

OPTO-EDU

HD Digital LCD Biological Microscope



- Safety Alert is included at the end of this instruction.
- Please read the instructions carefully before using this product.
- Please be sure to keep the guidebook with good safekeeping so that it can be inspected at any time in the future.
- Please use the product correctly on the basis of a full understanding of the content.
- This instruction is used to install and familiarize with AS2100 series digital LCD microscope.

CHS

Brief Introduction

AS2100 series high-definition digital LCD microscope can meet the observation of biological specimen slice demand of teaching field; it supports the HDMI high-definition output and realizes the microscopic pictures and videos without external computer, so it is your good helper for high efficiency observation! Equipped with a full-featured operation button, it can be clicked to achieve photos, videos, playback, local amplification, ruler display and other functions. It has a stable all-metal supportive structure, visual and easy-to-use digital light source display control system. An eye-catching handle is provided above the fuselage to ensure that the microscope is always in a positive position when it is lifted and moved, thus effectively avoiding the falling down of eyepiece and observation samples. Moreover, the instrument can be equipped with a high capacity lithium battery (optional), and can be used without connecting the power supply, which is convenient for outdoor observation.

To begin observing, be sure to read the following content

In order to avoid the bad effect of the observation image and the instrument damage caused by the illegal operation, please read the Safety Warning and Notable Matters of Operation first. Please read this instruction carefully to ensure the correct use of the instrument.

Please refer to this manual while using the instrument to familiarize with the instrument

As you read this manual, try to observe the biological slices and familiarize yourself with the operating procedures of the instrument. This will give you a better understanding of the instrument. Be sure to keep this instruction in good order so that you can read it again if necessary.

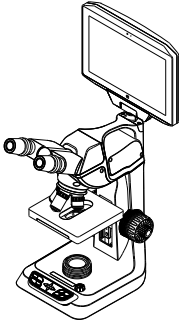
Copyright

The copyright laws of your country may prohibit the use of microscopic images and images of certain objects recorded by you, except for personal appreciation only.

List of items

Before using, please check all the following items in the package. If there is any deficiency, please contact the seller.

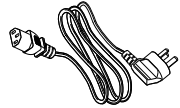
Standard Equipment



Microscope mainframe



Power adapter



Power cord



Micro slide *



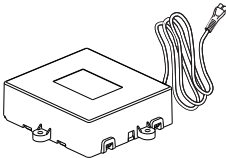
Microscope instruction

About the power adapter

Please check if the power adapter is available for power.

- * Micro slide (Model with stereoscopic objective is configured with slide by default. Other models are optional to equip it)

Optional Accessories



Built-in rechargeable battery

* About the built-in battery

The built-in battery is an optional accessory, which needs the purchase of the equipment to carry the battery. It is forbidden to refit or add the battery components. We are not responsible for any consequence caused by the private modification.

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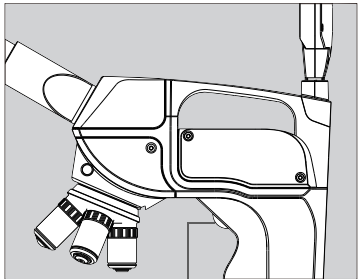
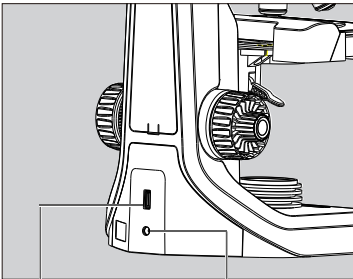
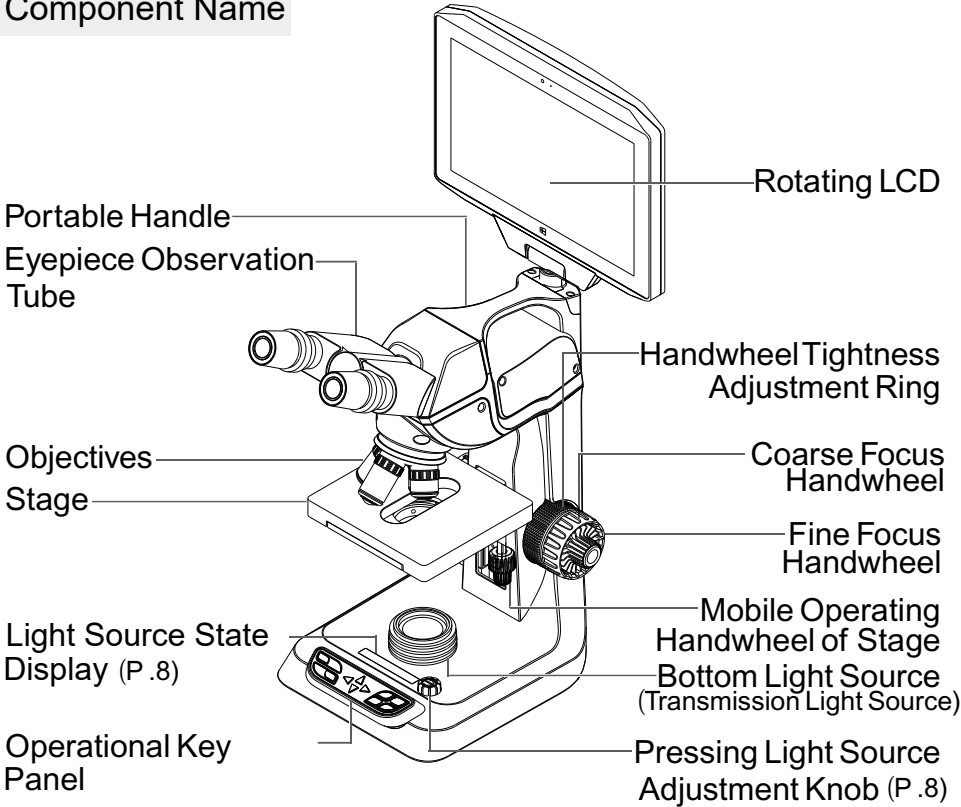
Notable Matters of Operation

Microscope Maintenance Rules

- This microscope is a precise instrument. Do not drop it or physically impact it.
- This microscope is not a waterproof one. Do not expose it in a high humidity environment for a long time. If there is water infiltrating or mold breeding, please send it to a professional maintenance site as soon as possible.
- Please make sure if the input voltage is consistent with the supply voltage in your area. If not, please do not force access to the power supply, otherwise the instrument may be damaged or dangerous. Please use the special power adapter provided by our company.
- There are precise optical devices in the microscope. Do not disassemble the microscope by yourself.
- Do not use the cleaner containing organic solvents to clean the fuselage. For stubborn stains, please contact professional maintenance staff.
- Do not touch the lens of the microscope with your fingers, lest the lens be contaminated and affecting the effectiveness of observation.
- If the microscope suddenly enters a warm room from low temperature, it may cause the dew on the surface and inner parts of the fuselage. In order to prevent dew, please put the microscope in a dehumidifying cabinet, wait for the temperature increasing gradually and then remove it from the cabinet.
- If there is dew on the microscope eyepiece, please stop using it. Remove the eyepiece from the microscope, and do not use the microscope until the dew has evaporated.
- If the microscope is not used for a long time, place it in a dehumidifying cabinet or a well-ventilated dry cool place. Use it several times during storage to make sure the microscope works as usual. (*The microscope with rechargeable battery should be periodically charged to guarantee the service life of the battery)
- Avoid keeping the microscope with corrosive chemicals.
- If the microscope has not been used for a long time, please test all functions before using.

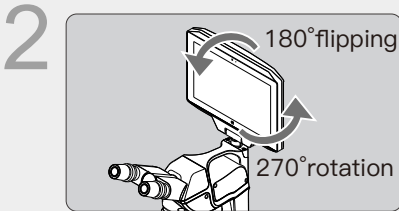
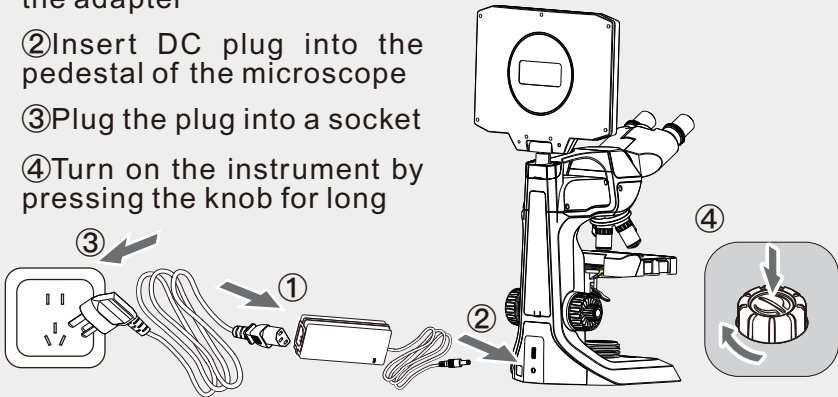
Components

Component Name

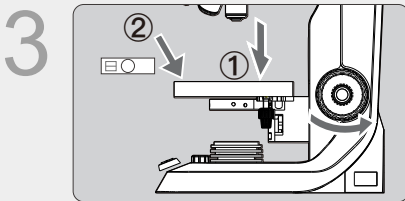


Quick Reference Guide

- 1 ①Connect the power cord to the adapter
- ②Insert DC plug into the pedestal of the microscope
- ③Plug the plug into a socket
- ④Turn on the instrument by pressing the knob for long

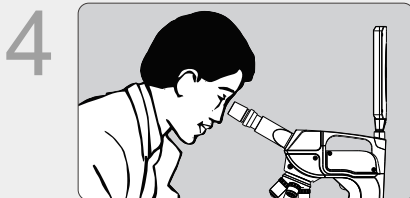


The LCD can be flipped 180° and rotated 270°. You can adjust the direction of the LCD according to your own situation.



①Revolve the Coarse Focus Handwheel, lower the stage to the bottom and convert the objective lens to low power;

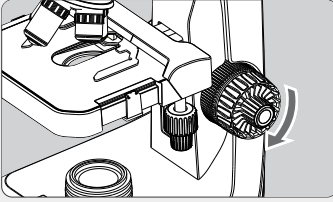
②Put the slice in the slice fixing clamp to avoid free movement.



Focus your eyes on the eyepieces or watch the LCD screen and adjust the light source to the brightness.

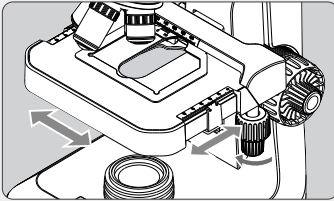
Quick Reference Guide

5



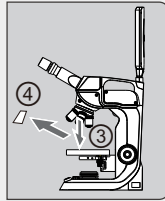
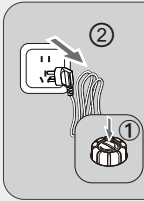
Revolve the Coarse Focus Handwheel to make the stage rise slowly until the object is visible. If not clear, the Fine Focus Handwheel can be adjusted to complete clarity.

6



Rotating the handwheel of the stage can make the stage move back and forth, left and right, so as to find the field range of view to observe.

7



- ① Turn off the instrument by pressing the knob for long
- ② Unplug the adapter
- ③ Lower the stage to the bottom
- ④ Remove the observed slice

8

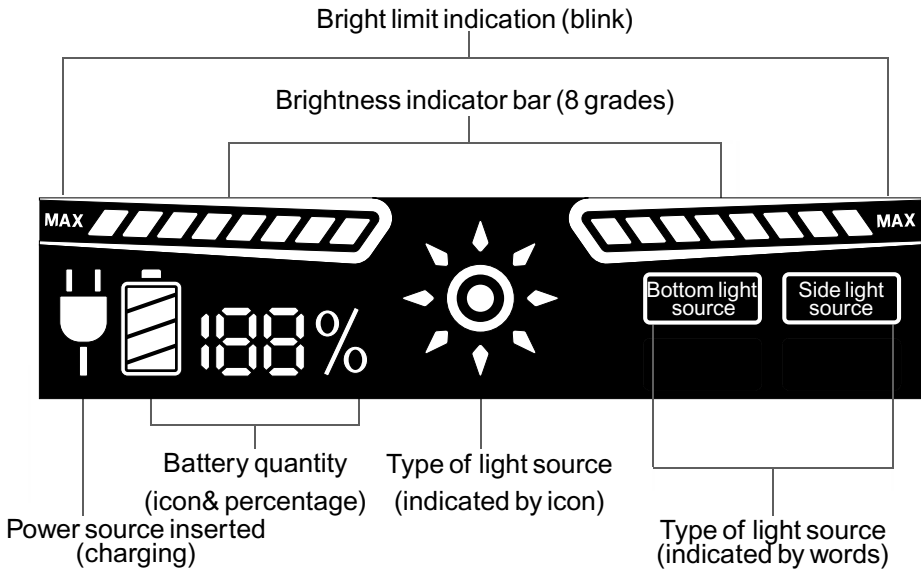
Check if the instrument is damaged and if there is contaminant on each lens during use.

9

Put away the power cord and power adapter. Place the microscope in a dehumidifying cabinet or a well-ventilated dry cool place.

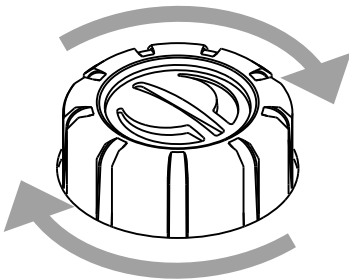
Detailed Functions

Light Source State Display



Pressing Light Source Adjustment Knob

The switch of light source and the adjustment of brightness can be realized by one click

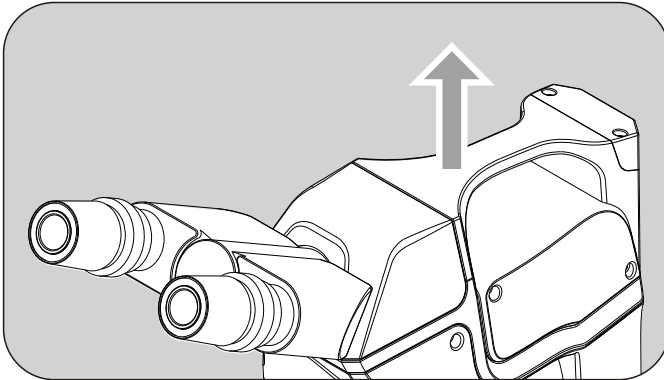


- Pressing the knob for long can control the power of the instrument to turn on and off.
- Pressing the knob for short can switch the light source (Bottom & Side light source)



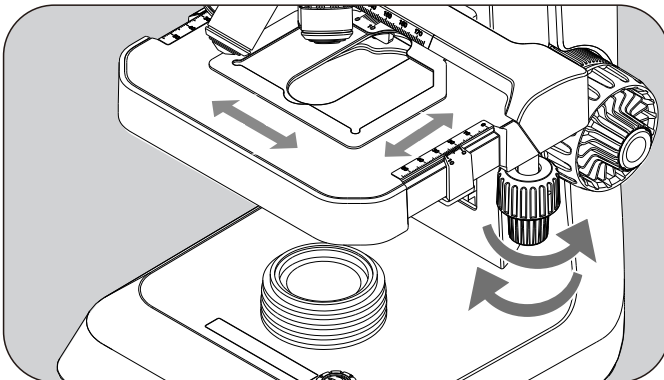
- knob button is used to adjust the brightness degree.
- Pressing for long can turn off the instrument.

Portable Handle



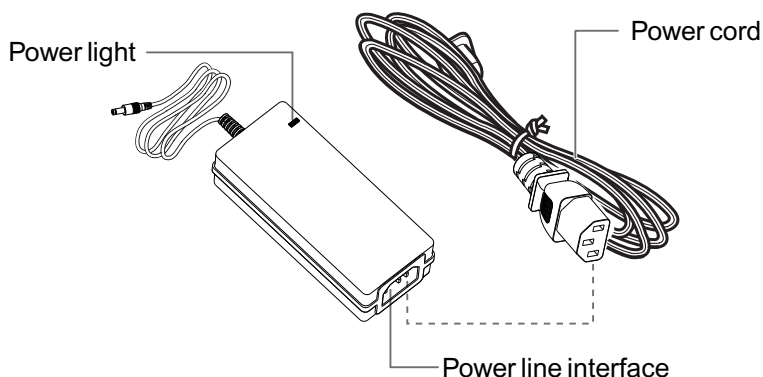
A handle with optimal design of gravity center is provided to ensure that the microscope is always in a positive position when it is lifted and moved, thus effectively avoiding the falling down of eyepiece and observation samples.

Mobile Operating Handwheel of Stage



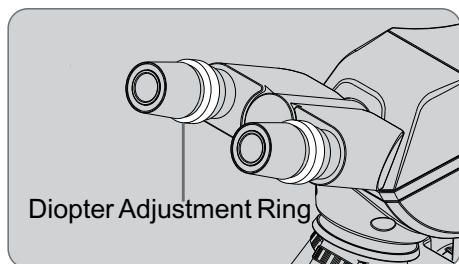
The stage is equipped with a hand wheel with coaxial displacement, which can accurately control the stage moving steadily towards X&Y direction.

Power Adapter



Convert the instrument voltage to the safe voltage through the adapter to ensure the safety during using.

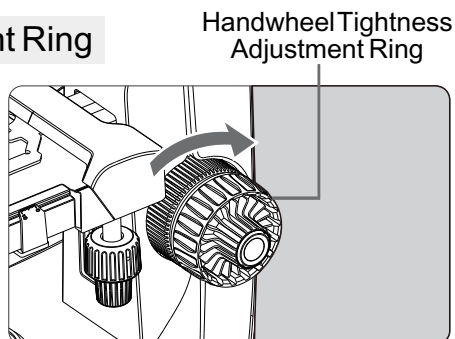
Diopter Adjustment Ring



The visual acuity of the left and right eyes is different, especially among myopic population. The images observed by both eyes can be clear by rotating the Diopter Adjustment Ring.

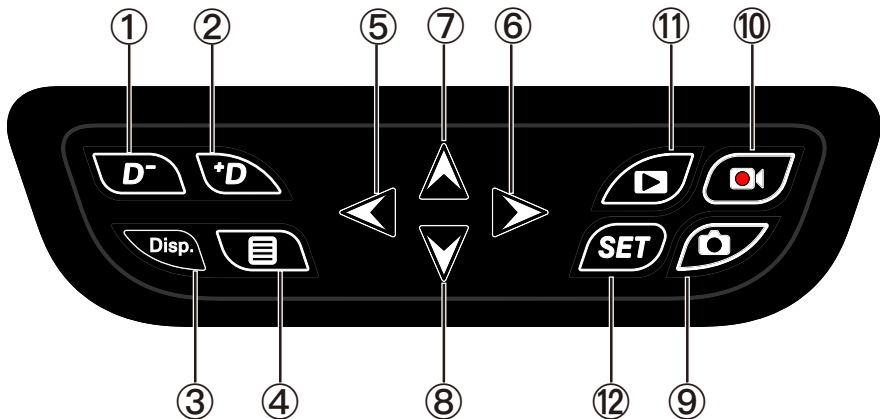
Handwheel Tightness Adjustment Ring

When the lifting handwheel is too loose and causes the stage to fall down, or too tight and causes the rotation difficulty, the ring can be adjusted by rotating the Handwheel Tightness Adjustment Ring to improve the handle feeling and adapt to the usage habit.



Operational Key Panel

Equipped with a full-featured operation button, it can be clicked to achieve photos, videos, playback, local amplification, ruler display and other functions.



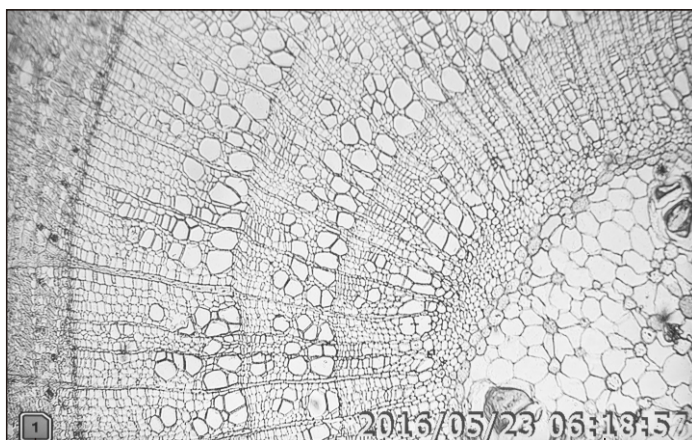
Names of Keys

- | | |
|---------------------------|--------------------------|
| ① Digital reduction | ② Digital magnification |
| ③ Menu hiding/display key | ④ Menu |
| ⑤ Left (Scale changing) | ⑥ Right (Scale changing) |
| ⑦ Up (Ruler color) | ⑧ Down (Ruler color) |
| ⑨ Camera | ⑩ Video Record |
| ⑪ Playback | ⑫ Settings |

Software Operation Guide

Introduction to Software Master Page

The instrument is equipped with LCD screen and can also be connected to external display equipment (external display, projector, TV set). The following software interface will be presented on all display devices. The software can realize the functions of taking pictures, recording video, replaying images and so on.



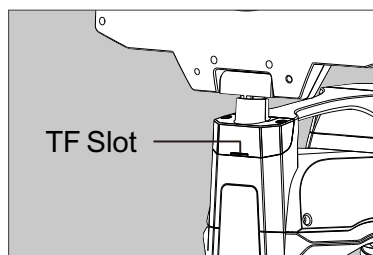
TF card indication

Software Master Page

Time indication

TF Slot

The TF card must be inserted into the instrument to activate the functions of taking pictures, recording video, saving and replaying images.



Setting Key

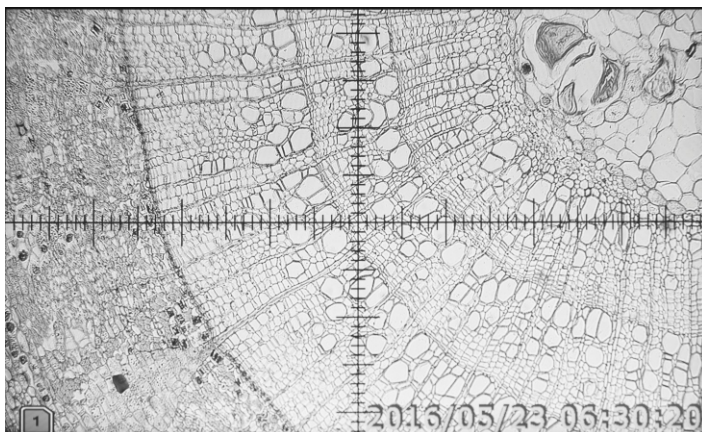


It is used to confirm the selected target and to enter the sub-menu at all levels. Please check corresponding functions for specific application.

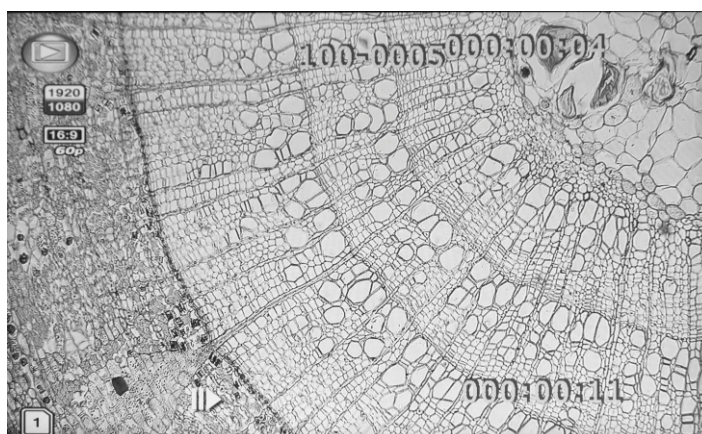
Left & Right Keys



The left key is used for coordinate mode switching, and the right key is used for coordinate color switching. The switching process is: cross coordinate, cross scale, line, arrow, close coordinate.



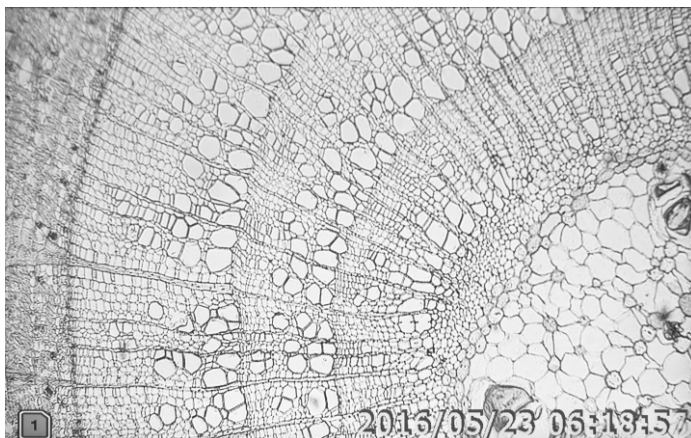
The keys have fast forward or backward function, which is convenient for users to observe objects when watching video.



Up & Down Keys



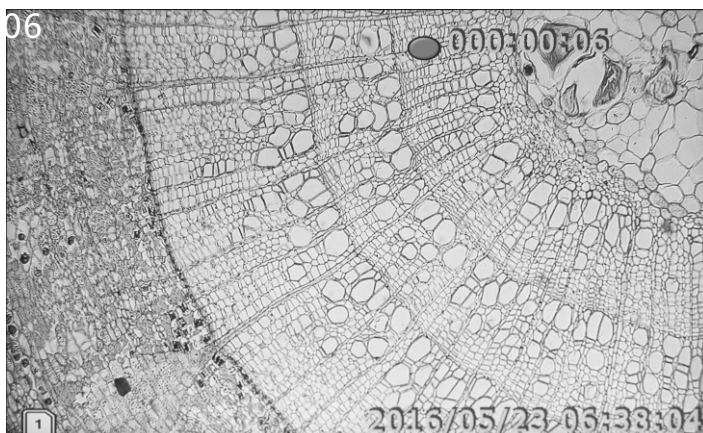
The Up & Down Keys are used to compensate for the exposure of the picture. If the ambient light is dark, users can increase the exposure value to highlight the clarity of the picture



Camera and Video Record Key



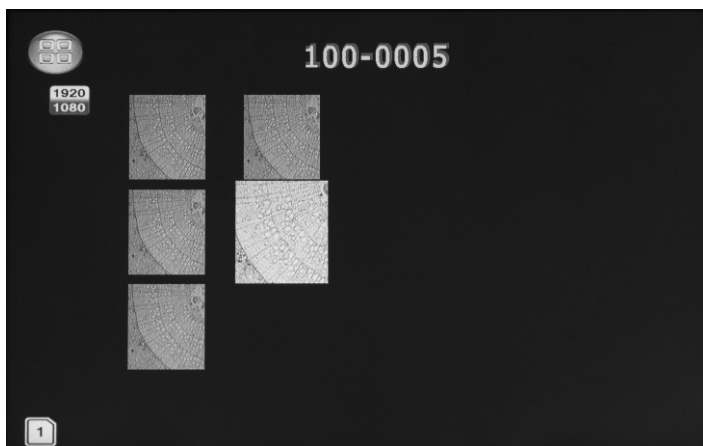
Click the Camera Key to activate the photo-taking function and record screen display. Click the Video Record Key to activate video recording function, and click again to stop recording.



Playback Key



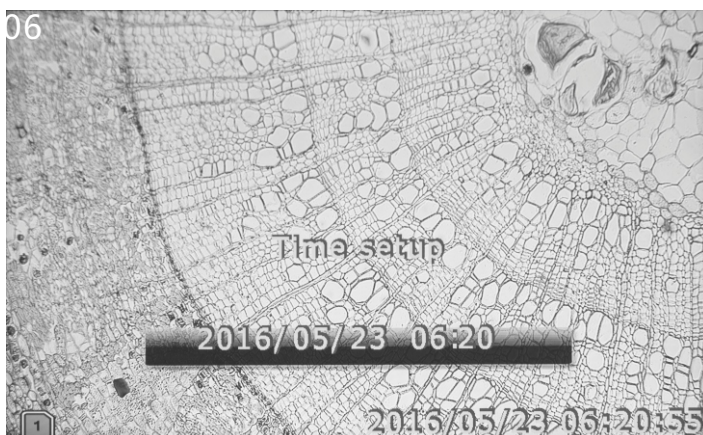
It is used for real time interface observation. Click Playback Key to look through the stored photos or videos. If the video is selected, the resolution parameters will be in the upper left of the display screen.



Menu Key



Menu Key is used for time setup. Users need to reset date and time before first use or after long time unused. Accurate time is more convenient to manage pictures and image files.



■ Use and Maintenance of Instrument Battery ■



***Skills for use of batteries and battery charging (only for instrument equipped with batteries)**

The battery was not fully charged when it was purchased.

Please charge the battery before using.

Please fully charge the battery one day or the day before using.

The charged battery will gradually discharge and lose power even during storage.

Please unplug the power adapter from the socket after finishing charging.

Please check if the battery has electricity.

If the instrument is fully charged, the battery icon  in the Light Source State Display will present the full lattice state; In the case of lacking power, the battery icon  will flash as a warning.

Please maintain a certain amount of electricity during storage.

If the microscope is not used for a long time, please keep the power at 40 % and storage temperature below 15 °C or lower, which can greatly increase the working life of the instrument.

This charger can also be used abroad.

If necessary, please install the plug adapters available on the market corresponding with your country or region. Do not connect any portable transformers to the microscope, otherwise the microscope will be damaged.

If the fully charged battery is rapidly depleted, it has reached its working life.

It takes hours to fully charge a battery that is completely depleted at 23°C. The required charging time depends on the ambient temperature and the charging amount.

It takes longer time to charge at low temperature (5°C-10°C) for safety.

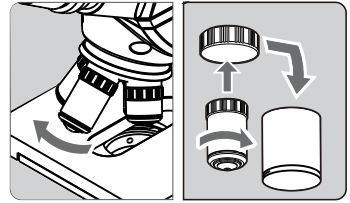


After unplugging the charger, please do not touch the plug for at least 10 seconds. If the battery has a remaining power of 94% or more, please do not charge it any more. The charger cannot be used to charge any battery other than the instrument.

Replacement of Objective

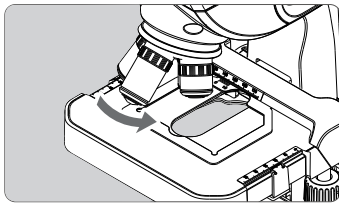
1 Remove the lens to be replaced and put it into the lens bottle.

Rotate and remove the lens in the direction of the arrow shown on the left picture, then tighten the lens in the lens lid, finally put in the lens bottle and tighten the lid with the bottle.



2 Install new lens

Rotate the objective lens in the direction indicated by the arrow and install it onto the objective lens converter. The installation sequence should ensure that the magnification rate is from low to high when the converter is rotated.



3 Confirm and use

After installation, please check whether it can focus. If not, check whether the objective lens is tightened. It can be used normally after the installation of objective lens.

Reduce dust

Please ensure that the lens are not damaged and contaminated.

Remove dust from the bottle lid before installing the objective lens.

Please replace lenses quickly in the place with very little dust.



Do not touch the glass part of the lens directly, which is easy to damage the lens and reduce the observation effect.

If there are stains on the lens, do not blow them off with your mouth. Please clean them with mirror paper or degreased cotton balls.

Trouble Shooting

If the instrument breaks down, please refer to this trouble shooting first. If it can not solve the problem, please contact the dealer or maintenance staff.

Optical Path Part

Problem	Reasons	Solutions
Field of view is inhomogeneous	The objective lens converter is not in position	Rotate the objective lens into the lens bayonet
	There are stains on the specimen or the lens	Clean it with degreased cotton balls.
	The aperture diaphragm is too small	Adjust the aperture diaphragm properly
	Brightness adjustment knob is not in position	Rotate the brightness adjustment button
	No slide on the specimen	Use the complete slide
	Cover glass is too thick or too thin	Use standard cover glass of 0.17mm
Image is moving during focusing	The specimen is floating	Specimens should be stably placed
The observation picture is dim or the object of observation cannot be found	Light source is not bright enough	Adjust the light source to increase the brightness
	Wrong light source has been used	Press switch for short to change light source

Digital Part

Problem	Reasons	Solutions
The screen is not displayed after turning on	Power supply is not connected	Check the connection of power wire
Images displayed on screen is in bad effects	Errors on software setup	Enter software settings to adjust image parameters
Fail to operate software	Malfunction of operation keys	Turn off the instrument and restart the software

Safety Warning

Please follow these safety instructions and use the instrument correctly to avoid personal injury, death and material damage.

Avoid Serious Accidents

- Please follow the following safety instructions to avoid fire, overheating, chemical leakage and explosion.
 - Do not use any other battery, power and accessories specified in the instructions. Do not use self-made batteries or refit batteries.
 - Do not short-circuit the battery or backup battery, self-disassemble or refit the battery.
 - Do not overheat or weld the battery or backup battery. Do not close the battery or backup battery to flame or water. Do not subject the battery or backup battery to a violent physical impact.
 - Do not charge the product outside the allowable ambient temperature range of 0 °C-40 °C. Do not exceed the charge time.
 - Do not insert any other metal objects into the instrument's electronic contacts, accessories, connectors, etc.
- If there is overheating, smoke and smell, please immediately unplug the power adapter from the socket to stop charging and avoid fire during charging.
- If there is chemical leakage, color changes, distortion, smoke or smell, stop using the instrument immediately and contact the maintenance staff to remove it. Please avoid burns during operation.
- Do not contact eyes, skin or clothing with battery leakage, which may lead to blindness or skin damage. If the battery leakage contacts your eyes, skin or clothing, please rinse the contact area immediately with a large amount of water (do not knead) and consult a doctor immediately.
- When the instrument is charging, please keep it out of reach of children. Power cord may cause accidental suffocation or electric shock to child.
- Do not bring any power cord near heat source, otherwise it will heat up to deform or melt the insulation layer, and cause fire or electric shock accident.
- Do not store this instrument in dusty or wet places to avoid fire or electric shocks.

Safety Warning

- If the instrument or accessories are not in use and stored all year round, please contact the maintenance staff to remove the battery and disconnect the plug, which can prevent electric shocks, heat or fire.
- Do not use the instrument in the environment with combustible gas to avoid explosion or fire.
- Do not touch the internal parts to avoid electric shocks if the instrument falls down and breaks the shell and expose the internal parts.
- Do not self-disassemble or refit the instrument. Electric shocks may occur in the internal high-voltage parts.
- Please keep the microscope out of reach of children. Falling instruments can cause accidental injuries to children.
- Before using this instrument in the laboratory or in hospital, please make sure if it is allowed. There may be important information in the instrument.
- Please follow the following safety instructions to avoid fire or electric shocks.
 - Be sure to plug in the plug completely
 - Do not touch the plug with wet hands
 - Please hold the plug and pull it out. Don't pull the power cord hard when unplugging.
 - Do not scratch, cut off or over-bend the power cord. Do not place heavy objects on the power cord.
 - Do not bend or knot the power cord.
 - Do not connect too many plugs on the same socket.
 - Do not use damaged insulation cord.
- Please unplug the power plug regularly and wipe off the dust around the socket with a dry cloth. If the socket is dusty, wet or greasy, the dust on the socket will be moist and easy to result in a short circuit to cause a fire.

Safety Warning

Avoid Personal Injury or Damage to Equipment

- Do not place the instrument in the burning sun or in the car near heat source, otherwise the increasing temperature of the device may burn your skin.
- When the instrument is not placed in a special mobile device, do not carry it for long distance so as not to lose the precision of the instrument.
- Do not cover or wrap the charging instrument with cloth, otherwise it will result in shell deformation or fire due to poor heat dissipation.
- If the instrument falls into water, or water or metal foreign objects enter the inner instrument, please stop using the instrument immediately and contact the maintenance staff to avoid fire or electric shocks.
- Do not use or store instruments in high temperature environments, which can cause leakage or shorten the working life of battery. Battery temperature may increase and cause skin burns.
- Do not use paint diluents, benzene or other organic solvents to clean this instrument, or it may cause fire or damage to health. If the instrument cannot be operated properly or needs repairment, please contact the dealer or maintenance staff