

# EBL1 (Elionix EBeam Lithography System)

## Load Sample/Beam Setup/Exposure Operating Procedure

### LOAD SAMPLE

1. Select **Exchange** position.
2. Ensure **ISO Valve** is closed. (The icon should NOT be orange)
3. Toggle red **Vent/Evac** switch to **Vent** and wait for solid red light signal.
4. Unlock chamber.
5. Pull **Exchange Arm** back slowly to open stage.
6. Place wafer/sample holder in correct position using. (See Appendix 1)
7. Set wafer/sample on stage assembly.
8. Set holder spring.
9. Close stage and lock chamber.
10. Toggle red **Vent/Evac** switch to **Evac**.
11. Wait for LED to turn solid green. (5.0 e-0 Pascal)
12. Toggle red **Gate Valve** switch to **Open** position. (Verify by viewing laser through viewport.)
13. Unlock **Exchange Arm**. (Turn Left)
14. Push **Exchange Arm** in slowly until it stops.
15. Unscrew **Exchange Arm**. (Turn Left)
16. Pull back **Exchange Arm**, verify that it is disconnected from the stage.
17. Push **Exchange Arm** forward lightly to ensure stage is completely loaded into position.
18. Pull back **Exchange Arm** slowly.
19. Lock **Exchange Arm** (Turn Right)
20. Toggle red **Gate Valve** switch to **Close**.

### BEAM SETUP

21. Select the **Isolation Valve** icon to **open** the isolation valve (Icon should turn orange when valve is open)
22. Select **Beam** menu, then the **Beam Memory**.
23. Select **Recall Recipe**.
24. Select the desired **Recipe**.
25. Close the **Beam Memory** window.
26. Select Faraday Cup icon (**FC**).

27. Select the **Beam Blank** icon to Unblank Beam.
28. Select **TV or Rapid Scan Mode**.
29. Change magnification to **100X** in order to locate Faraday Cup.
30. Center Faraday Cup using **Stage Center** option.
31. Set magnification to **1,000X**.
32. Select the **Spot** icon.
33. Use the Beam Current Meter on Control Panel to measure Beam I (**Zero Check Off**).
34. Use the **Lens Alignment Left** and **Right Arrows** to adjust the beam current.
35. Turn Meter off after verification (**Zero Check ON**).
36. Select the **Beam Blank** icon to Blank Beam.
37. Select **Reference** (Gold coated reference sample for focus check).
38. Allow stage to move to position.
39. Select **Beam Blank** icon to Unblank Beam.
40. Select **TV or Rapid Scan Mode**.
41. Set magnification to ~ **100X** to find scratch mark on gold reference sample.
42. Increase magnification up to **100000X – 150000X**.
43. Right click on mouse to Select **Focus, Stigmat, Contrast, Brightness** to obtain optimal image.
44. Select the **Beam Blank** icon to Blank Beam.
45. Perform **Z Height Adjustment**.
46. Select **Stage Memory** icon.
47. Enter chip position coordinates and select the **Move** icon.
48. Under the **Position** menu adjust Z height value until the laser display unit on the control rack reads <.00003
49. Note this Z Height value and enter it into the **Z Preset** window under the **Set Options** menu at **Step 62**.

## EXPOSURE

**\*If Overlay is required, refer to EBL Overlay Procedure document.\***

**\*If Field Correction is required, refer to the EBL Field Correction document\***

50. Transfer CAD files to the CAD PC via memory stick, CD, or DVD by inserting into USB port or CD/DVD drive on the **CAD PC**.
51. Be sure to select your desired Field Size and Dot Density in the WECA software PRIOR to opening your Con File.
52. Under the File menu select "**Open an existing CON file**".
53. Select desired file.
54. Select **EXP** icon.
55. Select **OK**.

56. Create new schedule file or load previously created file per the **EBL CAD Procedures** document.
57. Be sure to enter the **Z Height value** obtained at **step 53** into the **Z Preset** window under the **Set Options** menu, and choose **Preset ON**.
58. Select **Exposure** icon.
59. Select **Exposure** icon in the Exp. Grap. menu.
60. **If** Field Correction is needed (ie. Stitching) select the **Field Correction** icon, and follow Field Correction Procedure document.
61. Select **Exposure** icon in the Exposure menu.

## **UNLOAD SAMPLE**

62. Toggle the **Control Key** twice to switch to **SEM PC**.
63. Select the **SEM** Icon.
64. Select the **Isolation Valve** icon to **close** the isolation valve.
65. Select the **Exchange** icon.
66. Toggle red **Vent/Evac** switch to **Evac**.
67. Wait for LED to turn solid green. (5.0 e-0 Pascal)
68. Toggle **Gate Valve** switch to **Open** position.
69. Unlock **Exchange Arm**. (Turn Left)
70. Push **Exchange Arm** forward slowly until it stops.
71. Screw **Exchange Arm** into the stage assembly until it stops. (Turn Right)
72. Unscrew **Exchange Arm** ½ turn.
73. Pull **Exchange Arm** back slowly until it stops.
74. Lock **Exchange Arm**. (Turn Right)
75. Toggle **Gate Valve** switch to **Close** position.
76. Toggle red **Vent/Evac** switch to **Vent** position.
77. **Unlock** door.
78. Pull **Exchange Arm** back to unload stage.
79. **Unload** Sample.
80. Push **Exchange Arm** back in to reload stage.
81. **Lock door**.