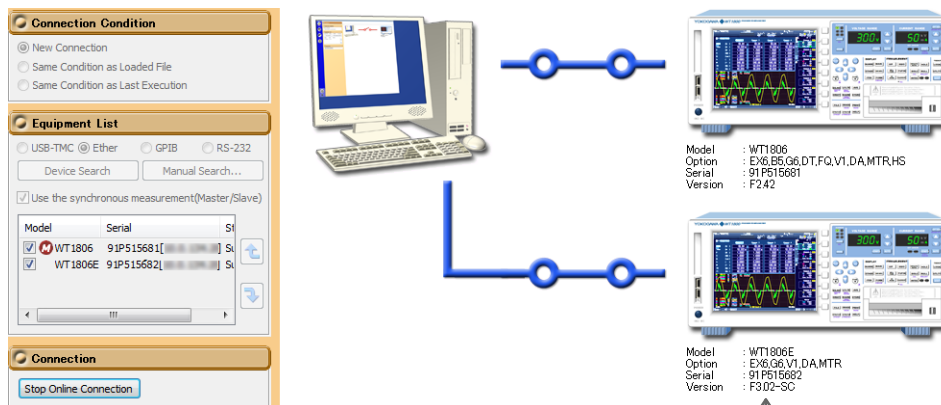
- To maintain synchronicity between data of multiple WTs in synchronous measurement, link the WTs using the master/slave synchronous measurement function. For details on the function, see the WT User's Manual.
- Synchronous measurement can be performed by connecting several WTs. The WT displayed at the 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.

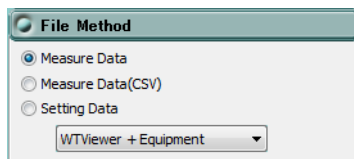
## 4.2 Making the Communication Settings and Device Settings the Same as Those of the Loaded File

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

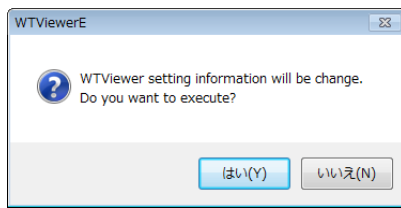
### Note


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

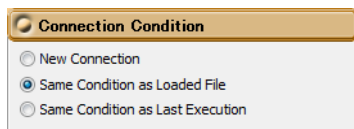
2. From the saved-date list, select the file to load communication settings and device settings from.
3. In the File Method dialog box, select **WTVIEWER + Equipment**.



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.




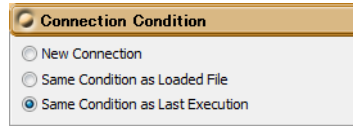
### Note

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**.

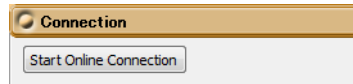


### Note

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.




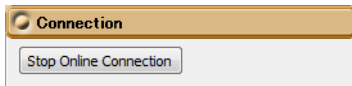
### Note

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

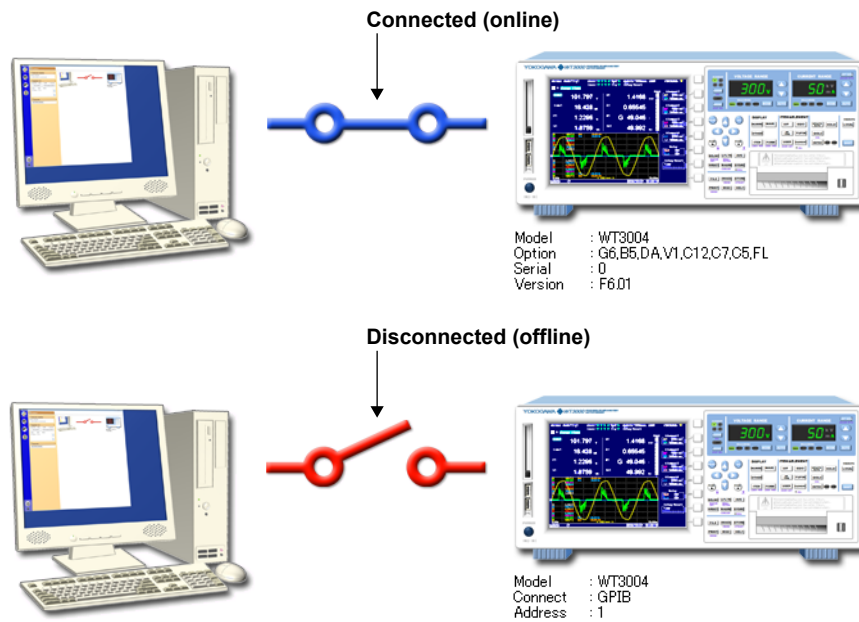
- The peer WT is not ready to measure.
- The GP-IB address, IP address, user name, or password is incorrect.
- There is no response from the peer WT.
- You are trying to connect to a different WT from the last time.

## 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.



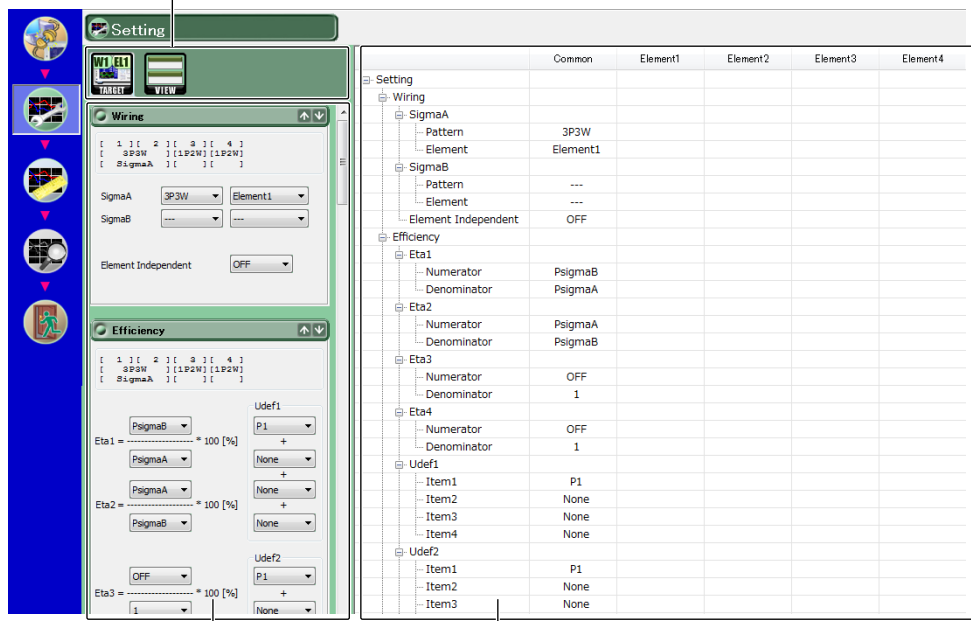
When the connection is cut and the WT and PC are offline, an illustration indicating this state appears.



# 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.

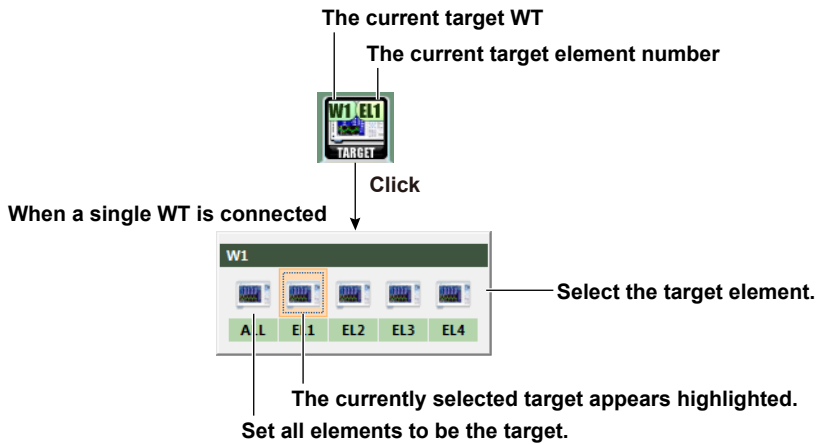
Examples of Setting screens are provided in the remainder of this section.

## Setting Toolbar

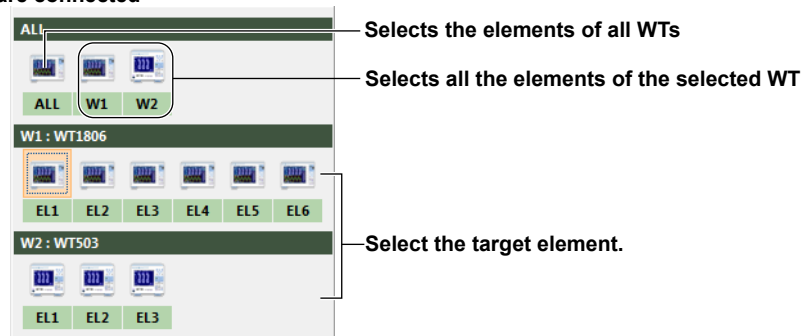


## Selecting the Target Element

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).

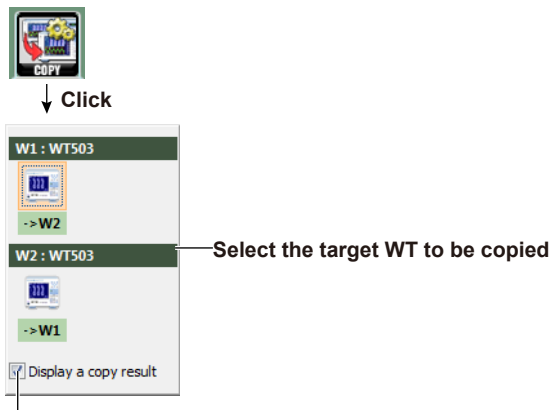


### Note

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

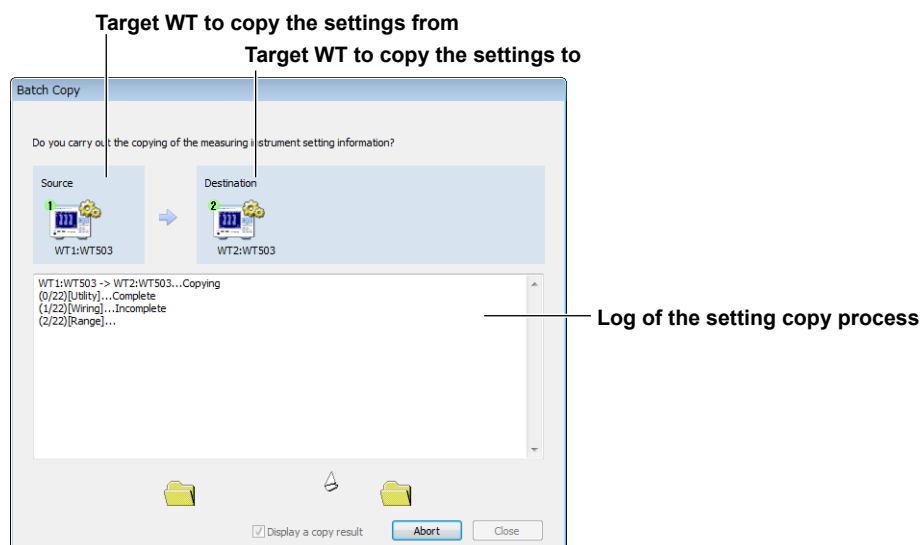
## Select the target WT to copy the settings.

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.

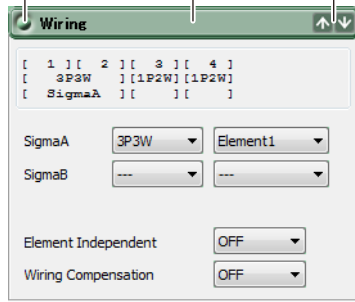
 is displayed when it is registered in favorites.

### 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

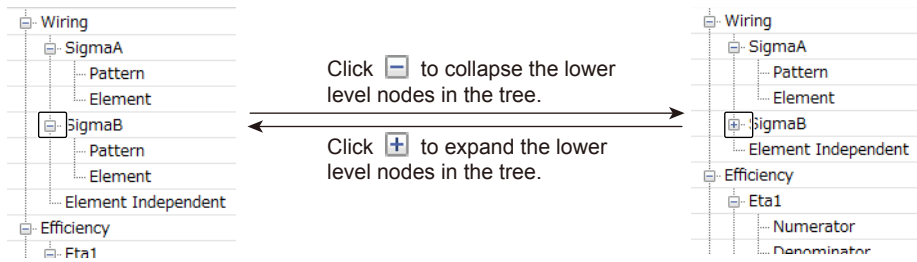
## List of settings

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.

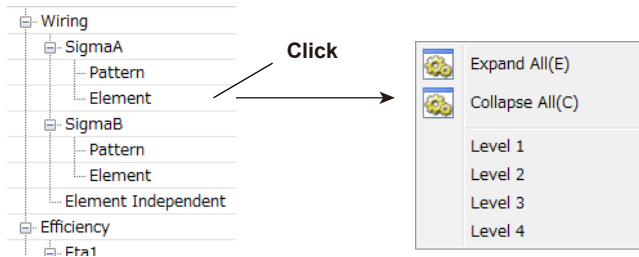
You can also change the settings from the list. However, you cannot collectively change the settings from the list. Change them individually.

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

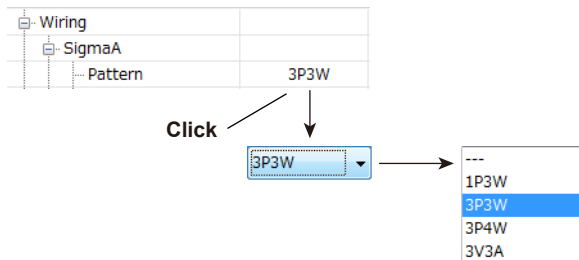


You can also right-click on the list of settings, and use the shortcut menu to expand and collapse the list.



### Changing Settings

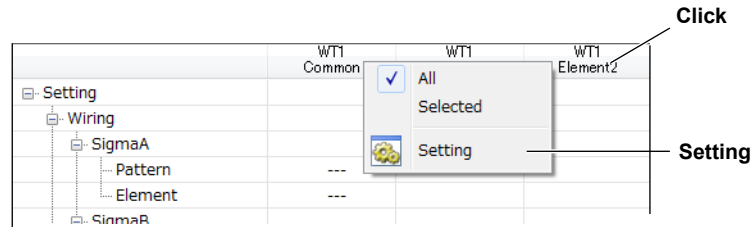
1. Click the cell containing the setting you want to change.
2. Change the setting in the box that appears or type the value.



## Showing and Hiding Settings

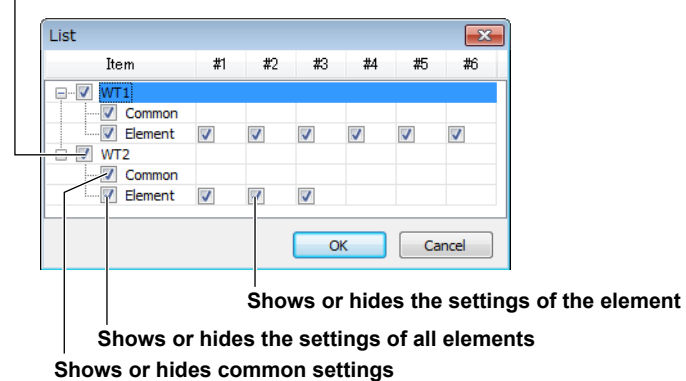
The settings shown in the list of settings can be shown or hidden at the column level. This function is useful when several WTs are connected and you want to fit the list of settings in a single screen.

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

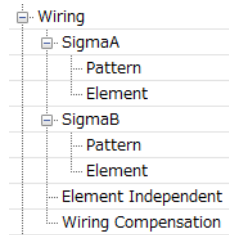
Showing and hiding settings are not available when only a single WT is connected.

## Details of Settings

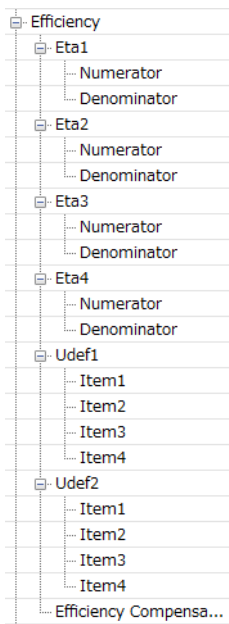
Examples of the various settings in setting display areas and the corresponding settings in the list of settings are provided below. The settings and the contents in the list of settings vary depending on the following factors.

- 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.

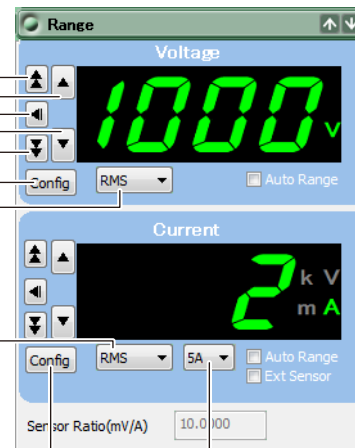
Decreases the range by one level.

Sets the minimum available range.

Sets the valid voltage measurement range.

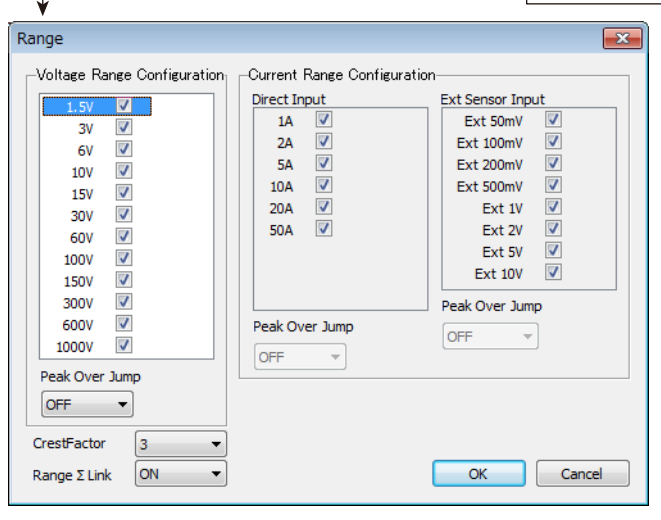
Voltage mode

Current mode



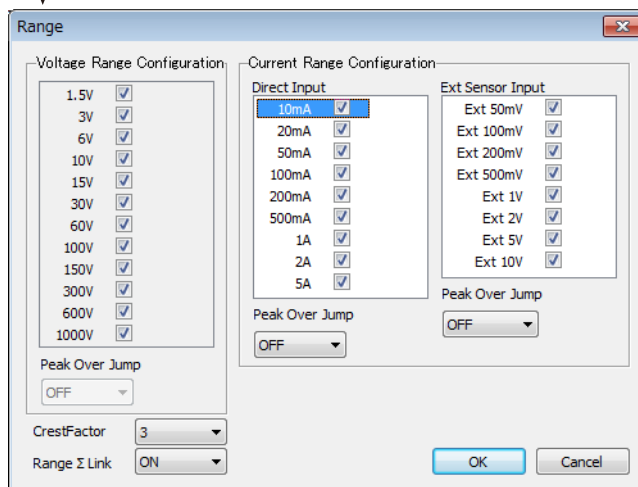
Range
Voltage
Voltage Mode
Auto Range
Voltage
Current
Current Mode
Auto Range
Current
Ext Sensor
Sensor Ratio(mV/...

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

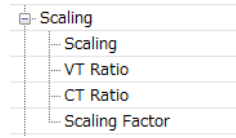
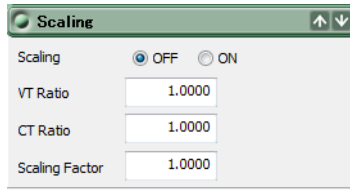


Range Configuration
Voltage Range
1000V
600V
300V
150V
100V
60V
30V
15V
10V
6V
3V
1.5V
Peak Over Jump
Current Range
Input Element(50A)
50A
20A
10A
5A
2A
1A
Peak Over Jump
Input Element(5A)
5A
2A
1A
500mA
200mA
100mA
50mA
20mA
10mA
Peak Over Jump
Input Element(Ext)
10V
5V
2V
1V
500mV
200mV
100mV
50mV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

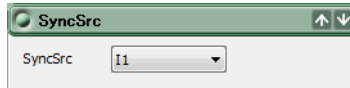
Sets the valid current measurement range.



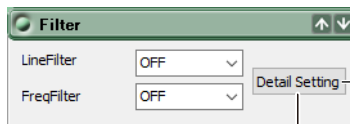
## Scaling



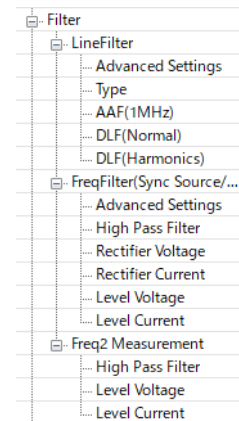
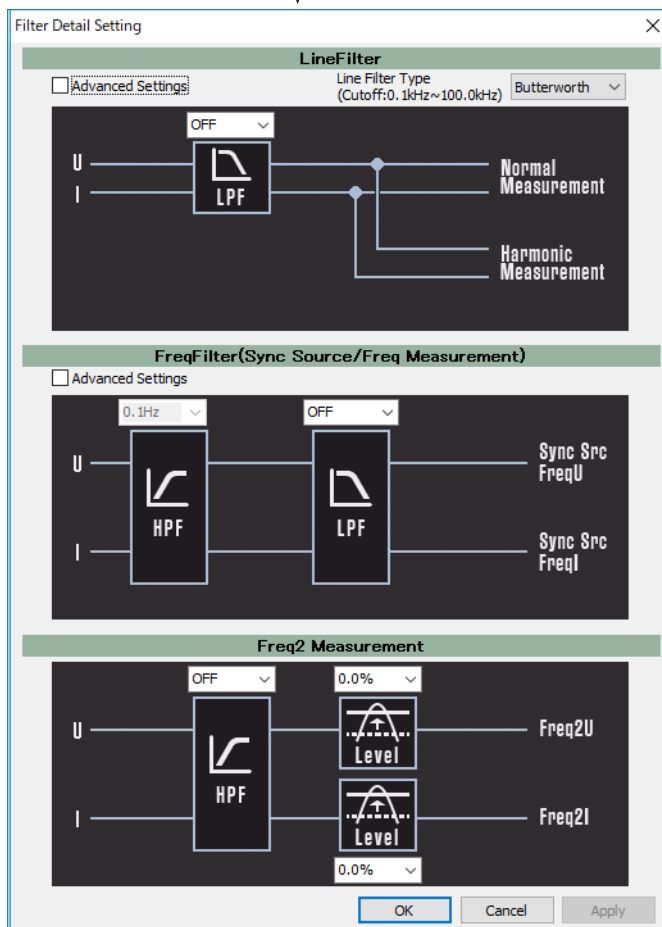
## Synchronization Source



## Filter

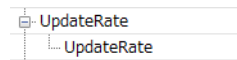


Appears only for the WT5000

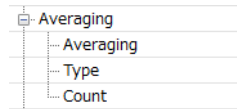




## Data Update Interval

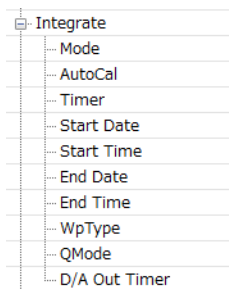


## Averaging



## 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).

### 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.

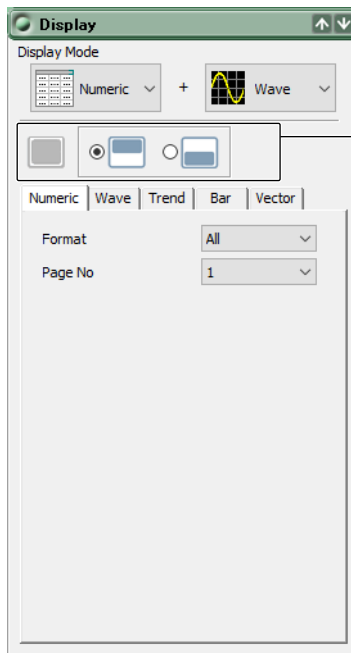
### When Individual Control is set to ON

	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.

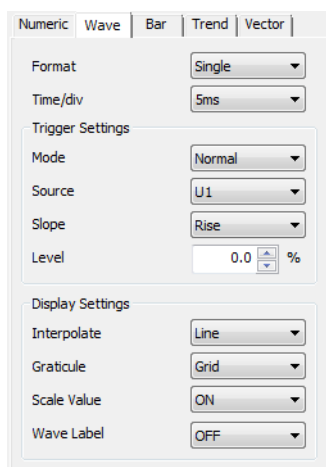
## Display

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)

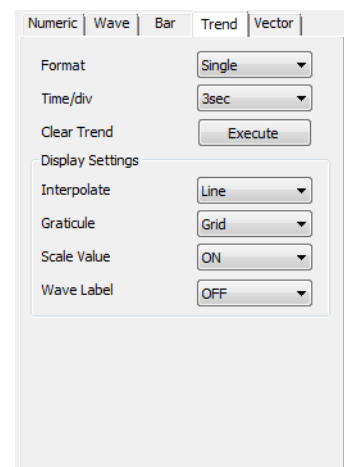


Numeric data

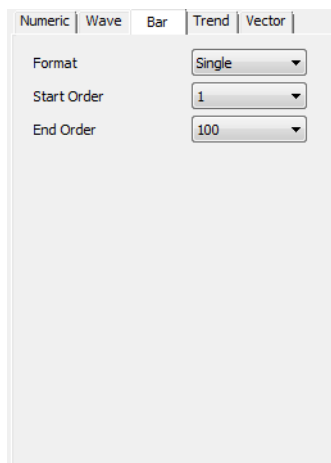
Appears only for the WT5000  
 Set the target to single screen, top half of the split screen,  
 or bottom half of the split screen



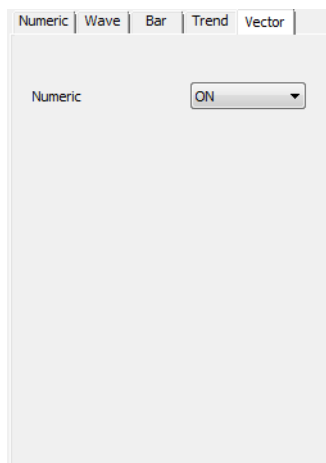
Waveform



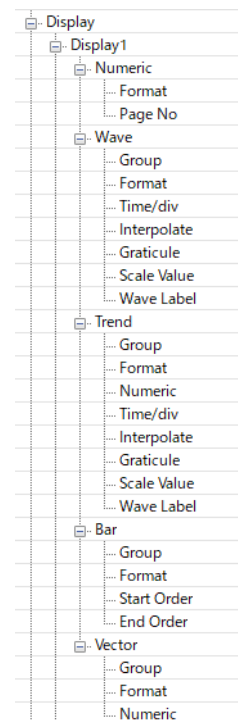
Trend



Bar graph



Vector



## 5.1 WT Configuration

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

The 'Display' window shows the following settings:

- DisplaySettings:  Normal,  Harmonics
- Function, Element, Order table:

	Function	Element	Order
A	U	1	1
B	I	1	
C	P	1	
D	FreqU	1	
- Resolution:  High,  Low

## Numeric Measurement

The 'Measure' window shows the following settings:

- S Formula: Urms<sup>2</sup>Irms
- S,Q Formula: Type1
- Phase: 180 Lead/Lag
- PC: IEC76-1(1976)
- P1: 0.5000
- P2: 0.5000
- Sampling Frequency: Auto
- MaxHold:  OFF,  ON

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

## Utility

The 'Utility' window shows the following settings:

- CrestFactor:  CF3,  CF6
- Initialize Settings: Execute

Utility
... CrestFactor

## User-Defined Function

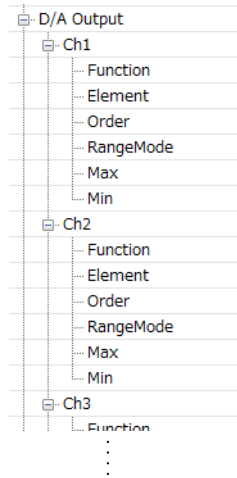
The process of defining a user function is shown in three steps:

- User Define Function Dialog:** A list of functions is shown. Function 1 is selected with the expression  $WH(E1)/(ITIME(E1)/3600)$ .
- Calculator:** The expression  $WH(E1)/(ITIME(E1)/3600)$  is entered into the calculator window.
- Detail Setting Dialog:** The constants K1, K2, K3, K4, and K5 are all set to 1.

## D/A Output

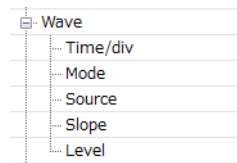
You can configure the D/A output if the /DA option is installed in the WT.

Ch	Function	Element	Order	RangeMode
1	U	Element1	---	Fixed
2	I	Element1	---	Fixed
3	P	Element1	---	Fixed
4	S	Element1	---	Fixed
5	Q	Element1	---	Fixed
6	PF	Element1	---	Fixed
7	Phi	Element1	---	Fixed
8	FreqU	Element1	---	Fixed
9	FreqI	Element1	---	Fixed
10	None	---	---	Fixed
11	None	---	---	Fixed
12	None	---	---	Fixed
13	None	---	---	Fixed
14	None	---	---	Fixed
15	None	---	---	Fixed
16	None	---	---	Fixed
17	None	---	---	Fixed
18	None	---	---	Fixed
19	None	---	---	Fixed
20	None	---	---	Fixed



## Waveform

Wave	
Time/div	5ms
Trigger Settings	
Mode	Normal
Source	U1
Slope	Rise
Level	0.0 %



## Harmonic Measurement

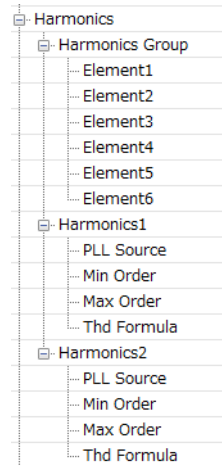
You can configure harmonics in the following situations.

- 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).

Harmonics Group Select		
	Harmonics 1	Harmonics 2
Element1	<input checked="" type="radio"/>	<input type="radio"/>
Element2	<input checked="" type="radio"/>	<input type="radio"/>
Element3	<input checked="" type="radio"/>	<input type="radio"/>
Element4	<input checked="" type="radio"/>	<input type="radio"/>
Element5	<input checked="" type="radio"/>	<input type="radio"/>
Element6	<input checked="" type="radio"/>	<input type="radio"/>

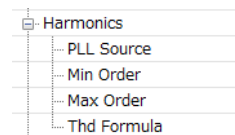
  

	Harmonics 1	Harmonics 2
PLL Source	U1	I1
Min Order	1	1
Max Order	500	500
Thd Formula	1/Total	1/Total



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

PLL Source: I1  
 Min Order: 1  
 Max Order: 100  
 Thd Formula: 1/Total



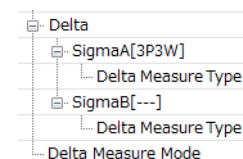
## Delta Computation

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)

[ 1 ] [ 2 ] [ 3 ] [ 4 ]	[ 3P3W ] [ 1P2W ] [ 1P2W ]
[ SigmaA ] [ ] [ ] [ ]	[ ] [ ] [ ] [ ]

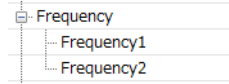
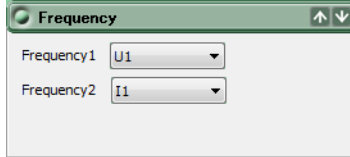
SigmaA: 3P3W    3P3W->3V3A  
 SigmaB: ---    ---  
 Delta Measure Mode: RMS



## Frequency Measurement

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

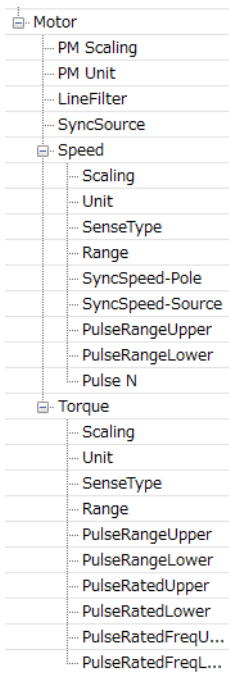
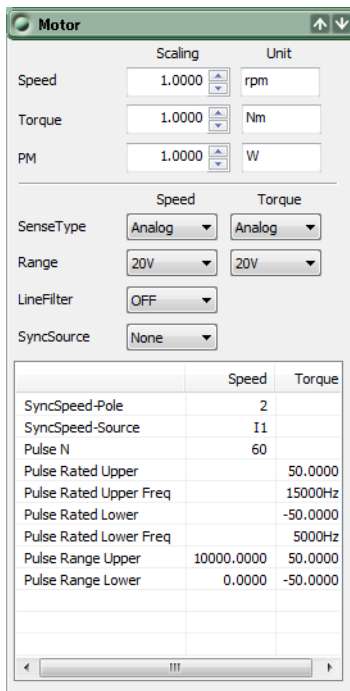
- WT3001E/WT3002E/WT3003E/WT3004E
- WT3000 (760301/760302/760303/760304)
- WT1800 (WT1801/WT1802/WT1803/WT1804/WT1805/WT1806)
- WT500 (760201/760202/760203)



## 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).



### Note

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

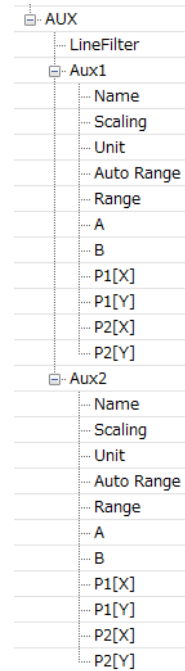


## AUX

You can configure AUX settings in the following situations.

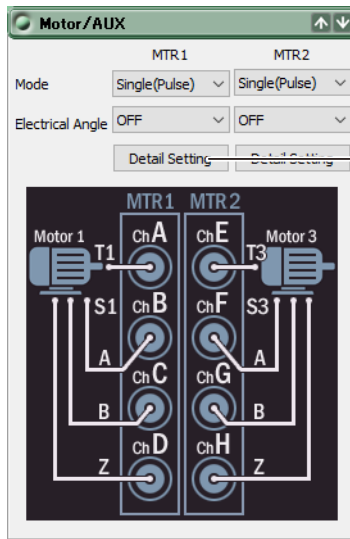
- An /AUX option is installed in the WT1801E/WT1802E/WT1803E/WT1804E/WT1805E/WT1806E.
- An /AUX option is installed in the WT1800 (WT1801/WT1802/WT1803/WT1804/WT1805/WT1806).

	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	

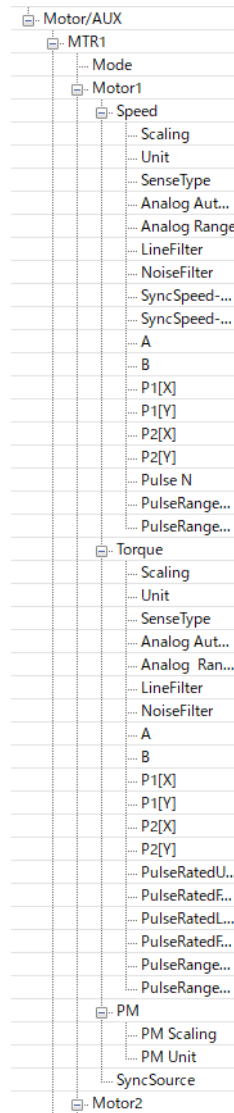


## Motor/AUX

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



Next page



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

Analog Range: 20V

LineFilter: OFF

NoiseFilter: OFF

SyncSource: None

	Speed	Torque	Speed	Torque
SyncSpeed-Pole	2			
SyncSpeed-Sou...	I1			
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

Analog Range: 20V

LineFilter: OFF

NoiseFilter: OFF

SyncSource: None

	Speed	Torque	Speed	Torque
SyncSpeed-Pole	2			
SyncSpeed-Sou...	I1			
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

Analog Range: 20V

LineFilter: OFF

NoiseFilter: OFF

SyncSource: None

	Speed	Torque	Speed	Torque
SyncSpeed-Pole	2			
SyncSpeed-Sou...	I1			
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

Analog Range: 20V

LineFilter: OFF

NoiseFilter: OFF

SyncSource: None

	Speed	Torque	Speed	Torque
SyncSpeed-Pole	2			
SyncSpeed-Sou...	I1			
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			

OK Cancel Apply

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: Execute

Harmonics Trigger

Hrm 1:Z Phase 1(ChD)  
Hrm 2:Z Phase 1(ChD)

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

## 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

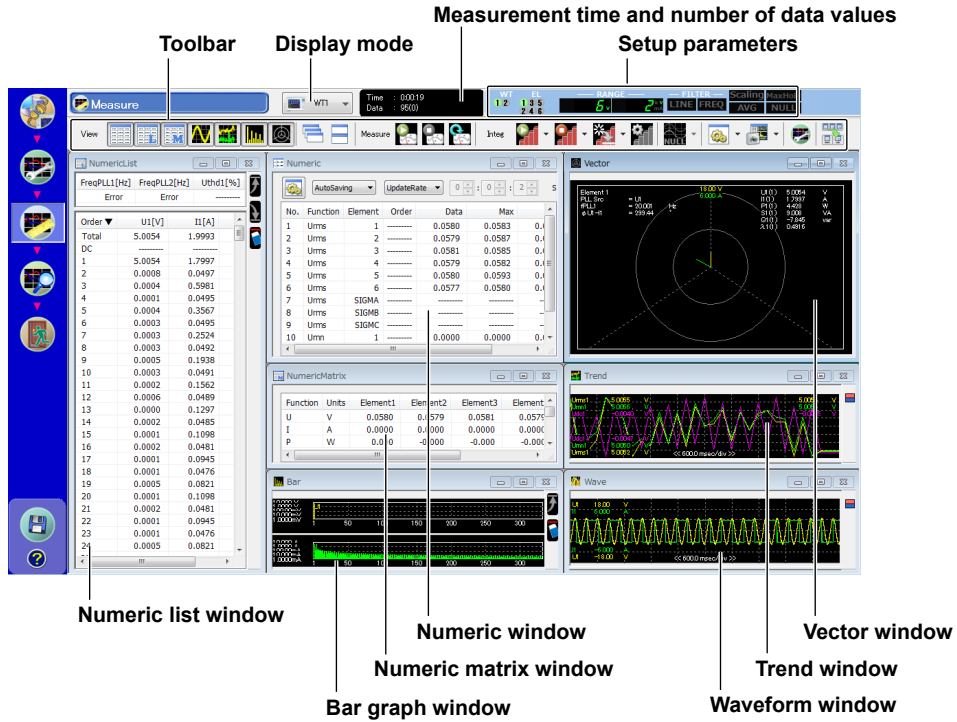
- For details on the user-defined function, see the WT User's Manual.
- Unit of the trigonometric function (SIN, COS, TAN) parameters
  - If the software version is 1.39 or earlier, the unit of trigonometric function parameters is radians.
  - If the software version is 1.42 or later, the unit of trigonometric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

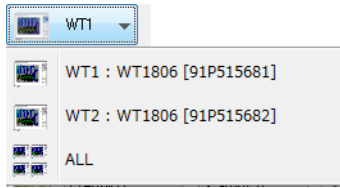


The screenshot shows the Measurement Screen interface with several windows and data displays. The interface is divided into several sections:

- Toolbar:** Located at the top left, containing various icons for measurement and display.
- Display mode:** Located at the top center, showing the current display mode and measurement time (00:19) and number of data values (900).
- Setup parameters:** Located at the top right, showing various setup parameters for the measurement.
- Numeric list window:** Located on the left side, displaying a table of measurement data. The table has columns for Order, U1[V], and I1[A].
- Numeric window:** Located in the center, displaying a table of measurement data. The table has columns for No., Function, Element, Order, Data, and Max.
- Numeric matrix window:** Located in the center, displaying a table of measurement data. The table has columns for Function, Units, Element1, Element2, Element3, and Element4.
- Bar graph window:** Located at the bottom left, displaying a bar graph of measurement data.
- Trend window:** Located in the center, displaying a trend graph of measurement data.
- Waveform window:** Located at the bottom right, displaying a waveform of measurement data.
- Vector window:** Located on the right side, displaying a vector plot of measurement data.

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

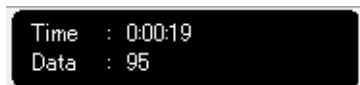
## Display Mode



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

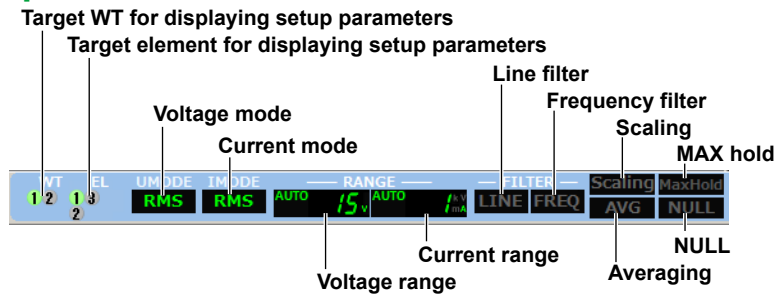
- ALL: Measured data of all WTs is displayed. This is useful in collectively comparing the measured data of individual WTs (WT1, WT2, etc.). Note that measured data not loaded into this software will not be displayed.
- WT: Measured data of individual WTs (WT1, WT2, etc.) is displayed.

## Elapsed Time of Measurement and Number of Data Values

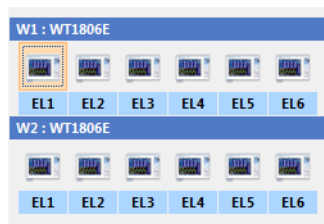


Elapsed time from the start of measurement and the number of data values are displayed.

## 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

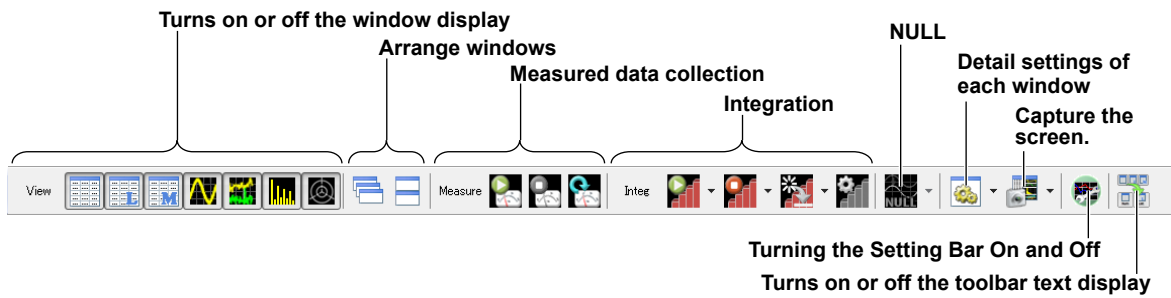
The current settings are displayed. For details on changing the settings, see chapter 5.

### Line Filter, Frequency Filter, Scaling, MAX Hold, Averaging, and NULL

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

For details on changing the settings, see chapter 5.

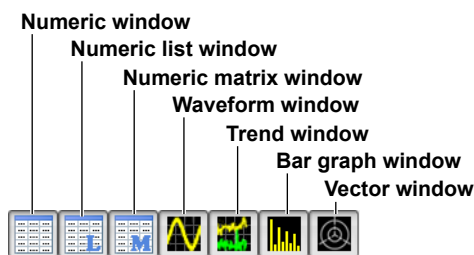
## Toolbar



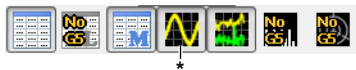
## Turning On and Off the Window Display (View Icons)

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

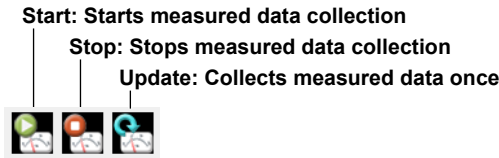
- Displayed windows are cascaded so that all the window titles can be seen.
- The active window will be shown in front of all cascaded windows.
- The order in which the windows are cascaded varies depending on the types of windows that are being displayed.

### 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.



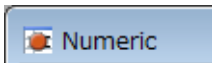
## Collecting Measured Data (Measurement Icons)



### 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.

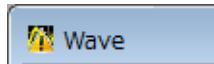
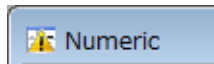
While data is being acquired from the WT, a icon blinks in the title bar of the numeric window.



### 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.



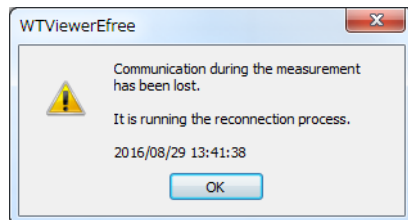
If this icon appears, the measured data acquired from the WT and saved in a CSV file may have dropouts. To avoid this problem, the following measures can be taken.

- 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.

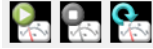
On the following models, the integration resume action that is taken when the power recovers can be selected with the “integration resume function at power failure recovery” setting.

- 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)

### 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.

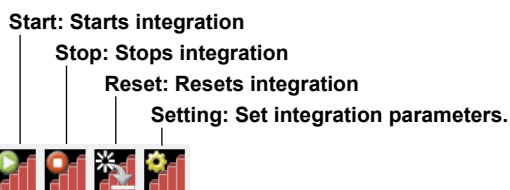
### Note

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.

## 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.

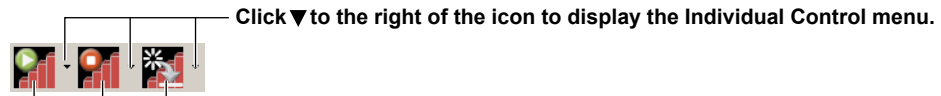
When Individual Control Is Set to ON

- 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).

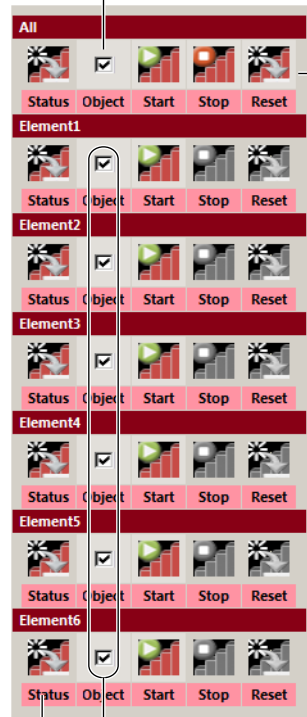


Click ▼ to the right of the icon to display the Individual Control menu.

**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.

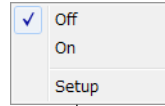
Integration status of each element

## 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.

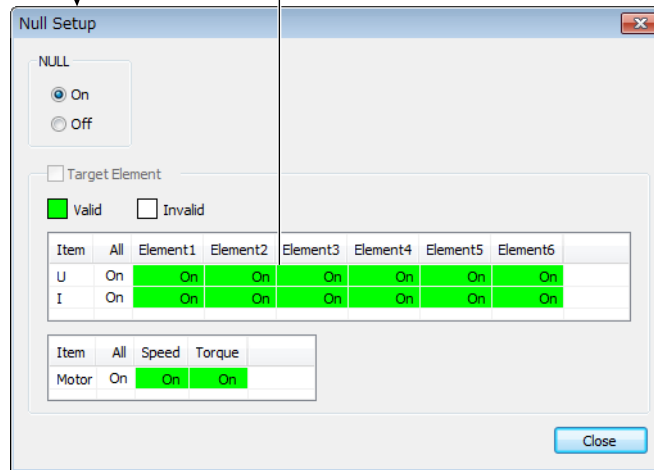
- WT5000
- WT1801E/WT1802E/WT1803E/WT1804E/WT1805E/WT1806E
- WT1800(WT1801/WT1802/WT1803/WT1804/WT1805/WT1806)

All:

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

Element 1 to Element 7:

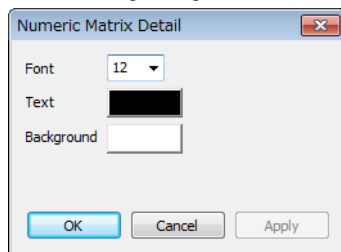
On, hold, or off is set on the controlled element.



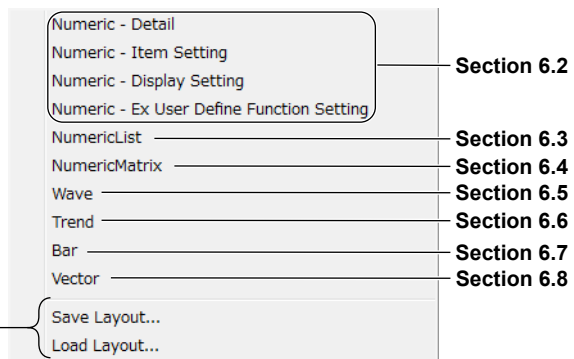
## Detail Settings of Each Window (View-Set icon)



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.



Section 6.2

Section 6.3

Section 6.4

Section 6.5

Section 6.6

Section 6.7

Section 6.8

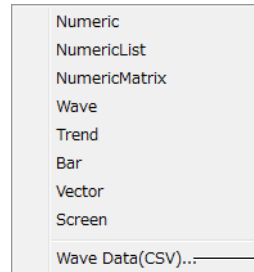
Save the layout of each measurement window to a file. File name extension: mvl  
Saved layout information can also be loaded.

## 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.

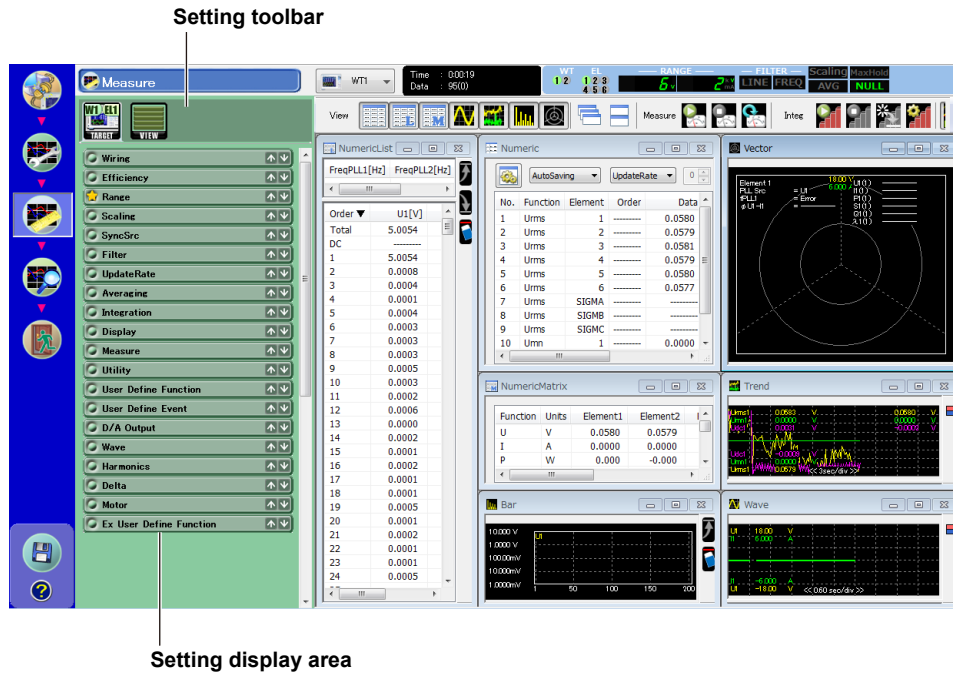
## Turning the Setting Bar On and Off



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.

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

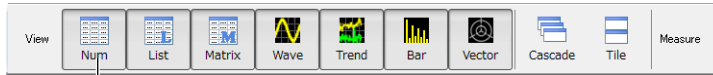


The toolbar text display toggles on and off every time you click the icon.

### Text display: OFF

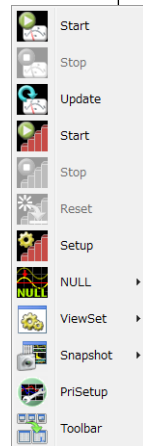


### Text display: ON



Toolbar text

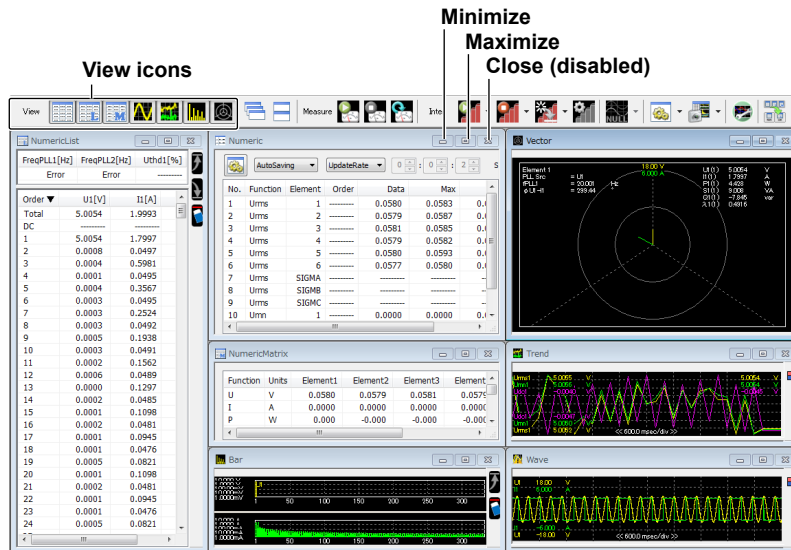
Click here to show the icons that do not fit on the screen.





## 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

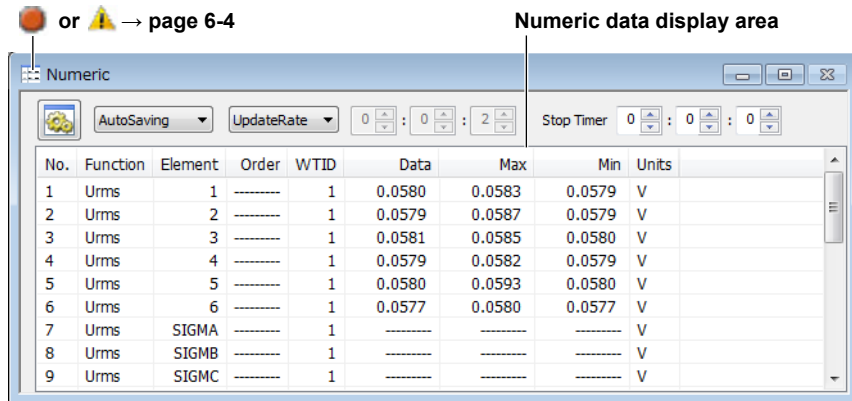
#### Display Sampling on the Measurement Screen

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

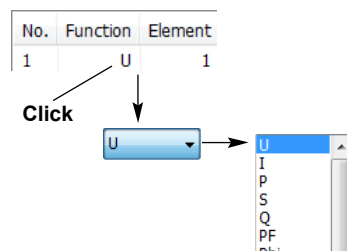
Displays the maximum and minimum values of each display item, obtained through the comparison of numeric data that has been collected from the WT. When a measurement is started, these values are initialized with the first measured data.

#### Setting the Display Items

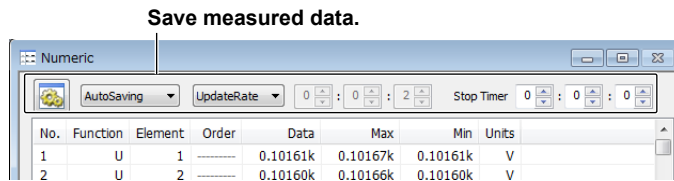
You can change the function, element, and harmonic order display items by following the procedure below. You cannot change them while measured data collection is in progress.

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

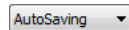


The items set in the numeric display are saved.

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.

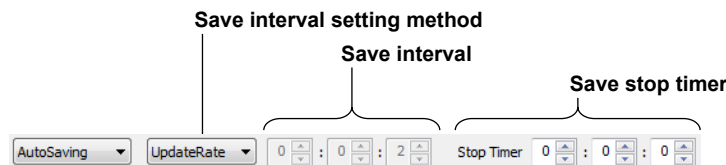


- OFF: Measure data is not saved.
- AutoSaving: Measured data is saved automatically at a fixed period.
- ManualSaving: Save measured data manually.

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.

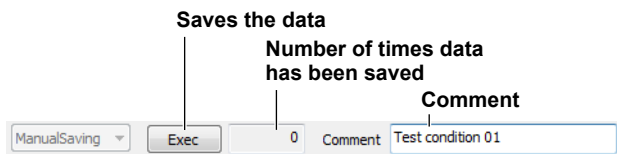
Selectable range: 2 seconds to 23 hours 59 minutes 59 seconds

#### 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.

## ManualSaving



### Saving Data

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

### Number of Times Data Has Been Saved

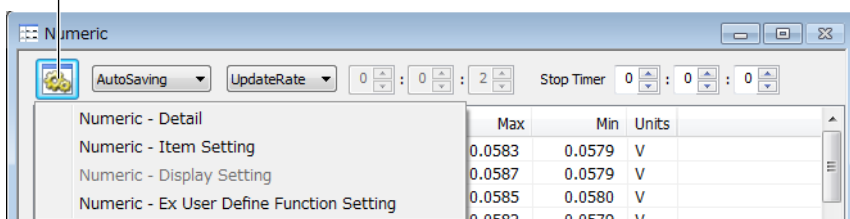
Shows the number of times data has been saved.

### Comment

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

## Detail Setting Dialog Box

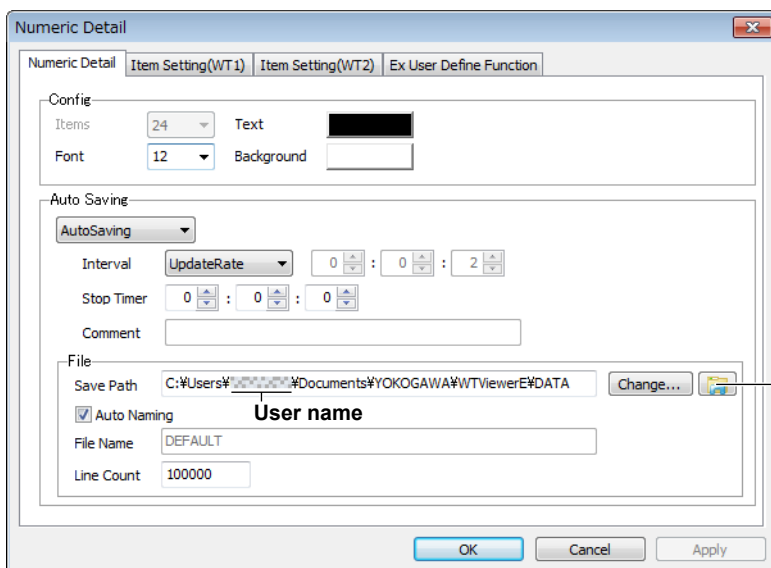
Detail setting dialog box display button



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

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### Items

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

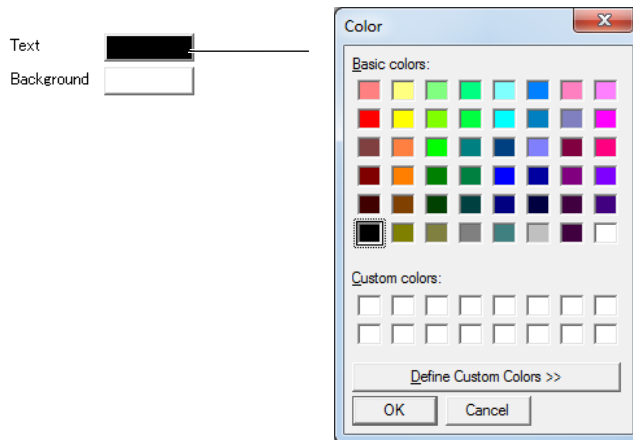
- \* The number 900 can be selected when connected to any of the following models.
  - WT1801E/WT1802E/WT1803E/WT1804E/WT1805E/WT1806E
  - WT1800 (WT1801/WT1802/WT1803/WT1804/WT1805/WT1806)  
(Must be firmware version 2.33 or later)

### 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).

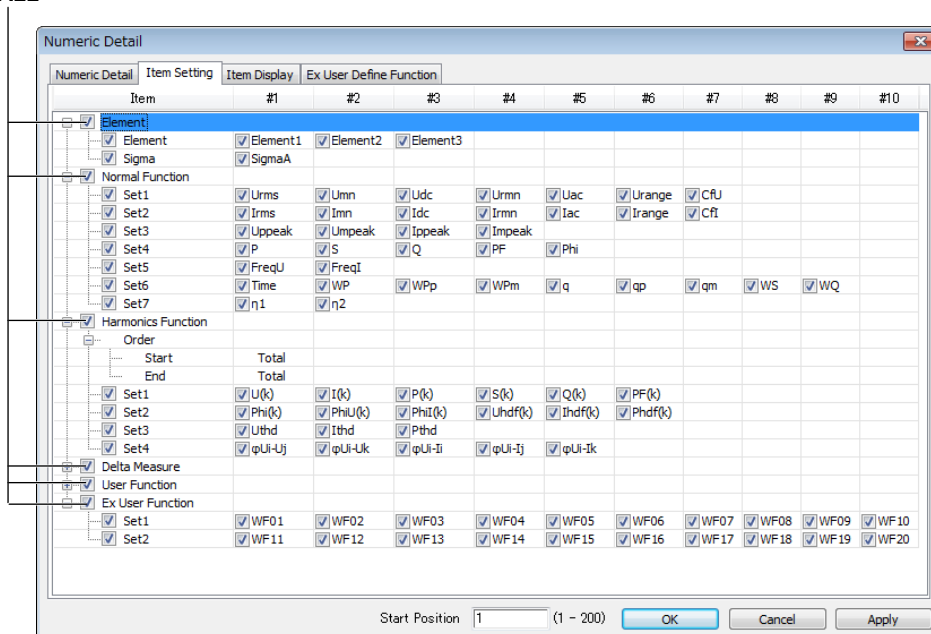
## Item Setting Dialog Box

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 / 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).

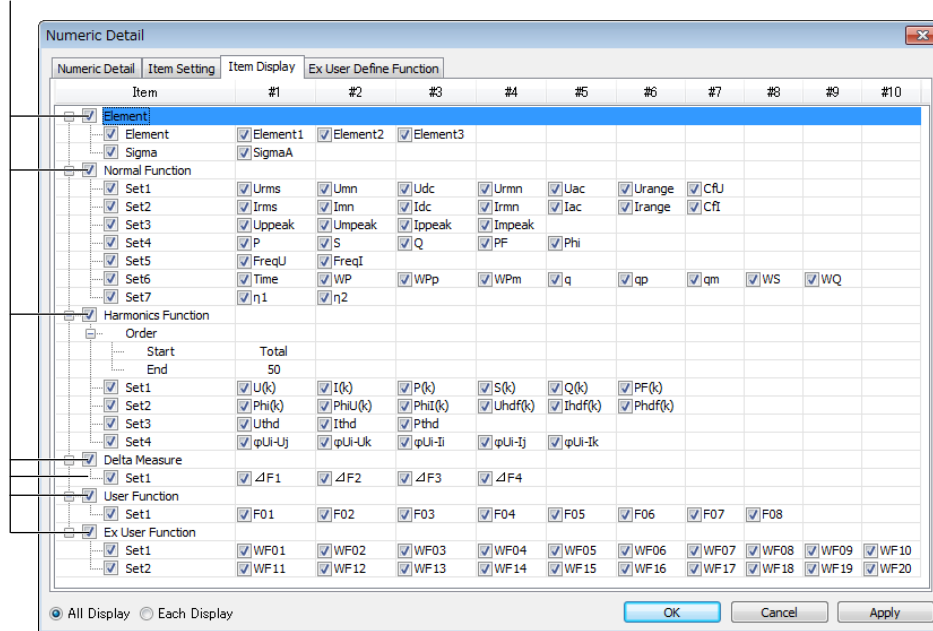
### Item Display Setting Dialog Box

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

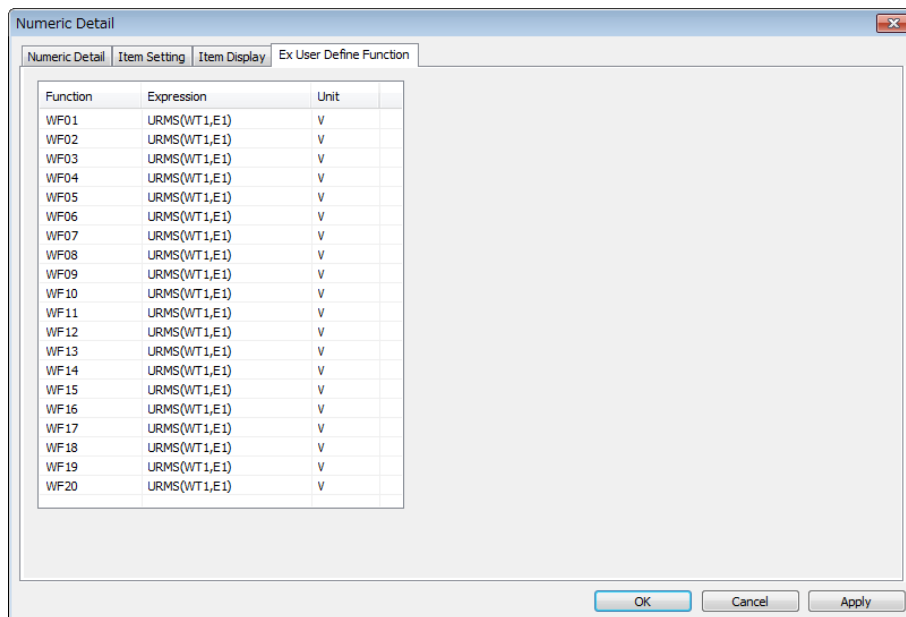
Only the items selected in Item Display are displayed in the numeric window.

**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 6-16.

Text color and background color: see page 6-16.

**Select all/clear all**

Font: 2

Text

Background

Order Filter

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	-----

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

OK Cancel Apply

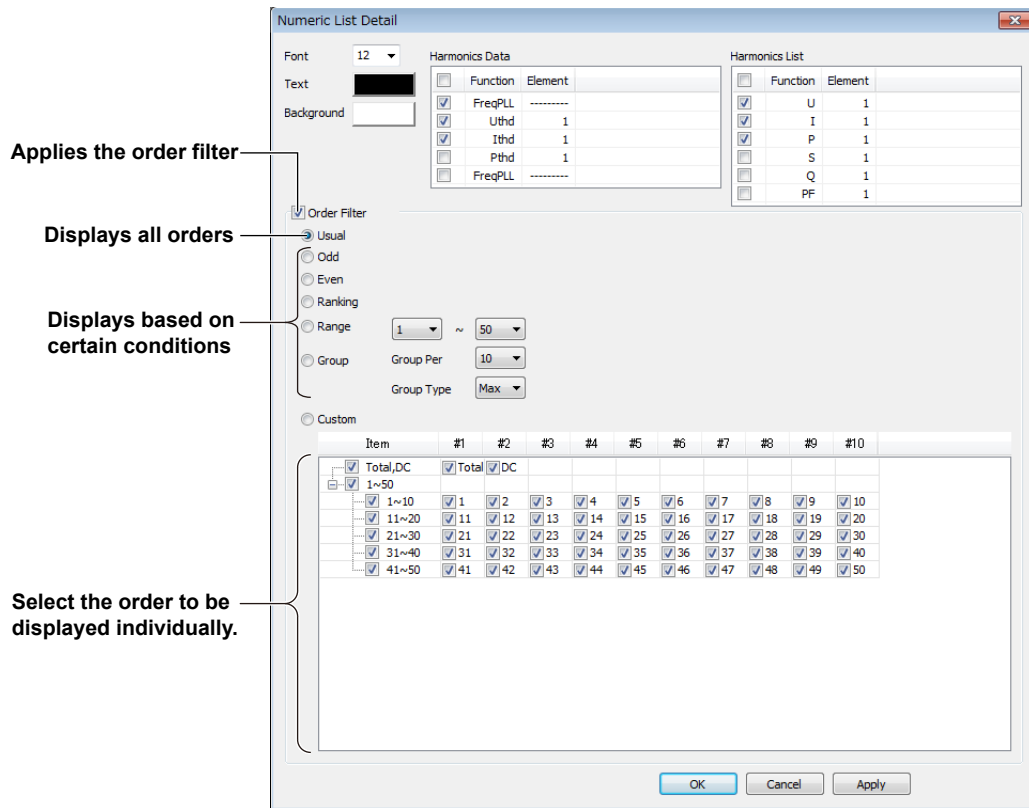
### Setting the Display Items

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. Only Total and DC are affected by the maximum/minimum display of data.
- **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. Only Total and DC are affected by the maximum/minimum display of 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,  $\lambda$ ,  $\phi$ , FreqU, FreqI

### Detail Setting Dialog Box

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

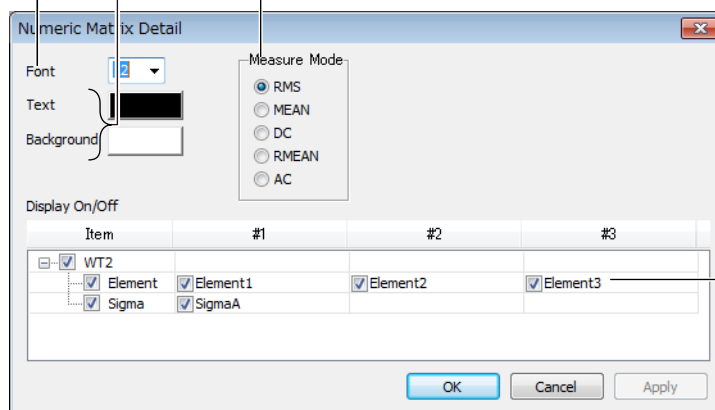
- Right-click the numeric matrix window.
- Click the window detail setting button when the numeric matrix window is selected (active).
- Select Numeric Matrix in the shortcut menu of the window detail setting button.

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

Font: see page 6-16.

Text color and background color: see page 6-16.

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

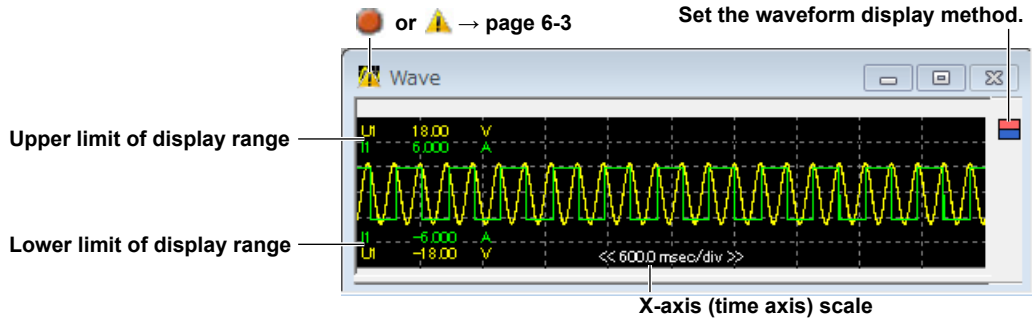
You can save measured data on the numeric display window. See section 6.2, "Numeric Display."

## 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)

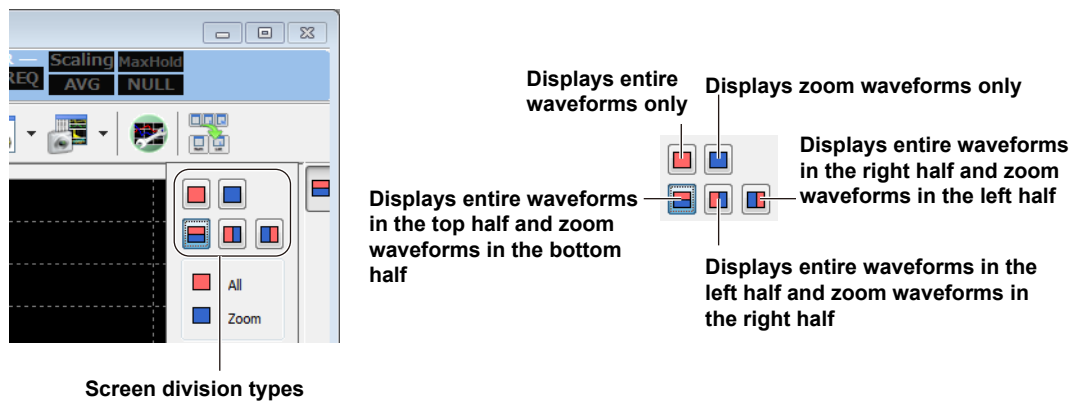


### Note

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

Select how to divide the display screen for displaying waveforms.

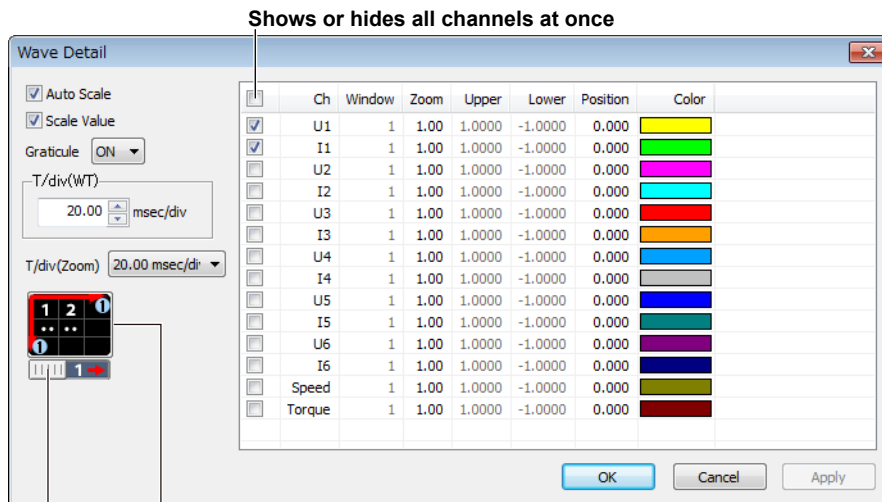


## Detail Setting Dialog Box

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.

## 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.

## Graticule

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

## Setting the Combination of Rows and Columns

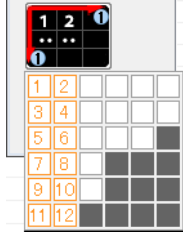
The waveform display screen can be divided.

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

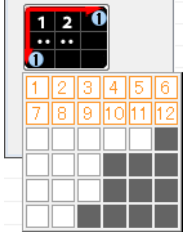
When the display mode is ALL: Up to 24 areas

### Example of horizontal direction

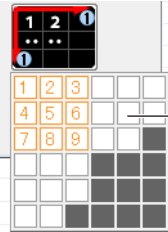
6 rows × 2 columns



2 rows × 6 columns



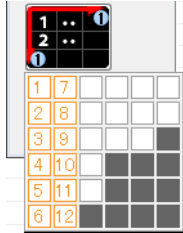
3 rows × 3 columns



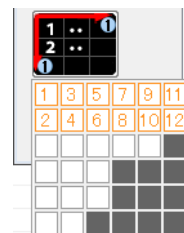
The combination of rows and columns is displayed automatically as you drag the mouse.

### Example of vertical direction

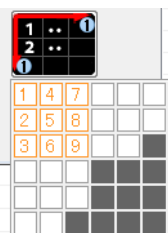
6 rows × 2 columns



2 rows × 6 columns



3 rows × 3 columns



## 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

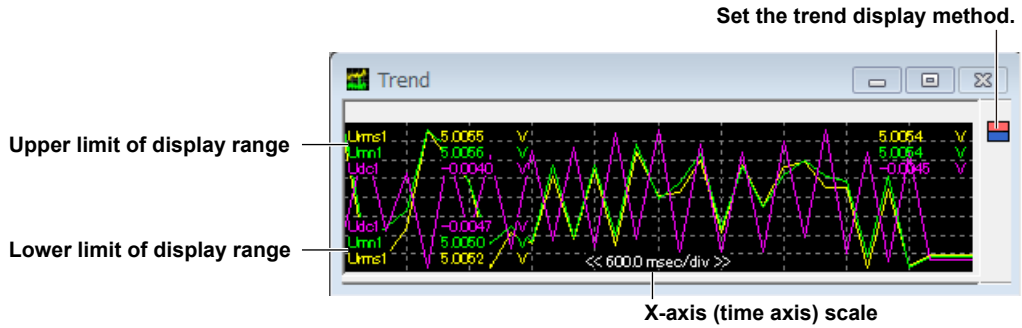
Select the waveform color.

## 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.

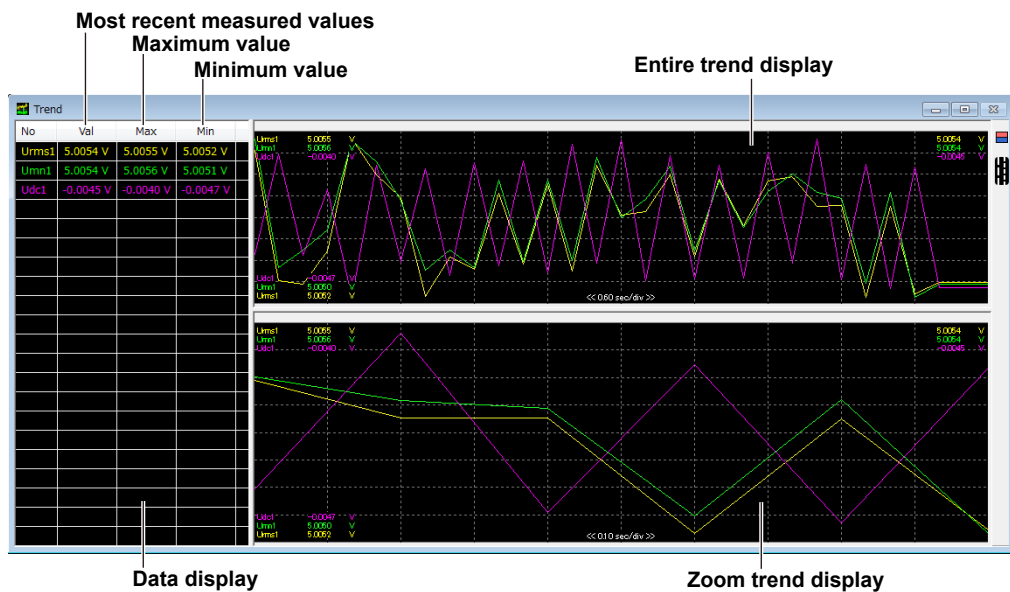
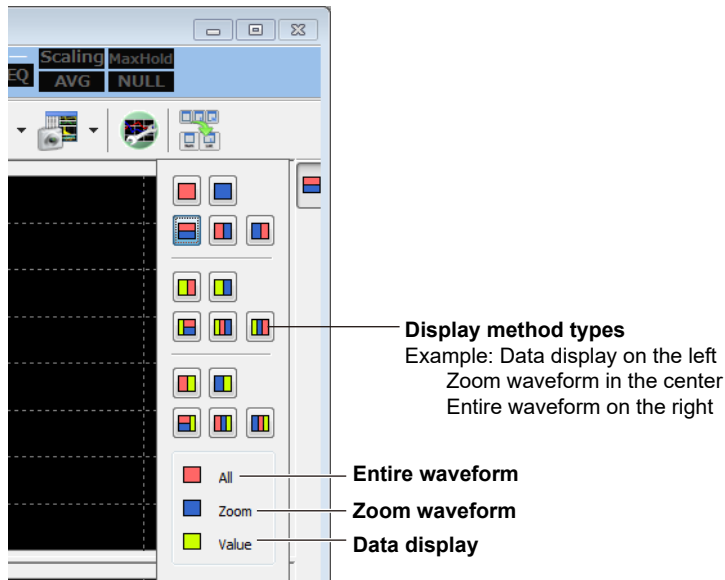
## 6.6 Trend Display

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.





## 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.

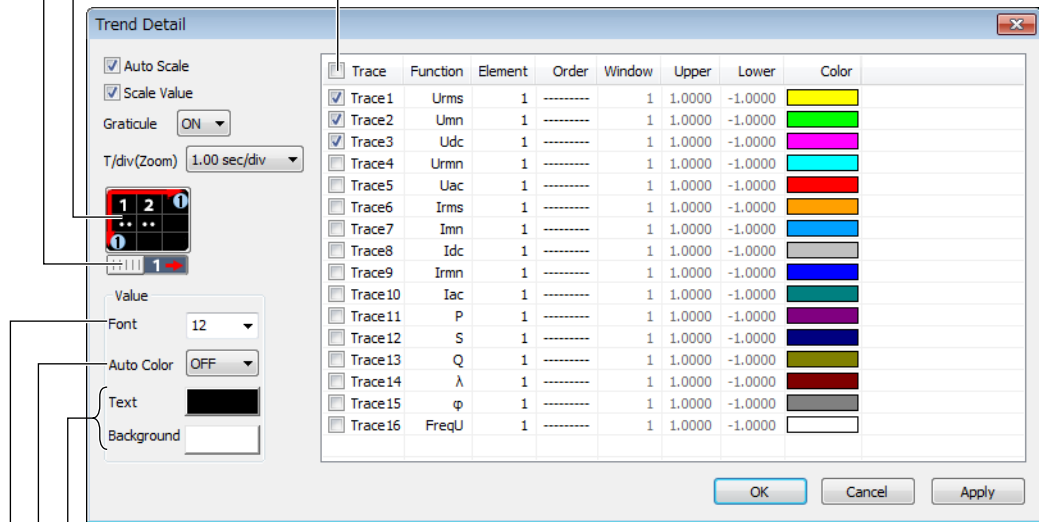
Drag to slide the bar display.

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 6-16.**

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

### Set auto color.

Font: see page 6-16.

## 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.

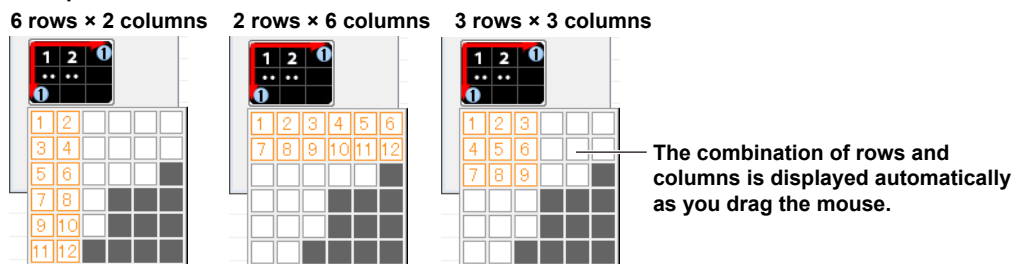
## Setting the Combination of Rows and Columns

The trend display screen can be divided.

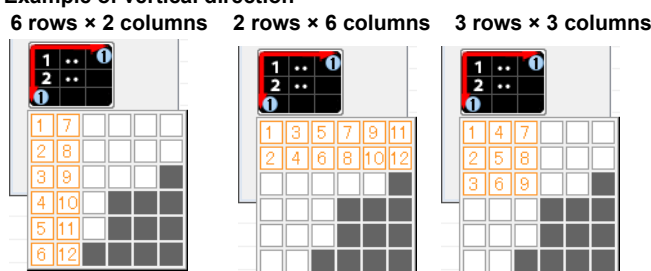
When the display mode is WT1, WT2, WT3, or WT4: Up to 12 areas

When the display mode is ALL: Up to 24 areas

### Example of horizontal direction



### Example of vertical direction



## 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.

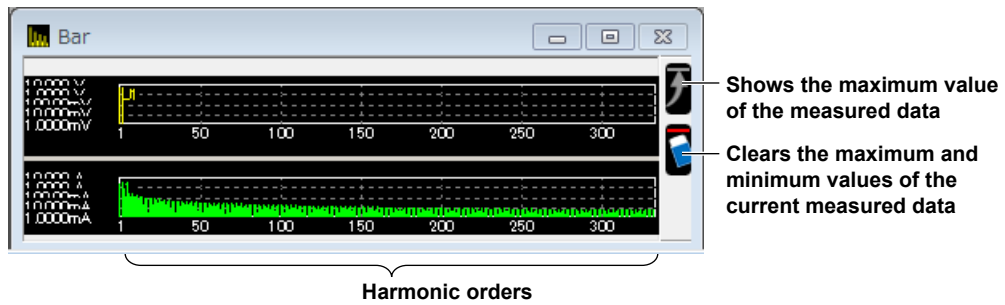
### Saving Measured Data

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.

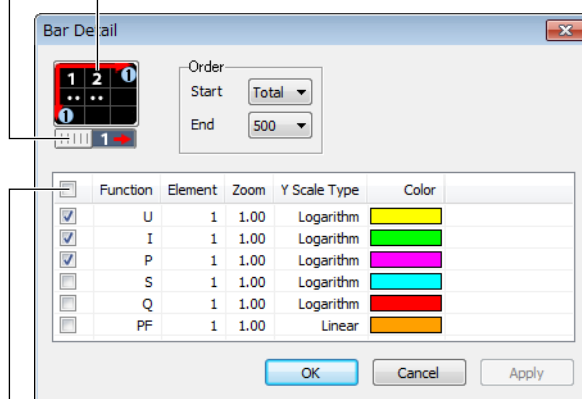
#### Set the screen division method.

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

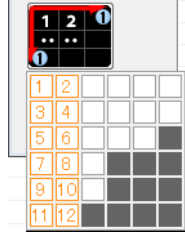
The bar graph display screen can be divided.

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

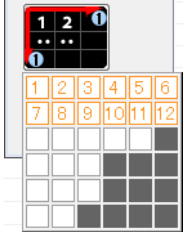
When the display mode is ALL: Up to 12 areas

### Example of horizontal direction

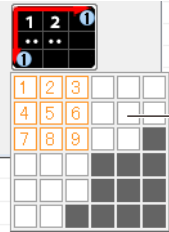
6 rows × 2 columns



2 rows × 6 columns



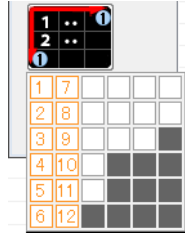
3 rows × 3 columns



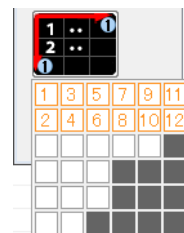
The combination of rows and columns is displayed automatically as you drag the mouse.

### Example of vertical direction

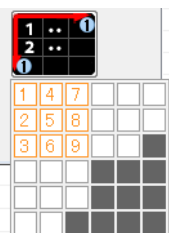
6 rows × 2 columns



2 rows × 6 columns



3 rows × 3 columns



## 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

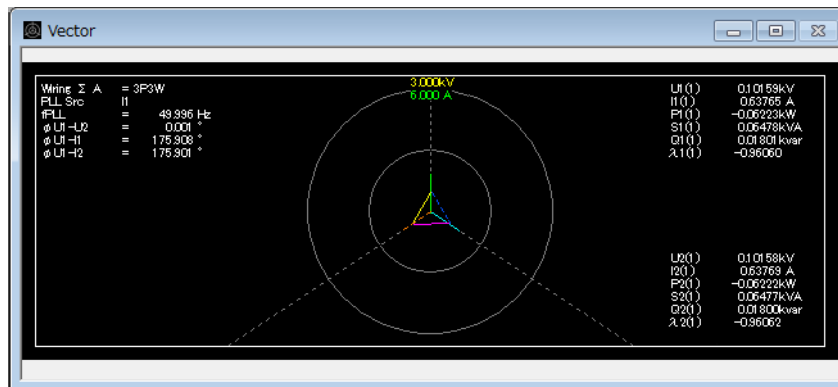
You can select a wiring unit to display vectors of the phase differences and amplitudes (rms values) of the fundamental signals, U(1) and I(1), in each element in the unit. The positive vertical axis is set to zero (angle zero), and the vector of each input signal is displayed.

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)

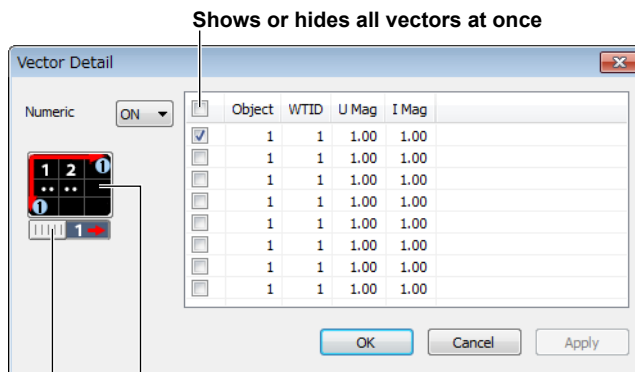


### Detail Setting Dialog Box

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

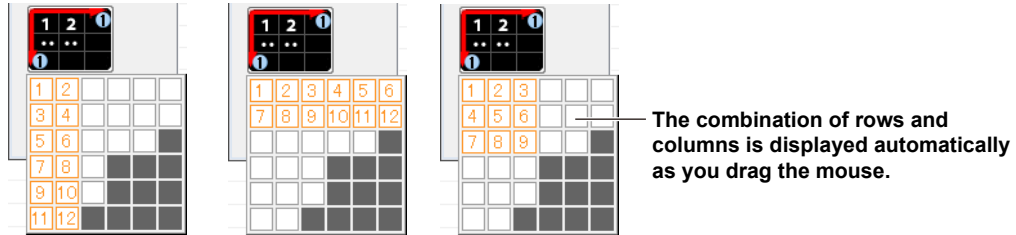
## Setting the Combination of Rows and Columns

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.

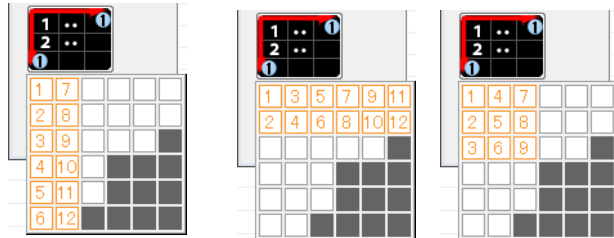
### Example of horizontal direction

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



## 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

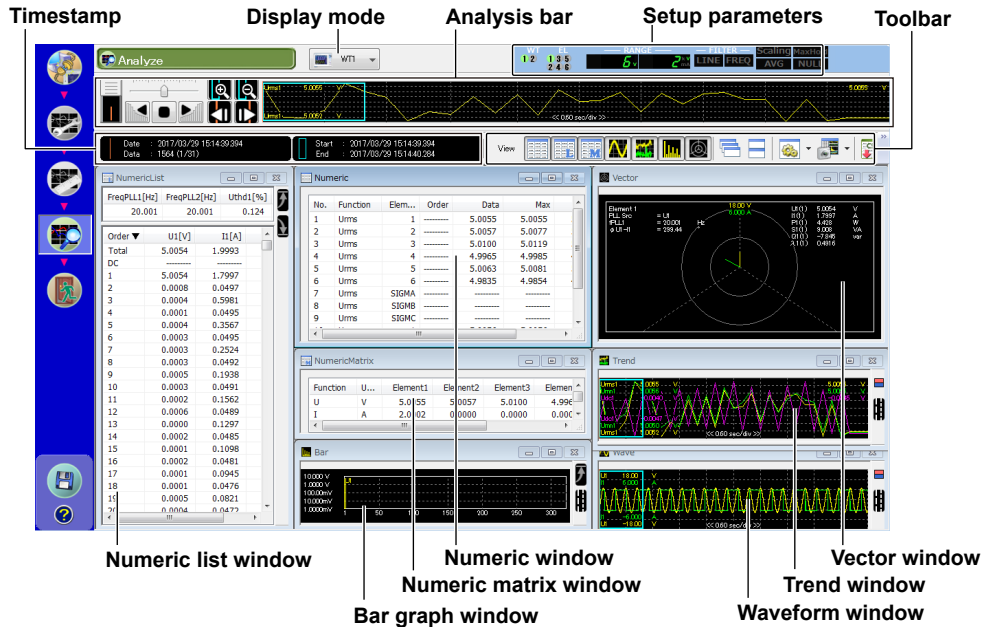
You can save measured data on the numeric display window. See section 6.2, "Numeric Display."

# 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.



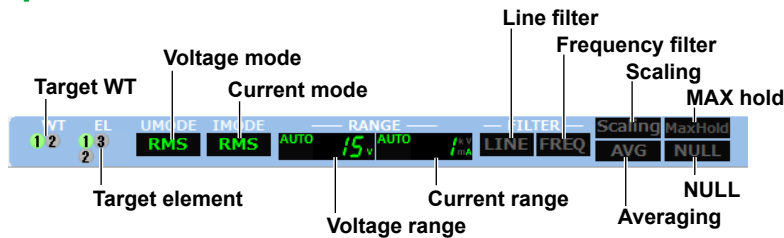
### Note

- 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

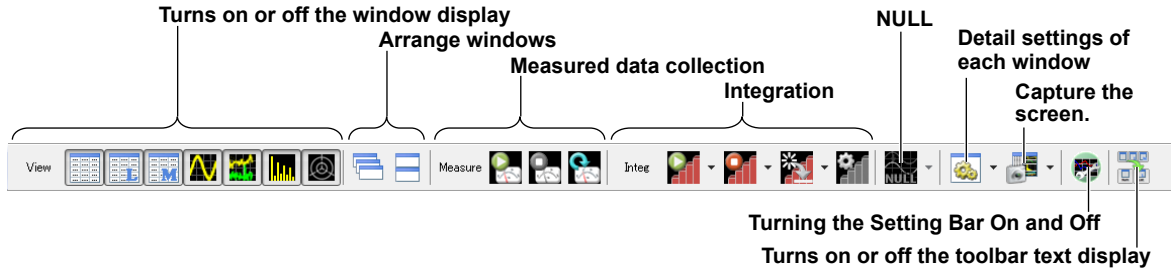
The settings that were in use when the data was acquired are displayed.



**Line Filter, Frequency Filter, Scaling, MAX Hold, Averaging, and NULL**

- ON: Displayed in green
  - OFF: Displayed in gray
- For details on changing the settings, see chapter 5.

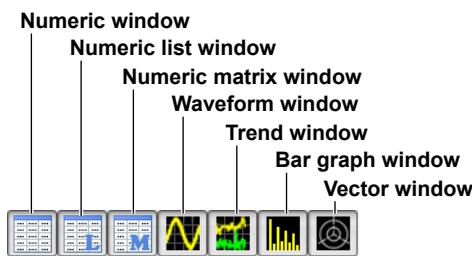
**Toolbar**



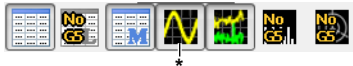
**Turning On and Off the Window Display (View Icons)**

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.

- Numeric - Detail **Section 6.2**
- Numeric - Item Setting **Section 6.4**
- Numeric - Display Setting **Section 6.4**
- Numeric - Ex User Define Function Setting **Section 6.4**
- NumericList **Section 6.3**
- NumericMatrix **Section 6.5**
- Wave **Section 6.5**
- Trend **Section 6.6**
- Bar **Section 6.7**
- Vector **Section 6.8**
- Save Layout...
- Load Layout...

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.

**Converts numeric data to CSV and saves the result**

**Converts waveform data to CSV and saves the result**

**Save destination of the numeric data CSV file**

**Name of the numeric data CSV file**

**Save destination of the waveform data CSV file**

**Name of the waveform data CSV file**

## 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.

## 7.1 Analysis Screen

### 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

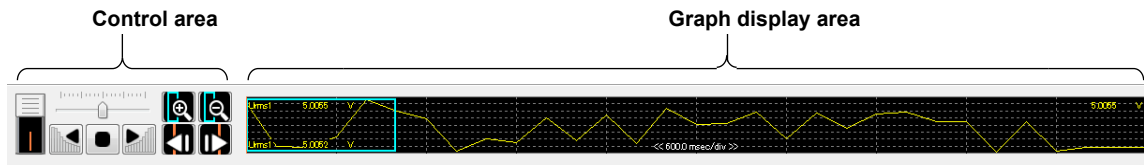
If the number of numeric data entries saved to a file reaches the number specified by Line Count, a new file is created with a name whose number at the end of the name is incremented. This process is repeated (e.g., DEFAULT\_0001.csv, DEFAULT\_0002.csv, . . . , DEFAULT\_9999.csv).

#### 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.

## Analysis Bar



### Control area

#### 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.

 : When moving the cursor

 : When moving the zoom range

 : When moving the cursor and zoom range

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.

#### Switches what to scroll

Drag the mouse to switch.

Cursor



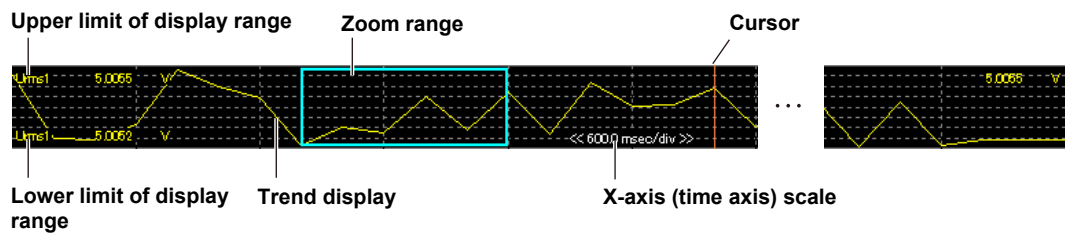
Zoom range



Cursor and zoom range



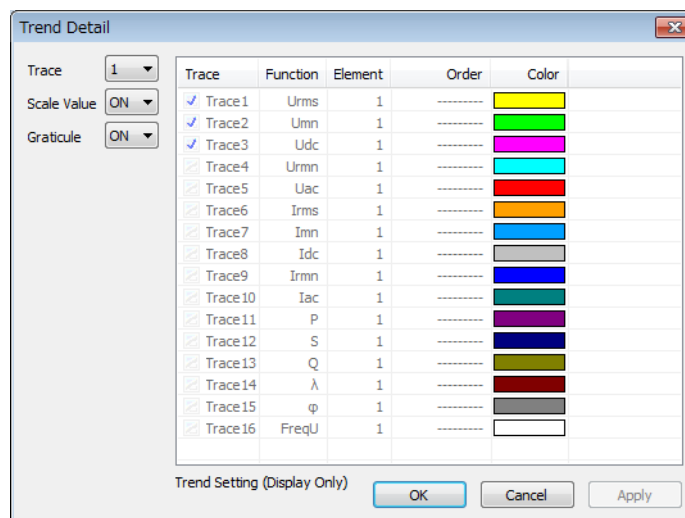
## Graph Display Area



## Trend Detail Dialog Box

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

- Right-click the graph display area.



\* If several WTs 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.

## Timestamp

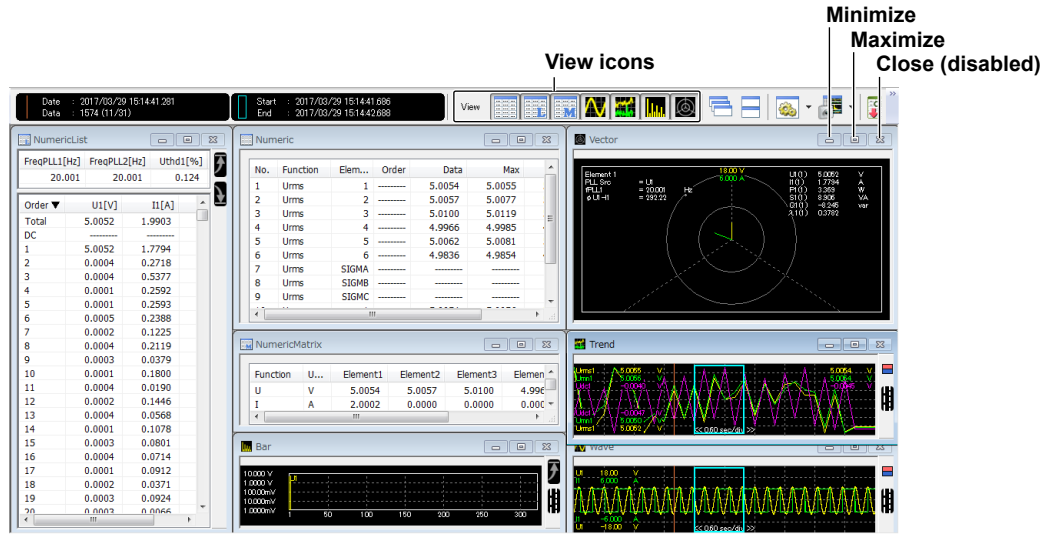
The date and time of the cursor and zoom range are displayed as position information in the graph display area.



Date and time at the cursor position  
Start date and time and end date and time of the zoom range

## 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 6-17. **Item Display:** See page 6-18. **Ex User Define Function:** See page 6-19.

Config

Items: 12 Text: [Black]

Font: 12 Background: [White]

**Items, Font, Text color, background color: see page 6-16.**

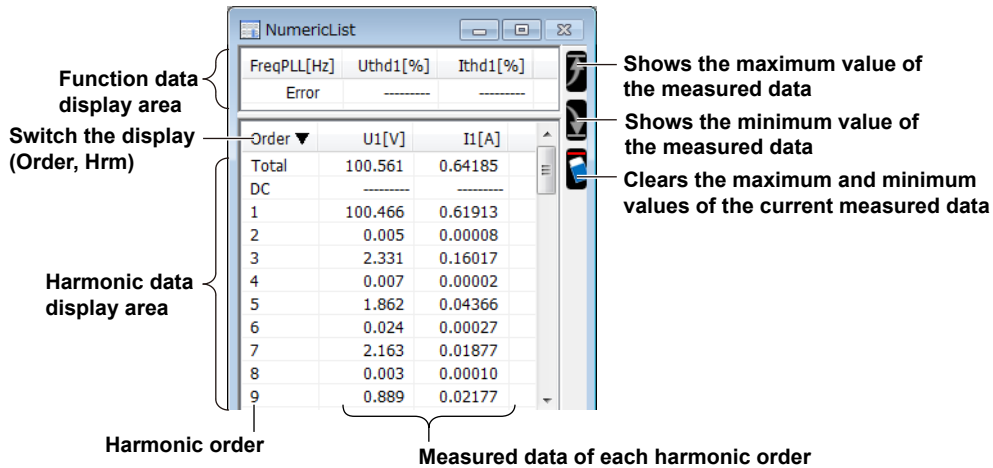
**If you change the numeric window settings during offline analysis or re-compute with the extended user-defined function, this button resets the measured data to the original.**

Reinstate OK Cancel Apply

## 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

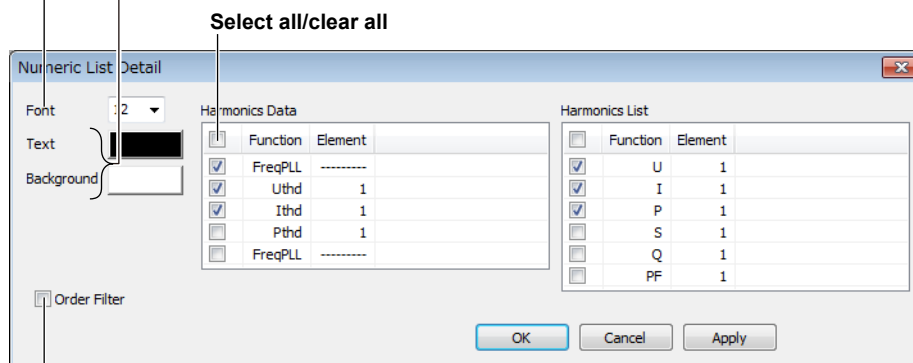
A detail setting dialog box appears when you perform any of the following operations.

- 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 6-16.

Text color and background color: see page 6-16.



Order filter: See page 6-21.

### 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---
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,  $\lambda$ ,  $\phi$ , FreqU, FreqI

### Detail Setting Dialog Box

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

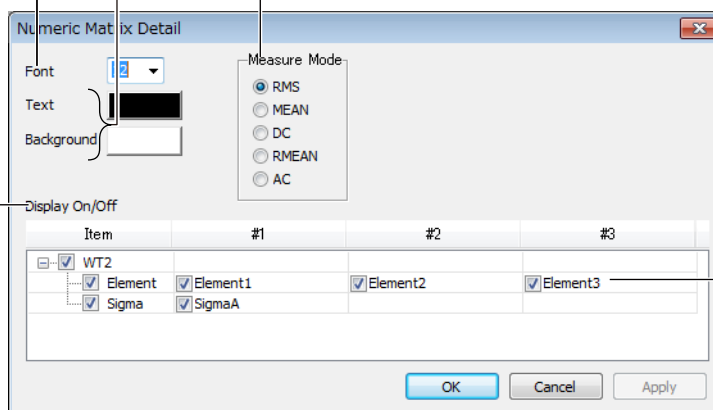
- Right-click the numeric matrix window.
- Click the window detail setting button when the numeric matrix window is selected (active).
- Select Numeric Matrix in the shortcut menu of the window detail setting button.

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

Font: see page 6-16.

Text color and background color: see page 6-16.

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 6-23.

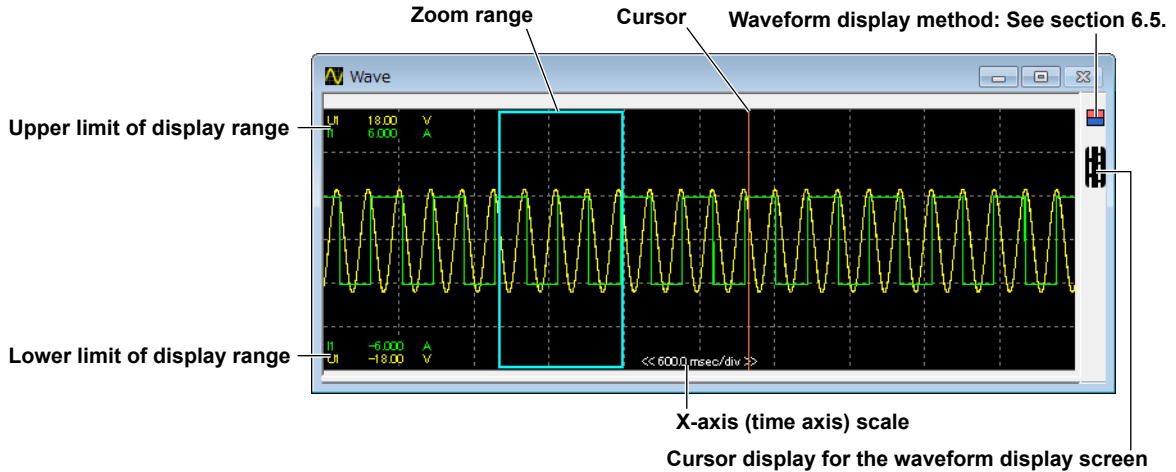


## 7.5 Waveform Display

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

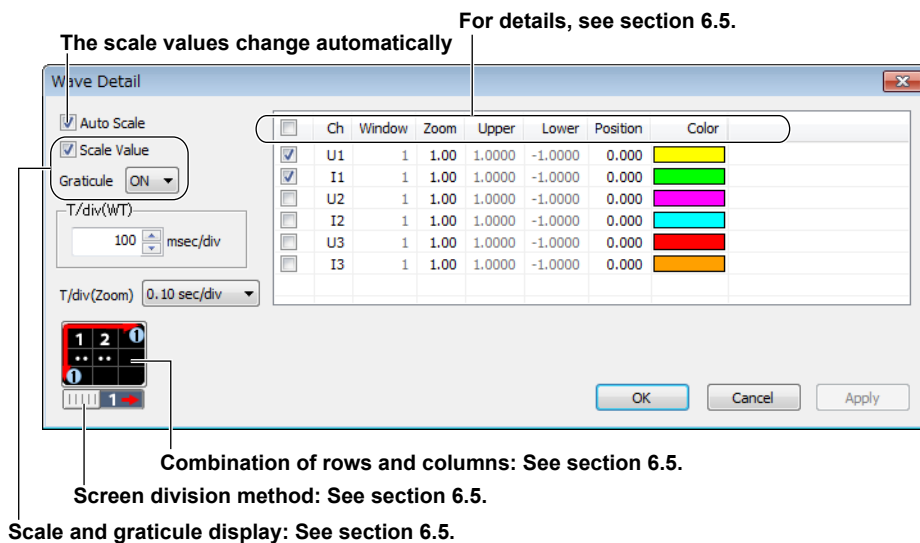
When connected to the WT500 during measurement data acquisition (see section 6.5), waveform is displayed in sections where integration has been started or stopped.

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.



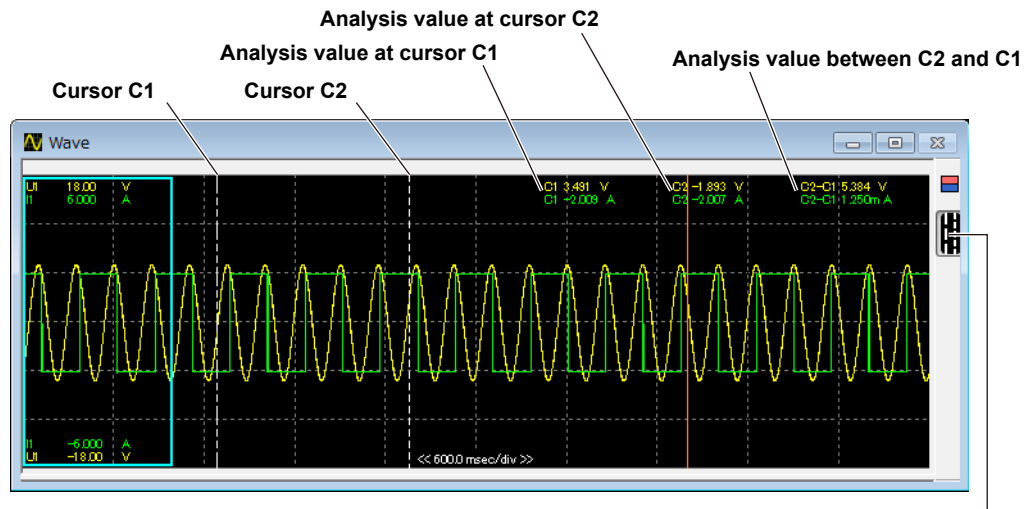
Combination of rows and columns: See section 6.5.

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

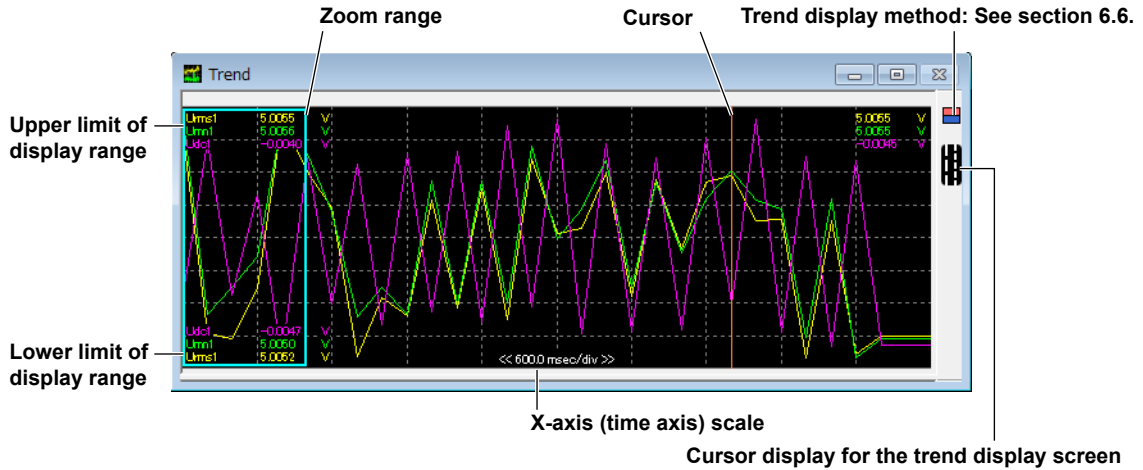
Click or drag while holding the Ctrl key on the PC keyboard to move cursors C1 and C2 simultaneously while maintaining the spacing between the two cursors.

### 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.

## 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 has a left sidebar with settings: 'Auto Scale' (checked), 'Scale Value' (checked), 'Graticule' (ON), and 'T/div(Zoom)' (1.00 sec/div). Below these are buttons for 'Value', 'Font' (12), 'Auto Color' (OFF), 'Text' (black), and 'Background' (white). The main area contains 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

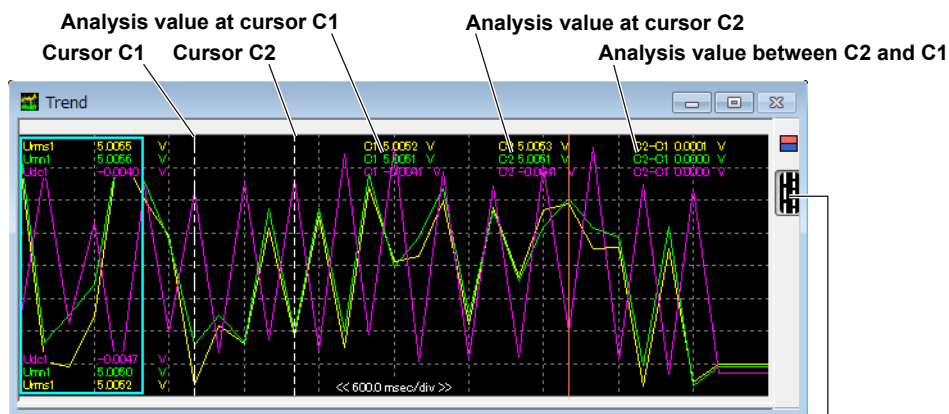
Labels in the image point to the 'Shows or hides all trends at once' button and the table header. A label 'For details, see section 6.5.' points to the table. A label 'Set the numeric display screen.' points to the 'Value' button. A label 'Text color and background color: see page 6-16. You can set this when the auto color is set to OFF.' points to the 'Text' and 'Background' settings. A label 'Set auto color.' points to the 'Auto Color' dropdown. A label 'Font: see page 6-16.' 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

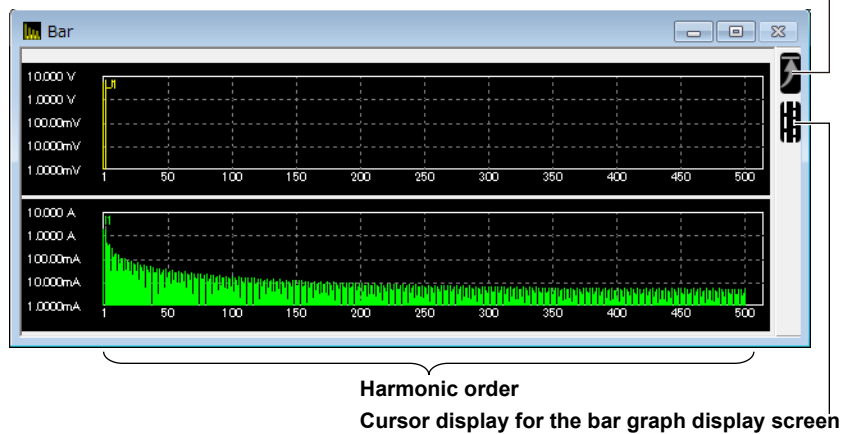
If the cursor display for the display screen is turned on, because the cursor or zoom range cannot be controlled in the trend window, turn the display off or use the analysis bar.

## 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

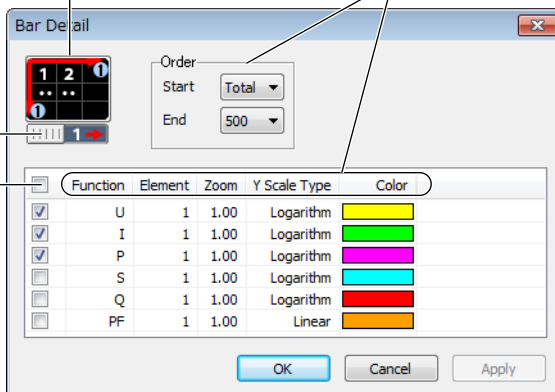
A detail setting dialog box appears when you perform any of the following operations.

- 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.

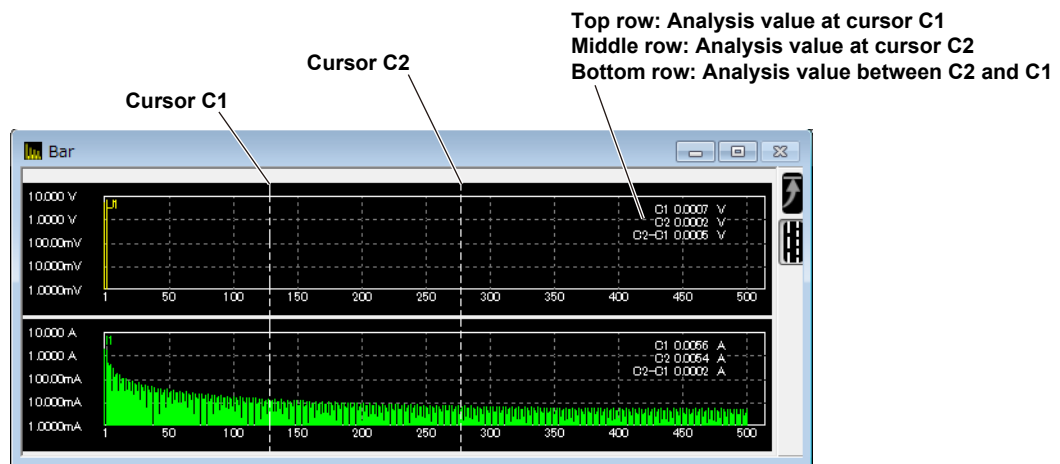
For details, see section 6.7.



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

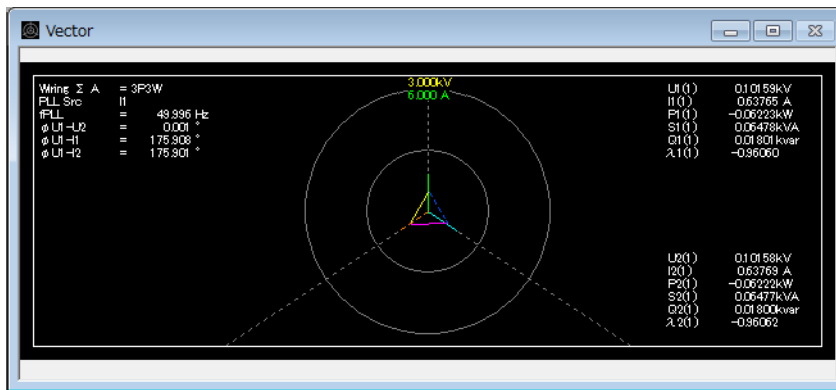
You can select a wiring unit to display vectors of the phase differences and amplitudes (rms values) of the fundamental signals, U(1) and I(1), in each element in the unit. The positive vertical axis is set to zero (angle zero), and the vector of each input signal is displayed.

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.

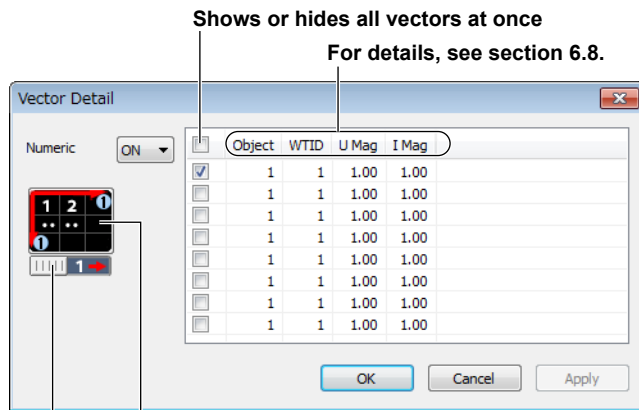
- WT310E/WT310EH/WT332E/WT333E
- WT310/WT310HC/WT330(WT332/WT333)



### 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.




Shows or hides all vectors at once

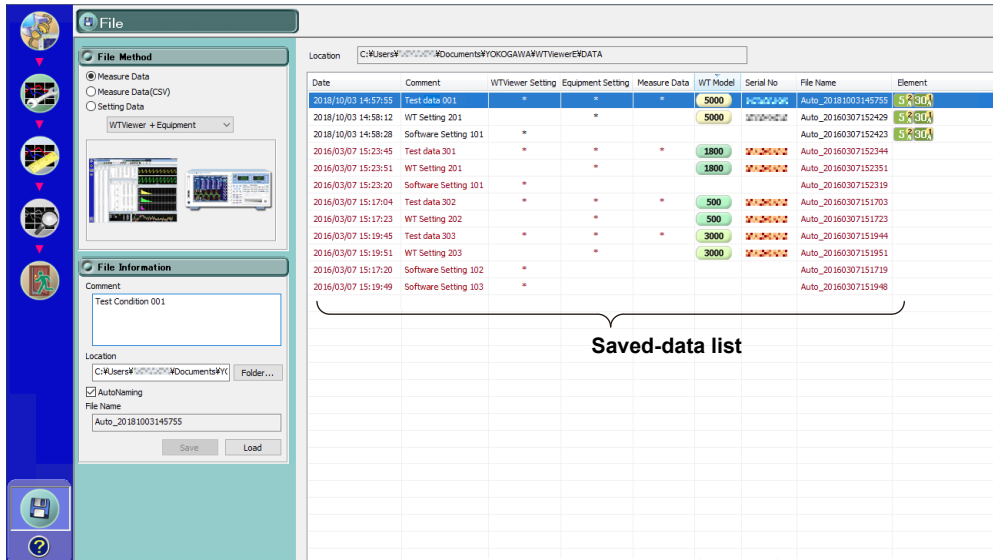
For details, see section 6.8.

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.

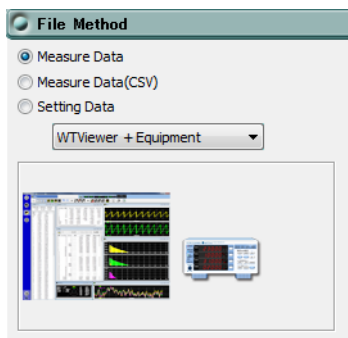


## Selecting the Type of File to Save

Select the type of data to save from the following:

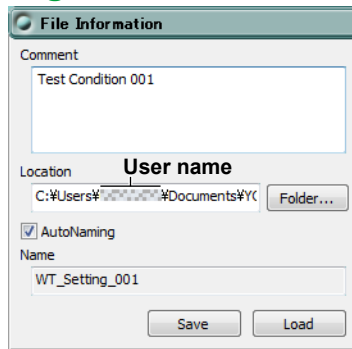
- Measure Data: Data measured on the WT will be saved. The device and this software's settings are also saved.
- Measure Data(CSV): Data measured on the WT will be saved in CSV format. For details on the dialog box that appears when saving the data, see “Configuring the CSV Output” in section 7.1.
- 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



### 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, .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

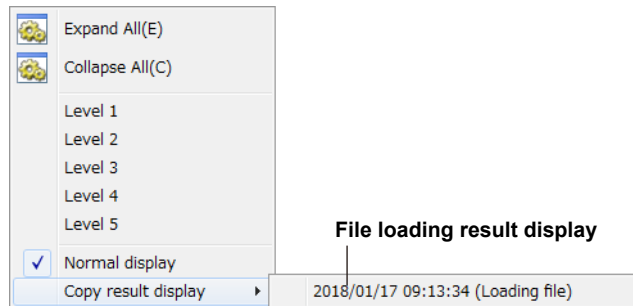
WT in which the following conditions are not aligned

- 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.

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

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.

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

User name

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	760902	Auto_20181003145755	WT1 5 30
2018/10/03 14:58:12	WT Setting 201		*		5000	760902	Auto_20160307152429	WT1 5 30
2018/10/03 14:58:28	Software Setting 101	*					Auto_20160307152423	WT1 5 30
2016/03/07 15:23:45	Test data 301	*	*	*	1800	760901	Auto_20160307152344	
2016/03/07 15:23:51	WT Setting 201		*		1800	760901	Auto_20160307152351	
2016/03/07 15:23:20	Software Setting 101	*					Auto_20160307152319	
2016/03/07 15:17:04	Test data 302	*	*	*	500	760902	Auto_20160307151703	
2016/03/07 15:17:23	WT Setting 202		*		500	760902	Auto_20160307151723	
2016/03/07 15:19:45	Test data 303	*	*	*	3000	760902	Auto_20160307151944	
2016/03/07 15:19:51	WT Setting 203		*		3000	760902	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).

WT1 5 30  
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.

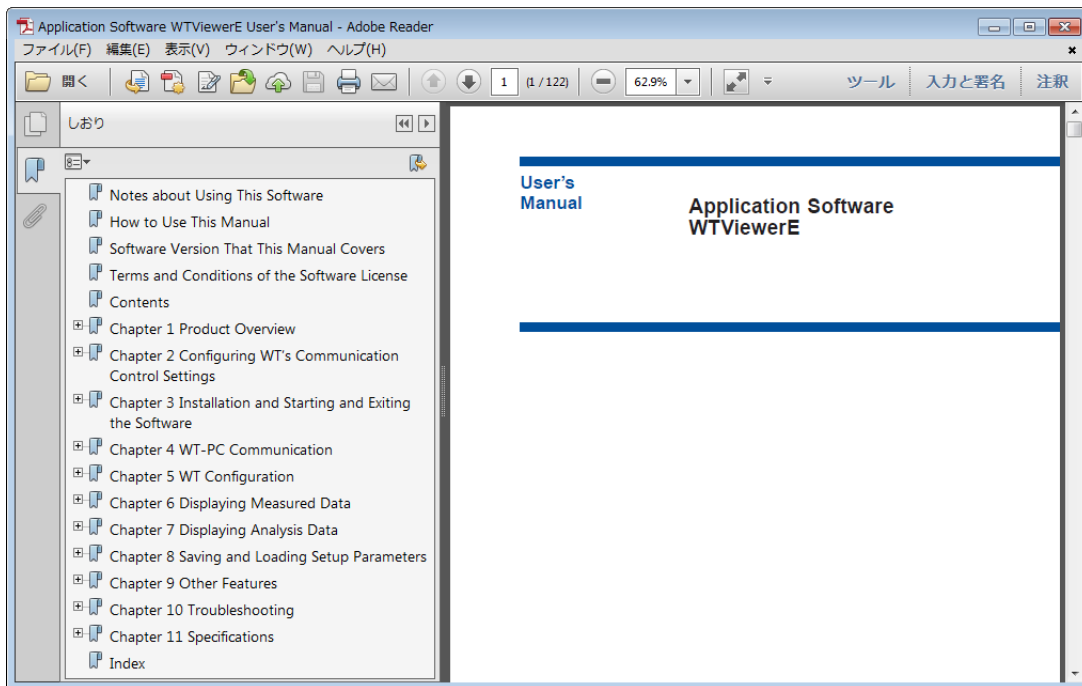
### Note

- 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

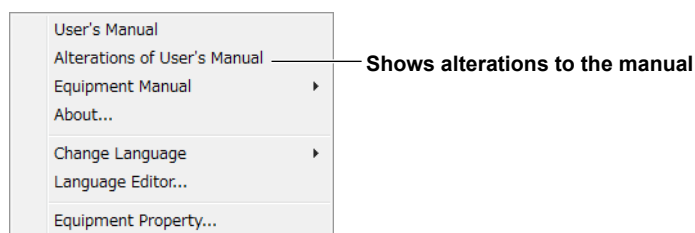
Click the help  button. If Adobe Acrobat Reader is installed on your PC, it will start, and the PDF of the software user's manual will open. You can look up how to use the software and terminology.



## 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.

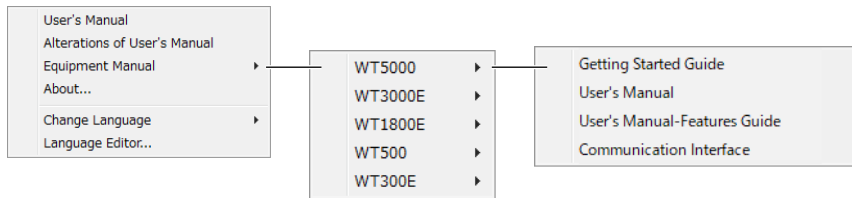
- User's manual file name: EN\_WTViewerE Users Manual.pdf
- Alteration notice file name: EN\_WTViewerE Alterations.pdf

### 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

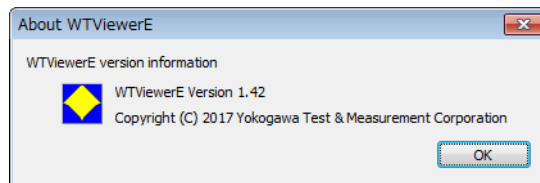
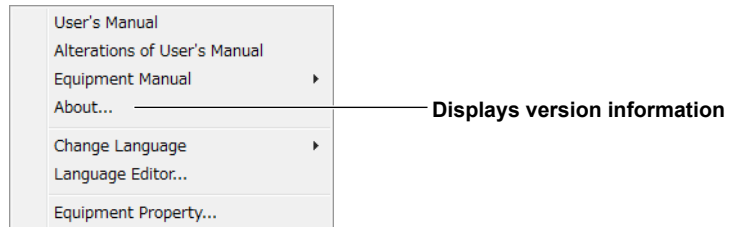
The help function does not show the user's manual for the following models.

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

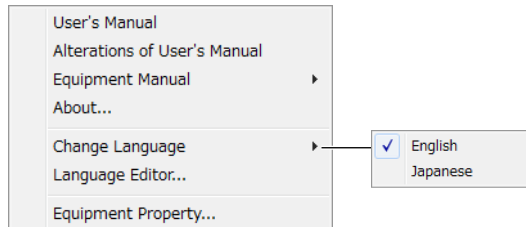
## 9.2 Viewing the Version Information

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.



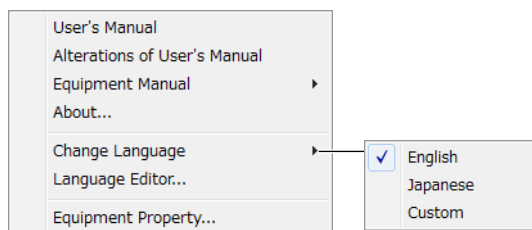
### Note

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

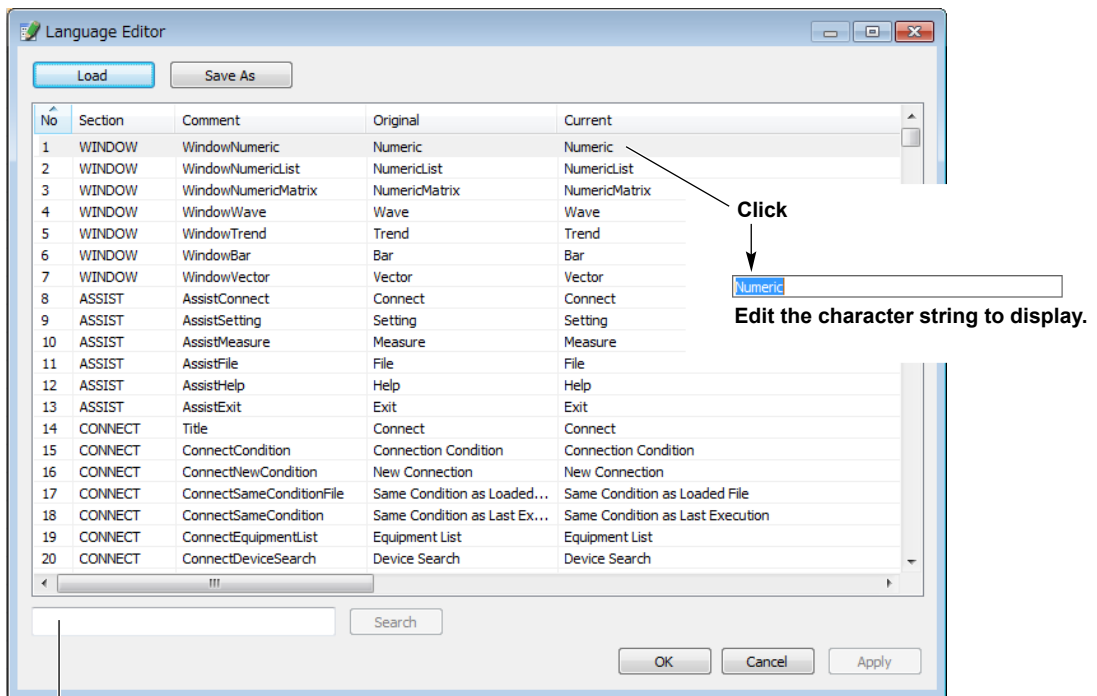
You can edit the text that is displayed in the dialog boxes and windows of the software.

### 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

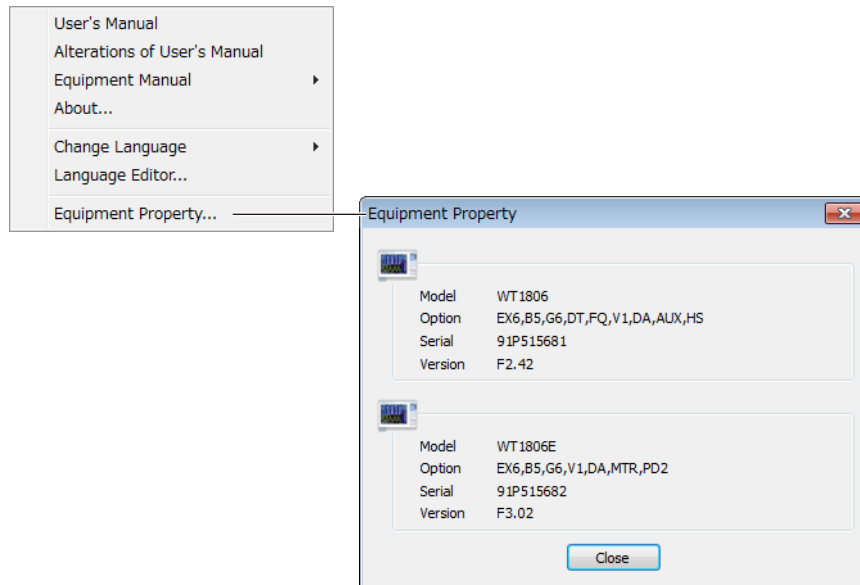
Click **Load** to load a language information file into the Language Editor dialog box.



## 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.

## 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.

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### 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.

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## 10.2 Error Messages

Message	Corrective Action
Equipment can not be found. <ul style="list-style-type: none"><li>• Please check the power supply.</li><li>• Please check the Device Manager.</li><li>• Please refer to help.</li></ul>	Check the following items. <ul style="list-style-type: none"><li>• Is the WT turned on?</li><li>• Is the GP-IB, RS-232, Ethernet, or USB cable connected properly?</li><li>• 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?</li><li>• 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?</li><li>• If you are using Ethernet, are the IP address, user name, and password set to the same values on the WT and WTVIEWER?</li><li>• 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?</li><li>• If you are using USB, is the USB driver is appropriate for the WT series?</li></ul>
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.	The value that you tried to set is outside the allowed range. Set a value within the allowed range.

# 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 parameters<sup>1</sup></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) 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 <sup>1</sup>	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) CDW format (.cdw; waveform data for analysis)	Trend data	CSV format (.csv), CDT format (.cdt; trend data for analysis)		
Setup parameters <sup>1</sup>	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) 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) 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) CDW format (.cdw; waveform data for analysis)	Trend data	CDT format (.cdt; trend data for analysis)
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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) 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	<p>Numeric Displays the numeric data that the software collects from the WT</p> <p>Numeric list<sup>2</sup> Lists the harmonic data that the software collects from the WT</p> <p>Numeric Matrix Displays the numeric data that the software collects from the WT for each element in a table</p> <p>Waveform<sup>3</sup> Displays the waveform display data that the software collects from the WT</p> <p>Bar Graph<sup>2</sup> Displays bar graphs of the harmonic components for each harmonic order during harmonic measurement</p> <p>Trend Displays the numeric data that the software collects from the WT as trend graphs</p> <p>Vector<sup>2,4</sup> 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</p> <p>Analysis graph Analysis screen only. Set a cursor and zoom range in the entire measured data and display the corresponding data in other screens.</p> <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 A vector window cannot be displayed on the WT310E/WT310EH/WT332E/WT333E or WT310/WT310HC/WT332/WT333.</p>										
WT Configuration	All functions that are available as communication commands										
System Requirements	See section 1.3.										

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