...SEE the Future

Princeton Instruments ACTON

InSight:256

InSIGHT

Princeton Instruments, the foremost innovator in CCD camera technology has teamed up with Acton Research Corporation, the world's leading designer of spectroscopic instrumentation, to create the InSight Integrated Spectroscopy System.

The InSight is a complete "out-of the box" solution that was designed to suit many applications. The system incorporates proprietary CCDs with an image corrected spectrograph that comes pre-aligned and focused allowing for effortless integration into your experiment. The InSight comes standard with a kinematic dual interchangeable grating turret and a deeply cooled CCD. The USB interface further enables true "plug-and-play" operation with the industry standard WinSpec software. There are a wide range of accessories available for use with the InSight, including fiber adapters, filter wheels and notch filter chambers.

Applications: Visible and UV Raman, Fluorescence, Luminescence, Multistripe Emission Spectroscopy

Features	Benefits
Permanent vacuum	Maintenance free operation for the life of the system
Deep thermoelectric cooling	Operate without the need for circulating liquid or an additional power supply
Compact design	Ideal for integration into applications where space is at a premium
Internal mounted shutter	Permits changing shutter later without removing slit and losing calibration
Industry standard 1024 x 256 array	High performance at low cost
Pre-aligned and focused digital spectroscopy solution	Quick and easy integration into your experimental setup
Image corrected optics	Offers the best spatial resolution for multi-stripe spectroscopy
USB 2.0 and RS 232 interface	Seamless, plug-n-play connection to PC notebooks and desktops No need for external control box or installing PCI cards
Renowned WinSpec software	Offers easy, yet sophisticated Windows® GUI controls Automates data acquisition, analysis and display
PICAM for VB, C, C++ and Scientific Toolkit for LabVIEW™	Respected application program interface provides a universal interface to all Princeton Instruments hardware
Wide range of accessories available	Including fiber adapters, filter wheels, sample chambers, and light sources
Manual or motorized slits	Provides the user the choice of either high accuracy slit mechanism
Two position detector mount	One flange with the ability to select best spectral or best spatial position
Acton Research high efficiency optical coatings	ARC #2000 Al + MgF_2 coatings deliver the highest throughput in the industry, guaranteeing 88 - 90% reflectance at 200 nm

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InSight:256 Preliminary Specifications

CAMERA

	InSight:256E		
CCD image sensor	e2v CCD30-11, scientific grade 1, MPP device		
	front-illuminated; open electrode		
CCD format	1024 x 256, 26 x 26 µm pixels, 26.6 x 6.7 mm imaging area		
	Typical	Maximum	
Dark current @ -75˚C (e/p/s)	0.001 e-/p/s	0.0025 e-/p/s	
System read noise @ 100 kHz readout @ 2 MHz readout	 6 e- rms 22 e- rms	 8 e- rms 28 e- rms	
Vertical shift rate	30 µsec/row		
Spectral rate* @ 100 kHz readout @ 2 MHz readout	 35 spectra/sec 85 spectra/sec		
	Minimum	Typical	
Spectrometric well capacity Single pixel Binned	 200 ke- 500 ke-	 300 ke- 800 ke-	
Deepest cooling temperature	-70˚C	-75˚C	
Thermostating precision	±0.05˚C across entire temperature range		
	High	Mid	Low
Software-selectable gains High sensitivity	 3 e-/ct	 6 e-/ct	 12 e-/ct
Dynamic range	16 bits		
Nonlinearity @ 100 kHz readout @ 2 MHz readout	 < 1% < 2%		

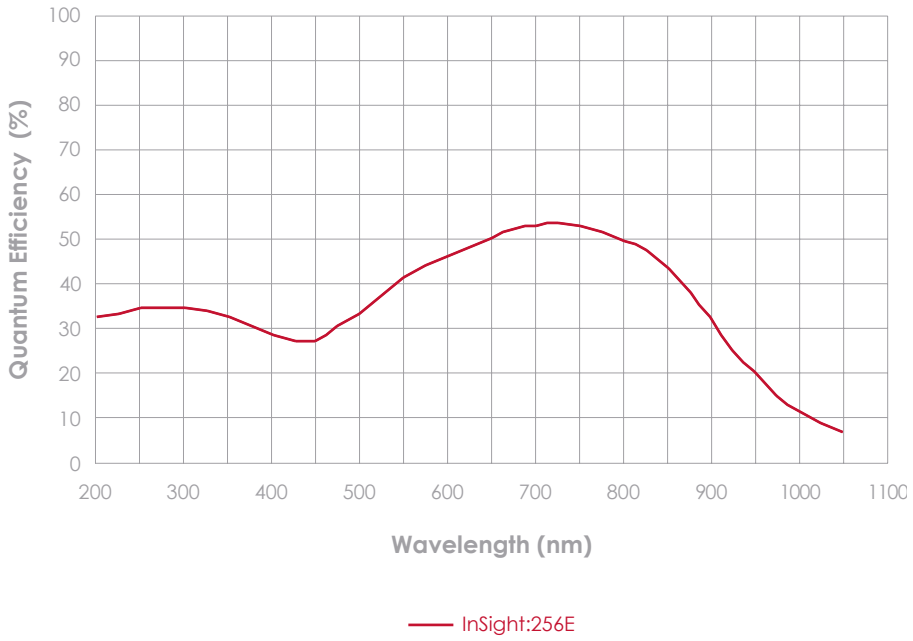
SPECTROMETER

Focal length	300 mm
Aperture ratio	f/3.9
Dispersion (RLD)	2.43 nm/mm with 1200 g/mm grating at 500 nm (nominal)
Spectral resolution (10 µm slit x 4 mm high, 20 µm CCD pixel size)	0.10 nm with 1200 g/mm grating
Spatial performance (Astigmatism)	60 µm
Wavelength accuracy	±0.2 nm
Wavelength repeatability	±0.05 nm
Drive step size	0.0025 nm
Focal plane size	27 mm wide x 14 mm high
Grating size	68 mm x 68 mm
Grating mount	Interchangeable, dual grating turret
Computer interface	USB and RS232

* Spectral rates have been measured with all rows vertically binned.

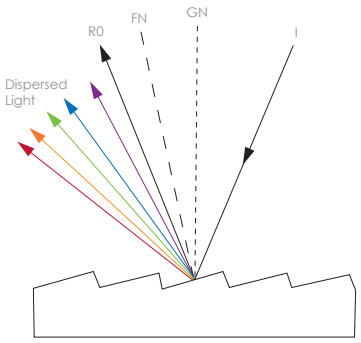
All specifications subject to change without notice.

InSight:256 Quantum Efficiency Curve



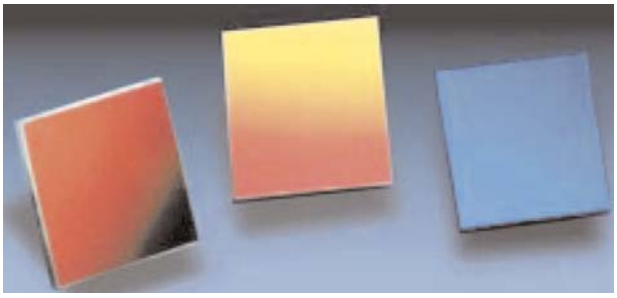
Diffraction Gratings

P/N	Groove Density	Blaze Wavelength	Range of Operation	Dispersion	Wavelength Coverage for 100 and 400 CCDs (26.8 mm)	Wavelength Coverage for 256 and 2K CCDs (27.6 mm)
1-05-600	50 g/mm	600 nm	400 - 800 nm	65.2 nm/mm	1748 nm	1800 nm
1-015-300 1-015-500 1-015-800	150 g/mm	300 nm 500nm 800 nm	200 - 450 nm 335 - 750 nm 535 nm - 1.2 µm	21.6 nm/mm	579 nm	596 nm
1-030-500 1-030-750 1-030-1	300 g/mm	500 nm 750 nm 1 µm	335 - 750 nm 500 nm - 1.1 µm 650 nm - 1.5 µm	10.7 nm/mm	287 nm	295 nm
1-060-300 1-060-500 1-060-750 1-060-1	600 g/mm	300 nm 500 nm 750 nm 1 µm	200 - 450 nm 335 - 750 nm 500 nm - 1.1 µm 650 nm - 1.5 µm	5.2 nm/mm	140 nm	144 nm
1-120-300 1-120-500 1-120-750 1-120-HUV 1-120-HVIS	1200 g/mm	300 nm 500 nm 750 nm Holographic, UV Holographic, VIS	200 - 450 nm 335 - 750 nm 500 nm - 1.1 µm 185 - 375 nm 300 - 800 nm	2.4 nm/mm	65 nm	67 nm
1-180-500 1-180-HUV	1800 g/mm	500 nm Holographic, UV	335 - 750 nm 185 - 375 nm	1.7 nm/mm	44 nm	46 nm
1-240-240 1-240-HUV 1-240-HVIS	2400 g/mm	240 nm Holographic,UV Holographic, VIS	185 - 375 nm 185 - 375 nm 300 - 800 nm	1.2 nm/mm	31 nm	32 nm
1-360-240 1-360-HUV	3600 g/mm	240 nm Holographic, UV	185 - 375 nm 185 - 375 nm	0.7 nm/mm	18 nm	18 nm



Diffraction Grating

GN: Grating Normal
FN: Facet Normal
I: Incident Light
R0 : 0-Order Reflection



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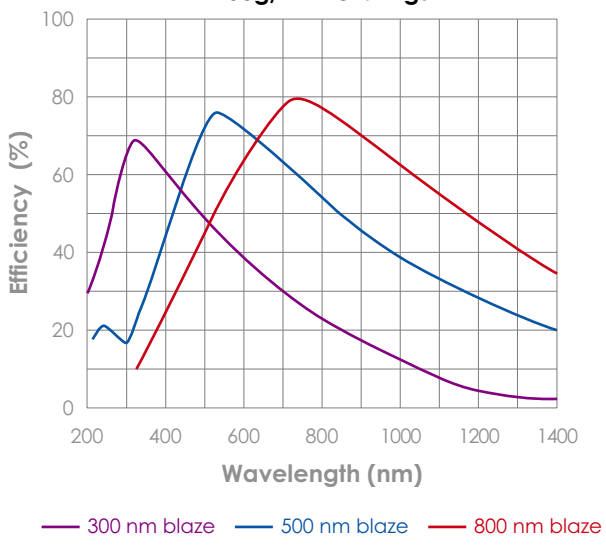
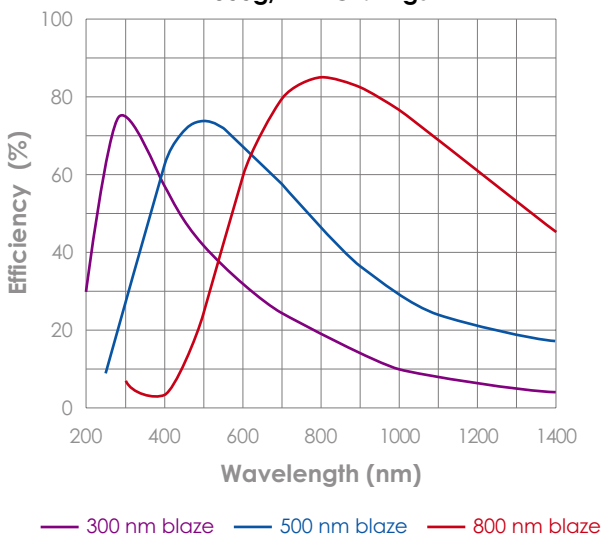
Grating Efficiency Curves

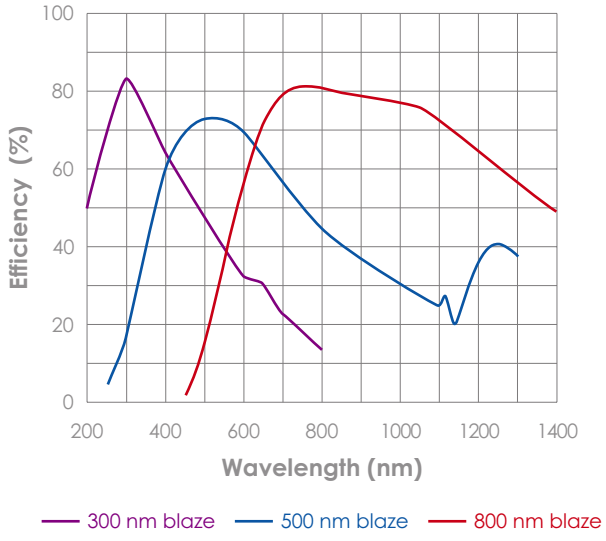
150g/mm Gratings



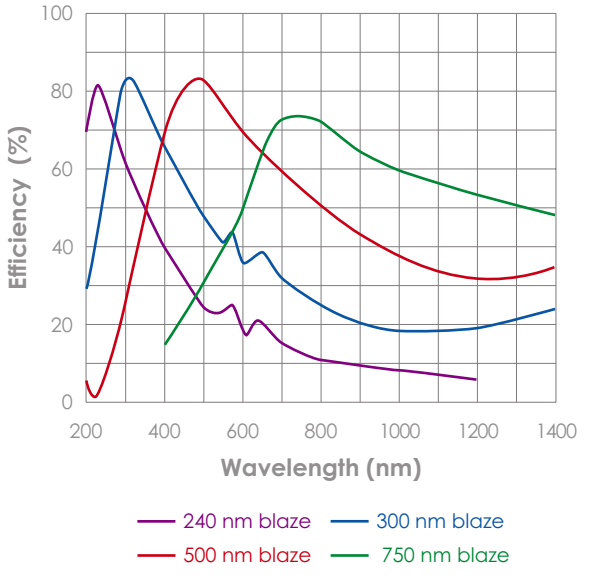
300g/mm Gratings

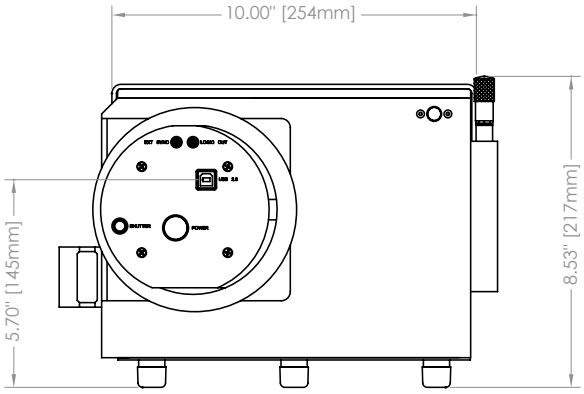


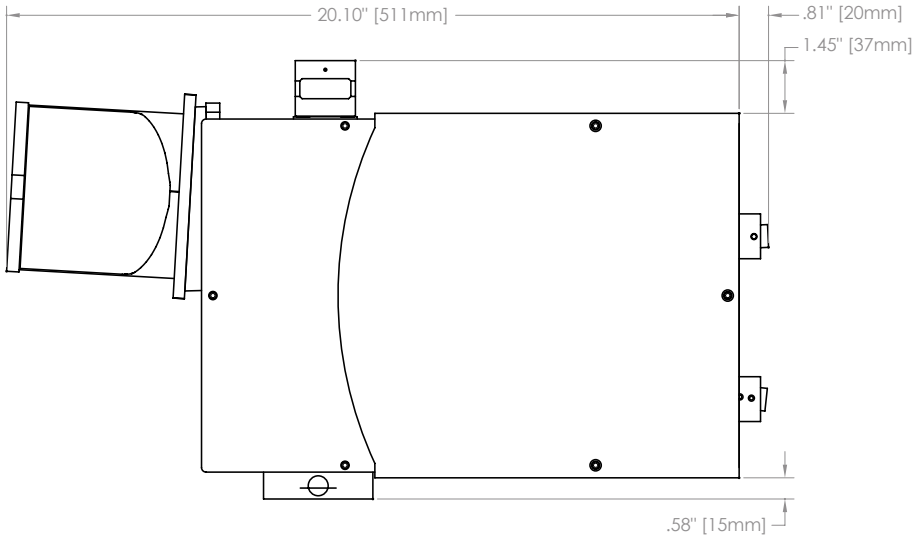
600g/mm Gratings

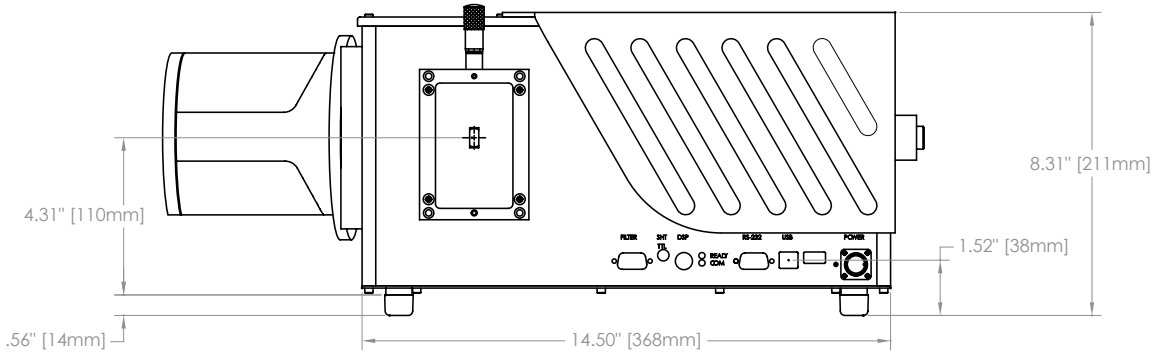


1200g/mm Gratings









All Dimensions Nominal
Measurements in Inches.

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