



*This guide obtains just brief information. In case you need detailed instructions, read chapter "Getting Started" in the TESCAN MIRA3 manual. It is recommended to read the **Safety Instructions and Basic Troubleshooting** manual before your work.*

TESCAN/RAITH MIRA3 SEM-EBL

Tescan - Getting Started

1. Read the Safety instruction and Basic Troubleshooting manual first.
2. Type your username and password in **MIRATC - Log in** screen. Wait till the software fully starts.
3. Type your username and password in **ELPHY - Log in** screen.
4. Move the stage in **MiraTC** software and watch the **Chamber View** whether the stage is moving.
5. Vent the microscope by using the **VENT** button on the [Vacuum](#) panel. Wait until the pressure is at the atmospheric level.
6. Click on any red number button on the carousel in the Tescan **Stage Contor** panel to park the stage in a safe position for uploading your sample
7. Open the chamber door by pulling it. Load your sample. Do not remove the Au/C resolution test sample. **DON'T TOUCH THE MIRRORS!**
8. Close the chamber door by pushing it slowly with care to avoid hitting the SEM chamber. Press **PUMP** button on the [Vacuum](#) panel. Wait until the pressure indicator bar turns from red to green.
9. Load the actual SEM configuration file via "**Options**" in the main menu **Configurations ► Load** from "NEW PRESETS" folder placed on the desktop (There usually are two config files for 20kV and 30kV).
10. Click on the appropriate button on the Raith LIS carousel in the **Stage Control** panel where you have placed your sample to move it under the SEM objective (Or use **Left Ctrl + Right mouse click** in Elphy to move your stage).
11. Click on the **BEAM ON** button on the **Electron Beam** panel to turn on the electron beam.
12. Magnify and focus appropriately on your specimen in **RESOLUTION** mode. Use **Degauss** function to be sure you stay in focus. If not, repeat the procedure. Magnify at least to 40kx and repeat the focusing process.
13. Go to **WD 9 mm** using **WD&Z** function in the **Stage Control** panel. We recommend moving in two or three steps when the change in WD is significant. Place the cursor over the **Stop** button and watch **Chamber View** when the stage is moving. Hit the **Stop** button immediately when it seems there might be a collision!
14. Choose HV you will use: click **HV**: in **Info Panel** and type desired value of the accelerating voltage (e.g., 30 kV) to **Pad** panel.
15. Working in **RESOLUTION** mode with **InBeam** detector is recommended for most lithographical applications. For specific requirements, consider using **FIELD** (massive structures) or **DEPTH** modes.
16. Choose the specific current (related to the lithography process) in the **Absorb current** panel in the **Info Panel**.
17. To measure the current in the Faraday cup, be sure that the whole view field is inside the Faraday cup. (black image)
18. Open the **Beam Blanker** panel from the SEM menu and check that you set the **Electrostatic Blanker control** to the **Enable beam on Acquisition**.
19. Placing the cursor over the **SEM Scanning window** and clicking the mouse wheel move area for electron beam alignment (Au grains, marks, dust particles, scratch...) into the center of the image.

20. Set the desired view field and focus the image. In the case that the image is moving during focusing, it is necessary to check the centering of the objective. Go for **Adjustment >>>** and **Manual Column Centering**. (Hold down the F12 key to change only X movement at the Trackball, and the F11 key to change only Y movement).
21. Correct astigmatism. If the image is moving when stigmatizing, click on **SEM** in the main menu and choose **Stigmators A/B centering**. Follow the procedure.
22. You can check your electron beam settings by burning the contamination spot in your resist (works only on resist). Magnify to at least 80kx, open the **Analysis & Measurement** panel from **Tools** in the main menu, check that **New Point/Line** button is on, and click on the **SEM Scanning window** and press  button. You should observe the increase in the intensity on the graph. To stop – press again  button. If the spot has not round shape, slightly defocus the beam, adjust stigmators and focus the spot again. Repeat the whole procedure until the spot is perfect if you need that.
23. Save the alignment to the preset via **SEM** menu and **Presets**.
24. Continue with an exposition of your project using DrawBeam in MIRA TC or Elphy Plus.

When finished:

1. Once finished, set the HV to **5 kV**, withdraw samples, and **evacuate the chamber**. In case you are the last user today, put the SEM to standby mode (click on the STANDBY button on the [Vacuum](#) panel). **Log off** and close MiraTC - **Log in** screen on. Exit **Elphy** software. Start the **Mira TC** software and leave **MiraTC – Log in** screen on. Switch off all the monitors.