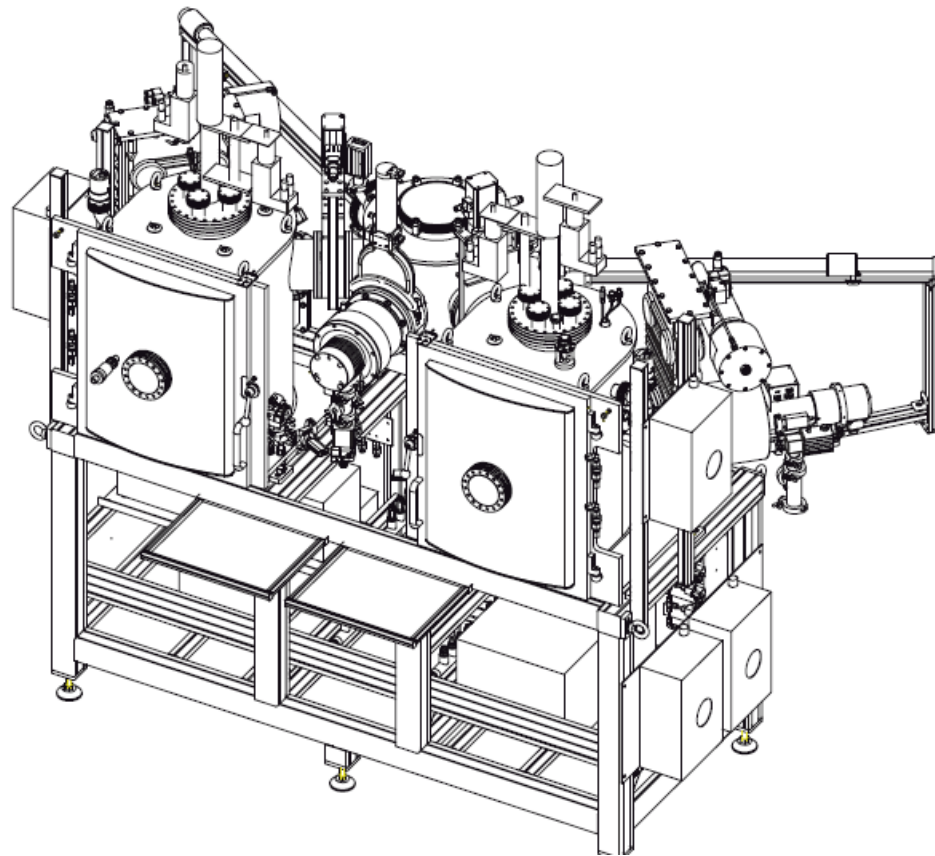# Oerlikon Sputtering Evaporator SOP
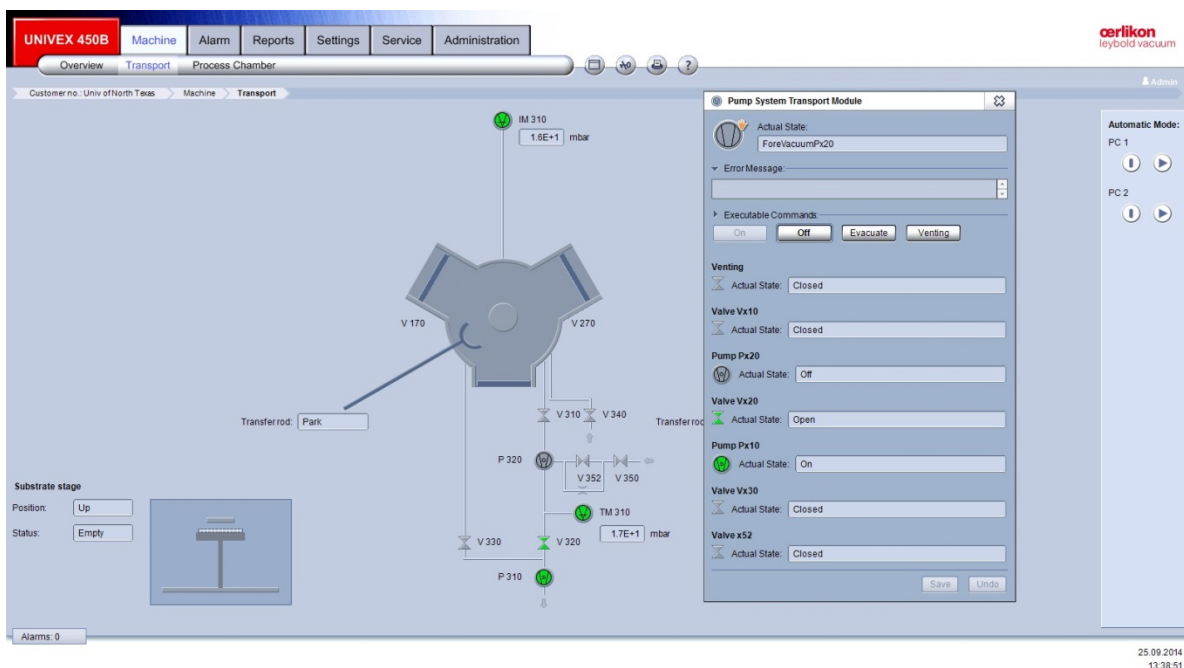# **Short**
UNT Cleanroom

1. **Taking out sample holder from "Transport Chamber":**

   - Log in FOM to access the software
   - Go to the software and log in with "user1" and password "user1"
   - Go to transport chamber page and click next to the p320 to "Venting" the chamber

2. **Prepare sample and load samples:**
   - For 4" wafer, the substrate holder has a ring to hold it. Loosen the screws and insert your wafer. Then tighten the screws.
   - For small samples, Kapton tape can be used to load the samples.
   - Place the substrate holder face down on the transport chamber table. The groove should fit in with the edge of the table

- Close the transport chamber door and tighten the latch knob a little
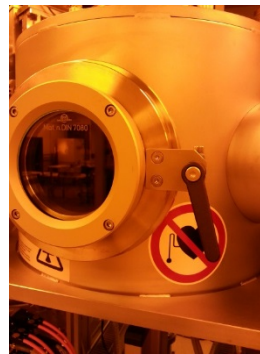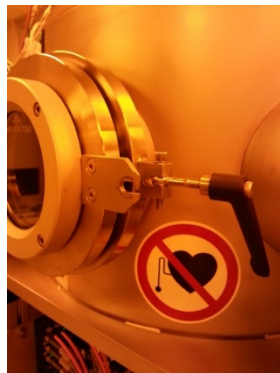
2.1 Loading sample:

1. Load the substrate holder back on the stage in transport chamber and make sure it properly sits.
2. Evacuate the transport chamber by clicking "evacuate" in "Pump system transport Module" page
3. Make sure Arm is at position sensor 2
4. Click "substrate inserted" at transport chamber at "Substrate table of Transfer chamber" page

Position 1

Position 2

Position 3
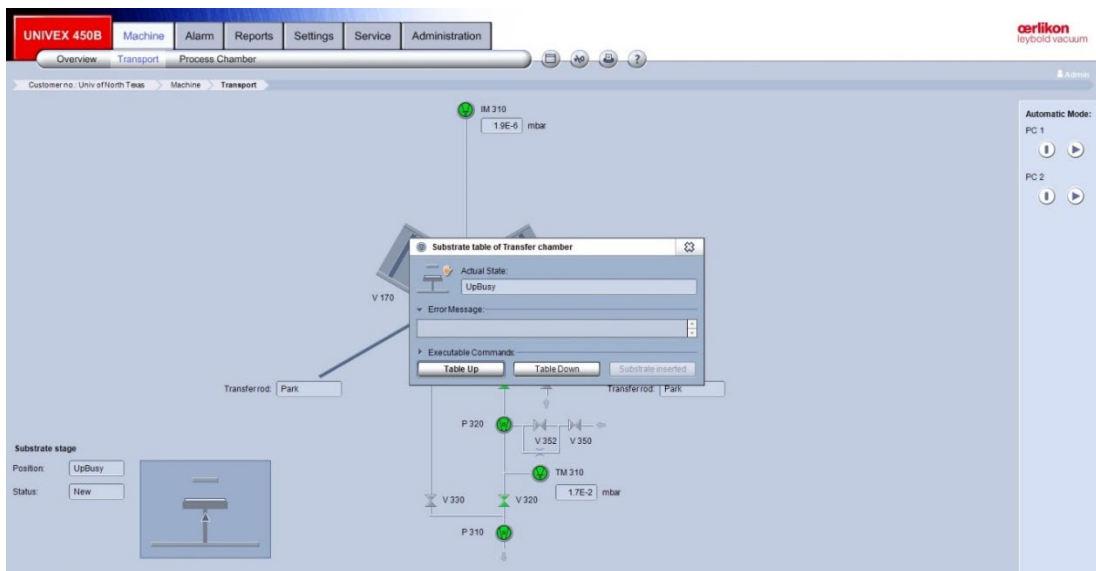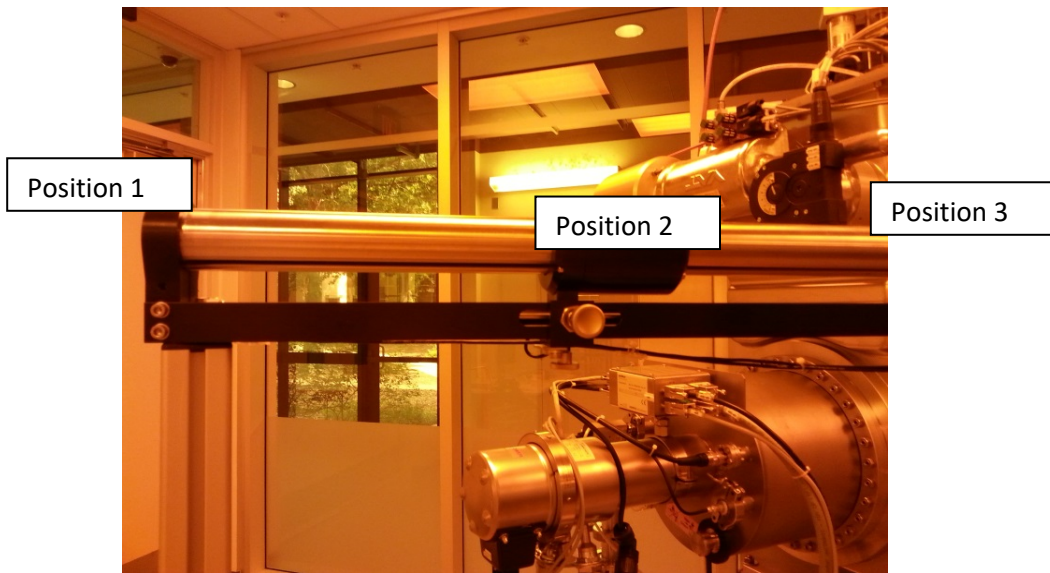
5. Click "Table down". Table has to be down to enable the valve V170 "open".

6. Once the transport chamber vacuum is less than **E-5 mbar,** Visual check to confirm shutter is out of the way inside Sputtering chamber!, then open V170 valve.

7. Transfer the arm all the way to position sensor 3 VERY SLOWLY!! Moving too fast will result in substrate holder falling off the arm.

8. Go to PC1 (sputtering process chamber page) and click "substrate up" on the "Substrate table" page.

9. Once the substrate is up, move the arm back to position 2 position sensor.
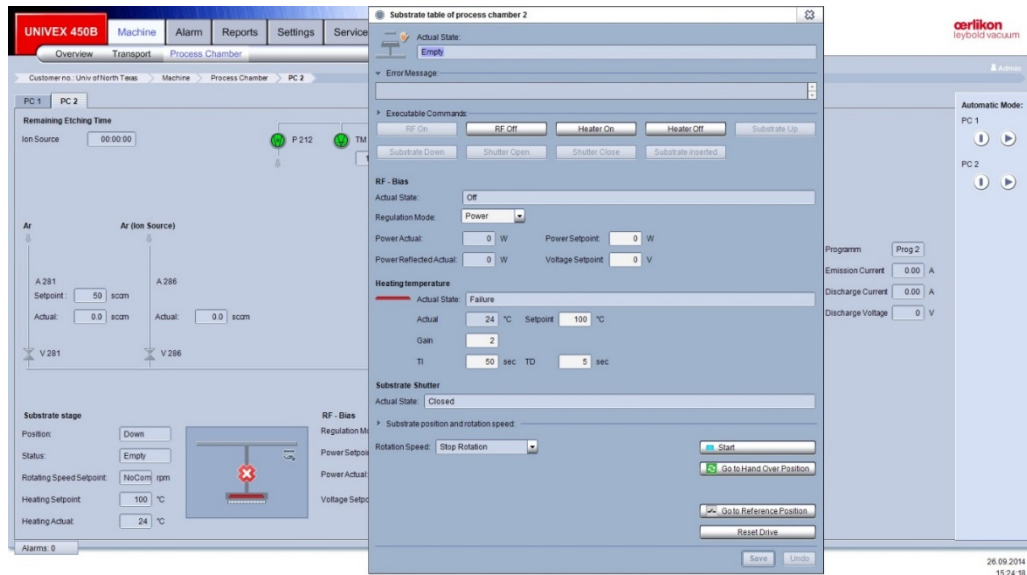
10. Click "Close" the V170 valve.
11. Click "Substrate inserted"" on the "Substrate table" page.
12. Click "Shutter close".

3. Deposition Process

Utility connection:
1. Before deposition process, MAKE SURE THE COOLING WTAER PUMP IS ON!!

2. Plug in the booster pump cord and turn on the booster pump switch.
3. Check the flow meters readings and the green lights underneath the readings should be ON!
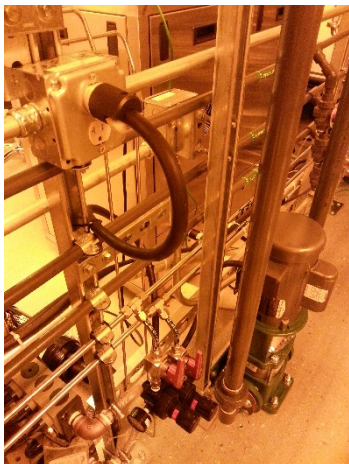

If cooling water pipes shake, turn off the booster pump immediately! Inform J.C. for further instruction.
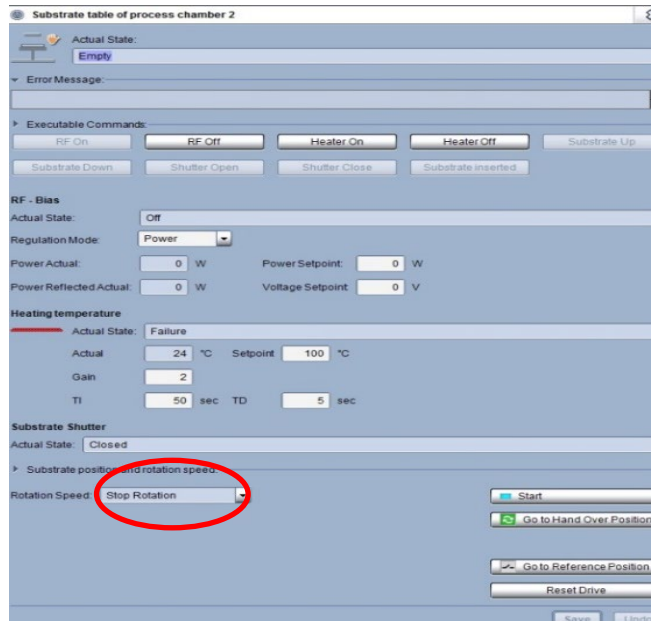
4. "Rotation Speed" at "Substrate table" page. The rotation will start automatically by choosing "4-6 rpm". **DO NOT click "start". It is for other function!!**

3.1 Sputtering Operation:

1. Make sure you have your sample loaded and clicked "substrate inserted" on the substrate table page.
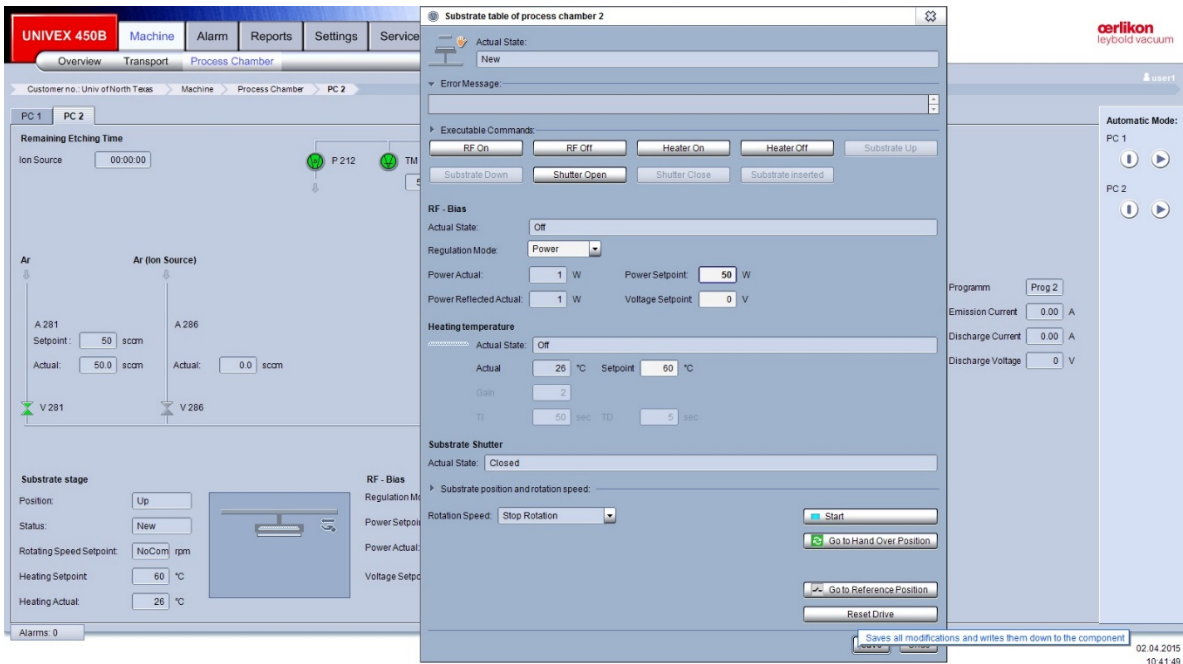
2. Click next to the gas lines to set desired gas flow and click "Open".
3. **Turn on** the RF/DC power supply on the control cabinet.
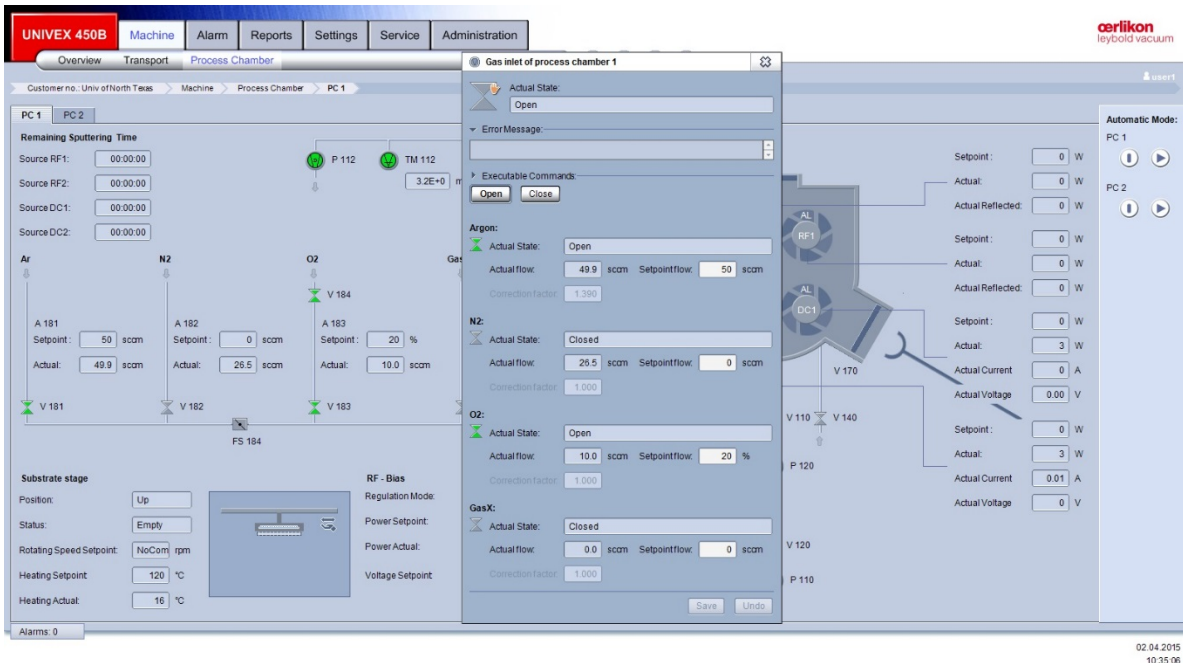

4. Go to the selected sputtering targets RF/DC and set desired power and press "Save".

5. Set up "Shutter Time Control" for run time: go to bottom of RF/DC Source page -> Shutter-> "Time Setpoint". Input desired run time and click "Save".

6. Make sure all shutters are closed. Click RF on/ DC on to turn on the power. **Verify visually the plasma is on.**
If plasma is not on, increase the gas flow to 40 sccm and retry it. Then lower gas flow to original value.
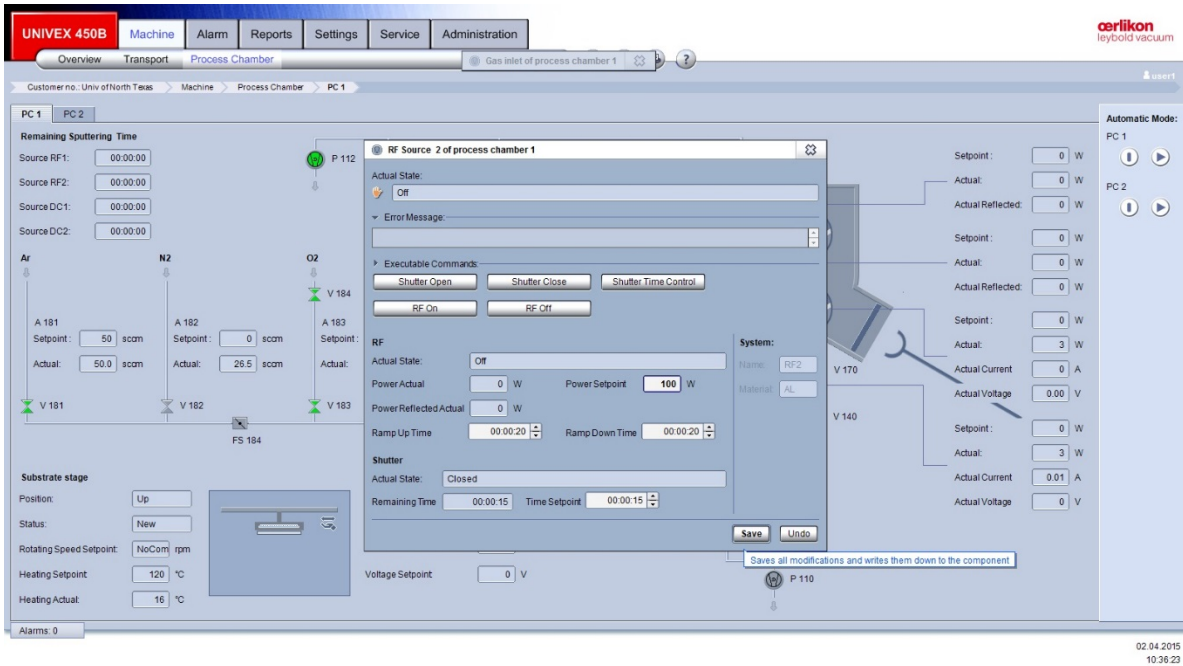

7. The target ion will turn into blue color and indicating plasma. The power setting will display on the right of the chamber icon.
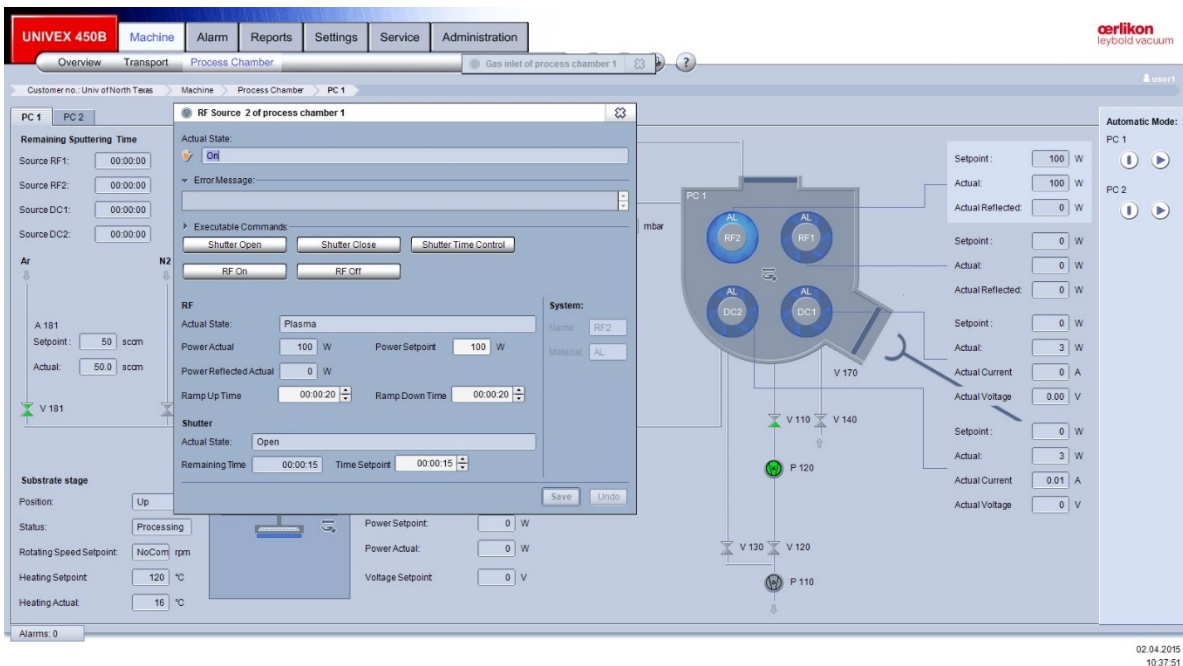
8. Click "Shutter Time Control" to start the deposition.

9. Once it reaches the set time, the shutters will close automatically to stop deposition to your sample. Click "RF/DC off" to turn off the power.

10. Then click "close" on the gas page to turn off the process gases.

11. Follow the sample retrieve steps to unload the sample.

4. Retrieve the sample from process chambers

1. Visually check the substrate shutter (open) and it should be Open if "shutter time control" was used.

2. Choose "Stop Rotation" if rotation is used.

3. Click "Go to handover position". The shaft for latching substrate holder rotates to hand over position. The icon became green.
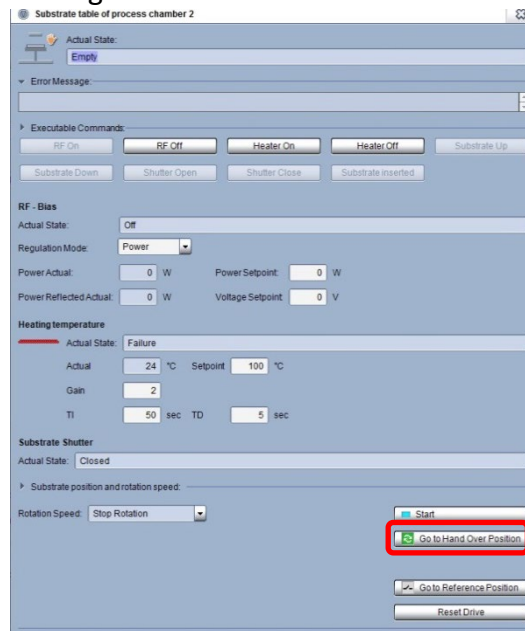
4. Verify the transport chamber pressure is <E-5 mbar. If transport chamber pumps are off, evacuate the transport chamber first.

5. **Visual check to confirm shutter is out of the way!** If not, redo step 1.

6. Open the V170 valves at process chamber.

7. Move the transfer arm into the process chamber and to engage position sensor 3.

8. At Process Chamber, click "substrate down" in the "Substrate stage" page. The shaft will lower to latch on the substrate holder stem.

9. Move the arm back to load-lock at position sensor 2 VERY SLOWLY!!

10. "Close" V170 valve.

11. Click "Table up" at transport chamber to enable the "Vent" function.

12. Venting the transport chamber to retrieve the sample.

13. Put sample holder back and on the table.

14. Evacuate the transport chamber and wait until the pressure <E-4.

15. Turn off the transport chamber pumps by click "off" on "Pump system transport module" page.

5. Shut down procedures:
1. Turn off booster pump switch and unplug the booster pump cord.
2. Turn off the power supplies.
3. Log out FOM.