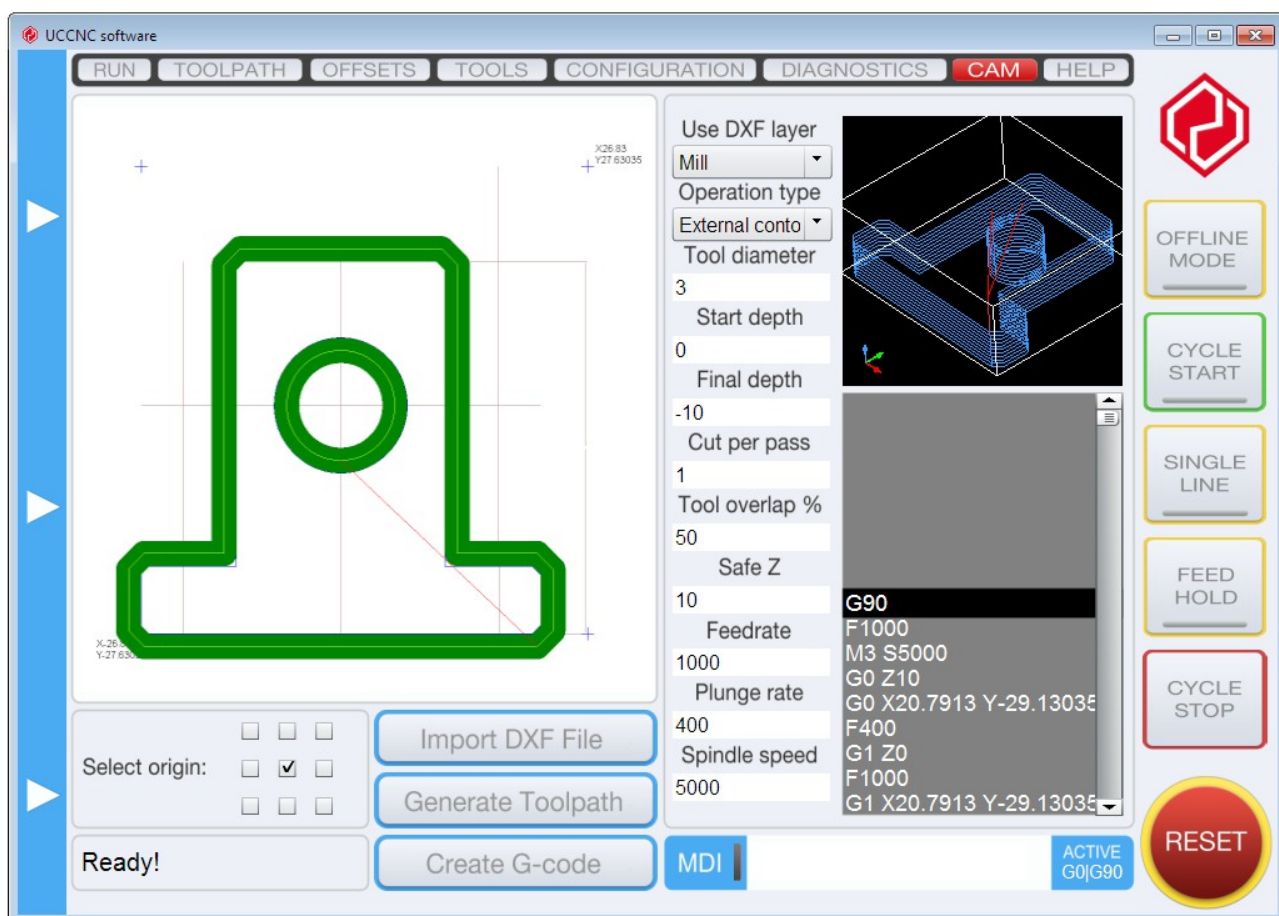


UCCAM software user's guide a module of the UCCNC software



Version of this software manual: 1.0002
Software version: 1.2113

Contents

1. Description of the UCCAM software module, introduction.
2. Licensing the UCCAM software module.
3. Importing DXF files.
4. Operations of the UCCAM software module.
 - 4.1. Internal contour.
 - 4.2. External contour.
 - 4.3. On line cutout.
 - 4.4. Pocket.
 - 4.5. Drill.
 - 4.6. Spiral drill.
5. Operations parameters.
6. Generating toolpath.
7. Creating G-code.
8. Known limitations.

1 .Description of the UCCAM software module.

For first of all we thank you for your interest in our software product and reading this user's guide.

The UCCAM software is a built in basic CAM module of the UCCNC software. This software module is however built into the UCCNC software it is developed separately and is described in this separated user's manual.

The UCCAM software is part of the UCCNC installer and installs with the software, there is no need to install anything separately.

To use the UCCAM software select the 'CAM" tab page in the UCCNC software.

2 .Licensing the UCCAM software module.

The UCCAM software module does not require a separate license, the license for the UCCNC software will unlock the UCCAM module also. This means that the users who licensed the UCCNC software can also use the UCCAM module without limitations, but the motion controller which the license was purchased for must be connected to the computer for the software module to work unlimited.

Without a license key the UCCAM module runs in demo mode and it generates G-codes with a 250 lines limit. If the actual code is longer than 250lines then the code will be truncated.

The EULA of the UCCNC software applies also for the UCCAM software module.

The EULA can be read on the software installation.

3 .Importing DXF files.

The UCCAM is capable to import .dxf drawing files and can do different operations on the layers of the drawing. To import a .dxf file press the "import dxf" button in the UCCNC software. This will create an open file dialog and browse the .dxf file to import it.

Once the file was selected the drawing it contains will be displayed on the left side of the screen.

The layers defined in the drawing will be listed in the "DXF layer to use" dropdown box.

The software can do operations on the selected layer of the drawing. Selecting a layer will

make all the objects on that layer to appear in blue color while all objects on the other layers will appear in gray color. Executing an operation will affect the selected layer (blue colored) objects only.

It must be also noted that the UCCAM software can make operations on closed polygons only which means that all polygon objects on any layers will be excluded from the operations and will be shown with brown color.

4 .Operations of the UCCAM software module.

As in most CAM softwares there are a few different type of milling, pocketing and drilling operations are available in the UCCAM software module. These operations are described in details in this section of the user's guide.

4.1 .Internal contour.

The internal contour operation offsets the closed drawing objects with the tool radius and runs inside the drawing. If any drawing objects contains other objects these are understand as "holes" in the object and these will be offset with an external contour, this way the drawing object is considered as the waste material and the sheet will be the workpiece. The drawing objects can be embedded into eachother to any level, the software always aware of which part is a workpiece and which part is a "hole".

4.2 . External contour

The external contour operation is very similar to the internal countour operation described previously, the difference is that in the external contouring the toolpath gets offset with a positive radius value, so the tool with run outside the drawing object's countour. The embedded other drawing objects are also considered as "holes". In this operation the drawing is considered as the workpiece and the sheet as the waste material. The drawing objects can be embedded into eachother to any level, the software always aware of which part is a workpiece and which part is a "hole".

4.3 .On line cutout

The online cutout operation runs the tool on the closed drawing objects' lines, there is no offset calculated.

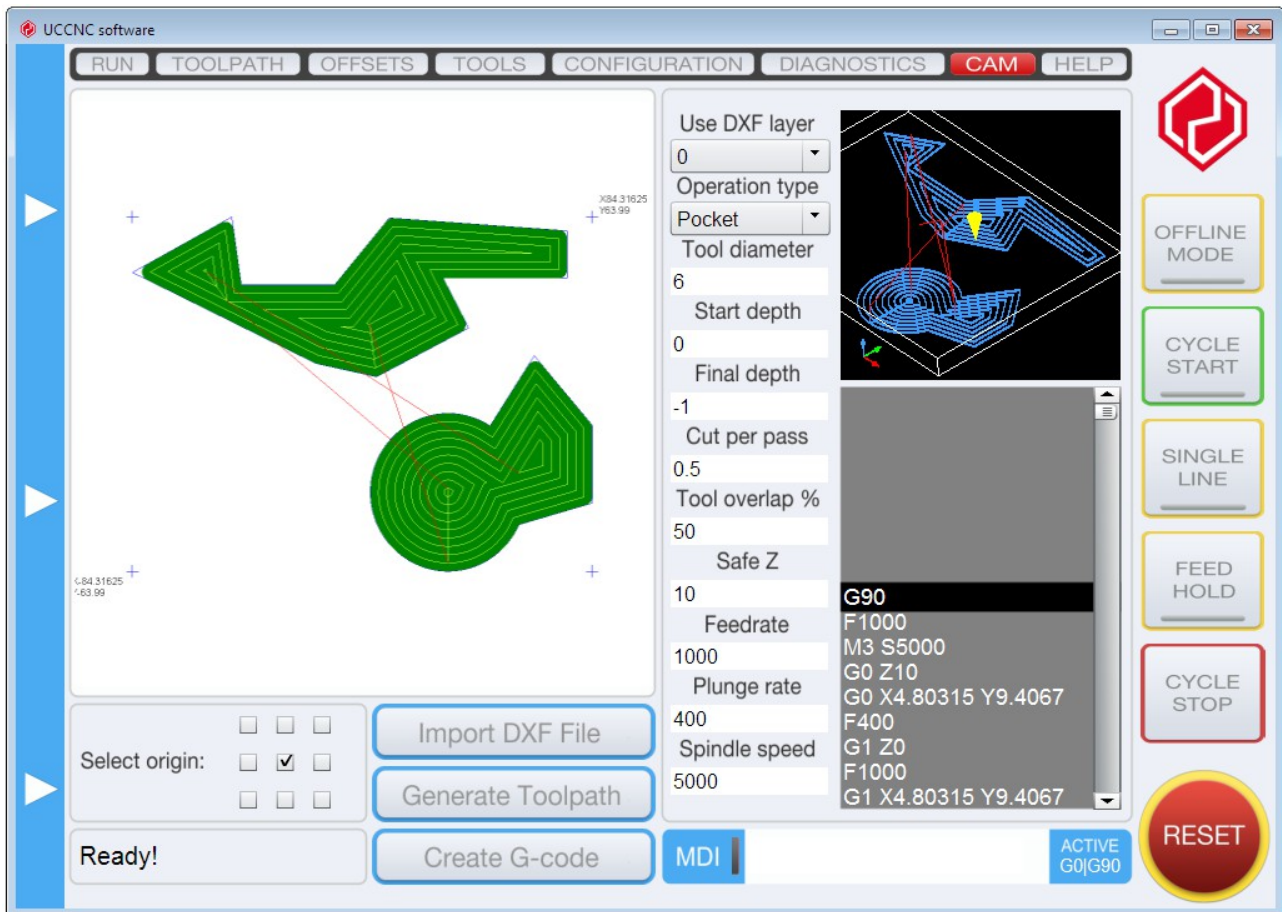
4.4 .Pocket

In the pocketing operation the drawing objects internal area are all considered as the waste material. The machine will remove all the material inside the closed drawing paths.

The tool is first offset inside the drawing with the tool radius and then it will be offset in a loop with the tool diameter times the tool overlap parameter, so there will be an overlap of the paths between the cycles. The loop ends when all material gets removed.

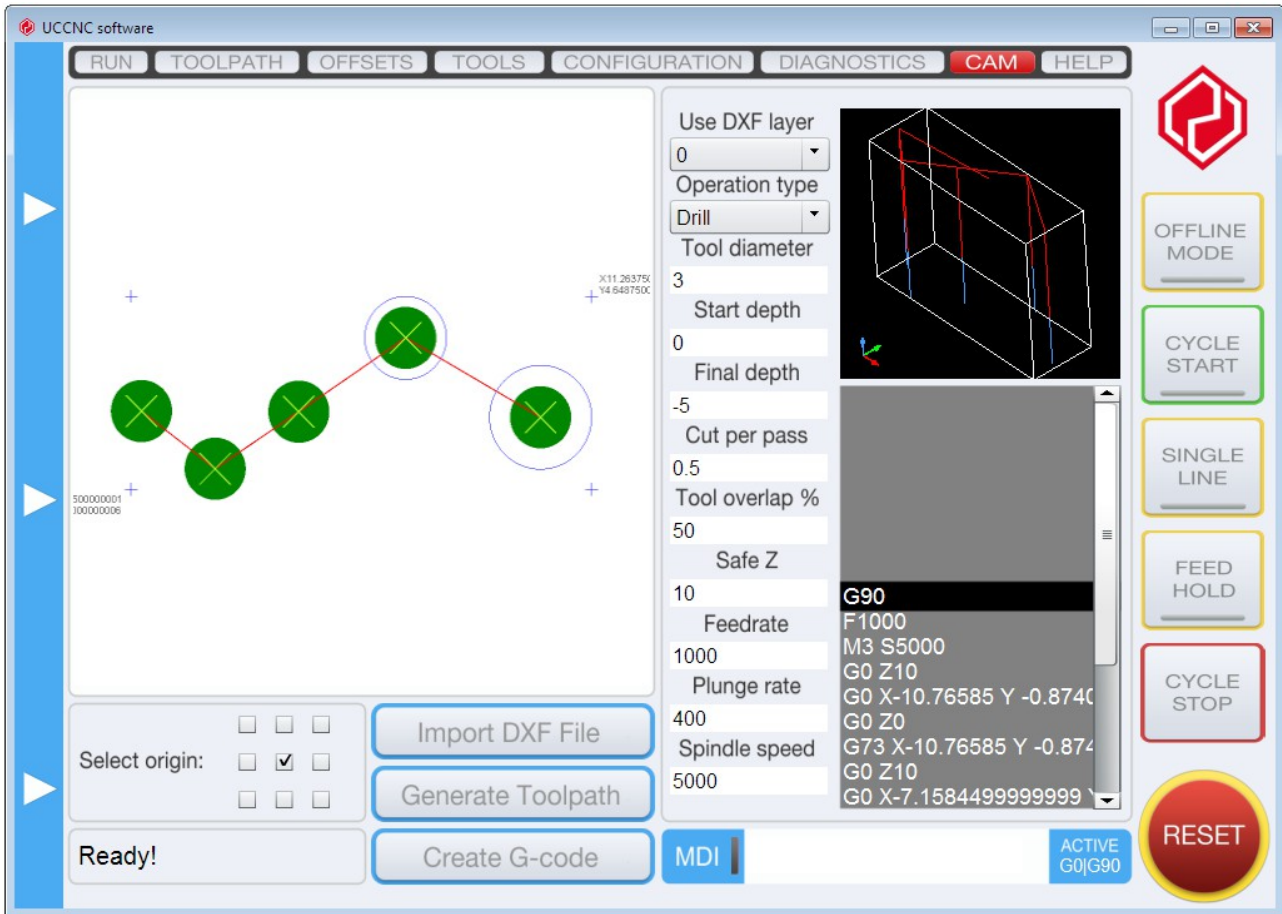
The drawing objects can be embedded into eachother to any level, the internal drawing objects will be considered as "holes" in the pocket and the software will leave these out and will not remove the material from the holes.

The following picture shows an example for the pocket operation:



4.5 .Drill

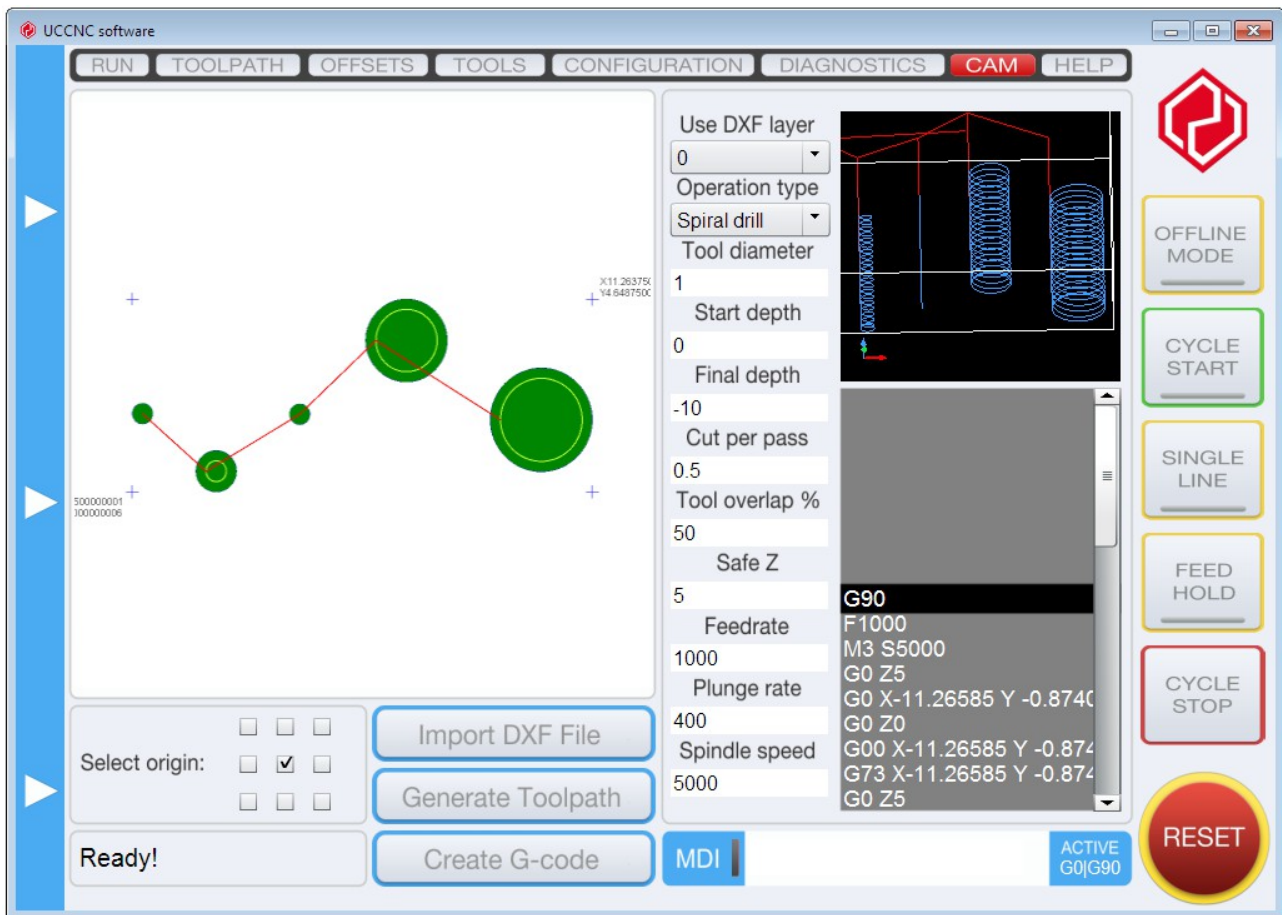
The drill operation makes a simple drilling where all full circles are considered as drilling points. The center of each circle will be drilled, no matter what the diameter of the circle is. The drilling points are drawn with filled circles with the midpoint marked with a cross symbol. The diameter of the drilling symbols is the diameter of the tool. The following drawing shows an example for the drilling operation.



4.6 .Spiral drill

The spiral drill operation drills all the full circle objects with a milling operation where the tool runs around inside the circle objects continuously lowering the Z axis height making a continuous spiral path inside the circle. All circles which has lower than the tool diameter are left out of the operation, because the tool then can't fit inside the circle.

The following drawing shows an example for the spiral drilling operation.



5 .Operations parameters

To control the toolpath generation there are a few parameters to setup, the available parameters are described in this section of the manual.

Use DXF layer

When loading a DXF file all the available layer names in the file will be listed in this dropdown list. The objects on the different layers can be selected with selecting the name of the layer in the dropdown list. The UCCAM makes the operations on the selected layer.

Operation type

There are a few different operations available in the software, the operations are described in section 4. of this manual. To select an operation select it from the dropdown list.

Tool diameter

This parameter defines the diameter of the tool used for the milling or drilling operations.

Start depth

The start depth parameter defines the start depth of the milling. The Z-axis will have this value for the milling of the first layer.

Final depth

The final depth parameter will be the lowest Z-axis value in the milling/drilling operation, in other words the part will be milled or drilled to this depth.

Cut per pass

The cut per pass parameter defines the depth change per pass the machine will do along the Z-axis. For example if the Start depth is 0, the final depth is -0.4 and the cut per pass is 0.2 then the operation will be done from 3 steps, the first depth will be at Z=0, the second will be Z=-0.2 and the finishing step will be at Z=-0.4 units.

The final depth of the cut will be always on the set final depth parameter and therefore there can be cases when the last depth pass will be smaller than the cut per pass parameter.

Tool overlap %

The tool overlap parameter is for the pocketing operation only. When cutting a pocket the tool is offset on the cycles with the tool overlap parameter times the tool diameter.

For example if the tool diameter is 6mm and the tool overlap parameter is 50% then the cycles will be offset with 3mm. The tool overlap parameter range is 50 to 99%.

Safe Z

The safe Z parameter defines the travel height of the tool, in other words the Z-axis is lifted to this height when the axis are traveling with rapid feedrate.

Feedrate

The Feedrate parameter defines the cut feedrate, in other words this parameter sets the speed of the cutting along the XY plane.

Plunge rate

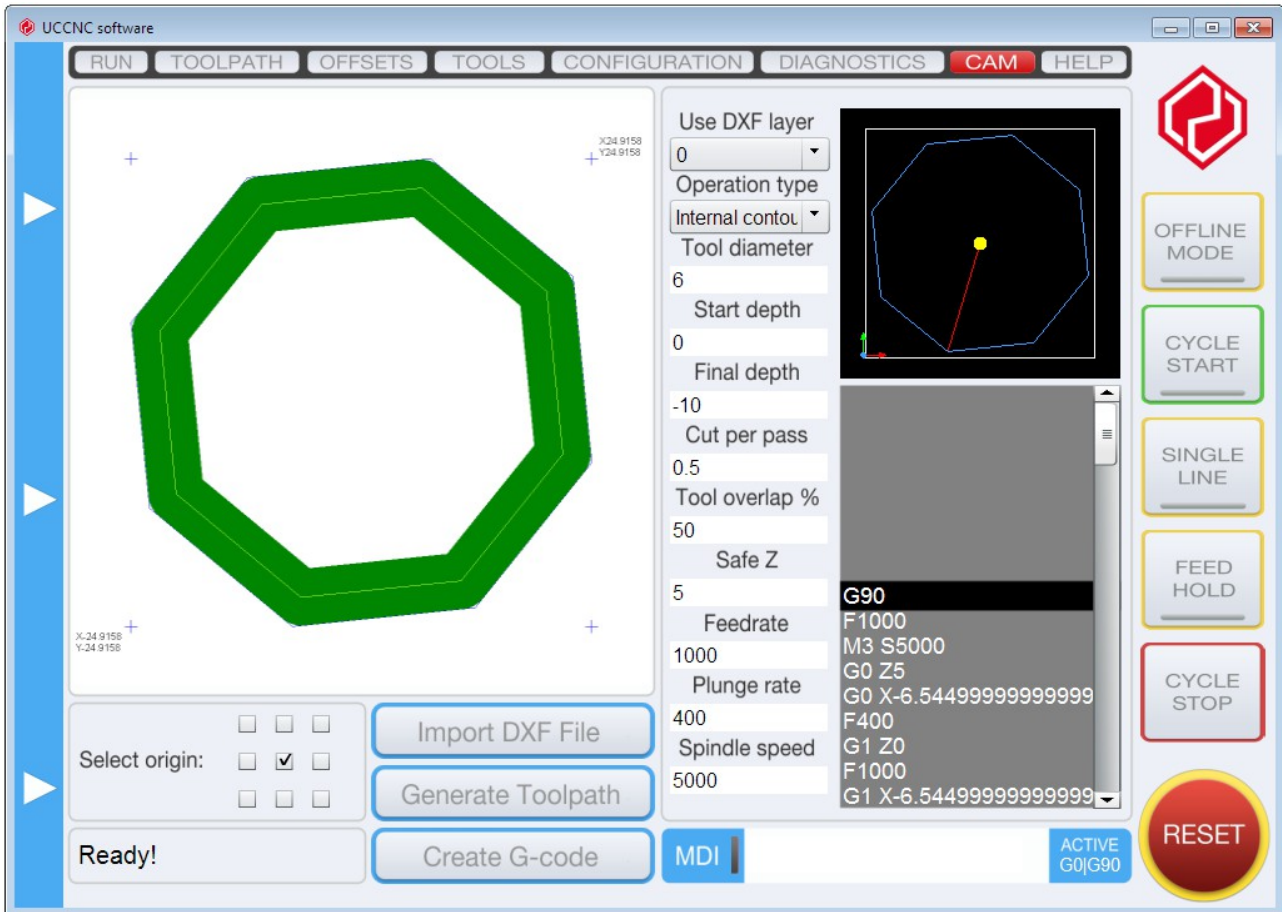
The plunge rate parameter is the feedrate along the Z-axis. The tool will move with this feedrate when moving downwards, to the material.

Spindle speed

The spindle speed parameter sets the rotational speed of the spindle, The spindle speed is programmed with the 'S' keyword.

Origin selection

To select the origin (zero point) of the drawing to the toolpath select one of the origin selection checkboxes. Selecting the origin will offset the toolpath generated from the drawing. If no origin checkboxes are selected then the generated toolpath will not be offset and the origin will remain the same as defined in the dxf file.



6 .Generating toolpath

After selecting the dxf layer for the operation and setting up the parameters for the operation press the Generate toolpath button to create the toolpath. The CAM viewer will show the generated path with green color. The thickness of the lines is proportional to the tool diameter used for the operation. The center of the path lines are marked with lightgreen color.

7 .Creating G-code

To generate G-code from the toolpath press the button with the create G-code text. The UCCAM module will generate the g-code for the operation and will send the code to the UCCNC software for execution. The code will appear in the G-code viewer of the software and also the toolpath viewer will show the toolpath. The code is now executable with the UCCNC software.

8 .Known limitations

The software cannot read splines/nurbs from the dxf file, it just ignores these type of objects.

The objects, lines and arcs must be connected with their endpoints to form closed shapes, midpoints connections are not supported, if the draw objects are connected via midpoints the software will ignore those connections and the object will not form a closed shape and will be left out of the operations.