Princeton Instruments

Spec-10:400B

Cryogenic Cooling
1340 x 400 imaging array
20 x 20-µm pixels

The Princeton Instruments Spec-10:400B utilizes a high-performance, back-illuminated, spectroscopic-format CCD designed exclusively for Roper Scientific®. The 1340 x 400 imaging array with 8-mm chip height is ideal for single- and multistripe spectroscopy applications. This detector delivers much higher resolution and sensitivity than industry-standard "1024 pixel" sensors. A second exclusive feature is the integration of software-selectable amplifiers that offer an easy choice of high sensitivity or high signal-to-noise ratio (SNR). Liquid nitrogen cooling eliminates dark noise, even for long exposure times.

Features	Benefits
1340 x 400 imaging array	Exclusive feature that provides superior resolution over industry-standard "1024 pixel" format
Exclusive CCD architecture	Provides industry's lowest-noise CCD system
20 x 20-µm pixels	Optimum pixel size for full well and high resolution
8-mm chip height	Ideal for rapid, multistripe spectroscopy
Software-selectable amplifiers	Exclusive feature provides choice of superior sensitivity or superior SNR
Back-illuminated CCD	High quantum efficiency
Cryogenic cooling	Eliminates noise attributable to dark current, even for long exposure times
Standard spectrometer interface	Will interface with most spectrometers
Dual-digitizer option	Multiple-speed digitization allows complete freedom to select between "slow operation" for low noise and highest SNR or "fast operation" for rapid image acquisition
"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, reliable data transfer
WinSpec and PVCAM®	Offers easy-yet-sophisticated Windows® GUI controls Automates data acquisition, analysis, and display
Linux® drivers and SITK™ plug-in for National Instruments' LabVIEW™	Extends system utility

Specifications

CCD image sensor	Princeton Instruments exclusive; scientific grade 1; MPP; back illumination; available with Unichrome UV-enhancement coating				
CCD format	1340 x 400 imaging pixels; 20 x 20-µm pixels; 100% fill factor; 26.8 x 8.0-mm imaging area				
	Minimum		Typical		Maximum
Dual digitizers: system read noise @ 50-kHz digitization @ 100-kHz digitization @ 200-kHz digitization @ 500-kHz digitization @ 1-MHz digitization @ 2-MHz digitization			 2.8 e- rms 3.5 e- rms 5 e- rms 6 e- rms 8 e- rms 13 e- rms		 3 e- rms 5 e- rms 6 e- rms 8 e- rms 10 e- rms 16 e- rms
Single digitizer: system read noise @ 50-kHz digitization @ 100-kHz digitization @ 1-MHz digitization			 2.8 e- rms 3.5 e- rms 8 e- rms		 3 e- rms 5 e- rms 10 e- rms
Spectrometric well capacity	high sensitivity	high capacity	high sensitivity	high capacity	
	250 ke-	800 ke-	300 ke-	1 Me-	
Deepest cooling temperature			-120˚C		
Dark current @ -120˚C operation			0.3 e-/p/hr		1 e-/p/hr
Software-selectable gains	1/2x, 1x, 2x (high-sensitivity mode) 1x, 2x, 4x (high-capacity mode)				
Dynamic range	16 bits				
Nonlinearity	<2%				
Vertical shift time	30 µs				
Spectral rates* @ 100-kHz digitization @ 1-MHz digitization @ 2-MHz digitization	 60 Hz 230 Hz 270 Hz				
Operating temperature	-70 to -120˚C				
Thermostating precision	±0.05˚C across entire temperature range				

SPEC-10®
PRINCETON INSTRUMENTS

Note: Specifications are subject to change.
*Spectral rates have been measured with 100 rows vertically binned.

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USA East Coast 609.587.9797 **USA West Coast** 520.889.9933 **Benelux** +31.347.324989
France +33.160.86.03.65 **Germany** +49.89.660.779.3 **Japan** +81.43.274.8022

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