

BitSetter Installation and Setup Guide

The Carbide3D BitSetter is an automatic tool offset probe. This device measures the length in the spindle and, combined with Carbide Motion, automatically resets your Z-axis zero point to reflect the new length, making tool changes simple, straight forward, and FAST!

With the BitSetter, you only need to set the Z-axis zero point of your material once before running each project. All subsequent tool changes will automatically be re-zeroed.



Figure 1

BitSetter Kit Contents

Item	Description	Qty	Note
A	BitSetter	1	Tool Offset Probe
B	3 Pin Cable	1	Connects Probe Adapter PCB to Carbide Motion Controller
C	Probe Adapter PCB	1	Accepts 2 Probe Inputs
D	Legacy Adapter Cable	1	Connects BitSetter to Carbide Motion Boards Prior to v2.4
E	M4 x 4mm Grub Screw	2	Attaches BitSetter to Machine (<i>not shown</i>)
F	M4 x 6mm Grub Screw	2	Attaches BitSetter to Machine (<i>not shown</i>)
G	Zip Ties	3	For Cable Routing / Tidying (<i>not shown</i>)
H	Adhesive Tie Downs	2	For Cable Routing / Tidying (<i>not shown</i>)

Install the BitSetter

Shapeoko XL/XXL Installation



Figure 2



Figure 3

The BitSetter attaches to the front of your Shapeoko by sliding over the lip of the front end plate. The unit is secured to the machine with grub screws inserted from the rear of the BitSetter. **See Figure 2.**

1. Turn off your machine and unplug it. Disconnect the USB cable.
2. Insert M4x4mm grub screws into the top two screw holes (shown in **Figure 3**). Just start the screws so they are barely in the threads.
3. Slide the BitSetter over the edge of the front end plate, about 4.5 inches (115mm) from the right edge of the end plate See **Figure 4**.
4. To make sure the spindle can touch the BitSetter without interference, slowly move the gantry (by hand) so it is directly above the BitSetter. Ensure the center of the spindle is in line with the center of the BitSetter. See **Figure 7** below.
5. If necessary, slide your BitSetter to the right or left along the front end plate to align the trigger with the center of your spindle.
6. Once aligned, tighten the two M4x4mm screws so they press into the rail. These need only be snug, do not overtighten!

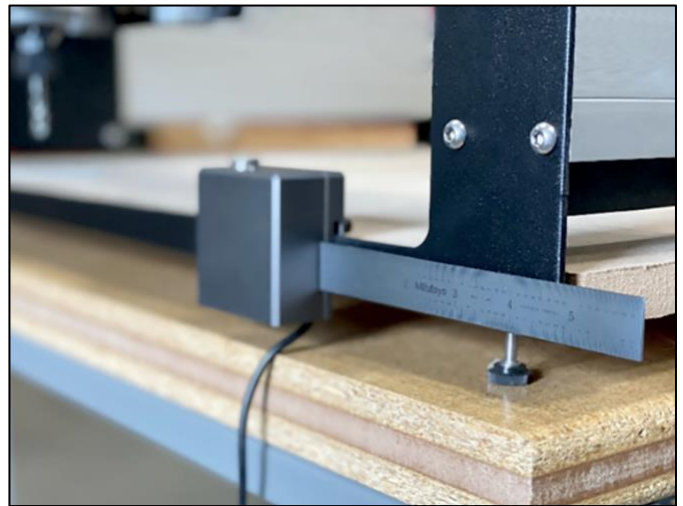


Figure 4

NOTE: If you would prefer your BitSetter to sit higher in the Z direction, you can also install the BitSetter per the Shapeoko 3 installation instructions (see next page).

Shapeoko 3 Installation

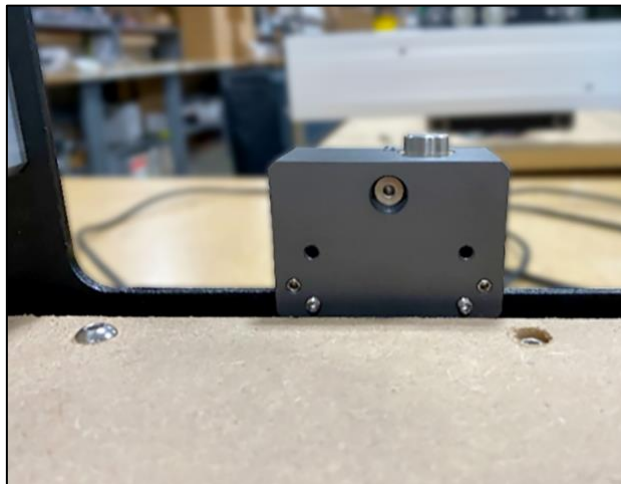


Figure 5



Figure 6

The BitSetter attaches to the front of your Shapeoko by sliding over the lip of the front end plate. The unit is secured to the machine with grub screws inserted from the rear of the BitSetter. *See Figure 5.*

1. Turn off your machine and unplug it. Disconnect the USB cable.
2. Insert two M4x6mm screws into the middle row of holes. *See Figure 6.*
3. Tighten the screws until they hit the back wall of the BitSetter. These screws will raise your BitSetter up so that it does not rest on the worktable.
4. Insert the two M4x4mm screws into the bottom holes; do not tighten them yet. *See Figure 5.*
5. Slide the BitSetter over the lip of the front end plate, about 4.5 inches (115mm) from the right edge of the end plate.
6. To make sure the spindle can touch the BitSetter without interference, slowly move your gantry (by hand) so it is above the BitSetter. Ensure the center of the spindle is in line with the center of the BitSetter. *See Figure 7.*
7. If necessary, slide your BitSetter to the right or left along the front end plate to align the trigger with the center of your spindle.
8. Once aligned, tighten the bottom two M4x4mm screws so they press into the end plate. These need only be snug, do not overtighten!



Figure 7

NOTE: If you are using the stock wasteboard, you can access the bottom screws using a ball-end hex key. If using additional wasteboards, you may need to remove the wasteboard to access the screws.

Route the Cable

The BitSetter cable is designed to route to your Carbide Motion controller one of two ways.

Routing Option 1

1. Using the cutout on the bottom of the BitSetter, route the cable under the machine, directly back to the controller.
2. Use the included adhesive tie downs and zip ties to secure the cable to the machine. We recommend one tie down immediately behind the BitSetter and another where the wire feeds out near the controller.

Routing Option 2

1. Using the cutout on the bottom of the BitSetter, route the cable around the front-left side of the machine.
2. Use the included adhesive tie downs and zip ties to secure the cable to your machine. Make sure the cable is out of the way and fastened to your machine in convenient locations.

Connect the BitSetter to the Controller Board

To make installation simple, we have included a variety of adapters to allow you to connect the BitSetter without needing to cut or solder any wires.

The instructions below apply to versions of the Carbide Motion boards shipped with Shapeoko:

- 2.1
- 2.2
- 2.3
- 2.4d
- 2.4e

To identify which version of the Carbide Motion board you own, look in the bottom-left corner of the PCB.

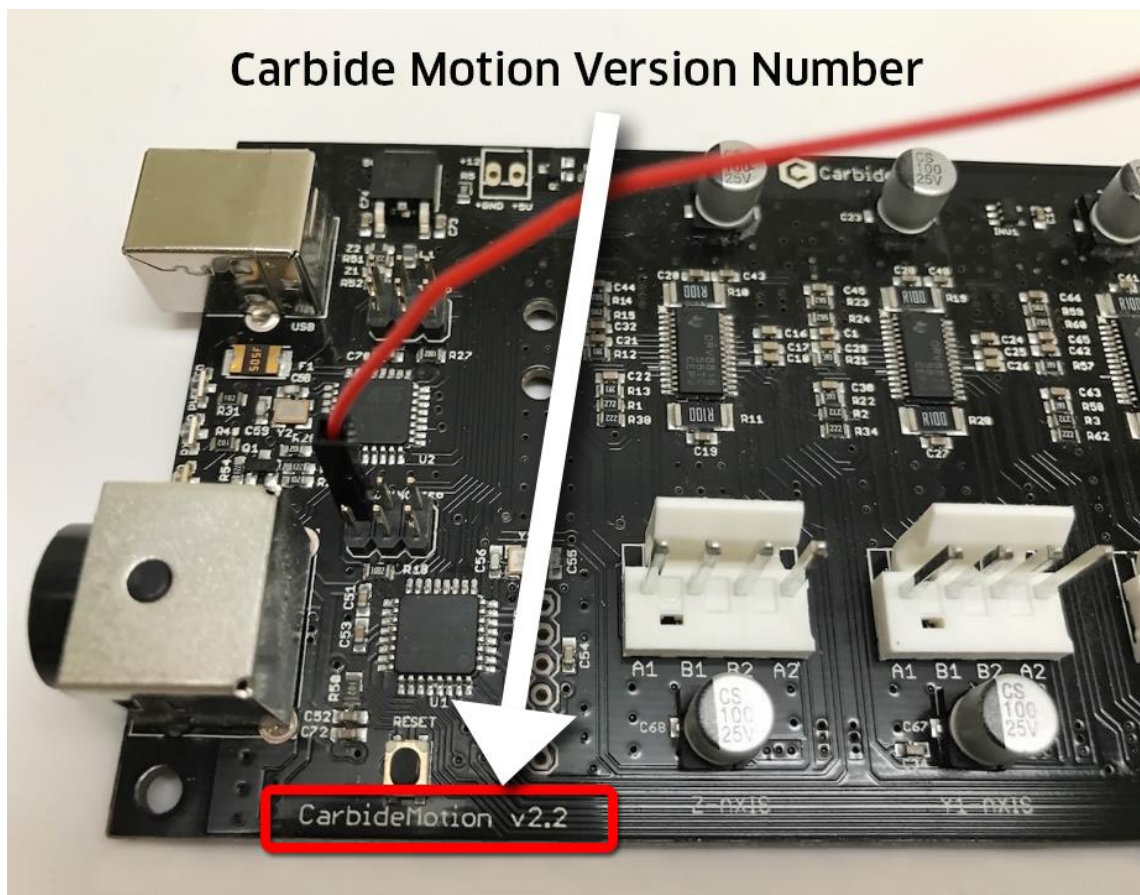


Figure 8

Version 2.1/2.2/2.3 (Using the Legacy Adapter Cable)

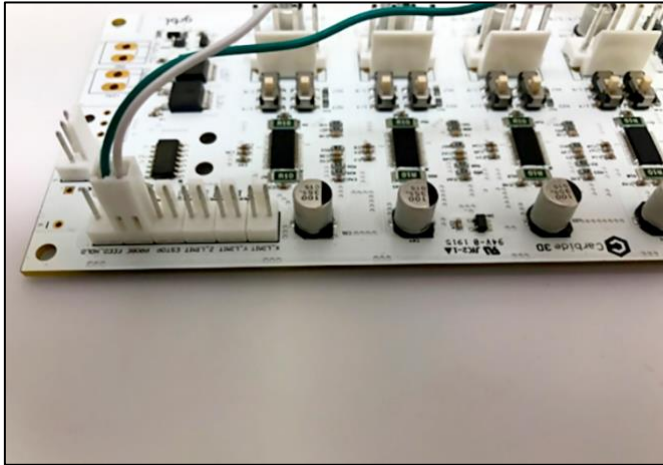


Figure 9

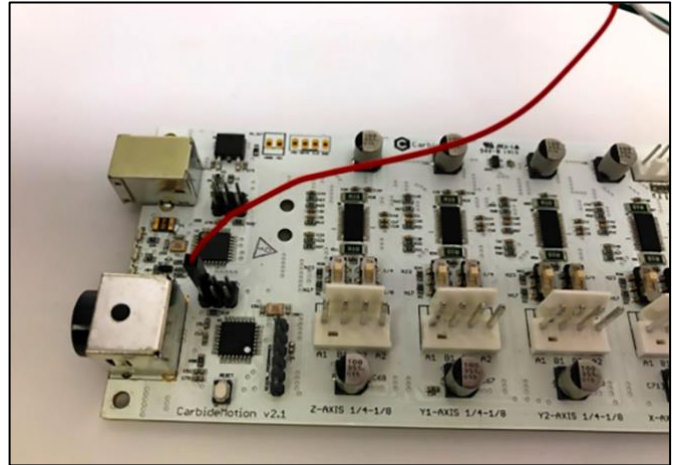


Figure 10

1. Connect the female connector (green and white wires) to the probe pins as shown in **Figure 9**.
2. Connect the red wire (+5V) to the upper-left pin on the *AVR PROGRAMMING* label as shown in **Figure 10**.
3. Once both wires are plugged in, your board should look like **Figure 11**.
4. Connect the Legacy Adapter Cable to the port labeled *TO CARBIDE MOTION* on the Probe Adapter PCB.
5. Connect the BitSetter to the port labeled *TOOL PROBE* on the Probe Adapter PCB.

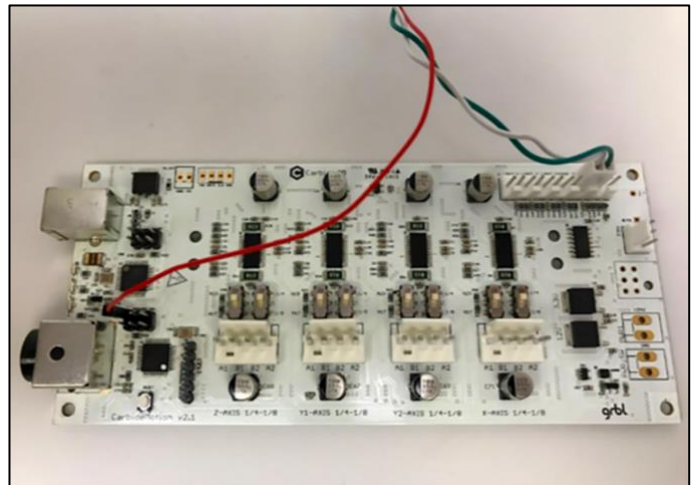


Figure 11

NOTE: If you also have a Carbide 3D probe, plug that into the port labeled *TOUCH PROBE* on the Probe Adapter PCB.

Version 2.4

Beginning with version 2.4d of the Carbide Motion Controller PCB, the controller boards have a purpose-built port labeled *RESERVED*, which is intended for a touch probe.

1. Connect the BitSetter:
 - a. If you only have the BitSetter, you can plug it directly into the port labeled *RESERVED* as shown in **Figure 12**.
 - b. If you have both the BitSetter and a Touch Probe, use the Probe Adapter PCB as shown in **Figure 13**.

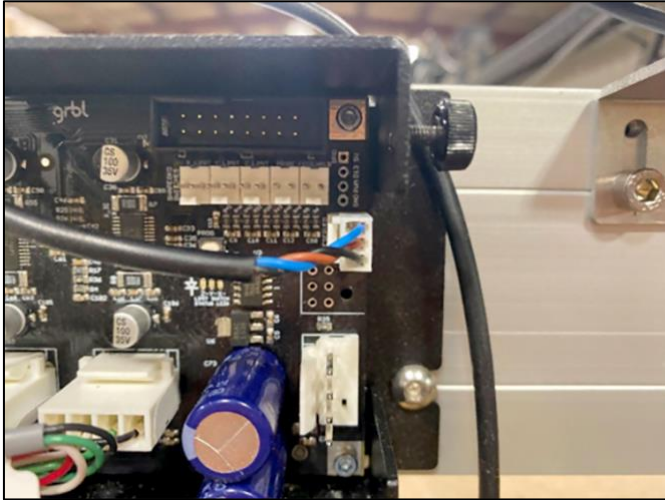


Figure 12

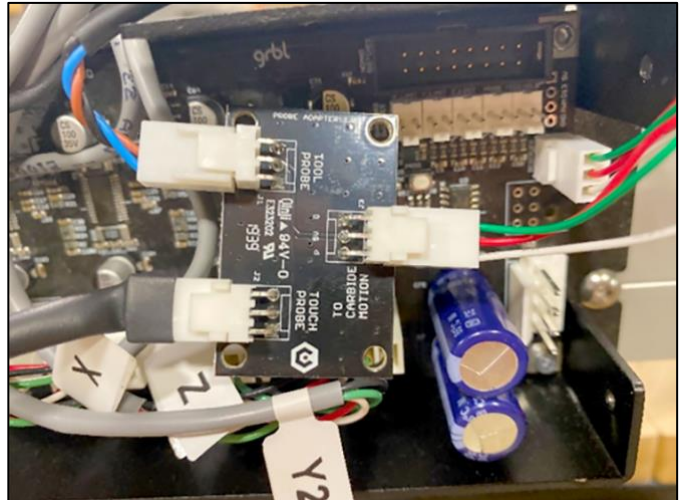


Figure 13

NOTE: If your 2.4d/e board is missing the *RESERVED* label, connect the Touch Probe using the adapter cable and follow the directions for connecting version 2.1/2.2/2.3 above.

2. After your cable is routed to the Carbide Motion Controller, re-install the controller cover or enclosure. Make sure not to pinch or accidentally loosen any of the cables.

Set Up and Calibrate Carbide Motion

With the hardware installed, you now need to setup Carbide Motion control software to recognize and calibrate your BitSetter.

NOTE: Carbide Motion v4.26 or higher is required to use the BitSetter. If you have not already done so, download the latest version of Carbide Motion now at: carbide3d.com/carbidemotion.

Connect to Shapeoko

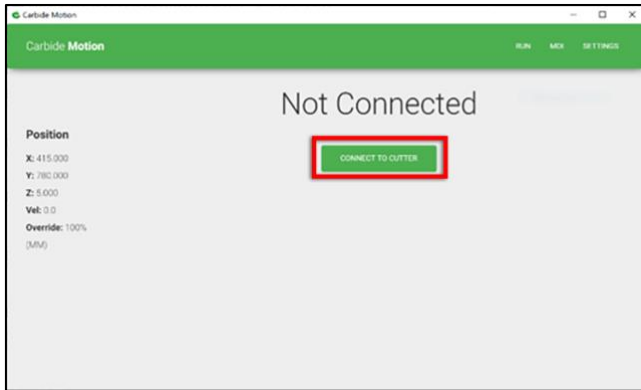


Figure 14

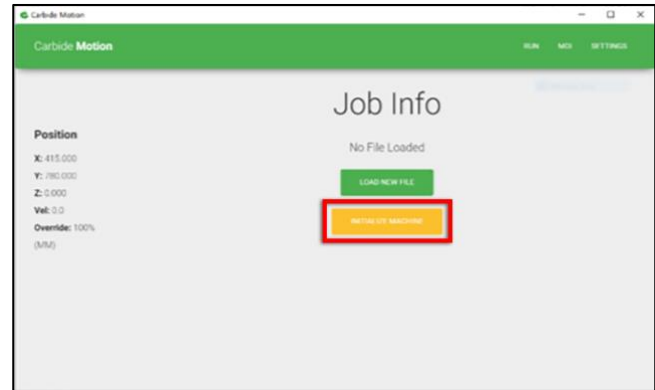


Figure 15

1. Open Carbide Motion.
2. Power on the Shapeoko, then click the **Connect to Cutter** button. See *Figure 14*.
3. After the software connects, click the **Initialize Machine** button. This will begin a homing cycle. See *Figure 15*.

Clear Offsets and Change to Machine Coordinates

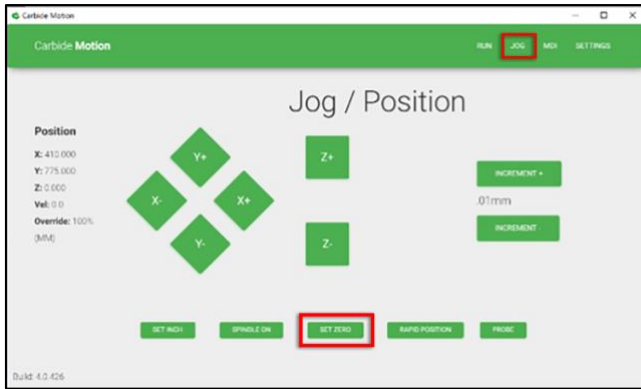


Figure 16

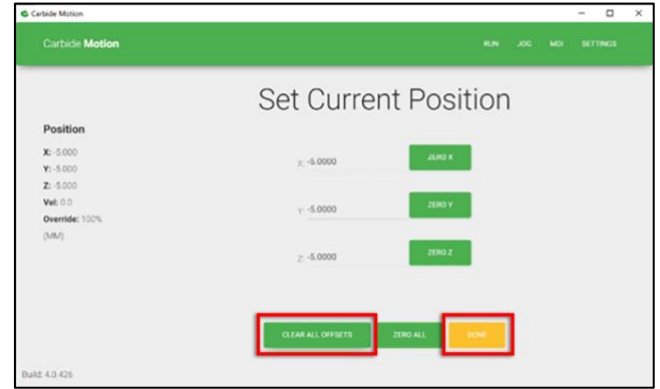


Figure 17

Clear Offsets

1. After homing completes, click **Jog** in the top menu bar.
2. Click the **Set Zero** button. See *Figure 16*.
3. On the Set Current Position screen, click the **Clear All Offsets** button. Then, click **DONE**. See *Figure 17*.
4. Click the **Position** label. This will toggle the view to the machine coordinates. See *Figure 18*.

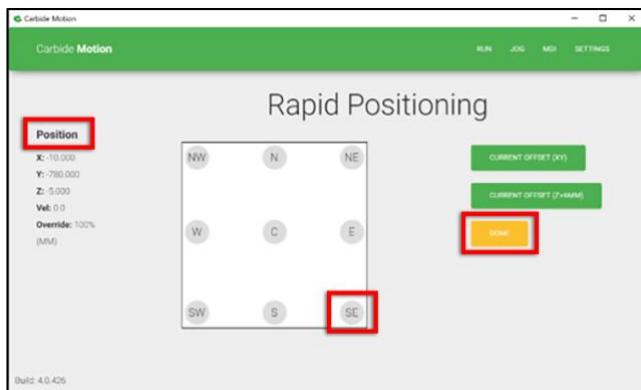


Figure 18

5. Click **Rapid Position**, then click the **SE** button to move the spindle to the front-right of the machine. Once in position, click **DONE**. See *Figure 18*.
6. From the JOG screen, use the arrows on the screen (or the arrows on your keyboard) to jog the gantry so the spindle is directly above the BitSetter (as shown in *Figure 19*).



Figure 19

Configure the Permanent Position of the BitSetter

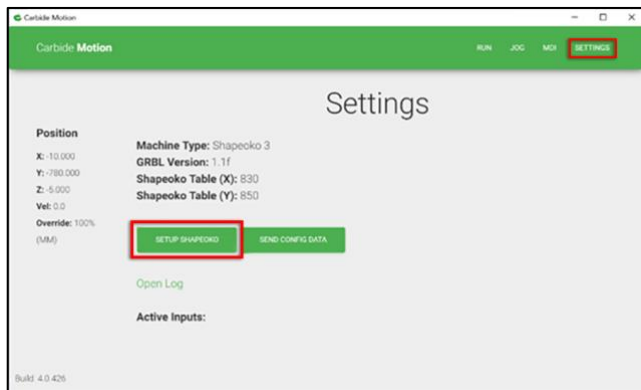


Figure 20

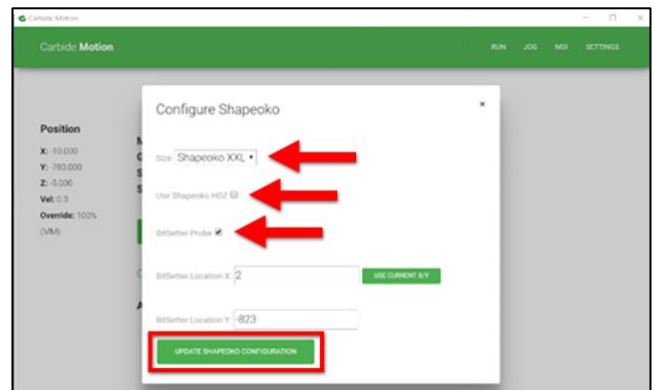


Figure 21

1. Click **Settings** in the top menu bar.
2. Click the **Setup Shapeoko** button. See *Figure 20*.
3. Select the appropriate size Shapeoko from the **Size dropdown list** (Shapeoko 3, XL, XXL). See *Figure 21*.
4. Select the **Use Shapeoko HDZ checkbox**, if you are using an HDZ.
5. Select the **BitSetter Probe checkbox**. This will expand the window and allow you to configure the permanent location of the BitSetter.
6. With your spindle directly above the BitSetter, click the **Use Current X/Y button** to set the location. This will permanently save the X/Y location of your BitSetter.

NOTE: If you physically change the BitSetter location, you will need to re-run this setup.

7. Click the **Update Shapeoko Configuration** button to save the settings.

CONGRATULATIONS! Your BitSetter is ready to use!

Operating Your Bitsetter

The start-up workflow using the BitSetter is as follows:

1. Power on and connect to machine.
2. Initialize Machine – this will begin a homing cycle.
3. After the homing cycle completes, the gantry will automatically move to the front-right location and prompt you to insert a tool. Think of this as ‘homing’ the tool offset.
4. After the tool is inserted or confirmed, the machine will then measure the length of the tool in the spindle.
5. Once the initialization sequence is complete, you can load and run a job by using the **Load File** feature.

Notes About Using Your BitSetter

- Ensure tools are long enough to reach the BitSetter trigger button. The minimum length the tool must extend from the collet is 0.5.”
- In order to instantiate a tool change and offset measurement, your CAM program must post unique tool numbers with each new tool. Carbide Create does this by default.
- If you ever physically move the BitSetter, you will need to reconfigure its new location by following these instructions again.

Check Out the BitSetter Installation Video

There is also a complimentary video to go along with these installation instructions, which can be viewed at: <https://youtu.be/I97XwLBmyuc>.