

User Manual

(Digital Camera & Digital Microscope)

2008.08

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Thank you for purchasing our microscope product. To avoid any misuse and damage, please read the operation instruction carefully before operation. This is a color USB2.0 digital image system that captures microscope images and displays real-time live video on your PC screen. It comes with a high-resolution digital camera, built-in reduction lens, user-friendly software, and adapters for all sizes of microscopes.

1. Introduction

Specification

Parameter	Typical Value
Optical format	1/2-inch (4:3)
Active imager size	6.55mm(H) × 4.92mm(V) 8.19 (Diagonal)
Active pixels	2048H × 1536V
Pixel size	3.2 μ m × 3.2 μ m
Shutter type	Global reset release (GRR), electronic rolling shutter (ERS)
Image Format Frame rate	6 fps @ 2048×1536
Sensitivity	>1.0 V/lux-sec (550nm)
Dynamic range	61dB
SNR	43dB
Image Output	USB2.0, Directshow and Twain
Operating System	Windows 2000/XP/Vista

- With High Resolution chip(3.0M),Providing High Quality Image and Widely Used in Academic and Medical Field for High Precision and Resolution Image Capturing and Processing;
- Very convenient to Use, just insert it into Eyepiece Tube or Top Tube of Trinocular Head;
- By USB2.0, getting Real-time and Non-compressing Video Data and Capturing Image Directly;

2. Installation Instruction

2.1 Minimum System Requirements

System Requirements

- Operating System Windows 2000, XP or Windows Vista
- DirectX 9.0 or higher (for Windows 2000)
- 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 Common sense about hardware and software

Here introduce the basic sense of digital camera. Generally speaking, it includes two sections: one is the hardware **driver**; the other is the software **application**.

The driver is combining with the hardware (the chip of the digital camera) closely. The computer can operate the hardware, only when it has installed the right driver. Say in brief, it's the question of can and can not.

The application, as we know the ScopelImage Plus, ScopelImage Advanced and so on. These applications perform the task that the users need; it's the question of how to operate.

Connect the Camera to the Computer

Connect USB devices to a computer while the computer is turned on. This "hot plug" capability is a convenient feature of USB products. To connect the camera to a computer, do as follows: Plug one end of the USB cable to an open USB port on your computer, and the other end to the camera. When you connect it rightly, the computer's Operating System should recognize it, and pops up a found new hardware dialog. The camera's RED LED should on. Please follow the clue to install the hardware and software of the camera device.



Attention:

Please use the same USB2.0 port; otherwise you need to update your driver again to make the camera work normally. And refer to the chapter 3 to update the driver.

Before installation

Follow the CD to setup the hardware and software of the Camera, and the image processing software 'ScopelImage Plus'. **Please link the digital microscope to the computer with the USB2.0 cable before you run the setup.**

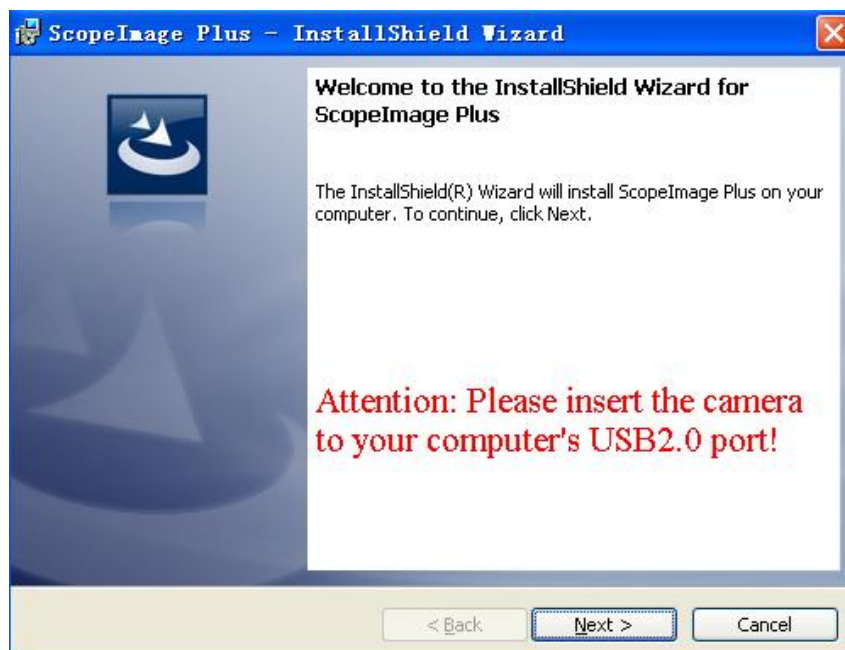
There're a few differences among the camera installation in Windows XP, Vista and 2000, here shows the introduction in Windows XP for an example.

2.3 Install Introduction for Windows XP

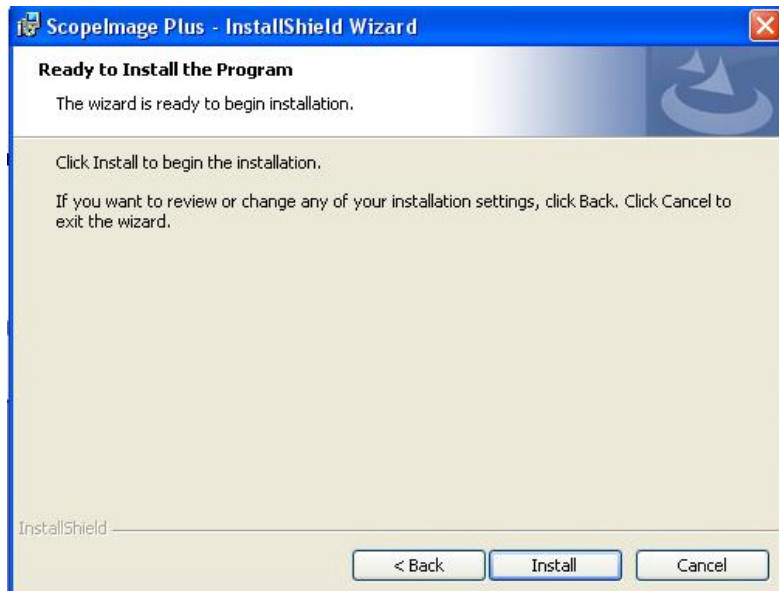
1. The system finds new hardware, and comes out New Hardware Wizard dialog. Please click "Cancel".



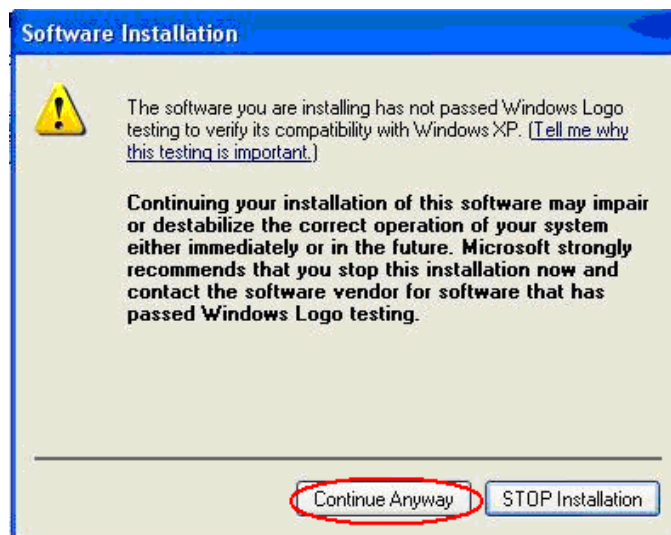
2. Double click the 'HDCE-30A Setup (En).exe' in the CD. The wizard will lead you to install **both the hardware and software**, after the installation, you can use the camera. Please follow the clue to install it.



3. Click 'next'.



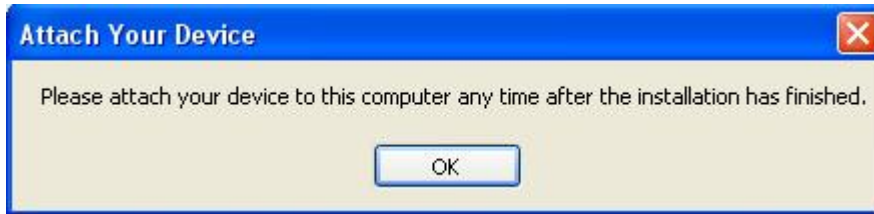
4. Click Install



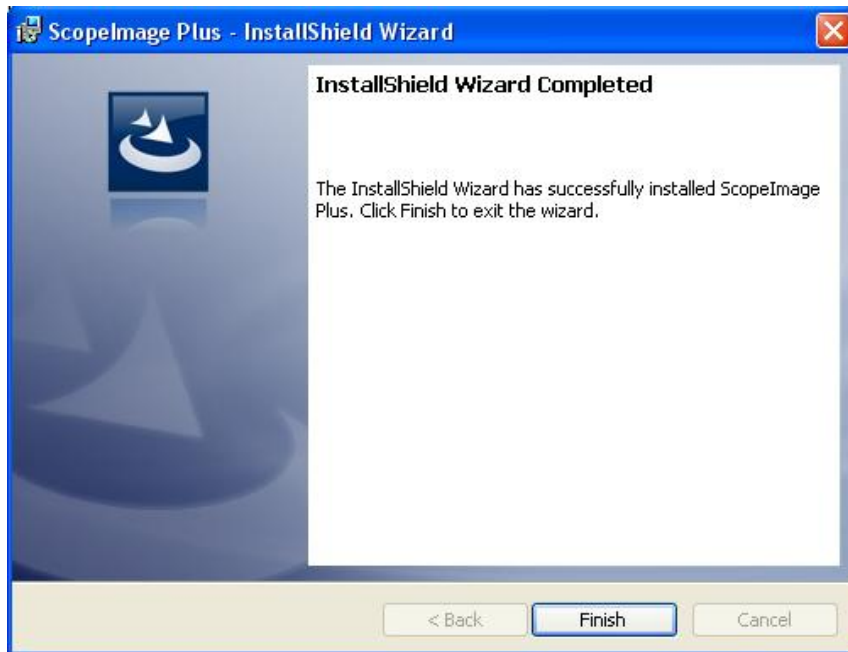
5. Software Installation. Just click 'Continue Anyway', Windows will continue the installation.



6. Hardware Installation. When your camera is linked, there will come out the dialog as above, just click 'Continue Anyway' to continue the installation.




7. **Attention:** If you have not attached your camera to your computer before the installation, there will come out a dialog telling you to attach your device. Click 'OK'



8. Click 'Finish', installation has been completed.

If there comes out the error dialog when you launch the application

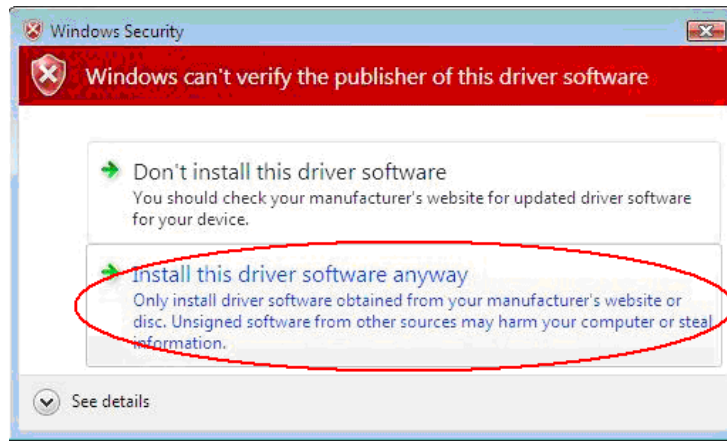


Please Install the  `vcredist_x86.exe` under the folder 'ActiveX'.
IExpress Setup
Microsoft Corpor...

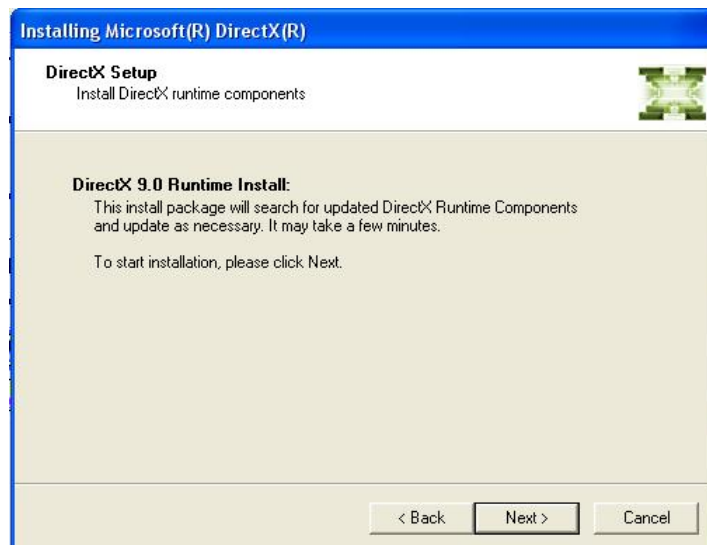
You'd better restart your computer to make the new device work rightly.

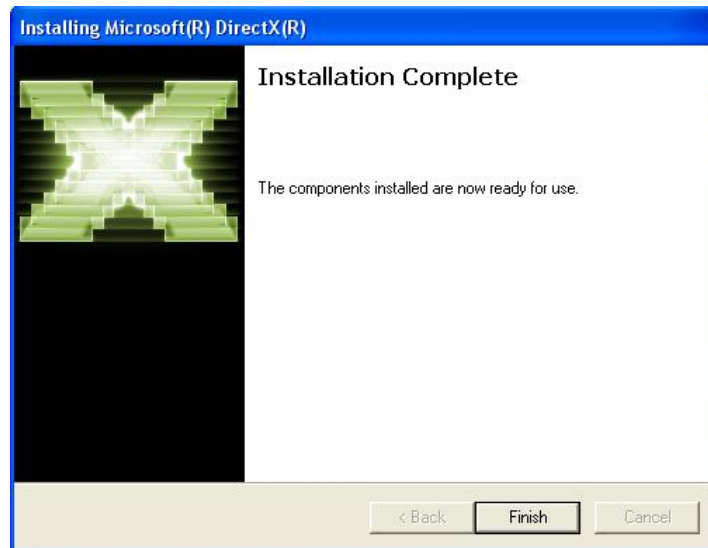
2.4 Attention in Windows Vista and Windows 2000

In the Windows Vista System, there will come out a warning dialog telling 'An unidentified program wants access to your computer', please click 'Allow'. And at the windows security dialog, please click 'Install this driver software Anyway'.

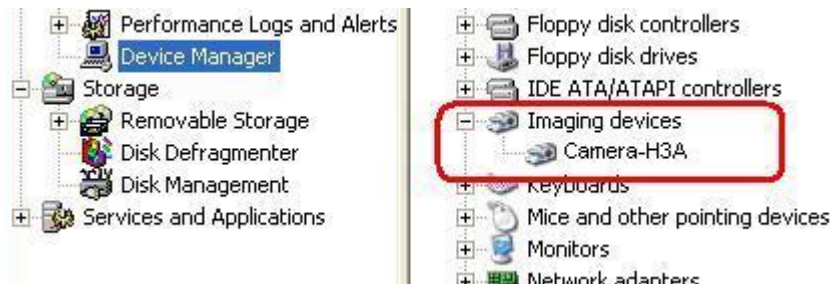


In the Windows 2000 System, you need to install DirectX9.0 to obtain better picture quality. Double click the document dxsetup.exe in the folder "DirectX9.0", run the DirectX installation



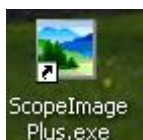


You'd better restart your computer to make the new device work rightly. And you can check it bellow the **“Imaging Devices”** in **“Device Manager / Hardware”**. Then you can use the camera to preview the images.



2.5 Check whether the device is rightly installed

(1). After the installation, there will be a quick launch icon on the desktop, as follows:



(2). Check the Start->ScopeImage Plus as Fig 2.4.1

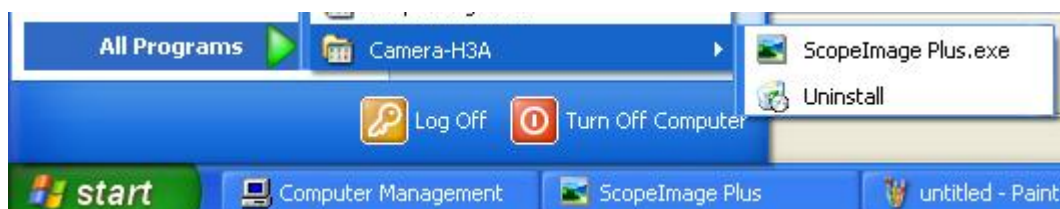


Fig 2.4.1

(3). Check the hardware driver, whether there an **“Imaging Devices”** **Camera-H3A** in **“Device Manager / Hardware”**, as Fig 2.4.2 (Make sure the camera is linked with the computer, and the camera's red LED is on, when you check the hardware driver.)

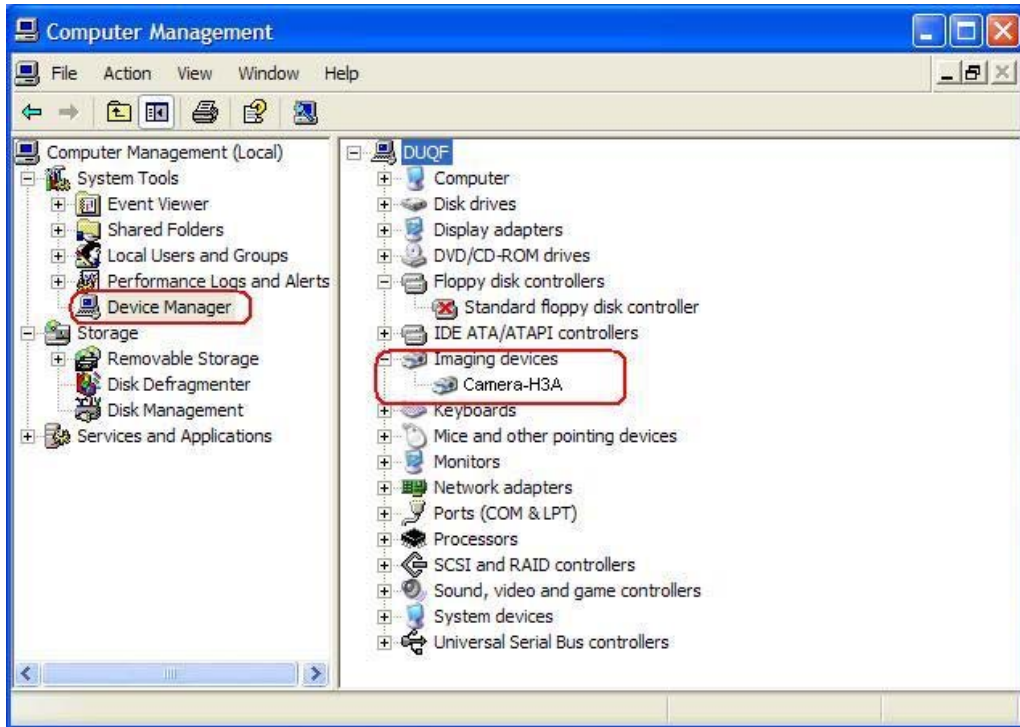
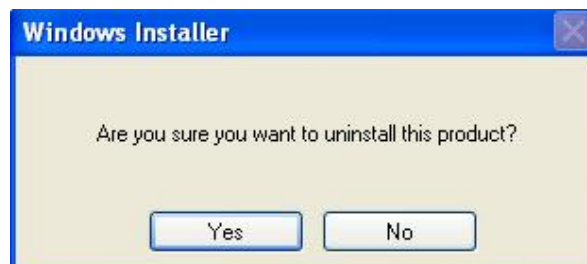


Fig 2.4.2

Note: If there's **no imaging device** in the device manager, or there's a **yellow warning symbol** before the imaging device "Camera-H3A", it means you have not installed the hardware device rightly, and you need to update the driver, please refer to the chapter "3 How to update the driver" to reinstall the driver.

2.6 Uninstall

Click Start->Program->ScopeImage Plus ->Uninstall.exe, and follow the clue to uninstall it.



Click "yes", the hardware and software will both be uninstalled.

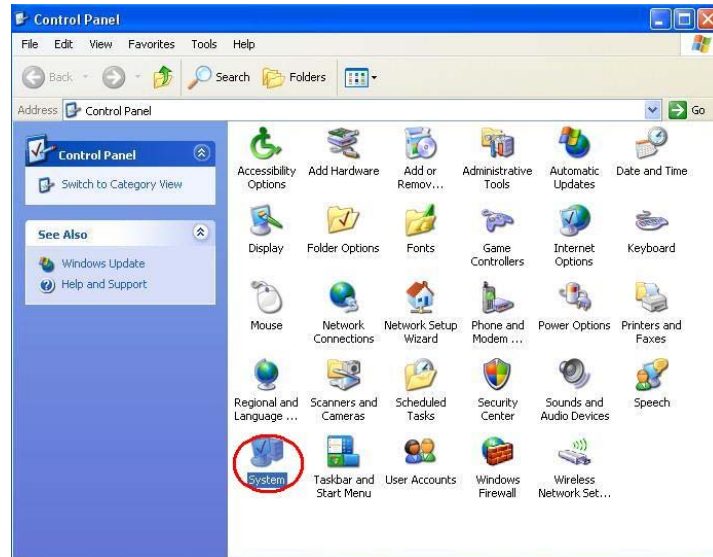
3. How to update the driver

If the camera does not work, or it conflict with other hardware of your computer, you need to update the driver. (Make sure you have run the setup before.) Or you can also uninstall it first, and then reinstall it again.

There are two ways to update the driver, please do as follows:

1, **Plug and unplug the camera, or try another USB2.0 port, then the system will comes out found new hardware wizard.**

2, Go to Control Panel, as follows:

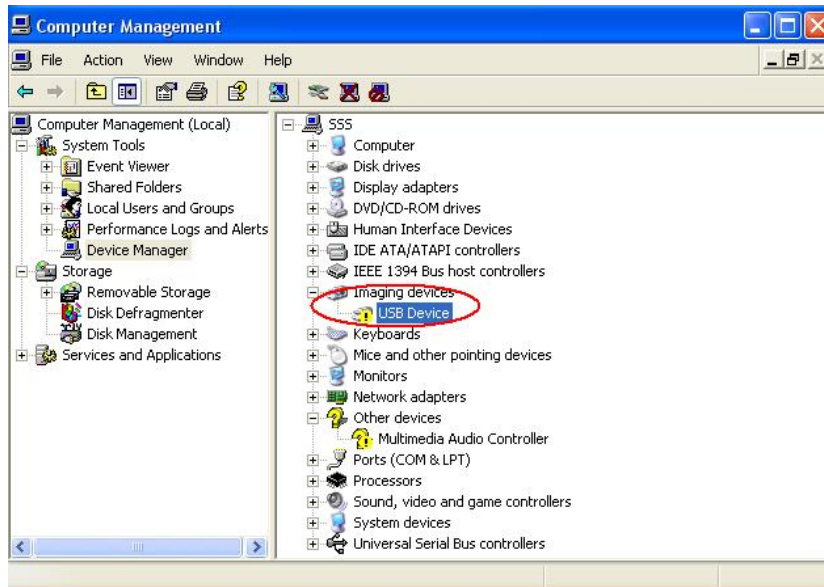


(1) Access Windows Control Panel. Double click 'System'

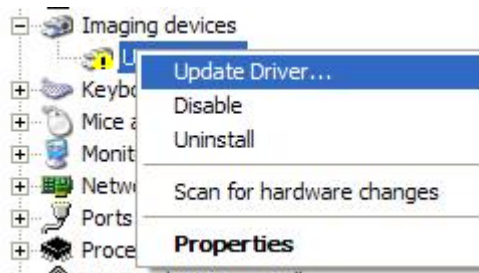


(2) Select Device Manager.

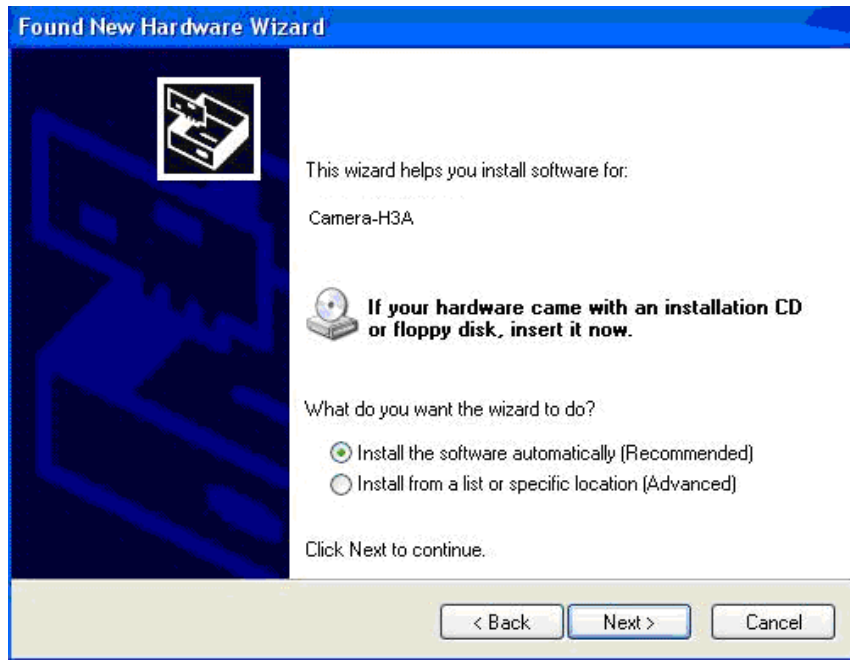
(3) Click 'Imaging devices'



(4) **Right click** 'USB Device', click 'Update Driver...', comes out found new hardware wizard.



1. Choose "this time only", click next.



There are two ways for you to update your driver, you can choose ‘Install the software automatically’, and then click next; or you can also choose ‘Install from a list or specific location (Advanced)’, then click next. Generally, we advise you to choose the first choice.

1) If you choose ‘Install the software automatically’, click next.

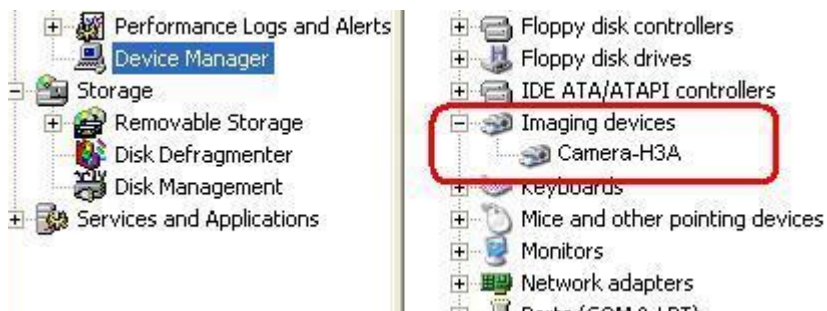


2) The system will find the right driver for the camera by itself, if find, there will come out a warning dialog, please choose ‘Continue Anyway’.

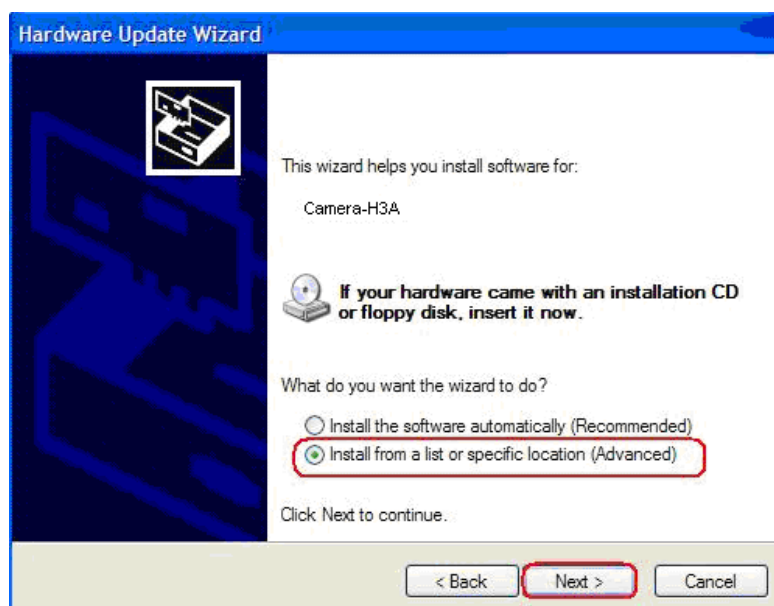


3) Click 'Finish'.

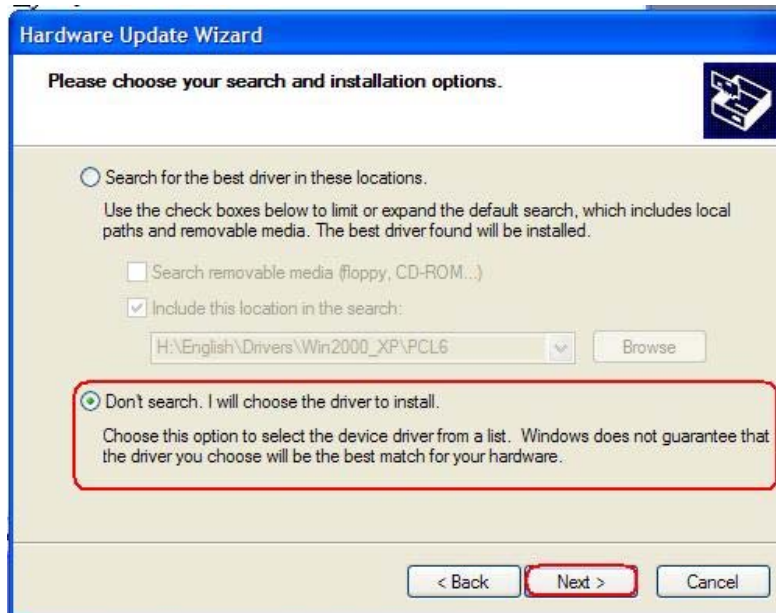
Hardware install has been finished; you can see the “**Camera-H3A**” bellow “**Imaging Devices**” in “**Device Manager / Hardware**”.



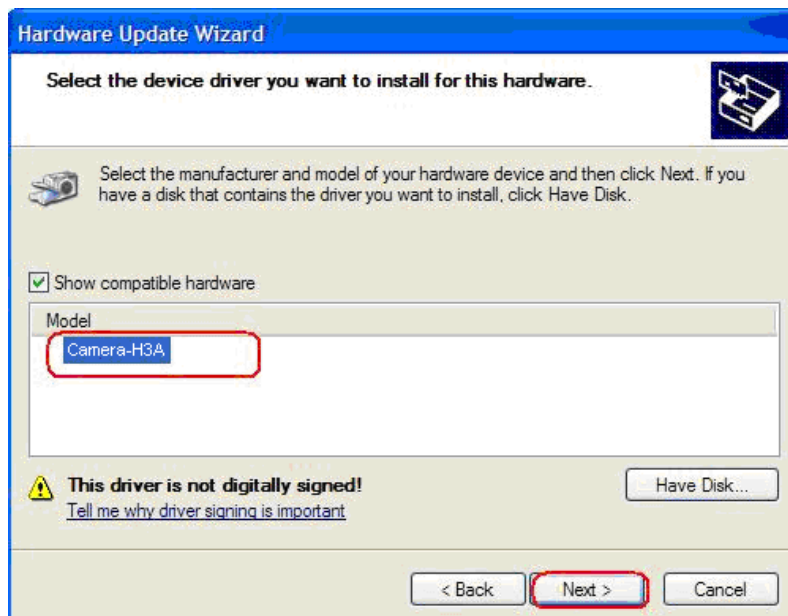
Sometimes the system can not find the driver by itself and the driver update is failure; you can redo it by choosing the second choice ‘Install from a list or specific location (Advanced)’, then click next.



2. Choose ‘Install from a list or specific location (Advanced)’



3. Choose 'Don't search. I will choose the driver to install.'



4. Choose 'Camera-H3A', Click 'Next'.

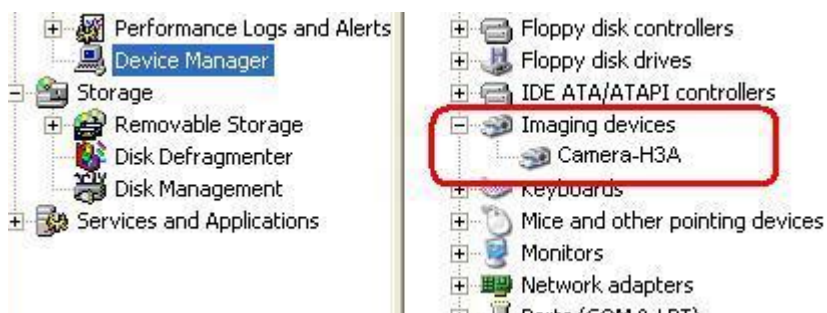


5. Hardware Installation, click 'Continue Anyway'.



1. Click 'Finish'. Hardware installation has been finished.

You'd better restart your computer to make the new device work rightly. And you can check it bellow the **"Imaging Devices"** in **"Device Manager / Hardware"**. Then you can use the camera to preview the images.



In Windows Vista system, you need to uninstall the driver clearly, and then install the recent version driver and software.

4. Camera Using Guide

Our camera includes two powerful software **ScopelImage Plus** and **ScopelImage Advanced**, it is extremely convenient to do the basic and advanced image processing and measurement to the images captured. The simple operation ensures you doing all these processing works at great ease.

Here we list the points for your special attention before using the camera.

Our camera supports both directshow and twain interface, and we still make a simple introduction of the directshow technique and twain technique, and shows you the sample use of the camera in ScopelImage Plus and ScopelImage Advanced. You can refer to the **'help'** menu of the ScopelImage Plus and the **'User Manual.pdf'** of ScopelImage Advanced to get more information about how to use the software.

4.1 Attention

- ★The manufacturing and assembling of the device need to be in the dust-free environment. Please do not attempt to open the camera case. There are no user serviceable parts inside. If you have any concerns about the device quality or the operation, please contact the dealer with detailed information.
- ★The camera comes with two different software applications; You are not able to use both of the applications at the same time since they are using the same device (For example Camera-H1A). You need to close one application to open another one, otherwise they won't work properly. For the same reason, you also can not use the directshow and twain (two different driver for the camera, see the instruction for details) at the same time.
- ★Please use the same USB2.0 port every time. Using on a different USB2.0 port may require to updating your driver again to make the camera work. Refer to the chapter 3 to update the driver.
- ★USB2.0 is a mandatory, not optional. This camera cannot work on the computers with USB1.1 ports.
- ★ScopelImage Advanced, one of the two included applications, is locked for unauthorized use. A special USB jump drive (also called USB Dog) is supplied to unlock this application. To use ScopelImage Advanced, you only need to plug the USB jump drive (USB Dog) into any of your USB2.0 ports.
- ★Please unplug the USB cable from the computer immediately after use. 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.

4.2 Introduce of DirectShow Technique

DirectShow is designed to address each of these challenges. Its main design goal is to simplify the task of creating multimedia applications on the Windows® platform by isolating applications from the complexities of data transports, hardware differences, and synchronization issues.

To achieve the throughput necessary for streaming video and audio, DirectShow uses DirectDraw® and DirectSound® to render data efficiently to the system's sound and graphics cards. Synchronization is achieved by encapsulating the multimedia data in time-stamped media samples. To handle the variety of sources, formats, and hardware devices, DirectShow uses a modular architecture in which operating system components called filters can be mixed and matched to provide support for many different scenarios.

DirectShow includes filters that support for codec written for the Audio Compression Manager (ACM) and Video Compression Manager (VCM) interfaces.

DirectShow enables applications to play files and streams from various sources, including local files and remote files on a network. DirectShow can compress and decompress for some file formats, and many third-party hardware and software decoders are compatible with DirectShow. In addition, DirectShow supports legacy VFW codec

based on the Video Compression Manager (VCM) and Audio Compression Manager (ACM) interfaces. Playback makes full use of DirectDraw hardware acceleration and DirectSound capabilities when the hardware supports it.

4.3 Introduce of Twain Capture Technique

TWAIN Interface is a cross-platform interface for acquiring images captured by certain scanners, digital cameras, and frame grabbers. The manufacturer of the TWAIN device must provide a Source Manager and TWAIN Data source for your device to work with ScopelImage Plus and ScopelImage Advanced.

You must install the TWAIN device and its software, and restart your computer, before you can use it to import images into ScopelImage Plus and ScopelImage Advanced.

If more than one TWAIN device is installed in your system and you want to switch devices, use the TWAIN Select Device command

(Note: When you run the installation, the twain device and software, the twain has been installed with the software already.)

5. Use the Camera in ScopeImage Plus

5.1 An overview of ScopelImage Plus

ScopelImage Plus is the image-processing software professionally designed for HDCE Series digital camera. It allows you to view, capture, edit, record, count, zoom, file, and manage still or moving microscope images. Specific features include the following:

- 1) Image format: supports many file formats, especially the native format (*.sft) preserve the most complete information for images acquired by ScopelImage Plus, including sampling interval and magnification settings, annotations and so on.
- 2) Image preview: support DirectShow, VFW (Video for Window) and Twain interface
- 3) Basic image operations like other similar software are included in the Image menu. You can adjust the image at ease.
- 4) Image cut & paste from image to image, image to file.
- 5) ScopelImage Plus uses the layer technique to record the extra information attached with the images, and the different results can be put on different layers, Image layer operation specially designed for image processing and measurement.
- 6) Image processing filters for noise reduction and enhancement (Image enhancement filters, edge enhancement filters, morphology operation filters. Also user defined kernel filter, includes convolution and morphological filters).
- 7) Image arithmetic operation between image and image, image and digital number (Including AND, OR, XOR, NAND, NOR, NOT, Add, Subtract, Multiply, Divide, Absolute, Min, Max, Average, Invert, Logarithm, Exponential, Square Root, Square, X to the power of Y operation)
- 8) Image pseudo color, range, segmentation operations are also include in the application




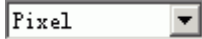

9) Image zooming operations and panning operations

10) Image browser, can let you efficiently find and organize your images.

5.2 Quick learn to use ScopelImage Plus


Quick Index

This is a quick index of ScopeImage Plus application. This index is designed for those who wish to master the ScopeImage Plus operations in a short time.

<p>How to display the video from the video devices?</p>	<ol style="list-style-type: none">1. To get the video from Twain Acquire (its shortcuts are  and  on Image Window Toolbar).2. To use DirectShow Capture Technique. Its shortcut is  .3. File->Import Image->DirectShow Capture....4. File->Import Image->Twain Acquire....
<p>How to define the Software Power?</p>	<ol style="list-style-type: none">1. Display the video using DirectShow Capture Technique first.2. According to Software Power Setup to define your own Software Power step by step.
<p>How to perform the measurement operation (we use term Draw in the application)?</p>	<ol style="list-style-type: none">1. Define your own Software Power according to Software Power Setup, otherwise, the unit will be Pixel only for the captured image.2. Select the right Software Power from  list on DirectShow Capture Window Toolbar and let this Software Power equal to your real microscope objective lens power you are using to capture the image .3. Capture an image using  button on the DirectShow Capture Window Toolbar.

	<p>3. Make a new layer on the Background layer using Draw->New menu or Tool Box Layer Page. The Draw Toolbar and Draw menu will become active.</p> <p>4. Select the draw icons on the Draw Toolbar or Draw menu to do the draw (measurement) operations.</p> <p>5. You can view and change the object Appearance and Coordinates from Tool Box Draw Page by selecting one object . You can also find the multiple objects parameters on the layer using Draw Manager... You can also print these parameters with the image together. See Options->Preference..., Click Print to set the print operation.</p>
<p>How to save the Draw results?</p>	<p>1. The only format to save the draw results is to use the file extension *.sft. See Save As for detail.</p> <p>2. You can let the application always "Remind me when save file with draw items not in *.sft format" by check the term "Remind me when save file with draw items not in *.sft format" in Options->Preference...Misc dialog.</p>
<p>How to perform Twain Acquire?</p>	<p>1. You can get the video from Twain Acquire (Its shortcuts are SD and TC on Image Window Toolbar).</p> <p>2. Choose File->Import Image->Twain Acquire...to display the Twain video and then capture it.</p>
<p>How to add the length unit?</p>	<p>There are many units for the length parameter. See Options->Draw... ->Unit->Length menu to select the right length unit.</p>
<p>How to define the angle unit?</p>	<p>The angle can be Radian, Degree and PI. See Options->Draw... ->Unit->Angle dialog box to select the right angle unit.</p>

How to select the **Software Power** in the **DirectShow Capture Window**?

1. Menu method: **File->Image Import...->Software Power.**
2. Icon method: Select the right **Software Power** from  list on [DirectShow Capture Window Toolbar](#) .

5.3 Video Preview and Capture

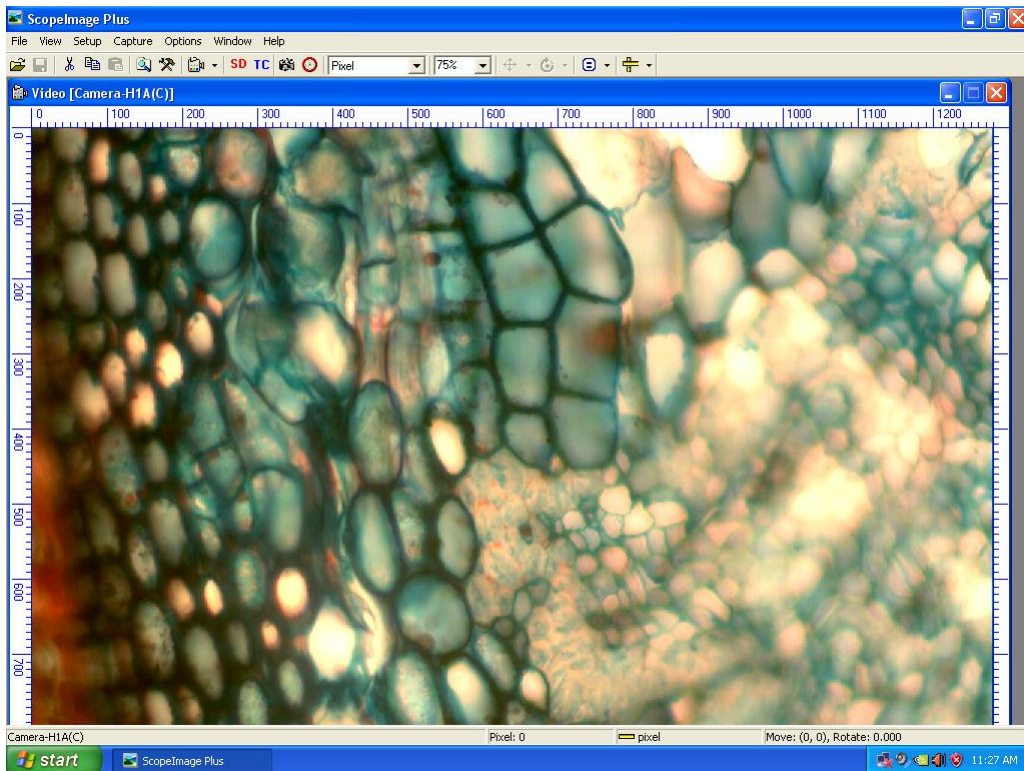
5.3.1 Use Directshow to Preview

(a) Start your Camera

1. Make sure the camera is linked with the computer with the USB2.0 wire, and your computer is **USB2.0** port, otherwise, the device will not run normally.
2. Run the ScopeImage Plus software you have installed.
3. Click 'Camera-H3A' button on the mainframe toolbar, or click the device on the start page to start your camera, shows below:



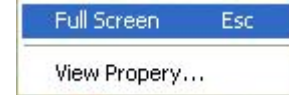
You can **also** do it by the menu. Please select **File->Import Image->Live Capture->Camera-H3A.**



(b) View the Video in Full Screen Format

Three ways to view the video in full screen format:

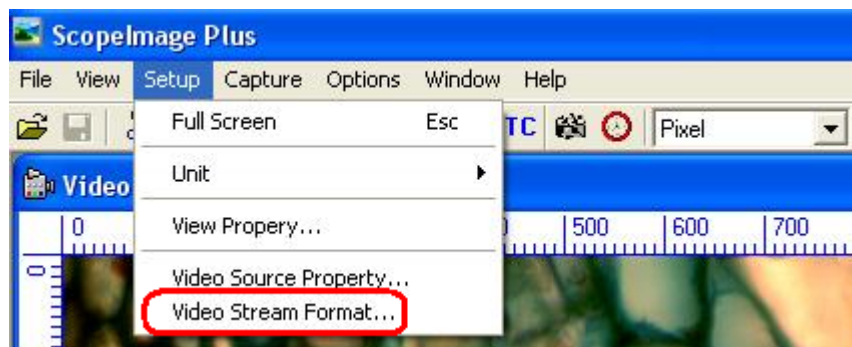
- (1) Double click your left mouse to go to full screen format, and double click to exit
- (2) Right click the right mouse, select 'Full Screen'

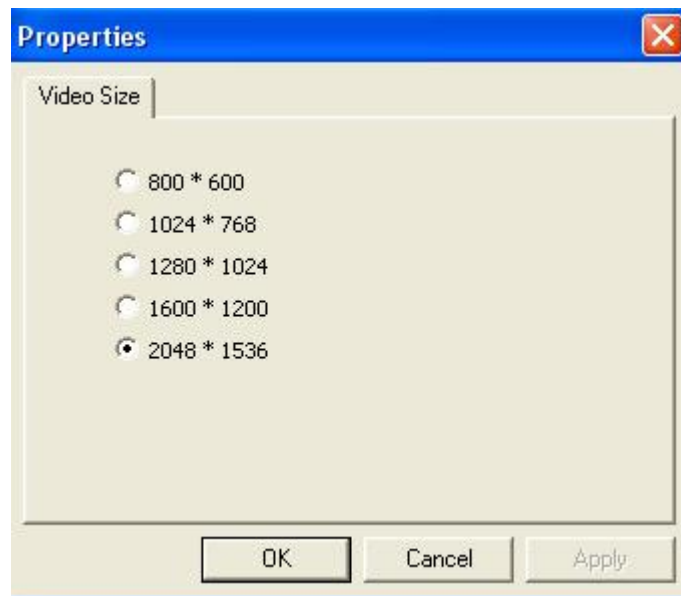


- (3) Press **ESC** will also enter the full screen preview operation, and press **ESC** again to exit.

(c) Set the Preview size

To set the size of preview window, please select the menu 'Setup->Video Stream Format...' and the stream format property is as follows:





Note:

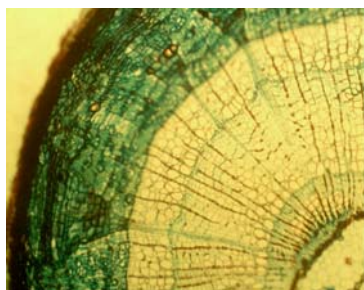
The higher resolution, the lower frame rate will be. If you want to increase frame rates to make the preview video see more fluently, you need to decrease the resolution, such as 1024x768 or 800x600.

(d) perform Auto White Balance (AWB) and Auto Exposure (AE)

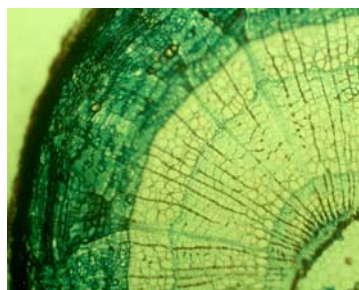
About white balance:

White balance basically means *color balance*. It is a function which gives the camera a reference to "true white" — it tells the camera what the color white looks like, so the camera will record it correctly. Since white light is the sum of all other colors, the camera will then display all colors correctly.

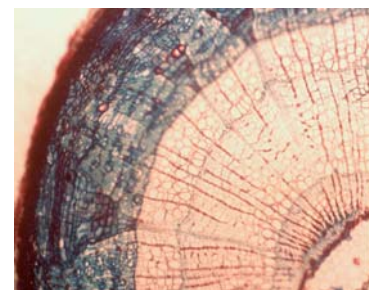
Incorrect white balance shows up as pictures with orange or blue tints, as demonstrated by the following examples:



Correct color balance



Color balance too blue



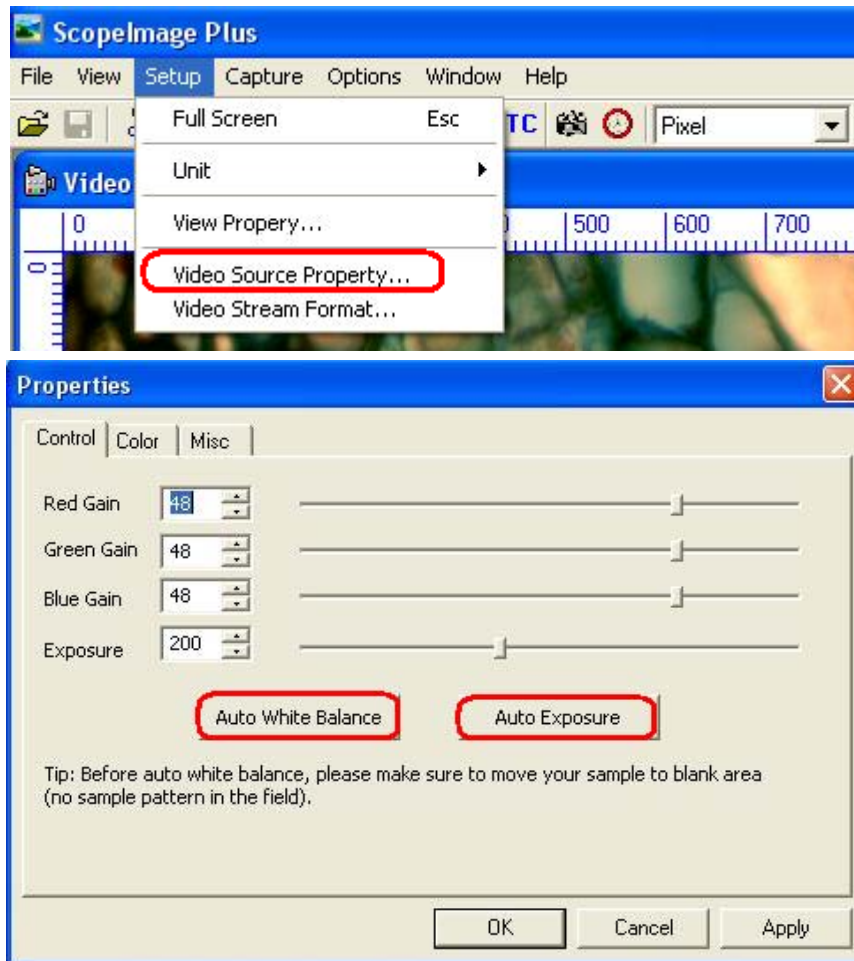
Color balance too red

Another very important parameter that affects the color of the images is the value of the exposure. Our camera support both auto exposure and manual exposure.

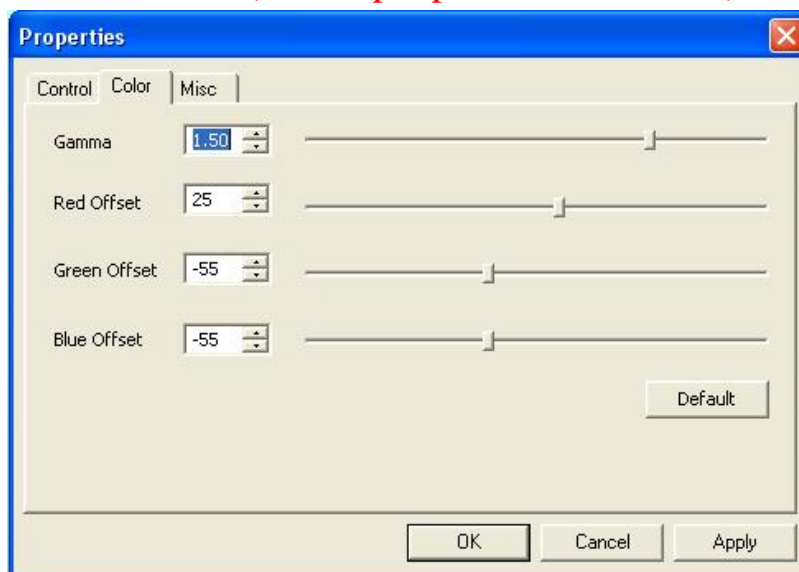
About auto exposure:

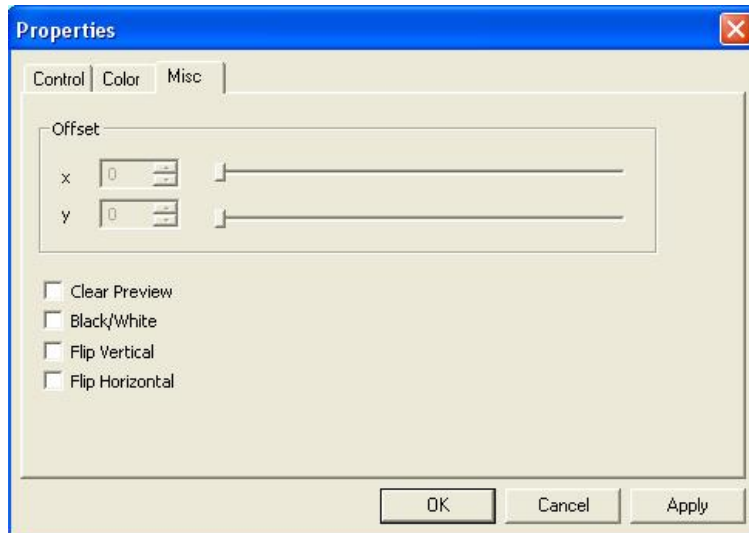
It means the camera will adjust the exposure value by itself to make the images display in normal. When the light source is too bright, the camera will decrease the exposure value, and when the light source is too dim, the camera will increase the exposure value. It just adjusts the exposure value by itself.

Select **Setup->Video Source Property...** on the menu to open the Video Image Properties dialog.




Before auto white balance, please make sure to move your sample to blank area (no sample pattern in the field).

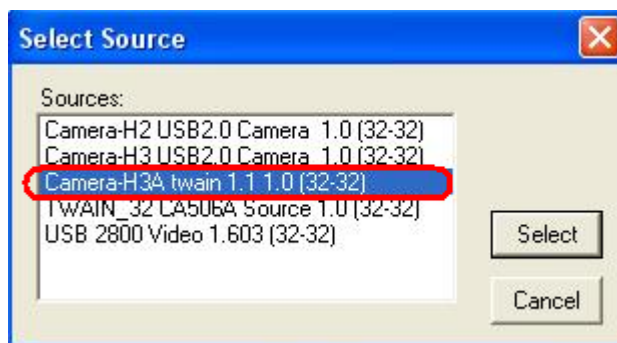




5.3.2 Use Twain to Preview:

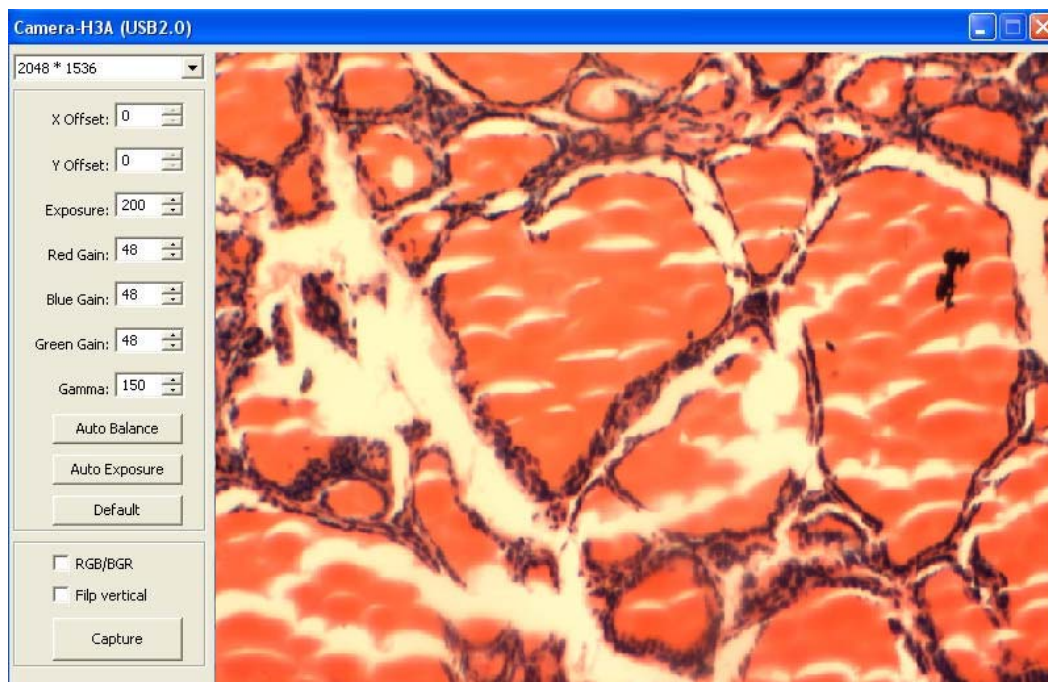
1). Select the twain source

Click the **SD** button on the tools bar, , choose **Camera-H3A**



2).Open the Twain source

Click the **TC** button on the tools bar.



With this twain interface, you can also open the camera in any software that support this interface, such as ACDSee, PhotoShop and so on.


Note: If you use just one type camera, you can skip step 1 (Select Twain Source) after you use the camera for the first time.

5.4 Layer and Draw

5.4.1 Use the Image Processing Tool Box (Layer and Draw)

(a) Create a layer, and enable the draw tools bar

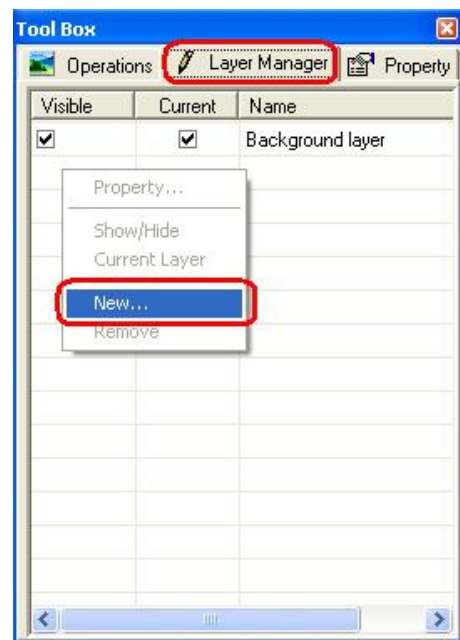
You may find the measurement tools are dim and you cannot click on them after you capture a frame. The reason is that you are at the “background layer” and you cannot do those measurements on the “background layer”. So you need to create a new layer (still the same image). Here are the steps to activate the measurement tools:

- Capture a frame
- Click “Tool Box” under “View” menu, or click  button on the tools bar
- Click “Layer Manager”
- Right click the mouse on the white grid pane, then left click on “new”
- Enter a layer name and click “OK”

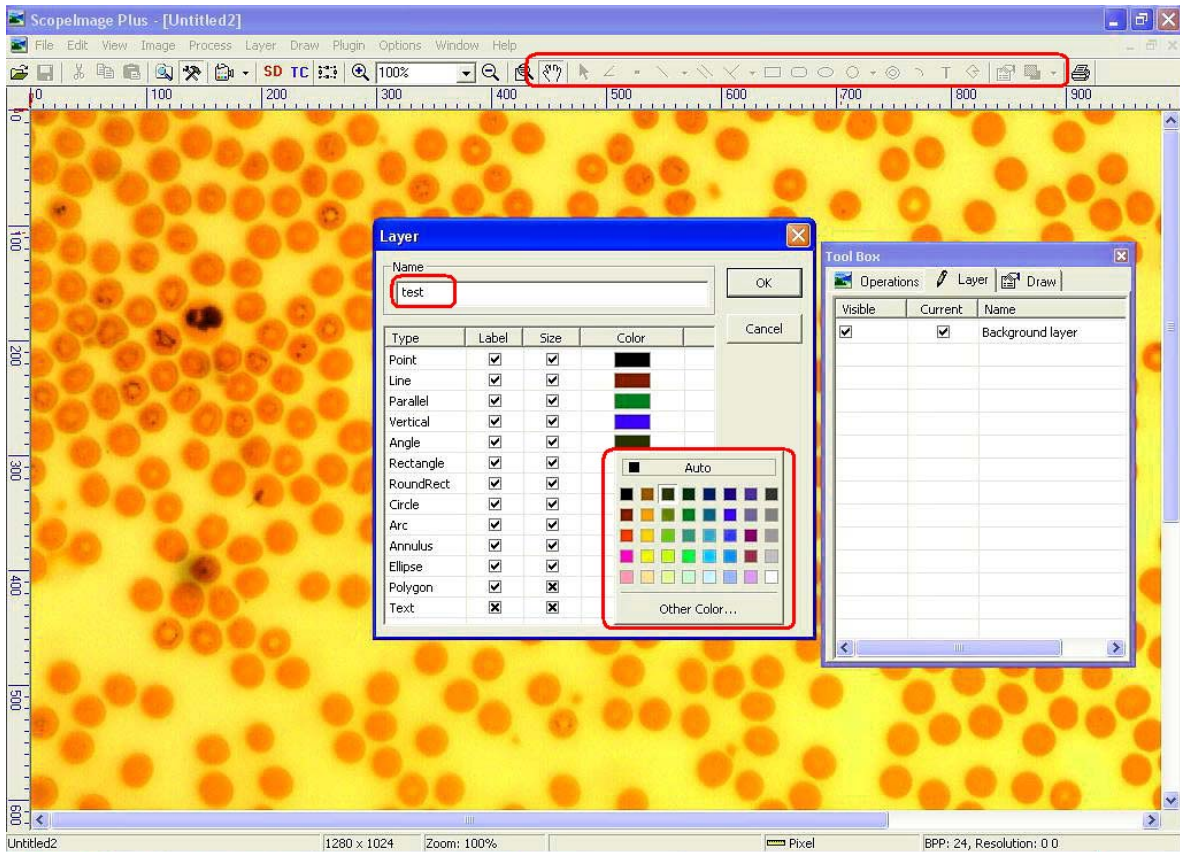
Now you are working on a new layer and all the measurement tools are enabled. See the pictures below.



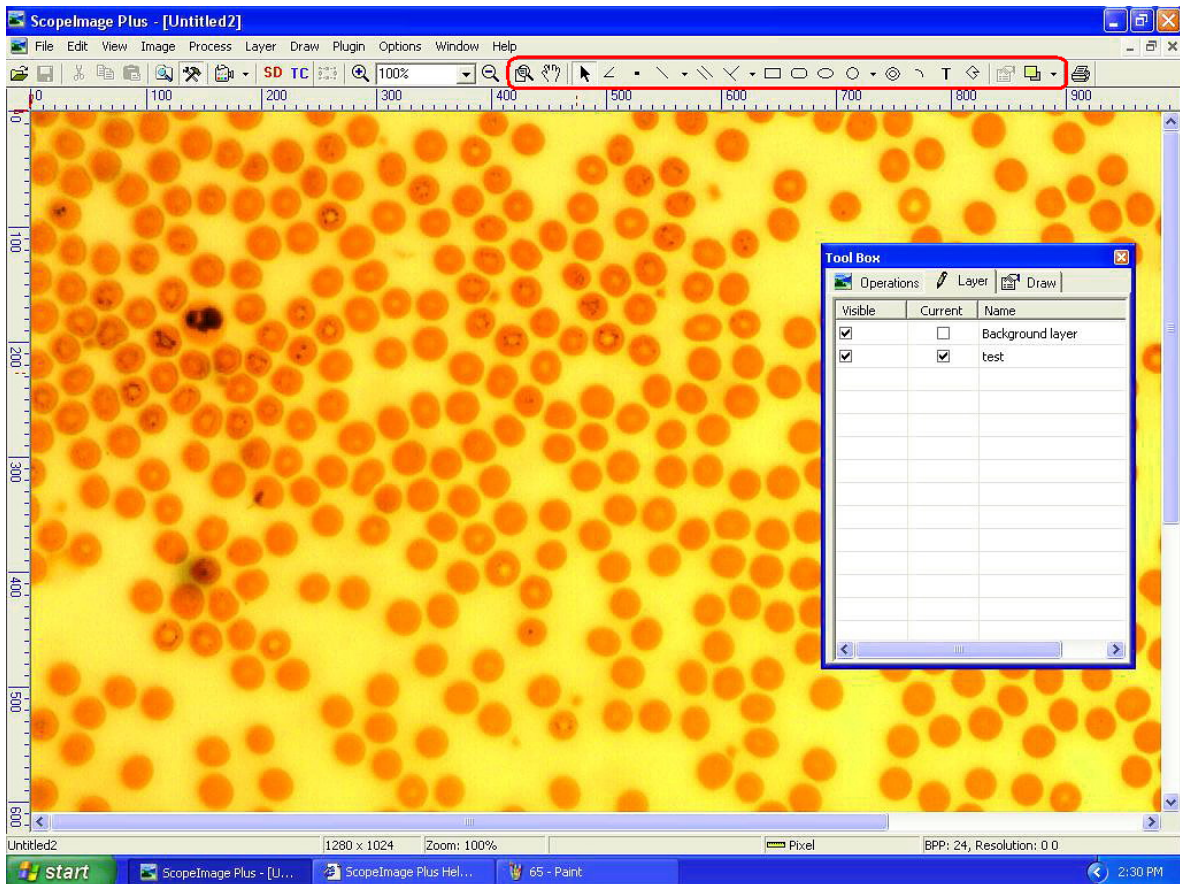
Open the Tool Box



Create a new layer



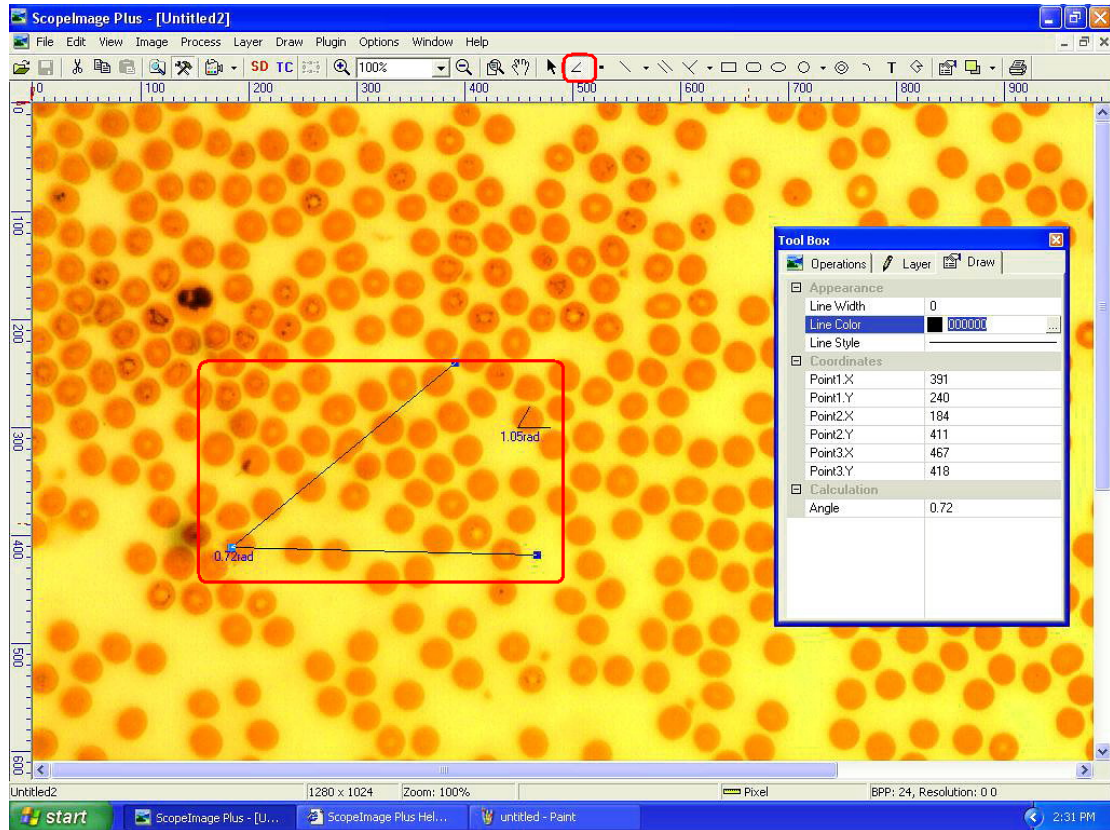
Name the new layer and the label color



A new layer created and the draw tool bar will be enabled

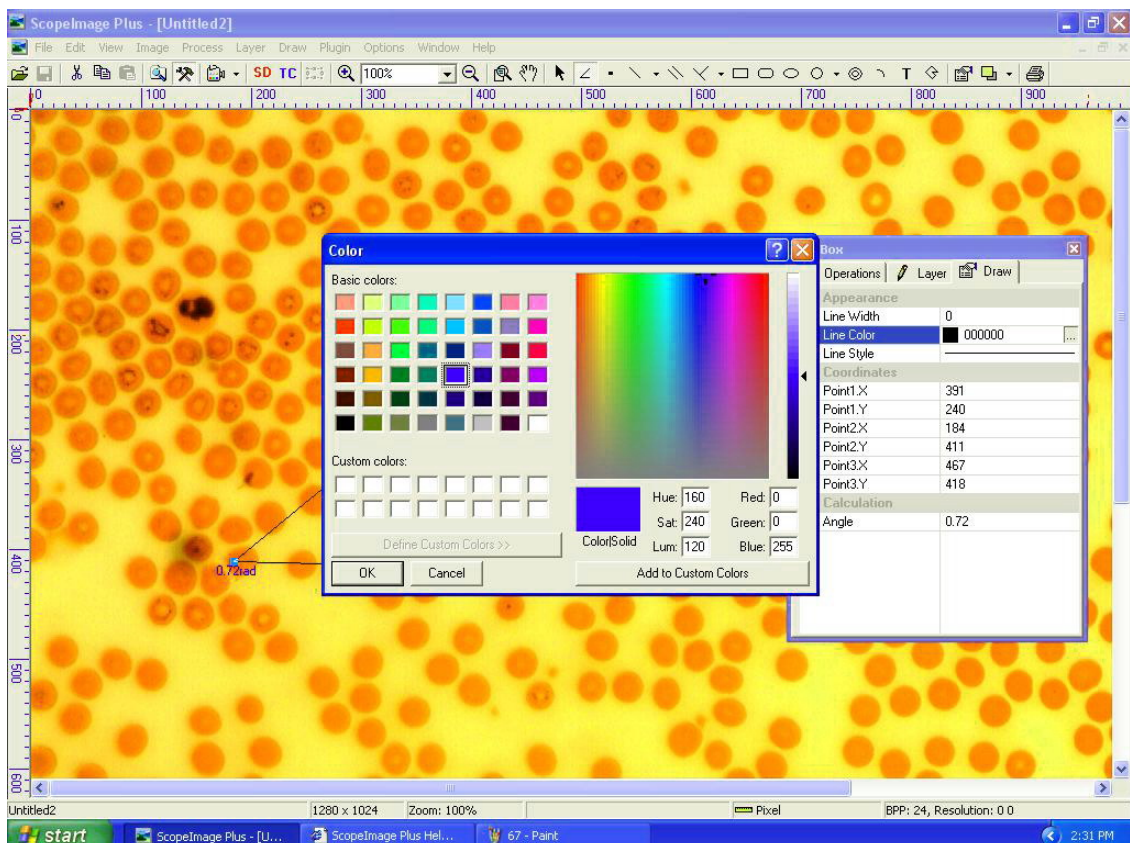
(b) Do angle measurement for an example

Here shows how to do the angle measurement for example:

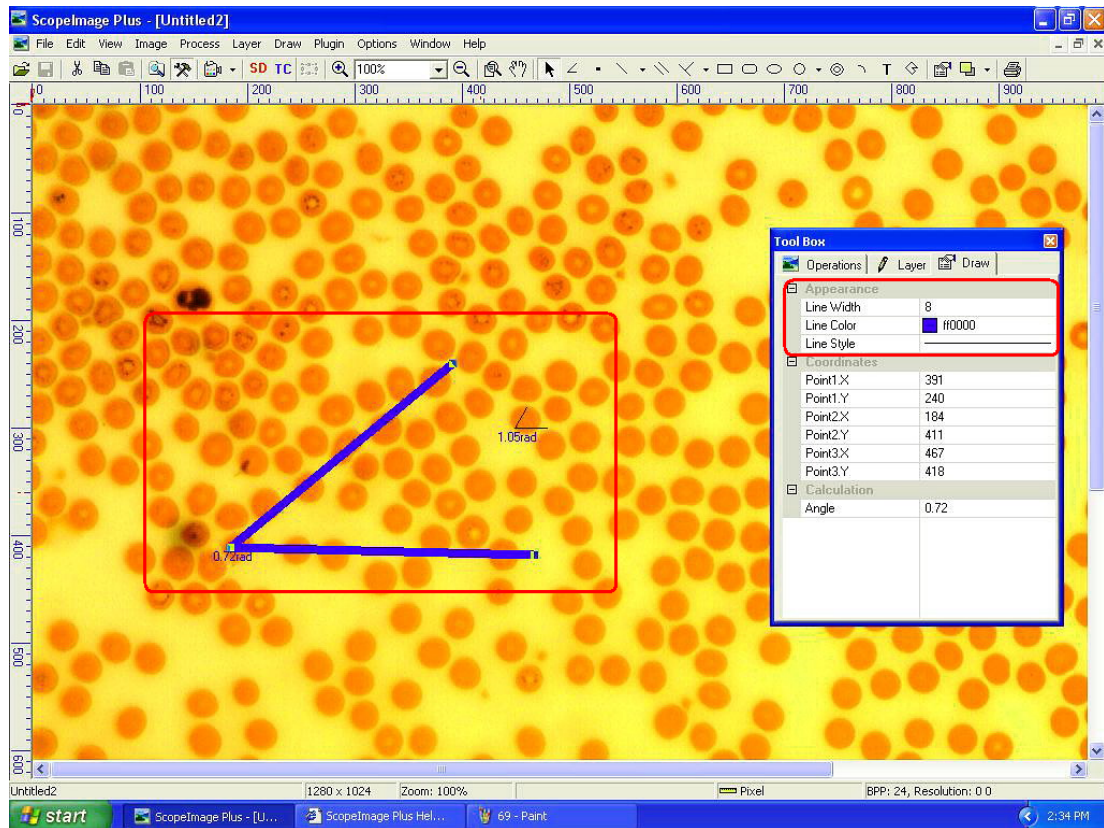


Click the angle icon on the tools bar and do angle measurement.

(c) Change the draw object appearance (Single object)



Modify angle appearance (include the line color, width and the line type)

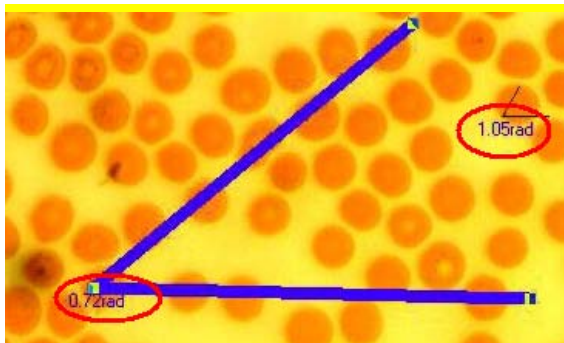
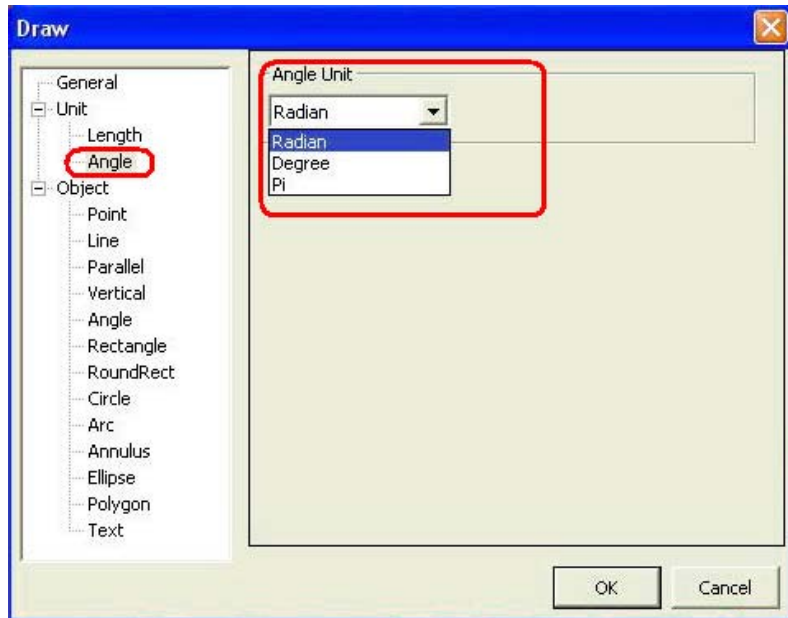


Now angle appearance has been changed.

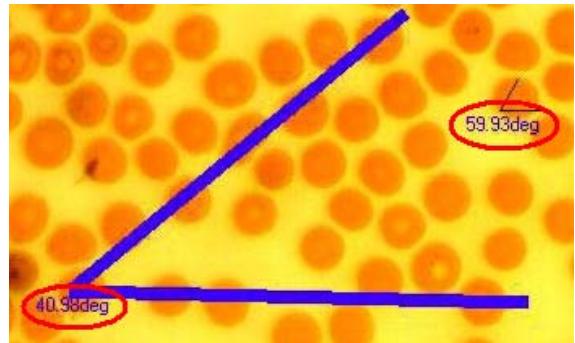
(d) Change the angle unit



Now the angle unit is radian; we can change the angle unit to 'degree' or 'pi'; Click the menu 'Options->Draw...' to open the draw property dialog.

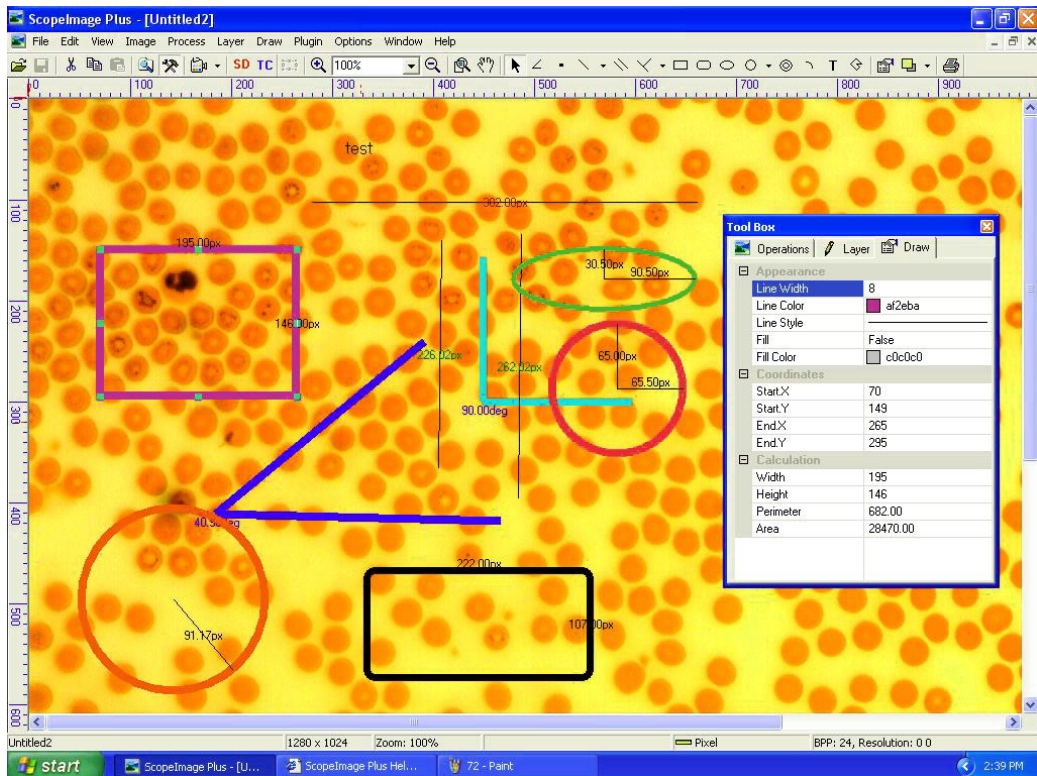


Before (Radian)



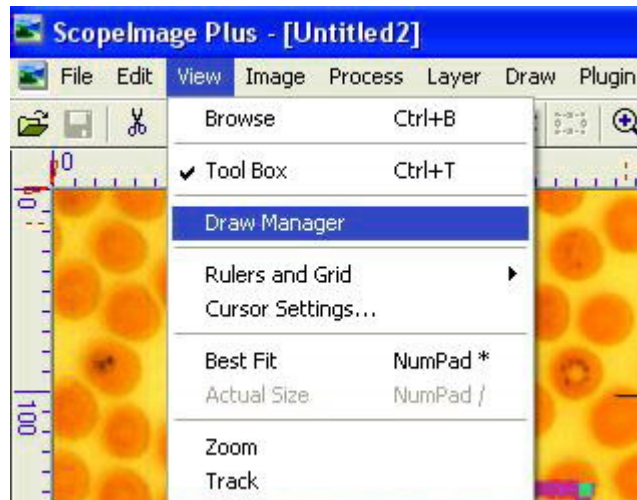
After (Degree)

The angle unit has been changed from radian to degree.

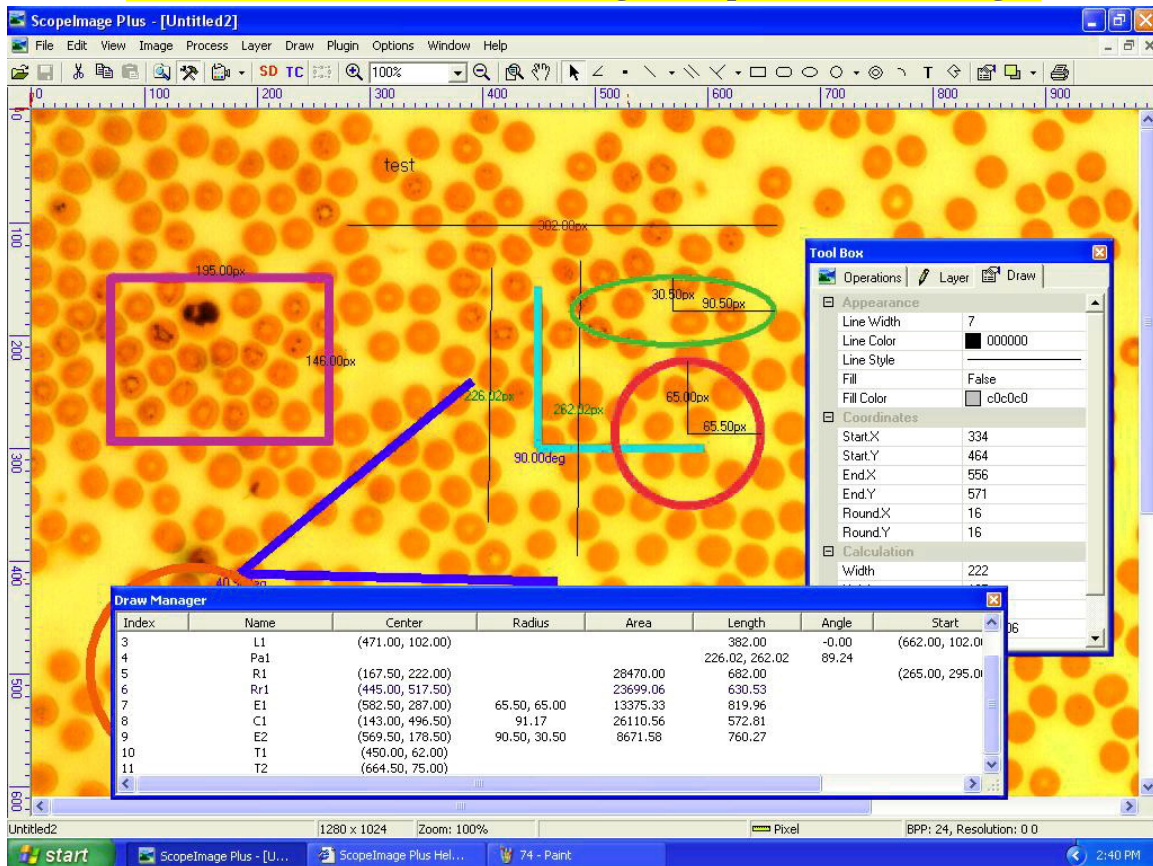


The measurement result displays with the draw at the same time.

(e) Open the Draw Manager

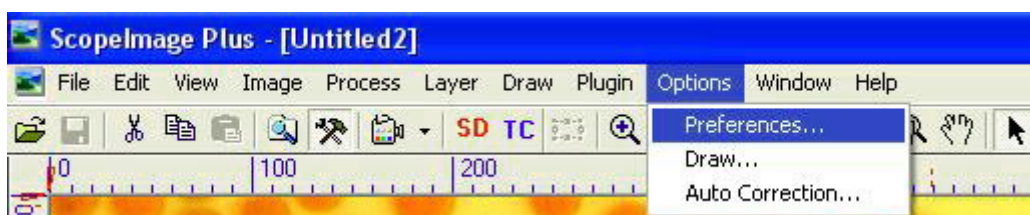


Click the menu 'View->Draw Manager' to open the draw manager.

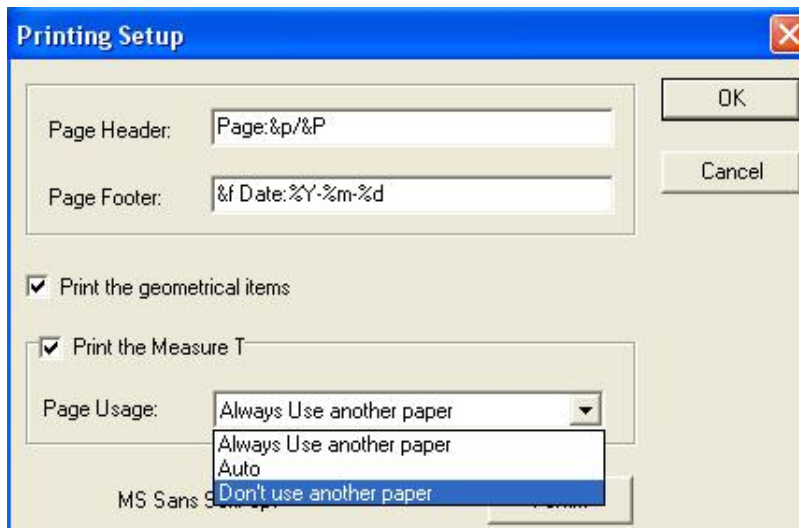


Show the draw object information

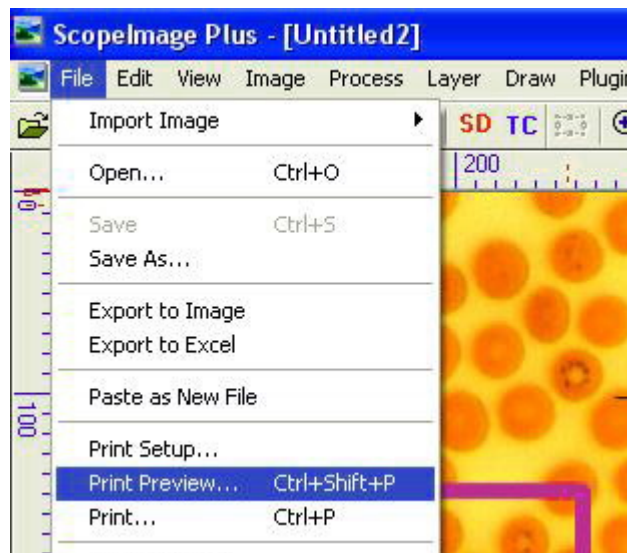
(f) Print the image with the draw and measurement result



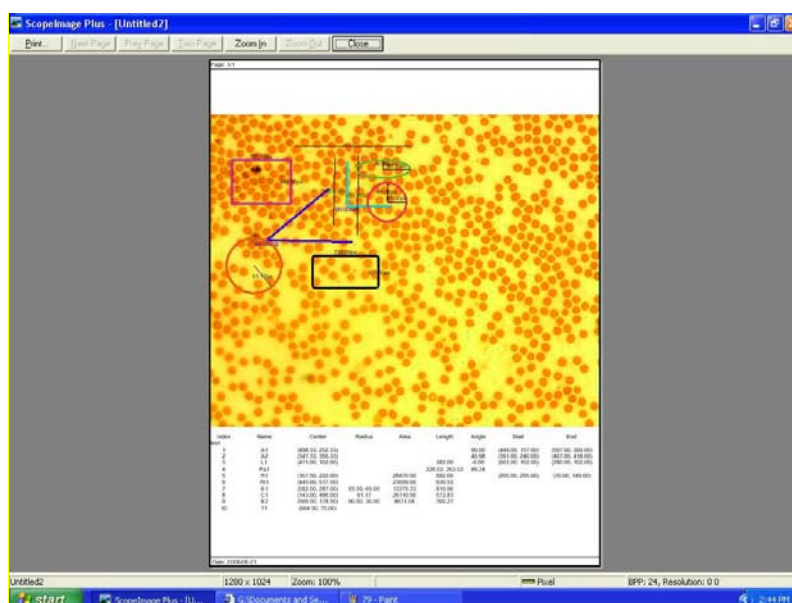
Click the menu 'Options->Preferences...' to open the Printing Setup Dialog.



Print preference: choose the page usage to 'Auto' or 'Don't use another paper'.



Click the menu 'File->Print Preview...' to preview the images you want to print.

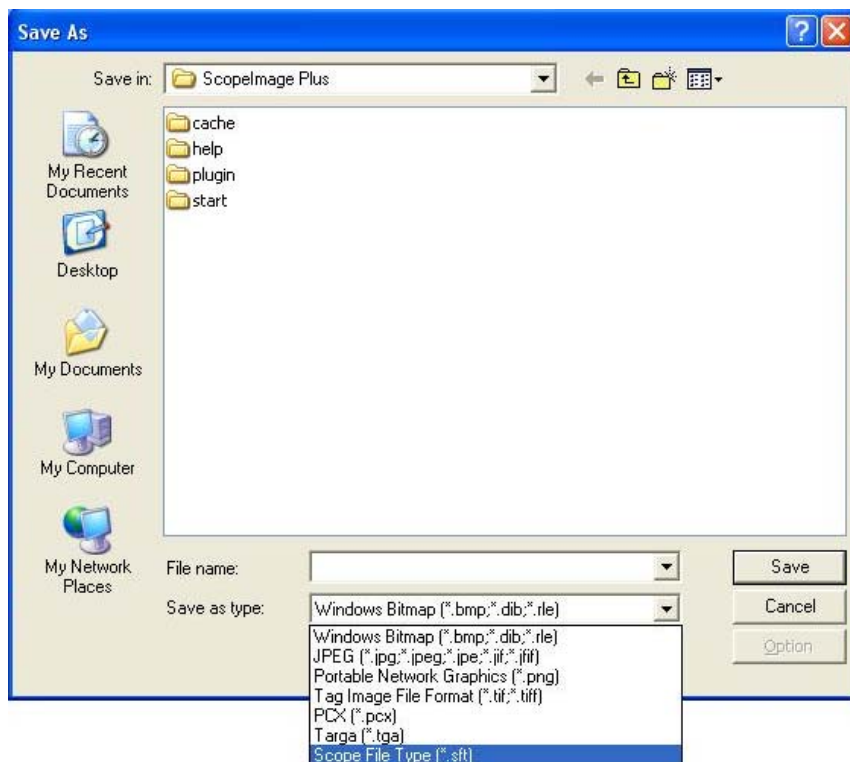


Print preview

(g) Save the complete information with the image together (*.sft)

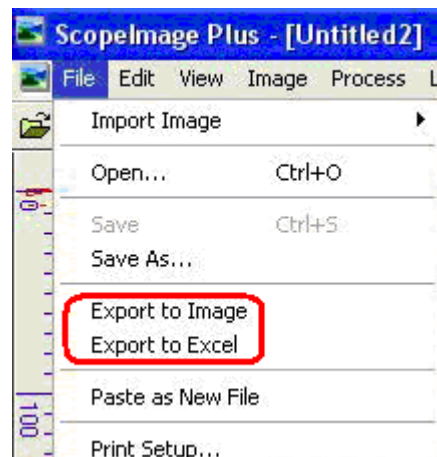
ScopeImage Plus supply the native format (*.sft) to preserve the complete information for images, including sampling interval and magnification settings, annotations and so on.

Save the image files in '.sft' format, click File->Save as... on the menu.

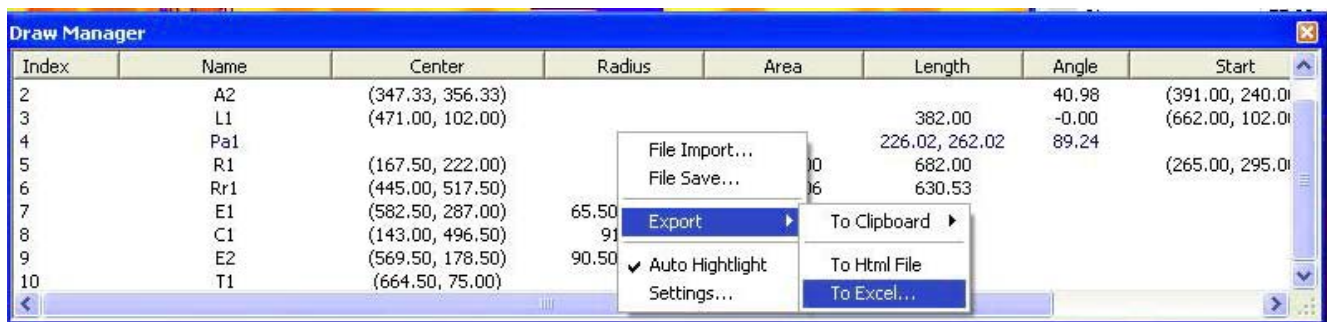


Select format (.sft format) to keep the draw information on the image.

(h) Export the draw result



Export data to image (unrecoverable), save the image with the draw.



Export the draw result, three ways: to Clipboard, to Html File or to Excel

5.4.2 Software Power Setup (Calibration)

(Remember to set them up in the DirectShow)

If you have a microscope with 4X, 10X, 40X, 100X objective lens, we can say this microscope have four different objective powers.

However, if this microscope is combined with different digital cameras when capturing the images, the magnification of the images taken by the software is no longer the same as the magnification of the objective lens. Instead, it is represented by the resolution, which is determined by the **Software Power** of the whole system (microscope plus digital camera).

For the consistency, we tried to build up a menu, called **Software Power** with some submenus named 4X, 10X, 40X, 100X to denote the resolution. Therefore, these **Software powers** are actually the system powers, corresponding to the image resolution.

When the **Software Powers** are calibrated, user can easily select the **Software Powers** (in the software) to be the same as the microscope objective power, then after the image is captured, the resolution can be saved with the image data together. If user wish to measure the object dimensions on the image, he need not to care about the detailed resolution or in

which objective power the image is captured, the software will calculate the object dimensions according to the resolution, the selected unit, automatically for further analysis.

So the first step is to set correct **Software Power**. Different microscope and digital camera combination need to set their **Software Powers** specifically.

Now we begin to set the **Software Power** for the digital microscope (Note: we need to have **micro ruler** with minimum increment 0.01mm or 10um, its overall length is 1mm. It is recommended that the stage micrometer or scale used in the calibration should be traceable to the National Institute of Standards and Technology (NIST) or a similar organization.

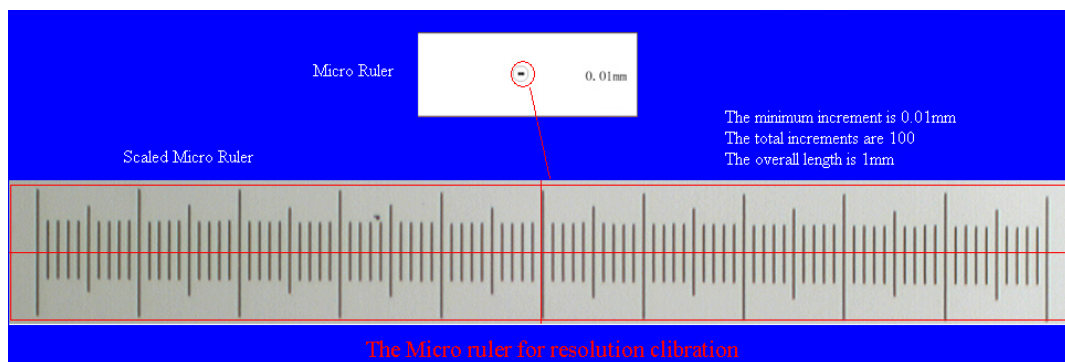



Fig.1 The micro ruler for the calibration of the digital microscope

1. Plug in the electric eyepiece (or digital camera for microscope) into the trinocular, and plug in the USB connector into the computer USB port (For USB2.0 camera, be sure to plug it in to the right one, some computer only has one USB2.0 port), run ScopeImage Plus

2. Select **File-> Import Image->DirectShow Capture...**(Or directly click the video icon

 on the Image Window Toolbar , a video

window will be displayed, select **Devices->Video Device Name** (depend on the devices installed in your computer). Click drop-down arrow button on the unit combo box

 on the video window [DirectShow Capture Window Toolbar](#) to show the Software Powers, because no power is added, the default term is **Pixel**, select "**Pixel**" as the video unit, the window should look like:

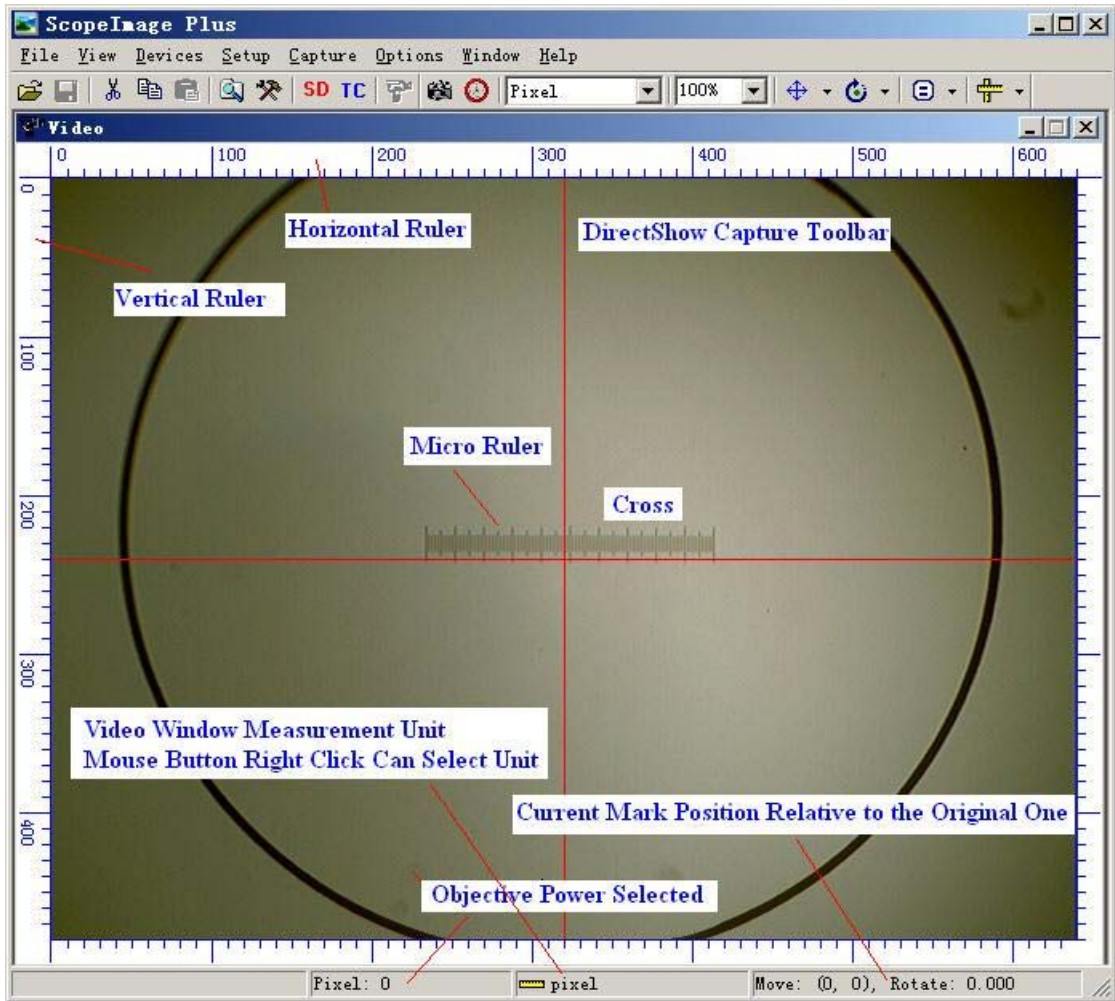

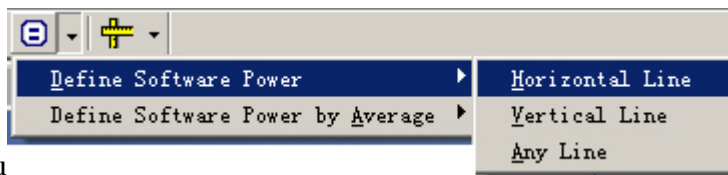


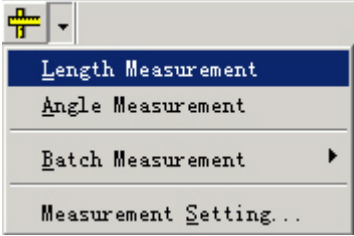
Fig.2 Video window of the ScopeImage Plus program

3. Switch your microscope' object lens to **4X** (or **10X, 40X, 100X**), focus the micro ruler to get the clear image, move the ruler to the video center. Click the drop-down arrow of the comb box  to get the drop down



menu, select: **Define Software**

Power-> Horizontal Line. The user can also select **Vertical Line** or **Any Line**, the precondition is that you must know the dimension between the clicked **start point** and **end point**. When your video window is not selected in the maximum resolution mode, the application will suggest you to set the **Video Stream Format** to the maximum resolution as shown in Fig.3 . Select **Setup->Video Stream Format...** to set the video window resolution to the maximum one. If the video resolution is in the device's maximum resolution, then there should display a big cross and a small cross according to the setup of

the **Measurement Setting** menu (the drop-down menu of ). The cursor position will also be shown near the small cross position.

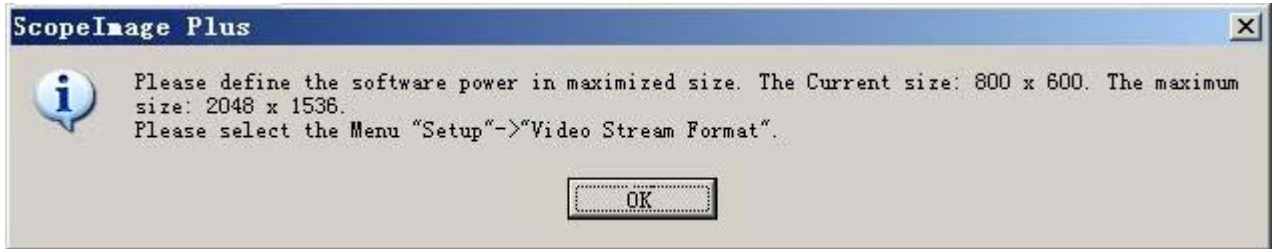


Fig.3 The maximum Video Stream Format resolution prompt dialog

4. Put the cursor at the **start point** (any vertical line of the micro ruler), click the left mouse button, the point will be marked with a small cross, its coordinate will also be displayed near the marked point. Move the mouse to the **end point** you want to mark, click the left mouse button again and the **end point** will be marked, the final screen looks like Fig. 4.

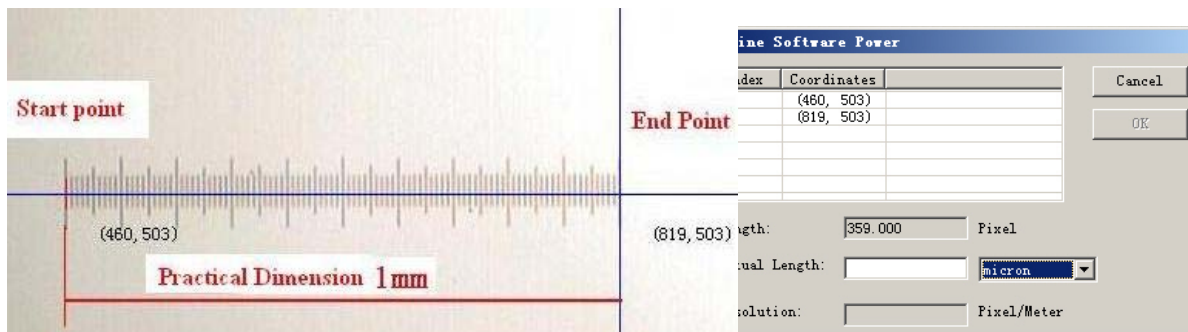


Fig.4 The marked start and end point for 4X objective power

Fig.5 Use the horizontal line to define the Software Power of the 4X objective lens

5. When the left mouse button is released in step 4, a **Define Software Power** dialog box will be shown like Fig.5, here, **Index 1** shows the **start point** coordinates and **Index 2** shows the **end point** coordinates. the length between these two points will be displayed in the length disabled edit box, the user should fill the **Actual Length** in edit box with the right unit (here, it is **1000 micrometer**). When the **Actual Length** is filled in, the **OK** button will be enabled. If everything is OK, press or click **OK** button.

6. A dialog box called **Software Power** will be pop up, click **Add...** button, there should pop up **Add Software Power** dialog box shown in Fig.7, Fill **4 (10,40,100)** into the **Software Power** edit box (means the current practical objective lens is **4x, 10X, 40X, 100X**). Click **OK** button.

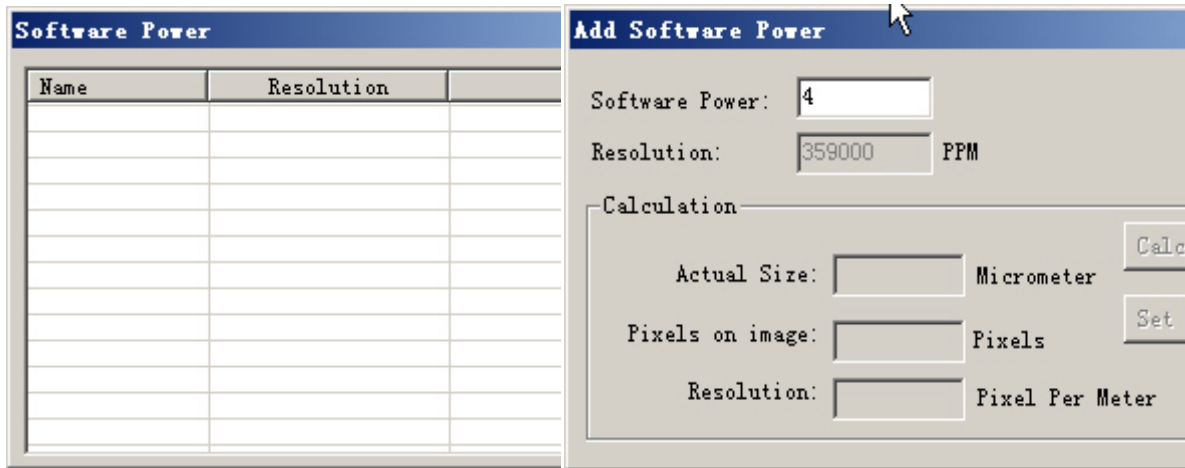


Fig. 6 **Software Power** list view

Fig.7 Add **Software Power** dialog box

7. The program will return to **Software Power** dialog box just the same as in Fig. 6 but **4X** and its resolution equal to **35900** item is added in the list view as shown in Fig.8.

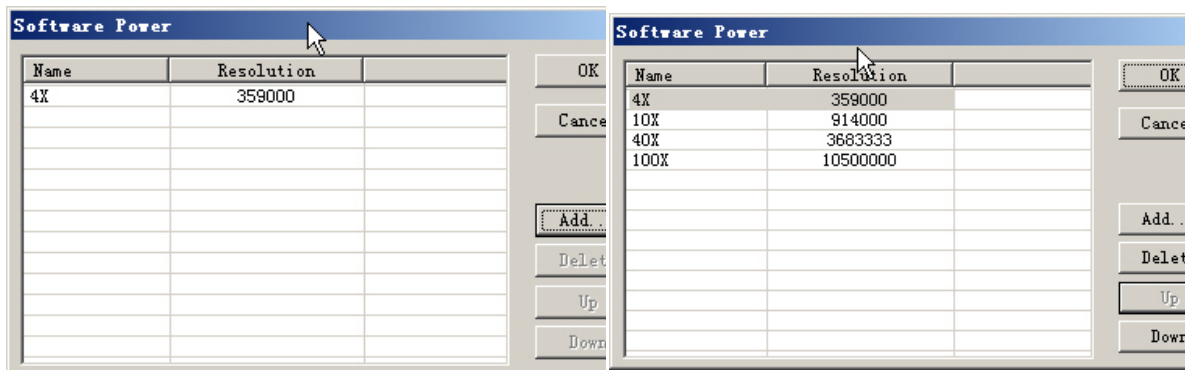


Fig. 8 **Software Power** list view with **4X** item added

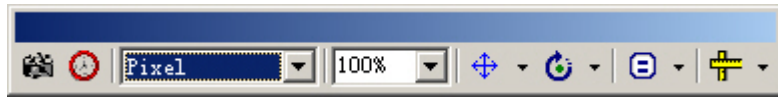
Fig.9 **Software Power** list view with **4X,10X,40X,100X** items added

8. Repeat step 3, 4, 5, 6, 7, In step 6, change the objective power in Fig.7 to the practical power you switch to such as **10X, 40X, 100X**. When the above operations are finished, The **Software Power** dialog box will be shown like Fig 9. Here user can **Add, Delete** (After selected, click the **Delete** button in Fig.9) and change the order of the list of the powers to what ever you want(Select the one you wish to change, click **Up** or **Down**

button). Up to now, User can select the objective power from comb box drop-down button on [DirectShow Capture Window](#)



[Toolbar](#)



(The program will

add all of the **Software Powers** listed in Fig.9 to comb box

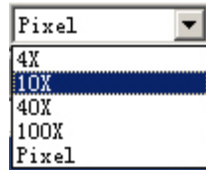


after **OK**

button is clicked, and click



drop-down button, the new comb box list



should look like this for user to select. At the same time, In **File->Import**

Image->Software Power submenu, the objective powers the microscope have will also be added as shown in Fig.10. The user can select his current **Software Power** either

from this menu or from the



comb box on the [.DirectShow Capture](#)

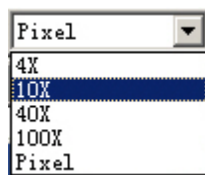
[Window Toolbar](#)



Fig.10. The Software Power submenu after the Software Powers setup is finished

9. Video measurement: if your current microscope's objective power is **40X**, then

select your **Software Power** from the



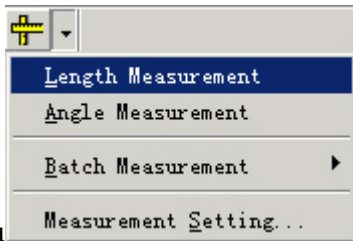
comb box to **40X**



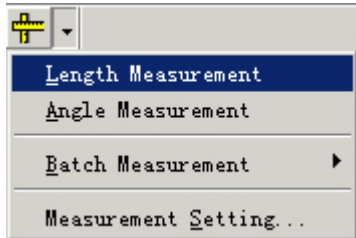
and click



drop-down button, select Length from the drop-down



menu , the should be a big and a small alignment mark shown in Fig, 11 (User can set their characteristic in **Measurement setting...** on



).Click the start point, move the mouse and click at the second point (end point), after the mouse button is released, a dialog box list the object properties will automatically pop up as shown in Fig,12

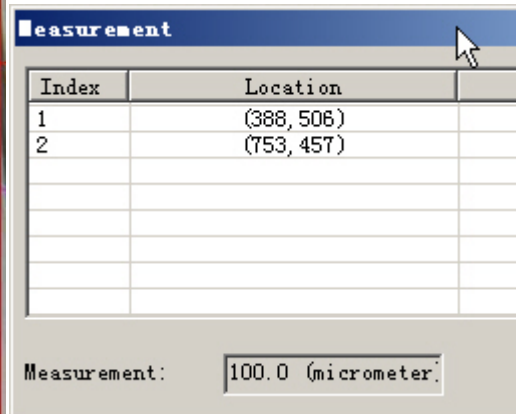
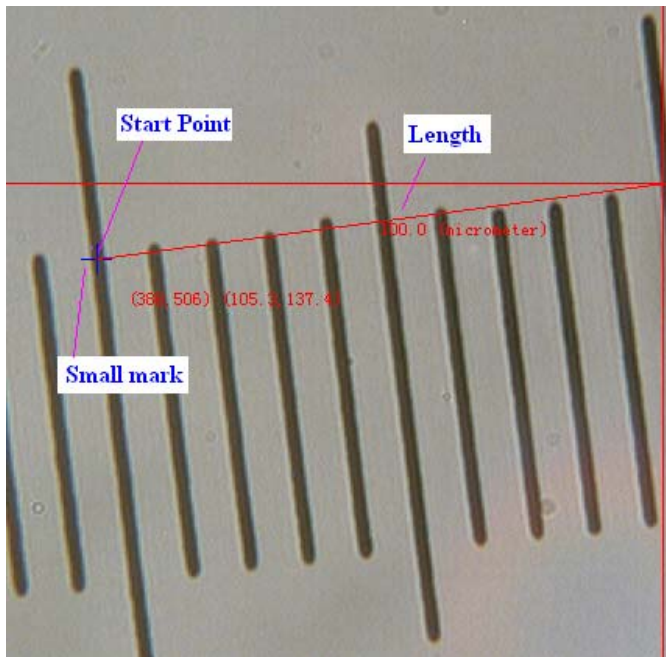


Fig.11 The measurement results under 40X objective power

Fig.12 The video measurement result

10. The user can measure the object angle, perform batch measurement in the video window. The batch measurement is shown in Fig.13, it includes **Length Measurement**, **Angle Measurement** and **View Result...**

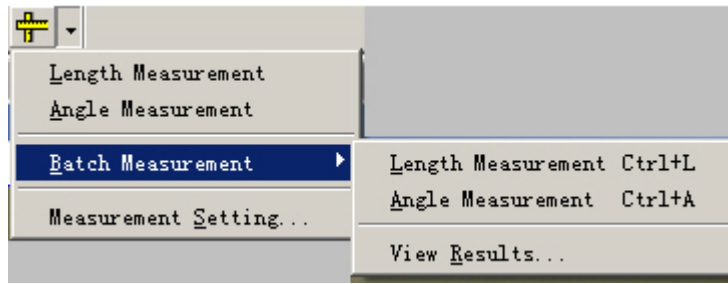

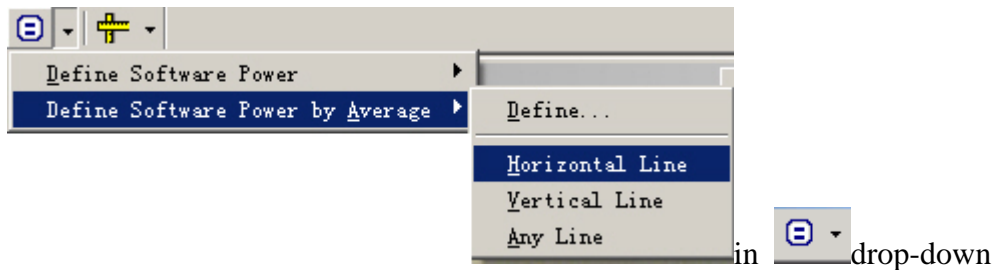


Fig.13. The measurement submenu on the DirectShow Capture Window Toolbar

11. Except this, according to the practical object power, the user can select Software Power power in comb box or In **File->Import Image->Software Power** submenu shown in Fig10, click  to capture image, define the layer in the [Tool Box Layer Page](#) and perform the other complex draw operations.

12. In the previous sections we have discussed how to use the **Horizontal Line**, **Vertical Line** and **Any Line** to define the **Software Power**, to increase the accuracy, we also provide **Define Software Power by**




Average menu, its principle is the same, it only need the user to draw the **Horizontal Line**, **Vertical Line** and **Any Line** multiple times and allocates it to one objective power to get the average resolution to delete or decrease the alignment error.

Please refer to the help content in the software help menu to find more information about the power setup (calibration) operation.

5.4.3 Video Watermark

Fig.1 shows the video window image, it's actually a micro ruler. You can try to extract the dark lines as the mark and overlay it with video in DirecShow Capture Window:

1. Click  to capture the image as shown in Fig.1.

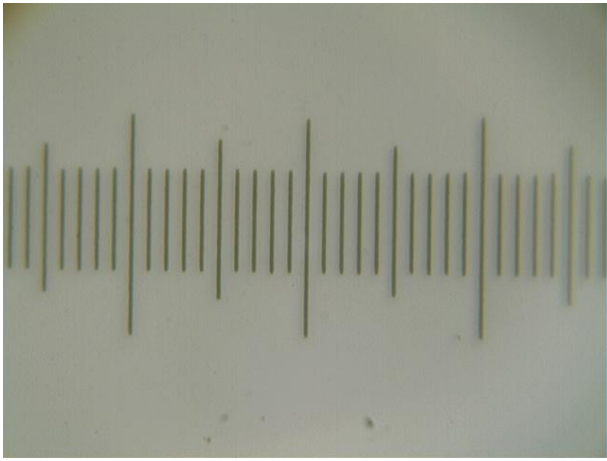


Fig.1 Image captured from the DirectShow Capture Window

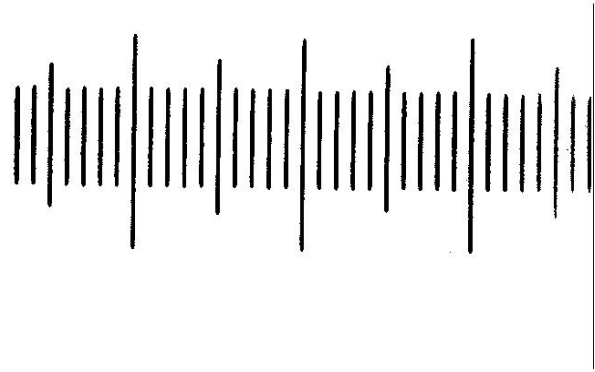


Fig.2 Image after binarized

2. Choose **Process->Binary...** to binarize the image, the result is shown in Fig.2.
3. Inverse the image using command **Image->Adjust->Invert**. Change the image to 24 bit using **Image->Color Quantize...** The result is shown in Fig.3

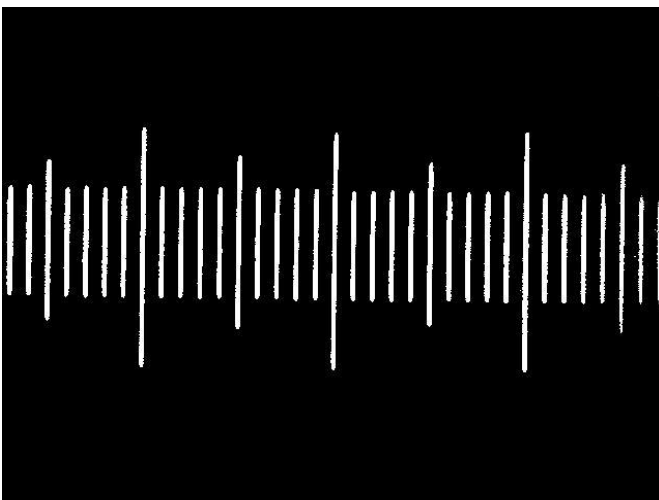


Fig.3 Inverted binarized image

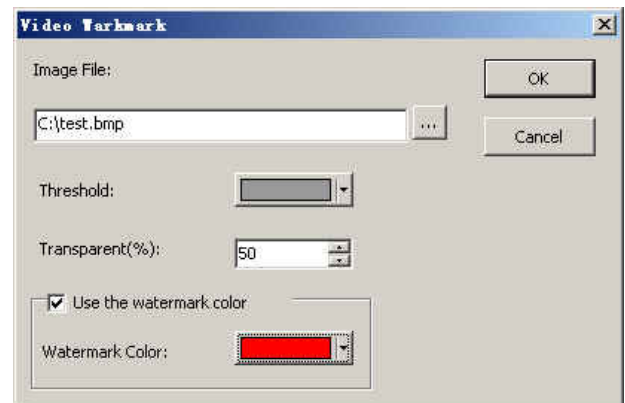



Fig.4 Video Watermark setup dialog

4. Save the image in **24 bit BMP format**.
5. Choose **File->Image Import->Video Watermark...**, there should pop up a Video Watermark dialog as shown in Fig.4. Click  button to find the image directory saved in step 4. Set the **Threshold** in color, select **Transparent (%)** index to what ever you want, Check or uncheck **Use the marker color**. Finally, select the **Waterark Color**. If everything is **Ok**, click **OK** button, the final **Video Watermark** should look like Fig.5.

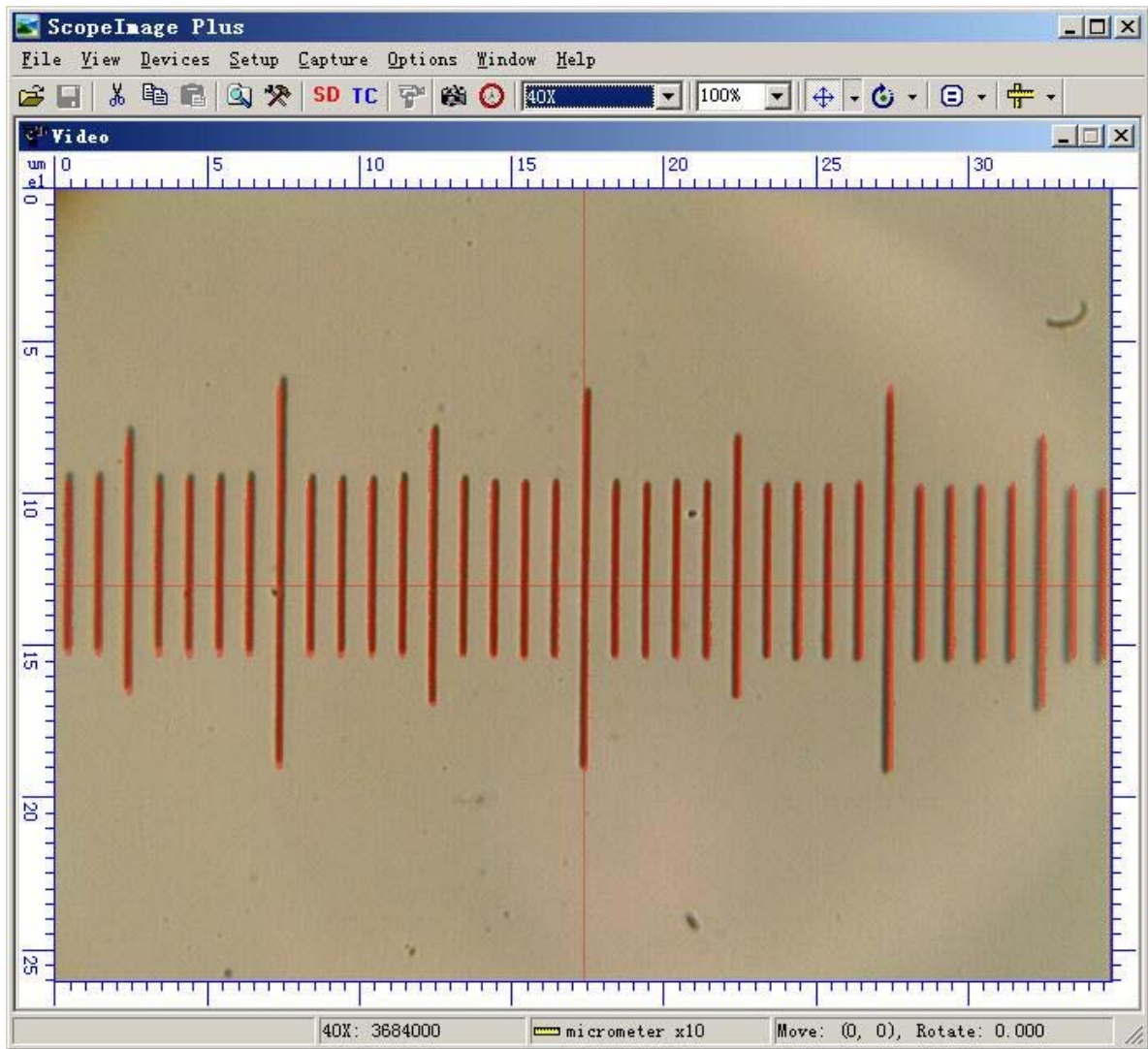




Fig.5 Video window with Video Watermark overlaid

6. User can press  or  down and using **arrow keys** to move or rotate the marker. Please refer to [DirectShow Capture Window Toolbar](#) for detailed information.

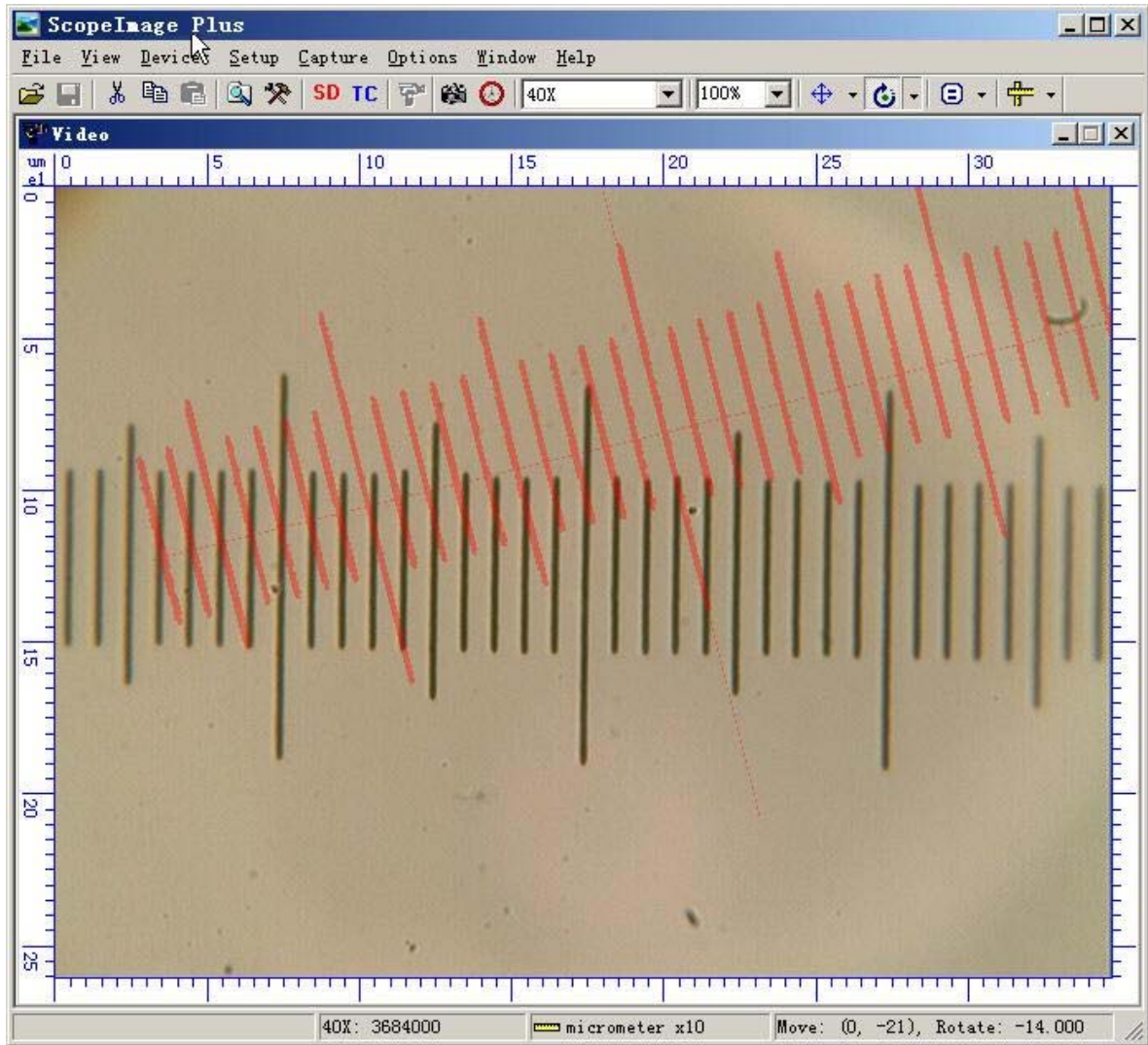


Fig.6 Video Watermark moved and rotated

5.5 Image Processing

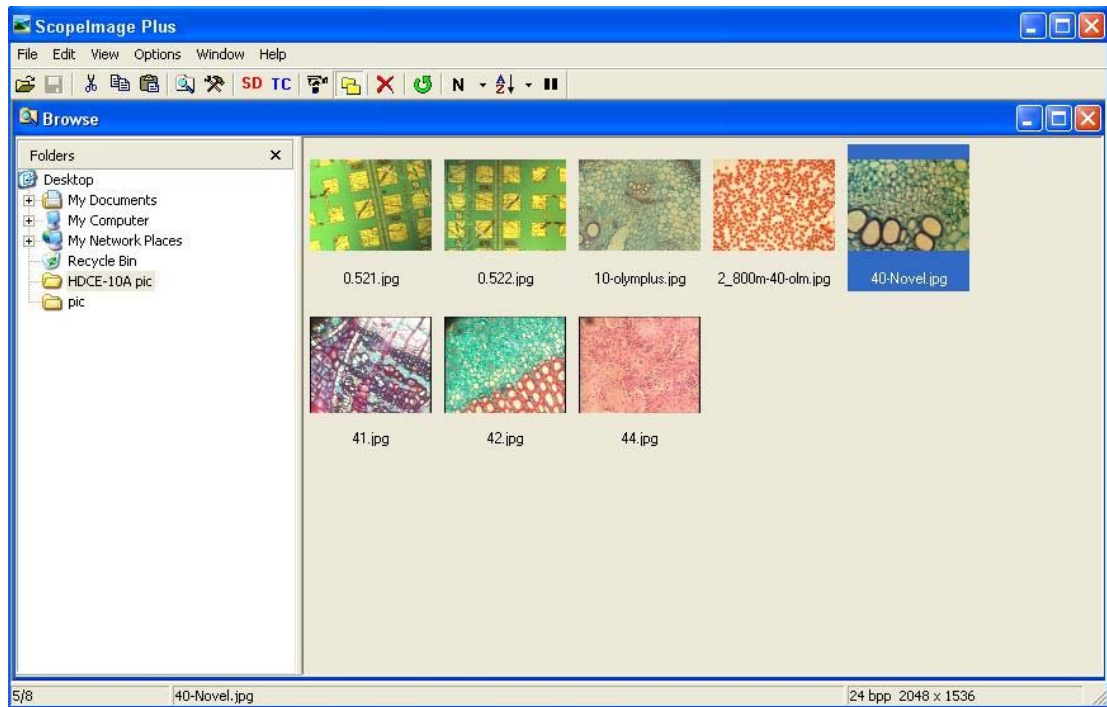
See the help contents in the software.

5.6 Image Browser

An Image Browser lets you efficiently find and organize your images.

To open the image browser, please select the menu 'View->Browse'.
















The Browser Window Toolbar

ScopeImage Plus's Browser Window toolbar is shown as below:



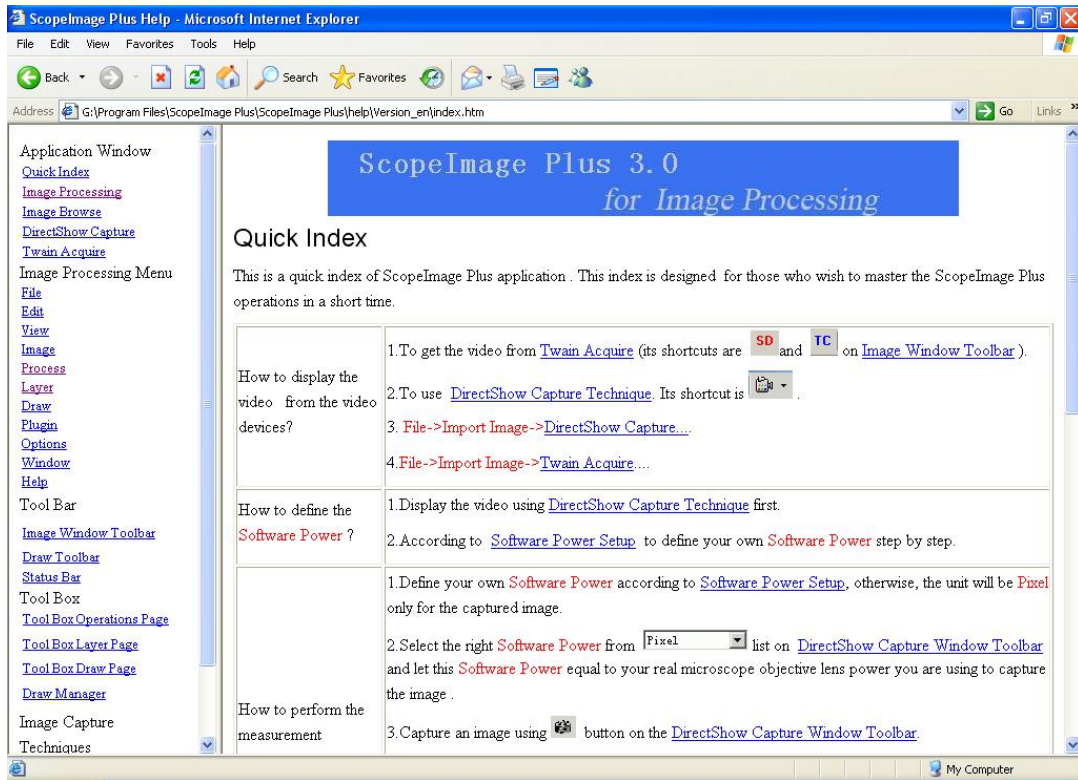
	Open an image file using file open dialog.
	Save image file. Disabled in the browser window
	Cut the selected image files
	Copy the current selected image files
	Paste image files from clipboard
	Display /hide the browser folder.
	Delete selected image file.
	Execute this button to reload images.
	Select thumbnail mode.
	Arrange images by their name, type, size or by alphabet order.
	Stop the icon loading of the image under current directory.

5.7 Help Contents

Click 'Help->Help Contents' or press 'F1' to find more information about how to use the ScopeImage Plus software.



Please refer to the index on the left side of the web page to get the information you want.



6. Use the Camera in ScopeImage Advanced

6.1 An overview of the ScopelImage Advanced

ScopeImage Advanced is a 24bits real color microscopy image processing software based years of experience in the field of digital image processing and analysis, which provided a large number of image processing and measurement tools, suitable for all kinds of microscopy image processing and measurement tasks. High reliability and robust performance, easy to use, makes it a powerful tool to the user in scientific and research fields.

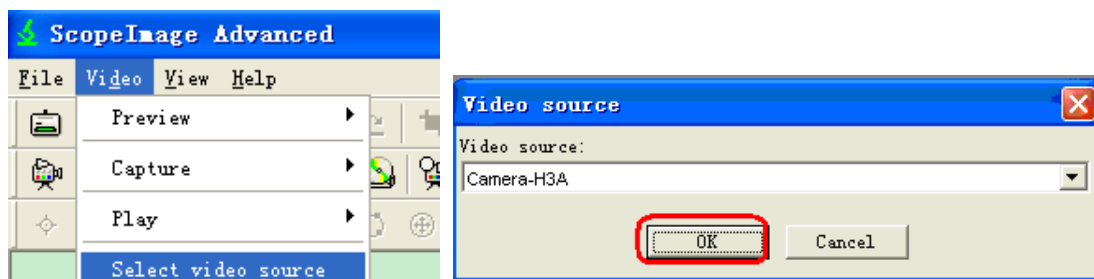
Note:

Before using the ScopelImage Advanced, please insert the encryption lock to your computer's USB2.0 port, otherwise, the software will not be activated.

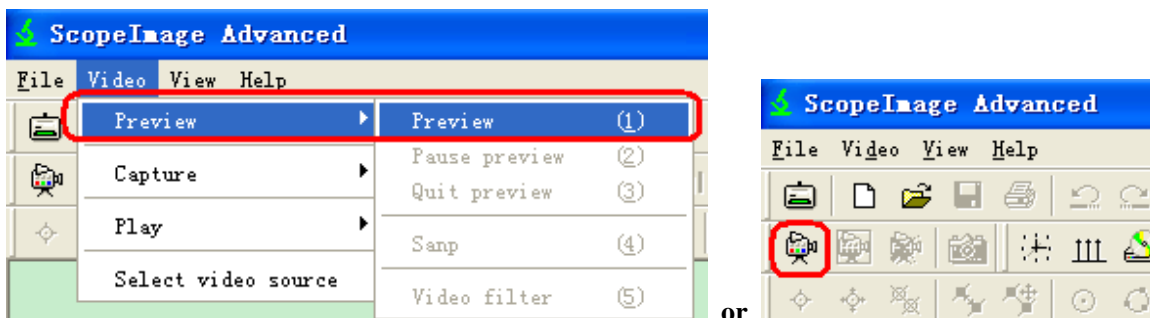
6.2 Use Directshow to Preview in ScopelImage Advanced

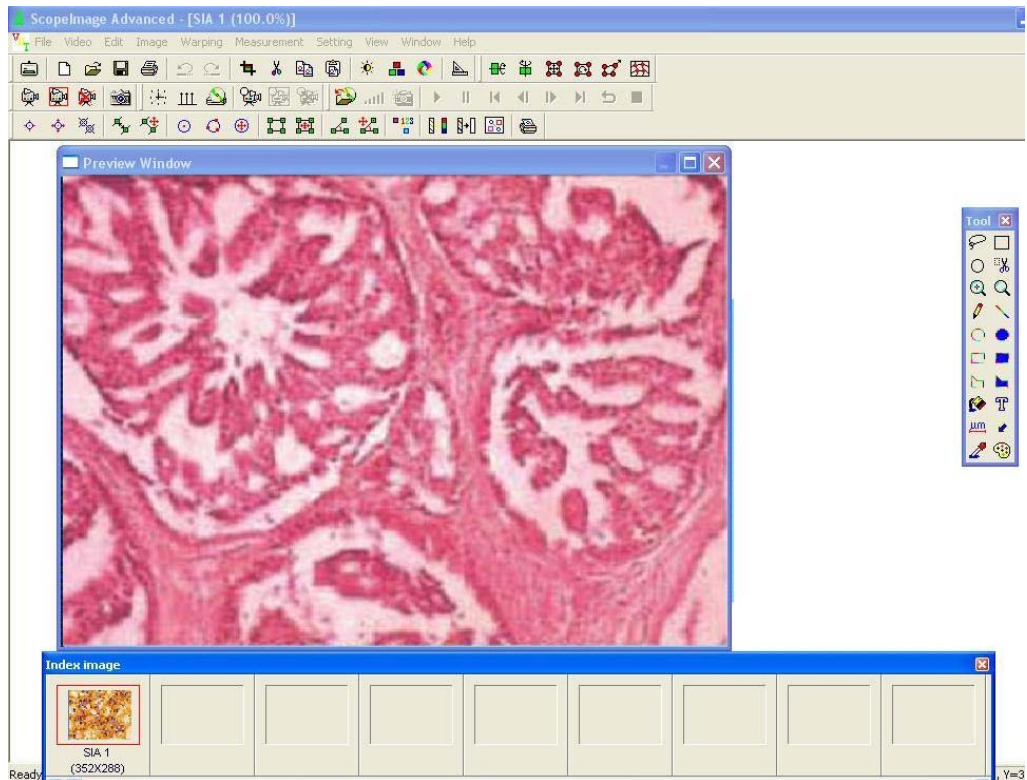
(a) Open the Directshow Preview Window

1. **Select video source.** Click the menu 'video ->Select video source', there will come out a dialog for you to choose video source, please select 'Camera-H3A', and **remember to click the button "OK"**.



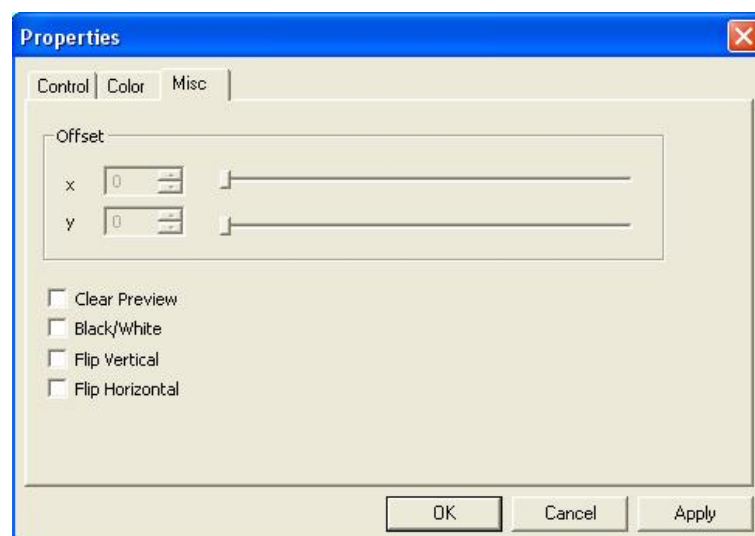
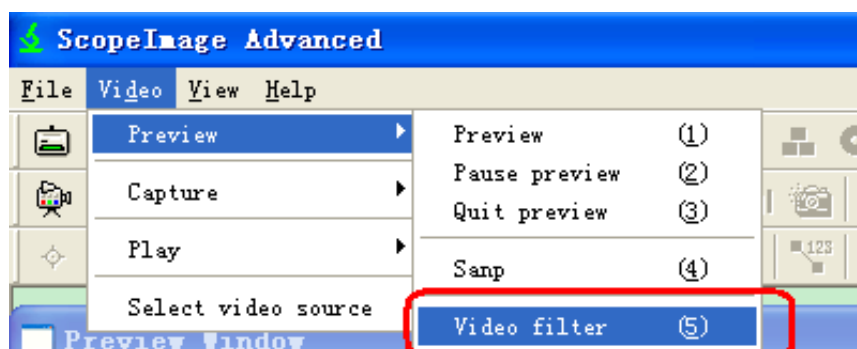
2. **Open the preview window.** Click the menu 'Video->Preview->Preview'. Or you can click the icon on the toolbar.

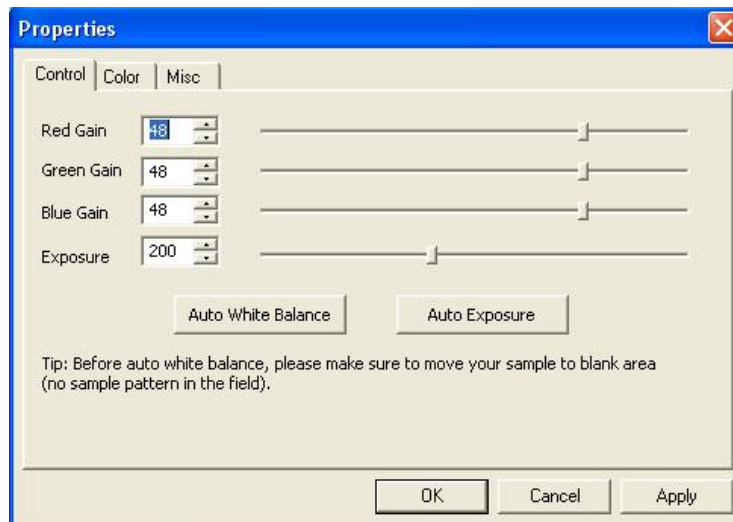
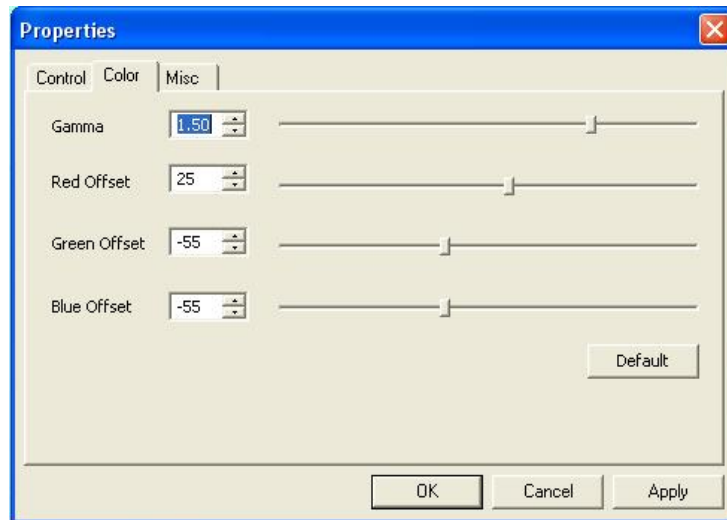




(b) Adjust the Color.

Please click the menu 'Video->Preview->Video filter' to open the video property window.



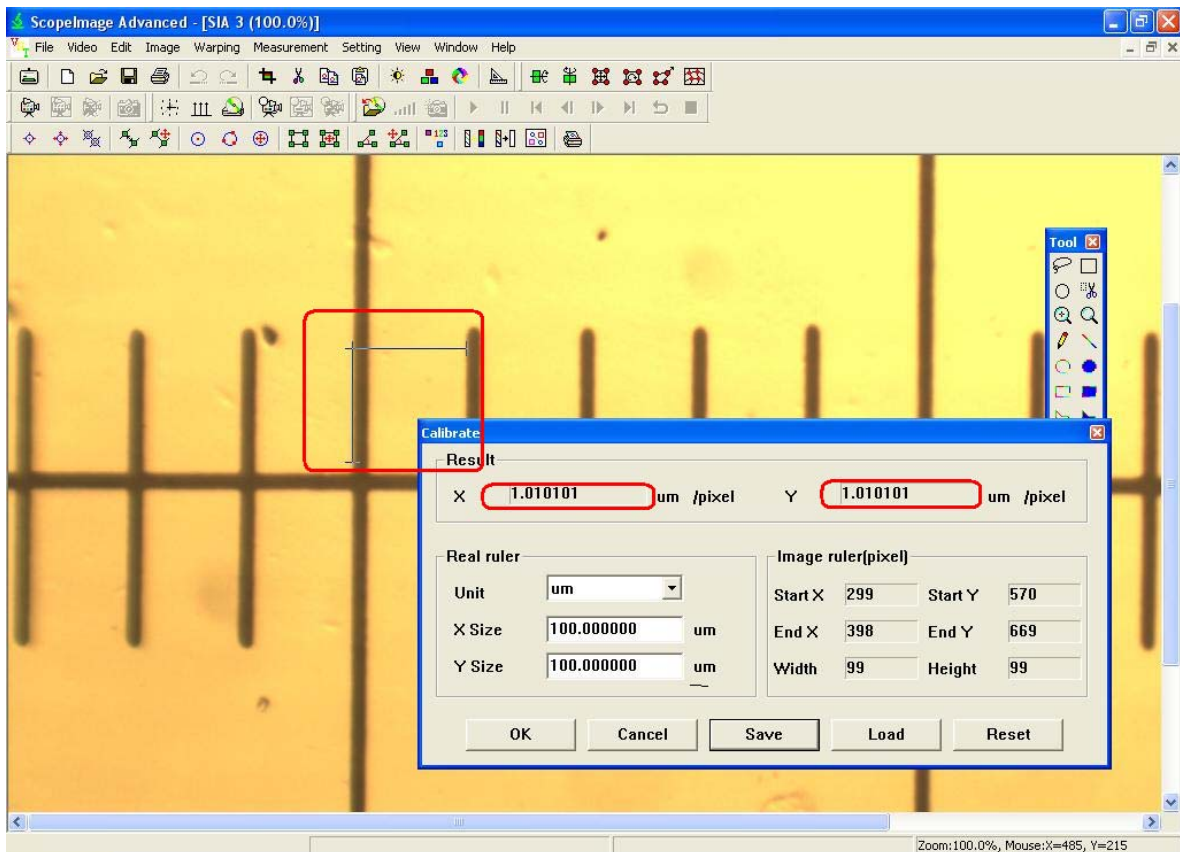


(c) Do the Calibrating in ScopeImage Advanced.

Do the calibration first:

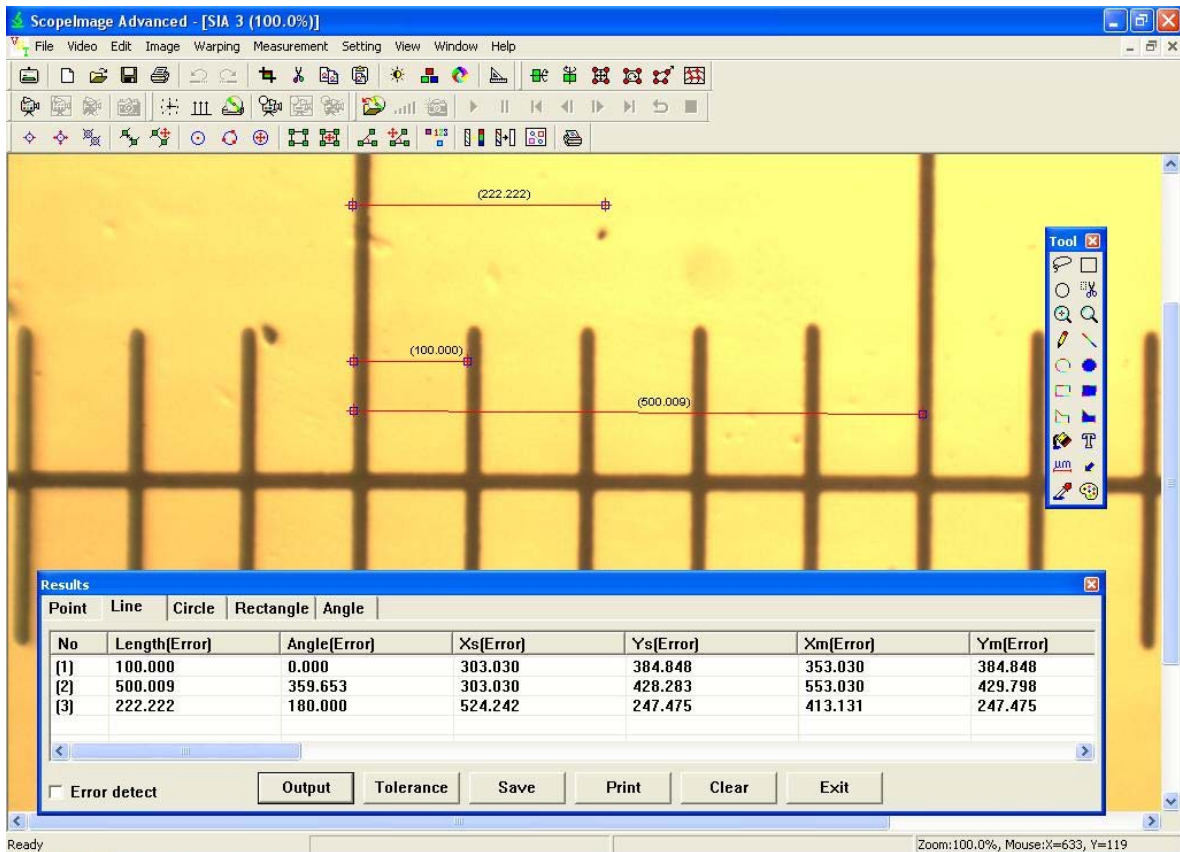
- Begin direct show preview
- Put the micro ruler in the video window
- Adjust the direction of the micro ruler to let it parallel to the horizontal mark
- Take a picture
- Open the Dimension calibration dialog, as follows:





Here we use the 100um micro ruler, move to adjust the cross line, set the 'X Size' and 'Y Size', be sure to make the value of X um/pixel and Y um/pixel is the same.

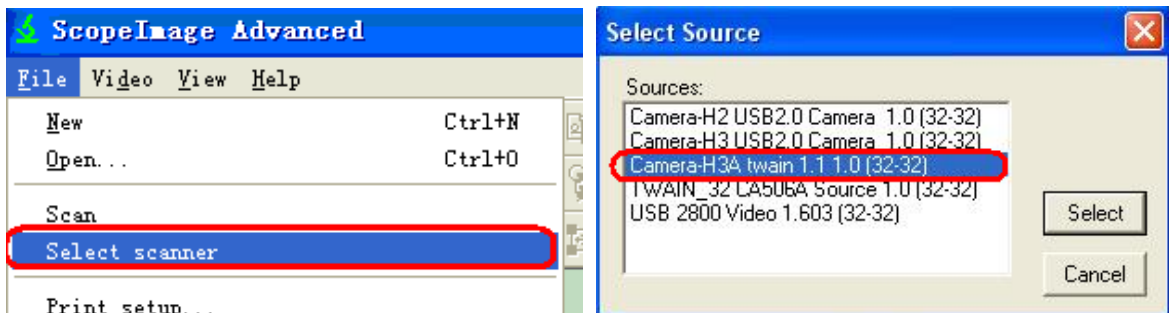
Now you can do the measurement.



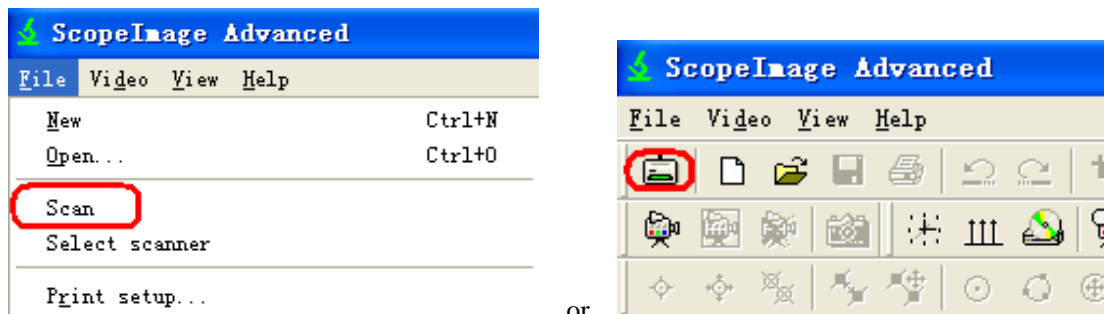
You can see the result in the measurement data bar.

6.3 Use Twain to Preview in ScopeImage Advanced

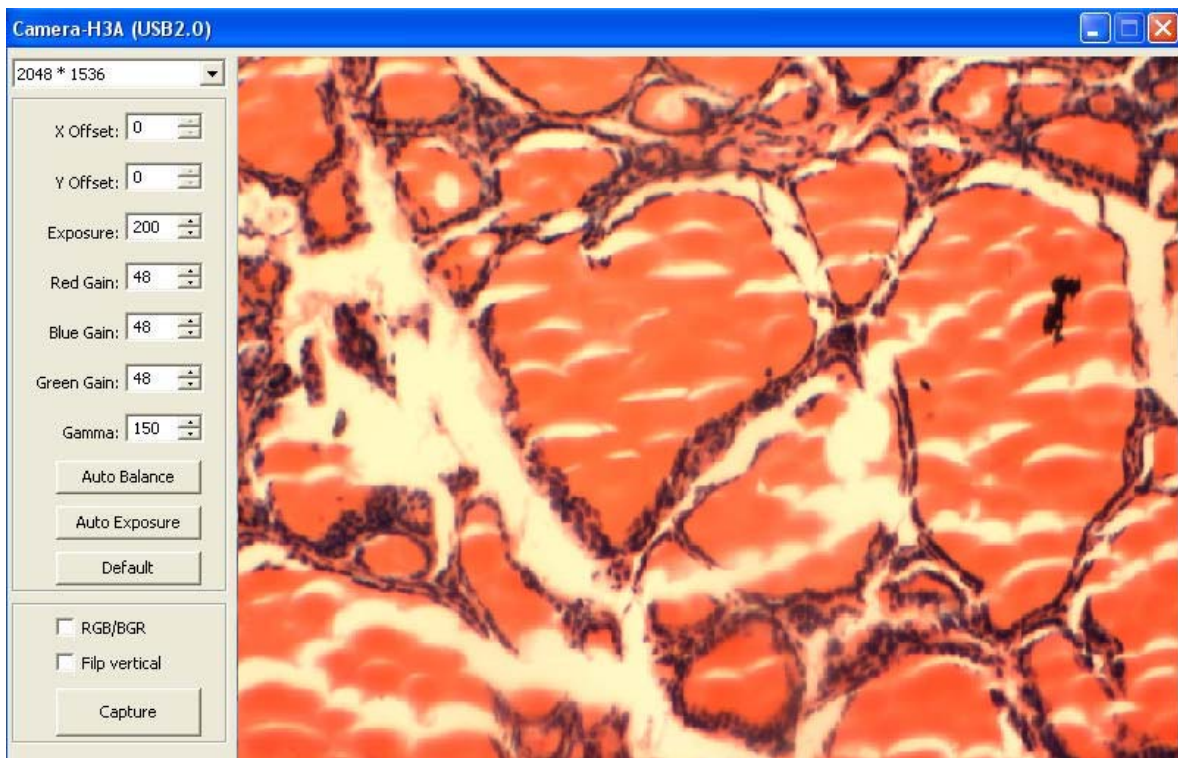
1. **Select a scanner;** open the file menu->Select scanner, there will come out a dialog for you to choose the device, please choose 'Camera-H3A', as follows:



2. Second, open File menu-> Scan or you can click the icon on the toolbar.



3. Now comes out the video preview window, you can preview and operate.



Please refer to the 'ScopeImage Advanced User Manual' to get more information of how to use the ScopeImage Advanced software.

7. Trouble shooting

Never disassembly the instruments yourself!

If you have any problems with the instrument quality or the operation, please contact with us or the distributor where you bought the instrument. Please never disassembly the instrument yourself because this may cause other problems or damage.

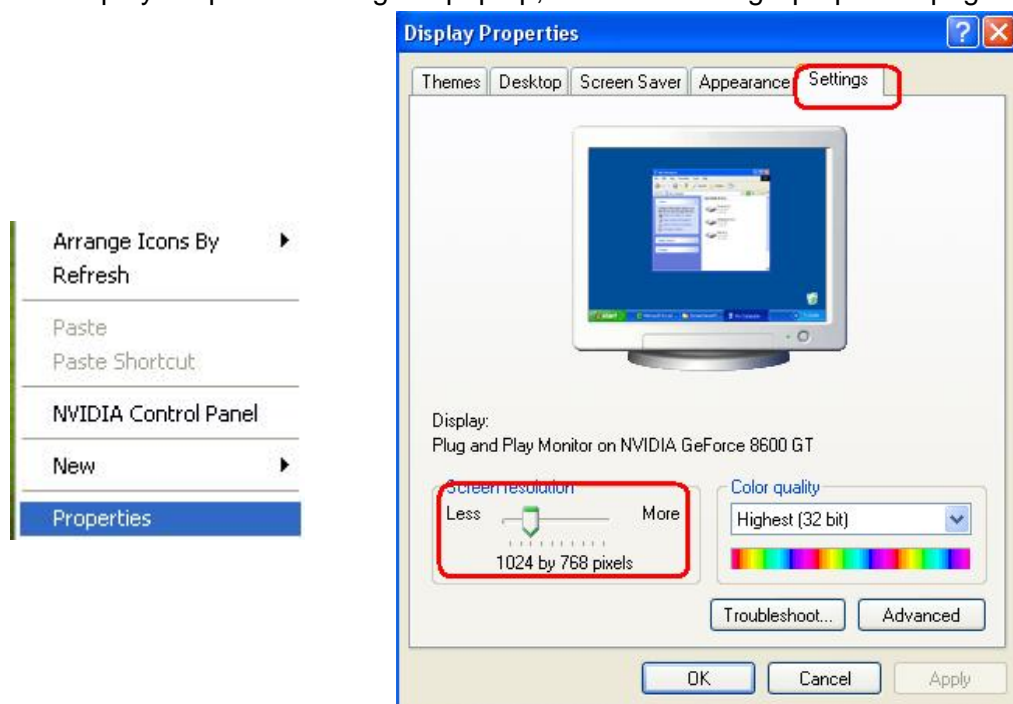
USB Device conflict

When your computer's main board connects with more than two USB devices, some unknowable errors will be happen; the errors contain the deficient USB bandwidth and the insufficient USB power supply and so on. Please plug out these USB device not use currently, and restart your computer, it may repair these errors. Sometimes you need to uninstall your device and reinstall the driver again.

Image Morphing

It is because the computer's display resolution is mismatch with the screen resolution. So please reset the screen resolution to avoid the image morphing. Please do as follows:

- (1) Right click the mouse on the desktop, and click 'Properties';
- (2) A 'Display Properties' dialog will pop up, click the 'Settings' properties page:




- (3) Check the Screen resolution, whether it is suitable with your monitor screen. If not, please change it.

Application fails to start

If there comes out the error dialog when you launch the application 'ScopeImage Plus'



Please Install the  `vcredist_x86.exe`
IExpress Setup
Microsoft Corpor... under the CD folder 'ActiveX'.