OLYMPUS

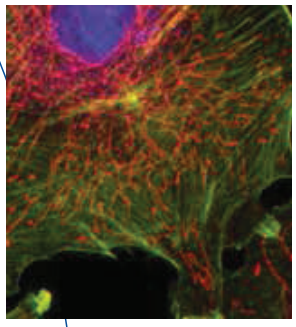
Your Vision, Our Future

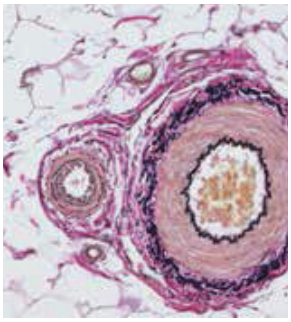
Digital cameras for microscopy

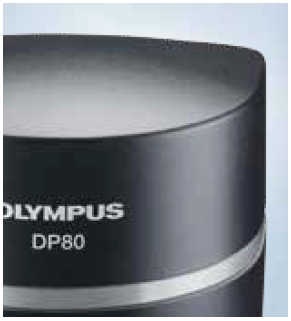
Camera overview

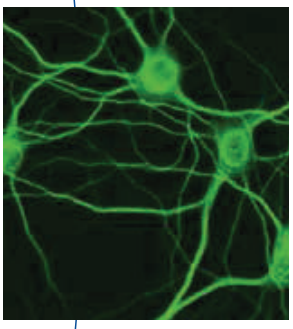
For Life Science Microscopes

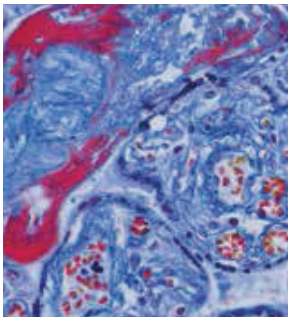
Versatility by design

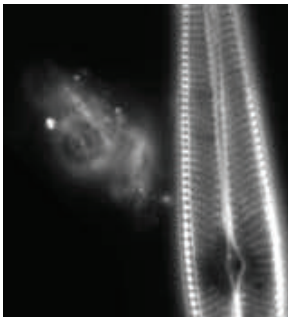






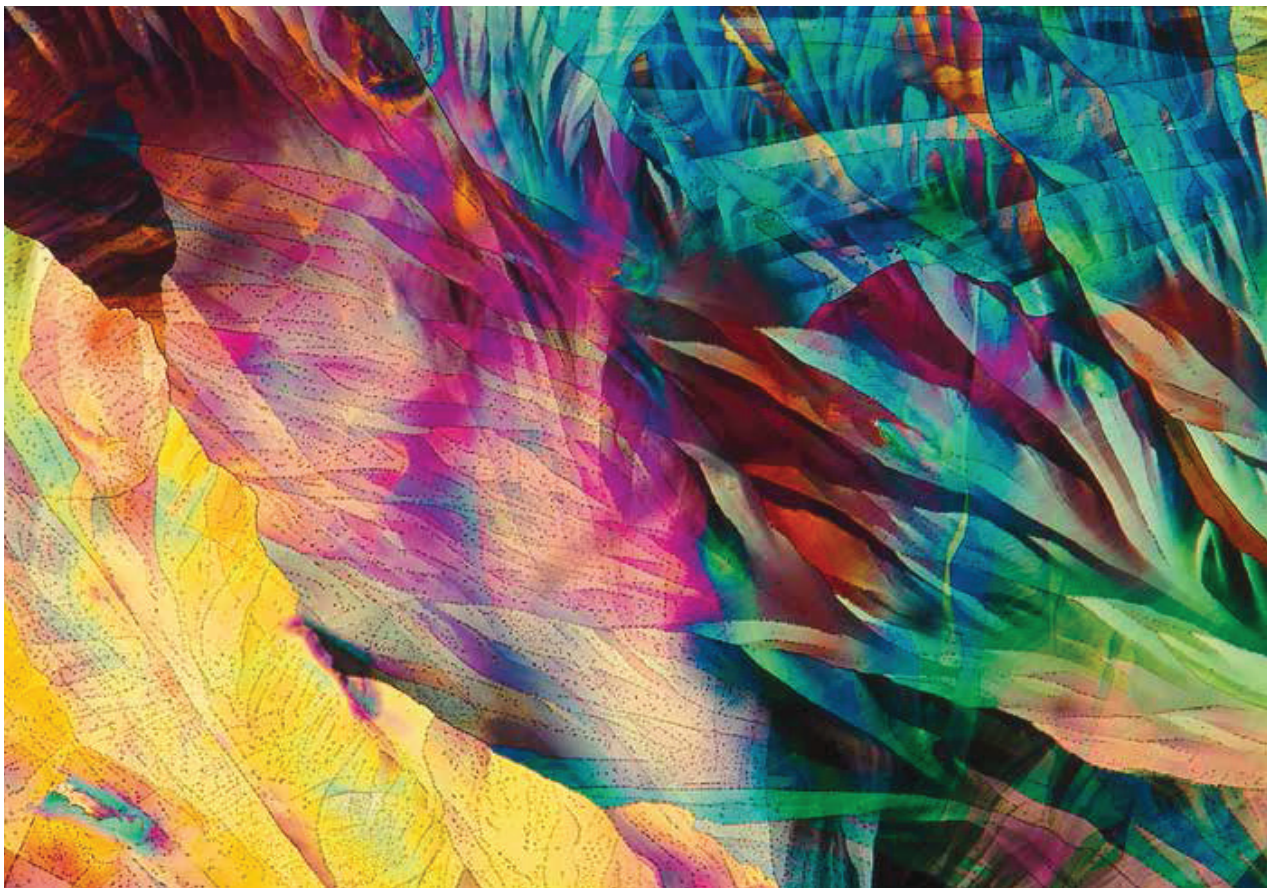






THE FLEXIBILITY OF CHOICE

Your project needs the right camera, and this is definitely true when it comes to matching your digital imaging requirements with your project work. Sometimes you'll want dazzling colour fidelity and at other times you'll need pixel-precise monochrome images. There are also those occasions when you would like a microscope camera that can do both. Add to this selection the ability to choose from a range of image sizes and resolutions, and the Olympus digital microscope camera range really does offer you the flexibility of choice.



Crystalline structures in polarised illumination.

STAYING IN THE SHADE

Colour management

Olympus' dedicated colour profiling technologies, implemented across the entire colour camera range, faithfully represent the sample colours, easily and automatically. At every stage, from the oculars up to the monitor, the "real" image of the sample will be displayed and recorded.

The importance of colour

Colour is one of the main methods of differentiating the relevant aspects of a sample. The colours in the sample could be natural or imposed by the research protocol, and the overall balance of the colours is often used to determine certain properties or even diagnose disease. Therefore it is essential that, as well as ensuring the optimum resolution and clarity, colours are captured with the right hue, saturation and intensity as seen through the eyepiece.

Highest fidelity

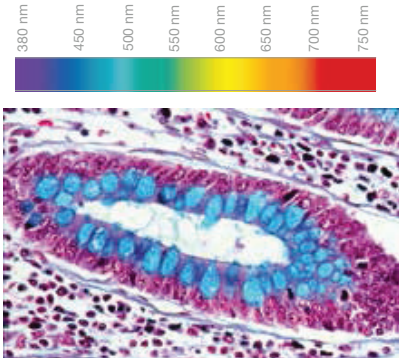
The unique Olympus colour profiles technologies are individually tuned for each colour camera model. International Color Consortium (ICC) reference profiles are used to govern the relationship between the colours at every stage of the imaging process. This ensures the best possible colour fidelity, from the specimen to the monitor, on any Olympus colour microscope camera.

Real-time, real colour

The Olympus colour profiling technologies are already at work in real-time, when you're looking at the live image. The best colour representation is then ensured from the beginning of your acquisition process, at the highest possible speed (patented technology): there will be no need to re-adjust your image after capture to compensate for colour mismatches.

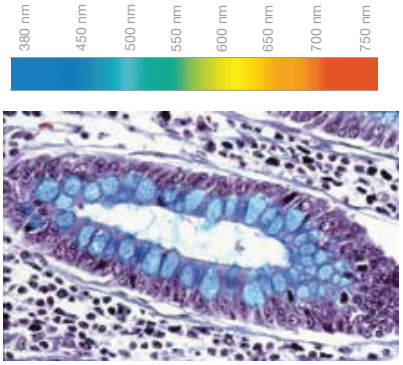
Colour profiles

Different components in an imaging system offer different "colour spaces", also termed "colour gamuts" by the International Color Consortium (ICC). Each component involved in colour reproduction is described by such a profile, and the resulting set of profiles is in turn used to achieve optimum colour reproducibility for the imaging system, based on human perception. Some Olympus colour cameras can also match the extended AdobeRGB colour space, for colour rendering at a professional level on supported monitors and printers.



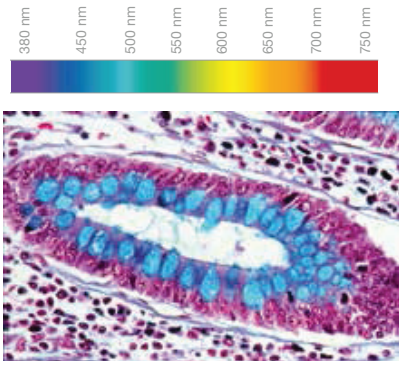
Human vision "optical spectrum" 380–750 nm: typical specimen as seen through human eyes on an Olympus microscope.

Camera sensor



Camera vision "optical spectrum" 380–750 nm: the same specimen "seen" by the sensor of a digital camera.

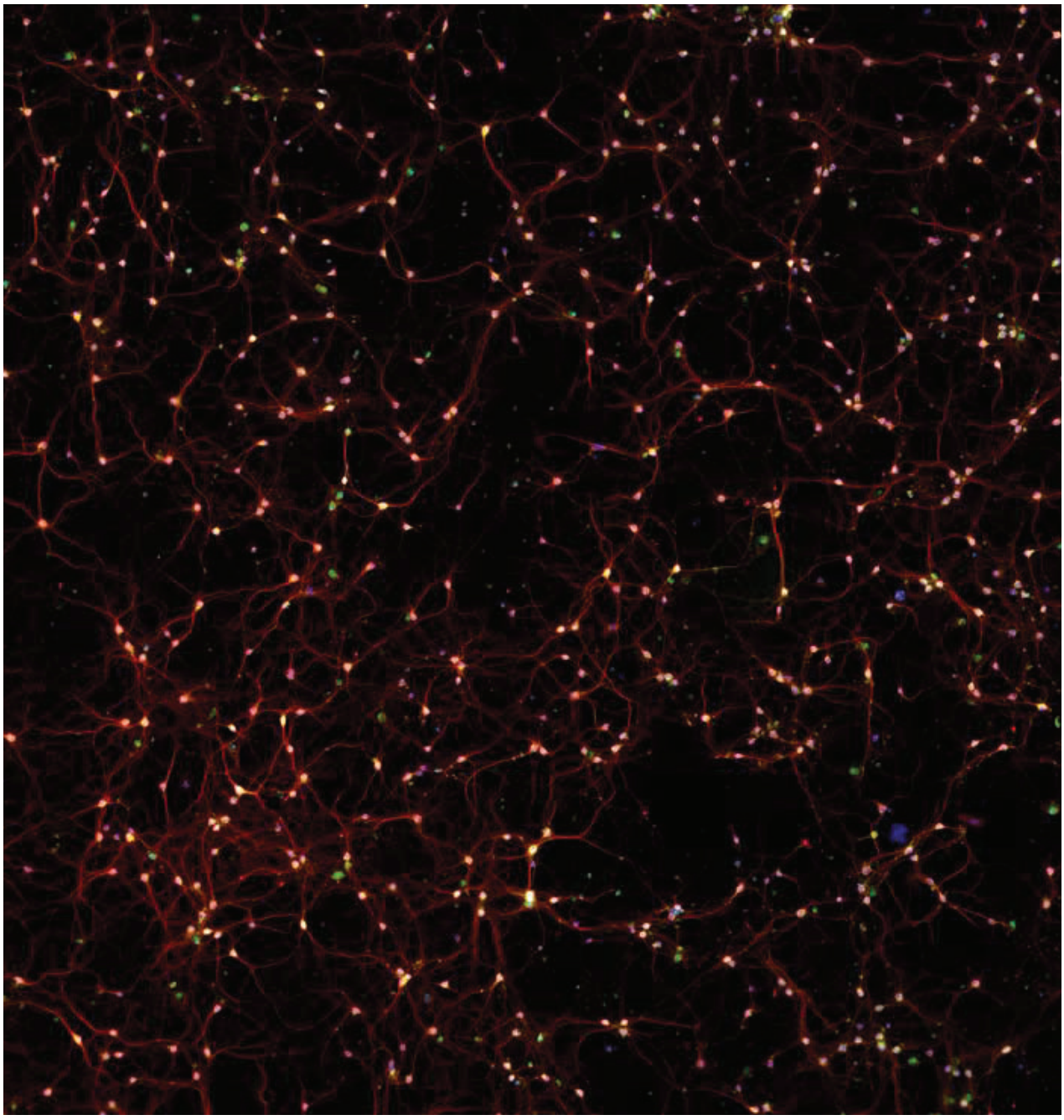
Olympus real-time colour profiles



Computer display "optical spectrum" 380–750 nm: monitor display of the image (after the application of the Olympus real-time colour profiles).

THE RIGHT ‘BLACK AND WHITE’

Even though fluorescence microscopy is intimately concerned with using the best combinations of excitation and emission spectra of dyes, the cameras used for fluorescence microscopy imaging must be designed to provide maximum sensitivity (capturing as many photons as possible) and clarity (as little background noise as possible). The Olympus monochrome camera offers an abundance of both of these qualities.



False colour image of a mouse neuronal tissue sample, stained with multiple fluorochromes and processed with Extended Focus Imaging (EFI) software function.

XM10

The XM10 offers all of the properties required to provide dependable fluorescence microscopy images: extremely high sensitivity, a cooled sensor chip, variable resolutions and an optional external trigger function.

Designed for fluorescence

At full resolution, the XM10 is ideal for all fluorescence acquisitions since it is extremely sensitive, low in electronic noise and supports long integration times of up to 160 seconds. The chip has a pixel size of 6.45 µm x 6.45 µm, which, in combination with the camera cooling, ensures that the XM10 is ideal for recording even the faintest fluorescence signals in your specimen.

The right tool for the job

The XM10 employs a sensor chip cooled to 10°C (at 25°C ambient temperature) with a 14 bit dynamic range and 15 fps (Frames Per Second) at full resolution. It offers three binning modes: 2x, 4x and 8x, resulting in increased sensitivity and excellent frame rates in live mode, which make it easier to focus and locate areas of interest within the viewfield while conserving highly sensitive fluorescence samples.

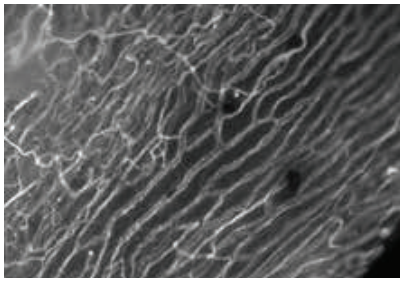
Four models

The four different versions of the XM10 are optimised with the user application in mind. Building on the capabilities of the basic XM10, the IR-extended version (XM10-IR) is ideal for the entire range of fluorescent dyes, including those emitting in the near-IR region such as CY5 and CY7. A specific model (XM10-T) guarantees precise image capture through the presence of an external trigger input, for integration into real-time acquisition systems such as Olympus xcellence and cellSens. The most advanced camera in this range (XM10-TIR) combines these advanced features to provide the user with the perfect camera for all levels of fluorescence microscopy.

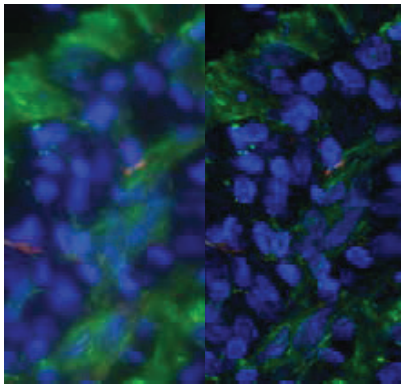
Easy to integrate

The Olympus XM10 makes a great addition to any microscopy system not only because of its great features, but also since it is easy to integrate, using a standard C-mount adaptor to connect to the microscope, and the high-speed data transfer and power capabilities of the FireWire™ interface. The XM10 is fully supported by the Olympus cellSens software, ensuring that whatever the application, the information is not only fully collected but properly analysed, processed and displayed. Ideal for a range of applications, the XM10 works in synergy with Olympus cellSens software to achieve excellent results in functions such as High Dynamic Range (HDR) acquisition, fast de-convolution and multi-fluorescence panoramic imaging. Maximum detail is resolved from even the most weakly emitting fluorescence sample.

XM10: 1.4 megapixel cooled monochrome camera.



Axon and dendrite morphogenesis during neuronal maturation task.



De-convolution (right image) of a gut tissue section stained with multiple fluorochromes.

Colour cameras

	DP21	DP26	SC30	SC100
Image sensor	Colour CCD	Colour CCD	Colour CMOS	Colour CMOS
Sensor type	Sony ICX 274 AQ	Sony ICX655AQ	MT9T001P12STC	Aptina MT9J003
Sensor size	1/1.8 inch	2/3 inch	1/2 inch	1/2.3 inch
Resolution (max.)	1,600 x 1,200 pixels	2,448 x 1,920 pixels	2,048 x 1,532 pixels	3,840 x 2,748 pixels
Pixel size	4.2 x 4.2 µm	3.45 x 3.45 µm	3.2 x 3.2 µm	1.67 x 1.67 µm
Binning	2x	2x	2x, 3x, 4x	2x
A/D Converter	12 bit	12 bit	10 bit	12 bit
Exposure time	from 50 µs to 8 s	from 50 µs to 8 s	from 60 µs to 1,75 s	from 0.12 ms to 14.6 s
Live frame rates	15 fps at 1,600 x 1,200	7 fps at 2,448 x 1,920 pixels	10 fps at 2,048 x 1,532 pixels	3 fps at 3,840 x 2,748 pixels
	27 fps at 800 x 600	16 fps at 1,224 x 960 pixels	28 fps at 1,024 x 768 pixels	12 fps at 1,920 x 1,374 pixels
		16 fps at 612 x 480 pixels	37 fps at 680 x 512 pixels	42 fps at 960 x 686 pixels
		31 fps at 320 x 240 pixels	49 fps at 508 x 384 pixels	
Cooling system	n/a	n/a	n/a	n/a
External trigger	n/a	n/a	n/a	n/a
Data transfer	FireWire™ IEEE 1394a/b	FireWire™ IEEE 1394a/b	USB 2.0	USB 2.0
Colour profiles	Olympus real-time colour profiles	Olympus real-time colour profiles	Olympus real-time colour profiles	Olympus real-time colour profiles
Partial readout	No	Yes	No	No
Remarks	· Stand-alone option	· Stand-alone option	· Convenient USB interface	· Single-shot 10 megapixel
	· Progressive readout	· Progressive readout		· Convenient USB interface
Operating system	Windows 8 32bit and 64bit	Windows 8 32bit and 64bit	Windows 7 32bit and 64bit	Windows 7 32bit and 64bit
	Windows 7 32bit and 64bit	Windows 7 32bit and 64bit		

	UC30	UC50	XC30	XC50
Image sensor	Colour CCD	Colour CCD	Colour CCD	Colour CCD
Sensor type	Sony ICX 252 AQ	Sony ICX 282 AQ	Sony ICX 252 AQ	Sony ICX 282 AQ
Sensor size	1/1.8 inch	2/3 inch	1/1.8 inch	2/3 inch
Resolution (max.)	2,080 x 1,544 pixels	2,588 x 1,960 pixels	2,080 x 1,544 pixels	2,576 x 1,932 pixels
Pixel size	3.45 x 3.45 µm	3.4 x 3.4 µm	3.45 x 3.45 µm	3.4 x 3.4 µm
Binning	2x, 3x	2x, 4x, 6x	2x, 3x	2x, 4x, 6x
A/D Converter	14 bit	14 bit	14 bit	14 bit
Exposure time	from 0.1 ms to 160 s	from 0.1 ms to 160 s	from 0.1 ms to 160 s	from 0.1 ms to 10 s
Live frame rates	7 fps at 2,080 x 1,544 pixels	9 fps at 2,588 x 1,960 pixels	7 fps at 2,080 x 1,544 pixels	9 fps at 2,588 x 1,960 pixels
	13.6 fps at 1,040 x 772 pixels	9 fps at 1,292 x 980 pixels	13.6 fps at 1,040 x 772 pixels	9 fps at 1,292 x 980 pixels
	25 fps at 688 x 514 pixels	33 fps at 640 x 480 pixels	25 fps at 688 x 514 pixels	33 fps at 640 x 480 pixels
		24.5 fps at 424 x 318 pixels		24.5 fps at 424 x 318 pixels
Cooling system	No	No	Peltier 10°C at 25°C ambient	Peltier 10°C at 25°C ambient
External trigger	No	No	No	No
Data transfer	FireWire™ IEEE 1394a	FireWire™ IEEE 1394a	FireWire™ IEEE 1394a	FireWire™ IEEE 1394a
Colour profiles	Olympus real-time colour profiles	Olympus real-time colour profiles	Olympus real-time colour profiles	Olympus real-time colour profiles
Partial readout	Yes	Yes	Yes	Yes
Remarks	—	—	· Low image noise with Peltier cooling	· Low image noise with Peltier cooling
Operating system	Windows 8 32bit and 64bit	Windows 8 32bit and 64bit	Windows 8 32bit and 64bit	Windows 8 32bit and 64bit
	Windows 7 32bit and 64bit	Windows 7 32bit and 64bit	Windows 7 32bit and 64bit	Windows 7 32bit and 64bit

Colour and monochrome cameras

	DP73	DP80	XC10	XM10 (monochrome only)
Image sensor	Colour CCD	Colour CCD + monochrome CCD	Colour CCD	Monochrome CCD
Sensor type	Sony ICX 274 AQ	Sony ICX 275 AQ + ICX 285 AL	Sony ICX 285 AQ	Sony ICX 285 AL
Sensor size	1/1.8 inch	2/3 inch (both sensors)	2/3 inch	2/3 inch
Resolution (max.)	4,800 x 3,600 pixels	4,080 x 3,072 pixels (colour)	1,376 x 1,032 pixels	1,376 x 1,032 pixels
		1,360 x 1,024 pixels (monochrome)		
Pixel size	4.4 x 4.4 µm	6.45 x 6.45 µm (both sensors)	6.45 x 6.45 µm	6.45 x 6.45 µm
Binning	2x	2x, 4x	2x, 4x	2x, 4x, 8x
A/D Converter	14 bit	14 bit (both sensors)	14 bit	14 bit
Exposure time	from 23 µs to 60 s	from 23 µs to 60 s	from 0.1 ms to 160 s	from 0.1 ms to 160 s
Live frame rates	15 fps at 1,600 x 1,200 pixels	15 fps at 1,360 x 1,024 pixels	15 fps at 1,360 x 1,024 pixels	15 fps at 1,376 x 1,032
	15 fps at 800 x 600 pixels	57 fps at 340 x 250 pixels	28 fps at 688 x 516 pixels	28 fps at 688 x 516
	27 fps at 800 x 600 (binning 2x)		50 fps at 344 x 258 pixels	50 fps at 344 x 258
				106 fps at 172 x 129
Cooling system	Peltier 10°C at 25°C ambient	Peltier 10°C at 25°C ambient	Peltier 10°C at 25°C ambient	Peltier 10°C at 25°C ambient
External trigger	Yes	Yes	Optional	Optional
Data transfer	PCIe dedicated controller	PCIe dedicated controller	FireWire™ IEEE 1394a	FireWire™ IEEE 1394a
Colour profiles	Olympus real-time colour profiles	Olympus real-time colour profiles	Olympus real-time colour profiles	Olympus real-time colour profiles
Partial readout	Yes	No	Yes	Yes
Remarks	· Extended dynamic range in DP73WDR model	· Fast motorised sensor switching · Pixel precise image overlay	· Highly sensitive both in colour and monochrome	· Optional Trigger and IR versions
	· Fine Detail Processing	· Dual CCD camera	· Optional Trigger and IR versions	
	· 3CCD mode	· Progressive readout		
	· Progressive readout	· Sensitive up to near-IR		
Operating system	Windows 8 64bit	Windows 8 64bit	Windows 8 32bit and 64bit	Windows 8 32bit and 64bit
	Windows 7 64bit	Windows 7 64bit	Windows 7 32bit and 64bit	Windows 7 32bit and 64bit

The manufacturer reserves the right to make technical changes without prior notice.

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