Version 14 : September 2020

Legacy Wire EDM Tutorials

Proprietary Notice

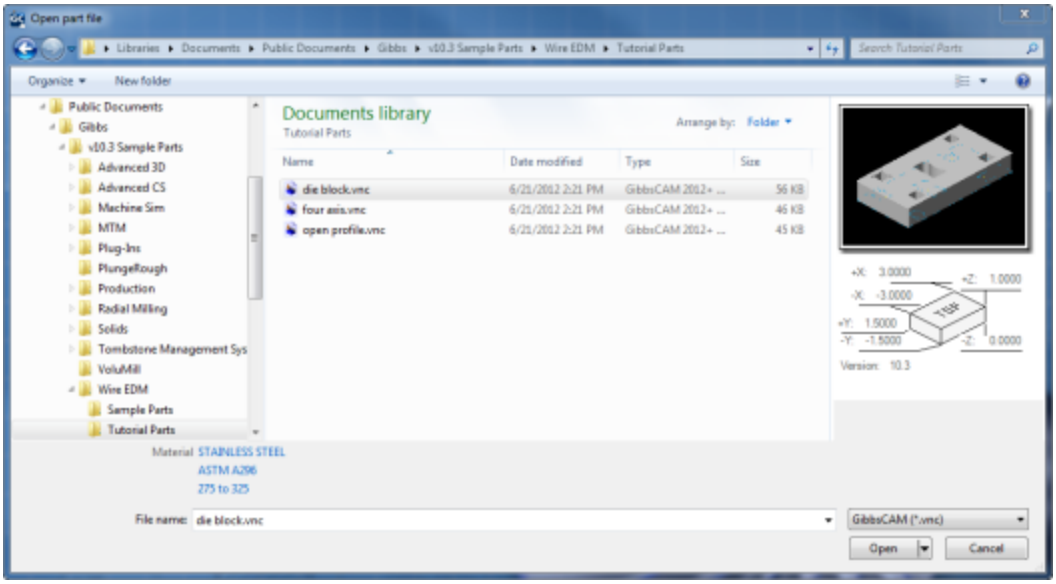
WIRE EDM TUTORIALS

The Tutorials section of the manual is designed to introduce you to actually working with the GibbsCAM Wire EDM package. There are three tutorials, one covering 2-axis parts, another covering 4-axis parts and the last covering open profile parts. All of the tutorials start with a part file that came with your Wire EDM package. For more information on topics brought up in the tutorial, refer to the EDM User guide, “Use and Reference” chapter.

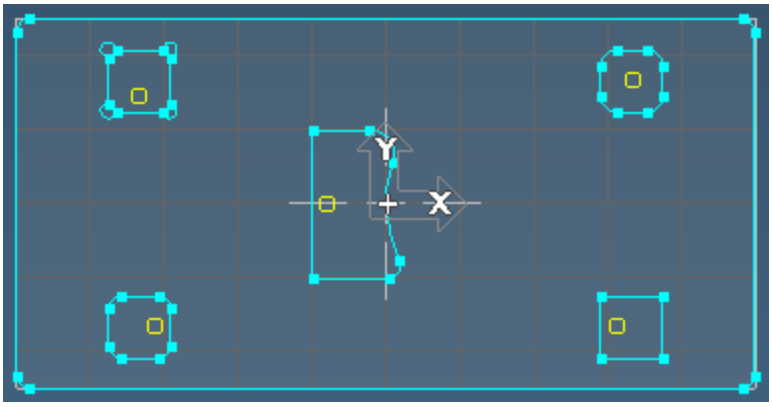
TUTORIAL #1 - WIRE EDM 2-AXIS

In this tutorial you will become familiar with working with the GibbsCAM Wire EDM interface and creating a simple 2-axis EDM part. You will need to have GibbsCAM and the Wire EDM package installed and licensed.

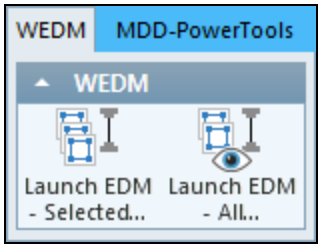
1. Launch GibbsCAM.
2. Open the file die block.vnc. The file should be located in a folder that was installed along with your Wire EDM package.



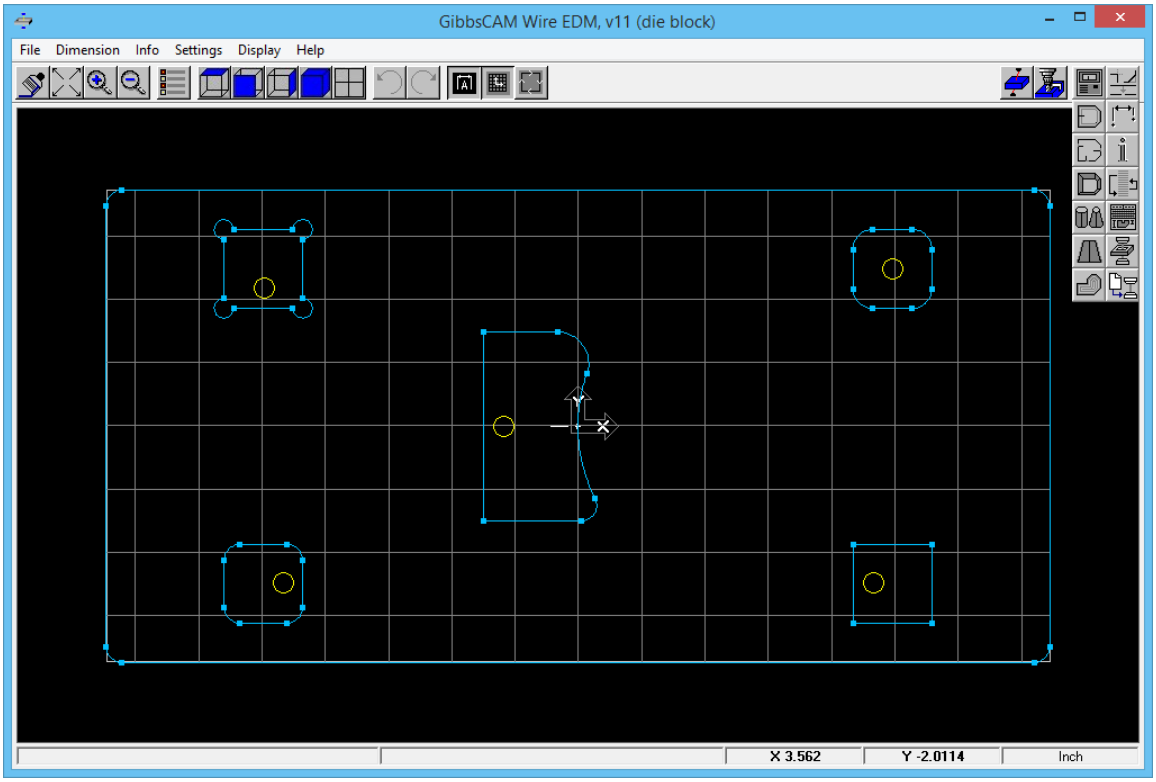
In top view (Ctrl+H), the part looks like the following image.



3. Select all of the geometry on the screen (Ctrl+A).
4. Select Launch EDM - Selected Geometry from the Wire EDM menu.



Your Wire EDM screen will look as shown below.



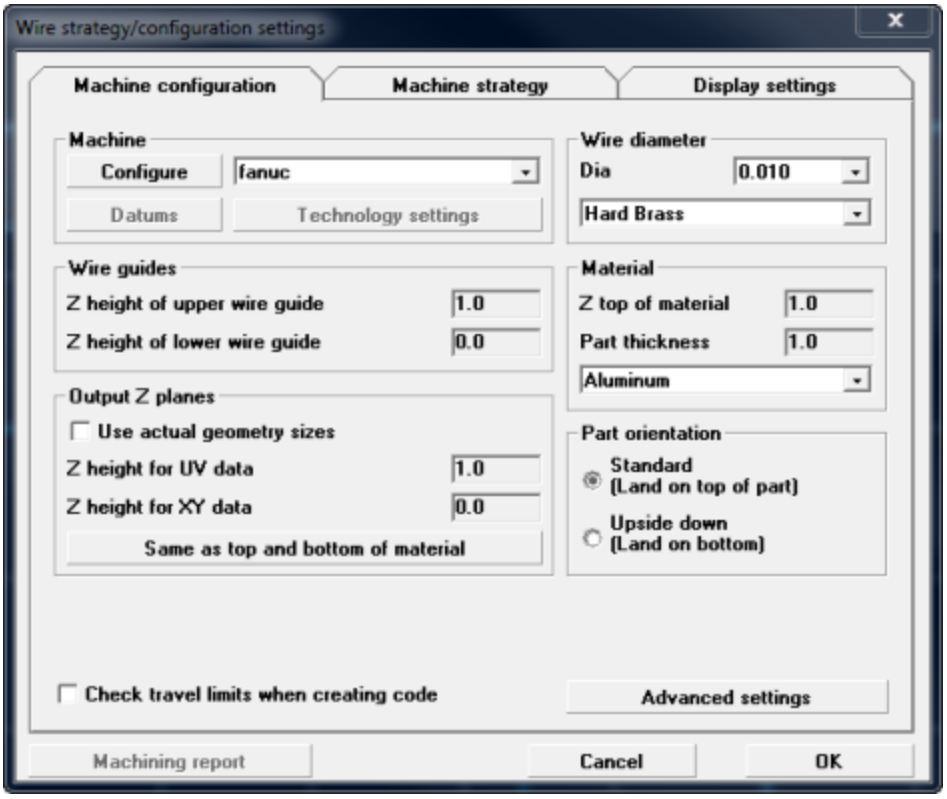
5. Click on the Zoom Full button  in the top Toolbar, to fit the geometry to the screen.

   The first thing we need to do is to set the wire configuration and strategy.

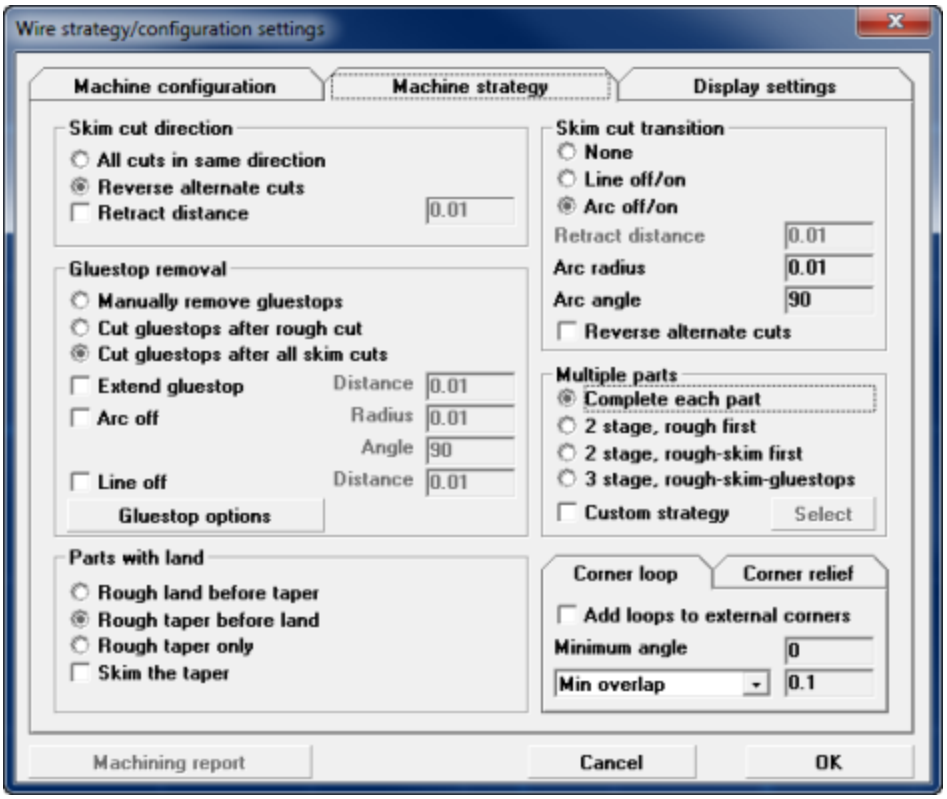
6. Click on the Wire Configuration  button. It is in the Top Level palette going down the right side of the screen.

   Clicking on the Wire Configuration button will activate the dialog shown below. This dialog is where you will specify the type of wire machine you have, wire display, the Z top of the part, part thickness, part orientation and the output for Z planes.

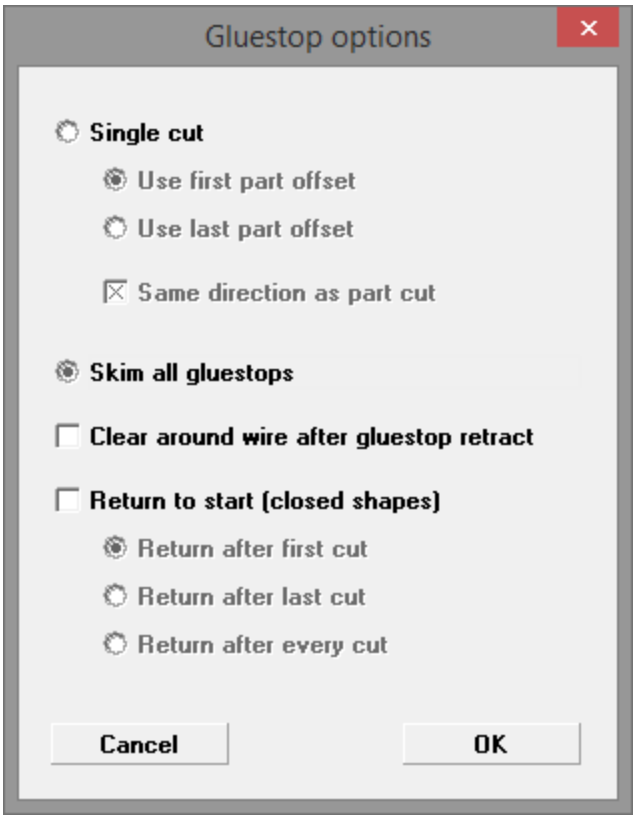
7. Enter the values as shown.



8. Click on the Machine strategy tab. Enter the values shown below. This sets the preferences for how we are going to machine this part.



9. Click on the Gluestop options tab. Make sure the Skim all gluestops option is checked and click OK.

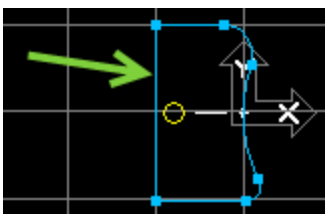


10. When you have finished, click OK. Now that we have set up the machine, we can begin to put toolpath on our geometry.

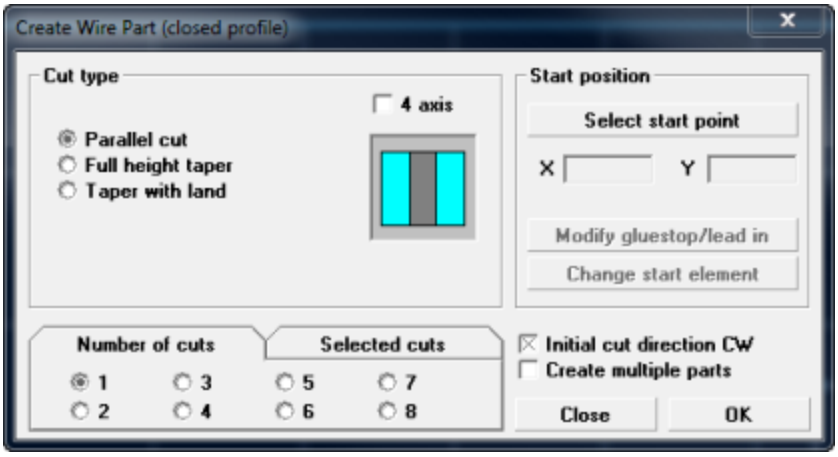
11. Click on the Create or edit a wire part button  in the Toolbar.

Looking at the bottom of the screen, we can see that we are being asked to pick the profile to be cut.

12. Select the area of the middle profile as shown.



You now get the Create Wire Part dialog.



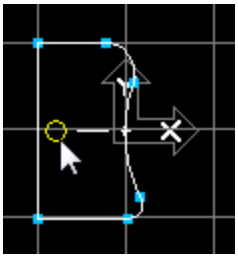
This dialog allows you to set Cut type, Start position and the number of skim cuts.

We now need to select a start point for the cut.

13. In the current dialog `click` on Select start point.

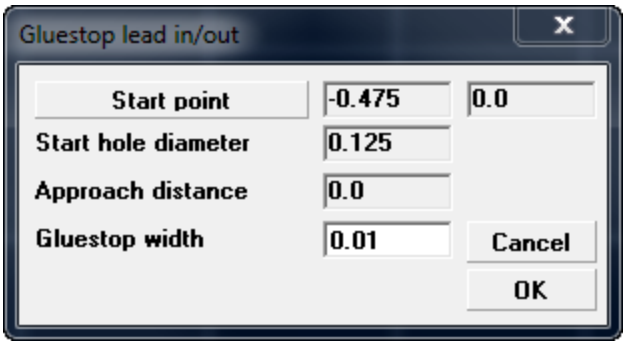
The bottom of the screen is asking us to select a start point.

14. Select the point in the middle profile as shown.

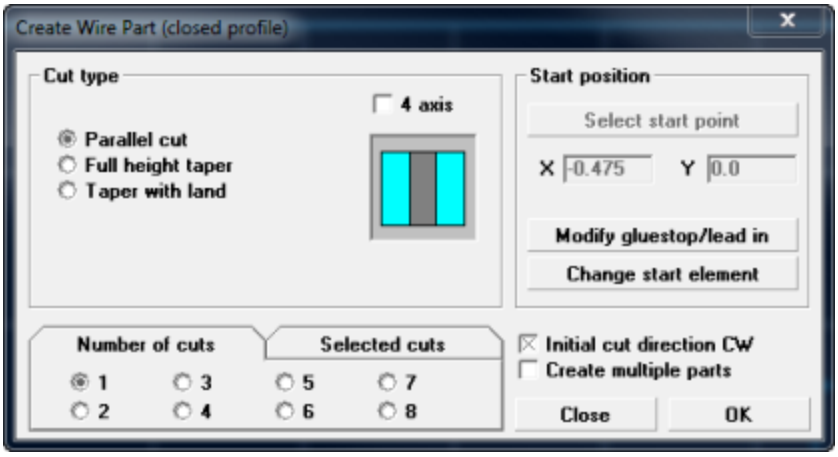


You will now see a dialog, as shown below, displaying the coordinates of the start point. We need to set the width of the gluestop.

15. Enter the value shown here and `click` OK.



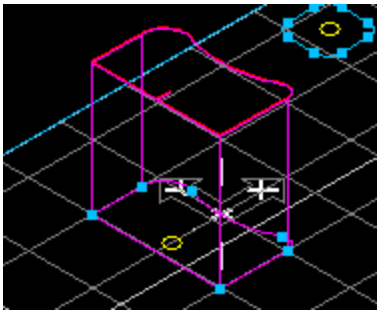
You will be sent back to the Create Wire Part dialog.



16. Click OK.

17. Click the ISO View button  in the top Toolbar.

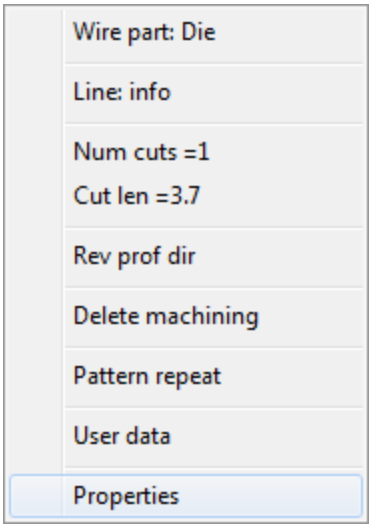
18. Click the Zoom Full button  in the top Toolbar.



This will put the part into isometric view and fit the geometry and the toolpath to the screen.The results of your toolpath will look like the image on the left.

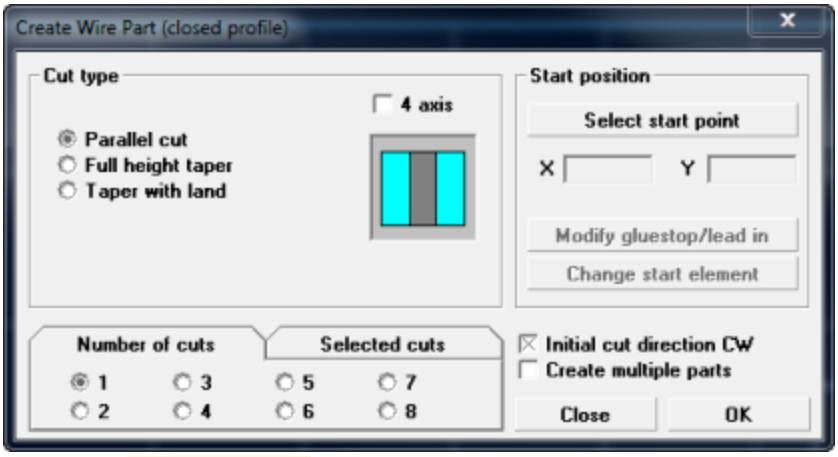
This is a simple example of how to create a wire path. Now we will go back and modify the toolpath.

19. Right-click anywhere on the profile to open the Right-click menu.



20. Select Properties.

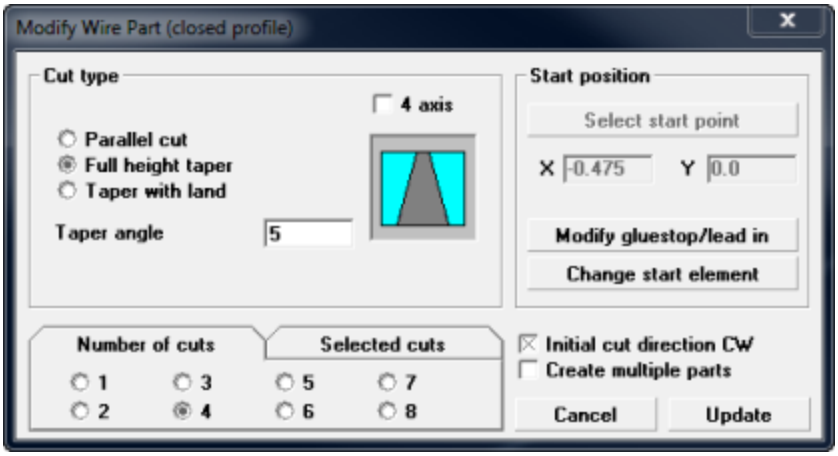
Clicking on Properties opens the Modify Wire Part dialog. This dialog looks similar to the Create Wire Part dialog that we used to generate the toolpath. We will use this dialog to modify the toolpath in order to set a taper and the number of skim cuts.



21. Click the Full height taper radio button.

    This modifies the dialog to include a Taper angle text box and a different graphic.

22. Enter a taper angle of 5 degrees.



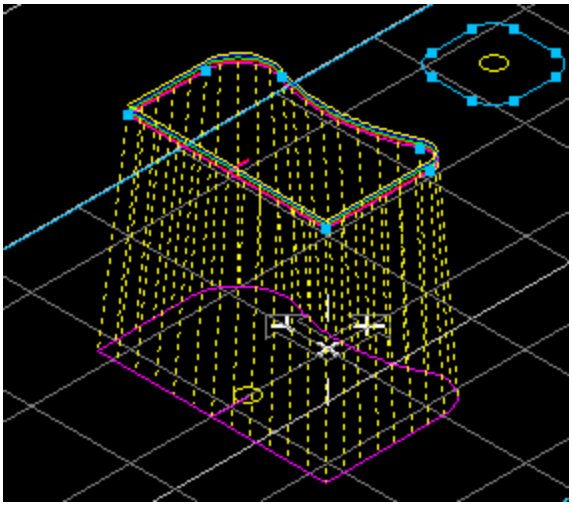
Next we will add some skim cuts.

23. In the Number of cuts section, click the 4 radio button to set four skim cuts.

    Your dialog will look like the image above.

24. Click Update.

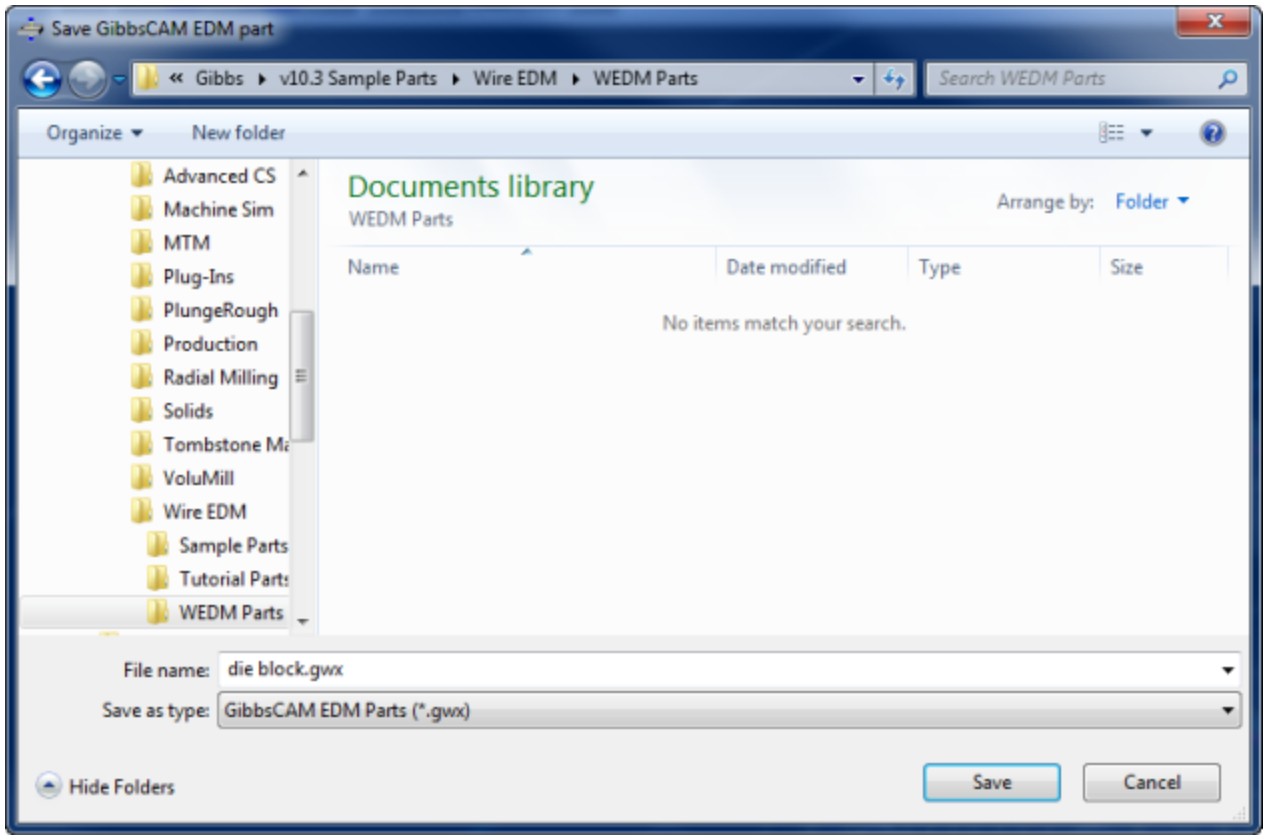
    The dialog will close and the result is an updated toolpath as shown in the image below.



The actual height between each displayed skim cut and the number as well as the color of the dashed 4-axis lines will vary depending on your Display settings found in the Wire strategy/configuration settings dialog.

There is geometry on this part that was not covered in this tutorial. You can use this geometry for continued practice with different machine settings, tapers etc.

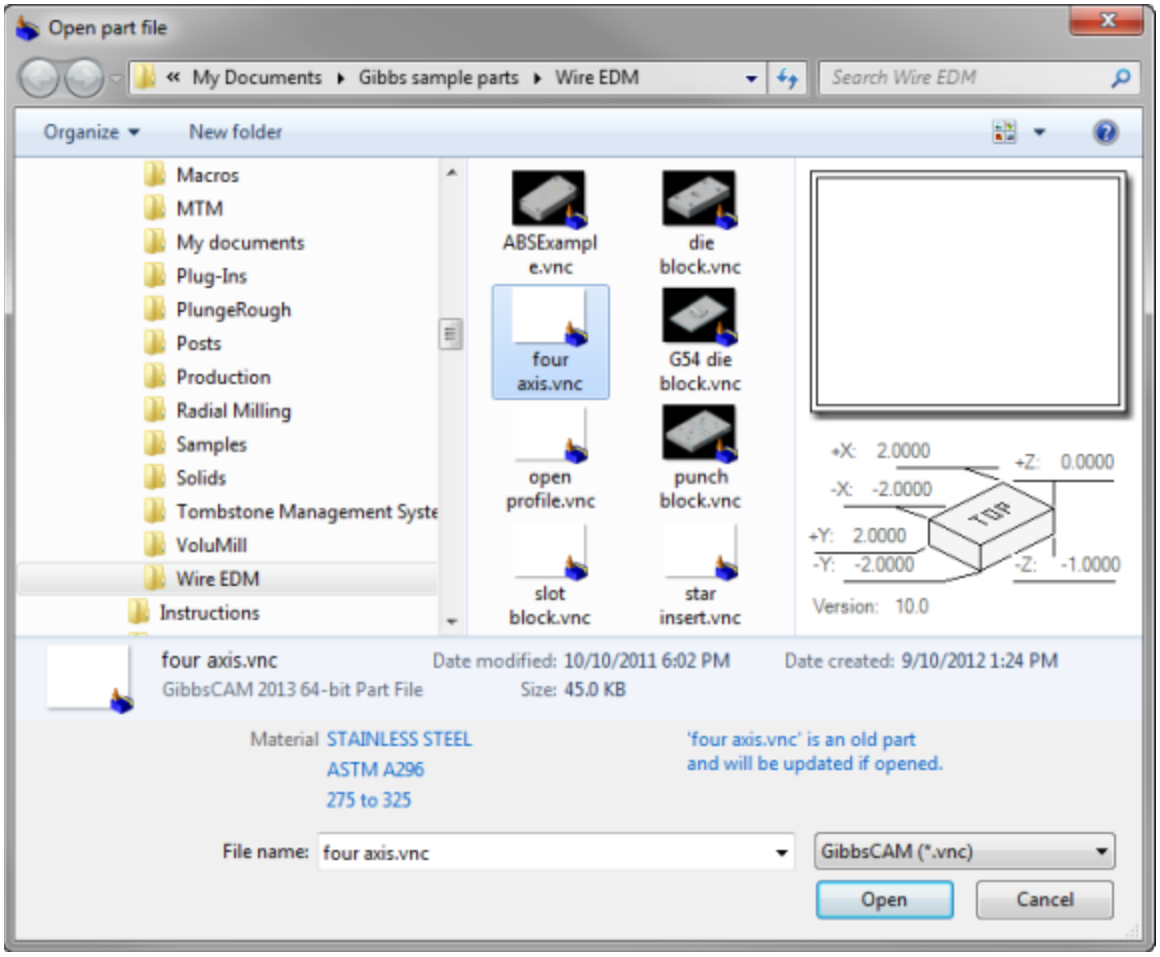
25. Save this file in case you would like to go back and work with it at a later date.



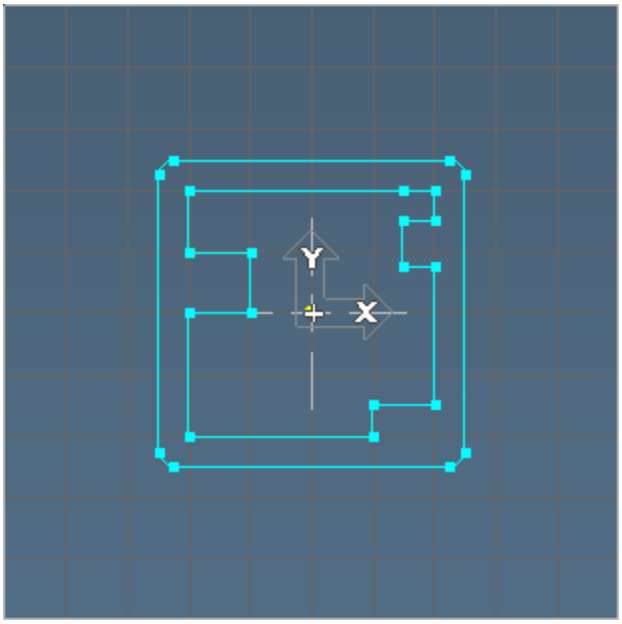
TUTORIAL #2 - WIRE EDM 4-AXIS

In this tutorial you will learn how to create a 4-axis Wire EDM part. Additionally, the lessons learned in the first tutorial will be reinforced through practice.

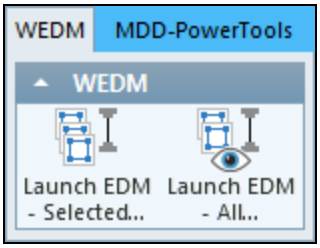
1. Launch GibbsCAM.
2. Open the file Four Axis.vnc. The file should be located in a folder that was installed along with your Wire EDM package.



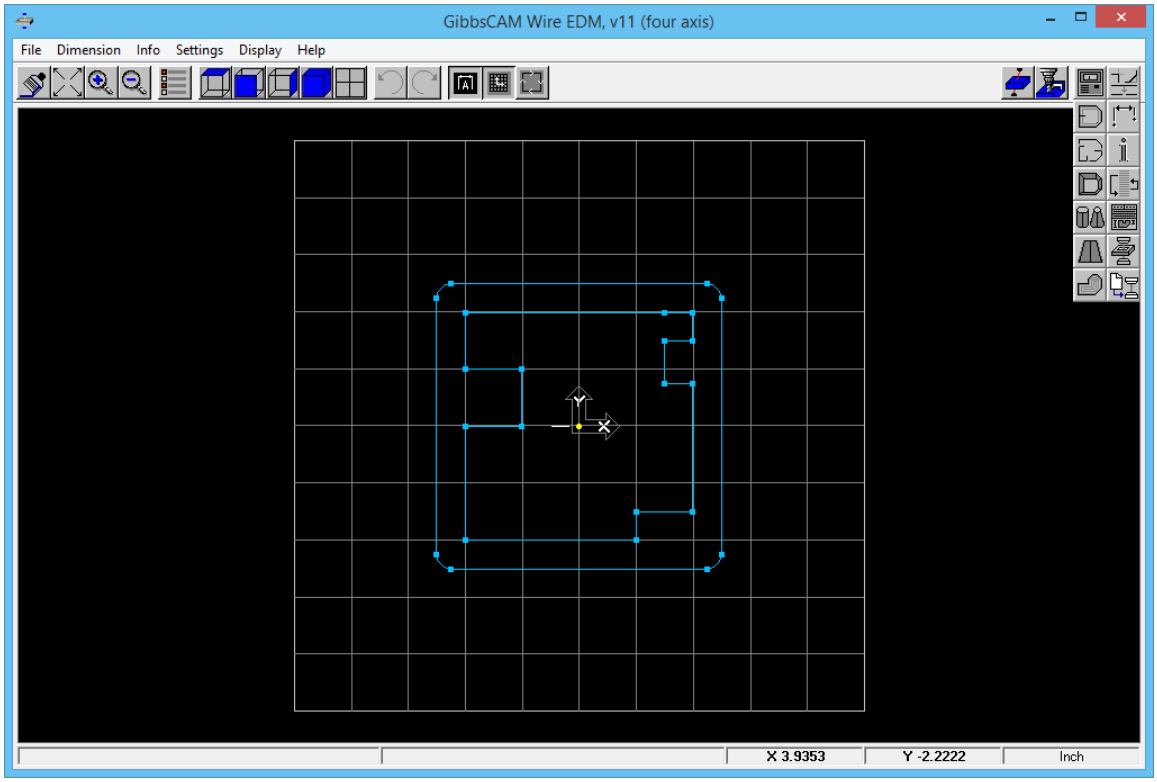
The part will look as shown below.



3. Select all of the geometry on the screen (`Ctrl-A`).
4. Select Launch EDM - Selected Geometry from the Wire EDM menu.



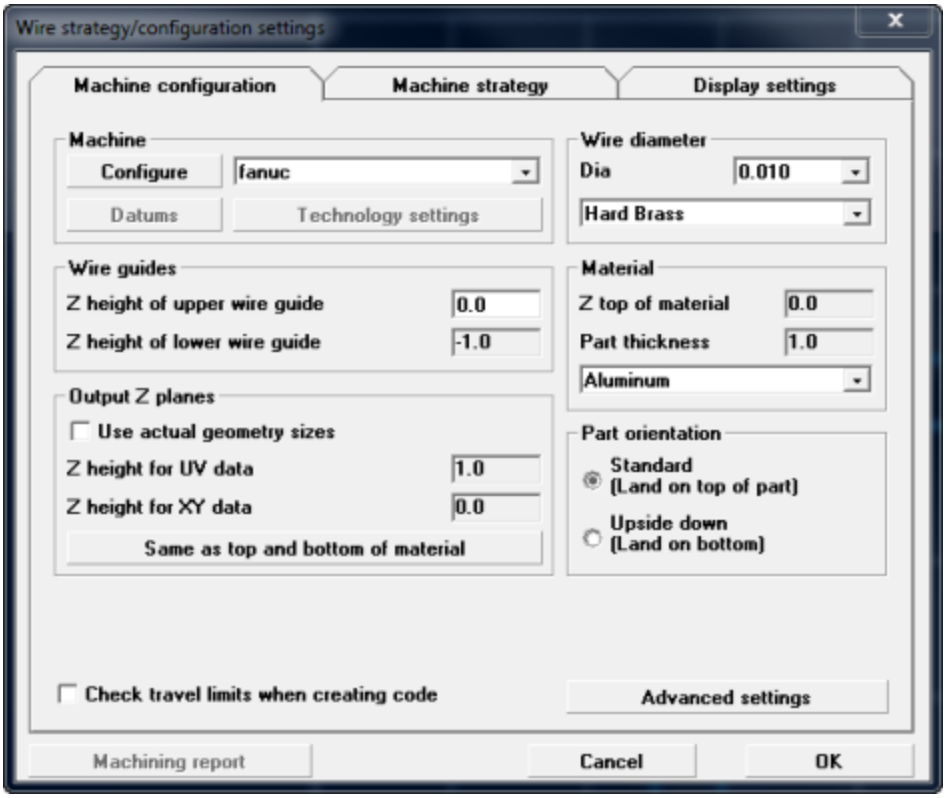
Your Wire EDM screen will look like following image.



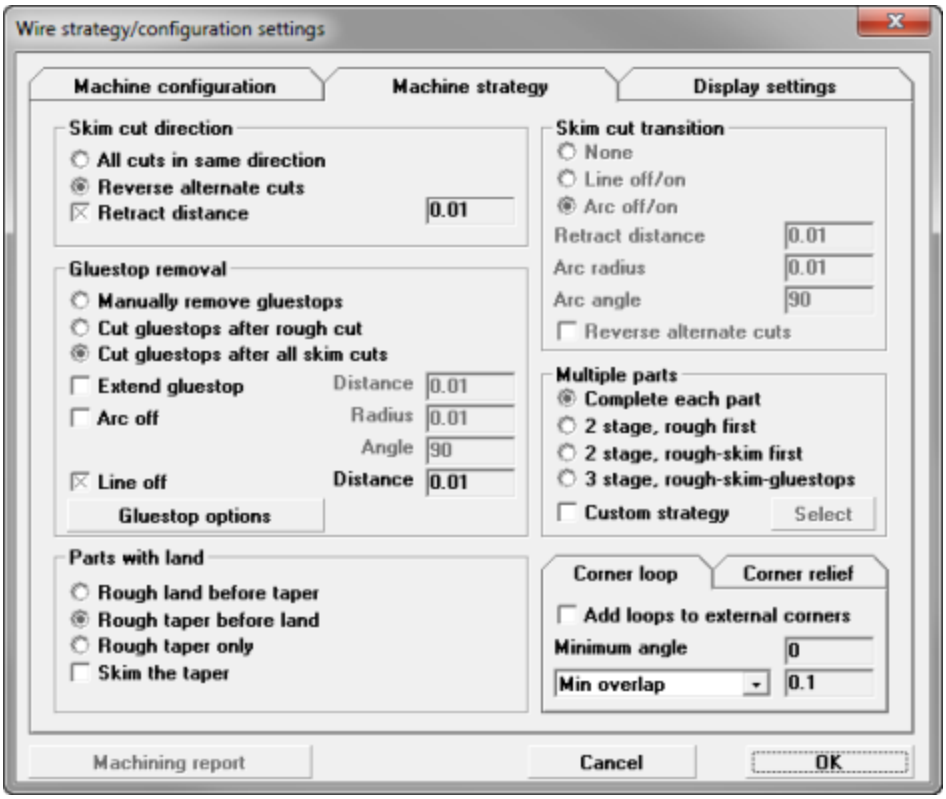
5. Click the Zoom Full button  in the top Toolbar to fit the geometry to the screen.

   The first thing we need to do is to set the wire configuration and strategy.

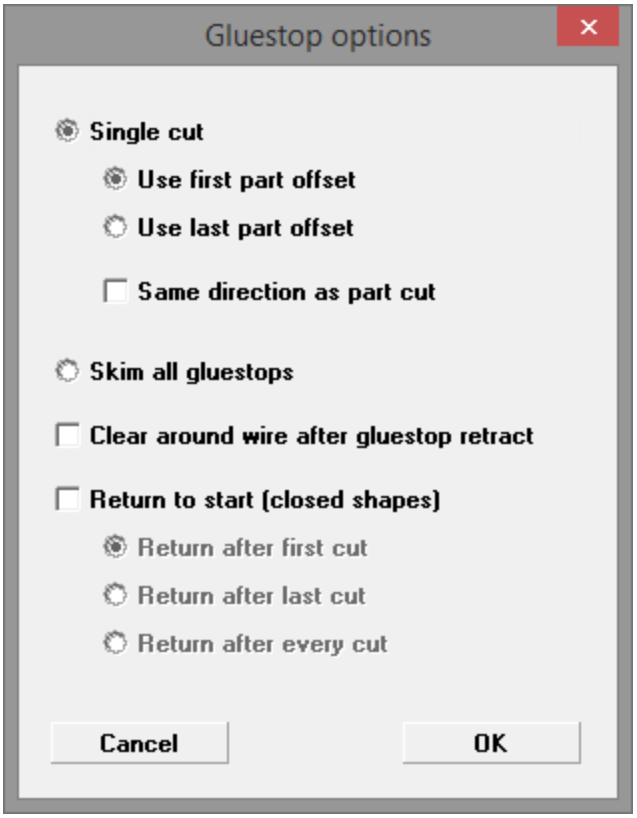
6. Click the Wire Configuration button  . It is the top left button in the Top Level palette.
7. Enter the values shown in the dialog below.



8. Click the Machine strategy tab and enter the settings shown below.



9. Click the Gluestop options tab and select the Single cut radio button.



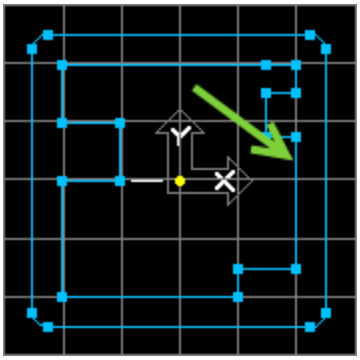
10. When you have finished, `click` OK.

    Now that we have set up the machine, we can begin to put a toolpath on our geometry.

11. `Click` the Machining button  in the Top Level palette.

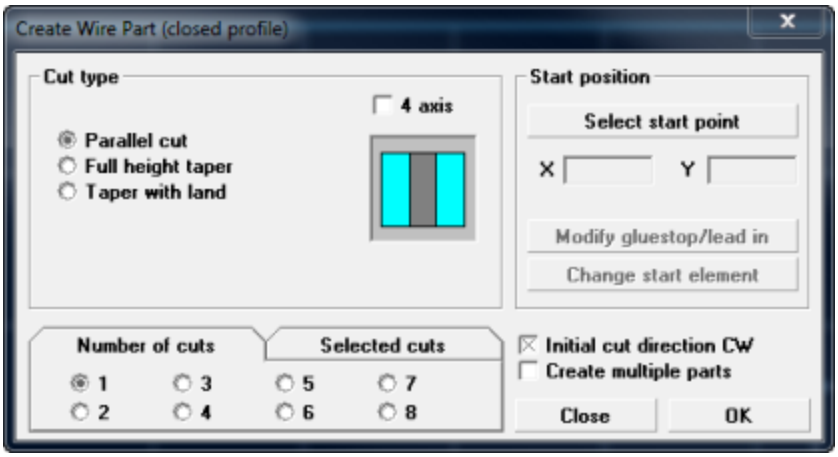
    Looking at the bottom of the screen, we can see that we are being asked to pick the profile to be cut.

12. Select the area of the middle profile as shown.

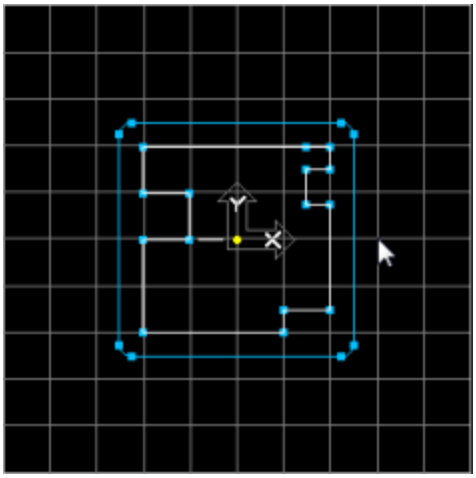


    The Create Wire Part dialog opens, ready for us to select the type of cut we want to make.

We now need to select a start point for the cut.

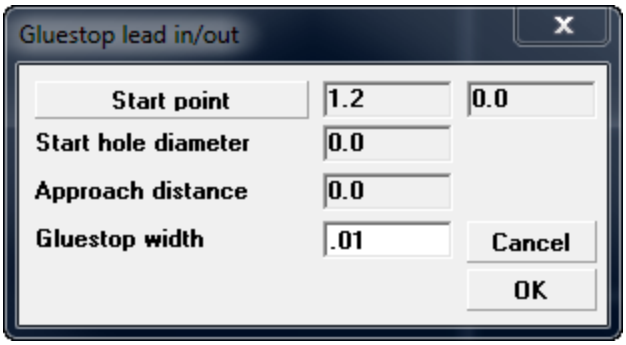


13. Click the Select start point button.
14. The bottom of the screen is asking for a start point. Select the approximate point shown below. It is a point outside of the profiles.



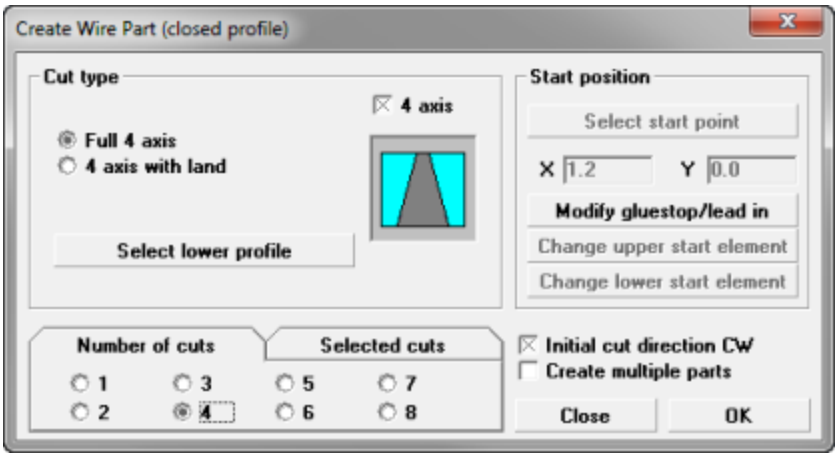
You will now see a dialog displaying the coordinates of the start point. We need to set the width of the gluestop.

15. Enter the values shown below and click OK.



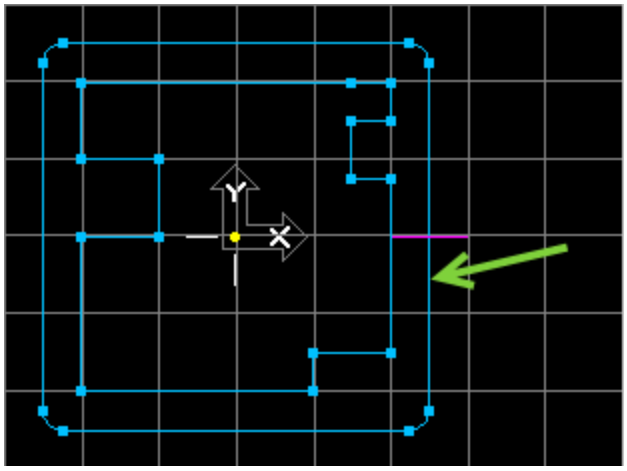
We have been sent back to the Create Wire Part dialog to select the lower profile and the number of cuts to take.

16. Click the 4 axis checkbox. Also set the dialog to take four cuts, as shown below.



17. Click the Select lower profile button.

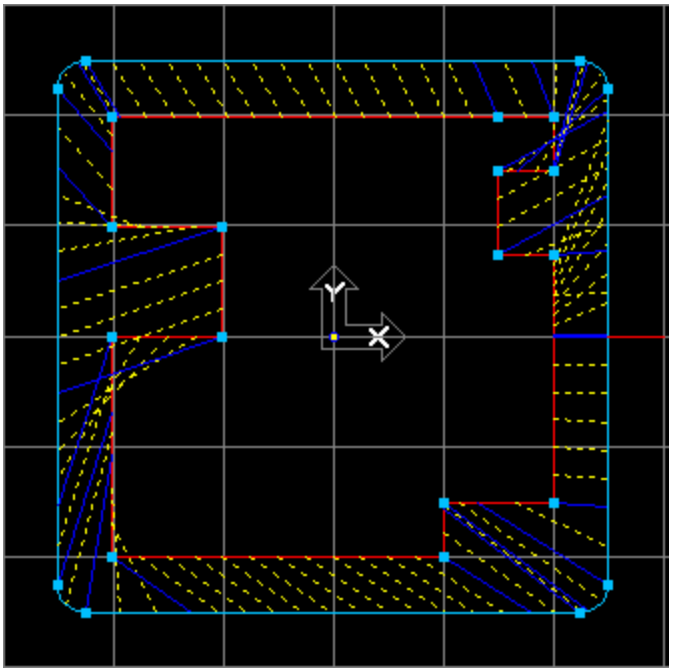
18. Select the profile as shown to designate the lower profile.



When you select the lower profile, we are sent back to the Create Wire Part dialog to finish setting up the toolpath.

19. Click OK.

The results of our work will look like the image below.

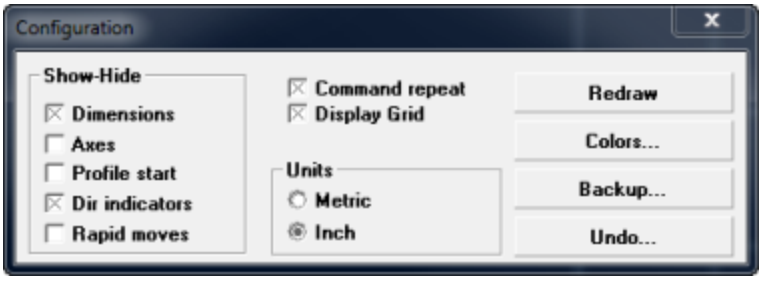


Looking at the toolpath, we probably have some more work to do, as is often the case with 4-axis parts. We need to synchronize the wire path.

In order to sync this toolpath, we need to break some of the elements. To make this easier, we are first going to turn on the Command repeat option.

20. Click the Configuration button  in the top Toolbar to open the Configuration dialog.

21. Activate the Command repeat function and close the dialog  .



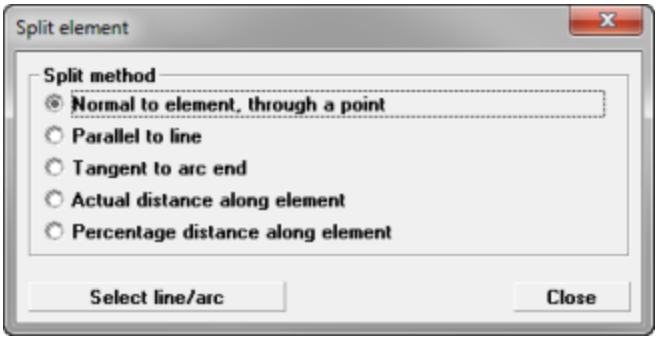
The Command repeat function allows us to perform the same action multiple times without having to repeatedly open a dialog and select a command.

22. Click the Edit /Modify geometry button  in the Top Level palette.

23. Click the Split Element button  in the Edit Geometry palette.

The Split element dialog provides several ways to break geometry.

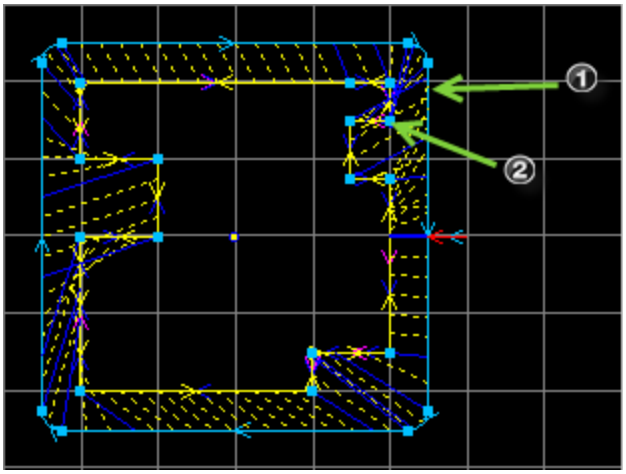
24. Select the first method—Normal to element, through a point.



25. `Click` Select line/arc.

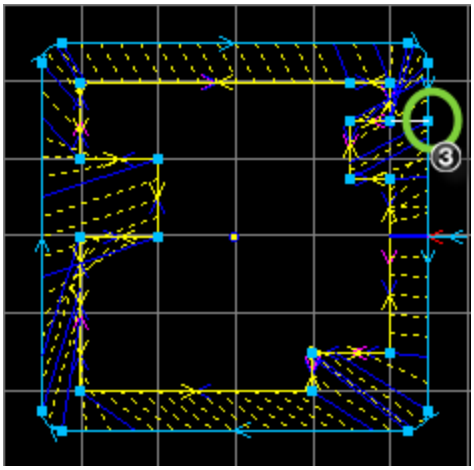
    To use the Normal to element, through a point function, we must first select the element we want to split, then we select the point normal to the element. The element will then be split at this point.

26. Split the element as shown here.



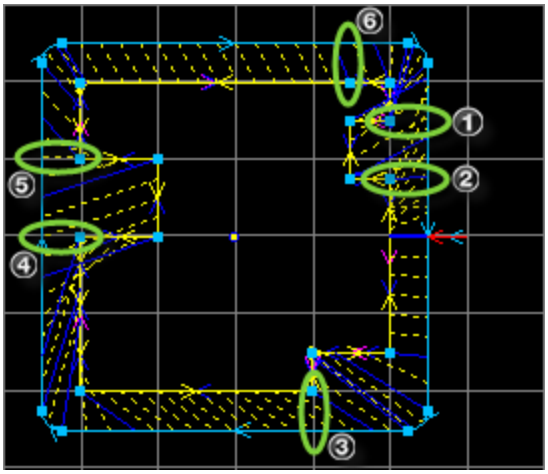
1. Select this element

2. Select this point

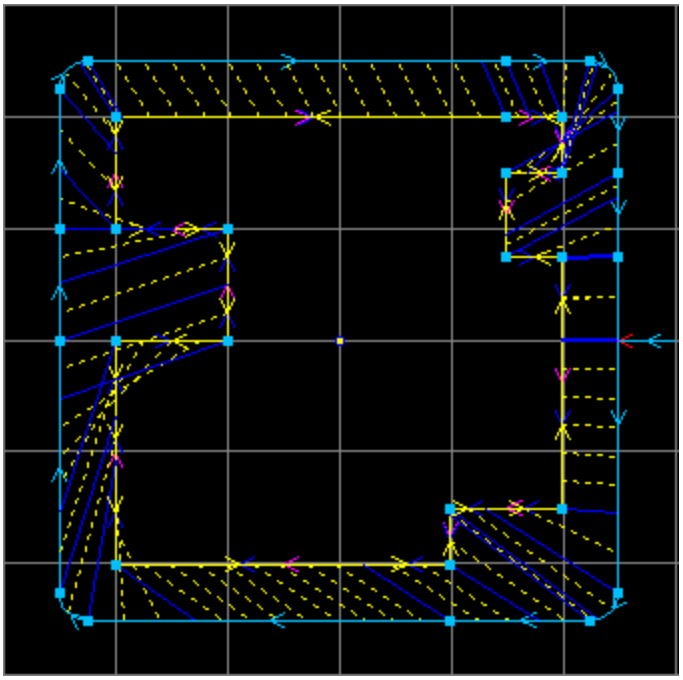


3. Result: A split element

Go through the part and split the elements in the places shown below.



After splitting the elements, your screen will look like the following image.

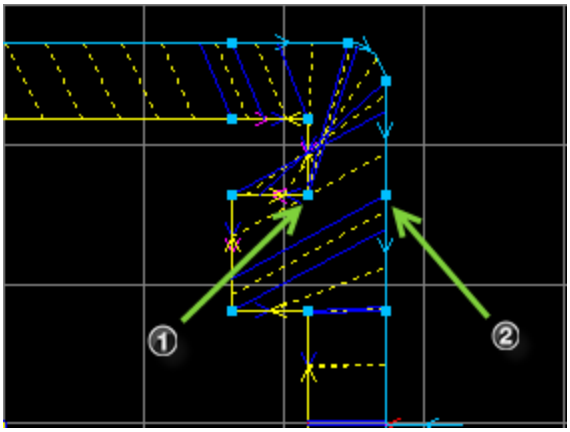


While the results do look better, the part still needs some work. We need to manually sync some points.

27. `Click` the Sync button  in the Top Level palette.

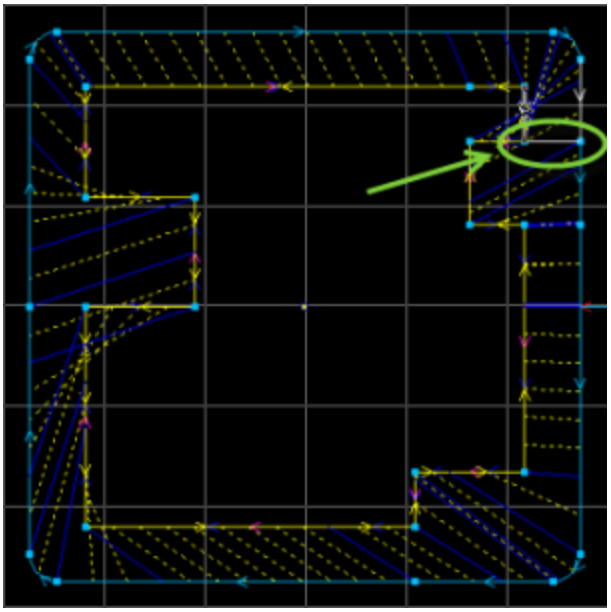
    Notice the bottom of the screen is prompting us to pick an element in the top profile that needs a sync point.

28. Select the points as shown in the following image.

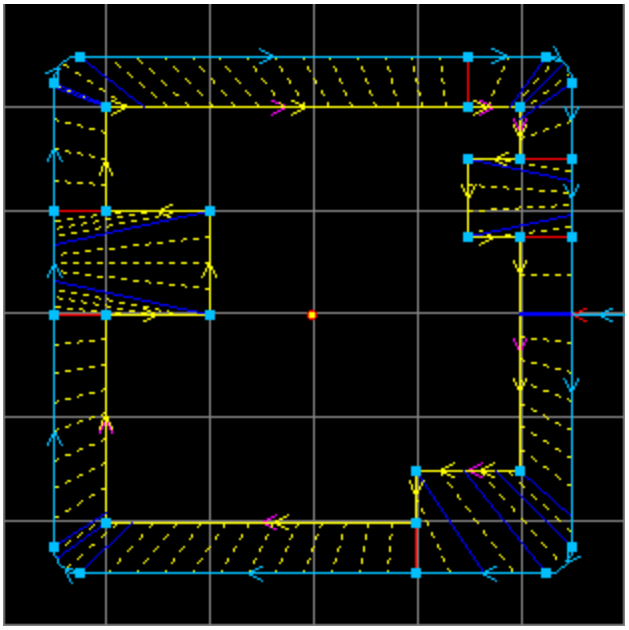


After the point on the top profile is selected, the bottom of the screen prompts you to pick the sync point on the bottom profile. A line attaches your cursor to the top profile and will remain that way until the bottom sync is selected or a right-click is performed.

After clicking the two points you will see that the points are now synced. We have some more syncs to add to complete the part.

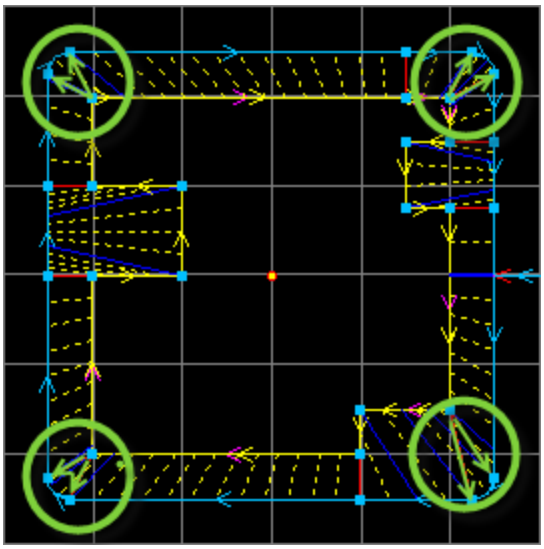


29. Add syncs at each of the elements that we split. `Click` Redraw  . The toolpath will look like the following image.

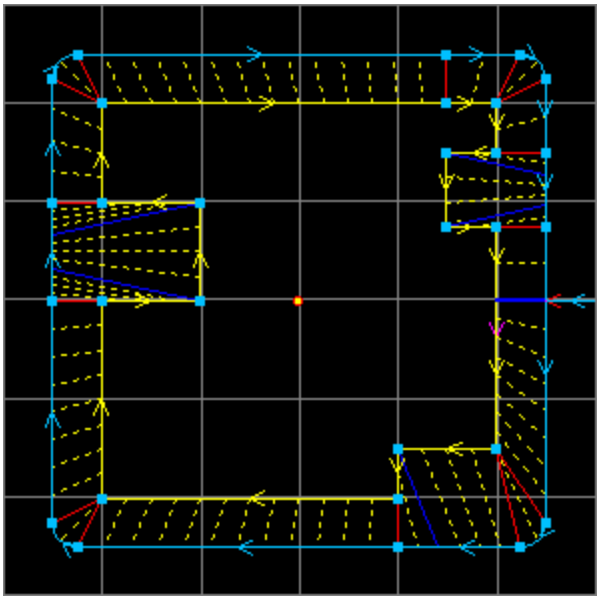


This is better, but the toolpath at the corners is still not optimal. We will not get clean, sharp corners with this toolpath. We will need to add syncs from some of the corners of the top profile to the rounded corners of the bottom profile. Remember each element may have two syncs.

30. Add a sync from the corners to the ends of the rounded corners as shown here.

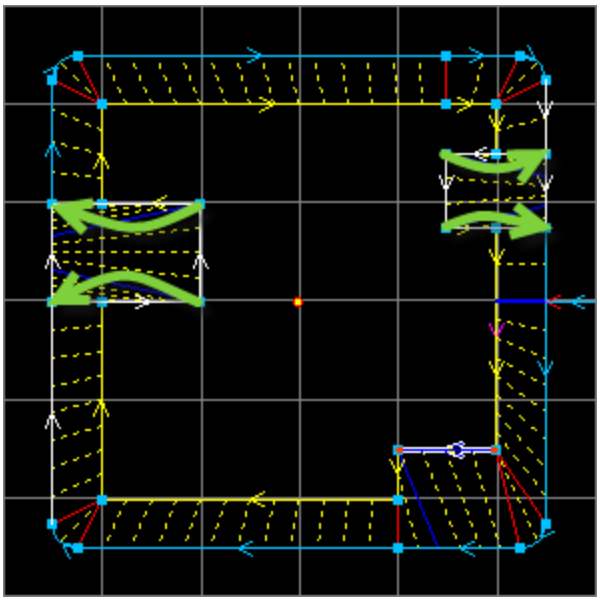


This is better.

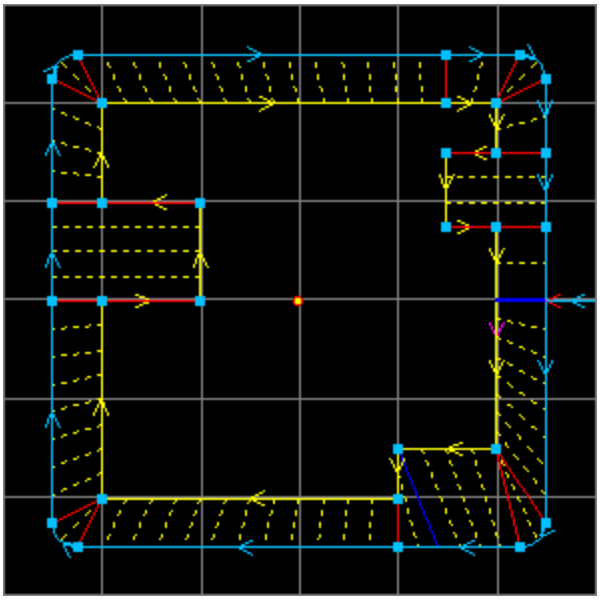


The exterior corners are controlled but the toolpath is still not optimal in the interior corners. The way to fix this is to have overlapping syncs from the interior corners.

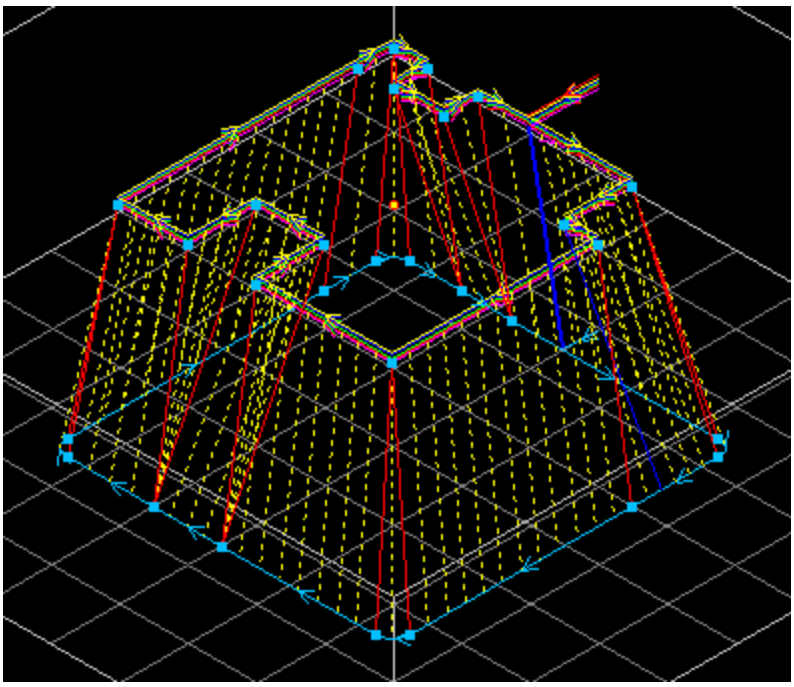
31. Create a sync from the interior corners to the split elements as shown below.



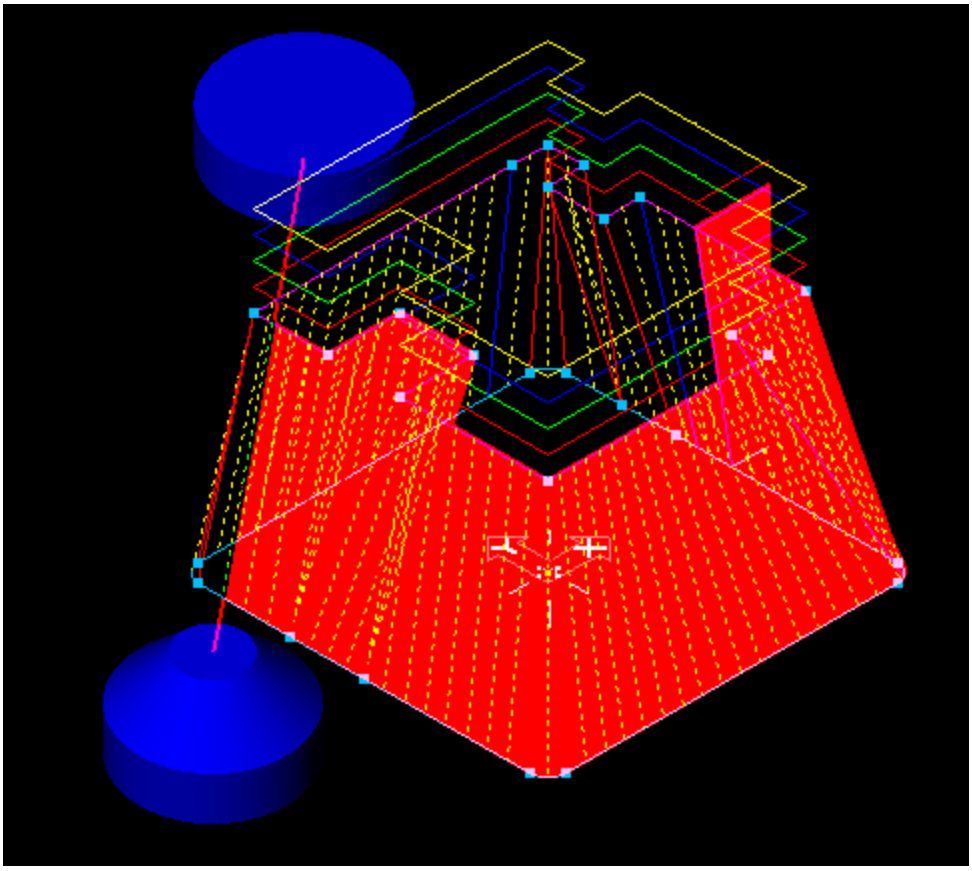
This results in good toolpath.



32. Switch to isometric view to see the part complete with all of the skim cuts.



33. Click the Simulation  button. Use the default settings, click Go to see the rendered part.

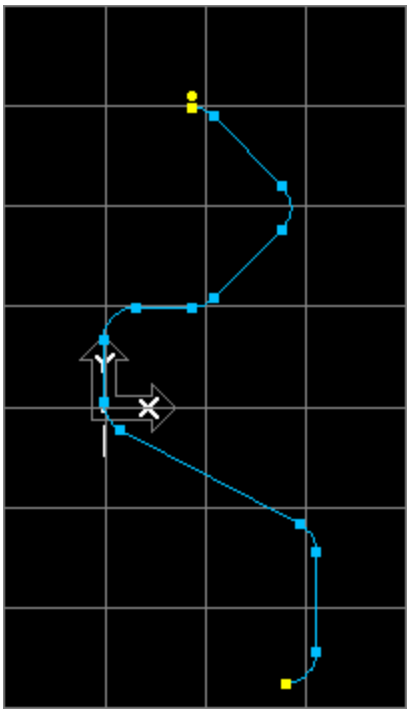


34. Be sure to save the part.

TUTORIAL #3 - WIRE EDM OPEN PROFILE

In this tutorial you will learn how to create a Wire EDM part from open profile geometry. An open profile part is really not that different than a closed profile part, but there are certain things to keep in mind.

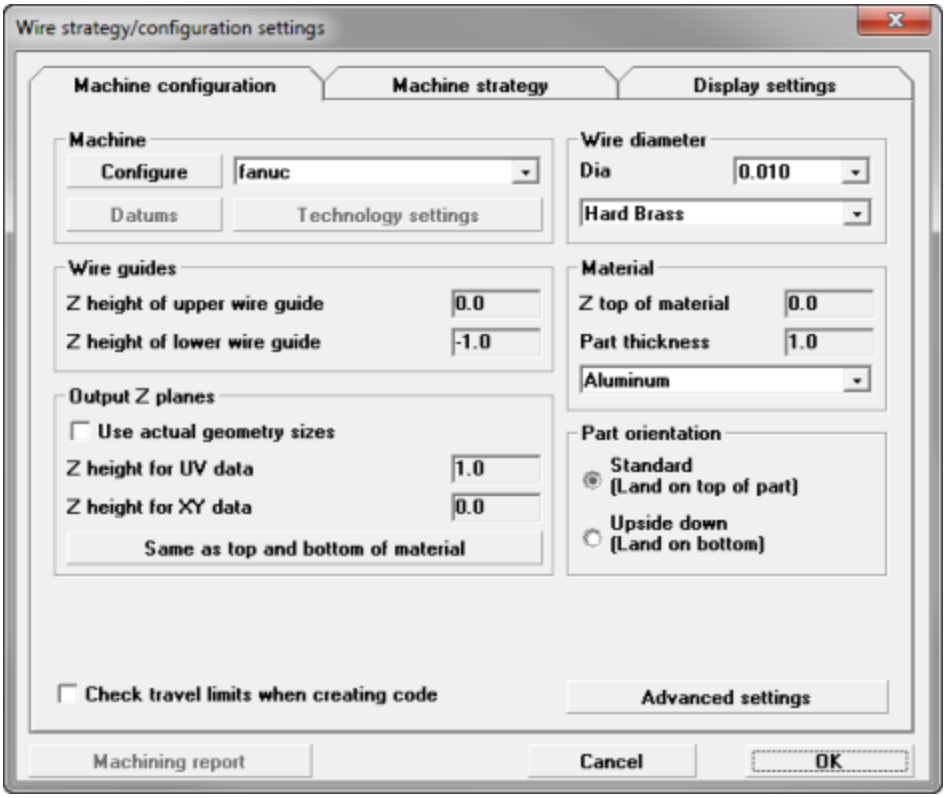
1. Launch GibbsCAM and open the part Open Profile.vnc.



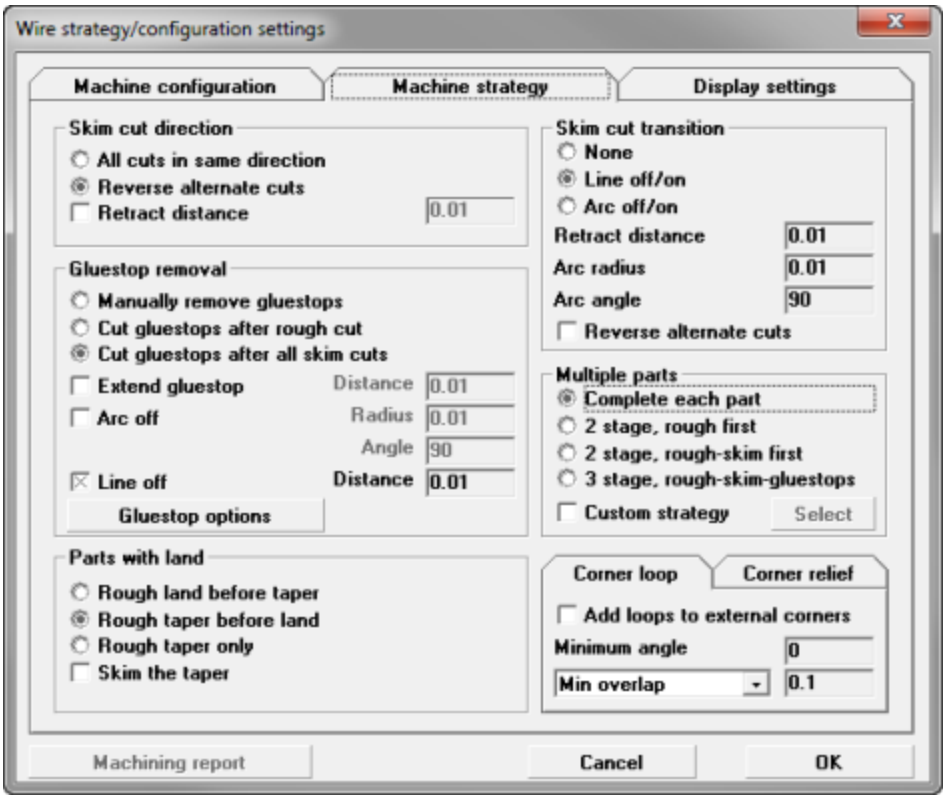
2. Select all the geometry (Ctrl-A) and transfer the data to the Wire EDM package.

   The first thing we need to do is to set the wire configuration and strategy.

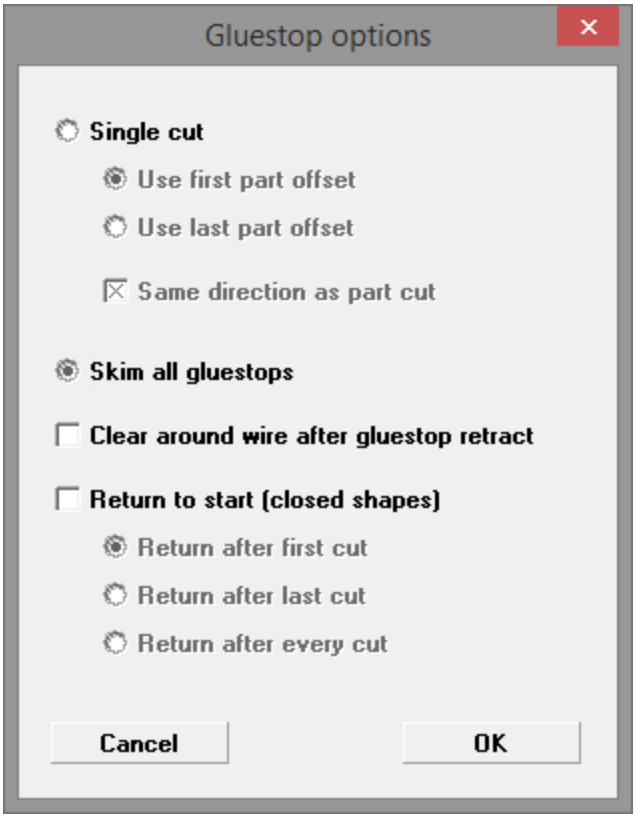
3. Click the Wire Configuration button  . It is the top left button in the Top Level palette.
4. Enter the values shown here.



5. Click the Machine strategy tab and enter the settings shown.



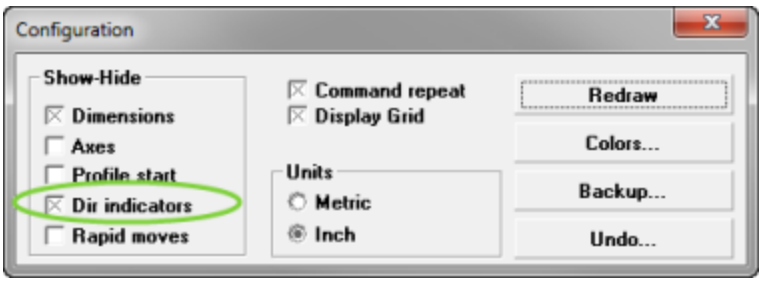
6. Click Gluestop options tab and enter the settings shown.



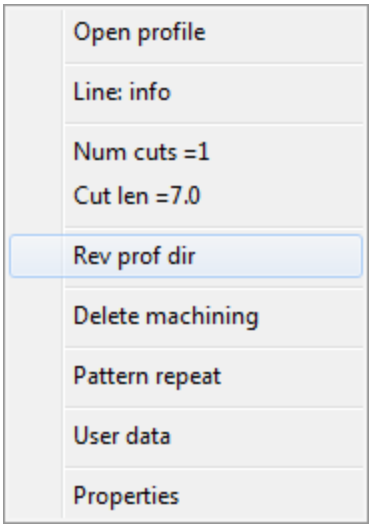
7. When you have finished, click OK. (Click OK again to dismiss any warning message (which might occur if the Cutter Radius Compensation settings are not as the system desires). We have set up the machine. We can now put a toolpath on our geometry.

   Check to ensure that the direction indicators are pointing from the top of the part to the bottom.

   If arrows are not being drawn on your geometry, change this in the Configuration dialog from the top Toolbar.



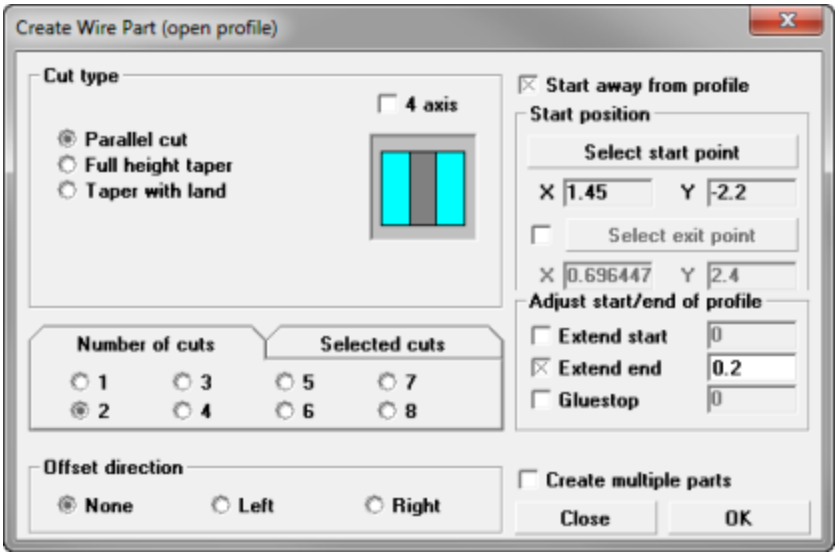
8. Now click the Machining button in the Top Level Palette.
9. Click anywhere on the part.
10. If the indicators are pointing in the wrong direction ie. not downwards, close the Create wire part dialog by clicking OK. The part will turn red in color. Right-click on any line. A dropdown menu will appear.



11. Choose Rev Prof Dir. Click the Machining button and then anywhere on the part again.

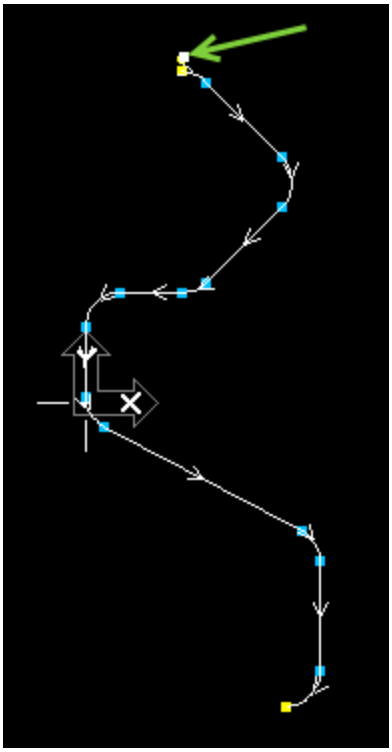
    Open profile parts travel in one direction and have a definite starting place, so the element you click on to select a profile to cut does not matter

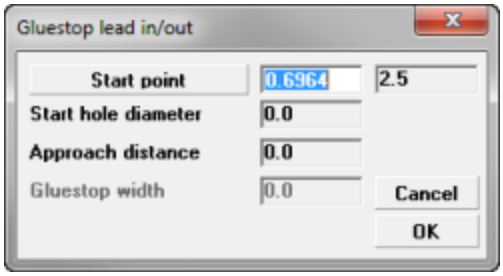
12. Enter information in the Create Wire Part dialog as shown here.



13. When you are ready, click Select start point.

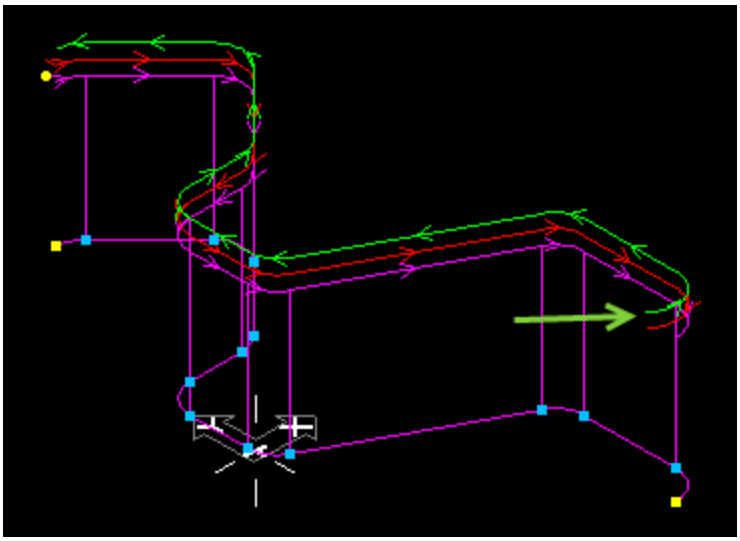
14. Select the point that lies above the open profile and click OK in the Gluestop lead in/out dialog.





15. Click OK in the Create Wire Part dialog to generate the wire toolpath.

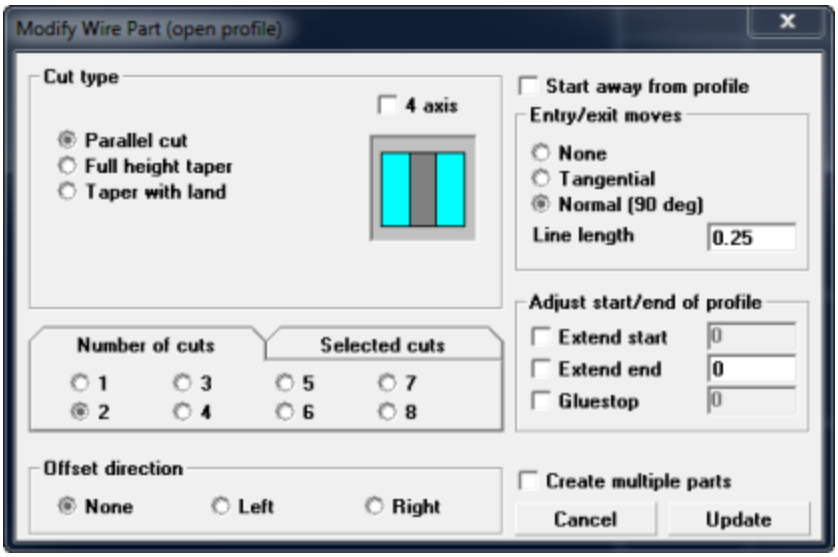
    There is a problem with the toolpath. We selected the Extend End option, which causes the wire to cut into the part.



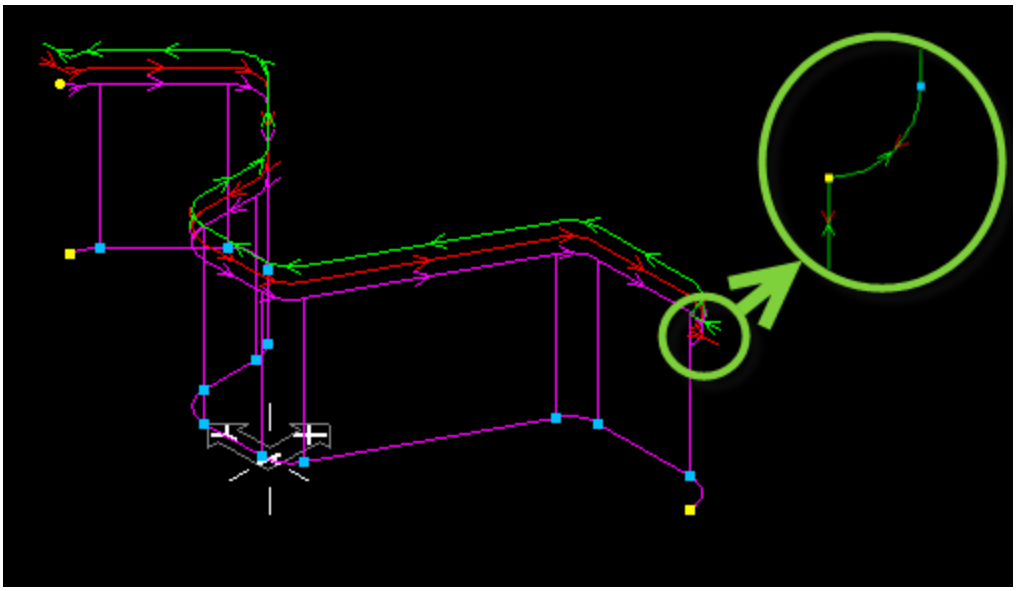
    Instead of tangentially coming off the part we actually want to exit at 90 degrees when we cancel compensation.

16. Right-click anywhere on the EDM part and select Properties from the menu to modify the operation.

17. Turn off Start away from profile and Extend end. Enter a Normal Entry/Exit move of 0.25 as shown here and click on Update to change the operation.

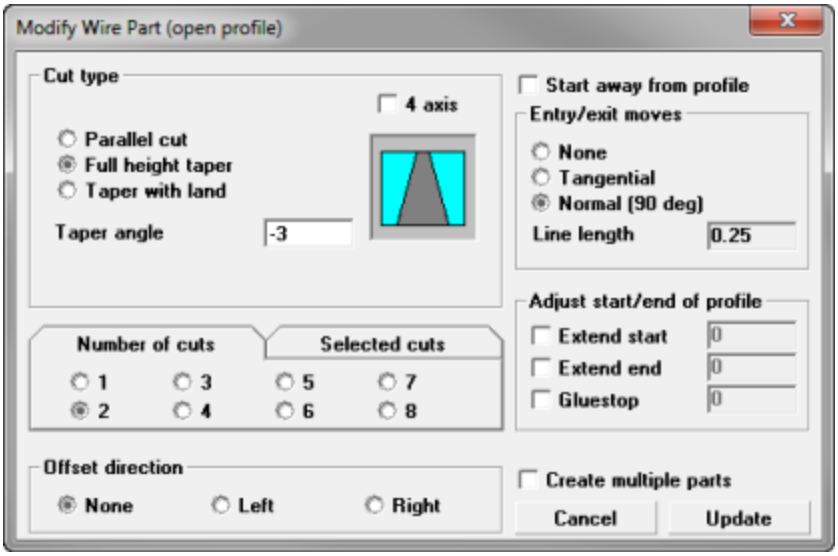


The results of the modified operation look much better with a sufficient lead-in and lead-out.

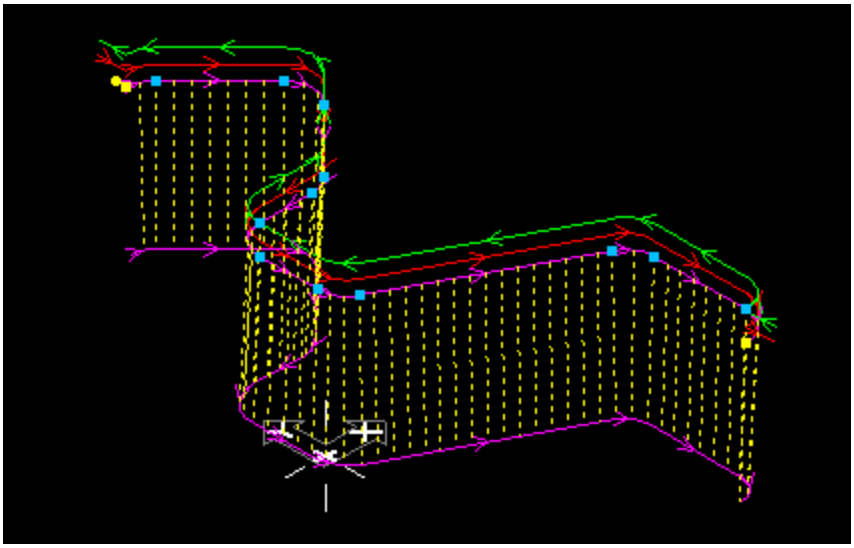


We are now going to make one last modification to this part, which is to add a taper.

18. Right-click on the profile to open the dialog and make the changes shown.



19. Click Update to generate the following path.

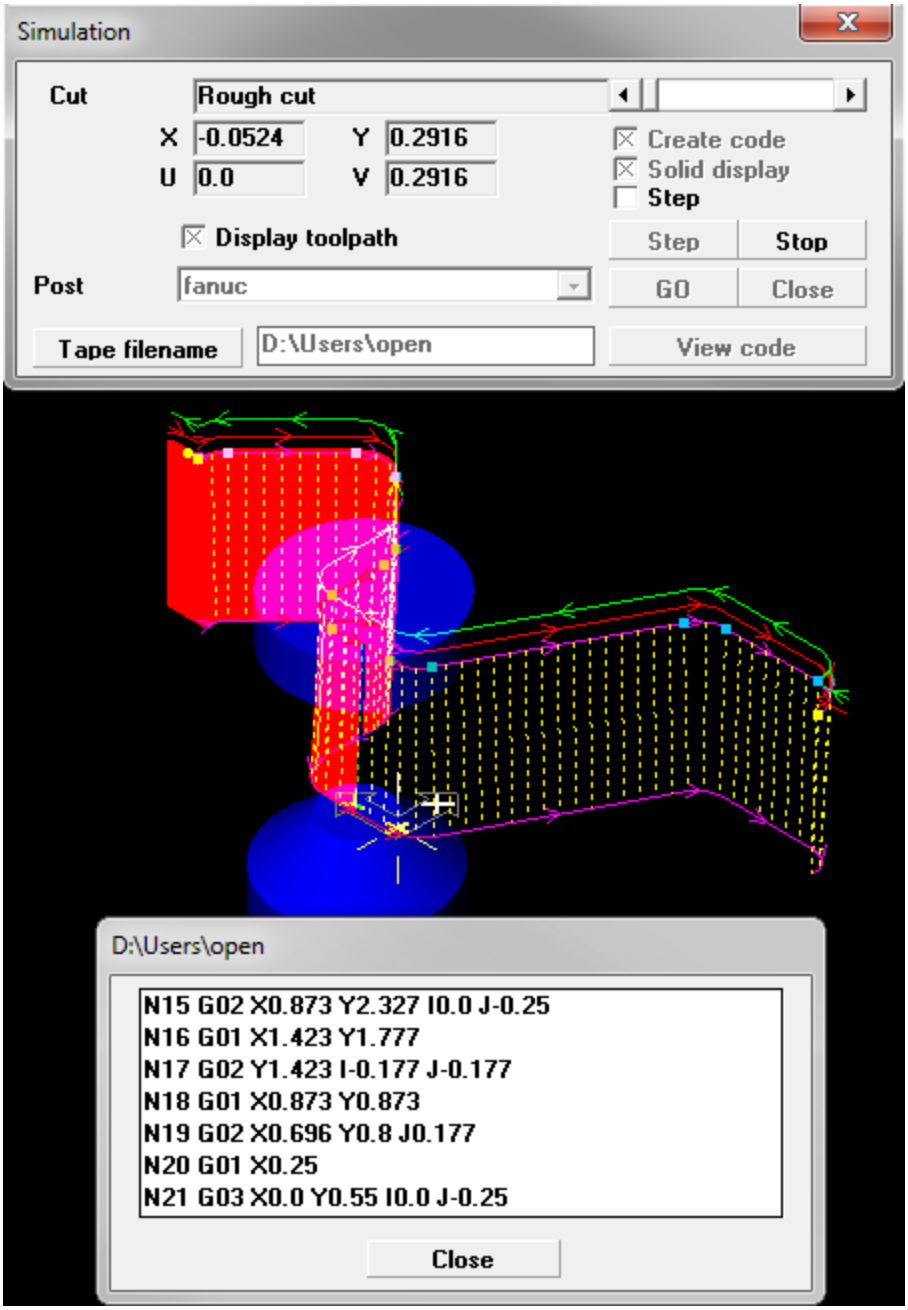


We will now post process this part.

20. Click the Create CNC Code button. 

21. Enter a name in the Tape filename box and click GO.

The rendering will run and code will be generated simultaneously.



22. Save the part when you are done.