Univex 450B SCSS (Single Chamber Sputtering System)
Oerlikon Experimental vacuum Coating System
Operating Instructions

1. Log into Coral to reserve access to the SCSS
2. Log on to the laptop computer (if needed).
   a. Select user: univex
   b. PW: univex
3. If the software for the SCSS in not running, click on the "SCSS" icon to start the SW.
4. The GUI for the software should come up, see page 25 of Operating Instructions Manual.
5. Click on the "Global" button that looks like a KEY at the top of the page and log in.
   a. User Name: Admin
   b. PW: admin
6. A basic process for the SCSS is as follows:
   a. Mounting your sample on the chuck
   b. Placing the chuck into the loadlock (LL)
   c. Moving the chuck into the chamber & then into the sputtering position
   d. Running and completing a recipe
   e. Moving the chuck from the chamber into the loadlock
   f. Removing the chuck from the loadlock
   g. Removing your sample from the chuck
7. After you have finished, place the machine in standby
   a. Stop all processes by clicking on and Disabling the "On" and "Run" buttons in the Automatic Mode operator's panel
   b. Place the Loadlock under vacuum
   c. Make sure the chuck is sitting on a polypropylene donut with the shaft in the center of the donut
   d. Clean up the area (even if you didn't mess it up)
   e. Log Out of the machine!!
8. A few notes:
   a. The nominal pressure inside the LL & main chamber is in the -7's & -8's, report any problems
   b. The metals loaded are indicated on the round Magnetron icons inside the chamber on the GUI.
   c. Only authorized users are allowed to use the SCSS (those who have received training).
9. Other
   a. This is a basic quick start operator's instruction. There is additional information in the Oerlikon operating instructions manual that shows more of the GUI panels and icons. Refer to it as necessary.

Mounting your sample on the chuck
1. Make sure the chuck is placed on a polypropylene (PP) donut with the shaft in the center of the donut. Doing this will help to eliminate the shaft from being bent and possible damage to your wafer.
2. Using the brown tape, tack down 2 sides of your wafer/sample in the center of the chuck.

Placing the chuck into the Load-Lock (LL)
1. Make sure the transfer arm is all the way to the left and the little yellow light on the sensor is lit (the green power light should always be lit).
2. Loosen (if not already loose) the black handle on the LL door and move it away from the door clamp.
3. Select the "Transport" screen, click below the LL chamber, another window should pop up. Click "Venting" to open the LL chamber.
4. Once the LL chamber reaches atmosphere open the door.
5. Place the chuck onto the circular cutout in the fork.
6. Close the LL door and tighten the black handle.
7. Select the "Transport" screen, click "Evacuate" to pump the LL chamber.
8. Once the chamber pressure has reached the 10-1 mbarr range (on the IM210), loosen the black handle and move it away from the door

Moving the chuck into the chamber & then into the sputtering position
1. From the "Substrate Stage" control box, select "Go to the Handover Position", wait for the arrows to be highlighted in green. Select the "Process Chamber" screen, click near the gate valve on the LL chamber and click "open" to open the gate valve into the chamber. (Note 1 applies here.)
2. Slowly slide the transfer arm round black control handle forward until it stops against the plate. The little yellow light on the sensor should be lit (the green power light should always be lit). The yellow LED is lit when it senses that the transfer arm is in a home or loading position.
3. Select the "Substrate Stage" control box, another window should pop up, choose "Substrate Up". Wait until the little upward moving arrow on the chuck disappears to indicate the chuck has stopped moving.
4. Slowly withdraw the transfer arm moving the round black control handle backwards until it stops against the plate. The little yellow light on the sensor should be on. Make sure the chuck is not on the fork (use the flashlight if necessary to view inside the LL).
5. Click near the gate valve and select "Close" to close the gate valve. The nominal pressure inside the chamber should be in the 10-6 mbarr range (on the IM110), before proceeding to running a recipe.

Running and completing a recipe
1. Select "Settings" from the Navigation Terminal on the GUI.
2. Select "Magazine" from of the top of the Navigation Terminal.
3. From the right side of the GUI, under "Process Recipes" and expand the recipes box. Click/hold/and drag a recipe to the "Assigned Process Recipes" box. The current recipe may be removed by selecting the "Clear" button in the lower left corner of the screen.
4. Select "Machine" then "Process Chamber" from the Navigation Terminal on the GUI.
5. Select the "On" button (circle with a vertical line) from the "Operator's Panel". This will turn on the Automatic Mode. The vertical line should turn green.
6. Select the "Run" button (circle with an arrow) from the "Operator's Panel". This will run the selected recipe in the Automatic Mode. The arrow should turn green.
7. After the recipe has finished, de-select the "Run" button and the "On" button from the "Operator's Panel". Both icons should now be grayed out (disabled).

Moving the chuck into the Load-Lock
1. From the "Substrate Stage" control box, select "Go to the Handover Position", wait for the arrows to be highlighted in green. Select the "Process Chamber" screen, click near the gate valve on the LL chamber and click "Open" to open the gate valve into the chamber. (Note 1 applies here.)
2. Slide the transfer arm round black control handle forward until it stops against the plate. The little yellow light on the sensor should be lit.
3. Select the "Substrate Stage" control box, another window should pop up, choose "Substrate Down". Wait until the little arrow on the chuck disappears to indicate the chuck has stopped moving.
4. Slowly withdraw the transfer arm moving the round black control handle backwards until it stops against the plate. The little yellow light on the sensor should be lit.
5. Click near the gate valve on the LL chamber, another window should pop up. Click "Close" to close the gate valve.

Removing the chuck from the Load-Lock
1. Loosen (if not already loose) the black handle on the LL door and move it away from the door.
2. Select the "Transport" screen, click below the LL chamber, another window should pop up, click "Venting" to open the LL chamber.
3. Once the LL chamber reaches atmosphere open the door.
4. Lift the chuck out and place on to a PP donut. Make sure the shaft is in the center of the donut. If you are doing another sample, place the other chuck inside on the fork.
5. Close the LL door and tighten the black handle.
6. Click "Evacuate" to pump the LL chamber.
7. Once the pressure has reached the 10-1 mbarr range (on the IM210), loosen the black handle and push it away from the door.
8. Repeats other steps as necessary to process more wafers.

Removing your sample from the chuck
1. Place the chuck on a polypropylene donut with the shaft in the center of the donut.
2. Remove the brown tape from the chuck/sample and discard the tape in the trash. *DO NOT!!* stick the tape to the table.

Notes:
1. At times the chuck rotation control can lose its position information. The chuck rotation control may have to be "Reset", or go to one of either a "Reference" or "Handover" position. To do this go to the "Substrate Stage" control box and select it, several options will occur, chose one to try and correct the problem. The small circular arrows on the "Go to Handover Position" should be highlighted in Green to allow a transfer and the gate valve to be opened.
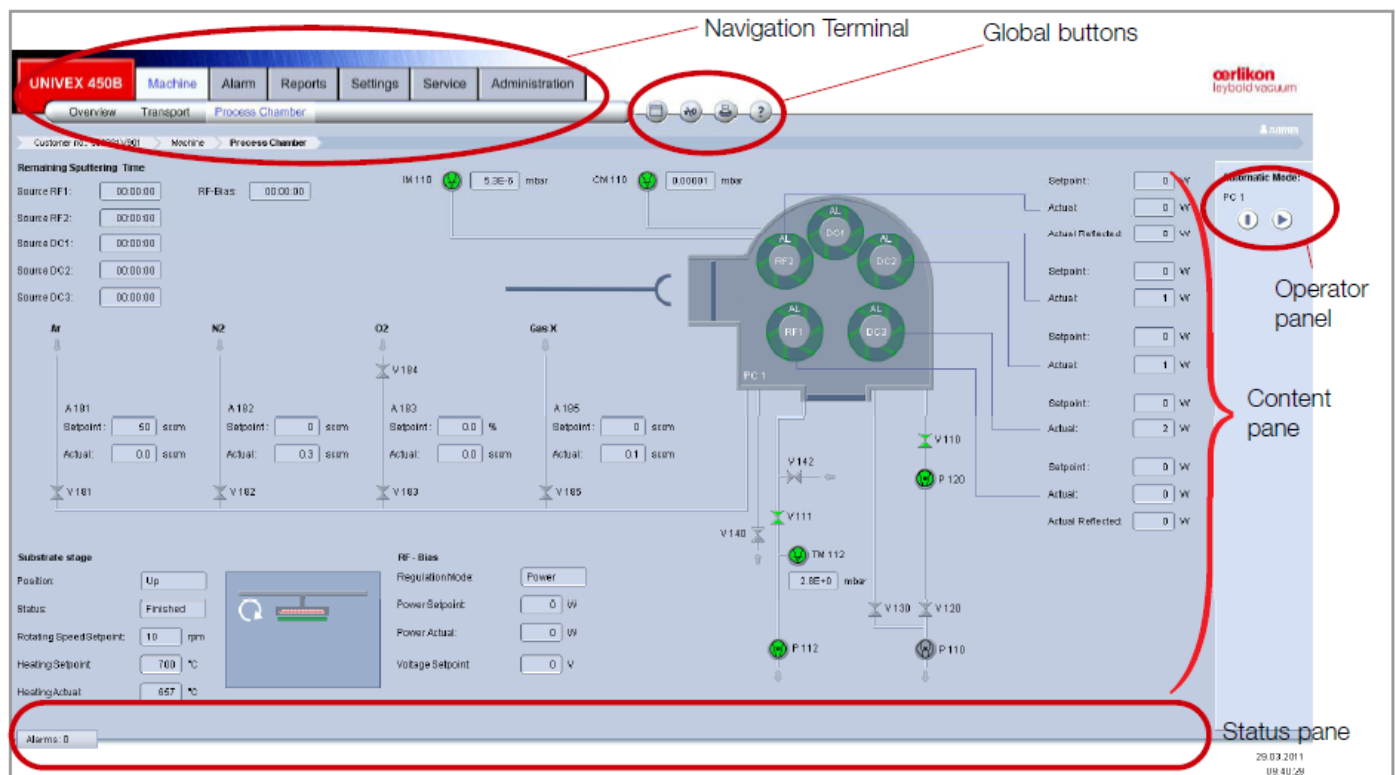2. If the compute does not seem to be following the instructions or running a recipe, "Restart" the computer and try again.

Fig. 4.1 Schematic overview of the UNIVEX process chamber