

User Manual

Digital Binocular Compound Microscope

Model MD828S30



MicroscopeNet.com

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i. Caution

1. Open the carton carefully with a knife or paper cutter. Find the "UP" sign and place the Styrofoam container on the side that makes the arrow upward. If the "UP" sign is missing, please open the Styrofoam container gently to prevent any accessory, 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. **Important:** the lamp, lamp housing and adjacent parts will become very hot. Do not touch these parts until they have completely cooled. Never attempt to handle a hot halogen bulb.
6. All electrical connectors (power cord) should be inserted into an electrical surge suppressor to prevent damage due to voltage fluctuations.
7. For safety when replacing the halogen lamp or fuse, be sure the main switch is off, unplug the power cord, and only replace the halogen bulb after the bulb and the lamp house has completely cooled.
8. Confirm that the input voltage indicated on your microscope corresponds to your line voltage. The use of a different input voltage other than that as indicated will cause severe damage to the microscope.
9. **Note:** please read the instruction of the operation of camera in manual 3.9 below and the CD in the package before you start to use it.

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. Observe the specimen with the 4X, 10X and 40X objectives in order, then observe the specimen with the 100X objective. Apply the immersion oil on the slide cover with the 100X objective. Do not let the immersion oil to contact with the dry objectives lens (especially the 40X). Clean the dry objective lens using the camera cleaning kit if the immersion oil is on the dry objectives lens. Clean the 100X objective lens first using the camera cleaning kit after observing the specimen with the 100X objective, then clean the specimen. More persistent dirt should be removed using a little bit alcohol. **Do not use organic solvents for cleansing.**
5. Store the instrument in a cool, dry environment. Cover the microscope with the dust cover when not in use.

2 Installation

2.1 Installation of the binocular viewing head

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

Caution: Do not release the head from your hand grip until you are sure the head is installed securely.

2.2 Installation of the eyepieces

- 1) Remove the protective caps from the 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: Inspect the objectives frequently for dirt or oil; clean if necessary. Use the 10x objective to initially focus the image of your specimen. 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 filter

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



2.5 Installing (or changing) the halogen bulb

- 1) Turn the power off and disconnect the power cord.
- 2) Allow some time to cool down the lamp.
- 3) Turn over the microscope on its side; find the bulb compartment at the bottom.
- 4) Open the cover of the bulb compartment by loosening the thumb screw. Take out the dead bulb and insert the new bulb. Be sure the pins on the bulb are completely inserted into the lamp socket. You may also loosen the two screws on the cover to adjust the position of the bulb to get centered and even brightness. Screw the cover on.



Caution: Before you turn over the microscope, be sure to take the eyepieces off and be certain that the head is securely locked by the thumb screw.

2.6 Replacing the fuse

- 1) Turn off the power and disconnect the power cord.
- 2) Turn over the microscope on its side; find the fuse holder at the bottom of the base.
- 3) Turn the fuse holder counter-clockwise to take it off, replace the fuse, and then turn

it on clockwise.

Caution: Before you turn over the microscope, be sure to take the eyepieces off and be certain that the head is securely locked by the thumb screw.

2.7 Installing the mirror (optional, your model may not have one)

- 1) Unplug the power cord.
- 2) Screw off the light cover on the base.
- 3) Screw the black disc onto the base and then insert the mirror into the hole at the center of the black disc. You may try to get reflected ambient light on either side of the mirror with different angles for best result.



Note: The mirror is only used when there is a power failure or you are in the field and no power is available.

3 Operation

3.1 Adjusting illumination

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

3.2 Placing specimen

- 1) Place the slide on the mechanical stage.
- 2) Use the slide holder to gently secure the slide.
- 3) 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 Adjusting interpupillary distance

While observing with both eyes, hold the left and right eyepiece tubes then slide the tubes in and out. The interpupillary distance is correct when the left and right fields of view converge completely into one image.

3.4 Adjusting eyepiece diopter

- 1) Rotate the 10x objective into position.
- 2) Rotate the diopter ring on the right eyepiece tube until its numerical value is the same as your interpupillary distance, for example, 65 in the right figure.
- 3) Close your left eye and bring the specimen into focus following the focusing procedures in 3.5.
- 4) Close your right eye and bring the same specimen into clear sharp focus by adjusting the diopter ring on left eyepiece tube only. Do not use focus knobs at this step.
- 5) Since both sides are adjustable, you may also do the above in the opposite way, in other words, left eye first and right eye second.



3.5 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.
- 3) Use the fine focus knob to obtain a sharp image.
- 4) 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 upper limit mechanical stage lever.

3.6 Adjusting condenser

- 1) Turn the condenser focus knob to raise or lower the condenser.

- 2) Raise the condenser when using high power objectives and lower it when using low power 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.

3.7 Adjusting iris aperture diaphragm

Swing the iris diaphragm lever left or right to adjust the aperture size.

Note:

The iris diaphragm is designed to adjust the aperture size, not to adjust the brightness although the brightness will be changed when it's adjusted. When aperture is adjusted to smaller size, the contrast will be increased and the depth of field will be increased as well. Turn up the intensity of the light if the image is too dim.



3.8 Adjusting focus tension

The focus tension has been pre-set at the factory. If the mechanical stage drops by itself, rotate the tension adjustment ring situated between the coarse focus knob and microscope body on the power switch side until the tension is maintained.

3.9 Photo/video observing, capturing and recording

- 1) Bring the microscope into focus by following the procedures in 3.5.
- 2) Insert the USB cable into the USB port on the back of viewing head, and the other end to the computer.
- 3) Turn on the computer; install the camera following the manual in the mini CD.
- 4) Open image observing software to examine (more details see camera's manual).
- 5) Capture images with manual white balance for image size of 1280X1024 and 2048X1536 or 1024X768 resolution when using auto white balance.
- 6) You also can record live videos through the software.

**Note:**

- Please refer to the manual in the camera's CD for the details of installation and operation of the camera.
- Do not capturing images of 1280X1024 or 2048X1536 resolution in auto white balance mode. The captured images may have problems with color rendering at this mode.

4 Specifications

Model	MD828S30
Total Magnification	40X, 80X, 100X, 200X, 400X, 800X, 1000X, 2000X
Viewing Head	Binocular, 45° inclined, 360° swiveling w/ built-in camera
Interpupillary Distance	Sliding adjustment, 55mm-75mm
Diopter Adjustment	On both eyepiece tubes
Eyepieces	1 pair of WF10X/18 1 pair of WF20X
Objective Tube Length	160mm
Nosepiece	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 w/ focus stop Minimum fine focusing adjustment at 0.002mm, range 28mm
Mechanical Stage	Double layer, Dimension: 5-1/2" x 5-1/2" (140mmx140mm) Translational range: 3" x 2" (75mm X 50mm)
Camera	Built-in USB2.0 2048 x 1536 pixel (3.0MP) Driver and Software included in the CD Compatible with Windows 2000, XP, Vista, Windows7 (32/64-bit) and Mac OS
Illumination	Transmitted: 6V/20W, Halogen, Variable intensity
Power Supply	AC 100V-240V, 50/60HZ (US and Canada plug)
Dimension	11" x 7-1/2" x 15" (28cm x 19cm x 38 cm)
Net weight	11 lbs (5 kg)

5 Troubleshooting Guide

Problem	Cause	Solution
Lamp does not light when switched on	No electrical power	Check power cord connection
	Lamp bulb burnt out	Replace bulb
	Fuse blown out	Replace fuse
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 lens eyepiece, condenser, objective, collector lens or specimen	Clean the lens with a camera cleaning kit
Poor image quality or not able to get focused image	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 (specimen at the bottom)	Turn slide over so the cover-glass faces up
	Diopter adjustment is not set properly	Readjust the diopter settings
	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
	Specimen rises from stage surface	Secure the specimen in the slide holder
	Blue filter not used	Use daylight blue filter
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