Motic®

MORE THAN MICROSCOPY

SWIFT LINE

INSTRUCTION MANUAL | ENGLISH

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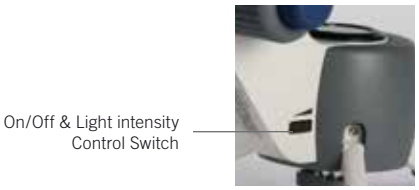
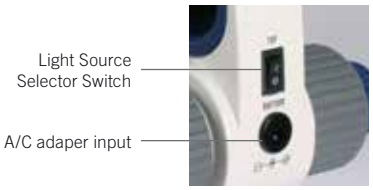
SWIFT3H SERIES

INSTRUCTION MANUAL | ENGLISH

Motic SWIFTLINE

SWIFT3H-B





USING YOUR SWIFTLINE MICROSCOPE

CORDLESS OPERATION

The rechargeable battery should be fully charged for approximately 8 hours before the initial use. It can be charged by using the 4.5 Volt A/C adapter included with the microscope. An LED indicator light on the A/C adapter will be red while the battery is charging and will turn green when the battery is fully charged.

The battery can be used to power the illumination system for approximately 40 hours. If the microscope is used in the same location, the A/C adapter can remain plugged-in without damage to the battery or recharging system.

MAGNIFICATION

The SWIFT3H comes with silver 4X, 10X and 40X objectives (for microscopic use only) and a black 1X objective (for macroscopic use only). The objective magnifications shown in the magnification window are color coded to correspond to the stage position icons on the side of the arm. Micro magnifications are written in blue to coordinate with the blue micro mode stage position. The 1X macro magnification is written in red to coordinate with the two macro mode stage positions.

STAGE SELECTIONS

SPECIMEN CUP: A container used for collecting and viewing specimens at a macroscopic level. This container has adequate depth and has a ventilated optically clear lid for use with a variety of specimens.

CONTRAST PLATE: Offers a black or white viewing background.

STAGE PLATE: The microscopic stage with a built-in 0.65 N.A. condenser, iris diaphragm, stage clips and swing out white filter.

STAGE POSITION ADJUSTMENT

Proper stage height is critical for achieving the correct focusing distance for viewing micro or macro specimens. The stage can be set at 3 levels:

MICROSCOPIC - Uppermost stage position (Stage plate must be placed in the stage ring).

MACROSCOPIC - Middle stage position (Specimen cup must be placed in the stage ring).

MACROSCOPIC - Lowermost stage position (Black/white contrast plate must be placed in the stage ring).

For proper stage ring adjustment, loosen the stage position thumbscrew to raise or lower the stage ring housing to line up with the desired stage position indicator marks. Tighten the thumbscrew to secure the stage assembly in place. The macro indicator marks are the suggested positions for viewing most macro specimens. The macro stage ring positions may have to be adjusted slightly to find the best working distance for unusual sized specimens.

MICROSCOPIC OPERATION

1. Loosen the stage ring thumbscrew on the right side of the stage ring. Insert the stage plate into the stage ring and secure it in place by tightening the thumbscrew.

2. Loosen the stage position thumbscrew on the right side of the stage to move the stage assembly to its uppermost position. The red dot underneath the stage position thumbscrew should be lined up with the blue dot on the right side of the microscope arm near the coarse focus knob.

3. Select the bottom (transmitted) illuminator by pressing the light source selector switch on the back of the microscope's arm to the bottom position.

4. Turn on the illumination by rotating the light on/off & intensity control dial towards the bottom illuminator. (Note: Please notice that that the dial will "click" when turning on the light. When turning the unit off, please ensure that the dial is rotated all the way back until it "clicks" off to save power and prolong LED lifespan).

5. Place the slide on the stage, securing it with the stage clips. Center the specimen in the optical path.

6. After securing and moving the slide into position, rotate the nosepiece to place the lowest power 4X objective into position over the specimen. Be sure the objective "clicks" into position. The iris diaphragm should be adjusted at this time to about a ¼ inch (5 mm) open.

7 (SWIFT3H-B only). 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.

8. 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. Now you can turn the nosepiece to the higher magnification micro objectives. The objectives are parfocalled so that once the 4X objective is focused; only a slight turn of the fine focus is required to refine the focus when changing to higher power objectives.

9 (SWIFT3H-B only). 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.

Note: A smaller 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 does increase contrast and depth of focus, but it also reduces resolution and causes diffraction. The aperture for the 10X objective will not be the same as for the 40X 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 microscope.

MACROSCOPIC OPERATION

1. Loosen the stage ring thumbscrew on the right side of the stage ring. Insert the specimen cup or the black/white contrast plate into the stage ring. The specimen cup is designed to be rotated while viewing a specimen so the thumbscrew does not need to be tightened. If the contrast plate is being used, tighten the thumbscrew to secure it in place.
2. Loosen the stage position thumbscrew on the right side of the stage to move the stage assembly to the suggested middle position for specimen cup use (indicated by 1 red dot) or the lowest position for contrast plate use (indicated by 2 red dots). The red dot below the stage position thumbscrew should be lined up with the red dot(s) on the right side of the microscope arm near the coarse focus knob. If odd-sized specimens are being viewed, the stage assembly may have to adjusted slightly off of the indicator marks to achieve the proper working distance in order to bring the specimen into focus.
3. Select the top (incident) illuminator by pressing the light source selector switch on the back of the microscope's arm to the top position.
4. Turn on the illumination by rotating the on/off & light intensity control dial towards the bottom illuminator.
5. Place the specimen in the specimen cup or on the contrast plate and center it in the optical path.
6. Rotate the nosepiece to place the 1X macro objective into position over the specimen. Be sure the objective "clicks" into position (the 1X macro objective in the only objective that can be used in macro mode).
7. (SWIFT3H-B only) Adjust the Siedentopf binocular head until one perfect circle is seen in the field of view. This is accomplished by moving the eyepiece tubes up and down in an arc-like motion, similar to adjusting binoculars.
8. 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.
9. (SWIFT3H-B only) Set the diopter adjustment, which is designed to help compensate the difference between the user's eyes. To adjust, first bring specimen into perfect focus by using the coaxial focusing knobs while using your right eye only (close your left eye). Now, using your left eye only (close your right eye), adjust the left eye diopter only (do not adjust the focus control knobs) until the specimen is in sharp focus. The diopter is now set and no further adjustment to the diopter is needed until a new operator uses the scope.

SWIFT100 SERIES

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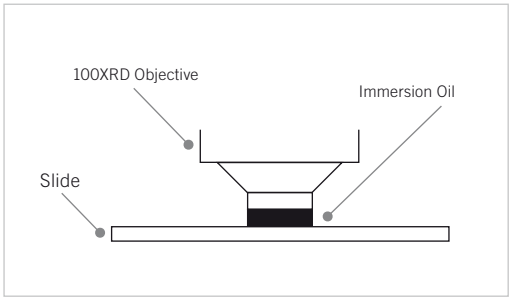
SWIFT132

MICROSCOPIC OPERATION

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.
4. (SWIFT132 only) 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 aperature.
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 aperature 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 microscope.
8. (SWIFT132 only) 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.

OIL IMMERSION (SWIFT132 only) For other models the 100X objective is optional

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 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 Motic 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.

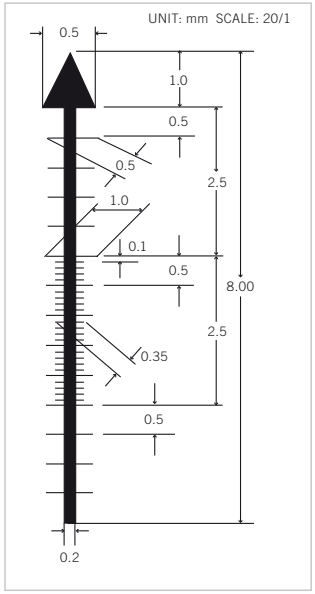


HOW TO USE THE POINTMASTER® EYEPIECE RETICLE

Motic's patented POINTMASTER® eyepiece reticle, which is installed in the eyepiece of the microscope, enables the user to easily measure the size of the specimen.

1. The numbers on the chart indicate the actual size of the POINTMASTER® scale in millimeters. For example, the length is 1.0mm from the top of the arrow to the bottom; the total length of the scale is 8.0mm, etc. The thickness of all the horizontal lines is 0.01mm.

2. To obtain the actual physical size of a specimen, divide the POINTMASTER® scale readings by the magnification of the objective lens that is in use. Divide the readings by 10 if the 10X objective is being used, 40 if the 40XRD objective is in use, or 100 if of 100XRD is in use.



LED REPLACEMENT

To prolong the life of the bulb you should always turn off the unit when not in use. The replacement LED part number can be found underneath the microscope on the metal base plate. The SWIFT100 Series models use a 70mW LED.

To replace the LED, you must first turn the power off and unplug the microscope's electrical cord from the electrical socket and remove any slides on the stage. Use the small allen wrench (0,9mm) that was included with the microscope to loosen (Loosen, but do not completely remove the screws to prevent loss) the set screws that hold the illuminator housing onto the base of the microscope. Remove the illuminator housing to expose the LED. Simply pull the LED straight up to remove it from the light socket. Align the 2 metal socket pins with the holes at the bottom of the new LED and push the LED onto the socket. Re-install the illuminator housing.

DIGITAL PHOTOGRAPHY

The SWIFT120 DIGITAL model feature a built-in digital camera to capture still images or video clips on to a computer. In order to use the camera, the imaging software must first be installed on a computer. The minimum computer requirements to use the camera is having an available USB 2.0 port, Windows XP or Mac OS X operating system installed on the computer, 1GB of RAM, 1GB free hard drive space and 2Ghz CPU.

Complete instructions on how to use the software is included on the software CD that was packaged with the SWIFT120 DIGITAL microscope.

1. Connect the USB cable to the port at the back of the digital microscope head and to an available USB 2.0 port on a computer.
2. Install the Motic Images Plus Imaging software on the computer you will be using with the microscope. The software should automatically detect and install the correct driver.
IMPORTANT: The next time you connect to a computer, make sure the USB cable is connected to the same USB port that was used during initial installation or the software driver will have to be re-installed).
3. After the software is installed, start the Motic Images Plus program and click on the Capture Window icon to view a live image.
4. The background balance setting will need to be adjusted to compensate for any uneven illumination light patterns. Place a slide on the stage. Move the specimen out of the field of view so an empty/blank spot of the slide is being displayed. Click on the "Background Balance" adjustment box found on the bottom of the basic setting toolbar to smooth out the light pattern.
5. Bring the specimen back into the field of view and use the microscope's focusing controls to bring the specimen into focus.
6. Use the mouse pointer and hold the left mouse button while dragging the mouse to create a small box in an area of the image that should be displayed as a white color. (The size of the box does not make a difference as long as it is only in an area that should be displayed as white). Click on the "White Balance" adjustment box found on the toolbar.
7. Click on the camera icon in the upper left corner of the screen to switch to the "Capture" toolbar. An image can be captured by clicking on the "Capture" box. A video clip can be recorded by clicking the "Record" box.

SWIFT200 SERIES

INSTRUCTION MANUAL | ENGLISH

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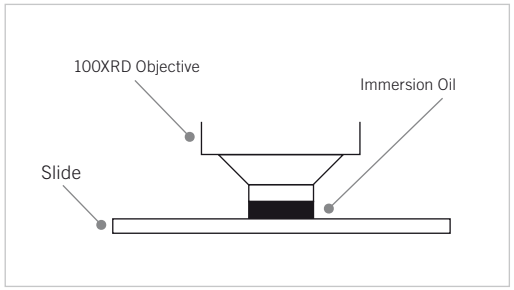
MICROSCOPIC OPERATION

Once you have learned the terminology and purpose of each component of the microscope, use of the microscope is simple. By following these steps, you will be able to begin studying specimens quickly and easily.

1. Open the slide holder of the mechanical stage by pressing the slide holder finger lever, and carefully place the slide against the fixed side and back edge of the mechanical stage. Now slowly release the slide holder finger lever allowing the "finger" to hold the slide in place.
2. Align the specimen under the objective lens by using the adjustment knobs under the mechanical stage. The bottom knob moves the slide from right/left while the top knob adjusts the slide from front/back. These knobs allow for precise movement and scanning of the slide.
3. Rotate the nosepiece to place the lowest power objective (4X) over the specimen. Be sure the objective "clicks" into position.
4. Adjust the interpupillary distance of the Siedentopf binocular head for a comfortable view. Adjust the eyepiece tubes of the binocular head by moving the eyepiece tubes in an arc motion to the position where one perfect circle can be seen in the field of view.
5. While viewing through the eyepiece, rotate the coarse focus knob to bring the specimen into focus. This should be done slowly and carefully.
6. To adjust the contrast of the specimen, open the iris diaphragm to its largest aperture. If additional contrast is required to permit accurate viewing of the specimen, the diaphragm should be slowly closed until the details of the specimen are sharply defined. Be careful not to close the aperture too much, as you may be achieving a higher contrast, but the fine structure of the image may be destroyed. Reducing the aperture increases the contrast and depth of focus, but it also reduces resolution and introduces diffraction. The aperture must be adjusted for each objective.
NA 0.25 for 10X / NA 0.65 for 40X / NA 1.25 for 100X
The iris diaphragm is not intended to control the brightness of the illumination, but induce contrast of the specimen by diffracting light rays.
7. Next, use the fine focus control to refine the focus and provide the sharpest image.
8. For increased viewing comfort when using the Binocular Head, use the left eye diopter adjustment to compensate for the differences between the user's eyes. Set the adjustable left eye diopter at zero. Close your left eye and focus with your right eye only by using the coaxial focusing knobs. Now using your left eye only (close your right eye), adjust the diopter ring until a clear image is seen. Now the binocular head is set for you to observe the specimen.
9. Now you can rotate the nosepiece to higher magnification objectives. The objectives are parfocalized, meaning that once the lowest objective (4X) is focused, only a slight turn of the fine focusing knob is required when changing to the 10X, 40X and 100X objectives.

OIL IMMERSION

It is desirable to use immersion oil with the 100X objective. Oil generates a fine resolution and brightens the image viewed through the microscope. Place a tiny amount of oil (1 very small drop) onto the slide (between the slide and the objective tip) prior to focusing with the 100XRD objective. It is essential to thoroughly clean the objective tip after use. Please contact Motic or your authorized Motic dealer for the appropriate immersion oil to use.
IMPORTANT: The working distances from the 100X and 40X objectives to the slide surface are very close. Even though the objectives are sealed to prevent oil contamination, it is a good practice to avoid dragging these objectives through an oiled slide.



LED REPLACEMENT

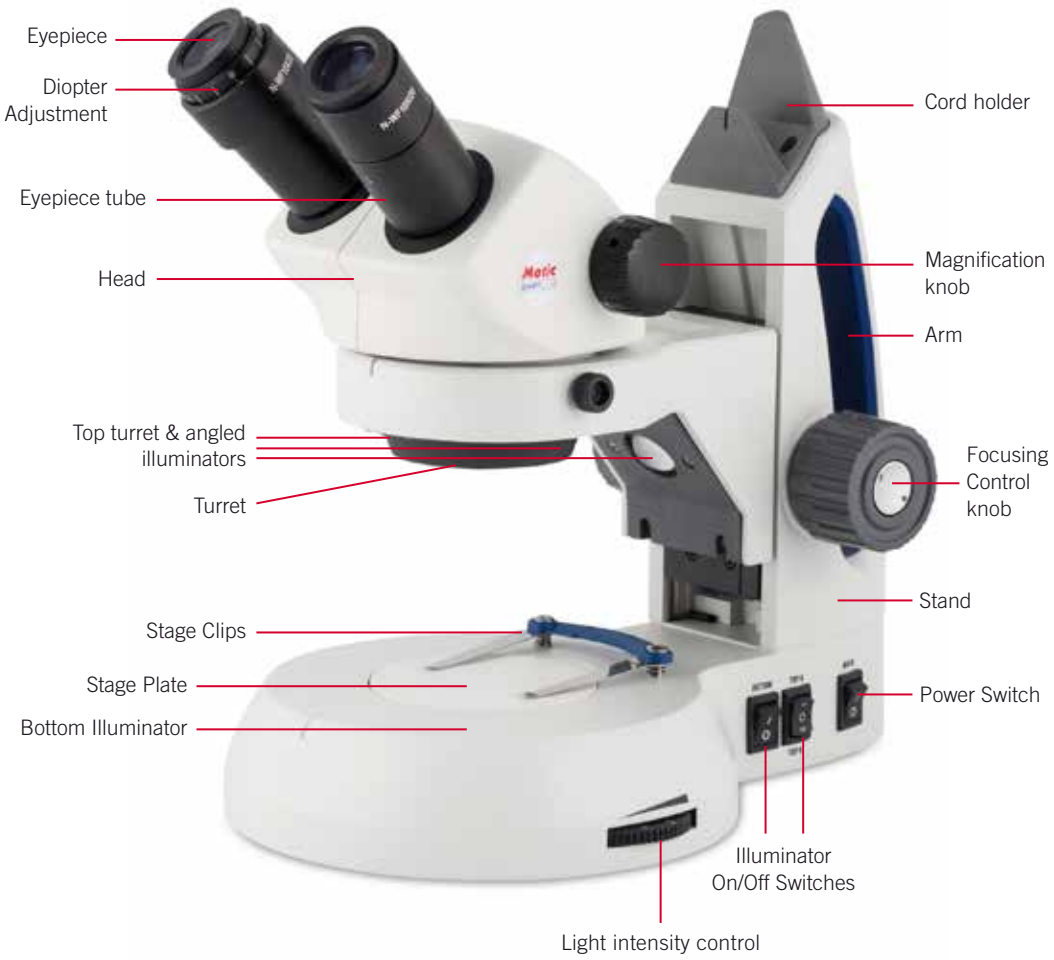
The SWIFT200 is equipped with a 3 Watt LED illumination system. The life of the LED may vary depending on use and intensity. To prolong the life of the LED, you should always turn off the unit when not in use.
It is important that you only use a Motic replacement LED because it is integrated onto a circuit board. This LED has been tested and approved for life span, color temperature and brightness.
Make sure the microscope is unplugged before replacing the LED.

1. Remove the eyepiece(s) from the head if they are not secured in place so they do not accidently fall out of the microscope. Remove any slide that may be on the stage.
2. Carefully turn the microscope on its side. Remove the 4 screws on the bottom of the microscope. Remove the base cover to access the LED.
3. The LED is integrated onto a circuit board. This LED circuit board is held into the illuminator housing by a black ring. Unscrew this black ring from the illuminator housing to remove the LED circuit board.
4. Unplug the LED's power wire from the circuit board attached to the base cover.
5. Carefully cut the cable tie that bundles the electrical component wiring together. (Using a cutter tool with a thin cutting tip will help prevent damage to wiring insulation while cutting the cable tie). Replacing the cable tie is not necessary, but will help prevent pinching wires while re-installing the base plate.
6. Reverse steps 1-4 to install the new LED.

SWIFT30 SERIES

INSTRUCTION MANUAL | ENGLISH

Motic SWIFTLINE



OPERATING WITH YOUR STEREO MICROSCOPE

1. Place the specimen onto the stage plate and select the type of illumination. If the specimen is transparent, turn on the bottom illumination. If the specimen is opaque, turn on the top illuminator.
2. The magnification knob is located on the right hand side of the microscope head. The knob is clearly marked with the optical magnification setting. To change magnifications, rotate the black magnification knob in one direction or in the opposite, as far as it will turn. This will place one pair of objectives in alignment for viewing. The power that is in use is marked on the black magnification knob.
3. Look through the eyepieces and rotate the focus control knob to focus the specimen in the field of view.
4. Grasp the eyepiece tubes and move them either closer together or farther apart, to change the interpupillary distance to obtain a clear image. Note, if two separate images are observed, the eyepiece tubes are too far apart and should be moved together. If two overlapping images are seen, the eyepiece tubes are too close together and should be moved apart.
5. Close your left eye and adjust the focus controls so the image is in sharp focus, while viewing with the right eye only.
6. Close your right eye and while viewing with the left eye only, adjust the diopter ring on the left eyetube to bring the image of the specimen into sharp focus. The optical system is now adjusted to your particular vision.

BULB REPLACEMENT

Unplug the stereo microscope from the electrical outlet and remove specimens from the stage before you attempt to replace an LED.
To prolong the life of the LED, you should always turn off the unit when not in use.
The extra long life LED incidental (top) illuminator bulbs can be replaced by removing the five retaining screws holding on the Illumination plate. This will require the use of a short handle screw driver. They can then be unclipped and replaced.
The transmitted (bottom) illumination bulb is 3.5V 150mA LED Bulb. The bottom bulb may be replaced by carefully laying your stereoscope on its side and using a Phillips screw driver remove the four screws securing the rubber feet and base plate to illuminator base. Remove four 3mm Phillips head screws securing lamp housing to lamp bracket; then remove lamp housing. Carefully unplug LED lamp connector. Replace LED lamp assembly and then, reverse the above process

CAUTION

NEVER DISASSEMBLE MECHANICAL OR OPTICAL COMPONENTS. THIS SERVICING SHOULD ONLY BE DONE BY AN AUTHORIZED MOTIC TECHNICIAN. THE WARRANTY WILL BE NULL AND VOID IF THE MECHANICAL OR OPTICAL COMPONENTS ARE DISASSEMBLED BY A NON-MOTIC DEALER.

10 YEARS SWIFTLINE WARRANTY

Motic assures that the microscope in respect of mechanical and optical parts is guaranteed against defects in material and workmanship for ten years. Electrical and electronical components are covered for two years after purchase. Normal wear, routine maintenance, light bulbs, power supplies, rechargers, batteries, fuses, cords, add-on accessories, damage resulting from repair by unauthorized parties, accident, alteration, shipping, misuse or abuse is not covered. Warranty service is provided by Motic authorized technicians. Determination of warranty is at the technician's discretion. Other than set forth above, Motic hereby disclaims all warranties, expressed or implied, of fitness for a particular purpose. Defective products covered by the warranty will be repaired free of charge when they are returned to:

Motic Spain, S.L.U.

Pol. Ind. Les Corts, C. Les Corts, 12 · 08349 Cabrera de Mar, Barcelona · Spain

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Motic®

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Design Change: The manufacturer reserves the right to make changes in instrument design in accordance with scientific and mechanical progress, without notice and without obligation.

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