## OMAX M83ES-C50U

# OMAX 40X-2000X Digital Lab Trinocular Compound LED Microscope

**Model: M83ES-C50U**

User Manual

## 1. Introduction

This manual provides instructions for the assembly, operation, maintenance, and troubleshooting of your OMAX 40X-2000X Digital Lab Trinocular Compound LED Microscope with 5MP Digital Camera. This instrument is designed for educational and professional use, offering a wide magnification range and digital imaging capabilities. Please read this manual thoroughly before using the microscope to ensure proper function and longevity.

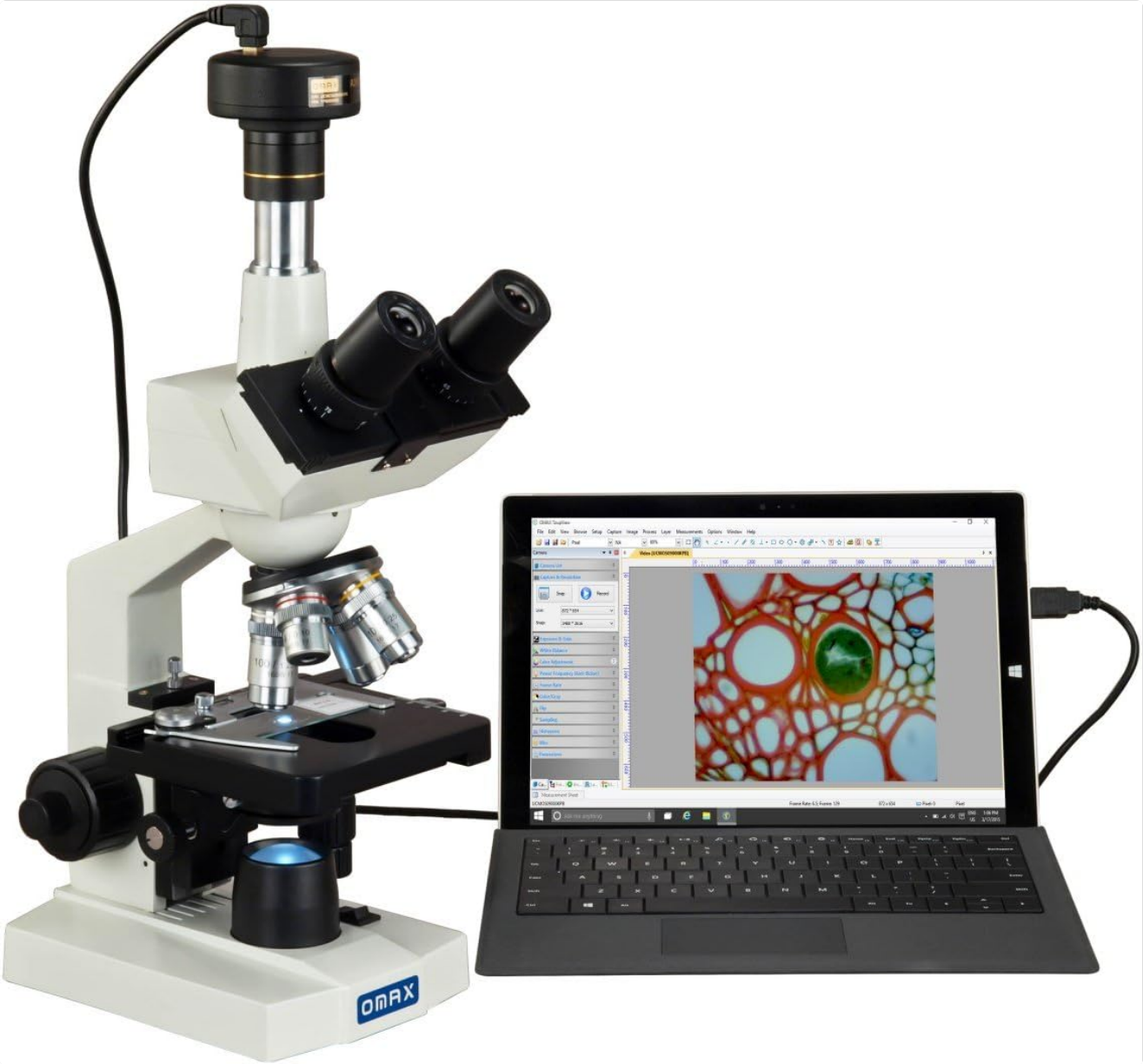


Figure 1: OMAX 40X-2000X Digital Lab Trinocular Compound LED Microscope with 5MP Digital Camera.

## 2. Package Contents

Verify that all items listed below are present in your package:

- OMAX Trinocular Compound LED Microscope Body
- Wide Field Eyepieces: WF10X (2 pieces) and WF20X (2 pieces)
- Achromatic DIN Objectives: 4X, 10X, 40X(S), 100X(S, Oil)
- 5MP Digital Camera (2592x1944 pixels)
- 0.5X Reduction Lens for Digital Camera
- 0.01 mm Calibration Slide (1mm/100 division)
- Digital Camera Software CD
- USB Cable for Digital Camera
- AC/DC Power Adapter (7.5V/7.5W, UL approved)
- Immersion Oil Bottle
- Dust Cover


Figure 2: Included accessories such as eyepieces, objectives, and power adapter.


Figure 3: The 5MP digital camera, USB cable, software CD, and calibration slide.

## 3. Microscope Components

Familiarize yourself with the main parts of the microscope:

- **Viewing Head:** 45-degree inclined, 360-degree swiveling trinocular head.
- **Eyepieces:** Inserted into the viewing head for direct observation.
- **Nosepiece:** Revolving quadruple nosepiece holds the objective lenses.
- **Objective Lenses:** 4X, 10X, 40X(S), 100X(S, Oil) for various magnifications.
- **Mechanical Stage:** Double-layer stage with X-Y movement controls for precise specimen positioning.
- **Condenser:** NA1.25 Abbe condenser with iris diaphragm to control illumination.
- **Illuminator:** Transmitted LED light source with adjustable intensity.
- **Focus Knobs:** Coaxial coarse and fine focus adjustment knobs on both sides of the microscope body.
- **Digital Camera Port:** Dedicated port on the trinocular head for camera attachment.

## 4. Setup

1. **Unpacking:** Carefully remove all components from the packaging. Retain the original packaging for future transport or storage.
2. **Placement:** Place the microscope on a stable, level surface away from direct sunlight, dust, and vibrations.
3. **Install Eyepieces:** Remove the protective caps from the eyepiece tubes and insert the WF10X eyepieces. If using WF20X eyepieces, install them similarly.
4. **Install Objectives:** Rotate the revolving nosepiece to allow space for objective installation. Screw each objective lens into the nosepiece in increasing order of magnification (4X, 10X, 40X, 100X).
5. **Connect Power:** Connect the AC/DC power adapter to the microscope's power input jack and then plug it into a standard electrical outlet.
6. **Install Digital Camera:**
    - Remove the protective cap from the trinocular port.
    - Attach the 0.5X reduction lens to the digital camera.
    - Insert the digital camera with the reduction lens into the trinocular port.
    - Connect the camera to your computer using the provided USB cable.
    - Install the camera software from the included CD or download the latest version from the manufacturer's website. Follow the on-screen instructions for installation.

## 5. Operating Instructions

### 5.1 Basic Observation

1. **Power On:** Flip the power switch located on the microscope base.
2. **Adjust Illumination:** Use the intensity control knob to set the desired brightness of the LED light source.
3. **Place Specimen:** Place your prepared slide on the mechanical stage, securing it with the stage clips. Use the X-Y movement knobs to center the specimen area of interest under the objective lens.
4. **Select Objective:** Rotate the nosepiece to select the lowest power objective (e.g., 4X). Ensure it clicks into place.
5. **Focus:**
    - While looking through the eyepieces, use the coarse focus knob to bring the specimen into approximate focus.
    - Then, use the fine focus knob for sharp, detailed focusing.

6. **Adjust Interpupillary Distance:** Adjust the distance between the two eyepiece tubes until you see a single, circular field of view.
7. **Adjust Diopter:** If one eye is sharper than the other, adjust the diopter ring on one of the eyepieces until both eyes perceive a clear image.
8. **Change Magnification:** Rotate the nosepiece to a higher power objective. Re-focus using only the fine focus knob. For the 100X oil immersion objective, apply a small drop of immersion oil directly onto the slide before rotating the 100X objective into place. Ensure the objective lens makes contact with the oil.
9. **Adjust Condenser and Iris Diaphragm:** Adjust the condenser height and iris diaphragm to optimize contrast and resolution for each objective.

### 5.2 Digital Camera Operation

1. **Software Launch:** Open the installed digital camera software on your computer.
2. **Live View:** The software should display a live feed from the microscope camera.
3. **Focus Adjustment:** Note that the focus through the eyepieces and the camera may differ slightly. Adjust the microscope's fine focus knob while observing the live feed on your computer screen to achieve optimal focus for the digital image.
4. **Image/Video Capture:** Use the software interface to capture still images (2592x1944 pixels) or record live video. The software also allows for measuring lengths, angles, areas, and basic image editing.
5. **Calibration:** Use the provided 0.01 mm calibration slide with the software's calibration function to ensure accurate measurements.

## 6. Maintenance

- **Cleaning Lenses:** Use only specialized lens cleaning paper and lens cleaning solution. Gently wipe lenses in a circular motion. Avoid touching lens surfaces with fingers.
- **Cleaning Body:** Wipe the microscope body with a soft, damp cloth. Avoid using harsh chemicals or solvents.
- **Immersion Oil:** After using the 100X oil immersion objective, clean the objective lens and the slide immediately with lens cleaning solution to prevent oil from hardening.
- **Storage:** When not in use, cover the microscope with the provided dust cover to protect it from dust and debris. Store in a cool, dry place.
- **Bulb Replacement:** The LED illuminator has a long lifespan and typically does not require frequent replacement. If replacement is needed, consult a qualified technician.

## 7. Troubleshooting

| Problem | Possible Cause | Solution |
|---|---|---|
| No illumination | Power not connected; Power switch off; LED failure | Check power connection; Turn on power switch; Contact support if LED is faulty |
| Image unclear/out of focus | Incorrect focus adjustment; Objective not clicked into place; Dirty lens; Specimen upside down | Adjust coarse/fine focus; Rotate nosepiece until objective clicks; Clean lenses; Reorient specimen |
| Dark field of view | Iris diaphragm closed; Condenser too low; Low illumination setting | Open iris diaphragm; Adjust condenser height; Increase illumination intensity |

| Problem | Possible Cause | Solution |
|---|---|---|
| Digital camera image blurry while eyepieces are clear | Focus difference between camera and eyepieces | Adjust fine focus while viewing the live feed on the computer screen. |
| Software not detecting camera | USB cable disconnected; Driver not installed correctly; Camera not powered | Check USB connection; Reinstall camera drivers; Ensure microscope is powered on |

## 8. Specifications

| Feature | Detail |
|---|---|
| Total Magnification | 40X-2000X |
| Eyepieces | WF10X, WF20X (Wide Field) |
| Objective Lenses | Achromatic DIN 4X, 10X, 40X(S), 100X(S, Oil) |
| Viewing Head | 45° Inclined, 360° Swiveling Trinocular |
| Interpupillary Distance | 55mm ~ 75mm (Sliding Adjustable) |
| Nosepiece | Revolving Quadruple |
| Stage | Mechanical Double Layer, 115mm x 125mm |
| Stage X-Y Travel Range | 70mm x 30mm |
| Condenser | NA1.25 Abbe with Iris Diaphragm |
| Illumination | Transmitted LED, Intensity Adjustable |
| Focus Adjustment | Coaxial Coarse and Fine Knobs |
| Digital Camera | 5MP (2592x1944 pixels) True Color |
| Camera Frame Speed | 5fps (2592x1944), 18fps (1280x960), 60fps (640x480) |
| Software Compatibility | Windows XP/Vista/7/8/10, Mac OS, Linux |
| Power Supply | AC/DC Adapter, 7.5V/7.5W (Input: 100-240VAC, 50/60Hz) |
| Product Dimensions | 9.06 x 7.09 x 12.99 inches |
| Item Weight | 10 pounds |
| Material | All Metal Mechanical Components |

## 9. Warranty and Support

This OMAX microscope is covered by a **5-year warranty** against manufacturing defects. For warranty claims or technical support, please refer to the contact information provided with your purchase documentation or visit the official OMAX support website.