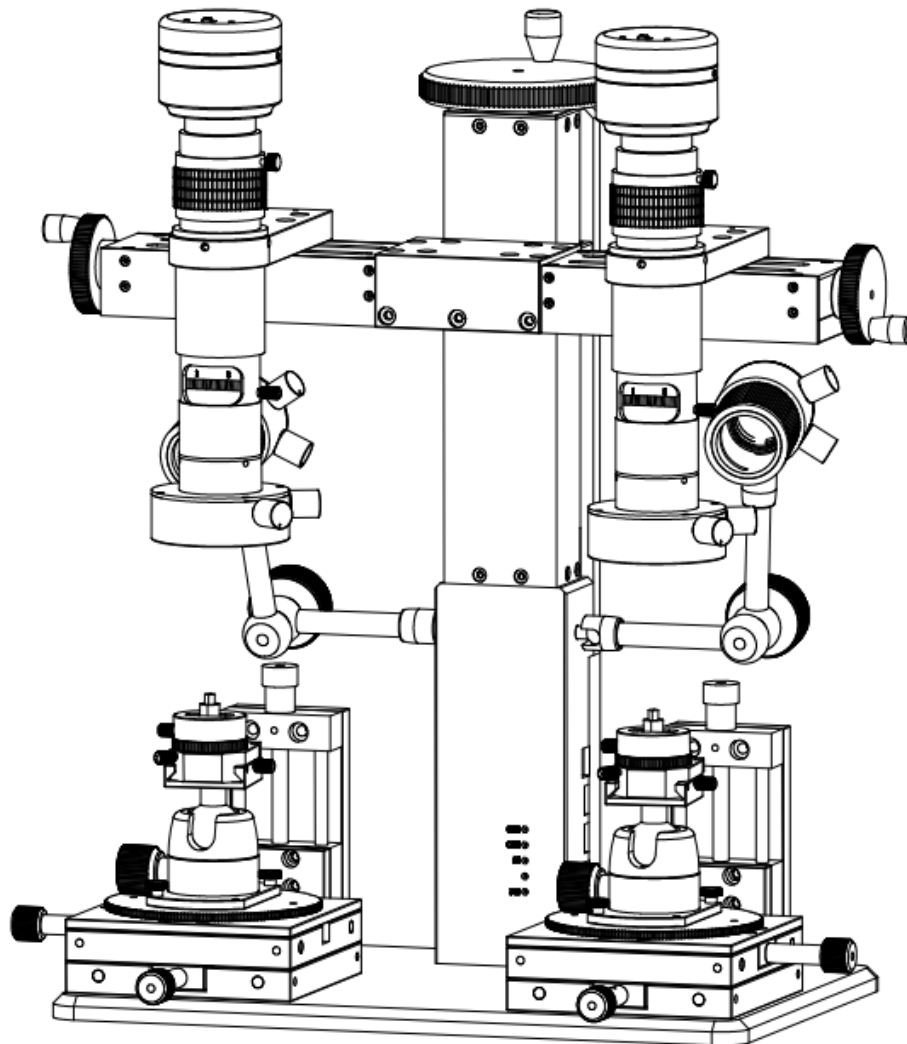# Digital Comparison Microscope BD1601

User Manual

LANOPTIK TECHNOLOGIES LTD

Content

Chapter 1 Notes and Safety Requirements

1.1 Cautions and Notes

(1)   To avoid danger or damage incurred to the lens or lens, do not touch the lens or sensor directly with your fingers.

(2)   To avoid failure or electric shock hazard and so on, do not disassemble or modify the internal structure of the device.

(3)   Do not plug in or unplug the power connection port when hands are wet.

(4)   Do not use alcohol and other organic solvents to clean.

(5)   If the lens or sensor is dirty or damp, you should better use dry and non-linen fabric or professional lens tissue to wipe them. To avoid scratches on the surface, do not touch the lens with your fingers. Wipe the lens or sensor lightly.

(6)   The products are not specifically designed for an outdoor use. Do not expose it to outdoor environment without any protection. Excessive temperature and humidity will damage the lens. Please avoid using the product under the following environment: high temperature or high humidity environment, places with direct sunlight, dirt or vibration and places near heat source.

(7)   Please use and store in the following environment:
Operating temperature ：0℃～40℃
Storage temperature：-20℃～60℃
Operating Humidity：30~60%RH
Storage Humidity：10~80%RH

(8)   If any foreign matter, water or liquid enter into the device by accident, disconnect the Power line immediately. Please send it to the maintenance center and do not use the hair dryer to dry it by yourself.

(9)   To prevent microscope from being tripped over or dropped, please put away the device's connect cable in use or standby.

(10)   To avoid electric shock by accident, please power off microscope before you move your display or equipment.

(11)   The cleanliness of the device lens will directly affect clarity degree of contents from the computer screen during preview. Problems like various circles or spots on the screen may mostly be incurred by dirt on the lens. When cleaning, please use professional lens tissue or other professional detergent to clear the dirt on the lens.

(12)   Registered trademark and copyright: Copyright ownership of this product belongs to Lanoptik Technologies Ltd Without written authorization of this company, any organizations or individuals shall not photocopy, print, or translation to another language to any part of this document.

Chapter 2 Requirements for working equipment
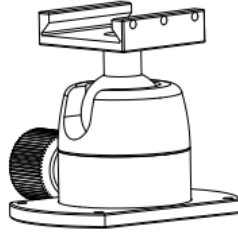
2.1 Requirements for working equipment

- Windows XP SP3、Windows 7（32 or 64 bits）、Windows 8（32 or 64 bits）、Windows8.1（32 or 64 bits）、Windows10（32 or 64 bits）。

- Quad-core 3GHZ or larger CPU

- 100Mbps/1000Mbps network interface

- 8G or more memory

- DVD-ROM driver (only needed when installing software)

Chapter 3 Packing List
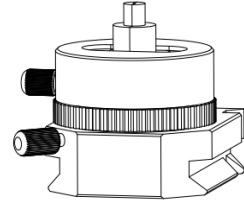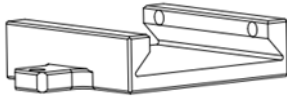
1、Microscope body
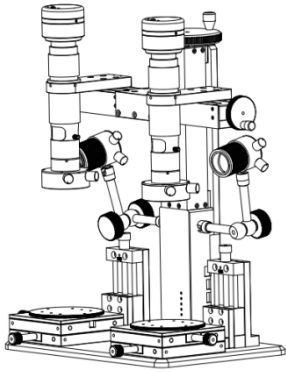
2、Rotatable ball head X2

3、Clamp holder X2

4、Quick-mount rail X2

5、Object distance extension ring X2

6、AC/DC power adapter
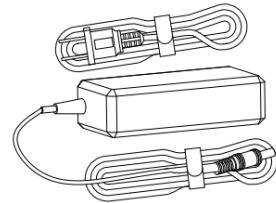
7、Hand screw X8
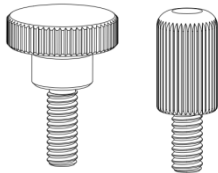
8、Installation tools
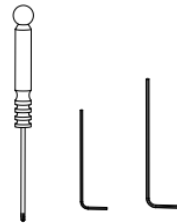
9、Cable X3
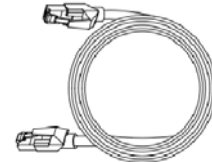
10、Stage clip X2

11. Installation disk

Chapter 4 Introduction to components

4.1 Product schematic and part name
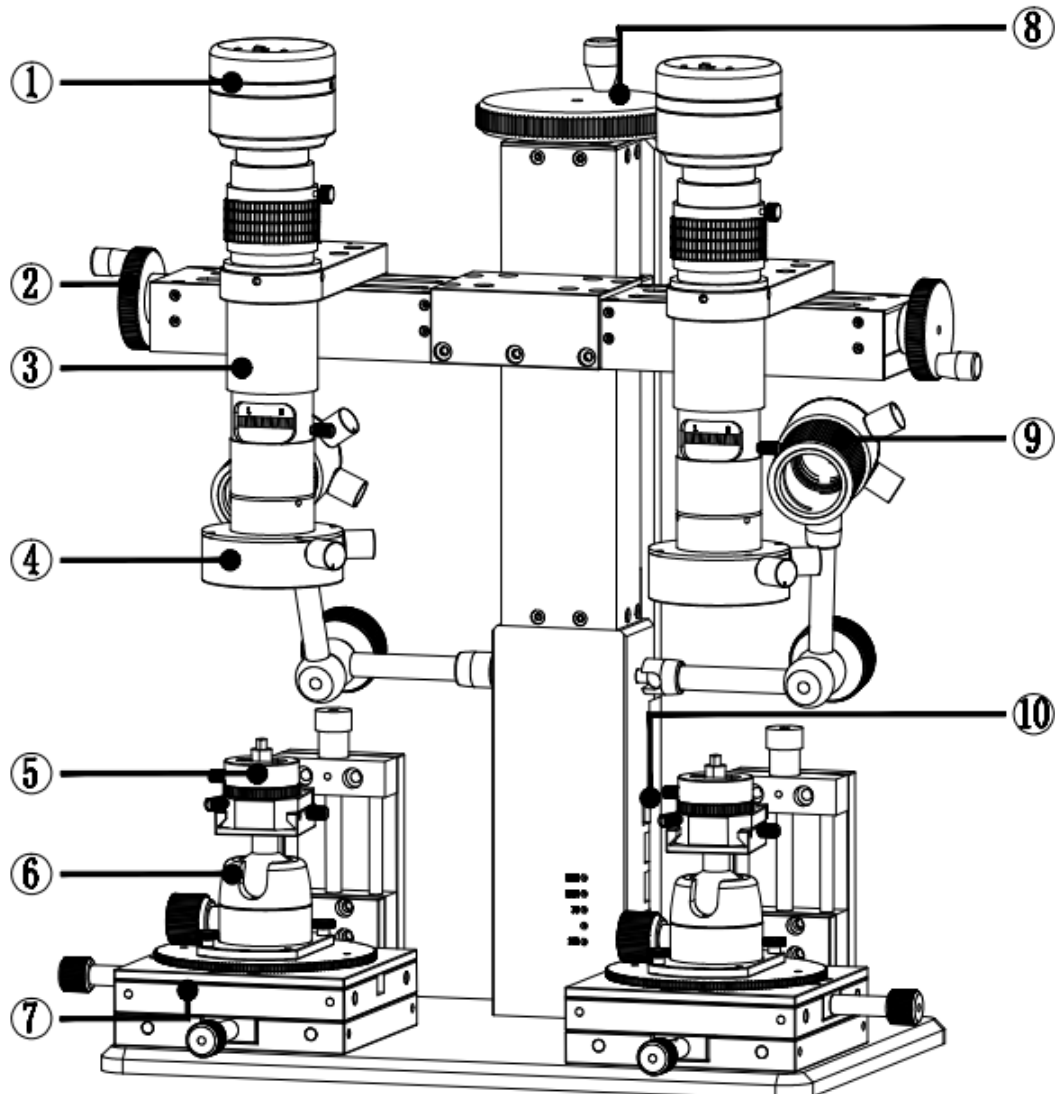
① Camera   ② Movable hand wheel

③ Lens   ④ Main light

⑤ Clamp holder   ⑥ Rotatable ball head

⑦ Adjustable stage   ⑧ Lifting hand wheel

⑨ Side light   ⑩ Ports and Indicator lights

4. 2 Product parts introduction

4.2.1 Camera
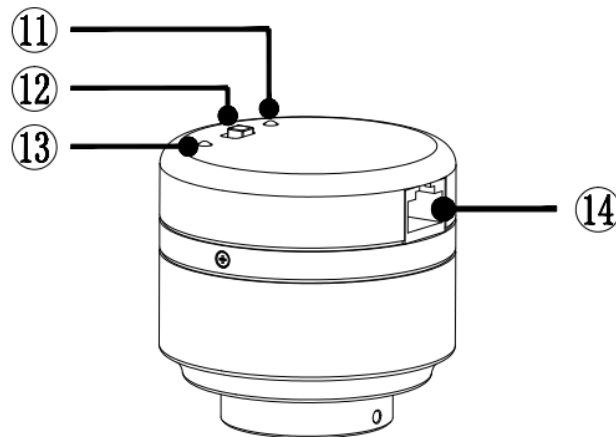
⑪Signal indicator	:	Blue light flashing, output signal.
⑫Power switch	:	Turn right (ON), turn on the camera; turn left (OFF), turn off the camera.
⑬Power indicator	:	Light does not shine, abnormal power supply; red Indicator light stays ON, camera is off; green Indicator light stays ON, camera is on.
⑭Network cable interface	:	Connect to the CAM interface on the bracket of main body through the network cable to realize DC 12V power supply, network 100Mbsp.

4.2.2 Movable Hand Wheel

Rotate clockwise, the lens moves outward; counterclockwise rotation, the lens moves inward; Travel is 80mm, each turn of the hand wheel moves 1.5mm.

4.2.3 Lens
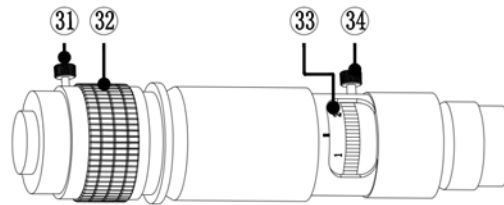
| ㉛ | Focal length fixing screw | : | Focal length fixing screw: After loosening, turn the Focal length adjustment ring to adjust the focus; after tightening, fix the magnification at the current position. |
㉜	Focal length adjustment ring	:	Focal length adjustment ring: Turn this ring to fine focus the lens.
㉝	Magnification adjustment ring	:	Magnification adjustment ring: continuous zoom, turn to the corresponding position, you can get the corresponding magnification.
㉞	Magnification fixing screw	:	Magnification fixing screw: After loosening, the magnification adjustment ring can be rotated to adjust the magnification; after tightening, the current magnification can be fixed.

4.2.4 Main light
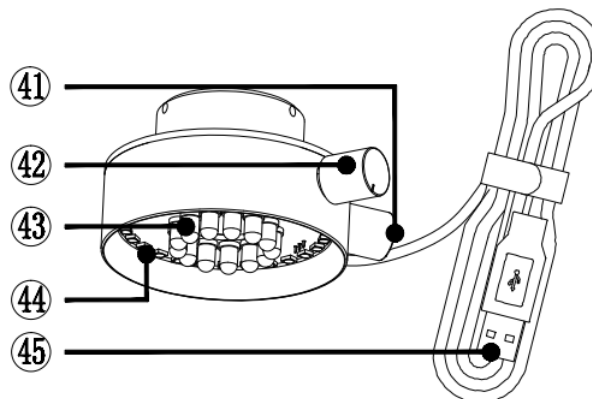
㊶	Coaxial light control knob	:	Rotate clockwise to turn on the coaxial light, the brightness of the lamp is enhanced; counterclockwise rotation, the brightness of the lamp is weakened, and the coaxial light is turned off.
㊷	Diffuse light control knob	:	Rotate clockwise to turn on the diffuse light, the brightness of the lamp is enhanced; counterclockwise rotation, the brightness of the lamp is weakened, and the diffuse light is turned off.
㊸	Coaxial light	:	Composed of 13 small angle high-brightness lamp beads.
㊹	Diffuse light	:	Composed of 40 large angle bright white LED.
㊺	USB cable	:	Connect to the "5V 1A OUT" interface on the Bracket of main body to achieve power supply.

4.2.5 Clamp holder
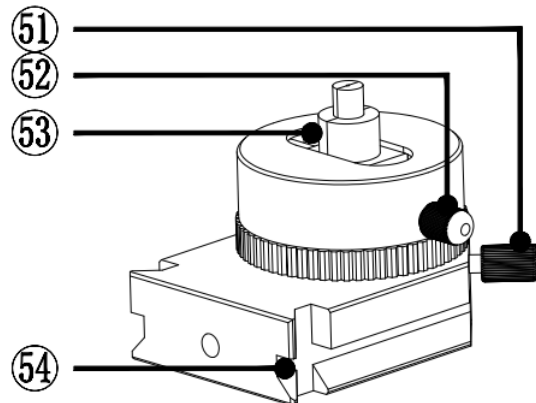
| �51 | Rotation adjustment screw | : | Loosen the screw, the rotating block can be rotated 360°; tighten the screw to fix the current rotation angle |
�52	Clamp holder adjustment screw	:	Turn the screw clockwise to expand the clamp; turn the screw counterclockwise to tighten the clamp.
�53	Chuck clamp	:	By rotating the screw, the slider is contracted to clamp the object, and the slider expands to support the ring.
�54	Slider	:	It can be fastened with the ball head guide rail and rail block. (Detailed reference: 5.1.1 Ball head and quick-mount rail assembly)

4.2.6 Rotatable ball head
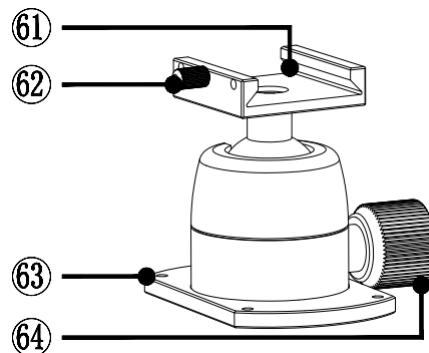
�61	Ball head guide rail	:	Cooperates with the chuck slider for mounting the clamp holder.
�62	Guide rail screw	:	After the clamp holder is installed. Tighten the screw, to secure the clamp holder to the ball head; loosen the screw, slide or remove the clamp holder.
�63	Quick- mount screw hole	:	The ball head can be quickly mounted to the adjustable stage by means of a hand screw. (Detailed reference: 5.1.1 Ball head and quick-mount rail assembly)
�64	Ball head fastening bolt	:	After loosening the screw, the position of the ball head guide rail can be rotated and oscillated; after tightening the screw, the position of the current ball head guide rail can be fixed.

4.2.7 Adjustable stage
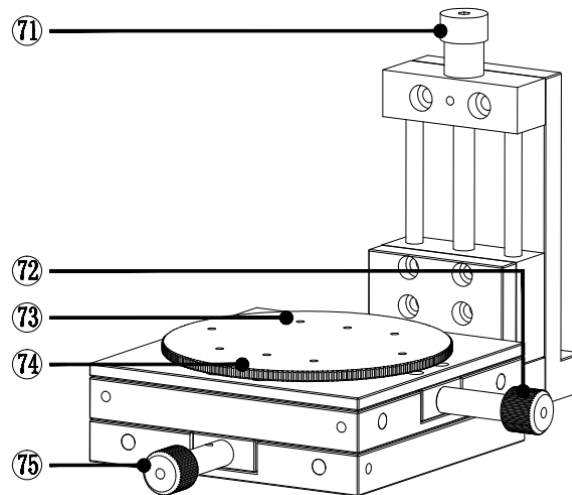
⑦1	Z axis adjustment knob	:	Rotate clockwise, the stage rises; counterclockwise rotation, the stage descends; each turn of the knob, the stage moves 1.5mm, Z-axis travels 50mm.
⑦2	X axis adjustment knob	:	Rotate clockwise, the stage moves to the inside; counterclockwise rotation, the stage moves outward; each turn of the knob, the stage moves 2mm, the X-axis travels 55mm.
⑦3	Round platform screw hole	:	M3 screw hole, the ball head and the guide rail can be fixed on the adjustable stage by hand screw.
⑦4	Round platform	:	Damping round platform, can rotate 360°; fix each accessory; level the stage;
⑦5	Y axis adjustment knob	:	Rotate clockwise, the stage moves to the inside; counterclockwise rotation, the stage moves outward; the knob moves 2mm per turn, and the X-axis travels 55mm.

4.2.8 Lifting hand wheel

Lifting hand wheel: Turn the knob to drive the microscope to move up and down; turn clockwise to raise the bracket; counterclockwise to rotate, the bracket is lowered; each turn of the hand wheel, the lens moves 4mm.

4.2.9 Side light
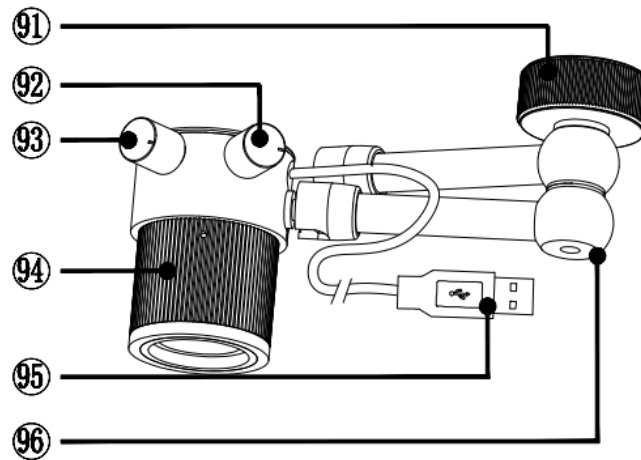
| ⑨① Adjustment knob	:	Loosen the knob to swing the position of the articulated arm arbitrarily within a certain range; tighten the knob to fix the current position of the articulated arm. (Note: When you need to swing the position of the lamp, you must first loosen the knob, otherwise it will damage the articulated arm)
⑨② Light switch knob	:	Each time a gear is rotated, the color of the light is switched once; the cycle is switched.
⑨③ Brightness adjustment knob	:	Rotate clockwise to turn on the light source, the brightness of the light is increased; counterclockwise rotation, the brightness of the light is weakened, and the light source is turned off.
⑨④ Focus adjustment ring	:	Rotate clockwise, the light spreads; counterclockwise rotation, the light gathers.
⑨⑤ USB power connector	:	Connect to the "5V 1A OUT" interface on the bracket of main body to supply power to the light source.
⑨⑥ Articulating arm		It consists of multiple sets of movable joints; after loosening the adjustment knob, the position of the light source can be arbitrarily oscillated.

4.2.10 Ports and indicator lights
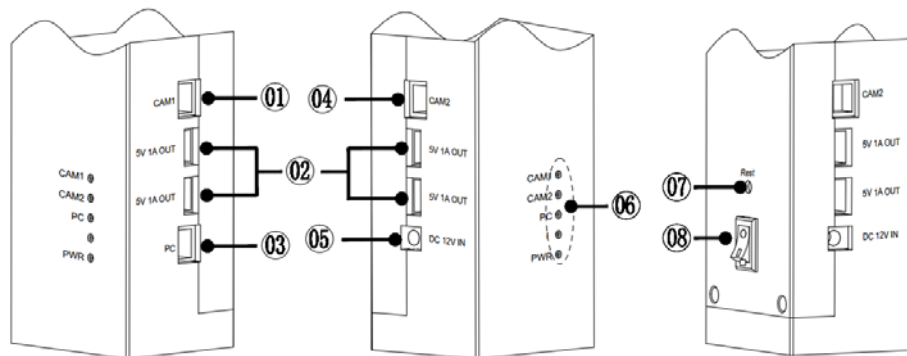
① CAM1 interface	:	Connected to the camera on the right through the network cable to realize power supply and signal transmission to the camera.
② USB 5V 1A power output	:	It is connected with the USB power interface of the main light and side light to realize the power supply to the main light and the side light.
③ PC connection interface	:	Through the network cable and the computer's LAN interface to achieve signal transmission between the camera and the computer.
④ CAM2 interface	:	Through the network cable and the left camera connected to achieve power and signal transmission to the camera.
⑤ power input interface	:	Through the power adapter and 110V ~ 240V power supply connection; provide DC12V power supply to the microscope.
⑥ Indicator	:	1. CAM1/CAM2: blue light flashes, signal transmission; the higher the flashing frequency, the stronger the transmission signal. 2. PC: blue light flashes, computer and microscope signal transmission; the higher the flashing frequency, the stronger the transmission signal. 3. PWR: The blue light is always on, the power is on; the light is off, and the power is off.
⑦ Reset button	:	Press it to restore the default settings.
⑧ Power switch	:	Turn the main power on and off, press down (1) to turn on the power; press up (0) to turn off the power.

4.2.11 Object distance extension ring

In the case of insufficient object distance, the lens can be raised and the object distance is increased by 45 mm. (Detailed assembly operation reference: 5.1.3 Object distance extension ring assembly)

Chapter 5 Product installation method

5.1 Stage assembly

5.1.1 Ball head and quick-mount rail assembly

1. Adjustable stage and ball head assembly

　1）Place the ball head on the round platform, and the ball stud hole is aligned with the screw hole of the bottom plate. (Image1)

　2）Fix the ball head on the round platform by hand screw. (Image 2)

2. Slider and ball head assembly

　1) Put the clamp holder slider on the guide rail (can be installed in different directions as needed). (Image 2)
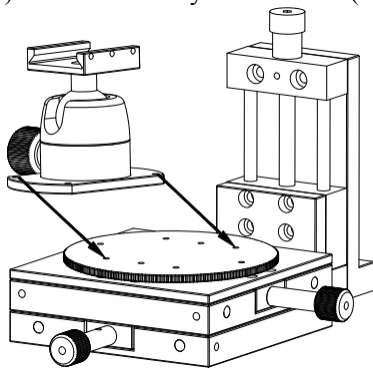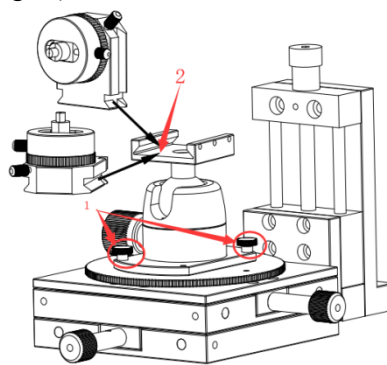
　2) Fix the slider by hand screw. (Image 3)

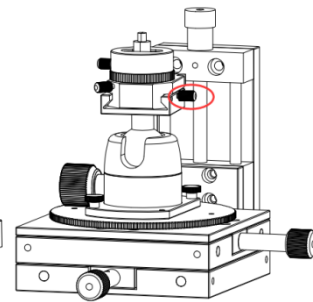Image1   Image2   Image3

5.1.2 Quick-mount rail and clamp holder assembly

　1. Fix the guide rail to the round platform by hand screw. (Image 4)

　2. Put the clamp holder slider on the quick-mount rail (can be installed in different directions as needed) (Image4)

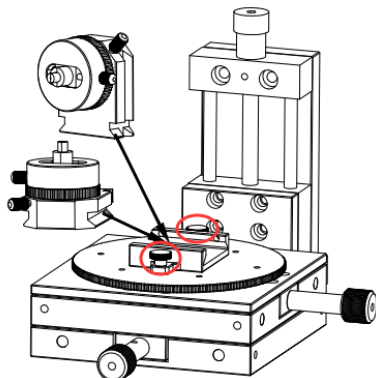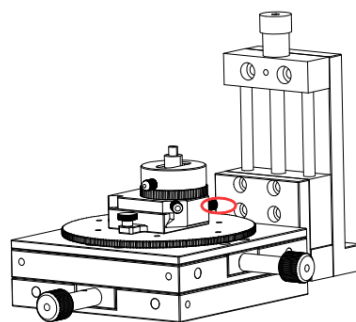　3. Fix the slider on the rail by hand screw. (Image 5)

Image 4   Image 5

5.1.3 Stage clips assembly

1. Install the stage clips in the form of image 6. (Image 6)

2. Screw the screws on the stage clips to the round platform with a screwdriver. (Image 7)
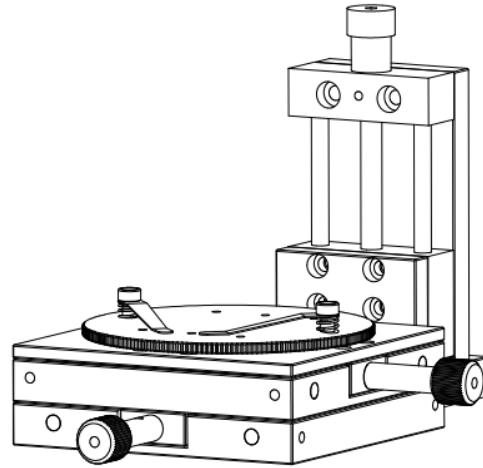

Image 6   Image 7

5.1.4 Object distance extension ring assembly

1、Loosen the main light fixing screw and remove the main light.
2、Unscrew the lens fixing screw and unplug the cable of the camera.
3、Loosen the lens fixing screw.
4、Take out the lens.
5、Put the object distance extension ring on the lens.
6、Fixed object distance extension ring with screws.
7、Put the lens back on the bracket and tighten the screws on the bracket.
8、Put the main light back on the lens and plug in the internet cable.

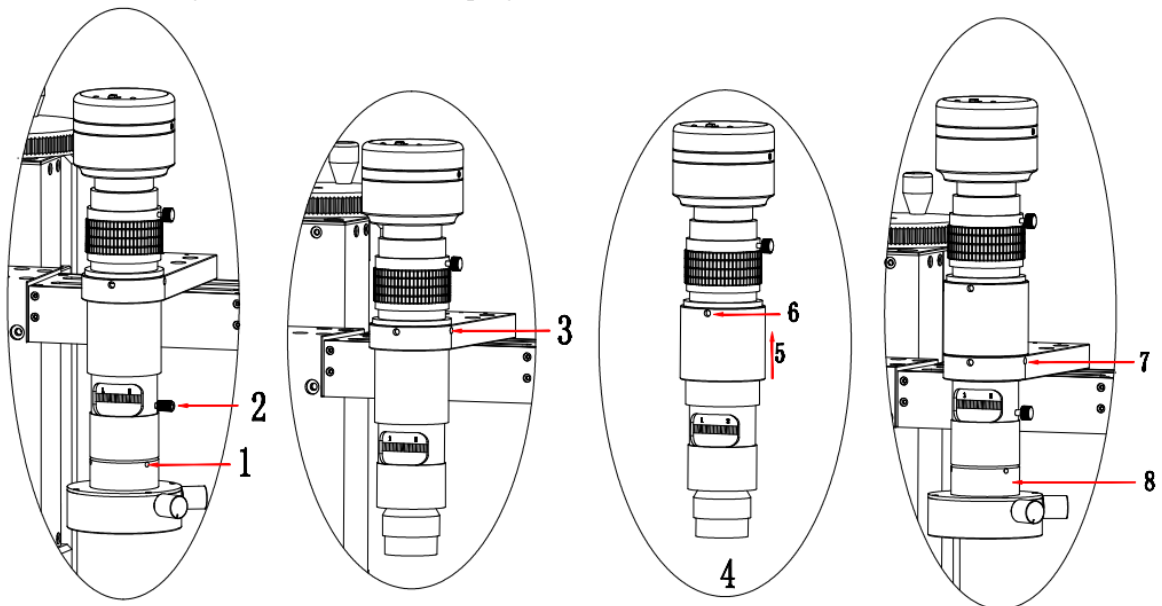Image 8

5.2 Cable connection

1、Network cable connection: Connect the camera to the bracket network port (the CAM1 or CAM2 interface is marked on the bracket) with the network cable. Camera on the right is connected with the CAM1 interface, and camera on the left is connected with the CAM2.

2、PC network cable connection: Connect the PC interface on the bracket to the LAN interface on the computer with a network cable.

3、Light connection: The USB interface of the main light and the side light can be connected to the USB interface (5V 1A OUT) on the bracket for power supply.

4、Power connection: Connect to the power input port of the bracket (DC 12V IN connector) with the standard power adapter (DC 12V IN port), and power adapter to AC: 100-240V, 50~60HZ.
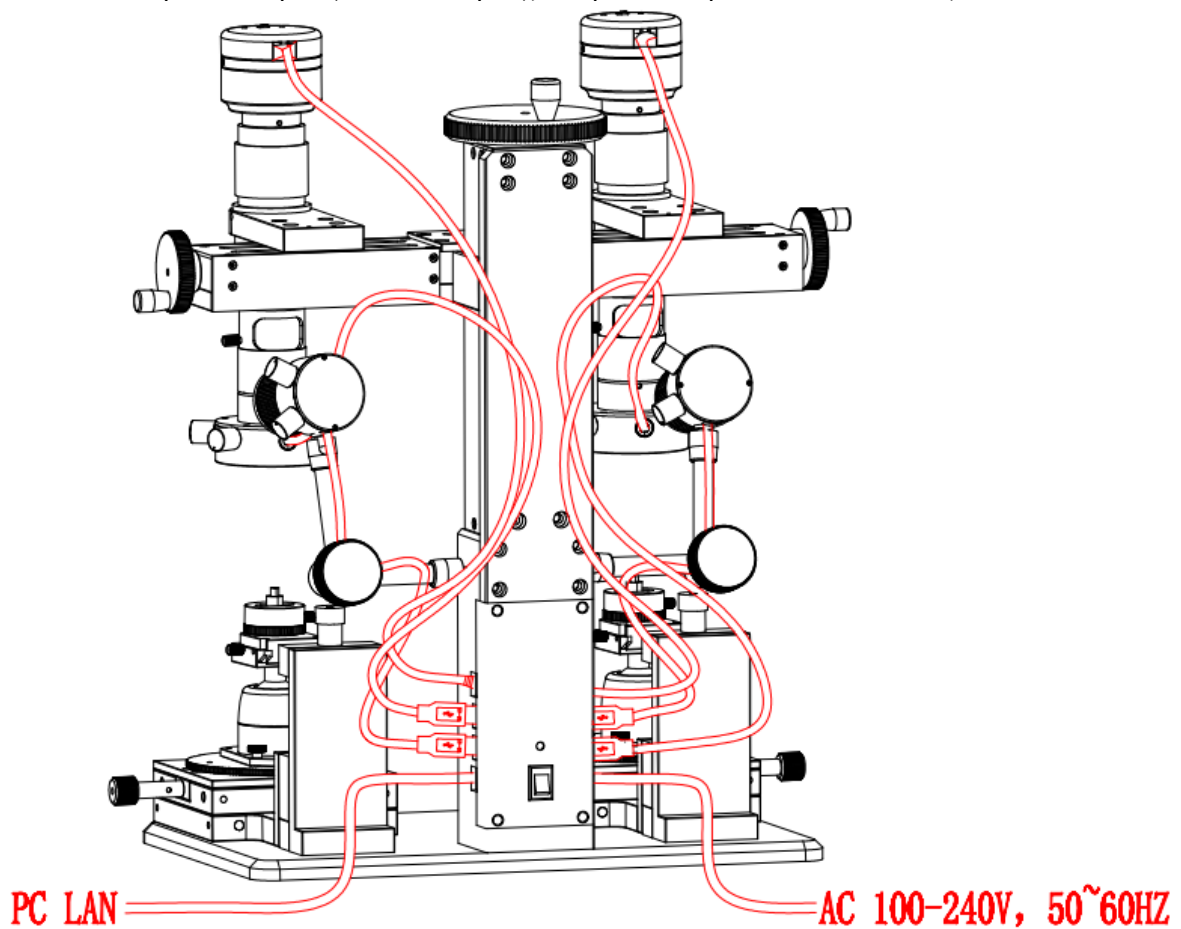

PC LAN   AC 100-240V，50~60HZ

Image 9

Chart 6 Instructions

6.1 Start to use

1、Software installation (software installation and usage instructions, please refer to the software manual)

2、Stage assembly (Detailed reference 5.1）

3、Cable connection (Detailed reference 5.2）

6.2 Instructions

1、After the device is connected, open the software.

2、Turn on the main switch of the device and turn on the light as needed.

3、Place the object on the workbench and observe them with rotating ball head or Clamp holder according to different needs. The ball head or the collet according to different objects.

　1）For cylindrical, spherical, etc., to view the entire outer surface, can match rotating ball head together with Clamp holder.

　2）For small objects, it is difficult to be placed flat. Can use clamp holder to lock it.

4、According to the height of the observed object, adjust the lifting handle until the image is clear.

5、According to the imaging requirements, the focus and magnification of the microscope can be adjusted to make the image clearer; Adjust the position of the table to adjust the imaging position of the object.

6、Software operation (detailed reference: software manual)