...SEE the Future

Princeton Instruments ACTON

PI-MAX: 1300

The PI-MAX: 1300 from Princeton Instruments/Acton is a high performance intensified camera system featuring a high resolution CCD fiberoptically coupled to a variety of 25mm Gen II, Gen III and Gen III *filmless* intensifiers. The intensifiers offer the highest possible sensitivity from UV to NIR, large field of view and resolution that is ideally matched to the CCD. Nano-second gating capability and integrated programmable timing generator (PTG) make these ICCD cameras ideal for time-resolved imaging and spectroscopy applications.

Applications: Planar Laser Induced Fluorescence (PLIF), Plasma Diagnostics, Time resolved imaging and spectroscopy (large format)

Features	Benefits
1340 x 1300 Imaging Array	High resolution and large field of view imaging and spectroscopy
Dual speed, 16-bit digitization	High speed provides rapid image acquisition for focusing; Low noise operation provides the best signal-to-noise ratio
Thermo-electric Cooling	Reduces dark current to negligible levels
A wide selection of Intensifiers **Gen II** **Gen III** **Gen III *filmless***	Best sensitivity and gate speed in the desired wavelength range. Best combination of UV-Blue sensitivity and fast gating (SB). RB provides wide spectral coverage. Ideal for Blue (350nm)-NIR (900nm) range. Unigen™ intensifier provides the widest wavelength coverage from UV to NIR. Offers highest sensitivity and fastest gate speed.
Fiberoptic coupling	Highest optical throughput possible
Fast gating	Temporal resolution for effective background discrimination, kinetics imaging and spectroscopy
Built-in high voltage pulser	Rugged, integrated design for minimal insertion delay
Programmable Timing Generator™ (PTG)	Built-in, fully software controlled gate timing; Controls gate widths and delays in linear, or exponential increments; Low insertion delay (25nsec)
USB 2.0 Interface	Seamless, plug-n-play connection to PC desktops and laptops
PCI Interface	Industry standard for fast data transfer over long distances
WinSpec/WinView and PVCAM®	Offers powerful, easy-to use set of Windows GUI controls; Automatic data acquisition, analysis and display; PVCAM provides unified programming interface for custom programming
LabVIEW™ Scientific Imaging Tool Kit (SITK™)	Pre-defined LabView vis provide easy integration of the camera into complex experiment setup

PI-MAX: 1300 Specifications

CCD

Image sensor	PI/Acton exclusive CCD36-40 scientific grade, MPP front-illuminated CCD		
CCD format	1340 x 1300 pixels (Max. 1250x1250 active pixels in the center with 25mm intensifier) 20 x 20 μm pixels		
Field of view	25mm diameter circle inscribed in 26.8x26mm CCD area		
	Minimum	Typical	Maximum
System read noise **@ 100-kHz digitization** **@ 1-MHz digitization**		 4 e- rms 8 e- rms	 6 e- rms 12 e- rms
Pixel Full Well	180 ke-	200 ke-	
Dark current (e-/p/sec) @ -20°C		3	5
Deepest cooling temperature	-10°C (air cooled); -20°C (with water circulation)		
Vertical Shift Rate	15 μsec/row (variable via software)		

Intensifier

Intensifiers available	25mm* - Gen II, Gen III , Gen III *filmless*							
Method of coupling to the CCD	1:1 fiber optic							
Intensifier type	Gen II			Gen III			Gen III *filmless*	
	UV	SB	RB	Unigen	HB	HQ	HB*f*	HQ*f*
Intensifier Input Window	$MgFl_2$	Quartz		Fiber	BK7 Glass		Borosilicate Glass	
Wavelength Range	See QE Curves							
Minimum Gate Speed (optical FWHM) **Fast Gate** **Slow Gate**	 < 7nsec < 100 nsec			 < 10nsec -NA-			 < 7nsec -NA-	
Repetition Rate: **sustained/burst (kHz)**	 50/500			 5/50			 50/500	
Resolution limit	45 lp/mm			64 lp/mm			57 lp/mm	
EBI (Photo e-/pixel/sec)	0.05 - 0.2			0.05 - 0.2			0.02	
Phosphor	P43 (P46 optional)							

Notes: All specifications subject to change.
* Not all intensifiers are available in 25mm configuration. Enquire with factory.

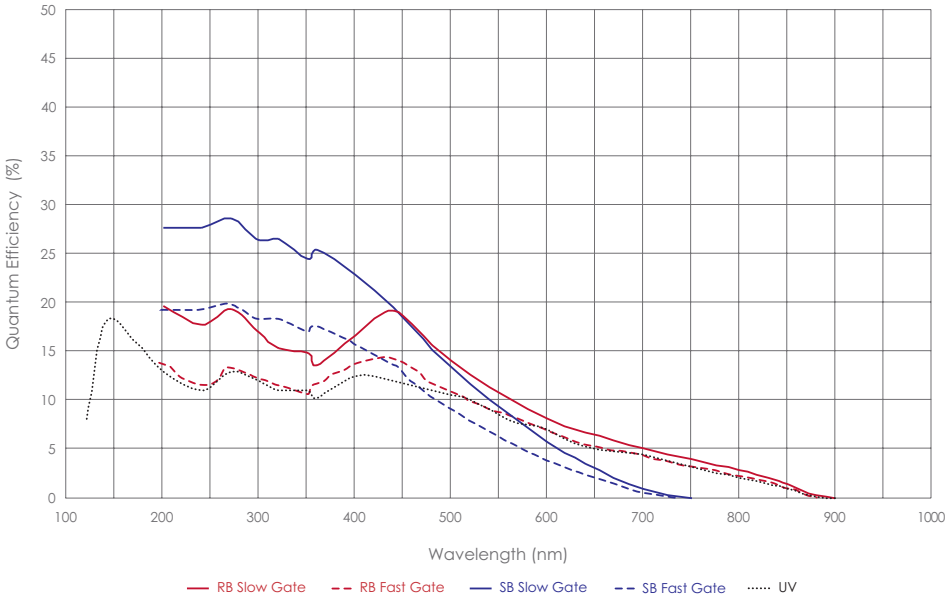
Frame Rates

Binning	1340 x 1300	1024 x 1024	512 x 512	256 x 256
1 x 1	0.6	0.8	2.1	4.4
2 x 2	1.4	1.9	4.2	7.7
4 x 4	3.4	4.3	7.8	11.8

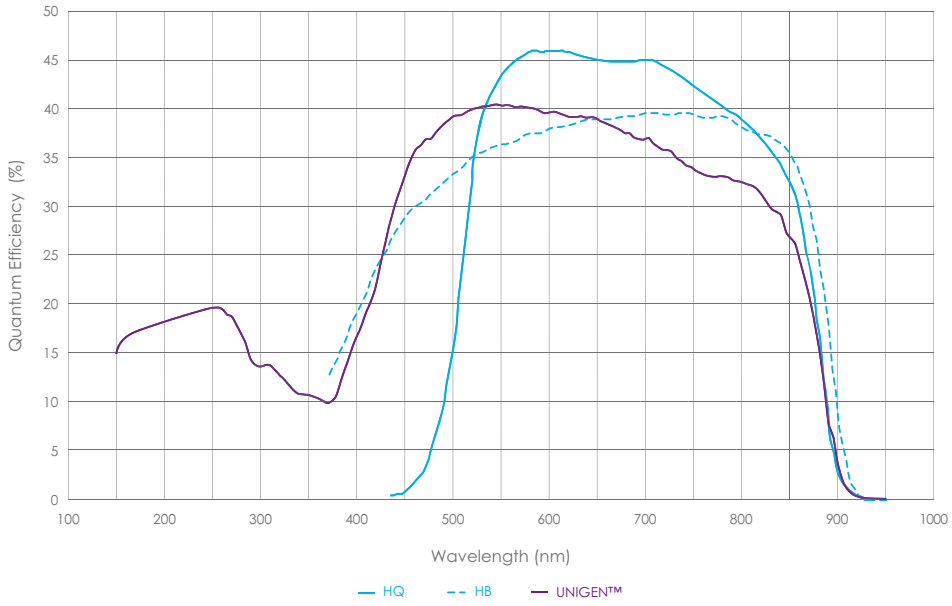
Notes: Frames per second at 1MHz digitization

Quantum Efficiency Curve

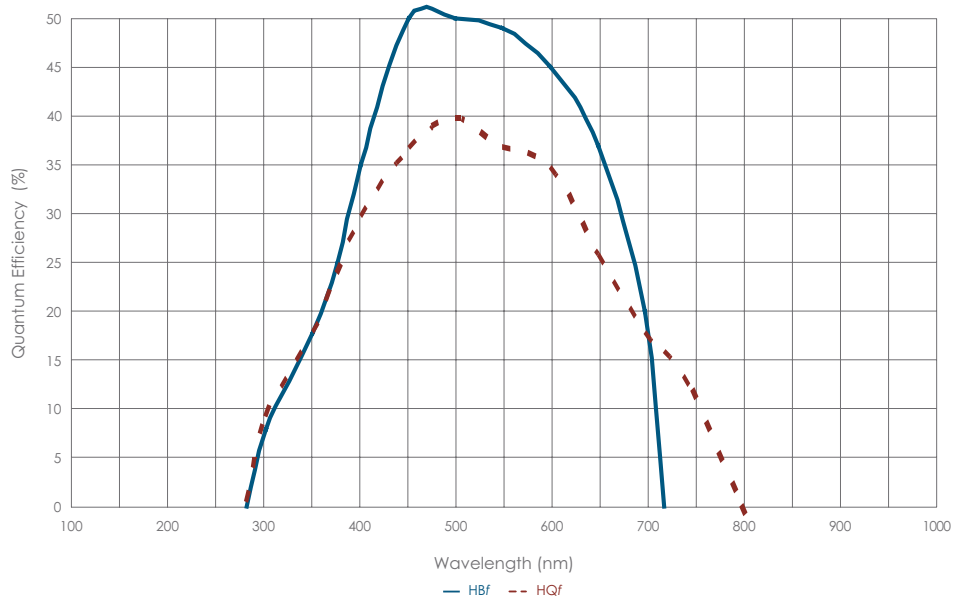
Gen II Intensifiers

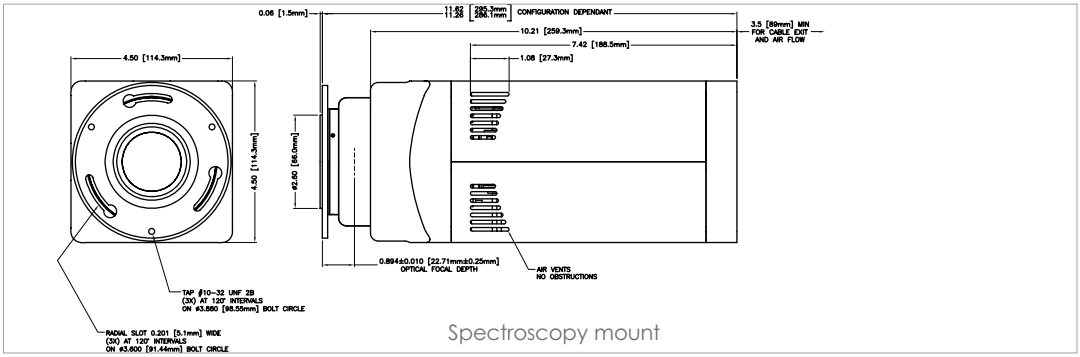


Gen III Intensifiers

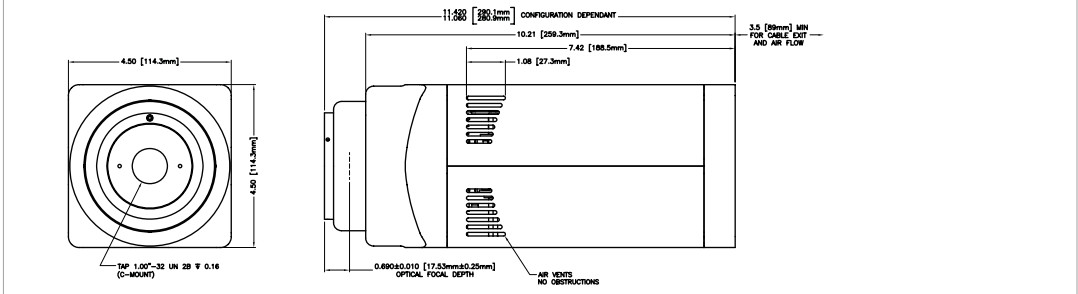


Gen III *filmless* Intensifiers

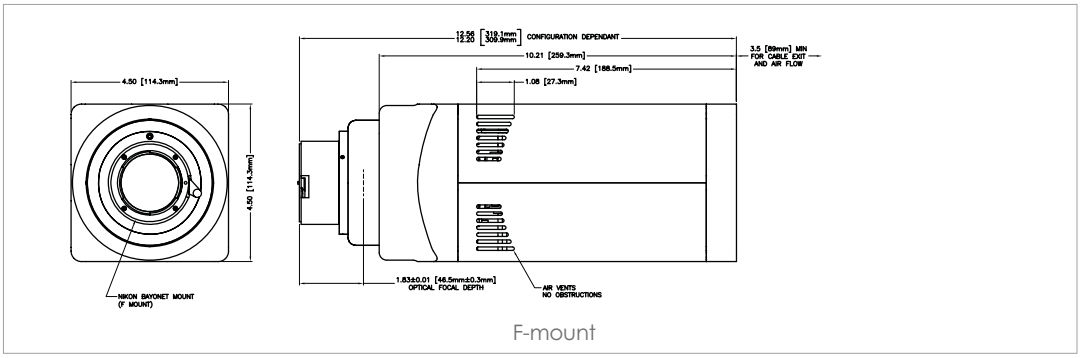




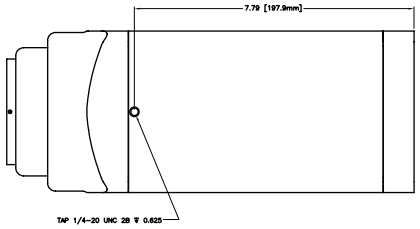
Spectroscopy mount



C-mount



F-mount



Bottom View showing tapped hole for tripod mount

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