

**TUENSEN**

# TrueChrome 4K Pro

## Dual-channel microscope camera

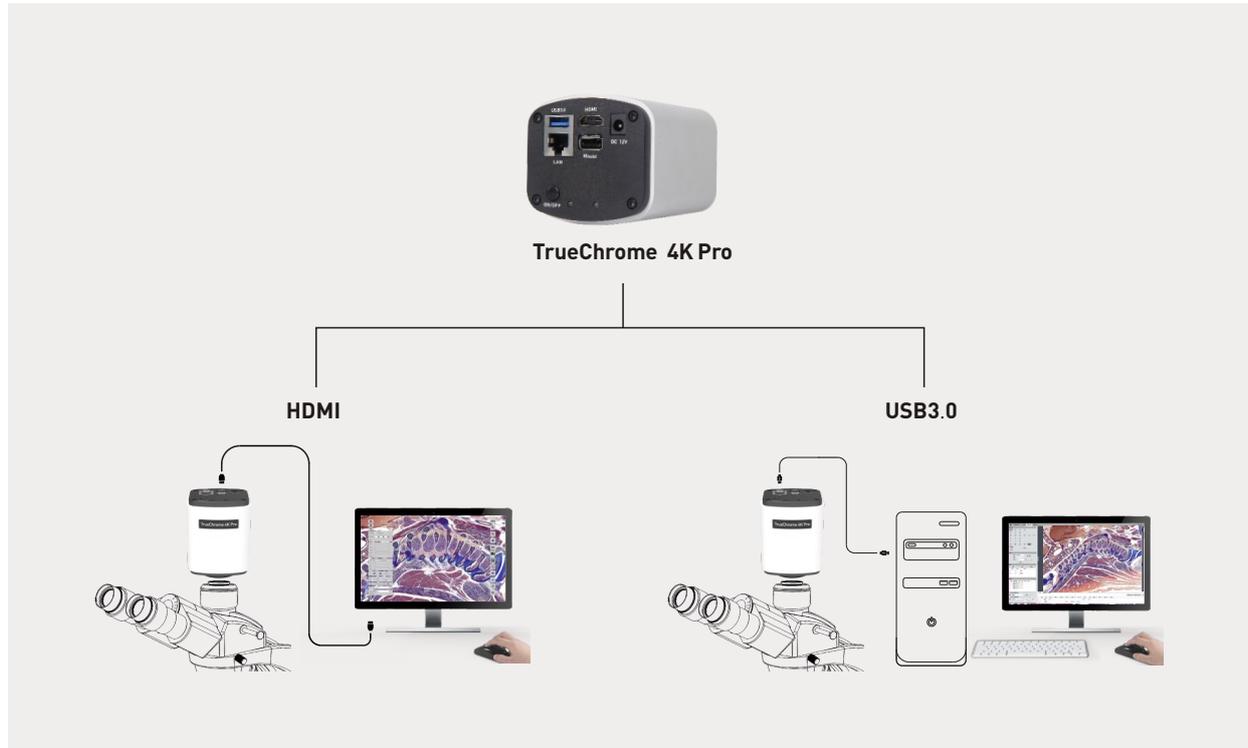
4K HDMI and USB3.0 two-in-one

Doubled functionality, with uncompromising performance



# 4K HDMI + USB3.0

Opens the dual-mode era of microscopic imaging



TrueChrome 4K Pro is one microscope camera mixing HDMI shortcut operation and USB 3.0 professional software analysis.

Generally one set of HDMI cameras can complete many regular operation in microscope application. And people is fond of this shortcut. However, it usually requires the professional cooperation of USB camera and computer software when performing fine image analysis and process.

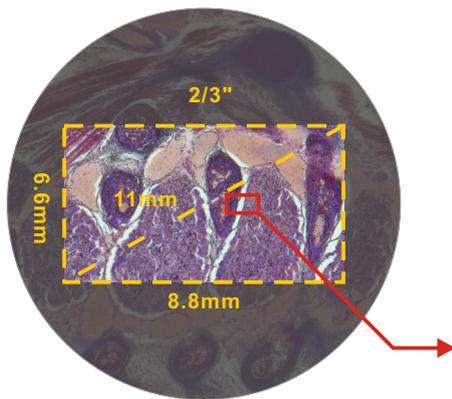
TrueChrome 4K Pro perfectly meet the both working needs. It not only inherits the shortcut operation function of “no computer need, mouse control” from Tucsen HDMI camera, but also perfectly transplants Mlchrome USB 3.0 camera with its advanced functions like complete imaging control, fine image process and live stitching, live EDF etc.

TrueChrome 4K Pro is opening a complete new dual-channel imaging mode, with doubled functions and uncompromising performance!

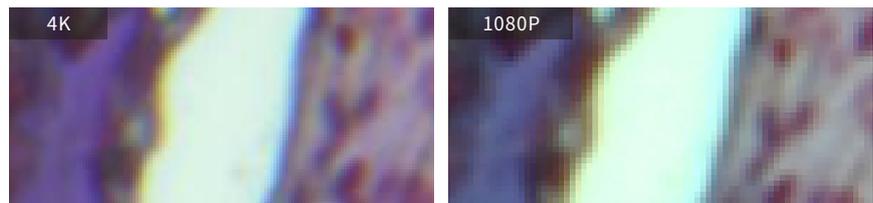
# What can 4K bring to you?

## ○ 4K presents more details than 1080P

The ideal camera pixel refers to the pixel size that is just big enough to resolve the optical resolution of a microscope. But in order to fully perform the optical efficiency of microscope, the real adopted camera pixel size should be smaller than ideal. The smaller pixel size, the higher resolution. Shown as below diagram: take the incident wavelength of 450nm for example, the adopted camera pixel size should be smaller than 2.8um pixel size which corresponds to 4 multiples of minimum objective lens. Under same 2/3 FOV, the actual resolution of a 1080P (1920 × 1080) camera is only equal to 4.6um(=8.8mm/1920), and it barely meet the demands of 40X and 60X objective lens, while 4K (3640×2160) is about 2.3um(=8.8mm/3640), totally meeting the demands of all objective lens and making the optical lens work at its best efficiency. No matter it is equipped with 4K or 1080P monitor, it can get higher resolution results.

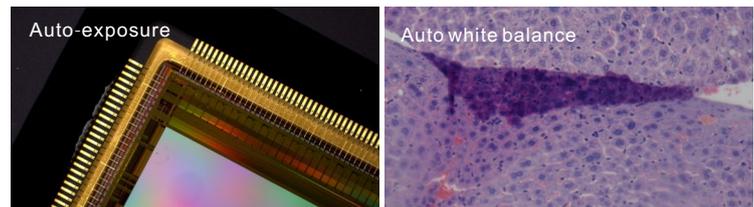


Ideal pixel size of a plan semi-apochromatic objective						
Magnification (Mag)	NA	Wavelength (λ)	Optical resolution (d=0.61*λ/NA)	Ideal pixel (d*Mag/3) < l < (d*Mag/2)	4K	1080P
4	0.13	450nm	2.1μm	2.8μm~4.2μm	✓	✗
10	0.3	450nm	0.9μm	3.1μm~4.6μm	✓	✗
20	0.5	450nm	0.5μm	3.7μm~5.5μm	✓	✗
40	0.75	450nm	0.4μm	4.9μm~7.3μm	✓	✓
60	0.85	450nm	0.3μm	6.5μm~9.7μm	✓	✓



## ○ Much Stronger 4K Image Signal Processor

The upgrade of 4K resolution requires camera to process a larger amount of data. Generally it is not easy to perfectly reveal 4K image, but Tucsen 4K ISP performs a very good professional level. It not only can accurately determine the exposure intensity of complex light scenes, but also accurately restore difficult colors such as blue, purple and pink, and maintain a high speed of 30 frames per second.



## ○ Embedded-type functionality upgrade

Based on previous generation of TrueChrome Metrics embedded software, three utility functions are added on TrueChrome 4K Pro to continuously optimize your shortcut operation experience.

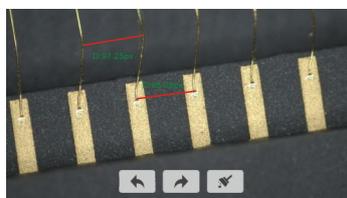
### 1. Time stamp

The file name automatically save the time image taken.  
The image attributes can record the shooting time for long time.



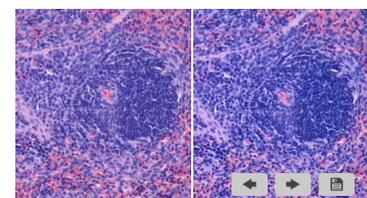
### 2. Measurement edit

The data display the position can be moved arbitrarily.  
Data modification can be undone and recovered



### 3. Image comparison

Support dynamic,static image comparison.  
The comparison images can be zoom in and zoom out.



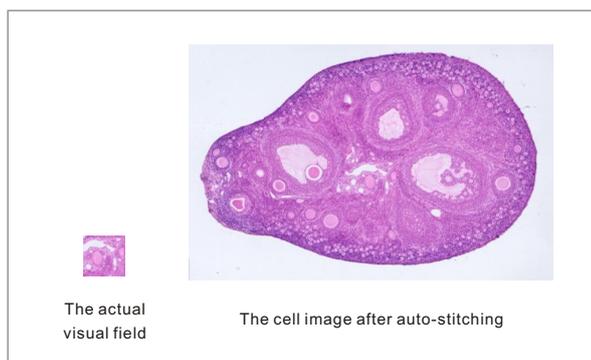
# USB 3.0+Mosaic V2 professional analysis software

## ○ Finetune analysis processing, efficient operation experience

The USB 3.0 channel on TrueChrome 4K Pro can realize high speed transmission at 25 fps@4k full resolution. It contains the same perfect color reproduction and complete parameter control functions as USB 3.0 cameras from Tucsen. Meantime, loaded with Tucsen Mosaic V2 professional image analysis software, containing shooting, processing, measurement, report etc. self-defined function modules, it also allows users to have efficient and stable operation experience when perform advanced functions like “Live Stitching” and “Live EDF”.

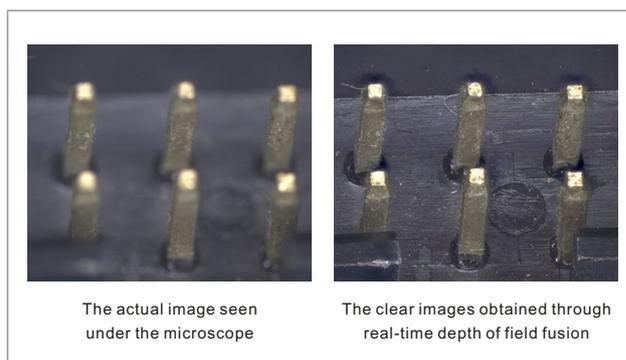
## ○ Live Stitching

When moving the loading platform, the software automatically completes the image stitching, which can be accurately and quickly done under different magnifications and any angle!



## ○ Live EDF

When turning the focus ring to shoot different DOF points, the software automatically generates large DOF images, and the feature points of different focal planes are clearly displayed on the same plane!



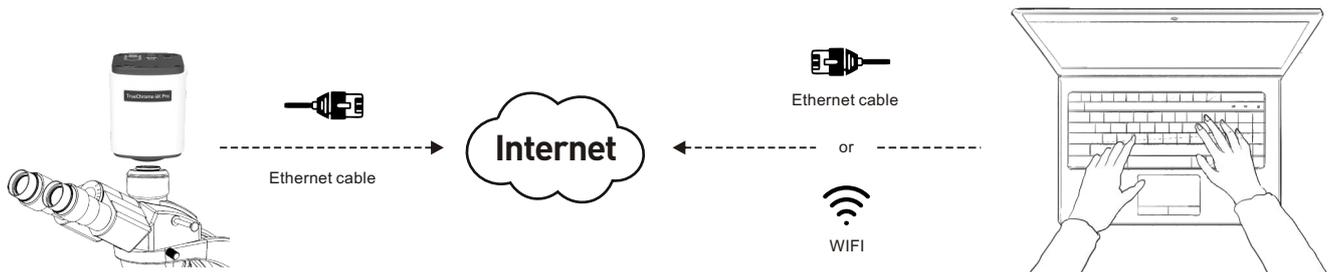
## ○ Mosaic V2 software features

Capture	Image	Measure	Report
Real-time EDF Real-time image stitching	HDR image synthesis	Customize measuring gauges, layers, precision	Report generation and printing
Real-time 3D noise reduction Real-time sharpening	Real-time fluorescence image synthesis and editing	Implements drawing: points, lines, rectangles, polygons, circles, arcs, angles	Data export as TXT or Excel
Intelligent flat field correction	Binaryzation	Dynamic measurement	
intelligent automatic exposure	Smooth	static measurement	
HDR	Filter/Extract/Inverse Color	Layered measurement	
Delay Capture		Intelligent metrics flow is established, reused to improve measurement efficiency	
JPG, PNG, TIF, DICOM			
User parameter group save and load			

# Internet interface, more flexible space application

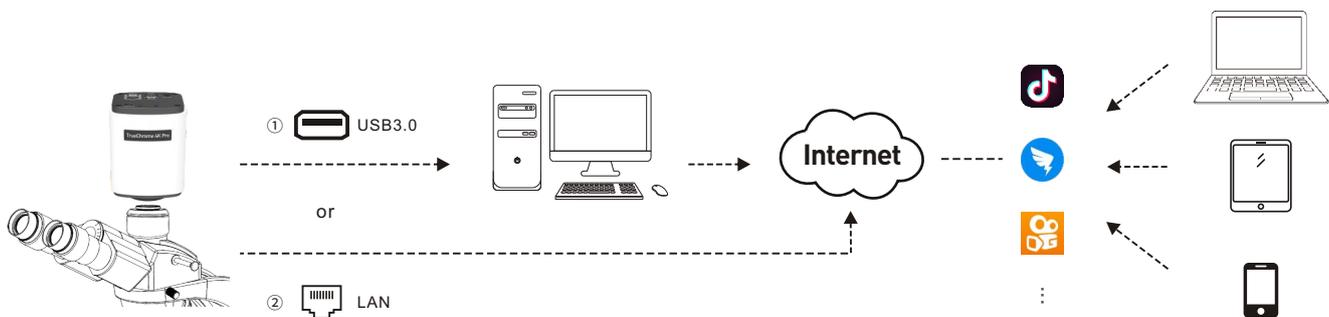
## ○ Remote control, separate human and experimental devices

The TrueChrome 4K Pro can meet the needs of many medical laboratories or clean workshops that often need to separate operators from operating areas to avoid unnecessary contact or contamination: only by connecting an observer with the TrueChrome 4K Pro and a computer with the Mosaic V2 software to Internet, you can use Mosaic V2 software to remotely control all features of the camera, and the TrueChrome 4K Pro can still deliver high speeds of up to 30 FPS @4K full resolution, even remotely, without affecting the experience.



## ○ Live interaction, share videos with multiple people in real time

The rapid development of internet technology makes communication more convenient and efficient, and the need of huge resources into multimedia interactive platform now can be easily done with one camera. TrueChrome 4 k Pro camera support network standard transmission protocol, and can be connected with the third party live platforms like Ding Talk, Kwai and Tik Tok etc. to set up the internet conference, teaching platform, and interact images with multiple people in real time.



Remark: ① USB 3.0: can perform voice interaction under the help of computer audio function.

② LAN: No simultaneous voice interaction supported since no audio interface on camera.

# Camera specification

<b>Product Model</b>	<b>TrueChrome 4K Pro</b>
Sensor Type	Sony IMX183C CMOS
Resolution	8MP ( 3840x2160 )
Frame	HDMI: 30fps@3840x2160 USB 3.0: 25fps@3840x2160 Ethernet: 30fps@3840x2160
Image format	HDMI: JPG/TIFF USB 3.0: JPG/PNG/TIFF/DICOM Ethernet: JPG/PNG/TIFF/DICOM
Exposure Mode	Auto/Manual
Exposure Time	2ms~10s
White Balance	Auto/Manual
Optical Interface	Standard C-Mount
Data Interface	HDMI: Connect monitor USB3.0: Connect computer or U disk LAN: Connect Internet USB2.0: Connect mouse
Software	HDMI: Embedded software PC: Mosaic V2
Operating system	Windows 7/8/10 ( 32bit/64bit )
Camera size	105.7x78x70.8 ( mm )
Camera weight	505g

ISO9001 CE RoHS



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