Keyence Microscope Training SOP

Last edited: Furst (11/03/20)

Instructor:

Date:

Attendees:

	Name	Group or Company	Signature
1			
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Overview:

- This training provides an introduction to using and operating the Keyence microscope including:
  - Changing Objectives
    - 0-50x and 20-200x
    - 100-1000x
  - Head tilt
  - Stage movement
  - Software
    - Lighting
    - Measure
    - Depth up
    - Image quality
    - Optimize
    - Stitching
  - Safety
  - General microscope use
  - Maintenance

Safety

Microscope Setup

At the microscope:

1. Changing objectives
   1. Press the button on the top of the objective (right above the Y axis of rotation screw)
   2. Twist the camera body counterclockwise and carefully lift directly off. Set carefully on its side to avoid damaging the lenses in the camera assembly

3. Loosen the large plastic wingnut screw located above the axis of rotation adjustment on the objective. (DO NOT ADJUST AXIS OF ROTATION SCREWS)
4. Lift the objective straight up off the mounting post on the microscope body and place carefully in drawer located under Keyence computer.
5. Remove the desired objective and lower over the mounting post on microscope body.
6. Gently snug up the wing nut screw to clamp on the flat of the mounting post
7. Gently lower the camera assembly onto the top of the objective
8. Once lined up, rotate camera assembly clockwise until a sharp click is heard
9. Make sure zoom knob is locked into a set zoom level detent
10. Follow steps to initialize the XY stage

2. Tilting the head
    1. The microscope head is able to tilt up to 90 degrees clockwise in order to better image samples. Caution should be taken to avoid crashing the objective into the sample or stage when head is tilted.
        1. Loosen the tilt lock knob a turn or two max (until the knob loosens)
        2. With a HAND ON THE MICROSCOPE HEAD rotate the locking lever counter clockwise to its vertical position
        3. Tilt the head to its desired angle using the graduations on the microscope body
        4. Lock the head in its tilted position using the large tilt lock knob. Make sure knob is snug before letting go of the head but do not overtighten
        5. If desired angle is greater then 60 degrees, pull the locking pin out away from the microscope before retightening the tilt lock knob. This should allow the microscope head to tilt up to 90 degrees. Be incredibly careful as the stage and objective will become very close at angles above 60 degrees.
3. Changing lighting elements
    1. Switching to fiberoptic Epi-illumination for 100-1000x objective
    2. Switching the stage glass for backlighting
4. Moving/positioning the stage

At the Computer:

1. Initialize the XY stage
    1. The XY stage needs to be initialized every time a objective is switched or the microscope is power cycled
    2. The microscope should prompt the user after objective is switched but can be done manually through “settings” → “initialize XY Stage”
    3. Be sure the objective is locked in a zoom detent and the XY stage is raised and locked to its highest position
    4. Be sure the black side of the XY stage disk is facing up and is fully in place
    5. click “initialize XY Stage” and the microscope will initialize automatically by homing the stage
2. Software lighting and Image Quality
    1. Within Software lighting two tabs are available:
        1. Brightness
            1. Adjust shutter speed and camera settings (set to auto)
        2. Lighting
            1. Epi-illumination
                1. Adjust/turn on internal objective illumination (press “light” on console to toggle)
            2. Transmitted illumination
                1. Adjust/turn on sample backlighting (requires the use of glass stage ring)

3. When 100-1000x objective is installed Epi-illumination is handled by the fiberoptic MI-150 located next to the microscope
2. Increased contrast can be achieved by turning on HDR under the Image Quality tab

3. Depth up
    1. The Keyence microscope is capable of taking hundreds of images as it raises the objective to capture an image larger depth of field. This is useful for observing objects that do not lie on a flat plane and would normally not be completely in focus. This image also contains depth mapping data which can be used to not only take XY and Z measurements, but also create a 3D mesh file of the scanned object.
        1. Select “depth up” from the right hand side bar then “quick composition and 3D”
        2. Focus the microscope slightly below the lowest point on the object
        3. Click “3D Display” on the Keyence control pad and the microscope will scan up the object and create a 3D file which can be analyzed.
4. Measure
    1. Measurements can be taken by selecting the “Measure
5. Stitching
6. saving images

Maintenance

Keyence microscope Quick Review

Tool Lead:
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Safety Concern

Safe Operation Procedures Review

Post Processing

Maintenance