User Manual

Digital Compound Binocular LED Microscope

Model MD827C30L

OMAX

Table of Contents

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. All electrical connectors (power cord) should be inserted into an electrical surge suppressor to prevent damage due to voltage fluctuations.

6. For safety when replacing the LED light and the fuse, be sure the main switch is off, unplug the power cord, and replace the LED light and the fuse

7. 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.

8. **Note:** please read the instruction of the operation of camera in **manual 3.10** 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.

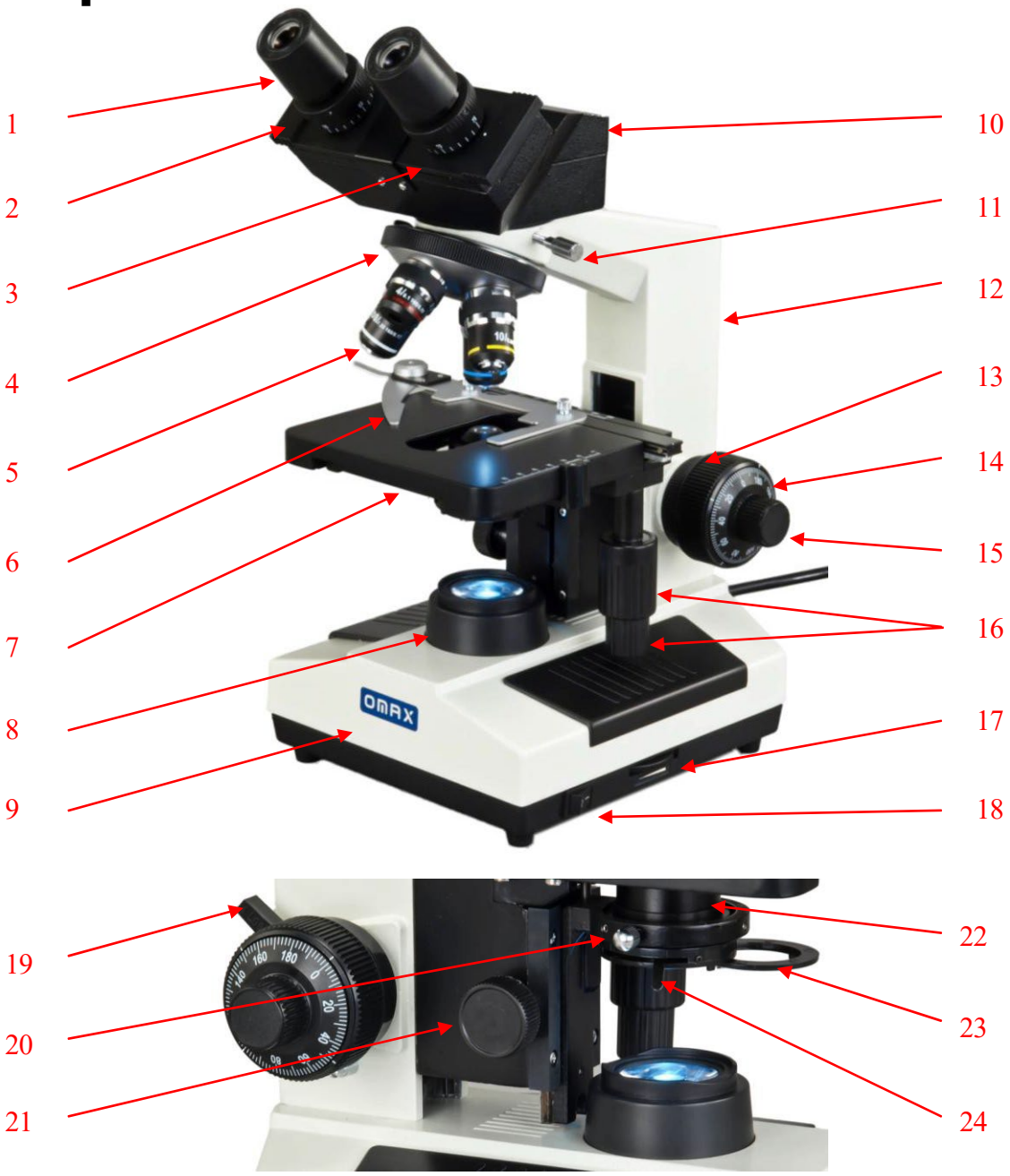
2. Keep the instrument clean; remove dirt and debris regularly. Accumulated dirt on metal surfaces should be cleaned with a damp cloth. More persistent dirt should be removed using a mild soap solution. **Do not use organic solvents for cleansing**.

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 lens cleaning paper if the immersion oil is on the dry objectives lens. Clean the 100X objective lens first using the lens cleaning paper 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.

1 Components Illustration



1	Eyepiece	9	Microscope Base	17	Brightness Intensity Dial
2	Diopter Ring	10	Viewing Head w/ Camera	18	Power Switch
3	Eyepiece Tube	11	Head Thumb Lock Screw	19	Focus Stop Lever
4	Nosepiece	12	Microscope Body	20	Condenser Lock Thumb Knob
5	Objective	13	Focus Tension Ring	21	Condenser Focus Knob
6	Slide Holder	14	Coarse Focus Knob	22	Abbe Condenser
7	Mechanical Stage	15	Fine Focus Knob	23	Color Filter Holder
8	Light Collector	16	X-Y Stage Moving Knobs	24	Iris Diaphragm Lever

2 Installation

2.1 Installation of the binocular viewing head

1) Loosen the head thumb lock screw on the top of the microscope 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 of the viewing head into the socket on the top of the microscope body and tighten the head thumb lock screw.

Caution:

Do not release the viewing head from your hand grip until you are sure the viewing 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) Turn the caps counter-clockwise to remove them from the nosepiece.
3) Take the objectives out from the plastic cases and turn each one clock-wise into the holes on the nosepiece. Install the 4X objective into the nosepiece first. Then in a counter-clockwise direction, rotate the nosepiece and install each succeeding higher magnification objective as shown in ***Fig. 1***.

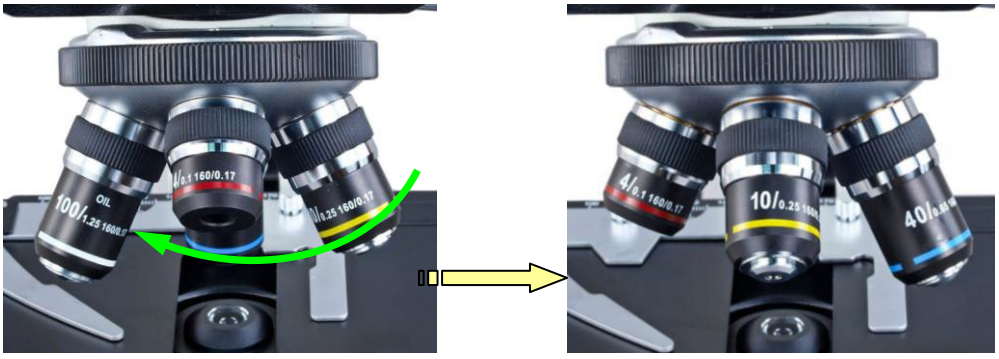


Fig.1

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 or have a clear "in position" feeling. This ensures the objective is centered in the optical light path.

2.4 Installation of the glass Filter

1) Swing out the color filter holder under the condenser.
2) Place the filter into the holder as shown in ***Fig. 2***, swing the holder in.

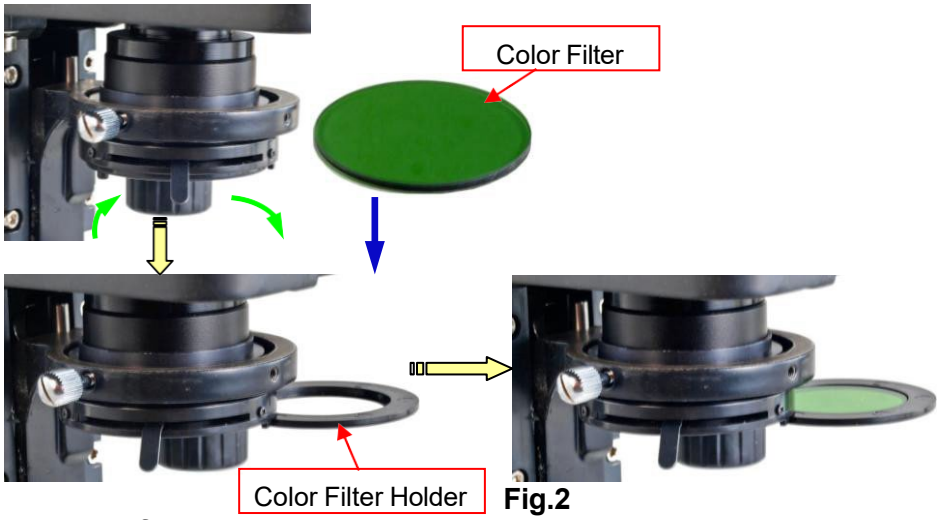


Fig.2

2.5 Replacing the fuse

1) Turn off the power switch 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. See ***Fig. 3***.

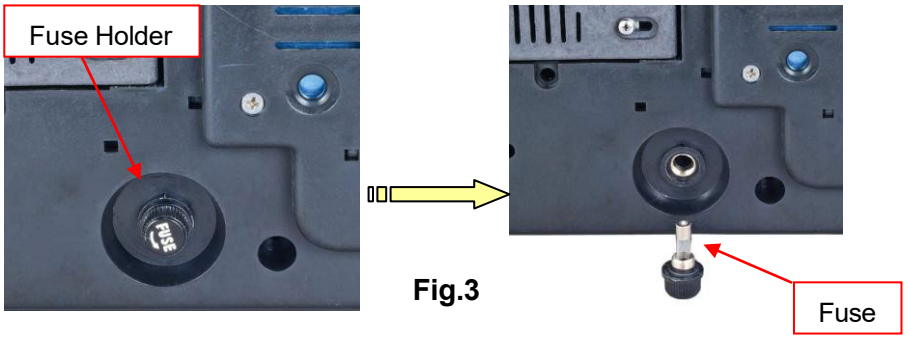


Fig.3

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 Installing the mirror *(optional, may not included in your package)*

1) Turn off the power switch and disconnect the power cord.
2) Screw off the light collector on the microscope base.
3) Screw the black disc onto the base and then insert the mirror into the hole at the center of the black disc. (See ***Fig. 4***.) You may try to get reflected ambient light on either side of the mirror with different angles for best result.

Fig.4

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) Plug the power cord into the power socket on the microscope and connect it to the power outlet.
2) Turn on the power switch.
3) Rotate the brightness intensity dial to increase or decrease the brightness.

Caution:

A diffusion filter is attached beneath the condenser to get uniform light and protect your eyes from strong light when a low power objective applied. The diffusion filter can be swung out to make the view field brighter when observing with a high power objective, such as 100X objective.

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 stage moving knobs to position the specimen in the center of viewing field.

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 rings on the eyepiece tubes until its numerical value is the same as your interpupillary distance, for example, **70** in the figure (See ***Fig. 5***).
3) Close your left eye and bring the specimen into focus following the focusing procedures in **3.5**.

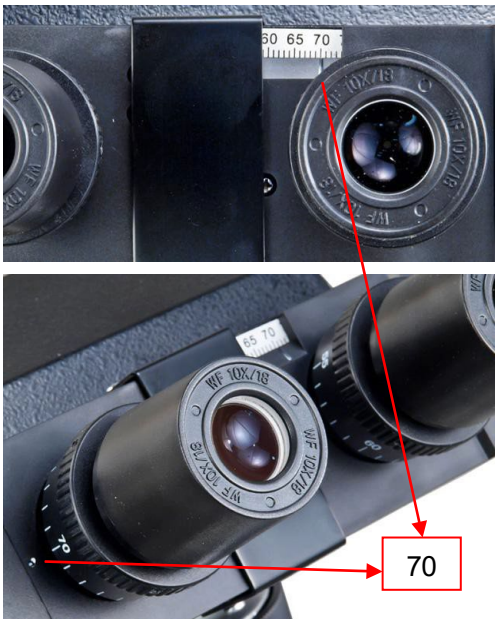


Fig.5

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) To get a good focused image, you may need to combine the focus knob adjustment and interpupillary distance adjustment, along with eyepiece diopter adjustment stated in **3.3** and **3.4**.
5) 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 focus stop lever (***Fig. 6***). Give the stage a tiny extra moving space to ensure the objective can be focused every time.

3.6 Applying the immersion oil

1) Rotate the objective nosepiece to seat the observing position between the 40X and 100X objectives as shown in ***Fig.7 (a)***.
2) Place a drop of immersion oil on the slide cover as shown in ***Fig. 7 (b)***.
3) Rotate the objective nosepiece to seat the 100X objective to the observing position until you hear a “click” sound.
4) After observing the specimen, use the lens cleaning paper to clean the 100X objective lens gently and the specimen in time.
5) If it is hard to clean, you need a little bit alcohol to clean the 100X objective lens and the specimen.

(a)

(b)

Fig.7

Caution (important):

- When you use the 100X objective to observe the specimen, you have to finish observing the specimen with the 4X, 10X, 40X objectives.
- When you use the 100X objective to observe the specimen, you have to apply the immersion oil on the top of the slide cover.
- When you apply the immersion oil with the 100X objective, do not let the immersion oil to contact with the dry objective lenses (especially the 40x). If the immersion oil is on the dry objectives lens, please use the lens cleaning paper to clean the objectives lens in time. The oil will damage the dry objective lenses.
- After observing the specimen with the 100X objective, clean the 100X objective lens first.

3.7 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 to re-adjust.
- The highest position of the condenser has been factory adjusted. Do not attempt to re-adjust.

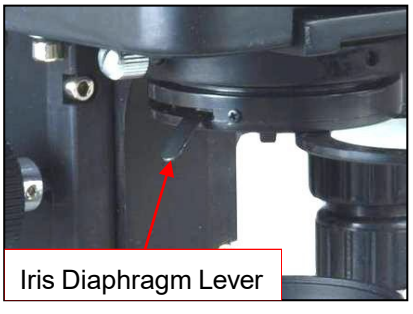


Fig.8

3.8 Adjusting iris aperture diaphragm

Swing the iris diaphragm lever (***Fig. 8***) 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.

3.9 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 (***Fig. 9***) situated between the coarse focus knob and microscope body on the power switch side until the tension is in maintained.

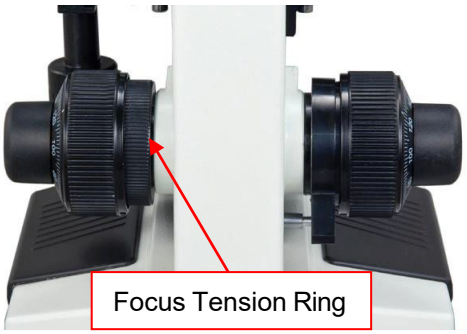


Fig.9

3.10 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 (***Fig. 10***) 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.

Fig.10

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	MD827C30L
Total Magnification	40X, 100X, 400X, 1000X
Viewing Head	Binocular, 45º inclined, 360º swiveling w/ built-in camera
Interpupillary Distance	Sliding adjustment, 2-3/16” ~ 2-15/16” (55mm ~ 75mm)
Diopter Adjustment	On both eyepiece tubes
Eyepieces	1 pair of WF10X/18
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 and Windows7 (32/64-bit),and Mac OS.
Illumination	Transmitted, LED, variable intensity
Power Supply	AC 100V-240V, 50/60HZ (US and Canada plug)
Dimension	7-7/8” x 10-1/4” x 15-3/8” (20cm x 26cm x 39 cm)
Net weight	12 lbs (5.45 kg)

5 Troubleshooting Guide

GENERAL PROBLEMS

Problem	Cause	Solution
Lamp does not light when switched on	No electrical power	Check power cord connection
	LED or power unit dead	Replace LED light
	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 lamp is not at the center	Adjust the position of the lamp
Dirt or dust on the view	Dirt or dust on the lens eyepiece, condenser, objective, collector lens or specimen	Clean the lens with a lens cleaning paper
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
	Lamp intensity is too high or low	Adjust the light intensity by rotating the intensity control dial
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