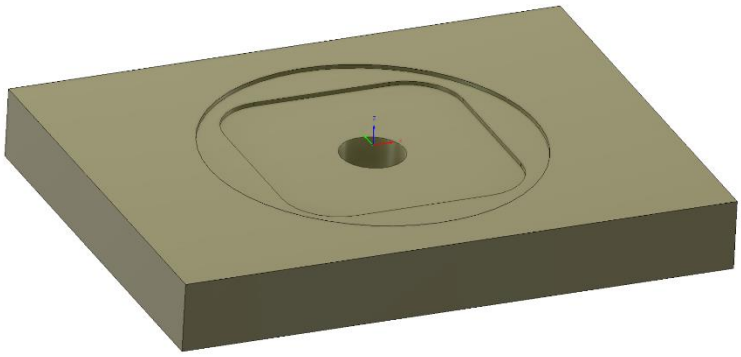
Elara Test File

Testing is the very first thing that nearly everyone wants to do when they receive a new CNC mill. However, this mill and its operation is complex and we strongly recommend that you read and understand the entire manual (including this section) before you insert a tool in the spindle and attempt to cut material. With the obvious statements out of the way, let's begin.

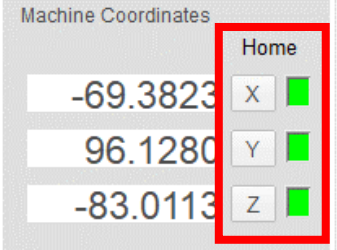
Your first machining test, while simple, includes several key elements.

- First, we want to be sure that the machine was not damaged during shipping. So we will cut both a circle and a square. If the circle machined is circular (verified by measurements taken at several diagonal positions) and the edges of the square are straight with perpendicular sides (measured at several positions), then we are assured that the XYZ axis of the machine are operating correctly.
- Next we can verify the correct operation and communication of the program and the stepper motors with just a few simple operations, and this pattern demonstrates 3 (circle, square, and hole bore).
- If you have a 4-th axis, we will repeat the operation on both sides, and verify that the A-axis is operating correctly, and see that the hole in the center aligns top and bottom.
- Finally, this simple test will verify YOUR ability to follow directions and operate the machine safely without crashing the cutter into the material, work holding, etc.

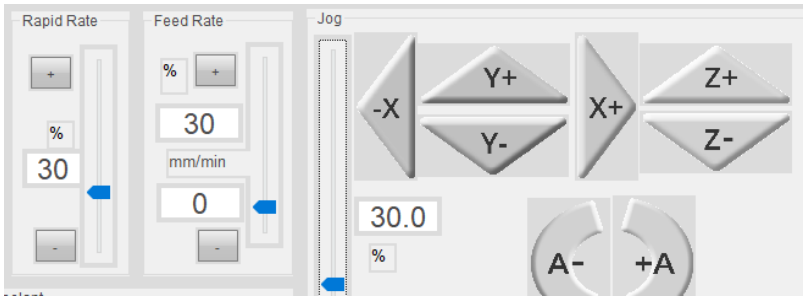


The steps are as follows:

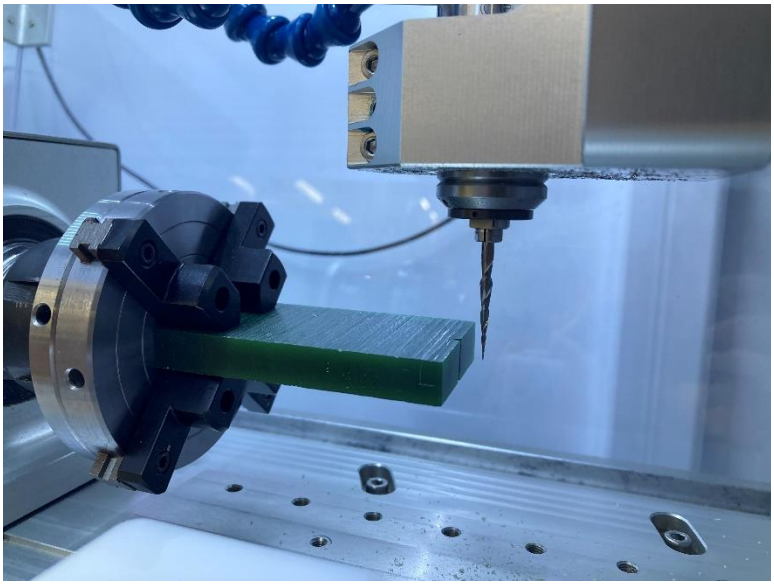
1. Initialize and home the machine as described in this manual.



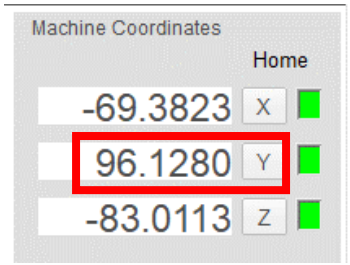
2. Set the Rapid Rate, Feed Rate and Jog to 30%



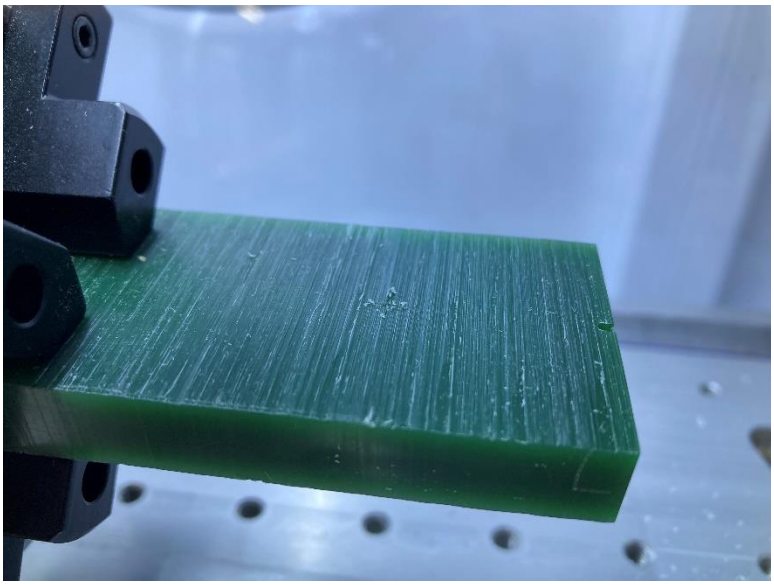
3. Fix the provided wax blank in the 4th axis chuck, or to the table.
    a. If you have a 4th axis machine, follow the steps in section “Wax Cut Calibration” to align the Y-axis to the A-axis



    b. Record the Y-axis Machine Coordinates for later reference.

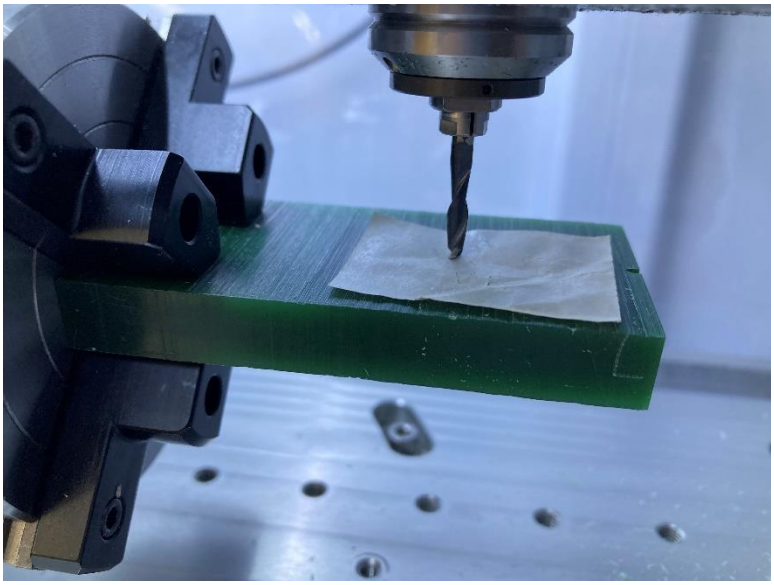


4. With the Y-axis centered, measure and mark the X center using a ruler. For this test, the X center should be 1” (25.4 mm) from the right side of the block.

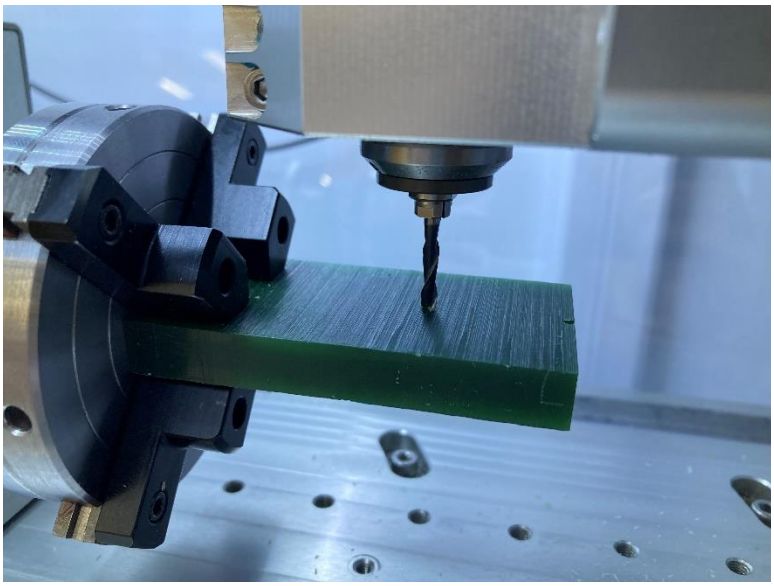


5. Insert into the spindle the 1/8” (3.175 mm) square endmill provided with the wax.

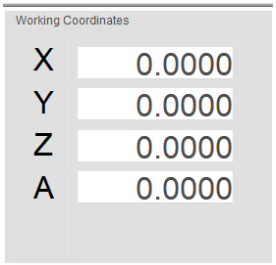
6. With a thin piece of paper, slowly and carefully move the Z-axis (spindle OFF) toward the wax until the paper is pinched between the endmill and the wax, and you can no longer shift the paper side-to-side.



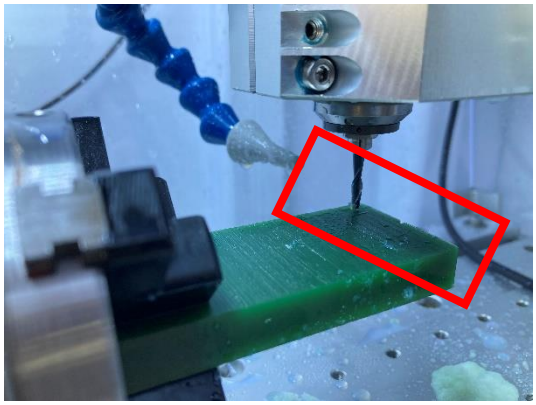
7. Move the Z-axis up (Z+) by 0.1 mm, remove the paper and move the Z-axis down again by 0.1 mm.

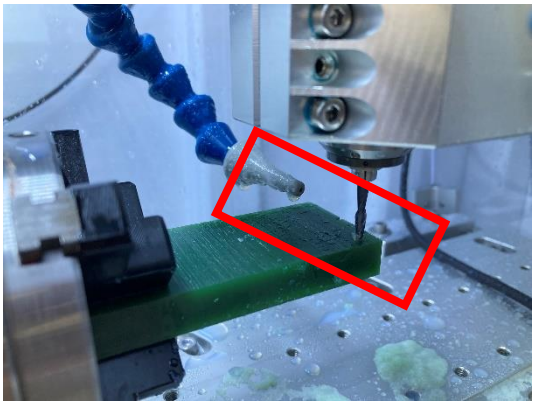


8. This is XYZ zero, so you need to zero the Working Coordinates in the controller.



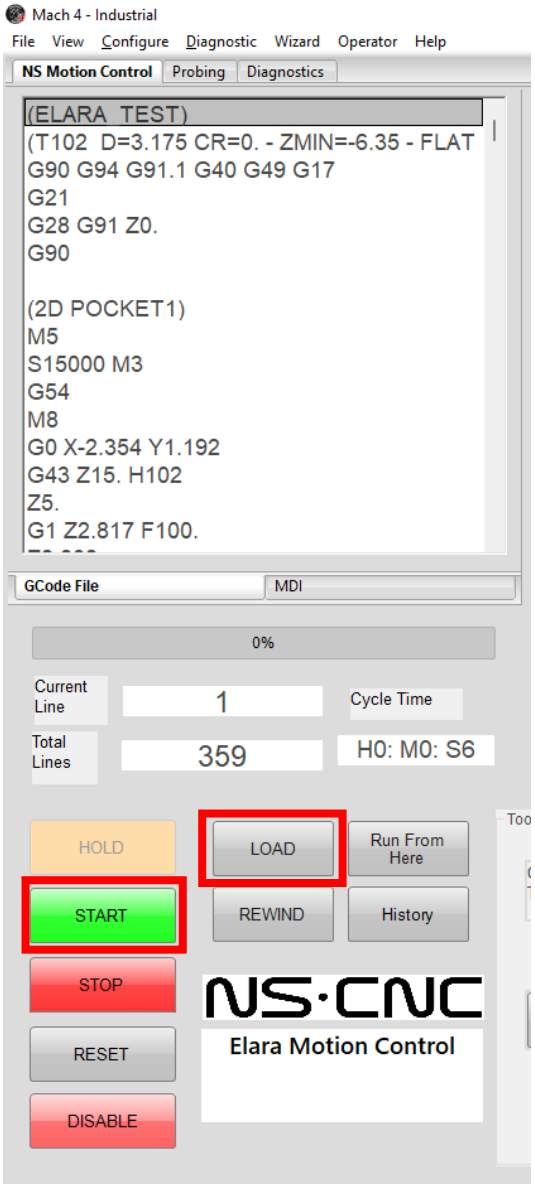
   a. If you have a 4th axis machine you will need to zero this axis. This is easily performed by placing the endmill close (within 0.1 mm) to the wax in one Y-axis location, then move the Y-axis to another location and verify that the Z height between the wax and the endmill is the same in both locations. Use the paper trick shown above to test the Z-height, and adjust the rotation of the A-axis until the Z height is the same at both Y locations. When you are finished, don't forget to zero the A-axis!



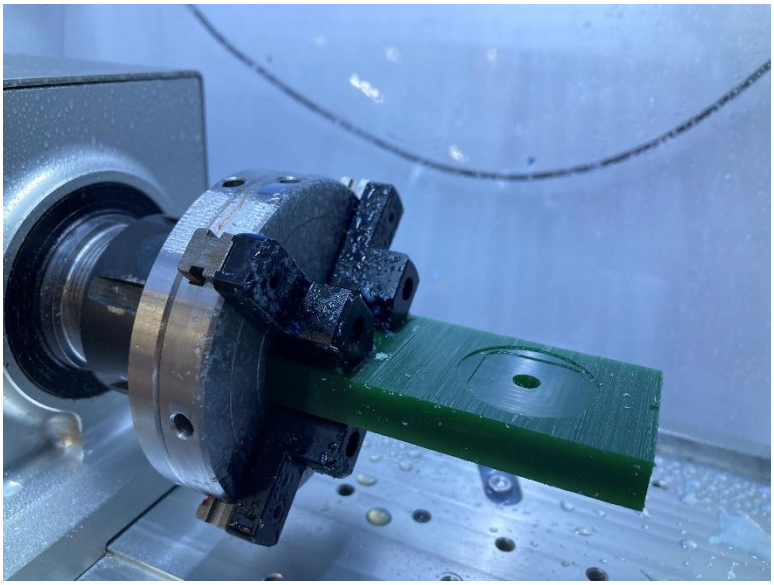


9. Re-install the front splash shield.

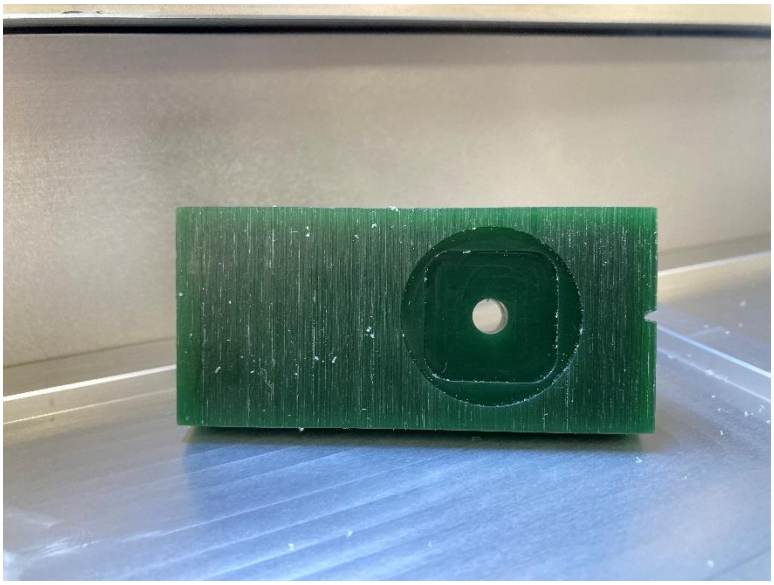
10. Next we will run the test file.
    a. Load the provided “elara_test.tap” file
    b. Verify that the file is the same as what is shown below
    c. Verify that your Rapid Rate, Feed Rate and Jog are set to 30% (so that you have time to react if something goes wrong)
    d. Click START
    e. Then immediately keep your curser over the HOLD button, and click HOLD if machine is not operating as expected.
    f. The program intentionally runs slow, with coolant pulsing, to ensure smooth operation.



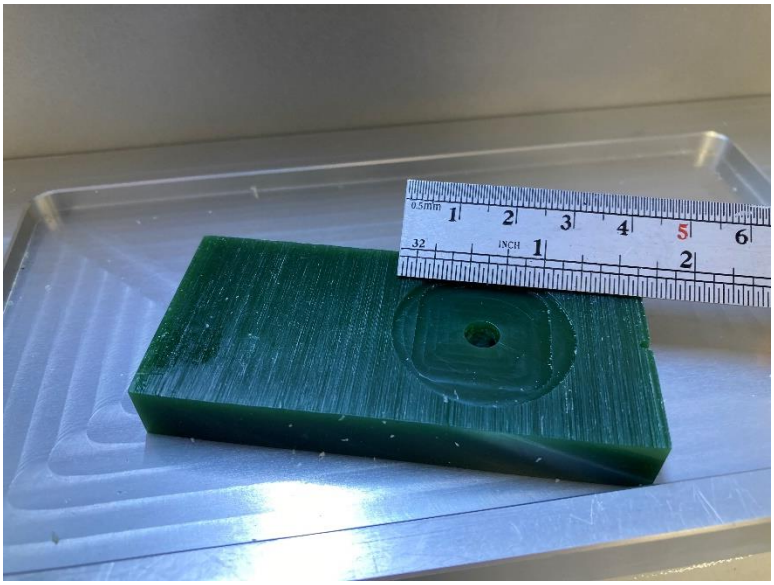
11. If you followed the directions, and your machine is operating correctly after shipping, then the material should look like the example below.



12. If you have a 4th axis
    a. Using the controller, manually rotate the A-axis 180 degrees
    b. Re-zero the Z-axis only, using the same steps shown previously.
    c. Load and run the same program. If you did everything correctly, the top and bottom holes should align perfectly



13. Finally, remove the wax from the chuck (or table) and
    a. Verify the circle diameter in several places
    b. Verify the square using a straight-edge or ruler
    c. Check the machined surface finish for irregularities.



14. **<u>Congratulations</u>**, you have completed your first part on your new Elara, and verified that it is operating correctly! You can use this procedure again if you move the machine to a new location.