

# User Manual

## Binocular Stereo Microscope

Model K2213 Series



[MicroscopeNet.com](http://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 base, 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. 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.

## 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 | Diopter                | 9  | Objective Switch Knob               |
| 2 | Eyepiece               | 10 | Stand Post                          |
| 3 | Eyepiece Tube          | 11 | Upper Light                         |
| 4 | Viewing Head           | 12 | Focus Knob                          |
| 5 | Head Thumb Lock Screw  | 13 | Upper Light Switch / Intensity Dial |
| 6 | Objective Housing      | 14 | Lower Light Switch / Intensity Dial |
| 7 | Microscope Base        | 15 | Stage Plate                         |
| 8 | Stage Plate Lock Screw |    |                                     |

## 2 Installation

### 2.1 Installation of the binocular viewing head

- 1) Loosen the head thumb lock screw on the top of the microscope.
- 2) Insert the binocular head into the ring holder; tighten the lock screw.

**Caution:**

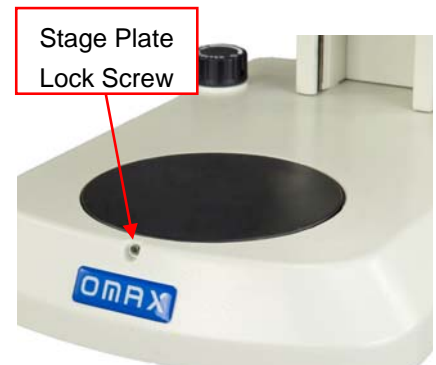
Do not release the viewing head from your hand grip until you are sure the viewing head is installed securely.

### 2.2 Installation of the eyepieces

- 1) Take off the protective caps from the eyepiece tubes.
- 2) Insert the eyepieces into the eyepiece tubes.

### 2.3 Installation or replacing the stage plate

- 1) Loosen the stage plate lock screw using the provided Allen key.
- 2) Put the stage plate you want to use onto the base.
- 3) Tighten the lock screw. (**Fig. 1**)



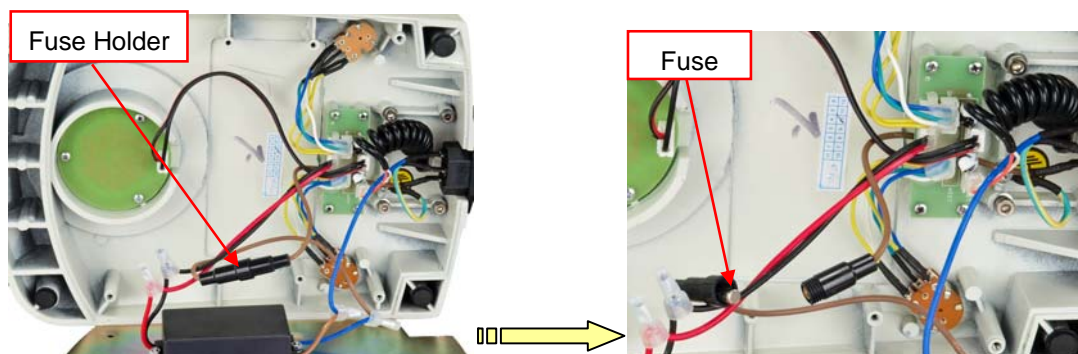
**Fig.1**

### 2.4 Replacing the fuse

- 1) Turn off the power switch and disconnect the power cord.
- 2) Turn over the microscope on its side.
- 3) Loosen the 4 screws on the bottom board. (**Fig. 2**)
- 4) Find the fuse holder and unscrew it. (**Fig. 3**)
- 5) Replace the old fuse with a new one, and then screw the holder back together.
- 6) Put the board back its place.
- 7) Tighten the 4 screws.



**Fig.2**



**Fig.3**

### 2.5 Installation of the Camera (optional, may not included in your package)

- 1) Take off the eyepiece from the eyepiece tube.
- 2) Insert the 23.2-30mm eyetube adapter into the eyepiece tube.
- 3) Insert the camera into the eyepiece tube. (**Fig.4**)
- 4) Connect the camera to a computer via USB2.0 cable.
- 5) The manual for the camera is on a CD (or mini CD). Refer to the manual to install the driver and software on to the computer
- 6) The camera is optional and may have different color and shape from the one in the figure, depending on the model purchased.



**Fig.4**

#### **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.

## 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 the intensity dial (**13**) to switch on and adjust the brightness of upper (reflected) light.
- 3) Turn the intensity dial (**14**) to switch on and adjust the brightness of lower (transmitted) light.

### 3.2 Placing specimen

- 1) Put the specimen in the center of the stage plate (**15**).
- 2) Adjust the intensity dial of upper or lower light as necessary.

### 3.3 Focusing

- 1) Turn the objective switch knob (**9**) to the magnification 1X or 3X.
- 2) Turn the focus knob (**12**) until the specimen is in focus.

### 3.4 Adjusting interpupillary distance (Fig.5)

While observing with both eyes, hold the left and right eyepiece tubes (3) and slide in or out, and adjust the distance between your eyes and the eyepieces slightly. The interpupillary distance is correct when the left and right fields of view converge completely into one image.

It may take some time to get the two view fields converge if you are not familiar with binocular observation.



Fig.5

### 3.5 Adjusting eyepiece diopter

- 1) Using your right eye only, observe your specimen through the right eyepiece and bring it into focus by adjusting the focus knob (12).
- 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 (1) until a sharp image is obtained.
- 3) 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.



Fig.6

### 3.6 Adjusting tension of focusing knobs (Fig.6)

The tightness of the tension has been pre-set at the factory. If the mechanical stage drops by itself, rotate the both focusing knobs with both hands to opposite directions at the same time to adjust the tension.

### 3.7 Camera (optional, may not included in your package)

- 1) Bring the microscope into focus by following the procedures in 3.3.
- 2) Install the camera by following the procedures in 2.5.
- 3) Open image observing software to examine (more details see camera's manual).
- 4) You also can capture images or record live videos through the software, depending on the functions provided by the software.

#### Note:

Please refer to the manuals in the camera's CD for the details of installation and operation of the camera.

## 4 Specifications




Model	K2213 series
Total Magnification	10X, 30X
Viewing Head	Binocular, 45° inclined, 360° swiveling
Interpupillary Distance	Sliding adjustment, 2" ~ 2-3/4" (50mm ~ 70mm)
Eyepieces	1 pair of widefield WF10X/23 Diopter adjustment on both eyepiece
Objectives	1X, 3X
Focusing Mechanism	Rack and pinion, focus knobs on both sides Focusing adjustment range: 4" (100mm) Tool free tension adjustment
Working Distance	4" (100mm)
Field of View	23 mm at 10X magnification 7.7 mm at 30X magnification
Stage Plate	Frosted glass stage plate, 3-3/4" (95mm) in diameter White/Black plastic stage plate, 3-3/4" (95mm) in diameter
Camera ( <i>optional</i> )	Refer to the cameras specifications
Illumination	Incident (upper): 2W LED light with own switch/intensity knob Transmitted (lower): 2W LED light with own switch/intensity knob
Power Supply	110V-240V, 50/60Hz, 0.5A
Dimension	11-1/2" x 7-1/4" x 15" (29cm x 18.5cm x 38cm)
Net weight	9 lb 12 oz (4.5 kg)



## 5 Optional Parts

(The optional parts may be included in some models or sold separately.)

### 1) Cameras

	Model	Resolution	Operating System	Software
	A1502	640 x 480 (0.3MP)	MS Windows (32/64-bit) Mac OS	Included
	A1520C	1600 x 1200 (2.0MP)		
	A3513U	1280 x 1024 (1.3MP)	MS Windows (32/64-bit) Mac OS Linux	

## 6 Troubleshooting Guide

Symptom	Cause	Remedy
Totally dark in the viewing field	The cover of objective housing is still on	Take off the cover of objective housing
Stains or dust on the field of view	Stains or dust on the eyepieces or objectives	Clean the lens with a lens cleaning paper ( <b>not included</b> )
	Stains or dust on the specimen	Clean the specimen
Image moves while focusing	Specimen rises from stage surface	Secure the specimen
Lamp does not light when switched on	No electrical power	Check power outlet Check power cord connection
	Fuse blown out	Replace fuse