

## Laboratory for Advanced Electron and Light Optical Methods

College of Veterinary Medicine  
1060 William Moore Drive  
North Carolina State University  
Raleigh, NC 27607  
Tel: 919-513-6202  
Fax: 919-513-6464  
Email: [Michael\\_Dykstra@ncsu.edu](mailto:Michael_Dykstra@ncsu.edu)  
[www.cvm.ncsu.edu.research/laelom](http://www.cvm.ncsu.edu.research/laelom)

### *Gatan 785-ES 1000W Digital Camera Short Instructions for Typical Use (April 8, 2010)*

*Abbey Wood*

#### **Start-up:**

1. Do all microscope alignments on the microscope viewing screen. The scintillator can be damaged by high beam intensity (i.e. diffraction mode, crossover).
2. Turn on the **Model 785/ES 100W Control Box** by flipping the **toggle switch** on the back to the upper position. When the **green LED light** on the back is continuously illuminated, the unit is warming up. It is **ready** when that light is blinking, and the LED light on the front of the control box is illuminated.
3. Turn on the Gatan PC (the one on the right).
4. Set up a folder under the appropriate year's image folder (i.e. **2010images**). Preferably save in folder called "file####". It is recommended to make subfolders named with the date "MM-DD-YY" for subsequent scope sessions for the same file. This will keep our records better organized.
5. Open the program: **Gatan Digital Micro...(DM)** by double clicking its icon on the desktop.
6. Set up the **Global Info** for your scope session.
  - a. Click on the **Hammer and Wrench Icon** on the lower toolbar on the main DM screen
    - i. Click on **Save Numbered** and designate the file saving destination by browsing for the folder you created in step 3.
    - ii. See Instruction Manual (page 2) to make sure all selections are properly checked.
    - iii. Add or remove information as desired, like operator or sample info.

#### **Camera Set-up:**

1. **Dark reference:** should not be necessary unless a feature from the live image doesn't move with the specimen, and Gain reference does not fix it. See LAELOM Staff.
2. **Gain reference:** needed if there are image defects (i.e. dirt on the CCD chip) that are present in every image, in the same place. See LAELOM Staff.
3. **Magnification Calibration:** Done by LAELOM staff, and should not be necessary after its initial set-up.

#### **Capturing Images:**

1. It is recommended to search the specimen on the TEM phosphorescent screen because the camera's perspective is turned 90 degrees. It is also better to capture images in "**Image Mode**", not "Page Mode" since Page Mode files cannot be batch converted to TIFFs. They can be converted individually.
2. Once a desired area is found, spread the beam to a lower intensity and click on "**Fine**" on the left of the microscope panel so that the intensity is not increased too quickly with the scintillator in place (too much intensity can damage it).
3. Insert the **scintillator** into the beam path by flipping the **Toggle Switch** towards the microscope column. To retract the **scintillator**, flip the **Toggle Switch** away from the column.
4. Under **Camera View**, select **Start View**.

- a. Enter the **Image Magnification** from the **Morgagni Computer Display** when prompted.
- b. IF THERE IS NO IMAGE...
  - i. Close the **Gatan DM program**.
  - ii. Turn off the **control box**.
  - iii. Wait about 10-15 seconds and turn the **control box** back on.
  - iv. Once initialized, open the **Gatan DM program**, and repeat steps 3-4a.
  - v. If there is still no image, close the program, turn off the control box, and restart the **Gatan computer**. Once the Gatan computer reboots, repeat steps 4.b.iii-4.b.iv.
5. To focus the image in search mode (check manual (page 4, #4) for default parameters); click on the **Magnifying Glass** on the toolbar.
  - a. Click on the image twice to enlarge the pixels (does not change the actual magnification).
  - b. Focus the image as usual, using the **wobbler** and **focusing knobs** on the microscope panel.
  - c. Click on the **maximize window** icon (square at upper right of image window) to get back to normal viewing magnification.
6. Set the image intensity so that a “white” area yields counts (values) of about 2000 if possible. This number is harder to attain as magnification increases and intensity decreases. Restart the view if the change is drastic.
7. To capture the image, click on **Start Acquire** in the camera view window.
  - a. Enter the **Image Magnification** from the **Morgagni Computer Display** when prompted.
8. Adjusting contrast/brightness:
  - a. The quickest way to get an optimal image is to do a **histogram stretch** in the top left of the screen. To do this, click on the furthest left side of the histogram and drag the mouse to the right to highlight the entire histogram while omitting the empty areas of the graph. If the results are not desirable, double click on the bar beneath the histogram to **undo**.
  - b. **Contrast, brightness, and gamma** can be individually toggled in the bottom left of the screen. Double click on the bar below to **undo** changes.
9. Adding annotations:
  - a. To add image data (selected parameters from Global Info) and a scale bar, click on the **10+** icon in the main toolbar.
  - b. To alter the scale bar
    - i. Length: Click on the scale bar. Click on one of the green dots at the edge. Drag the mouse left and right.
    - ii. Text Size: Click on the scale bar. Click on one of the green dots at the edge. Drag the mouse up and down.
    - iii. Click on the line of the scale bar to move around on the image.
    - iv. Right click on the scale bar to adjust font and line color.
  - c. Click on the **10X** icon to remove the data bar
10. Saving Images
  - a. Note: If you did not set up a save destination folder at the beginning of the session, do so now, or it will be saved in the folder from the last session.
  - b. Click on the **123 Disk Icon** to save the image and assign its exposure number. These are the numbers (YY-5####) recorded when entering images taken into the log book.
  - c. These files are saved in a proprietary format that can only be opened on the Gatan PC.
  - d. To **convert** your files to universal TIFF format:
    - i. Go to **File**→**Batch Convert**
    - ii. Browse for your file folder.
    - iii. Click on **Save Display As** and select TIFF format.
    - iv. Click OK. The TIFF files will be in the same folder as the original DM files.

**Shut Down:**

1. Exit **Gatan DM** program.
2. Back-up files to your USB drive or a CD-R (use Roxio program)
3. Back-up files onto **Maxtor external hard drive** by clicking the illuminated button on the front.
4. Shut down the **Gatan computer** and **monitor**.

5. Turn off the **Camera Control Box**.