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LCD Digital Microscope NYMCS-1262



Instruction Manual

This manual is for LCD digital microscope NYMCS-1262. To ensure the safety, obtain optimum performance and to familiarize yourself fully with the use of this microscope, it is strongly recommended that you study this manual thoroughly before operating the microscope.

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Safety notice

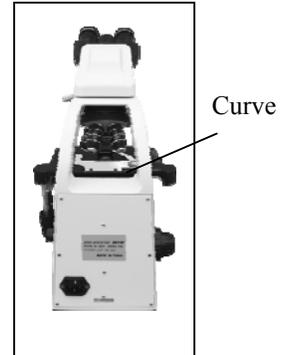
1. Transportation

As microscope is a precision instrument, handle with care, avoiding impact or abrupt movement during transportation. Do not push or pull the microscope during using, otherwise the precision for image will be reduced.

- (1). Hold the curve and keep the microscope in balance
- (2). Do not hold the focusing knob, eyepiece tubes and stage as these parts are movable.

Troubles maybe caused by such handles.

★Do not make specimen or filters fall off.



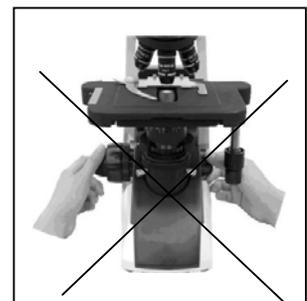
2. Working Environment

As microscope is a precision instrument, improper using will make it unworkable or reduce its precision.

- (1). Do not expose the microscope in the sun directly.
- (2). Temperature range is 0-40 and the max. humidity is 85%.
- (3). Avoid high temperature and humidification otherwise there will be fog or mold on the lens.
- (4). Avoid violent vibration as the vibration will reduce the images quality.
- (5). Place microscope on a stable plane and keep it in balance. Keep the environment breezy and cover the microscope with the dust-cover.
- (6). Do not place microscope in moist room to avoid short circuit. Please turn off the power supply as soon as water drop in the microscope. If there are other things unsafe come into the microscope may cause short circuit too, please stop using and contact with manufacturer.

3. Focusing knob

Never turn the left and right focusing knob in the adverse direction at the same time. Do not turn the coarse focusing knob when the stage reaches max position. These improper operations will make focusing structure unworkable.

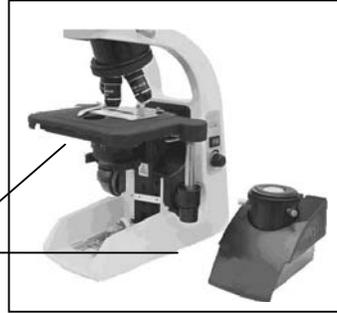


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4. Clamp

The clamps fix the microscope firmly during transportation, please remove them before using.

Clamp



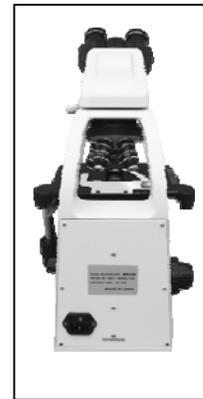
5. Do not take the microscope apart

As it will be damaged. Such operations might have bad effect on the performance and make user get an electric shock or injured. Please contact with manufacturer if there is any problem.

6. Make sure the voltage

There is correct input voltage in the label on microscope. Make sure the voltage in your position is right. Improper input voltage may cause short circuit and fire. The microscope will be damaged.

Input voltage in the label: 100-240V, 50/60Hz



7. Use the spare parts supplied by the manufacturer

The bulb, fuse and electronic cord have been assembled already in the factory and please make sure to use the spare parts of them supplied by the manufacturer. Improper bulb, fuse and electronic cord will destroy microscope and cause fire. Please make sure to use PE electronic cord when using extra-long electronic cord.

Spare bulbs: halogen bulb 12V20W (or 12V30W)

Spare fuse: 250V 1A delayed model, mini type fuse



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8. Mounting the bulb

Never touch the surface of bulb with your hand directly. Please use gloves or cloth material when you mount the bulb to avoid leaving fingerprints. Fingerprints or stains should be wiped off with a tissue moistened with a small amount of alcohol. The fingerprints will etch on the bulb's surface and make brightness lower and life cycle shorter.

Please make sure the bulb's touching points are Ok as it will not light or short circuit if the bulb's touching points are damaged. Insert the bulb's legs into the bulb holder firmly. The bulb will go out if its legs have not been inserted into the holder firmly. Such Operation may cause short circuit or smoking. At last, please make sure if the collector has been mounted properly.

9. Temperature for illumination

There will be high temperature when the bulb is lightened, never move the collector when the bulb is lightened. Do not touch the bulb within 30 minutes after it has been turned off. Make sure the bulb has been cooling for enough time (at least 30 minutes) to avoid scald. Do not put fiber, papers and incensive things (eg. Gasoline, aether, methanol and ethanol) close to the bulb.

10. Make sure to turn off the power supply before assembling microscope, replacing bulb or fuse.

11. Observing with oil immersion

Using small amount of oil immersion is enough. The redundant oil will adhere to stage or condenser and these will reduce microscope's performance.

Get rid of the redundant oil or clean the lens by using aether or pure alcohol according to this instruction. Pay attention during process as these things are incentive



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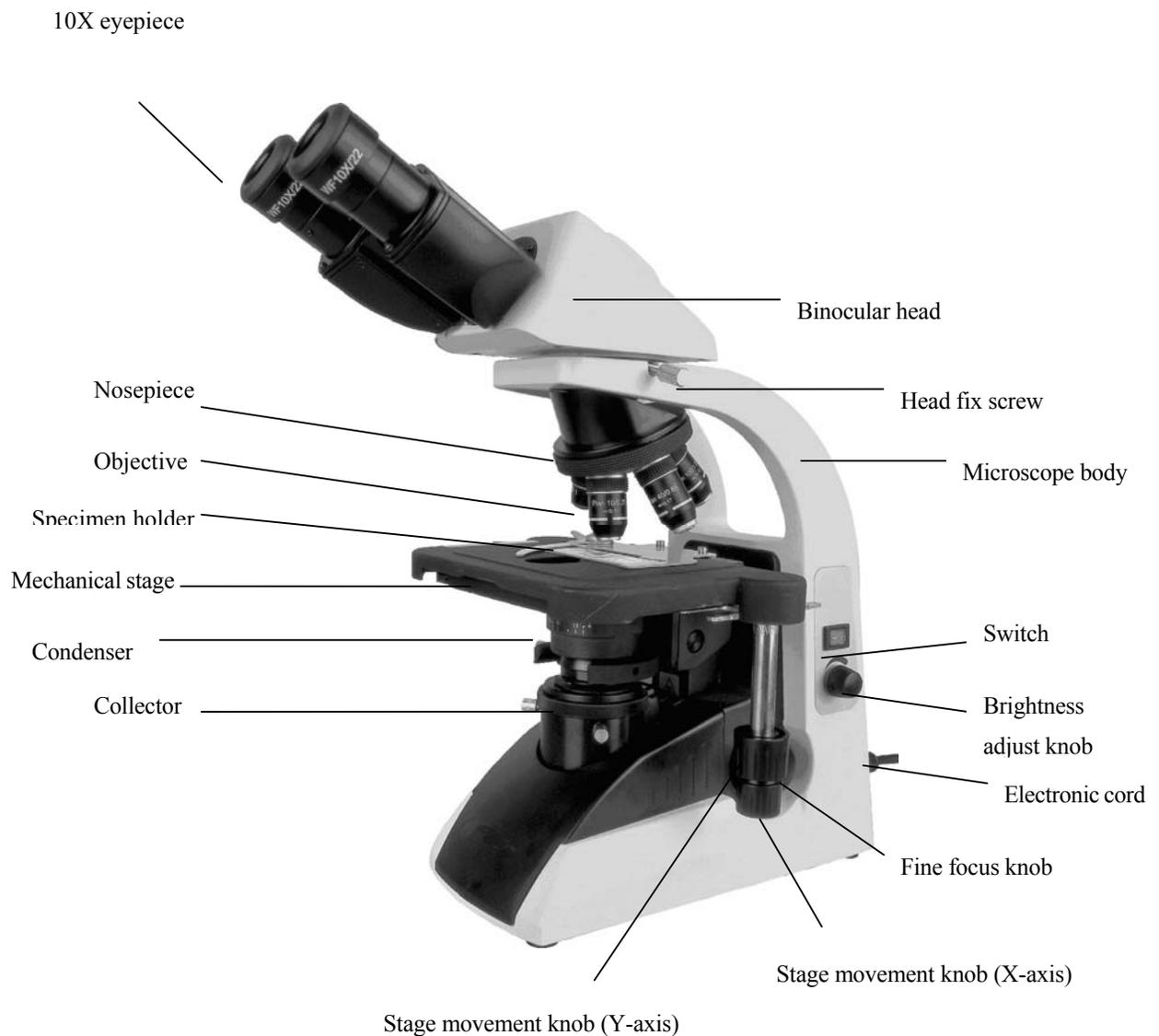
**12. Operating the microscope only indoor and under the altitude 2000m,
IP52 grads.**

If the equipment is used in manner not specified by the manufacturer, the equipment may be impaired.

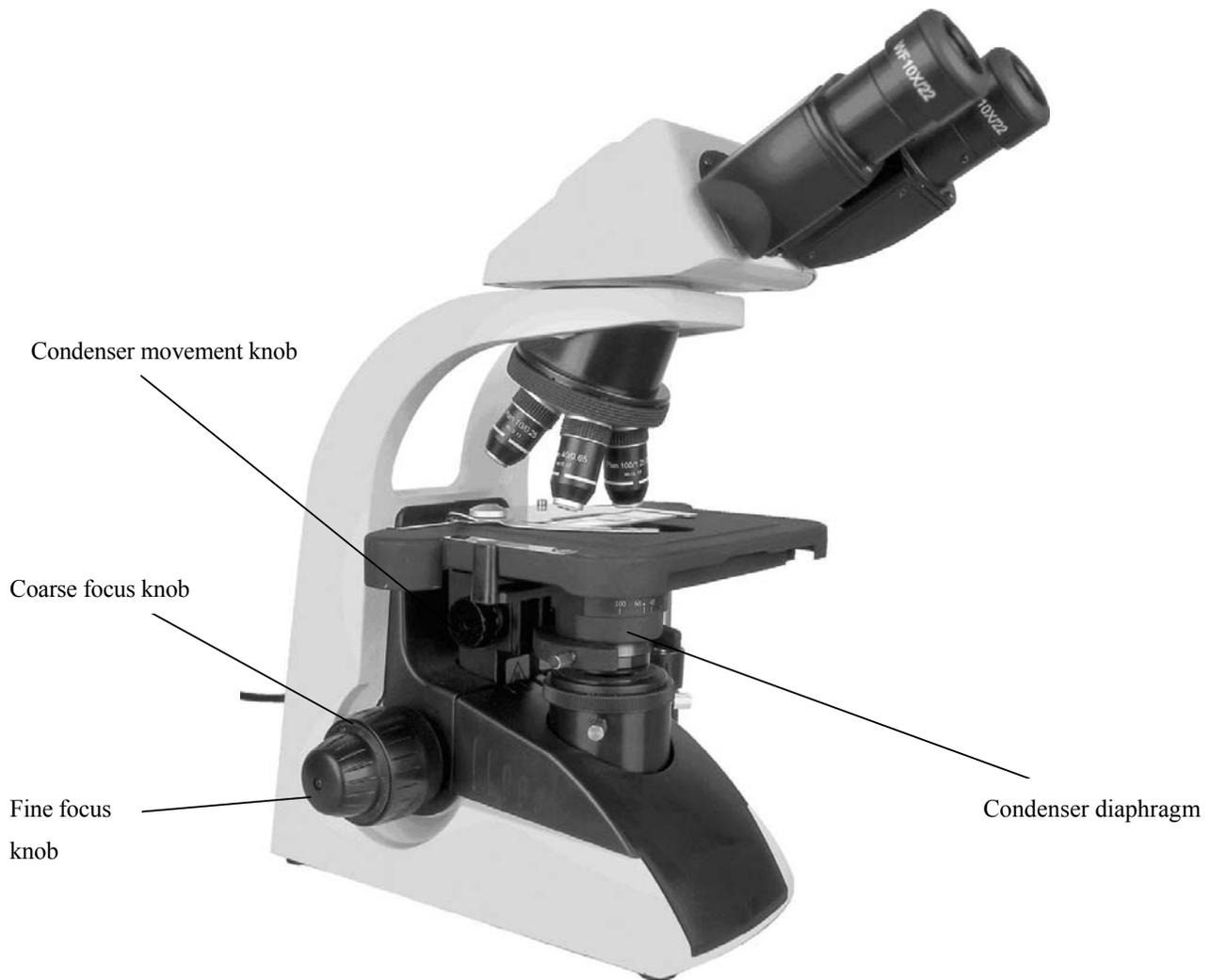
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Optical Part

1. Components



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2. Technical parameter and specification

2.1 Specification

1. Optical system:

Infinite optical system

2. Illumination:

Inserted transmitted illumination, 12V20W halogen bulb(standard outfit)

Input voltage: 100V~240V 50/60Hz

Voltage undulation 10%

Rating 100V~240V 50/60Hz 0.8A

Fuse 250V 1A delayed model, mini type fuse 2pcs

3. Focusing adjustment:

Division of fine focusing adjustment: 0.002mm

Fine focusing knob control range: stage will be up or down 0.2mm per circle

Coarse focusing knob control range: stage will be up or down 20mm

4. Mechanical stage

X-movement range: 54mm, Y-movement range: 78mm

5. Nosepiece:

Roller bear quintuple nosepiece

6. Condenser:

Abbe NA=1.25 with iris diaphragm

7. Eye tubes:

Interpupillary range 55~75mm



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8. Working environment:

Temperature: 0 ~40°C, Humidity: max. 85%, no dew

2.2 Optical parameter

1. Optical parameter

Objectives: infinite plan achromatic objectives

Objectives	N.A.	Cover glass thickness(mm)	W.D. mm	Dry/Oil
4X	0.1	0.17	25	Dry
10X	0.25	0.17	6.7	Dry
40X	0.65	0.17	0.6	Dry

2. Eyepiece: WF10X/22mm

2.3 Nomenclature

Total magnification

Total magnification = Eyepiece's magnification * objective's magnification

Numerical aperture (N.A.)

N.A. value will affect resolution and image's brightness, it is the leading parameter for objectives. $N.A. = n \cdot \sin$

n stands for refractive index of the medium between objective and specimen or condenser (air or oil immersion)

a stands for half angle of max. aperture angle in the axis

The image will be sharper and brighter when the N.A. value is bigger

Resolution

Resolution can be measured by the distance value from one point to another one which could be distinguished on the object surface



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Resolution= $\lambda / 2N.A.$

λ stands for wavelength ($\lambda = 0.55 \text{ m}$)

Working distance

The distance between the object surface to the first surface of optical system when you get the sharpest image. The W.D. will become more short when the magnification for the objective is bigger.

Eyepiece view field

The max diameter measured when the diaphragm is open. 10X/20 means the magnification is 10X and the max diameter of view field is 20mm

Effective view field

Liner view field which is observed on the object surface

Effective view field = eyepiece view field / objective's magnification

Depth of field

Depth of field stands for depth of the space in which there is sharp image on the object surface. Depth of field will be longer when the diaphragm reduces. Depth of field will be shorter when the N.A. becomes bigger.

3. Configuration

1	Microscope's body (including stage, nosepiece, coaxial coarse and fine focusing adjustment, bracket for condenser, adjusting power supply, halogen bulb and normal collector)	1pc
2	Siedentopf binocular inclined at 30° (360° rotatable)	1pc
3	Condenser (with iris diaphragm, without auxiliary lens)	1pc
4	Objectives(Infinite achromatic objectives)4X10X40X100X	1 set
5	WF10X/22 eyepiece	2 pcs



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6	Blue filter	1 set
7	Electronic cord	1 pc
8	Immersion oil	1 bottle
9	Dust cover	1 pc
10	Instruction and quality certificate	1 pc
11	Halogen bulb (12V20W)	2 pcs
12	Wrench 2.5, 1.5	1pc

Optional

Item	Content	Piece
1	Dark field condenser	
2	WF10X eyepiece with reticle	
3	WF15X eyepiece (16mm)	
4	phase contrast condenser	
5	LED transmitted illumination	
6	110V, 240V transmitted illumination	
7	Disc phase contrast condensor	
8	Polarization attachment	
9	WF20X eyepiece (12mm)	

4. Assemblage

Please read the safety notice carefully before assembly and make the assembly according to the following steps ever turn the left and right focusing knob in the adverse direction at the same time.

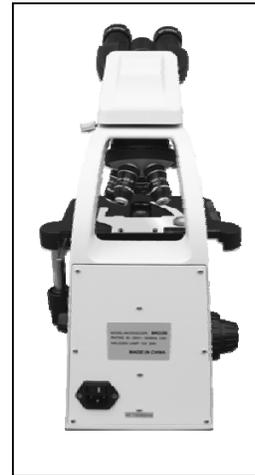
Tools: wrench (2 pcs)

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4.1. Checking the input voltage

There is correct input voltage in the label on microscope. Make sure the voltage in your position is right. Improper input voltage may cause short circuit and fire. The microscope will be damaged. Turn off the power supply (turn the switch to “O”) and insert one end of the electronic cord (connector) into the entrance for AC. Insert the other end of the electronic cord (pin) into the grounded AC connector and make sure that the electronic cord has been connected safely.

- ★Please use the supplied electronic cord by manufacturer
- ★Please make sure to use PE electronic cord when using extra-long electronic cord.
- ★Pay attention that the microscope should be placed near AC connector and the AC connector is touchable for users



4.2. Removing the clamps for transportation

The clamps fix the stage and focusing adjustment firmly during transportation.

Handle the grooves beside collector and pull it out. Remove the clamps by wrenches.

Mechanical stage

There is one clamp fixing the mechanical stage in Y axis direction. Remove the bolts and clamps.

AC input socket

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Focusing adjustment

Pull out the collector. The bracket is fixed by one clamp.

Please remove the bolts and clamps.

Clamps of Y axis

Clamps of stage



4.3. Mount the binocular head

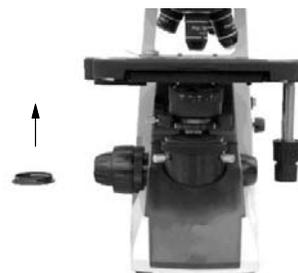
Loosen the fixing screw in the eye tubes and insert the binocular head into the eye tubes. Then tighten the screw.

Fixing screw for binocular head



4.4. Mount the blue filter

Take out the filter from the bottom of condenser and mount it in the bracket then move the bracket into the condenser.

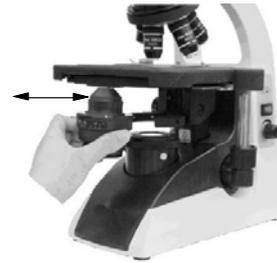


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4.5. Adjustment and replacement

(1). Condenser

The condenser is mounted in the microscope before shipment. Remove or replace the condenser according to the following steps.



- a. Handle the grooves of the condenser and pull it out.
- b. Turn the lifting knob for condenser and make the bracket in a suitable position.
- c. Loosen the screw in the left side of condenser and take out the condenser. Mount the blue filter in the bracket then move it into the bottom of the condenser. Make the label in the condenser forward and move the condenser into the bracket. At last tighten the screw.
- d. Handle the grooves and push the collector in.
- e. Turn the lifting knob of condenser and make the condenser to the highest position.
- f. Turn the lifting knob of condenser and make the condenser a lit bit lower. The image will be focused in the right place of object (center of light path) when the light transit condenser. Move the condenser up and down a little to make the dispersion image disappeared.

(2). Objectives

The objectives have been mounted in the microscope before shipment.

Take off the specimen from the stage and make the stage lower when you replace the objectives.

Handle the objective with your two hands and remove it. Be carefully do not make it fall off.

Turn the nosepiece to get the objective you need. The magnification for the objectives becomes bigger in clockwise direction (observing from the top of the microscope).

(3). Specimen clip

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The clip has been mounted in the stage before shipment.

Loosen two screws by wrenches supplied by manufacturer to remove the clip.

(4). Eyepieces

10X eyepieces have been in the foam box before shipment. Insert the eyepiece into the eyepiece tubes and tighten the fixing screws by wrench.

Handle the eyepieces and replace them according to following picture.

Left and right eyepiece should be replaced together when replacing to use 15X eyepiece to keep the same magnification between left and right eye tubes.



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★Notice: The 10X eyepiece should touch the end of eye tube.

The “o” scale should be consistent with standard line when the eyepieces are inserted in or pulled out of the eye tubes.

(5). Other attachments

Replace other attachments (eg, camera) according to the instruction.

(6). Replacement

a. Replacement for bulb

Turn off the power supply (turn the switch to “O”) and pull out the connector.

Wait for 30 minutes till the bulb is cooling Handle the grooves in condenser and pull it out Pull out the original bulb. Replace the bulb by gloves or cloth material then insert the bulb into the socket entirely.

Pull the condenser back to its original position. Connect the electronic cord to the power supply



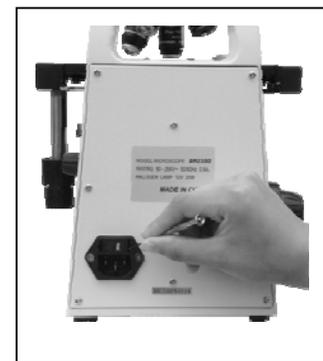
b. Replacement for fuse

Turn off the power supply (turn the switch to “O”) and pull out the connector.

Open the cover for fuse by screwdriver.

Mount the new fuse

★Make sure that the voltage shown in the cover for fuse is same to the working voltage.



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5. Operation

5.1. Illumination

Turn on the power supply (turn the switch to “-”) then the bulb will be on. The lightness can be adjusted by turning the adjusting knob.



5.2. Interpupillary range

Adjust the interpupillary distance of the binocular to make sure that the view field in the right and left eyepiece is consistent.

The point stands for the interpupillary distance.



5.3. Placing the specimen

Put the specimen in the stage and make the cover glass on it. Make the clips clamp them entirely. Two slides can be put in the stage in the same time.



5.4. Focus by 10X objective

Put the 10X objective into the optic path and focus by turning coarse and fine focusing knob.

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Turn the stage and focusing knob according to the direction shown in the picture.

There is no coarse focusing knob in one side of stage's moving knob and in the other side there are both coarse and fine focusing knob.

Never turn the left and right focusing knob in the adverse direction at the same time.

Never turn the coarse focusing knob when the stage is in the end of removing range. Otherwise it will make damage to the instrument.

Detailed operation

It is difficult to do focusing if turning the focusing knob optionally. The specimen may be crushed when 100X objective is used. Please read the instruction carefully to avoid making damage to the cover glass or objective

- a. Put the 10X or 4X objective into optic path.
- b. Remove the stage to the top by turning the coarse focusing knob.
- c. Observe through the eyepiece and turn the coarse focusing knob slowly to let the stage down and down till there is sharp image.
- d. Turn the fine focusing knob to focus finely. Use the 10X objective or 4X objective firstly before 40X and 100X objective. Turn the fine focusing knob to focus finely.



5.5. Adjusting the diopter for eyepieces

Adjust the diopter ring according to user's diopter for left and right eyes. This function could make use of advantages of objectives fully. Meanwhile it also can be react as focusing.

- a. Put the 40X objective in the optic path and turn the coarse





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and fine focusing knob to do focusing.

- b. Put the 10X objective (or 4X objective) in the optic path.
- c. Let your left eye observe through the left eyepiece and do focusing by the diopter adjusting ring in left eyepiece.
- d. Repeat the above steps till sharp image can be observed by left and right eyepiece at the same time.

5.6. Adjusting the upright position for condenser

Turn the lifting knob for condenser till it reaches the top position then fall it a little bit down. If there is dispersion image in the view field, please remove the condenser a little bit of up and down to make the dispersion image disappeared.

5.7. Objectives

Turn the nosepiece to choose the objective and adjust the view field diaphragm and aperture accordingly.

5.8. View field diaphragm

Adjust the view field diaphragm according to the objective till its image touches the edge of view field as this could eliminate the outside light and increase the contrast of the image.

★Notice: There will be no image for view field diaphragm when 100X objective is used. So adjust the diaphragm to its min diameter

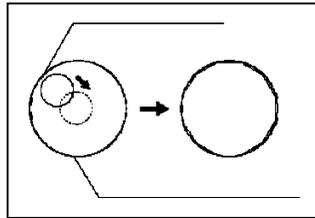
Centering view field diaphragm

- a. Use the 10X objective and focus the image. Turn the view field diaphragm adjusting ring and reduce the diaphragm's diameter.
- b. Turn the lifting knob for condenser to focus the image of view field diaphragm.
- c. Turn the two centering screws for condenser and make the image in the center of view field.
- d. Check the centering and open the view field diaphragm till the image of the diaphragm touches the

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edge of view field. Please do the centering again if the image of the diaphragm does not touch the edge of view field.

- e. Open the view field diaphragm and make its image a little bigger than the view field in practice.



5.9. Adjusting aperture diaphragm

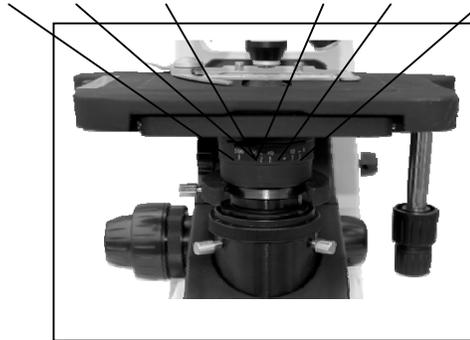
Adjust the aperture diaphragm adjusting shaft for condenser till the position which stands for the magnification of objective adjusting the aperture diaphragm

- Adjust the aperture diaphragm by the adjusting shaft. The brightness and resolution will be decrease while the contrast and depth of view will increase if the diameter of aperture diaphragm reduces.
- Adjust the value of aperture diaphragm to 70%-80% of the value of objectives N.A..
- The aperture diaphragm could control the N.A. of condenser. Do not adjusting the brightness by it while use the brightness adjusting knob to make the adjustment.
- N.A. is marked in each objective e.g. 40X/0.65 stands for that magnification is 40X and N.A. is 0.65.
- Remove the eyepiece and observe through the eye tubes by eyes directly N.A. of condenser could tell users the position of aperture diaphragm adjusting shaft in corresponding magnification. (That is to say, the value of aperture diaphragm should be 70% to 80% of the N.A. of objective when the aperture diaphragm adjusting shaft reaches some position) If the objective has been changed, please move the shaft to the position with the same value which is in the objective in the optic path and this will make ideal contrast.

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100X 60X 40X 20X 10X 4X



same value to the objective's magnification

5. 10. Observing with oil immersion

There is "oil" marked in the oil immersion objective. Please use the oil immersion, which supplied by the manufacturer, between the objective and cover glass.

a. Operation

Condenser

Remove the slide back and fall the condenser down a little. One drop of oil could be placed in the top of condenser by through the long aperture of stage. Then move the slide forward and lift the condenser up.

Objectives

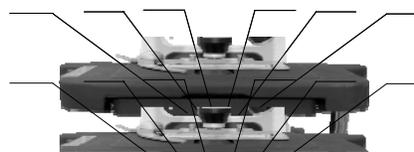
Turn the nosepiece and take the objective out of the optic path. Place one drop of oil on the slide then turn the condenser slowly and mount the objective.

b. Air bubble in oil immersion

★Never make the oil immersion into your eyes. Please take following steps as soon as the oil immersion touches your skin or eyes.

Use soap or clean water to wash your skin carefully.

Please wash your eyes with clean water (at least wash 15 minutes) and go to the hospital at once.





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★ Do not expose the oil immersion in the sun or ultraviolet radiation directly.

As the air bubble in the oil immersion will make bad affect to the quality of image, please make sure that there is no air bubble in the oil immersion before use. Please check the air bubble as following, remove the eyepieces and open the view field diaphragm and aperture diaphragm entirely then observe the exit pupil which is light and in nummular shape.

★**Remove the air bubble as following:**

Turn the nosepiece slowly and turn the oil immersion objective once or twice.

Turn the lifting knob for condenser slowly and make the condenser a little bit of up and down.

Increase the amount of oil immersion or change the old oil immersion with new one.

c. Operation for oil immersion

Use the oil immersion as little as possible. The oil immersion will be conglutinated to the stage and condenser and this will have bad effect the performance if there is too much oil immersion. Please clean the redundant oil on the objective and condenser after finishing the observation otherwise the image will be affected. Use the aether to clean the oil then use the pure alcohol (ethanol or carbinol) to make entirely cleaning. Please repeat the clean three or four times.

★**Notice:**

Please follow the instruction from manufacture when the aether or pure alcohol is used. Keep them away from the fire or electronic spark.

d. Attention

★Keep the bottle for oil immersion sealed as much as possible and check it periodically.

★Never press the bottle overly as it may caused oil gushed out of the bottle.

★Clean the out surface of the bottle from remanent oil.

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5.11. Adjusting the coarse focusing knob

The tension of coarse focusing knob is adjustable. Please turn the tension controlling ring of the coarse focusing knob clockwise then the tension will be increased. This ring is near the coarse focusing knob. If you want decrease the tension, please turn the ring withershins. The stage will fall down automatically if the tension of the ring decreased too much.



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6. Troubleshooting

The performance of the microscope can be made fully by unfamiliar using and this table will give some advice. Please see the following table and please contact with manufacturer if the troubles could not be solved.

6.1. Optical Part

Trouble	Cause	Remedy
I. optical		
Darkness at the periphery or uneven view field brightness	Revolving nosepiece not in click stop position(objective not centered in optical path)	Revolve to click position (switch the objective correctly into the optical path)
	Filament image not in center	Centering
	Dirt or dust on the lens (condenser, objective, eyepiece, collector)	Cleaning
Dirt or dust in the view field	Dirt or dust on the lens (condenser, objective, eyepiece, collector)	Cleaning
	Dirt or dust on the slide	Cleaning
	Condenser position too low	Correct position
Poor image quality (low resolution poor contrast)	No cover glass on the specimen	Attach cover glass
	Cover glass too thick or thin	Use cover glass of specified thickness (0.17mm)
	Slide upside-down	Turn over the slide
	Immersion oil on dry objective	Cleaning
	Dirt or dust on the lens (condenser, objective, eyepiece, collector)	Cleaning
	No immersion oil used on objective	Use immersion oil
	Air bubbles in immersion oil	Remove air bubbles
Poor image quality (low resolution poor contrast)	Unspecified immersion oil used	Use specified immersion oil
	Condenser aperture and field	Close properly
	Dirt or dust on the entrance lens	Cleaning
	Condenser aperture closed too far	Close properly
	Condenser position too low	Raise to the position where the field diaphragm image is in focus
	Condenser not in the center of the	Reinstall condenser and carefully

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Image shift on one side	Revolving nosepiece not in click	Revolve to click-stop position
	Floating specimen	Fasten securely
Insufficient illumination brightness	Specimen rise from stage surface	Place it stable
	Revolving nosepiece not in	Revolve to click-stop position
Image tinged yellow	Blue filter not used	Use blue filter
Insufficient illumination brightness	Condenser aperture too small	Readjust aperture
	Condenser position too low	Correct position
	Dirt or dust on the lens (condenser objective, eyepiece, collector)	Cleaning

6.2. Mechanical Part

Trouble	Cause	Remedy
Image not focusable with high power objective	Slide upside-down	Turn slide cover
	Cover glass too thick	Use cover glass of specified thickness (0.17mm)
High power objective contacts slide when changed <small>over from low power</small>	Side upside down	Turn slide over
	Cover glass too thick	Use cover glass of specified thickness (0.17mm)
Specimen movement unsmooth	Mechanical stage not securely fastened	Tighten all fastener
Binocular images not integrated	Interpupillary distance not correctly adjusted	Adjustment
Excessive eye fatigue	Incorrect diopter adjustment	Correct adjustment
	Inadequate brightness or illumination	Adjust brightness with control dial

6.3. Electrical

Trouble	Cause	Remedy
Lamp dose not light when switched ON	No electrical power	Check power cord connection
	Lamp bulb not inserted	Insert correctly
	Lamp failure	Replacement



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Sudden lamp failure	Unspecified lamp bulb used or input voltage too high	Replace with specified lamp bulb. If the same symptom occurs after replacing the lamp, contact your dealer
Insufficient illumination brightness	Unspecified lamp bulb used	Replace with specified lamp bulb
	Voltage too low	Increase brightness with control dial
Flickering or unstable lamp brightness	Lamp bulb about to fail	Replacement
	Lamp bulb not correctly inserted into socket	Check for positive connection

7. Maintenance

7.1. Cleaning Lenses

Dust is best removed with a soft brush or gauze.

More persistent dirt, such as fingerprints, grease and oil, may be removed with soft cotton, lens tissue, or gauze lightly moistened with absolute alcohol (ethyl or methyl alcohol).

To clean immersion oil off the oil-immersion type objective, use lens tissue, soft cotton or gauze lightly moistened with petroleum benzine only.

Do not use petroleum benzine to clean the entrance lens at the bottom of the eyepiece tube or prism surfaces inside the eyepiece tube.

Absolute alcohol and petroleum benzine are quite inflammable. Take great care when handling them and when setting the power switch on and off. Be very careful with fire.

7.2. Cleaning painted or plastic surfaces

Avoid use of and organic solvents (such as alcohol, ether, thinner,ect.) to clean the painted or plastic surfaces of the instrument. We recommend the use of silicon cloth.

More persistent dirt may be cleaned with mild detergent solution.

Printed plastic surfaces should be cleaned only by soft cloth moistened with water.



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7.3. When not in use

When the microscope is not in use, cover it up with dust cover, and store in a dry place not subject to mold.

We especially recommend that the objectives and eyepieces be kept in a container (such as a plastic bottle).

7.4. Periodical inspection

To maintain the performance of the microscope, periodical inspection is recommended.

Digital Part

□. Introduction

1.1 About Digital Display

Digital display is a new generation display that embedded Android system. It is with 8 inch IPS LCD screen, A7 dual-core processor, friendly man-machine interface and powerful image processing functions (supporting image browsing, photos, video, storage, dynamic calibration, measurement etc.). This display supports 5 points touch, a variety of peripheral equipment interfaces, and comfortable ergonomic design. It is very easy to operate and is your good assistant on the teaching, scientific, electronic detection fields.

1.2 Main Features



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1. Embedded OS Android 4.2.2, can link mouse and keyboard, just like a micro computer.
2. 8 inch IPS LCD screen with clear and bright vivid vision.
3. Friendly human-machine interface, can use the mouse, keyboard or touch screen to operate.
4. Built-in a 5.0M camera, providing the high quality images.
5. Provides a powerful software of international advanced technology. It supports real-time preview, photos, video, storage, network, Bluetooth, dynamic calibration and measurement.
6. LCD screen supports 5 points touch. Very convenience to use.
7. Supports more interfaces, such as USB, SD card, Mini USB, HDMI interface and so on.
8. Supports WI-FI wireless communication, can transmit real-time image and video.
9. Images and videos can be captured and saved to the SD card and USB driver for subsequent analysis.
10. Automatic measurement, real-time displays measurement results.

1.3 System Specification

Cortex-A7 CPU



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Interface

- Built-in 2GB memory.
- Supports external extension SD card.

Camera video interface

- Support external USB camera.
- 5 million pixels camera to image when using LCD. Frame rate: 10-15 fps.

Man-machine interface

- 8.0 inch (Diagonal)IPS screen, resolution:1024*768.
- Supports the keyboard and mouse input.
- Capacitive touch screen.
- Hardware key: reset, power switch.

Expansion card

- Supports large capacity SD card. The maximum capacity is 32G.

External interface

- USB 2.0 HOST interface in flank.



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- USB 2.0 OTG interface at the back
- HDMI interface
- Mini USB interface

Audio module

- Stereo speaker with double channels

Network module

- Supports WI-FI access
- Supports bluetooth

Power management

- Power mode: ordinary, sleep (lock screen) and power off. System default sleep time is 20 days when no operating.
- Supports some module shut to minimize power consumption.

Operation environment

- 5V 2A DC power adapter
- LED power lamp
- OS support all kinds of languages.



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- Video player software, picture viewer software.

1.4 Camera Specification

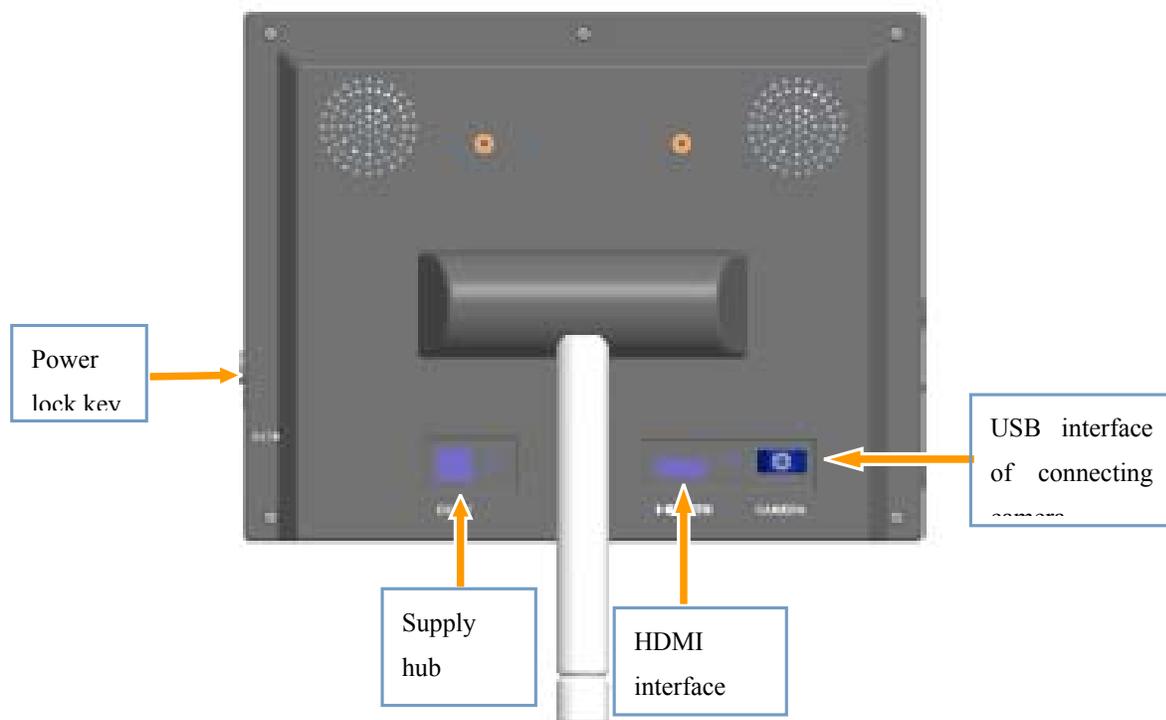
Sensor size (diagonal)	1/2.5-inch (4:3)
Effective image size	5.70mm (H) x4.28mm (V)
	7.13mm(diagonal)
Effective pixels	2592H x 1944V
Pixel size	2.2um x 2.2um
Dynamic range	66.5dB
S/N (maximum)	40.5dB
A/D conversion resolution	12-bit, on-chip
Sensitivity	0.53V/lux-sec(550nm)
Video format and frame rate	1280x720, 15fps
	640x480, 30fps
Exposure range and mode	Electronic shutter (ERS), auto
White balance	Manu/Auto

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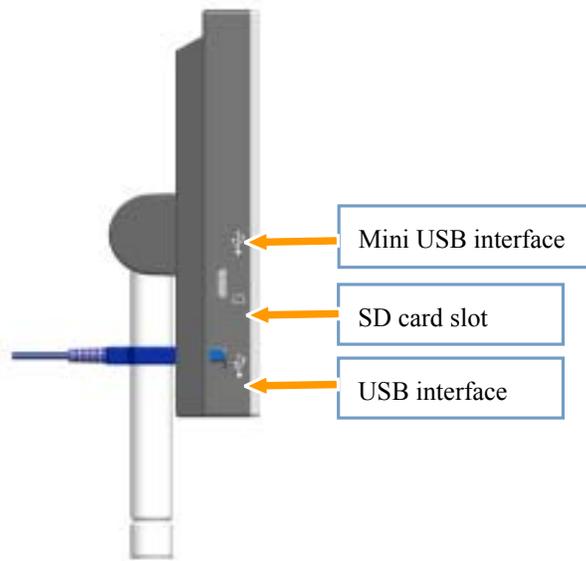
Software	TouchScope
Software function	Capture, Video and dynamic measure

□. Structure

Structure is shown as below:

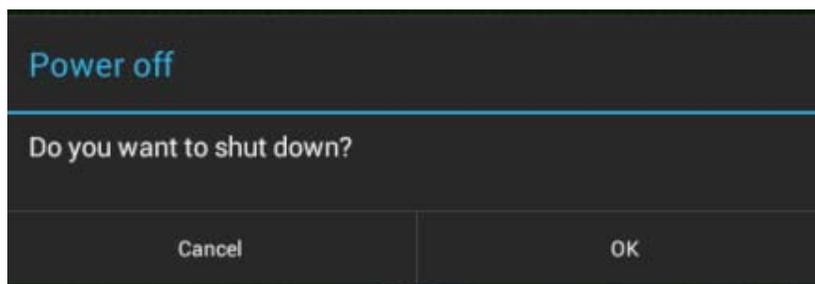


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When booting, Please long press the power key until the screen appear image.

When shutting down, please long press the power key, popping up a box as below:



Then click “OK”.



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□. Usage and Operation

3.1 Software-TouchScope

TouchScope is a special software of microscope system that apply to android platform. Using this software, you can finish the image capture, video and dynamic image calibration and measurement.

3.1.1 Main Function

The main function of the software as follows:

- 1) Real-time image preview
- 2) Capture image
- 3) View the captured images
- 4) Real-time measurement.
- 5) Support bluetooth, WI-FI and Gmail.

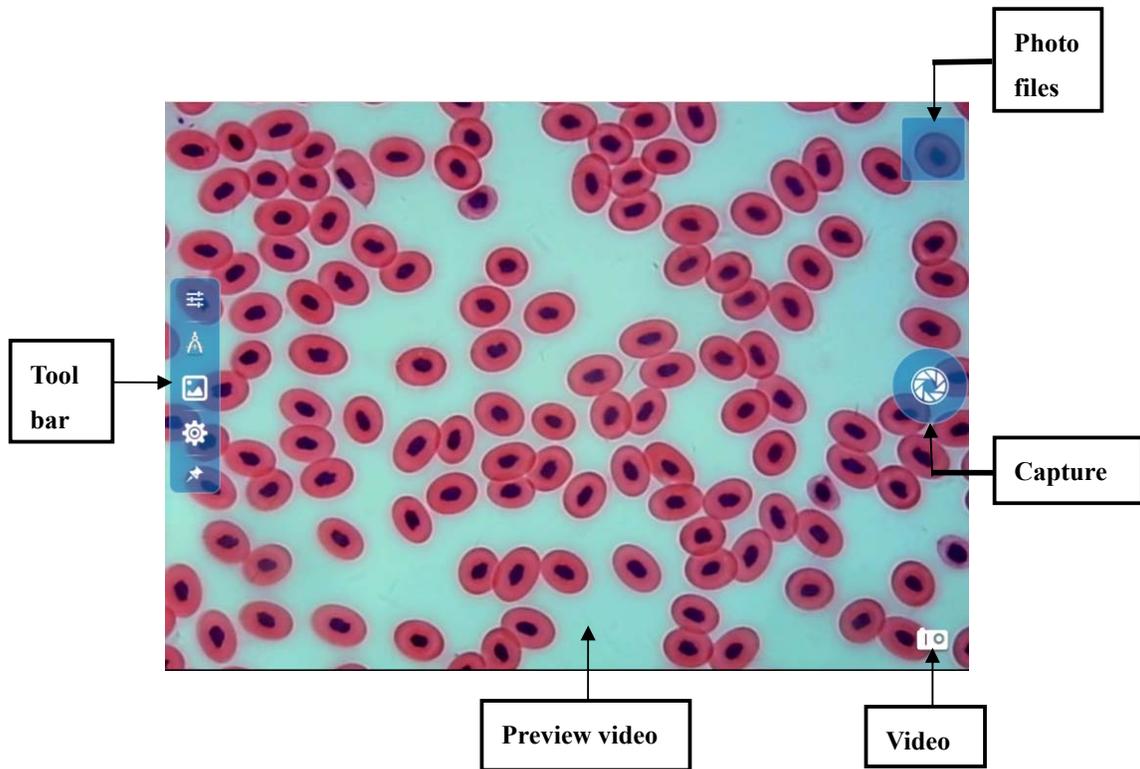
3.2 Operate TouchScope

1. Boot to run android OS. Please long press the power key until the screen appear image.

2. Click the desktop icon , the main interface of software shown as below:



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3.2.1 Capture

Icon	Instruction
	Click "capture" icon, start to capture and display image on the photo viewing thumbnails

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3.2.2 Video

Icon	Instruction
	<p>Click "video" icon, the software is in video mode. Then click , software starts to video.</p> <p>If want to stop video, please click  and will end the function of video. Then click , software interface will restore to the original state.</p>

3.2.3 Color Adjustment

Click button , pop-up function box:



Icon	Instruction
	Click icon, software performs automatic white balance mode..

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	RGB : manual white balance adjustment
	Click icon, software performs incandescent lamp mode.
	Click icon, software performs fluorescent lamp mode
	Click icon, software performs sunny mode
	Click icon, software performs cloudy mode

3.2.4 Dynamic Calibration and Dynamic Measurement

TouchScope provides a variety of measurement tools and supports calibration and dynamic measurement. **Before measuring, please do calibration.**

Click”  ”, unfold a control panel of measuring tool:

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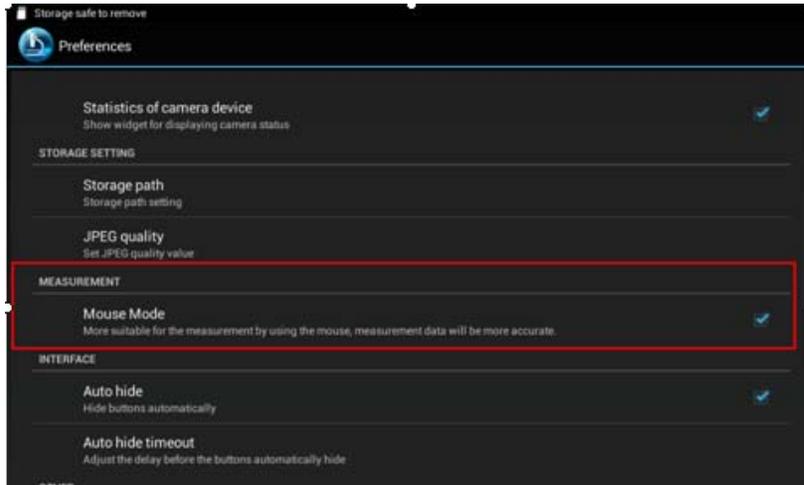
Icon	Instruction
	Spot measurement
	Circle measurement
	Line measurement
	Rectangle measurement
	Cross measurement
	Angular measurement
	Tool for modifying the color and thickness of lines and tag text.
	Export graphics to images
	Delete the specified measurement graphic
	Delete all measurement graphics

(Click the button again and hide measuring tools)

When measuring, it is recommended to use the mouse to stretch and drag the lines. Please do the specific setting as follows:

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Click“”, enter the setting interface of software:



As shown in the red box, check the mode of using mouse, which is a convenient way to measure. The measurement data will be more accurate.

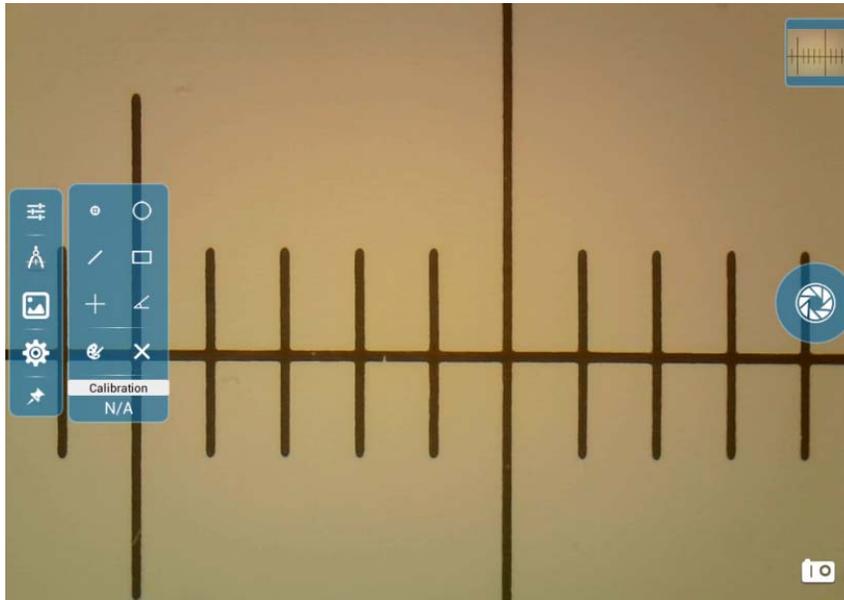
A. Calibration

Before measuring, please do calibration.

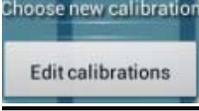
Here the objective is 10X and the micro ruler is 0.1mm.

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1. Put a micro ruler on the stage. select the objective (here is 10X), focus the microscope, and make the micro ruler display clearly on the LCD screen.



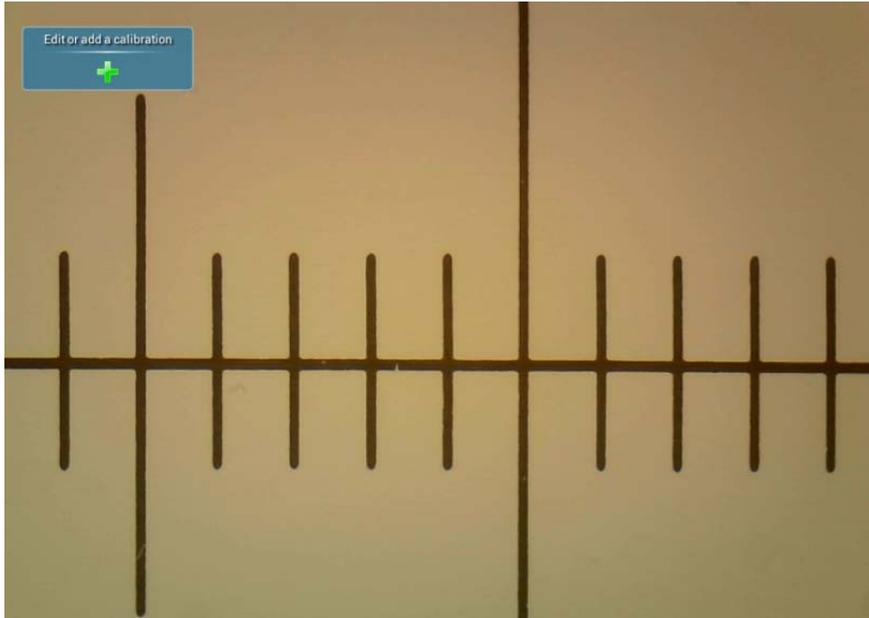
2. Set calibration value

Click button “”, pop up a box: 

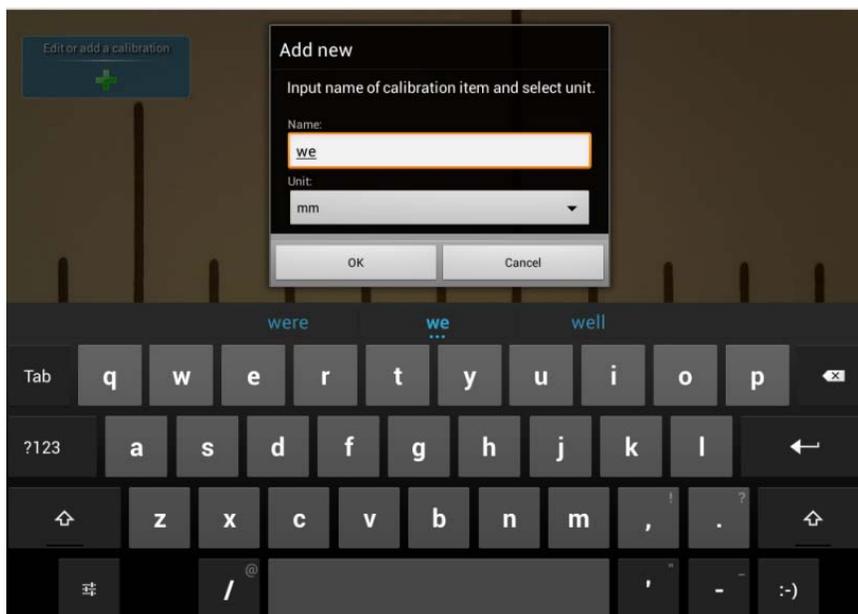
click “edit calibration value”, pop up a box:



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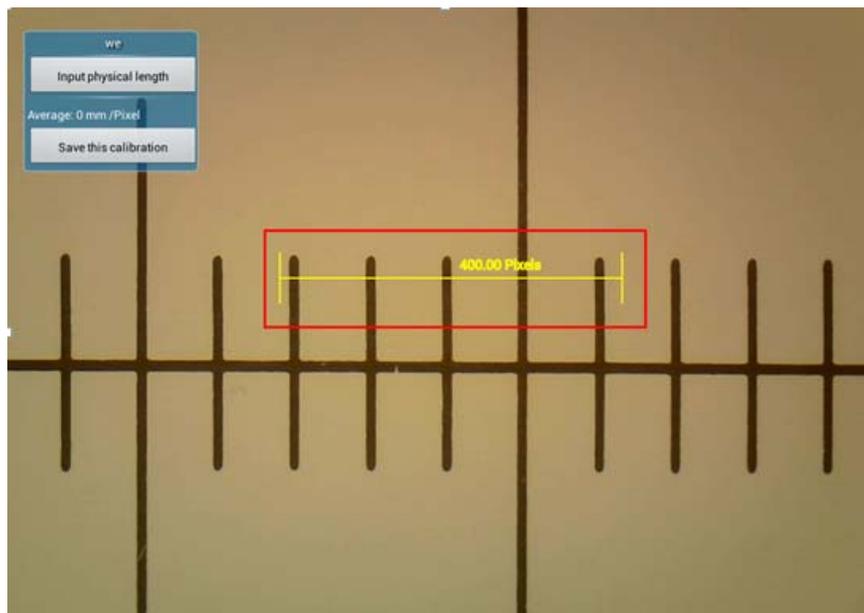
Click “”, pop up a box: :



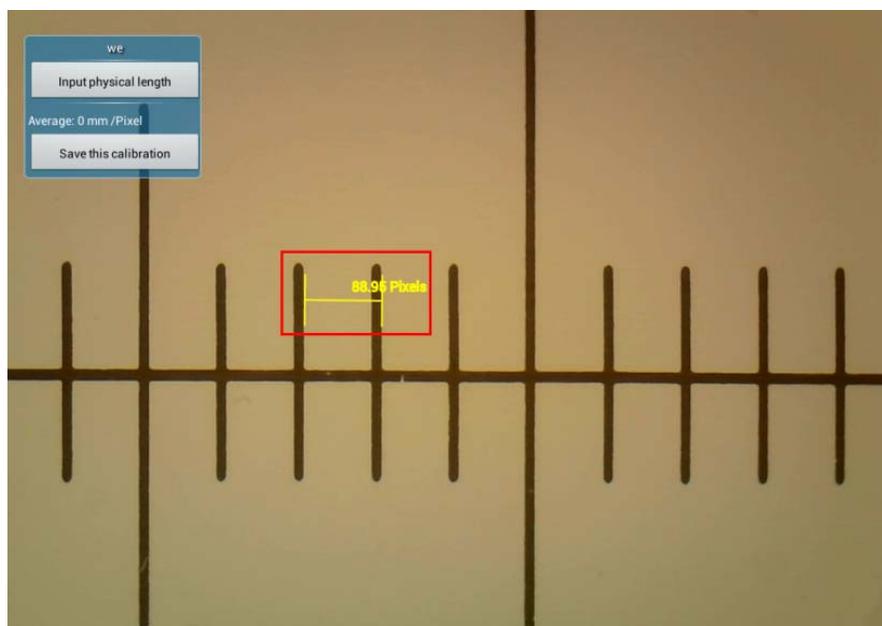
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Enter the name of the calibration item and choose a unit. Then click “Yes”.

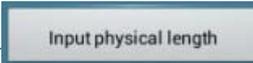
There will come out an adjustable calibrating line.

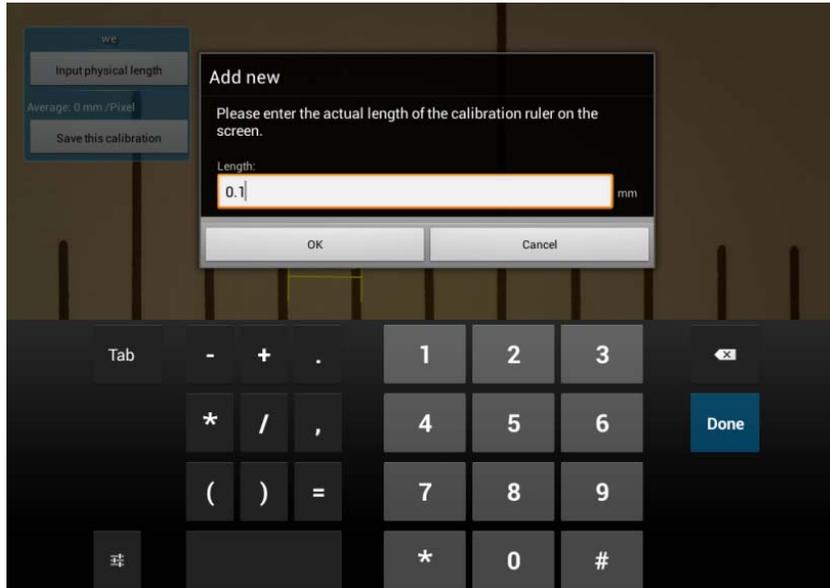


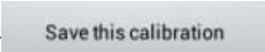
3. Move the line by mouse and set the starting point.



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Click “”, enter the physical length of this line.



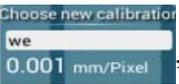
Click “”, save the result of calibration.

Then click return key, back to the video.

B **Line measurement**

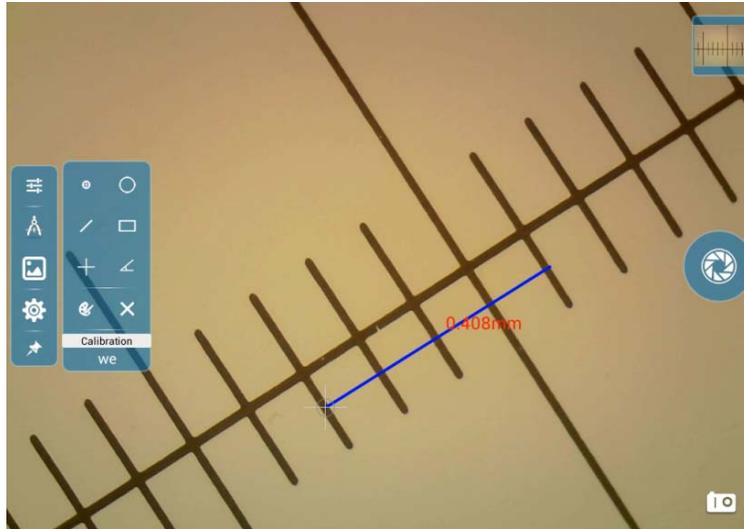
Click the icon “” on the control panel.

Select the line on the video, move line, click one side of line and adjust the start

point and end point of line. Then click “”, loading the calibration, now the measurement value will display on the screen.

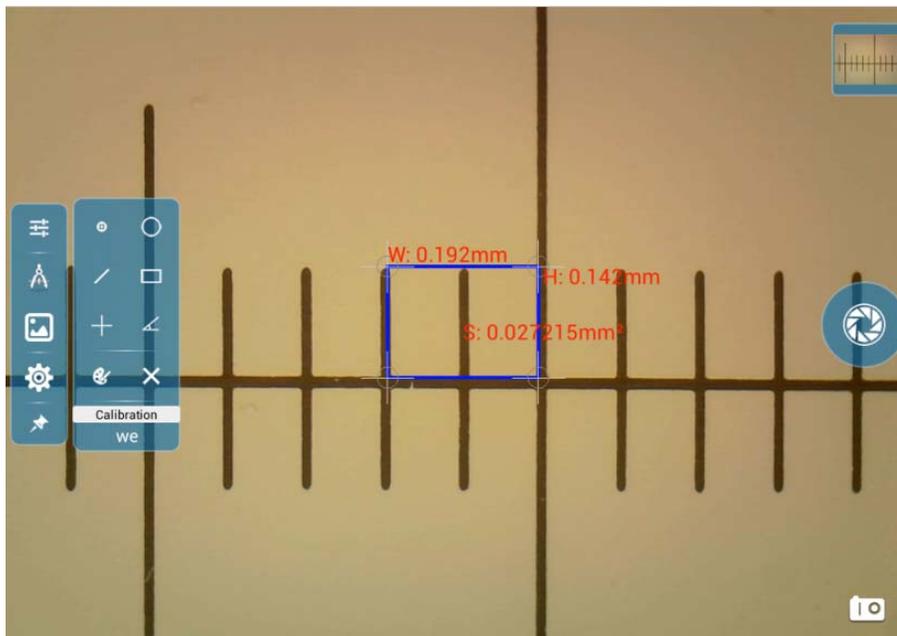
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Here the length is 0.413mm. It is matched with the physical length.



C. Rectangle measurement

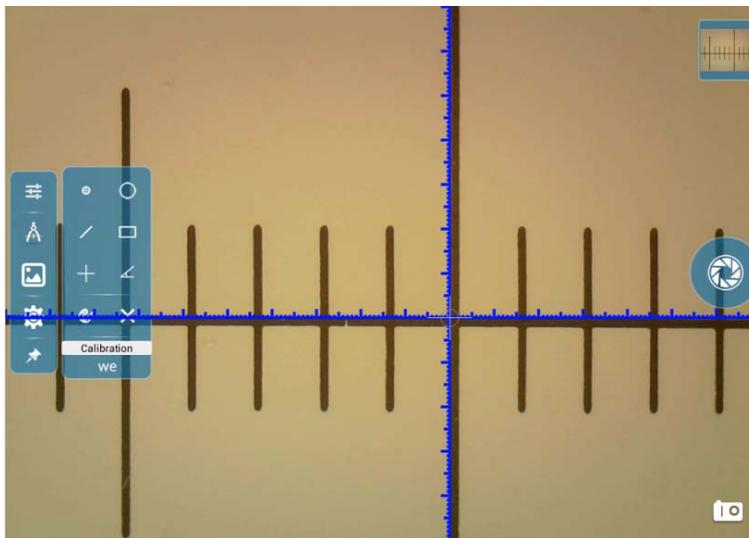
Click the icon “” and display the Rectangle tool on the screen. Click the center of Rectangle can move Rectangle. Click four corners of rectangle can adjust the size of rectangle. Then the length, width and area of rectangle will display on the screen. As shown in the below, area is 0.04078mm^2 , which is matched with physical area.



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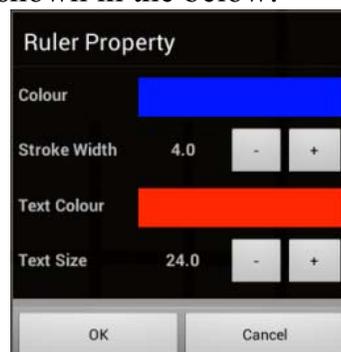
D. Reticle ruler

Click the reticle button. There will be a reticle tool on the image, click the center of the reticle with the mouse, there will be a little white reticle in the center of the reticle, drag the reticle, the reticle will move.



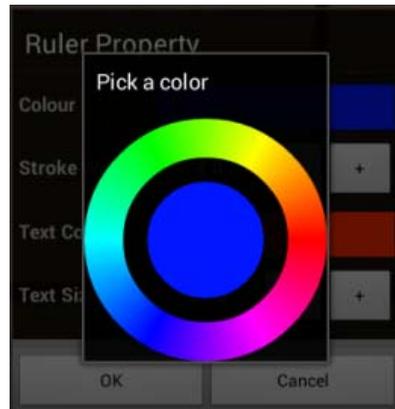
E. Property of ruler

Click the button “”, there are many tools to modify the color, line width and text size of ruler. As shown in the below:



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Click the color selection bar of line, pop up a box:



Click and choose one color you wanted on the annulus. Then click inner circle and you can get the choosed color successfully.

Click the button “”, add the width of line.

Click the button “”, minus the width of line.

The way to change the color and size of text is the same as the way to change line.

F **Delete graph**

Click on the selected graph, then click button “” and delete it.

Continuously pressing the button “” can delete all graph.

3.2.5 Software Setting

Click button “”, pop up a box to set software .

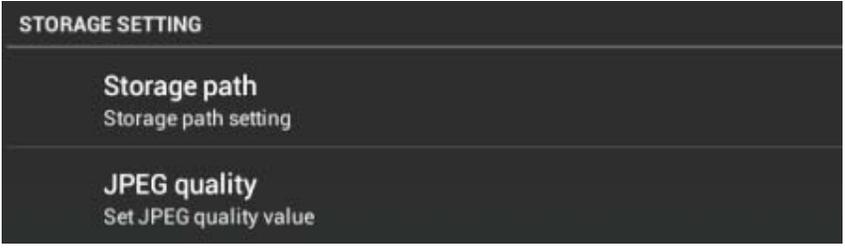
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1. Camera

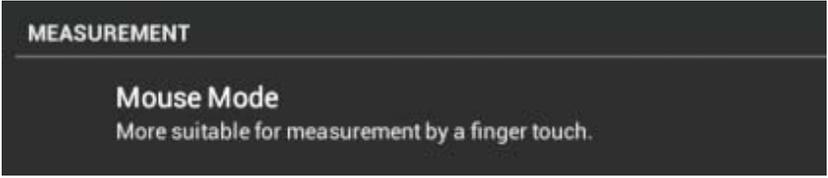
Control panel	 <p>The screenshot shows a dark-themed control panel titled 'CAMERA'. It contains three sections: 'Preview size' with a sub-option 'Preview size summary', 'Capture size' with a sub-option 'Set size of picture taken', and 'Statistics of camera device' with a sub-option 'Show widget for displaying camera status' and a checked checkbox.</p>
Function	<ul style="list-style-type: none">◆Preview size: choose one preview resolution of video. Two resolutions: 640*480; 1024*768.◆Capture size: choose one capture resolution. Three resolutions: 2592*1944; 1600*1200; 2048*1536.◆Camera state: check the option to show the state of camera. There will display the resolution and frame rate of video on the video.
Initial Set	<ul style="list-style-type: none">◆If getting video preview resolution higher, the video frame rate will drop.

2. Storage

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<p>Control panel</p>	
<p>Function</p>	<ul style="list-style-type: none"> ◆Storage location: Choose the storage path of image and video. Three paths: internal storage, SD card, USB flash disk. ◆JPEG compression quality: inferior quality (50%), medium quality (70%), high quality (80%), ultra quality (90%)
<p>Initial set</p>	<ul style="list-style-type: none"> ◆Choose different storage path to save files. ◆The compression quality of software is medium quality (70%)

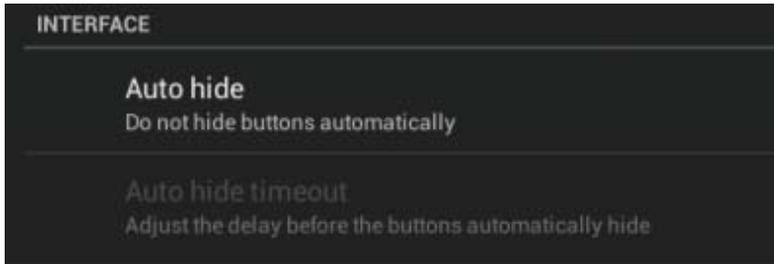
3. Measurement

<p>Control panel</p>	
<p>Function</p>	<ul style="list-style-type: none"> ◆Mouse mode: check the mouse mode, which is convenient to measure. The measurement value will be more accurate.

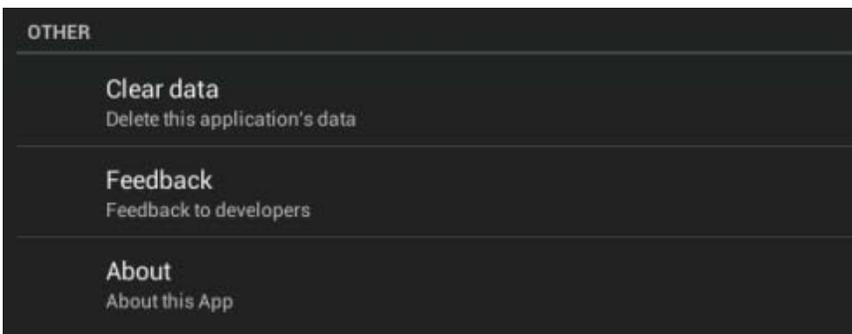
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Initial set	When measuring, it is more advantageous to improve the accuracy of measurement after choosing the mouse mode.
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4. Interface

Control panel	 <p>The screenshot shows a dark-themed interface with the title 'INTERFACE'. It contains two settings: 'Auto hide' with the description 'Do not hide buttons automatically' and 'Auto hide timeout' with the description 'Adjust the delay before the buttons automatically hide'.</p>
Function	◆Autohide: check the autohide mode to set delay time to hide the widget on the interface of software.
Initial set	◆The tolerant delay time is 5S. In 5 seconds, there is no people operate software, the widget will be hide. If don't check this mode, software will not hide widget.

5. Other

Control panel	 <p>The screenshot shows a dark-themed interface with the title 'OTHER'. It contains three options: 'Clear data' with the description 'Delete this application's data', 'Feedback' with the description 'Feedback to developers', and 'About' with the description 'About this App'.</p>
	◆Clear data: permanently remove all data on the software.

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Function	◆Feedback: feedback suggestion to developer of software. ◆About: software version
Initial set	◆Please don't easily remove the data of software.

3.2.6 Image Processing Module

Click the button “” and process the captured image

1. Optimize image

Item	Icon	Instruction
Image color		There are many different forms set for the color of image: punch, vintage, black & white, instant, coffee latte, blue, plate mark, negative.

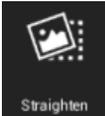
2. Image border

Item	Icon	Instruction
Border		Adding different borders for image.

3. Crop image

Item	Icon	Instruction
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Straighten		Drag the image by finger to change image size.
Crop		You can select the proportion to crop the image, also can drag the white border by finger to cut the size of image.
Rotate		Drag the image by finger to rotate
Mirror		Drag the image by finger to mirror

4. Image color

Item	Icon	Instruction
Image color		Set the color of image: automatically adjust the color, exposure, halation, contrast, cloudy, vibrance, acutance, curve, saturation, black and white filter.

5. Send image

Click the button “

Item	Icon	Instruction
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Bluetooth		Open bluetooth function in the setting of system and send image by bluetooth.
Gmail		Through the gmail to send image
Picasa		Share image to the Google web photo album.

□ Common Failure And Solution

4.1 Software Crash

Phenomenon: Software crash, point out “Camera error: 100”.

Cause: The interface of camera is unsteadiness or wrong operation.

Solution: 1. Exit software, check the connection of USB line and plug line again to ensure the connection is tightness. then restart software.

2. After restarting software, if the software can not run normally, please shut down and restart display.

4.2 System Halted

Phenomenon: The system halt, and no response of any operation.

Causes: Wrong operation or the unstable voltage.



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Solutions: 1) Press the “Power Button” for more than 2 seconds,

2) Click the small “Rst” hole with a needle (or other things

that have a small, sharp-point) to reset your system, as

the picture below.

4.3 Can Not Switch On The System

Phenomenon: Can not switch on the system or the system can not work.

Causes: Power isn't connected properly.

Solutions: Check the power supply of the LED head, make sure

the 5V DC is connect properly. Or Plug the power and

link again.