



1 Document

1.1 Revision History

Version	Date	Comments
100	02/08/2013	Initial release.
110	05/20/2013	Updated for Tau 2.4 Release

1.2 Scope

Tau™ is a family of miniature infrared imaging cores from FLIR Systems®, offered in various configurations. The purpose of this document is to provide a summary of all features and general changes between the Tau 1.X and Tau 2 products for a quick reference and product comparison. All features and changes are described in the Tau 2 Product Specification and/or Tau 2 Software IDD documents.

While Tau 2 resembles the Tau 1.5 (324x256) and Tau 1.7 (640x512) configurations in size and shape, it is a different product providing more capabilities not possible with the older hardware platform. Furthermore it is intended that most features will be field-upgradeable with feature improvements over time. Consequently this product comparison will be updated to reflect the new features of each upgrade. The features by Tau 2 release are summarized in Table 1 - Table 4.

For customers that wish to remain on a particular Tau 2 release, an OEM part number may be obtained (e.g. 46640001X-FPOEM instead of 46640001X-FPNLX). For OEM part numbers, FLIR will hold the camera software and firmware fixed and will not upgrade to each release unless otherwise requested.

2 References

The following documents form a part of this product comparison to the extent specified herein.



2.1 FLIR Website / Contact Information

In multiple locations throughout this document, FLIR’s Tau website is referenced as a source of additional information. This website can be accessed via the following URL:

www.flir.com/cvs/cores/uncooled/products/tau/

Additionally, FLIR’s Applications Engineering Department is referenced as a resource for obtaining additional help or information. The department can be accessed via the following phone number: +1-805-964-9797 (or toll-free within the United States at 888-747-FLIR (888-747-3547).) Email requests can be addressed to SBA-cores@flir.com].

2.2 FLIR Systems Documents

102-PS242-100-14	Advanced Radiometry Application Note
102-PS242-40	Tau 2 Product Specification
102-PS242-41	Tau 2 Electrical Interface Description Document (IDD)
102-PS242-43	Tau2/Quark Software IDD

2.3 Abbreviations / Acronyms

CMOS	Complementary Metal-Oxide-Semiconductor
IDD	Interface Description Drawing / Document
LVDS	Low-Voltage Differential Signaling
ROI	Region of Interest



- OEMs with “Advanced Radiometry” will receive further improved accuracy on the order of ± 5 C° in high-gain state (varies slightly across the full operating temperature range). The ability to perform a field radiometric calibration is included.
- OEMs with “Advanced Radiometry” will receive per pixel radiometric information (i.e. moveable spotmeter) and additional spotmeter data (e.g. standard deviation, minimum, and maximum pixel values with the ROI). See the Radiometry Application Note for further details.
- OEMs with “Advanced Radiometry” may enable the TLinear feature which gives digital data linear in scene temperature, i.e. in real-time operation, the pixel values in the 14-bit digital data correspond to the temperature of the scene. See the Radiometry Application Note for further details.
- 8-bit snapshot and playback
 - 8-bit snapshots in BMP8 format may be stored and played back on analog video. This snapshot feature is in addition to the original 14-bit snapshot feature.
 - Snapshot memory for both 14-bit and new 8-bit snapshots has been increased.
- Fault tolerant FW upgrades
 - For Tau 2, the upgrades load into a secondary location to preserve the original firmware. SW upgrades remain fault tolerant.
- Revert applies to all digital channels
 - In Tau 1, only invert (vertical image flip) was applied to the digital channels. For Tau 2, both invert and revert (horizontal image flip) are applied to the digital channels.
- Splash screen delay time is adjustable
 - The display time of the start-up splash screen is now user configurable and unlike Tau 1, the user may set the display time independent from loading a new splash screen.
- Selectable symbol resolution for all configurations
 - Independent of camera resolution (e.g. 324x256), the symbol resolution can be selected as either 640x512 or 324x256.
- Isotherm with three color ranges
 - Tau 1 included two color ranges, and Tau 2 now includes three color ranges. For Tau 2, the top half of the color palette may be mapped to a lower (yellow), middle (orange), and upper (red) threshold.
- Overtemp indicator
 - As a diagnostic feature, the Tau 2 core can report a status indicating whether the operating temperature is higher than the specified temperature range. Some configurations can also display an overtemp indicator.
- Improved full temperature performance (-40°C to 80°C)
 - Improved factory calibration procedure and software were introduced to improve image quality over temperature. This update does not affect the user interface or the field calibration procedures available in the Camera Controller GUI.



3.2 New Features by Release

Release Version	Release Date	New Features relative to Tau 1.X:	Reference Documents
2.0	October 2011	New auto-polarity detection	102-PS242-43, section 3.1.1
		New baud rate options are provided	102-PS242-43, section 3.1.2, command 0x07
		Digital output mode updates to support setting CMOS and LVDS bit-width independently	102-PS242-43, command 0x12
		60Hz frame rate is available for array sizes 336x256 and smaller	102-PS242-40 rev100 and later, section 3.3.2 102-PS242-43, command 0x72
		Splash screen display time is adjustable via command	102-PS242-43, command 0x31
		FW / SW upgrade is fault tolerant	102-PS242-40 rev100 and later, section 3.3.1.4
		Revert applies to all digital output channels	102-PS242-40 rev100 and later, section 3.3.2.3
		All configurations, regardless of number of pixels, can provide 640x512 symbol resolution	102-PS242-40 rev100 and later, section 3.3.2.8
		Isotherms provide three color ranges rather than two	102-PS242-43, command 0x23
		Iris-style shutter option available for all resolutions	102-PS242-40 rev100 and later, section 3.1.1.1

Table 1: New Features for Tau 2.0 release relative to Tau 1.X



Release Version	Release Date	New Features relative to Tau 2.0:	Reference Documents
2.1	August 2012	Addition of available resolution options	102-PS242-40 rev110 and later, section 3.2.1
		New continuous electronic zoom feature	102-PS242-40 rev110 and later, section 3.3.2.4 102-PS242-43, command 0x32
		Selectable symbol resolution	102-PS242-40 rev110 and later, section 3.3.2.8
		New 8-bit snapshot / playback feature	102-PS242-40 rev110 and later, section 3.3.2.9 102-PS242-43, command 0x82
		New advanced radiometric features and improved accuracy (OEMs with “Advanced Radiometry” only)	102-PS242-40 rev110 and later, section 3.3.3.3 102-PS242-43, various commands
		New over-temperature indicator	102-PS242-40 rev111 and later, section 3.3.4.4 102-PS242-43, command 0x20

Table 2: New Features for Tau 2.1 release relative to Tau 2.0

Release Version	Release Date	New Features relative to Tau 2.1:	Reference Documents
2.1.1	November, 2012	The supplemental FFC feature now available in Tau2	102-PS242-40 rev112 and later, section 3.3.2.11

Table 3: New Features for Tau 2.1.1 release relative to Tau 2.1



- For experienced users, the limitation may be removed by using a separate command. Contact the FLIR Applications Engineering department for further details and instructions.
- AGC ROI change
 - The coordinates to set the ROI via software command are now expressed as percentages.
 - A single AGC ROI is defined for Tau 2, as opposed to Tau 1.X in which a separate ROI for each zoom factor was defined.

4.2 Software Command Changes

The following software commands existed in Tau 1 and were altered for Tau 2. Not including the exceptions below, backwards compatibility with software commands was intentionally maintained to facilitate integration of the Tau 2 product in place of Tau 1. Some new features were accomplished by adding new sub-commands for existing software commands and some new features required entirely new commands. The new commands or sub-commands supporting the increased feature set for Tau 2 are not included in this section as they will not affect backward compatibility and are well documented in the Tau 2 Software IDD. The changes in Tau 2 relative to existing Tau 1 commands are highlighted in **blue font** for emphasis:



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This product is protected by patents, design patents, patents pending, or design patents pending.

If you have questions that are not covered in this manual, or need service, contact FLIR Commercial Systems Customer Support at 805.964.9797 for additional information prior to returning a camera.

This documentation and the requirements specified herein are subject to change without notice.



This equipment must be disposed of as electronic waste.

Contact your nearest FLIR Commercial Systems, Inc. representative for instructions on how to return the product to FLIR for proper disposal.

FCC Notice. This device is a subassembly designed for incorporation into other products in order to provide an infrared camera function. It is not an end-product fit 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 an infrared camera function. It is not an end-product fit 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 product incorporating this device 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 un autre produit afin de fournir une fonction de caméra infrarouge. Ce n'est pas un produit final destiné aux consommateurs. Une fois intégré à un dispositif hôte, 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 le matériel brouilleur pour les appareils numériques (NMB-003) d'Industrie Canada avant que le produit 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 an infrared camera function. 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.



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