

CMM
QUARTERLY

PLANNER – CALYPSO’S SIMULATION SOFTWARE

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Introduction

What is it:

Planner is Zeiss Calypso's CMM simulation software. This is an add on module and can be purchased from Zeiss Metrology. The simulation is executed after a program has been written. The simulation will run through the program and log collisions with the part.

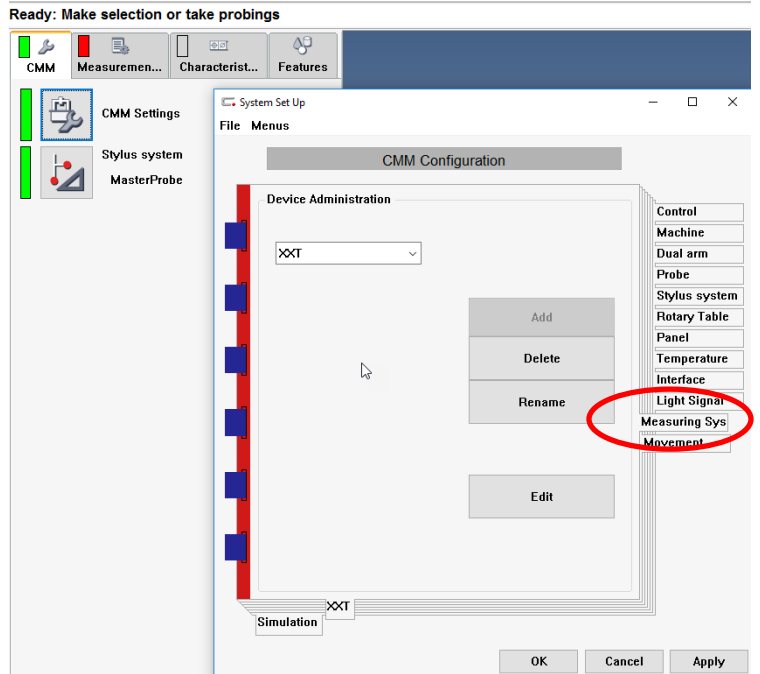
Setting Up Planner

In this example, we will be setting up an offline seat of Calypso not actually hooked up to a machine.

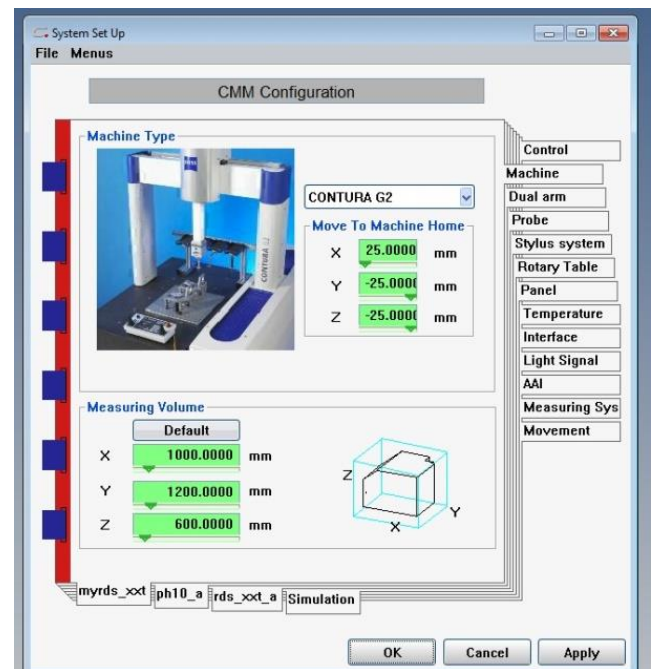
Machine

To get started, a machine tab that reflects your actual machine(s) should be set up. Remember that if you have multiple machines, you simply add as many machine tabs as necessary. To do this, go to CMM SETTINGS tab. Then go to the MEASURING SYS TAB.

Type in the name of the machine tab you'd like to add, then hit enter. When you hit enter, the ADD button becomes active. Add your new machine tab by hitting the active ADD button.



Once you've added the tab successfully, go up to the MACHINE tab. Put in the appropriate machine type with the blue drop down. (In this example, a Contura G2). Put in appropriate values as shown for movement off the limits after the machine homes. Then put in values that reflect the size of the machine, such as 1000,1200,600. This is the machine travel in MM.



Stylus System

Hit apply, then go to the PROBE tab. Select the appropriate configuration that you're simulating. In this example, it's an RDS head with an XXT probe.

What if I have a VAST fixed head?

Simply choose the proper sensor and enter the proper values below and proceed as shown

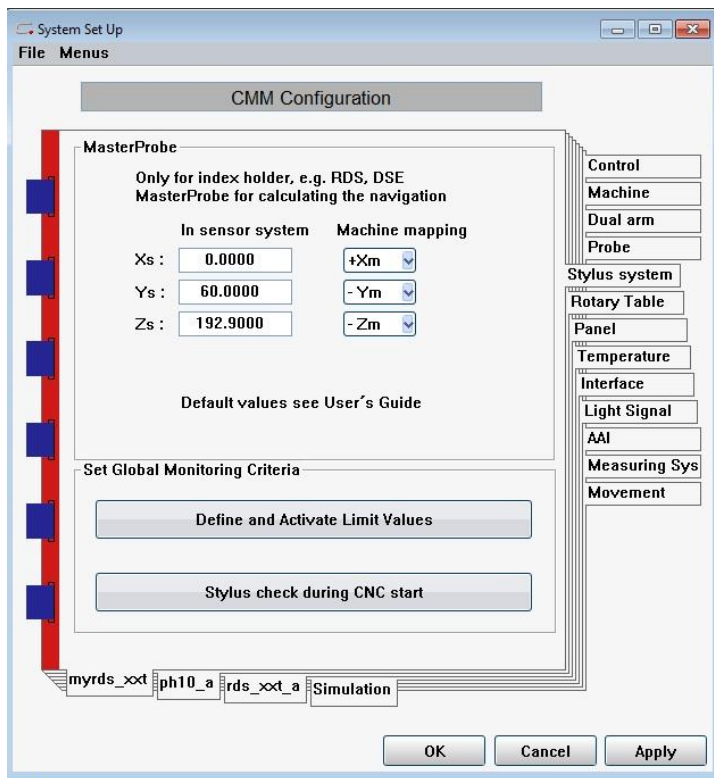
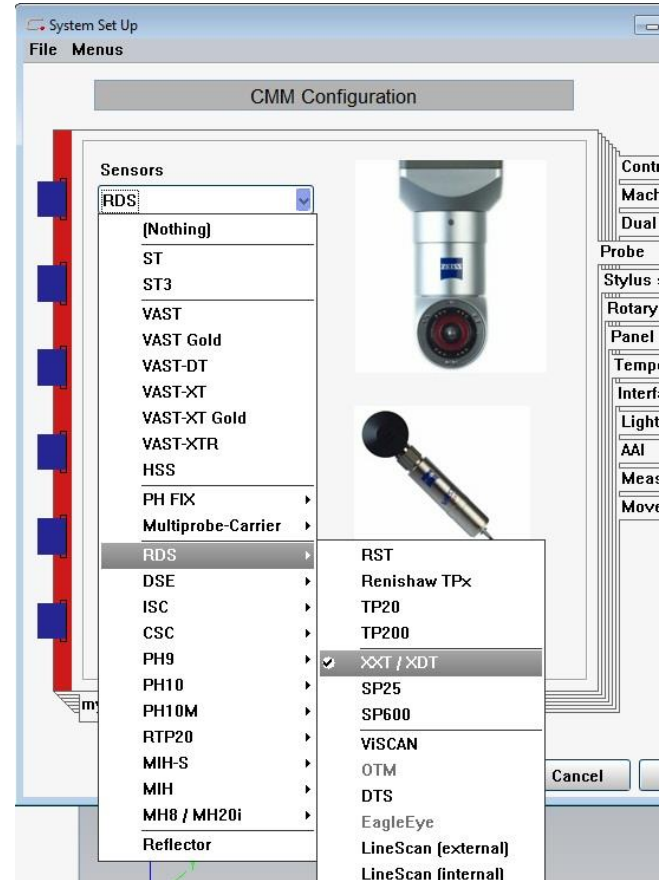
For the VAST series the values are:

Xs 0.000 +Xm

Ys 0.000 -Ym

Zs 0.000 -Zm

Find other sensor values in the end of this section.

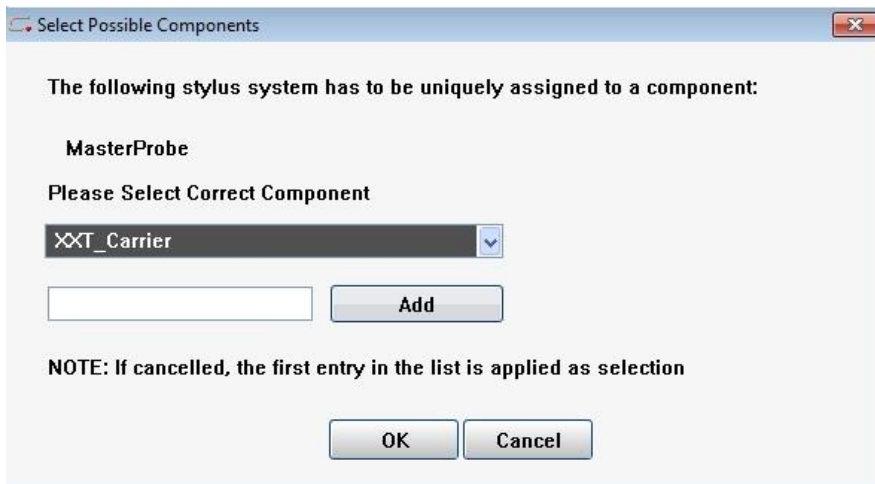


Hit apply, then move to the STYLUS SYSTEM tab. Fill in the Xs, Ys, and Zs values, paying careful attention to the corresponding drop down settings. In this example, they are +Xm, -Ym, -Zm. These values change per machine configuration. You can either copy them from your CMM or call Zeiss for help. The values in this example are good for an RDS head with an XXT sensor.

Hit apply, then move back up to the CONTROL tab and connect your new machine tab. (Hit the big CONNECT button in the center of the screen). Once you've connected, there will be a delay before the following message pops up:



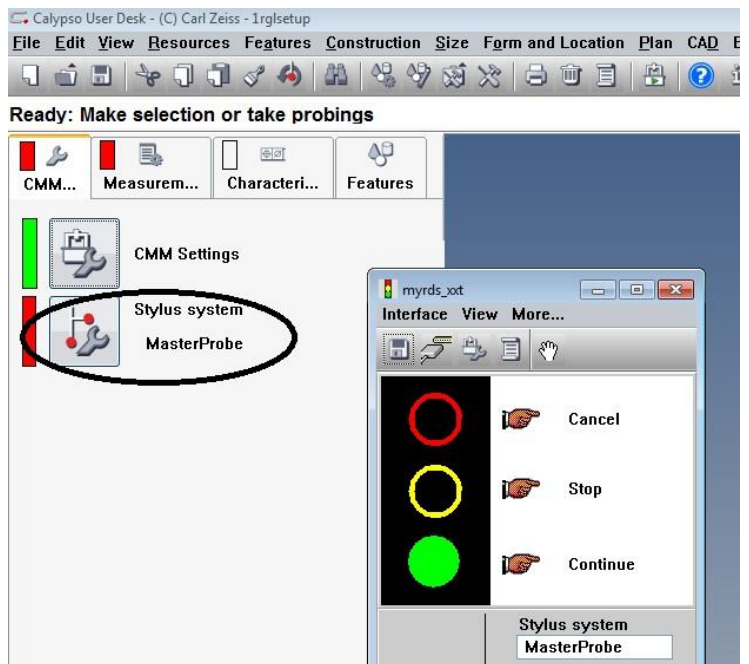
Hit OK and allow Calypso to create a MasterProbe for your machine tab. A component selection screen may appear.

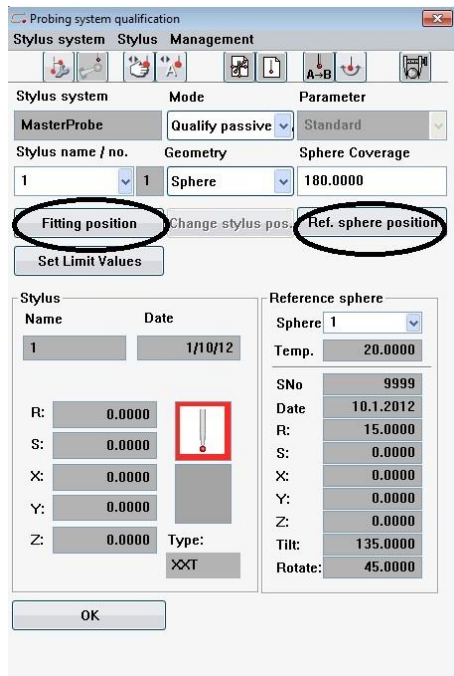


Hit OK. No need to fill anything in.

The next step is to do a virtual "Ref Sphere Position". Go to the STYLUS SYSTEMS button.

You can Reference Sphere Position, and if you have an RDS-CAA system, also perform the Fitting Position. This is done only once per new machine tab.

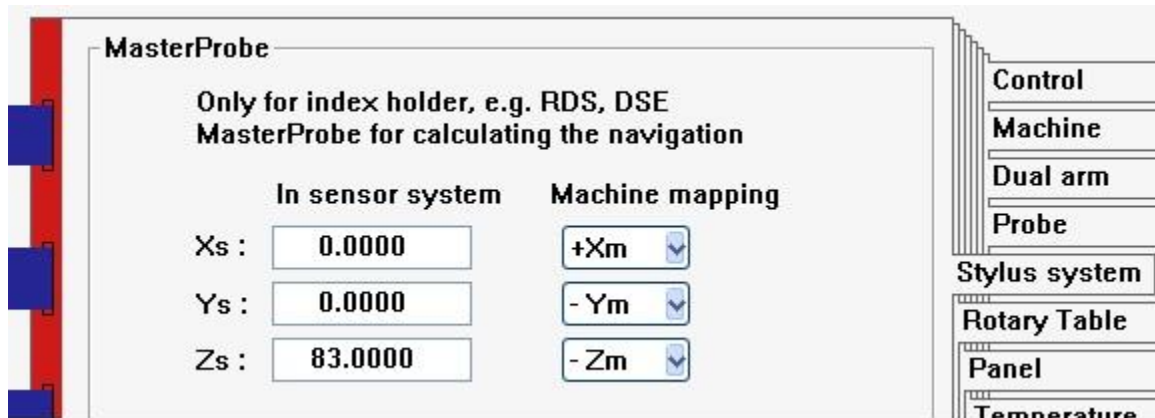
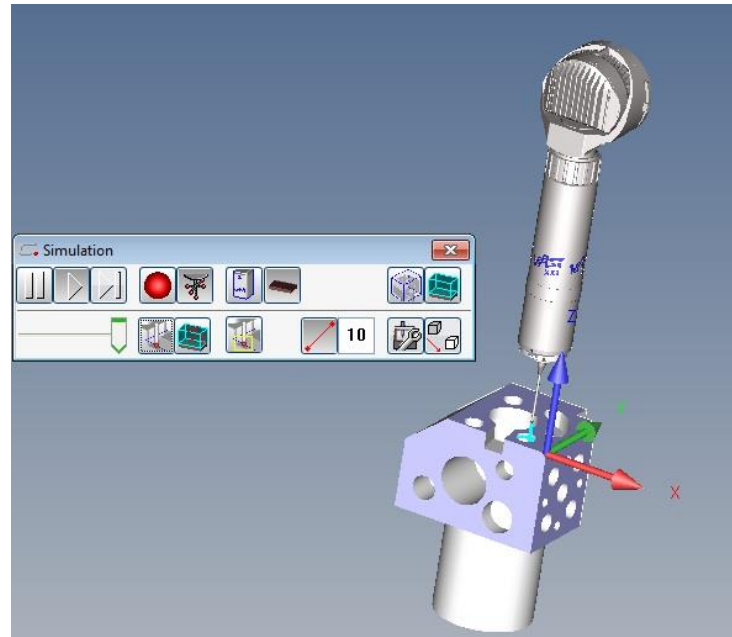
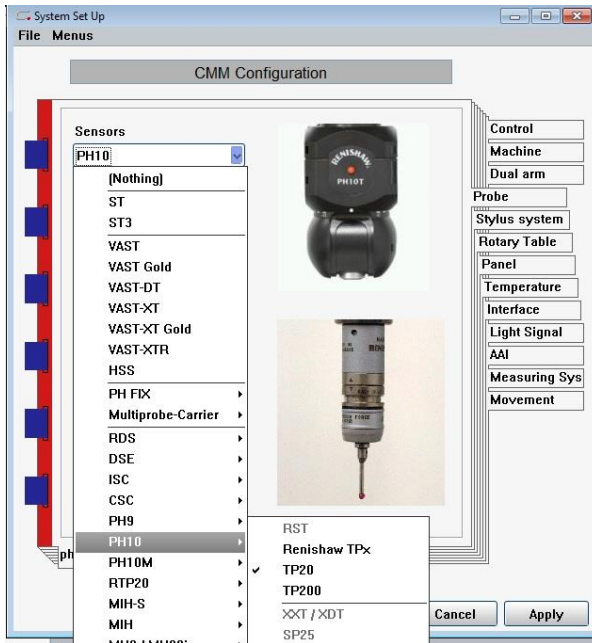




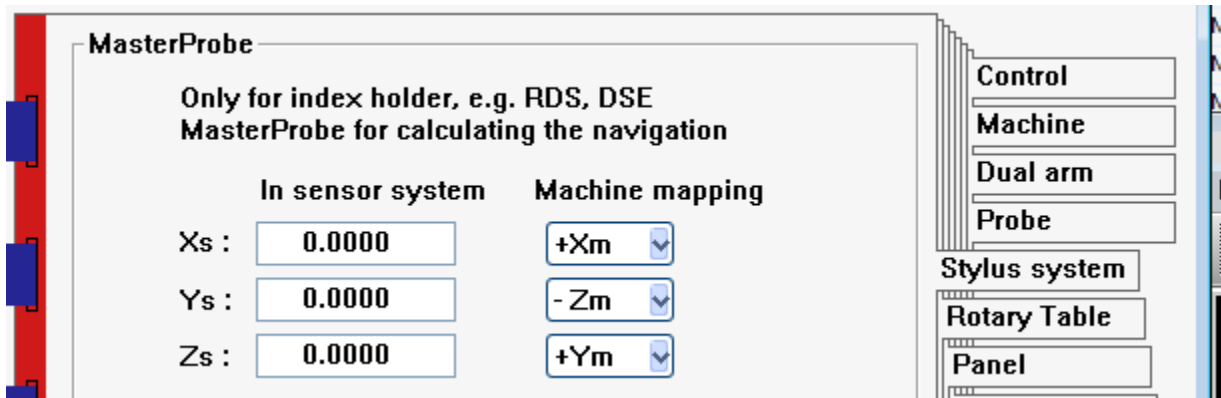
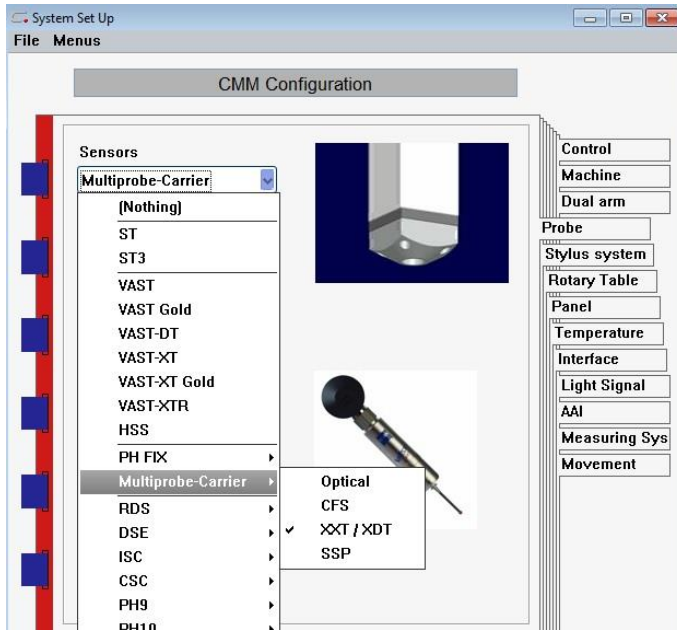
Additional Stylus Systems Offsets:

Machine tab setup parameters for other common configurations:

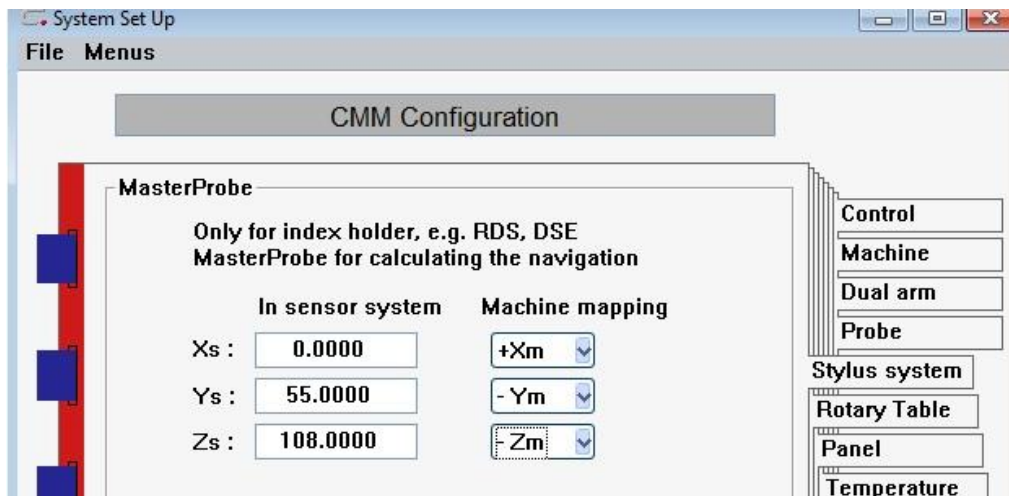
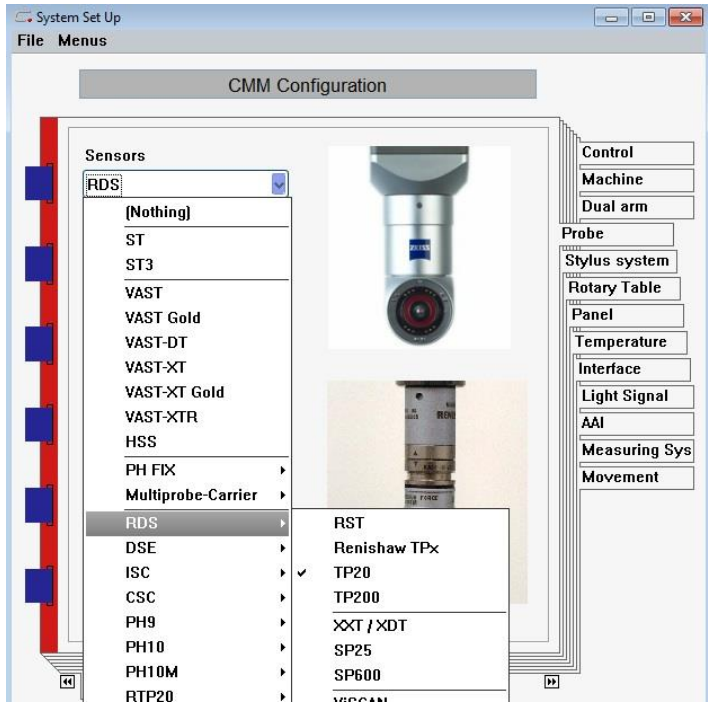
1. PH10 with TP20:



2. Duramax

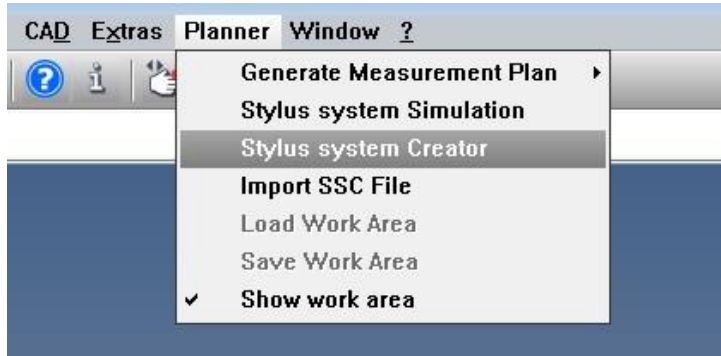


3. RDS-TP20



Create a Stylus System

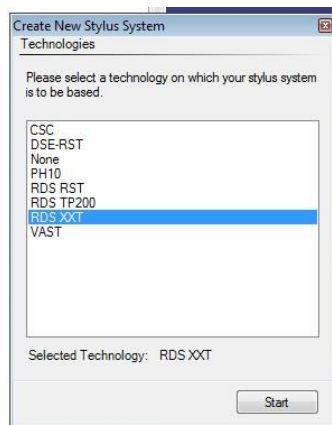
The next step is to build a MasterProbe to be used for on-screen simulation. Go to:



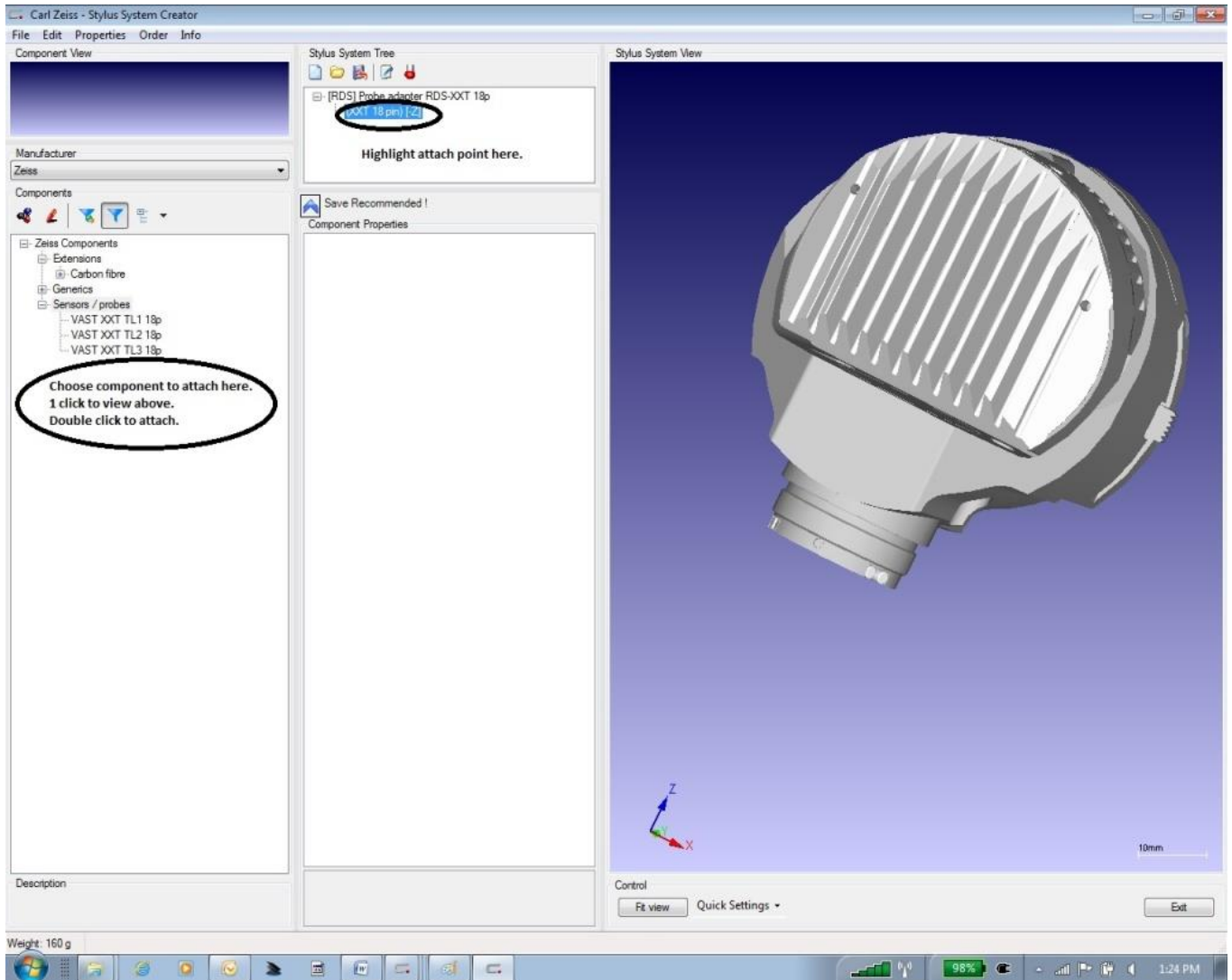
New stylus system



Select the correct type of probe.



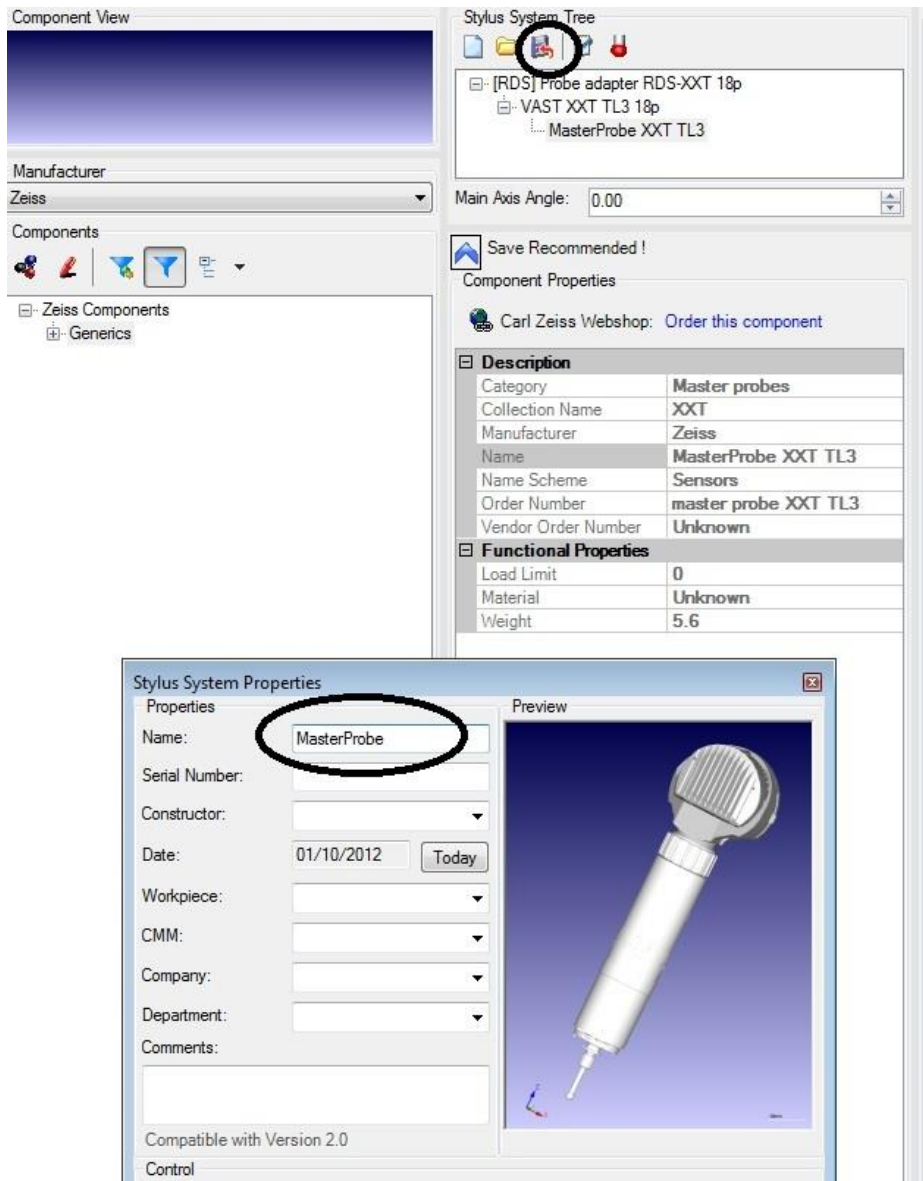
Starting with the Probe adapter, start to build your probe by double clicking the correct component in the list on the left. Then continue to highlight the position you'd like to add to in the list on the upper middle of the screen. For an easy down tip, just continue to add your components to the z- position. For stars, highlight the node you wish to add to, such as x+, then double click the correct component in place.



Now double click on the Sensor you have.

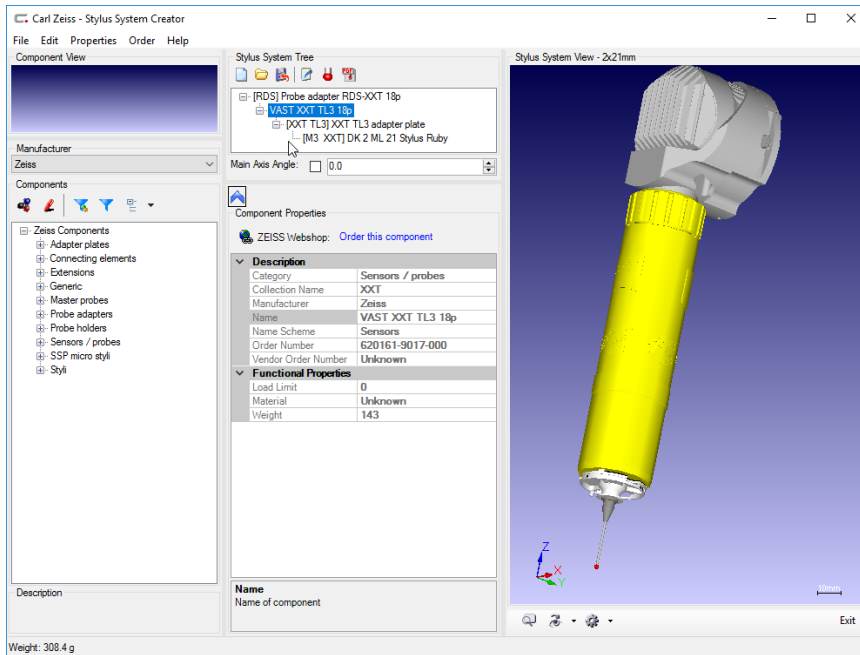
MasterProbe selection will now appear in the list. Select the MasterProbe.

Once you're finished selecting components (in this case, MasterProbe buildup), go to the SAVE AS button and name your component. For MasterProbe, it must be named exactly as shown.



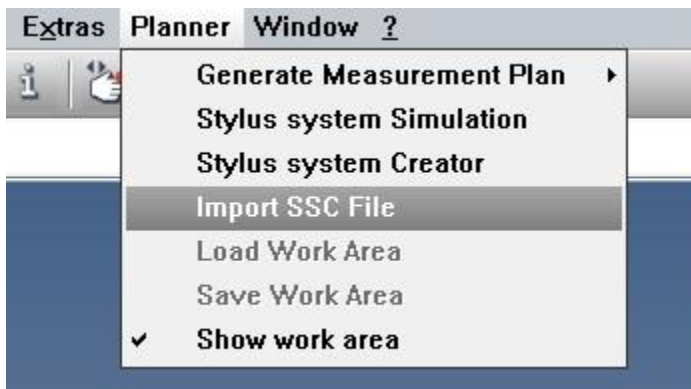
You must name the probe in the screen above, then name it again when the save as screen pops up. **PAY ATTENTION TO WHERE YOU'RE PUTTING YOUR SIMULATION PROBES!** If you're setting up more than one machine tab for different CMM configurations, you'll want a MasterProbe for each different setup. It's recommended to have a folder for each machine tab. At this point you may continue to build any other probes you'll need. It's acceptable to use both Zeiss and Renishaw components in the same buildup if necessary. For example, if you're building up a Renishaw star and can't find components you need, you could substitute in a Zeiss M2 cube. The components are close enough in nature that it wouldn't adversely affect simulation and collision detection.

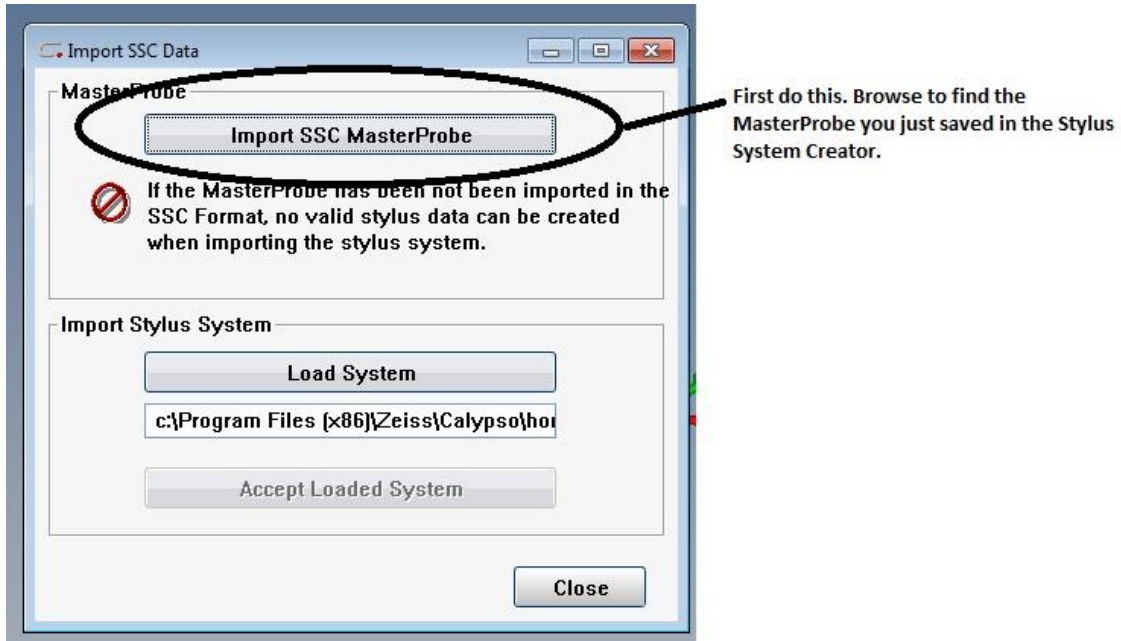
Another quick example for a 2mm by 21mm buildup:



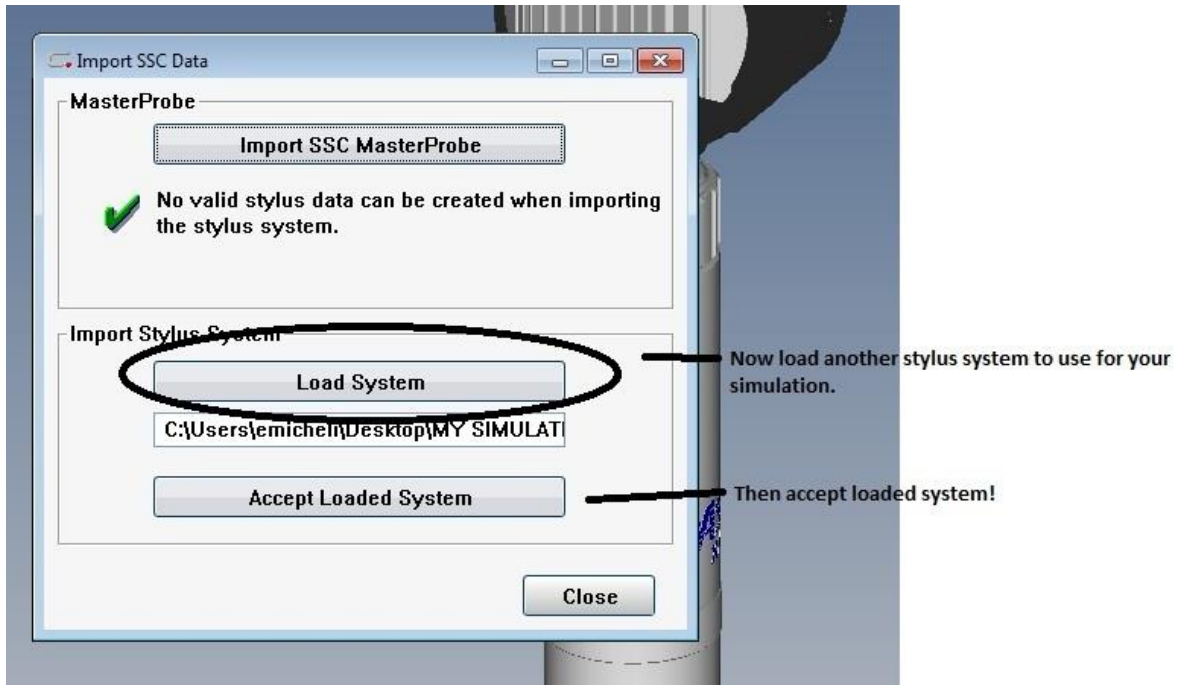
Begin by selecting File/ New and repeat the process you just did for the MasterProbe adding the appropriate assemblies to construct the stylus system you want.

Now after the stylus system is saved click on Planner/ Import SSC File to import the stylus systems. We must import the MasterProbe first.

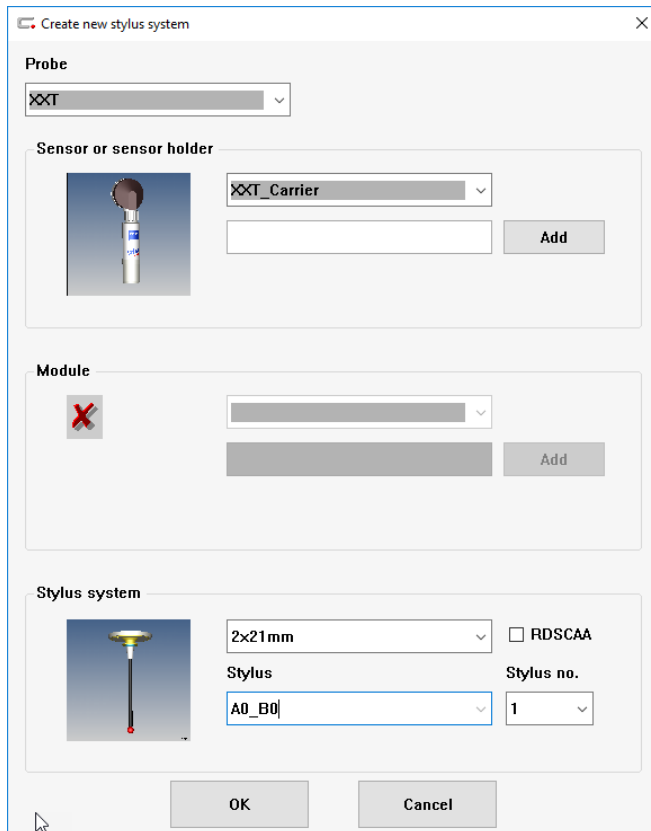




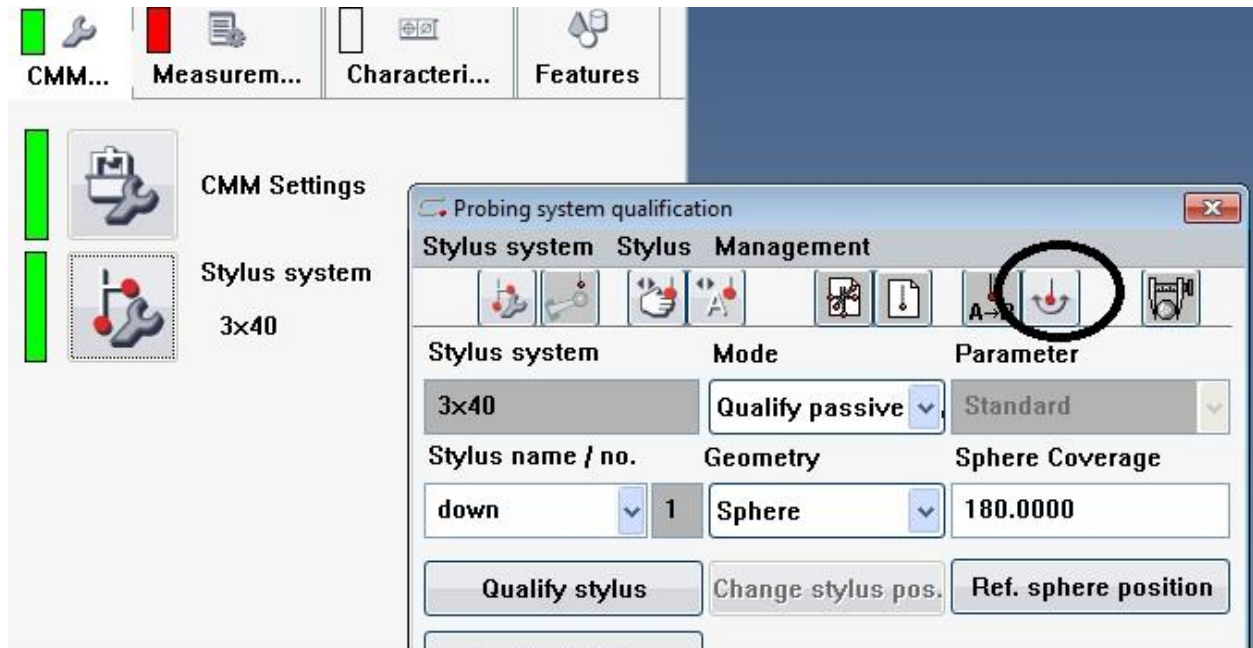
Import SSC MasterProbe **is only done once** for each machine tab you set up. From then on, you load in other simulation probes to use in your on-screen simulation.



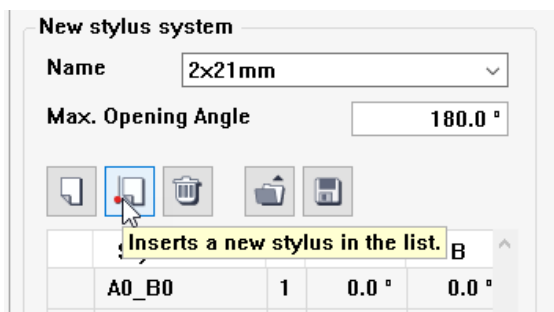
When you accept loaded system, you must name the tip you wish to use. In this example, we named it "A0_B0".



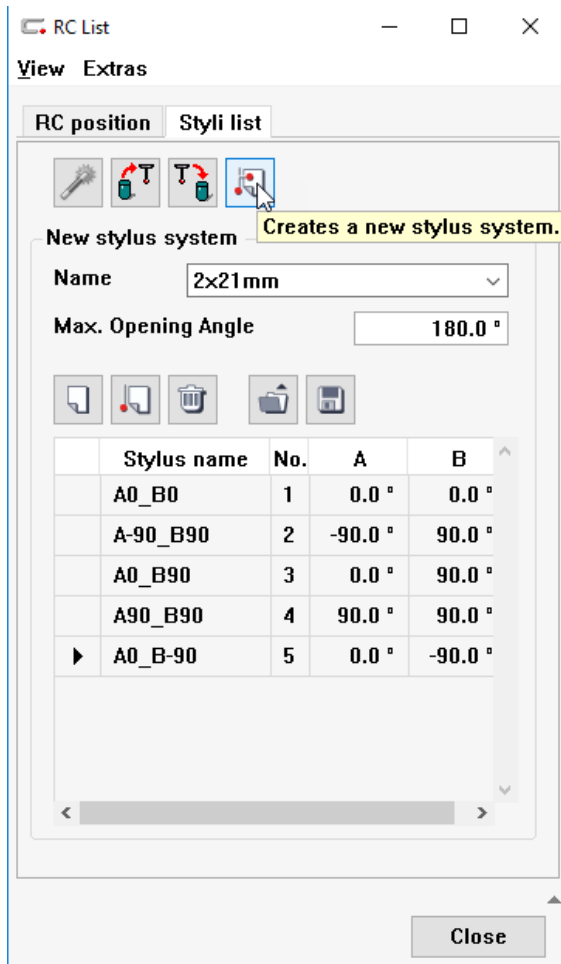
If you wish to add additional tip rotations for use with your RDS head, here's how you proceed: Go to the STYLUS SYSTEM/ROTATE SCREEN as shown below:



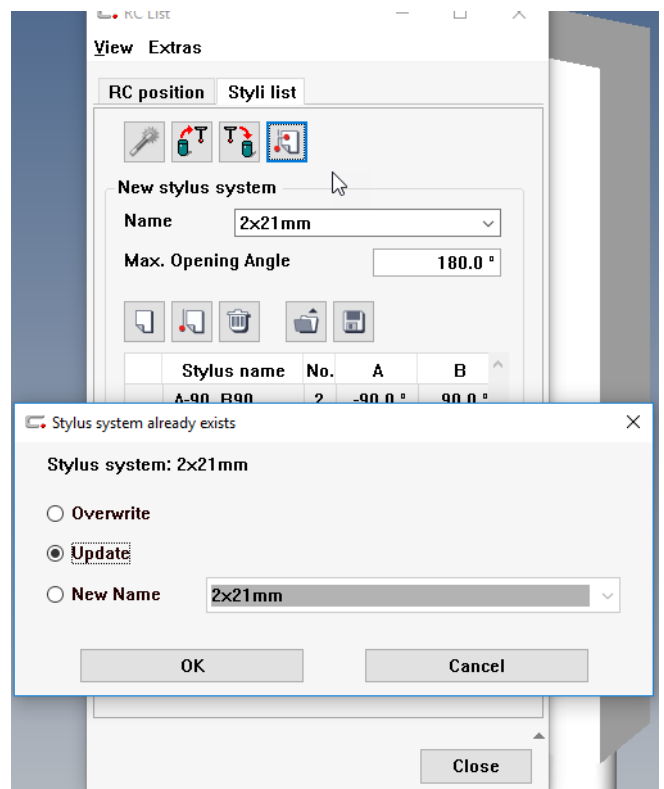
Go to the Styli List tab and select the new tip icon shown below:



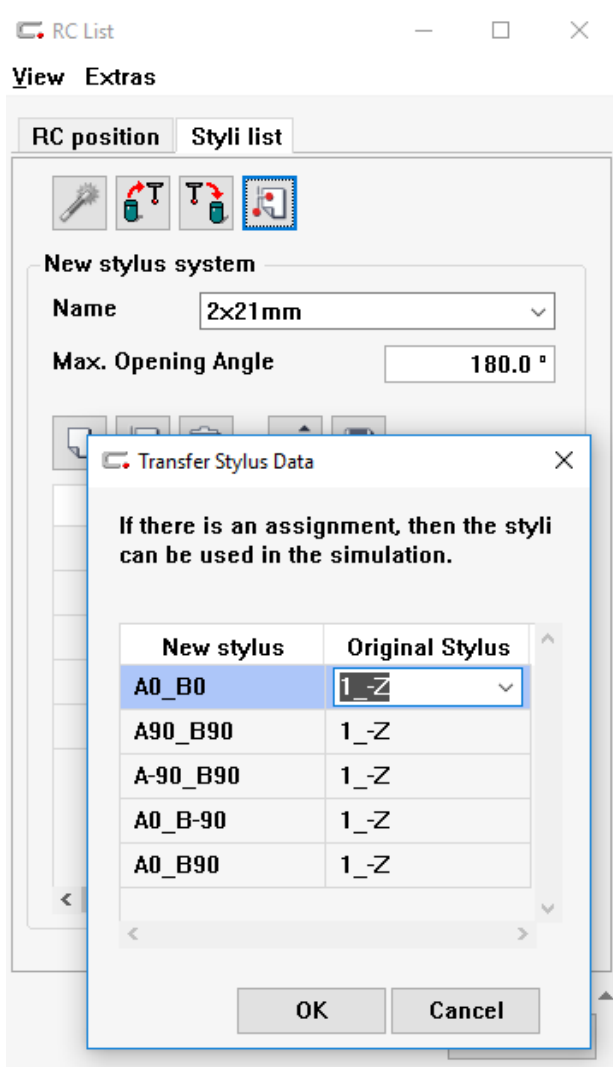
Click the new tip icon to add as many tip rotations you need. In our example we will add the most common tips -90,90 0,90 90,90 0,-90 rotations. When you've finished typing in the names and A/B angles you need, hit the CREATE NEW STYLUS SYSTEM button shown below:



You will be presented with the following screen. Make sure to select UPDATE!

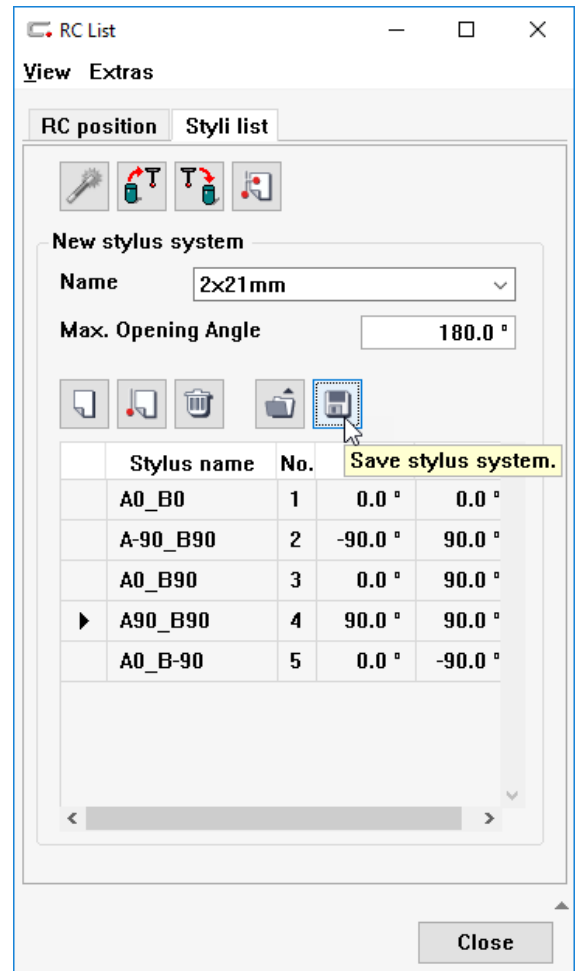


Hit OK to accept the new names you've assigned to your additional tips.

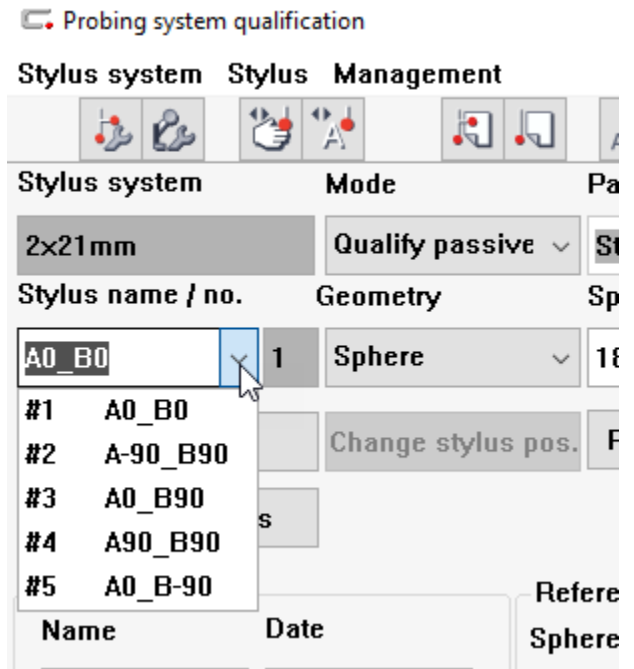


Save your updated stylus system list.

The additional tip rotations are saved as a .txt file.



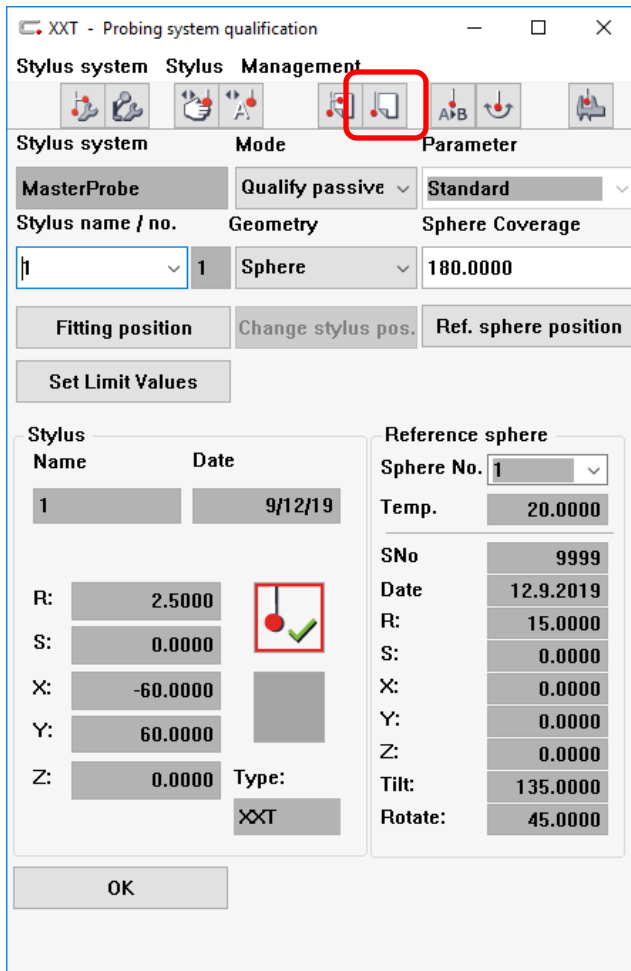
Now you will see that the stylus' are added to your list already calibrated



Adding a Rack

Whether you have a rack or not on your CMM you can add a rack to your Planner simulation. This will make the programming quicker.

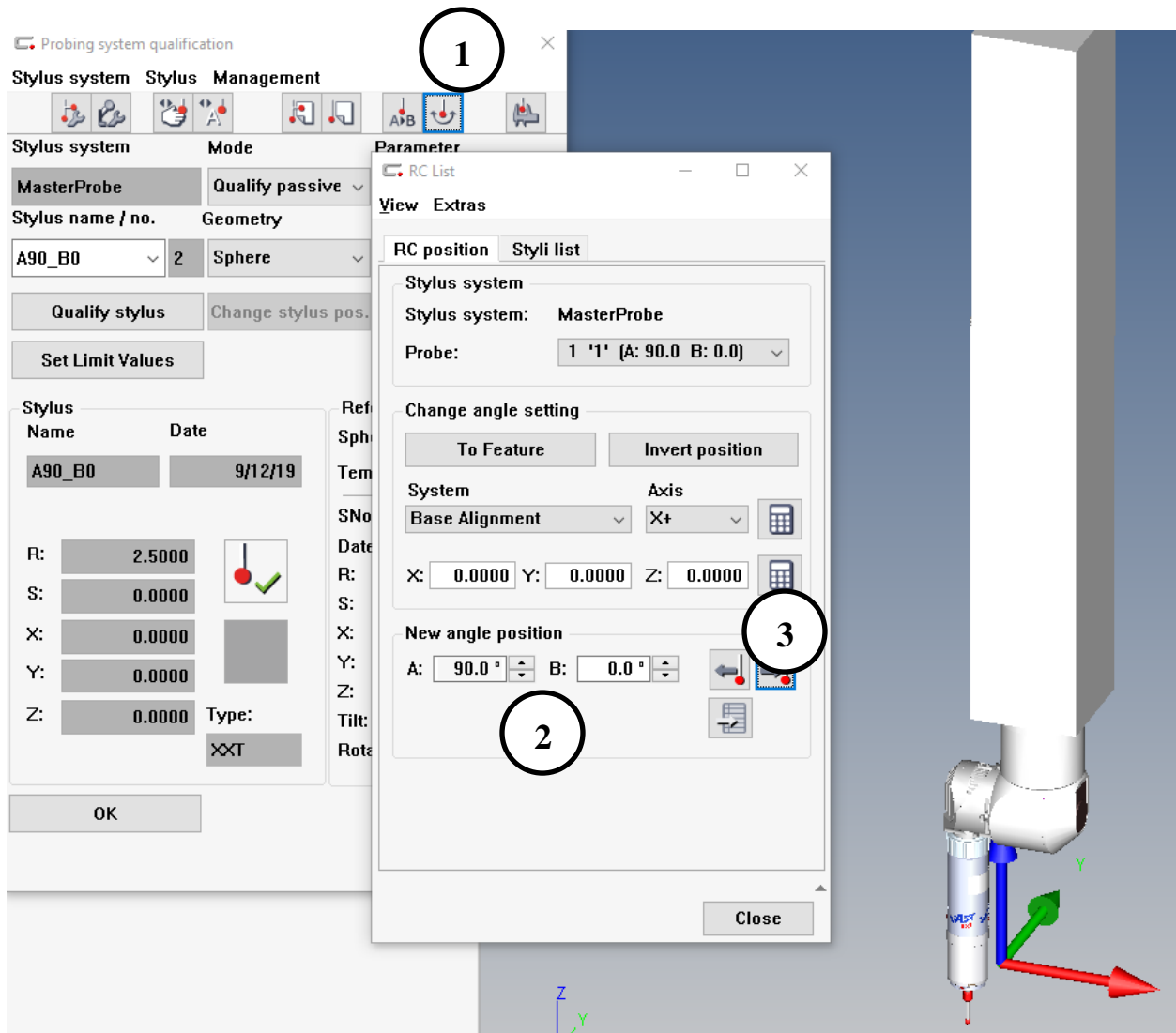
First we will need to add a new stylus to the MasterProbe stylus system. We will need a stylus that will be orientated to the correct position to calibrate the rack.



Select Insert New Stylus

Give the new stylus a name.

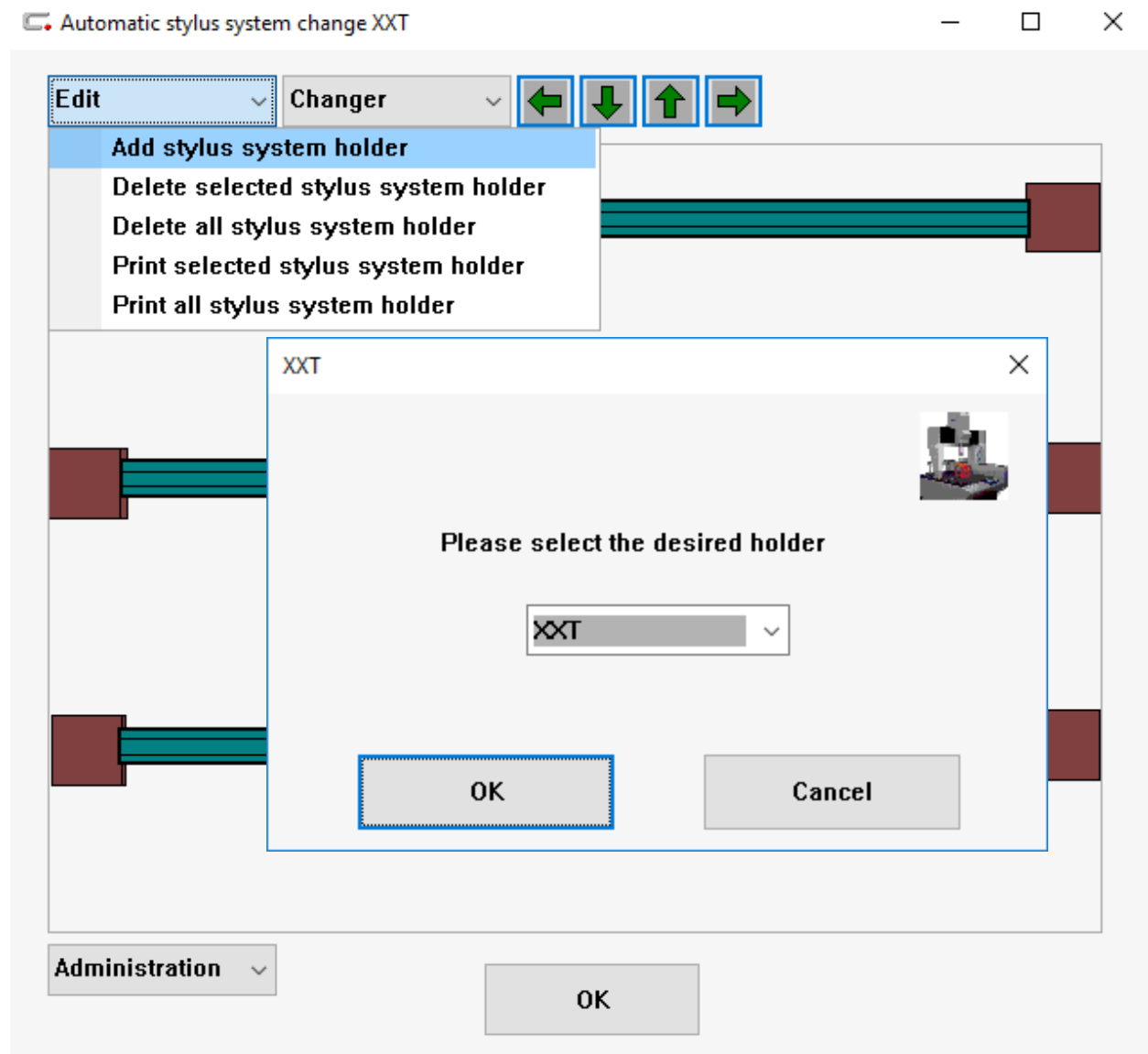
Follow the next steps in order



1. Rotate Stylus to New Position
2. Enter new values for A rotation. Enter 90
3. Click on Rotates the Axis on the Machine
 - a. Make sure the probe is free to rotate to the new position

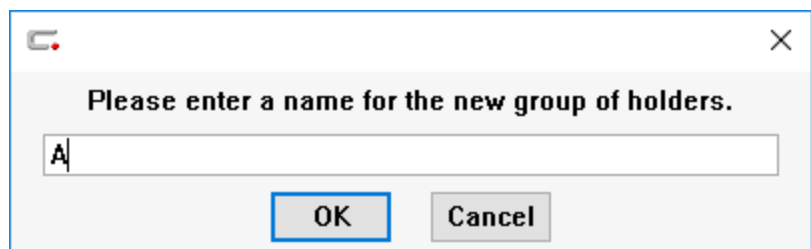
Click on the Auto Change Rack icon

Select Add stylus system holder

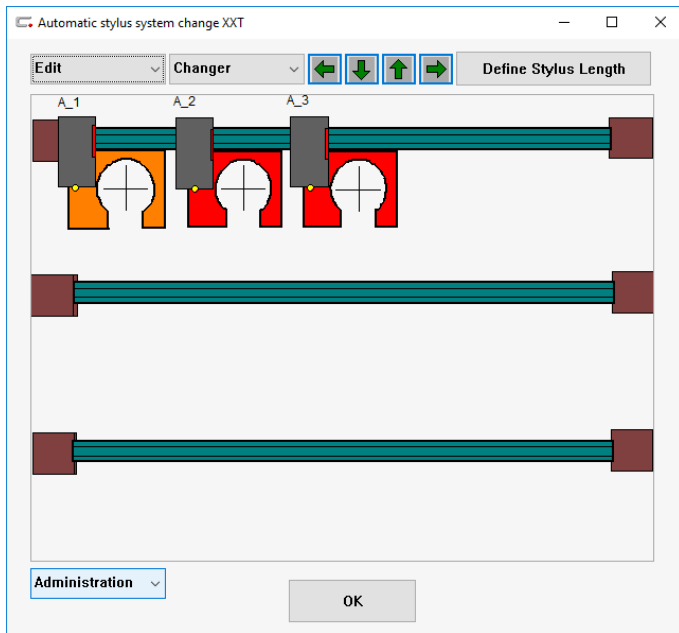


Select the proper head type.

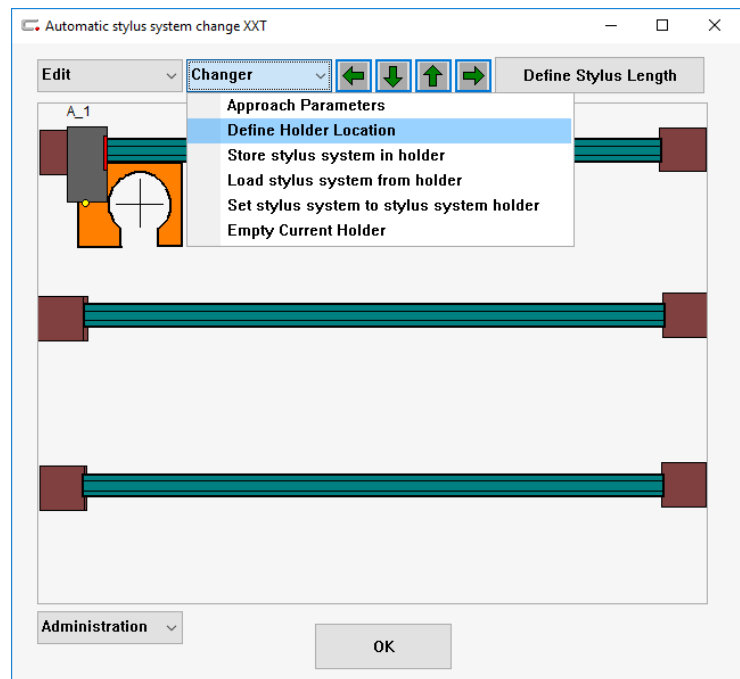
Give the holder a name

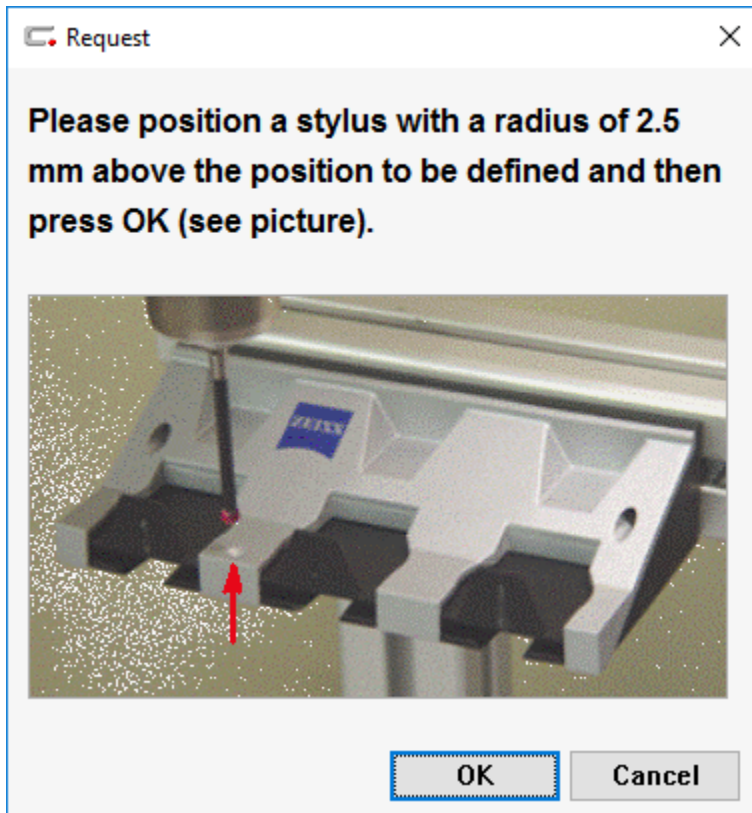


You will now see the holders, for XXT 3 holders are added. XT an individual holder will be added. The steps are the same for any probe head type.



Now pull down the Changer menu and select Define Holder Location

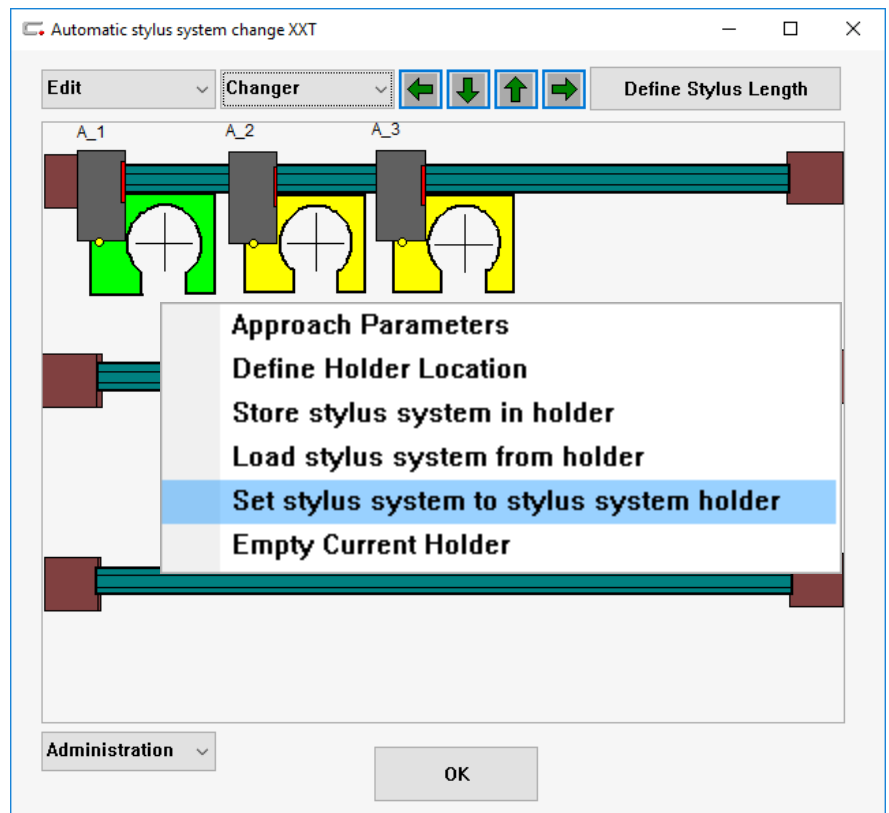




Click OK here and the holder locations will be defined.

Click Changer again and select Set stylus system to stylus holder

Select the desired stylus to add to the holder.



Creating a Simulation Program

Create your CMM program as normal. There is no special requirement in Planner just select the stylus systems out of the rack as normal making sure to select the correct stylus when writing your program.

Later when we run the simulation it will detect if there is a collision. A simple edit can be made to correct the collision and simulation can be rerun.

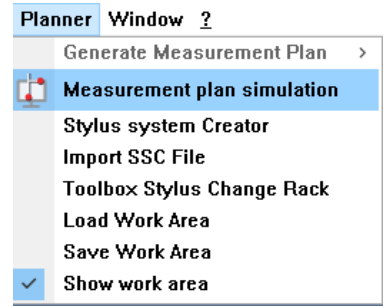
When programming everything is the same as being online. Position the model through CAD transformation to match the way it will sit on the CMM. Create the Base Alignment and Clearance Planes. Finally, create your entire CMM program.

When you are finished proceed to the next section – Placing your part on the CMM for simulation

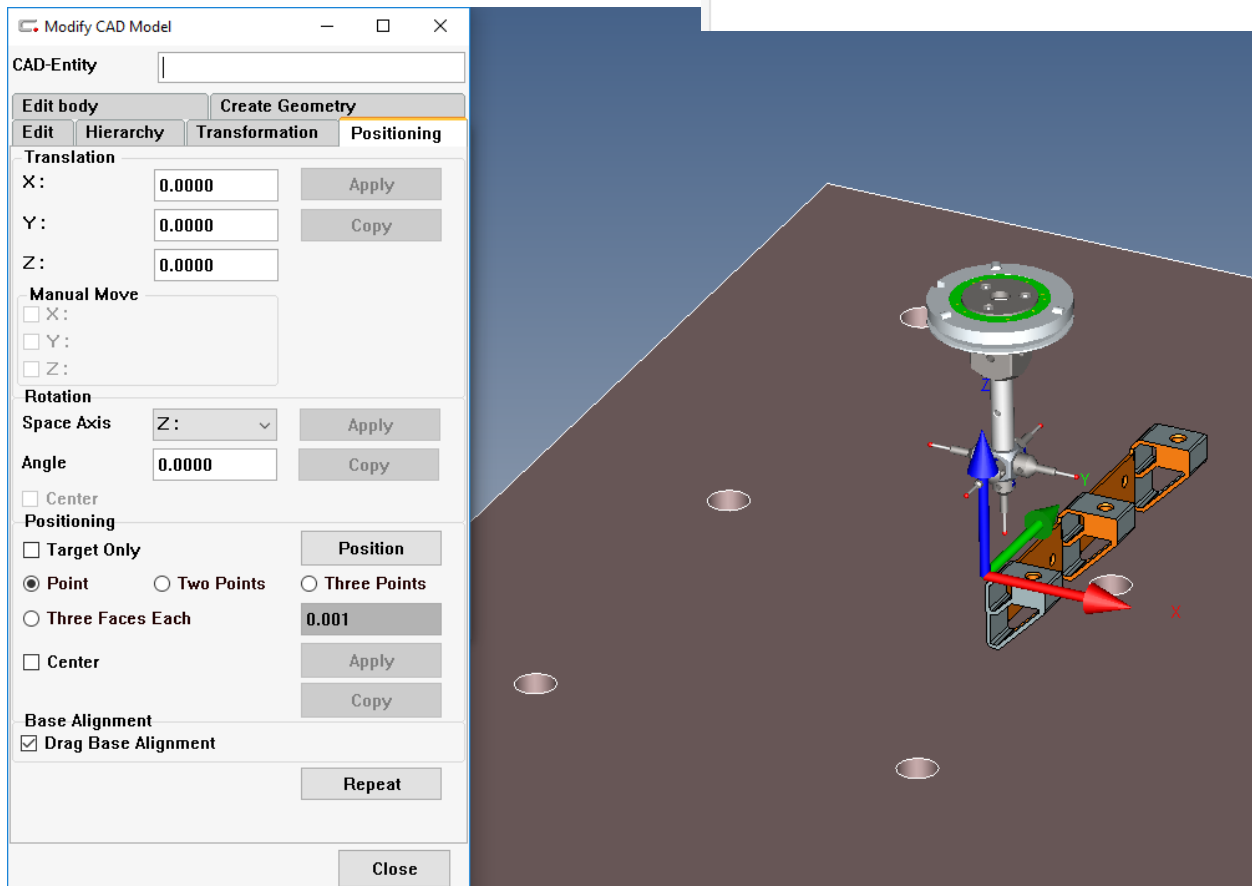
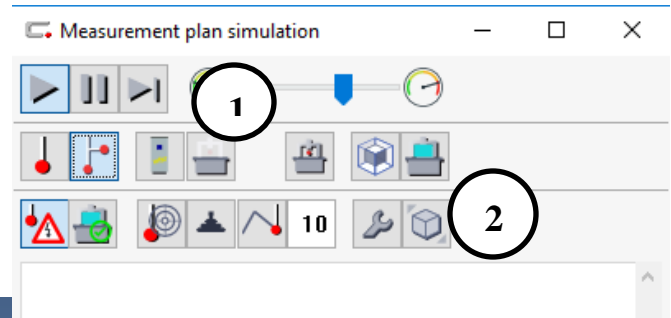
Place part on CMM

Click on Planner/ Measurement Plan Simulation

When the model is brought in while programming the model is located near the home position. This is not a problem during programming but during simulation the stylus system will register collisions during probe changes. It is recommended that you place the model roughly where it will sit on the CMM table.



1. Click on Show Base Plate
2. Modify CAD Model

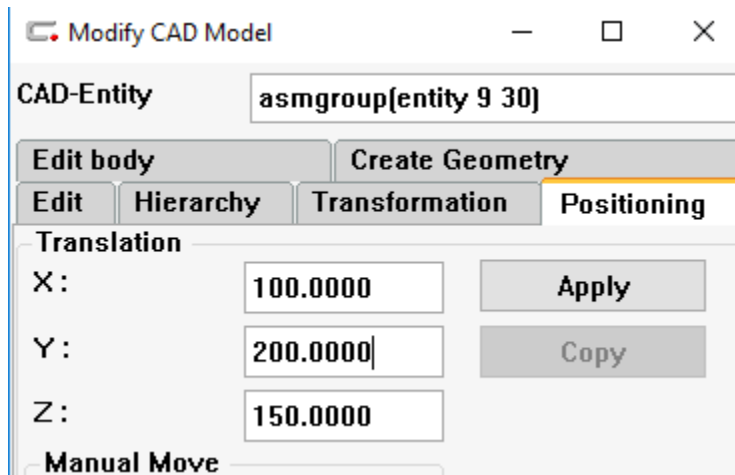
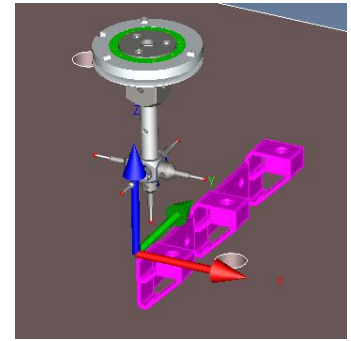


4 Ways to Move CAD Model

Method 1

Translation

First select the part on the CAD window . The part will now be highlighted as shown on right.

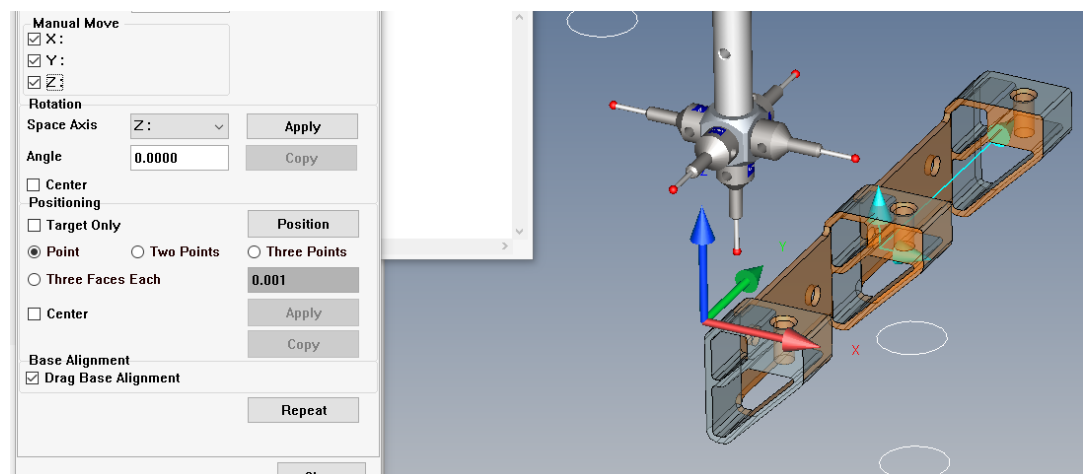


Now within the Translation enter the offset values. Each time you click on Apply the part will move the given values.

The part does not have to be exactly place on the CMM as a general rule unless you have a concern about the measuring volume of the CMM and the fit of the part.

Method 2

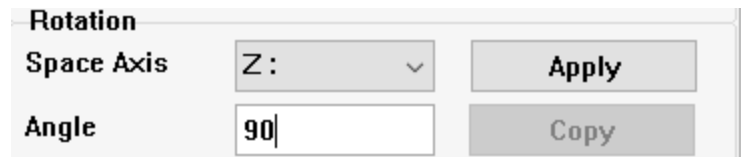
Manual Move



Highlight the part on the CAD window and under Manual Move check the appropriate axis to move the part. In this example, we will move the part in 3 axis. Now with the left mouse button click on a axis direction arrow and move the part. The part will move in one axis at a time. When you have finish release the axis and the part will update to that new position.

Method 3

Rotation

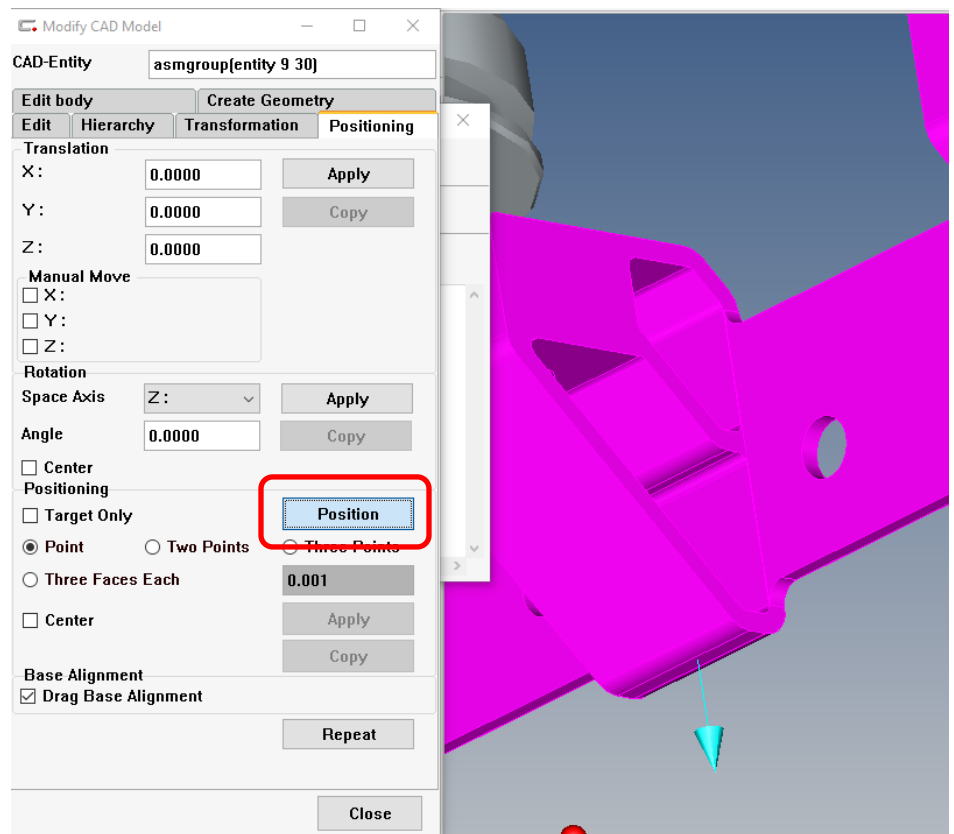


Select an axis and enter a angle to rotate the part. When finished click apply.

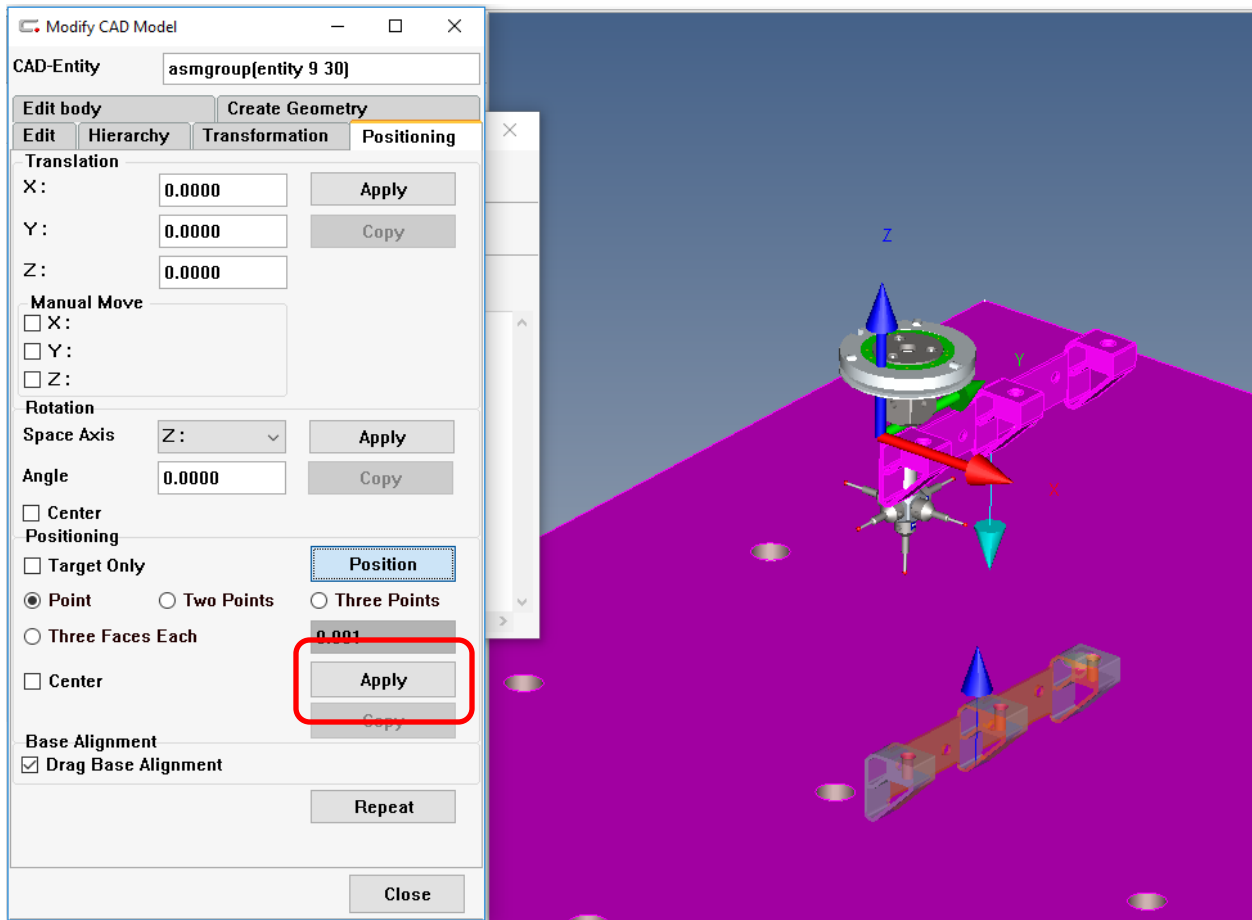
Method 4

Position

Click on the Position button and select a point on the model. Preferably a flat portion of the model that is parallel to the table. A blue point will appear.

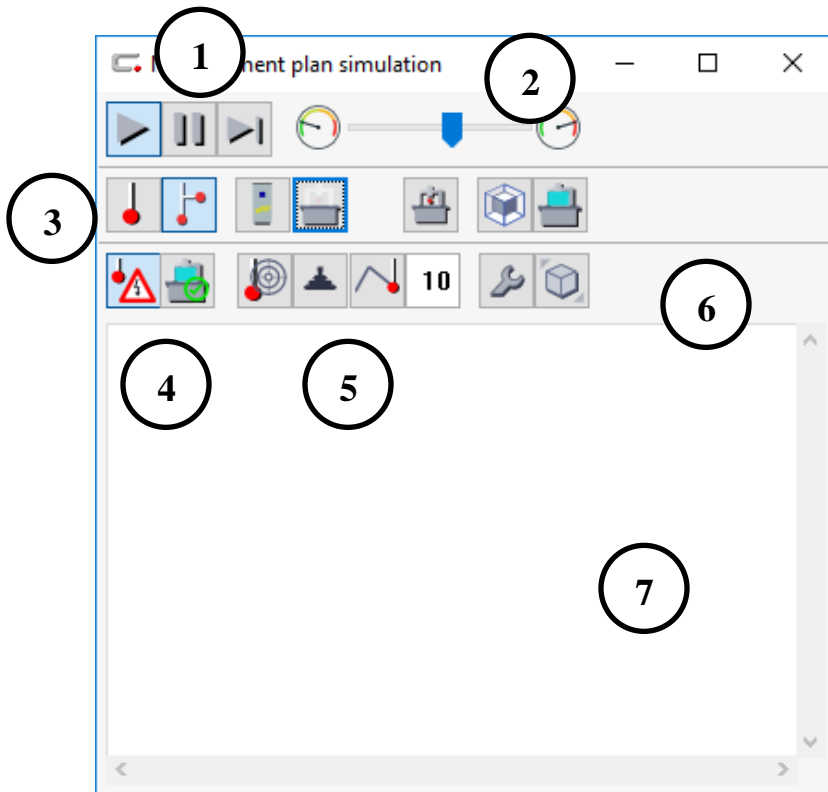


Now select a position on the table and the part will move to this position. Now click on the Apply button to accept this position.



This will drop the part to the table. You can now use a translation in Z, for example, to lift it above the table a desired known height for a fixture, vee block, etc.,

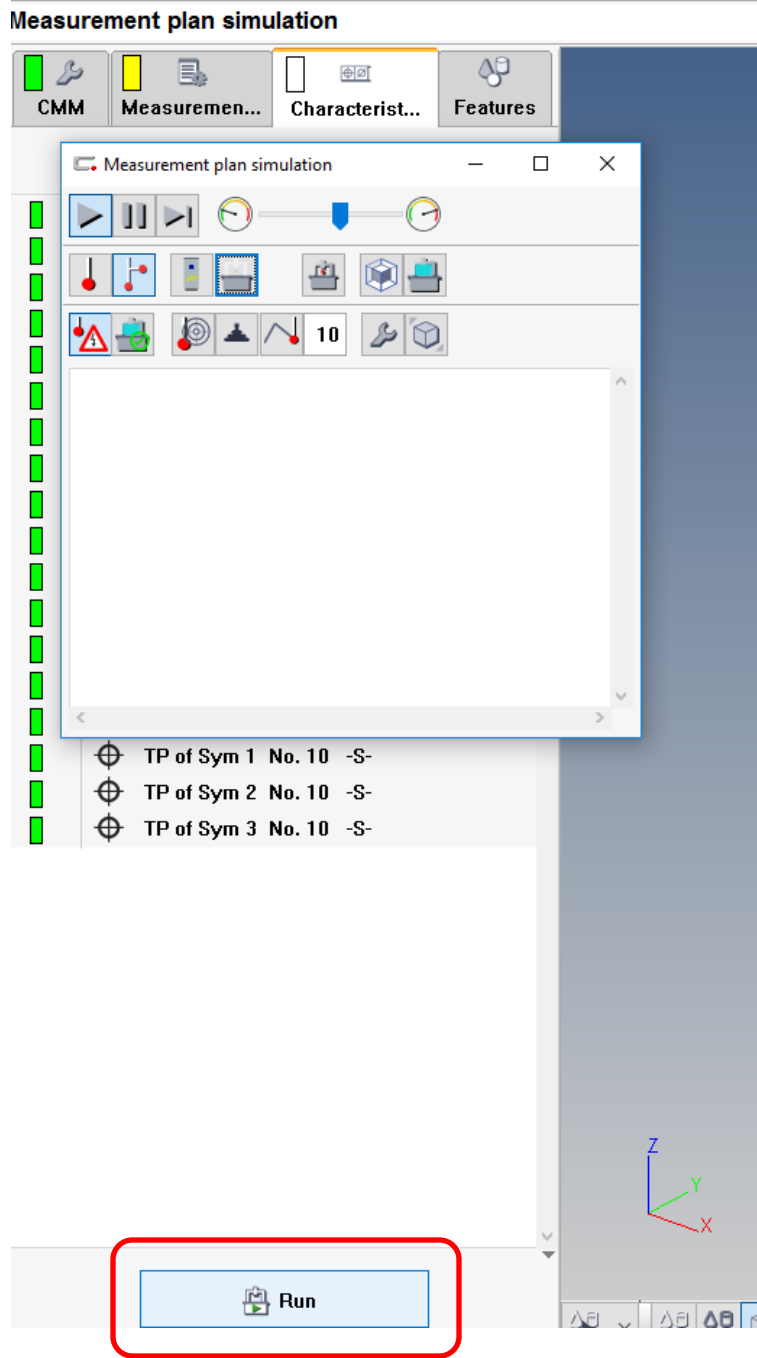
Simulation Panel



1. Controls
 - a. Start
 - b. Pause
 - c. Step
2. Run speed
3. Stylus
 - a. Stylus
 - b. Stylus System
 - c. Probe
 - d. Base plate
 - e. CMM
 - f. Clearance Plane
 - g. Display Measuring Range
4. Collision
 - a. Collision Observance – adds to collision list below
 - b. Check Measuring Range
5. Move
 - a. Follow Stylus system
 - b. CMM Operation
 - c. Show Navigation
6. Modify
 - a. Settings
 - b. Modify CAD Model
7. Collision List

Simulation

Planner/ Measurement Plan Simulation



The next step is to click the Run button

Setup the Run screen as desired and the simulation will begin.

