

Agilent Medalist SP50

SP50 Manual Version 3.1.6, December 2008



Agilent Technologies

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Release Notes

SP50 Software

Version

Version 3.1.6, December 2008

Printed in Malaysia

Agilent Technologies Microwave Products (Malaysia) Sdn. Bhd. Bayan Lepas Free Industrial Zone 11900 Penang, Malaysia

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Contents

Contents i

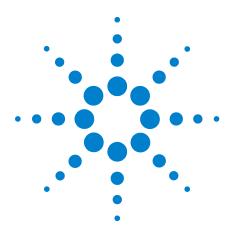
1 Legal Information

Legal Information 2 Warranty 2 Technology Licenses 2 Restricted Rights Legend 2 Service And Support 3 Agilent On The Web 3 Agilent By Phone 3

2 Version 3.1.6 Release Notes

Overview of Ease of Calibration 2 **Overview of Ease of Programming** 3 Improve Small Deposit Measurement 3 **Copper Thickness** 4 **Defect Prioritization on the SP50 Inspection Report** 4 Display Min, Max, Mean, ± 3 Sigma values to Area, Volume & Height Chart on Result Views 4 **ART to Display Paste Limits** 4 Using Barcode to Trigger AWA 5 Improvement in Z-Axis Compensation 5 Added Information on Run Summary in Operator GUI 5 Ease of Calibration 6 GUI: Tools - Laser Setup 7 New GUI for Laser Setup 8 Graphical User Interface (GUI) 8 Laser Calibration Steps and Passing Criteria 9 Automatic Z-Axis Homing 10 Laser Position in WOI 12 Laser Setup Window 13 **Existing Laser Setup Window** 13 New Laser Setup Window 14 **Calibration Result Window** 17 **Existing Calibration Result Window** 17 **New Calibration Result Window** 19

Ease of Programming 2
Database Management3Manage Existing3Inspect All4Single Algorithm Type5Global Paste6Device Editor Log File7
Improve Small Deposit Measurement 8 Improvement on A,H & V Measurement 8 Setting Up Report Peak Height 9
Copper Thickness 10
Using ImageJ 11
Defect Prioritization on the SP50 Inspection Report 12
Display Min, Max, Mean, ± 3 Sigma values to Area, Volume & Height Chart on Result Views 14
ART to Display Paste Limits 15
Using Barcode to Trigger AWA 16 16 Steps to Setup Barcode Triggers AWA 16
PLC Reset Procedure 24
Improvement on Z-Axis Compensation 25 Current Z-Axis Compensation 25
Added Information on Run Summary in Operator GUI 27



Agilent SP50 Release Notes Version 3.1.6

1

Legal Information

Warranty 2 Technology Licenses 2 Restricted Rights Legend 2 Service And Support 3 Agilent On The Web 3 Agilent By Phone 3



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	Canada	(877) 894-4414
Americas	Latin America	305 269 7500
	United States	(800) 829-4444
	Australia	1 800 629 485
	China	800 810 0189
	Hong Kong	800 938 693
	India	1 800 112 929
Asia Pacific	Japan	0120 (421) 345
Asia Pacific	Korea	080 769 0800
	Malaysia	1 800 888 848
	Singapore	1 800 375 8100
	Taiwan	0800 047 866
	Thailand	1 800 226 008
	Austria	01 36027 71571
Europe & Middle East	Belgium	32 (0) 2 404 93 40
	Denmark	45 70 13 15 15

Table 1-1 Agilent Call Centers and Regional Headquarters

	Finland	358 (0) 10 855 2100
	France	0825 010 700* *0.125 €/minute
	Germany	07031 464 6333** **0.14 €/minute
	Ireland	1890 924 204
Europe & Middle East	Israel	972-3-9288-504/544
	Italy	39 02 92 60 8484
	Netherlands	31 (0) 20 547 2111
	Spain	34 (91) 631 3300
	Sweden	0200-88 22 55
	Switzerland	0800 80 53 53
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Agilent SP50 Release Notes Version 3.1.6

Version 3.1.6 Release Notes

Overview of Ease of Calibration 2-2 Overview of Ease of Programming 2-3 Ease of Calibration 2-6 New GUI for Laser Setup 2-8 Laser Setup Window 2-13 Calibration Result Window 2-17



Overview of Ease of Calibration

Users often encounter difficulties in performing laser calibration steps which may result in "Bad Calibration" during the calibration testing.

Common mistakes and problems faced by users during laser calibration are:

- The laser is not at the HOME position while performing laser setup.
- Users forget to clamp the board and start calibrating the laser.
- Laser is not in the correct position within the WOI.
- Users do not refer to the user manual to obtain the passing criteria for laser setup (centroids, laser width).
- Users forget to home the Z-Axis after completing the laser setup.
- When a bad calibration occurs, error details are not displayed to the user. Users will not be able to identify the errors properly.

For this release, three areas have been identified whereby improvements will be made to the software to further assist users in performing proper laser calibrations:

- New GUI: Tools Laser Setup
- New Laser Setup Window
- New Calibration Result Window

Overview of Ease of Programming

Updates and enhancements included in the software (version 3.1.6) assists the user in setting up the program. The enhancements include:

- Ability to inspect all deposit of single algorithm type and get summarized inspection results by algorithm type.
- Run 5.15 sigma repeatability tests on deposits of an algorithm type as guidance to set best thresholds.
- Algorithm (Device) Editor will automatically log changes made to database file at CPI's log directory.
- New Database Management window allows user to backup database file and delete database file from GUI.

Improve Small Deposit Measurement

The current software has difficulty reporting H, A and V within the expected range for small deposits. The reasons for this are

- Regularly it is seen that small deposits print in an approximately conical shape.
- For a conical deposit the systems default/recommended setting for the user defined parameter, Paste Threshold, is not correct.
- Existing software reports the average height. The user requires a height result that is in accordance with the stencil height.

Enhancement included in the improved software:

- Software changes allow the user to reduce the Paste Threshold to the minimum possible value to achieve an accurate A and V measurement while Reported Height is calculated from the peak height region only.
- Peak Height is a user defined percentage (specified in the InspUnitConfig.XML) of the pixels that correspond to paste. This feature may be turned on/off per deposit type in the algorithm editor.
- Paste Volume is calculated from Area and Average Height as in previous versions of software.

Copper Thickness

The copper thickness can be measures from a scan image and entered into the system to compensate for height and volume exaggeration.

Example:

Copper thickness = (Pad Gray Level – Background Gray Level) * H/G Ratio

Copper thickness = $(76 - 68) * 3.5 = 28 \mu m$

Defect Prioritization on the SP50 Inspection Report

- All the defect items for a deposit will be list at the end of the deposit result line and will only list one fail item according to the preset defect priority.
- There will be an interface for the user to select the defect priority and those setting will be saved in the InspUnitConfig.XML.

Display Min, Max, Mean, \pm 3 Sigma values to Area, Volume & Height Chart on Result Views

After an inspection is completed, the result view on the Engineer level displays

- Min values to the charts for Height, Area and Volume.
- Max .values to the charts for Height, Area and Volume.
- ±3 sigma values to the charts for Height, Area and Volume.

ART to Display Paste Limits

After an inspection is completed, the ART displays

- Value of the height, area, volume, x and y offset of the fail deposit.
- Min and Max values of the height, area, volume, x and y offset.
- Based on these measurements the operator can easily say false call.

Using Barcode to Trigger AWA

This is a feature that used barcode to trigger the AWA.

When a barcode is read by the machine it tries to find a match in the barcode_list.txt file, if no match is found the system does nothing. If a match is found the software then tries to get the board's width from the corresponding .plx (or .pls) file. If a width is found the system will try to change the conveyor's width, but it will wait until the machine is empty - there must be no board in the machine.

Improvement in Z-Axis Compensation

For each scan line, an average pixel will be used as the height data for Z-Axis compensation. This new method is now more stable and is seen to behave robustly for the large variation of board surfaces, shapes, geometries, etc.

Added Information on Run Summary in Operator GUI

In the operator GUI (Graphic User Interface), the Run Summary column contains more information on the number of boards tested. The added information:

- · Passed show the number of pass boards by operator
- Failed show the number of fail boards by operator
- FTQ (First Time Quality) show the number of pass boards by the system and operator

Ease of Calibration

User often encounters difficulties in performing laser calibration steps which may be resulted in "Bad Calibration" during the calibration testing.

Following are the commonly found issues and mistakes done by user during the laser calibration process:

- The laser is not at the home position while performing laser setup.
- Users forget to clamp the board and start calibrating the laser.
- Laser is not in the correct position within the WOI.
- Users need to refer to the user manual to get the passing criteria for laser setup (centroids, laser width).
- Users forget to home the Z-Axis after completing the laser setup.
- When a bad calibration occurs, error details are not displayed to the user. Users will not be able to identify the errors properly.

Three areas have been identified which required enhancement from the software to help up user in performing laser calibration:

- GUI: Tools Laser Setup
- Laser Setup Window
- Calibration Result Window

Please refer to the document: **SP50 Laser Setup and Calibration Procedure Rev A**.

GUI: Tools - Laser Setup

Changes on the GUI: Tools - Laser Setup:

- New GUI for Laser Setup
- Laser Calibration Steps and Passing Criteria
- Auto Z-Axis Home
- Laser Position in WOI

New GUI for Laser Setup

Graphical User Interface (GUI)

Tools for Laser Setup

Category: Tools for: Laser Setup	🖡 Tools		×
	Category:	Tools for: Laser Setup	
 Inspection (General) Automatic Bridging Reference Plane Invert Display Reports Repetibility Tests XY Calibration XY Table Laser Setup Camera Lighting Controller Measurement Calibration Visualisation Save Laser WOI Settings Home Z-Axis 	Inspection (General) Automatic Bridging Reference Plane Reports Repeatibility Tests XY Calibration XY Table Camera Lighting Controller Visualisation	Invert Display Redundant butter to be removed in version 3.1.6. Laser Window Height (Pixels): 63 + Laser Position in WOI (Pixels):	

Figure 2-1 Existing GUI

	🎒 Tools		X
	Category:	Tools for: Lase	er Setup
Two new buttons have been added to	Interface Inspection (General) Automatic Bridging Reference Plane Reports Repeatibility Tests XY Calibration XY Table	Laser Integration Time: 505 Laser Window Height (Pixels): 64 Position in WOI (Pixels): 16	 Automatic Integration Time Invert Display This area has been left blank for second laser implementation in the near future.
accommodate laser	Camera	Enter Calibration	Save Laser WOI Settings
	Measurement Calibration Visualisation Digital ID Machine ID	Exit Calibration	Home Z-Axis

New feature: When checked, the integration time will be updated automatically.

Figure 2-2 New GUI

Laser Calibration Steps and Passing Criteria

The following message will be displayed to guide the user in performing the subsequent laser calibration steps. Guidance on getting a good laser setup is shown as well. This will appear after clicking on the "Enter Calibration" button.

🖹 Laser Setup Steps
Laser Calibration Steps:
1. Open the machine hood and turn maintenance key to position 1.
2. Select Clamp Up button.
 Select Automatic Integration Time or manually set the Laser Integration Time until a clear laser line can be seen on the screen. The integration time can be ranged from 4us to 320,000 us.
Passing Criteria:
(A) First, move the laser along the focus axis to the most bottom and slowly move the laser upward. The minimum width of the laser will be recorded. Move the laser to the postition where the minimum width has been achieved by looking at the screen. Repeat this step again when there is a change in Integration Time.
(B) Get GOOD status on Laser Skew by adjusting the goniometer thumb screw clockwise/anti-clockwise.
For details of graphic illustration, please refer to SP50 Hardware Manual under: SP50 Laser Setup and Calibration > Laser System Setup

Figure 2-3 Laser Setup Guide message

NOTE

The "Automatic Integration Time" algorithm can only calculate a GOOD integration time if there is a **Valid Laser Line** present (the laser line stays within the WOI).

Automatic Z-Axis Homing

After clicking on the "Enter Calibration" button, the wizard will home the Z-Axis automatically as shown below.

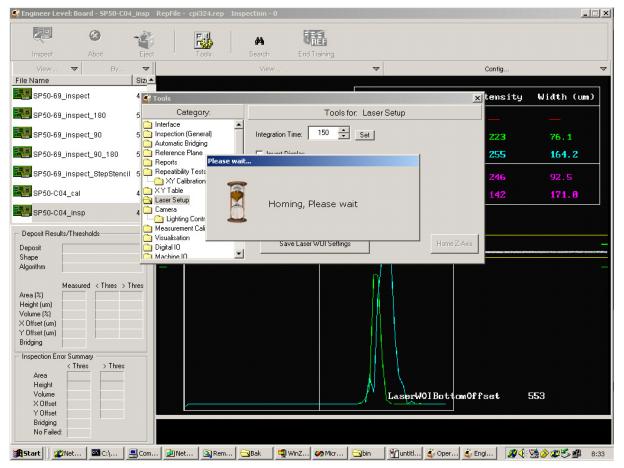


Figure 2-4 Z-Axis Homing Process

After completing the laser calibration, user will click the "Exit Calibration" button. This will again home the Z-Axis automatically and restore the typical value of "Laser Integration Time" if the "Automatic Integration Time" is unchecked. User will be prompted for saving the laser parameters into the "*Paste_3D_Calibration.txt*" file.

🗳 Tools		×
Category:	Tools for: Las	ser Setup
Interface Inspection (General) Automatic Bridging Reference Plane Reports Repeatibility Tests XY Calibration XY Table Aser Setup	Laser Integration Time: 45	Automatic Integration Time
Camera	Enter Calibration	Save Laser WOI Settings
Measurement Calibration Visualisation Digital IO Machine ID	Exit Calibration	Home Z-Axis

Save Laser Paramet	ers 🔀
Do you want to save	the laser parameters?
(West 1)	No
<u> </u>	<u> </u>

Figure 2-5 Laser Integration Time

Laser Position in WOI

The checking that will be done in the Laser Setup Tool is to ensure that the laser is staying within the Laser WOI. If the Laser Position in WOI is > $\frac{1}{2}$ of the Laser Window Height, the following message will pop up when user is trying to save the settings. User is required to continue the saving step or cancel the action.

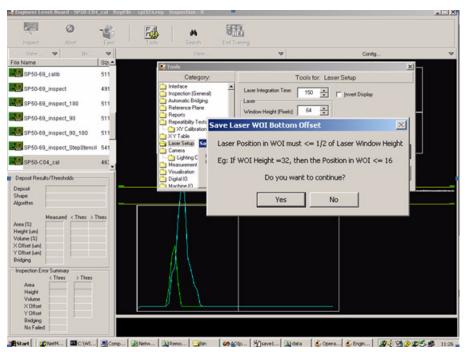


Figure 2-6 Laser Position in WOI message

NOTE

The "Laser Window Height" and "Laser Position in WOI" will be set according to which camera type is used on the machine.

Table 2-2 Laser Window Height and Laser Position in WOI

Machine	Laser Window Height	Laser Position in WOI
SP Series II	64	16
SP Series III	32	16

Laser Setup Window

Existing Laser Setup Window

Drawbacks of the existing software interface:

- Some information/data shown are redundant, (example: left/middle/right values for centroids, intensity and width).
- No indication of the results of the laser setup (GOOD/BAD).
- No guidance on how to achieve a GOOD laser setup, users have to refer to the manual to identify the passing criteria.

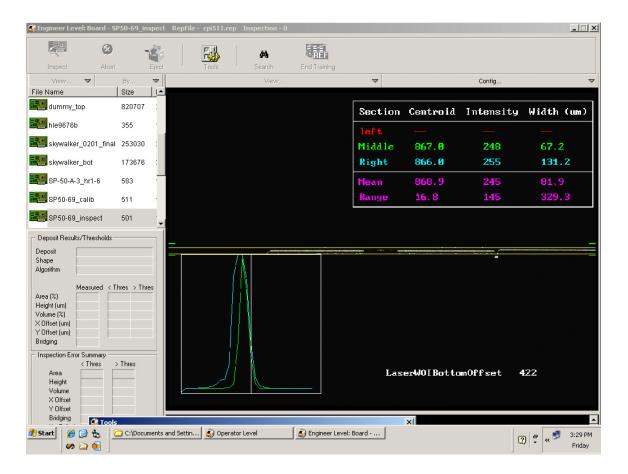


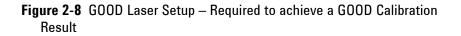
Figure 2-7 Existing Laser Setup Screen

New Laser Setup Window

New improvements:

- The displays of the laser setup results are redesigned. Only the Mean values of Centroids, Width and Intensity are displayed.
- There are two new parameters which are the "Laser Skew" and the "Min Width". These two parameters are used to determine the status of laser setup and they can be configured through InspUnitConfig.xml.
- The laser setup status will be shown in a three-coloured scheme, whether is it GOOD, MODERATE or BAD.
- When the status of Skew is MODERATE/BAD, users will be guided in adjusting the goniometer thumb screw to achieve a GOOD laser skew.

🗳 Engineer Level: Board - SP50-C04_cal	RepFile - cpi341.rep Inspection - 0	
Inspect Abort	End Training	
Inspect Abon	Lind Haining View	~
File Name Siz		
SP50-69_calib 511	Centroid (pixel) 495.9 Skew (pixel) -8.6 (GOOD)	
SP50-69_inspect 491	Width (um) 77.6 Min Width (um) 77.6 (GOOD)	
SP50-69_inspect_180 511	Intensity 225	
SP50-69_inspect_90 511	Laser line is PARALLEL.	
SP50-69_inspect_90_180 511		
SP50-69_inspect_StepStencil 541	Laser line is focused	
SP50-C04_cal 463		
Deposit Results/Thresholds Deposit Shape Algorithm Measured < Thres > Thres Area (%) Height (um) Volume (%) Y Offset (um) Bridging Thres of thres Area Height Volume X Offset Y		
No Failed:		
Maintanence B X	Emergency Stop 3.1.2.RC2	13:48



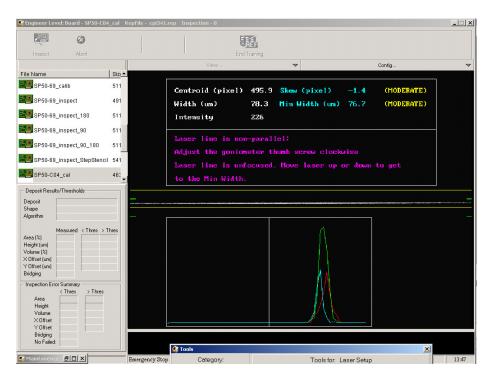


Figure 2-9 MODERATE Laser Setup - May not achieve a GOOD Calibration Result

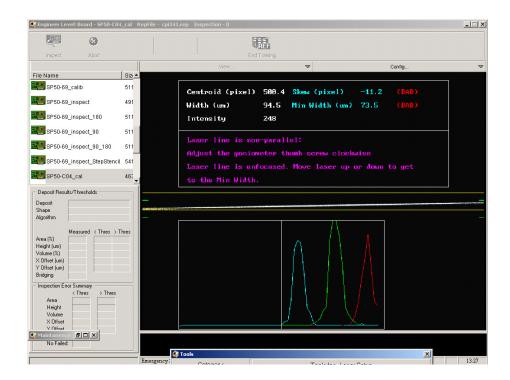


Figure 2-10 BAD Laser Setup - Will lead to BAD Calibration Result

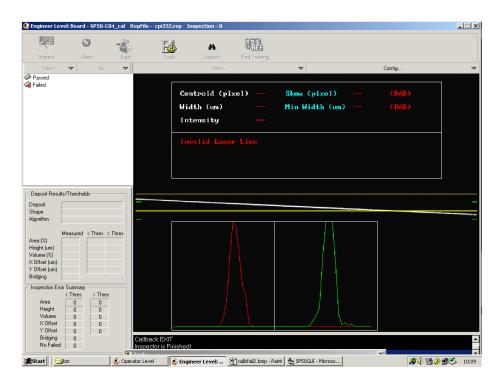


Figure 2-11 INVALID Laser Line - Laser Line is OUR of Laser WOI

Calibration Result Window

Existing Calibration Result Window

Drawbacks of the existing interface:

- No indication on failed parameters when BAD Calibration occurs.
- Only the last calibration result is shown in the end of inspection. If there is a BAD Calibration on Off Mode or Scan Mode and GOOD Calibration on ROI Mode result, users may miss those results and assume that it is a GOOD Calibration result for all Modes.
- Information displayed on the range tolerances for Laser Angle and H/G Range which determines a GOOD/BAD calibration result.
- No indicators or information on what has gone wrong when BAD Calibration occurs.

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E	8	-		<i>6</i> 4				
•		*	100					
Inspect		Eject	Tools	Search	End Training			
View	♥ Ву	. ▼		View		\bigtriangledown	Config	
Passed Failed								
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eposit Results	/Thresholds	1						
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Figure 2-12 Screenshot of GOOD CALIBRATION

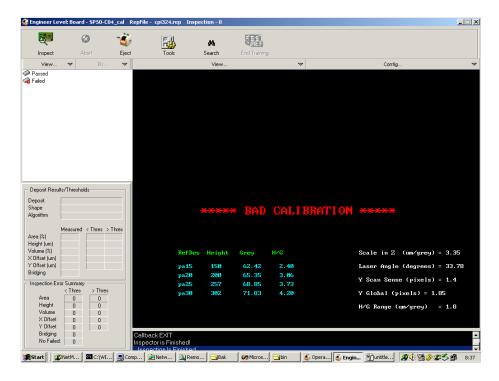


Figure 2-13 Screenshot of BAD CALIBRATION

New Calibration Result Window

Improvements of the new interface:

- Failed parameters will be highlighted in RED and shown in the table when a BAD Calibration result is obtained.
- At the end of inspection, the calibration results of each inspection mode will be displayed in a table.
- Possible root cause of BAD Calibration will be shown in a message box.

Engineer Le	vel: Boarc	I - SP50-C	U4_cal R	epFile - cpi341.re	p Inspec	tion - U					<u>.</u>	_ 🗆
Inspect		8) bort	- 🇳 Eiect	Tools		AA Search	End Trainin					
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Passed		10 y				1011		•		ouring		
Failed												
					In	sp Mode	Stat	tus	Fail Parameters	5		
						OFF	GO	סס	_			
						SCAN	GO	DD				
						ROI	600	DD				
Deposit Resu	ilts/Thresho	lds	[
Deposit												
Shape Algorithm												
					жжж	жжжж	ROI	MODE (CALIBRAI	'ION жини	×	
vea (%)	Measured	< Thres >	hres									
Height (um)												
/olume (%) < Offset (um)					RefDes	Height	H∕G	H/G	Range (um/grey) = 0.17 (0-0.5))	
r Offset (um)					pa15	150	8.76	Lase	er Angle (degre	es) = 60.18 (59-61))	
Bridging					pa20	200	8.65	8	le in Z (um∕gr	> = 0 70		
Inspection Er					pa25	257	8.83	oCa.	ie in Z (um/gr	ey) = a.ra		
Area	< Thres	> Thres			pa30	302	8.66	Y So	can Sense (pixe	ls) = 2.77		
Height	0	0						Y G	lobal (pixels)	= -1.64		
Volume	0	0										
X Offset Y Offset	0	0										
	0			Inspector is Finis	hed!							
Bridging												
	data		1	NetMeeting - 1 Con	nection (Noto		bin	00 F	OIpEngine - Microsoft Vi	# 4:3	13

Figure 2-14 Screenshot of GOOD CALIBRATION

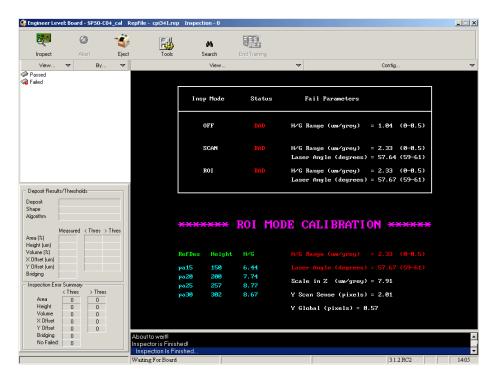


Figure 2-15 Screenshot of BAD CALIBRATION

a a a a a a a a a a a a a a a a a a a	3	-3	F	44	REF.		
Inspect	Abort	Eject	Tools	Search	End Training		
View T	₹ By	~		View		マ Config	
Passed Failed							
T dica							
			In	sp Mode	Status	Fail Parameters	
				OFF	BAD	H/G Range (um/grey) = 2.24 (0-0.5	5)
						Laser Angle (degrees) = (59-61	
				SCAN		H/G Range (um/grey) = 2.19 (0-0.5	5)
						Laser Angle (degrees) = (59-61	1)
				ROI		H/G Range (um/grey) = 2.15 (0-0.5	
		(Laser Angle (degrees) = (59-61	1)
Deposit Results/TI Deposit Shape Algorithm							
				жжжж	ROL MO	DE COLLUDATION ANALYS	
	isured < Thres >	Thres			101 110	DE CALIBRATION ****	
vea (%)	isured < Thres >	Thres			101 110	CHLIDAHIION AAAA	
trea (%) Height (um) Volume (%)	isured < Thres >	Thres	RefDes			H/G Range (um/grey) = 2.15 (8-8.5	
Area (%) Height (um) Volume (%) K Offset (um)	isured < Thres >	Thres					
Area (%) Height (um) /olume (%) < Offset (um) / Offset (um) Bridging		Thres	RefDes	: Height	H∕G		
Area (%) Height (um) /olume (%) < Offset (um) / Offset (um) Bridging Inspection Error St	Immary	Thres	<mark>Ref Des</mark> pa15 pa20 pa25	: Height 150 200 257	H/G 3.82 4.68 5.50	H/G Range (um/grey) = 2.15 (8-8.5 Laser Angle (degrees) = (59-61 Scale in Z (um/grey) = 5	
Area (%) Height (um) /olume (%) Offset (um) 3ridging Inspection Error Su </ Area</td <td>Immary Chres > Thres 0 0</td> <td>Thres</td> <td>Ref Des pa15 pa20</td> <td>: Height 150 200</td> <td>H∕G 3.82 4.68</td> <td></td> <td></td>	Immary Chres > Thres 0 0	Thres	Ref Des pa15 pa20	: Height 150 200	H∕G 3.82 4.68		
Area (%) Height (um) /olume (%) < Offset (um) / Offset (um) Bridging Inspection Error Su < 1	immary	Thres	<mark>Ref Des</mark> pa15 pa20 pa25	: Height 150 200 257	H/G 3.82 4.68 5.50	H/G Range (um/grey) = 2.15 (8-8.5 Laser Angle (degrees) = (59-61 Scale in Z (um/grey) = 5	
Area (%) Height (um) /olume (%) (Offset (um) 3ridging Inspection Error Su Area Height Volume	Immary Thres > Thres 0 0 0 0 0 0 0 0 0 0 0 0 0		<mark>Ref Des</mark> pa15 pa20 pa25	: Height 150 200 257	H/G 3.82 4.68 5.50	H'G Range (um/grey) = 2.15 (8-8.5 Laser Angle (degrees) = (59-61 Scale in Z (um/grey) = 5 Y Scan Sense (pixels) = 1.52	

Figure 2-16 More screenshots of BAD CALIBRATION

A message box will appear to provide users with some of the possible root causes of bad calibration, as seen below.

🧳 SP50 C	iui 🔀
8	Check if the laser is within the WOI. Check if the laser line is parallel. Ensure that the calibration plate is clean. For details troubleshooting, please refer to SP50 AOI Hardware Manual
	under SP50 Laser Setup and Calibration > Laser System Setup > Troubleshooting section

Figure 2-17 Possible root causes of BAD CALIBRATION

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Agilent SP50 Release Notes Version 3.1.6

3

Version 3.1.6 Release Notes

Ease of Programming 3-2 Database Management 3-3 Improve Small Deposit Measurement 3-8 Copper Thickness 3-10 Using ImageJ 3-11 Defect Prioritization on the SP50 Inspection Report 3-12 Display Min, Max, Mean, ± 3 Sigma values to Area, Volume & Height Chart on Result Views 3-14 ART to Display Paste Limits 3-15 Using Barcode to Trigger AWA 3-16 PLC Reset Procedure 3-24 Improvement on Z-Axis Compensation 3-25 Added Information on Run Summary in Operator GUI 3-27



Ease of Programming

In order to achieve this goal, users will have the ability to inspect all deposits of single algorithm types and get summarized inspection results by algorithm type. Furthermore, user will be able to run 5.15 sigma repeatability tests on deposits of an algorithm types as a guidance to obtain and set the best thresholds.

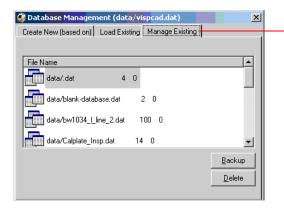
Besides that, the new Database Management window allows users to backup database files and deletes database files from the GUI and the Algorithm (Device) Editor will automatically log changes made to database files into CPI's log directory, for easier reference.

The enhancements include:

- Database Management
- Inspect All
- Device Editor's Log File

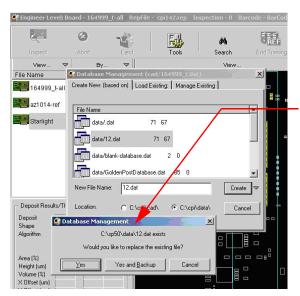
Database Management

Manage Existing



An option in the 'Manage Existing' tab for users to backup and delete from GUI

Figure 3-18 'Manage Existing' tab



New confirmation message appears if the new database name attempts to overwrite the existing database name

Figure 3-19 New 'Confirmation' message

Inspect All

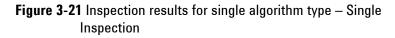
New "Inspect All" functions in Algorithm Editor (Device Editor) with Repeatability option.

pa_0996x0296f0	04 - Pacto			×	
Main	04 - Faste			_	Single Inspect
🕀 Algorithm 🛛	🧼 pa_0996x02	96f004		•	Summarized inspection
General				* 🔺	results by algorithm
Algorithm		pa_0996x0296f	004		type
Comment		Automatic Paste pa	art		-, -, -, -, -, -, -, -, -, -, -, -, -, -
Paste Size X	(um)	996			
Paste Size Y	(um)	296			
Search Area	X (um)	2490			Repeatability
Search Area	Y (um)	740			nopoutubiity
Nominal Heig	ght (um)	130			Run 5.15 sigma
Volume Fill (\$	%)	100			repeatability tests on
Area Fill (%)		100			
Nominal Pas	te Factor (%)	100			deposits of an algorithm
Mode		🔗 0 - One Blob		-	type
Paste Thresh	nold (um)	100			
Outlier Thres	hold (um)	180			
Bridging		🔗 0 - No Bridging		•	
Bridge Thres	hold (um)	40			
Bridge Thick	ness (um)	0			
Report Peak	Height	🔗 0 - Off		•	
Copper Thick	kness (um)	0			
Bridging Box A	•			»>	
Pass/Fail Crite				×	
Upper Area (150			
Lower Area (70			
Upper Heigh		200			
Lower Heigh		120			Outing to shares
Upper Volum		150			— Option to choose
Lower Volum		50			'Single Inspect' or
Upper X Offs		200			'Repeatability'
J Louier ⊠ Offs	et (um)	-200			
Inspect Inspec	ct All Res	~ 1	ave Create	다. 아이에 Assign	
Waiting	ngle Inspect epeatability				

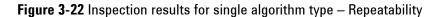
Figure 3-20 'Inspect All' function

🏟 Engineer Leve	el: Board - SP-50)-A-3_hr1	-6 RepFile -	cpi386.rep Insp	ection - 2							_ 🗆 🗙
Inspect	oa_0993x0193f Main		te 193x0193f004			End Trainin	3					
View		l.du. baToc	00001001004					\bigtriangledown		Config		\bigtriangledown
Passed Failed	General Algorithm Comment		pa_0993x0 Automatic Pas		*	F : 70 SKE	W : 0.07	5886		Rect	tification	Mode: Off
	Paste Size	Viumi	993	ste pair	_							0
	Paste Size		193		_							F2
	Search Are		2483		_							
	Search Are		483		-111							
	Nominal He		150		- 111							
			I - Inspect Al	Results							×	
	Area Fil					1			1			
	Nomina	Device Ty	/pe (0193f004	Data Height (um)	Min 135	Max 135	Mean 135	Sigma 0	<threshold err<br="">0</threshold>	>Threshold Err 0		
	Mode		(0193f004	Area (1/10)%	1133	1133	1133	0	0	0		
	Paste T		(0193f004	Volume (1/10)%	1019	1019	1019	0	0	0		
Deposit Resul	Outlier		(0193f004	X Offset (um)	3	3	3	0	0	0		
Deposit	Bridging	pa_0993>	(0193f004	Y Offset (um)	70	70	70	0	0	0		
Shape Algorithm	Bridge								- CSV	Report		
Algonann	Bridge -								Γ	Save As		
Area (%)	Report								<u></u>			
Height (um)	Copper Thi	ckness (um) 0									
Volume (%)	Bridging Box		nt		>>							
X Offset (um) Y Offset (um)	Pass/Fail Crit		4.00		×							
Bridging	Upper Area		130									
- Inspection Erro	Lower Area		70									
	Upper Heig		200		-111							
Area	Lower Heig		100									
Height Volume	Upper Volu		130									
× Offset	Lower Volu		70									
Y Offset	Upper X Of		200									
Bridging No Failed: -	I Lower⊻Ωf	rset lumi	-200									<u>^</u>
	. .	and a	2 -	. 🛄 🛙	à.							-
	Inspect Inspe	ct All	Reset Ne		reate					3.1.2	2.RC2	11:44

Single Algorithm Type



Device Type	Data	Process Widths	Repeatability %	Min	Max	Mean	<threshold err<="" th=""><th>>Threshold E</th></threshold>	>Threshold E
pa_0994×0394f004	Height (um)	60	0	145	145	145	0	0
pa_0994×0394f004	Area (1/10)%	101	17.66	982	982	982	0	0
pa_0994×0394f004	Volume (1/10)%	100	21.44	1092.33	1092.33	1092.33	0	0
pa_0994×0394f004	X Offset (um)	400	0	20	20	20	0	0
pa_0994x0394f004	Y Offset (um)	400	0.74	-40.33	-40.33	-40.33	0	0
Legend								



Global Paste

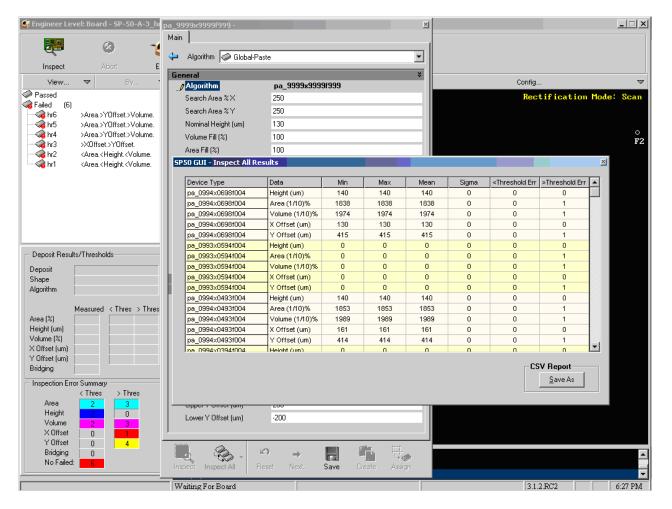


Figure 3-23 Inspection results for Global Paste – Single Inspection

Device Type	Data	Process Widths	Repeatability %	Min	Max	Mean	<threshold err<="" th=""><th>>Threshold Err</th></threshold>	>Threshold Err
pa_0993x0594f004	Height (um)	9009	0.03	139.33	139.33	139.33	0	0
pa_0993x0594f004	Area (1/10)%	9009	0.11	1005	1005	1005	0	0
pa_0993x0594f004	Volume (1/10)%	9009	0.07	1078.67	1078.67	1078.67	0	0
pa_0993x0594f004	X Offset (um)	19008	0.02	24.67	24.67	24.67	0	0
pa_0993x0594f004	Y Offset (um)	19998	0	-32	-32	-32	0	0
pa_0994x0493f004	Height (um)	9009	0	141	141	141	0	0
pa_0994x0493f004	Area (1/10)%	9009	0.22	979.33	979.33	979.33	0	0
pa_0994x0493f004	Volume (1/10)%	9009	0.17	1062.33	1062.33	1062.33	0	0
pa_0994x0493f004	X Offset (um)	19008	0.03	23	23	23	0	0
pa_0994x0493f004	Y Offset (um)	19998	0.03	-34	-34	-34	0	0
pa_0994x0394f004	Height (um)	9009	0	141	141	141	0	0
pa_0994x0394f004	Area (1/10)%	9009	0.26	962.33	962.33	962.33	0	0
pa_0994x0394f004	Volume (1/10)%	9009	0.21	1043	1043	1043	0	0
pa_0994x0394f004	X Offset (um)	19008	0.03	28.33	28.33	28.33	0	0
pa_0994x0394f004	Y Offset (um)	19998	0.03	-32	-32	-32	0	0
na 0996v0296f004	Height (um)	9009	0	140	140	140	0	n
- Min, Max_Mean are single pad	<mark>derate Good</mark> : average inspection re number of deposits w						L C:	SV Report

Figure 3-24 Inspection results for Global Paste – Repeatability

Device Editor Log File

Algorithm (Device) Editor will automatically log changes made to database file at CPI's log directory.

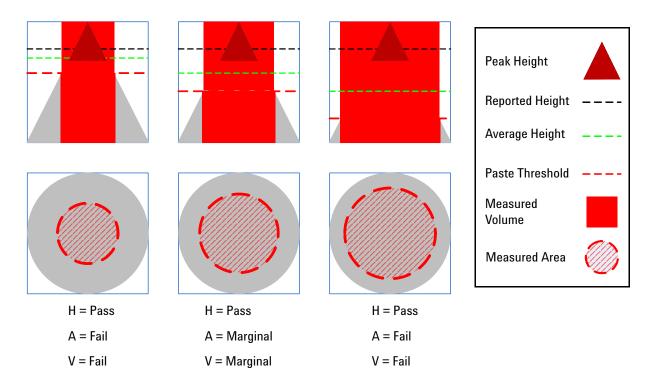
device_editor.log - Notepad File Edit Format View Help					-02
DE az1014-ref Time Algorithm Type 22:53:43 pa_0940x1440f100 22:53:46 pa_0940x1440f100 22:54:49 pa_0940x1440f100 22:54:49 pa_0940x1440f100	20-Apr-2007 22:53:43 Item Changed Bridge Threshold (um) Bridge Thickness (um) Bridge Thickness (um)	old 0 1 1	New 1 1 0 0	Changes in the Algorithm	
DE az1014-ref Time Algorithm Type 16:16:56 pa_2007x2007f079	23-Apr-2007 16:16:56 Item Changed Bridge Threshold (um)	old 0	New 2	Editor will be updated in the <i>device_editor.log</i> file	
DE 164999_t-all Time Algorithm Type 18:20:54 pa_3658x1372f084	23-Apr-2007 18:20:54 Item Changed Bridge Threshold (um)	old 0	New 1]]
1					Þ

Improve Small Deposit Measurement

The improvement that had been done for small deposit measure:

- Software changes allow the user to reduce the Paste Threshold to the minimum possible value to achieve an accurate A and V measurement while Reported Height is calculated from the peak height region only.
- Peak Height is a user defined percentage (specified in the *InspUnitConfig.xml*) of the pixels that correspond to paste. This feature may be turned on/off per deposit type in the algorithm editor.
- Paste Volume is calculated from Area and Average Height as in previous versions of software.

Improvement on A,H & V Measurement



Please proceed to "Setting Up Report Peak Height".

Setting Up Report Peak Height

To report peak height, this can be turn on in the algorithm editor:

Main			
Algorithm pa_0610x2	2210/100	-	
General		* 🔺	
Algorithm	pa_0610x2210f100		
Comment	Automatic Paste part		
Paste Size X (um)	610		
Paste Size Y (um)	2210		
Search Area X (um)	1372		Activate the Report
Search Area Y (um)	4972		
Nominal Height (um)	150		Height Peak for
Volume Fill (%)	100		particular packages
Area Fill (%)	100		
Nominal Paste Factor (%)	100		by selecting = 1 – Or
Mode	🔗 0 - One Blob		
Paste Threshold (um)	70		
Outlier Threshold (um)	500		
Bridging	🔗 0 - No Bridging		
Bridge Threshold (um)	0		
Bridge Thickness (um)	0		
Report Peak Height	🔗 0 - Off	• >	_
Copper Thickness (um)	0		
Bridging Box Adjustment		>>	
Pass/Fail Criteria		×	
Upper Area (%)	130		
Lower Area (%)	70		
Upper Height (um)	190		
Lower Height (um)	110		

Figure 3-25 Algorithm Editor

To set the range of the report peak height, this can be done in the *InspUnitConfig.xml* under the *c:\cpi\data* folder:

InspUnitConfig.xml

<ComputePeakHeight>

<Active>false</Active>

<HistogramStartRangePercent>N</HistogramStartRangePercent>

<HistogramEndRangePercent>M</HistogramEndRangePercent>

</ComputePeakHeight>

Where:

$$0\% \le N \le M$$

 $N \leq M \leq 100\%$

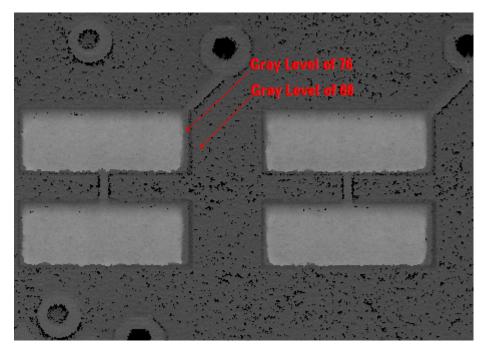
Default values 80% (Start) and 95% (End)

Copper Thickness

The copper thickness can be measures from a scan image and entered into the system to compensate for height and volume exaggeration.

Download the ImageJ software from this website http://rsb.info.nih.gov/ij/index.html.

This software calculates the gray level of the image taken.



Copper thickness = (Pad Gray Level – Background Gray Level) * H/G Ratio

Example:

Copper thickness = $(76 - 68) * 3.5 = 28 \mu m$

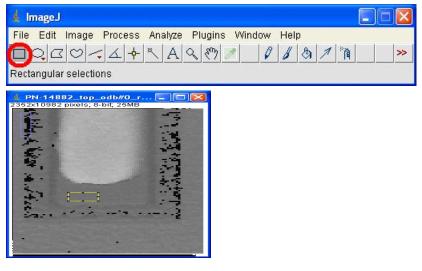
For further information, please refer to section "Using ImageJ" on page 11.

Using ImageJ

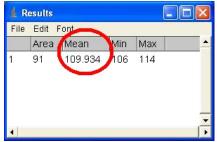
- 1 Open up the scan image from *c:\cpi\img\scans* by using the ImageJ software.
- 2 Enlarge the image by pressing the ctrl & + at the same time.
- **3** Go to the specified pad that is not totally cover by deposit by scrolling through the image.



4 Draw a rectangle around the pad that is not covered by the deposit using the **Rectangular selections** tool.



5 Under the Analyze tabs, choose measure. The result will appear as shown below.



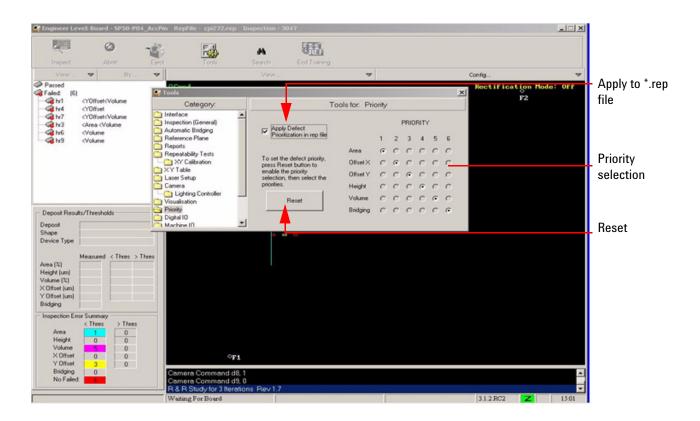
- 6 The mean pad grey value will be used in the calculation.
- 7 Repeat the same steps for the substrate grey value.
- 8 By using the H/G Ratio value to calculate the Copper Thickness. This value can be found in the *c:\cpi\data\ Paste_3D_Calibration_Data_ROI.txt*.

Defect Prioritization on the SP50 Inspection Report

Defect prioritization option give the user an option to choose the one type of defect to be reported out in the *.*rep* file rather than all the failure for that particular deposit.

The current software behavior:

- All the defect items for a deposit will be list at the end of the deposit result line and will only list one fail item according to the preset defect priority.
- There will be an interface for the user to select the defect priority and those setting will be saved in the *InspUnitConfig.xml*.
- User can revert back to previous reporting type by disabling this function in the Tools menu.



RefDes	SP50-P04_A Stencil	ccPin, Type	Operator:	deve Area	loper, vol	10-Ap ×	r-2008 Y	15:19:10 Ht Eri), BC: BarCode0 LO R3.1.2.RC2 0 5 s1
hr1 hr7 ud1 hr5 hr5 hr8 hr6 hr9	sp-1 sp-1 sp-1 sp-1 sp-1 sp-1 sp-1 sp-1	pa_10 pa_04 pa_04 pa_10 pa_10 pa_10 pa_10 pa_10 pa_10	00x0400f100 00x0400f100 00x2000f100 00x2000f100 00x0300f100 00x0300f100 00x0200f100 00x0200f100 00x0200f100 00x0200f100	952 949 822 996 867 787 869 784 910 960	796 787 683 890 1034 993 1069 638 713 759	11 -4 6 -5 7 -11 -1 4 -8 -4	-42 -38 -36 -14 -33 -13 -46 -26 -9	142 104 141 104 103 0 131 4 139 5 135 0 138 105 133 100 135 100	<roffset. <roffset. <roffset. <roffset. <area. <area. <area. <volume. <volume.< td=""></volume.<></volume. </area. </area. </area. </roffset. </roffset. </roffset. </roffset.

Display Min, Max, Mean, \pm 3 Sigma values to Area, Volume & Height Chart on Result Views

After an inspection is completed, the charts view on the Engineer level will be displayed.

- Min values to the charts for Height, Area and Volume.
- Max .values to the charts for Height, Area and Volume.
- ±3 sigma values to the charts for Height, Area and Volume.

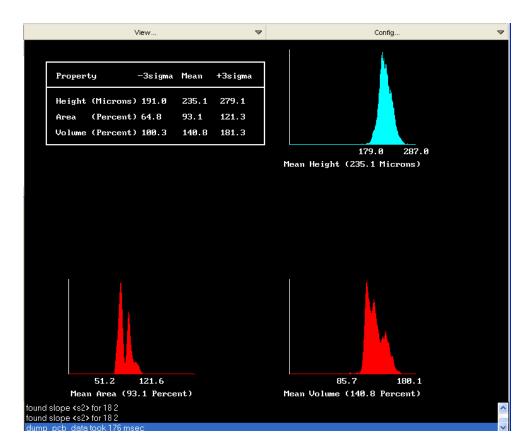


Figure 3-26 Charts view on the Engineer level

ART to Display Paste Limits

This is a new feature added to the error images to include the result and thresholds.

After an inspection is completed, the ART displays

- Min, Max and actual values of the height, area, volume, x and y offset.
- This feature can only be turn on in the $c:\langle cpi \rangle data \rangle config.txt$ file by setting the image_save feature to Image_save 4 100 500000 1 1 0 1.

The first value force it to save into the AQT server and the last value is to render the image to include the value of the height, area, volume, x and y offset of the fail deposit. Plus, the thresholds value will be include into the error images. The last value can be set to $\mathbf{0}$ to disable this feature.

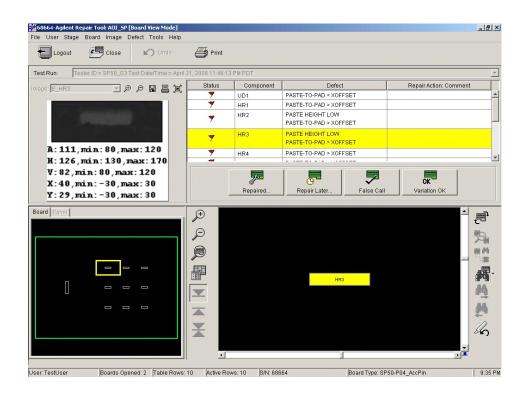


Figure 3-27 Based on these measurements, the operator can easily determine its status : False Call

Using Barcode to Trigger AWA

This is a feature that uses the barcode to trigger the AWA.

When a barcode is read by the machine it tries to find a match in the *barcode_list.txt* file and if there is no matching barcode found, the system does not proceed. If a match is found the software then tries to get the board's width from the corresponding *.plx* (or *.pls*) file. If a width is found the system will try to change the conveyor's width, but it will wait until the machine is empty – there must be no board in the machine.

Steps to Setup Barcode Triggers AWA

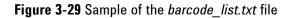
1 Ensured there's a *barcode_list.txt* in *c:\cpi\data folder* (as shown in Figure 3-28).

🔁 data			
<u>File E</u> dit <u>V</u> iew F <u>a</u> vorites	<u>T</u> ools <u>H</u> elp		2
🔆 Back 🔹 💮 🗸 🏂 🔒	🔎 Search 🦻 Folders 🛛 🎹 🗸		
Address 🛅 C:\cpi\data			Go
	▲ Name ▲	Size	Тур▲
File and Folder Tasks	▲ Cf	1	File
📺 Rename this file	Lighting		File
Move this file			File
Copy this file	C A A A A A A A A A A A A A A A A A A A		File File
Publish this file to the			File
Web	PAS		File
📄 E-mail this file	Con u500		File
🍓 Print this file	🗖 🖻 alternative_types.dat	0 KB	DA1
X Delete this file	AutoBridgeConfig.xm	1 KB	XML
	BackupCalibratedLightingValues.xml		XML
	barcode_list.txt		Tex
Other Places	ist.txt_		TXT
🛅 срі	blank-database.dat calibrate.cal		
My Documents		IND	
Type: Text Document Date Modifi	ed: 8/15/2008 12:05 AM Size: 152 bytes 152 bytes 3	My Computer	11.

Figure 3-28 The barcode_list.txt file

Below is a sample of the *barcode_list.txt* file.

📕 b	arcod	e_list.tx	t - Nol	epad	
Eile	<u>E</u> dit	F <u>o</u> rmat	⊻iew	Help	
mod	ie O				
str	ing	***			
6 6 6 6 6 6		004 602 307 123 987		adPlus_top_180.plx adPlus_top.plx SP50-C33_calib_qfp.plx az10143.plx beta13-fullnocolons.plx	
					V



2 Open the *config.txt* file which is located in the *C:\cpi\data* folder.

data	and the	_	
ile <u>E</u> dit <u>V</u> iew F <u>a</u> vorites	iools <u>H</u> elp		_
🌏 Back 🝷 🕥 👻 🏂 🎾	Search 😥 Folders 🔢 🕂		
ddress 🗀 C:\cpi\data			Go
	Name A	Size	Тур
File and Folder Tasks 🛛 🛠	🗀 u500		File
🗐 Rename this file	alternative_types.dat	0 KB	DA
	🔮 AutoBridgeConfig.×ml	1 KB	ХМ
🔯 Move this file	🔛 BackupCalibratedLightingValues.xml	1 KB	ХМ
Copy this file	📃 📃 barcode_list.txt	1 KB	Te
🔕 Publish this file to the	arcode_list.txt_	1 KB	TX
Web	📄 blank-database.dat	2 KB	DA
🛜 E-mail this file	🔤 calibrate.cal	1 KB	CA
🍓 Print this file	CalibratedLightingValues.xml	1 KB	XM
🗙 Delete this file	Calplate_Insp.dat	9 KB	DA
	📃 config.txt	12 KB	Те
	💽 corr2d.prm	1 KB	PR
Other Places *	E cpk_data.prm	1 KB	PR
🗎 coi	🔤 database_map.old Type: PRM File	1 KB	OL
	adatabase map.txt Date Modified: 8/15/2008 12:22 AM Size: 59 bytes	1 KB	Te
My Documents	▼ ◀ Size: 59 bytes 8/14/2008 10:27 PM Size: 11.5 KB 11.5 KB	My Computer	

3 In the *config.txt* file, change the number of the barcode to 1 in the barcode field as shown in Figure 3-30 below.

📙 config.txt - Notepad	<u>_ ×</u>
<u>File Edit Format View H</u> elp	
+ 5: <u>set to 1</u> to turn LEDs on for block skip inspection. (0)	
Barcode 1010 # 1: Number of barcode readers on the system [0, 1 or 2]. (0)	
# 2: This should not be modified (0)	
₽ 3: This should not be modified (1)	
4: This is specific functionality designed for tracking of boards. (0)	
 Ø - Nothing enabled. I - After a board is inspected, the following board will automatically 	
\mathbf{r} = Arter a board is inspected, the rotwing board with automatically \mathbf{r} take the previous barcode for the next board.	/
# 2 - If no barcode is read in it will continue to use the last good # barcode until another valid one is read in.	
# barcode until another valid one is read in.	
digital 1 2000	
# 1: Set to 1 if there is digital i/o, or 0 for offline software. (1)	
# 2: Duration in milliseconds of "board failed" SMEMA signal. (2000)	
Dual_file 0	
# 1: Set to 1 to allow automatic change-over between two files based on # digital input, blockskips or fiducials. (0)	
False_fail_1	
# 1: This is a bitfield which determines how false failures are handled in the section of failure area	
 the action on failure menu. (5) 1 - enable marking of false fails in the action on failure menu. 	
F 1 - enable matching of false fail marking when re-inspecting a board	
· · · · · · · · · · · · · · · · · ·	

Figure 3-30 Changing the barcode number

4 Check the **Registry** at '*HKEY_LOCAL_MACHINE*\ SOFTWARE\MV Technology\GS-1\Barcode'.

Create the **BarcodeTriggersAWA** if it is not in the list. This can be done by right clicking and choosing New, followed by choosing DWORD Value and then name it as '**BarcodeTriggersAWA**'. Set it to (1) to enable Barcode Triggers AWA, or set to (0) to disable the function as shown in the figure below.

	REG_SZ REG_DWORD REG_DWORD REG_SZ	(value not set) intermer 0x00000001 (1) 0x00000000 (0)
BiockStep CountIncrement CountMask CountOffset	REG_DWORD	0×00000001 (1)
왕 BiockSkip 와 CountIncrement 와 CountMask 와 CountOffset	KEG_DWORD	
환)CountIncrement 환)CountMask 환)CountOffset		UXUUUUUU (0)
	REG_SZ	
CountOffset		0
	REG_SZ	กกกกกกกกกกกกกกกกกกกกกกก
	REG_SZ	0
	REG_DWORD	0×00000000 (0)
	REG_DWORD	0×00000000 (0)
BigSource	REG_DWORD	0×00000001 (1)
👸 TopBottomPerLane	REG_DWORD	0×00000000 (0)
E TopBottomPerLine	REG_DWORD	0×00000000 (0)
а Туре	REG_SZ	intermec
WriteBarcodeComponents	REG_DWORD	0x00000000 (0)

Name	Туре	Data
(Default)	REG_SZ	(value not set)
ACTIVE	REG_SZ	intermec
BarcodeTriggersAWA	REG_DWORD	0×00000001 (1)
80 BlockSkip	REG_DWORD	0×00000000 (0)
ab CountIncrement	REG_SZ	0
💩 CountMask	REG_SZ	חחחחחחחחחחחחחחחחחחחחחחחחחחחחחחחחחחחחחחח
and CountOffset	REG_SZ	0
80 LoadInReverse	REG_DWORD	0×00000000 (0)
88 Mode	REG_DWORD	0×00000000 (0)
👸 Source	REG_DWORD	0×00000001 (1)
👪 TopBottomPerLane	REG_DWORD	0×00000000 (0)
	REG_DWORD	<u>0×00000000 (</u> 0)
	REG_SZ	intermec
BB WriteBarcodeComponents	REG_DWORD	0×00000000 (0)

5 Set Active and Type to 'datalogic' or 'intermec', depending on the type of barcode that is in use.

Figure 3-31 Example of both Active and Type set to 'intermec'

6 Go to '*HKEY_LOCAL_MACHINE**SOFTWARE**MV Technology**GS-1**Barcode**Datalogic or Intermec*' and set the **LOGENABLED** and **LOGFILE** as shown below.

Name	Туре	Data
ab)(Default)	REG_SZ	(value not set)
🕮 Barcode Delay	REG_DWORD	0×00000000 (0)
BARCODEREADERS	REG_DWORD	0x00000001 (1)
BarcodeSeperator	REG_SZ	
BARCODESPERCLUSTER	REG_DWORD	0x00000002 (2)
BAUDRATE 3	REG_DWORD	0x00002580 (9600)
BYTESIZE	REG_DWORD	0x0000008 (8)
	REG_DWORD	0x00000005 (5)
	REG_SZ	
BULINES	REG_DWORD	0×00000001 (1)
	REG_DWORD	0x00000001 (1)
	REG_SZ	c:\cpi\log\barcode.log
	REG_DWORD	9x00000000 (10)
B PARITY	REG_DWORD	0×00000000 (0)
Reference and the second secon	REG_DWORD	0×00000004 (4)
Registorbits	REG_DWORD	0×00000000 (0)

If the barcode function was **enabled**, the title bar on top of the window will also display "Barcode - Barcode" as shown in Figure 3-32).

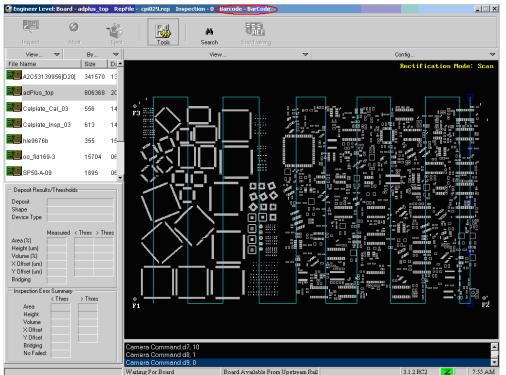


Figure 3-32 Barcode – Barcode displayed on the title bar

Also, if the **BarcodeTriggersAWA** function was **enabled** in the **Tools > Machine IO**, the **'Waiting for Good BC signal'** is active as shown in Figure 3-33. Now, the machine is ready for Inspection.

🗳 Tools						x
Category:		Tools fo	or:	Machine IO		
Reports Repeatability Tests	Inputs			Outputs (Space b	ar to togo	gle)
Y Calibration	Emergency Stop	Inactive	٠	Flash Green	Inactive	
🛅 XY Table	Board Present Rail1	Inactive		Flash Amber	Inactive	
🛅 Laser Setup	Board Present Rail2	Inactive		Flash Red	Inactive	
Camera	HW Passthru Rail1	Inactive		Pulse Alarm	Inactive	
Lighting Controller	Air Pressure	Active		Two Sided Inspection	Inactive	
🛅 Visualisation	HW Passthru Rail2	Inactive		Barcode Delay	Inactive	
Priority	Maintanence	Inactive	/	Barcode Trigger	Inactive	\neg
Digital IO	AWA Moving	Inactive	(-	Waiting for Good BC sig	Active	
📇 Machine IO			-	Stop Boards Loading	Inactive	
🛅 Auto Width Adjust				Good Barcode Rail 2	Inactive	
🛅 Maintenance	View PLC Inform	nation		Enable AWA	Inactive	
🛅 Dual Files 📃				Home AWA	Inactive	
· ·				Calibrate AWA	Inactive	•

Figure 3-33 'Waiting for Good BC signal' highlighted

7 Switch **ON** the upstream SMEMA signal; then the barcode reader will be triggered to read the barcode. After an audible beep, the barcode reader should turn **OFF**.

If the barcode read was not in the *barcode_list.txt*, a warning message will appear on the screen as shown in Figure 3-34. In this case, the user need to **reset the PLC** (refer to "PLC Reset Procedure" on page 24) and make appropriate changes in the *barcode_list.txt*.

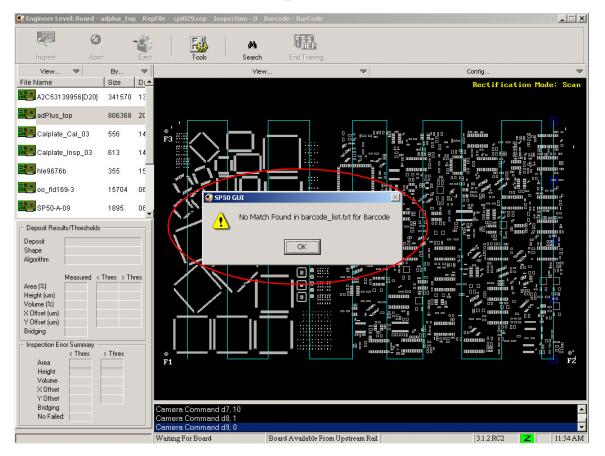


Figure 3-34 Match Not Found message

8 If the barcode read was in the *barcode_list.txt* but the *.*plx* file is not in the CAD folder, there will be another warning message as shown below in Figure 3-35. In this case, create or copy the file needed into the CAD folder and click the Retry button. If the users choose to click the cancel button to abort the function, the user needs to reset the PLC (refer to "PLC Reset Procedure" on page 24).

	🗳 Engineer Lev	el: Board -	sp50-c03_c	al RepFile-	cpi029.rep	Inspection - O	Barcode - 608				<u>_ ×</u>
Passed Failed Peposit Results/Thresholds Deposit Shape Algorithm Measured < Thres > Thres	_			Eject							
	View	\bigtriangledown	Ву	~		View		\bigtriangledown		Config	~
Deposit Results/Thresholds Deposit Results/Thresholds Deposit Results/Thresholds Deposit Shape Algorithm Measured < Thres > Thres	 Passed Failed 										
	Deposit Shape	s/Thresholds			utomatic conv	eyor width adju c33_calib_qfp.p	lx. Please see log/	awa.log for mo	ed - Could not get bo ore details.		
Height (um) Volume (%) X Offset (um) Y Offset (um) Bridging	Area (%) Height (um) Volume (%) X Offset (um) Y Offset (um)	Measured <	Thres > Thr	es							
Inspection Error Summary < Three	Area Height Volume X Offset Y Offset	< Thres 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0								
No Failed: 0 Performing X'rable recovery after Alarm Check				Perfo	ming XYtable	recovery after	Alarm Check				
Now moving to Fiducial 1 Waiting For Board Downstream Busy Rail 1 3.1.2.RC2 9.04 AM)ownstream Busy Re	a11		312 BC2	

Figure 3-35 Error message

9 Below is a screenshot of the Barcode Triggers AWA function running. Users will see the message "AWA GUI ON" shown in the status bar at the lower part of the window.

🖗 Engineer Lev	el: Board - s	sp50-c03_ca	l RepFile - cpi029.rep Ins	spection - 0 Barcode - <mark>608</mark>			
Ę.	6	-1		M GRE			
Inspect	Abor	t E	ject Tools	Search End Traini			
View	\bigtriangledown	Ву	▽	View	\bigtriangledown	Config	\bigtriangledown
ŵ Passed ✿ Failed							
Area (%) Height (um) Volume (%) X Offset (um) Y Offset (um)		Thres > Thres					
Bridging Inspection Erro Area Height Volume × Offset Y Offset Bridging No Failed:		> Thres 0 0 0 0 0	Abortad, Re-Initialisin Performing Xrtable ra	ecoverv after Alarm Check			A
			Now moving to Fiduci	181 I			

Figure 3-36 Screenshot of Barcode Triggers AWA

📄 cpi497.rep - Notepad							
<u>File Edit Format View H</u> elp							
Board: Jabil_300x300, Operator:	develo	oper,	14-Aug	-2008	21:43:20,	BC: BarCode602	L0 🔺
R4.0.0.ALPHA1.2 0 4 50							
RefDes Stencil Type	Area	vol	x	Y	Ht Eri	•	
n1919-1 sp-1 pa_0300x0300f1	100 911	639	1	86	53 100	<volume.< td=""><td></td></volume.<>	
		571	12	92	50 100	<volume.< td=""><td></td></volume.<>	
			12				
n1911-1 sp-1 pa_0300x0300f1		585	2	96	52 100		
n1912-1 sp-1 pa_0300x0300f1		572	1	93	50 100		
n1917-1 sp-1 pa_0300x0300f1	LOO 805	558	5	88	52 100	<volume.< td=""><td></td></volume.<>	
n1913-1 sp-1 pa_0300x0300f1	LOO 828	550	3	91	50 100	<volume.< td=""><td></td></volume.<>	
n1916-1 sp-1 pa_0300x0300f1		576	4	93	51 100		
n1915-1 sp-1 pa_0300x0300f1		590	10	84	49 100		
n1914-1 sp-1 pa_0300x0300f1		615	4	81	52 100		
			4				
n1910-1 sp-1 pa_0300x0300f1		611	<u> </u>	90	53 100		
n1920-1 sp-1 pa_0300x0300f1	LOO 884	614	5	90	52 100	<volume.< td=""><td>•</td></volume.<>	•

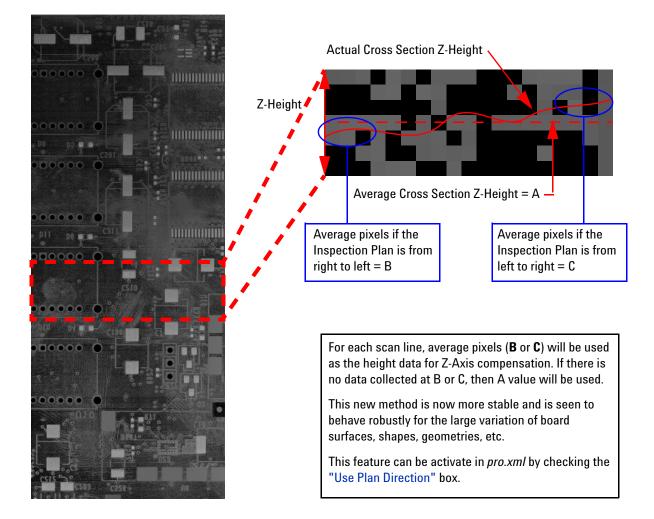
10 After the Inspection, the *.*rep* file will contain the scanned barcode as shown in the figure below.

3 Version 3.1.6 Release Notes

PLC Reset Procedure

- 1 Ensure that the upstream board available SMEMA signal is off, and then press the PLC Reset Button on the control panel.
- **2** Wait for a few seconds for the PLC to reboot.
- **3** During this process, the barcode reader will turn on. Wait until the barcode reader is off.
- 4 Now, the user can proceed with the test.

Improvement on Z-Axis Compensation



Current Z-Axis Compensation

Use Plan Direction

This feature can be activated in the *pro.xml* by checking the **Use Plan Direction** box under the Z-Axis Configuration.

adPlus_top.pro.xml		
Enable/Disable Z compensation	Misc. Configuration	
Enable Z Axis	Variable Scan Y	ОК
	Save Acq. Plan	Cancel
Z-Axis Configuration		
Number of Profiles 6	Speed and Resolution Speed 94000	÷
Y Anchor Offset 0		-
X Anchor Offset 0	Aller to Achieve Speed	
Use Plan Direction	P	
Save Profile Points	Camera Algorithm Threshold	
Save Profile Images 🛛 🗍	Threshold 15	* *
Reference Plane	Upper Threshold (grey) 120	÷
Enable Reference Plane	10	
Reference From PAD	Integration Time (us) 45	÷
Threshold 10	Outlier Threshold (pixels)	×
Auto Assignment Option	Image Rectificatio	n
Auto Assign to Part Number Algorith	m Use Global	Defaults
○ Auto Assign to Package and Part N	umber Algorithm Local Sca	n

Figure 3-37 Use Plan Direction checkbox

Added Information on Run Summary in Operator GUI

In the operator GUI (Graphic User Interface), the Run Summary column contains more information on the number of boards tested. The added information are:

- Passed shows the number of pass boards by operator
- Failed shows the number of fail boards by operator
- FTQ (First Time Quality) shows the number of pass boards by the system and operator

🎒 Operator L	evel: Board -	SP50-C01_insp	/ersion: 4.0.0.ALPHA1.1 RepFile - cpi340.rep Inspection -	-5	×
Cards Boards	Results	Uiew Board	Good XOFF : -1512 YOFF : 134 SKB Bad F3	J : −154.869	Rectification Mode: ROI F2
C Deposit Rest	ults/Thresholds				
Error Count Deposit					
Shape Device Type					
Height (um) Area (%)	Measured <	Thres > Thres			
Volume (%) X Difset (um) Y Difset (um) Bridging					
نې Previous	니. Next	False Fail			
ිද 3D Image	2D View	SSM			
Historical Info					
Type	Deposit	 Offset			
A0F Decision	n				
Eass Pass	Eall	R <u>R</u> eview	°F1		
Machine Status			Error Summary Inspection Sum	mary	- Run Summary Boards Inspected: 5
Downstream Busy Rail 2			Height: 0 0 Inspection No: Area: 0 0 Deposits Faile	5 Cycle Time: 17 secs d: 19 Insp. Time: 5 secs	Passed: 3 60% Failed: 1 20%
Waiting For Board			Volume: 0 0 Deposits Paise XOffset 0		FTQ 1 20%
			YOffset: 0 1 Barcode:	d:	Last Reset: 10/6/2008 9:03:42 Reset

Figure 3-38 Added information in Run Summary

3 Version 3.1.6 Release Notes

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