

## 6.USING YOUR MOTIC DIGITAL MICROSCOPE

1. Use the stage clips or slide holder mechanism to secure the slide in place. Be sure the specimen is centered over the opening in the stage.
2. Rotate the nosepiece to place the lowest power (4X) objective over the specimen. Be sure the objective “clicks” into position.
3. Turn on the illumination by pressing the on/off switch
4. Adjust the Siedentopf binocular head (by moving the eyepiece tubes up and down in an arc-like motion, similar to adjusting binoculars) until one perfect circle is seen in the field of view.
5. Open the iris diaphragm to its largest aperture.
6. While viewing through the eyepiece(s), rotate the coarse focus knob slowly and carefully to bring the specimen into focus. The specimen may require some centering in the field of view at this time. By using the fine focusing knob, slowly and carefully refine the focus to clearly observe the fine details of the specimen.
7. If the image of the specimen appears pale, the aperture of the iris diaphragm should be slowly closed until the details of the specimen are sharply defined. If the specimen appears dark, slightly open the diaphragm.

**Please note:** a smaller iris diaphragm aperture (opening) increases the contrast in the image while a larger aperture decreases the contrast. (The diaphragm is not intended for controlling the brightness of the illumination). A good procedure to follow in selecting the proper opening is to start with a large aperture and reducing it until the fine detail of the specimen is in exact focus. Using an inappropriate aperture results in a “washing out” of the image. Care must be exercised not to reduce the aperture too much to gain high contrast, as then the fine structure in the image of the specimen will be destroyed. Reducing the aperture increases contrast and depth of focus, but it also

reduces resolution and causes diffraction. Example: The aperture for the 10X objective will not be the same as for the 40XRD objective, since the angle of the required light is determined by the numerical aperture (N.A.) of the objective. The proper aperture of the diaphragm can be easily achieved after minimal experience with the digital microscope.

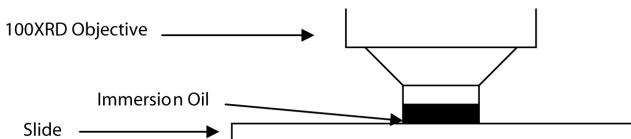
8. Set the diopter adjustment which is designed to help compensate for the difference between the user's eyes. To adjust, first bring the specimen into perfect focus by using the coaxial focusing knobs while looking through the eyepiece with the right eye only (close your left eye). Now, using your left eye only (close the right eye) turn the left eye diopter only (don't touch the focus controls) to obtain a crisply focused image. The diopter adjustment is now set and no further adjustment will be needed until a new operator uses the scope.
9. Rotate the nosepiece to the next higher power objective. A slight turn of the fine focusing knob may be required to bring the image of the specimen into sharp focus. Once the specimen is in focus with the highest power objective, it will be in focus with each lower power objective.

## 7. OIL IMMERSION(Only for models with a 100X objective)

When light rays pass through air from the specimen to the objective lens, they are distorted slightly, a phenomenon known as refraction. This is usually not a problem at a magnification of 400X or lower. However, at a magnification of 1,000X and above, refraction becomes problematic. This problem is reduced significantly by placing a thin layer of very clear, viscous oil between the slide and tip of the objective lens. The result is a much clearer image at 1,000X because the oil has the same light transmitting properties as glass. Using oil slightly increases the resolution and brightness of the image. Usually a very thin slide (size #1) is used for oil immersion because at this magnification, the working distance is very small and is critical to focusing the specimen. Good quality glass (not plastic) cover slips should be used. If their thickness is over 0.17mm, the objective will not resolve properly, because the specimen cannot be moved close enough to the objective lens to be in focus.

Place a tiny amount of oil (only 1 drop should be sufficient) onto the slide prior to rotating the 100XRD objective into position. It is essential to thoroughly clean the objective tip after use to prevent damage and to ensure that an image can be seen clearly the next time the objective is used. Please contact Motic Optical or your authorized Motic dealer for the appropriate immersion oil to use.

**IMPORTANT:** The working distances of the 40XRD and 100XRD objectives to the slide surface are very small and although these objectives are sealed to prevent oil contamination, it is a good practice to avoid dragging these objectives through an oiled slide. The 100XRD oil immersion lens on digital microscopes has a spring-loaded end to prevent cracking the cover slip upon its initial contact. Once this zone of safety is exceeded by moving the slide further toward the lens, a point can be reached where damage will occur. Always make a practice of frequently checking the position of the lens on the slide. Note that a 100XRD objective requires an iris diaphragm for brightfield oil immersion microscopy.



## 8.CARE AND CLEANING

Digital microscopes are designed to function with minimal maintenance, but certain components should be cleaned frequently to ensure ease of viewing. The power switch should be turned off or the digital microscope should be unplugged when not in use.

### 8.1 CLEANING

The front lens of the objectives (particularly the 40XRD and 100XRD) should be cleaned after use. The lens surface may be gently cleaned with a soft camel hair brush, or blown off with clean, oil-free air to remove dust particles. Then wipe gently with a soft lens tissue, moistened with optical cleaner (eyeglass or camera lens) or clean water. Immediately dry with a clean lens paper.

**CAUTION** - Objectives should never be disassembled by the user. If repairs or internal cleaning should be necessary, this should only be done by qualified, authorized digital microscope technician. The eyepiece(s) may be cleaned in the same manner as the objectives, except in most cases optical cleaner will not be required. In most instances breathing on the eyepiece to moisten the lens and wiping dry with a clean lens tissue is sufficient to clean the surface. Lenses should never be wiped while dry as this will scratch or otherwise mar the surface of the glass.

The finish of the digital microscope is hard epoxy and is resistant to acids and reagents. Clean this surface with a damp cloth and mild detergent.

Periodically, the digital microscope should be disassembled, cleaned and lubricated. This should only be done by a qualified, authorized digital microscope technician.

### 8.2 DUST COVER AND STORAGE

All digital microscopes should be protected from dust by a dust cover when in storage or not in use. A dust cover is the most cost-effective digital microscope insurance you can buy. Ensure that the storage space is tall enough to allow the digital microscope to be placed into the cabinet or onto a shelf without making undue contact with the eyepieces. Never store digital microscopes in cabinets.

containing chemicals which may corrode your digital microscope. Also, be sure that the objectives are placed in the lowest possible position and the rotating head is turned inward and not protruding from the base. digital microscope with mechanical stages should be adjusted toward the center of the stage to prevent the moveable arms of the mechanical stage from being damaged during storage in the cabinet.

## 9.TROUBLESHOOTING

**CAUTION** – Never disassemble mechanical or optical components. This servicing should only be done by an authorized Motic technician. The Limited Lifetime Warranty will be null and void if the mechanical or optical components are disassembled by a non-Motic dealer.

**A. PROBLEM** – No Illumination

**CORRECTION** –

1. Is the power plug connected to an active A.C. outlet?
2. Is the on/off power switch working properly?
3. Turn the illuminator rheostat to a brighter setting.
4. Check the bulb. Try a new bulb if you have one.

**B. PROBLEM** – Illumination “hot spots” and uneven brightness in the field of view.

**CORRECTION** –

1. Is the Abbe condenser in the correct position?
2. Is the nosepiece and objective clicked into proper position?

**C. PROBLEM** – Image appears “washed out” or weak.

**CORRECTION** –

1. Slightly close the diaphragm to a smaller aperture
2. Objective lens is dirty. See “**Care and Cleaning**” Section.
3. Eyepiece is dirty. See “**Care and Cleaning**” Section.

**D. PROBLEM** – Dust or hairs seem to be moving in the image.

**CORRECTION** – The iris diaphragm is not open wide enough. Slowly open the diaphragm to increase the size of the opening allowing for additional illumination.

**E. PROBLEM** – Once the specimen is in focus, it moves out of focus.

**CORRECTION** – Gravity is causing the stage to drift downward, causing loss of focus. The focusing tension should be increased to act as a brake to prevent this downward drift. The M150iSeries is outfitted with a tension collar on the coarse focusing shaft to allow tension on the slip-clutch system to be increased or decreased.

**FCC Statement:**

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) This device must accept any interference received, including interference that may cause undesired operation.

**FCC Radiation Exposure Statement:**

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment .This equipment should be installed and operated with minimum distance 20cm between the radiator& your body.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.



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