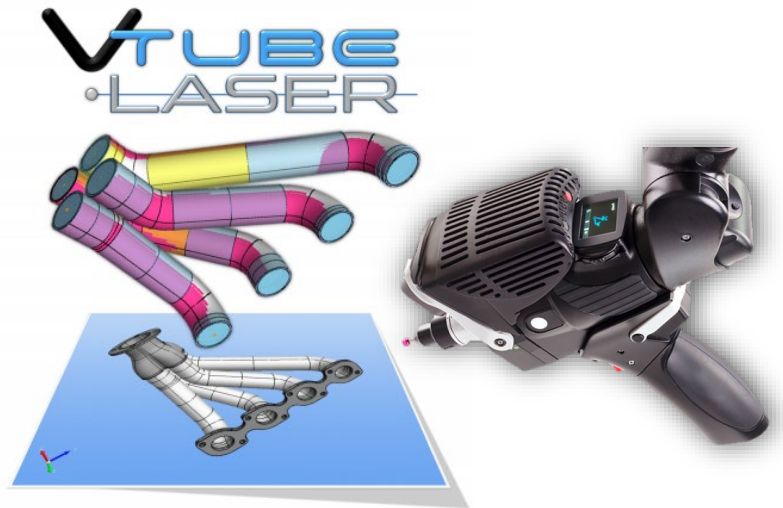
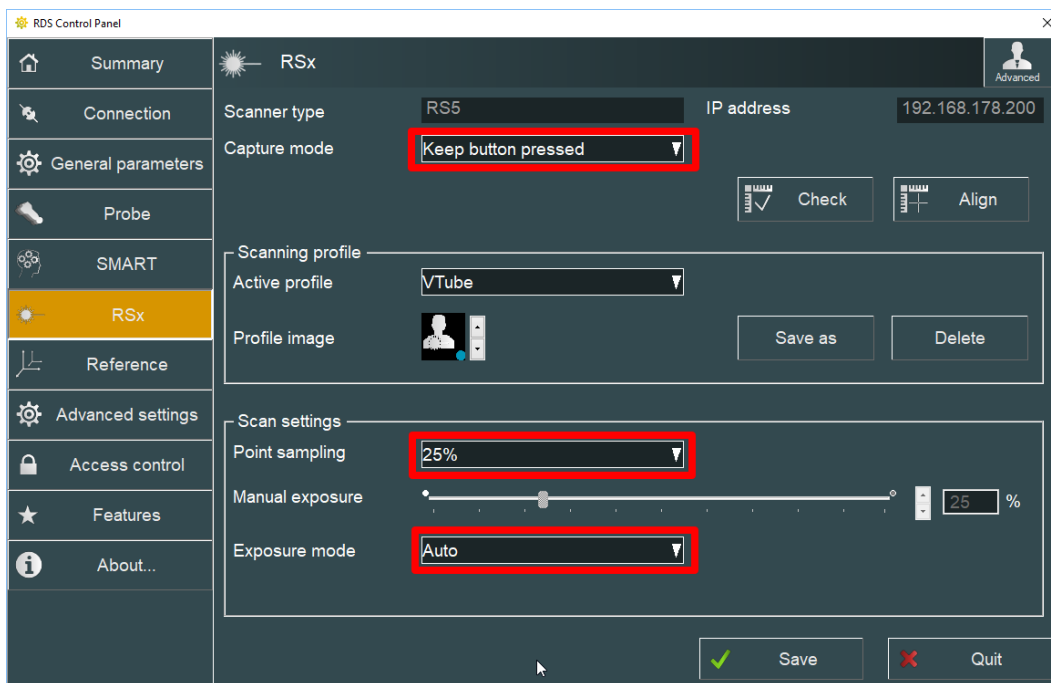


# How to Prepare for a VTube-LASER Demo with HEXAGON RA8 Scan Arms



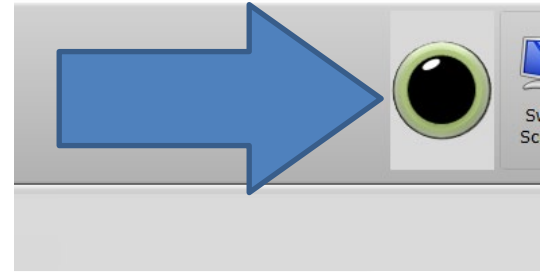
Setup RDS like this:



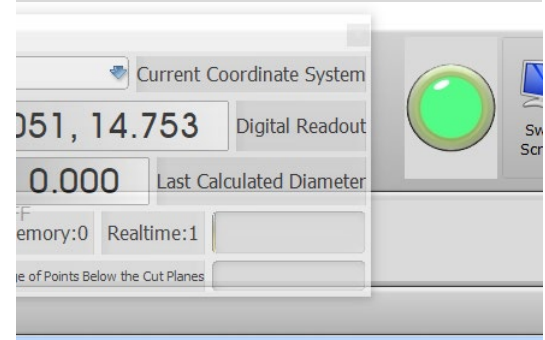
Set point sampling as low as possible. For the new RS6 scanners, use SHINE exposure mode with the point sampling rate at 100 Hz (or the lowest rate possible).

We recommend that you save the RSx profile as “VTube” for future use.

1. Start VTube-LASER, then click on the black LED in the upper right corner.



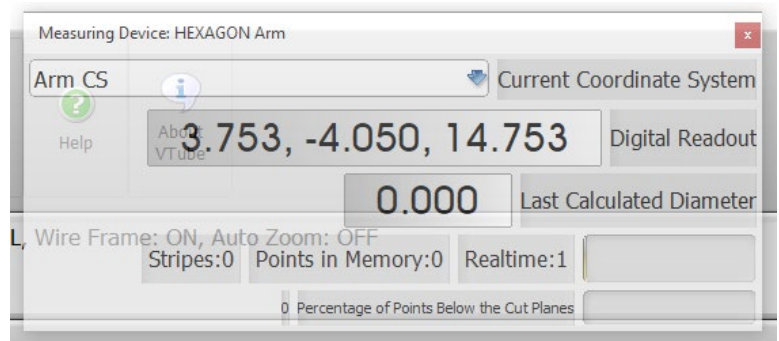
When the connection to the arm is active, the LED turns green, you will hear a connection sound, and the transparent DRO (Digital Readout) window will appear.



2. Pull the arm away from its resting position and watch the values in the DRO (Digital Readout) move.

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

Even if the laser is not on, then should see the XYZ data changing whenever you move the arm. In this mode, the data will represent the **center of the ball probe**.



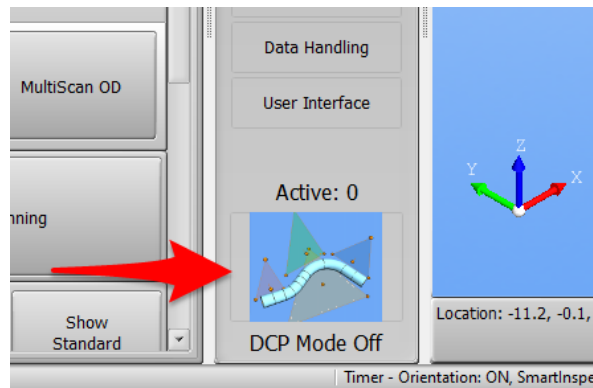
If the DRO values do not move, this indicates that VTube-LASER is not properly connected to the arm. This occasionally occurs at the first attempted connection. This connection issue can be resolved by clicking on the green LED to toggle it to off, then click on it again to reconnect.

3. VTube-LASER can measure a part on a flat surface using the Cut Plane feature. Cut Planes will remove any laser points beyond the measured plane. However, please be careful about what kind of surface you use for Cut Planes. For example, shiny or glass Cut Planes will not work well.

The issue with Cut Planes is not lack of flatness, but that certain types of surfaces can create flyers. Care must be taken to mitigate this problem for demos by paying attention to the type of Cut Plane surface. If the Cut Plane surface is reflective or has chamfered holes, then it may cause issues. If this is the case, then be prepared to mount the tube in a part holder to bring it off the table for measuring.

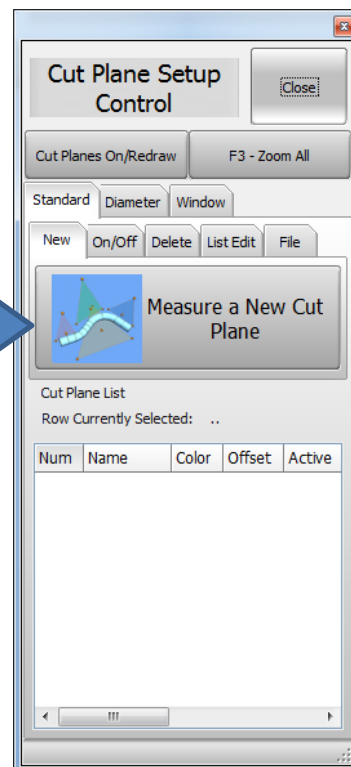
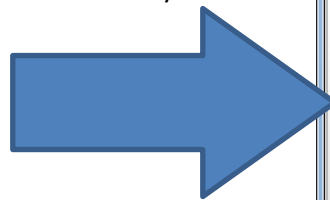
Flat-colored darker surfaces are excellent. We prefer to use black rubber mat for our Cut Plane surface. Concrete floors are an excellent surface. Dark grey granite surfaces are good. Avoid scanning over embedded threaded holes on the granite tables.

If you choose to use a Cut Plane, then follow these steps:



Click on the **Cut Plane icon** at the bottom of the navigate pane.

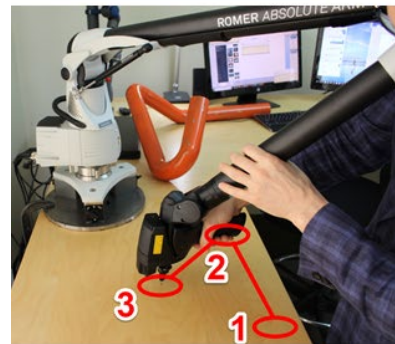
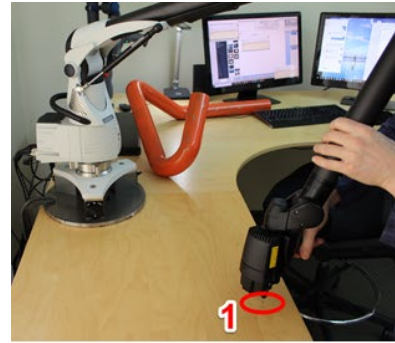
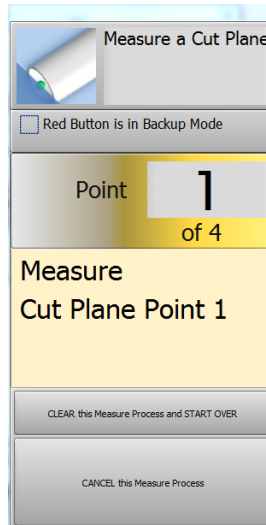
4. Press the **Measure a New Cut Plane** button in the NEW tab.
5. Change to **probe mode**. VTube-LASER currently uses the probe to measure cut planes.



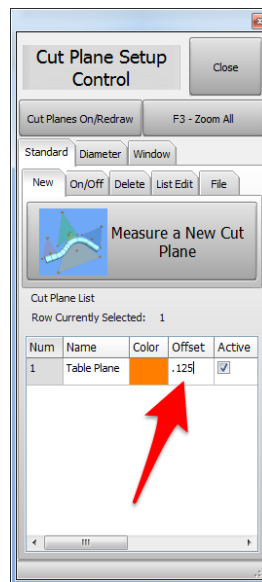
## 6. Press the red button for all four points.

Take the first three points on the plane of the table surface using the red button.

Take the last (fourth) point is at least 1 millimeter above the table also with the red button.



## 7. The **Active** label in the Cut Planes icon will now show "1".



## 8. Enter an **offset** for the new cut plane of up to half of the diameter of the tube.

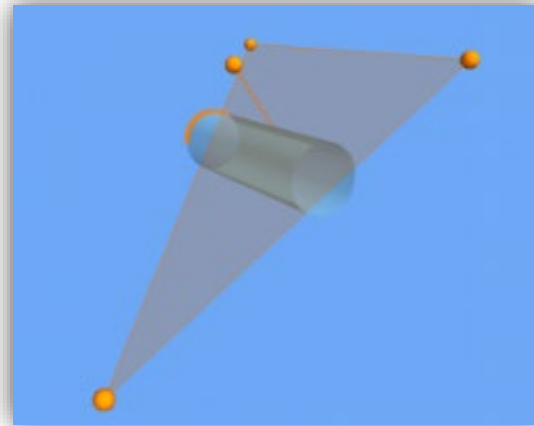
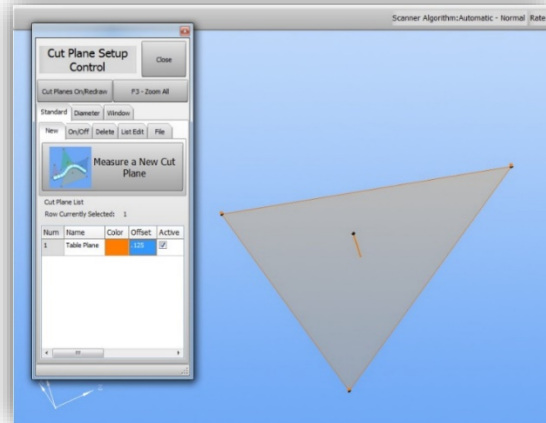
An offset is important, or the scanner may pickup surface outliers. The greater the offset, the less chance of outliers.

For most tables, we recommend 0.125" or 3 mm as a starting point. Some surfaces will require a larger value.

Enter the offset, then press the **Enter button** to allow the value to be entered into memory.

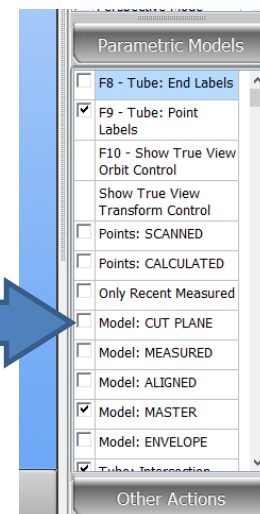
## 9. Setup the Cut Plane

- a. Cut Planes are always stored until you delete or change them – even if you shut VTube-LASER down.
- b. Cut Planes are only used for laser scans. They are **IGNORED when using the ball probe.**
- c. Make changes to the Cut Plane at any time during any other measurement.
- d. You can add as many cut planes as you want.
- e. You can activate or deactivate the cut planes any time. Each cut plane has its own active switch and offset value.
- f. If you move the arm relative to the table, then you will need to remeasure the cut planes – or the cut plane will be in the wrong place relative to the table.



10. The Cut Plane model will display in the viewport when it is first measured. We recommend that you switch the Cut Plane model OFF in order to allow for better “Zoom All” of the tube geometry during measuring.

Turning off the model will not turn off the Cut Plane – just the model of the Cut Plane in the viewport. Uncheck the Model: CUT PLANE checkbox, then press F2 to redraw the viewport with no Cut Plane model.



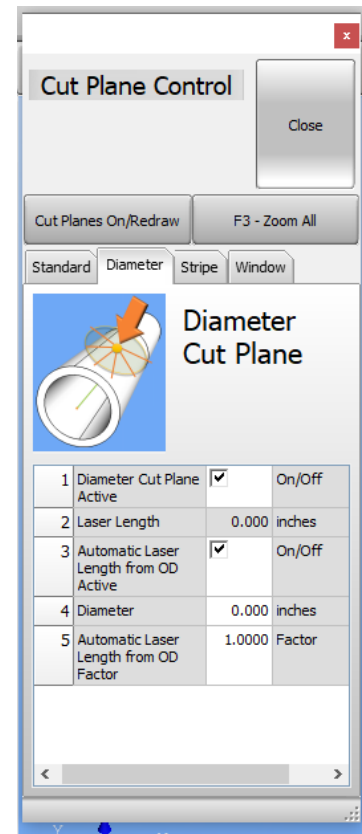
## 11. Know About the “DCP” (Diameter Cut Plane)

The DCP feature allows VTube-LASER to ignore the tails of the LASER that are too far from the tube that is nearest to the scanner. This removes objects behind the first tube closest to the probe. DCP can not only remove unwanted objects from the scanned data, it can also remove unwanted flyers that enter the data.

When in DCP AUTO MODE, DCP relies on the diameter value to know how much LASER LENGTH should be used – so it is important to have the diameter set to the actual value before you measure using the DCP command.

If you turn DCP on, and also enable the **Automatic Laser Length from OD** feature, then AUTO mode will be active. In that case, be careful to enter the actual nominal DIAMETER, and the Length FACTOR in row 5 should be normally 1.0 to 2.0.

If the LASER LENGTH is ever ZERO, then no scan data will be allowed into VTube-LASER. **Also, if the LASER LENGTH values are too short, then the cylinder calculations will fail. Be sure that the laser length is at least 0.75 of the current tube diameter.**



**The main reason for you to understand DCP is in case you are measuring a tube with other items nearby. Consider enabling DCP when there are objects nearby that could be scanned by mistake.**

12. Here are important notes about DCP.

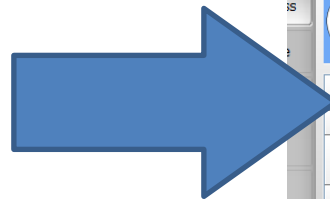
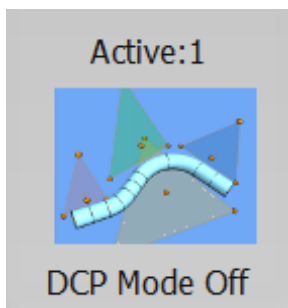
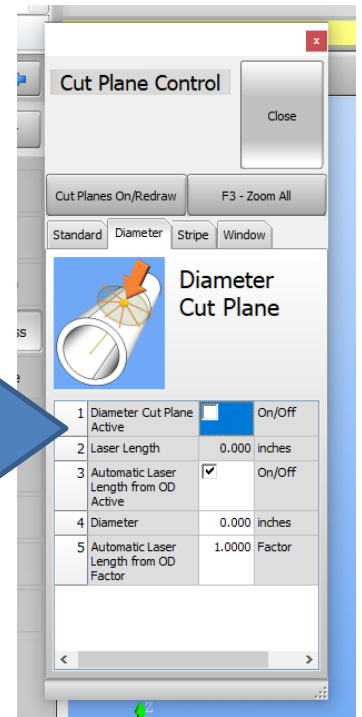
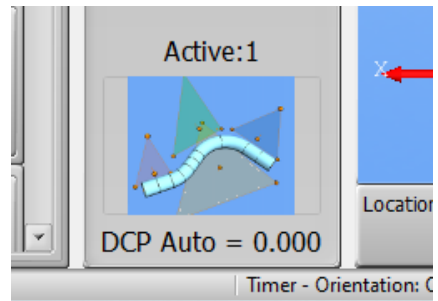
- a. DCP only works when the scanner is active - **not the ball probe** - because it requires multiple points per scanned line to work.
- b. DCP only applies to **cylinder scans** and **bend profile scans**. **It does not have any effect on END scans.**
- c. **DCP values are not remembered persistently across all projects like regular Cut Planes.** The DCP setting can be different for every project, unlike the Cut Plane settings which will carry across to other projects.

13. For this demo setup, we're going to assume that there is nothing nearby to interfere with scanning. **If the DCP is on, then turn it OFF.**

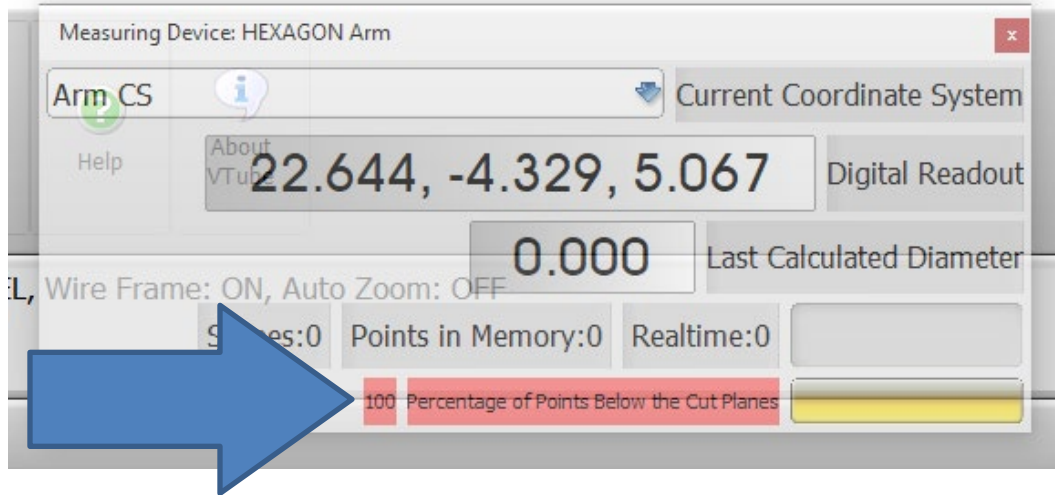
Click on the blue tube on the bottom of the navigation pane.

Click on the Diameter tab.  
Switch the Diameter Cut Plane off.

Close this window. The DCP Mode will say "DCP Mode Off" at the bottom of the navigation pane.



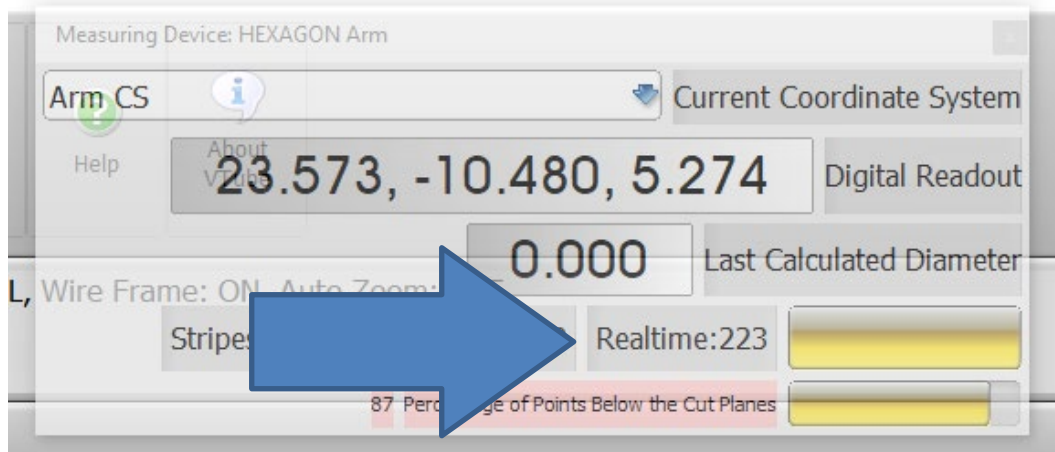
14. **Test for a good CUT PLANE setup** by aiming the laser at the table and watching the bottom part of the DRO. It should show “100 Percentage Points Below the Cut Plane” everywhere you point the laser at the cut plane like this:



You can also look for the solid RED to know that the Cut Plane is setup properly.

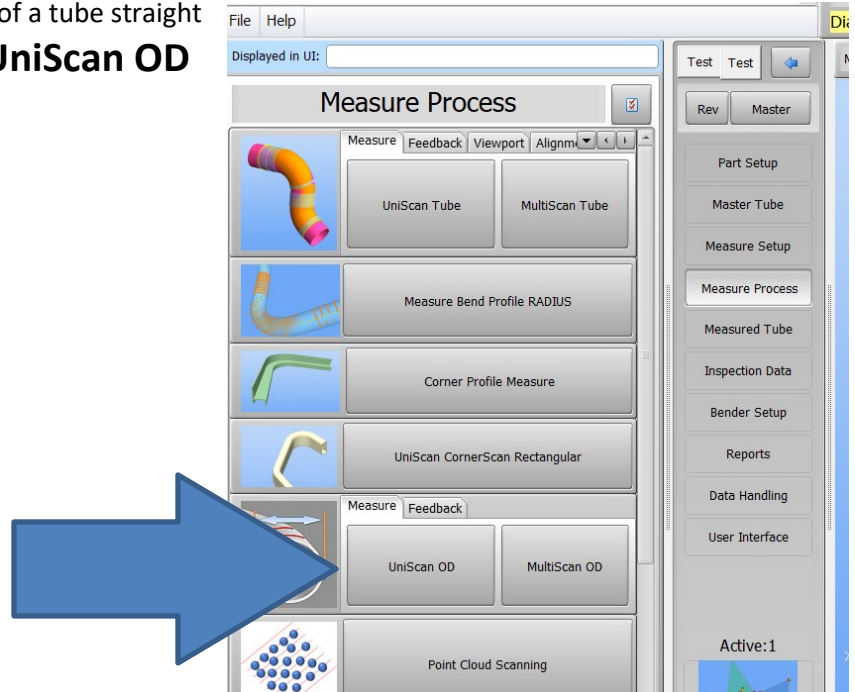
Be sure that no part of the table allows for the Realtime point value to go above zero. If it does, then it is important to either remeasure the Cut Plane or increase the Cut Plane offset until VTube-LASER no longer shows Realtime data when scanning the Cut Plane surface.

15. Place a tube on the Cut Plane. Aim the laser at any part of the tube. When in range, you will see that some points are now allowed into VTube-LASER. See the Realtime point count in the DRO:



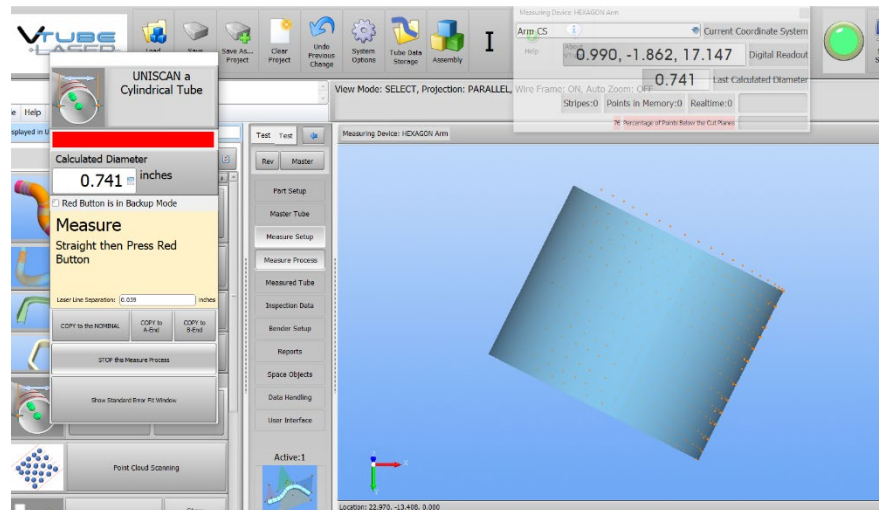


16. Next, perform a simple scan of a tube straight using the Measure Process **UniScan OD** button.



17. Scan a straight, then let VTube-LASER calculate the cylinder. When you scan, you must hold the green button down.

**This does NOT operate like programs like PolyWorks where you press and release to start the scanning, then press and release to stop the scanning. You must keep the red button pressed while scanning. The moment you let go of the button, VTube-LASER will understand that you are finished with the straight and will attempt to calculate the cylinder centerline.**



(This automatic calculation when you let go of the button is how the standard setup acts. You can also setup VTube-LASER to require the red-button press when you are finished with a cylinder scan.)

18. When you've completed this setup, then follow the steps in the next document "**20200414\_Demo\_VTube-LASER\_HEXAGON\_RA8**" to learn how to perform the demonstration.

This is the end of the demo preparation document.