

# Shapeoko 3 XXL

## Safety and Operation

Version 2.0



# Our Machine





# Features

- 830mm X, 850mm Y and 140mm Z - with a few limitations you'll see at the machine side, e.g. the front overhang
  - The large X isn't always of use. In practice, once you get beyond the length of your flutes your toolpaths and workholding get a lot more interesting
- The router is a Carbide Motion model and 1.25 HP. The RPM's are 1 = 10,000, 1.5 = 12,000, 2 = 14,000, 2.5 = 16,000, 3 = 18,000, 3.5 = 20,500, 4 = 23,000, 4.5 = 25,000, 5 = 27,000, 5.5 = 29,500, 6 = 32,000
- **We have a Bitzero version 1 (not Version 2) ← IMPORTANT**
- **We have an Shapeoko 3 XXL HDZ Ballscrew Z axis ← IMPORTANT**
- We have a bitsetter - it's optional to use but recommended
- You may use the attached Surface Book or your own machine



# Launching using the Surface Tablet

- Log into the machine using your DMS Active Directory credentials
- Using the start menu or search find 'Carbide Motion' and launch

You can create shortcuts on your desktop to make this easier in the future by dragging the program to your desktop



# First time Setup (or re-setup)

Focus on creating and maintaining the configuration settings.

Bitsetter V2 Manual <https://my.carbide3d.com/pdf/bitsetter-v2.pdf> is worth a read, focus on pages 11 to 14

Bitzero V1 Manual hard to find but the V2 manual is similar and also worth a read. If you read the manual regarding the V2 keep in mind it's essentially the same unit but the V2 is a different shape and if you configure that instead your offsets will be incorrect.

[https://my.carbide3d.com/pdf/BitZero\\_V2\\_Shapeoko\\_Setup\\_User\\_Guide\\_03-08-2021\\_v1.pdf](https://my.carbide3d.com/pdf/BitZero_V2_Shapeoko_Setup_User_Guide_03-08-2021_v1.pdf)



# Reminders

- Always check the machine settings when you first start using the machine
- Check the configuration and push from Carbide Motion to the Controller to ensure it's right
  - **Re-check this if you have a machine abort or other drastic interruption in work flow**
- The power switch is on the top left edge of the surface book and the volume buttons are to the right of it.
- To bring up login prompt press power while holding down the right most volume button.
- The Bitzero offsets are  $X = -19.000$  and  $Y = -788.500$
- When the black 'BUSY' is showing relax, let it finish what it's doing before pressing more buttons
- Machine home is back right corner (X0 Y0)



# Useful Links

To download Carbide Motion or Create <https://carbide3d.com/downloads/>

Video training, design and support resources <https://my.carbide3d.com/>

Community Forum <https://community.carbide3d.com/>



# Common Gotcha's

Setup is one of the trickier and problematic areas of the machine

- If the machine is not acting as you expected check your configuration!

Read the prompts, don't just hit 'Enter' - there is a lot of very useful information there

Don't forget to make sure the spindle is actually running when it's time to cut

The STOP button on the right of the machine only stops the spindle, nothing else. A better FULL STOP switch is the power strip on the right side of the machine.

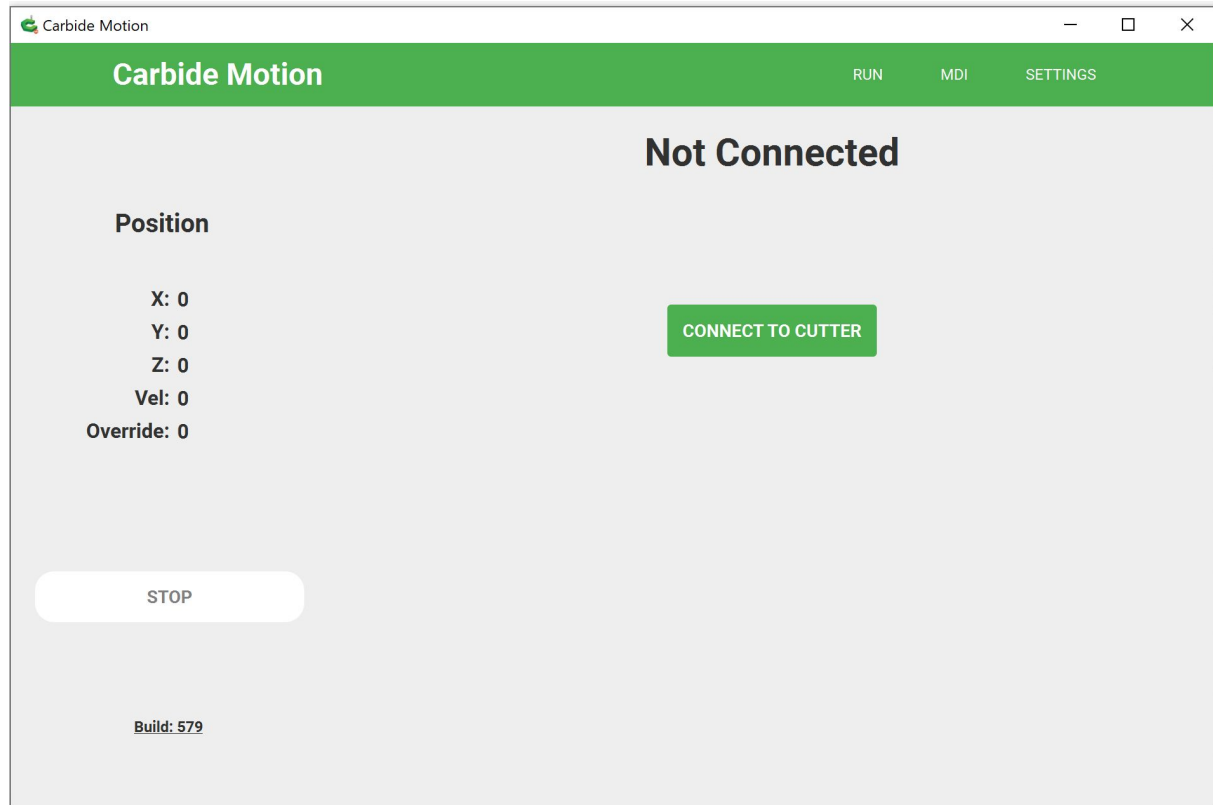




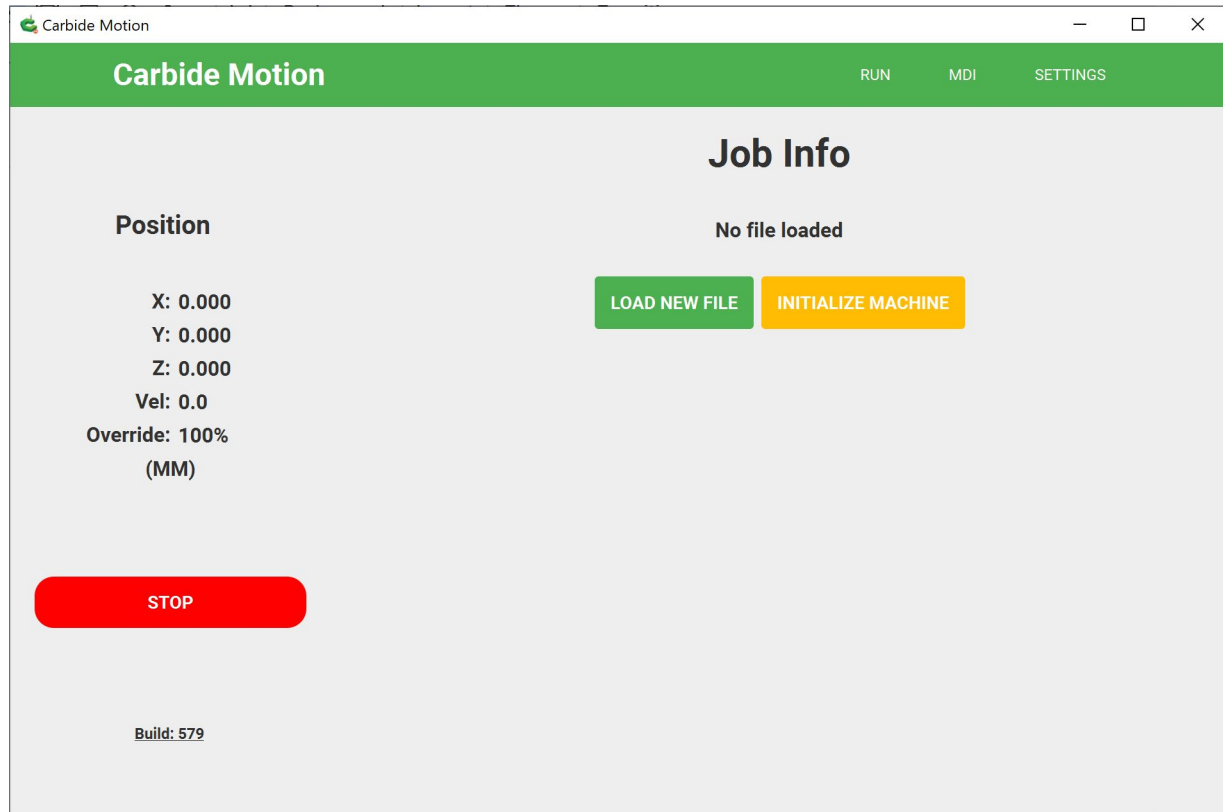
# Materials

- We allow any non-toxic plastic.
  - Toxic items such as carbon fiber are not allowed
- Soft metals
  - Aluminum
  - Brass
  - Etc.
- Glass (for diamond drag bit use)
- Wood is ONLY allowed for spoil boards (MDF recommended)

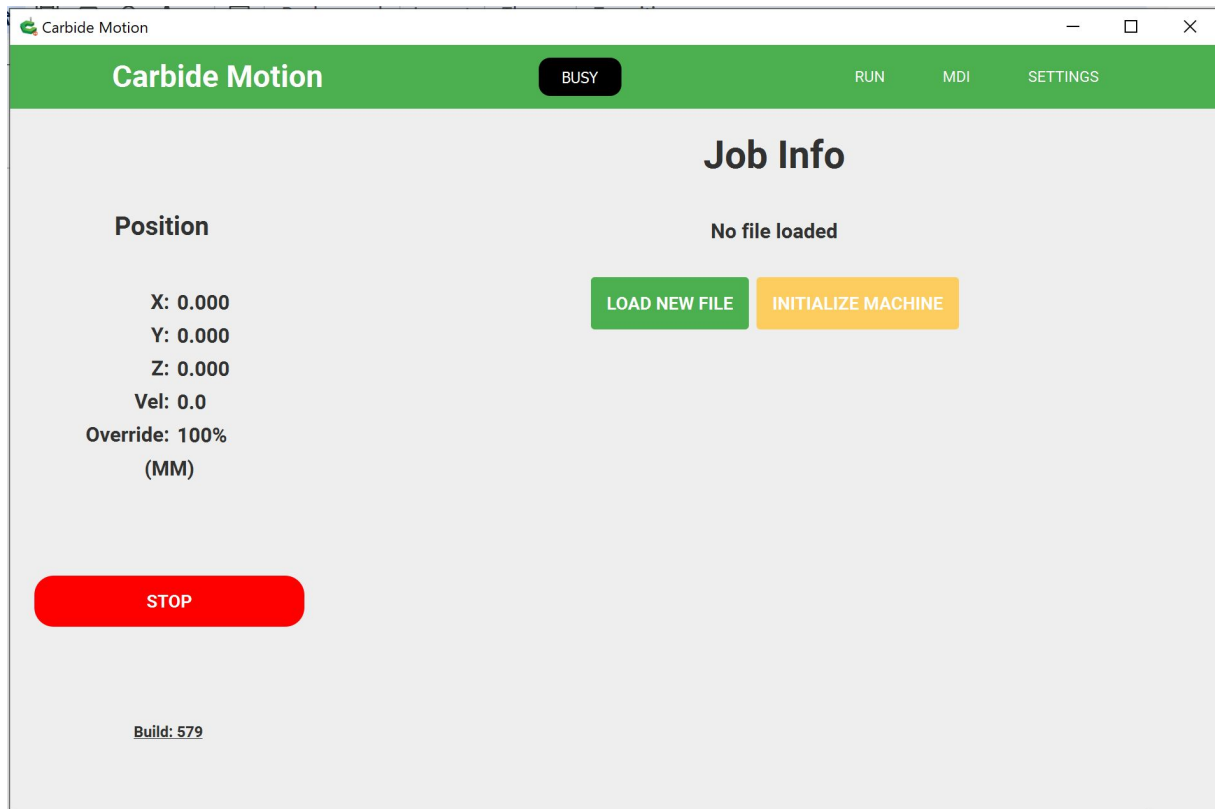
If you'd like to request an exception consult with the current Machine Shop chair.



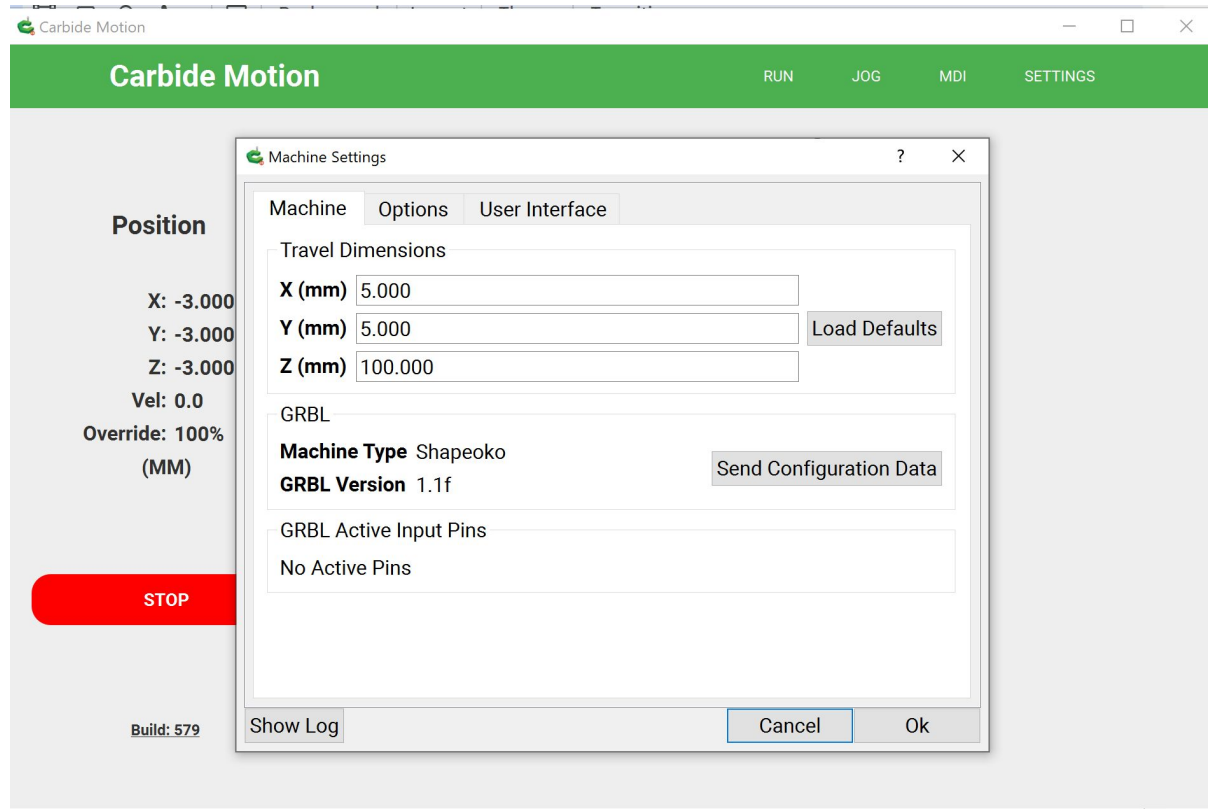
This is the screen you see on startup. You must connect to the cutter to proceed.



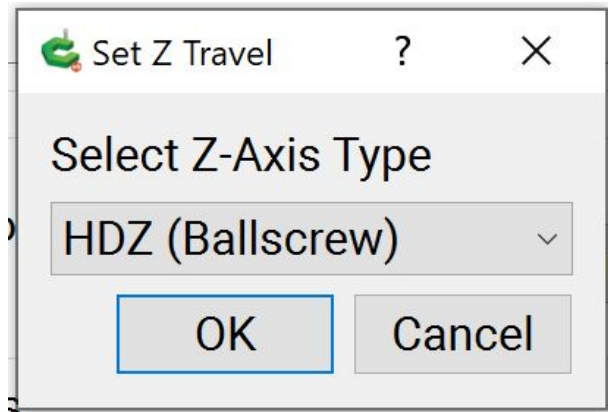
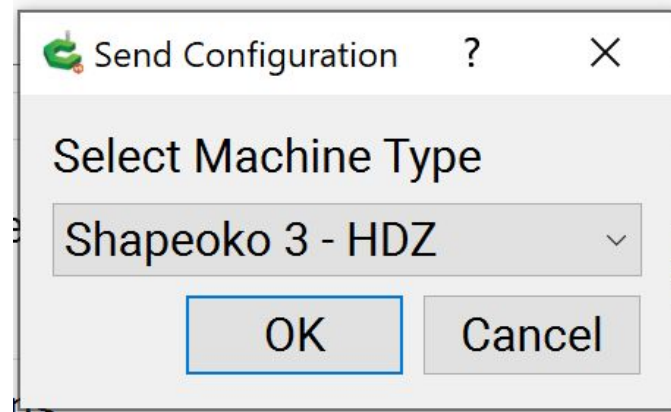
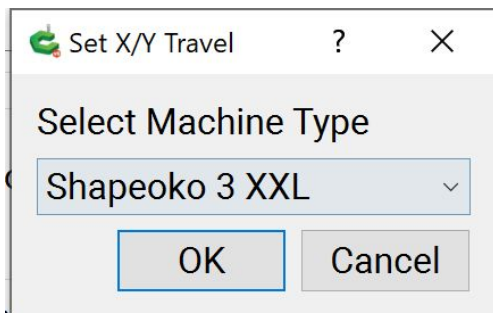
This is the screen you get on startup. You can't do a lot here other than 'Initialize Machine'



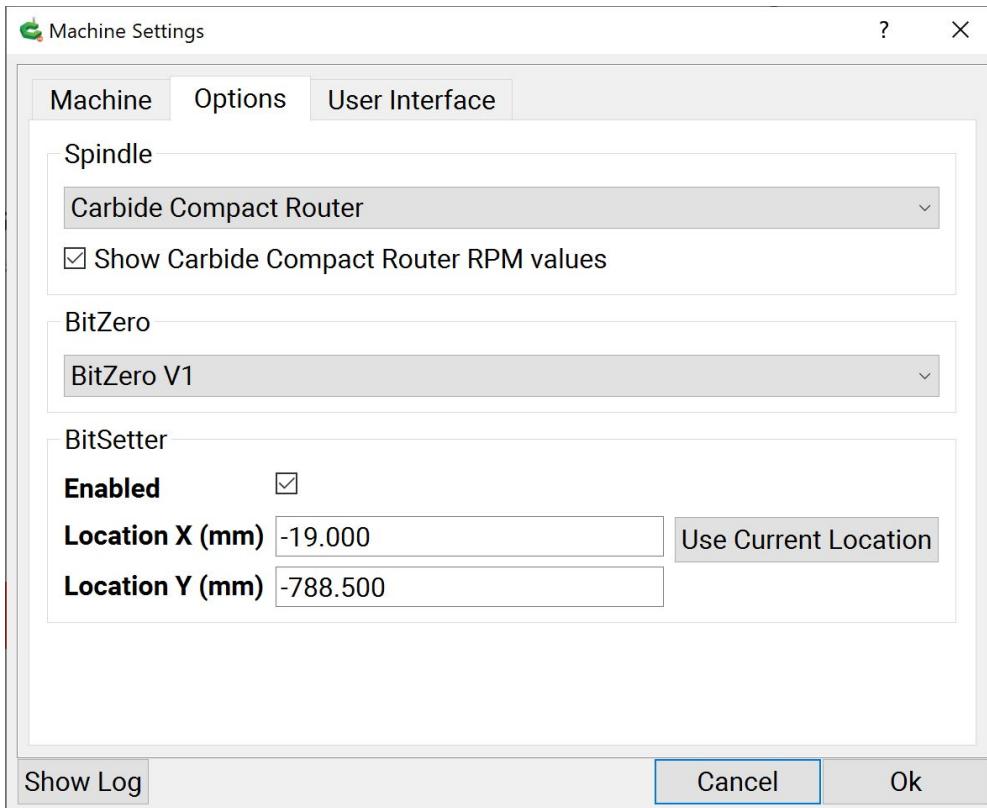
Anytime you see 'BUSY' in black at the top relax, you can't do anything.



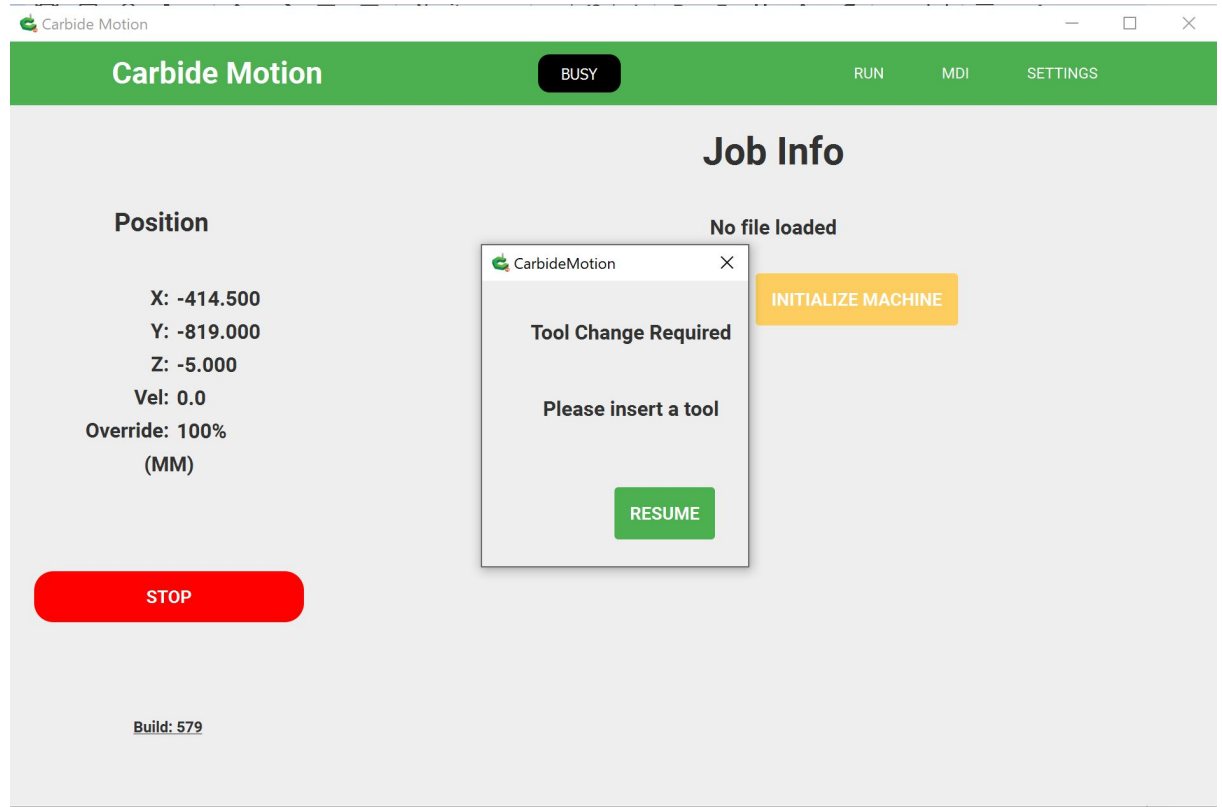
These are the defaults, totally inoperable. Time to load defaults and then Send Configuration data. Don't forget to check the Options and User Interface tabs.



These are the Load Defaults and Send Configuration settings you are looking for ...

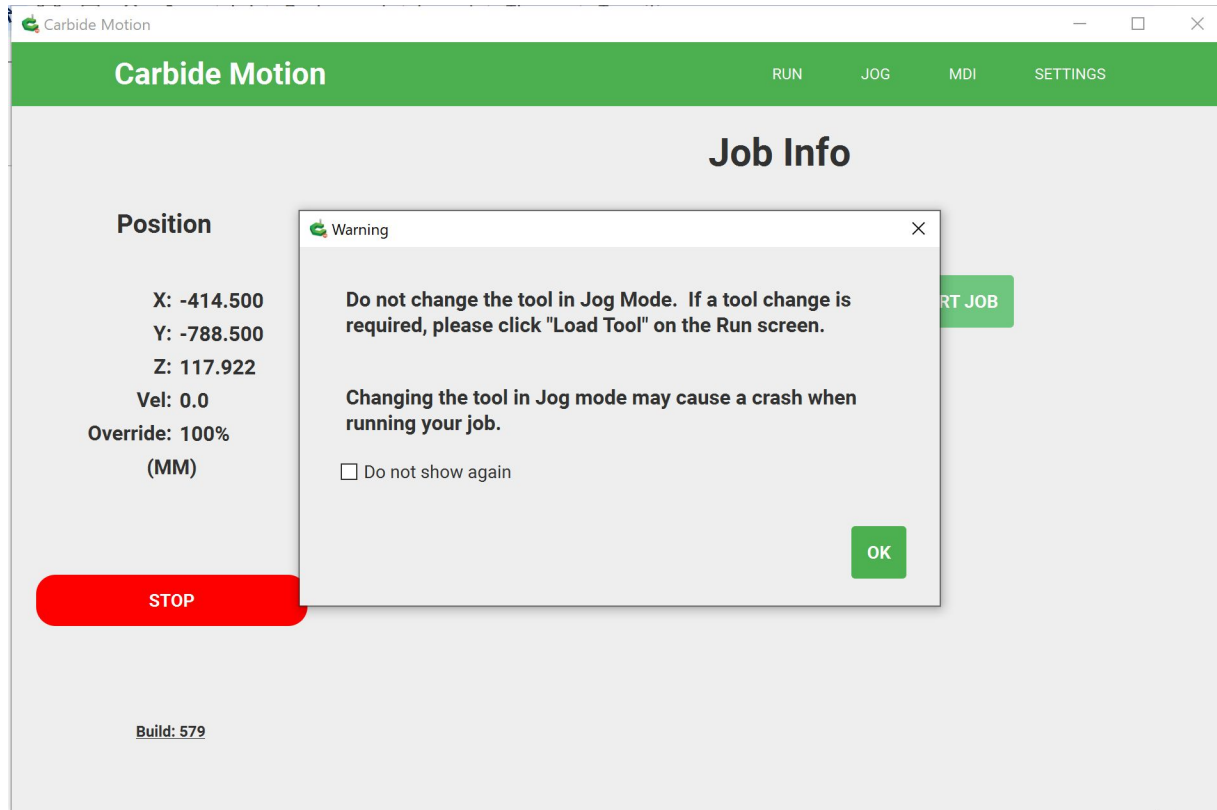


Here you can enable or disable the BitSetter and make sure you have BitZero set to V1. V2 is a narrower unit and you will have incorrect Z offsets.

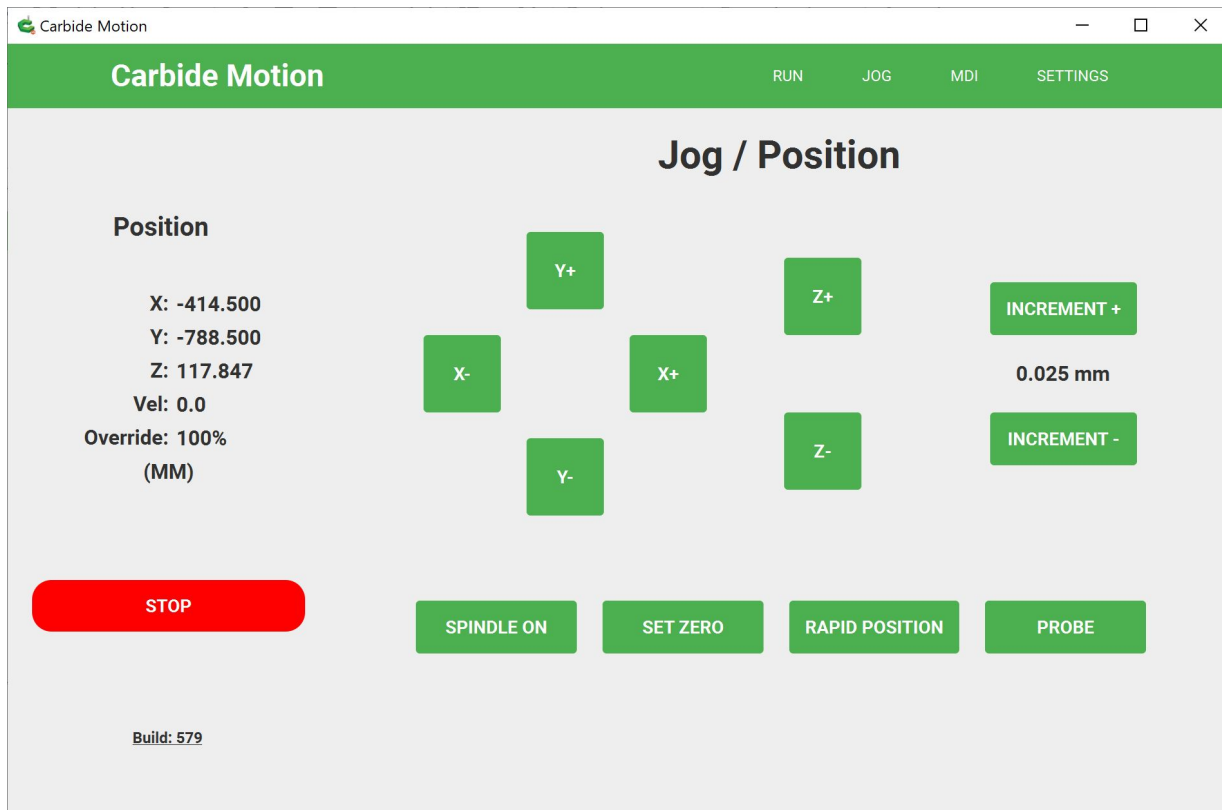


Once you initialize, with the Bitsetter enabled, the machine will home and then rapid move to front center and prompt you to insert a tool. It will then go through a tool load cycle with Bitsetter.





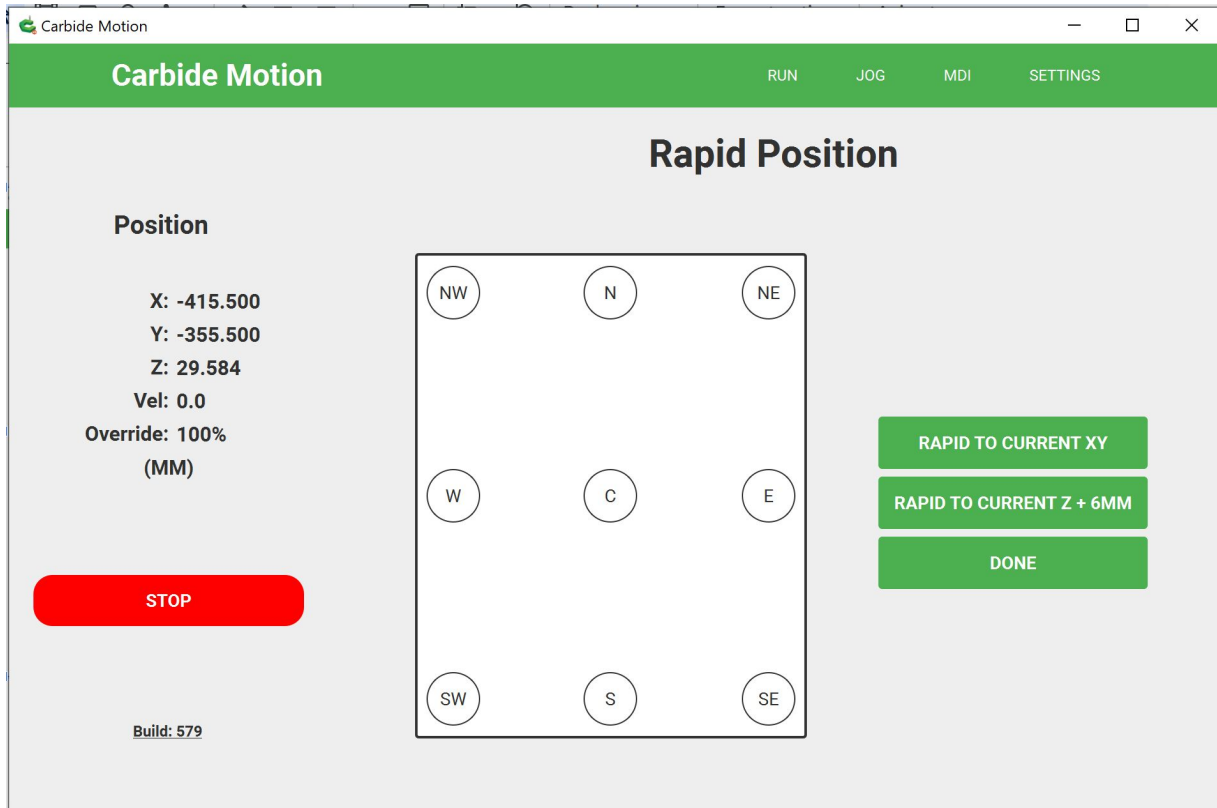
Read the prompts when you see them; for instance, this one.



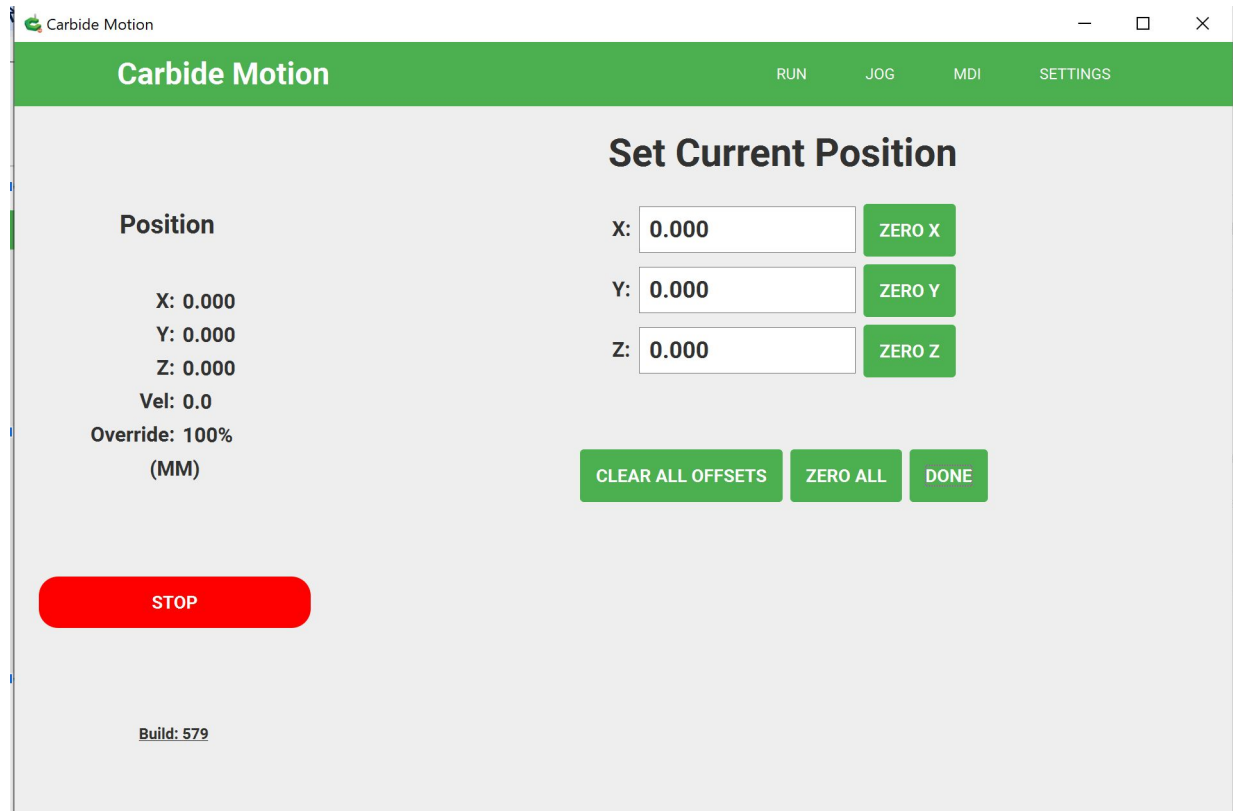
The Jog screen - of particular note is Increment, Set Zero, Rapid Position and Probe - and of course the X/Y/Z/Stop buttons and the position display - there are keyboard shortcuts as well Spindle ON will not work on our machine.



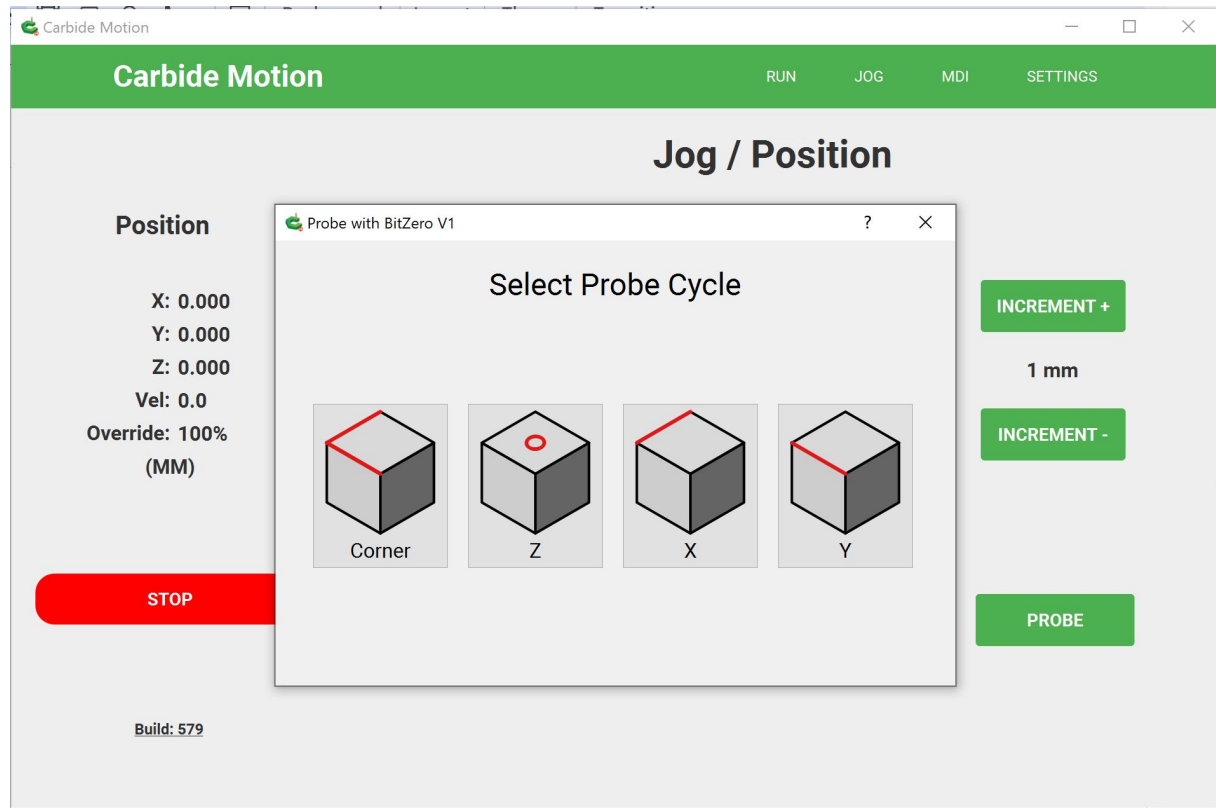
TO RESOLVE: Joystick JOG operation



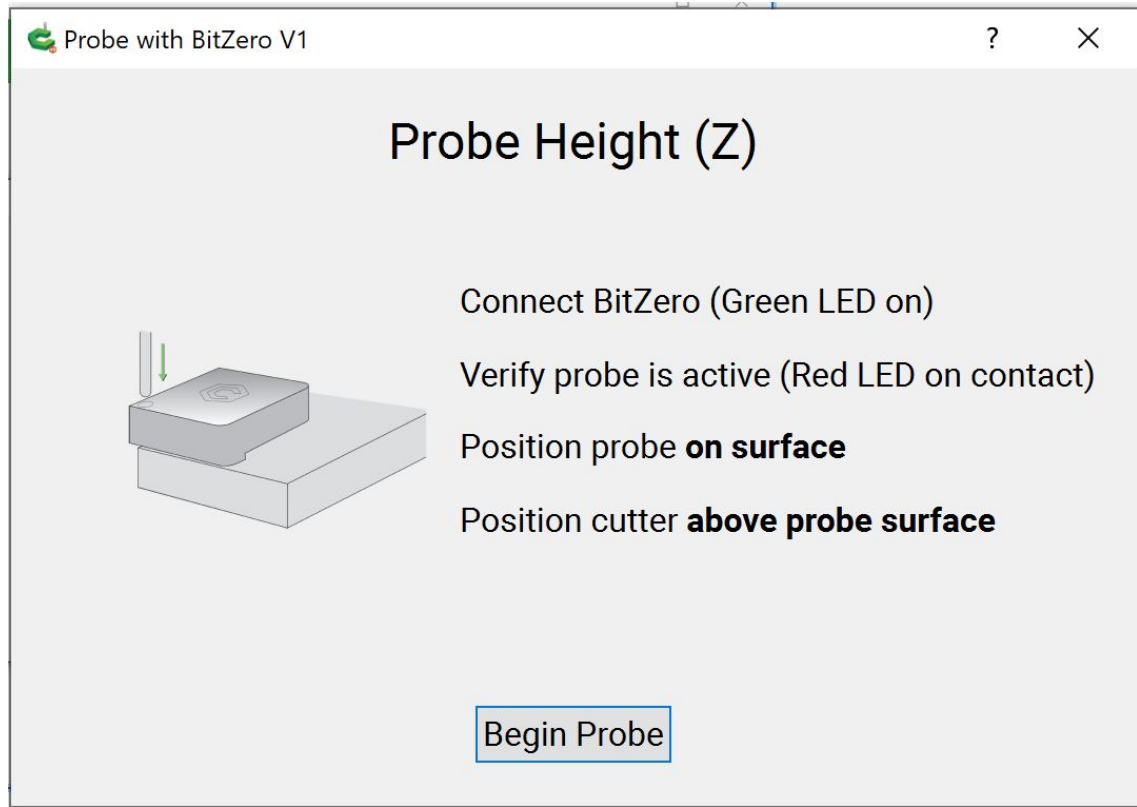
Rapid positioning is very useful but make sure your Z clearance won't hit any clamps or your workpiece.



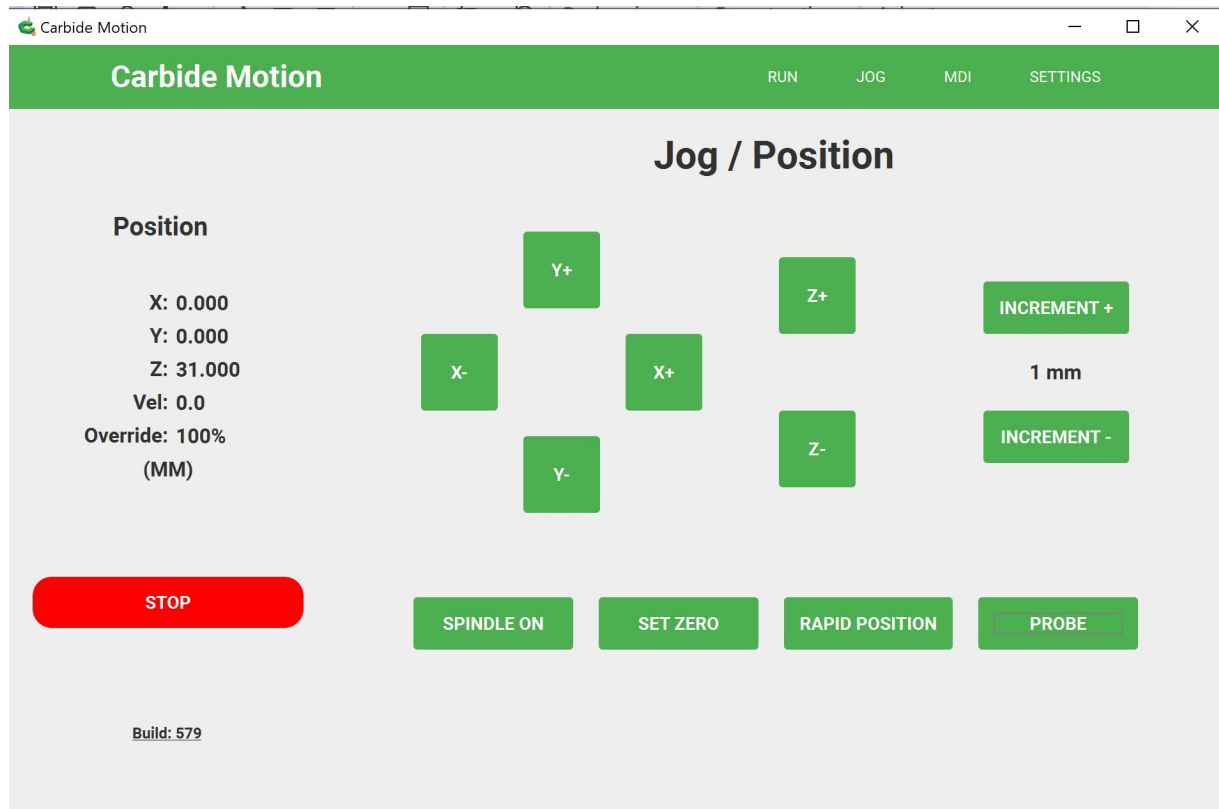
Used to zero out coordinates in conjunction with probing.



Probing uses the Bitzero V1 and can do individual axis or all at once. NOTE: Max distance of travel is 18mm before erroring out.

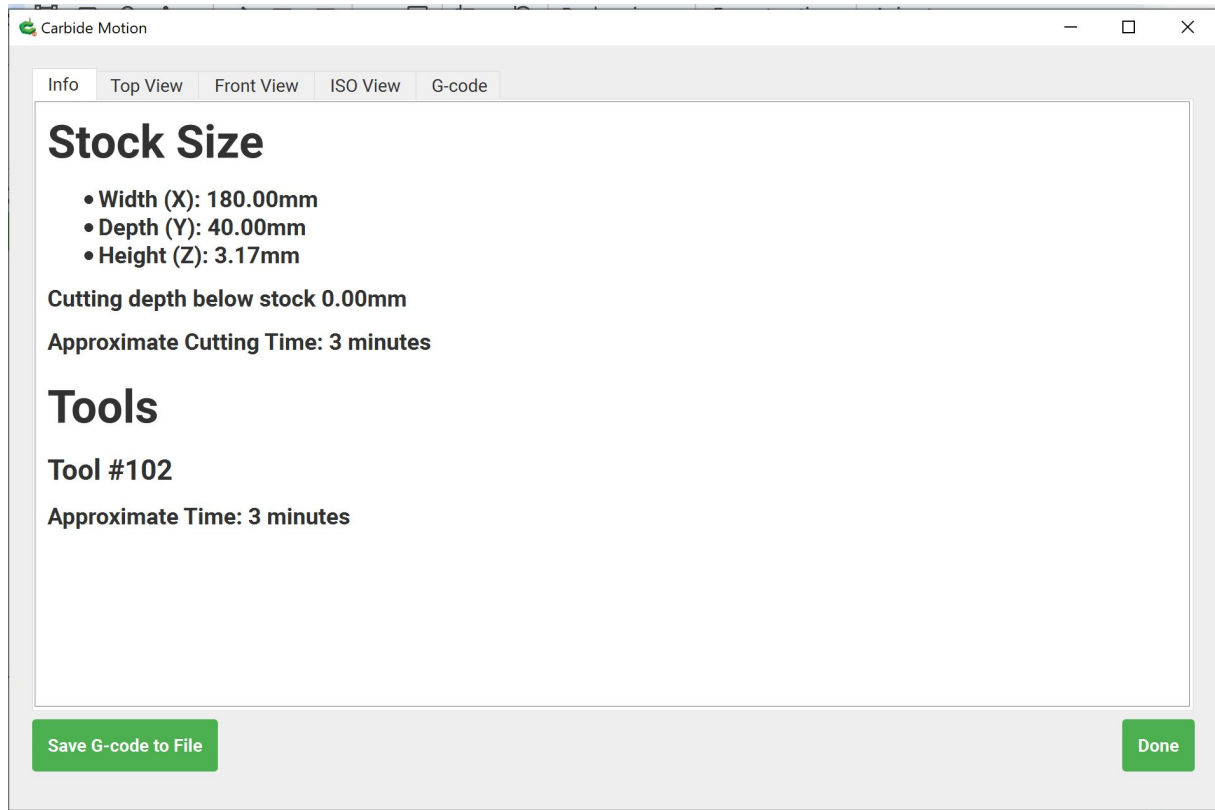


Always be checking for continuity when proving and read these prompts!

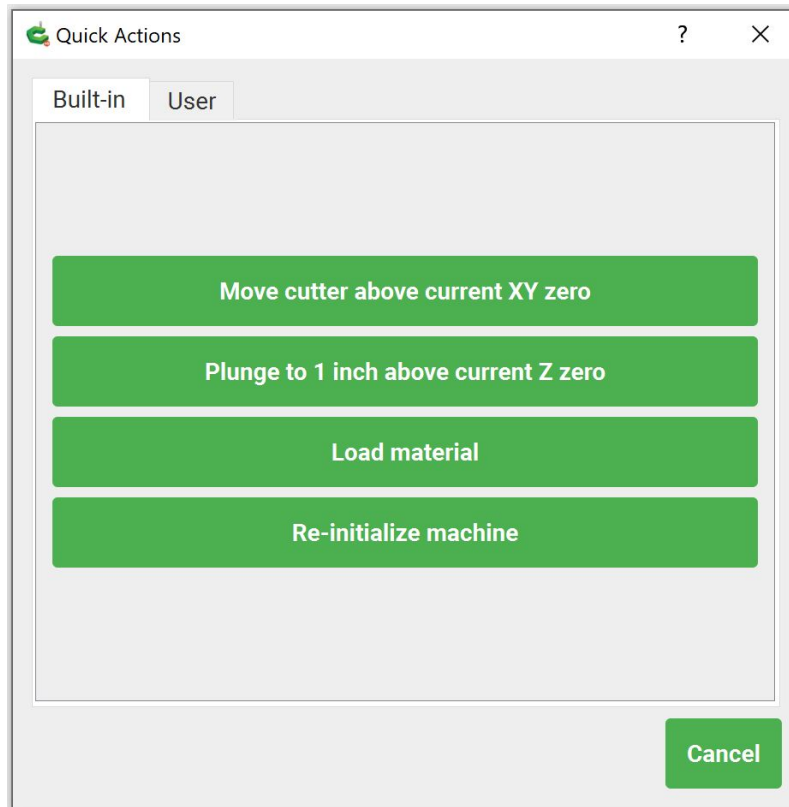


Sanity check: After a probe of Z your offset will be 31 MM; anything else is a problem with process or machine configuration.

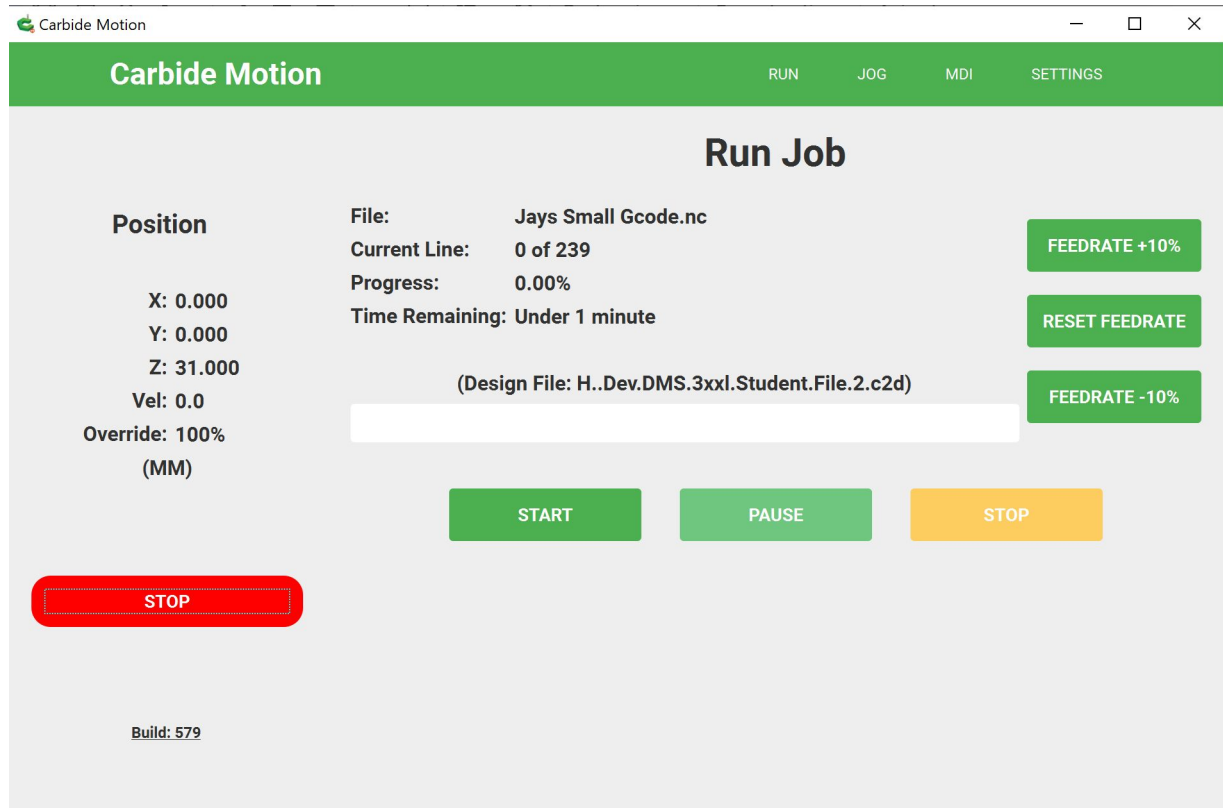




Once you load a job this is the section you see; check the various tabs for visual representation of your job.



The quick actions can sometimes be useful.



Once you 'Start' you will be prompted to set tools and spindle speeds.

Carbide Motion

**Carbide Motion** **BUSY** RUN JOG MDI SETTINGS

## Run Job

**Position**

X: 396.000  
Y: -266.625  
Z: 132.072  
Vel: 0.0  
Override: 100%  
(MM)

**File:** Jays Small Gcode.nc  
**Current Line:** CarbideMotion  
**Progress:**  
**Time Remaining:**  
**Status:**

FEEDRATE +10%  
RESET FEEDRATE  
FEEDRATE -10%

RESUME PAUSE STOP

**STOP**

Build: 579

**Jays Small Gcode.nc**

CarbideMotion

**Tool Change Required**

Please insert tool #102  
(1/8" Endmill)

RESUME

The screenshot displays the Carbide Motion software interface. At the top, a green header bar contains the 'Carbide Motion' logo, a 'BUSY' status indicator, and navigation buttons for 'RUN', 'JOG', 'MDI', and 'SETTINGS'. The main area is titled 'Run Job' and shows the following information:

- Position:** X: 396.000, Y: -236.125, Z: 132.072, Vel: 0.0, Override: 100% (MM)
- File:** Jays Small Gcode.nc
- Current I:** CarbideMotion
- Progress:** (indicated by a green progress bar)
- Time Re:** (partially visible)
- Status:** (partially visible)

A modal dialog box is centered on the screen with the following text:

**Spindle RPM Change Required**  
Please set spindle to 18000 RPM  
( Set speed dial to 3 )

Buttons in the dialog include 'RESUME' (green) and 'STOP' (yellow). On the right side of the main interface, there are three green buttons: 'FEEDRATE +10%', 'RESET FEEDRATE', and 'FEEDRATE -10%'. A large red 'STOP' button is located at the bottom left of the main interface. The bottom left corner of the software window shows 'Build: 579'.

Because we have the Carbide Motion router and have told the configuration that it can help prompt us with settings in some cases (program dependency)

## Run Job

### Position

X: 14.950

Y: 18.650

Z: -1.144

Vel: 1143.0

Override: 100%  
(MM)

File: Jays Small Gcode.nc

Current Line: 28 of 239

Progress: 11.72%

Time Remaining: 2 minutes

Status: Pocket.Toolpath.1.-.Pocket  
X39.151



FEEDRATE +10%

RESET FEEDRATE

FEEDRATE -10%

START

PAUSE

STOP

STOP



And we're off!

Carbide Motion

BUSY RUN JOG MDI SETTINGS

## Job Info

Position

X: 100.125  
Y: 11.350  
Z: 6.350  
Vel: 0.0  
Override: 100%  
(MM)

Jays Small Gcode.nc PREVIEW...

5:05 pm  
#102

NEW TOOL START JOB

STOP

Build: 579

CarbideMotion

Spindle RPM Change Required

Please turn off spindle

RESUME



Fin!

The screenshot shows the Carbide Motion software interface. At the top, there is a green header bar with the text "Carbide Motion" on the left and "RUN", "MDI", and "SETTINGS" on the right. Below the header, the main area is titled "Job Info". On the left side, under the heading "Position", the following coordinates are listed: X: 360.700, Y: -212.900, Z: 132.065, Vel: 0.0, and Override: 100% (MM). On the right side, the job name "Jays Small Gcode.nc" is displayed with a green "PREVIEW..." button next to it. Below the job name, it says "Loaded at: 5:05 pm" and "First Tool: #102". A red "STOP" button is located at the bottom left of the main area. In the bottom left corner, the text "Build: 579" is visible. An error dialog box is overlaid in the center, titled "Error" with a yellow warning triangle icon. The message in the dialog reads: "Machine controller restarted unexpectedly and may be in an undefined state." with an "OK" button at the bottom right.



STOP = this point you will need to reinitialize the machine to move on from this point