

# Create Geometry Objects



ATOMS  
Precision V2

Welcome to the Atoms precision tutorial series.

This tutorial focuses on Creating Geometry Objects such as Lines, circles and points on an object contour in Atoms Precision v2.

To start with, we will import an image file and create a few circle objects.

Go to start tab. Select **Import Source Base File** and select **CreateGeometryObjects.jpg**. Select default optical profile file.

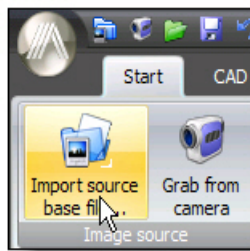


Figure 1

Geometry objects can be created in Template and Orientation tab. We use template tab to create geometry objects.

You will find the commands required for creating geometry objects in the **Create Object** drop down list. The commands are grouped by type in three categories lines, circles and points.

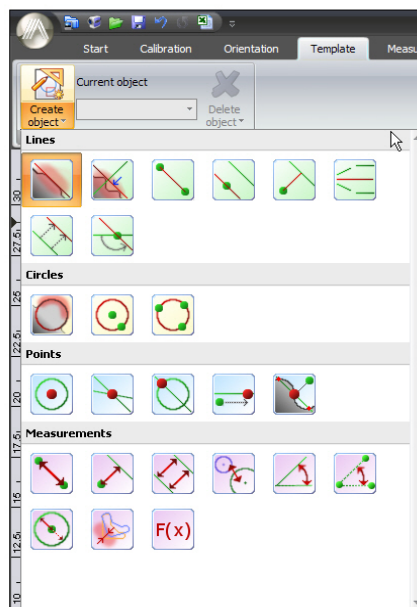


Figure 2

In order to create Geometry Objects in Atoms Precision V2 we use the unique Masking Tool.

You can simply paint over an object contour to let Atoms Precision V2 identify where to create the object on. Additionally, new geometries can be often derived from existing Geometry Objects.

So, to create a circle as object, select the **New Circle From Mask** button from the create object dropdown list.

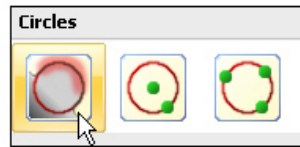


Figure 3

The cursor will change to a painting tool with which you can mask the object contour. Painting tool size can be increased or decreased by changing the value in the task bar or by dragging Left mouse button while holding the CTRL key pressed.

Now, Mask the desired object contour and select the point on circle center button from create dependents panel.

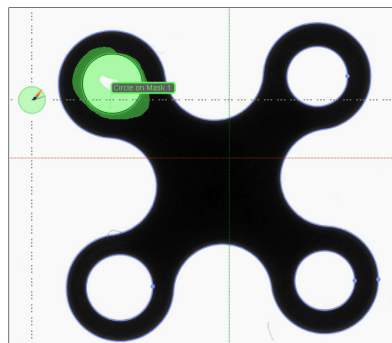


Figure 4

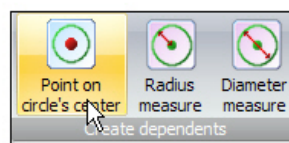


Figure 5

Let's create three more circles with a point on its center.

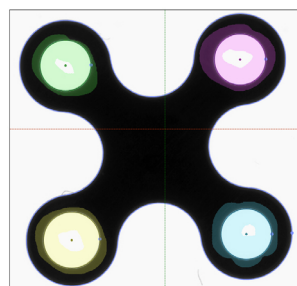


Figure 6

Next, we create a circle using two points.

Select the **New Circle on Two Points** button from the create object drop down list and choose Center Point and Radius Point from the Subjects panel.

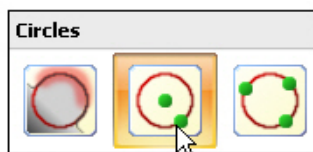


Figure 7

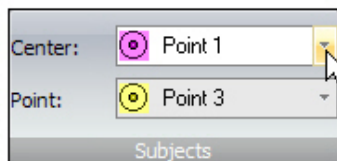


Figure 8

Next we are going to create line objects, the commands required to create line objects are listed in the Create object drop down list.

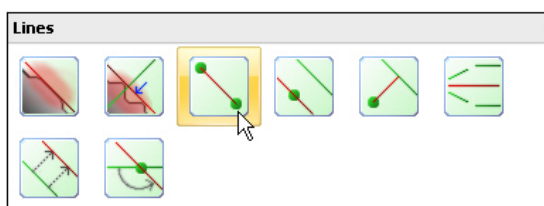


Figure 9

First select the **New Line Between Points** command and choose point 1 and point 2 from the Subjects panel.

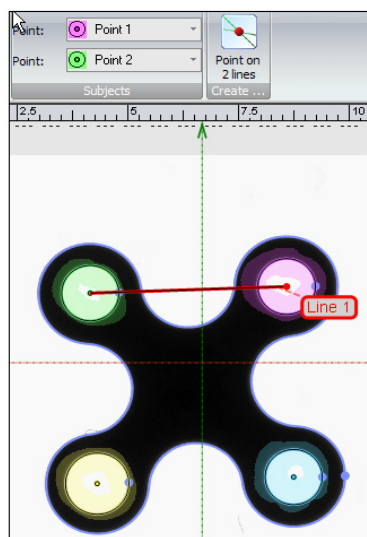


Figure 10

Furthermore, you can create one more lines between point two and point three.

Next, we are going to create a line passing through a point and perpendicular to a line.

For this, select the **New Line Passing Through A Point and Perpendicular to a Line** button and Select point 4 and Line 2 from the subject panel.



Figure 11

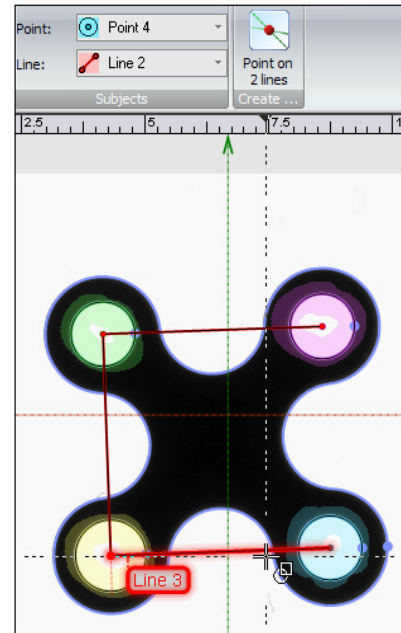


Figure 12

Now we are going to create a line passing through a point and parallel to a line. Select the **New Line Passing Through a Point And Parellel to a Line** command and this time choose point 4 and Line 2 from the subject panel.

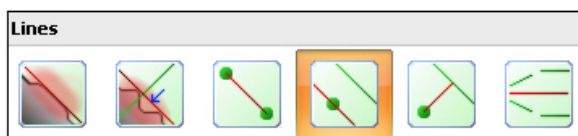


Figure 13

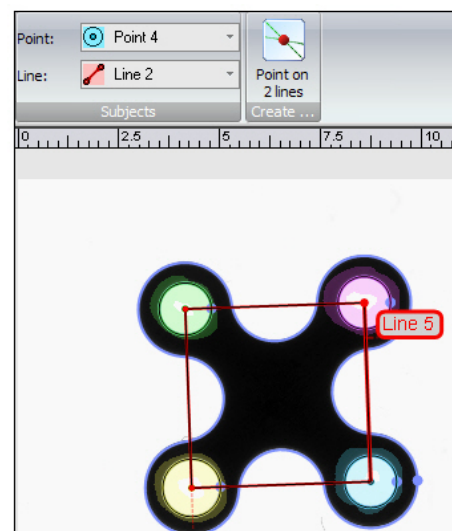


Figure 14

To create a mid line parallel to two lines, select the **New Line Parallel to a Line** command from the create object drop down list and select Line 1 and line 3 in subject panel.

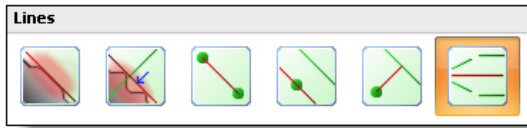


Figure 15

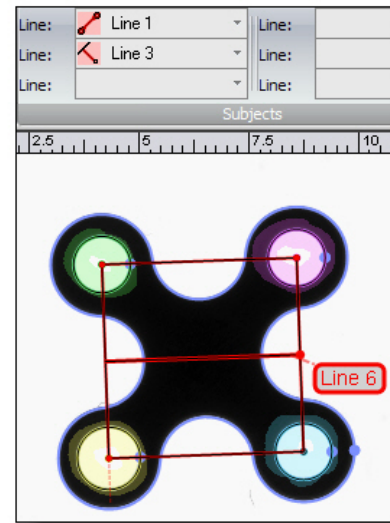


Figure 16

The following part will deal with how to create point objects. In Atoms Precision V2, there are five commands to create point object.



Figure 17

To create a point on the intersection of a line and a circle, select the **New Point of Intersection on Line and Circle** button from the create object drop down list and select line1 and circle on mask 1 from the Subjects panel.

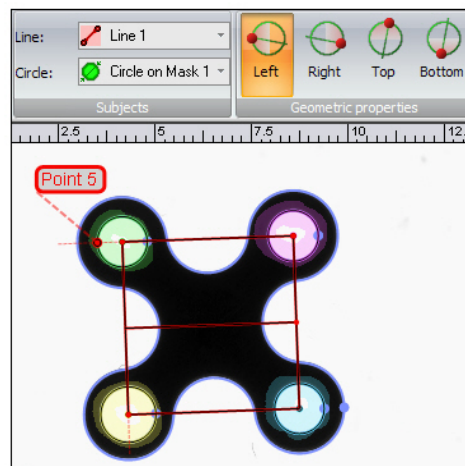


Figure 18

There is an additional option to select the right or left intersection points in the geometric properties panel.

To create a point along a line direction, select the **Point at a Distant** command and select line1 and point 4 from the subject panel.

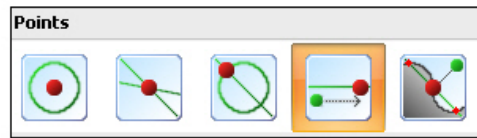


Figure 19

There are two additional options to select from in the geometric properties panel: In-line and along line.

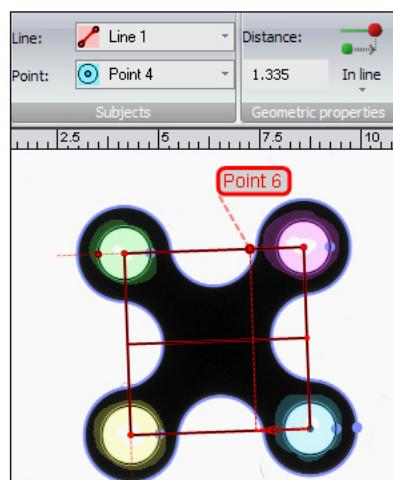


Figure 20

In-line projects the selected point on to the line and offset by a distance.

Along the line offsets the point towards the line. In this case select the in line option and enter 10mm as offset distance.

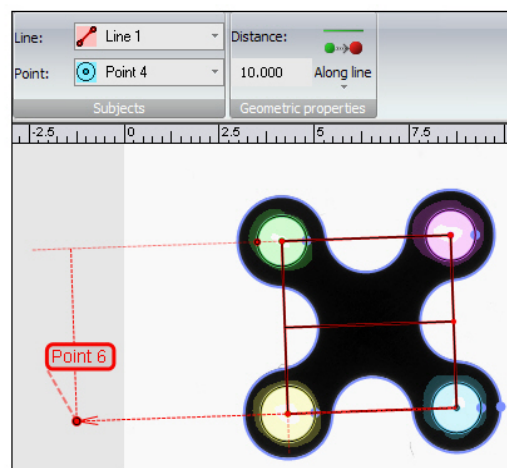


Figure 21

To create point objects at the intersection of a line and a object contour, select the **Point On Line and Object Contour Intersection** button



Figure 22

and select line1 from the subject panel.

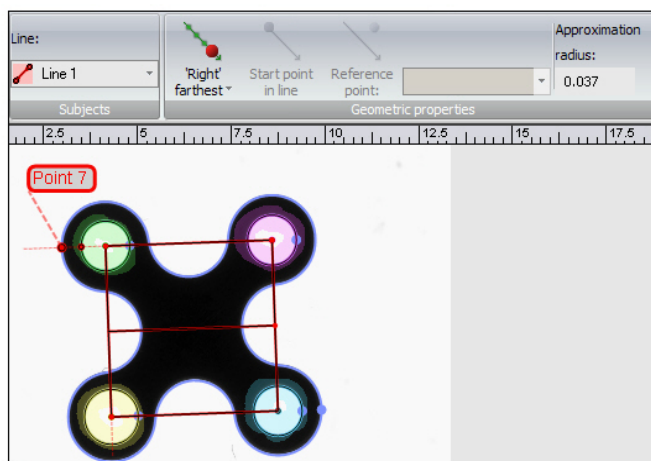


Figure 23

There are four options to select from in Geometric properties panel: Point at left farthest, Point at Left Closest, Point at Right Closest and Point at Right farthest.

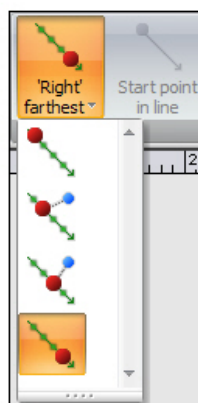


Figure 24

For Left closest and Right closest options, a reference point is required and Atoms Precision V2 will select a line end point as reference by default. If required you can specify your own reference point.

For this tutorial I select the **Right farthest** option and my new point is being created on the object contour.

Next, we are going to create line objects using masking. For that, we are going to import a DXF file and start by creating a new line with the masking tool.

Go to start tab. Select import source base file and select **CreateGeometryObjects.dxf**

The Line object is created based on the masking of the object contour. To create an accurate line object we need to make sure the required object area is masked.

Select **New Line for Mask** from create object drop down list and mask the object contour.



Figure 25

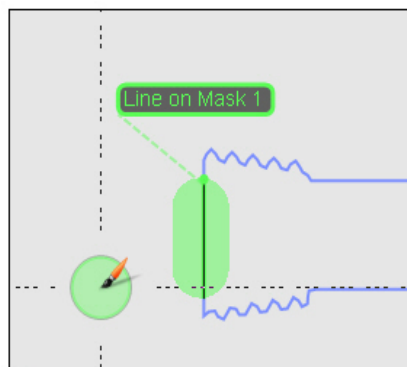


Figure 26

Now, we are going to create tangent lines, which we also call magnetic lines.

ATOMS Precision V2 has an advanced line creating command called **New Line Masked and Guided**. Using this command, we can create tangent lines on any contour profile whether it is a defined geometric shape or irregular profile.



Figure 27

To create tangent line on a curved contour, select the **New Line Masked and Guided** command from the create object drop down list and mask the contour area.

Select **Line 1** as guide curve from the Subjects panel. There are two options to select from in geometric properties panel tab: Strictly orthogonal to the guideline and Roughly orthogonal to the guideline.

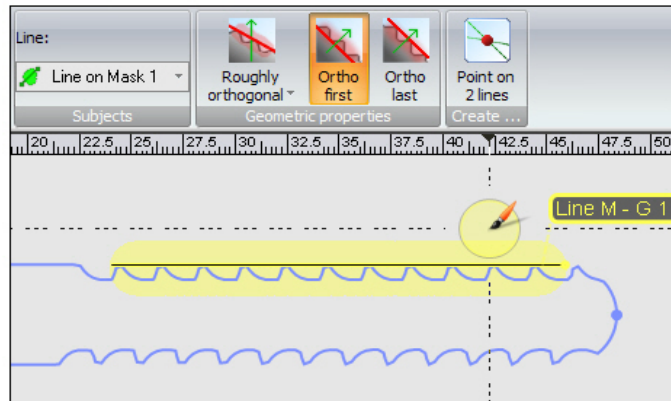


Figure 28

Strictly orthogonal creates tangent line normal to the selected guide curve, whereas roughly orthogonal creates tangent line based on the masked contour and the line created is roughly orthogonal to the selected guide curve. For our case in the tutorial, I choose **Strictly Orthogonal** to guideline.

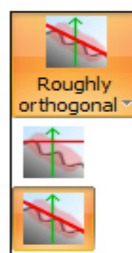


Figure 29

Next, we need to specify ortho first or ortho last option. Ortho first is to create a line, which applied to the first linear part of the contour. Ortho last is to create a line, which applied to the last linear part of the contour. Once again, for our case, we select the **Ortho First** option.

We call this line a magnetic line and it is very useful to create line objects on taper and irregular contour profiles.

