

## Camera Overview

For Materials Science Microscopes

More Detail, Faster Inspections



# Passionate about Imaging

Versatility, performance, and precise color reproduction are characteristics all Olympus microscope cameras share. We're committed to providing innovative cameras that capture the clear, reliable images critical to every microscopist. Our comprehensive range of digital cameras for materials science are optimized for various applications, so you can choose the one that works best for you.

## Powerful Cameras for Everyday Industrial Microscopy Applications

### DP28 and DP23 Digital Microscope Cameras

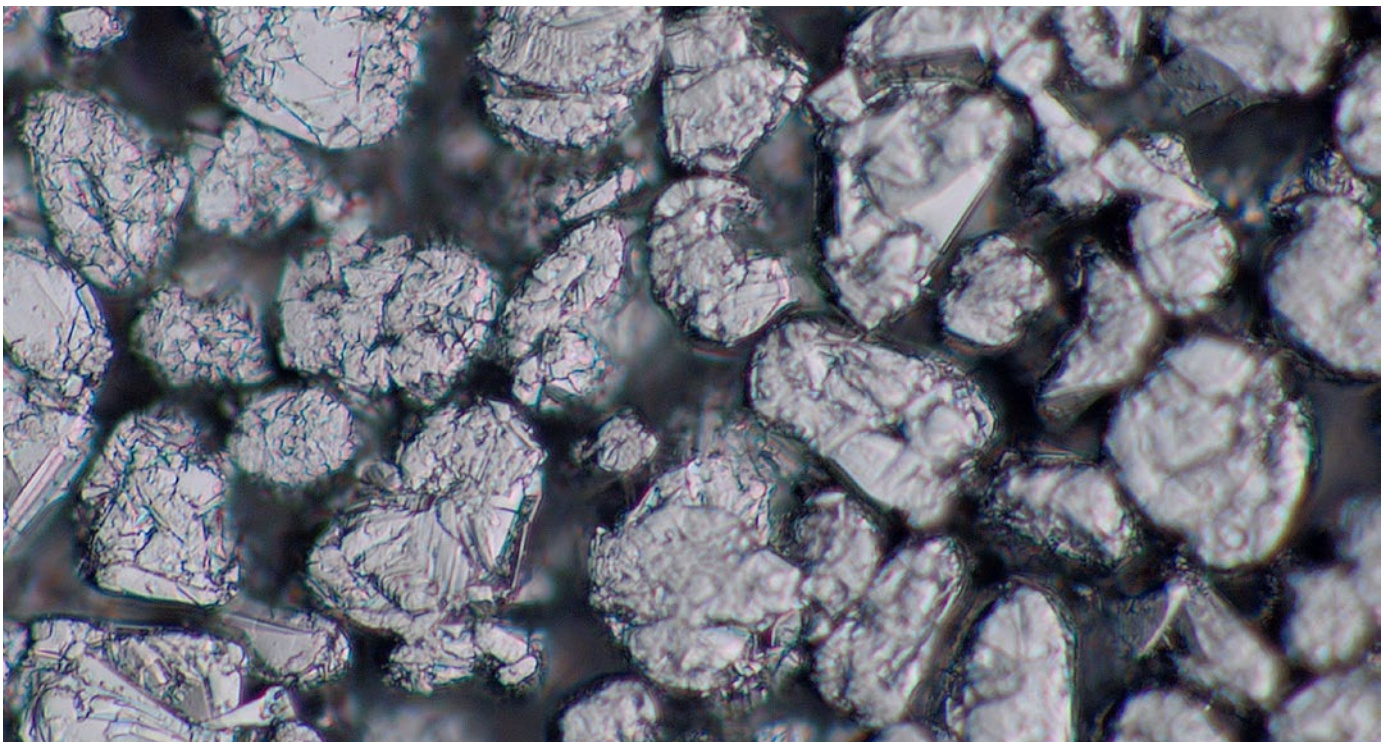
#### Reliable Data from Images You Can Trust

The DP28 and DP23 cameras share a suite of smart features and precise color accuracy that make your microscopy imaging easier. The DP28 camera offers up to 4K resolution across a wide field of view to provide high-resolution images of your inspection samples that are free from artifacts. If resolution isn't your focus, the DP23 camera balances advanced functions to perform almost any industrial imaging application.

## Efficient Inspections with Clear, Distortion-Free Images

#### High-Quality and High-Resolution 4K Images **DP28**

View your samples in stunning 4K resolution to see even the finest details under low magnification.





Comfortably View Images on Screen **DP28**

Whether you’re showing your samples on a monitor or a projector, the images on the screen look exactly as they appear through the microscope’s eyepieces, so you know you’re not missing details or data. The DP28 camera’s 8.9-megapixel CMOS sensor and global shutter capture full-HD-quality images at 60 fps, so your samples render clearly. If you move your sample or the microscope stage, the image is displayed with no wobbling or tearing artifacts, so you can scan samples even faster.

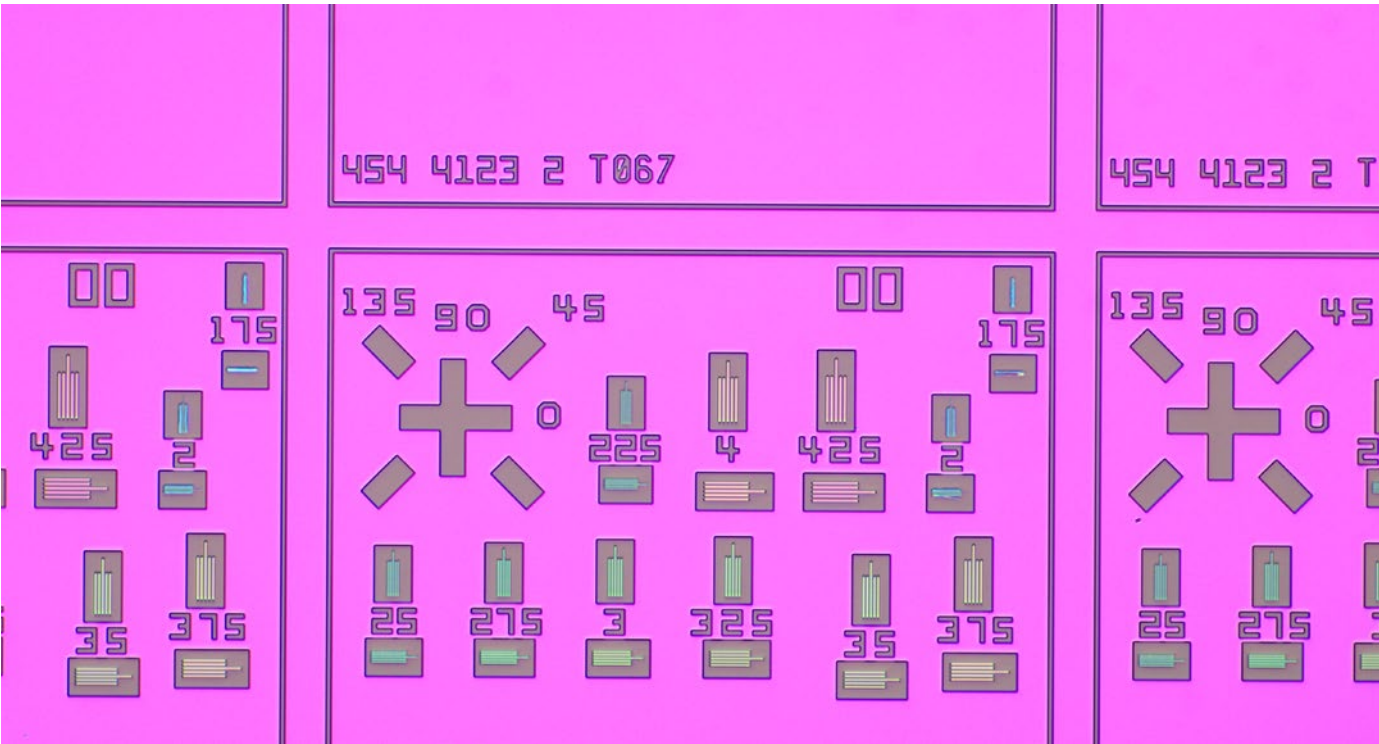
The Right Balance of Resolution and Speed **DP23**

The 6.4-megapixel DP23 camera can capture full-HD-quality images at up to 60 frames per second (fps), so you can obtain images with the level of detail you need quickly and efficiently.

Accurate Color Reproduction Improves Inspection Quality

**DP23** **DP28**

The DP28 and DP23 cameras provide reliable color accuracy. Dedicated ICC profiles show your samples in their natural colors to more easily spot defects.



# Easy to Use with Minimal Training

## High Frame Rate for Smooth Navigation in Low Light

DP23

DP28

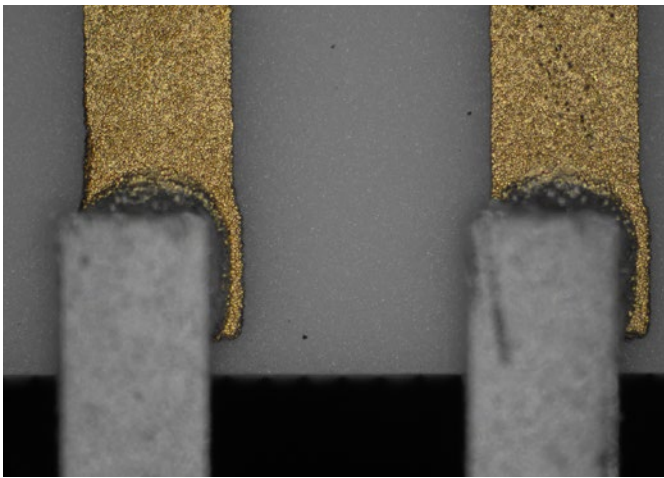
The Fast Live function provides a consistently high frame rate during long-exposure imaging, so your image remains smooth when scanning samples, even under low light conditions.

## Confirm that Your Measurement Area Is in Focus

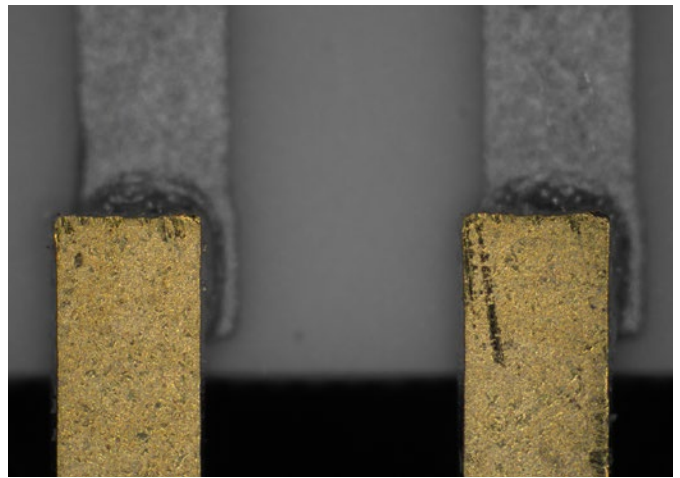
DP23

DP28

Make sure that your measurement area is properly focused using the Focus Peaking function.\* The software shows a map of the sample with the in-focus areas in color and the out-of-focus areas in grayscale.



Focused on the lower layer

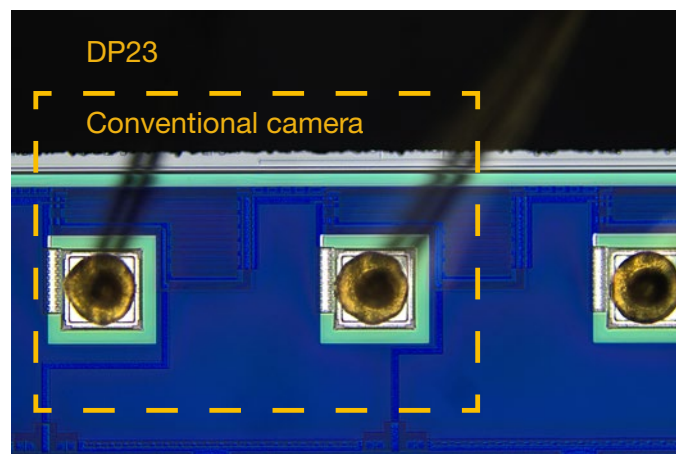


Focused on the upper layer

## Find Defects Fast

DP23

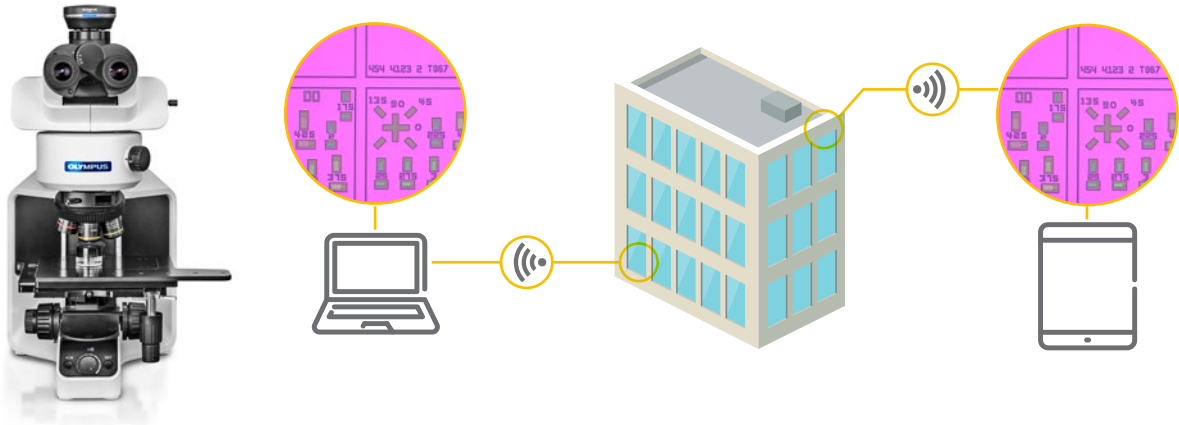
With a field of view up to FN25, you can spot defects faster since you can see more of your sample at a glance. This means you spend less time scanning around the sample during the inspection and more time evaluating what you're seeing on the screen. Avoid the time-consuming process of stitching multiple smaller images together, so you can be more productive and efficient.



The DP23 camera's field of view when used with the 0.35X TV adaptor

\*Available in OLYMPUS Stream software.

# Efficient Workflow



## Easily Share Images Outside Restricted/High-Security Areas

DP23

DP28

All your critical data—images, annotations, and analytics—can be displayed and shared together locally or remotely using the camera's AOU software with network controller. This provides a much simpler solution than relying on email attachments to discuss images and results with colleagues. And thanks to support for network security protocols such as NIST and GDPR along with antivirus support, you can share your data safely.\*

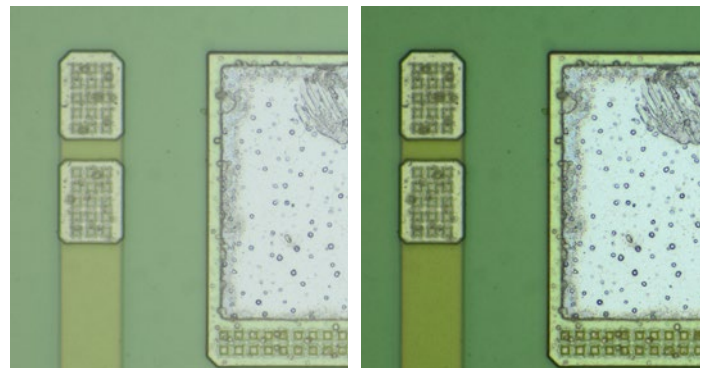
For complex or advanced image analysis, both cameras are compatible with OLYMPUS Stream software to further streamline your workflow.

## Capture Clear Images from Dim Samples

DP23

DP28

When making observations using polarization, the High Contrast mode enables easier image acquisition with a high signal-to-noise ratio so that you can capture high-quality images from dim samples.



Without contrast mode vs with contrast mode

## Save Valuable Work Space

DP23

DP28

You can attach the camera's stand-alone module to the back of a monitor using a VESA adaptor to keep it off the desk and out of the way.



\*Antivirus software is optional.

# Advanced Digital Camera for Challenging Applications

## DP74 Digital Microscope Camera

### Intelligent Imaging for an Improved Workflow

The DP74 color camera supports advanced functions to capture high-quality images. It's optimized for fluorescence imaging with powerful noise reduction and a high level of gain sensitivity.

### Fast Image Acquisition, Fast Inspections

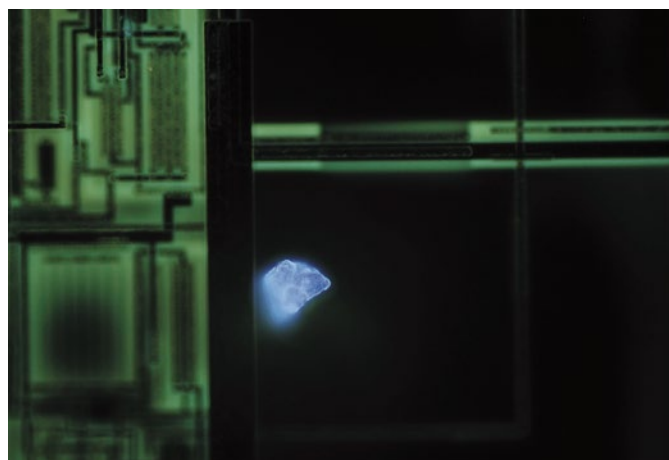
High-definition 1920 × 1200-pixel live images can be displayed at 60 fps, enabling clear observation and real-time focusing with no image deterioration. During inspections, the camera renders clear images of microstructures, such as fine patterns on wafers or the surfaces of new materials. When using features such as multiple image alignment (MIA) to acquire panoramic images or extended focus imaging (EFI) to capture an all-in-focus image over multiple Z-levels, the camera's high frame rate enables users to complete their imaging tasks quickly and efficiently.

### Detect Subtle Flaws

A sample's appearance can vary depending on the quality of the material, surface conditions, or illumination methods. To show samples accurately, the camera's Live High Dynamic Range (HDR) combines several images taken at different exposures to correct for brightness differences on the sample's surface. Live HDR provides high-fidelity images that show not only textures but also flaws and defects that were previously undetectable. Glare is also reduced for more comfortable observation.

### Observe Faint Fluorescence

A CMOS drive system, low-noise electronics, and optimized image processing enable you to capture images across a broad range of signal gain corresponding to ISO200-6400 standards. The camera's advanced technologies enable the CMOS sensor to capture sample details using multiple observation methods such as reflected light, darkfield, or fluorescence.



### High-Resolution Images Under Low Magnification

Using 3-CMOS mode, a 2.3-megapixel CMOS is combined with pixel-shifting technology, resulting in a 20.7-megapixel resolution. In addition to conventional 3 × 3 pixel shifting of one color per pixel, the DP74 camera's 3-CMOS pixel shift mode enables three-color image resolution (RGB) within a single pixel to further enhance resolution.

# See Fine Details Under Low Magnification

## SC180 Digital Microscope Camera

### Capture More Detail

If you prefer a camera with high resolution and 4K capabilities but don't need the highest levels of field of view, frame rate, and signal-to-noise ratio, consider the SC180 digital camera.

With almost four times more pixels than a standard microscope camera, the 18-megapixel SC180 camera's high resolution enables you to capture images with a high level of detail, so you can zoom in to view fine structures using low-power objectives.

### Advanced Image Tools

The camera supports the advanced Olympus imaging tools found in DP series cameras, including:

- Olympus Smart Image Averaging
- Automatic white balance
- Focus peaking
- Fast Live

### Good Color Reproduction

Integrated shading correction and a sharpness filter help you view color details and subtle variations in your samples.

### Affordable 4K Live Images

4K live images enable you to engage colleagues by showing detailed images on a screen or monitor. When showing a live image, you can pan across the sample and zoom in to view fine details.

## Microscope Digital Camera Specifications

Category	Our highest performance camera	Cost-effective 4K resolution	Exceptional color fidelity
Digital camera	DP74	SC180	DP28 <sup>*1</sup>
Resolution (megapixels)	20.7	18.0	8.9
Sensor size and type	1/1.2 in. Color CMOS	1/2.3 in. Color CMOS	1 in. Color CMOS
Shutter type	Global shutter	Rolling shutter	Global shutter
Pixel size (µm)	5.86 × 5.86	1.25 × 1.25	3.45 × 3.45
Exposure times	39 µs–60 s	22 µs–1 s	27 µs–15 s
Dynamic range <sup>*2</sup>	12-bit	12-bit	10-bit
Live frame rates <sup>*3</sup>	60	59 to 10.5	64 to 32
Dimensions (Ø × H)	116 mm × 87.7 mm (4.6 in. × 3.5 in.)	58 mm × 32 mm (2.3 in. × 1.3 in.)	76.7 mm × 37.3 mm (3 in. × 1.5 in.)
Weight (approx)	1100 g (38.8 oz)	188 g (6.6 oz)	380 g (13.4 oz)
3CMOS mode	Available	—	—
LiveHDR	Available	—	—
Camera adaptor	C-mount	C-mount	C-mount
Control box	—	—	DP2-AOU
Camera I/F	PCI Express × 4 Rev.2.0 or later Compatible with low profiles	USB 3.0	USB 3.1

<sup>\*1</sup> The DP28 may also be used as a stand-alone model.  
<sup>\*2</sup> Analog-to-digital converter. The camera's actual bit depth depends on the software used.  
<sup>\*3</sup> Frame rate depends on the condition of your PC and/or software.



# Microscope Digital Camera Specifications

Category	Entry-level camera	Compact stand-alone camera	Monochrome imaging	For IR observation
Digital camera	LC30	DP23	XM10	XM10IR
Resolution (megapixels)	3.1	6.4	1.4	1.4
Sensor size and type	1/1.2 in. Color CMOS	1/1.8 in. Color CMOS	2/3 in. Monochrome CCD	2/3 in. Monochrome CCD
Shutter type	Rolling shutter	Rolling shutter	Global shutter	Global shutter
Pixel size (μm)	3.2 × 3.2	2.4 × 2.4	6.45 × 6.45	6.45 × 6.45
Exposure times	57 μs—750 ms	13 μs – 15 s	100 μs—160 s	100 μs—160 s
Dynamic range <sup>*1</sup>	10-bit	10-bit	14-bit	14-bit
Live frame rates <sup>*2</sup>	49 to 10	30 to 25	80 to 15	80 to 15
Dimensions (Ø × H)	— <sup>*3</sup>	76.7 mm × 37.3 mm (3 in. × 1.5 in.)	86 mm × 48 mm (3.4 in. × 1.9 in.)	86 mm × 48 mm (3.4 in. × 1.9 in.)
Weight (approx)	41 g (1.4 oz)	380 g (13.4 oz)	420 g (14.8 oz)	420 g (14.8 oz)
3CMOS mode	—	—	—	—
LiveHDR	—	—	—	—
Camera adaptor	C-mount	C-mount	C-mount	C-mount
Control box	—	DP2-AOU	—	—
Camera I/F	USB 2.0	USB 3.1	IEEE 1394a	IEEE 1394a

\*1 Analog-to-digital converter. The camera's actual bit depth depends on the software used.

\*2 Frame rate depends on the condition of your PC and/or software.

\*3 Unlike other cameras, the LC30 is not cylindrical. Dimensions (H × W × H): 48.6 mm × 44 mm × 31 mm (1.9 in. × 1.7 in. × 1.2 in.)

	PC connection	Stand-alone
Image size	3088 × 2076 (full resolution)	3088 × 2076 (full resolution)
	2072 × 2072 (square)	2072 × 2072 (square)
	1544 × 1038 (sub-sampling 2 × 2—high speed)	1544 × 1038 (sub-sampling 2 × 2—high speed)
	1544 × 1038 (binning 2 × 2—high sensitivity)	1544 × 1038 (binning 2 × 2—high sensitivity)
	1920 × 1080 (full HD)	1920 × 1080 (full HD)
Live image display (frame rate)	45 fps (full resolution), 58 fps (square), 59 fps (sub-sampling 2 × 2), 59 fps (binning 2 × 2), 60 fps (full HD)	30 fps (full resolution), 43 fps (square), 59 fps (sub-sampling 2 × 2), 59 fps (binning 2 × 2), 60 fps (full HD)
Compatible image display	Depends on the PC's specifications.	3840 × 2160 4K UHD TV, 2560 × 1440 WQHD, 1920 × 1200 WUXGA, 1920 × 1080 FHD, 1680 × 1050 WSXGA+, 1440 × 900 WXGA+, 1366 × 768 FWXGA, 1280 × 854 HDTV (720p), 1600 × 1200 UXGA, 1280 × 1024 SXGA
Storage media	Depends on the PC's specifications.	Integrated storage device (SSD: 60 GB) External USB storage device PC connected to a network
Controller interface	USB3.1 Gen1	Display output: 2 × HDMI
		I/F: 4 × USB3.1 Gen1
		Wired LAN: 2 × LAN (1000BASE-T/100BASE-TX/10BASE-T)
		Serial port: RS-232C
		Audio: mic. input (monaural), phone jack
Scale display	Scale bar	Supported
	Info stamp	Document name, total magnification, objective magnification, zoom magnification
	Zooming magnification	10% to 1600%
Measuring function	According to OLYMPUS Stream software's specifications.	Measurement function count, distance between 2 points, polyline, 3-point circle, rectangle, 3-point angle, 4-point angle, perpendicular, area and perimeter of polygon, distance between 2 centers, ruler

Remote function	PC connection	Stand-alone
Optional license	Remote live view (NetCam)	Network solution (remote function) <sup>*1</sup>
	—	Antivirus software (white list type)
Web browser (client computer)	Microsoft Edge (chromium), Google Chrome, Safari	Microsoft Edge (chromium), Google Chrome, Safari

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