

1340 x 1300 imaging array | 20 x 20 μm 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.

Applications: Streak tube, Image intensifier and CRT readout, X-ray microtomography, X-ray diffraction, Medical and Industrial X-ray Imaging

Features	Benefits
Back-illuminated CCD	Provides highest possible quantum efficiency
Patented fiberoptic-coupling technology	Preserves highest possible resolution and sensitivity
1340 x 1300 imaging array 20 x 20 μm 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*	Gd ₂ O ₂ S:Tb Available for 8 keV and 17 keV Resolution of 60 to 80 μm Emission wavelength ~550 nm
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
Linux® drivers and SITK™ plug-in for National Instruments' LabVIEW™	Extends system utility

*Contact PI for information about additional fiber ratios and phosphors.

Readout Rates

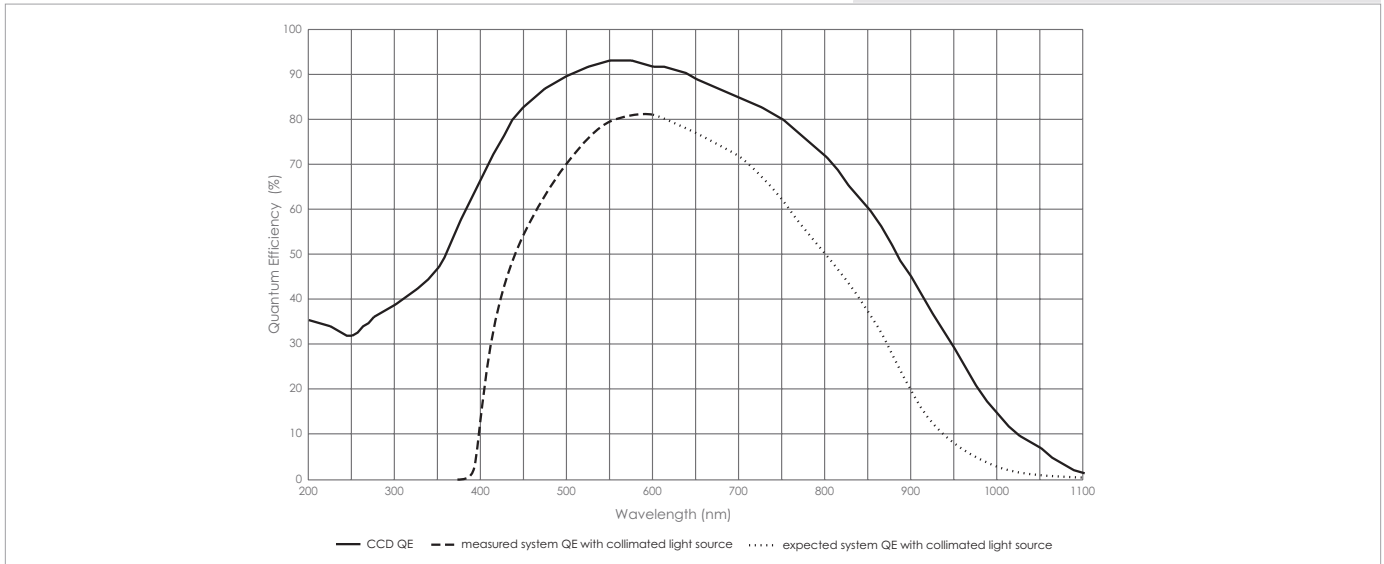
Binning	@ 1 MHz	@ 100 kHz	@ 50 kHz
1 x 1	1.78 sec	17.46 sec	34.75 sec
2 x 2	0.74 sec	4.98 sec	9.14 sec
4 x 4	0.29 sec	1.46 sec	2.5 sec

PI-SCX: 1300B Specifications

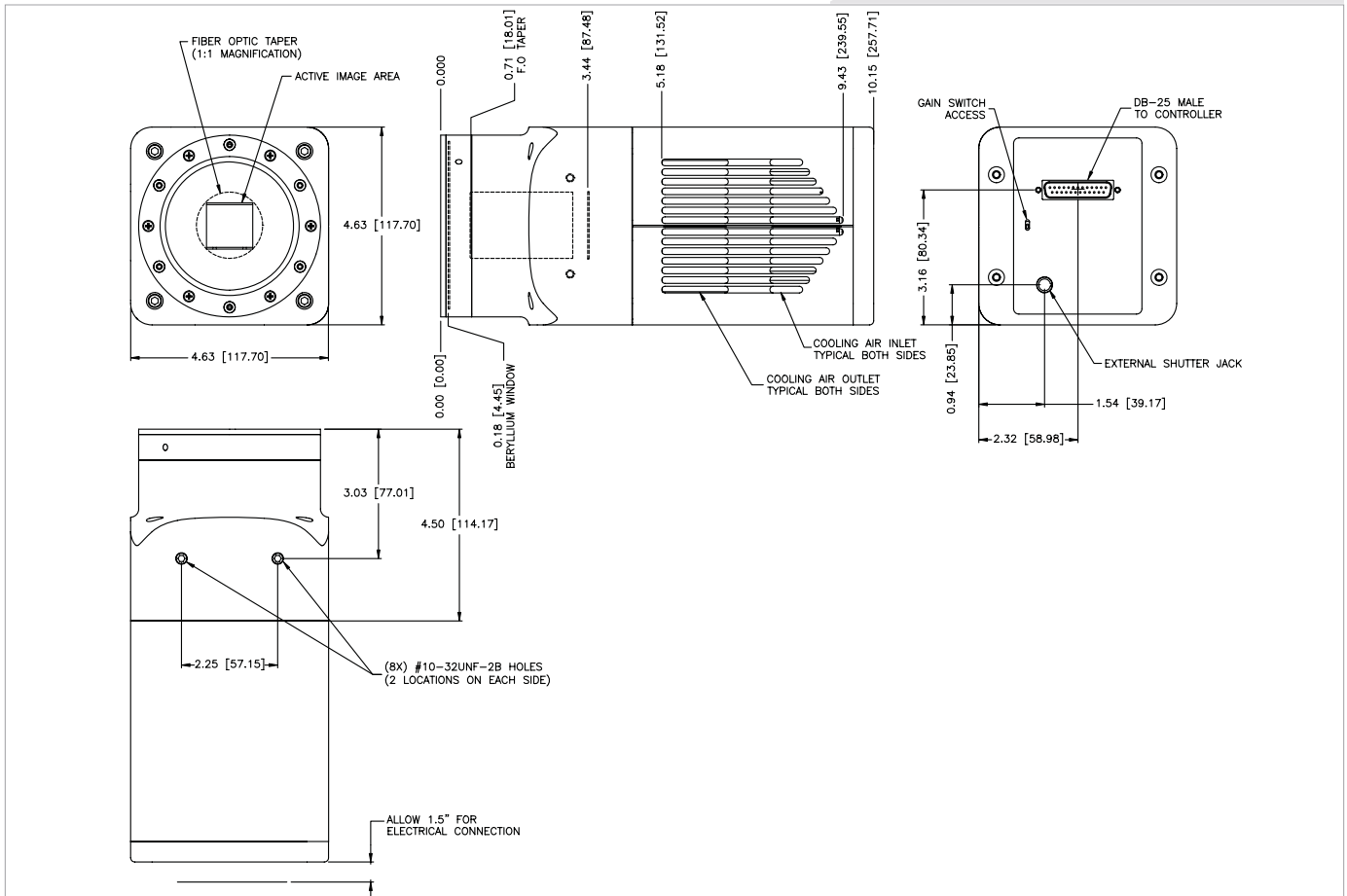
CCD image sensor	Princeton Instruments exclusive; back-illuminated, scientific-grade, MPP device				
CCD format	1340 x 1300 imaging pixels 20 x 20 μm pixels 100% fill factor 26.8 x 26.0 mm imaging area (optically centered)				
Grade	Grade 1				
	Minimum		Typical		Maximum
CCD read noise			2 e- rms		
System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

Note: Specifications are preliminary and subject to change.
*Contact PI for information about additional CCD grades.

Quantum Efficiency Curve



PI-SCX: 1300B Drawing



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