B/W Digital Camera Systems

DX 4 – 285 | 274 | 205 |1020 CL

Digital camera system
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 DX 4C – 285 CL

Kappa DX denotes complete and ready-to-use camera systems, which means the scope of delivery includes not only a camera, but also a data cable, frame grabber, power supply unit and the Kappa CameraControl (KCC) software.

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.

Together with the Kappa ImageBase software the DX systems provide comprehensive solutions for applications such as measurement engineering, process automation and scientific diagnostics.

The cameras of the DX series come in a block housing as standard, but for the individual touch they are 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.

Standard equipment

realize visions .

Technical Data

Sensor-specific data

DX 4 – 285 CL | DX 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)	1392 x 1040, effective
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 DX 4C – 285 CL)

DX 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)	1628 x 1236, effective
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

DX 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)	1392 x 1040, effective
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

DX 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)	1004 x 1004, effective
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 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 0.0005 lx at 120 s exposure time

Technical Data

Interface-specific data

DX 4 – 285 CL | DX 4C – 285 CL

Camera output format	full frame:	1392 x 1040 pixel, 15 fps		
	binning:	2 fold	4 fold	8 fold
	max. image size (pixel):	696 x 520	348 x 260	174 x 130
	frame rate:	25 fps	41 fps	62 fps
	partial scan:	image size freely adjustable		
Exposure	manual:	1 µs to 120 s (cooled up to 20 min)		
	automatic (AE):	1 µs to 66 ms at 1280 x 960 pixel		
Power supply	9-36 V DC, 2.6 W			

DX 4 – 274 CL

Camera output format	full frame:	1628 x 1236 pixel, 12 fps		
	binning:	2 fold	4 fold	8 fold
	max. image size (pixel):	814 x 618	407 x 309	204 x 155
	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 pixel		
Power supply	9-36 V DC, 2.6 W			

DX 4 – 205 CL

Camera output format	full frame:	1392 x 1040 Pixel, 15 fps		
	binning:	2 fold	4 fold	8 fold
	max. image size (pixel):	696 x 520	348 x 260	174 x 130
	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 pixel		
Power supply	9-36 V DC, 2.6 W			

DX 4 – 1020 CL

Camera output format	full frame:	1004 x 1004 pixel, 30 fps		
	binning:	2 fold	4 fold	8 fold
	max. image size (pixel):	502 x 502	251 x 251	126 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 pixel		
Power supply	9-36 V DC, 2.9 W			

Signal processing | Software

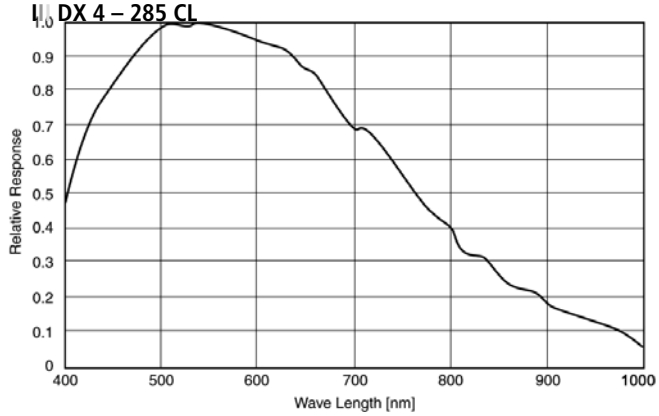
Control software	Kappa CameraControl (KCC)	
System	12 bit digital	
Gain	manual/automatic (AGC): 0 to 18 dB	
Enhancement	contrast:	1.0 to 8.0 fold
	brightness:	subtraction, 0 to 4095 LSB, maximum 50% of the output level
	edges:	adjustable
Gamma	0.3 to 2.2	
Diagnostics	camera name, serial number, revision 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	internal/external, reset/restart (delay <10 µs)	
Hardware trigger	Minimum trigger delay 4.2µs - 8.2µs depending on the sensor type Frame on Demand	

General Technical Data

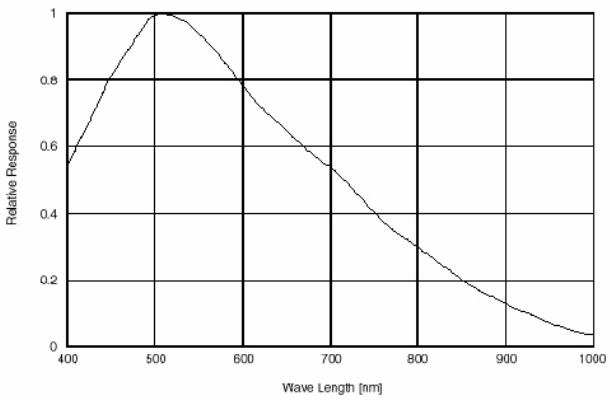
Interfaces	CameraLink connector system connector (power supply, additional RS 232, control and trigger signals)			
Lens mount	C-mount, focal plane adjustable, CS-mount on request			
Filter	IR-filter, removable			
Temperature	operating temperature -20°C to +60°C, storage temperature -30°C to +70°C			
Dimensions | Weight	block housing: 60 x 60 x 47 mm; 235 g design housing: diameter 75, length 41 mm; 370 g cooled camera: 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	DX 4-285 CL	951-1710	DX 4-285 CL PCMCIA	951-1711
	DX 4-274 CL	951-1714	DX 4-274 CL PCMCIA	951-1715
	DX 4-205 CL	951-1712	DX 4-205 CL PCMCIA	951-1713
	DX 4-1020 CL	951-1700	DX 4-1020 CL PCMCIA	951-1702
Order-no. design housing (yellow)	DX 4-285 CL	951-1710G	DX 4-285 CL PCMCIA	951-1711G
	DX 4-274 CL	951-1714G	DX 4-274 CL PCMCIA	951-1715G
	DX 4-205 CL	951-1712G	DX 4-205 CL PCMCIA	951-1713G
	DX 4-1020 CL	951-1700G	DX 4-1020 CL PCMCIA	951-1702G
Order-no. cooled camera	DX 4C-285 CL	951-1716	DX 4C-285 CL PCMCIA	951-1717
Standard equipment	camera, CameraLink Frame Grabber, CameraLink cable (4 m); power supply cable (4 m), power supply, software CD Kappa CameraControl (KCC) incl. operating manual			
In addition for cooled camera	power supply ACC 2 (incl. control cable 4 m and power supply cable)			

Spectral Sensitivity Characteristics (without IR-filter)

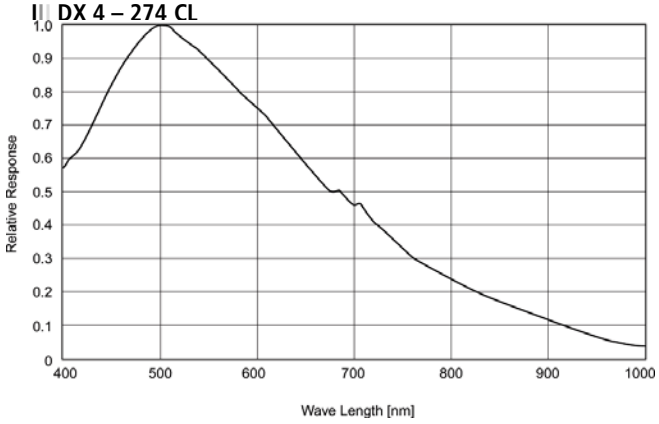
DX 4 – 285 CL



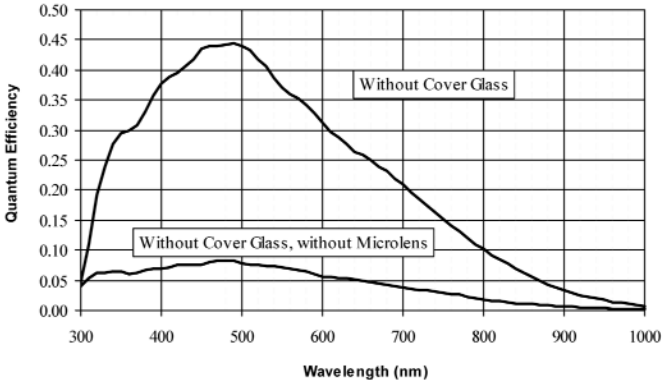
DX 4 – 205 CL



DX 4 – 274 CL



DX 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!

TECHNICAL SUPPORT
Fon +49.1805.371371
Fax +49.551.30 77 211
support@kappa.de

Kappa opto-electronics Inc.
911 S. Primrose Ave., Unit P
Monrovia, CA 91016 | USA
Fon +1.626.256.4343
Fax +1.626.256.6484
info@kappa-vision.com
www.kappa-vision.com

Kappa opto-electronics GmbH
Kleines Feld 6
37130 Gleichen | Germany
Fon +49.5508.974.0
Fax +49.5508.974.100
info@kappa.de
www.kappa.de

Member of Measurement Valley

realize visions .