



Princeton Instruments

# VersArray:1300B

1340 x 1300 imaging array  
20 x 20- $\mu$ m pixels

The Princeton Instruments VersArray:1300B is a high-performance, full-frame digital camera system that utilizes a back-illuminated, scientific-grade CCD offered exclusively by Roper Scientific®. With a 1340 x 1300 imaging array, 100% fill factor, and 20 x 20-micron pixels, this system provides a very large imaging area with very high spatial resolution. Dark current is reduced through a thermoelectrically cooled option for easy maintenance or a liquid-nitrogen-cooled option for long exposures. The large field of view, exceptionally high quantum efficiency, low readout noise, and low binning noise make this camera ideal for a variety of low-light applications, including macro-imaging of chemiluminescence.

Features	Benefits
1340 x 1300 imaging array 20 x 20- $\mu$ m pixels	Large-format, back-illuminated camera provides excellent resolution
Back-illuminated CCD	Offers the highest sensitivity from the ultraviolet to the near infrared
Scientific-grade CCD	Low noise, few defects, linear response
User-selectable amplifiers	Ability to configure system to best meet requirements of experiment
Flexible, user-selectable binning and subarray readout	Increases frame rate and signal-to-noise ratio (SNR)
High intrascene dynamic range	Quantifies both strong and weak signals in the same image
Dual-digitizer option	Slow speed for low noise and highest SNR High speed for rapid image acquisition
LN cooling option	Allows long exposures and very low dark current
Thermoelectric cooling option	Easy maintenance
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

## Specifications

<b>CCD image sensor</b>	E2V CCD36-40; scientific grade 1; MPP; back-illuminated device; available with UV-enhancement coating				
<b>CCD format</b>	1340 x 1300 imaging pixels; 20 x 20- $\mu$ m pixels; 100% fill factor; 26.8 x 26.0-mm imaging area (optically centered)				
	<b>Minimum</b>		<b>Typical</b>		<b>Maximum</b>
<b>CCD read noise</b>			2 e <sup>-</sup> rms		
<b>System read noise</b>			<b>low noise</b>	<b>high capacity</b>	<b>low noise</b> <b>high capacity</b>
@ 50-kHz digitization			2.8 e <sup>-</sup> rms	6 e <sup>-</sup> rms	4 e <sup>-</sup> rms    8 e <sup>-</sup> rms
@ 100-kHz digitization			3 e <sup>-</sup> rms	10 e <sup>-</sup> rms	5 e <sup>-</sup> rms    12 e <sup>-</sup> rms
@ 1-MHz digitization			8 e <sup>-</sup> rms	18 e <sup>-</sup> rms	10 e <sup>-</sup> rms    20 e <sup>-</sup> rms
<b>Single-pixel full well</b>	200 ke <sup>-</sup>		300 ke <sup>-</sup>		
<b>Output amplifier</b>	<b>low noise</b>	<b>high capacity</b>	<b>low noise</b>	<b>high capacity</b>	
	200 ke <sup>-</sup>	650 ke <sup>-</sup>	250 ke <sup>-</sup>	800 ke <sup>-</sup>	
<b>Dark current</b>					
@ -40°C operation			0.1 e <sup>-</sup> /p/s		0.3 e <sup>-</sup> /p/s
@ -110°C operation			0.5 e <sup>-</sup> /p/hr		1 e <sup>-</sup> /p/hr
<b>Deepest operating temperature</b>					
TE cooling (air)	-35°C		-40°C		
TE cooling (chilled liquid)	-45°C		-55°C		
LN cooling (liquid nitrogen)	-80°C		-110°C		
<b>Outputs</b>	Low-noise (high-sensitivity) or high-capacity amplifier; user selectable*				
<b>Software-selectable gains</b>	1/2x, 1x, 2x (low-noise mode) 1x, 2x, 4x (high-capacity mode)				
<b>Nonlinearity @ 100 kHz</b>	<2%				
<b>Dynamic range</b>	16 bits				
<b>Scan rates</b>	"100 kHz / 1 MHz" or "50 kHz / 1 MHz"				
<b>Frame readouts</b>					
@ 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				
<b>Thermostating precision</b>	$\pm 0.05^\circ\text{C}$ across entire temperature range				
<b>LN hold time</b>	>25 hours				

**VersArray**  
PENNINGTON INSTRUMENTS



Note: Specifications are subject to change.

\*Applies to thermoelectric head only.

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