# The XCAM4K Series Camera Help Manual

# Contents

# 1 XCAM4K Series Camera Application

Figure 1 TheXCAM4K Series Camera

The XCAM4K series camera is intended for acquisition of digital images from stereo microscopes, biological microscopes, or online interactive teaching. The basic characteristic is listed as below:

- Sony Exmor/STARVIS back-illuminated CMOS sensor
- 4K HDMI/ LAN/Wi-Fi / USB multiple video outputs
- 4K/1080P auto switching according to monitor resolution
- SD card/USB flash drive for captured image and video storage, support local preview and playback
- Embedded XCamView for the control of the camera and image processing
- Excellent ISP with local tone mapping and 3D denoising
- ToupView/ToupLite software for PC
- iOS/Android applications for smart phones or tablets

# 2 XCAM4K Series Camera Datasheet and Functions(3)

| Order Code | Sensor & Size(mm) | Pixel(μm) | G Sensitivity<br>Dark Signal | FPS/Resolution | Binning | Exposure(ms) |
|---|---|---|---|---|---|---|
| XCAM4K8MPA<br>XP4K8MA | Sony IMX334(C)<br>1/1.8"(7.68x4.32) | 2.0x2.0 | 505mv with 1/30s<br>0.1mv with 1/30s | 60@3840*2160(HDMI)<br>30@3840*2160(NETWORK)<br>30@3840*2160(USB) | 1x1 | 0.04~2000 |
| XCAM4K8MPB<br>XP4K8MB | Sony IMX485(C)<br>1/1.2"(11.14x6.26) | 2.9x2.9 | 2188mv with 1/30s<br>0.39mv with 1/30s | 60@3840*2160(HDMI)<br>30@3840*2160(NETWORK)<br>30@3840*2160(USB) | 1x1 | 0.04~2000 |
| XCAM4K16MPA<br>XP3K16MA | Sony IMX183(C)<br>1/1.06"(13.06x7.34) | 2.4x2.4 | 461mv with 1/30s<br>0.21mv with 1/30s | 30@3840*2160(HDMI)<br>30@3840*2160(NETWORK)<br>15@5440*3060(USB) | 1x1 | 0.04~2000 |


Figure 2 Available Ports on the Back Panel of the Camera Body(Cubic and Flat Shape)

| Interface or Button | Function Description |
|---|---|
| USB Mouse | Connect USB mouse for easy operation with embedded XCamView software. |
| USB3.0 | Connect USB flash drive to save pictures and videos (Host Mode).<br>Connect 5G WLAN module to transfer video wirelessly in real time(AP/STA, Host Mode); |

| | |
|---|---|
| HDMI | Comply with HDMI2.0 standard. 4K/1080P format video output and supporting automatic switch between 4K and 1080P format according to the connected monitors.， |
| LAN | LAN port to connect router and switch to transfer video. |
| SD | Comply with SDIO3.0 standard and SD card could be inserted for video and images saving. |
| ON/OFF | Power switch. |
| LED | LED status indicator. |
| DC12V | Power adapter connection (12V/1A). |
| **Video Output Interface** | **Function Description** |
| HDMI Interface | Comply with HDMI2.0 standard;<br>60fps@4K or 60fps@1080P(XCAM4K8MPA, XCAM4K8MPB);<br>30fps@4K or 60fps@1080P(XCAM4K16MPA); |
| LAN Interface | 30ps@4K resolution, support real time resolution switching;<br>H264/H265 encoded video;<br>Bandwidth adjustment in real time;<br>DHCP configuration or manual configuration;<br>Unicast/multicast configuration; |
| WLAN Interface | Connecting 5G WLAN adapter (USB3.0 slot) in AP/STA mode (Host Mode); |
| USB3.0 Slot | Connecting USB3.0 port of PC for video transfer (Device Mode);<br>MJPEG format video; |
| **Other Function** | **Function Description** |
| Video Saving | Video format：8M(3840*2160) H264 encoded MP4 file;<br>Video saving frame rate：50~60fps(XCAM4K8MPA, XCAM4K8MPB) (related with SD card and video resolution);<br>26~30fps(XCAM4K16MPA) (related with SD card and video resolution); |
| Image Capture | 8M (3840*2160, XCAM4K8MPA, XCAM4K8MPB) JPEG/TIFF image in SD card or USB flash drive;<br>16M (3840*2160, XCAM4K16MPA) JPEG/TIFF image in SD card or USB flash drive. |
| Measurement Saving | Measurement information saved in different layer with image content;<br>Measurement information is saved together with image content in burn in mode. |
| ISP | Exposure(Automatic / Manual Exposure) / Gain， White Balance(Manual / Automatic / ROI Mode)，Sharpening， 3D Denoise， Saturation Adjustment， Contrast Adjustment， Brightness Adjustment，Gamma Adjustment， Color to Gray， 50HZ/60HZ Anti-flicker Function |
| Image Operation | Zoom In/Zoom Out(Up to 10X), Mirror/Flip, Freeze, Cross Line, PIP (Picture in Picture), Compare(Comparison between real time video and images in SD card or USB flash drive ), Embedded Files Browser, Video Playback, Measurement Function |
| Embedded RTC(Optional) | To support accurate time on board |
| Restore Factory Settings | Restore camera parameters to its factory status |
| Multiple Language Support | English / Simplified Chinese / Traditional Chinese / Korean / Thai / French / German / Japanese / Italian |
| **Software Environment under LAN/WLAN/USB Video Output** | |
| White Balance | Auto White Balance |
| Color Technique | Ultra-Fine Color Engine |
| Capture/Control SDK | Windows/Linux/macOS/Android Multiple Platform SDK(Native C/C++, C#/VB.NET, Python, Java, DirectShow, Twain, etc) |
| Recording System | Still Picture or Movie |
| Operating System | Microsoft® Windows® XP / Vista / 7 / 8 / 8.1 /10(32 & 64 bit)<br>OSx(Mac OS X)<br>Linux |
| PC Requirements | CPU: Equal to Intel Core2 2.8GHz or Higher |
| | Memory: 4GB or More |
| | Ethernet Port: RJ45 Ethernet Port |
| | Display:19” or Larger |
| | CD-ROM |
| **Operating Environment** | |
| Operating Temperature (in Centidegree) | -10°~ 50° |
| Storage Temperature (in Centidegree) | -20°~ 60° |
| Operating Humidity | 30~80%RH |

| | |
|---|---|
| Storage Humidity | 10~60%RH |
| Power Supply | DC 12V/1A Adapter |

## 3 Dimension of XCAM4K Series


Figure 3 Dimension of XCAM4K Series

# 4 XCAM4K Series Camera Packing Information


Figure 4 XCAM4K Series Camera Packing Information(Cubic and Flat Shape)

| | | | |
|---|---|---|---|
| **Standard Packing List** | | | |
| A | Gift box : L:25.5cm W:17.0cm H:9.0cm (1pcs, 1.57Kg/ box) | | |
| B | XCAM 4K Camera(One of the two different shapes) | | |
| C | Power Adapter: Input: AC 100~240V 50Hz/60Hz, Output: DC 12V 1A<br>American standard: Model: POWER-U-12V1A(MSA-C1000IC12.0-12W-US): UL/CE/FCC<br>European standard: Model: POWER-E-12V1A(MSA-C10001C12.0-12W-DE): UL/CE/FCC<br>EMI standard: FCC Part 15 Subpart B<br>EMS standard: EN61000-4-2,3,4,5,6 | | |
| D | USB Mouse | | |
| E | HDMI 2.0 Cable | | |
| F | High-speed USB3.0 A male to A male gold-plated connectors cable /2.0m | | |
| G | CD (Driver & utilities software, Ø12cm) | | |
| **Optional Accessory** | | | |
| H | SD Card(16G or above; Speed: class 10) or USB flash drive | | |
| I | USB WLAN adapter | | |
| J | Ethernet cable | | |
| K | Adjustable lens adapter | C-Mount to Dia.23.2mm Eyepiece Tube<br>(Please choose 1 of them for your microscope) | 108001/AMA037<br>108002/AMA050<br>108003/AMA075 |

| | | | |
|---|---|---|---|
| L | Fixed lens adapter | C-Mount to Dia.23.2mm Eyepiece Tube<br>(Please choose 1 of them for your microscope) | 108005/FMA037<br>108006/FMA050<br>108007/FMA075 |
| | Note: For K and L optional items, please specify your camera type(C-mount, microscope camera or telescope camera), ToupTek engineer will help you to determine the right microscope or telescope camera adapter for your application; | | |
| M | 108015(Dia.23.2mm to 30.0mm Ring)/Adapter rings for 30mm eyepiece tube | | |
| N | 108016(Dia.23.2mm to 30.5mm Ring)/ Adapter rings for 30.5mm eyepiece tube | | |
| O | Calibration kit | | 106011/TS-M1(X=0.01mm/100Div.);<br>106012/TS-M2(X,Y=0.01mm/100Div.);<br>106013/TS-M7(X=0.01mm/100Div., 0.10mm/100Div.) |

# 5 Software and App

The software or the APP can be downloaded from the following link：

Windows: https://www.touptekphotonics.com/download/

Linux & macOS: https://www.touptekphotonics.com/download/

iOS: https://itunes.apple.com/us/app/toupview/id911644970

Android: https://play.google.com/store/apps/details?id=com.touptek.tpview

# 6 XCAM4K Series Camera Configurations

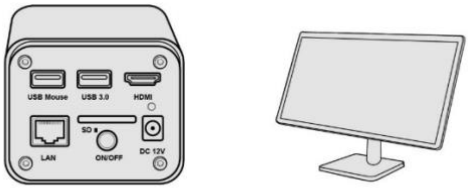
You can use the XCAM4K series camera in 5 different ways. Each application requires different hardware environment.

## 6.1 Camera working standalone with built-in XCamView software

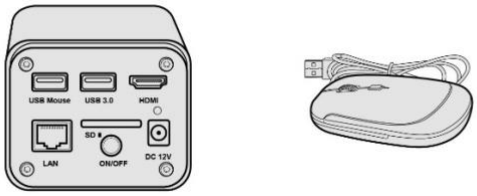
For this application, apart from the microscope, you only need an HDMI monitor, the supplied USB mouse, and the camera embedded XCamView software. A computer or a network connection is not required to operate the camera in this application. The steps to start the camera are listed as below:

Figure 5 XCAM4K Series Camera with the HDMI Monitor

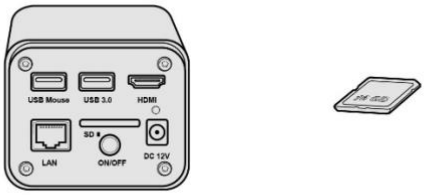
Connect the camera to a HDMI monitor using the HDMI cable;




Insert the supplied USB mouse to the camera's USB port;

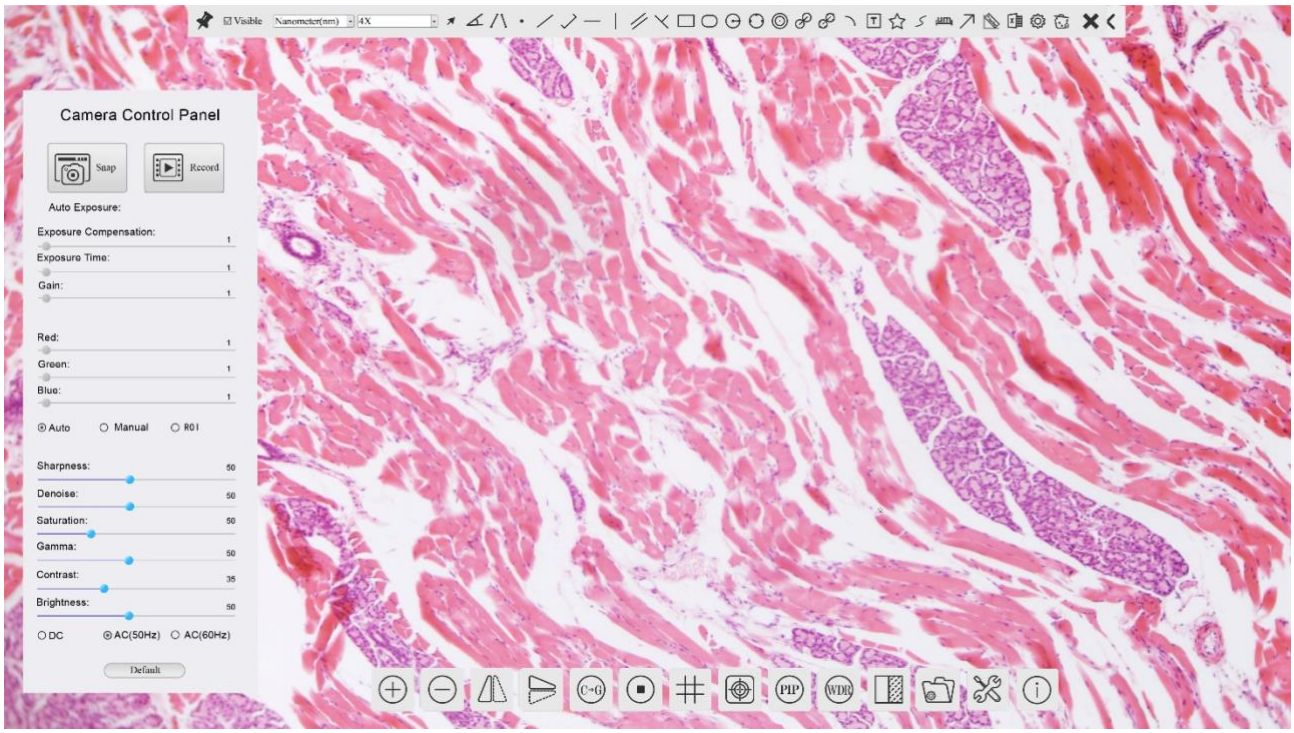



Insert the supplied SD card/USB flash drive (USB3.0 slot, the camera should be in Host Mode) into the XCAM4K series camera SD card slot/USB3.0 slot;




Connect the camera to the power adapter and turn it on;


Turn on the monitor and view the video in the XCamView software. Move the mouse to the left, top or bottom of the XCamView UI, different control panel or UI will pop up and users could operate with the mouse at ease.

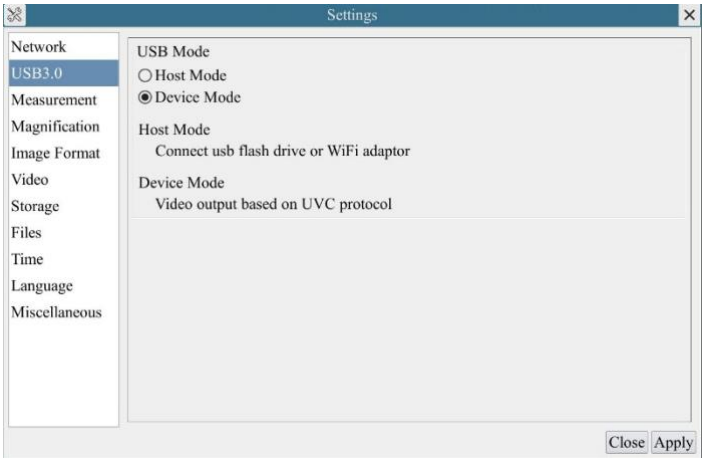



## 6.2 Connecting camera to computers with USB3.0 Port (The camera's USB3.0 port is in Device Mode)

For Windows user (Windows XP (32bit), Windows 7/8/10 (32/64 bit) ), please use ToupView.

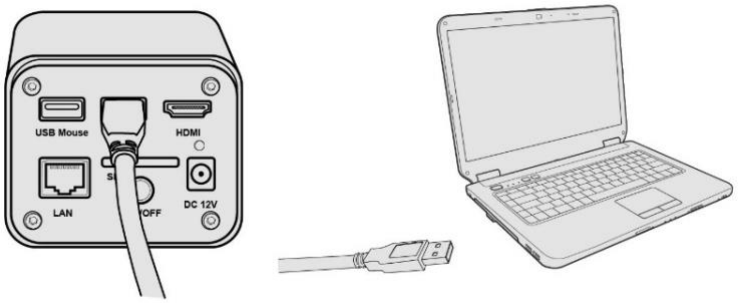
For macOS and Linux user (macOS 10.10 or above or Linux distributions with kernel 2.6.27 or higher), please use ToupLite. The steps to start the camera are listed below:

Start the camera according to Sec. 6.1. After the camera is running, move the mouse to the bottom of the UI and clicking the  button on the Synthesis Camera Control Toolbar at the bottom of the video window, a small window called Settings will pop up as shown below. Go to USB3.0 property page. Select Device Mode under USB Mode edit box(The factory default configuration is Device Mode ). It is important that you select Device Mode, otherwise you cannot connect to computers.




Install the ToupView/ToupLite on your ;

Connect camera to computer with USB cable. Please use "USB3.0" slot, NOT "USB Mouse" slot as shown below.




Open ToupView/ToupLite software. The XCAM4K series camera will be recognized automatically in software.

## 6.3 Camera working in WLAN mode (AP mode, the camera's USB3.0 port is in Host Mode)

Please make sure your PC is WLAN enabled.

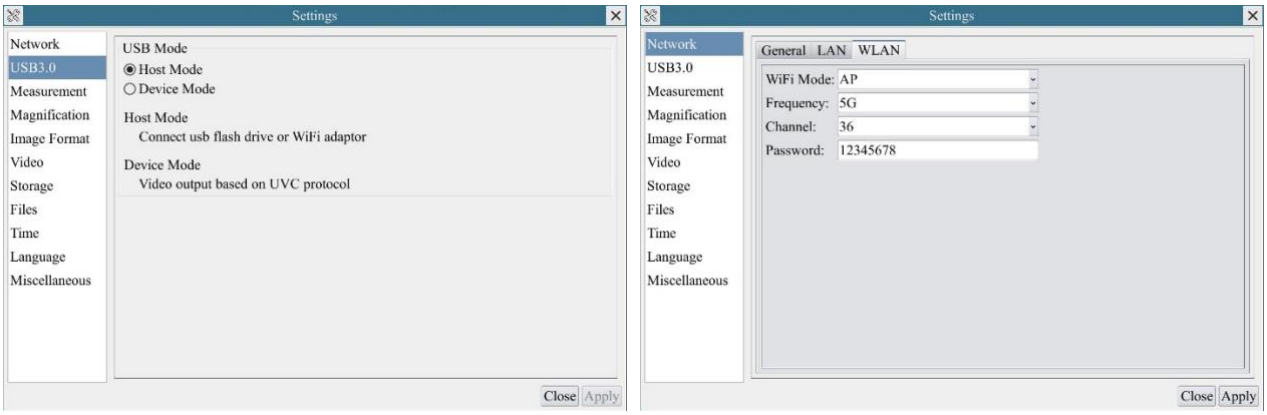
For Windows user (Windows XP (32bit), Windows 7/8/10 (32/64 bit) ), please use ToupView.

For macOS and Linux user (macOS 10.10 or above or Linux distributions with kernel 2.6.27 or higher), please use ToupLite. When connecting the camera with a mobile device, the free ToupView App is required. Just make sure that the mobile device uses iOS 11 or higher/Android 5.1 or higher operating systems.


Figure 6 The PC or Mobile Device Connect to the Camera through WLAN

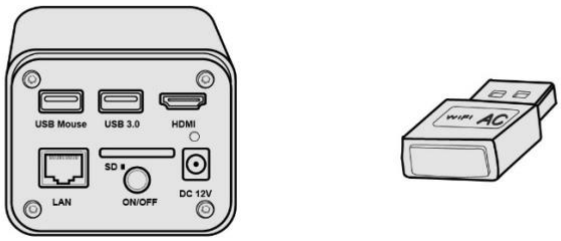
The steps to start the camera are listed below:

Start the camera according to Sec. 6.1. After the camera is running, move the mouse to the bottom of the UI and clicking the  button on the Synthesis Camera Control Toolbar at the bottom of the video window, a small window called Settings will pop up as shown below. Click USB3.0 property page and choose the Host Mode in USB Mode edit box(The factory default configuration is Device mode ). Click Network>WLAN property page and choose the AP in the Wi-Fi Mode edit box(The factory default configuration is AP mode ).

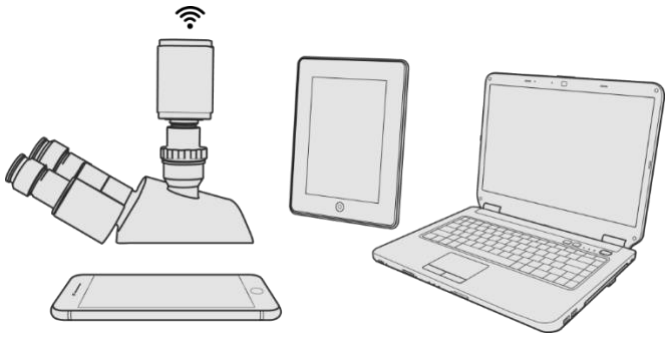



Install the ToupView/ToupLite on your PC or install the ToupView App on the mobile device;

Plug the USB WLAN adapter into the camera's USB3.0 port;




Connect the PC or mobile device to the camera's WLAN AP point; The network name (SSID) and the WLAN password (The default one is 12345678) can be found on the camera's Setting>Network>WLAN page in AP mode



Start the ToupView/ToupLite software or ToupView App and check the configuration. Normally, the activeXCAM4K series cameras will be automatically recognized. The live image of each camera is displayed. For the display, the Camera List tool window is used in the ToupView/ToupLite software, and the Camera Thumbnail is used in the ToupView App.

## 6.4 Connecting camera to the PC with LAN port

This application uses the camera as the network camera. User must configure the IP of the camera and PC manually and ensure their IP addresses are in the same net. The subnet mask and gateway of the camera and PC must be the same.

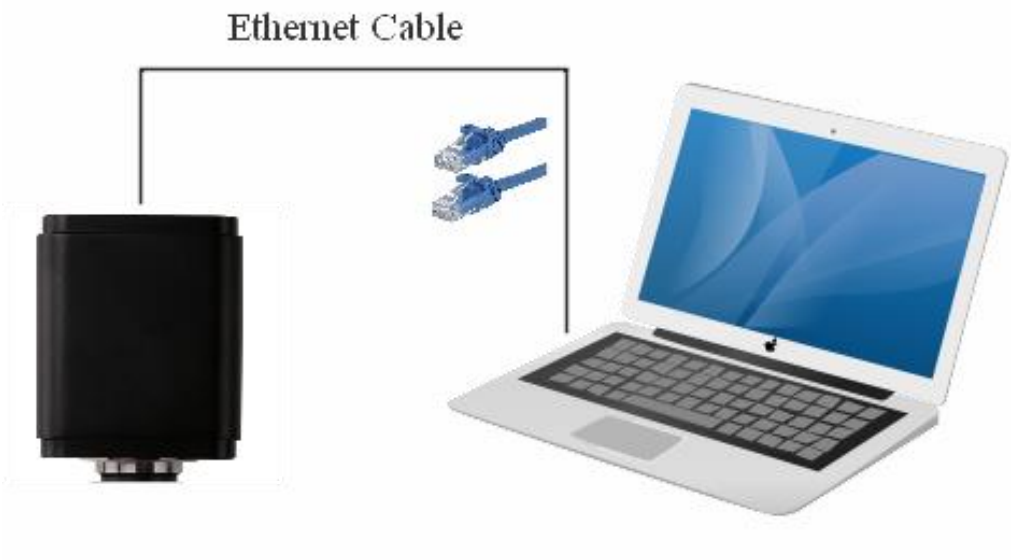
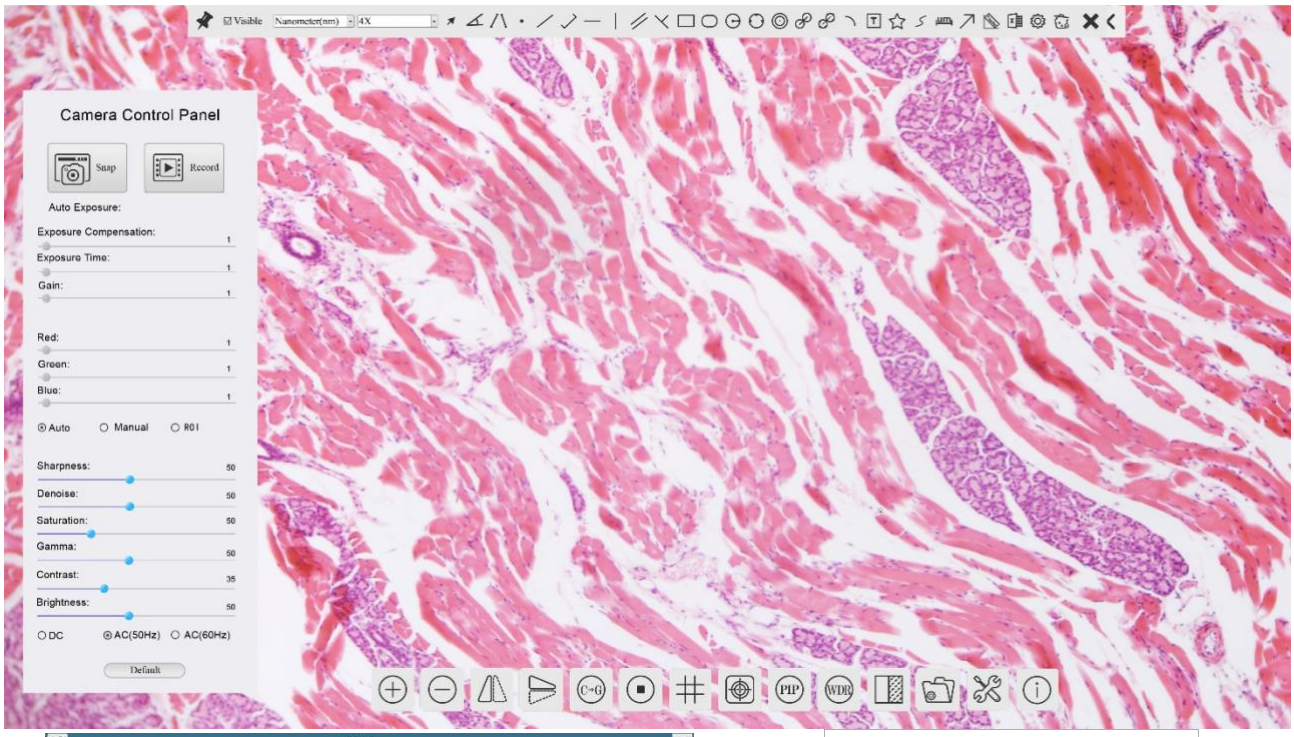



Figure 7 Connecting theXCAM4K Series Camera with Ethernet Cable to the PC

Start the camera according to Sec. 6.1 after the camera is running, clicking the button on the Synthesis Camera Control Toolbar at the bottom of the video window, a small window called Settings will pop up as shown below on the left side, clicking the LAN property page, uncheck the DHCP item. Input the IP Address, Subnet Mask and Default Gateway for the camera. Designate the Internet Protocol Version 4 (TCP/IPv4) Settings page's IP address on the PC with similar configuration as shown below on the right side but with different IP address.



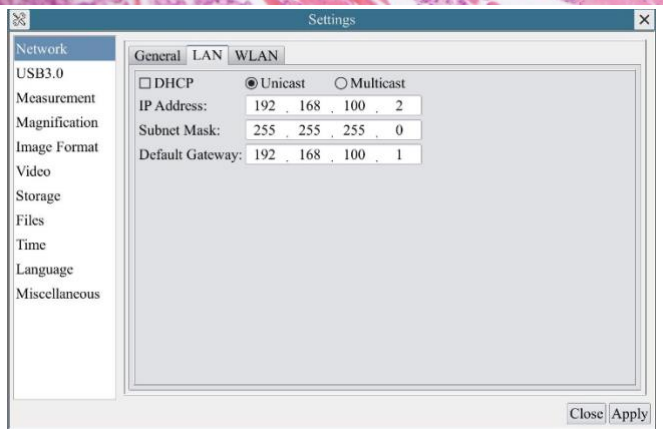




Figure 8 Configure theXCAM4K Series Camera IP

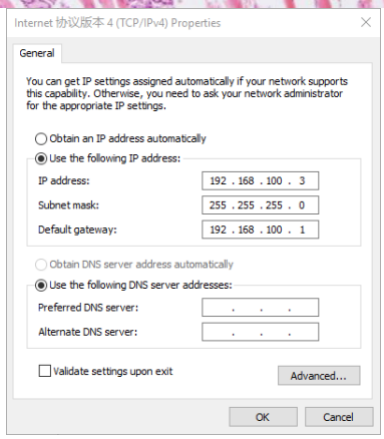
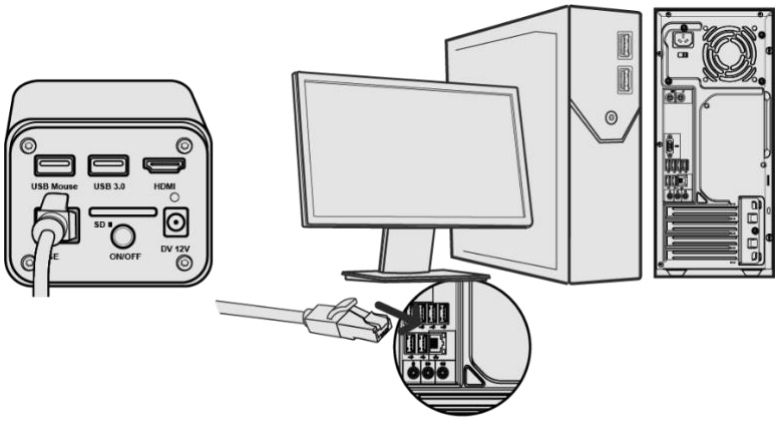


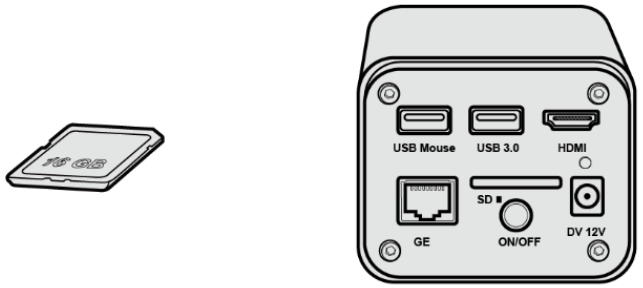

Figure 9 Configure the PC's IP

After the above configurations are finished, user can connect the XCAM4K series camera to the computer through the USB to Ethernet adapter as shown below:

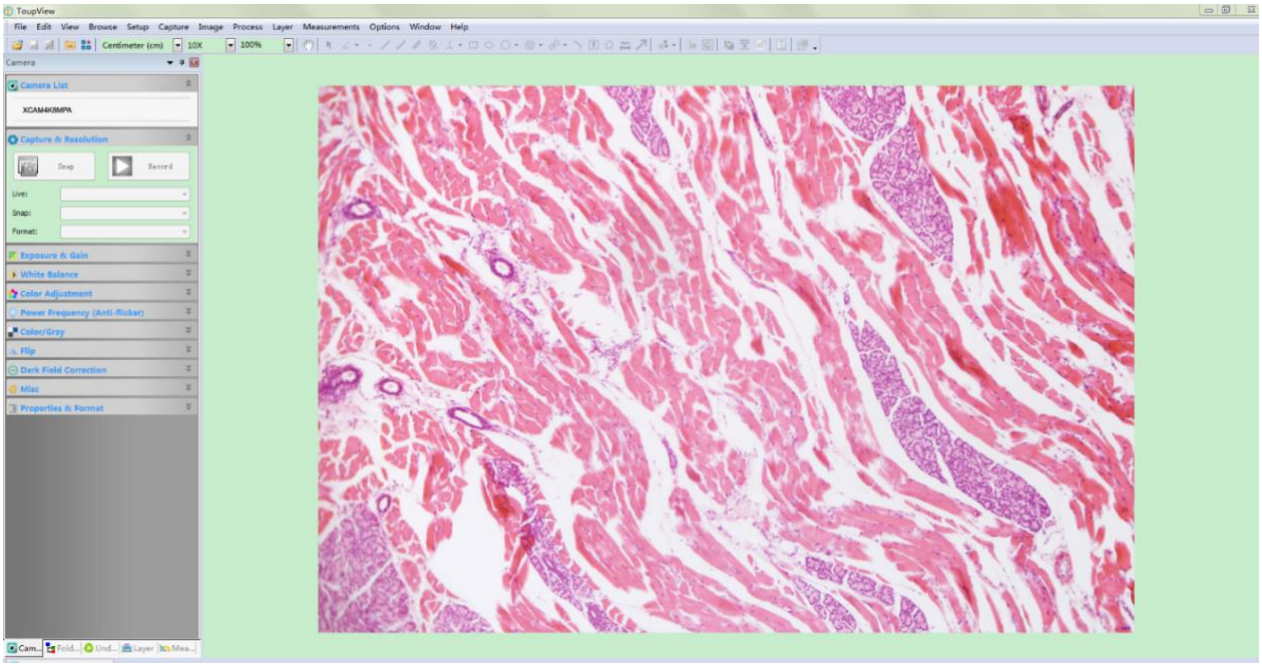
Connect the GE port with the Ethernet cable to the PC's network port;




Insert the supplied SD card/USB flash drive (USB3.0 slot) into the XCAM4K series camera SD card slot/USB3.0 slot;




Install the ToupView/ToupLite on your PC or install the ToupView App on the mobile device; Run the software ToupView/ToupLite, clicking the camera name in the camera list starts the live video.



## 6.5 Connecting multi-cameras to the router through the LAN port/WLAN STA mode for the network application

In LAN/WLAN STA mode, the camera connects to the router by LAN port/WLAN STA mode. If a router with LAN/WLAN capability is used, users could connect the router with Ethernet cable/WLAN to control the camera.

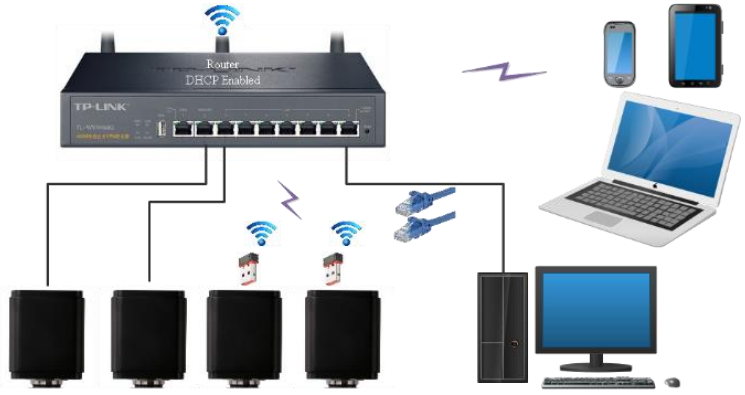
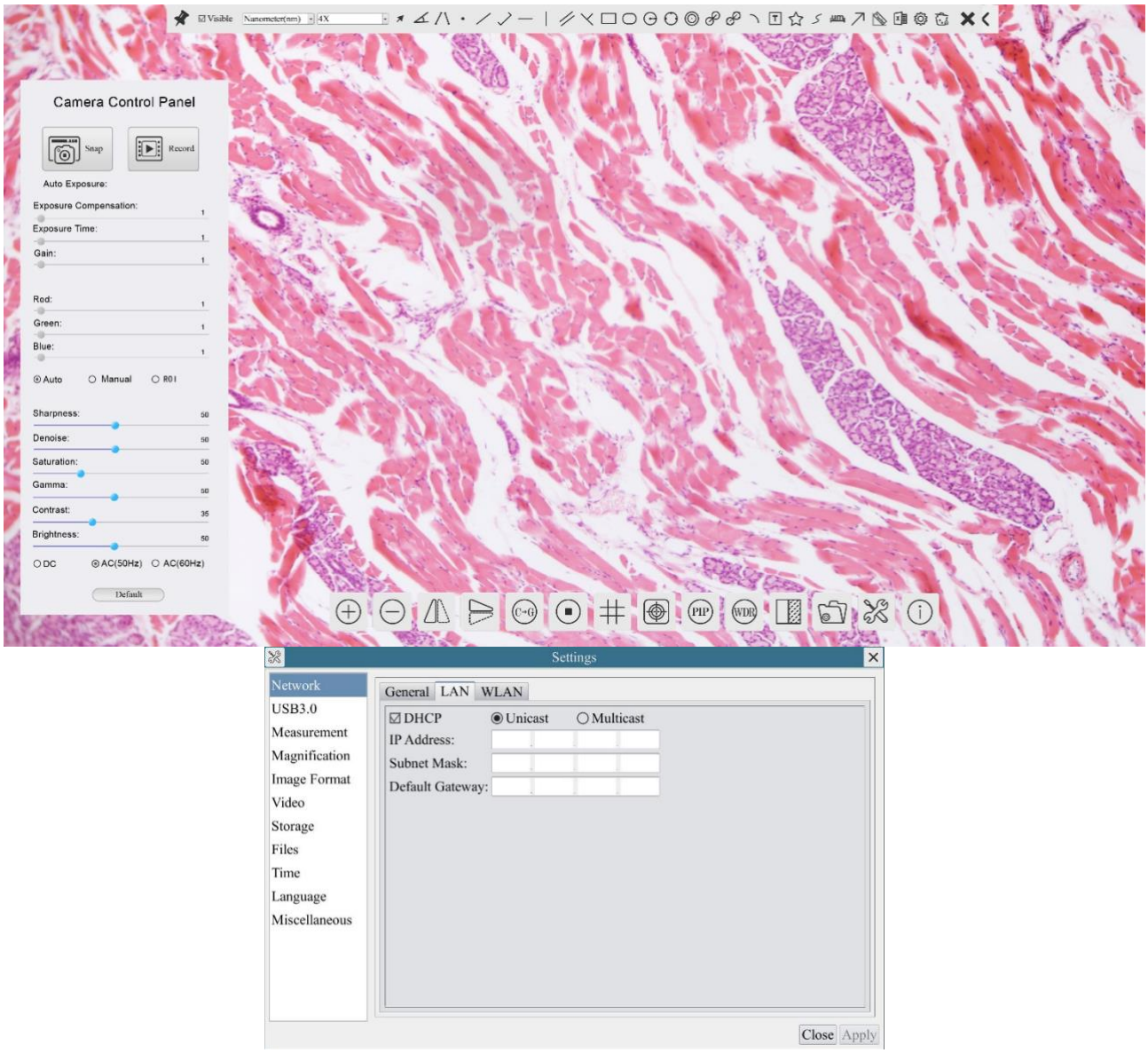


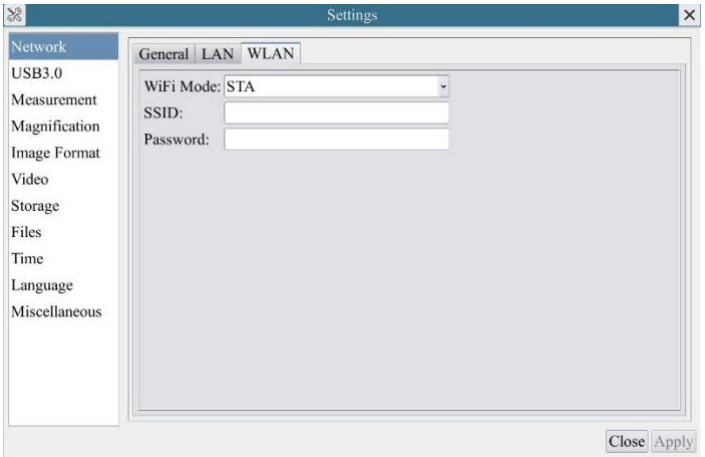

Figure 10 Multi XCAM4K Series Cameras Connecting to the Router through the LAN Port/WLAN Style

The connection and configuration are just the same as in Sec.6.1 or Sec. 6.4. But here, users need to check DHCP. If Multicast is disabled or is not supported, users should only select Unicast. If Multicast is supported by the network, users could select Multicast to achieve a better performance, especially in the case that multi-users connecting to the same camera. In addition, please guarantee that the broadcasting function is enabled in the network.

ActiveXCAM4K series camera is recognized by the ToupView/ToupLite software or the ToupView App and they are displayed as a camera list or thumbnail in the software or app.

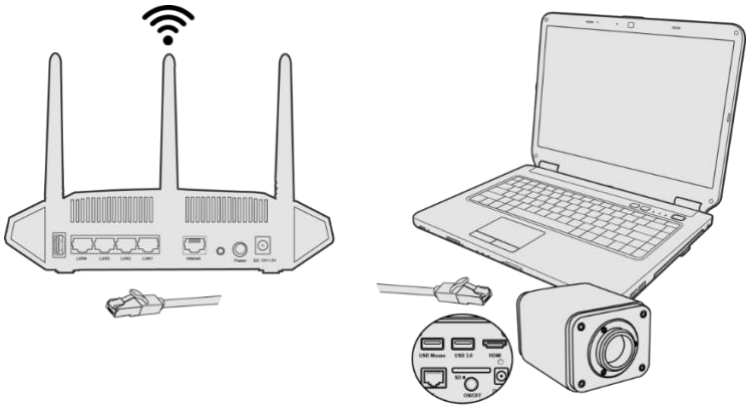



Or start the camera according to Sec. 6.1. After the camera is running, move the mouse to the bottom of the video window and clicking the  button on the Synthesis Camera Control Toolbar at the bottom of the video window, a small window called Settings will pop up as shown below. Clicking Network>WLAN property page and choosing the STA in the Wi-Fi Mode edit box(The factory default configuration is AP mode ). Input the to be connected router's SSID and Password as shown below:

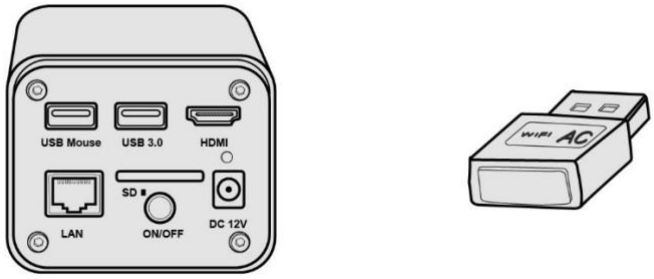



Install the ToupView /ToupLite software on your PC. Alternatively, install the free ToupView App on the mobile device;

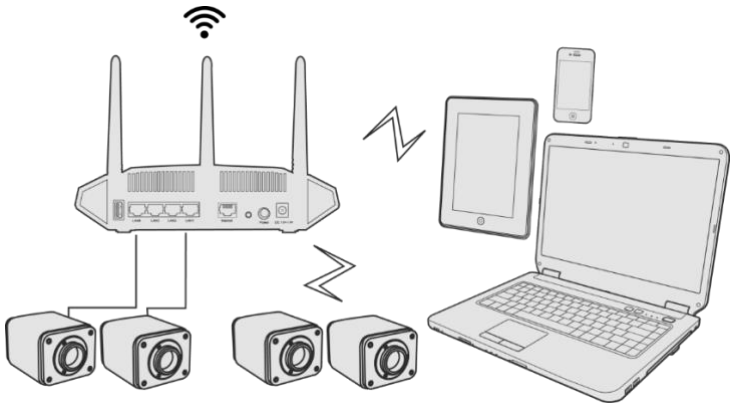
Plug the Ethernet cable into the camera's LAN port and the other end to the PC (for those connected to router with WLAN STA mode );



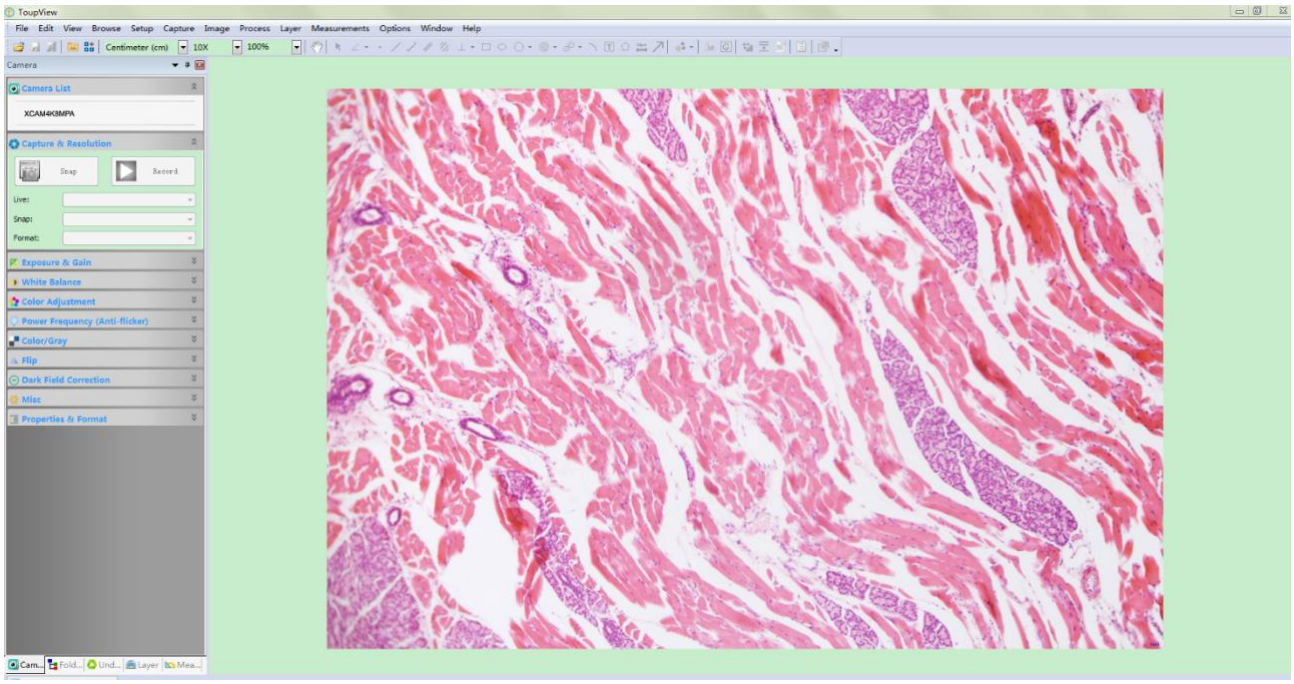
Or plug the USB WLAN adapter into the camera's USB3.0 port(for those connected to router with WLAN STA mode, the USB3.0 port is in Host Mode );




Finally, as shown below, 2 XCAM4K series cameras are connected to the router with LAN cable and 2 XCAM4K series cameras are connected to the same router with WLAN STA mode(The number of the cameras, the connection mode(LAN or WLAN STA)) connected to the router are determined by the router performance)



Make sure that your PC or your mobile device is connected to the LAN or WLAN of the router; Start the ToupView/ToupLite software or ToupView App and check the configuration. Normally, activeXCAM4K series cameras are automatically recognized. The live image of each camera is displayed. For the display, the Camera List tool window is used in the ToupView/ToupLite software, and the Camera Thumbnail is used in the ToupView App; Select theXCAM4K series camera you are interested in. To do so, double click the camera's name in the Camera List tool window if you use the ToupView /ToupLite software; If you use the ToupView App, tap the camera's thumbnail in the Camera List page.




## Note on data security

The data transfer of theXCAM4K series camera in LAN or WLAN is not encrypted. Anyone who is connected to the network and has installed the ToupView software or ToupView App, can see the live image of all activeXCAM4K series cameras. Operate the camera with the XCamView software, if you want to make sure that nobody in the network can see the camera's live image.

## About the routers/switches

It is suggested that routers/switches supporting 802.11ac 5G segment should be selected to achieve better wireless connection experience.

# 7 Brief Introduction of XCAM4K UI and Its Functions

## 7.1 XCamView UI

The XCAM4K UI shown in Figure 11 includes a Camera Control Panel on the left of the video window, a Measurement Toolbar on the top of the video window and a Synthesis Camera Control Toolbar on the bottom of the video window.

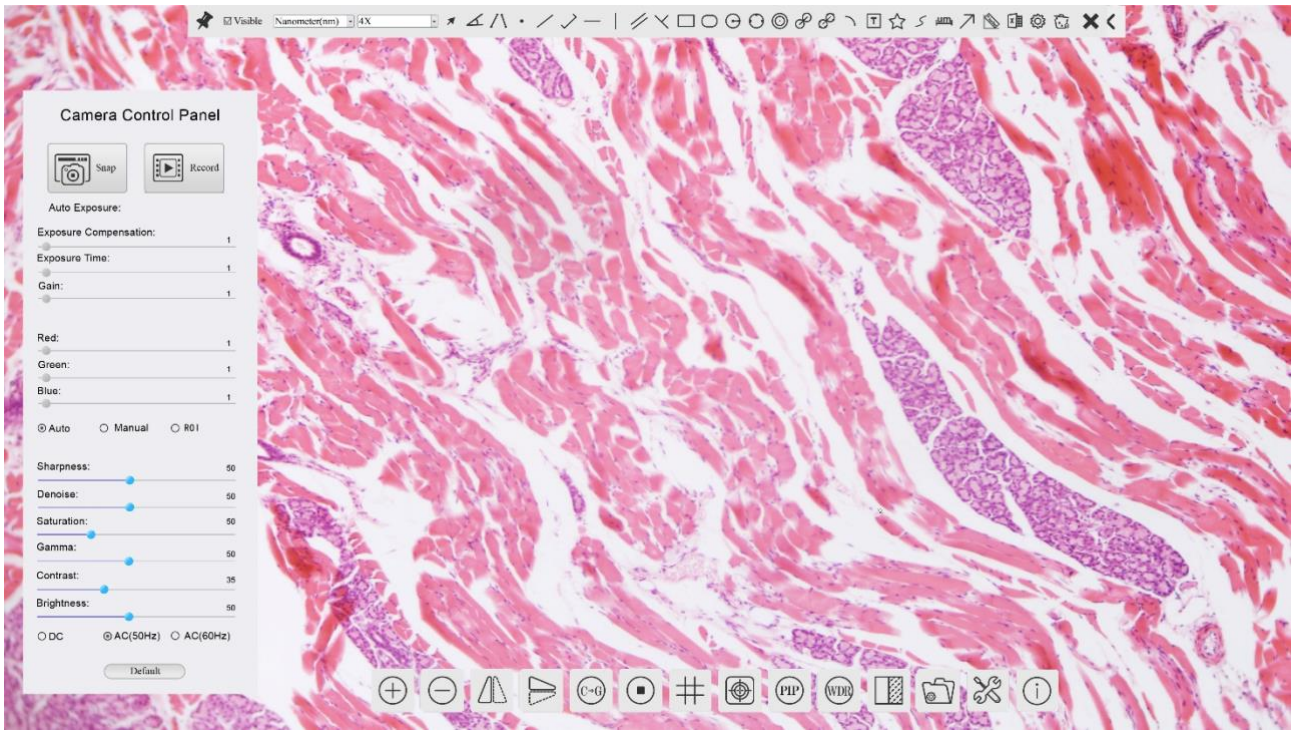
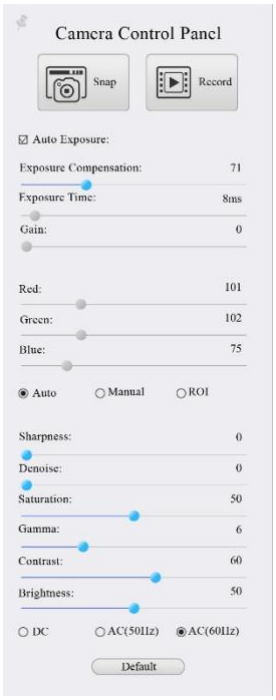



Figure 11 The XCAM4K Series Camera's Control GUI

| | Notes |
|---|---|
| 1 | To show the Camera Control Panel, move your mouse to the left of the video window. See Sec.7.2 for details |
| 2 | Move the mouse cursor to the top of the video window, a Measurement Toolbar will pop up for calibration and measurement operations. When user left-clicks the Float/Fixed button on the Measurement Toolbar, the Measurement Toolbar will be fixed. In this case the Camera Control Panel will not pop up automatically even if users move mouse cursor to left side of the video window. Only when user left-clicks the button on the Measurement Toolbar to exit from measuring procedure will they be able to do other operations on the Camera Control Panel, or the Synthesis Camera Control Toolbar. During the measuring process, when a specific measuring object is selected, an Object Location & Attributes Control Bar will appear for changing location and properties of the selected object. See Sec.7.3 for details. |
| 3 | When users move mouse cursor to the bottom of the video window, the Synthesis Camera Control Toolbar will pop up automatically. See Sec.7.4 for details. |

## 7.2 The camera control panel on the left side of the video window

The Camera Control Panel controls the camera to achieve the best video or image quality according to the specific applications; It will pop up automatically when the mouse cursor is moved to the left side of the video window (in measurement status, the Camera Control Panel will not pop up. The Camera Control Panel will only pop up when the measurement process is finished or terminated while user's cursor on the left edge of the video window). Left-clicking  button to achieve Display/Auto Hide switch of the Camera Control Panel.

| Camera Control Panel | Function | Function Description |
|---|---|---|
|  | Snap | Capture image and save it to the SD card |
| | Record | Record video and save it to the SD card |
| | Auto Exposure | When Auto Exposure is checked, the system will automatically adjust exposure time and gain according to the value of exposure compensation |
| | Exposure Compensation | Available when Auto Exposure is checked. Slide to left or right to adjust Exposure Compensation according to the current video brightness to achieve proper brightness value |
| | Exposure Time | Available when Auto Exposure is unchecked. Slide to left or right to reduce or increase exposure time, adjusting brightness of the video |
| | Gain | Adjust Gain to reduce or increase brightness of video. The Noise will be reduced or increased accordingly |
| | Red | Slide to left or right to decrease or increase the proportion of Red in RGB on video |
| | Green | Slide to left or right to decrease or increase the proportion of Green in RGB on video |
| | Blue | Slide to left or right to decrease or increase the proportion of Blue in RGB on the video |
| | Auto | White Balance adjustment according to the window video every time the button is clicked |
| | Manual | Adjust the Red or Blue item to set the video White Balance |
| | ROI | Check the ROI item will display a red ROI rectangle on the video window, drag it to the interested area will perform the White Balance according to the area video data |
| | Sharpness | Adjust Sharpness level of the video |
| | Denoise | Slide left or right to denoise the video |
| | Saturation | Adjust Saturation level of the video |
| | Gamma | Adjust Gamma level of the video. Slide to the right side to increase Gamma and to the left to decrease Gamma. |
| | Contrast | Adjust Contrast level of the video. Slide to the right side to increase Contrast and to the left to decrease Contrast. |
| | Contrast | Adjust Brightness level of the video. Slide to the right side to increase Brightness and to the left to decrease Brightness. |
| | DC | For DC illumination, there will be no fluctuation in light source so no need for compensating light flickering |
| | AC(50HZ) | Check AC(50HZ) to eliminate flickering caused by 50Hz illumination |
| | AC(60HZ) | Check AC(60HZ) to eliminate flickering caused by 60Hz illumination |
| | Default | Restore all the settings in the Camera Control Panel to default values |

## 7.3 The Measurement Toolbar on top of the video window

The Measurement Toolbar will pop up when moving mouse cursor to any place near the upper edge of the video window. Here is the introduction of the various functions on the Measurement Toolbar:


Figure 12 The Measurement Toolbar on the upper Side of the Video Window

| Icon | Function |
|---|---|
| | Float/ Fix switch of the Measurement Toolbar |
| Visible | Show / Hide Measurement Objects |
| Nanometer(nm) | Select the desired Measurement Unit |
| 4X | Select Magnification for Measurement after Calibration |
| | Object Select |
| | Angle |
| | 4 Points Angle |
| | Point |
| | Arbitrary Line |
| | 3 Points Line |
| | Horizontal Line |
| | Vertical Line |
| | 3 Points Vertical Line |
| | Parallel |
| | Rectangle |
| | Ellipse |
| | Circle |
| | 3 Points Circle |
| | Annulus |
| | Two Circles and its Center Distance |
| | 3 Points Two Circles and its Center Distance |
| | Arc |
| | Text |
| | Polygon |
| | Curve |
| | Scale Bar |
| | Arrow |
| | Execute Calibration to determine the corresponding relation between magnification and resolution, which will establish the corresponding relationship between measurement unit and the sensor pixel size. Calibration needs to be |

| | |
|---|---|
| | done with the help of a micrometer. For detailed steps of carrying out Calibration please refer to ToupView help manual. |
|  | Export the Measurement information to CSV file(*.csv) |
|  | Measurement Setup |
|  | Delete all the measurement objects |
|  | Exit from Measurement mode |
|  | When the measurement ends, left-click on a single measuring object and the Object Location & Properties Control Bar will show up. User could move the object by dragging the object with the mouse. But more accurate movement could be done with the control bar. The icons on the control bar mean Move Left, Move Right, Move Up, Move Down, Color Adjustment and Delete. |

Note:

1) When user left-clicks Display/Hide button  on the Measurement Toolbar, the Measurement Toolbar will be fixed. In this case the Camera Control Panel will not pop up automatically even if moving the mouse cursor to the left edge of the video window. Only when user left-click the  button on the Measurement Toolbar to exit from the measurement mode will they be able to doing other operations on the Camera Control Panel or the Synthesis Camera Control Toolbar.

2) When a specific Measurement Object is selected during the measurement process, the Object Location & Attributes Control Bar  will appear for changing the object location and properties of the selected objects.

## 7.4 Icons and functions of the Synthesis Camera Control Toolbar at the bottom of the video window

| Icon | Function | Icon | Function |
|---|---|---|---|
| | Zoom In the Video Window | | Zoom Out the Video Window |
| | Horizontal Flip | | Vertical Flip |
| | Color/gray | | Video Freeze |
| | Display Cross Line | | Image Overlay |
| | Picture in Picture | | Wide Dynamic Range |
| | Compare Image with the Current Video | | Browse images and videos in the SD Card |
| | Settings | | Check the Version of XCamView |

The  Setting function is relatively more complicated than the other functions. Here is more information about it:

### 7.4.1 Setting>Network>General

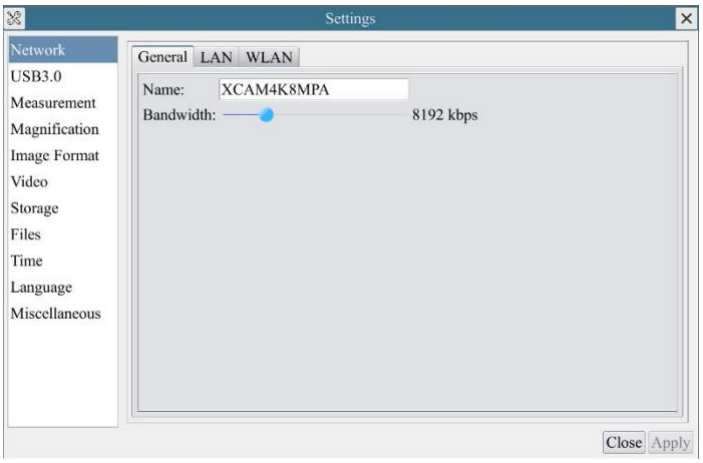



Figure 13 Comprehensive Network Settings Page

| | |
|---|---|
| Name | The current camera name recognized as the network name |
| Bandwidth | The encoding bandwidth for the video transmission stream. The larger the bandwidth, the higher quality the video. |

### 7.4.2 Setting>Network>LAN

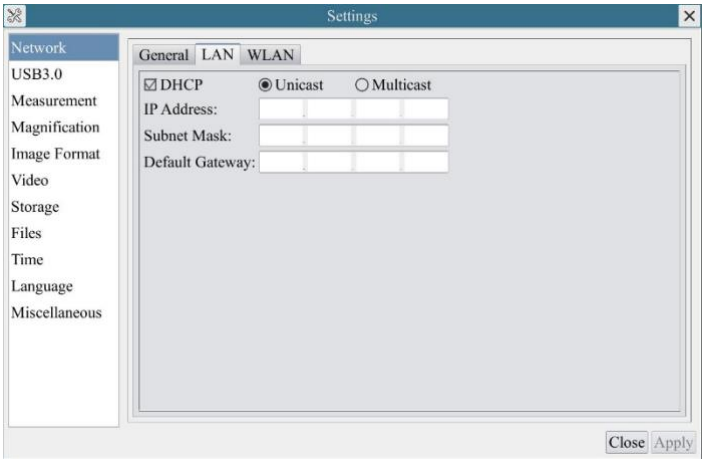



Figure 14 Comprehensive Network LAN Settings Page

| | |
|---|---|
| DHCP | Dynamic host control protocol allows DHCP server to automatically assign IP information to the camera. Only in Sec 6.4 LAN networking this item should be checked, so that cameras can automatically get IP information from routers/switches to facilitate networking operation; |

| | |
|---|---|
| Unicast/Multicast | By default, unicast function is used. Only in Sec 6.4 networking environment, when the router/switch has multicast function, camera can switch to multicast mode, which can save the network bandwidth consumed by the camera and facilitate the connection of more cameras in the same network; |
| IP Address | Every machine on a network has a unique identifier. Just as you would address a letter to send in the mail, computers use the unique identifier to send data to specific computers on a network. Most networks today, including all computers on the Internet, use the TCP/IP protocol as the standard for how to communicate on the network. In the TCP/IP protocol, the unique identifier for a computer is called IP address.<br>There are two standards for IP address: IP Version 4 (IPv4) and IP Version 6 (IPv6). All computers with IP addresses have an IPv4 address, and many are starting to use the new IPv6 address system as well.<br>Users must manually configure their IP addresses on the camera side and computer side. The IP addresses set on the camera side and computer side should be in the same network segment. The specific settings are shown<br>Figure 15. It's usually a private address. Private address is a non-registered address used exclusively within an organization. The internal private addresses retained are listed below: Class A 10.0.0-10.255.255; Class B 172.16.0-172.31.255.255; Class C 192.168.0-192.168.255.255. The suggested IP address is Class C. |
| Subnet Mask | Subnet Mask is used to distinguish network domain from host domain in 32-bit IP address; |
| Default Gateway | A default gateway allows computers on a network to communicate with computers on another network. Without it, the network is isolated from the outside. Basically, computers send data that is bound for other networks (one that does not belong to its local IP range) through the default gateway;<br>Network administrators configure the computer's routing capability with an IP range's starting address as the default gateway and point all clients to that IP address. |

Uncheck the DHCP and select the Unicast item, user still need to set the IP address, Subnet mask and Default Gateway as shown below:

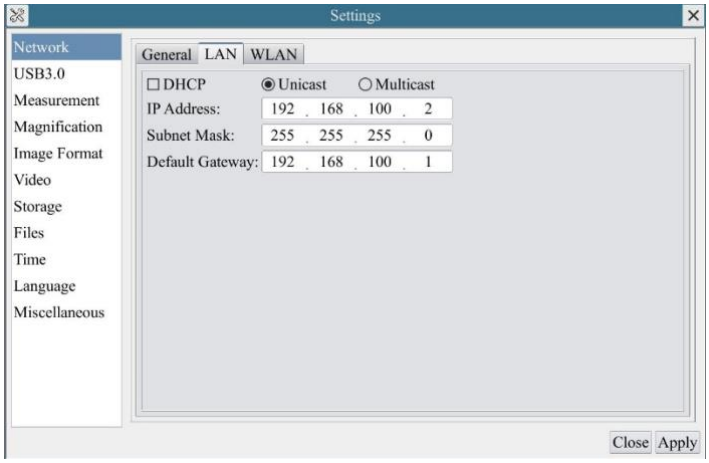



Figure 15 Manual DHCP and Unicast

Uncheck the DHCP and select the Multicast item, user still need to set the IP address, Subnet Mask and Default Gateway as shown below:

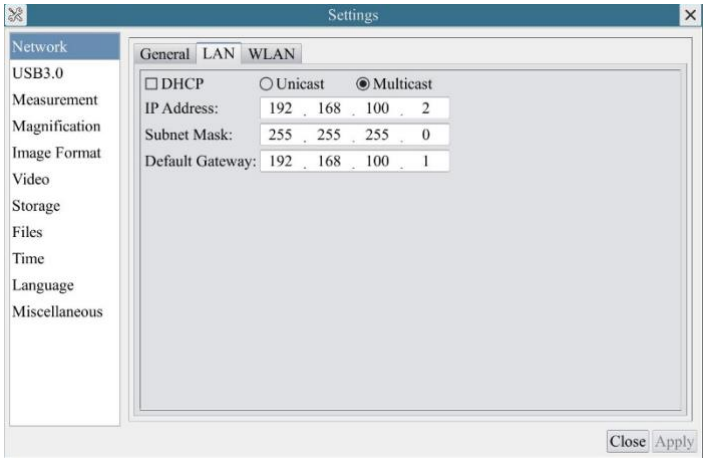



Figure 16 Manual DHCP and Multicast

### 7.4.3 Setting>Network>WLAN

| | |
|---|---|
| Wi-Fi Mode | AP/STA mode to select; |
| Channel/SSID | Channel for the AP mode and SSID for the STA mode. Here, the SSID is the router's SSID; |
| Password | Camera Password for the AP mode. Router Password for the STA mode |

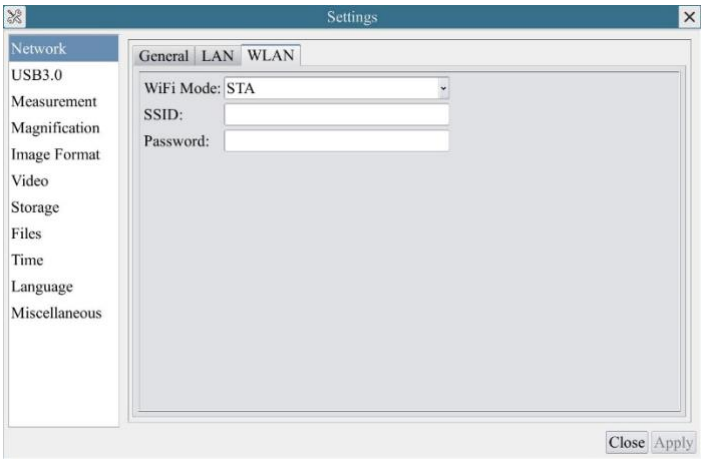



Figure 17 WLAN Setup

### 7.4.4 Setting>USB3.0

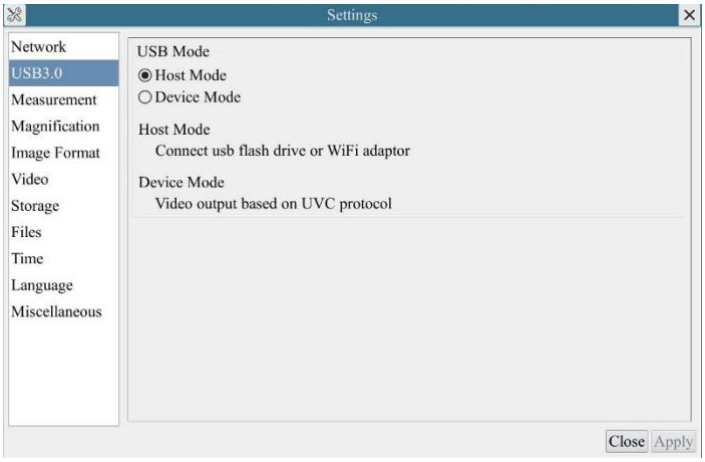



Figure 18 USB Mode Choice

| | |
|---|---|
| Host Mode | Connect USB flash drive or Wi-Fi adaptor |
| Device Mode | Video output through connection to PC with USB cable |

### 7.4.5 Setting>Measurement

This page is used for the define of the Measurement Object properties.

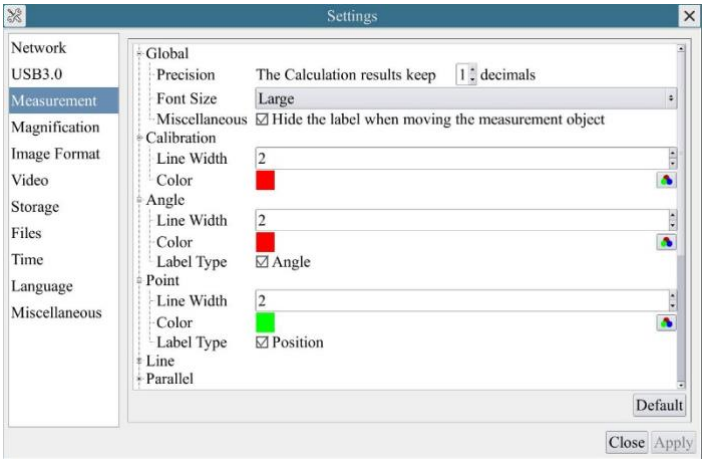



Figure 19 The Measurement Setup

| | | |
|---|---|---|
| Global | Used for setting digits behind the decimal point for measurement results; | |
| Calibration | Line Width | Used for defining width of the lines for calibration; |
| | Color | Used for defining color of the lines for calibration; |
| | EndPoint | Type: Used for defining shape of the endpoints of lines for calibration: Null means no EndPoint, rectangle means rectangle type of endpoints. It makes alignment more easily; |
| Point, Angle, Line, Horizontal Line, Vertical Line, Rectangle, Circle, Ellipse, Annulus, Two Circles, Polygon, Curve | | |
| | Left-click the along with the Measurement command mentioned above will unfold the corresponding attribute settings to set the individual property of the Measurement Objects. | |

### 7.4.6 Setting>Magnification

This page's items are formed by the Measurement Toolbar's Calibration command.

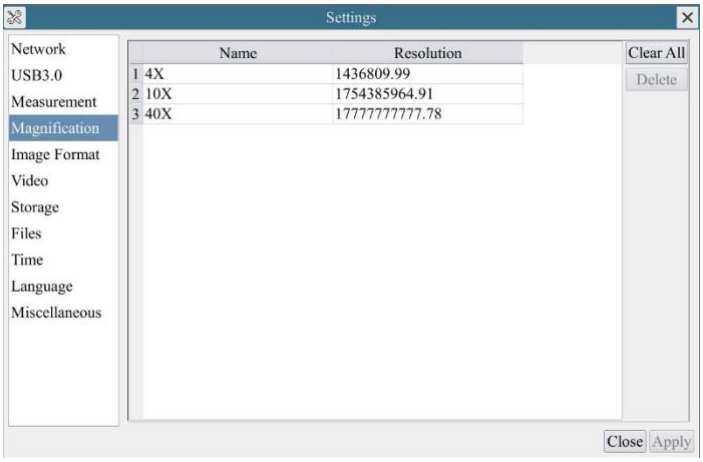



Figure 20 Comprehensive Magnification Calibration Settings Page

| | |
|---|---|
| Name | Names such as 10X, 40X, 100X are based on magnification of the microscopes. For continuous zoom microscopes, ensure that the selected magnification coincides with the scale alignment line on the microscope zoom knob; Users could also edit the name of the magnification with other information, for example, microscope mode, users name, etc. |
| Resolution | Pixels per meter. Image device like microscopes have high Resolution value; |
| Clear All | Click the Clear All button will clear the calibrated magnifications; |
| Delete | Click Delete to delete the selected magnification; |

### 7.4.7 Settings>Image Format

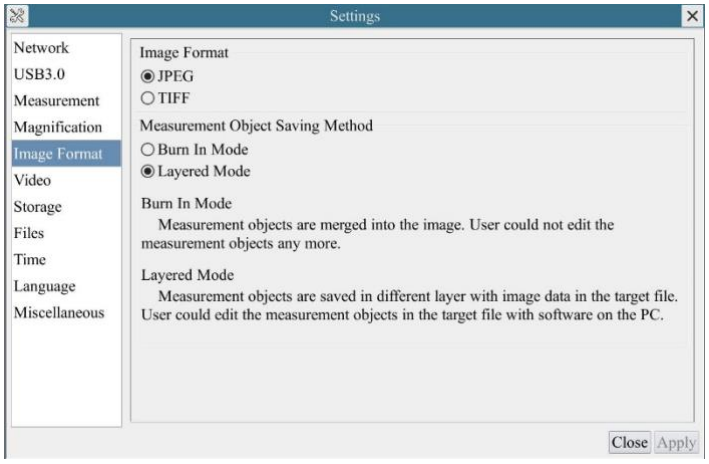



Figure 21 Comprehensive Image Format Settings Page

| | |
|---|---|
| Image Format | JPEG: The extension of JPEG file can get very high compression rate and display very rich and vivid images by removing redundant images and color data. In other words, it can get better image quality with the least disk space. If measurement objects are available, the measurement objects will be burned into the image and the measurement cannot be edited.<br>TIFF: TIFF is a flexible bitmap format mainly used to store images including photos and artistic images. |
| Measurement Object Saving Method | Burn in Mode: The measurement objects are merged into the current image. User could not edit the measurement objects any more. This mode is not reversable.<br>Layered Mode: The measurement objects are saved in different layer with current image data in the target file. User could edit the measurement objects in the target file with some software on the PC. This mode is reversable. |

### 7.4.8 Setting>Video

| | |
|---|---|
| Video Playback | Fast Forward/Reverse internal in second unite for Video Playback |
| Video Encode | Select the Video Encode format. Can be H264 or H265. Compared with H264, H265 has a higher H265 compression ratio which is primarily used to further reduce the design flow rate, in order to lower the cost of storage and transmission |

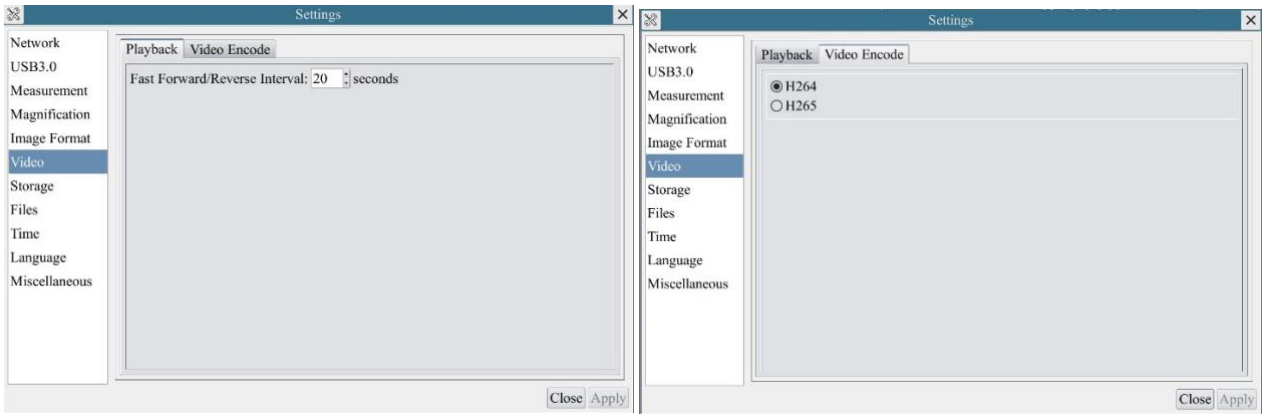



Figure 22 Comprehensive Setting of Video Playback page

### 7.4.9 Setting>Storage

| | |
|---|---|
| Preferred Storage Page | SD Card: Select it to save the video and image to the SD Card.<br>USB Flash Drive: Select it to save the video and image to the SD Card. |
| File System Format of the Storage Device | List the file system format of the current storage device<br>FAT32: The file system of SD Card is FAT32. The maximum video file size of single file in FAT32 file system is 4G Bytes;<br>NTFS: The file system of SD Card is NTFS. The maximum video file size of single file is 2T Bytes.<br>Use PC to format the SD Cards and switch between FAT32 and NTFS.<br>Unknown Status: SD Card not detected or the file system is not identified; |

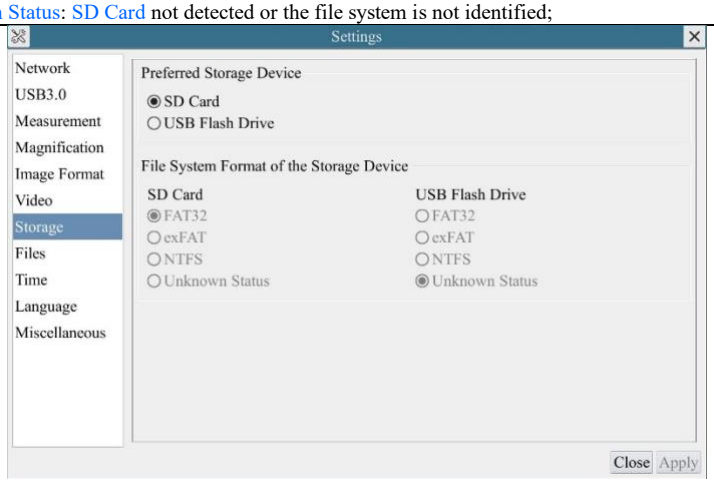



Figure 23 Comprehensive Setting of SD Card Setting Page

### 7.4.10 Setting>Files

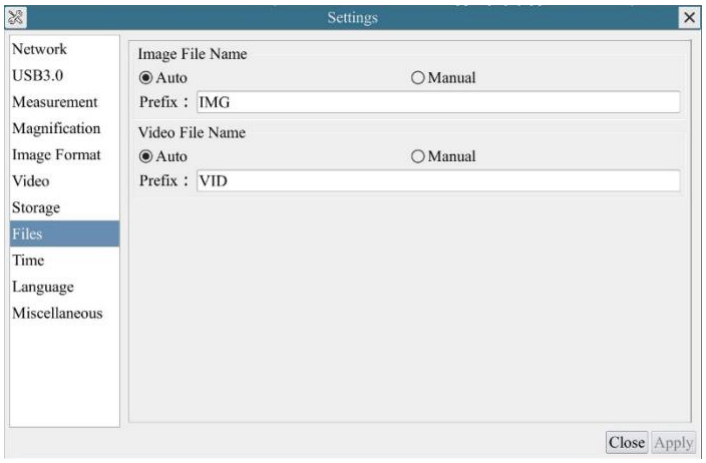



Figure 24 Comprehensive Setting of Files Name

| | |
|---|---|
| Image or Video File Name Paradigm | Provide Auto or Manual naming paradigm for Image or Video file; |
| Auto | With specified name as the Prefix and XCamView will add digital after the Prefix for the Image or Video file; |
| Manual | A file dialog will pop up to enter the Image or Video file name for the captured Image or Video. |

### 7.4.11 Setting>Time

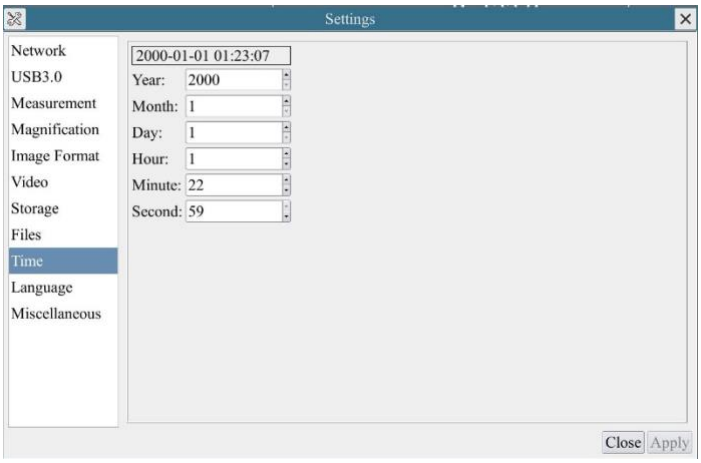



Figure 25 Time Setting

| | |
|---|---|
| Time | User can set Year, Month, Day, Hour, Minute and Second ital.in this page. |

### 7.4.12 Setting>Language

| | |
|---|---|
| English | Set language of the whole software into English; |
| Simplified Chinese | Set language of the whole software into Simplified Chinese; |
| Traditional Chinese | Set language of the whole software into Traditional Chinese; |
| Korean: | Set language of the whole software into Korean; |
| Thailand | Set language of the whole software into Thailand; |
| French | Set language of the whole software into French |
| German | Set language of the whole software into German |
| Japanese | Set language of the whole software into Japanese |
| Italian | Set language of the whole software into Italian |


Figure 26 XCAM4K Comprehensive Setting of Language Selection Setting Page

### 7.4.13 Setting>Miscellaneous

| | |
|---|---|
| Clarity Factor Show | Check this will show the Clarity Factor on the video window screen to tell if the camera is focused correctly or not; |
| ROI Color | Choosing the ROI rectangle line color |
| Cursor | Choosing the Cursor size according to the screen resolution or personal preference |
| Camera Parameters Import | Import the Camera Parameters from the SD Card or USB flash drive to use the previously exported Camera Parameters |
| Camera Parameters Export | Export the Camera Parameters to the SD Card or USB flash drive to use the previously exported Camera Parameters |
| Reset to factory defaults | Restore camera parameters to its factory status; |

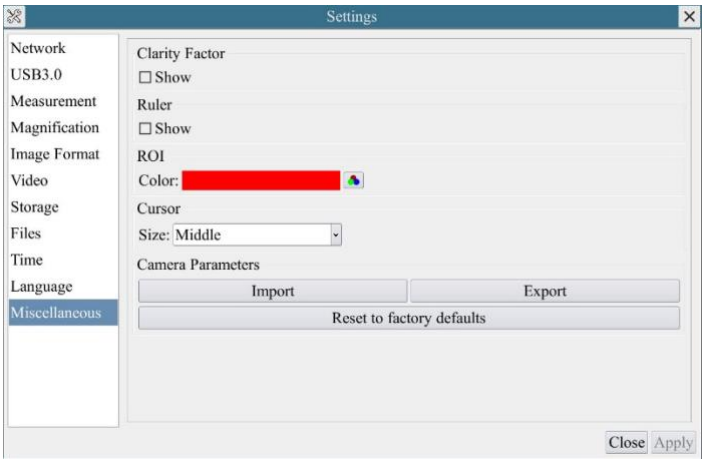



Figure 27 Comprehensive Miscellaneous Settings Page

# 8 Sample Photos Captured with XCAM4K Series Camera

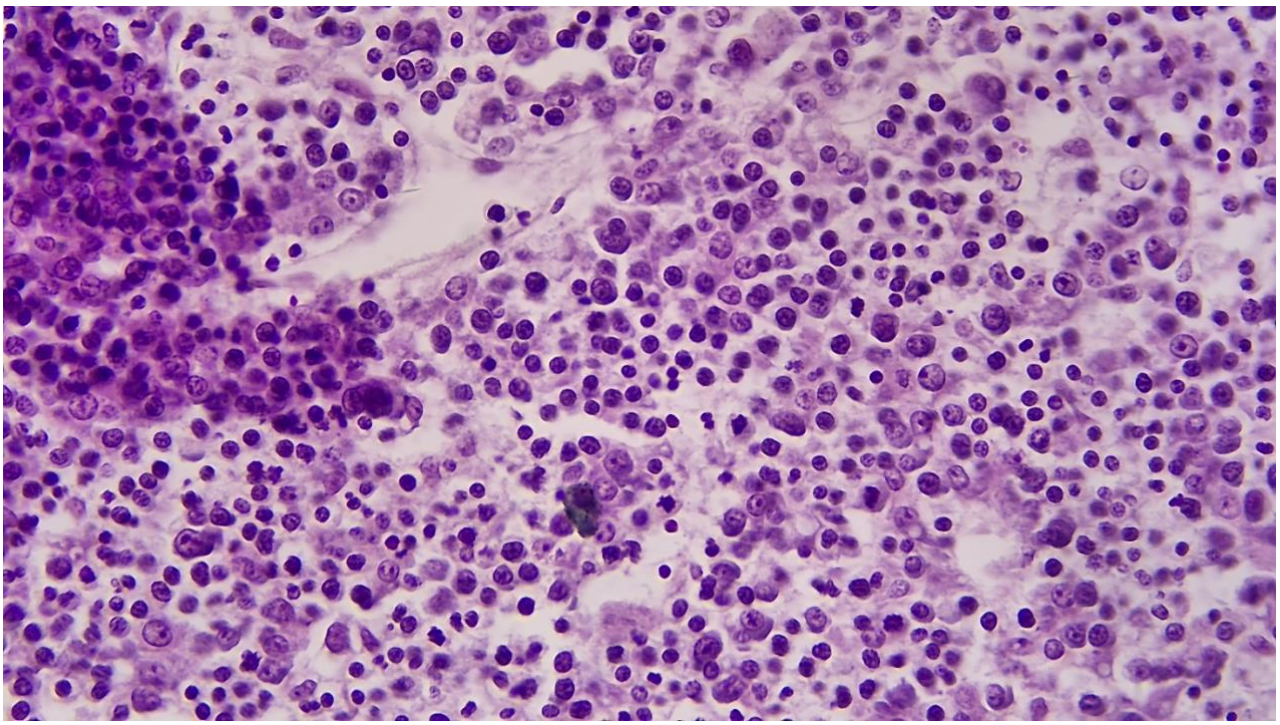


Figure 28 Rabbit Embryo captured XCAM4K8MPA

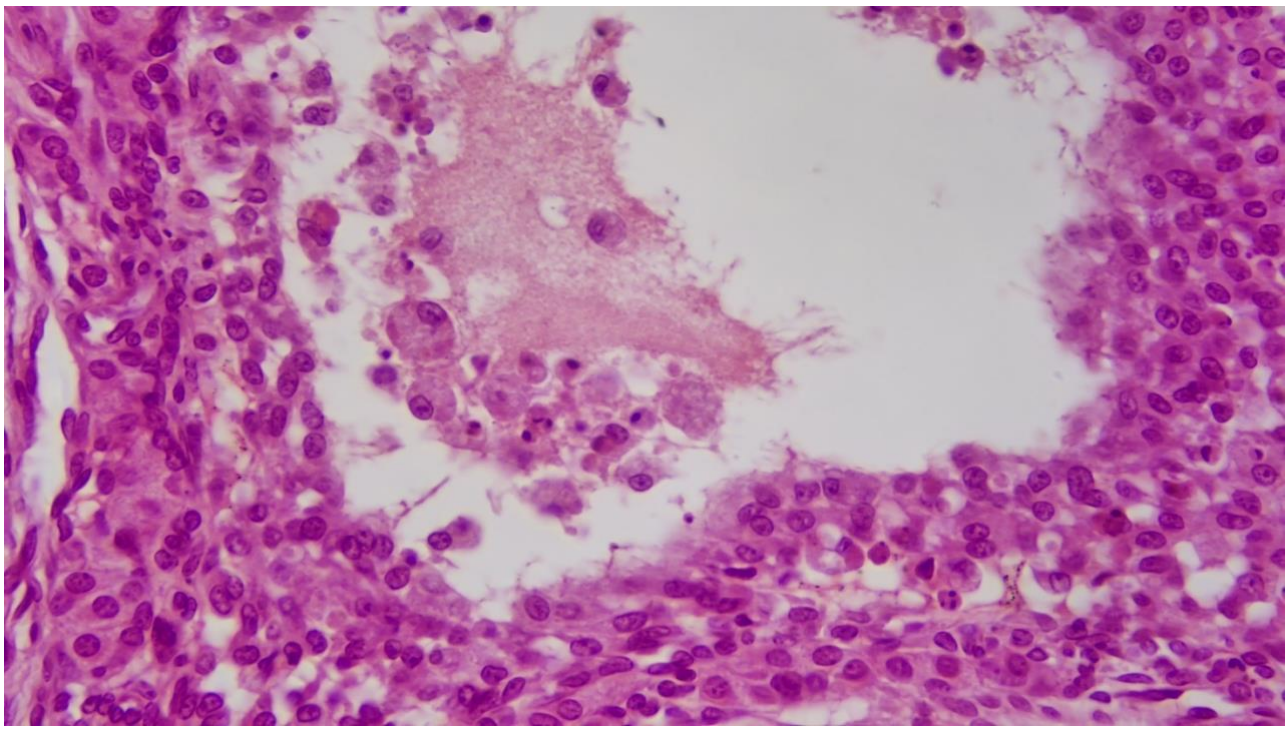


Figure 29 Ovary Captured with XCAM4K8MPA

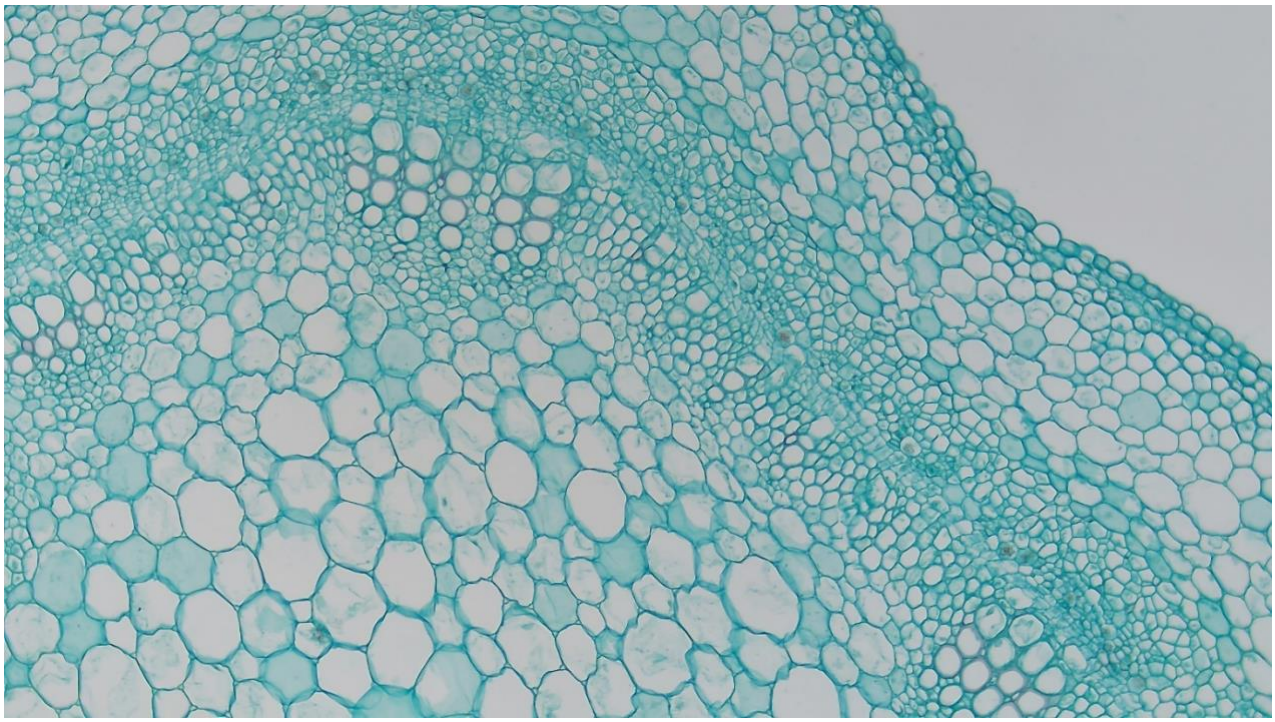


Figure 30 Cotton Stem captured with XCAM4K8MPA

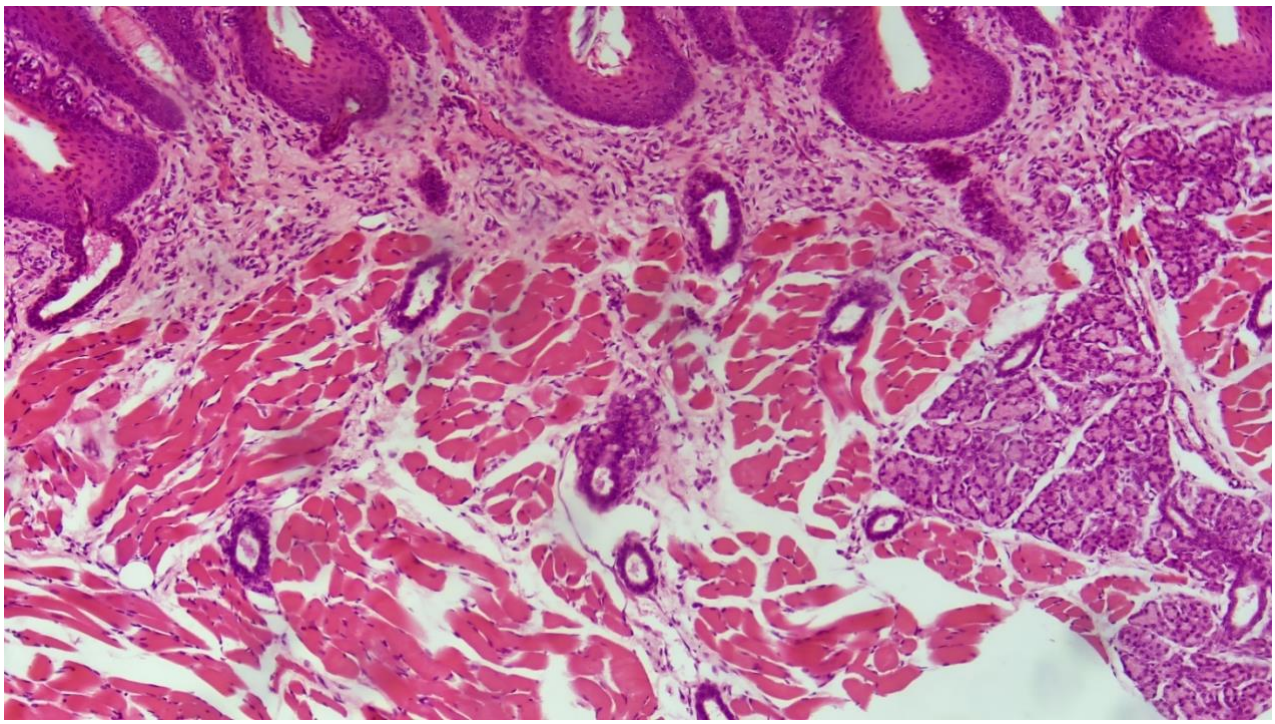


Figure 31Taste Bad Captured with XCAM4K8MPA

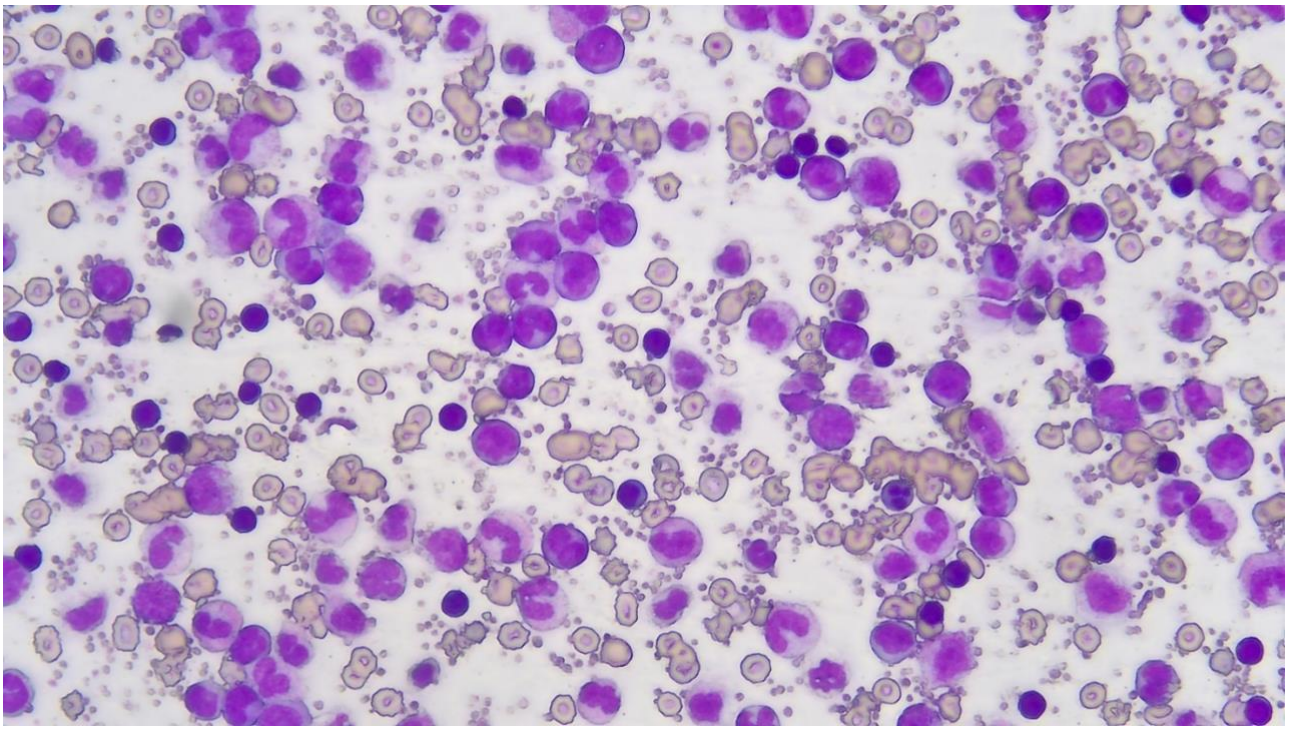


Figure 32 MK54-40

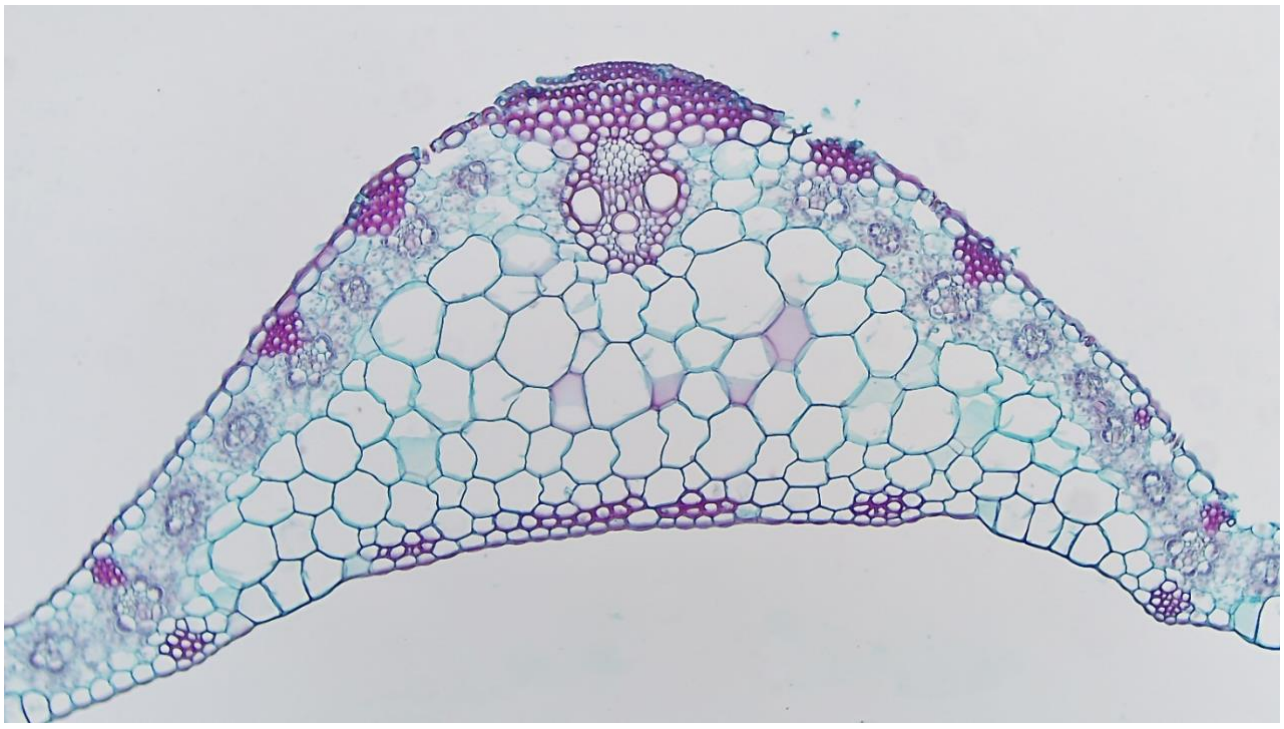


Figure 33 Corn Leaf

## 9 Contacting Customer Service

Please contact your local distributor if you have any questions about the product.