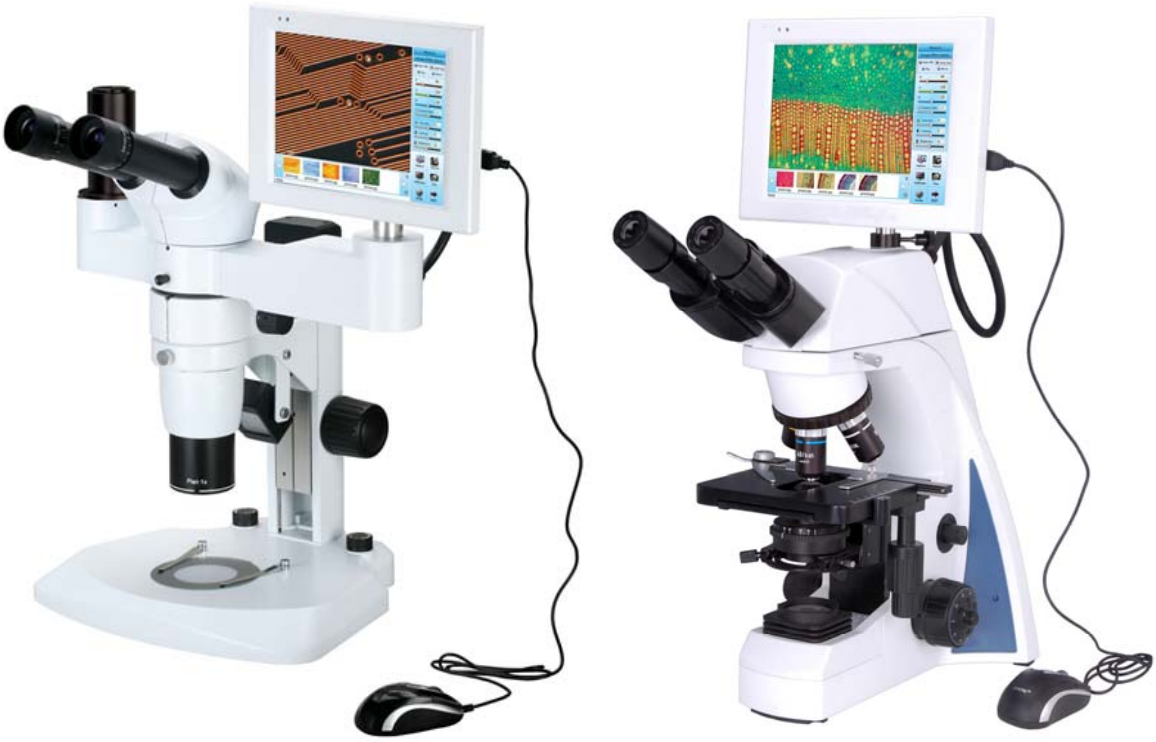


Embedded System LCD Microscope

Operation Manual

2010-12-1

Table of Contents

Ⅰ. Introduction

1.1 About LCD Digital Microscope

New generation of the microscopes!

This LCD digital microscope is a bland new system that has an embedded system. With a 8.4” LCD screen, friendly man-machine interface, powerful processing function (real-time preview, dynamic calibrating and measuring), multiple peripheral interfaces, and comfortable mechanical design; it become a new generation microscope and easy to operate. So it is your good assistant in teaching, research and electronic checking!

1.2 Features

1. Embedded operating system WinCE 5.0, can link mouse or keyboard, just like a micro computer.
2. 8.4 Inch LCD screen, brings up a bright and vivid view, so it can be viewed by many observers at same time.
3. Friendly man-machine interface. Can operate the operating system by USB mouse, keyboard and **Touching screen**
4. Build-in high resolution 2Mega Pixel camera, provide high quality images.
5. Powerful software with international advanced technology. Support **real-time** preview, dynamic calibrating and measuring, and can capture images or videos.
6. LCD screen rotatable at maximum 30°elevation angle and 180°pivoting, makes the observation much more comfortable, and is suitable for long-time observation.
7. Touching screen, very convenient to operate.
8. Support multiple peripheral interfaces, such as VGA, USB, SD Card, RCA, Mini USB, Audio, and so on.
9. (New) Support 100M Ethernet network and WI-FI wireless net. And can communicate with the PC. Furthermore, it lays a foundation of multimedia and network interactive teaching.
10. The images or videos captured can be stored in the SD card for further analyzing.
11. Automatic measurement and real-time measurement result display.
12. Quick Focus®, coaxial fine and coarse focus system facilitates smooth focusing.
13. Parfocal objective lenses ensure the image stays in focus when the objective power is changed

    …

1.3 System Specification

ARM926EJ embedded system CPU

- 16KB I-Cache, 16KB D-Cache
- Support full-duplex video codec with resolution up to VGA(640*480), and frame rate 30fps
- Image zooming, picture in picture, image post processing.
- Real time operating system WINCE5.0, supported by MMU
- 16KB TCM
- Highest frequency: 266MHz @ 1.2V

EMS memory interface

- Support maximum 512MB SDRAM
- Support large capability Nand Flash
- Bootstrap support NOR Flash

Camera video frequency interface

- Support multiple input format: RAW, RGB and YUV
- 2.0M pixel CMOS digital imaging, 30f/s(640*480) real-time display
- CCIR-656 in-out interface
- Stepped digital zooming, bit rang from 1/32 to 4 times
- White balance adjustment and image correction
- Electron viewfinder and screen menu function

Human machine interface

- 8.4 Inch(Diagonal)TFT liquid crystal display, resolution 800*600
- Support keyboard, mouse input;
- Hardware switch button: reset, soft switch button, power switch;
- Can configure touching and handwriting function according to customer's demands.

Extend card

- Support up to 4G High Speed SD card

Peripheral Interface

- Support USB 1.1 HOST flash memory disk
- Min USB interface AB type
- Support VGA interface
- Support AV OUT interface
- Audio output 3.5" interface

Audio Module

- AC'97 audio controller
- Build-in two channels stereophonic speaker.

Network Module

- Support WI-FI wireless net
- Support 100M Ethernet network

Power management

- Four power model: common, wait, sleep and shut down
- Support close part of models to reduce power consumption

Measurement function

- Image measurement: Calibration and real-time dynamic image measurement, After calibration, can using physical length unit to measure dynamic images, such as micron, millimeter, inch; Support several basic measurement tools, as cross ruler, rectangle ruler and so on;
- Image effect adjustment: brightness, contrast and saturation adjustment, automatic white balance;
- Snap: image capture function, can store by JPG format
- Recording: record dynamic image as AVI files
- File browser: browse the image and video files stored in the system;

Operation circumstance

- Core voltage: 1.2V
- I/O voltage: 2.5V/3.3V
- Simple Chinese or English WINCE 5.0 operating system
- Support Media Player software and can choose applications as Word, Excel and so on, according to the customers needs

1.4 Camera Specification

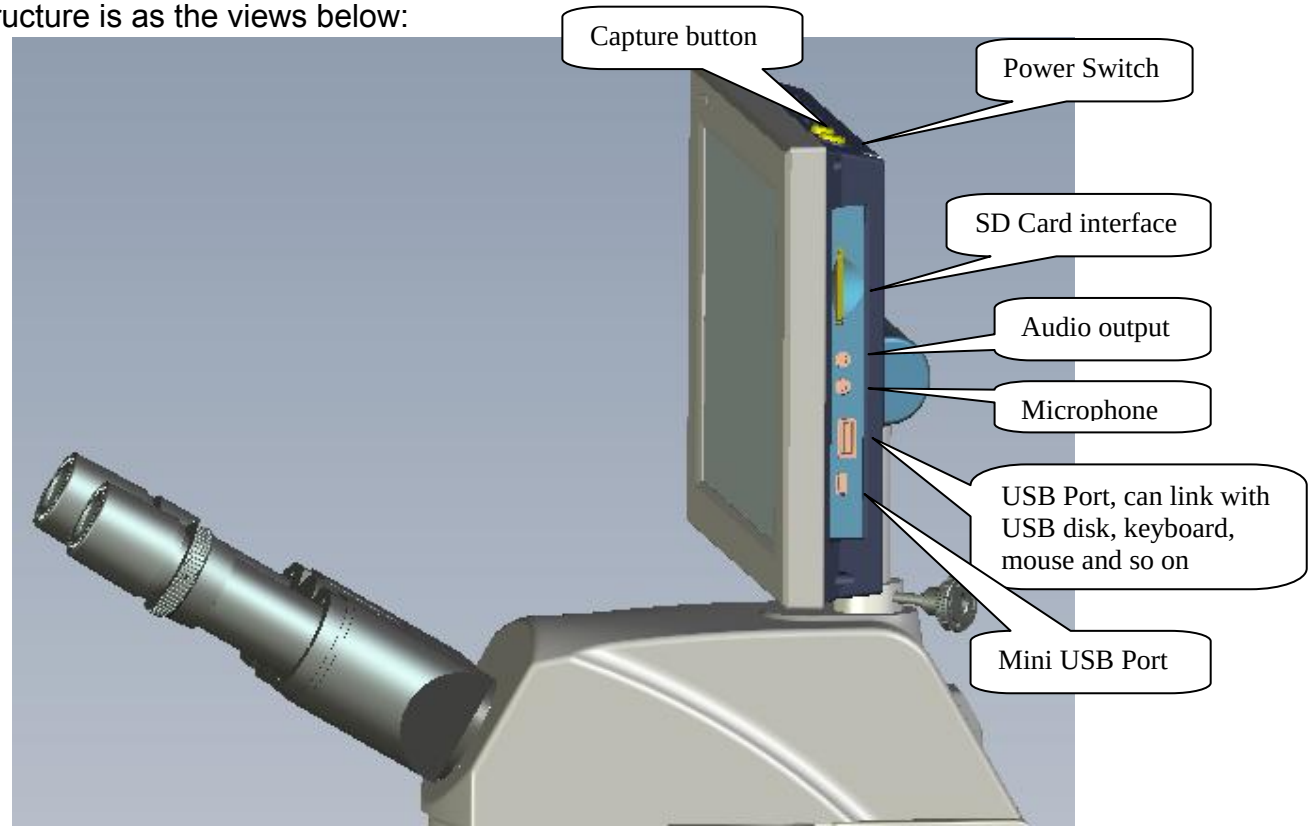
LCD Size	8.4 Inch TFT Touch Screen
Image Sensor	1/3.2″CMOS
Valid Pixel	1600×1200(2.0M Pixel)
Pixel Size	2.8um×2.8um
Digital Output	24–bit (color)
Image Format frame rate	1600×1200 7.5f/s
	800×600 30f/s
Sensitivity	1.8v@550um/lux/s
SNR	42.3dB
Dynamic Range	71dB
Exposure	Manual/Auto Exposure Process, Exposure Time Adjustable（1～500ms）
White Balance	Manual/Auto White Balance
Operating System	Embedded operating system WinCE 5.0
Software	NMS
Software function	Real-time image preview, measure and so on.
Output	VGA,RCA,USB and Min USB, SD card, Audio, RJ-45, Support mouse and keyboard output
Outward appearance	
Observation LCD	Can rotate at maximum 30°elevation angle and

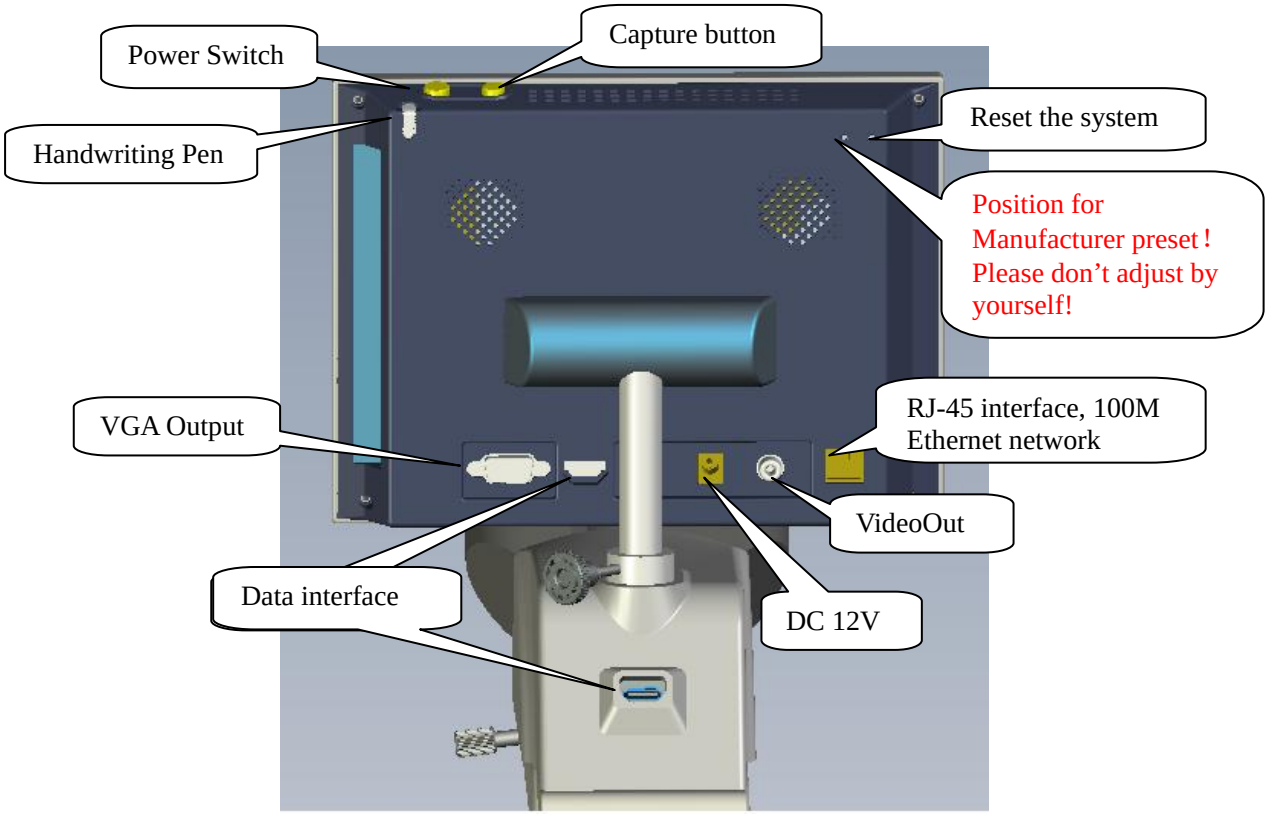
Screen	180°pivoting
Accessories	**Data Wire, Touching Pen, Mouse, Power Adaptor**

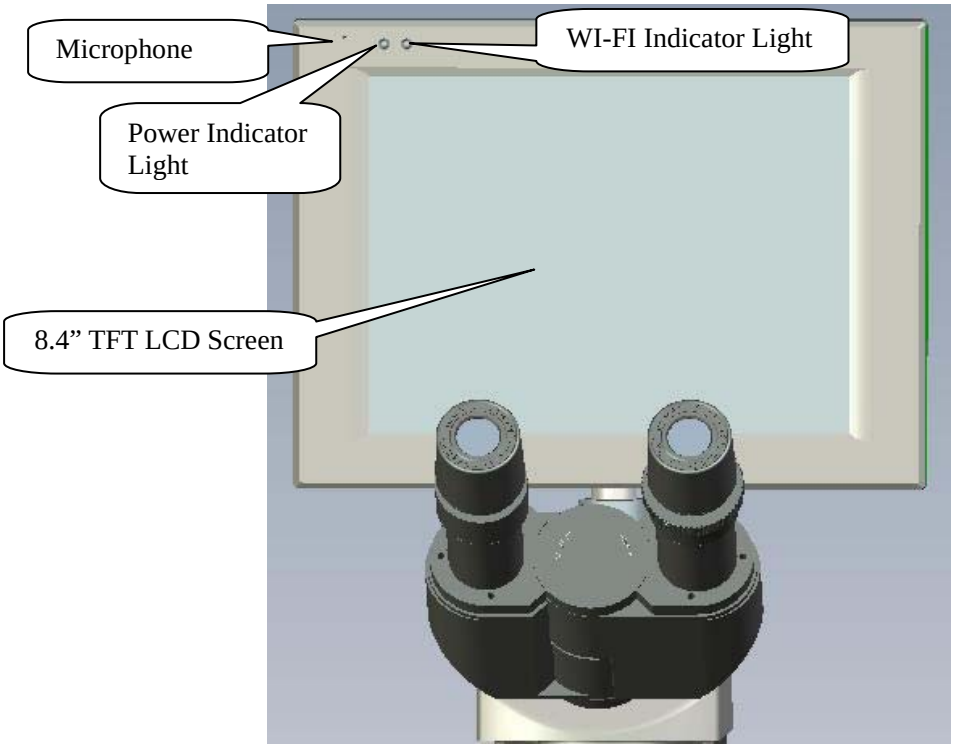
Ⅱ. Structure and Installation

2.1 Structure

Structure is as the views below:







2.2 Working condition

Choose a working condition without direct light, place the equipment far away from window and without facing window, since the direct light will affect the image contrast and observation effect.

Working conditions of digital microscope:

1）Environment temperature: 0℃-40℃, max relative humidity: 85%.

2）Avoid the dirty environment, and cover the microscope with plastic cover while not using it.

Ⅲ. Usage and Operating

3.1 Windows CE

(a) About Windows CE

Windows CE (also known officially as Windows Embedded CE, and sometimes abbreviated WinCE) is a variation of Microsoft's Windows operating system for minimalistic computers and embedded systems.

Like the full-scale Windows systems, Windows CE is a 32-bit multitasking, multithreading operating system that has a scalable, open architecture design,

especially designed for including or embedding in mobile and other space-constrained devices. Actually, it is an electronic device operation system, and "CE" is reported to have originally stood for "Consumer Electronics." Standard communications support is also built into Windows CE, enabling access to the Internet to send and receive e-mail or browse the World Wide Web. In addition, a graphical user interface incorporating many elements of the familiar the Desk-Top Windows user interface is also available, facilitating ease-of-use for end users.

The meaning of “C” and “E” in Windows CE

“C” Stands for:	“E” stands for:
Compact	Electronics
Consumer	
Connectivity	
Companion	
…	

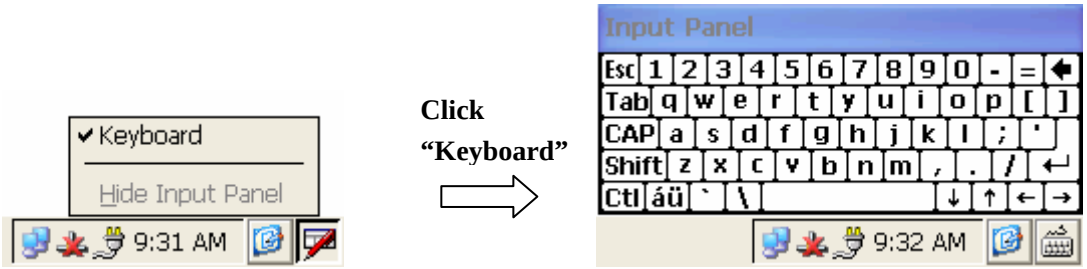
(b) Open the Soft keyboard

Besides the keyboard (you can link a keyboard with the USB port), thanks to the touching screen, the system also support soft keyboard, and it brings great convenient to the users.

Click the icon  on the taskbar at the bottom of the main window to open the keyboard.

OPEN:

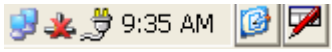
Click “Keyboard”. The soft keyboard displays.



CLOSE:

Click the keyboard icon  again, and select “Hide Input Panel” to close the keyboard.

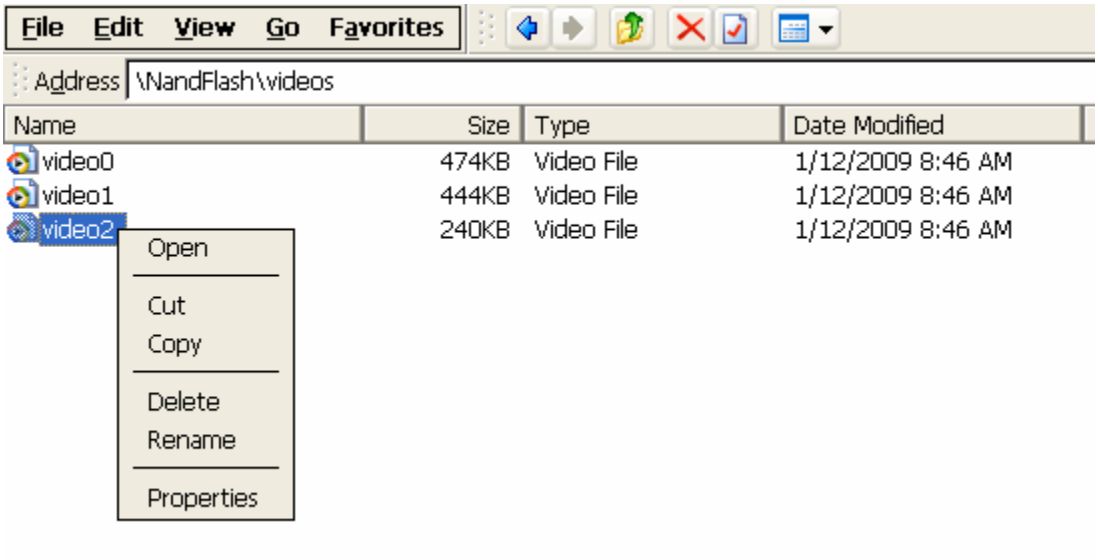
Click "Hide Input Panel"



(c) The mouse right click function

If you use the mouse, you can use the right key of the mouse very easily. But if you use the handwriting pen, please click for more than 2 seconds, the system will response it as a right click.

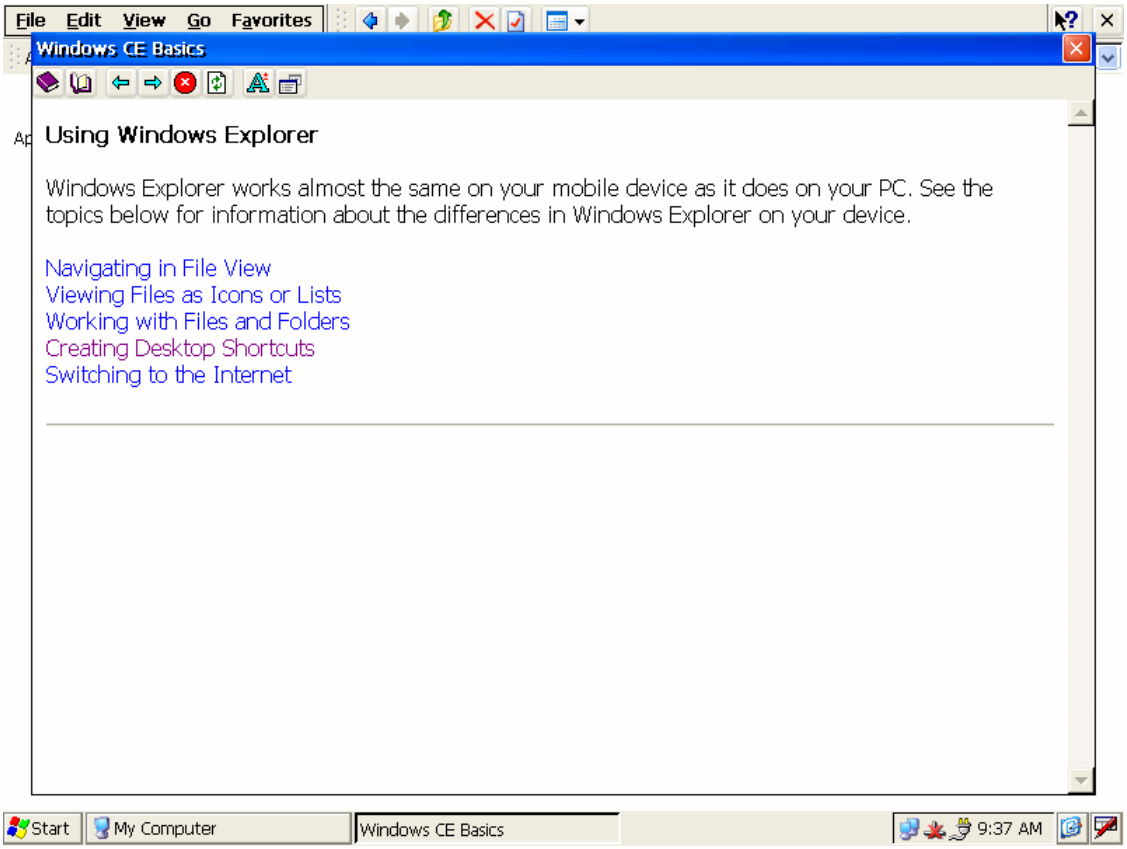
For Example:
Select the file, and click it with more than 2 seconds, the right click menu will come out as follows:



(d)Get the help

Click the icon  on the command bar.

WinCE help window comes out. Just click the items you interest. The system will give out the relevant help information.



3.2 The software - NMS

(a) Main function

NMS is a software especially designed for Windows CE system. This special software makes it very easy to capture, record, calibrate and measure digital images. The main function is as follows:

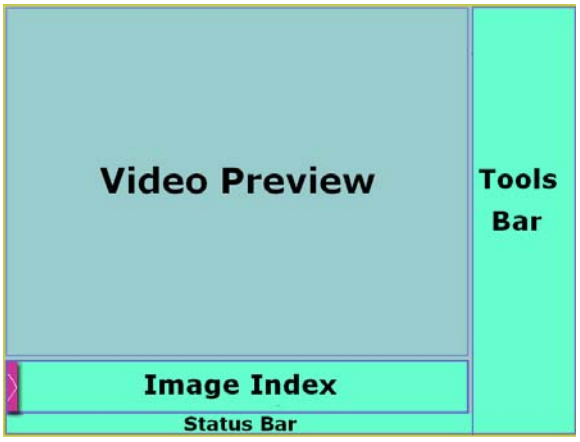
1) Real time preview images
2) Adjust the color
3) Capture images
4) Record videos
5) View the captured image
6) Real time measurement
7) Support WIFI function, can communicate with the PC by wired network or wireless network: can receive and display the real time images on the PC.

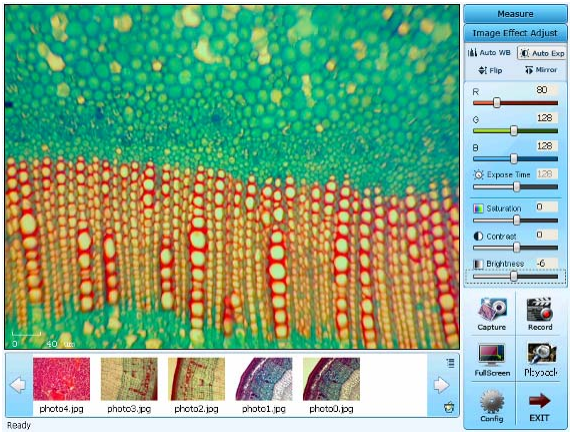
(b) Start NMS

Attention：This NMS software can use both on the biological microscope and stereomicroscope, the operation of them is the same. Here we show the operation on biological microscope as an example.

1, Turn on the power of the machine, start the WinCE5.0 operating system.

2, Double click the icon  on the desktop. The main interface displays as below:





The software is divided into 4 parts:

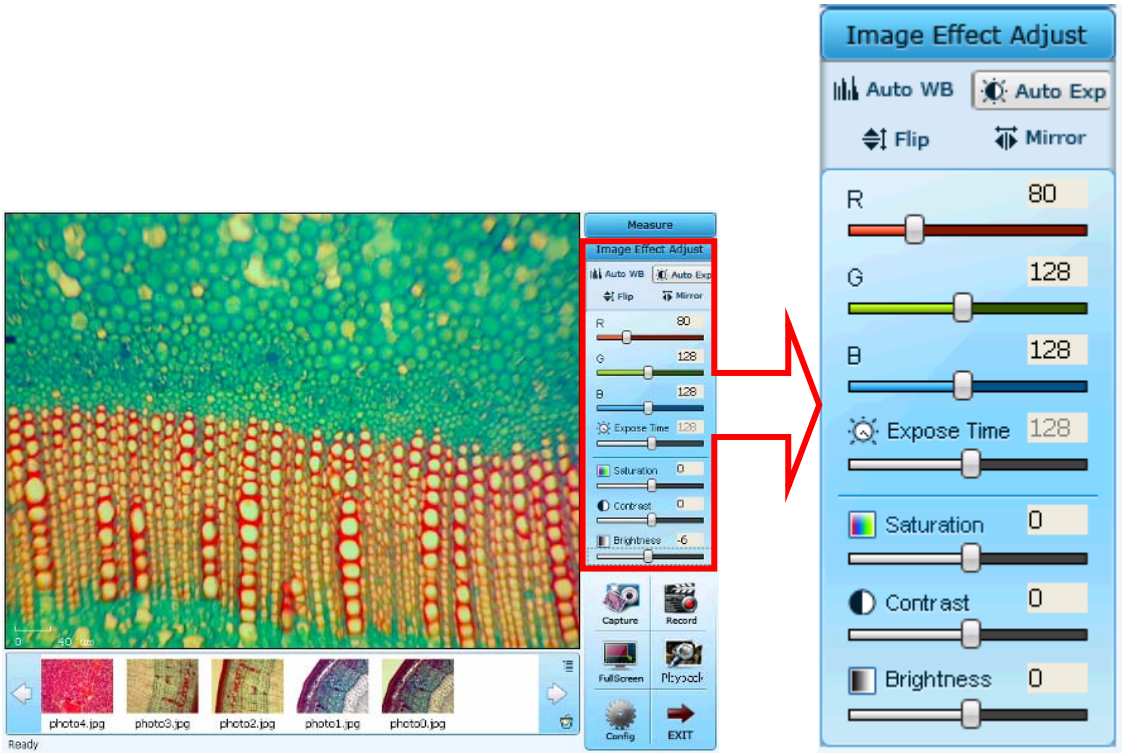
a) Video Preview: display real-time dynamic image, resolution 640x480,

Tools: Located on the right of the main window, there are various tools, buttons **and** icons.

b) Image Index: Located under the video or image preview window, and display the captured images.

c) Status Bar: Located at the bottom of the main window. Depending on a still image or displaying video in the active image window, the status bar gives different information.

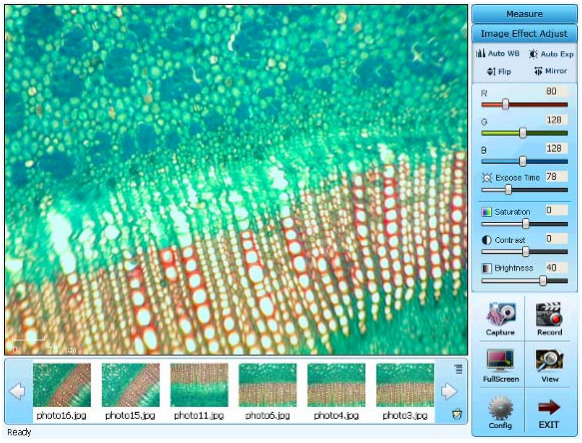
(c) Image Effect Adjust



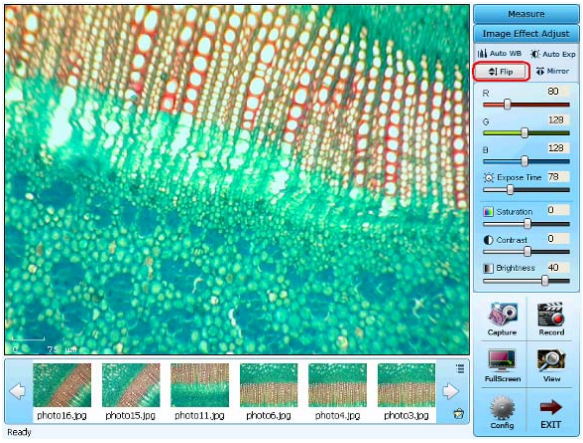
Auto WB **Auto White Balance:**	Press the Auto WB button, the system will do **auto white balance**. Press again to **manual white balance**. **Attention:** If you set it to auto white balance, you can not adjust the R G B values.
Auto Exp **Auto Exposure:**	Press the Auto Exp button, the system will do **auto exposure**. Press again to **manual Exposure**. **Attention:** the default station is set to auto exposure. And you can only adjust the exposure value when it has been set to manual exposure.
Flip **Vertical Flip:**	Flip the active image by the **horizontal axis**, press to set or reset a flip state. When the active image window is showing the live images, the command actually flips the live images.
Mirror **Horizontal Flip:**	Flip the active image by the **Vertical axis**, press to set or reset a flip state. When the active image window is showing the video, the command actually flips the live images.

Examples as below:

Flip Vertical Flip:

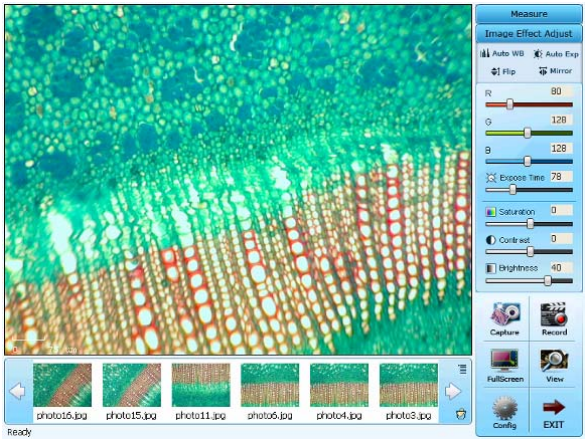


Original Image

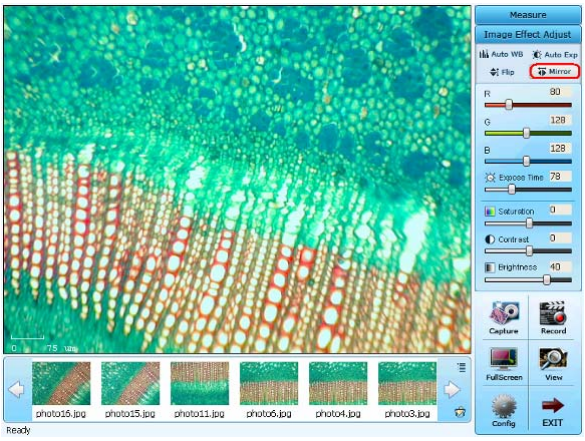


After click the Flip button

Mirror Horizontal Flip:

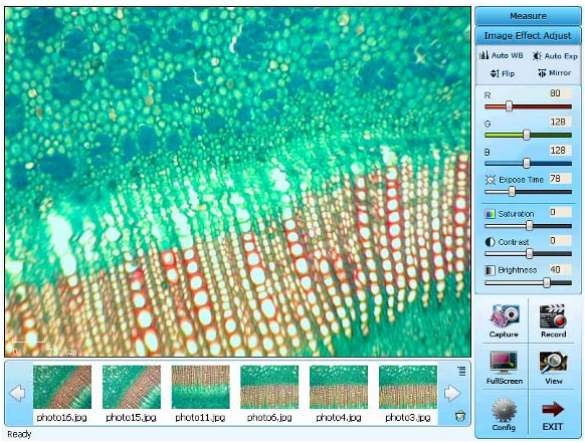


Original Image

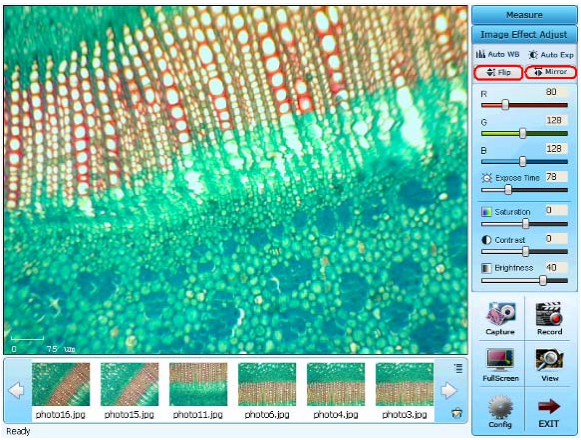


After click the Mirror button

Flip Mirror Vertical and Horizontal Flip:



Original Image

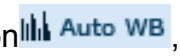
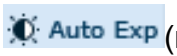


After click both the Flip and mirror button

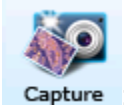
Color parameters:

	Use the slider to adjust the **Red** gain of the **camera**. It works **only** at **manual white balance** station.
	Use the slider to adjust the **Green** gain of the **camera**. It works only at **manual white balance** station.
	Use the slider to adjust the **Blue** gain of the **camera.** It works only at **manual white balance** station.
	Use the slider to adjust the **Exposure** value of the **camera.** It works only at **manual exposure** station.
	Use the slider to adjust the **Saturation** of the **screen.**
	Use the slider to adjust the **Contrast** of the **screen.**
	Use the slider to adjust the **Brightness** of the **screen.**

Attention:

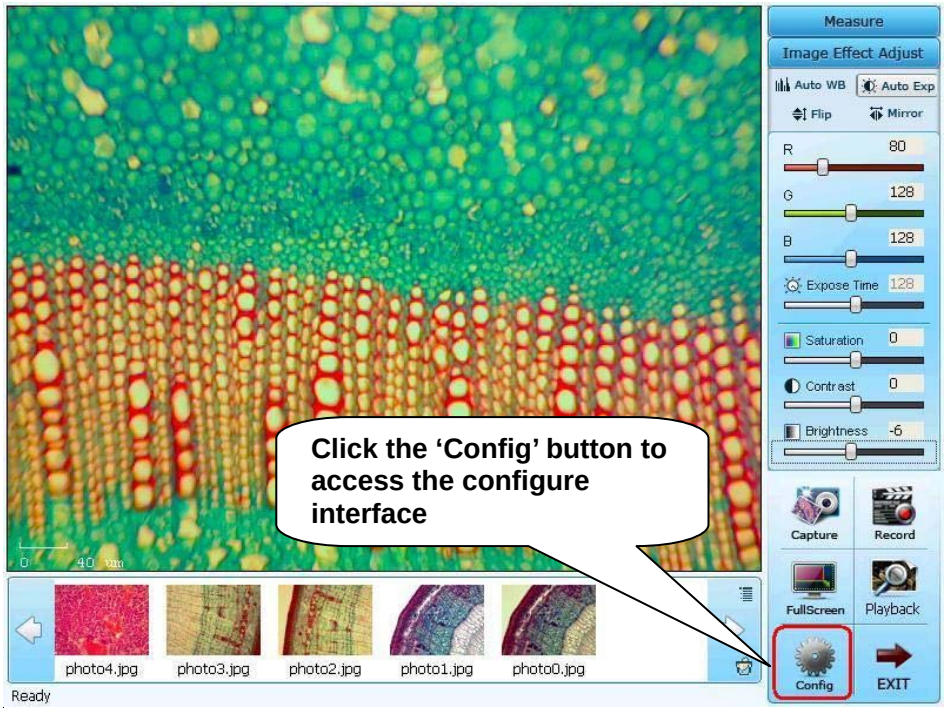
1) If you press the button  , you can not adjust the RGB values, for it is at the auto white balance station.
2) For the same reason, you can only adjust the Exposure value, when it is at manual exposure station  (not press the button down).
3) Move the slider of the RGB value can adjust the color of the **image,** and the adjust result can be stored into the image.
4) Move the slider of the saturation contrast brightness value can adjust the color of the **screen**, but the adjust result can **not** be stored into the image.

(d) Buttons function:

 :	Click “Capture” to capture a still image, the captured image will displays in the image index part. **Equivalent Command:** the **Capture button** on the main board of the LCD Head, see the Structure

 &  :	Click “Record” to capture an active video (click again to stop recording). In the mean time, the status bar displays “Recording” and the button changes to “Stop”, Click stop to stop recording. And the status bar will display the captured videos name and storage folder. **The store folder: \\SDStoreCard\Videos.**
 :	Full screen display the active image. **Equivalent Command: Double click** the active image on the video preview window to access full screen preview, and double click again to return back.
 & 	Click this button to switch between **active video window** and **captured image preview window**.
 :	This commend configure the capture option (resolution, format, store path …), the video sender information (IP address and port) and so on. The Configure dialog is showing below.
 :	Exit the system.

(e) Access the configure interface



1. Capture Parameter Set

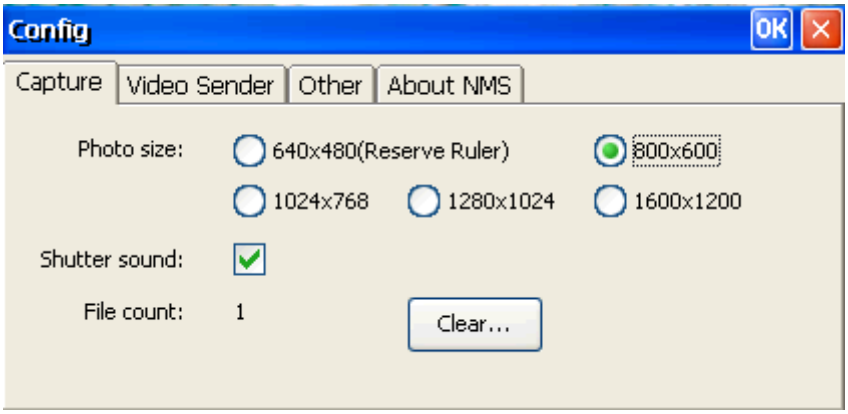
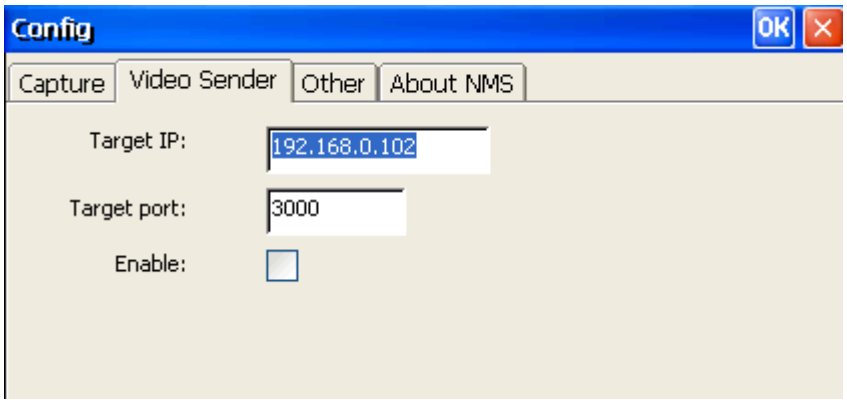


Photo size: Set the resolution of the capture image, rang from 640*480 to 1600*1200, If you want to reserve ruler to the image, please select 640*480

Shutter sound: Click to close the sound.

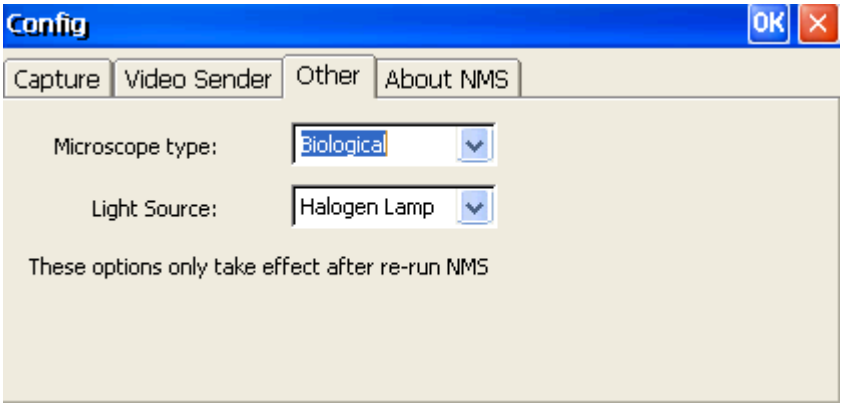
File count: the photo number. Click ‘Clear…’ button to reset the photo number to 0, click OK to check, or click ‘X’ to cancel.

2. Network Set



Set the IP address of the target PC and send the image to it. See Part IV Network Operation.

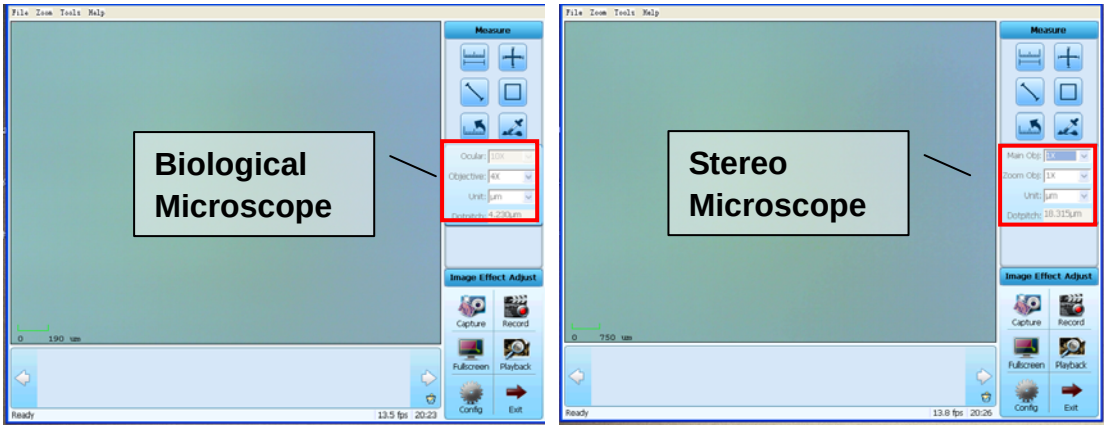
3. Type Set



Microscope type: Biological Microscope and Stereomicroscope for choice

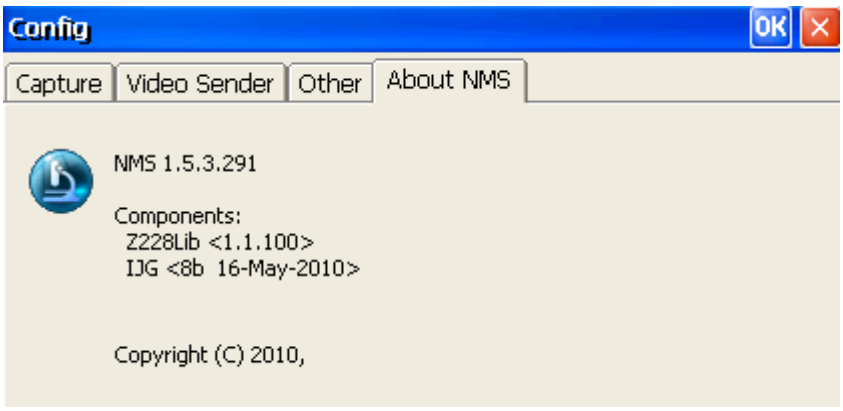
Light Source: Halogen Lamp and LED for choice

Attention: you need to re-start the NMS software to make the settings effect.



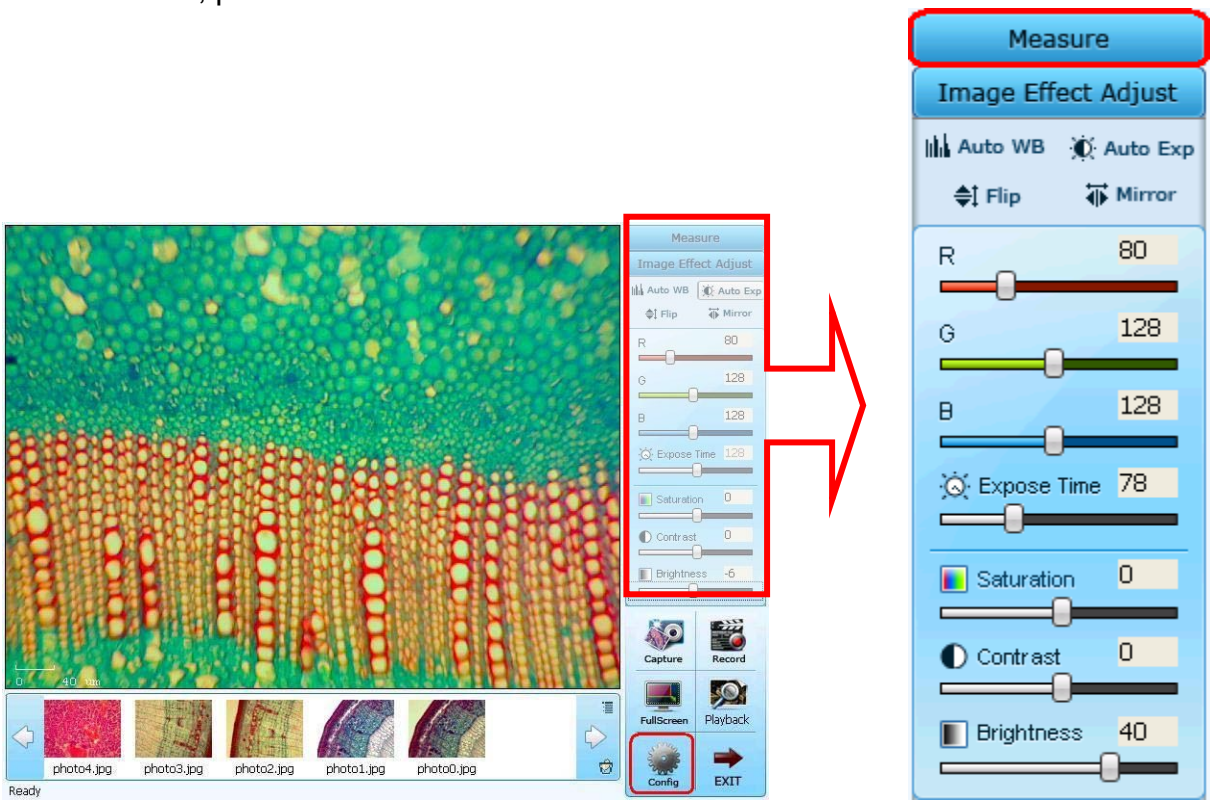
The picture above shows the difference between the biological microscope and the stereo microscope, they are just different in the measurement.

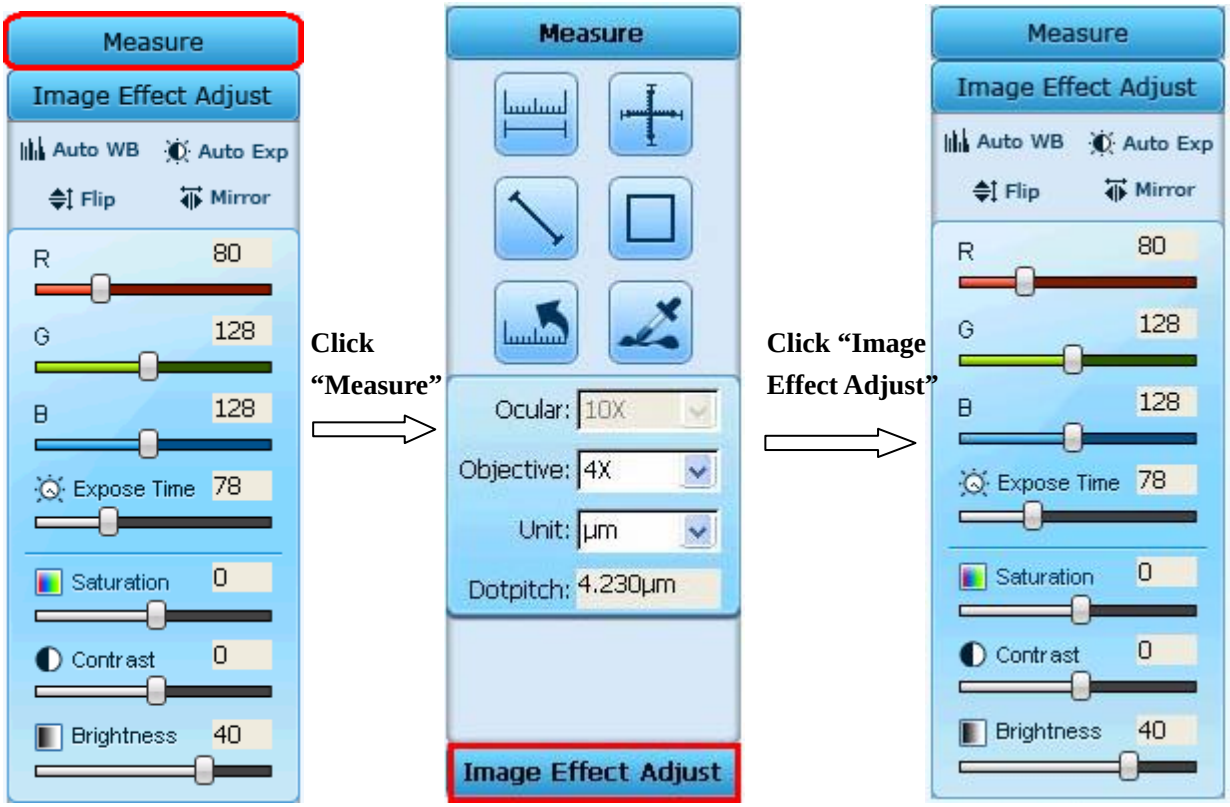
4. The Version Information



(f) Dimension Calibration and Dynamic Measurement

NMS supplies several measurement tools, it supports dimension calibration and dynamic measurement. To do the measurement, simply click on the image to define control points. The program will automatically perform measurements, and calculate areas. All measurements are drawn over a special measurement layer. It is simple, convenient, easy to learn and suitable for needs of different users. Before doing measurement, please do calibration first.





Click “Measure”, the system will switch from the “Image Effect Adjust” to the “Measure”.

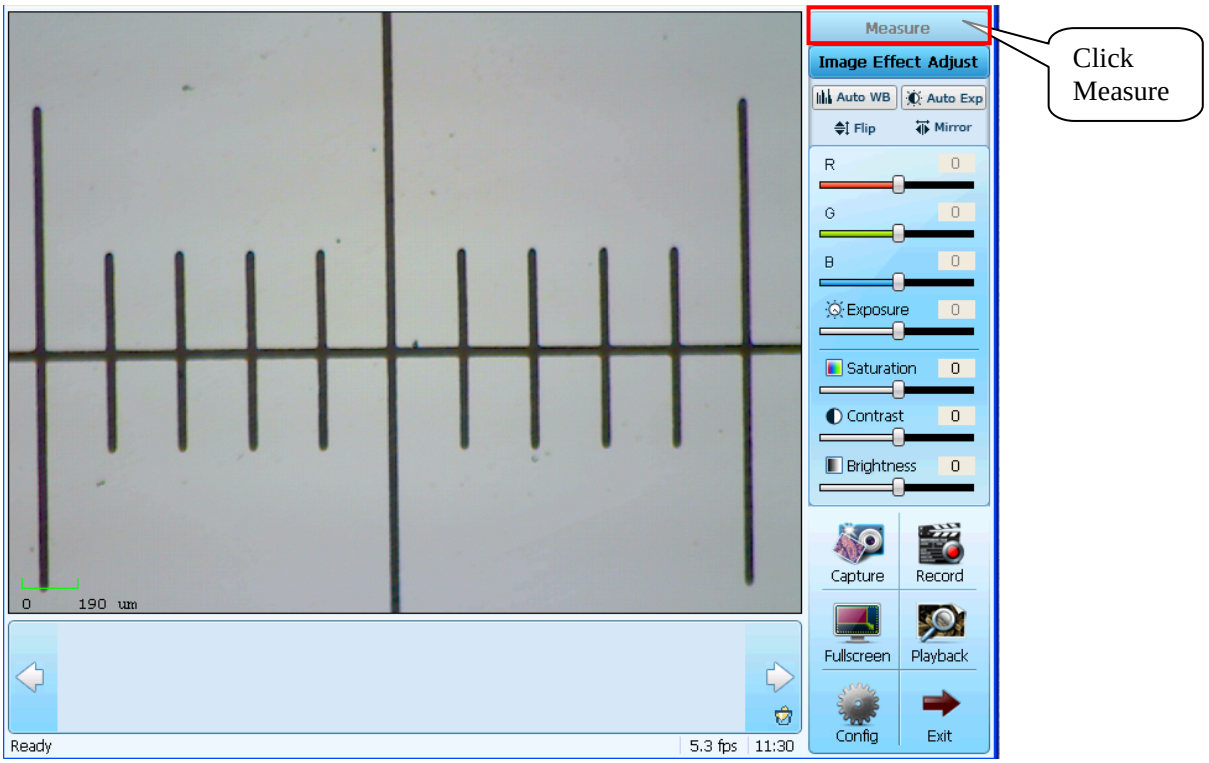
Click “Image Effect Adjust”, the system will switch from the “Measure” to the “Image Effect Adjust”.

	Calibration.
	Reticle ruler.
	Line measurement
	Rectangle measurement.
	Recovery to the default setting.
	Set the color of the measure tools.

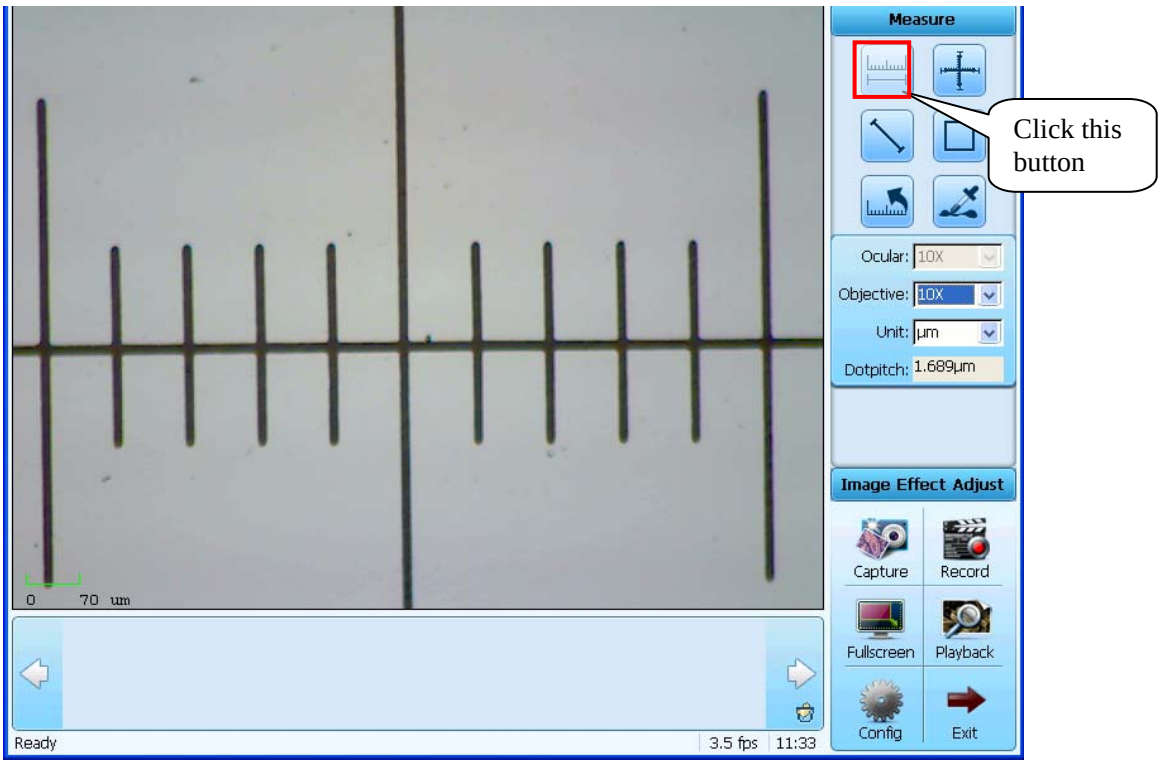
①Dimension Calibration

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

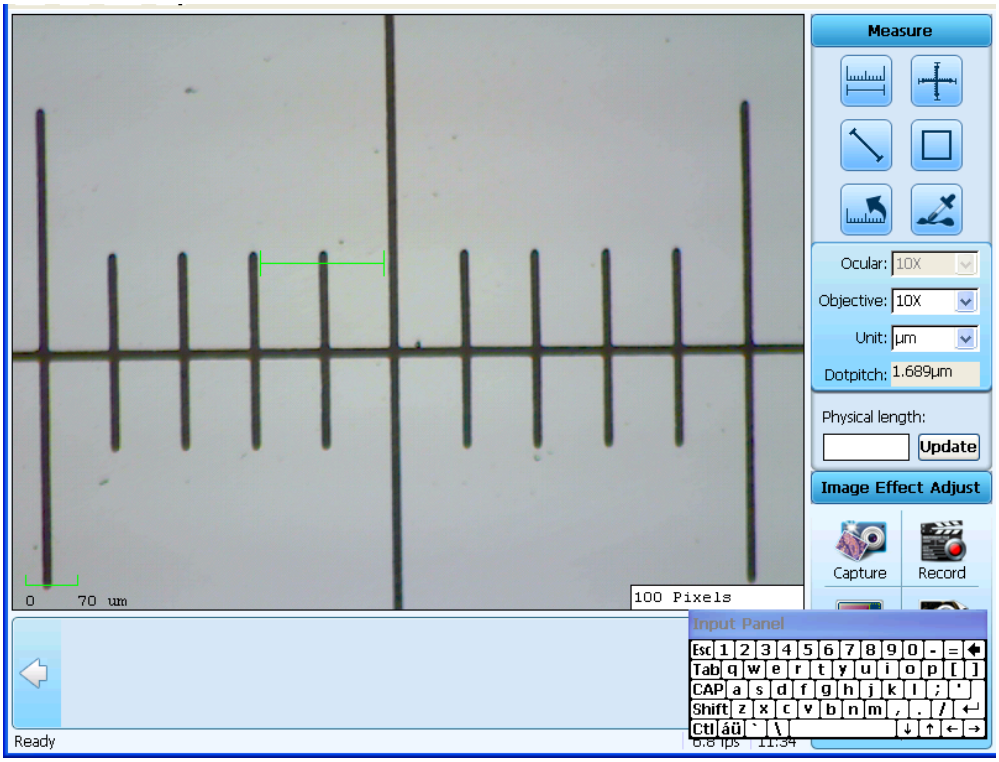
1. Put a micro ruler on the stage; select the objective (here is 10X), focus the microscope, and make the micro ruler display clearly on the LCD screen.



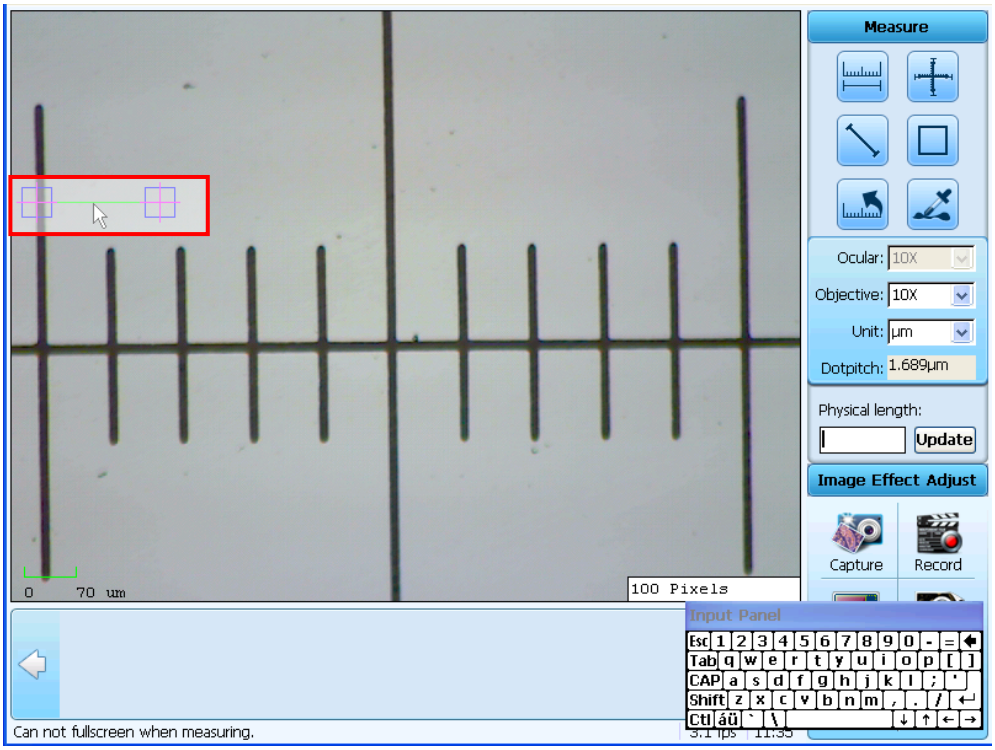
2. Switch the command bar from “Image Effect Adjust” to “Measure”



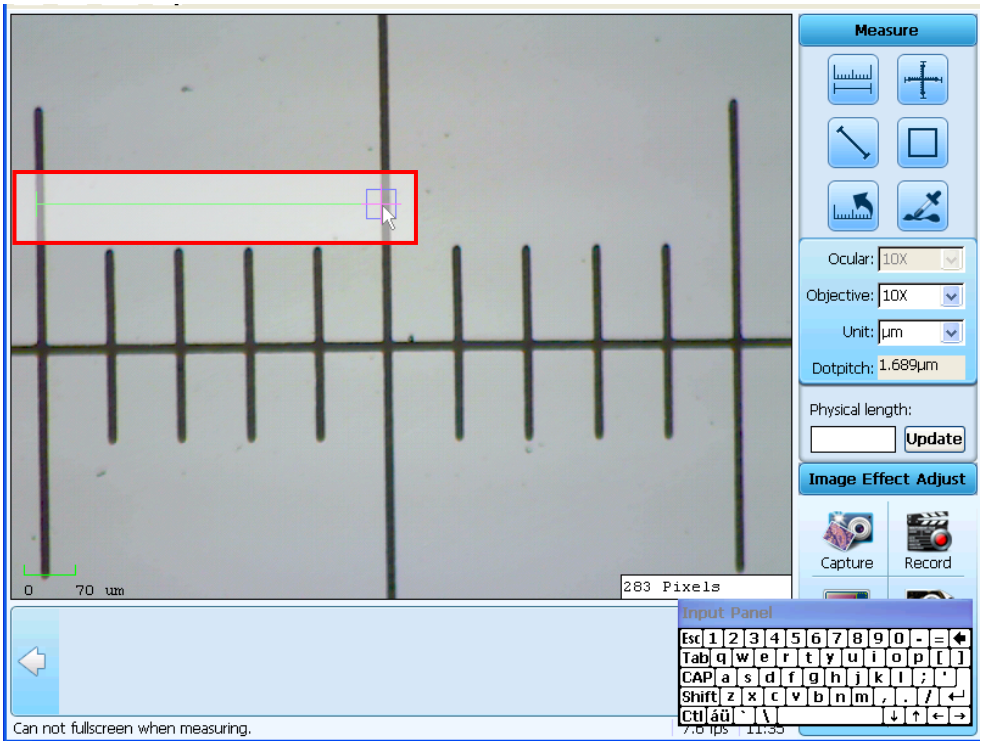
3. Click the icon  on the command bar, there will come out an adjustable calibrating line.



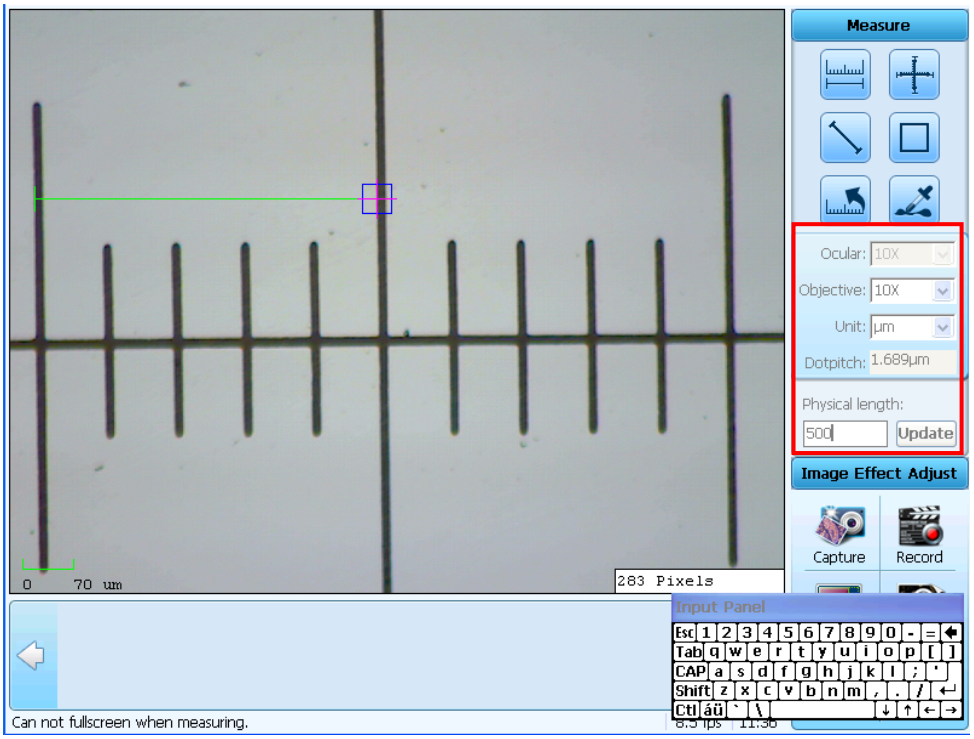
4. Move the line and set the begin point.



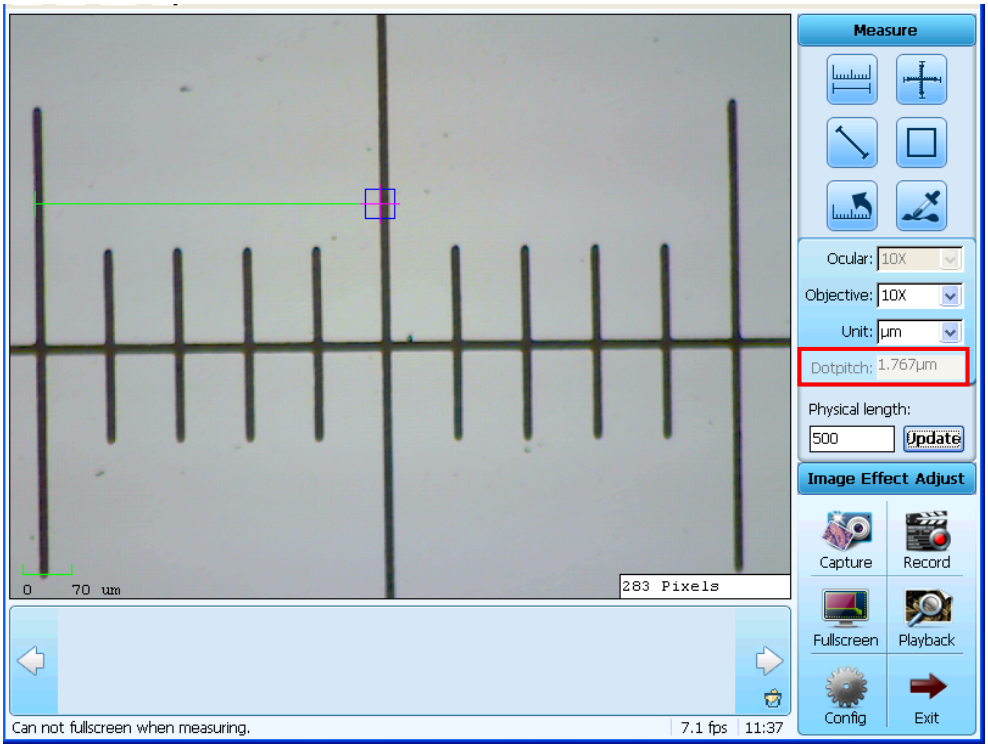
5. Set the end point.



6. Set the objective magnification, length unit and input the actual length (with the keyboard or the soft keyboard).



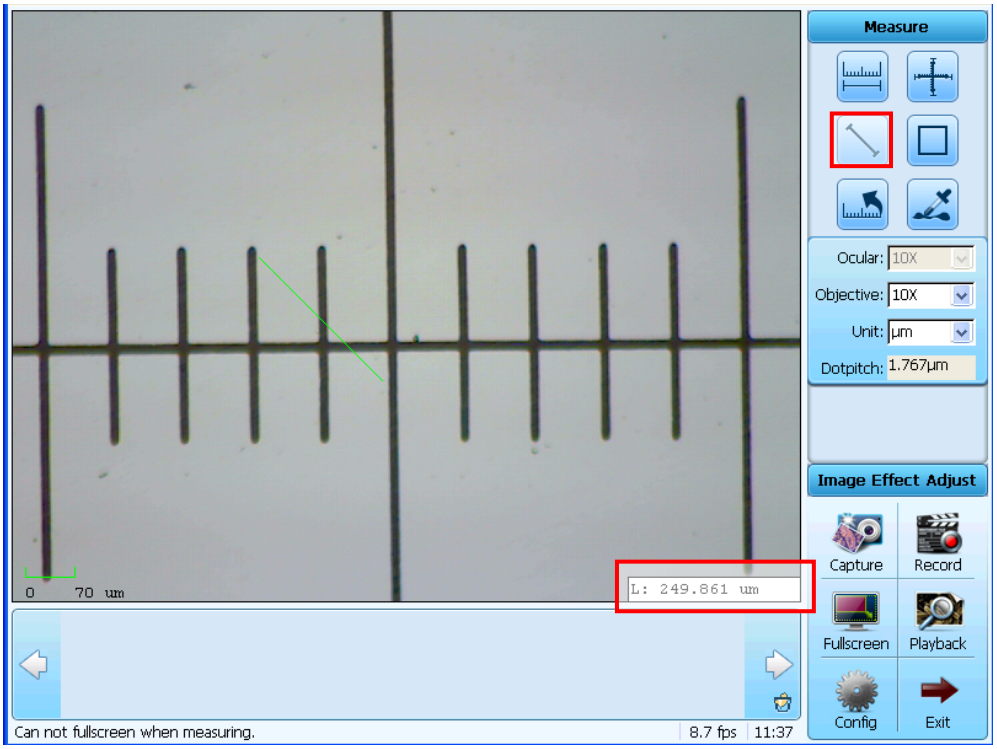
7. Click “OK”, the system will calculate the dimension data that just has calibrated (the actual length of each pixel) by itself and displays in the control panel, as follows:



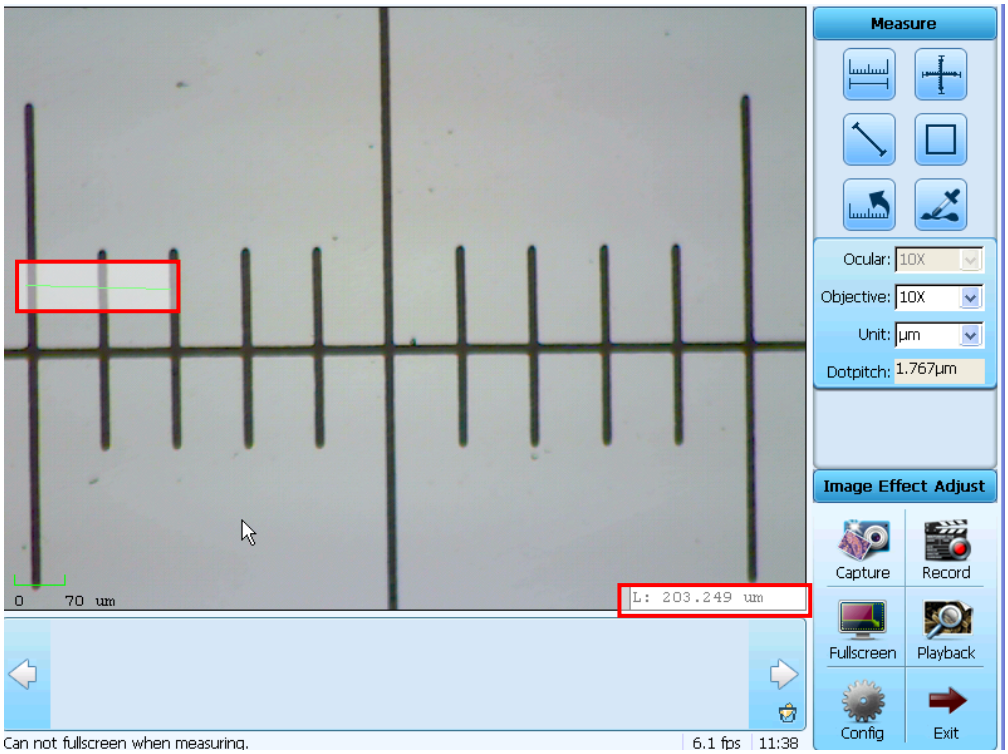
The dimension calibration of 10X objective has been finished.
Repeat the above steps to calibrate 4X, 40X and 100 X.

②Length Measurement

1. Click the icon  on the command bar.

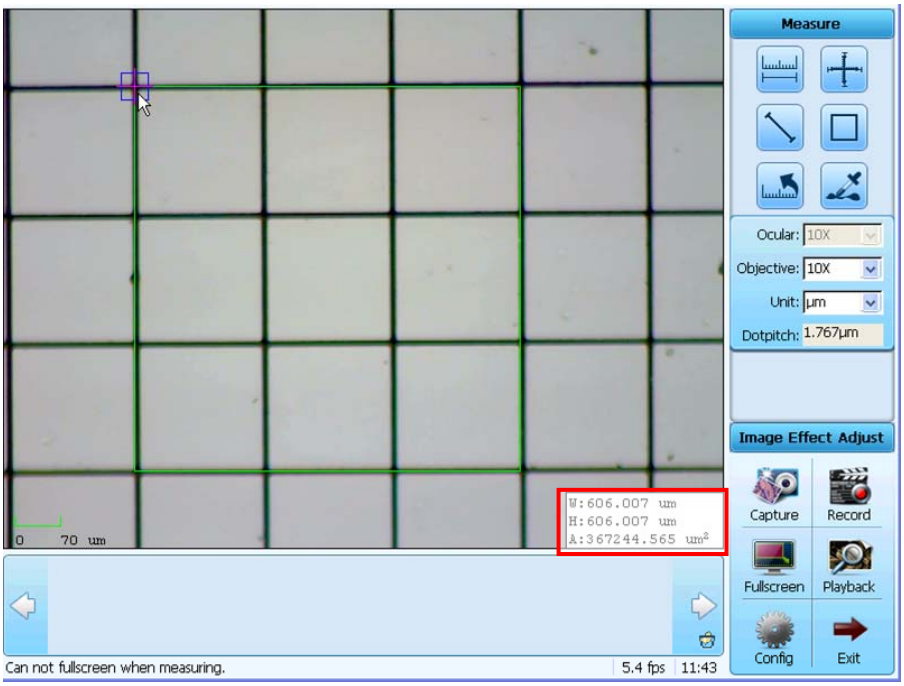


2. Move the line to the place you want to measure. Set the begin point and the end point of the line, the system will then calculate the length itself according to the dimension you have just calibrated. Here the result of line length is 203.249um, and is coincident with the actual length.



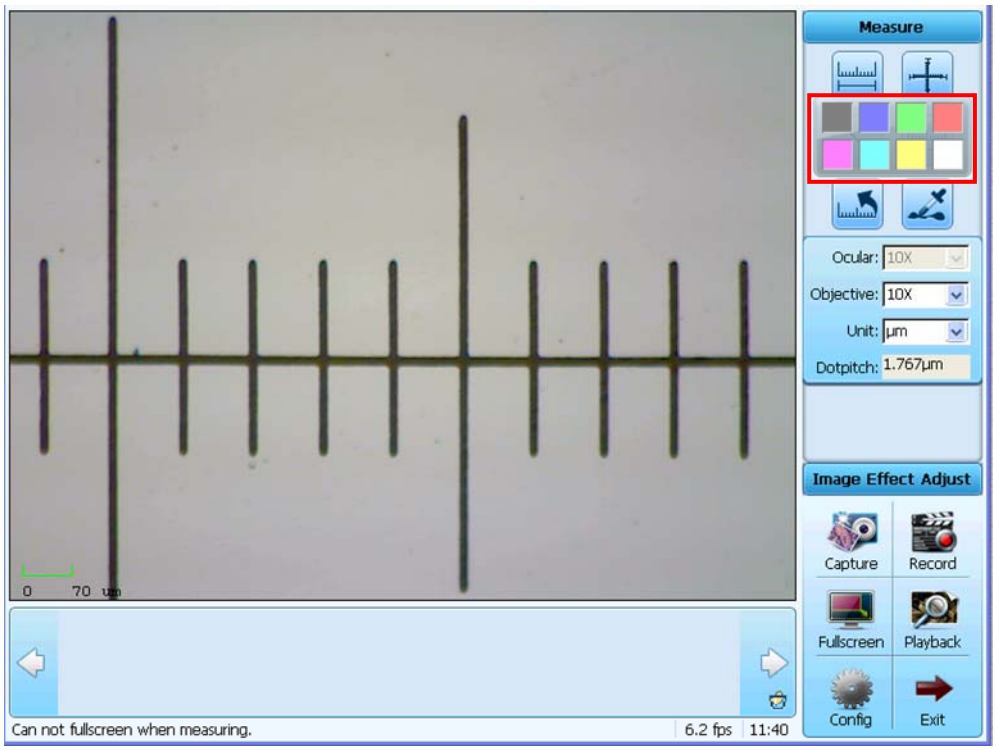
③Rectangle Measurement

1. Click the rectangle button  , there will come out a rectangle tool, click the center or the four corners of the rectangle with the mouse or writing pen, you can drag, magnify or reduce the rectangle.

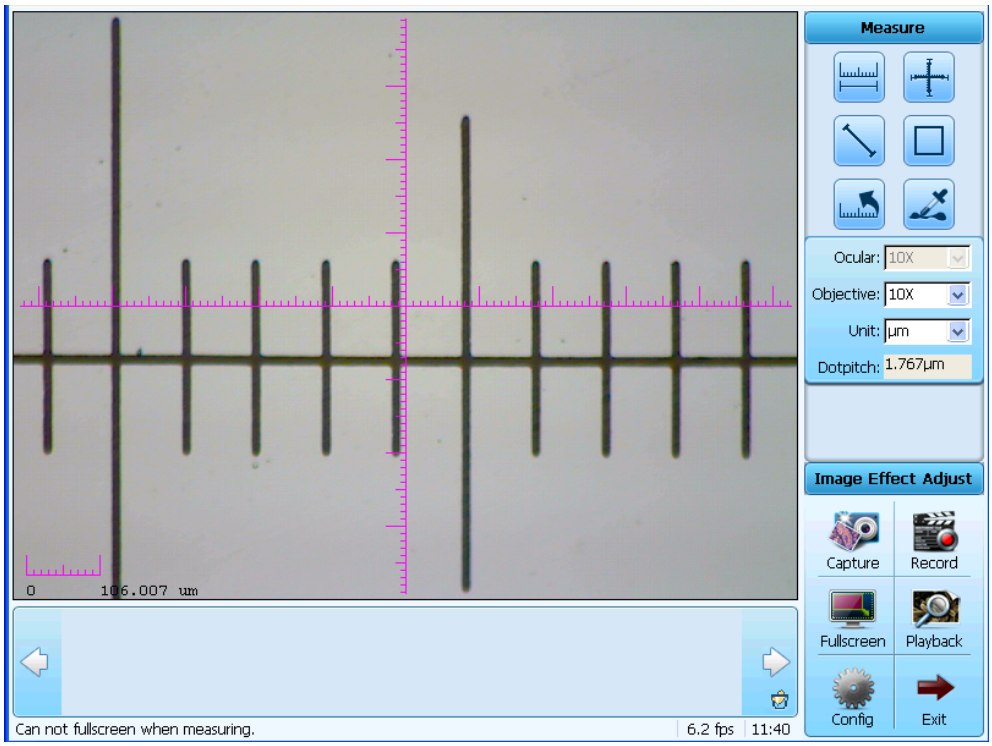


④Color Selecting

1. Click this button  , there will come out a color plate, selects your performance color to set the line color.

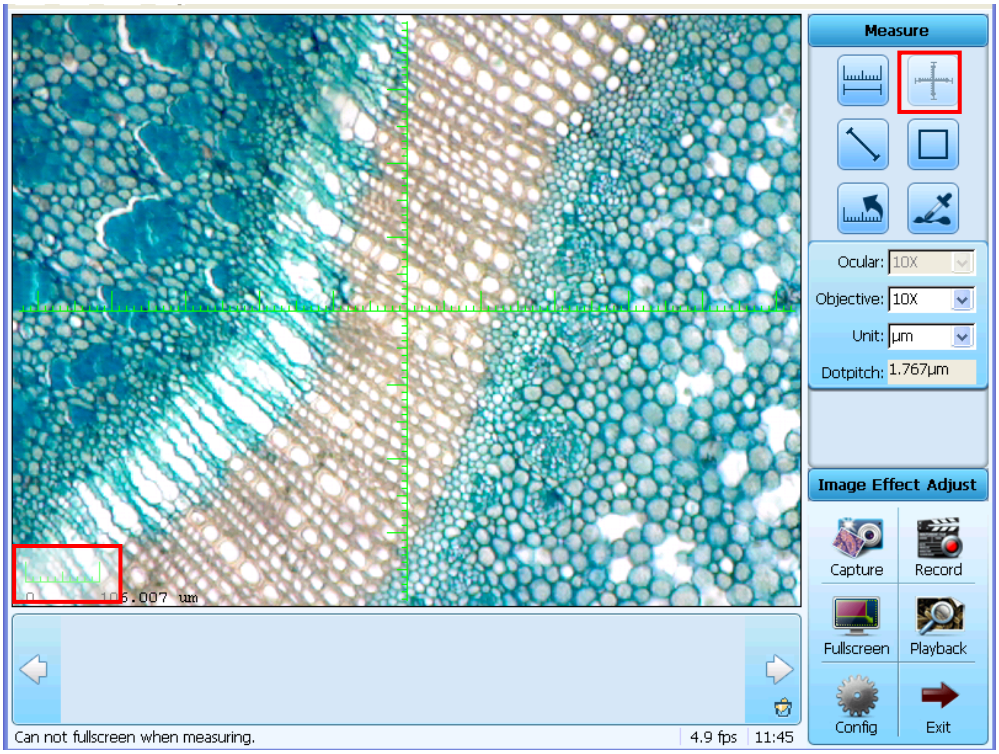


2. All the tools color has been changed into mauve.



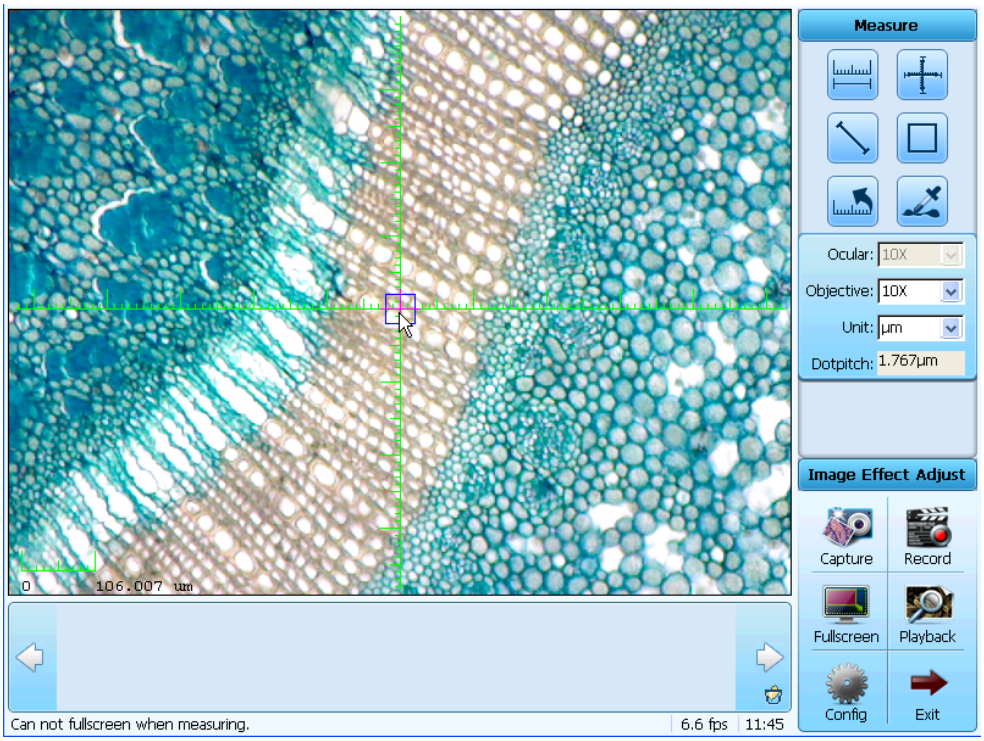
⑤Reticle Ruler

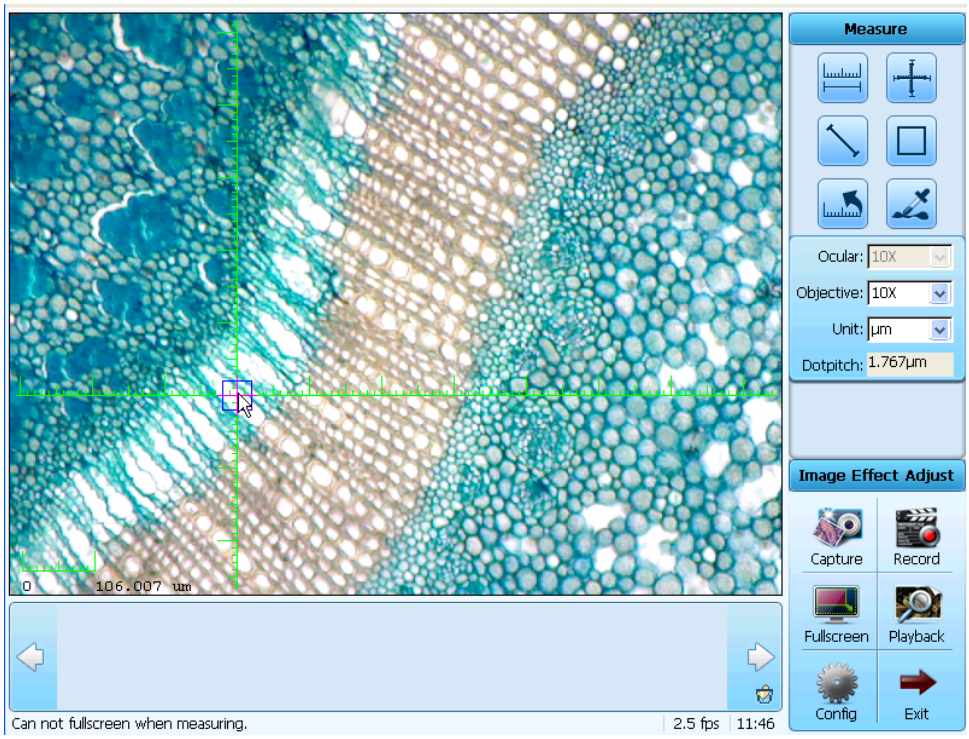
1. Click the reticle button  . There will be a reticle tool on the image, click the center of the reticle with the mouse or writing pen, there will be a red square in the center of the reticle, drag the square, the reticle will move following the square. At the same time, the control panel will display the minimum scale value of the current reticle after dimension calibrating.



2. Click the center of the reticle, there will come out an square, you can move the

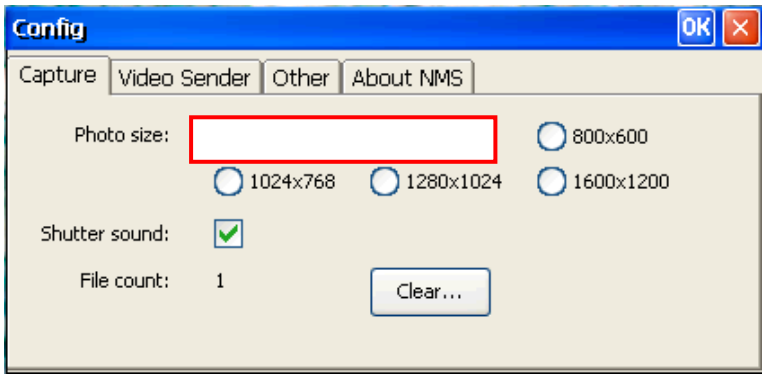
square to anyplace you want.

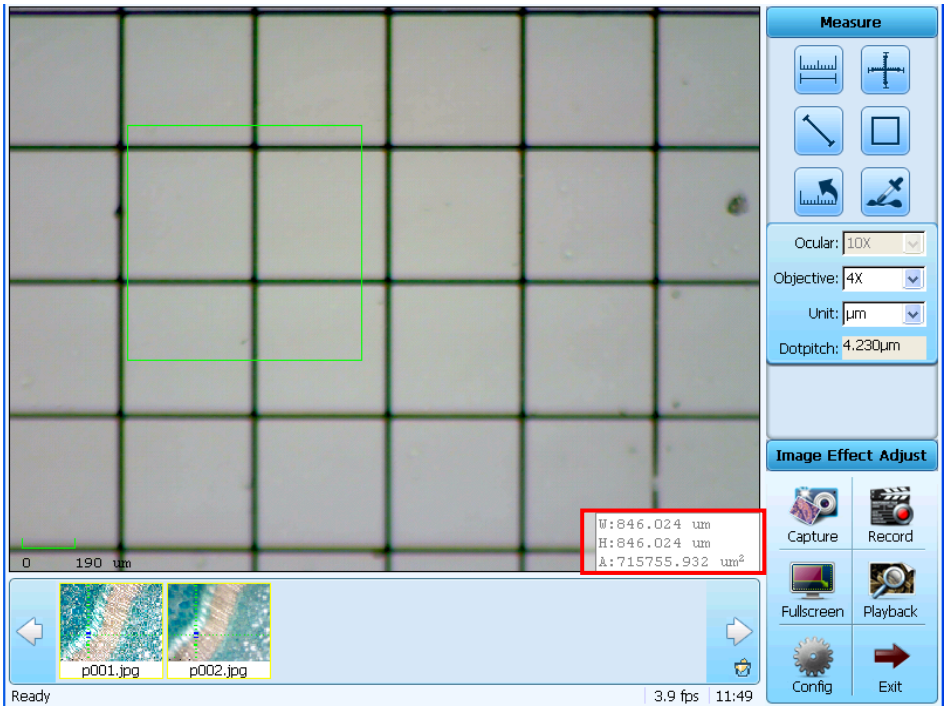




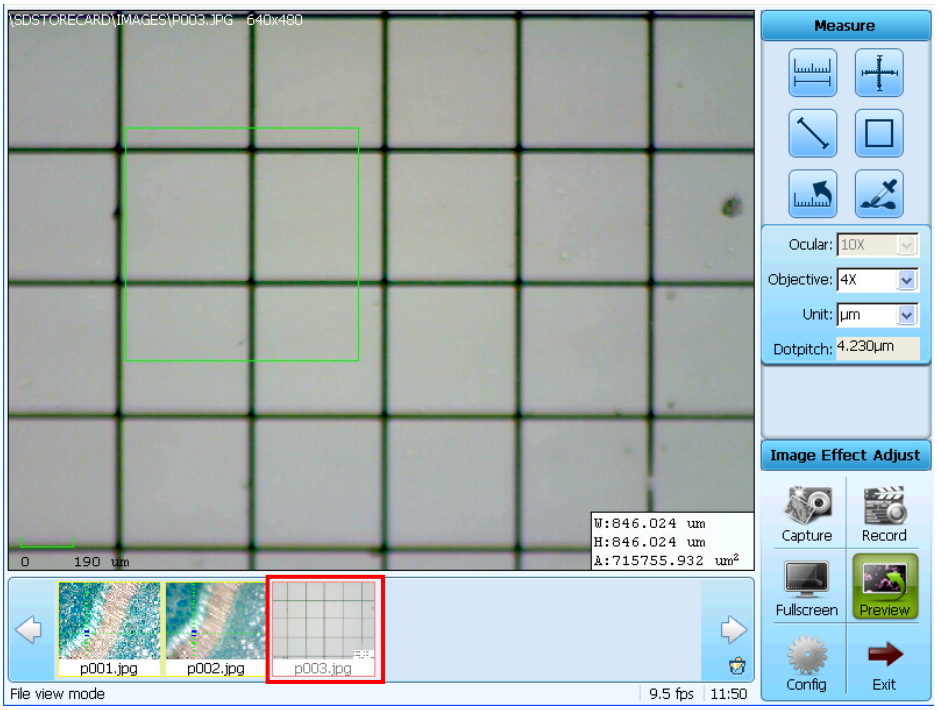
⑥Store the measurement result

In order to store the measurement result, you should set the resolution to 640*480(Reserve ruler) first, as the picture below.



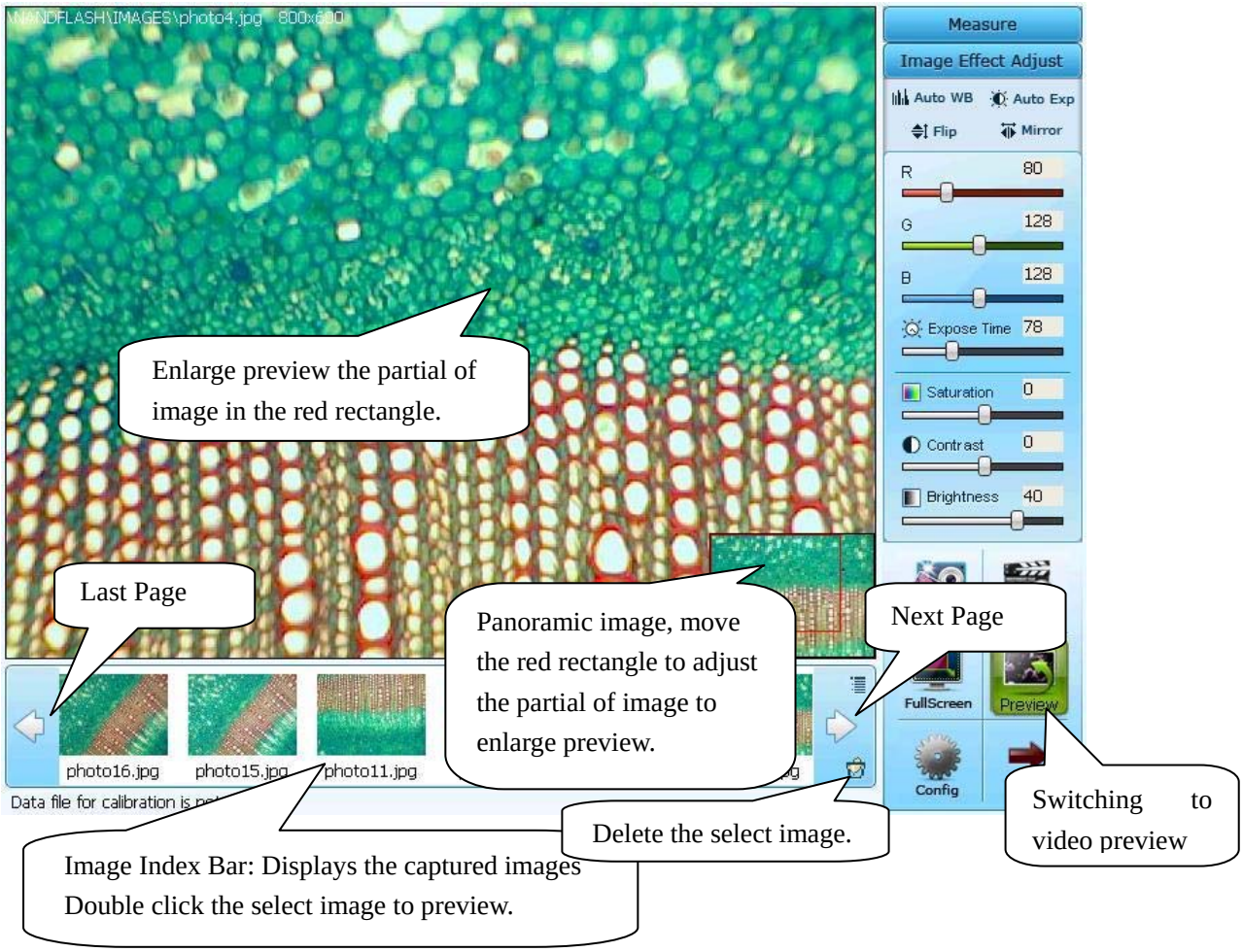


Capture an image with the measurement result.



Preview the captured image ‘photo003.jpg’.

(g) Image Preview Window



(1) Switch to the image preview window:

Click the view icon 

to switch from video preview to image preview, and the image preview window displays partial enlargement image, you can drag the red rectangle in the panoramic image to adjust the partial of image to enlarge preview.
Double click a select image in the image index bar to access to the image preview window.

(2) Delete an image:

Select the image you want to delete, and click the icon, the system will ask you to check delete, click ok if you want to delete, and click cancel if you don’t want to delete.
Equivalent Command: Use the right click function, use the right key of the mouse or click the select image directly on the touching screen by the handwriting pen for more

than 2 seconds, the system will response it as a right click, and come out a right key menu, select “Delete”.

(3) Switch back to video preview window:

Click the video icon 

to return to video preview window.

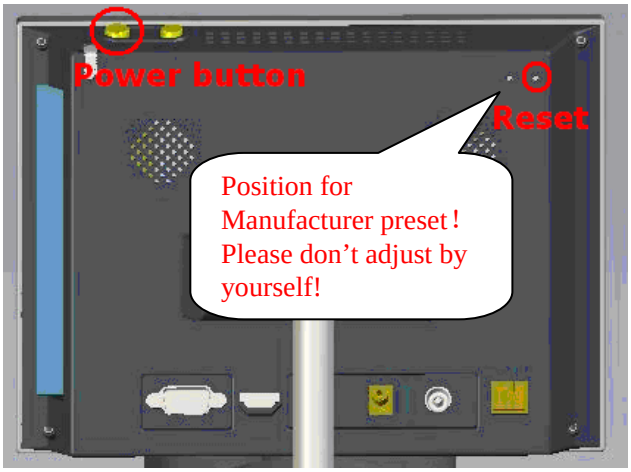
(h) Attention: If the System halted

Attention: The unstable voltage or wrong operation may cause the system halt or don’t work normally. If this happens, please reset your system.

There’re two ways:

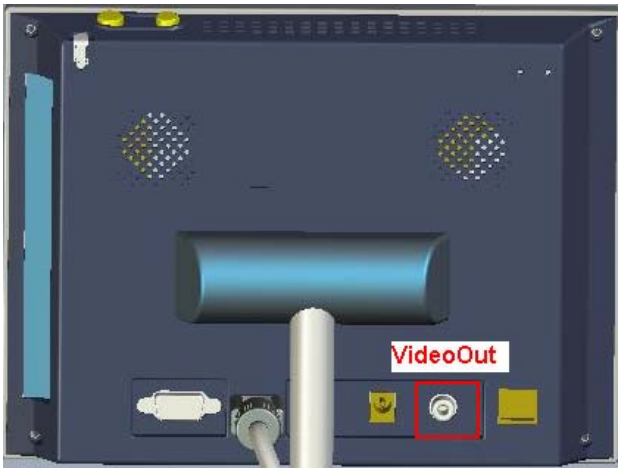
(1) Press the “Power Button” for more than 2 seconds to close the system, and then press again to restart your system.

(2) Click the small “Reset” hole with a needle (or other things that have a small, sharp-point) to reset your system, as the picture below.



3.3 View on TV

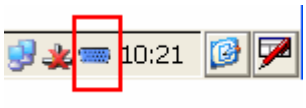
(a)Connect the TV Set.

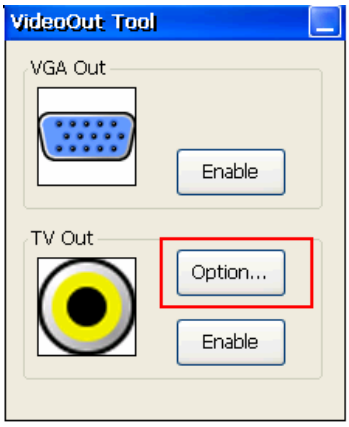


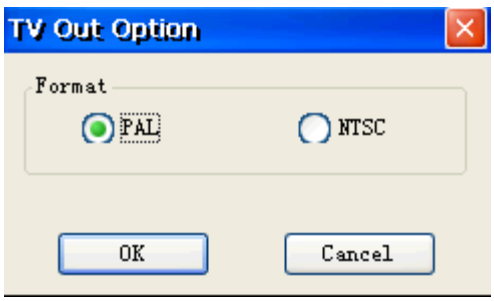
Connect the Microscope to the TV by the VideoOut Port.

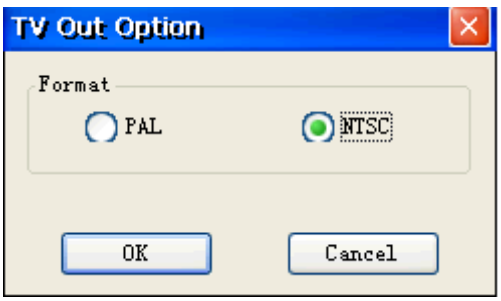
(b) Set the TV Format

Click the  button to open ‘VideoOut Tool’ Panel, and Click the Option to choose the Format.









IV. Network Operation

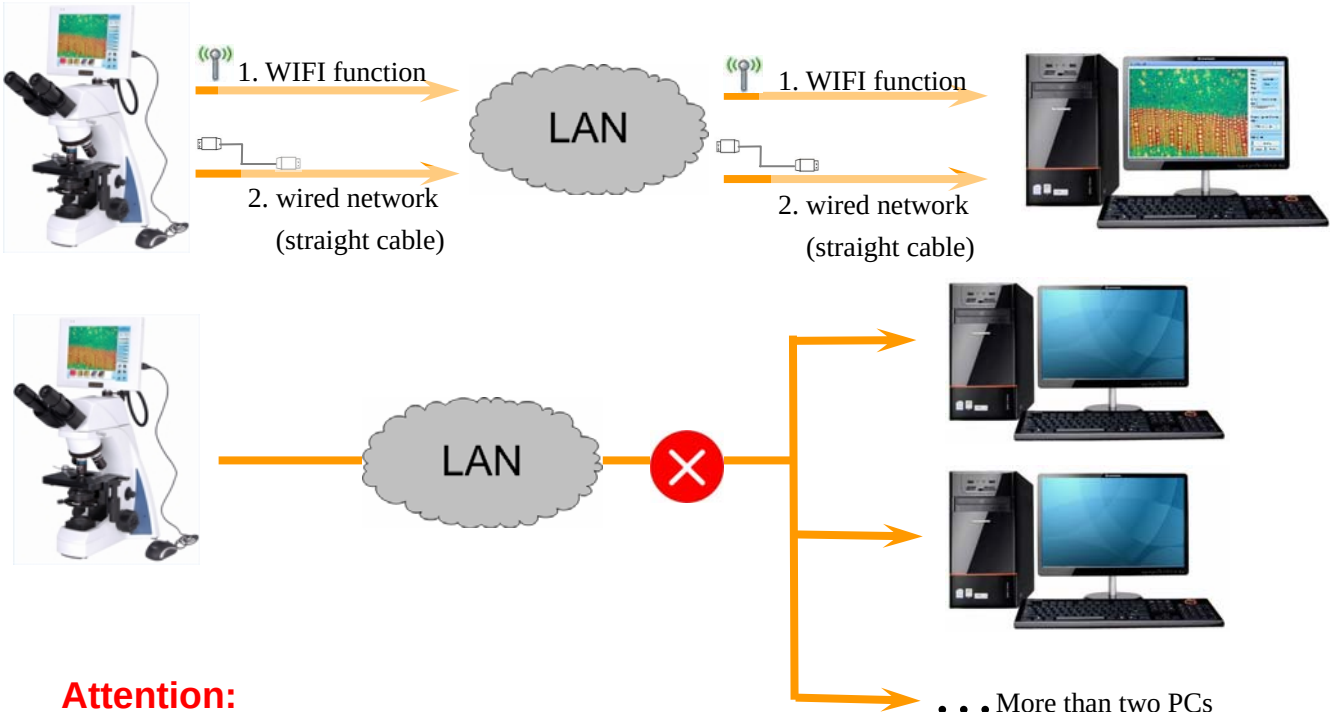
4.1 About WIFI

Our LCD digital microscope support both wired network and WI-FI wireless network. To use this WIFI function, you need a computer and a router (wireless support) or wireless network card.

What is WIFI? "WIFI" means "wireless fidelity". The term "WIFI" refers to certain kinds of wireless local area networks, or WLAN (as opposed to LAN, or computers that are networked together with wires).

4.2 Communication Model

(a) Network Communication (With the LAN)



Attention:

1. There are two ways to link the LCD digital microscope to the LAN, one is with its WIFI function, and the other one is through the network cable. At the mean time, the PC end has the same two ways to link to the LAN, too.

2. To use the WIFI function, the **router** of the LAN and the **PC** receiver must support wireless function, and you should check whether the router and the PC's network card are support wireless function or not.

3. Use the wired network, the network cable should be a straight cable. See the part V

to know what are straight and crossover cable.

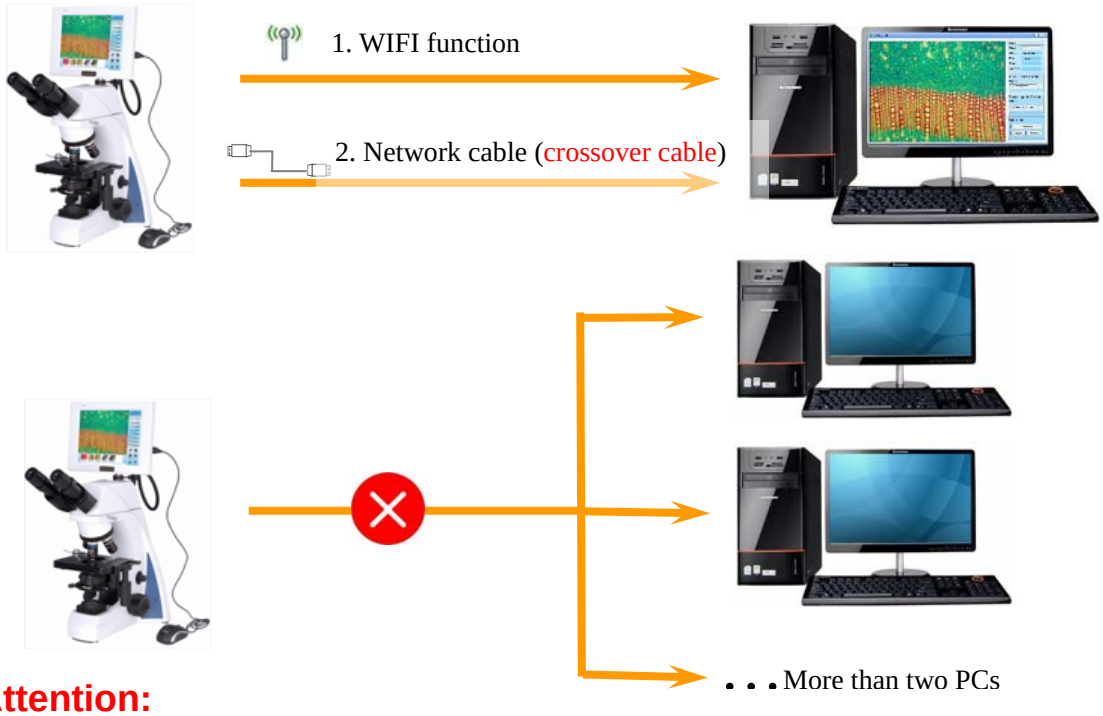
4. The PC receiver must install the NMSClient software to receive the images sending by the LCD microscope.

5. **The LCD microscope, router and PC's IP address must in the same LAN.** And at present, only one PC can receive the images sent by the LCD microscope.

6. In order to ensure the image transmission quality in using the WIFI function, please make sure the wireless signal is not too low, it means the LCD microscope is not very far from the router and in a non-blocking space.

(b) Point to Point Model (Without the LAN)

There're two ways to communicate with the PC **without** the LAN: One is by WIFI function (wireless), and the other is by network cable (here is crossover cable). We call both of them as point to point communication.



Attention:

1. Use the WIFI function, the PC receiver must support wireless function, please check whether your network card support wireless function or not.

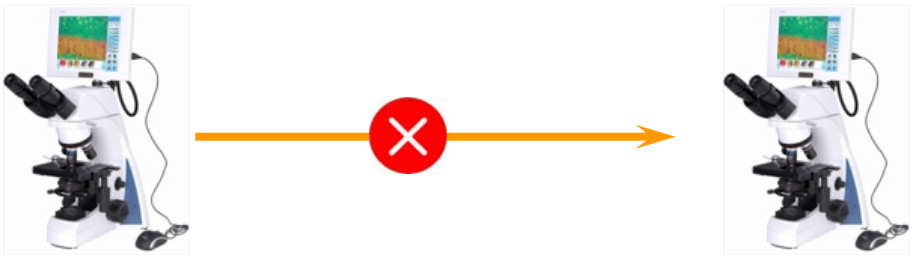
2. Use network cable to link the LCD Microscope and PC, the network cable must be a crossover cable. See the part V to know what are straight and crossover cable.

3. PC receiver must install the NMSClient software to receive the images sent by the LCD microscope.

4. In this model, one LCD microscope can only communicate with one PC, it can not communicate with more than two PCs.

5. In order to ensure the image transmission quality when using the WIFI function, please make sure the LCD microscope is not very far from the PC and in a non-blocking space.

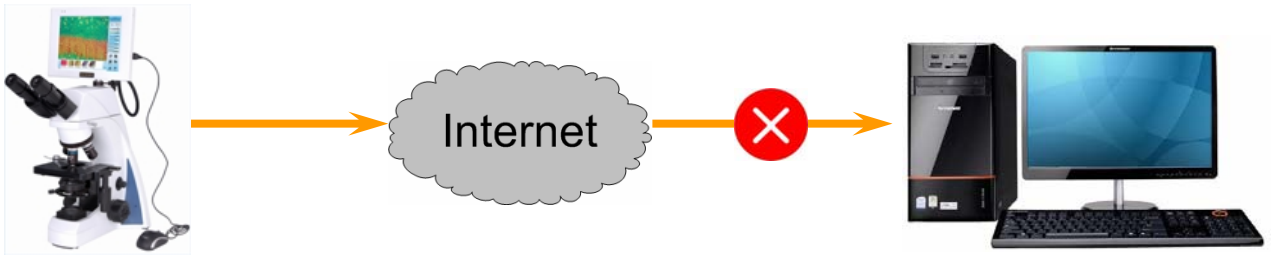
(c) LCD Microscope to LCD Microscope (not support)



Attention:

It can not communicate between the LCD microscopes.

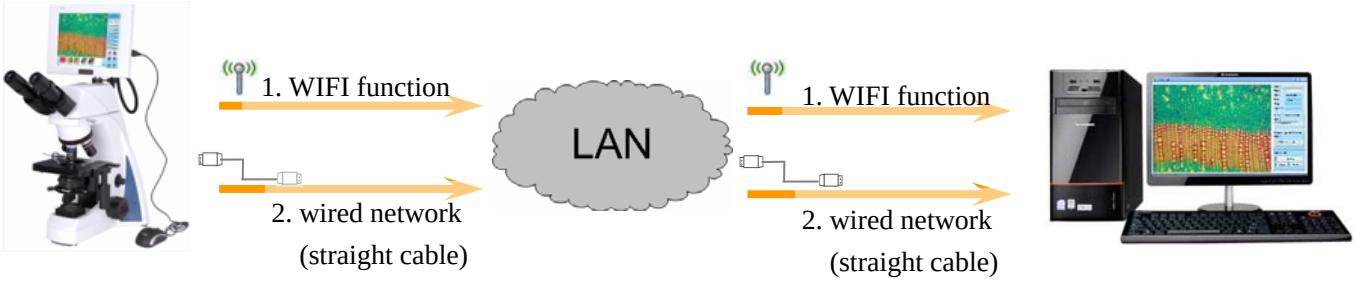
(d) Visit the Internet



Attention:

We can use the LCD microscope to visit the website, but we can **not** receive the microscope images though the internet, just browse the web pages.

4.3 Network Communication



Attention:

1. There are two ways to link the LCD digital microscope to the LAN, one is with its

WIFI function, and the other one is through the network cable. At the mean time, the PC end has the same two ways to link to the LAN, too.

2. To use the WIFI function, the **router** of the LAN and the **PC** receiver must support wireless function, and you should check whether the router and the PC's network card are support wireless function or not.

3. Use the wired network, the network cable should be a straight cable. See the part V to know what are straight and crossover cable.

4. The PC receiver must install the NMSClient software to receive the images sending by the LCD microscope.

5. The LCD microscope, router and PC's IP address must in the same LAN. And at present, only one PC can receive the images sent by the LCD microscope.

6. In order to ensure the image transmission quality in using the WIFI function, please make sure the signal is not too low, it means the LCD microscope is not very far from the router and in a non-blocking space.

4.3.1 WIFI function

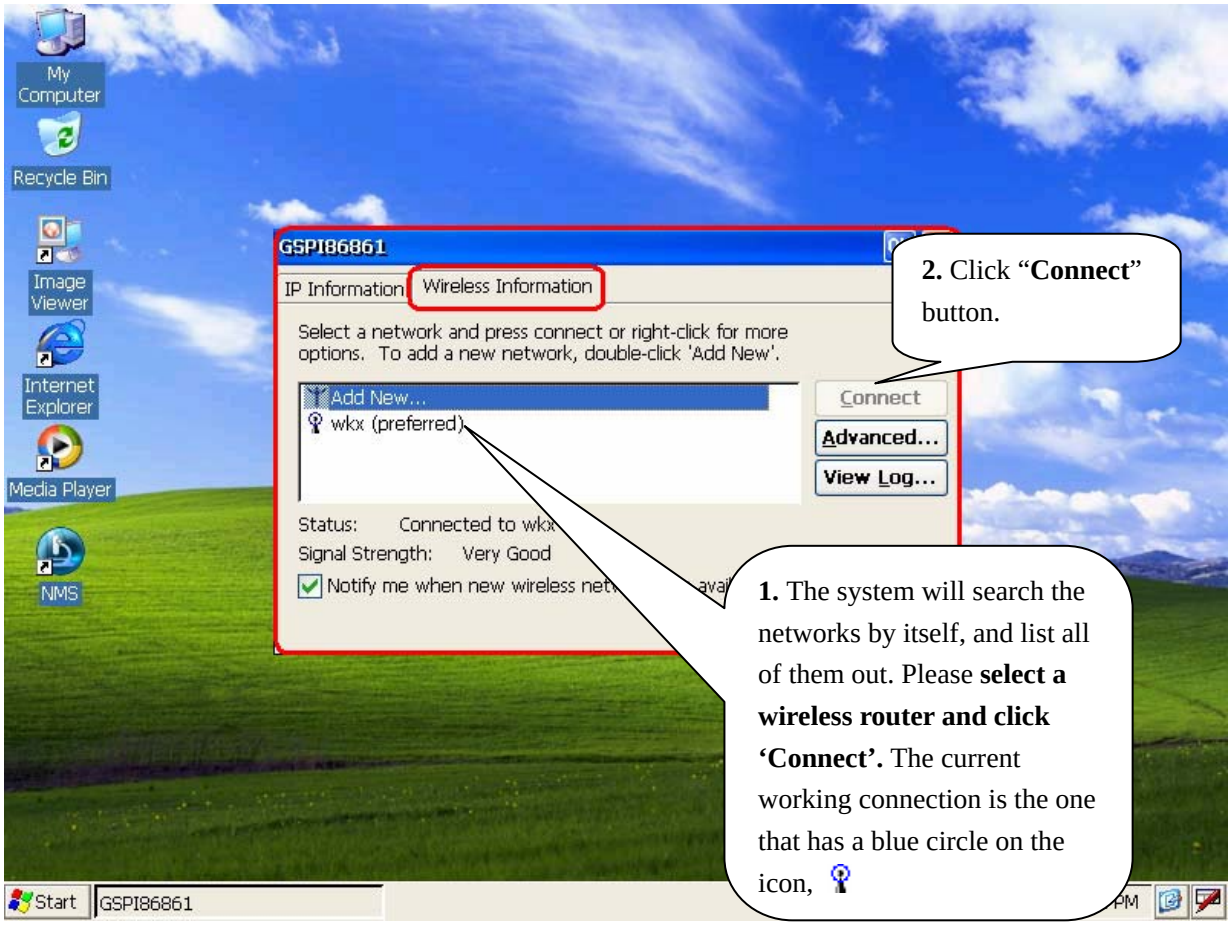
To use this WIFI function, you need a computer and a wireless support router.

The LCD Digital Microscope communicates with the PC by a router (LAN).

(1) Link the LCD microscope to the LAN

(1) Start your system Window CE.
(2) There will come out a dialog, listing all the networks the system has searched. You can also get this dialog by **double clicking** the icon on the task bar.

(3) Select a wireless router, and click the button "**Connect**"
As the picture shows below:



The LCD will connect to the router and get the IP address by itself.

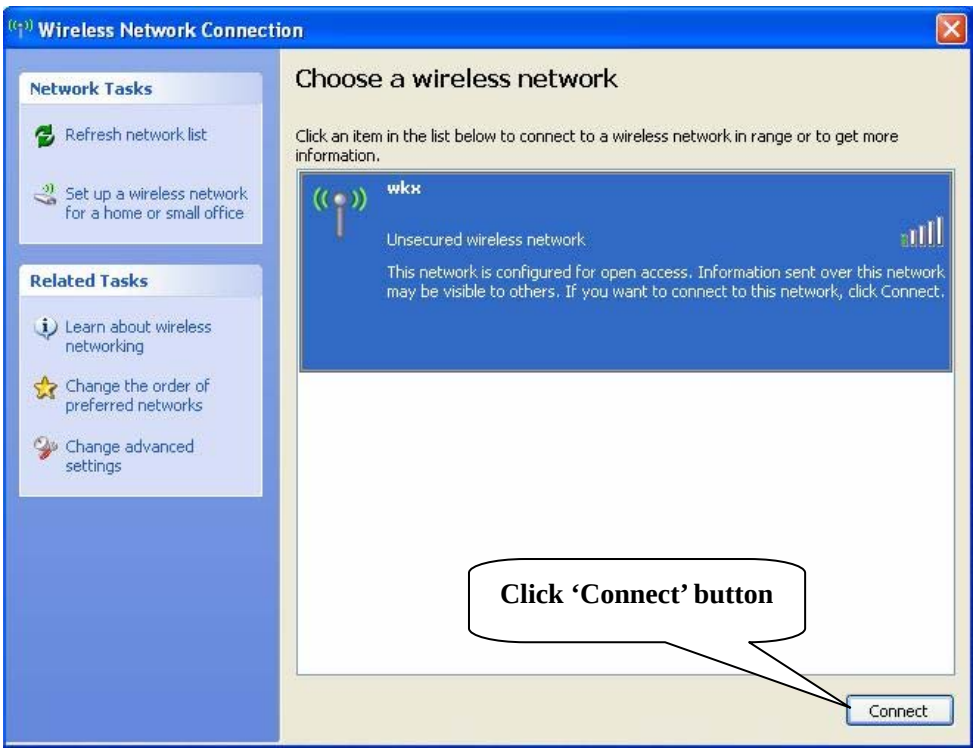
(2) Link the PC to the LAN

The PC can link to the router by WIFI function, or by network cable.

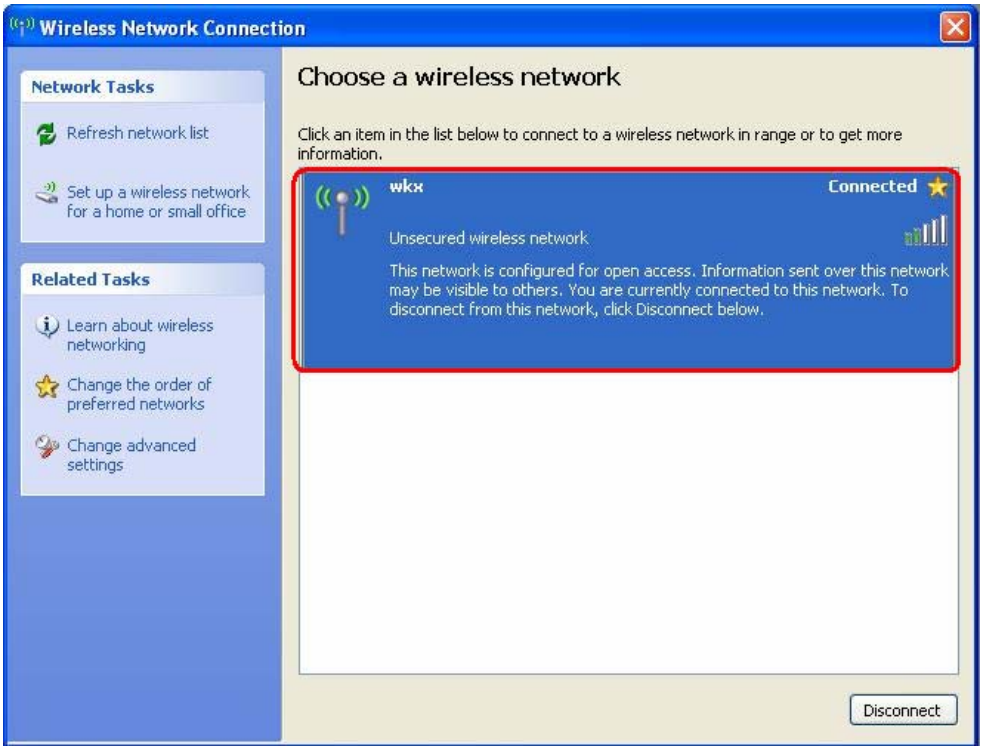
Here we show by wireless network. By wired network, please see the chapter 4.3.2 Wired Network.

If you use the wireless network, please make sure your PC has a wireless network card and support wireless function.

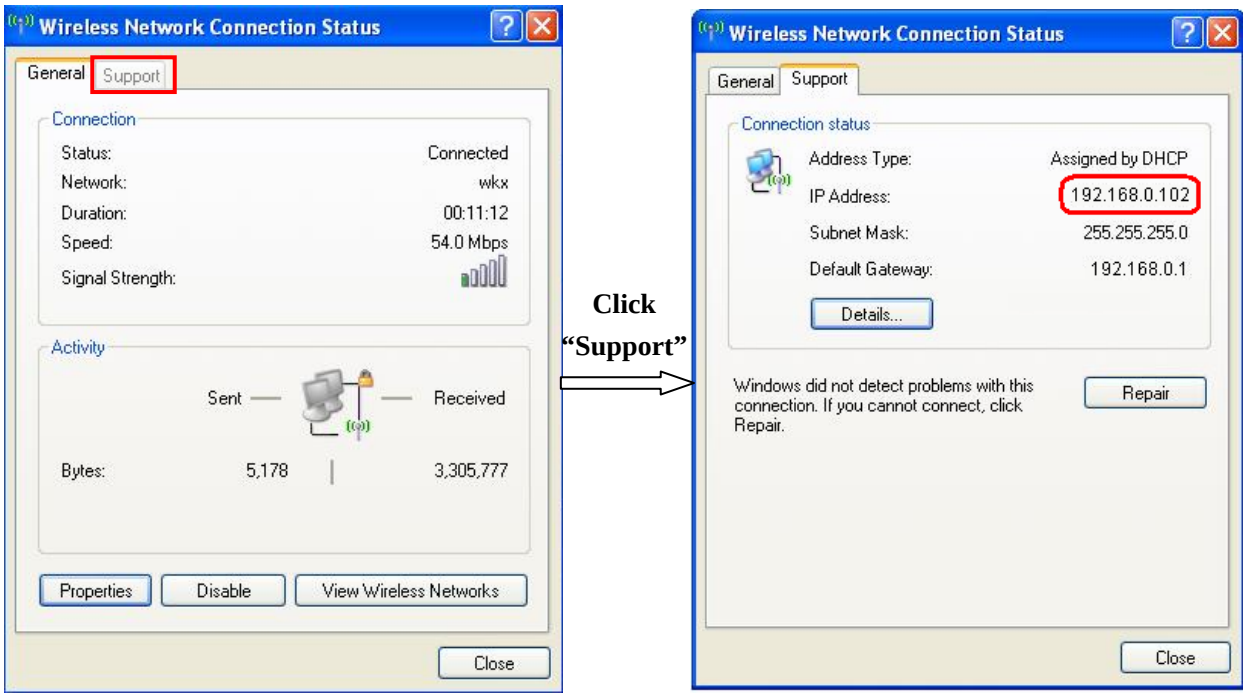
(1) Double click the icon  on the task bar 



(2) Click the 'Connect' button. The PC will connect the router and get the IP address by itslef.



(3) Now the wireless icon on the task bar displays as  , double click it.



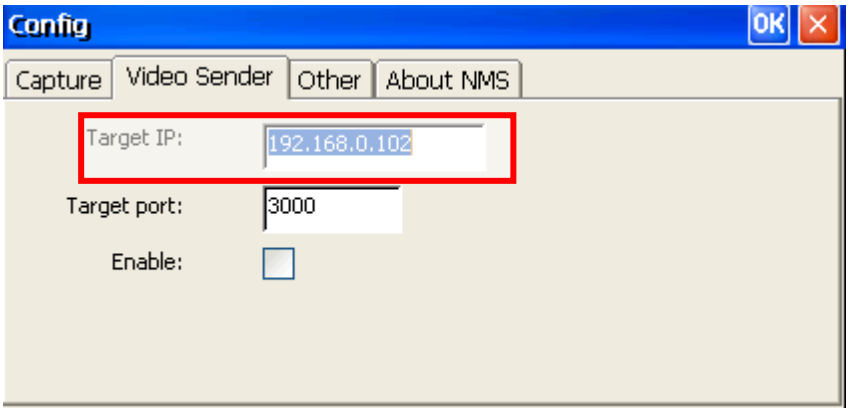
(4) Check the IP address, and record it.

(3) The LCD microscope begin to send images

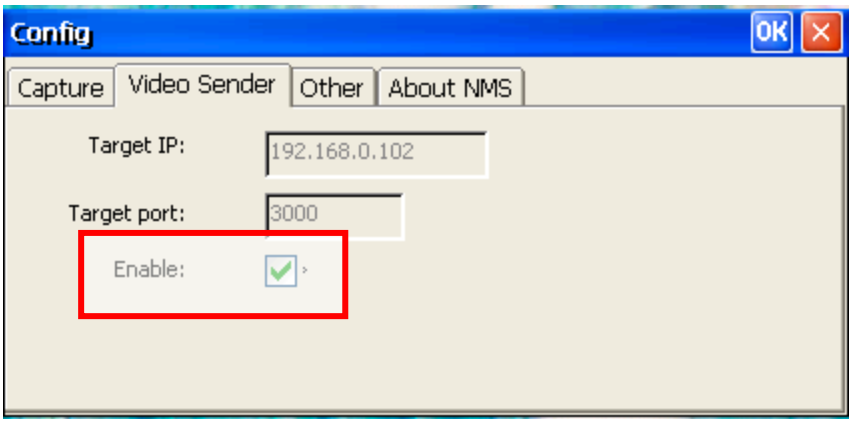
(1) Start your software "NMS"

(2) Click the button , there will come out an "Configure" dialog, set the IP Address (The IP Address of the PC), port number (rang from 2000 to 5000), and click "Start" button, the system begins to send the data via WIFI wireless net. The button now changes from Start to Stop; you can click "Stop" to stop sending.

Input the PC's IP address:



Select "Enable":

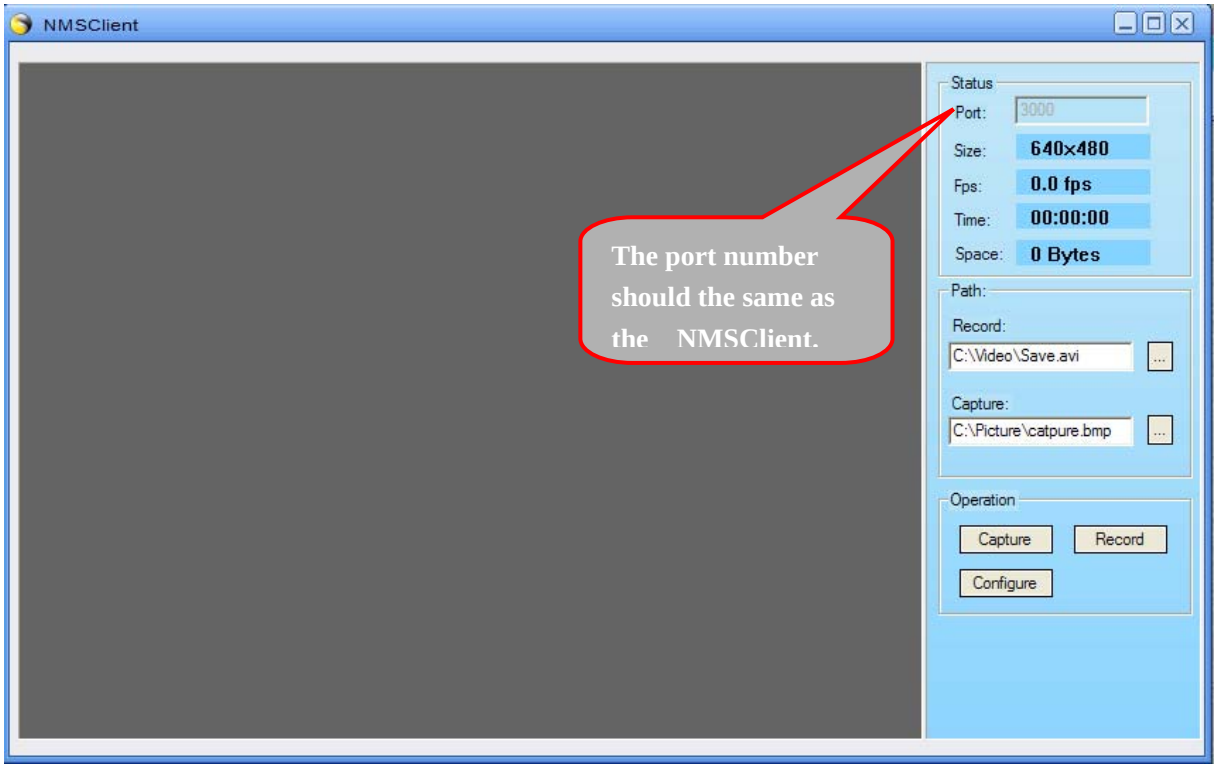


Now we have finished the setting of the LCD digital, and it is sending video, you can cancel the select to stop sending video.

(4) The PC begin to receive images

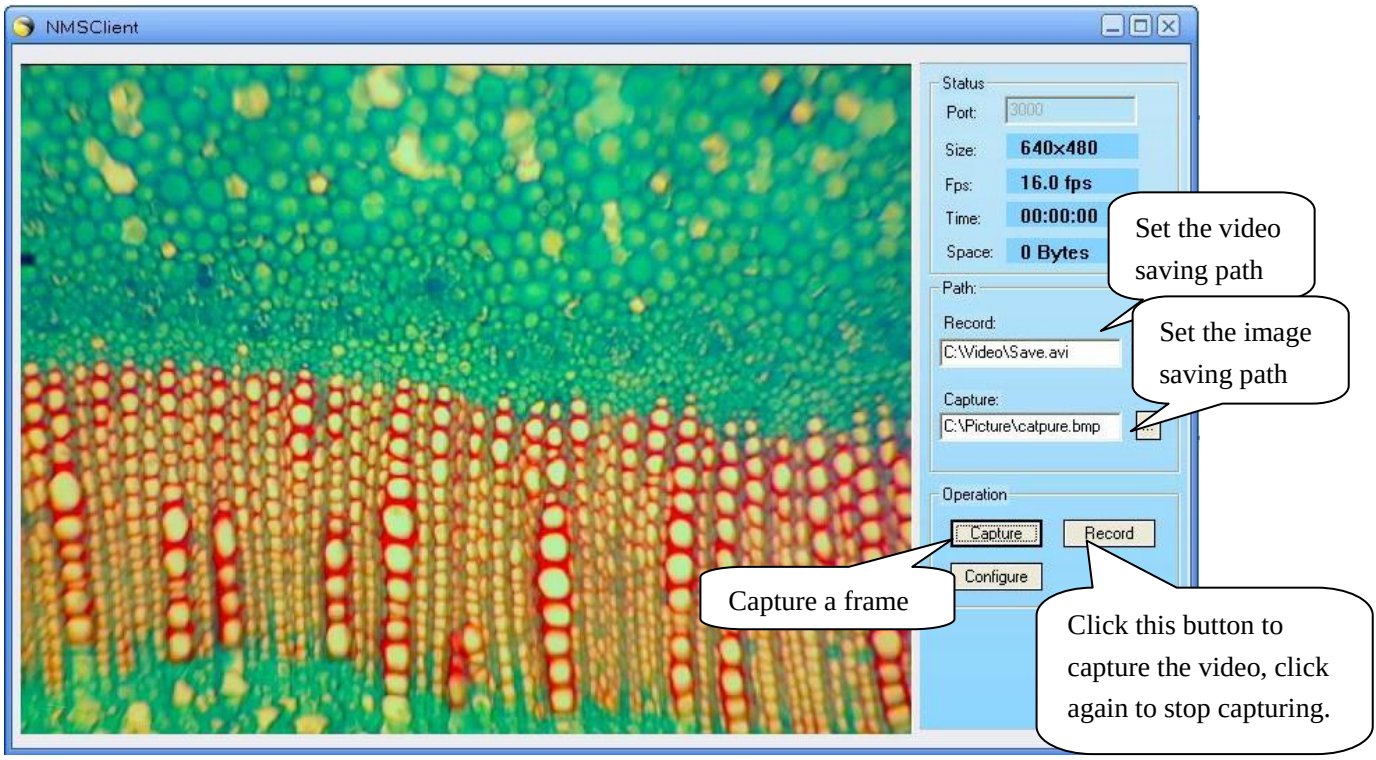
(1) Make sure the software NMSClinent has been installed in the PC.

(2) Launch the “NMSClinent” software.



Attention: The port number of video sender and the NMSClient should be the same. And make sure your microscope video sender has been enabling.

(3) The NMSClient begins to receive video, and displays the real time video. You can capture images or record videos.



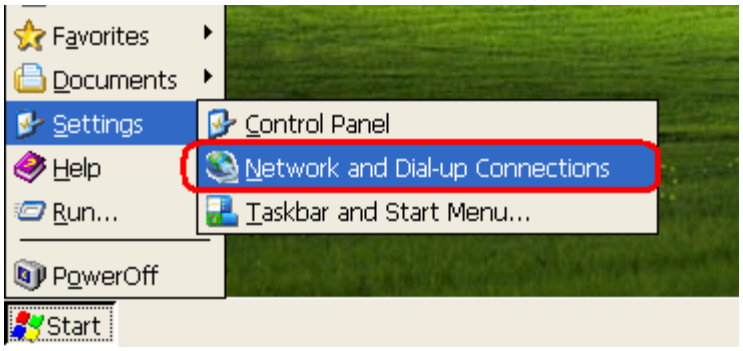
(4) The Configure button is used for change languague: English or Chinese.

4.3.2 Wired Network

(1) Link the LCD microscope to the LAN

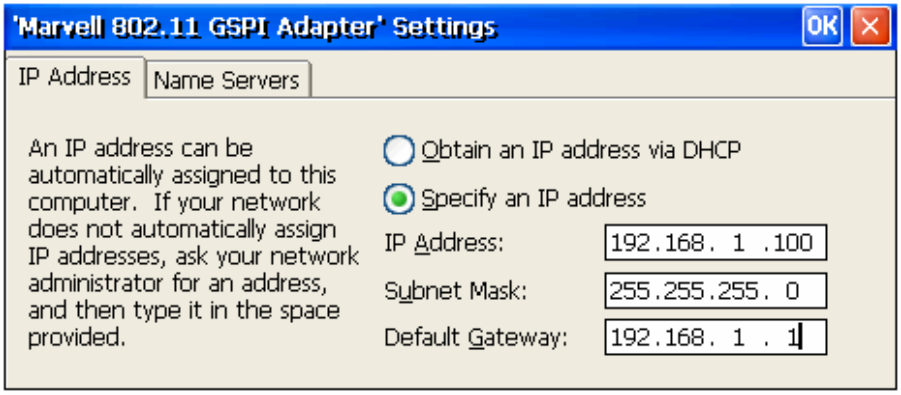
(1) Link the LCD digital microscope to the router with network cable (straight cable)
(2) Set the IP address of the LCD digital microscope, and the operation is the same as the Windows XP system.

Note: the LCD's IP address should in the same LAN as the router.
Click "Start-> Settings->Network and Dial-up Connections";



Double click the wire network icon 

Set the IP address, for example

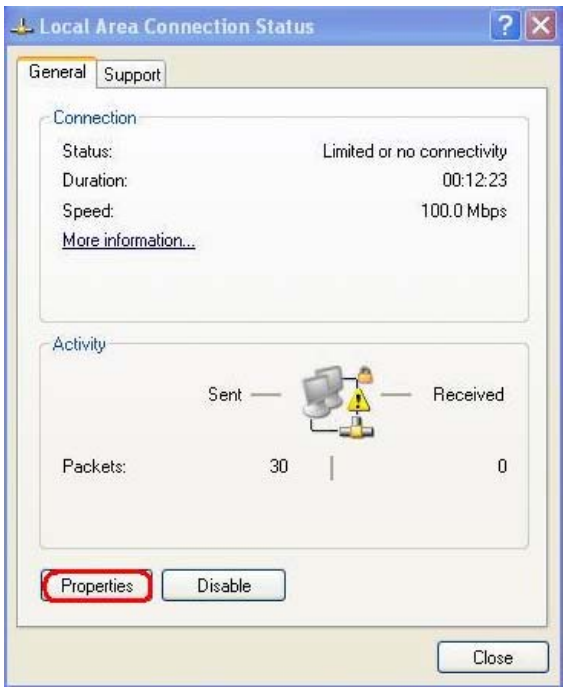


Click OK.

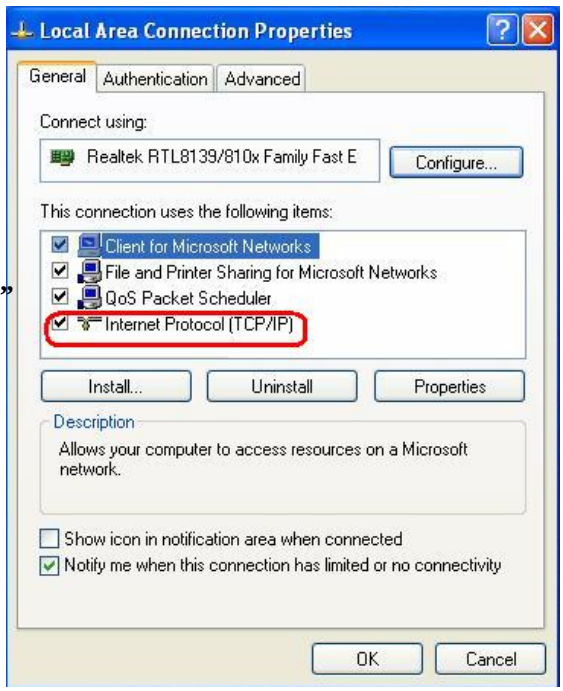
(2) Link the PC to the LAN

(1) Link the PC to the **router** with network cable (straight cable)
(2) Set the IP address of the PC.
Note: The PC's IP address should in the same LAN as the router.

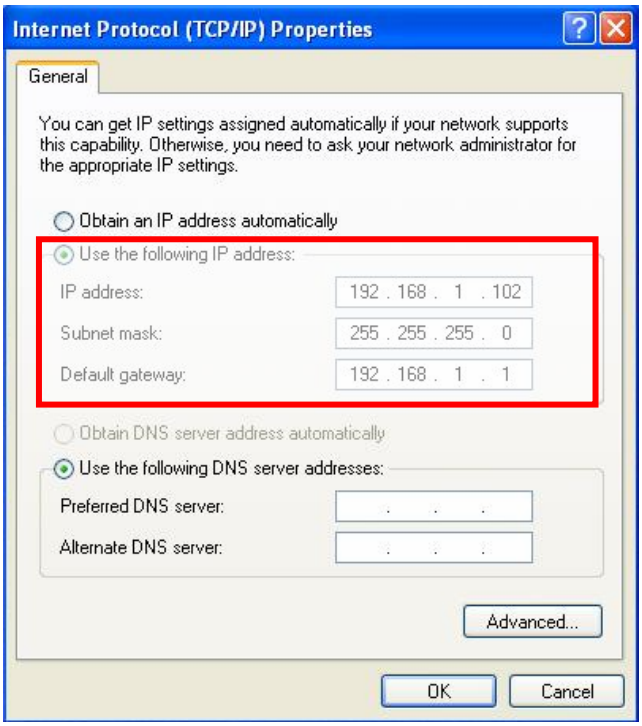
Double click the icon  on the task bar 



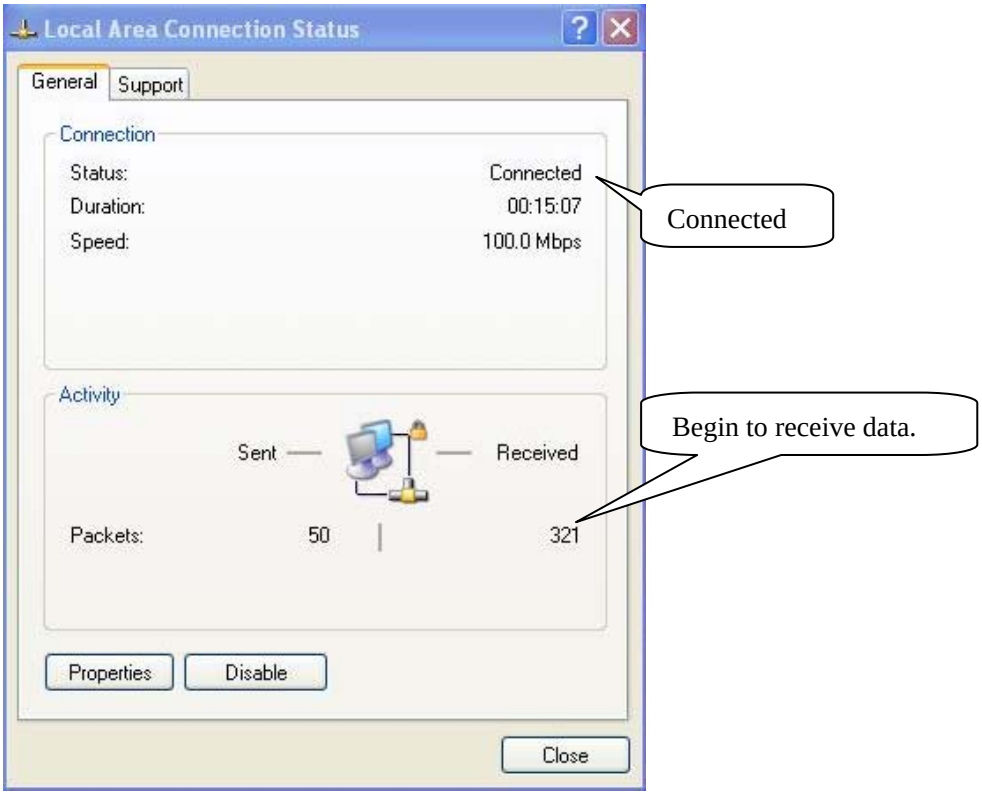
Click "Properties"



Click "Internet Protocol (TCP/IP)



Now we have set the IP address of the PC, if the PC begins to receive, you will find the local area connection status displays as follows:

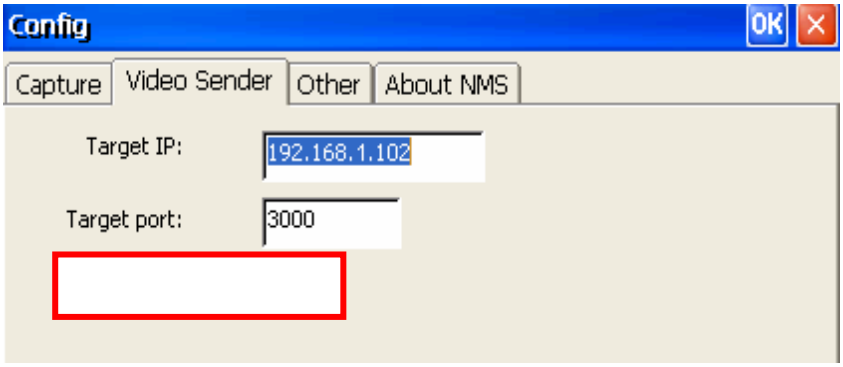


(3) The LCD microscope begin to send images

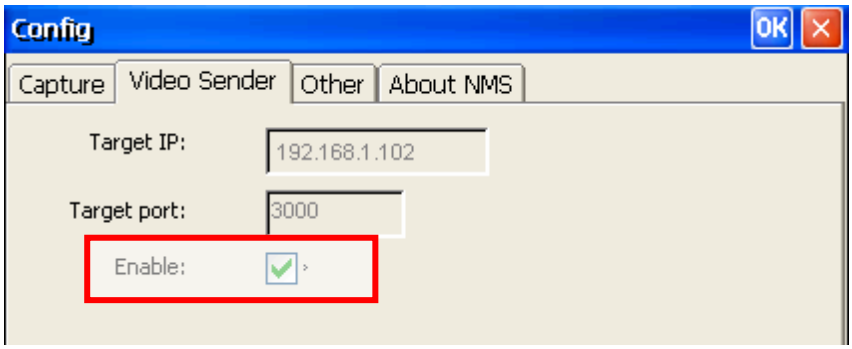
(1) Launch your software “NMS” on the desktop.

(2) Click the button 

, there will come out an “Configure” dialog, set the IP Address as the PC’s IP address, port number (rang from 2000 to 5000), and click “Start” button, the system begins to send the datas. The button now changes from Start to Stop; you can click “Stop” to stop send.



Select “Enable”

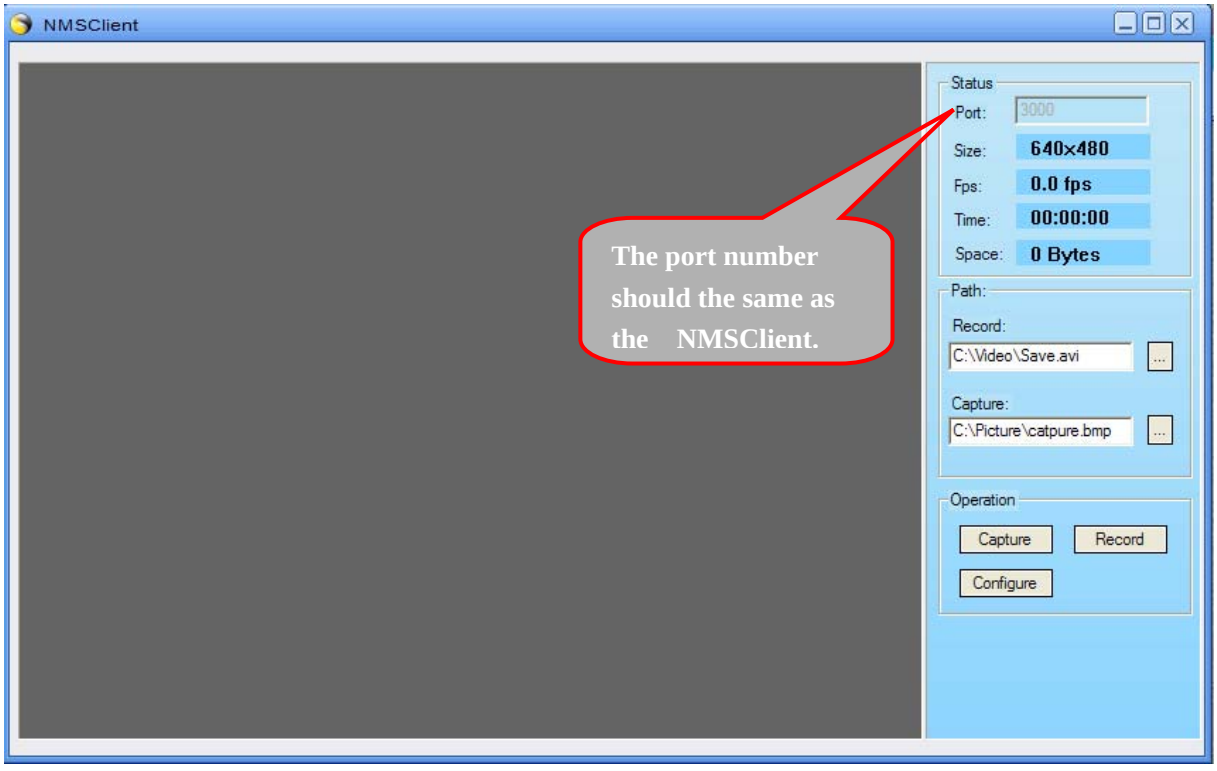


Now we have finished the setting of the LCD digital, and it is sending video, you can cancel the select to stop sending video.

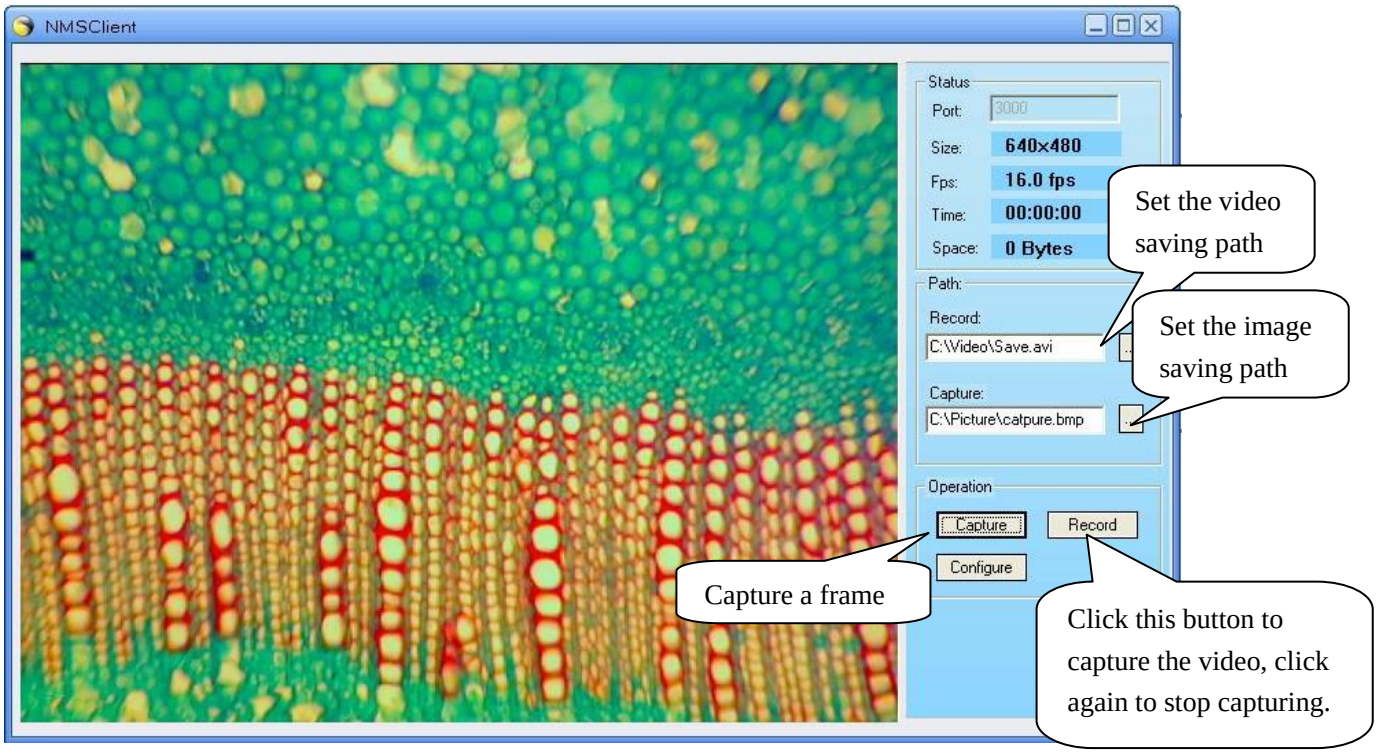
(4) The PC begin to receive images

(1) Make sure the software NMSClinent has been installed in the PC.

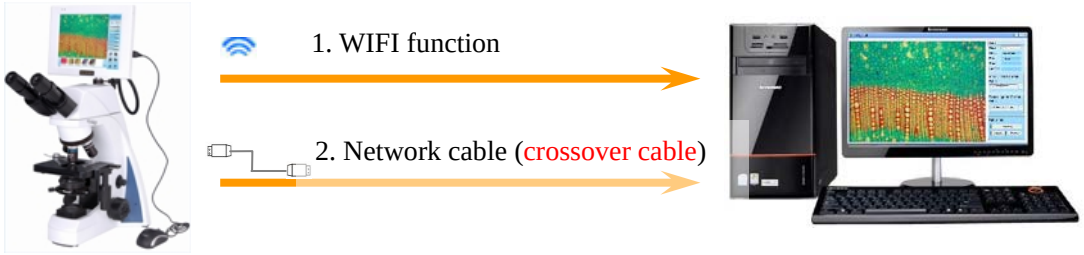
(2) Launch the “NMSClinent” software.



(3) Wait a minute, the NMSClient begins to receive video, and displays the real time video. You can capture images or record videos.



4.4 Point-to-point Model



Attention:

1. Use the WIFI function, the PC receiver must support wireless function, please check whether your network card support wireless function.

2. Use network cable to link the LCD Microscope and PC, the network cable must be a crossover cable. See the part V to know what are straight and crossover cable.

3. PC receiver must install the NMSClient software to receive the images sent by the LCD microscope.

4. In this model, one LCD microscope can only communicate with one PC, it can not communicate with more than two PCs.

5. In order to ensure the image transmission quality when using the WIFI function,

please make sure the LCD microscope is not very far from the PC and in a non-blocking space.

4.4.1 WIFI Function

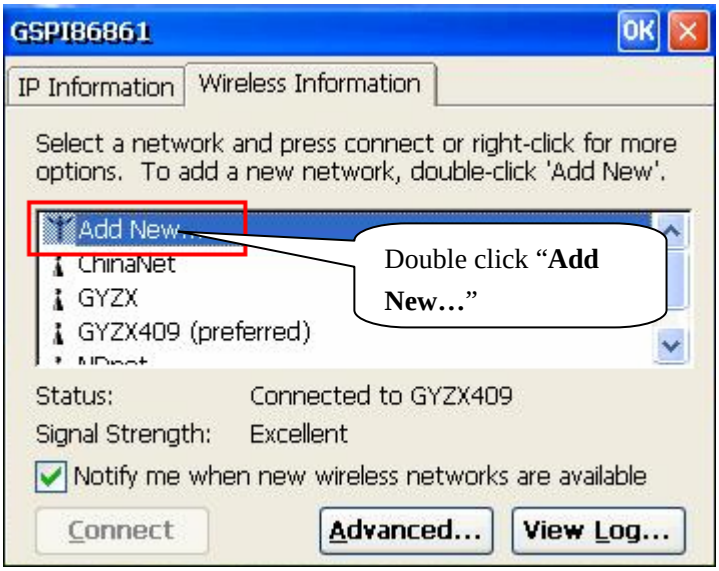
To point to point communication, you need a computer with a wireless network card.

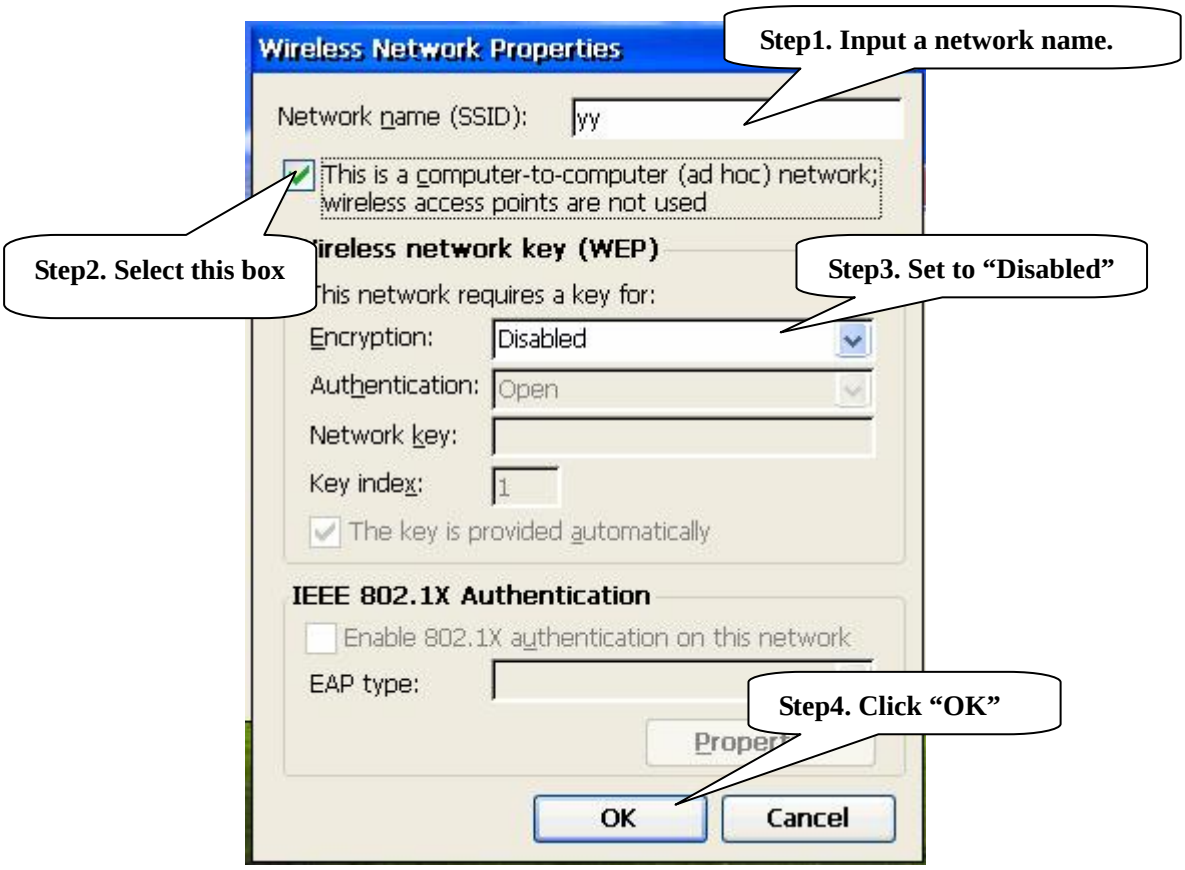
The LCD Digital Microscope communicates with the PC directly, without a router.

(1) New a point-to-point network

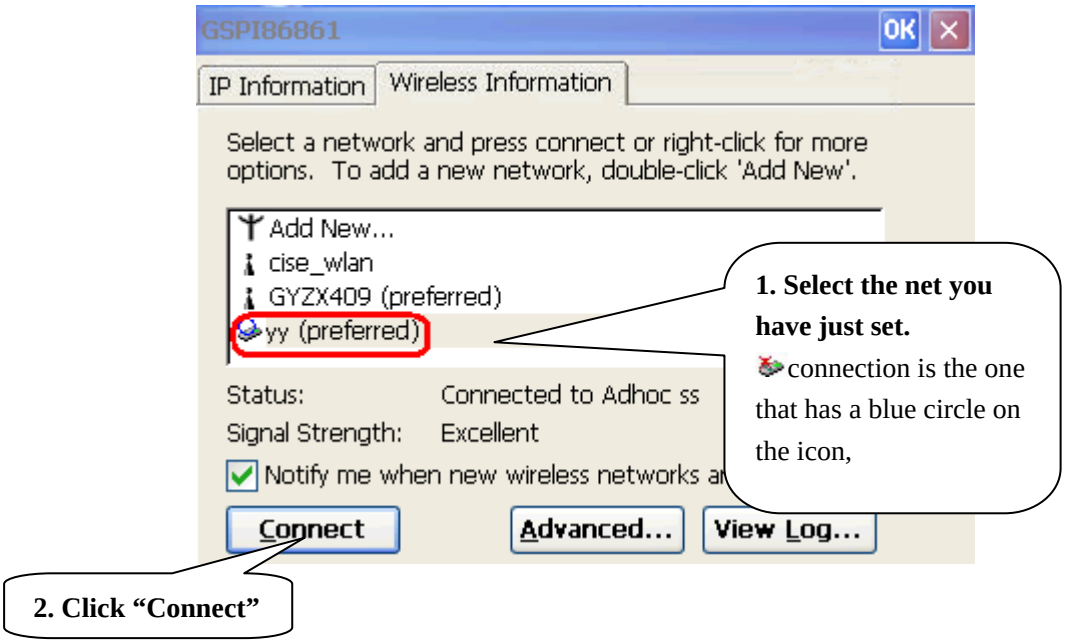
(1) Start your system Window CE.
(2) There will come out a dialog. You can also get this dialog by double clicking the icon on the task bar.

(3) Double click “Add New…”.
(4) Comes out a “Wireless Network Properties” dialog. Settings as below:



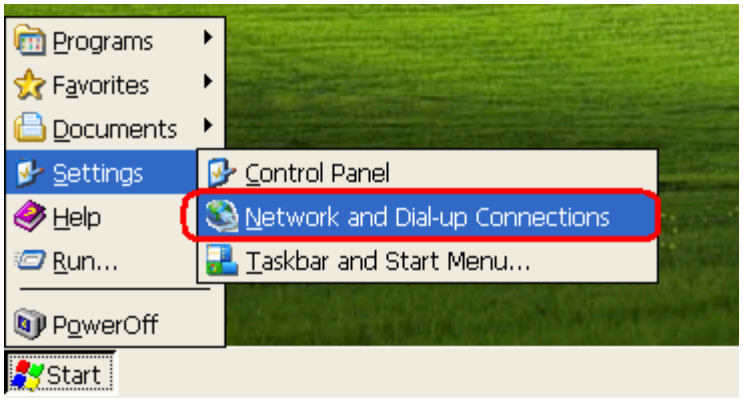


(5) After setting, there's a new point-to-point (computer-to-computer) network has been setup.



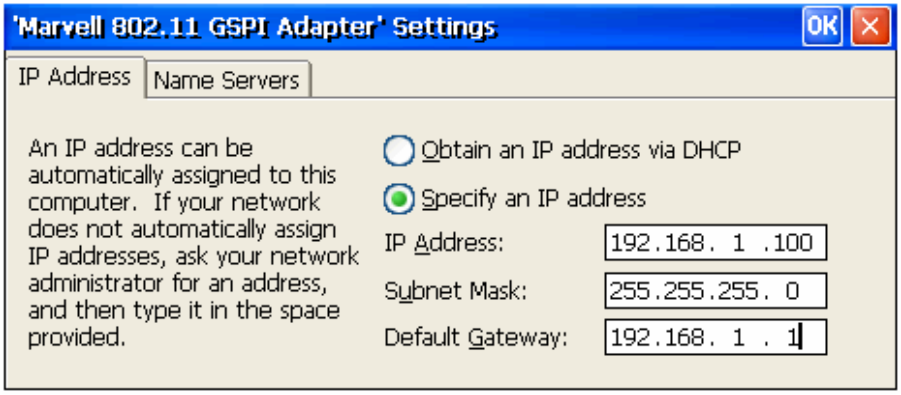
(4) Set the IP address of the LCD digital microscope, the same operation as the Windows XP system.

Click "Start-> Settings->Network and Dial-up Connections";



Double click the wireless icon 

Set the IP address, for example



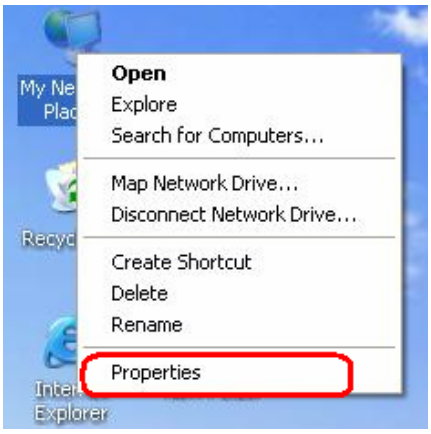
Click OK.

(2) Link the PC to the new network

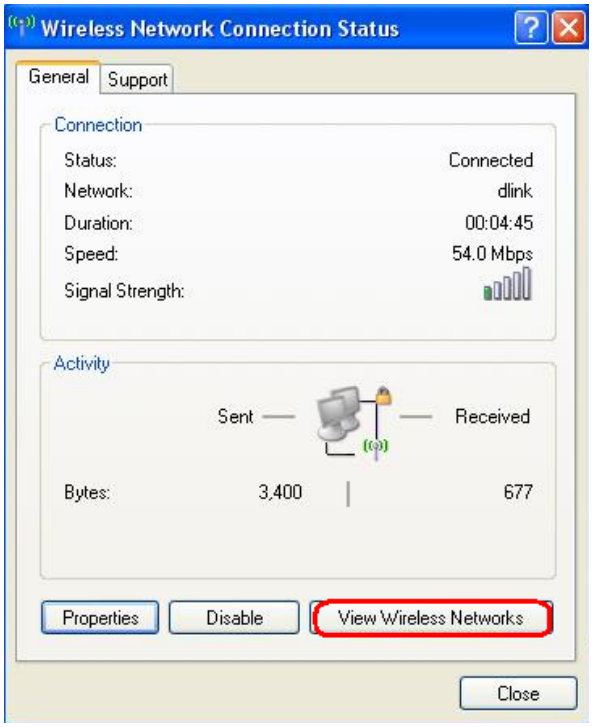
Make sure your PC has a wireless network card and the card had installed driver.

First, you should set the PC's IP address to the same LAN as the LCD digital microscope.

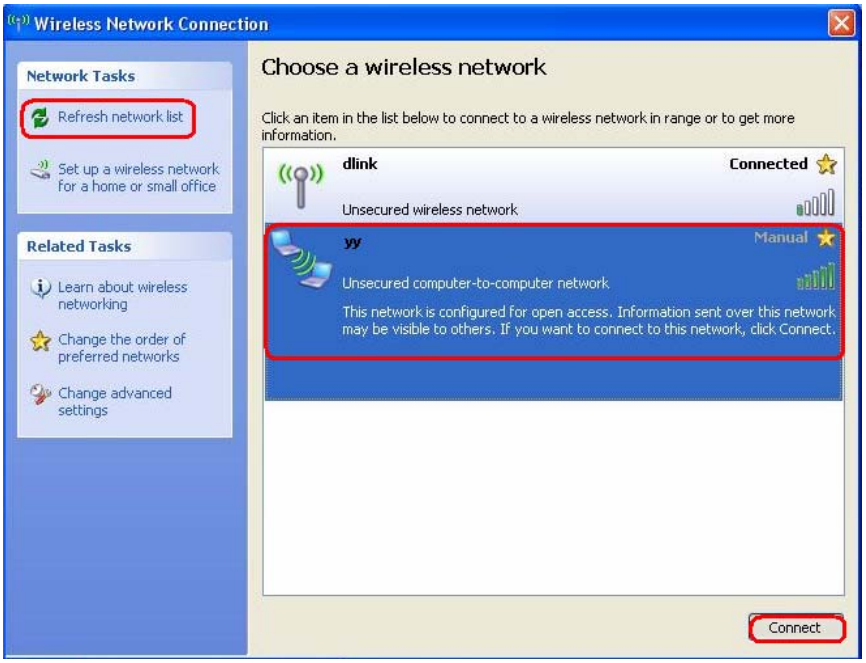
- Right click the My Network Places icon  on the desktop, click 'Properties'.

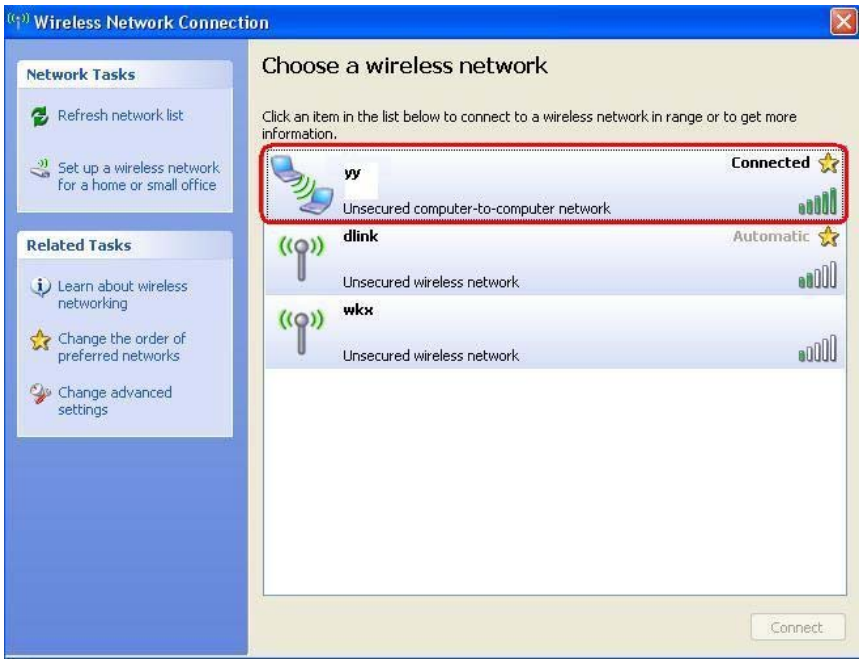


- Double click the “Wireless Network Connection”. There will come out a ‘Wireless Network Connection Status’ dialog. Or you can also get this dialog by double clicking the icon on the task bar. 

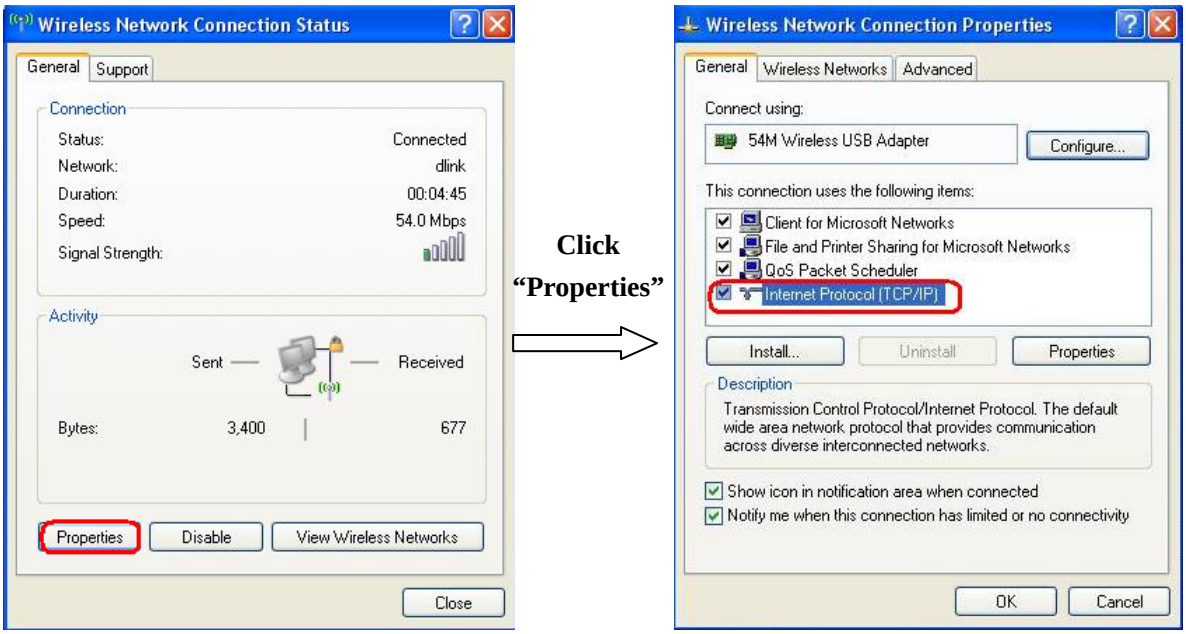


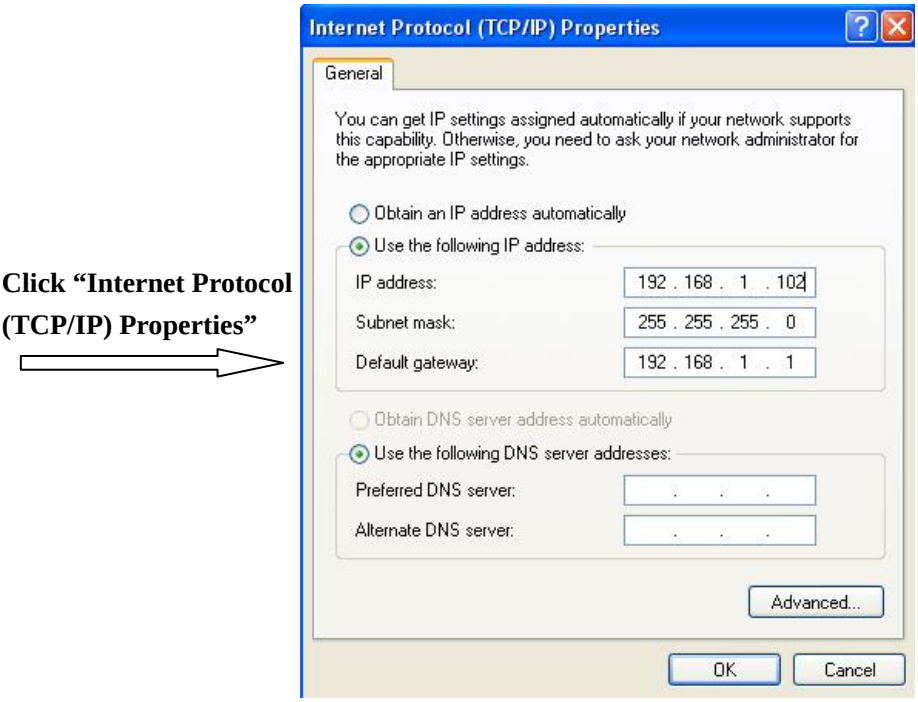
- The system will search the wireless network by itself, please select the Point-to-Point net you have just created. If not, please click the “Refresh network lit” on the left control bar. Then click the button “Connect”.





- Click Properties





Attention: The IP address should be set to in the same LAN as the LCD digital microscope.

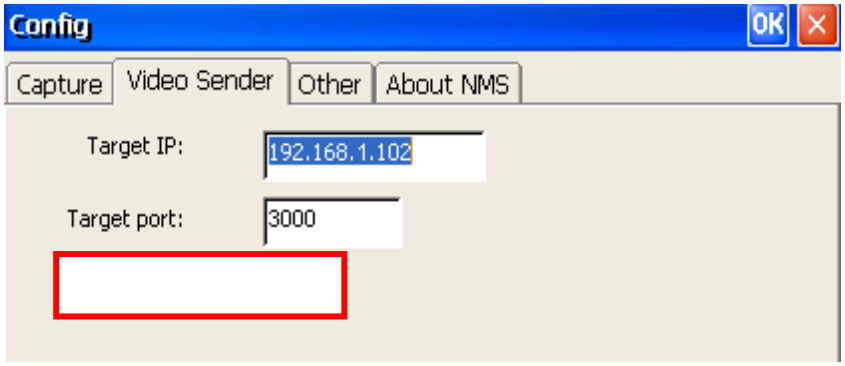
(3) The LCD microscope begin to send images

(1) Start your measuring software "NMS"

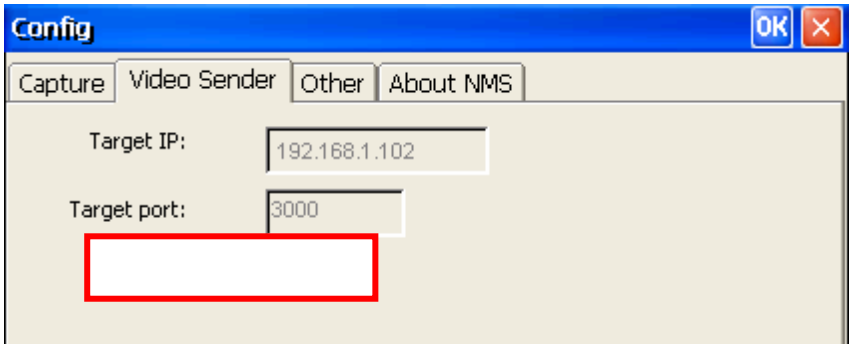
(2) Click the button 

, there will come out an "Configure" dialog, set the IP Address (reference the router), port number (rang from 2000 to 5000), and click

“Start” button, the system begins to send the data via WIFI wireless net. The button now changes from Start to Stop; you can click “Stop” to stop send.



Select “Enable”

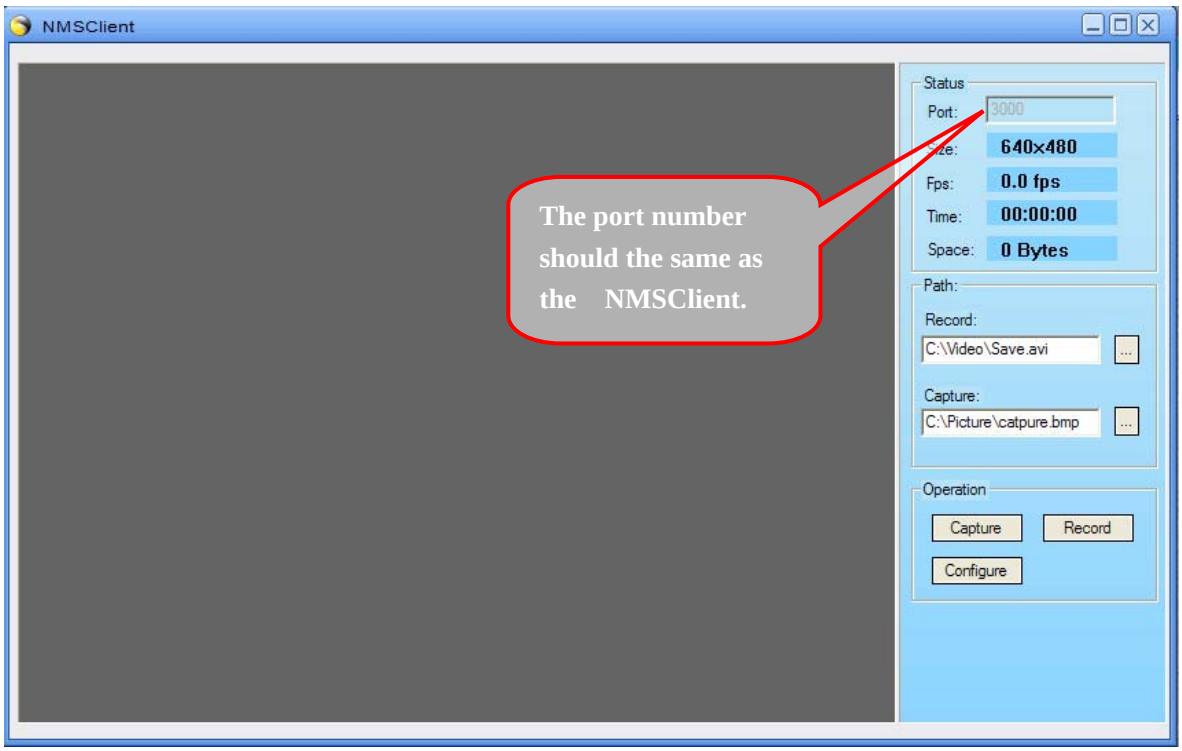


Now we have finished the setting of the LCD digital, and it is sending video, you can cancel the select to stop sending video.

(4) The PC begin to receive images

(1) Make sure the software NMSClinent has been installed in the PC.

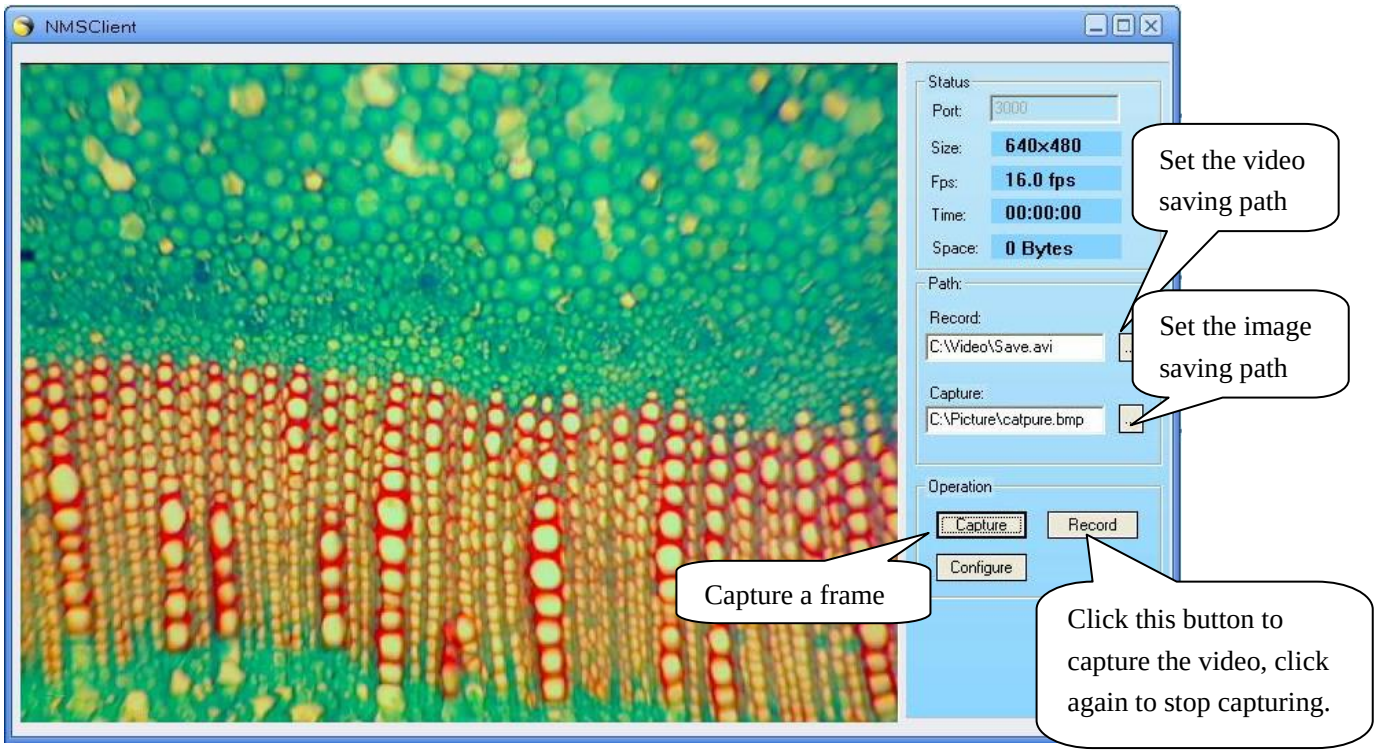
(2) Launch the “NMSClinent” software.



Attention: The port number of video sender and the NMSClient should be the same. And make sure your microscope video sender has been started.

Attention: Sometimes there will come out a 'windows security Alert', just click the 'Unblock' button.

(3) The NMSClient begins to receive video, and displays the real time video. You can capture images or record videos.



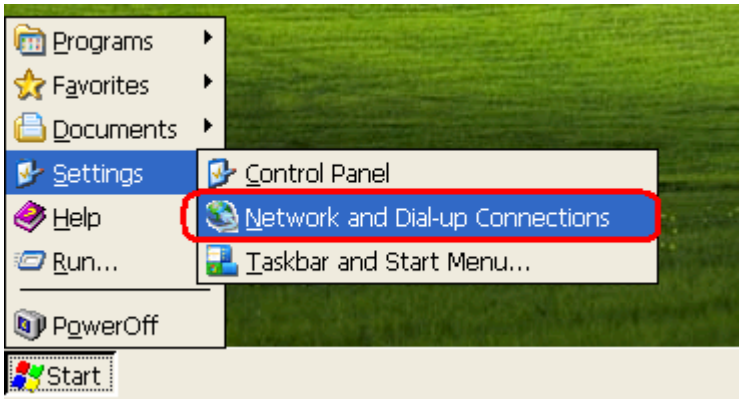
4.4.2 By Network Cable (crossover cable)

(1) Set the LCD microscope

(1) Link the LCD digital microscope to the PC with network cable (attention: here the network cable should be the **crossover cable,** see chart 5.1 what are straight and crossover cable**)**

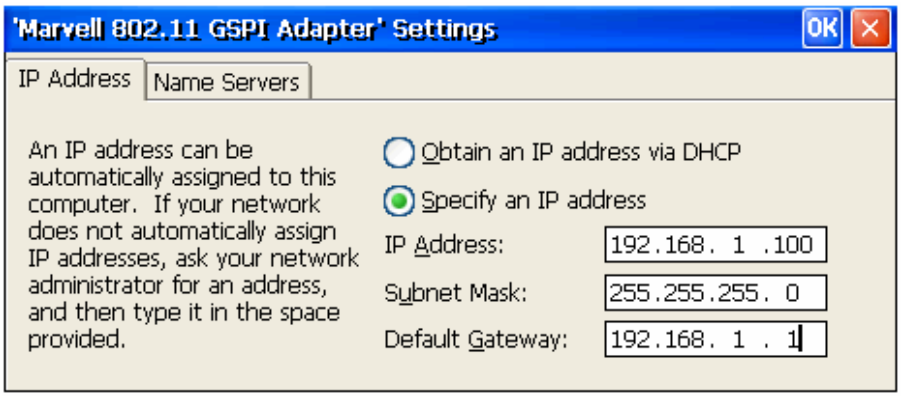
(2) Set the IP address of the LCD digital microscope

Click “Start-> Settings->Network and Dial-up Connections“;



Double click the wire network icon 

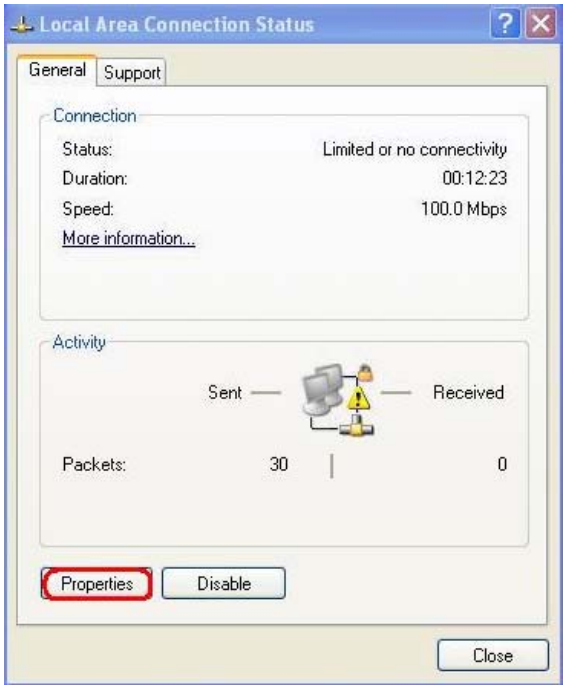
Set the IP address, for example



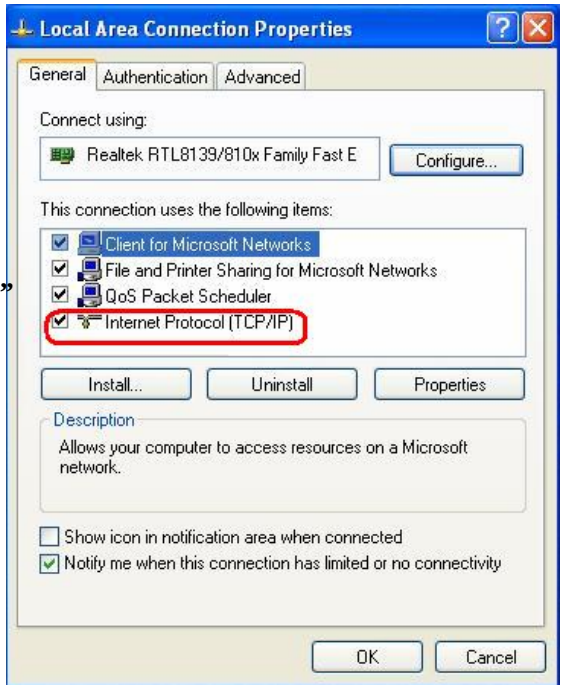
Click OK.

(2) Set the PC

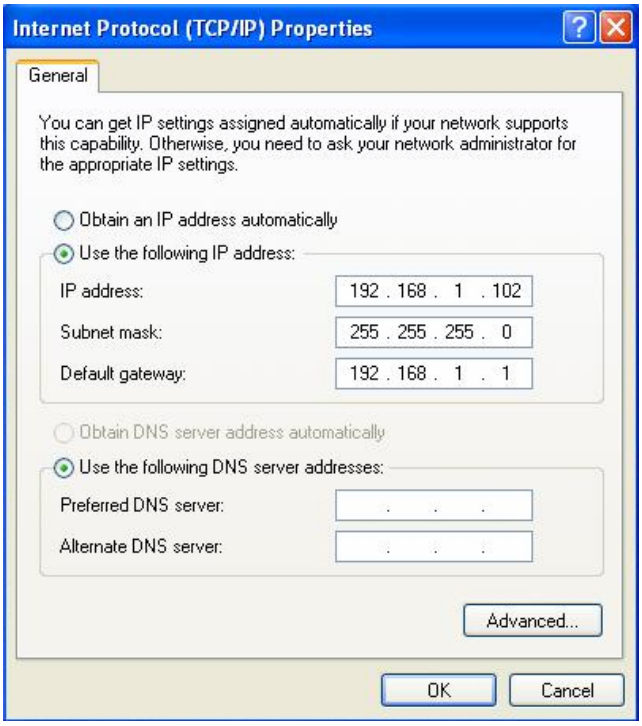
(1) Double click the icon  on the task bar 



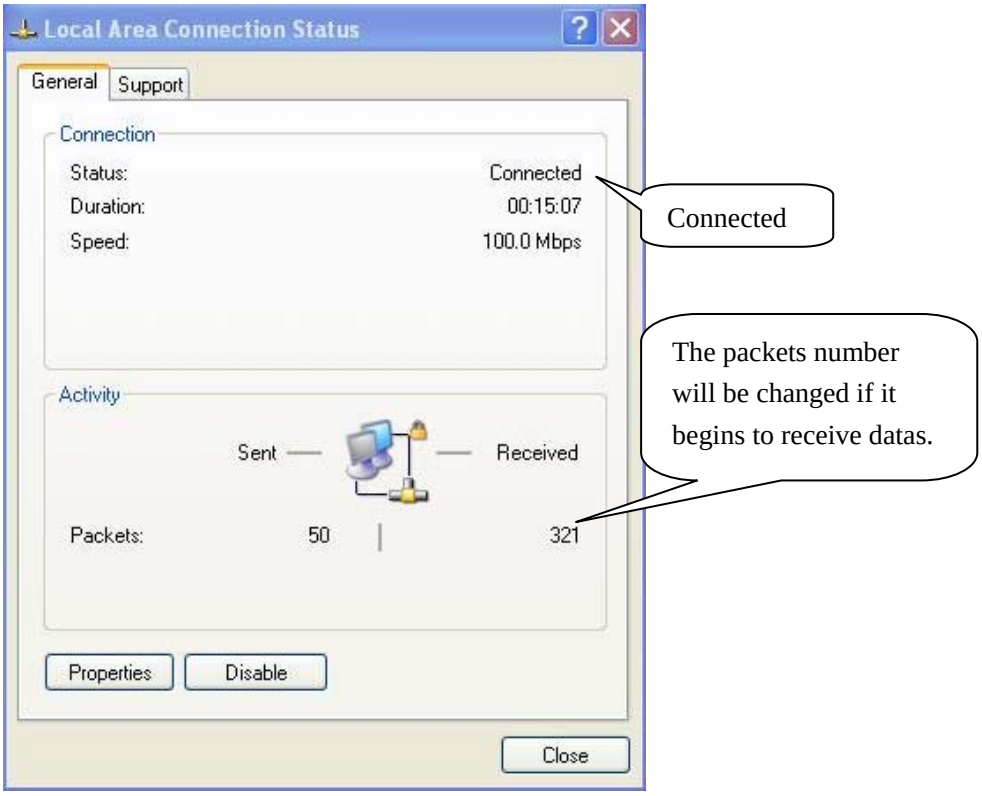
Click "Properties"



Click “Internet Protocol(TCP/IP)



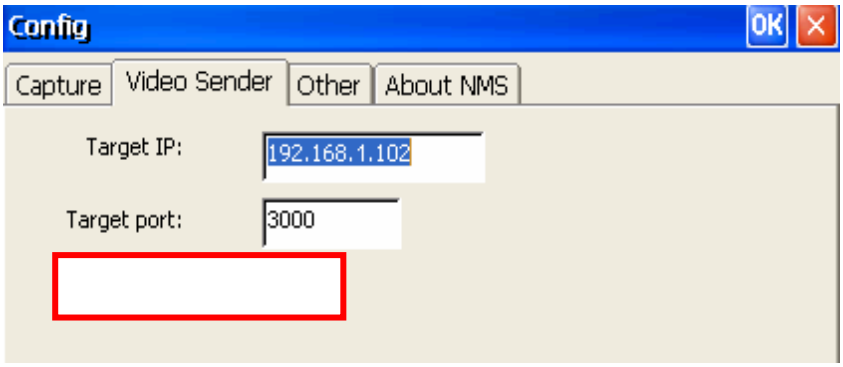
Now we have set the IP address of the PC, if the PC begin to receive, you will find the local area connection status displays as follows:



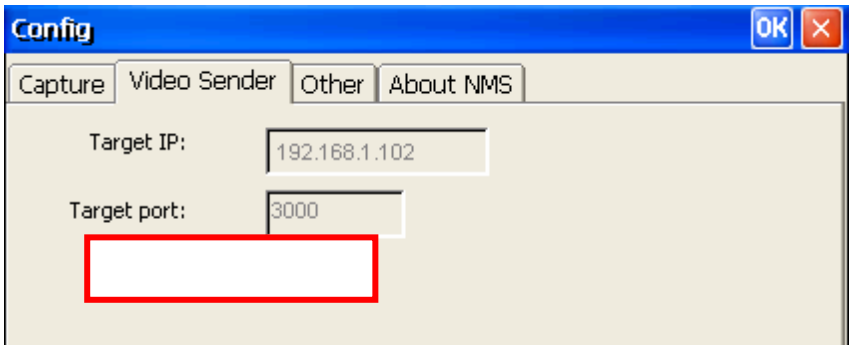
(3) The LCD microscope begin to send images

(1) Start your software “NMS”

(2) Click the button  , there will come out an “Configure” dialog, set the IP Address (The IP Address of the PC), port number (rang from 2000 to 5000), and click “Start” button, the system begins to send the data via WIFI wireless net. The button now changes from Start to Stop; you can click “Stop” to stop sending.



Select “Enable”

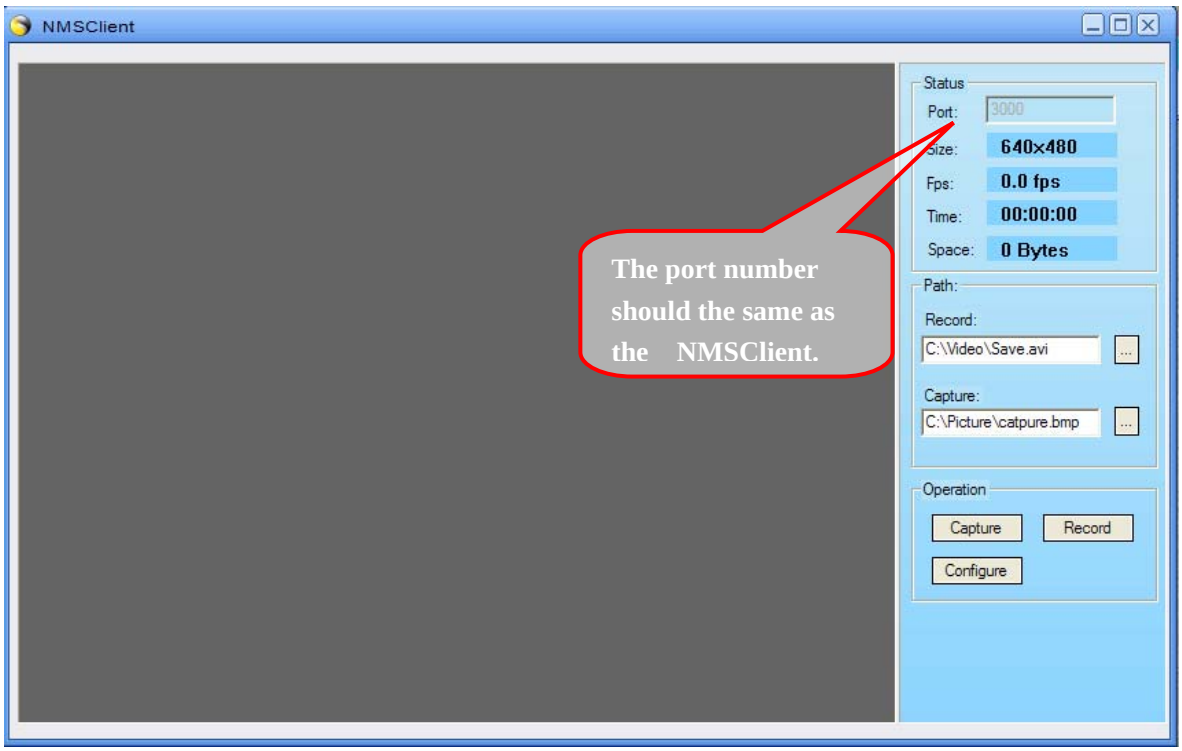


Now we have finished the setting of the LCD digital, and it is sending video, you can cancel the select to stop sending video.

(4) The PC begin to receive images

(1) Make sure the software NMSClinent has been installed in the PC.

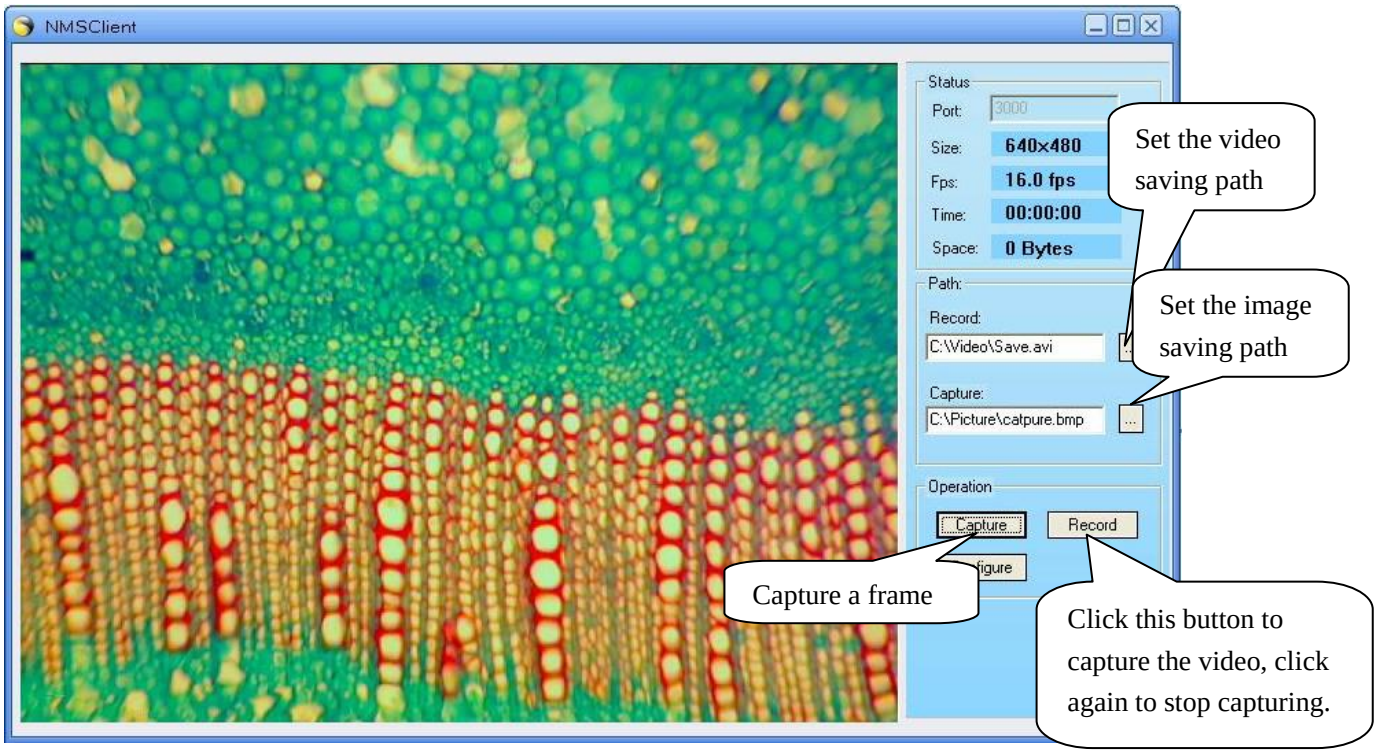
(2) Launch the “NMSClinent” software.



Attention: The port number of video sender and the NMSClient should be the same. And make sure your microscope video sender has been started.

Attention: Sometimes there will come out a 'windows security Alert', just click the 'Unblock' button.

(3) The NMSClient begins to receive video, and displays the real time video. You can capture images or record videos.



V. Common Failure and Solution

When failure occurs, please look up the cause from the table below to get rid of the failure. If there is any difficulty and problem, please contact with our marketing department, we will solve it as soon as possible.

Common Failure and Solution Table
The failure and solution contains 3 sections: Optical section, mechanical section and electronic section. Here we just give the electronic section

5.1 Electric section

(a) Can not switch on the system

Phenomenon: Can not switch on the system or the system can not work.
Causes: Power isn't connected properly.
Solutions: Check the power supply of the LED head, make sure the 12V DC is connect properly. Or Plug the power and link again.

(b) Blur image on LCD

Phenomenon: Blur image on LCD or the system doesn't works normally
Causes: The line for data transfer isn't connected tightly.
Solutions: Check and link again. Make sure the connection is well. (Very

important)

(c) Right key function

Phenomenon: Can not use the right key function of the digital LCD.

Solutions:

1) Use a mouse to operate, just plug a mouse to the USB port of the LCD, you can operate it very easily.

2) Use the handwriting pen, press for more than 2 seconds, the system will response it as a right click.

(d) System halted

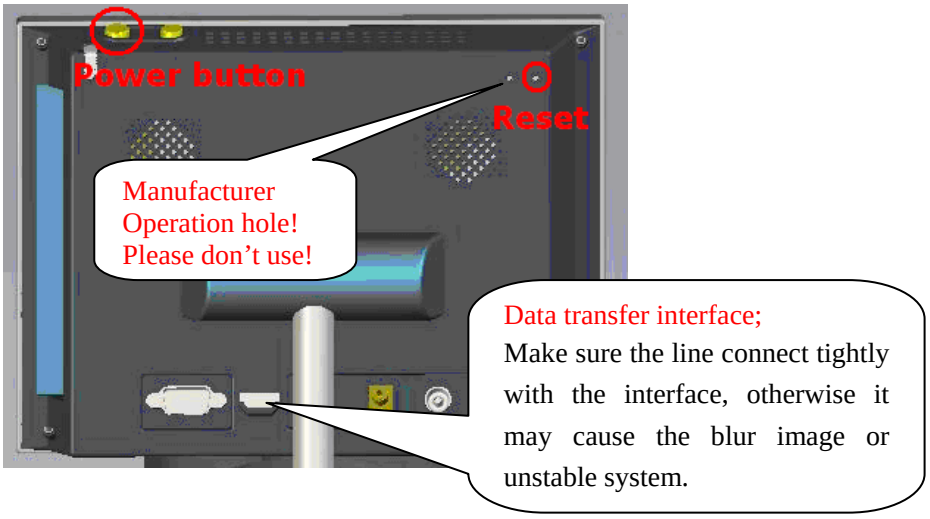
Phenomenon: The system halt, and no response of any operation.

Causes: Wrong operation or the unstable voltage.

Solutions:

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

2) Click the small “Reset” hole with a needle (or other things that have a small, sharp-point) to reset your system, as the picture below.



(e) No response of the touching screen.

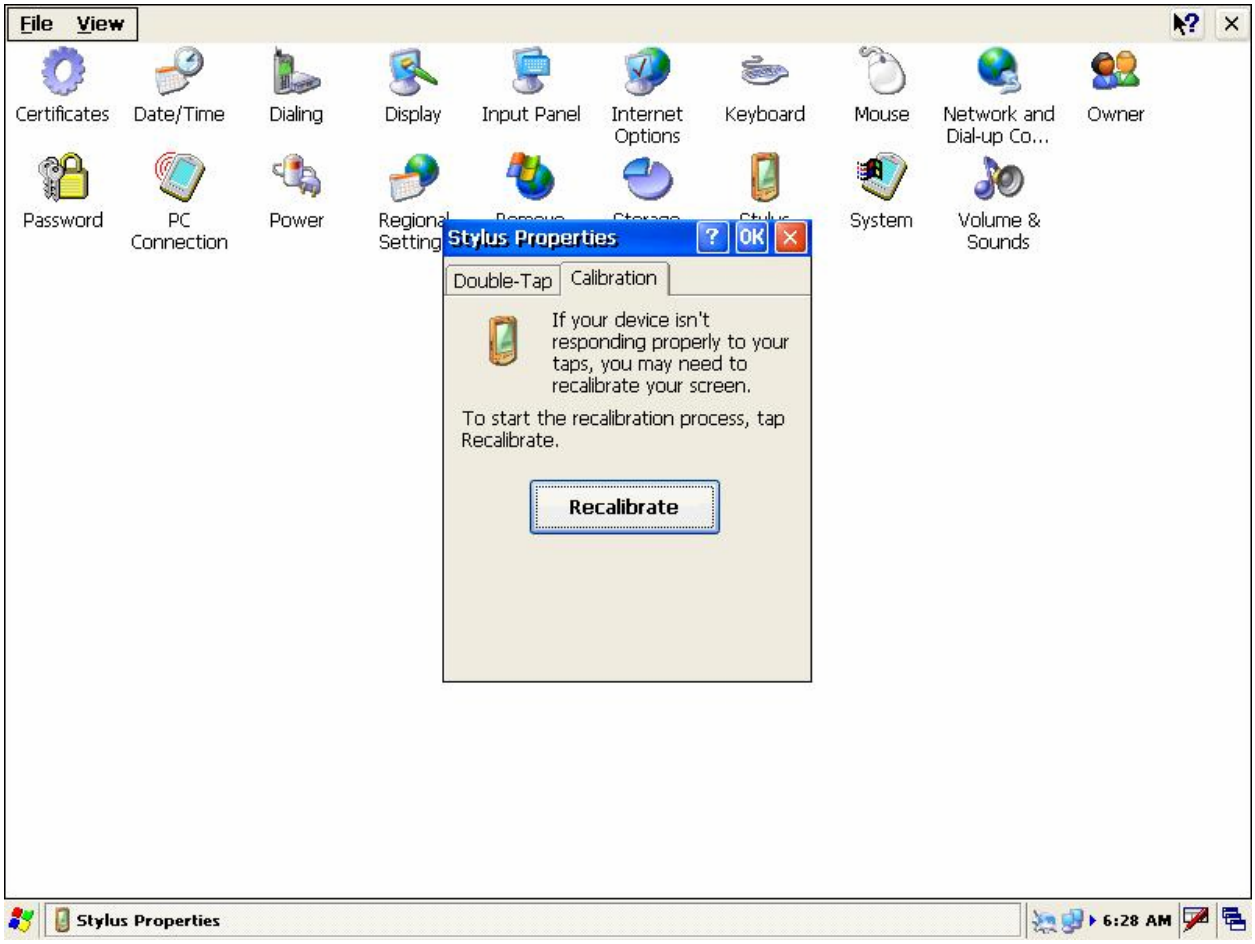
Phenomenon: The touching screen isn’t responding properly to your taps.

Causes: The screen stylus not in the right place.

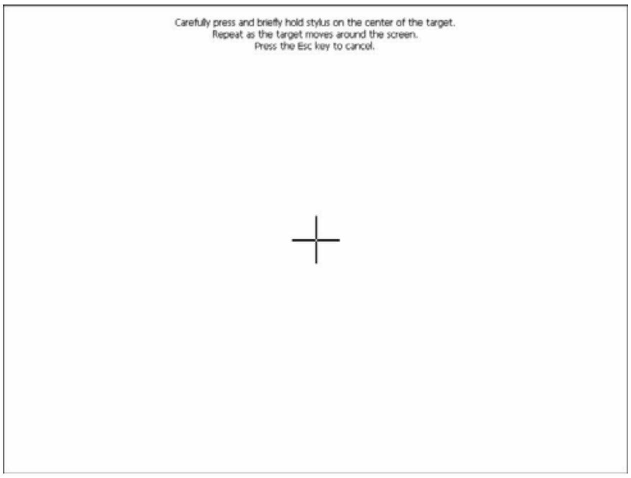
Solutions: Recalibration your screen again. Do as follows:

1) Enter the control panel.

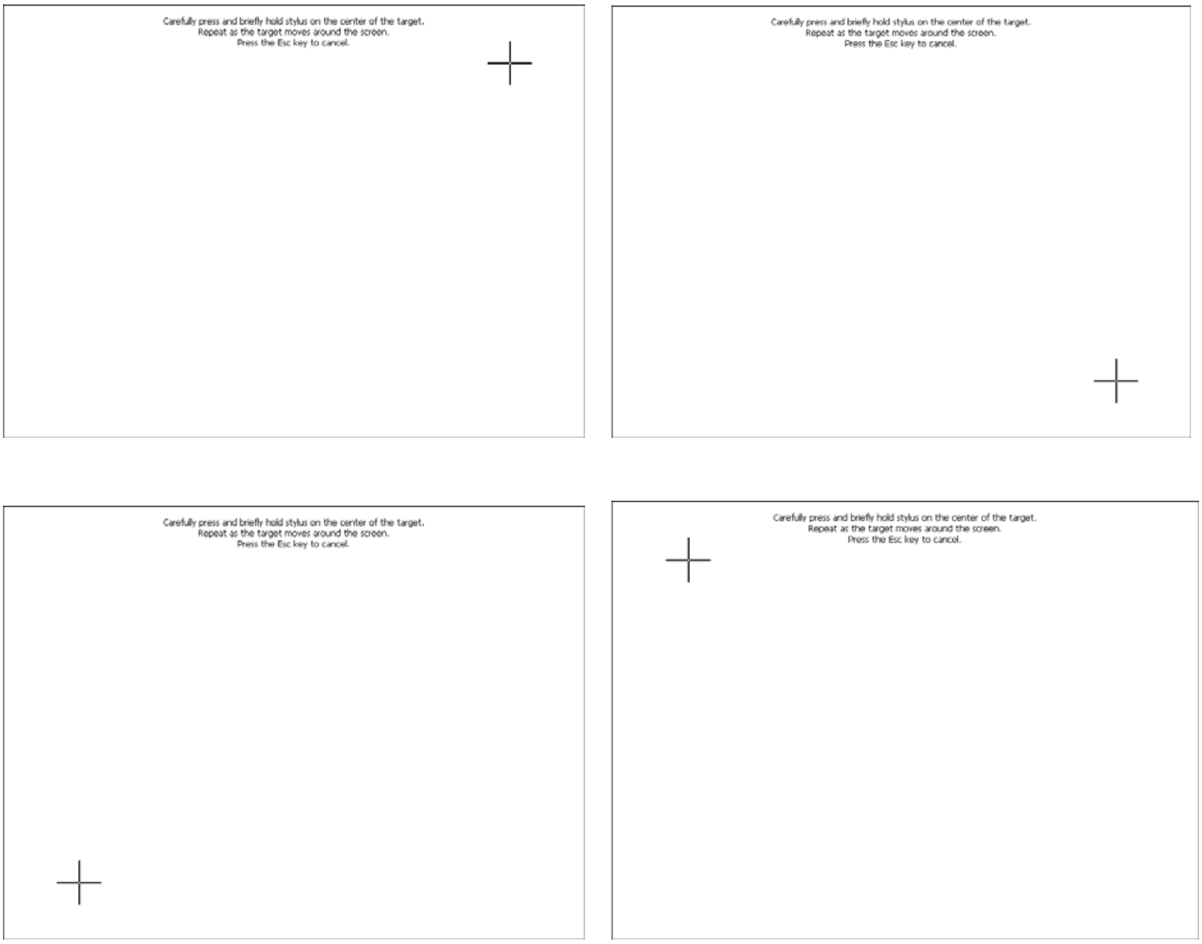
2) Double click the ‘Stylus’ button, there will come out a ‘Stylus Properties’ dialog; click the ‘Recalibrate’ button.



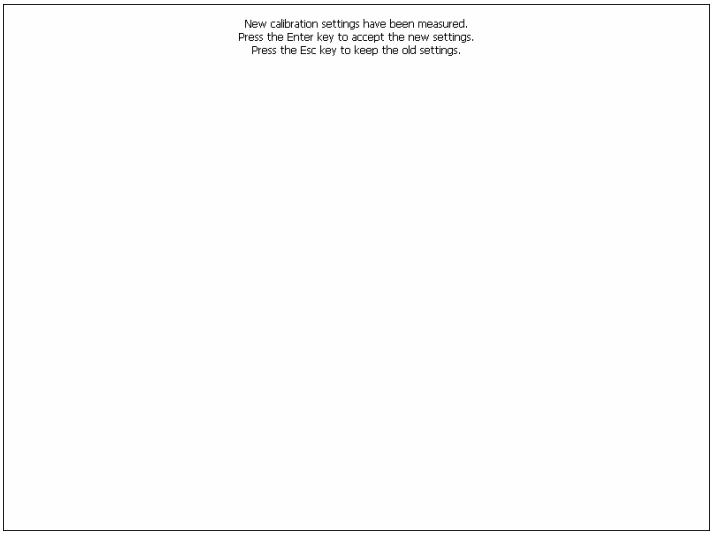
3) There will be a cross in the center of the screen. **Carefully press and briefly hold stylus on the center of the target.** Press the Esc key to cancel. As follows:



4) Repeat as the target moves around the screen. Press the Esc key to cancel. As follows:



5) New calibration settings have been measured. Press the **Enter** key to accept the new settings. Press the **Esc** key to keep the old settings.



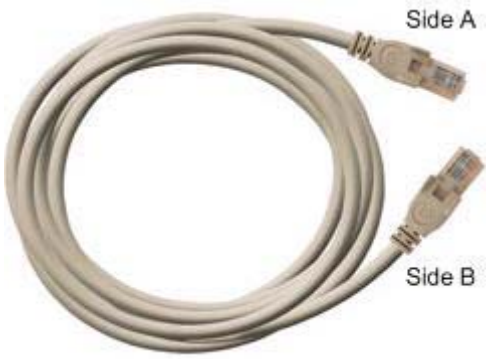
6) Now the screen recalibration has been finished, you can use the touching screen again.

(f) What are Straight and Crossover cable

Common Ethernet network cable are straight and crossover cable. This Ethernet network cable is made of 4 pair high performance cable that consists twisted pair conductors that used for data transmission. Both end of cable is called RJ45 connector.

The cable can be categorized as **Cat 5, Cat 5e, Cat 6 UTP cable**. Cat 5 UTP cable can support 10/100 Mbps Ethernet network, whereas Cat 5e and Cat 6 UTP cable can support Ethernet network running at 10/100/1000 Mbps. You might heard about Cat 3 UTP cable, it's not popular anymore since it can only support 10 Mbps Ethernet network.

Straight and crossover cable can be Cat3, Cat 5, Cat 5e or Cat 6 UTP cable, the only difference is each type will have different wire arrangement in the cable for serving different purposes.



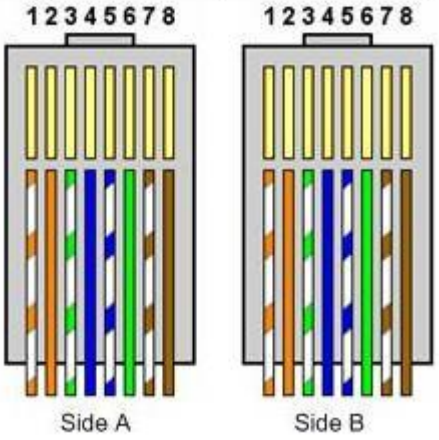
Straight Cable

You usually use straight cable to connect different type of devices. This type of cable will be used most of the time and can be used to:

1) Connect a computer to a switch/hub's normal port.
2) Connect a computer to a cable/DSL modem's LAN port.
3) Connect a router's WAN port to a cable/DSL modem's LAN port.
4) Connect a router's LAN port to a switch/hub's uplink port. (normally used for expanding network)
5) Connect 2 switches/hubs with one of the switch/hub using an uplink port and the other one using normal port.

If you need to check how straight cable looks like, it's easy. **Both side (side A and side B) of cable have wire arrangement with same color**. Check out different types of straight cable that are available in the market here.

Pin ID	Side A	Side B
1	Orange-white	Orange-white
2	Orange	Orange
3	Green-white	Green-white
4	Blue	Blue
5	Blue-white	Blue-white
6	Green	Green
7	Brown-white	Brown-white
8	Brown	Brown



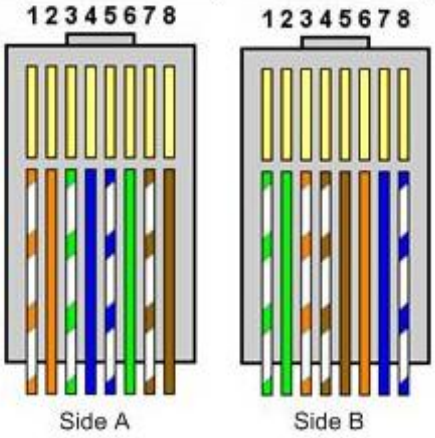
Crossover Cable

Sometimes you will use crossover cable, it's usually used to connect same type of devices. A crossover cable can be used to:

1) Connect 2 computers directly.
2) Connect a router's LAN port to a switch/hub's normal port. (normally used for expanding network)
3) Connect 2 switches/hubs by using normal port in both switches/hubs.

In you need to check how crossover cable looks like, **both side (side A and side B) of cable have wire arrangement with following different color** . Have a look on these crossover cables if you plan to buy one. You can also find more network cable choices and information from Comtrad Cables.

Pin ID	side A	side B
1	Orange-white	green-white
2	Orange	green
3	green-white	orange-white
4	blue	brown-white
5	blue-white	Brown
6	green	orange
7	brown-white	Blue
8	brown	blue-white



In case you need to make a crossover cable yourself! You can use this crimper to do it.

Finally, if you still not sure which type of cable to be used, please **try both cables and see which one works**.

Note: If there is **auto MDI/MDI-X** feature support on the switch, hub, network card or other network devices, you don't have to use crossover cable in the situation which I mentioned above. This is because crossover function would be enabled automatically when it's needed.

VI. Preservation and Maintenance:

1 The microscope, which is offered to you, is tested according to product standard in factory, and can be used regularly. For keeping the fine state of the microscope to prolong the service life, please pay attention to preservation and maintenance of the microscope.

1) Optical system of the appliance has been rectified to the best state by professional; the unprofessional should not dismount the microscope by itself.

2) The appliance should be placed in environment of dry and cool and without dirt, corrosiveness and steam.

3) Fill the space between specimen and objectives, between specimen and condenser with oil for microscope when 100X oil objective is used. There should be no impurities and bubbles which affect the observation in oil for microscope. Lightly turning the objectives converter repeatedly can dispel the bubbles in oil. Wipe to clean the microscope with absorbent cotton cloth dipped with little ethanol and ether mixture at once after using it.

4) Over-weight objects should not be placed on the object stage for avoiding damaging the stage by transformation.

5) Observing head, objectives，condenser, collecting lens are not used for long time, they should be placed in dry container for avoiding mould and fog on the surfaces.

6) Cover the appliance with dust cap and cut off the power when not using it. Objectives and ocular should be place in mirror case after use, cover the ocular eyepiece tube with eyepiece tube cover.

7) Maintenance of LCD screen: Working scope of regular humidity is 30%-80%. Pay attention to compressing by heavy thing on the surface of color LCD screen while using and storing it. When the surface of LCD screen is dirty, wipe the screen with clean and soft cloth lightly, do not use organic solvent to wash it.

   Do not unload the microscope by user's own for avoiding damage and electric shock.

   Please unplug out the power line when not using it, external power supply should be connected with earth!

8) The appliance is a precise instrument, shock and rigid operation is forbidden, since it will damage the appliance seriously.

9) Pull out the power plug from the AC power socket before cleaning the appliance. Do not use liquid or spray cleaning device to wipe the power part.

10) Reduce the brightness of bulb first, and then switch off the power when you close it for avoiding large current surge shortening the life when the LED background lamp is lighted again.

2 Cleaning the lenses

1) You’d better clean the dirt with soft brush or gauze.
2) More obstinate stain such as fingerprint, oil etc. can be wiped with clean and soft cotton, lens tissue or gauze dipped with anhydrous (pure) alcohol (ethanol or methyl alcohol) lightly.
3) If you want to wipe off the immersion oil from oil lens, you should use lens tissue, soft cotton or gauze dipped with xylene to wipe off lightly.
4) Warning: xylene and anhydrous alcohol are inflammable; please pay attention to fire when switching on or off the power.

3 Cleaning the paint or plastic surface

1) Avoid using any organic solvent (such as alcohol, ether, dilute dose and so on) to clean the paint or plastic surface, we suggest you to use gauze, and more obstinate stain can be clean by using soft cleaning dose.
2) Plastic surface can only be cleaned by using soft cloth dipped with cleaning dose.

4 While not using it

1) Please cover the appliance with plastic cover and store it in dry environment for avoiding enzyme while not using it.
2) We suggest specially that that the objectives and ocular should be stored in dry container with dryer.

Regular inspection

For keeping fine performance, periodic regular inspection is suggested.