

PI-MAX: 512



The PI-MAX: 512 from Princeton Instruments/Acton is a high performance intensified camera system featuring a wide dynamic range 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 this an ideal choice for a variety of time-resolved imaging and spectroscopy applications.

PI-MAX: 512 provides the widest dynamic range of all ICCD cameras in the market today.

Applications: Fluorescence Life time Imaging Microscopy (FLIM), Time Resolved Imaging and Spectroscopy, Combustion, Planar Laser Induced Fluorescence (PLIF), Plasma Diagnostics, Time Resolved Spectroscopy

Features	Benefits
512 x 512 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 for negligible levels
A wide selection of Intensifiers	Best sensitivity and speed in the desired wavelength range.
Gen II	Best combination of UV to 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: 512 Specifications

CCD

Image sensor	Thomson 7895 scientific grade, MPP front-illuminated CCD		
CCD format	512 x 512 imaging pixels 19 μm x 19 μm (effective size 24 μm x 24 μm) 12.4 mm x 12.4 mm (17.5 mm diagonal)		
	Minimum	Typical	Maximum
System read noise @ 100-kHz digitization @ 1-MHz digitization		8 e- rms 35 e- rms	15 e- rms 50 e- rms
Pixel Full Well	450 ke-	550 ke-	
Dark current (e-/p/sec) @ -20°C		5	11
Deepest cooling temperature	-20°C (air cooled); -35°C (with water circulation)		
Vertical Shift Rate	1.6 $\mu\text{sec}/\text{row}$ (variable via software)		
Spectral Rate	500 Hz, full vertical binning 875 Hz, 200 μm tall spectrum		

Intensifier

Intensifiers available	18mm - Gen II, Gen III and Gen III <i>filmless</i>							
Method of coupling to the CCD	1:1.27 fiber optic reducer							
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			Slow Gate				
	< 2nsec(500 ps*)			< 5nsec			< 2nsec (500 ps)	
	< 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

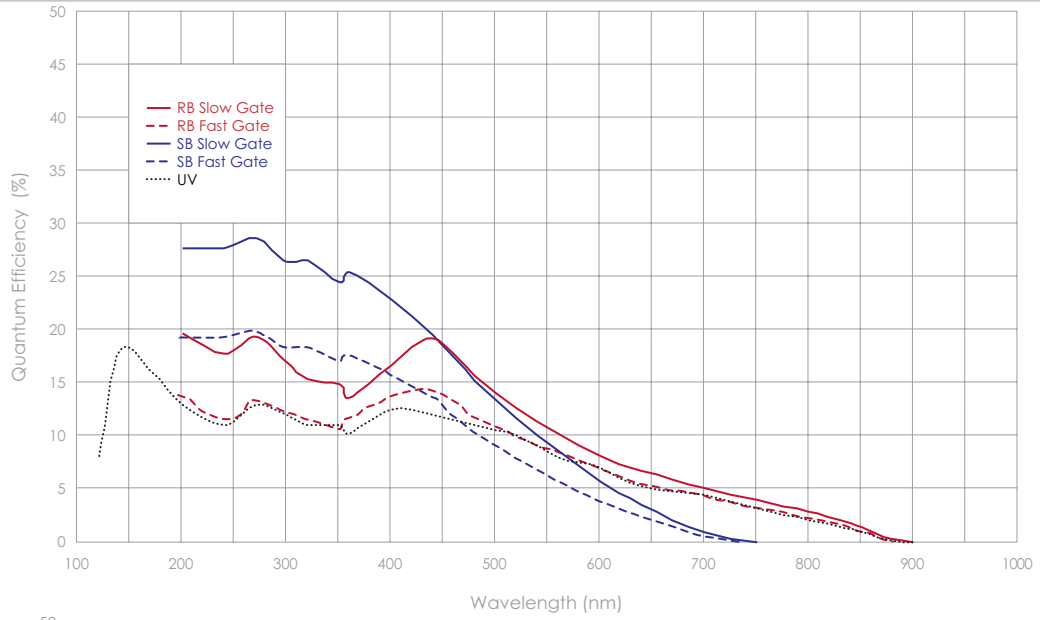
** SB slow gate tubes are offered with special MCP Gating (MG) option to achieve < 9 nsec gate width and >25% QE in the UV-blue region.

Frame Rates

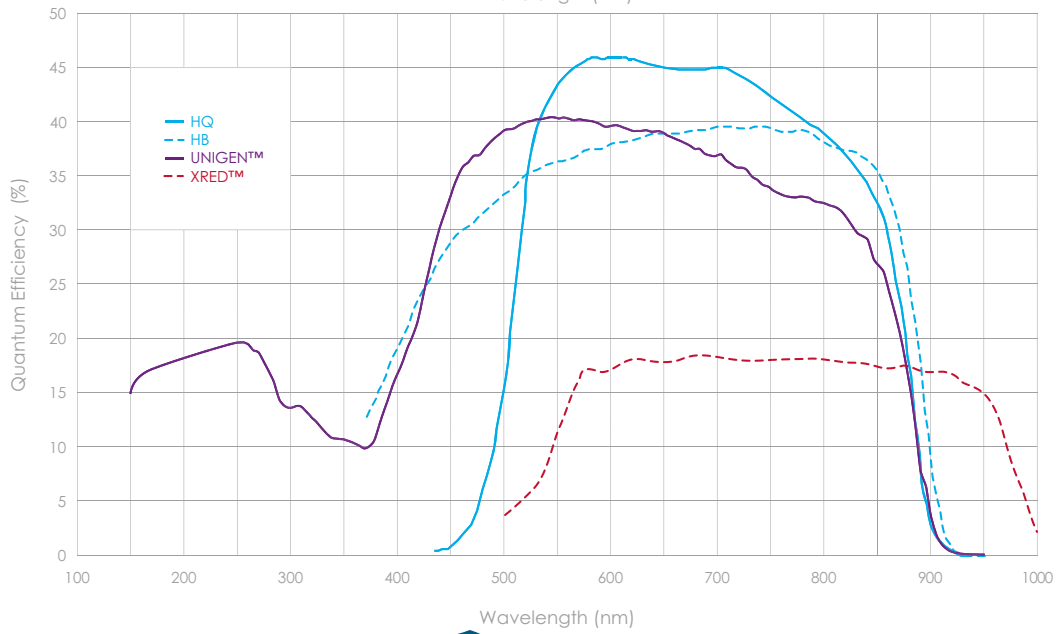
Binning	512 x 512	200 x 200	100 x 100
1 x 1	3.7	14.6	33.7
2 x 2	11.0	34.3	66.8
4 x 4	28.9	67.9	111.7

Notes: Frames per second at 1MHz digitization

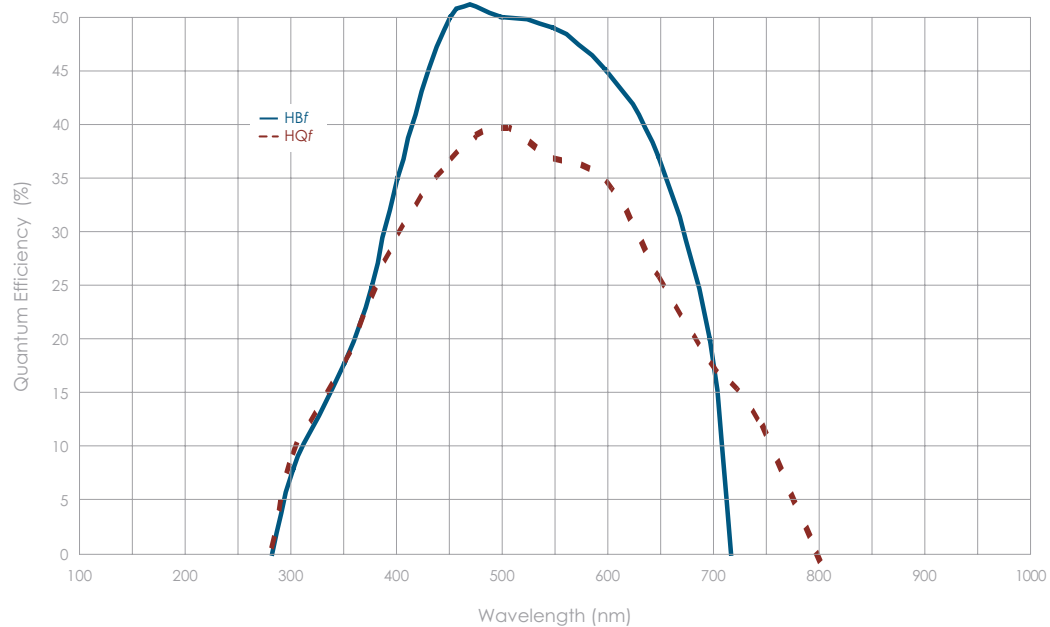
Gen II Intensifiers

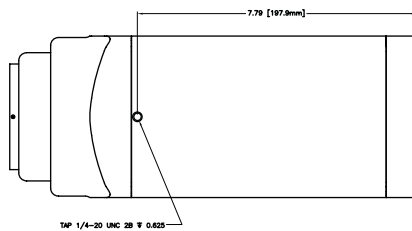
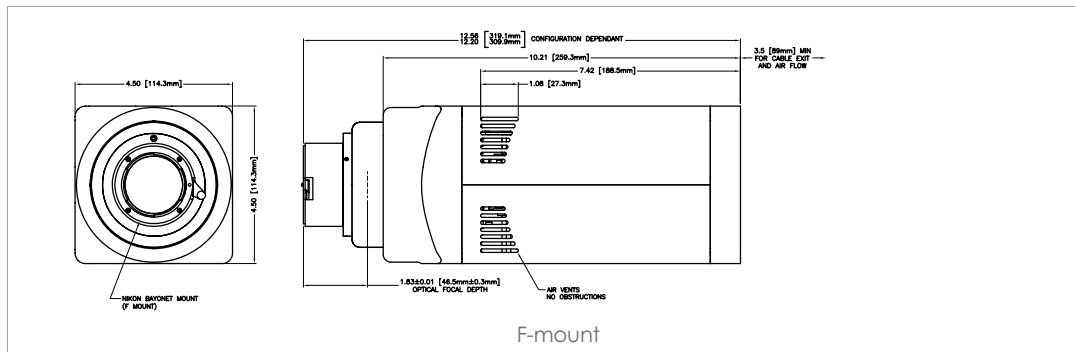
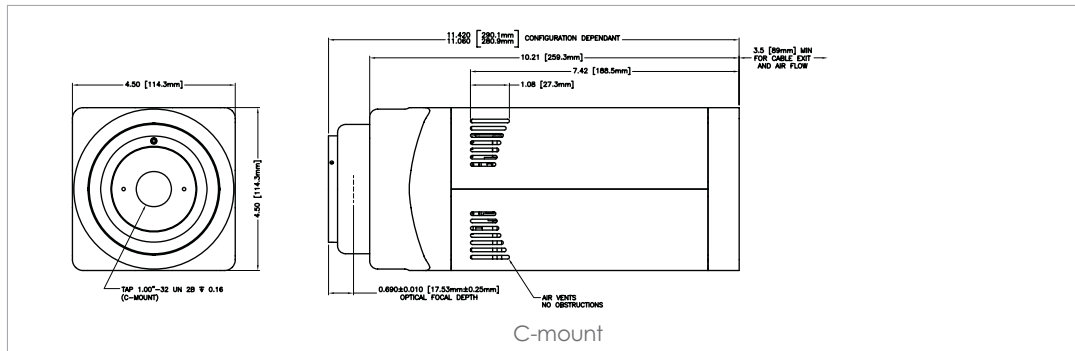
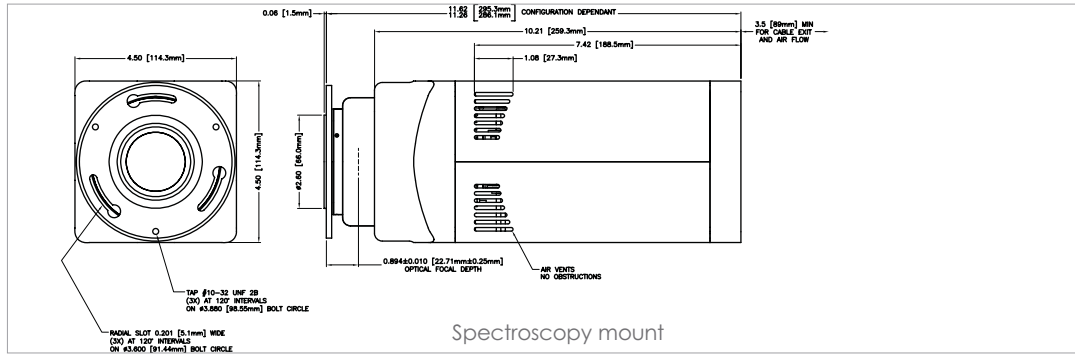


Gen III Intensifiers



Gen III filmless Intensifiers





Bottom View showing tapped hole for tripod mount

Princeton Instruments



www.piaction.com

email: moreinfo@piaction.com

USA +1.877.4 PIACTION | Benelux +31 (347) 324989

France +33 (1) 60.86.03.65 | Germany +49 (0) 89.660.779.3

Japan +81.3.5639.2741 | UK +44 (0) 28.38310171