JEOL IT800 SEM

Operating Procedure



# Log into the software.

Click on your login name and enter your password. If the login window is closed, double-click on **SEM Center**.

# Preparing your sample.

If the specimen protrudes from the top of the specimen holder, measure from the top of the sample holder to the highest point on your sample. This will be

the **Specimen Height Oﬀset** you record in the specimen holder settings window.

# Loading a sample into the load lock.

* 1. Attach the clip to close the Load Lock and press

**Evac** on the Exchange Chamber or click **Evac** in

Navigation Camera Settings

the GUI. The Stage Navigation Camera will automatically take an image.

* 1. Before loading the sample into the chamber, check the Stage Navigation image.
  2. If the automatic image is too dark or too bright, it can be re-taken. Click the **Wrench** to change settings (choose **Dim, Normal,** or **Bright).**

Then, click the **Camera** icon to retake the photo.

If the camera is not in view use the slider bar to scroll down.

Check to show the current position

Click to retake

the photo

Click to zoom in

and out

Click to change

photo settings

Once the **Evac** button is solid green you can transfer your sample Into the chamber.

* + 1. **Grip the rod by the handle and lower the rod until it is completely horizontal.**
    2. **Pull out the handle towards you and turn it clockwise to 'IN/OUT only'.**
    3. Insert the rod fully, so that the sample holder is on the stage. The sample holder

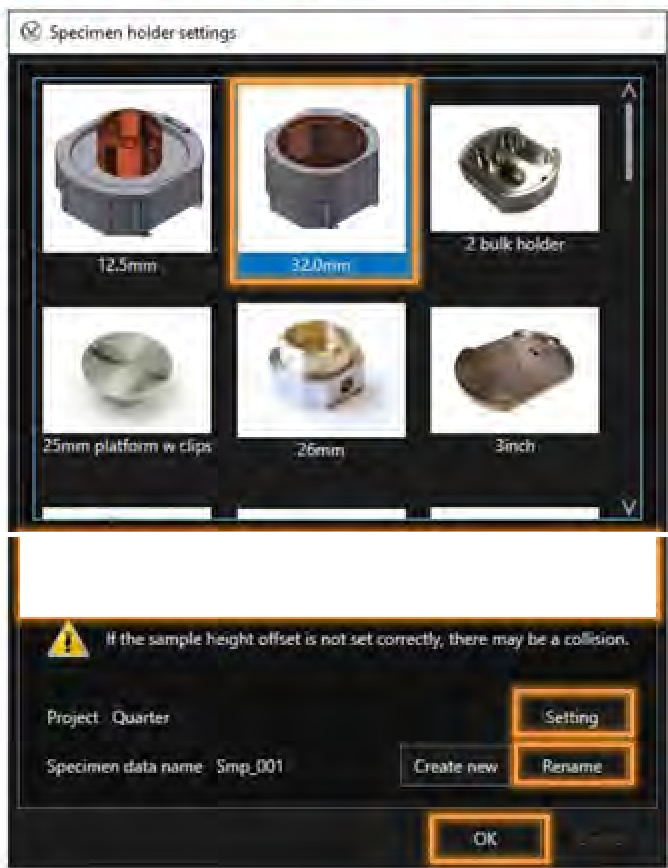
window will pop up when fully

inserted.

* + 1. Pull the rod out all the way until it sto11s.
    2. Turn the handle counterclockwise to'UP/DOWN only'.
    3. Raise the rod until it is back in its original vertical position.

When the loadarm is fully inserted into the chamber, the **Specimen Holder Senttings** window pops up.

**Make sure you retract the loadarm and set your height offset (if you have one) before clicking 'OK'!**



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* + - 1. Choose the correct speclmen holder
      2. Move the slider to the correct Specimen Height

Offset value measured

previously.

* + - 1. Click Setting to open the Project Control window, to choose

-an existing Project or create a new Project.

.,.\_.Add/Rename a Specimen name

* + - 1. Click OK when done

# Operating conditions.

Current viewing conditions are shown at the bottom of the display. Each area is active. Click the area to manually change these conditions.

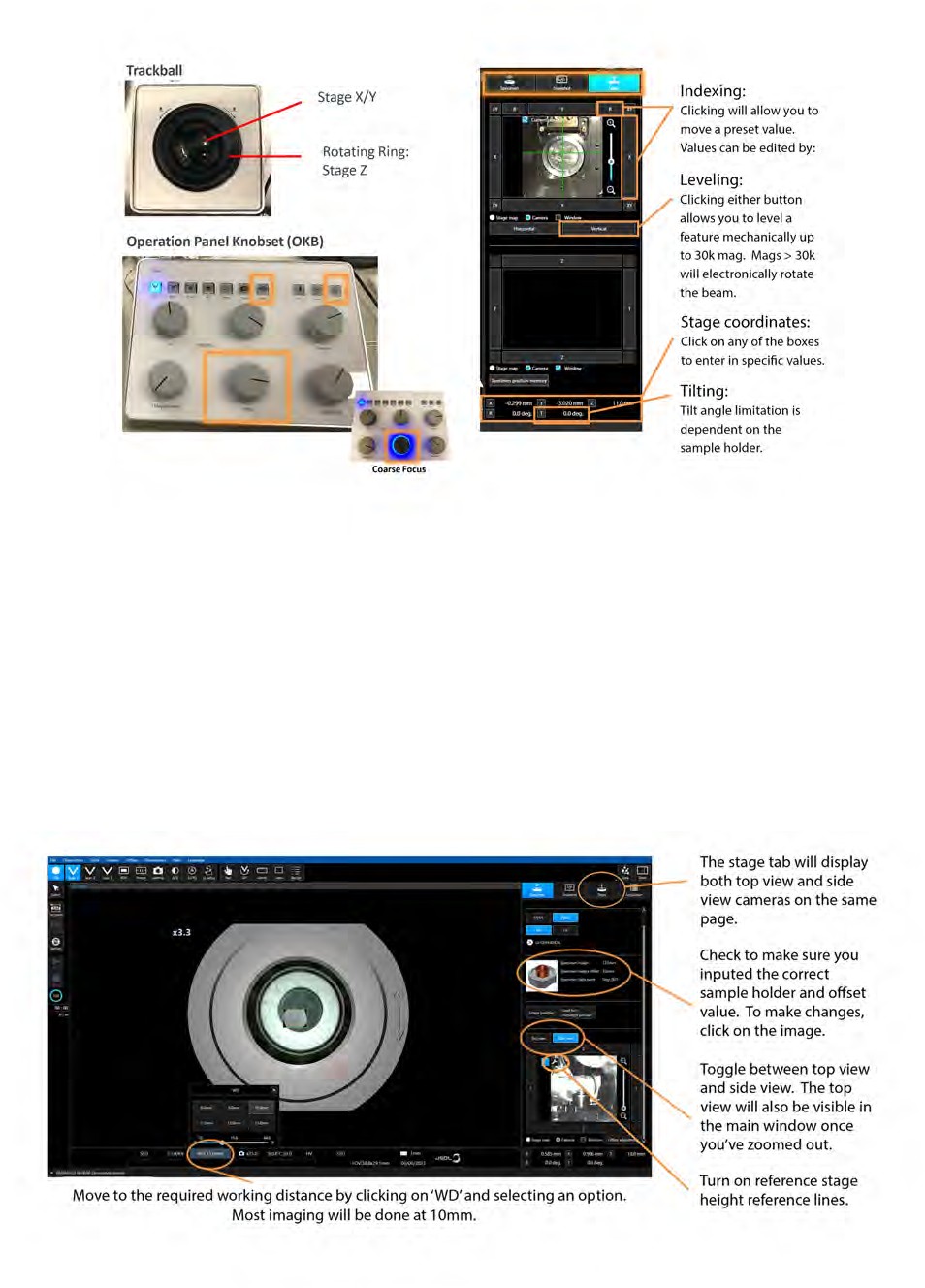
# Turning on/off observation.

1. **Sample navigation with Zeromag**
   1. After turning on the beam, zoom out to see the SEM image on top of the optical image. An

optical image of your sample holder is indexed to the stage coordinates and linked with the SEM image.

* 1. Move to your area of interest.

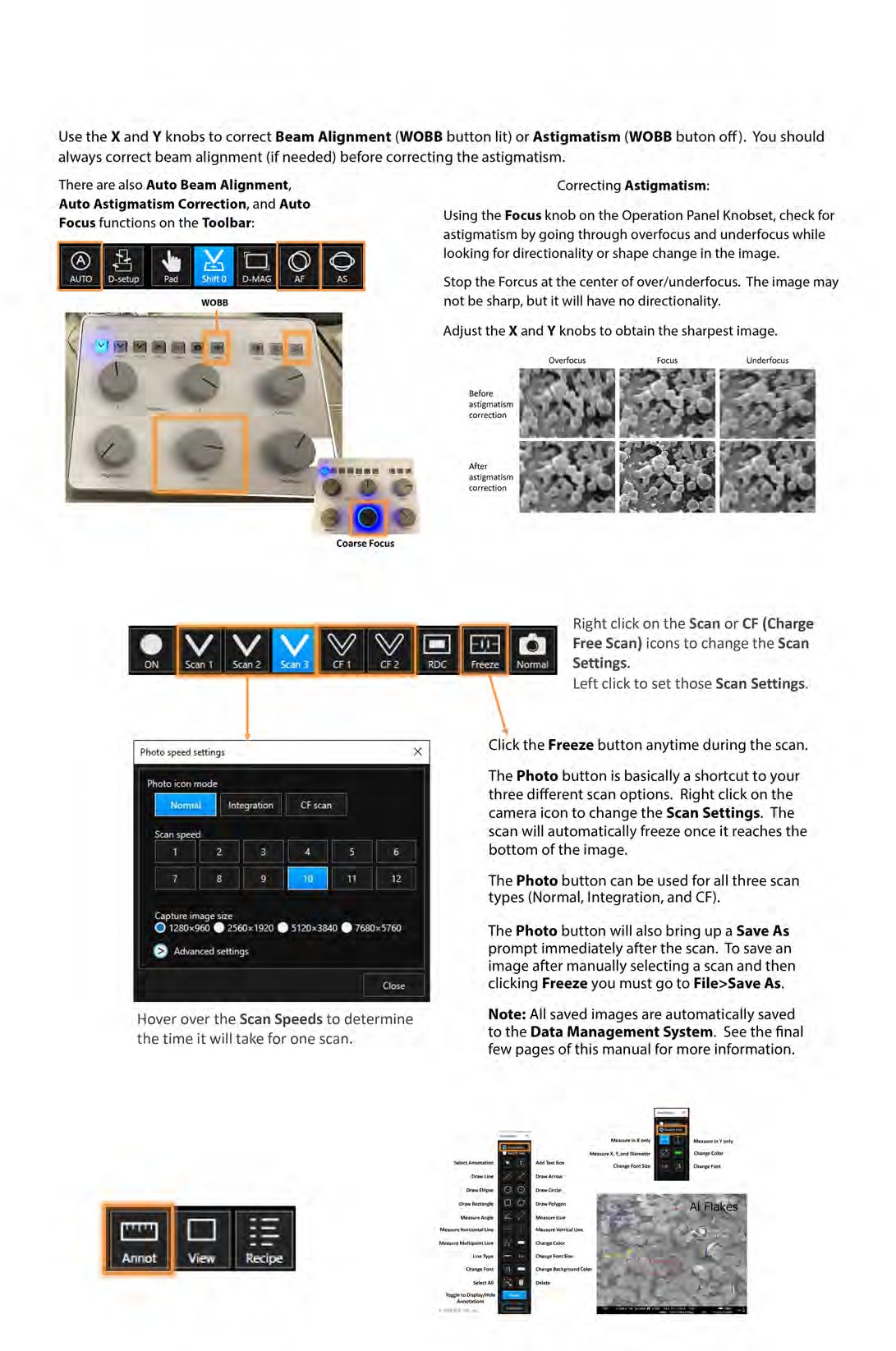
# Controls overview.

The instrument can be controlled through hardware and software. The Focus, Contrast, and Brightness knobs on the Operation Panel Knobset have coarse and fine settings. Press down on a knob to toggle between coarse and fine adjustment. A blue ring will light up around the knob if the setting is coarse.

# Moving the stage up

* 1. Before moving the stage, you **MUST** ensure the **Side view** camera option is selected in the camera window or click on the **Stage** tab and make sure the side view camera is in view. You **MUST** also make sure the stage height reerence lines are displayed. If they’re not, click the wrench icon and turn them on.
  2. To move the stage up, click the **WD** drop down and select **10mm**. Make sure you have correctly entered any oﬀset you may have. A window will pop up prompting you to click ok. Once you click **OK**, the stage will start moving up. If your sample/sample holder crosses over the 10mm reference line, click Cancel on the movement window or touch the trackball. This will immediately stop any stage movement. Adjust your oﬀset and then select 10mm again.

1. **Resolving an image.**
   1. Once the stage has reached your selected WD you should initially focus the image using the **Z focus**.

To do this, rotate the ring around the trackball clockwise/counterclockwise until the image comes into focus. This will set your selected **WD** to the surface of your sample.

* 1. From here you can use the **Focus** knob for finer adjustments.

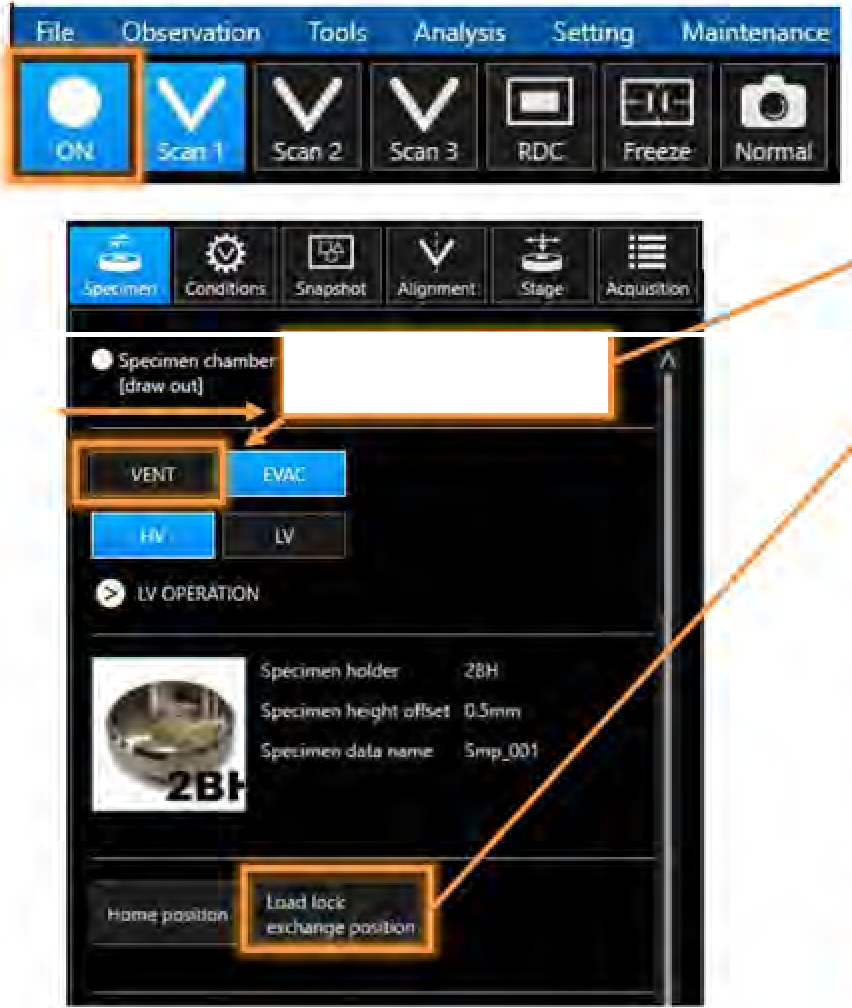
# Taking an image, scan settings and saving.

1. **Measurement and annotation.**

To take a measurement click the

**Annot** button on the **Toolbar**.

Once you are done imaging click the **Observation On** button to turn *off* the beam. The blue area should turn to black.



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Make sure the **Specimen exchange chamber** is selected

if you are unloading through the load lock.

Click the **Load lock exchange position** icon and wait until it turns blue. It is now safe to unload your sample into

the load lock.

Follow the instructions for loading/unloading on page

Once you have retracted the load arm and returned It to it's home position you can press the **Vent** button on the load lock chamber.

Unclasp the clamp and remove your sample. Close the load lock and press **Evac.**

Go to **File>Log off**

**DO NOT EXIT!**

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**STD (Standard):**

Standard mode for imaging with the **SEO, BED, LVBED,** or **LVSED.**

**LDF (Large Depth of Field):**

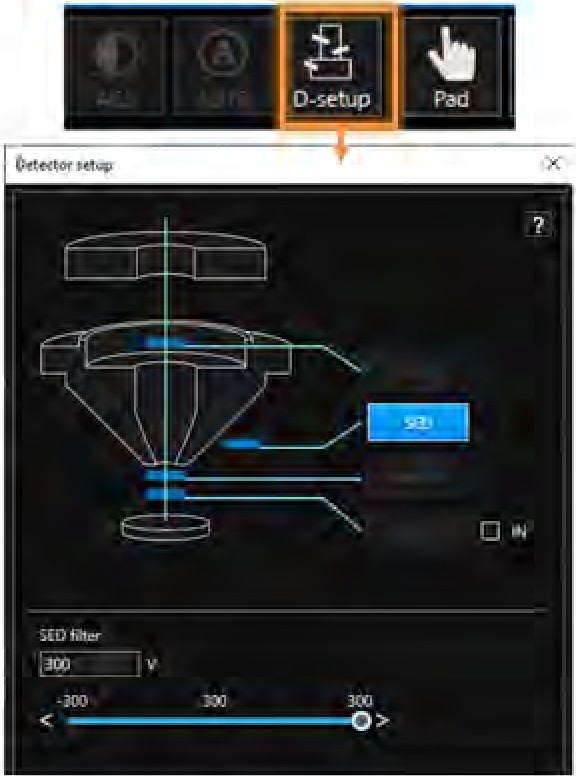
Turns off the objective lens and can be used when imaging very tall samples to get a large-depth-of-field image, to get an undistorted low-magnification image, or to get a lower magnification image at short WD.

**BD (Beam Deceleration):**

Appliesa bias to the sample stage for high-resolution imaging and/or charge balancing (bias voltage up to 5 kV on IT800SHL).

**SHL (Super Hybrid Lens on ITB00SHL):**

Turns the electrostatic field of the objective lens on, attracting more electrons up the column.

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Before inserting the **SBED** detector you must be at a **WO** of **8mm** or greater.

Click on the **Detector** name to open the **Detector window.**

,.Activate a detector by clicking on It.

The filter settings of the **UED**

detector can be changed here.

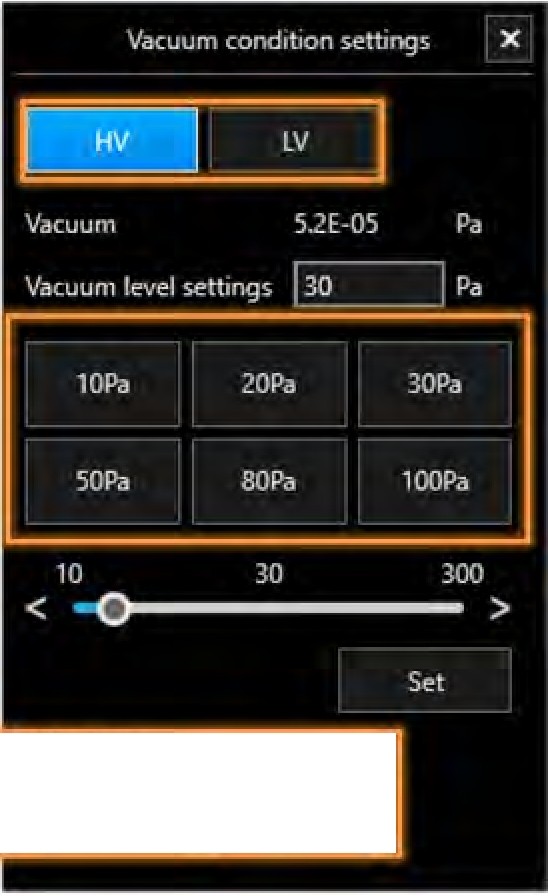
To insert a retractable detector (Option), click **D-setup** from the **Toof bar** to open the **Detector Setup** W!ndow.

Check **IN** to insert a detector. Uncheck **IN** to retract a detector.

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Ut100 FOV 3 6b)(/ 14mm

**Low Vac** mode mechanically inserts a detector onto the base of the pole piece. The safest way to enter **Low Vac** mode is to enter it before loading a sample.



LVorifice

IN

To switch from **High Vacuum Mode** to **Low Vacuum Mode,** click on **HV** to open the **Vacuum Condition Settings** window. Or click the **LV** button above the sample holder image.

**Make sure the Specimen Height Offset is correct before proceeding!**

Click **LV.** A pop-up window will ask to confirm the transition to low vacuum. Click **OK.**

Automatically, the stage moves to the insertion position, the LV orifice inserts, then the stage moves back to the original position. The observation will be active in ~2.3 minutes.

To set a different pressure, click on a preset, or type in a value or use the slider and click **Set.**

**You MUST return to HV mode before ending your imaging session!**

To load the specimen through the chamber door: Click **Vent** in the Specimen Tab. A popup window will ask if the stage should be moved to the specimen exchange position.



Click **OK** and wait until the system is vented.

Pull on the handles to open the chamber and slide the specimen holder onto the dovetail.

If the IT800 has a Load Lock, one can load a sample via the Chamber or Load Lock. To open the Chamber, click **Specimen Chamber** in the **Specimen** tab first. Then click **Vent.**

For **Load Lock Specimen Exchange**

instructions, proceed to Slide 1131.

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