Longwave Infrared Thermal Imaging Cameras

Key Features:

• 4 models: Tau 640, Tau 336, Tau 320 and Tau 160
• Multiple lens options available: 9 - 100 mm
• Proven rugged, reliable thermal imaging for UAVs, UGVs & handheld devices

PHONE: 1-888-919-2263  FAX: +1-845-343-4299
INTL: +1-845-343-4077  EMAIL: support@oemcameras.com
**Tau 2 Features**

Introducing Tau 336 — a 17-micron pixel version of Tau 320.

FLIR’s Tau 2 thermal imaging cameras offer an unmatched set of features and capabilities, making them well-suited to many demanding applications. Improved electronics will enable FLIR to implement new capabilities in the coming months. In most cases, Tau 2 customers will be able to upgrade their cameras with additional features at no charge, without needing to return them to FLIR. Since the electrical functions are common among the various Tau models, integrators have direct compatibility between the different camera formats, and Tau camera versions share many of the same lens options.

**Product Applications**

Easy integration, low power consumption, and specialized imaging capabilities combine to make Tau 2 an ideal firefighting thermal camera core.

**Tau 2 Part Number Configuration Guide** (Example: 46640019H-FPNLX)

<table>
<thead>
<tr>
<th>46</th>
<th>640</th>
<th>019</th>
<th>H-F</th>
<th>P</th>
<th>NL</th>
<th>X</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shutter Type</td>
<td>Resolution</td>
<td>Lens Focal Length</td>
<td>Lens Coating</td>
<td>Video Speed</td>
<td>Tau Type</td>
<td>OEM Info</td>
</tr>
<tr>
<td>46 = Standard</td>
<td>640 (640 x 512)</td>
<td>336 (336 x 256)</td>
<td>320 (324 x 256)</td>
<td>001 = no lens</td>
<td>F = Fast</td>
<td>NL = No Logo</td>
</tr>
<tr>
<td>47 = Shutterless</td>
<td>336 (336 x 256)</td>
<td>320 (324 x 256)</td>
<td>009 = 9 mm</td>
<td>S = Slow</td>
<td>P = Performance</td>
<td>XX = FLIR Logo</td>
</tr>
<tr>
<td>013 = 13 mm</td>
<td>019 = 19 mm</td>
<td>025 = 25 mm</td>
<td>035 = 35 mm</td>
<td>050 = 50 mm</td>
<td>060 = 60 mm</td>
<td>100 = 100 mm</td>
</tr>
<tr>
<td>17 µm VOx FPA pixels for greater image detail in Tau 640 &amp; Tau 336 (26 µm in Tau 320)</td>
<td>17 µm FPA pixels for greater image detail in Tau 640 &amp; Tau 336 (26 µm in Tau 320)</td>
<td>High sensitivity: &lt;60 mK @ f/1.0</td>
<td>Light weight: &lt;72 grams (WFOV models)</td>
<td>Multiple lens options available</td>
<td>High reliability shutter</td>
<td>Rugged, environmental coating on lens flange</td>
</tr>
<tr>
<td>1.75 in</td>
<td>30.5 mm</td>
<td>1.75 in</td>
<td>44.5 mm</td>
<td>1.18 in</td>
<td>30.0 mm</td>
<td>1.75 in</td>
</tr>
<tr>
<td>30 mm</td>
<td>1.18 in</td>
<td>30.0 mm</td>
<td>1.18 in</td>
<td>30.0 mm</td>
<td>1.75 in</td>
<td>44.5 mm</td>
</tr>
<tr>
<td>1.18 in</td>
<td>30.0 mm</td>
<td>1.18 in</td>
<td>30.0 mm</td>
<td>1.75 in</td>
<td>44.5 mm</td>
<td></td>
</tr>
<tr>
<td>3.0 in</td>
<td>76.2 mm</td>
<td>3.0 in</td>
<td>76.2 mm</td>
<td>7.5 in</td>
<td>191 mm</td>
<td>9.0 in</td>
</tr>
<tr>
<td>Three mounting surfaces, each with two M2×0.4 threaded mounting holes</td>
<td>Two M2×0.4 threaded mounting holes</td>
<td>User-definable options: low polarity, color video palettes, 256 B&amp;W, zoom, fast (256 grayscale and 256 color), video output format, and many others</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Threaded outer lens barrel and O-ring seal groove with birefringent locating pins (WFOV models)</td>
<td>Digital Detail Enhancement for clearer imagery and edge sharpening</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Small, light, and reliable, Tau 2 is the perfect thermal camera core for small unmanned systems.
## Tau 2 Lens Data

### TAU 2 WIDE FIELD OF VIEW (WFOV) MODELS

<table>
<thead>
<tr>
<th>9 mm</th>
<th>13 mm</th>
<th>19 mm</th>
<th>25 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Weight</strong> (Camera + Lens)</td>
<td>72 g</td>
<td>&lt;70 g</td>
<td>&lt;70 g</td>
</tr>
<tr>
<td><strong>Diameter</strong></td>
<td>19 mm</td>
<td>19 mm</td>
<td>19 mm</td>
</tr>
<tr>
<td><strong>Length</strong></td>
<td>29 mm</td>
<td>29 mm</td>
<td>29 mm</td>
</tr>
<tr>
<td><strong>FOV3</strong> (h x v)</td>
<td>72° x 56°</td>
<td>45° x 37°</td>
<td>32° x 26°</td>
</tr>
<tr>
<td><strong>Recognition, Detection, Identification (DRI)6</strong></td>
<td>I = 0.895</td>
<td>I = 0.895</td>
<td>I = 0.895</td>
</tr>
</tbody>
</table>

### TAU 2 NARROW FIELD OF VIEW (NFOV) MODELS

<table>
<thead>
<tr>
<th>35 mm</th>
<th>50 mm</th>
<th>60 mm</th>
<th>100 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Weight</strong> (Camera + Lens)</td>
<td>38 g</td>
<td>42 g</td>
<td>150 g</td>
</tr>
<tr>
<td><strong>Diameter</strong></td>
<td>25 mm</td>
<td>29 mm</td>
<td>39 mm</td>
</tr>
<tr>
<td><strong>Length</strong></td>
<td>50 mm</td>
<td>61 mm</td>
<td>60 cm</td>
</tr>
<tr>
<td><strong>FOV3</strong> (h x v)</td>
<td>112° x 91°</td>
<td>72° x 56°</td>
<td>54° x 41°</td>
</tr>
<tr>
<td><strong>Recognition, Detection, Identification (DRI)6</strong></td>
<td>I = 0.895</td>
<td>I = 0.895</td>
<td>I = 0.895</td>
</tr>
</tbody>
</table>

### Minimum Focus Distance

| All Taus | 3 cm | 8 cm | 16 cm | 30 cm |

---

1. All WFOV lenses are integrated directly into a common lens holder with an internal O-ring that furnishes an IP67 rating at the front surface. All WFOV lenses are M34 x 0.3 inside thread. Outside thread is M36 x 0.5.

2. NFOV lenses are M34 x 0.3 inside thread.

3. Digital output used for FOV calculation.

4. Minimum focus distance for WFOV cameras is measured with the lens unscrewed to the point just before the O-ring groove becomes visible; for NFOV cameras it is measured one complete revolution after the lens first engages the lens flange.

5. Length is measured from the front, flat surface of the lens holder to the end of the lens.

6. DRI values shown are nominal values and should be used as estimates only. Exact DRI calculations depend on a wide variety of conditions. For more information, please contact FLIR.

---

FLIR Uncooled Cores Platforms and Applications

Tens of thousands of FLIR uncooled cores are being used as thermal imaging payloads or modules in:

- Unmanned vehicles
- Driving vision enhancement
- Unattended ground systems
- Thermal sights
- Handheld imagers for firefighting
- Security and surveillance

---

FLIR.com/Tau2   805.680.5097
There are several Tau-specific accessories available. Individual components are also available; contact FLIR for details.

**VPC BREAKOUT MODULE** - Provides video, power, and communications interface. (FLIR p/n: 421-0039-00)

**TRIPOD ADAPTER** - Allows users to put Tau 2 on a standard tripod mount. (FLIR p/n: 261-2071-00)

**PHOTON REPLICATOR BOARD** - (FLIR p/n: 421-0040-00) Gives users backward compatibility with the Photon Accessory Kit (FLIR p/n: 421-0045-00).

**CAMERA LINK EXPANSION BOARD** - Furnishes 14-bit digital data with separate connectors for analog video, power, and communication. (FLIR p/n: 421-0048-00)

**TAU PCB WEARSAYER WITH SOLDER PADS** - A low-profile adapter that attaches to the Tau’s 50-pin Hirose connector, furnishing a solder pad interface. Schematic included. (FLIR p/n: 421-0047-00)

**THE TAU LENS LOCKING RING** - Lets users adjust the focus of 9 mm, 13 mm, and 19 mm lenses. (FLIR p/n: 421-0037-00)

**THE TAU LENS FOCUS TOOL** - Lets users adjust the focus of 9 mm, 13 mm, and 19 mm lenses. (FLIR p/n: 261-1495-00)

**NARROW FIELD OF VIEW LENS HOLDER AND CLAMP**. (FLIR p/n: 421-0041-00)

**4” BLACKBODY SOURCE FOR LENS CALIBRATION & SUPPLEMENTAL FFC**. (FLIR p/n: 265-0028-02)

---

**SYSTEM OVERVIEW**

**System Type**
- Uncooled LWIR Thermal Imager

**Tau 640**
- 640 x 512 VOx Microbolometer

**Tau 336, 320**
- 336 x 256 VOx Microbolometer

**Pixel Size**
- 17 µm (Tau 640, 336); 25 µm (Tau 320)

**Spectral Band**
- 7.5 - 13.5 µm

**Performance**
- <50 mK @ f/1.0

**OUTPUTS**

**Analog Video**
- Field-switchable between NTSC and PAL

**Quark 640**
- 30 Hz (NTSC), 25 Hz (PAL); <9Hz option for export (factory set)

**Quark 336, 320**
- 30/60 Hz (NTSC), 25/50 Hz (PAL); <9Hz option for export (factory set)

**Digital Video**
- 8- or 14-bit serial LVDS; 8- or 14-bit parallel CMOS; 8-bit BT.656

**OPERATION & CONTROL**

**Image Control**
- Invert, revert, continuous digital zoom, dynamic zoom & pan, 2x & 4x digital zoom (8x in Tau 640), polarity, false color or monochrome, AGC, digital detail enhancement (DDE), image optimization (BPR, NUC & AGC’d video), settable splash screens

**Camera Control**
- Manual via SDK & GUI, dynamic range switching (Tau 336 & 320 only)

**Signal Interface**
- Camera Link (Expansion Bus Accessory Module), discrete I/O controls available, RS-232 compatible (57,600 & 921,600 baud), external sync input/output, power reduction switch (removes analog video)

**FFC Duration**
- <0.5 sec

**PHYSICAL ATTRIBUTES**

**Size**
- 1.75” x 1.75” x 1.75” (less lens)

**Mounting Interface**
- 6 attach points in lens mount, M2 x 0.4 on 3 sides, 2 per side (sealable bulkhead mounting feature on lens barrel [M29 x 1.0, WFOV only])

**Power**

**Input Voltage**
- 4.0 - 6.0 VDC

**Primary Electrical Connector**
- 50-pin Hirose

**Power Dissipation**
- ~1.0 W

**Time to Image**
- <3.5 seconds

**ENVIRONMENTAL**

**Operating Temperature Range**
- -40°C to +80°C external temp

**Storage Temperature Range**
- -55°C to +95°C external temp

**Scena Temp Range**
- High gain: -40°C to +160°C; Low gain: -40°C to +550°C

**Shock**
- 200 g shock pulse with 11 msec sawtooth

**Temperature Shock**
- 5g/min

**Vibration**
- 4.3 g 3 axes, 8 hours each

**Humidity**
- 5 - 95% non-condensing

**Operational Altitude**
- +40,000 feet

**EMC Radiation**
- FCC/CE Class B

**ROHS, REACH, and WEEE**
- Compliant
**TAU 2 CAPABILITIES**

### Tau 640, Tau 336 & Tau 320

- **Standard lens options**: 3 WFOV, 5 NFOV
- **WFOV lenses sealed to IP-67 at front surface**
- **Threaded WFOV lens barrel for bulkhead mounting or external attachment options**
- **Lens-less configuration offered**
- **Ability to calibrate a second lens and store the calibration data in the camera via Advanced GUI function**
- **Supplemental FFC feature allows users to calibrate out lens effects to improve image quality**
- **Field-switchable between NTSC and PAL**
- **CMOS, BT.656, 14-bit LVDS data output**
- **Camera Link digital data accessory option**
- **Accessories available for backward-compatibility with Photon cameras**
- **Expansion board reference design for customers to develop custom interface electronics**
- **High-speed serial communications up to 921K baud**
- **Camera Control GUI**
- **Camera power and communication over USB**
- **Up to 200g shock tolerance**
- **Eight discrete camera input functions available to OEMs (CMOS interface limits users to one discrete function)**
- **Shutterless version available for OEM customers with volume constraints**
- **Field-upgradeable software/firmware**
- **Support for user-defined symbology**
- **Relative temperature measurement Tau 320 & Tau 336**
- **Provision to load custom start-up splash screens (10-camera minimum purchase required)**
- **Optional SDK for access to Tau’s complete feature set**

Visit [www.fli.com/cvss/cores/knowledgebase](http://www.fli.com/cvss/cores/knowledgebase) to browse the Tau Knowledge Base.


---

### Tau 2 GUI

- **FCC Notice**: This device is a subassembly designed for incorporation into other products in order to provide thermal imaging capability. It is not an end-product for consumer use. When incorporated into a host device, the end-product will generate, use, and radiate radio frequency energy that may cause radio interference. As such, the end-product incorporating this subassembly must be tested and approved under the rules of the Federal Communications Commission (FCC) before the end-product may be offered for sale or lease, advertised, imported, sold, or leased in the United States. The FCC regulations are designed to provide reasonable protection against interference to radio communications. See 47 C.F.R. §§ 2.803 and 15.1 et seq.

- **Industry Canada Notice**: This device is a subassembly designed for incorporation into other products in order to provide thermal imaging capability. It is not an end-product for consumer use. When incorporated into a host device, the end-product will generate, use, and radiate radio frequency energy that may cause radio interference. As such, the end-product incorporating this subassembly must be tested for compliance with the Interference-Causing Equipment Standard, Digital Apparatus, ICES-003, of Industry Canada before the end-product may be manufactured or offered for sale or lease, imported, distributed, sold, or leased in Canada.

- **Avis d’Industrie Canada**: Cet appareil est un sous-ensemble conçu pour être intégré à d’autres produits à des fins d’imagerie thermique. Il ne s’agit pas d’un produit final destiné aux consommateurs. Une fois intégré à un dispositif hôtes, le produit final va générer, utiliser et émettre de l’énergie radiofréquence qui pourrait provoquer de l’interférence radio. En tant que tel, le produit final intégrant ce sous-ensemble doit être testé pour en vérifier la conformité avec la Norme sur les appareils numériques causant des interférences (ICES-003) d’Industrie Canada avant que le produit final intégrant ce dispositif puisse être fabriqué, mis en vente ou en location, importé, distribué, vendu ou loué au Canada.

- **EU Notice**: This device is a subassembly or component intended only for product evaluation, development or incorporation into other products in order to provide thermal imaging capability. It is not a finished end-product fit for general consumer use. Persons handling this device must have appropriate electronics training and observe good engineering practice standards. As such, this product does not fall within the scope of the European Union (EU) directives regarding electromagnetic compatibility (EMC). Any end-product intended for general consumer use that incorporates this device must be tested in accordance and comply with all applicable EU EMC and other relevant directives.

Equipment described herein may require US government authorization for export purposes. Diversion contrary to US law is prohibited. Specifications are subject to change without notice. Imagery used for illustration purposes only.

©2012 FLIR Systems, Inc. All rights reserved. Imagery used for illustration purposes only, 20877 (Rev. 4/12)