

# ViTrox Corporation Berhad

JetPower 2.0.0.23 MainGUI Training Material

[www.vitrox.com](http://www.vitrox.com)

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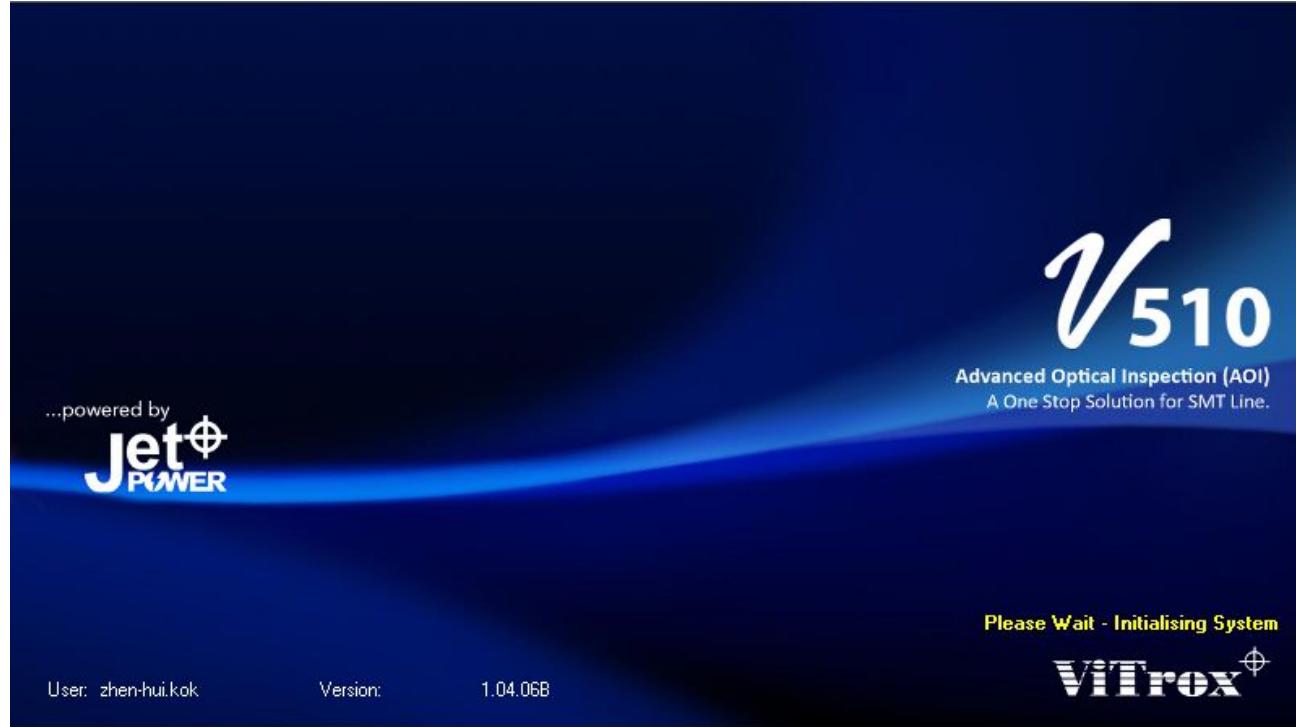
 Innovating vision



**ABI**

# JetPower - An upgrade of V510

Automated Board Inspection



**ViTrox** <sup>⊕</sup>

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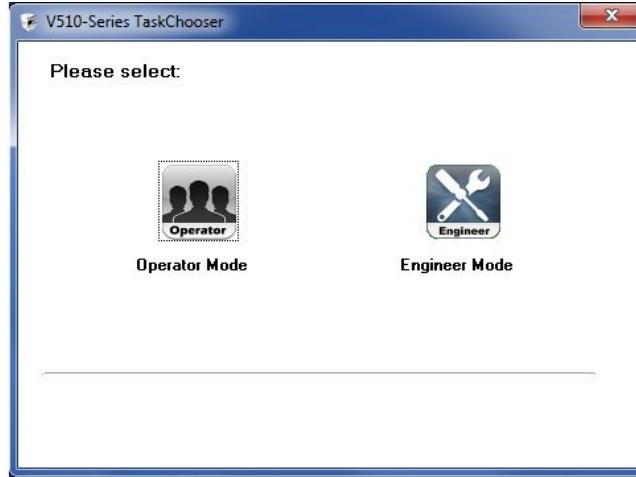


# JetPower - Operator or Engineer

This program started with the selection of mode to allow different accessibility

## Operator Mode

- Less functionalities
- Mainly do repetitive inspection without customisation
- Easier to learn by lower level worker
- No login requires

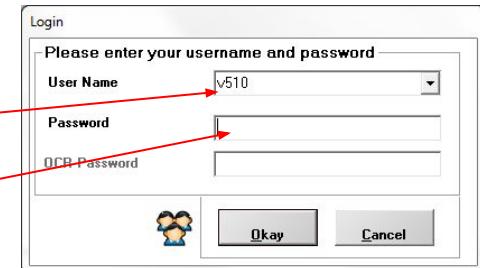


## Engineer Mode

- More functionalities
- Customisable for each setting and inspection
- Extra access to other features such as:
  - 1) CAD Converter
  - 2) CAD Visualizer
  - 3) Multiple Board Panel
  - 4) Golden Library
  - 5) Program Library
  - 6) V-One Platform
- Requires Login

Select username from drop down list here

Key in password here



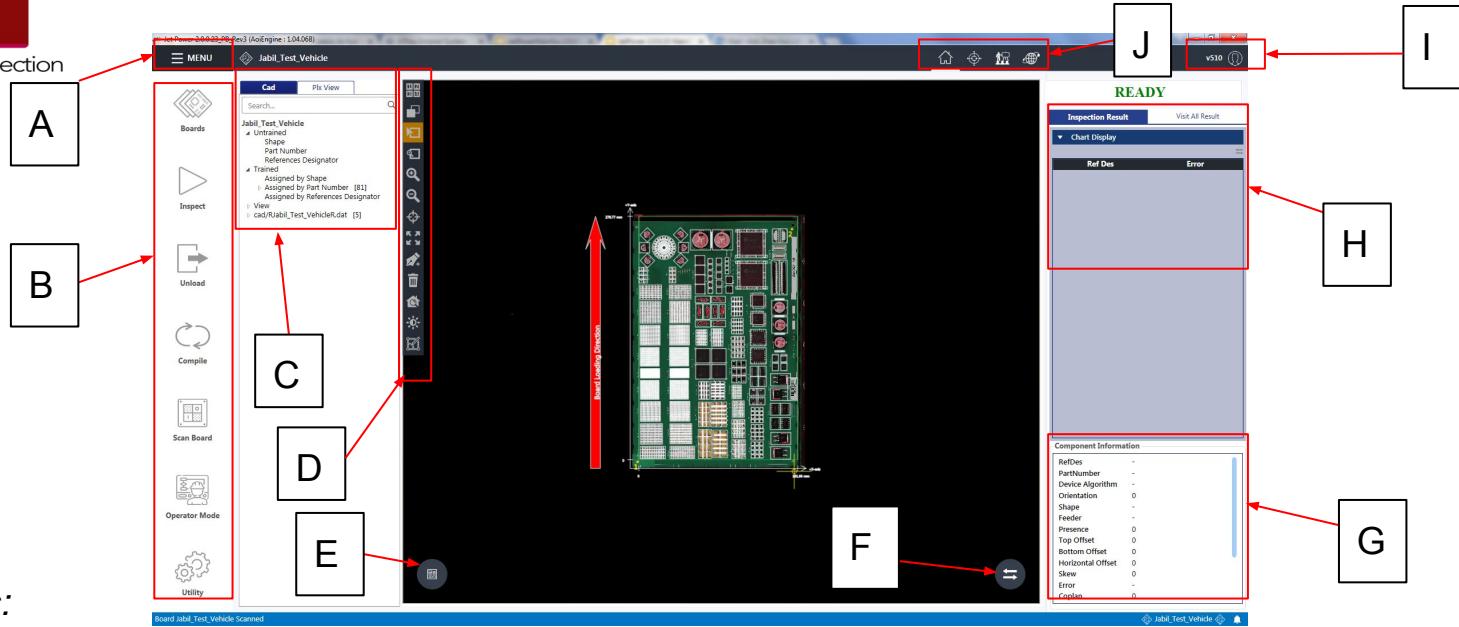
- ❖ Main GUI
  - Main Button
  - Side bar
  - Component List
  - Tools bar
  - Component Info Button
  - Switch Board View Button
  - Component Information
  - Inspection/Fiducial Result
  - V510 Profile Icon
  - Change Page Mode
- ❖ Fiducial Editor
  - Fiducial List
  - Fiducial Tools
  - Full Board CAD View
  - Fiducial Camera View
  - Fiducial Inspection Parameter Editor
- ❖ Trainer Editor
  - Component List
  - Trainers Tools
  - Board View
  - Algorithm Type
  - Switch Board View Button
  - Inspection Result
  - Train History
- ❖ V-One



**ABI**

# JetPower Engineer Mode Main GUI

Automated Board Inspection

**Features:**

A) Menu Button	D) Tools Bar	G) Component Information	J) Change Page Mode
B) Side Bar	E) Component Info Button	H) Inspection/Fiducial Results	
C) Component List	F) Switch Board View Button	I) V510 Profile Icon	

# Main GUI Features

Item	Name	Description
A	Menu Button	-After click, the screen will change to Menu Bar -To change the program to different mode
B	Side Bar	-Perform different functions in the program to the board
C	Component List	- List out the components in different view
D	Tools bar	-Choose different tools to have different inspection view
E	Component Info Button	-Message box that display the mouse-pointed component information
F	Switch Board View Button	-Change to Full Board View or Camera View
G	Component Information	-Display the selected component properties
H	Inspection/Fiducial Results	-Display the results after the inspection of components/fiducial
I	V510 Profile Icon	-Display login page
J	Change Page Mode	-Change to different mode to perform different function



# Detailed Full Board View

## Y-axis Dimension Ruler

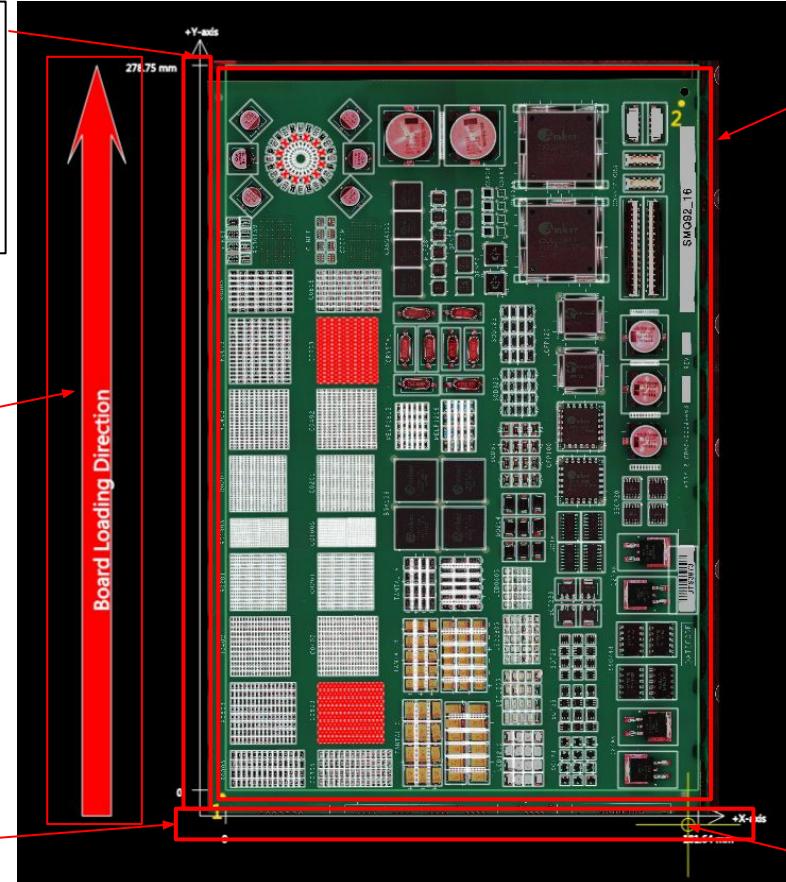
-generated y-axis ruler for quick reference

## Board Loading Direction Indicator

-to show the board loading direction into the inspection machine.

## X-axis Dimension Ruler

-generated x-axis ruler for quick reference



## Board Graphic

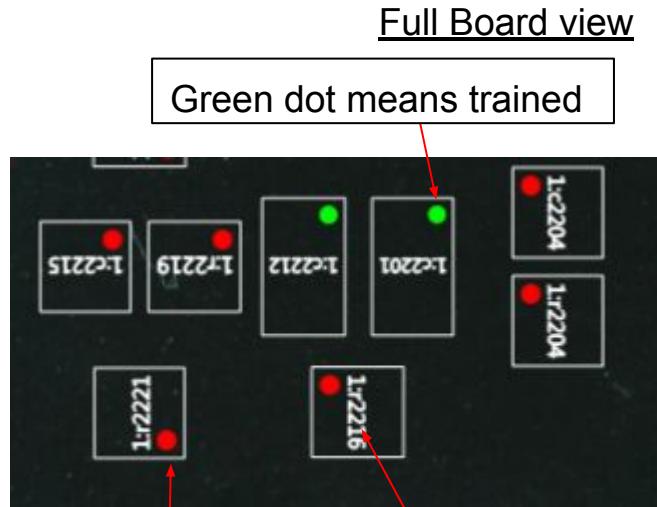
-Visualize the board and components dimension, orientation and position in scale reference from the .plx file.

## Origin Location

-Reference point for the board when loaded into the machine

Action	Function
left click	Select one component
hold and drag left button	Select multiple components
Scrolling the middle roller	Zoom in and out
Hold and drag right button	Grab the screen and adjust accordingly
right click mouse	Contextual menus



Orientation

0°



45°



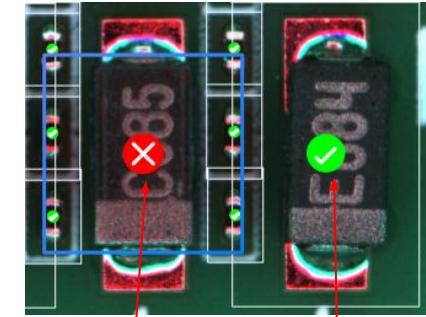
90°



180°



270°

Camera view

Red Cross means untrained

Red Cross means untrained

Green Tick means trained



# Main Page- Component List (CAD view)

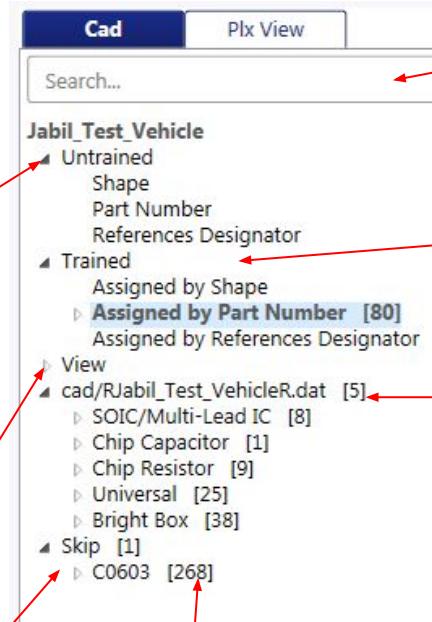
Automated Board Inspection

1) Untrained components sort by :  
 a) Shape  
 b) Part number  
 c) References Designator

3) View - All region of Inspection path

5) Skip - If there are skipped component, it will be listed here

## CAD view



Bracket value indicates number of component

2) Trained component sort by the way of assignment:  
 a) Shape  
 b) Part number  
 c) References Designator

## 4) Type of algorithms:

- ↳ (cad/RJabil\_Test\_VehicleR.dat)
  - ↳ SOIC/Multi-Lead IC [8]
  - ↳ Chip Capacitor [1]
  - ↳ Chip Resistor [9]
  - ↳ Universal [25]
  - ↳ Bright Box [38]
- ↳ Skip [1]
  - ↳ C0603 [268]

\*Only used algorithm type is shown

Search every section (Shape, PartNumber, Ref Des)  
 -Filter out accordingly  
 -case insensitive

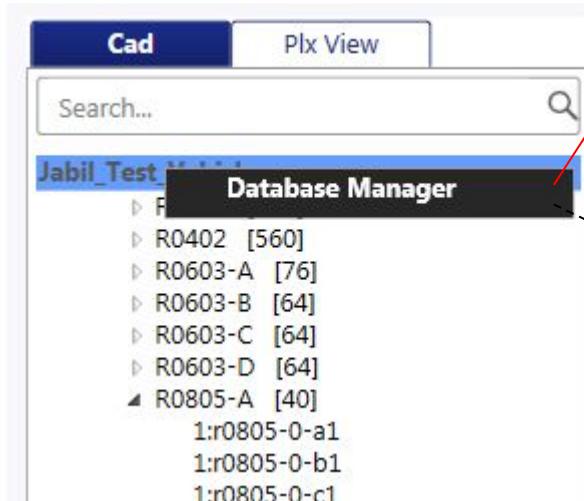
Search Result	
↳ Shape [4]	
LED0603	Trained
LED0805	Trained
LED1206	Trained
LED1210	Trained
↳ Part Number [7]	
LED0603-A	Trained
LED0603-B	Trained
LED0805-A	Trained
LED0805-B	Trained
LED1206-A	Trained
LED1206-B	Trained
LED1210	Trained
↳ References Designator [96]	
1:led1210-0-a1	bled1210

Different View

Header  
-Click on respective header to sort the column

Cad	Pix View	No.	Board Id.	X	Y	RefDes	Device Type	Orientation	Part Number	Machine	RefDes2	Shape
1	1	-174638	16932	r0805-0-a1	rr0805-a	0	R0805-A	mc-1	r0805-0-a1	R0805		
2	1	-172631	16932	r0805-0-b1	rr0805-a	0	R0805-A	mc-1	r0805-0-b1	R0805		
3	1	-170625	16932	r0805-0-c1	rr0805-a	0	R0805-A	mc-1	r0805-0-c1	R0805		
4	1	-168618	16932	r0805-0-d1	rr0805-a	0	R0805-A	mc-1	r0805-0-d1	R0805		
5	1	-166611	16932	r0805-0-e1	rr0805-a	0	R0805-A	mc-1	r0805-0-e1	R0805		
6	1	-164605	16932	r0805-0-f1	rr0805-a	0	R0805-A	mc-1	r0805-0-f1	R0805		
7	1	-162598	16932	r0805-0-g1	rr0805-a	0	R0805-A	mc-1	r0805-0-g1	R0805		
8	1	-160592	16932	r0805-0-h1	rr0805-a	0	R0805-A	mc-1	r0805-0-h1	R0805		
9	1	-158585	16932	r0805-0-i1	rr0805-a	0	R0805-A	mc-1	r0805-0-i1	R0805		
10	1	-156578	16932	r0805-0-j1	rr0805-a	0	R0805-A	mc-1	r0805-0-j1	R0805		





Mouse Right Click

This will open the  
Database Manager  
Window.

01 MENU

DATABASE  
MANAGER

FINISHED

Menu

This CAD (Jabil\_Test\_Vehicle.plx) is already linked to database cad/RJabil\_Test\_VehicleR.dat.  
Thus, any assignments made will be inserted into that database.

4792 out of 4792 Components are already assigned as follows:

Assigned by Ref Des :	0
Assigned by Part No :	4792
Assigned by Shape :	0

Summarise the status of  
algorithm assignment

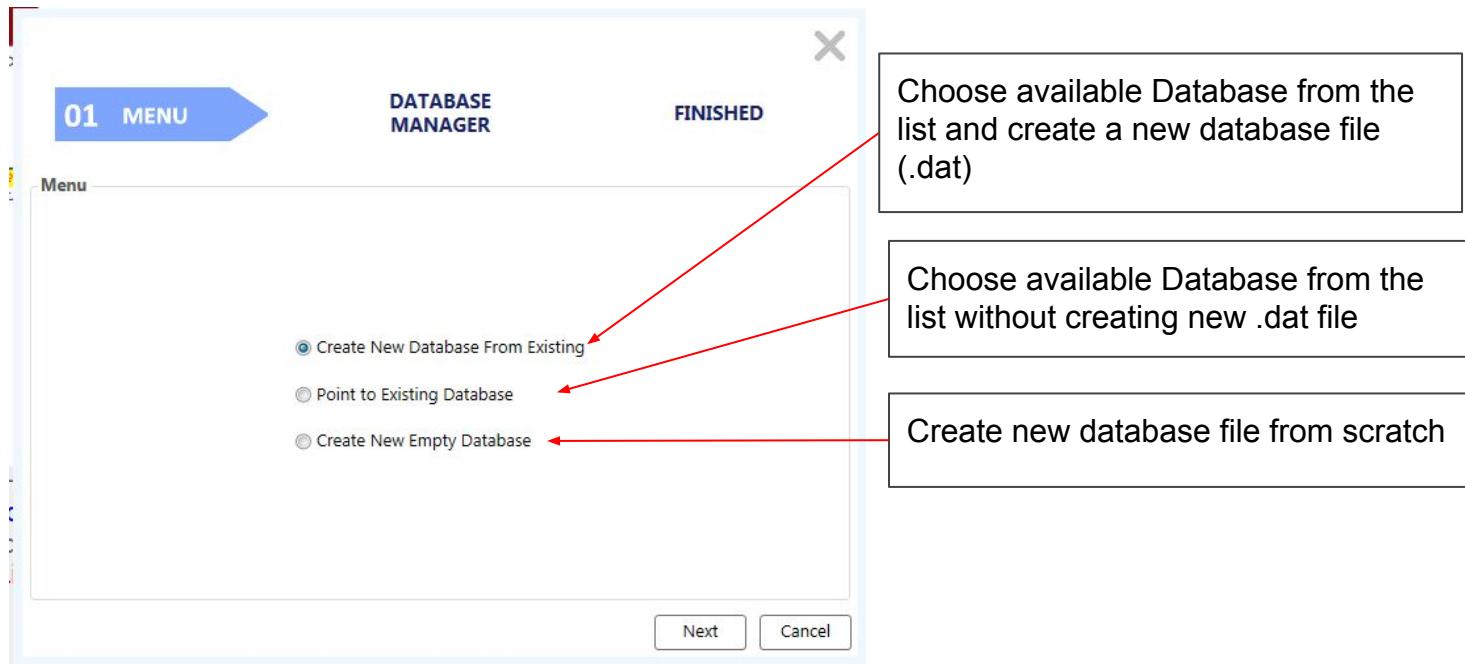
Break Link

Pressing this will break the  
linkage to the database

# Main Page-Database manager

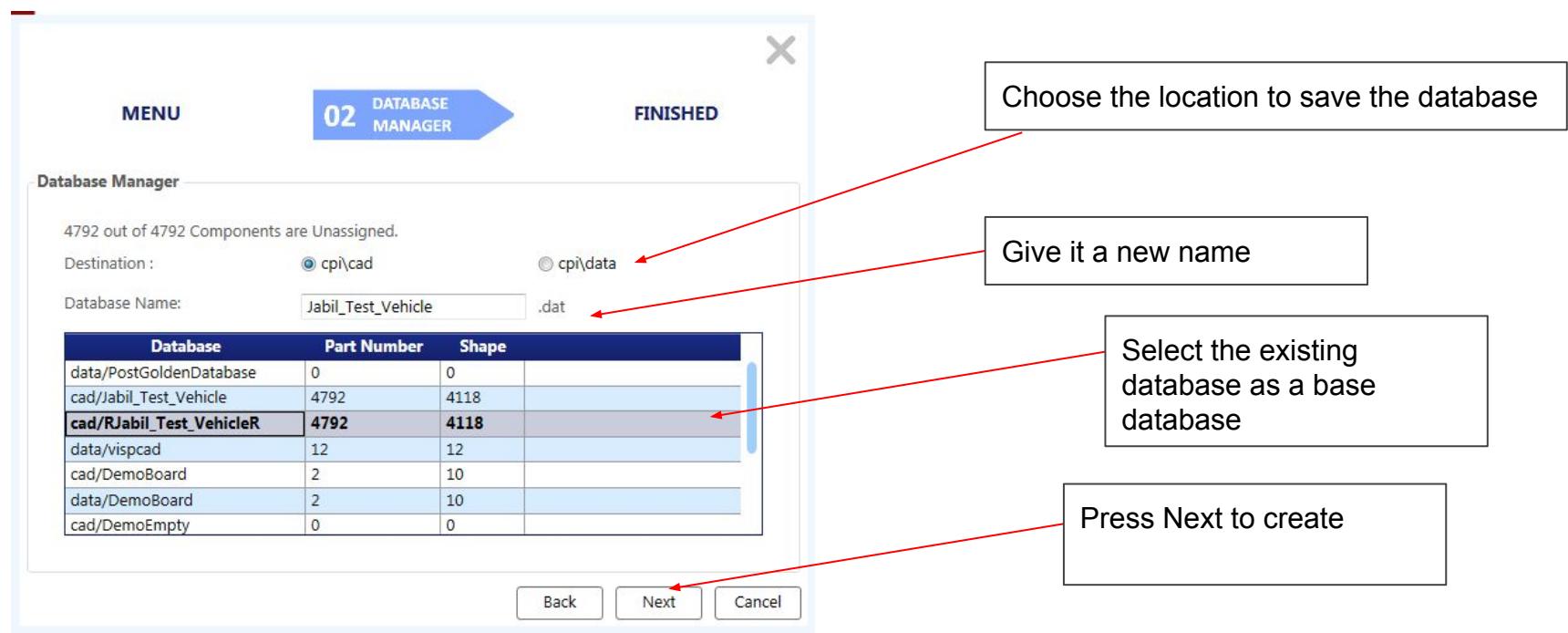
Automated Board Inspection

- Once break link, this message will prompt out to choose the database



# Database Manager - Create new database from existing

- After this Creating new database will make sure any changes made to the database will not affect the selected base database.



- After this, Changes made to the database will update the selected base database

The screenshot shows a software interface titled "Database Manager". At the top, there's a navigation bar with "MENU", a blue arrow pointing right labeled "02 DATABASE MANAGER", and "FINISHED". Below the navigation bar, the title "Database Manager" is displayed, followed by the message "4792 out of 4792 Components are Unassigned.". A table lists various databases with their Part Number and Shape. The first row, "cad/Jabil\_Test\_Vehicle", has a Part Number of 4792 and a Shape of 4118. The second row, "cad/RJabil\_Test\_VehicleR", also has a Part Number of 4792 and a Shape of 4118. A red arrow points from a callout box to the "4118" entry in this row. Another red arrow points from another callout box to the "Next" button at the bottom of the screen. The table rows include: cad/Jabil\_Test\_Vehicle, cad/RJabil\_Test\_VehicleR, data/vispcad, cad/DemoBoard, data/DemoBoard, cad/DemoEmpty, cad/NG\_644101b\_OK, cad/NG\_644101t\_OK\_2, cad/ViTroxDB\_Rev1\_odb\_0810\_T, and data/vbvispcad.

Database	Part Number	Shape
cad/Jabil_Test_Vehicle	4792	4118
<b>cad/RJabil_Test_VehicleR</b>	<b>4792</b>	<b>4118</b>
data/vispcad	12	12
cad/DemoBoard	2	10
data/DemoBoard	2	10
cad/DemoEmpty	0	0
cad/NG_644101b_OK	0	0
cad/NG_644101t_OK_2	0	0
cad/ViTroxDB_Rev1_odb_0810_T	0	0
data/vbvispcad	0	0

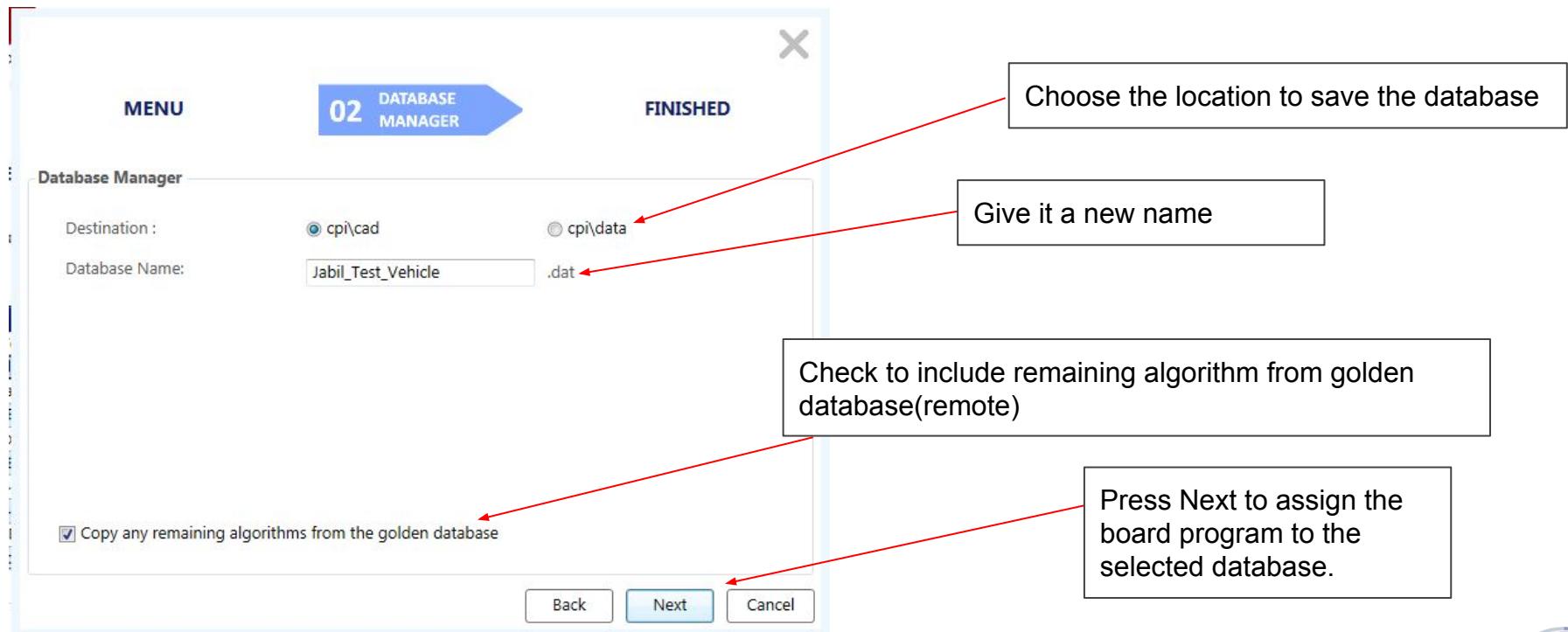
Back    Next    Cancel

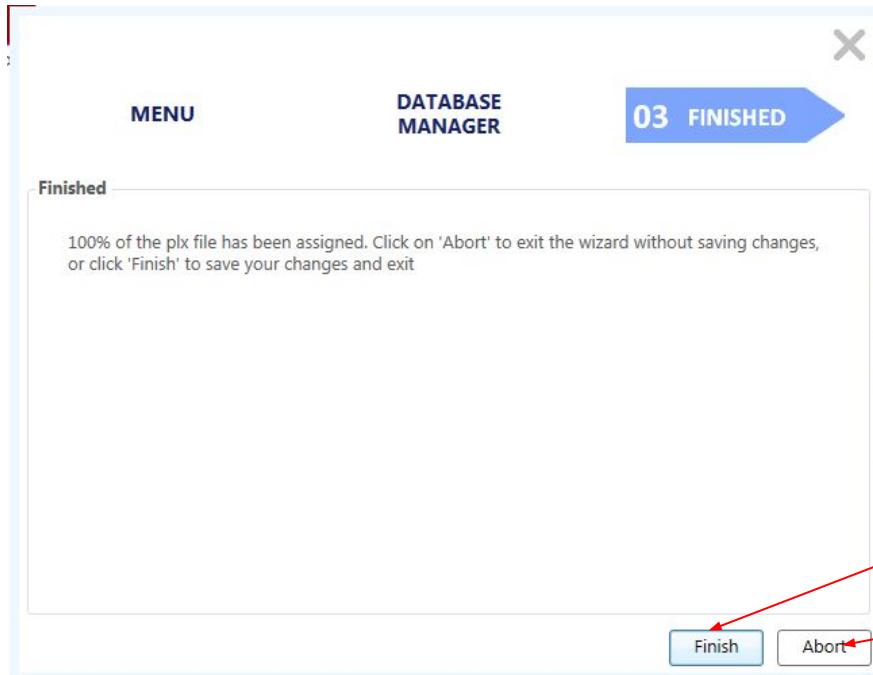
Select the existing database as a base database

Press Next to assign the board program to the selected database.



- Creating new database and requires assignment of algorithm to component one by one





Press Abort to save and applying the changes

Press Abort to exit without applying the changes



Icon	Description	Short Cut
	Zoom 1 to 1	Insert
	Fit To Screen	Home
	Zoom in	+/=
	Zoom Out	-/_
	Zoom to selected region	z

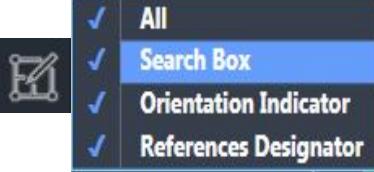
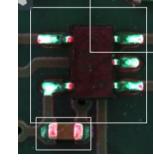


Automated Board Inspection

Icon	Name	Description	Short Cut	Graphical Display
	Show Board Number	Display the number of board to differentiate different layer of board	N/A	
	View CAD	Show inspection path region	C	
	Select Component /board	Blue colour highlight the component or board search box	S	

Icon	Name	Description	ShortCut	Graphical Display
	View Origin Location	Display the origin of this board that act as a reference point	N/A	
	Brightness adjuster	-Adjust the brightness of the board. -This will change the display of the fullboard image captured	N/A	
	Delete Component	This tools allows engineer to delete one or more components at one time.	Delete	Refer to slides page 19-Delete Components

Automated Board Inspection

Icon	Name	Description	Graphical Display
	Component Reference CheckList	By checking the item in the list, the reference will be shown on the screen	 Search Box  Orientation Indicator
	Add Component	This tools allows engineer to add single or multiple components on full board.	Refer to slides page 16-18-Add Single Component/ Add Multiple Components



# Menu Tools Bar - Add Single Component

## Add Component Button



- This tools allows engineer to add single or multiple components on full board.
- The following function will appear at the right hand side, under Inspection Result section

The angle of the component. Ranging from 0° to 345° with the interval of 15° (0°, 15°, 30°, 45°...330°, 345°)

A Point assignment or an area assignment

Assign to Shape and machine

Point assignment method (rectangular)

Dimension that can be changed are width and height

**Add Component Function**

Component Info	Current BoardID	1
RefDes	bar_1	
PartNumber	BGA196	
DeviceType	bbga196	
Orientation	0	
Assignment Method	Point	
Multi Panel	<input checked="" type="checkbox"/>	
<b>Advanced Infomation</b>		
Shape	SHAPE	
Machine	mc-1	
<input checked="" type="radio"/> Single <input type="radio"/> Multiple		
<input checked="" type="radio"/> Multi Panel Editor <input type="radio"/> Component Assignment Editor		
<input checked="" type="radio"/> Point Method <input type="radio"/> Line Method		
<input checked="" type="radio"/> Circle Diameter <input type="radio"/> Rectangle Width & Height		
Small dot here is changed by dragging left and right		

Current Board ID

Reference Designator

Drop down list of Part Numbers

-Universal Device Type(Algorithm)  
-automatically selected based on Part Number

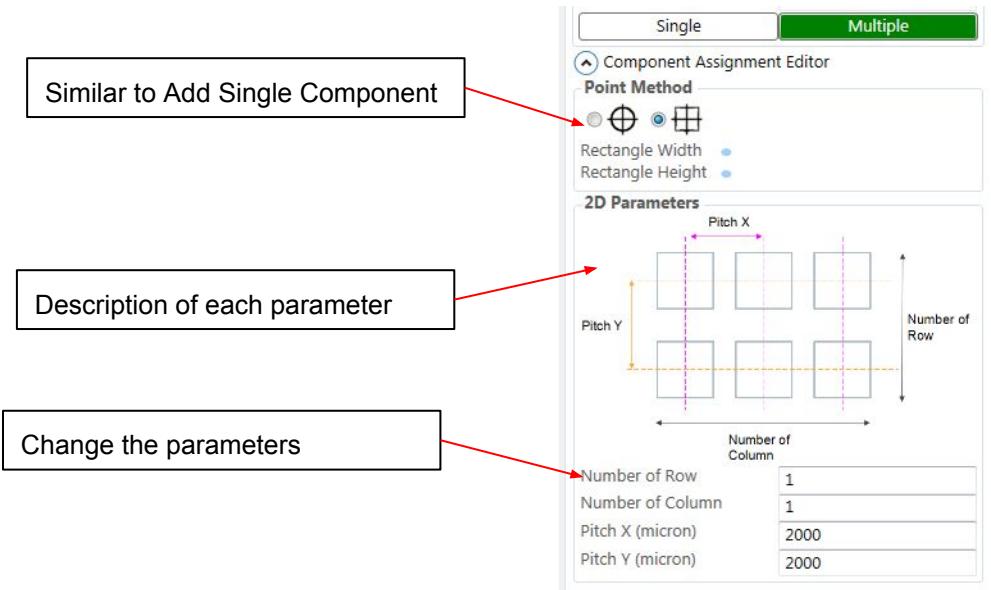
Multi Panel

<input checked="" type="checkbox"/>	BoardID
-------------------------------------	---------

To Edit multiple Panel

Point assignment method (Circular)

Dimension that can be changed is Diameter

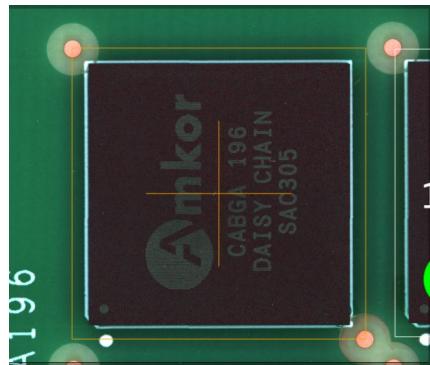


# How to Add Component

Automated Board Inspection

## Step 1

After setting the required informations, draw the frame for the component by hold and drag the Mouse Left Button

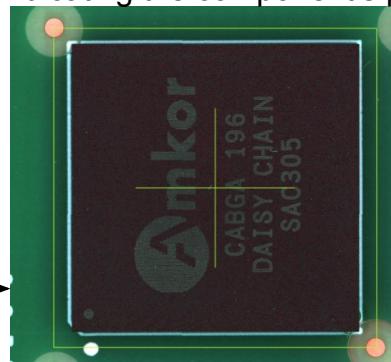


Components

1

Preview

The box changed to Green Colour indicating the component's preview



Components

1

Next

## Step 2

Press Preview to view the component

Add Component Function

List Summary  
Sort By BoardID

All Boards

PartNumber: BGA196  
Orientation: 0  
Device Type: bbg196  
Machine: mc-1  
Shape: SHAPE

Board	RefDes	X	Y
1	bga196-0-a2	-102573	132621



## Step 5

Component Added

## Step 4

Press Done to complete the process

Components

1

Back

Done



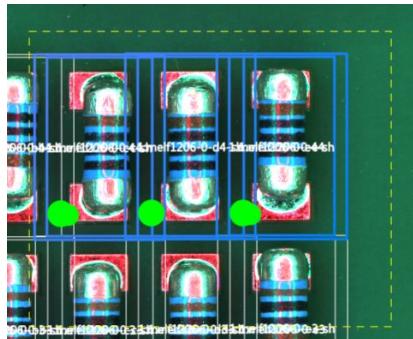
# Menu Tools Bar - Delete Component



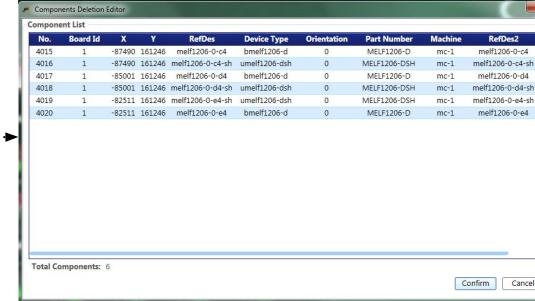
Delete Component Button

-This tools allows engineer to delete one or more components at one time.

Select Multiple Components by hold and drag left mouse button



Press Confirm to delete

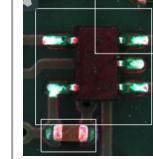


\*Select single Components by mouse left click



Icon	Description	Short Cut
	Zoom 1 to 1	Insert
	Fit To Screen	Home
	Zoom in	+/=
	Zoom Out	-/_



Icon	Name	Description	Short Cut	Graphical Display
	Reference CheckList	By checking the item in the list, the reference will be shown on the screen	N/A	 Search Box  Orientation Indicator
	Add Component	This tools allows engineer to add single or multiple components on current FOV.	N/A	Refer to previous slides - Add Single Component/ Add Multiple Components
	Delete Component	This tools allows engineer to delete one or more components at one time.	Delete	Refer to slides 19- Delete Components

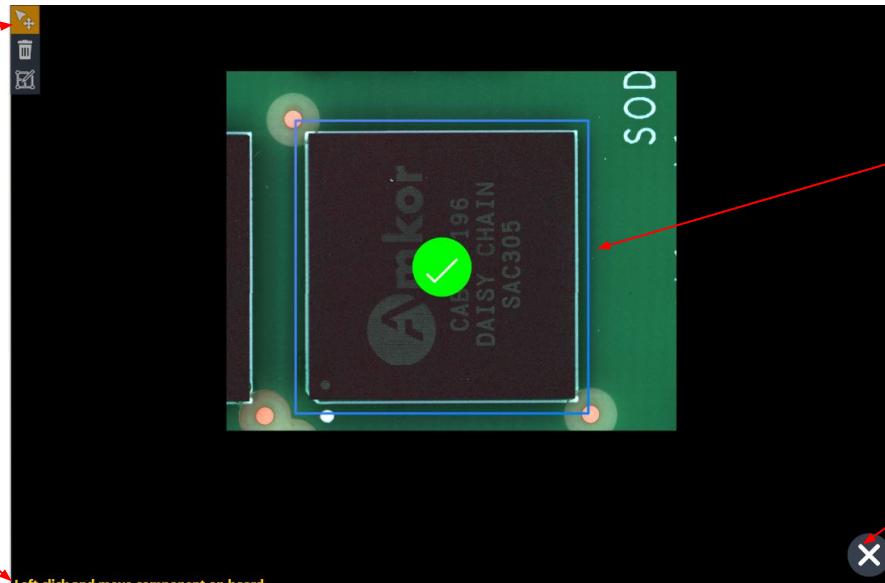




Move Component Button

-This tools allows engineer to move single or multiple components on full board.

Move  
Component  
Button enabled



Component must be  
fully located within  
Frame of View

Instruction to  
move component

Undo Changes



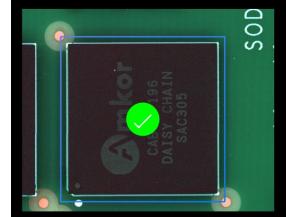
# How to Move Component

## Step 1



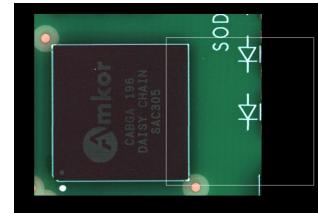
Click to enable move component

## Step 2



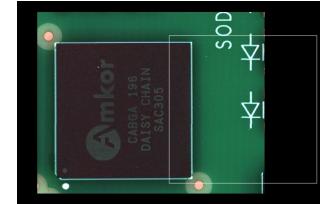
Locate a component

## Step 3 Hold and drag the left button on mouse



## Step 4

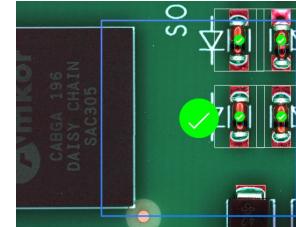
Click to disable move component function



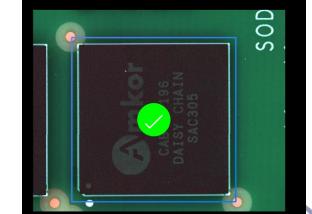
## Step 5



Click yes to apply changes



Click no to discard changes

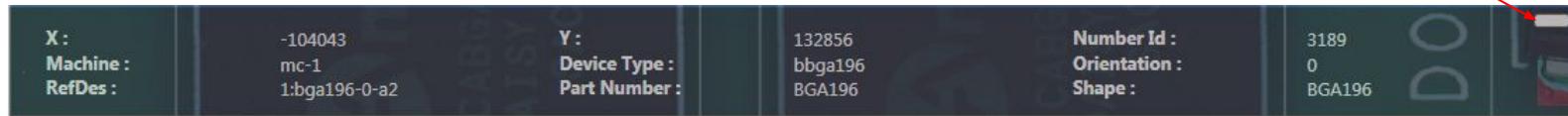


# Component Information

Automated Board Inspection

- The information provided by both format is the same.
- The update method for Component Info Button message box is when the mouse **pointed** at the component while Component Information Column only update when the component is **clicked**
- Component Info Button has X, Y Coordinates and ID Number while the column has more information regarding inspection result instead

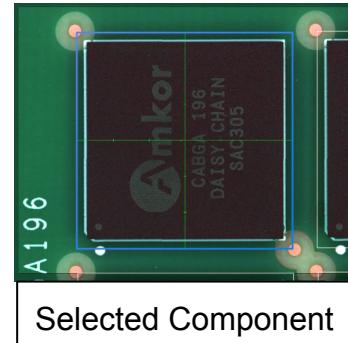
## Component Info Button



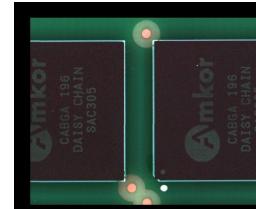
Minimize button to minimise the message box

## Component Information Column at right side

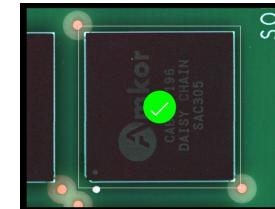
Component Information	
RefDes	1:bga196-0-a2
PartNumber	BGA196
Device Algorithm	bbga196
Orientation	0
Shape	BGA196
Feeder	mc-1
Presence	0
Top Offset	0
Bottom Offset	0
Horizontal Offset	0
Skew	0
Error	-
Coplan	0



## Extra Notes in Camera View:



Cannot update



Can update

-To update the component information, the component must fully present in the Frame Of View

# Side Bar - Board

Automated Board Inspection



- To switch the current active program from the available list of board program(.plx extension).
- The board programs are available in c://cpi/cad directory.

The screenshot shows the ABI software interface. On the left is a vertical sidebar with icons for 'Boards' (selected), 'End Inspection', 'Unload', 'Compile', 'Scan Board', 'Operator Mode', and a gear icon. The main area displays a list of available programs:

Name	Size	LastModifiedDate
DemoBoard	24064	12/11/2017 4:49:17 PM
NG_644101b_OK	45448	12/12/2017 8:44:30 AM
ViTroxDB_Rev1_odb_0810_T	25434	12/11/2017 3:32:25 PM

A red box highlights the list of programs, and a red arrow points from the text 'List of available programs' to this box. A red circle with a minus sign is located at the top right of the list area, and a red arrow points from the text 'Refresh button to update the program' to this circle.

Refresh button to update the program

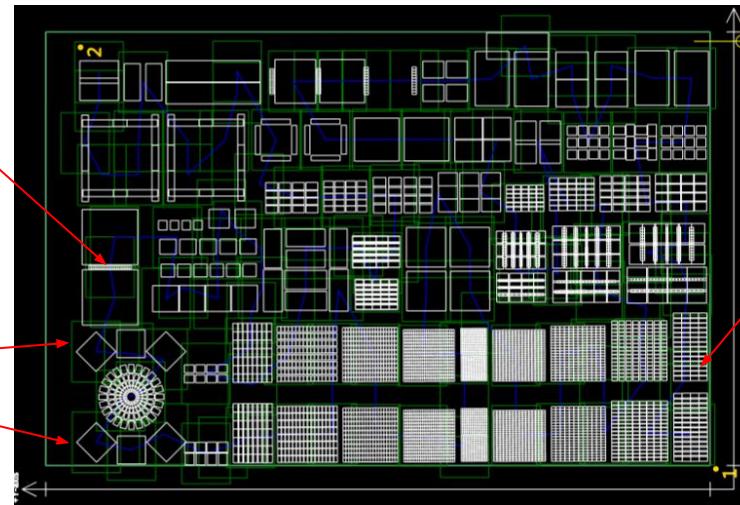
List of available programs





# Side Bar- Inspection

- Purpose : To start inspection on current active program.
- Inspection is to detect if any defect component on the board
- The inspection of the components are done view by view following the path created
- The path is calculated using the algorithm to have the most efficient pathway (shortest time taken to capture all components)



Blue colour – Path

Green Colour Boxes  
- Frame of View(FOV)

Small white  
colour  
– components  
on the board



# ABI

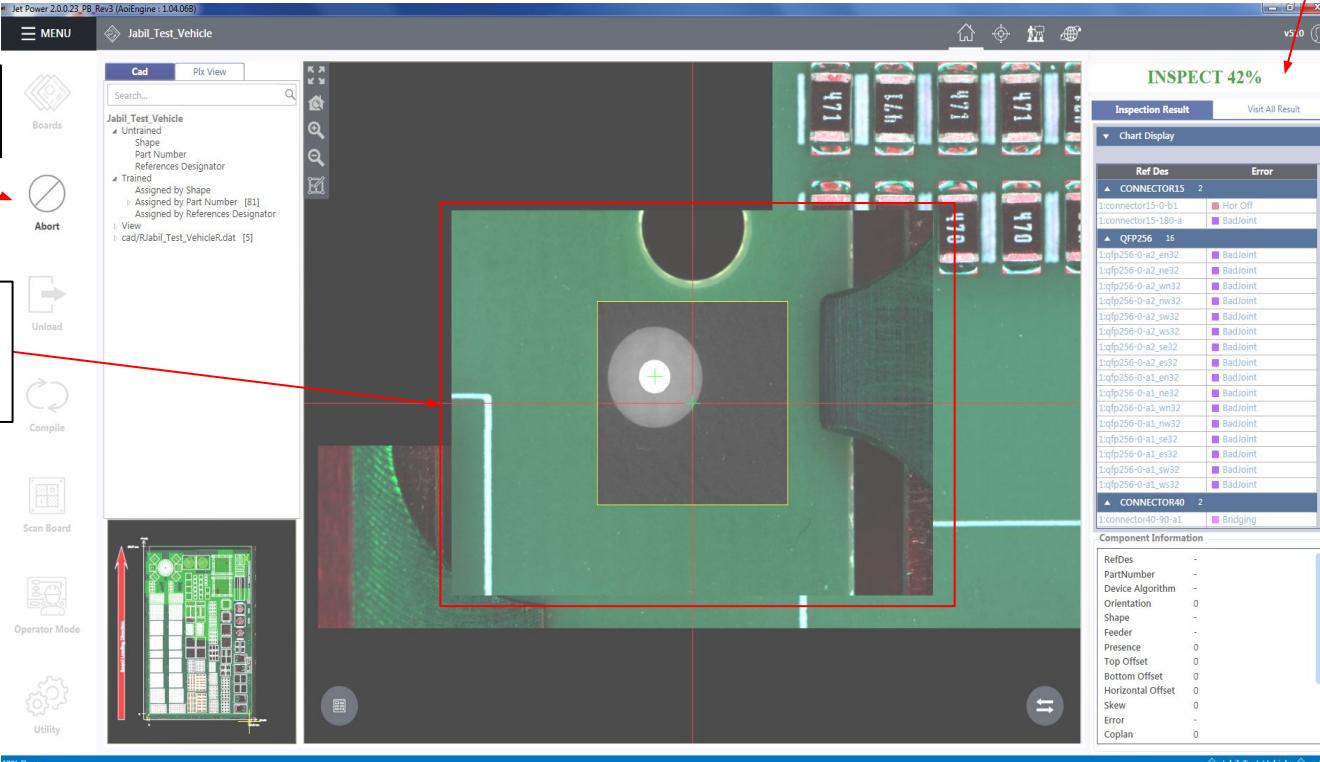
Automated Board Inspection

# Inspection in Progress

Display the progress percentage

## Camera View

Aborting the inspection is allowed



This box is showing the fiducial of the inspecting board

Display the progress percentage

ViTrox

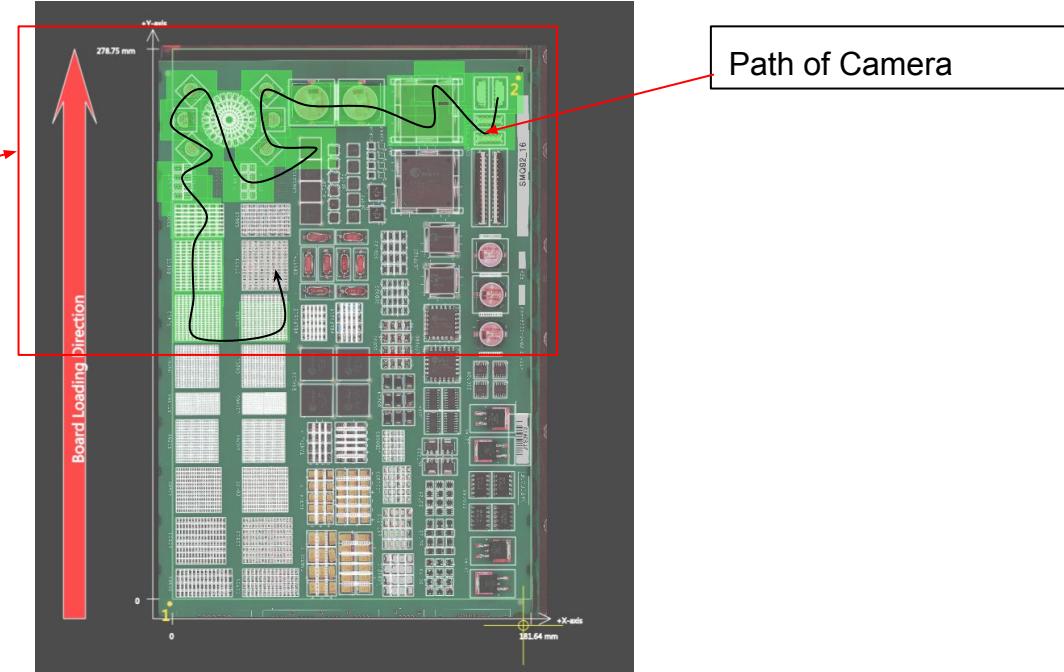
# Inspection in Progress

Automated Board Inspection

## Full Board View

-Green Box are the view of camera

-In the JetPower, it can be seen how does the camera capture image view by view, and the status of inspection



Path of Camera



# Inspection Result - Overall Chart/List Display

Automated Board Inspection

Result of Inspection

Inspection Progress (100% means completed)

The errors for each component

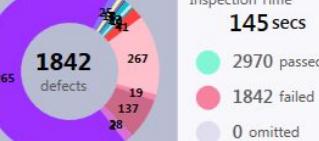
## Chart View

INSPECT 100%

Inspection Result

Visit All Result

Chart Display



Ref Des

Error

CONNECTOR15 2	
1:connector15-0-b1	Hor Off
1:connector15-180-a	BadJoint
QFP256 16	
1:qfp256-0-a2_en32	BadJoint
1:qfp256-0-a2_ne32	BadJoint
1:qfp256-0-a2_wn32	BadJoint
1:qfp256-0-a2_nw32	BadJoint
1:qfp256-0-a2_sw32	BadJoint
1:qfp256-0-a2_ws32	BadJoint
1:qfp256-0-a2_se32	BadJoint
1:qfp256-0-a2_es32	BadJoint
1:qfp256-0-a1_en32	BadJoint

Inspection Progress (100% means completed)

Result of Visit All

## List View

Chart Display

Error Type	Total Error	Percentage
Missing	44	2.4%
Left Off	241	13.2%
Right Off	16	0.9%
Hor Off	143	7.8%
Extra Part	29	1.6%
Bridging	2	0.1%
BadJoint	1268	69.4%
Skew	27	1.5%
Polarity	14	0.8%
Billboard	7	0.4%
Damaged	5	0.3%
OCV Fail	17	0.9%
Lifted Lead	11	0.6%
Coplanarity	3	0.2%

Open Chart View

Open List View

View by Multiple Defects

Ref Des	Error
1:connector15-0-b1	Hor Off BadJoint Lifted Lead Missing Lead
1:connector15-180-a	BadJoint Lifted Lead Missing Lead

Instead of listing down each defects, View by Multiple Defects will group each components' defect

Single Defect

Multiple Defect

# Inspection Result - Colour Table

Automated Board Inspection

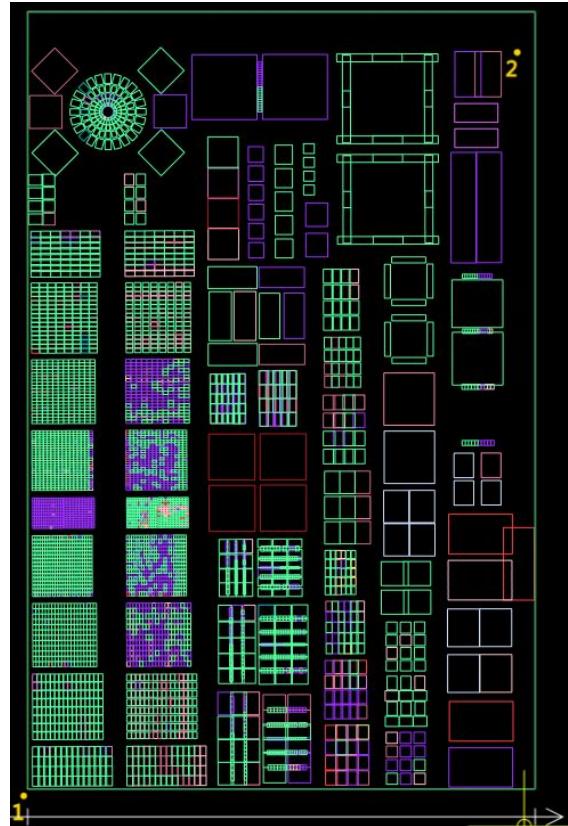
Result	Colour
BadFid	deepskyblue3
BadJoint	purple1
Barcode	gold2
Billboard	royalblue1
Bridging	mediumorchid1
Coplanarity	manganeseblue
Damaged	indianred
ExtraPart	orchid
Failures	indianred1
Flipped	cadetblue1

Result	Colour
HeightError	cyan
HorOff	palevioletred3
LeftOff	pink
LiftedLead	lightsteelblue1
Missing	brown1
MissingLead	brown3
OCIFailed	navajowhite2
OCVFail	turquoise3
Omitted	lightgrey
Passed	seagreen1

Result	Colour
Paste	plum1
Polarity	khaki1
RightOff	palevioletred1
RowOffset	dodgerblue2
Skew	lightslateblue
Text	maroon3
Tilt	darkgoldenrod1
Tombstone	magenta2
Tweeze	darkorchid
XSPaste	hotpink

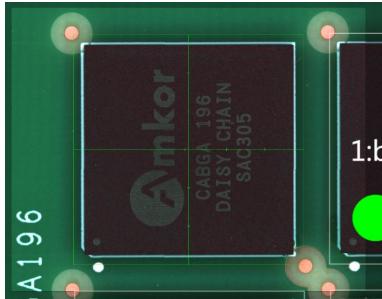
### Full Board View of Inspected Result

- The colours show the errors in the component if the component is defect.
- Refer to previous slide for different meaning of different colour
- It will shows   in colour if the component passed the inspection without defect



# Single Component Inspection Result

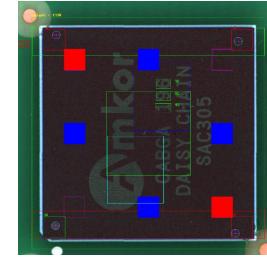
Automated Board Inspection

Before Inspection

## Component Information

Feeder	mc-1
Presence	0
Top Offset	0
Bottom Offset	0
Horizontal Offset	0
Skew	0
Error	-
Coplan	0
Billboard	0
Missing	0
Damage	0
Coplan Horizontal	0

If the component is defect, error is shown after inspection

After Inspection

## Component Information

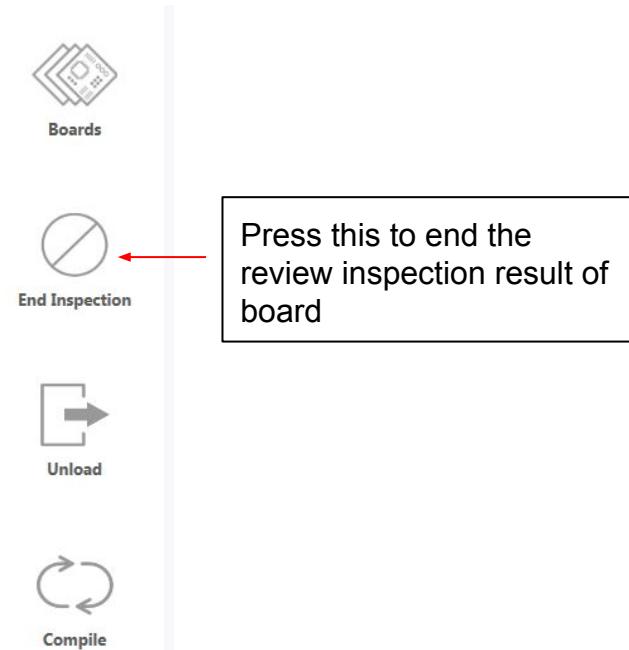
Feeder	mc-1
Presence	1330
Top Offset	28
Bottom Offset	16
Horizontal Offset	27
Skew	-2
Error	Damaged, Coplanarity
Coplan	113
Billboard	-20
Missing	98
Damage	131
Coplan Horizontal	126



# Stop the Inspection

Automated Board Inspection

- After the inspection is finished, end inspection will be shown until user finished review on each of the defects.
- The Side Bar Inspect Button will changed to End Inspection when inspection of board is completed



# Side Bar - Unload

Automated Board Inspection



- This will unclamp the current board from the inspection machine and wait for another board to be loaded



Unload completed



# Side Bar - Compile

Automated Board Inspection



- To save the changes from memory into relevant files
- Actually, every action done is automatically saved into the program board file. However, Compile button is better to use after a number of changes to ensure that the information is saved.

Compilation Completed



Compiling in progress



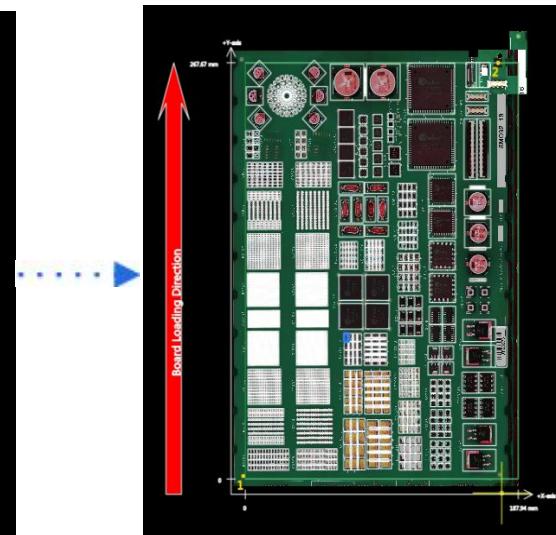
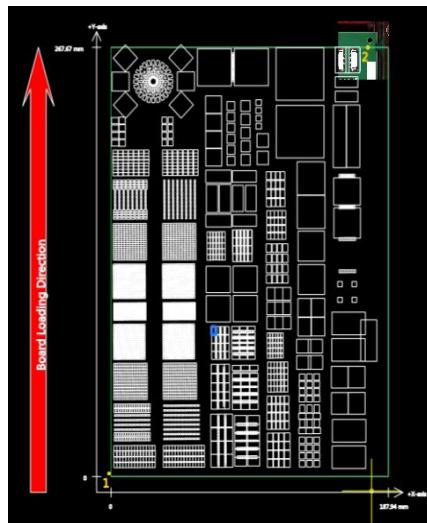
# Side Bar – Scan Board



- Initially when the board loaded into the machine, there is no full image view of components.
- Scan board will move the camera to capture each view and compile the images into a full board.
- Correct fiducial location is important for the machine to start scanning
- \* Inspection can still be done without Scan Board

## Before Scan

- All boxes indicates the component on the board
- These are the informations loaded into the program from the .plx file



## After Scan

- All components are displayed accordingly
- Full board view is to help engineer/operator to have a better graphical display of the board



# Side Bar - Operator Mode



Operator Mode

Switch back to Engineer Mode

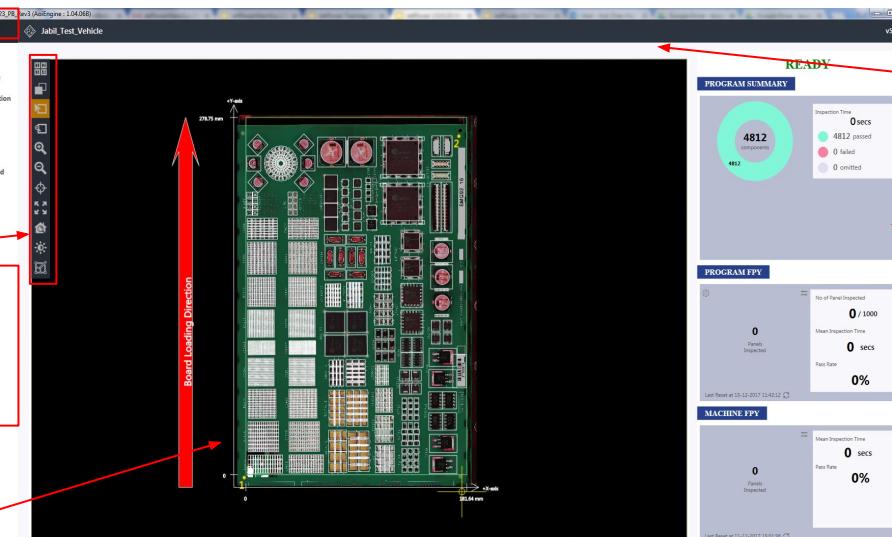
Much less Features than Engineer Mode

Same tools with Engineer Mode

No Component information display

-Only full board view.  
-Camera view is not allowed

- This button will change the current mode to Operator Mode instead of Engineer Mode.
- This mode is much simpler to be used because no setting required
- Can easily be learnt by low-level workers



Do not have Fiducial Editor, Trainer Editor, V-One Platform

Display the Inspection result summary without the need of pressing Inspect Button

# Operator Mode- Program Selection

Automated Board Inspection

Indicating Currently active Board Program

- This allows the operator to change the board program.
- The selections come in 2 different view
- Single Click to Select.
- Double Click to Load (Make it active)

The screenshot shows a software interface for managing board programs. At the top, a blue button labeled "Current Program" is highlighted, and next to it is the text "Jabil\_Test\_Vehicle". Below this is a table with columns: Program Name, Size, and Modified Date. The table contains four rows of data. A red arrow points from the "Current Program" button to the row for "Jabil\_Test\_Vehicle", which is highlighted with a gray background. Another red arrow points from the "Jabil\_Test\_Vehicle" row to a callout box at the bottom left that says "Change the current board program".

Program Name	Size	Modified Date
DemoBoard	24064	12/11/2017 4:49:17 PM
<b>Jabil_Test_Vehicle</b>	<b>438857</b>	<b>12/15/2017 11:29:54 AM</b>
NG_644101b_OK	45448	12/13/2017 5:42:16 PM
ViTroxDB_Rev1_odb_0810_T	25434	12/11/2017 3:32:25 PM

List View

The screenshot shows the same software interface in Grid View. The "Current Program" button is still highlighted with "Jabil\_Test\_Vehicle" next to it. Below the button is a grid of four icons representing different board programs. The icon for "Jabil\_Test\_Vehicle" is a dark blue rectangle, while the others are white rectangles with a logo. A red arrow points from the "Jabil\_Test\_Vehicle" icon to a callout box at the bottom right that says "Grid View".

Grid View



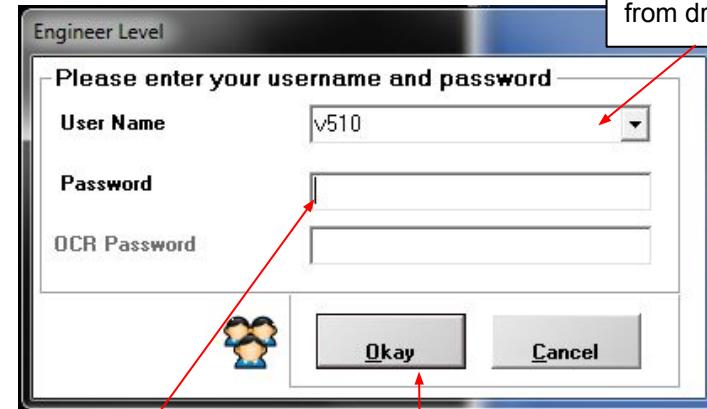
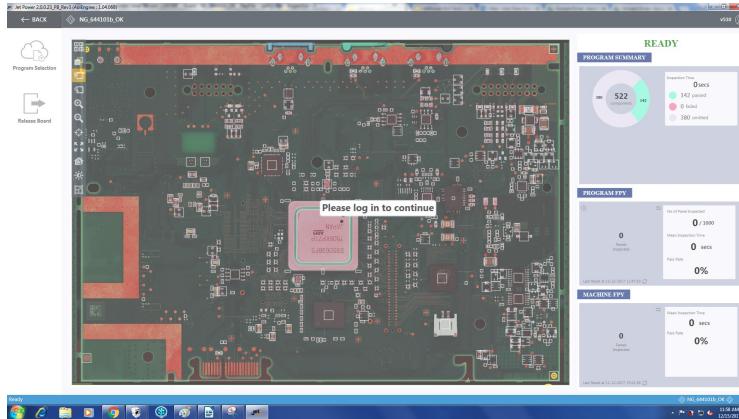
- This allow the machine to unload(release) current board and load another board into the machine



# Switching back to Engineer Mode

Automated Board Inspection

- Switching back to Engineer Mode requires password.
- This allows only authorised person to assess the Engineer Mode



Select username  
from drop down list

Type in the correct password

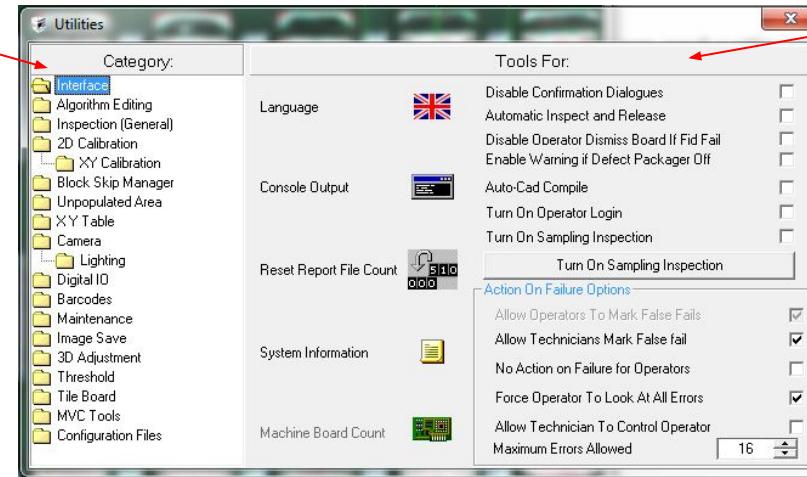
Click Okay, Press Alt+O or  
Press Enter to continue

# Side Bar - Utilities



- Change the parameters and settings of the system
- This will prompt the old GUI of the Utility

Different Categories to be changed

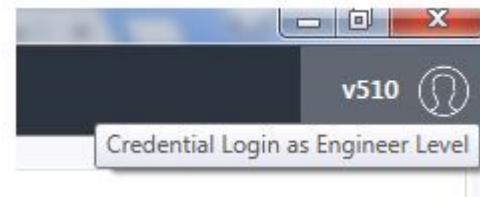


Different Tools to be changed



# V510 Profile Icon

Automated Board Inspection

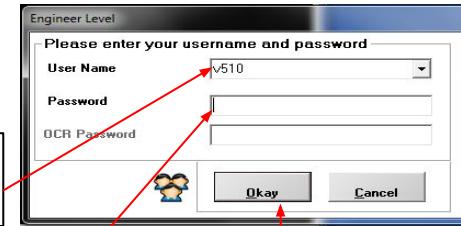


In this version of JetPower, clicking this profile icon will prompt the old GUI of Operator mode. This will require the Engineer to key in password to login back to Engineer Mode.



Old Operator Mode GUI

Prompt to login to Engineer Mode



Select username from drop down list

Type in the correct password

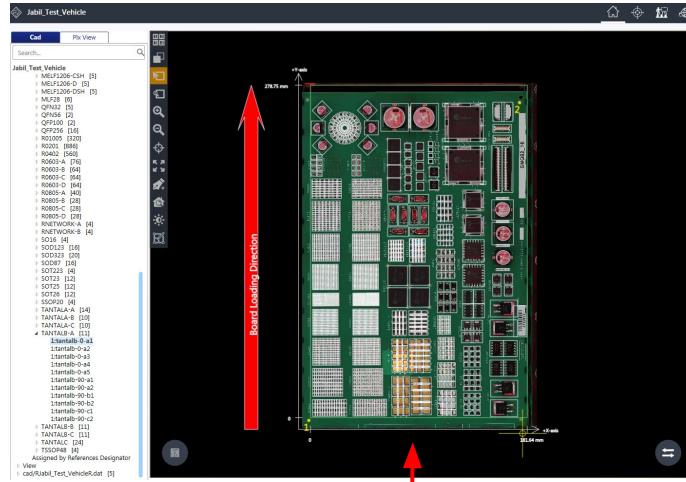
Click Okay, Press Alt+O or Press Enter to continue



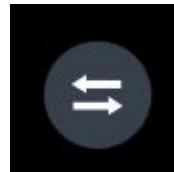
# Switch Board View

Automated Board Inspection

## Full Board View

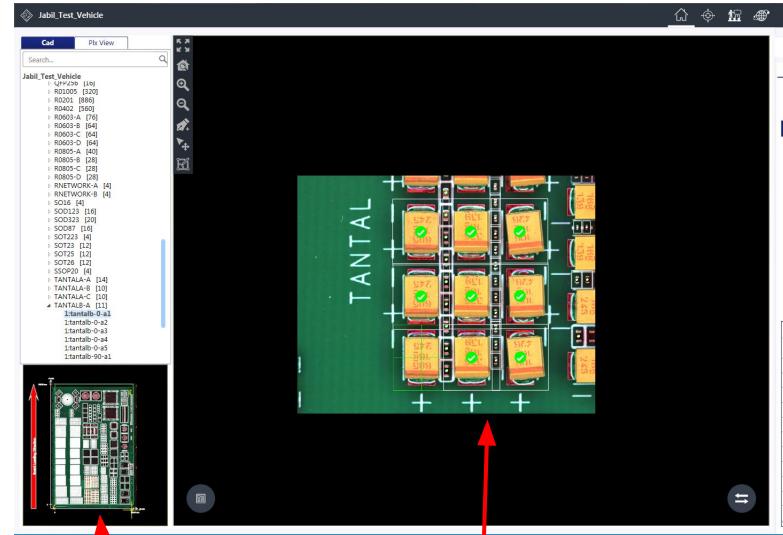


Has only full board view at the screen



Toggle

## Camera View

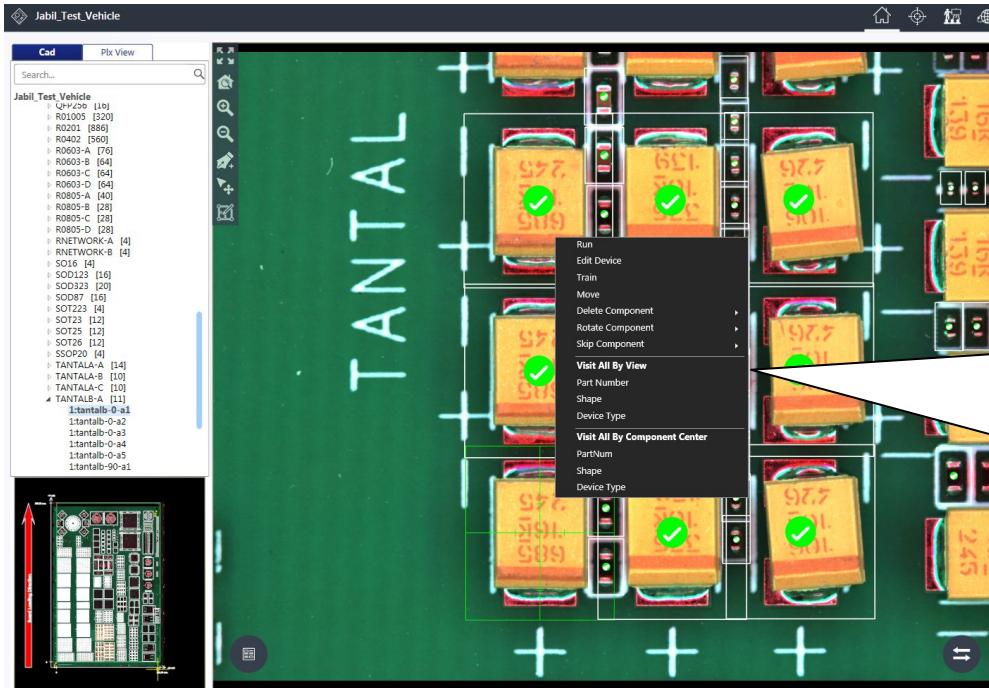


Full board size view is here

Camera Region as the maximum size of Frame of View(FOV)

# Right click of Component in Main Page

Automated Board Inspection



List of available functions:

- 1) Run
- 2) Edit Device
- 3) Train
- 4) Delete Component
- 5) Rotate Component
- 6) Skip Component
- 7) Visit All by View
- 8) Visit All by Component Center

# Functions

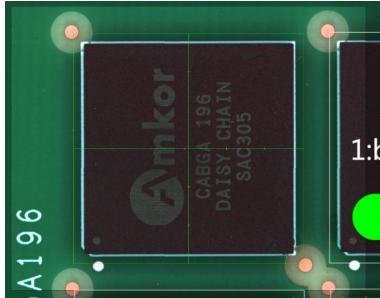
Item	Description
Run	Run the inspection of single component
Edit Device	Open Algorithm Editor Window
Train	Change page to Trainer Editor to train the component
Delete Component	<ul style="list-style-type: none"><li>-Delete the components with the same level of classification (Shape, Part Number or Ref Des).</li><li>-Can choose to delete from all boards instead of current active board</li></ul>
Rotate Component	<ul style="list-style-type: none"><li>- This will rotate the orientation of the component</li></ul>
Skip Component	Exclude the components from inspection with the same level of classification
Visit All by view	Inspect the selected components by capturing image the view that contains the component
Visit All by Component Center	Inspect the selected components by capturing the image where individual component is at the center of camera



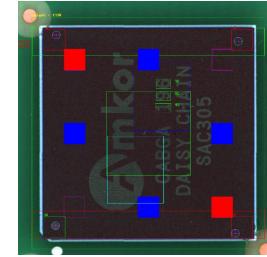
# Run

- Run the inspection of single component

Before Run



After Run



Component Information

Feeder	mc-1
Presence	0
Top Offset	0
Bottom Offset	0
Horizontal Offset	0
Skew	0
Error	-
Coplan	0
Billboard	0
Missing	0
Damage	0
Coplan Horizontal	0

If the component  
is defect, error is  
shown after run

Component Information

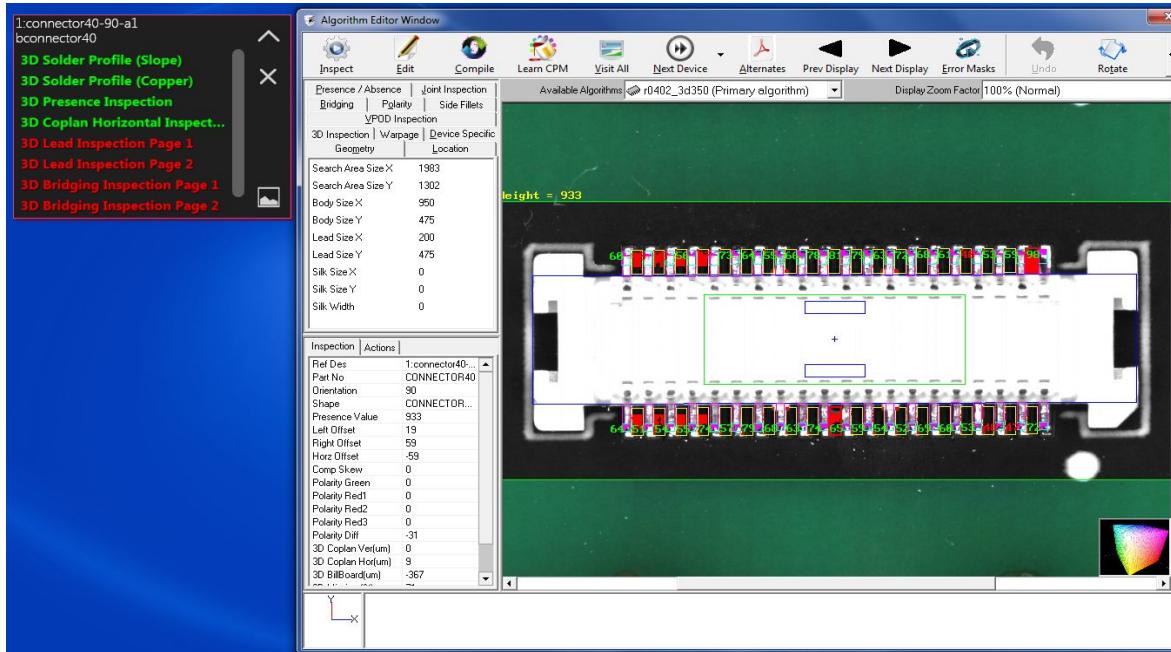
Feeder	mc-1
Presence	1330
Top Offset	28
Bottom Offset	16
Horizontal Offset	27
Skew	-2
Error	Damaged, Coplanarity
Coplan	113
Billboard	-20
Missing	98
Damage	131
Coplan Horizontal	126



# Edit Device- Algorithm Editor Window

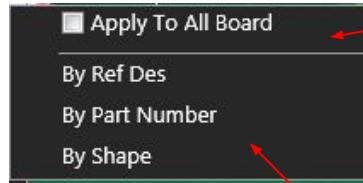
Automated Board Inspection

- This window is opened when right clicked at an device(algorithm) and choose Edit Device



# Delete Component

-This will delete all the component by the desired level of classification  
(Shape, Part Number, Ref Des)



-Checking this will affect all the components from all level of the boards in this program  
- Without checking this, only current active board's components will be deleted. Others will not be affected

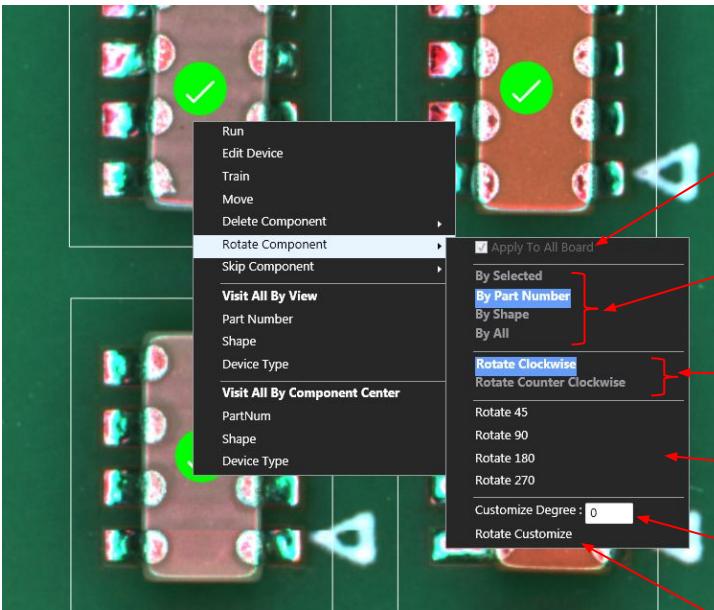
Delete the components based on the desired level of classification



# Rotate Component

Automated Board Inspection

-This will rotate all the component by the requirement



-Checking this will affect all the components from all level of the boards in this program  
- Without checking this, only current active board's components will be deleted. Others will not be affected

By selected means rotate the selected component (similar to by ref des)  
By Part Number  
By Shape  
By all - rotate all component on the board

Rotate clockwise ↗ or counterclockwise ↘

Click to rotate based on the given degree of rotation

Key in any degree between 0 to 360 for customization

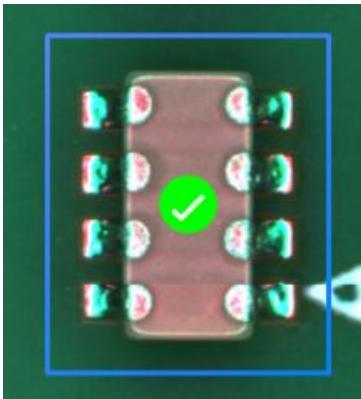
Click to rotate customized degree of rotation



# Rotate Component

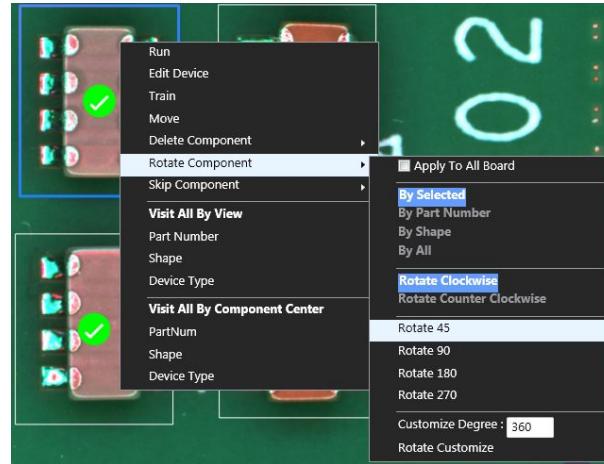
## Step 1

Select the component



## Step 2

Choose the rotation requirement



## Step 3

Rotation completed

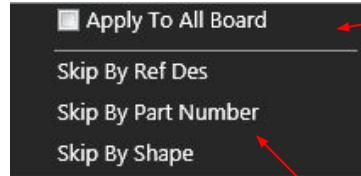


\*Let's say, single component,  
clockwise and 45°



# Skip Component

-This will exclude all the component for inspection by the desired level of classification (Shape, Part Number, Ref Des)



-Checking this will affect all the components from all level of the boards in this program  
- Without checking this, only current active board's components will be skipped. Others will not be affected

Skip the components based on the desired level of classification



# Skip Component

Automated Board Inspection

## Step 1

Choose the way to skip

- Apply To All Board
- Skip By Ref Des
- Skip By Part Number
- Skip By Shape

## Step 2 Double Confirm

Skip Components Editor

Component List

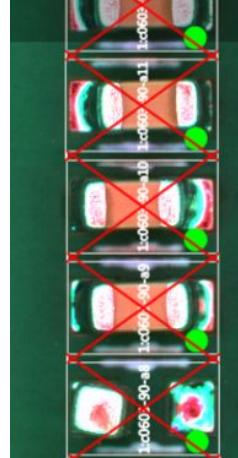
No.	Board Id	X	Y	RefDes	Device Type	Orientation	Part Number	Machine	RefDes2	Shape
233	1	-141180	33220	c0603-0-11	uc0603	0	C0603	mc-1	c0603-0-a1	C0603
234	1	-139617	33220	c0603-0-b1	uc0603	0	C0603	mc-1	c0603-0-b1	C0603
235	1	-138055	33220	c0603-0-c1	uc0603	0	C0603	mc-1	c0603-0-c1	C0603
236	1	-136493	33220	c0603-0-d1	uc0603	0	C0603	mc-1	c0603-0-d1	C0603
237	1	-134931	33220	c0603-0-e1	uc0603	0	C0603	mc-1	c0603-0-e1	C0603
238	1	-133369	33220	c0603-0-f1	uc0603	0	C0603	mc-1	c0603-0-f1	C0603
239	1	-131807	33220	c0603-0-g1	uc0603	0	C0603	mc-1	c0603-0-g1	C0603
240	1	-130245	33220	c0603-0-h1	uc0603	0	C0603	mc-1	c0603-0-h1	C0603
241	1	-128688	33220	c0603-0-i1	uc0603	0	C0603	mc-1	c0603-0-i1	C0603
242	1	-127121	33220	c0603-0-j1	uc0603	0	C0603	mc-1	c0603-0-j1	C0603
243	1	-125559	33220	c0603-0-k1	uc0603	0	C0603	mc-1	c0603-0-k1	C0603
244	1	-124000	33220	c0603-0-l1	uc0603	0	C0603	mc-1	c0603-0-l1	C0603
245	1	-122424	33220	c0603-0-m1	uc0603	0	C0603	mc-1	c0603-0-m1	C0603
246	1	-120872	33220	c0603-0-n1	uc0603	0	C0603	mc-1	c0603-0-n1	C0603
247	1	-119310	33220	c0603-0-o1	uc0603	0	C0603	mc-1	c0603-0-o1	C0603
248	1	-117748	33220	c0603-0-p1	uc0603	0	C0603	mc-1	c0603-0-p1	C0603
???	5	-141180	36184	uc0603-0-a9	uc0603	n	C0603	mc-1	uc0603-0-a9	C0603

Total Components: 268

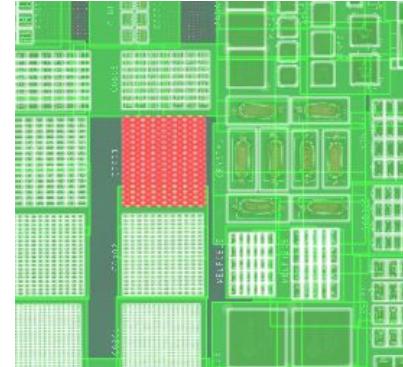
Confirm  Cancel

## Step 3

The components has an Red X indicating that this component will be skipped when inspection



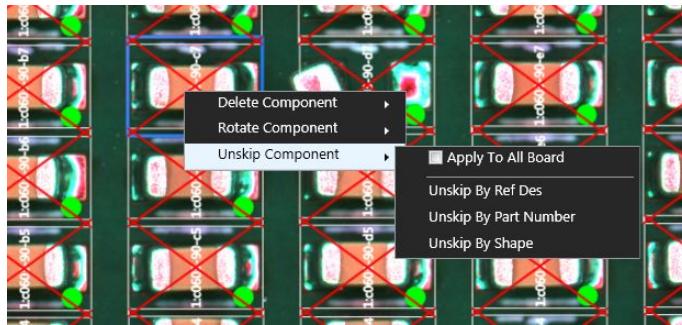
-The red Colours are the components that skipped  
-This will change the path calculated for the camera



# UnSkip Component

Automated Board Inspection

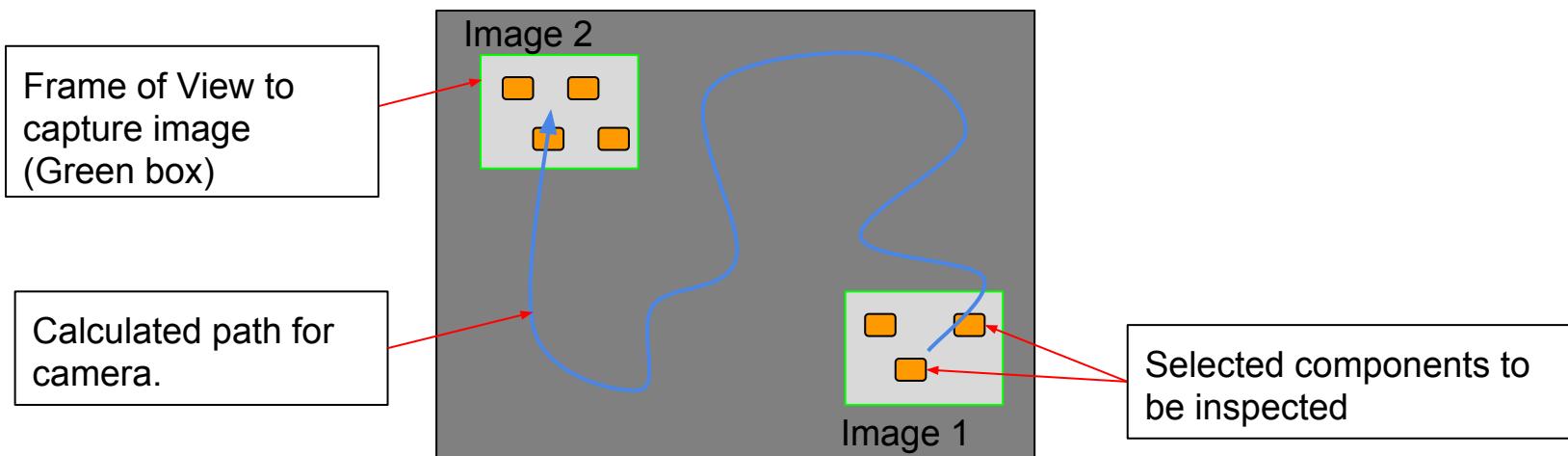
- The unskip component function will appear when right click at the skipped component.
- Choosing the unskip function will allow inspection on this component



# Visit All - By View

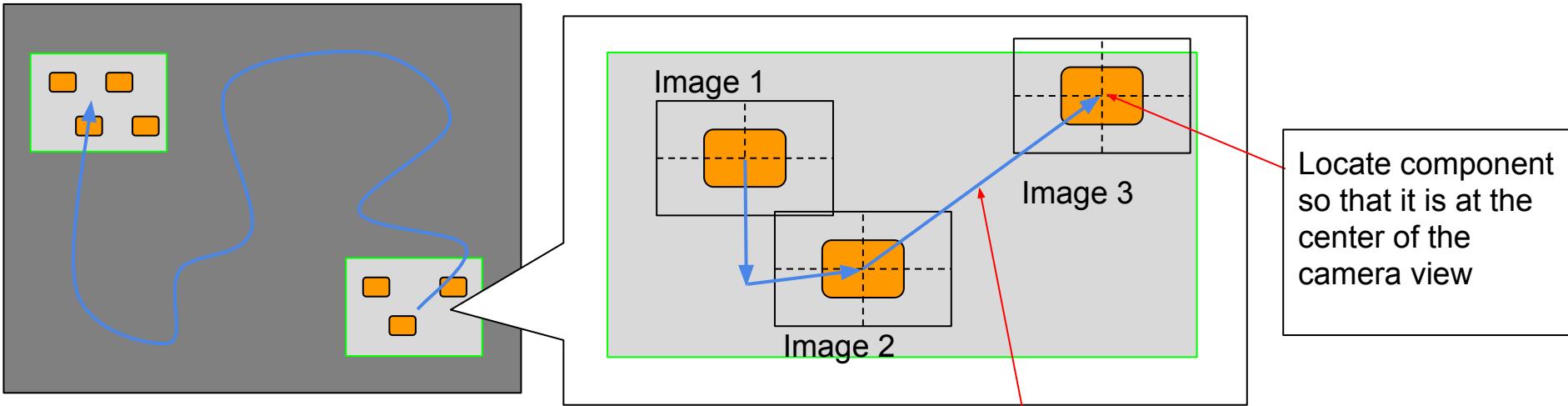
“Visit all” function will inspect the components based on the selected level of Classification.

- By view, the camera will capture the views(Green boxes from SideBar-Inspection, page 7) that contain the components.
- However, the components that are not at the center of view may have lower brightness than components at center of view due to inconsistent light intensity by the flashlight of the camera



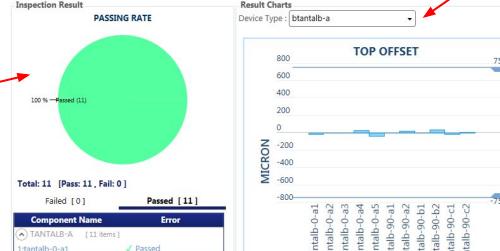
# Visit All - By Center

- The reason to have visit all by center is to provide a greater accuracy.
- This allows the flash to provide high brightness on each of the captured component image
- By center is slower than by view because the camera will adjust to locate the inspecting component at the center of camera view.

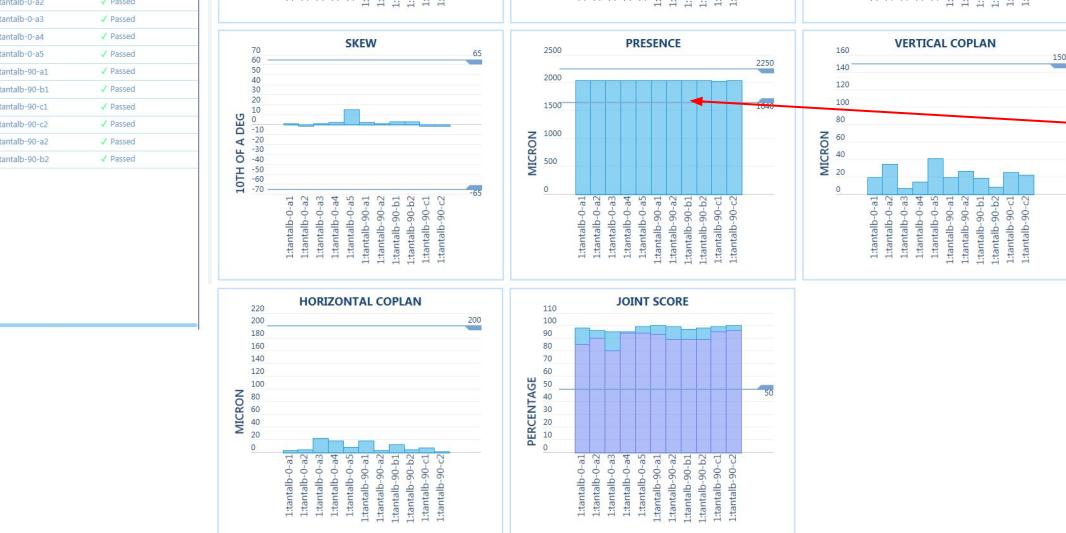


# Visit All Result- First page

Overall result of the inspection



Result of the inspection for individual component



-Device type is listed here if Visit All using Shape(has multiple Part Number)  
-Otherwise, only 1 device type

Different bar charts provided as result of inspection

- 1) Top Offset
- 2) Bottom Offset
- 3) Horizontal Offset
- 4) Skew
- 5) Presence
- 6) Vertical Coplan
- 7) Horizontal Coplan
- 8) Joint Score

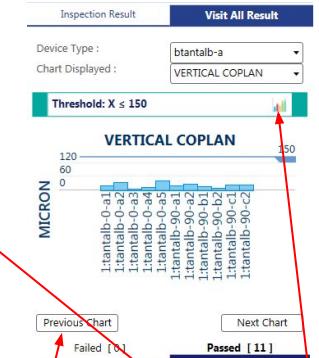
# Visit All Result - Back to Train editor

Automated Board Inspection

The screenshot shows the software interface with the following components:

- Top Bar:** Shows the application name "Jet Power 2.0.0.23\_PB\_Rev3 (AoiEngine : 104.068)" and the project name "Jabil\_Test\_Vehicle".
- Left Sidebar:** Includes icons for MENU, Boards, Inspect, Unload, Compile, Scan Board, Operator Mode, and Utility.
- Main Area:**
  - Train View:** Displays a board layout with several component footprints. A callout box states: "-Device type is listed here if Visit All using Shape(has multiple Part Number)  
-Otherwise, only 1 device type".
  - Overall Result of the inspection (Visit all):** A large green circle indicating 100% Passed [11].
  - Result of the inspection for Individual component (Visit all):** A table showing inspection results for various components. One row for "btantalb-a" is highlighted.

-Change to Display individual chart  
For example:



Component Name	Error
TANTALA-A [11 items]	
btantalb-a-01	Passed
btantalb-a-02	Passed
btantalb-a-03	Passed
btantalb-a-04	Passed
btantalb-a-05	Passed
btantalb-90-a1	Passed
btantalb-90-b1	Passed
btantalb-90-c1	Passed
btantalb-90-c2	Passed

Change to other charts one by one

Small icon to change page to Visit All Result -first page

**ABI**

Automated Board Inspection



## Fiducial Editor



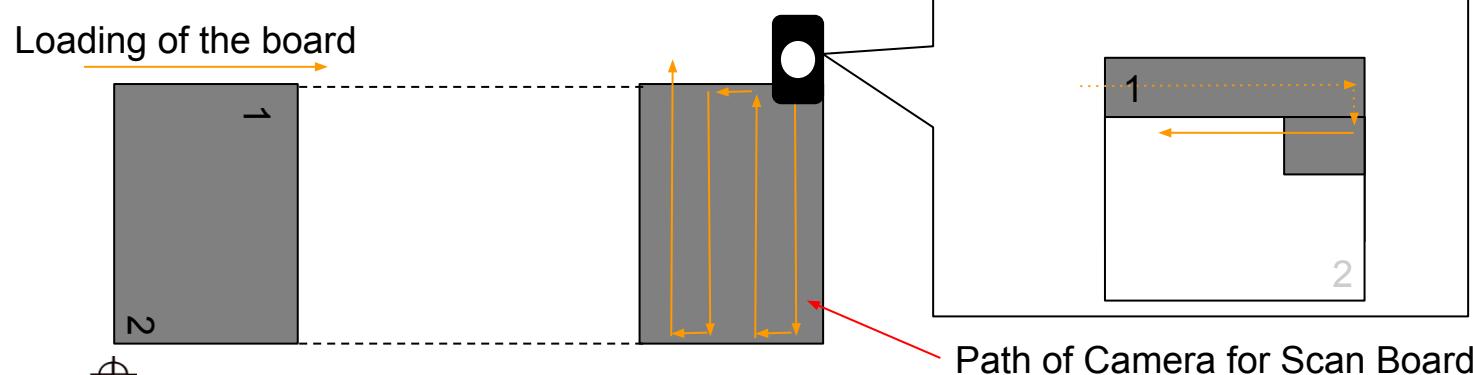
# Set Fiducial

Automated Board Inspection

- Before the scanning/inspection can be done, the fiducial must be set correctly.
- The method to set is switch to Fiducial Editor at the Change Page Mode at the top of the program

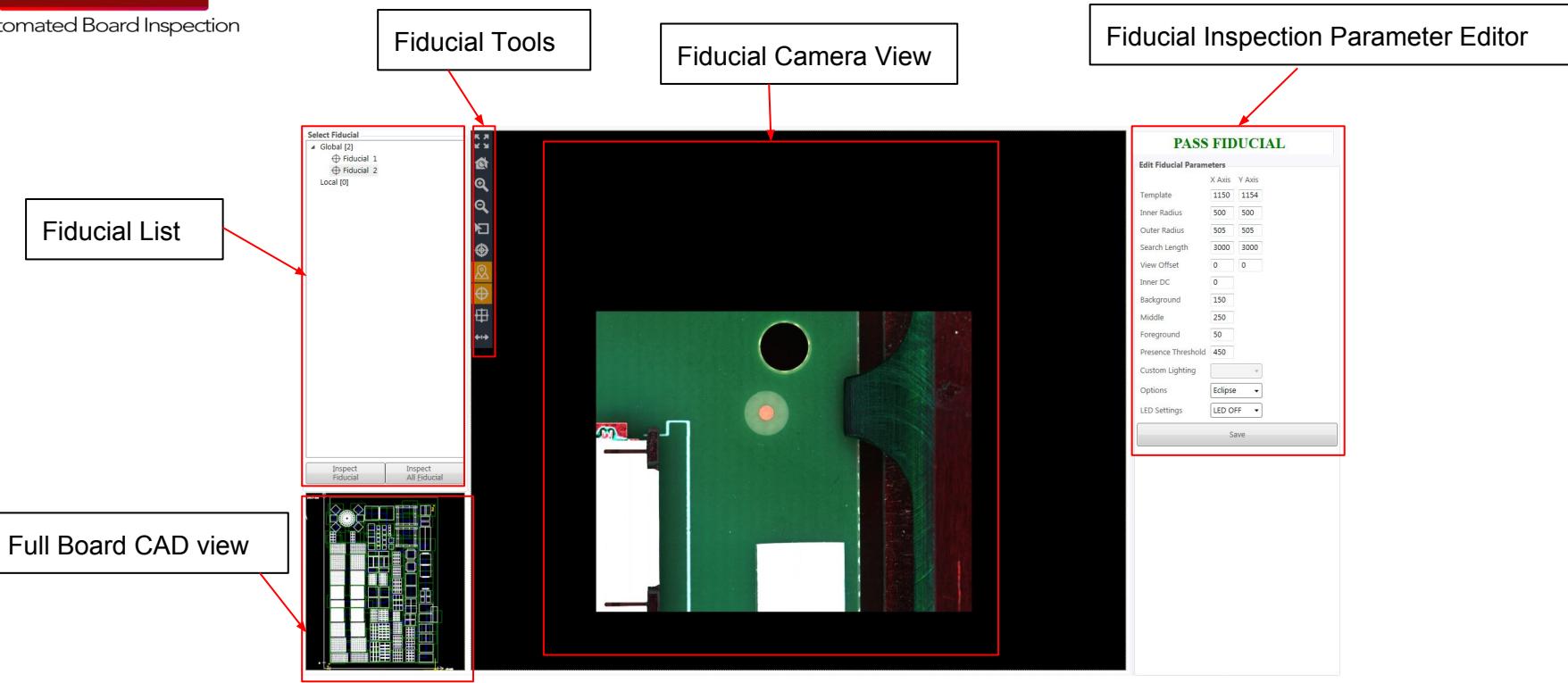


- Fiducial marking is important to understand because the loading of the board and the orientation of the camera is perpendicular.



# Fiducial Editor

Automated Board Inspection



Item	Description	Remarks
Fiducial List	List down the fiducials on the board	Inspect one/all Fiducial
Fiducial Tools	Choose different tools to have different inspection view	Zooming Tools, View Tools
Full Board CAD View	Display the board in CAD view without the image from scan board	Zoom by scrolling and left click to select the region
Fiducial Camera View	Display the image of that region	Region size is the Frame of View(FOV)
Fiducial Inspection Parameter Editor	Change Fiducial Property for new fiducial inspection	Different parameter give different result



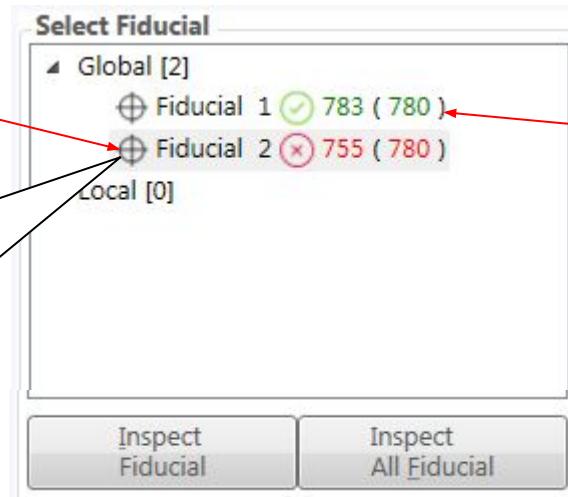
Highlighted means selected

Mouse Right Click



-This ease the searching of Fiducial by navigate the Frame of View to the estimated location.

-Manual search of Fiducial could be tedious sometimes



- Inspect Fiducial - inspect one fiducial (selected)
- Inspect All Fiducial- inspect all available fiducial on the board

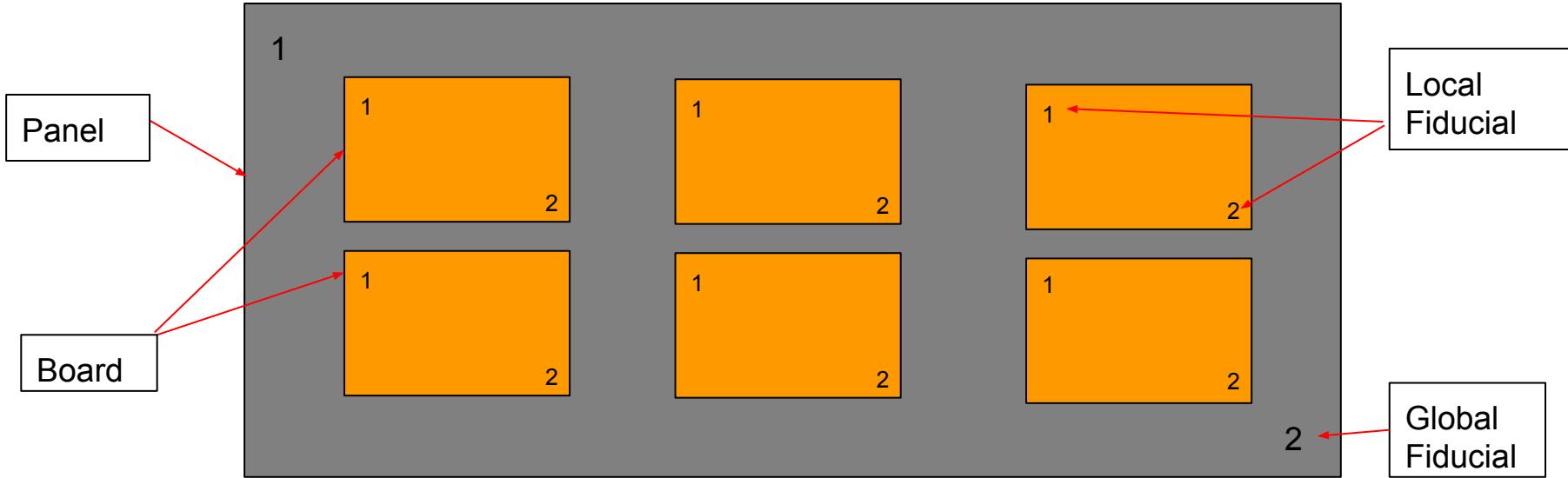
Green - Pass

Red - Fail

- Depends on Presence Threshold value (value in the bracket)
- Presence Threshold lower than the inspected value = pass



-Suppose the machine is not inspecting a single board. If it is inspecting a panel (consist of multiple board), global fiducial and local fiducial comes in handy.

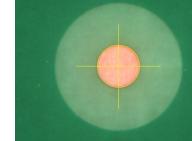
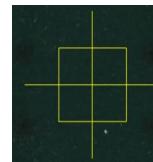
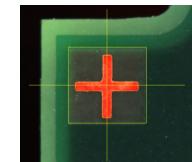
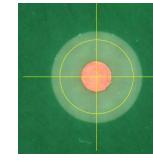
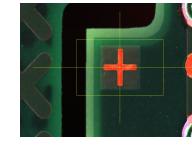


Icon	Description	ShortCut
	Zoom 1 to 1	Insert
	Fit To Screen	Home
	Zoom in	+/=
	Zoom Out	-/_



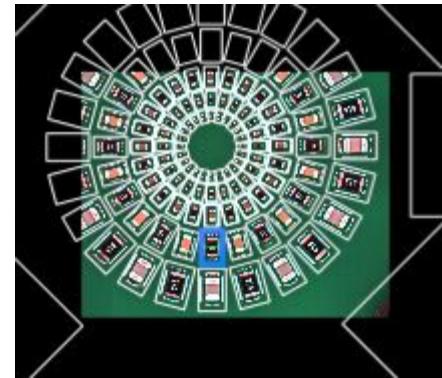
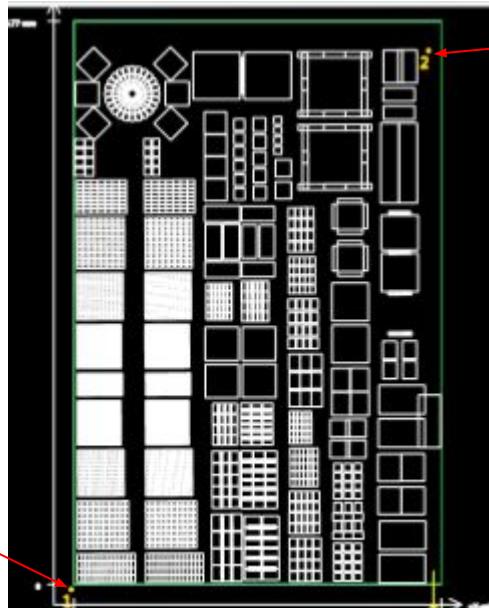
Icon	Name	Description	Graphical Display
	Draw	Manually draw the fiducial(Circle covered in rectangle) to make sure that the fiducial is at the correct location	
	Show Centre Line	Display the X and Y axis intersect at the centre of camera view	
	Show CAD Location	<ul style="list-style-type: none"><li>-Display reference points when a fiducial is located.</li><li>-These can be used to ensure that fiducial is correctly located.</li><li>-Reference points should be located at the centre of the components</li></ul>	



Icon	Name	Description	Graphical Display
	Round Target Style	-Round shaped fiducial -Ease the marking on circular fiducial	 
	Rectangle Target Style	-Rectangle shaped fiducial -Ease the marking on rectangular fiducial	 
	Custom Dimension Target	Change the dimension of the fiducial manually depending on the shape: >>Round - change radius >>Rectangle- Top bar change width - Bottom bar change height	 



- Show only board view in CAD without the image captured from camera



- Mouse Left Click on the CAD view will display the image of the board at the Frame of View(FOV)
- This will also change the Fiducial Camera View to the same image



Automated Board Inspection

Title that display the result of the fiducial inspection

- Display "Ready" if not started the fiducial inspection
- Display "PASS FIDUCIAL" if the fiducial inspection is passed

The required parameter to determine the success.

Change lighting of the machine

Change Shape inspection cursor

Change LED (Auto/On/Off)

**FAIL FIDUCIAL**

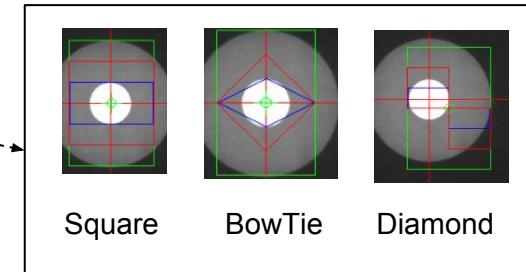
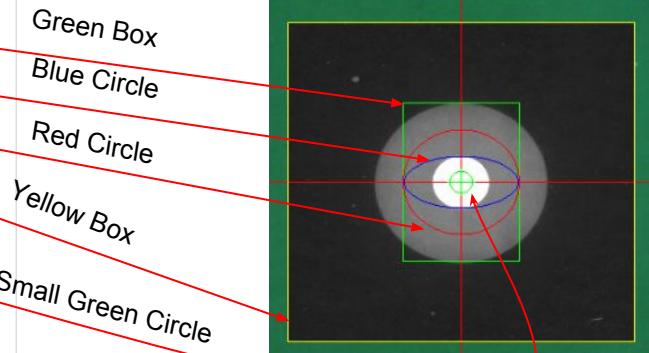
Edit Fiducial Parameters

	X Axis	Y Axis
Template	2044	3000
Inner Radius	1000	500
Outer Radius	1002	1002
Search Length	3000	3000
View Offset	0	0
Inner DC	200	
Background	200	
Middle	250	
Foreground	50	
Presence Threshold	450	

Custom Lighting:

Options:

LED Settings:



# How to Set Fiducial

## Step 1



Enable Draw Fiducial Icon

## Step 4



Set the correct parameter for the fiducial

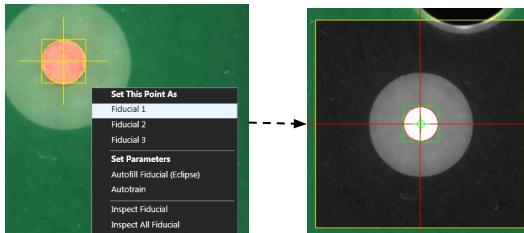
## Step 2

Locate one fiducial position

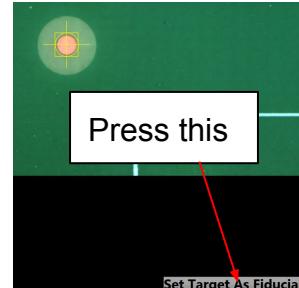


## Step 5

Right Click and set the Fiducial

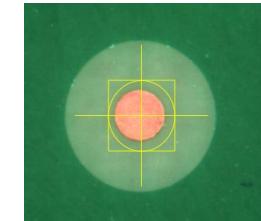


OR



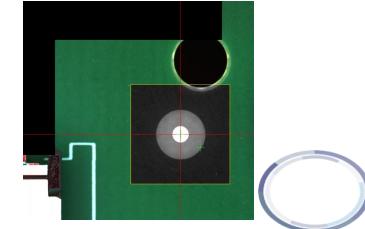
## Step 3

Draw Fiducial Box over the desired Fiducial location



## Step 6

Ctrl+a to locate all fiducial  
\*Make sure it passed



**ABI**

Automated Board Inspection



Trainer Editor

**ViTrox** 

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# Start Training Process

Automated Board Inspection

- Before the inspection can be done correctly, all components must be trained. Otherwise, the program will not know which algorithm to use to inspect that component.
- The method to set is switch to Training Editor at the Change Page Mode at the top of the program



- In this Trainer Editor, start training the components that are untrained.
- Updating parameter value can also be done here for any device type.



# ABI

Automated Board Inspection

# Trainer Editor

Components List

Trainer tools

Board View

Train History

Inspection Results

Switch Board View Button

Components List

Algorithms type

Board Loading Direction

READY

Train History

Inspection Result

Component Information

RefDes	Barcode
PartNumber	Barcode
Device Algorithm	barcode
Orientation	0
Shape	BARCODE
Feeder	mc-1
Presence	-8888
Top Offset	0
Bottom Offset	0
Horizontal Offset	0
Skew	0
Error	Missing
Coplan	3
Billboard	11
Missing	101
Damage	-
Coplan Horizontal	12

Type of Algorithms

SOIC	All
SOIC	Device Name Height Threshold Total Pins N Pins S Pins E Pins W Pins Pitch Ver Offset Hor Offset Skew Coplan Bridge (Angle) OCV Polar
CAPACITOR	schnet6-0805-wh - 6 0 0 3 3 1000 200 200 100 - - OFF
RESISTOR	schnet6-0603-dk - 8 0 0 4 4 800 400 250 75 - - Max (Angle 1, Angle 2) OFF
UNIVERSAL	schnet6-0603-wh - 8 0 0 4 4 800 200 200 70 - - - OFF
BRIGHT BOX	schnet6-0603x4 - 8 0 0 4 4 810 1200 1200 75 - - Max (Angle 1, Angle 2) OFF
	schnet6-0603x4-a1 - 8 0 0 4 4 810 1200 1200 75 - - Angle 2 OFF
	sdiode-smr - 32 0 0 16 16 500 150 150 70 - - - OFF
	sdiode-sma - 2 1 1 0 0 1270 400 400 70 - - - Mean +
	sdiode-smb - 2 1 1 0 0 1270 400 400 70 - - - Std Dev
	sdiode-sod106 - 2 1 1 0 0 1270 400 400 70 - - - Edge Fir
	sdiode-sod323 - 2 1 1 0 0 1270 400 400 70 - - - Mean +

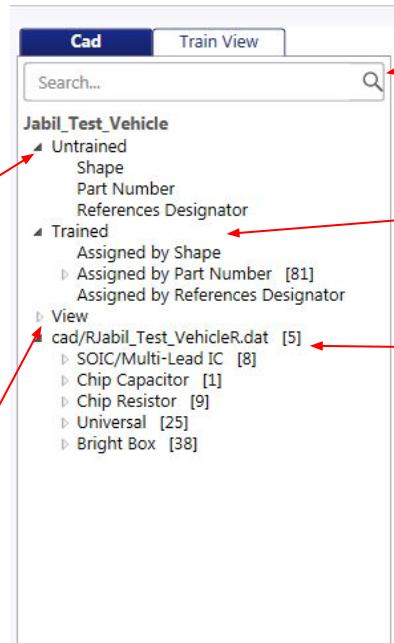
Item	Description	Remarks
Components List	Display the training status of each component in different format	Search Button ease the process if the component information is known
Trainer Tools	Different functionality that can be used in trainer editors	Depends on which View mode
Board View	Display the board to perform training	Region size is either Camera Region or full board size
Algorithm Type	Different algorithm is used for different type of component	Extra: Parameter Configuration and Used Algorithm Display
Switch Board View Button	Toggle different mode of displaying the board	Full Board View/ Camera View
Inspection Results	Display Selected Component Information only if no inspection	Including Additional information such as errors, missing, damage etc.
Train History	List out the train log (activity log) of this session.	The program will not remember the train log for future reference



1) Untrained components sort by :  
 a) Shape  
 b) Part number  
 c) References Designator

3) View - Different region of captured image

### CAD view



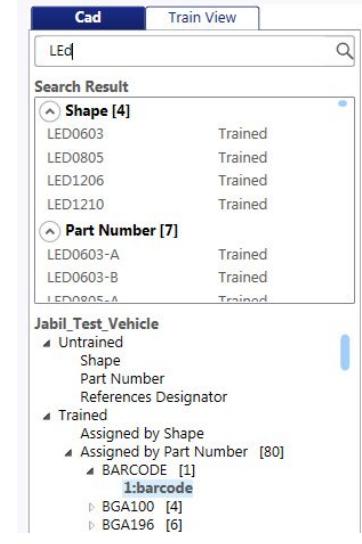
- 2) Trained component sort by the way of assignment:  
 a) Shape  
 b) Part number  
 c) References Designator

### 4) Type of algorithms:

- ↳ (cad/RJabil\_Test\_VehicleR.dat)
  - ↳ SOIC/Multi-Lead IC
  - ↳ Split-up SOICs
  - ↳ Single Side SOIC
  - ↳ Chip Capacitor
  - ↳ Chip Resistor
  - ↳ Transistor
  - ↳ Bright Box
  - ↳ Paste
  - ↳ Statistics (Presence/Absence)
  - ↳ Area
  - ↳ Ellipse
  - ↳ Power Transistor
  - ↳ Universal
  - ↳ Cross 4/Lead
  - ↳ Through Hole

\*Only used algorithm type is shown

Search every section (Shape, PartNumber, Ref Des)  
 -Filter out accordingly  
 -case insensitive



# Trainer Editor - Component List (Train view)

## Train view

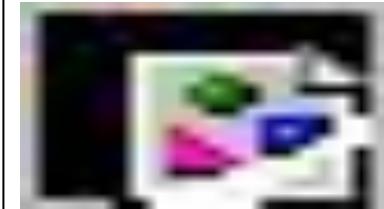
Classified into different type:

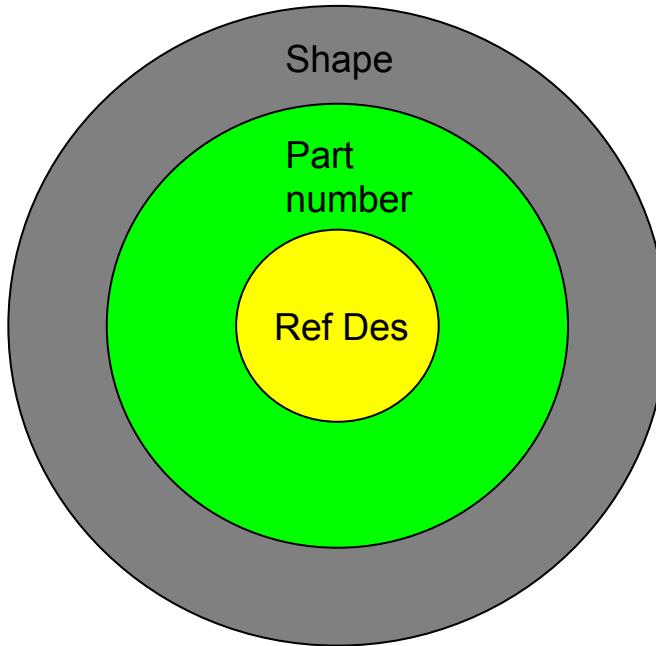
- 1) Untrained
- 2) Trained

- Each of them consist of Shape, Part Number and Ref Des
- bracket value is the number of Part Number in each category
- Sorted by Part Number
- Drop down menu shows the ref des in the part number



Search by the selected parameter  
-Parameter value must contain the search test



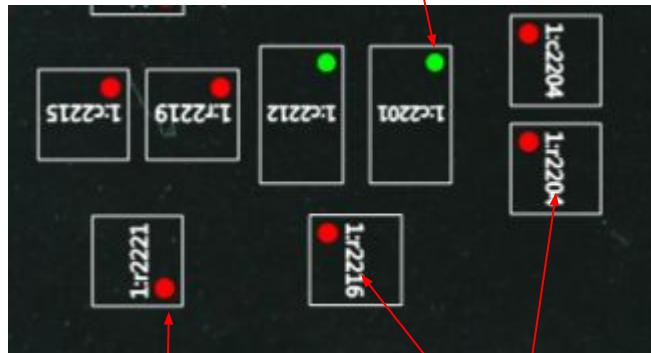


- A board can have many different shape of components.
- A component Shape type can consist of multiple different part numbers.
- A Part number can further classified into multiple reference designators.
- Overall, each component will have 1 reference designator. Depending on which part number it belongs and which shape the part number belongs.



Full Board view

Green dot means trained



Red dot means untrain

Ref Des

Orientation

0°



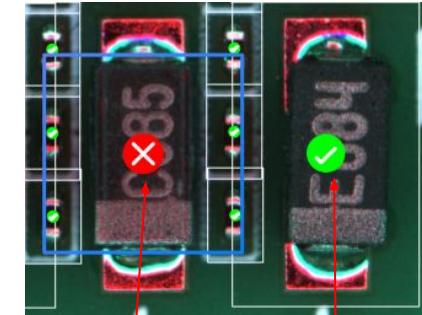
90°



180°



270°

Camera view

Red Cross  
means  
untrain

Green Tick  
means  
untrain



# Algorithm Type

Automated Board Inspection

- There are different type of algorithm available to train the component.
- The algorithm is differentiated into 5 major types which are SOIC, Capacitor, Resistor, Universal and Bright Box.
- Each type is further classified into different package.
- Each package has several different algorithm depending on the parameters.

Show Used Algorithms



Parameter Configuration

Parameter Configuration

<input checked="" type="checkbox"/> All	<input checked="" type="checkbox"/> 3D Height
<input checked="" type="checkbox"/> Width	<input checked="" type="checkbox"/> Length
<input checked="" type="checkbox"/> Diagonal	<input checked="" type="checkbox"/> Image Plane
<input checked="" type="checkbox"/> Horizontal Offset	<input checked="" type="checkbox"/> Vertical Offset
<input checked="" type="checkbox"/> Skew Threshold	<input checked="" type="checkbox"/> Missing Threshold
<input checked="" type="checkbox"/> Billboard Threshold	<input checked="" type="checkbox"/> Vertical Coplan
<input checked="" type="checkbox"/> Horizontal Coplan	<input checked="" type="checkbox"/> Damage Threshold
<input checked="" type="checkbox"/> Bridging/Fm Threshold	<input checked="" type="checkbox"/> OCV Count
<input checked="" type="checkbox"/> Polarity Mode	<input checked="" type="checkbox"/> Missing Alternate
<input checked="" type="checkbox"/> Joint Inspection	<input checked="" type="checkbox"/> Device Specific

Choose which parameter to be shown

\*Important\*

In JetPower, “Device Type” is the “Algorithm” used.

Search by Device Name

- Filter all algorithm, left the device name contains the search text

# Collaboration between different section

Automated Board Inspection

Type of Algorithms	All	Circle	Rectangle	SOT	QFN	CRYSTAL	CR NETWORK	SOD			
<b>SOIC</b>											
<b>CAPACITOR</b>	b2421 bhp100 bhp196 brc1005 bc0612-wd bc1632	5400 10000 15000 200 1400 1400	6000 10000 15000 200 3200 3000	8072 14142 21213 447 3493 3311	- 3D Only 3D Only Auto 2D + 3D Colour Transform 3 Colour Transform 3	400 150 150 225 250 250	100 80 80 60 1000 1000	2D 50 50 50 2D 2D	- - - 100 - -		
<b>RESISTOR</b>											
<b>UNIVERSAL</b>	<b>bcnetwork_a</b> <b>bcnetwork_b</b> <b>bcnetwork15</b> <b>bcnetwork40</b>	<b>830</b> <b>3050</b> <b>1900</b> <b>13761</b>	<b>1500</b> <b>1500</b> <b>11856</b> <b>3100</b>	<b>3399</b> <b>3399</b> <b>4291</b> <b>14106</b>	<b>3D Only</b> <b>3D Only</b> <b>Auto 2D + 3D</b> <b>3D Edge Detector</b>	<b>220</b> <b>220</b> <b>150</b> <b>150</b>	<b>240</b> <b>180</b> <b>50</b> <b>50</b>	<b>100</b> <b>85</b> <b>70</b> <b>50</b>	<b>150</b> <b>150</b> <b>250</b> <b>150</b>	<b>80</b> <b>80</b> <b>100</b> <b>100</b>	<b>80</b> <b>80</b> <b>100</b> <b>150</b>
<b>BRIGHT BOX</b>											

Algorithm used in this component

- Select the component from Camera View/ Component List will highlight the component at every other section.
- Select the Algorithm will test the selected component and provide the result without assigning the algorithm to the component.

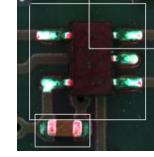
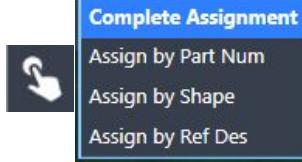
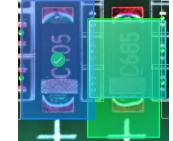


Icon	Description	ShortCut
	Zoom 1 to 1	Insert
	Fit To Screen	Home
	Zoom in	+/=
	Zoom Out	-/_



# Trainer Tools - Camera View

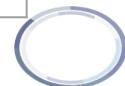
Automated Board Inspection

Icon	Name	Description	Short Cut	Graphical Display
	Drag and measure	Manually drag a rectangular box over a component and the program will estimate the type of algorithm to be used	X	 3715,3088
	Reference CheckList	By checking the item in the list, the reference will be shown on the screen	N/A	 Search Box  Orientation Indicator
	Drag and drop algorithm	After enabled, drag the trained component algorithm and drop it to the untrained component. *For different type of assignment, refer to Assignment Of Device (pg .97 )	Enabled - D Select source component - Ctrl	 Blue - initial component Green - Dragged algorithm

Icon	Description	ShortCut
	Zoom 1 to 1	Insert
	Fit To Screen	Home
	Zoom in	+/=
	Zoom Out	-/_
	Zoom to selected region	z

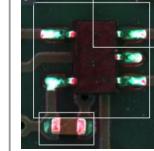
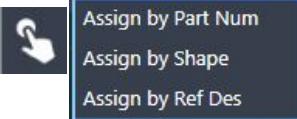
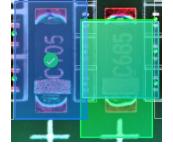


Icon	Name	Description	Short Cut	Graphical Display
	Show Board Number	Display the number of board to differentiate different layer of board	N/A	
	View CAD	Show the search box, the path of the camera as well as the fiducial number	C	
	Select Component /board	Blue colour highlight the component or the board search box	S	



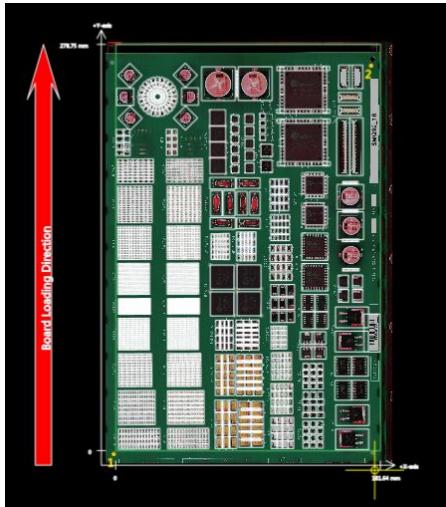
Icon	Name	Description	Graphical Display
	View Origin Location	Display the number of board to differentiate different layer of board	
	Brightness adjuster	<ul style="list-style-type: none"><li>-Adjust the brightness of the board.</li><li>-This will change the display of the image captured</li></ul>	



Icon	Name	Description	Short Cut	Graphical Display
	Reference CheckList	By checking the item in the list, the reference will be shown on the screen	N/A	 Search Box  Orientation Indicator  References Designator
	Drag and drop algorithm	<p>After enabled, drag the trained component algorithm and drop it to the untrained component.</p> <p>*For different type of assignment, refer to Assignment Of Device (pg .97 )</p>	Enabled - D Select source component - Ctrl	 Blue - initial component Green - Dragged algorithm

- Different views have their own advantages and disadvantages for Training Purpose.
- The following slides explain the component training steps and the additional features in camera view

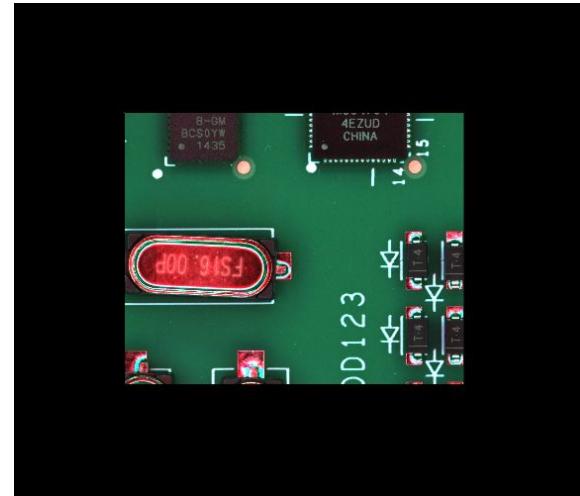
Full board view



Camera view



Toggle between  
both view

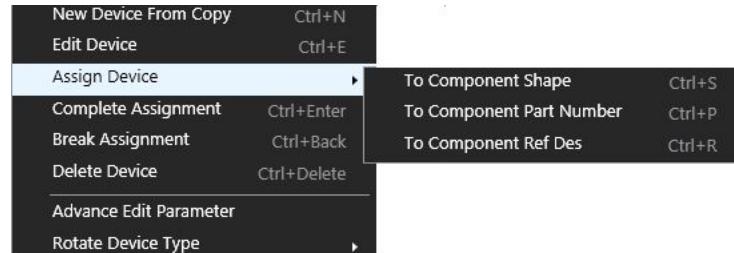


For Full Board view,

1. Select the component that requires assignment
2. Choose the suitable algorithm for the component
3. After the algorithm is chosen, it will auto assess if the algorithm is suitable for component by showing the inspection result as shown in image below



4. Right click the algorithm, choose either complete assignment or assign device to either part number, shape, or ref des. However, assign device option will use back existing algorithm instead of create a new copy from it. So it is recommended to use complete assignment (Complete Assignment- Page 77 ) to assign component.



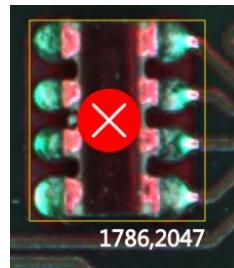
# How to Train - Camera view

Automated Board Inspection

For Camera view, same procedure may be used to train a component. However, the program has an additional feature called Drag and Measure



This will simplify the process by drawing the box around the outline of the device and the program will suggest the algorithm for that component.



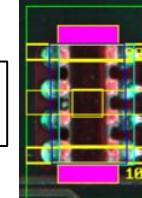
Draw the box

Suggested algorithm (this case, resistor with code 0805 with device name r0805)



All	01005	0201	0402	0603	0805	1206
Device Name	3D Height	Width	Length	Diagonal	Image Plane	Hor Offset
r0805	-	2000	1250	2358	Angle 1	300
r0805-na	-	2000	1200	2332	Angle 1	300

Correct algorithm

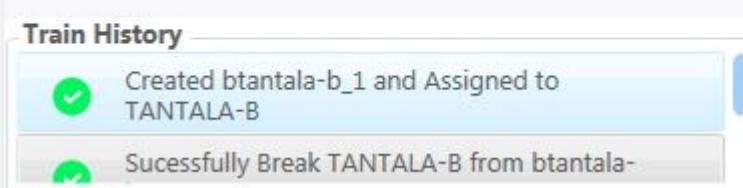


- This train history will display the activity log done in this training session.
- The training log will either be creating of algorithm, assignment of device, break of assignment or delete of algorithm.

-Inspection results  
-But without inspection, it will show READY

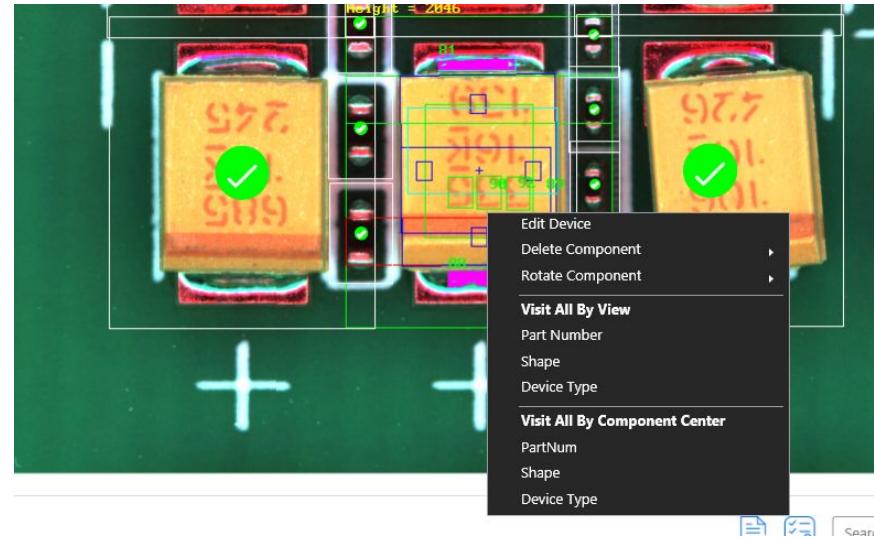
READY

Training history of current session



# Right click of a component at Trainer Editor

Automated Board Inspection

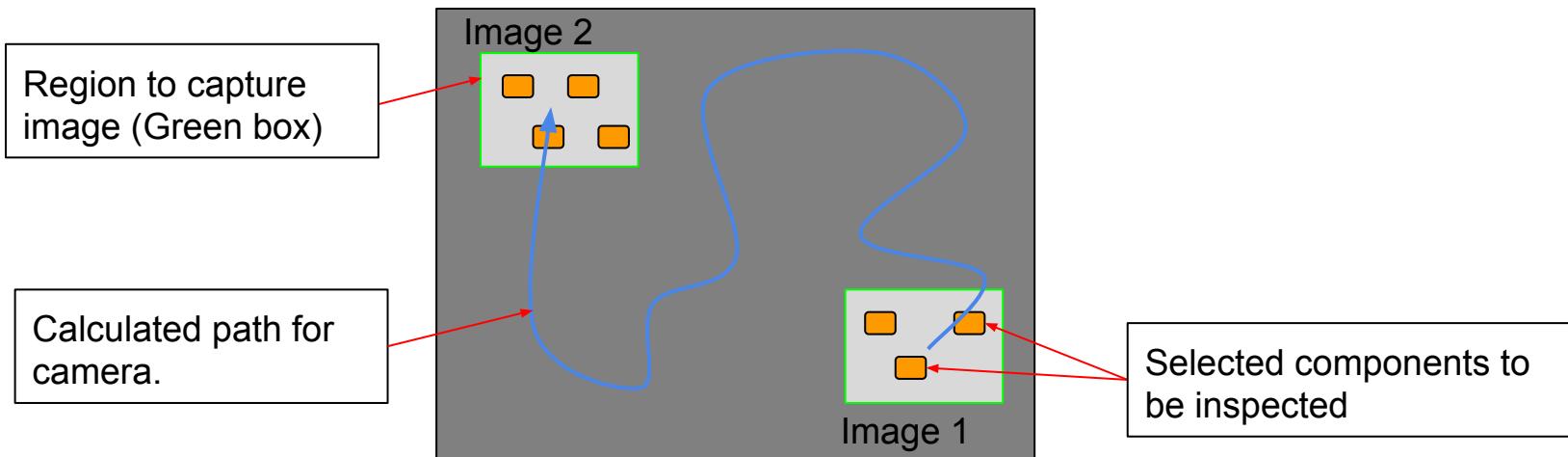


Edit Device	Delete Component	Rotate Component
Visit All by Component Center	Visit All By view	



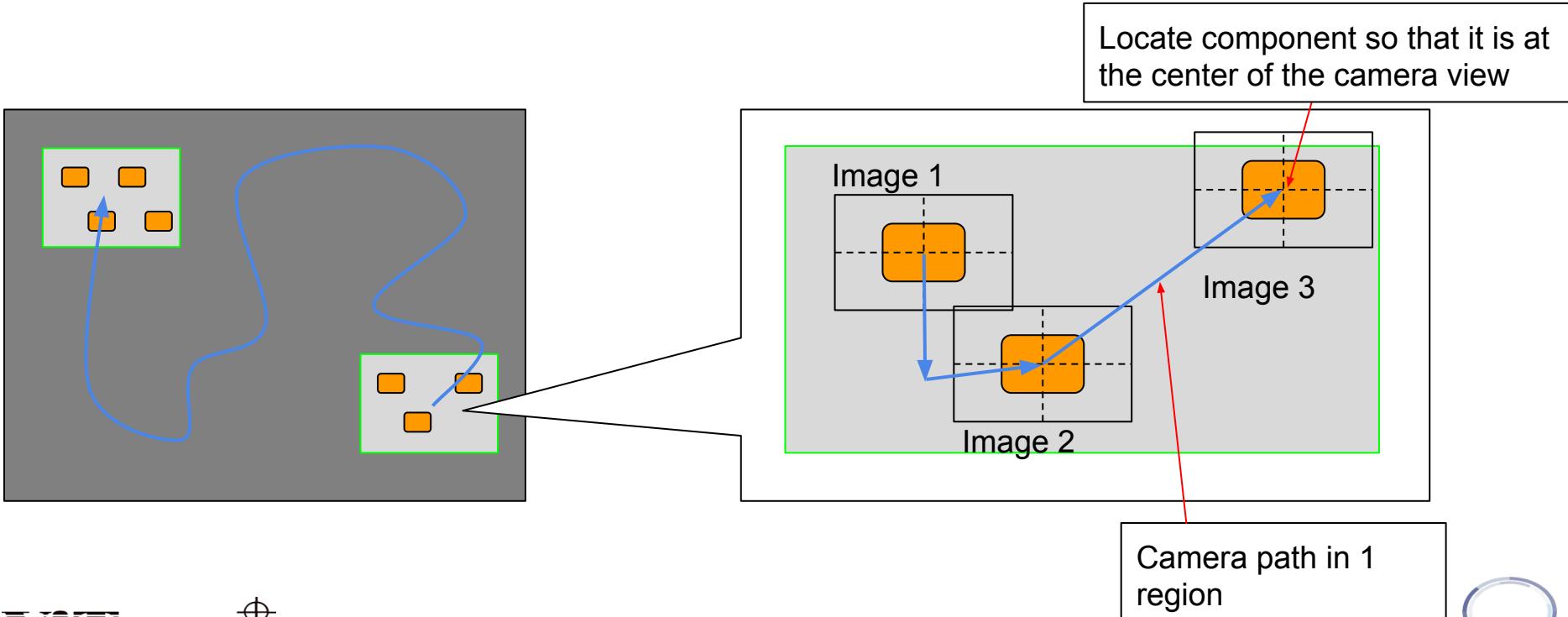
“Visit all” function will inspect the components based on the selected level of Classification.

- By view, the camera will capture the regions(Green boxes from SideBar- Inspection, page 26) that contain the components.



# Visit All - By Center

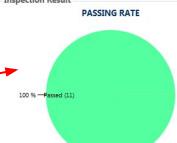
- By center is slower than by view because the camera will adjust to locate the inspecting component at the center of camera view.



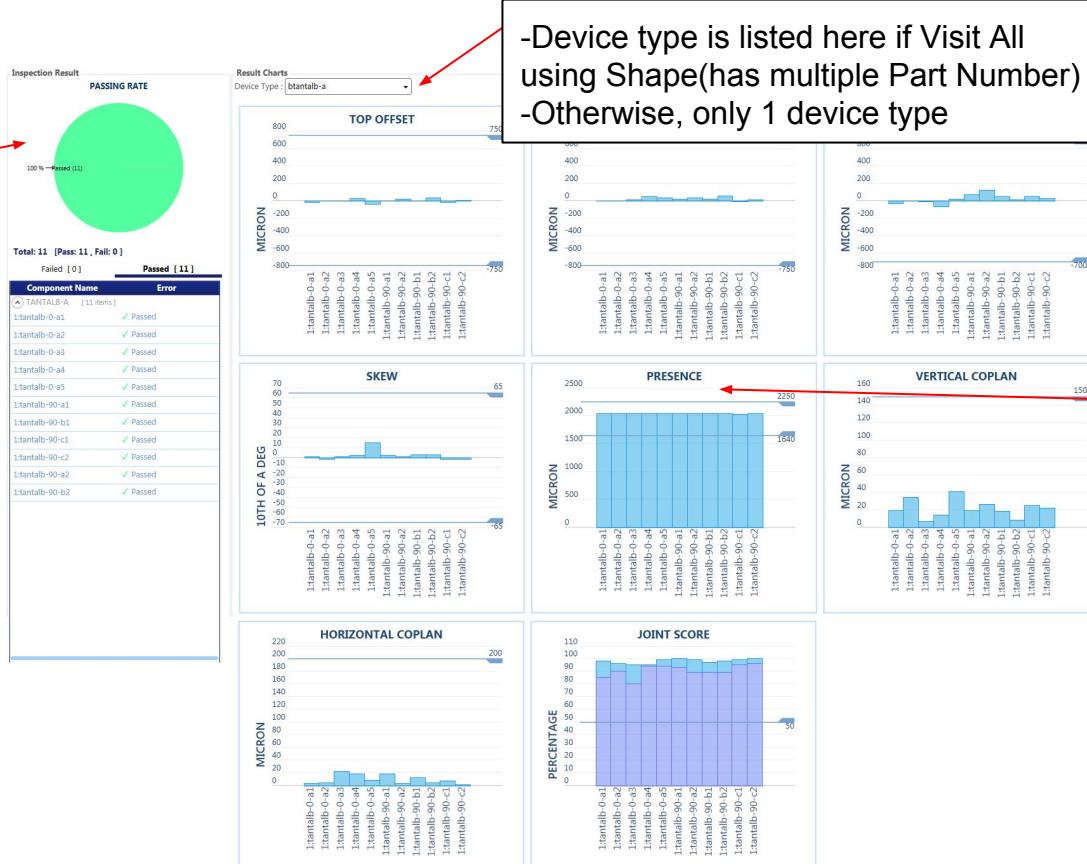
## Visit All Result- First page

Automated Board Inspection

Overall result of the inspection



result of the inspection for Individual component



-Device type is listed here if Visit All using Shape(has multiple Part Number)  
 -Otherwise, only 1 device type

Different bar charts provided as result of inspection

- 1) Top Offset
- 2) Bottom Offset
- 3) Horizontal Offset
- 4) Skew
- 5) Presence
- 6) Vertical Coplan
- 7) Horizontal Coplan
- 8) Joint Score



# Visit All Result - Back to Train editor

Automated Board Inspection

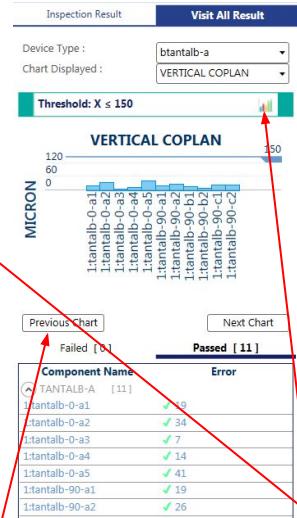
-Device type is listed here if Visit All using Shape(has multiple Part Number)  
-Otherwise, only 1 device type

Overall result of the inspection (Visit all)

Result of the inspection for Individual component (Visit all)

Component Name	Error
TANTALA-A [11 items]	
btantalb-a-01	Passed
btantalb-a-02	Passed
btantalb-a-03	Passed
btantalb-a-04	Passed
btantalb-a-05	Passed
btantalb-90-a1	Passed
btantalb-90-b1	Passed
btantalb-90-c1	Passed
btantalb-90-c2	Passed
btantalb-90-d1	Passed

-Change to Display individual chart  
For example:

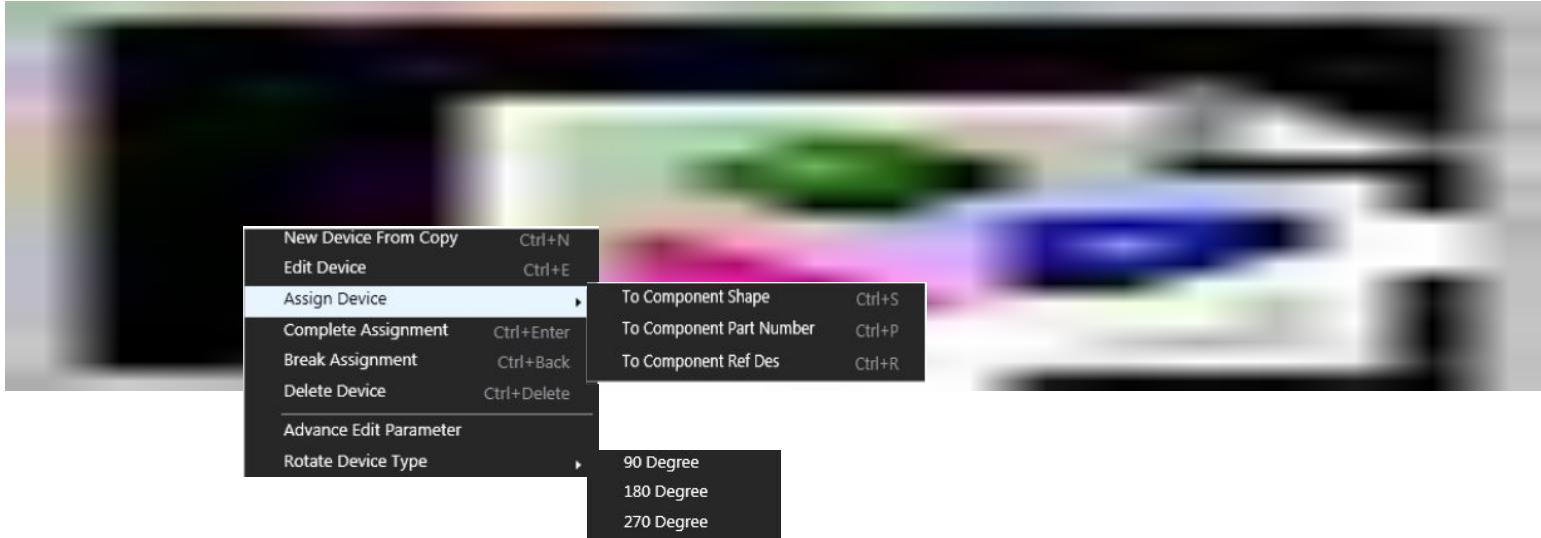


Small icon to change page to Visit All Result -first page

Change to other charts one by one

# Right Click of algorithm in Trainer Editor

Automated Board Inspection

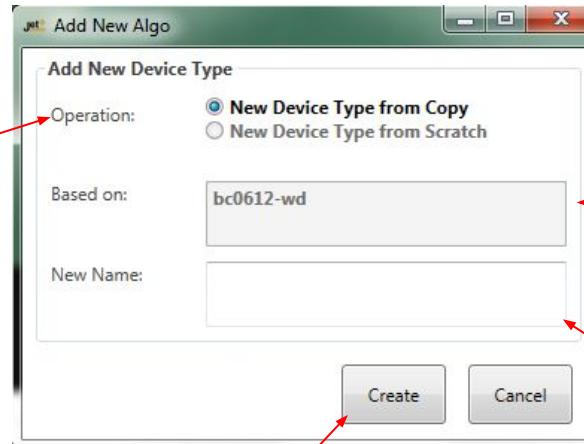


New Device from Copy	Assign Device	Complete Assignment	Rotate Device type
Break Assignment	Delete device	Advance Edit parameter	Edit Device



# New Device from Copy

- This is to create a new algorithm based on the existing device



-Choose from Copy or scratch  
-However, the from scratch function is disabled because this menu is only create algorithm from copy

-Base algorithm  
-this algorithm is from where you click "New Device From Copy"

-Give the new algorithm a name

Start creating new device



Name	Description	Short Cut	Remarks
Complete Assignment	<ul style="list-style-type: none"><li>- Complete assignment will create a new device from existing algorithm and assign it to component by Part Number by default</li><li>- User are allowed to naming the new device when creating it.</li></ul>	Ctrl+ Enter	<ul style="list-style-type: none"><li>-This is useful especially when majority of the algorithm needed with minor difference.</li><li>-Modifying the device parameter will not affect the original algorithm</li><li>-Changing the algorithm will affect other component using this algorithm</li></ul>
Assign Device to component: a)Shape b)Part Number c)Ref Des	<ul style="list-style-type: none"><li>-This will assign the existing algorithm to the components by either Shape, Part Number or Ref Des</li></ul>	a)Ctrl+S  b)Ctrl+P  c)Ctrl+R	Any changes to the current algorithm will affect the original and every other components with this algorithm



# Complete Assignment

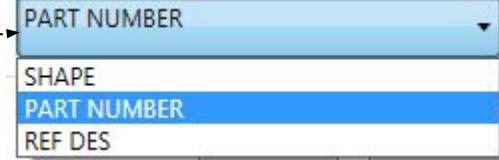
Automated Board Inspection

Target component

Base algorithm



New name for the algorithm



Assign to different level of classification

Create the algorithm



# Multiple Components Assignment

Automated Board Inspection

## Step 1

Part Number	Ref Des
SOD123	1:sod123-0-a1
SOD323	1:sod323-0-a1
<b>SOD87</b>	1:sod87-0-a1
SOT223	1:sot223-90-a1
SOT23	1:sot23-0-a1
<b>SOT25</b>	1:sot25-0-a1
SOT26	1:sot26-0-a1
SSOP20	1:ssop20-90-a1
TANTALA-A	1:tantala-90-a1
<b>TANTALA-B</b>	1:tantala-0-c1
TANTALA-C	1:tantala-0-d1
TANTALB-A	1:tantalb-90-a1
TANTALB-B	1:tantalb-0-b1

### Skipped Selection

- 1) Hold Ctrl
- 2) Click the component PartNum

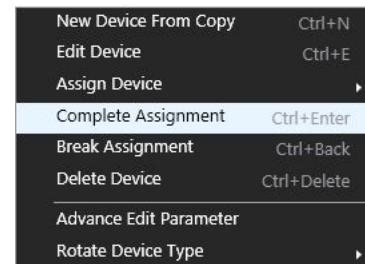
### Consecutive selection

- 1) Click first component PartNum
- 2) Hold shift
- 3) Click last component PartNum

Base Algorithm

## Step 2

Choose a type of assignment



## Step 3

Double Click to Change Device Name

Part Number	No. Components	New Device Type
SSOP20	4	sSSOP20
TANTALA-A	14	sTANTALA-A
<b>TANTALA-B</b>	<b>10</b>	<b>sTANTALA-B</b>
TANTALA-C	10	sTANTALA-C
SOT25	12	sSOT25_1
SOD87	16	sSOD87

Complete assignment of multiple components

OR



Assignment by Shape, Part Number or Ref Des

# Breaking Assignment and Delete Device

Name	Description	Short Cut	Graphical Display
Break Assignment	<ul style="list-style-type: none"><li>- Remove the algorithm from all the components that attached to it</li><li>- After remove, those components will be place in untrained tab</li></ul>	Ctrl+ Back	
Delete device	<ul style="list-style-type: none"><li>- Delete the algorithm from linked database</li><li>- Algorithm will be removed from all components that are using it.</li></ul>	Ctrl+ Delete	



# Edit Device Parameter

Automated Board Inspection

Name	Description	Graphical Display																																																							
Double click the cell	Change single parameter of algorithm without affecting others	<table border="1"> <thead> <tr> <th>Device Name</th> <th>3D Height</th> <th>Width</th> <th>Length</th> <th>Diagonal</th> </tr> </thead> <tbody> <tr><td>bsnetwork-b</td><td>470</td><td>1600</td><td>3200</td><td>3578</td></tr> <tr><td>bsod123</td><td>1250</td><td>2473</td><td>1454</td><td>2869</td></tr> <tr><td>bsod123</td><td>950</td><td>1521</td><td>1136</td><td>1808</td></tr> <tr><td>bsod87</td><td>1150</td><td>3420</td><td>1172</td><td>3613</td></tr> <tr><td><b>bsat223</b></td><td><b>1790</b></td><td><b>6100</b></td><td><b>3200</b></td><td><b>6888</b></td></tr> <tr><td>bsat23</td><td>970</td><td>1200</td><td>2800</td><td>3046</td></tr> <tr><td>bsat25</td><td>1200</td><td>2840</td><td>1372</td><td>3154</td></tr> <tr><td>btant-a-3216</td><td>-</td><td>3200</td><td>1600</td><td>3578</td></tr> <tr><td>btantala-a</td><td>1600</td><td>2869</td><td>1612</td><td>3291</td></tr> <tr><td>btantala-b</td><td>1600</td><td>2869</td><td>1612</td><td>3291</td></tr> </tbody> </table>	Device Name	3D Height	Width	Length	Diagonal	bsnetwork-b	470	1600	3200	3578	bsod123	1250	2473	1454	2869	bsod123	950	1521	1136	1808	bsod87	1150	3420	1172	3613	<b>bsat223</b>	<b>1790</b>	<b>6100</b>	<b>3200</b>	<b>6888</b>	bsat23	970	1200	2800	3046	bsat25	1200	2840	1372	3154	btant-a-3216	-	3200	1600	3578	btantala-a	1600	2869	1612	3291	btantala-b	1600	2869	1612	3291
Device Name	3D Height	Width	Length	Diagonal																																																					
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bsod87	1150	3420	1172	3613																																																					
<b>bsat223</b>	<b>1790</b>	<b>6100</b>	<b>3200</b>	<b>6888</b>																																																					
bsat23	970	1200	2800	3046																																																					
bsat25	1200	2840	1372	3154																																																					
btant-a-3216	-	3200	1600	3578																																																					
btantala-a	1600	2869	1612	3291																																																					
btantala-b	1600	2869	1612	3291																																																					
Right click the Parameter bar (Column Header)	<ul style="list-style-type: none"> <li>-Change the single parameter of all the algorithm in this package of device type</li> <li>-Only certain parameter are allowed to edit:           <ul style="list-style-type: none"> <li>a) 3D Height</li> <li>b) Width and Length</li> <li>c) Horizontal and vertical offset</li> <li>d) Skew</li> <li>e) Missing</li> <li>f) Billboard,Damage and OCV threshold</li> <li>g) Horizontal and Vertical Coplan</li> </ul> </li> </ul>	<p>Step 1</p> <p>Step 2</p>																																																							

# Edit Device Parameter - Advance Parameter Editor

This algorithm's parameter will be used to apply to others

Check the Parameter to be changed in other algorithm

Select the algorithm to be changed

The screenshot shows a software window titled "Advance Parameter Editor". At the top, it displays "Golden Algorithm : rr0805-a". Below this is a section titled "Parameters" containing a list of checkboxes for various inspection parameters. A red box highlights this section. The main area contains a table listing several algorithms, each with its parameters listed in columns: Device Name, 3D Height, Width, Length, Image Plane, Hor Offset, Ver Offset, Skew, Missing, and Bill. A red box highlights the first few rows of this table. At the bottom right of the window are "Apply" and "Cancel" buttons.

	Device Name	3D Height	Width	Length	Image Plane	Hor Offset	Ver Offset	Skew	Missing	Bill
<input checked="" type="checkbox"/>	r0201	-	600	300	Angle 1	150	150	100	2D	-
<input checked="" type="checkbox"/>	r0402	-	950	475	Angle 1	200	200	100	2D	-
<input checked="" type="checkbox"/>	r0402_3d	350	950	475	3D Only	220	220	100	50	150
<input checked="" type="checkbox"/>	r0402_3d300	300	950	475	3D Only	220	220	100	50	150
<input checked="" type="checkbox"/>	r0402_3d350	350	950	475	3D Only	220	220	100	50	150
<input checked="" type="checkbox"/>	r0402_b_3d350	350	950	475	3D Only	220	220	100	50	150
<input checked="" type="checkbox"/>	r0603	-	1500	750	Angle 1	300	300	100	2D	-
<input checked="" type="checkbox"/>	r0603_3d	480	1660	790	3D Only	300	350	100	50	150
<input checked="" type="checkbox"/>	r0603_3d450	480	1660	790	3D Only	300	350	100	50	150

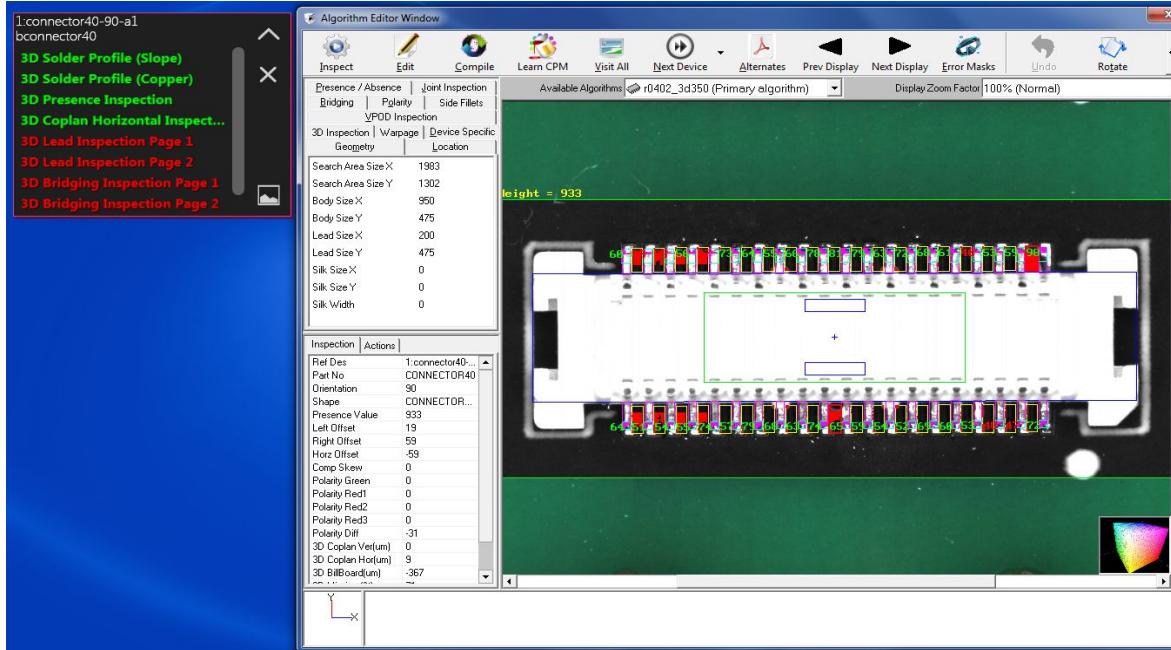
Start the applying process

Display different parameters of the algorithm in this package

# Edit Device- Algorithm Editor Window

Automated Board Inspection

-This window is opened when right clicked at an device(algorithm) and choose Edit Device



**ABI**

Automated Board Inspection



V-One

**ViTrox** 

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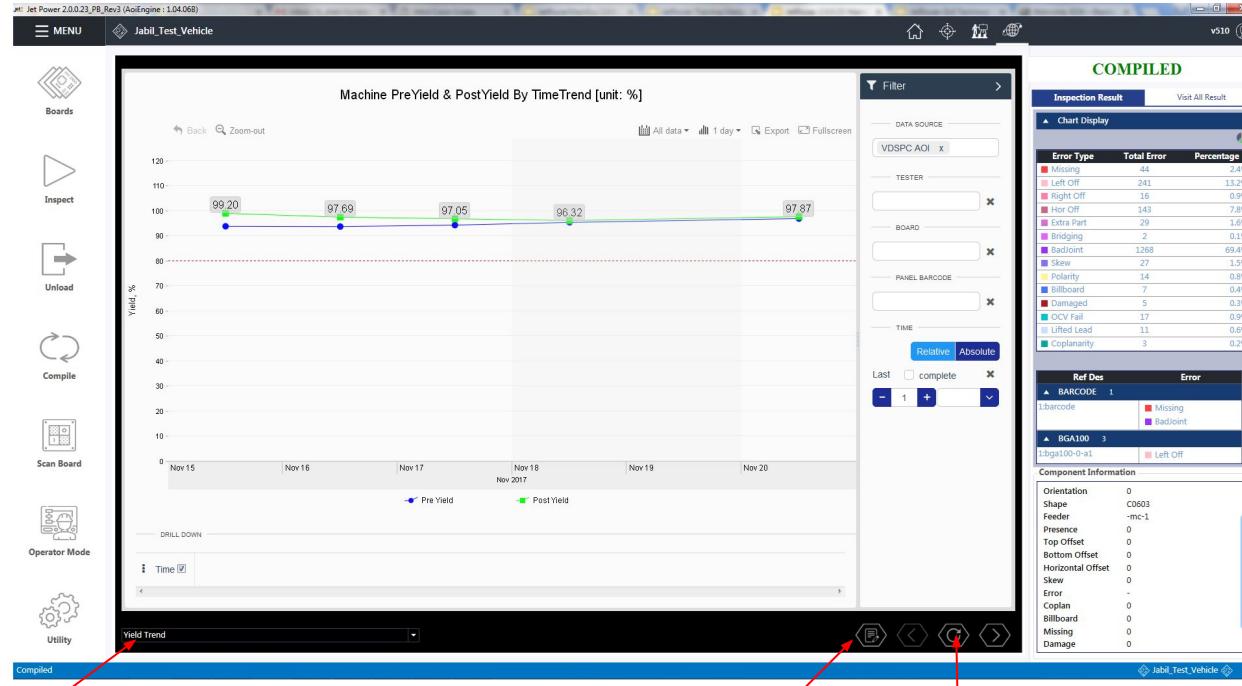


- This platform in JetPower allows the user to locate their commonly used charts
- The method to set is switch to V-One at the Change Page Mode at the top of the program



- This platform act as an internet browser by using the chart URL link.
- Actual V-One Platform in the internet allows user to select customized charts according to case basis and preference. However, this could be tedious for some user to go through setting and using external internet browser every time they want to view the charts related to the board inspected.
- JetPower ease the process by saving the V-One Chart URL and load it up immediately, provided there is internet access.





Change to bookmarked URL

Edit URL Button

Refresh Screen Button

Chart URL Link

Title of the URL Link

New V-ONE Link

Title:	<input type="text"/>
URL:	<input type="text"/>
Refresh Rate (sec):	30
<input type="button" value="Add"/>	

Automatic refresh screen rate

-Create new URL link  
-Mainly for V-One Chart

JTC V-ONE Manager

Title	URL	Refresh Rate (sec)
Yield Trend	http://192.168.22.200/api/da/chart/824?embed=1&api_key=4bt	100
False Call Error	http://192.168.22.200/api/da/chart/770?embed=1&api_key=4bt	100
Machine Output	http://192.168.22.200/api/da/chart/795?embed=1&api_key=4bt	100

New V-ONE Link      OK      Cancel      Save

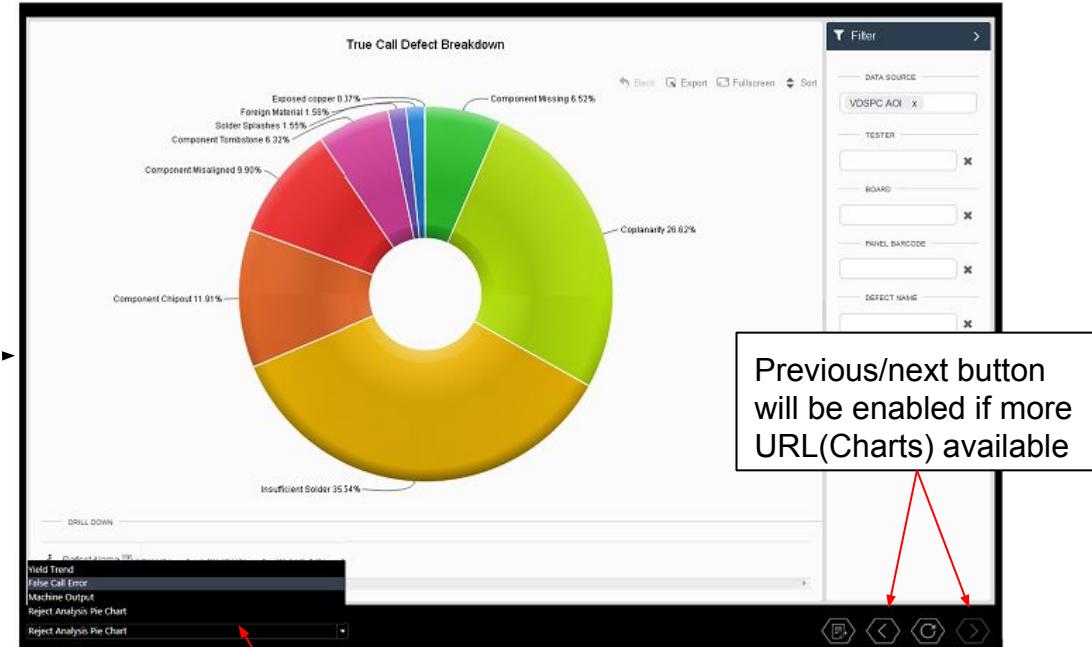
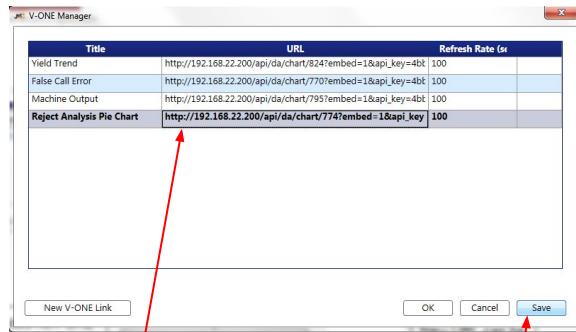
Automatic refresh screen rate

Double click to edit the existing URL



# Added new URL

Automated Board Inspection



Added new URL

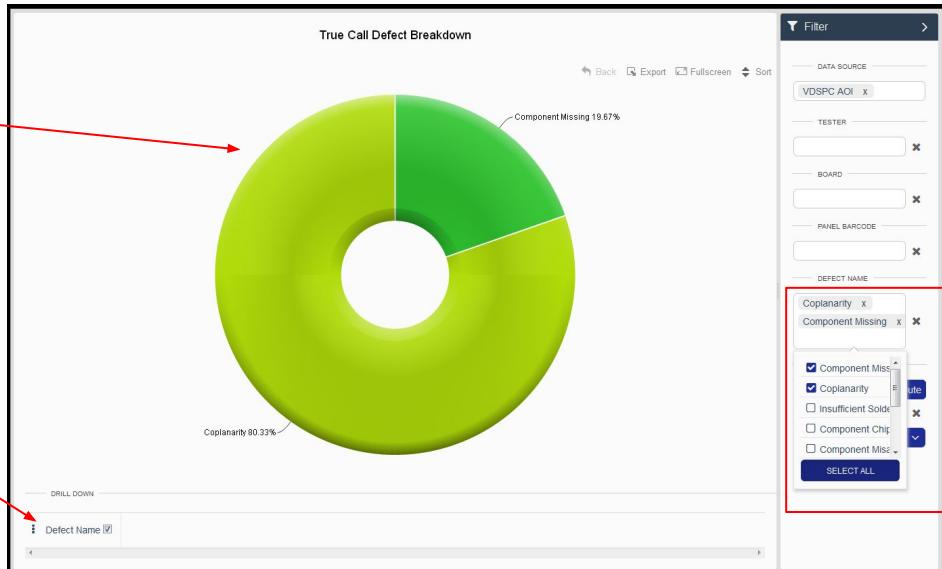
Save button is enabled  
when changes is made

New URL can be  
access from here

# Filter and Different Chart Format

Automated Board Inspection

- V-one Platform supports different type of graph and charts
- Besides, It also supports filters on each of the graph



Show the chart  
According to the  
selected properties

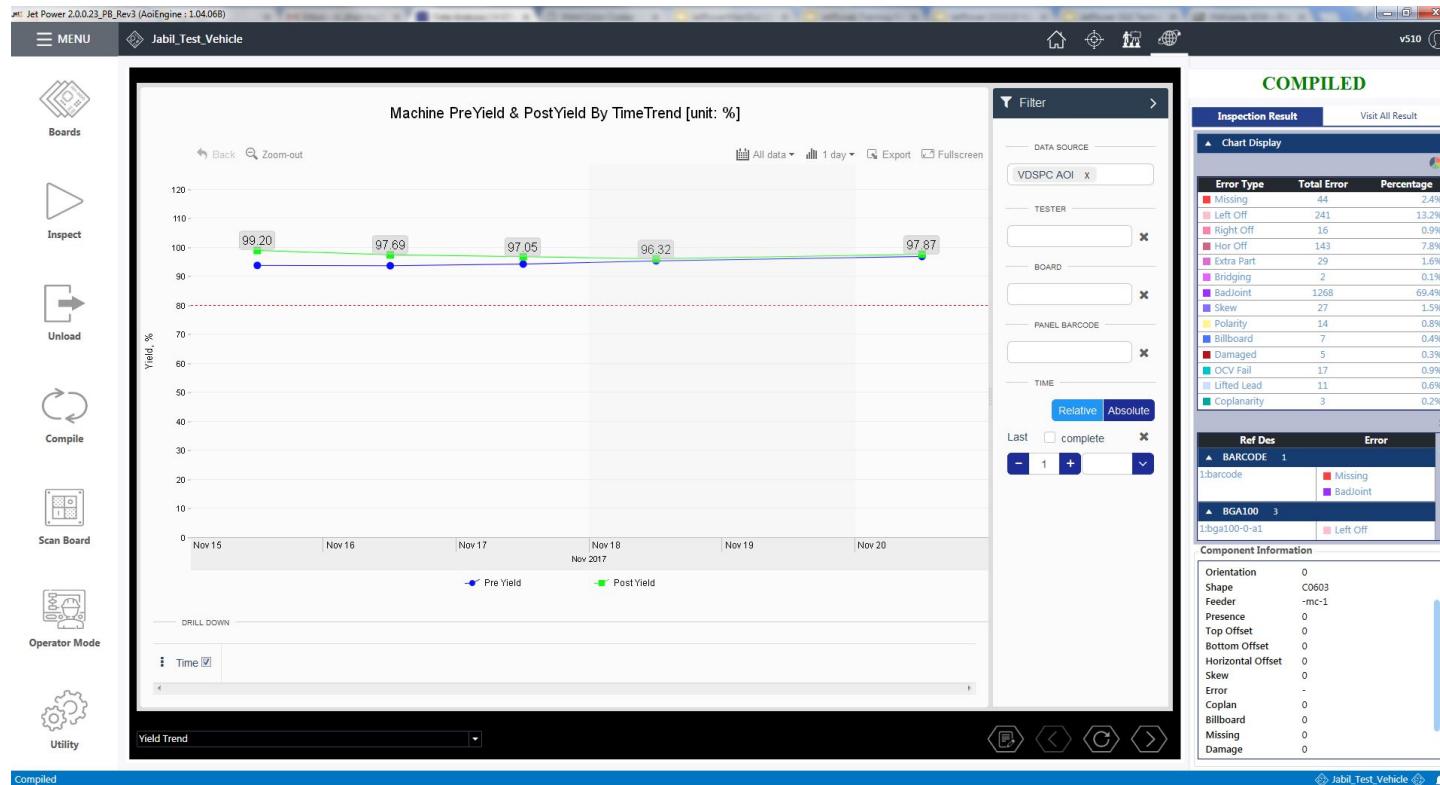
Show the chart  
with the selected  
filters



# ABI

Automated Board Inspection

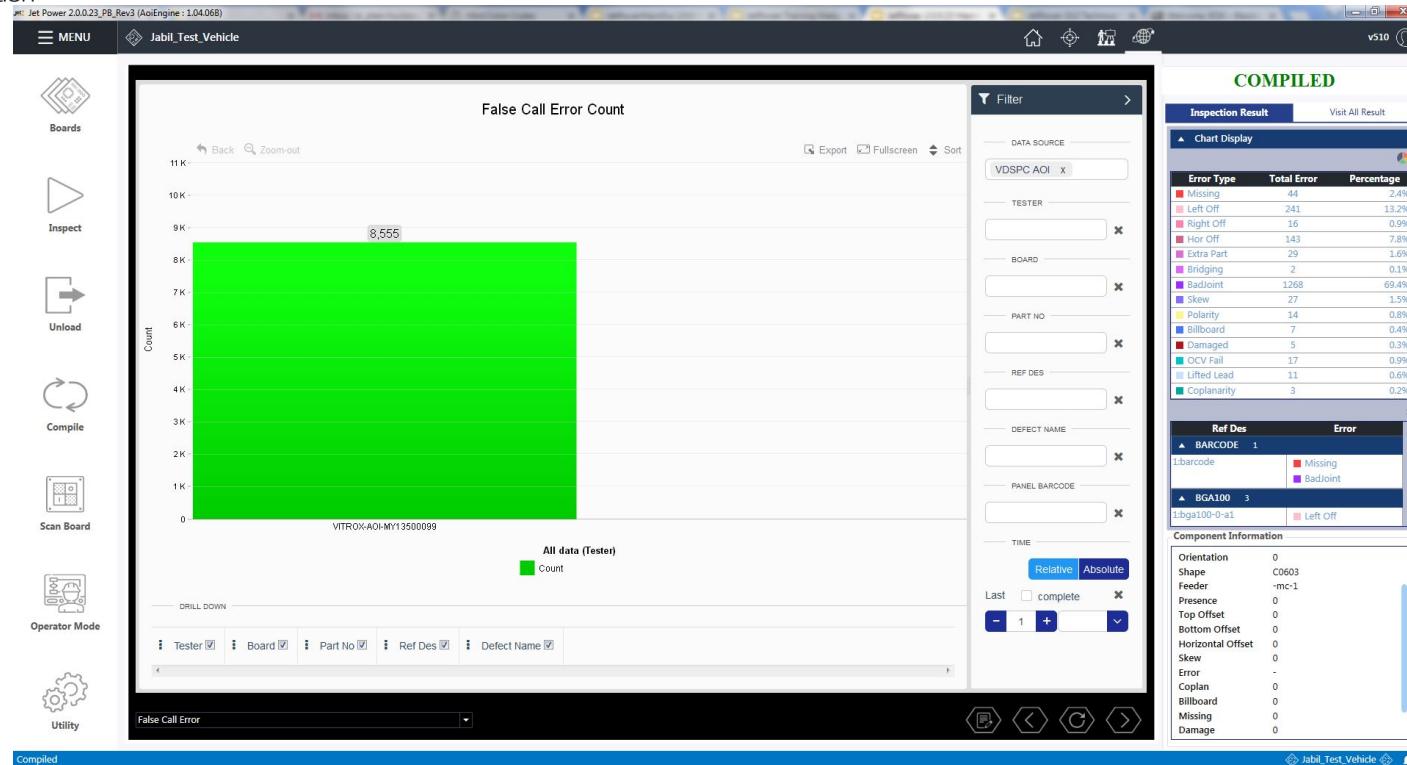
# Line Graph -Yield Trend



# ABI

Automated Board Inspection

# Bar Graph- False Call Error



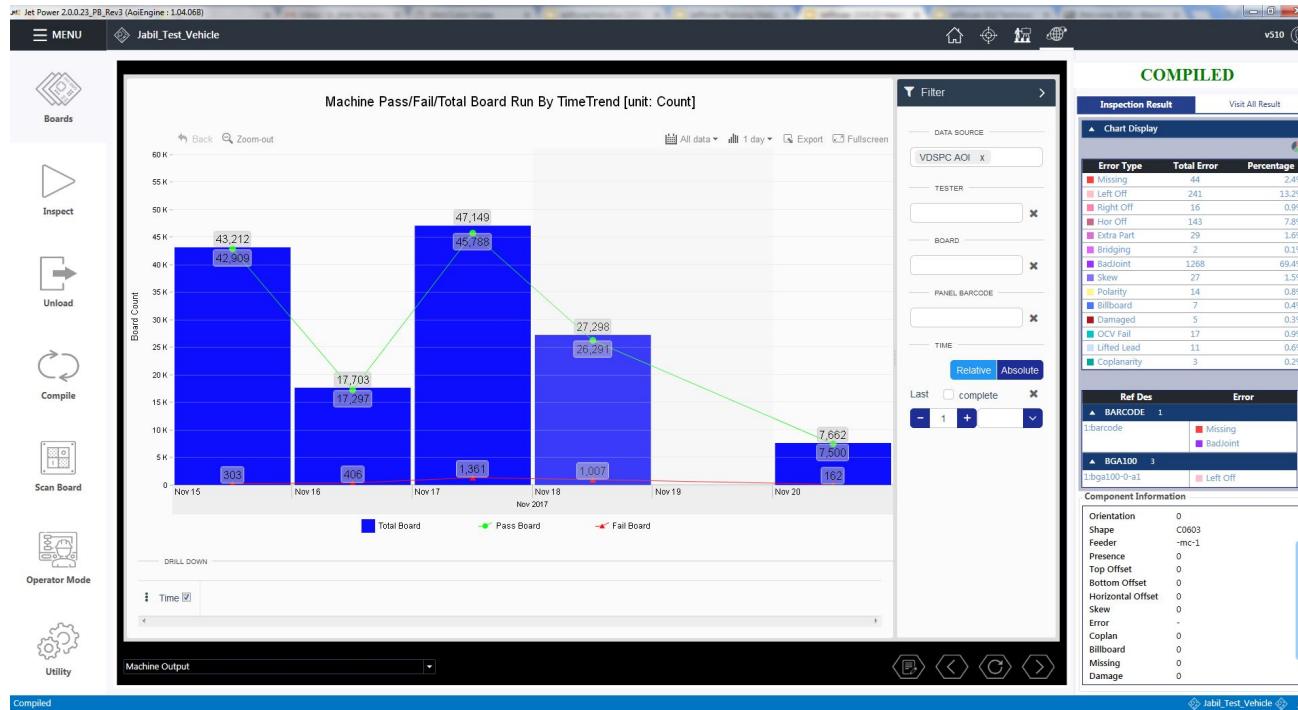
**ViTrox**

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# ABI

Automated Board Inspection

# Bar & Line Graph-Machine Output

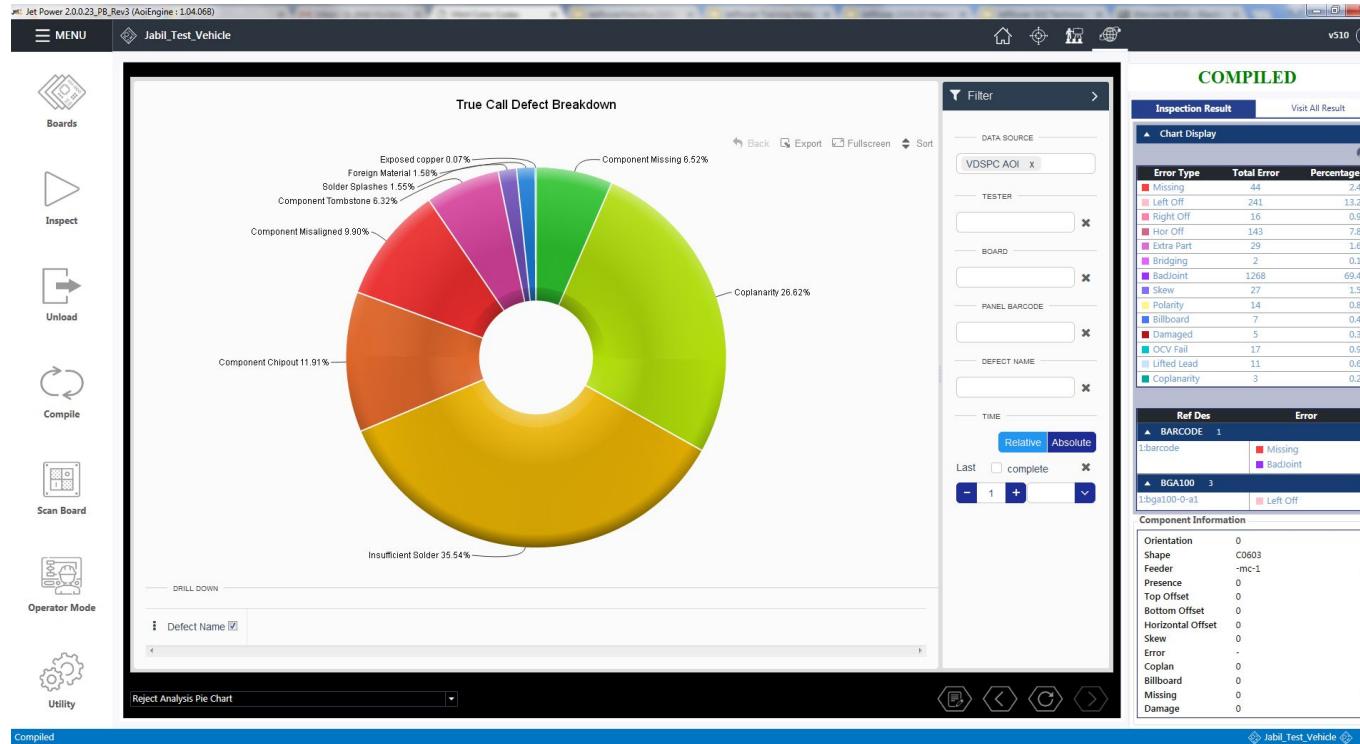


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# Pie Chart -Reject Analysis Pie Chart

Automated Board Inspection

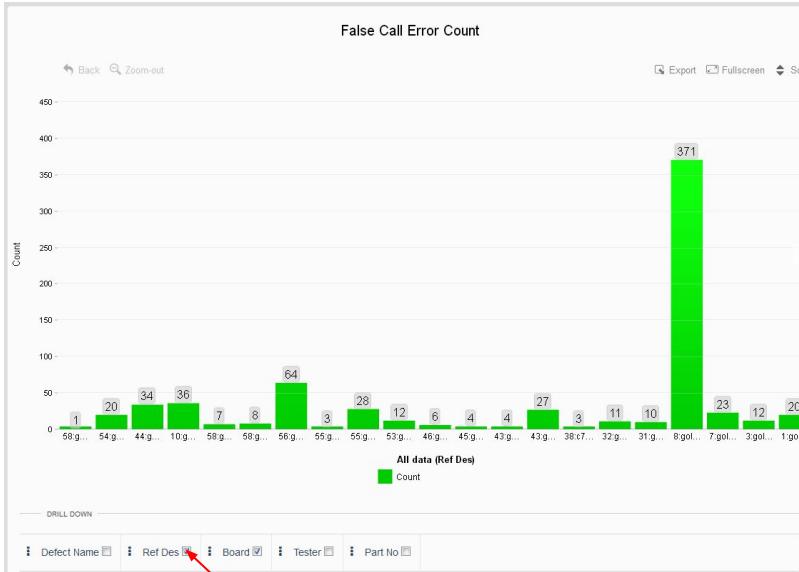


# Priority of Drill Down

Automated Board Inspection

- Drill down selection prioritise the checked properties at the most left
- Automatic refresh will automatically sort the drill down (Checked at the left, unchecked at the right)

According to Ref Des



Ref Des is at the Left of Board

According to Board

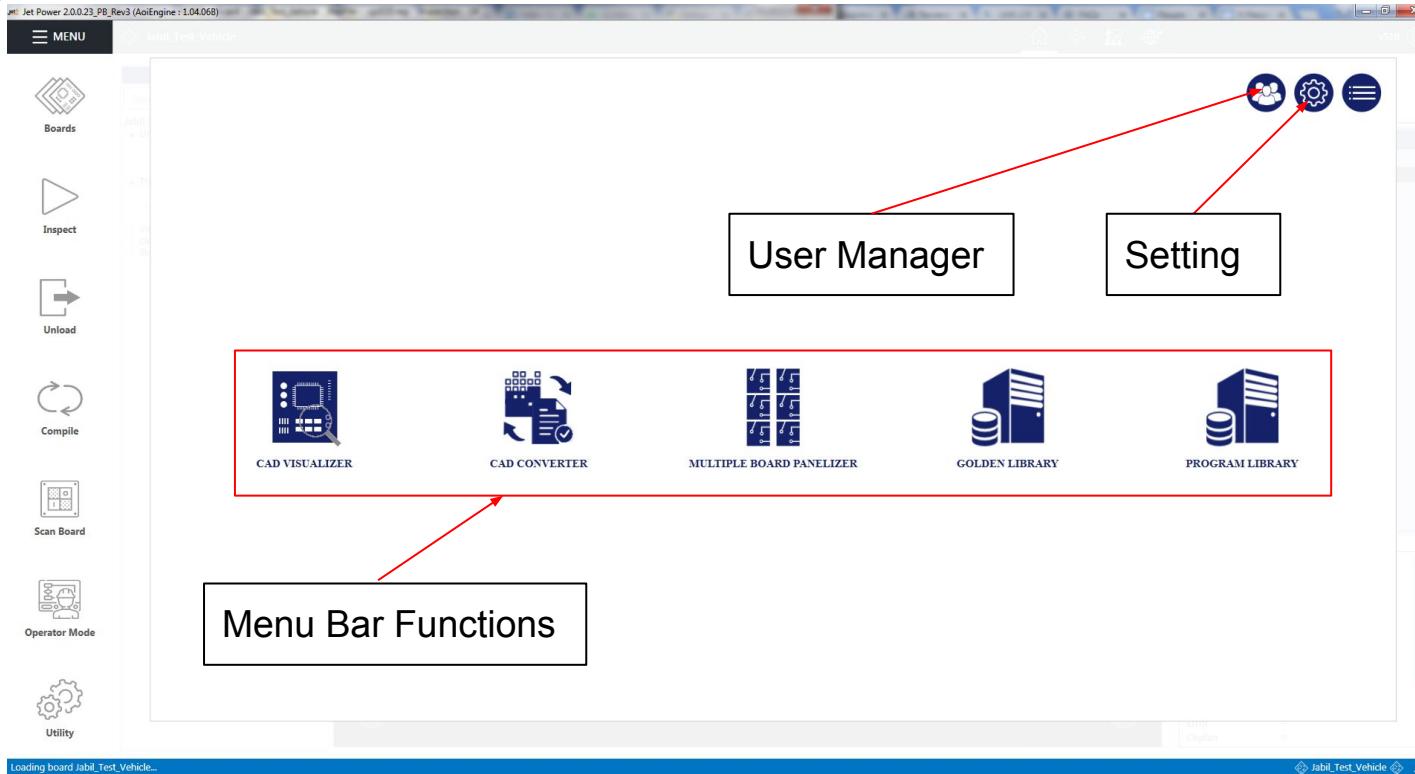


Board is at the Left of Ref Des



# Menu Button - Menu Bar Page

Automated Board Inspection



# Menu Bar - User Manager

Automated Board Inspection

Click header to sort

Go to Setting

Back to Menu Bar Page

Different user

Check and uncheck the authority

Click to save the changes

User	Access Level	User Control	Golden Library Builder
nopl	Developer	<input type="checkbox"/>	<input checked="" type="checkbox"/>
v510	Engineer	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Save Cancel



# Menu Button - Menu Bar Setting

Enable or disable In Tray Icon

Check to notify user if the JetPower Version is not capable with the V510 version

Explain in next page

Go to user manager



Change Language  
(language available depend on location and version)

Back to Menu Bar Page

The screenshot shows the 'JetPower User Settings' menu. It includes sections for 'User Settings' (Language: English, Hide In Tray Icon: Enable, Show Version Compatible Message checked), 'Library Path Setting' (Library Path: C:\cp\jetpower\library\categoryA, Add New Library Path input field, Select Path button, Add button), 'ALGORITHM TRAINER SETTING' (Auto Navigation checked), and 'FPY SETTING' (Update FPY in Engineer Mode unchecked). Red arrows from callout boxes point to specific UI elements: 'Check to notify user if the JetPower Version is not capable with the V510 version' points to the 'Show Version Compatible Message' checkbox; 'Explain in next page' points to the 'Update FPY in Engineer Mode' checkbox; 'Key in the path' points to the 'Add New Library Path' input field; 'Browse for a new path' points to the 'Select Path' button; 'Press to add the path' points to the 'Add' button; 'Update the First Pass Yield when changed' points to the 'Update FPY in Engineer Mode' checkbox; and 'Go to user manager' points to the user manager icon in the top right.

Check to notify user if the JetPower Version is not capable with the V510 version

Explain in next page

Key in the path

Browse for a new path

Press to add the path

-Select available golden library path from the drop down list.  
-Refresh to update.

Update the First Pass Yield when changed



Automated Board Inspection

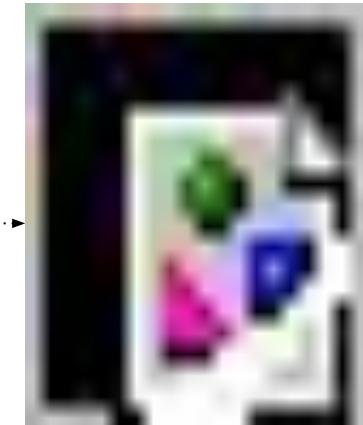
**ALGORITHM TRAINER SETTING**

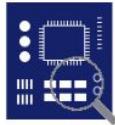
- 
- Auto Navigation

Automatically change listing to Trained after training



Stay at untrained list after training





CAD VISUALIZER



CAD CONVERTER



MULTIPLE BOARD PANELIZER



GOLDEN LIBRARY



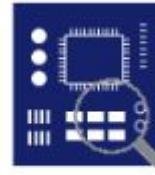
PROGRAM LIBRARY

- **CAD Visualizer** - To visualize the .plx file in board graphic view and grid view.
- **CAD Converter**- To convert custom file into .plx file.
- **Multiple Board Panelizer**- To generate multiple panels from from the .plx file.
- **Golden Library**- To manage V510 algorithm library in single and multi AOI.
- **Program Library**- Centralized Program Management System that manage and centralized programs that is shared / standalone



**ABI**

Automated Board Inspection



**CAD VISUALIZER**

## CAD Visualizer

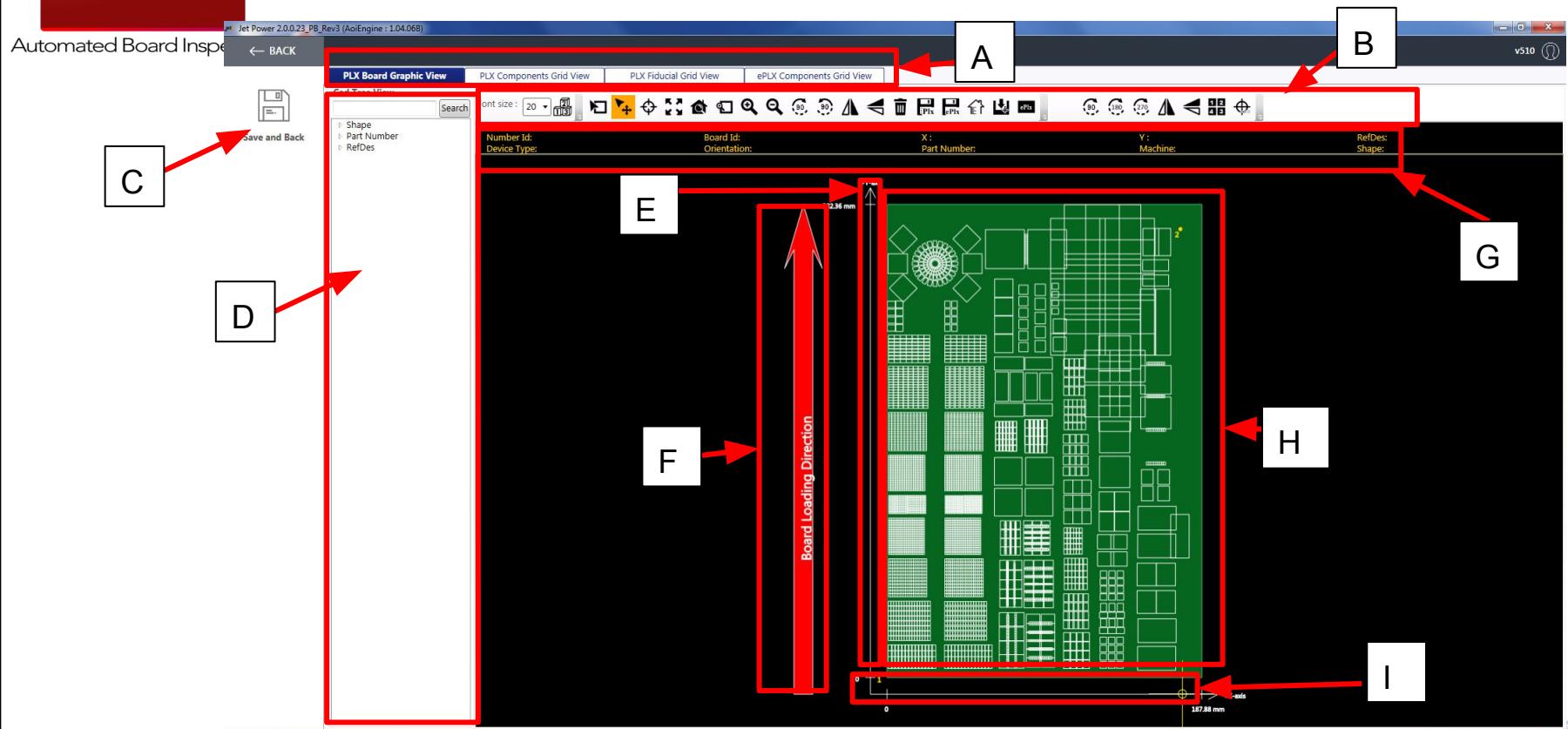


- Cad Visualizer uses current board program file and visualize the CAD image in board graphic and grid view.
- Board graphic provides the function:
  - 1) select single or multiple components
  - 2) show board's ID
  - 3) delete boards or components
  - 4) change board sequence
  - 5) select or delete fiducials (local or global)
  - 6) rotate or mirror board
  - 7) reset board origin.



# ABI

# CAD Visualizer Overview



No	Item	Descriptions
A	Board Graphic View Tab	To display PLX Board Graphic View, PLX components Grid View, PLX Fiducial Grid View or ePLX Components Grid View.
B	Board Graphic Tool	A set of buttons to control the components and board in the Board Graphic.
C	Save and Back	Update the current saved file and return to main page. Similar to Compile
D	CAD Tree View	To search and display the components by Shape, Part Numbers and RefDes.
E	Y-axis Dimension Ruler	A generated Y-axis dimension ruler for quick reference.
F	Board Loading Direction	An indicator to show the board loading direction into the inspection machine.
G	Panel Board Details	Display the panel board information.
H	Board Graphic	Visualize the board and components dimension, orientation and position in scale reference from the .plx file.
I	X-axis Dimension Ruler	A generated X-axis dimension ruler for quick reference.



List of components according to different classification

#### Cad Tree View

Search

- ▷ Shape
- ▷ Part Number
- ▷ RefDes

#### Search in Shape

- Red Colour Highlighted and orange colour display in board graphic view
- case insensitive

#### Cad Tree View

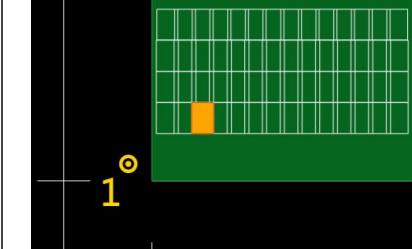
r0805-0

Search

#### Shape

#### R0805

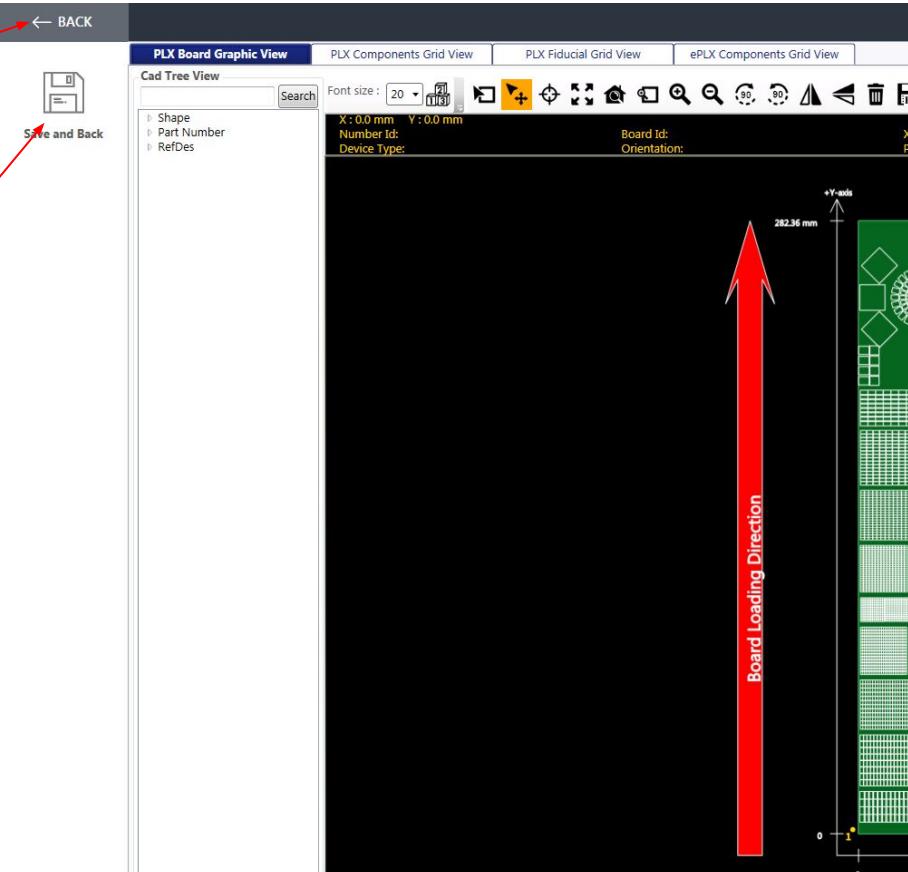
- 1:r0805-0-a1
- 1:r0805-0-b1
- 1:r0805-0-c1**
- 1:r0805-0-d1



Automated Board Inspection

Do not save the changes  
and back to Main GUI

Save the changes and  
back to Main GUI



Icon	Name	Short Cut	Description
	Font Size Selection	N/A	Drop down list to change the font size of the component ref des. (8,10,12,14,16,18,20,30,40,50)
	Show Board No	N/A	Display the respective board number of the panel.
	Selection Mode	s	Change the cursor to selection mode to select single or multiple components or board.
	Pan View Mode	m	Change the cursor to pan view mode to view the panel board.



Icon	Name	Short Cut	Description
	View Origin Location	N/A	Show and navigate to the panel origin in the Board Graphic.
	Zoom 1 to 1	Insert	Shows the original panel size in the Board Graphic.
	Zoom Fit to Screen	Home	Display the whole panel view onto the display screen.
	Zoom in Selected Region	z	Display the selected region in frame of view
	Zoom in	+/=	Zoom in the panel on the board graphic window
	Zoom Out	-/_	Zoom out the panel on the board graphic window



Icon	Name	Description
	Rotate selected board by 90° clockwise	Rotate the selected components on the board by 90 degrees clockwise
	Rotate selected board by 90° anti-clockwise	Rotate the selected components on the board by 90 degrees anti-clockwise
	Mirror selected board horizontally	Flip the selected components on the board horizontally
	Mirror selected board vertically	Flip the selected components on the board vertically
	Delete Selected Object	Delete the selected components on the panel from the board graphic window.



Icon	Name	Description
	Export PLX file	Save the current components, boards, and panel configuration onto a new .plx file.
	Export both PLX and ePLX file	Save the current components, boards, and panel configuration onto a new .plx file and new ePLX file.
	Generate Home File	Create a new home file for the current panel on the board graphic window.
	Save as Program Library	Save the PLX file in "C:\CPI\jetpower\cadstore\" program name folder
	Import ePLX File	Import extra information to store at ePlx file.



## Panel Transformation Toolbar Controls

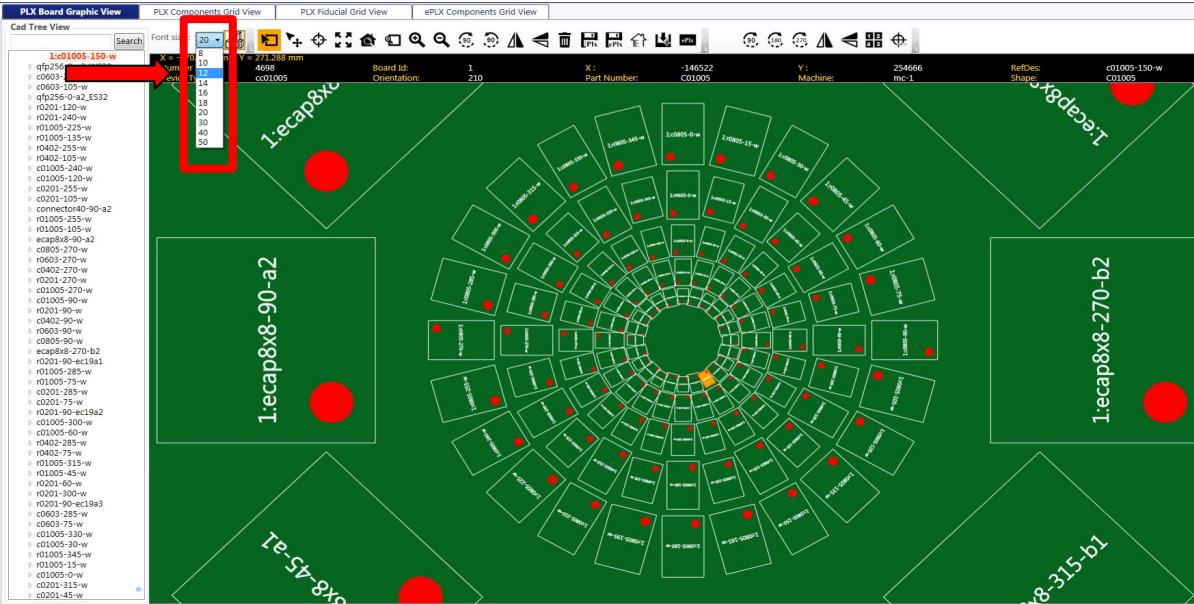
Icon	Items	Descriptions
	Rotate Panel by 90 degree / 180 degree / 270 degree	Rotate the panel clockwise on the board graphic window by 90, 180 or 270 degrees.
	Mirror panel vertically / horizontally	Mirror the whole components and board on the panel vertically or horizontally.
	Reset Board Arrangement/ID	Change the multiple boards numbering / order of the panel.
	Reset Origin	Reset the panel origin.



# CAD Visualizer - Font Size

## Change the Component Ref Des font size

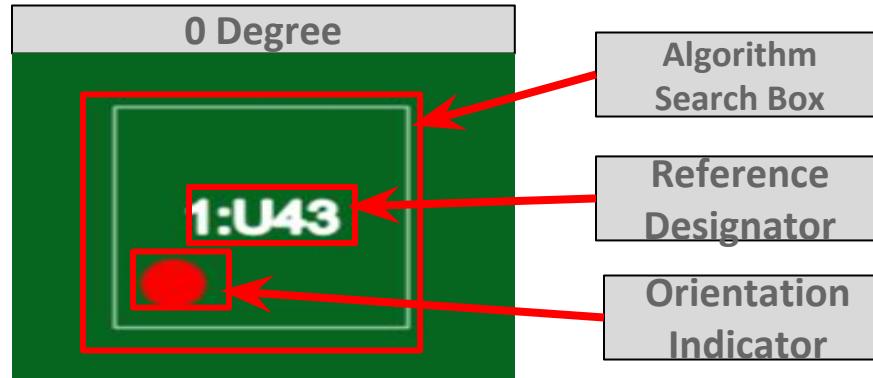
- Click on the font size drop down list and click on the desired font size.



# CAD Visualizer - Component Graphic Legend

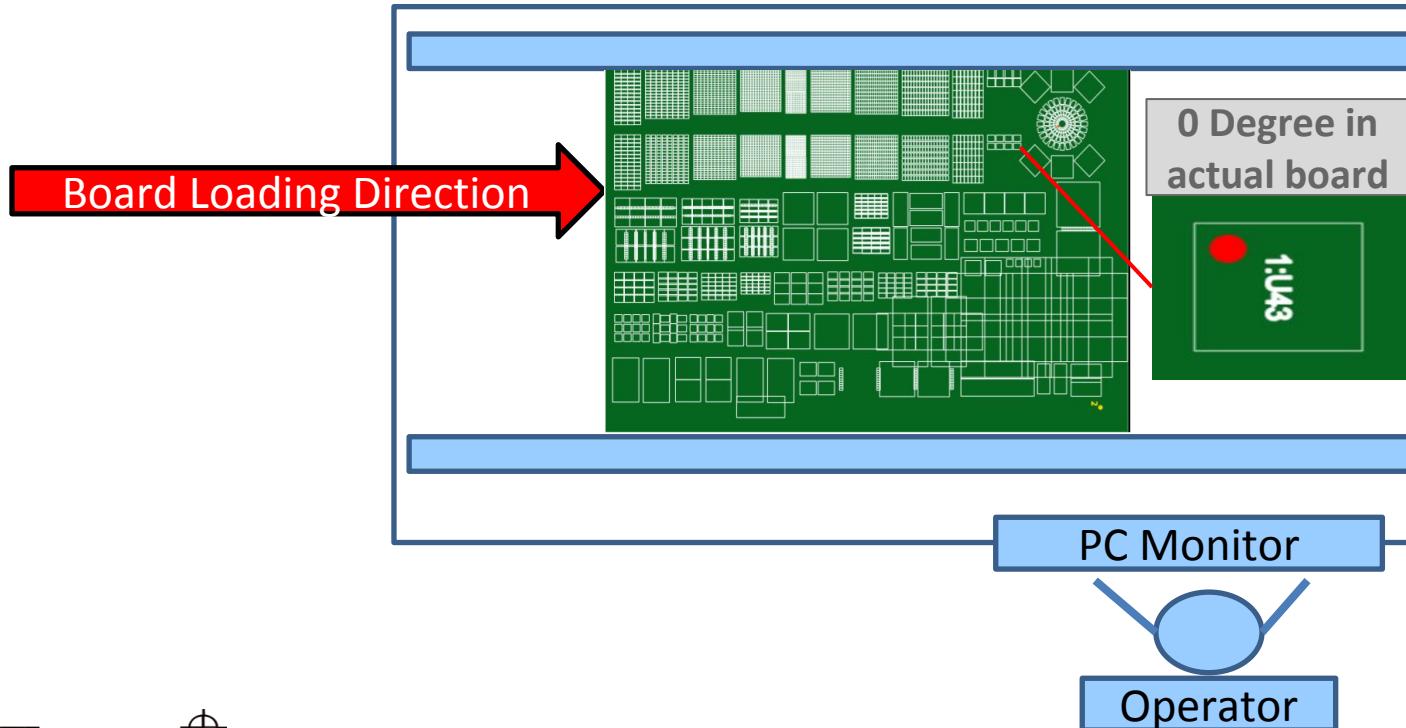
## Component Graphic Legend

- Every component would have their algorithm search box region, reference designator and an orientation indicator.



**Board Loading Direction**

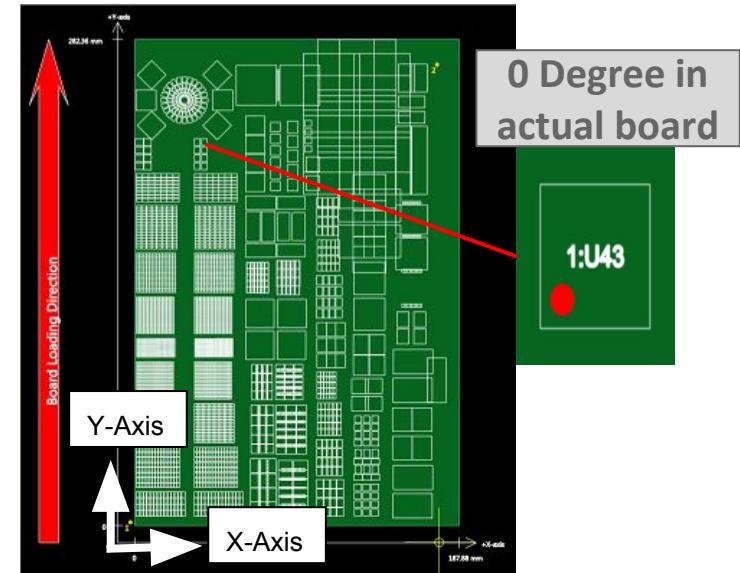
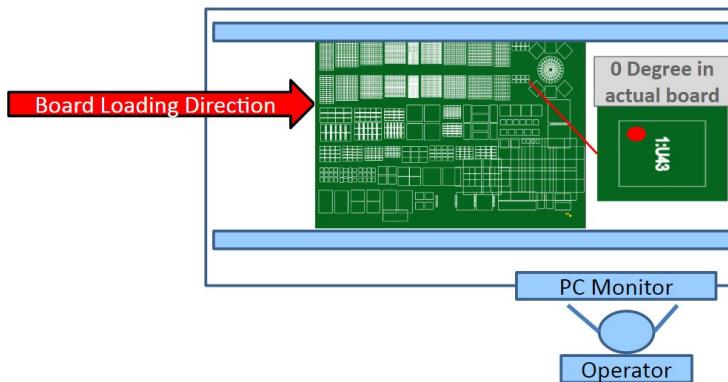
- The red arrow on the board graphic window indicates the board loading direction as shown as below from the top view orientation.



Automated Board Inspection

## Board Loading Direction

- Side by side comparison between the top view and board graphic window. Notice the XY axis are revert to each other.



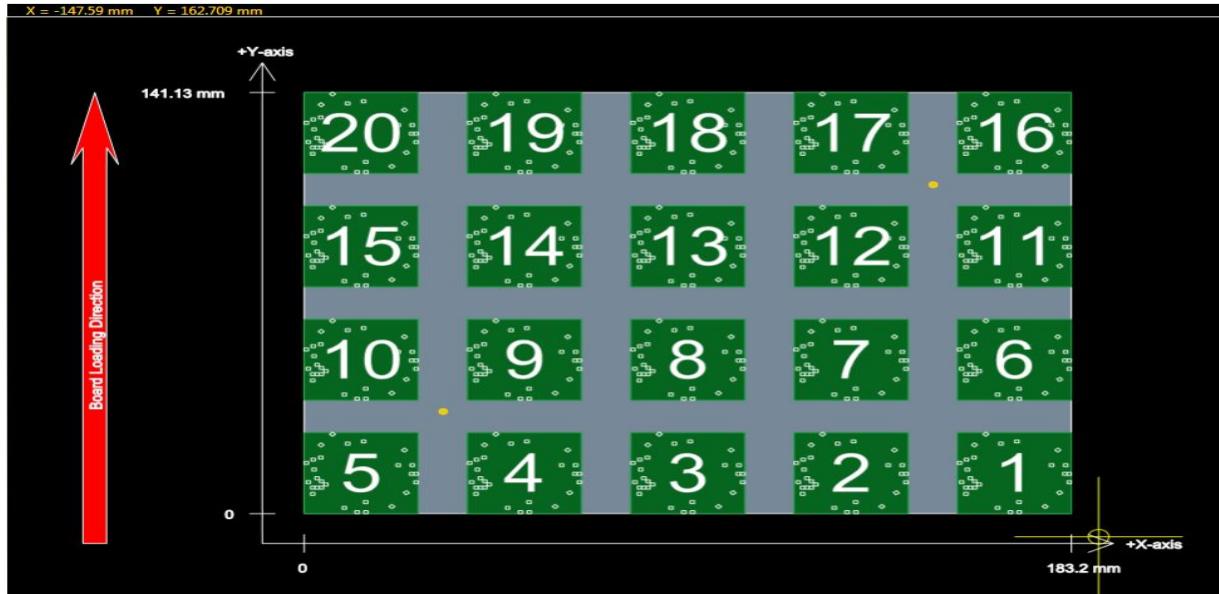
0 Degree in  
actual board



## Show Board No

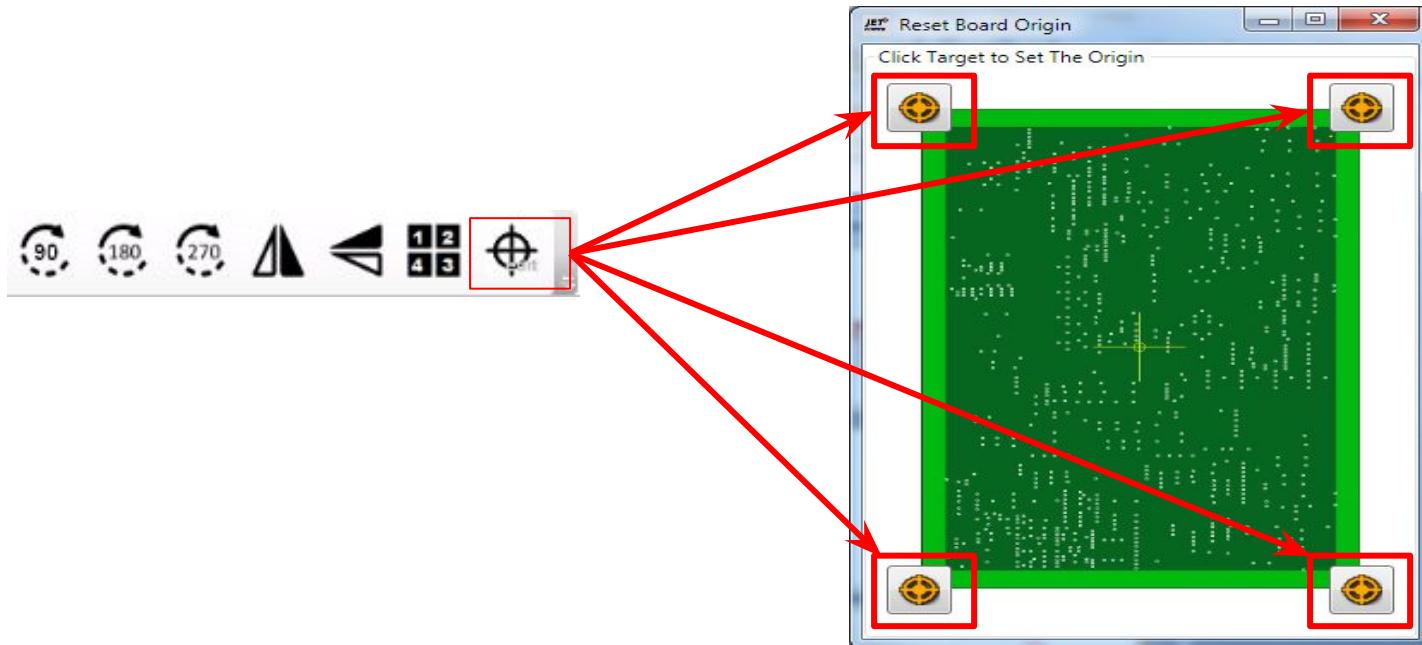


- Enable the Show Board Number Button to display the board number on the panel.
- Press it again will hide the number



## Reset Board Origin

- Click on any of the four target buttons to change the origin position to one of the panel corners.

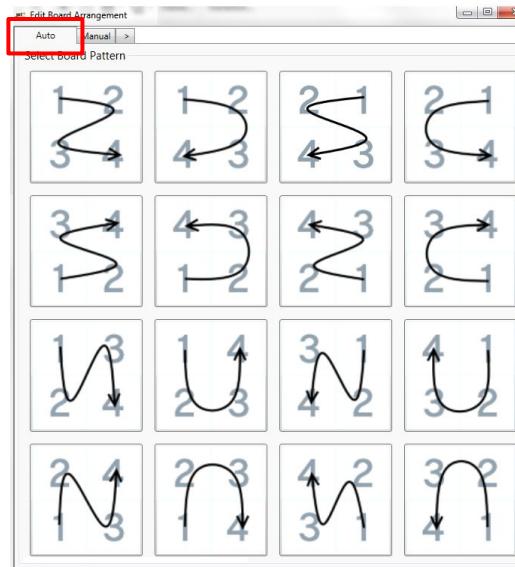


Automated Board Inspection

## Reset Board Arrangement



- To change the board number order / arrangement in the panel. There are two mode, Auto or Manual Mode.
- Auto Mode will automatically assign the board number according to the selected board pattern configuration.
- Manual Mode will allow the user to key in the board number value according to the board placement on the panel. Click on the Submit button to confirm and re-visualise the board number.



Save the  
changes

Undo any  
changes



**PLX Components Grid View**

- Shows the total components that displayed on the board graphic. Any changes in component orientation, refdes, X-position, Y-position, will be re-visualise on the board graphic.

PLX Board Graphic View		PLX Components Grid View			PLX Fiducial Grid View		ePLX Components Grid View			
No.	Board Id.	X	Y	RefDes	Device Type	Orientation	Part Number	Machine	RefDes2	Shape
1	1	-174638	16932	r0805-0-a1	rr0805-a	0	R0805-A	mc-1	r0805-0-a1	R0805
2	1	-172631	16932	r0805-0-b1	rr0805-a	0	R0805-A	mc-1	r0805-0-b1	R0805
3	1	-170625	16932	r0805-0-c1	rr0805-a	0	R0805-A	mc-1	r0805-0-c1	R0805
4	1	-168618	16932	r0805-0-d1	rr0805-a	0	R0805-A	mc-1	r0805-0-d1	R0805
5	1	-166611	16932	r0805-0-e1	rr0805-a	0	R0805-A	mc-1	r0805-0-e1	R0805
6	1	-164605	16932	r0805-0-f1	rr0805-a	0	R0805-A	mc-1	r0805-0-f1	R0805
7	1	-162598	16932	r0805-0-g1	rr0805-a	0	R0805-A	mc-1	r0805-0-g1	R0805
8	1	-160592	16932	r0805-0-h1	rr0805-a	0	R0805-A	mc-1	r0805-0-h1	R0805
9	1	-158585	16932	r0805-0-i1	rr0805-a	0	R0805-A	mc-1	r0805-0-i1	R0805
10	1	-156578	16932	r0805-0-j1	rr0805-a	0	R0805-A	mc-1	r0805-0-j1	R0805
11	1	-154572	16932	r0805-0-k1	rr0805-a	0	R0805-A	mc-1	r0805-0-k1	R0805
12	1	-152565	16932	r0805-0-l1	rr0805-a	0	R0805-A	mc-1	r0805-0-l1	R0805
13	1	-150559	16932	r0805-0-m1	rr0805-a	0	R0805-A	mc-1	r0805-0-m1	R0805
14	1	-148552	16932	r0805-0-n1	rr0805-a	0	R0805-A	mc-1	r0805-0-n1	R0805
15	1	-140957	16932	c0805-0-a1	uc0805	0	C0805	mc-1	c0805-0-a1	C0805
16	1	-138951	16932	c0805-0-b1	uc0805	0	C0805	mc-1	c0805-0-b1	C0805
17	1	-136944	16932	c0805-0-c1	uc0805	0	C0805	mc-1	c0805-0-c1	C0805
18	1	-134938	16932	c0805-0-d1	uc0805	0	C0805	mc-1	c0805-0-d1	C0805
19	1	-132931	16932	c0805-0-e1	uc0805	0	C0805	mc-1	c0805-0-e1	C0805
20	1	-130924	16932	c0805-0-f1	uc0805	0	C0805	mc-1	c0805-0-f1	C0805

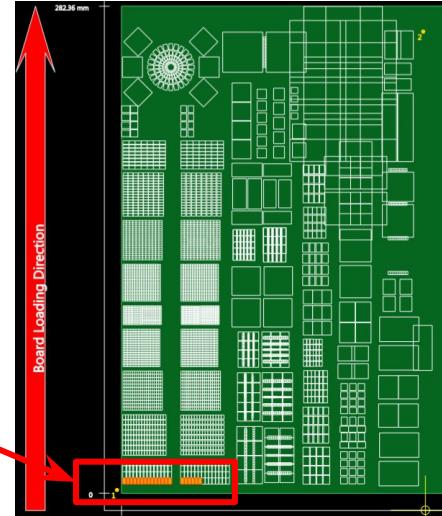
**Header** - Click on the respective header to sort the components.

**Component Information** - Double click on the component cell to edit the data. All changes will be re-visualise at the Board Graphic Window.

## PLX Components Grid View

- Selecting the components on the PLX Components Grid View will highlight the components in orange in colour for the ease of view or searching.

PLX Board Graphic View		PLX Components Grid View		PLX Fiducial Grid View		ePLX Components Grid View				
No.	Board Id.	X	Y	RefDes	Device Type	Orientation	Part Number	Machine	RefDes2	Shape
1	1	-174638	16932	r0805-a	r0805-a	0	R0805-A	mc-1	r0805-a	R0805
2	1	-172631	16932	r0805-b	r0805-a	0	R0805-A	mc-1	r0805-b	R0805
3	1	-170625	16932	r0805-c	r0805-a	0	R0805-A	mc-1	r0805-c	R0805
4	1	-168618	16932	r0805-d	r0805-a	0	R0805-A	mc-1	r0805-d	R0805
5	1	-166611	16932	r0805-e	r0805-a	0	R0805-A	mc-1	r0805-e	R0805
6	1	-164605	16932	r0805-f	r0805-a	0	R0805-A	mc-1	r0805-f	R0805
7	1	-162598	16932	r0805-g	r0805-a	0	R0805-A	mc-1	r0805-g	R0805
8	1	-160592	16932	r0805-h	r0805-a	0	R0805-A	mc-1	r0805-h	R0805
9	1	-158585	16932	r0805-i	r0805-a	0	R0805-A	mc-1	r0805-i	R0805
10	1	-156578	16932	r0805-j	r0805-a	0	R0805-A	mc-1	r0805-j	R0805
11	1	-154572	16932	r0805-k	r0805-a	0	R0805-A	mc-1	r0805-k	R0805
12	1	-152565	16932	r0805-l	r0805-a	0	R0805-A	mc-1	r0805-l	R0805
13	1	-150559	16932	r0805-m	r0805-a	0	R0805-A	mc-1	r0805-m	R0805
14	1	-148552	16932	r0805-n	r0805-a	0	R0805-A	mc-1	r0805-n	R0805
15	1	-146545	16932	r0805-o	uc0805	0	C0805	mc-1	r0805-o	C0805
16	1	-140957	16932	r0805-p	uc0805	0	C0805	mc-1	r0805-p	C0805
17	1	-138951	16932	r0805-q	uc0805	0	C0805	mc-1	r0805-q	C0805
18	1	-136944	16932	r0805-r	uc0805	0	C0805	mc-1	r0805-r	C0805
19	1	-132931	16932	r0805-s	uc0805	0	C0805	mc-1	r0805-s	C0805
20	1	-130924	16932	r0805-t	uc0805	0	C0805	mc-1	r0805-t	C0805
21	1	-128918	16932	r0805-u	uc0805	0	C0805	mc-1	r0805-u	C0805
22	1	-126911	16932	r0805-v	uc0805	0	C0805	mc-1	r0805-v	C0805
23	1	-124905	16932	r0805-w	uc0805	0	C0805	mc-1	r0805-w	C0805
24	1	-122898	16932	r0805-x	uc0805	0	C0805	mc-1	r0805-x	C0805
25	1	-120891	16932	r0805-y	uc0805	0	C0805	mc-1	r0805-y	C0805
26	1	-118885	16932	r0805-z	uc0805	0	C0805	mc-1	r0805-z	C0805
27	1	-116878	16932	r0805-aa	uc0805	0	C0805	mc-1	r0805-aa	C0805
28	1	-114872	16932	r0805-ab	uc0805	0	C0805	mc-1	r0805-ab	C0805
29	1	-47244	17257	sot23-0-a1	bsc023	0	SOT23	mc-1	sot23-0-a1	SOT23
30	1	-d2791	17257	ext73-n-h1	hsr172	0	ext73	mc-1	ext73-n-h1	ext73



PLX Board Graphic View

## PLX Fiducial Grid View

- To add, delete, edit selected global or local fiducial.

No.	X	Y
1	-179070	11733
2	-1270	277495
3	-1270	277495
4	-179070	11733

No.	Board Id	X	Y
1	1	0	0
2	1	10	0
3	1	20	0



**Global Fiducial** - Has a brighter yellow colour compared to the local fiducial.



**Local Fiducial** - Has a darker yellow colour compared to the global fiducial.



## ePLX Components Grid View

- Shows the total components' Ref Des that displayed on the board graphic.

No.	RefDes
3	r0805-0-c1
4	r0805-0-d1
5	r0805-0-e1
6	r0805-0-f1
7	r0805-0-g1
8	r0805-0-h1
9	r0805-0-i1
10	r0805-0-j1
11	r0805-0-k1
12	r0805-0-l1
13	r0805-0-m1
14	r0805-0-n1
15	c0805-0-a1
16	c0805-0-b1
17	c0805-0-c1
18	c0805-0-d1
19	c0805-0-e1
20	c0805-0-f1
21	c0805-0-g1
22	c0805-0-h1
23	c0805-0-i1
24	c0805-0-j1
25	c0805-0-k1
26	c0805-0-l1
27	c0805-0-m1
28	c0805-0-n1



**ABI**

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CAD Converter

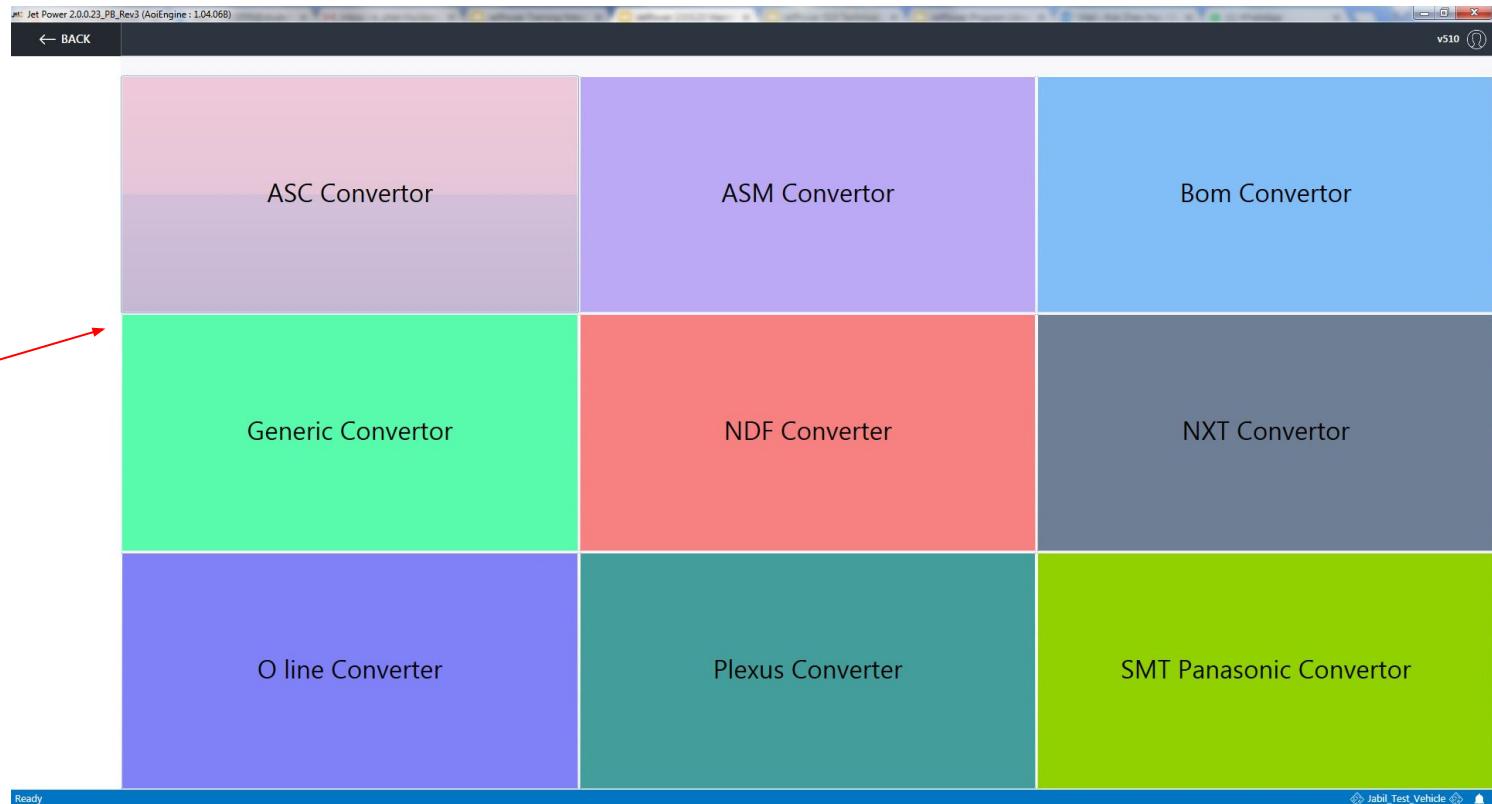
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# CAD Convertor - Plugin Design

Automated Board Inspection



# CAD Convertor - Plugin Design

- Current supported format for CAD converter function are:
  - a) ASC
  - b) ASM
  - c) Bom
  - d) Generic (Row/Column)
  - e) NDF
  - f) NXT
  - g) O line
  - h) Plexus
  - i) SMT P-brand
- All Plugin DLL Design will be at JetPower exe folder path under the “Plugins” folder.

	Name	Date modified	Type	Size
★ Favorites				
Desktop	PluginASC.dll	12/11/2017 3:11 PM	Application extens...	15 KB
Downloads	PluginASC.pdb	12/11/2017 3:11 PM	PDB File	42 KB
Recent Places	PluginASMCconvertor.dll	12/11/2017 3:11 PM	Application extens...	31 KB
	PluginASMCconvertor.pdb	12/11/2017 3:11 PM	PDB File	58 KB
	PluginBOMConvertor.dll	12/11/2017 3:11 PM	Application extens...	44 KB
	PluginBOMConvertor.pdb	12/11/2017 3:11 PM	PDB File	74 KB
	PluginGenericConvertor.dll	12/11/2017 3:11 PM	Application extens...	50 KB
	PluginGenericConvertor.pdb	12/11/2017 3:11 PM	PDB File	82 KB
	PluginNDF.dll	12/11/2017 3:11 PM	Application extens...	53 KB
	PluginNDF.pdb	12/11/2017 3:11 PM	PDB File	98 KB
	PluginNXTCconvertor.dll	12/11/2017 3:11 PM	Application extens...	32 KB
	PluginNXTCconvertor.pdb	12/11/2017 3:11 PM	PDB File	60 KB
	PluginOLineConvertor.dll	12/11/2017 3:11 PM	Application extens...	14 KB
	PluginOLineConvertor.pdb	12/11/2017 3:11 PM	PDB File	26 KB
	PluginPlexusConvertor.dll	12/11/2017 3:11 PM	Application extens...	17 KB
	PluginPlexusConvertor.pdb	12/11/2017 3:11 PM	PDB File	28 KB
	PluginSMTPanasonic.dll	12/11/2017 3:11 PM	Application extens...	17 KB
	PluginSMTPanasonic.pdb	12/11/2017 3:11 PM	PDB File	36 KB



## ASC Convertor

ASC Convertor is to convert the .asc file to .plx file for the use in JetPower



[Return to CAD Converter Selection page](#)

[Back to CAD Converter](#)

### ASC Converter

Please select ASC file:

[Browse](#)

[Convert](#)

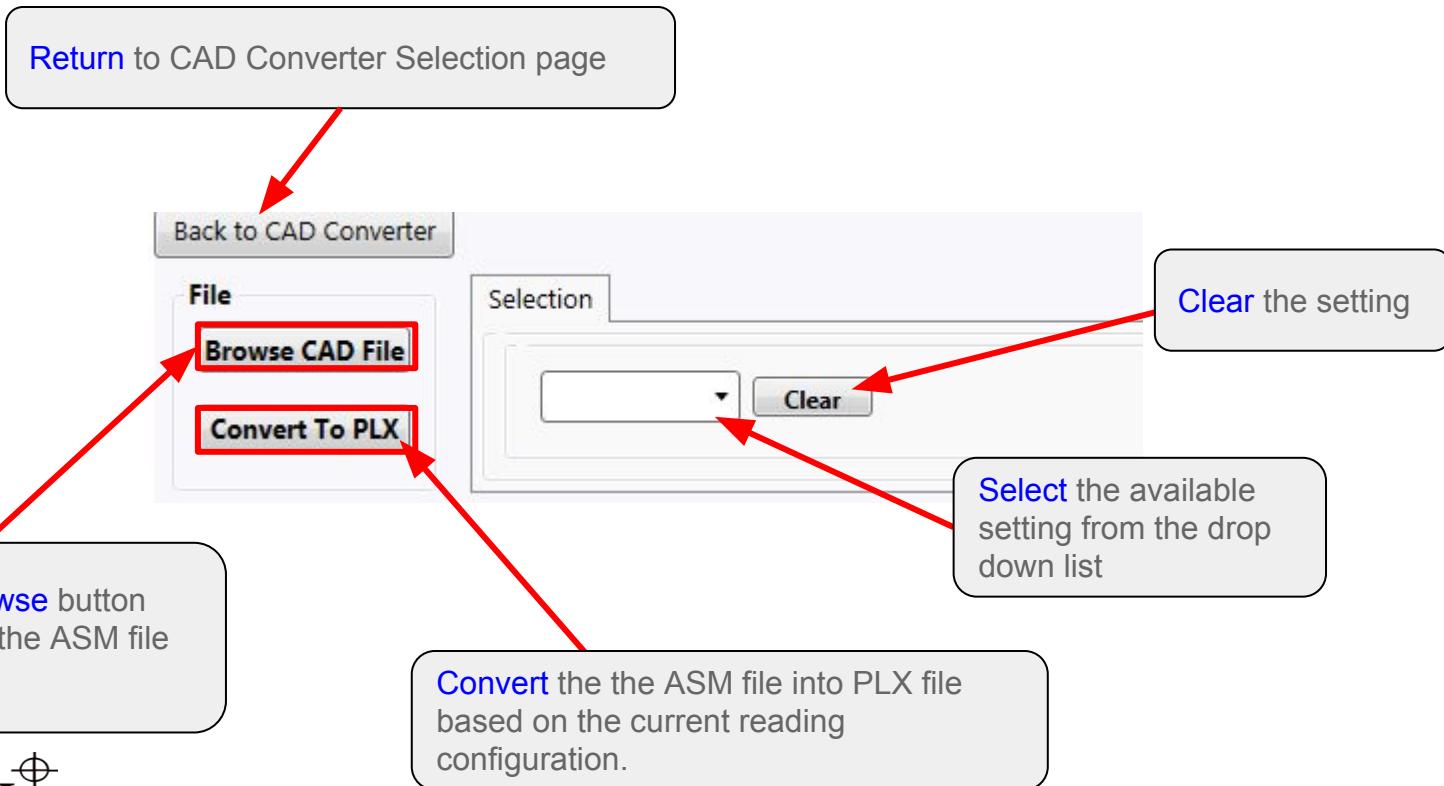
Click on the [browse](#) button and navigate to the ASC file path.



## ASM Convertor

ASM Convertor is to convert the .asm file to .plx file for the use in JetPower





## Bom Convertor

BOM Convertor is to convert the BOM file to .plx file for the use in JetPower



# CAD Converter - Bom Plugin

**Browse CAD file** - Browse for BOM file and will be load on the component list window.

[Return to CAD Converter Selection page](#)

**File Arrangement** - A set of methods on how to read the generic file.

The screenshot shows the CAD Converter - Bom Plugin interface. At the top, there's a navigation bar with 'Back to CAD Converter' and tabs for 'File Arrangement' (selected) and 'CAD Conversion Template'. Below the tabs are settings for separators: Space (checked), Tab (unchecked), Comma (checked), Semicolon (unchecked), and Others. There's also a checkbox for 'Remove Empty Entries'. To the right, there's a table with columns for component data and a dropdown menu for 'Component List Header' with options like 'X (micron)', 'Y (mils)', etc. Red arrows point from the explanatory text boxes to the corresponding UI elements.

No.	--Select--	--Select--	--Select--	--Select--	--Select--	--Select--	--Select--	--Select--	--Select--	--Select--
1	P	1				SOT-23	mc-1	1:q8		
2	w	1423				CRYSTAL	mc-1	1:osc3		
3	f	-850				0402-R	mc-1	1:r5		
4	f	1850				0402-R	mc-1	1:r6		
5	f	1850				0603-R	mc-1	1:r11		
6	f	-850				CAP-0805	mc-1	1:c19		
7	d	3317				CAP-0805	mc-1	1:c20		
8	d	42611	7251	1:osc3	bcrystal_osc					
9	d	62065	7620	1:r5	r0402r	0				
10	d	64605	7620	1:r6	r0402r	0				
11	d	81650	7683	1:r11	r0603r	0				
12	d	86195	8085	1:c19	ccap0805	0				
13	d	89370	8085	1:c20	ccap0805	0				
14	d	92545	8085	1:x21	ccan0805	0				

**Convert To PLX** - Convert the the Bom file into PLX file based on the current reading configuration.

**CAD Conversion Template** - Export out the template recipe on how to read the file.

**Component List Header** - A dropdown list for the user to define the each data categories.



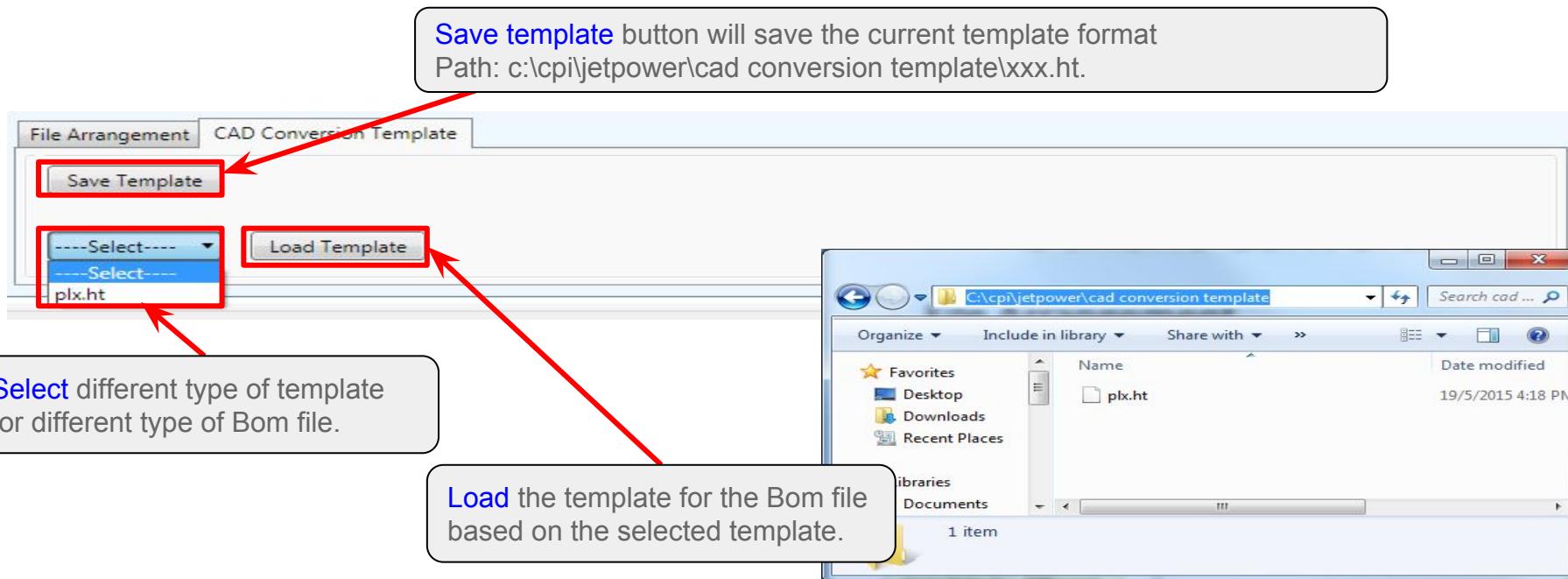
Define on which symbol or multiple of symbol used to separate the data into row and columns.

Skipping the lines from the beginning of the file (header).

Checking on remove empty entries will remove any blank space/field in the generic file.

Skipping the lines from the ending of the file (footer).





## Generic Convertor

Generic Convertor is to convert the any extension of file to .plx file for the use in JetPower  
\* Certain rules should be fulfilled and it will be explained in the following slides



- Generic converter can accept any types of file with any extension, as long as it can be open using Notepad and it is readable without encryption.
- The file must be able to separate the data into rows and column.
- Extra header and footer of the file are allowed.

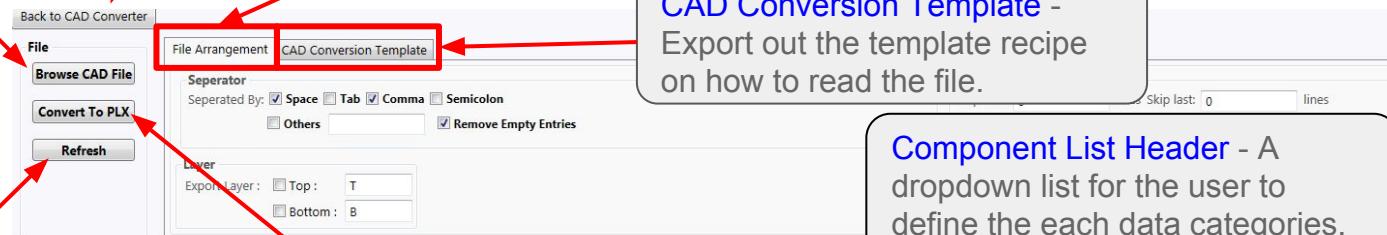


# CAD Convertor - Generic Plugin

**Browse CAD file** - Browse for generic file and will be load on the component list window.

**Return to CAD Converter Selection page**

**File Arrangement** - A set of methods on how to read the generic file.



**CAD Conversion Template** - Export out the template recipe on how to read the file.

**Component List Header** - A dropdown list for the user to define the each data categories.

No.	X (inches)	Y (inches)	Z (inches)	Orientation	Part Number	Reference Designator	Machine	Shape Code	Layer	SHAPE
1	P	1				SOT-23	mc-1	1:q8		
2	w	142	-85			CRYSTAL	mc-1	1:osc3		
3	f	-85				0402-R	mc-1	1:r5		
4	f	185				0402-R	mc-1	1:r6		
5	f	185				0603-R	mc-1	1:r11		
6	f	-85				CAP-0805	mc-1	1:c19		
7	d	33173	6604	1:q8	tsot23	0				
8	d	42611	7251	1:osc3	bcrystal_osc	270				
9	d	62065	7620	1:r5	r0402r	0				
10	d	64605	7620	1:r6	r0402r	0				
11	d	81650	7683	1:r11	r0603r	0				
12	d	86195	8085	1:c19	ccap0805	0				
13	d	89370	8085	1:c20	ccap0805	0				
14	d	92545	8085	1:c21	ccap0805	0				
15	d	10520	8128	1:r40	hrtn3216	n	3216-C	mr-1	1:r40	SHAPE

**Convert To PLX** - Convert the generic file into PLX file based on the current reading configuration.

**Refresh** the screen to update the component information



[Back to CAD Converter](#)**File**[Browse CAD File](#)[Convert To PLX](#)[Refresh](#)**File Arrangement** **CAD Conversion Template****Separator**Separated by:  Space  Tab  Comma  Semicolon Others Remove Empty Entries**Layer**Export Layer :  Top :  Bottom :

Export the layer of depending  
on Top or Bottom

Define on which symbol or multiple of  
symbol used to separate the data into  
row and columns.

Skipping the lines from  
the beginning of the file  
(header).

**Skip Lines**

Skip first: 0 lines Skip last: 0 lines

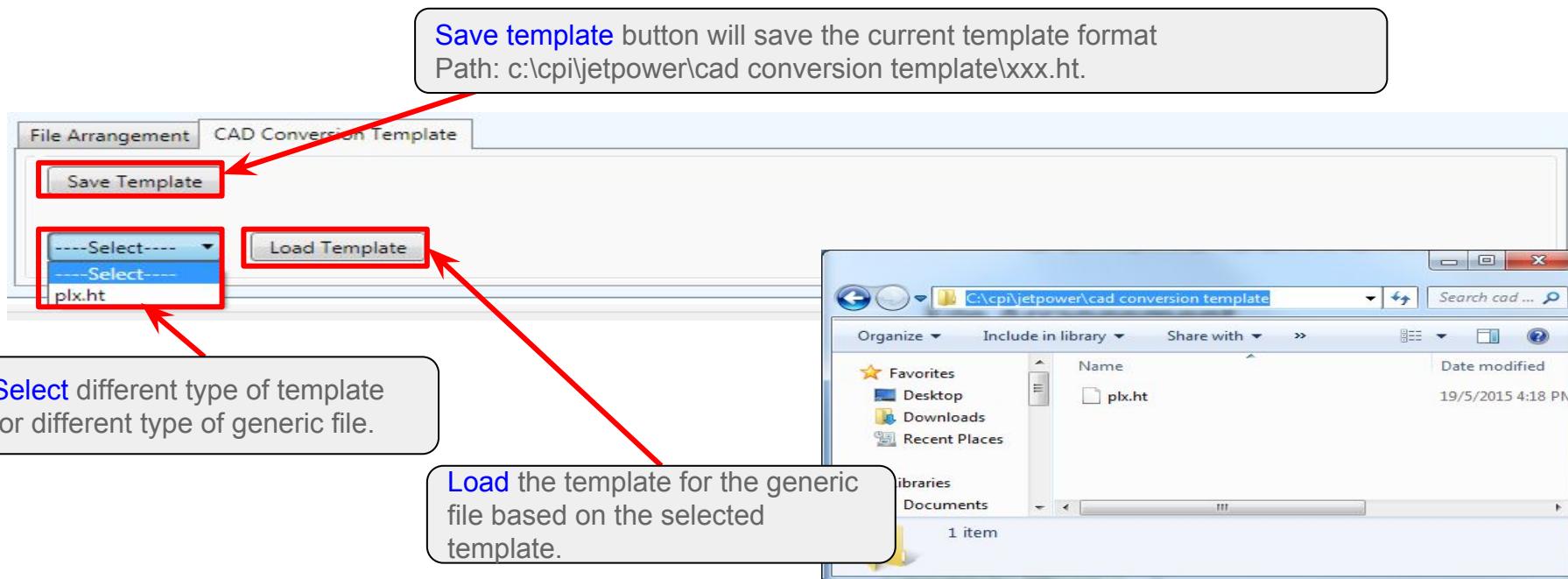
Skip by text :

Checking on **remove empty  
entries** will remove any blank  
space/field in the generic file.

Skipping the lines  
from the ending of the  
file (footer).

Skip the component  
that contain the text





## NDF Converter

NDF Convertor is to convert the NDF file to .plx file for the use in JetPower



## NDF Plugin

- NDF is actually a folder not a single file.
- Major file needed - board.ndf.



[Return to CAD Converter Selection page](#)

Click on the **browse** button to browse for NDF.

Select the type of Output

Click on the **convert** button to convert the NDF file.

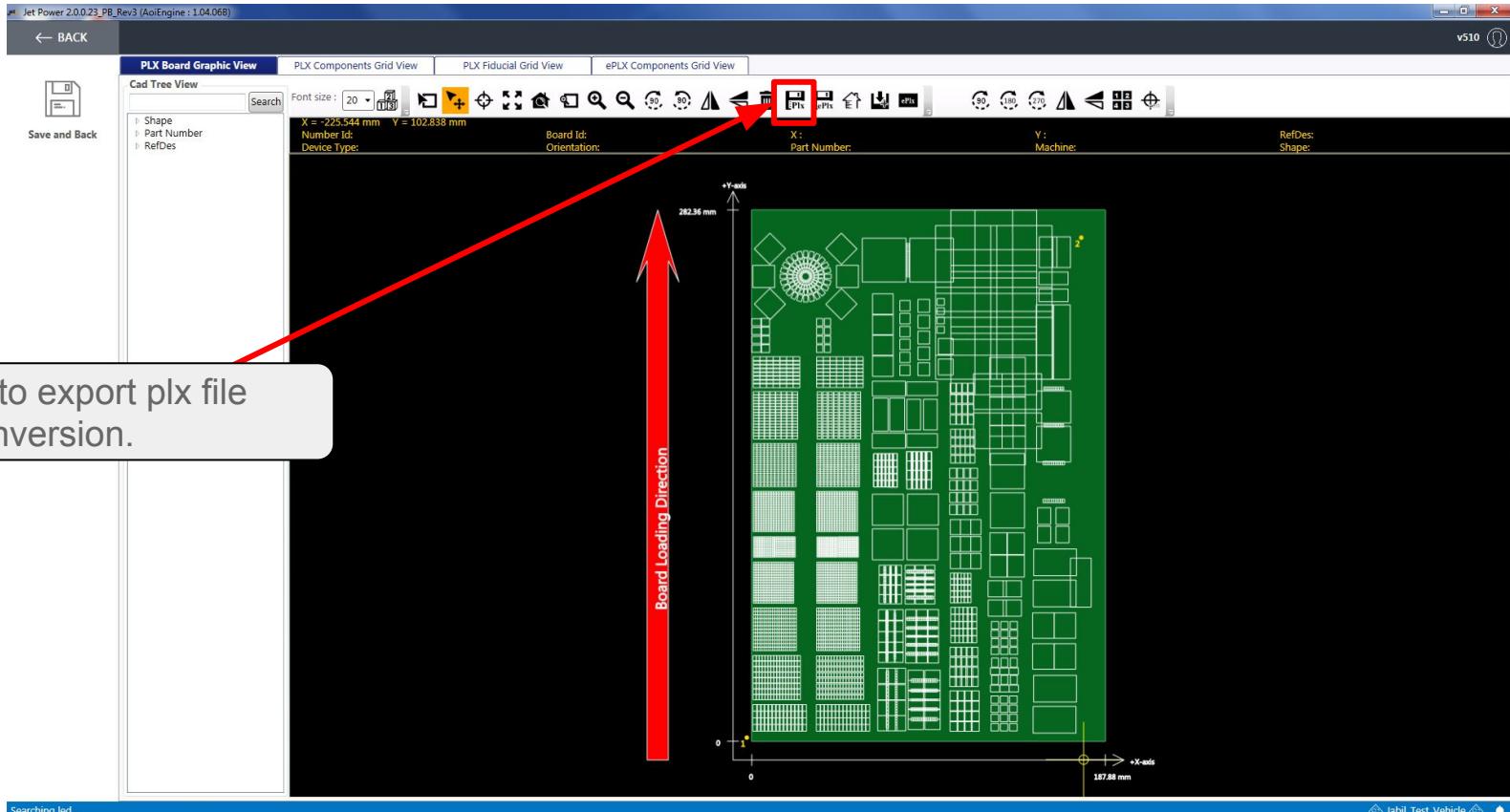
Click on the **browse** button to browse for part number file.



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## CAD Convertor - NDF Plugin Design





NXT Convertor is to convert the .nxt file to .plx file for the use in JetPower



[Return to CAD Converter Selection page](#)

[Clear the setting](#)

Click on the **browse** button  
and navigate to the NXT file  
path.

Select the available  
board number from  
the drop down list

Select the available  
size of board number  
from the drop down  
list

Convert the the NXT file into PLX file  
based on the current reading  
configuration.



O-Line Convertor is to convert the o-line .plx file to I-line .plx file for the use in JetPower



[Return to CAD Converter Selection page](#)

[Back to CAD Converter](#)

### **o-Line to I-Line Convertor**

Please select input o-Line .plx file to convert I-Line .plx file:

C:\CPI\cad\Jabil\_Test\_Vehicle.plx

[Browse](#)

[Convert](#)

Click on the [browse](#) button and navigate to the o-Line plx file path.

Click on [convert](#) button and convert the o-Line file to I-Line file



## Plexus Converter

Plexus Convertor is to convert the .csv file to .plx file for the use in JetPower



[Return to CAD Converter Selection page](#)

[Back to CAD Converter](#)

### Plexus Converter

#### Step 1:

Please select input .csv file to convert to .plx file:

[Browse](#)

#### Step 2:

Please select layer:

- Top Layer
- Bottom Layer

#### Step 3:

[Convert](#)

Select Top or bottom layer

Click on the [browse](#) button and navigate to the .csv file path.

Click on [convert](#) button and convert the .csv file to .plx file



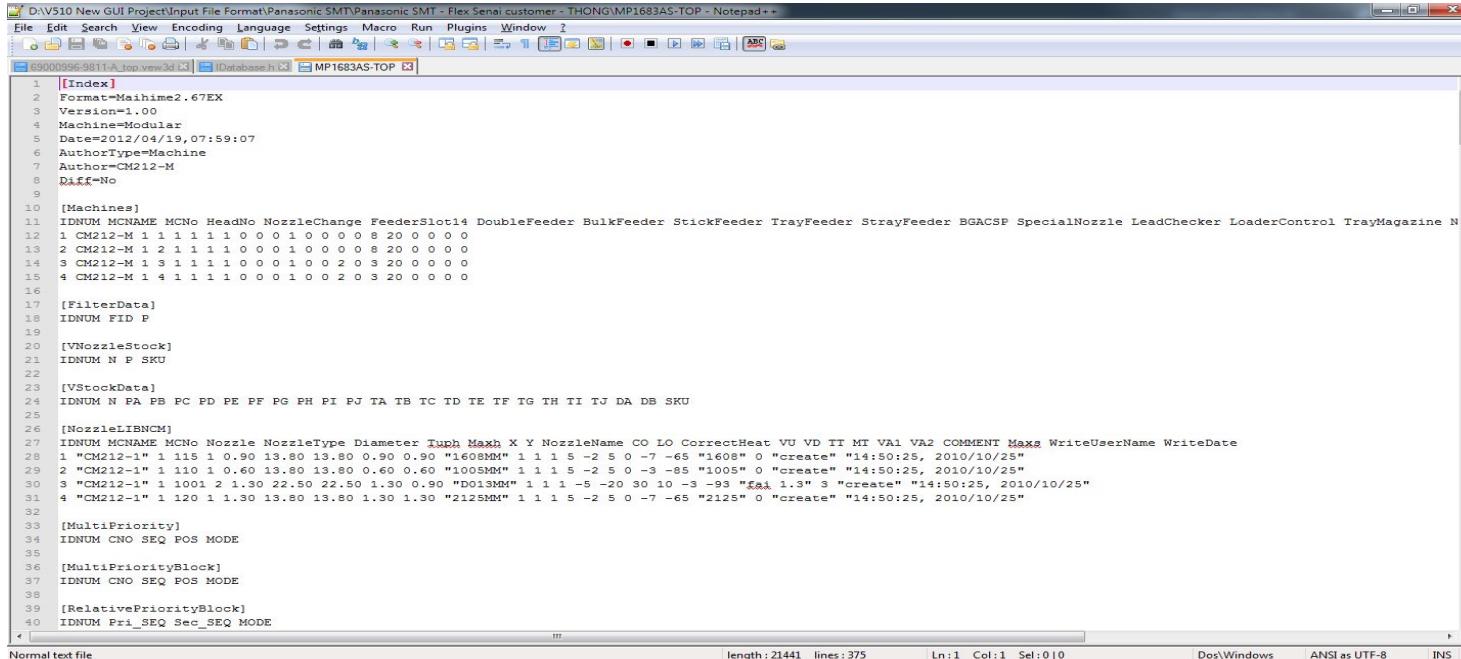
## SMT Panasonic Convertor

SMT Panasonic Convertor is to convert the smt file to .plx file for the use in JetPower



Automated Board Inspection

- SMT Panasonic file is a single file at below format.



The screenshot shows a Notepad++ window displaying a configuration file for a SMT Panasonic machine. The file contains various sections and parameters, such as [Index], [Machines], [FilterData], [VNozzleStock], [VStockData], [NozzleLIBNCM], [MultiPriority], and [RelativePriorityBlock]. The code is written in a plain text format with some specific syntax for the Panasonic plugin.

```
1  [Index]
2  Format=Mahime2.67EX
3  Version=1.00
4  Machine=Modular
5  Date=2012/04/19,07:59:07
6  AuthorType=Machine
7  Author=CM212-M
8  Diff=No
9
10 [Machines]
11 IDNUM MCNAME MCNo HeadNo NozzleChange FeederSlot14 DoubleFeeder BulkFeeder StickFeeder TrayFeeder StrayFeeder BGACSP SpecialNozzle LeadChecker LoaderControl TrayMagazine N
12 1 CM212-M 1 1 1 1 1 0 0 0 1 0 0 0 0 8 20 0 0 0 0
13 2 CM212-M 1 2 1 1 1 0 0 0 1 0 0 0 8 20 0 0 0 0
14 3 CM212-M 1 3 1 1 1 0 0 0 1 0 0 2 0 3 20 0 0 0 0
15 4 CM212-M 1 4 1 1 1 1 0 0 0 1 0 0 2 0 3 20 0 0 0 0
16
17 [FilterData]
18 IDNUM FID P
19
20 [VNozzleStock]
21 IDNUM N F SKU
22
23 [VStockData]
24 IDNUM N PA PB PC PD PE PF PG PH PI PJ TA TB TC TD TE TF TG TH TI TJ DA DB SKU
25
26 [NozzleLIBNCM]
27 IDNUM MCNAME MCNo Nozzle NozzleType Diameter Iuph Maxh X Y NozzleName CO LO CorrectHeat VU VD TT MT VA1 VA2 COMMENT Maxg WriteUserName WriteDate
28 1 "CM212-1" 1 115 1 0.90 13.80 0.90 0.90 "1608MM" 1 1 1 5 -2 5 0 -7 -65 "1608" 0 "create" "14:50:25, 2010/10/25"
29 2 "CM212-1" 1 110 1 0.60 13.80 13.80 0.60 0.60 "1005MM" 1 1 1 5 -2 5 0 -3 -85 "1005" 0 "create" "14:50:25, 2010/10/25"
30 3 "CM212-1" 1 1001 2 1.30 22.50 22.50 1.30 0.90 "D013MM" 1 1 1 -5 -20 30 10 -3 -93 "fai 1.3" 3 "create" "14:50:25, 2010/10/25"
31 4 "CM212-1" 1 120 1 1.30 13.80 13.80 1.30 "2125MM" 1 1 1 5 -2 5 0 -7 -65 "2125" 0 "create" "14:50:25, 2010/10/25"
32
33 [MultiPriority]
34 IDNUM CNO SEQ POS MODE
35
36 [MultiPriorityBlock]
37 IDNUM CNO SEQ POS MODE
38
39 [RelativePriorityBlock]
40 IDNUM Pri_SEQ Sec_SEQ MODE
```

Normal text file

length: 21441 lines: 375

Ln:1 Col:1 Sel:0|0

Dos\Windows ANSI as UTF-8 INS



[Return to CAD Converter Selection page](#)

[Back to CAD Converter](#)

## SMT Panasonic Converter

Please Select SMT File

[Browse](#)

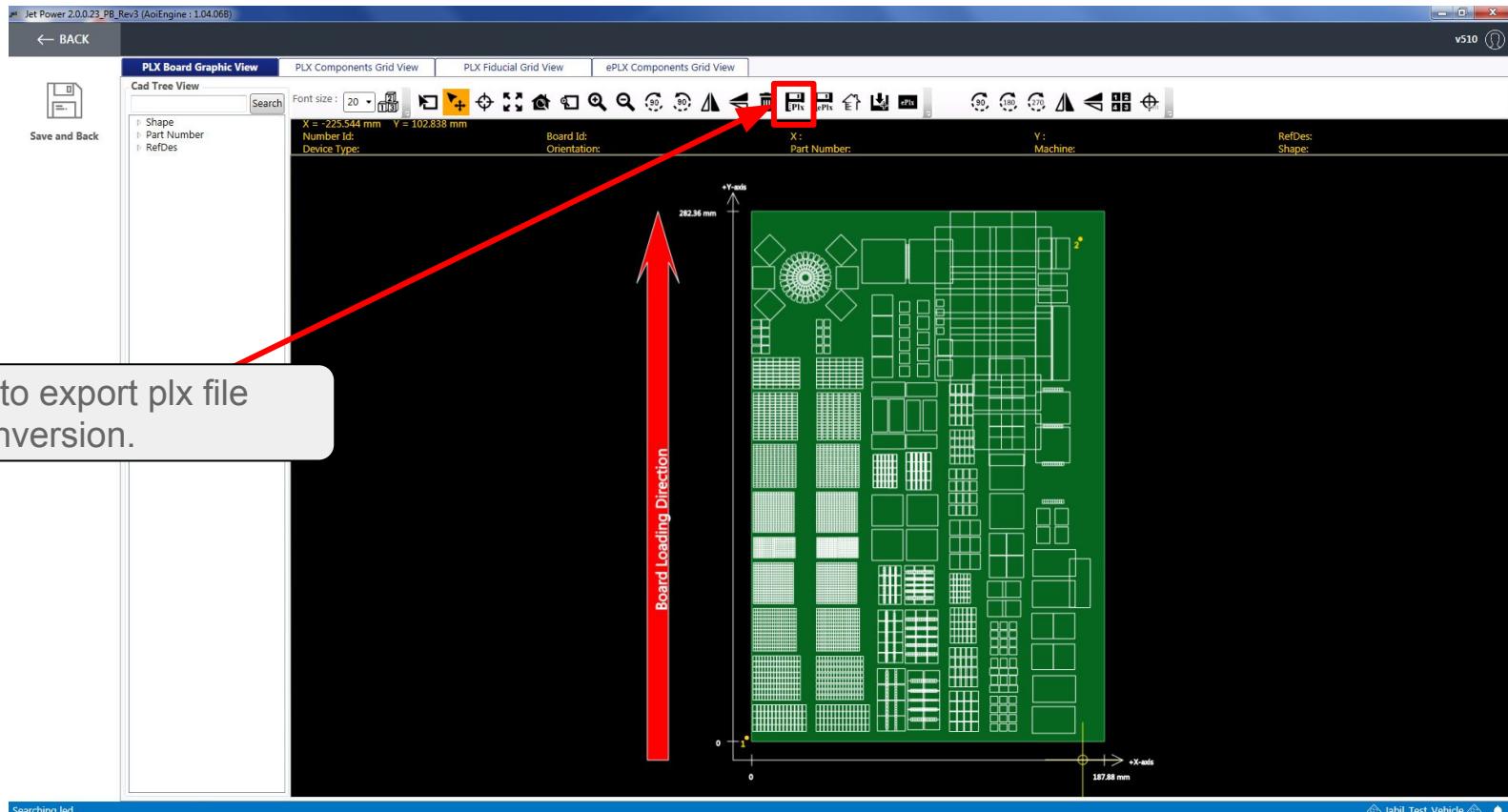
Click on the [browse](#) button and navigate to the SMT Panasonic file path.



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# CAD Convertor - SMT Panasonic Plugin

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Click on the **save** to export plx file  
after complete conversion.

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**ABI**

Automated Board Inspection



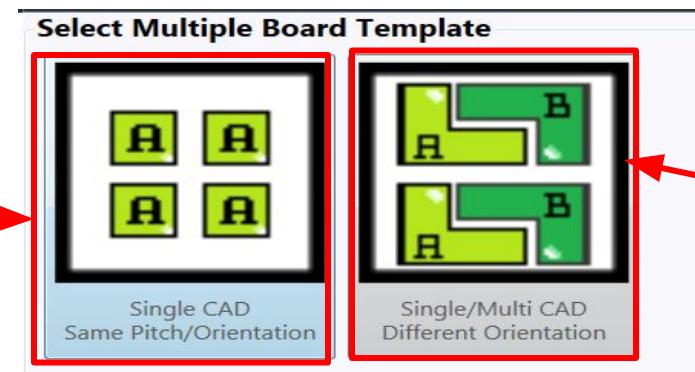
MULTIPLE BOARD PANELIZER

## Multiple Board Panelizer



## Multiple Board

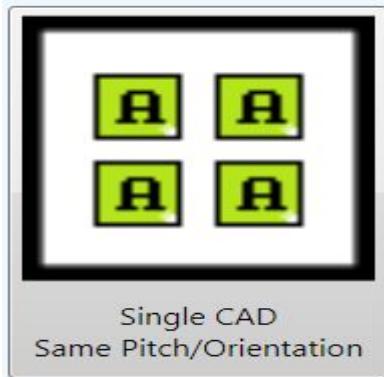
- To duplicate single or multiple CAD in orderly manner or different orientation to be displayed on to the board graphic window.



**Single CAD** - To duplicate single CAD with same pitch and same board orientation.

**Single /Multi CAD** - Duplicate single / multi CAD which can be different orientation or different pitch.

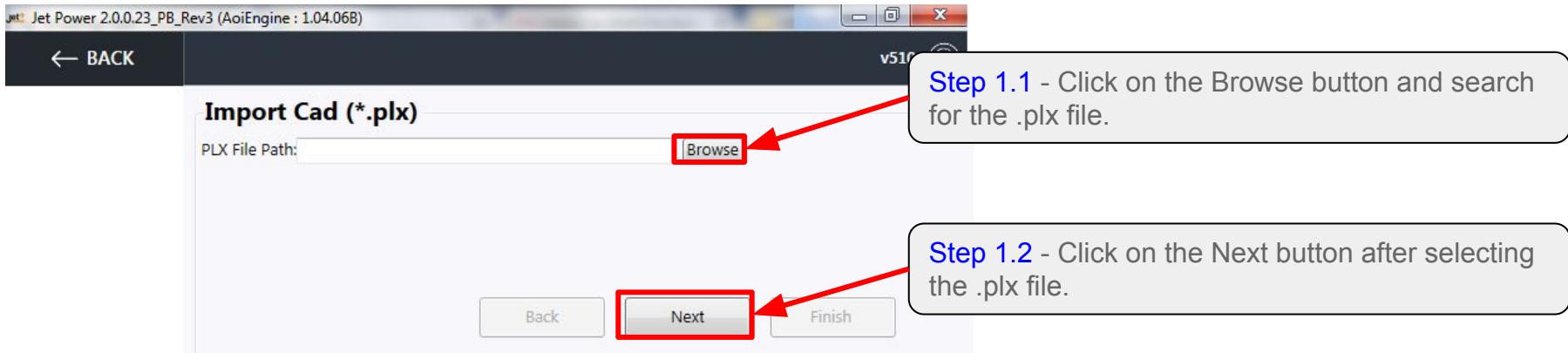




## Single CAD with Same Orientation & Pitch

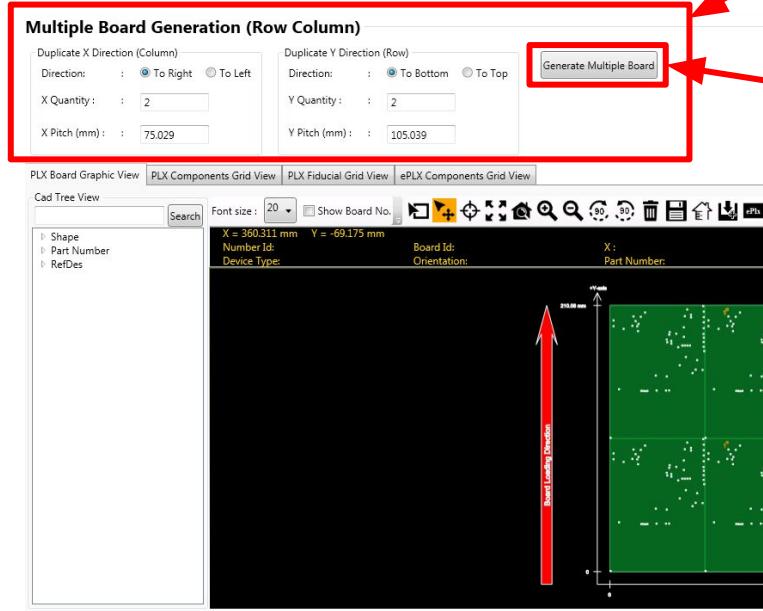
- Step 1 : Input CAD plx file.
- Step 2 : Input Row and Column quantity.
- Step 3 : Select one component from the most Top Left Board.
- Step 4 : Select same component at the most Top Right Board.
- Step 5 : Select the same component at most Bottom Right Board.
- Step 6 : Add global fiducials from gantry (\*optional), preview gantry location to component.
- Step 7 : Final Preview, change board id, save to plx file.



**Step 1 : Input CAD plx file.**

**Note** - Once completely browse for the plx file, the graphics window will automatically render out the CAD for the plx board.



**Step 2 : Input Row and Column quantity.**

**Step 2.1** - Insert in the X,Y quantity and pitch information.

**Step 2.2** - Click on the Generate Multiple Board button and board graphic window will display the board visualisation. The board graphics will visualise the full view of the panel.

**Step 2.3** - Click on the Next button once satisfied with the board visualisation.

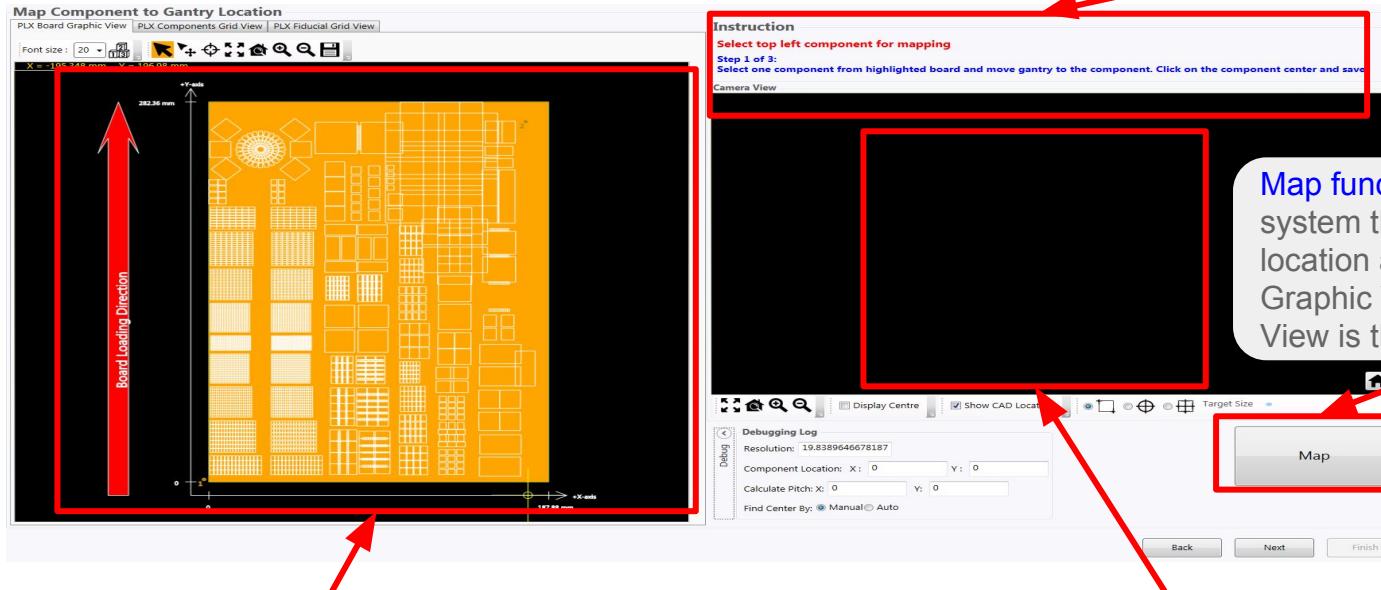
Back Next Finish



# Multiple Board - Single CAD with Same Orientation & Pitch

**Step 3 :** Select one component from the most Top Left Board.

**Guided Instruction-** Step by step instruction provided to guide the user.



**Full Board Graphic View** - Visualise the whole panel with the array of boards.

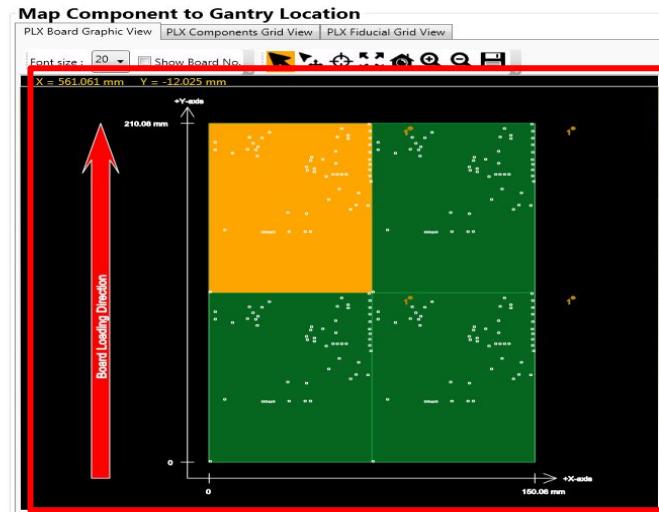
**Camera View**- Display the view seen by the top camera as control by the Mouse click.



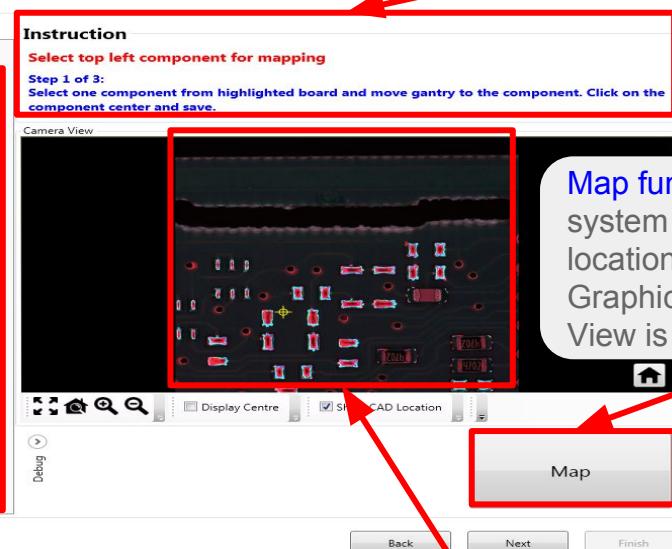
# Multiple Board - Single CAD with Same Orientation & Pitch

**Step 3 :** Select one component from the most Top Left Board.

**Guided Instruction-** Step by step instruction provided to guide the user.



**Full Board Graphic View** - Visualise the whole panel with the array of boards.



**Camera View**- Display the view seen by the top camera as control by the Mouse click.

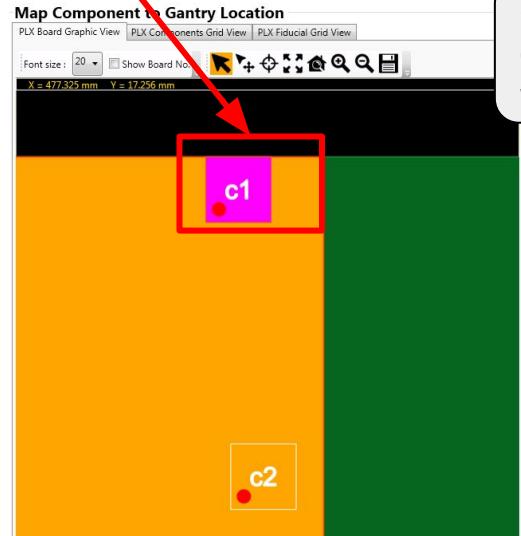
**Map function-** Program the system that the component location at the Full Board Graphic View and Camera View is the same.



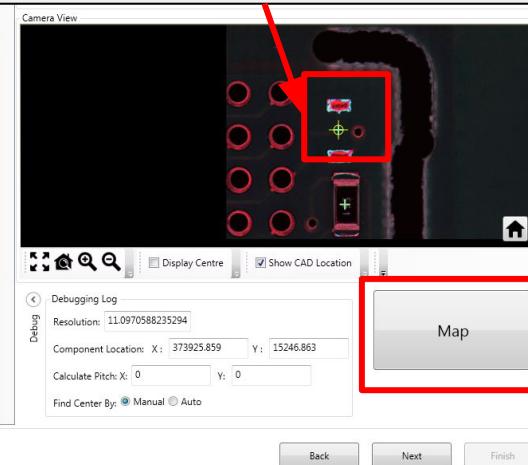
# Multiple Board - Single CAD with Same Orientation & Pitch

**Step 3 : Select one component from the most Top Left Board.**

**Step 3.1** - Click on any of the component from the CAD.



**Step 3.2** - Click on the same component from the camera view.



**Step 3.3** - Click the Map button after clicking the same component on both board graphic and camera view windows.



# Multiple Board - Single CAD with Same Orientation & Pitch

## Camera control (Mouse and Keyboard)

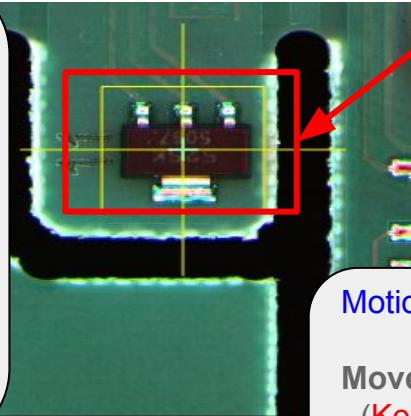
### Change target shape and size

#### Round Shape

- (Page up) to increase the size, (Page down) to reduce.

#### Rectangle Shape

- (Page up) or (Page down) to change the vertical size.
- (Ctrl + Page up) or (Ctrl + Page down) to change the horizontal size.



### Mouse Control

#### Move Target

- (Mouse Left Click + Drag)

#### Move Camera View

- (Mouse Right Click + Drag)

#### Camera Zoom In / Out

- (Mouse scroll forward / backward)

### Motion Control

#### Move Gantry

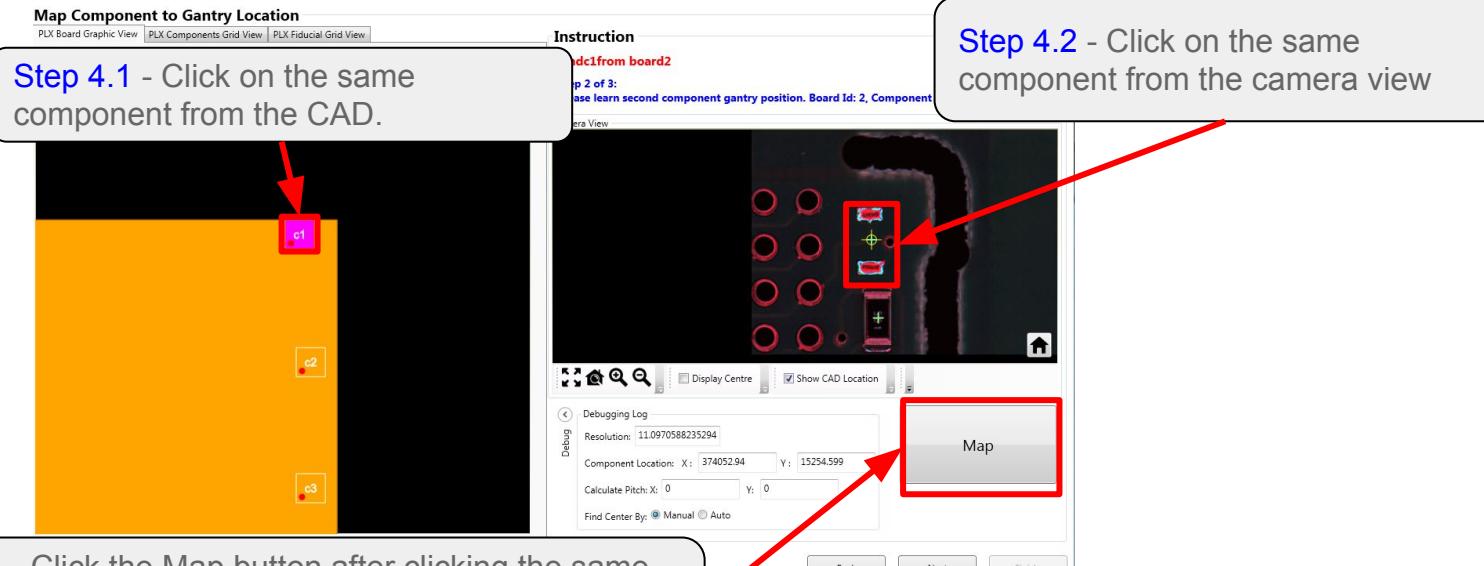
- (Keyboard Arrow Button)

#### Camera Zoom In / Out

- (Keyboard +) or (Keyboard -)

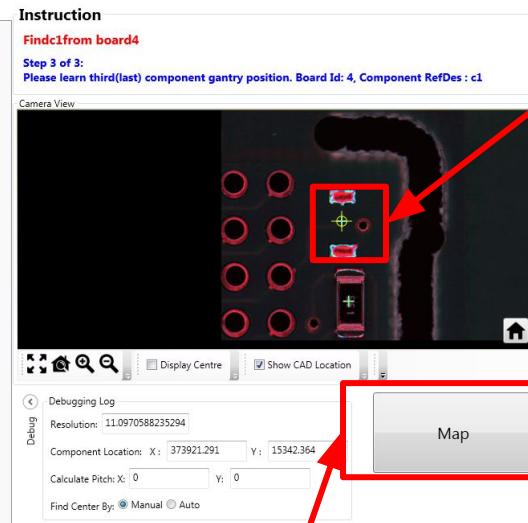
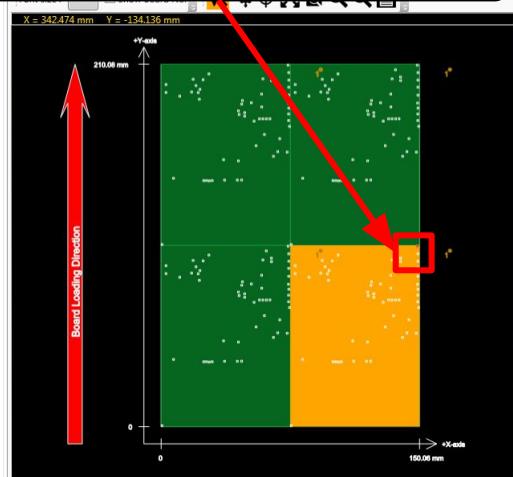


**Step 4 : Select same component at the most Top Right Board.**



**Step 5 :** Select the same component at most Bottom Right Board.

**Step 5.1** - Click on the same component from the CAD.



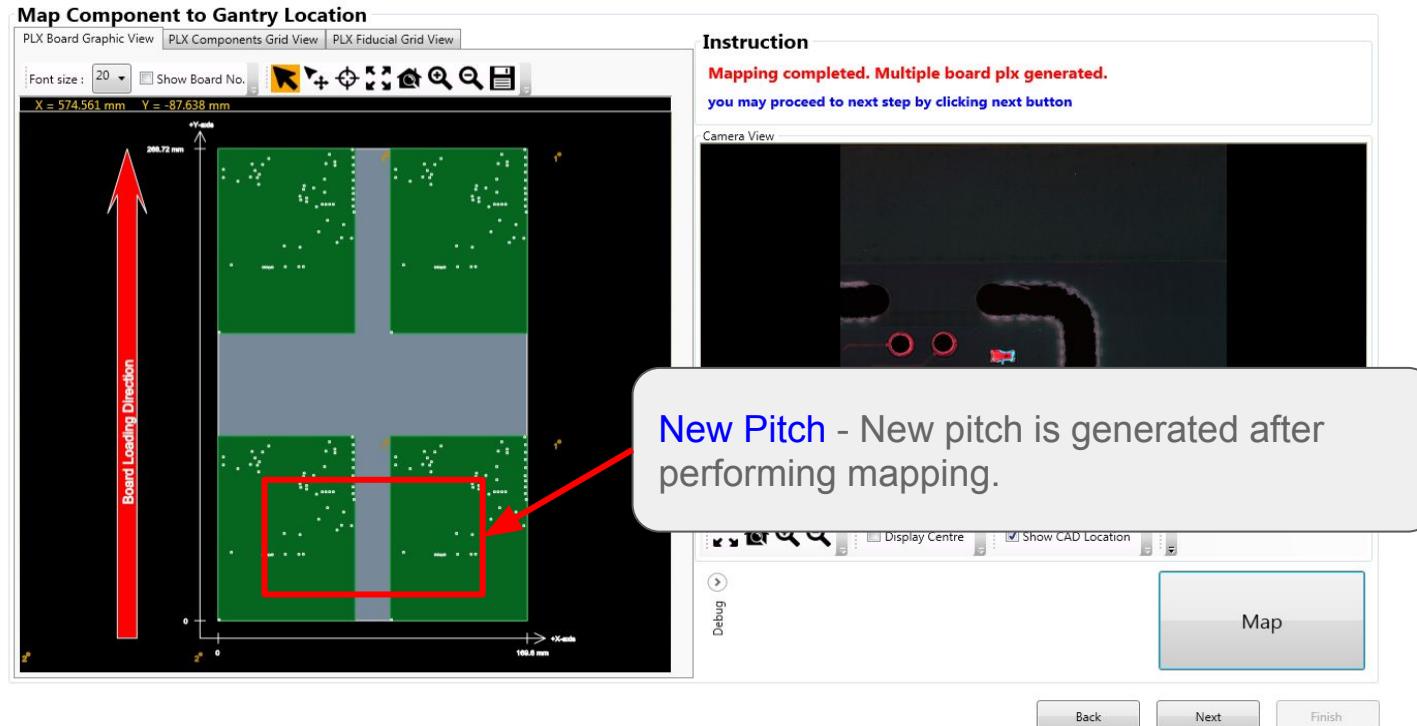
**Step 5.2** - Click on the same component from the camera view

**Step 5.3** - Click the Map button after clicking the same component on both board graphic and camera view windows.



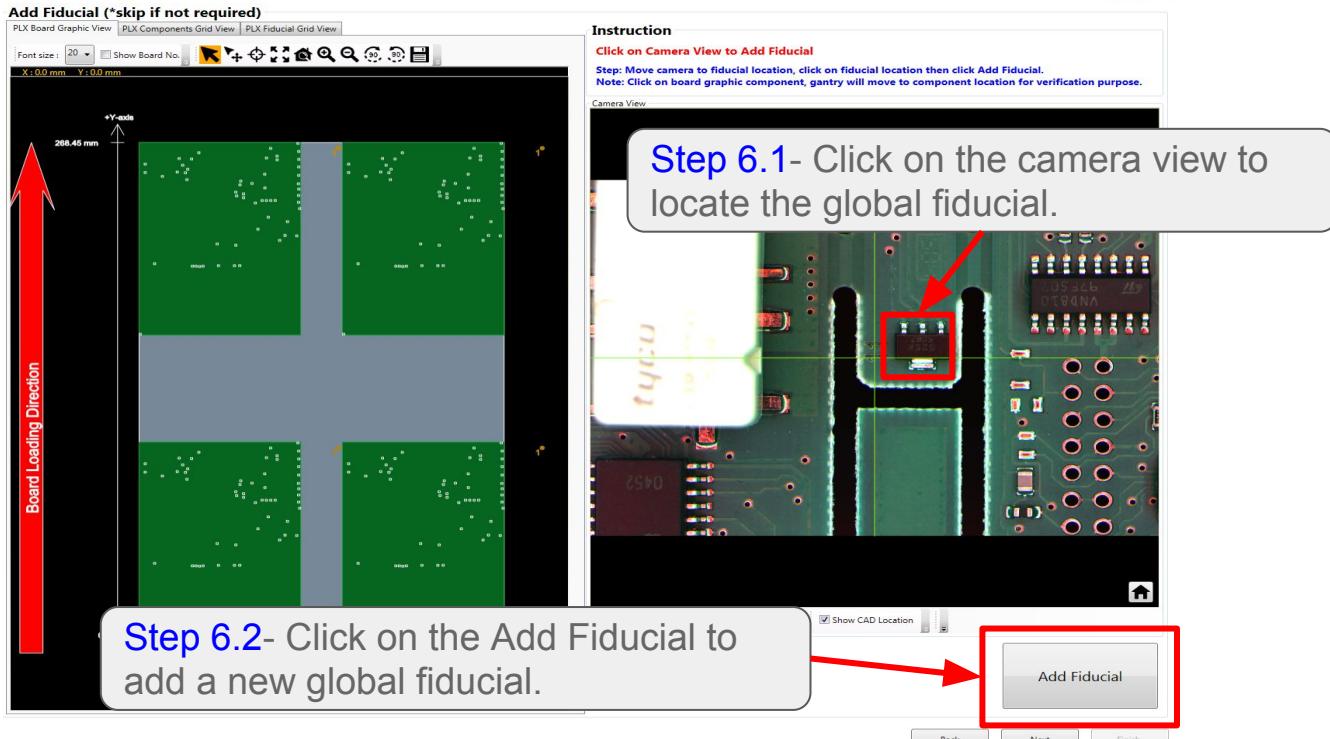
# Multiple Board - Single CAD with Same Orientation & Pitch

Automated Board Inspection



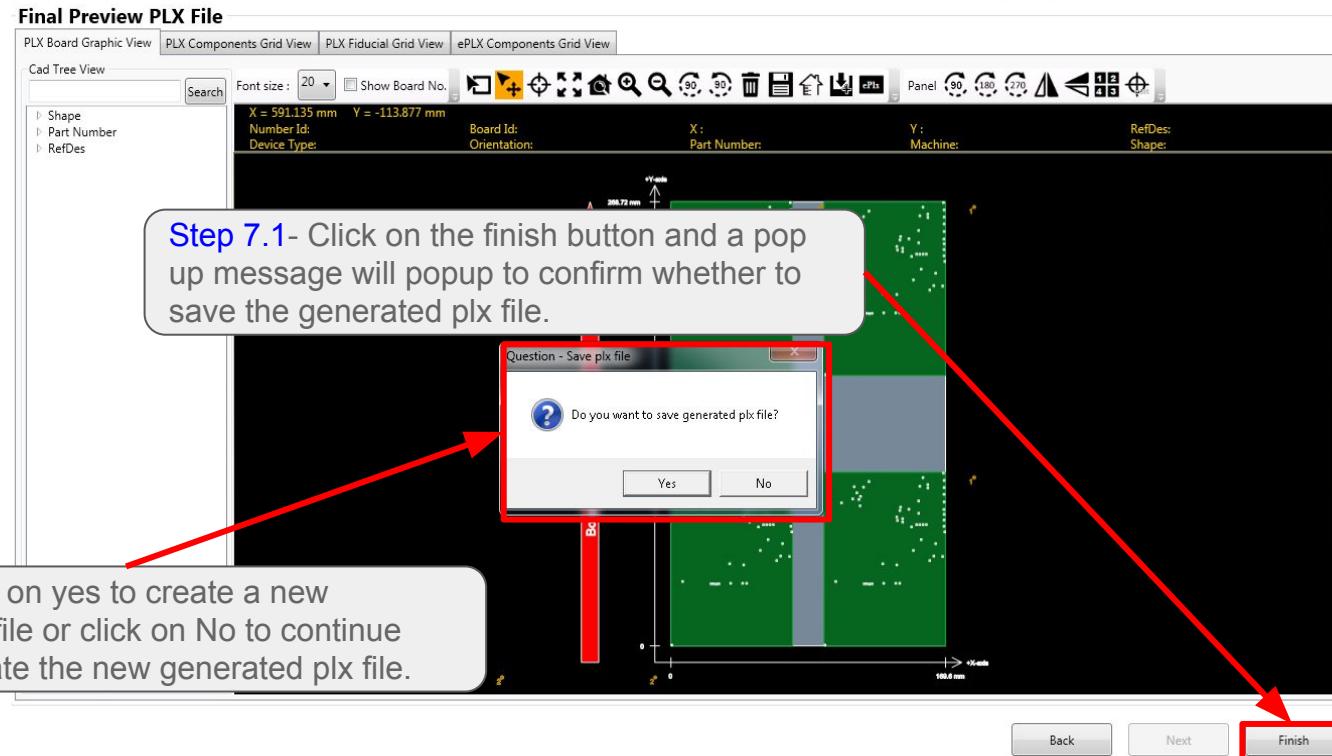
# Multiple Board - Single CAD with Same Orientation & Pitch

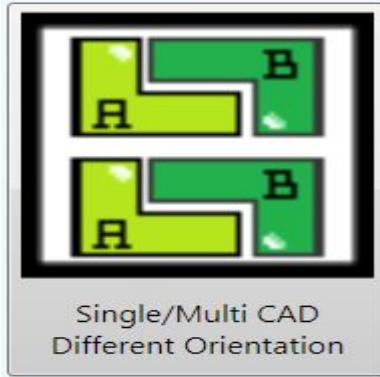
**Step 6 :** Add global fiducials from gantry (\*optional), preview gantry location to component.



# Multiple Board - Single CAD with Same Orientation & Pitch

## Step 7 : Final Preview, change board ID, save to plx file.





## Single CAD with Different Orientation & Pitch

- Step 1 : Input CAD plx file.
- Step 2 : Locate first board on gantry (2 - 3 points mapping).
- Step 3 : Duplicate board. Change board orientation at duplicate board dialog (Repeat Step 3 until all board are duplicated)
- Step 4 : Add global fiducials from gantry (\*optional), preview gantry location to component.
- Step 5 : Final Preview, change board id, save to plx file.



**Step 1 : Input CAD plx file.**

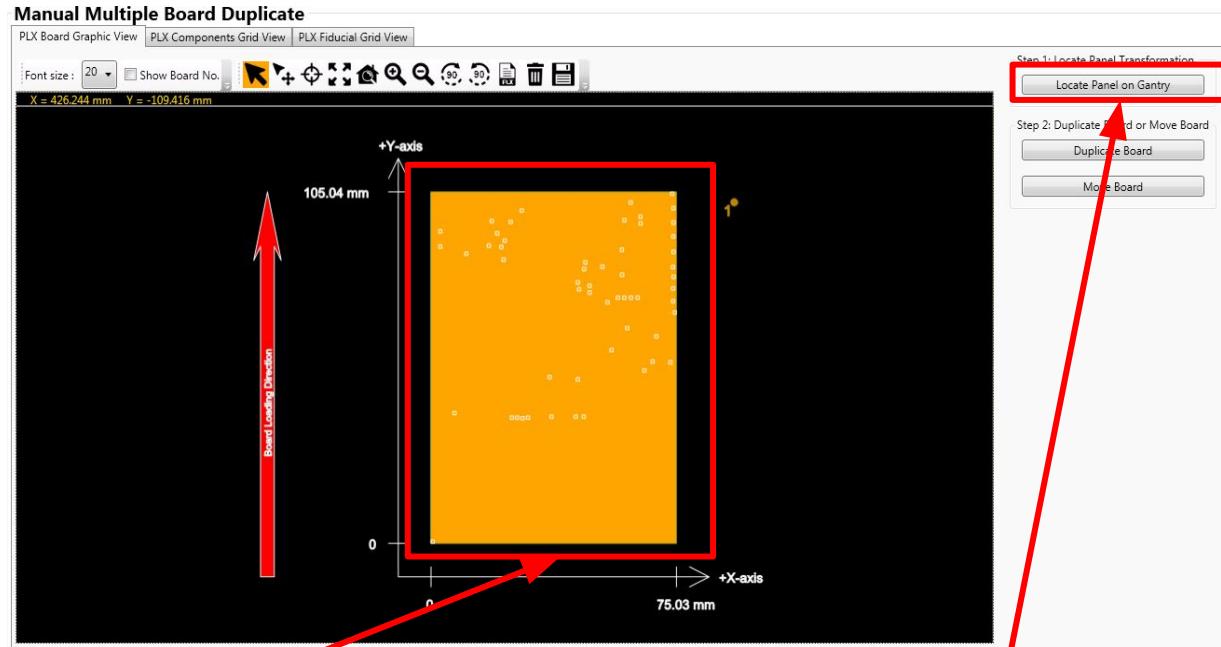
**Step 1.1** - Click on the Browse button and search for the .plx file. After browse the CAD will automatically generated on the Board graphics window.

**Step 1.2** - Click on the Next button after selecting the .plx file.



# Multiple Board - Single CAD with Different Orientation & Pitch

**Step 2 : Locate first board on gantry (2 - 3 points mapping).**

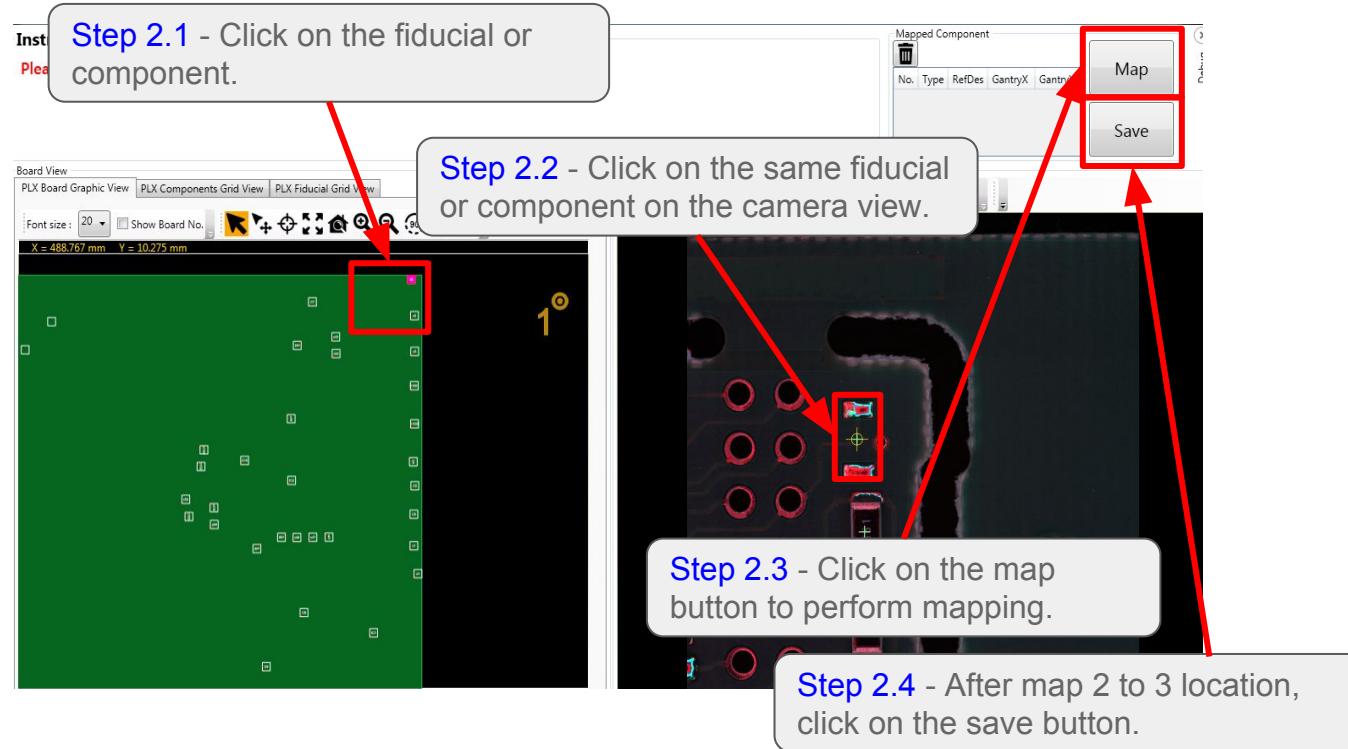


**Step 2.1** - Click on the board to select

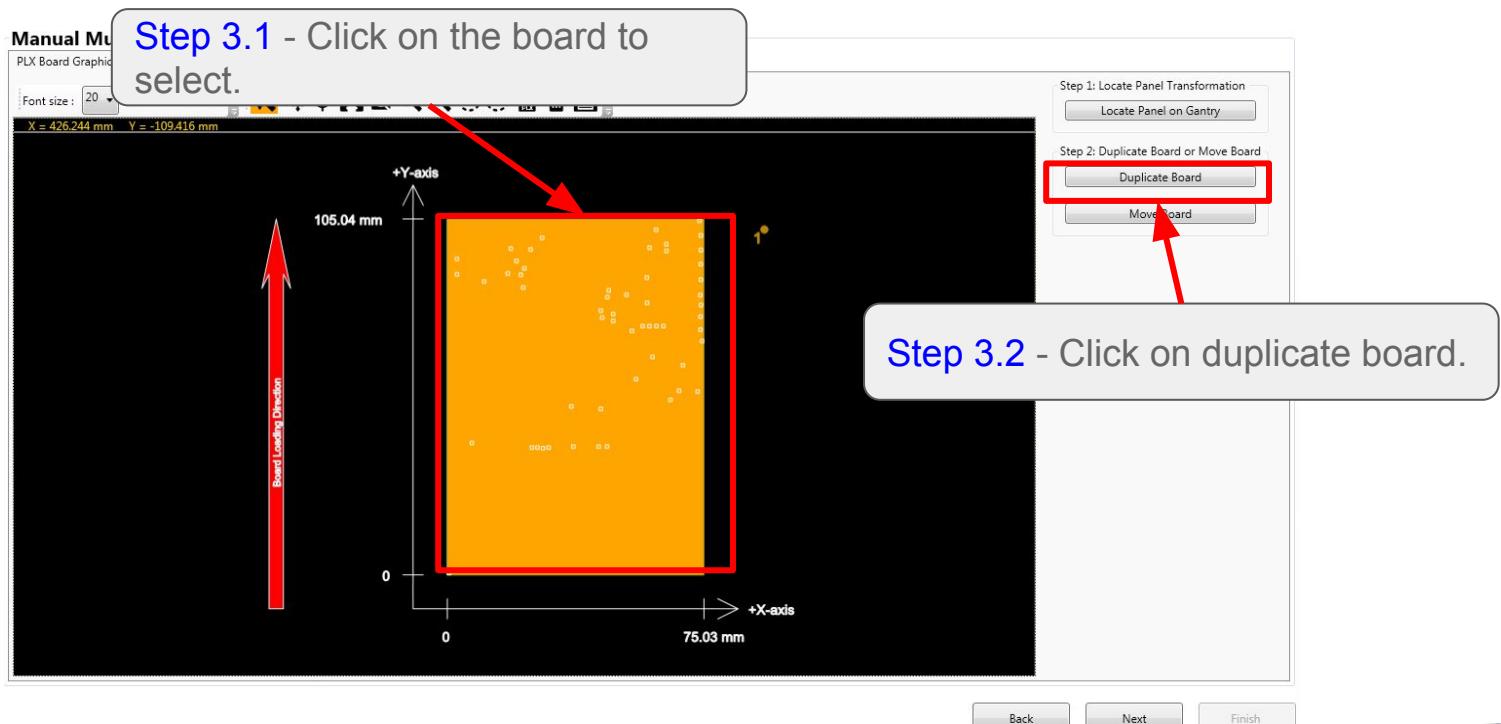
**Step 2.2** - Click to locate panel on gantry



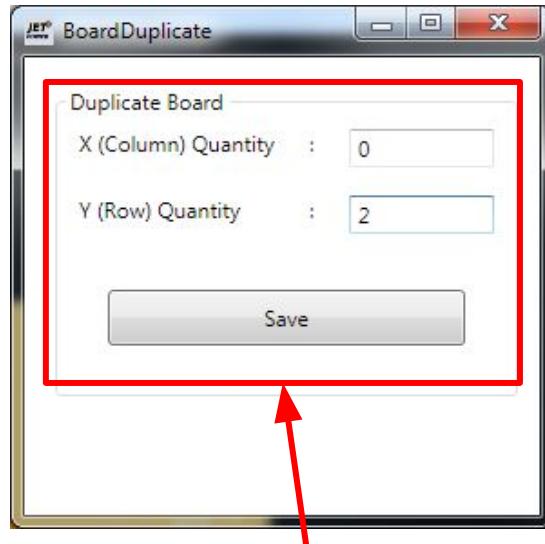
Step 2 : Locate first board on gantry (2 - 3 points mapping).



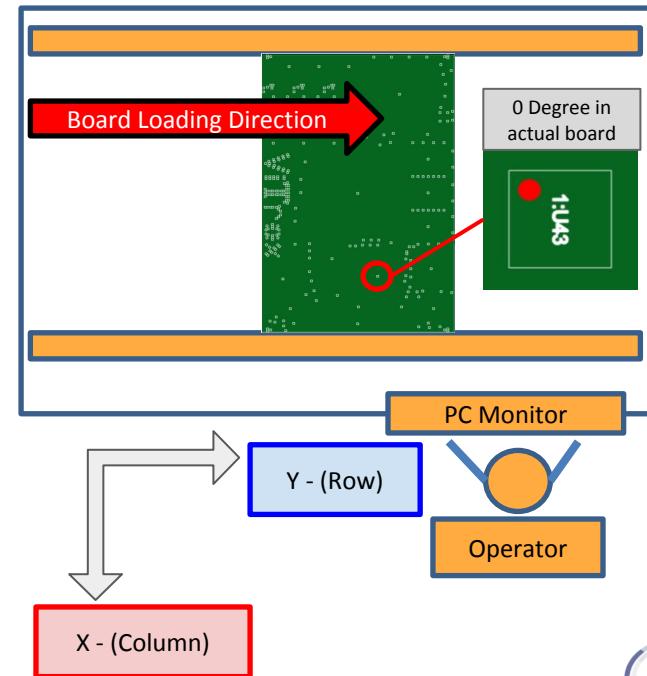
Step 3 : Duplicate board. Change board orientation at duplicate board dialog.



**Step 3 : Duplicate board. Change board orientation at duplicate board dialog**



**Step 3.3** - Dialog box will be shown and insert in the X and Y quantity. Click on the save button once confirm.

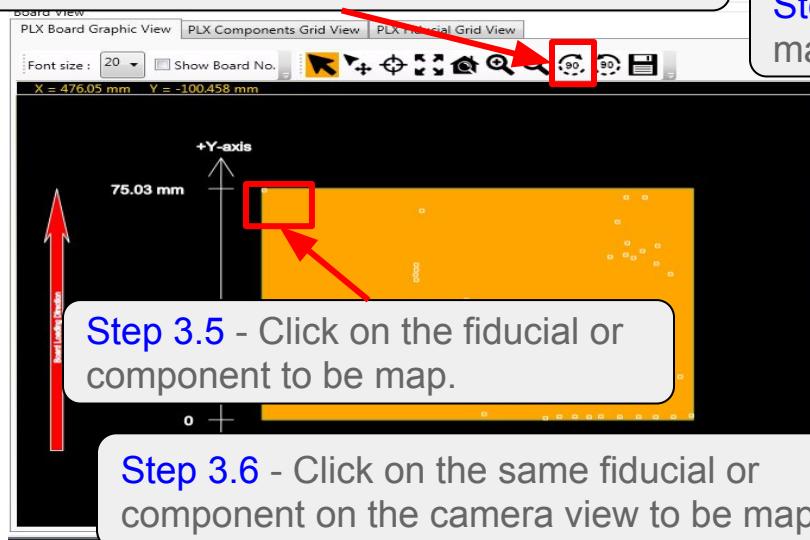


# Multiple Board - Single CAD with Different Orientation & Pitch

**Step 3** : Duplicate board. Change board orientation at duplicate board dialog

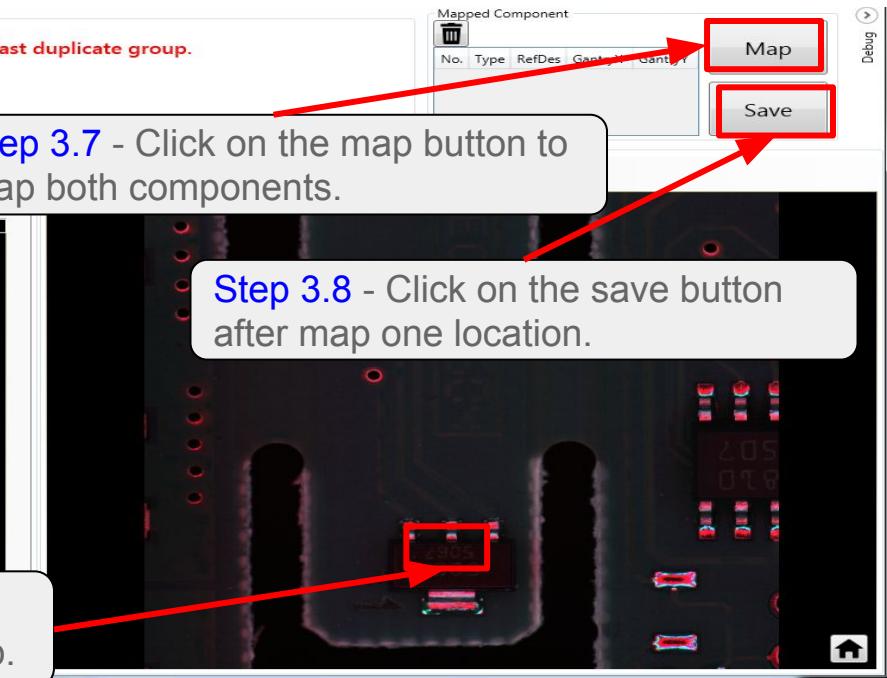
## Instruction

**Step 3.4** - Click on the board, and then click on the rotate function to rotate the board.

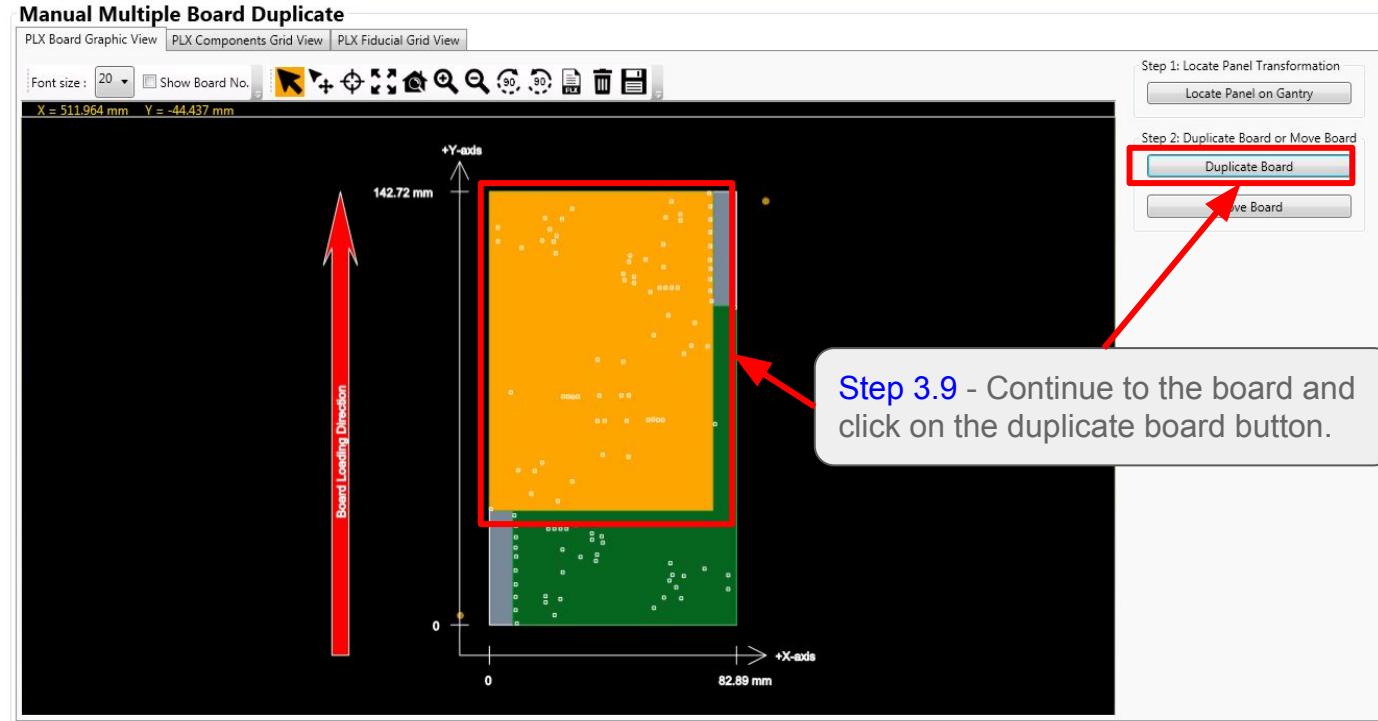


**Step 3.7** - Click on the map button to map both components.

**Step 3.8** - Click on the save button after map one location.



Repeat Step 3 until all board is been duplicate onto the panel.



Back

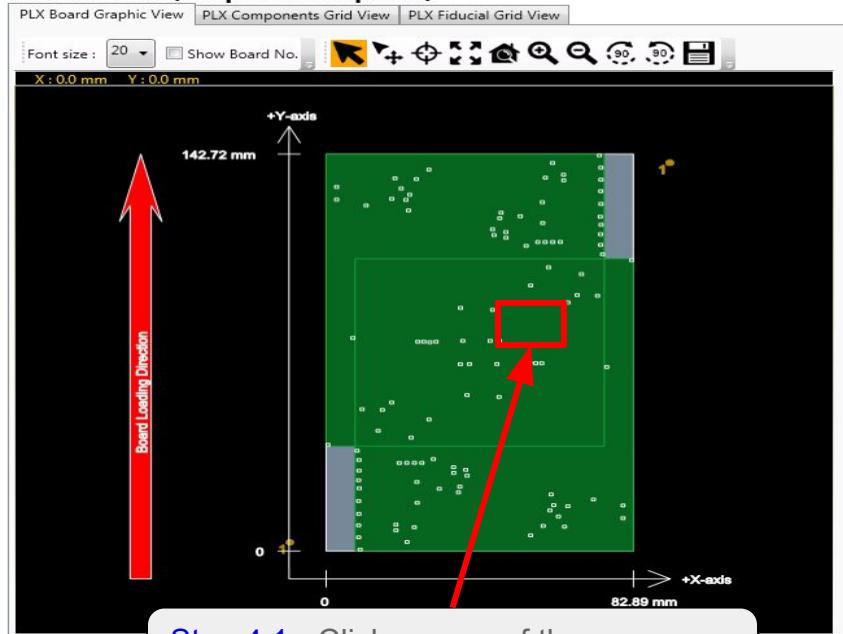
Next

Finish



Step 4 : Add global fiducials from gantry (\*optional), preview gantry location to component.

#### Add Fiducial (\*skip if not required)



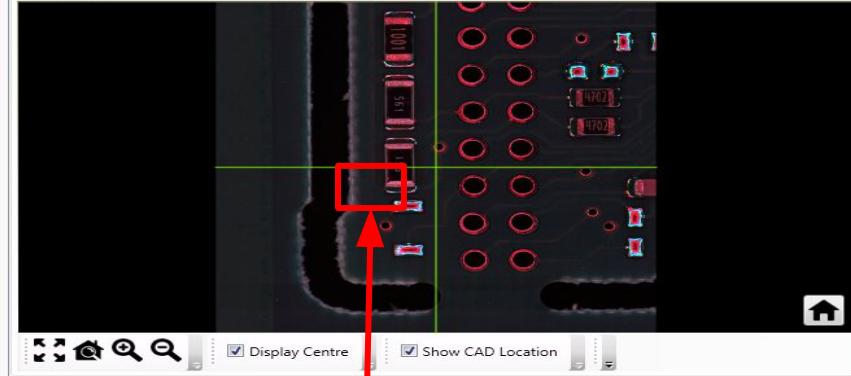
Step 4.1 - Click on one of the component on the board graphic.

#### Instruction

**Click on Camera View to Add Fiducial**

Step: Move camera to fiducial location, click on fiducial location then click Add Fiducial.  
Note: Click on board graphic component, gantry will move to component location for verification purpose.

#### Camera View

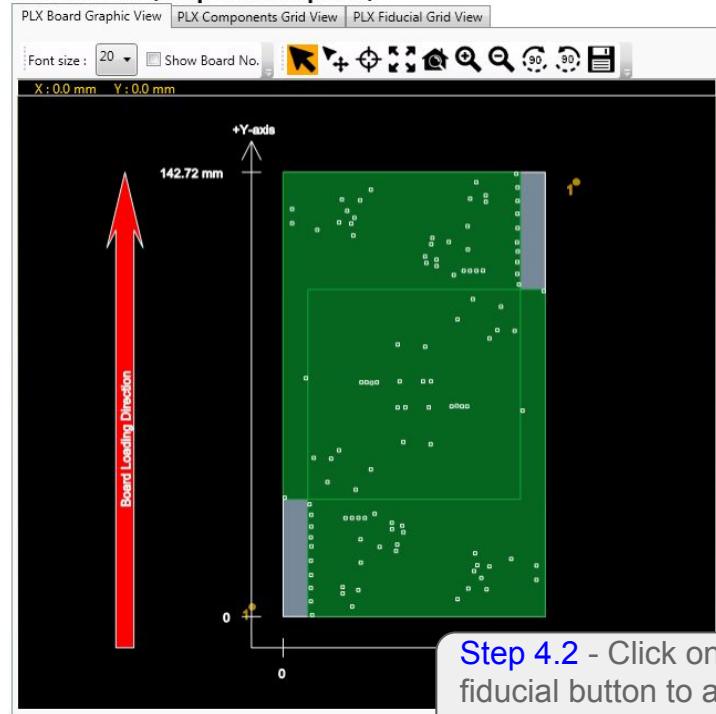


Gantry will move to the selected component location for verification purpose.

# Multiple Board - Single CAD with Different Orientation & Pitch

Automated Board Inspection

## Add Fiducial (\*skip if not required)



### Instruction

#### Click on Camera View to Add Fiducial

Step: Move camera to fiducial location, click on fiducial location then click Add Fiducial.  
Note: Click on board graphic component, gantry will move to component location for verification purpose.

#### Camera View



**Step 4.1** - Click on the camera view to locate global fiducial.

**Step 4.2** - Click on the add fiducial button to add new global fiducial.

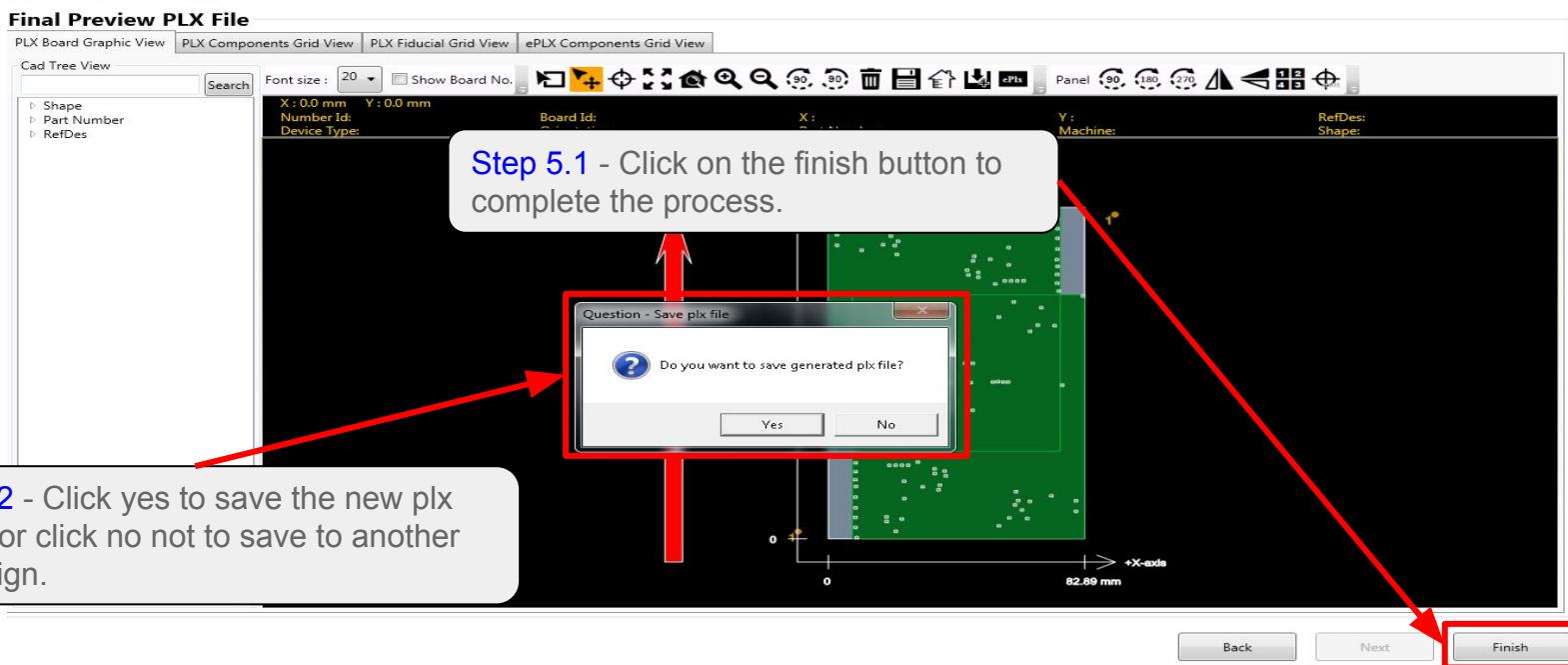
Add Fiducial

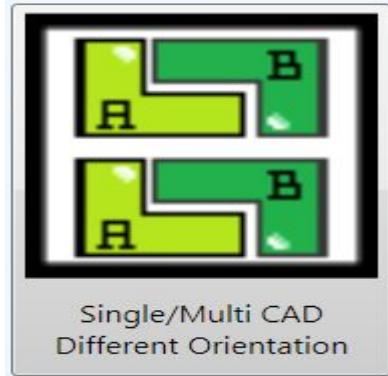
Back

Next

Finish



**Step 5 : Final Preview, change board ID, save to plx file.**



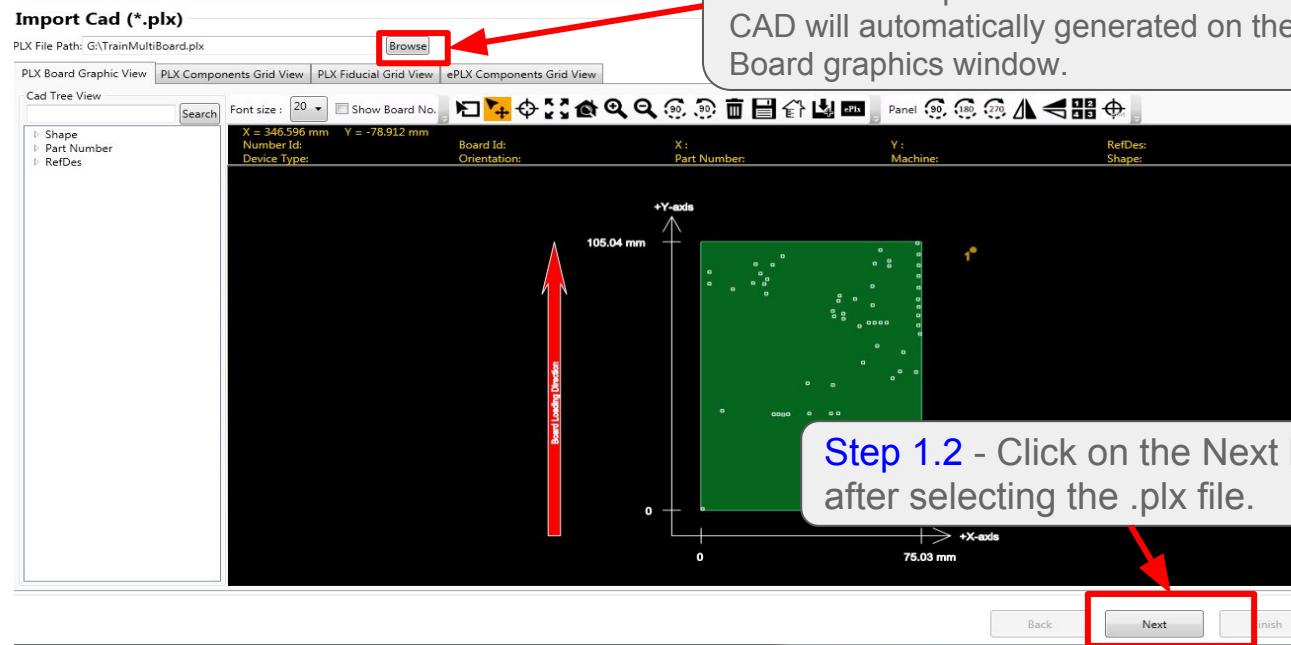
## Multiple CAD Orientation / Pitch

- Step 1 : Input CAD plx file.
- Step 2 : Locate first board on gantry (2 - 3 points mapping).
- Step 3 : Duplicate board. Change board orientation at duplicate board dialog.
- Step 4 : Add plx file. Select and move the board. Map one component to teach gantry on new board location (Repeat Step 3 & 4 until all the board are duplicated)
- Step 5 : Add global fiducials from gantry (\*optional), preview gantry location to component.
- Step 6 : Final Preview, change board ID, save to plx file.



# Multiple Board - Multiple CAD Orientation/Pitch

## Step 1 : Input CAD plx file.



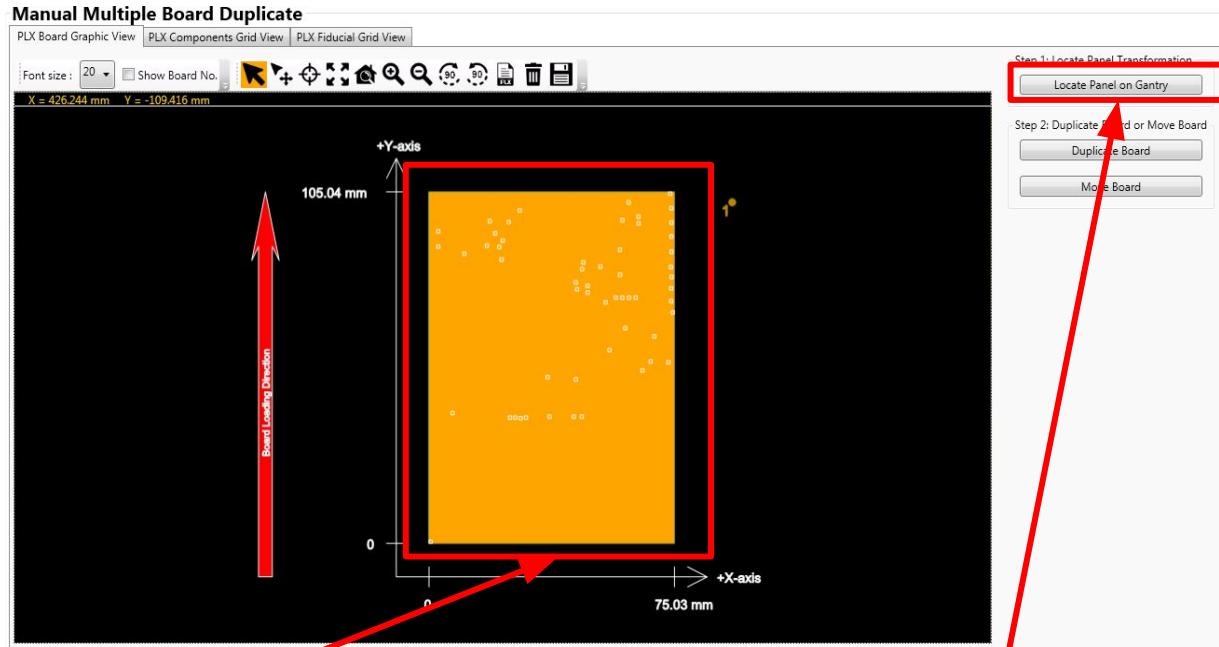
**Step 1.1** - Click on the Browse button and search for the .plx file. After browse the CAD will automatically generated on the Board graphics window.

**Step 1.2** - Click on the Next button after selecting the .plx file.



# Multiple Board - Multiple CAD Orientation/Pitch

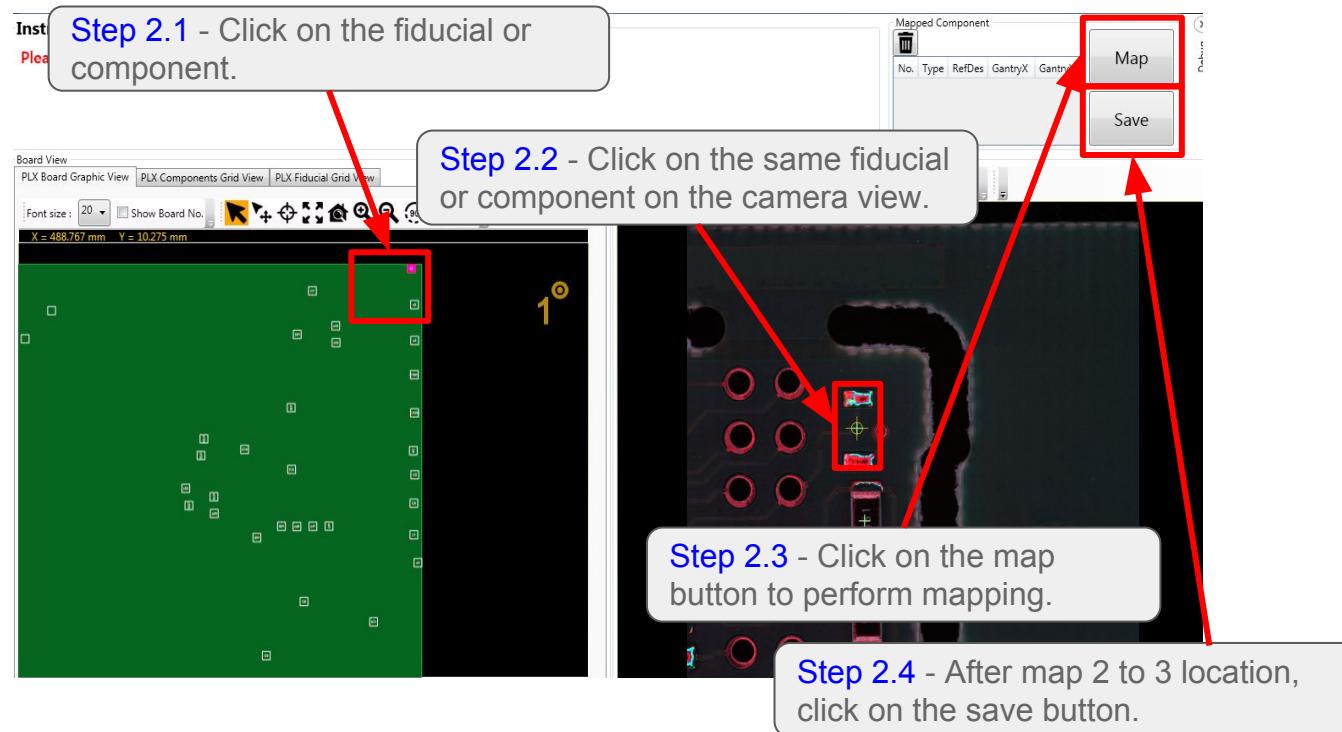
**Step 2 : Locate first board on gantry (2 - 3 points mapping).**



**Step 2.1** - Click on the board to select

**Step 2.2** - Click to locate panel on gantry

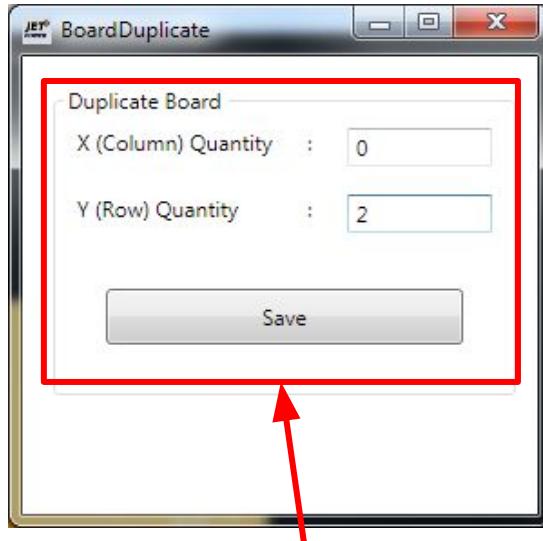
**Step 2 :** Locate first board on gantry (2 - 3 points mapping).



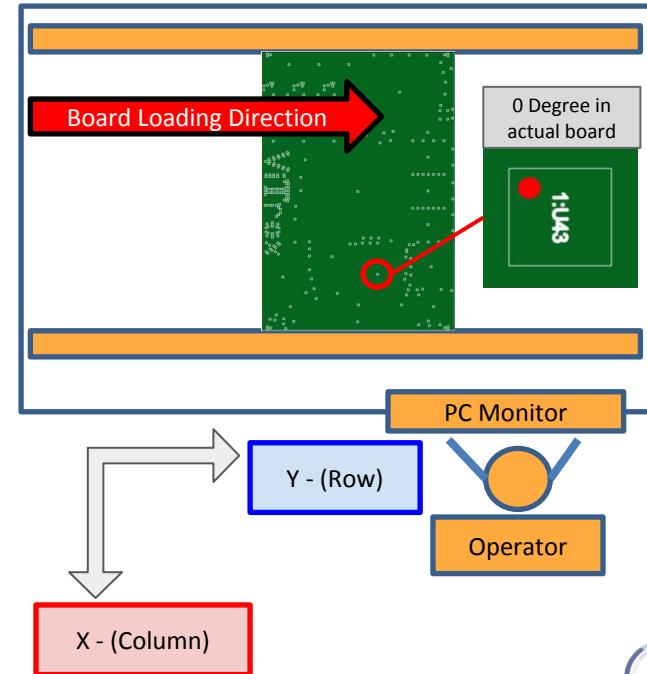
Step 3 : Duplicate board. Change board orientation at duplicate board dialog.



**Step 3 :** Duplicate board. Change board orientation at duplicate board dialog



**Step 3.3** - Dialog box will be shown and insert in the X and Y quantity. Click on the save button once confirm.

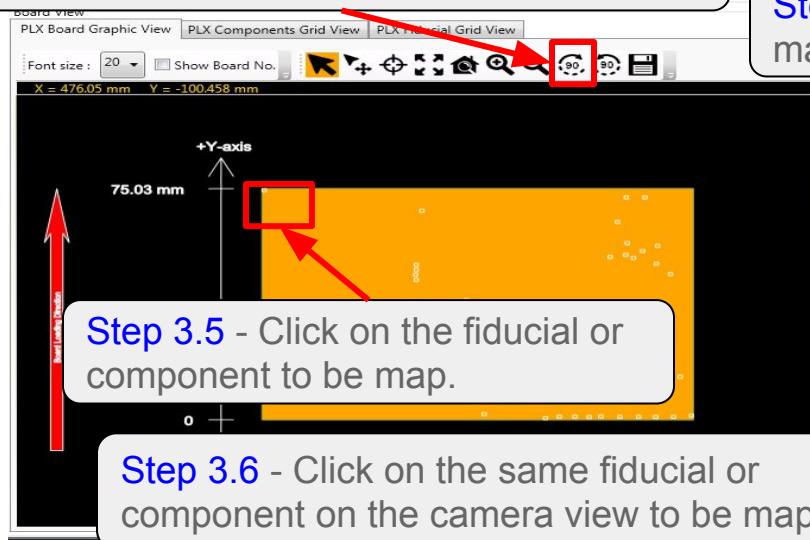


# Multiple Board - Multiple CAD Orientation/Pitch

**Step 3** : Duplicate board. Change board orientation at duplicate board dialog

## Instruction

**Step 3.4** - Click on the board, and then click on the rotate function to rotate the board.



From the last duplicate group.

**Step 3.7** - Click on the map button to map both components.



**Step 3.5** - Click on the fiducial or component to be map.

**Step 3.6** - Click on the same fiducial or component on the camera view to be map.



# Multiple Board - Multiple CAD Orientation/Pitch

Automated Board Inspection

**Repeat Step 3 until all board is been duplicate onto the panel.**



Back

Next

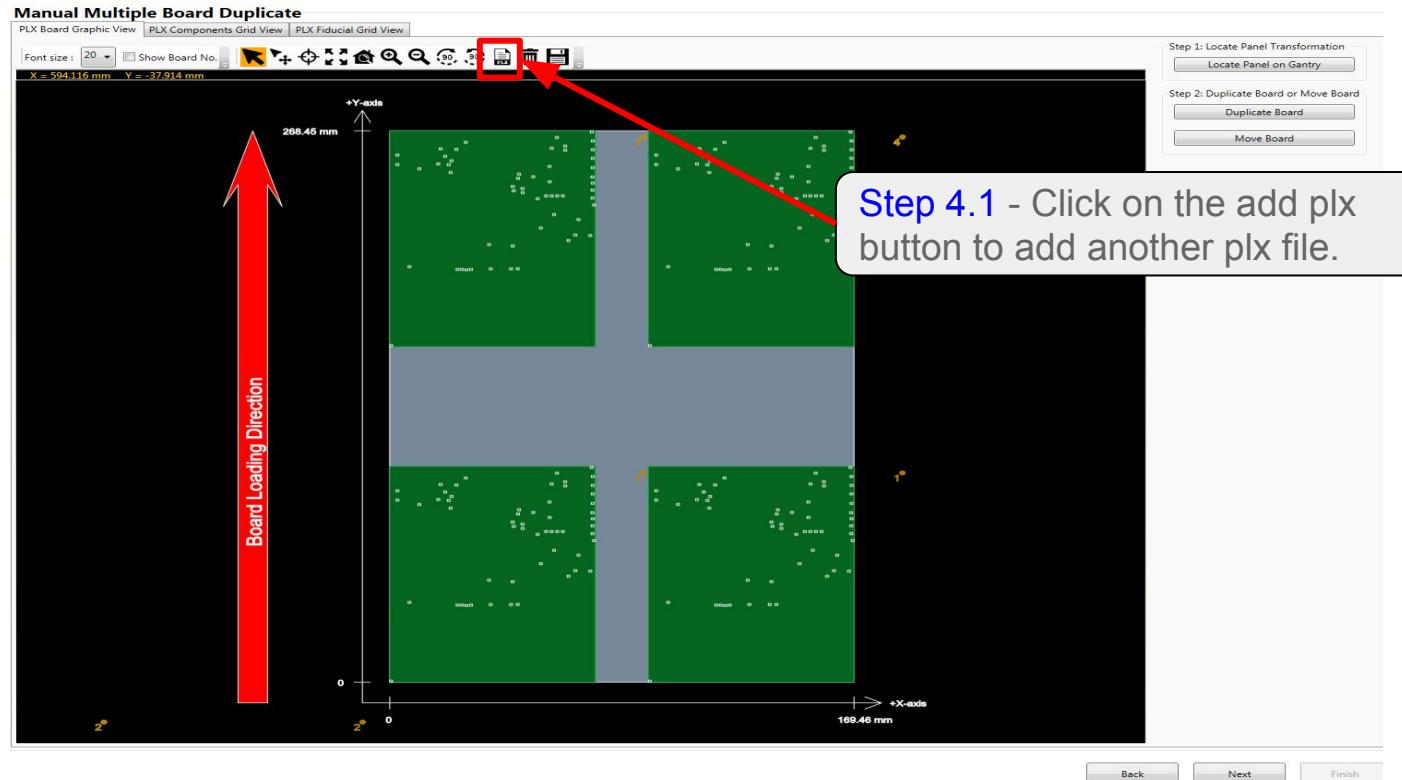
Finish



# Multiple Board - Multiple CAD Orientation/Pitch

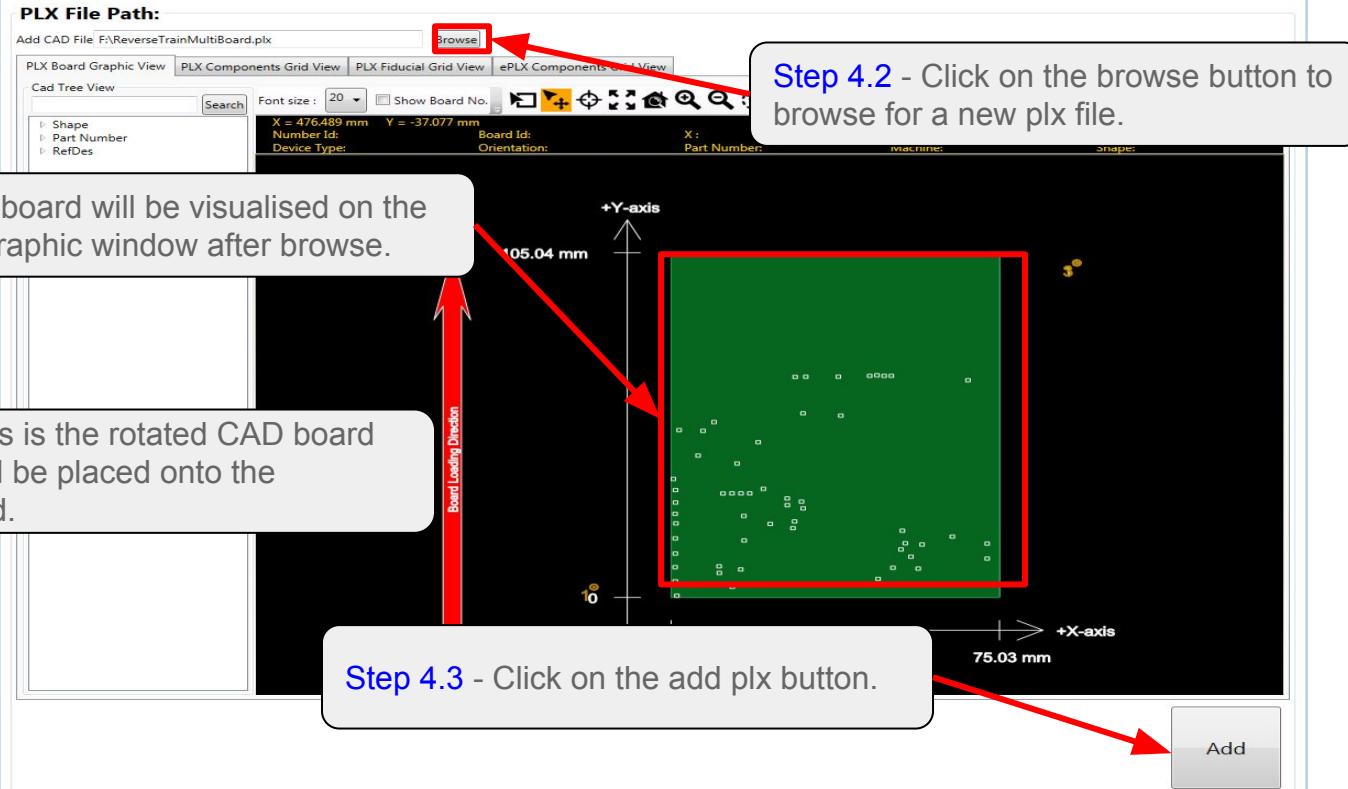
Step 4 : Add plx file. Select and move the board. Map one component to teach gantry on new board location.

Automated Board Inspection



# Multiple Board - Multiple CAD Orientation/Pitch

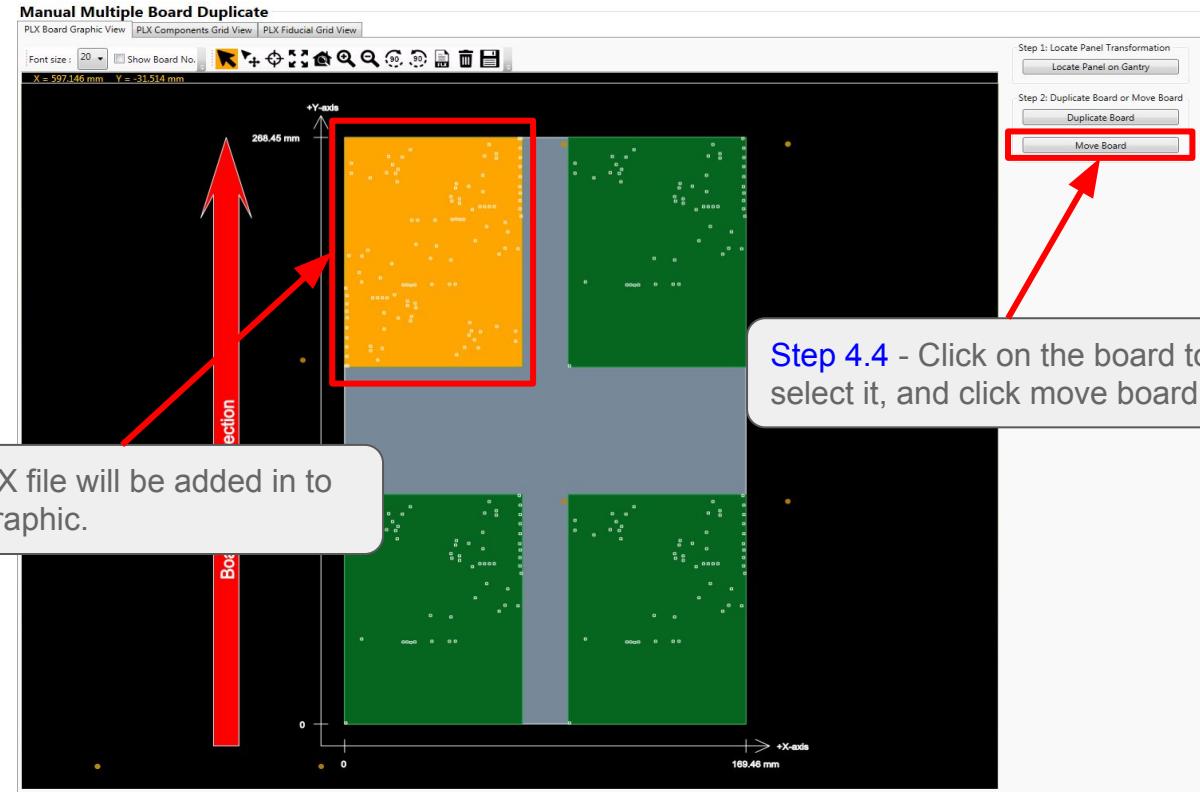
Automated Board Inspection



# Multiple Board - Multiple CAD Orientation/Pitch

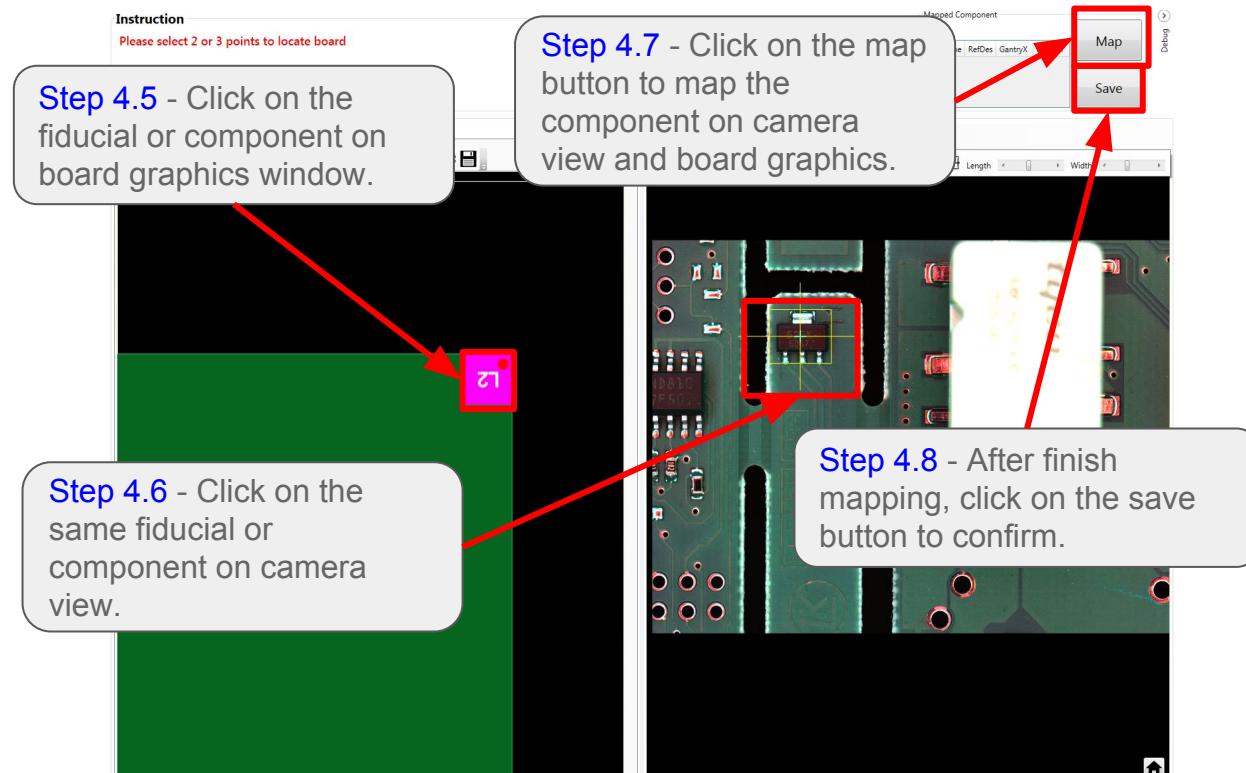
Automated Board Inspection

**Step 4 :** Add plx file. Select and move the board. Map one component to teach gantry on new board location.



# Multiple Board - Multiple CAD Orientation/Pitch

**Step 4 :** Add plx file. Select and move the board. Map one component to teach gantry on new board location.



# Multiple Board - Multiple CAD Orientation/Pitch

**Step 4 : Add plx file. Select and move the board. Map one component to teach gantry on new board location.**

**Step 4.9 - Selected board will be move to teach location.**



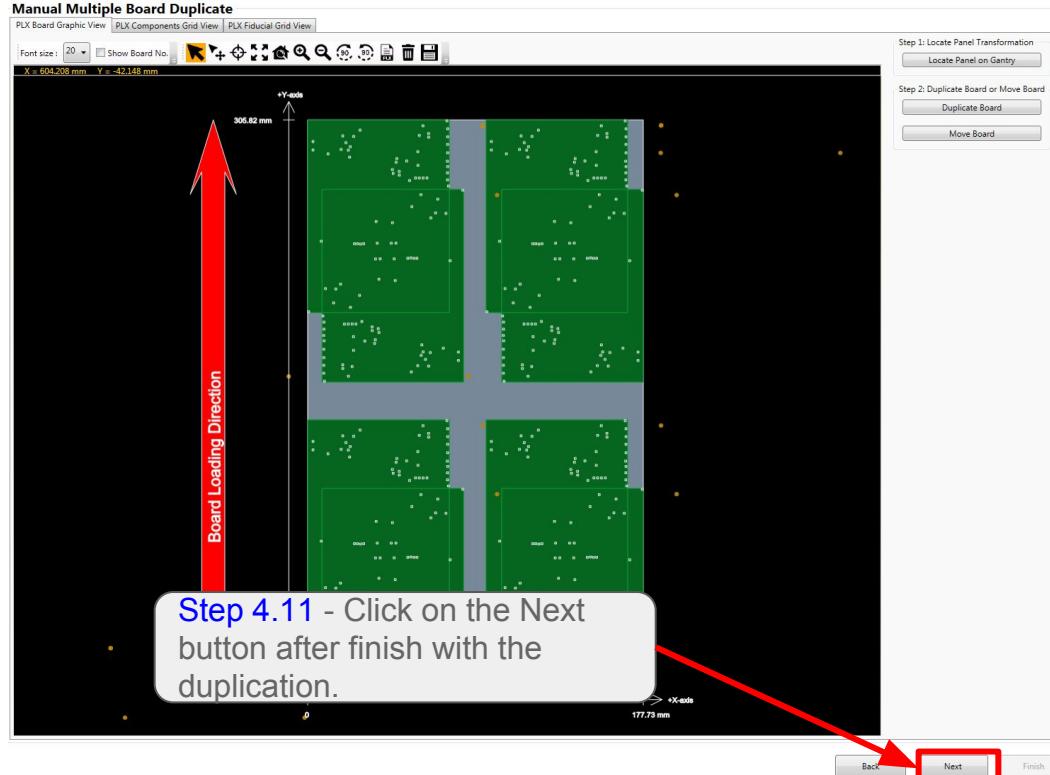
Back Next Finish



# Multiple Board - Multiple CAD Orientation/Pitch

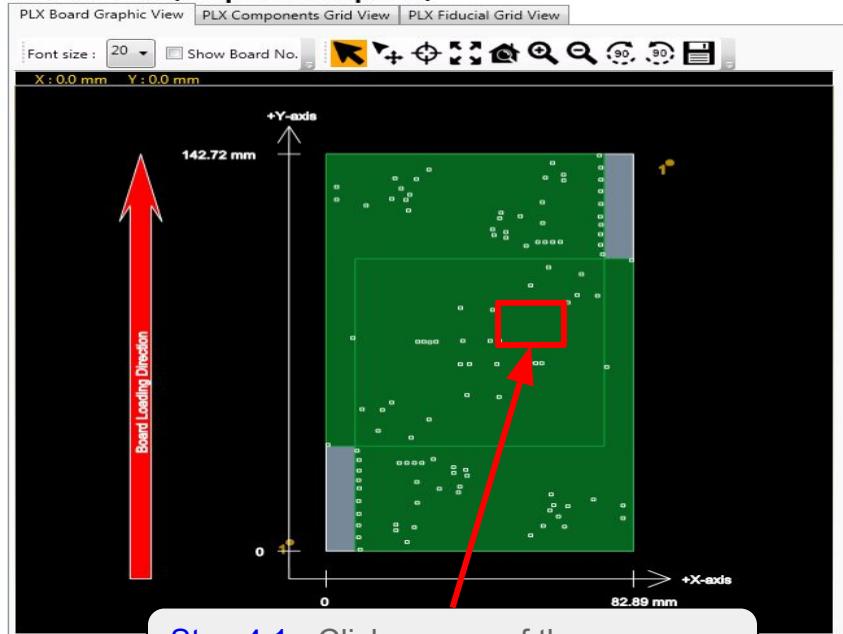
Step 4 : Add plx file. Select and move the board. Map one component to teach gantry on new board location.

Automated Board Inspection



Step 5 : Add global fiducials from gantry (\*optional), preview gantry location to component.

#### Add Fiducial (\*skip if not required)



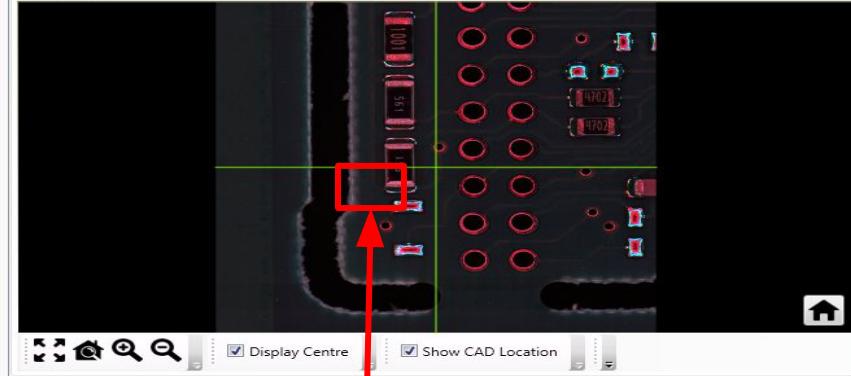
Step 4.1 - Click on one of the component on the board graphic.

#### Instruction

**Click on Camera View to Add Fiducial**

Step: Move camera to fiducial location, click on fiducial location then click Add Fiducial.  
Note: Click on board graphic component, gantry will move to component location for verification purpose.

#### Camera View



Debug

Gantry will move to the selected component location for verification purpose.

Add Fiducial

Finish

# Multiple Board - Multiple CAD Orientation/Pitch

Automated Board Inspection

**Step 5 : Add global fiducials from gantry (\*optional), preview gantry location to component.**

**Add Fiducial (\*skip if not required)**

PLX Board Graphic View PLX Components Grid View PLX Fiducial Grid View

Font size : 20 Show Board No. X : 0.0 mm Y : 0.0 mm

**Instruction**

**Click on Camera View to Add Fiducial**

Step: Move camera to fiducial location, click on fiducial location then click Add Fiducial.  
Note: Click on board graphic component, gantry will move to component location for verification purpose.

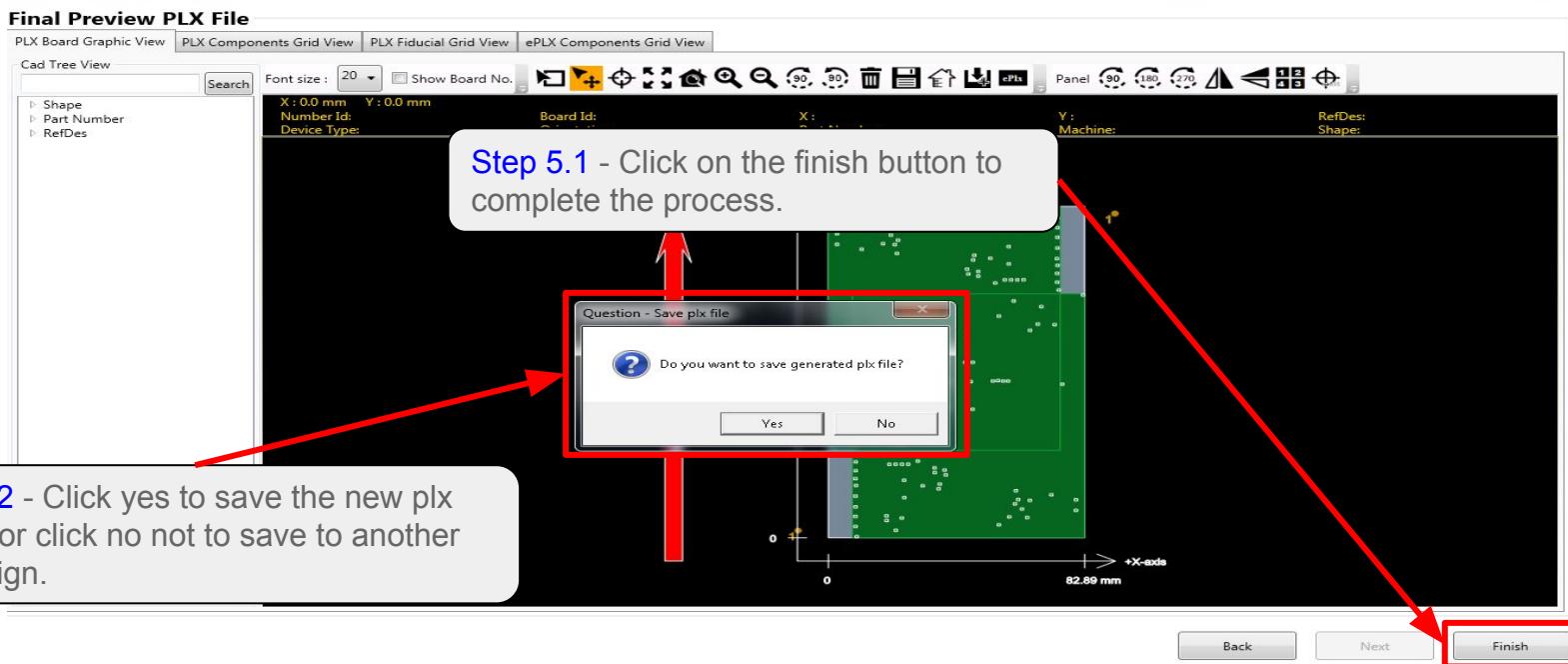
**Step 4.1 - Click on the camera view to locate global fiducial.**

**Step 4.2 - Click on the add fiducial button to add new global fiducial.**

Add Fiducial

Back Next Finish



**Step 6:** Final Preview, change board ID, save to plx file.

**ABI**

Automated Board Inspection



**GOLDEN LIBRARY**

# Golden Library

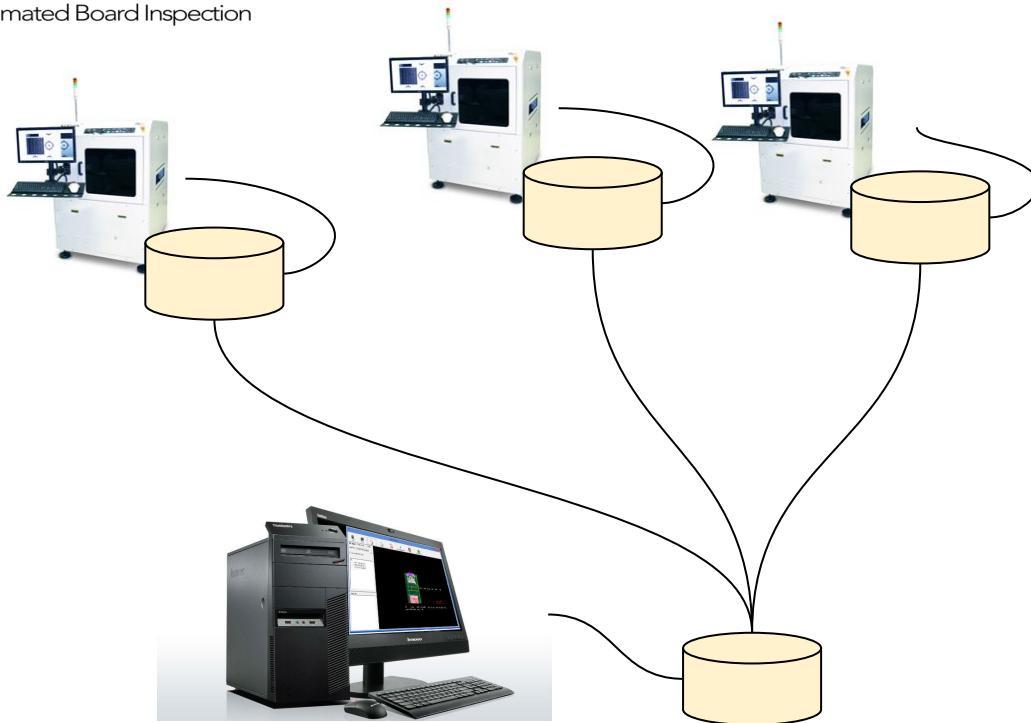
**ViTrox** 

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# Golden Library Concept Overview

Automated Board Inspection



**Synchronise Algorithm** - Standard golden threshold for each algorithm for all the inspection machine.

**One Time Fine Tuning**- A single part number threshold and algorithm that only need to be fine tune once.

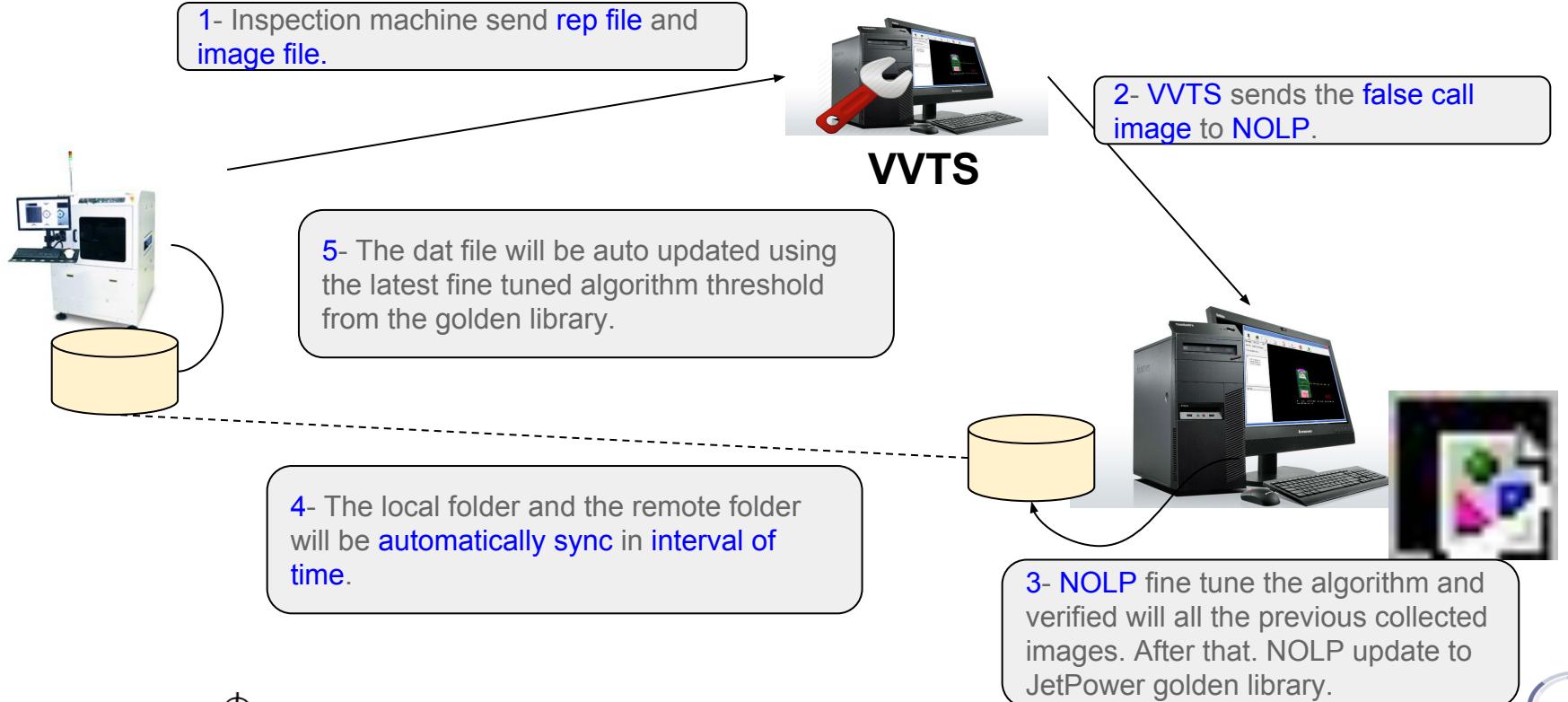
**Remote Fine Tuning**- The main server able to perform remote fine tuning from all the previous collected images and update to all the inspection machine.

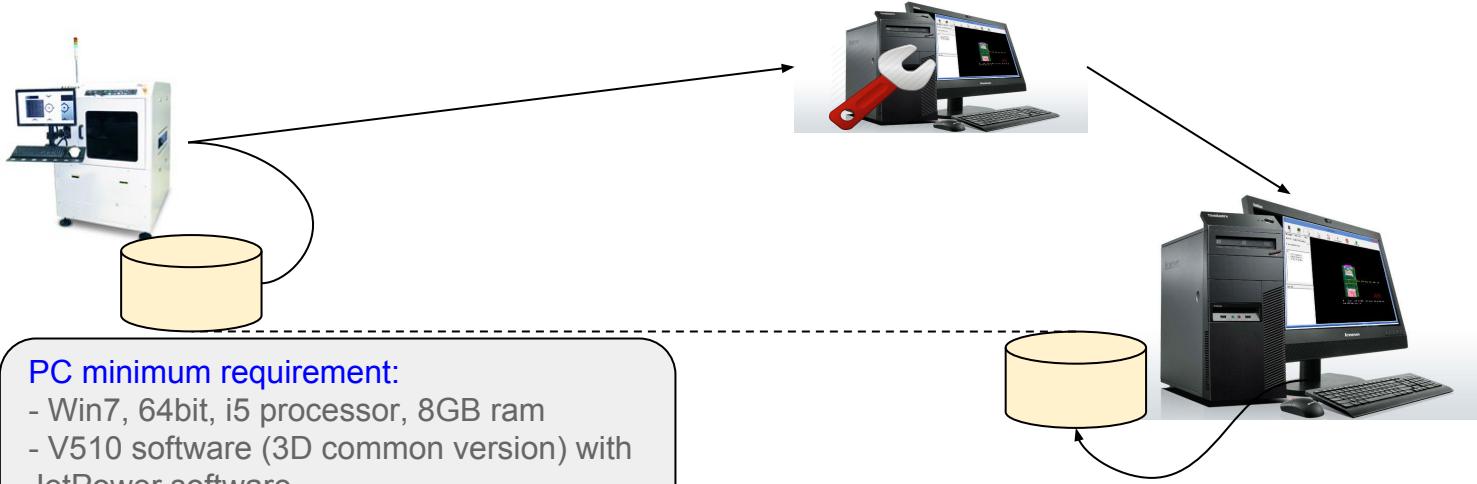
**Local and Remote Database** - With this architecture, the inspection machine able to perform normally even the network is disconnected. The data will be sync and updated again when the network if finally connected again.



# Golden Library Concept Overview

Automated Board Inspection





# Golden Library Main Features

Automated Board Inspection



**JetPower Golden Library Viewer**- To view algorithm and view the parameter threshold and ocv image.

**JetPower Golden Library Linker**- To generate the .dat file for plx program from golden library.

**JetPower Golden Library Builder** - To compare the difference of the selected program database to golden library. Build and save the golden library.



**Library Path**

- A dropdown list that shows a collection of library path.  
- Able to customize multiple library folder by editing the xml config file

**Refresh -**  
Click to refresh the folder

**Library Report** - Clicking on the view button will update the algorithm list based on the header description situated at the left of the button respectively.

**Algorithm Tree View** - A list of algorithm load from the library path. Double click the algorithm to display the [Algorithm Visualizer](#) for that algorithm.

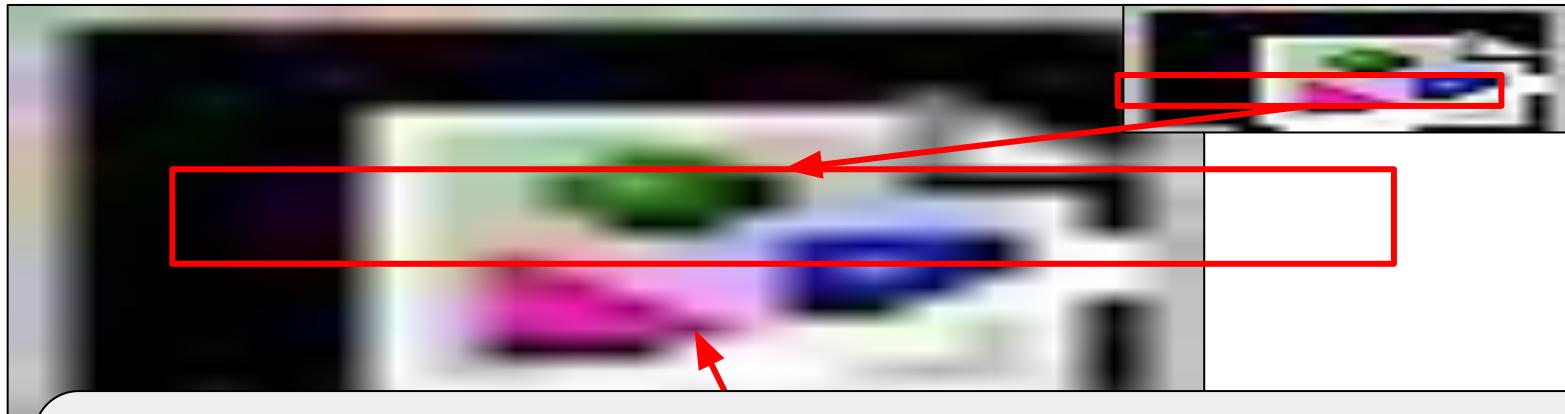
**Add** in prefix or postfix for naming

**OCV Management** - Click to rename the Golden Library OCV

**Algorithm List**  
- A list of algorithm load from the library path with details.  
- Double click the algorithm to display the [Algorithm Visualizer](#) for that algorithm.



**Golden Library path** - The golden library path can be set in the config file place at the default path:  
c:\cp\jetpower\libraryConfig.xml



**Adding new library path** - user can add the new library path in this segment <GoldenLibraryPaths> and just add this template by changing the Library folder and Library history folder details.

```
<LibraryPath>
  <LibraryFolder>C:\cp\jetpower\library\categoryB</LibraryFolder>
  <LibraryHistoryFolder>C:\cp\jetpower\library\_history\categoryB</LibraryHistoryFolder>
</LibraryPath>
```



# JetPower Golden Library Viewer - Algorithm Visualizer

**Algorithm Visualizer** - The algorithm visualizer window will be pop up when the user double click the algorithm in the algorithm tree view or the algorithm list.

**History** - Shows the details and can apply algorithm revisions. Clicking on the history button will pop up the algorithm history window.

Name Date Of Revision

Delete

Apply

The list of images and xml collected for this algorithm.

Algorithm Parameter details- Shows the full information of the algorithm parameters.

General Parameter
SD 1 : 0
SD 2 : 0
SD 3 : 0
SD 4 : 0
Warp 3D 5 : 0
Warp 3D 6 : 0
Warp 3D 7 : 0
Warp 3D 8 : 0
Warp 3D 9 : 0
Warp 3D 10 : 0
Warp 3D 11 : 0
Warp 3D 12 : 0
Warp 3D 13 : 0
Warp 3D 14 : 0
Warp 3D 15 : 0
Warp 3D 16 : 0
Warp 3D 17 : 0
Warp 3D 18 : 0
Warp 3D 19 : 0
Warp 3D 20 : 0

# JetPower Golden Library Linker

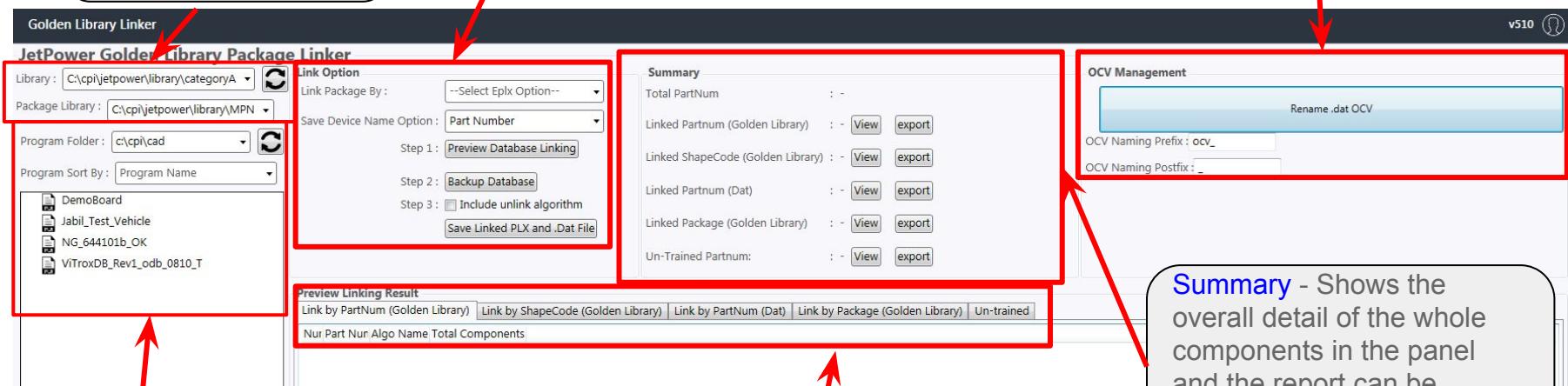
Automated Board Inspection

**Library Path** - Able to change to different library for linking.  
Select the library folder.  
Refresh to update.

**Golden Library Linker Tools** - Contains tool to preview Database linking, backup Database, save Linked .dat, reload program and upload database.

**OCV Management**

-Rename .dat OCV file  
-Put Prefix or Postfix for the naming of OCV



**Program TreeView**

- Show the list of available board program in tree view.
- Change to different program folder
- Refresh to update

**Linker Results** - Shows result on:

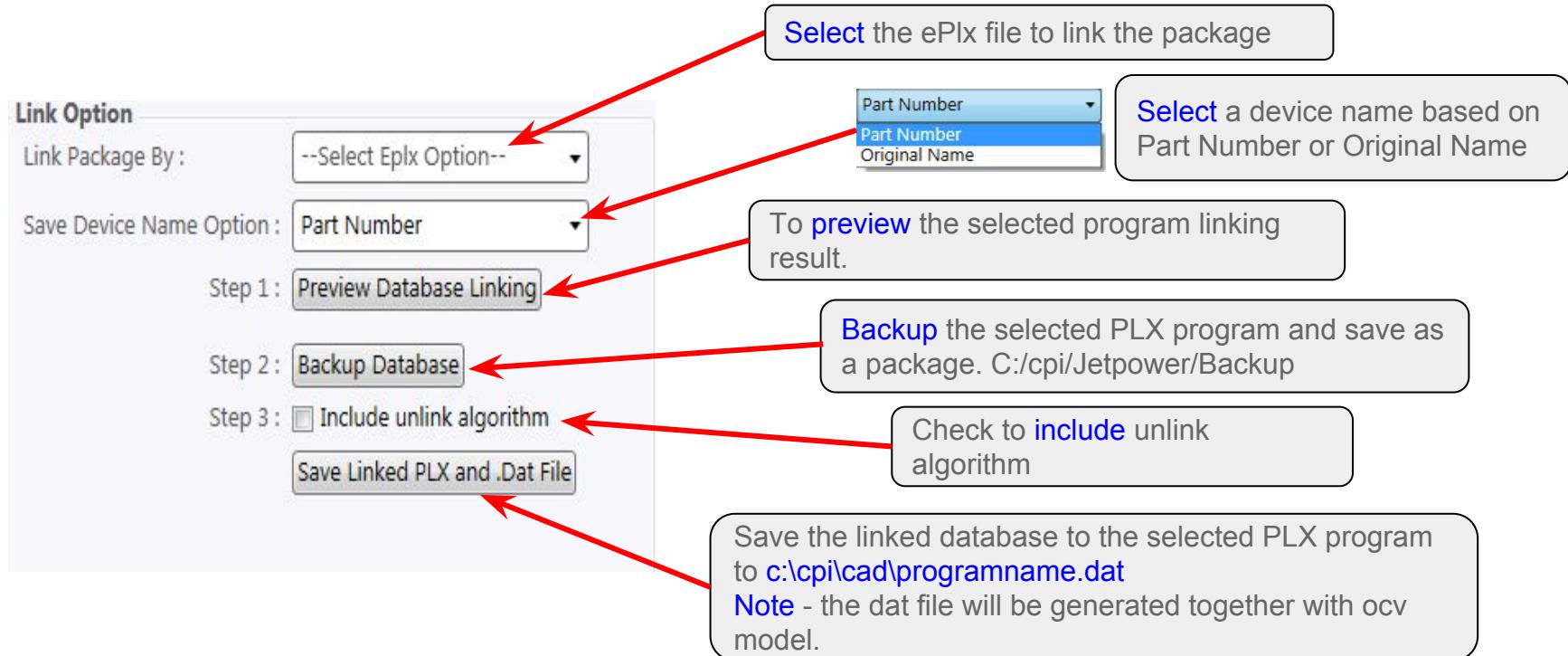
- Linked by Part Number (Golden Library)
- Linked by Shape Code (Golden Library)
- Linked by Package (Golden Library)
- Linked by Part Number (Dat)
- Untrained

**Summary** - Shows the overall detail of the whole components in the panel and the report can be generated to a text file by clicking the export button.

# JetPower Golden Library Linker

Automated Board Inspection

**Golden Library Linker Tools** - Contains tool to preview Database linking, backup Database, save Linked .dat, reload program and upload database.



Select the Golden library folder. Refresh to update

Golden Library Builder v510

Library : C:\cpil\jetpower\library\categoryA

Board Name : JabilTest\_Vehicle

Database Linked : cad/RJabilTest\_VehicleR.dat

include unlink algorithm  
 Save component image  
\*\*\* Before click Save To Golden Library, please load the board into AOI machine and run inspection once to save all images.

Username	Program	Database	Modified Golden Library Date	Modified Categories
v51	NG_644101b_OK	cad/NG_644101t_OK_2.dat	12/11/2017 4:00:05 PM	Added New Device Type , Resolved Device Type Conflict , Resolved Device Type Conflict

Compare Golden Library

Compare Golden Library and local library

History of modifying Golden Library

Check to include unlink algorithm or save component image.

Notes: Run inspection on loaded board once to save all image

Notes:

Local Library - offline library used in the active board program .plx file  
Golden Library - remote library stored in database in the server.

Display result based on different category

### RESULT ANALYSIS

New Device Type		Device Type Conflict		Part Number Conflict		OCV Conflict		Completed									
Total New Device Type Found : 81																	
<input checked="" type="checkbox"/> Number      Device Name      Part Numbers      Total Device Conflict      Total Part Number Conflict      Total OCV Conflict      Total identical Algorithm      Total Different Algorithm																	
<input checked="" type="checkbox"/>	11	bba196	BGA196,	0	0	0	0	0	0								
<input checked="" type="checkbox"/>	13	bcnetwork-a	CNETWORK-A,	0	0	0	0	0	0								
<input checked="" type="checkbox"/>	12	bcnetwork-b	CNETWORK-B,	0	0	0	0	0	0								
<input checked="" type="checkbox"/>	6	bconnector40	CONNECTOR40,	0	0	0	0	0	0								
<input checked="" type="checkbox"/>	9	bcsp3	CSP36,	0	0	0	0	0	0								
<input checked="" type="checkbox"/>	26	bdo14	DO214,	0	0	0	0	0	0								
<input checked="" type="checkbox"/>	20	bled603-a	LED0603-A,	0	0	0	0	0	0								
<input checked="" type="checkbox"/>	3	ble0603-b	LED0603-B,	0	0	0	0	0	0								
<input checked="" type="checkbox"/>	4	bled0805-a	LED0805-A,	0	0	0	0	0	0								
<input checked="" type="checkbox"/>	5	bled0805-b	LED0805-B,	0	0	0	0	0	0								
<input checked="" type="checkbox"/>	27	bled1206-a	LED1206-A,	0	0	0	0	0	0								
<input checked="" type="checkbox"/>	28	bled1206-b	LED1206-B,	0	0	0	0	0	0								
<input checked="" type="checkbox"/>	42	bled1210	LED1210,	0	0	0	0	0	0								
<input checked="" type="checkbox"/>	53	bmelf0805-a	MELF0805-A,	0	0	0	0	0	0								
<input checked="" type="checkbox"/>	46	bsod87	SOD87,	0	0	0	0	0	0								
<input checked="" type="checkbox"/>	47	bsot223	SOT223,	0	0	0	0	0	0								
<input checked="" type="checkbox"/>	56	bsot23	SOT23,	0	0	0	0	0	0								
<input checked="" type="checkbox"/>	29	btantala-a	TANTALA-A,	0	0	0	0	0	0								
<input checked="" type="checkbox"/>	81	btantala-b_1	TANTALA-B,	0	0	0	0	0	0								
<input checked="" type="checkbox"/>	33	btantala-c	TANTALA-C,	0	0	0	0	0	0								
<input checked="" type="checkbox"/>	32	btantalo-a	TANTALB-A,	0	0	0	0	0	0								
<input checked="" type="checkbox"/>	30	btantalo-b	TANTALB-B,	0	0	0	0	0	0								
<input checked="" type="checkbox"/>	31	btantalo-c	TANTALB-C,	0	0	0	0	0	0								

This filters the algorithm that is not exist in golden library (check using algorithm name)

<input checked="" type="checkbox"/>	46	bsod87	SOD87,	0
<input checked="" type="checkbox"/>	47	bsot223	SOT223,	0
<input checked="" type="checkbox"/>	56	bsot23	SOT23,	0
<input checked="" type="checkbox"/>	29	btantala-a	TANTALA-A,	0
<input checked="" type="checkbox"/>	81	btantala-b_1	TANTALA-B,	0
<input checked="" type="checkbox"/>	33	btantala-c	TANTALA-C,	0
<input checked="" type="checkbox"/>	32	btantalo-a	TANTALB-A,	0
<input checked="" type="checkbox"/>	30	btantalo-b	TANTALB-B,	0
<input checked="" type="checkbox"/>	31	btantalo-c	TANTALB-C,	0

This conflict will filter the algorithm that has the same name but with different parameters value

The algorithm assigned to the PartNumber in Local library is different with the golden library

The OCV(Optical Character Verification) has conflict when the local OCV has different parameter or name with the golden OCV.

Push to GL

Continue

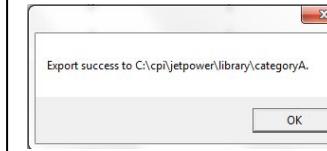
Display result based on different category

### RESULT ANALYSIS

New Device Type		Device Type Conflict		Part Number Conflict		OCV Conflict		Completed									
<b>Total New Device Type Found : 81</b>																	
Number	Device Name	Part Numbers	Total Device Conflict	Total Part Number Conflict	Total OCV Conflict	Total identical Algorithm	Total Different Algorithm										
11	bbga196	BGA196_	0	0	0	0	0										
13	bcnetwork-a	CNETWORK-A_	0	0	0	0	0										
12	bcnetwork-b	CNETWORK-B_	0	0	0	0	0										
6	bconnector40	CONNECTOR40_	0	0	0	0	0										
9	bcsp36	CSP36_	0	0	0	0	0										
26	bdo214	DO214_	0	0	0	0	0										
20	bled0603-a	LED0603-A_	0	0	0	0	0										
3	bled0603-b	LED0603-B_	0	0	0	0	0										
4	bled0805-a	LED0805-A_	0	0	0	0	0										
5	bled0805-b	LED0805-B_	0	0	0	0	0										
27	bled1206-a	LED1206-A_	0	0	0	0	0										
28	bled1206-b	LED1206-B_	0	0	0	0	0										
42	bled1210	LED1210_	0	0	0	0	0										
53	bmelf0805-a	MELF0805-A_	0	0	0	0	0										
54	bmelf0805-b	MELF0805-B_	0	0	0	0	0										
55	bmelf0805-c	MELF0805-C_	0	0	0	0	0										
63	bmelf1206-a	MELF1206-A_	0	0	0	0	0										
64	bmelf1206-b	MELF1206-B_	0	0	0	0	0										
65	bmelf1206-c	MELF1206-C_	0	0	0	0	0										
66	bmelf1206-d	MELF1206-D_	0	0	0	0	0										
48	bmflf28	MLF28_	0	0	0	0	0										
8	bqfn32	QFN32_	0	0	0	0	0										
14	bqfn56	QFN56_	0	0	0	0	0										
21	brnetwork-a	RNETWORK-A_	0	0	0	0	0										
22	brnetwork-b	RNETWORK-B_	0	0	0	0	0										
45	bsod123	SOD123_	0	0	0	0	0										
7	bsod323	SOD323_	0	0	0	0	0										
46	bsod87	SOD87_	0	0	0	0	0										
47	bsot223	SOT223_	0	0	0	0	0										
56	bsot23	SOT23_	0	0	0	0	0										
29	btantala-a	TANTALA-A_	0	0	0	0	0										
29	btantala-b_1	TANTALA-B_	0	0	0	0	0										
81	btantala-c	TANTALA-C_	0	0	0	0	0										
33	btantalo-a	TANTALO-A_	0	0	0	0	0										
32	btantalo-b	TANTALO-B_	0	0	0	0	0										
30	btantalo-c	TANTALO-C_	0	0	0	0	0										
31	btantalo-e	TANTALO-E_	0	0	0	0	0										

- List all algorithm/component found under this conflicts
- Double click on the algorithm column to show detail comparison conflict on the AlgoConflictVisualizer window (New Device Type and Device Type Conflict only).

Load the selected algorithm into Golden Library



Display next result. If no more conflict, jump to Completed

Push to GL Continue

Automated Board → BACK Golden Library Builder v510

### RESULT ANALYSIS

New Device Type Device Type Conflict Part Number Conflict OCV Conflict Completed

Total Device Type Conflict Found : 38

Number	Device Name	Part Numbers	Total Device Conflict	Total Part	Number Conflict	Total OCV Conflict	Total Identical	Algorithm	Total Different Algorithm
10	bbga100	BGA100,	2	0	0	0	1		
11	bbga196	BGA196,	2	0	0	0	1		
13	bcnetwork-a	CNETWORK-A,	2	0	0	0	1		
12	bcnetwork-b	CNETWORK-B,	2	0	0	0	1		
6	bconnector40	CONNECTOR40,	2	0	0	0	1		
9	bcsp36	CSP36,	2	0	0	0	1		
26	bdo214	DO214,	2	0	0	0	1		
20	bled0603-a	LED0603-A,	2	0	0	0	1		
63	bmelf1206-c	MELF1206-C,	2	0	0	0	1		
64	bmelf1206-a	MELF1206-A,	2	0	0	0	1		
65	bmelf1206-b	MELF1206-B,	2	0	0	0	1		
66	bmelf1206-d	MELF1206-D,	2	0	0	0	1		
48	bmif28	MLF28,	2	0	0	0	1		

OCV Conflict :  Append  Ignore  Overwrite

Select the decision done to the overall conflicts  
 -Append: add to the golden library with new name  
 -Ignore: do not do anything  
 -Overwrite: change to the new algorithm and replace the old algorithm

Select the decision done to the individual conflict

Load the selected components into Golden Library

Save selected conflict as alternative

Push To GL Save As Alternate Continue

Continue to next conflict or Completed

Automated Board Inspection

Detailed Conflicts between local and Golden Library

Display the difference between Local and Golden

OCV Conflict Options

- Append - append local OCV into golden library OCV
- Append - append local OCV into golden library OCV
- Ignore - use golden library OCV
- Overwrite - use local OCV

Different decision to be made and description provided

Apply the decision made to the golden library

Save And Close

The screenshot shows a window titled "AlgoConflictVisualizerWindow". Inside, there is a table with columns: Device Name, ProgramName, Ocv Name, Alternate Algo Name, Search Area Width, Search Area Height, Body Y, Body X Offset, Body Y Offset, Body Height, Body Colour, Bound Width, Bound Height, Bound Ink Wid, Lead X, Lead Y, and Lead X Off. Two rows are present: one for "bd0214" with "R0abi\_10\_VehicleR.dat" and "do214new", and another for "bd0214" with "Golden Library" and "ocv\_d0214\_0". Below the table is a section titled "OCV Conflict Options" with a dropdown menu. The menu has four items: "Append - append local OCV into golden library OCV" (selected), "Append - append local OCV into golden library OCV", "Ignore - use golden library OCV", and "Overwrite - use local OCV". To the left of the dropdown is a small image showing two overlapping rectangles labeled "do214". A red box highlights the table, and another red box highlights the dropdown menu. Red arrows point from the surrounding callout boxes to these highlighted areas.

Device Name	ProgramName	Ocv Name	Alternate Algo Name	Search Area Width	Search Area Height	Body Y	Body X Offset	Body Y Offset	Body Height	Body Colour	Bound Width	Bound Height	Bound Ink Wid	Lead X	Lead Y	Lead X Off
bd0214	R0abi_10_VehicleR.dat	do214new		8028	5431	3100	0	0	8	0	0	0	0	1000	1200	0
bd0214	Golden Library	ocv_d0214_0		8028	5431	3100	0	0	8	0	0	0	0	1000	1200	0



# JetPower Golden Library Builder - Completed

Automated Board Insp

Jet Power 2.0.0.23\_PB\_Rev3 (AoIEngine : 1.04.068)

← BACK      Golden Library Builder      v510 ⓘ

RESULT ANALYSIS

New Device Type      Device Type Conflict      Part Number Conflict      OCV Conflict      Completed

Viewer

Linker

Builder

Data Committed to Golden Library Successfully

Finished

Click here to finish



## Standard practice for JetPower Golden Library Builder

- Standardize the ocv name by follow part number with the prefix o-XXXXX
- For multiple ocv in single device type, add numbering to ocv naming. For example : o-XXXXX-1
- Standardize device type name follow part number. For example part number (0001-0001-0001) shall use (c0001-0001-0001) instead.
- One part number will link to one device type and one device type algorithm should used by one part number.
- Add alternate for the part number if there is a new AVL need alternate algorithm.



## Standard flow to build golden library

- Save minimum 3 full boards SSM image when first time NPI run.
- During production run, error image will send to the NOLP software and save by device type.
- Engineer can use NOLP to fine tune. Before save the fine tuned algorithm to the golden library, the user shall:
  - Run all 3 previous saved NPI images.
  - Run recent production false call and true call images to ensure the fine tuned algorithm does not happen escapee and false cll.



**ABI**

Automated Board Inspection



PROGRAM LIBRARY

## Program Library



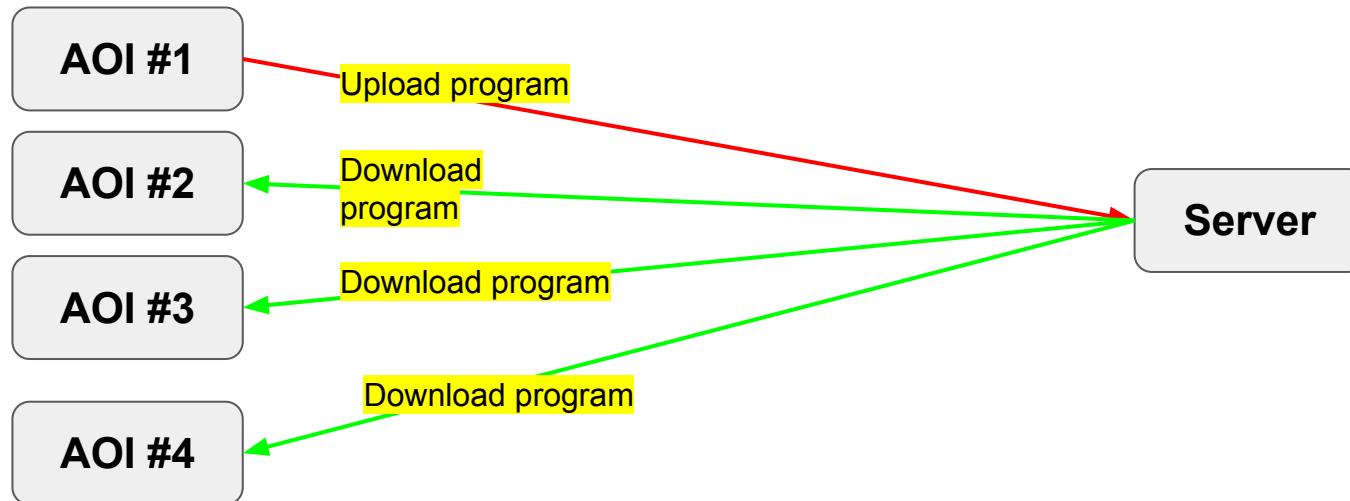
- ❖ Challenges faced currently
  - ◆ No synchronize program's data between machines
  - ◆ Difficulty in knowing what modification have done
  - ◆ Unable to trace back previous program's data
  - ◆ Time consuming in packaging programs for other machines to use
  - ◆ Difficulty in knowing if all relative program's data is pack completely and correctly
- ❖ Program Library serves as a **Centralized Program Management System** that manage and centralized programs that is shared / standalone.

The benefits of program library would be :-

- ◆ Program Distribution
- ◆ Program Synchronization
- ◆ Program Revision Control

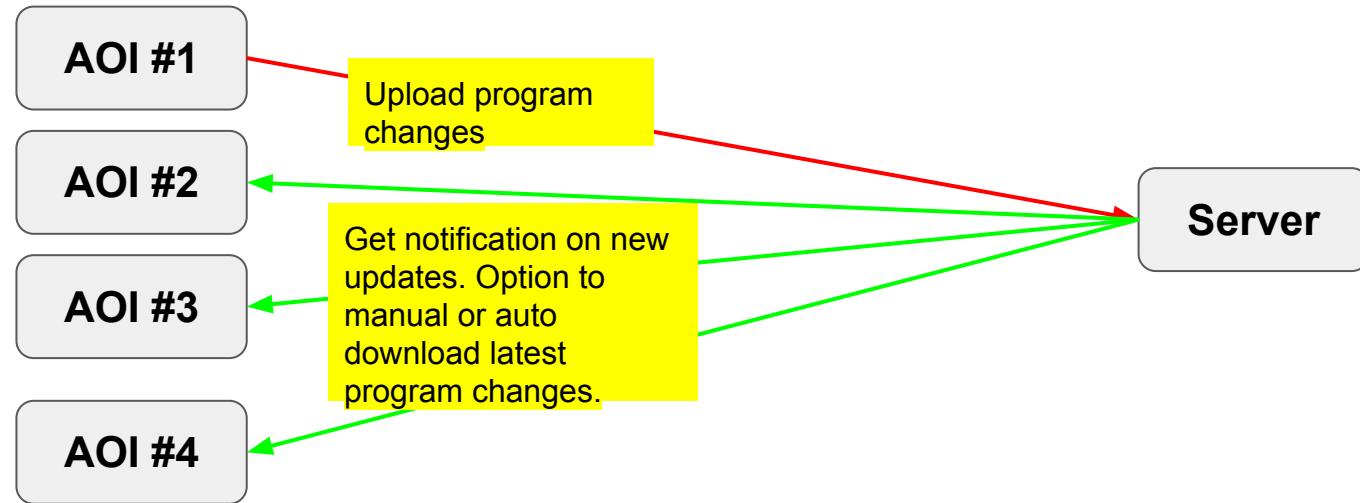


- 1) Complete full program at AOI#1 can upload to server easily. Other AOI can retrieve the full program to run production. Server can download the program for OLP/NOLP used.
- 2) Option to choose which program categories to upload : Basic program, Database, OCI, OCR, GPM, OCV, SLA, Unpop, CPM, Z Height or Tiles.
- 3) Can serve as program backup and centralization feature.



# Program Synchronization

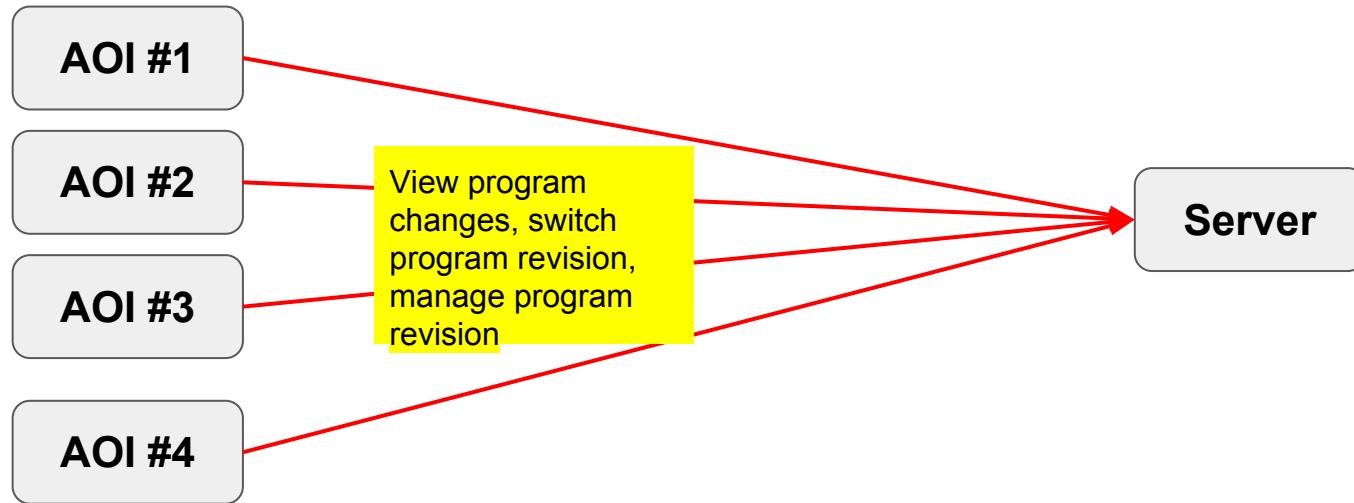
- 1) Any update or fine tune parameter at AOI able to push to server as an update revision.
- 2) Other AOI will get notification on the update and able view file difference before decide to download the changes.
- 3) Manual or auto program synchronization option available.



# Program Revision Control

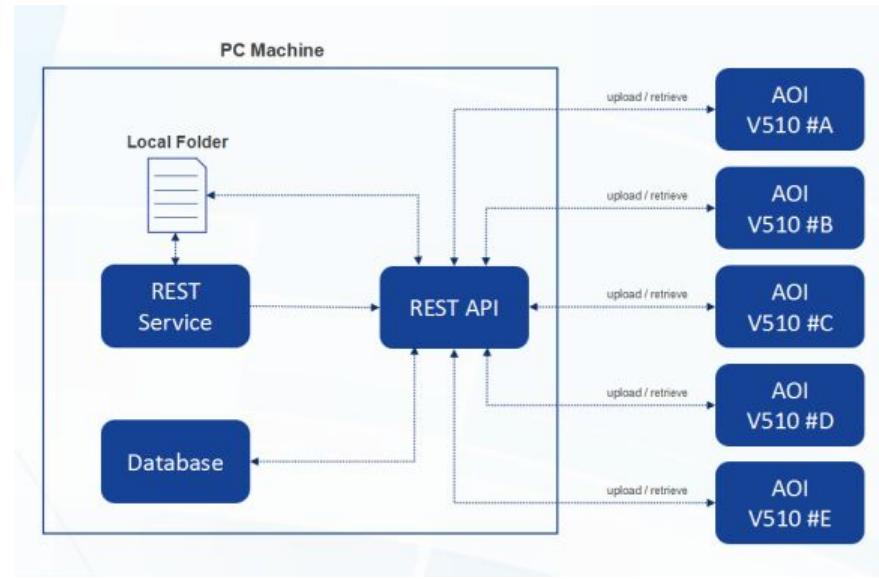
Automated Board Inspection

- 1) Able to tag a program with different revision and comment.
- 2) Able to track previous program changes easily (file modified, added or removed).
- 3) Able to see file difference between local program and server.
- 4) Able to switch program revision instantly.
- 5) Able to filter program easily by date, program, revision, machine type, tag,..



# Program Library - Introduction

Automated Board Inspection



REST API manage to upload 10 programs from 10 machines concurrently  
(Assuming hardware RAM is 16GB and each process taking 1GB space to do the upload process)



- ❖ **Program Library Uploader** is used for uploading program to centralized server database so that program can be synchronized with one another.
- ❖ What can program library uploader done?
  - ◆ Able to upload single or multiple programs at once
  - ◆ Get to know the files that have been modified, added or deleted
  - ◆ Get to know the data that have been modified, either compare with based local or latest revision from server
  - ◆ Reduce uploading time and space where user able to select the categories to upload
  - ◆ Able to tile program image and upload to server
  - ◆ Categorized and centralized program that used by different kind of machines, lines, or plants
  - ◆ Get to know current revision machine using and latest revision server have



# ABI

# Uploader - Single Mode

Automated Board Inspection

Jet Power 2.0.0.23\_PB\_Rev3 (AoiEngine : 1.04.068)

Program Library Uploader

v510

PROGRAM

Upload Mode :  Single  Multiple

Program Libraries : 3D

Tag (Optional) : Server Tag : test

Comment :

Include tiles file

Uploader

Downloader

Setting

CATEGORIES

Select All

Basic Program  Database

Optical Color Inspection (OCI)  Optical Character Recognition (OCR)

GPM  Optical Character Verification (OCV)

Self Learning Algorithm (SLA)  Unpop Data

Color Pattern Matching (CPM)  Z-Height

ViTroxBoardDemo\_T

Local Revision - Updated at -

Server Revision 9 v510 AOI-BHLM-PC Updated at 30-Nov-2017 11:05:47

Total Local Conflict Files 25 / 25 files

Display Conflict Categories Only

Program	DB	OCR	OCV	SLA
Last update 12-12-2017 13:3 WARNING ▲ 5 items	Last update 12-12-2017 13:3 WARNING ▲ 1 items	Last update 21-04-2017 16:2 WARNING ▲ 3 items	Last update 12-12-2017 13:3 WARNING ▲ 10 items	Last update 12-12-2017 13:3 WARNING ▲ 4 items
ViTroxBoardDemo_T.fid ViTroxBoardDemo_T.home ViTroxBoardDemo_T.xls ViTroxBoardDemo_T.plx ViTroxBoardDemo_T.skip	ViTroxBoardDemo_Test.dat	OCR_Alt_ViTroxBoardDemo_T.txt OCR_Data_ViTroxBoardDemo_T.txt OCR_Total_ViTroxBoardDemo_T.txt	oa-mif68-10mm-_5mm-dc.infoC oa-mif68-10mm-_5mm-dc.csvl oa-mif68-10mm-_5mm-dc.csv3l oa-mif68-10mm-_5mm-dc.ppr oa-mif68-10mm-_5mm-dc.tpl na-nvflnhsa05-_5mm-12.infoC	ViTroxBoardDemo_T.pac ViTroxBoardDemo_T.sla ViTroxBoardDemo_T.trb ViTroxBoardDemo_T.trg
Unpop	CPM			
Last update 17-08-2017 09:5 WARNING ▲ 1 items	Last update 17-08-2017 09:5 WARNING ▲ 1 items			
ViTroxBoardDemo_T.npm	ViTroxBoardDemo_T.ncc			

UPLOAD

**PROGRAM**

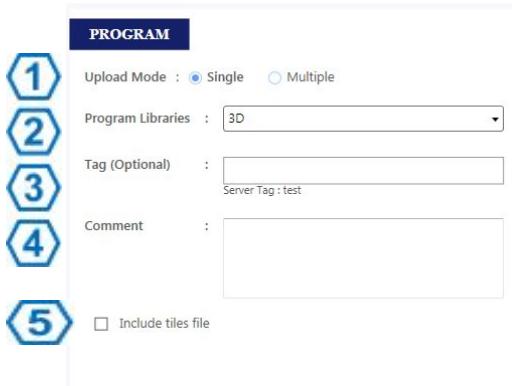
1. Upload Mode :  Single  Multiple

2. Program Libraries : 3D

3. Tag (Optional) :   
Server Tag : test

4. Comment :

5.  Include tiles file

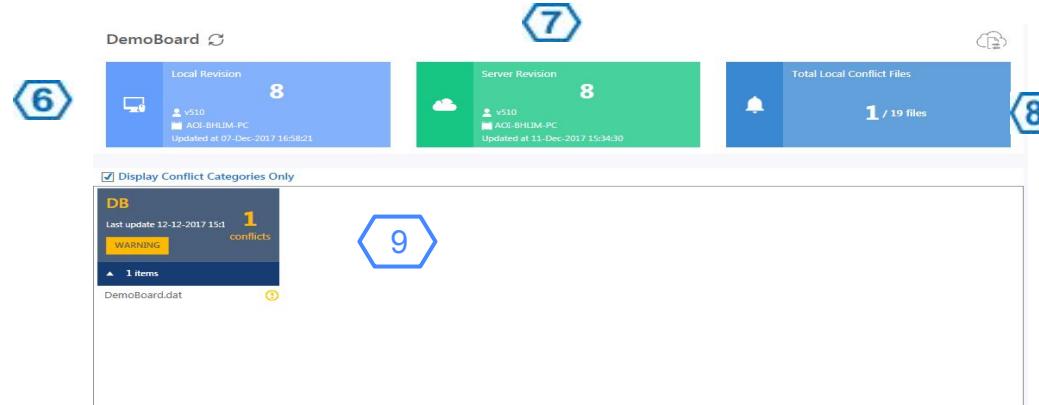


1. **Upload Mode** : Options to upload single or multiple programs
2. **Program Library** : By default, there will be three library available which are machine name, Golden 3D and Golden 2D. User are able to configure library name in config file C:\CPL\jetpower\config\program\_library\_config.xml
3. **Tag (Optional)** : Optional to add tag to current program
4. **Comment** : Optional to add comment to current program
5. **Include tiles file** : Option to include tile images in upload process



# Uploader - Single Mode

Automated Board Inspection



6. **Local Revision** : Display local machine revision, machine name, user name and last updated time.
7. **Server Revision** : Display server latest revision, machine name, user name and last updated time.
8. **Total local conflicts files** : Number of files difference between local program and server.
9. **Conflict categories** : Show the conflict categories file information



# ABI

Automated Board Inspection

# Uploader - Multiple Mode

Jet Power 2.0.0.23\_PB\_Rev3 (AoiEngine : 1.04.068)

← BACK Program Library Uploader v510

**PROGRAM**

Upload Mode :  Single  Multiple

Search...  Include tiles file

Program Name	Program Library	Tag
ViTroxBoardDemo_T	3D	
DemoBoard	3D	
ERROA1285805_1R1C_01_B	3D	

**CATEGORIES**

Select All

Basic Program  Database

Optical Color Inspection (OCI)  Optical Character Recognition (O)C

GPM  Optical Character Verification (O)CV

Self Learning Algorithm (SLA)  Unpop Data

Color Pattern Matching (CPM)  Z-Height

**ViTroxBoardDemo\_T**

Local Revision - Updated at -

Server Revision 9 Updated at 30-Nov-2017 11:05:47

Total Local Conflict Files 25 / 25 files

Display Conflict Categories Only

Program	DB	OCR	OCV	SLA
Last update 12-12-2017 13:3 WARNING 5 conflicts	Last update 12-12-2017 13:3 WARNING 1 conflicts	Last update 21-04-2017 16:2 WARNING 3 conflicts	Last update 12-12-2017 13:3 WARNING 10 conflicts	Last update 12-12-2017 13:3 WARNING 4 conflicts
▲ 5 items	▲ 1 items	▲ 3 items	▲ 10 items	▲ 4 items
ViTroxBoardDemo_T.fid ViTroxBoardDemo_T.home ViTroxBoardDemo_T.pls ViTroxBoardDemo_T.plx ViTroxBoardDemo_T.skip	ViTroxBoardDemo_Test.dat	OCR_Al_ViTroxBoardDemo_T.txt OCR_Data_ViTroxBoardDemo_T.txt OCR_Total_ViTroxBoardDemo_T.txt	oa-mlf68-10mm-_5mm-dc.infoC oa-mlf68-10mm-_5mm-dc.ov3l oa-mlf68-10mm-_5mm-dc.ov3l oa-mlf68-10mm-_5mm-dc.cppm oa-mlf68-10mm-_5mm-dc.tpl oa-nmfha205-_5mm-12.infoC	ViTroxBoardDemo_T.pacl ViTroxBoardDemo_T.sla ViTroxBoardDemo_T.trb ViTroxBoardDemo_T.trg

**Unpop**

Last update 17-08-2017 09:5  
WARNING 1 conflicts

▲ 1 items

ViTroxBoardDemo\_T.npm

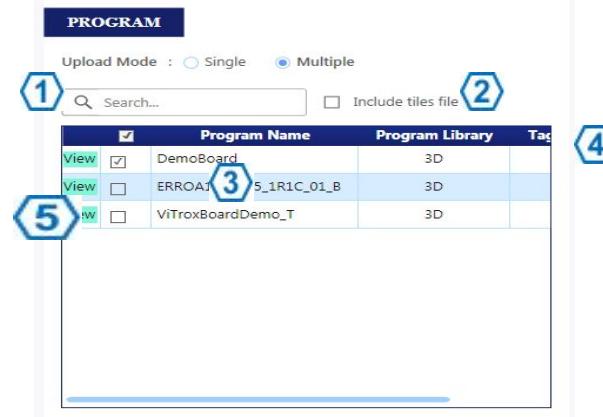
**CPM**

Last update 17-08-2017 09:5  
WARNING 1 conflicts

▲ 1 items

ViTroxBoardDemo\_T.ncc

**UPLOAD**



1. **Search Program** : Search programs that matches or contains the text in search box
2. **Include Tile Files** : Option to include tile images for all selected programs in upload process
3. **Program List** : Display programs available for upload. Check the program that want to upload.
4. **Tag / Comment** : Add the tag or comment if any of the respective program.
5. **View** : Press the View button to see the detail of each program



**CATEGORIES**

Select All  
 Basic Program  
 Database  
 GPM  
 Unpop Data

Optical Color Inspection (OCI)  
 Optical Character Verification (OCV)  
 Color Pattern Matching (CPM)

Optical Character Recognition (OCR)  
 Self Learning Algorithm (SLA)  
 Z-Height

- ❖ Categorized file to respective category
- ❖ Option to select category of files to be uploaded or to be excluded
- ❖ By default, all category will be selected
- ❖ Recommend to upload full package for new program (Full package = All category)
- ❖ At least one category need to be selected to perform upload process





- ❖ Show respective files in each category
- ❖ Each of the files will be compared with **local cache** to see if any changes on it
- ❖ An warning indicator will be shown if found any changes made in each file or category

#### Right click on file

Show difference between current program and local cache data





Automated Board Inspection

The screenshot shows a software interface titled "ProgramLibraryRevisionComparison". At the top, it displays "DemoBoard" and "3D". Below this, there are two main sections: "Local Revision" (blue background) and "Server Revision" (green background). Both sections show a user icon (v510), the machine name (AOI-BHUM-PC), and the update time (Updated at 12-Dec-2017 15:10:20 and 11-Dec-2017 15:34:30 respectively). The Local Revision section has a "8+" badge, while the Server Revision section has an "8" badge. In the top right corner of the main area, there is an orange box containing the number "1" and the word "Conflicts". Below these sections is a table with three columns: "Feature", "File", and "Action". The table contains one row for "DB" with the file "DemoBoard.dat" and the action "Modified". At the bottom right of the main area is a button labeled "Compare File".

Feature	File	Action
DB	DemoBoard.dat	Modified

- ❖ Show current program and server latest program information
- ❖ Changes of each file will be listed in Action tab [ 4 types : Conflict, Modified, Added, and Deleted ]
- ❖ Click on the file then click compare file button to see the changes made between these two files



# Uploader - JP Compare

Automated Board Inspection

Dat Differences : FMC2H-M3J4118480C-1\_B.dat

		Parameter	Local	Remote
▲ R Type 2 items		▲ Thresh		
rdefault 2 items		Horizontal Threshold	250	200
rd1ba1021a015 215 items		Vertical Threshold	250	200
▲ C Type 1 items				
cf1g1h8r2a798 15 items				
▲ OCV Type 1 items				
of1g1h8r2a798 228 items				

Added    Modified    Deleted

- ❖ **JP Compare** presents a more direct view that show only modified parameters
- ❖ Data will be group accordingly to respective group for ease of view
- ❖ Three changes type
  - Added
  - Modified
  - Deleted
- ❖ Each type has its own specific color to represent it
- ❖ JP Compare is only applicable for file with **PLX or DAT** extension



# Uploader - WinMerge Compare

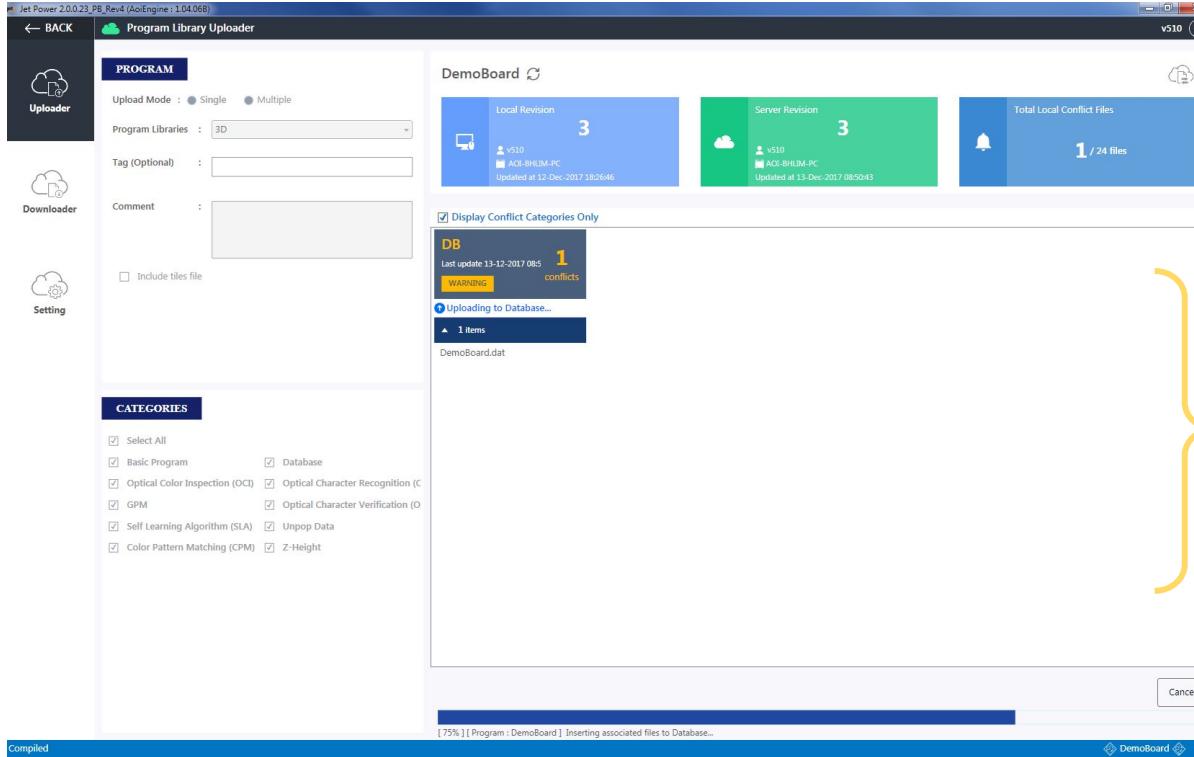
c:\cp1\cad\FMC2H-MB411848C-1.b.dat										c:\cp1\cad\FMC2H-MB411848C-1.b3D\bcp1\cad\fmc2h-mb411848c-1.b.dat														
!	Agilent AOI Device Type Component Library	!	!	!	!	!	!	!	!	!	Agilent AOI Device Type Component Library	!	!	!	!	!	!	!	!					
!	Rev 2.0 August 2003	!	!	!	!	!	!	!	!	!	Rev 2.0 August 2003	!	!	!	!	!	!	!	!					
!	Image intensity not calibrated for intensity yet	!	!	!	!	!	!	!	!	!	Image intensity not calibrated for intensity yet	!	!	!	!	!	!	!	!					
#	Capacitor - c2421 (5400x6000) - Algorithm Developed for standard 2421 component	!	!	!	!	!	!	!	!	!	# Capacitor - c2421 (5400x6000) - Algorithm Developed for standard 2421 component	!	!	!	!	!	!	!	!					
DEVICE	b2421	SEARCH	8000	6600	BOUND	0	0	0	BODY	5400	6000	SEARCH	8000	6600	BOUND	0	0	0	BODY	5400	6000			
LEADS	0	0	0	0	LEADS	0	0	0	PADS	500	5000	LEADS	0	0	PADS	500	5000	NUM_PINS	0	150	PADS	500	5000	
NUM_PINS	0	150	0	0	NUM_PINS	0	150	0	THRESH	100	400	400	100	55	THRESH	100	400	400	100	50	THRESH	100	400	
FILTER	0	0	0	0	FILTER	0	0	0	CAMDATA	5	0	CAMDATA	5	0	INFO3D	0	0	0	INFO3D	0	0	INFO3D	0	0
CAMDATA	5	0	0	0	CAMDATA	5	0	0	INFO3D	0	0	INFO3D	0	0	JOINT3D	0	0	0	JOINT3D	0	0	JOINT3D	0	0
INFO3D	0	0	0	0	INFO3D	0	0	0	JOINT3D	0	0	JOINT3D	0	0	JOINT3D	0	0	0	JOINT3D	0	0	JOINT3D	0	0
JOINT3D	0	0	0	0	JOINT3D	0	0	0	JOINT3D	0	0	JOINT3D	0	0	JOINT3D	0	0	JOINT3D	0	0	JOINT3D	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

- ❖ **WinMerge Compare** presents an indirect view where user are able to see the whole content of file
- ❖ Modified data will be highlighted in **light yellow color** and it's line will be in **dark yellow color**
- ❖ WinMerge Compare is applicable for all type of file except for image file



# Uploader - Upload Progress

Automated Board Inspection



Show respective indicator while uploading in progress



Display upload progress status



- ❖ **Program Library Downloader** is used for retrieving program package from centralized server database
- ❖ What can program library downloader done?
  - ◆ Retrieve program package from server and direct apply to V510
  - ◆ Able to view all program available in database
  - ◆ Able to know each revision relative information
  - ◆ Get to download program package for specific revision only
  - ◆ Get to download full package of program
  - ◆ Get to download tiled images
  - ◆ Able to do filtering to show necessary programs and revisions in view
  - ◆ Auto download synchronize mode program
    - Auto download latest revision of program from server without user click
    - If program is in inspecting or waiting stage, downloaded program will not direct apply it until next inspection start



# Downloader - Overview

Automated Board Inspection

Jet Power 2.0.0.23\_PB\_Rev3 (AoiEngine : 1.04.06B)

← BACK Program Library Downloader v510

**PACKAGES AVAILABLE**

DemoBoard 3D

**Local Revision** 4  
v510 AOI-BHLIM-PC Updated at 12-Dec-2017 18:2646

**Server Revision** 4  
v510 AOI-BHLIM-PC Updated at 13-Dec-2017 08:57:20

**-Download Configuration**

Download Full Package  Include tiles file

Program Name	Revision	Tag	Program Library	Date Uploaded	Username	Machine Name	Modified Field	Comment
DemoBoard	4	3D	AOI-BHLIM-PC	13-Dec-2017 08:57:20	v510	AOI-BHLIM-PC	DB	
DemoBoard	3	3D	AOI-BHLIM-PC	13-Dec-2017 08:50:43	v510	AOI-BHLIM-PC	DB, OCV	
DemoBoard	2	3D	AOI-BHLIM-PC	12-Dec-2017 18:29:31	v510	AOI-BHLIM-PC	DB, OCV	
DemoBoard	1	3D	AOI-BHLIM-PC	12-Dec-2017 18:26:46	v510	AOI-BHLIM-PC	Program, DB, OCV, SLA	
<b>ViTroxBoardDemo_T ( Local Revision : 2 Program Library : 3D )</b>								
ViTroxBoardDemo_T	2	3D	AOI-BHLIM-PC	13-Dec-2017 08:41:46	v510	AOI-BHLIM-PC		
ViTroxBoardDemo_T	1	3D	AOI-BHLIM-PC	13-Dec-2017 08:40:23	v510	AOI-BHLIM-PC		

**FILTER**

DATE RANGE  
11/13/2017 - 12/13/2017

**SEARCH**

-File Filter  
 Show Current Program Only  
 Show New Program Only

REVISION  
Filter by Revision...

PROGRAM NAME  
Filter by Program Name...

TAG  
Filter by Tag...

COMMENT  
Filter by Comment...

LIBRARIES  
 3D  2D

SEARCH

DOWNLOAD



**PACKAGES AVAILABLE**

① DemoBoard ③  
② 3D

Local Revision ④ 8  
v510 AOI-BHLM-PC  
Updated at 07-Dec-2017 16:58:21

Server Revision ⑤ 8  
v510 AOI-BHLM-PC  
Updated at 11-Dec-2017 15:34:30

**-Download Configuration -** Download Full Package Include tiles file

1. **Current Program** : Show current program
2. **Program Libraries** : Show current program libraries name
3. **Refresh** : Refresh current program data to show if revision or library changed
4. **Local revision info** : Show local revision number, user name, machine name and last updated time.
5. **Server revision info** : Show server revision number, user name, machine name and last updated time.
6. **Download Full Package** : Option to download full package of program
7. **Include Tile File** : Option to download tiled file in download process



# Downloader - Packages View

Automated Board Inspection

9



8

Program Name	Revision	Tag	Program Library	Date Uploaded	Username	Machine Name	Modified Field	Comment
▲ FMC2H-M3J4118480C-1_B ( Local Revision : 3 Program Library : AOI-SNTAN-NB )								
FMC2H-M3J4118480C-1_B	3		AOI-SNTAN-NB	29-Nov-2017 13:15:08	xinni	AOI-SNTAN-NB	Program, DB, OCV, SLA	
FMC2H-M3J4118480C-1_B	2		AOI-SNTAN-NB	29-Nov-2017 10:04:15	xinni	AOI-SNTAN-NB	Program, DB, SLA	
FMC2H-M3J4118480C-1_B	1		AOI-SNTAN-NB	29-Nov-2017 09:55:54	xinni	AOI-SNTAN-NB	Program, DB, SLA	
▲ NG_644101b_OK ( Local Revision : 3 Program Library : AOI-SNTAN-NB )								
NG_644101b_OK	3		AOI-SNTAN-NB	28-Nov-2017 20:24:35	xinni	AOI-SNTAN-NB	Program, DB, OCI, OCR, GPM, OCV, SLA, ZHeight	
NG_644101b_OK	2		AOI-SNTAN-NB	28-Nov-2017 19:19:45	xinni	AOI-SNTAN-NB	Program, DB, OCI, OCR, GPM, OCV, SLA, ZHeight	
NG_644101b_OK	1		AOI-SNTAN-NB	28-Nov-2017 18:13:34	xinni	AOI-SNTAN-NB	Program, DB, OCI, OCR, GPM, OCV, SLA, ZHeight	
▲ ViTroxDB_Rev1_odb_0810_T ( Local Revision : 3 Program Library : AOI-SNTAN-NB )								
ViTroxDB_Rev1_odb_0810_T	3		AOI-SNTAN-NB	28-Nov-2017 10:01:37	xinni	AOI-SNTAN-NB	Program, DB, SLA	
ViTroxDB_Rev1_odb_0810_T	2		AOI-SNTAN-NB	28-Nov-2017 10:01:24	xinni	AOI-SNTAN-NB	Program, DB, SLA	

8. **Server Program List** : Display all program available in centralized database, local and server revision and library it uses will be display in the header of each program
9. **Refresh** : Refresh to see if any new revision available on database



# Downloader - Filter Feature

**FILTER**

DATE RANGE  
11/13/2017  - 12/13/2017

**SEARCH**

- File Filter -  
 Show Current Program Only  
 Show New Program Only

REVISION  
Filter by Revision...

PROGRAM NAME  
Filter by Program Name...

TAG  
Filter by Tag...

COMMENT  
Filter by Comment...

LIBRARIES  
 3D       2D

**SEARCH**

- ❖ **Filter Feature** enable user to search the program library history by date filter and file filter.
- ❖ Date filter can select the range of dates to display the program library changes.
- ❖ There is option for user to Show All Program and Show New Program Only.
- ❖ File filter can be searched by:
  - revision
  - Program name
  - tag
  - comment
  - libraries



# Setting - Overview

Automated Board Inspection

Jet Power 2.0.0.23\_PB\_Rev4 (AoiEngine : 1.04.06B) v510

**Program Library Setting**

**Uploader**    **Downloader**    **Setting**

**REST SETTING**

REST IP Address : localhost  
REST Port : 8080  
Vitrox License Server IP Address : localhost

**EDIT**    **CHECK CONNECTION**

**CONNECTED**

**DATABASE SETTING**

Database IP Address : localhost  
Database Port : 5433  
Database Name : postgres  
Database Username : postgres  
Database Password : postgres

**EDIT**    **CHECK CONNECTION**

**PROGRAM AUTO SYNC SETTING**

Search...

**NON AUTO SYNC PROGRAMS**

ViTroxBoardDemo\_T

**ADD**

**AUTO SYNC PROGRAMS**

**REMOVE**

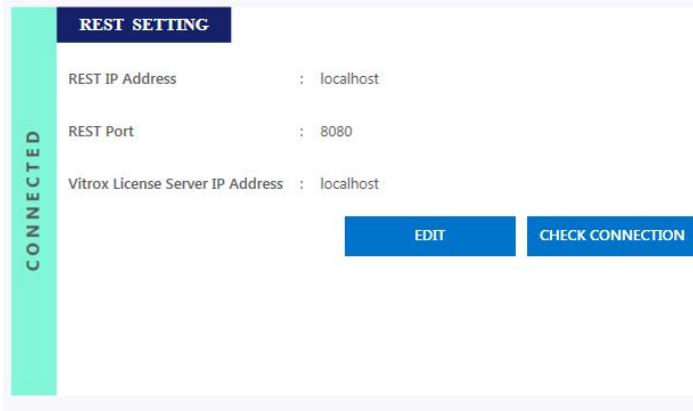
**SAVE**

Ready

DemoBoard

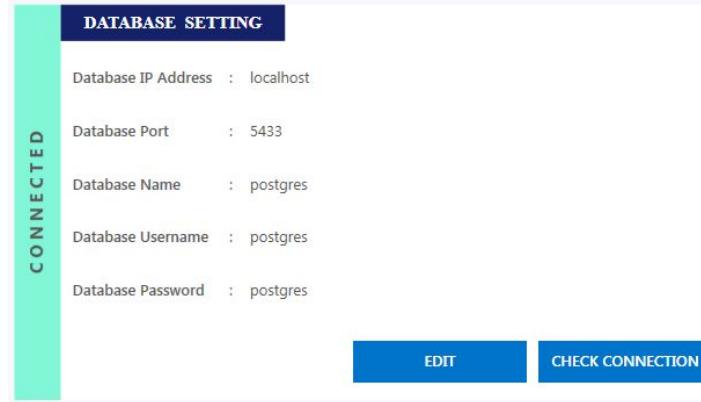


# Setting - REST Setting



- ❖ **REST Setting** is to configure the setting of
  - REST IP address
  - REST port number
  - Vitrox License server IP address
- ❖ The status bar at the left side will display REST connection status.
- ❖ User can click Check Connection to get the REST connection status.
- ❖ If user want to modify the REST setting, click the Edit button and modified accordingly.
- ❖ After user finish edit the parameter, press Update and Close button.





- ❖ **Database Setting** is to configure the setting of
  - Database IP address
  - Database port number
  - Database name
  - Database user name
  - Database Password
- ❖ The status bar at the left side will display Database connection status.
- ❖ User can click Check Connection to get the Database connection status.
- ❖ If user want to modify the Database setting, click the Edit button and modified accordingly.
- ❖ After user finish edit the parameter, press Update and Close button.



PROGRAM AUTO SYNC SETTING

NON AUTO SYNC PROGRAMS

ViTroxBoardDemo\_T

AUTO SYNC PROGRAMS

ADD REMOVE

SAVE

- ❖ **Program Auto Sync Setting** is to configure which program to auto sync the program file if have changes at server.
- ❖ User can add and remove the program to have auto sync function with server. Press the Save button after configure the setting.





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