

Microscribe Digitizer

The Microscribe digitizer is supported through a Rhino plugin, which allows the digitizer to act as a 3D hardware input device for controlling the graphic input to Rhino.

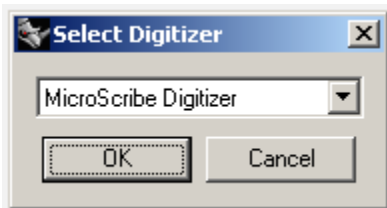
How does it work?

Digitizers contain sensors that read a location in 3D space. The machine has pedals, with the primary one functioning like the button on the computer's mouse.

Process

At the digitizer station, open Rhino and type *Digitize* at the Command prompt. [You may also open the tools menu and choose "3-D Digitizer" and then choose "Connect"].

You will next be prompted to select what type of digitizer you will be using. Make sure the "MicroScribe Digitizer" option is selected, and click OK.



Confirm that the green light near the base of the digitizer is on. If not, turn it on, and check the cables attaching the digitizer to the computer and the foot pedals.

Calibrating the Digitizer

To calibrate or not? You can utilize the existing [aka "native"] digitizer coordinates **if** the digitizer can easily reach all parts of the model you wish to scan. However, you should calibrate the arm yourself if your model is too complex or too large to be digitized without moving the model. This permits you to re-calibrate the digitizer after moving your model to coordinate the digitized points from the different scanning phases [before and after moving the model].

This process involves identifying the origin and X and Y axes in the physical world and the corresponding origin and axes within Rhino. The actual points on the digitizer must be linked to your model, and it is important that the model not move relative to these points. If your model is light, you may consider fastening it to the surface.

Move the tip of the digitizing stylus to the point on the model you would like to use as the origin, and step on the left pedal of the digitizer. Follow the remaining prompts in Rhino to identify the X and Y axes—with the X axis being a left-right axis, the Y axis moving towards and away from you, and the Z-axis moving up and down (vertically).

When you identify these points in the physical world, you are then prompted to identify the origin and axes within the Rhino modeling space. Use your mouse to select the origin and axes in response to the screen prompts.

Capturing Geometry

After opening the digitizer plug-in and calibrating the digitizing arm, you will be able to use it as a 3D input device in conjunction with a large assortment of tools. Consider it as a 3D mouse – any command you might use in Rhino can be used with the digitizing arm, describing the geometry rather than the standard mouse.

Several common ways of digitizing are as follows:

Points

The simplest way to capture geometry is through a stream of points. *Right-click* on the Point icon, which tells Rhino you will be capturing multiple points instead of just one.

Next, work in a precise and methodical manner. Make sure to keep the tip of the arm in contact with your model, and click with on the right foot pedal to create individual points while pulling the digitizer tip around the physical model geometry. You can view the points as they are captured in the modeling window. Make sure to adequately cover the surface to be captured.

When you are finished, you can create lines through the points as you normally would with Rhino with the *Curve ThroughPt* command. You can then connect the lines into surfaces through the *Loft* tool.

Lines

You can create lines directly in a similar manner to the point process described above. To begin a line, select the *Curve ThroughPt* command, then click on the right petal until you have finished the curve. Click on the left petal to indicate that you are ending it.

Strategizing an Approach

Think about the digitizing as being able to do any of the basic form making commands in Rhino.

Remember if you have a symmetrical object to use the mirror function to save yourself work.

DigSection

In addition to working with the native Rhino commands, there are also commands available which are specific to digitizer input. Perhaps the best of these is the DigSection command, which automates and regularizes some of the "curves" method described above.

To use the DigSection command, type "DigSection" at the command prompt. Rhino will ask you to define a plane in space at one end of your object. Then, you will define the spatial axis along with that plane will be arrayed. Define the start of the axis at one extreme of your model, and the end of the axis at the other extreme of your model. Then, using a technique similar to the point capturing method above, define a stream of points that stretch across all the section planes. While you are constantly registering points, they will only be created in the Rhino file when they intersect one of the section planes.

At the conclusion of the DigSection command, Rhino will create a series of curves - one in each section plane - based on the number of points that were defined on that plane. These regular curves can then be used to loft a surface, similar to the Curves method above.

When you finish your digitizing, save the model as you normally would in Rhino.

