OptoFidelity Touch And Test TPPT Analysis Software User Guide

Version x.x.x, Valid for build version z.z.z

Contents

1 Introduction

This Document describes how to use analysis software with OptoFidelity Touch Panel Performance Tester (TPPT). This guide is valid for analysis software version x.x.x.

1.1 Requirements

Software and hardware requirements are explained in document SoftwareInstallationGuide.pdf.

2 Installation

2.1 Hardware installation

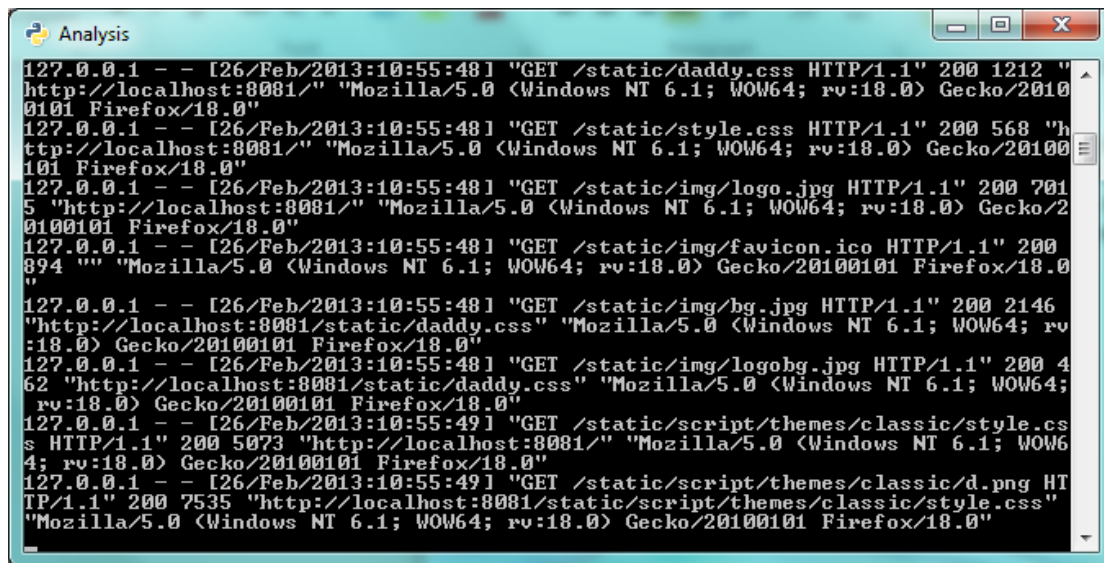Running tests on hardware is specified in document **TnT_TPPT_Script_UserManual.pdf**.

2.2 Software installation

Software installation is specified in document **TPPT_Installer_User_Guide.pdf**.

3 Starting and stopping the system

3.1 Starting the system

To start the analysis software, use shortcut located on desktop or navigate to TPPTAnalysisSW folder in TPPTApplication installation and click on the icon named *Analysis.bat*. This opens command line prompt and shows the status of the application and a web browser. The browser will show the main view.

Figure 1 Command prompt window
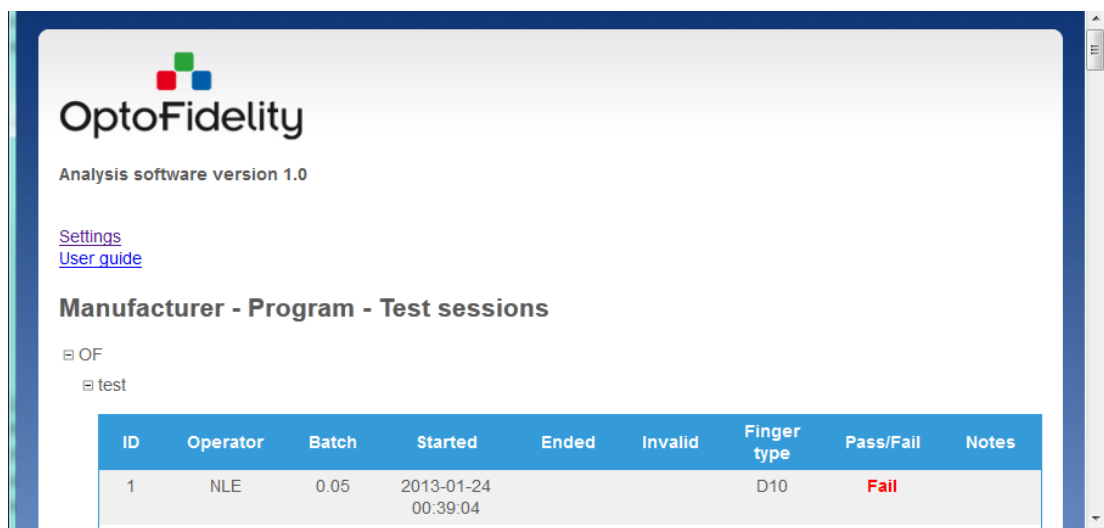
Figure 2 Analysis SW main view

3.2 Stopping the system

To stop the system, close command line prompt.
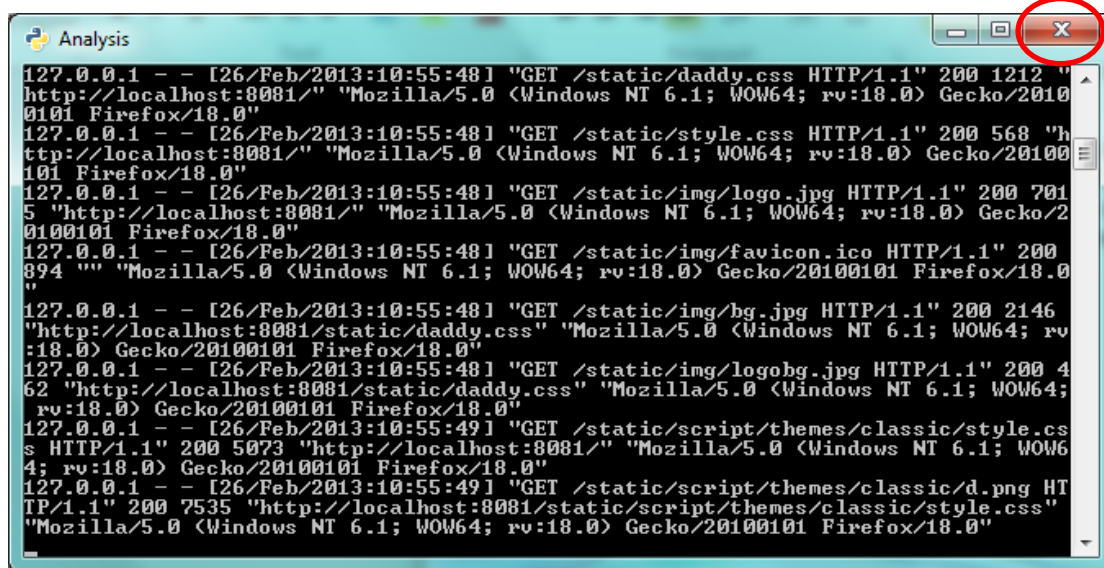
Figure 3 Closing analysis SW

4 Using the system

4.1 Main view

The main view shows the *test sessions* currently in the database. It has two different views:

- Most recent test sessions
- Hierarchical tree of test sessions

In addition the main view has links to global settings (see 4.2) and recalculate all –button.

4.1.1 Most recent test sessions

Figure 4 Most recent test sessions

The monkst recent test sessions view shows at most 10 most recent test sessions.

4.1.2   Hierarchical view of test sessions

Figure 5 Hierarchical view of test sessions

The hierarchical view shows the test sessions categorized by DUT information: Manufacturer name and Program name. The showing of the contents can be toggled by clicking the manufacturer or program name.

If there's incorrect information in the tree, like misspelled manufacturer name, that information can be corrected in DUT settings (see x.x)

4.2 Settings view

In the settings view the global acceptance limits of the tests can be changed. Changing a test limit results in re-calculation of all test verdicts.

The settings view can be accessed from the main view under the link 'Settings'.

Figure 6: Settings view navigation

Back

Settings

Setting	value	
Maximum allowed jitter	1.0	mm
Maximum allowed stationary jitter	0.0	mm
Jitter search mask	10.0	mm
Maximum allowed response latency	1.0	ms
Maximum allowed response latency from an active state for the initial input	25.0	ms
Maximum allowed response latency from an idle state	50.0	ms
Minimum allowed reporting rate	100.0	Hz
Maximum allowed positional error	1.0	mm
Maximum allowed missing inputs	0.0	pcs
Maximum allowed offset	1.0	mm
Maximum allowed difference of visible display size and size reported by digitizer	1.0	mm
Maximum allowed finger separation distance (vertical and horizontal)	12.0	mm
Maximum allowed finger separation distance (diagonal)	15.0	mm
Minimum allowed display resolution	25.0	ppi

Save

Figure 7 Settings view

The settings are divided to categories based on the tests they are used in. For each setting the description and the value is shown. The value can be changed by typing a new value to the field. Invalid values are marked with red field background.

The save button saves the values to the database. At that time all the analysis results are recalculated, which can be a lengthy operation if there are many measurements in the database.

The descriptions of the individual tests are given in the tests (see chapter 5).

Settings should not be changed when there is a test session running. In the worst case it can introduce errors to the TPPT test run.

4.3 Recalculate all

Settings

Manufacturer - Program - Test sessions

⊟ Win
  ⊟ Win

ID	Operator	Batch	Started	Ended	Invalid	Finger type	Pass/Fail	Notes
1	KPu	Win	2012-07-12 10:41:02	2012-07-12 11:19:38	False	D9	**Fail**	
2	KPu	Win	2012-07-12 11:20:54	2012-07-12 11:22:55	False	D9	**Fail**	Swipe

Figure 8: Recalculate all

The recalculate all button recalculates all the analysis results in the database. This can take some time if there are many test sessions in the database.

The recalculate all button can be used in situations where the analysis has been run while the test measurements are still active. In these situations the verdicts of the tests may be invalid. By recalculating all measurements with the current data the consistency of the results can be ensured.

Recalculate all should not be run when there is a test session running. In the worst case it can introduce errors to the TPPT test run.

4.4 Test session overview

Settings

Manufacturer - Program - Test sessions

⊟ Win
  ⊟ Win

ID	Operator	Batch	Started	Ended	Invalid	Finger type	Pass/Fail	Notes
1	KPu	Win	2012-07-12 10:41:02	2012-07-12 11:19:38	False	D9	**Fail**	
2	KPu	Win	2012-07-12 11:20:54	2012-07-12 11:22:55	False	D9	**Fail**	Swipe

Figure 9: Test session overview

The test session page can be opened by clicking a test session in the main view. The test session view shows the individual test results in a single test run.

If multiple DUT functionality is enabled, the test results are grouped by DUT. Below the DUT information is link to the DUT settings (see 4.5)

Settings

Manufacturer - Program - Test sessions

⊟ Win
  ⊟ Win

ID	Operator	Batch	Started	Ended	Invalid	Finger type	Pass/Fail	Notes
1	KPu	Win	2012-07-12 10:41:02	2012-07-12 11:19:38	False	D9	**Fail**	
2	KPu	Win	2012-07-12 11:20:54	2012-07-12 11:22:55	False	D9	**Fail**	Swipe

Figure 10: Session notes

At the top of the page the session notes are shown. The first words of the notes are shown also in the main page. The notes can be edited by selecting 'edit', after which the notes can be edited in the text field. The edited notes must be saved by selecting 'save'.

4.5 DUT settings view

Product settings

Setting	original value	analysis value	
Touch screen size x	86.0 mm	100.0	mm
Touch screen size y	154.0 mm	128.0	mm
Touch digitizer resolution x	600.0 px	800.0	px
Touch digitizer resolution y	1020.0 px	1024.0	px
Display native resolution x	1300.0 px	800.0	px
Display native resolution y	800.0 px	1024.0	px

Test session settings

Setting	original value	analysis value
Touch screen offset x	0.0 mm	20.0 mm
Touch screen offset y	0.0 mm	20.0 mm
Touch screen rotation	0 degrees	○ 0 ○ 90 ◉ 180 ○ 270
Coordinate direction	R;U	◉ Right, down ○ Left, down ○ Left, up ○ Right, up

Save all

Figure 11 DUT settings view

The DUT settings control the characteristics of the DUT. The settings are separate for each DUT and test session. The different settings are the following:

Touch screen size x: width of the touch screen in millimeters.

Touch screen size y: height of the touch screen in millimeters.

Touch digitizer resolution x: touch digitizer resolution in direction of width of the screen in pixels.

Touch digitizer resolution y: touch digitizer resolution in direction of height of the screen in pixels.

Display native resolution x: display native resolution in direction of width of the screen in pixels.

Display native resolution y: display native resolution in direction of height of the screen in pixels.

Touch screen offset x: Offset of the actual panel top left from the taught top left corner of the panel in millimeters.

Touch screen offset x: Offset of the actual panel top left from the taught top left corner of the panel in millimeters.

Flip X coordinates: Normally the positive X coordinate direction is right. If Flip X coordinates is selected, the direction is reversed (positive direction to left).

Flip Y coordinates: Normally the positive Y coordinate direction is down. If Flip Y coordinates is selected, the direction is reversed (positive direction up).

Switch X and Y coordinates: If selected, the X and Y coordinates are exchanged. Flip X and Y settings are used before the switch.

The Flip X, Flip Y, and Switch X and Y coordinates can be used to adjust to screen rotation. For example, if a typical display is rotated 90° clockwise (positive X direction down, positive Y direction left), this can be adjusted by selecting Flip X coordinates (positive X direction left) and Switch X and Y coordinates.

Below the test session related DUT settings are the DUT properties: Manufacturer name, program name, version, and Sample ID.

All the settings are saved by pressing "Save all". After the settings have been changed, the measurements in the test session are re-calculated to accommodate new settings.

4.6 Test session summary

Summary page lists all results of tests run in test session. Test session overview is in the top of the page. From each test item the general test results are shown. In order to view the detailed results, use the individual test reports.

5 Test analysis

5.1 Common items in test reports

Settings

Manufacturer - Program - Test sessions

⊟ Win
  ⊟ Win

ID	Operator	Batch	Started	Ended	Invalid	Finger type	Pass/Fail	Notes
1	KPu	Win	2012-07-12 10:41:02	2012-07-12 11:19:38	False	D9	**Fail**	
2	KPu	Win	2012-07-12 11:20:54	2012-07-12 11:22:55	False	D9	**Fail**	Swipe

Figure 12: Common items

At the top of the test report page are the functions common to all test reports:

Back: Return to test session view.

Analysis Home: Return to main page

Print: Print the test report.

Load CSV: Load the test item raw data as a CSV file.

Note: use the print button in the test page rather than the browser's print function. The print button is disables when all the images in the report are not yet loaded.

When detailed plots (pictures) are shown in test reports, they can be toggled by the toggle buttons:

Settings

Manufacturer - Program - Test sessions

⊟ Win
 ⊟ Win

ID	Operator	Batch	Started	Ended	Invalid	Finger type	Pass/Fail	Notes
1	KPu	Win	2012-07-12 10:41:02	2012-07-12 11:19:38	False	D9	**Fail**	
2	KPu	Win	2012-07-12 11:20:54	2012-07-12 11:22:55	False	D9	**Fail**	Swipe

Figure 13: Toggle buttons

All: Toggles the state of all detailed plots.

Failed: Toggles the state of failed plots

Passed: Toggles the state of passed plots

If some of the plots are manually opened and then toggle button is pressed, the plots are all either opened or closed, depending on the state of the detailed plots. The desired state can be achieved with at most two presses of the toggle button.

5.2 One Finger Tap Test

One Finger Tap Test report shows the results of the tap test. The tap test is used to measure the tap accuracy performance of the DUT.

5.2.1 Settings

The settings (see 4.2 Settings view) related to the one finger tap test are:

Maximum allowed positional error: The distance from the point that the robot presses to the coordinates reported by the DUT.

Maximum allowed missing inputs: The maximum allowed amount of missing inputs in the test.

Edge area distance from edge in Tap test: The edge area width. The edge area can have different thresholds than rest of the DUT. If this setting is positive (larger than 0), the edge area analysis is enabled and the two following settings are in use:

Maximum allowed positional error in edge area: The maximum allowed positional error if the point that the robot presses resides in the edge area.

Maximum allowed missing edge inputs: The maximum allowed amount of missing inputs in the edge area *in addition to the global value*. Thus, if the global value is 1 and missing edge inputs value is 2, there can be at most 3 missing inputs in the edge area if none are missing in other parts of the DUT.

5.2.2 Report contents

The detailed results are:

Max accuracy error: Maximum accuracy error. If edge area analysis is enabled, this is reported for both the edge area and for the rest of the display (center).

Missing inputs: Missing inputs in the test. If edge area analysis is in use, this is reported separately for the edge area and for the rest of the display (center).

5.2.3 Preview images

The first preview image shows the overview of the DUT. Circles represent the robot points and the size of the circle is the size of the allowed area given by accuracy error. If the input is missing, the circle is drawn red. If the input is outside the allowed area, the position of the input is shown with red marker, otherwise a green marker is used.

The second image gives the scatter plot. It plots all the measurements in relation with the point that the robot has pressed (reference point). In the image the distribution of the tap error can be observed.

The last image(s) give the same information with limited display area. This is useful if there are erroneous measurements that are far from the reference point. With limited display area the points near the reference point can be viewed in more detail. If edge analysis is enabled,

All the preview images can be viewed in higher resolution by clicking the preview image.

5.3 One Finger Swipe Test

The one finger swipe test report shows the results of the swipe test. The swipe test is used to measure the accuracy of the DUT, when the touch is in linear motion.
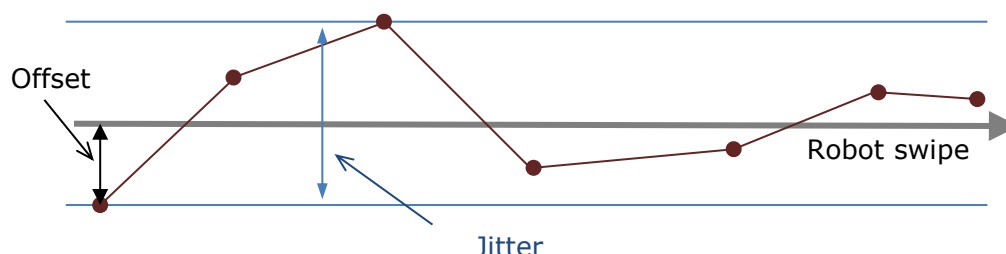
5.3.1 Settings

Figure 14: Swipe parameters

The settings related to the one finger swipe test are:

Maximum allowed offset: The maximum allowed offset of swipe point perpendicular to the line that the robot has swiped (see Figure 14 above).

Maximum allowed jitter: Maximum allowed jitter in a swipe. Jitter is the peak-to-peak maximum movement perpendicular to the swipe line (see Figure 14 above).

Jitter search mask: The distance (or window) along the swipe line in which the jitter is calculated.

Maximum amount of missing swipes: A swipe is missing if no points are reported for a single swipe. If the number of missing swipes is more than the maximum amount, the test has failed.

5.3.2 Report contents

The report shows the maximum offset measured in the test, maximum jitter and the amount of missing swipes.

The second table shows the offset and jitter values for each swipe. The pass/fail value for the swipe is determined by the offset and jitter values. If no measurement values for a swipe are available the offset and jitter values are 'N/A'. If there is only one measurement value, the jitter value is 'N/A', as jitter calculation requires at least two measurement values.
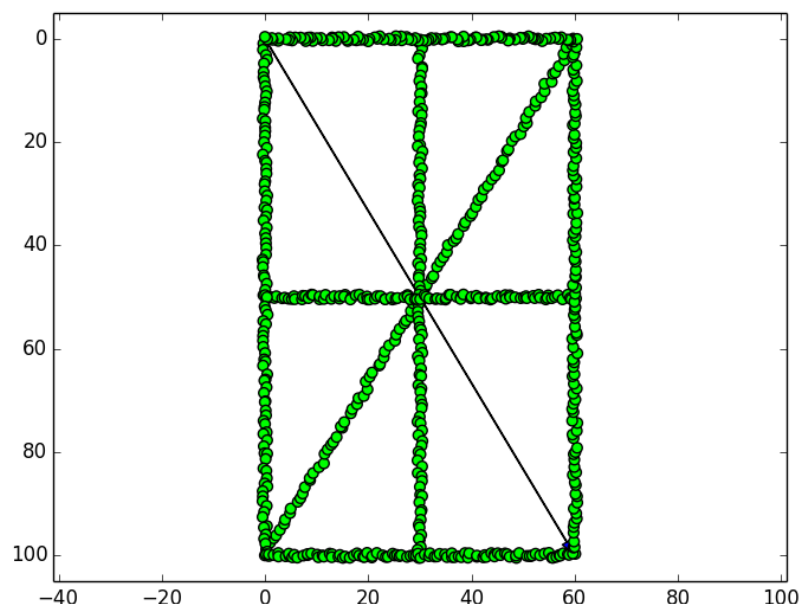
5.3.3 Preview images

Figure 15: Main swipe test preview image

The main preview image shows the swipes and the measured points. The swipes are shown with gray arrows. The measured points are colored green or red based on their offset values – the values exceeding the offer are colored red. If maximum allowed jitter is exceeded, it is not shown on the preview image. A higher resolution version of the image is available by clicking the preview image on the report.

Toggle:	All	Failed	Passed	
Swipe ID	**Max Jitter**	**Max Offset**	**Pass/Fail**	**Detailed plot**
1	N/A	N/A	**Fail**	Show/Hide
2	1.111 mm	0.620 mm	**Fail**	Show/Hide

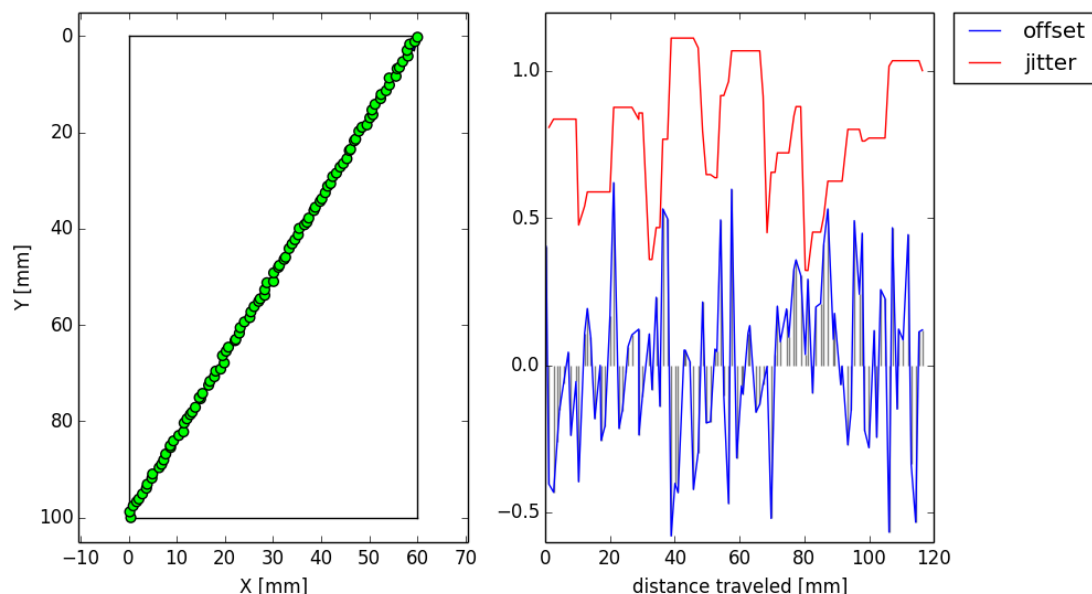Preview: One Finger Swipe details 5.2" Touch

Figure 16: Swipe details

The individual swipe plot images show the measured swipe points on the left and the detailed analysis of the swipe on the right. The detailed analysis shows the offset for each point (blue) and the calculated jitter (red). The x-axis is measured along the robot swipe line. Vertical lines (gray) show the location of the measurement point in the X axis.

5.4 One Finger Stationary Jitter Test

One finger stationary jitter report reports the results of the stationary jitter test. It is used to test the performance of the DUT when a single point is pressed and hold. Optimally the DUT should report a single coordinate consistently.

5.4.1 Settings

The one finger stationary jitter test has the following settings:

Maximum allowed stationary jitter: The maximum amount of jitter allowed for a single point.

5.4.2 Report contents

The stationary jitter reports the maximum measured stationary jitter in the test. In addition, the results for individual points pressed are measured.

The jitter is calculated from the first coordinate reported by the DUT. The jitter for each successive measurement value is the distance from the first reported point. The jitter reported for an individual tap is the maximum of jitters for individual points.

5.4.3 Preview images

The main preview image shows the different points measured related to the DUT. Passed points (jitter value not exceeding threshold) are marked green, failed points are marked with red color.

Individual points are shown in a table.

6 Troubleshooting

Trouble	Solution
Analyzing results is slower than before	Use new empty database to store test results. Large databases are slower than small ones.
500 Internal Server Error or other HTTP error	If you get this or any other HTTP error message, please send it to support@optofidelity.com Also send measurement database as attachment if possible.
Web browser cannot display any webpage	Restart analysis SW by first closing web browser and command prompt windows (see 3.2) and then start analysis SW normally (see 3.1).

7 Change history

Ver.	Status	Date	Author	Remarks
1.5	Draft	28.04.2014	JLE	First draft of new edition.