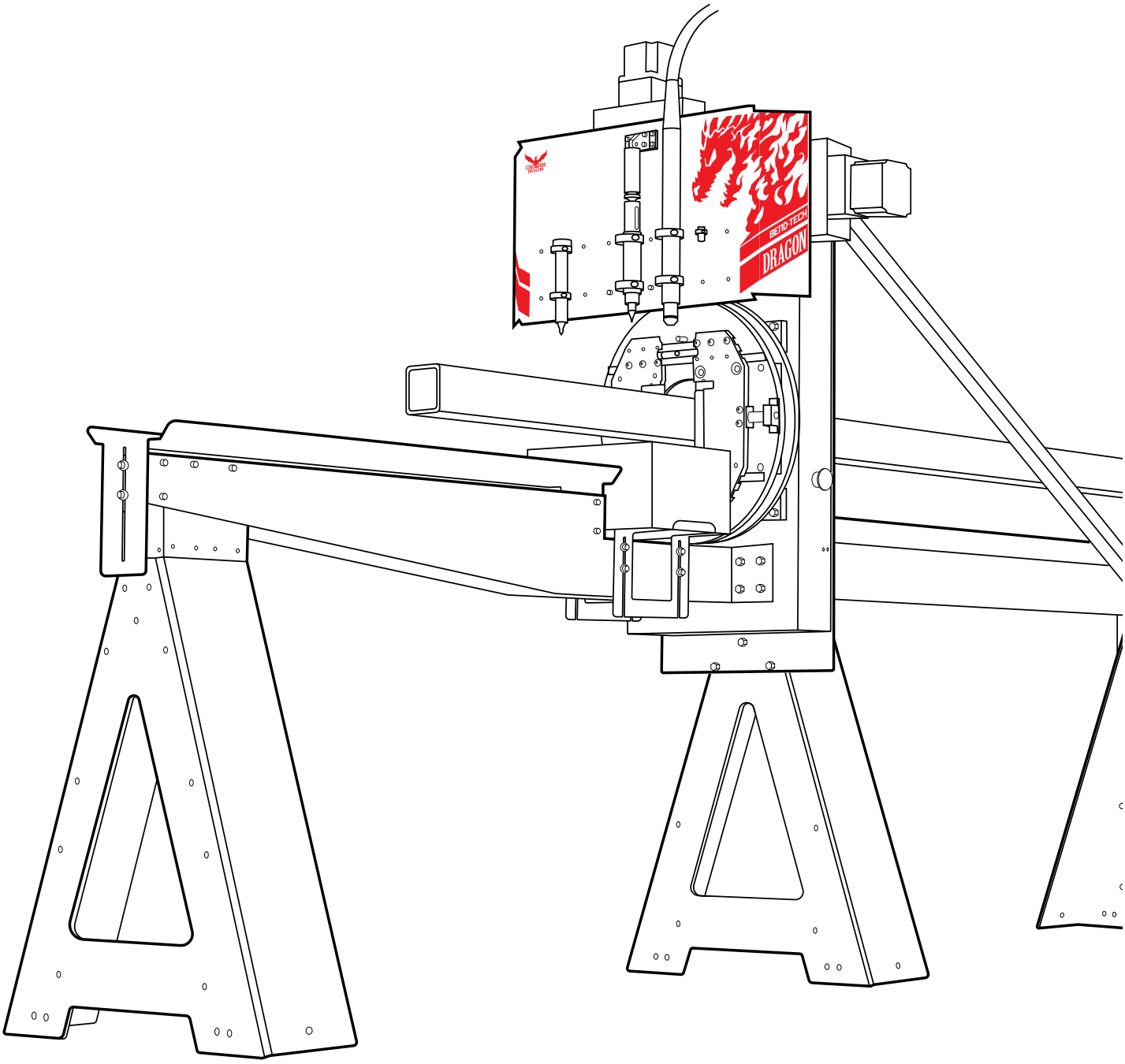
Part 4 of 4

BEND-TECH

DRAGON A400

Start-Up and Training Manual

Part 4: Side Offsets, Angle & Channel, and Calibration



Revision 4 | English

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Dragon A400

Start-Up and Training Manual
Revision 4

English
Original Instructions

July 2020

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Contents

Dragon CAM Side Offsets Calibration

1.1 Side Offsets Calibration for Square and Rectangle Tube

Square and Rectangle Tubing has measurable sides which makes the procedure for setting up these materials in the Dragon A400 different than setting up round tubing. The following process will walk the Operator through the procedure to set up a piece of square tubing, but rectangular tubing will be similar.

1.1.1 Open Bend-Tech 7X

To begin the Side Offset Calibration process, open Bend-Tech 7X. Click Dragon CAM near the center of the interface.

1.1.2 Chuck Grip Settings

Before proceeding with Side Offsets Calibration it is important to ensure the Chuck Grip setting in the Bend-Tech Dragon software matches how the material is chucked into the machine.

In the Tube / Pipe Library, under the Machine tab, locate the Chuck Grip dropdown menu within the Basic Settings box. To reference which Chuck Grip to choose, click the question mark icon next to the Chuck Grip dropdown. Set Chuck Grip appropriately.

1.1.3 Corner Rotation Extension

Corner Rotation Extension is the distance set before the tool reaches the edge of a given material prior to the machine beginning rotation of the material. If the Corner Rotation Extension is not set correctly it can lead to Torch collision or the Torch cutting vertically into the wall of the material. It can also cause Torch failure.

In the Tube / Pipe Library, in the Machine interface, locate the Corner Rotation Extension box in the bottom center of the interface. Use the formula to calculate the value to enter in the Distance text box.

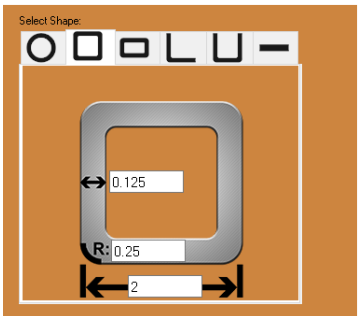
(wall thickness + kerf) - radius = Corner Rotation Extension

Example:
(.120 + .06) - .15 = .03

If the Corner Rotation Extension value is negative, leave it set to 0 in the software. For this material the CRE would be set to 0.

1.1.4 Add Square Or Rectangle Material

On the Bend-Tech Dragon Home Interface click Tube Library then click Add New below the Material List in the bottom left of the interface.

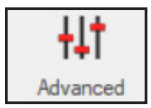


Select the shape of the material that will be used in the Select Shape box on the right hand side of the interface. Enter the dimensions of the material in the appropriate text boxes. Enter a name for the material.

Click Save.

Bend-Tech recommends using a corner radius gauge to determine material corner radius. If a corner radius gauge is not available the Operator can multiply material thickness by 2 and enter that value as an estimated corner radius.

Ensure Machine Control is open before clicking the Calibrate icon.



The material will appear in the Material List on the left hand side of the interface. Click on the material. In the menu bar at the top of the same interface click Advanced.

In the middle of the interface in the Side Offsets box, click Calibrate.

1.1.5 Disable Feature

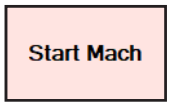
The next interface will give the Operator the option to Disable the Side Offset Calibration feature and use the machine's default measurements.

Bend-Tech requires performing the Side Offset Calibration to achieve more precise results when cutting square or rectangular material.

Click Next.

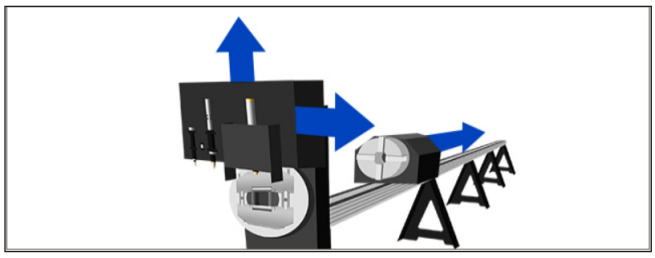
1.1.6 Power On The Machine

Select the machine, click Next, then assure the machine is powered on. The interface will prompt the Operator to Start Mach by clicking the icon on the interface.



Click Start Mach.

1.1.7 Homing Procedure



The Operator will be asked to perform the machine's Homing process. To begin the Homing process click the image in the interface.

During the homing process, the software will display a message in green text. Upon homing, the green text will disappear.

After the Homing process is complete, click Next.

1.1.8 Load The Material

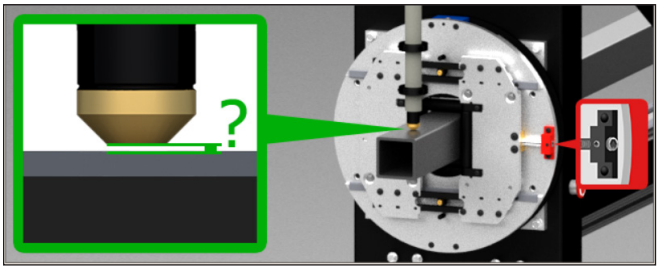
The machine will ask the Operator to enter the length of the material. The Side Offsets Calibration should use a piece of material between 3 ft. and 6 ft. in length. This will move the Trolley into place so the Operator can load the material into the machine.

Turn the Gate Lead Screws clockwise until the Gate rollers are snug to the material. The material should move freely in the Gate with no play. Ensure the Gate Lead Screws are in the 12 o'clock and 3 o'clock positions.

Feed the material into the Chuck, making sure the Chuck is adjusted so it will accept the material. Using a torpedo level on the material, secure it in the Chuck making sure it is as level side-to-side as possible. If the machine is equipped with a Powered Gate the Operator will not need to position the Gate Lead Screws or use a Torpedo Level on the material.

When the material is loaded into the machine click Next.

1.1.9 Torch Distance



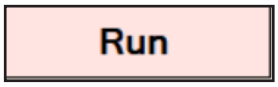
The program will ask the Operator to record the gap distance between the Torch and the material for each side of the material. This can be accomplished using a set of feeler gauges and Vernier calipers. Before beginning, verify the Gate Lead Screws are in the 12 o'clock and 3 o'clock positions.

To begin, click Move Torch. Measure the distance between the Torch and the material by stacking the appropriate number of feeler gauges. Measure the thickness with a caliper. This is the gap distance.

Type the gap distance into the text box and click Next. The machine will automatically move to the next side of the material. Perform this for all four sides.

1.1.10 Run Test Cuts

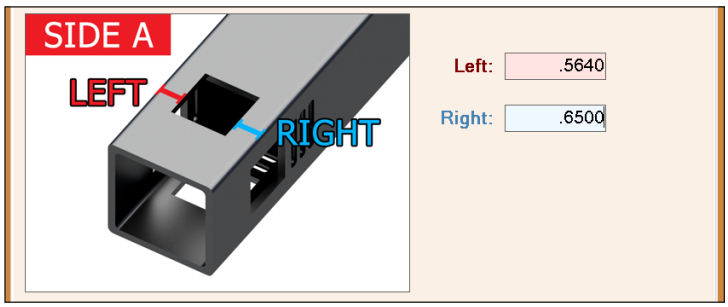
The machine will now perform a test cut procedure based on the Torch height values entered by the Operator.



Click Run to begin this process.

When the process is complete, click Next.

1.1.11 Measure Test Cuts



The program will ask the Operator to measure the distance of the left hand and right hand side of the hole to the edge of the material.

Use the images on the interface as a reference regarding which sides to measure. Enter the appropriate values in the text boxes.

After performing this for sides A, B C and D, click Next.

An interface will open showing the Side Offset values for the material. The program will use the material size and the values entered in the Side Offset Calibration to center the holes on each side.

To assure the calculations are correct, click verify and the machine will perform the test cut process again. If the holes are not centered after the second test cut click Go Back to repeat the calibration process.

If the holes are centered click Finish.

1.1.12 Save Calibration

Once the calibration is finished, the program will bring the Operator back to the Tube and Pipe Library interface. The Side Offsets box will show the calibration values determined during the Side Offset Calibration process.

Click Save to record the calibration values to go along with the material. Whenever the material is run the machine will pull the calibration values saved in this process.

Material only needs to be calibrated when it is first entered into the Tube and Pipe Library.

02 Angle and Channel Material Setup

2.1 Angle and Channel Material Overview

In addition to round, square and rectangle tubing, the Dragon A400 is also capable of processing angle and channel material. Bend-Tech software allows the user to design parts and assemblies using angle and channel material. Angle and channel material designs cannot be imported to Dragon software, angle and channel material parts can only be designed in Dragon CAM.

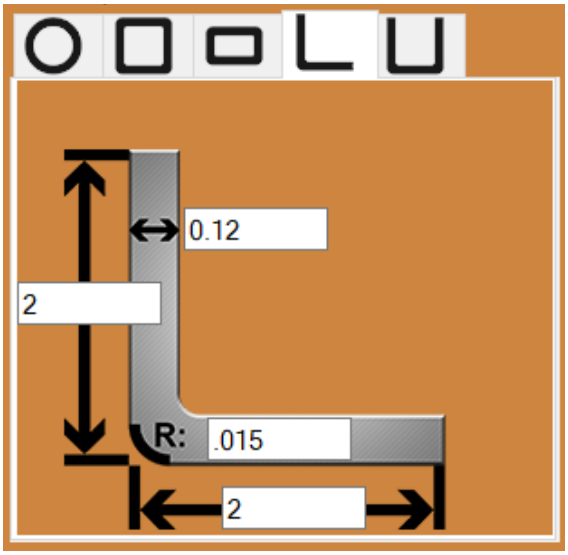
2.2 Adding Angle and Channel Material

Before processing angle or channel material, the Operator will need to add the material to the Tube and Pipe Library. After creating and saving angle or channel material, the Operator will be directed to the Lead In/Out tab in the material settings.

2.3 Angle and Channel Material Machine Settings

Angle and channel material brings unique challenges to the Operator when trying to process that material in the Dragon A400. The Operator must take into consideration the sharp radius on the outside corner, as well as the differing thicknesses of the material. It is important to follow the steps outlined in this chapter for proper processing of angle and channel material.

2.3.1 Corner Radius



It is advised that the Operator enter .015 as the corner radius in the material dimensions when processing angle material.

Using a value less than .015 will cause rounding issues. Using a value greater than .015 will move the Torch closer to the material and possibly result in the Torch contacting the material.

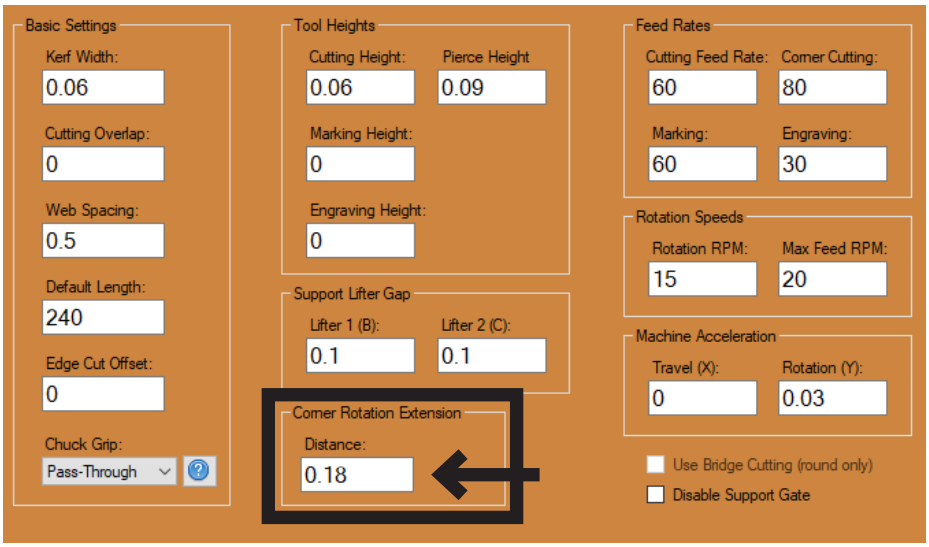
2.3.2 Y-Axis (Chuck) Acceleration

It is advised the Operator set the Y Axis acceleration value to .030 to ensure the angle or channel material is moved properly and stays secure and in position during machine operation. Another method the Operator can use to figure Y Axis acceleration is:

Radius x 2 = Y acceleration

To set Y-Axis acceleration, on the Bend-Tech Dragon home interface, under Library, click Tube Library, then click the Machine icon. In the bottom right, in the Machine Acceleration box, change the Rotation (Y) value to .030 in.

2.3.3 Corner Rotation Extension



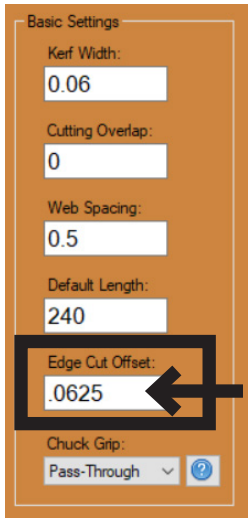
When processing angle and channel material, or any material with a sharp radius, it is necessary to slow the Torch and give it a larger radius as it passes over the corner. Bend-Tech has calculated a formula for this:

Material Thickness + Kerf Width

For example, if the Kerf Width is 0.060 in. and the material thickness is 0.25 in. the corner rotation extension would calculate to 0.31 in.

Incorrect corner rotation extension (too close to the material or too far) could result in loss of Torch arc.

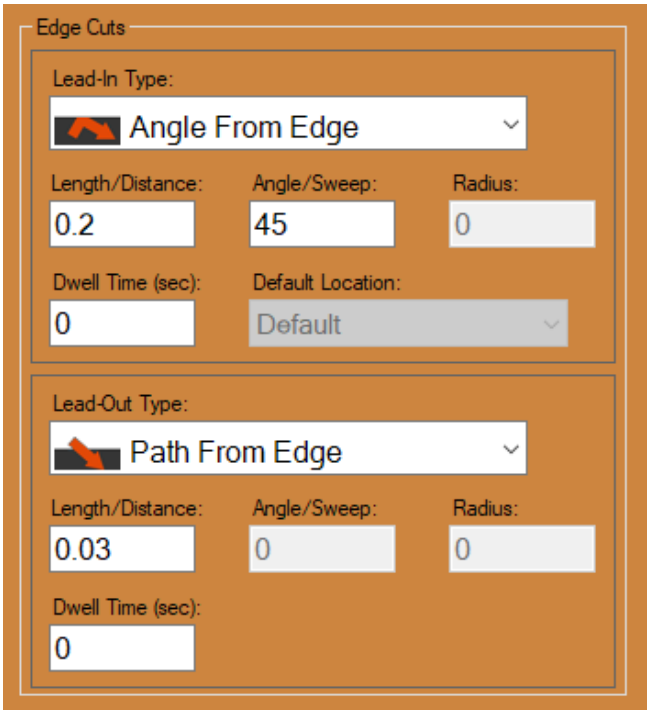
2.3.4 Edge Cut Offset



Under the Machine tab, in the Basic Settings box, set Edge Cut Offset to .0625. Edge Cut Offset is the distance beyond the edge of the material the Lead In/Out is allowed to extend when performing edge cuts. Bend-Tech has found .0625 to be the optimal setting when processing angle or channel material.

Using a value greater than .0625 for Edge Cut Offset may cause the Torch to lose arc. A value smaller than .0625 will result in inconsistent cut quality.

2.3.5 Lead In/Out Settings



In the Lead In/Out settings, under Edge Cuts, set the Lead-In Type to Angle From Edge, the Length/Distance to 0.2 in. and the Angle/Sweep to 45-degrees.

Set the Lead Out Type to Path From Edge and the Length/Distance to 0.030 in.

Set all other values in Edge Cuts to 0 or leave at the default value. Internal cuts can be run with typical settings.

2.4 Side Offsets Calibration

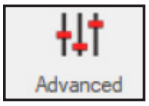
As with square or rectangular tubing, the Operator must perform a Side Offsets calibration prior to processing angle and channel material.

2.4.1 Open Bend-Tech 7X

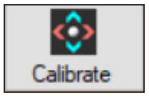
To begin the Side Offsets Calibration process, open Bend-Tech 7X. Click Dragon CAM.

2.4.2 Begin The Calibration Process

On the Bend-Tech Dragon Home Interface click Tube Library then choose the angle or channel material to be calibrated from the Material List.



In the menu bar at the top of the same interface click Advanced.



In the middle of the interface in the Side Offsets box, click Calibrate.

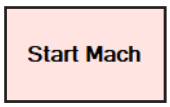
2.3.3 Disable Feature

The next interface will give the Operator the option to Disable the Side Offsets Calibration feature and use the machine's default measurements. Bend-Tech requires performing the Side Offsets Calibration to achieve more precise results when cutting square, rectangular, angle or channel material.

Click Next.

2.4.4 Power On The Machine

Select the machine, click Next, then assure the machine is powered on. The interface will prompt the Operator to Start Mach by clicking the icon on the interface.



Click Start Mach.

2.4.5 Homing Procedure

The Operator will be asked to perform the machine's Homing process. To begin the homing process click the image in the interface.

After the homing process is complete, click Next.

2.4.6 Load The Material

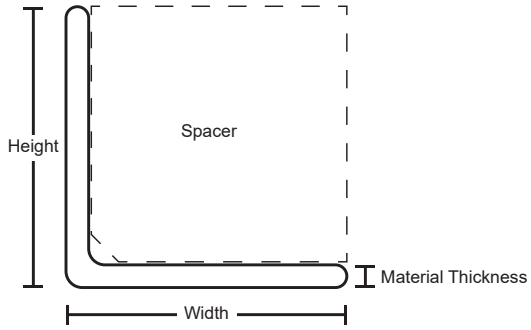
The machine will ask the Operator to enter the length of the material. This will move the Trolley into place so the Operator can load the material into the machine. Always load angle material with one flat down and one flat on the left (Marker side) of the machine. If one flat is larger than another, ensure the larger flat is down.

For channel material, load with the largest side down. Turn the Gate Lead Screws clockwise until the Gate rollers are snug to the material. The material should move freely in the Gate with no play. Ensure the Gate Lead Screws are in the 12 o'clock and 3 o'clock positions. Feed the material into the Chuck, making sure the Chuck is adjusted so it will accept the material.

When the material is loaded into the machine click Next.

2.4.7 Angle Material Spacers

When loading angle material, the Operator will need to use a spacer to ensure the material is securely clamped in the Chuck. This may require fabricating a piece that fits the material. The spacer should be the size of the material minus the thickness of the material. The spacer should fit the angle material so it essentially creates a square.

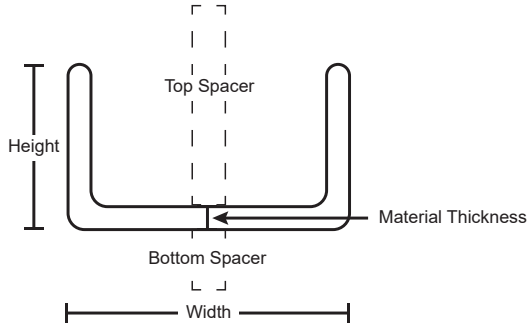


Formula
Size of material - material thickness

For example, if the material is 2 in. angle, and is .25 thick, the spacer would measure 1.75 in. x 1.75 in. -- [2.0 - .25 = 1.75]

2.4.8 Channel Material Spacers

When loading channel material, the Operator will need to use a spacer to ensure the material is securely clamped in the Chuck. This may require fabricating a piece that fits the material. Channel material will have a spacer above and below the material.

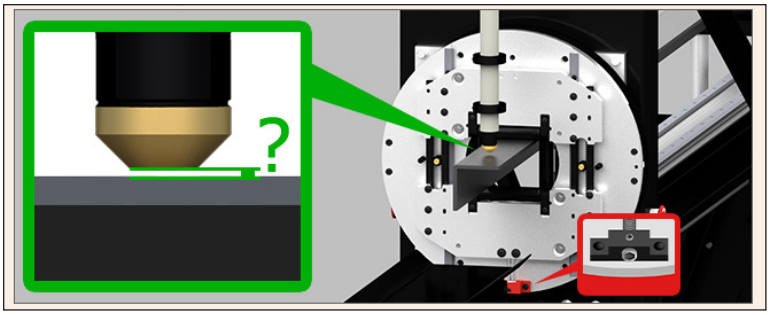


Formulas
Bottom Spacer: ((Width - Height) / 2)

Top Spacer: (Bottom Spacer + (Height - Material Thickness))

For example, if the material is 3 in. x 2 in. channel, and is .25 thick, the top spacer would measure 2.25 in. and the bottom spacer would measure .5 in. -- [(3 - 2) / 2 = .5] and [.5 + (2 - .25) = 2.25]

2.4.9 Torch Distance



The program will ask the Operator to record the gap distance between the Torch and the material for each side of the material. This can be accomplished using a set of feeler gauges and calipers as outlined in section 1.1.7.

To begin, click Move Torch. Measure the distance between the Torch and the material, this is the gap distance.

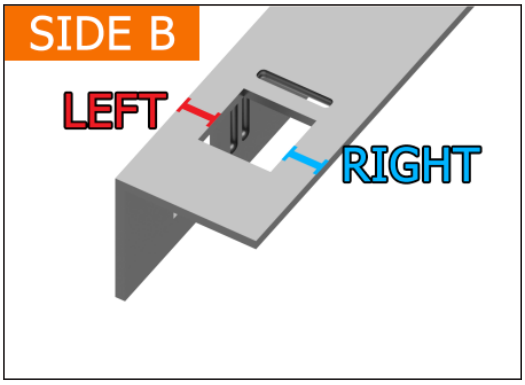
Type the gap distance into the text box and click Next. The machine will automatically move to the next side of the material. Perform this for all sides.

2.4.10 Run Test Cuts

The machine will now perform a test cut procedure based on the Torch height values entered by the Operator. Click Run to begin this process.

When the process is complete, click Next.

2.4.11 Measure Test Cuts



The program will ask the Operator to measure the distance of the left hand and right hand side of the hole to the edge of the material. Use the images on the interface as a reference regarding which sides to measure.

After performing this for each side of the material, click Next.

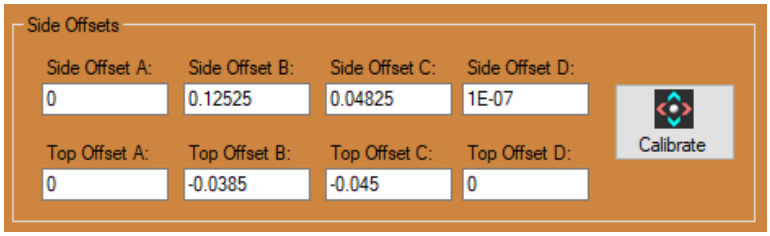
An interface will open showing the Side Offsets values for the material. The program will use the material size and the values entered in the Side Offsets Calibration to center the holes on each side.

To assure the calculations are correct, click verify and the machine will perform the test cut process again. If the holes are not centered after the second test cut click Go Back to repeat the calibration process.

If the holes are centered click Finish.

2.4.12 Save Calibration

Once the calibration is finished, the program will bring the Operator back to the Tube and Pipe Library interface. The Side Offsets box will show the calibration values determined during the Side Offsets Calibration process.



Click Save to record the calibration values to go along with the material. Whenever the saved material is run the machine will pull the calibration values saved in this process.

Material only needs to be calibrated when it is first entered into the Tube and Pipe Library.

03 Calibrating

3.1 Calibration Overview

The Dragon A400 is delivered to the customer from the Bend-Tech manufacturing facility fully calibrated. While the machine is delivered pre-calibrated, it is possible for the machine to lose calibration over time, or lose calibration due to servicing such as changing a tool or part. The purpose of this guide is to assist the Customer in the understanding and execution of the calibration process of the Dragon A400.

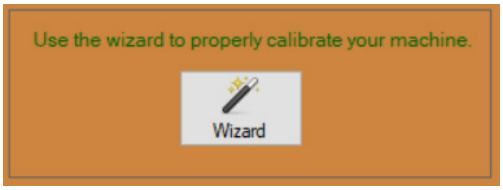
3.1.1 Calibration Points

The Dragon A400 uses calibration points as references in its operation procedures. There are seven different calibration points in regard to Dragon A400 operation:

- Trolley travel/Dead zone
- Adjust Chuck Zero
- Material Support Lift
- Marker
- Engraver
- Torch
- Laser
- Powered Gate

Each of these can be calibrated individually or the Operator can perform a full calibration to calibrate the entire machine.

3.2 Wizard



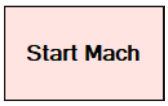
From the home interface, open Bend-Tech CAM software. Open the Machine Control interface. From the Tools dropdown, click Machine Library, select Dragon, then click the Wizard icon.

3.3 Dragon Calibration Wizard

The Dragon Calibration Wizard will display options to calibrate individual values in the machine, or the Operator can choose Perform Full Calibration.

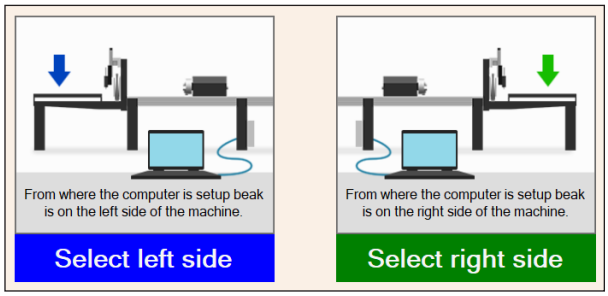
3.3.1 Introduction

When the Operator clicks into any of the calibration features the operation will prompt the user to ensure the Dragon A400 is powered on.



It will then prompt the Operator to start Mach3, click Start Mach.

3.3.2 Computer Setup



The procedure will then ask the Operator to choose a left side and a right side of the machine based on where the operator has placed the computer. Choose which side the computer is placed.

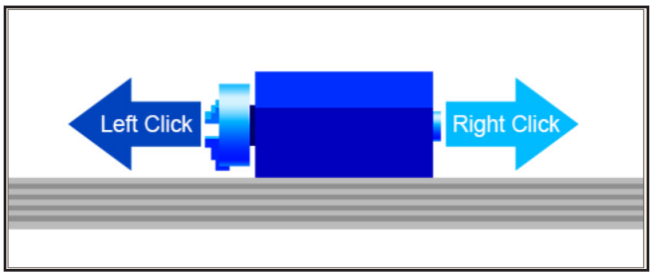
Click Next.

The Right and Left sides chosen during the calibration procedure may be different from the actual Left and Right sides as referred to in Dragon A400 Operators Manual. Follow the prompts on the computer for calibration purposes.

3.4 Calibration Wizard and Computer Interface Confirmation

Before the Operator can begin calibrating the machine, it must first determine the computer and machine are functioning in tandem. In this procedure the calibration process will require the Operator jog each Axis point.

3.4.1 Jog Trolley - X Axis



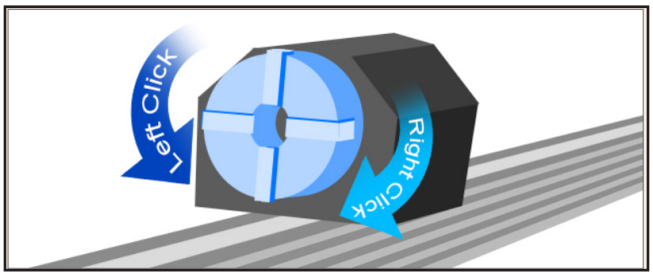
The calibration process will begin by asking the Operator to jog the Trolley using the left and right buttons on the mouse.

Clicking the left button the mouse will move the Trolley forward, clicking the right button will move it backward. This is the X Axis.

Next >

When the Operator has determined the Trolley is moving in relation to computer mouse operation, click Next.

3.4.2 Jog Chuck - Y Axis



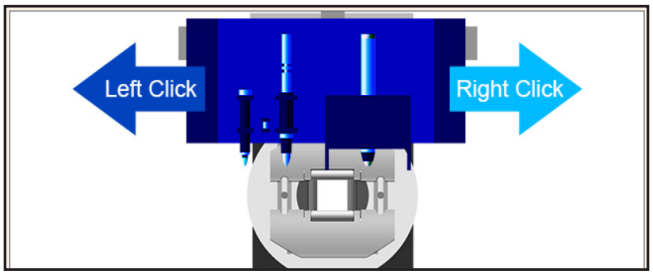
The program will then ask the Operator to verify the Chuck is moving properly in relation to the computer mouse controls.

Clicking the left button on the mouse will move the Chuck counterclockwise, clicking the right button will move it clockwise. This is the Y Axis.

Next >

If proper operation is determined, click Next.

3.4.3 Jog Toolhead - Z Axis



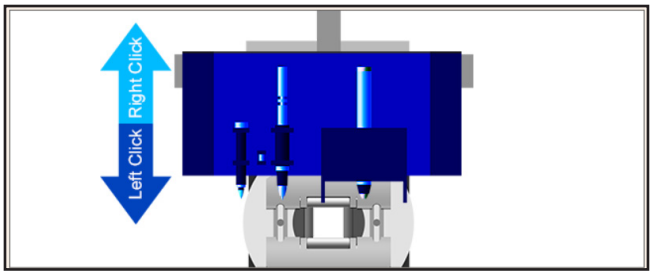
Next the program will ask the Operator to use the computer mouse to verify the Toolhead is moving properly from side-to-side.

Clicking the left button on the computer mouse will move the Toolhead to the left, clicking the right button on the mouse will move the Toolhead to the right.

Next >

This is the Z Axis. Once the Operator has confirmed proper operation, click Next.

3.4.4 Jog Toolhead - A Axis



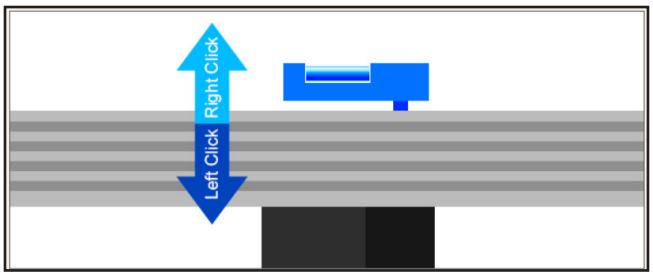
Next the program will ask the Operator to use the computer mouse to verify the Toolhead is moving properly up and down.

Clicking the left button on the computer mouse will move the Toolhead down, clicking the right button on the mouse will move the toolhead up. This is the A Axis.

Next >

Once the Operator has confirmed proper operation, click Next.

3.4.5 Jog Material Lift Support - B Axis



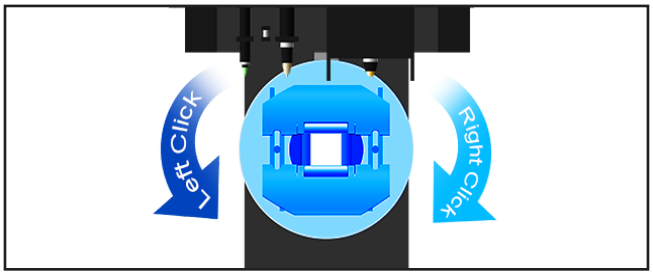
Next the program will ask the Operator to use the computer mouse to verify the Material Lift Support is moving properly up and down.

Clicking the left button on the computer mouse will move the Material Lift Support down, clicking the right button on the mouse will move the Material Lift Support up. This is the B Axis.

Next >

Once the Operator has confirmed proper operation, click Next.

3.4.6 Jog The Powered Gate - C Axis



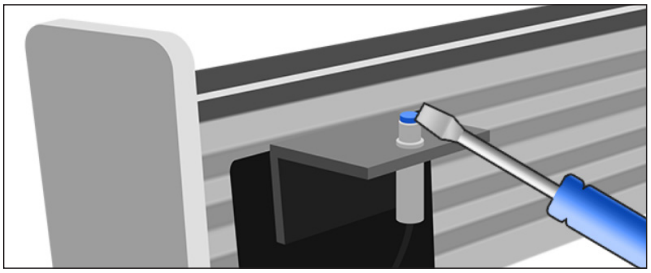
Next the program will ask the Operator to use the computer mouse to verify the Powered Gate is rotating properly.

Clicking the left mouse button will rotate the Powered Gate counterclockwise. Clicking the right mouse button will move the Powered Gate clockwise. This is the C Axis.

Next >

Once the Operator has confirmed proper operation, click Next.

3.5 Homing Switches

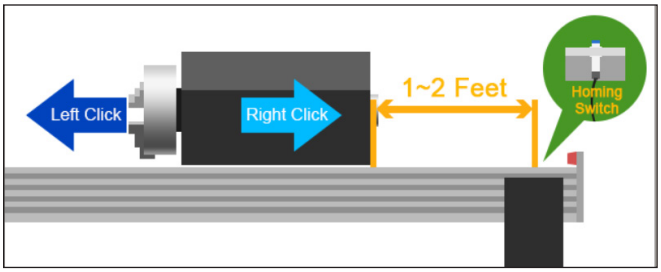


Homing Switch operation is checked by touching the face of each switch with a metal tool, such as the blade of a screwdriver.

Locate Homing Switches on the end of the Rail (X) axis, the Tool Head horizontal (Z) axis and the Tool Head vertical (A) axis. Each Axis should read “Inactive” until touched with a tool when it will change to “Active.”

Next > Click Next after checking each one.

3.6 Ready the Trolley



The computer will ask the Operator to use the mouse to jog the Trolley within 1-2 feet of the end of the Rail.

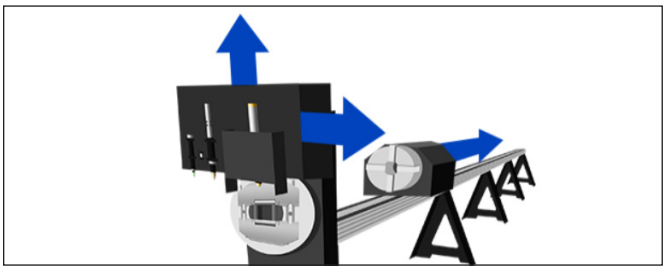
Next > Once this is complete click Next.

! Caution !

Avoid moving the Trolley past the homing switch on the Rail. Damage to the Trolley, homing switch and Rail could occur.

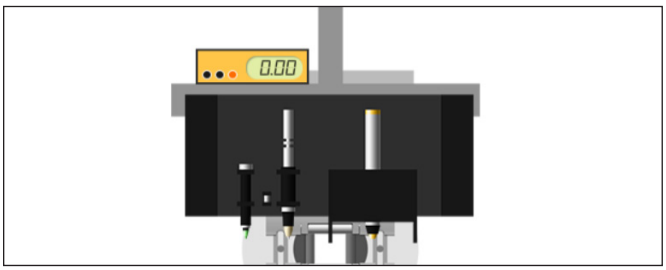
It is not necessary to jog the Trolley within 1-2 feet of the end of the Rail, but jogging the Trolley to the end of the Rail speeds up the process.

3.7 Begin Homing Process



The program will then ask the Operator to click the image on the screen to begin the homing process. Click the image. A message will appear informing the Operator that the machine is homing. Click Next after the message disappears.

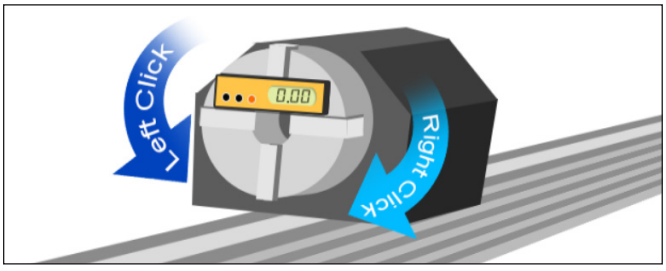
3.7.1 Toolhead



The computer will next ask the Operator to determine if the Toolhead is level. This step in the procedure is no longer necessary.

Next > Click Next to skip this step.

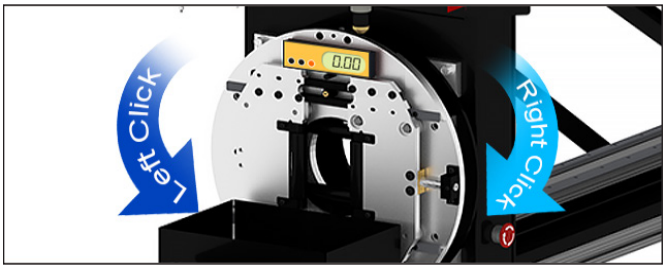
3.7.2 Chuck



Calibrating the Chuck requires placing a small level or angle finder on the Chuck teeth. Once the level or angle finder is placed, the Operator can jog the Chuck into a level configuration using the left and right mouse buttons. With the Chuck head calibrated to level it is now synchronized with the Toolhead. This is critical when performing cutting procedures.

Next > Once this is done, click Next.

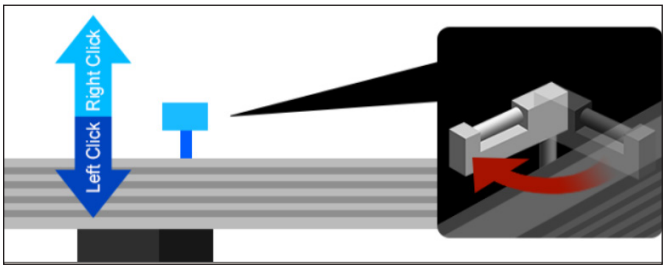
3.7.3 Powered Gate



Calibrating the Powered Gate requires the Operator to place a level on the Gate. As indicated on the screen, the best place to do this is by placing the level on the top of the front adjustable Gate as shown in the image on the screen. Use the right and left mouse buttons to jog the Powered Gate into a level position.

Next > Click Next.

3.7.4 Lifter Station Switch



The Lifter Station Switch establishes the the engagement position for the Material Support Lift.

Click Move Lifter, then use the right mouse button to jog the Material Support Lift into position. Using the left mouse button, jog the Material Support Lift down until it triggers the switch and begins to move away from the rail.

Immediately stop jogging when the Material Support Lift begins to move out of the way. The Lifter will continue to move into its resting position.

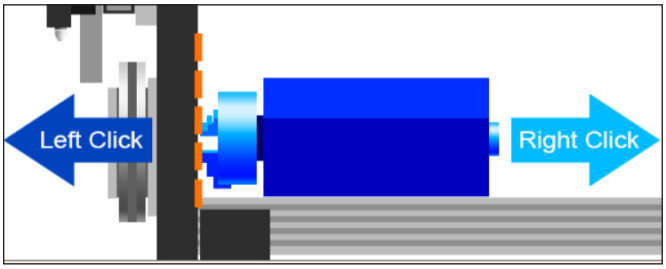
If the Material Support Lift is jogged too far down after it begins to rotate out of the way, repeat this process to re-establish the trigger point.

3.7.5 Lifter Station

The next step will ask the Operator to jog the Trolley forward to a position 1-2 inches behind the Material Support Lift position. The Operator should disregard this figure. It has been determined that moving the Trolley into a position above the Rail break just behind the Material Support Lift is a more appropriate position. This position will be calibrated as the point where the Material Support Lift will retract during cutting procedures when the Trolley moves the stock forward.

Next > After establishing the Trolley in this position click Next.

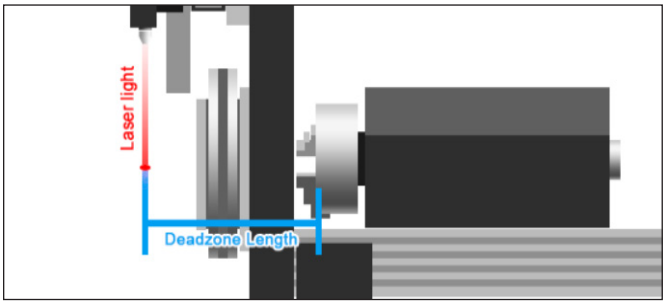
3.8 Maximum Chuck Travel (X Axis)



Max travel length is determined by moving the Trolley as far forward as possible. It is recommended that the Operator move the Trolley forward so there is a minimal amount of space visible between the front surface of the Chuck teeth and the Toolhead when viewing from the side of the Toolhead. If there is no space visible the Trolley is too far forward.

3.8.1 Dead Zone Length

Using a tape measure, and with the Trolley in its maximum travel position on the X Axis from the previous calibration step, feed the tape through the gate to the base of the Chuck. If the Trolley is in the correct position the measurement from the base of the Chuck to the laser should be 13-13.125-inches. This is the machine's Dead Zone.



However, the Dead Zone is subjective and can vary between machine and Operator depending on the Maximum Chuck Travel procedure.

Once the Operator has determined the distance from the base of the Chuck to the laser, enter the value into the Dead Zone Length window on the calibration screen and click Next.

3.9 Toolhead Calibration

Toolhead calibration is a multistep process that is critical to the precise operation of the Dragon A400. Toolhead Calibration will ensure all Tools are synchronized. Toolhead calibration will ensure the operations of the Toolhead are being performed properly in relation to the material.

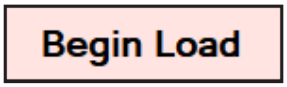
3.9.1 Type of Material

The program will ask the Operator to select round or square material for calibration. Select The type of material that will be used at this time.

Click Next.

3.9.2 Load Material

The Operator will need to load material in the machine to calibrate the Marker, Engraver, Torch and Laser.



Click Begin Load.

3.9.3 Material Dimensions

Now that the type of material is entered, the program will ask for the dimensions of the material. For round tubing the program will ask for OD, for square or rectangular tubing the program will ask for material height. Enter the material dimensions in the appropriate window.

Click Next.

3.9.4 Load Material Into Machine

Jog the Trolley into position for length of material that will be used in the calibration process. The Trolley should be positioned such that with the material chucked in properly it extends at least three inches past the laser.

Use the vertical and horizontal Gate Lead Screws to adjust the Gate wide enough to load the material that will be used for calibration. Load the material through the Gate, then adjust the vertical and horizontal Gate Lead Screws so the material is snug in the Gate with no play, yet moves freely within the rollers.

Adjust the Chuck jaws so the material can be fed into the Chuck. Feed the material into the Chuck so it either passes through the jaws or bottoms on the base of the Chuck. Whether the material can be fed through the Chuck or will bottom on the Chuck will depend on the size of the material being used. Using the Chuck key, tighten the Chuck onto the material.

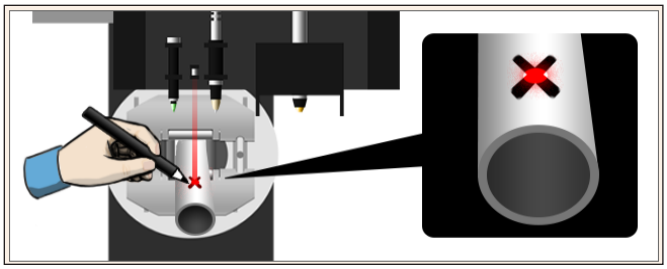
It is possible with smaller diameter material to feed the material all the way through the Chuck. It is at the Operators discretion how much material will be fed through the Chuck. Larger Material will not fit through the Chuck.

3.9.5 Laser Calibration

The Program will ask the Operator to center the Laser on the material. To do this, jog the Toolhead to the left until the Laser is completely off the material. It is best to use small clicks to “bump” the Laser off the edge of the material. Once the Laser is “bumped” completely off the material, enter the Toolhead positions where this occurs as the Left and Right side values. The Wizard will remember this position.

If performing Laser calibration with square or rectangular material it is possible to calibrate the Laser by choosing a spot near the corner radius on each edge of the material. However, this is not possible with round material.

An error message may pop up saying “These Laser Positions May Be Incorrect.” Disregard this message. Click OK.



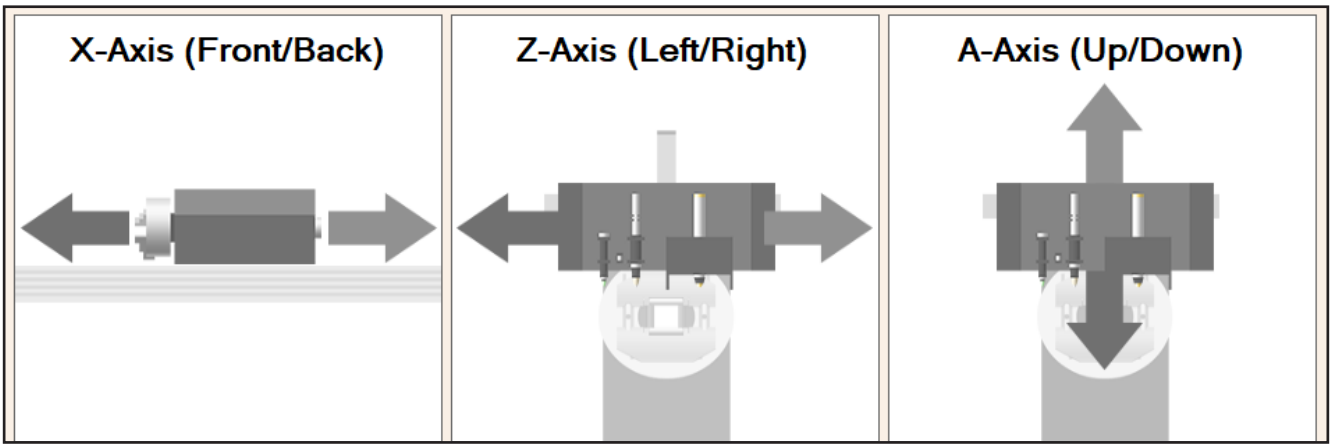
The program will ask the Operator to move the Laser. This will move the Laser to the center of the material.

The program will ask the Operator to mark an X in the Laser center position. This X will be used to calibrate the Marker, Engraver and Torch.

3.9.6 Calibrating The Marker

Move Pen — Click the Move Pen button to move the Marker into position.

Using the directional jog controls for both the Trolley and the Toolhead, move the Marker into position above the X that is marked on the tube. It may be necessary to jog the Trolley forward and/or backward to align the X with the Marker tip. Perform these adjustments until the tip of the Marker falls at the intersection of the X marked on the tube.



Next > — Click Next to log this position as the calibrated value.

3.9.7 Calibrating the Engraver

Run Engraver — Click the Run Engraver button to move the Engraver into position.

Using the directional jog controls for both the Trolley and the Toolhead, move the Engraver into position above the X that is marked on the tube. It may be necessary to jog the Trolley forward and/or backward to align the X with the Engraver tip. Perform these adjustments until the tip of the Engraver falls at the intersection of the X marked on the tube.

Next > — Click Next to log this position as the calibrated value.

3.9.8 Calibrating the Torch

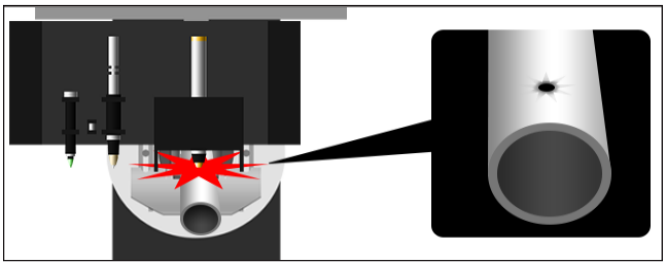
Move Torch — Click the Move Torch button to move the Torch into position.

Using the directional jog controls for both the Trolley and the Toolhead, move the Torch into position above the X that is marked on the tube. It may be necessary to jog the Trolley forward and/or backward to align the X with the Torch tip. Perform these adjustments until the tip of the Torch falls at the intersection of the X marked on the tube. The Torch should be moved as close to the material as possible without touching it.

Next > Click Next to log this position as the calibrated value.

3.10 Pierce Hole

Ensure the Hypertherm unit is properly connected to the Dragon A400 as outlined in Chapter 3. Ensure the Torch Mount has been performed as outlined in Chapter 1 of the Start-Up and Training Manual Part 3. Ensure the Hypertherm is powered on. Ensure the Hypertherm is connected to a source of pressurized air.



Click the Pierce Hole button to initiate the Torch action. The Torch will move to the material and fire once. Depending on what the machine amperage is set at the Torch may only gouge a hole, it may not pierce through the material. This is sufficient for calibration purposes.

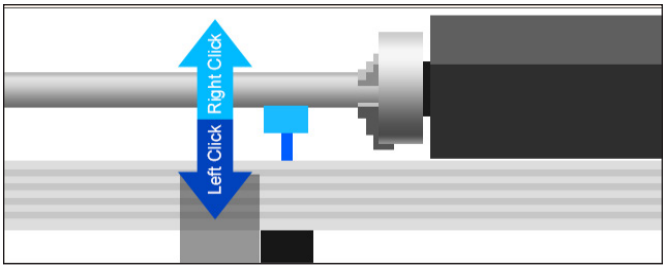
Next > Click Next.

4.10.1 Pierce Hole Verification

Jog the Toolhead and Trolley to verify the Laser is pointing at the pierced hole.

Next > Once the Laser is centered on the pierced hole, click Next.

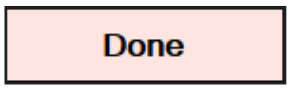
3.11 Lifter Station Material Gap



This step will establish the working height of the Material Lift Support. Click Move Trolley.

Jog the Material Support Lifter up until it just contacts the material. The roller should be in contact with the material but should still spin by hand. It should not spin freely.

Click Next.



Click Done.

The Calibration process is now complete. Click Save.

The Material Lift Support should simply support the material to keep it from sagging, it should not put upward pressure on the material.

Attention

After completing Start-up and Training Manual Part 4, please contact Bend-Tech Customer Support if you need further assistance in operating the Bend-Tech Dragon A400.

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