

pco.edge series

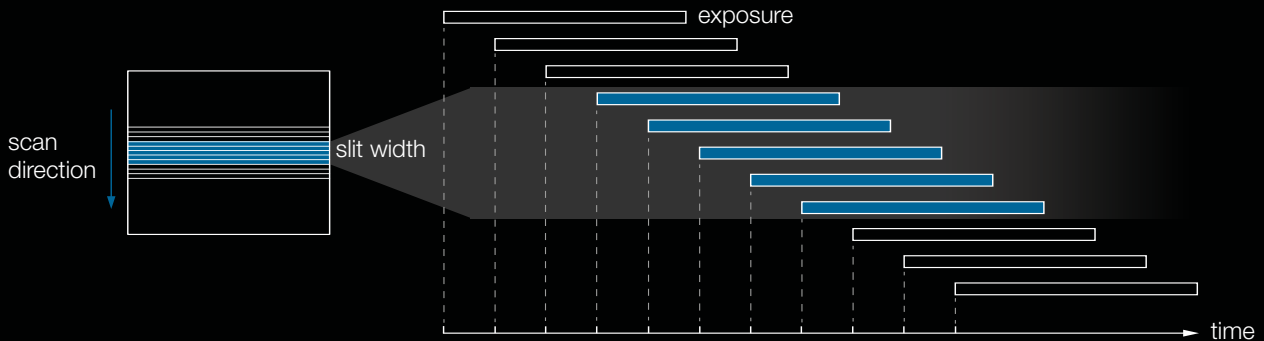
product overview

active cooled
sCMOS
cameras



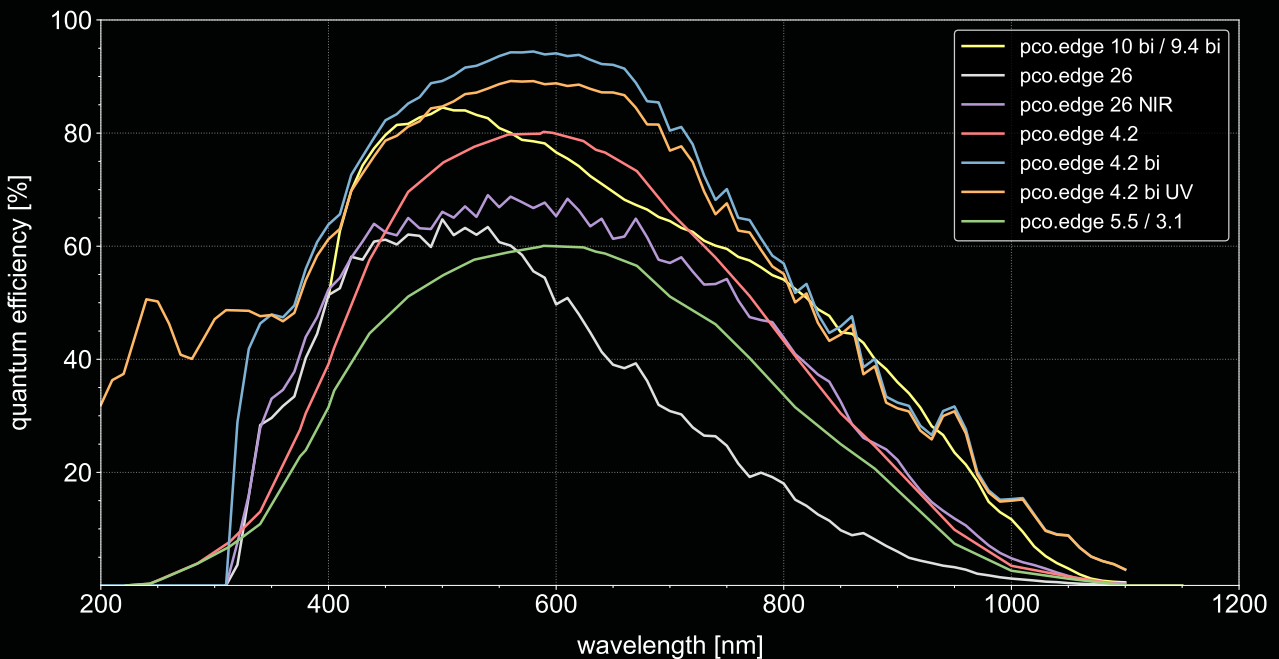
Top feature – Line scanning mode

The PCO line scanning mode is a special readout mode dedicated to lightsheet fluorescence microscopy (LSFM), enabling optimized synchronization of the camera and the lightsheet microscope system. This feature is built on the rolling shutter mode. Compared to the standard rolling shutter, in line scanning mode parameters for the number of exposure lines and line time are adjustable. The number of exposure lines corresponds to the slit width, while the line time defines the slit speed. The camera supports various trigger options for external synchronization.



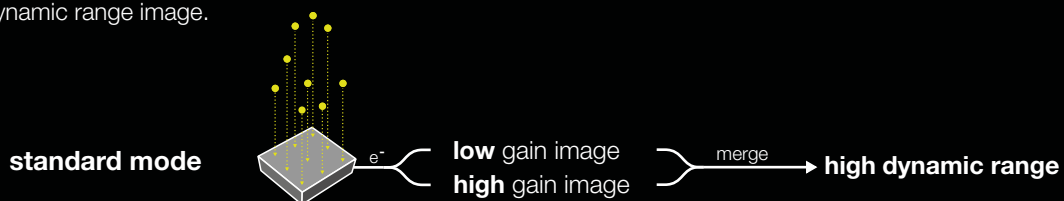
Exemplary illustration of the readout in line scanning mode with five exposure lines.

Quantum Efficiency

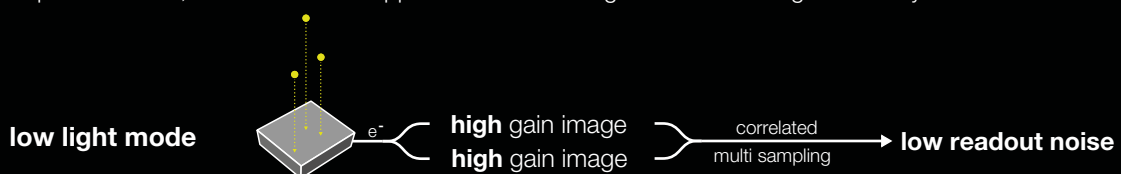


Top feature – Low light mode

In standard mode, two images with exactly the same exposure time but different gains are recorded. The low gain image is optimized for high fullwell capacity and the high gain image is optimized for low readout noise. Both images are merged into one high dynamic range image.

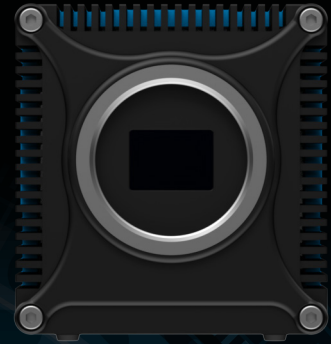


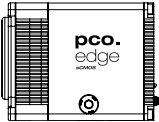
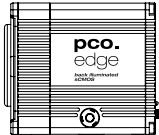
The low light mode benefits from two times correlated multi sampling of high gain images. This reduces the temporal noise by a factor of the square root of 2, which is ideal for applications demanding low noise and high sensitivity.



pco.edge series

The pco.edge series represents the high-end segment of PCO's scientific CMOS (sCMOS) camera product portfolio, delivering exceptional imaging performance across a wide range of applications. Built around temperature-stabilized, high-performance sCMOS image sensors, these cameras offer extremely low readout noise, wide dynamic range, high frame rates, and high resolution across a large field of view. The pco.edge cameras are also equipped with versatile features, such as low light mode, line scanning mode, or lens control, that further enhance their capabilities for specialized applications.



technical table ¹	pco.edge 26		pco.edge 10 bi	pco.edge 10 bi LT	pco.edge 9.4 bi
interface	CLHS FOL	USB 3.1 Gen 1	CLHS FOL		CLHS FOL
sensor technology	sCMOS		back illuminated sCMOS		back illuminated sCMOS
color type	monochrome		monochrome		monochrome
resolution [pixels]	5120 x 5120		4416 x 2368		4096 x 2300
sensor diagonal [mm]	18.1		23.0		21.6
pixel size [µm]	2.5 x 2.5		4.6 x 4.6		4.6 x 4.6
max. frame rate @ full resolution	150	6	122		122
max. pixel rate [MPixel/s]	3932	187	1467		1467
peak QE	65 % @ 500 nm		85 % @ 500 nm		85 % @ 500 nm
typ. readout noise ² [e ⁻]	3.0	2.3	0.7	1.3	0.3
dark current [e ⁻ /pixel/s] @ sensor temperature	0.4 @ +15 °C	0.09 @ -10 °C	0.4 @ +10 °C		0.4 @ +10 °C
max. dynamic range	1300 : 1	2000 : 1	14 000 : 1	14 000 : 1	23 300 : 1
shutter mode ³	GS		RS		RS
cooling method ⁴	air & liquid		air & liquid		air & liquid
features	double shutter ⁶ , lens control, NIR-enhanced sensor ⁶	NIR-enhanced sensor ⁶	line scanning mode, lens control	lens control	line scanning mode, lens control
dimensions H x W x L [mm]	95 x 90 x 109	85 x 80 x 109	95 x 90 x 109		
camera housing					

High performance through optimized mechanics

The pco.edge series features a sophisticated mechanical housing. An optimized cooling concept enables thermal stabilization of the sensor at low temperatures, resulting in a negligible dark current and improved image quality. Cooling is achieved either via external liquid cooling or through optimized internal airflow within the camera. Additionally, the cooling system's special design protects the sensor from vibrations, ensuring unimpaired imaging performance.



technical table ¹	pco.edge 5.5		pco.edge 4.2 bi	pco.edge 4.2 bi UV
interface	CLHS FOL	USB 3.0	USB 3.1 Gen 1	
sensor technology	sCMOS		back illuminated sCMOS	
color type	monochrome or color		monochrome	
resolution [pixels]	2560 x 2160		2048 x 2048	
sensor diagonal [mm]	21.8		18.8	
pixel size [µm]	6.5 x 6.5		6.5 x 6.5	
max. frame rate [fps] @ full resolution	100	30	40	
max. pixel rate [MPixel/s]	572	320	184	
peak QE	60 % @ 600 nm ⁵		95 % @ 580 nm	89 % @ 580 nm 48 % @ 240 nm
typ. readout noise ² [e ⁻]	1.0		1.0	
dark current [e ⁻ /pixel/s] @ sensor temperature	0.6 RS/GR 0.9 GS @ +7 °C	0.5 RS/GR 0.8 GS @ +5 °C	0.2 @ -25 °C	
max. dynamic range	30000 : 1		26500 : 1	
shutter mode ³	RS, GR, GS		RS, GR	
cooling method ⁴	air, optional: liquid	air & liquid	air & liquid	
features	double shutter ⁶ , lens control	–	line scanning mode, low light mode	
dimensions H x W x L [mm]	76 x 70 x 122.5	76 x 70 x 99.5	85 x 80 x 109	
camera housing				

¹ Note: All values represent maximum achievable specifications in specific operational modes and may not be attainable simultaneously.

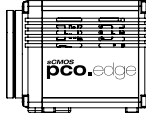
² The readout noise values are given as median (med). All values are raw data without any filtering.

³ RS = Rolling Shutter | GR = Global Reset | GS = Global Shutter

Top feature – Camera Link HS

Camera Link HS (CLHS) is a standardized protocol renowned for its exceptional speed, reliability, and bandwidth. It evolved from Camera Link, the vision industry's first standard camera interface protocol. Camera Link HS is poised to provide significantly expanded capabilities in upcoming releases, positioning it as a leading choice for camera interfacing. Cameras of the pco.edge series use this mature and robust interface combined with a fiber-optic link (FOL), enabling high-speed data transmission over long distances.



technical table ¹	pco.edge 4.2		pco.edge 4.2 LT	pco.edge 3.1
interface	CLHS FOL	USB 3.0	USB 3.0	USB 3.0
sensor technology	sCMOS		sCMOS	sCMOS
color type	monochrome		monochrome	monochrome or color
resolution [pixels]	2048 x 2048		2048 x 2048	2048 x 1536
sensor diagonal [mm]	18.8		18.8	16.6
pixel size [μm]	6.5 x 6.5		6.5 x 6.5	6.5 x 6.5
max. frame rate [fps] @ full resolution	100	40	40	50
max. pixel rate [MPixel/s]	548	220	220	408
peak QE	80 % @ 580 nm		80 % @ 580 nm	60 % @ 600 nm ⁵
typ. readout noise ² [e ⁻]	0.8		0.8	1.1
dark current [e ⁻ /pixel/s] @ sensor temperature	0.6 @ +7 °C	0.3 @ 0 °C	0.8 @ +10 °C	0.5 RS/GR 0.8 GS @ +5 °C
max. dynamic range	37500 : 1		37500 : 1	27000 : 1
shutter mode ³	RS	RS, GR	RS, GR	RS, GR, GS
cooling method ⁴	air, optional: liquid	air & liquid	air	air
features	lens control	–	–	–
dimensions H x W x L [mm]	76 x 70 x 122.5	76 x 70 x 99.5	76 x 70 x 99.5	76 x 70 x 99.5
camera housing				

⁴ air = air forced with fan | liquid = external liquid connection

⁵ Monochrome version.

⁶ Specific camera variant.

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