

## PI•SCX:4300

2084 x 2084 imaging array | 24 x 24- $\mu$ m pixels

The PI•SCX:4300 from Princeton Instruments is a high-performance, cooled camera designed for lensless, direct imaging of phosphor screens and other Lambertian sources. This advanced system is ideal for use in medical and industrial x-ray imaging, image intensifiers and streak tubes, x-ray microtomography, and x-ray phase-contrast imaging. The 2.4:1 fiberoptically coupled configuration with a 165-mm taper is an attractive choice for protein crystallography and other applications where a large field of view is important. The 1:1 fiberoptically coupled option — with the fiber optic extended outside the vacuum — provides flexibility, as well as resolution of 20 lp/mm. When used with an x-ray scintillator screen and a software-programmable, high-sensitivity or high-capacity amplifier, the 1:1 fiberoptically coupled system can effectively provide x-ray photon-counting capability with up to 16-bit dynamic range.

Features	Benefits		
Patented fiberoptic-coupling technology	Preserves highest possible resolution		
1:1 fiber-ratio option*	Distortion- and vignetting-free optical coupling		
2.4:1 fiber-ratio option*	Large field of view (120 x 120 mm)		
2084 x 2084 imaging array 24 x 24- $\mu$ m pixels	Large image area		
CCD with indium tin oxide (ITO) technology	QE ~65% at 550 nm with front-illuminated CCD		
Custom phosphors*	<table border="0"> <tr> <td>Gd<sub>2</sub>O<sub>2</sub>S:Tb Available for 8 keV and 17 keV Resolution of 60 to 80 <math>\mu</math>m Emission wavelength ~550 nm</td> <td>CsI:Tl Available for 8, 25 and 40 keV Resolution of 20 to 40 <math>\mu</math>m Emission wavelength ~550 nm</td> </tr> </table>	Gd <sub>2</sub> O <sub>2</sub> S:Tb Available for 8 keV and 17 keV Resolution of 60 to 80 $\mu$ m Emission wavelength ~550 nm	CsI:Tl Available for 8, 25 and 40 keV Resolution of 20 to 40 $\mu$ m Emission wavelength ~550 nm
Gd <sub>2</sub> O <sub>2</sub> S:Tb Available for 8 keV and 17 keV Resolution of 60 to 80 $\mu$ m Emission wavelength ~550 nm	CsI:Tl Available for 8, 25 and 40 keV Resolution of 20 to 40 $\mu$ m Emission wavelength ~550 nm		
Flexible binning and readout	Increases frame rate and signal-to-noise ratio (SNR)		
16-bit digitization	Provides simultaneous wide dynamic range and SNR		
Thermoelectric cooling	Chilled water provides deep cooling		
PCI interface	Industry standard for fast data transfer over long distances		
WinView and PVCAM®	Offers powerful, easy-to-use set of Windows® GUI controls Automates data acquisition, analysis, and display		
Linux® drivers and SITK™ plug-in for National Instruments' LabVIEW™	Extends system utility		

\*Contact Princeton Instruments for information about additional fiber ratios and phosphors.

## Specifications

**CCD image sensor**      Kodak® KAF4301E; front-illuminated, scientific-grade, MPP device with indium tin oxide (ITO) technology

**CCD format**            2084 x 2084 imaging pixels  
 24 x 24- $\mu$ m pixels  
 100% fill factor  
 50 x 50-mm CCD imaging area

**Grade**                    Grade 2\*

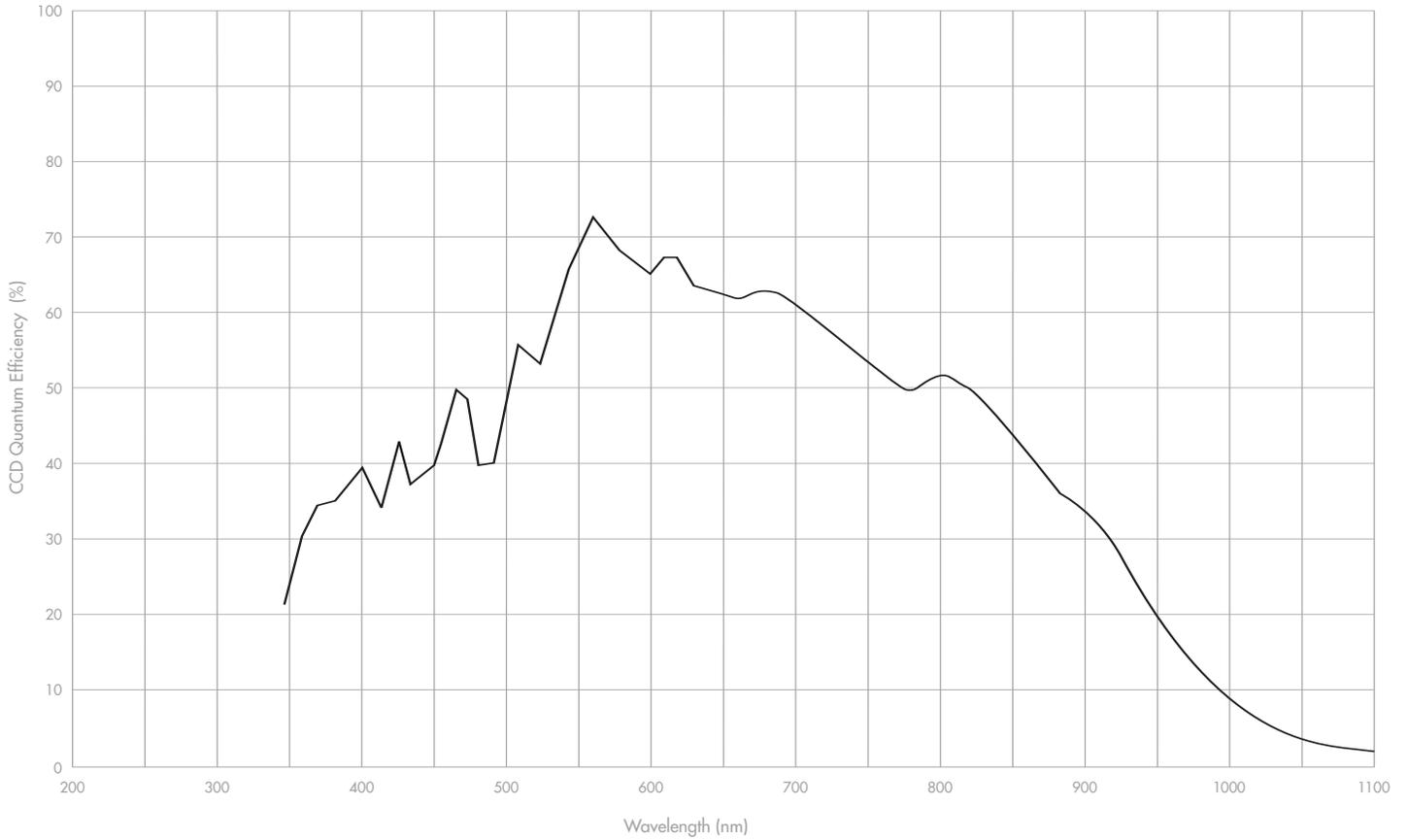
	Minimum		Typical		Maximum	
	low noise	high capacity	low noise	high capacity	low noise	high capacity
<b>Linear full well</b>	510 ke-		570 ke-		700 ke-	
<b>CCD read noise</b>			13 e- rms	22 e- rms	22 e- rms	30 e- rms
<b>System read noise @ 1 MHz</b>	8 e- rms	19 e- rms	13 e- rms	22 e- rms	20 e- rms	30 e- rms
<b>Output amplifier</b>	130 ke-	1000 ke-	150 ke-	1500 ke-	200 ke-	1800 ke-
<b>Dark current @ -50°C operation</b>	0.02 e-/p/s		0.06 e-/p/s		0.5 e-/p/s	
<b>Deepest cooling temperature thermoelectric (+5°C liquid)</b>						
$\leq$ 1.5:1 fiber ratio	-45°C		-50°C			
$>$ 1.5:1 fiber ratio	-40°C		-45°C			
<b>Nonlinearity @ 1 MHz</b>	2%					
<b>Dynamic range @ 1 MHz</b>	16 bits					
<b>Parallel shift rate</b>	150 $\mu$ sec					
<b>Operating environment</b>	0 to 30°C ambient, <50% relative humidity					

Note: Specifications are subject to change.

\* Contact Princeton Instruments for information about additional CCD grades.



# Princeton Instruments PI•SCX:4300



## Readout Rates

Binning	@ 1 MHz
1 x 1	4.7 sec
2 x 2	2.68 sec
4 x 4	1.5 sec