

Laser Machining Center Cagila Software

Version 1.1, August 15, 2007, by Steven Sergenes

Version 1.2, January 19, 2010, by D.Turnbull and J. Brown

Introduction

Cagila is the software on the Rofin laser cutter located in V15. This software is used to convert user drawings, usually AutoCAD *.dxf files, to machine code. The software through a series of steps, “cleans-up” the user drawing (gaps etc.), inserts lead-ins and lead-outs for the laser cutting path, sets-up a processing sequence, and generates the machine code cutting program.

Startup and File Loading

1. Turn on the main switch on the back of the machine. (Already done if following the laser cutter start-up)

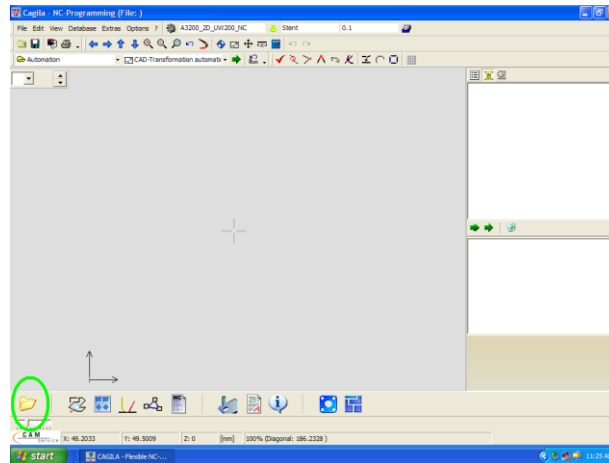


2. Turn on the computer (if not already on) and log into the system (no password is required).
3. Select the Cagila icon on the desktop.



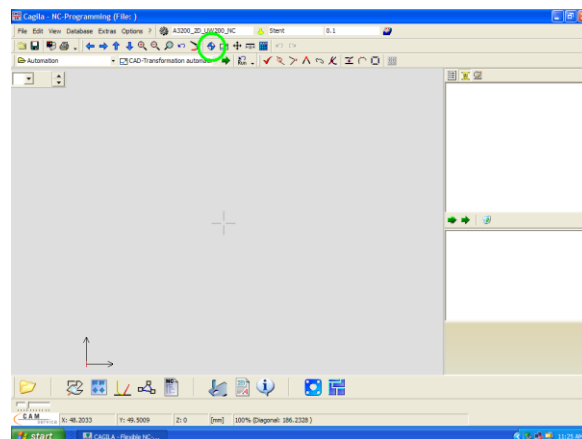
4. This will prompt you for a password to proceed. Enter the correct password to use the software (user = admin, password = admin).
5. Using the open file button at the lower left of the screen, select the file to open.

It is recommended that the user check their drawing carefully for errors prior to opening them in Cagila as repairing them in Cagila can be from very time consuming to impossible.



File Preparation

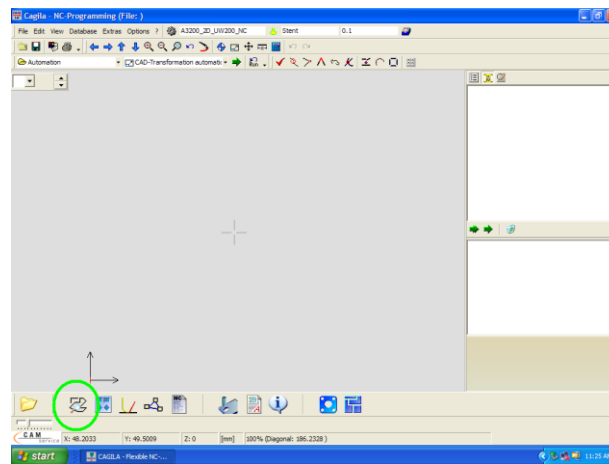
1. Select the “place point of origin” button (crosshairs with blue fill in the toolbar at the top of the screen) and select a spot on the screen where you want the laser’s home position to be. Usually it is best to place the point of origin in the lower left of the drawing. This corresponds to the right rear on the cutter when setting up the cutting head later on.



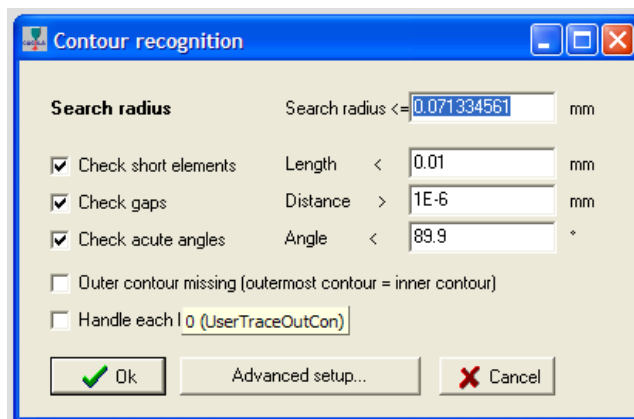
There are two icons to the right of the “point of origin” icon that are also helpful. The “measure” icon for checking your drawing is the correct size (dimensions are in millimeters), and the “scale” icon which converts the drawing from inches to millimeters or vice versa. One may also scale the drawing with a user defined factor.

2. Generating the machine code required entails selecting the buttons that run across the bottom of the screen, from left to right. The process involves selecting each of the buttons and performing the tasks required. If your file is drawn correctly without major errors, you can simply proceed through the first four steps by continually selecting OK. Otherwise the Cagila software will usually highlight the problem area of your drawing and recommended a solution.

A. Select the Analyze Topology button.



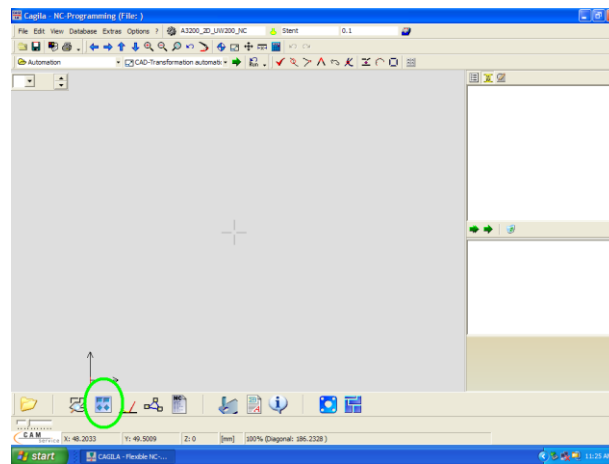
In the contour recognition screen deselect the “look for acute angles” and “check short elements” options and select OK.



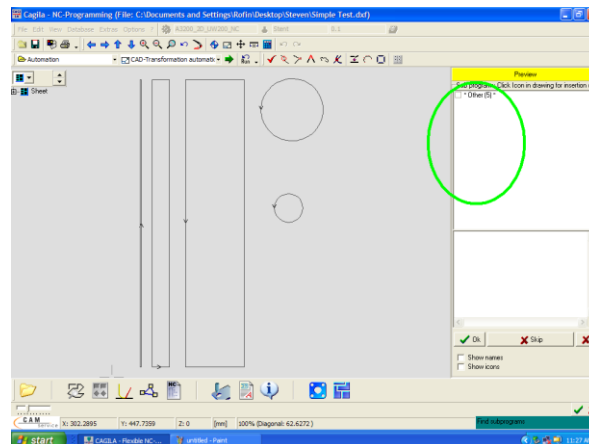
The software may recommend another tolerance that the one originally used. You can usually select OK and proceed to the next step. If not, the software will recognize errors and offer a repair. If gaps cannot be recognized and repaired by Cagila, it is normally easiest to fix the drawing in AutoCAD then reopen it in Cagila.

Also, in the contour recognition window a box that can be selected when there is no outer contour (outermost contour = inner contour). In a typical project, one would cut out all the inside (inner contours) then cut out the piece when complete (outer contour). If there is no final “cut out” one needs to select this button or problems with the program conversion will occur later on during the lead-in/lead-out placement.

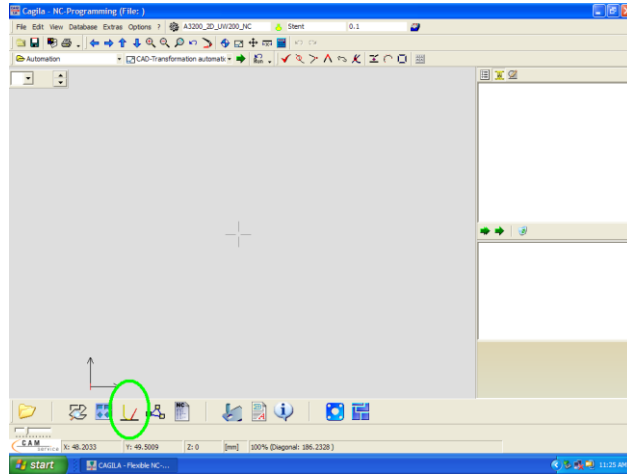
- B. Select the Find Subprograms button. Select ok. This simplifies the program and keeps it small in size when many repetitive parts are being cut.



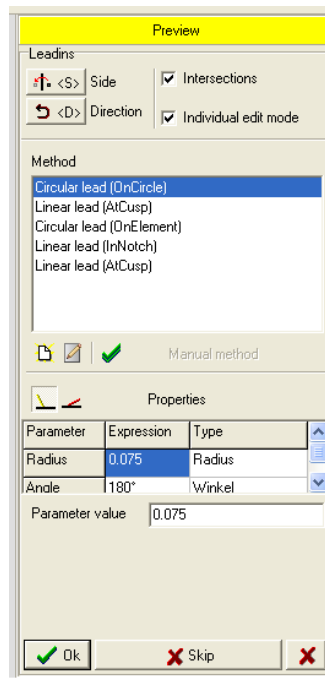
Selecting ok will lead to the next step. If you want to observe the subprograms, select each that the software has found to highlight their location on your image. Select OK.



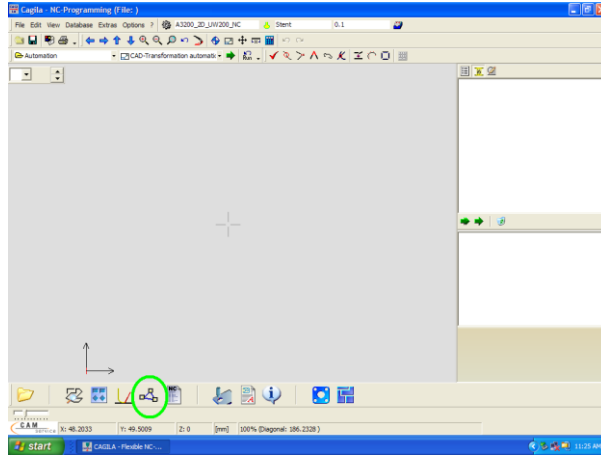
C. Select the Lead-in/Lead-out button.



The software will automatically select lead-ins and lead-outs as well as the direction the cut will proceed. If you want to change the type of lead-in/lead-out, select the point and using the options on the right side of the screen you can change the type and which side of the cut line the lead-in/lead-out will be. Select OK.



D. Select the Processing Sequence button.

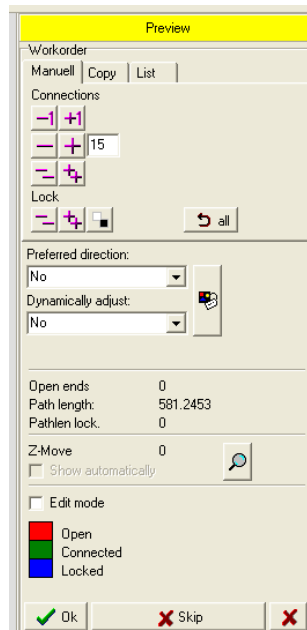


Select ok on the sequence screen.

The software will automatically choose a cutting sequence. Selecting ok will proceed to the next step. You can choose your own sequence by deselecting the automatic process (clicking the -1 button) and clicking on each start point as you want the laser to proceed. Select OK.

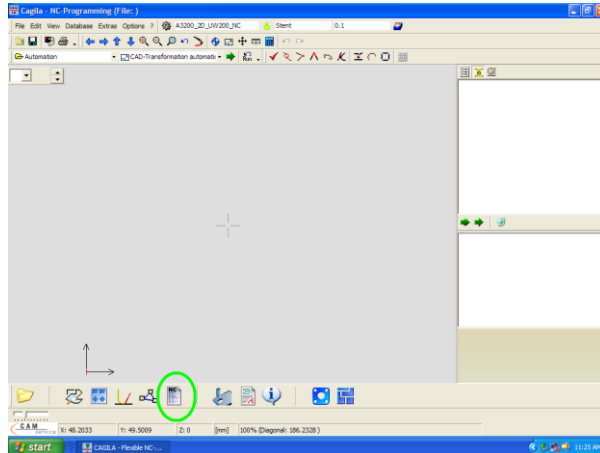
Note: The processing sequence is very important because when a piece is cut out it can occasionally stick up. As the cutting head is only 0.3mm above the work piece, the cutting head can strike this sticking up piece if it travels back over top of it.

Whenever possible, a sequence should be selected that never crosses back over a piece that has already been cut.



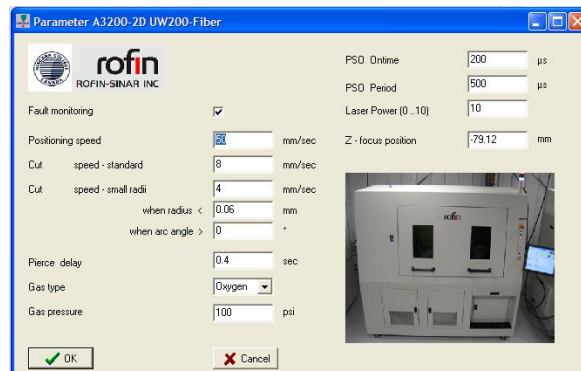
Code Generation

1. Select the NC-Program button.



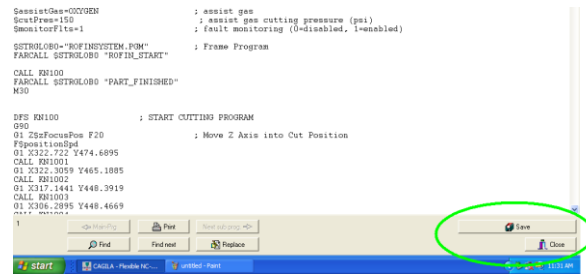
It will prompt you for a comment. Enter a brief description and select ok. These comments will appear in the header section of your cutting program and can be very helpful later on.

All items on the parameter screen shown below can be edited later in the cutting program file and do not need to be entered now. However, if you know the parameters desired it is convenient to enter them here. Correct parameters here will provide an accurate cutting simulation (see step 2 below). When complete Select OK.



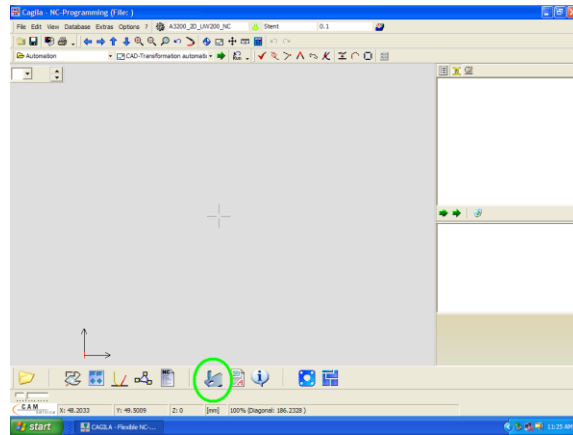
Continue to select OK until the code is brought onto the screen.

Select save on the code screen and save the program to your folder, USB etc...

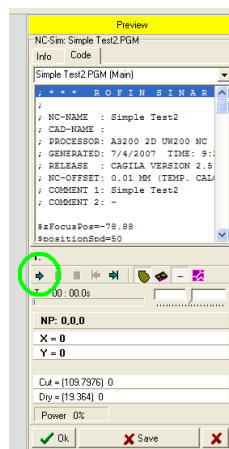


After saving select close.

2. If you wish to see the entire process being performed in its entirety, select the NC-simulation button. This will prompt you to select the program that you wish to see processed. Select OK.



When the screen comes up select the small arrow on the side toolbar. This will show you the sequence the laser cutter will perform.



3. Close the software. **Do not create a system backup.**

Appendix

The drawing files used are AutoCAD files. A few restrictions apply to using these files:

1. The files must be in a DXF format for the Cagila software to accept the file.
2. The drawing must be free of multilines, text, points that connect to nothing, and splines. These AutoCAD features are not recognized by the software.

Note: Text and spline recognition software are very expensive options in Cagila but,

Text can be imported into an AutoCAD drawing from a third party software i.e. Outline art and in the final AutoCAD *.dxf file the text will be recognized by Cagila as a series of lines.

Splines can be imported into Cagila if first saved with an older AutoCAD *.dxf format which converts the splines into a format Cagila recognizes.

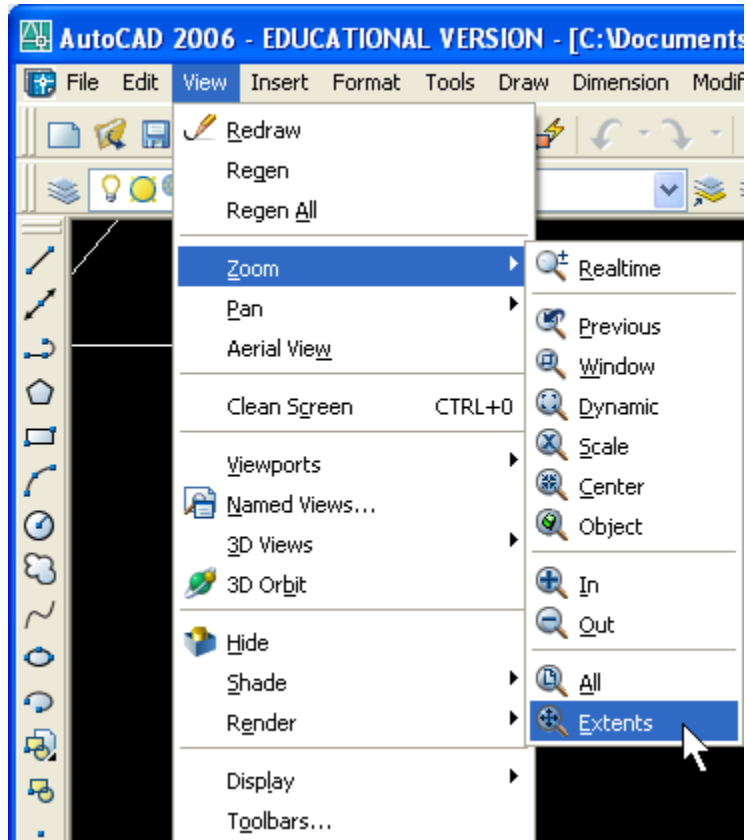
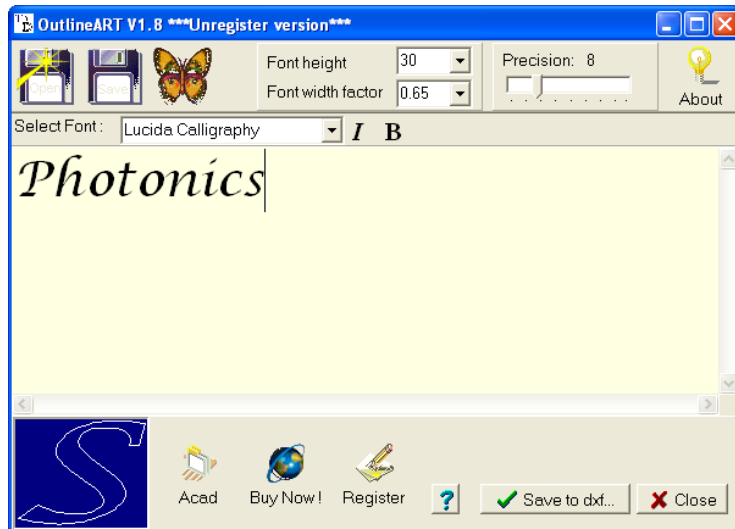
Importing Text into AutoCAD

Download and install OutlineART or copy from network share. This is Freeware. One licensed version available in V15 which provides additional options.

<http://www.dwgtool.com/outline.htm>

Select the font of your choice and type in the text you want to convert to dxf format. The unregistered version limits text to a single line.

If you will be cutting the text on the laser cutter, you will need to consider the counters, this is the area which is either fully or partially enclosed by the character such as the 'P' and the 'O' in Photonics. You can use a stencil font design which has bridges to hold the counters in place however this will restrict your choice of fonts. You can also manually create the bridges in AutoCAD using any font



Using Modify > Break

Fonts

Stencil - Standard Windows Font (XP, Vista)
THE QUICK BROWN FOX JUMPS OVER THE LAZY DOG. 1234567890

Crassroots Stencil - Available from Open Font Library
<http://openfontlibrary.org/media/files/ChozCunningham/30>
The quick brown fox jumps over the lazy dog. 1234567890

Splines

Caglia does not process spline curves. However, AutoCAD will convert the splines if it is saved in an older format then reopen the newly created DXF file (see below).

