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kappa

Digital Color Camera Systems

DX 40 – 285 | 274 | 205 | 1020 GigE

GigE

Digital camera system
Color
GigE
12 bit digital signal processing
Progressive scan
Megapixel resolution
External trigger, reset/restart
Partial scan | Binning
Gamma correction
Automatic functions
Long time integration
Cooled camera DX 40C – 285 GigE

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 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 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.

Real-time Color Signal Processing

The camera-internal color processing algorithm is FPGA-based and works independently of specific signal processors. Maximum true color rendition is achieved by adapting the color image reproduction for different lighting conditions to the sensor. Reproducibility of the results in other cameras is also ensured. Further features are high detail sharpness, edge enhancement, contrast enhancement and variable Gamma correction.

Standard equipment

realize visions .

Technical Data

Sensor-specific data

DX 40 – 285 GigE | DX 40C – 285 GigE

CCD sensor	2/3" interline transfer CCD progressive scan with micro lenses (Sony ICX285AQ, 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, color: B = 470 nm, G = 540 nm, R = 630 nm (peak sensitivity)
Full well capacity	23 000 e^-
A/D-conversion factor	5.6 e^- / increment
Filter	RGB Bayer filter
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) 0.35 lx at 100 ms exposure time 0.00029 lx at 120 s exposure time 0.000029 lx at 20 min exposure time (cooled camera DX 40C – 285 GigE)

DX 40 – 274 GigE

CCD sensor	1/1.8" interline transfer CCD progressive scan with micro lenses (Sony ICX274AQ, 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, color: B = 460 nm, G = 535 nm, R = 620 nm (peak sensitivity)
Full well capacity	5 500 e^-
A/D-conversion factor	1.3 e^- / increment
Filter	RGB Bayer filter
Dynamic range	52 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) 0.69 lx at 100 ms exposure time 0.00058 lx at 120 s exposure time

DX 40 – 205 GigE

CCD sensor	1/2" interline transfer CCD progressive scan with micro lenses (Sony ICX205AK, 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, color: B = 470 nm, G = 540 nm, R = 630 nm (peak sensitivity)
Full well capacity	12 000 e^-
A/D-conversion factor	2.9 e^- / increment
Filter	RGB Bayer filter
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) 0.61 lx at 100 ms exposure time 0.00051 lx at 120 s exposure time

DX 40 – 1020 GigE

CCD sensor	2/3" interline transfer CCD progressive scan with micro lenses (Kodak KAI 1020 CM)
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. 41% at 470 nm
Spectral sensitivity (without IR-filter)	320 nm – 1000 nm , color: B = 470 nm, G = 535 nm, R = 620 nm (peak sensitivity)
Full well capacity	42 000 e^-
A/D-conversion factor	10.3 e^- / increment
Readout noise	50 e^- rms
Filter	RGB Bayer filter
Dynamic range	57 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) 0.65 lx at 100 ms exposure time 0.00054 lx at 120 s exposure time

Technical Data

Interface-specific data

DX 40 – 285 GigE | DX 40C – 285 GigE

Camera output (YUV 4:2:2)	full frame:	1388 x 1036 pixels, 15 fps		
	b/w-binning: image size (pixels): frame rate:	2 fold 694 x 518 25 fps	4 fold 347 x 259 41 fps	8 fold 173 x 129 62 fps
	partial scan:	image size freely adjustable		
Exposure	manual: automatic (AE):	1 µs to 120 s (cooled: up to 20 min) 1 µs to 66 ms at 1280 x 960 pixels		
Power supply	9-36 V DC, 3.6 W			

DX 40 – 274 GigE

Camera output (YUV 4:2:2)*	full frame:	1624 x 1232 pixels, 12 fps		
	binning: image size (pixels): frame rate:	2 fold (color or b/w) 812 x 616 15 fps	4 fold (b/w) 406 x 308 26 fps	8 fold (b/w) 203 x 154 40 fps
	partial scan:	image size freely adjustable		
Exposure	manual: automatic (AE):	1 µs to 120 s 1 µs to 115 ms at 1600 x 1200 pixels		
Power supply	9-36 V DC, 3.6 W			

DX 40 – 205 GigE

Camera output (YUV 4:2:2)	full frame:	1388 x 1036 pixels, 15 fps		
	b/w-binning: image size (pixels): frame rate:	2 fold 694 x 518 25 fps	4 fold 347 x 259 41 fps	8 fold 173 x 129 62 fps
	partial scan:	image size freely adjustable		
Exposure	manual: automatic (AE):	1 µs to 120 s 1 µs to 66 ms at 1280 x 960 pixels		
Power supply	9-36 V DC, 3.6 W			

DX 40 – 1020 GigE

Camera output (YUV 4:2:2)	full frame:	1000 x 1000 pixels, 30 fps		
	b/w-binning: max. size (pixels): frame rate:	2 fold 500 x 500 36 fps	4 fold 250 x 250 60 fps	8 fold 125 x 125 90 fps
	partial scan:	image size freely adjustable		
Exposure	manual: automatic (AE):	1 µs to 120 s 1 µs to 33 ms at 800 x 600 pixels		
Power supply	9-36 V DC, 3.6 W			

Signal processing | Software

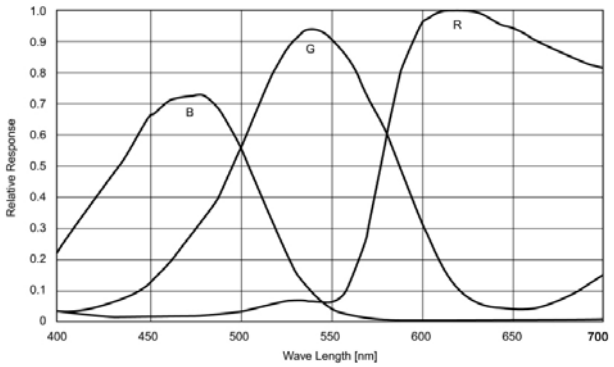
Control software	Kappa CameraControl (KCC)	
System	12 bit digital	
Gain	manual/automatic (AGC): 0 to 18 dB	
Enhancement	contrast: brightness: edges:	1.0 to 8.0 fold subtraction, 0 to 4095 LSB, maximum 50% of the output level adjustable
Color processing	type of light source, color balance (RGB), automatic white set, color saturation	
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

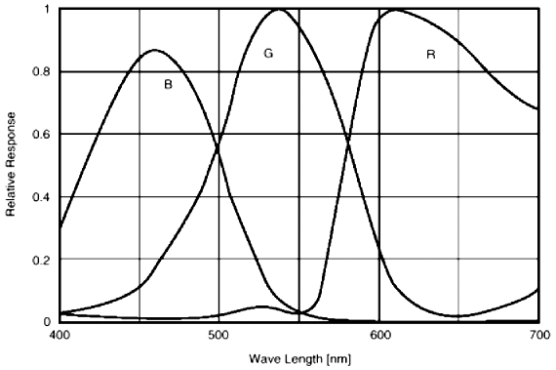
Interfaces	GigE connection system connector (power supply, additional RS 232, control and trigger signals)
Lens mount	C-mount, focal plane adjustable, CS-mount on request
Filter	IR-filter, removable
Temperature	operating temperature -20°C to +60°C, storage temperature -30°C to +70°C
Dimensions | Weight	block housing: 65 x 65 x 56 mm; 320 g cooled camera: 73 x 69 x 116 mm; 905 g
Cable length	Ethernet (min. CAT5) up to 100 m
System requirements	hardware: GigE network connection, minimum 1.8 GHz, minimum 512 MB RAM, DirectX9-enabled graphics card with at least 64 MB operating system: Microsoft Windows 2000 ®, Microsoft Windows XP ® (32 Bit Edition)
Order-no. block housing	DX 40-285 GigE 961-1735 DX 40-274 GigE 961-1736 DX 40-205 GigE 961-1737 DX 40-1020 GigE 961-1706
Order-no. cooled camera	DX 40C-285 GigE 961-1738
Standard equipment	camera, Ethernet-cable 2.5 m (6 pin/6 pin), power supply cable (4 m), Software CD Kappa CameraControl (KCC) incl. operating manual
In addition for cooled version	power supply ACC 2 (incl. control cable 4 m and power supply cable)

Spectral Sensitivity Characteristics (without IR-filter)

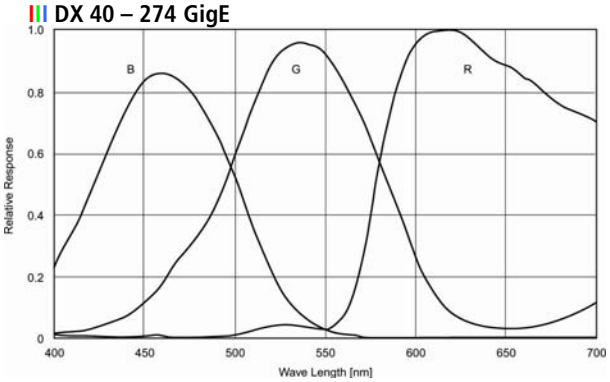
DX 40 – 285 GigE



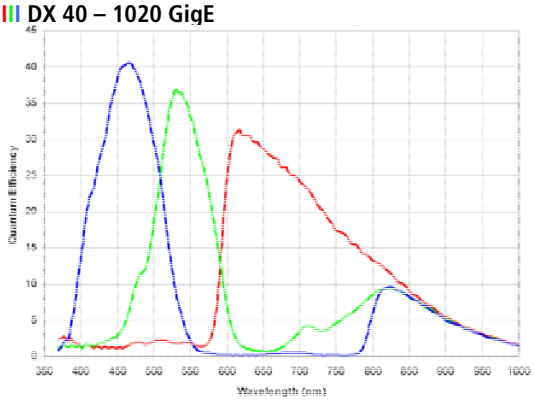
DX 40 – 205 GigE



DX 40 – 274 GigE



DX 40 – 1020 GigE



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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Member of Measurement Valley

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