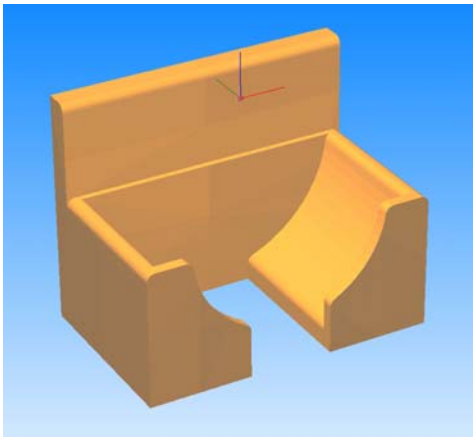
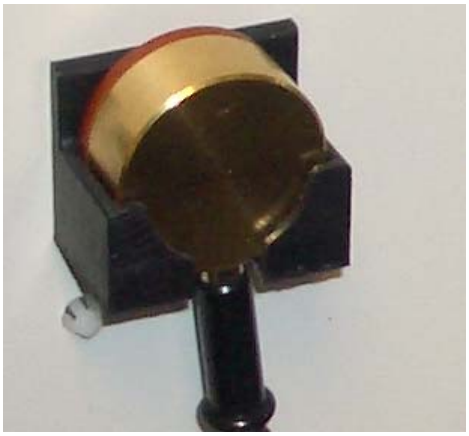
Tool Sensor Holder





This tutorial will guide you through the various steps required of producing a single sided part using the MDX-40 and Modela Player 4. The resulting part is a tool sensor holder that can be used to hold the sensor in a safe, accessible location.

Roland ASD 25691 Atlantic Ocean Drive Suite B-7 Lake Forest, CA 92630 949-655-5555

Materials Required:

•Double sided tape (Duck Brand Heavy Traffic Carpet Tape works great)

•ABS Material Stock (min. 1.5” x 1” x 1.25”)

•Material Source: http://www.professionalplastics.com

•0.250 Flat End Mill (EMF-250-2F-250)

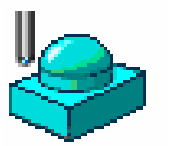
•0.125 Ball End Mill (EMB-125-3F-125)

•0.250(6.35mm) Collet (ZC-23-635, Included with MDX-40)

•0.125(3.175mm) Collet (ZC-23-3175, Included with MDX-40)

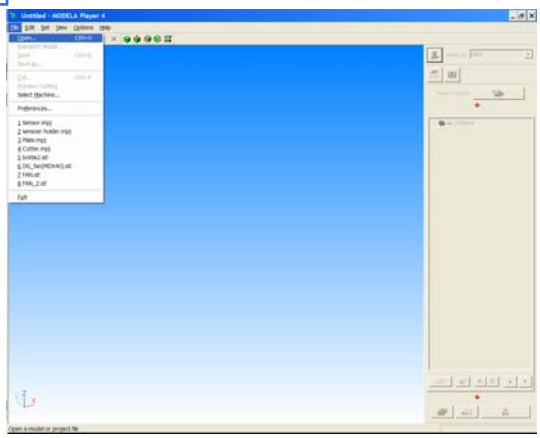
Starting Modela Player 4

1



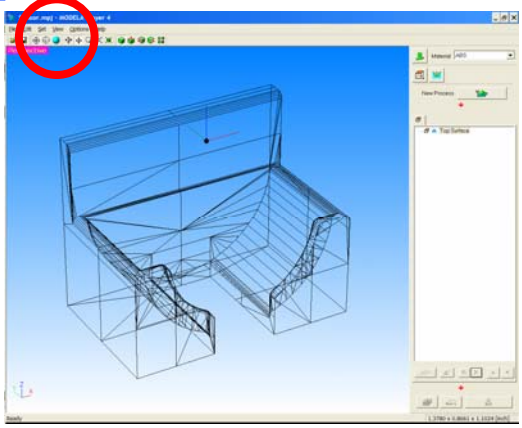
Start Modela Player 4. Either Click on the Desktop Shortcut or **Start** menu, **Programs** and **Roland Modela Player 4**.

2



Click on **File**, **Open**, and select the sensor.stl file or sensor.mpj file. Please note that you need to have Modela Player 4 Version 1.95 or higher to view the .mpj file. You can update to the latest version by going to http://www.rolanddga.com/support/ and downloading the update under current products, 3D software.

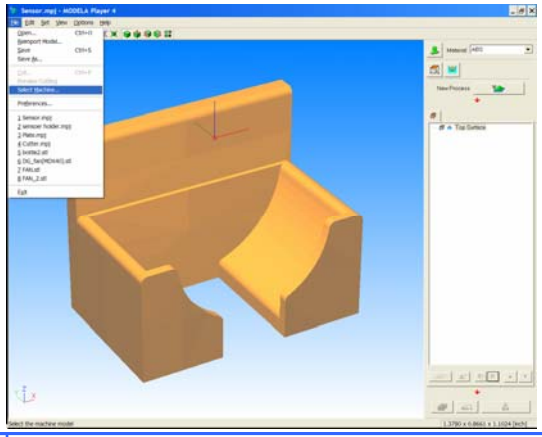
3



To view the part with shading, click on the shading button.

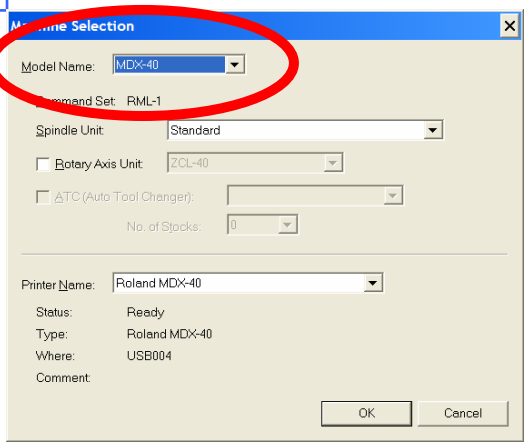
Machine Selection

1



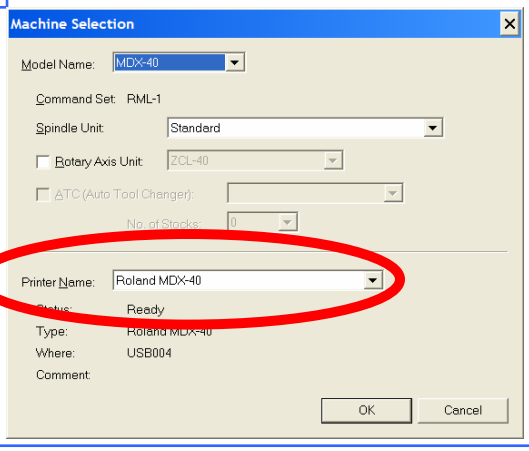
The proper machine and machine driver will have to be selected in Modela Player 4. Click on **File** and **Select Machine** to select the appropriate machine.

2



Select **MDX-40** under **Model Name**.

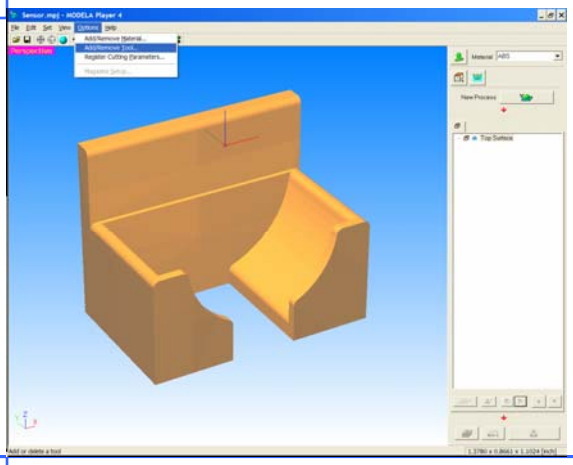
3



Select **Roland MDX-40** under **Printer Name** to select the correct Machine Driver.

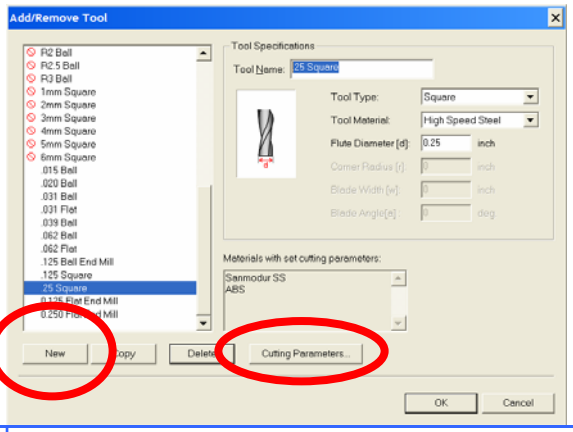
Add Tooling

1



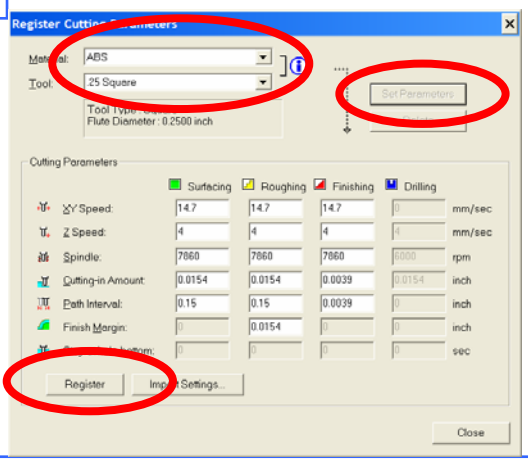
Click on **Option** and **Add\Remove Tool…** to add tools and material information.

2



Select **New** and type in **Tool Name, Tool Type**, **Tool Material**, and **Flute Diameter** for .250 Square Tool. Try to use a name that will easily identify the tool, for example ".250 Square". Select **Cutting Parameters** to start adding cutting parameters for that tool.

3



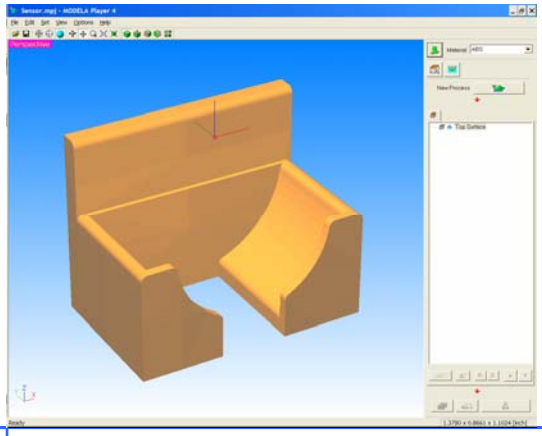
Select **ABS** Material, click on **Set Parameters**, and **Register** to accept the cutting parameters.

Repeat for other possible materials you may use in the future.

Repeat steps 2 and 3 for the ".125 Ball End Mill"

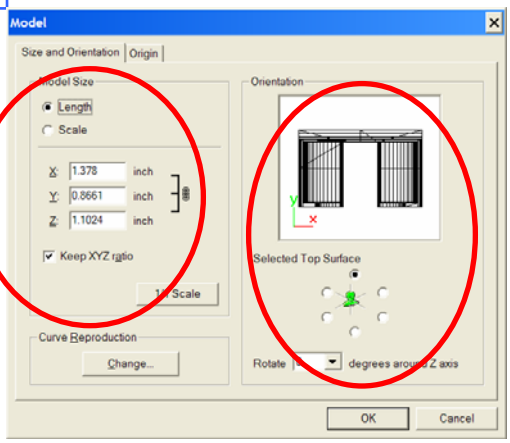
Model Set Up

1



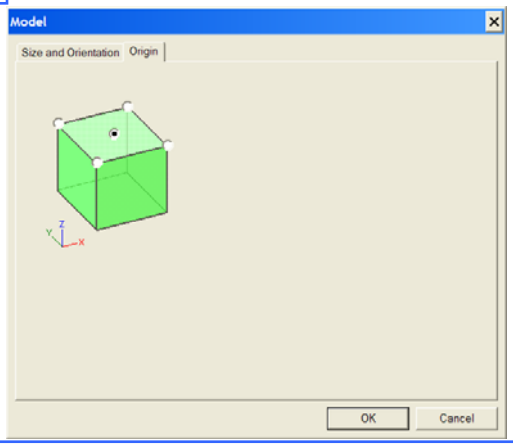
To check the dimensions and origin of the part, click on the **Model** button.

2



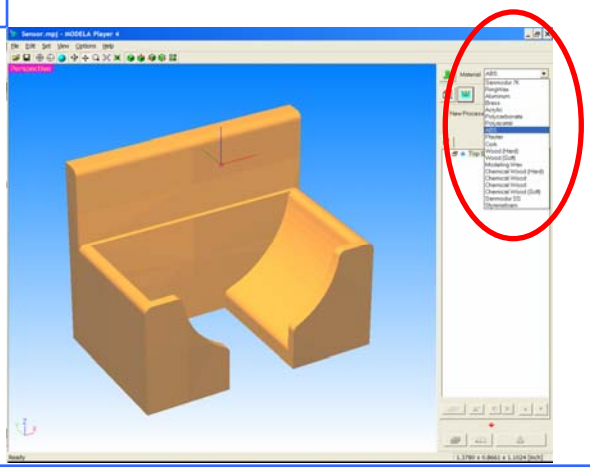
Check the size of the part as well as the orientation of the part. The view in the orientation window is from the top. If you need to change the orientation of the part, you would select the different surface view below the orientation view

3



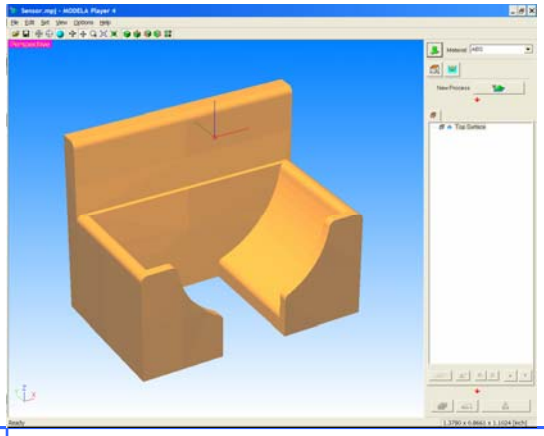
Click on the **Origin** tab and select the center of the part as the new origin. Click **OK** when finished.

Material Selection

1	 Select **ABS** from the pull down material selection.

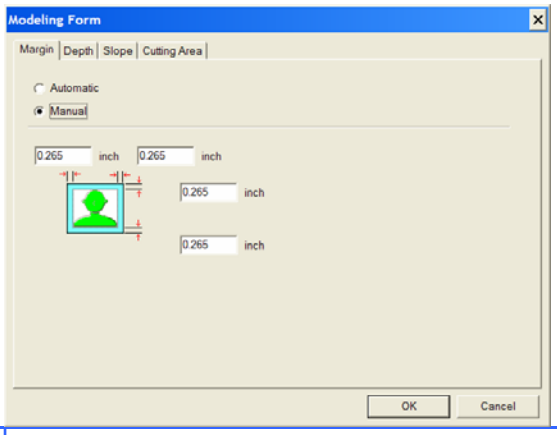
Modeling Form

1



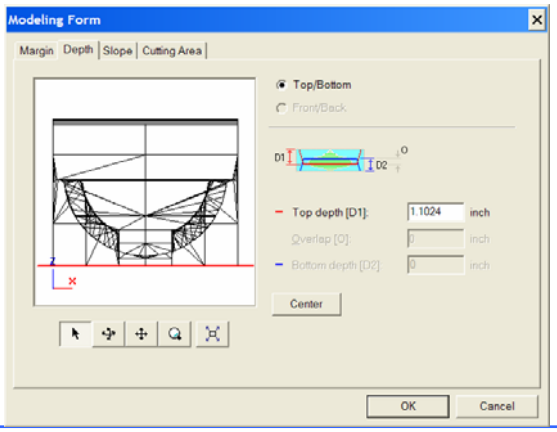
Select **Modeling Form**.

2



This will be the **Margins** around the part. You want the margin to be larger than the largest tool that you will be using. For this example change them to 0.265

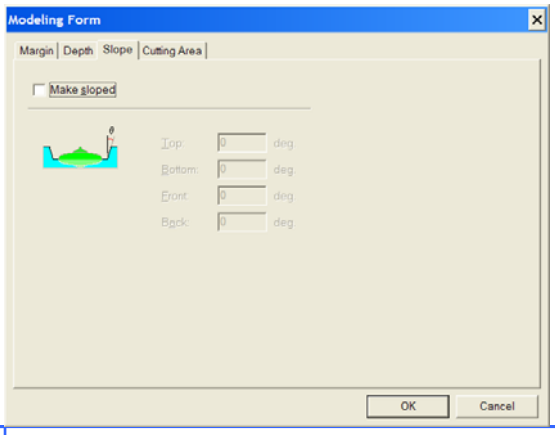
3

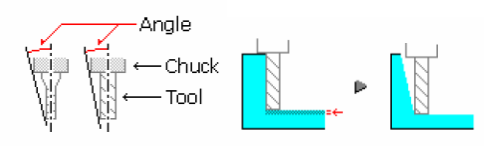


Click on the **Depth** tab. You will be cutting down to the bottom so leave this at the default setting.

Modeling Form

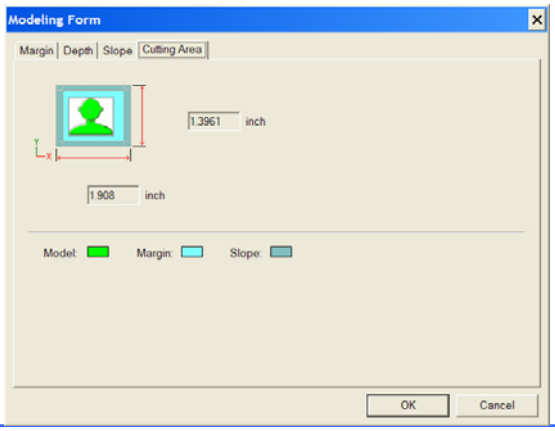
4





Slope will add a slight slope to the side of the material that you are cutting for extra tool clearance if necessary. We won't use this for this sample.

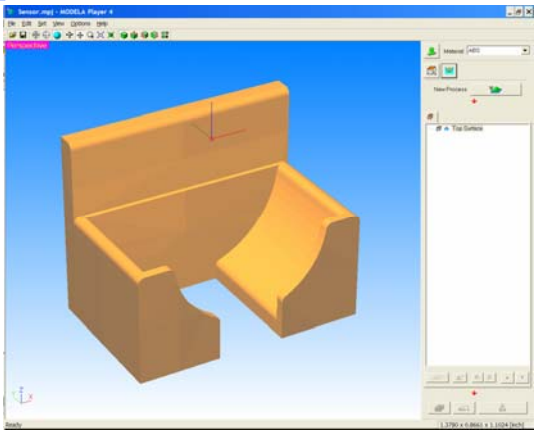
5



Cutting Area will let you know the total area to cut, including part and margins. You need to make sure that your material stock is larger than the cutting area.

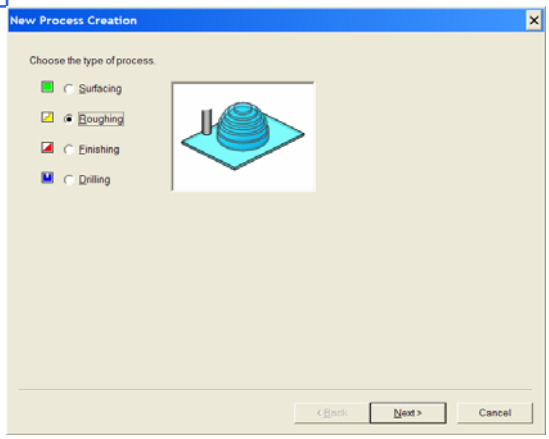
Adding Processes, Roughing

1



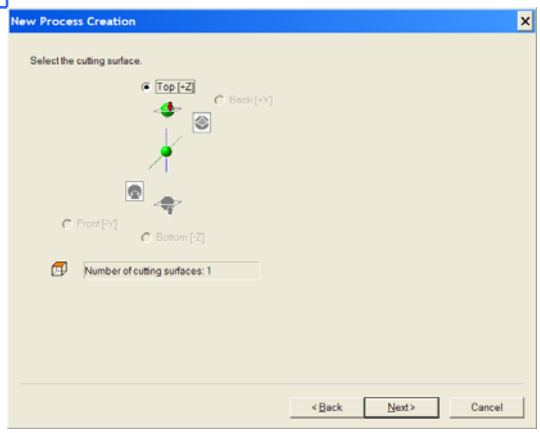
Click on **New Process** to start adding processes.

2



Select **Roughing** and then click on **Next**.

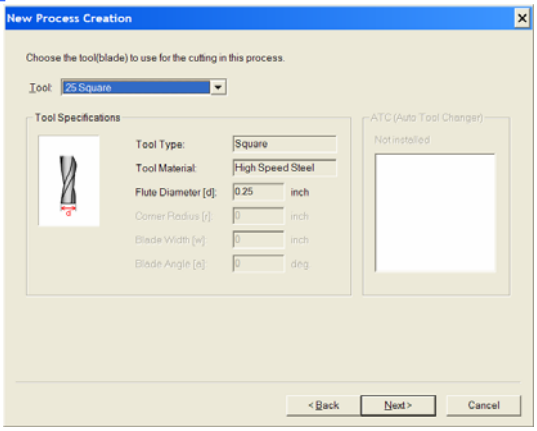
3



You are only cutting on the Top surface so select **Top[+Z]** and slick on **Next**.

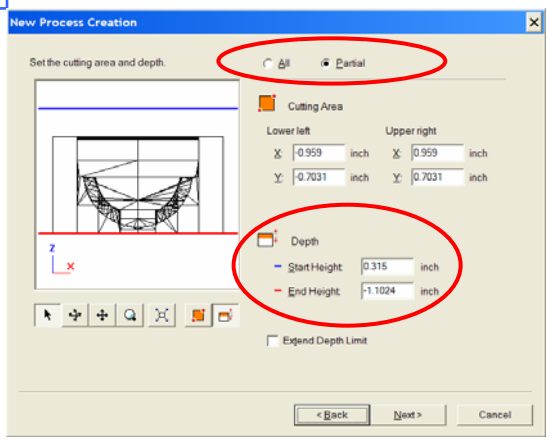
Roughing Process

4



Select your tool, or 0.250 Square for this example. Click **Next** when finished.

5

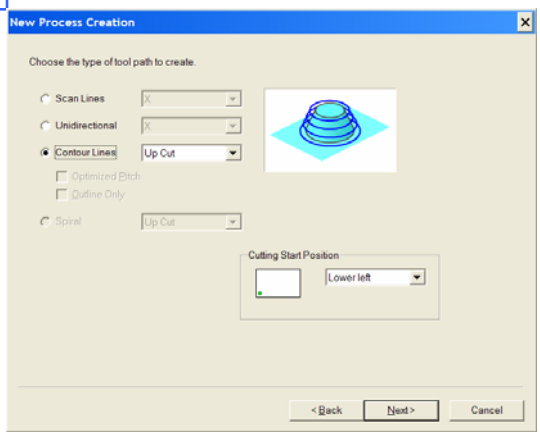


Select **Partial**. You need to change the Start Height of the cutting area, or where the end mill will start to cut. To quickly find it, just follow the below method.

(Material) – (Part Height) = (Start Height)

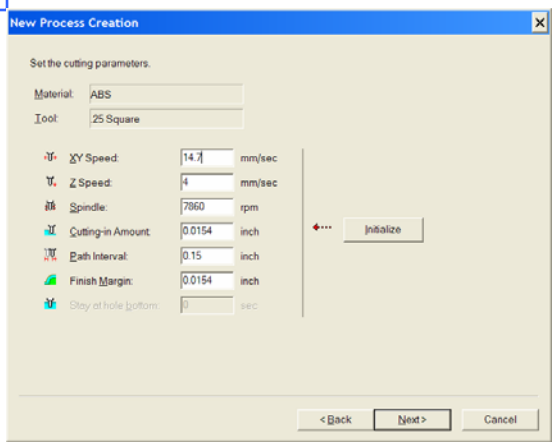
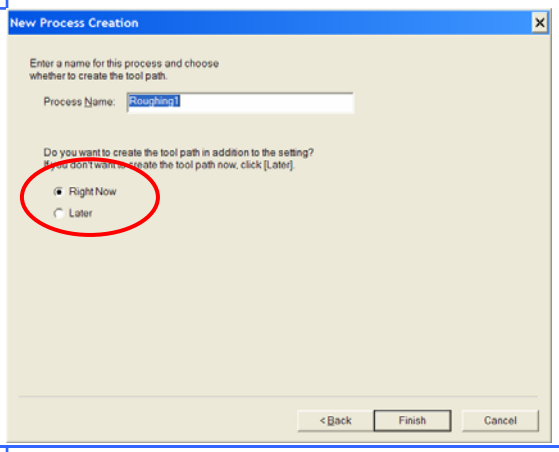
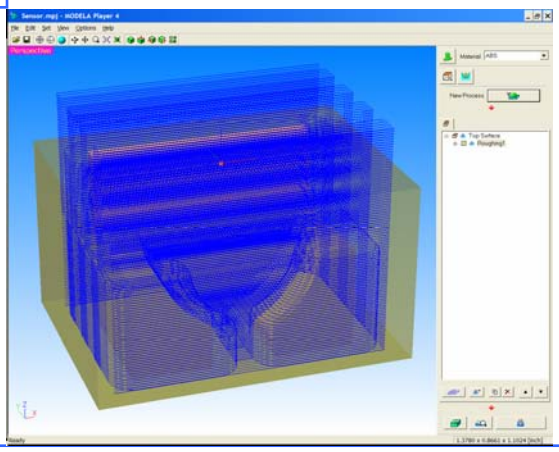
1.4174 – 1.1024 = .315

6



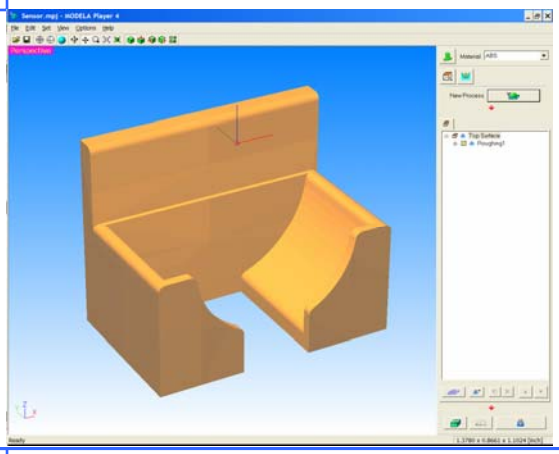
Select **Contour Lines** for the type of tool path.

Roughing Process

7		The cutting parameters will be displayed.
8		The Process name will be displayed and you can either process the tool path **Now**, or **Later**.
9		The roughing tool path displayed after processing.

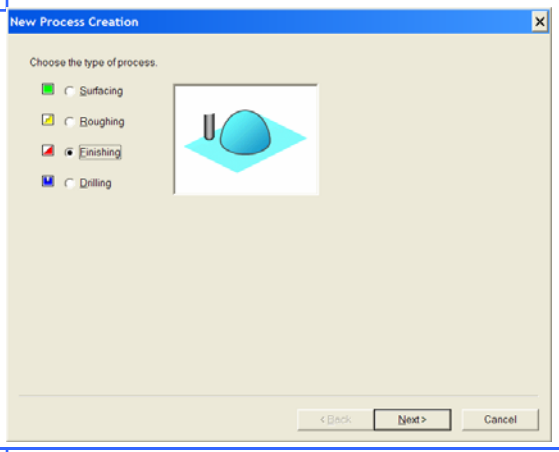
Finish Process

1



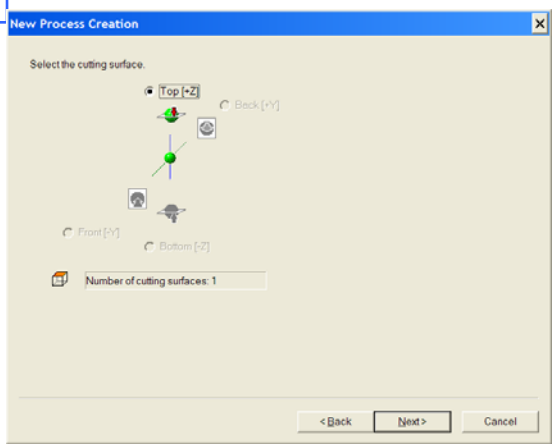
Next you will add the finishing process so click on **New Process** again.

2



Select the finishing process.

3

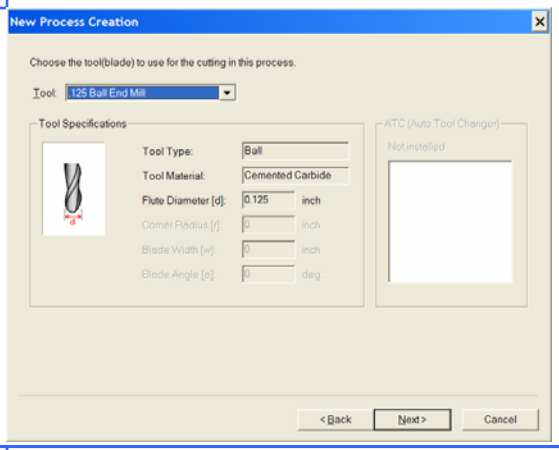


You are milling from the Top.

Roland ASD 25691 Atlantic Ocean Drive Suite B-7 Lake Forest, CA 92630 949-655-5555

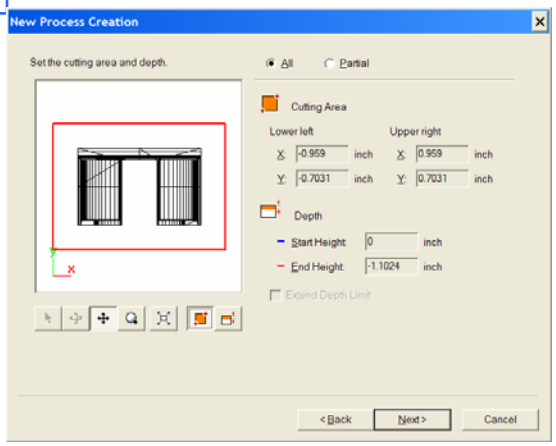
Finish Process

4



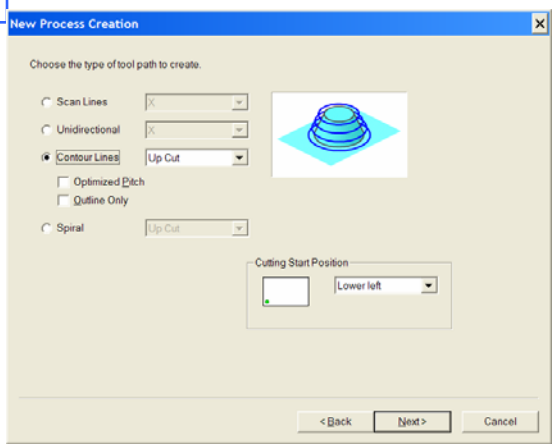
Select the .125 Ball End Mill

5



Select **Partial** again. You want to cut a little deeper this time so select **Extend Depth Limit**. Change the End Height to -1.1524. You will be cutting 0.050” below the bottom of part.

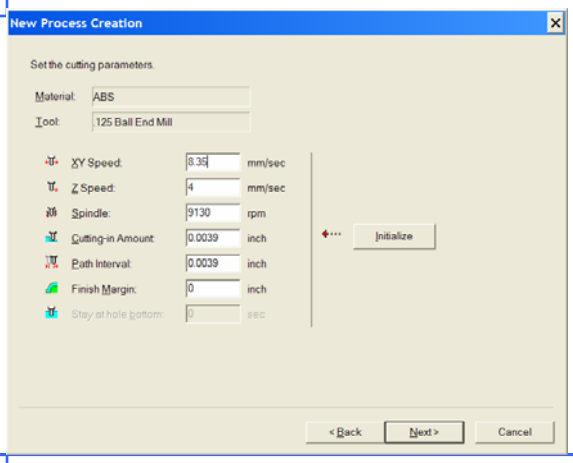
6



Again you are selecting **Contour Lines** for the Tool Path. It may take longer to mill than Scan Lines, but it yields better results.

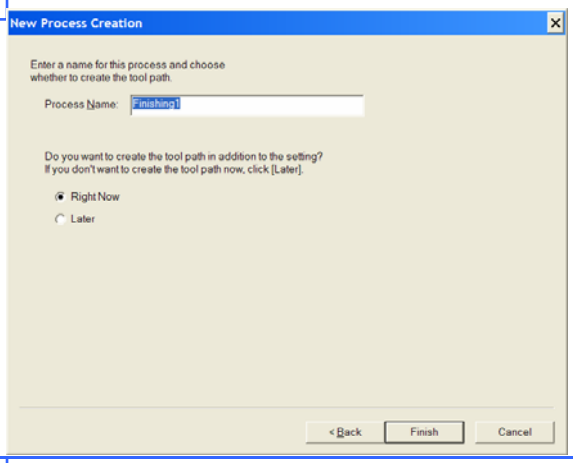
Finish Process

7



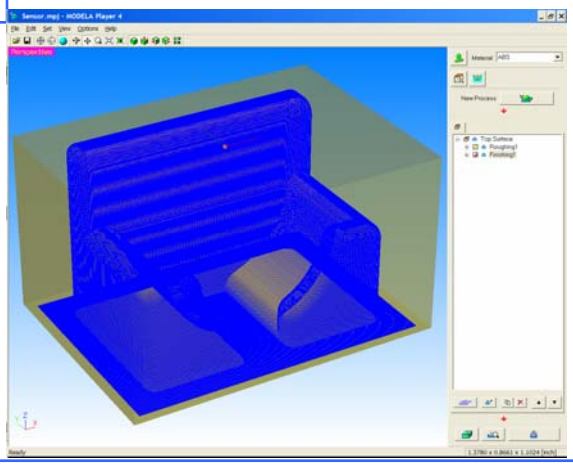
Again use the default settings.

8



Process the finishing process right now.

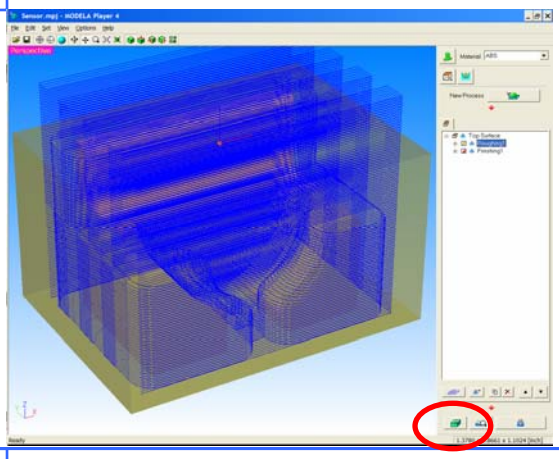
9



Finishing Process tool paths.

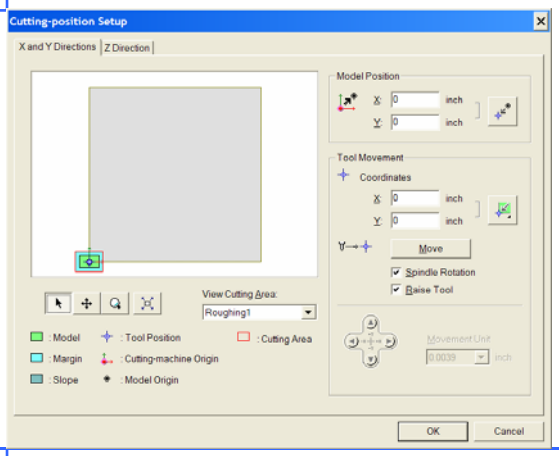
Cutting Position Setup

1



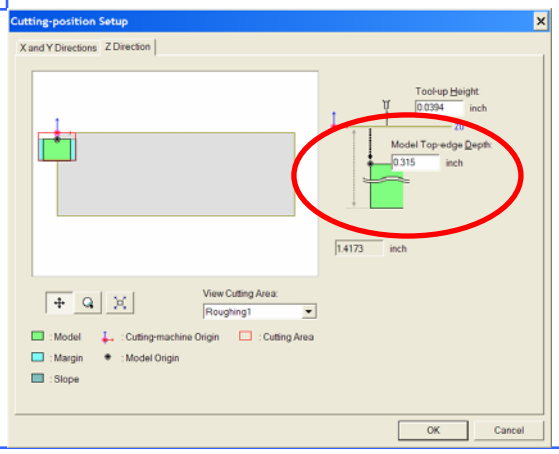
Click the **Cutting Position** setup to setup your material stock.

2



Since you are using the X0.0 and Y0.0 as the center of the part, there is nothing to change here.

3



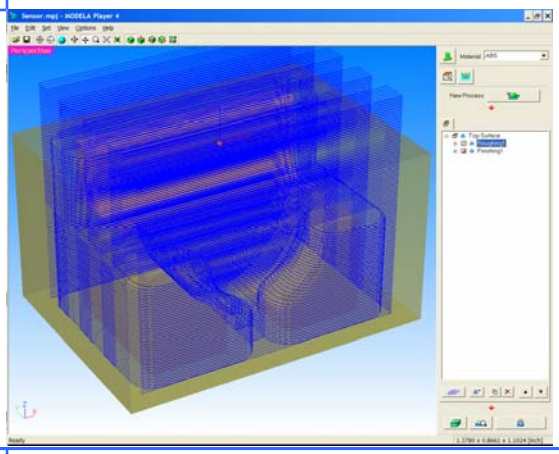
Click the **Z-Direction** tab. Enter how far deep the part is in the material stock. It will be the same as the start height that was performed during the roughing process. Follow the below method.

(Material) – (Part Height) = (Start Height)

1.4174 – 1.1024 = .315

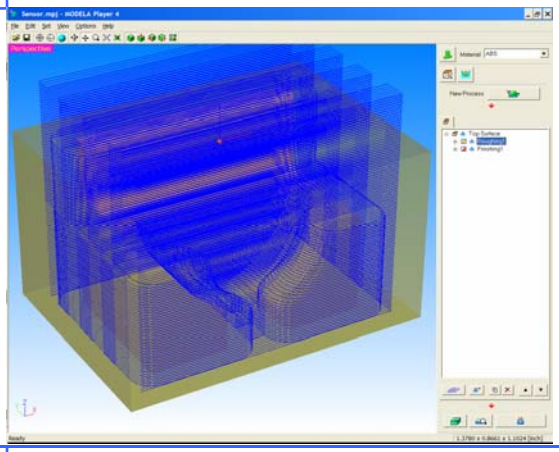
Simulation

1

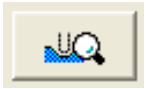


To view the processes simulation, select the **roughing process**.

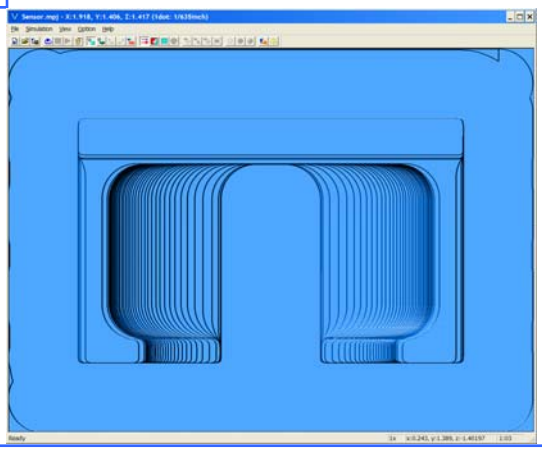
2



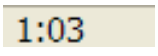
Select the **Preview Cutting** button which will open the Virtual Modela Software.



3



Vitual Modela will show you the process selected. You can also see approximately how long the process will take. When you close Virtual Modela, you do not have to save the changes.

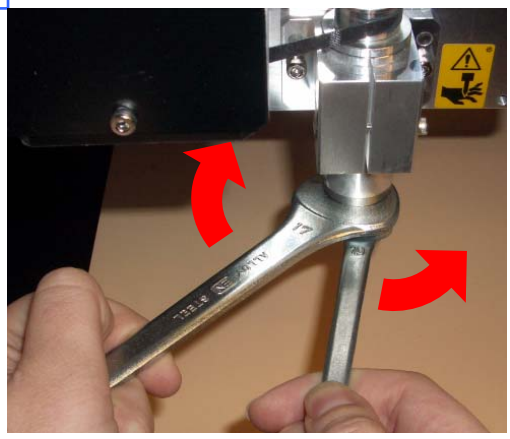


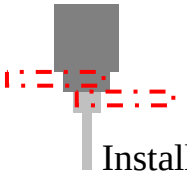
Installing Tool, Material

1

Select your 1/4” collet and 1/4” Square End Mill.

2





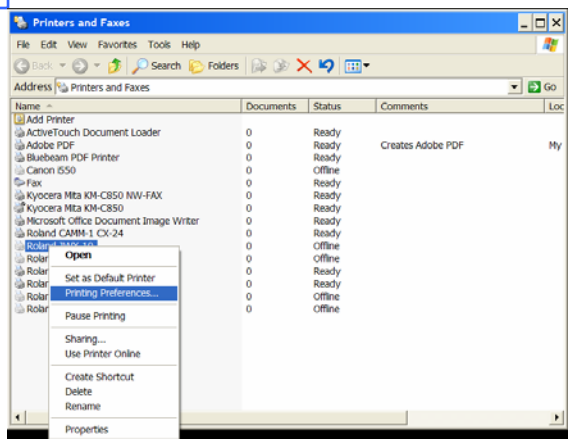
Install the collet and tool in the spindle. Place the 17mm tool in your left hand and over the spindle nut as shown. Place the 10mm tool in your right hand and over the collet. To tighten, pull the wrenches away from each other.

3

Use the double sided tape to secure the material to the table.

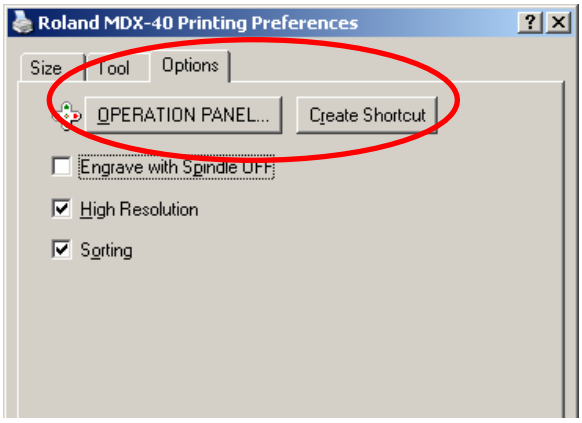
Virtual Control Panel

1



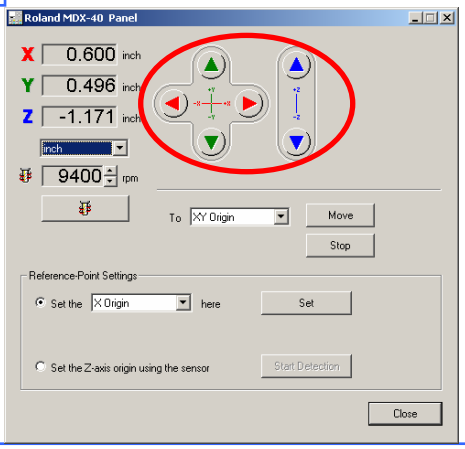
To load the Virtual Control Panel, click the Windows **Start** menu, **Settings**, and **Printers and Faxes**. Right click over the **Roland MDX-40** and select **Printing Preferences.**

2



You can open the Virtual Control Panel by clicking on **OPERATION PANEL**, or you can also Create a Shortcut onto your desktop.

3

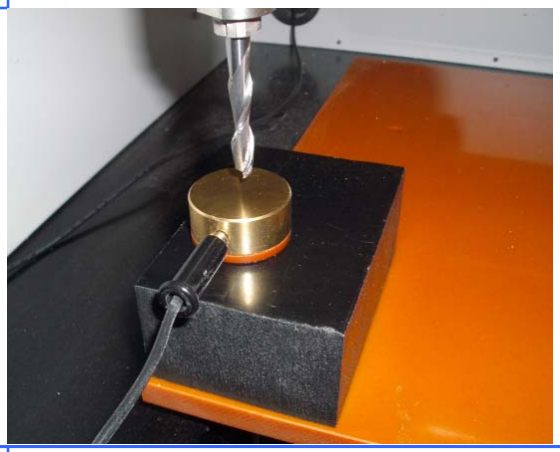


You will use the Virtual Control Panel to move the machine in the X,Y, and Z direction. You will also use this to set the various origins.

Roland ASD 25691 Atlantic Ocean Drive Suite B-7 Lake Forest, CA 92630 949-655-5555

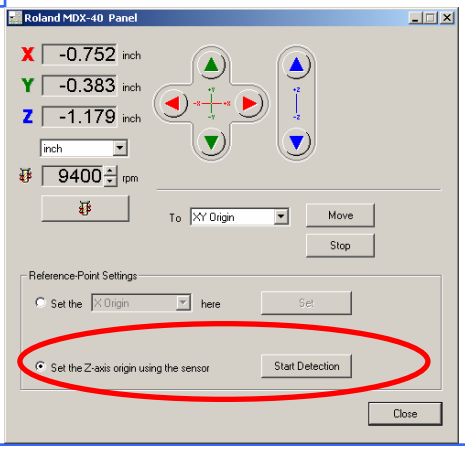
Z-Origin

1



To set the tool Z-Origin on the top surface of the material, use the Tool Sensor and the place it over the material. Use the Virtual Control Panel to move the tool over the tool sensor.

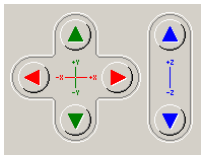
2



Select the **Z-Axis Reference Point Settings** and Click on the **Start Detection** button. The Tool will move down, touch the Tool Sensor 3 times, and the Z-Origin will be set after this. **Remove Tool Sensor.**

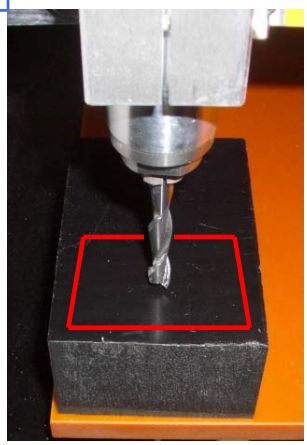
XY Origin

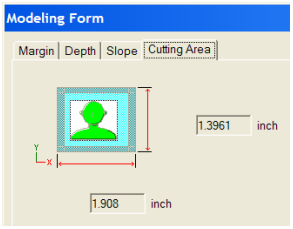
1

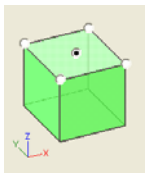


To set the XY origin, use the virtual control panel to move the tool to the approximate center of the cutting area.

2

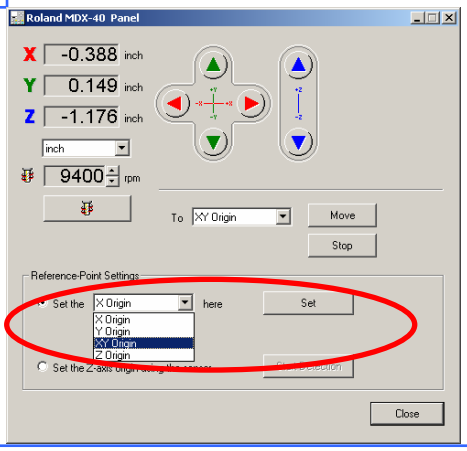


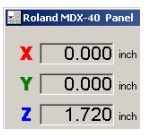




The material stock needs to be larger than the cutting area specified under Modeling Form, Cutting Area. Also note that the origin used under Model, Origin, center is how you are locating the cutting area on the material.

3

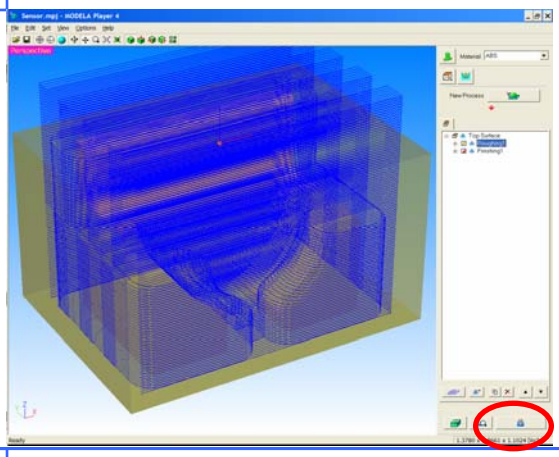




Set the XY Origin by selecting the **Reference Point Settings** and selecting the **XY Origin**, and clicking on Set to set the XY origin. You will notice that the Virtual Control Panel will now display X 0.00 and Y 0.00.

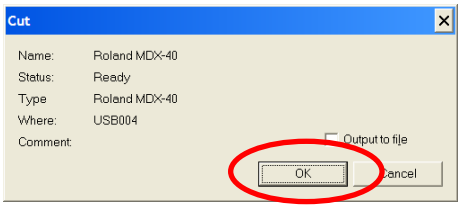
Cutting!

1



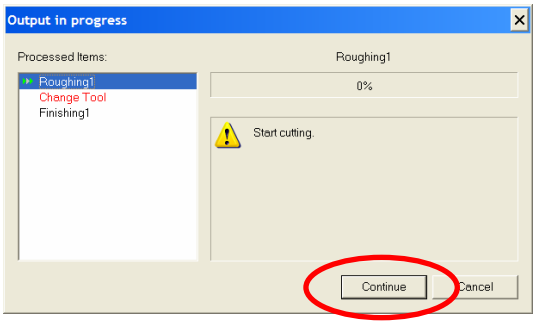
Click the **Cut** button to send the program to the machine.

2



You will get Cut screen confirming the Machine Name and Printer Driver selected. Click ok.

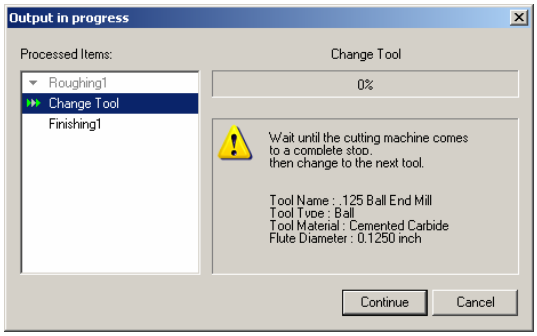
3



Click **Continue** to start sending the program to the machine.

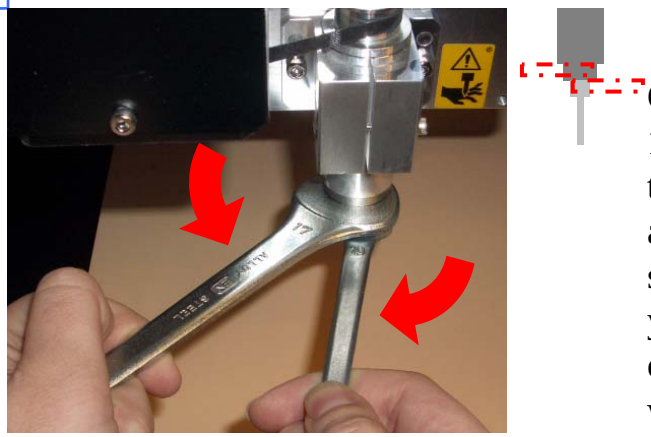
Cutting!

4



The software will prompt you to make a tool chance. **DO NOT PRESS CONTINUE**.

5



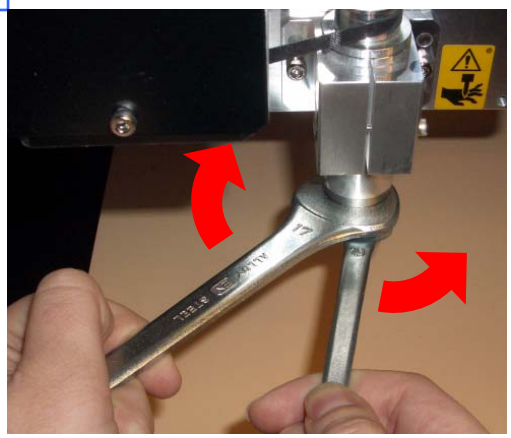
Change the tools using the 17mm and 10mm tools. Place the 17mm tool in your left hand and over the spindle nut as shown. Place the 10mm tool in your right hand and over the collet. To loosen, pull the wrenches towards each other.

6

Remove the 1/4” collet and 1/4” tool and install the 1/8” collet and 1/8” tool.

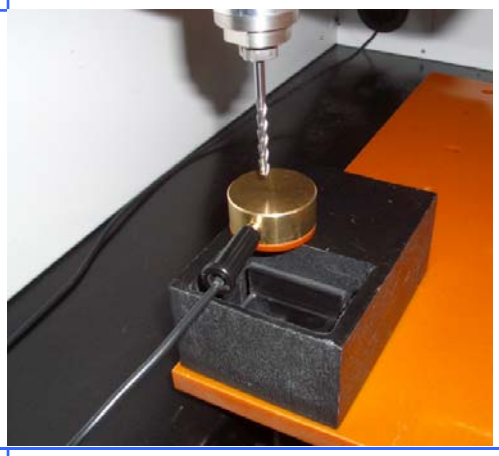
Cutting!

7



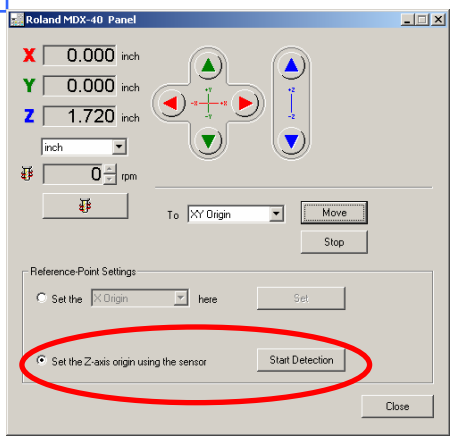
Tighten the tools by pulling the tools away from you.

8



Place the Tool Sensor over the material. Move the tool over the sensor.

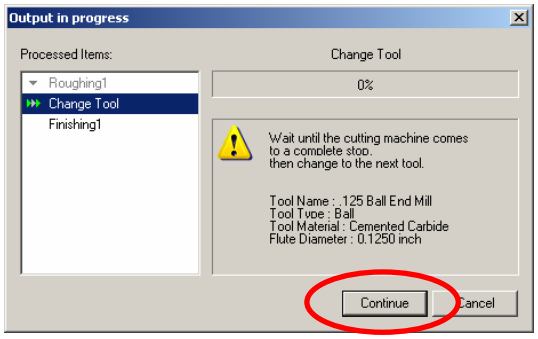
9



Use the Virtual Control Panel to Start the Z-Origin detection process and set the Z-Origin at the top of the material for the new tool. **Remove sensor before cutting.**

Cutting!

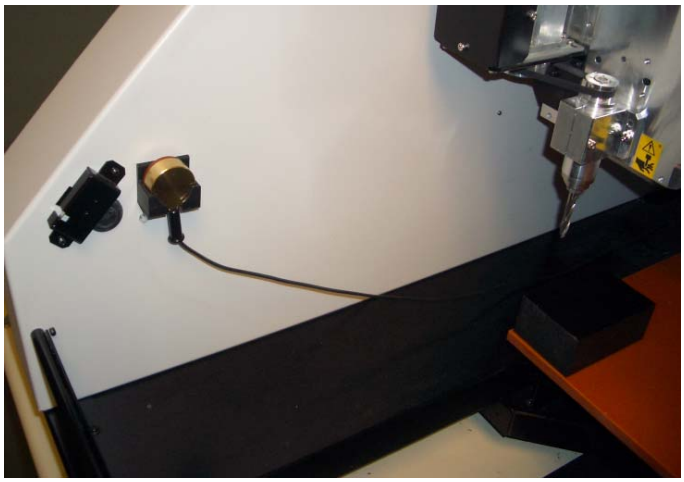
10



Press **Continue** to cut remaining tool paths.

Finished Functional Part

1



Roland ASD 25691 Atlantic Ocean Drive Suite B-7 Lake Forest, CA 92630 949-655-5555