

# TUESSEN

## TrueChrome 4K Pro Dual-channel microscope camera

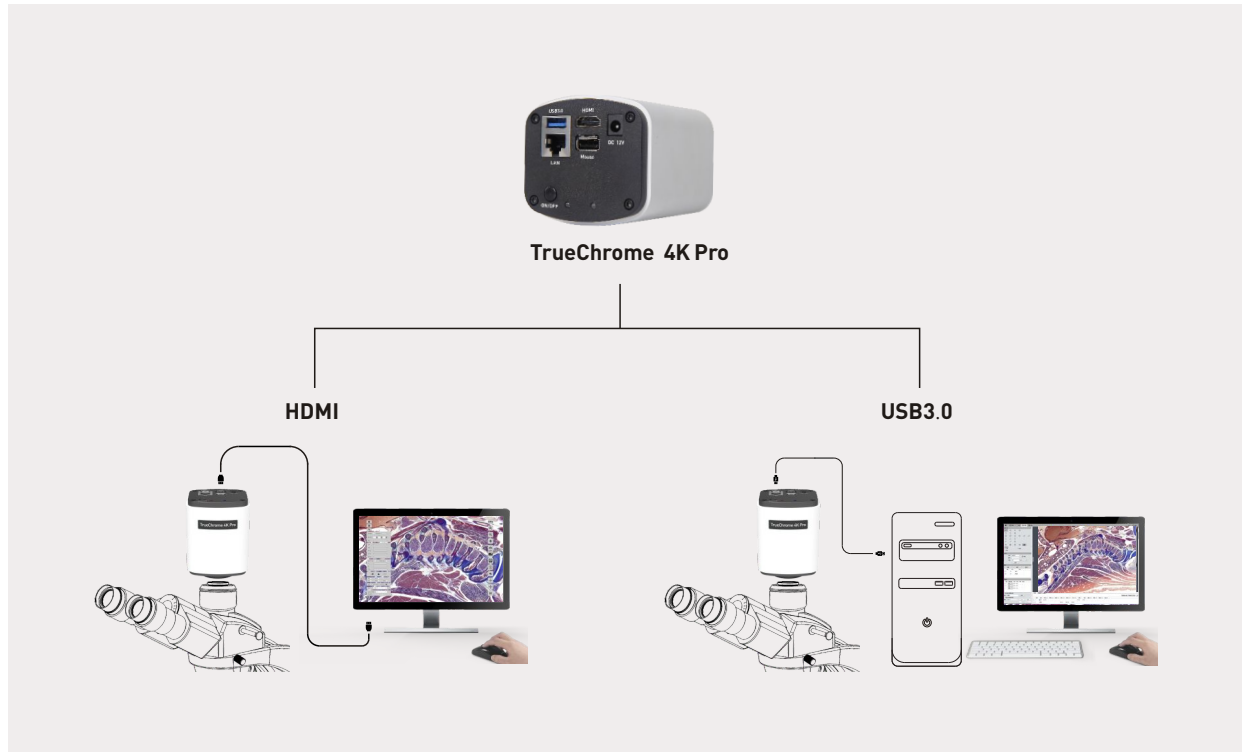
4K HDMI and USB3.0 two-in-one

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.

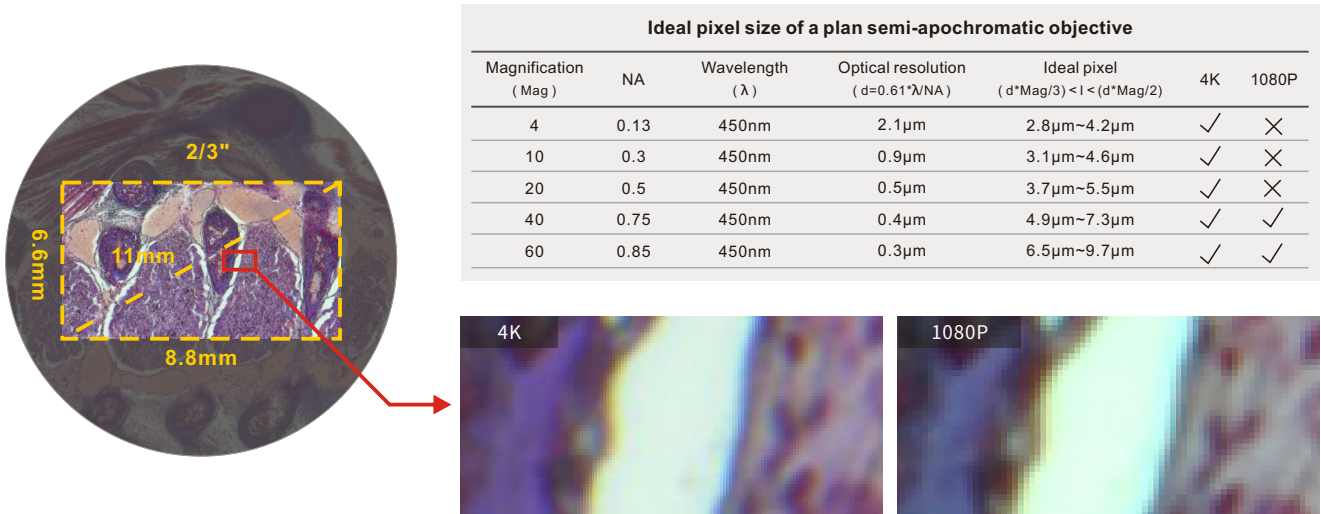
TrueChrome 4K Pro perfectly meet the both working needs. It not only inherits the shortcut operation function of “no computer need, mouse control” from Tucsen HDMI camera, but also perfectly transplants Mlchrome USB 3.0 camera with its advanced functions like complete imaging control, fine image process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

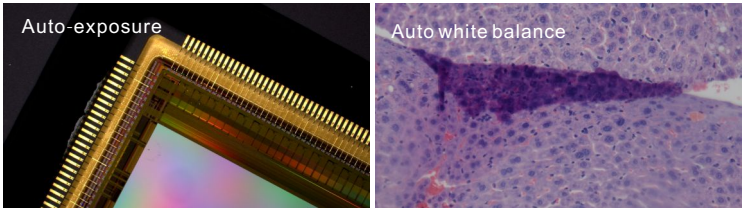
## ○ 4K presents more details than 1080P

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 performs 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.



## ○ 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.

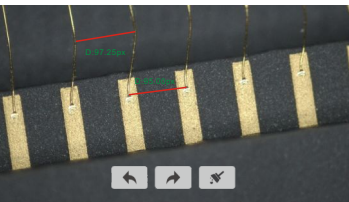
### 1.Time stamp

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



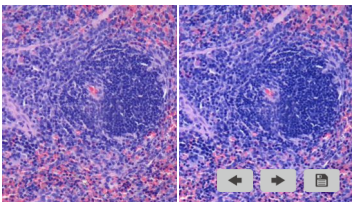
### 2.Measurement edit

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.



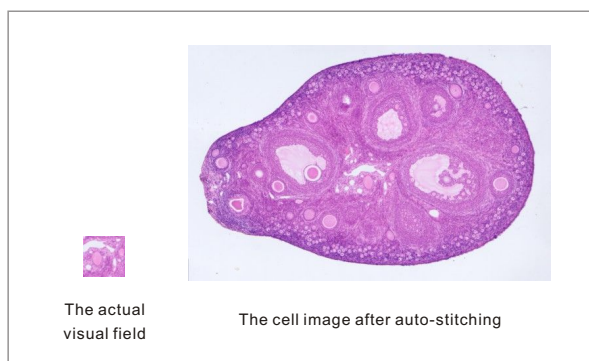
# USB 3.0+Mosaic V2 professional analysis software

## ○ 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”.

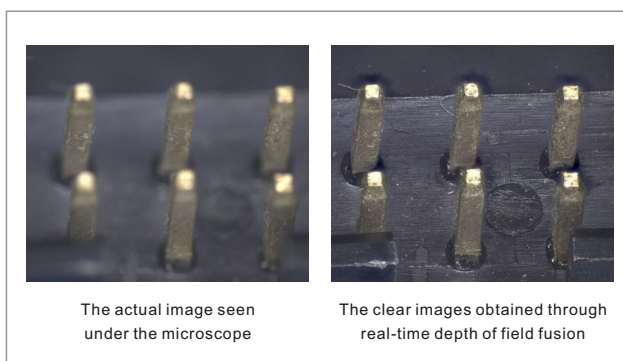
## ○ Live Stitching

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

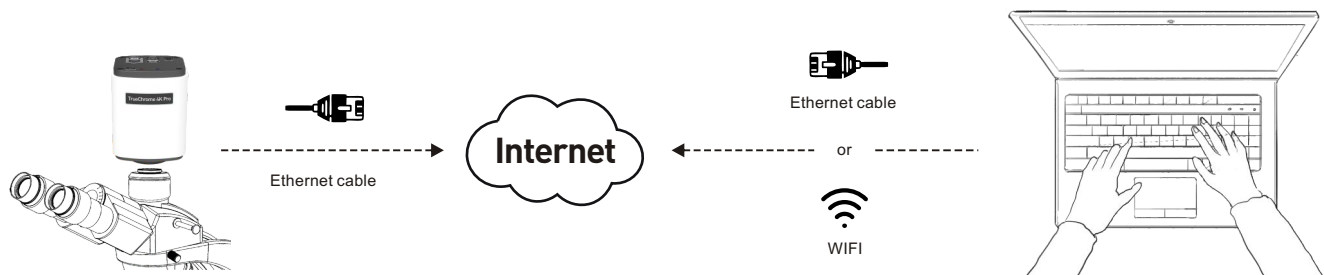
Capture	Image	Measure	Report
Real-time EDF Real-time image stitching	HDR image synthesis	Customize measuring gauges, layers, precision	Report generation and printing
Real-time 3D noise reduction Real-time sharpening	Real-time fluorescence image synthesis and editing	Implements drawing: points, lines, 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

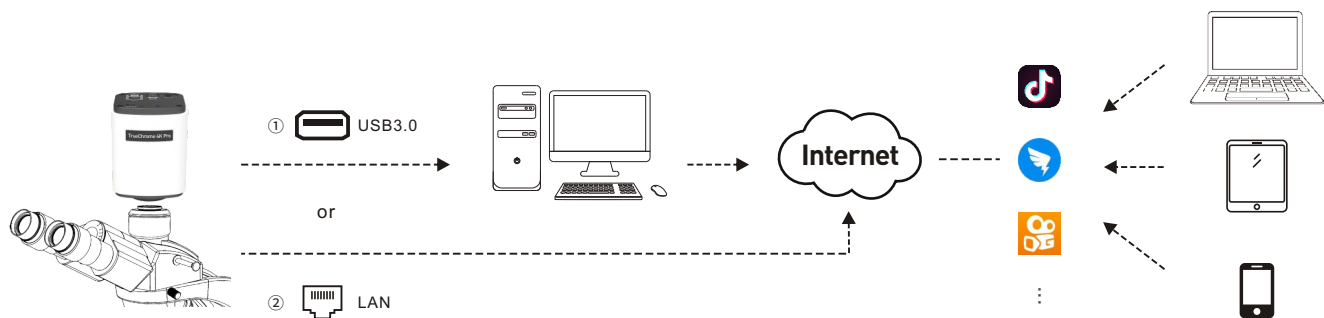
## ○ Remote control, separate human and experimental devices

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

Product Model	TrueChrome 4K Pro
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

Tucsen Photonics Co., Ltd.

ISO9001 CE RoHS

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# TrueChrome Metrics

## Built-in Measurement HDMI Camera

Perfect color reproduction with built-in mouse control and measurement

Compatible with Mosaic V2.1 Computational Imaging Software

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# Built-in Mouse Control and Image Measurement System

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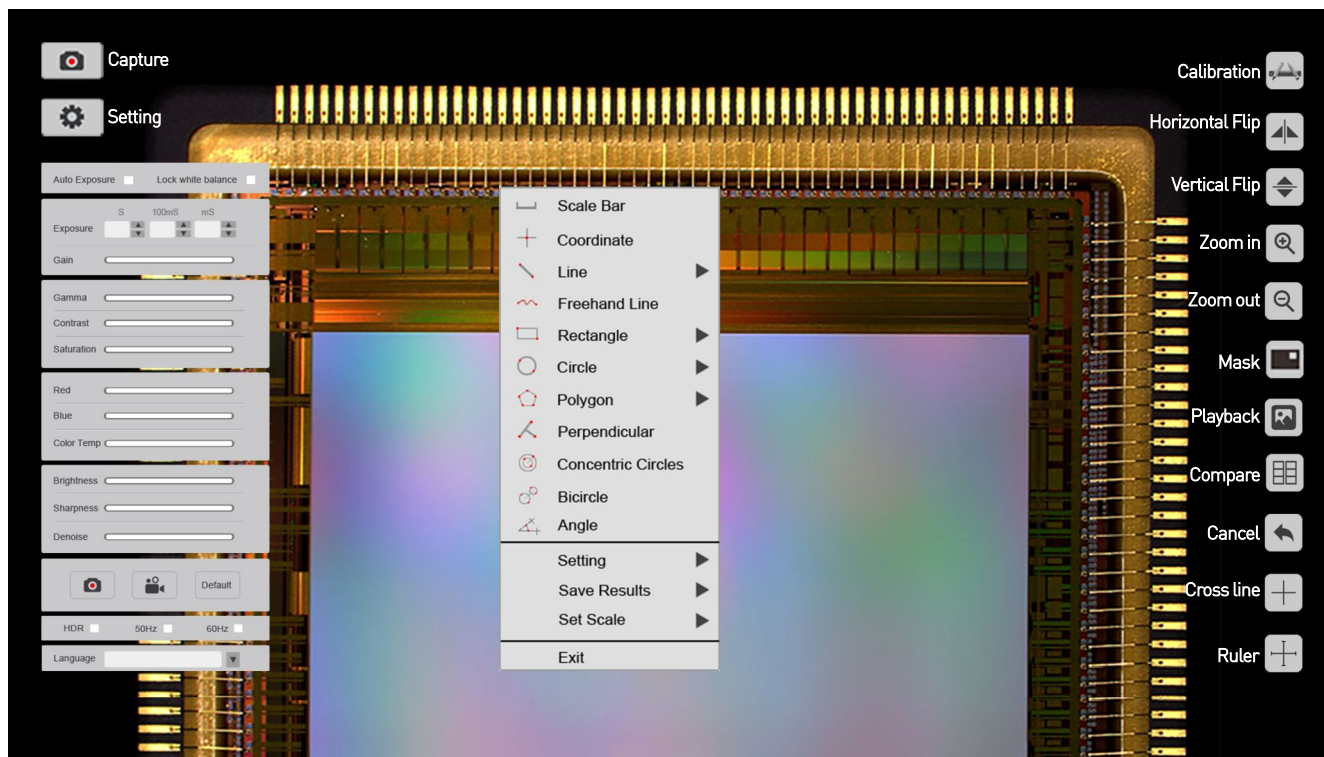


## ○ Built-in Mouse Control

The significant innovation of TrueChrome is embedding the software inside the camera. Users can perform image capture processing-measurement-save-export functions through the mouse directly.

## ○ Professional Digital Image Measurement System

TrueChrome Metrics provides extremely powerful measurement functionalities including, freehand line, rectangle, polygon, circle, bicircle, angle, point-line distance and much more, realizing precise measurement of point and line distance, angle, length, circumference and area. Three different length units of millimeter, centimeter, and micrometer are provided to meet various measurement requirements in different applications.





# Revolutionary PC computing imaging software Mosaic V2.1

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Unique from the cumbersome process of traditional technology to obtain images after processing, the revolutionary computing imaging software Mosaic V2.1 provides real-time image stitching and real-time depth of field fusion. This can automatically complete the image while the operator moves the stage - productivity at its best.

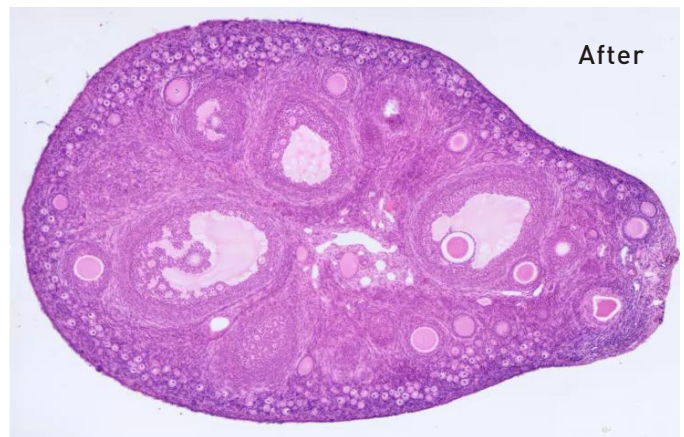
## ○ Real-time image stitching

Within a few seconds of moving the stage, Mosaic V2.1 can complete the whole process of panoramic stitching in real time, and it can be accurately and quickly stitched under different magnifications and arbitrary angles.

Sample: Mouse ovary section

Magnification: 10X ▶

Before



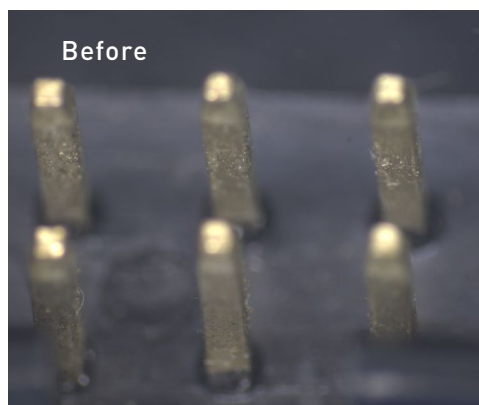
## ○ Real-time depth-of-field fusion

Rotating the focus ring to image different depth of field points, Mosaic V2.1 can then realize the depth of field expansion, full-length details at a glance, no more blurred images!

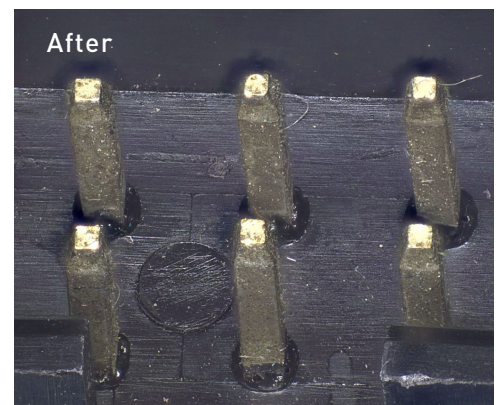
Sample: Circuit board pin

Magnification: 4.5X ▶

Before

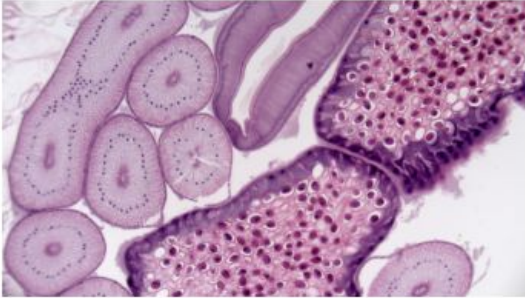


After



## The continuation of the TrueChrome

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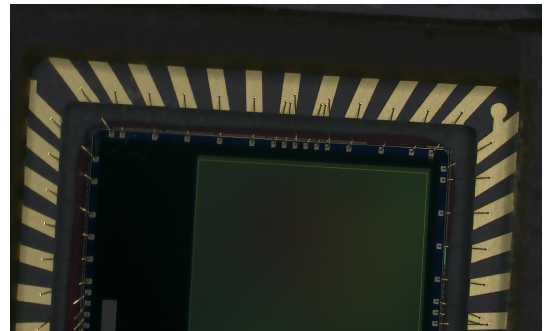
- Perfect color reproduction

TUCSEN's color processing is capable of a new level of precision, matches the monitor image to the eyepiece view, produces extremely-high color definition.

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- Fastest USB2.0 camera with 30 fps

With 30fps data transfer at an uncompressed resolution of 1920X1080, TrueChrome Metrics sets a precedent. Make it one of the fastest USB2.0 camera in the world.



- Tailored 1080P HD screen

In order to let users better feel the excellent quality of the Tucsen cameras, we specially customized a 1080P high definition display screen - Retina Screen, which perfectly matches the performance of TrueChrome camera, the up to 30fps transmission rate gives high fidelity, smooth performance

Note: Retina Screen is an optional accessory that users can choose to use.

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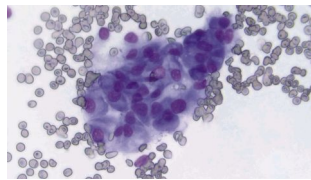
## Copyright >>

Tucsen is an authorized dopter of the international organization HDMI associate. We are the legal supplier of HDMI scientific cameras which represents the best stability and compatibility of Tucsen HDMI scientific cameras.



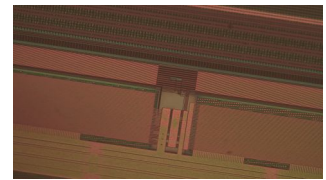
## Sample >> Applications

### Pathological analysis



Pathological analysis requires that the image color fidelity be 100% accurate, especially for digital imaging, it has great claims for the purple blue color rendition. With perfect performance for purple blue colors, TrueChrome Metrics ensures precise and accurate pathological images.

### Material qualification



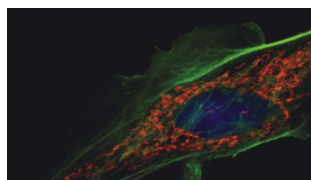
Industry applications highly require excellent clear and sharp images without any delay, up to 60fps high definition live preview from TrueChrome Metrics allows you to comfortably and efficiently perform quality inspection.

### Teaching



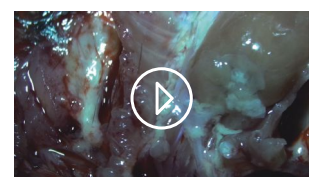
In teaching presentations, the lecturer can use a computer to set up a specimen and project the specimen images to a big screen for students to view. TrueChrome Metrics allows a dual live video stream to a PC and any imaging device with HDMI interface.

### Fluorescence imaging



When it comes to low light applications, it crucial to have a high sensitivity camera, with up to 10 seconds exposure capability. This means the TrueChrome Metrics is 300 times more sensitive than the other HDMI cameras in the market.

### Medical anatomy recording



Need to record the microsurgery procedures clearly and fluently? TrueChrome Metric's high definition with fast speed recording capability offers superb documentation at 1080P 30fps.

## Camera specification

Sensor	CMOS	Sensor Size	1/2.8"
Preview Resolution	2MP, 1920x1080	Capture Resolution	6MP, 3264x1836
Frame Rate	30fps @USB2.0 30fps @HDMI	Capture	SD card(16G)
Video Recording	30fps @PC 30fps @SD Card	Exposure Mode	Auto/Manual
Exposure Time	2ms~10s	White Balance	Auto/Manual
Setting	White Balance, Exposure Time, Noise Reduction, Gain, Gamma, WDR		
Built-in Software	Cloud 1.0 Ver	PC Software	Mosaic V2
Data Interface	USB2.0, SD, HDMI	Optical Port	Standard C-Mount
Optical Interface	Windows 7 / 8 / 10( 32 / 64bit ), Mac		
Camera Size	90.7x78x70.8(mm)	Camera Weight	448g

## Retina Screen Features

Resolution	1080P(1920x1080)	Display Type	IPS-Pro
Screen Size	11.6"	Aspect Ratio	16:09
Brightness	320cd/m2	Static Contrast Ratio	1000:01:00
HDMI Port	1	Power Supply Type	12V, 2A
Size	282.0x180.5x15.3(mm)	Weight	600(g)

## PC software features

Modular function configuration
Intelligent 12-bit ISP color reproduction
Real-time depth of field fusion (Option)
Real-time image stitching (Option)
Real-time fluorescence image synthesis and editing
HDR image synthesis
Micro-imaging-based intelligent automatic exposure
Intelligent flat field correction based on dynamic calculation
Smart measurement workflow
Implements multiple iterations of workflow execution
Supports single shot, delayed camera
Automatic video and delay video generation
Output format selection
User parameter group save and load
Dynamic \ static measurement
Layered measurement
Customize measuring gauges, layers, precision
Customize image naming, style, save location
Implements drawing: points, lines, rectangles, polygons, circles, arcs, angles
Data export as TXT or Excel
Report generation and printing

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# TrueChrome Serices

## HDMI High Speed Color Micro Camera

Camera built-in mouse control function, matches with HDMI dedicated HD display, to bring you a portable tour for scientific photography anywhere.

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# Built-in Mouse Control

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The TrueChrome series possess a perfect color reproduction capability, customers can perform the following through mouse in HDMI mode: capture, processing, measurement, save, export etc, quite convenient to operate without a computer. Users can choose the most suitable model based on different applications:

- TrueChrome AF
- TrueChrome Metrics
- HD Lite



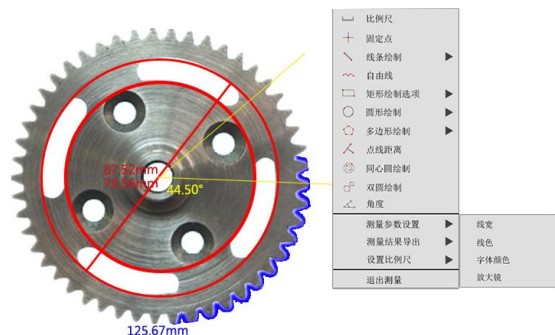
## TrueChrome AF Built-in autofocus

TrueChrome AF offers both continuous and single-shot autofocus modes. It also supports mouse wheel control for fine-tuning. Data transfer up to 60 frames per second enables users to get clear images with ease.



## The Essence of TrueChrome Metrics

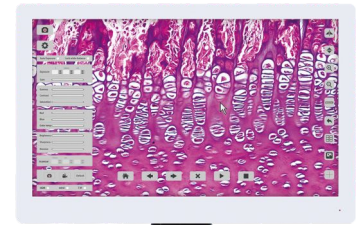
TrueChrome Metrics provides extremely powerful measurement functionalities including, freehand line, rectangle, polygon, circle, bicircle, angle, point-line distance and much more. Three different length units of millimeter, centimeter, and micrometer are provided to meet various measurement requirements in different applications.



# Tailor-made 1080P HD Monitor

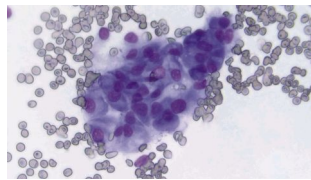
In order to let users better feel the excellent quality of the Tucsen cameras, we specially customized a 1080P high-definition display screen - Retina Screen, which perfectly matches the performance of TrueChrome camera.

Note: Retina Screen is an optional accessory that users can choose to use.



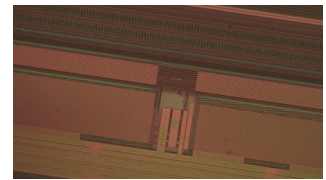
## Sample >> Applications

### Pathological analysis



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### Material qualification



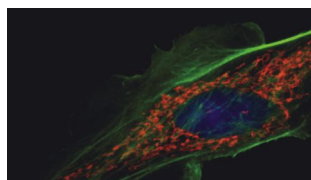
Industry applications highly require excellent clear and sharp images without any delay, up to 60fps high definition live preview from TrueChrome Metrics allows you to comfortably and efficiently perform quality inspection.

### Teaching



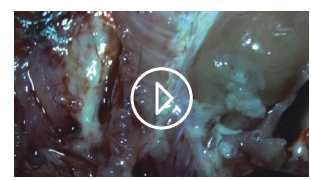
In teaching presentations, the lecturer can use a computer to set up a specimen and project the specimen images to a big screen for students to view. TrueChrome Metrics allows a dual live video stream to a PC and any imaging device with HDMI interface.

### Fluorescence imaging



When it comes to low light applications, it crucial to have a high sensitivity camera, with up to 10 seconds exposure capability. This means the TrueChrome Metrics is 300 times more sensitive than the other HDMI cameras in the market.

### Medical anatomy recording



Need to record the microsurgery procedures clearly and fluently? TrueChrome Metric's high definition with fast speed recording capability offers superb documentation at 1080P 30fps.

## Camera Specification

Model	TrueChrome AF	TrueChrome Metric	HD Lite
Sensor	CMOS	CMOS	CMOS
Sensor Size	1/2.8"	1/2.8"	1/2.5"
Preview Resolution	2MP, 1920x1080	2MP, 1920x1080	5MP, 2592x1944
Capture Resolution	6MP, 3264x1836	6MP, 3264x1836	5MP, 2592x1944
Frame Rate	35fps @USB2.0 60fps @HDMI	30fps @USB2.0 30fps @HDMI	15fps @USB2.0 15fps @HDMI
Capture	SD card(16G)	SD card(16G)	SD card(8G)
Video Recording	30fps @SD 30fps @PC	30fps @SD 30fps @PC	15fps @SD 15fps @PC
Exposure Mode	Auto/Manual	Auto/Manual	Auto/Manual
Exposure Time	2ms~10s	2ms~10s	2ms~10s
White Balance	Auto/Manual	Auto/Manual	Auto/Manual
Setting	White Balance,Exposure Time,Noise,Reduction, Gain,Gamma,WDR	White Balance,Exposure Time,Noise,Reduction, Gain,Gamma,WDR	White Balance,Exposure Time,Noise,Reduction, Gain,Gamma,WDR
Built-in Software	Cloud 1.0 Ver	Cloud 1.0 Ver	Cloud 1.0 Ver
PC Software	Mosaic V2	Mosaic V2	Mosaic V2
Data Interface	USB2.0,SD,HDMI	USB2.0, SD, HDMI	USB2.0, SD, HDMI
Optical Interface	Windows 7/8/10(32/64bit), Mac	Windows 7/8/10(32/64bit), Mac	Windows 7/8/10(32/64bit)
Optical Port	Standard C-Mount	Standard C-Mount	Standard C-Mount
Camera Size	90.7x78x70.8(mm)	90.7x78x70.8(mm)	90.7x74.5x67.2(mm)
Camera Weight	460g	448g	272g

## Retina Screen Features

Display Resolution	1080P(1920x1080)	Display Type	IPS-Pro
Screen Size	11.6 inch	Aspect Ratio	16:09
Brightness	320 cd/m2	Static Contrast Ratio	1000:01:00
HDMI Port	1	Power Supply Type	12V, 2A
Size	282.0x180.5x15.3 (mm)	Size & Weight	600g

## System Components

One screen with brackets

One camera (with SD card)

Five butterfly screws

HDMI L shaped adapter

12V/2A power adapter

Y power splitter cable

2m HDMI cables

0.5m HDMI cables

USB mouse and cable



Note: It is recommended to use the TrueChrome camera combo kit with complete accessories and plug and play.

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E-mail: [support@tucsen.com](mailto:support@tucsen.com)





# TrueChrome AF

HDMI Autofocus Color Microscope Camera

Built-in mouse control for autofocus and image measurement operations

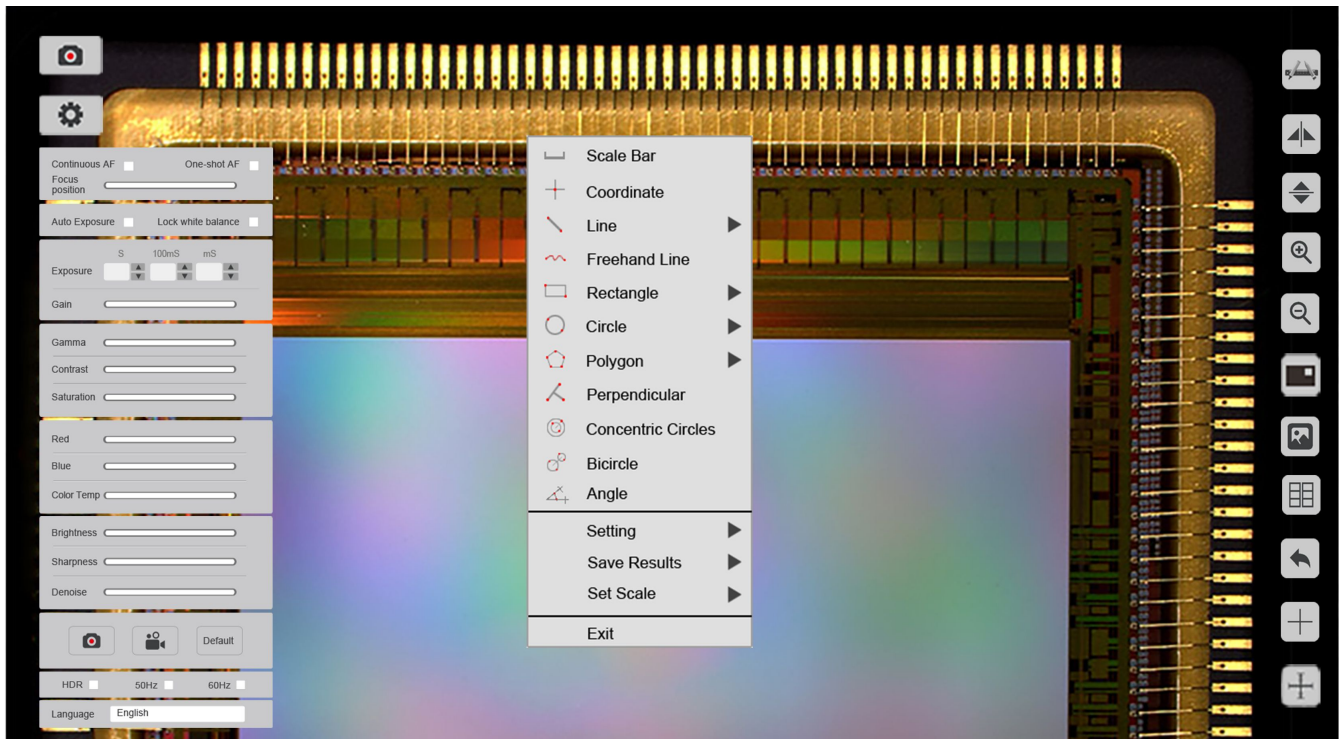
Compatible with Mosaic V2.1 Computational Imaging Software

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## Built-in mouse control for autofocus and image measurement operations



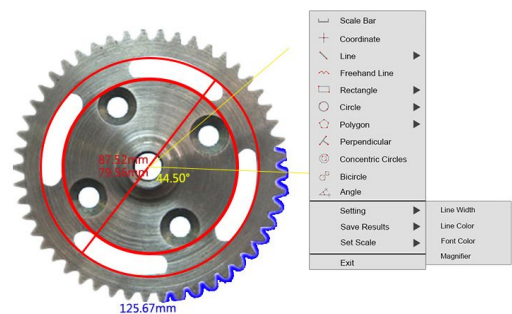
### ○ An unprecedented high-speed focusing experience

TrueChrome AF offers both continuous and single-shot autofocus modes. It also supports mouse wheel control for fine-tuning. Data transfer up to 60 frames per second enables users to get clear images with ease.



### ○ Professional digital image measurement system

TrueChrome AF provides extremely powerful measurement functionalities including, freehand line, rectangle, polygon, circle, bicircle, angle, point-line distance and much more. Three different length units of millimeter, centimeter, and micrometer are provided to meet various measurement requirements in different applications.

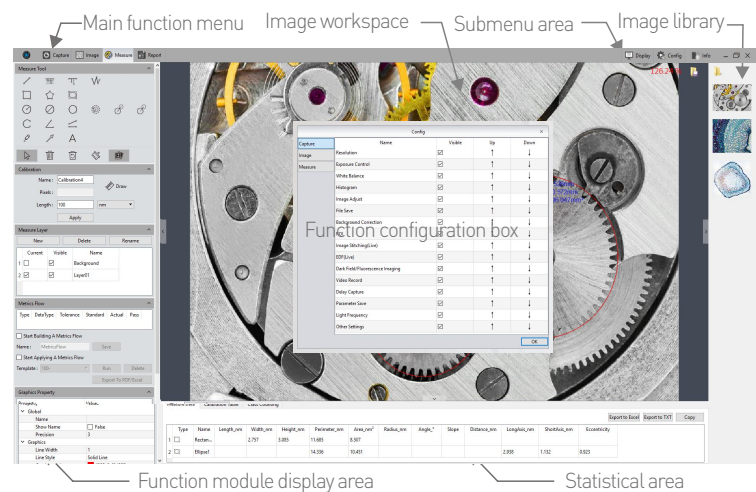


# Revolutionary PC computing imaging software Mosaic V2.1

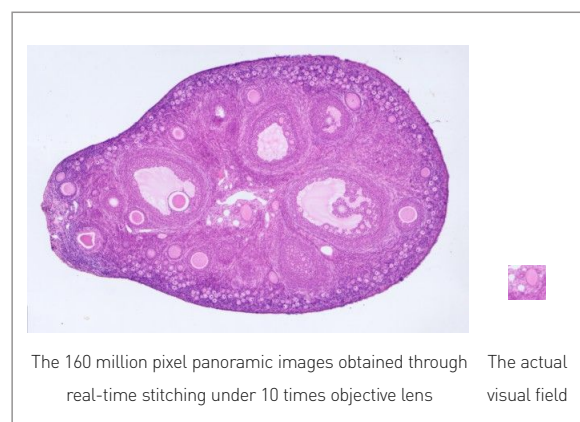
Fast, efficient and worry-free is the core design concept of Mosaic V2.1 software. It adopts a new image "shooting-processing-measurement-reporting" function, modular design, and integrates various intelligent image processing algorithms from Tucsen. It is dedicated to providing users with more simple operation modes and improve work efficiency in all circumstances.

## ○ Custom function module

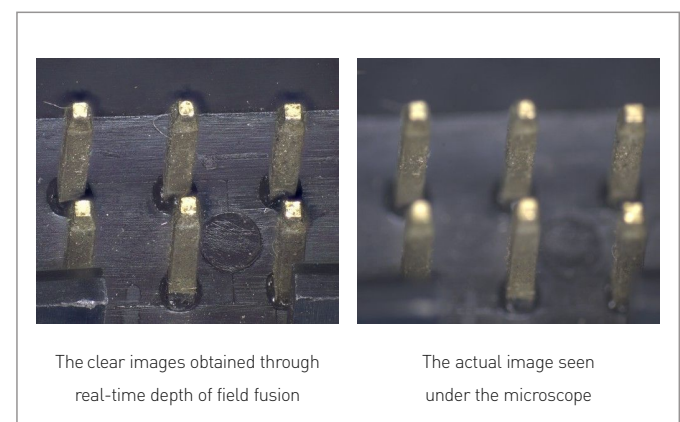
- ① Autofocus and fine-tuning operations
- ② Intelligent image capture and processing
- ③ Efficient measurement and attribute editing
- ④ Reports are automatically created and modified



## ○ Real-time image stitching



## ○ Real-time depth-of-field fusion



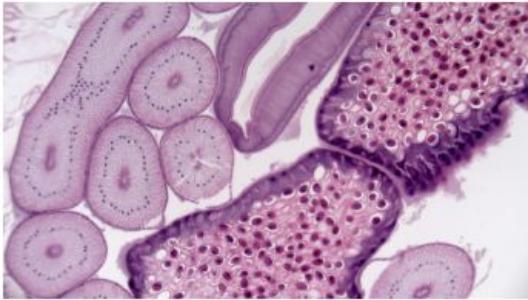
It can generate large-sized mosaic images in a few seconds while moving the stage, which is light, smooth and worry-free!

Turning the focus ring to capture different depth of field points while generating clear depth of field images, fast, accurate and efficient.



## The continuation of the TrueChrome

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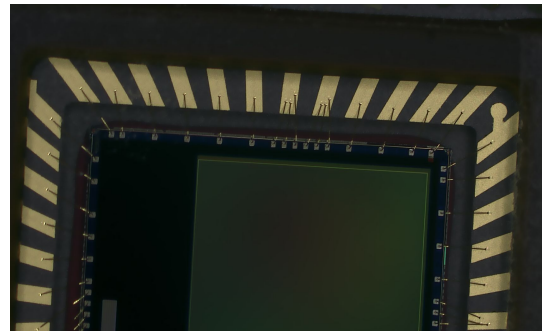
- Perfect color reproduction

TUCSEN's color processing is capable of a new level of precision, matches the monitor image to the eyepiece view, produces extremely-high color definition.

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- Fastest USB2.0 camera with 30 fps

With 30fps data transfer at an uncompressed resolution of 1920X1080, TrueChrome AF sets a precedent. Make it one of the fastest USB2.0 camera in the world.



- Tailored 1080P HD screen

In order to let users better feel the excellent quality of the Tucsen cameras, we specially customized a 1080P high definition display screen - Retina Screen, which perfectly matches the performance of TrueChrome camera.

Note: Retina Screen is an optional accessory that users can choose to use.

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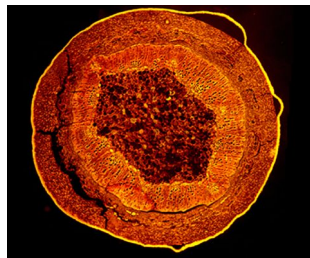
## Copyright >>

Tucsen is an authorized dopter of the international organization HDMI associate. We are the legal supplier of HDMI scientific cameras which represents the best stability and compatibility of Tucsen HDMI scientific cameras.



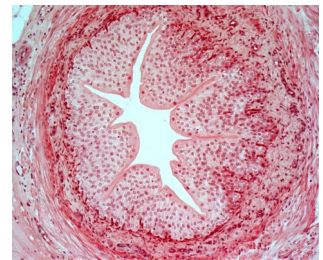
## Sample >> Applications

Fluorescence  
microscope



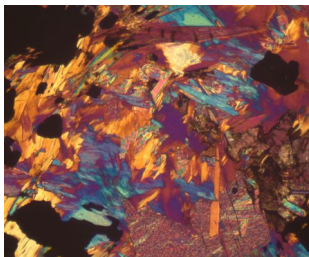
Plant stem section, 10X

Biological  
microscope



Blood vessel, 20X

Polarizing  
microscope



Rock section, 20X

Metallographic  
microscope



PCB board, 5X

Stereoscopic  
microscope



Screw hole, 4.5X

## Camera specification

Sensor	CMOS	Sensor Size	1/2.8"
Preview Resolution	2MP, 1920x1080	Capture Resolution	6MP, 3264x1836
Frame Rate	60fps @HDMI 35fps @USB2.0	Capture	SD card(16G)
Video Recording	30fps @PC 30fps @SD	Exposure Mode	Auto/Manual
Exposure Time	2ms~10s	White Balance	Auto/Manual
Setting	White Balance,Exposure Time,Noise,Reduction,Gain,Gamma,WDR		
Built-in Software	Cloud 1.0 Ver	PC Software	Mosaic V2
Data Interface	USB2.0,SD,HDMI	Optical Port	Standard C-Mount
Optical Interface	Windows 7 / 8 / 10 ( 32 / 64bit ), Mac		
Camera Weight	460g	Camera Size	90.7x78x70.8(mm)

## Retina Screen Features

Resolution	1080P(1920x1080)	Display Type	IPS-Pro
Screen Size	11.6"	Aspect Ratio	16:09
Brightness	320cd/m2	Static Contrast Ratio	1000:01:00
HDMI Port	1	Power Supply Type	12V, 2A
Size	282.0x180.5x15.3(mm)	Weight	600[g]

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## PC software features

Modular function configuration
Intelligent 12-bit ISP color reproduction
Real-time depth of field fusion
Real-time image stitching
Real-time fluorescence image synthesis and editing
HDR image synthesis
Micro-imaging-based intelligent automatic exposure
Intelligent flat field correction based on dynamic calculation
Smart measurement workflow
Implements multiple iterations of workflow execution
Supports single shot, delayed camera
Automatic video and delay video generation
Output format selection
User parameter group save and load
Dynamic \ static measurement
Layered measurement
Customize measuring gauges, layers, precision
Customize image naming, style, save location
Implements drawing: points, lines, rectangles, polygons, circles, arcs, angles
Data export as TXT or Excel
Report generation and printing

