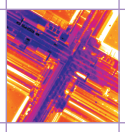
Alpha NIR™

World's first all-digital InGaAs camera

- Solid-State reliability
- Industry's best NIR sensor linearity
- LabView™ compatibility
- Comprehensive infrared imaging software (IRvista™)



Alpha NIR is a camera that employs a 320 x 256 Indium Gallium Arsenide (InGaAs) focal plane array (FPA). InGaAs detectors are highly sensitive to energy in the near-infrared (NIR) and shortwave-infrared (SWIR) wavebands from 900 to 1700 nanometers, well beyond the range of silicon CCD cameras.

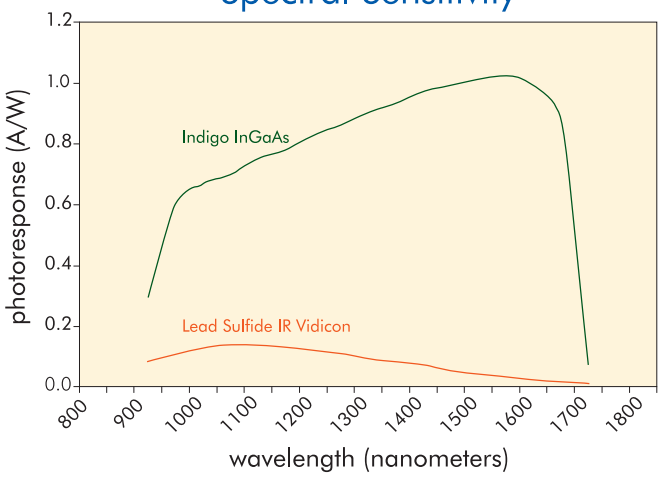
Alpha NIR is ideally suited for detection of telecommunication laser radiation, particularly in the S, C, and L DWDM wavebands. Uses include: laser beam profiling; silicon wafer characterization; fiber alignment and inspection; and optical measurement and analysis.

Unlike lead-oxysulfide vidicons, InGaAs detectors are highly resistant to damage from intense lasers, allowing direct illumination onto the focal plane from beam profiling. Integration times can be set to provide a very wide dynamic range. This range allows users to measure all aspects of a laser beam profile from the peak to the outer fringes without attenuating the laser signal.

Alpha NIR™ Applications

- Laser beam profiling
- Imaging spectroscopy
- Machine vision
- Optical testing & Measurement
- Imaging through materials (paint, silicon, ink, blood…)

Spectral Sensitivity

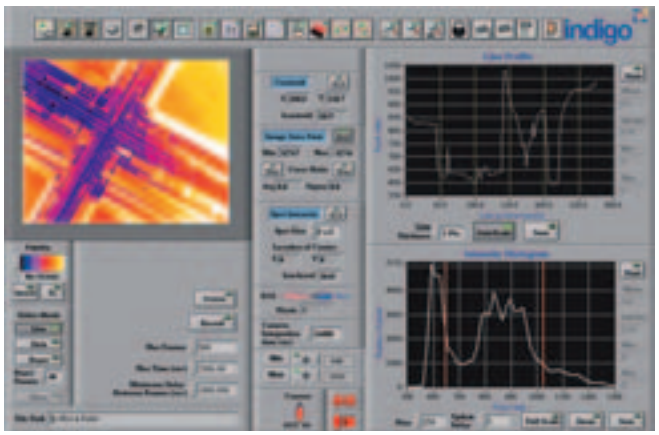


Data Acquisition

The Alpha NIR camera is designed for use with National Intruments™ digital image acquisition (IMAQ) board. FLIR provides software and hardware in the form of a LabView™ virtual instrument (IRvista), a digital interface cable and an IMAQ board. The virtual instrument enables bi-directional remote serial camera control, including integration time setting, invert/revert, gain state, and other sensor parameters.

The system allows the user to acquire and display 12-bit digital image data, change camera settings, calibrate the camera, and analyze the acquired data. Analysis tools include: regions of interest; line profiles; image histogram; zoom; image stills and sequences: and spot meters. Non-uniformity compensation and bad pixel replacement are also supported through software.

FLIR offers a comprehensive LabView Toolkit for users who wish to develop custom applications with the Alpha NIR.



Imaging Software: IRvista™

Image Acquisition	Non-Uniformity Compensation (NUC)	Camera Control	Image Analysis
Acquire and Save sequences of images at 30 Hz frame rate	Apply NUC and Pixel Replacement	Continuously Variable Integration Time	Live Image Histogram with Zoom Function
Export Functions: > 12-bit TIFF Sequence Files > FITS Format	Non-Uniformity Compensation (NUC): > Create and Edit NUC and Bad Pixel Maps > Modify Bad Pixel Maps with Masking > Apply to Live Image Display and Saved Sequences	On-Chip Gain Selection	Freeze Image
		Invert/revert Functions	Zoom Image and ROI
		External Synchronization	Line Profile and Image Histogram Exportable to Text File
		Test Patterns	Surface Plot
			Multiple Spot Meters
			Centroid Function
			Mean, Sigma, Min and Max Functions
			Image Arithmetic
			Time Averages
			Record and Playback Image Sequences
			Color Palette Selection
			Image Polarity Control

TECHNICAL SPECIFICATIONS

CAMERA SPECIFICATIONS

Detector	Indium Gallium Arsenide (InGaAs)
Array Format	320 (H) x 256 (V)
Pixel Size	30 x 30 microns
Spectral Response	900 to 1700 nanometers
Thermal Stabilization	Thermoelectric
Window Material	BK-7 Optical Glass
Digital Data	Real-time, 12-bit, Parallel
Frame Rate	30 Hz
Integration Type	Snapshot Mode
Integration Time Range	25 μsec to 33.3 msec (capable of shorter integration times)
Sensitivity NEI	$<1x10^{10}$ ph/cm^2/sec
Operability	>99.8%
Damage Threshold	>1 W/cm^2
Time to Initial Image	30 sec @ 25°C ambient; ≤ 1 sec, not temperature dependent
Cooling Method	Passive Convection and Conduction to Camera Bottom
Power Dissipation	4.5 W max; 3 W typical
Power Connector	2.0 mm Power Jack (in parallel with Aux. I/O connector)
Power Input	6 VDC ± 5%
Serial Commands	RS-232 Protocol
Operating Temperature Range	0 – 40°C conduction 0 – 35°C still air
Humidity	95% Non-condensing
Lens Interface	C-Mount

PHYSICAL SPECIFICATIONS

Camera	Dimensions (excluding lens)
Height	5.3 cm (2.1 inch)
Width	6.4 cm (2.5 inch)
Length	9.5 cm (3.7 inch)
Weight	350 grams (12.4 oz), excluding lens
Volume	320 cm3 (19.5 inch3)

OPTICS

f-number	Set by lens
Lens Focal Lengths	25mm, 50 mm
Fields of View (degrees)	22 x 16, 11 x 8, respectively
IFoV (milliradiants)	1.2, 0.6, respectively

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FLIR SYSTEMS

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