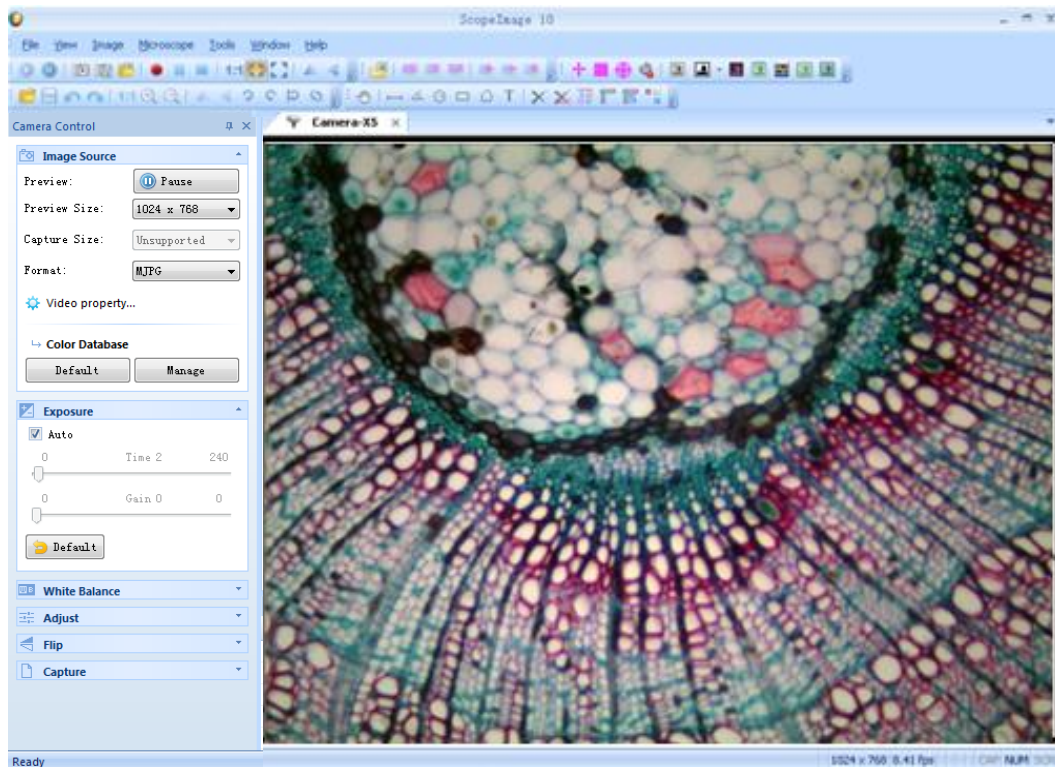


# ScopelImage 9.0

Professional imaging software

## Operation Manual



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# 1.Instruction

ScopelImage 9.0 is a powerful software that is provided with image analysis and processing. Its application has spread all over optical microscope fields, which are involved in scientific research , manufacture, education and so on. Its friendly operation interface and stable performance has provided convenience for users.

## ★supported language:

1. Chinese    2. English    3. Arabic    4. French    5. German
6. Japanese    7. Polish

## ★the matched camera specification:

Type	HDCE-X1	HDCE-X2	HDCE-X3	HDCE-X5	HDCE-P5
Image Sensor	1/2.5"CMOS	1/2.5"CMOS	1/2.5"CMOS	1/2.5"CMOS	1/2.5"CMOS
Valid Pixel	1280×1024 (1.3M)	1600×1200 (2.0M)	2048×1536 (3.0M)	2592×1944 (5.0M )	2592×1944 (5.0M )
Digital Output	24-bit (color)	24-bit (color)	24-bit (color)	24-bit (color)	24-bit (color)
Image Format frame rate	1280×1024 6 f/s	1600×1200 6f/s	2048×1536 4 f/s	2592×1944 2.5 f/s	2592×1944 13.6f/s
	1024×768 10 f/s	1024×768 10 f/s	1024×768 10 f/s	1024×768 10 f/s	1024×768 20f/s
Sensitivity	0.53v @550um/lux/s	0.53v @550um/lux/s	0.53v @550um/lux/s	0.53v @550um/lux/s	1.4v @550um/lux/s
SNR	40dB	40dB	40dB	40dB	42.3 dB
Exposure	Auto/Manual Exposure	Auto/Manual Exposure	Auto/Manual Exposure	Auto/Manual Exposure	Auto/Manual Exposure
White Balance	Auto/Manual White Balance	Auto/Manual White Balance	Auto/Manual White Balance	Auto/Manual White Balance	Auto/Manual White Balance
Working Temperature	-30°C ~ 70°C	-30°C ~ 70°C	-30°C ~ 70°C	-30°C ~ 70°C	-30°C ~ 70°C
System	XP/ Win 7 32bit or 64bit	XP/ Win 7 32bit or 64bit	XP/ Win 7 32bit or 64bit	XP/ Win 7 32bit or 64bit	XP/ Win7/ Win8/Win10 32bit or 64bit

## **2.Installation Instruction**

### **2.1 Minimum System Requirements**

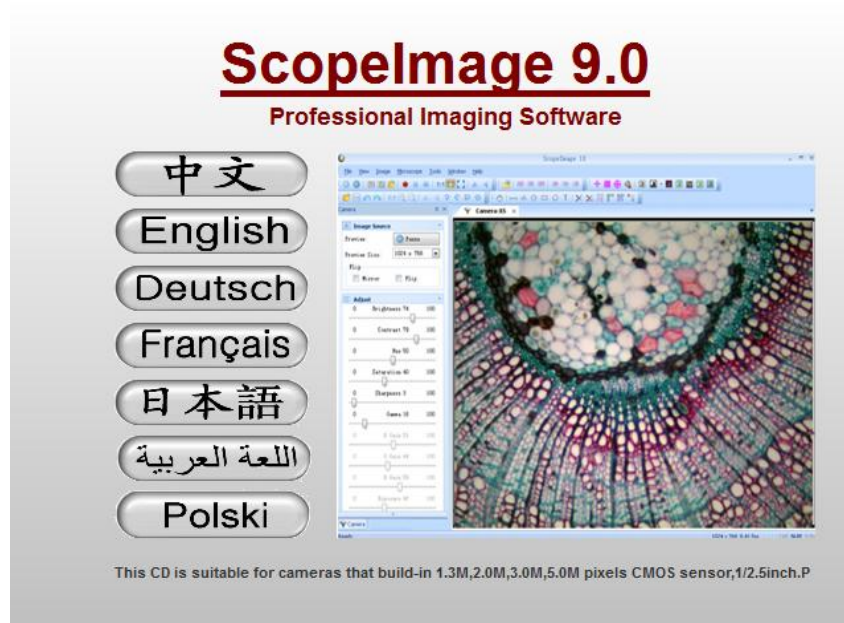
#### System Requirements

- Video adapter supports 24bit color or more and 1280\*1024 or 1024\*768 resolution
- CPU with 2.0GHz or more
- System Memory 256MB or more, Display Memory 128MB or more.
- USB2.0 interface
- Hard Disk Space 1GB for installation plus additional space for captured images

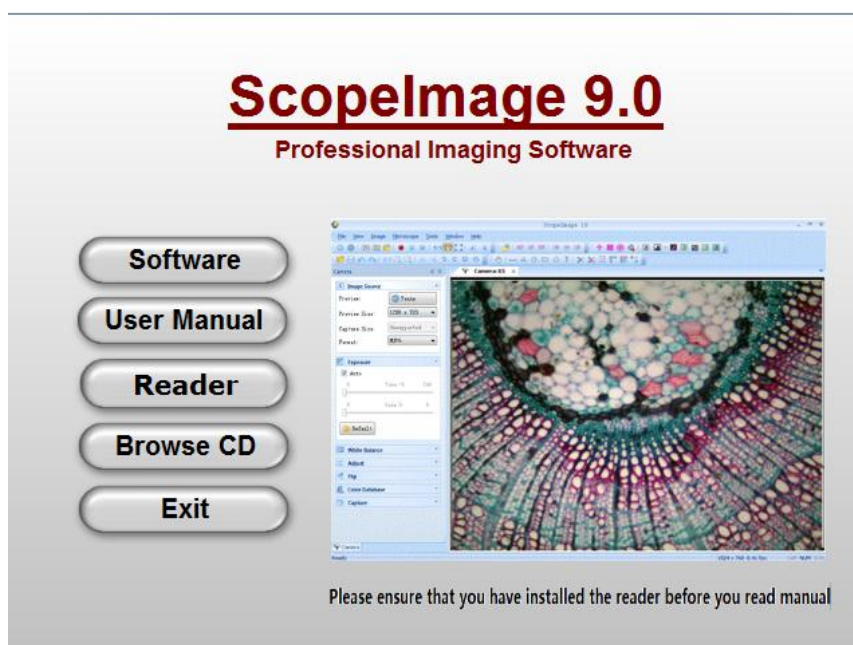
Since video processing is hardware intensive, a faster computer with a fast hard disk drive and extra memory will yield better results.

### **2.2 Install Instruction**

Put the CD into the CD driver, it will pop out an installation wizard, just click the relevant button and follow the clue to finish the installation, and then we can use the camera.



Select the relevant language, here the language means the installation language, after installation, you can change the language interface in the menu of the software.



**Software:** Click the software button to install the microscope image processing software – **ScopelImage 9.0**. Follow the clue to finish

the installation.

**User Manual:** Click it, you can read the user manual directly.

**Reader:** If you can't open the user manual, please install the reader directly.

**Browse CD:** Click this button to browse the CD.

**Exit:** After the installation, click this button to exit and close the installation wizard.

**Attention:**

**Please choose the same USB2.0 port at the second use; otherwise you need to update your driver again to make the camera work normally.**

## 3.Start to Use ScopelImage 9.0

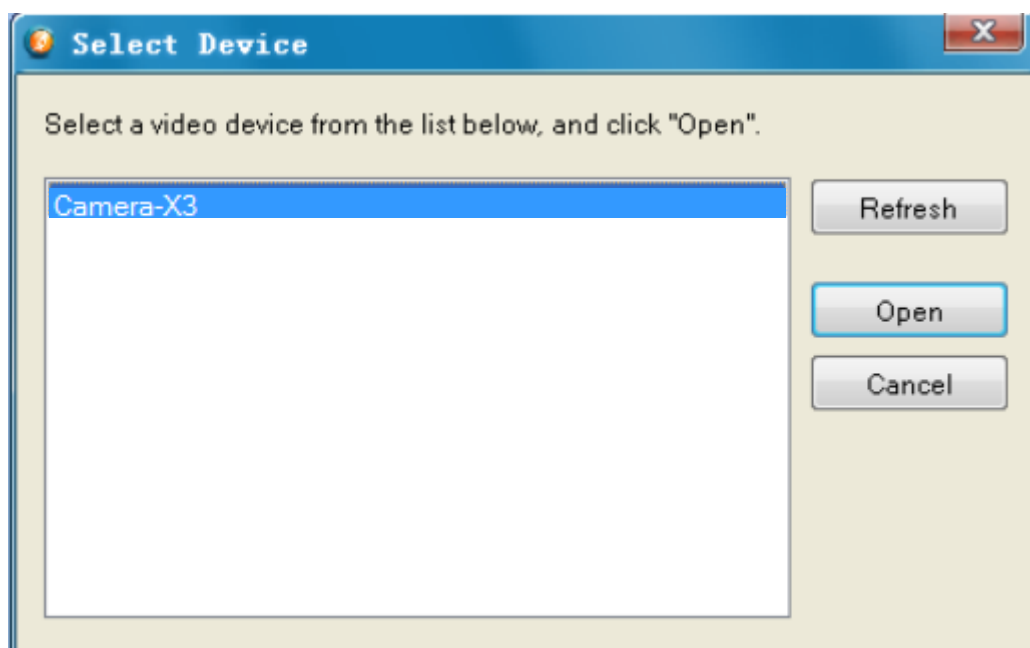
### 3.1 Start ScopelImage 9.0



Double click icon on the desktop, running ScopelImage 9.0;

### 3.2 Open the Camera

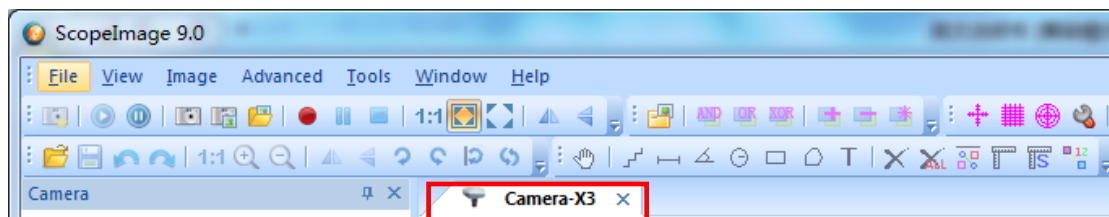
ScopelImage 9.0 will detect all cameras that your computer has installed. During starting ScopelImage 9.0 , it will automatically pop up a video equipment selection box:



All cameras' name will be included in the box. For example:

Digital camera HDCE-X3. When starting ScopelImage 9.0, it will automatically detect Camera-X3, which is the image processing device named for HDCE-X3. Then click 'open', now you can open the camera.

When you open the camera, the name of the video view in the software is matched with camera's driver name: (in the red square)





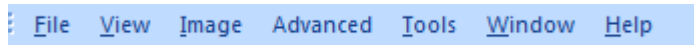
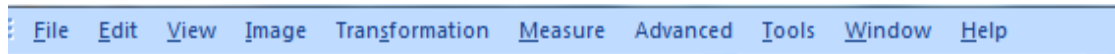



Image model menus:



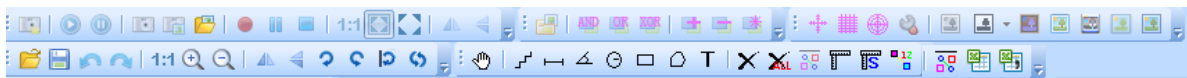
## 4.1.2 Tools Bar


ScopelImage 9.0 has five toolbars. Each toolbar can be either shown or hidden. When a toolbar is shown, it can be either docked or floating. Double-click its grip or caption to toggle between the two states. When a toolbar is docked, it can be docked to any of the four sides of the main window. Drag the grip or caption of a toolbar to adjust its position or to dock it to a particular side of the main window. The grip of a toolbar is the dot matrix at the left or top of the toolbar in docked state (  ) .

Video model tool bar:
























Image model tool bar:

















At the same time, users can custom set the tool bar on the workspace. Clicking the sign  on the right of toolbar, users can add or remove some buttons.

















Video button function:

Button	Description	Button	Description
	New preview		Flip vertical

	Preview video		Load mask image
	Pass video		Add ruler to video
	Capture		Add square to video
	Capture one frame to view		Add circle marker to video
	Open image folder		Marker setting
	Start recording		Gray
	Pass recording		Binary
	Stop recording		Negative
	Actual video size		Sharpness
	Fit to window		Emboss
	Fullscreen		Clear noise
	Flip horizontal		Equalize

### Image button function:

Button	Description	Button	Description
	Image full screen		Image flip
	Open image folder		Rotate 90
	Save captured image		Rotate 270
	Undo		Rotate 180
	Redo		Rotate any angle
	Actual image size		Move
	Zoom in		Line measure

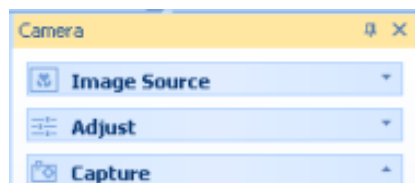
	Broken line measure		Zoom out
	Angle measure		Image mirror
	Circle measure		Rect measure
	Delete one		Polygon
	Delete all		Text annotation
	Calibration		Show/hide calibration ruler
	Measure setting		Generate measure data
	Export data to Excel		Export data to CSVfile

### 4.1.3 Control Pane

Control pane is where camera control commands are issued.

Control pane can be either docked or floating. Double-click its grip or caption bar to toggle between two states.

Camera pane can be divided into three subpanel, which are used to control the process of image formation.



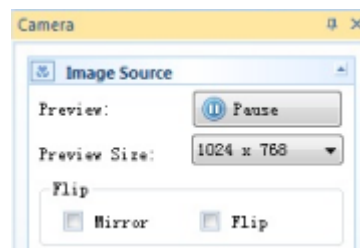
Subpanel can be shrinked. To shrink a subpanel, click the arrows at its top right corner. To expand a shrunk subpanel, click again the arrows at this. The arrows at the top left corner of a subpanel point upward in expanded state and downward in shrunk state.

If all the three subpanels have been opened, the pane will be too

long to display all the contents, so there will be two arrows at the top and the bottom of panel, put the mouse on it, the pane will expand upward or downward to display the other part contents.



Using the idler wheel of the mouse to extend the contents of the camera pane: click to select the camera pane, when it displays as yellow, roll the idler wheel to upward or downward display the contents of the camera pane.



Double click the title bar of the camera pane(the yellow part of the image above),which can turn to floating state, drag the grip or caption of the menu to adjust its position. Double click to return back.

Camera pane can close, hide and display.

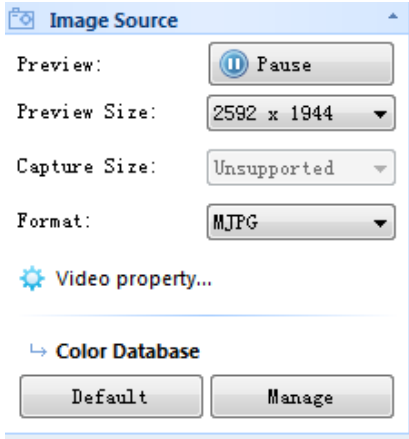

	Lock out	
	Auto hide	



When it is in hiding or hanging state, click the Camera pane or just put your mouse on it, the camera pane will display.

# 5. Image Process Modules

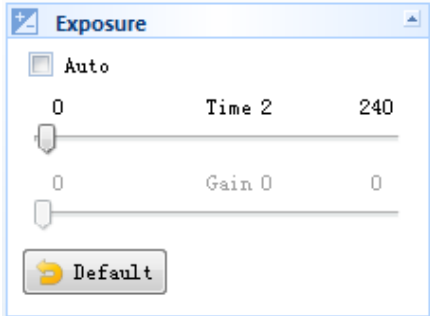
## 5.1 Video mode

### 5.1.1 Video Preview

<p><b>Control Pane</b></p> <p><b>Illustration</b></p>	
<p><b>Function State</b></p>	<ul style="list-style-type: none"> <li>◆ <b>Preview:</b> Changing-over animation and tableaux.</li> <li>◆ <b>Preview Size:</b> To change-over the preview resolution.</li> <li>◆ <b>Format:</b> There are two video formats, MJPG and YUY2.</li> <li>◆ <b>Video property:</b> Adjust the color data of video.</li> <li>◆ <b>Color Database:</b> Click “Default”, the color data of video recover to default. Click “Manage”, popup the box of color database, user can apply the saved color data, or save color data in the database.</li> </ul>
	<p>◆ When preview shows , Video picture</p>

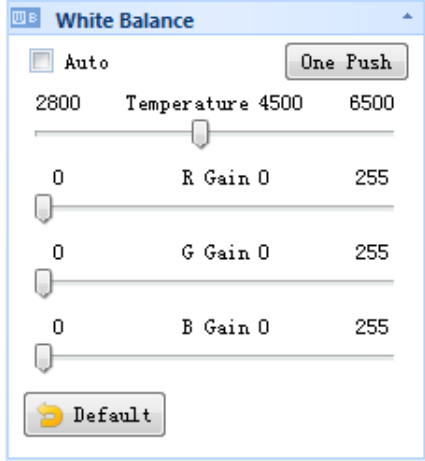
<p><b>Initialization</b></p>	<p>is animation. At this moment, you can observe some samples and sections. If you want to make a detail observation for a video picture part, click , then it will show .</p> <p>◆ <b>Configure Preview Size Combobox:</b> In order to make a full use of display's resolution, you can choose a resolution matched with displays' to preview. Furthermore, choosing an lower resolution will get a fast Video refresh rate.</p>
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### 5.1.2 Exposure

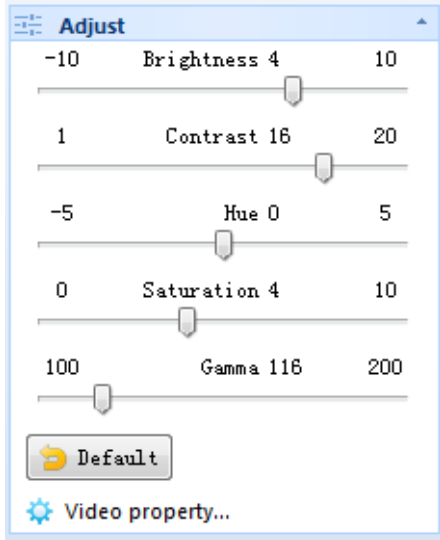
<p><b>Control Pane Illustration</b></p>	
<p><b>Function State</b></p>	<p>◆ <b>Auto Exposure:</b> Click 'Auto Exposure', the system will do auto exposure. Click again to manual exposure.</p> <p>◆ <b>Default:</b> Recovery to the default setting.</p>
<p><b>Initialization</b></p>	<p>◆ The primary user can choose Automatic Exposure mode.</p> <p>◆ When using polarizing microscope, user can cancel the mode of auto exposure, choose</p>

	manual exposure and achieve a good effect.
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### 5.1.3 White Balance

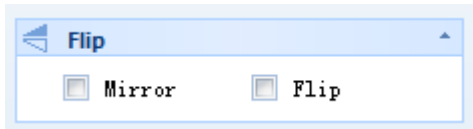
Control Pane Illustration	
Function State	<p>◆ <b>Auto</b>: Click 'Auto', the system will do auto white balance.</p> <p>◆ <b>One push</b>: make the background of video is full of white, click "one push" mode.</p> <p>◆ <b>Default</b>: Recovery to the default setting.</p>
Initialization	<p>◆ HDCE-X1, HDCE-X2, HDCE-X3, HDCE-X5 camera supports auto white balance function.</p> <p>◆ HDCE-P5 camera support one push white balance function.</p>

### 5.1.4 Video Adjustment

<p><b>Control Pane Illustration</b></p>	 <p>The screenshot shows a video adjustment interface titled 'Adjust'. It contains five horizontal sliders: 'Brightness' (range -10 to 10, value 4), 'Contrast' (range 1 to 20, value 16), 'Hue' (range -5 to 5, value 0), 'Saturation' (range 0 to 10, value 4), and 'Gamma' (range 100 to 200, value 116). Below the sliders is a 'Default' button with a circular arrow icon and a 'Video property...' link with a gear icon.</p>
<p><b>Function State</b></p>	<ul style="list-style-type: none"> <li>◆ <b>Brightness</b>: Adjust the brightness value of the video.</li> <li>◆ <b>Contrast</b>: Adjust the contrast value of the video.</li> <li>◆ <b>Hue</b>: Adjust the hue value of the video.</li> <li>◆ <b>Saturation</b>: Adjust the saturation value of the video.</li> <li>◆ <b>Gamma</b>: Adjust the gamma value of the video.</li> <li>◆ <b>Default</b>: Recovery to the default setting.</li> </ul>
	<ul style="list-style-type: none"> <li>◆ <b>Brightness</b>: Increase or decrease the brightness of the current video .</li> <li>◆ <b>Saturation</b>: Adjust the saturation of the camera. Saturation is a measurement of a color's pureness and brilliance.</li> </ul>

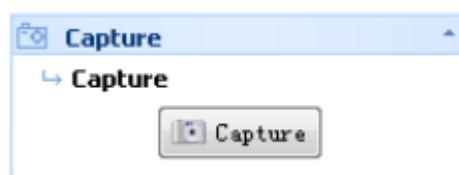
Initialization	<p>◆ <b>Gamma</b>: Adjust the gamma of the camera. Gamma is an image quality enhancement function that offers a richer image by brightening the darker portions of the image without altering the brightness of the brighter portions.</p>
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### 5.1.5 Flip

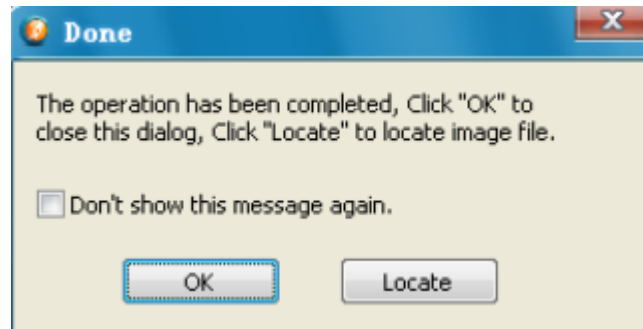
Control Pane Illustration	
Function Stat	<p>◆ <b>Flip</b>: Video picture flip consists of Mirror and flip</p>
Initialization	<p>◆ Configure flip: Select “Mirror”, video picture will flip horizontal. Select “Flip”, video picture will flip vertical.</p>

### 5.1.6 Video capture

Control Pane Illustration:

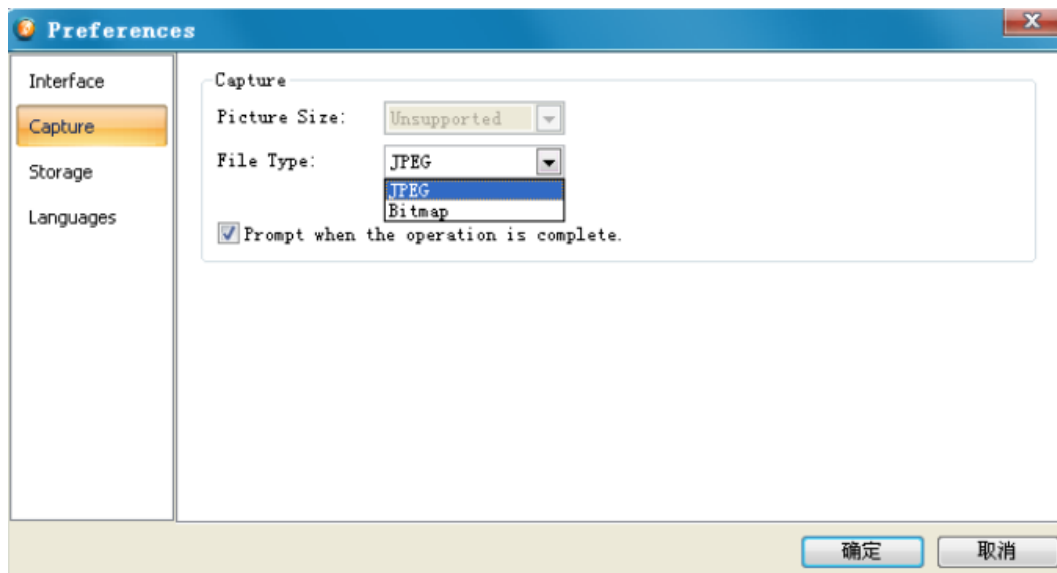


**Capture**: Click ‘Capture’, you can capture a picture, which size is same to default resolution. Then pop up a box:



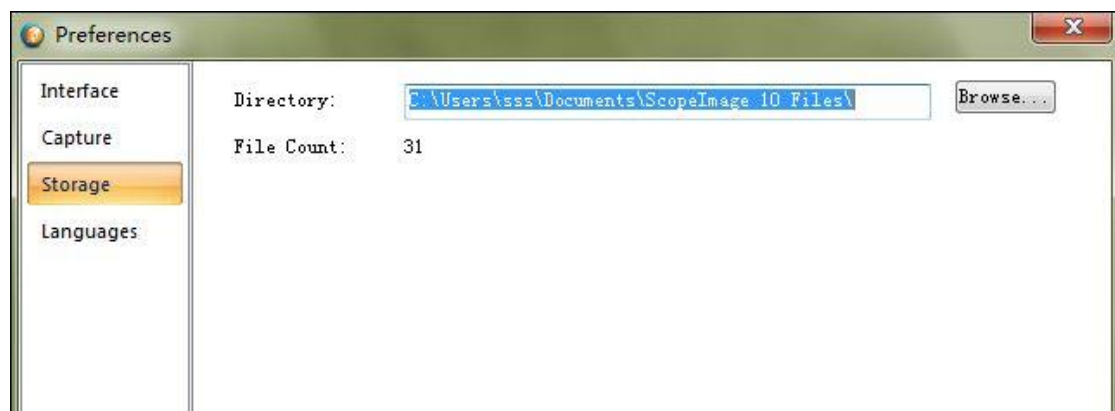
Click 'OK', software will save this picture to a default folder. Click 'Image Locating', software will open the default folder.

Changing picture's type: Click '⚙️ Video property...' pop up a box:



You can choose file types: bmp and jpg.

Changing path:

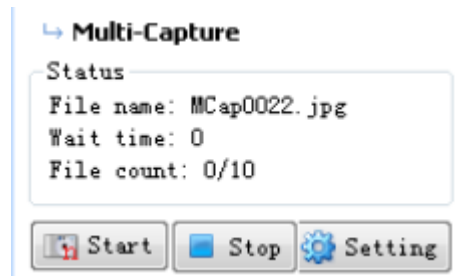


Click 'Browse' , choose the path that you want to save picture, then

click 'OK'.

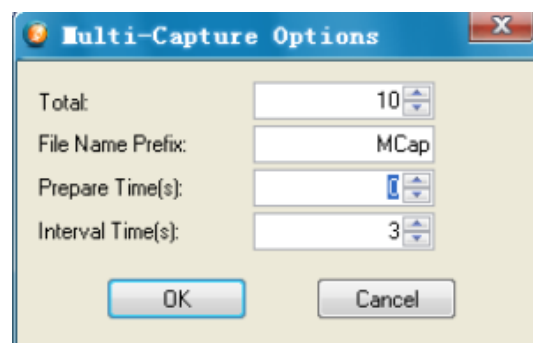
## 2.Multi-Capture

Control Pane Illustration:



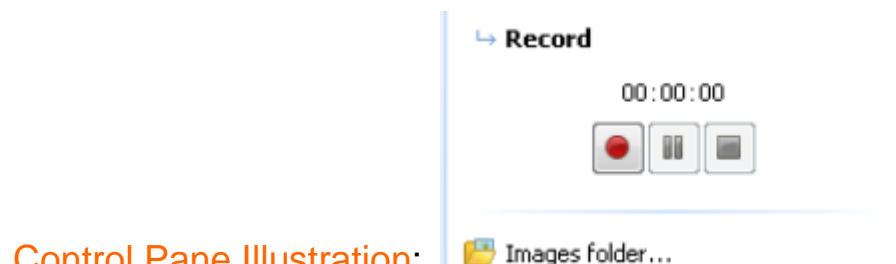
**Multi-Capture:** Click 'Start', software will start to capture some pictures. Click 'Stop', software will finish it.

**Configure Multi-Capture:** Click 'Setting', pop up a box:



You can finish the configuration of Multi-Capture.

## 3.Record Video



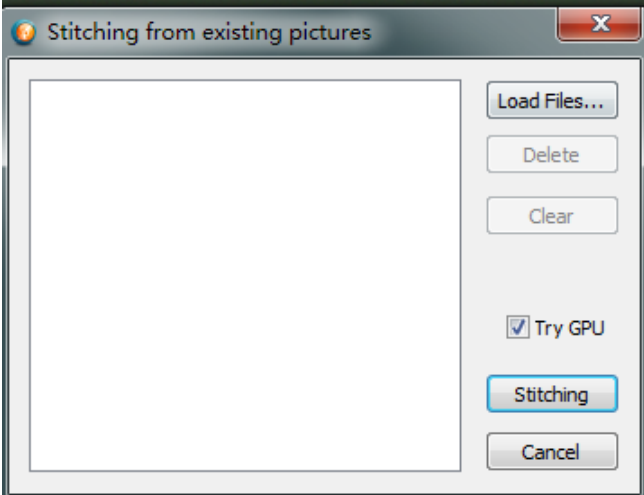
Control Pane Illustration:

**Record:** Click button 'Start', it will start to record. Click button 'Pause', it will pause. Click button 'Stop', it will stop recording.

**Save record:** Click button 'Images folder...', you can open the image

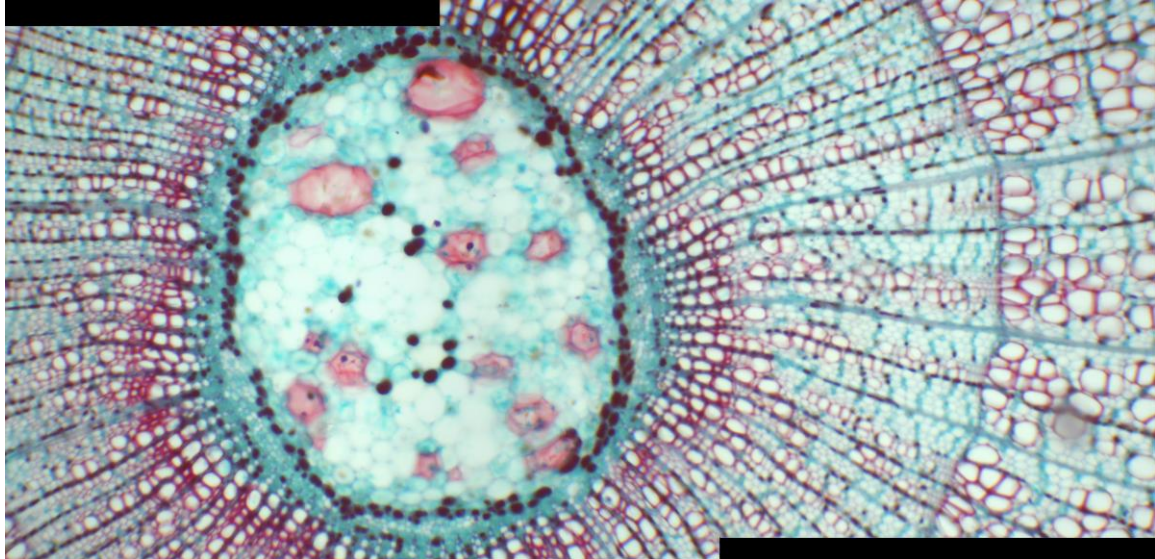
folder. There are many pictures and records in this folder.

### 5.1.7 Image Stitching Tool

<p><b>Control Pane Illustration</b></p>	
<p><b>Function State</b></p>	<ul style="list-style-type: none"> <li>◆ Make the image clear.</li> <li>◆ Make sure that the image brightness will not change significantly.</li> <li>◆ Click capture button and then move the sample forward along a direction, save these images to specified path.</li> <li>◆ choose "Advanced"-&gt;"Stitching" on the menu bar and pop up a box. Then click "Load files" and choose the images you have captured, click "Stitching". After a while, a stitched image will be generated in a new window.</li> </ul>
<p><b>Initialization</b></p>	<ul style="list-style-type: none"> <li>◆ Each moving distance should not exceed 75% of window content, which means that there should have 25% overlap region between every 2 adjacent</li> </ul>

images.

A picture of jointing:

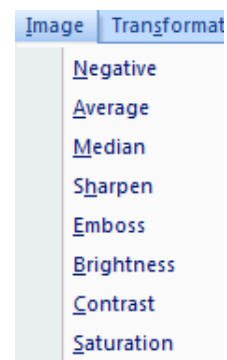


## 5.2 Image mode

### 5.2.1 Image Process

**Notice:** Only processing the pictures that have been captured.

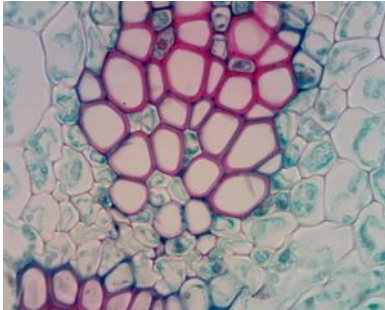
Project	Description
Negative	Color reversal, can turn a positive image to a negative image, or turn a negative image back to a positive image. A negative image performing higher contrast and higher color saturation.
Average	Do average filter to the image, to



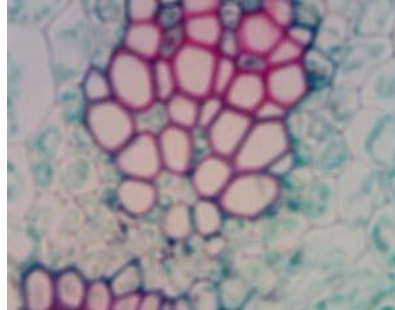
	clear the image noise.
<b>Median</b>	Do mediate filter to the image, the median filter is much better at preserving sharp edges than the average filter.
<b>Sharpen</b>	All digital photographs lose a certain amount of sharpness. That means that most photographs will look a bit blurred and their details won't be as prominent. Basically, sharpening makes the edges of a photographed object appear most distinct.
<b>Emboss</b>	The Emboss filter makes a selection appear raised or stamped by suppressing the color within the selection and tracing its edges with black.
<b>Brightness</b>	Change the brightness of the image.
<b>Contrast</b>	Change the contrast of the image.

## Saturation

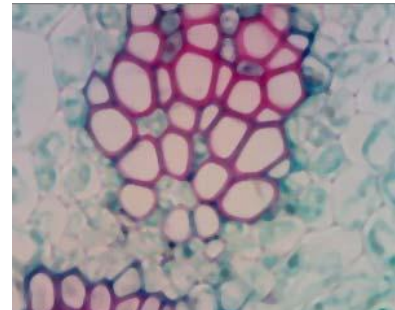
Change the saturation of the image.



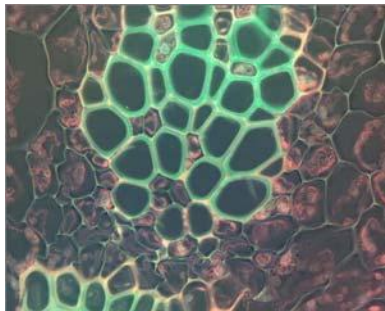
Original



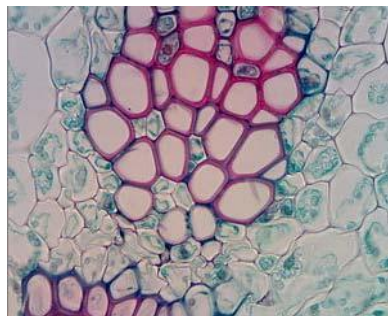
Average



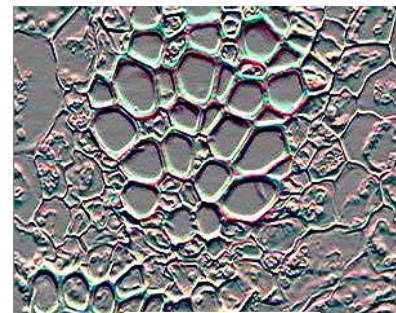
Median



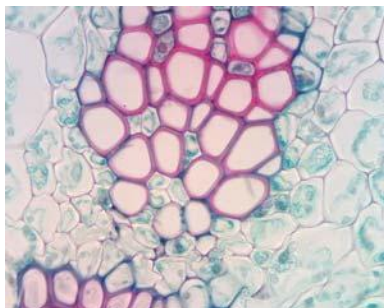
Invert



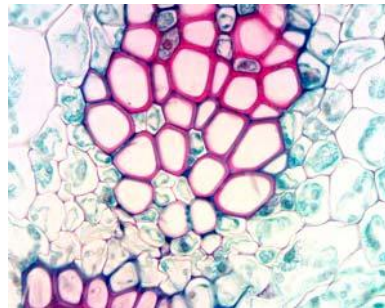
Sharpen



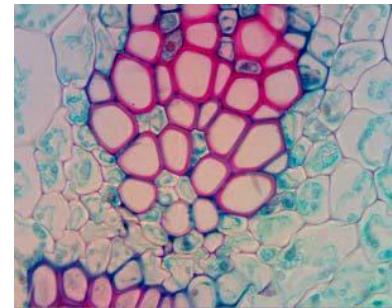
Emboss



Brightness












Contrast



Saturation

## 5.2.2 Image Flip


Icon	Project	Description
	Image mirror	Image flip horizontal

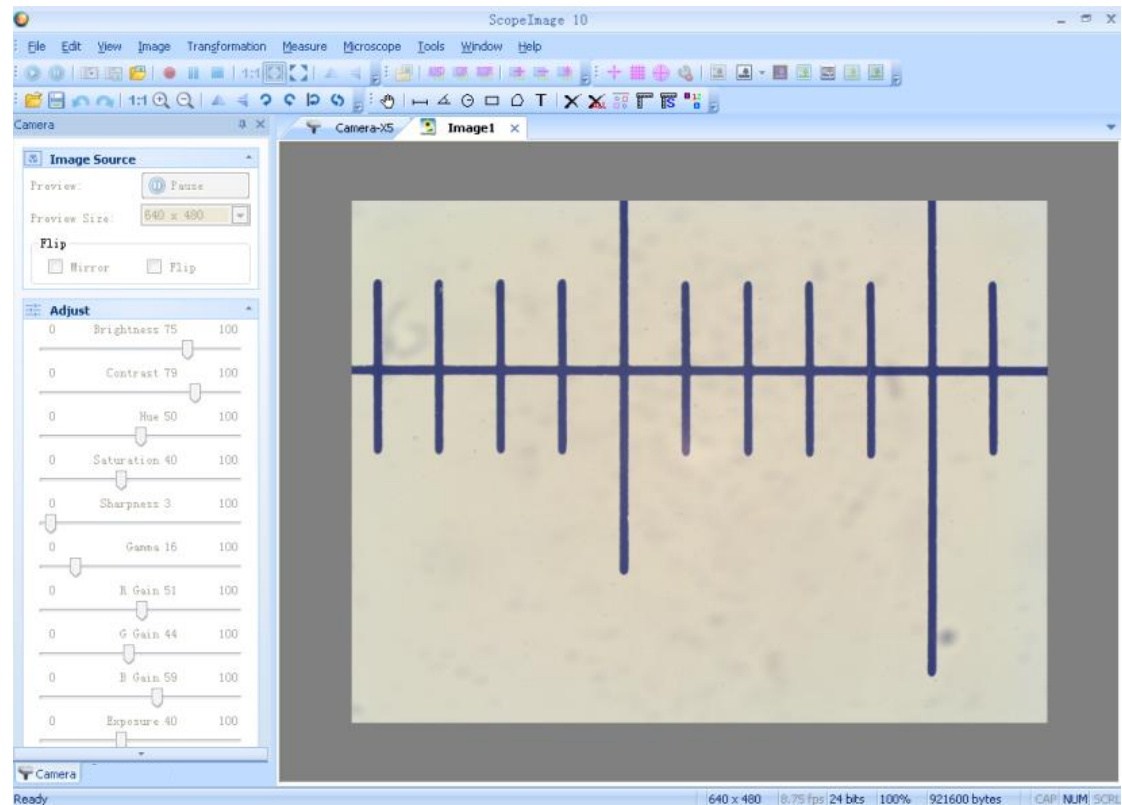
	Image flip	Image flip vertical
	Retort 90 degree	Retort 90 degree of the image
	Retort 180 degree	Retort 180 degree of the image
	Retort 270 degree	Retort 270 degree of the image
	Retort any degree	Retort any angle of degree of the image
	Zoom in	Magnify display the image
	Zoom out	Reduce display the image
	1 : 1	Actual image size




### 5.2.3 Image Calibration

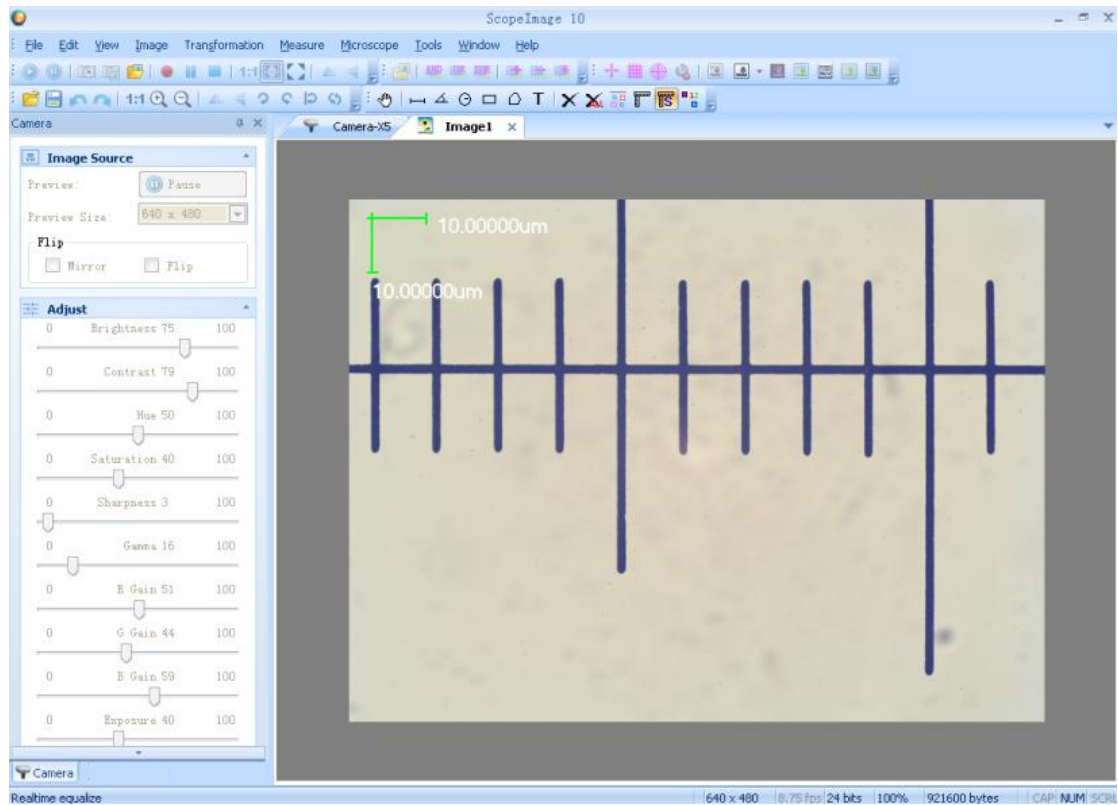
The system micrometer consists of the sampling intervals in horizontal and vertical directions. In the calibration process both of the two sampling intervals should be calculated as there's tolerance error between the two directions.



Here shows the calibration under 10X object lens for an example.

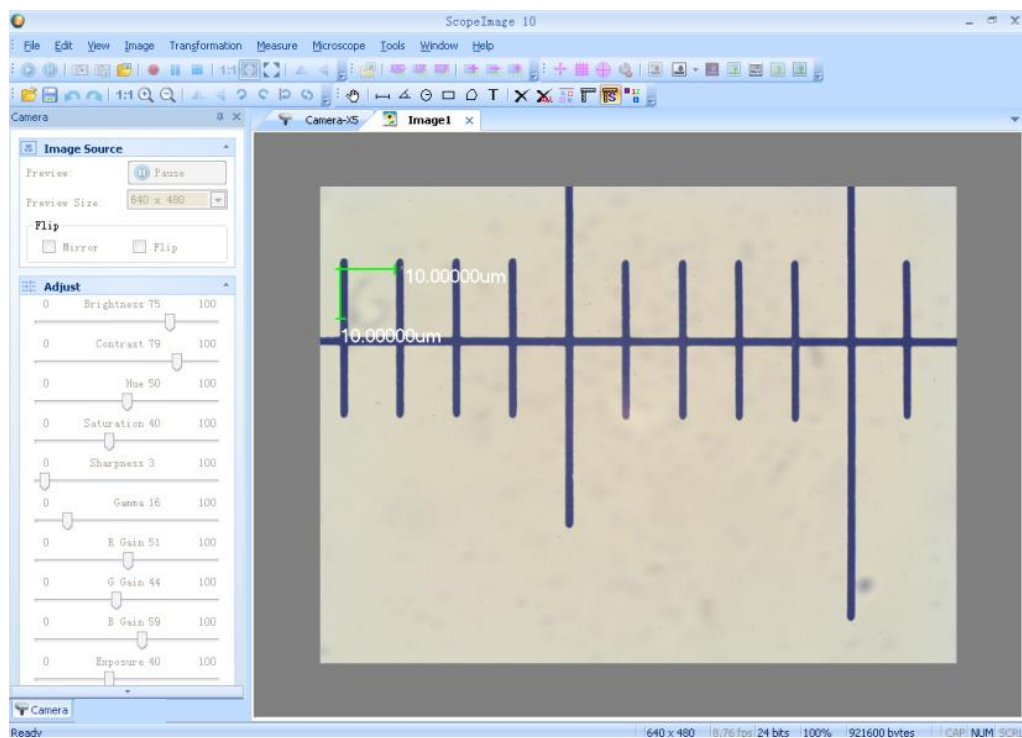
1. For the calibration can only do to the static image, we should take a picture first, put the 0.1mm micro-ruler in the video window, adjust to display clear, then turn around the camera, make the active images parallel to the horizontal line, and click the button  on the tools bar to capture a frame to the field, as the picture shows below.




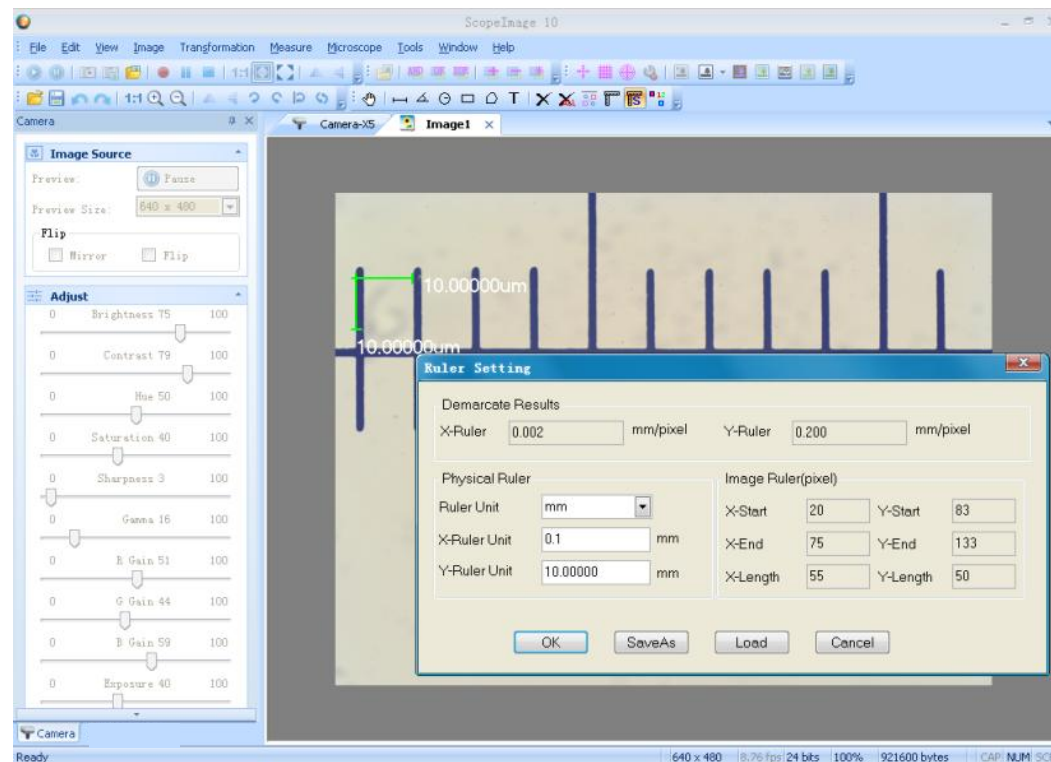
2. In the image field, click the button  to move the scale, you can also click the  or  button to magnify or reduce the current image in order to convenient the calibration. Here shows the calibration result when it is reduced to 50%.



3. Click the icon  to display the calibration scale, click the icon  to move the scale to the right position, confirm the begin point and the end point, as the picture shows below.




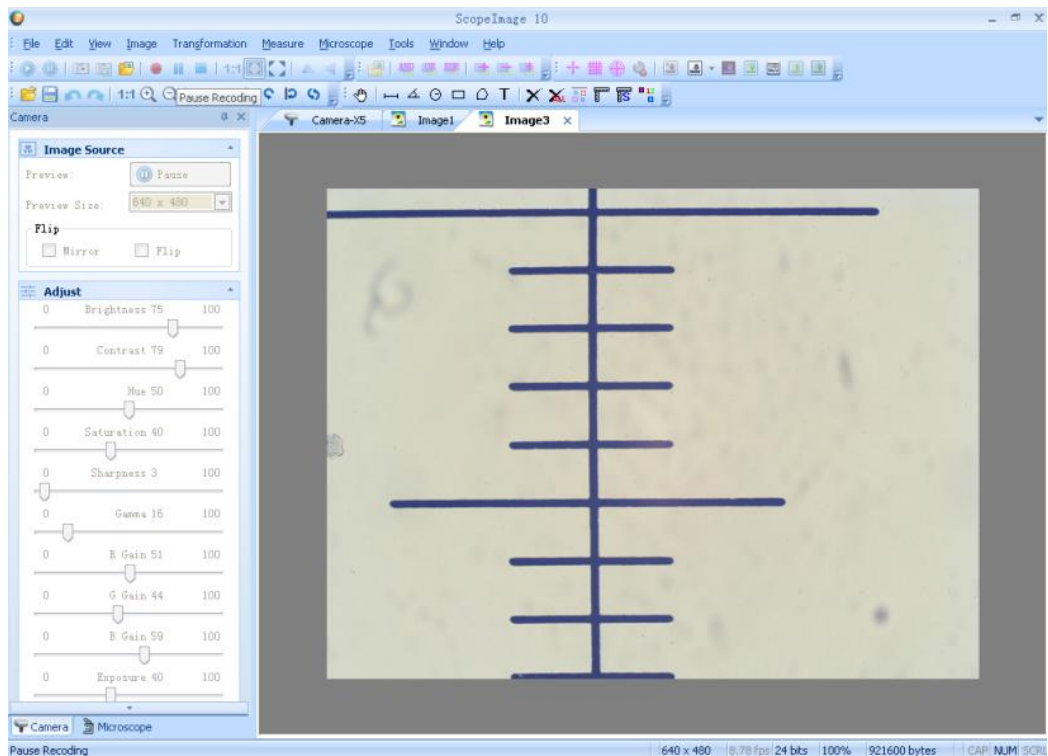
4. Click the calibration icon  to set the 'X-Ruler Unit', input the actual length 0.1um, and click the button 'Save As' to save the calibration for X axis.




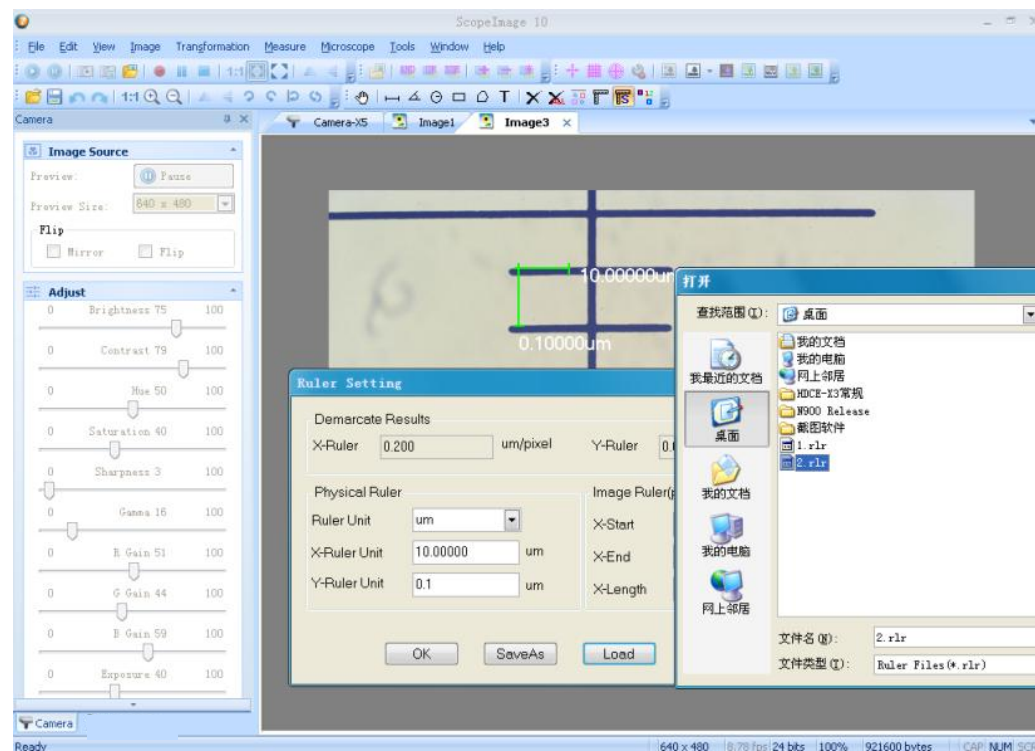
5. Click input a calibration file name on the box, and click 'save' to save it, then click 'OK' to exit, now we have finished the calibration for the X axis.

### **The calibration for Y axis is as follows.**

6. The calibration for the Y axis is similar to the X axis. First, we turn around the camera to make the micro ruler vertical to the horizontal line, click the button  on the tools bar to capture a frame to the field, as the picture shows below.

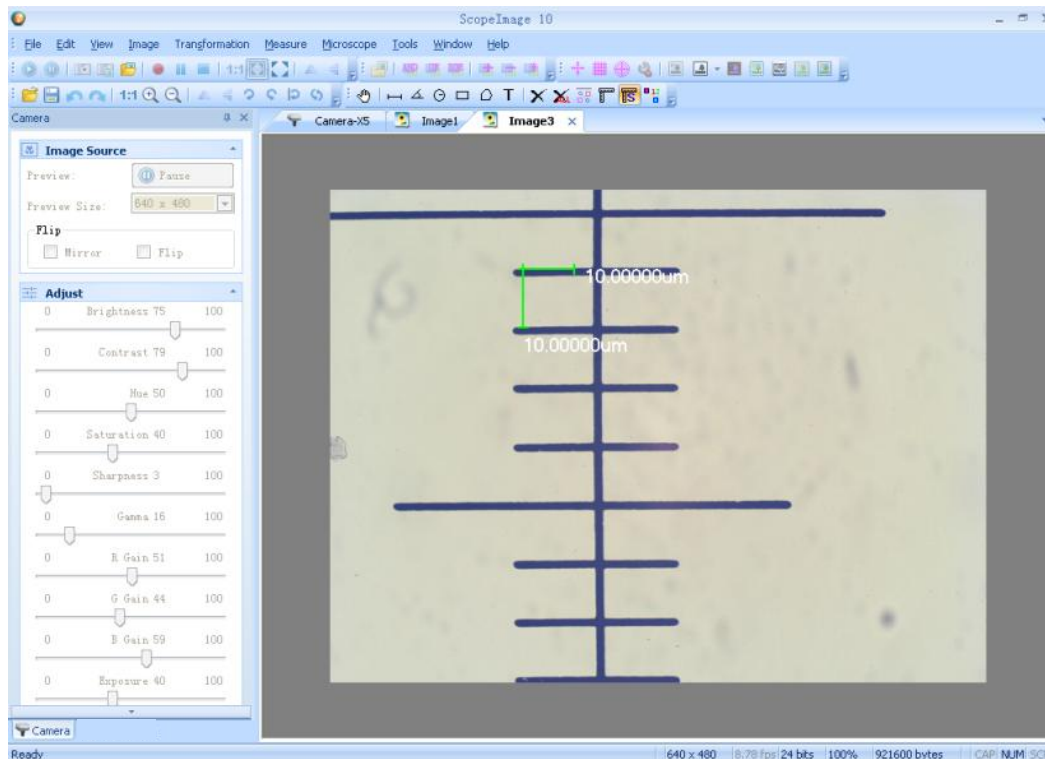



7. Click the calibration icon  on the tools bar, then click 'Load' button, and select the file of calibration for X axis we have just done, click "Open".

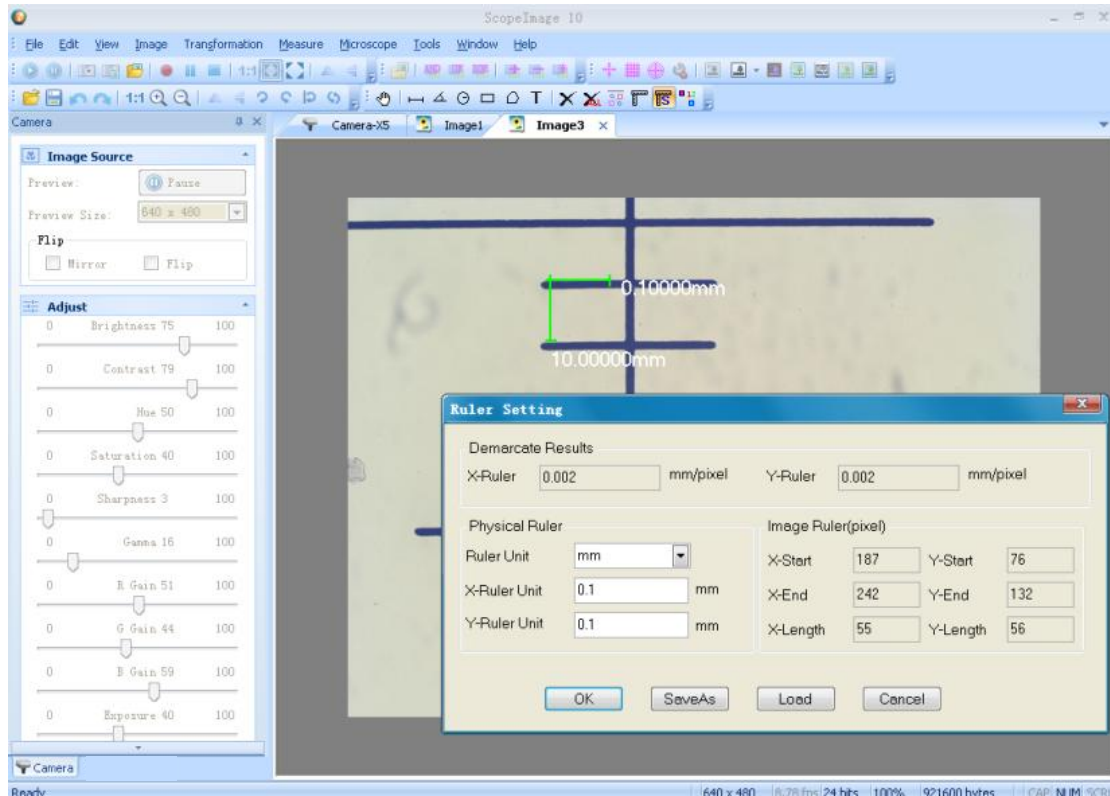


8. Now we keep the X axis don't move, and do calibration to the Y

axis, move the scale to the right position, confirm the begin and the end point.



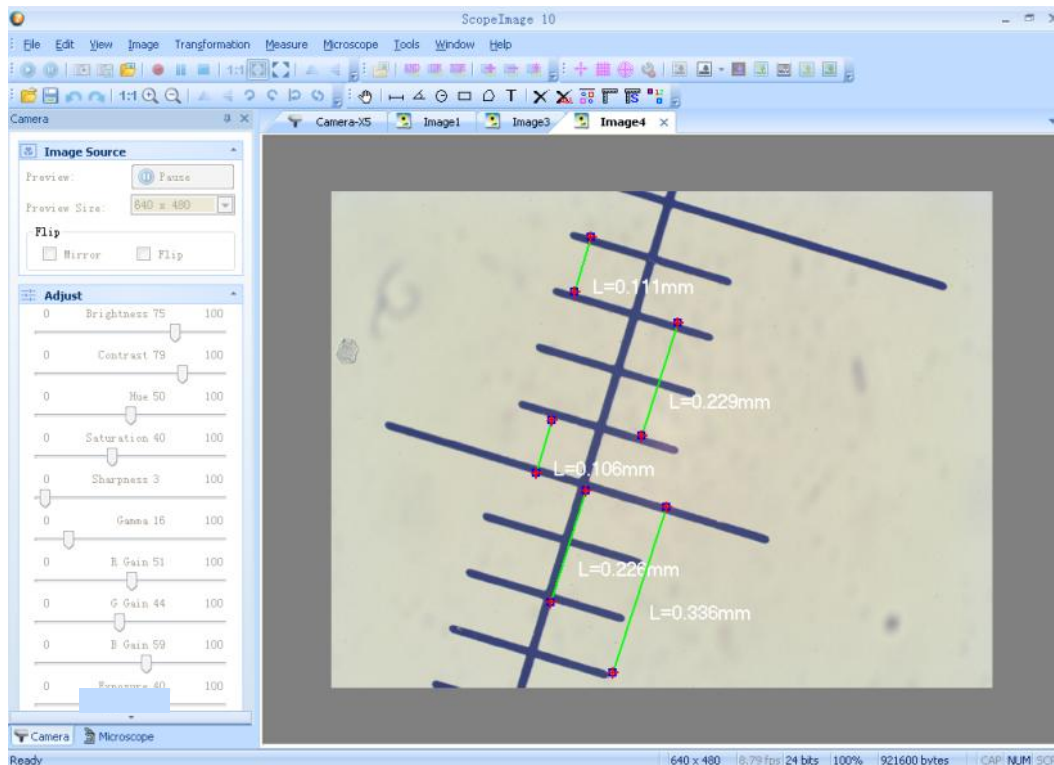
9. Click the icon , input the actual length in the 'Y-Ruler Unit', and click 'save' to save the calibration result for further using. Click 'OK' to exit, now we have finished the calibration for both X axis and Y axis, and we can find that there is a little difference between them.



### Check the calibration result:

The calibration has been finished, now we check it.


Use the micro ruler, and capture a frame to the field, load the calibrations we have just done, and do line measure, as the picture below:






We can find the measurement is close to the actual length, take the tolerance error for account, the measurement result is right.





## 5.2.4 Image Measurement




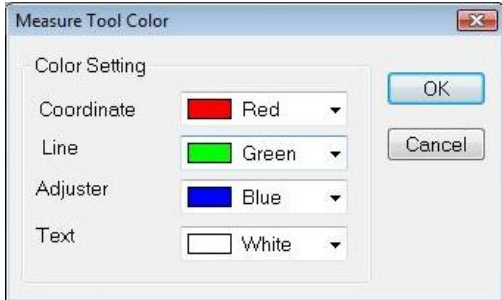
The system support several measure tools, as the line, circle, rectangle, angle and so on. The measure result can real time display on the image and can be merged and save for further using. The function is equivalent to the commands under the Measure menu.

Icon	Function	Function Introduction
	Move	Move or adjust the objects, containing line, angle, circle, and rectangle.

	<p><b>Line</b></p>	<p>Add line objects.</p> <p>Each line object is defined by two endpoints. Press left mouse button to specify one of the endpoints. Move the mouse to the other endpoint, while keeping the left mouse button pressed, to draw the line. Release the left mouse button to complete the line drawing.</p> <p>The above procedure may be repeated to create more lines.</p> <p>A line object has two resizing handles, located at the two endpoints.</p> <p>The length of the line will appear over the image at the same time.</p>
	<p><b>Angle</b></p>	<p>Use the <i>Angle</i> command to measure angles.</p> <p>Click to specify three controlling points.</p> <p>The angle made by the line passing through the 1st and the 2nd point, and the line passing the 2nd and 3rd point, will be measured.</p> <p>The degree of the angle will appear over</p>

		the image at the same time.
	<b>Circle</b>	<p>Click to specify two controlling points. The 1st point as the center of the circle, move the mouse to the 2nd point while keeping left mouse button pressed to draw the circle. Release left mouse button to complete the creation of this circle. The line between the 1st and the 2nd point as the radius.</p> <p>Repeat the procedure above to add more circle objects.</p> <p>Drag the handles at the corners to adjust the size of the circle simultaneously. Drag anywhere else within the circle to move the circle object.</p> <p>The area and radius of the circle will appear over the image at the same time.</p>

	<b>Rectangle</b>	<p>Each rectangle is specified by two diagonal vertices. Press down left mouse button to specify one vertex. Move the mouse to the other vertex while keeping left mouse button pressed to draw the rectangle. Release left mouse button to complete the creation of this rectangle. Repeat the procedure above to add more rectangle objects.</p> <p>A rectangle object has four resizing handles. Drag the handles at the four corners to adjust width and height of the rectangle simultaneously. Drag anywhere else within the rectangle to move the rectangle object.</p> <p>The area of the rectangle will appear over the image at the same time.</p>
	<b>Delete one</b>	<p>Use the <i>Delete one</i> command to remove the selected object on the image.</p>
	<b>Delete All</b>	<p>Use the Delete All command to clear all the objects on the image.</p>
	<b>Generate</b>	<p>This command will clear background</p>

	measurement data	image, and generate an image that just will the measurement marker.
	Calibration	<p>The system micrometer consists of the sampling intervals in horizontal and vertical directions. In the calibration process both of the two sampling intervals should be calculated.</p> <p><b>IMPORTANT!!!</b></p> <p>Calibration should be done on an image before measuring.</p>
	Show/hide calibration ruler	Click this button to show the calibration ruler, click again to hide it.
	Measure setting	<p>Set the color of the coordinate, line, adjuster and text,</p> 

**Ruler Setting**

Demarcate Results

X-Ruler: 0.200 um/pixel      Y-Ruler: 0.200 um/pixel

Physical Ruler

Ruler Unit: um

X-Ruler Unit: 10.00000 um

Y-Ruler Unit: 10.00000 um

Image Ruler(pixel)

X-Start: 50      Y-Start: 50

X-End: 100      Y-End: 100




X-Lenth: 50      Y-Lenth: 50

OK      SaveAs      Load      Cancel

## 5.2.5 The measurement data processing

The data of measuring can be enrolled in the table.

Measurement results list								
Index	Center	Radius	Width	Height	Area	Perimeter	Length	
1	(169, 84)						10.385 um	
2	(360, 163)						1.720 um	
3	(217, 196)						16.201 um	

	Click it, you can export the data to Microsoft Excel or CSV file.
	Click it, you can hidden the measurement result list.
	Click it, you can close the measurement result list.

# 6.TroubleShooting

## 6.1 Attention

1. Can not record or record error. Please check whether you have installed the 'Video Codec'



wmv9VCMsetup.exe  
Windows Media Vi...  
Microsoft Corpor...

in the CD.

2. USB2.0 is a mandatory, not optional. This camera cannot work on the computers with USB1.1 ports. In order to ensure the stability of the connection with the USB2.0 interfaces, please insert the plug into those interfaces in the back panel the mainframe.



3. Please use the same USB2.0 port every time. Using on a different USB2.0 port may need to reinstall the driver again to make the camera work. Refer to the next chapter to reinstall the driver.
4. Please unplug the USB cable from the computer immediately after using. It will shorten the lifetime of the camera, sometimes may cause repair service if the camera is plugged in the computer all the time and you do not shut down the computer for a long time.