

## 3D Cutting Simulator – Mach4 Hobby Plugin

*This Plugin was created by ModuleWorks for Mach4 – Hobby. The Plugin adds a new display to Mach4 that allows the virtual cutting of parts. Inputs such as the tool measurement, material size, cutting speed, etc. are all used and displayed on the screen as if the part was actually being cut on a real machine. This Plugin gives users a method to test their gcode before cutting real stock. This plugin is licensed and supported by Artsoft.*

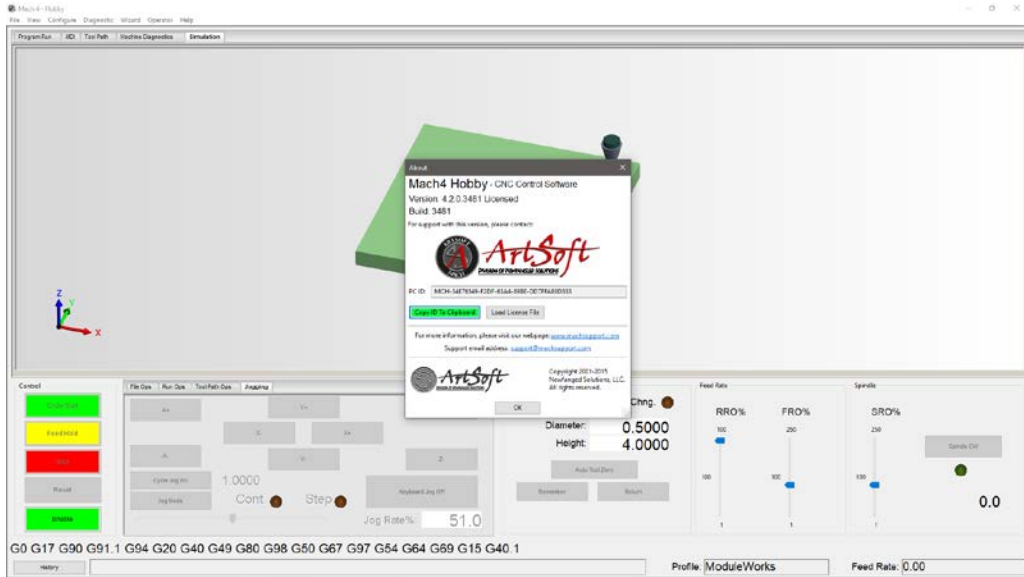
*CAUTION: The Simulation is limited to the tool and the stock being machined and will Not indicate interference or crash potentials with clamps, work surfaces, the cnc machine itself, etc.*

### **Installation**

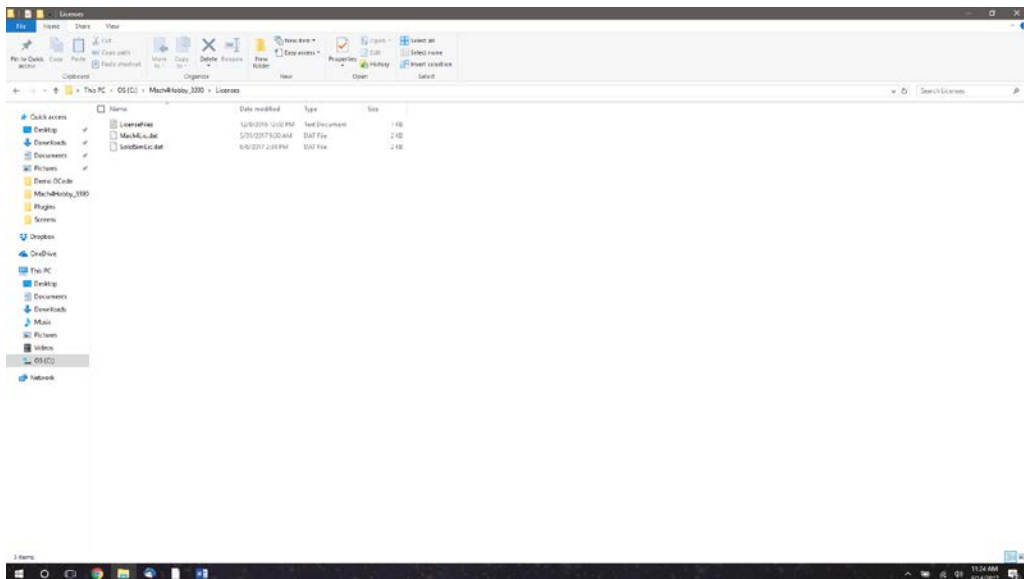
In order to use the 3D Cutting Simulator, you will need to download the plugin files and purchase a license. You can accomplish both at the Mach Support website.

Start by clicking ‘Download 3D Cutting Simulator Plugin.’ On the next page, select ‘ModuleWorks\_3D\_Plugin\_M4\_Hobby’ to start your download. Once finished, run the Installer and select the Mach4 Hobby folder for the plugin.

Next, you’ll need to purchase a license, which can be done at the Mach Support website. When you receive your license, make note of where it is located on your computer. Do not rename the file or alter it in any way. Open Mach4 and select the new ModuleWorks profile that has been created for you. From the menu options across the top of your screen, navigate to Help>About. This will open a small window. Click ‘Load License File’ and find your license file in your computer. Close Mach4 and reopen to use 3D Cutting Simulator.



**Note:** If there is an issue loading your license, you will not be able to see your stock in the Simulation tab. Rather than seeing a cube or other shape, your screen will appear blank or a solid color in the Simulator window. You will also see an error message in the status bar at the bottom of Mach4. If your license was loaded correctly, your C: >Mach4>Licenses folder should look like this:

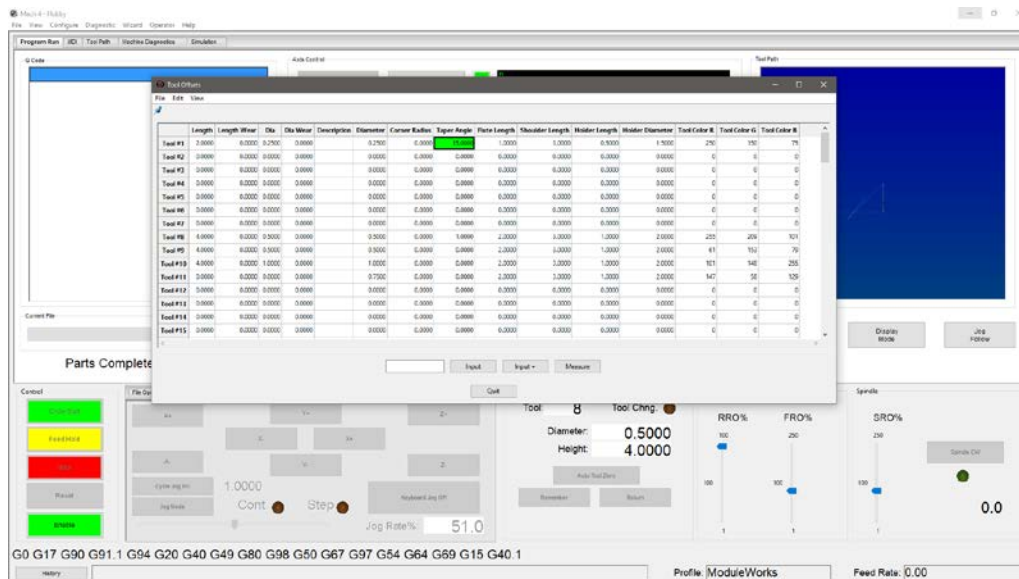


# Operation

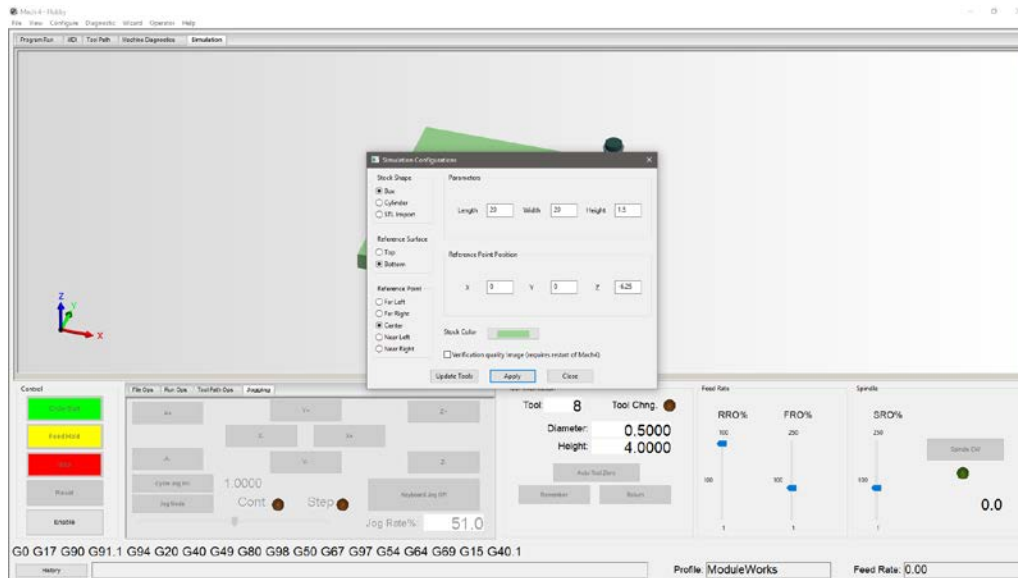
## Getting Started:

Open Mach4 Loader and select the ModuleWorks profile, which was included in the plugin files you downloaded. Once you have loaded the profile, you can begin to enter in the specifications you will be using in your simulation.

To enter in the dimensions of your tool, navigate to View>Tool Table and begin filling in the necessary information. For the best results, be as accurate as possible.



Next, you can enter in the dimensions of your stock by navigating to Configure>Plugins>Simulator-ModuleWorks. This will open a window that will allow you to set your stock and the bottom center position for your tool. This window is important and you may have to return to it to change these settings often. You can choose between a box, a cylinder, or you can import an STL file with custom stock dimensions. Once your stock is selected, you can choose the Reference Point, which is where your tool will begin in reference to your stock.

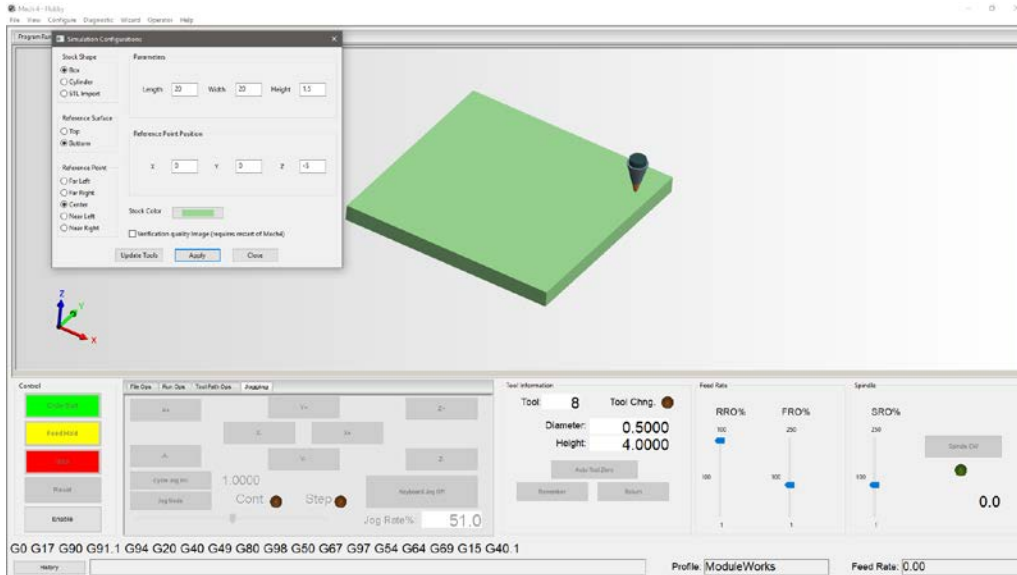


Once you have established your tool settings and configured your stock, navigate to the Simulation tab. You should see your tool and stock ready and waiting to be cut. Based on your cut file, you may have to maneuver your tool to the correct zero location. You can do this by accessing Configure>Plugins>Simulator-ModuleWorks and adjusting your Bottom Center Position so that your tool is in the correct starting location. (future changes coming)

### Troubleshooting:

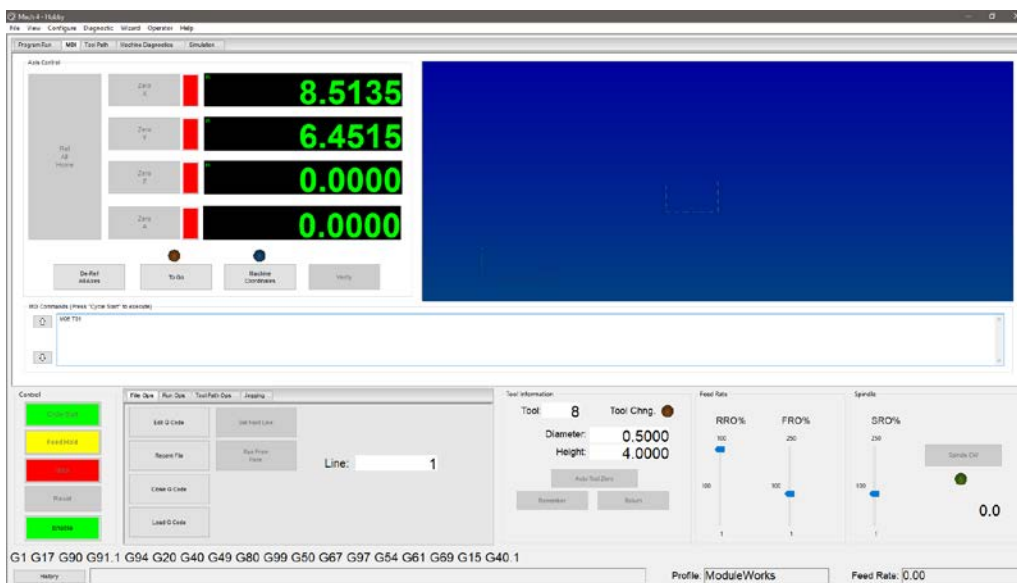
If your tool is not visible, or it is visible but not where it should be (i.e., positioned above your stock), navigate back to Configure>Plugins>Simulator-ModuleWorks and adjust your bottom center position until your tool is visible. Bear in mind, your Z may need to be negative. You may have to zoom in or out in the Simulation window to get a view that works for you. The work surface can also be rotated within that same window.

In the example below, my tool was hidden beneath my stock until I adjusted my 'Z' to -5. Your settings will not necessarily match mine, as your tool size, stock size, and the size of your design may require different specifications. Don't be afraid to play around with your settings and specifications. The beauty of this program is it allows you the wiggle room to figure out how to get it right without risking damage, injury, or too much wasted time.



### Additional troubleshooting:

If adjusting your settings, changing the angle of the stock, and altering the level of zoom still don't produce a tool, you will need to manually enter in a tool change. This "equips" the tool you have created through a macro. To do this, navigate to the MDI tab. In the middle of the screen you should see an empty field. Select MDI (Manual Data Input) instead and type in M06 T01 (or replace 01 with your tool number). Enable Mach4 and click Cycle Start MDI. Disable Mach4, return to the Simulation tab, and your tool should be visible. You will need to adjust your tool to the correct position as discussed previously.



## Running a simulation:

Once you have your parameters set to your liking, it is time to run a simulation. If you have a g code file ready to go, click the 'Load G Code' button in the File Ops tab at the bottom center of your Mach4 window. Find and select your g code file. Now you just Enable Mach4, Cycle Start the program, and you can watch your project start to unfold in the Simulation tab.

If you don't have a file ready, you can create one with a number of CAD/CAM software packages or you can find a pre-made file online. Our support forum has an established thread where users share their g code files and it is a great resource for all Mach-related questions.

When your file has loaded, you should see a preview of the toolpath. This can be found in the Program Run tab or the Toolpath tab. Switch back to the Simulation tab, Enable, Cycle Start, and you can watch your part as it's cut.

