



# SightLine

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APPLICATIONS

## **EAN-Airborne Innovations Camera**

PN: EAN-Airborne-Innovations-Camera

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**Alerts**

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**⚠ CAUTION:** Alerts to a potential hazard that may result in personal injury, or an unsafe practice that causes damage to the equipment if not avoided.

**ⓘ IMPORTANT:** Identifies crucial information that is important to setup and configuration procedures.

**📄** *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 describes how to configure the 1500-OEM and 3000-OEM to receive video from the Airborne Innovations AGS-720p Micro Global Shutter Color camera and AGS-720p Micro Global Shutter Mono camera.

### 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-Digital Video Configuration](#): Describes how to configure the SLA-Hardware for digital video input.

[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.

[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: A complete overview of settings and dialog windows in Panel Plus. Located in The Help menu of the Panel Plus application.

### 1.2 SightLine Software Requirements

1500-OEM and 3000-OEM - 2.24.xx and higher

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

### 1.3 1500-OEM FPGA

FPGA version 10 is required for the camera to operate correctly with the 1500-OEM. This information is located on the *Connect* tab (see below). FPGA version 10 does not support other digital cameras.

## 2 Interface Boards

The interface board kits for the 1500-OEM and 3000-OEM come with screws, nuts, and stand-offs for connecting to the video processing boards and the camera. See the [ICD-1500 Adapter Boards](#) and [ICD-3000 Adapter Boards](#) for power requirements, thermal management, interface specifications, and connector pin-outs.

**IMPORTANT:** All boards should be connected and secured with the included hardware fasteners first before applying power.



**Table 1: Interface Boards and Connection Hardware**

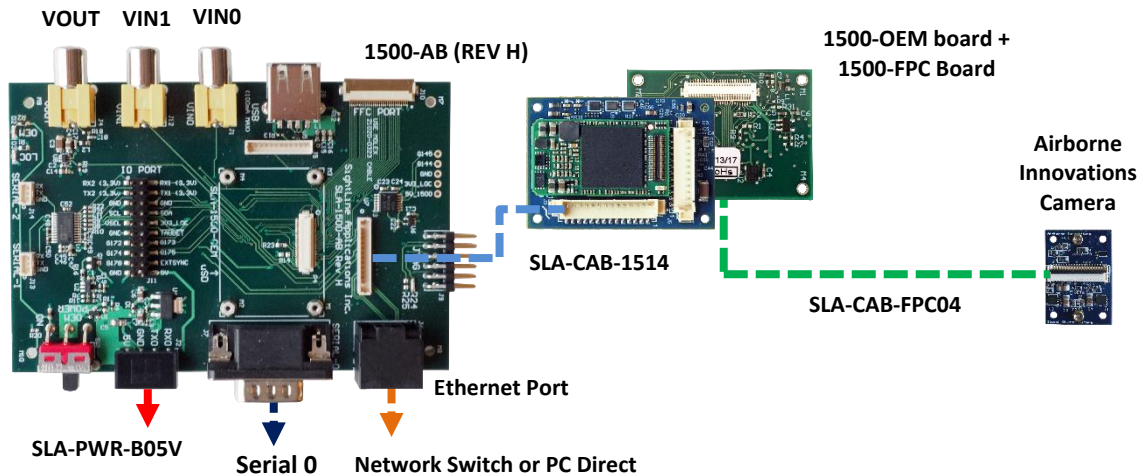
1500-OEM		3000-OEM	
Part Number	Description	Part Number	Description
SLA-1500-FPC	FPC ribbon interface board	SLA-3000-FPC	FPC ribbon interface board
SLA-1500-AB	Serial and network interface board	SLA-3000-IO	Serial and network interface board
SLA-CAB-FPC04	39-pin FPC cable	SLA-CAB-FPC04	39-pin FPC cable
SLA-PWR-B05V	5VDC power supply	SLA-PWR-C12V	12VDC power supply
SLA-CAB-ETH0	Ethernet cable	SLA-CAB-ETH0	Ethernet cable

### 3 Hardware Connections

#### 3.1 Hardware Bench Setup 1500-OEM

This section describes the connection for the 1500-OEM and the 1500-FPC interface board to the supporting components. See the [1500-FPC drawing](#) for connector layout. The 1500-AB board is used as the serial and network interface board.

1. Connect SLA-CAB-1514 Molex cable to the 1500-OEM J3 (14-pin) connector and to the 1500-AB J3 (14-pin) connector. This provides analog video, network, and serial connections to the 1500-OEM.
2. Attach the 1500-FPC (J40) to the digital input connector on the 1500-OEM (J4).
3. Connect the SLA-CAB-FPC04 cable to the SLA-1500-FPC interface board and to the Airborne Innovations camera.
4. Connect the Ethernet and power cables to the 1500-AB board.
5. Plug in the power adapter (SLA-PWR-B05V) to an AC power source. A green light indicates the 1500-AB is powered on.
6. Slide the switch to the left to power-on the 1500-OEM board. A blue light on the 1500-AB board and a green light on the 1500-OEM indicates that all the boards are powered on.



**Figure 1: 1500-OEM Airborne Innovations Camera Bench Setup**




### 3.2 Hardware Bench Setup 3000-OEM

This section describes the connections for the 3000-OEM and the 3000-FPC interface board to the supporting components. See the [3000-FPC drawing](#) for connector layout.

The 3000-IO board provides power to the camera through the 3000-FPC interface board. It is supplied via the FPC cable that is used between the interface board and the camera.

1. Attached the 3000-IO board to the 3000-OEM board.
2. Attach the 3000-FPC interface board to one of the available video input connectors on the 3000-IO board. The 3000-IO board has two connectors for the 3000-FPC board (VIN1 and VIN0). See the [3000-OEM](#) exploded assembly drawing for more physical connection layout information.

 *On the 3000-IO board, VIN0 has camera channels 0 and 1 assigned. VIN1 has camera channels 2 and 3 assigned. The 3000-IO board supports installing the 3000-FPC interface board onto either of these connectors. If the configuration includes an analog board with a digital interface board the analog board must be installed onto VIN0.*

3. Connect the SLA-CAB-FPC04 cable to the 3000-FPC interface board and to the Airborne Innovations camera.
4. Connect the Ethernet and power cables to the 3000-IO board.
5. Plug in the power adapter (SLA-PWR-C12V) to an AC power source. A green light on the 3000-IO board indicates that all boards are powered on.

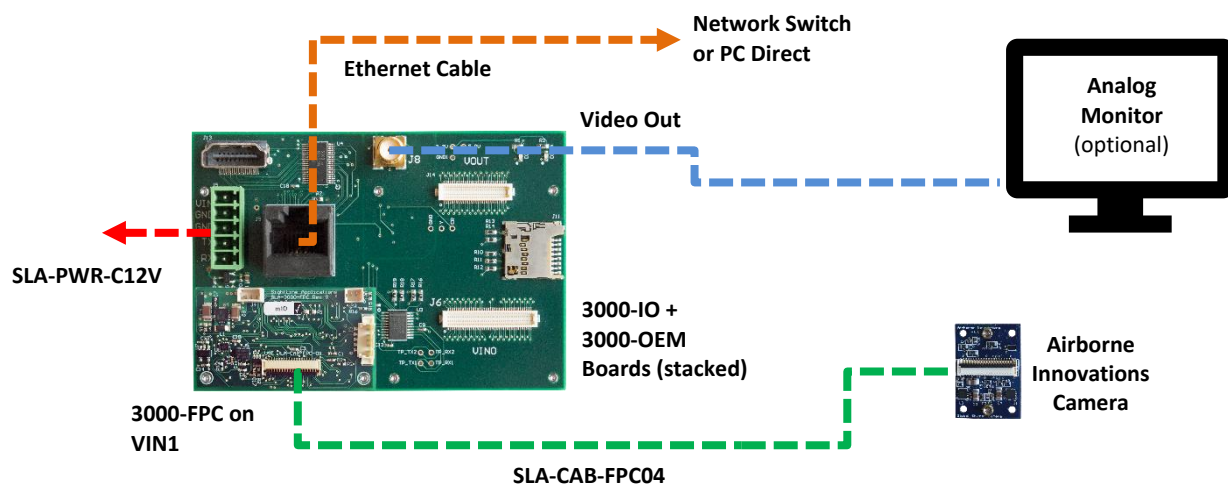
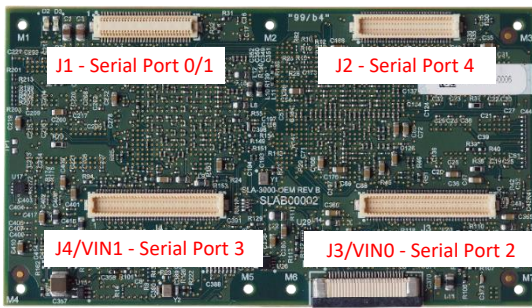


Figure 2: 3000-OEM Airborne Innovations Camera Bench Setup



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

## 4 Configuration Settings

This section how to configure the 1500-OEM and 3000-OEM video processing boards to support the Airborne Innovations cameras. The following steps reference the Panel Plus software.

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

**⚠ IMPORTANT:** If the 1500-OEM board is not running version 2.24.xx firmware or greater and version 10 FPGA code, the Airborne camera will not operate correctly. See [EAN-FPGA Firmware Update 1500-OEM](#) for information of updating the FPGA firmware.

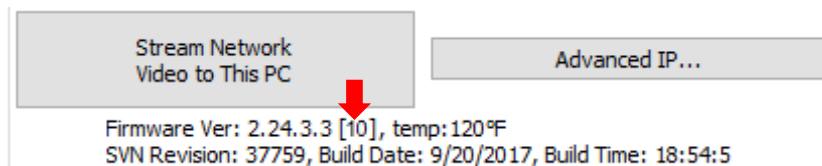


Figure 4: FPGA Version Number Location

2. From the main menu » *Configure* » *Acquisition Settings*. Set the *Camera Index* and *Camera Type* according to [Table 2](#). The *Apply* button will turn red indicating input field changes have been detected.

*3000-OEM Camera Index: If the Airborne camera FPC adapter board is connected on VIN1 of the 3000-IO board use Cam 2. If the board is connected on VIN0, use Cam 0.*

*The AutoFill dropdown menu populates the relevant fields with the correct settings. If the camera is not shown in the dropdown menu, settings can be entered manually.*



3. Click the *Apply* button and close the *Acquisition Settings* dialog window.

**Table 2: Panel Plus Basic Camera Configuration Settings**

Acquisition Settings	1500-OEM	3000-OEM	1500-OEM / 3000-OEM
Camera	AGS720P Color	AGS720P Color	AGS720P Mono
Camera Index:	Digital	Cam 0 / Cam 2	Digital / Cam 0 / Cam 2
Camera Type:	Generic Digital	Generic Digital	Generic Digital
Frame Step:	0	2	1
AutoFill:	Airborne AGS720P Color	Airborne AGS720P Color	None
Height:	720	720	720
Width:	1280	1280	1280
Vertical Front Porch:	2	2	2
Horizontal Front Porch:	1	1	0
Bit Depth:	8	16	16
Input:	Bayer	Bayer	Gray Scale
Sync/Crop:	None	None	None
Camera Init Code:	InitAR0134CS	InitAR0134CS	InitAR0134CS
Resulting Flag Bits:	0x203	0x203	0x200

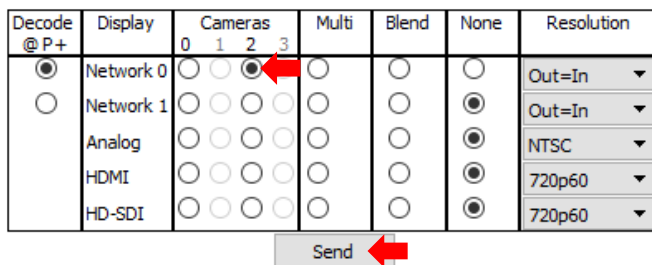
4. Close the *Acquisition Settings dialog* window.

5. 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 3000-FPC board is connected on VINO on the 3000-IO board, select 0. If connected on VIN1, select 2 (see [Figure 2](#)). This enables video to display in Panel Plus.



6. Click the *Send* button to save the settings to the parameter file. This enables video to display in Panel Plus.






7. 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.

#### 4.1 Airborne Camera Color Controls

The imager used in the Airborne Innovations camera has *luma*, *red*, *green* and *blue* color controls. These can be modified using the image controls in the *Video* tab of Panel Plus.

 When using the 3000-OEM board make sure the correct Command Camera is selected when adjusting the color controls.

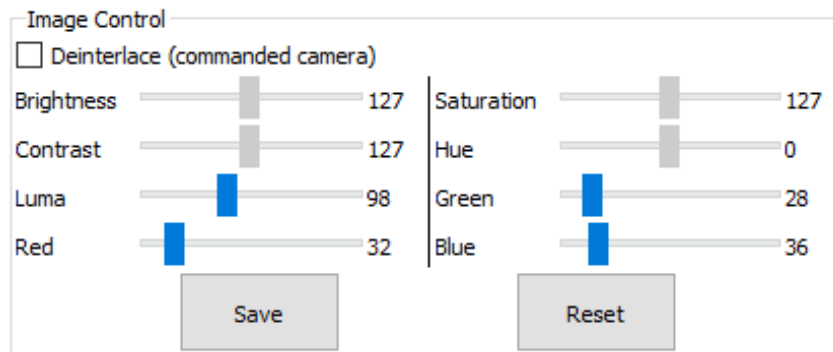


Figure 5: Imager Color Controls

Luma (default = 98)

Green1 (default = 28)

Red (default = 32)

Blue (default = 36)

 *Brightness, Contrast, Saturation, and Hue are not adjustable.*

Save the parameters to the board. Restart the system to keep the settings in place through subsequent restarts.

## 5 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 - Camera Setup Notes

The AGS720p camera setup is done through the *InitAR0134CS* Camera Init Code in SightLine firmware when the acquisition settings are configured (see [Table 2](#)). The settings in the camera do not need to be changed.

The following camera setup notes are useful for customers that build custom versions of the 1500-OEM board. Camera control registers are configurable through the I<sup>2</sup>C bus.

1500-OEM - I<sup>2</sup>C bus 2:

- `i2cdetect -a -r -y 2` (should show device at bus ID 0x10)
- `i2cset -f -y 2 0x10 0x30 0x00` (register address 0x3000)
- `i2cget -f -y 2 0x10` (returns 0x24) (high byte)
- `i2cget -f -y 2 0x10` (returns 0x06) (low byte)
- Chip ID for Aptina AR0134 is 0x2406

Camera suspend-and-reset are controlled through 2 GPIO lines.

1500-OEM - GPIO174 and GPIO178:

- 1500-OEM J 4 (50 pin):
  - GPIO174 = pin 13
  - GPIO178 = pin 19
- 39-pin in FPC cable (Molex cable, FPC 39 Position 0.3mm pitch)
  - GPIO174 = pin 36
  - GPIO178 = pin 1