

NOTE: this "quick guide" is meant to demonstrate the very basic working functions of the X-ray analysis software (NSS software). It does not and cannot cover all capabilities of the NSS software. Please refer to the product handbook (saved as a PDF on the EDS cpu desktop) or an EMC staff member if you desire to do more than what is presented here.

Quick guide to Thermo EDS (with the Tescan SEM)

1. **Log in to your Tescan account, and load your sample into the SEM.** For help with Tescan operation, please refer to the Tescan quick guide that is available online.

2. **Set the working distance at 15 mm. Under SEM>Image parameters, adjust live viewing screen to 4:3 aspect ratio at 1024x768 pixel dimensions.**

3. **Adjust the magnification to your desired level.** Next, focus your sample.

3. **Adjust the beam intensity (BI) to 13 as a starting point.** Turning the BI up will produce more signal. It will also create more charging in your specimen if your sample is not strongly conductive.

4. **Adjust brightness/contrast** by clicking on "auto signal."

5. **Turn chamber camera off.** Click on the camera icon on the top right panel. If left on, X-ray signal will be very noisy.

6. **Samples are now ready for EDS analysis.**

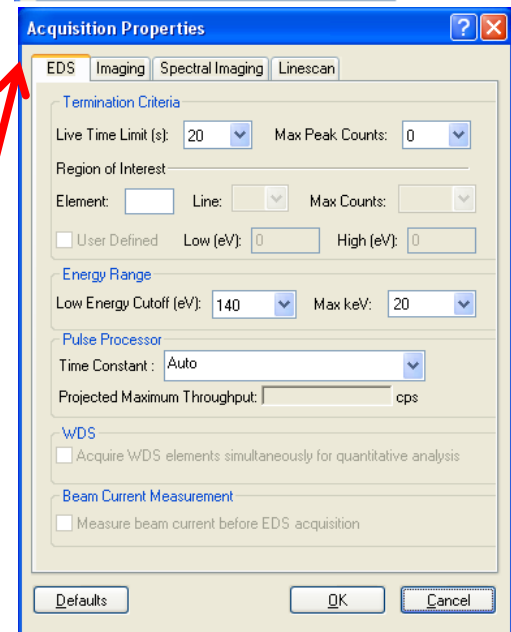
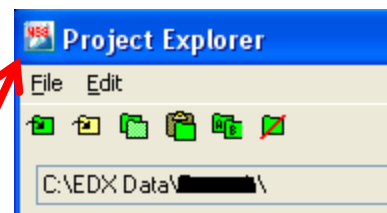
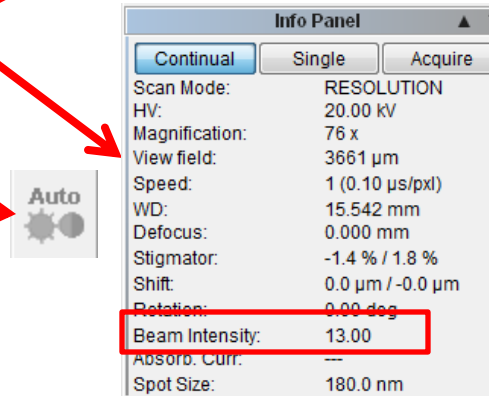
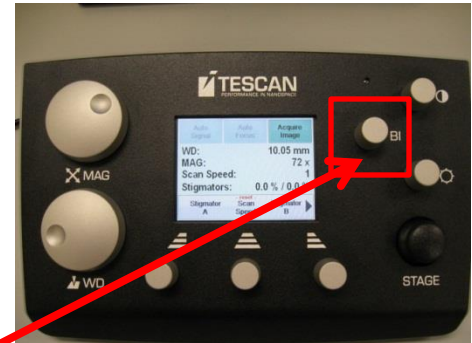
7. **Open NSS 3 software on right-hand monitor.** Note: the NSS software will function properly only when the Tescan software is running before NSS is initiated. If, for some reason, the Tescan software is closed while NSS is still on, then close down NSS. Restart the Tescan software and then NSS. Also note that the mouse and keyboard for the Tescan computer is linked to the right-hand monitor, the right monitor is actually running from its own CPU separate from the Tescan.

8. A "project explorer" window will open on start. **To create a new project**, highlight the green folder labeled "EDX data." Click on the green folder with the black arrow, a new folder will be created under the EDX data folder. Right click on the folder to rename it. To the right, under the "project template" pull-down menu and choose "emc_standard."

9. **Check that the microscope properties** in the right-hand corner are the same as you see them on the Tescan. If they are not, then reset the NSS software.

10. Click on Edit>Acquisition properties. Under the EDS tab **live time limit** will set your acquisition time. The default is 30 s. You can adjust as deemed fit. Alternatively, you can cut off the signal acquisition at a desired mas peak count (e.g., 10,000 counts). Also, make sure that the low energy cutoff (eV) is set at 140, otherwise the EDS will produce a zero peak that will drown out the rest of your spectrum.

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11. Next, you must acquire a spectrum to use any other task on this software.

12. **To create a spectrum.** Align your sample in the Tescan, i.e., the specimen area of which you want to collect an elemental spectrum. Click on the spectrum icon on the left tab, and then click the black play icon on the top toolbar.

13. To quantify the spectrum click on the quantify icon. You can specify what you want the software to report by clicking on Edit>Properties>Quant Results. **Please reset** it when you are finished, because all changes are reflected globally. The preferred default settings are displayed on sign next to the monitor.

14. You can stop here or continue on with another function.

Point and Shoot. Click on the point and shoot icon. Take an image by clicking on the picture icon.

Next, choose how you want to point and shoot (e.g., circle, point, square, etc.). Choose your point(s) or area. Click play. If you want to collect a spectrum for one point/area then choose another, then leave the **batch** icon active. If you want to choose all points/areas first then collect all spectra, then unclick the batch icon. Choose the P & S Select tab and highlight a point to view the spectrum and quant results for each individual point or area select the percentage icon.

Spectral map. Align the area in the Tescan which you wish to draw an elemental map. Click on the mapping icon. Click on the image icon in the NSS software, then click play.

15. **To take a line scan.** Click on the X-ray icon. Take an image. Choose an area of **contrast**. Hold the mouse click and drag the line over the desired area and click play.

16. **To Save.** You can export to word or powerpoint. If you want to save point and shoot data, for example, make sure you are in the point and shoot menu. To save just click the MS Word icon and choose 'save as' and save into the shared data folder.

F. When you're done.

> After removing your samples, make sure to **pump the chamber**

> Make sure the **HV is off**

> Log off, **DO NOT exit through the red "x" it will turn off the microscope.**

