



Princeton Instruments

VersArray^{XP}: 1KB

1024 x 1024 imaging array
13 x 13- μ m pixels

The Princeton Instruments VersArray^{XP}:1KB from Roper Scientific® is a high-performance, full-frame digital camera that uses a back-illuminated, scientific-grade CCD. With a 1024 x 1024 imaging array, 100% fill factor, 13 x 13- μ m pixels, deep thermoelectric cooling, low-noise electronics, and **lifetime-vacuum guarantee**, this system provides worry-free operation. A modular, metal-seal vacuum design ensures very high MTBF for OEM and research applications. High QE, low readout and binning noise, low dark current, and fast readout speed make this camera ideal for a variety of ultra-low-light applications, including high-throughput screening, semiconductor failure analysis, astronomy, macro-imaging, and chemiluminescence. Software-selectable gains and readout speeds offer highly flexible configuration capabilities.

Features	Benefits
1024 x 1024 imaging array 13 x 13- μ m pixels	High spatial resolution
Guaranteed lifetime vacuum	Guaranteed temperature performance and worry-free operation
Up to 2-MHz digitization	Delivers high frame rates without compromising system performance
Ultra-low-noise electronics	Best possible system performance
Deep thermoelectric cooling/air	Worry-free operation without the need for circulating liquid or an additional power supply (reliable, streamlined design)
Separate controller	Practically no limit on distance between computer and controller (up to 165 feet with PCI cable, up to 1000 meters with fiberoptic interface)
Back-illuminated CCD	Highest sensitivity from UV to NIR
Scientific-grade CCD	Low noise, few defects, linear response
Flexible, user-selectable binning and subarray readout	Total flexibility to optimize experiments and signal-to-noise ratio (SNR)
High intrascene dynamic range	Quantifies both strong and weak signals in the same image
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
Software-selectable gains	Allows optimization of system performance for lowest noise to highest dynamic range
"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
WinView 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

Binning	@ 2 MHz	@ 1 MHz	@ 500 kHz	@ 200 kHz	@ 100 kHz	@ 50 kHz
1 x 1	1.7	0.9	0.5	0.2	0.1	0.05
2 x 2	3.6	2.3	1.5	0.7	0.4	0.2
8 x 8	12.3	10.5	8.5	6.1	4.5	2.7

(Frames per second)

Data acquired with 1-ms exposure time.

Specifications			
	Minimum	Typical	Maximum
CCD image sensor	E2V CCD47-10; scientific grade 1; MPP; back-illuminated device; available with UV-enhanced process		
CCD format	1024 x 1024 imaging pixels; 13 x 13- μ m pixels; 100% fill factor; 13.3 x 13.3-mm imaging area (optically centered)		
CCD read noise		2 e ⁻ rms	4 e ⁻ rms
System read noise			
@ 50-kHz digitization		2.6 e ⁻ rms	4.5 e ⁻ rms
@ 100-kHz digitization		3.6 e ⁻ rms	5 e ⁻ rms
@ 200-kHz digitization		4.5 e ⁻ rms	6 e ⁻ rms
@ 500-kHz digitization		6 e ⁻ rms	8 e ⁻ rms
@ 1-MHz digitization		7.5 e ⁻ rms	10 e ⁻ rms
@ 2-MHz digitization		9 e ⁻ rms	15 e ⁻ rms
Single-pixel full well	60 ke ⁻	100 ke ⁻	
Output amplifier	200 ke ⁻	240 ke ⁻	
Dark current @ -70°C operation with ambient air @ +20°C		0.001 e ⁻ /p/s	0.003 e ⁻ /p/s
Deepest operating temperature TE cooling (air) with ambient air @ +20°C	-65°C	-70°C	
Software-selectable gains	1/2x, 1x, 2x		
Nonlinearity @ 100 kHz	<2%		
Vertical shift rate	30 μ sec		
Readout bits/speed	16 bits @ 50 kHz to 2 MHz		
Thermostating precision	\pm 0.05°C across entire temperature range		

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Note: Specifications are preliminary and subject to change.

When you're **SERIOUS** about high-performance imaging...

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