KIKUSUI

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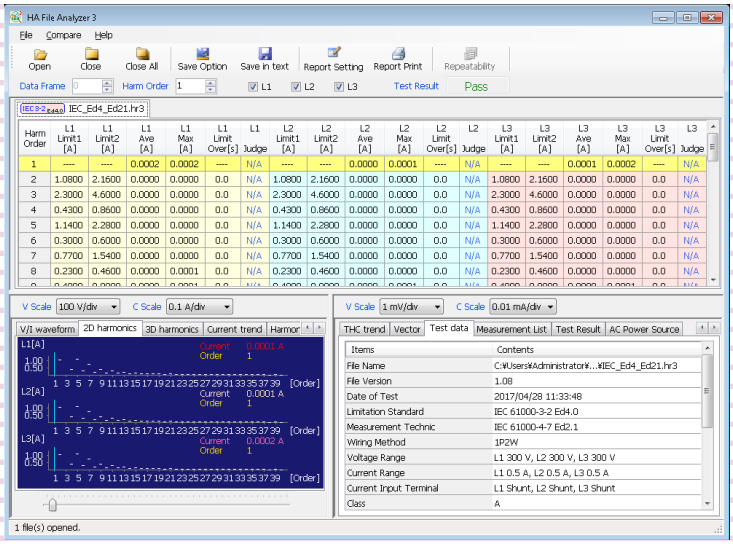
Operation Guide

Application Software

HA File Analyzer 3

Ver. 2.6x



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Introduction

This operation guide explains how to:

- Analyze the data of a test results file that is acquired during a harmonic current test using HarmoCapture3 or acquired with KHA3000, and
- Print reports of test result files.

■ Product versions that this guide covers

This operation guide applies to HA File Analyzer 3 with version 2.6x.

You can check the version from the help menu **HA File Analyzer 3**.

■ Who should read this operation guide?

The intended audience of this operation guide is anyone using the KHA3000 to control a harmonic current and voltage fluctuation test system or anyone teaching operators how to use such a system.

Explanations are given under the presumption that the reader has electrical knowledge related to harmonic current and voltage fluctuation tests.

■ Notations used in this guide

- In this guide, the KHA3000 Harmonic/Flicker Analyzer is also called “KHA3000.”
- In this guide, the LIN3020JF, LIN1020JF and LIN40MA-PCR-L Line impedance network are also called “Line impedance network.”
- In this guide, the PCR-WE series and PCR-WE2 series (including the PCR-WE2R, a model with a regeneration function) AC power supplies, in addition, the PCR-WEA series and PCR-WEA2 series (including the PCR-WEA2R, a model with a regeneration function) AC power supplies are also referred to as the “PCR-WE.”
- In this guide, the PCR-LE series and PCR-LE2 series AC power supplies are also referred to as the “PCR-LE.”
- In this guide, the PCR-LA series is also referred to as the “PCR-LA.”
- **In this guide, all the above AC power supply series may be referred to collectively as the “AC power supply.”**
- "Personal computer" and "PC" are generic terms for personal computers and workstations.
- The following symbols are used with the explanations in this guide.

⚠CAUTION	This symbol indicates a potentially hazardous situation. Ignoring the symbol may result in damage to the product or other property.
NOTE	Indicates information that you should know.

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What is HA File Analyzer 3?

HA File Analyzer 3 is application software that analyzes the data of a test results file (xxx.hr3) that is acquired during a harmonic current test using HarmoCapture3 or acquired with KHA3000. HA File Analyzer 3 operates without being connected to the KHA3000.

HA File Analyzer 3 can be used to:

- Load the harmonic current test results file acquired by the KHA3000 or HarmoCapture3.
- Display test results lists (pass/fail judgment.)
- Display graphs (V/I waveform, 2D harmonics, 3D harmonics, current trend, harmonics trend, THC trend, and vector.)
- Check AC power source.
- Check repeatability.
- Save test results files as text.
- Print reports (comments, test conditions, results lists, and various waveform graphs.)

Opening a Test Results File

Opening a Test Results File Acquired by HarmoCapture3

1. Click **Open** on the toolbar.
   The Open dialog box appears.
2. Select the file that you want to open.
   The test results file name extension for harmonic current tests is .hr3.

Opening a Test Results File Acquired by the KHA3000

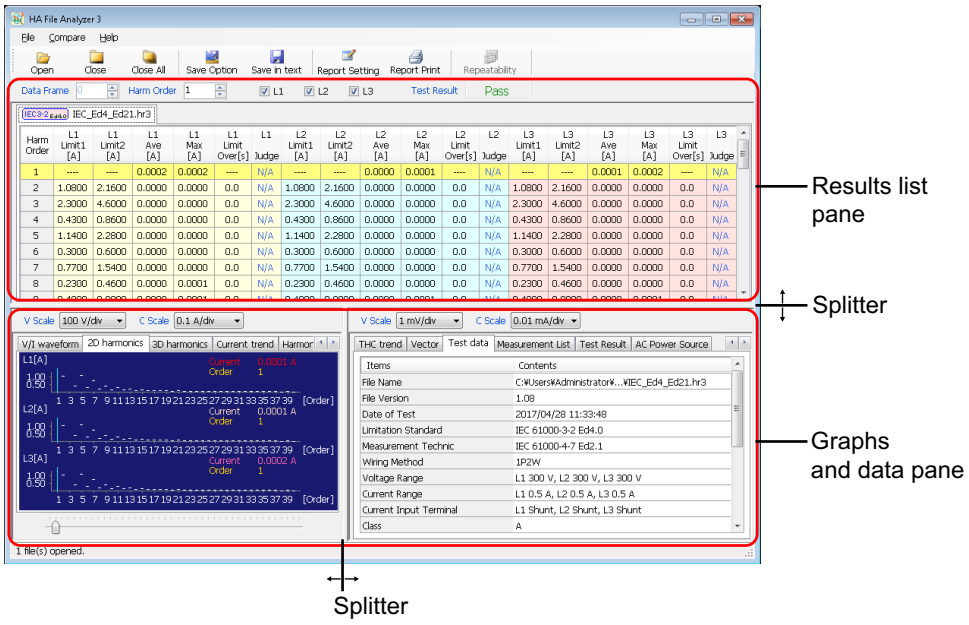
Follow the procedure below to load a test condition file that was acquired on the KHA3000 to the PC and open it with HA File Analyzer 3.

1. Remove the storage media (CompactFlash card or USB flash drive) that contains the test conditions from the KHA3000.
2. Connect the storage media to the PC.
3. Load the test condition file from the storage media to the PC.
4. Click **Open** on the toolbar.
   The Open dialog box appears.
5. Select the file that you want to open.
   The test results file name extension for harmonic current tests is .HR3.

Window Configuration

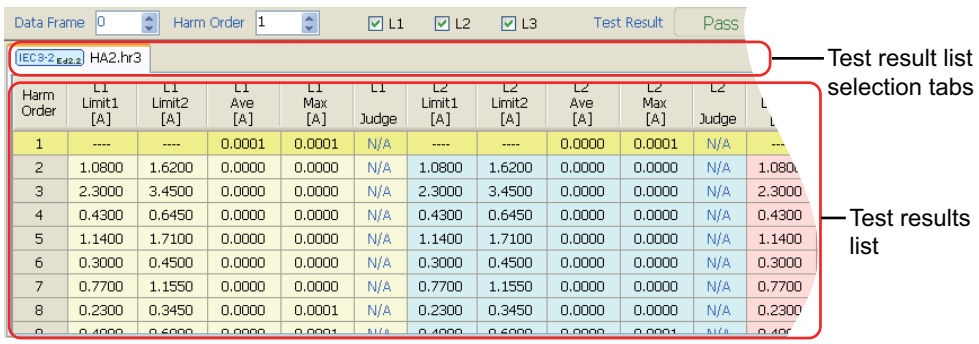
HA File Analyzer consists of the following upper and lower panes.

You can change a ratio of the results list pane and the graph and data pane by dragging the splitter.



Item	Description
Results List Pane See p. 6	Lists the test results file for the harmonic current test.
Graph and Data Pane See p. 9	Displays a graph of test results file for the harmonic current test.

Results List Pane



Item	Description
Data frame	The measurement time is divided equally so that the displayed data can be controlled. An individual division of the measurement time is referred to as a data frame. You can specify what data to display using data frame numbers. Time for data frame depends on the measuring time in the test conditions. As the time extends, the value increases (the setting resolution becomes rough), linking with the results list and graphs.
Harm order	The harmonic order is set. In the test results list, the specified order is distinguished by different colors.
L1, L2, L3	Specify the phase to display.
Test Result	The final judgment results for the selected test result file appear. The judgment results that appear are Pass (in green), Warn (in yellow), and Fail (in red).
Test result list selection tabs	When multiple test result files are open, use these tabs to select a file. The test standard is displayed in abbreviated form in the tabs.
Test results list	The displayed items vary depending on the standard that was used for the test. • IEC 61000-3-2 (Ed4.0, Ed3.0, Ed2.2), JIS C 61000-3-2 • IEC 61000-3-12

Time for data frame

Standards for measurement techniques	Measurement time		
	150 seconds or less	More than 150 seconds to 300 seconds	More than 300 seconds to 600 seconds
IEC 61000-4-7 Ed2.1 IEC 61000-4-7 Ed2.0	0.2 second	0.4 second	0.8 second
IEC 61000-4-7 Ed1.0	0.32 second (50 Hz) or 0.266 second (60 Hz)	0.64 second (50 Hz) or 0.532 second (60 Hz)	1.28 seconds (50 Hz) or 1.06 seconds (60 Hz)

Example: When the measurement time is set to 150 seconds in IEC 61000-4-7 Ed2.1 or IEC 61000-4-7 Ed2.0 standard, a data frame is set to 0 to 750 seconds. Five data frames per second is set.

Abbreviated standard display

Tab display	Standards for limits
IEC3-2 Ed4.0	IEC 61000-3-2 Ed4.0(2014)
IEC3-2 Ed3.0	IEC 61000-3-2 Ed3.0(2005)
IEC3-2 Ed2.2	IEC 61000-3-2 Ed2.2(2004)
JIS3-2 2011	JIS C 61000-3-2 (2011)
JIS3-2 2005	JIS C 61000-3-2 (2005)
IEC3-12 2011	IEC 61000-3-12 Ed2.0(2011)
IEC3-12 2004	IEC 61000-3-12 Ed1.0(2004)

■ Items in test results list (IEC 61000-3-2 (Ed4.0, Ed3.0, Ed2.2), JIS C 61000-3-2)

Item	Description
Harm Order	Order of harmonics.
Lx Limit 1 (A rms)	Indicates the limit value or shows "---". "---" appears when there is no limit value or when the computed limit value is less than 0.0001 A (or less than 0.001 A for a range of 10 A or above).
Lx Limit 2 (A rms)	Indicates 150 % of the limit value or shows "---". "---" appears when there is no limit value or when the computed limit value is less than 0.0001 A (or less than 0.001 A for a range of 10 A or above).
Lx Ave (A rms)	Average value of harmonic current in the total measurement time
Lx Max (A rms)	Maximum value of harmonic current in the total measurement time
Lx Limit Over (s)	Indicates the time (accumulated value within the total measurement time), in which a measured value is greater than 150 % of its limit value but equal to or smaller than 200 %. Displayed in the test result of IEC 61000-3-2 Ed4.0 or IEC 61000-3-2 Ed3.0 standard.
Lx Judge	Judgment result of each order. Pass: No limit value or (Margin X Lx limit 1 > average value) and (Margin X Lx limit 2 > maximum value) Warn: (Limit 1 > average value) and (Limit 2 > maximum value) except for PASS Fail: Other than listed above

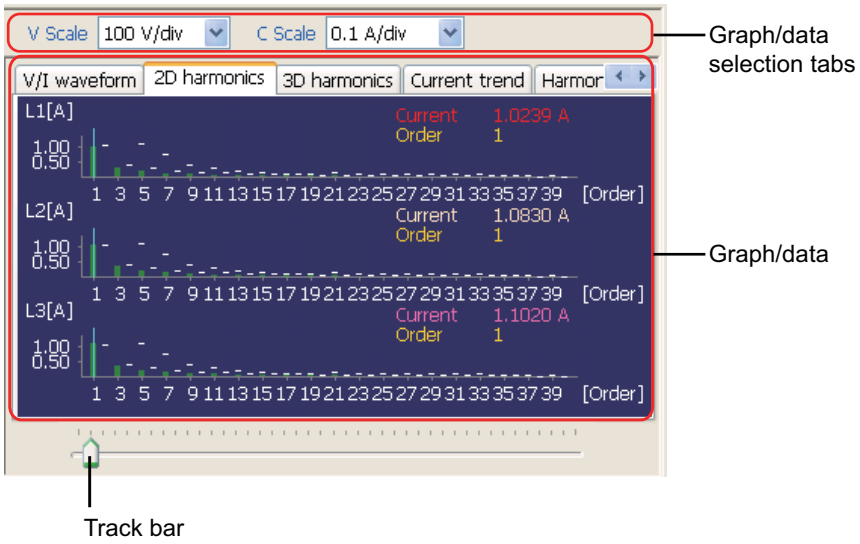
Lx: L1, L2, or L3

■ Items in test results list (IEC 61000-3-12)

Item	Description
Harm Order	Order of harmonics.
Lx Limit 1 (A rms)	Indicates the limit value or shows "---". "---" appears when there is no limit value or when the computed limit value is less than 0.0001 A (or less than 0.001 A for a range of 10 A or above).
Lx Limit 2 (A rms)	Indicates 150 % of the limit value or shows "---". "---" appears when there is no limit value or when the computed limit value is less than 0.0001 A (or less than 0.001 A for a range of 10 A or above).
Lx Ave (%)	Average value of the total measurement time. Ratio (%) to the reference fundamental current
Lx Ave (A rms)	Average value of harmonic current in the total measurement time
Lx Max (%)	Maximum value of the total measurement time. Ratio (%) to the reference fundamental current
Lx Max (A rms)	Maximum value of harmonic current in the total measurement time
Lx Judge	Judgment result of each order. Pass: No limit value or (Margin X Lx limit 1 > average value) and (Margin X Lx limit 2 > maximum value) Warn: (Limit 1 > average value) and (Limit 2 > maximum value) except for PASS Fail: Other than listed above

Lx: L1, L2, or L3

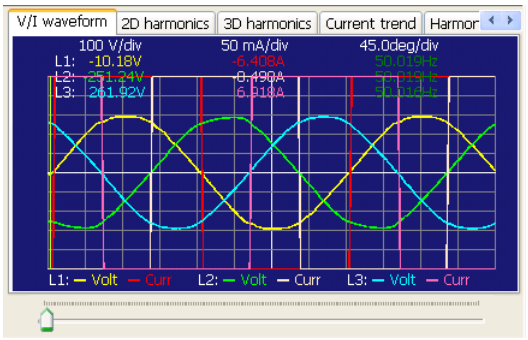
Graph and Data Pane



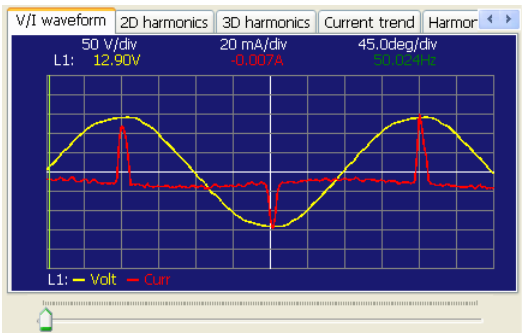
Item	Description
V Scale	Use to enlarge or reduce the graph voltage scale.
C Scale	Use to enlarge or reduce the graph current scale.
Track bar	Use to specify the location of the cursor on the graph.
Graph/data selection tabs	Use these tabs to select the graph or data that you want to display.
Graph/ Data	The graph or data of the tab that you select appears. • V/I waveform • 2D harmonics • 3D harmonics • Current trend • Harmonics trend • THC trend • Vector • Test data • Measurement list • Test Result • AC Power Source

■ V/I waveform

The V/I waveform graph of the input voltage and current of a data frame selected. The vertical axis indicates the voltage and current. The horizontal axis indicates the time.



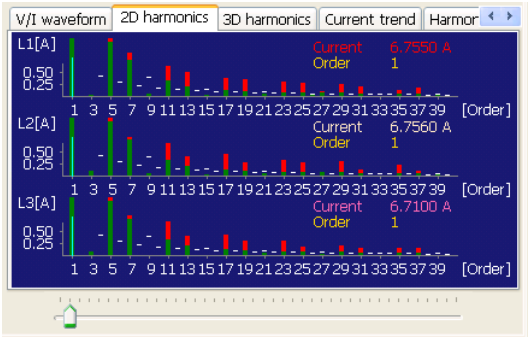
When you have set the standard to IEC 61000-3-2 Ed4.0, the class to class C, and the limit values to 3rd/5th/Current Wave, the current waveform analysis diagram that is prescribed from IEC 61000-3-2 Ed3.0(2005)/ A2(2009) is displayed in place of the V/I waveform in the test results file. (Only valid for single-phase, two-wire circuits.)



2D harmonics

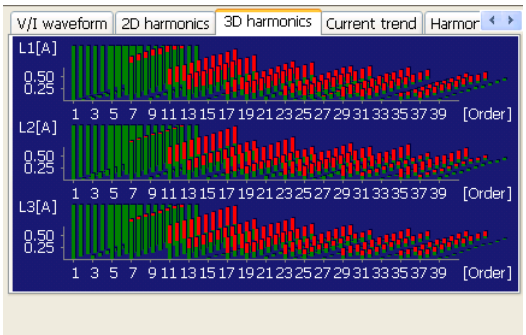
The harmonic current spectrum of a data frame selected. Harmonic current values up to the 40th harmonic are displayed in bar graphs with each data frame. The vertical axis indicates the current. The horizontal axis indicates the order.

A white mark above a graph indicates a limit value. Parts for which the measured value exceeds 100 % of the limit value are displayed in red. Parts that are equal to or smaller than the margin value set are displayed in green, and those that are greater than the margin value set but equal to or smaller than 100 % of the limit value are displayed in yellow. The limit value is not displayed if it exceeds the maximum value of the vertical axis scale. To display the limit value within the vertical axis scale, reduce the display scale factor of the vertical axis scale. The limit value can also be displayed by extending the current range when setting the HarmoCapture3 test conditions.



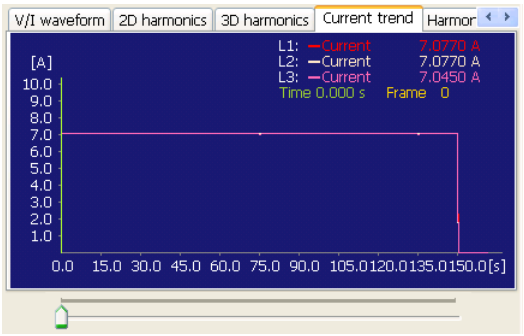
3D harmonics

The elapsed time for the harmonic current spectrum of a data frame selected. The vertical axis indicates the current. The horizontal axis indicates the harmonic order and the depth indicates the data frame (up to 10 frames.)



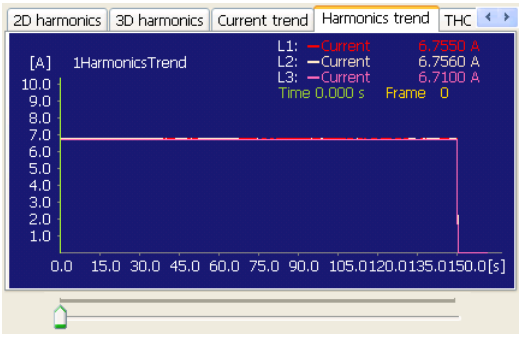
Current trend

The transition of input current in the total measurement time. The vertical axis indicates the effective value of the current. The horizontal axis indicates the time (data frame.)



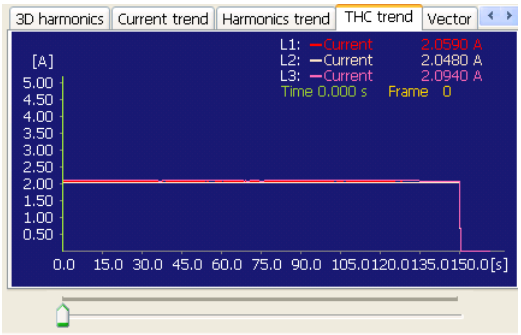
Harmonics trend

The transition of harmonic current in the total measurement time with each order. The vertical axis indicates current values. The horizontal axis indicates the time (data frame.)



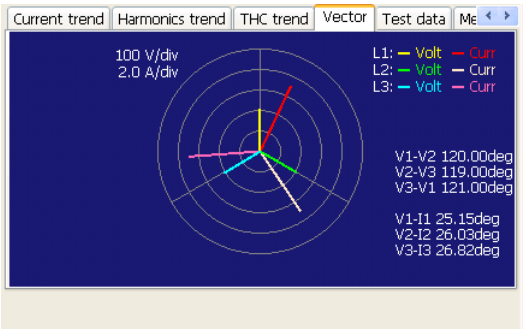
THC trend

The transition of THC (the total harmonic current of input current, the effective value of the 2nd to the 40th harmonic current components) in the total measurement time. The vertical axis indicates the THC. The horizontal axis indicates the time (data frame.)



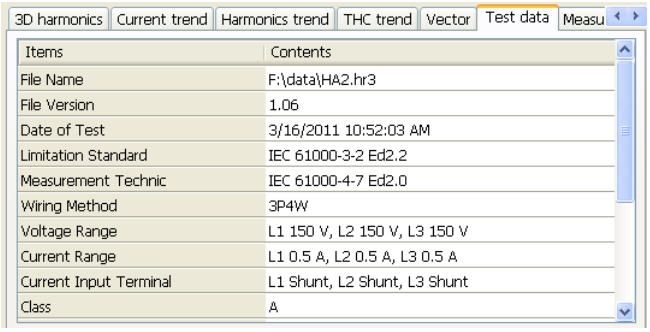
Vector

Displays input voltages/current phases in vectors. Obtaining the phase difference of the current against the voltage, and the difference between each phase.



■ Test data

The test conditions for the selected test result file appear.



■ Measurement list

The measurement data for the selected data frame appears

.

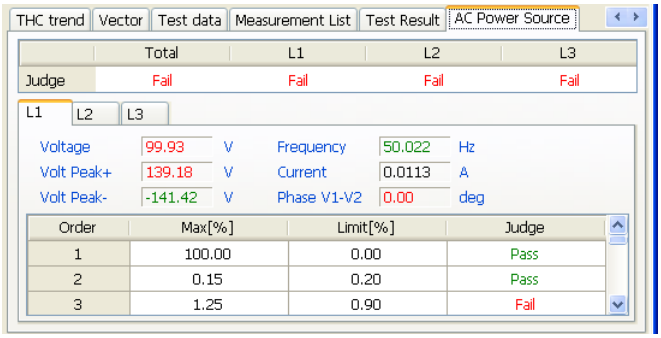
Item	Description
Voltage rms	Effective value of input voltage
Voltage Peak +	Positive amplitude peak value of input voltage
Voltage Peak –	Negative amplitude peak value of input voltage
Current rms	Effective value of input current
Current Peak +	Positive amplitude peak value of input current
Current Peak –	Negative amplitude peak value of input current
Active Power	Active power of EUT
Apparent Power	Apparent power of EUT
Reactive Power	Reactive power of EUT
Power Factor	Power factor of EUT
THC	Total harmonic current of input current, effective value of 2nd to 40th harmonics current components
POHC	Partial odd harmonic current of input current, effective value of harmonic current component of odd orders from 21st to 39th

Test Result

The test result of each phase, the final test result and the maximum measurement data appear. The judgment results that appear are Pass (in green), Warn (in yellow), and Fail (in red).

AC Power Source

This displays the results of the AC power test source performance check. The results of the judgments performed on the limit values of each order and the final judgment result are displayed. The judgment results that appear are Pass (in green), Warn (in yellow), and Fail (in red).



Analyzing Data

This section gives three examples of how to use the displayed graphs and data to examine the operation of the EUT.

- Finding the Maximum Value of the THC and Its Time of Occurrence
- Finding the Maximum Value of the Harmonic Current and Its Time of Occurrence
- Finding the Time when the Harmonic Limit Value Is Exceeded

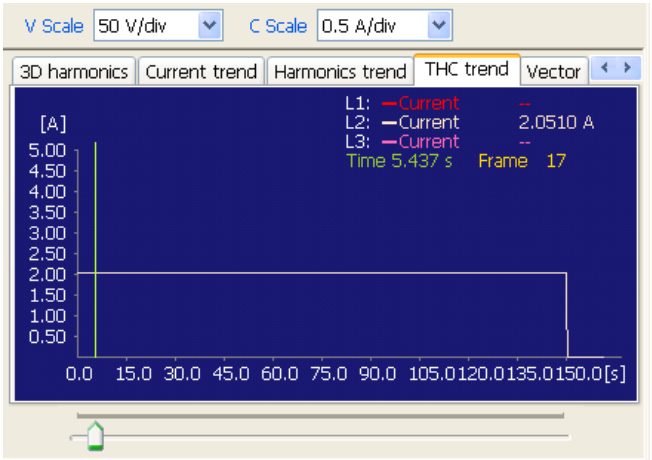
See p. 17
See p. 20

Finding the Maximum Value of the THC and Its Time of Occurrence

To analyze the operating state of EUT, the time when the THC is maximized is found. The time is the elapsed time since starting the meaturement. The harmonic spectrum at that time, the harmonic order that applies to most effective for change of the THC, and its current waveform are found.

■ To find the time of the maximum value of the the THC

1 **Select the THC trend graph.**



2 **Move the cursor to the position that you regard as the maximum current value on the waveform using the track bar.**

If it is difficult to find the maximum value, increase C Scale factor or increase the horizontal size of the window by dragging the window splitter.

3 **Find the maximum value from the current value displayed by moving the cursor.**

The track bar is also moved with the <– and –> keys. This is useful for finely adjusting the cursor position.

4 **Stop the cursor at the maximum value of the current.**

Time that is displayed at this point is the elapsed time since starting the measurement.

To find the harmonic spectrum at the time of maximum value of the THC

5 **Select the 2D harmonics graph.**

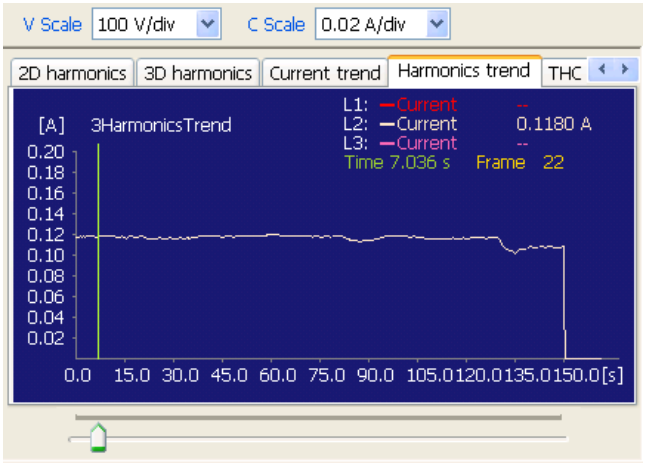
The harmonic spectrum of the data frame with the THC maximized is displayed.

6 **Select an order using a track bar.**

Harmonic current values are displayed. Each color is displayed for each limit value.

To find the harmonic order that applies to most effective for the change of the THC

7 **Select the Harmonics trend graph.**



8 **Observe the current change in the cursor position from the trend graph.**

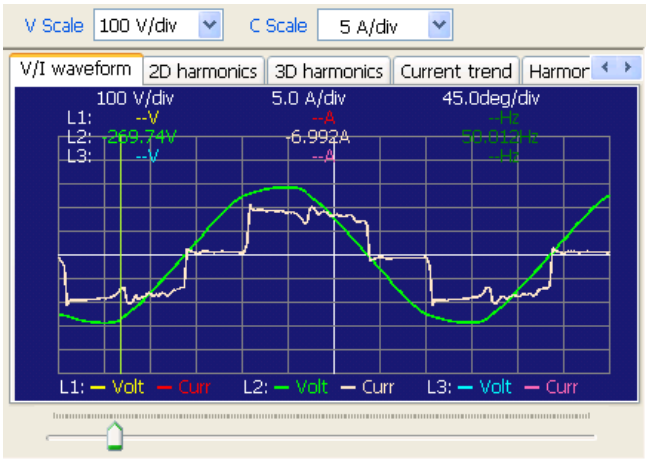
If it is difficult to recognize the change, increase C Scale factor or increase the horizontal size of the window by dragging the window splitter.

9 **To find other orders, make new settings in the Harm order.**

Viewing waveform

10 **Select the V/I waveform graph.**

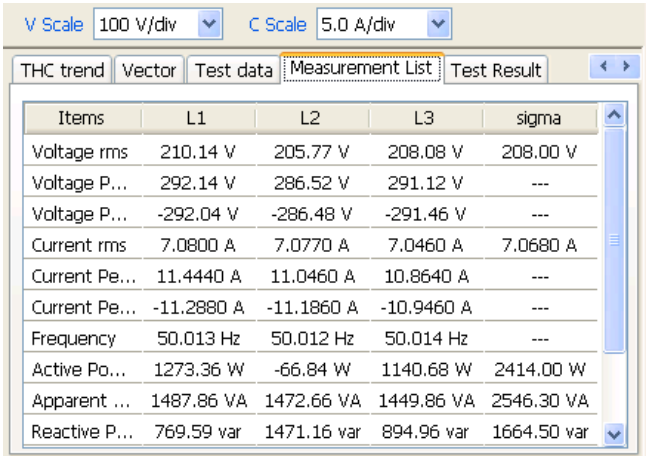
The waveform of the current data frame is displayed.



To find the power with the THC maximized

11 **Select the Measurement list.**

The measurement data of the actual data frame is displayed.



Items	L1	L2	L3	sigma
Voltage rms	210.14 V	205.77 V	208.08 V	208.00 V
Voltage P...	292.14 V	286.52 V	291.12 V	---
Voltage P...	-292.04 V	-286.48 V	-291.46 V	---
Current rms	7.0800 A	7.0770 A	7.0460 A	7.0680 A
Current Pe...	11.4440 A	11.0460 A	10.8640 A	---
Current Pe...	-11.2880 A	-11.1860 A	-10.9460 A	---
Frequency	50.013 Hz	50.012 Hz	50.014 Hz	---
Active Po...	1273.36 W	-66.84 W	1140.68 W	2414.00 W
Apparent ...	1487.86 VA	1472.66 VA	1449.86 VA	2546.30 VA
Reactive P...	769.59 var	1471.16 var	894.96 var	1664.50 var

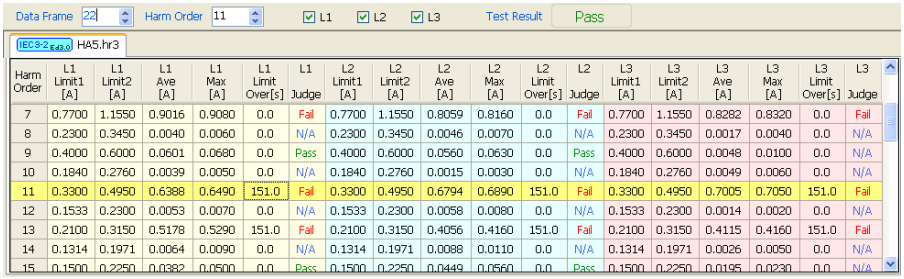
12 **Read the power value from the list.**

Finding the Maximum Value of the Harmonic Current and Its Time of Occurrence

To analyze the operating state of EUT, the time when the harmonics are maximized is found. The time is the elapsed time since since starting measurement. The harmonic spectrum and current waveform at that time are found.

■ To find the maximum current value with harmonic order specified

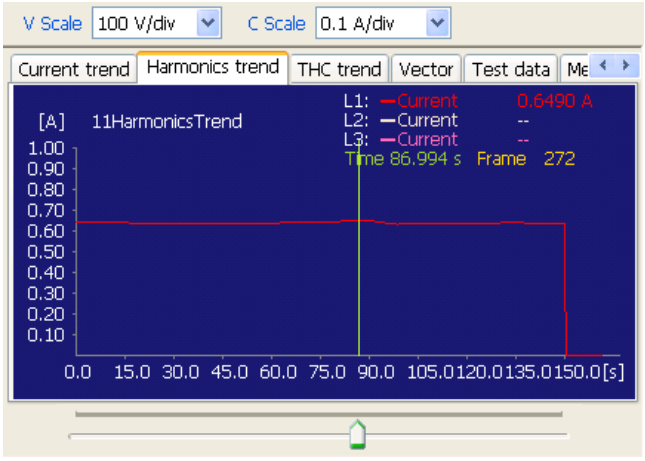
1 **From the maximum values in the results list, determine the harmonic order that you wish to investigate.**



Harm Order	L1 Limit1 [A]	L1 Limit2 [A]	L1 Ave [A]	L1 Max [A]	L1 Limit Over[s]	L1 Judge	L2 Limit1 [A]	L2 Limit2 [A]	L2 Ave [A]	L2 Max [A]	L2 Limit Over[s]	L2 Judge	L3 Limit1 [A]	L3 Limit2 [A]	L3 Ave [A]	L3 Max [A]	L3 Limit Over[s]	L3 Judge
7	0.7700	1.1550	0.9016	0.9080	0.0	Fail	0.7700	1.1550	0.8059	0.8160	0.0	Fail	0.7700	1.1550	0.8282	0.8320	0.0	Fail
8	0.2300	0.3450	0.0040	0.0060	0.0	N/A	0.2300	0.3450	0.0046	0.0070	0.0	N/A	0.2300	0.3450	0.0017	0.0040	0.0	N/A
9	0.4000	0.6000	0.0601	0.0680	0.0	Pass	0.4000	0.6000	0.0560	0.0630	0.0	Pass	0.4000	0.6000	0.0048	0.0100	0.0	N/A
10	0.1840	0.2760	0.0039	0.0050	0.0	N/A	0.1840	0.2760	0.0015	0.0030	0.0	N/A	0.1840	0.2760	0.0049	0.0060	0.0	N/A
11	0.3300	0.4950	0.6388	0.6490	151.0	Fail	0.3300	0.4950	0.6794	0.6890	151.0	Fail	0.3300	0.4950	0.7005	0.7050	151.0	Fail
12	0.1533	0.2300	0.0053	0.0070	0.0	N/A	0.1533	0.2300	0.0058	0.0080	0.0	N/A	0.1533	0.2300	0.0014	0.0020	0.0	N/A
13	0.2100	0.3150	0.5178	0.5290	151.0	Fail	0.2100	0.3150	0.4056	0.4160	151.0	Fail	0.2100	0.3150	0.4115	0.4160	151.0	Fail
14	0.1314	0.1971	0.0064	0.0090	0.0	N/A	0.1314	0.1971	0.0088	0.0110	0.0	N/A	0.1314	0.1971	0.0026	0.0050	0.0	N/A
15	0.1500	0.2250	0.0382	0.0500	0.0	Pass	0.1500	0.2250	0.0449	0.0560	0.0	Pass	0.1500	0.2250	0.0195	0.0230	0.0	N/A

■ To find the time of the maximum current value

2 **Select the Harmonics trend graph.**



3 **Set a harmonic order that you wish to find in the Harm order.**

The trend graph of the specified harmonic order is displayed.

4 **Move the cursor to the position that you regard as the maximum current value on the waveform using the track bar.**

If it is difficult to find the maximum value, increase C Scale factor or increase the horizontal size of the window by dragging the window splitter.

5 **Find the maximum value from the current value displayed by moving the cursor.**

The track bar is also moved with the <– and –> keys. This is useful for finely adjusting the cursor position.

6 **Stop the cursor at the maximum value of the current.**

Time that is displayed at this point is the elapsed time since starting the measurement.

7 **If you wish to find another harmonic order, return to Step 3 .**

See p. 17

■ To find the harmonic spectrum at the time of maximum current value

8 Select the **2D harmonics** graph.

The harmonic spectrum of the data frame in which the current of the specified harmonic order is maximized is displayed.

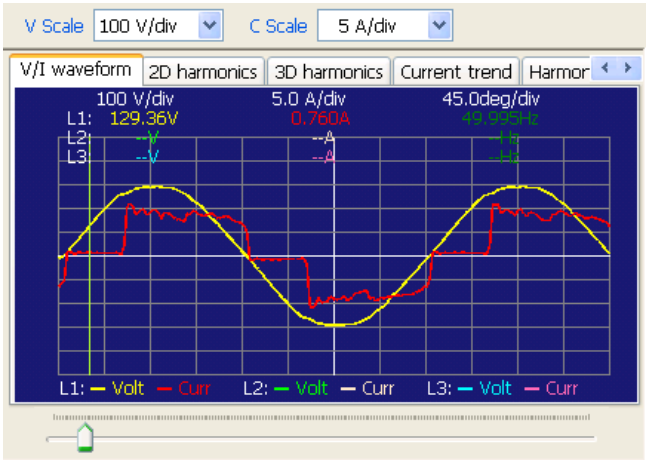
9 If you wish to find another harmonic order, specify the order using the track bar.

Harmonic current values are displayed. Each color is displayed for each limit value.

■ Viewing waveform

10 Select the V/I waveform graph.

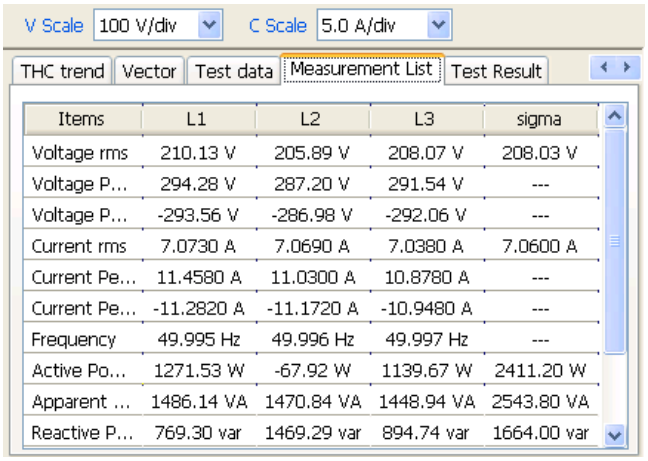
The waveform of the current data frame is displayed.



■ To find the power with the harmonic current maximized

11 **Select the Measurement list.**

The measurement data of the actual data frame is displayed.



Items	L1	L2	L3	sigma
Voltage rms	210.13 V	205.89 V	208.07 V	208.03 V
Voltage P...	294.28 V	287.20 V	291.54 V	---
Voltage P...	-293.56 V	-286.98 V	-292.06 V	---
Current rms	7.0730 A	7.0690 A	7.0380 A	7.0600 A
Current Pe...	11.4580 A	11.0300 A	10.8780 A	---
Current Pe...	-11.2820 A	-11.1720 A	-10.9480 A	---
Frequency	49.995 Hz	49.996 Hz	49.997 Hz	---
Active Po...	1271.53 W	-67.92 W	1139.67 W	2411.20 W
Apparent ...	1486.14 VA	1470.84 VA	1448.94 VA	2543.80 VA
Reactive P...	769.30 var	1469.29 var	894.74 var	1664.00 var

12 **Read the power value from the list.**

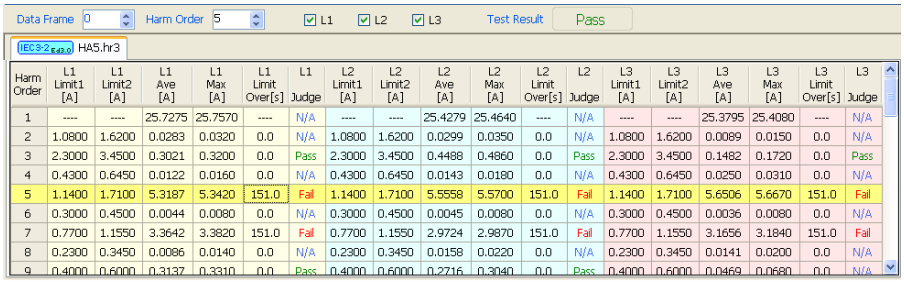
Finding the Time when the Harmonic Limit Value Is Exceeded

To find the operating state of EUT when the limit value is exceeded, find the time when the limit value is exceeded. The time is the elapsed time since starting the measurement. The harmonic spectrum and waveform at that time are also found.

To search for the time when a limit value is exceeded, each harmonic is compared with its limit value in data frames.

■ To find the harmonics that exceed limit values

1 **Investigate the judgment of the results list.**



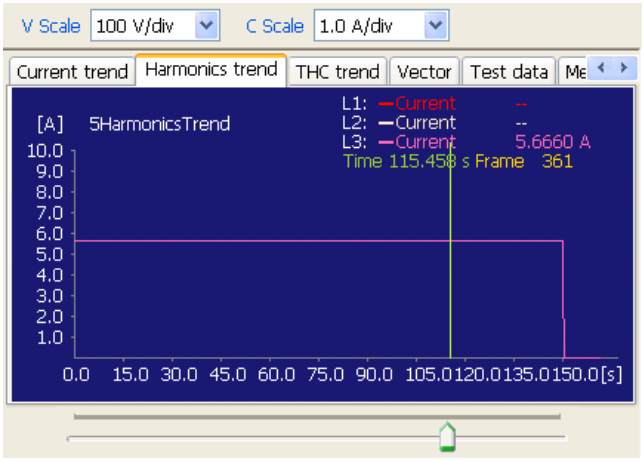
Harm Order	L1 Limit1 [A]	L1 Limit2 [A]	L1 Ave [A]	L1 Max [A]	L1 Limit Over[s]	L1 Judge	L2 Limit1 [A]	L2 Limit2 [A]	L2 Ave [A]	L2 Max [A]	L2 Limit Over[s]	L2 Judge	L3 Limit1 [A]	L3 Limit2 [A]	L3 Ave [A]	L3 Max [A]	L3 Limit Over[s]	L3 Judge
1	----	----	25.7275	25.7570	----	N/A	----	----	25.4279	25.4640	----	N/A	----	----	25.3795	25.4080	----	N/A
2	1.0800	1.6200	0.0283	0.0320	0.0	N/A	1.0800	1.6200	0.0299	0.0350	0.0	N/A	1.0800	1.6200	0.0089	0.0150	0.0	N/A
3	2.3000	3.4500	0.3021	0.3200	0.0	Pass	2.3000	3.4500	0.4488	0.4860	0.0	Pass	2.3000	3.4500	0.1482	0.1720	0.0	Pass
4	0.4300	0.6450	0.0122	0.0160	0.0	N/A	0.4300	0.6450	0.0143	0.0180	0.0	N/A	0.4300	0.6450	0.0250	0.0310	0.0	N/A
5	1.1400	1.7100	5.3187	5.3420	151.0	Fail	1.1400	1.7100	5.5558	5.5700	151.0	Fail	1.1400	1.7100	5.6506	5.6670	151.0	Fail
6	0.3000	0.4500	0.0044	0.0080	0.0	N/A	0.3000	0.4500	0.0045	0.0080	0.0	N/A	0.3000	0.4500	0.0036	0.0080	0.0	N/A
7	0.7700	1.1550	3.3642	3.3820	151.0	Fail	0.7700	1.1550	2.9724	2.9870	151.0	Fail	0.7700	1.1550	3.1656	3.1840	151.0	Fail
8	0.2300	0.3450	0.0086	0.0140	0.0	N/A	0.2300	0.3450	0.0158	0.0220	0.0	N/A	0.2300	0.3450	0.0141	0.0200	0.0	N/A
9	0.4000	0.6000	0.3137	0.3310	0.0	Pass	0.4000	0.6000	0.2716	0.3040	0.0	Pass	0.4000	0.6000	0.0469	0.0680	0.0	N/A

2 **Set a failed harmonic order in the Harm order.**

■ To find the time when the limit value is exceeded

3 **Select the Harmonics trend graph.**

The trend graph of the specified harmonic order is displayed.



4 **Move the cursor using the track bar while observing the current value on the waveform.**

If it is difficult to find the current value, increase the C Scale factor or increase the horizontal size of the window by dragging the window splitter.

5 **Stop the cursor when the current exceeds the limit value in the results list.**

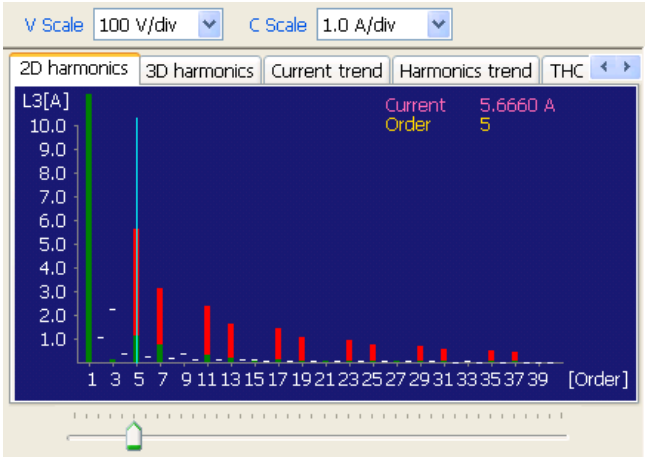
Time that is displayed at this point is the time elapsed after a test is started. A data frame is also displayed.

6 **If the current exceeds the limit value in the results list in two or more positions, move the cursor to each position and read the time.**

To find the harmonic spectrum at the time when the limit value is exceeded

7 Select the **2D harmonics** graph.

The harmonic spectrum of the failed data frame is displayed.



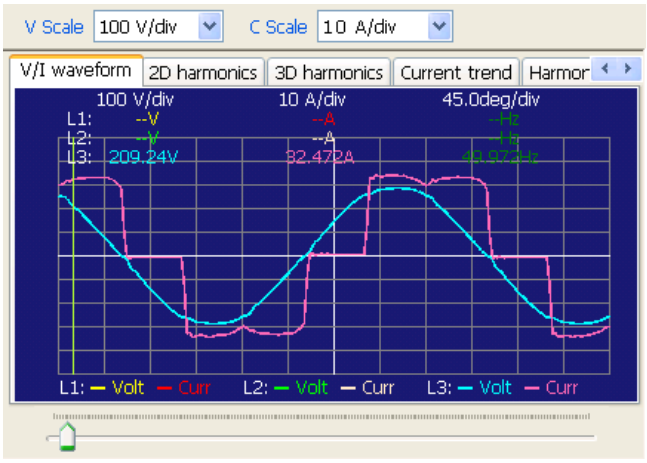
8 If you wish to investigate another harmonic order, specify the order using the track bar.

Harmonic current values are displayed. Each color is displayed for each limit value.

Viewing waveform

9 Select the **V/I waveform** graph.

The waveform of the current data frame is displayed.



Checking Repeatability

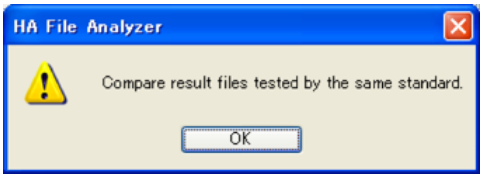
Comparing Test Results Files

1 **Open test results files to be compared.**

The repeatability check allows the comparison of 2 to 15 test results files.

2 **Click the Test data tab in the graph and data pane and check the test conditions of each test result file.**

To check repeatability, compare test results files under the same test conditions. If they are compared under different standards, the message is displayed.



3 **Select the test results file to be referenced for the comparison.**

4 **Click the Repeatability button on the toolbar.**

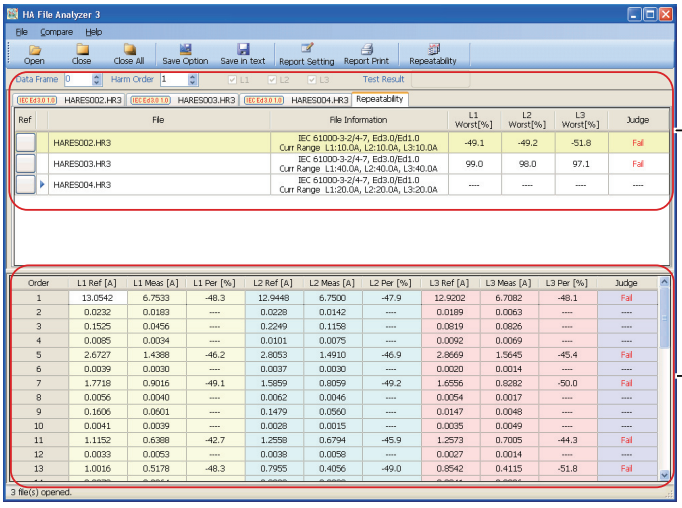
The Repeatability **tab appears in the results list pane, and the judgment results appear.**

The values are compared in each harmonic order, a difference within ±5 % of the reference value is automatically checked. The results are displayed in the judgment column of each order in the repeatability check window.

You can also change the reference file and the files for comparison from the repeatability check window.

Results of Repeatability Check

The interfile comparison results are displayed in the results list pane, and the comparison results of each order are displayed in the graph and data pane.



Interfile judgment display

The reference test results file of each order and each test results file are compared. The results of each file are displayed as **Pass**, **---**, or **Fail**.

Item	Description
Ref	Indicates the reference test result file with a ▶. You can select the reference test result file by clicking the button.
File	File name of test results
File Info.	Test target standard and class
Lx Worst (%)	Ratio of the values of the order with the largest current difference.
Judge	Judgment result for the order with the largest current difference.
	In IEC3-2 Ed4.0 --- : Reference or measured value is less than 3 % of current range Pass : {(Measured value – reference value) / limit value X 100 %} < ±5 % Fail : {(Measured value – reference value) / limit value X 100 %} ≥ ±5 %
	In other standards --- : Reference or measured value is less than 3 % of current range Pass : {(Measured value – reference value) / reference value X 100 %} < ±5 % Fail : {(Measured value – reference value) / reference value X 100 %} ≥ ±5 %

Lx: L1, L2, orL3

Interfile order judgment display

The reference test results file of each order and the test results file (displayed in yellow) that is specified in the result list pane are compared. The results of repeatability check are displayed as **Pass**, **---**, or **Fail**.

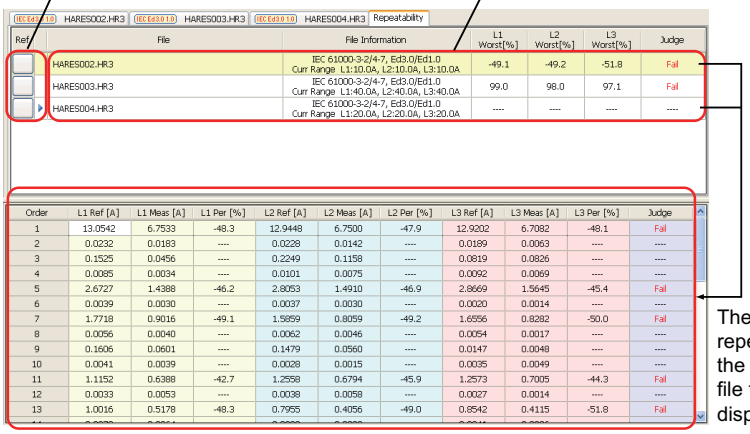
Item	Description
Harm order	Indicates the harmonic order.
Lx Ref (A rms)	Effective value of the harmonic current of the comparison reference results file.
Lx Meas (A rms)	Effective value of the harmonic current of the compared results file.
Lx Per (%)	Ratio of current test results to reference value {(Meas – Ref) / Ref} x 100 %
Judge	In IEC3-2 Ed4.0 --- : Reference or measured value is less than 3 % of current range Pass : {(Measured value – reference value) / limit value X 100 %} < ±5 % Fail : {(Measured value – reference value) / limit value X 100 %} ≥ ±5 %
	In other standards --- : Reference or measured value is less than 3 % of current range Pass : {(Measured value – reference value) / reference value X 100 %} < ±5 % Fail : {(Measured value – reference value) / reference value X 100 %} ≥ ±5 %

Lx: L1, L2, orL3

Changing the file for comparison or the reference file

A ▶ appears next to the reference file. Click the button to change the reference file.

The file for comparison is displayed in yellow. Click the file's cell to change the file for comparison.



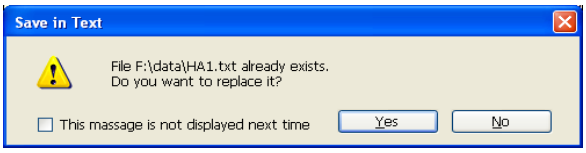
The results of the repeatability analysis of the reference file and the file for comparison are displayed.

Saving a Test Results File as Text

A test results file can be saved as text for use in Microsoft Excel and other application software.

See p. 26

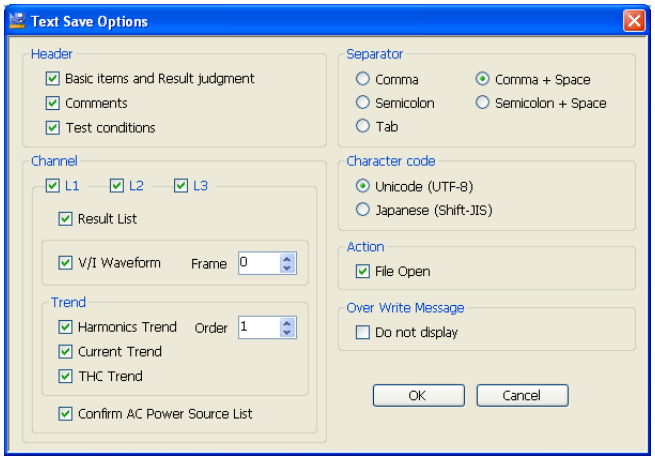
1. **Select a test results list that you wish to save.**
2. **Click the Save Option button on the toolbar.**
   The Text Save Options dialog box is displayed.
3. **Select an item to be saved as a text file.**
4. **Click the OK button.**
5. **Click the Save in Text button on the toolbar.**
   The Save Text dialog box is displayed.
6. **Enter a file name and select file extension .txt or .csv.**
7. **Click the Save button.**
   If a text file with the same name already exists, the message is displayed.



If you select the This message is not displayed next time check box, the message will not appear the next time. You can clear this check box in the Text Save Options dialog box.

Text Save Options

Click the **Save Option** button on the toolbar to display the **Text Save Options** dialog box. In the **Text Save Options** dialog box, you can specify which options can be selected when you save the test results to a text file.



■ Header

Check the items that you want to save.

Item	Description
Basic items and Result judgment	Test date, Version of test results file
Comments	Information on EUT (memo, model name, type, and serial number) (The comments and test information included in the test result file)
Test conditions	Test conditions information (standard, class, voltage/current range, nominal voltage/frequency, and measurement time)

■ Channel

Check the items that you want to save.

Item	Description
L1, L2, L3	Phase data selection
Result list	Final judgment result and margin for a limit value
V/I waveform	Instantaneous values of the specified voltage and current Counts are positioned in the time-axis direction.
Trend	Harmonics trend, current trend, and THC trend of the specified order
Confirm AC Power Source List	The results of the AC power test source performance check

■ Separator

Select the text separator.

Character code

Set the character code of a text file.

Item	Description
Unicode (UTF-8)	Save it in a test file that supports Unicode (UTF-8).
Japanese language (Shift-JIS)	Save it in a text file that supports the Japanese language (Shift-JIS).

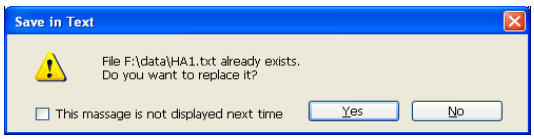
Action

After the text file is saved, you can open it with the software that text files are associated with.

Over Write Message

If you save a file with the same name already exists, a file overwrite message appears. The **Do not display** check box is used to enable or disable this message.

If you select the **This message is not displayed next time** check box in the file overwrite dialog box, the **Do not display** check box in the **Text Save Options** dialog box is also selected. If you clear the **Do not display** check box, the PDF file overwrite message is enabled.



Printing a Report

Reports are printable PDF files of test result files. Numeric value data, various waveform graph, and results of repeatability check can be printed. You can include comments in reports, such as the company name and test environment.

Reports are automatically saved in the same folder as test result files using the same file name as the test result file that they are converted from and a pdf extension.

NOTE To print PDF files, you need a PDF viewing application such as Adobe Reader.

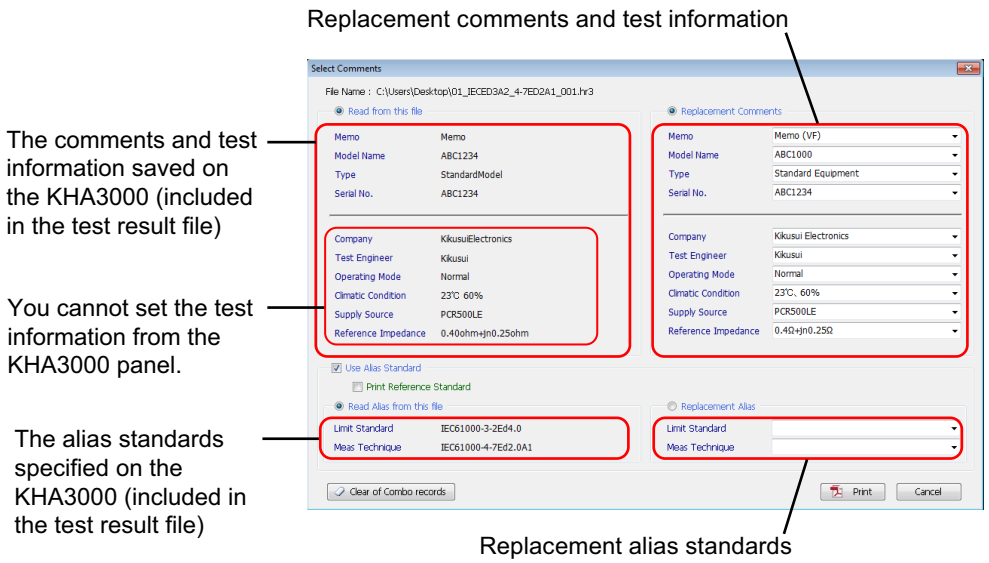
1 **On the results list pane, select the results file to be printed in a report.**

2 **Click Print Setting on the toolbar.**
Open the Report Setting dialog box.

See p. 32

3 **Select the data to print.**

4 **Click Print Report on the toolbar.**
The Select Comment dialog box appears.



5 Select the comments, test information, and test standard that you want to print on the report.

Item	Description
Read Comments from this file	The comments and test information in the test result file are printed on the report.
Replacement comments	The comments and test information in the box are printed on the report.
Use Alias Standard	Select this option to print standard names other than the default standard names on the report.
Print Reference Standard	Select this option to print on the report the standard names also that are displayed when you select the test standards using the KHA3000 or the HarmoCapture3.
Read Alias from this file	The alias standards specified on the KHA3000 are printed on the report.
Replacement alias	The alias standards in the Report Setting dialog box are printed on the report.

See p. 30

For more information about replacement comments, see "Entering Comments, Test Information and Alias Standard."

6 Click **Print**.

Your PDF viewing application (such as Adobe Reader) starts, and the report appears.

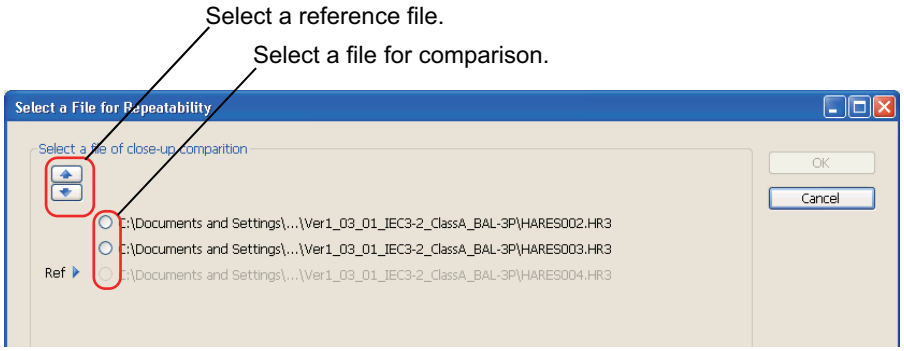
See p. 28

■ If you selected the repeatability check list in step 2.

The Select a File for Repeatability **dialog box appears.**

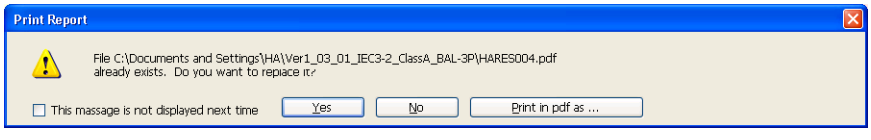
Select a reference file using the arrow buttons, select a file to compare, and then click OK.

If you open multiple test result files for comparison in repeatability checking, all the files will appear in the Select a File for Repeatability **dialog box.**



■ When a PDF file with the same name exists

The message is displayed.



Click Print in pdf as **to save the report as a PDF file with a different file name.**

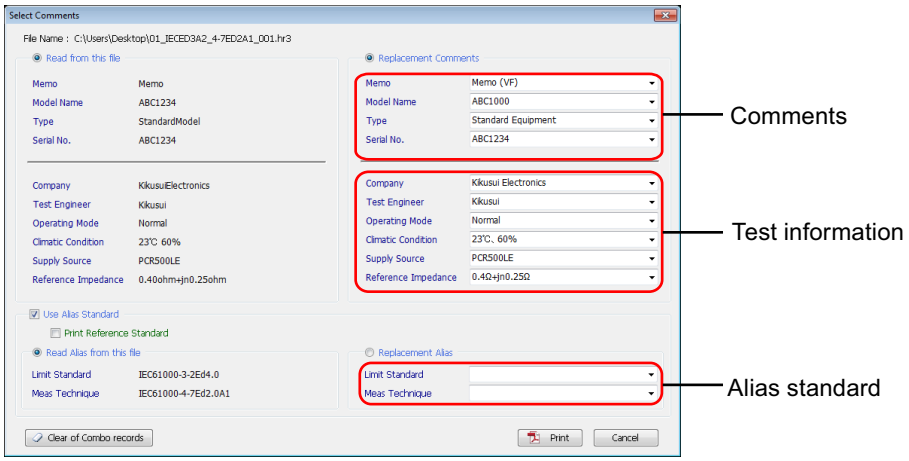
If you select the This message is not displayed next time **check box, the message will not appear the next time. You can clear this check box in the** Report Setting **dialog box.**

7 Print the report from your PDF viewing application.

Entering Comments, Test Information and Alias Standard

You can print the comments, test information, and alias standards that you enter in the Select Comment dialog box.

The information that you enter into the boxes is registered when you click **Print**. Up to eight previous entries are stored in the boxes' lists. The oldest entry is removed first.



■ Comments and test information

For each of these sets of comments and test information, the maximum number of characters that can be printed on reports is 20 characters. You can enter text that exceeds 20 characters, but only the first 20 characters will be printed.

Memo:	
Model Name:	The name of the EUT
Type:	The model number of the EUT
Serial No. :	The serial number of the EUT

You cannot set the test information from the KHA3000 panel.

Company:
Test Engineer:
Operating Mode:
Climatic Condition:
Supply Source:
Reference Impedance:

■ Alias standard

You can enter up to 31 characters for the alias standards.

Deleting characters

Press **Delete** to delete a character. To clear a combo box, enter a space, and press Enter. If you do not enter any characters, the corresponding comment is not updated. After you close the dialog box, the previous comment will return.

Clearing combo box history

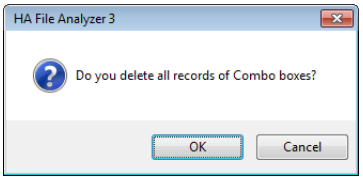
The **Comment** and other combo boxes retain histories of entries that you make even when you close HA File Analyzer3. You can select these entries from the list the next time. However, there may be cases in which it is better to reset the combo boxes to their default conditions (without the histories) if another user is going to use HA File Analyzer3. To clear the histories of all combo boxes, follow the procedure below.

1 Click **Print Report** button on the toolbar.

The Select Comments **dialog box appears.**

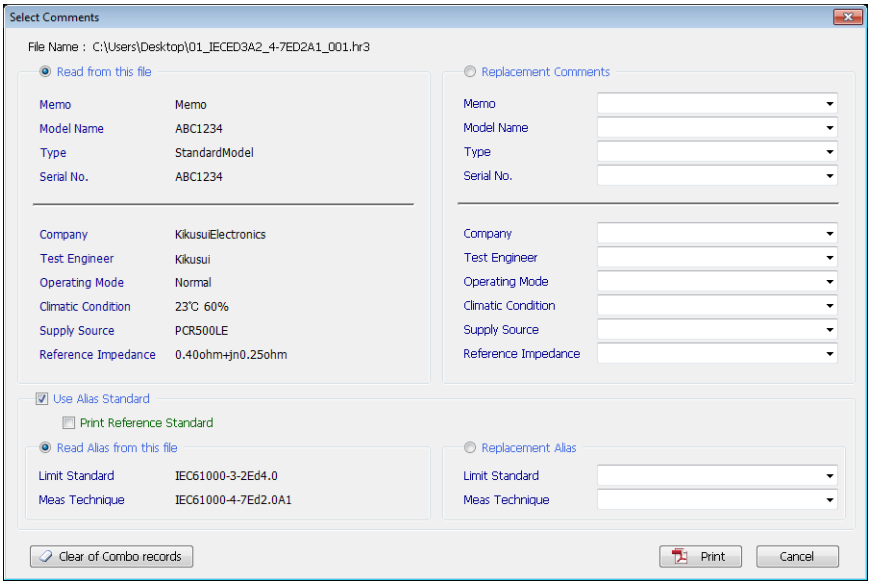
2 Click **Clear of Combo records** button.

The message appears.



3 Click **OK** button.

The histories of the Comment, Test Information, **and** Standard Name **combo boxes are cleared.**



Configuring the Report Format

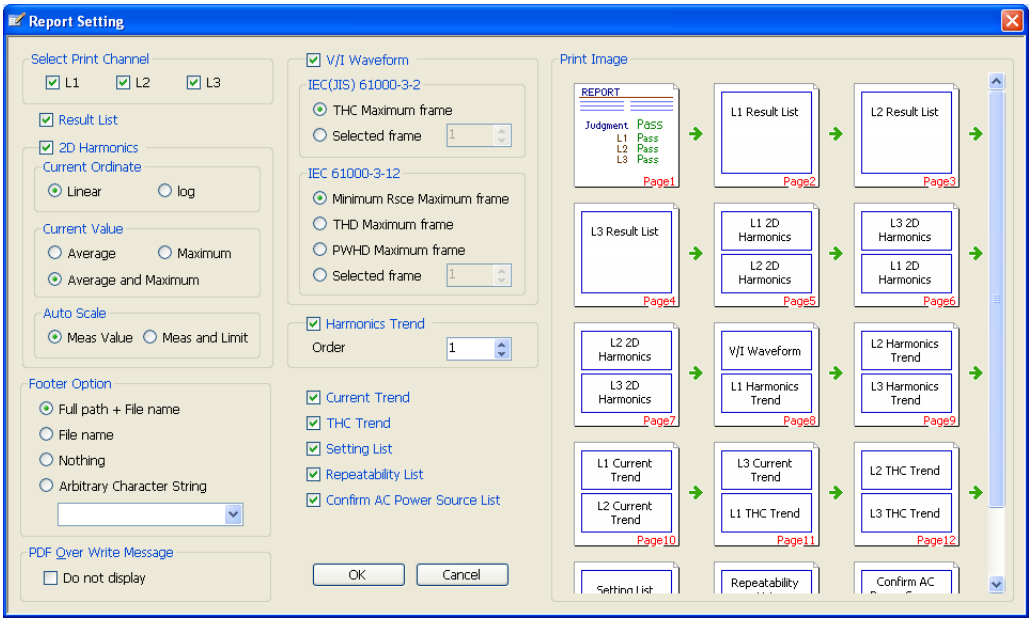
In the Report Setting dialog box, you can:

- Select the data to print.
- Enable or disable the PDF file overwrite message.

See p. 33

Selecting which Data to Print

You can select which phase data (L1, L2, and L3) and graphs to print in reports using the check boxes. After selecting which data to print, you can preview how the report will be printed.



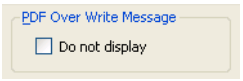
Item	Description
Select Print Channel	The phase data that will be printed (L1, L2, and L3).
Result List	The data displayed in the results list pane.
2D Harmonics*1	Prints the judgment results of each order of harmonic current using 2D harmonics bar graph. You can set the current scale to **linear** or **log** (logarithmic.) You can select whether to print the **average** or **maximum** value or both in the report. You can set whether to determine the optimal current scale from **Meas Value** or **Meas and Limit**.

*1 When you have set the standard to IEC 61000-3-2 Ed3.0 A2, the class to class C, and the limit values to 3rd/5th/Current Wave, the printout of the test result file will not contain the maximum value of 2D harmonics. The number of pages in the print preview may differ from the actual number of pages that will be printed.

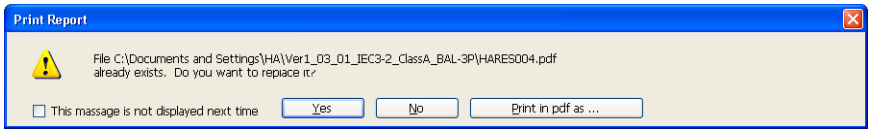
Item	Description
Footer Option	Adds a footer to a report. You can select any one of **Full path + File name**, **File name**, **Nothing**, or **Arbitrary Character Strings**. The character strings that you enter in the **Arbitrary Character Strings** combo box are stored, when you click the **OK**. Up to eight of the most recent characters are stored.
V/I Waveform	Prints the voltage and current waveforms of a frame. You can select the frame to **THC Maximum frame** or **Selected frame**. Select a particular frame using the Up/Down box.
Harmonics Trend	Prints the harmonics trend of each order. Specify an orderoption the Up/Down box.
Current Trend	Prints the current trend waveform.
THC Trend	Prints the THC trend waveform.
Setting List	Prints a list of test conditions.
Repeatability List	Prints a list of the results of interfile repeatability check.
Confirmation of AC Power Source List	Prints the results of the AC power test source performance check.

PDF Overwrite Message

If you select a test result file that you have printed before, a PDF file overwrite message appears. The **Do not display** check box is used to enable or disable this message.



If you select the **This message is not displayed next time** check box in the PDF file overwrite dialog box, the **Do not display** check box in the **Report Setting** dialog box is also selected. If you clear the **Do not display** check box, the PDF file overwrite message is enabled.



Menu Reference

Menu		Description
File		
	Open...*1	Opens a test condition file (.hr3 extension) that you created using HarmoCapture3 or a test condition file that you saved on the KHA3000.
	Close*1	Closes a test results file that was selected in the results list pane.
	Close All*1	Closes all test results files currently open.
	Save Option...*1	You can specify which options can be selected when you save the test results to a text file.
	Save in text As...*1	Saves a test results file selected in text or CSV format with another name.
	Report Setting...*1	You can specify which phase data (1, L2, and L3) and graphs to print in reports.
	Print Report...*1	Creates a report (PDF) from a test results file and prints it.
	Exit	Exit from HA File Analyzer 3.
Compare		
	Repeatability*1	Checks whether or not a test results file selected is repetitive.
Help		
	User's Manual (Japanese)	Opens the HA File Analyzer 3 Japanese Operation Guide.
	User's Manual (English)	Opens the HA File Analyzer 3 English Operation Guide.
	About HA File Analyzer 3...	Displays the version of HA File Analyzer 3.

*1 The tool bar provides buttons.

If you find any misplaced or missing pages in the manuals, they will be replaced. If the manual gets lost or soiled, a new copy can be provided for a fee. In either case, please contact your Kikusui agent or distributor. At that time, inform your agent or distributor of the “Part No.” written on the front cover of this manual.

Every effort has been made to ensure the accuracy of this manual. However, if you have any questions or find any errors or omissions, please contact your Kikusui agent or distributor.

After you have finished reading this manual, store it so that you can use it for reference at any time.

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