

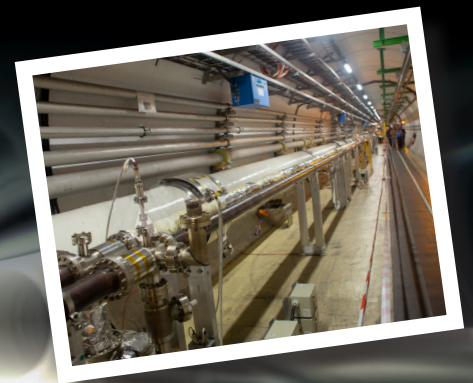
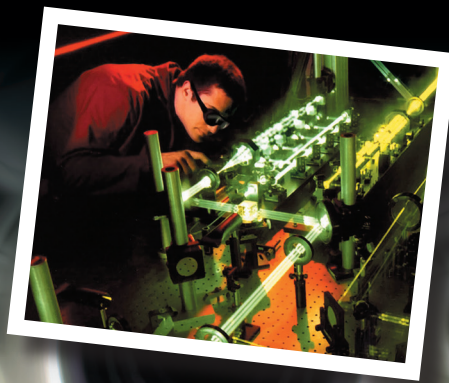
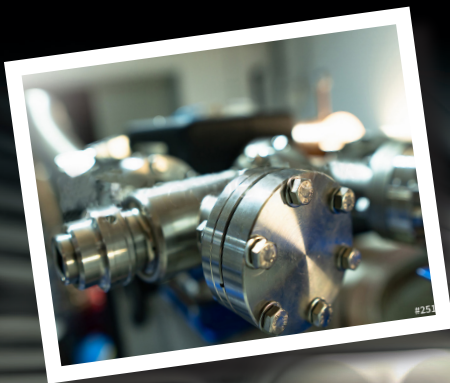
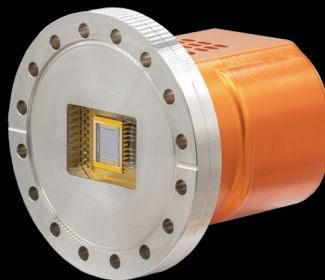
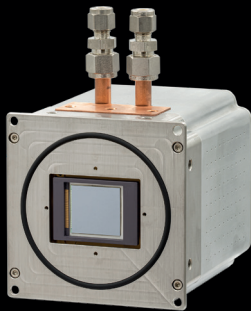


Leaders in digital camera solutions

X-RAY

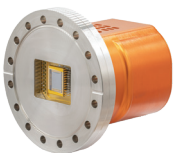
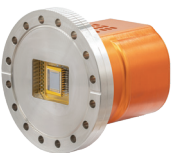
EMCCD

CCD



X-RAY & HIGH ENERGY 2021

Open Front DIRECT X-Ray Cameras

	Eagle XO	Eagle XO	Eagle XO	Falcon III XO
				
Model Number	EA4240XO-BN-CL	EA4210XO-BN-CL	EA4710XO-BN-CL	FA351XO-BN-CL
Sensor¹	CCD-4240	CCD-4210	CCD-4710	CCD-351
Sensor size	4MP	1MP	1MP	1MP
Array Size (pixels)	2048 × 2048	2048 × 512	1024 × 1024	1024 × 1024
Pixel Pitch (µm)	13.5 × 13.5	13.5 × 13.5	13 × 13	10 × 10
Active Area (mm)	27.6 × 27.6	27.6 × 6.9	13.3 × 13.3	10.2 × 10.2
Pixel Well Depth (Typical Value)	100ke-	100ke-	100ke-	35ke-
Shift Register Well Depth	150ke-	150ke-	150ke-	200ke-
Digitization (bits)	16	16	16	16
Typical Readout Noise (RMS)	2.3e- @ 75kHz 9.0e- @ 2MHz	2.3e- @ 75kHz 9.0e- @ 2MHz	2.3e- @ 75kHz 9.0e- @ 2MHz	EM Gain ON: @ 10MHz EM Gain OFF: <60e-
Max. Full Resolution Frame Rate in (Hz)	0.42	<1	1.45	31
Peak Quantum Efficiency	> 90%	> 90%	> 90%	> 90%
Spectral Response (nm)	12eV - 20keV	12eV - 20keV	12eV - 20keV	12eV - 20keV
TE Cooling	-80°C	-80°C	-80°C	-70°C
Dark Current (e/p/s)	BN: 0.005 BN-DD: 0.016	BN: 0.005 BN-DD: 0.016	BN: 0.005 BN-DD: 0.016	BN: 0.001
Flange Specification	6"CF	6"CF	6"CF	8"CF
Dimensions (mm) Excluding flange	155 x 141 x 110	155 x 141 x 110	155 x 141 x 110	116 x 202.5 x 202.5
Weight (g)	3.5kg	3.5kg	3.5kg	<6.5kg

All specifications are typical and correct at time of print. More detailed and most recent specifications can be found in datasheets for each product on www.raptorphotronics.com. For custom options please contact us directly at sales@raptorphotronics.com
Note 1: Raptor offers a range of sensor options including uncoated (BN), front (FI), back (BI) and deep-depleted (DD), please contact us to discuss available options.

Features

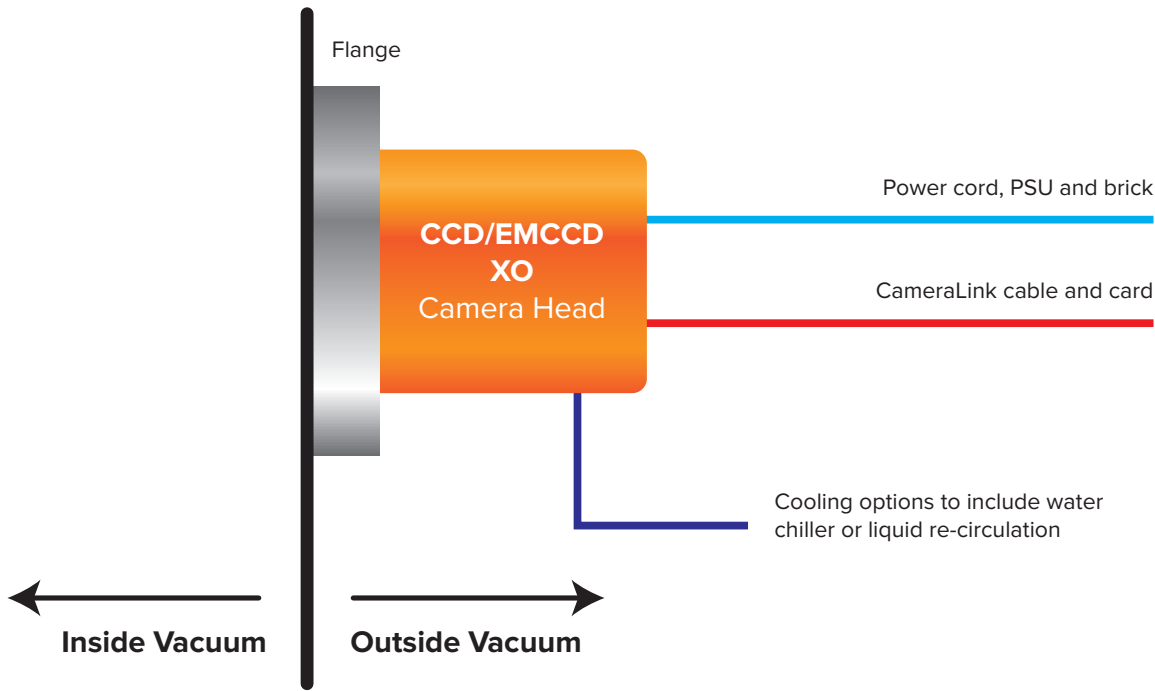
- Choice of CCD and EMCCD sensors
- Choice of sensor options; FI, BN, BN DD
- Interface includes Camera Link / Gig-E
- Range of Flange Options
- Both passive and active cooling
- Custom Options Available

Raptor offers a sensor damage replacement scheme. We will replace any laser damaged sensors in our cameras at a cost equal to **50% of the initial camera cost**, during the first two years of ownership. Contact us for more information on sales@raptorphotronics.com

Applications

- X-Ray Imaging
- X-Ray Diffraction (XRD) and X-Ray Fluorescence (XRF)
- X-Ray Plasma Imaging and Diagnostics
- Soft X-Ray Microscopy
- EUV X-Ray Spectroscopy
- X-Ray source characterization
- X-Ray Phase Contrast Imaging
- X-Ray Tomography
- VUV/EUV/XUV Imaging
- Lithography Crystallography

Configuration

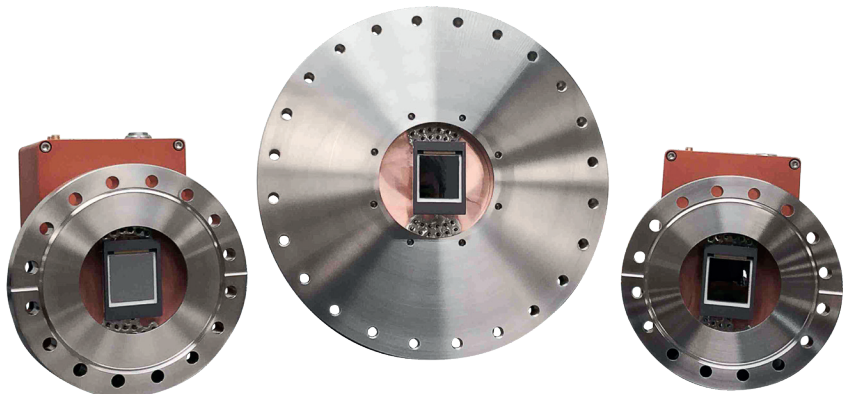


Accessories

A full range of accessories are available with our Open Front cameras. Please consult the camera spec sheets on our website. We also offer information on dimensions, 2D and 3D drawings and ordering information, all available on request.





Flange Options

CF (Conflat) is our standard flange type. Other flange standards are also available. Please contact us at sales@raptorphotronics.com



Range of CF Flanges

In Vacuum DIRECT X-Ray Cameras

	Eagle XV	Eagle XV	Eagle XV	Falcon III XV
				
Model Number	EA4240XV-BN-CL	EA4210XV-BN-CL	EA4710XV-BN-CL	FA351XV-BN-CL
Sensor¹	CCD-4240	CCD-4210	CCD-4710	CCD-351
Sensor size	4MP	1MP	1MP	1MP
Array Size (pixels)	2048 × 2048	2048 × 512	1024 x 1024	1024 x 1024
Pixel Pitch (µm)	13.5 x 13.5	13.5 x 13.5	13x 13	10 x 10
Active Area (mm)	27.6 x 27.6	27.6 x 6.9	13.3 x 13.3	10.2 x 10.2
Pixel Well Depth (Typical Value)	100ke-	100ke-	100ke-	35ke-
Shift Register Well Depth	150ke-	150ke-	150ke-	200ke-
Digitization (bits)	16	16	16	16
Typical Readout Noise (RMS)	2.3e- @ 75kHz 9.0e- @ 2MHz	2.3e- @ 75kHz 9.0e- @ 2MHz	10e- @ 2MHz <3.5e- @ 75kHz	EM Gain ON: @ 10MHz EM Gain OFF: <60e-
Max. Full Resolution Frame Rate in (Hz)	.042	<1	1.45	31
Peak Quantum Efficiency	> 90%	> 90%	> 90%	> 90%
Spectral Response (nm)	12eV - 20keV	12eV - 20keV	12eV - 20keV	12eV - 20keV
TE Cooling	-80°C	-80°C	-80°C	-70°C
Dark Current (e/p/s)	BN: 0.005 BN-DD: 0.016	BN: 0.005 BN-DD: 0.016	BN: 0.005 BN-DD: 0.016	BN: 0.001
Dimensions (mm)	132 x 110 x 110	132 x 110 x 110	132 x 110 x 110	132 x 110 x 110
Weight (g)	<1.5kg	<1.5kg	<1.5kg	<1.5kg

All specifications are typical and correct at time of print. More detailed and most recent specifications can be found in datasheets for each product on www.raptorphotonics.com. For custom options please contact us directly at sales@raptorphotonics.com
Note 1: Raptor offers a range of sensor options including uncoated (BN), front (FI), back (BI) and deep-depleted (DD), please contact us to discuss available options.

Features

- Choice of CCD and EMCCD sensors
- Choice of sensor options; FI, BN, BN DD
- Interface includes Camera Link / Gig-E
- Both passive and active cooling
- Custom Options Available

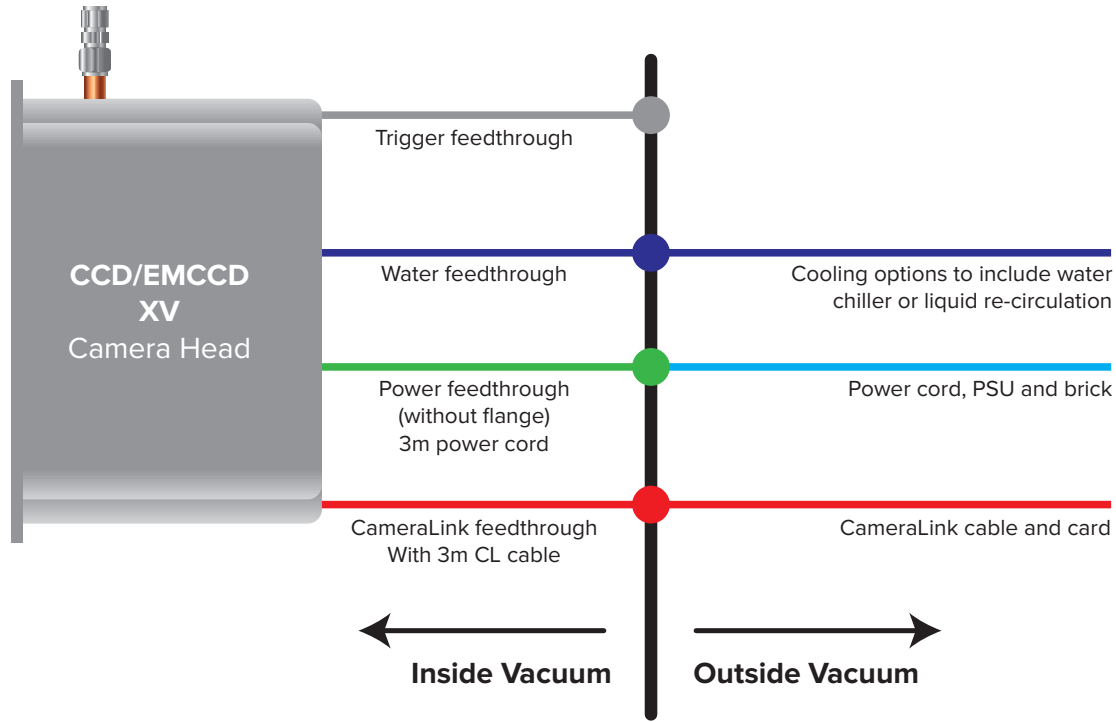


Custom Options

Applications

- X-Ray Imaging
 - X-Ray Diffraction (XRD) and X-Ray Fluorescence (XRF)
 - X-Ray Plasma Imaging and Diagnostics
 - Soft X-Ray Microscopy
 - EUV X-Ray Spectroscopy
- X-Ray source characterization
 - X-Ray Phase Contrast Imaging
 - X-Ray Tomography
 - VUV/EUV/XUV Imaging
 - Lithography Crystallography

Configuration



Accessories

A full range of accessories are available with our In Vacuum cameras including a range of feedthroughs for power, CameraLink, trigger and liquid. The list of accessories and part numbers are available on our camera spec sheets which can be found on our website. We also offer information on dimensions, 2D and 3D drawings and ordering information, all available on request.

Custom Options

Raptor offers a full range of custom options for your X-Ray experiment. This includes:

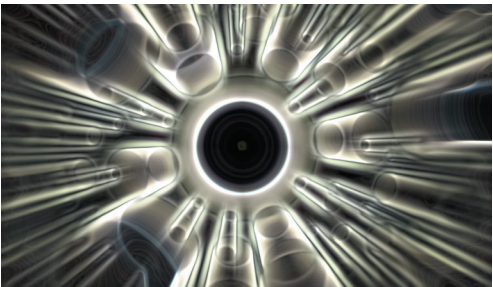
- Sensor orientation and variable distance of focal plane and flange
- Variable angle of sensor relative to flange plane with wedge options.

INDIRECT X-Ray Cameras

Raptor offers an extensive range indirect X-Ray camera options for hard high energy X-Ray applications.

Features

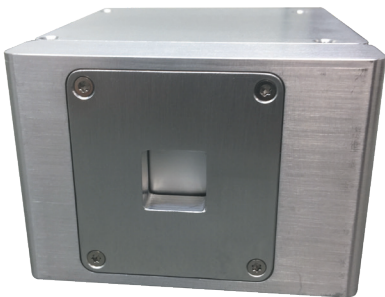
- Choice of CCD and EMCCD sensors, with different resolutions and pixel sizes
- Choice of sensor options; Front-illuminated, back-illuminated and deep depleted
- Fibre Optic Input Plates
- A selection of scintillators including phosphors / Gadox, depending on specific requirements
- A selection of Fibre Optic input plates
- Range of window options, Be, Al
- Interface includes CameraLink / Gig E /USB2.0



Raptor X-Ray solutions delivered

Indirect X-Ray solution for tube quality control

Raptor developed a CCD X-Ray camera solution for an OEM to inspect and QC cathode tubes. The camera incorporates a CsI scintillator for indirect detection of 20-140 keV. It is based on a fibre-optic CCD47-10 front-illuminated sensor. It is uncooled with ruggedised electronics to ensure 24/7 operation. It features a CameraLink interface.



XRD / XRF solution for Art Inspection

Raptor has developed an OEM solution for art inspection using XRD / XRF techniques. It uses a cooled, low power, deep depleted CCD30-11 camera with a protruding, offset sensor. It is coupled to a miniature X-ray source to record the X-ray diffraction and fluorescence signatures of a small area of the surface of an object, enabling the identification of the materials, such as pigments in paintings. This helps scientists to better understand the materials and techniques used by artists, to develop strategies for conservation and restoration, and to provide evidence for dating / authenticity purposes.



Raptor X-Ray solutions delivered

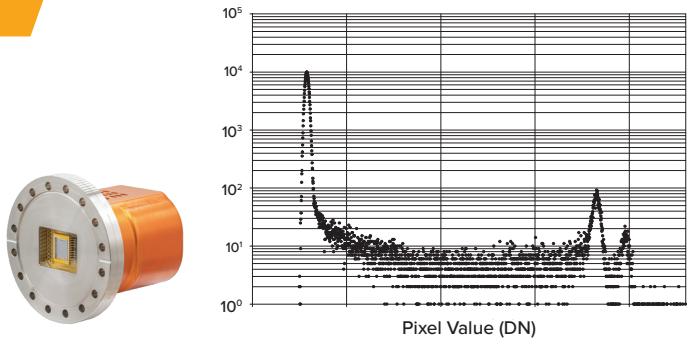
High Energy In-Vacuum Direct Detection

Raptor won a contract to design and build both 1MP (CCD47-10) and 4MP (CCD42-40) deep-cooled in-vacuum cameras for use in a key national lab to support a wide-ranging programme in fundamental physics and advanced applications. The cameras are interfaced with CameraLink and the camera on the left has an offset sensor for beam alignment purposes.



High Energy Electron Detection

A key national lab commissioned Raptor to design a 1MP back-illuminated CCD (CCD-42-10) to directly measure resolution test-chart images formed by 14keV electrons. The Eagle XO is an open front detector with CF mounting flange. The sensor resolution is 2048 x 512 pixels.



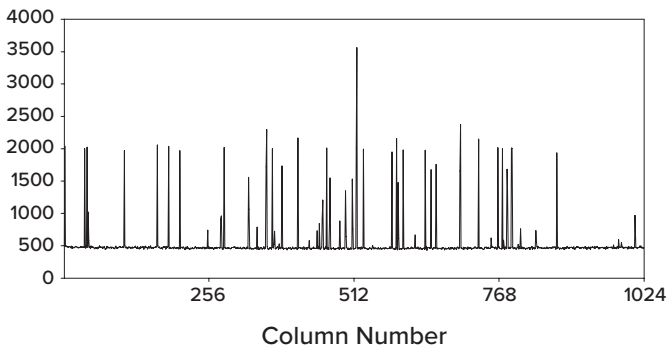
Remote In-Vacuum Direct Detection

A European national lab commissioned Raptor to design and build a series of uncooled in-vacuum cameras with a 200m fibre optic connection to provide maximum immunity from electrical interference for remote in-vacuum direct X-Ray experiments. You can see custom mounting holes and an offset sensor.



X-Ray Diffraction and X-Ray Fluorescence (XRD/XRF) – Toucan OEM

Raptor designed a custom camera solution for a XRD/XRF application. Users get ultra-fast analysis for full compound identification of major, minor and trace components within mining and ores, petrochemical, fast HAZMAT ID and pharmaceuticals industries. The solution was based on ta CCD30-11 sensor cooled to -40C and USB2.0 interface, with an integral Beryllium window acting as a visible light barrier.



About Us / Capabilities

Raptor develops, manufactures and markets a range of high quality CCD, EMCCD and InGaAs cameras targeting the global Scientific and Surveillance imaging markets, specifically for OEMs and instrumentation manufacturers. We design and build a range of custom solutions for OEMs and National Laboratories around the world. Fusing advanced material science with the latest sensor technologies, we deliver high performance camera designs with unsurpassed performance and reliability.

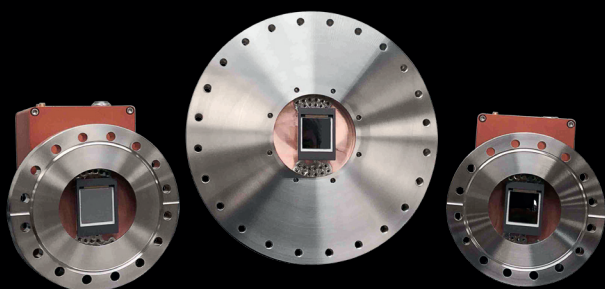
Total Solutions

If you want a total “plug and play” solution, Raptor can provide everything you need, including the camera, lens, fibre optics, scintallators, flanges, frame grabber, cables, leads, software, laptop / PC all packaged up in a sturdy Peli case for easy transport and shipping.

Customer Support

Raptor offers the highest levels of aftersales service and support with a team of engineers and application specialist staff to help address any questions or issues you may have. We also have excellent support from our partners and distributors around the world. This includes:

- Telephone, email support, online chat and secure screen sharing services
- On-site training, where applicable and permissible
- Comprehensive User Guides and detailed Instruction Manuals
- One-2-one training videos and product demonstrations
- Comprehensive RMA / returns service inside warranty period
- We will provide a full diagnostic and quote for any repairs falling outside standard warranty period.



For further information, datasheets or to schedule a demo of any of our cameras please refer to our website, contact your local distributor or reach out to us directly:

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