



# SightLine

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APPLICATIONS

## EAN-Blending

PN: EAN-Blending

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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 specific information that will assist with setup and configuration procedures and/or prevents damage to the hardware components.



## Contents

1	Overview .....	1
1.1	Associated Documents .....	1
1.2	Hardware Compatibility .....	1
1.3	SightLine Software Requirements .....	1
1.4	Hardware Setup.....	1
2	Example Blending.....	2
2.1	IR Image into EO Blending Example .....	2
3	Details .....	6
3.1	Blending Algorithm (Mode).....	6
3.2	Blending Variables.....	7
3.3	Image Alignment .....	7
4	Troubleshooting.....	8
4.1	Questions and Additional Support.....	8

## List of Figures

Figure 1: EO Image of Interest .....	2
Figure 2: IR Image of Interest.....	2
Figure 3: Configure Blending Alignment Dialog.....	5

## List of Tables

Table 1: Blending Mode Descriptions .....	6
Table 2: Blending Variables.....	7
Table 3: Image Alignment Options .....	7



## 1 Overview

Video blending is a way to include features from one video stream into another. This document will describe how to use some of the 3000-OEM blend features to combine elements from an Infrared (IR) camera and Visible (EO) camera. Software references are for Panel Plus software version 2.24.

In addition to selecting the type of algorithm used to control video mixing, one video may be translated, rotated, and delayed relative to the other to compensate for misalignment and latency differences between sensors.

### 1.1 Associated Documents

[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.

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 Hardware Compatibility

Standard Ethernet network or serial connection to the SightLine hardware.

Video blending is only available on systems that support multiple simultaneous input such as the 3000-OEM.

### 1.3 SightLine Software Requirements

- The 3000-OEM requires firmware 2.23.xx and higher.
- The 3000-OEM (REV C) requires firmware 2.24.xx and higher.

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

### 1.4 Hardware Setup

- 3000-OEM
- 3000-IO
- 3000-HIT connected to a Hitachi DI-SC120R
- 3000-FFC
- DRS 320 with FFC-DRS adapter board and CAB-Fxxx cable
- Power and Ethernet connected



## 2 Example Blending

Use the [EAN-Startup Guide 3000-OEM](#) to setup the SLA-hardware and confirm that video and Ethernet communications are functioning.

### 2.1 IR Image into EO Blending Example

This example will explain how to use the alignment tools to match up the images.

**Note:** In this example the camera acquisition settings have been previously setup. The image of interest in Figure 1 and Figure 2 is the same, but the field-of-view is different.



Figure 1: EO Image of Interest

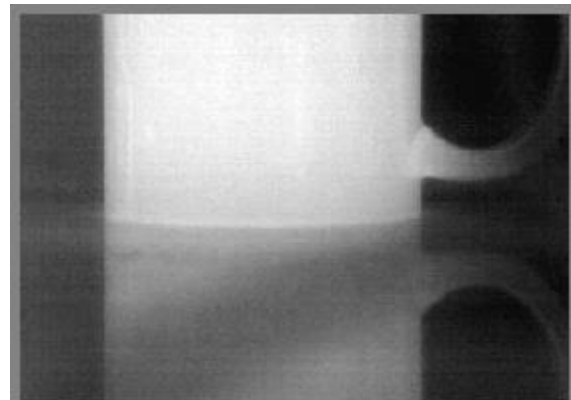


Figure 2: IR Image of Interest

1. Select the *Multi Camera* tab.
2. Set *Network 0* to *Blend*.
3. Set the resolution to the size of the larger camera source (1280 x 720).
4. Click *Send*.

Decode @ P+	Display	Cameras 0 1 2 3	Multi	Blend	None	Resolution
<input checked="" type="radio"/>	Network 0	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	1280x720 ▼
<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**



- Set the Display mode to *1-Up/Blend*.

Display

1-Up / Blend

2 Up

Picture in Picture

- Select the Blending algorithm.

Blending

Mode: **FrameBlend Warp EO**

Amount: **FrameBlend Warp EO**

Hue: **ThermalBlend Warp EO**

Align: **NightBlend Warp EO**

Warp I: **ColorBlend Warp EO**

**ColorIR Warp EO**

**FrameBlend Fixed EO**

**ThermalBlend Fixed EO**

**NightBlend Fixed EO**

**ColorBlend Fixed EO**

**ColorIR Fixed EO**

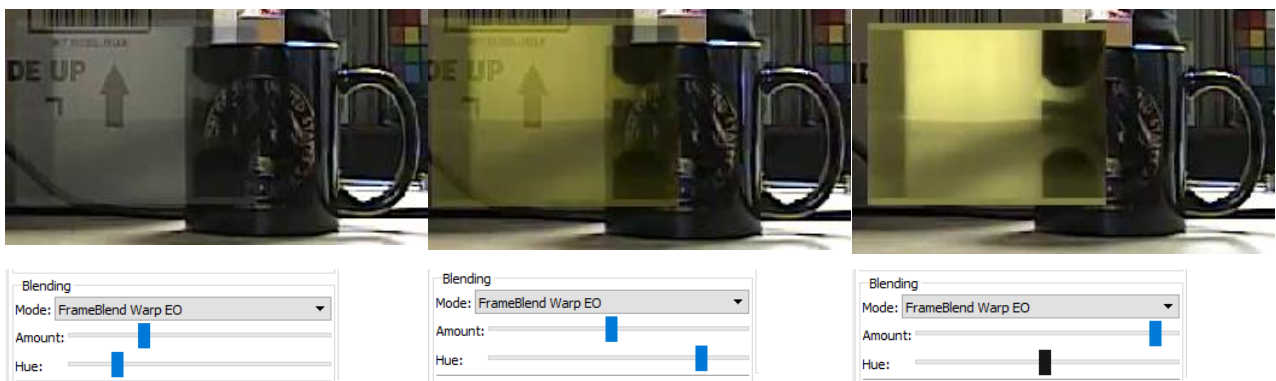
- Set the camera indexes.

Align:  1  2  3  4  5

Warp Idx: **2** Fixed Idx: **0**

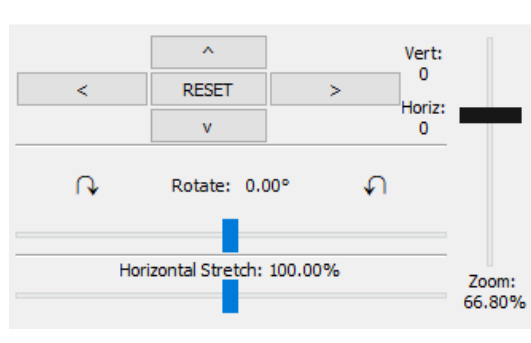
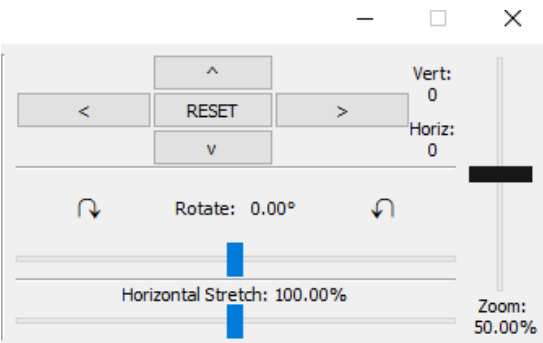
Configure Alignment

- Use the sliders and adjust the *Amount* and *Hue* settings to emphasize the IR. Adjust the *Amount* to change the % of the image being blended. Adjust the *Hue* to change the color.





- Click *Configure Alignment* to adjust how the images will line up. Use the *Zoom* control to size the IR image as closely as possible with the EO image.

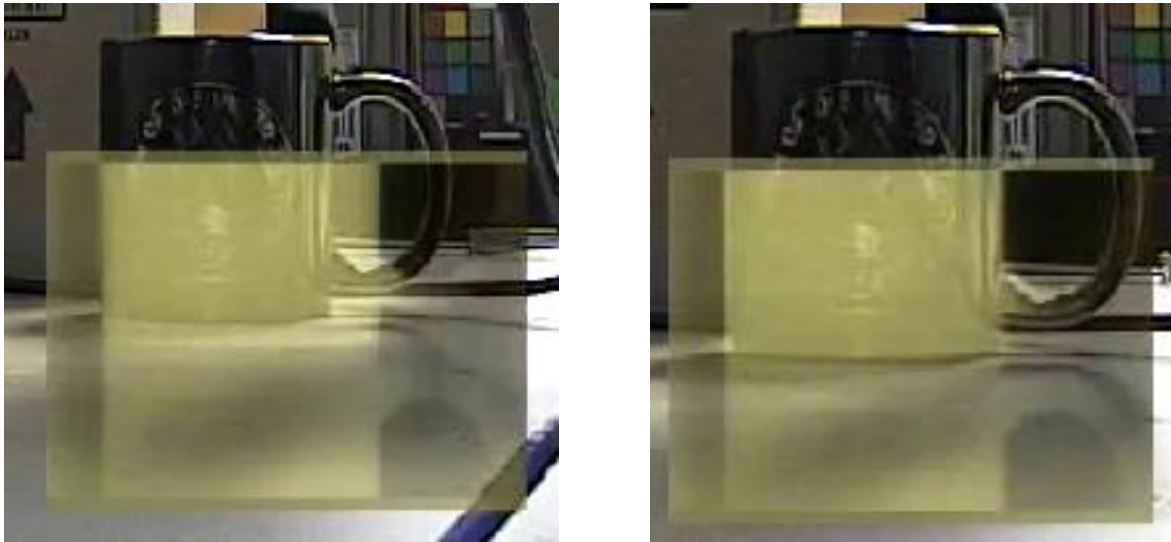


- Use the arrow controls to match the position as closely as possible.





11. Repeat steps 9 and 10 until the IR and EO images are aligned.



**Note:** The Configure Blending Alignment dialog shows the number of pixels the warp image has moved.

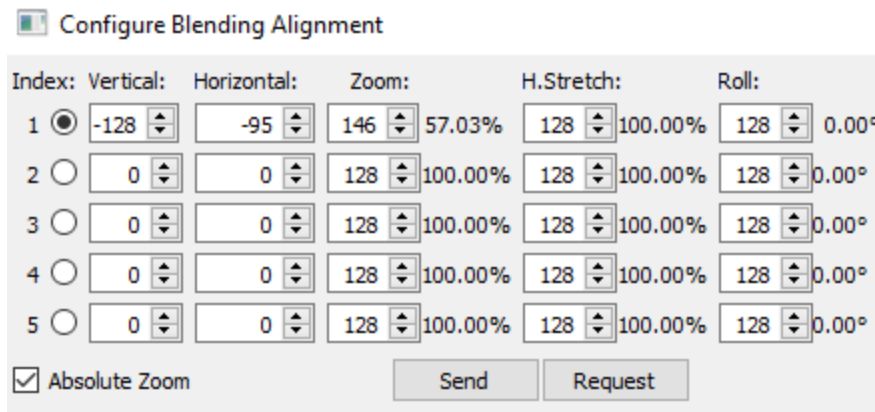


Figure 3: Configure Blending Alignment Dialog

12. Once the images are aligned, from the main menu go to *Parameters » Save to board*.





### 3 Details

#### 3.1 Blending Algorithm (Mode)

Controls the method used to blend the EO/IR images. (Assumes that EO camera is logical camera 0, and IR camera is logical Camera 1.)

**Table 1: Blending Mode Descriptions**

Mode	Description
Frame Blend	Pure frame alpha blend. Use the <i>Amount</i> parameter in Table 2 to control blend amount. 0 corresponds to all EO, 100 corresponds to all IR. Basic percentage (controlled by <i>amt</i> ) blending of the warped EO and fixed IR images. Optionally applies yellow hue from bright areas in the warped EO image to the output.
Thermal Blend	Blend of EO/IR luminance with false coloring derived from IR. Red corresponds to fully saturated IR and blue corresponds to no IR. Blends hot pixels from the fixed IR camera (shown in red) with the warped EO image. Typically used to highlight hot areas in a daytime EO image.
Night Blend	Meant for night use. IR luminance blended with portions of the EO image that contain visible data. Blends bright areas from the warped EO camera (modify color with hue) with the fixed IR image. Typically used to highlight bright lights in a night time IR image.
Color Blend	Similar to Frame Blend, but retains the color information from the EO camera. Percentage (controlled by <i>amt</i> ) blending of the warped EO and fixed IR images like Frame Blend, but the color from the warped EO image is also passed to the output (also controlled by hue ).
Frame Blend Fixed EO	Basic percentage (controlled by hue) blending of the fixed EO and warped IR images. Optionally applies yellow hue from bright areas in the IR image to the output.
Thermal Blend Fixed EO	Blends hot pixels from the fixed EO camera (shown in red) with the warped IR image. Typically used to highlight hot areas in a daytime EO image.
Night Blend Fixed EO	Blends bright areas from the fixed EO camera (modify color with hue) with the warped IR image. Typically used to highlight bright lights in a night time IR image.
Color Blend Fixed EO	Percentage (controlled by <i>amt</i> ) blending of the fixed EO and warped IR images like Frame Blend, but the color from the fixed EO image is also passed to the output (also controlled by hue ).
Color IR Blend Fixed EO	Percentage (controlled by <i>amt</i> ) blending of the fixed EO and the user palette colored warped IR images like Frame Blend, with the color from the fixed EO and user palette colored IR also blended.
Color IR Blend Warped EO	Percentage (controlled by <i>amt</i> ) blending of the warped EO and the user palette colored fixed IR images like Frame Blend, with the color from the fixed EO and user palette colored IR also blended.



## 3.2 Blending Variables

**Table 2: Blending Variables**

Amount	Amount of luminance information from the EO (visible) camera to include in the blended result. 0 = no change, (1..255) maps to (0..100%). Applies to Frame Blend, Night Blend, Color Blend, Thermal Blend and Color IR Blend modes
Hue	Amount of yellow hue to apply from bright areas of the EO camera. 0 = no change, 1 = no hue, 255 = full hue

## 3.3 Image Alignment

When both cameras are standard definition with similar fields of view, set the *Absolute Zoom Mode* to off to scale the EO camera to match the IR.

When the warp camera is HD, *Absolute Zoom Mode* can be turned on for larger zoom factors. For example, a 1280 x 720 HD camera is blending with a 640 x 480 camera:

- and the horizontal fields of view match
- pass zoom = 128 and zoom absolute = 1 to get a zoom factor of 0.5
- the HD image will then be scaled to 640 x 360 before blending

Requires SLASetVideoMode\_t be used to set Display Modes to Blend. Also see SLACurrentBlendParameters\_t.

**Table 3: Image Alignment Options**

absOffZoom	Interpret vertical and horizontal as incremental offsets Interpret as absolute offsets 1 zoom mode Zoom (1..255) maps to (0.9..1.1) - Useful when both cameras are SD or have matching pixel size on target. Zoom maps to (0.004..0.996) - Useful when one camera is HD and the other is SD.
vertical	Shift warp camera index video position vertically.
horizontal	Shift warp camera index video position horizontally.
rotation	Rotate warp camera index video relative to the fixed camera; (1..255) maps to (-5..5) degrees; 0 = no change.
zoom	Scale warp camera index video. (1..255) maps to (0.9..1.1) or (0.004..0.996) depending on zoom mode.
reset	Calibration reset (0 or 1). Resets the image warp calibration (zoom, rotate, shift up / down / left / right) back to default.
warpIndex	Warp camera index - Video from this camera is warped into the space of the other camera through the calibrations settings before blending.
fixedIndex	Fixed camera index - Video from this camera is not warped before blending.



usePresetAlign	Image alignment parameter index. 0 Use the alignment parameters in this message. 1 Use a preset alignment (defined by SLASetMultipleAlignment_t) and set index of preset alignment parameters to value of presetAlignIndex
presetAlignIndex	Indicate index of preset alignment parameters - ignored if usePresetAlign is 0
hzoom	Horizontal zoom scale applied to EO camera (1..255, 0=no change) on top of zoom. Maps to (0.9..1.1) Verical zoom = zoom Horizontal zoom = hzoom * zoom

## 4 Troubleshooting

### 4.1 Questions and Additional Support

If you are still having issues and require 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](#).