

X-ray sCMOS 37.7MP 165 Detector



High resolution X-ray imaging

The detector offers a round 165mm diameter active area, fibre optically coupled to a single chip with 37.7 megapixel resolution. A custom scintillator is deposited onto the camera in order to allow 1keV up to 100keV.

The X-ray sCMOS detector delivers up to 11 fps full resolution allowing real time acquisition routine.

A built in electronic shutter allows smear free, shutterless acquisition even with exposure time down to <100 microsecond range. Frame rate of >100 fps can be achieved when used in local sub area mode or line scan mode.

A device server driver control allows remote acquisition through existing GUI interface, allowing easy integration within existing synchrotron or laboratory software.

Applications

Small Angle X-ray Scattering

Single Crystal Diffraction

Macro Molecular Crystallography

Key Features

Input sizes

Monolithic 165mm circular fiber optic taper imaged on to a square large area sCMOS sensor with no gaps or dead area

Scintillator

Gadox:Tb : 98.8% efficiency @ Cu K alpha
Structured CsI:Tl 83.4% efficiency @ Mo K alpha

Simultaneous integration / readout enabling 100% duty cycle acquisition with zero dead time

Single photon counting detection capability

Fast 16-bit digitization and real time signal to noise thresholding routine

Real time storage into 32-bit frame buffer with noise suppression (read & dark noise / cosmic)

OEM versions available with vacuum compatibility

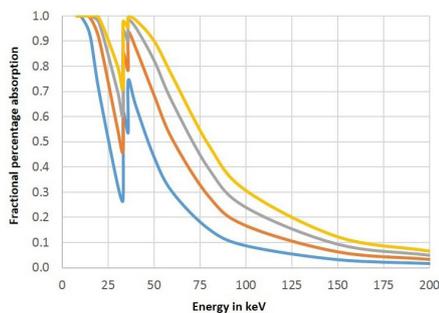
Laue Diffraction

Wide Angle X-ray Scattering

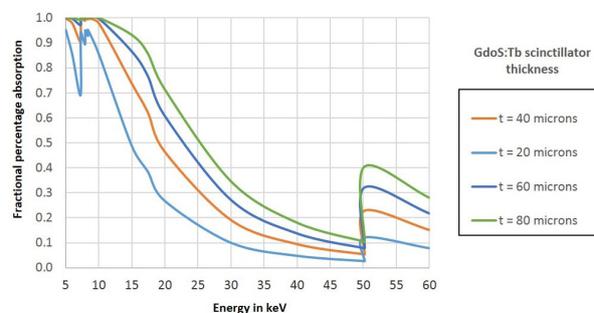
Coherent Diffraction Imaging

X-ray sCMOS 37.7MP 165

Characteristics	sCMOS 37.7MP_165
Default Resolution	6144 x 6144
Input Size (mm)	165mm diameter with no dead area
Input Size (μm)	25 μm
Dynamic Range (single frame)	30,000:1
Frame Rate	11 fps
Full Well Capacity	>120,000 electrons
Read Out Noise	<4 electrons
Quantum gain @ 8keV with GdOS:Tb	3.5 electrons per incident photon
Dark Current	<0.1 electron/pixel/second (supressed with real time noise thresholding)
Sensor Temperature ($^{\circ}\text{C}$)	Operating at -40°C with water cooling
Digitization / acquisition	16-bit digitization / 32-bit image depth
Peak QE	72% at scintillator emission wavelength
Exposure	80 microseconds up to hours in accumulation mode
Spatial Resolution (μm)	75 μm FWHM with GdOS:Tb & 75 μm FWHM with CsI:Tl
Detector Interface	10 Gigabit Ethernet / data through fibre optic
Energy Range	1keV-20keV with Gadox:Tb/15keV-200keV with CsI:Tl
Max flux rate Cu K alpha	> 10^9 photons per mm^2 per second



X-ray absorption efficiency CsI:Tl



X-ray absorption efficiency GdOS:Tb