

# **User Manual**

## **Digital Binocular Compound Microscope**

**Model MD8211E30**

The logo for OMAX, featuring the word "OMAX" in white, uppercase, sans-serif font, centered within a solid blue rectangular background.

**OMAX**

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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 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.
6. **Important:** confirm that the input voltage (**110V/220V, switchable at the bottom**) 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.
7. **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.
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         | 8  | Light Collector       | 15 | Fine Focus Knob            |
| 2 | Diopter Ring     | 9  | Microscope Base       | 16 | X-Y Stage Moving Knobs     |
| 3 | Eyepiece Tube    | 10 | USB Cable             | 17 | Power Switch               |
| 4 | Viewing Head     | 11 | Head Lock Thumb Screw | 18 | Brightness Intensity Dial  |
| 5 | Objective        | 12 | Nosepiece             | 19 | Condenser Lock Thumb Screw |
| 6 | Slide Holder     | 13 | Microscope Body       | 20 | Condenser Focus Knob       |
| 7 | Mechanical Stage | 14 | Coarse Focus Knob     | 21 | Condenser                  |

## 2. Installation

### 2.1 Installation of the digital binocular viewing head

- 1) Loosen the head lock thumb 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 digital binocular viewing head.
- 3) Seat the dovetail of the viewing head into the socket on the top of the microscope body and tighten the head lock thumb 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

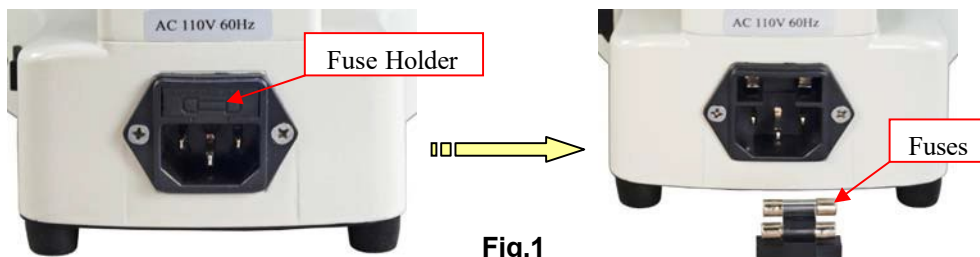
- 1) Adjust the coarse focus knob until the mechanical stage is at its lowest position.
- 2) Turn the caps counter-clockwise to remove them from the nosepiece.
- 3) Take the objectives out from the plastic cases and turn each one clock-wise into the holes on the nosepiece. Install the 4X objective into the nosepiece first. Then in a counter-clockwise direction, rotate the nosepiece and install each succeeding higher magnification objective.

**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 Replacing the fuse

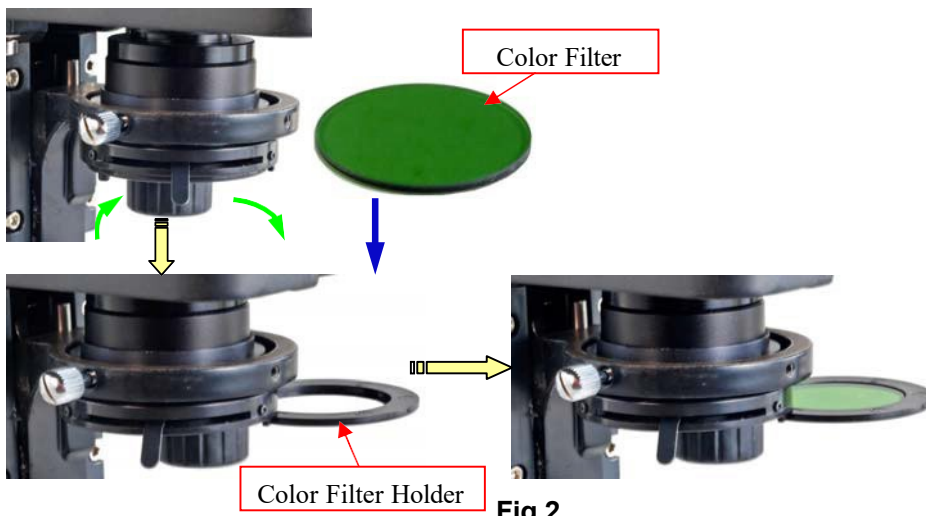
- 1) Turn off the power switch and disconnect the power cord.
- 2) Find the fuse holder at the rear bottom of the microscope body.
- 3) Pry out the fuse holder gently with a flat head screwdriver.
- 4) Replace the old fuse with a new one, and then insert it back in. See **Fig. 1**.



**Fig.1**

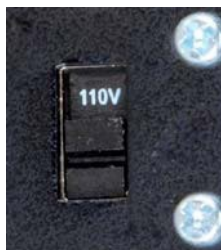
### 2.5 Installation of the glass filter

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



**2.6 Choosing the power voltage**

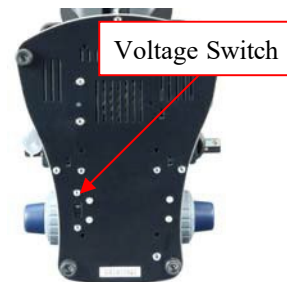
The power voltage can be switched between 110V and 220V.  
The switch can be found from the bottom.  
Push the switch down, the microscope will work at 110V.  
Push the switch up, the microscope will work at 220V.



110V



220V



Voltage Switch

### 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 of the illuminator.

**Caution:**

A diffusion filter is attached beneath the condenser to get uniform light and protect your eyes from strong LED light when a low power objective applies. 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 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.
- 3) 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 3.4 and 3.5.



**Fig.3**

**Tips:**

To prevent your specimen slide from making contact with an objective, turn the 40X objective in position and adjust the thumb screw of focus stop (as shown in **Fig. 3**) so that the 40X objective will not contact the specimen while the stage is adjusted to its highest position. Give the stage a tiny extra moving space to ensure the objective can be focused every time.

#### 3.4 Adjusting interpupillary distance

While observing with both eyes, hold the left and right eyepiece tubes then swing them around the center axis. The interpupillary distance is correct when the left and right fields of view converge completely into one image.

#### 3.5 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, turn the diopter ring on the eyepiece tube until a sharp image is obtained.

### 3.6 Adjusting 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:**

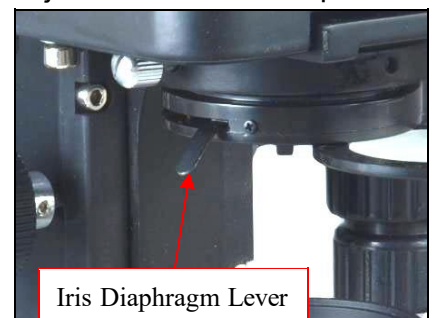
- The centering of the condenser and the light axis of the objective are factory adjusted. Do not attempt to re-adjust.
- The highest position of the condenser has been factory adjusted. Do not attempt to re-adjust.

### 3.7 Adjusting iris aperture diaphragm

Swing the iris diaphragm lever (**Fig. 4**) left or right to adjust the aperture size.

**Note:**

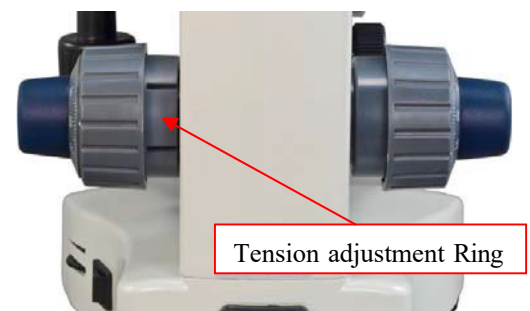
The iris diaphragm is designed to adjust the aperture size, not to adjust the brightness although the brightness will be changed when it's adjusted. When aperture is adjusted to smaller size, the contrast will be increased and the depth of field will be increased as well. Turn up the intensity of the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



**Fig.4**

### 3.8 Adjusting focus knob tension

The tightness of the focus knob tension has been pre-set at the factory. If the mechanical stage drops by itself, rotate the tension adjustment ring (**Fig. 5**) located inside the focus knob on the power switch side until the tension is maintained.



**Fig.5**

### 3.9 Photo/video observing, capturing and recording

- 1) Insert the USB cable into the USB port (**Fig. 6**) on the back of the viewing head, and the other end to the computer.
- 2) Turn on the computer, install the camera following the manual in the mini CD.
- 3) Bring the microscope into focus by following the procedures in **3.3**.
- 4) Open image observing software to examine.
- 5) You also can capture images or record live videos through the software, depending on the functions provided by the software.



**Fig.6**

**Note:**

For the details of installation and operation of the camera and its software, please refer to the manual in the mini CD.

## 4. Specifications

Model	MD8211E30
Total Magnification	40X, 100X, 200X, 400X
Viewing Head	30° inclined, 360° swiveling siedentopf binocular viewing head with built-in 3.0MP camera
Interpupillary Distance	Hinge adjustment, 48mm - 75mm
Diopter Adjustment	On left eyepiece tube
Eyepieces	1 pair of WF10X/18
Objective Tube Length	160mm
Nosepiece	Reversed revolving quadruple
Objectives	Achromatic DIN 4X/0.10 160/0.17 10X/0.25 160/0.17 20X/0.40 160/0.17 (spring) 40X/0.65 160/0.17 (spring)
Condenser	Abbe, NA=1.25, w/ iris aperture diaphragm and filter holder Rack and pinion focus adjustment
Focus Mechanism	Coaxial coarse and fine focusing knobs on both sides w/ stop
Stage	Double layer mechanical stage Dimension: 5-1/2" x 4-5/16" (140mm x 110mm) Translation range: 3" x 1-5/8" (78mm x 40mm)
Illumination	Transmitted, LED, variable intensity
Camera	Built-in USB2.0 2048 x 1536 pixel (3.0MP) Driver and Software included in the CD Compatible w/ Windows 2000/XP/Vista/Windows7 (32/64-bit)
Power Supply	AC 110V/220V (switchable at the bottom), 60HZ (US and Canada plug)
Fuse	0.5A 250V
Dimension	12" x 8" x 15" (31cm x 20cm x 39cm)
Net weight	11 lbs 14.5 oz (5.4 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	Contact seller for service
	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
Dirt or dust on the view	Dirt or dust on the 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
	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
	Revolving nosepiece is not in the click-stop position	Revolve the nosepiece to the click-stop position
	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