



# TELEDYNE PRINCETON INSTRUMENTS

Everywhereyoulook™

Part of the Teledyne Imaging Group



## PyLoN-IR:1024

The PyLoN®-IR is a controllerless, cryogenically-cooled photodiode array designed for quantitative scientific spectroscopy applications demanding the highest possible sensitivity. PyLoN-IR replaces the OMA V InGaAs detector linear photodiode array camera and is the ideal camera for high-performance, near-infrared and SWIR spectroscopy. Two models are available with spectral coverage from 800 nm up to 2.2  $\mu\text{m}$ . PyLoN-IR is responsive in UV and visible with high sensitivity from 800 nm to 1.7  $\mu\text{m}$  or 1.0 to 2.2  $\mu\text{m}$ . This InGaAs detector offers 16-bit digitization and leads the industry with the fastest spectral rate (up to 6600 spectra/sec) and lowest system read noise. PyLoN-IR applications include NIR Raman and photoluminescence spectroscopy. Liquid nitrogen cooling greatly reduces dark current, while PyLoN's indium metal seals enhance its vacuum longevity. PyLoN-IR is supported by Princeton Instruments LightField® 64-bit software as well as PI's IntelliCal™ wavelength calibration system.

FEATURE	BENEFITS
High sensitivity from 0.8 to 1.7 $\mu\text{m}$ or 1.0 to 2.2 $\mu\text{m}$	Ideal for spectroscopy in SWIR region where CCD detectors are insensitive
1024 x 1 pixel linear photodiode array	26 mm wide linear sensor is ideal for spectroscopy
Cryogenic cooling to -100° C with liquid nitrogen	Effectively eliminates dark charge, permitting acquisition times from milliseconds to hours
Dual mode readout	Choose between high sensitivity and high dynamic range readout
External shutter control with available connector	<b>For 1.7:</b> Provides integration times from 20 $\mu\text{s}$ to tens of minutes* <b>For 2.2:</b> Provides integration times from 20 $\mu\text{s}$ to tens of seconds*
<b>New!</b> Highest spectral data rate of any deep-cooled InGaAs spectroscopy camera	Provides up to 6600 Hz with 2 MHz ADC rate for an 8 MHz pixel read rate
<b>Updated!</b> Cryogenic cold shield	Reduces ambient thermal noise. <b>Redesigned for increased background rejection</b>
TTL input and output	Allows external control of and triggering by lasers or timing generators
Software-selectable system gain settings	High sensitivity setting reduces read noise floor for weak signals; High capacity setting increases dynamic range
Data acquisition rates of 2MHz and 8MHz	8X as fast as its predecessor - Choose low speed digitization to reduce noise, or high speed for rapid spectral acquisition
Optional end-on and all-directional dewar mounts	Allows for easy and flexible camera positioning
GigE data interface	Reliable data transmission over 50 m for remote operation
<b>Optional:</b> LightField (for Windows 7, 64-bit) or WinSpec (for Windows XP/7, 32-bit)	Flexible software packages for data acquisition, display and analysis. LightField provides an intuitive user interface, with features that include IntelliCal, hardware time stamping & more.
PICAM/PVCAM SDKs	Universal programming interface for software developers

\*Acquisition time upper limit determined by thermal background radiation flux.

**Applications:**  
NIR Raman Spectroscopy,  
Photoluminescence



**SPECIFICATIONS**

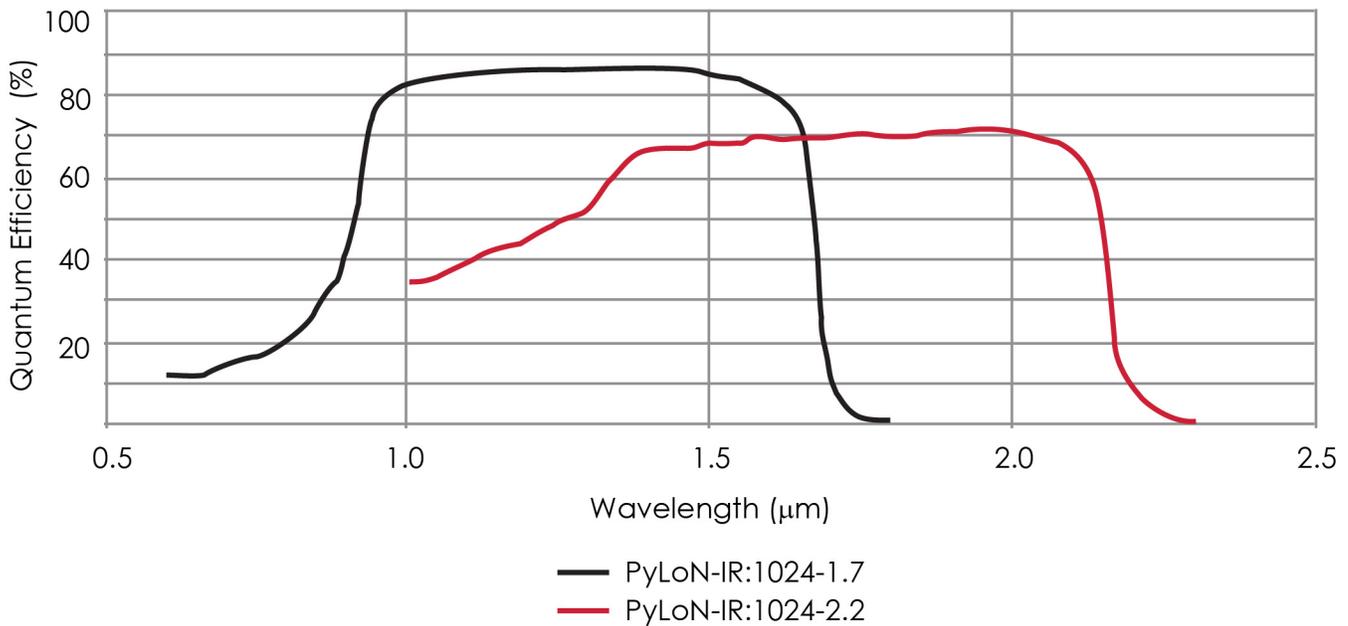
	<b>PyLoN-IR: 1024-1.7</b>	<b>PyLoN: 1024-2.2</b>
Image sensor	Linear InGaAs photodiode array	Linear InGaAs photodiode array
Format	1024 x 1 pixels, 25 μm (W) x 500 μm (H)	1024 x 1 pixels, 25 μm (W) x 250 μm (H)
Spectral range	0.8 - 1.7 μm	1.0 - 2.2 μm
Typical system read noise	low gain: 5000 e- high gain: 400 e-	low gain: 8000 e- high gain: 650 e-
Typical dark signal**	low gain: 2.3 ke-/p/s high gain: 3.2 ke-/p/s	low gain: 1.2 Me-/p/s high gain: 1.5 Me-/p/s
Spectral rate	6600 spectra/sec. max.	
Typical spectrometric well capacity	low gain: 120 Me-, 100Me- min. high gain: 4.5 Me-, 4 Me- min.	
Nominal gain	low gain: 2000 e-/ct high gain: 75 e-/ct	
Response non-linearity	low gain: <1.5% high gain: <2.5%	
Response non-uniformity	typical: +/- 5% max.: +/- 10%	
Digitization	16 bits	
Scan rate	500 kHz and 2 MHz ADC rate @ 4X = 2 MHz and 8 MHz scan rate	
Minimum exposure time	20 μs	
Thermostating precision	+/- 0.05° C across temperature range	
Operating temperature	-50° C to -100° C	
Blemish specifications	<b>For 1.7:</b> <1% defects, minimum of 5 active pixels between any two inactive pixels <b>For 2.2:</b> <2% defects	
Dimensions	14.6 inches (371 mm) x 8.2 inches (208 mm) x 10.5 inches (267 mm) (H x W x D)	
Weight	Approximately 10 lbs (4.5 kg)	

\*\*includes device dark current @ -100°C looking at a 77K scene

All specifications are subject to change.



**QE DATA**



**NOTE:**

Graph shows typical Quantum Efficiency (QE) data measured at + 25°C. QE decreases at normal operating temperatures. For the best results for your application, please discuss the specific parameters of your experiment with your sales representative.



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