MZ.4600

MacroZoom

euromex
microscopes holland

user manual

v.530261

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General safety instructions

Intended use: a non-medical device

This device is intended for general observation of cells and tissues, with transmitted/reflected illumination and with the specimen fixed on a slide

Suffocation hazard

The packaging can contain protective plastic bags without perforations, as well as dust protection bags that could be pulled over the head of a child. To avoid danger of suffocation:

- Keep the bags away from babies and children
- Tie a knot in plastic bags before throwing them out
- Plastic bags should be stored out of reach of children
- The installation and use of this product must always be supervised by a qualified adult

Dangers associated with the operation

- Improper use could result in injury, malfunction or damage to property. It must be ensured that the operator informs every user of existing hazards
- Danger of electrocution. Disconnect the power to the entire lighting system before installing, adding or changing any component
- Not to be used in corrosive or explosive environments
- Avoid direct exposure of eyes to the collimated light beam or direct light from the light guides or fibres
- To avoid a hazard to children, account for all parts and keep all packing materials in a safe place

Prevention of biological and infectious hazards

Infectious, bacterial or viral biohazard substances under observation may be a risk to the health of humans and other living organisms. Special precautions should be taken during in vitro medical procedures:

- **Biological hazards**: keep a logbook of all the biological substances or pathogenic microorganisms that were under observation with the device and show it to everybody before they use the device or before they do some maintenance work on the device! Agents can be bacterial, spores, enveloped or non-enveloped virus particles, fungi or protozoa
- **Contamination hazard:**
  - A sample that is properly enclosed with a cover glass never comes in direct contact with the device parts. In that case prevention of contamination lies in the handling of the slides; as long as the slides are decontaminated before use and are undamaged and treated normally, there is virtually zero risk of contamination
  - A sample that is mounted on a slide without cover glass, can come in contact with components of the device and may be a hazard to humans and/or the environment. Therefore, check the device and accessories on possible contaminations. Clean the device's surfaces and its components as thoroughly as possible. Should you identify a possible contamination, inform the local responsible person in your organisation
  - Operators could be contaminated from other activities and cross-contaminate components of the device. Therefore, check the device and accessories on possible contaminations. Clean the device's surfaces and its components as thoroughly as possible. Should you identify a possible contamination, inform the local responsible person in your organisation. it is recommended to wear sterile gloves when preparing the slides and handling the device in order to reduce contamination by the operator
- **Infection hazard:** direct contact with the focusing knobs, stage adjustments, stage and eyepieces/tubes of the device can be a potential source of bacterial and/or viral infections. The risk can be limited by using personal eyeshades or eyepieces. You can also use personal protections such as operation gloves and/or safety goggles, which should be changed frequently to minimize the risk
- **Disinfectant hazards:** before cleaning or disinfecting, check if the room is adequately ventilated. If not, wear respiratory protective gear. Exposure to chemicals and aerosols can harm human eyes, skin and respiratory system. Do not inhale vapours. During disinfection, do not eat, drink or smoke. Used disinfectants must be disposed of according to local or national regulations for health and safety

Disinfection and decontamination:

- Exterior casing and mechanical surfaces must be wiped with a clean cloth, dampened with a disinfectant
- Soft plastic parts and rubber surfaces can be cleaned by gently wiping a clean cloth, dampened with a disinfectant. Discoloration can occur if alcohol is used
- The front lens of eyepieces and objectives are sensitive to chemicals. We recommend not to use aggressive disinfectants but to use lens paper or a soft fibre-free tissue, damped in cleaning solution. Cotton swabs may also be used. We recommend you use personal eyepieces without eyeshades in order to minimize risk
- Never immerse or dip the eyepiece or objective into a disinfectant liquid! This will damage the component
- Never use abrasive compounds or cleaners that may damage and scratch optical coatings
- Properly clean and disinfect all possible contaminated surfaces of the device or contaminated accessories before storing for future use. Disinfection procedures must be effective and appropriate
- Leave the disinfectant on the surface for the required exposure time, as specified by the manufacturer. If the disinfectant evaporates before the full exposure time, reapply disinfectant on the surface

- For disinfection against bacteria, use a 70% aqueous solution of isopropanol (isopropyl alcohol) and apply for at least 30 seconds. Against viruses, we recommend to refer to specific alcohol or non-alcohol based disinfection products for laboratories

Before returning a device for repair or maintenance through a Euromex dealer, an RMA (return authorization form) together with a decontamination statement must be filled in! This document - available from Euromex for any reseller- must be shipped together with the device at all times

Handle with care

- This product is a high quality optical instrument. Delicate handling is required
- Avoid subjecting it to sudden shocks and impacts
- Impacts, even small ones, can affect the precision of the instrument

Dirt on the lenses

- Dirt on or inside the optical components, such as eyepieces, lenses, etc., affects the image quality of your system negatively
- Always try to prevent your device from getting dirty by using the dust cover, prevent leaving fingerprints on the lenses and clean the outer surface of the lens regularly
- Cleaning optical components is a delicate matter. Please, read the cleaning instructions further on in this manual

Environment, storage and use

- This product is a precision instrument and it should be used in a proper environment for optimal use
- Install your product indoors on a stable, vibration free and level surface in order to prevent this instrument to fall thereby harming the operator
- Do not place the product in direct sunlight
- The ambient temperature should be between 5 to +40°C and humidity should be within 80% and 50%
- Although the system is anti-mold treated, installing this product in a hot, humid location may still result in the formation of mold or condensation on lenses, impairing performance or causing malfunctions
- Never turn the right and left focus knobs in opposite directions at the same time or turn the coarse focus knob past its farthest point as this will damage this product
- Never use undue force when turning the knobs
- Make sure that the device can dissipate its heat (fire hazard)
- Keep the device away from walls and obstructions for at least approximately 15 cm
- Never turn the device on when the dust cover is in place or when items are placed on the device
- Keep flammable fluids, fabric, etc. well out of the way

Disconnect power

Always disconnect your device from power before doing any maintenance, cleaning, assembling or replacing LEDs to prevent electric shocks

Prevent contact with water and other fluids

Never allow water or other fluids to come in contact with your device, this can cause short circuiting your device, causing malfunction and damage to your system

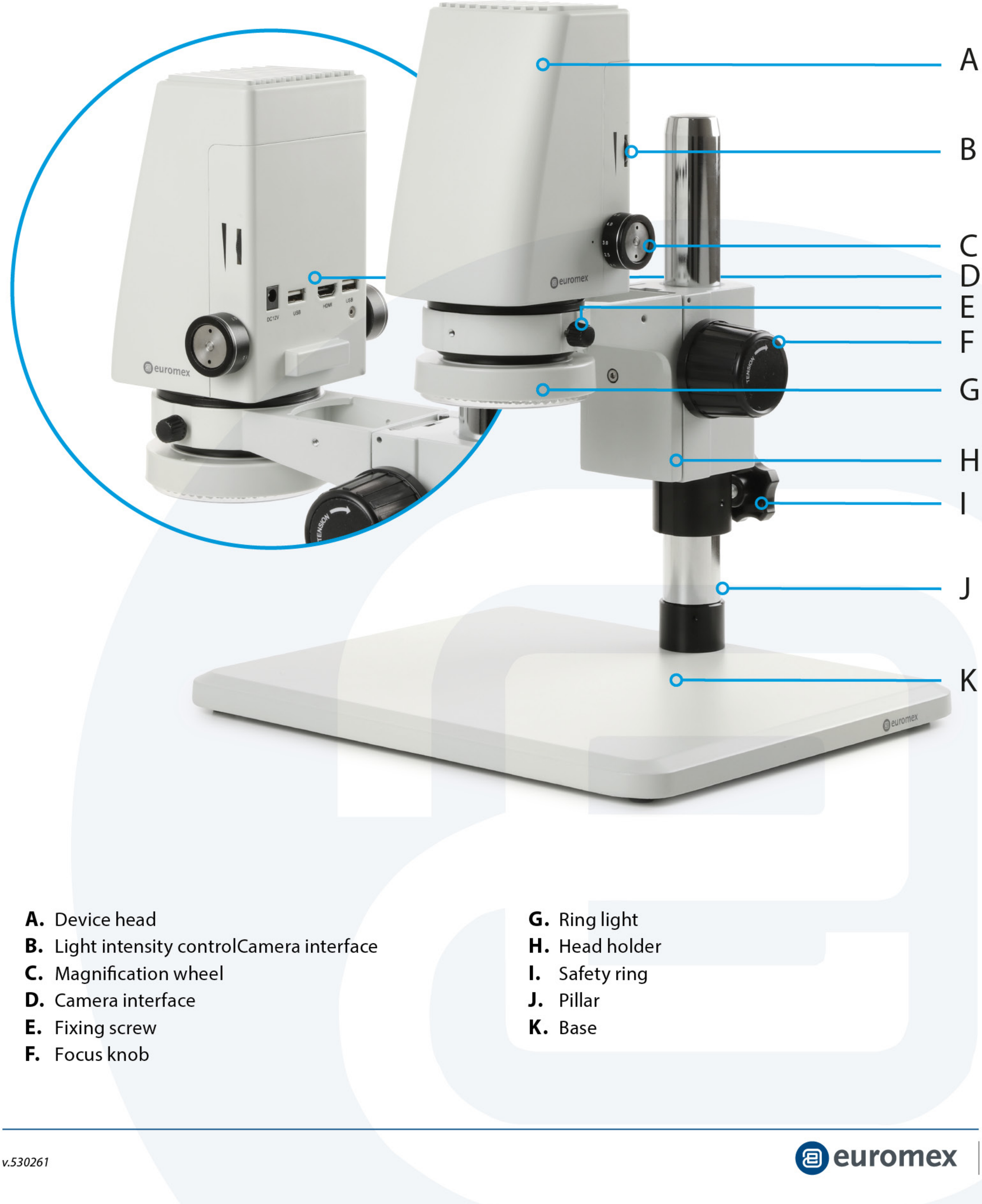
Moving and assembling

- This device is a relatively heavy system, consider this when moving and installing the system
- Always lift the device by holding the main body and base of the device
- Never lift or move the device by its focusing knobs, stage or head
- When needed, move the device with two persons instead of one

1. Introduction

This digital MacroZoom (MZ.4600) is equipped with a 0.7 to 5x zoom objective enables direct inspection of objects on external HD screen (not supplied). The mouse-driven built-in software controls the camera parameters and enables measurements on screen, capturing and saving .jpg or .bmp format pictures and .mp4 format video on a USB memory stick. The MZ.4600 has a built-in High Definition 1080p 2MP camera which can deliver up to 60 images per seconds and needs to be connected to an external stand-alone HD screen

2. Device parts



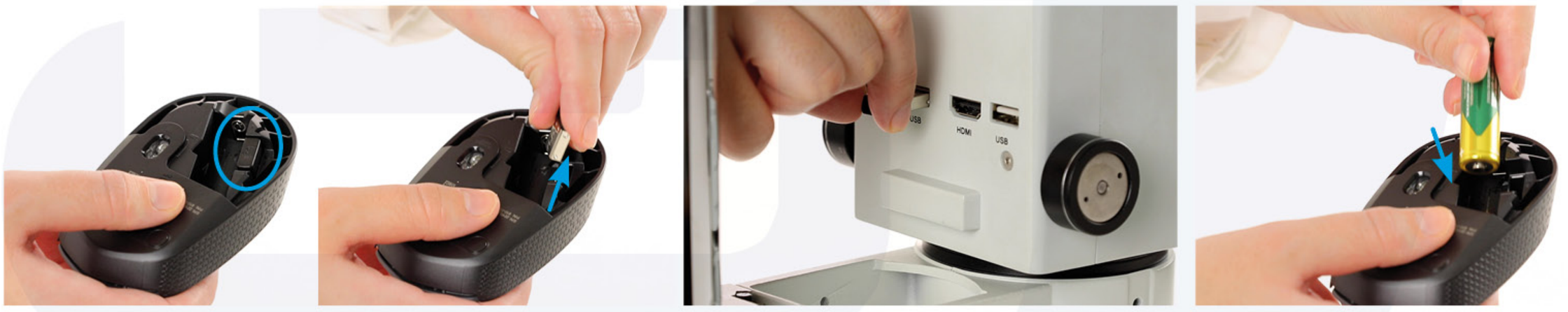
A. Device head
B. Light intensity controlCamera interface
C. Magnification wheel
D. Camera interface
E. Fixing screw
F. Focus knob
G. Ring light
H. Head holder
I. Safety ring
J. Pillar
K. Base

3. Set up

3.2 Camera installation instructions

1. Please use the power adapter to power up the camera
2. Connect the mouse
3. Connect the camera and monitor with HDMI cable
4. Optionally, connect a USB storage device





4. Menu interface

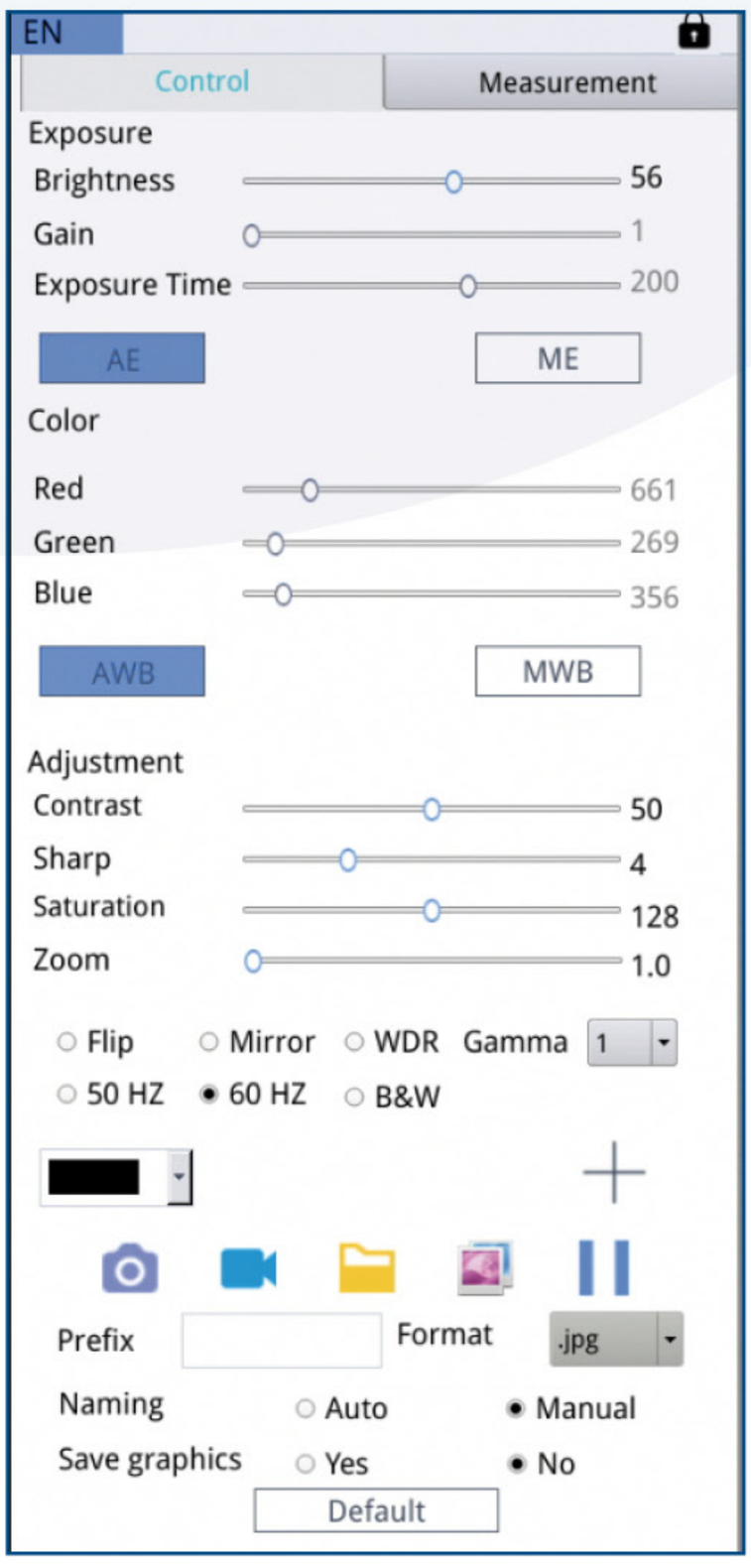
Move cursor to the upper left corner to open the interface

4.1 Control

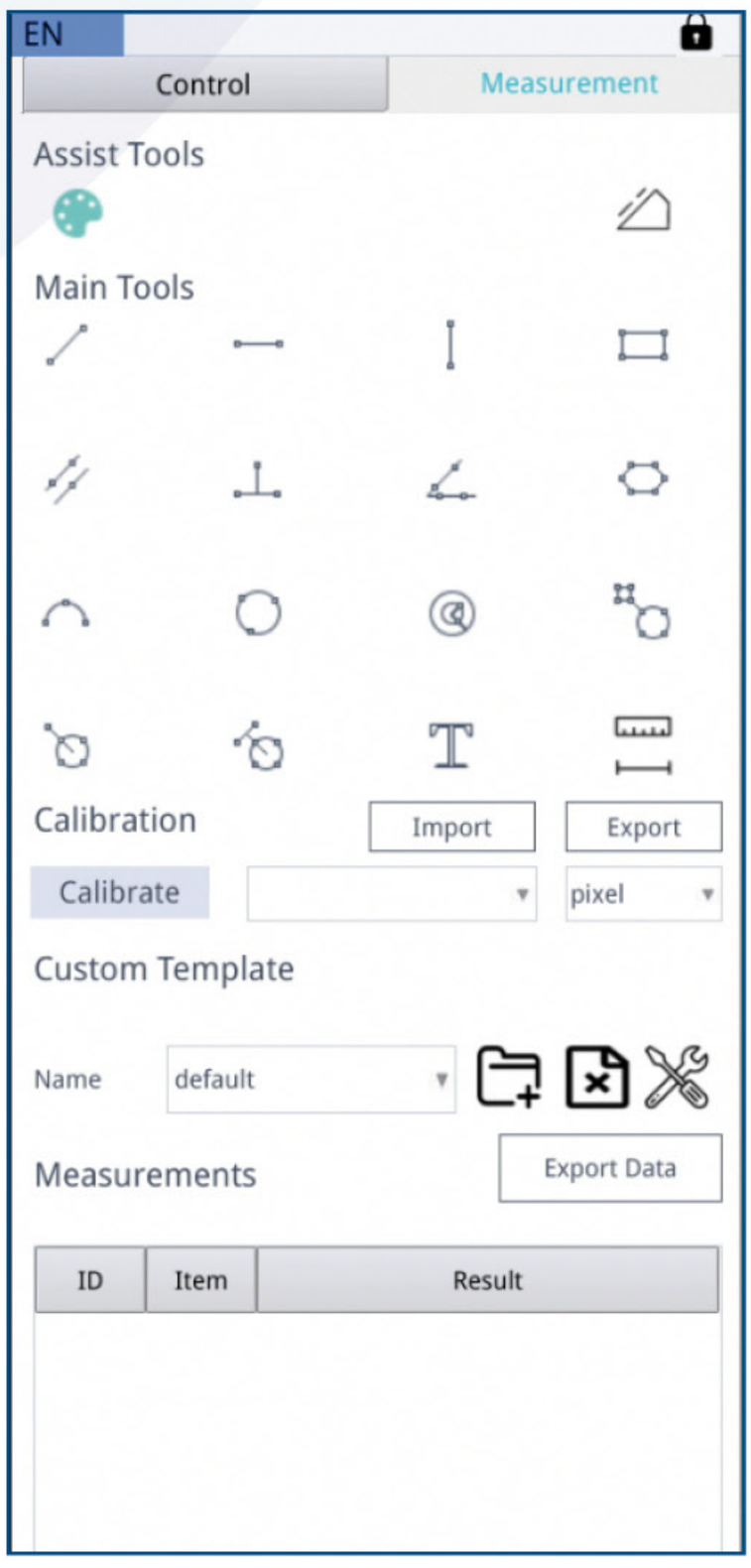
See image 4.1

4.2 Measurement

See image 4.2



4.1



4.2

5. Control interface

5.1 Language mode

Click the upper left corner of the menu to select the language mode

5.2 Lock menu

Click the lock icon in the upper right corner of the menu to switch the menu display status



Always show menu when "blocked"

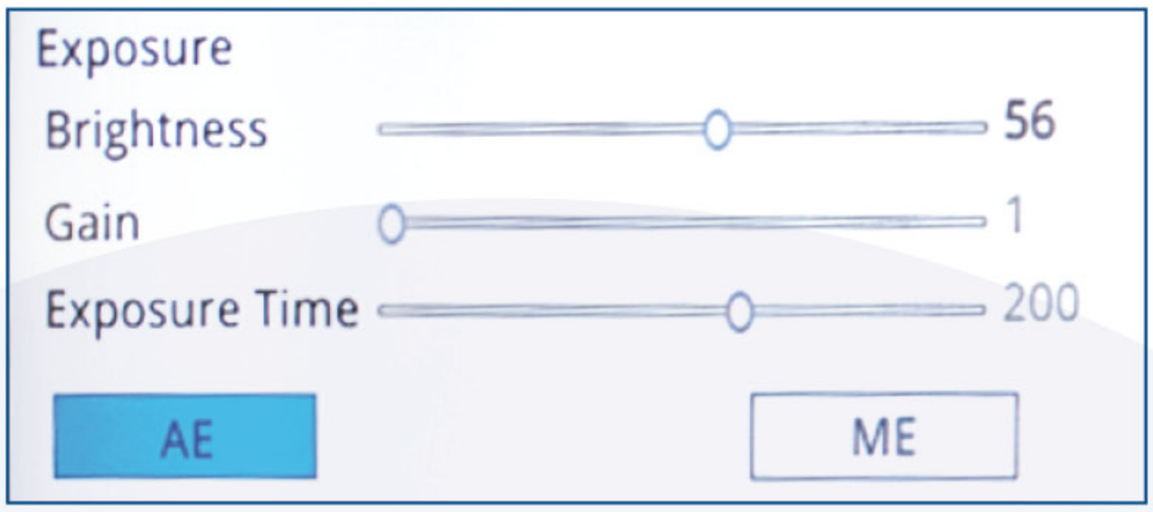


When "Open", move the mouse to the upper left area menu display, move out of the upper left area menu to hide

5.3 Exposure

Exposure: Auto \ Manual

- When "AE" (Automatic exposure) is selected, you can drag the "Bright" progress bar to adjust the brightness
- When "ME" (Manual exposure) is selected, you can adjust the "Gain", and the "Exposure Time" progress bar to adjust the shutter.

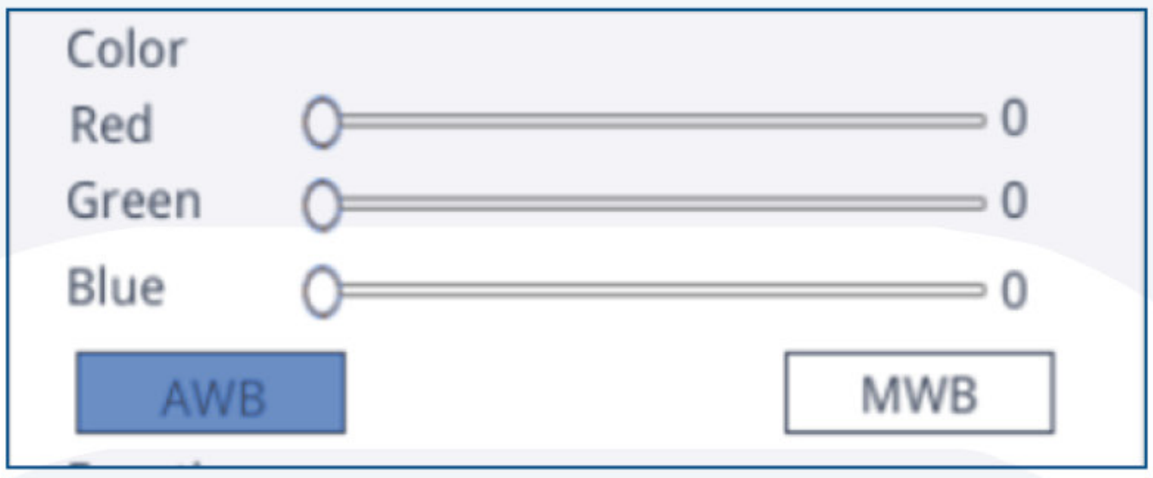


Default: Automatc exposure

5.4 White balance

White balance: Auto \ Manual

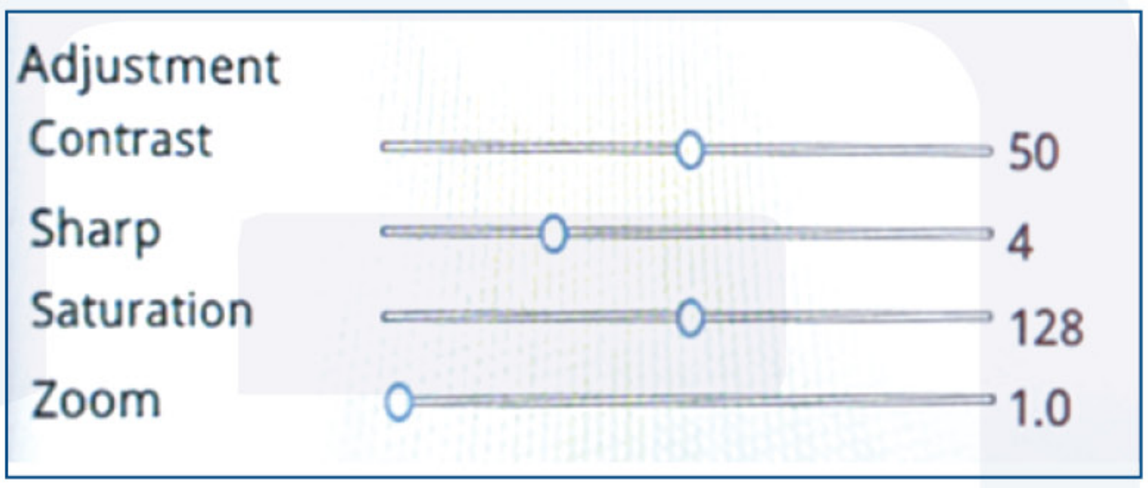
- **AWB:** automatic white balance can be achieved under different color temperatures
- **MWB:** You can drag the "Red" "Green" "Blue" progress bars to adjust the color value



5.5 Function

Function: Contrast\Sharp\Saturation\Zoom

- **Contrast:** 0-100 value adjustable, the default value is 50
- **Sharp:** 0-15 value adjustable, the default value is 4
- **Saturation:** 0-254 value adjustable, the default value is 128
- **Zoom:** 1.0-6.0 value adjustable, the default value is 1.0



5.6 Flip/Mirror

- **Flip:** the vertical direction of the video on the screen is the opposite of the actual
- **Mirror:** the horizontal direction of the video on the screen is the opposite of the actual



5.7 WDR

- **WDR:** In very strong contrast, click on the WDR to see the brighter and darker areas of the object

Note: The frame rate of the image will drop to 30fps after WDR is checked.

5.8 Gamma

- **Gamma:** 0-3 value adjustable, the default value is 1



5.9 Anti-screen flicker

When checked, anti-screen flicker effect is achieved



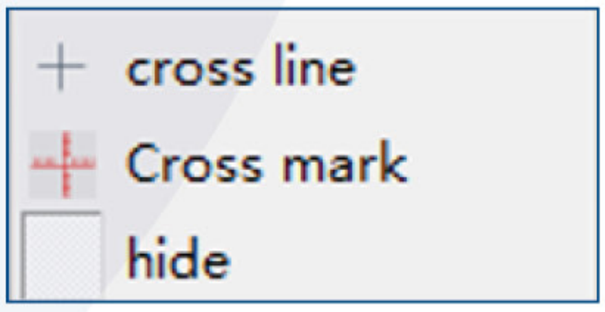
5.10 Black and white mode

Checked for black and white mode, default is color mode



5.11 Crosshair tool

1. Click Crosshairs tool - + -, select "cross line", display crosshairs to set the number of horizontal and vertical lines.
   After the setting is complete, select "Display" to display the set crosshairs in the image display area, and select "Delete" to not display crosshairs



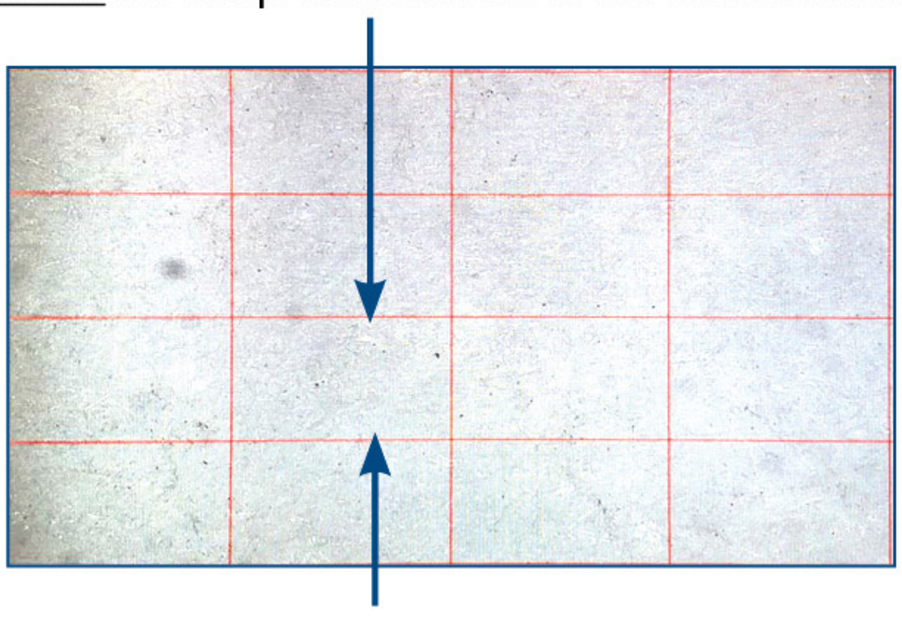
Set the number of horizontal and vertical lines

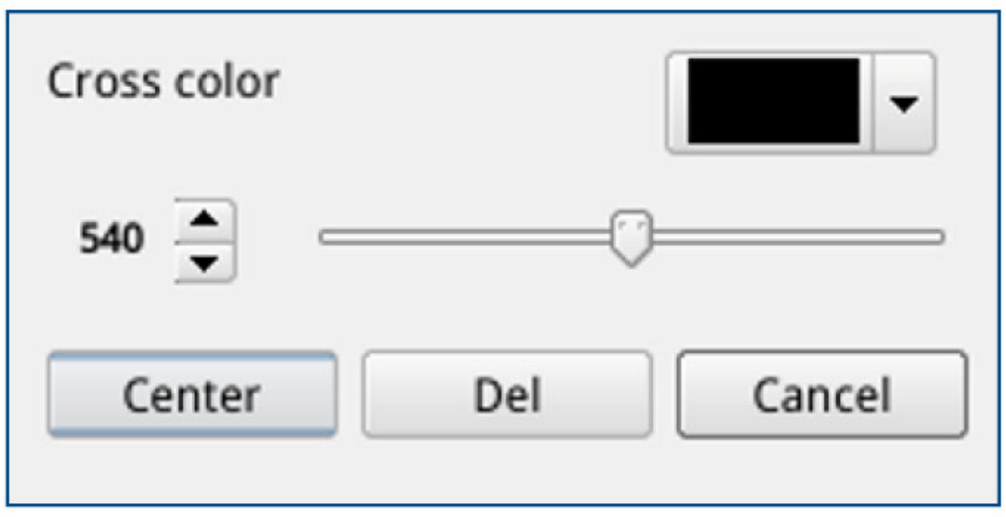


Display crosshairs:

Hold the left button to drag the crosshairs

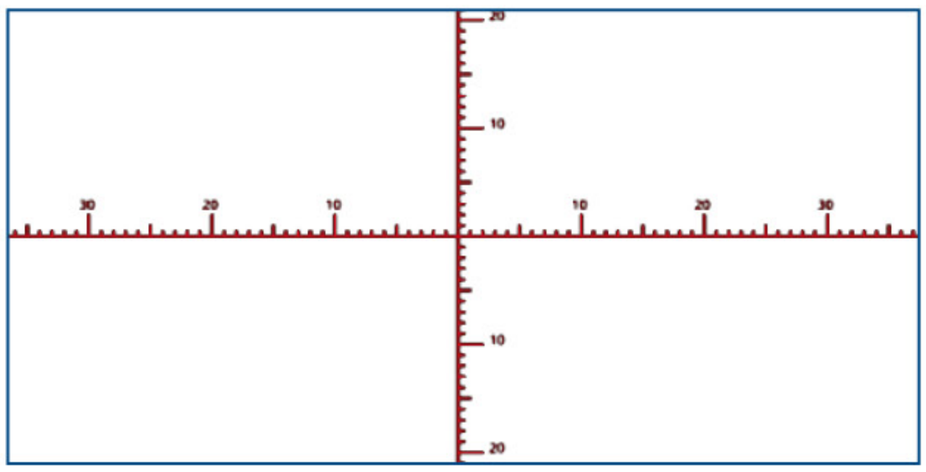
Note: Do not press and hold at the intersection of the horizontal and vertical lines





Double-click a single crosshair to set its color and position, center and delete

2. Click Crosshairs tool - ┼ -, select “Cross Mark”, image area displays cross tick marks



3. Click Crosshairs tool - ┼ -, select “Hide”, all cross lines or cross tick marks will be hidden in the image area

4. Click on the Crosshairs color tool -  - , Pull down to set the crosshairs color. After the color is set, draw the crosshairs again to take effect, the color of the crosshairs drawn before does not change

5.12 Photos

5.12.1 Photo operation

First confirm whether the USB drive is inserted successfully

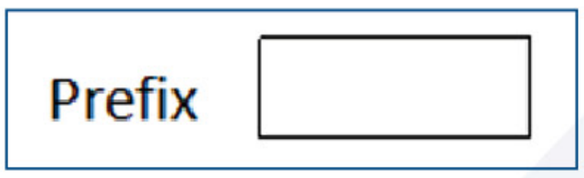


After inserting the USB drive, the icon of the successful insertion of the USB drive is displayed in the upper right corner of the display. Now you can click to take a photo

Click the “Capture” -  - , and the icon -  - will be displayed in the center of the screen. After about 3 seconds, the icon disappears and the picture is automatically saved on the /mnt/sdcard/img folder of the USB drive

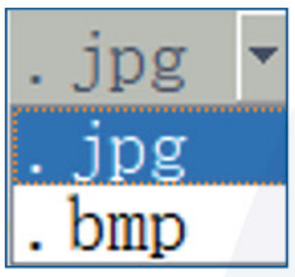
5.12.2 Prefix

When the “Naming” is “Auto”, the prefix of the file name can be added, and the file is named and saved with “prefix + serial number”

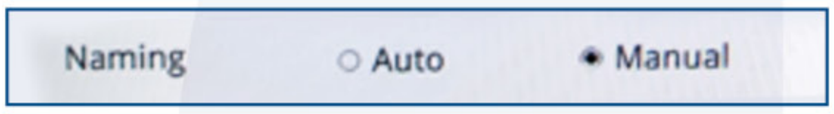


5.12.3 Photo format

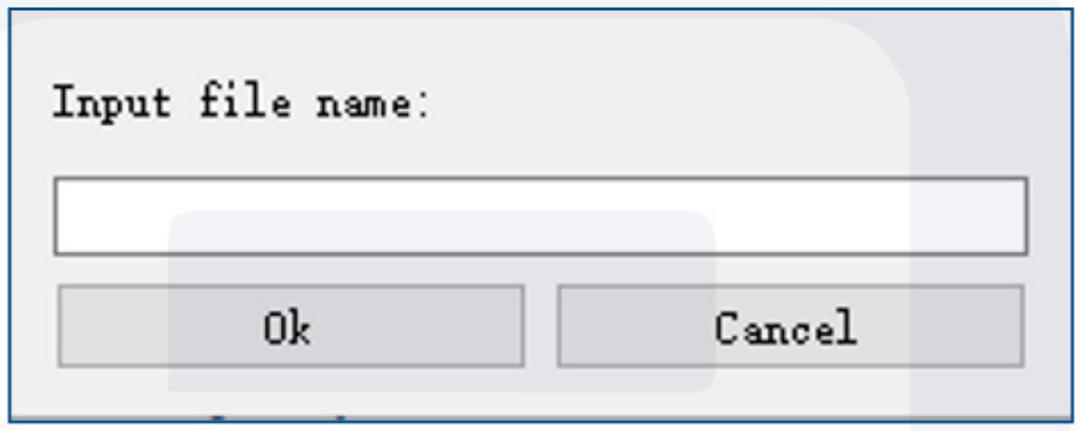
Click on the photo format drop-down to select the photo format. There are two formats to choose from: .jpg/.bmp



5.12.4 Photo naming rules



- Select “Auto” to name the photo according to the time
- Select “Manual” to enter a name to save



5.13 Recording

- Click on “record” -  -, the interface prompts “Begin recording”. Click “OK” to confirm starting recording
- During recording, the icon in the lower right corner of the screen flashes -  -
- Click on “Record” icon again, the interface prompts “Recording stopped”. Click “OK” to confirm stopping recording

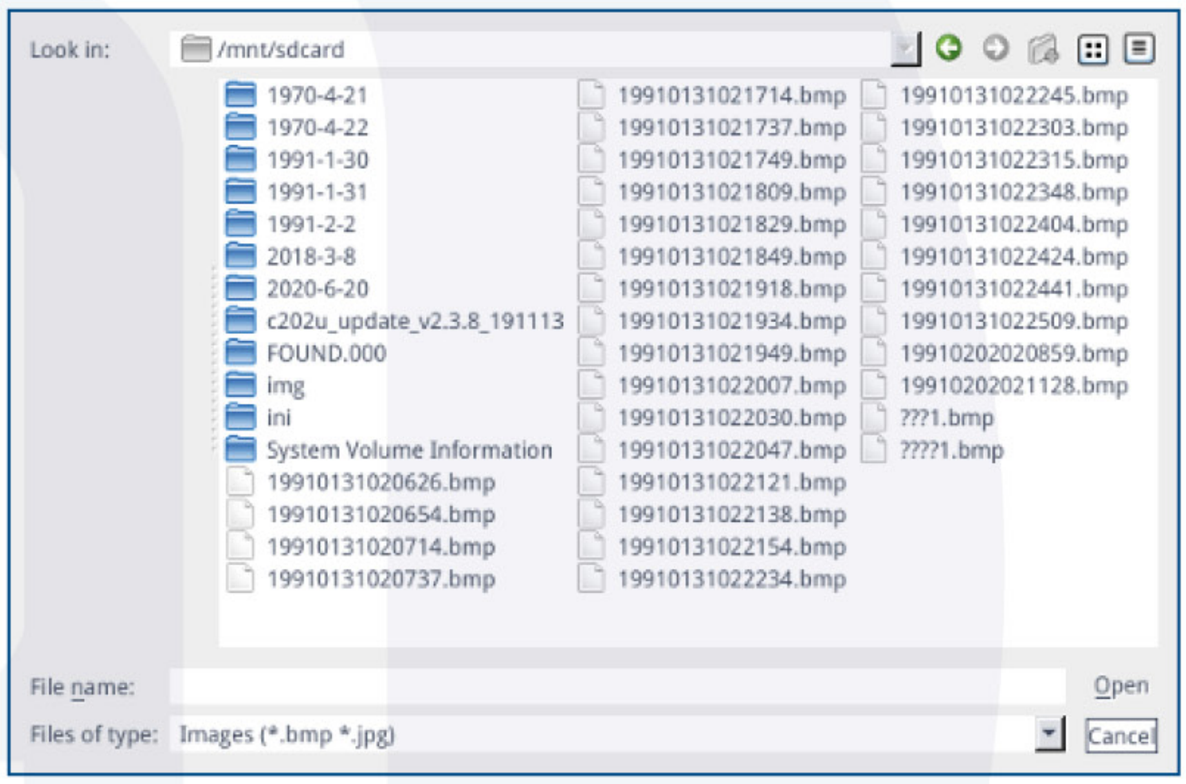
Remark: The recorded video is named “video + serial number”, and is automatically saved in the USB drive in the .mp4 format. The maximum length of a single recording is approx. 2 hours, the maximum size is approx. 4 GB. If it exceeds 2 hours, it will automatically stop recording

5.14 Open picture

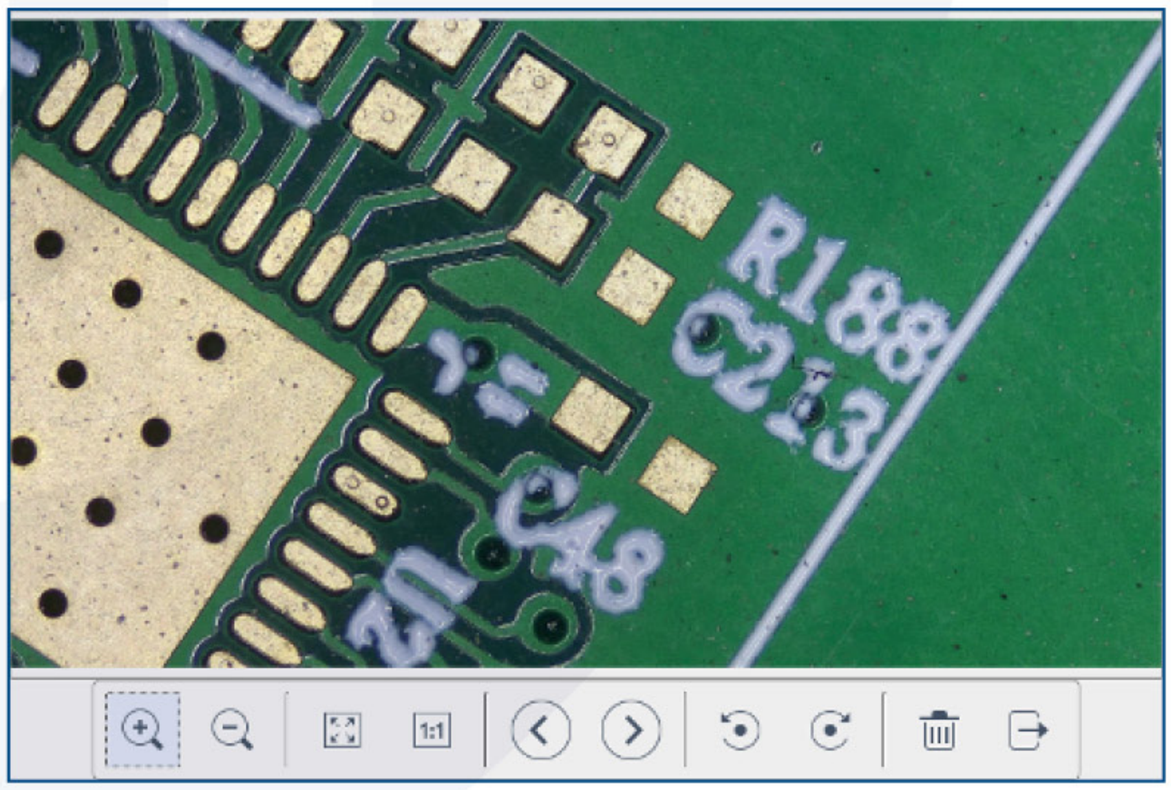
- Click on “Open” -  -, the interface pops up to select the picture interface (5.14.1)
- Select the picture you want and pop up the picture interface (5.14.2)
- Click the“ scaling” tool - -, you can zoom in and out
- Click the“Full Screen” tool -  -, the entire picture is displayed
- Click“1:1” tool -  -, The picture is displayed in its actual size. Press and hold the left mouse button to navigate in the picture
- Click “Browse” tool - - to browse the previous and next pictures
- Click“Rotate” tool -  - to change the picture direction clockwise or counterclockwise
- Click “Delete” tool - - to delete current picture
- Click “Return” tool - - to close the current picture interface

5.15 Compare pictures

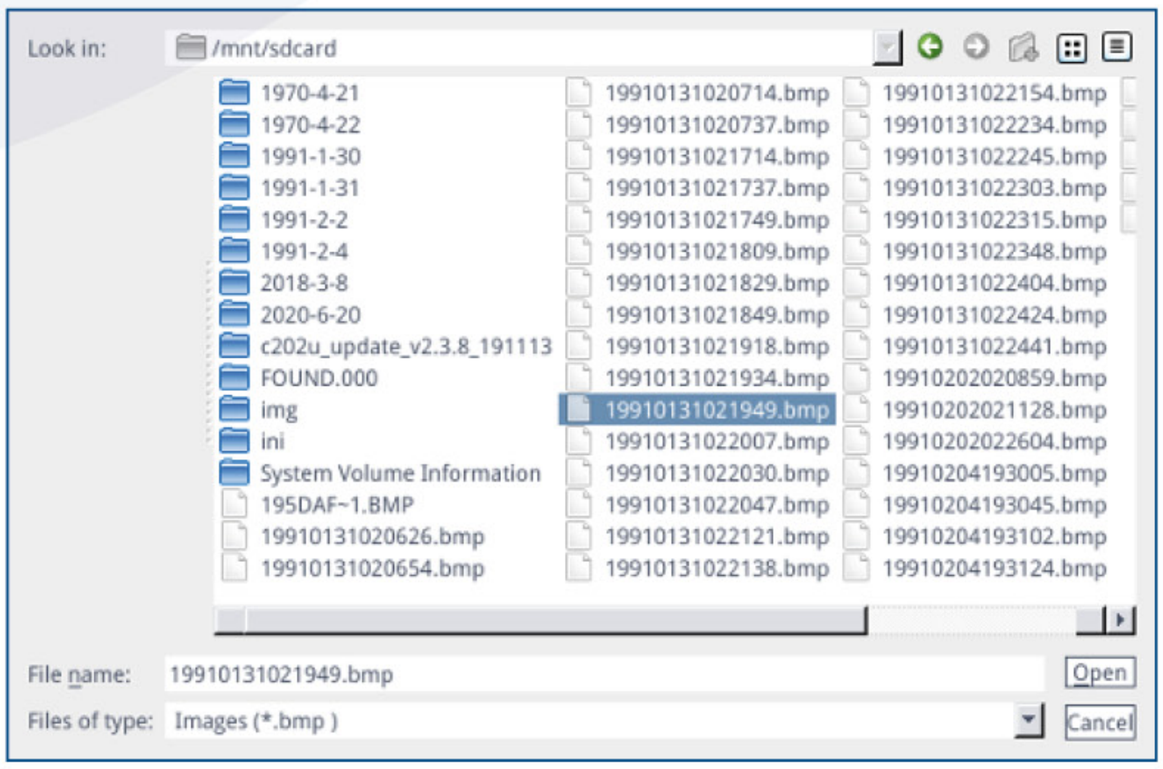
- Click the “Compare Picture” - -, and the interface pops up to select the picture (5.14.3)
- Select the picture you want to compare, pop up the comparison picture interface, the left side of the screen is the real-time video, and the right side is the selected picture
- Click “compare picture” icon again to close this function



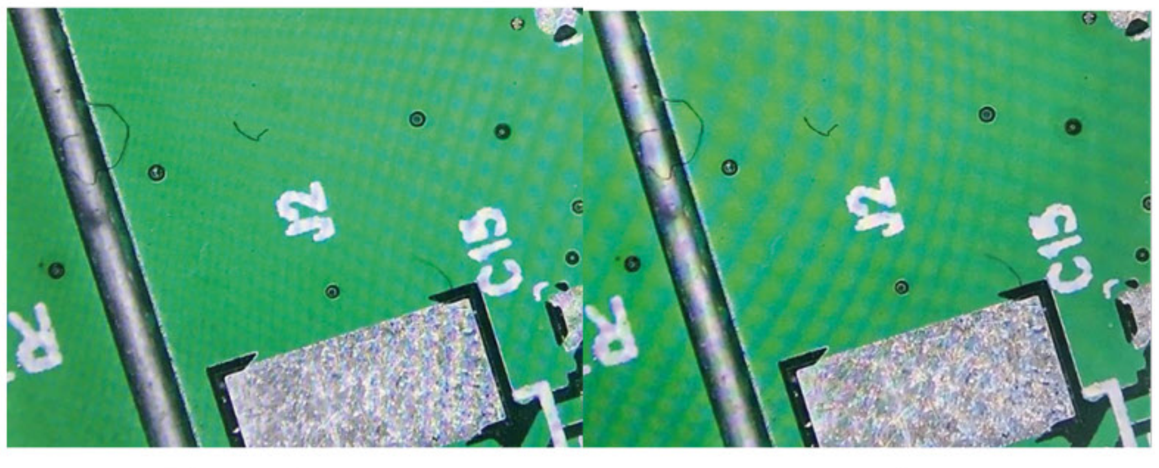
5.14.1



5.14.2



5.14.3



realtime picture *compare picture*

5.16 Freeze

Click “Freeze” - ❚❚ -, The current image will be frozen, and the image window remains static, which makes it easy to observe the measured object; After freezing, the icon becomes - ▶ -. Click this icon to restore real-time display

5.17 Save graphics



When “Yes” is checked, the upper measurement line is saved in the picture, while “No” is not saved

5.18 Version number

At the bottom of the menu, you can view the current software version number

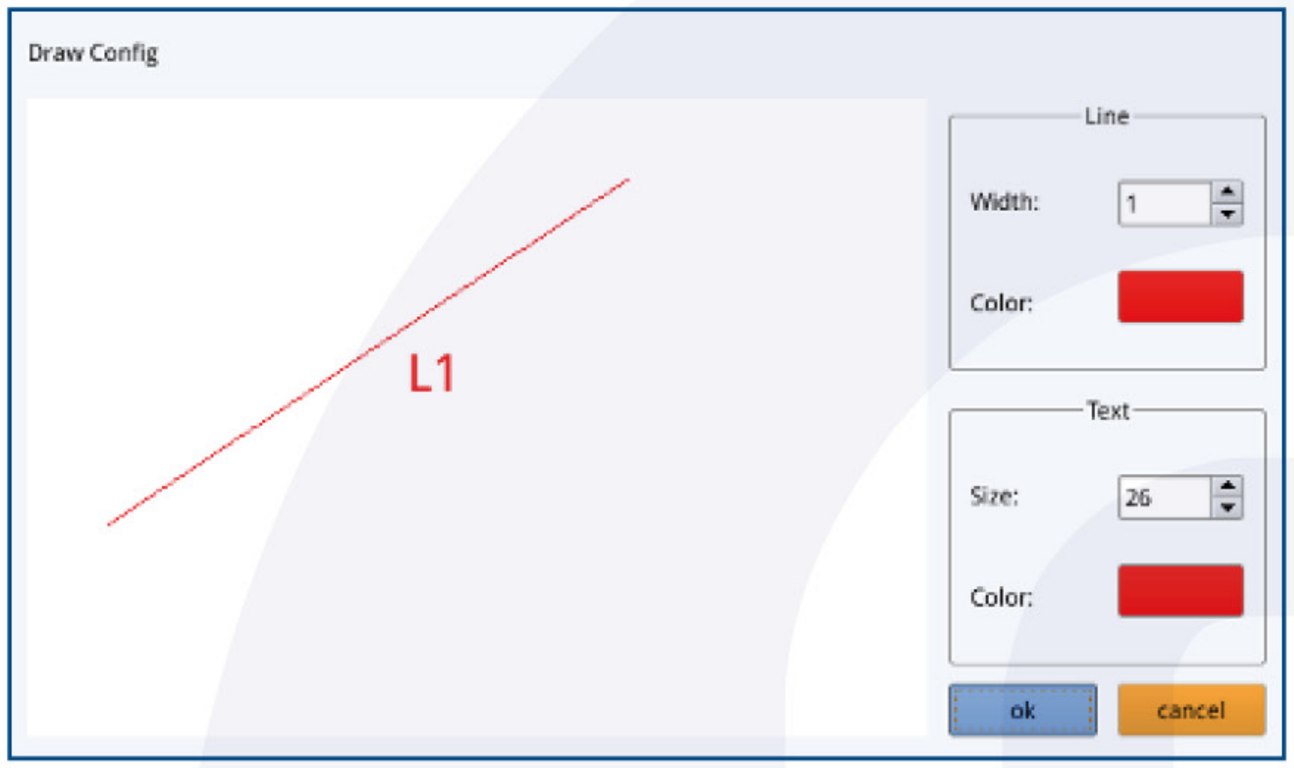
6. Detailed measurement interface

Click the measurement tab to carry out the measurement operation. In case you want to display the menu, after the measurement operation is completed; right-click in the image area and move the mouse to the menu area to display the menu

6.1 Assist tool

6.1.1 Color setting

Click “color setting” - 🎨 -, to pop-up color setting interface



Set the width and color of the line

Set the font size and color of the label

6.1.2 Edge detection

Click “Edge Detection” - ⛰ -. When selected, the icon turns blue. When measuring a picture, it will automatically find the edge

6.2 Measurement tool

Icon	Function
	Straight line
	Horizontal line
	Vertical line
	Rectangle
	Parallel lines
	Perpendicular
	Angle
	Polygon

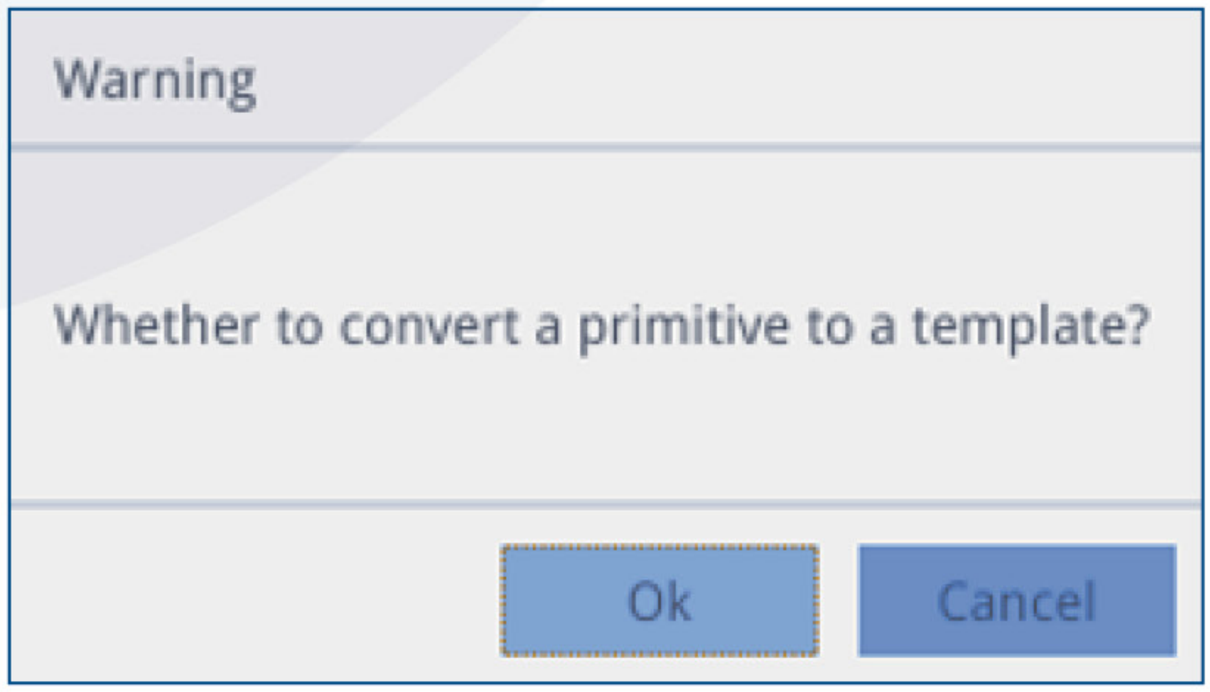
Icon	Function
	Arc
	Circle
	Concentric circles
	Double circle
	Line-circle
	Perpendicular-circle
	Text

6.3 Custom template

After drawing the artwork for your template (primitives) in the image area, click “New” - - , and the window “Whether to convert a primitive to a template” pops up. Click “OK” to create a new template

After entering a name in the name window,

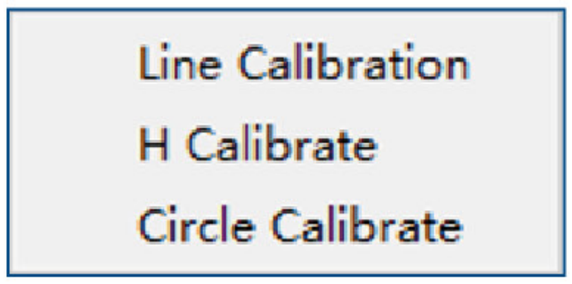
- Click “Save” - - to save the template
- Click “Delete” - - to delete this template
- Click “Edit” - - to modify the template
- Click “Save” again to save the modified template
- Click “Back” - - to return to the initial saved template



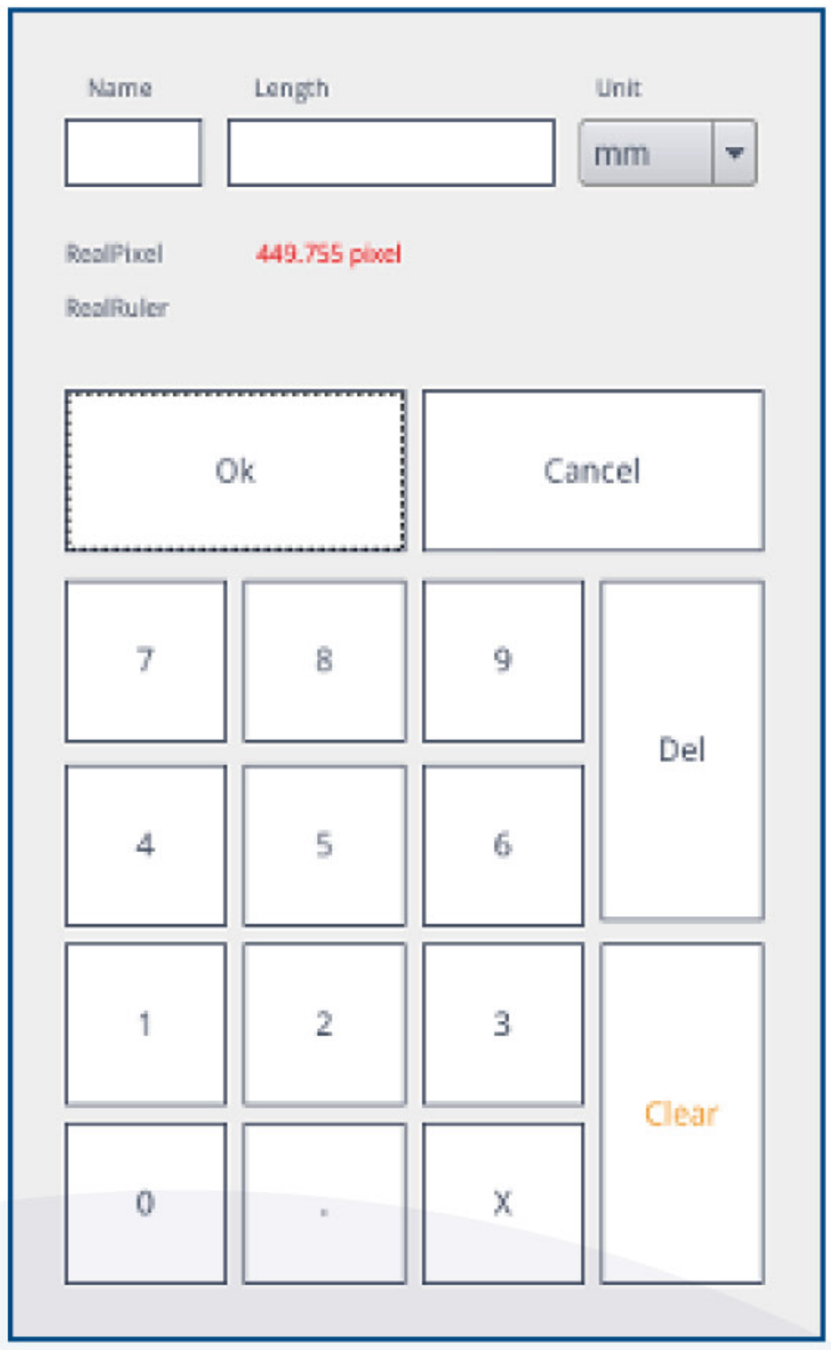
6.4 Measurement operation

6.4.1 Calibration

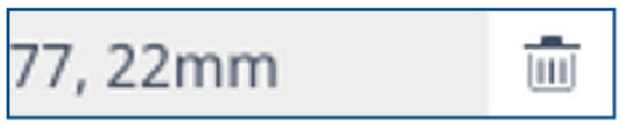
1. Click on the calibration tool drop down:
   "Line Calibration", "H Calibrate" or "Circle Calibrate" can be chosen



2. Drag the marking line to align with the engraved line of the scale, enter name and length, select the unit and complete the calibration



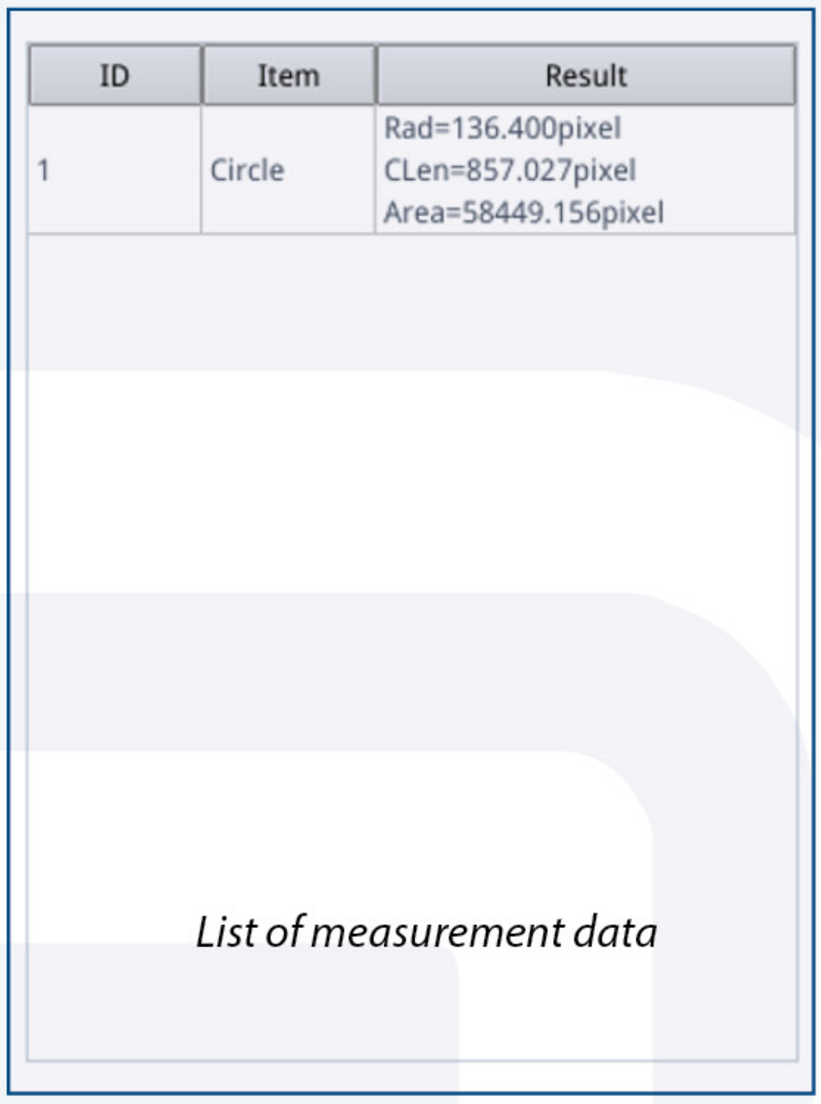
Delete calibration: Click the drop-down calibration list, select the calibration group to be deleted and click the "delete" icon to delete this group of calibrations:



6.4.2 Measuring

The measurement tool includes a variety of stitch measurements. Depending on the specific application, you can first select the appropriate calibration and unit

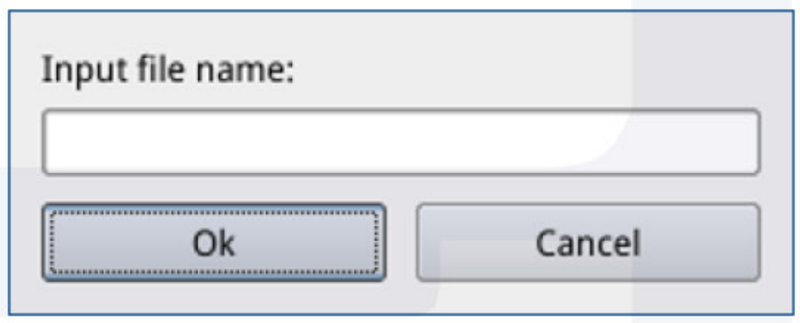
- Pull down the calibration list and select the calibration
- Then select the appropriate tool for measurement; when measuring, you only need to click the anchor point of the measurement. After you click and release the mouse, the measurement data is displayed in the measurement data list area

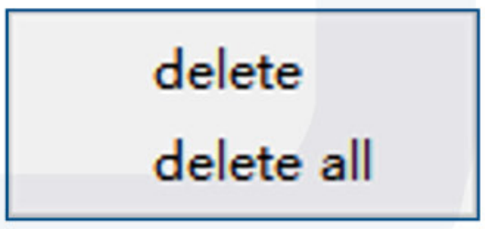


List of measurement data

After the measurement is completed, you can export the data in the measurement data list

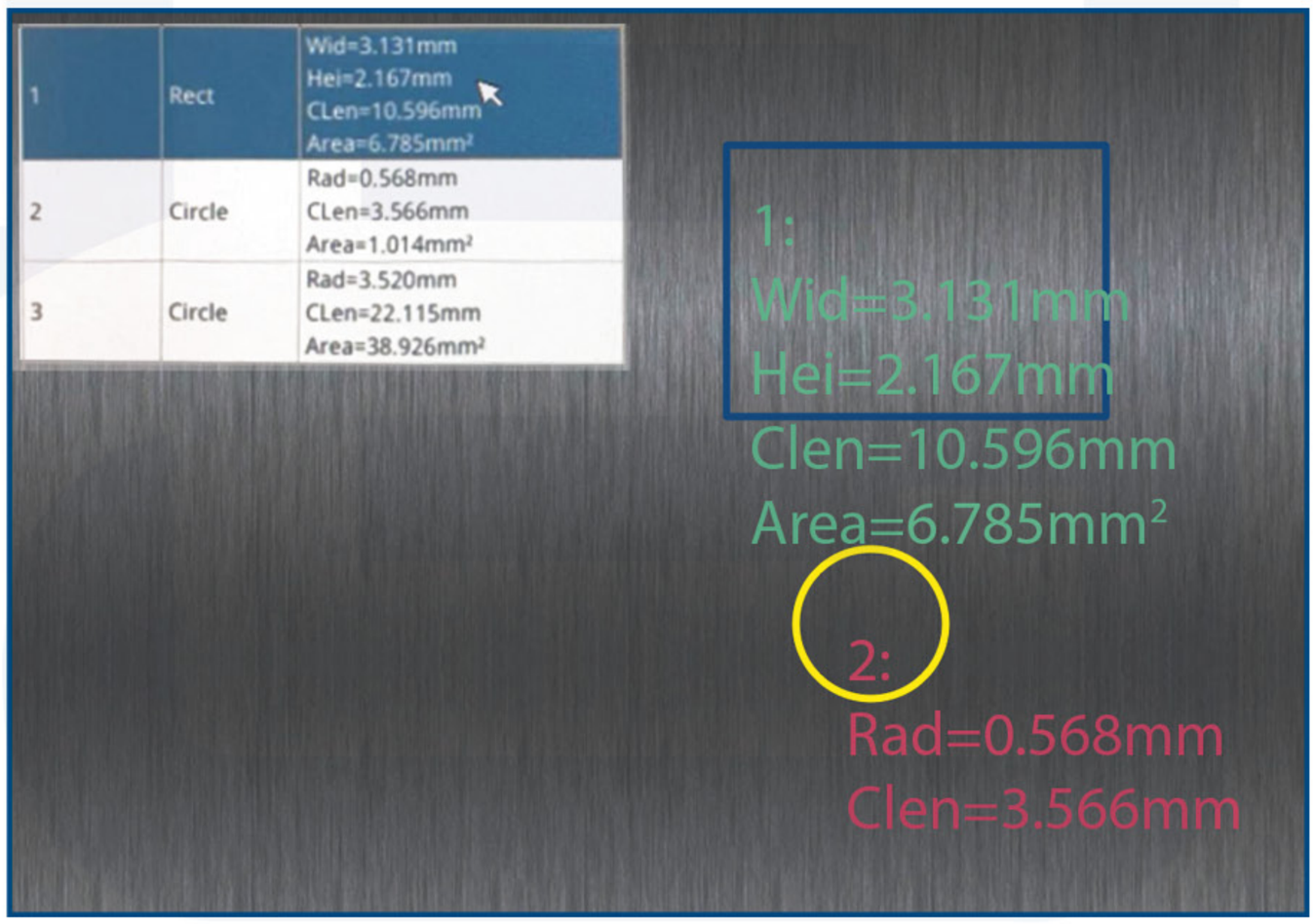
- Click **"Export Data"** and the data will automatically be saved in the .csv file in the USB drive. The user can input the file name
- **Delete measurement data:** In the measurement data list, select the data you want to delete, right-click, you will be prompted to delete a group of data, or delete all data, and select according to your needs





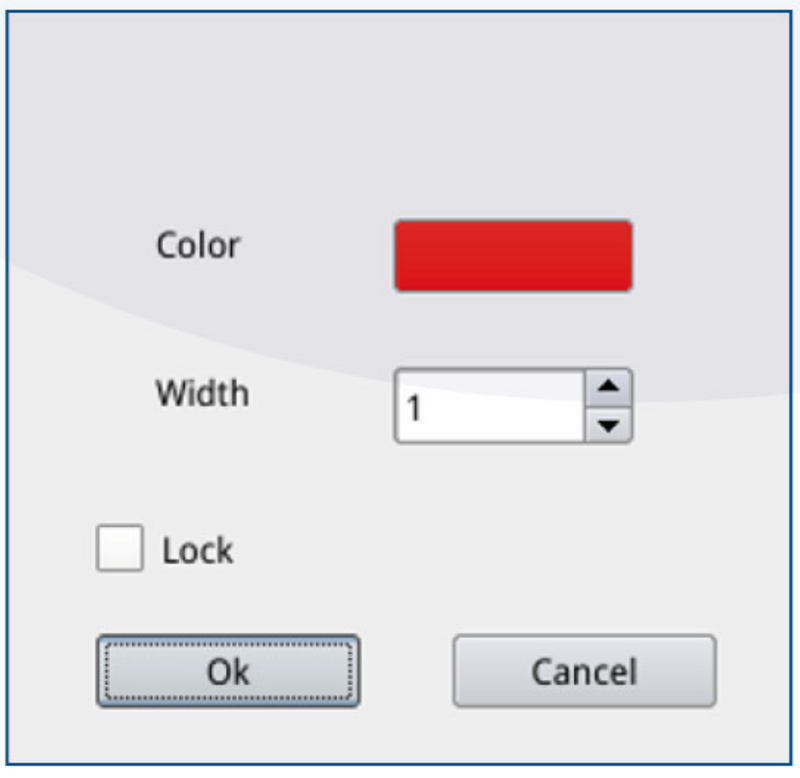
6.4.3 Select measurement data

Left-click the data in the measurement data list to select it. The color of the selected graphic in the image will be highlighted



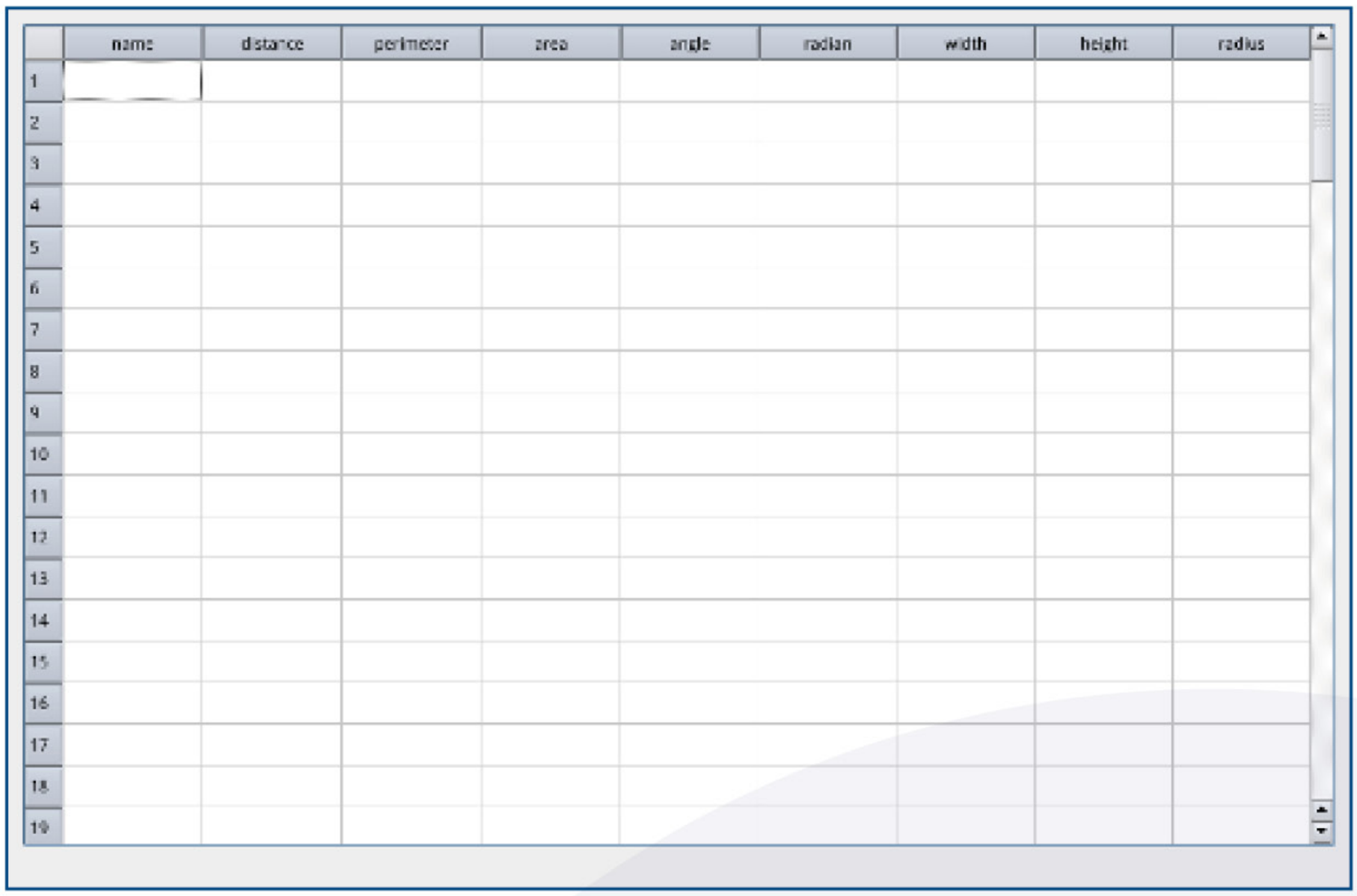
6.4.4 Selected graph

Double-click the data in the measurement data list and a dialog box will pop up. You can modify the line color and line width and lock the selected graph. The locked graph can no longer be operated



6.4.5 Detailed data

Double-click on “List Show” - List Show - to pop up the detailed data dialog box to view all the current detailed measurement data



6.4.6 Mark tool

Click “Text” - T -. Draw the position to be marked in the image area, enter the comment content in the pop-up window, and click “OK” to complete the marking



Note: some instructions are slightly different, please focus on the actual menu and operation

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