

User Manual

Digital Binocular Compound Microscope w/ LED Light

Model MD82CLED



MicroscopeNet.com

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i. Caution

1. Find the “UP” sign and place the Styrofoam container on your table or bench so that the arrow is pointing upward. Open the shipping carton carefully to prevent any accessory items (i.e. objectives or eyepieces) from dropping and being damaged.
2. Do not discard the molded Styrofoam container. The container should be retained should the microscope ever requires reshipment.
3. Keep the instrument out of direct sunlight, high temperature or humidity, and dusty environments. Ensure that the microscope is located on a smooth, level and firm surface.
4. If any specimen solutions or other liquids splash onto the stage, objective or any other component, disconnect the power cord immediately and wipe up the spillage. Otherwise, the instrument may be damaged.
5. All electrical connectors (power cord) should be inserted into an electrical surge suppressor to prevent damage due to voltage fluctuations.

IMPORTANT:

6. The lamp, lamphouse and adjacent parts will become very hot during or short after operation. Do not touch these parts until they have completely cooled. Never attempt to handle a hot halogen bulb or mercury bulb.
7. Make sure there is sufficient room around the microscope base for heat elimination.
8. For safety when replacing the lamps or fuses, be sure the main switch is off, unplug the power cord, and only replace the bulb after the bulb and the lamphouse has completely cooled.
9. Do not touch the surface of halogen bulbs with bare fingers. If so, clean the surface with soft cloth.

ii. Care and Maintenance

1. Do not attempt to disassemble any component including eyepieces, objectives or focusing assembly.
2. Keep the instrument clean; remove dirt and debris regularly. Accumulated dirt on metal surfaces should be cleaned with a damp cloth. More persistent dirt should be removed using a mild soap solution. **Do not use organic solvents for cleansing.**
3. The outer surface of the optics should be inspected and cleaned periodically using an air stream from an air bulb. If dirt remains on the optical surface, use a soft cloth or cotton swab dampened with a lens cleaning solution (available at camera stores). All optical lenses should be swabbed using a circular motion. A small amount of absorbent cotton wound on the end of a tapered stick makes a useful tool for cleaning recessed optical surfaces. Avoid using an excessive amount of solvents as this may cause problems with optical coatings or cemented optics or the flowing solvent may pick up grease making cleaning more difficult. Oil immersion objectives should be cleaned immediately after use by removing the oil with lens tissue or a clean, soft cloth.
4. Store the instrument in a cool, dry environment. Cover the microscope with the dust cover when not in use.

1. Components Illustration



- 1. Eyepiece
- 2. Diopter Ring
- 3. Eyepiece Tube
- 4. Nosepiece
- 5. Objective
- 6. Slide Holder
- 7. Mechanical Stage

- 8. Abbe Condenser
- 9. Light Collector
- 10. Microscope Base
- 11. Viewing Head w/Camera
- 12. Thumb Screw
- 13. Microscope Body
- 14. Focus Rack Stop

- 15. Focus Tension Ring
- 16. Coarse Focus Knob
- 17. Fine Focus Knob
- 18. Stage Trans. Knob
- 19. Power Switch
- 20. Intensity Dial

2. Installation

2.1 Installation of the viewing head

- 1) Loosen the thumb screw on the top of the microscope body and remove the plastic cover.
- 2) Remove the cap on the circular dovetail of the viewing head.
- 3) Seat the dovetail into the socket on the top of microscope body completely and tighten the thumb screw.

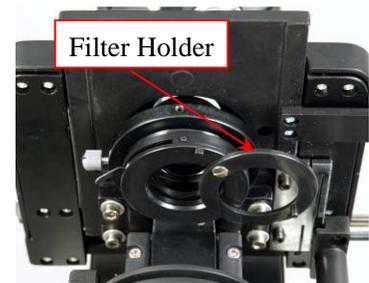
2.2 Installation of the eyepieces

- 1) Remove the protective caps from both eyepiece tubes.
- 2) Insert the eyepieces into the eyepiece tubes.

2.3 Installation of the objectives

- 1) Adjust the coarse focus knob until the mechanical stage is at its lowest position.
- 2) Install the 4X objective into the nosepiece. Then in a clock-wise direction, rotate the nosepiece and install each succeeding higher magnification objective.

Note: When changing the objective magnification, rotate the objective nosepiece until you hear a “click” sound. This ensures the objective is centered in the optical light path.



2.4 Installation of the glass color filter

- 1) Swing out the filter holder under the condenser.
- 2) Insert the filter into the holder, swing the holder back in.

2.5 Replacing the fuse

- 1) Turn off the power and unplug the power cord.
- 2) Find the fuse holder at the back of microscope body, just above the power socket, as shown in the right figure.
- 3) Gently pry the fuse holder by a screw driver to take it out.
- 4) Replace the fuse, and then push the fuse holder back in.



3. Operation

3.1 Adjusting illumination

- 1) Connect the power cord to the power outlet and the microscope.
- 2) Turn on the main power switch.
- 3) Rotate the variable intensity dial to increase or decrease the brightness.

3.2 Placing specimen

- 1) Place the slide on the mechanical stage. Use the slide holder to gently secure the slide.
- 2) Turn the X and Y translational knobs to position the specimen for viewing.

Caution: Be sure not to allow an objective to touch a specimen slide when changing objectives.

3.3 Focusing

- 1) With the 10X objective in position, raise the mechanical stage using the coarse focus knob until the specimen is close to the objective.
- 2) Turn the coarse focus knob until the specimen is in focus. Then use the fine focus knob to obtain a sharp image. You may now switch to another magnification objective.

Tips: To prevent your specimen slide from making contact with an objective, raise the stage to its highest position without contacting the 100X objective, then tighten the screw of focus rack stop.



3.4 Adjusting substage condenser

- 1) Turn the condenser focus knob to raise or lower the condenser.
- 2) The condenser is raised when using high magnification objectives and lowered when using low magnification objectives.



Note:

- The centering of the condenser and the light axis of the objective are factory adjusted. Do not attempt re-adjustment.
- The highest position of the condenser has been factory adjusted. Do not attempt re-adjustment.

3.5 Adjusting aperture iris diaphragm

Move the Iris Diaphragm Lever left or right to adjust the aperture size.



3.6 Adjusting interpupillary distance

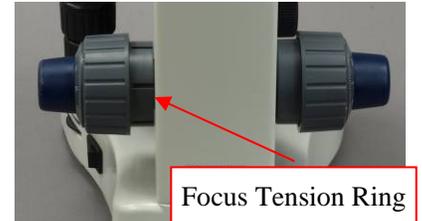
While observing with both eyes, hold the left and right eye tubes then swing the tubes inwards and outwards. The interpupillary distance is correct when the left and right fields of view converge completely into one image.

3.7 Adjusting eyepiece diopter

- 1) Using the 10X objective and your right eye only, observe your specimen through the eyepiece and bring it into focus by adjusting the focus knobs.
- 2) Then observe the specimen with your left eye only through the left eyepiece. If the specimen is not in focus, rotate the diopter ring until a sharp image is obtained.

3.8 Adjusting focus tension

The tightness of the focus tension has been pre-set at the factory. If the mechanical stage (15) drops by itself, rotate the tension adjustment ring located between the focus knob and microscope body on the right side until the tension is in maintained.



3.9 Photo/video observing, capturing and recording

- 1) Insert the USB cable into the USB port on the back of viewing head, and the other end to the computer.
- 2) Turn on the computer; launch the observing software to examine.
- 3) You also can capture images or record live videos through the software.

Note: For the details of installation and operation of the camera and its software, please refer to the manuals in the camera's CD.



4. Specifications

Model	MD82CLED
Total Magnification	40X, 80X, 100X, 200X, 400X, 800X, 1000X, 2000X
Viewing Head	Binocular seidentopf head, inclined 30°, swiveling 360° Interpupillary distance 48 mm – 75 mm Adjustable diopter on left eyepiece tubes (-5 to +5)
Eyepieces	1 pair of WF10X/18 1 pair of WF20X
Objective Tube Length	160 mm
Nosepiece	Reversed revolving quadruple
Objectives	Achromatic DIN 4X, 10X, 40X (spring), 100X (spring, oil)
Condenser	Abbe, NA=1.25, w/ iris diaphragm and filter holder Rack and pinion adjustment
Focus Mechanism	Coaxial coarse and fine focusing knobs on both sides Minimum fine focusing adjustment at 0.004mm, range 24 mm Focus rack stop
Stage	Large double layer mechanical stage Dimension: 5-3/16" x 5-9/16" (132 mm x 142 mm) Translational range: 2-15/16" x 1-9/16" (75mm X 40mm)
Camera	Built-in 2.0 MP digital camera, 1600 x 1200 pixel USB2.0 port Driver and software included in CD Compatible with Windows 2000, XP, Vista and Win7 (32/64bit)
Illumination	Transmitted, 3W LED Variable intensity
Power Supply	110V/60Hz or 220V/50Hz switch US and Canada plug
Net weight	11.2 lb (5.2 kg)

5. Troubleshooting Guide

OPTICAL PROBLEMS

Problem	Cause	Solution
Darkness at the periphery or uneven brightness in the field of view	Revolving nosepiece not in click stop position	Revolve the nosepiece to click-stop position by swinging the objective correctly into the optical path
	The light source of the bulb is not at the center	Adjust the position of the bulb
Dirt or dust on the view	Dirt or dust on the eyepiece, condenser, objective or collector lens or specimen	Clean the lens with a camera cleaning kit
Poor image quality	No slide cover attached to the slide	Attach a 0.17mm slide cover
	Slide cover is too thick or thin	Use a slide cover of the appropriate thickness (0.17mm)
	Slide may be upside down	Turn slide over so the cover-glass faces up
	Immersion oil is on a dry objective (especially the 40X)	Check the objectives, clean if necessary
	No immersion oil used with 100X objective	Use immersion oil
	Air bubbles in immersion oil	Remove bubbles
	Condenser aperture is closed or open too much	Open or close properly
	Condenser is positioned too low	Position the condenser upward

ELECTRICAL PROBLEMS

Problem	Cause	Solution
Lamp does not light when switched on	No electrical power	Check power cord connection
	LED bulb dead or circuit board malfunction	Need to service
	Fuse blown out	Replace fuse

IMAGE PROBLEMS

Problem	Cause	Solution
Image moves while focusing	Specimen rises from stage surface	Secure the specimen in the slide holder
	Revolving nosepiece is not in the click-stop position	Revolve the nosepiece to the click-stop position
Image tinged yellow	Lamp intensity is too low	Adjust the light intensity by rotating the intensity control dial
Image is too bright	Lamp intensity is too high	Adjust the light intensity by rotating the intensity control dial
Insufficient brightness	Lamp intensity is too low	Adjust the light intensity by rotating the intensity control dial
	Aperture diaphragm closed too far	Open to the proper setting
	Condenser position too low	Position the condenser upward

MECHANICAL PROBLEMS

Problem	Cause	Solution
Image will not focus with high power objectives	Slide upside down	Turn the slide over so the cover glass faces up
	Cover glass is too thick	Use a 0.17mm cover glass
High power objective contacts slide when changed from low power objective	Slide upside down	Turn the slide over so the cover glass faces up
	Cover glass is too thick	Use a 0.17mm cover glass
	Diopter adjustment is not set properly	Readjust the diopter settings
Slippage of focus when using the coarse focusing knob Fine focus is ineffective	Tension adjustment is set too low	Increase the tension on the focusing knobs
	Tension adjustment is set too high	Loosen the tension on the focusing knobs