



SightLine

APPLICATIONS

EAN-Airborne Innovations Camera

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Alerts

The following notifications are used throughout the document to help identify important safety and setup information to the user:

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

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 FPGA - 1500-OEM

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

ⓘ IMPORTANT: If the 1500-OEM board is not running version 2.24.xx firmware and version 10 FPGA code, the Airborne camera will not operate correctly.

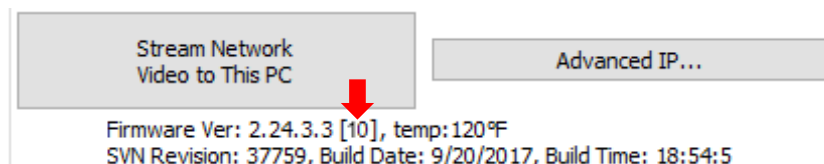


Figure 1: FPGA Version Number Location



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 first before applying power.

- 1500-FPC interface board (connects to 1500-OEM)
- 1500-AB board (serial and network interface)
- 39-pin FPC flat flex Molex cable
- 3000-FPC interface board (connects to 3000-OEM)
- 3000-IO board (serial and network interface)
- 39-pin FPC flat flex Molex 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. 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. Connect a network cable to the 1500-AB Ethernet port.
3. Connect the FPC ribbon cable to the 1500-FPC interface board and the interface board on the Airborne Innovations camera.
4. Connect the SLA-PWR-B05V to the 1500-AB board. A green light indicates the 1500-AB is powered on.
5. 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.

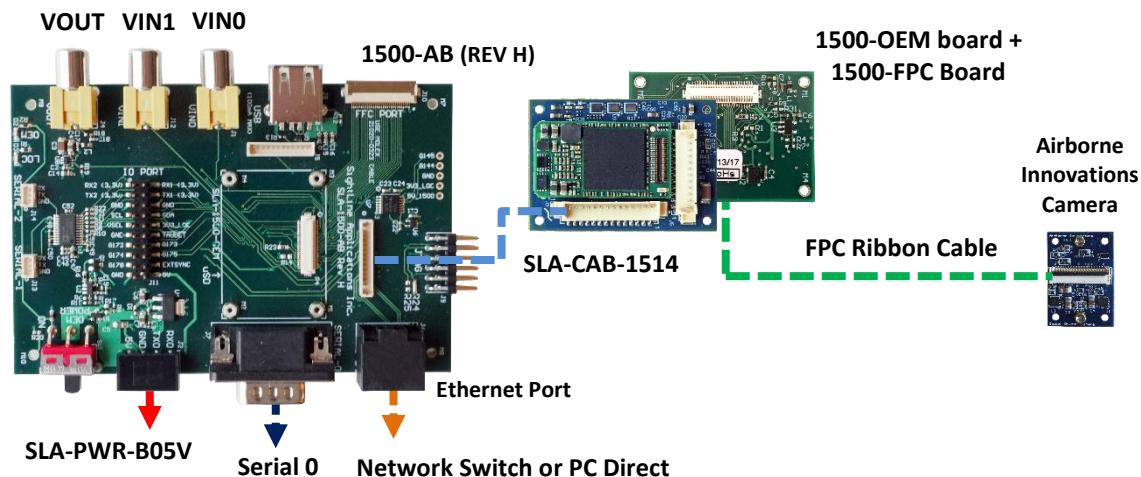


Figure 2: 1500-OEM Airborne Innovations Camera Bench Setup




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 and equipment.

The 3000-IO board provides power to the camera through the 3000-FPC interface board. It is supplied via the FPC ribbon 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-FC 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 FPC ribbon cable to the 3000-FPC interface board and the interface board on 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.

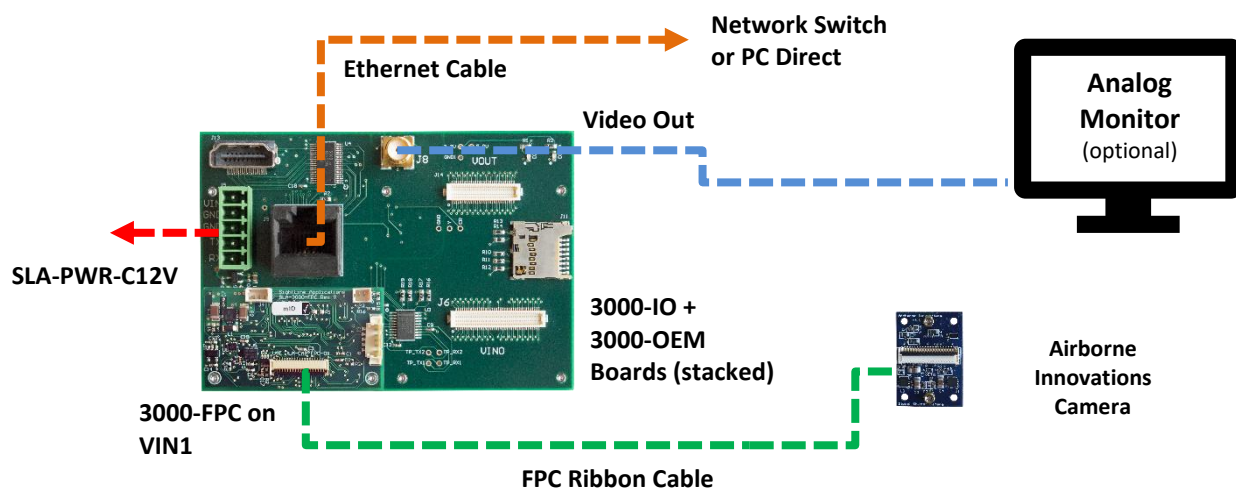


Figure 3: 3000-OEM Airborne Innovations Camera Bench Setup



4 Configuration Settings

This section covers how to configure the video processing boards to support the Airborne Innovations camera. The following steps will reference the Panel Plus software.

The 3000-OEM and 1500-OEM configuration procedures are somewhat different.

4.1 1500-OEM Camera Settings

To setup the camera for 720p processing on the 1500-OEM:

1. Connect to the board over an Ethernet connection using the Panel Plus application. See the [EAN-Startup Guide 1500-OEM](#) for connection instructions.
2. From the main menu » *Configure* » *Acquisition Settings*. Set the *Camera Index* to *Digital* and *Camera Type* to *Generic Digital*. The *Apply* button will turn red indicating input field changes have been detected.

Follow step 3 if the camera is and AGS720P Color camera. Skip to step 4 if the camera is an AGS720P Mono camera.

3. Configure acquisition settings for the AGS720P Color camera:
 - a. In the *AutoFill* drop down menu select *Airborne AGS720P Color*. This populates the relevant fields with the correct settings.
 - b. Set *Frame Step* to 2.
 - c. Click the *Apply* button.

Acquisition Settings

Camera Index: Digital

Camera Type: Generic Digital

Frame Step: 2

Apply

Hit *Apply*, then *Save Parameters* and cycle power. [Check for errors in menu View >> User Warnings](#)

Generic Digital Settings (Applies to CameraType: Generic Digital Only)

AutoFill: Airborne AGS720P Color

Height: 720 Width: 1280

Vertical Front Porch: 2 Horizontal Front Porch: 1 Bit Depth: 8

Input: Gray Scale YUV color G8 16bit in Bayer Interlaced Byte Swap

Invert V-Sync Polarity Invert H-Sync Polarity UB0 Sync/Crop: None

Camera Init Code: InitAR0134CS Options:

Big: Height 0 Width 0 Vertical Blanking 0 Horizontal Blanking 0

Figure 4: 1500-OEM AGS720P Color Camera Settings



4. Configure acquisition settings for the AGS720P Mono camera:
 - a. Set *Frame Step* to 1.
 - b. Set *Height* and *Width* to 720 x 1280.
 - c. Set *Vertical Front Porch* to 2 and *Horizontal Front Porch* to 0.
 - d. Set *Bit Depth* to 16.
 - e. Set *Input* to *Gray Scale*.
 - f. Set *Camera Init Code* to *InitAR0134CS*. Make sure *Resulting Flag bits* are *0x200*.
 - g. Click the *Apply* button.

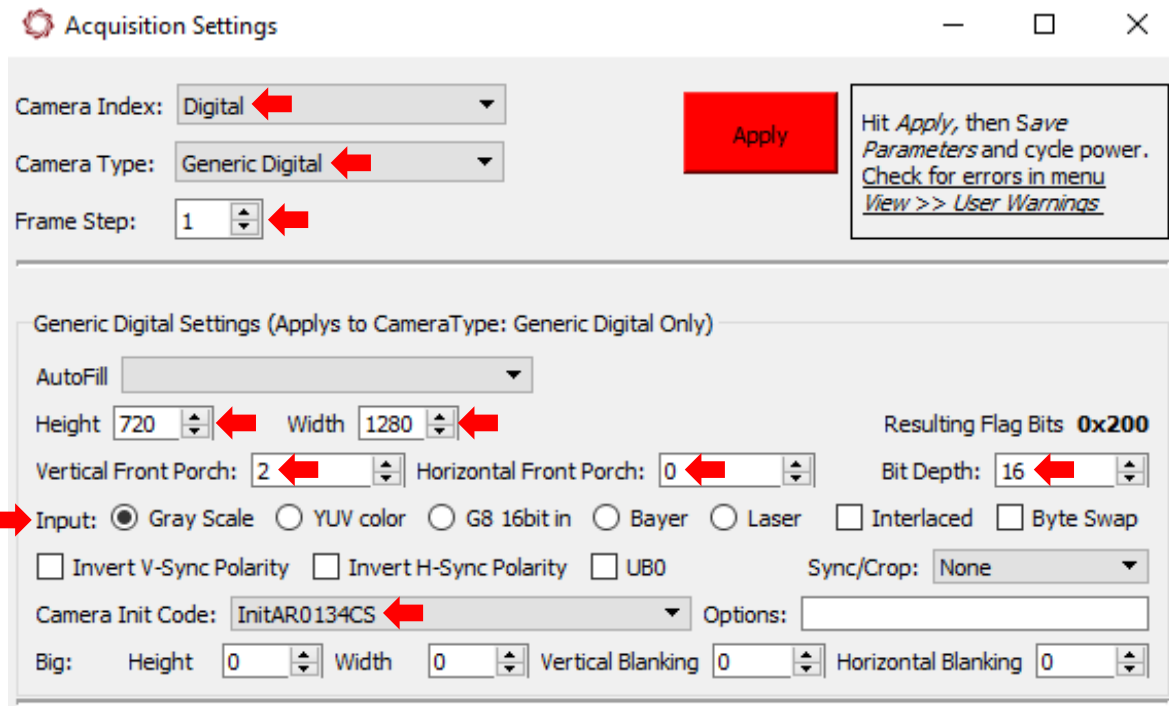


Figure 5: 1500-OEM AGS720P Mono Camera Settings

5. From the *Connect* tab, select *Network* and *Cam 2* or *Cam 0* depending on the camera configured. This enables video to display in Panel Plus. Click *Stream Network Video to This PC*.



6. Close the *Acquisition Settings dialog* window.
7. 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.



4.2 3000-OEM Camera Settings

To setup the camera for 720p processing on the SLA-3000-OEM:

1. Connect to the board over an Ethernet connection using the Panel Plus application. See the [EAN-Startup Guide 3000-OEM](#) for connection instructions.
2. From the main menu » *Configure* » *Acquisition Settings*. Set the *Camera Index* and *Camera Type* as shown. The *Apply* button will turn red indicating input field changes have been detected.

If the Airborne camera FPC adapter board is installed on VIN1 of the 3000-IO board, use Cam 2 (shown). If the board is installed on VIN0, use Cam 0.

Follow step 3 if the camera is an AGS720P Color camera. Skip to step 4 if the camera is an AGS720P Mono camera.

3. Configure acquisition settings for AGS720P Color camera:
 - a. In the *AutoFill* drop down menu select *Airborne AGS720P Color*. This populates the relevant fields with the correct settings.
 - b. Set *Frame Step* to 2.
 - c. Click the *Apply* button.

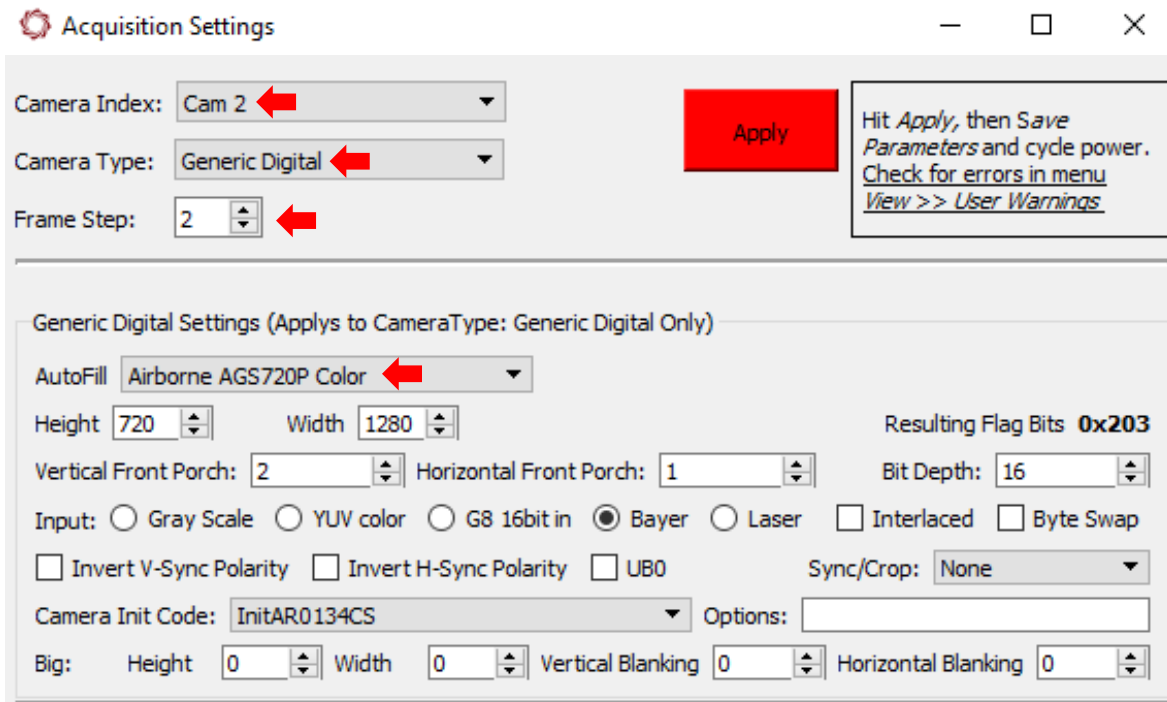


Figure 6: 3000-OEM AGS720P Color Camera Settings



4. Configure acquisition settings for AGS720P Mono camera:
 - a. Set *Frame Step* to 1.
 - b. Set *Height* and *Width* to 720 x 1280.
 - c. Set *Vertical Front Porch* to 2 and *Horizontal Front Porch* to 0.
 - d. Set *Bit Depth* to 16.
 - e. Set *Input* to *Gray Scale*.
 - f. Set *Camera Init Code* to *InitAR0134CS*.
 - g. Make sure *Resulting Flag bits* are 0x200.
 - h. Click the *Apply* button.

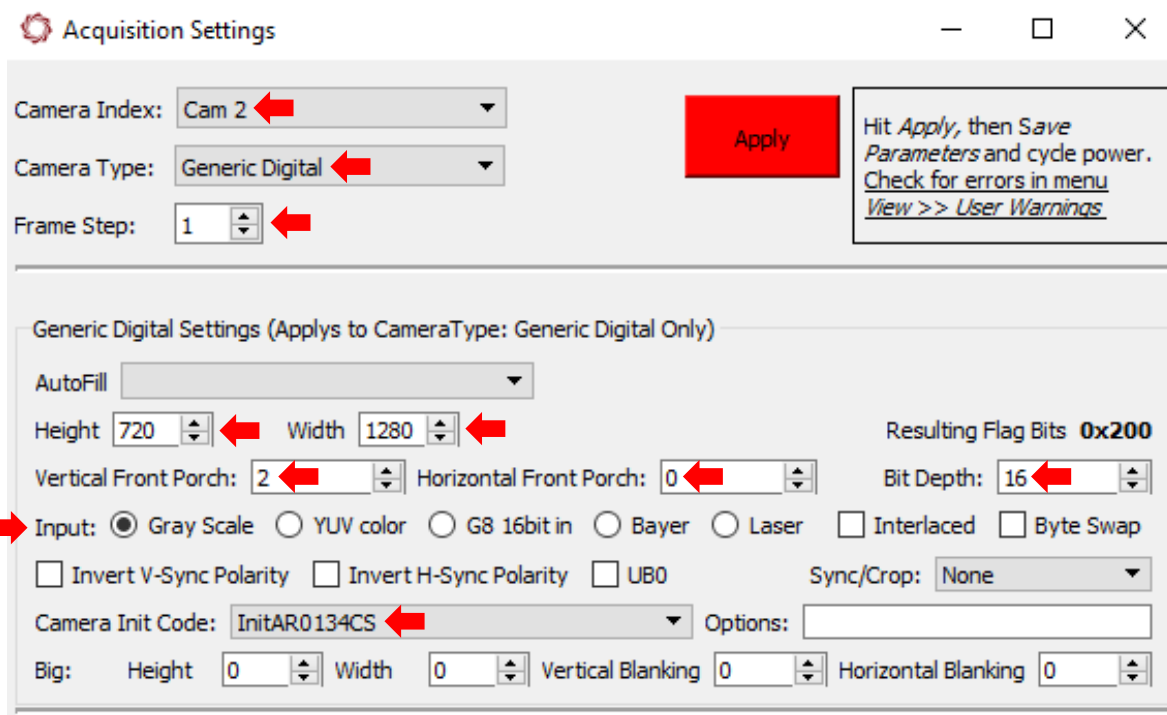


Figure 7: 3000-OEM AGS720P Mono Camera Settings

5. From the *Multi Camera* tab select *Network 0*. If the 3000-FPC board is connected on VIN0 on the 3000-IO board, select camera 0. If it is connected on VIN1, select camera 2. This enables video to display in Panel Plus.
6. Click the *Send* button to save the settings to the parameter file.

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 type="radio"/>	<input checked="" 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


Send



8. Close the *Acquisition Settings dialog* window.
9. 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.

4.3 Airborne Camera Color Controls

The Aptina 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 camera is selected when adjusting the color controls.

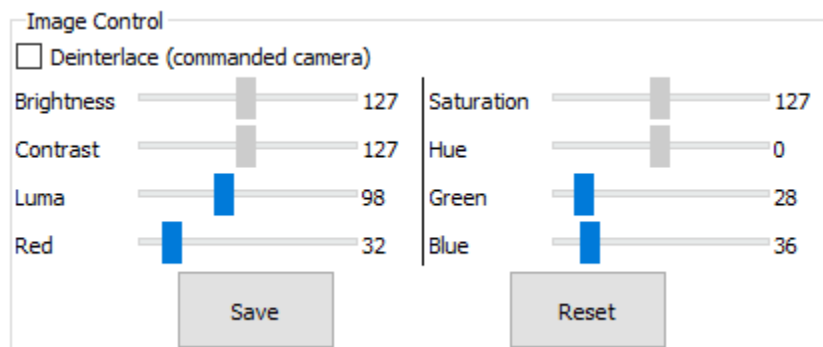


Figure 8: Aptina Imager Color Controls

- Luma (default = 98)
- Red (default = 32)
- Green1 (default = 28)
- Blue (default = 36)

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

Save the parameters to the board, and then 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 SLA firmware. 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 I2C bus.

1500-OEM - I2C 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