

17-micron pixels



actual size

Tau™ 640

LWIR Thermal Imager



More Pixels.
On Target.

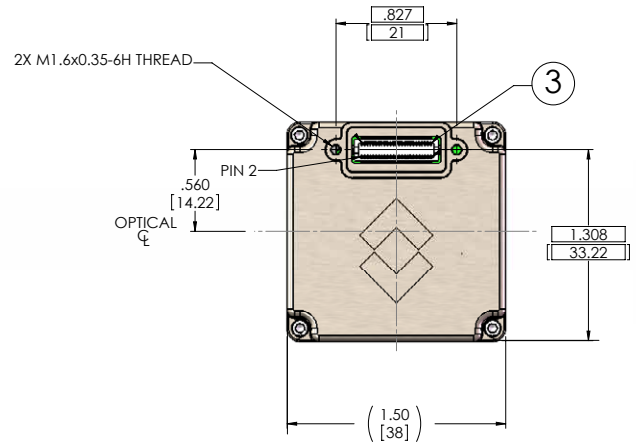
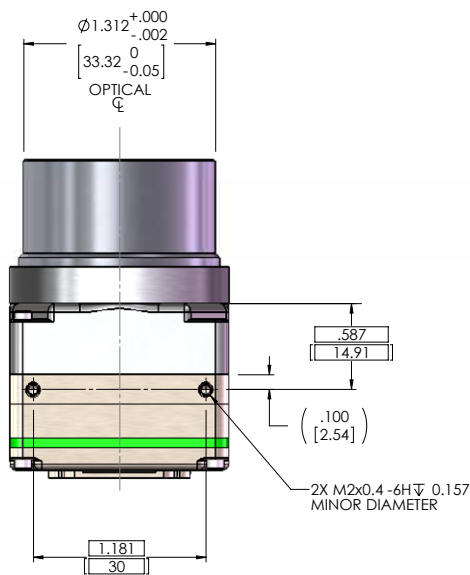
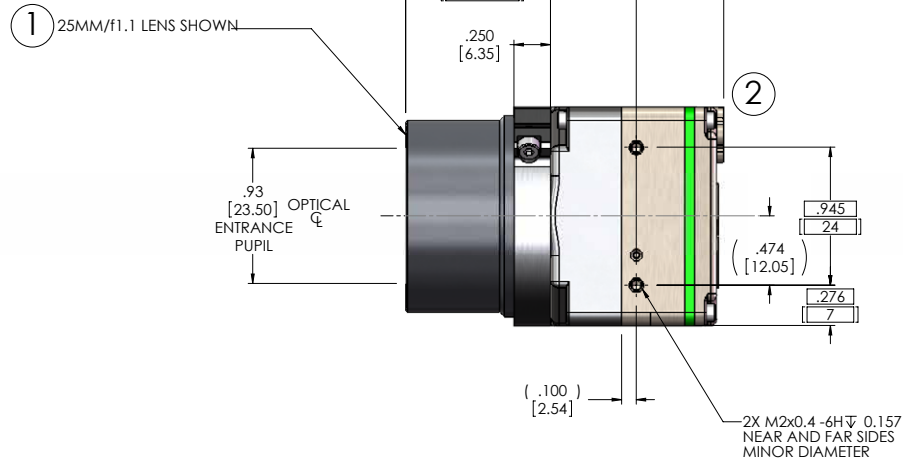
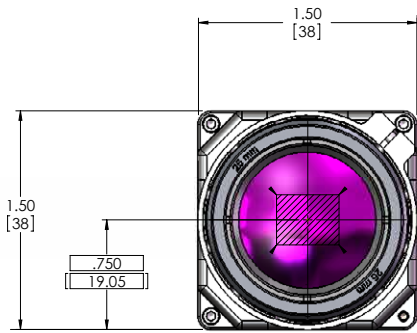


Tau 640: an incredibly small thermal imaging camera with 17-micron pixel pitch, and VGA resolution

FLIR demonstrates once again why it is the forward-looking infrared company. This amazing uncooled longwave IR camera is almost 25% smaller than the Tau 320 and has four times as many pixels for unmatched image quality in a small, lightweight package.

The Tau 640's 2.6 in³ camera body volume is enabled through a combination of FLIR's 17-micron pixel focal plane array, as well as an advanced shutter design that fits within the 1.5 in² camera cross-section.

Since the electronics are common between the Tau 640 and Tau 320, integrators have immediate, direct compatibility between cameras, and both Tau camera versions share several lens designs.



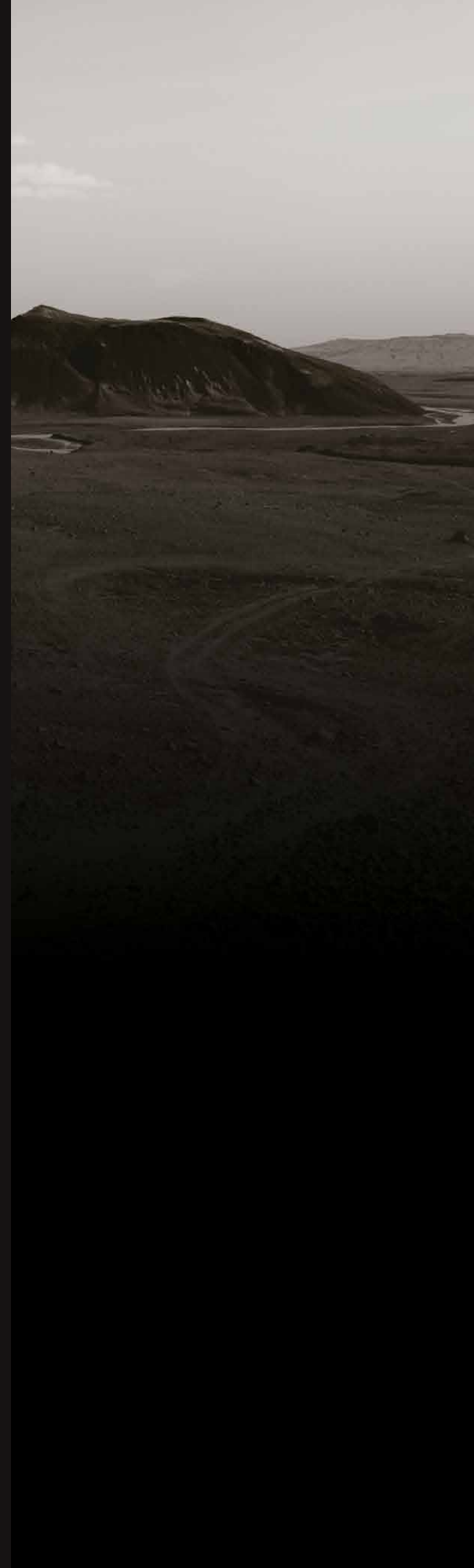
1 - 25 mm lens shown as representative example; five other configurations are available, including lens-less.

2 - Check the Drawings & Models tab on the Tau 640 web page (www.flir.com/cvs/tau640) for the most current O&M drawings.

3 - Hirose 50-pin connector.



Actual size



Tau 640 Features

Besides being small and light, Tau 640 provides many capabilities exclusively available from FLIR:

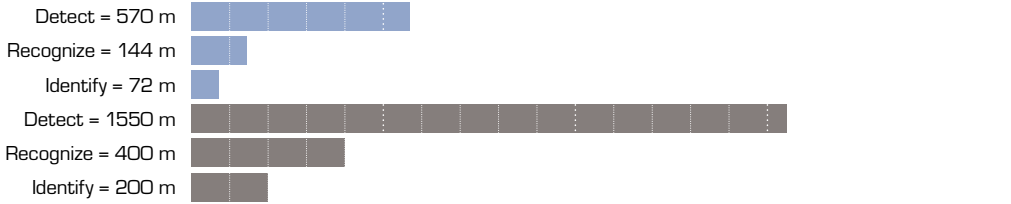
- 17-micron pixel size
- ~1 W power dissipation
- Field-switchable between NTSC and PAL video formats
- CMOS and BT.656 digital video options, as well as the legacy Photon LVDS
- Expansion (XP) board accessory options, including Camera Link digital data, and backward compatibility with Photon cameras
- XP board reference design available at no cost to customers who want to develop custom interface electronics
- High-speed serial camera communication up to 921,600 baud (via the Tau VPC serial-to-USB Accessory)
- User-friendly Tau GUI for camera control and configuration
- Camera power and communication over USB option (via the Tau VPC serial-to-USB Accessory)
- EMI suppression to Class B
- Up to 200g shock tolerance
- Discrete camera control functions available to OEMs
- Multiple lens options available in wide and narrow fields of view
- Lenses sealed to IP-67
- Threaded WFOV lens barrel for bulkhead mounting or external attachment options

Tau 640 Range Chart

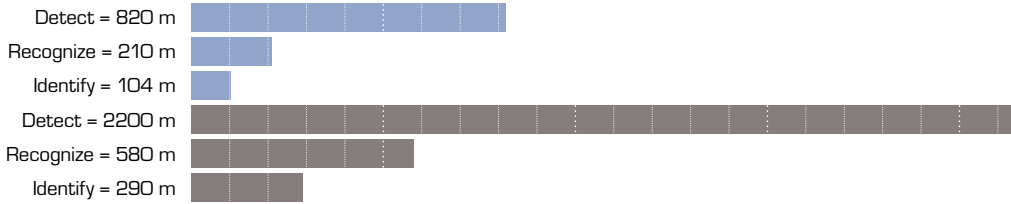
13 mm, f/1.25



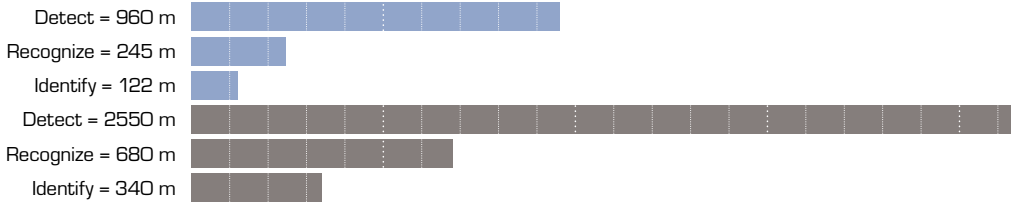
19 mm, f/1.25



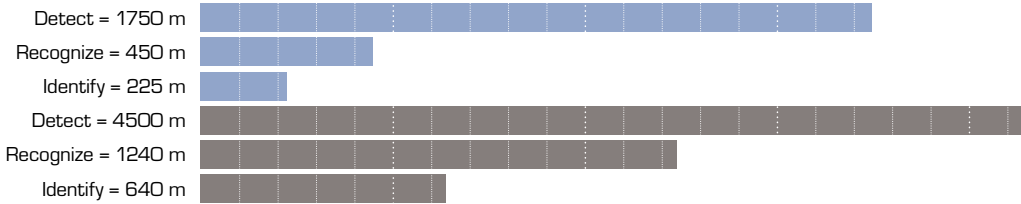
25 mm, f/1.1



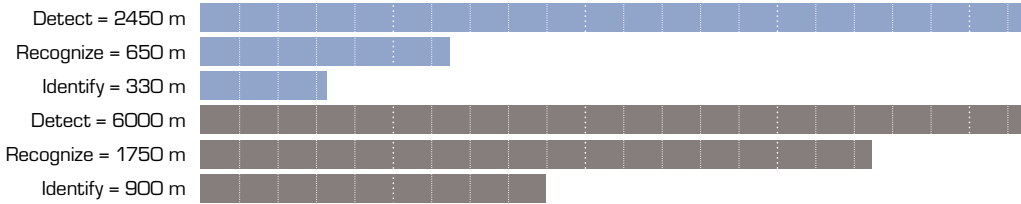
35 mm, f/1.4



60 mm, f/1.25



100 mm, f/1.6



Product Applications

Tau's small size, light weight, and choice of lenses make Tau 640 an excellent choice for integration into a wide variety of payloads, platforms, and systems that require affordable, high-resolution thermal imaging.

A complete feature set, including specialized imaging capabilities, digital image processing, along with several accessories and expansion modules, make Tau 640 a perfect solution for nearly any LWIR application.

Small, light, and easy to integrate, Tau is the ideal thermal camera core for unmanned vehicles, helmet-mounted applications, handheld thermal viewers, unattended ground and security systems, and small turrets and gimbals.



PUMA UAV image courtesy AeroVironment, Inc.



Alternate configurations

For OEM customers, Tau 640 is available in several additional factory configurations:

- Tau 640 is available as a lens-less core
- OEM-specific configurations and volume pricing are available
- Field upgradable software/firmware
- Support for user-defined symbology
- Supplemental FFC software feature gives OEMs field-calibration to remove lens effects and improve image quality
- Customers can load their own start-up splash screens (10-camera minimum purchase required)

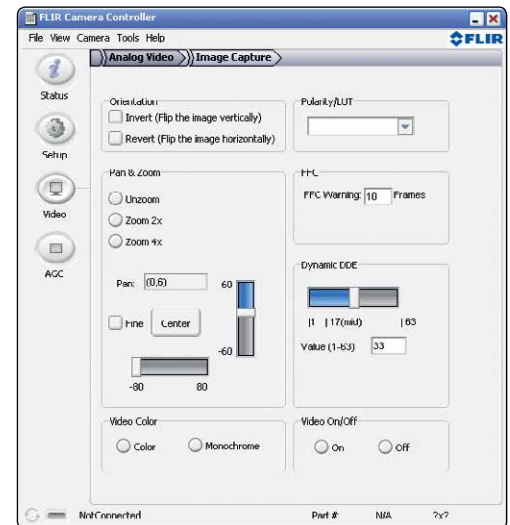
User configurability

The Tau 640 offers complete configuration and integration flexibility with the powerful Tau GUI and optional SDK. Through our XP bus interface, users can:

- Select the optimal digital data interface – 8/14-bit serial LVDS, 8/14-bit parallel CMOS, and BT.656 (now an input into many LCDs)
- Convert the digital output of Tau to Camera Link format data
- Directly command the camera through configurable discrete inputs to control digital zoom, polarity, etc. (up to eight commands selectable*)

*Use of CMOS interface limits users to one discrete function

Visit www.flir.com/cvs/tau640 to browse the Tau 640 FAQ, or download the Tau GUI, connector pin-out definition, IDD interface, and User's Guide.



Tau GUI

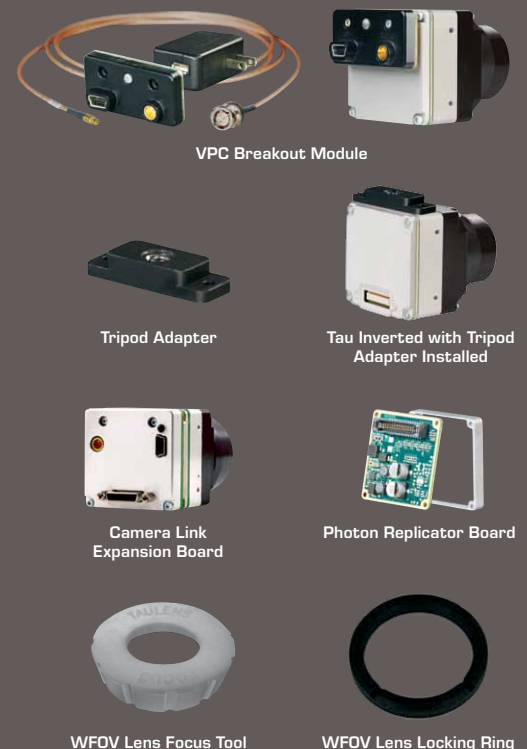
Accessories

Several Tau-specific accessories are available:

- VPC (video/power/communication) breakout module (FLIR p/n: 421-0039-00)
- A tripod adapter (FLIR p/n: 261-2071-00)
- The Photon Replicator Board (FLIR p/n: 421-0040-40) give users backward compatibility with the Photon Accessory Kit (FLIR p/n: 421-0021-00)
- The Camera Link Expansion Board (FLIR p/n: 421-0046-00) furnishes 14-bit digital data. A separate MCX connector is provided for analog video. Input power and camera communication are enabled via the mini-USB port.†
- The Tau Lens Focus Tool (FLIR p/n: 421-0037-00) lets users adjust the focus of 13 mm and 19 mm lenses
- The Tau Lens Locking Ring (FLIR p/n: 421-0041-00) lets users mount select Tau 640 cameras to a bulkhead
- The software SDK (FLIR p/n: 110-0133-16)

† The Camera Link XP accessory provides access to Tau digital data only. Portions of the base Camera Link specifications are not met:

- Power to the Tau camera is not supported via the Camera Link connector (the XP accessory does furnish a mini-USB port for power)
- Communication through the Camera Link connector is supported, but requires a minor modification by the user. Otherwise, communication is via USB.



WFOV Lens Focus Tool

WFOV Lens Locking Ring



Tau 640 Lens Data						
Focal Length	13 mm	19 mm	25 mm	35 mm	60 mm	100 mm
f/number	1.25	1.25	1.1	1.4	1.25	1.6
Field of View	45° x 37°	32° x 26°	25° x 20°	18° x 14°	10.4° x 8.3°	6.2° x 5.0°
IFoV (milliradians)	1.308	0.895	0.680	0.486	0.283	0.170
Camera & Lens Weight	79 g	79 g	110 g	132 g	202 g	475 g

Tau 640 Feature	Tau 640 Performance
Features & Performance	
Thermal Imager	Uncooled VOx Microbolometer
Display Formats	640 x 480 (NTSC); 640 x 512 (PAL)
Pixel Size	17 µm
Spectral Band	7.5 - 13.5 µm
Full Frame Rates	30 Hz (NTSC); 25 Hz (PAL)
Exportable Frame Rates (no license required)	7.5 Hz (NTSC); 8.3 Hz (PAL)
Input Power	4.4 - 6.0 VDC
Power Dissipation	~1.0 W Steady-State
Sensitivity (NEΔT)	<50 mK at f/1.0 with FLIR's proprietary noise reduction
Time to Image	<3.5 sec
Factory Set, User-Selectable AGC'd Video	Y
Digital Detail Enhancement	Y
Physical Attributes	
Size (w/o lens)	1.5" x 1.5" x 1.16"
Lensed & Lensless Configurations Available	Y
Precision Mounting Holes (M2x0.4) on 3 Sides (2 per side)	Y
Sealable Bulkhead Mounting Feature on Lens Barrel (M2.9x1.0), WFOV Only	Y
ROHS, REACH, and WEEE Compliant	Y
Interfaces and Controls	
Parallel CMOS (14-bit or 8-bit)	Y
BT.656 (8-bit)	Y
Legacy Photon LVDS (30 Hz, 14-bit or 8-bit)	Y
NTSC (30 Hz)/PAL (25 Hz) (field switchable)	Y
Slow Video (7.5 Hz NTSC/8.3 Hz PAL) (factory configured)	Y
Invert/Revert (analog and 8-bit digital)	Y
Polarity Control	Y
2x, 4x, & 8x Digital Zoom	Y
Dynamic Range Switching	Y
Symbology (256 gray & 256 color)	Y
Color & Monochrome Palettes (LUTs)	Y
Connectivity	
RS-232 Compatible Communication	57,600 & 921,600 baud
USB to RS-232 Accessory	Y
User Configurability via SDK & GUI	Y
Camera Link Accessory	Y
External Sync Input/Output	Y
Discrete I/O Controls Available	Y
Environmental	
Operating Temperature Range	-40°C to +80°C
Non-Operating Temperature Range	-55°C to +105°C
Temperature Shock (5°/min)	Y
Operational Altitude (+40,000 feet)	Y
Humidity (non-condensing between 5% and 95%)	Y
Vibration (4.3g three axis, 8 hr each)	Y
Shock (200g shock pulse w/ 11 msec sawtooth)	Y
EMC Radiation FCC/CE Class B	Y

* Images not to scale.



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