

# Eos

## Highest sensitivity, fast read-out CCD

- Gain 330
- Fast read-out, 0.22 sec
- 64 x 64 mm active area
- 2k x 2k Kodak 4-port readout CCD chip
- NEW 'Super plus' scintillator
- True 18 bit detector



The Eos CCD is the most sensitive and fastest CCD detector from Oxford Diffraction or any manufacturer. At 92 mm diagonal and with a gain of 330 the Eos is the highest sensitivity CCD detector available today. The ideal detector for the most challenging experiments in small molecule crystallography, the Eos CCD provides extremely fast data collections, faster than any other commercially available CCD detector.

The high speed of the Eos stems from the overall design and construction which utilises state-of-the-art electronics designed around a 2k x 2k Kodak CCD chip with a 4-port read-out design. Each of the 4 ports operates at 1.4 MHz providing a total pixel sampling rate of 5.6 MHz and read-out is via an 18 bit analogue-to-digital circuit. Inside the Eos detector the CCD chip is coupled via a fibre-optic stub to Oxford Diffraction's new 'Super plus' scintillator which provides 70% greater conversion efficiency. The combined result is the highest sensitivity and highest dynamic range CCD detector from any manufacturer.

Data collected by the Eos CCD are read out as fast as 0.22 seconds (4x4 binning) and transferred to the control PC whilst data collection proceeds, thus removing any additional dead-time associated with other CCD detectors. This unique feature is achieved using Oxford Diffraction's proprietary multi-threaded, parallel data pipelining technology (PDPT) and use of a dedicated fast 1Gb Ethernet communication channel between the CCD and control PC.

As with all Oxford Diffraction CCD detectors the design and construction of the Eos is modular for ease of service and support and utilises Oxford Diffraction's patented non-permanently bonded CCD construction.

In order to achieve ultra-low noise all image conversion is carried out inside the Eos CCD detector and the CCD chip is cooled to -40°C via a peltier system.

*Patented CCD design*

## Electrical system

Power consumption	1/ AC 230V $\pm$ 10%, 50/60Hz
Maximum power consumption	250 W
Maximum mains current	1.1 A
Main fuse	3.15 A
Ground terminal	2.5 mm <sup>2</sup> Cu

## Technical data

Overall dimensions	218 x 178 x 234 mm
Weight	9 kg
Active area	64 x 64 mm
CCD chip	Kodak KAF4320 2048x2048
Pixel size on scintillator	31 $\mu$ m
Scintillator material	'Super plus'
Fibre optic reduction	1.3:1
Peltier cooling	-40°C
Temperature stability	$\pm$ 0.05°C (micro-processorised PID)
Analogue-to-digital resolution	True 18 bits
System noise (so-called read noise)	<10e- RMS full frame
Dark current	<0.05 e-/pix.s
Communication	1 Gb ethernet
Gain	330 e-/X-ray (Mo) : 120 e-/X-ray (Cu)
Pixel sampling rate	5.6 MHz
Readout time	0.22s (4x4 binning) 0.46s (2x2 binning) 1.59s (1x1 binning)

## PC CCD interface

Communication	1 Gb ethernet
Drivers	Win XP™
Recommended host computer	Intel Core2 Duo PC: 2.13 GHz, 1Gb RAM, 320Gb HDD, DVD $\pm$ RW, LCD monitor

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