


E-line Protocol

1. Load sample **via loadlock**
2. Follow on-screen instructions until load procedure is complete
3. Pop-up window: Reset UV adjustments. Press OK (unless you want to keep the previous UV alignment, then press cancel)
4. Pop-up window: Re-use previous current parameters. Press cancel. (if you want to keep the same parameters press ok and skip step 6)
5. Open correct wafermap (100mm_ush.wlo)
6. **Column Control** Choose settings and activate (typically 20-30kV, 20 μ m, 10mm for writing & 5kV, 10 μ m, 18mm for SEM). Focus beam.

NOTE: For SEM you may focus and image at this point, for E-beam lithography continue with the following steps:

7. **Adjustments** – Adjust UVW(Global) – Adjust W – uncheck "read from CCD" click pipette icon  then "adjust"
8. **Adjustments** – Drive – Set W (working distance) to 10mm
9. Focus beam
10. **Adjustments** – origin correction – press adjust to define your sample origin (U=0, V=0)
11. Burn spot and focus beam
12. **Patterning** – Beam current – check "drive back" choose "FC on flat USH" and press measure
13. **Adjustments** or **Writefield Control** – Scan manager – Writefield alignment – Manual – execute **three** alignments:
 - a. 5 μ m marks, 100 μ m WF
 - b. 2 μ m marks, 100 μ m WF
 - c. 1 μ m marks, 100 μ m WF
14. **Design** – open GDS file with your design. View and edit as needed.
15. Drag design file onto wafer map near alignment mark
16. **Patterning** – patterning parameters – calculator icon – define area dose and auto-calculate all parameters until all text is **black** (**red** text means parameters are not properly calculated)
17. To create a matrix click on the positions list. The main toolbar will give additional options:
 - a. Filter – matrix copy – create matrix of design with varying dose
18. **Automation** – drag "Beams shutdown" to end of positions list
19. Scan – "all" **to start writing**
20. When lithography is complete unload sample **via loadlock**

DON'T FORGET TO FILL THE LOGBOOK

E-line Important Notes

1. Load and unload from the loadlock only. Do not open the chamber
2. Adjust $w = wd = 10$.
3. To restart the SmartSEM program you must restart the E-line program. You cannot open SmartSEM independently
4. Ensure transfer rod is completely pulled out before opening the loadlock door
5. open/close loadlock door by holding the door, not the transfer rod