

ViTrox Corporation Berhad

3D AOI Unpopulated Area Inspection



Add Component In Full board view



(1)



(2)



(3)

- 1) Press Scan Board to get the full board image
- 2) Click bottom right button to switch to full board view
- 3) Press the button to go to the add component mode

Add Component In Full board view

Add Component Function

Component Info

Current BoardID 1

RefDes	unpop
PartNumber	UNPOPULATED
DeviceType	n0000
Orientation	0
Assignment Method	Area
Multi Panel	<input checked="" type="checkbox"/>

Advanced Information

Multi Panel Editor

<input checked="" type="checkbox"/>	BoardID
<input checked="" type="checkbox"/>	1
<input checked="" type="checkbox"/>	2
<input checked="" type="checkbox"/>	3
<input checked="" type="checkbox"/>	4

Component Assignment Editor

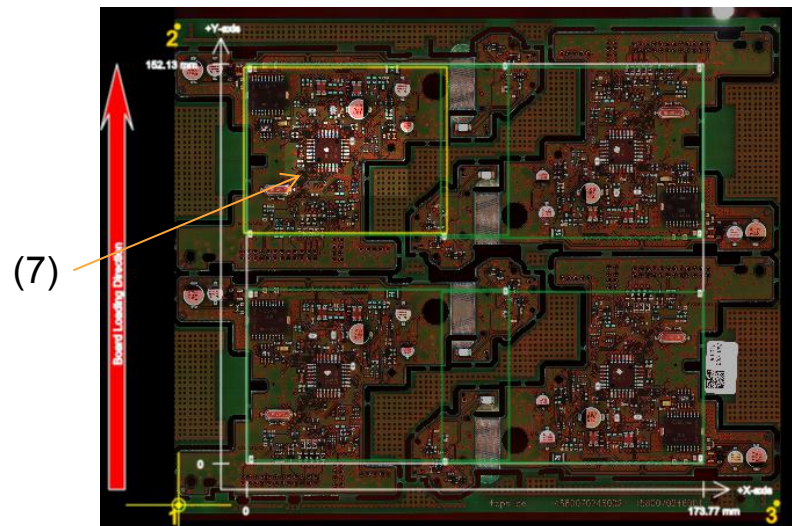
4) Fill in the following value in Component Info

- RefDes
- PartNumber
- Orientation

5) Change Assignment Method from Point to Area

6) Tick Multi Panel To enable the multiple panel assignment. Expand Multi Panel Editor and make sure all board ID are being ticked

7) Go to the Full Board View and drag on a single board boundary



Add Component In Full board view

Add Component Function

Component Info

Current BoardID 1

RefDes unpop

PartNumber UNPOPULATED

DeviceType n0000

Orientation 0

Assignment Method Area

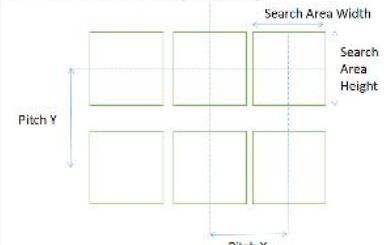
Multi Panel ☒

Advanced Information

Multi Panel Editor

Component Assignment Editor

Area Parameters(micron)



Search Area Width 2999

Search Area Height 3000

Pitch X 2999

Pitch Y 3000

Fill CurrentBoard ☐

Region Edge Overlap Region

8) Go to Component Assignment Editor. Fill the following information

- Search Area Width
- Search Area Height
- Pitch X
- Pitch Y

9) Tick Fill CurrentBoard to fill the current search areas with current mouse pointed board

10) In region edge, choose between overlap region and within region to select whether overlap the boundary or within the boundary of the coverage. (See next slide for reference)

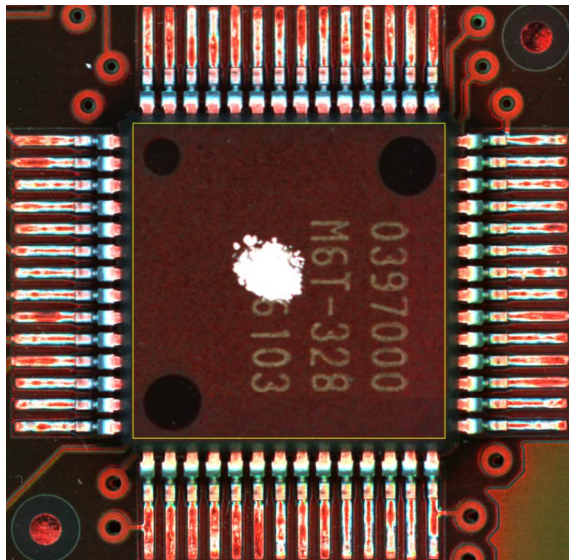
11) Press preview if done. Press Next again after check that the locations is correct on the view.

Components 4



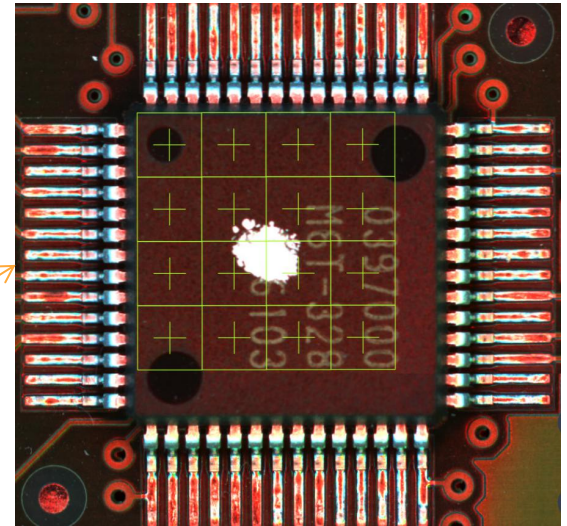
Add Component In Full board view

(10)

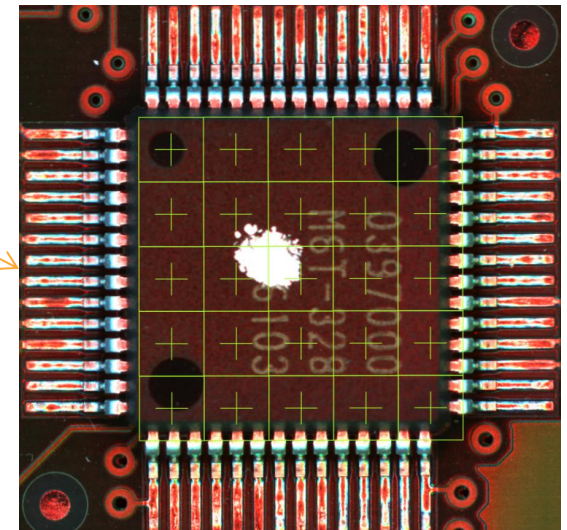


Draw a region

Within region



Overlap region



Add Component In Full board view

12) Check on the list to verify if it is at correct position

13) To check for specific board ID list, use sort by board ID and choose selected board ID list.

13) If want to delete unwanted components, drag and highlight the components, right click and press delete.
(Refer to next slide for reference)

14) Press Done to save the components to the plx.

Add Component Function

List Summary:

Sort By BoardID All Boards

PartNumber UNPOPULATED
Orientation 0
Device Type n0000
Machine mc-1
Shape SHAPE

Boa	RefDes	X	Y
1	unpop-1	31460	162031
1	unpop-2	41460	162031
1	unpop-3	51460	162031
1	unpop-4	61460	162031
1	unpop-5	71460	162031
1	unpop-6	81460	162031
1	unpop-7	91460	162031
1	unpop-8	31460	152031
1	unpop-9	41460	152031
1	unpop-10	51460	152031
1	unpop-11	61460	152031
1	unpop-12	71460	152031
1	unpop-13	81460	152031
1	unpop-14	91460	152031
1	unpop-15	31460	142031
1	unpop-16	41460	142031
1	unpop-17	51460	142031
1	unpop-18	61460	142031
1	unpop-19	71460	142031
1	unpop-20	81460	142031
1	unpop-21	91460	142031
1	unpop-22	31460	132031
1	unpop-23	41460	132031
1	unpop-24	51460	132031
1	unpop-25	61460	132031

Components 196

Back **Done**

(13)

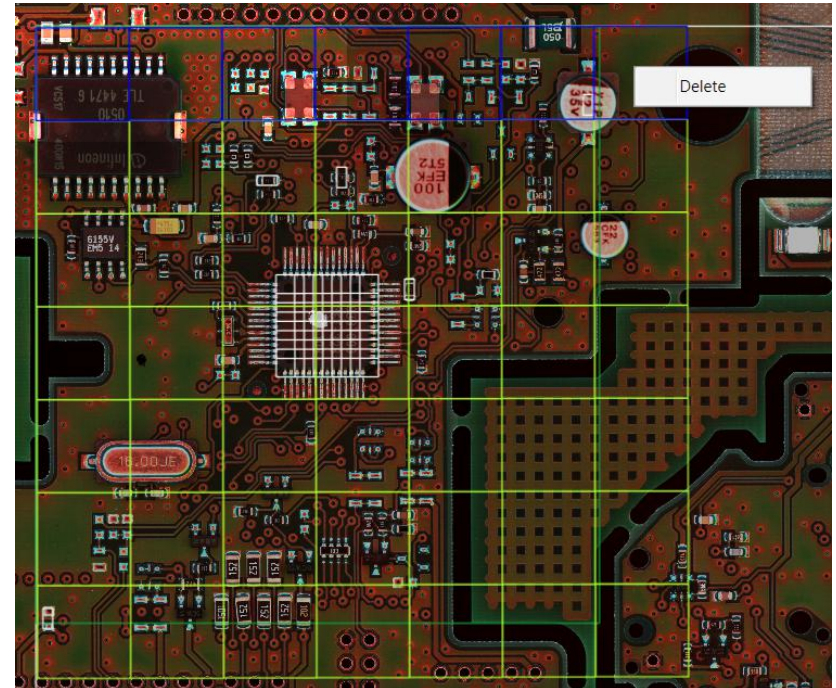
(12)

(14)

Add Component In Full board view

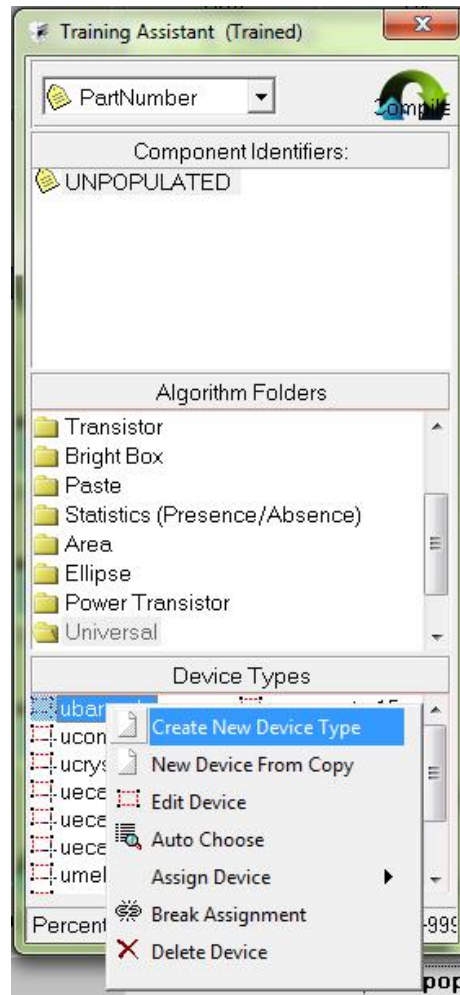


(11)



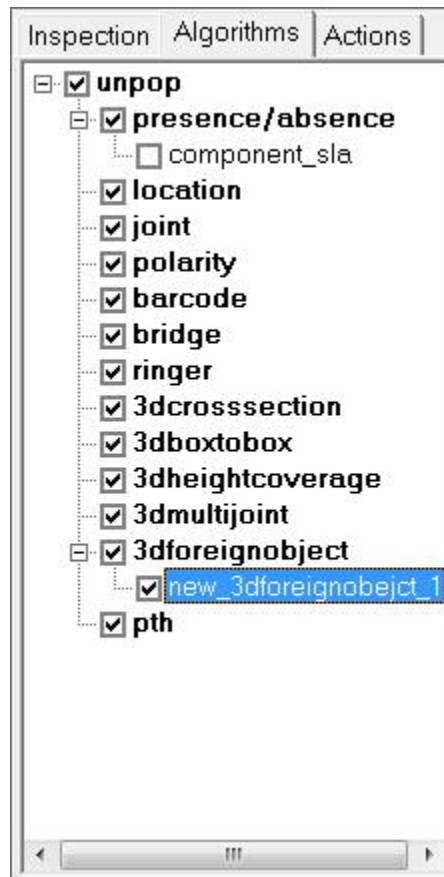
(14)

Assign Algorithm



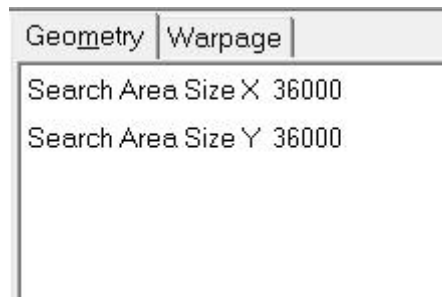
Assign a new U-type to **UNPOPULATED** Part Number.

Foreign Object Inspection



Add **3dforeignobject** algorithm.

Foreign Object Inspection



The screenshot shows a software interface with two tabs: 'Geometry' and 'Warpage'. The 'Geometry' tab is selected. Below the tabs, there are two text input fields. The first field is labeled 'Search Area Size X' and contains the value '36000'. The second field is labeled 'Search Area Size Y' and also contains the value '36000'.

Set Search Area Size X and Search Area Size Y according to previous Pitch XY setting.



The screenshot shows a software interface with two tabs: 'Geometry' and '3D Inspection'. The '3D Inspection' tab is selected. Below the tabs, there are six settings, each with a label, a value, and a dropdown arrow. The settings are: 'Detect Full Search...' with a green diamond icon and the value 'True'; 'Foreign Object De...' with a yellow cube icon and the value 'Enable'; 'FOD Height Thres...' with the value '100'; 'FOD Gray Thresh...' with the value '25'; 'FOD Size Thresh...' with the value '100'; and 'Small Dot Detection' with a yellow cube icon and the value 'Disable'.

Set 3D Foreign Object inspection setting.

Foreign Object Inspection

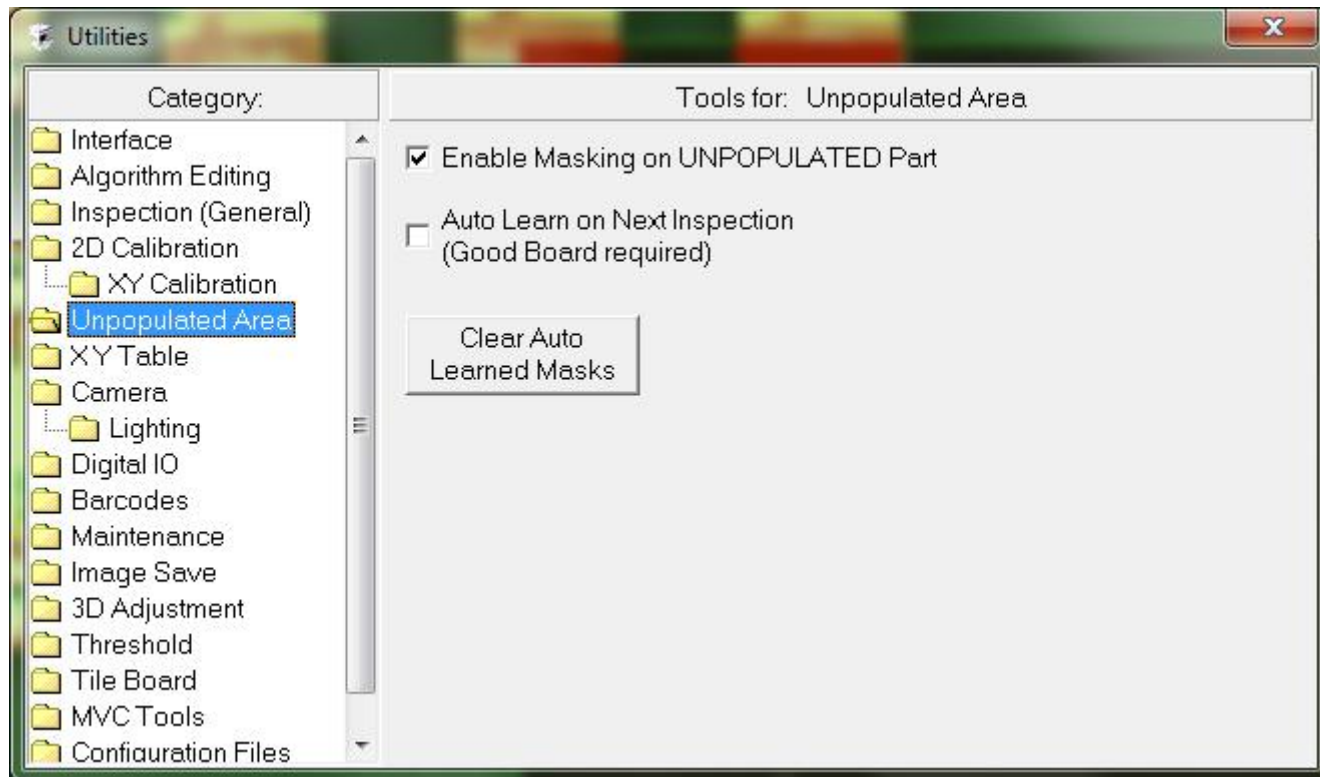


Foreign Object Inspection will detect any object with height.
If any object is detected, **Extra Part** error is reported.

Masking

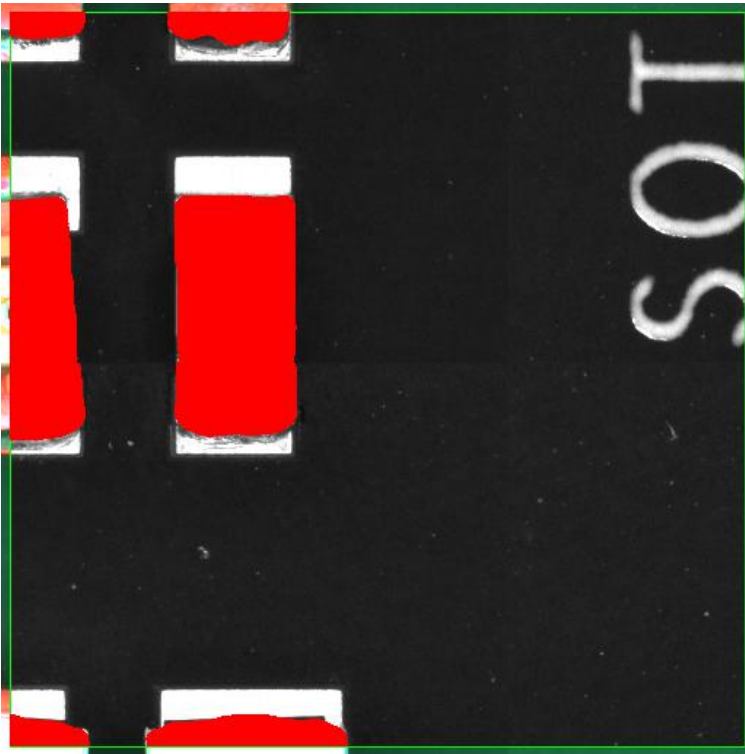
As search areas of UNPOPULATED part always overlap with components, masking is necessary to reduce false calls. There are two types of masking for UNPOPULATED part : **Component masking** and **Auto learned masking**.

To enable masking, check **Enable Masking on UNPOPULATED part** under **Utilities -> Unpopulated Area**.

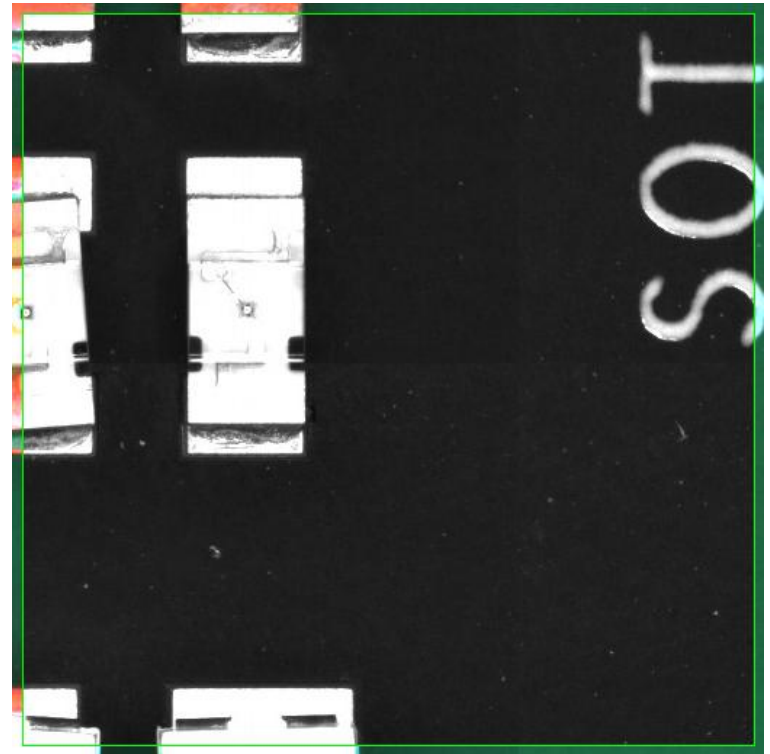


Component Masking

Component masks are based on other components which are not UNPOPULATED part.



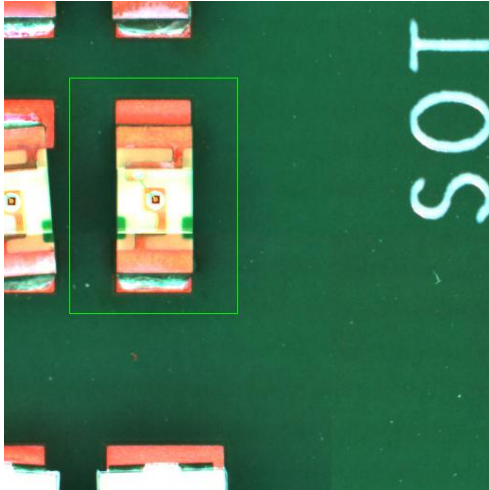
☐ Enable Masking on UNPOPULATED Part



☒ Enable Masking on UNPOPULATED Part

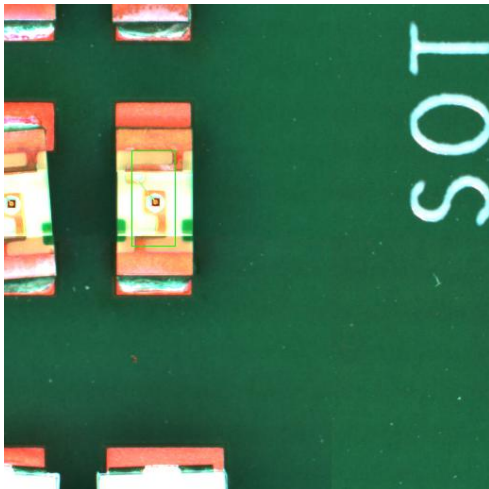
Component Masking

Size of component masks follow exactly size of search area of components.



Search area covers whole LED.

Whole LED is masked.



Search area does not cover whole LED.

Some part of LED are unmasked.



Auto Learned Masking

Component masking is not enough to fully prevent false calls. Some regions on PCB have height but without search area. Therefore, **Auto Learning on Good Board** is required to add masking on those regions.

To perform Auto Learning, do following steps :

1. Load a **good board** into V510.
2. Click **Utilities**, select **Unpopulated Area** and check **Auto Learn on Next Inspection**.
3. Close Utilities and click **Run**.
4. Wait until full inspection on board is done.

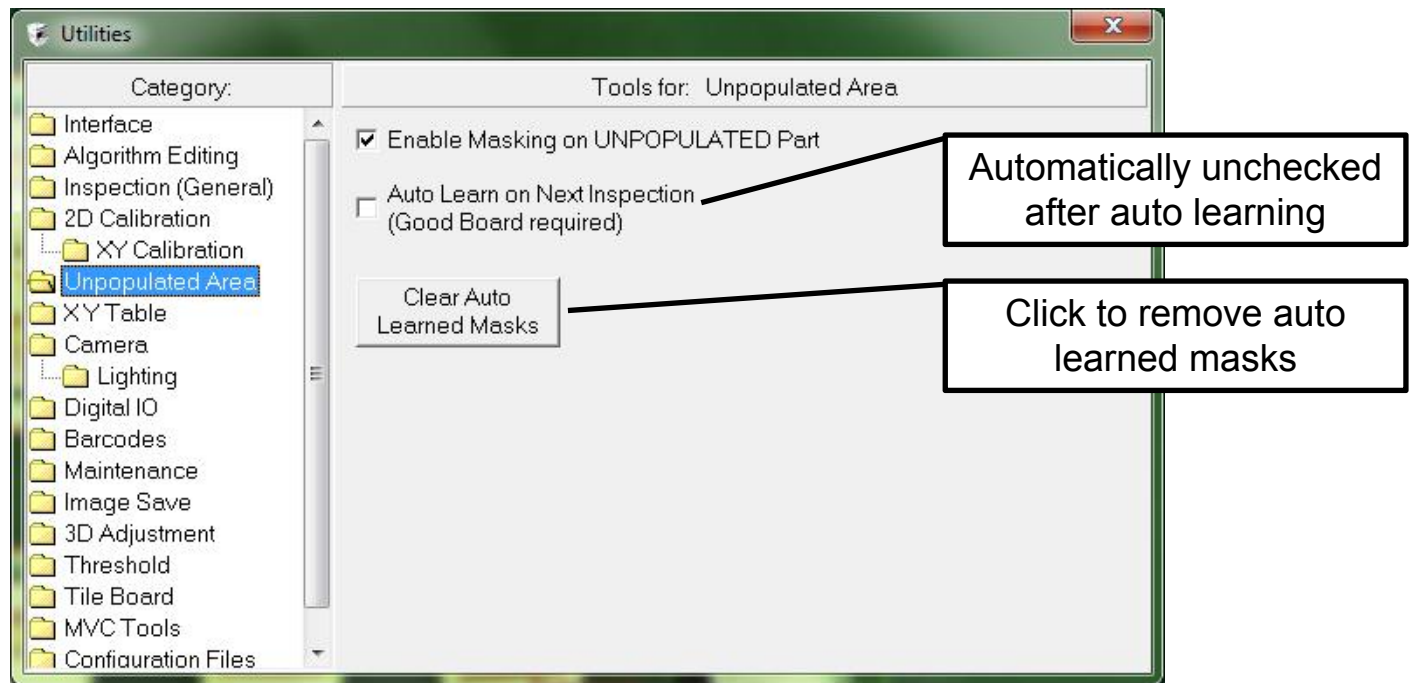


Auto Learned Masking

During Auto Learning, Height Threshold in Foreign Object Detection is overridden by a lower value. With lower height threshold, auto learned masks will have bigger size and thus more robust against height fluctuation.

When auto learning is done, **Auto Learn on Next Inspection** will be automatically unchecked.

In case of auto learning on bad board, auto learned masks can be removed by clicking the button **Clear Auto Learned Masks**.



Thank You