



APPLICATIONS

- Surveillance
- Reconnaissance
- Unmanned Vehicles
- Force Protection
- Vehicle Viewers

Features

- Long wave thermal imager
- Compact size
- Incredible thermal sensitivity
- Wide operating range
- Multiple video out options
- Multiple lens choices
- It's all FLIR inside

Benefits

- Get clear imagery in total darkness, through smoke, fog, and most obscurants
- Super compact imager, so it easily integrates easily into OEM platforms requiring small packages, such as unmanned vehicles and viewer enclosures
- Get sensitivity below 40 mK when normalized to f/1.0, which approaches that of cooled systems
- Performs in extreme climates from -40 to 75°C
- Standard NTSC or PAL video and 14-bit digital outputs accommodate most applications
- Wide, medium, and narrow lenses add flexibility to meet most requirements
- FLIR controls the entire supply chain on the critical technology inside ThermoVision systems ensuring fast service and long term support

ThermoVision



High sensitivity thermal imagery



An array of lenses to meet different needs

ThermoVision Photon[®]

Thermal Imaging Performance

Sensor type	320 x 240 microbolometer
Field of view 14.2 mm	50° x 39°
Field of view 19 mm	36° x 27°
Field of view 30 mm	23° x 17°
Field of view 35 mm	20° x 15°
Field of view 50 mm	14° x 10°
E-zoom	2x
Spectral band	7.5-13.5 μ m

Outputs

Video	NTSC or optional PAL and 14-bit serial LVDS digital data
Connector types	30 -pin SAMTEC connector for video, power, communications, and digital data

Power

Power requirements	5.0 - 24.0 VDC
Power consumption	1.5 W steady state

Environmental

Operating temp	-40°C to 75°C (-40°F to 167°F)
----------------	--------------------------------

Dimensions, Weights and Mounting

Dimensions	51.4 x 49.8 x 45.0 mm (2.1 x 2.0 x 1.8 in.)
Weight	170 g, (6 oz) average weight of lens included, less rear cover
Mounting	7 heatsink attach points

Interfaces

Command and Control	ICD provided, SDK in development
---------------------	----------------------------------

Options

Gyro stabilized pan/tilt	
Universal protocol converter box	
Eyesafe laser rangefinder	

Equipment described herein may require US Government authorization for export purposes. Diversion contrary to US law is prohibited.
©2006 FLIR Systems, Inc. Specifications are subject to change. Check website: www.flir.com. 02062006



Photon™ OEM Core

Higher-resolution infrared sensor with new features in one of the smallest, lightest, and most affordable thermal imagers available



Actual Size

Setting New Performance Standards

Photon's 324x256 uncooled focal plane array (FPA) employs 38-micron pixels. Based on FLIR's well-developed vanadium oxide (VOx) technology, the FPA furnishes outstanding image quality and sensitivity. Photon delivers an exceptional NEΔT of <85mK with f/1.6 optics. When normalized to f/1 optical systems, this is equivalent to <35mK!

Keeping a Low Profile

In the tradition of FLIR / Indigo uncooled miniature camera products, Photon is a very compact package, with the camera body (core) approximating just 7.5 cubic inches. The core weight is 4 ounces (115 grams), not including rear cover or lens. Power dissipation is 1.5 Watts steady-state.

Wider Range of Operating Temperature

Photon surpasses the requirements of the most demanding ambient environmental requirements with an operating temperature range of -40 to +75 °C.

Extensive Video Processing Capabilities

Photon supplies NTSC analog video at 30 fps as a standard. PAL video (25 fps) is available as an option. A choice of 8- or 14-bit digital video is output simultaneously with the analog format. The digital data protocol is serial LVDS.

Video processing features include multiple automatic, dynamic image optimization algorithms, as well as polarity control (white-hot/black-hot), image-orientation control (invert / revert), and freeze-frame capability. New to Photon is a 2X digital zoom feature, whereby the center 160x120 of the FPA is upsampled to the full 320x240 image resolution. Color look-up tables are also supported.

No Thermo-Electric Cooler (TEC) Required

Photon employs a singular combination of on-focal-plane circuitry and non-uniformity compensation (NUC) processing to eliminate the TEC. The unique approach to TEC-less operation enables the camera to operate over a wide temperature range while maintaining excellent dynamic range and image uniformity. Two significant benefits are realized from TEC-less operation: Reduced power consumption and a near "instant-on" capability.

Benefits

- > Excellent Uniformity and Dynamic Range Across a Wide Operating Temp Range (-40 °C to +75 °C)
- > 2X Digital Zoom Enables Close-Up Imaging and Electronic Pan/Tilt in Zoom Mode
- > External Sync Input Allows Control of FPA Integration Start Time
- > 2-second Turn-On Time for "On-Demand" Applications
- > Better Detection and Recognition Ranges
- > Fully Integrated Design Supports OEM as Well as Commercial Camera Customers & Applications
- > New Digital Data Enhancement (DDE) Sharpening Filter Brings out Detail in Image Data





Optics

Several lens options are available, including focal lengths of 14.25mm (50-degree FOV), 19mm (36-degree FOV), 30mm (23-degree FOV), 35mm (20-degree FOV) (not pictured), and 50mm (14-degree FOV). Additional lenses are planned.

Camera Core Specifications

Parameter	Photon	Comment
Detector	Uncooled Microbolometer	Vanadium Oxide (VOx)
Array Format: Block 2	320x240	160x120 "zoom" mode available
Block 1	320x120	
Pixel Size	38 μm	
Spectral Response	7.5 to 13.5 μm	Longwave Infrared (LWIR)
Video Output	NTSC	PAL Optional
Digital Data	8-bit Serial LVDS or 14-bit Serial LVDS*	Real-time, corrected bad pixel replaced (*pre-AGC)
Frame Rate	30 Hz (320x240) 60 Hz (320x120)	25 Hz PAL 50 Hz PAL
NE Δ T (subject to export license restriction)	< 85 mK @ f/1.6	Equivalent to 35 mK at f/1.0
Normalization Source	Internal Shutter (Offset Only)	0.7 sec video freeze during shutter wink
Time to Image	< 2 sec.	No Thermoelectric Cooler (TEC)
Image Control	Revert Invert 2x Digital Zoom	320x240 only 320x240 only Electronic Pan/Tilt in Zoom Mode
Camera Operation	Autonomous or manual	Manual control via GUI
Serial Command	RS-232 compatible	
Signal Interface	Connector for power, video, communication, digital data	30-pin SAMTEC TFML-115-02-S-D-K
Input Voltage Range	5.0 to 24.0 VDC	
Operating Temp Range	-40 ° to +75 °C External Temp	
Scene Temp Range (Lens Dependent)	To 150 °C standard; optional auto-gain mode extends range to 560 °C	
Mounting Interface	7 heatsink attach points	
Dimensions mm	51.4 x 49.8 x 45.0	Including Rear Cover and Universal Lens Mounting plate
inches	2.1 x 2.0 x 1.8	
Weight Camera Core	~97 g (~3.4 oz)	Not including lens
Rear Cover	~14 g (~0.5 oz)	
Universal Lens Holder	~14 g (~0.5 oz)	
Power Dissipation	~1.5 W	

Lens Options



14.25mm
50 ° HFoV
f/1.3



19.0mm
36 ° HFoV
f/1.4



30.0mm
23 ° HFoV
f/1.6



35.0mm
20 ° HFoV
f/1.4



50.0mm
14 ° HFoV
f/2.0

*Additional
lenses
planned*

FLIR Systems Indigo Operations
By Opto Vision France

For more information, email: info@optovision.fr

