

*This guide obtains just brief information. Extended version with advisory images is available in the instrument folder and in the instrument computer. In case you need detailed instructions, read chapter "Getting Started" in TESCAN MIRA3 manual. It is recommended to read the **Safety Instruction and Basic Troubleshooting** manual prior to your work.*

## TESCAN MIRA3 SEM

### Getting SEM Image

1. Turn on the SEM monitors. Left screen is for SEM, right screen is for EDS. Both monitors and computers are interconnected via Mouse without Borders software.
2. Type your username and password in **MiraTC - Log in** screen. Wait until self-test is done. Contact the guarantor immediately if an error occurs.
3. Vent the microscope by using the **VENT** button on the **Vacuum** panel. Wait until the pressure is at the atmospheric level and sound of N2 infill stops. Chamber door should be opened by N2 pressure. **The gun pressure should be always in green status. If not, contact the guarantor immediately!**
4. Select the position for uploading your sample by clicking on the appropriate number button on the carousel in the **Stage Control** panel.
 

**Wear gloves while manipulating inside the SEM chamber and with samples!** Do not touch the carousel or load the samples until carousel fully stops its motion. Carefully open the chamber door and load your sample.
5. Carefully close the chamber door and press **PUMP** button on the **Vacuum** panel. Wait until pressure indicator bar turns from red to green.
6. Click on the appropriate number button on the carousel in the **Stage Control** panel where you have placed your sample to move it under the SEM objective.
7. Click on the **BEAM ON** button on the **Electron Beam** panel to turn the electron beam on.
 

**NOTE:** The emission is always running but the gun is physically separated from the chamber and the column when these are vented to maintain the high vacuum of the gun.

The button is active only if the Column and Chamber pressure bars are green.
8. **Magnify and focus properly on your specimen to lock the working distance (WD&Z).** Use **Degauss**  function to be sure you stay in focus. If not, repeat the procedure. Magnify at least to 10kx and repeat the focusing procedure.
9. Go to WD 9 mm using **WD&Z** function in the **Stage Control** panel. It is recommended to move in two or three steps when the change in WD is large. Place the cursor at **Stop** button and watch the **Chamber View** (IR camera) when the stage is moving. Hit the **Stop** button immediately when it seems there might be a collision! 
10. Choose HV you will use: select **HV** in the **Info Panel** and type desired value of the accelerating voltage (e.g. 20 kV) to **Pad** panel.
11. Check that you are in **RESOLUTION** scan mode and you are using **SE detector** (Uncheck the **Continual Wide Field** function).
12. In the case you have chosen voltage different than 2, 5, 10 or 20 kV: Check there is no charging or Faraday cup in your image or move to ADJ sample or clean SEM stub, focus properly and set the minimum magnification. In the **Electron beam** panel click on **Adjustment >>>** and choose **Auto gun centering** function. It will take approx. 3 minutes to finish the procedure.
13. Click on **Spot Size:** in the **Info Panel** and type 0 value to the **Pad** panel. Minimum spot size and optimum beam intensity will be set automatically for current HV and WD.
14. Placing the cursor over the **SEM Scanning window** and clicking the mouse wheel move area of interest into the centre of the image.

15. 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** or press the  icon. (Hold down the F12 key to change only X movement at the Trackball, and the F11 key to change only Y movement). The image should not move in X or Y axis, it should be stationary and only “flashing”.
16. Correct astigmatism. In case that the image is moving when stigmatizing,, click on **SEM** in the main menu and choose **Stigmators A/B centering**. Follow the procedure.
17. Select a suitable scanning speed (at least 4, but 5-7 is recommended). Clicking on the **Acquire** button saves the image.

**When finished:**

18. Once finished, set the HV to **5 kV**, retract all detectors to parking position, withdraw samples and **evacuate chamber**. Put the SEM to **standby mode** (unless the next user is already present) and **log off**. Leave **LyraTC - Log in** screen on. Turn off the PC monitors but leave the PCs on.