



SightLine

APPLICATIONS

EAN-Blending

PN: EAN-Blending

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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

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.

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.

Synchronizing two separate cameras so that the frames match at the entrance to the blending algorithm is outside the scope of the SightLine hardware and is left up to the integrator. This may be important with high velocity movements of the cameras and/or the scenes.

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 PDF download on the [Software Download](#) page.

[Panel Plus User Guide](#): A complete overview of settings and dialog windows 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. Firmware and Panel Plus software versions are available on the [Software Download](#) page.

1.4 Application Bit Requirements

The functions described in this EAN require Application Bits (app bits) purchased from SightLine. App bits 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 [Sales](#).

Table 1: Application Bits Requirement Table

Function	Initial Software Release	Required Application Bit(s) v7 License
Blending	2.22.xx	Blending 0x0000 0100 Optional: Enhancement 0x0000 0080



1.5 Hardware Setup example

- 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 Blending IR and EO Images

This section explains how to use the alignment tools to match up the images.

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

In this example the camera acquisition settings have been previously setup. The image of interest shown in [Figure 1](#) and [Figure 2](#) is the same, but the field-of-view is different.



Figure 1: EO Image of Interest

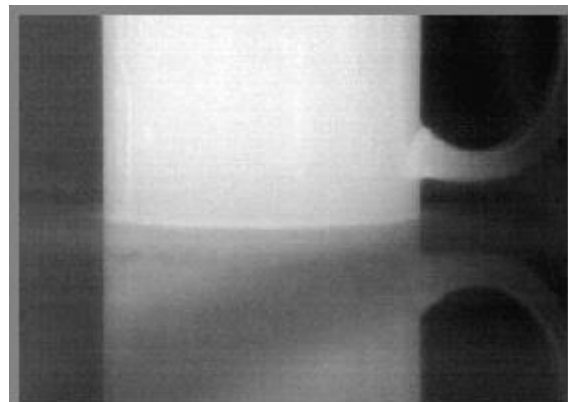


Figure 2: IR Image of Interest

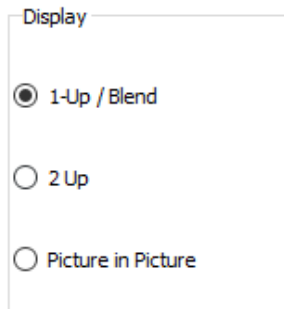
1. Select the *Multi Camera* tab.
2. Set the *Video Source* for *Network Index 0* to *Blend*.
3. In the *Compression* tab, set the resolution for *Network 0* to the size of the larger camera source (1280 x 720).
4. Click *Send*.

Index	Video Source	Network Display		Physical Display			Decode @ P+	
		Enable	Resolution	Ana	HDMI	HDSDI		Resolution
0	Blend ▾	<input checked="" type="radio"/>	1280x720	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	720p60 ▾	<input checked="" type="radio"/>
1	None ▾	<input type="radio"/>	N/A	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	720p60 ▾	<input type="radio"/>

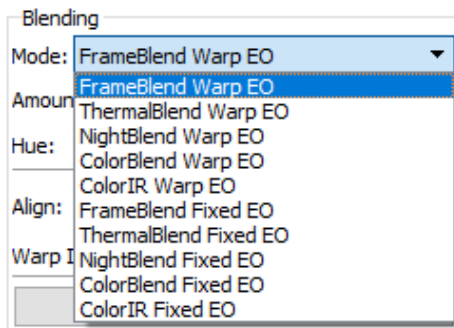
Send



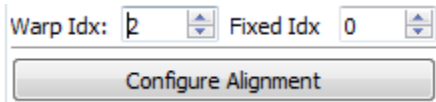
- Set the *Display* mode to *1-Up/Blend*.




- Select the *Blending* algorithm.

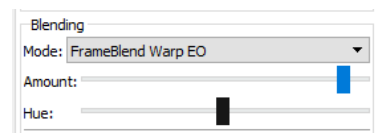
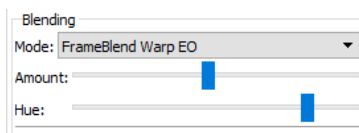
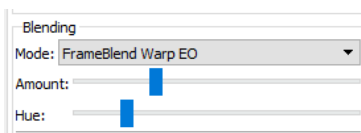


- Set the camera indexes.



 If the blended cameras are 0 and 1, 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.

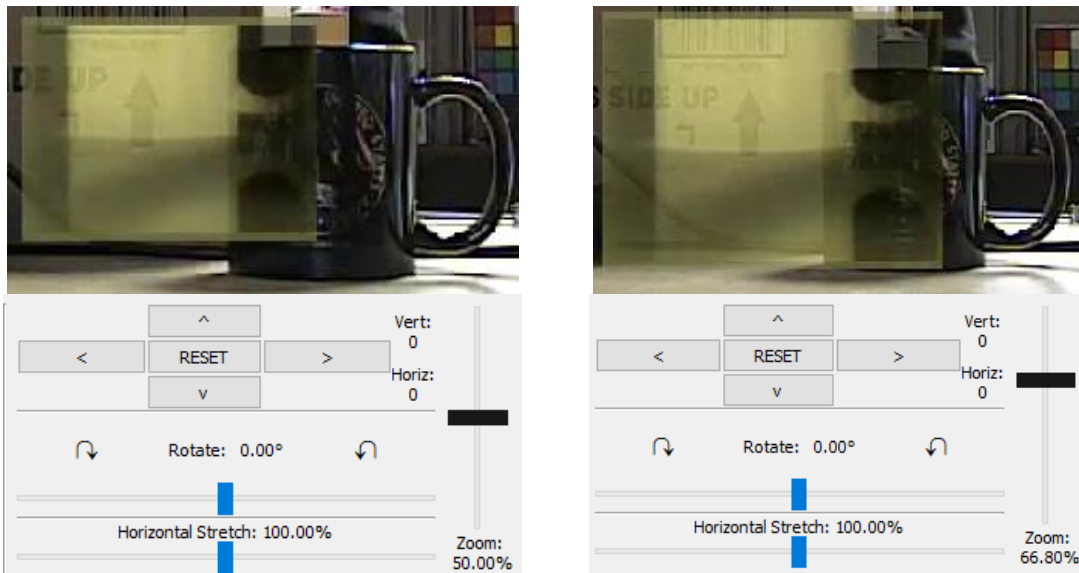


2.1 Configuring the Alignment


As of firmware version 2.25, there are two ways to align the two cameras - Parameter Alignment (legacy) and 4-Point Alignment (new). Use the one of these methods to adjust how the images will line up.

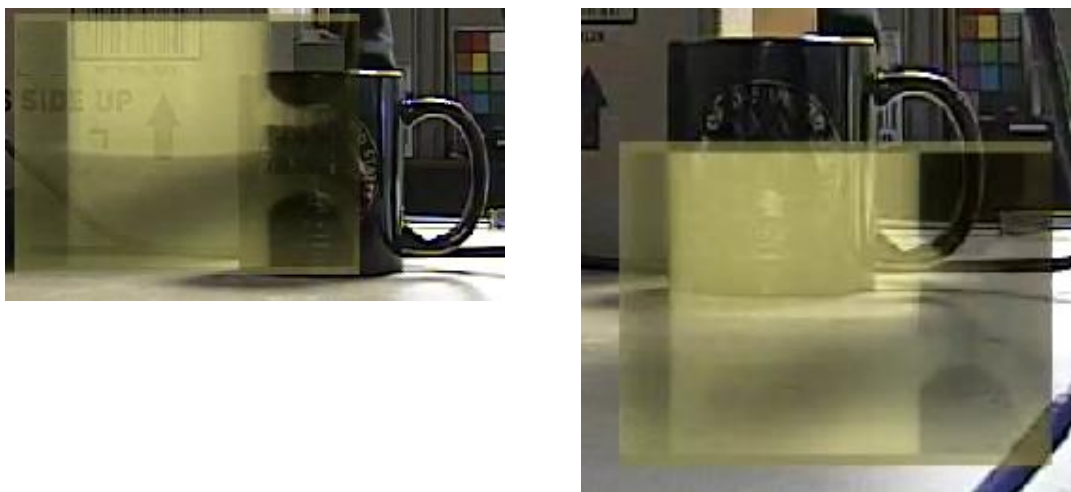
2.1.1 Parameter Alignment

1. Click the *Configure Alignment* button.
2. 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.



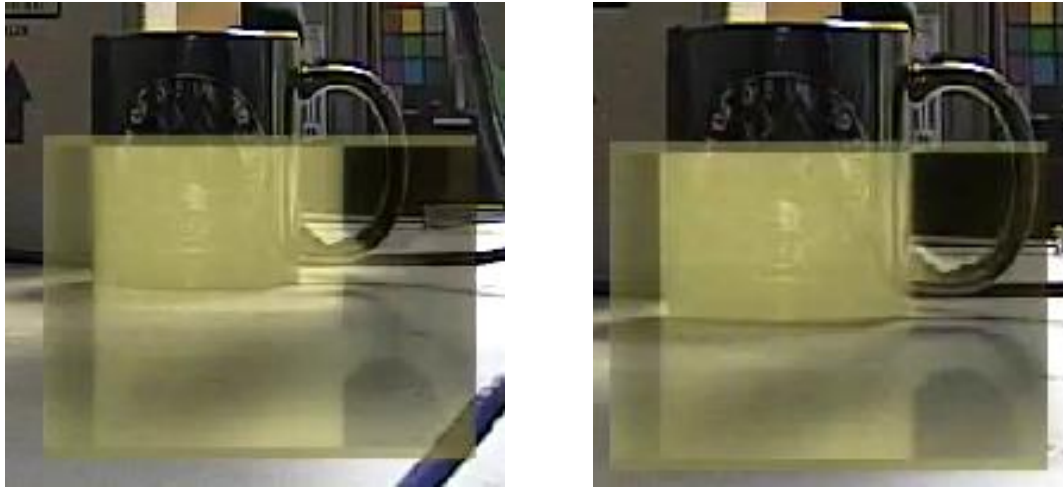
3. Use the arrow controls to match the position as closely as possible.

 When both cameras show the image at similar sizes, leave the zoom multiplier at 0, for a +/- 5% effective zoom. But when higher zoom is needed, increase the zoom multiplier.





- 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.

Index:	Vertical:	Horizontal:	Zoom:	H.Stretch:	Roll:
1 <input checked="" type="radio"/>	-128	-95	146 101.42%	128 100.00%	128 0.00°
2 <input type="radio"/>	0	0	128 100.00%	128 100.00%	128 0.00°
3 <input type="radio"/>	0	0	128 101.42%	128 89.92%	128 -0.08°
4 <input type="radio"/>	0	0	128 101.42%	128 89.92%	128 -0.91°
5 <input type="radio"/>	0	0	128 101.42%	128 89.92%	128 -0.24°

Zoom Multiplier

Figure 3: Parameter Alignment Dialog

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

2.1.2 4-Point Alignment

With the compression resolution settings set to *Out=In* in the compression tab, 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.

Align Presets:

Params: 1 2 3 4 5

4-Points: 1 2 3 4 5

Warp Idx: Fixed Idx

Figure 4: Alignment Presets



3 Blending Modes

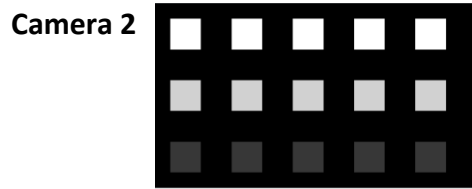
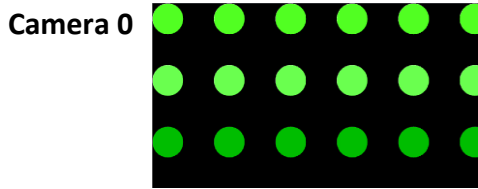
Controls the method used to blend the EO/IR images. Assumes that EO camera is logical camera 0 and IR camera is logical Camera 1.

Table 2: Blending Mode Descriptions

Mode	Description
Frame Blend Warp EO	Pure frame alpha blend. Use the <i>Amount</i> parameter to control blend amount. 0 corresponds to all EO, 100 corresponds to all IR. Optionally apply yellow hue from bright areas in the warped EO image to the output.
Thermal Blend Warp EO	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 Warp EO	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 nighttime IR image.
Color Blend Warp EO	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 nighttime 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.



4 Blending Modes results



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:

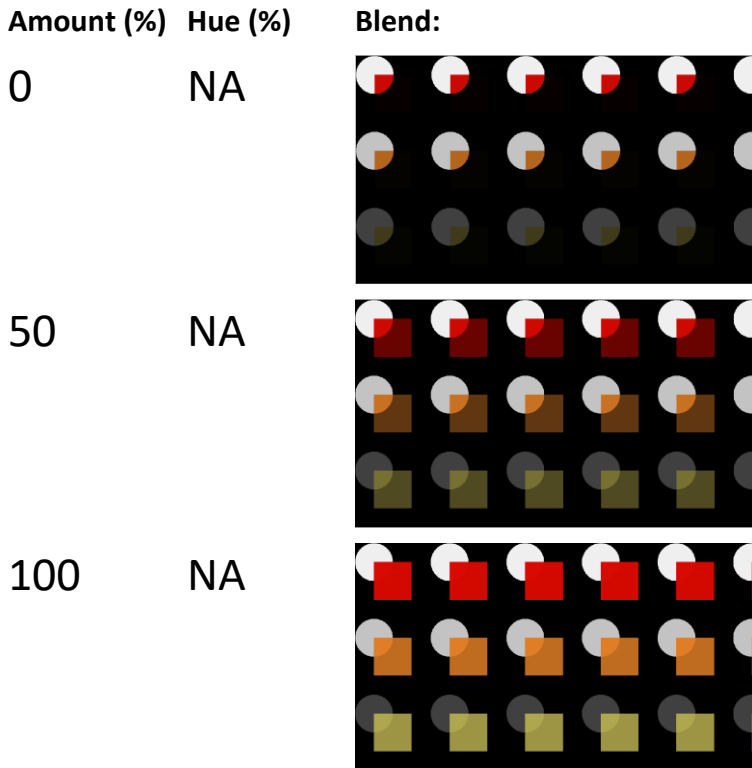
Amount (%)	Hue (%)	Blend:
0	0	
50%	0	
100	0	
50	50	
50	100	



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

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