

Kurt J. Lesker AXXIS Sputtering System

Operating Instructions

This machine is to be used by authorized personnel only. For training & consultation contact:

Manager, **Greg Book**, (678) 372-4665, book@arizona.edu

1. Contact a Staff Member if you observe anything unusual such as the controller and the thickness monitor being off, chamber not under vacuum, or strange and unusual noises. DO NOT ATTEMPT TO OPERATE THE SPUTTER COATER if there are any doubts.
2. Also advise as to which targets will be used. A member of the staff will install the targets and prepare the instrument.
3. Place the "Machine Reserved" sign on the sputter coater.
4. ENABLE AXXIS using iLabs, log into system with passwords and user id's

Preliminary Check, Loading Substrates & Pumpdown

1. Check that the system is functioning normally, i.e. pumps and valves are working and in the correct state to begin. The computer display should be as in Figure 1. If not, contact MNFC staff to help. It could be that the iLabs interlock is not working or the computer needs a reset.
2. Click on the Start PC Vent button located on the right side of the screen.
3. Pull door latch loose. Wait for door to open.
4. Open door and place sample on stage. Use tape or clips to fix sample to surface. Leave stage shield in place.
5. Close door by lifting door up and tightly holding the door shut once closed. The hinges are wearing out.
6. Click on the Start PC Pump button located on the right side of the screen.
7. Hold door shut until PC High Vac Valve can be heard to open and pressure begins dropping.
8. Wait until the pressure drops below $1.00E-5$ before processing. Usually this takes overnight.
9. The computer display screen should appear as in Figure 1.

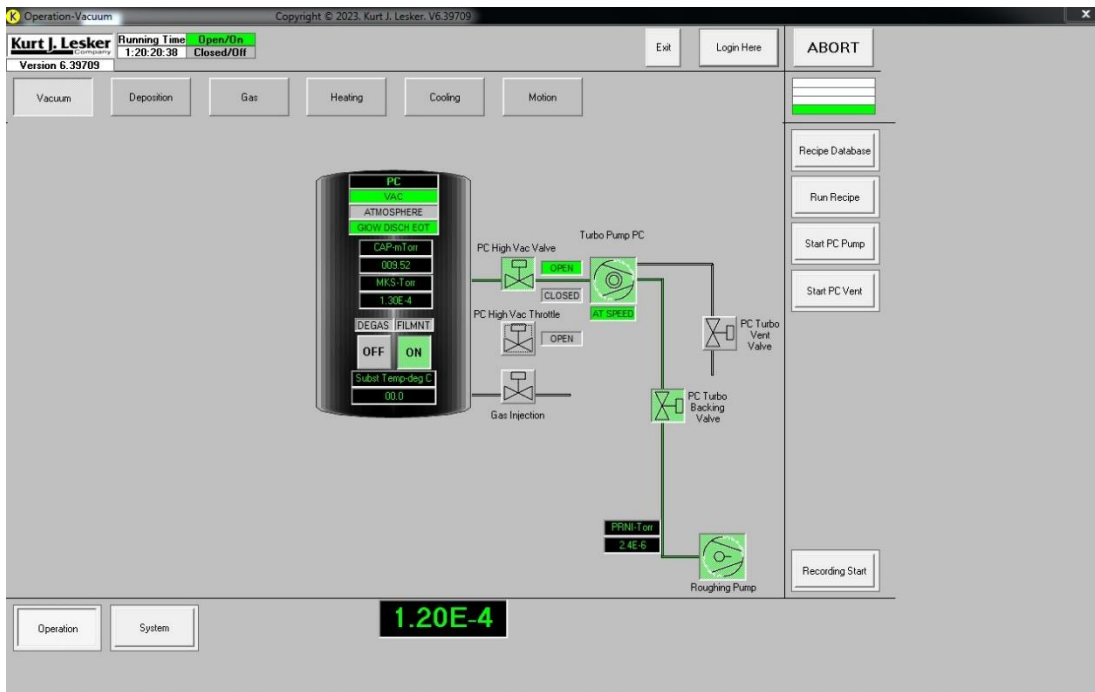


Figure 1 - Starting Status of AXXIS sputter coater.

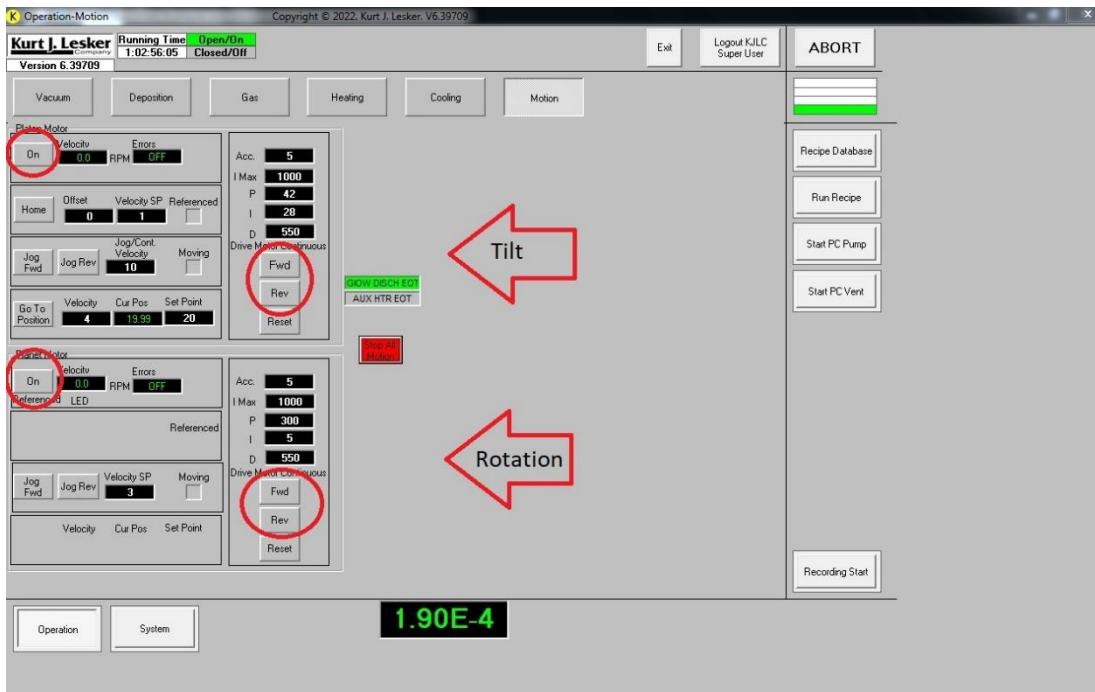


Figure 2 - Rotation and Sample Orientation

Rotation – Set sample orientation and rotation

1. Click the Motion button to show Figure 2.
2. Click ON and FWD (or REV) of Tilt panel to orient the sample stage so to get the desired degree of angle between stage and target.
3. Click ON and FWD (or REV) of Rotation panel to enable continuous rotation around axis perpendicular to sample (for improved uniformity).

RF Deposition

1. Click on PC High Vac Throttle valve button and insure button is green.
2. Click on Gas Injection valve button and insure button is green.
3. Click on Gas tab so Figure 3 is displayed on the screen.
4. Click on Setpoint SCCM for MFC2 - Circled in Figure 3.
5. Type desired Argon flow into dialog box (MFC2 SP) in Figure 4 and click OK.
6. Click the Deposition tab. See Figure 5.

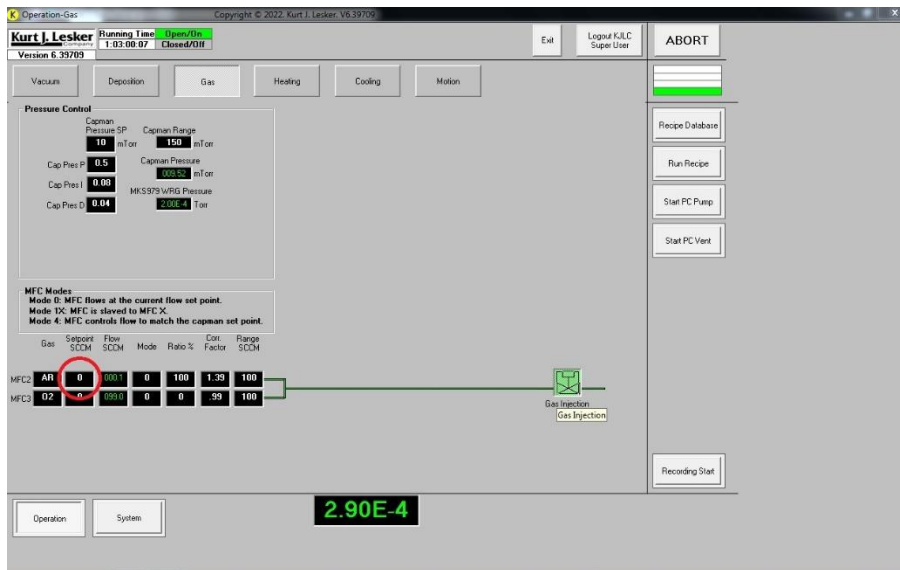


Figure 3 - Gas Set-Up Screen

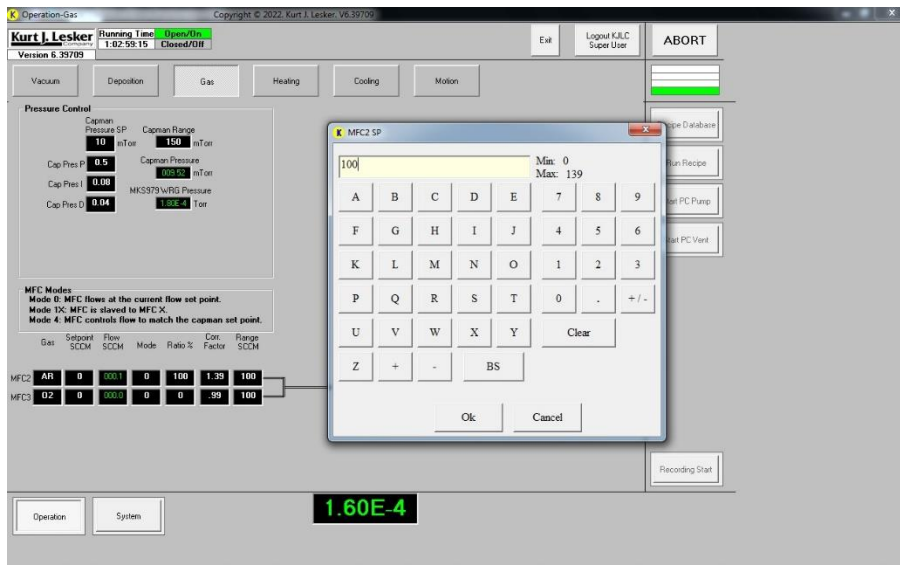


Figure 4 - Gas Setup Dialog Screen

7. Click on Source SW1, Power Supply 3 and Power Supply 4. These enable the RF and DC power supplies.
8. Turn on the power to the MDX 1K and RFX 600A power supplies in the equipment rack.
9. Turn on MDX1K Output. Wait for plasma to ignite on right-hand Target 1.
10. Push RF \oplus pushbutton switch to power on RF plasma to left-hand target 3.
11. Open Source Shutter 3 after which RF plasma should ignite.
12. If RF plasma fails to ignite, open and shut Source Shutter 5 momentarily.
13. When RF plasma starts, shut off output from MDX 1K and turn off power to it.
14. If RF plasma still fails to ignite, turn off power to both the MDX 1K and RFX 600A power supplies and advise MNFC staff for help.
15. When RF plasma starts, begin timer for desired deposition thickness.

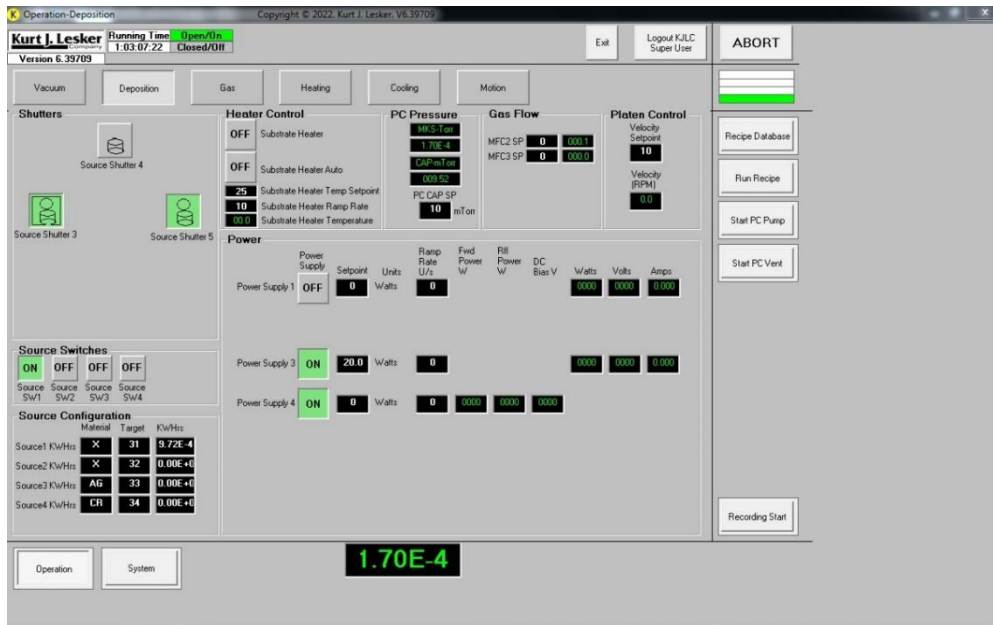



Figure 5 - AXXIS Deposition Tab Screen

DC Deposition

1. Click on PC High Vac Throttle valve button and ensure the button is green.
2. Click on the Gas Injection valve button and ensure button is green.
3. Click on Gas tab so Figure 3 is displayed on the screen.
4. Click on Setpoint SCCM for MFC2 - Circled in Figure 3.
5. Type desired Argon flow into dialog box (MFC2 SP) in Figure 4 and click OK.
6. Click on the Deposition tab. See Figure 5.
7. Click on Source SW1 and Power Supply 3 to enable the DC power supply.
8. Turn on the power to the MDX 1K power supply in the equipment rack.
9. Turn on MDX1K Output. Wait for plasma to ignite on right-hand Target 1.
10. Open the Source Shutter 5 and start timer.

Shutdown

1. Click on the Deposition tab. See Figure 5. Press green Source Shutters on operating targets. Buttons should not then be green.
2. Push RF  pushbutton switch to power on RF plasma to left-hand target 3 if doing an RF deposition.
3. Turn off the Output from the MDX 1K power supply.
4. Turn off the power to the MDX 1K power supply.
5. Also click on Source SW1 and Power Supply 3 and Power Supply 4 to disable the magnetron power supplies. Buttons should not be green.
6. Go to Motion tab - Figure 2. Stop rotation – Press the FWD/REV buttons and OFF buttons so they are no longer green.
7. Click on Gas tab so Figure 3 is displayed on the screen.
8. Click on Setpoint SCCM for MFC2 - Circled in Figure 3.
9. Type '0' Argon flow into dialog box (MFC2 SP) in Figure 4 and click OK.
10. On Vacuum screen, Figure 1.– Click Gas Injection Valve and PC High Vac Throttle buttons. Color will change from green to grey again.
11. Vent Chamber to retrieve sample – Click on Start PC Vent. Loosen door latch.