

EZwindowHR High Resolution Video Combiner

Synchronizes multiple standard video inputs with a high resolution video stream, to produce a high resolution video output with windowing and other video combining capabilities.

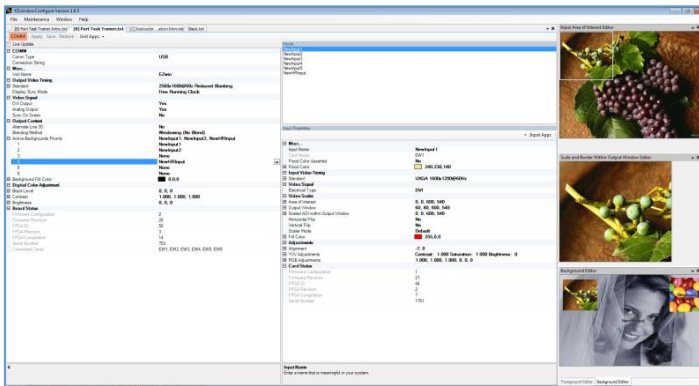


EZwindowHR™ Video Processor

The EZwindowHR™ provides a wide range of video windowing functions for one high resolution (up to 2560x1600 @ 60 Hz) input channel, and from 1 to 5 standard resolution (up to 1920x1200 @ 60 Hz) input channels. **If a high resolution (2560x1600) input is not required, please consider the standard EZwindow product.**

The EZwindowHR can be ordered with up to (5) standard input channels. The number of input channels is specified directly in the part number. For example, the EZwindowHR-3 supports one Hi-Res (HR) input channel plus (3) standard input channels. The EZwindowHR-5 supports one HR input channel plus (5) standard input channels.

Powerful Configuration Utility



Use Westar's EZwindow configuration utility to define the input timing, output timing, keying scheme, and the area-of-interest within the source video and where to map the AOI within the output resolution. The configuration utility supports user-defined:

Features

High Resolution Input Features

- Accepts RGBHV analog or DVI video at the desired output resolution.
- Supports single link or dual link DVI with resolutions up to 2560x1600 and pixel rates up to 330 MPixels/sec.
- If the HR input is used, then the output timing is identical to the HR input timing. **The delay between HR input and the output is << 100 usec.**

Standard Resolution Input Features

- Up to (5) DVI-I standard (TMDS and Analog RGB) Inputs
- Digitization of computer-generated video sources with separate sync, composite sync, or sync-on-green
- Digitization and de-interlacing of interlaced video formats, including RS170, RS343, NTSC and PAL
- Resolutions up to WUXGA with pixel rates up to 162MHz
- Incoming video gain and offset adjustments
- Fine phase clock adjustment for pixel sampling

Output Features

- Single or Dual link DVI (TMDS) and RGBHV
- Resolutions up to 2560x1600 with pixel rates up to 330 MPixels/sec
- Digital contrast and brightness adjustments on output

Windowing Features

- Each standard input is mapped to rectangular area in foreground or background layer, max width is 1600 pixels
- **The HR input cannot be scaled.** It can be mapped to the foreground or background, and a specific area-of-interest can be defined.
- Each input is assigned a priority for overlapping regions.
- "Overlay" applications use keying logic on the foreground layer to combine the foreground and background layers.

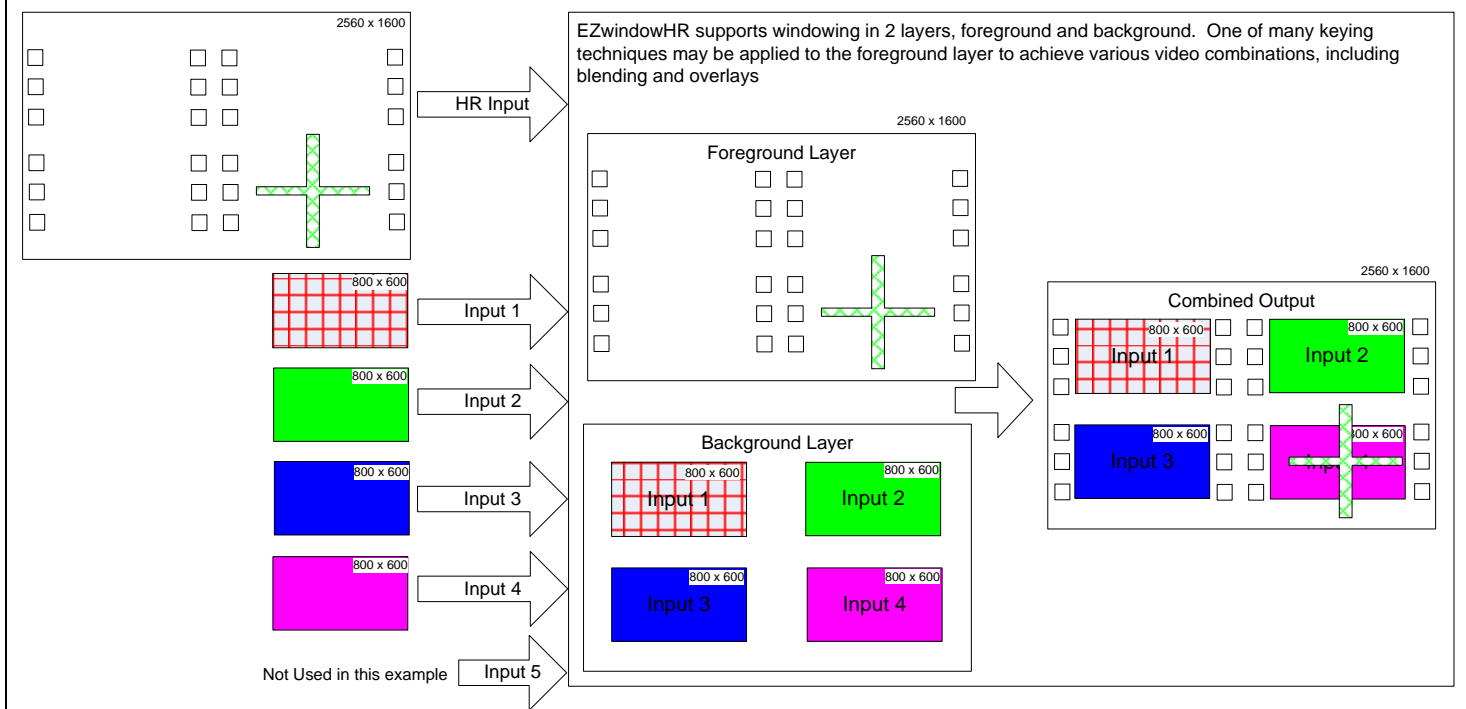
Foreground and background scalers are defined for inside the key area for key = true, inside the key area key = false, and outside the key area:

Foreground Alpha	1.000, 0.000, 0.800
Key True Alpha	1.000
Key False Alpha	0.000
Outside Key Alpha	0.800
Background Alpha	0.000, 1.000, 0.600
Key True Alpha	0.000
Key False Alpha	1.000
Outside Key Alpha	0.600

$$\text{Output pixel} = (\text{Foreground alpha} * \text{foreground pixel}) + (\text{background alpha} * \text{background pixel})$$

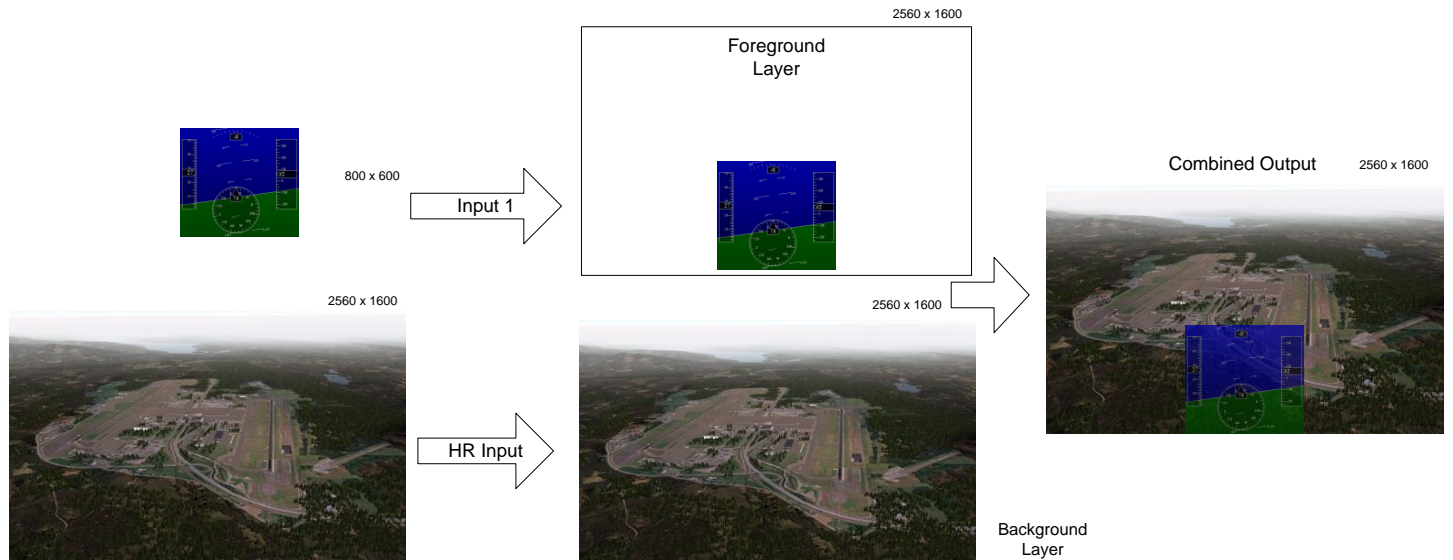
- Keying methods include:
 - RGB Key, Luma Key, HSV Key
- Both foreground and background layers have programmable fill colors for unmapped regions.
- Synthesizer allows two inputs to be combined prior to assignment to foreground or background layer.

Application #1



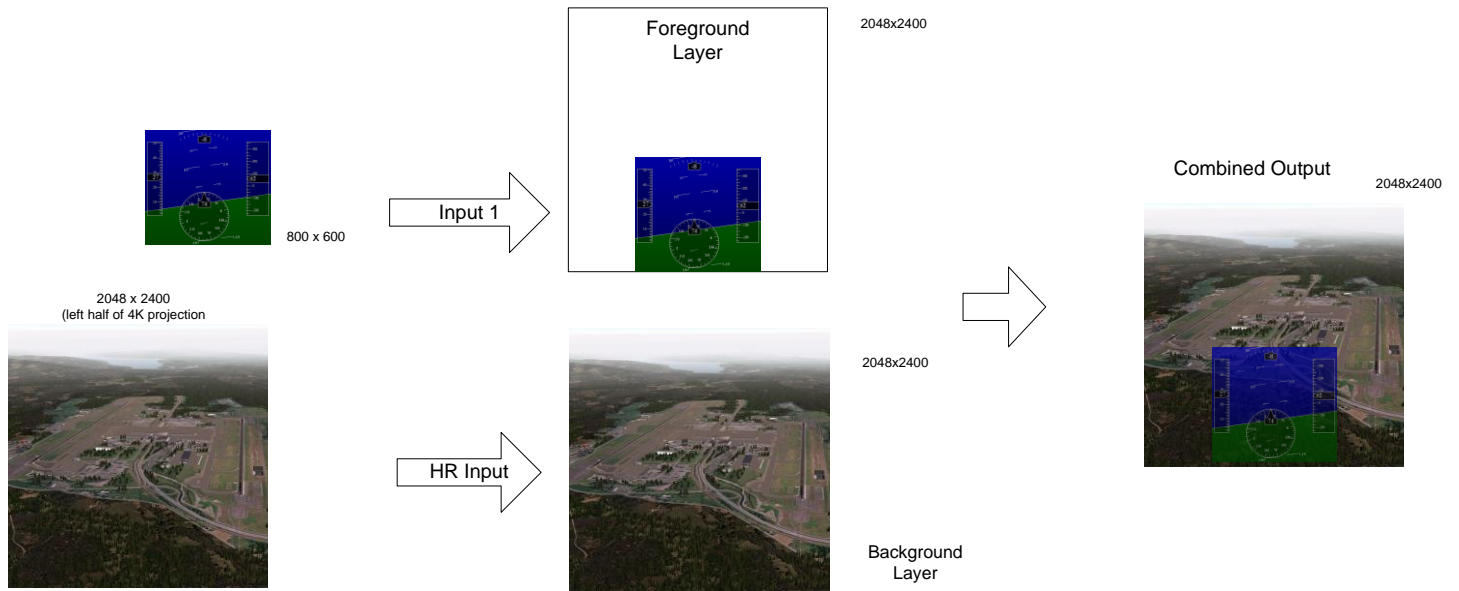
In Application #1 above, a EZwindowHR-4 is used to combine 4 video feeds into the background layer. The HR input is a 2560x1600 video stream mapped to the foreground layer, where luma keying is used to overlay the symbology over the combined imagery.

Application #2



In application #2 above, a EZwindowHR-1 is used to combine a HUD video feed into a projector Out-the-Window (OTW) video stream. The HR input is a 2560x1600 OTW projection. A RGB key is used, with a defined key area and separately programmable alpha values for when the key is true and when the key is false.

Application #3



In application #3 above, a EZwindowHR-1 is used to combine a HUD video feed into a projector Out-the-Window (OTW) video stream. The HR input is a 2048x2400, the left half of a 4096x2400 4K OTW projection. A RGB key is used, with a defined key area and separately programmable alpha values for when the key is true and when the key is false.

EZwindowHR Spec Summary

Inputs	Std Resolution Inputs	HR Input	Functional	Specification
Number of Inputs	1 to 5 per Unit	1 Per Unit	Features	<ul style="list-style-type: none"> Interlaced / non-interlaced conversion Image Flip Image Scaling Windowing, PIP Blending (Alpha, RGB, Luma, HSV) Stereo (L/R) Combining Programmable Border Colors Brightness / Contrast Adjustments
Video Type	Analog RGB (0.7 Volt levels, Interlaced or Non-Interlaced), TMDS, NTSC/PAL	Analog RGB (0.7 Volt levels, Interlaced or Non-Interlaced), TMDS		
Pixel Rate	Up to 162 MHz	Up to 330 MHz		
Clocks per Line	Up to 4096 ¹	Up to 4096		
Lines per frame	Up to 4096	Up to 2048		
Sync Type	HV, Composite Sync, Sync-on-Green			
Phase Adjustments	Adjustable sample clock to ensure center sampling			
Connectors	<ul style="list-style-type: none"> DVI-I connector for TMDS and Analog RGB (DVI to HD15 adapters included) BNC and S-Video for NTSC/PAL 	<ul style="list-style-type: none"> DVI-I (Dual Link) 	Output Sync Modes	Free run, External sync, locked to HR input, Sync to input
			Color Processing Depth	8 bits per color
			Re-sizing Limits	Virtually unlimited
			Electro Mechanical	Specification
			Input Power	IEC Connector, 100-240 VAC, 47-63 Hz, less than 60 Watts
			Control	RS-232, USB, Ethernet (optional)
			Dimensions (W x D x H)	Rackmount: 19" x 13.75" x 1.75"
			Weight	Less than 7 lbs.
			Warranty / Certification	Specification
			Warranty	1 Year Limited
			Certifications	CE, RoHS
Output	Output Specification			
Video Type	Analog RGB (0.7 V, Interlaced or Non-Interlaced), TMDS			
Pixel Rate	Up to 330 MHz			
Clocks per Line	Up to 4096			
Lines per frame	Up to 4096			
Sync Type	HV, Composite Sync, Sync-on-Green			
Connectors	DVI-I (Dual Link)			

Note 1: Output active pixels or input active pixels limited to 2048
 Maximum active input or output area of interest is 5 MPixels



EZwindowHR-2 Note: The HR Input is Input #6

EZwindowHR Operation

Typically, the EZwindowHR operates as follows:

1. Upon power up, the EZwindowHR configures itself based on parameters pre-programmed into non-volatile memory.
2. Prior to detection of valid video on an input channel, the EZwindowHR can drive a user-defined color in the corresponding output window.
3. When a valid video signal is detected on any of the inputs, the EZwindowHR converts the incoming video per its pre-defined settings and places the image in the output window per the pre-programmed settings.

What's Included

- EZwindowHR Video Processor
- DVI to HD15 adapters
- RS-232 Serial Cable
- USB Cable
- Power Cable

CD Containing:

- Configuration Utility Software
- User's Guide
- Command Line Description

Ordering Configurations

- EZwindowHR-x
EZwinHR with x standard input cards and 1 High Res input
- EZwindowHR-x :E
EZwinHR with x standard input cards and 1 High Res input and Ethernet option

EZwindowHR is delivered with installed rackmount ears. For benchtop applications, please contact the factory for user-installable feet.