

Orientation Setting



ATOMS
Precision V2

Orientation setting helps to align template contour accurately on to the inspection object contour during measurement operation.

Default orientation is enabled by ATOM when Images or DXF files imported. Manual orientation setup is required when very accurate alignment is needed.

Advanced Orientation setting is done in four steps:

Setting Image axis.

Setting Start lines.

Setting Object axis and

Setting contour alignment.

SETTING IMAGE AXIS

Image axis defines the horizontal and vertical axis of the whole image.

These axis are enabled by default and always active. It serves as a reference for further orientation setting. Image axis marked as Image X and Image Y. Visibility of the images axis changed in Geometry primitives' tool panel.

Select **Start** tab. Select **Import Source base file from** Image source panel.

Select **Orientation.jpg** from tutorials folder.

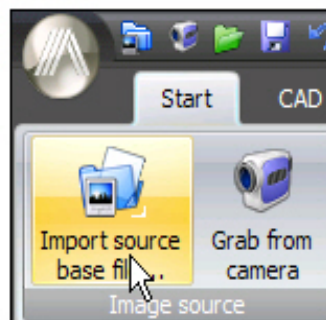


Figure 1

Select **Default** from optical profile selection window.
Click **OK** to open image file in Calibration tab.

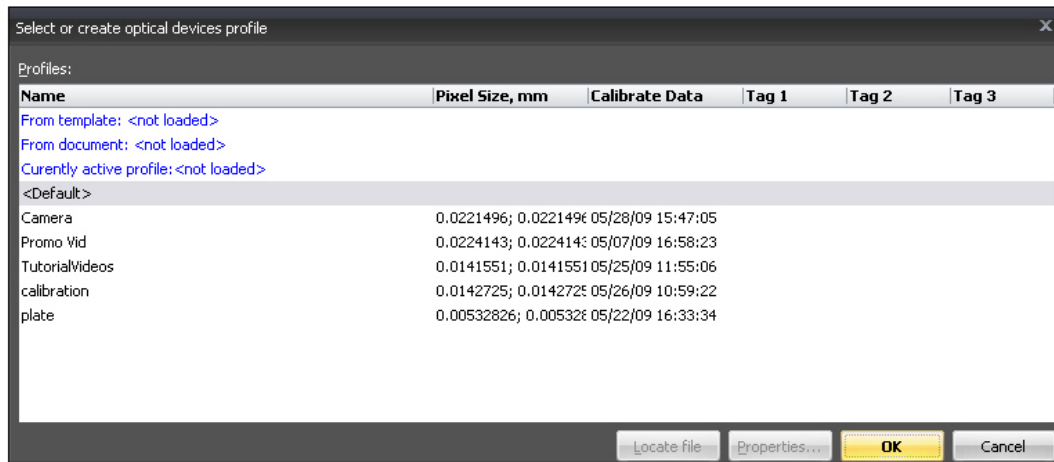


Figure 2

Go to **Orientation** tab. Image axis, Default orientation is displayed.

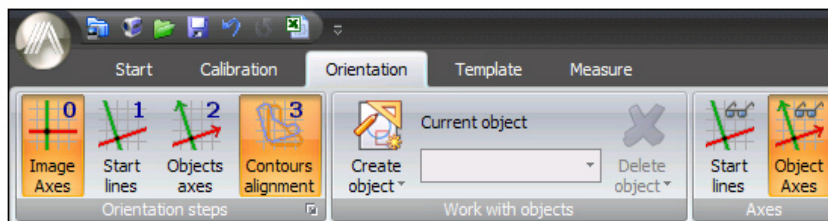


Figure 3

Image axis is reference for orientation setup and it is defined by the software.

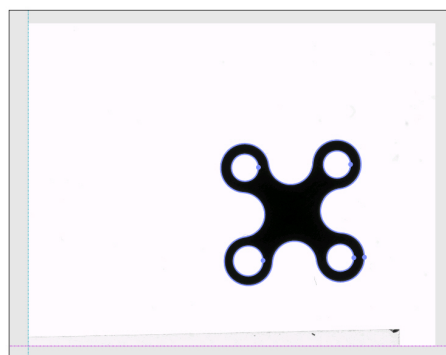


Figure 4

Image axes are made visible and invisible in Geometry primitive panel.

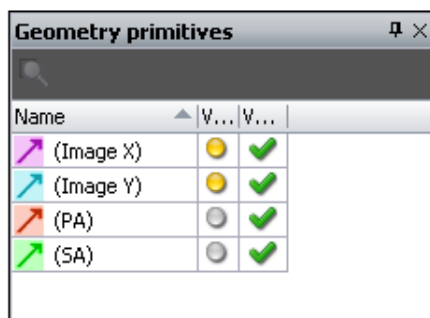


Figure 5

SETTING START LINES

There two start lines. Primary start line and secondary start line. Primary start line is symmetry to image contour in y-axis. Secondary start line is orthogonal to Primary start line and pass through the intersection of primary start line and template contour.

Start lines are defined in two ways. Default setting and manual setting.

In Default setting, Start lines are parallel to image axis.

Click **Start line** button at Axes panel to view start lines.

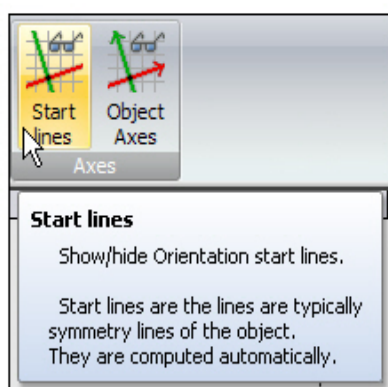


Figure 6

To apply Manual setting select **Start lines** command in Orientation Steps panel.

Primary start line (PSL) is objects symmetry line. Secondary start line (SSL) is normal to primary start line and pass through the intersection of the PSL and object contour.

If there is more than one intersection, Secondary start line can be moved using start line position dialog.

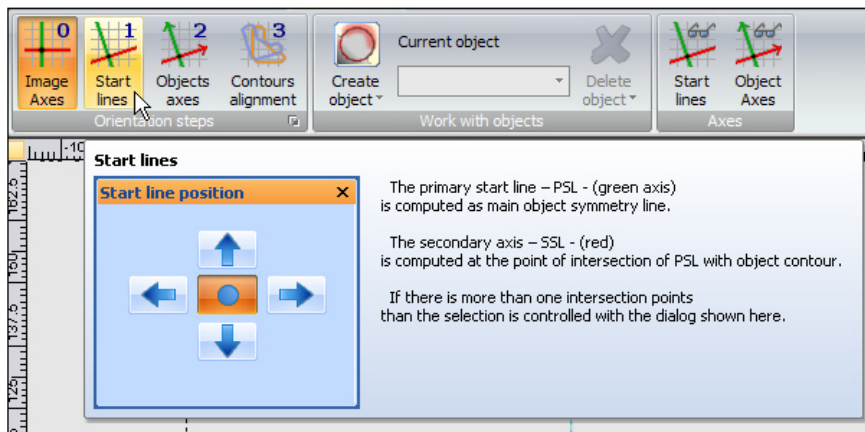


Figure 7

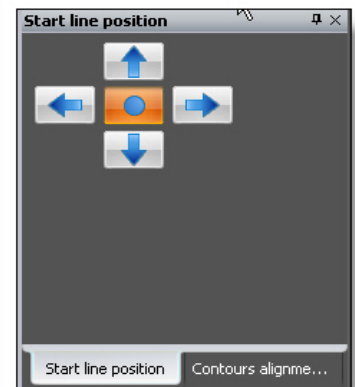


Figure 8

If start lines command in Orientation Steps panel is not selected, PSL and SSL are aligned to image axes, which is Atoms default alignment if Start lines.

SETTING OBJECT AXIS

Object axes are horizontal and vertical axis used for orientation of the template image and they are defined in two ways. Manual assignment of object axis or using atoms default assignment of object axis.

To set object axis manually, identify most stable areas in the template object contour.

Create Geometry objects in template contour by masking those identified stable area and use it to create object axis.

Object axis consists of Primary axis, which is x-axis of the object, and secondary axis, which is normal to primary axis.

Now we create two lines and assign them as object axis. X-axis pass through the slot center and y-axis normal to x axis and pass through hole center.

Select **New Circle for Mask** from Create Object drop down list as shown in figure 9.

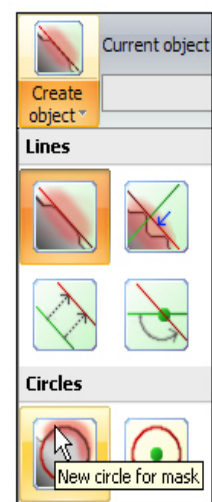


Figure 9

Create two circles by masking.



Figure 10

Select circle object and click **point on circle center** from circle dependents panel. This creates point on circle center. Add point to another circle.

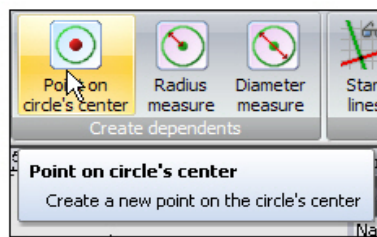


Figure 11

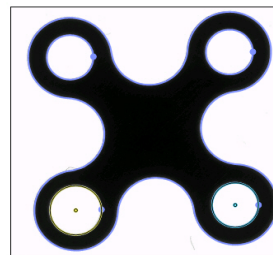


Figure 12

Select **New line between points** command from Create object drop down list. Select two points in Subject panel to create line.

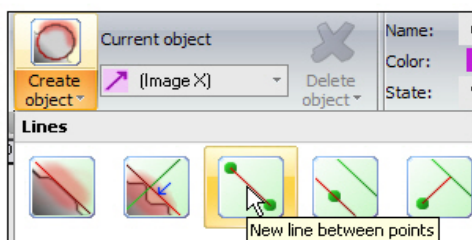


Figure 13

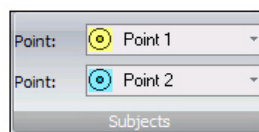


Figure 14

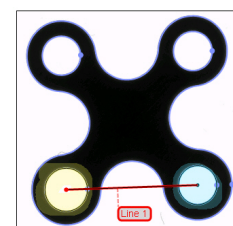


Figure 15

Select **Line on an angle to a specified line coming to a specified point** from create object drop down list.

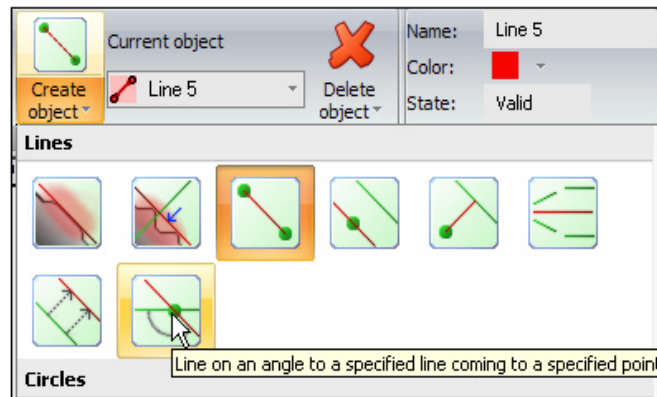


Figure 16

Select Point and a Line in Subjects panel.

Enter Angle value in Geometric properties panel.

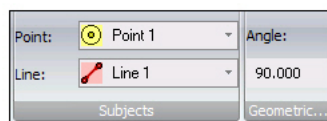


Figure 17

New line normal to horizontal line and pass through center point is created.

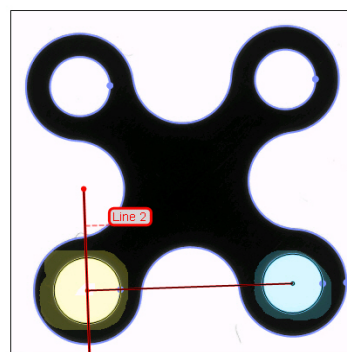


Figure 18

To view object axes **select Object Axes** from Axes panel.

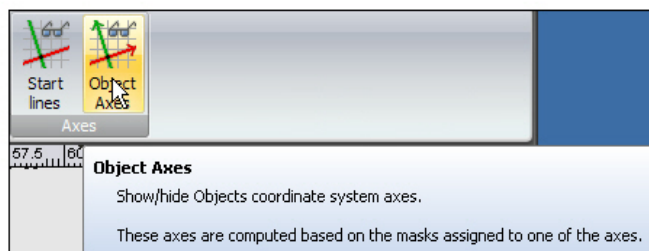


Figure 19

Select Object axis from Orientation steps panel.

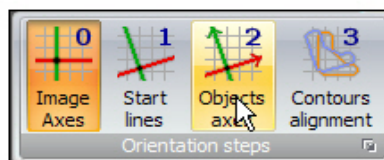


Figure 20

In object orientation axes panel set Line 1 to primary axis and Line 2 to secondary axis.

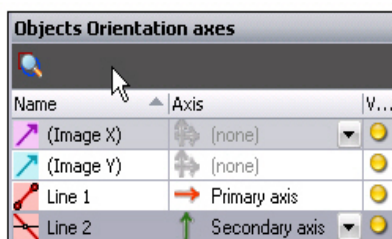


Figure 21

Object axes set to Line1 and Line2

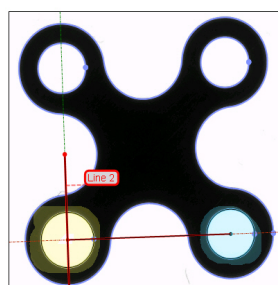


Figure 22

SETTING CONTOUR ALIGNMENT

Contours alignment is the third and optional step of orientation setting. Orientation is performed by moving and rotation method by matching template contour to inspection object contour.

This alignment can be performed either using default start line and object axes setting or by using Manual start line and object axes setting.

Select **Contours alignment** from Orientation steps panel.

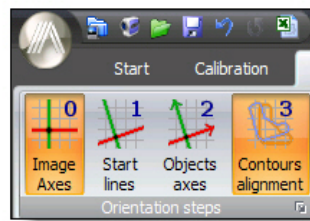


Figure 23

Selection window pops up. Select **YES** to use default Object axes and start lines.

Select **No** to use manually setup of Object axes and start lines.

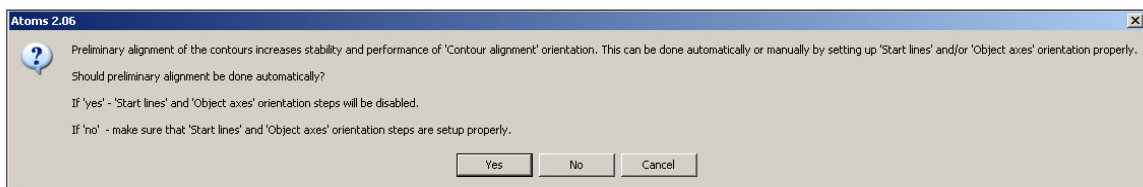


Figure 24

Contour alignment properties window appears. Use contour cropping mask tool to remove area from contour alignment calculation. Use these option to remove unwanted area line clamps and holders.

Select Pre-Orient by center option:

Off – Atoms will try to match template's and inspected object's contours anyway;

On – Matching done by calculating center of mass of both template and inspected object contour.

Auto – ATOMS checks if there are breaks in one of the contours and selects pre-orientation by centers mode, automatically.

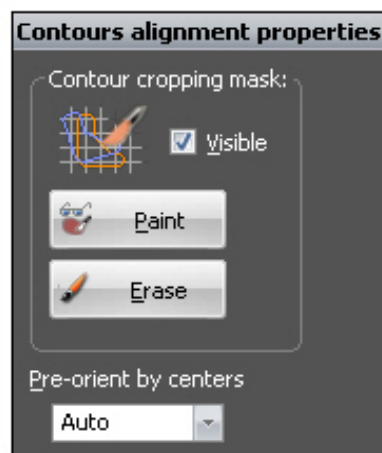


Figure 25

