# Tau
# LWIR Video Camera

## Quick Start Guide

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# 1.0 Document

## 1.1 Revision History

| Version | Date | Comments |
|---------|------|----------|
| 100 | 10/14/2011 | Initial Release |

## 1.2 Scope

Tau ™ is a miniature infrared imaging core from FLIR Systems®. This Quick Start includes information required for first-time use of the Tau Camera.

The FLIR website will have the newest version of this document as well as offer access to many other supplemental resources: http://www.flir.com/cvs/cores/resources/

Here is a sample of some of the resources that can be found:

| Document Title | Document Number | Description |
|----------------|-----------------|-------------|
| Tau Quick Start Guide | 102-PS242-01 | Quick Start Guide for first-time use |
| FLIR Camera Controller GUI User's Guide | 102-PS242-02 | Detailed Descriptions for functions and adjustments for FLIR cameras using the FLIR Camera Controller GUI |
| Tau 2 Product Specification | 102-PS242-40 | Product specification and feature description |
| Tau 2 Electrical IDD | 102-PS242-41 | Written for Electrical Engineers to have all necessary information to interface to a Tau 2 camera |
| Tau 2/Quark Software IDD | 102-PS242-42 | Written for Software Engineers to have all necessary information for serial control of Tau 2 and Quark |
| Assorted Mechanical Drawings and Models | Various | There are drawings and 3D models for various camera configurations for mechanical integration |
| Application Notes | Various | Written for Systems Engineers and general users of advanced features such as Gain Calibration, Supplemental FFC Calibration, NVFFC Calibration, Camera Link, On-Screen Symbology, AGC/DDE explanation, Camera Mounting, Spectral Response, Optical Interface for lens design, and others. |

There is also a large amount of information in the Frequently Asked Questions (FAQ) section on the FLIR website: http://www.flir.com/cvs/cores/knowledgebase/. Additionally, a FLIR Applications Engineer can be contacted at 888.747.FLIR (888.747.3547).

# 2.0 Unpacking the Camera

When unpacking the camera, please heed customary electrostatic-discharge (ESD) sensitive device precautions including static-safe work station and proper grounding. The Tau camera is packaged in foam to prevent damage during shipping. It is also placed in a conductive anti-static bag to protect from electrostatic-discharge damage.

Disassembling the camera can cause permanent damage and will void the warranty. Operating the camera outside of the specified input voltage range or the specified operating temperature range can cause permanent damage. The camera back is not sealed. Avoid exposure to dust and moisture. This camera contains electrostatic-discharge-sensitive electronics and should be handled appropriately.

The camera has been focused in the factory using a collimated bar target. Although it is possible to adjust the focus, doing so may compromise the external seal of the camera and factory focus will be lost.

## 3.0 Basic Accessories

The Tau Camera can be simply used with either the VPC Module Accessory (FLIR PN 421-0039-00) or the Camera Link Module Accessory (FLIR PN 421-0046-00). These accessories provide an easy way to evaluate the camera core and access analog and, in the case of the Camera Link Module, digital video during development. The Photon Replicator (FLIR PN 421-0040-00) allows access to a 30-pin SAMTEC connector (SAMTEC Part Number: TFML-115-02-S-D-P) that can be useful for a cable connection. You can find these and other accessories at http://www.flirshop.com.

## 3.1 VPC Module Accessory

The VPC module accessory includes USB-A to USB-mini B cable for power and communications, USB power supply, European power adapter, MCX-to-BNC cable for analog video, and mounting screws.
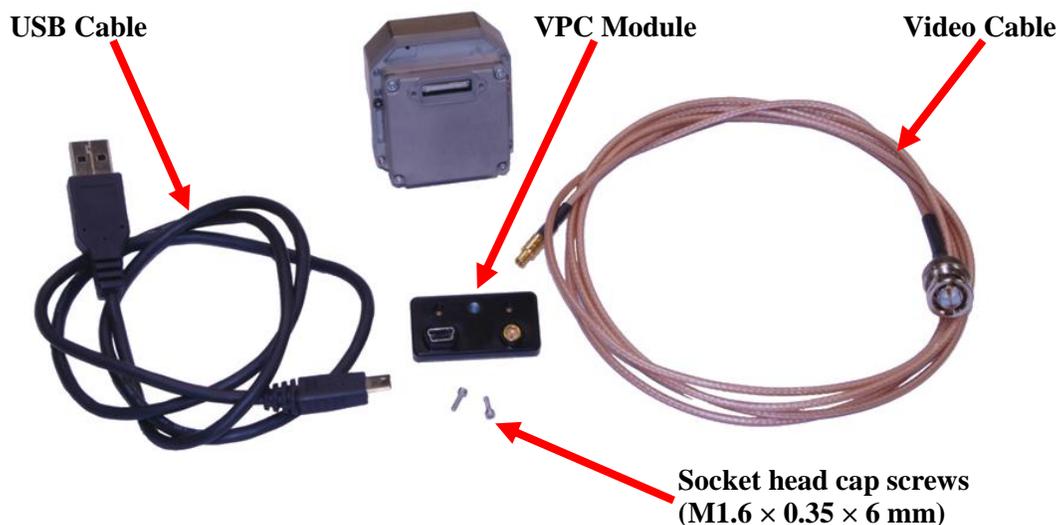


**Figure 1: Tau Camera and VPC Module Accessory Kit**

**(USB Power Supply and European Power adapter not pictured)**

## 3.2 Photon Replicator Board

Photon Replicator Board adapts the Tau camera's native 50-pin Hirose connector to the 30-pin SAMTEC connector used on FLIR's Photon cameras. The replicator board makes the Tau camera electrically pin-compatible to a Photon camera, including the provision for operating the Tau camera over the same input voltage range as the Photon camera: 5-24VDC. Refer to the Photon 640 User's Manual for more details including pin definition.

A cast magnesium spacer and 4 socket-head machine screws are included.

## 4.0  Connecting to the Camera

This section describes installation of necessary software, physical camera connections, and software connection to the camera.

## 4.1  FLIR Camera Controller GUI

The FLIR Camera Controller GUI provides communication between a PC and a Tau camera using either the USB interface or some other means of serial communication.

1. If you have an older version of the FLIR Camera Controller GUI loaded on your PC, you should first uninstall it using the Windows Uninstall utility via the Windows Control Panel before proceeding with this installation.
2. The newest version of the FLIR Camera Controller GUI can be found at the following URL: http://www.flir.com/cvs/cores/resources/software/tau/
3. Click on the link to download the GUI and save it to your computer.
4. Extract the file using WinZip or other software. This can typically be done by right-clicking on the zip file and selecting "Extract".
5. Open the directory where you saved the file and double-click "setup.exe".
6. Walk through the installation steps.
7. When the primary installation is completed, you will be prompted to install Silicon Laboratories drivers. This portion of the installation is necessary for using a USB connection to the camera.
8. The program will install to **Start→All Programs→FLIR Systems→Camera Controller GUI**

## 4.2  Physical Connection

This section describes physical connections to the camera and assumes that you have either the VPC or Camera Link Accessory Module.

1. Plug the accessory directly into the rear of the camera. There is a white 50-pin connector that will mate. Use the included socket head cap screws to secure the expansion board to the camera. These will insert on either side of the 50-pin connector. The VPC module uses M1.6 × 0.35 × 6 mm screws and the Camera Link module uses M1.6 × 0.35 × 8 mm screws. Using longer screws could damage the camera.
2. Connect the analog video cable to the VPC or Camera Link Module on the back of the Tau Camera. There is an MCX mini coaxial connector on the back of the accessories. The opposite end of the cable has a standard coaxial connector. Connect this to the video input of an analog monitor. It may be necessary to use a BNC Female to Phono Plug (RCA) Adapter. These are readily available at electronics stores and allow the camera to be connected to the standard yellow video input on a monitor.



**Figure 2: BNC to RCA Adapter**

3. Connect the USB-mini B cable to the VPC Module or the Camera Link Module and the USB-A end to your computer. (If you have sound enabled on your computer, you should hear a chime and see a notification that the device has been connected).



**Figure 3: VPC Physical Connections**

4. Analog video should appear within a few seconds after connecting the USB cable. Verify analog video is displayed on the monitor to ensure the camera is properly powered.
5. Additional Information: Access the Device Manager to verify proper driver installation and identify communications port. **Connection issues are most often caused by attempting to use the wrong COM Port to connect to the camera.**
   a. Right-Click on "My Computer" and select "Manage". This is typically either on the desktop or available through the start menu.
   b. Select "Device Manager" on the left Pane.
   c. Expand the tree for "Ports (COM & LPT)".
   d. Note the COM Port number used for Silicon Labs. The following example shows COM3.
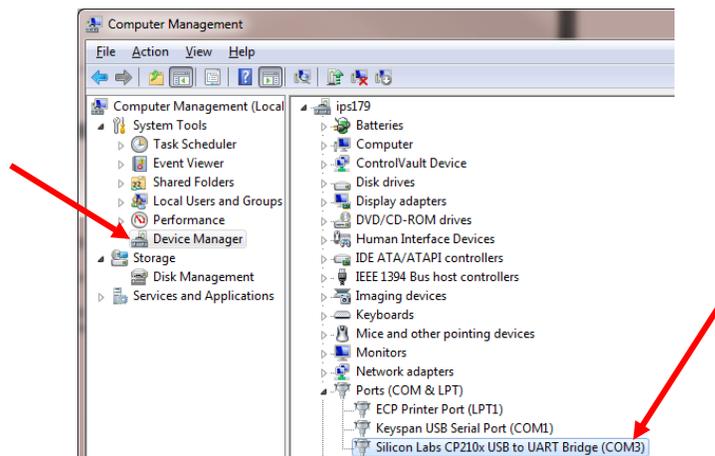


**Figure 4: Device Manager showing proper driver installation**

## 4.3  Software Connection

This section describes simple communication with the camera using the FLIR Camera Controller GUI and assumes that the camera is connected to the PC using a USB cable and either the VPC or Camera Link Accessory Module. Please refer to the FLIR Camera Controller GUI User's Guide for more details on functionality of the FLIR Camera Controller GUI and the Tau camera.

1. Run the FLIR Camera Controller GUI by clicking on the start menu and accessing **Start→All Programs→FLIR Systems→Camera Controller GUI. (**The software may take up to 30 seconds to load the first time.

2. When the GUI first opens, it will display "Not Connected" on the bottom left. The first step is to connect to the camera.

**Figure 5: FLIR Camera Controller GUI Status Tab – Not Connected**

3. Connect to the camera by selecting **Tools→ Connection**
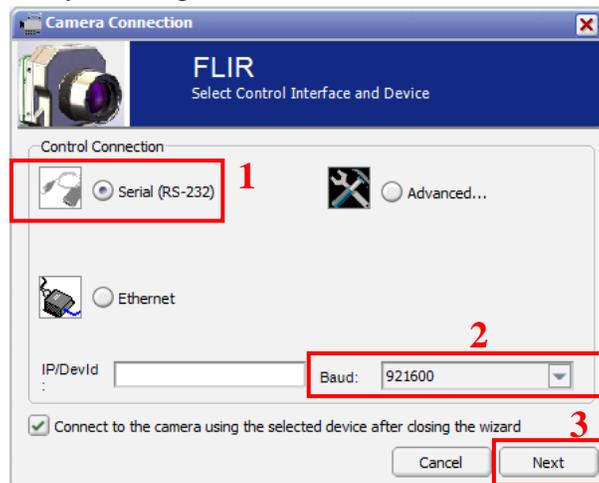
**Figure 6: FLIR Camera Controller GUI Connection Window Part 1**

4. Select Serial (RS-232), select 921600 as the Baud Rate for fastest communication, and click Next. If you only have one serial communication port on your computer, the button will say Finish.
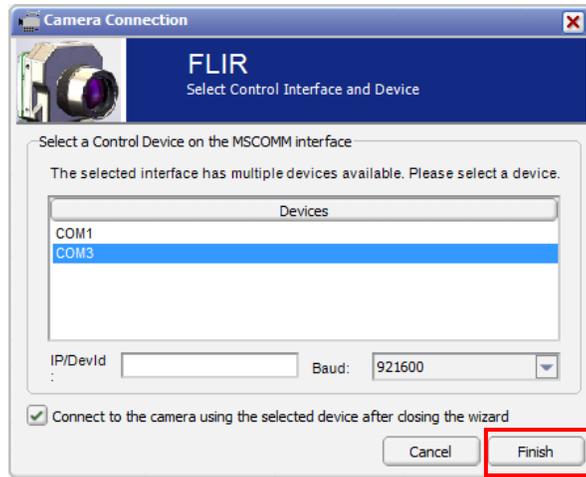


**Figure 7: FLIR Camera Controller GUI Connection Window Part 2**

5. Select the Com port seen in the Device Manager and click Finish.
6. The GUI will now automatically connect to the camera and refresh information in the software. The status LED will turn green and it will display "Connected" on the bottom left. It is also possible to retrieve the part number and serial number of your camera from this screen.
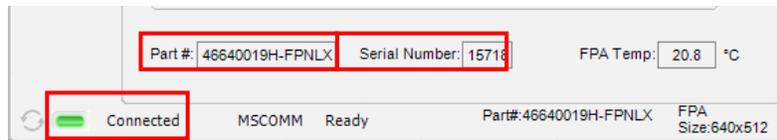


**Figure 8: FLIR Camera Controller GUI Status Tab – Connected**

7. Use the Help Menu at the top to open the FLIR Camera Controller GUI User's Manual or view camera version information.

**Help**: Select Camera Controller User Guide to open documentation in the default pdf viewer. The latest version of this document installs in the Program Files directory.
Select SDK Documentation to view help information for the Photon SDK that can be used with Quark, Tau 2, Tau, and Photon. The SDK does not install with the GUI and must be purchased separately.
Select About Camera Controller to open a separate window with version information for the GUI and the camera.

**About**: The GUI Framework is the version of the GUI. The Main App is the software version of the camera. The version in the example is v15.1.2.104. The firmware is v13.1.0.103. Click Details to view versions for each individual dll in the GUI.

## 4.4 Troubleshooting the FLIR Camera Controller GUI

If the FLIR Camera Controller GUI does not link with the camera, you may see the popup shown below which indicates that the GUI has not been able to communicate with the camera.
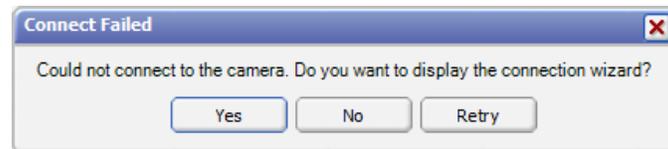
**Figure 9: FLIR Camera Controller Error Message**

If this is the case, verify the following:

- The USB Cable is properly connected to both the computer and the Accessory Module so that there is a green LED illuminated on the accessory.
- Verify that you selected the proper port if it was not detected automatically. Select Advanced, then Next in the Tools→Connection dialog box. Also, try disconnecting and then re-connecting the cable to the PC.  If the GUI was launched before the cable was connected, close the GUI, connect the cable, and then re-launch the GUI.
- The Baud rate must be set in the Tools→Connection dialog box. The Tau camera supports Baud rates of 57600 and 921600. In the factory default configuration, the Tau camera automatically detects if the Baud Rate of the first incoming message to determine whether it is either 57600 or 921600 and will communicate at that Baud Rate until reset.
- The Port may be occupied by another application. Shut down any other applications that may be using the port. Also, multiple instances of the FLIR Camera Controller GUI Program can be initiated using different ports, so be sure the camera you are interested in controlling is actually connected to the physical port that was verified in the Device Manager in Section 3.2, step 5.
- Verify that the camera is powered by checking that the camera is producing an image on an analog monitor. On cameras with a shutter installed, listen for the sound of the FFC at startup. There will be a clicking sound as the shutter is moved in and out of the field of view in the first 5 seconds after power is applied.

If you cannot initiate serial communication with the camera after verifying these items, refer to the frequently asked questions (FAQ) at http://www.flir.com/cvs/cores/knowledgebase/. Additionally, a FLIR Applications Engineer can be contacted at 888.747.FLIR (888.747.3547).

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 is 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.