

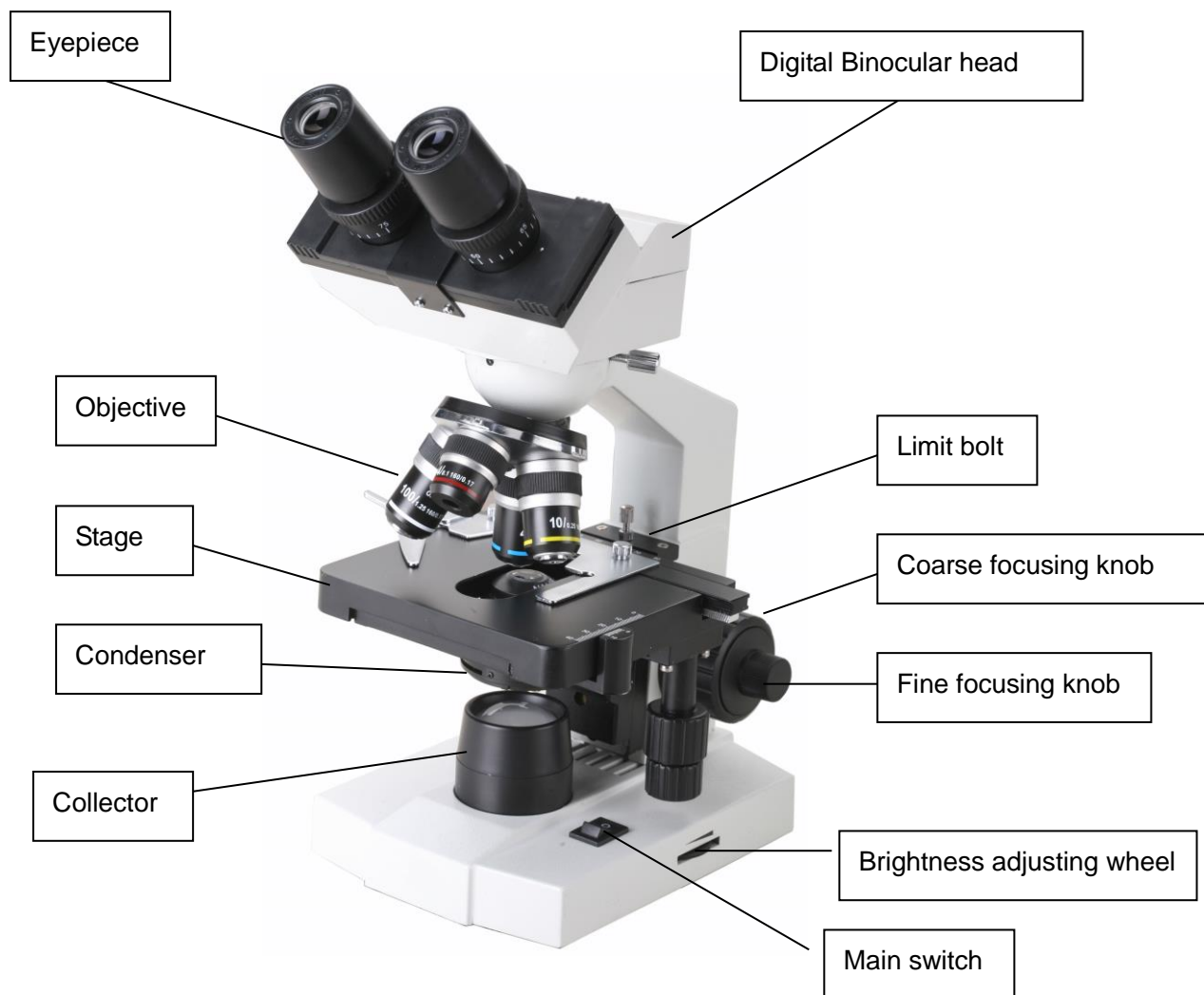
# Digital Binocular Microscope

## BS-2010BD

### Instruction Manual



This manual is written for digital binocular microscope BS-2010BD. To ensure the safety, obtain optimum performance and to familiarize the use of this microscope, it is recommended strongly that you study this manual thoroughly before using the microscope and retain this manual in an easily accessible place near the work desk for future reference.



### 1. Brief introduction

Digital binocular microscope BS-2010BD is widely used in biological, pathological, bacteriological fields for purposes such as observation, research, academic demonstration, clinic, medical inspection. It features more comfortable and reliable operation with modern design and advanced technology.

## 2. Main Specifications

1. Mechanical tube: 160mm

2. Objectives (achromatic):

Magnification	Numerical Aperture	Focal Length f (mm)	Working distance (mm)
4X	0.10	31.05	37.5
10X	0.25	17.13	7.316
40X	0.65	4.65	0.632
100X	1.25	2.906	0.198

3. Eyepiece

Category	Magnification	Focal Length f(mm)	Field of view (mm)
Plan Eyepiece	10X	24.95	Ø18

4. Total Magnification

Eyepiece	10X	10X	10X	10X
Objective	4X	10X	40X	100X
Total	40X	100X	400X	1000X

5. Objective conjugate distance: 195mm

6. Stage: double layer stage 125mmX115mm

7. Coarse focusing range: 6.5mm

8. Condenser: Abbe Condenser, NA=1.2 with iris diaphragm

9. Diameter of filter: Ø28mm

10. Illuminator: LED Lamp, brightness adjustable

## 3. Outfit

Name	Specifications	Standard outfit
Body	Stand	0
	Double-layer mechanical stage	0
	Base (LED lamp)	0
Viewing Head	Binocular digital head	0
Condenser	NA1.2 Abbe Condenser	0
Nosepiece	Quadruple	0
Illuminator	LED lamp	0
Eyepiece	10X Plan Eyepiece	0
Objectives	4X	0
	10X	0
	40X	0
	100X	0
Immersion oil	5ml	0
AC Adapter	USA/European/UK plug type	0
User Manual	English version	0
Package	Foam box and carton	0

#### 4. Structure Feature

a) **Eyepiece, objective and nosepiece**

10X plan eyepieces combined with 4X, 10X, 40X, 100X achromatic objectives can give the microscope a large and clear field of view. The nosepiece has a precise frame which can locate objectives accurately and stably. The digital binocular head can turn 360 degree freely with comforts and conveniences.

b) **Curved arm and coarse and fine focusing frame**

The C-type molding of the curved arm is sprightly. The coarse focusing frame adopts dovetail guide and move smoothly with upper limit device.

c) **Base**

The base, with built-in illuminator, is the foundation of whole microscope which adopts streamline circular in consonance with the curved arm.

d) **Stage**

Use double-layer mechanical stage, the slide is fixed with slide clip.

e) **Illumination system**

The illumination system consists of illuminator, iris diaphragm and condenser. Abbe condenser can be raised and lowered by simple operation.

#### 5. Assembly

**A) Environmental Requirement:**

1. Ambient temperature: 5°C to 40°C(41°F to 104°F), Maximum R.H: 85%.
2. High Temperature will result in a mildewing, dew and even ruinous instrument.
3. Avoid placing the instrument in a dusty environment. When ending your microscope operation, please cover it with the dust cover.
4. Lay the microscope in a plan and stable position, please.

**B) Input voltage check:**

Check the input voltage: be sure the input voltage which signed in the back of the microscope is consistent with the power supply voltage, or it will bring a serious damage to the instrument.

**C) Eyepiece:**

Insert the eyepiece into the eyepiece tube.

**D) Objective:**

Adjusting the coarse focus knob until the mechanical stage reaches its lower limit position.

Screw the lowest magnification objective into the nosepiece from the left or the right side, then revolve the nosepiece clockwise and mount other objectives in the sequence of low to high magnification

**E) Condenser:**

The condenser had been installed in the microscope before leaving factory.

**F) Collector:**

The collector had been installed and located before leaving factory. The screw-mounted collector can be taken down by anticlockwise turning.

**H) Filter:**

Mount the filter on the iris diaphragm bracket under the condenser if necessary.

## 6. Operation

1. Insert the eyepiece into the eyepiece tube and revolve the objectives into the nosepiece in sequence of magnification.

2. Place the specimen in the center of the stage, keeping the cover slip upward, and then nip it with the specimen holder.

3. Search the image by lower magnification objective, turn the longitudinal and transversal adjustment knobs which on the mechanical ruler to move the specimen onto the center of the field of view. Then replace with higher magnification objective, turn the fine focusing knob to sharpen the image.

4. When using 100X oil objective, add the immersion oil between the objective and specimen.

5. You should be aware of the cleaning procedures to be used after the use of oil. Wipe oil from the oil immersion objective, and from any other parts in need of cleaning. Clean lenses immediately with xylene after use. Leaving oil on the lens may lead oil to seep behind and harden on the inside of the lens.

★To obtain a bright and clear image, it is important to adjust the illumination system. The condenser position and the iris diaphragm size should match with objectives of different magnifications. Turn the condenser focus knob to shift the condenser. It needs to raise the condenser when using the high magnification objective, and to decline when using the low magnification one.

★The aperture diaphragm is used to adjust the numerical aperture instead of brightness. Generally, setting the size of the aperture diaphragm at 70%~80% of the numerical aperture, you can obtain a clear image with enough contrast.

★ For observing a batch of specimen of the same type, use the limit bolt to locate general position of the stage to simplify operation. In this way, the specimen can come into focus rapidly just by turning the coarse focusing knob.

**Note:** specimens of the same type means they are same in the thickness of slide, cover slip and specimen slice.

## 7. Maintenance

1. Carefully open the box, avoid the accessories, like lens, dropping to ground and being damaged.

2. All the lenses have been well checked and adjusted. It is forbidden to disassemble them by user self.

3. The nosepiece and coarse/fine focus unit have a compact and precise frame, so please don't

disassemble them as possibly as you can.

4. Keep the instrument clean, wipe dust regularly, apply a little non-corrosive grease in the sliding parts and be attention to avoid contaminating the optical elements especially.
5. Place the instrument in a cool, dry position. When not using the microscope, keep it covered with a dust helmet. Make sure the lamp socket is cool before covering the microscope.

## 8. Troubleshooting

Under certain conditions, performance of this unit may be adversely affected by factors other than defects. If a problem occurs, please review the following list and take remedial action as needed. If you cannot solve the problem after checking the entire list, please contact your local distributor for assistance.

### 1) Optical part

Problem	Cause	Solution
The edge of the field of view has shadow or the brightness is asymmetry	The nosepiece is not in the located position (objective is not in the center of the optical path)	Turn objective to the right position (the optical light center)
	The image of the filament is not in the center	Center it
	The surface of the lens is moldy or has contaminant (include condenser, objective, eyepiece and collector)	Clean it up
Find dust and stain in the field of view	There are stains on the lens (include condenser, objective, eyepiece and collector)	Clean it up
	There are stains on the specimen	Clean it up
	The position of the condenser is too low	Raise it to proper position
The image is defocused (low resolution \ contrast)	There is no coverslip on the specimen	Add coverslip
	The coverslip is too thick or too thin	Use the standard coverslip ( 0.17mm )
	The specimen is placed inversely	Reverse it back
	There was oil on the dry objective (easily happened in 40X objective)	Clean it up
	There are stains on the lens (including condenser, objective, eyepiece and collector)	Clean it up
	The oil objective didn't immersion oil	Use immersion oil
	There was bleb in the oil	Eliminate the bleb
	Use an unsuitable oil	Change to the specified one

	The size of the aperture diaphragm is too large	Minify it
	The size of the aperture diaphragm is too small	Open it up
	The position of the condenser is too low	Adjust the position
One side of the image is dark	The condenser is not in the center of the field of view\the condenser inclines	Re-install the condenser
	The nosepiece is not in the right position	Turning it until it reaches the "clicked" position
	The specimen is floating	Fix it
The image shift during focusing	The specimen slips on the stage	Fix it
	The nosepiece is not in the right position	Turn it to the "clicked" position

## 2) Mechanical part

TROUBLE	CAUSE	SOLUTION
The image can focus when using high magnification objective	The specimen is placed inversely The coverslip is too thick	Turn inversely Use the standard coverslip (0.17 mm)
The objective and the specimen touch when change objectives from low magnification to higher magnification	The specimen is placed inversely The coverslip is too thick	Turn inversely Use the standard coverslip (0.17 mm)
The specimen is not easy to move	The specimen holder is not fixed	Fix it
The eyes are too tired	The brightness is not suitable	Adjust the voltage of the lamp

## 3) Electrical Part

TROUBLE	CAUSE	SOLUTION
The lamp can't light when turning on the switch	No power supply	Check the connection of the power cord
	The LED lamp is burnt out	Replace it
The lamp burns out suddenly	The voltage is too high	Use the specified AC adapter, if the problem is not solved, contact with the service department

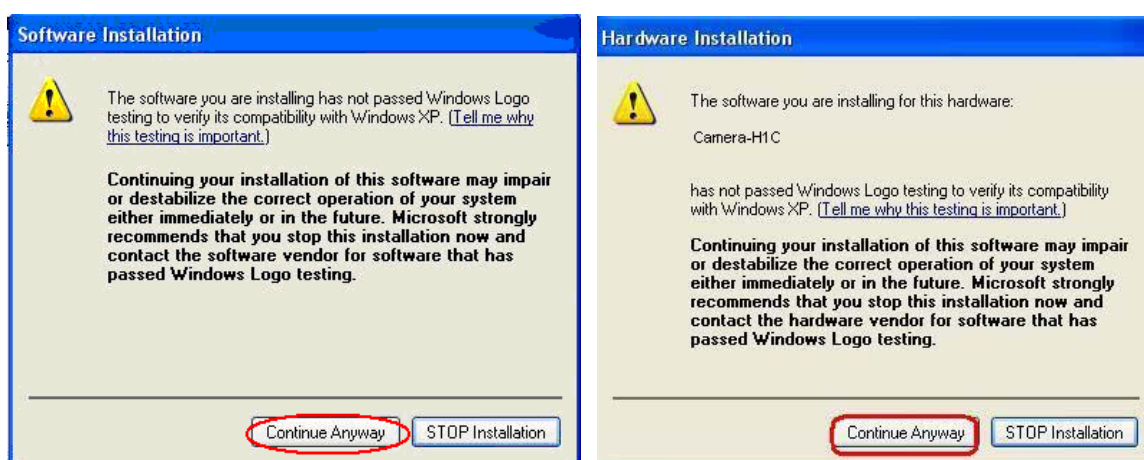
The brightness is not enough	Use a substandard AC adapter	Use the specified AC adapter
	The voltage is too low	Add the voltage


## 9. The software Scopeimage 9.0

### 1) Installation

1. Link the digital Binocular head to a PC by the USB cable, the system will find the new device, and then run the driver under the CD, please follow the clue to finish the installation.

**Attention:** please link the camera to a PC before running the driver installation; and when there comes out warning dialog, just click 'Continue Anyway', as the pictures show below:

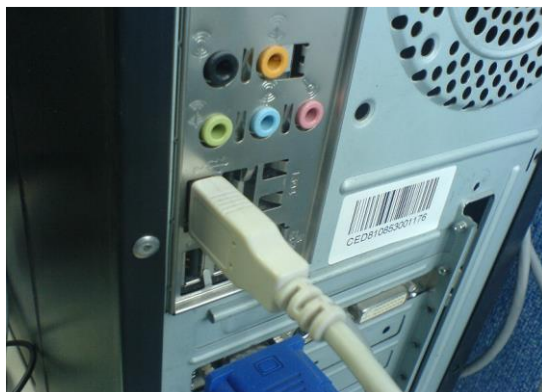


2. Install the software, follow the clue to finish the installation, after the installation, there will be a shortcut icon on the Desktop and the Start Menu.
 
3. Please install the video codec 'wmv9VCMsetup.exe', it can compress the video files when recording, and greatly reduce the size of the video files. If you can not do record, please check whether you have installed the video codec already.
4. Double click the shortcut icon on the desktop to preview the images, please insure the camera has linked with the PC, and the driver has been installed rightly, or there will come out an error hint: Cannot preview successfully. Please check your camera.

### Attention:

- ★ Please install all the three setup files in the CD, otherwise the camera may can not work normally.
- ★ USB2.0 is a mandatory, not optional. This camera cannot work on the computers with USB1.1 ports. In order to ensure the stability of the connection with the USB2.0 interfaces, please insert the plug into those interfaces in the back panel the mainframe.





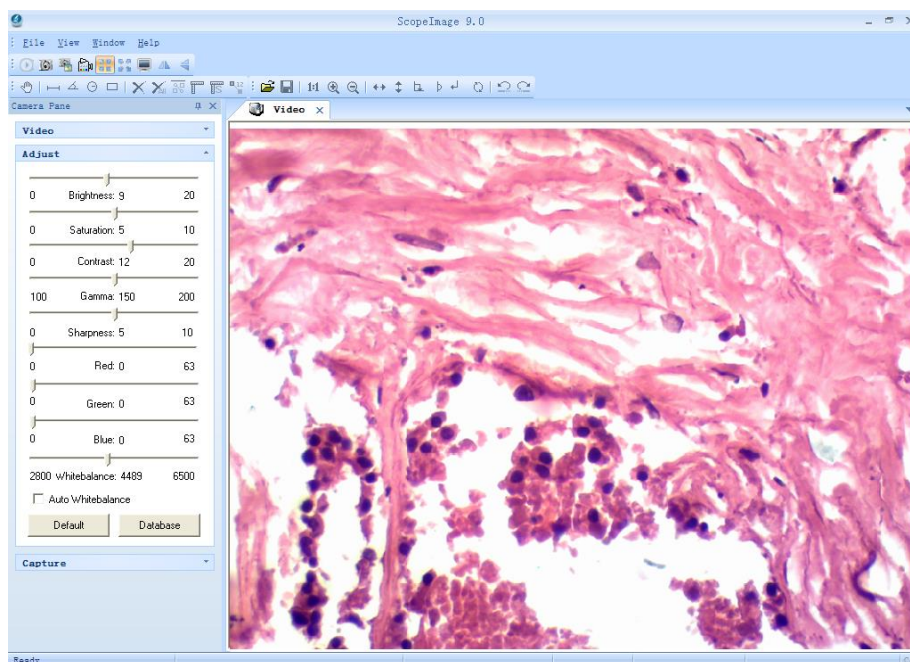
★ Please use the same USB2.0 port every time. Using on a different USB2.0 port requires reinstalling or updating the driver again to make the camera work rightly. If not, it will influence the performance of the camera, and cause the live image displays drag, for there is another system driver, and the system set it as default driver.

★ Support operation system: Windows2000/XP/Vista/Win 7/Win 8/Win 10, 32bit & 64bit operation system.

★ Please unplug the USB cable from the computer immediately after using. It will shorten the lifetime of the camera, sometimes may cause repair service if the camera is plugged in the computer all the time and you do not shut down the computer for a long time.

## 2) Operation

ScopeImage 9.0 is image-processing software professionally designed for digital microscope. It allows you to view, capture, edit, record, zoom, measure, and process microscope images. The main interface of the software is as follows:



Besides image windows, many other windows or user interface elements reside within the main window of ScopelImage 9.0. These include menu, toolbars, status bar and control windows, providing additional information about the images or control of the camera.

ScopelImage 9.0 mainly divides into two parts operation, one is for the video operation, and the other one is for the image operation;

Video operation includes video preview, video control, color adjustment, video capture, ect.

Image operation includes image processing, image flip, image calibration and measurement, ect.

ScopelImage 9.0 is image-processing software professionally designed for digital microscope. It allows you to view, capture, edit, record, zoom, measure, and process microscope images. Specific features included are as follows:

- 1) Active image preview, freezing preview, fit to window preview, real preview, full screen preview... various preview modes make you preview the active images with great ease.
- 2) Convenient color adjustment of the active image, containing brightness, contrast, saturation, RGB value, white balance and so on, very convenient to adjust the color during previewing.
- 3) Special design color database, we can associate the parameters of the color to the database, and can store or delete the color scheme.
- 4) Various image measurement tools, including line, angle, rectangle and circle, can move, delete or set the color of the objects. And you can also burn all the objects into the image for further using.
- 5) Basic image operations like other similar software are included in the Image menu. You can adjust the image at ease.
- 6) Image flip function, include horizontal flip and vertical flip of the active image, and rotate 90 degree, 180 degree, 270 degree or any angle degree of the captured image.
- 7) Image Zoom: Contain image zoom in, zoom out, 1:1.

**Attention:**

When launching the software, there will be several seconds displays as black preview, please don't worry, it is normal, because the camera needs time to do some pretreatment, to ensure the stable working of the camera. The same reason for the recording, when you begin to record, it will display as black preview for several seconds, and when the images display normal, the recording begins.

Detail information about how to operate the software, please refer to the user manual in the CD.