

PI•SCX: 1300B

1340 x 1300 imaging array | 20 x 20- μ m pixels



The PI•SCX:1300B from Princeton Instruments utilizes patented fiberoptic-coupling technology and a back-illuminated CCD to deliver the highest sensitivity available for streak tube readout and x-ray imaging. This camera has been engineered to provide outstanding system flexibility and performance. Its carefully selected fiberoptic faceplate extends outside the vacuum, facilitating simple, direct interfacing with streak tubes while also allowing phosphors to be changed quickly and easily for x-ray microtomography and a broad range of medical and industrial x-ray imaging applications. When used with an x-ray scintillator screen and a software-programmable, high-capacity or high-sensitivity amplifier, this system can effectively provide x-ray photon-counting capability with up to 16-bit dynamic range. The 1:1 fiber ratio offers resolution of 25 lp/mm.

Features	Benefits		
Back-illuminated CCD	Provides high quantum efficiency		
Patented fiberoptic-coupling technology	Preserves highest possible resolution and sensitivity		
1340 x 1300 imaging array 20 x 20- μ m pixels	"Princeton Instruments exclusive" CCD provides large image area		
1:1 fiber ratio*	Distortion- and vignetting-free optical coupling		
Dual-speed, 16-bit digitization	High-speed readout for rapid image acquisition Slow-speed readout for high sensitivity with wide dynamic range, high signal-to-noise ratio (SNR), and excellent energy resolution		
Custom phosphors*	<table border="0"> <tr> <td>Gd₂O₂S:Tb Available for 8 keV and 17 keV Resolution of 60 to 80 μm Emission wavelength ~550 nm</td> <td>CsI:Tl Available for 8, 25 and 80 keV Resolution of 20 to 40 μm Emission wavelength ~550 nm</td> </tr> </table>	Gd ₂ O ₂ S:Tb Available for 8 keV and 17 keV Resolution of 60 to 80 μ m Emission wavelength ~550 nm	CsI:Tl Available for 8, 25 and 80 keV Resolution of 20 to 40 μ m Emission wavelength ~550 nm
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Flexible binning and readout	Increases frame rate and SNR		
Software-selectable gains, readout speeds, and output amplifiers	Allows optimization of system performance (lowest noise to widest dynamic range)		
Thermoelectric cooling	Choice of air or water cooling		
"USB 2.0 interface" configuration	Seamless, plug-and-play connection to PC notebooks and desktops Easy OEM integration		
"PCI interface" configuration	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 fiberoptics, fiber ratios and phosphors.

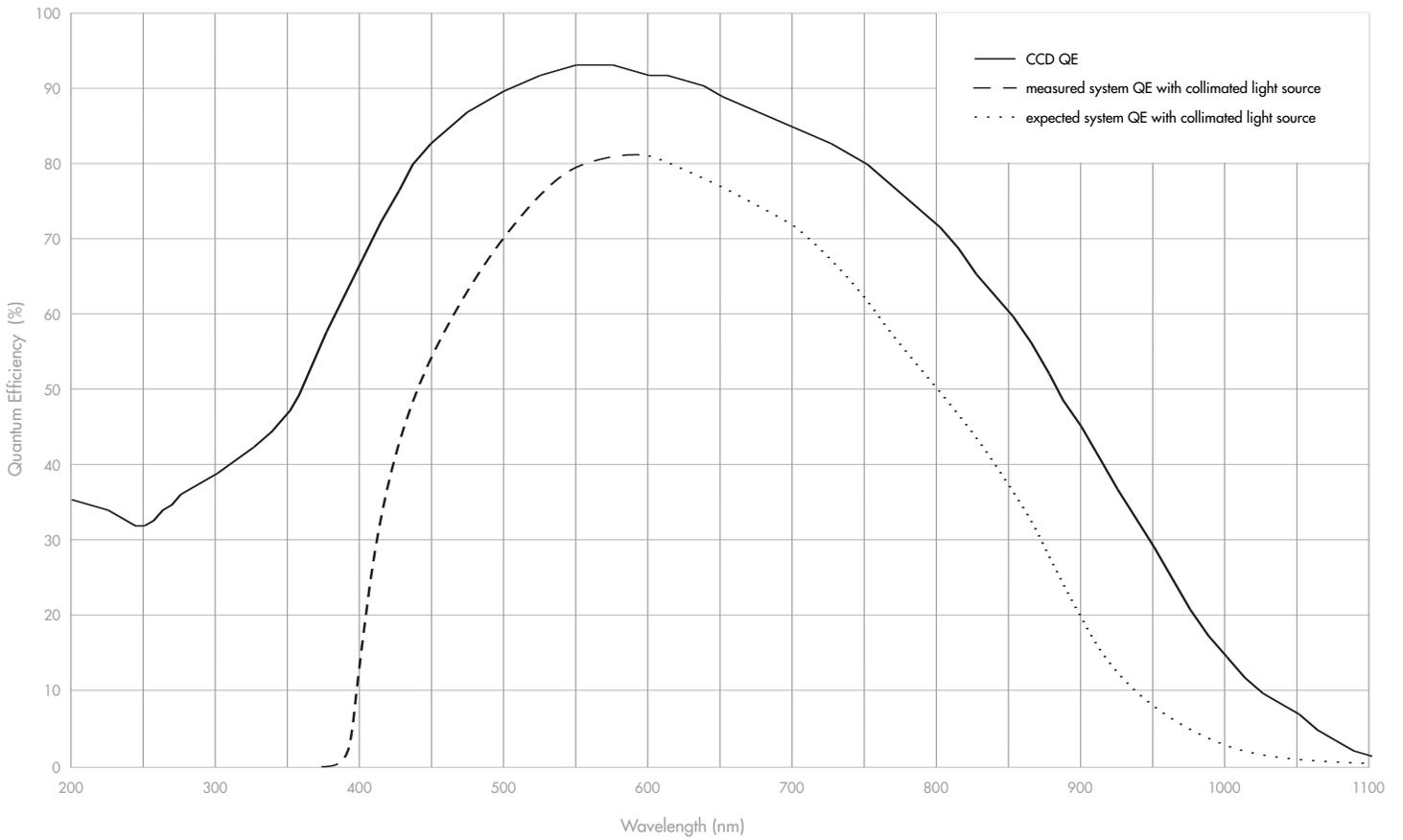
Specifications

CCD image sensor	Princeton Instruments exclusive; back-illuminated, scientific-grade, MPP device				
CCD format	1340 x 1300 imaging pixels 20 x 20- μ m pixels 100% fill factor 26.8 x 26.0-mm imaging area (optically centered)				
Grade	Grade 1				
	Minimum		Typical		Maximum
CCD read noise			2 e- rms		
System read noise			low noise	high capacity	low noise high capacity
@ 50-kHz digitization			4 e- rms	6 e- rms	5 e- rms 8 e- rms
@ 100-kHz digitization			5 e- rms	10 e- rms	6 e- rms 12 e- rms
@ 1-MHz digitization			8 e- rms	18 e- rms	10 e- rms 20 e- rms
Single-pixel full well	200 ke-		300 ke-		
Output amplifier	low noise	high capacity	low noise	high capacity	
	200 ke-	650 ke-	250 ke-	800 ke-	
Dark current @ -40°C			0.3 e-/p/s		0.8 e-/p/s
Deepest cooling temperature					
thermoelectric (air)	-35°C		-40°C		
thermoelectric (+5°C liquid)	-40°C		-45°C		
Outputs	Low-noise (high-sensitivity) or high-capacity amplifier; user selectable				
Software-selectable gains	1/2x, 1x, 2x (low-noise mode) 1x, 2x, 4x (high-capacity mode)				
Nonlinearity @ 100 kHz	<2%				
Dynamic range	16 bits				
Scan rates	"100 kHz / 1 MHz" or "50 kHz / 1 MHz"				
Frame readouts					
@ 1-MHz digitization	<1.8 seconds for full frame				
@ 100-kHz digitization	<18 seconds for full frame				
@ 50-kHz digitization	<36 seconds for full frame				
Thermostating precision	$\pm 0.05^\circ\text{C}$ across entire temperature range				

Note: Specifications are subject to change.



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Readout Rates

Binning	@ 1 MHz	@ 100 kHz	@ 50 kHz
1 x 1	1.78 sec	17.46 sec	34.75 sec
2 x 2	0.74 sec	4.98 sec	9.14 sec
4 x 4	0.29 sec	1.46 sec	2.5 sec