The HDMI 4K Series Camera manual

9991002015 - manual Camera 76604K8MPA

Content

1 The Application of the HDMI 4K Series Camera

Figure 1-1 The HDMI 4K Camera

The HDMI 4K series camera is intended to be used for the acquisition of digital images from the stereo microscope, biological microscope or online interactive teaching. The basic characteristic is listed as below:

- Sony Exmor back illuminated CMOS sensor
- 4K HDMI/NETWORK/USB multiple video outputs
- 4K/1080P auto switching according to the display resolution
- SD card/USB flash disk for the captured image and video storage
- Embedded Onboard BMS for the control of the camera
- With strong ISP and other related processing functions
- BMS_pix3 software for PC
- iOS/Android applications for smart phones or tablets

2 Available Ports on the Back of the Camera Body

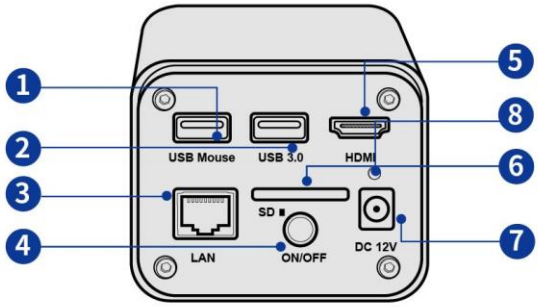


Figure 2-1 Available Ports on the Back Panel of the Camera Body

Interface	Function Description
USB Mouse	Connect USB mouse for easy operation with embedded Onboard BMS software.
USB3.0	1. Connect USB flash drive to save pictures and videos. 2. Connect 5G WLAN modules to transfer video wirelessly in real time(AP/STA)； 3. Connect computer with USB connection to transfer video in real time (Will be supported later)；
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.
DC12V	Power adapter connection (12V/1A).
ON/OFF	Power switch.
LED	LED status indicator.

3 HDMI 4K Camera Datasheet

Order Code	Sensor & Size(mm)	Pixel (μm)	G Sensitivity Dark Signal	FPS/Resolution	Binning	Exposure (ms)
76604K8MPA	Sony IMX334(C) 1/1.8"(7.68x4.32)	2.0x2.0	505mv with 1/30s 0.1mv with 1/30s	60@3840*2160(HDMI) 30@3840*2160(NETWORK) 30@3840*2160(USB)	1x1	0.04~2000

4 HDMI 4K Camera Function Description

4.1 Video Output

Video Output Interface	Function Description
HDMI Interface	1. Comply with HDMI2.0 standard; 2. 60fps@4K or 60fps@1080P(XCAM4K8MPA); 30fps@4K or 60fps@1080P(XCAM4K16MPA);
LAN Interface	1. 30ps@4K resolution; 2. H264 encoded video; 3. Bandwidth adjustment in real time; 4. DHCP configuration or manual configuration; 5. unicast/multicast configuration;
WLAN Interface	Connecting 5G WLAN adapter(USB3.0 interface) in AP/STA mode;
USB3.0 Interface	1. Connecting USB3.0 port of PC for video transfer ; 2. MJPEG format video;

4.2 Image Capture and Video Saving in SD card

Function Name	Function Description
Video Saving	1. Video format：8M(3840*2160) H264 encoded MP4 file； 2. Video saving frame rate：50~60fps(XCAM4K8MPA) (related with SD card and video resolution)
Image Capture	8M (3840*2160, XCAM4K8MPA) JPEG/TIFF image in SD card or USB flash disk
Measurement Saving	1. Measurement information saved in different layer with image content。 2. Measurement information is saved together with image content in burn in mode.

4.3 ISP Function

Function Name	Function Description
Exposure / Gain	Automatic / Manual Exposure
White Balance	Manual / Automatic / ROI Mode
Sharpening	Supported
3D Denoise	Supported
Saturation Adjustment	Supported
Contrast Adjustment	Supported
Brightness Adjustment	Supported
Gamma Adjustment	Supported
50HZ/60HZ Anti-flicker Function	Supported

4.4 Image Operation Function

Function Name	Function Description
Zoom In/Zoom Out	Up to 10X
Mirror/Flip	Supported
Freeze	Supported
Cross Line	Supported
PIP (Picture in Picture)	Supported
Compare	Comparison between real time video and images in SD card or USB flash drive
Embedded Files Browser	Supported
Video Playback	Supported
Measurement Function	Supported

4.5 Other Functions

Function Name	Function Description
Embedded RTC(Optional)	To support accurate time on board
Restore Factory Settings	Supported

Multiple Language Support	English / Simplified Chinese / Traditional Chinese / Korean / Thai / French / German / Japanese / Italian

5 HDMI 4K Camera Packing Information

Figure 5-1 HDMI 4K Camera Packing Information

Standard Packing List			
A	Gift box : L:25.5cm W:17.0cm H:9.0cm (1pcs, 1.43Kg/ box)		
B	BMS 4K Camera		
C	Power Adapter: Input: AC 100~240V 50Hz/60Hz, Output: DC 12V 1A European standard:Model:GS12E12-P1I 12W/12V/1A; TUV(GS)/CB/CE/ROHS EMI Standard:EN55022,EN61204-3, EN61000-3-2,-3, FCC Part 152 class B, BSMI CNS14338 EMS Standard:EN61000-4-2,3,4,5,6,8,11,EN61204-3,Class A Light Industry Standard		
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)		
H	SD Card(16G or above; Speed: class 10) or USB flash disk		
I	USB WLAN adapter		
J	Ethernet cable		
K			
L	Fixed lens adapter	C-Mount to Dia.23.2mm Eyepiece Tube (Please choose 1 of them for your microscope)	FMA050
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		106013/TS-M7(X=0.01mm/100Div., 0.10mm/100Div.)

6 Software and App

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

http://extern.bmsmicroscopes.com/BMS_pix3/BMS_pix3.rar

7 HDMI 4K Camera Application Configurations

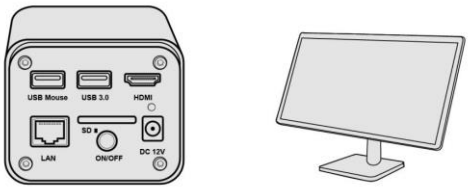
You can use the HDMI 4K series camera in 5 different ways. Each application requires different hardware environment.

7.1 Camera working standalone with built-in Onboard BMS software

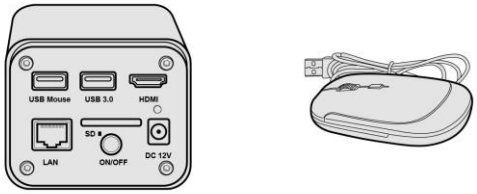
For this application, apart from the microscope, you only need an HDMI displayer, the supplied USB mouse and the camera embedded Onboard BMS software. A computer or a network connection is not required to operate the camera in this application. The steps to start the camera are listed as below:

Figure 7-1HDMI 4K Camera with the HDMI Displayer

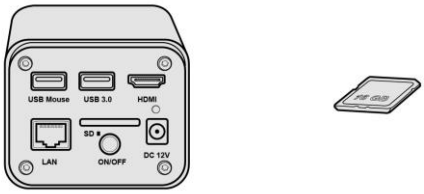
- Connect the camera to a HDMI displayer using the HDMI cable;



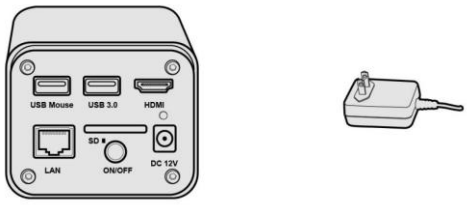
- Insert the supplied USB mouse to the camera’s USB port;



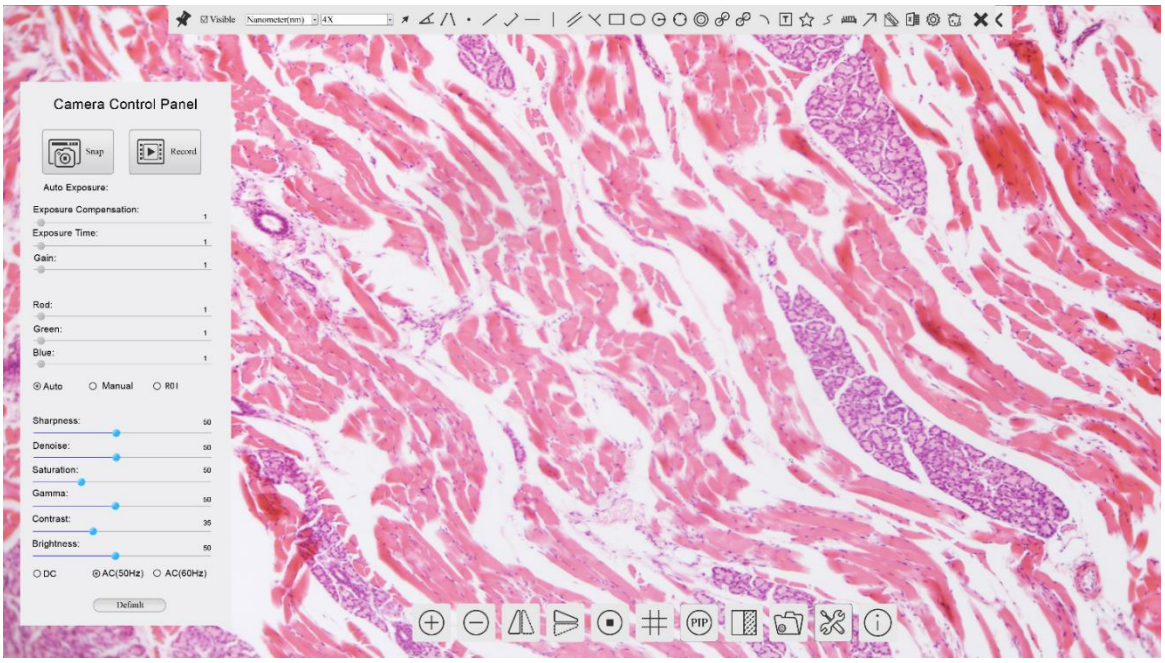
- Insert the supplied SD card/USB flash disk (USB3.0 interface) into the HDMI camera SD card slot/USB3.0 interface;



- Connect the camera to the power adapter and switch it on;



- Switch on the displayer and view the video in the Onboard BMS software. Move the mouse to the left, top or bottom of the Onboard BMS UI, different control panel or UI will pop up and users could operate with the mouse at ease.



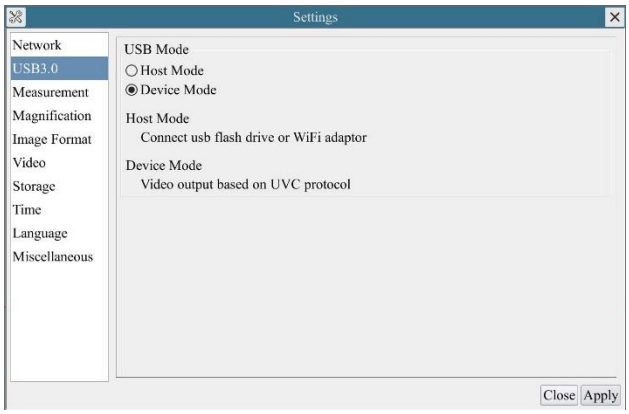
7.2 Connecting camera to the PC with USB3.0 port

For Windows user (Windows XP (32bit), Windows 7/8/10 (32/64 bit)), please use BMS_pix3.

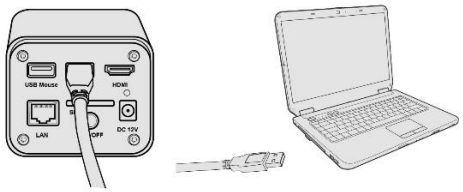
For macOS and Linux user (macOS 10.10 or above or Linux distributions with kernel 2.6.27 or higher), please use latest version of BMS_pix3 from download.

The steps to start the camera are listed below:

- Start the camera according to Sec. 7.1. After the camera is running, moving 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 Device Mode in USB Mode edit box(The factory default configuration is Device mode).



- Install the BMS_pix3 on your PC;
- Plug one end of USB cable into the camera's USB3.0 port and the other end into the usb port of PC.



- Open BMS_pix3 software. The HDMI camera will be recognized automatically in software.

7.3 Camera working in WLAN mode (AP mode)

The PC should be a WLAN enabled one.

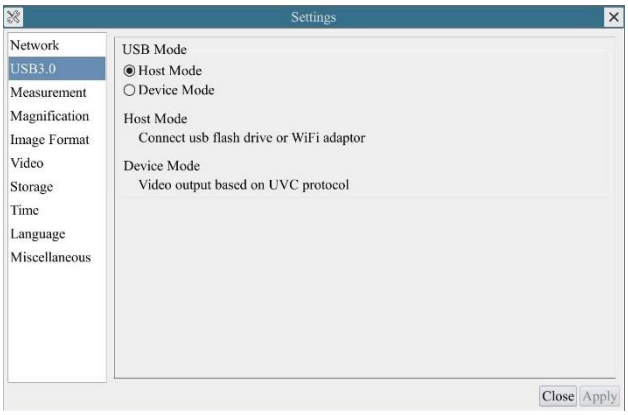
For Windows user (Windows XP (32bit), Windows 7/8/10 (32/64 bit)), please use BMS_pix3.

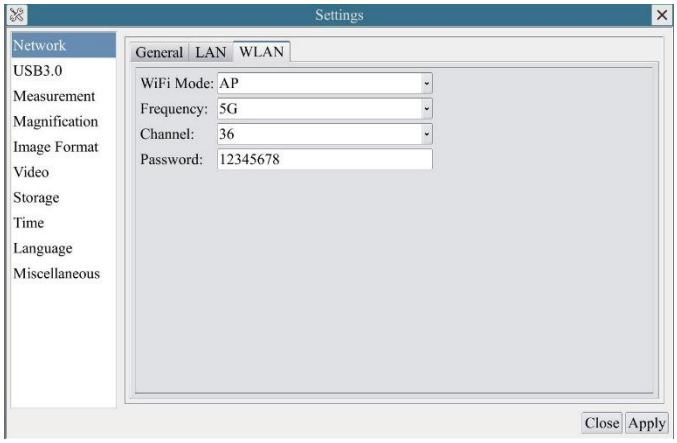
For macOS and Linux user (macOS 10.10 or above or Linux distributions with kernel 2.6.27 or higher), please use latest version of BMS_pix3 from download. When connecting the camera with a mobile device, the free BMS_pix3 App is required. Just make sure that the mobile device uses iOS 11 or higher/Android 5.1 or higher operating systems.

Figure 7-2 The PC or Mobile Device Connect to the Camera through WLAN

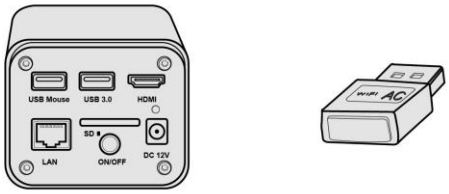
The steps to start the camera are listed below:

- Start the camera according to Sec. 7.1. After the camera is running, moving 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 WiFi Mode edit box(The factory default configuration is AP mode).

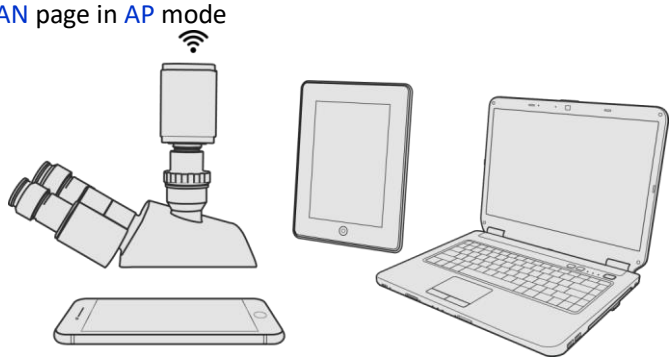




- Install the BMS_pix3 on your PC or install the BMS_pix3 App on the mobile device;
- Plug the USB WLAN adapter into the camera's USB3.0 port;



- Connect the PC or mobile device with the WLAN AP point that the camera provides; 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 BMS_pix3 software or BMS_pix3 App and check the configuration. Normally, active HDMI 4K cameras are automatically recognized. The live image of each camera is displayed. For the display, the Camera List tool window is used in the BMS_pix3 software, and the Camera Thumbnail is used in the BMS_pix3 App.

7.4 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.

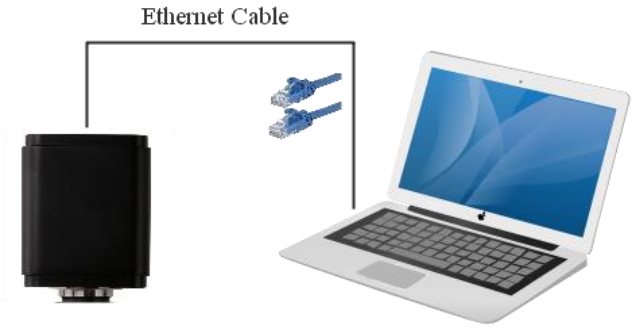
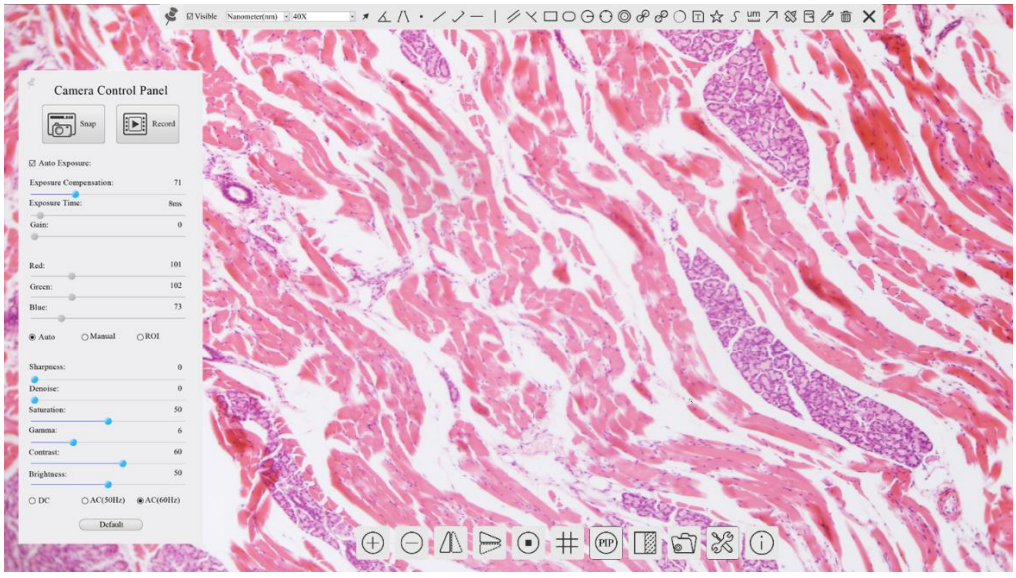


Figure 7-3 Connecting the HDMI 4K Camera with Ethernet Cable to the PC

- Start the camera according to Sec. 7.1 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.



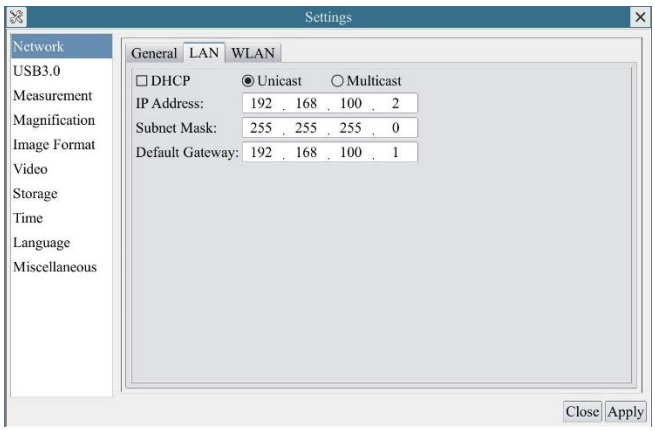


Figure 7-4 Configure the HDMI 4K Camera IP

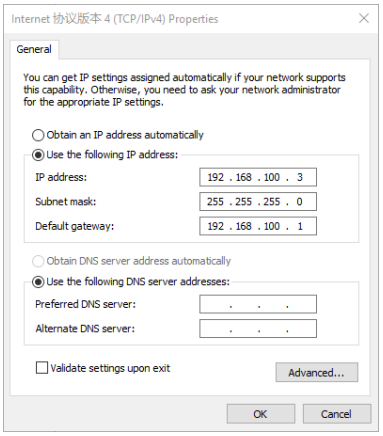
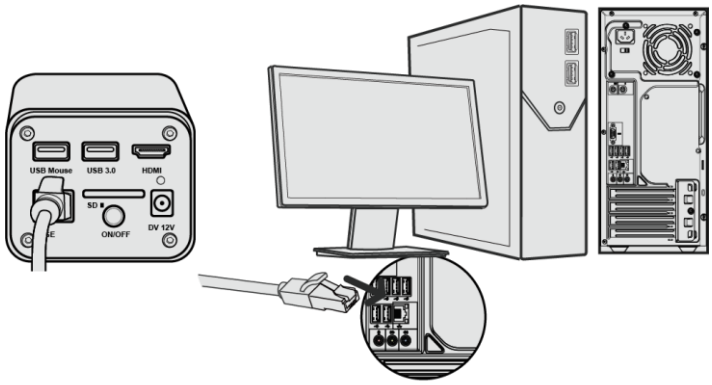


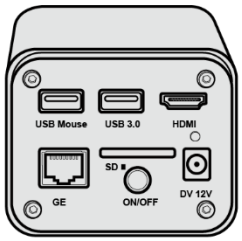
Figure 7-5 Configure the PC's IP

After the above configurations are finished, user can connect the HDMI 4K camera to the computer through the USB to Ethernet adapter as shown below:

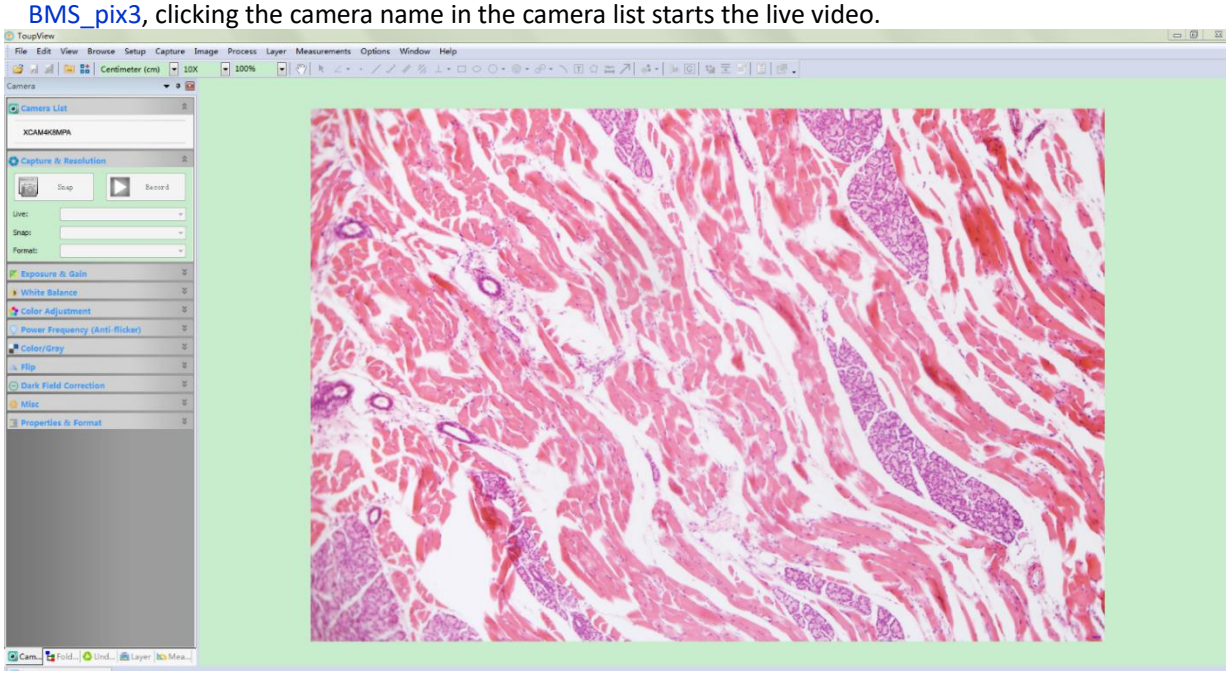
- Connect the GE port with the Ethernet cable to the PC's network port;



- Insert the supplied SD card/USB flash disk (USB3.0 interface) into the HDMI camera SD card slot/USB3.0 interface;



- Install the BMS_pix3 on your PC or install the BMS_pix3 App on the mobile device; Run the software BMS_pix3, clicking the camera name in the camera list starts the live video.



7.5 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 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 and control the camera.

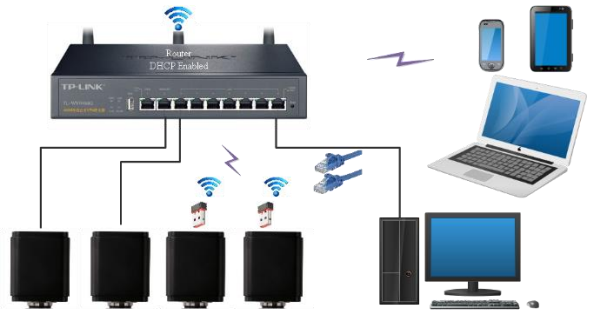
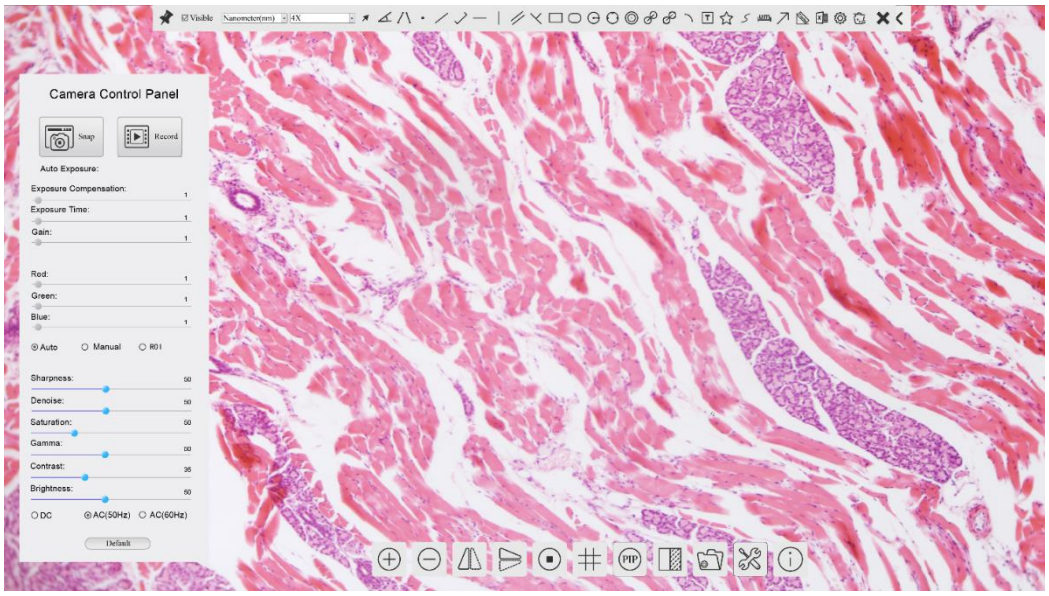
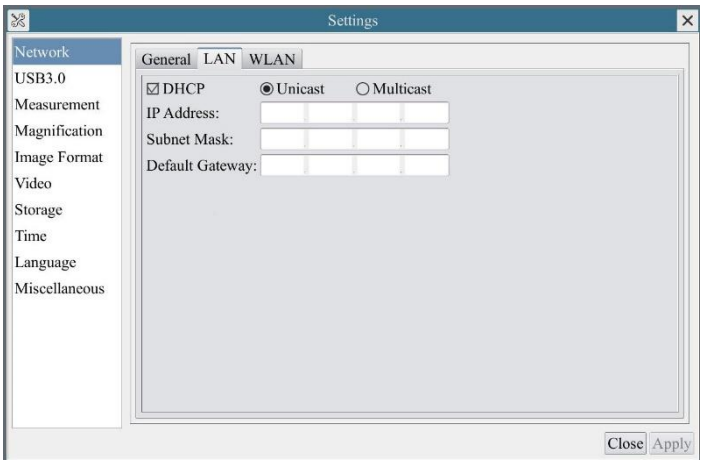


Figure 7-6 Multi HDMI 4K Cameras Connecting to the Router through the LAN Port/WLAN Style

- The connection and configuration are just the same as in Sec.7.1 or Sec. 7.4. 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.

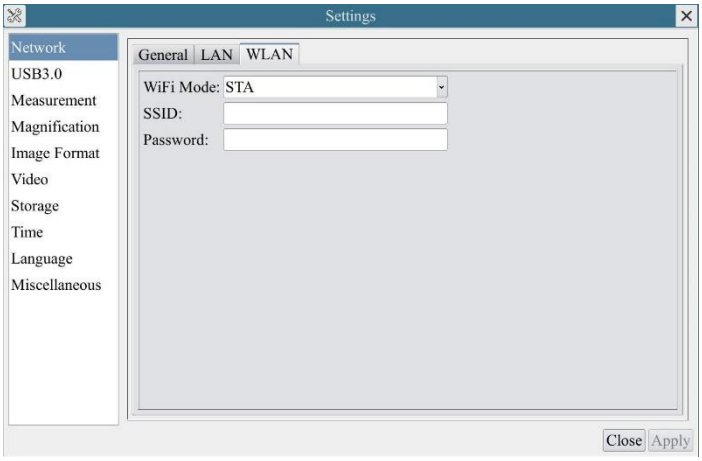
Active HDMI 4K camera recognized by the BMS_pix3 software or the BMS_pix3 App and they are displayed as a camera list or thumbnail in the software or app.



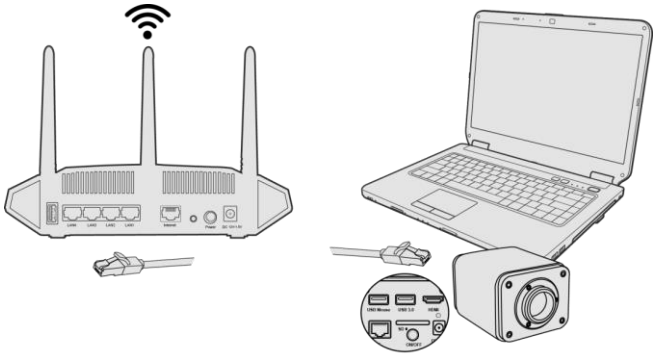


- Or start the camera according to Sec. 7.1. After the camera is running, moving the mouse to the

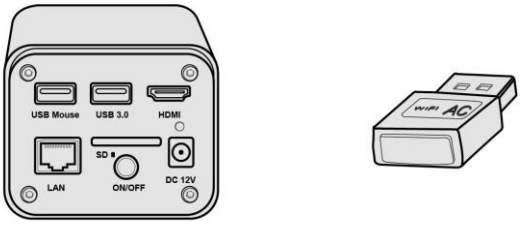
bottom of the UI and clicking the  button on the Synthesis Camera Control Toolbar at the bottom of the video window, a small window called Settings will pop up as shown below. Clicking Network>WLAN property page and choosing the STA in the WiFi Mode edit box(The factory default configuration is AP mode). Input the to be connected router's SSID and Password as shown below:



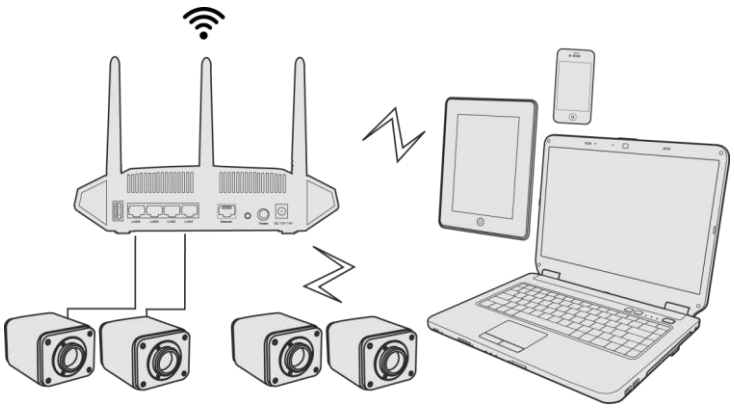
- Install the BMS_pix3 software on your PC. Alternatively, install the free *BMS_pix3 App* on the mobile device;
- Plug the Ethernet cable into the camera's LAN port and the other end to the PC (for those connected to router with WLAN STA mode);



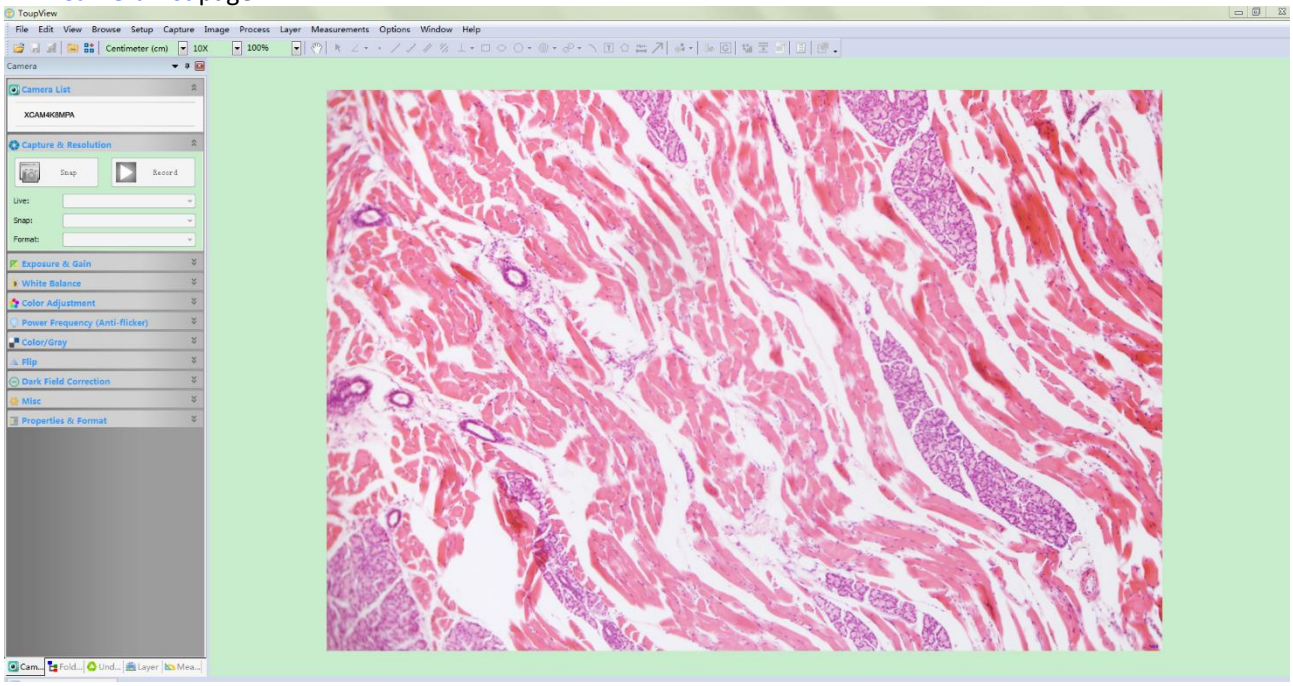
- Or plug the USB WLAN adapter into the camera's USB3.0 port(for those connected to router with WLAN STA mode);



- Finally as shown below, 2 HDMI cameras are connected to the router with LAN cable and 2 HDMI 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 BMS_pix3 software or BMS_pix3 App and check the configuration. Normally, active HDMI 4K cameras are automatically recognized. The live image of each camera is displayed. For the display, the Camera List tool window is used in the BMS_pix3 software, and the Camera Thumbnail is used in the BMS_pix3 App; Select the HDMI 4K camera you are interested in. To do so, double click the camera's name in the Camera List tool window if you use the BMS_pix3 software; If you use the BMS_pix3 App, tap the camera's thumbnail in the Camera List page.



Note on data security

The data transfer of the HDMI 4K camera in LAN or WLAN is not encrypted. Anyone who is connected to the network and has installed the BMS_pix3 software or BMS_pix3 App, can see the live image of all active HDMI 4K cameras. Operate the camera with the Onboard BMS 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.

8 Brief Introduction of HDMI 4K UI and Its Functions

8.1 Onboard BMS UI

The HDMI 4K UI shown in Figure 8-1 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.

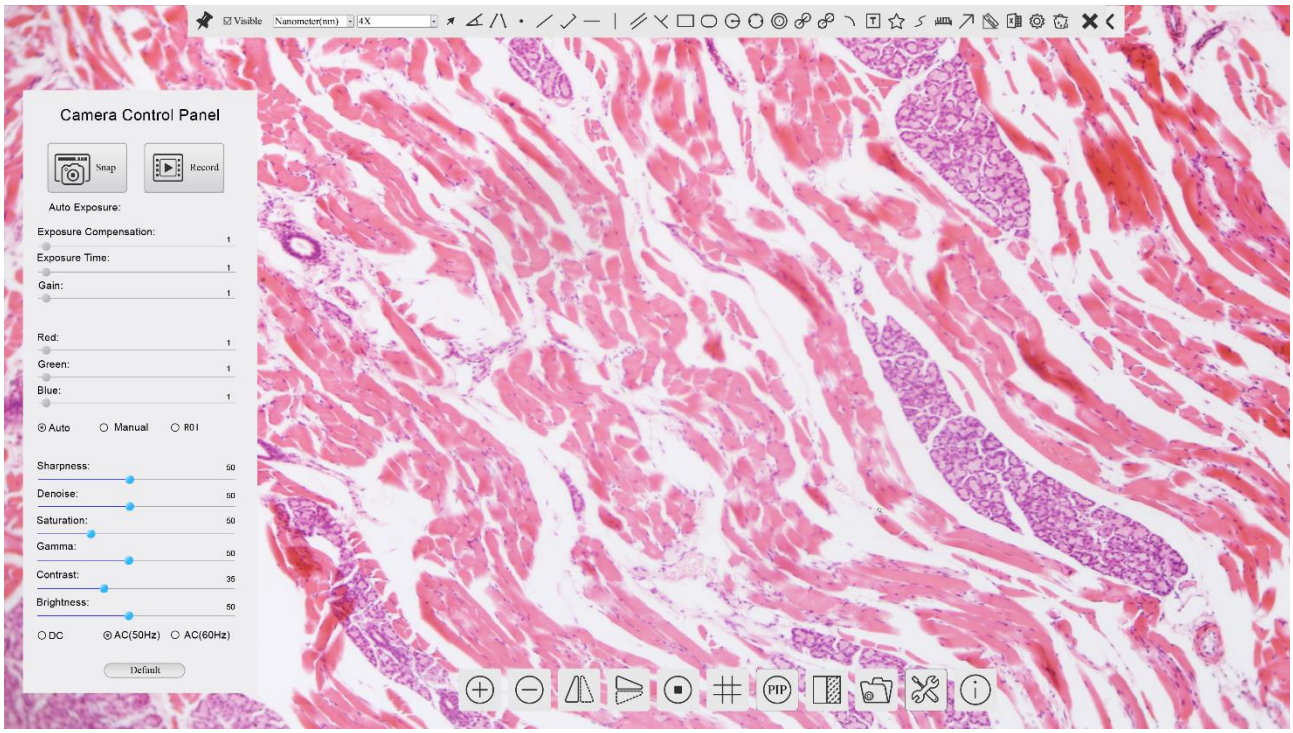
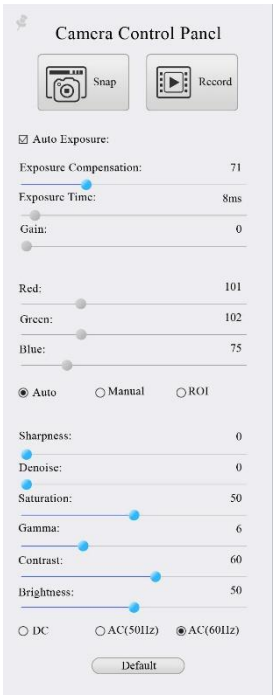


Figure 8-1 The HDMI 4K Camera Control GUI

Notes	
1	To show the Camera Control Panel, move your mouse to the left of the video window. See Sec.8.2 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.8.3 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.8.4 for details.

8.2 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	White Balance adjustment according to the window video every time the button is clicked
	Manual White Balance	Adjust the Red or Blue item to set the video White Balance.
	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.
	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

8.3 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 8-2 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
um	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 *BMS_pix3* 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.

8.4 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
	Video Freeze		Display Cross Line
	Picture in Picture		Compare Image with the Current Video
	Browse Images and Videos in the SD Card		Settings
	Check the Version of Onboard BMS		Color/gray

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

8.4.1 Setting>Network>General

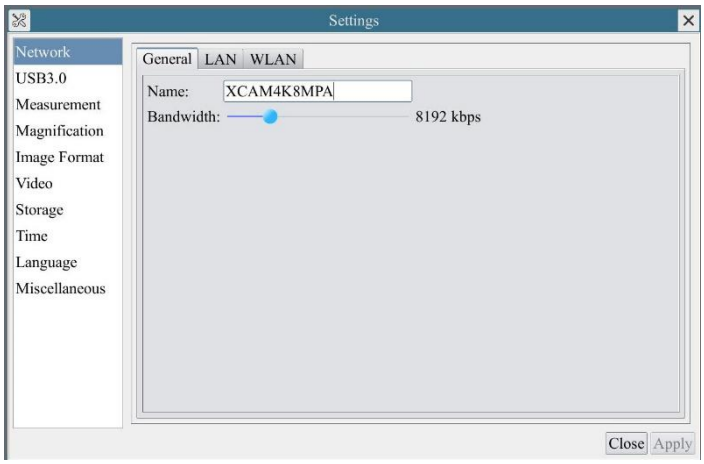


Figure 8-3 Comprehensive Network Settings Page

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.

8.4.2 Setting>Network>LAN

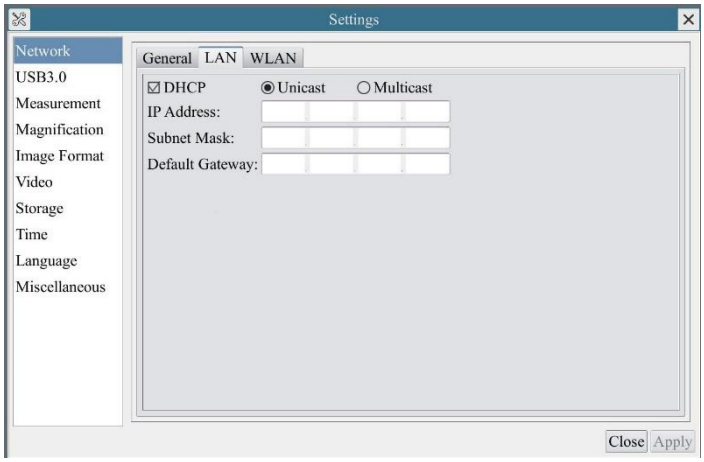


Figure 8-4 Comprehensive Network LAN Settings Page

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. 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. 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 Figure 8-5. 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 Getway	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; 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:

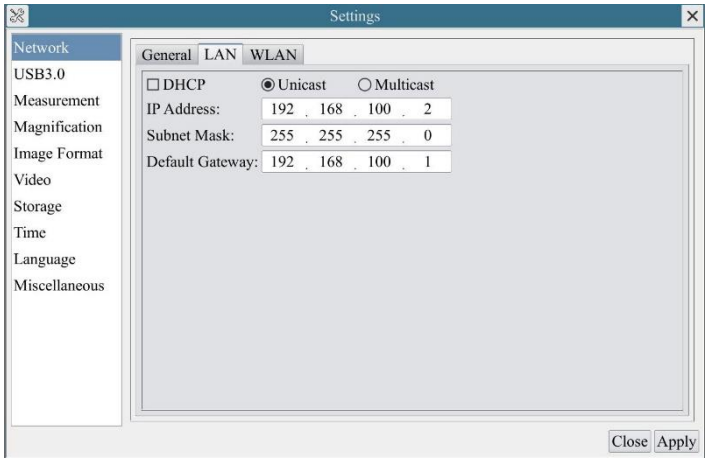


Figure 8-5 Manual DHCP and Unicast

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

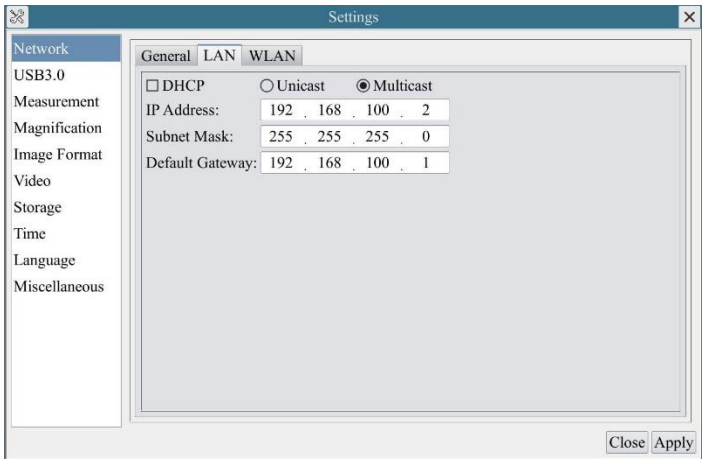


Figure 8-6 Manual DHCP and Multicast

8.4.3 Setting>Network>WLAN

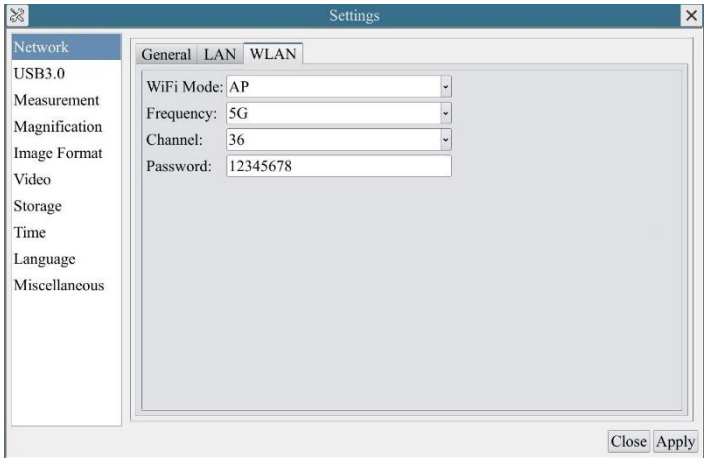


Figure 8-7 WLAN Setup

WiFi 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

8.4.4 Setting>USB3.0

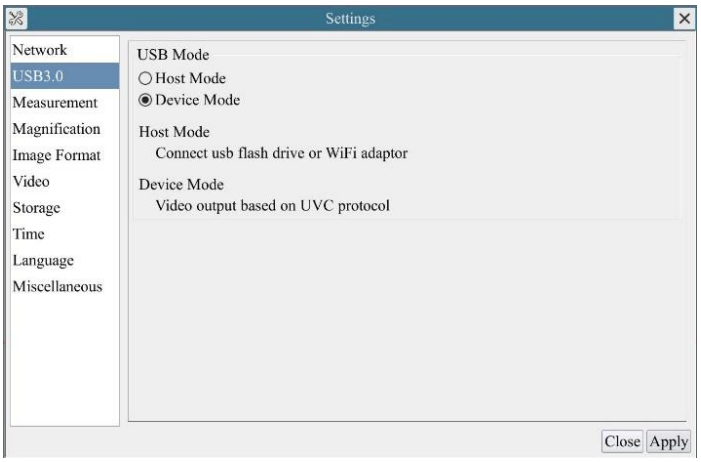


Figure 8-9USB Mode Choice

Host Mode: Connect usb flash drive or WiFi adaptor

Device Mode: Video output through connection to PC wich usb cable

8.4.5 Setting>Measurement

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

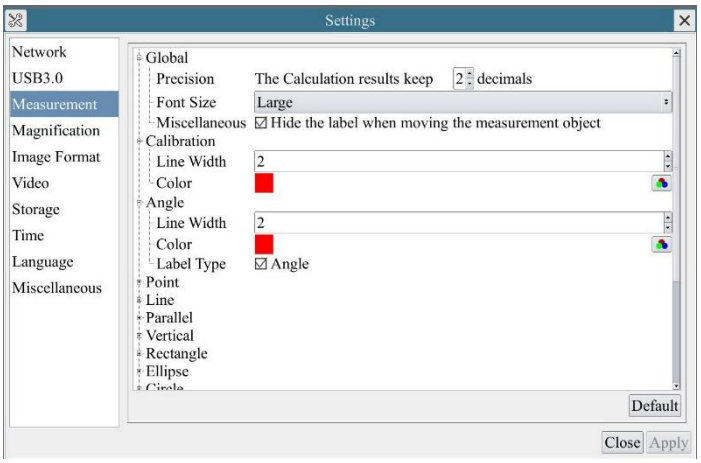


Figure 8-10 The Measurement Setup

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 EndPoints, 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.

8.4.6 Setting>Magnification

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

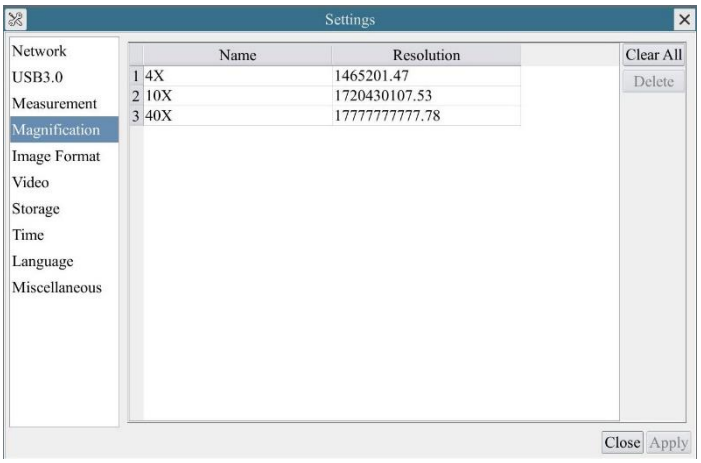


Figure 8-11 Comprehensive Magnification Calibration Settings Page

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;

8.4.7 Settings>Image Format

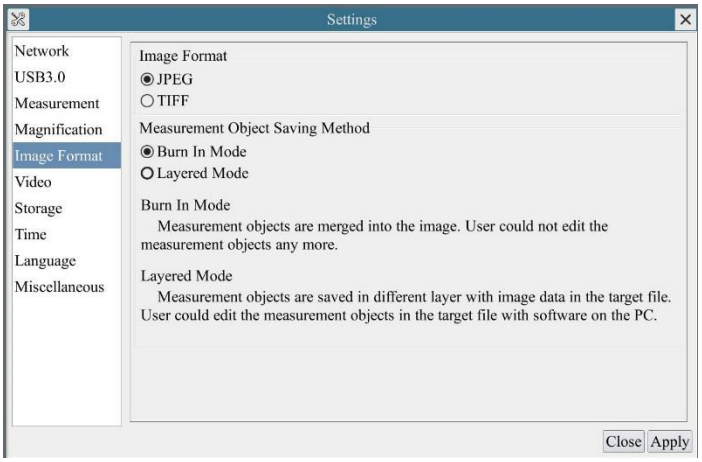


Figure 8-12 Comprehensive Image Format Settings Page

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.
TIFF: Tag Image File Format(TIFF) is a flexible bitmap format that is mainly used to store images including photos and artistic images.

Measurement Object Save 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.
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.

8.4.8 Setting>Storage

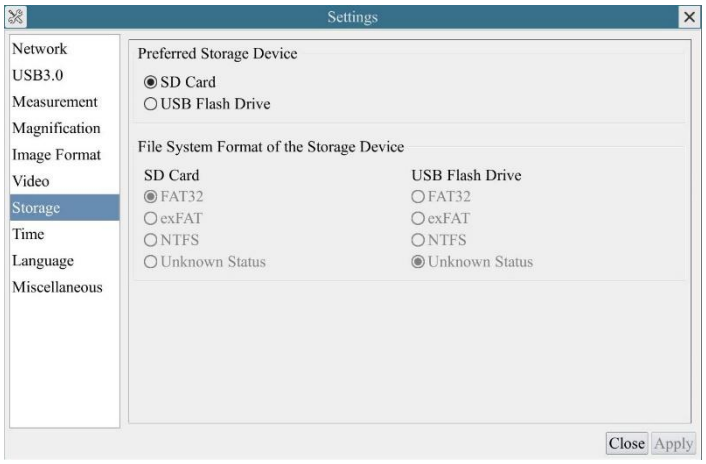


Figure 8-13 Comprehensive Setting of SD Card Setting Page

Prefered Storage Page
SD Card: Select it to save the video and image to the SD card.
USB Flash Disk: 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
FAT32: The file system of SD card is FAT32. The maximum video file size of single file in FAT32 file system is 4G Bytes;
NTFS: The file system of SD card is NTFS. The maximum video file size of single file is 2T Bytes.
Use PC to format the SD cards and switch between FAT32 and NTFS.
Unknown Status: SD card not detected or the file system is not identified;

8.4.9 Setting>Time

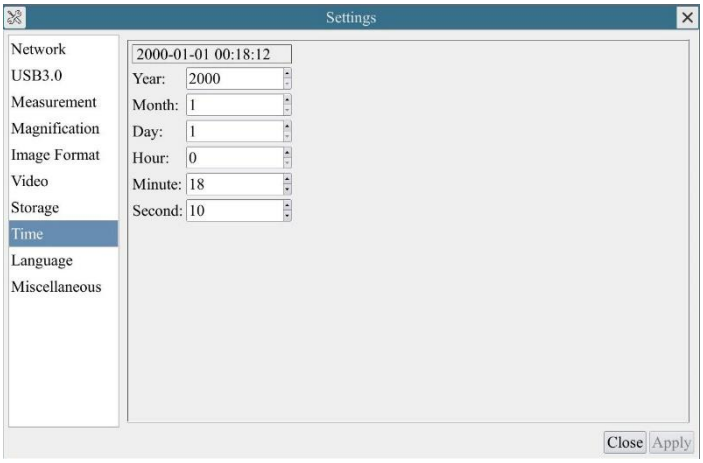


Figure 8-8 Time Setting

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

8.4.10 Setting>Language

Figure 8-15 HDMI 4K Comprehensive Setting of Language Selection Setting Page

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

8.4.11 Setting>Miscellaneous

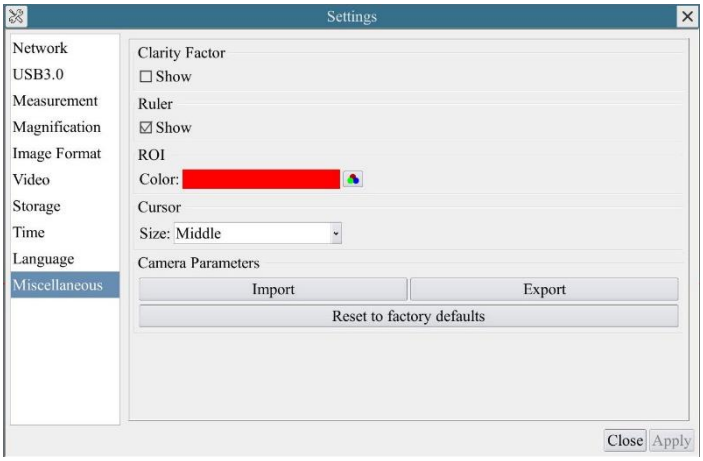
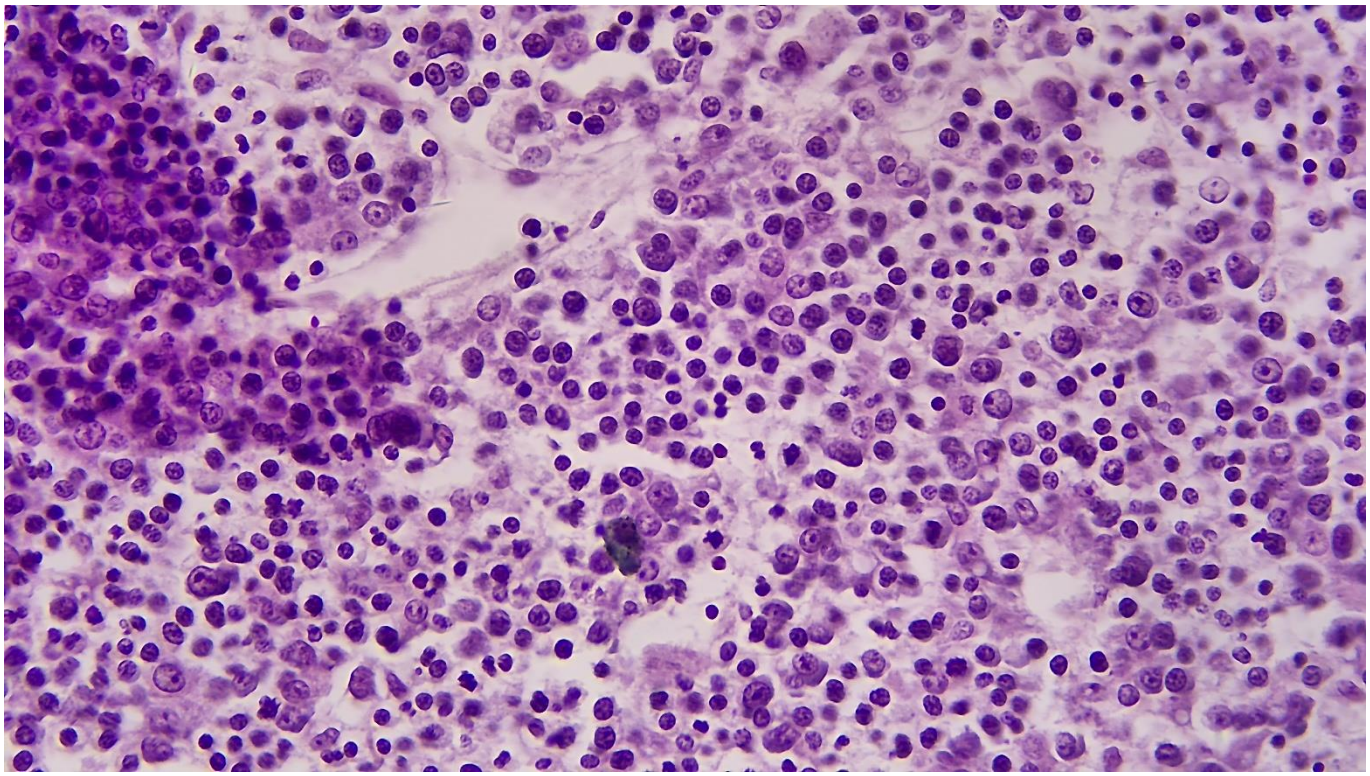


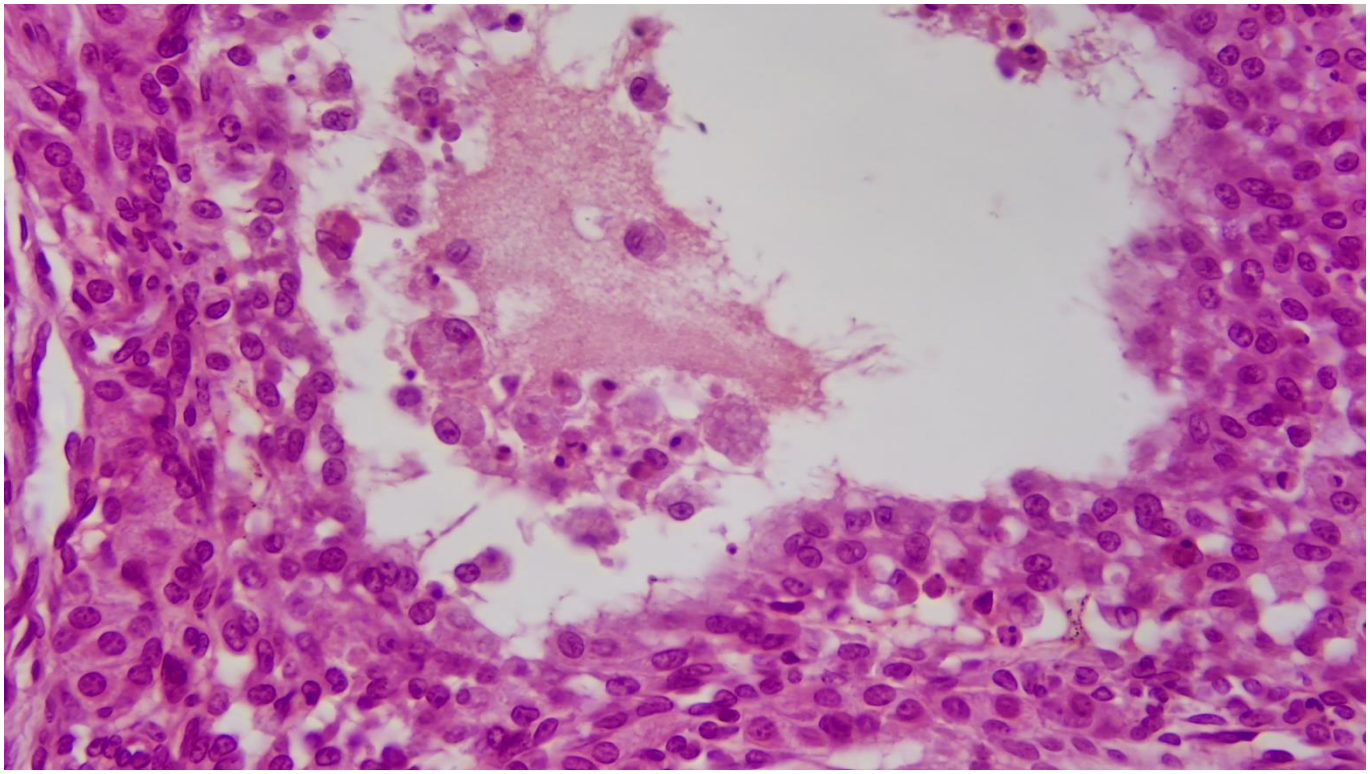
Figure 8-16 Comprehensive Miscellaneous Settings Page

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 disk to use the previously exported Camera Parameters
Camera Parameters Export	Export the Camera Parameters to the SD card or USB flash disk to use the previously exported Camera Parameters
Reset to factory defaults	Restore camera parameters to its factory status;

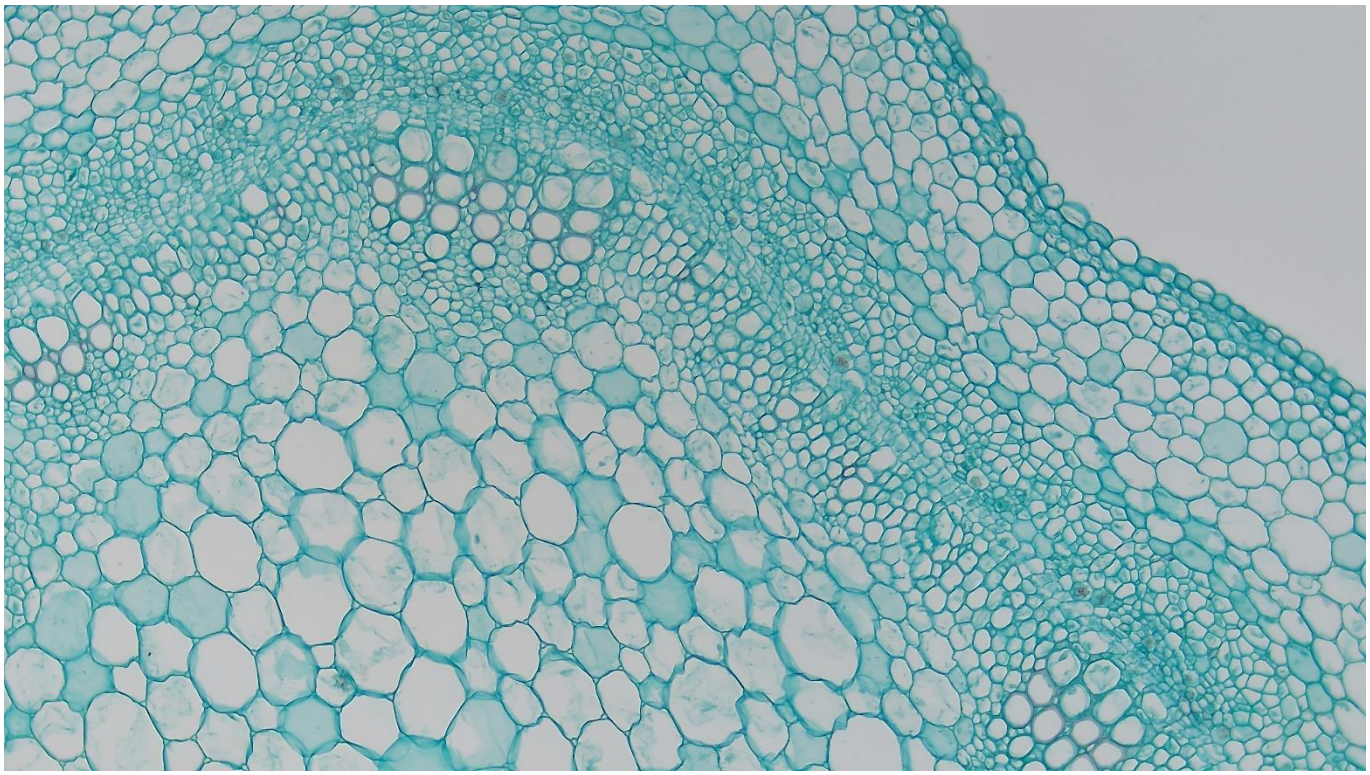
9 Sample Photos Captured with HDMI 4K Series Camera



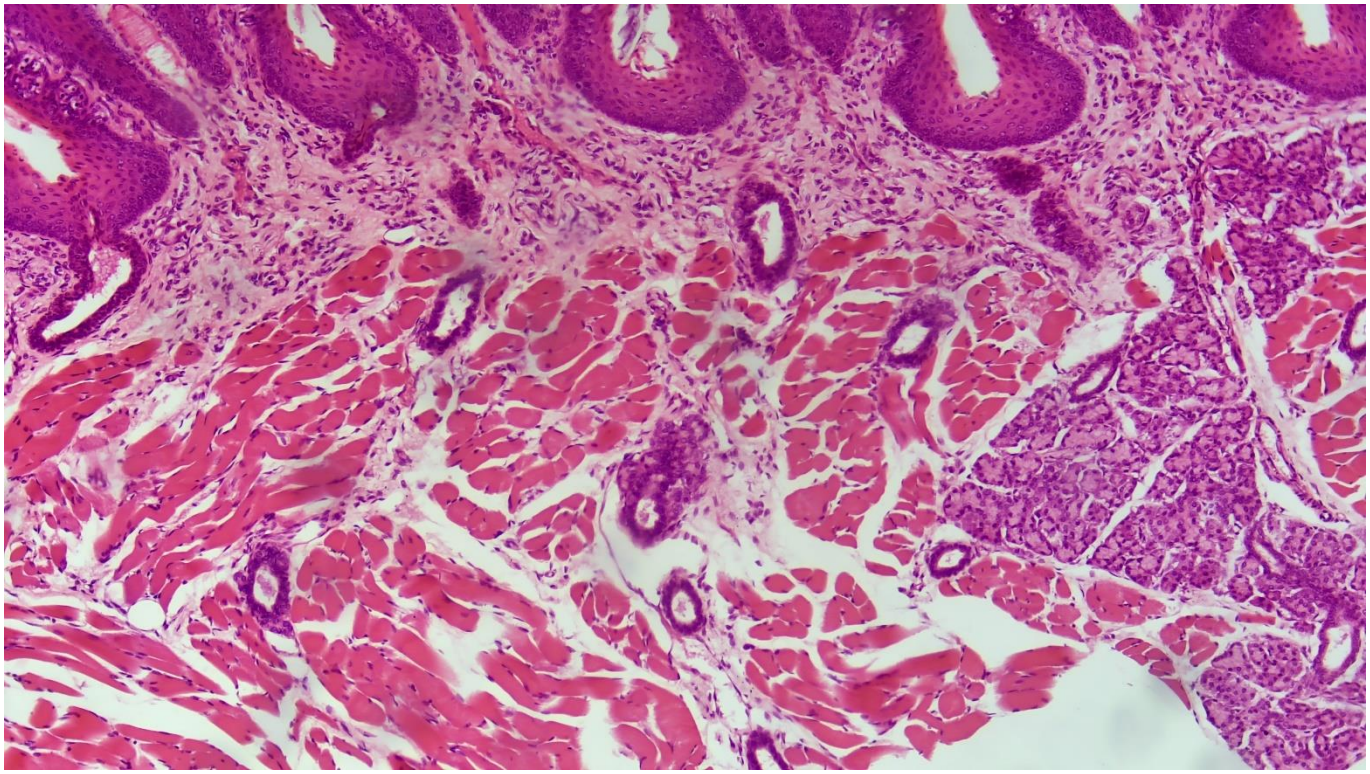
Rabbit Emdryo captured XCAM4K8MPA



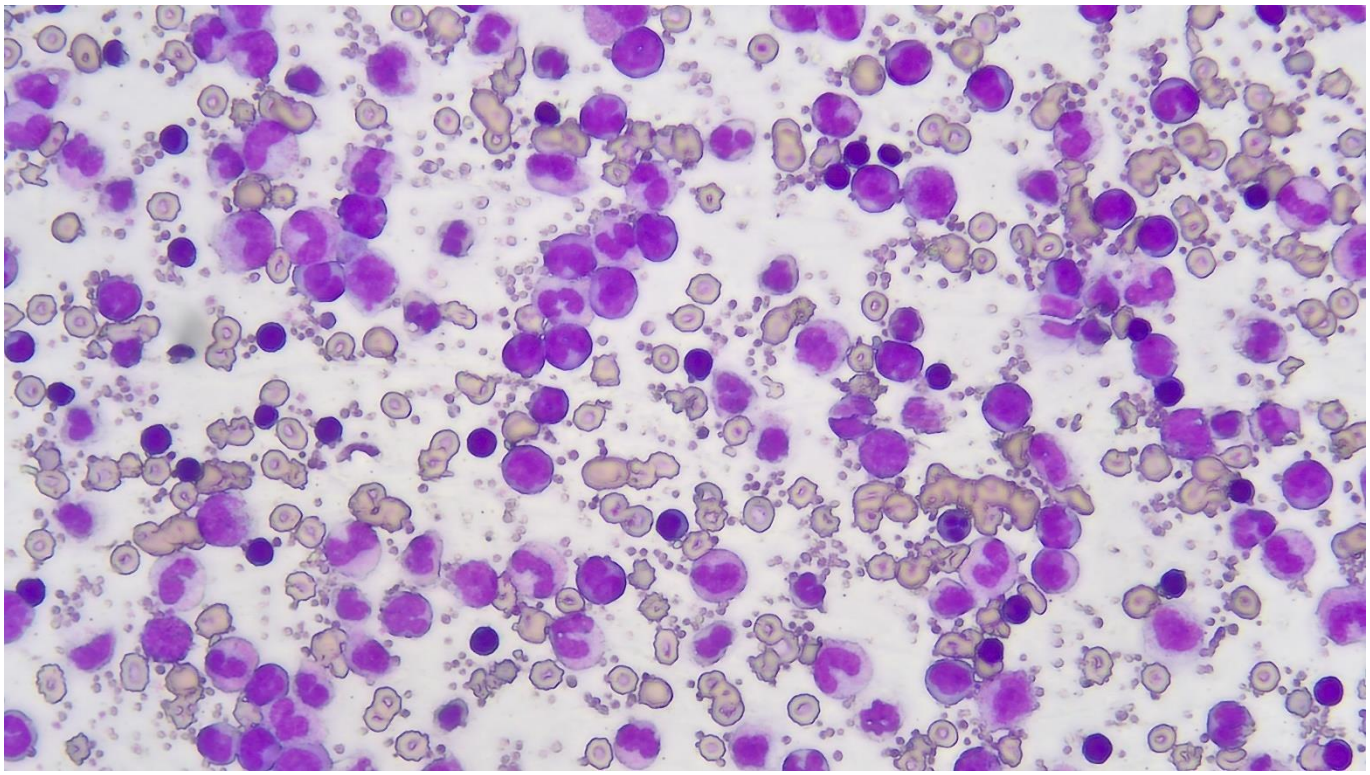
Ovary Captured with XCAM4K8MPA



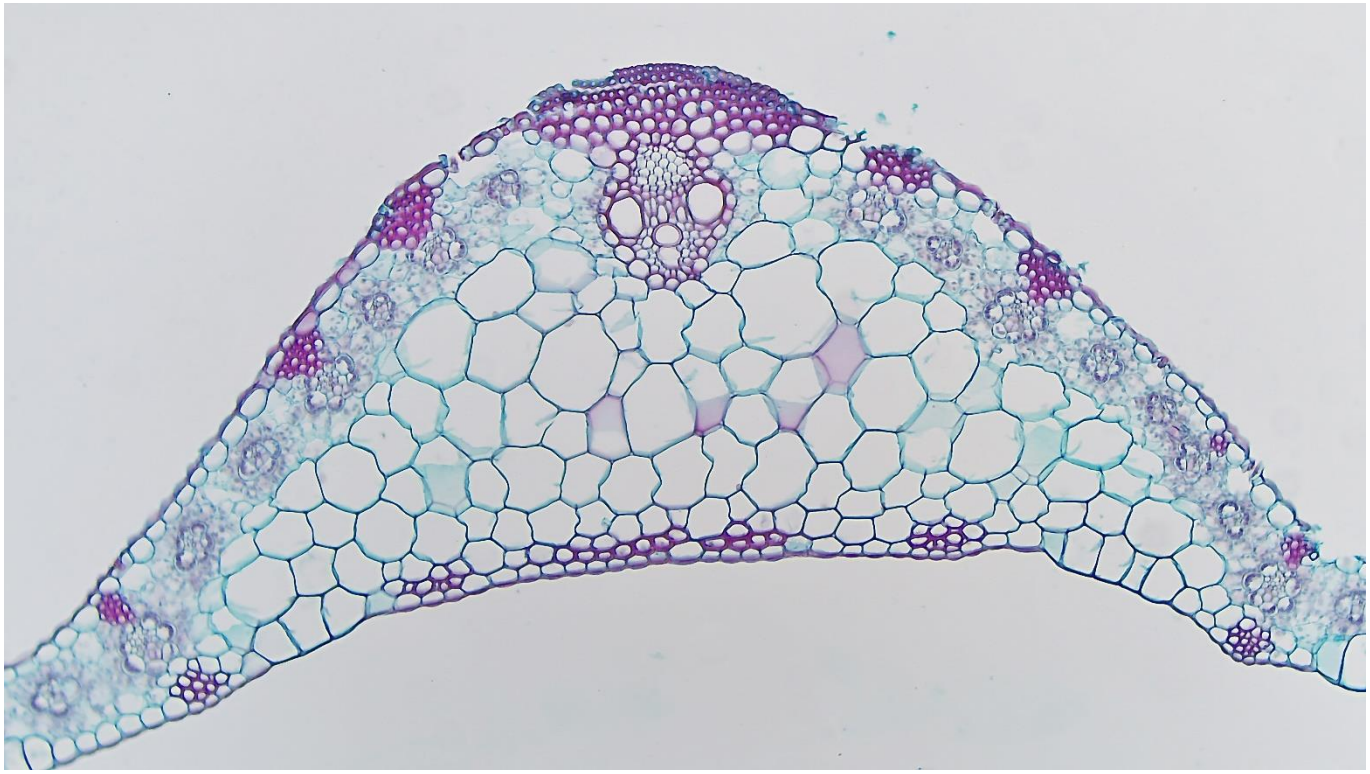
Cotton Stem captured with XCAM4K8MPA



Taste Bad Captured with XCAM4K8MPA



MK54-40



Corn Leaf

10 Contacting Customer Service

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

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Die Niederlande

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Fax: 010-450 82 51

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Environment protection first!
Your appliance contains valuable materials which can be recovered or recycled.
Leave it at a local civic waste collection point

www.bmsmicroscopes.com

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