

PI-MAX: 1K



The PI-MAX: 1K from Princeton Instruments/Acton is a high performance intensified camera system featuring a high resolution CCD fiberoptically coupled to a variety of Gen II, Gen III and Gen III *filmless* intensifiers. The intensifiers offer the highest possible sensitivity from UV to NIR and offer 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: Fluorescence Life time Imaging Microscopy (FLIM), Time Resolved Imaging and Spectroscopy, Combustion, Planar Laser Induced Fluorescence (PLIF), Plasma Diagnostics.

Features	Benefits
1024 x 1024 Imaging Array	High resolution 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	Best sensitivity and gate speed in the desired wavelength range.
Gen II	Best combination of UV-Blue sensitivity and fast gating (SB). RB provides wide spectral coverage.
Gen III	Ideal for Blue (350nm)-NIR (900nm) range. Unigen™ intensifier provides the widest wavelength coverage from UV to NIR.
Gen III <i>filmless</i>	Offers highest sensitivity and fastest gate speed.
Fiberoptic coupling	Highest optical throughput possible; No vignetting
Sub-nano second 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: 1K Specifications

CCD

Image sensor	e2v CCD47-10 scientific grade, MPP front-illuminated CCD		
CCD format	1024 x 1024 imaging pixels 13 x 13- μ m pixels 13.3 x 13.3 (18.8 mm diagonal)		
	Minimum	Typical	Maximum
System read noise @ 100-kHz digitization @ 1-MHz digitization		6 e- rms 10 e- rms	8 e- rms 12 e- rms
Pixel Full Well	100 ke-	160 ke-	
Dark current (e-/p/sec) @ -20°C		0.75	1
Deepest cooling temperature	-20°C (air cooled); -35°C (with water circulation)		
Vertical Shift Rate	30 μ sec/row (variable via software)		
Spectral Rate	30 Hz, full vertical binning 280 Hz, 200 μ m tall spectrum		

Intensifier

Intensifiers available	18mm - Gen II, Gen III , Gen III <i>filmless</i>							
Method of coupling to the CCD	1:1 fiber optic							
Intensifier type	Gen II			Gen III			Gen III <i>filmless</i>	
	UV	SB	RB	Unigen	HB	HQ	HBf	HQf
Intensifier Input Window	MgF ₂	Quartz		Fiber	BK7 Glass		Borosilicate Glass	
Wavelength Range	See QE Curves							
Minimum Gate Speed (optical FWHM)								
Fast Gate	< 2nsec(500 ps*)			< 5nsec			< 2nsec (500 ps*)	
Slow Gate	< 50 nsec (< 9 nsec with MCP gating**)			-NA-			-NA-	
Repetition Rate: sustained/burst (kHz)	50/500			5/50			50/500	
Resolution limit	54 to 64 lp/mm			64 to 72 lp/mm			57 to 64 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.

* Enquire about the ultra-fast gating option for fast gate tubes

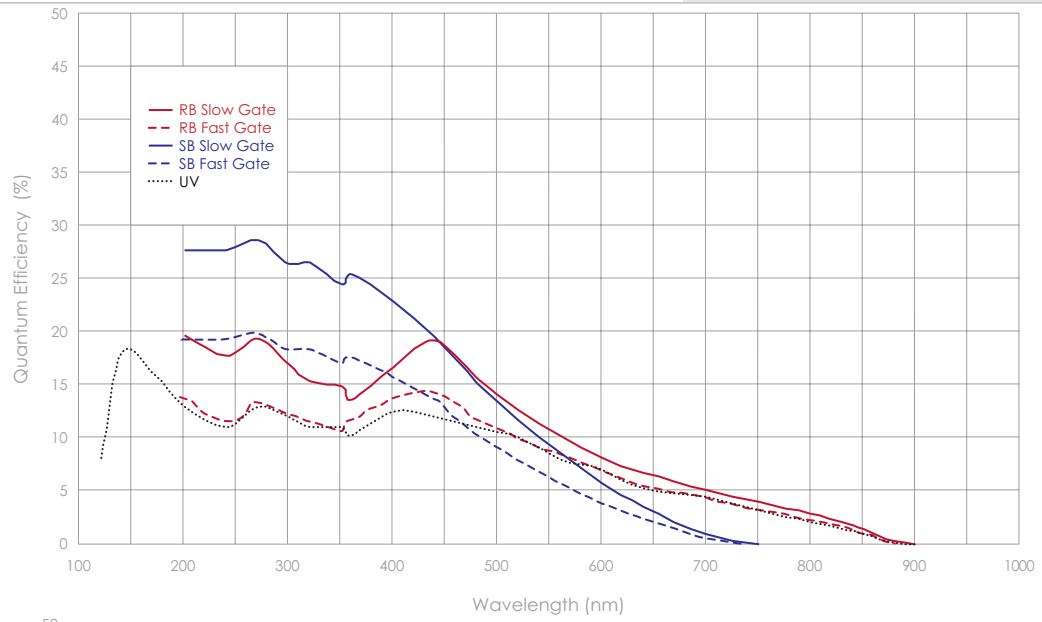
** SB slow gate tubes are offered with special MCP Gating (MG) option to achieve < 9 nsec gating and at the same time offering >25% QE

Frame Rates

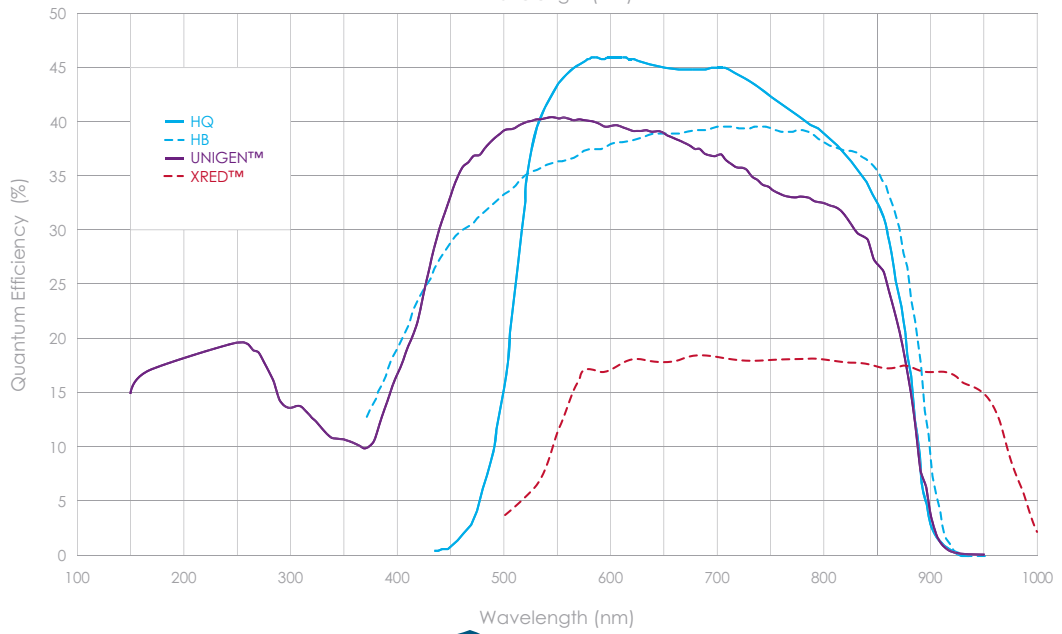
Binning	1024 x 1024	400 x 400	200 x 200
1 x 1	0.9	3.3	6.8
2 x 2	2.5	6.9	11.7
4 x 4	5.8	11.8	16.7

Notes: Frames per second at 1MHz digitization

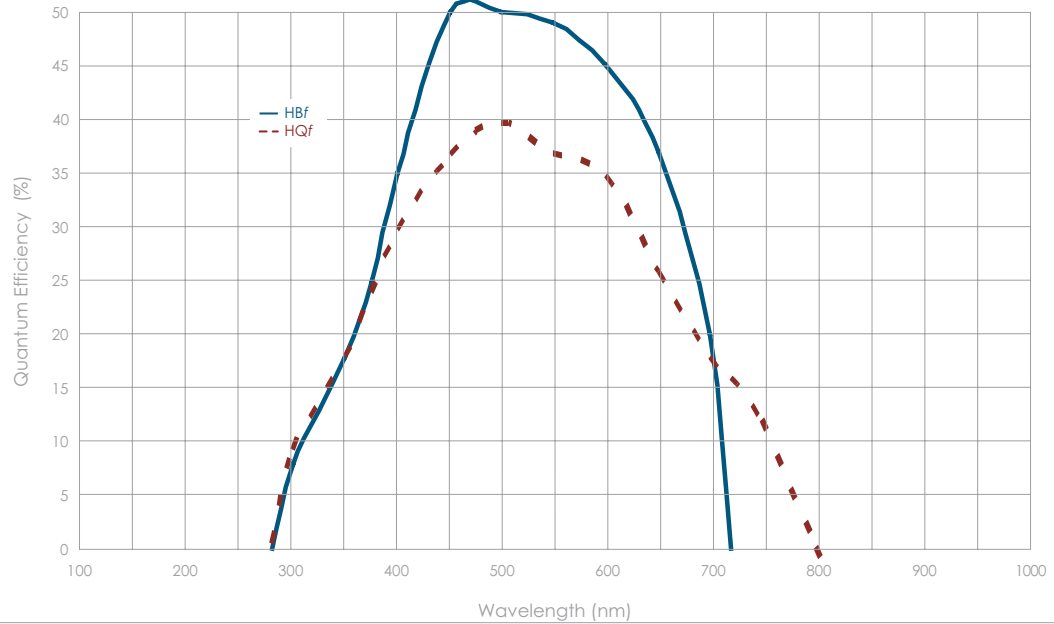
Gen II Intensifiers

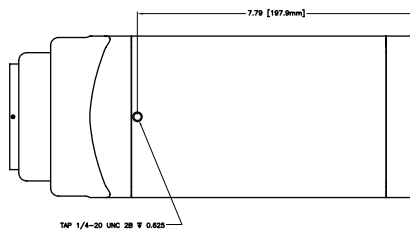
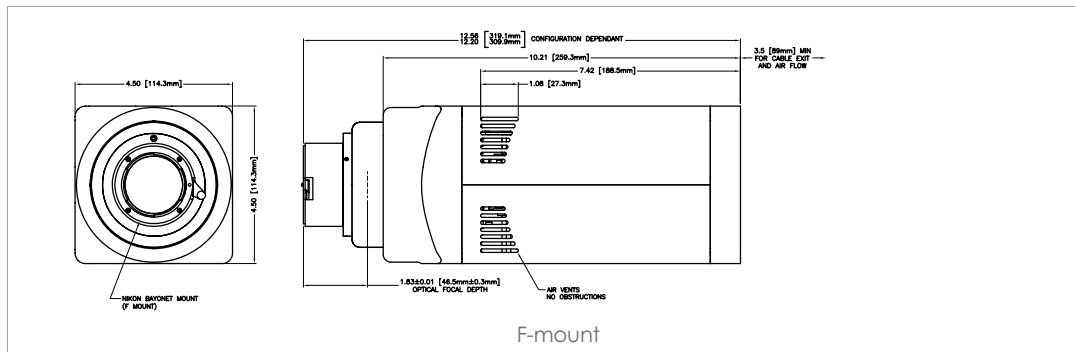
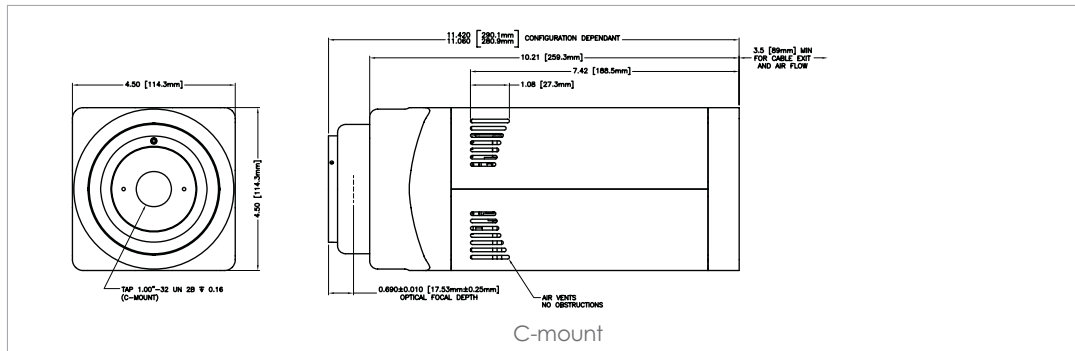
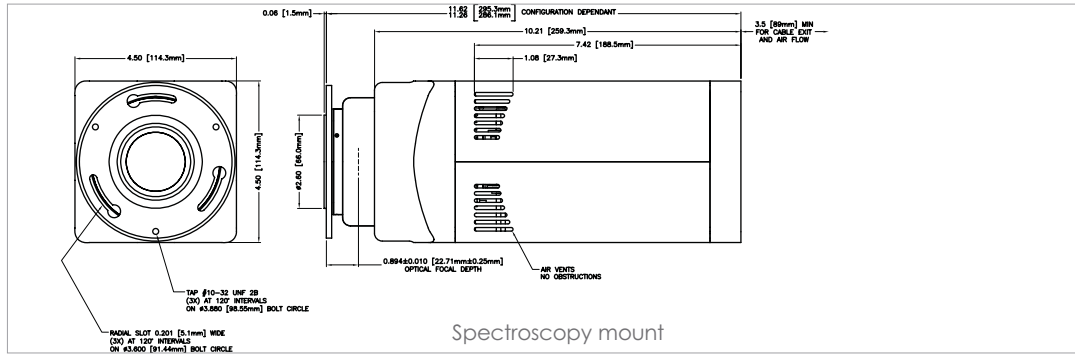


Gen III Intensifiers



Gen III filmless Intensifiers





Bottom View showing tapped hole for tripod mount

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