



Comparison microscope

LB-10CIM

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1. Safety Measures

- When operating the equipment or moving the high-intensity light source, only grasp surfaces with heat protection.
- The high-intensity light source must not directly illuminate anything other than the specimen. Avoid exposing heat-sensitive materials to the high-intensity light source due to its high temperature.
- It is strictly prohibited to open the power system of the equipment without authorization.
- Do not place liquids or heat-sensitive, easily deformable objects around the equipment.
- The equipment must be placed on a solid, stable, and level surface during use.
- Ensure that all component locking and fixing bolts are properly installed and tightened.
- Make sure the electrical supply is stable before turning the equipment on or off.
- Before turning the equipment on or off, set all light sources to their minimum setting or turn them off completely.
- Unplug the main power socket before replacing the bulb.
- After use, cover the equipment with a dust cover and ensure the surrounding area is free from strong light, high temperatures, and humidity.

2. Introduction

Comparison microscope LB-10CIM is a benchtop unit with dual stage setup for simultaneous viewing of two separate specimens. Methods such as field cutting, jointing and overlapping are used for specimen comparison. Polarizing attachment is used for stray and glare light elimination. It features excellent optical performance and complete comparison function. C-mount video attachment can be used for synchronous observation.

3. Features

- Left or Right single view field observation, overlapping view field observation, segmentation and jointing view field observation
- High resolution (can identify tiny differences between objects accurately)
- Nosepiece has stop clicks (comfortable to change the objectives)
- The transverse, longitudinal and vertical stage directions
- Two stages can be adjusted horizontally at the same time
- Images and videos can be saved and analyzed
- DSLR camera attachment
- Coaxial illumination device (optional)

4. Specifications

Model No.	LB-10CIM
Total optical magnification	9.6X ~ 115X
Viewing head	Seidentopf Trinocular Head
	Inclined at 45°
	Interpupillary Distance 55 mm ~75mm
Eyepiece	Wide Field Eyepiece WF10X/ 22mm, diopter adjustment
	Wide Field Eyepiece WF20X/ 12mm, diopter adjustment
Objective	0.8X
	1.25X
	2X
	3.2X
	4.8X
Nosepiece	Sextuple nosepiece
Stage	Manually operate stage
	Moving range: X-54mm, Y-54mm, Z-54mm
	Two stage horizontal moving range: 54 mm
	The coarse vertical lifting range: 60 mm
Stage size	100 mm × 100 mm
Horizontal rotation	0° ~ 360°
Illumination	High power LED illumination, Brightness and angel adjustable
	Side illumination, 12 V / 50 W air cooled reflecting lamps
	Polarizing attachment
Dimension (L X W X H)	390 × 380 × 700 mm

5. Applications

Used in forensic science, police schools, to compare and identify the bullet, tool marks, fingerprints, seals, text, signatures, drawings, and bank notes.

6. Instrument Introduction

6.1 Main Picture of the Model



6.2 Equipment Area Picture



1. **Field of View (FOV):** FOV of the eyepiece- 10x (12.3mm) 20x(12.5mm).
2. **Camera System:** 3MP pixel camera.
3. **Adjustable Split Line:** Horizontal and vertical adjustment for precise comparison.
4. **Reflected Light Source.**
5. **Stage Clippers:** Use the holder to fix the sample, not by stage clippers.
6. **Image Capture and Processing Software:** Image capture and processing software is included and license-free.
7. **Polarizing lens set:** Polarized Light Device.
8. Only compatible with Windows systems, including 10 and 11, but not macOS and Linux.

7 Operations

Description of main equipment components

1. Instructions for using the main functions of the equipment host.

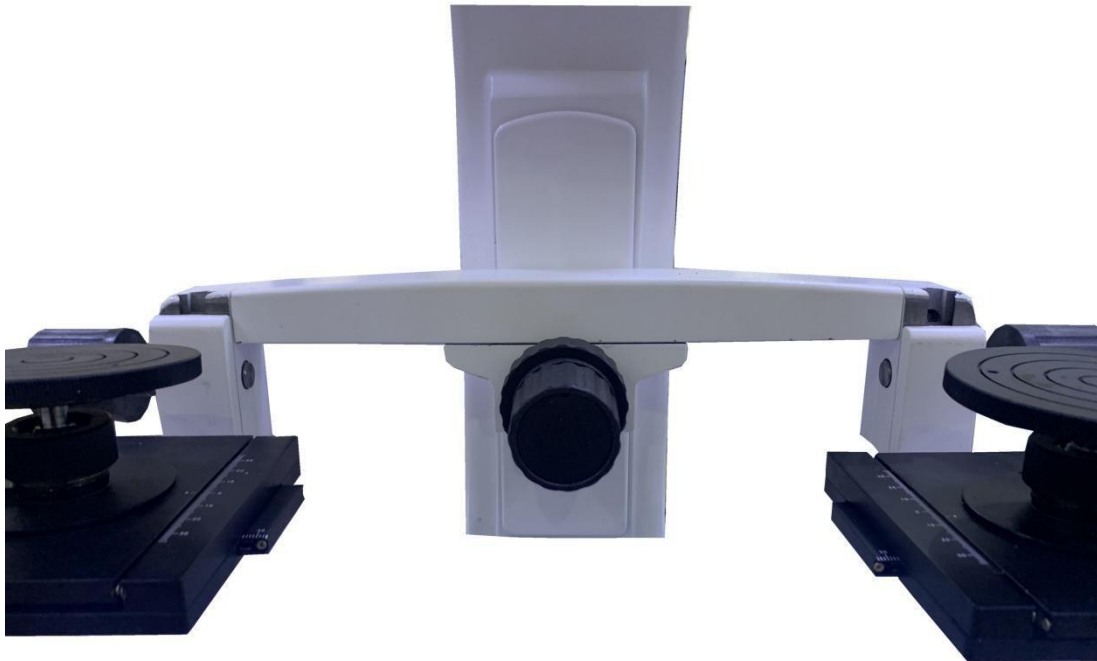


Figure 1 Lifting column knob

- By rotating the front end of the lifting column knob, you can raise or lower the worktable to adjust the focal length.
- Rotating the rear end of the lifting column knob enables synchronous horizontal movement of the worktable.

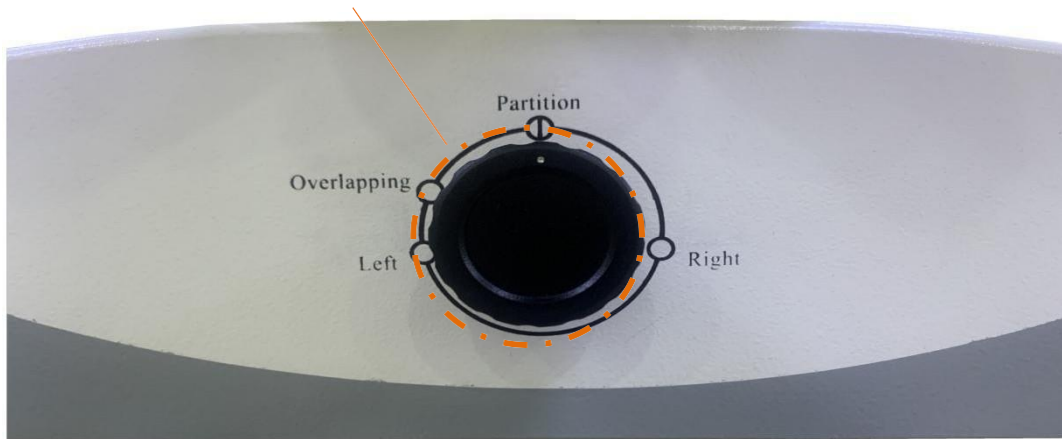


Figure 2 Bridge comparison switch knob

- The pontic comparison switching knob allows you to switch the field of view by rotating it.



Figure 3 Field of view adjustment knob

- If the comparison image sizes on both sides of the field of view are not synchronized, use the field of view adjustment knob to calibrate them.
- **Note:** This knob is pre-calibrated at the factory; avoid turning it unnecessarily.

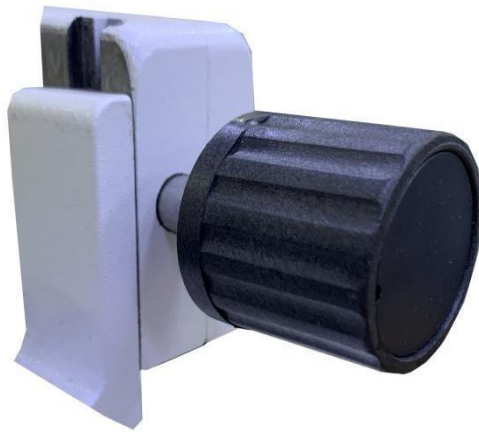


Figure 4 Workbench lifting knob

- Fine-tune the focus of the inspection material using the workbench lifting knob.



Figure 5 Comparison microscope ridge calibration port (back of the device)

- The ridge line calibration port, located on the back of the comparison microscope, allows for ridge line calibration using the provided specialized tools.

Note: This calibration port is pre-calibrated at the factory. Do not open it unnecessarily!



Figure 6 Magnifier

- To adjust the magnification of the inspection material, use the rotary magnifier to increase or decrease the magnification. (The number displayed on the side indicates the objective lens magnification.)



Figure 7 CVT adapter (top of device)

- The CVT adapter, located at the top of the device, serves as the output port for a CCD or CMOS camera.
- The default interface is a C-mount.

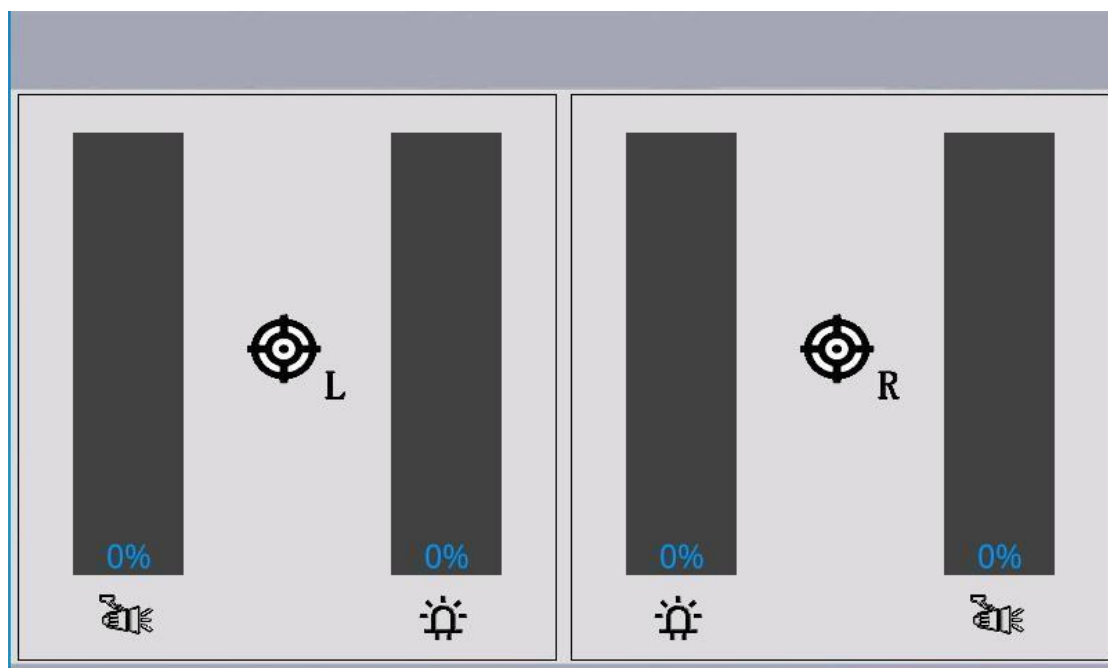


Figure 8 Comparison microscope touch screen icon descriptions



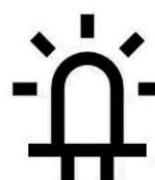
Left workspace icon



Right workspace icon



Strong light icon



Cold light icon

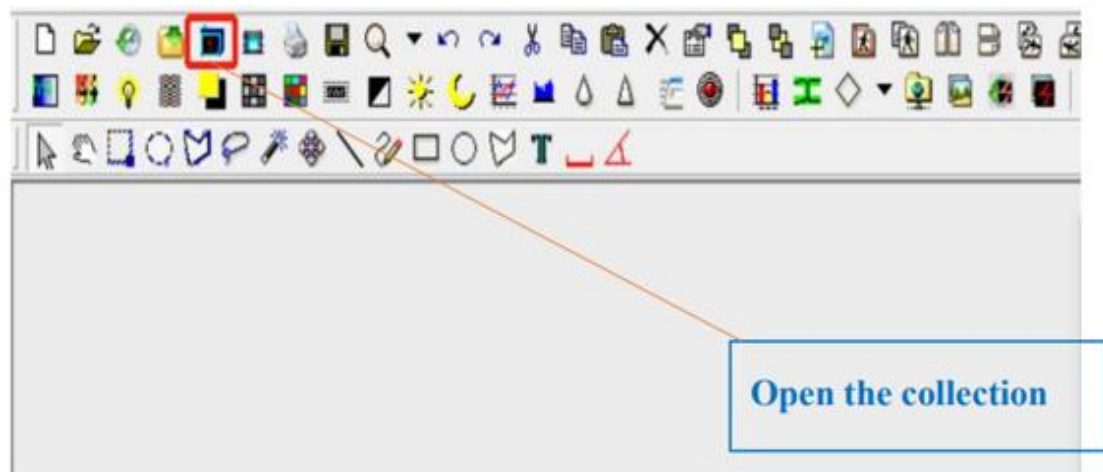


Strong and cold light source brightness bar

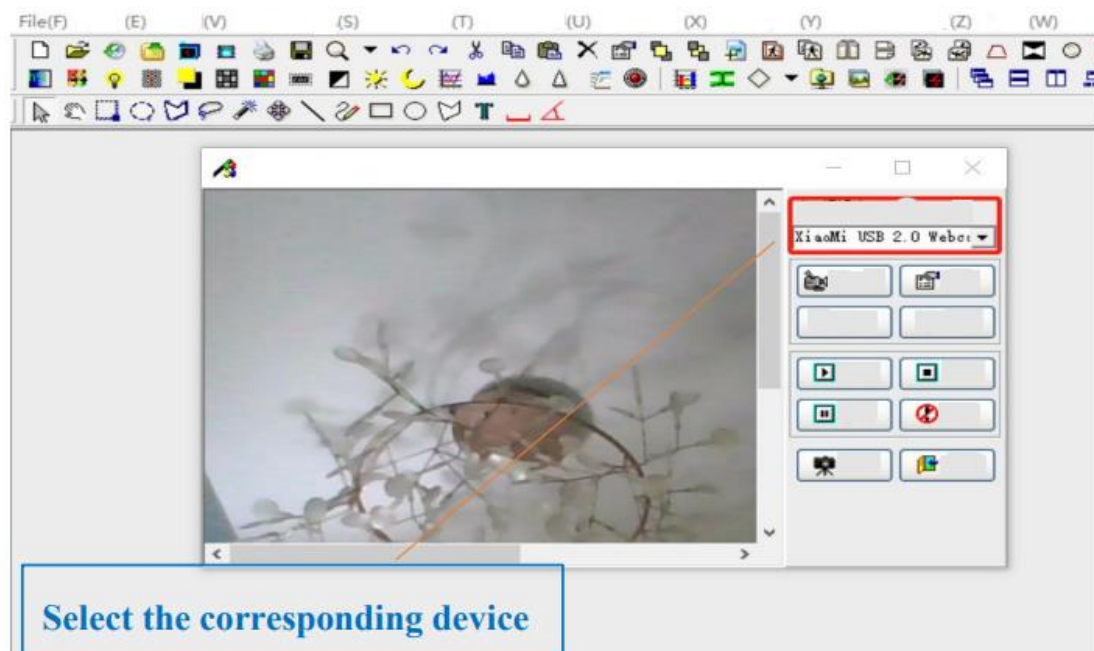
2. Instructions for using the main functions of device image analysis.

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1) LB-10CIM Software Collection window.

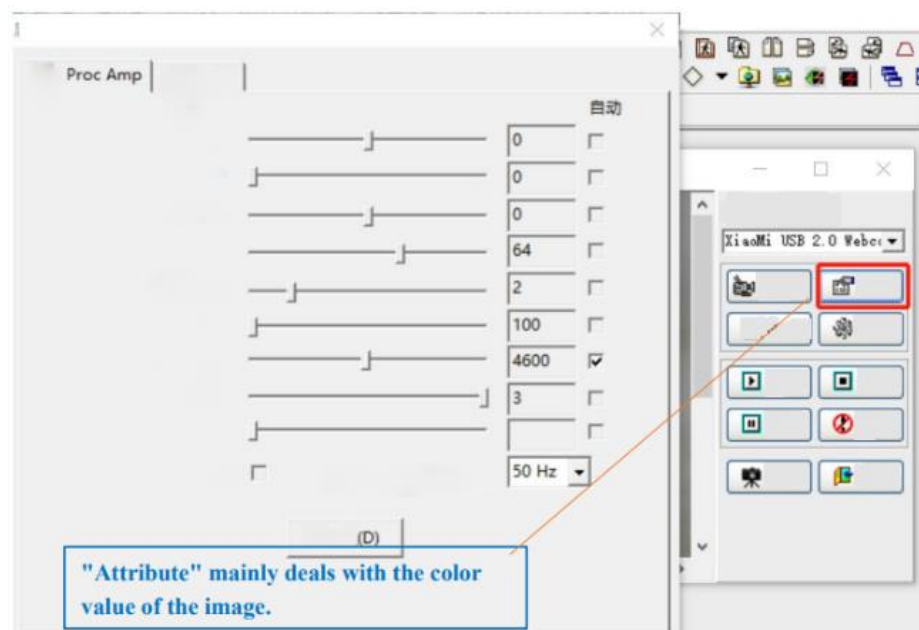
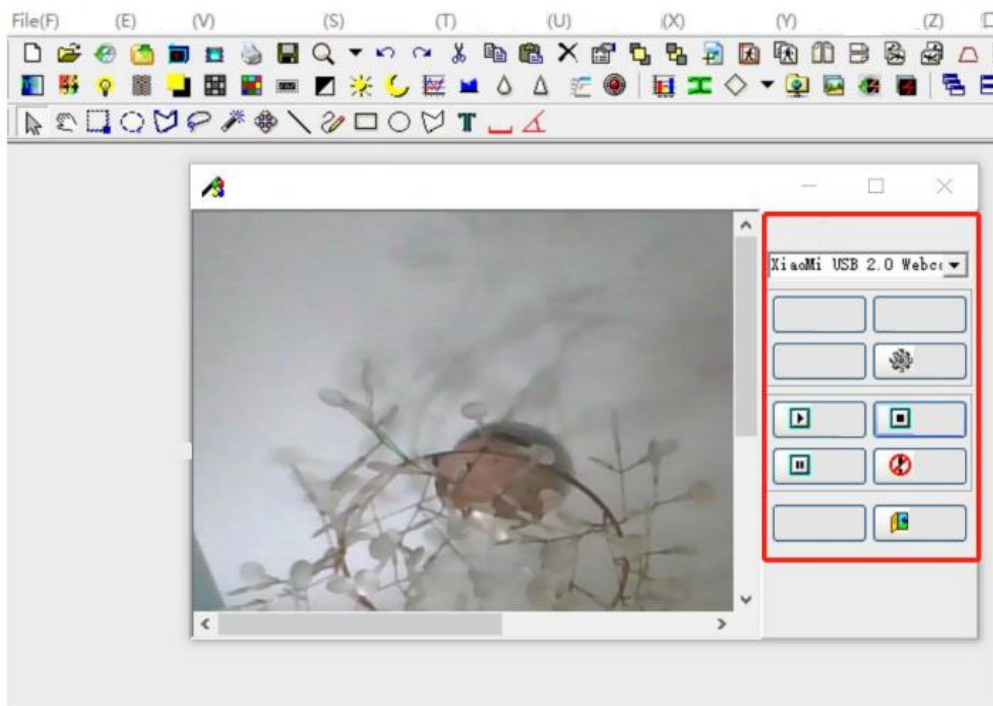


2) LB-10CIM Software video selection window.

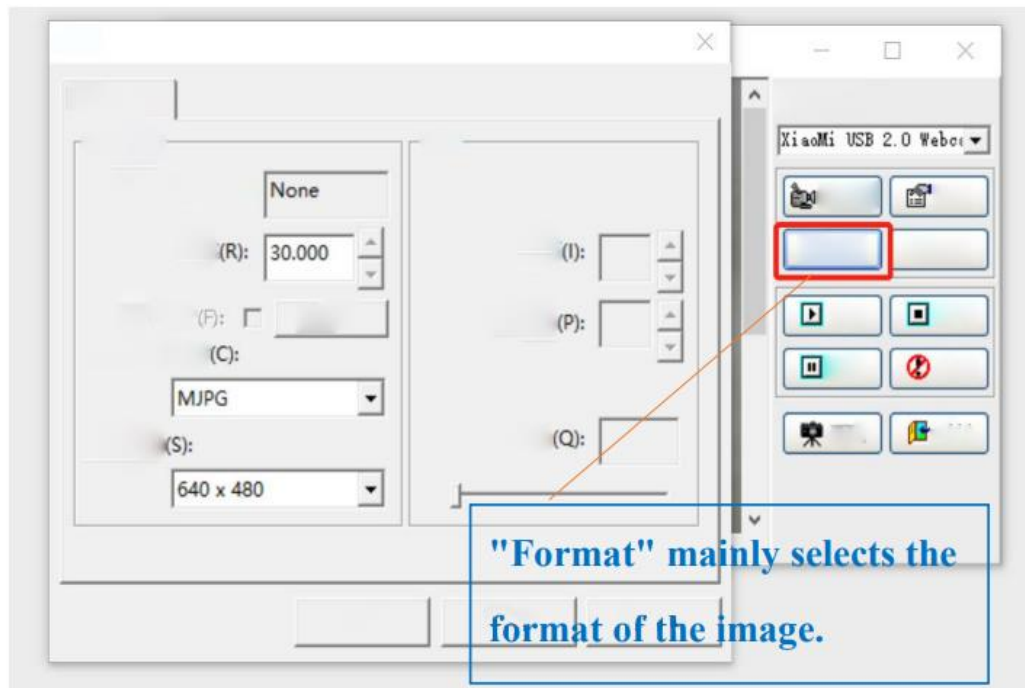


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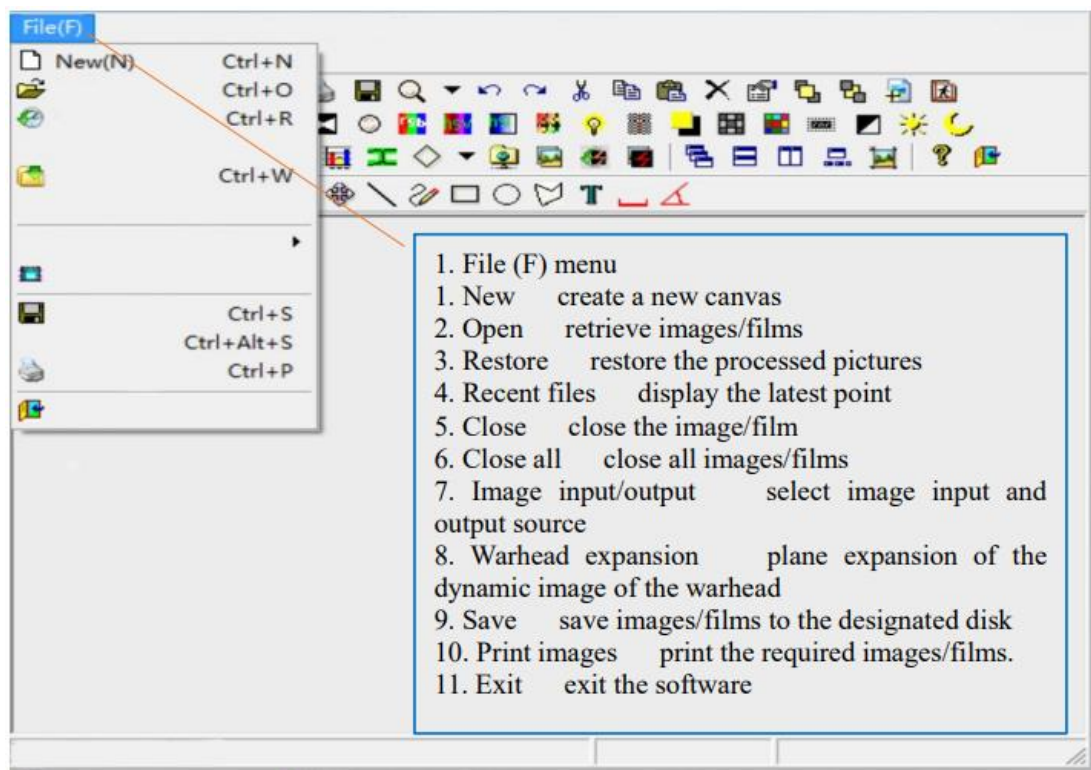
3) LB-10CIM commonly used "Attribute" and "Format" windows.



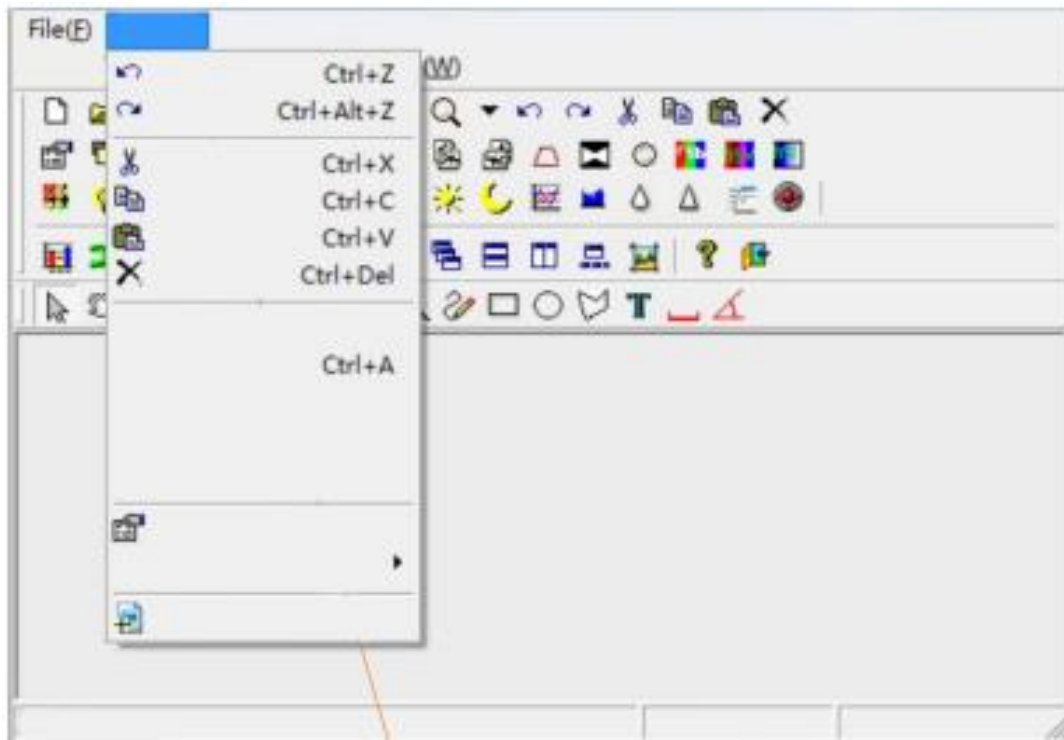
Comparison microscope LB-10CIM



4) LB-10CIM software "File (F) Menu".



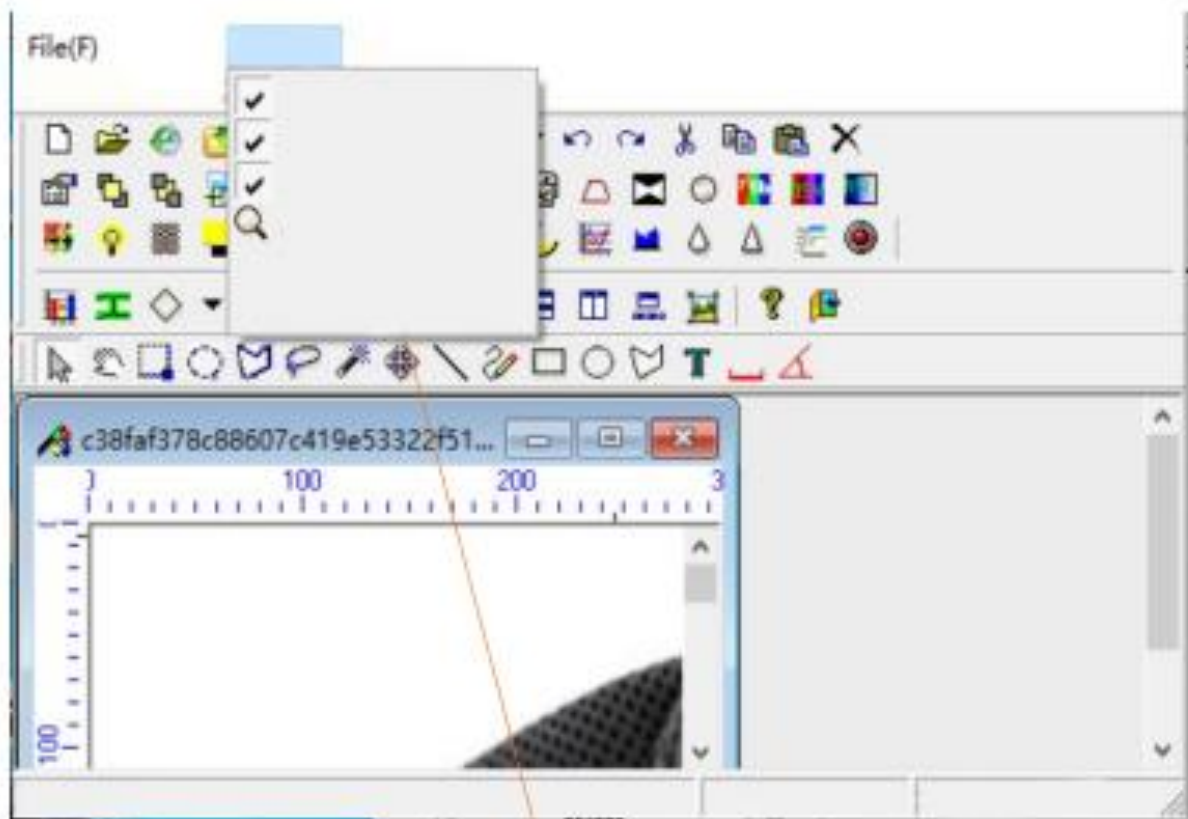
5) LB-10CIM software "Edit (E) Menu".



II. Edit (E) menu

1. Undo Undo the previous image/film
2. Redo Re-operate on the image/film
3. Cut paste images/films.
4. Copy Copy images/text
5. Paste Paste images/texts
6. Delete Delete images/pictures text and annotations
7. Magic wand tolerance setting Set the magic wand tolerance value
8. Select all Select all images/films or text
9. Reverse selection Reverse selection of images/films
10. Selectly Save selectively save images/films.
11. Selective release Selective release of images/films
12. Object attribute settings Set label font attributes
13. Object level Setting the label font level
14. Composite the object into the image Composite the annotation font onto the image.

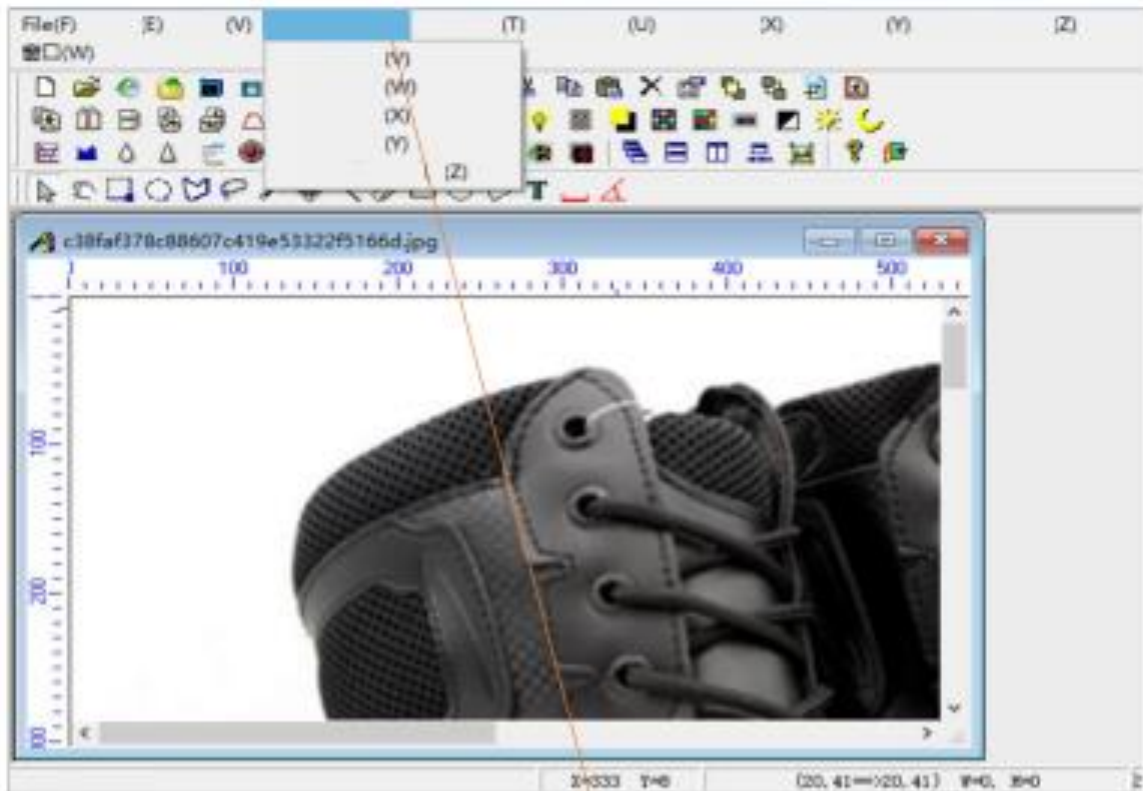
6) LB-10CIM software "View (V) Menu".



III. View (V) menu

1. Toolbar software shortcut key window options
2. Mouse control bar software shortcut key window options
3. Status bar software shortcut key window options
4. Image display ratio: Select the size for the image/film ratio
5. Image browsing Select image/film browsing
6. Image browsing settings Select the image browsing method

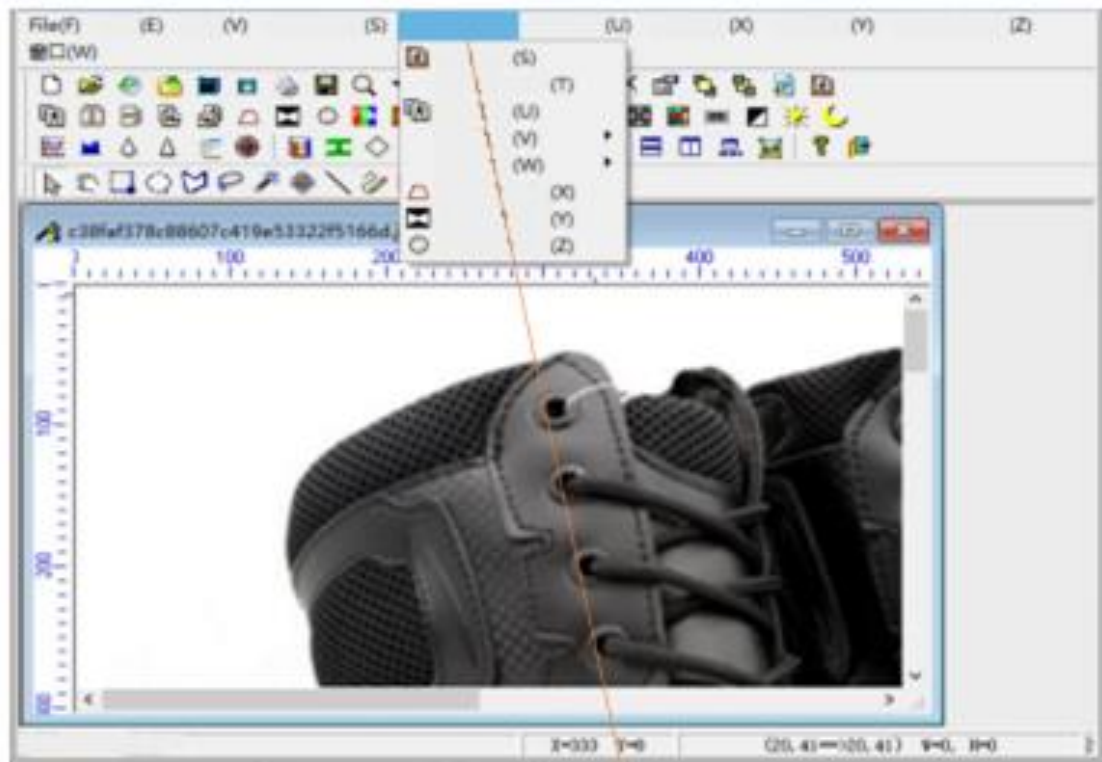
7) LB-10CIM software "Measurement and Calculation (S) Menu"



IV. Measurement and Calculation (S) Menu

1. Measure the length Measure the length of the image/piece.
2. Measure the angle Measure the image/slice angle.
3. Calculate perimeter Calculate image/film perimeter.
4. Calculate the area Calculate the image/slice area.
5. Calculate perimeter and area Calculate image/slice area and perimeter

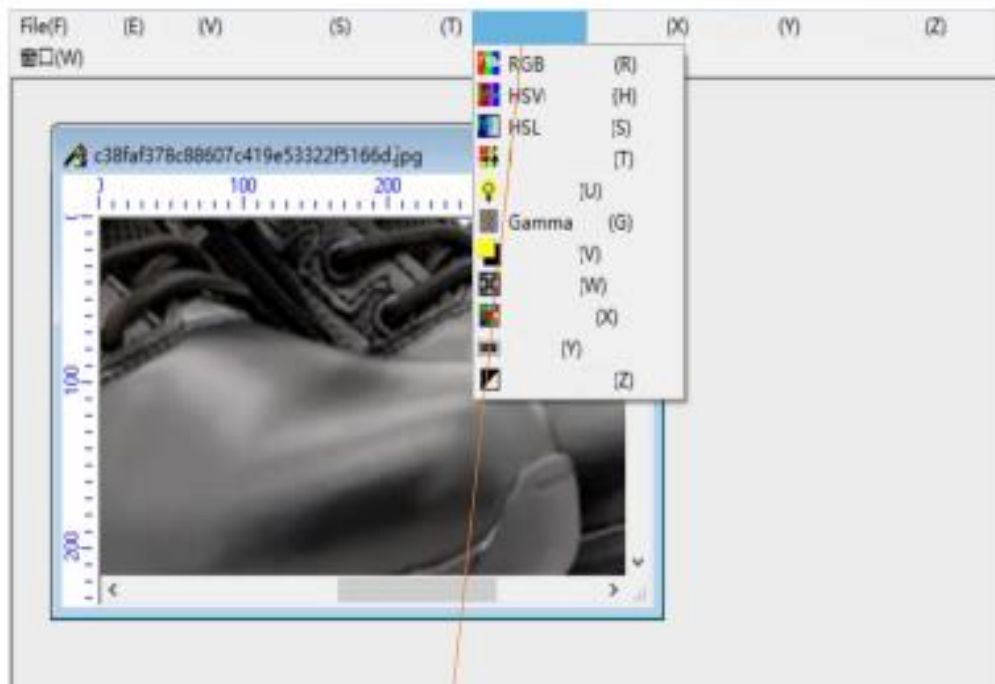
8) LB-10CIM software "Image transformation (T) menu"



V. Image transformation (T) menu

1. Canvas size Change canvas size properties
2. Automatically crop images Automatically crop images.
3. Image scaling Adjust image/film aspect ratio and pixels
4. Image flip Flip the image/film horizontally or vertically
5. Image rotation Rotate or customize the image/film by $\pm 90^\circ$
6. Linear deformation correction Linear image/film correction
7. Bucket and pillow deformation correction Correction of barrel and pillow deformation images/films
8. Lens deformation correction Correct lens deformation image/film X, Y; Height and width correction

9) LB-10CIM software "Image Color (U) Menu"



VI. Image color (U) menu

1. RGB parameter adjustment increase or decrease the red, green, and blue colors of the image/film
2. HSV parameter adjustment increase or decrease the chroma, saturation and purity of the image/film
3. HSL parameter adjustment increase or decrease the chroma, saturation and brightness of the image/film
4. Visual color changes Adjust the visual red, green and blue of the image/film
5. Image lighting Adjust image/film aperture height/width
6. Gamma correction Adjust the Gamma correction factor of the image/slice
7. Color replacement Replace the color difference of images/films.
8. Grayscale image Adjust the grayscale value of the image/slice
9. Pseudo-color image Adjust the pseudo-color value of the image/film
10. Thresholding Adjust the upper and lower lines of the image/slice threshold
11. Binary black and white image. Adjust the black and white threshold of the image/film.

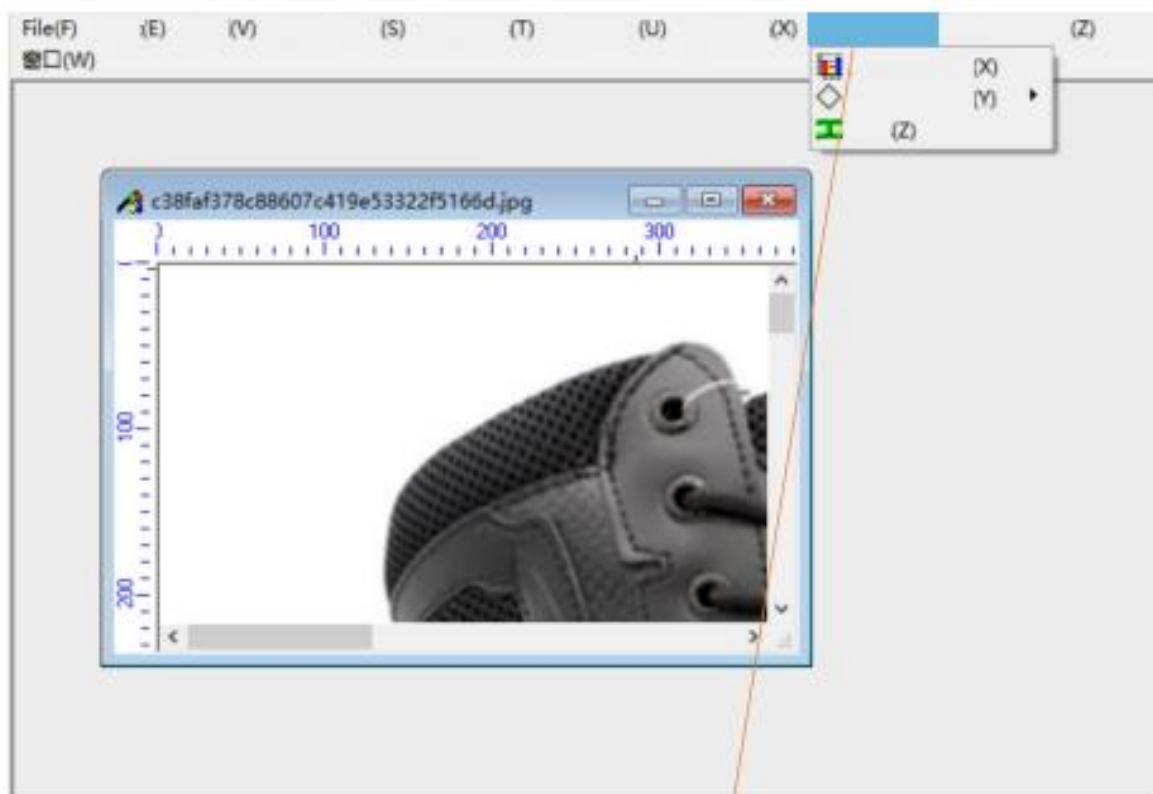
10)LB-10CIM software "Image Enhancement (X) Menu"



VII. Image enhancement (X) menu

1. Contrast/Brightness Contrast and increase or decrease the brightness of images/films
2. Exposure compensation: increase or decrease the red, green, and blue values of the image/film exposure
3. Segment enhancement: segment inflection point enhancement of image/slice color
4. Histogram enhancement: adjust the red, green and blue balance of the histogram
5. Smooth feathering: Adjust image/film feathering degree
6. Sharpen and clear Adjust the sharpness of the image/film
7. Motion blur restoration: Adjust the horizontal and vertical (restore) original components of the blurred image
8. Defocus blur restoration: Adjust the defocus degree and (restoration) component of the defocused image/piece

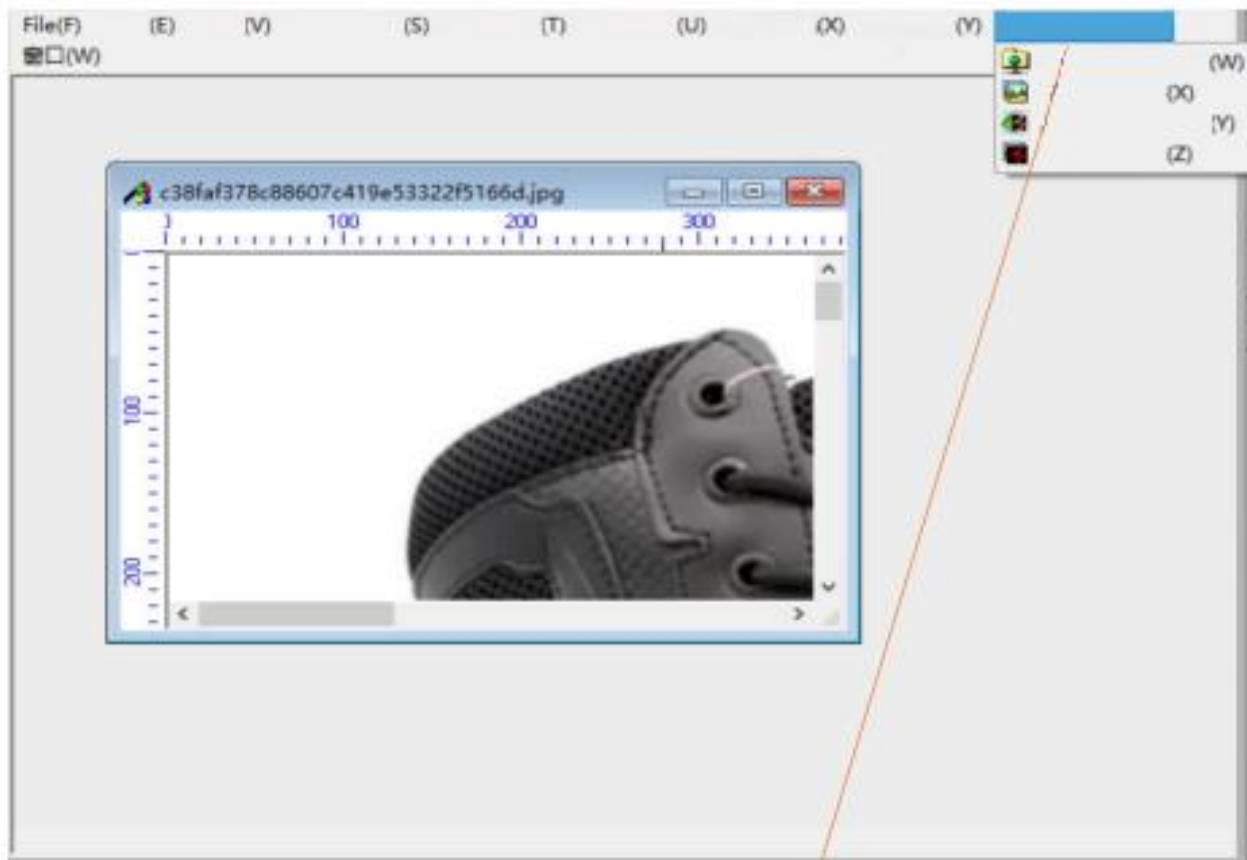
11) LB-10CIM software "Image Analysis (Y) Menu"



VIII. Image analysis (Y) menu

1. Reflectivity and absorbance. Perform reflectance spectrum analysis on images/films of red, blue, green and gray.
2. Edge detection and extraction. Adjust the red, green and blue colors of the image/slice edges.

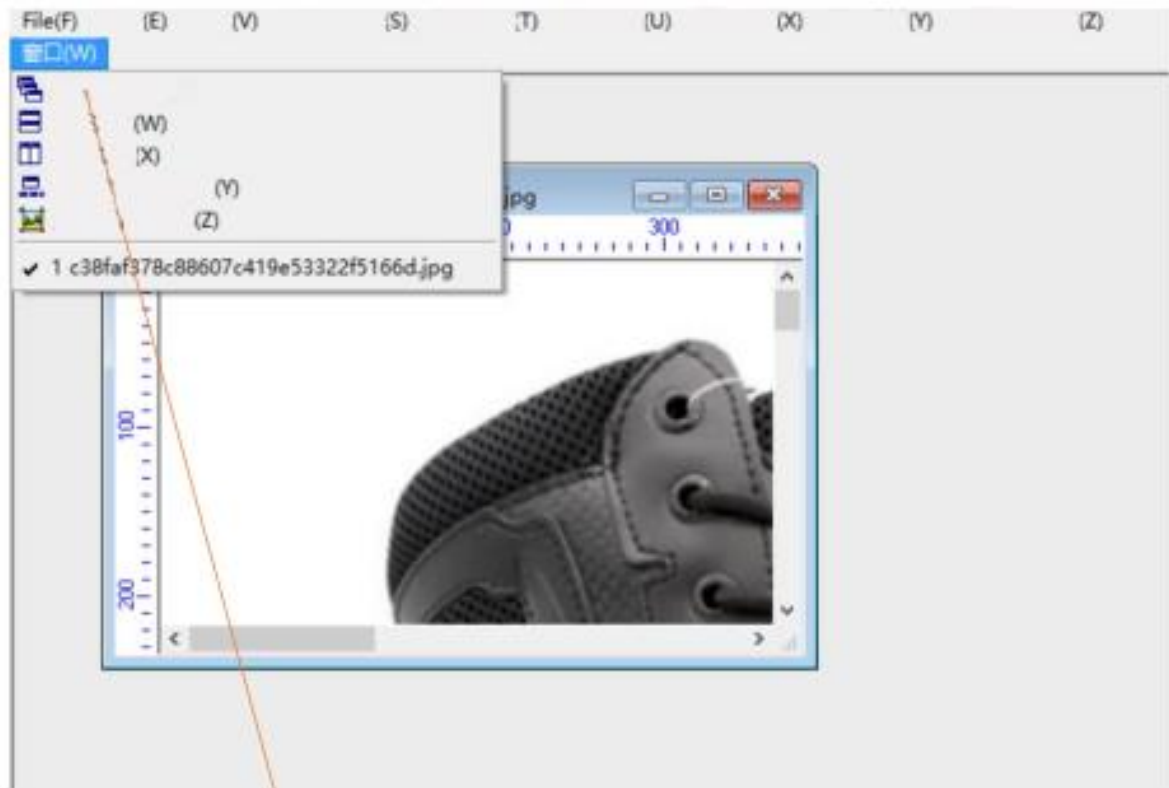
12)LB-10CIM software "Image retrieval comparison (Z) menu".



IX Image retrieval comparison (Z) menu

1. Automatic image comparison search. Automatically compare pre-compared images with the database for similarity.
2. Static comparison of images. Compare feature points of two images.
3. Automatic video comparison search by comparing external video sources with database images
4. Dynamic video comparison: Ghost docking comparison through external video sources

13)LB-10CIM software "Window (W) Menu".



X. Window (W) Menu

1. Cascading hierarchical arrangement Arrange images in a cascading manner
2. Arrange horizontally Arrange the images horizontally
3. Vertical arrangement Arrange the images vertically
4. Minimize the non-current window minimize the first image.
5. Window adaptive size: Set the image to the size of the current form.

8 Troubleshooting

Brief troubleshooting instructions for equipment

- If the high-intensity light source fan is running but the light source does not illuminate, turn off the power and replace the bulb.
- If the computer displays a dark image, ensure the high-intensity light source is properly aligned with the specimen and set to its brightest level. Then, adjust the "Properties" settings in the software for white balance calibration (refer to page 11 under the "Camera Control" menu).
- If the equipment gets wet, unplug the power immediately and allow the equipment to air dry completely before powering it on and testing.
- If the stage is loose, secure it using the built-in stage locking knob.
- If the connection between the high-intensity light source and the stage is loose, tighten it using the connection locking knob.
- If the connection port of the high-intensity light source on the stage is damaged, use the spare upper light source connection port for reattachment.

9. Accessories

Standard Accessories

Accessory No.	Accessory
1	5D microscope one unit
2	WF10× eyepiece and 20× eyepiece each one pair
3	Standard objective 0.5×1.0×,1.5×,2×,4×,6×
4	0.4× Reduction lens 1 piece
5	LED ultraviolet light one piece
6	Filter sets (red, green, yellow, blue)
7	Polarizing kits one set
8	Canon DSLR adapter one piece
9	Electronic bullets holder one piece



(Polarized Light Device)



Labotronics Scientific. 1007 N Orange St., Wilmington, DE 19801, USA.

info@labotronics.com | www.labotronics.com