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PIoNIR: 640

The PloNIR: 640 from Princeton Instruments is the world's first scientific grade, deep-cooled, large format InGaAs camera for low-light scientific NIR imaging and spectroscopy applications. The camera uses a 640 x 512 InGaAs array with response from 0.9 μm to 1.7 μm . The detector is Peltier cooled to -80°C or below to minimize thermally generated noise and to improve signal-to-noise ratio for the most demanding NIR applications. It offers 16-bit digitization and low read noise for outstanding dynamic range.

FEATURE	BENEFITS
640 x 512 InGaAs array	High resolution imaging in the NIR region; Offers 4X more pixels over 320 x 256 sensor
20 μm x 20 μm pixels	High spatial resolution
Response from 0.9 μm to 1.7 μm with 85% (typical) peak quantum efficiency	Excellent NIR sensitivity for demanding imaging applications
Thermo-electric (Peltier) cooling	Minimizes dark noise and allows extended integration times without the need for liquid nitrogen; Built-in air or liquid cooling option for vibration sensitive environments
Integrated cold-shield	Special "cold shield" limits the ambient thermal background
Electronic shutter	Provides integration times from 1 μs to many minutes
C-mount	Standard lens interface compatible with numerous lenses and microscopes (spectrometer adapters available)
Fused silica window	AR coated, fused silica window for high transmission in NIR range
Gig E interface	Industry standard for fast data transfer over long distances, up to 50m
LightField™ for 64-bit Windows 7	Offers intuitive, cutting edge user interface; Provides data acquisition, defect correction, display and analysis
WinView and WinSpec for 32-bit Windows XP/7	Offers powerful, easy-to-use set of Windows GUI controls; Automates data acquisition, background and flat field corrections and display
SITK™ for LabVIEW™	Easy integration into complex experimental setup
PICAM (64-bit)/PVCAM (32-bit) software development kits (SDKs)	Universal programming interfaces for easy custom programming; Compatible with Windows XP/7 (32-bit) and Windows 7 (64-bit)

* PloNIR: 640 shown with lens, sold separately.

Applications:

Nanotube fluorescence, emission, absorption,
non-destructive testing and singlet oxygen detection

SPECIFICATIONS

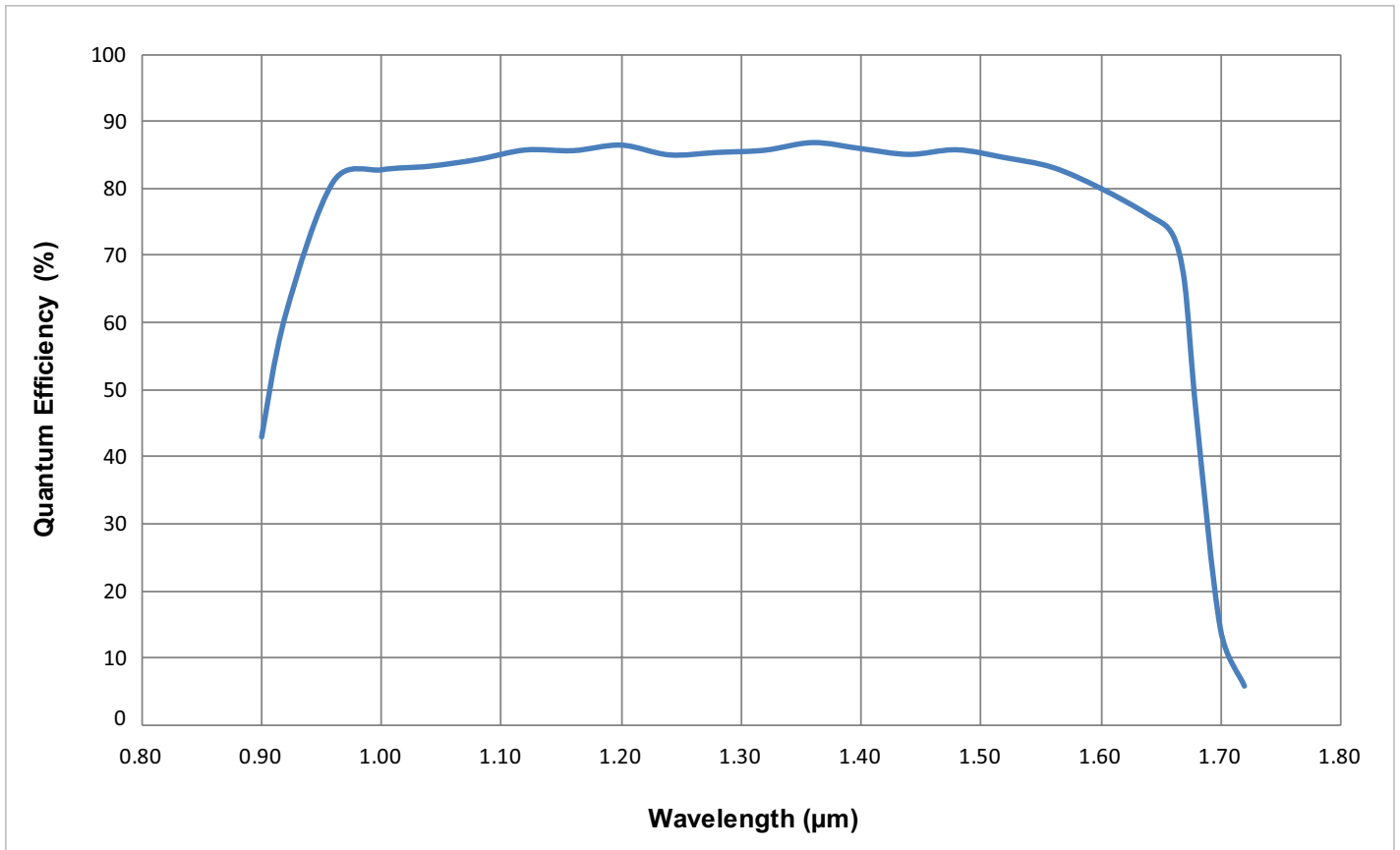
CCD image sensor	2D InGaAs focal plane array
CCD format	640 x 512 imaging pixels
CCD image area	12.8 mm x 10.24 mm
Pixel size	20 μm x 20 μm
Pixel well capacity (ke-) High gain	40
System read noise (e-)	< 120 ¹ (High Gain)
Nominal gain (e-/count) High gain	1
Response nonlinearity High gain	< 2 %
Cooling temperature @ +20°C ambient	-80°C ² (guaranteed), -90°C ² (typical with Air +15°C liquid circulation)
Cooling method	Air only or liquid only, or a combination of air and liquid
Dark current (e-/p/sec)	480 (High Gain)
Blemish specification	Grade A: <2% defects For detailed blemish specifications, contact Princeton Instruments
Digitization	16 bits
Scan rate	2 MHz, 5 MHz, 10 MHz
Frame rate	22 fps @ 2 MHz 55 fps @ 5 MHz 110 fps @ 10 MHz
Binning and ROI	Software only
Cold shield	f#/1.5
Exposure time	< 10 μs to >10 sec
Window material	Fused silica (AR coated)
Thermostating precision	$\pm 0.05^\circ\text{C}$ across entire temperature range
Operating temperature	0°C to +30°C

¹ Measured with 1 μs exposure time

² Measured using room temperature target

All specifications are typical and are subject to change.

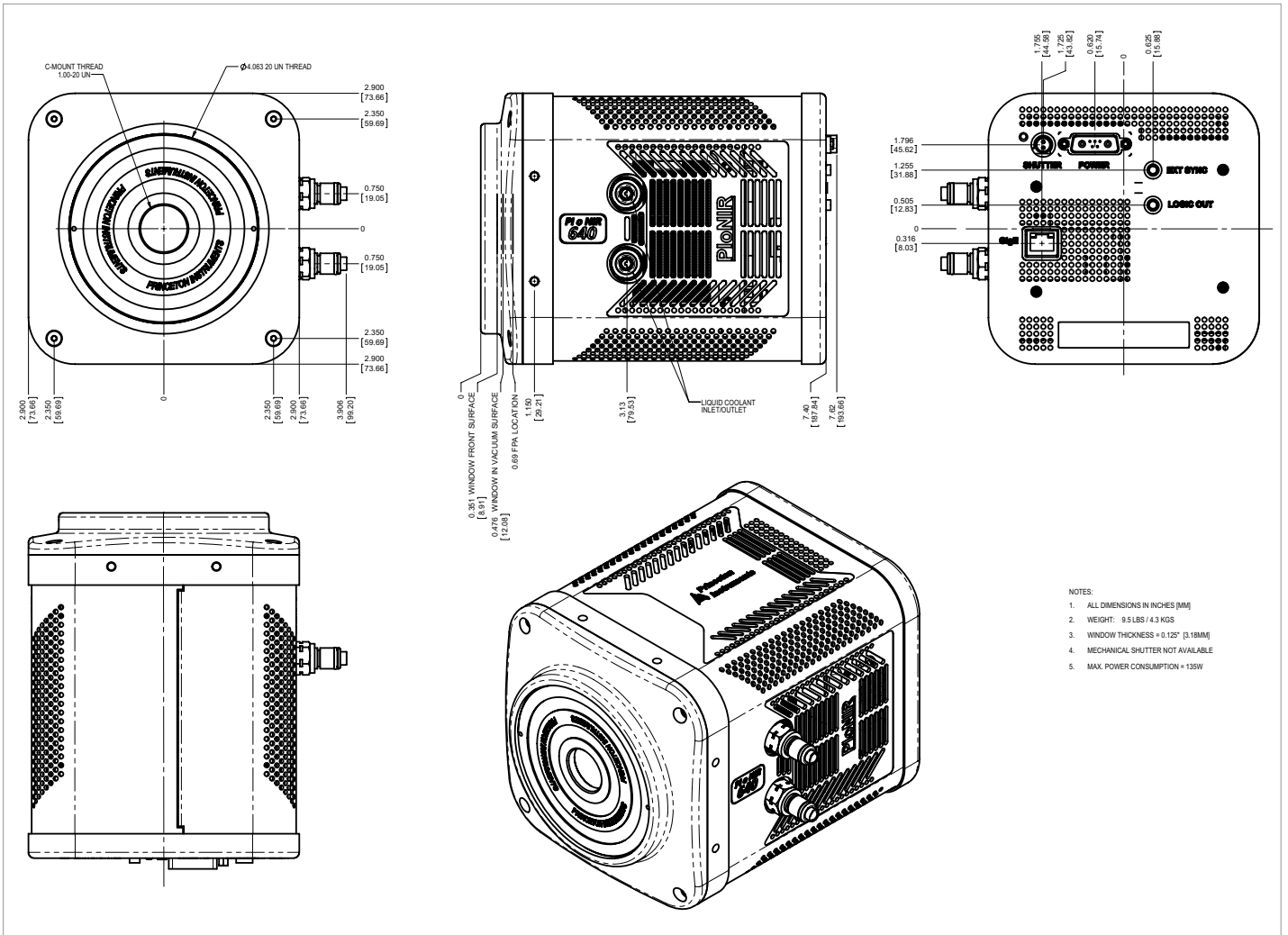
Sensor QE Curve



NOTE:

Graph shows typical Quantum Efficiency (QE) data measured at + 25°C. Longer cut-off wavelength shifts towards blue by 8nm per every 10°C of cooling.

Outline Drawing (C-mount)



Spectrometer adapter is available upon request.

Application Images

Photoluminescence of a textured solar cell

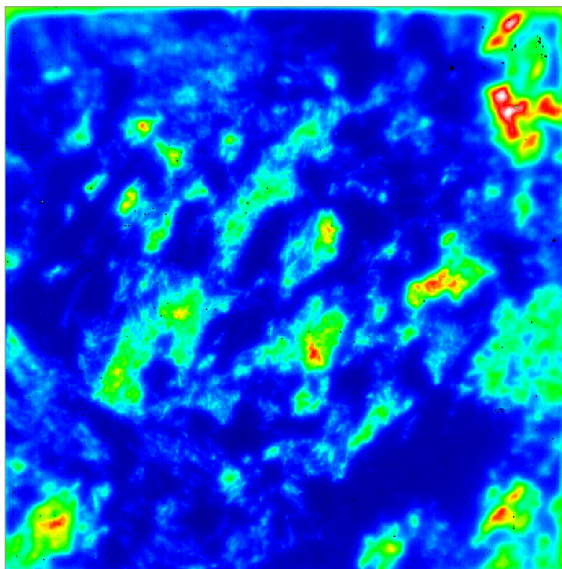
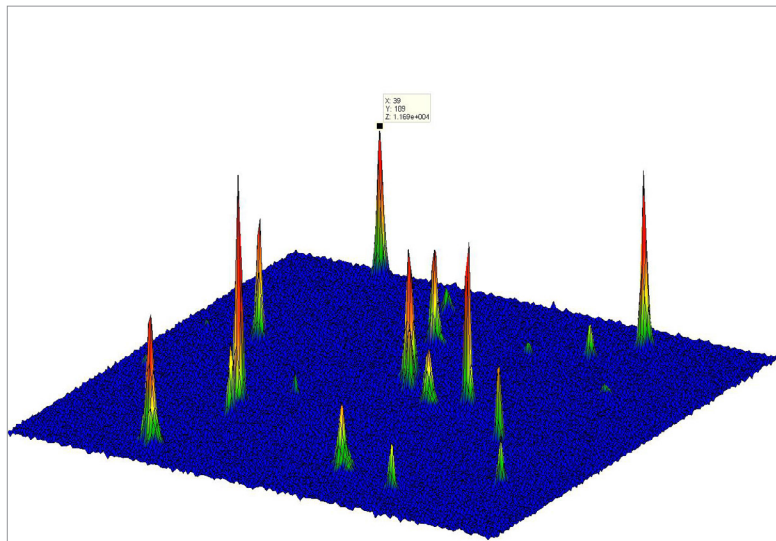
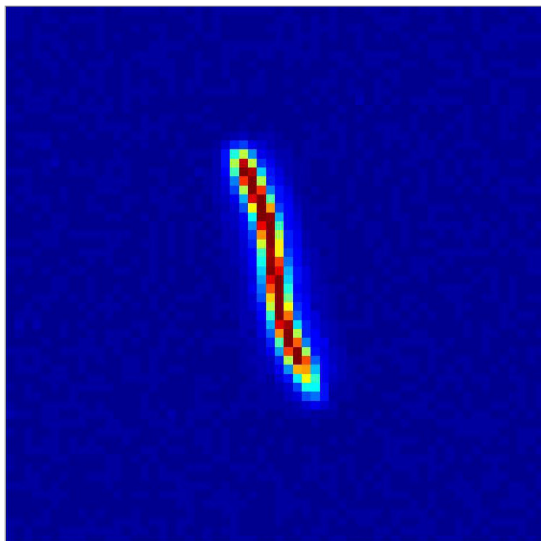


Image courtesy of Dr. Steven Johnson,
National Renewable Energy Laboratory
Golden, CO USA

Single walled nanotube (SWNT)



Images courtesy of Dr. R. Bruce Weisman, Professor of Chemistry
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