



*The New Standard  
in High-Performance  
Infrared Imaging*

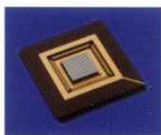


**Raytheon**

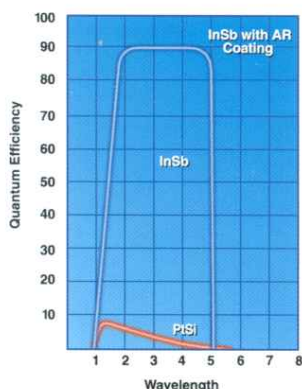


## Radiance HS. Performance Leader.

Introducing Radiance HS, the high-performance infrared camera designed to make thermal imaging work better for you. Radiance HS combines Raytheon's high-speed snapshot indium antimonide (InSb) focal plane array and miniaturized electronics with an ultra-reliable linear Stirling cooler into the smallest full-featured infrared camera available.



## The InSb Advantage.



InSb's high quantum efficiency (>85%) delivers unrivaled image quality. With spectral response from 3 to 5 microns, the camera provides higher scene contrast and significantly increased imaging performance over long atmospheric path lengths

than systems operating in the 8 to 12 micron band. Two standard cold shield designs ( $f/2.5$  and  $f/4.1$ ) are available to meet specific application requirements.

## Heavyweight Performance In An Ultra-Light Package.

Incorporating snapshot focal plane array technology, Radiance HS enables stop-action analysis of events as short as 2 microseconds, fast enough to stop a bullet in flight! Radiance HS can switch between three different integration times at the selected frame rate and load the corresponding nonuniformity compensation (NUC) tables, yielding an effective dynamic range of 132 dB. This unique feature is ideal for applications in spectral radiometry, nondestructive testing and the study of thermally dynamic events. A wide range of interfaces includes

video (NTSC or PAL), S Video, Raytheon's 12-bit HSVB parallel output, a HOTLink™ high-speed serial output, inputs for synchronizing the focal plane array (FPA) and, video genlock. All this power fits into a volume less than 197 cubic inches.

## It Even Does Windows.

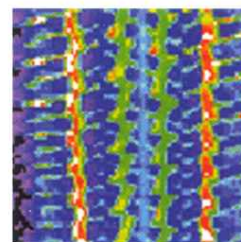
A powerful windowing feature enables users to dramatically increase the camera's frame rate. Capture imagery at up to 140 frames per second at the FPA's full 256 x 256 resolution, or window down to a 128 x 128 area and capture images at up to 480 frames per second. Faster yet? Select the center 64 x 64 area and you'll be screaming along at up to 1800 frames per second. High-speed applications such as air bag testing, rotating equipment analysis, tracking and combustion research can now be captured and studied in detail.

## Freeze It.

Capture high-speed events without the blur associated with scanning systems and PtSi FPA cameras. With snapshot integration, each of the FPA's 65,536 detector elements stares at the scene at precisely the same time and duration. This powerful shuttering feature allows stop-action analysis during target signature collection, range tracking, time-versus-temperature analysis, and provides unparalleled detail of subsurface defects during nondestructive testing.



*Corrosion of 737 lap joint*



*Tire at 80 mph*



*Airborn*

## From Microns To Miles.

Raytheon offers a wide selection of optics designed to bring your most demanding applications into focus. Select a microscope lens with better than 10 micron resolution or our triple field-of-view telescope featuring a narrow field of view of less than 1 degree.

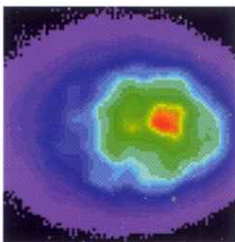


## It's A Split Decision.

The engineers at Raytheon realized that one size does not fit all, and designed Radiance HS with



Airborne flir



Medical laser

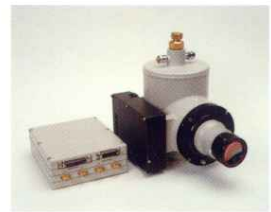


Explosive testing

real flexibility. The camera's electronics can be separated from the sensor engine by up to 10 feet. This enables gimbal payload designers to place the camera electronics and their associated heat load outside the ball. Raytheon designed a system architecture that allows OEMs to specify custom electronic and mechanical layouts, providing the ultimate in system flexibility.

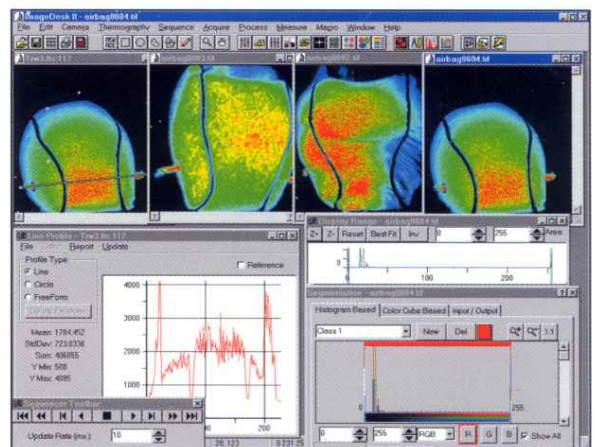
## Lab Configuration Provides Flexibility.

An optional LN<sub>2</sub> laboratory dewar configuration is available for applications that require interchangeable cold filters. The compact electronics module can be located up to 10 feet from the detector dewar package.



## Capture All Your Data.

...with ImageDesk II™, a Windows™ NT application designed to capture real-time digital data and perform sophisticated image analysis. ImageDesk provides a radiometric calibration routine and extensive thermographic analysis tools that enable comprehensive quantitative analysis. ImageDesk's powerful macro editor automates the most complex routines, and a built-in report generator allows you to professionally document your results. ImageDesk does it all!



Airbag inflation captured with ImageDesk



# Raytheon. A World Leader In Advanced IR Imaging.

Raytheon is a leader in the design and manufacture of infrared imaging sensors and thermal imaging systems. Raytheon's expertise includes sophisticated CMOS integrated readout circuit design,



indium antimonide detector

fabrication, imaging electronics

design, commercial camera development

and powerful imaging processing

software.



Raytheon is organized to effectively service a worldwide

customer base that includes a wide range of military and

development programs and the application of advanced

infrared imaging technology for commercial use.

## Applications

SURVEILLANCE	RESEARCH AND DEVELOPMENT	NONDESTRUCTIVE TESTING
Gimbal Payload Marine FLIR Range Camera Fire Control Wide-Area Surveillance	High Speed Testing Laser Research Temperature Analysis Spectral Radiometry Medical	Aging Aircraft Corrosion Stress Analysis Composite NDT Material Thickness

## Radiance HS Specifications

Detector	256 x 256 InSb	Calibration Source		Internal flag	
Detector Pitch	30 microns	Input Power		18 - 32 VDC	
Well Capacity	9 x 10 <sup>6</sup> electrons	Power Consumption		< 50 watts nominal	
QE	> 85%	Weight		9.6 lb.	
Spectral Response	3-5 μm	Dimensions		5.1 H x 5.7 W x 6.8 L (inches)	
Uniformity, Uncorrected	< 5% sigma/mean	Temperature Range:			
Operability	> 99.5%	Operating		-10 °C to 50 °C	
Sensitivity	0.025 °C NEΔT	Storage		-54 °C to 65 °C	
Integration Time	2 μs to 14 ms				
Cooling	Linear Stirling Cooler or LN <sub>2</sub>	Optics	f/#	Field of View	IFOV (mrad)
Cool Down Time	< 10 minutes	13 mm	2.3	32.9°	2.3
Dynamic Range	12 bit	25 mm	2.3	17.5°	1.2
Output Data Rate	10 Mpixels/sec	50 mm	2.3	8.8°	0.6
Control	RS-232, RS-422	100 mm	2.3	4.4°	0.3
Data Interface	Parallel, Serial HOTLink™	75/250 mm	2.3	5.9°/1.8°	0.4/0.12
FPA Frame Sync.	External TTL or internal clock	60/180/500 mm	4.0	7.3/2.4/0.9°	0.5/0.17/0.06

Specifications subject to change without notice

Benelux: Fairlight B.V. 31 10/420-6444 Canada: Spectra Research 905-890-0555 France: LOT-Oriel 33 1/6092-1616 Germany: LOT-GmbH 49/6151-8806-22 Israel: IES, LTD 972 3 763-0780  
Italy: LOT-Italia 39 2/7012-6938 Japan: Seki Technotron 81 3/3820-1712 Scandinavia: Gamma Optronik 46 18 56 58 34 Singapore: Aerotech Singapore 65-735-3511  
Spain: Optilas Iberica S.A. 34-1-358-8611 Switzerland: LOT-Suisse 41 21/869-9033 United Kingdom: LOT-Oriel, Ltd. 44/1372-378822

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