

Sydor Fast CCD X-ray Detector



The Sydor Fast CCD X-ray Detector is a complete direct detection, x-ray imaging system that combines a custom, LBNL developed, in vacuum sensor module with a commercial-off-the-shelf data acquisition system. The camera head is an in-vacuum, 960 x 960 pixel, frame store, fast CCD sensor with a maximum frame readout rate of 200 frames per second. The readout system is implemented on an ATCA backbone and is used to control and readout the camera head, store raw camera data to hard disk, perform simple signal processing tasks and provide a simple user interface.

SYDOR FAST CCD X-RAY DETECTOR	KEY PERFORMANCE PARAMETERS
SENSOR	
Chip Geometry	Back-Illuminated
Chip Size	1920 x 960, 30 μm pixels
Read Noise	<50 e^{-1}/p RMS
Dark Current @ -50°C	<1 $\text{e}^{-1}/\text{p}/\text{s}$ RMS
Electron Well Depth	200,000 e^{-1} (1000 ph/p @ 700 eV)
Operating Temperature	-50°C
Dynamic Range	15 Bits
Frame Rate	200 fps
Efficiency (0.2-2 keV)	>60%
Binning (digital)	Up to 4 x 4
MECHANICAL	
Vacuum Compatibility	10^{-8} torr
Mass	<1.5 kg
Cooling	Recirculating Chiller
Size (L x W x H)	127 x 80 x 80 mm (excluding cooling lines and cabling)
INTERFACE	
Software interface	Embedded EPICS IOC
Electrical Vacuum Feedthrough	UHV compatible
Triggering	5V TTL (external and internal)
Electrical interface	Camera Power 51 pin, Camera Head to Interface 100 pin
READOUT SYSTEM	
Fiber Optic Transceivers	
Camera Interface Node ATCA Blade Electronics Board	
5 Slot ATCA Crate	
10 GBps ATCA Networking Switch with port replication	
ATCA RAID Storage System with 4TB Capacity at 0.8GBps	

Specifications subject to change at any time