Digital B/W Cameras

PS 4 – 285 | 274 | 205 | 1020 CL

Digital camera
Black-and-white
CameraLink
12 bit digital signal processing
Progressive scan
Megapixel resolution
Up to 30 fps (full frames)
External trigger, reset/restart
Partial scan | Binning
Gamma correction
Automatic functions
Long time integration
Cooled camera PS 4C – 285 CL

The digital PS cameras have been designed especially for software integration.

The matching Kappa sdk3 offers a state-of-the-art software environment based on .net and C-API. In combination with the sdk or a detailed interface description the PS cameras convince as high-performance components in all measuring and testing machines.

The camera series is based on variable camera electronics, low power consumption and advanced circuitry, providing both an extremely rugged design and excellent signal quality.

The user can choose from a range of high-quality CCD sensors with megapixel resolution by Sony and Kodak.

As standard the series comes in a block housing, but for the individual touch it is also available in a striking hexagonal design housing.

The digital Kappa camera systems comply with the highest standards and offer outstanding Kappa-specific technological highlights, such as rugged design, excellent highly linear signal quality, extraordinary signal-to-noise ratio, long-time exposure and, optionally, a second serial interface with bespoke configuration of functions. High frame rates are achieved by binning and partial scan, while the image size remains freely adjustable.

Technical Data

Sensor-specific data

PS 4 – 285 CL | PS 4C – 285 CL

CCD sensor	2/3" interline transfer CCD progressive scan with micro lenses (Sony ICX285AL, EXview HAD)
Pixel size (H x V)	6.45 µm x 6.45 µm
Light-sensitive area (H x V)	8.93 mm x 6.66 mm
Number of pixels (H x V)	1434 x 1050, total
Spectral sensitivity (without IR-filter)	320 nm – 1100 nm
Full well capacity	23 000 e^-
A/D-conversion factor	5.6 e^- / increment
Dynamic range	63 dB (measured in dark image, at 66 ms exposure time and 0 dB gain)
Sensitivity	(measured at 18 dB gain, gamma = 1, and 50 % level, 3000 K) 0.02 lx at 100 ms exposure time 0.000017 lx at 120 s exposure time 0,0000017 lx at 20 min exposure time (Cooled camera PS 4C – 285 CL)

PS 4 – 274 CL

CCD sensor	1/1.8" interline transfer CCD progressive scan with micro lenses (Sony ICX274AL, EXview HAD)
Pixel size (H x V)	4.40 µm x 4.40 µm
Light-sensitive area (H x V)	8.50 mm x 6.80 mm
Number of pixels (H x V)	1688 x 1248, total
Spectral sensitivity (without IR-filter)	320 nm – 1100 nm
Full well capacity	5 500 e^-
A/D-conversion factor	1.3 e^- / increment
Dynamic range	56 dB (measured in dark image, at 115 ms exposure time and 0 dB gain)
Sensitivity	(measured at 18 dB gain, gamma = 1, and 50 % level, 3000 K) 0.05 lx at 100 ms exposure time 0.000042 lx at 120 s exposure time

PS 4 – 205 CL

CCD sensor	1/2" interline transfer CCD progressive scan with micro lenses (Sony ICX205AL, EXview HAD)
Pixel size (H x V)	4.65 µm x 4.65 µm
Light-sensitive area (H x V)	7.6 mm x 6.2 mm
Number of pixels (H x V)	1434 x 1050, total
Spectral sensitivity (without IR-filter)	320 nm – 1100 nm
Full well capacity	12 000 e^-
A/D-conversion factor	2.9 e^- / increment
Dynamic range	55 dB (measured in dark image, at 66 ms exposure time and 0 dB gain)
Sensitivity	(measured at 18 dB gain, gamma = 1, and 50 % level, 3000 K) 0.04 lx at 100 ms exposure time 0.000033 lx at 120 s exposure time

PS 4 – 1020 CL

CCD sensor	2/3" interline transfer CCD progressive scan with micro lenses (Kodak KAI 1020 M)
Pixel size (H x V)	7.4 µm x 7.4 µm
Light-sensitive area (H x V)	7.4 mm x 7.4 mm
Number of pixels (H x V)	1028 x 1008, total
Quantum efficiency	max. 42% at 490 nm
Spectral sensitivity (without IR-filter)	320 nm – 1000 nm
Full well capacity	42 000 e^-
A/D-conversion factor	10.3 e^- / increment
Readout noise	50 e^- rms
Dynamic range	60 dB (measured in a dark image, at 33 ms exposure time and 0 dB gain)
Sensitivity	(measured at 18 dB gain, gamma = 1, and 50 % level, 3000 K) 0.06 lx at 100 ms exposure time 0.00005 lx at 120 s exposure time

Technical Data

Interface-specific data

PS 4 – 285 CL | PS 4C – 285 CL

Camera output format	full frame:	1434 x 1050 pixels, 15 fps		
	binning:	2 fold	4 fold	8 fold
	max. size (pixels):	717 x 525	358 x 262	179 x 131
	frame rate:	25 fps	41 fps	62 fps
	partial scan:	image size freely adjustable		
Exposure	manual:	1 µs to 120 s (Cooled camera: up to 20 min)		
	automatic (AE):	1 µs to 66 ms at 1280 x 960 pixels		
Power supply	9-36 V DC, 2.6 W			

PS 4 – 274 CL

Camera output format	full frame:	1688 x 1248 pixels, 12 fps		
	binning:	2 fold	4 fold	8 fold
	max. size (pixels):	844 x 624	422 x 312	211 x 156
	frame rate:	15 fps	26 fps	40 fps
	partial scan:	image size freely adjustable		
Exposure	manual:	1 µs to 120 s		
	automatic (AE):	1 µs to 115 ms at 1600 x 1200 pixels		
Power supply	9-36 V DC, 2.6 W			

PS 4 – 205 CL

Camera output format	full frame:	1434 x 1050 pixels, 15 fps		
	binning:	2 fold	4 fold	8 fold
	max. size (pixels):	717 x 525	358 x 262	179 x 131
	frame rate:	25 fps	41 fps	62 fps
	partial scan:	image size freely adjustable		
Exposure	manual:	1 µs to 120 s		
	automatic (AE):	1 µs to 66 ms at 1280 x 960 pixels		
Power supply	9-36 V DC, 2.6 W			

PS 4 – 1020 CL

Camera output format	full frame:	1028 x 1008 pixels, 30 fps		
	binning:	2 fold	4 fold	8 fold
	max. size (pixels):	514 x 504	257 x 252	128 x 126
	frame rate:	36 fps	60 fps	90 fps
	partial scan:	image size freely adjustable		
Exposure	manual:	1 µs to 120 s		
	automatic (AE):	1 µs to 33 ms at 800 x 600 pixels		
Power supply	9-36 V DC, 2.5 W			

Signal processing | Development tool

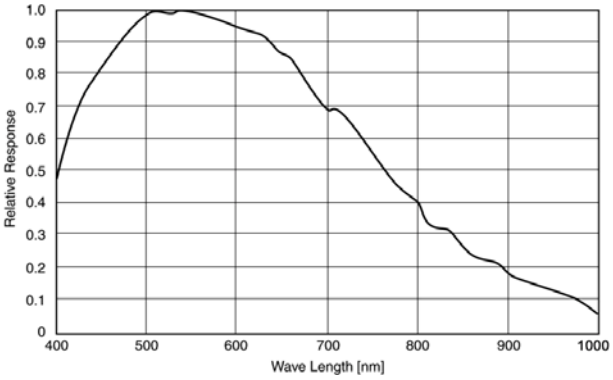
Development tool	software development kit, Kappa sdk3 (.Net-class library/C-function library, API) order-no.: 771-5757
System	12 bit digital
Gain	manual/automatic (AGC): 0 to 18 dB
Enhancement	contrast: 1.0 to 8.0 fold brightness: subtraction, 0 to 4095 LSB, maximum 50% of the output level edges: adjustable
Gamma	0.3 to 2.2
Diagnostics	camera name, serial number, revision number, temperature of sensor and camera, built-in test, image size, frame rate, test pattern
Line generator	2 reticles: position, color and style adjustable
Measuring window	position and size adjustable
Synchronization	Intern/extern, reset/restart (delay < 10 µs)
Hardware Trigger	Minimum trigger delay 4.2µs - 8.2µs depending on the sensor type Frame on Demand
Software Trigger	via SDK 3

General Technical Data

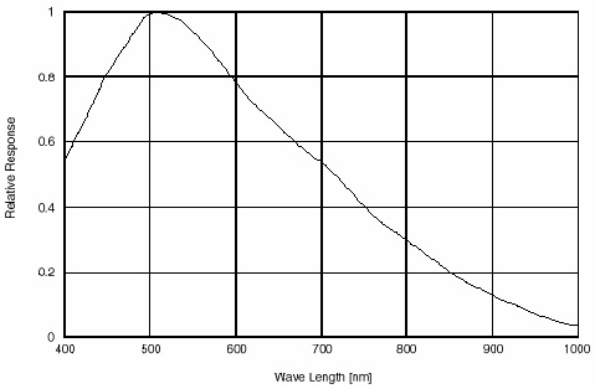
Interfaces	CameraLink connector system connector (power supply, additional RS 232, control and trigger signals)	
Lens mount	C-mount, focal plane adjustable, CS-mount on request	
Filter	IR-filter, removable	
Temperature	operating temperature -20°C to +60°C, storage temperature -30°C to +70°C	
Dimensions | Weight	block housing: design housing: cooled camera:	60 x 60 x 47 mm; 235 g diameter 75 mm, length 41 mm; 370 g 73 x 69 x 107 mm; 820 g
Cable length	CameraLink up to 10 m (other cable lengths on request)	
System requirements	hardware: bus master enabled PCI slot (or PCMCIA type 2 CardBus interface), minimum 1.8 GHz, minimum 512 MB RAM, DirectX9-enabled graphic card with at least 64 MB operating system: Microsoft Windows 2000 ®, Microsoft Windows XP ® (32 Bit Edition), Microsoft Windows Vista ® (32 Bit Edition)	
Order-no. block housing	PS 4-285 CL PS 4-274 CL PS 4-205 CL PS 4-1020 CL	953-1710 953-1714 953-1711 953-1700
Order-no. design housing (yellow)	PS 4-285 CL PS 4-274 CL PS 4-205 CL PS 4-1020 CL	953-1710G 953-1714G 953-1711G 953-1700G
Order-no. cooled camera	PS 4C-285 CL	953-1716
Standard equipment	camera	
In addition for cooled version	power supply ACC 2 (incl. control cable 4 m and power supply cable)	

Spectral Sensitivity Characteristics (without IR-filter)

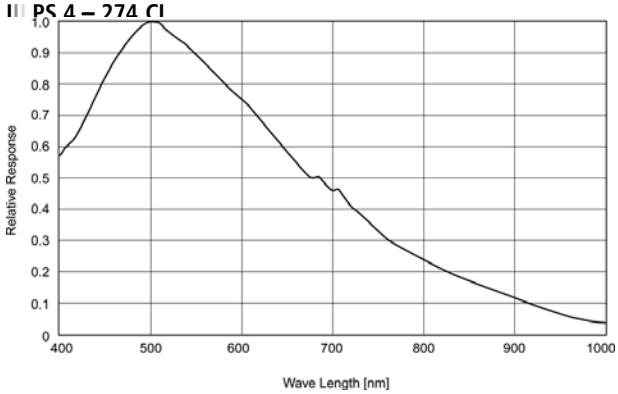
PS 4 – 285 CL



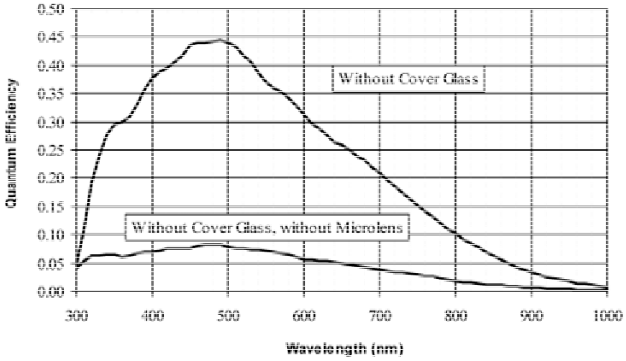
PS 4 – 205 CL



PS 4 – 274 CL



PS 4 – 1020 CL



We are constantly checking the accuracy of the technical data. We are prepared to provide more detailed information on request.
Technical data are subject to change without notice!

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