TROY INTELLIGENT

www.Troysupply.com

High-definition measuring camera

Instruction Manual

Model: TVN-2K30

Table of contents

Chapter 1 Function Introduction and Features

The SMART-2K30M high-definition industrial camera is easy to use, featuring a built-in personalized interface editing function, template application, mouse operation, USB flash drive storage, and includes functions such as automatic edge finding, automatic contouring, horizontal and vertical flipping, line/circle calibration, data export, and playback browsing. It also provides various measurement tools such as "parallel lines," "point-to-line," "concentric circles," angles, and radians.

Camera features:

◆SONY high-performance image sensor, low noise, high sensitivity, and high color reproduction;

◆High-definition video recording;

◆ HDMI real-time image transmission

◆Customizable interface editing and customizable template editing functions;

◆HDMI 2.0 interface;

◆Supports mouse and keyboard operation (wireless operation also possible);

◆ Camera built-in image measurement system

◆Supports box selection measurement mode, making measurement faster and more accurate;

◆More convenient measurement operations, one-click measurement

1.1 Camera Structure Diagram

1.2 Technical Parameters

SMART-2K30M			
chipstructure	Uultra HD Smart IP Camera SOC	**Optical dimensions**	1/3inch

operating system	LINUX	**Pixel size**	2.75um*2.75um
Kernel Structure	ARM CortexA53 Dual-core	**resolution**	1920*1080
clock speed	1.2GHz	**Frame rate**	60fps
USB interface	USB 2.0	**Intelligent unit**	Built-in intelligent computing acceleration engine
Operating temperature	0-70Spend	**Video output**	HDMI digital output
External dimensions	51*51*58mm	**Lens mount**	C interface
weight	0.7Kg	**Voltage input**	DC 12V2A

第二章 Camera Function Description

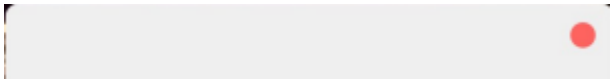
2.1 Startup Screen

After confirming that the high-definition measurement camera interface is connected correctly, power it on (12V 2A power supply). The camera will start up and display the startup screen. After completion, it will enter the main interface.

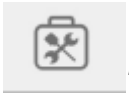
2.2 Main Interface


倍率显示
镜头倍率:
成像倍率:
辅助工具
冻结
拍照
视频
文件夹
寻边
图形设置
INFO
相机设置
系统设置
AE
WB
一键曝光
一键白平衡
镜像
翻转
测量工具
T
输出设置
工具箱
测量表
删除
十字线
开关:
不带刻度
带刻度
分割线
0
确定
0
确定

2.3 Showing and Hiding the Menu Bar



(1) OperationThe icon is located in the upper right corner of the menu bar..

(2)  Click the icon to close the menu bar and select the left side.  The icon can display the menu bar.

(3) 

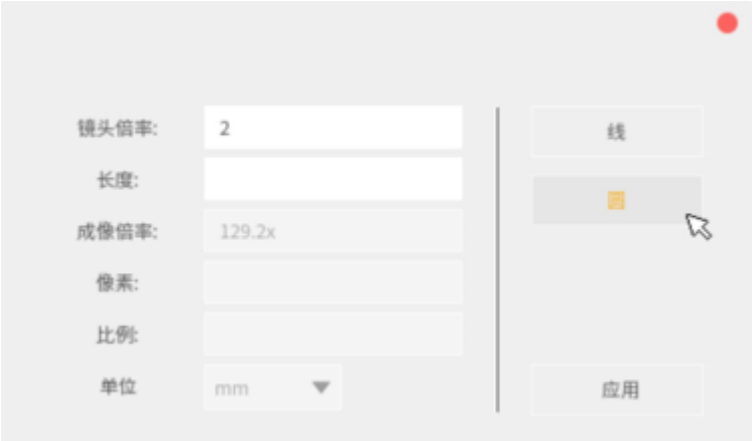
More options in the bottom right corner allow you to adjust more parameters.

2.4 Calibration

2.4.1 Establishing a new calibration

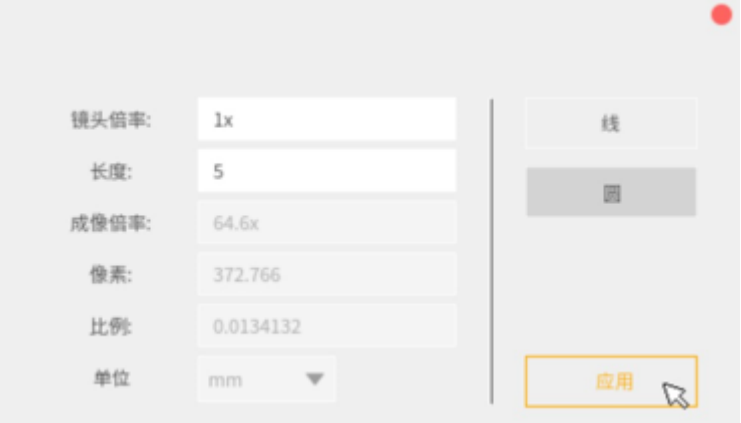
Users must log in as an administrator before they can create or modify labels. For details, please refer to the system settings for logging in as an administrator. The changes in the label column after logging in are shown in the following figure:

Adjust the lens magnification accordingly, place the calibration plate in the center below the lens, focus clearly, and click the calibration icon shown in the image above. A calibration dialog box will pop up, as shown in the image below:



You can select the "calibration method" as needed, choosing either "line" or "circle" to enter the calibration creation state. For example, if you choose the circular calibration method, place the circular calibration plate below the lens. After the image is clear, select three points arbitrarily on the outer edge of the circle to draw a circle. Check the alignment of the drawn circle with the circle on the calibration plate. If you are not satisfied, redraw the circle until you are. Then, enter the current lens magnification and the actual diameter of the calibration circle in the dialog box. The calibration information will then appear in the "Calibration" dialog box. After calibration, if the lens is a zoom lens, you can switch to another magnification to continue calibration. Repeat the previous operation in the software to calibrate at another magnification. Repeat the above calibration to complete the

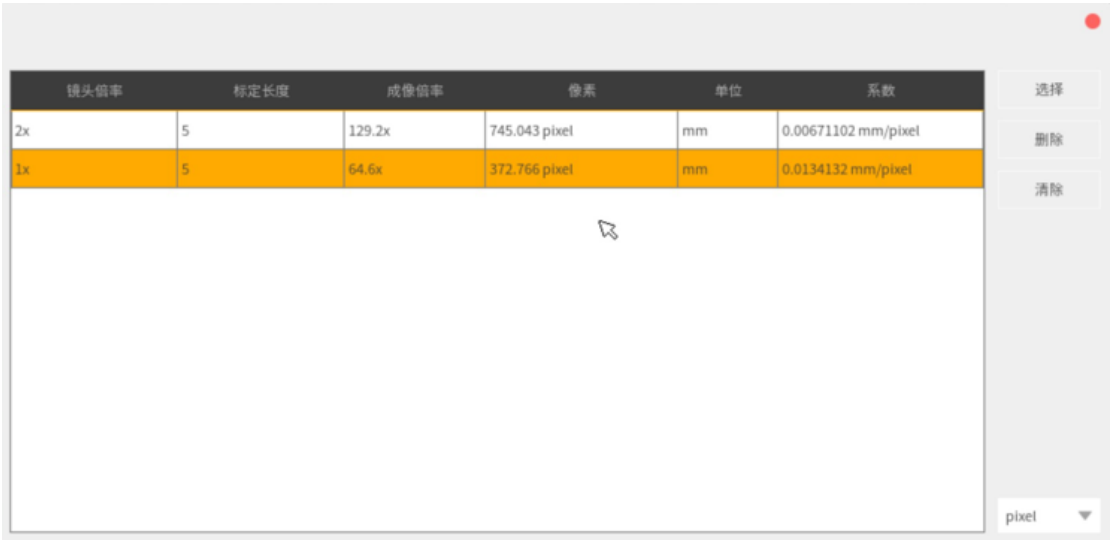
calibration between different lens magnifications. The imaging magnification is the total magnification, calculated by default for a 21-inch monitor. If you have a monitor of other sizes, you can change the setting in the system settings. After clicking Apply, the calibration bar in the menu will automatically switch to the currently calibrated magnification. After calibration, click the red circular icon in the upper right corner to close the dialog box.



2.4.2 Switching Rate

After calibration, if the magnification is switched during measurement, the software should also be switched to the corresponding magnification calibration by clicking the calibration list icon on the right side of the calibration panel. A calibration list dialog box will pop up. Select the calibration row corresponding to the current lens and click the selection icon. The calibration box in the menu bar will automatically switch to this calibration, as shown in the

figure below:



2.4.3 Change Calibration

Referring to the image above, selecting a calibration row and clicking the delete icon on the right will delete that calibration; clicking the clear icon will delete all calibrations. The lower right corner of the calibration row allows you to select the measurement display unit: pixel, mm, etc., as shown in the image below.

2.5 Measurement Function

2.5.1 Measurement Tool Description

(1)  Two-point line - Draw a line segment by taking two points.

(2)  Angle - First, draw a line through two points, then draw another line through two points. The system will automatically calculate the angle between the two lines.

(3)  Parallel lines: First, draw a line through two points, then find another point on the other line, and a second line will be automatically drawn. The system will automatically measure the distance between the two lines.

(4)  rectangle----You can select two points, and the system will

draw a rectangle based on those two points.

(5)  Polygons - You can select points by clicking on the polygon's location, and the system will automatically connect all the points. When selecting the last point, you can right-click, and the system will automatically connect the first and last points to form a closed shape. Note that a polygon can only select a maximum of 10 points.

(6)  radian----An arc can be drawn using three points.

(7)  round----A circle can be drawn by taking three points as the boundary..

(8)  concentric circlesYou can draw the first circle by taking three points as the starting point, and then drag the mouse to select a point on the edge of the second circle to draw the second circle.

(9)  Point to Circle - First select a point, then draw a circle using three points. The system will automatically measure the distance from the first point to the center line and the center of the circle.

(10)  From line to circleFirst, draw a line through two points. Then, find a circle and draw a circle by taking three points. Measure the

distance from the center of the line to the center of the circle..

(11) Distance between centers----Draw two circles by taking three points as reference. The system will automatically measure the distance between the centers of the two circles.

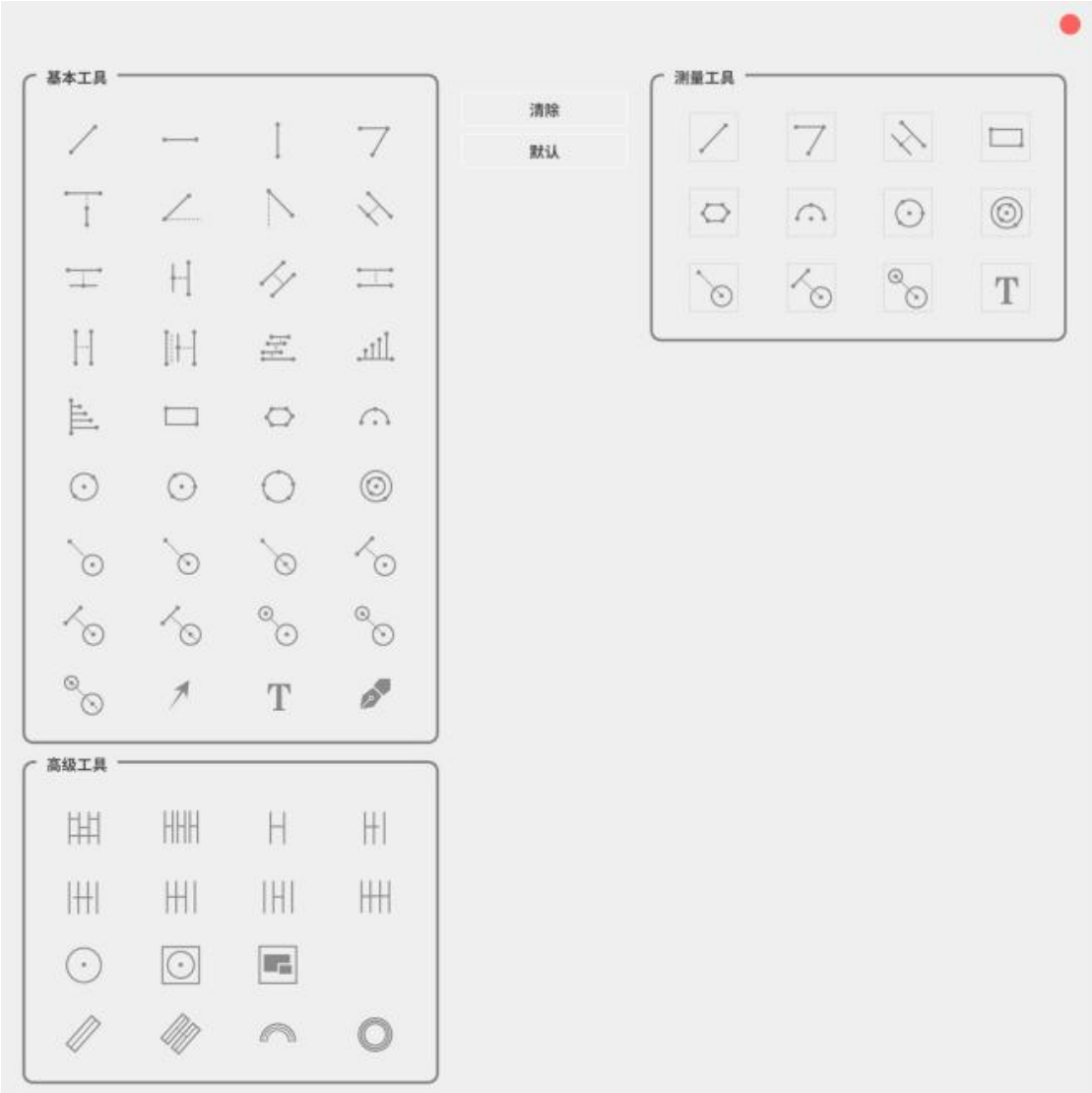
(12) Text annotation----You can annotate text information at specified locations on the screen.

(13) Clear ---- Remove all measurement tools from the interface.

(14) Output Settings ---- Set the data for all measured features. For example, for circles, you can choose to display radius/diameter/circumference/area/center; for angles, you can choose to display acute angles or supplementary angles.... As shown in the image below:

(15)) Toolbox----Multiple measurement tools are available, and the measurement tool table can be customized. As shown in

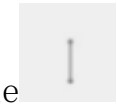
the image below, drag an icon from the measurement tools menu with the left mouse button, and then drag a tool from the basic tools menu to that position to replace the dragged-out tool. Alternatively, click the clear icon to clear the measurement tools. Drag tools from the left-hand basic toolbar into the measurement tools menu as needed to customize the measurement tools in the menu bar.



Since we have previously introduced 12 measuring tools, this section will introduce the newly added basic tools.

(1) Horizon 

Draw a line segment by selecting two horizontal points.

(2)vertical line 

Draw a line segment by selecting two vertical points.

(3)Four point angle 

Click the left mouse button on the four points to generate the angle between the two lines.

(4)Horizontal angle 

Click the left mouse button to select the first point, move the mouse, click the left mouse button again to select the second point, and complete the angle measurement between the line connecting these two points and the horizontal line.

(5)vertical angle 

Click the left mouse button to select the first point, move the mouse, click the left mouse button again to select the second point, and complete the angle measurement between the line connecting these two points and the vertical line.

(6)Three points horizontal parallel lines 

Click the left mouse button, drag the mouse, click the left mouse button again to generate a horizontal line, and then click

a point to automatically calculate the distance between the two horizontal lines.

(7)Three points vertical parallel lines 

Click the left mouse button, drag the mouse, click the left mouse button again to generate a vertical line, and then click a point to automatically calculate the distance between the two vertical lines.

(8) Four points are any parallel lines 

Click the left mouse button, drag the mouse, click the left mouse button again to generate a straight line, then click two points to automatically calculate the distance between the two parallel lines.

(9) Four points horizontal parallel lines 

Click the left mouse button, drag the mouse, click the left mouse button again to generate a horizontal line, then click two points to automatically calculate the distance between the two parallel lines.

(10) Four points vertical parallel lines 

Click the left mouse button, drag the mouse, click the left mouse button again to generate a vertical line, then click two points to automatically calculate the distance between the two parallel vertical lines.

（11）Distance from the center of a parallel line to the center of a straight line 

Click the left mouse button to select four points, and the center of the parallel lines will be automatically generated. Then click two more points to generate a straight line, and the distance between the two lines will be automatically calculated.

（12）Distance between two adjacent parallel lines 

Click the left mouse button to select multiple points to generate multiple parallel lines, and automatically calculate the distance between any two adjacent parallel lines.

（13）Distance from each point to the horizontal baseline 

Click the left mouse button to select two points to generate a horizontal line. Drag the mouse to select multiple points and automatically calculate the distance of each point to the horizontal baseline.

（14）Distance from each point to the vertical baseline 

Click the left mouse button to select two points to generate a vertical line. Drag the mouse to select multiple points and automatically calculate the distance of each point to the vertical baseline.

(15)Draw a circle from two points 

Click the left mouse button to select the first point on the circle, move the mouse and click the left mouse button again to select the second point on the circle to complete the drawing of the circle. The line connecting the two points is the diameter of the circle.

（15）Three points to draw a circle 

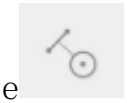
A circle can be drawn by taking three points as the boundary..

(16)Shortest distance from a point to a circle 

Click the left mouse button to select the first point, move the mouse to select three more points, draw a circle, and complete the measurement.

(17)Longest distance from a point to a circle 

Click the left mouse button to select the first point, move the mouse to select the three points, draw a circle and finish.

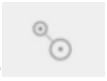
(18)The shortest distance from a straight line to a circle 

Click the left mouse button to select two points and draw a straight line; move the mouse to select three points and draw a circle to complete the measurement.

(19)The longest distance from a straight line to a circle 

Click the left mouse button to select two points and draw a

straight line; move the mouse to select three points and draw a circle to complete the measurement.

(20)Shortest distance from circle to circle 

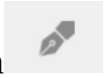
Click the left mouse button to select three points and draw a circle. Move the mouse and select three more points to draw another circle to complete the measurement.

(twenty one)The longest distance between circles 

Click the left mouse button to select three points and draw a circle. Move the mouse and select three more points to draw another circle to complete the measurement.

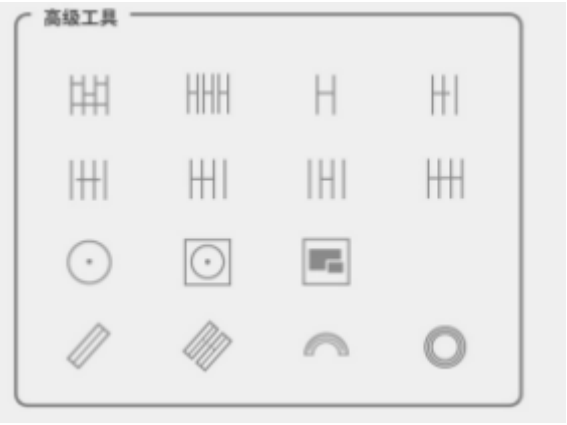
（22）Arrow indicator 

Draw arrows to mark the target area.

（23）Text annotation 

Add annotations and text descriptions to the images.

2.6 Advanced Tools



(1) Spacing between inner parallel lines and spacing between

outer parallel lines 

This is an automatic edge detection tool that automatically detects edges within a rectangle. Click the left mouse button to select a point as a vertex of the rectangle, move the mouse to enclose the four edges within the rectangle, and click the left mouse button to complete the rectangle selection.

(2) Spacing between inner parallel lines 

This is an automatic edge detection tool that automatically detects edges within a rectangle. Click the left mouse button to select a point as a vertex of the rectangle, move the mouse to enclose the four edges within the rectangle, and click the left mouse button to complete the rectangle selection.

(3) Automatic detection of parallel line spacing 

This is also an automatic edge detection tool that automatically detects edges within a rectangle by selecting a point with the mouse and triggering the detection. Click the left mouse button to select a point as a vertex of the rectangle, move the mouse to enclose the four edges within the rectangle, and click the left mouse button to complete the rectangle selection.

(4) Distance between two parallel lines 

This is an automatic edge detection tool that automatically detects edges within a rectangle. Click the left mouse button to select a point as a vertex of the rectangle, move the mouse to enclose the four edges within the rectangle, and click the left mouse button to complete the rectangle selection.

(5) Spacing between outer parallel lines (2.4 lines) 

This is an automatic edge detection tool that automatically detects edges within a rectangle. Click the left mouse button to select a point as a vertex of the rectangle, move the mouse to enclose the four edges within the rectangle, and click the left mouse button to complete the rectangle selection.

(6) Spacing between inner parallel lines (1.3 lines) 

This is an automatic edge detection tool that automatically detects edges within a rectangle. Click the left mouse button to select a point as a vertex of the rectangle, move the mouse to enclose the four edges within the rectangle, and click the left mouse button to complete the rectangle selection.

(7) Distance between the medians of parallel lines 

This is an automatic edge detection tool that automatically

detects edges within a rectangle. Click the left mouse button to select a point as a vertex of the rectangle, move the mouse to enclose the four edges within the rectangle, and click the left mouse button to complete the rectangle selection.

(8) The distance between parallel lines 

This is an automatic edge detection tool that automatically detects edges within a rectangle. Click the left mouse button to select a point as a vertex of the rectangle, move the mouse to enclose the four edges within the rectangle, and click the left mouse button to complete the rectangle selection.

(9) Select the circle 

This is an automatic circle detection tool. Simply left-click within the circle to automatically detect it.

(10) Selecting a circle in the region 

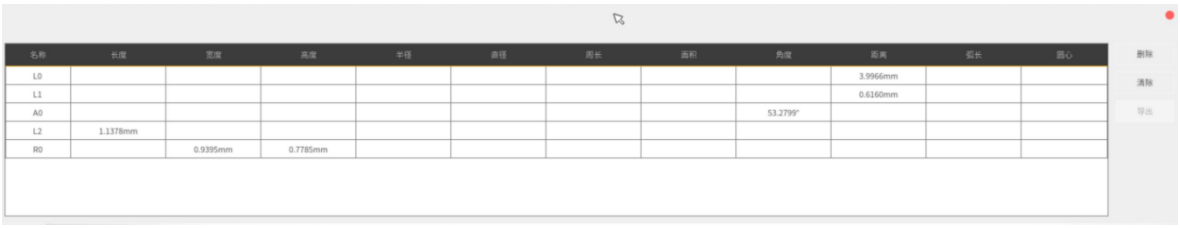
This is an automatic circle detection tool. Click the left mouse button to select a point as a vertex of a rectangle, move the mouse to draw the desired circle into the rectangle, and click the left mouse button to complete the detection.

(11) Automatic contour detection 

This is an automatic outline detection tool. Click the left

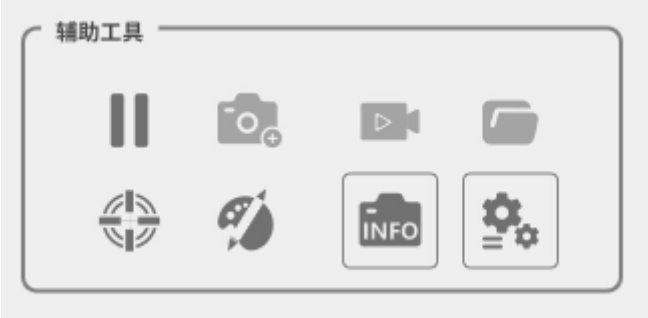
mouse button to select a point as a vertex of a rectangle, move the mouse, and click the left mouse button again to select the rectangle.

（16） Measuring table----Click the icon to open the tool that records the measurement values of the current window.



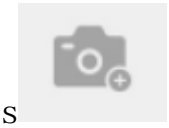
Referring to the image above, selecting a data row and clicking the delete icon on the right will delete that measurement row, and the graphic in the window will also be deleted. Clicking the clear icon will delete all measurement rows, as shown in the image below:

2.6 Auxiliary Tools

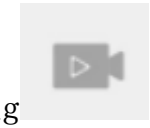


2.6.1 Freeze 

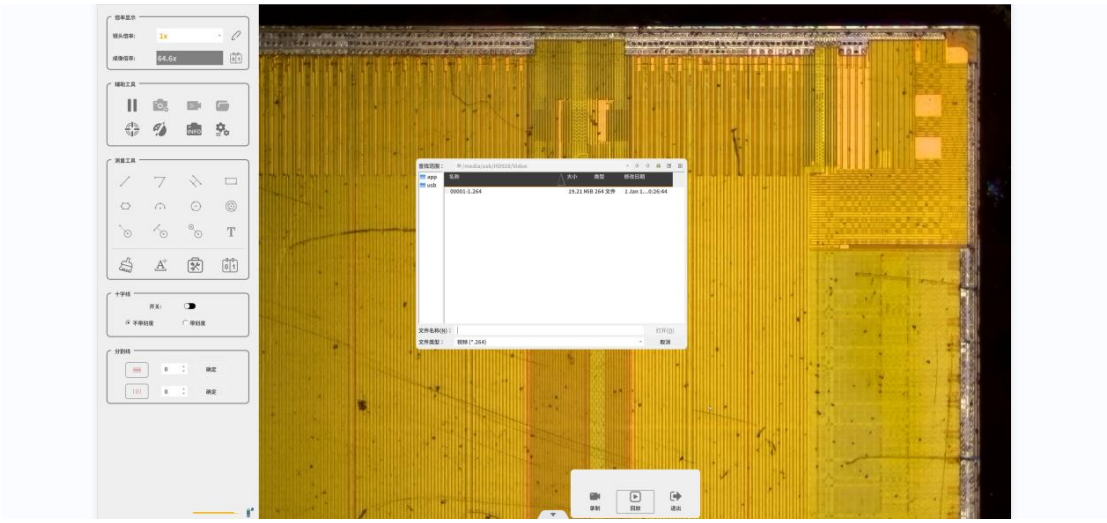
If the machine experiences unstable shaking while drawing, you can select the "Freeze Current" button to freeze the current screen. Pressing the button again will unfreeze the screen.

2.6.2 Taking photos 

Clicking the image capture icon will save the current image and data as an image. The format can be BMP, JPG, or PNG.

2.6.3 Video Recording 

Insert the USB drive, click the record icon, and a record dialog box will pop up, allowing you to set the record file name. The record file format is H.264. The video can be paused and played back in real time, as shown in the image below:

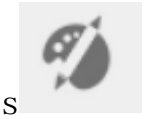


2.6.4 folder 

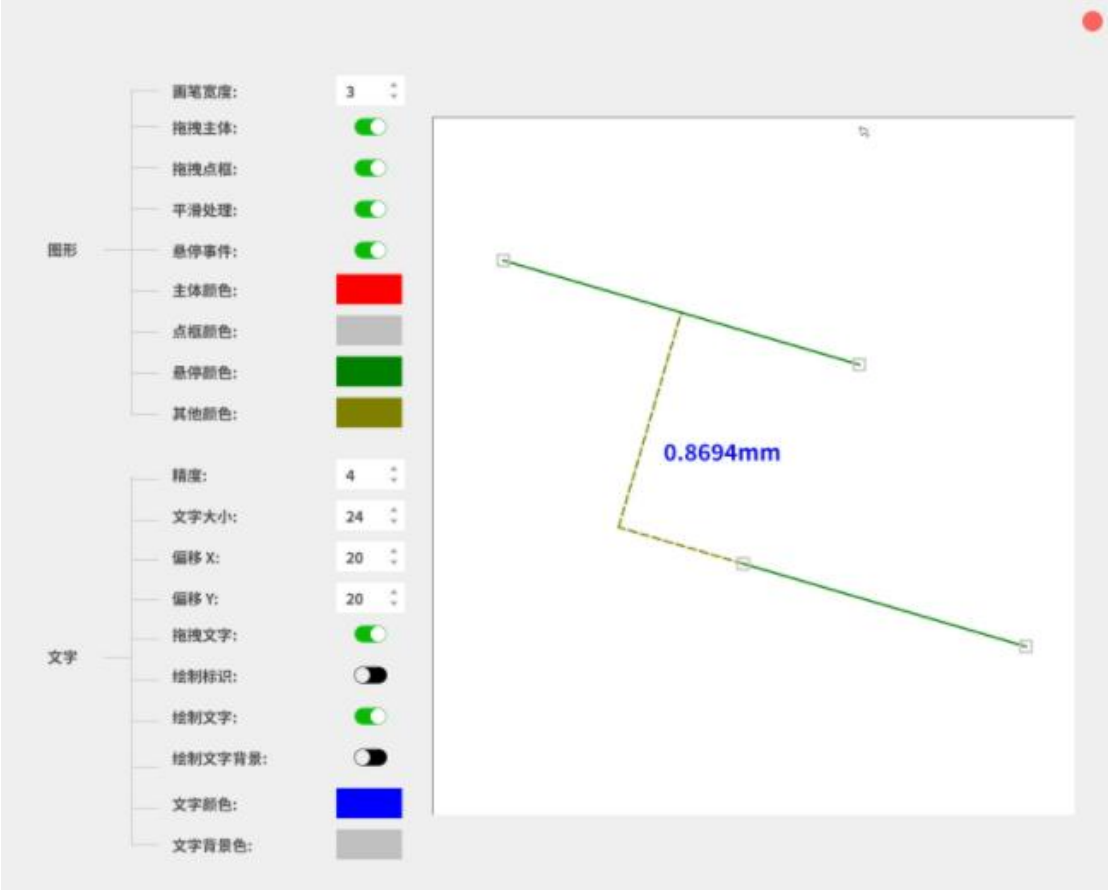
Click the folder icon to save an image preview. You can then preview previously saved images.

2.6.5 Edge Detection 

The selected point is used to draw on the screen. If you choose manual...  If you select a point, the point will be where the mouse clicks. If you choose automatic intelligent selection...  When you select a point, the system will automatically find the edge around the mouse cursor within 20 pixels. This method reduces errors from manual point selection. However, there cannot be more than two edges around the selected point, otherwise, you may select the wrong point.

2.6.6 Graphics Settings 

Clicking the icon will bring up a dialog box. Users can set the line width, color, font size and color of the measured label, whether the label is turned off, length, and other settings for the drawn image.



(1) Graphics - You can set the brush width (dimension line width), drag the main body and drag the point frame (drag the dimension line and adjust its length) to open or close, set the main body color (dimension line), set other colors (dimension lines), etc.

(2) Text----You can set the precision of the text (number of decimal places), offset value (relative position of the text), drag text (text dragging) to turn on or off, as well as the text color and background color, etc.

2.6.7 Camera Settings 

Clicking the icon will bring up the camera settings dialog box. Checking the boxes on the left indicates that the camera software settings will be automatically adjusted; unchecking them allows you to manually adjust the parameter values.

（1）exposure

Drag the time or gain position bar with the mouse to change the

brightness.

(2) White balance

Checking the box will automatically adjust the white balance, or unchecking it will adjust the RGB values.

(3) Sharpness

Adjust the image sharpness value by adjusting the edge (edge sensitivity, highlighting the edge sharpening effect), texture (highlighting the texture detail), and overall settings.

(4) DRC (Wide Dynamic Range)

Improve the overall image quality by adjusting shadows (adjusting dark images), highlights (adjusting bright images), and intensity (overall illumination).

（5）Comparison

Enhanced detail processing through comparative adjustments to the product.

(6) Saturation

Adjust the vibrancy of the colors.

(7) Horizontal mirror

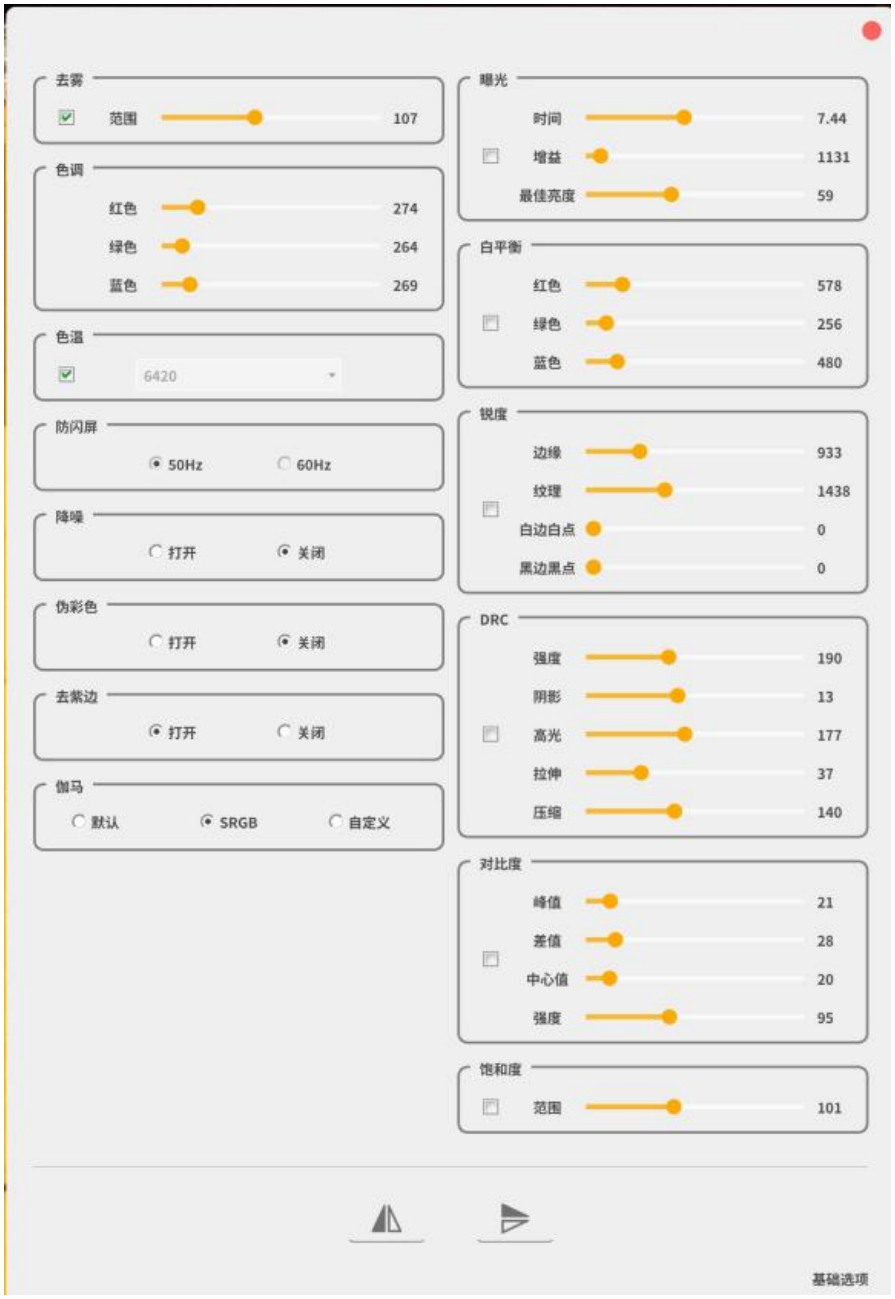
Click Horizontal Mirror  The icon allows you to mirror the image horizontally.

(8) Vertical mirror

Click Vertical Mirror  The icon allows you to flip the image

vertically.

Clicking on "More Options" allows you to adjust more parameters.



(1) Defogging

Image optimization for low-quality, blurry images.

（2）tone

By adjusting the three primary colors, color rendering is performed on some products that require coloring.

（3）Color temperature

Adjust the color temperature settings

（4）Anti-flicker screen

Anti-flicker settings for objects that are shaking or slightly trembling.

（5）Noise Cancellation

Regional noise reduction for products

（6）False color

Reduce interference caused by false colors

（7）Remove purple edges

Remove purple fringing caused by light

(8) Gamma

Gamma image correction allows you to choose between default, sRGB, or custom to correct images for optimal results.

2.6.8 System Settings

Click the system settings icon to bring up the system settings dialog box, as shown in the image below:

(1) Image

Image data sources: Video - images stored when taking a photo; Scene - drawn graphics saved when taking a photo; Window - menu bar captured when taking a photo.

Image naming options: Manual - A dialog box pops up when taking a picture, allowing you to set the file location and name; Automatic - Images are automatically saved to the specified folder according to the set file path, format, and naming convention when taken.

Image saving format: JPG/BMP/PNG, JPG is recommended.

Image preservation quality: 0-100%. The higher the value, the better the image quality, the larger the file size, and the longer the preservation time.

Image name length: 5 characters by default, e.g., XXXXX.JPG

Image naming format: 1% serial number, 2% date and time, 3% barcode. These can also be combined, e.g., 1%-2% is 00001-2022031211305901.JPG

System time: year/month/day/hour/minute/second. Hover your mouse over the location and scroll to change the value. After changing it, click "Set".

Language: Simplified Chinese/Traditional Chinese/English

/Switch User: You can choose between administrator or user mode. You must switch to administrator mode when changing calibrations.

/Restore factory settings: Restore factory settings

Application Upgrade: Place the upgrade file in the root directory of the USB drive, insert the camera, and click "Upgrade" to upgrade the application.

（2）video

Video naming options: Manual - A dialog box will pop up when saving, allowing you to set the video location and name; Automatic - When saving, the video will be automatically saved to the specified folder according to the set video path,

format, and naming method.

Video playback modes: Single loop (once-ending), playlist loop.

/Video zoom method: You can zoom in and out on specific areas of the image by scrolling the mouse wheel.

（3）document

File naming options: Manual --- a dialog box will pop up when saving, allowing you to set the file location and name;

Automatic --- files will be automatically saved to the specified folder according to the set file path, format, and naming convention when saving.

/File name length: 5 characters by default, e.g., xxxxx

File naming format: Serial number 1%, date and time 2%, barcode 3%, or a combination thereof, such as: 1%-2% as 00001-2022031211305901

(4) Folder

/ Folder name length: 5 characters by default, e.g., xxxxx

Folder naming format: 1% serial number, 2% date and time, 3% barcode. These can also be combined, e.g., 1%-2% is 00001-2022031211305901.

(5) Other

Monitor size: Default is 21 inches, can be changed according to actual needs. The monitor size here relates to the rated total magnification.

/Eyepiece: The magnification of the eyepiece can be set according to the lens.

/Objective lens: The objective lens magnification can be set according to the lens.

/Fan switch: Turns the top fan on or off

/Logo: Generate company logo in the bottom left corner of the

page

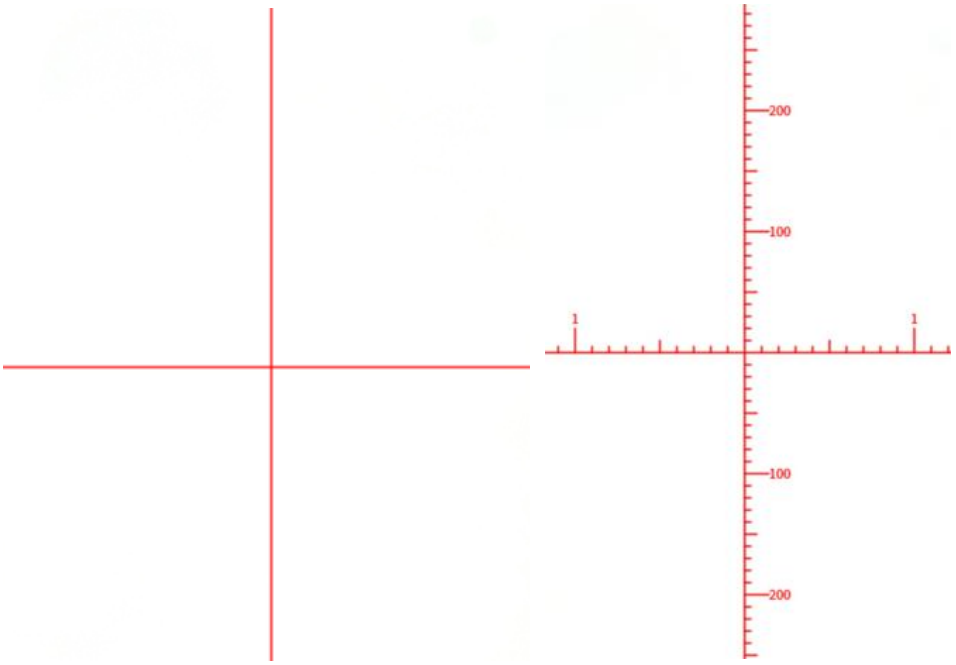
2.7 Crosshair

2.7.1 Crosshair Switch

Turning on the crosshair switch (green color) will display a crosshair on the screen.

2.7.2 Crosshair Type

There are two types: one with and without graduations. The graduation lines will change according to the calibration.



2.8 dividing line

2.8.1 Horizontal dividing line

Click the up and down triangles to set the number of horizontal dividing lines, then click OK to confirm.

2.8.2 Vertical dividing line

Click the up and down triangles to set the number of horizontal dividing lines, then click OK to confirm.

2.8.3 Setting the parameters for the dividing line

Move the mouse to the dividing line you want to change, right-click, and the dividing line settings dialog box will pop up.

(1) The vertical lines within the X/Y boxes represent pixel

values, indicating the position of the dividing line. Changing the corresponding values changes the position of the dividing line.

(2) Change the width value to change the width of the divider line.

(3) Click the color box to bring up the color selection window, then select the desired color to change it.