

Shapeoko 3 **XXL**

Safety and Operation

Version 3.0 (February 2026)



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
- We have the Carbide Motion VFD version ER16 (NOT the ER11 version)
- **We have a Bitzero version 2 (not Version 1) ← IMPORTANT**
- **We have an Shapeoko 3 XXL HDZ Ballscrew Z axis ← IMPORTANT**
- We have a bitsetter - it's optional to use but recommended



Latest guidelines

- Please use the attached Surface Book to operate the machine
- You must have completed training and checkout to use the machine
- If you have previously been checked out on the machine prior to the VFD upgrade you must work with the Machine Shop teachers team to get caught up on the changes. Please see Talk (<https://talk.dallasmakespace.org>) for instructions
- It is recommended to use the 1/4" collet and pin for setting zero's
- The eStop on the right now will stop all activity aggressively. Please use the STOP functionality in the control software if at all possible instead and the eSTOP for emergency stops
- Please use the inline power switch to turn the controller off when not in use
- The VFD can be placed in Standby mode to prevent its operations as needed
- When resuming a job you have paused the VFD will not start turning until it's very close to the workpiece. This is normal.
- Review the latest reminders section of this document for additional information



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 V2 Manual is worth a read.

https://my.carbide3d.com/pdf/BitZero_V2_Shapeoko_Setup_User_Guide_03-08-2021_v1.pdf



Reminders 1 of 2

- 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 for the Surface Book is on the top left edge of the surface book and the volume buttons are to the right of it.
- The power switch for the controller is on the top left of the table inline with the power supply. The VFD standby switch will not light up unless the controller is on.
- **VFD in active, not standby mode, = front button ring light Orange (standby is dark)**
- When your first power on the controller the VFD may briefly spin. **Make sure you are clear of the VFD when powering on and there is not a lose collet or tool installed.**
- To bring up login prompt press power while holding down the right most volume button. (Or use the mouse or keyboard)
- The Bitzero offsets are $X = -19.000$ and $Y = -788.500$



Reminders 2 of 2

- 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)
- Make sure the VFD is not in standby mode prior to starting your job
- Always run the Warmup procedure unless you are certain the machine has been used in the last 24 hours.
- The VFD standby switch should be RED for normal operation. If it's off the spindle will not run
- Keep aware of clearances, particularly between the spindle and tools and the workholding you are using
- After a Z probe the tool will be measured, if using a bitstter. If that process does not complete your Z height will be off



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 area we see people make mistakes regularly. Double check your inputs!

- 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

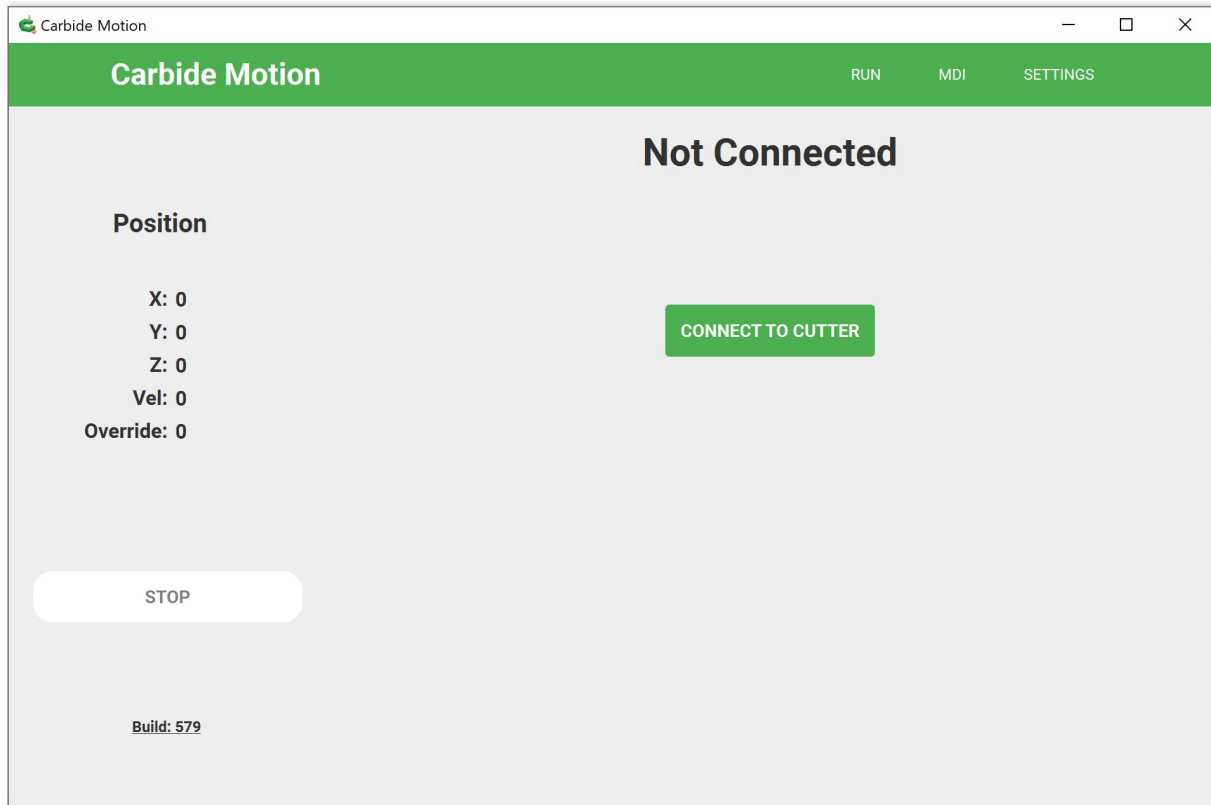
The STOP button on the right of the machine kills power to everything and should only be used in urgent situations. Otherwise please use a stop within the CNC control program you are using.



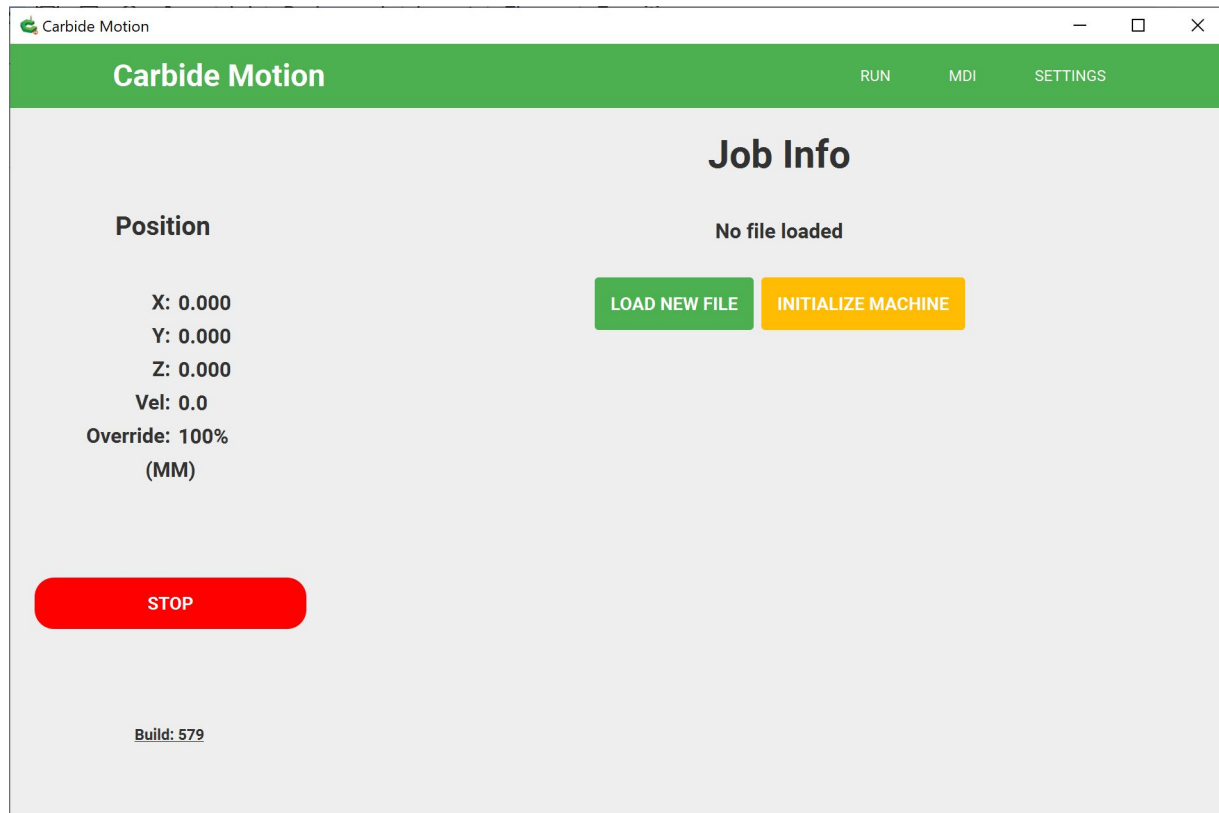
Materials

- 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)

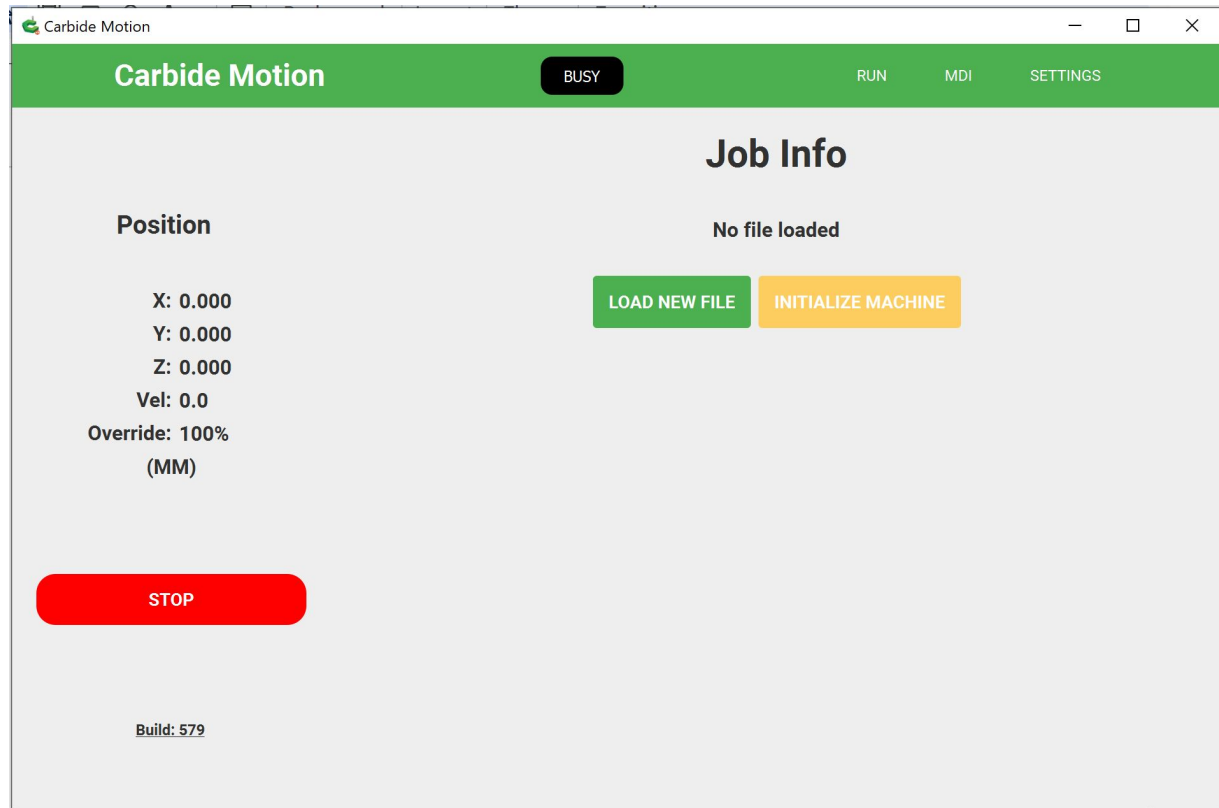
If you'd like to request an exception consult with the current Machine Shop chair.



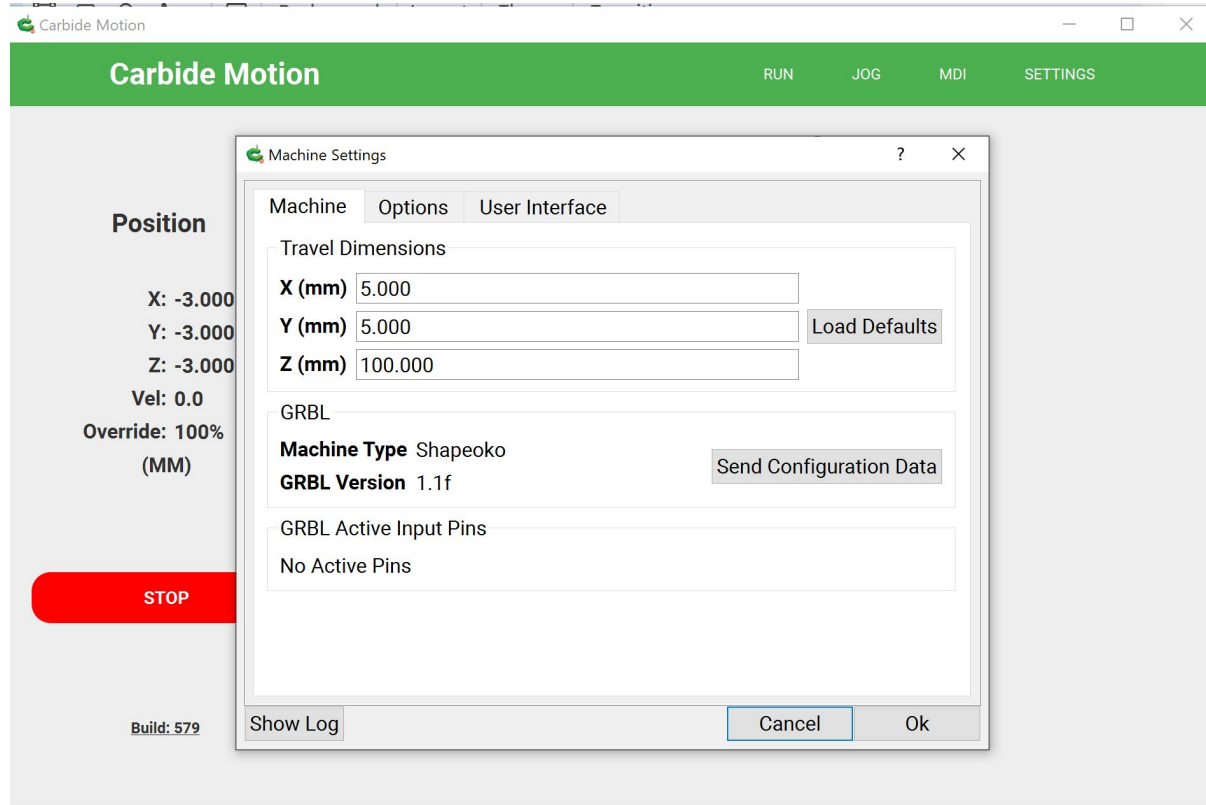
This is the screen you see on startup. You must connect to the cutter to proceed.



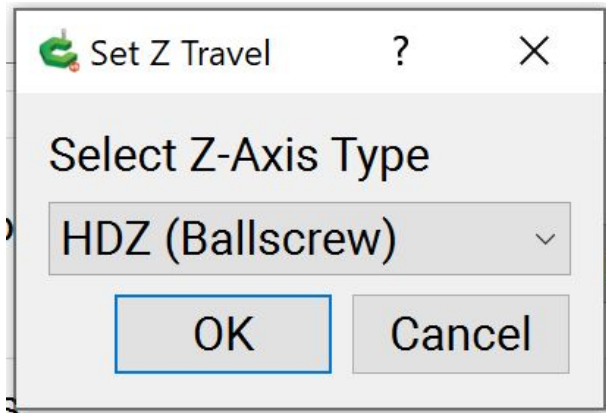
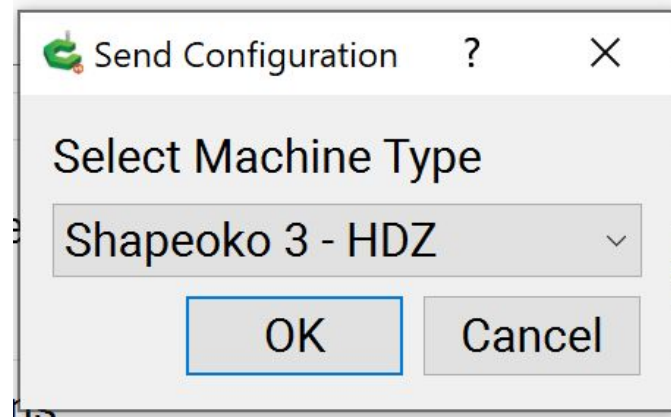
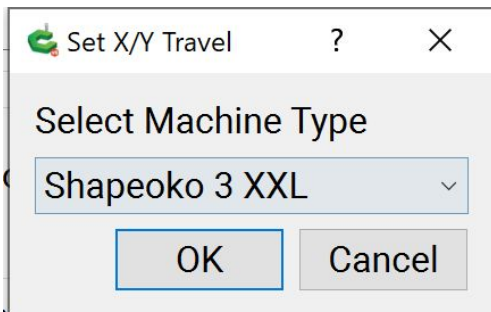
This is the screen you get on startup. You can't do a lot here other than 'Initialize Machine'



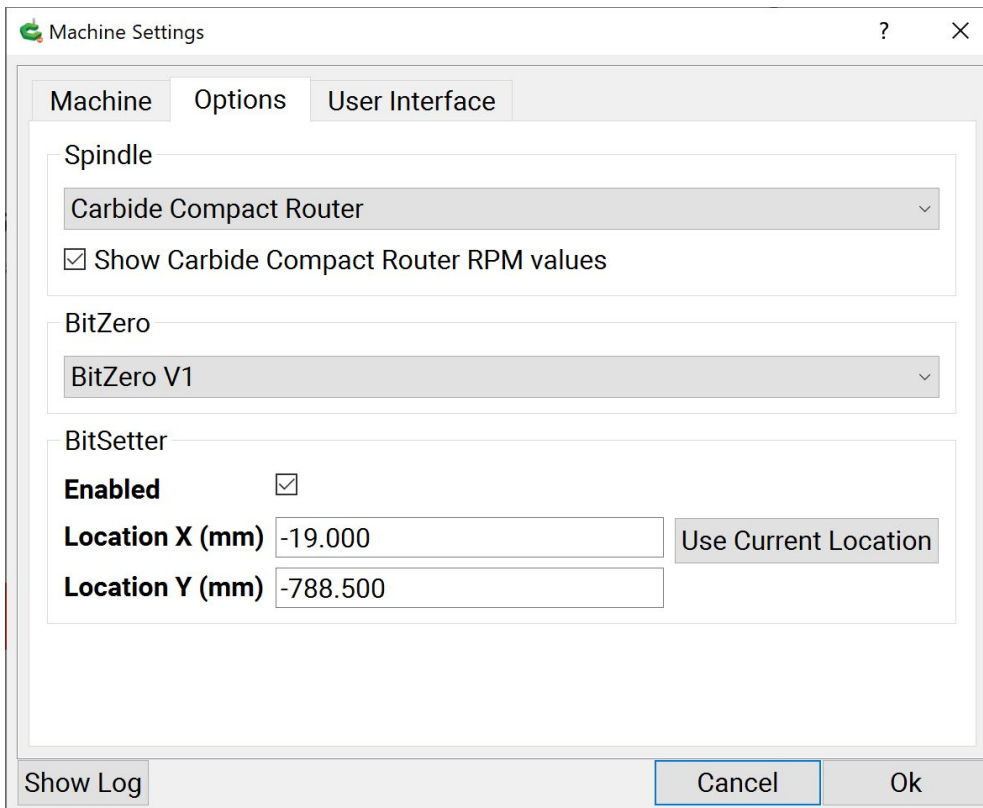
Anytime you see 'BUSY' in black at the top relax, you can't do anything.



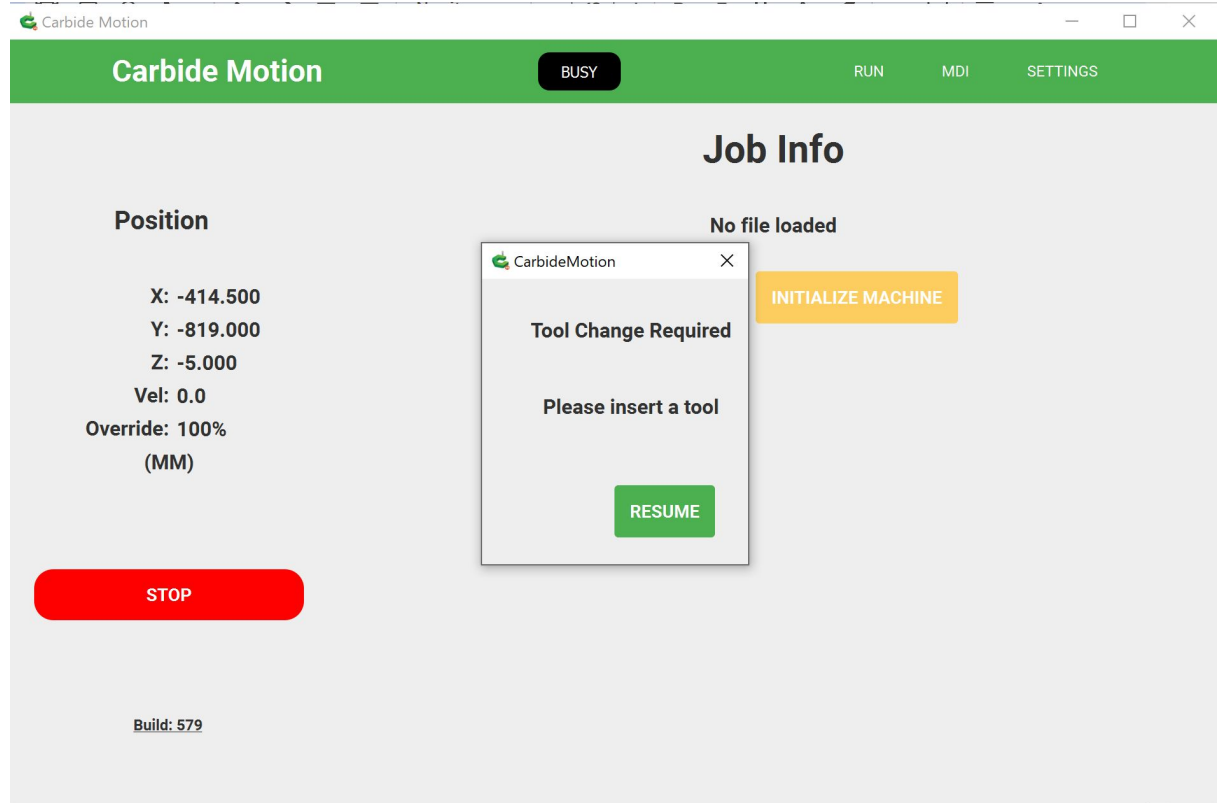
These are the defaults, totally inoperable. Time to load defaults and then Send Configuration data. Don't forget to check the Options and User Interface tabs.



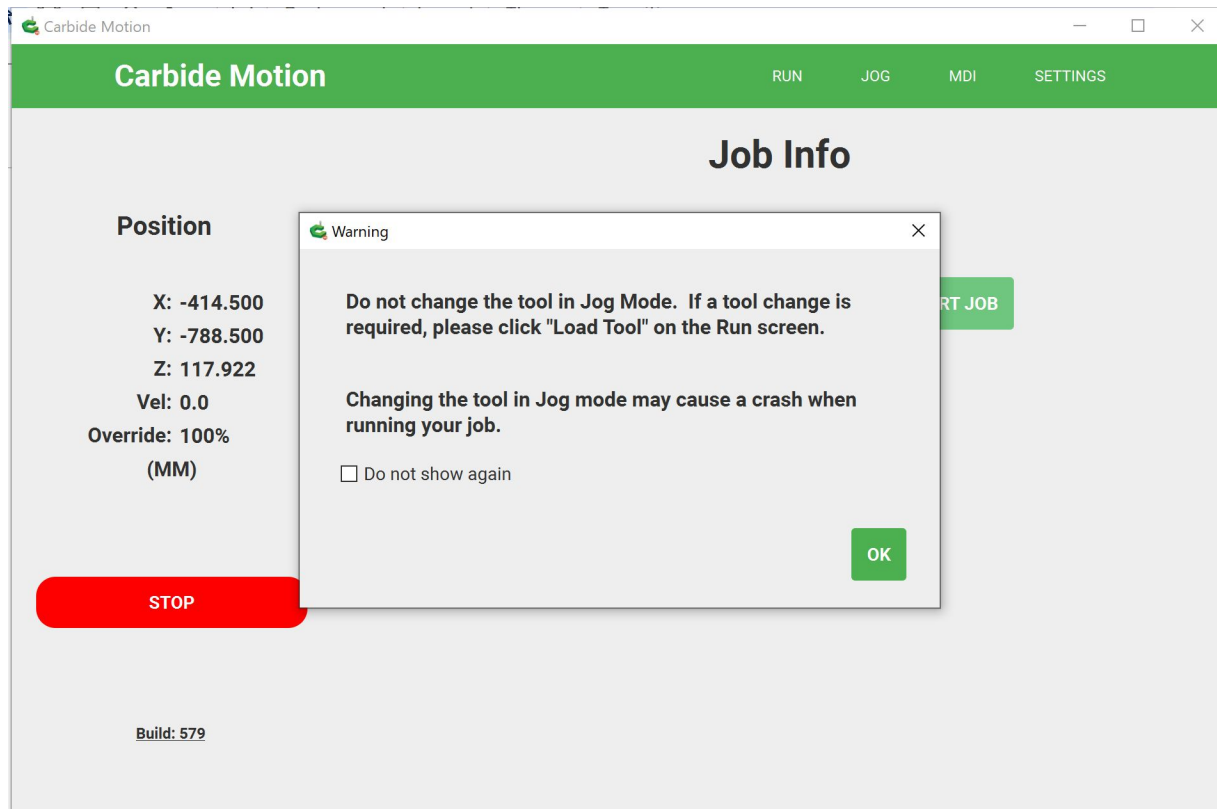
These are the Load Defaults and Send Configuration settings you are looking for ...



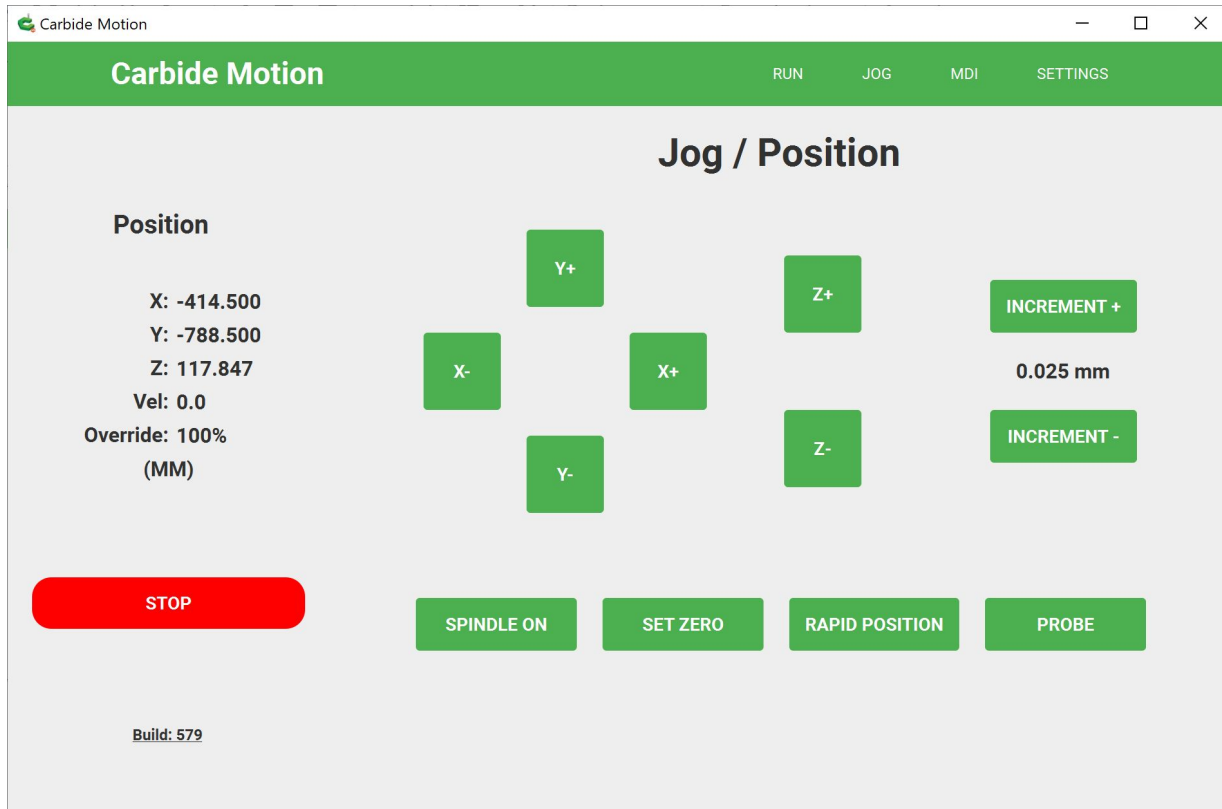
PENDING: New slide:
Here you can enable or disable the BitSetter and make sure you have BitZero set to V2. V1 is a thicker unit and you will have incorrect Z offsets.



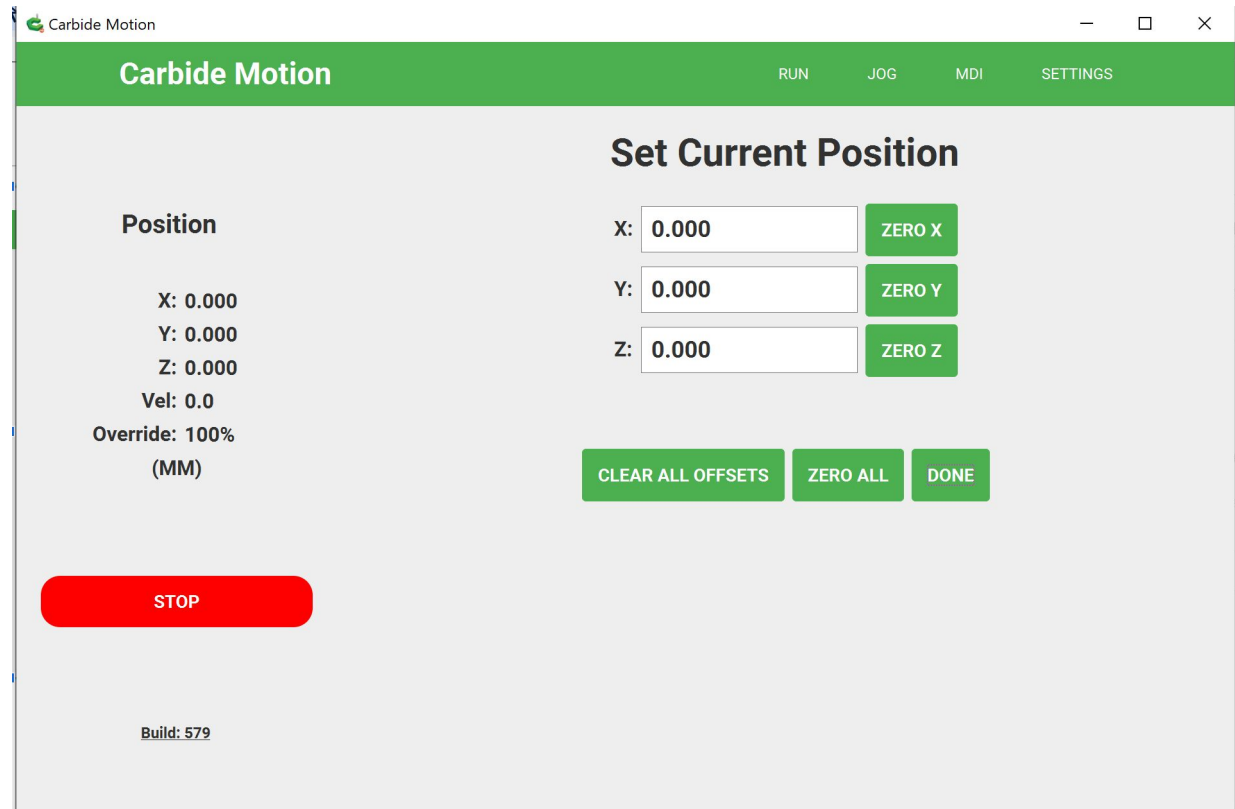
Once you initialize, with the Bitsetter enabled, the machine will home and then rapid move to front center and prompt you to insert a tool. It will then go through a tool load cycle with Bitsetter.



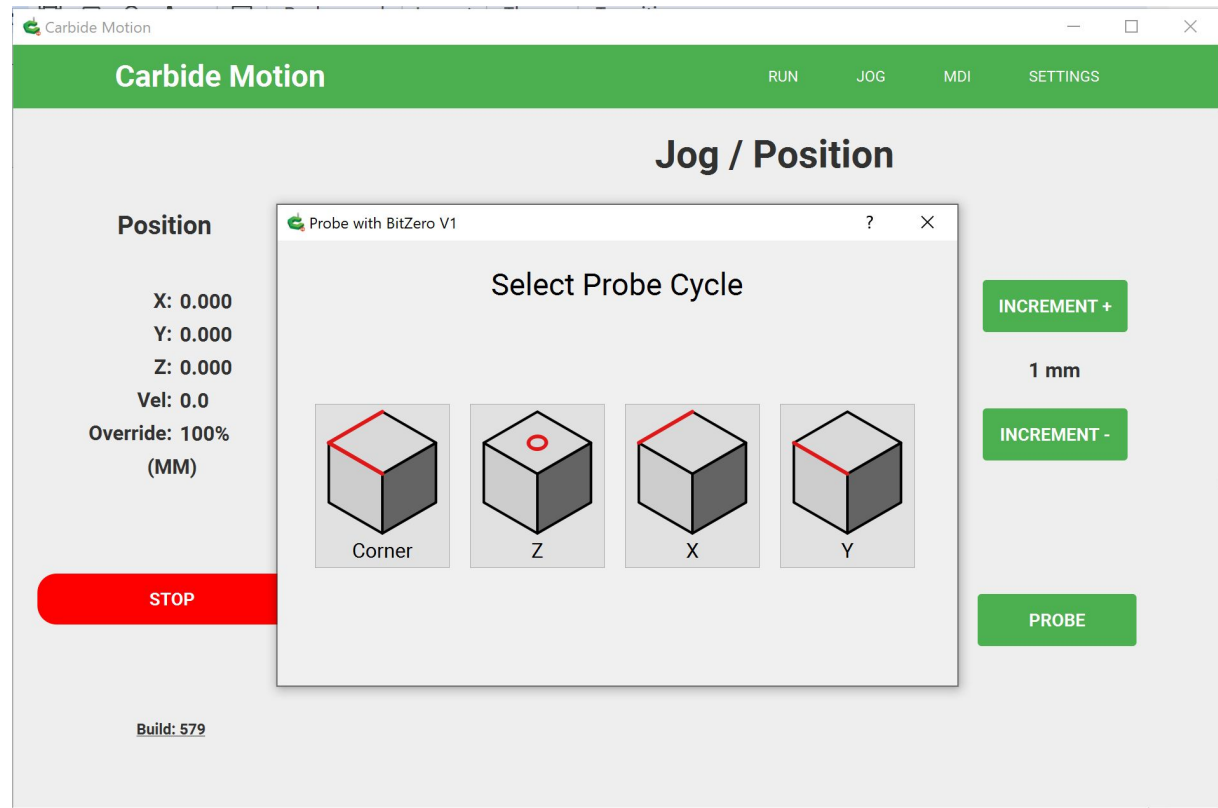
Read the prompts when you see them; for instance, this one.



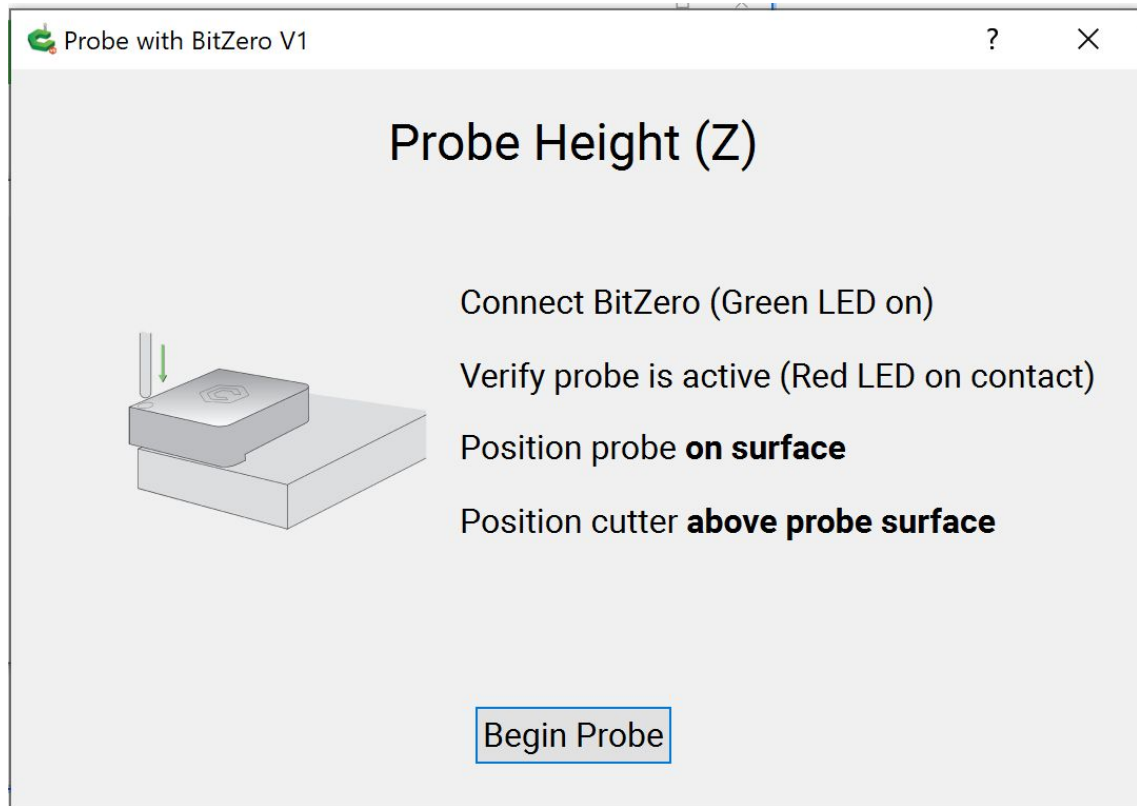
The Jog screen - of particular note is Increment, Set Zero, Rapid Position and Probe - and of course the X/Y/Z/Stop buttons and the position display - there are keyboard shortcuts as well



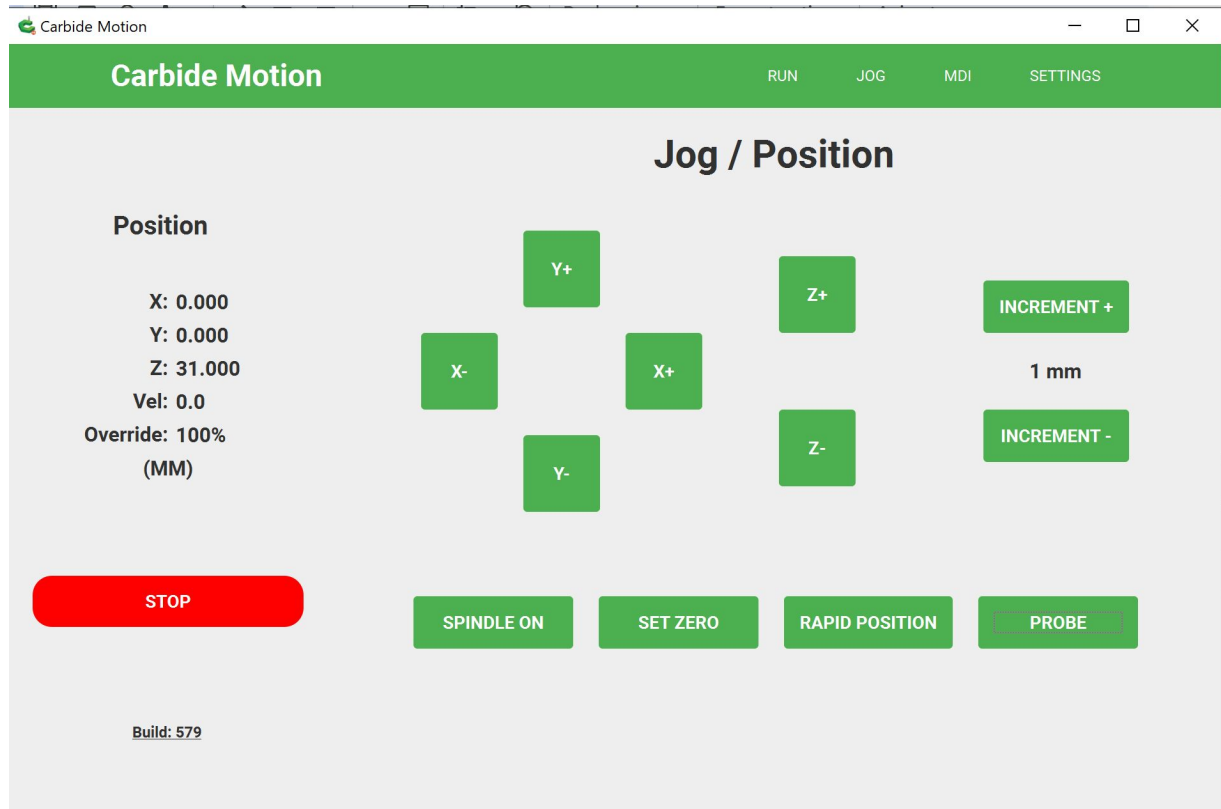
Used to zero out coordinates in conjunction with probing.



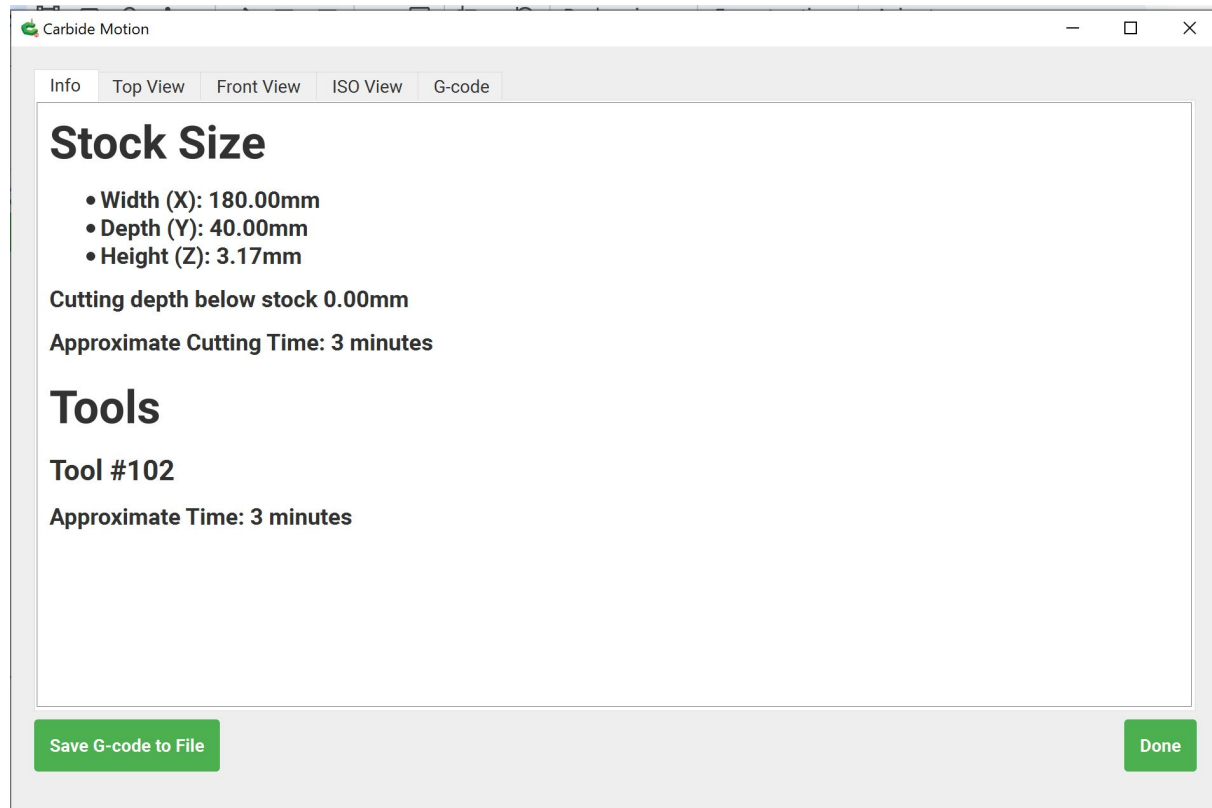
Probing uses the Bitzero V2 and can do individual axis or all at once. NOTE: Max distance of travel is 18mm before erroring out.



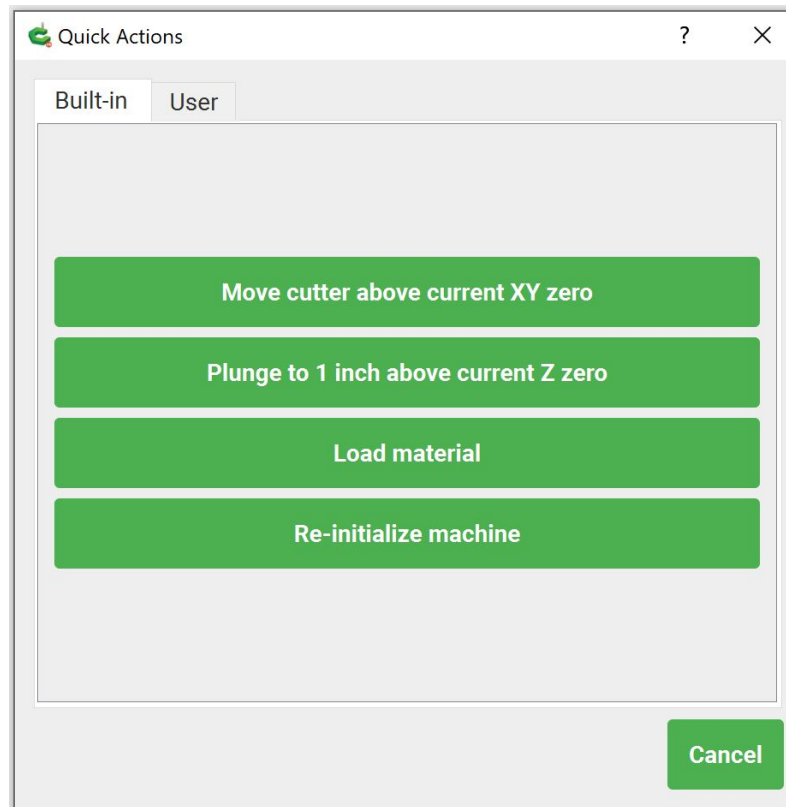
PENDING: Updated shot with V2



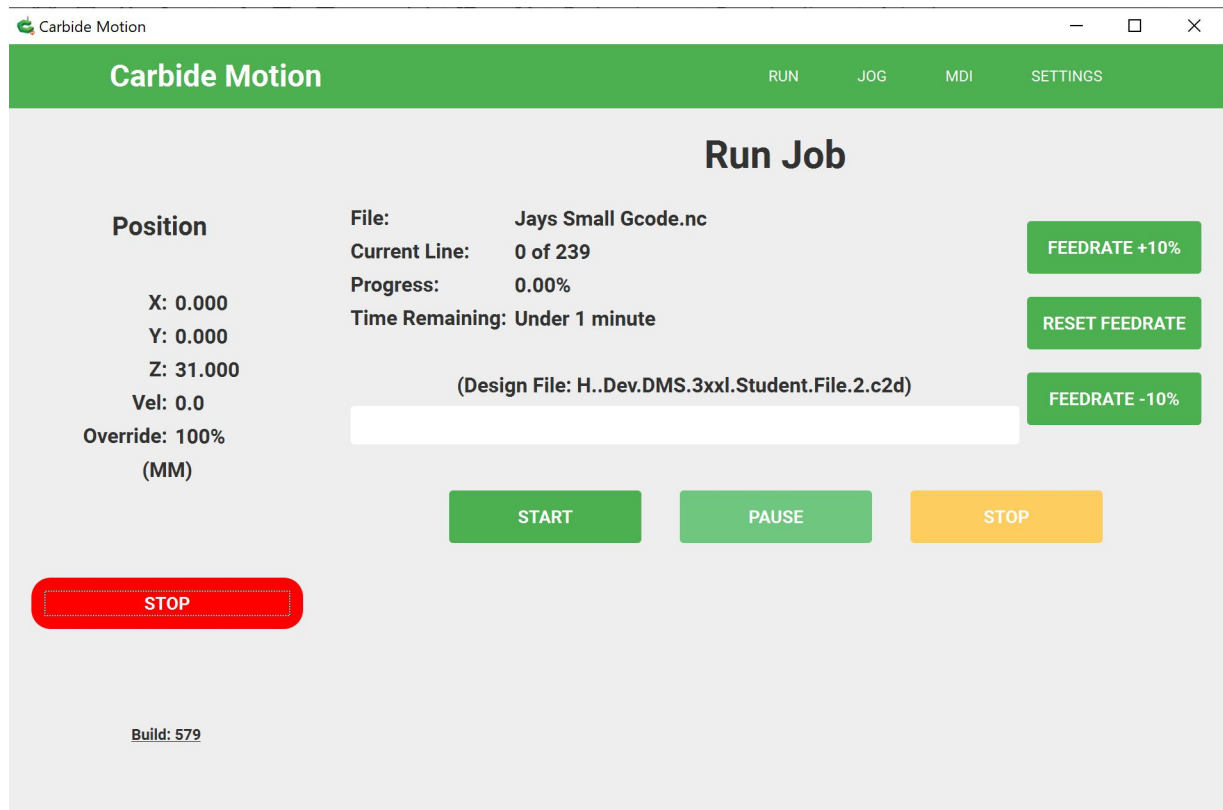
Sanity check: After a probe of Z your offset will be 31 MM; anything else is a problem with process or machine configuration.



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



PENDING: Need new shot showing SPINDLE WARMUP option



Once you 'Start' you will be prompted to set tools

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

CarbideMotion

Tool Change Required

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

RESUME



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

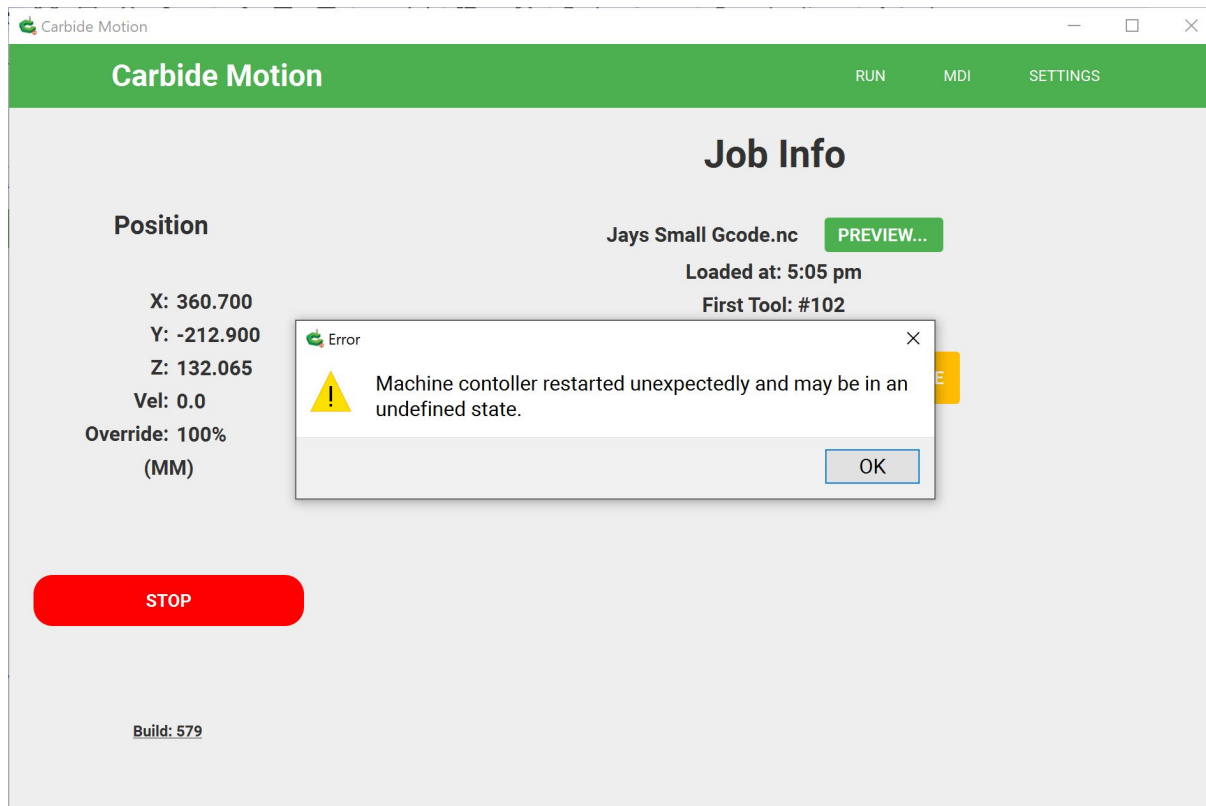
STOP

STOP

Build: 579



And we're off!



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

Plastics - Shapeoko3 - Checklists

Startup

Check machine for damage

Ensure the E-Stop is in Start mode

Ensure there are no loose tools in the spindle

Turn on the in-line power switch to power the controller

Check VFD and take out of standby mode if needed

Log into the tablet

Start Carbide Motion

Connect to cutter (VFD may spin)

Initialize Machine

Load a pin into the collet and tighten, then choose quick actions, spindle warmup (as needed)

Operating

Turn on dust collection and OPEN the blast gate

Remain in the area unless the machine is paused. **Do not leave the machine unattended!**

Shutdown

Clean up

Leave e-stop in ON mode, do not 'STOP' as this kills power to everything, including the surface book, which has limited battery life

Turn off dust collection and CLOSE the blast gate

Turn off power to the controller

