



# SightLine

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APPLICATIONS

## EAN-FLIR Cameras

PN: EAN-FLIR-Cameras

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 *Used to emphasize points or reminds the user of something. Supplementary information that aids in the use or understanding of the equipment or subject that is not critical to system use.*



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## 1 Overview

This document covers how to setup and configure the FLIR Tau, Quark, and Boson cameras with the 1500-OEM and 3000-OEM video processing boards.

### 1.1 Associated Documents

[EAN-Startup Guide 1500-OEM](#): Describes steps for connecting, configuring, and testing the 1500-OEM video processing board on the 1500-AB accessory board.

[EAN-Startup Guide 3000-OEM](#): Describes steps for connecting, configuring, and testing the 3000-OEM video processing board on the 3000-IO interface board

[EAN-Ethernet-and-Serial-Communication](#): Describes how to setup serial communications for cameras or other payload devices from SLA-hardware.

[EAN-FPGA-Firmware-Update-1500-OEM](#): Describes how to upgrade the FPGA driver firmware on the 1500-OEM board.

[EAN-Network Configuration](#): Describes how to assign a static IP address to the board, set telemetry destinations and ports, and provide configuration information for both the 3000-OEM and the 1500-OEM video processing boards.

[ICD-3000-OEM](#): Describes power requirements, thermal management, interface specifications, and connector pin-outs for the 3000-OEM.

[ICD-3000 Adapter Boards](#): Describes power requirements, thermal management, interface specifications, and connector pin-outs for the 3000-OEM associated camera interface boards.

[ICD-1500-OEM](#): Describes power requirements, thermal management, interface specifications, and connector pin-outs for the 1500-OEM.

[ICD-1500 Adapter Boards](#): Describes power requirements, thermal management, interface specifications, and connector pin-outs for the 1500-OEM associated camera interface boards.

[FFC-Tau Exploded](#): Assembly for connecting to the Tau via camera FFC interface boards.

[FFC-Quark Exploded](#): Assembly for connecting to the Quark via camera FFC interface board.

[Interface Command and Control \(IDD\)](#): Describes the native communications protocol used by the SightLine Applications product line. The IDD is also available as a local download on the [Software Download](#) page.

Panel Plus User Guide: Provides descriptions of all the settings in the Panel Plus application. (Located in the Panel Plus application in the *Help* menu.)



## 1.2 Sightline Firmware and Software Requirements

Panel Plus software and firmware versions:

- Tau and Quark (1500-OEM): Version 2.20 or later and FPGA version 5 or 12.
- Tau and Quark (3000-OEM): Version 2.23 or later.
- Boson (1500-OEM): Version 2.23 or later and FPGA version 11.
- Boson (3000-OEM): Version 2.24 or later.

**ⓘ IMPORTANT:** The Panel Plus software version should match the firmware version running on the board.

All SightLine firmware and Panel Plus software revisions are available for download on the SightLine Applications [Website](#).

*14-bit mode requires a license for the Enhance + High Depth + Temp feature.*

## 2 Hardware Connections

### 2.1 1500-OEM Camera Connections

**Table 1: 1500-OEM Camera Connection Summary**

Camera	Connection
FLIR Tau	Board-to-board (direct) connection or SLA-1500-FFC
FLIR Quark	SLA-1500-FFC
FLIR Boson	SLA-1500-FPC

#### 2.1.1 Analog Video Connection

The FLIR Boson can be used with the FLIR USB interface adapter. This cable harness provides analog video output, which can be connected to the analog input of 1500-OEM.

Another option is to use the [COTS adaptor board from RHP International](#). It provides a round wire harness option for the FLIR Boson.

*Reference the [ICD-1500 Adapter Boards](#) or the [ICD-3000 Adapter Boards](#) when connecting the video processing boards to the Boson through the FFC interface boards.*

#### 2.1.2 Tau Camera Bench Setup 1500-OEM

The 1500-OEM can be configured to accept either the digital or the analog output of the Tau camera. SightLine recommends using the digital output from the camera to be able to capture IR temperature data along with camera video data.

The most common digital video connection with the 1500-FFC adaptor board is shown in [Figure 1](#). The FFC cable connects to a separate FFC-Tau camera interface. The 1500-OEM can also be connected directly to the back of the Tau camera through the 50-pin digital connector shown in [Figure 2](#).



The Tau SWIR camera uses the same connections.

*The Tau to 1500-OEM direct connection requires additional hardware prerequisites. Contact [Sales](#) for any questions on using a direct connection option. See the [Direct Connection to Tau Camera](#) section for more information.*

Reference the following documents for connecting the 1500-OEM to the Tau directly or through the optional FFC interface boards.

[ICD-1500-OEM](#): Direct connection of OEM board to Tau camera option.

[ICD-1500 Adapter Boards](#): Connection to the Tau through camera FFC interface boards.

[FFC-Tau Exploded](#): Assembly for connecting to the Tau via camera FFC interface.

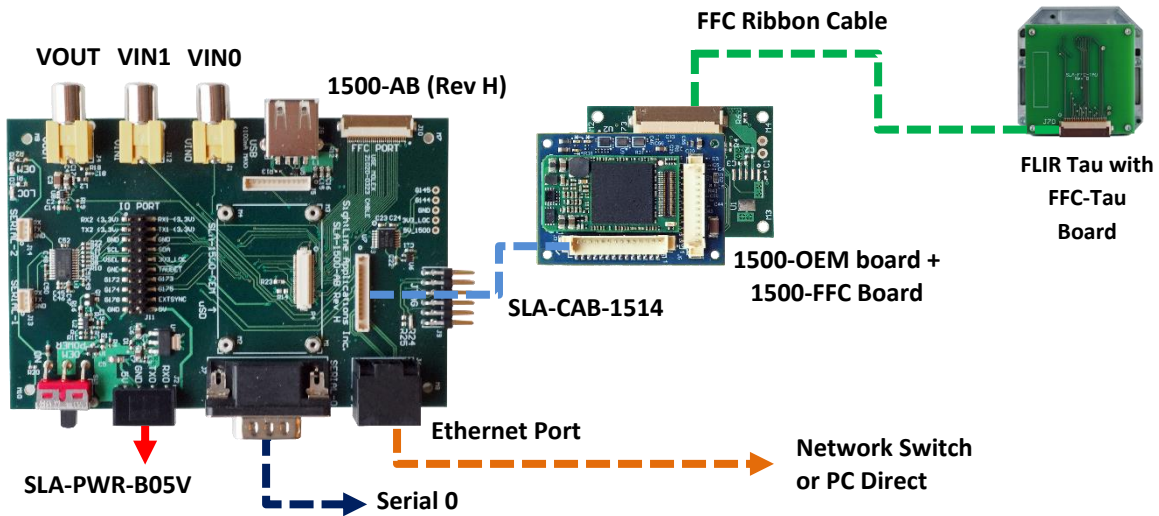


Figure 1: 1500-OEM FLIR Tau Bench Camera Setup

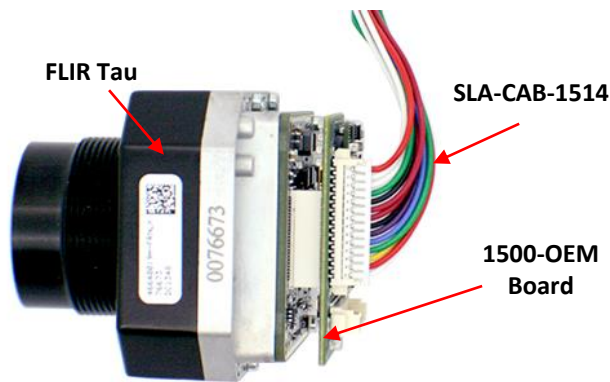


Figure 2: 1500-OEM Direct Connect





### 2.1.3 Quark Camera - 1500-OEM

The 1500-OEM can be configured to accept the digital output of the FLIR Quark camera core. SightLine recommends using the digital output from the camera to be able to capture IR temperature data along with camera video data.

A digital video connection with the 1500-FFC adaptor board is shown in [Figure 1](#). The FFC cable connects to a separate SLA-FFC-QRK camera interface board.

Reference the following drawings and documents when connecting the 1500-OEM to the Quark through the FFC interface boards:

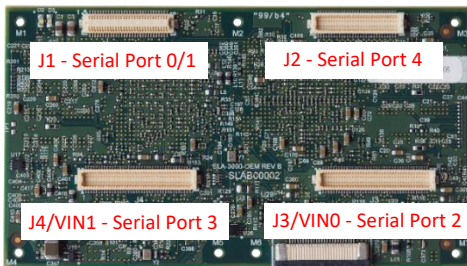
- [ICD-1500 Adapter Boards](#): Connection to the Quark through camera FFC interface boards.
- [FFC-Quark Exploded](#): Assembly for connecting to the Quark via camera FFC interface board.

### 2.1.4 Boson Camera - 1500-OEM

The 1500-OEM can be configured to accept the digital output of the Boson camera. SightLine recommends using the digital output from the camera to be able to capture IR temperature data along with camera video data.

The digital video connection is possible with the 1500-FPC adaptor board. The FPC cable connects to a separate FPC-Boson camera interface board. [Figure 1](#) above is very similar (FFC cable is replaced with FPC).

## 2.2 3000-OEM Camera Connections



3000-OEM	SLA-3000-IO	Serial Port	Camera Index Panel Plus
J1		0/1	NA
J2	VOUT	4	NA
J3	VIN0	2	CAM0/CAM1
J4	VIN1	3	CAM2

Figure 3: 3000-OEM Serial Port and Connector Reference

### 2.2.1 Tau and Quark Cameras - 3000-OEM

The 3000-OEM can be configured to accept either the digital or the analog output of the Tau or Quark cameras. SightLine recommends using the digital output from the camera to be able to capture IR temperature data along with camera video data.

The digital video connection with the 3000-FPC adaptor board. The FFC cable connects to a separate FFC-QRK camera interface board (same camera side board used with the 1500-OEM connection).

Analog video connection is done via an SMA connector on the 3000-AB analog adaptor board.

See the [ICD-3000 Adapter Boards](#) for both analog and FFC ribbon connections to the 3000-OEM board.



## 2.2.2 Boson Camera Bench Setup 3000-OEM

The 3000-OEM can be configured to accept either the digital or the analog output of the Boson camera. SightLine recommends using the digital output from the camera to be able to capture IR temperature data along with camera video data.

The digital video connection with the 3000-FPC adaptor board. The FPC cable connects to a separate FPC-Boson camera interface board. The picture of the FPC connection between the 3000-OEM and the Boson camera is shown in [Figure 4](#).

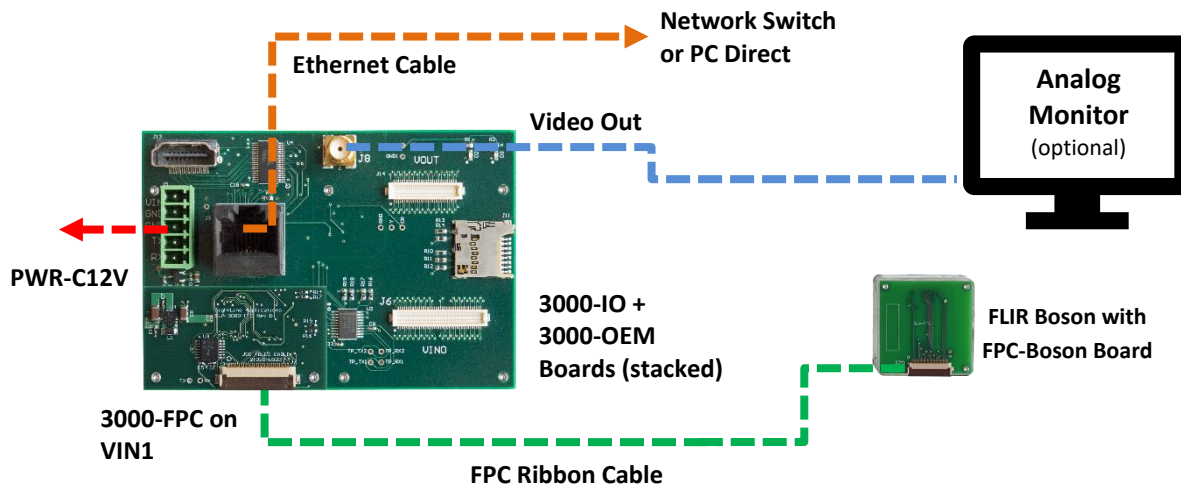


Figure 4: 3000-OEM FLIR Boson Bench Camera Setup

## 3 Configuration Settings

Connect to the board using the Panel Plus application. See the [1500-OEM Startup Guide](#) or the [EAN-Startup Guide 3000-OEM](#) for connection instructions.

### 3.1 FLIR Tau, Quark and Neutrino Cameras

The next section outlines predefined configurations to setup the Tau or Quark in 640x480 or 320x240 mode with the video processing boards. Except for digital camera settings, the Quark and Tau camera setups are the same. The Neutrino has the same physical interface as the Tau, with the addition of a separate 12 power connection to drive the cooler.

The supported configurations discussed in this section:

- Generic Digital: Supports 336x256 or other detector sizes other than 640 and 320.
- BT.656: Allows acquisition of FLIR generated color overlays.

*The 1500-OEM and 3000-OEM communicate with the FLIR Tau camera over UART to set 14 or 8-bit mode. It then saves the settings within the FLIR Tau camera.*



### 3.2 Preconfigured Acquisition Setup - Tau and Quark Cameras

To configure the 1500-OEM to process the analog feed from the Tau or Quark camera, see the [1500-OEM Startup Guide](#).

Using the setup shown below will result in acquisition of 640x480 video. Some Tau cameras output 640x512 video. Using the setup in [Generic Digital - Tau Cameras](#) will result in a full 640x512 image.

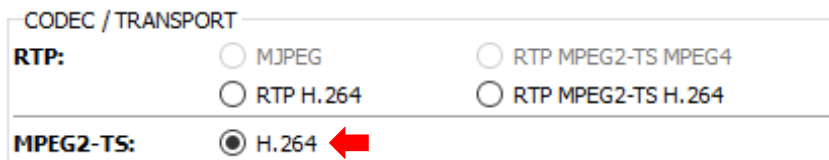
To configure the digital feed, use the following steps:

1. Start Panel Plus and connect to the board.
2. Main menu » *Configure* » *Acquisition Settings*. Set the *Camera Index*:
  - a. 1500-OEM: *Digital*
  - b. 3000-OEM: If the camera adapter board is installed on VIN1 of the 3000-IO board, use *Cam 2*. If the board is installed on VIN0, use *Cam 0*.
3. Set the *Camera Type* to match the camera. The frame *Height* and *Width* will be selected automatically based on the camera type. The *Apply* button will turn red indicating input field changes have been detected.

The *Camera Type* list for the Tau and Quark include the 640 and 320 in 8-bit or 14-bit mode.



4. Click the *Apply* button, and then close the *Acquisition Settings* dialog.
5. Click on the *Compression* tab. Select a video protocol. (*MPEG2-TS: H.264* is recommended.)



6. Click *Use My IP - Unicast*, and then click *Send*.
7. Click the *Multi Camera* tab.
  - a. 1500-OEM: Select the *Digital (2)* input as the primary camera to display the video in Panel Plus.





- b. 3000-OEM: Select Network 0. In the Cameras section if the camera board is connected on VIN0 on the 3000-IO board, select 0. If connected on VIN1 select 2. This enables video to display in Panel Plus.

Decode @ P+	Display	Cameras				Multi	Blend	None	Resolution
		0	1	2	3				
<input checked="" type="radio"/>	Network 0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Out=In ▼
<input type="radio"/>	Network 1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	Out=In ▼
	Analog	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	NTSC ▼
	HDMI	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	720p60 ▼
	HD-SDI	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	720p60 ▼

8. Click the *Send* button to save the settings to the parameter file.
9. Close the *Acquisition Settings dialog* window.
10. Save and activate the settings:
  - a. Main menu » *Parameters* » *Save to Board*.
  - b. Main menu » *Reset* » *Board*.
  - c. After the system reboots reconnect to the board. Make sure the board connects.

The 1500-OEM will supply 5V DC power to the Tau. As the Tau powers up, it will perform a Non-Uniformity Correction (NUC) with the internal mechanical paddle. This action will make a noticeable sound. Status lights on Tau camera will illuminate.

If video does not display, try saving and activating the settings again in step 8. Check the encoding settings on the *Compression* tab and review the network addresses for the destination video.

If a connection cannot be made to the Tau camera in 14-bit mode, use the 8-bit mode. See the [Direct Connection to Tau Camera](#) section in *Troubleshooting* for more information.

### 3.2.1 Generic Digital - Tau Cameras

The Generic Digital mode requires additional setting entries in the *Acquisition Settings* dialog. This can be used in place of a predefined configuration for Tau/Quark 640 and 320. Setting the Height to 512 and Width to 640 will capture the full image pixels for a 640 Tau. Generic Digital configuration settings for the Tau 336 in 14-bit mode are shown in [Figure 5](#).

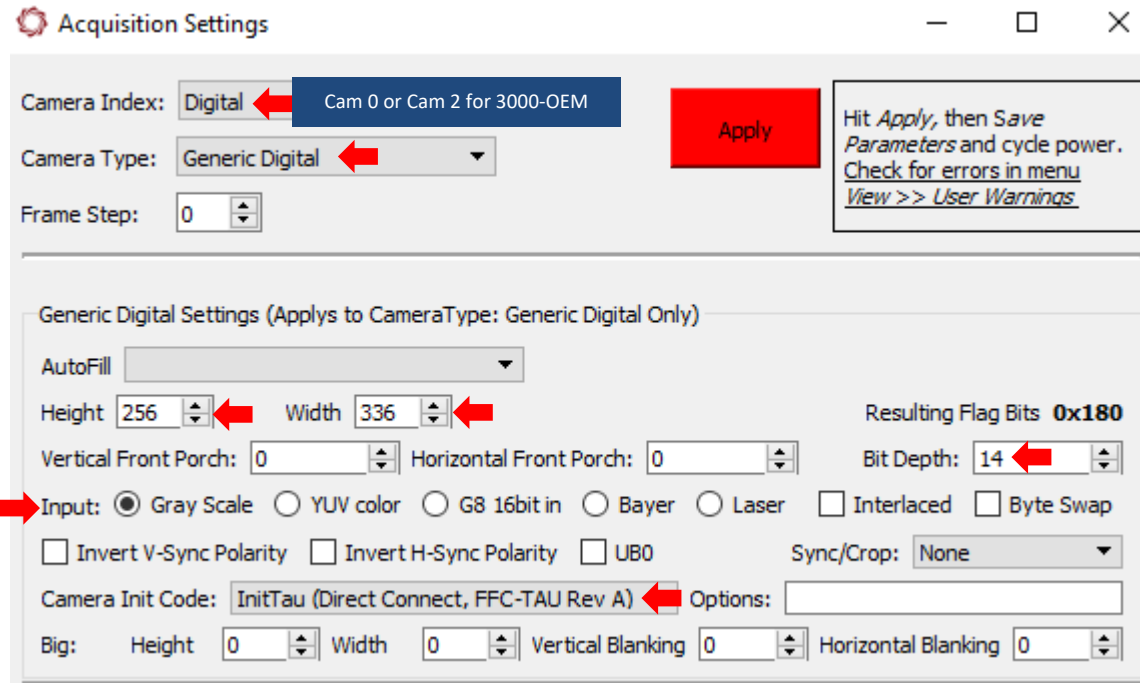


Figure 5: Tau Generic Digital Configuration 14-Bit Mode (1500-OEM shown)

Generic Digital configuration settings for the Tau 336 in 8-bit mode are shown in Figure 6.

In 8-bit mode, the width must be adjusted to 320 to allow for 32-bit data alignment.

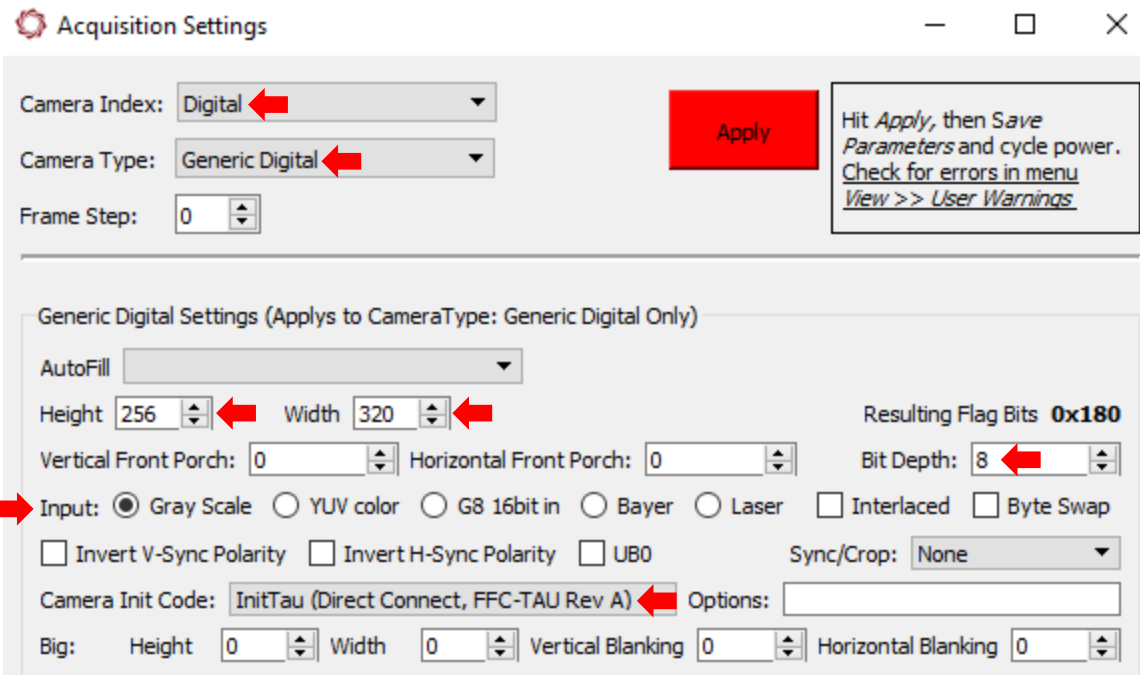


Figure 6: Tau Generic Digital Configuration 8-Bit Mode (1500-OEM shown)



### 3.2.2 Tau Cameras Serial Port Passthrough Configuration

To configure the serial port passthrough, from the Panel Plus main menu » *Configure* » *Serial Ports*. Use the following settings shown in [Figure 7](#):

- Serial Port 2 for the 1500-OEM
- Serial Port 2 (Cam0 / VIN0) or Serial Port 3 (Cam2 / VIN1) for the 3000-OEM

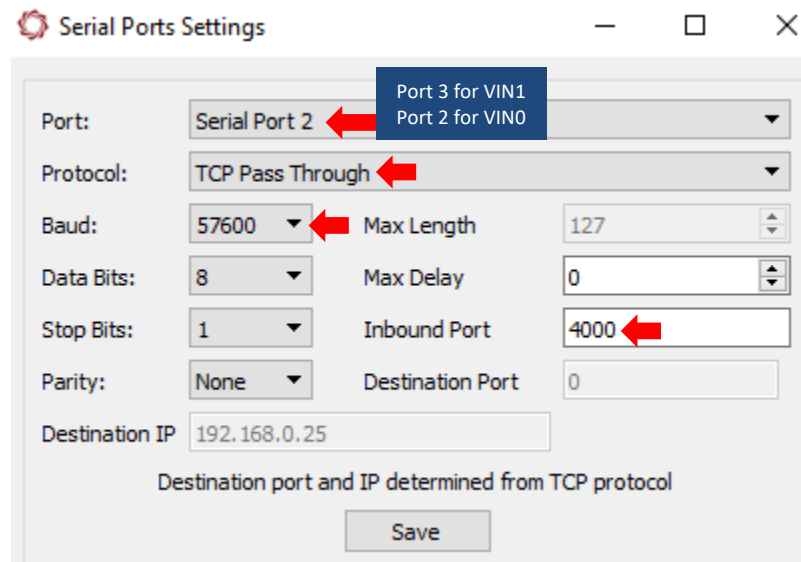


Figure 7: Serial Port Passthrough Configuration (3000-OEM shown)

### 3.3 Tau SWIR Camera

The Tau SWIR camera and the Tau LWIR camera setup and configuration are the same.

- Passthrough: When connecting the FLIR Camera Control GUI to the Tau SWIR camera the baud rate must be set to 57,600. The FLIR Camera Control GUI version must be 1.21 or later. The FLIR GUI must be configured in SWIR mode (menu *Camera* » *Select*) before connecting to the camera.
- Camera Link: The Tau SWIR can also be setup with a Camera Link adapter. To get the Camera Link video, use the *Generic Digital* configuration for Tau with the following changes:
  - 1500: Init Code *InitCameraLink*
  - 3000: Init Code *None*

*The Camera Link version may need to be configured in 14-bit mode using passthrough to the camera and using the FLIR camera control GUI. Baud rate is 57,600. The FLIR Camera Control GUI version must be 1.21 or later.*

### 3.4 Boson 640 and 320 Cameras

This section covers how to setup and configure the FLIR Boson 320 and 640 cameras with the video processing boards.



### 3.4.1 FPGA Driver Firmware - 1500-OEM

Version 11 of the FPGA driver firmware should be installed on the 1500-OEM board for the Boson camera to work correctly. See the [EAN-FPGA-Firmware-Update-1500-OEM](#) document for how to upgrade the FPGA driver firmware on the 1500-OEM board.

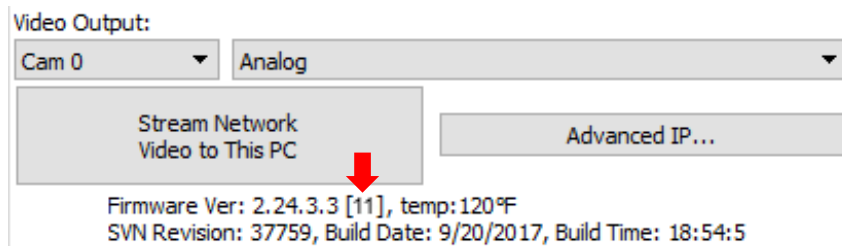


Figure 8: FPGA Version Number Location

### 3.4.2 Boson 320 Camera

Later versions of Boson 320 cameras may require a *Horizontal Front Porch* setting of 580. If the Boson video does not work with a setting of 692, use the 580 setting.

For the 320 60Hz output camera, setting the frame step to 1 will acquire at 60 fps. Setting the frame step to 2 will acquire at 30 fps.

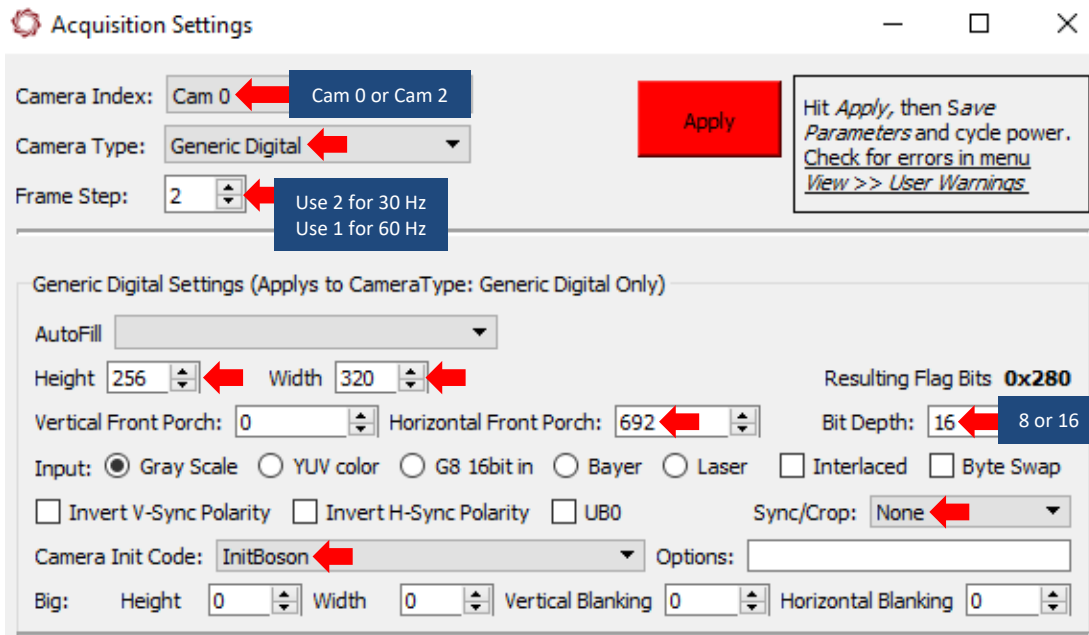


Figure 9: Boson 320 Camera Configuration (3000-OEM shown)



### 3.4.3 Boson 640 Camera

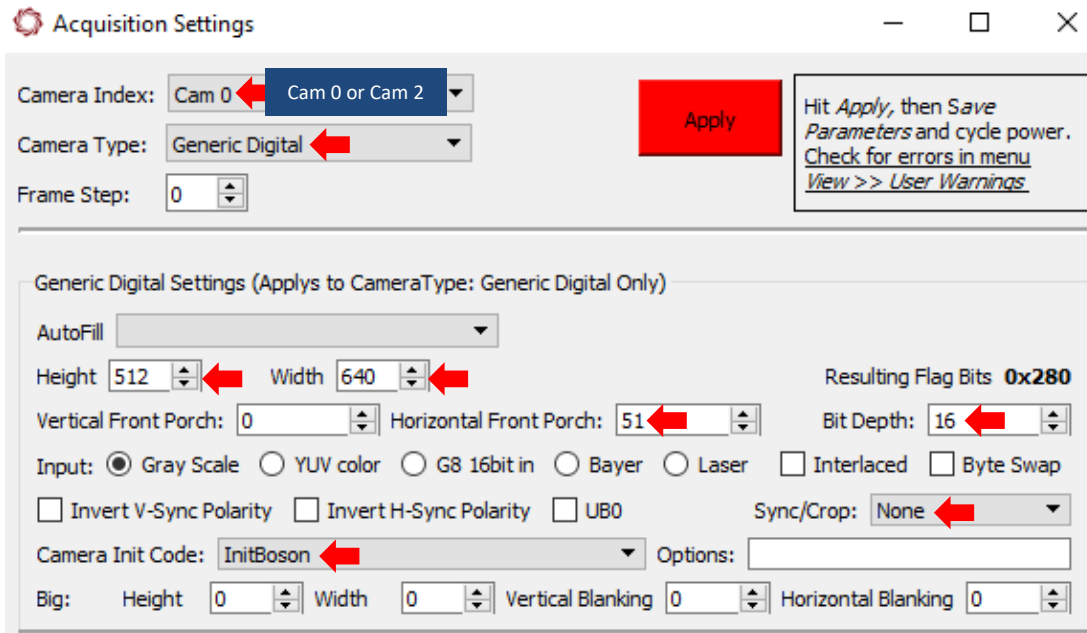


Figure 10: Boson 640 Camera Configuration (3000-OEM shown)

### 3.4.4 Boson Cameras Serial Port Passthrough Configuration

From the Panel Plus main menu » *Configure* » *Serial Ports*. Use the following settings:

- Serial Port 2 for the 1500-OEM
- Serial Port 2 (Cam0 / VIN0) or Serial Port 3 (Cam2 / VIN1) for the 3000-OEM

**⚠ IMPORTANT:** Serial passthrough to the Boson camera from the 3000-OEM is enabled in software release 2.25.07 (and later).

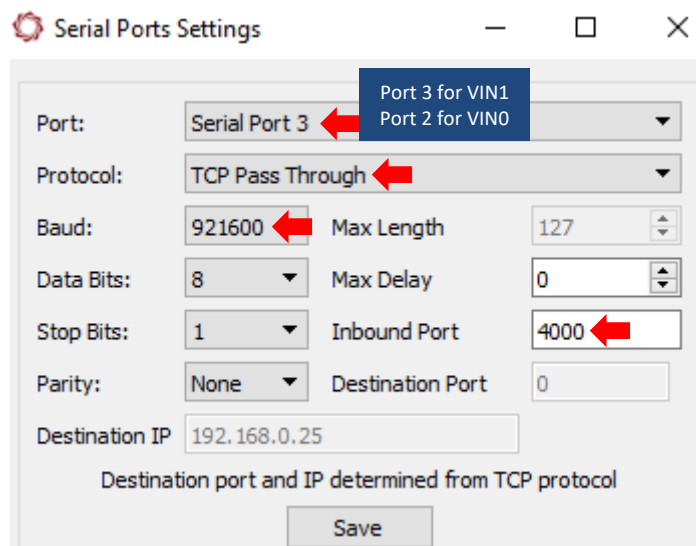


Figure 11: Serial Port Passthrough Configuration (3000-OEM shown)





## 4 NUC/FFC Command

The Tau and Quark often need to be calibrated. This is done through applying a Non-Uniformity Correction (NUC) using Flat Field Correction (FFC) processes.

**ⓘ IMPORTANT:** Before starting the process and sending FFC commands, place an object of uniform density and temperature in front of the camera lens as shown in [Figure 13](#).

Use the Command Passthrough (0x3D) to send FLIR protocol messages to the camera. From the Panel Plus main menu » *File* » *Send Command*.

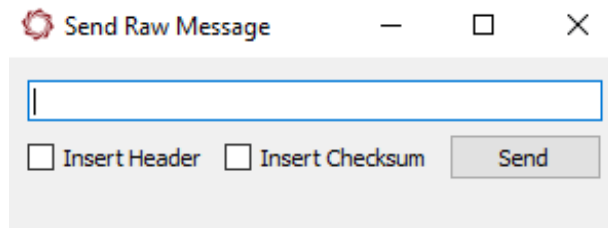


Figure 12: Sending Commands

**Before Calibration**



**After Calibration**



Figure 13: Calibration Example

Table 2: Camera Comm Protocols

Camera Type	Baud	Data Bits	Stop Bits	Parity
Tau/Quark	57600	8	1	none
Boson	921600	8	1	none



## 4.1 Tau and Quark Cameras

### 4.1.1 1500-OEM or 3000-OEM: Cam0/Vin0/Serial2

1. Panel Plus main menu » *Configure* » *Serial Ports*.
2. Set *Serial Port 2* to 57600 baud. Set the *Protocol* field to something other than *Port Not Used*.
3. Go to *File* » *Send Command*.
4. Send FFC: 51,AC,0D,3D,04,6E,00,00,0C,00,00,AA,DA,00,00,0B
  - 51,AC = header
  - 0D = length
  - 3D = Command Pass Through
  - 04 = serial port 2
  - 6E ... 00 = Tau command
  - 0B = SLA checksum

Optional (before sending the FFC command):

- FFC Mode Select Manual: 51,AC,0F,3D,04,6E,00,00,0B,00,02,0F,08,00,00,00,00,64
- FFC Mode Select Auto: 51,AC,0F,3D,04,6E,00,00,0B,00,02,0F,08,00,01,10,21,5E
- FFC Mode Select External: 51,AC,0F,3D,04,6E,00,00,0B,00,02,0F,08,00,02,20,42,10

Other commands (shown without header or checksum):

- 14 bit depth: 0F,3D,04,6E,00,00,12,00,02,d2,FA,06,00,AA,A6
- 8 bit depth: 0F,3D,04,6E,00,00,12,00,02,d2,FA,06,01,BA,87
- 14 bit unfiltered: 0F,3D,04,6E,00,00,12,00,02,D2,FA,06,03,9A,C5
- Save parameters: 0D,3D,04,6E,00,00,01,00,00,E8,8B,00,00


### 4.1.2 3000-OEM Cam2 / Vin1 / Serial3

1. Panel Plus main menu » *Configure* » *Serial Ports*.
2. Set *Serial Port 3* to 57600 baud. Set the *Protocol* field to something other than *Port Not Used*.
3. Go to *File* » *Send Command*.
4. Send FFC: 51,AC,0D,3D,06,6E,00,00,0C,00,00,AA,DA,00,00,B8
  - 51,AC = header
  - 0D = length
  - 3D = Command Pass Through
  - 06 = serial port 3
  - 6E ... 00 = Tau command
  - B8 = SLA checksum



Optional (before sending the FFC command):

- FFC Mode Select Manual: 51,AC,0F,3D,06,6E,00,00,0B,00,02,0F,08,00,00,00,00,33
- FFC Mode Select Auto: 51,AC,0F,3D,06,6E,00,00,0B,00,02,0F,08,00,01,10,21,09
- FFC Mode Select External: 51,AC,0F,3D,06,6E,00,00,0B,00,02,0F,08,00,02,20,42,47

 See the *Panel Plus User Guide* for instructions on creating Macros for these commands.

## 4.2 Boson Camera

Serial passthrough to the Boson camera from the 3000-OEM is enabled in software release 2.25.07 (and later).

### 4.2.1 1500-OEM or 3000-OEM Cam0/Vin0:

1. Panel Plus main menu » *Configure* » *Serial Ports*.
2. Set *Serial Port 2* to 921600 baud. Set the *Protocol* field to something other than *Port Not Used*.  
Configure Port: 51,AC,14,3E,04,06,08,01,00,7F,64,05,A1,0F,00,00,00,00,00,00,4C,FE,DB
3. Go to *File* » *Send Command*.
4. Send: 51,AC,14,3D,04,8E,00,00,00,00,20,00,05,00,07,FF,FF,FF,FF,6E,83,AE,BB
  - 51,AC = header
  - 14 = length
  - 3D = Command Pass Through
  - 04 = serial port 2
  - 8E ... AE = Boson command
  - BB = SLA checksum

### 4.2.2 3000-OEM Cam2 / Vin1

1. Set *Serial Port 3* to 921600 baud. Set the *Protocol* field to something other than *Port Not Used*.
2. Go to *File* » *Send Command*.
3. Send: 51,AC,14,3D,06,8E,00,00,00,00,20,00,05,00,07,FF,FF,FF,FF,6E,83,AE,7F
  - 51,AC = header
  - 14 = length
  - 3D = Command Pass Through
  - 06 = serial port 3
  - 8E ... AE = Boson command
  - 7F = SLA checksum

 See the *Panel Plus User Guide* for instructions on creating Macros for these commands.



## 5 Using the Adapter from RHP

This section provides an example of connecting the SightLine 1500-OEM and FLIR Boson using the TTL adapter from RHP International.

### 5.1 Summary

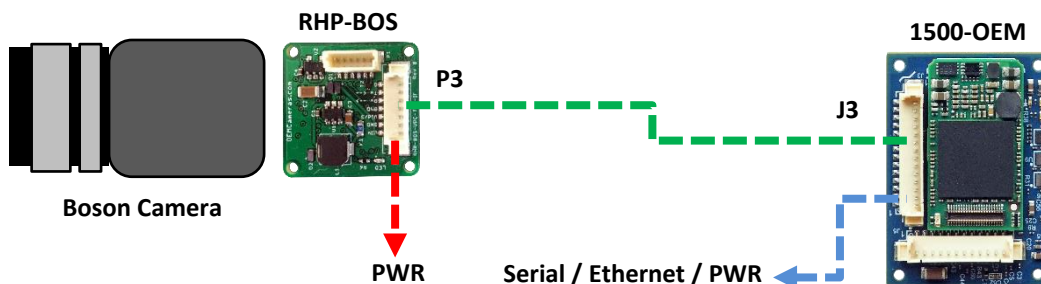
- Tested with the RHP Part Number: RHP-BOS-TTL-VPC (RHP-BOS)
- Power can be supplied externally
- Analog Video to 1500-OEM
- Command and control of FLIR Boson:
  - Serial-to-serial or Ethernet-to-serial pass-through
  - FLIR GUI can configure the camera
  - User implementation of the FLIR Boson command packet (FLIR Serial Line Packet FSLP)
  - Using PANEL+, use the *Send Command* option to send raw bytes (in hex) to the camera
    - Can be combined into a MACRO for easy reuse during bench setup
    - Can be combined in a LUA script and sent
- Other features and functionality provided by RHP can be seen in their upcoming reference manual

### 5.2 Hardware Connection

The [Table 3](#) and [Figure 15](#) below show an example of how the RHP-BOS board can be connected to the 1500-OEM. Serial connections are 3.3V TTL on both the 1500-OEM and RHP-BOS. Analog video is NTSC. Power to the RHP-BOS can be supplied externally.

**Table 3: Connection Example RHP-BOS to 1500-OEM (J3)**

RHP-BOS-TTL-VPC		1500-OEM		
P3 (Pins)	Description	J3 (Pins)	Description	
1	Vin (+5V DC)			
2	Ground			
3	Analog Video Out	1	Analog Video In ( <b>Cam0</b> )	
4	Ground	2	Ground	
5	RX »	5	RX (Receive)	<b>Serial Port 0</b>
6	TX «	6	TX (Transmit)	
7	Ground	7	Ground	



**Figure 14: Connection Example RHP-BOS to 1500-OEM (J3)**

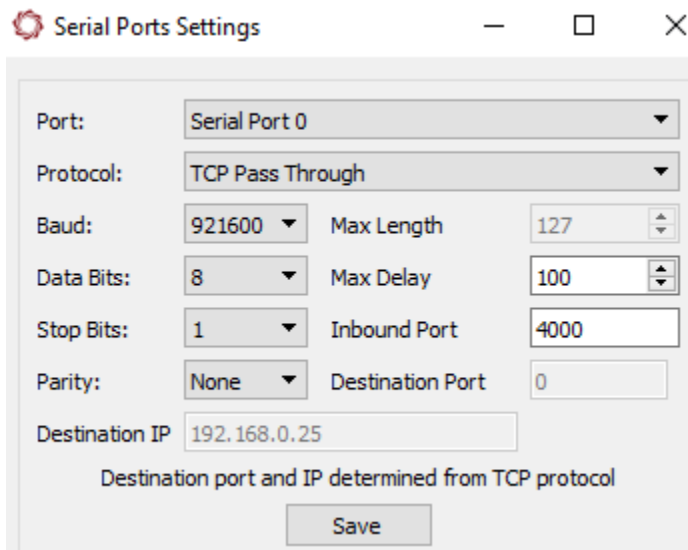


### 5.3 Configuring 1500-OEM

1. Configure 1500-OEM for NTSC input on *Analog 0*:
  - a. Panel Plus main menu » *Configure* » *Acquisition Settings*.
  - b. Click *Apply* when finished.



2. Configure 1500-OEM *Serial Port 0* to work with the Boson camera.
  - a. Panel Plus main menu » *Configure* » *Serial Ports*.



- b. Click *Save*.
- c. When prompted, click *Yes, Apply Settings* to commit the settings to the onboard parameter file and reboot the board. Once the board has been rebooted, the system will be ready to accept video and communications with the Boson camera.

### 5.4 Boson Camera Configuration

To work correctly, the analog video should be enabled by serial command. It can be set to power on by default. The Boson GUI can be used to configure the Boson camera (see above), or the commands can be sent directly using Panel Plus.

1. Panel Plus main menu » *File* » *Send Command*.
2. Enable *Insert Header* and *Insert Checksum*.



### 3. Disable *Video Send*:

51,AC,18,3D,00, 8E, 00, 00, 00, 00, DF, 00, 06, 00, 04, FF, FF, FF, FF, 00, 00, 00, 00, D9, C2, AE, 23

- 51,AC = SightLine header
- 18 = Packet length (23 decimal)
- 3D = Command Pass Through command
- 00 = serial port 0
- 8E ... AE = Boson command
- 23 = SLA checksum

### 4. Enable *Video Send*:

51,AC,18,3D,00, 8E, 00, 00, 00, 00, DF, 00, 06, 00, 04, FF, FF, FF, FF, 00, 00, 00, 01, C9, E3, AE,E3

## 6 Troubleshooting


### 6.1 Direct Connection to Tau Camera - 1500 OEM

On some Tau cameras there can be a conflict when switching to analog video (Analog 0 and 1).

There are two pins (7, 8) on the Tau 50-pin connector that are connected through a 100-ohm resistor. The pins are not used by the Tau camera. The 1500-OEM uses the pins for I<sup>2</sup>C communications. Directly connecting the 1500-OEM to a Tau camera can disable the I<sup>2</sup>C bus. The analog video inputs are disabled because the I<sup>2</sup>C bus is used internally by the 1500-OEM for enabling analog video acquisition.

#### Workarounds:

If analog video input is not required, configure the digital Tau video as outlined in the [Tau and Quark Cameras](#) section. If analog input video is required, use an FFC-Tau adapter board or remove the resistor from the camera's PCB.

 *This workaround does not connect the two pins.*

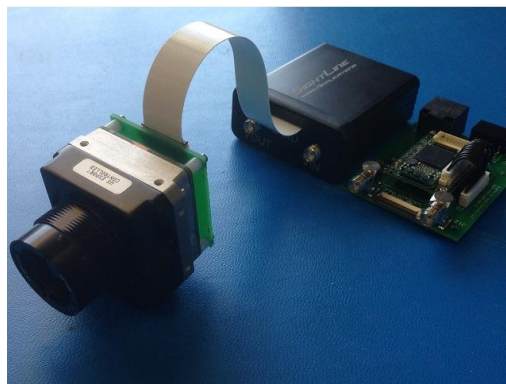


Figure 15: Tau Connected with FFC-Tau Adapter Board



### 100-ohm resistor removal:

If analog input video is required, the 100-ohm resistor can be removed from the Tau camera board. Removing the resistor will enable the analog video. The resistor is easily accessible and not used by the Tau camera.

Pins 7 and 8 on the 50-pin connector are connected through the 100 Ohm resistor on the Tau camera board as shown in [Figure 16](#).

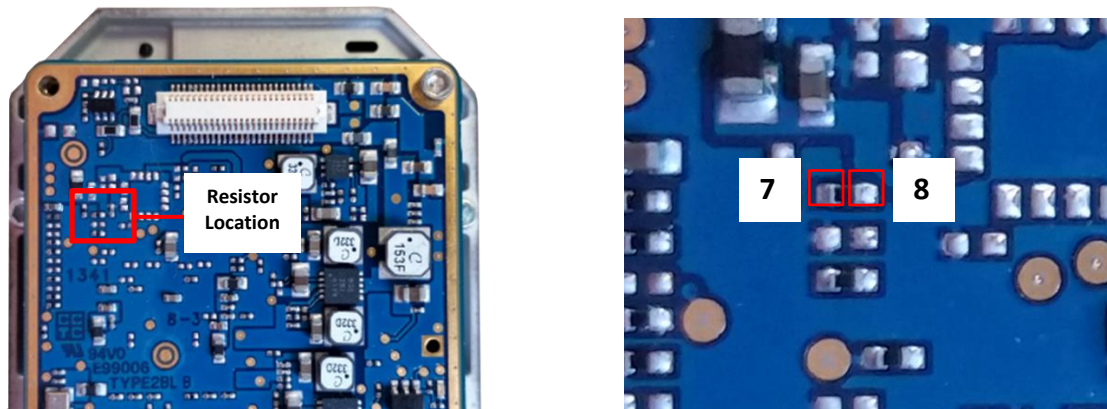


Figure 16: Tau Camera 100-Ohm Resistor Location

## 6.2 Boson Video or Serial Communication Issues

Most issues encountered with the Boson camera are the result of a damaged FPC connector ([Figure 18](#)).

Serial passthrough to the Boson camera from the 3000-OEM is enabled in software release 2.25.07 (and later).

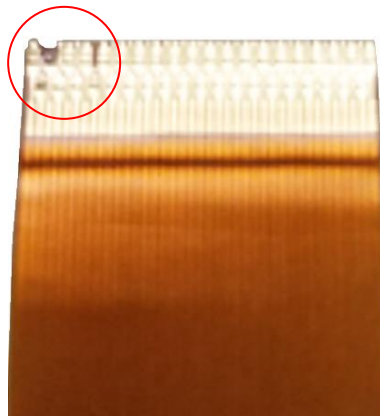


Figure 17: Damaged FPC Connector

## 6.3 Questions and Additional Support

For questions and additional support, please contact [Technical Support](#). Additional support documentation and Engineering Application Notes (EANs) can be found on the Support pages of the SightLine Applications [website](#).



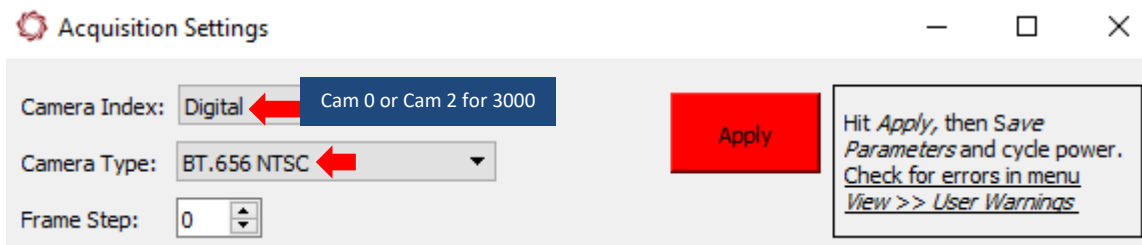
## Appendix - BT.656 Mode - Tau Cameras

**ⓘ IMPORTANT:** Color maps and overlays can be enabled in most cameras. This can have a negative impact on SightLine's image processing functions and is not recommended.

To keep the settings persistent through subsequent restarts, the configuration must be setup manually in the camera using the FLIR camera controller GUI. This can be facilitated using serial passthrough function to the Tau camera (see the next [section](#)). To setup serial passthrough communications, see the [EAN-Ethernet-and-Serial-Communication](#) document.

To setup the BT.656 configuration in Panel Plus:

1. From the main menu » *Configure* » *Acquisition Settings*.
2. Set the *Camera Index*:
  - a. *Digital* for the 1500-OEM.
  - b. *Cam 0* or *Cam 2* for 3000-OEM.
3. Set the *Camera Type* to *BT.656*.
4. Click *Apply*.



5. Save and activate the settings:
  - a. Main menu » *Parameters* » *Save to Board*.
  - b. Main menu » *Reset* » *Board*.
  - c. Wait for the system to boot, and then reconnect to the board. Make sure the board connects.

Use the FLIR Camera Controller GUI to enable color LUTs of other overlays and view them in the output video.
6. Use the FLIR Camera Controller GUI to setup the Tau camera in the BT.656 mode (change from XP Bus control).