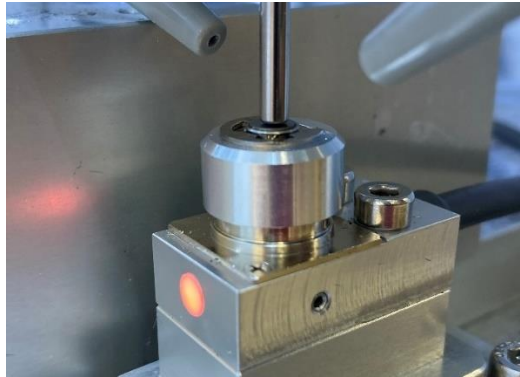


## Elara Tool-Change Test File

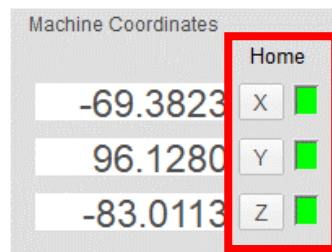


There are a few important steps to successfully use the Tool Height Set probe. Herein we describe the basic steps with a few important tips to avoid causing the Controller to freeze in an unexpected state.

1. Secure a piece of wax (supplied with the machine) in the 4<sup>th</sup> axis chuck or secure the wax to the XY table.
2. Open Mach4
3. "Enable" machine

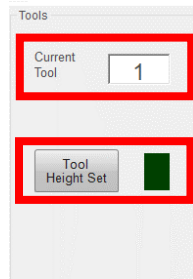


4. "Home" machine in X, Y, Z

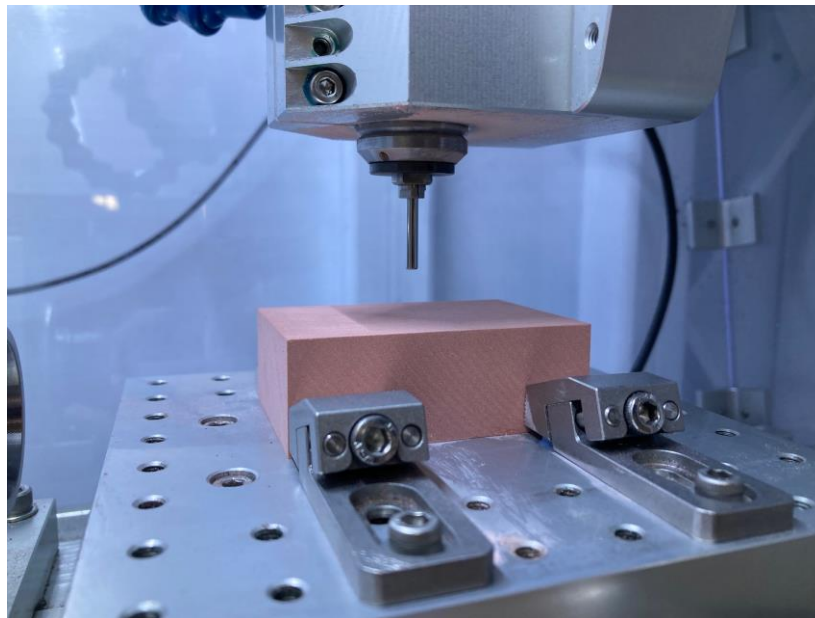
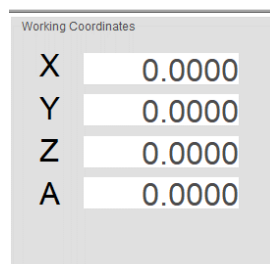


5. Insert tool 1. Here just use the endmill blank supplied with the machine.

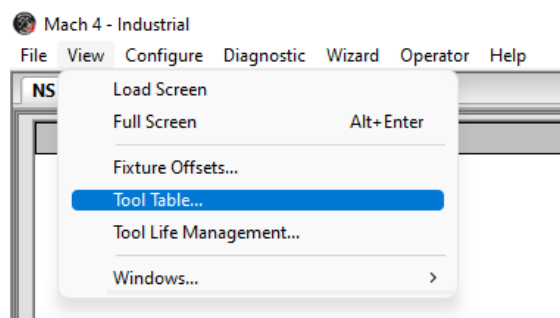
6. Type tool “1” and press “enter” on the keypad (this will ensure the value is saved). Then click Tool height set



7. Find the XY center of material, and set Working Coordinates X=0 and Y=0 zero, then position the Z axis roughly 10 mm above the material and set Z = 0. Because this is a test, this is the only reason we are setting Z = 0 at 10 mm above the material. When you are using this procedure on a real program, you need to set the XYZ zero to the XYZ zero you set in the .nc or .tap program.



8. Open tool table



9. Verify the Tool Height Set probe measured the height. **Now set Tool #1 = 0.**

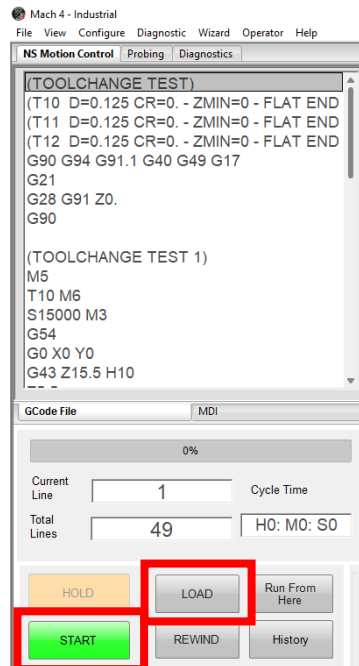
The image shows two side-by-side screenshots of the 'Tool Offsets' window. Both windows have a menu bar with 'File', 'Edit', and 'View'. The left window shows a table with columns: Length, Length Wear, Dia, Dia Wear, Description, X Tool Change, and Y Tool Change. The data is as follows:

	Length	Length Wear	Dia	Dia Wear	Description	X Tool Change	Y Tool Change
Tool #1	16.9539	0.0000	0.0000	0.0000		0.0000	0.0000
Tool #2	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000
Tool #3	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000
Tool #4	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000

The right window shows the same table, but Tool #1's Length is now 0.0000. A red arrow points from the 16.9539 value in the left window to the 0.0000 value in the right window.

	Length	Length Wear	Dia	Dia Wear	Description	X Tool Change	Y Tool Change
Tool #1	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000
Tool #2	16.9539	0.0000	0.0000	0.0000		0.0000	0.0000
Tool #3	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000
Tool #4	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000

10. Click “Load” to and select the “toolchange test.tap” program, verify the program title matches the one shown below, then press “Start”. The program will start and run to the first tool change.

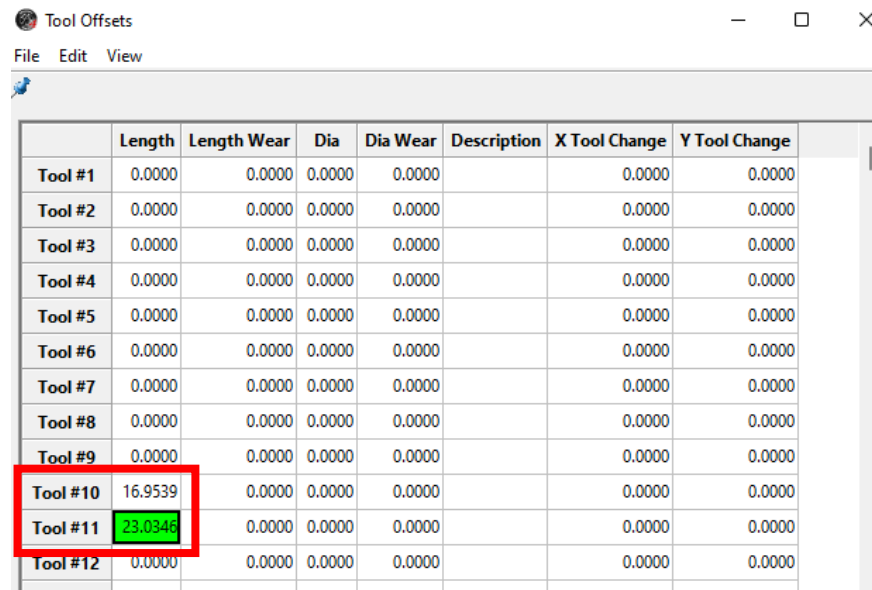


11. Verify Tool #1 is zero, and Tool #10 is not zero (height will vary depending on how you inserted the tool).

The image shows the 'Tool Offsets' window with a table containing 12 tools. The table has columns: Length, Length Wear, Dia, Dia Wear, Description, X Tool Change, and Y Tool Change. The data is as follows:

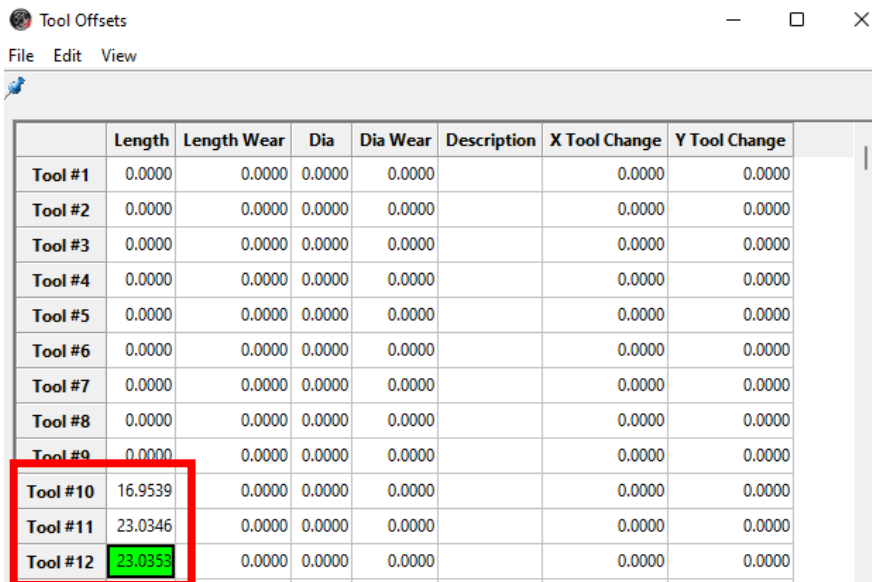
	Length	Length Wear	Dia	Dia Wear	Description	X Tool Change	Y Tool Change
Tool #1	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000
Tool #2	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000
Tool #3	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000
Tool #4	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000
Tool #5	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000
Tool #6	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000
Tool #7	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000
Tool #8	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000
Tool #9	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000
Tool #10	16.9539	0.0000	0.0000	0.0000		0.0000	0.0000
Tool #11	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000
Tool #12	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000

12. Machine should auto run until next tool change and turn off the spindle.
13. We will simulate a tool change. Loosen the collet on the spindle, change the height of the endmill blank (make it “longer”), then tighten the collet again.
14. This time enter the next value, here it is 11. Again, DO NOT click on the popup window. Like before, enter “11”, press “enter” on the keypad, then click on “Tool Height Set.”
15. Verify that Tool #11 is longer than Tool #10.



	Length	Length Wear	Dia	Dia Wear	Description	X Tool Change	Y Tool Change
Tool #1	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000
Tool #2	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000
Tool #3	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000
Tool #4	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000
Tool #5	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000
Tool #6	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000
Tool #7	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000
Tool #8	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000
Tool #9	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000
Tool #10	16.9539	0.0000	0.0000	0.0000		0.0000	0.0000
Tool #11	23.0346	0.0000	0.0000	0.0000		0.0000	0.0000
Tool #12	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000

16. Repeat 14-18. This time do not change the height of the tool in the collet, just go to the next step. Because you DID NOT adjust the tool, Tool #12 should be roughly the same as Tool #11.



	Length	Length Wear	Dia	Dia Wear	Description	X Tool Change	Y Tool Change
Tool #1	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000
Tool #2	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000
Tool #3	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000
Tool #4	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000
Tool #5	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000
Tool #6	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000
Tool #7	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000
Tool #8	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000
Tool #9	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000
Tool #10	16.9539	0.0000	0.0000	0.0000		0.0000	0.0000
Tool #11	23.0346	0.0000	0.0000	0.0000		0.0000	0.0000
Tool #12	23.0353	0.0000	0.0000	0.0000		0.0000	0.0000

**Congratulations**, you have completed your first tool change procedure on your new Elara! This is the process you will use each time you run a program with tool changes.

**TIP.** Don't forget that when you find the XYZ zero of your material, you also need to zero Tool #1.