



SightLine

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.

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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

Video blending is a way to include features from one video stream into another. This document describes 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 2.25.

In addition to selecting the type of algorithm used to control video mixing, one video may be manipulated relative to the other to compensate for misalignment 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.

[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 Hardware Compatibility

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

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 Application Bit Requirements

The functions described in this EAN require Application Bits (app bits) purchased from SightLine. App bits reside on the hardware unit and are enabled with a license file provided by SightLine at initial unit purchase or during a license upgrade process. License files use a hardware ID that is applicable to a specific hardware serial number. For questions and upgrade support contact [SightLine Sales](#).

Table 1: Application Bits Requirement Table

Function	Minimum Software Version	Required Application Bit(s)
Blending	ALL	DPR, NUC and Blending. 0x0100

1.5 Hardware Setup

- 3000-OEM
- 3000-IO
- 3000-HIT on Hitachi DI-SC120R
- 3000-FFC
- DRS320 with FFC-DRS adapter board / CAB-Fxxx cable
- Power and Ethernet connector



2 Example Blending

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

2.1 Blend IR Image into EO Example

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


 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

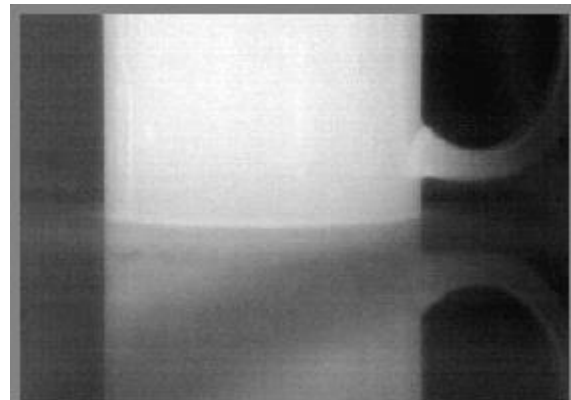


Figure 2: IR Image of Interest

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				Multi	Blend	None	Resolution
		0	1	2	3				
<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: ColorBlend Warp EO

Warp 1: ColorIR Warp EO

ColorBlend Fixed EO

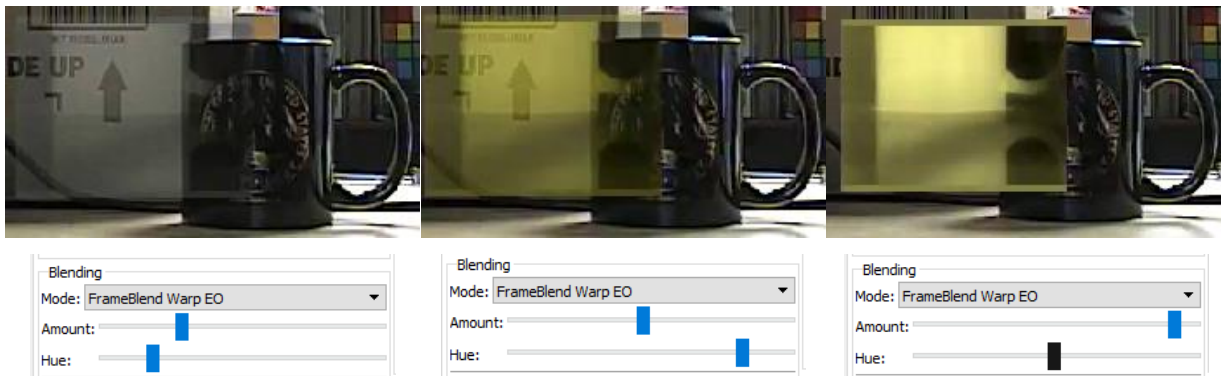
ColorIR Fixed EO

- Set the camera indexes.

Warp Idx: Fixed Idx

Warp Idx = 0 and Fixed Idx = 1 is not supported. Use Warp Idx = 1 and Fixed Idx = 0 and choose the appropriate Blending Algorithm or switch the physical camera connections.

- 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.




- Continue to the next section.

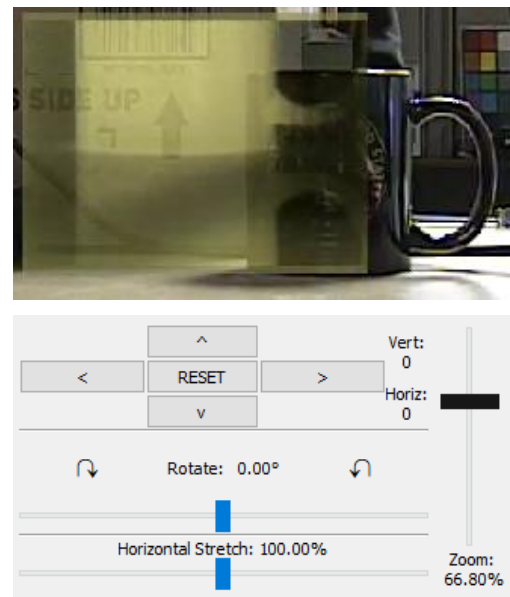
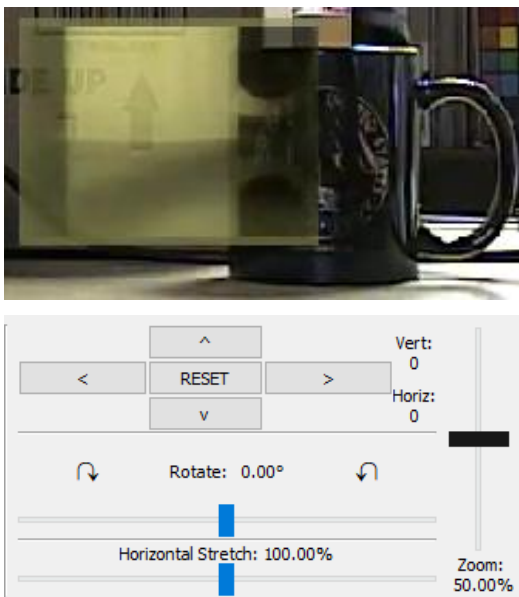


2.1.1 Configuring the Alignment

Use the one of the following methods to adjust how the images will line up.

 As of Firmware version 2.25, there are two ways to align the two cameras, *Parameter Alignment* and *4-Point Alignment* (new).

1. Click the *Configure Alignment* button.
2. Parameter Alignment:
 - a. Select the *Parameter Alignment* tab in the *Advanced Alignment* dialog. Use the *Zoom* control to size the IR image as closely as possible with the EO image.

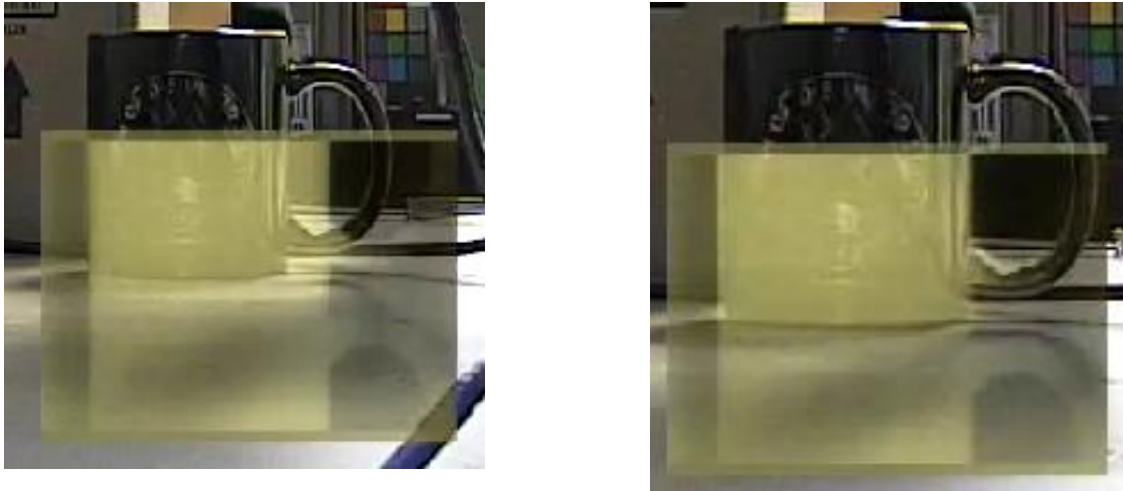


- b. Use the arrow controls to match the position as closely as possible.





c. Repeat the previous steps until the IR and EO images are aligned.



The Parameter Alignment dialog shows the number of pixels the warp image has moved.

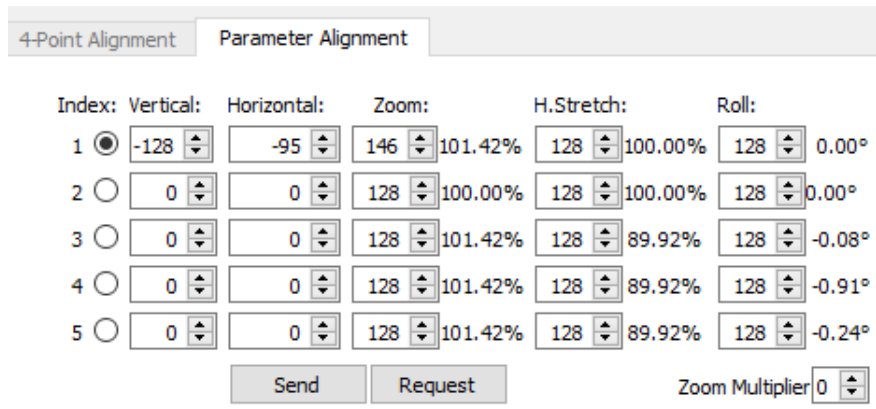


Figure 3: Parameter Alignment Dialog

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

3. 4-Point Alignment:

Follow the instructions in the 4-Point alignment tab of the Advanced alignment dialog. Similar to the Parameter Alignment, this method also allows the user to configure up to five sets of alignments, e.g., five different zoom levels for a camera.

Once the alignment has been set and saved to board, the alignment presets can be used by specifying their index.

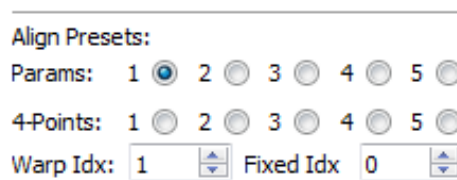


Figure 4: Alignment Presets



3 Blending Fundamentals

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 2: 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. Make sure the user palette exists on the board, but not selected as the palette for the video stream.
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. Make sure the user palette exists on the board, but not selected as the palette for the video stream.

3.2 Blending Variables

Table 3: Blending Variables

Variable	Description
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

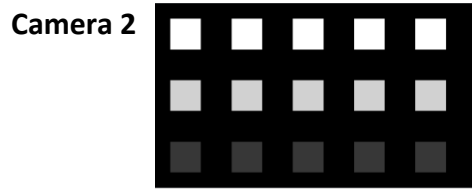
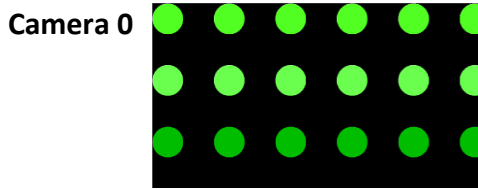
Requires **SLASetVideoMode_t (0x1F)** be used to set Display Modes to Blend. Also, see **SLACurrentBlendParameters_t (0x4D)**.

Table 4: Image Alignment Options

Option	Description
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) percent 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 (0x74) and set index of preset alignment parameters to value of presetAlignIndex (below).
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) Vertical zoom = zoom Horizontal zoom = hzoom * zoom



4 Blending Modes



4.1 Frame Blend

Pure frame alpha blend. Use the *Amount* parameter to control blend amount. 0% corresponds to all fixed index (EO). 100% corresponds to all warped index (IR). Results shown in a grayscale image. Optionally applies yellow hue from bright areas in the warped EO image to the output.

Warp Idx: Fixed Idx:

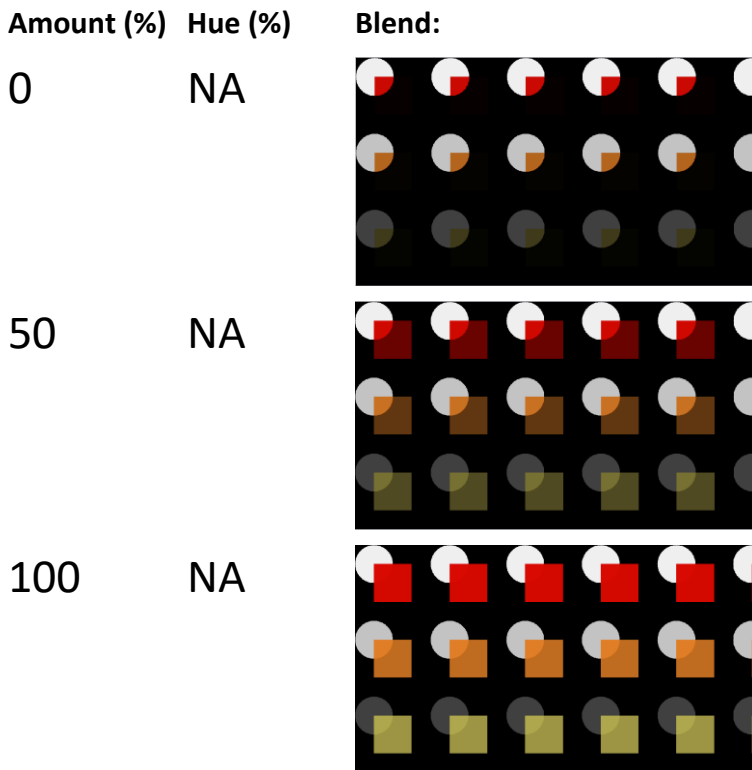
Amount (%)	Hue (%)	Blend:
0	0	
50%	0	
100	0	
50	50	
50	100	



4.2 Thermal Blend

Blend of EO/IR luminance with false coloring derived from IR (warped). Red corresponds to fully saturated IR. Blue corresponds to no IR. Blends hot pixels from the fixed camera (shown in red) with the EO image. Typically used to highlight hot areas in a daytime EO image.

Warp Idx: Fixed Idx:





4.3 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.

Warp Idx: Fixed Idx:

Amount (%)	Hue (%)	Blend:
0	0	
50	0	
100	0	
50	50	
50	100	



4.4 Color Blend

Similar to Frame Blend. Percentage (controlled by *amt*) of blending the warped EO and fixed IR images. The color from the warped EO image is also passed to the output (controlled by hue).

Amount (%)	Hue (%)	Blend:
0	0	
50	0	
100	0	
50	50	

5 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](#).