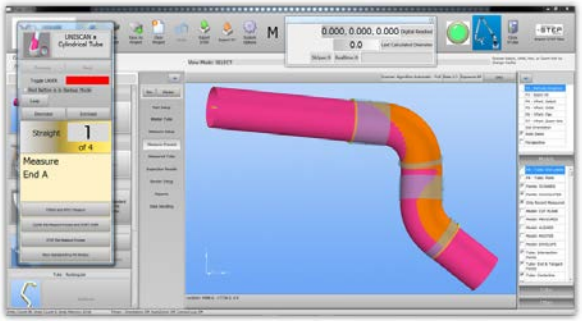


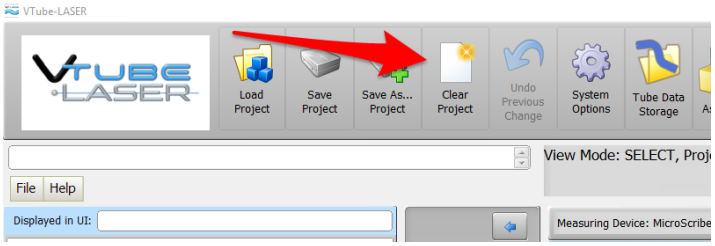
VTube-LASER Quick Start Guide for MicroScribe

This guide shows how to import a STEP file and then MEASURE and qualify demo tube 4 using a MicroScribe arm with a ball probe.

The steps in this workflow are from version 2.9.3 and higher.

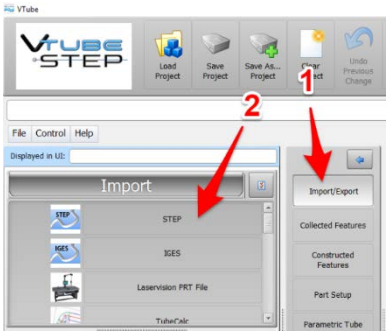
VTube always starts in the STEP mode window.

1. If VTube has a tube showing in the viewport, then press the **Clear Project** button in the tool bar on the top of the VTube-LASER window.



2. On the far-right side of the toolbar, press SWITCH TO STEP MODE button. This will allow switch you to the window that allows you to import solid models into VTube.

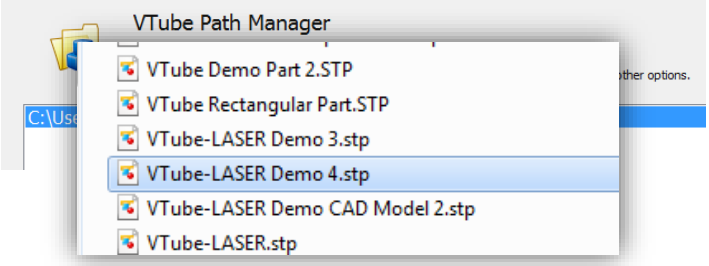
3. You are now in the VTube-STEP Window. Press the **Import/Export** button in the Navigation Pane, then press the **Import STEP** button in the Import menu.



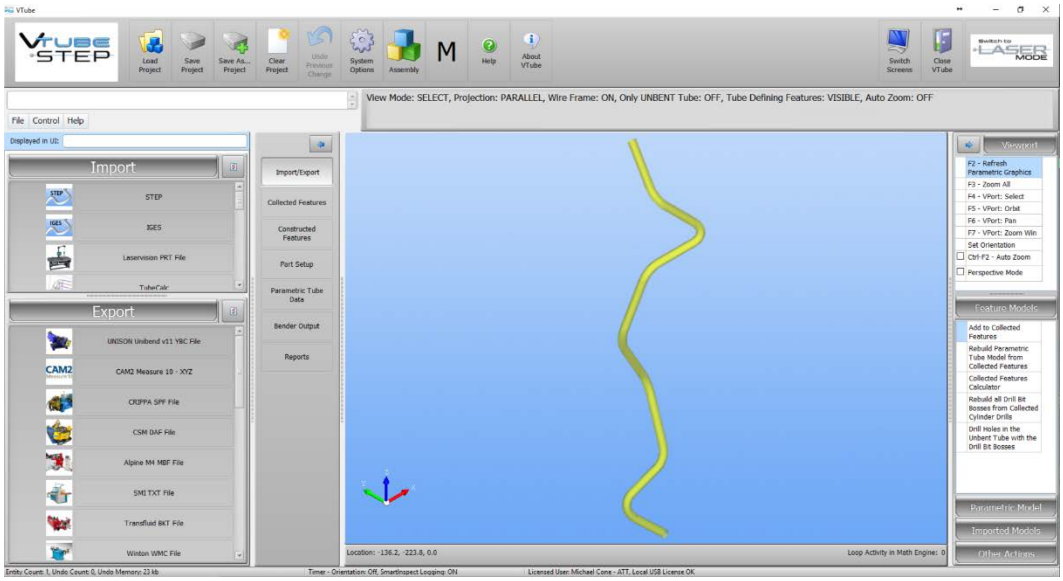
Document Revision Date: August 1, 2017

4. Double click on the VTube path in the Path Manager.

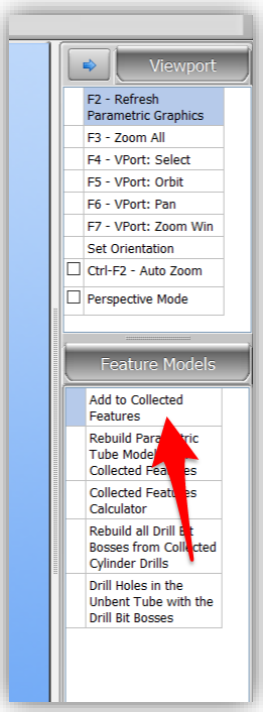
   Find **VTube-LASER Demo 4.stp** file and load it into VTube-STEP.



5. The screen will appear something like this:



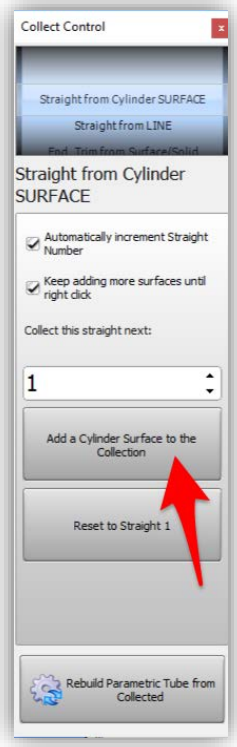
6. Press the **Add to Collect Features** on the right side of the screen in the Feature Models menu.



7. Check on both the checkboxes in the **Straight from Cylinder SURFACE** option.

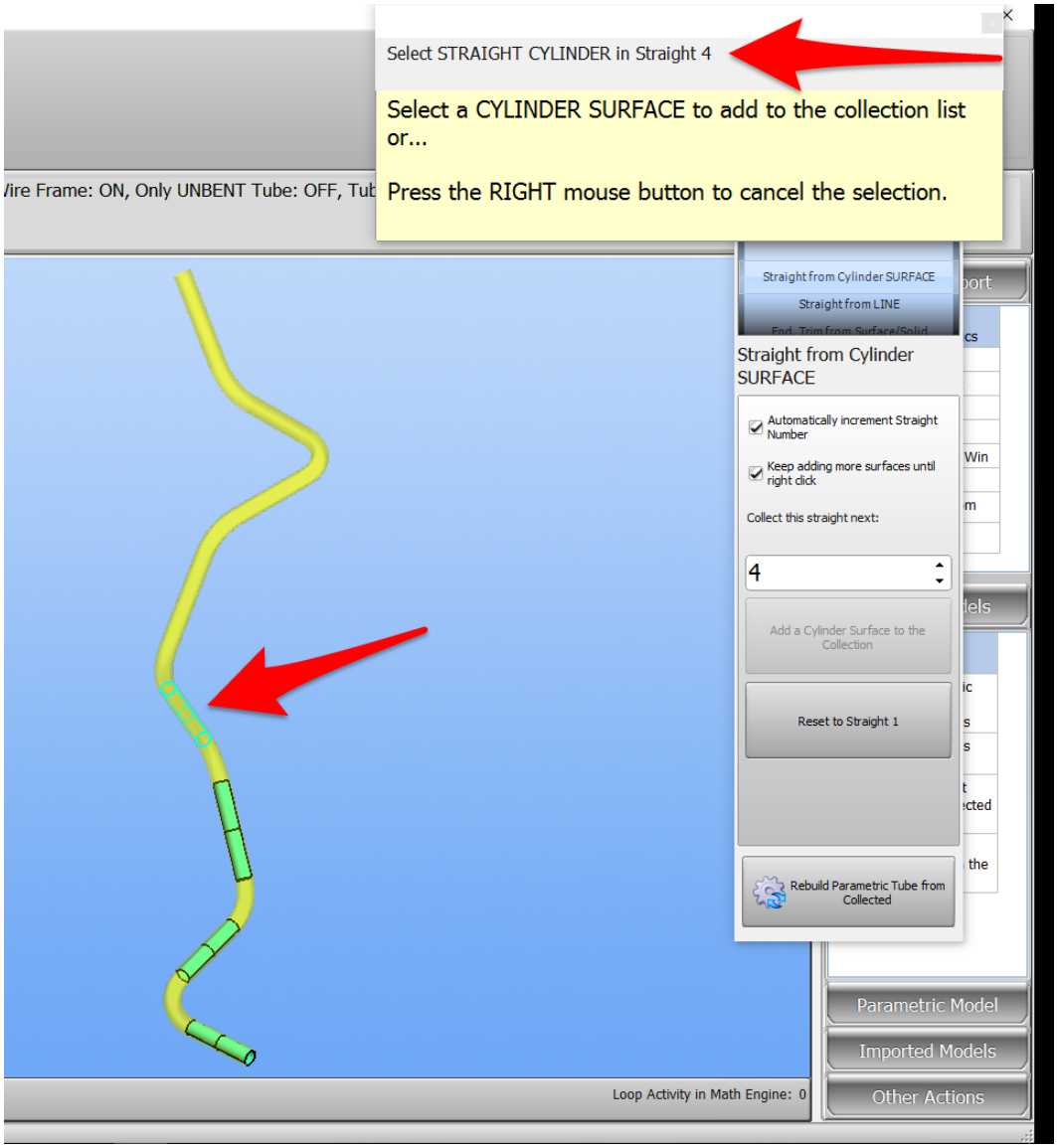
8. Press **Add a Cylinder Surface to the Collection** button.

   Note that with the **Keep adding more surfaces** option enabled, VTube will continue to press the "Add Cylinder Surface to the Collection" button automatically after every straight surface selection.



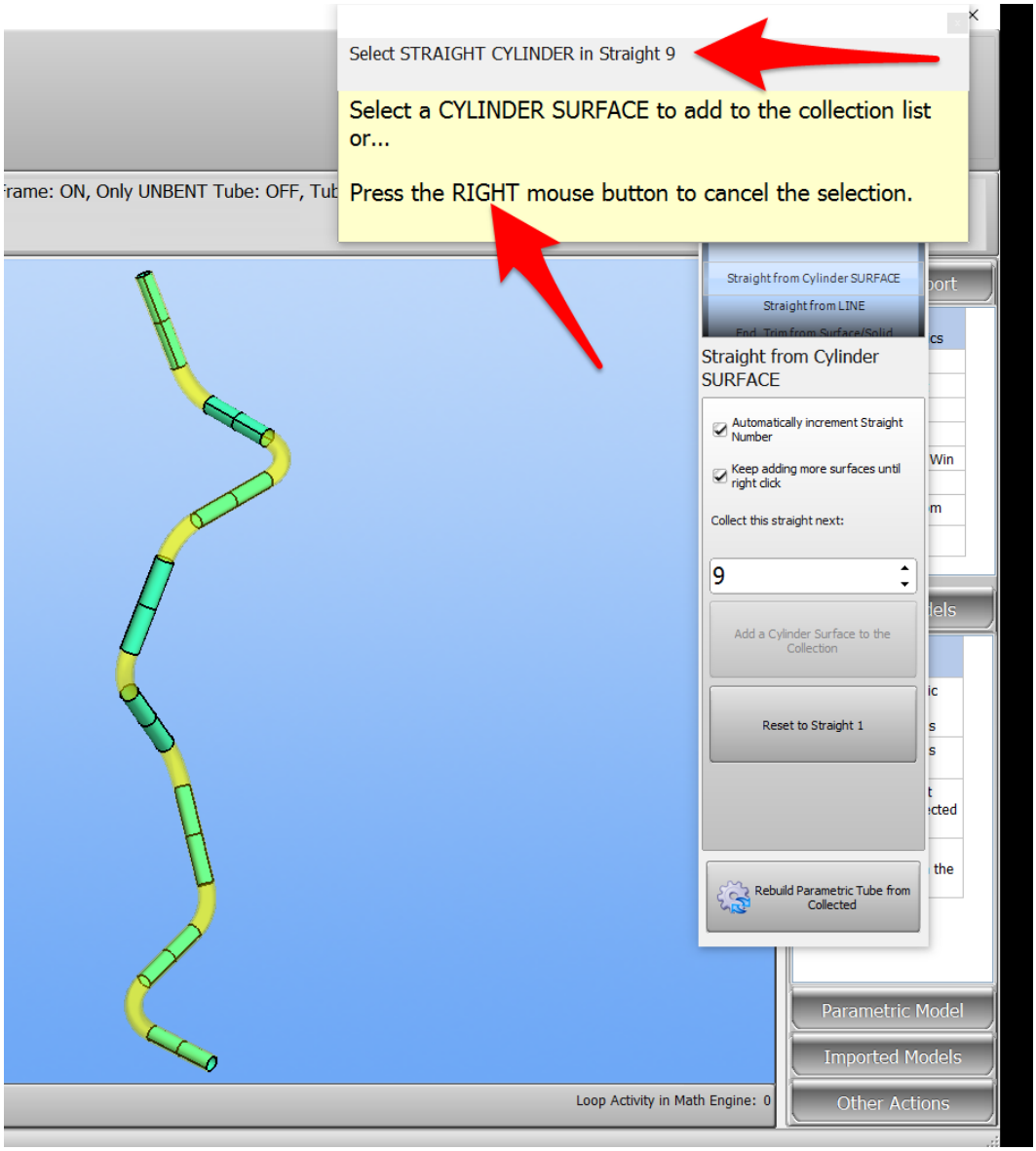
9. Select the surfaces of the tube straights in order. We recommend that you choose the shorter of the two end straights as the first straight.

   Follow the instructions in the yellow guide box.



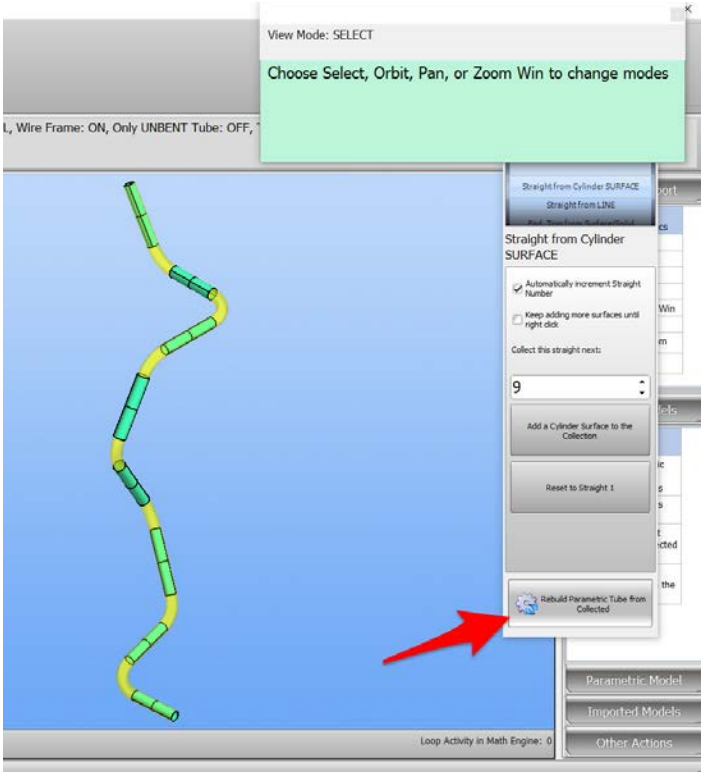
10. It is acceptable to collect both outer diameter surfaces and inner wall surfaces in any straight. If you collect a variety of both, then VTube will calculate the wall thickness as well as the diameter.

    When you have selected all the straights, VTube will continue to ask for straight 9. There is no straight 9 in this part, so stop the collection process by RIGHT clicking the mouse on the viewport.

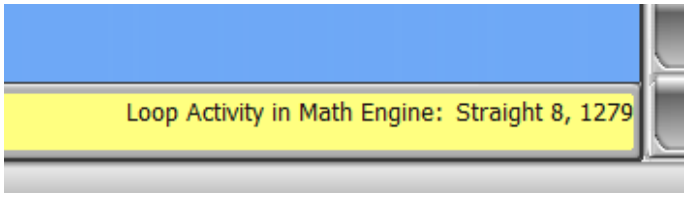


11. The CAD mouse mode will change to SELECT mode, which means that the process of adding to the collection is stopped.

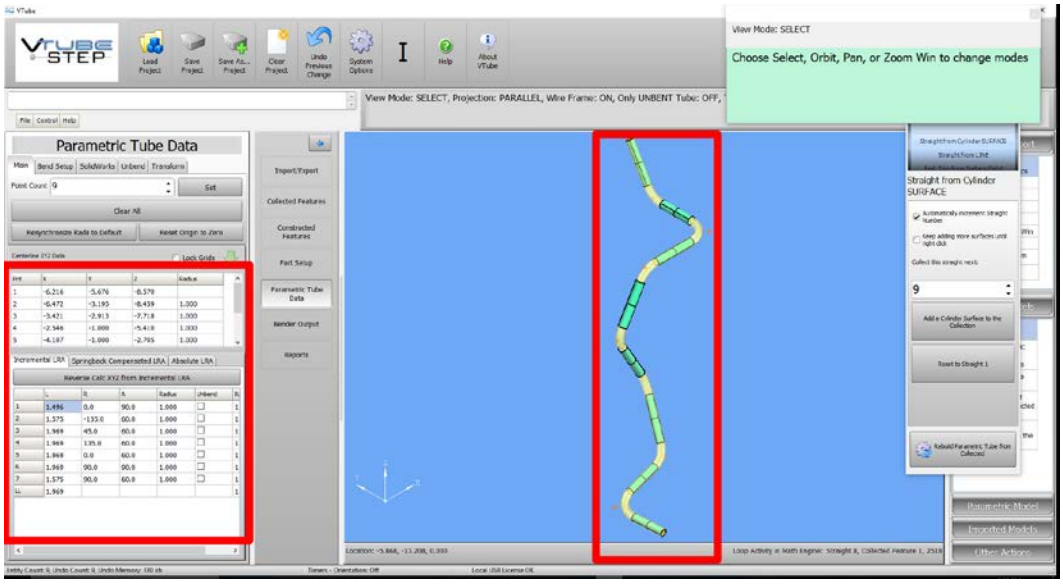
12. Click on **Rebuild Parametric Tube from Collected** at the bottom of the Collect control.



13. In the lower right corner of the viewport, you will see the math engine work its way through the straights to solve for the centerline end and intersection point positions.



14. When the calculation is complete, you will see new XYZ data in the Tube Data menu. You will also see a white tube superimpose on the imported model.



15. Click on the **Part Setup menu** in the navigation pane to see how VTube automatically calculated what it could determine from the model.

During the calculation, VTube calculated…

a. The **diameter** (row 16)
b. If you selected an inner wall in the collection, the **wall thickness** (row 19)
c. The **cut length** (row 25)
d. The **default radius** (row 26).

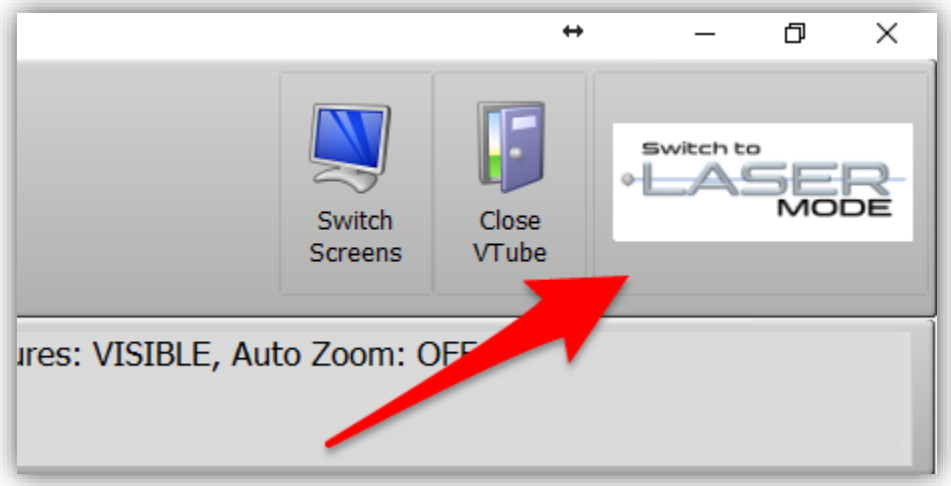
14	Date/Time	1/21/2016 7:22:05 PM	
15	Diameter Profile Setup	Cylinder	
16	Diameter	0.375	inches
17	A-End Diameter	0.375	inches
18	B-End Diameter	0.375	inches
19	Wall	0.032	inches
20	Rec Width 1	1.000	inches
21	Rec Width 2	0.500	inches
22	Rec Wall	0.059	inches
23	Rec Fillet Radius	0.125	inches
24	Rec Angle	0.0	deg
25	Cut Length	24.775	inches
26	Default Radius	1.000	inches

16. The import and calculation of the master data is complete.

The **Tube Data in VTube-STEP** will become the **<u>Master</u> Data in VTube-LASER** automatically. The Master Data is used to tell us if we have a good part after measurement.

Press the LASER button in the upper right corner to change to LASER mode. The LASER window is the only one that connects to the MicroScribe arm.

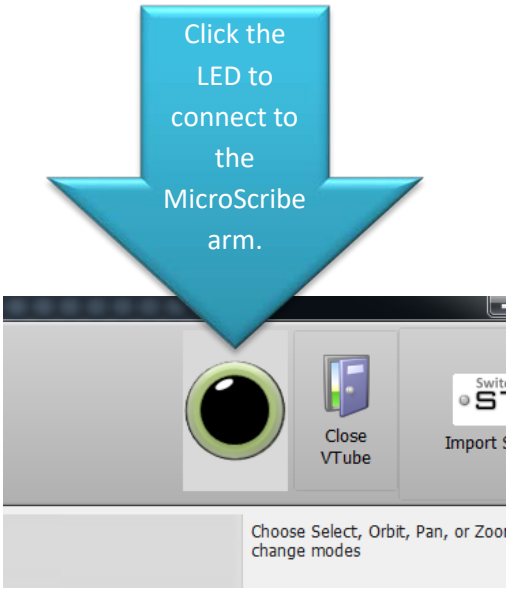
When you press this button, VTube-STEP will automatically close any control and guide windows.



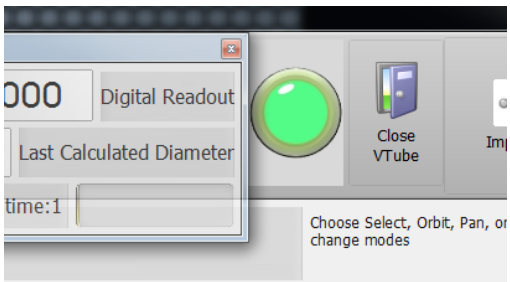
Measuring and Qualifying the Tube Shape

Follow these steps to setup to measure the tube:

1. If the arm is not connected to VTube-LASER, then **click on the black LED** in the upper right corner.



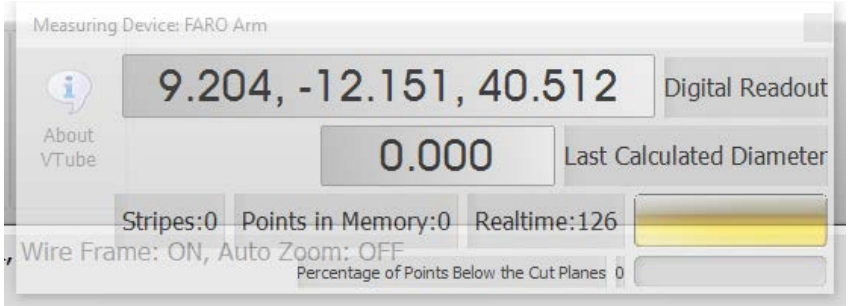
   When the connection to the arm is active, the LED turns green, you will hear a connection sound, and the transparent DRO (Digital Readout) window will appear.



2. Move the MicroScribe to the home position and press the home button on the back-right side of the base.

3. The values in the in the DRO will start to change in real-time. The live values indicate that the arm is connected.

   This is the **DRO (Digital Readout):**

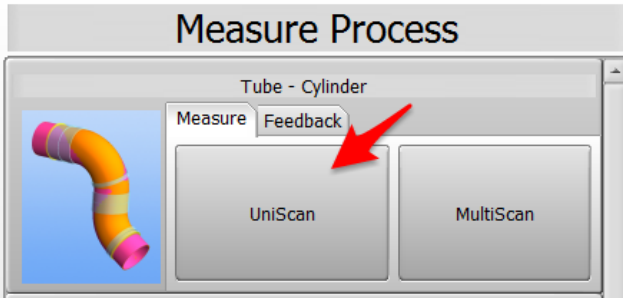


   In a MicroScribe, the XYZ value at the top of the window represents the location of the **center of the ball probe**.

4. Go to the Navigation Pane and press

   MEASURE PROCESS

   menu and find the Tube - Cylinder panel at the top of the choices on the left side of the screen. Press the **UniScan**.



We are going to use the **UNISCAN** method to measure the demo tube. During measurement, when you press and release the main button, VTube takes in location of the center of the ball probe. During measurement, when you release the main button, new scanned points will draw on the screen.

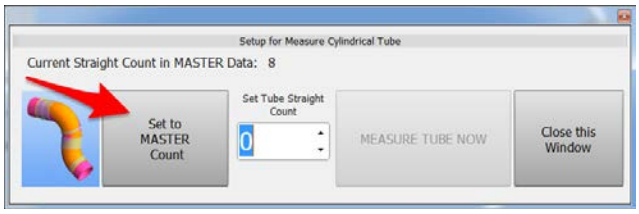
MULTISCAN that is ideal for for situations where the straights are bowed or curved. In MULTISCAN, you take points only near each tangent on a straight. You measure some near tangent 1, then press the Z button, then take some points near tangent 2 and press the Z button again – for each straight.

For most measurements, we recommend UNISCAN, because this mode can take more of the entire surface data and is able to give operators better assurance that the scan is good.

5. Press

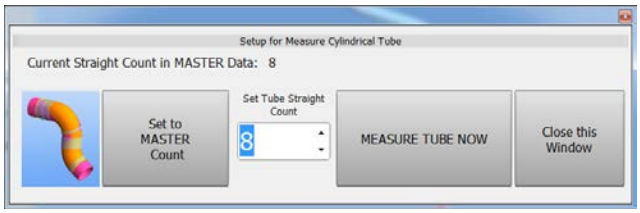
   Set to MASTER Count

   button.

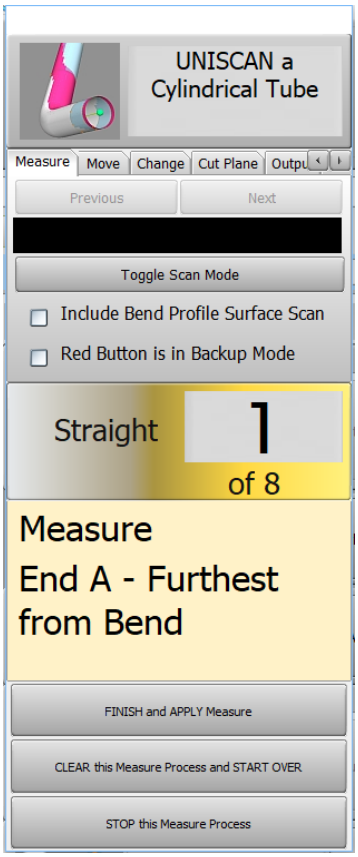


6. Press

   MEASURE TUBE NOW.



7. Measure the part following the instructions in the guide box like the one shown here. The yellow box tells you the current step.

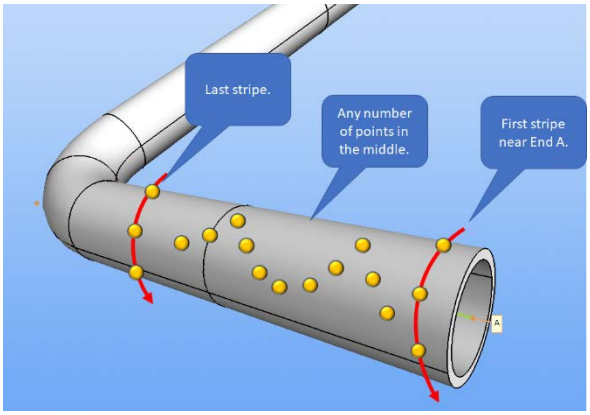


Press the main button to take measurements.

Press the Z button to end measurements.

Take any number of points on the end, then press the Z button.

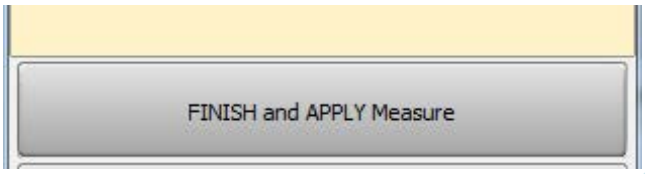
For cylinders take three points near the first end that act as a stripe that is parallel to the end wall. Then take any number of points in the middle of the straight. Then take three points near the far end that act as a second stripe.



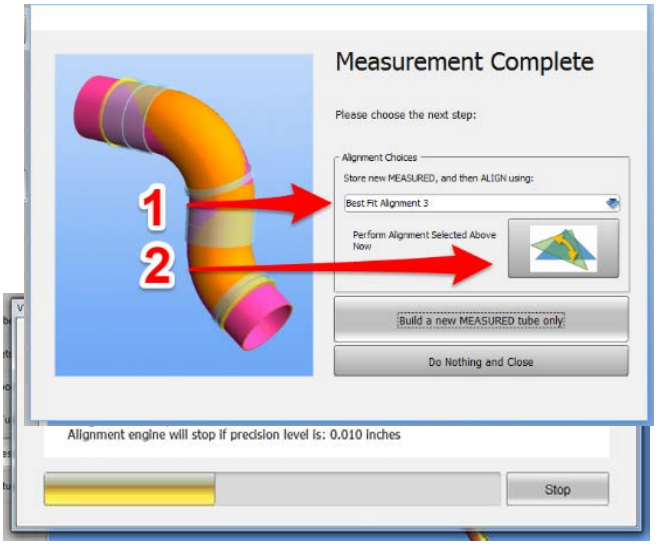
To help you understand how to measure the tube, then please see video 1 in the knowledgebase in this page:

http://www.advancedtubular.wiki/index.php/VTube-LASER_Videos_for_MicroScribe

8. After measuring End B, press the **Finish and Apply** button.



9. Change the **alignment type to #3** and then press the **Alignment button** with the triangles.



10. Press **Inspection Results** in the navigation pane.

11. VTube will align the measured part to the master part. It will show a progress bar as it is doing the alignment.

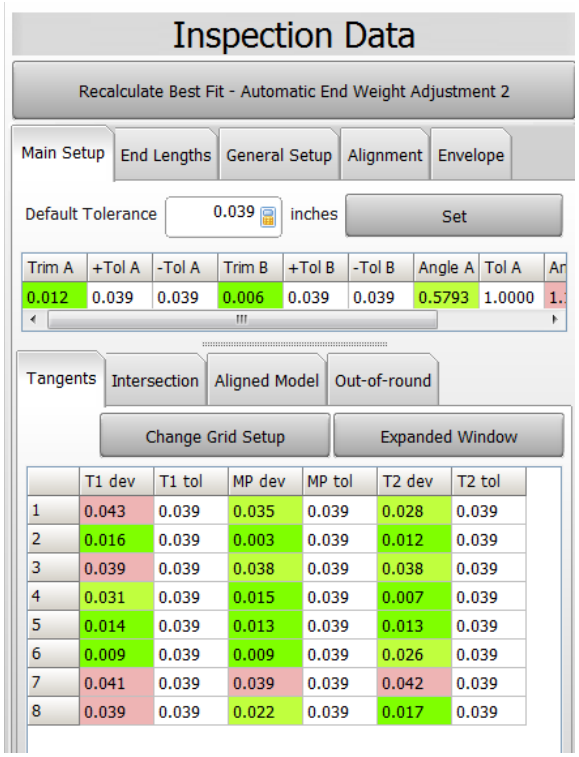
    For the demo tube, don't be surprised if you see a lot RED cells in the Inspection Data menu. This tutorial is designed to show you how to determine if a part is out of profile deviation – and then how to correct that situation. (The out of tolerance condition is expected.)

12. You will see **Inspection Data** menu display on the left with color-coded deviations. End length and tangent point deviations are always shown here.

    The **Tangents** deviation grid qualifies the profile of the straights as a virtual gauge. Tangents are where the straights meet the bends. For example, the **T2 dev, row 1** cell shows the deviation where the first straight meets the first bend on the centerline.

    Note that **T1-1** and **T2-8** cells in this grid are really <u>trimmed</u> end points (not tangent points).

    The end lengths are qualified at the top of the menu. The default profile tolerance can be set at the very top.

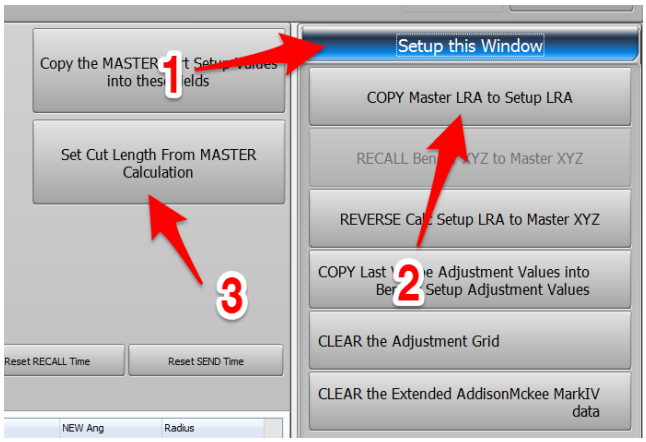


CORRECTING BENDERs with COMMUNICATIONS

This next section works through how to communicate with the bender. This is only an example correction communication. It simulates the Benderlink feature to teach the principles of communications to benders.

To make communications work (and not just simulate), the Benderlink feature must be setup by an experienced technician. The Benderlink setup steps are not covered in this document because it's too complex to be covered here.

1. Press **Bender Setup** to show the Bender Setup screen (for communicating with the bender).

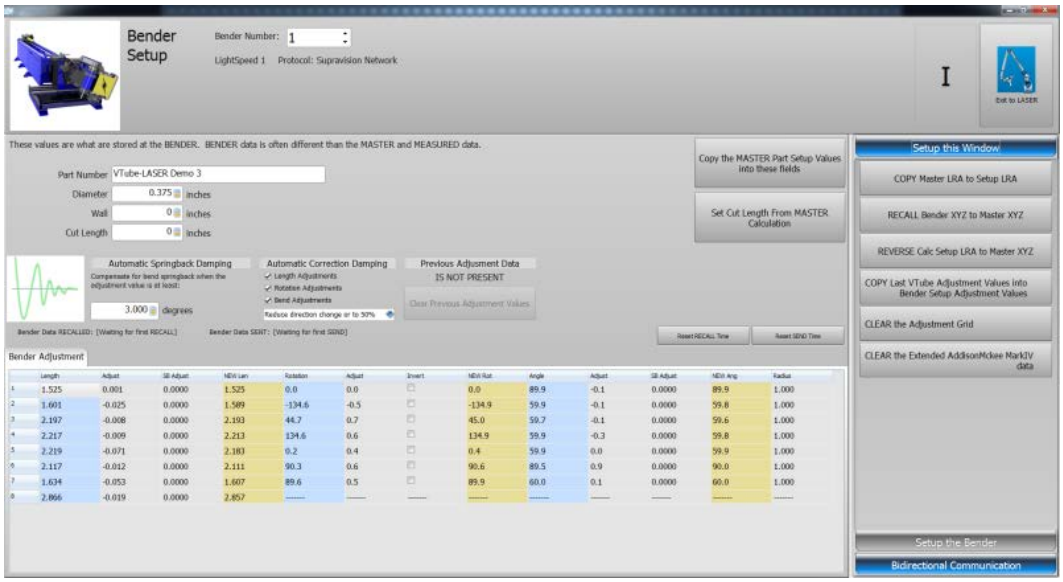


2. Press **(1) Setup This Window on the right side.**

3. Press **(2) COPY Master LRA to Setup LRA**. (Press the Continue in the Confirmation dialog if it appears.)

4. If the cut length is zero, then press **(3) Set Cut Length From MASTER Calculation**.

   This will fill the starting values into the bender setup like this:



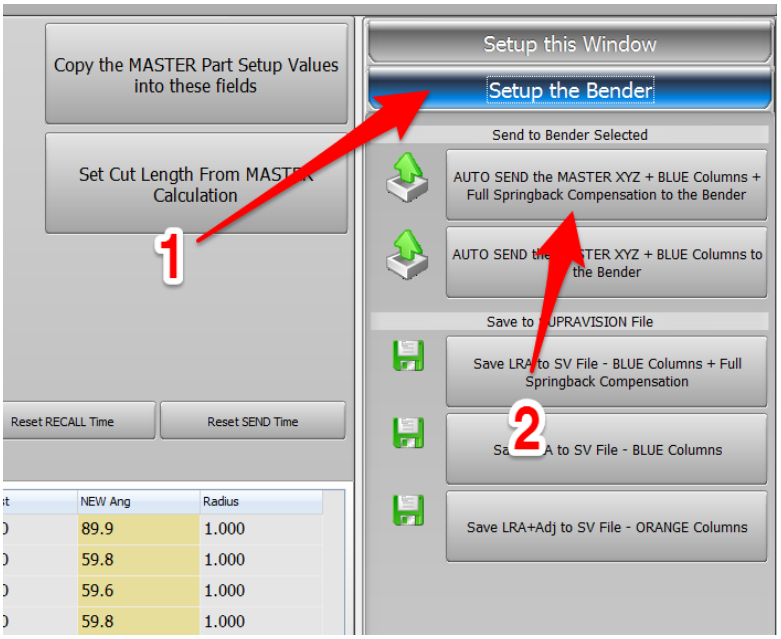
The BLUE columns represent bender data before correction. The ORANGE columns represent corrected data to be sent to the bender. The columns in between the BLUE and ORANGE columns are ADJUSTMENT columns.

This BLUE and the GREY cells can be manually adjusted for total control by the operator over the corrections being sent to the bender.

5. Press **(1) Setup the Bender** button.

6. Press **(2) AUTO SEND the MASTER…** button.

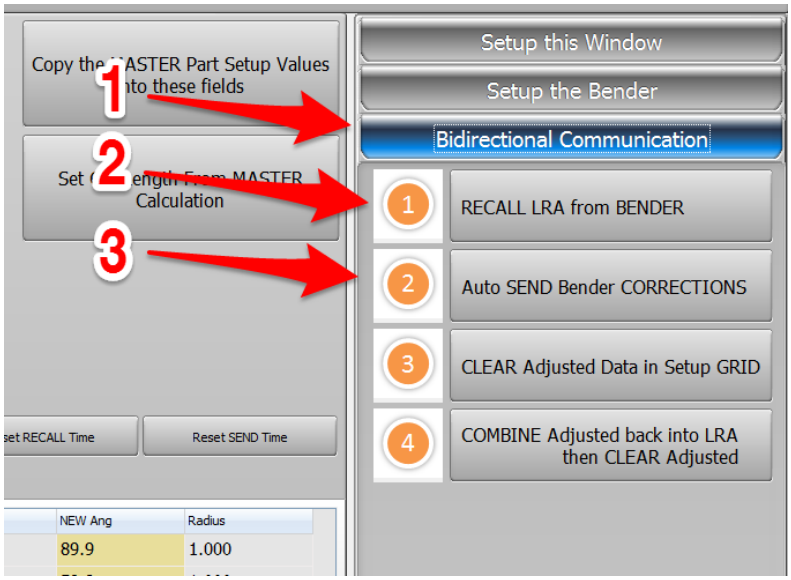
   If VTube-LASER was connected to a bender, then **this would have transferred new setup data** to the bender.



7. Press the **(1) Bidirectional Communication** button on the right bottom side.

   This sequence of button presses is how VTube can RECALL and SEND data for corrections loops to benders. VTube can communicate with up to 100 benders.

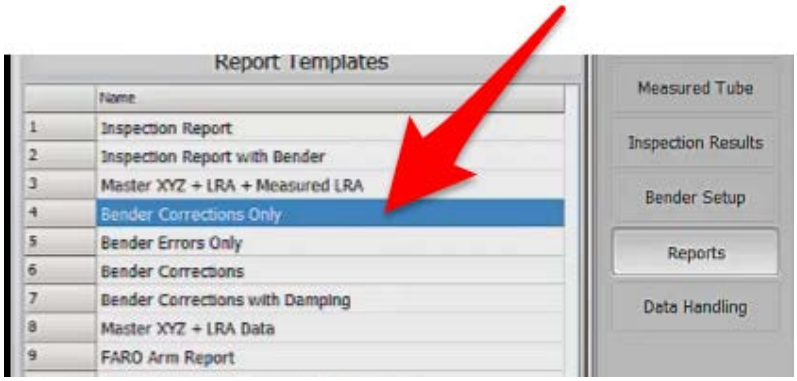
8. Press **Exit to LASER** on the top right corner of this window.



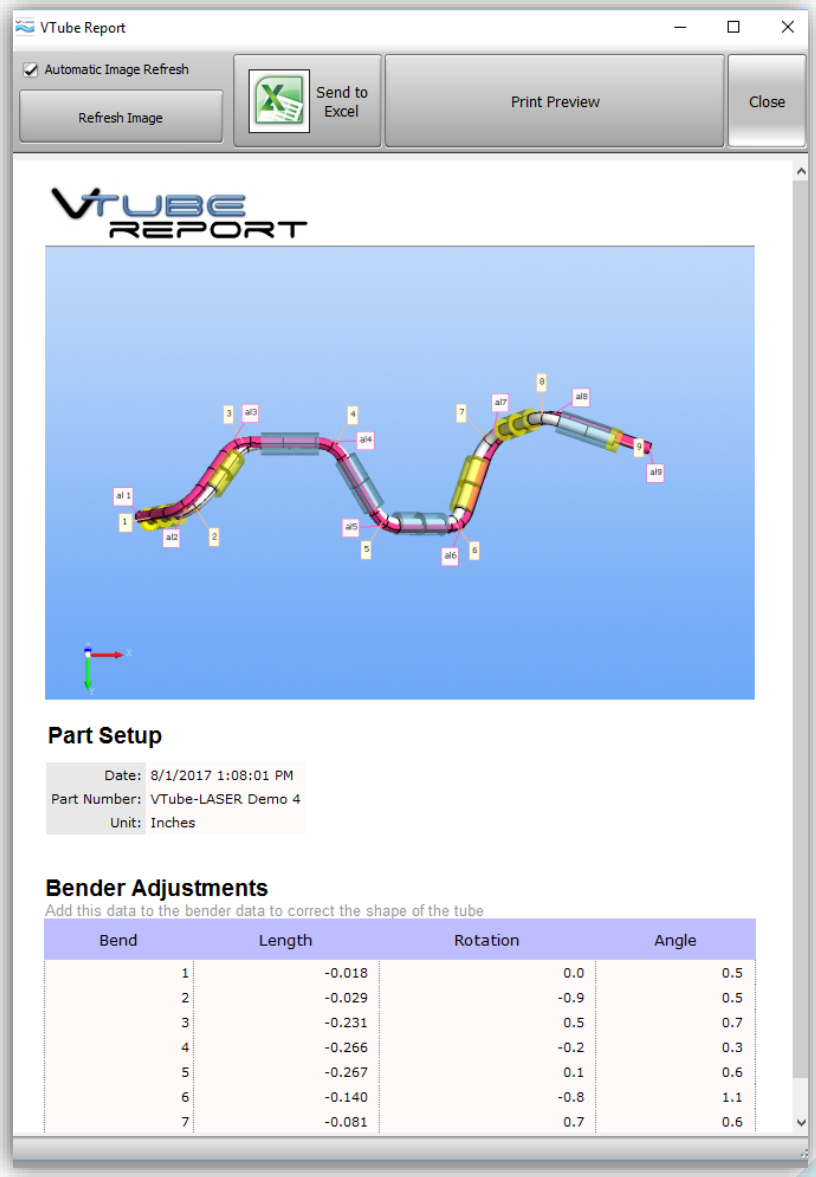
CORRECTIONS REPORT EXAMPLE

You may not have a connection to the bender. That's ok, because you can still get to the correction data using printed reports.

Click on **Reports** in the navigation pane.



Double-click on the **Bender Corrections Only** template cell in row 4.



If the tube image is not the same as the image in the main screen, then press **Refresh Image** at the top of the screen.

You can also tell VTube to always automatically refresh the image by putting a check in the **Automatic Image Refresh** switch at the top.

This is the end of the Quick Start Guide.