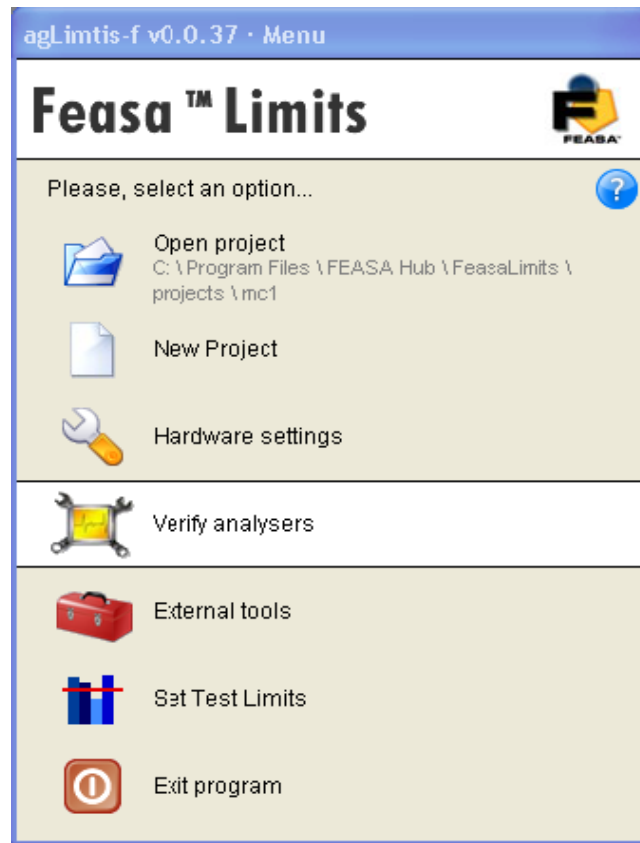


FeasaLimits User Guide



User Manual for FeasaLimits



Feasa Enterprises Ltd,
Holland Road,
National Technology Park,
Castletroy,
Limerick,
Ireland.

www.feasa.ie

Email: sales@feasa.ie

Rev. 1.3
Date: March, 2012

FeasaLimits User Guide



About this Manual

Feasa operates a policy of continuous development. Feasa reserves the right to make changes and improvements to any of the products described in this document without prior notice.

Feasa reserves the right to revise this document or withdraw it at any time without prior notice.

This manual is written for the Feasa Hub and Satellite LED Analyser.

© Copyright 2005-2012 by Feasa Enterprises Ltd. All rights reserved. No parts of this manual may be reproduced or retransmitted in any form or means, electronic or mechanical, including photocopying, recording, or any other storage and retrieval system without prior permission in writing from Feasa Enterprises Ltd.

FeasaLimits User Guide



Table of Contents

Introduction	4
Project Screen	5
Hardware Settings	7
Verify analysers	9
Balance Intensity and Chromaticity	12
Set Test Limits	13
Enable Limits	14
Calculate Limits	15
Test LED's Pre-Save Mode	17
Debug a Fiber	19
Set Limits Manually	20
Transfer values to Analysers	21
Remote Test Limits on Analysers	22
Save the Project	24
Set Limit Group	25
Generate Testability Report	27

FeasaLimits User Guide



Introduction

The FeasaLimits Software provides a Graphical User Interface for the Feasa Legend LED Test system.

The system comprises two component parts:- A *Satellite module* which is mounted on the Test Fixture and a *Hub Module*. Each Hub can control up to 8 *Satellite* modules.

The software can communicate with the Hub module through a USB or Serial ports on the Hub.

The FeasaLimits software allows the User to set up and manage any quantity of LED's up to a maximum of 160 LED's per Hub.

Multiple Hubs may be connected to additional ports on the PC which extend the amount of LED's that can be tested.

[Back to Index](#)

FeasaLimits User Guide



Project Screen

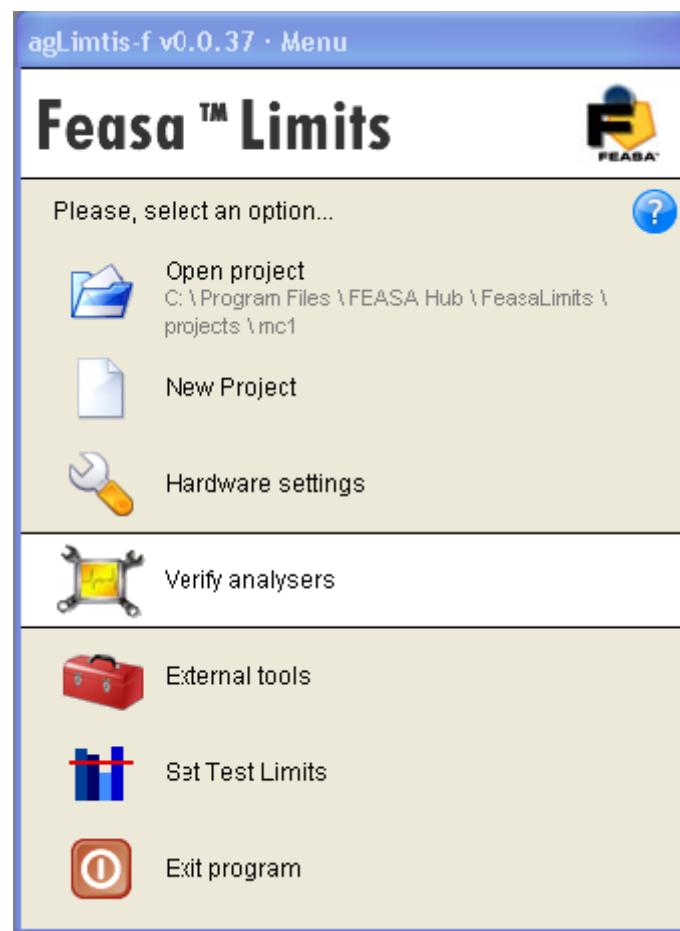


Figure 1

Figure 1 shows the Project menu which is displayed after FeasaLimits is run. A project contains all the setup, configuration and limit data for a specific set of LED's to be tested. Each project must be given a unique name and this name is given to a folder in the projects sub-folder in the FeasaLimits directory.

To create a new project click on the *New Project* icon and enter a name. Click on *Open Project* to see a list of saved projects and click on the required name.

[Back to Index](#)

FeasaLimits User Guide

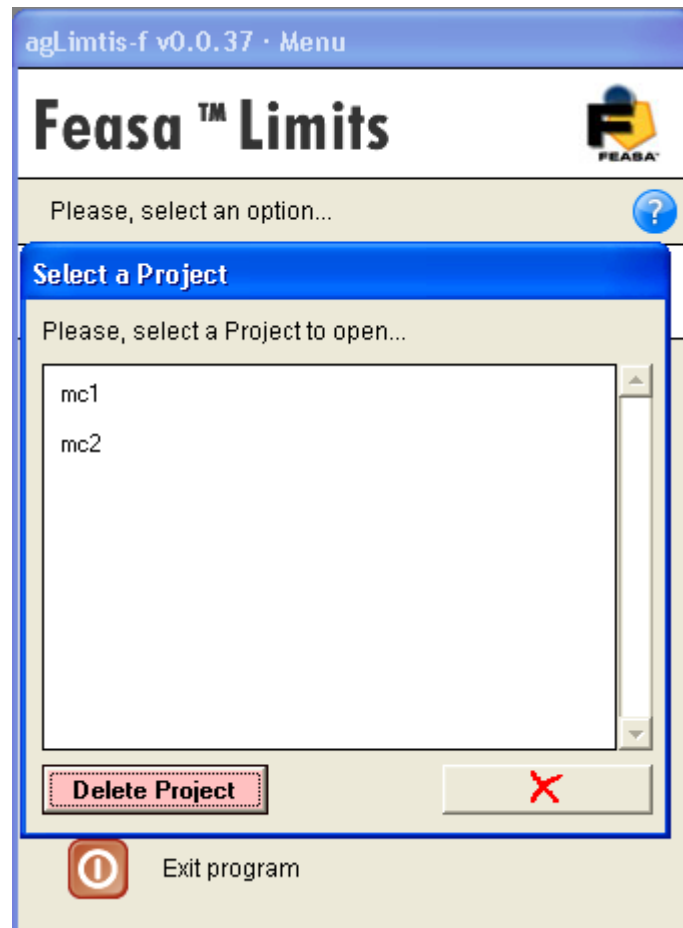


Figure 2

Figure 2 shows two saved projects *mc1* and *mc2*. To open a project click on the name and the project will be opened. To delete a project click on the Delete Project icon and the colour will change to red. Then click on the project name to be deleted and click yes to confirm.

[Back to Index](#)

FeasaLimits User Guide



Hardware Settings

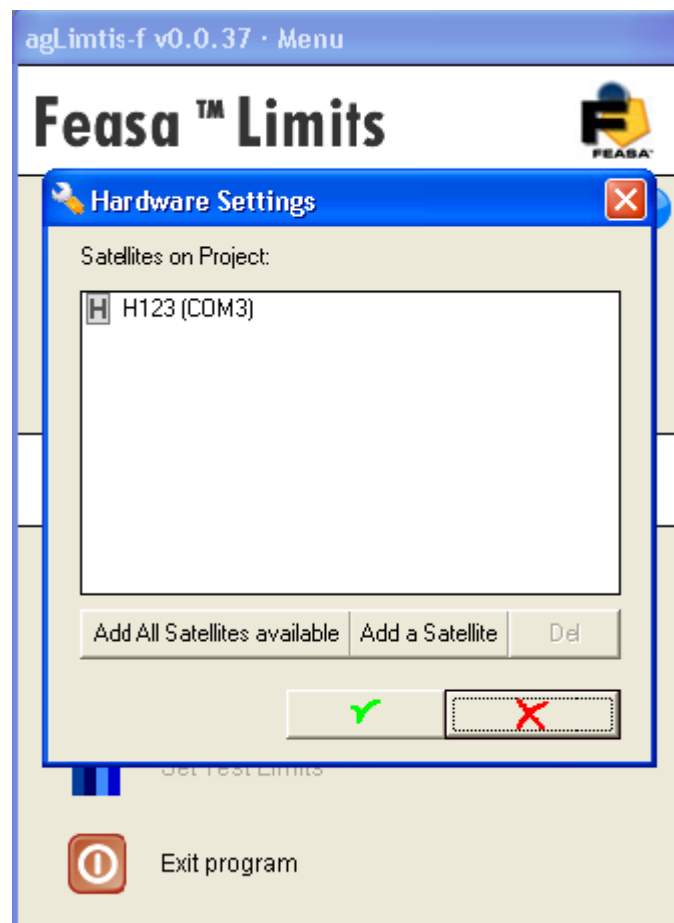


Figure 3

When creating a new project and after entering the project name a *Hardware Settings* screen similar to Figure 3 will be displayed. In this example a single Hub with Serial Number H123 has been detected on Communications port COM3.

[Back to Index](#)

FeasaLimits User Guide

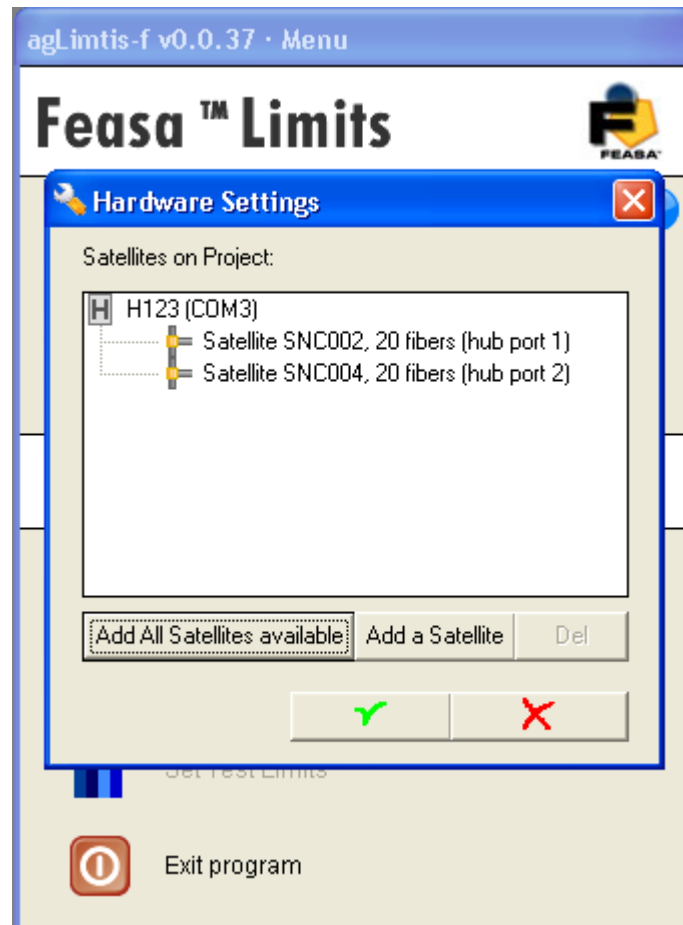


Figure 4

A click on the *Add All Satellites available* icon will cause the Hub to detect all Satellite LED Analysers connected to the Hub and a list will appear in the Dialog Box.

Figure 4 shows an example where two Satellites were detected giving a total of 40 Fiber channels. Individual Satellites can also be added by clicking on the *Add a Satellite* icon.

[Back to Index](#)

FeasaLimits User Guide



Verify analysers

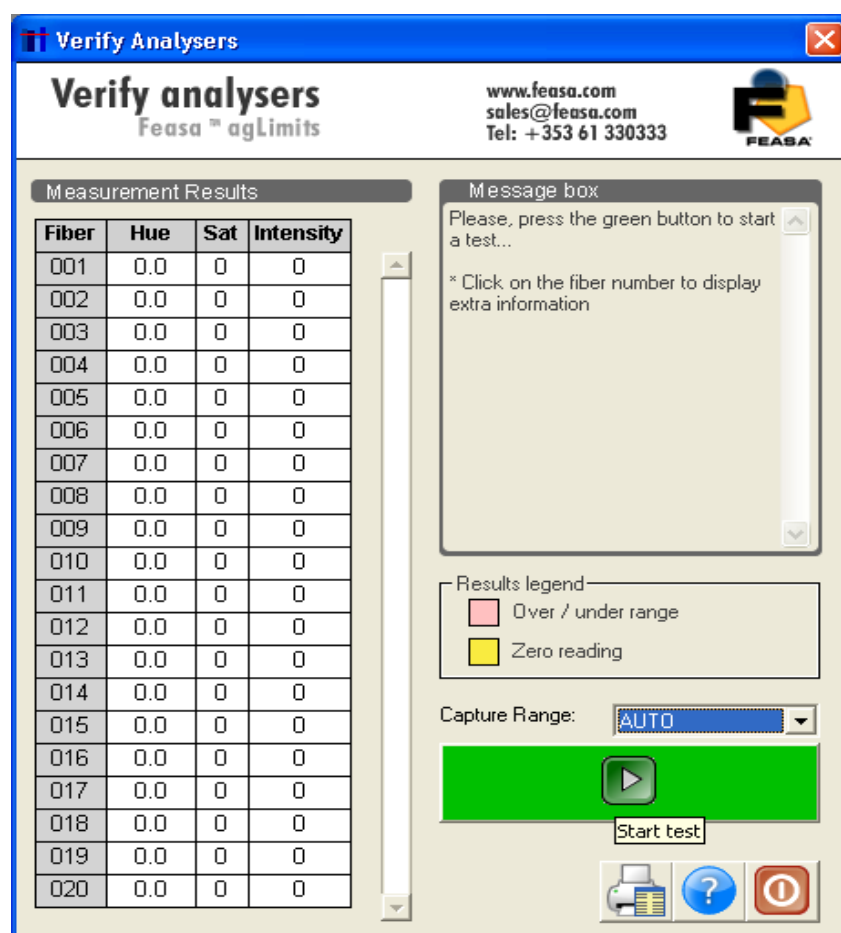


Figure 5

Clicking on the *Verify analysers* icon brings up the screen shown in Figure 5. This function is used to verify that all LED Analysers are working correctly and that all Fiber Channels are reading valid data. The Auto Capture Range is the default setting – other Capture Ranges can be selected if desired. The LED's must be turned on before this function is executed. The function is executed by clicking on the Green icon. Errors will be displayed in the Message Box and highlighted as shown in Figure 6.

[Back to Index](#)

FeasaLimits User Guide

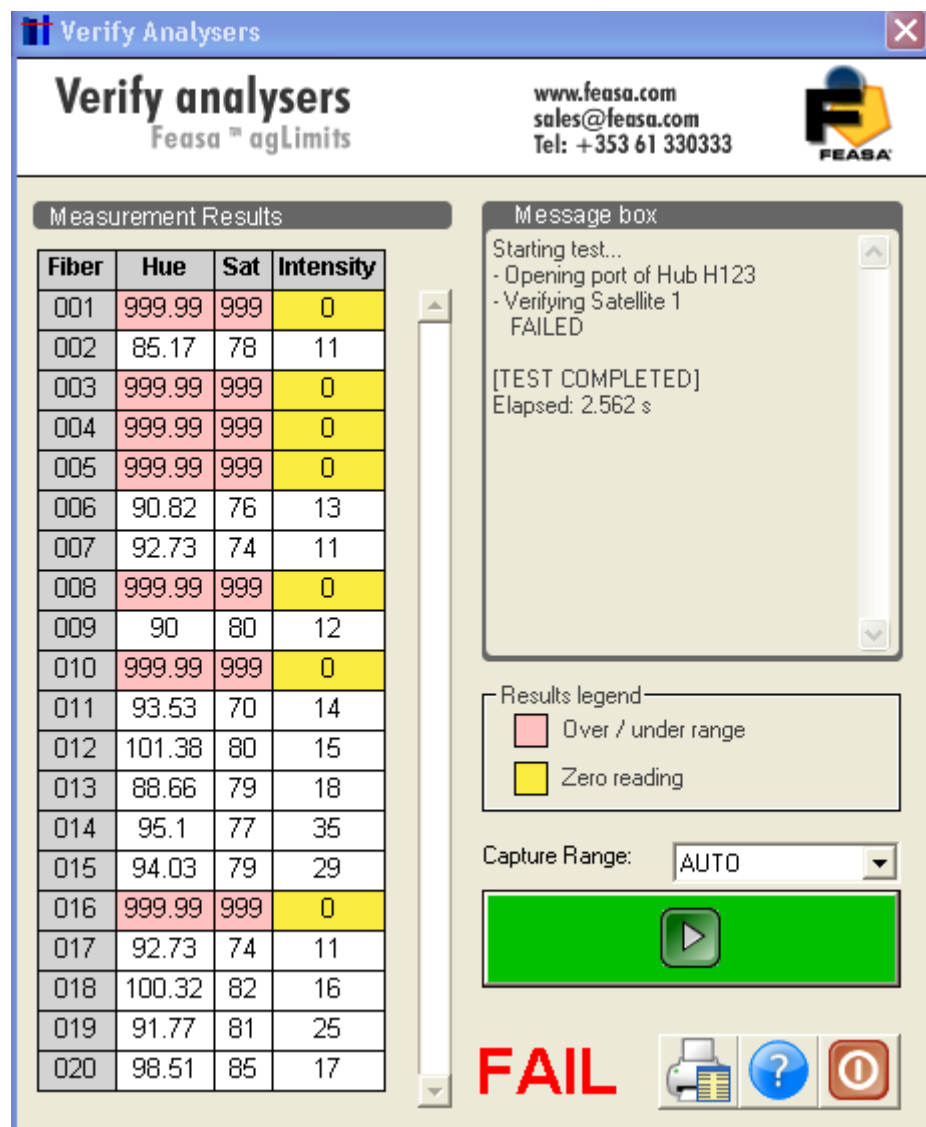


Figure 6

In this example Fiber channels 001, 003, 004, 005, 008, 010 and 016 are failing because there is insufficient light being received by the Analyser.

All errors should be fixed before proceeding to the next stages.

[Back to Index](#)

FeasaLimits User Guide

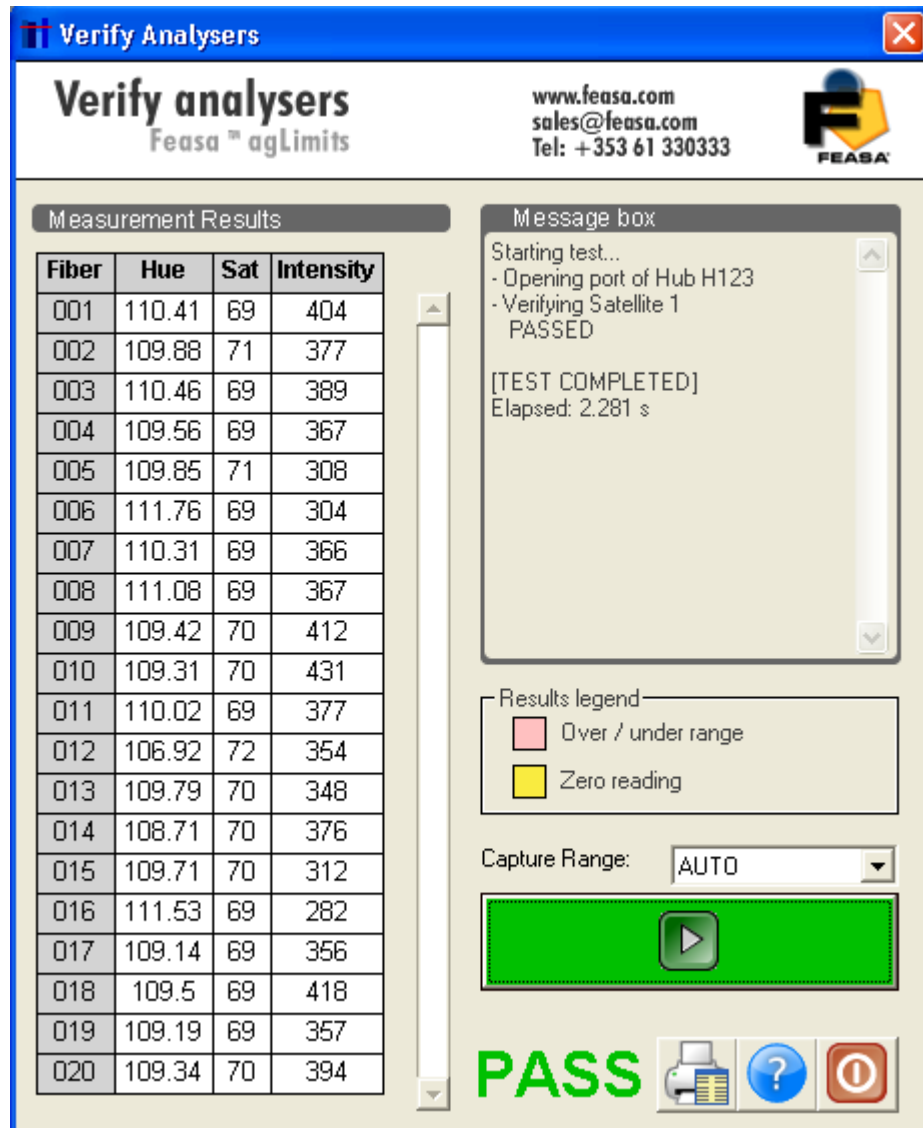


Figure 7

Figure 7 shows a result of a Pass when the Verify analysers is executed. The Message Box identifies the Hub that is connected and that the test has passed. Also shown is the time taken to complete this test.

[Back to Index](#)

FeasaLimits User Guide



Balance Intensity and Chromaticity



Figure 8

After the Hardware has been verified the next step is to balance the Intensity and xy Chromaticity, if required. Usually, xy Chromaticity applies to White LED's. The Intensity balancing nullifies any effects due to the Fixture. A Known Good Board is required for best results. To balance the Intensity, click on the User Gains icon and this will start the external *User Gains* program. Click on the *xy Offsets* icon to start the external xy balancing program.

To find out more about either of these programs see the separate documentation for these programs.

The next step is to *Set Test Limits* by clicking on the icon. The screen shown in Figure 9 will be presented.

[Back to Index](#)

FeasaLimits User Guide



Set Test Limits

Glob#	Board	Designator	Hue Min	Hue Max	Sat Min	Sat Max	Int Min	Int Max	x Min	x Max	y Min	y Max	V/I Min	V/I Max	CCT Min	CCT Max	d Min	d Max	Range
☒	001	1	1		0	0	0	0	0	0	0	0	0	0	0	0	-0.075	-0.075	MEDIUM
☒	002	1	2		0	0	0	0	0	0	0	0	0	0	0	0	-0.075	-0.075	MEDIUM
☒	003	1	3		0	0	0	0	0	0	0	0	0	0	0	0	-0.075	-0.075	MEDIUM
☒	004	1	4		0	0	0	0	0	0	0	0	0	0	0	0	-0.075	-0.075	MEDIUM
☒	005	1	5		0	0	0	0	0	0	0	0	0	0	0	0	-0.075	-0.075	MEDIUM
☒	006	1	6		0	0	0	0	0	0	0	0	0	0	0	0	-0.075	-0.075	MEDIUM
☒	007	1	7		0	0	0	0	0	0	0	0	0	0	0	0	-0.075	-0.075	MEDIUM
☒	008	1	8		0	0	0	0	0	0	0	0	0	0	0	0	-0.075	-0.075	MEDIUM
☒	009	1	9		0	0	0	0	0	0	0	0	0	0	0	0	-0.075	-0.075	MEDIUM
☒	010	1	10		0	0	0	0	0	0	0	0	0	0	0	0	-0.075	-0.075	MEDIUM
☒	011	1	11		0	0	0	0	0	0	0	0	0	0	0	0	-0.075	-0.075	MEDIUM
☒	012	1	12		0	0	0	0	0	0	0	0	0	0	0	0	-0.075	-0.075	MEDIUM
☒	013	1	13		0	0	0	0	0	0	0	0	0	0	0	0	-0.075	-0.075	MEDIUM
☒	014	1	14		0	0	0	0	0	0	0	0	0	0	0	0	-0.075	-0.075	MEDIUM
☒	015	1	15		0	0	0	0	0	0	0	0	0	0	0	0	-0.075	-0.075	MEDIUM
☒	016	1	16		0	0	0	0	0	0	0	0	0	0	0	0	-0.075	-0.075	MEDIUM
☒	017	1	17		0	0	0	0	0	0	0	0	0	0	0	0	-0.075	-0.075	MEDIUM
☒	018	1	18		0	0	0	0	0	0	0	0	0	0	0	0	-0.075	-0.075	MEDIUM
☒	019	1	19		0	0	0	0	0	0	0	0	0	0	0	0	-0.075	-0.075	MEDIUM
☒	020	1	20		0	0	0	0	0	0	0	0	0	0	0	0	-0.075	-0.075	MEDIUM

Figure 9

This program is used to automatically set Pass/Fail limits by reading values from known good LED's. The fiber numbers are shown in the left column and range from 001 to a maximum of 160. The Tick Box near the fiber number indicates whether the fiber is selected or deselected for learning and testing functions. Each value to be tested has a Minimum limit and a Maximum limit assigned to it. These values can be learned automatically or manually set by typing values in the appropriate box.

The next section of this manual describe each of the available functions in more detail.

[Back to Index](#)

FeasaLimits User Guide



Enable Limits

When *Enable Limits* icon is clicked the screen shown in Figure 10 is displayed.

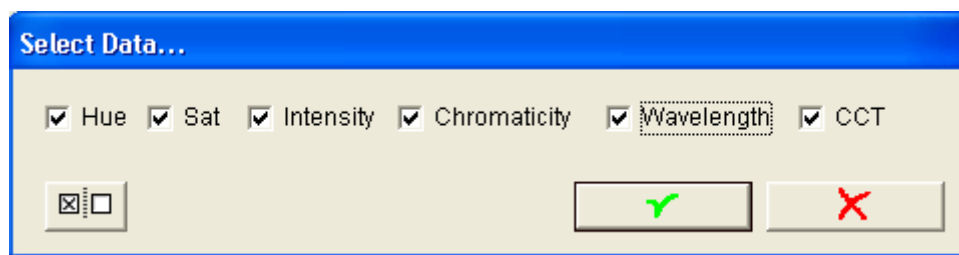


Figure 10

These are the Colour and Intensity options that can be enabled or disabled.

The default is that all values are enabled. Clicking on the Tick Box will disable the test. For Coloured LED's (Red, Green, Blue, etc) select Hue, Saturation, Intensity and Wavelength. For White LED's select Saturation, Intensity, Chromaticity and CCT.

The more Tests that are selected the greater the overall Test Time. If Test time is critical then select Intensity and one other parameter.

[Back to Index](#)

FeasaLimits User Guide



Calculate Limits

When *Calculate Limits* icon is clicked the screen shown in Figure 11 is displayed.

A screenshot of the 'Autoset Limits' dialog box. It has a blue title bar and a light beige background. The text inside explains that these tolerances are used to generate test limits for each selected fiber and can be adjusted before use. It lists various color and intensity tolerances with input boxes and units. At the bottom are buttons for 'Reset to default', 'Save as default', and two buttons with a green checkmark and a red X.

Autoset Limits

These tolerances are used to automatically generate the test limits for each selected fiber. The tolerances can be adjusted before use. Click on (Tick) button to accept or (X) button to cancel this operation.

TOLERANCES

Hue (0 to 10):	1	digits	Sat:	10	digits
Hue (10 to 20):	3	digits	Intensity:	15	%
Hue (20 to 40):	5	digits	x:	0.1	digits
Hue (40 to 118):	12	digits	y:	0.1	digits
Hue (118 to 122):	1	digits	Wavelength:	10	digits
Hue (122 to 233):	5	digits	CCT:	5	%
Hue (233 to 240):	2	digits	CCT delta:	0.01	digits
Hue (240 to 360):	5	digits			

Figure 11

This Dialog Box allows the User to specify the tolerances for Colour and Intensity tests. These values are used to generate the Minimum and Maximum limits for the tests described later in this manual. The default values are shown but these can be changed by typing in the appropriate box. These tolerances can be saved as a default so that they can be used in different Projects.

[Back to Index](#)

FeasaLimits User Guide

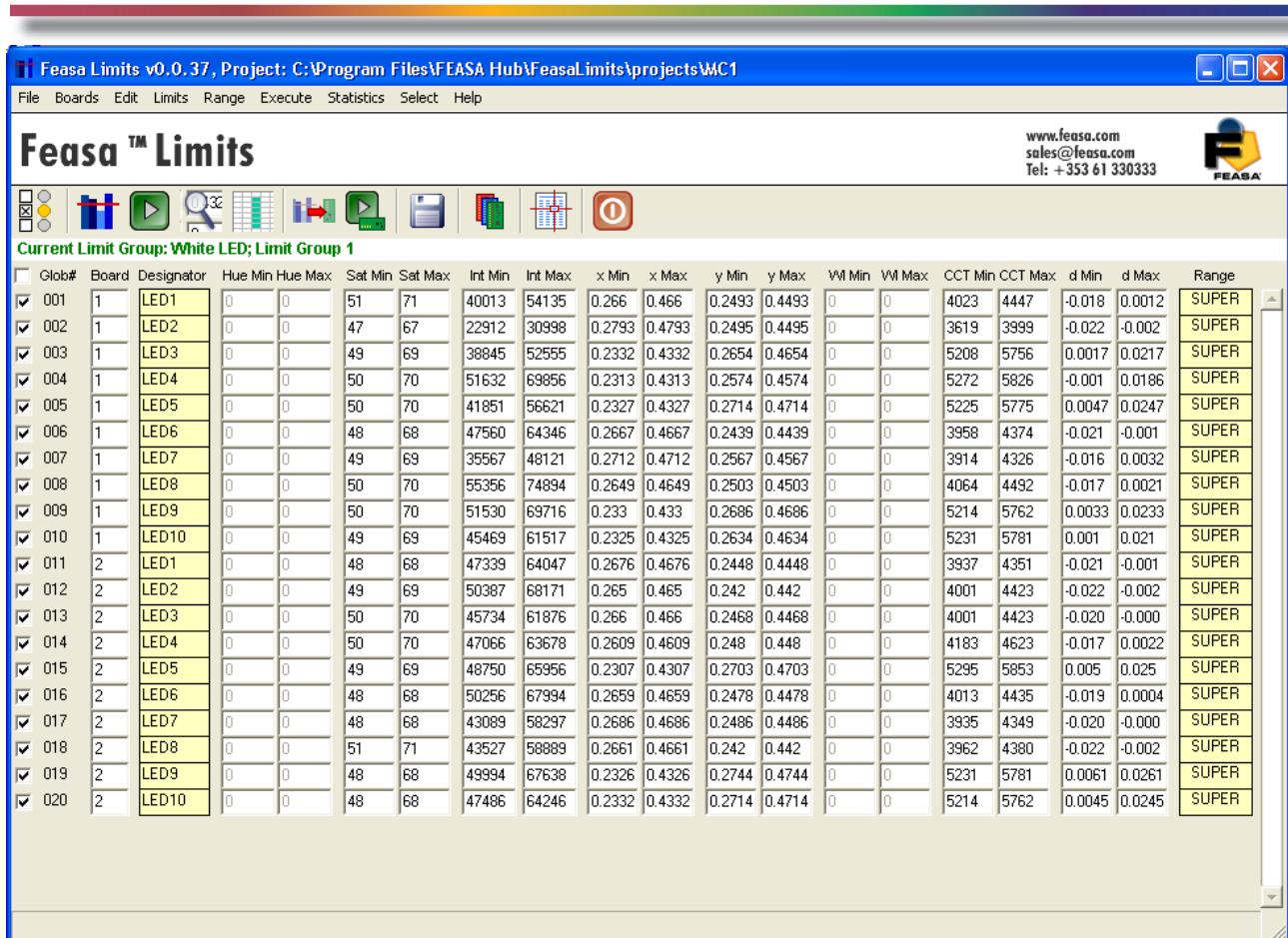


Figure 12

After the limits have been learned a screen similar to that shown in Figure 12 will be displayed. In this example the Hue and Wavelength are not tested. Also notice that the range selected is Super to avoid saturating the Analyser.

The fiber numbers are shown on the left and the Tick Boxes are all selected indicating that all fibers are tested. The next column is called 'Board' indicating the number of the board that the fiber numbers are assigned. In this example there are two boards in a panel where fibers 001 - 010 are assigned to Board 1 and fibers 011 - 020 are assigned to Board 2. The 'Designator' column allows a Component Name to be assigned to each fiber channel. The remaining columns display the calculated minimum and maximum limits for each test. The greyed out columns identify those tests that are not executed.

[Back to Index](#)

FeasaLimits User Guide



Test LED's Pre-Save Mode

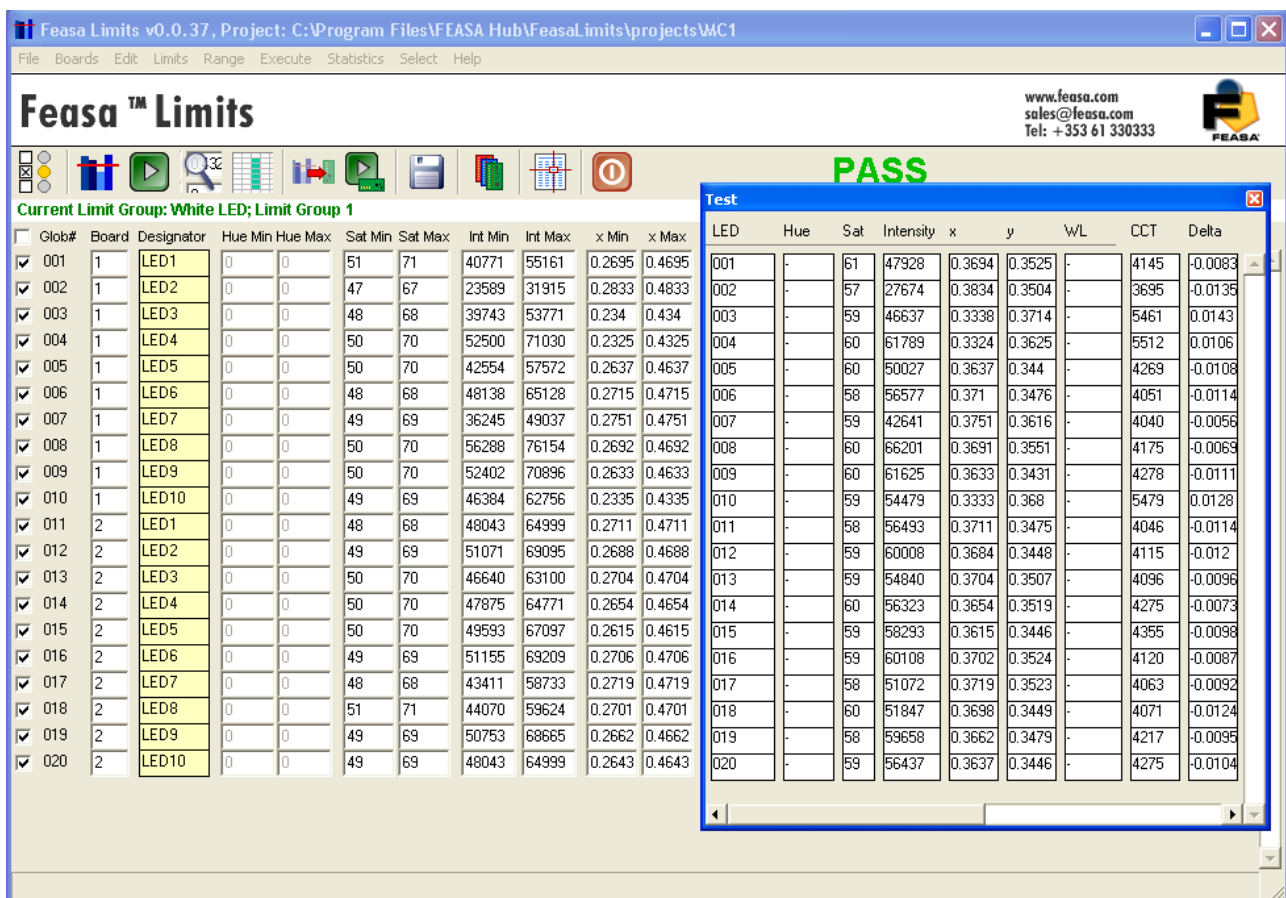


Figure 13

Clicking the Left Green Icon will cause the Analyser to test the LED's against the limits previously learned. Note that these limits are still in the memory of the computer and have not been transferred to the LED Analysers.

Figure 13 shows a sample display of the results. In this example the test has passed and a Green PASS is displayed. Also, a second display box is generated showing the results of the test.

[Back to Index](#)

FeasaLimits User Guide

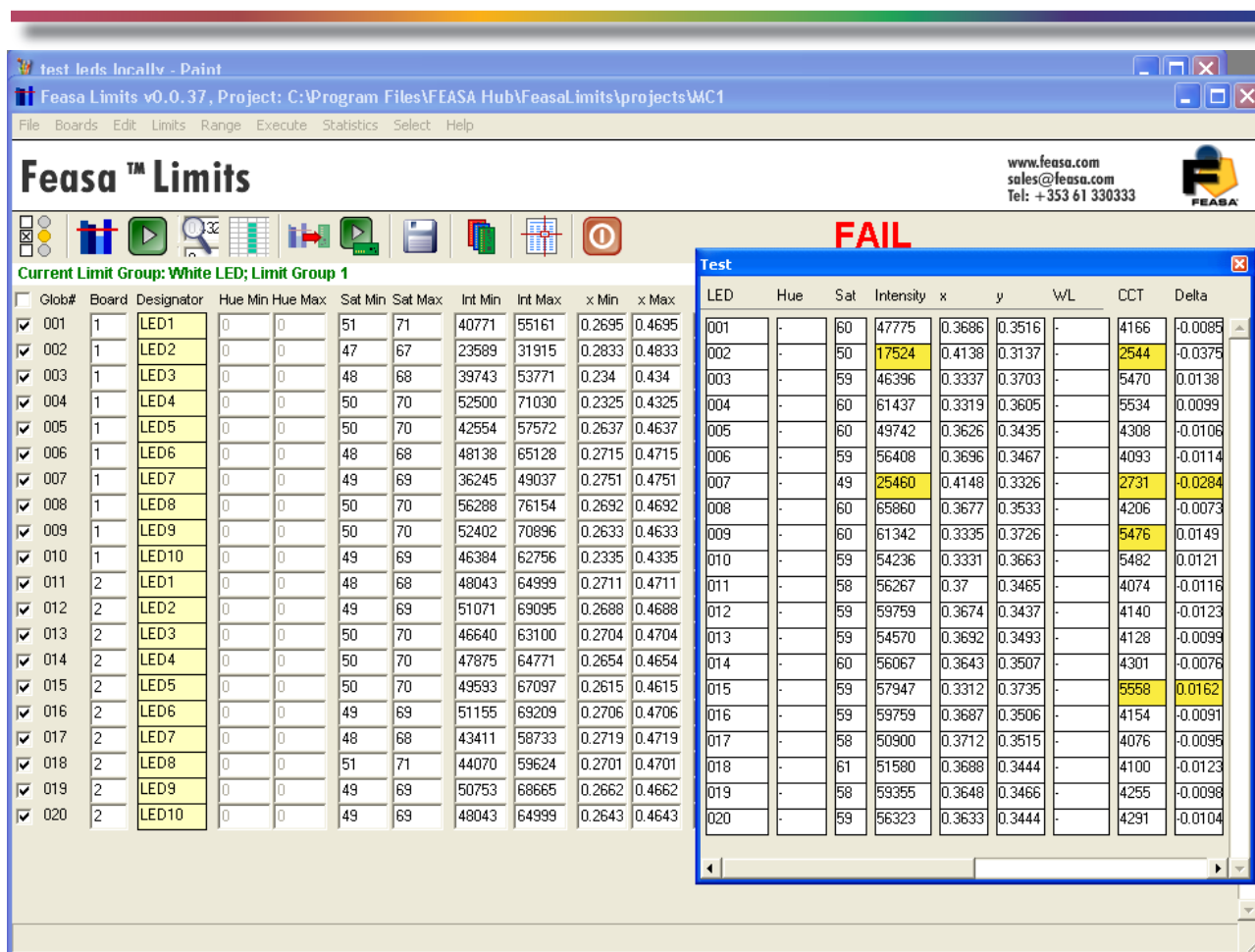


Figure 14

In Figure 14 some failures are shown and are identified by the yellow background. In this example the Intensity and CCT has failed for some LED's.

These failures must be resolved before transferring the limits to the Analysers.

[Back to Index](#)

FeasaLimits User Guide



Debug a Fiber

A screenshot of the 'Debug' window in the FeasaLimits software. The window has a blue title bar with a magnifying glass icon and the word 'Debug'. Below the title bar, it says 'Board: 1, LED: LED7, Fiber: 7'. The main area contains a table with columns 'Min', 'Actual', 'Max', and 'Enable'. The rows are 'Hue', 'Sat', 'Int', 'x', 'y', 'WL', 'CCT', and 'delta'. The 'Actual' column shows values like 59, 40828, 0.3696, etc. The 'Enable' column has checkboxes, some of which are checked. To the right of the table, there is a 'Test Range:' dropdown set to 'SUPER', a large green 'PASS' text, a green play button icon, and a 'Go to fiber...' dropdown set to '7'. At the bottom, there are buttons for '- Copy to Grid -', 'Next Fiber >', and a red 'X' button.

Figure 15

This function allows the user to debug one fiber (LED) at a time. The fiber number is selected from the drop-down box. Clicking on the Green Icon will run the test and the results will be displayed on the screen. Tests can be enabled or disabled by checking the tick boxes.

The range can be selected from the drop-down box at the top right. The limits can be modified by clicking in the appropriate box and typing in the values.

When satisfied with the results the limits can be copied to the main screen by clicking on the *Copy to Grid* button.

[Back to Index](#)

FeasaLimits User Guide



Set Limits Manually

The following values will be copied to the selected fibers

Hue Min	Hue Max	Sat Min	Sat Max	Int Min	Int Max	x Min	x Max	y Min	y Max	WVL Min	WVL Max	CCT Min	CCT Max	d Min	d Max
0	0	48	71	45348	61803	0.2304	0.4687	0.2432	0.4727	0	0	3545	6427	-0.021	0.0255
Current Min:	-	48	68	45348	61352	0.2304	0.4304	0.2432	0.4432	-	-	3545	4797	-0.0219	-0.0019
Current Max:	-	51	71	45681	61803	0.2687	0.4687	0.2727	0.4727	-	-	4751	6427	0.0055	0.0255
Current Avg:	-	49.5	69.5	45548	61624	0.2473	0.4473	0.2577	0.4577	-	-	4195	5676	-0.0076	0.0124

☒ Hue ☒ Sat ☒ Intensity ☒ Chromaticity ☒ Wavelength ☒ CCT + delta

Figure 16

This function allows all the limits to be set to the same values. Generally LED's will have differences in Colour and Intensity even for the same Part Number. When the limits are learned from the measured values is it desirable to set global limits for all similar LED's to avoid the problem of false failures occurring.

The display in Figure 16 shows the current minimum and maximum limits calculated from the LED's under test. Note that only selected LED's (via the tick-box) are considered for this function.

The user can also enter values by typing in the appropriate box.

Clicking on the Green button will apply these values to the selected fibers.

[Back to Index](#)

FeasaLimits User Guide



Transfer values to Analysers

Clicking on this Icon will cause all the limits that have been calculated to be transferred to the Analysers. Only values that have the tick-box checked on the left side of the screen will be transferred. Fibers that have their tick-boxes unchecked will not be modified.

Once the limits have been transferred to the Analysers, these limits are stored in non-volatile memory on the Analysers. When Power is removed these limits are not lost.

Note that the limits that have been transferred are stored under the current Limit Group. By default, the first group, Limit Group 1, is selected when a new project is started.

The Analysers can store up to 99 different Limit Groups. See Page 25 for more information on Limit Groups.

[Back to Index](#)

FeasaLimits User Guide



Remote Test Limits on Analysers

After the limits have been transferred to the Analysers the LED's can be tested automatically by the Legend. Clicking on the Remote Test Icon will cause the command *Capturetest* to be sent to the Hub. This will initiate a Test Cycle whereby the Analysers will capture the LED light for all selected fibers and check the values against the stored limits.

The result of the test can be seen in the Result Window.

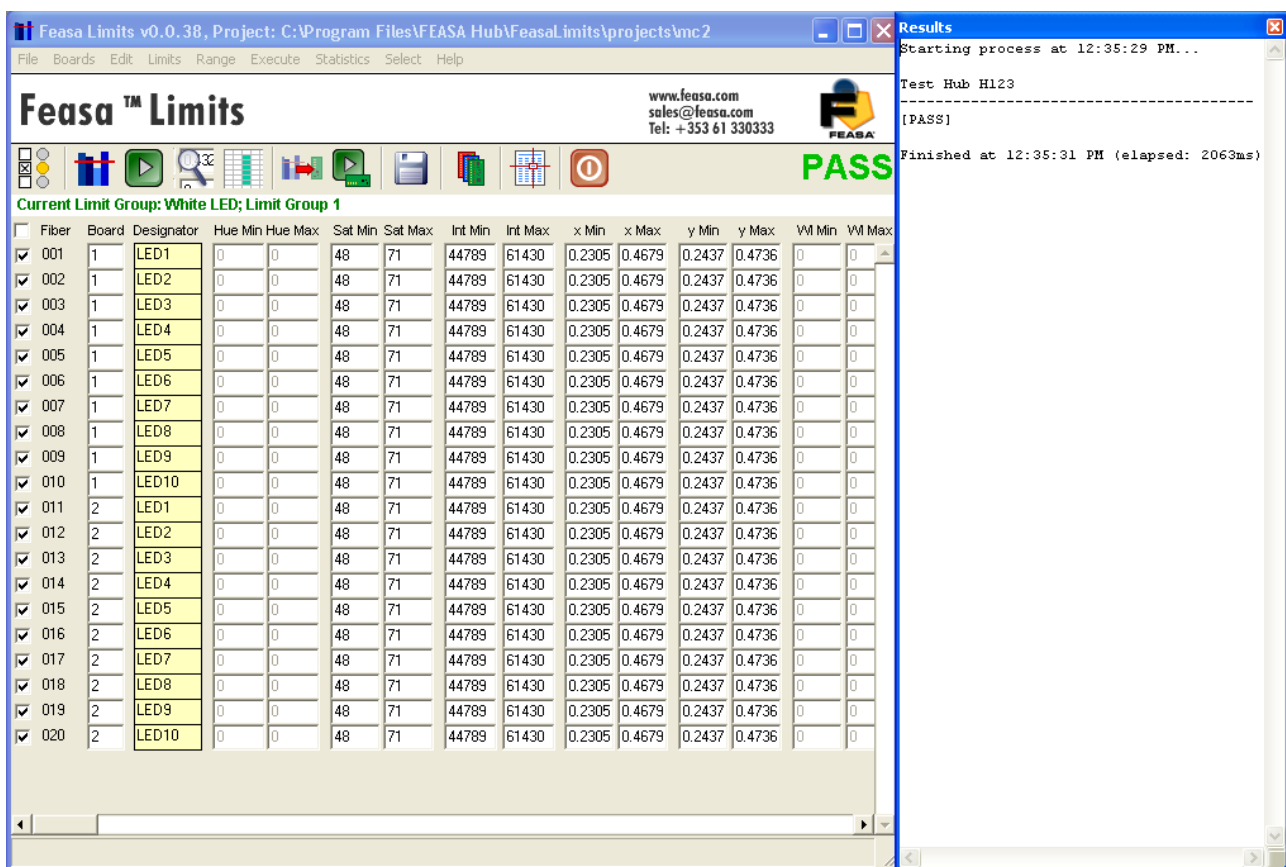


Figure 17

The Results window in Figure 17 shows the test has passed.

[Back to Index](#)

FeasaLimits User Guide

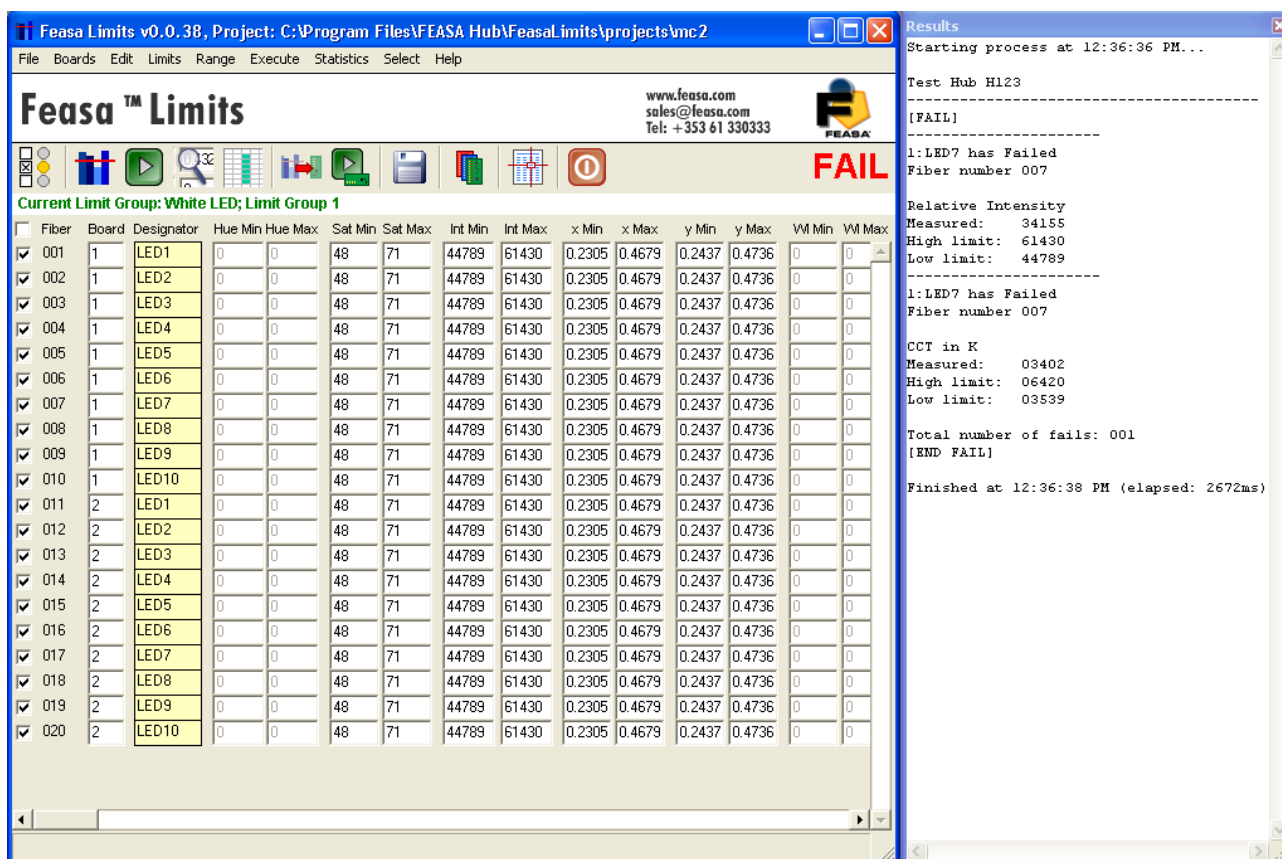


Figure 18

Figure 18 shows an example of a test that has failed.

[Back to Index](#)

FeasaLimits User Guide



Save the Project

To save a Project click on the save icon. The limits and settings for the project will be stored in a new folder with the same name as the project. The folder can be found under *Feasalimits/Projects/Project Name* on the hard drive of the computer.

[Back to Index](#)

FeasaLimits User Guide



Set Limit Group

This function allows up to 99 Limit groups to be programmed. A limit group is a set of learned Minimum and Maximum values. Only one limit group can be selected at a time. When the *Feasalimits* program is started for the first time the default limit group is set to 01.

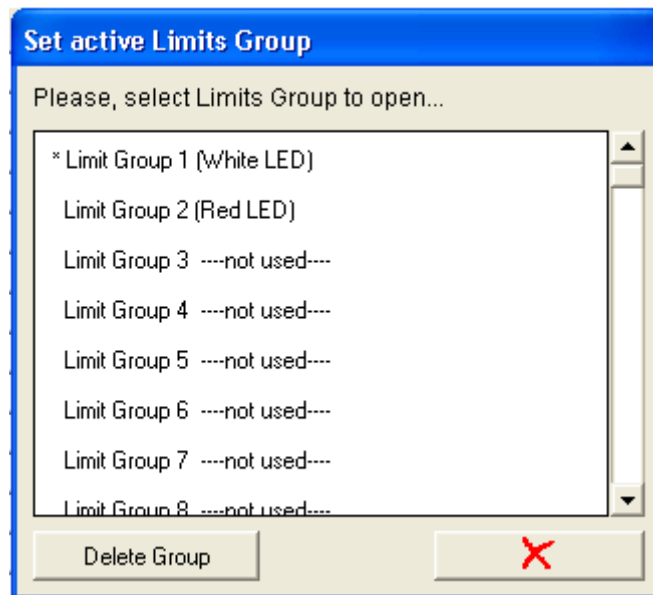


Figure 19

The screen shown in Figure 19 is displayed when the *Select Limit Group* Icon is selected. In this example the first two limit groups have been programmed.

To create a new Limit Group, click on the next (not used) group and enter a name for this group when prompted and click OK. See Figure 20.

[Back to Index](#)

FeasaLimits User Guide

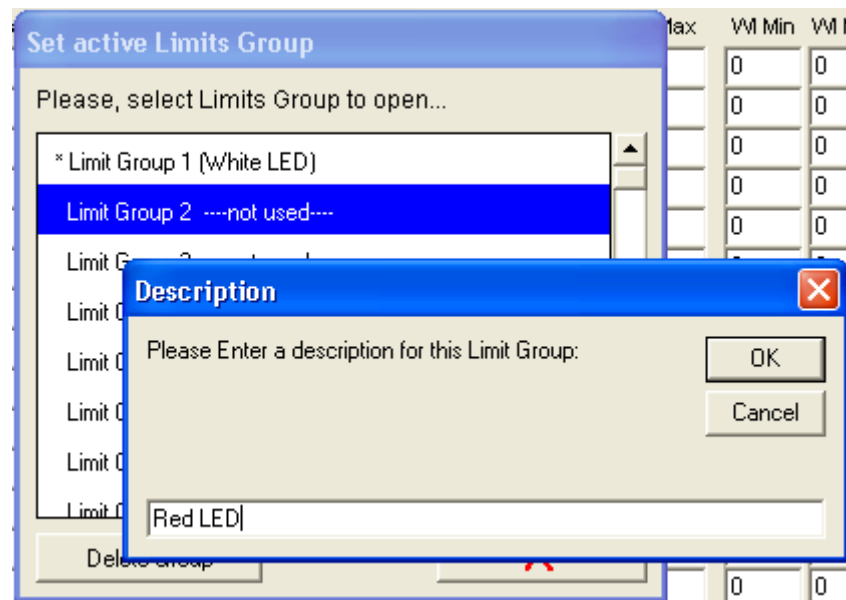


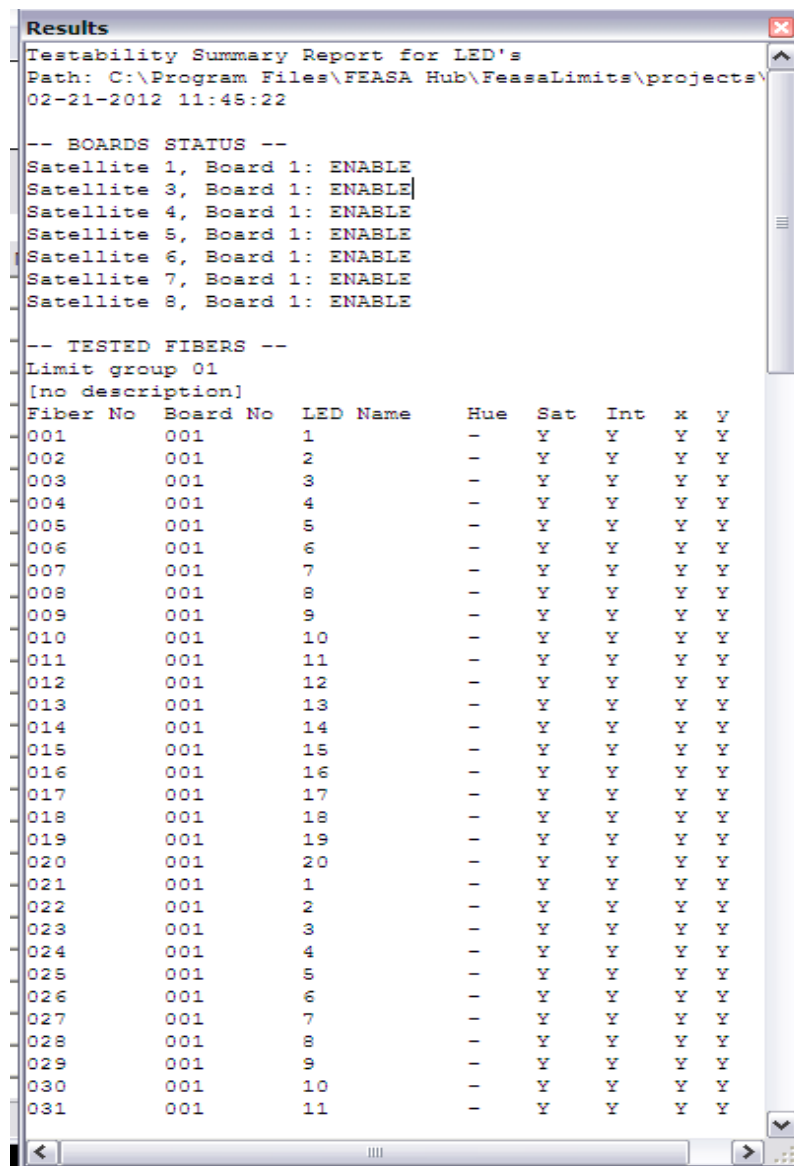
Figure 20

[Back to Index](#)

FeasaLimits User Guide



Generate Testability Report



The screenshot shows a window titled "Results" containing a "Testability Summary Report for LED's". The report includes the path "C:\Program Files\FEASA Hub\FeasaLimits\projects\" and the date/time "02-21-2012 11:45:22". It lists the status of boards (all ENABLE) and a table of tested fibers. The table has columns for Fiber No, Board No, LED Name, Hue, Sat, Int, x, and y. The data shows 31 fibers tested, all with Hue "-", Sat "Y", Int "Y", and x/y coordinates of "Y Y".

Fiber No	Board No	LED Name	Hue	Sat	Int	x	y
001	001	1	-	Y	Y	Y	Y
002	001	2	-	Y	Y	Y	Y
003	001	3	-	Y	Y	Y	Y
004	001	4	-	Y	Y	Y	Y
005	001	5	-	Y	Y	Y	Y
006	001	6	-	Y	Y	Y	Y
007	001	7	-	Y	Y	Y	Y
008	001	8	-	Y	Y	Y	Y
009	001	9	-	Y	Y	Y	Y
010	001	10	-	Y	Y	Y	Y
011	001	11	-	Y	Y	Y	Y
012	001	12	-	Y	Y	Y	Y
013	001	13	-	Y	Y	Y	Y
014	001	14	-	Y	Y	Y	Y
015	001	15	-	Y	Y	Y	Y
016	001	16	-	Y	Y	Y	Y
017	001	17	-	Y	Y	Y	Y
018	001	18	-	Y	Y	Y	Y
019	001	19	-	Y	Y	Y	Y
020	001	20	-	Y	Y	Y	Y
021	001	1	-	Y	Y	Y	Y
022	001	2	-	Y	Y	Y	Y
023	001	3	-	Y	Y	Y	Y
024	001	4	-	Y	Y	Y	Y
025	001	5	-	Y	Y	Y	Y
026	001	6	-	Y	Y	Y	Y
027	001	7	-	Y	Y	Y	Y
028	001	8	-	Y	Y	Y	Y
029	001	9	-	Y	Y	Y	Y
030	001	10	-	Y	Y	Y	Y
031	001	11	-	Y	Y	Y	Y

Figure 21

[Back to Index](#)

FeasaLimits User Guide



This function is used to generate a summary listing of the testability status of the current project. Figure 21 illustrates a typical output from this function.

The fiber numbers are listed in the column on the left side of the screen. A **Y** on the same row as the fiber number indicates that a test is performed. In this example Hue is not tested and this is indicated by the character - .

[Back to Index](#)