

This user's manual explains how to operate the Power Consumption Measurement Software.

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Disclaimer

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System Requirements

PC

- CPU: Pentium 4 1.5 GHz or higher (recommended)
- Memory: 512 MB or more (recommended)
- HDD: 500 MB or more of free space

Operating System

An English version of Microsoft Windows: Windows 7, Windows 8.1, or Windows 10

* 32-bit versions and 64-bit versions are supported.

Communication Port

• GP-IB

NI (National Instruments)

| | 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 | 14.0 or later | |
| GPIB-USB-HS+ | | | |

• RS-232

An available COM port on the PC

• Ethernet

10BASE-T or 100BASE-TX Ethernet port

• USB

A USB revision 1.1 or later USB port

Display, Printer, and Mouse

Devices supported by the operating systems listed above

Applicable Measuring Instruments

This software can be used with the Yokogawa measuring instruments listed below. This user's manual describes the case in which this software is used in combination with the WT. For information about the handling precautions, functions, and operating procedures of each WT, see the respective manuals.

| Model | Model Code | Supported WT Series Version | Current Input Type | Direct Input Measurement | Input Slot That This Software Can Use | External Input Measurement | Communication Device | | | |
|--------------------|--|-----------------------------|--|--------------------------|---------------------------------------|---------------------------------------|--|------------|------------|------------|
| | | | | | | | GP-IB | RS-232 | Ethernet | USB |
| WT210 ⁴ | 760401 | Ver. 1.01 or later | 1 type | Yes | Input slot 1 (channel 1) only | No | Yes (opt.) | Yes (opt.) | - | - |
| WT310 | WT310 | Ver. 4.01 or later | 1 type | Yes | Input slot 1 (channel 1) only | No | Yes (select GP-IB or RS-232 ⁵) | | Yes (opt.) | Yes (st'd) |
| WT310E | WT310E | Ver. 4.22 or later | 1 type | Yes | Input slot 1 (channel 1) only | No | Yes (select GP-IB or RS-232 ⁵) | | Yes (opt.) | Yes (st'd) |
| WT500 | 760201 760202 760203 | Ver. 1.01 or later | 1 type | Yes ² | Input slot 1 (channel 1) only | Yes (opt, special model) ¹ | Yes (opt.) | - | Yes (opt.) | Yes (st'd) |
| WT1600 | 760101 | Ver. 2.01 or later | 5 A input element | Yes | Input slot 1 (channel 1) only | No | Yes (select GP-IB or RS-232) | | Yes (opt.) | - |
| | | | 50 A input element | Yes ³ | | | | | | |
| | | | 5 A/5 A input element | Yes (5 A) | | | | | | |
| WT1800 | WT1801 WT1802 WT1803 WT1804 WT1805 WT1806 | Ver. 3.01 or later | 5 A input element | Yes | Input slot 1 (channel 1) only | No | Yes | - | Yes | Yes |
| | | | 50 A input element | Yes ³ | | | | | | |
| | | | 5 A/5 A input element | Yes (5 A) | | | | | | |
| WT1800E | WT1801E WT1802E WT1803E WT1804E WT1805E WT1806E | Ver. 4.23 or later | 5 A input element | Yes | Input slot 1 (channel 1) only | No | Yes | - | Yes | Yes |
| | | | 50 A input element | Yes ³ | | | | | | |
| | | | 5 A/5 A input element | Yes (5 A) | | | | | | |
| WT3000 | 760301 760302 760303 760304 | Ver. 1.01 or later | 2 A input element | Yes | Input slot 1 (channel 1) only | No | Yes (st'd) | Yes (opt.) | Yes (opt.) | Yes (opt.) |
| | | | 30 A input element | Yes ² | | | | | | |
| | | | 2 A/30 A mixed input element (special model) | Yes (2 A) | | | | | | |
| WT3000E | WT3001E WT3002E WT3003E WT3004E | Ver. 4.21 or later | 2 A input element | Yes | Input slot 1 (channel 1) only | No | Yes (st'd) | Yes (opt.) | Yes (opt.) | Yes (opt.) |
| | | | 30 A input element | Yes ² | | | | | | |
| | | | 2 A/30 A mixed input element | Yes (2 A) | | | | | | |
| WT5000 | WT5000 | Ver. 4.2.6 or later | 5 A input element | Yes | Input slot 1 (channel 1) only | No | Yes | - | Yes | Yes |
| | | | 30 A input element | Yes ² | | | | | | |
| | | | 5 A/30 A mixed input element | Yes (5 A) | | | | | | |

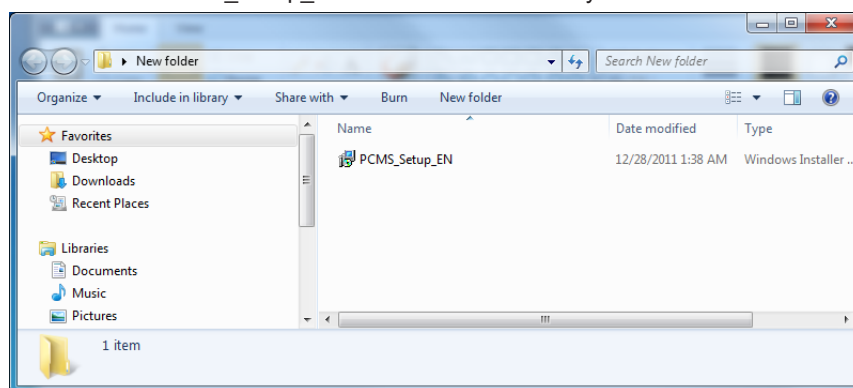
-
- 1 You can perform this measurement by using a low current measurement box together with the WT.
 - 2 The minimum range is 500 mA. Minute currents cannot be measured.
 - 3 The minimum range is 1 A. Minute currents cannot be measured.
 - 4 This product supports WT210 firmware version 1.10 or later.
 - 5 RS-232 of the WT310 or WT310E is not supported.

Explanation of Functions

| Item | Explanation |
|---|---|
| Communications with WT series | Select the communication method, and click OK to start communicating with the target WT. You can use the software to set the measurement conditions on the WT. |
| Measurement of power data defined in IEC62301 | This software can be used to measure total harmonic distortion(THD), crest factor(voltage), voltage, frequency, power variation (from the maximum power value observed), and accumulated energy. In addition, while they are not required values, the apparent power, power factor and crest factor(current) are also measured as reference values. |
| Report entry | Information other than measured values (for example, information about the product) must also be included in reports. You can enter this other information. |
| Report preview | You can see a preview of the report that will be generated |
| PDF output | You can print reports as PDF files. |
| Saving application settings | You can save the application settings (for example, the IP address) to files. |

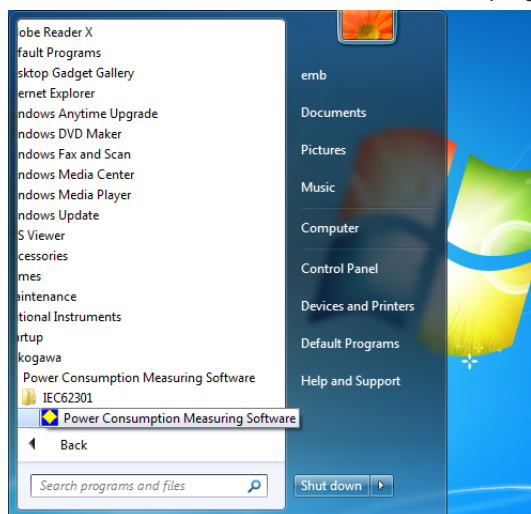
Installing the Software

Double-click "PCMS_Setup_EN.msi" in the folder that you downloaded.



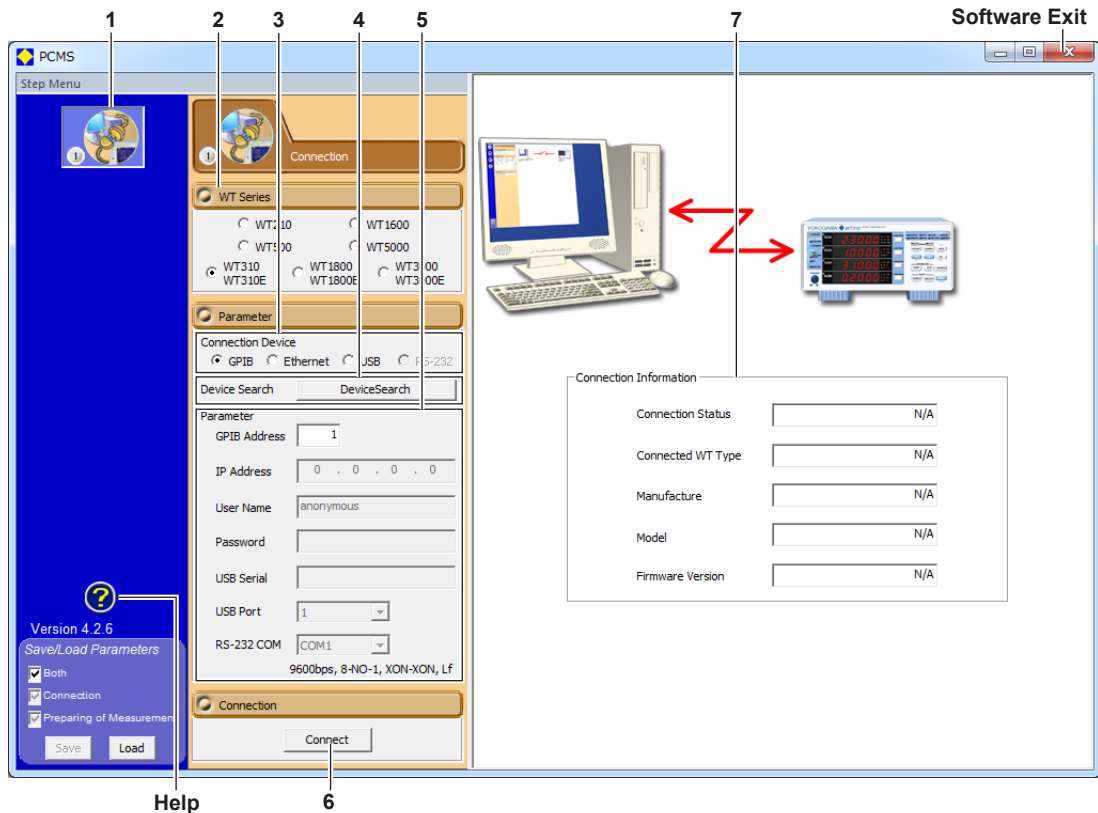
Starting the Software

On the taskbar, click Start, and then click the programs as shown below.



Establishing a Connection

Configuring and Establishing a New Connection between the PC and a WT



1 Click the connection icon.

2 Select the power analyzer to connect.

Supported models:

- WT5000
- WT3000, WT3000E
- WT1800, WT1800E
- WT1600
- WT500
- WT310, WT310E
- WT210

3 Select the communication interface.

Selectable interfaces:

- WT5000 (GP-IB, Ethernet, and USB*)
 - WT3000, WT3000E (GP-IB, Ethernet, RS232, and USB*)
 - WT1800, WT1800E (GP-IB, Ethernet, and USB*)
 - WT1600 (GP-IB, Ethernet, and RS232)
 - WT500 (GP-IB, Ethernet, and USB*)
 - WT310, WT310E (GP-IB, Ethernet, and USB*)
 - WT210 (GPIB and RS232**)
- * This requires you to first install a USB driver. (Download the driver from the following URL.)
<https://y-link.yokogawa.com/YL007.po/>
- ** When you are using the RS232 interface, configure the WT settings as shown below.
- Mode: 488.2
 - Handshaking: hand1
 - Format: For 0
 - Terminator: Lf
 - Baud rate: 9600 bps

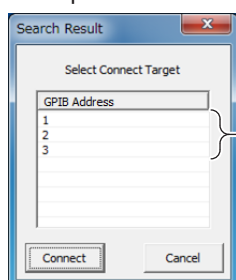
For details on the communication interface settings, see the power analyzer manual.

4 Search for a connected power analyzer.

Click DeviceSearch to search for power analyzers that the software can connect to using the current settings.

- If there is a single power analyzer that the software can connect to, the communication parameters of that analyzer are used.
- If multiple analyzers are found, the following dialog box appears.

Example of the screen of GPIB connection

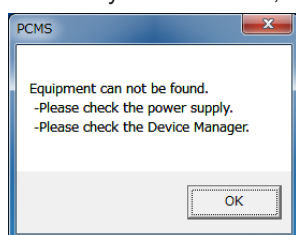


Communication Interface Setting

- **GPIB connection:** GPIB address
- **Ethernet connection:** IP address
- **USB connection:** Serial number (instrument number) of the WT

Select the communication interface setting of the power analyzer you want to use, and click Connect. A connection will be established with the analyzer.

- If no analyzers are found, the following dialog box appears.

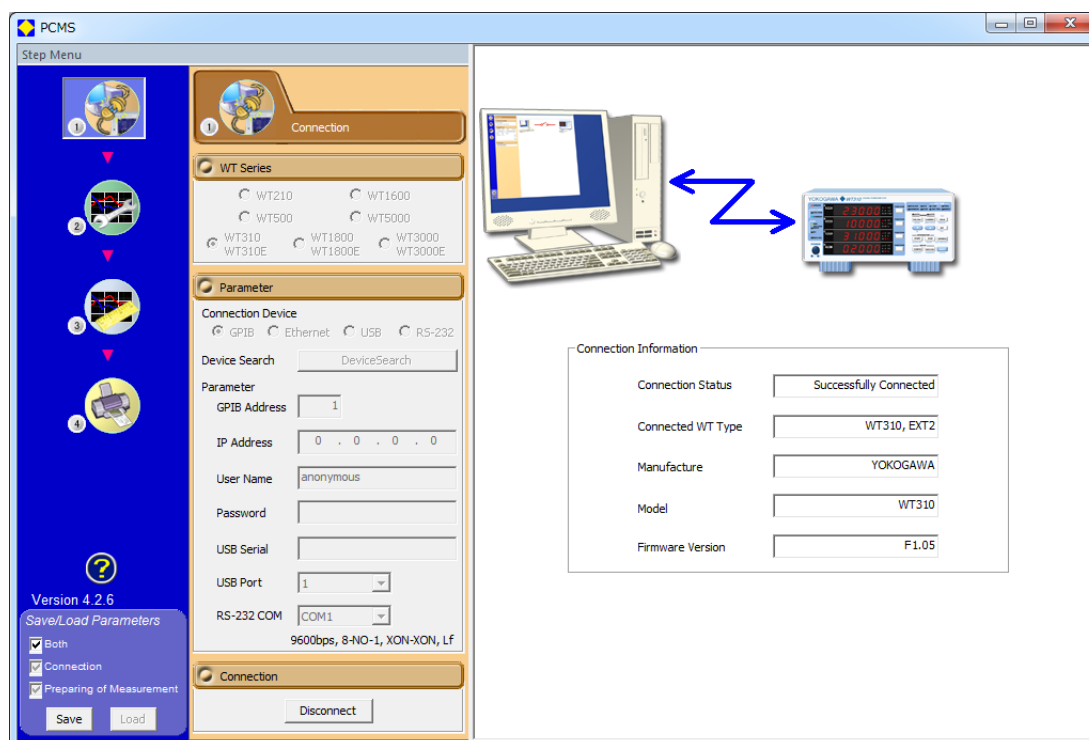


- 5 Set the connection parameters of the communication interface.
What appears varies depending on what is selected for items 2 and 3.
- 6 Click "Connect" to establish a connection between the PC and the WT.

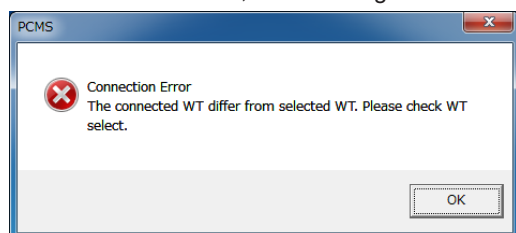
Note

- The configuration and measurement operations described later in this manual can be performed once the software has automatically determined that communication is possible.
The power analyzer settings are changed so that they can be used with this application software. We recommend that you save the settings before you start the application software.
- An error message will appear if you attempt to connect to an unsupported model.

- 7 If the connection is established successfully, the power analyzer's information is displayed on the Connection Information screen.

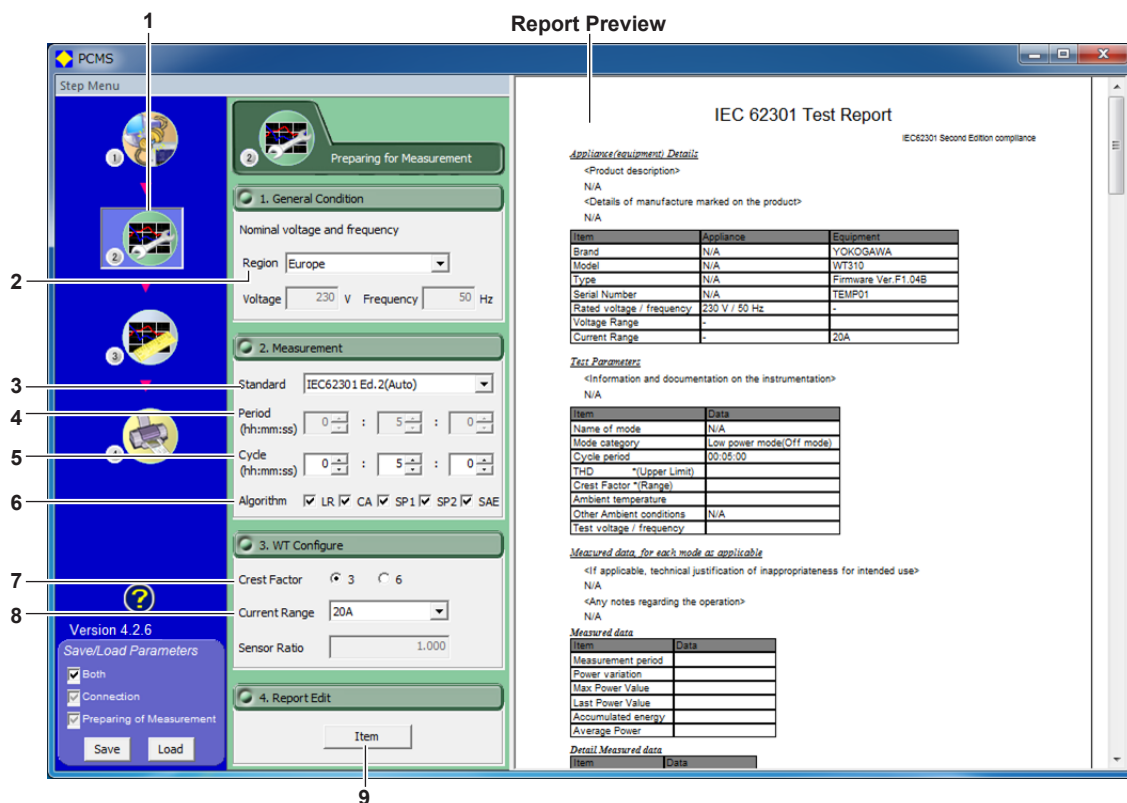


If the connection fails, the following Connection Error dialog box will appear.



Settings

Set the rated voltage, frequency, and measurement mode. Enter appliance details.



1 Select Preparing for Measurement display.

2 Select the region.

Options

- Europe, NorthAmerica, Japan (East), Japan (West), China, Australia and NewZealand, and Custom
- When you select Custom, you can set the voltage and frequency

3 Set the standard.

Options

- IEC62301 Ed. 1
The software stops measuring when the measurement period (Period) elapses. Stability judgment is not performed.
- IEC62301 Ed. 2 (Auto)
Using the algorithm defined in IEC62301, the software performs stability judgments every 10 seconds and stops measuring when stability is reached. If stability is not reached in three hours, the software stops measuring at that point.
- IEC62301 Ed. 2 (Manual)
The software stops measuring when the measurement period (Period) or "cycle period × 10," whichever is shorter, elapses. Stability judgment is not performed.
- EN50564: 2011 (Domestic appliance)
The same as IEC62301 Ed.2 (Auto).
- EN50564: 2011 (Other)
The same as IEC62301 Ed.2 (Auto). However, the measurement data time that is excluded by the SP2 and SAE algorithms is different.
- JIS C62301 (Auto)
The same as IEC62301 Ed.2 (Auto).
You can select this when Region is set to "Japan(East)," "Japan(West)," or "Custom."
- JIS C62301(Manual)
The same as IEC62301 Ed.2 (Manual).
You can select this when Region is set to "Japan(East)," "Japan(West)," or "Custom."

-
- 4 Set the measurement time.

When the standard is IEC62301 Ed. 1

Until the measurement period elapses, the software measures data that corresponds to the measurement modes (Stable and Unstable) defined in IEC62301.

The data for each measurement mode is included in the report.

You can set the measurement period to a value between 00:05:00 and 50:59:59.

Regardless of the measurement data, the software measures the data for the Stable and Unstable measurement modes.

- **Stable**

This mode measures the data that is used to judge whether the DUT meets the stable condition.*The measured result is included in the report next to "Power variation."

- **Unstable**

This mode is for measuring the DUT under unstable conditions.

The measured result—the average power—is determined from the accumulated energy during measurement and is included in the report next to "Accumulated energy."

- * **Stable status condition**

A variation of less than 5% (from the maximum value observed) in the measured power over 5 minute.

When the standard is IEC62301 Ed. 2 (Manual)

The software compares the measurement period with "cycle period × 10," and stops measuring when the shorter of the two elapses.

You can set the measurement period to a value between 00:05:00 and 50:59:59.

- 5 Set the cycle period.

When the standard is IEC62301 Ed. 2 (Auto), EN50564: 2011 (Domestic appliance), EN50564: 2011 (Other), or JIS C62301 (Auto)

Set the cycle period as one of the conditions that is used to judge stability.

You can set the cycle period to a value between 00:01:00 and 01:59:50 in 10 seconds steps.

When the standard is IEC62301 Ed. 2 (Manual), or JIS C62301 (Manual)

The software compares the measurement period with "cycle period × 10," and stops measuring when the shorter of the two elapses.

You can set the cycle period to a value between 00:01:00 and 01:59:50 in 10 seconds steps.

- 6 Select the algorithms to enable.

Specify which stability judgment algorithms to enable. When Standard is set to IEC62301 Ed. 2 (Auto), the software uses the enabled algorithms to perform the stability judgment once every 10 seconds. The software stops measuring when one algorithm returns a positive stability judgment result. If you disable all the algorithms, the software will not be able to start measuring.

LR (Linear Regression)

This algorithm is valid for a period of 15 to 180 minutes after measuring starts.

It performs the judgment by excluding the measured data from the first third of the period.

The algorithm calculates the linear regression that approximates the measured power data and judges the device to be stable when the slope is smaller than the value defined by the standard.

CA (Cumulative Average)

This algorithm is valid for a period from the point 60 minutes after measuring starts.

It performs the judgment by excluding the measured data from the first third of the period.

This algorithm calculates the cumulative averages of the measured power data and judges the device to be stable when their maximum and minimum values are within the range defined by the standard, which uses the arithmetic mean as its reference.

SP1 (Section Compare (Power) 1)

This algorithm is valid for a given period from the point "10 minutes + 2 x cycle time x N" after measuring starts. "Cycle time x N" must be longer than 10 minutes, where N is an integer larger than 2.

It performs the judgment by excluding the measured data from the first 10 minutes of the period.

This algorithm splits the valid period into two periods, and then calculates the arithmetic means of the measured powers in each period. It uses the arithmetic means to calculate the rate of change of the power. The algorithm judges the device to be stable when the rate of change is smaller than the value defined by the standard.

SP2 (Section Compare (Power) 2)

This algorithm is valid for a period of 50 to 90 minutes after measuring starts.

It performs the judgment by excluding the measured data from the first 30 minutes (10 minutes in the case of EN50564:2011 (Other)) of the period.

This algorithm splits the valid period into two periods, and then calculates the arithmetic means of the measured powers in each period. It uses the arithmetic means to calculate the rate of change of the power. The algorithm judges the device to be stable when the rate of change is smaller than the value defined by the standard.

SAE (Section Compare (Accumulated Energy))

This algorithm is valid for a period of 50 to 90 minutes after measuring starts.

It performs the judgment by excluding the measured data from the first 30 minutes (10 minutes in the case of EN50564:2011 (Other)) of the period.

This algorithm splits the valid period into two periods, and then uses the measured integrated powers at the center points in each period to calculate the rate of change of the power. The algorithm judges the device to be stable when the rate of change is smaller than the value defined by the standard.

7 Select the crest factor.

The options are 3 and 6.

The current range options will change depending on the selected crest factor.

8 Select the current range.

Select appropriate current range from the menu. Auto range can not be used.

9 Enter report comments.

Refers to next page.

Settings (Report)

Text Entry (IEC62301Ed.1)

The details that have been entered in the dialog box are included in the report as shown on the next page. You can select which items are included in the report. By removing unnecessary items, you can simplify the report (see page 12).

* Character codes other than ASCII are not supported.

The 'Report Edit' dialog box is divided into several sections for configuring the report content:

- Appliance details:** Includes fields for Brand (N/A), Type (N/A), Model (N/A), and Serial (N/A). It has checkboxes for 'Product description, as appropriate' and 'Details of manufacture marked on the product(if any)', both of which are checked and have associated text areas containing 'N/A'.
- Test Parameters:** Includes a field for 'Ambient temperature' (blank) with a 'degree' unit, and a checked checkbox for 'Information and documentation on the instrumentation' with a text area containing 'N/A'.
- Test and laboratory details:** Includes a field for 'Test Report No./reference' (N/A), and checked checkboxes for 'Laboratory name and address' and 'Test Officer', each with a text area containing 'N/A'.
- Measure data, for each mode as applicable:** Includes checked checkboxes for 'Detail Measured Data' and 'Description of how the appliance mode was selected or programmed', each with a text area containing 'N/A'. It also has a checked checkbox for 'Any notes regarding the operation of the appliance (equipment)' with a text area containing 'N/A'.
- Remarks column:** A checked checkbox with a large text area containing 'N/A'.

At the bottom of the dialog are 'OK' and 'Cancel' buttons.

You can use the Report Preview to view the information that you have entered. See the next page for the format that this information is displayed in.

IEC 62301 Test Report

IEC62301 First Edition compliance

Appliance(equipment) Details

<Product description>

This is "Product..."

<Details of manufacture marked on the product>

This is "Details..."

| Item | Appliance | Equipment |
|---------------------------|------------------|------------------------|
| Brand | Appliance Brand | YOKOGAWA |
| Model | Appliance Model | WT1806-60 |
| Type | Appliance Type | Firmware Ver.F2.00-X07 |
| Serial Number | Appliance Serial | 91KC22206 |
| Rated voltage / frequency | 100 V / 50 Hz | - |
| Voltage Range | - | 100V |
| Current Range | - | 100mA |

Test Parameters

<Information and documentation on the instrumentation>

This is "Information..."

| Item | Data |
|--------------------------|-----------------------------|
| THD *(Upper Limit) | 1.960 % (2.000 %) |
| Crest Factor *(Range) | 1.390 - 1.410 (1.34 - 1.49) |
| Ambient temperature | 23.3 degree |
| Test voltage / frequency | 103.900 V / 49.970 Hz |

Measured data, for each mode as applicable

<Description of how the appliance mode>

This is "Description..."

<Any notes regarding the operation>

This is "Any notes..."

Stable Measurement period (00 :05 :00)

| Item | Data |
|--------------------------------|-------------------|
| Power variation *(Upper Limit) | 7.692 % (5.000 %) |
| Max Power Value | 2.470 W |
| Last Power Value | 2.370 W |

Unstable load Measurement period (00 :05 :00)

| Item | Data |
|--------------------|----------|
| Accumulated energy | 0.198 Wh |
| Average Power | 2.374 W |

Detail Measured data

| Item | Data |
|-------------------|----------|
| Apparent Power | 4.740 VA |
| Real Power Factor | 0.501 |

Test and laboratory details

<Laboratory name and address>

This is "Laboratory..."

<Test officer(s)>

This is "Test Officer"

| Item | Data |
|---------------------------|----------------------|
| Test report No./reference | This is "..." |
| Date of test | 12 / 12 / 2011 13:00 |

Remarks column

This is "Remarks column"

Selecting Which Items Are Included in the Report (IEC62301Ed.1)

By selecting and clearing the check boxes in the dialog box, you can specify which items are displayed in the report. An example of a report that is generated when all check boxes are cleared is shown below.

IEC 62301 Test Report

IEC62301 First Edition compliance

Appliance(equipment) Details

| Item | Appliance | Equipment |
|---------------------------|------------------|------------------------|
| Brand | Appliance Brand | YOKOGAWA |
| Model | Appliance Model | WT1806-60 |
| Type | Appliance Type | Firmware Ver.F2.00-X07 |
| Serial Number | Appliance Serial | 91KC22206 |
| Rated voltage / frequency | 100 V / 50 Hz | - |
| Voltage Range | - | 100V |
| Current Range | - | 100mA |

Test Parameters

| Item | Data |
|--------------------------|-----------------------------|
| THD *(Upper Limit) | 1.960 % (2.000 %) |
| Crest Factor *(Range) | 1.390 - 1.410 (1.34 - 1.49) |
| Ambient temperature | 23.3 degree |
| Test voltage / frequency | 103.900 V / 49.970 Hz |

Measured data, for each mode as applicable

Stable Measurement *period (00 :05 :00)*

| Item | Data |
|--------------------------------|-------------------|
| Power variation *(Upper Limit) | 7.692 % (5.000 %) |
| Max Power Value | 2.470 W |
| Last Power Value | 2.370 W |

Unstable load Measurement *period (00 :05 :00)*

| Item | Data |
|--------------------|----------|
| Accumulated energy | 0.198 Wh |
| Average Power | 2.374 W |

Test and laboratory details

| Item | Data |
|---------------------------|----------------------|
| Test report No./reference | This is "..." |
| Date of test | 12 / 12 / 2011 13:00 |

Text Entry (IEC62301Ed2)

The details that have been entered in the dialog box are included in the report as shown on the next page. You can select which items are included in the report. By removing unnecessary items, you can simplify the report (see page 15).

* Character codes other than ASCII are not supported.

The 'Report Edit' dialog box is divided into several sections for configuring the report content:

- Appliance details:** Includes fields for Brand (N/A), Type (N/A), Model (N/A), and Serial (N/A). It also has checkboxes for 'Product description, as appropriate' and 'Details of manufacture marked on the product(if any)', both of which are checked and have associated text areas containing 'N/A'. At the bottom of this section are fields for 'Name of mode' (N/A) and 'Mode category' (Low power mode(Off mode)).
- Test Parameters:** Includes a field for 'Ambient temperature' and a 'degree' unit. It has checkboxes for 'Other Ambient Information' and 'Information and documentation on the instrumentation', both checked, with associated text areas containing 'N/A'.
- Test and laboratory details:** Includes a field for 'Test Report No./reference' (N/A). It has checkboxes for 'Applicant name and address', 'Laboratory name and address', 'Test Officer', and 'Approver', all of which are checked. Each checked item has an associated text area containing 'N/A'.
- Measure data, for each mode as applicable:** Includes checkboxes for 'Detail Measured Data' and 'If applicable, technical justification of inappropriateness for intended use', both checked, with associated text areas containing 'N/A'. It also has a checkbox for 'Any notes regarding the operation of the appliance (equipment)', which is checked, with an associated text area containing 'N/A'.
- Remarks column:** Includes a checkbox for 'Remarks column', which is checked, with an associated text area containing 'N/A'.

At the bottom of the dialog are 'OK' and 'Cancel' buttons.

You can use the Report Preview to view the information that you have entered. See the next page for the format that this information is displayed in.

IEC 62301 Test Report

IEC62301 Second Edition compliance

Appliance(equipment) Details

<Product description>
This is "Product..."
<Details of manufacture marked on the product>
This is "Details..."

| Item | Appliance | Equipment |
|---------------------------|------------------|------------------------|
| Brand | Appliance Brand | YOKOGAWA |
| Model | Appliance Model | WT1806-60 |
| Type | Appliance Type | Firmware Ver.F2.00-X07 |
| Serial Number | Appliance Serial | 91KC22206 |
| Rated voltage / frequency | 100 V / 50 Hz | - |
| Voltage Range | - | 100V |
| Current Range | - | 100mA |

Test Parameters

<Information and documentation on the instrumentation>
This is "Information..."

| Item | Data |
|--------------------------|-----------------------------|
| Name of mode | N/A |
| Mode category | Low power mode(Off mode) |
| Cycle period | 00:05:00 |
| THD *(Upper Limit) | 1.960 % (2.000 %) |
| Crest Factor *(Range) | 1.390 - 1.410 (1.34 - 1.49) |
| Ambient temperature | 23.3 degree |
| Other Ambient conditions | N/A |
| Test voltage / frequency | 103.900 V / 49.970 Hz |

Measured data, for each mode as applicable

<If applicable, technical justification of inappropriateness for intended use>
N/A
<Any notes regarding the operation>
This is "Any notes..."

Measured data

| Item | Data |
|--------------------------------|---------------------------|
| Measurement period | 00:05:00 (Measure Period) |
| Power variation *(Upper Limit) | 7.692 % (5.000 %) |
| Max Power Value | 2.470 W |
| Last Power Value | 2.370 W |
| Accumulated energy | 0.198 Wh |
| Average Power | 2.374 W |

Detail Measured data

| Item | Data |
|-------------------|----------|
| Apparent Power | 4.740 VA |
| Real Power Factor | 0.501 |

Test and laboratory details

<Applicant name and address>
N/A
<Laboratory name and address>
This is "Laboratory..."
<Test officer(s)>
This is "Test Officer"
<Approver>
N/A

| Item | Data |
|---------------------------|----------------------|
| Test report No./reference | This is "..." |
| Date of test | 12 / 12 / 2011 13:00 |

Remarks column

This is "Remarks column"

Selecting Which Items Are Included in the Report (IEC62301Ed.2)

By selecting and clearing the check boxes in the dialog box, you can specify which items are displayed in the report. An example of a report that is generated when all check boxes are cleared is shown below.

IEC 62301 Test Report

IEC62301 Second Edition compliance

Appliance(equipment) Details

| Item | Appliance | Equipment |
|---------------------------|------------------|------------------------|
| Brand | Appliance Brand | YOKOGAWA |
| Model | Appliance Model | WT1806-60 |
| Type | Appliance Type | Firmware Ver.F2.00-X07 |
| Serial Number | Appliance Serial | 91KC22206 |
| Rated voltage / frequency | 100 V / 50 Hz | - |
| Voltage Range | - | 100V |
| Current Range | - | 100mA |

Test Parameters

| Item | Data |
|--------------------------|-----------------------------|
| Name of mode | N/A |
| Mode category | Low power mode(Off mode) |
| Cycle period | 00:05:00 |
| THD *(Upper Limit) | 1.960 % (2.000 %) |
| Crest Factor *(Range) | 1.390 - 1.410 (1.34 - 1.49) |
| Ambient temperature | 23.3 degree |
| Test voltage / frequency | 103.900 V / 49.970 Hz |

Measured data, for each mode as applicable

Measured data

| Item | Data |
|--------------------------------|---------------------------|
| Measurement period | 00:05:00 (Measure Period) |
| Power variation *(Upper Limit) | 7.692 % (5.000 %) |
| Max Power Value | 2.470 W |
| Last Power Value | 2.370 W |
| Accumulated energy | 0.198 Wh |
| Average Power | 2.374 W |

Test and laboratory details

| Item | Data |
|---------------------------|----------------------|
| Test report No./reference | This is "..." |
| Date of test | 12 / 12 / 2011 13:00 |

Selecting Which Items Are Included in the Report (EN50564: 2011 or JIS C62301)

The standard name for EN50564:2011 (Domestic Appliance) and EN50564:2011(Other) reports is "EN 50564:2011 Compliance," but for all other items, they are the same as those of IEC62301 Ed.2 reports.

The standard name for JIS C62301 (Auto) and JIS C62301 (Manual) reports is "JIS C62301 Compliance," but for all other items, they are the same as those of IEC62301 Ed.2 reports.

EN 50564 Test Report

EN 50564:2011 compliance

Appliance(equipment) Details

<Product description>

This is "Product..."

<Details of manufacture marked on the product>

This is "Details..."

| Item | Appliance | Equipment |
|---------------------------|---------------|--------------------|
| Brand | N/A | YOKOGAWA |
| Model | N/A | WT310E |
| Type | N/A | Firmware Ver.F0.71 |
| Serial Number | N/A | C2NL02065V |
| Rated voltage / frequency | 230 V / 50 Hz | - |
| Voltage Range | - | 300V |
| Current Range | - | 2V |

Test Parameters

<Information and documentation on the instrumentation>

This is "Information..."

| Item | Data |
|--------------------------|-----------------------------|
| Name of mode | N/A |
| Mode category | Low power mode(Off mode) |
| Cycle period | 00:05:00 |
| THD *(Upper Limit) | 0.000 % (2.000 %) |
| Crest Factor *(Range) | 1.441 - 1.460 (1.34 - 1.49) |
| Ambient temperature | |
| Other Ambient conditions | N/A |
| Test voltage / frequency | 4.990 V / 0.000 Hz |

Measured data, for each mode as applicable

<If applicable, technical justification of inappropriateness for intended use>

N/A

<Any notes regarding the operation>

This is "Any notes..."

Measured data

| Item | Data |
|--------------------|----------------------|
| Measurement period | 00:10:00 (LR Stable) |
| Power variation | 0.600 % |
| Max Power Value | 5000.000 W |
| Last Power Value | 4970.000 W |
| Accumulated energy | 829.790 Wh |
| Average Power | 4978.740 W |

Detail Measured data

| Item | Data |
|-------------------|--------------|
| Apparent Power | 13400.000 VA |
| Real Power Factor | 0.371 |

Test and laboratory details

<Applicant name and address>

N/A

<Laboratory name and address>

N/A

<Test officer(s)>

This is "Test Officer"

<Approver>

N/A

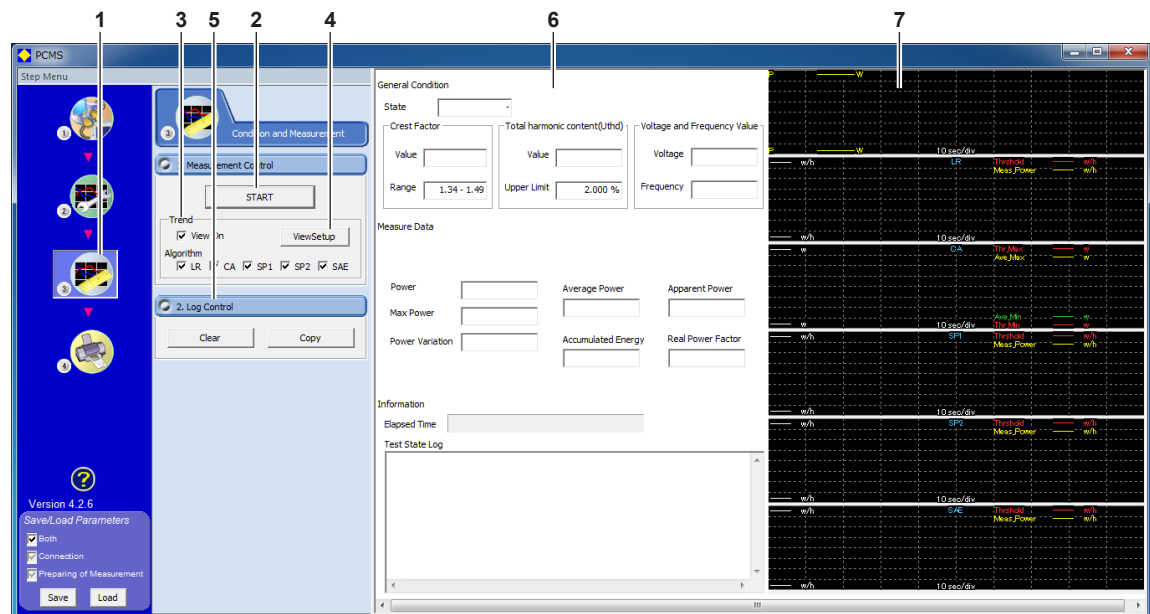
| Item | Data |
|---------------------------|----------------------|
| Test report No./reference | N/A |
| Date of test | 10 / 09 / 2015 11:32 |

Remarks column

This is "Remarks column"

Measurement

Starting test for power measurement. The software will stop testing automatically once the specified measurement time has been reached.



1 Select Condition and Measurement display.

2 Start the measurement

Click Start to start measuring (the button will change from "Start" to "Stop").

The software automatically stops measuring when the specified measurement stop conditions are met. The button will change back to "Start."

- To stop measuring before the measurement stop conditions are met, click Stop. In this situation, the measured data that was available when measuring was stopped is displayed on the screen and is applied to the report.
- The date used in the report corresponds to the time when Start was clicked.

3 Trend graph display (when Standard is set to IEC62301 Ed.2 (Auto), EN50564:2011 (Domestic appliance), EN50564:2011 (Other), or JIS C62301 (Auto))

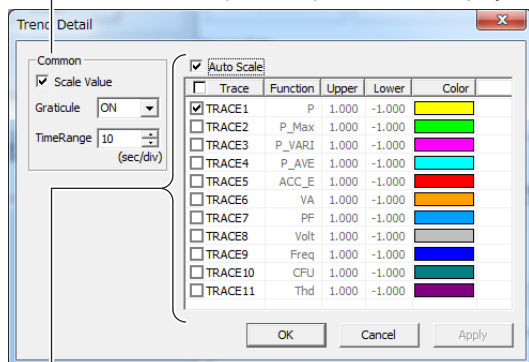
Under Trend, selecting the ViewOn and Algorithm(LR to SAE) check boxes displays a trend graph on the right side of the Condition and Measurement display.

4 Trend graph settings

Click ViewSetup to display a Trend Detail dialog box.

Settings under Common apply to the entire trend graph.

- 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 a graticule in the trend display area.
- TimeRange
Set the X-axis (time axis) in the trend display area.



Settings outside the Common area apply to the trend graph of the measured data.

- Auto Scale
When selected, the scale values change automatically.
When not selected, you can set the upper and lower limits in the Upper and Lower columns for each channel.
- Trace
Select the trend to display.
- Function
Displays the function that can be shown as a trend
- Upper
Set the upper limit of the graph' s Y-axis display range.
You can change this value only when Auto Scale is not selected.
- Lower
Set the lower limit of the graph' s Y-axis display range.
You can change this value only when Auto Scale is not selected.
- Color
Select the trend graph color.

5 Log Control function

You can clear or copy the log displayed in the Test State Log area of the data display screen.

The copied data can be pasted using Ctrl+V or the Windows standard paste function.

6 The measured data and testing conditions are displayed.

General Conditions

| General Condition | | |
|--|--|--------------------------------|
| State <input type="text"/> | | |
| Crest Factor | Total harmonic content(Uthd) | Voltage and Frequency Value |
| Value <input type="text"/> | Value <input type="text"/> | Voltage <input type="text"/> |
| Range <input type="text"/> 1.34 - 1.49 | Upper Limit <input type="text"/> 2.000 % | Frequency <input type="text"/> |

- State
When the CF or THD is outside the corresponding range defined in the standard*, "Out of Range" is displayed.
In addition, an entry is recorded in the test state log when a value goes outside of its range.
- CF
The measured crest factor (Value) and the range defined in the standard* (Range) are displayed here.
- Total harmonic content(Uthd)
The measured THD (Value) and the upper limit of the range defined in the standard* (Upper limit) are displayed here.
- Voltage and Frequency Value
The measured voltage and frequency are displayed here.

*: IEC62301, EN50564, or JIS C62301 set for Standard in step 3 of page 7.

Measurement Data (When Standard is set to IEC62301 Ed. 1)

Measure Data

State

| Stable | | Unstable | | Detail Data | |
|-----------------|---------|--------------------|----------|-------------------|----------|
| Power | 2.280 W | Average Power | 2.279 W | Apparent Power | 4.610 VA |
| Max Power | 2.300 W | Accumulated Energy | 0.190 Wh | Real Power Factor | 0.495 |
| Power Variation | 2.174 % | | | | |
| Upper Limit | 5.000 % | | | | |

- **State**
If the variation (from the maximum value observed) in the measured power is within the range specified by the standard^{*1}, "Stable" is displayed here. If the variation is outside of this range, "Unstable" is displayed here.
- **Stable**
The measured power (Power), maximum power (Max. power), and power variation^{*2} (Power variation) as well as the upper limit defined by the standard^{*1} (Upper limit) are displayed here. The measured data is updated regardless of the state.
- **Unstable**
The accumulated energy is displayed here in units of watts (Average power) and watt hours (Accumulated energy).

^{*1}: IEC62301, EN50564, or JIS C62301 set for Standard in step 3 of page 7.

Measurement Data (When Standard is set to IEC62301 Ed.2 (Auto), EN50564:2011 (Domestic appliance), EN50564:2011 (Other), or JIS C62301 (Auto))

Measure Data

| | | | | | |
|-----------------|----------------------|--------------------|----------------------|-------------------|----------------------|
| Power | <input type="text"/> | Average Power | <input type="text"/> | Apparent Power | <input type="text"/> |
| Max Power | <input type="text"/> | | | | |
| Power Variation | <input type="text"/> | Accumulated Energy | <input type="text"/> | Real Power Factor | <input type="text"/> |

The measured power, max power, power variation^{*2}, and accumulated energy are displayed.

^{*2}: $\text{Power Variation (\%)} = (\text{Max power} - \text{Min power}) / \text{Max power} \times 100$

The accumulated energy is displayed in units of watts (W) and watt hours (Wh).
For reference, the apparent power and real power factor are also displayed.

Information

Information

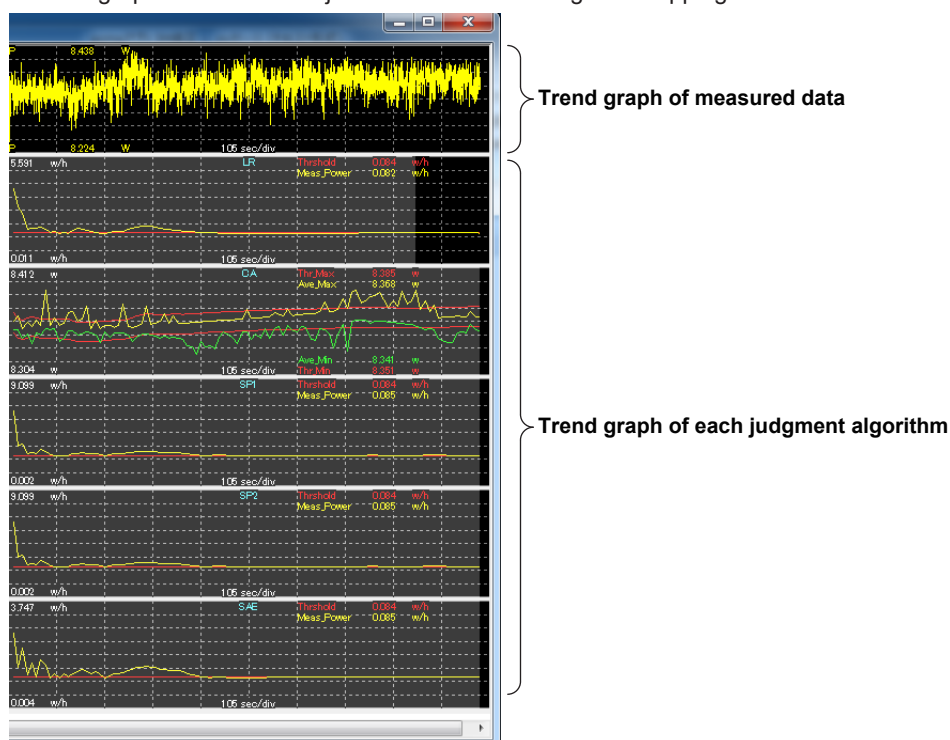
Elapsed Time / 00:05:00

Test State Log

- **Elapsed Time**
The elapsed measurement period is displayed here.
- **Test State log**
A log of error messages and other information is displayed here.

- 7 Trend graph display (when Standard is set to IEC62301 Ed.2 (Auto), EN50564:2011 (Domestic appliance), EN50564:2011 (Other), or JIS C62301 (Auto))

A trend graph is drawn in conjunction with the starting and stopping of a measurement.



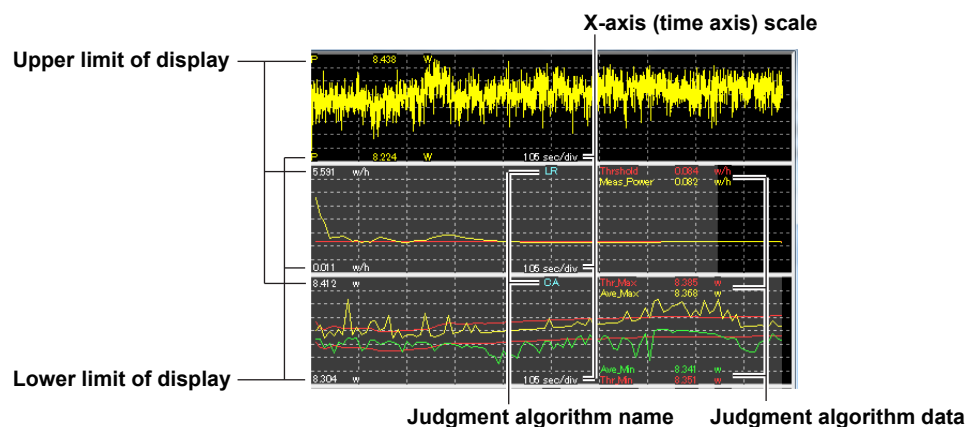
Trend graphs that can be displayed

- Trend graph of measured data
- Trend graph of the measured data and judgment data of the stability judgment algorithm (LR, CA, SP1, SP2, SAE)

Graph update timing

- Trend graph of measured data
Updated in sync with the updating of the displayed numeric data
- Trend graph of the measured data and judgment data of the stability judgment algorithm
Updated once every 10 seconds

Displayed Items



- Displayed items common to all graphs
 - X-axis (time axis) scale
 - Upper and lower limits of the display range
- Items displayed on the stability judgment algorithm trend graph
 - Judgment algorithm name
 - Nearest measured data and judgment data used by the stability judgment algorithm

Stability Judgment Algorithm Graph

The LR, SP1, SP2, and SAE graphs display the following trends. Display colors are indicated in parentheses.

- Threshold: Judgment data (red)
- Meas_Power: Measured data (yellow)

* The DUT is stable when the measured data is less than the judgment data.

The CA graph displays the following trend. Display colors are indicated in parentheses.

- Thr_Max: Judgment data's maximum value (red)
- Thr_Min: Judgment data's minimum value (red)
- Ave_Max: Measured data's maximum value (yellow)
- Ave_Min: Measured data's minimum value (green)

* When the measured data's maximum and minimum values are within the judgment data's maximum and minimum values, the DUT is stable.

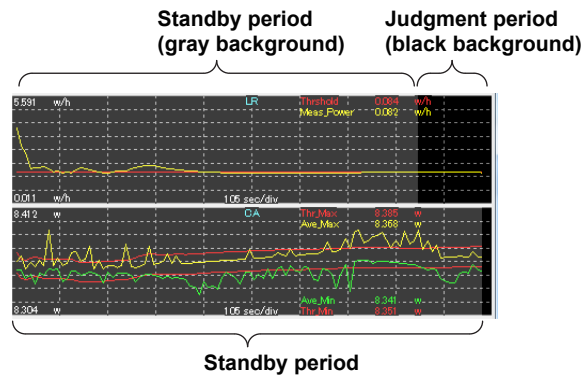
Background Color of the Stability Judgment Algorithm Trend Graph

Stability judgment algorithms have standby periods before judgment periods.

(See item 6 of the setup screen on page 8.)

The background color of the trend graph is gray during the standby period.

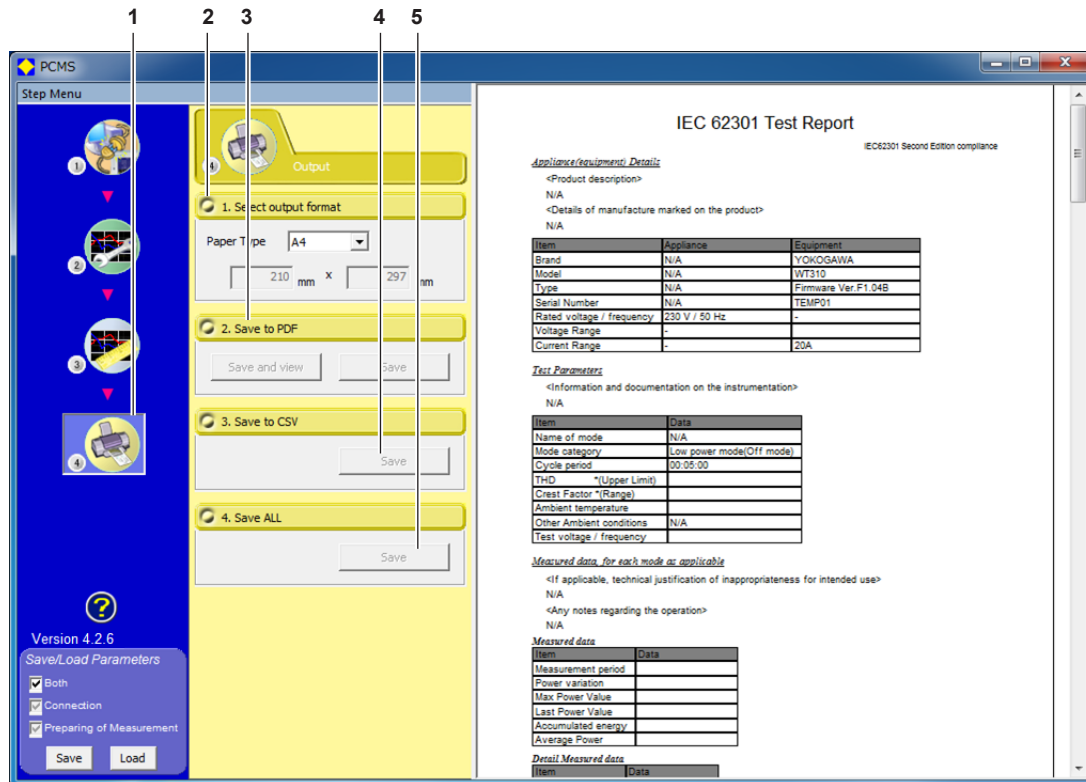
The background color is black during the judgment period (after the standby period).



How the graph is displayed when the trend graph reaches the right edge of the display

The software continues drawing the graph by extending the time axis by the TimeRange amount.

Printing



- 1 Select Print display.
- 2 Select the paper size
Support size
 - A4
 - Letter
- 3 Generate a PDF file.
 - Save and View
Clicking this button displays a dialog box that you can use to specify the name of the file to save and the destination that you want to save it in. The saved PDF file is then opened.
 - Save
Clicking this button displays a dialog box that you can use to specify the name of the file to save and the destination that you want to save it in. The saved PDF file is not opened.
- 4 Execute the CSV output.
 - Save
Click this button to display a dialog box for specifying the file name and save destination.
The .CSV file contains measurement data. For details about the data format, see the next page.
- 5 Generate all related files.
 - Save
Click this button to display a dialog box for specifying the folder to save to. The setup file (PCMS_setting.lot6), PDF (PCMS_report.pdf), and CSV file (PCMS_meas.csv) will be saved to the specified folder.

Note

- PDF file may differ slightly from screen shot image.
- You need a PDF reader to view the PDF file that you have saved.
- This software uses the libHaru library to create PDF files.
<http://libharu.sourceforge.net/>
We would like to express our gratitude to the authors of the libHaru library.

CSV Data Format

The following information is output.

Information Section

| | |
|-----------------|--|
| Model: | Power analyzer model name |
| Serial Number | |
| Version: | The firmware version |
| Start Time: | Measurement start time (year, month, day, hour, minute, second) |
| Voltage Range | |
| Current Range | |
| Crest Factor: | 3 or 6 |
| Update Rate | |
| Standard: | Compliant standard |
| Period Time: | Measurement time; second; output when Standard is set to "IEC62301 Ed.1," "IEC62301 Ed.2 (Manual)," or "JIS C62301 (Manual)" |
| Cycle Time: | Second; output when Standard is set to "IEC62301 Ed.2 (Auto)," "IEC62301 Ed.2 (Manual)," "EN50564:2011 (Domestic appliance)," "EN50564:2011(Other)," "JIS C62301 (Auto)," or "JIS C62301 (Manual)" |
| Algorithm: | Enabled algorithms (output when Standard is set to "IEC62301 Ed.2 (Auto)," "EN50564:2011 (Domestic appliance)," "EN50564:2011 (Other)," or "JIS C62301 (Auto)") |
| Stop Factor: | Measurement stop conditions |
| Measure Period: | Measurement stopped because the specified measurement time elapsed. |
| Time Limit: | When Standard was set to "IEC62301 Ed.2 (Auto)," "EN50564:2011 (Domestic appliance)," "EN50564:2011 (Other)," or "JIS C62301 (Auto)," measurement stopped because 3 hours of measurement time elapsed. |
| User Stop: | Measurement stopped because the user pressed STOP. |
| LR Stable: | Measurement stopped because stability was confirmed through the use of the LR algorithm. |
| CA Stable: | Measurement stopped because stability was confirmed through the use of the CA algorithm. |
| SP1 Stable: | Measurement stopped because stability was confirmed through the use of the SP1 algorithm. |
| SP2 Stable: | Measurement stopped because stability was confirmed through the use of the SP2 algorithm. |
| SAE Stable: | Measurement stopped because stability was confirmed through the use of the SAE algorithm. |
| COMM Error: | Measurement stopped because a communication error occurred during measurement. |
| DATA Error: | Measurement stopped because a data acquisition error occurred during measurement. |
| RANGE Error: | Measurement stopped because the voltage range setting or current range setting was too small. |
| Valid Period: | The start time—the number of seconds that have elapsed from the start of measurement—and end time—the number of seconds that have elapsed from the start of measurement—of the valid period |

Data Section

| | |
|------------------------|---|
| Time: | The number of seconds that have elapsed from the start of measurement |
| Test Voltage(V) | |
| Test Frequency(Hz) | |
| THD: | Total harmonic distortion |
| Crest Factor U: | Voltage crest factor |
| Crest Factor I: | Current crest factor |
| Power(W): | Active power |
| Accumulated Energy(Wh) | |
| Real Power Factor | |
| Apparent Power(VA) | |

If measurement is performed with Standard set to “IEC62301 Ed.2 (Auto),” “EN50564:2011 (Domestic appliance),” “EN50564:2011 (Other),” or “JIS C62301 (Auto),” the data displayed on the trend graph of the measurement is also output.

TrendCount: Draw count (judgment count)
 LR-MeasurePower: LR measurement value
 LR-Threshold: LR judgment value
 CA-AverageMaximum: CA measurement value (maximum)
 CA-AverageMinimum: CA measurement value (minimum)
 CA-ThresholdMaximum: CA judgment value (maximum)
 CA-ThresholdMinimum: CA judgment value (minimum)
 SP1-MeasurePower: SP1 measurement value
 SP1-Threshold: SP1 judgment value
 SP2-MeasurePower: SP2 measurement value
 SP2-Threshold: SP2 judgment value
 SAE-MeasurePower: SAE measurement value
 SAE-Threshold: SAE judgment value

Note

The data is separated by commas.

Output Example (Displayed in Excel)

Information Section

| 20120106_1009_MeasData.xls | | | | | | | | | | |
|----------------------------|------------------|--------------------|--------------------|-----|----------------|----------------|----------|--------------------|-------------------|--------------------|
| | A | B | C | D | E | F | G | H | I | J |
| 1 | **[INFO_BEGIN]** | | | | | | | | | |
| 2 | Model | WT1806-06 | | | | | | | | |
| 3 | Serial Number | 91 KC22198 | | | | | | | | |
| 4 | Version | F2.01 | | | | | | | | |
| 5 | Start Time | 2012 | 1 | 6 | 10 | 9 | 38 | | | |
| 6 | Voltage Range | 100 V | | | | | | | | |
| 7 | Current Range | 10 mA | | | | | | | | |
| 8 | Crest Factor | 3 | | | | | | | | |
| 9 | Update Rate | 200 MS | | | | | | | | |
| 10 | Standard | IEC62301 Ed2(Auto) | | | | | | | | |
| 11 | Cycle Time | 300 | | | | | | | | |
| 12 | Algorithm | LR | CA | SP1 | SP2 | SAE | | | | |
| 13 | Stop Factor | User Stop | | | | | | | | |
| 14 | Valid Period | 0 | 27.8 | | | | | | | |
| 15 | **[INFO_END]** | | | | | | | | | |
| 16 | **[DATA_BEGIN]** | | | | | | | | | |
| 17 | Time | Test Voltage(V) | Test Frequency(Hz) | THD | Crest Factor U | Crest Factor I | Power(W) | Accumulated Energy | Real Power Factor | Apparent Power(VA) |
| 18 | 1 | 100.28 | 50.037 | 0 | 1.407 | 7.545 | 0 | 0.000001 | 0.004 | 1 |
| 19 | 1.2 | 100.25 | 50.033 | 0 | 1.407 | 6.048 | 0 | 0.000001 | 0.0048 | 1 |
| 20 | 1.4 | 100.3 | 50.034 | 0 | 1.407 | 6.741 | 0 | 0.000001 | 0.0038 | 1.01 |
| 21 | 1.6 | 100.23 | 50.032 | 0 | 1.407 | 7.25 | 0 | 0.000002 | 0.0041 | 1 |
| 22 | 1.8 | 100.28 | 50.036 | 0 | 1.406 | 7.987 | 0 | 0.000002 | 0 | 1 |
| 23 | 2 | 100.26 | 50.034 | 0 | 1.407 | 7.542 | 0 | 0.000002 | -0.0006 | 1 |
| 24 | 2.2 | 100.28 | 50.036 | 0 | 1.407 | 6.444 | 0 | 0.000002 | -0.0003 | 1 |
| 25 | 2.4 | 100.37 | 50.035 | 0 | 1.407 | 6.712 | 0 | 0.000002 | 0.0013 | 1 |
| 26 | 2.6 | 100.3 | 50.032 | 0 | 1.407 | 6.989 | 0 | 0.000001 | -0.0024 | 1 |
| 27 | 2.8 | 100.26 | 50.036 | 0 | 1.406 | 7.335 | 0.01 | 0.000002 | 0.0062 | 1 |
| 28 | 3 | 100.22 | 50.034 | 0 | 1.406 | 6.818 | 0 | 0.000002 | 0.0038 | 1 |
| 29 | 3.2 | 100.25 | 50.036 | 0 | 1.406 | 6.52 | 0 | 0.000002 | 0.0021 | 1 |
| 30 | 3.4 | 100.34 | 50.034 | 0 | 1.407 | 6.926 | 0 | 0.000002 | 0.0006 | 1.01 |
| 31 | 3.6 | 100.3 | 50.034 | 0 | 1.406 | 9.247 | 0 | 0.000002 | -0.0019 | 1 |
| 32 | 3.8 | 100.36 | 50.034 | 0 | 1.406 | 7.435 | 0 | 0.000002 | 0.0014 | 1 |
| 33 | 4 | 100.31 | 50.033 | 0 | 1.407 | 7.19 | 0 | 0.000002 | -0.0022 | 1 |
| 34 | **[DATA_END]** | | | | | | | | | |
| 35 | | | | | | | | | | |

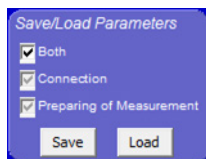
Data Section

Information
Section

Data
Section

Saving Setting

With this application, you can save setup information (such as the IP address) to a file. If you want to reuse the settings that you have configured, you can save and load them by using the Save/Load Parameter in the lower left of the screen.



Procedure

1. Select the Both check box, Connection check box, or Measurement Preparation check box
 - Select Connection to save or load the information on the connection screen.
 - Select Measurement Preparation to save or load the information that you have to configure on the setup screen before measurement (see "Settings" on page 7).
 - Select Both to save or load both of the above sets of information.
2. Click Save to save the settings. Click Load to load settings. In either case, a dialog box for specifying the file to save or load (the file extension is .lot6) will be displayed.

Note

If you cannot perform save and load operations.

- Saving is possible only when the software is connected to the power analyzer.
- Loading is not possible when the software is connected to the power analyzer.
- Saving or Loading is not possible while measuring.

Files to which settings have been saved

- Do not set the file as a read-only file. The application software cannot access read-only files.
- If a setup file is lost, you will no longer be able to load the settings that it contained. Be sure to back up all important settings.

Saving Settings Automatically

Different from the features described above, this application software has a feature for automatically saving settings. Settings are saved when you exit the application and are loaded when the application starts again.

Automatically Saved File

This software automatically saves the settings to a file named PCMS.lot6 in the C:\Users\<user name>\AppData\Roaming\YOKOGAWA\Power Consumption Measuring Software folder.

Note

Do not edit the PCMS.lot6 file directly. Doing so may cause the application software to malfunction. If you connect to a WT that is different than the one that you had previously connected to, the application software may not be able to load the current range

Help Feature



Click the help button in the lower left of the display to show the user's manual (this manual).