

# Nikon Microscope Camera Instructions

11/13/09

*Please leave these instructions near the microscope camera*

The **Nikon Digital Sight DS-5M-L1** consists of a 5 Mpixel camera and a controller with a 6.3 inch LCD screen and a mouse. These cameras are connected to the following microscopes:

- **Olympus BX60** on process bench
- **Wild M400** zoom microscope on process bench
- **Olympus MX50** near pattern generators

*Please do not change the network settings, which are essential for transferring images.*

## I. Normal sequence of operations

The main steps for capturing and saving images are described in the lettered subsections of this section. In brief, the process is:

- Get an image you like
- Press Capture button to transfer to nearby PC
- Transfer image to USB memory stick from PC hard drive

### A. Get an Image

#### 1. Set image file type and resolution

The best image resolution and format for use in publications is the full resolution of the camera and the bitmap (.bmp) format with 12 bits/pixel. This is an uncompressed format, whereas JPEG uses a lossy compression algorithm. If you are more concerned about file size than image quality, you can change the image format to JPEG as follows: press the **MENU** button; click on **SETUP**; press the **FILE SETTINGS** button; check the box for **JPEG**; check a box for desired **image size**; press **SAVE** button at bottom of screen; press **RETURN TO WINDOW** button. *If you change the file format, please restore it to **BMP** format when you are finished.*

## 2. Choose scene mode and custom mode.

Press the **MENU** button on the controller to view the camera (**CAM**) menu. The camera comes up in "Easy" mode, but to gain access to all features it is recommended that you immediately click on the **ADV.N.** tab.

Pick a scene mode by clicking the **WAFER/IC CHIP, METAL/CERAMIC, CIRCUIT BOARD, DARK FIELD/FLUORESCENCE (DF/FL), BRIGHT FIELD (BF),** or **DIFFERENTIAL INTERFERENCE CONTRAST / PHASE CONTRAST (DIC/PH)** icons. **Wafer/IC Chip mode should work for most samples at CNF** but others may look better to you.

## 3. Adjust the white balance

Image an evenly white subject such as the frosted white end of a microscope slide, and adjust the white balance by pressing **WB** .

## 4. Use real-time mode to adjust the focus

While watching the monitor, adjust the image composition and the focus. If you have difficulty adjusting the focus because of a dark subject, or the exposure time is too long to allow rapid updating of the image, there is a way to display a subsection of the image at a faster scan rate, much like the fast scan mode on an SEM. If you have not already clicked on the Advanced camera mode (**ADV.N.**) tab, then press the **MENU** button, click on **CAM**, click on the advanced tab (**ADV.N.**) and click on **F** (focus button) to change to Focus mode.

## 5. Correct exposure

Adjust the brightness of the image with **CMP +00** button in the CAM menu screen, or the camera gain (**C-GN**) control, whichever is visible. To increment or decrement the numerical value, click with the **left mouse button** or **right mouse button**, respectively.

## 6. Confirm the image

Press **||** (**FREEZE** button) or **E** (exposure start button) to confirm the image. The **FREEZE** button toggles between frozen and live images.

During dark field or fluorescence (**DF/FL**) mode, always use the **E** (exposure start button), not **FREEZE**.

## 7. Scale bar

- 1) Display the **TOOL** menu and select the calibration value you want to use from **S1** through **S7**, which correspond to the microscope objectives from lowest to highest power. CNF staff will check calibration periodically, but you may wish to do it yourself to confirm that it is correct.
- 2) Press **SCALE ON** , and a scale matched to the selected calibration value will be displayed.
- 3) Press **SCALE OFF** to erase the displayed scale.

A scale normally is displayed on only the screen, and is not drawn in the saved or printed image.

If you want to have the scale bar included in the saved or printed image, select the **SCALE CHECK BOX** on the **REC** menu.

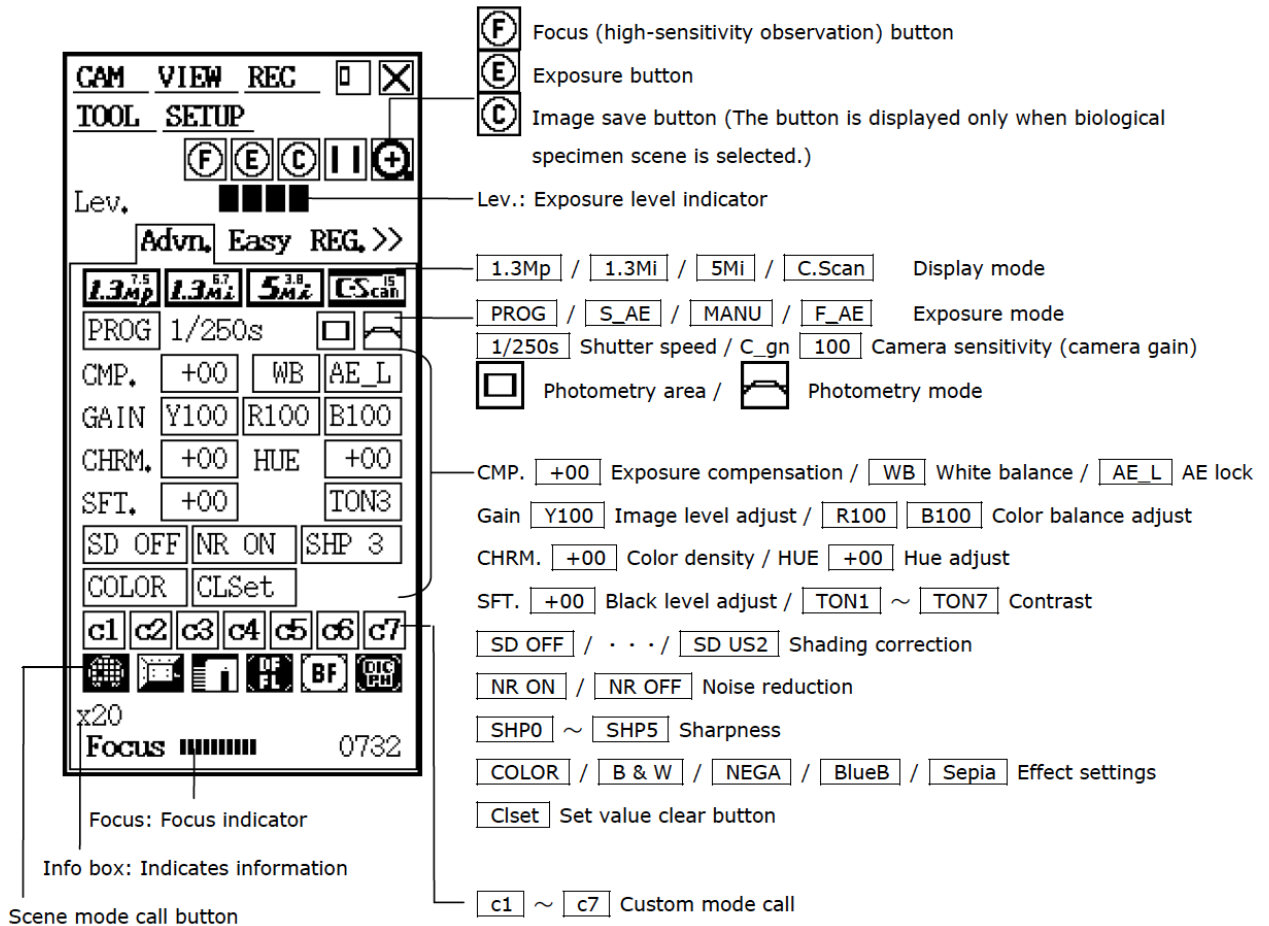


Figure 1: Camera menu ADVANCED tab controls - see manual for detailed descriptions of all controls

## 8. Distance Measurements

You can measure the distance between two specified points on an image. The measurement line can be saved to the overlay for the image. *"Because this is a simple function for measurement, its accuracy is not high."* (from Nikon manual).

See the DS-5M-L1 instruction manual on the PC, section 3.4, p. 63, for calibration instructions. CNF staff will check calibration periodically, but you may wish to do it yourself to confirm that it is correct.

- Display the **TOOL** menu and select the calibration value you want to use from **S1** through **S7**, which correspond to the microscope objectives from lowest to highest power. Drag the mouse pointer over one of the numbers **S1** through **S7**, and the calibration information for that number will be displayed in the **INFO** area for your confirmation.
- Press **MEASURE**. A tool bar will be displayed.
- Press the **RED**, **BLUE** or **GREEN** color icon to determine the color of the measurement line.
- Draw a measurement line by clicking and dragging the mouse.
- Each measurement line is assigned numbers 1 to 9. The number of measurement lines drawn in the same color is limited to nine. To change colors, click another color icon, so that measurement lines drawn in that color will be assigned numbers separately from those in other colors.
- To save a measurement line to the overlay of the image, press **PASTE** to fix it after drawing it.

## B. Save the Image

Press the **CAPTURE** button on the controller. Wait for the image to be transferred by network to ftp (file transfer protocol) server.

- **Olympus BX60 and Wild M400** zoom microscope on process bench: images go to the CNF AFS (Andrew File System) server, in folders within **x:\shares\public\ftp\microscopes**
- **Olympus MX50** near pattern generators: images go to PC on same table as microscope. On the PC you will need to find the folder with images from the microscope. It should be called **FTPIBOX**.

## C. Store the Image

Open the images folder and click on **DATE MODIFIED** to put your images at the top of the list of files. Use Windows file management to copy your images to a USB memory stick or disk drive. *Use the **REMOVE HARDWARE** button at the right end of the task bar to safely remove the USB drive after you have copied the images.*

## II. Additional Information

This document and the manual for the camera and controller are available on the CNF file server at **x:\shares\public\cnf\Microscope cameras**. (Some of these instructions are quoted directly from the manual.) Please do not copy the manual. View it on the PC only.

On the web, Microscopy U has detailed information and a Java applet which simulates the controller at

**<http://www.microscopyu.com/articles/digitalimaging/digitalsight>**

and image troubleshooting information at

**<http://www.microscopyu.com/articles/digitalimaging/digitalsight/troubleshooting.html>**

You may also contact the author of these instructions, Alan Bleier, at 607 254-4931 or [bleier@cnf.cornell.edu](mailto:bleier@cnf.cornell.edu)

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