# User Instructions

# Oxford Instruments
# System100 ICP300

# For the Micro-Electronics Laboratory

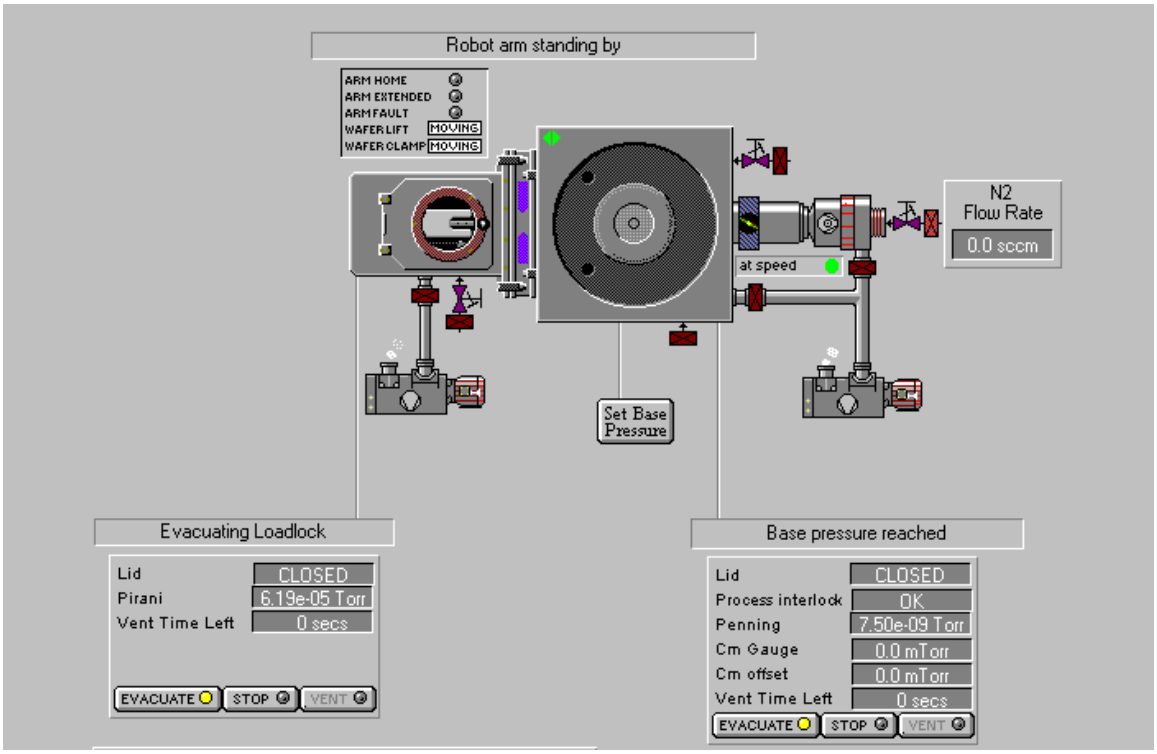
# at

# University of Notre Dame

# Department of Electrical Engineering

# Standby conditions

1. The process chamber and the load lock chamber should be closed and “Evacuate” should be lit on both pumps.




2. The program should be showing the pump control page. If not, go to Menu “System”, click “Pumping”, and check the bottom left of the screen, where it shows the Loadlock Chamber Pressure. Make sure that it is ~ 2e-02 Torr or better.

3. Check the process chamber base pressure at the bottom right of the screen, and its normal reading after processing is ~ 2e-06 Torr or better.

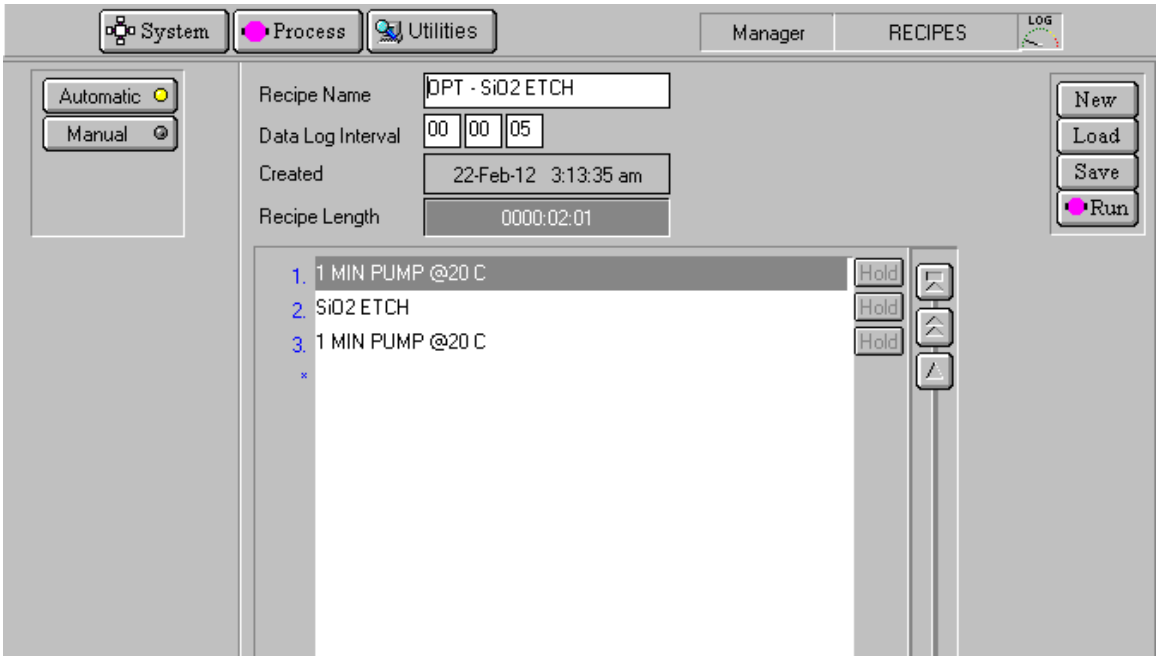
   Overnight pumping will bring the base pressure down to 8e-07 Torr or better. If you find it is much higher than this value, check when the last user used this machine. If the pressure is still too high even after one hour pumping down, please report a problem in coral.

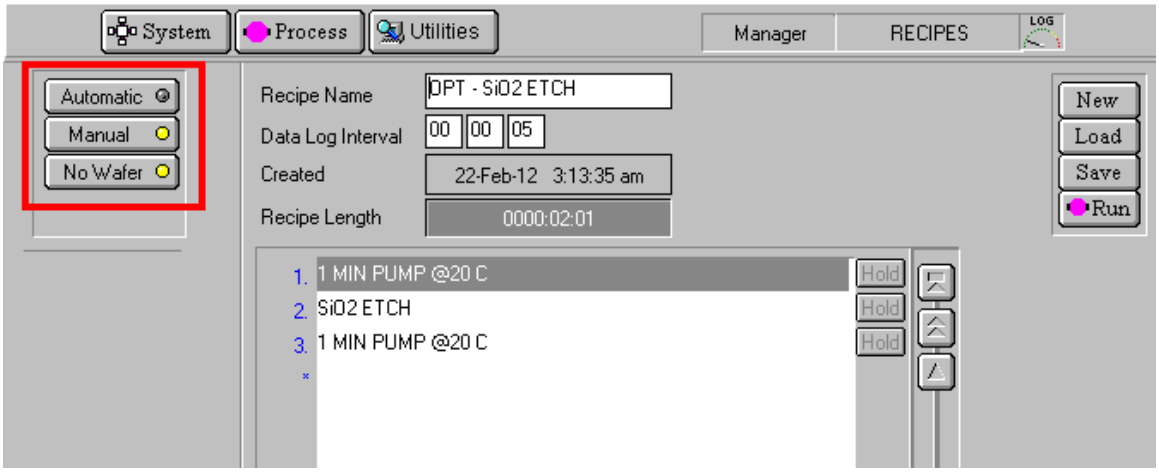
4. The $N_2$ flow rate for the turbo pump is around 80 sccm at the time the system is installed. Note: $N_2$ flow rate should be kept greater than 50 sccm, otherwise turbo will stop automatically.

# Start an automatic process run

1. Log into iLab and enable the machine.

2. Automatic process is recommended. The difference between the automatic and manual process is that, in automatic mode, the system will automatically do the wafer transfer.




3. A carrier 4 inch wafer should be used to load small samples. Kapton tape can be used to tape small samples to the holder. Fomblin oil is recommended to stick small samples to the carrier wafer for better heat conductivity especially for low temperature process.

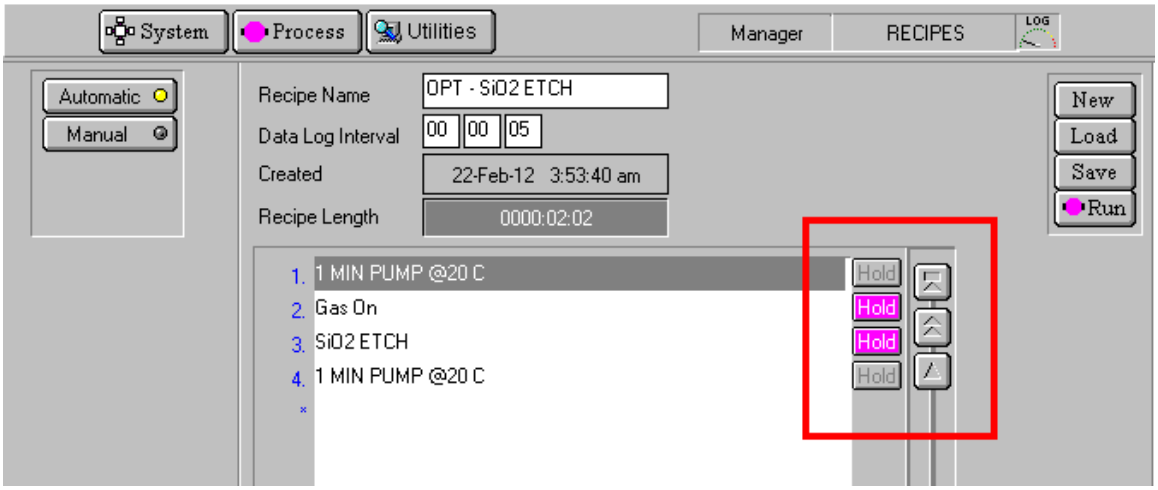
4. Go to Menu “System”, click “Pump”. Check if the pressure in both loadlock chamber and process chamber is at normal conditions.

5. Go to the bottom left of the page, click “Stop” and then “Vent”. The loadlock chamber starts to vent. It takes ~3 minutes to reach the atmospheric pressure.

6. Open the lid, and put the carrier wafer on the robot arm and align the major flat of the wafer parallel to the two pins. This way the wafer clamp will be aligned nicely on the carrier wafer to minimize Helium flow for backside cooling. Close the lid and click “Stop” and then “Evacuate”.

7. Go to Menu “Process” and click “Recipe”. Load the appreciate recipe for etching. You can create and edit your own recipe referring to those recipes with the name beginning with your NETID. (“mrichmon -”.)

A standard recipe usually contains the steps as shown in the following screen shot. It starts with normally 1 minute pump then the main etching followed by another 1-2 minute pumping before unloading wafer from the chamber.




8. Save your recipe by clicking “Save” with a name starting with your NETID and click on “Run”. If you have previously saved a recipe, you can load your saved recipe by clicking the “load” button and then Click “Run”. Under “Automatic” mode, the sample will be automatically loaded from the loadlock chamber into the process chamber.

9. During the process all process parameter will be displayed on “chamber 1” process page. It is a good habit to observe any abnormal readings such as unstable pressure, Helium backside cooling pressure (flow) and reflected powers.

10. When the process finishes, the sample will be automatically unloaded from the process chamber into the loadlock chamber. “Process completed” will show up. Click “OK”.

11. Go to Menu “System”, and click “Pump”. Go to the bottom left of the page, and click “Stop” and then “Vent”. When venting is finished, open the lid and remove the carrier wafer. Close the lid, click “Stop” and then “Evacuate” on the screen.

12. 5-10 min of O2 plasma clean is recommended in between different etching processes.

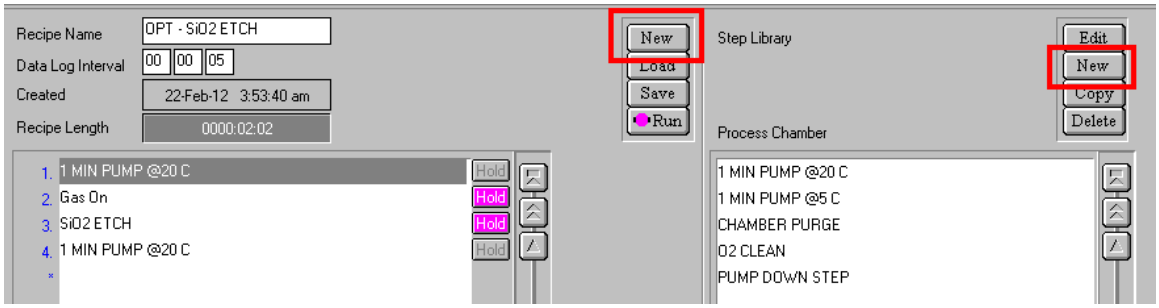
13. Set the machine to the standby conditions.

14. In iLab disable the machine.

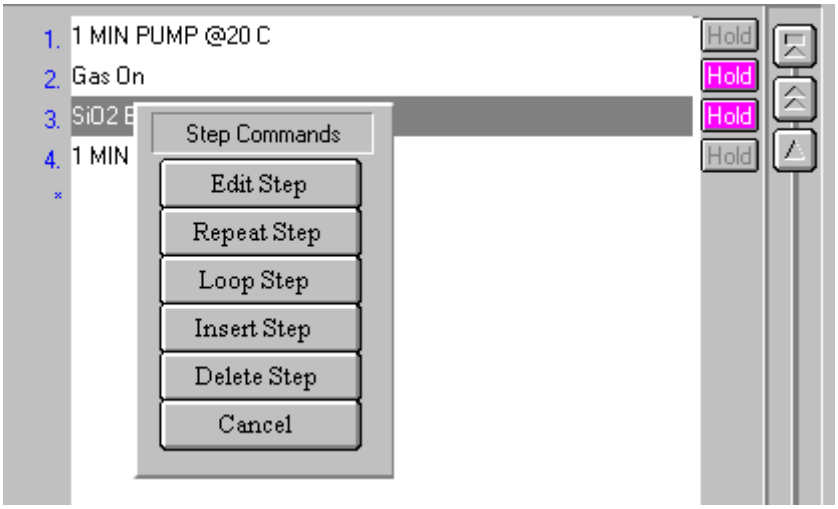
# Creating a New Recipe

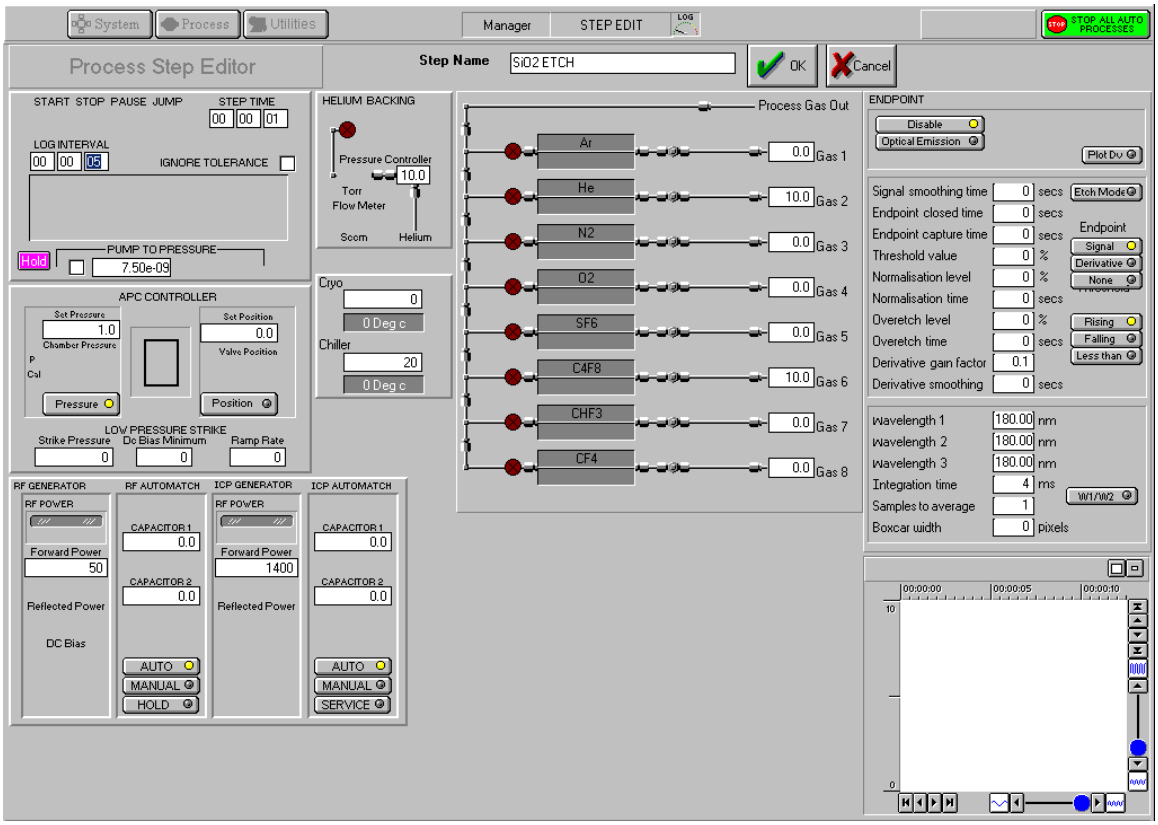
1. In the recipe panel or step library, click “New”. A new recipe name or new recipe

step in the library will be created.




2. Click a recipe step in the step library list. Then hold down the left mouse button, drag the mouse pointer to the step name field next to the asterisk (*), and release the mouse button. The step name is displayed in the step name field.
3. If desired, the recipe step can be edited using step commands pop-up menu accessed by clicking on the recipe step field. For example the step time or any of the process parameters can be changed.






4. Continue dragging recipe steps into the recipe as required until the recipe is complete. When the step name field has been filled, the recipe step list can be scrolled. This allows a maximum of 1000 steps to be added.
5. To remove a step from the list, click on the step to highlight it and then click “Delete Step”. All subsequent steps ascend the list by one place to fill the gap that has been created.
6. To insert a step before an existing step, click on the existing step and then click “Insert Step”. The selected step and all succeeding steps, ascend the list by one place. Another step can then be dragged from the “Step Library list” into the vacant row.
7. When all steps have been added, enter the required data log interval time into the Data Log Interval field.
8. All recipes are required to have a “purge” and “evac” steps (X2) before unloading the chamber.
9. Type a name for the recipe in the Recipe Name field. The name should contain enough information so that the recipe can be identified without examining the steps it contains.
10. Click “Save” to save the recipe.