GeoBox

G802 Dual Channel Edge Blender Datasheet

New generation Warp & Edge blending engine

Input: up to 4096*2160 @60Hz, 7680*1200 @30Hz 4:4:4

Output: 2048*1080@60Hz

Sales & Technical support

Website: www.vigillink.com

E-mail: info@vigillink.com Version: V1.01

Tel: +949-502-4484

DCi/UHD 4k/60/4:4:4	HDMI 2.0 DisplayPort 1.2	HDCP 2.2/1.4	10-bit High-end scaler	Cadence Film 3:2 / 2:2	3D Motion De-interlace	Deep Color xvYCC/12-bit	Edge Blend RGB separate Gamma
Corner wall Geometry Alignment	Multi-Unit Cascade	Multi-view Discrete display	Flexible Aspect Ratio Bezel Correction	Rotation Landscape Protrait	Loop Out Daisy chain	Control IR/USB/RS232 /Ethernet	Video wall Embedded

Table of Contents

Introduction

G802 is a dual channel professional curved screen edge blending processor designed for sophisticated edge blending as well as image warping and stacking.

4 inputs (2x HDMI, 1x DP, 1x VGA) and 2x HDMI outputs are designed in G802. Input supports up to 4096*2160 @60Hz, 7680*1200 @30Hz with 4:4:4 full color sampling. Output supports up to 2048*1080 @60Hz. It is integrated with 10-bit high end processor, motion adaptive de-interlace, low angle smooth algorithm, 3:2/2:2 pull-down and supports non-VESA standard input timing.

Advanced warp technology is embedded in G802. Users can perform sophisticated geometry alignment and curved screen edge blending through remote control, WebGui, USB, or Ethernet. The maximum geometry control point is 17x17 grids. Linearity Grid Line Adjustment and Corner Wall image adjustment for mapping images at 90 degrees corners is a new function in geometry alignment. Separate RGB gamma correction for edge blending color fine-tuning, individual color correction for each output, fine pixel color uniformity, and 9 regions non-edge blending area black level uplift are also embedded in G802. Users can see real-time geometry and color adjustment to get an optimized result.

HDMI 2.0 loop out supports daisy chain connection up to 7680*1080 @30Hz and allows large displays with multiple units cascaded. The video wall function in G802 is to crop and allocate source images for each projector and set overlap pixels for edge blending. Complete curved screen edge blending can be achieved through a remote controller or Ethernet without PC software, a video distributor, and a splitter.

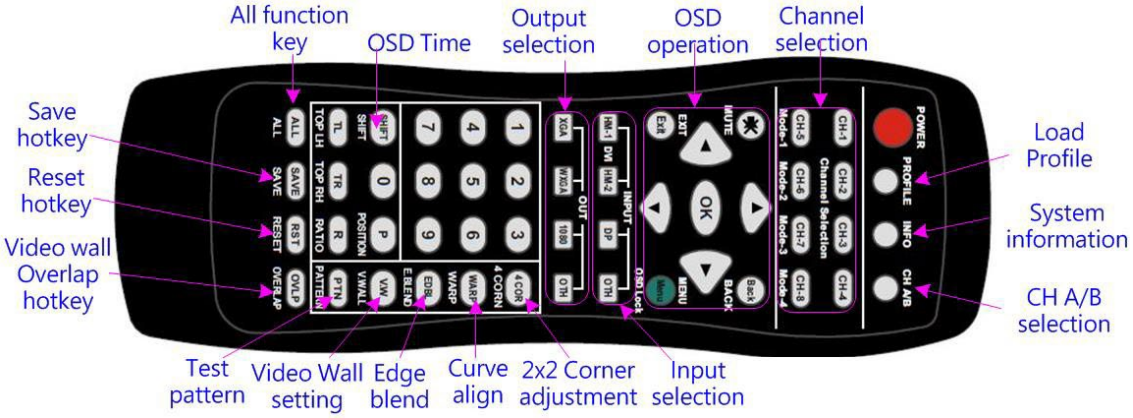
G802 is designed to support programmable EDID and non-VESA standard input. Users can create any EDID timing in the range between 1024x768 and 3840x2400 to optimize video performance.

Using G802, users can replace high-end projectors with low-cost projectors without lens shift, warp, and edge blending. It provides easy configuration, a low entry barrier, cost-effective, reliable, and flexible solution.

A dual power supply system is embedded in G802. Users can use an AC power 100V-240V power supply or a DC 12V 2A power supply with an external DC 12V power adapter. When applying an AC power supply, the user will have one DC 12V 1A output for the signal extender.

Outlook


440mm
44mm
ON
OFF
POWER
INPUT
OUTPUT
CH-1 CH-2
CH-1 CH-2
Dual CH Edge Blender
In 4096*2160 / 60fps
Out 2048*1080 / 60fps
Default IP: 192.168.0.100
GeoBox®
OUTPUT
SPDIF
CH-2
Unprocessed Source
INPUT
HDMI 2.0-1
HDMI 2.0-2
DP
VGA
OUTPUT
CH-1
RS-232
CONTROL
DC Out 12V as 1.0A
IR Ext
Ethernet
USB-B
Reset
100-240V~1.0A Max 50/60Hz


All function key
OSD Time
Output selection
OSD operation
Channel selection
Save hotkey
Reset hotkey
Video wall Overlap hotkey
Load Profile
System information
CH A/B selection
Test pattern
Video Wall setting
Edge blend
Curve align
2x2 Corner adjustment
Input selection
ALL
SAVE
RESET
OVERLAP
SHIFT
TOP LH
TOP RH
RATIO
POSITION
PATTERN
VWALL
E.BLEND
WARP
4 CORN
XGA
WXGA
1080
OTH
OUT
HM-1
DM
HM-2
DP
OTH
INPUT
OSD Lock
EXIT
MUTE
OK
MENU
BACK
CH-5
Mode-1
CH-6
Mode-2
CH-7
Mode-3
CH-8
Mode-4
CH-1
CH-2
Channel Selection
CH-3
CH-4
POWER
PROFILE
INFO
CH A/B

Specification

- Input: 2x HDMI 2.0b, 1x DP1.2a, 1x VGA.
- HDCP: HDMI V2.2/V1.4, DP: HDCP: V1.3.
- Max. input resolution: 4096x2160 @60Hz, 7680*1200 @30Hz.
- Support non-VESA standard input timings.
- Output: 2x HDMI up to 2048x1080 @60Hz & WUXGA.
- Input / Output signal is 10 bits, 4:4:4 chroma sampling. Input support RGB/YUV progressive and interlaced signals. Output is progressive RGB.
- 1x HDMI 2.0b loop out ports for multiple unit cascade & daisy chain connection.
- Geometry alignment up to 9x5 control points via remote controller and 17x17 points via PC Tool.
- Maximum geometry adjustment range is up to 1200 pixels in both H&V directions.
- Two frame latency: 33ms (at V=60Hz)
- Edge blending at 4 edges up to H= 1920 pixels, V=1200 pixels with independent RGB gamma correction and 9 area black level uplift.
- Support Corner Wall adjustment in H&V at flexible location with the same image scaling factor. The adjustment range in 4 corners, horizontal / vertical and curve point are 900 pixels each.
- Support Linearity Grid Line adjustment for quick H&V line position alignment via remote controller.
- Edge Mask up to 500 pixels following the result of geometry alignment.
- Edge Mask up to 900 pixels in H&V directions through 8 control points around image border.
- Embedded full function video wall function for image split, cropping and overlap pixel setting.
- 15 preset output resolution up to 2048*1080 @60Hz. Support refresh rate 24/30/50/60/120 in some output timings.
- Input support xvYCC & 8/10/12-bit deep color processing.
- System settings can be stored and backup.
- Selectable grid pattern size from 8-120 pixels in H&V direction. Default is 32*32 pixels.
- 50Hz in/out & frame rate conversion.
- Selectable grid pattern color and with optional transparency to see background image.
- Flexible aspect ratio adjustment in each edge up to +_ 1800 pixels cropping range.
- 10-bit processor, 3:2/2:2 cadence, low angle smooth algorithm, high quality scaling engine.
- 3D motion adaptive de-interlace.
- Frame lock for multiple channel synchronized outputs.
- Support HDR input signal but no HDR effect in the output.
- Individual color and white balance adjustment in each output channel.
- Individual 90/180/270 rotation, flip, cropping, scaling & color adjustment in each channel
- 90/270 degrees rotation and flip only available under 4k/30Hz input resolution.
- Embedded HDMI & SPDIF audio outputs
- Selectable and programmable EDID in the range: H=1024-3840, V=720-2400.

- ESD Protection: ±8kV (Air-gap discharge), ±4kV (Contact discharge)
- Dual power supply in G802. User can use either AC 100-240V or DC 12V power supply. When use AC power supply, there is a DC 12V 1A output for signal extender.
- Power consumption:
- Without DC12V/1A output: AC 240V: 0.05A/11.9W, 110V: 0.106A/11.7W
- With DC12V/1A output: AC 240V: 0.10A/23.9W, 110V: 0.215A/23.7W
- Working environment: 45° C, 10-90% RH
- Control: IR, RS232, WebGui & PC tool for USB & Ethernet
- Dimensions (Body only): 440mm*161mm*44mm (without protruding parts). 440mm*172mm*55mm (including protruding part)
- Weight: 2.10 kg (body only)
- CE/FCC/RoHS Certified
- 30-Month Warranty

Function and features:

A. Input and output:

- Input ports: 2x HDMI, 1xVGA, 1x DisplayPort。
  - ✓ HDMI & DisplayPort support 4096*2160 @60Hz, 3840*2400 @60Hz with 4:4:4 sampling without compression. VGA supports up to WUXGA or 205MHz analog input signal.
  - ✓ Connect with various video sources and support none VESA standard input resolution.
- Output ports: 4x HDMI. Selectable output resolutions: XGA, WXGA,1280x720, 1280x1024, 1366x768, 1920x1080 (24/30/50/60Hz), 1920x1200 (30/60Hz), 2048x1080/60, 1024x768 @120Hz, 1280x720 @120Hz, 1280x800 @120Hz.
- Loop out port: 2x HDMI 2.0b (supports 4096x2160@60Hz & 7680x1200@30Hz)

B. Image warp, geometry alignment, and edge blending

- Selectable grid pattern color and size for geometry alignment from 8-120 pixels in H&V. Default size are 32*32 pixels. Users can also apply external patterns for geometry alignment.
- With full functions for quick 4 corner alignment, vertical and horizontal keystone correction, Pincushion & Barrel adjustment, image warp, and image 90/180/270 degrees rotation and flip.
- Each unit controls dual projectors and can be cascaded to support an unlimited number of projectors.
- Integrated with full-function IR remote controller. Manual geometry alignment via Remote controller and WebGui up to 9*5 control points with H=+_ 1200 pixels and V=+_1200 adjustment range in full HD output (4 corners + warp adjustment).
- Gwarp3 PC tool is available for warp and geometry alignment up to 17x17 control points with H=+_1200 pixels and V=+_1200 pixels adjustment range through USB or Ethernet. After finishing the geometry alignment, the parameters can be stored inside GeoBox, and no more PC tools are needed.
- Corner Wall geometry alignment at 90 degrees corner wall up to 900 pixels adjustment range in 4 corners and H&V directions and 900 pixels position adjustment in curvature point.
- Linearity Grid Line adjustment function to move grid lines position for quick geometry alignment.
- 4 directions edge blending up to H=1920, V=1200 overlapped pixels for flat, curved & cylindrical screens.
- Independent RGB gamma selection for edge blending color fine.

C. Black level uplift

Precise black level uplift at multiple areas (up to 9) to compensate for light leakage in the projector optical system in a dark environment.

D. Background white balance

White balance and individual color correction for each output channel.

E. High-end 10-bit video processor

- Integrated with 10-bit high-end processor with 3D motion adaptive de-interlace, low angle smooth

algorithm and 3:2/2:2 film mode detect and recovery function.

- Complete color adjustment function, including brightness, contrast, hue, saturation, preset color temperature, independent RGB color adjustment and white balance correction.

F. Edge mask

Image SHIFT to execute edge mask up to 500 pixels following the image after geometry adjustment and [Edge Mask] with 8 adjustment points to provide irregular edge mask with random edge position up to 900 pixels in H&V directions at each control points. Both functions can be executed at the same time.

G. Video wall function

- Image cropping and location assignment for each projector.
- Overlap pixel adjustments up to +_1800 pixels for image cropping, position shift, bezel compensation, creating overlap region for edge blending and aspect ratio adjustment.
- Serve as video wall controller for irregular video wall displays up to 15x15 matrix from single input source.

H. Image rotation and flip

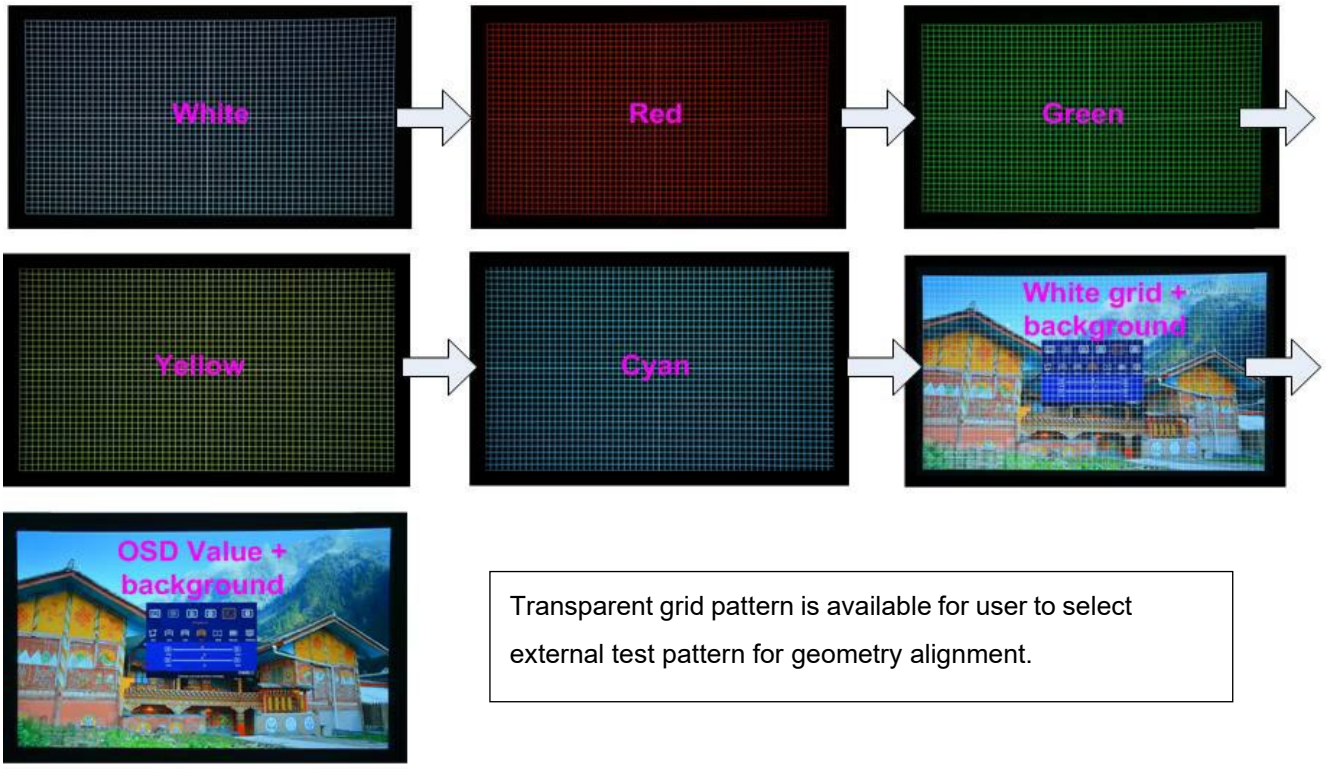
Image 90/270 degrees rotation & flip under 4k/30Hz input. Image 0/180 degrees rotation and flip supports up to 4k/60Hz input.

I. System control and other features

- 1U housing for easy rack installation. Professional design and reliability.
- Replace high price projectors with low-cost projectors and achieve the same functionality.
- Full-function system setup through IR remote controller, USB, WebGui or Ethernet (Including through WiFi by Mobile or iPad)
- Firmware update via USB or Ethernet.
- Gwarp3 PC tool can control multiple processors simultaneously through USB or Ethernet.
- Internal grid pattern with selective color for easy geometry alignment.
- RS232 & Ethernet system control is compatible with most of the control systems.
- Users can select blue or black background color when no input signal is detected.
- Programmable EDID in the range at H=1024~3840, V=720~2400.
- BOX ID and programmable IP address for convenient multiple unit control simultaneously.
- Users can save up to 5 user settings which can be recalled by remote controller, RS232, USB or network.
- Automatic power ON/OFF through input signal control. While no input signal is detected, it will shut down output automatically. Users can power ON/OFF complete system through the control in the signal source.
- AC & DC dual Power supply systems. Provide DC 12V 1A output for signal extender while using AC.

Feature illustration

Selectable Grid Pattern for geometry alignment



Transparent grid pattern is available for user to select external test pattern for geometry alignment.

Selectable grid pattern size

The pixel size in grid pattern for geometry alignment is selectable to meet high end simulation system geometry alignment requirements. The grid size in both horizontal and vertical directions is from 8 to 120 pixels with 1-pixel increasement. While select 120 pixels grid size, the grid location can be aligned with 17x17 control points for easy setup. H&V grid size will be the same. User can select grid size under [Edge Blend] menu.

4K/60 (8k/1k) daisy chain connection

No additional equipment is required.

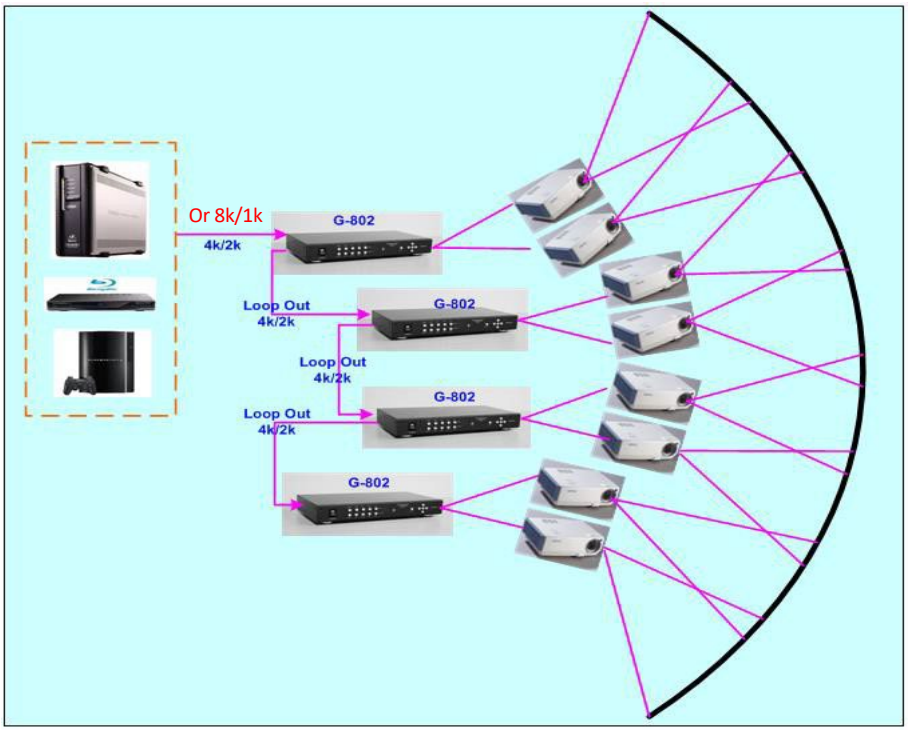
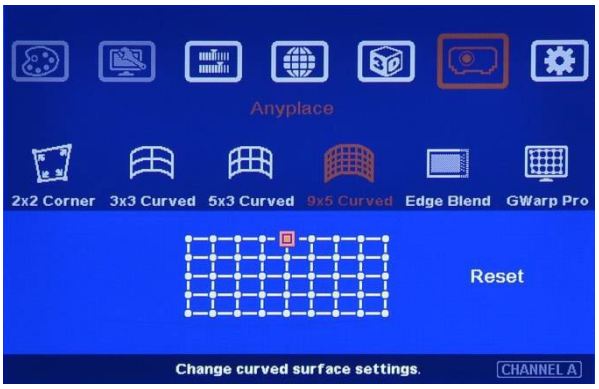
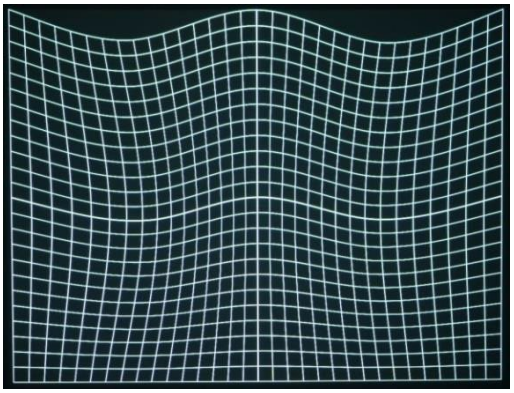


Image geometry alignment and warp





Edge blending on flat and curved screen

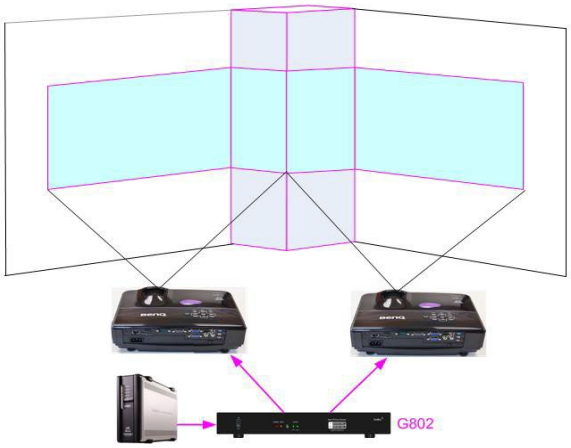
Corner wall Alignment & Display

Corner wall alignment function is functional in horizontal or vertical direction. The image scaling factor in two split sections will keep the same. Corner wall geometry alignment up to 900 pixels adjustment range in both H&V directions with up to 900 pixels position adjustment. Example for horizontal adjustment: the control point can be moved down to 900 pixels and the corner point can be +_900 pixels away from the center point in horizontal line. 4 Corner position alignment and Edge Blend function are still available with Corner Wall adjustment for easy image mapping and system setup.

In Horizontal and Vertical directions

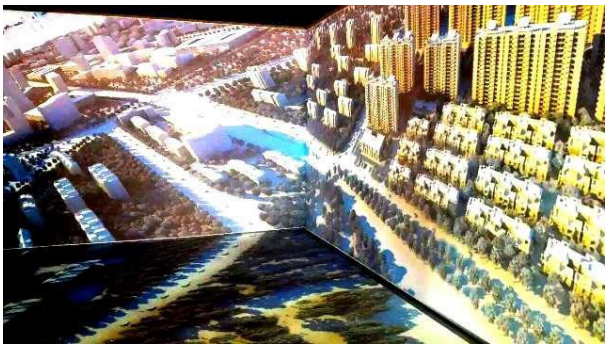
At selectable location but not only at center

Two projector corner wall application



Three projector corner wall application

Another corner wall application examples



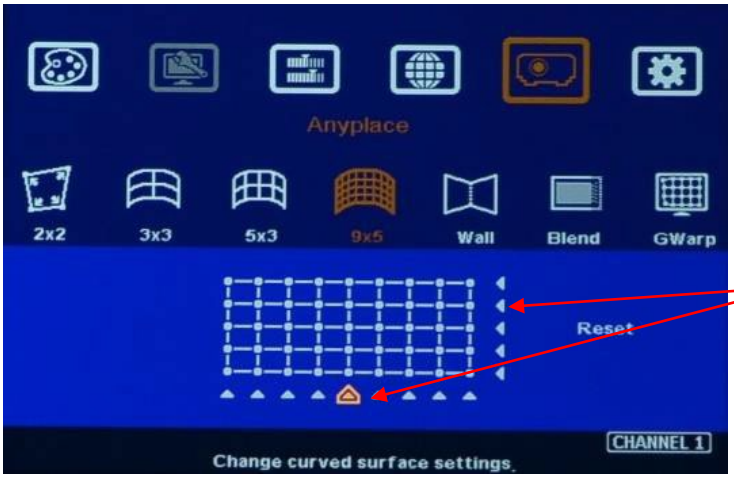
Single projector application

Portrait & Landscape Corner wall

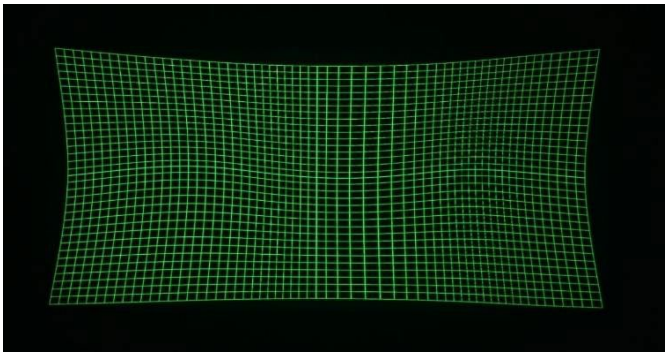
Linearity grid line adjustment

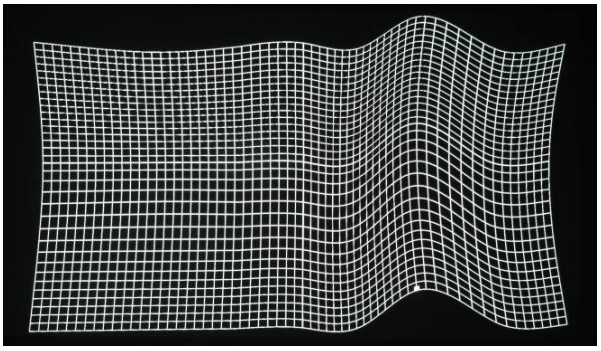
When projector projects image on curved screen, the image will change the grid size gradually and cause different scaling factor on the center and both sides. Linearity grid line adjustment is to compensate this kind of effect and enable complete image with the same scaling factor. Another application is to align images from adjacent projectors in overlap region, this function can reduce the alignment time quiet a lot.

1. This function can be executed only through remote controller.
2. It can be applied to both horizontal and vertical directions.
3. The operation OSD menu is under 3x3, 5x3 & 9x5 warp alignment menu. The result can be further adjusted by Gwarp3 PC tool for detailed 17x17 image position fine tune.
4. Linearity grid line adjustment can be executed together with warp alignment & edge blending at the same time.

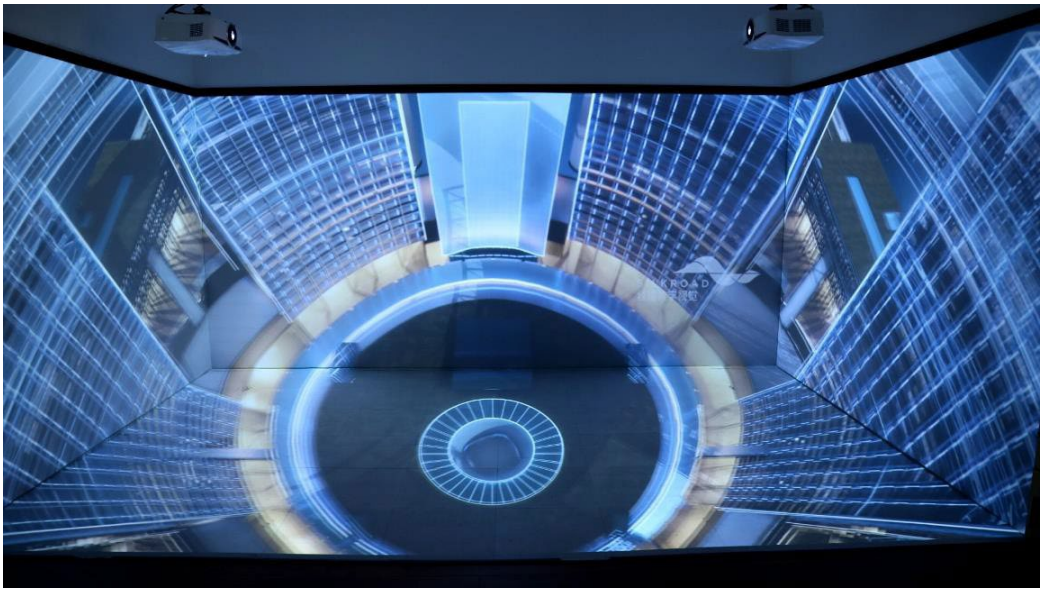


Control point for Linearity Grid Line Adjustment



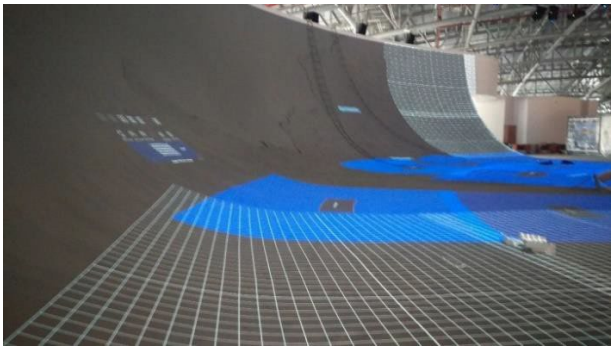


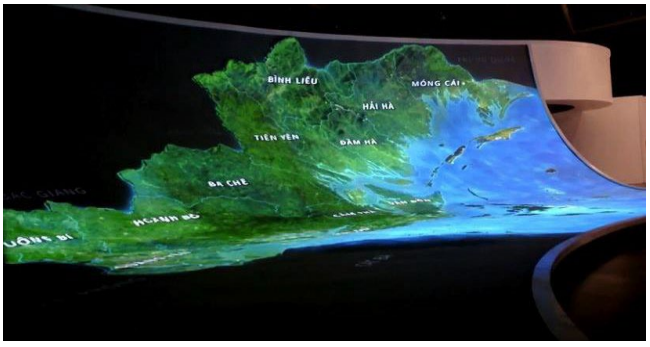
Virtual reality display



Immersive system with 3 walls and one floor

Big scale display





24 units of Christie projectors together with GeoBox for 35mx18m screen

Flexible display

One G802 has below flexible display functions:

1. One big content edge blending.
2. Independent content display from each projector.
3. 16:9/16:10 image at the center
4. Edge Blending with a projector at the portrait to increase image height.
5. If the user selects two inputs for two discrete displays in two projectors, the input source can't be two HDMI. It should be HDMI+DP, HDMI +VGA or DP+VGA.

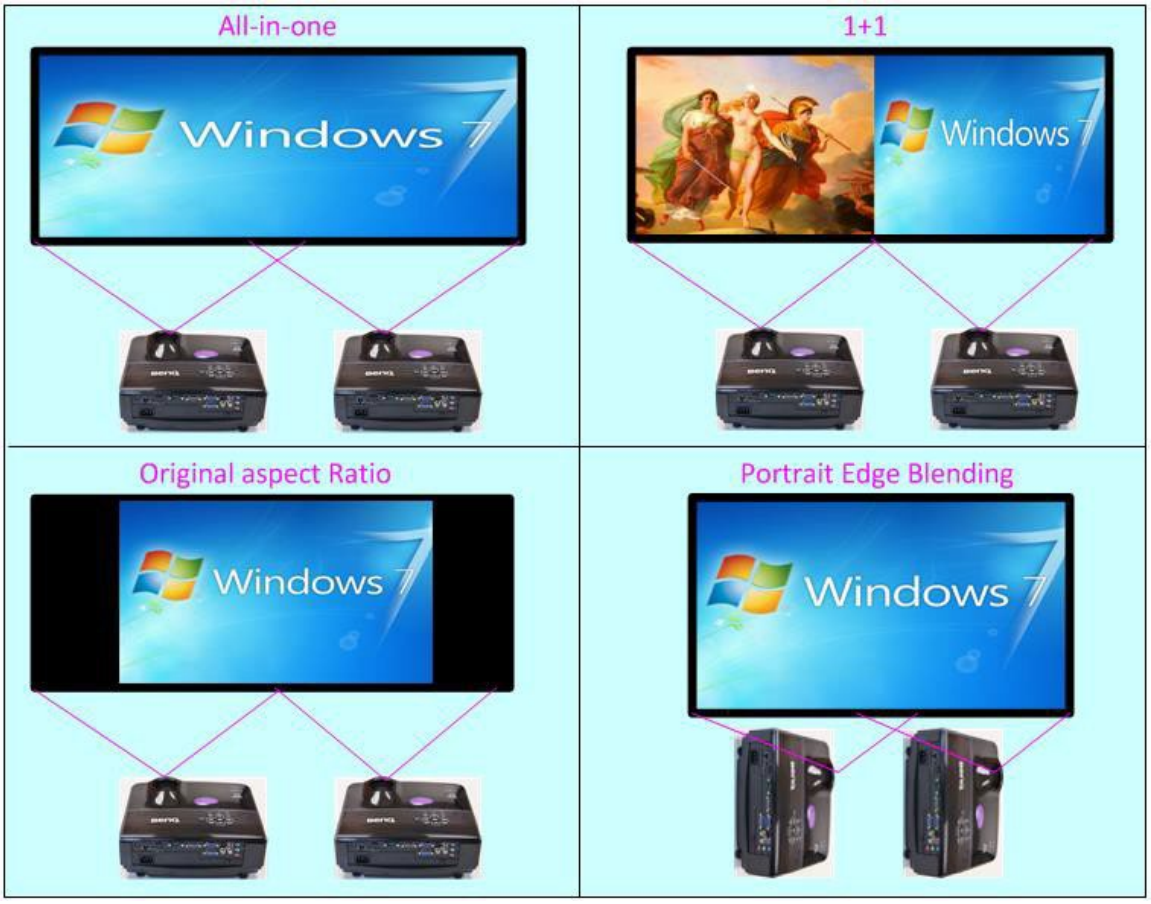
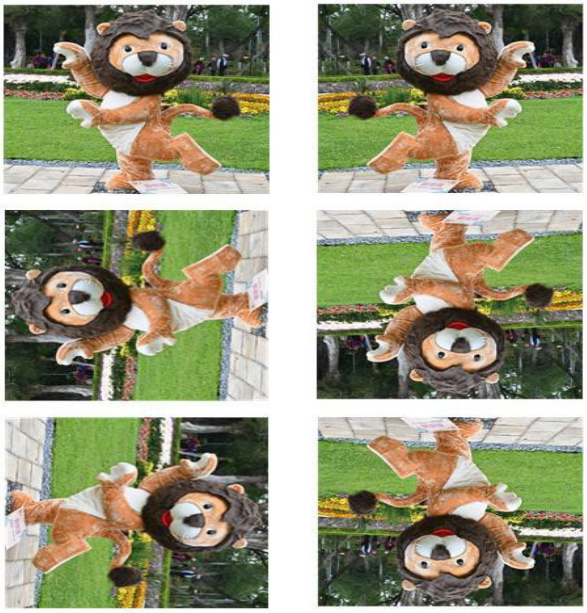
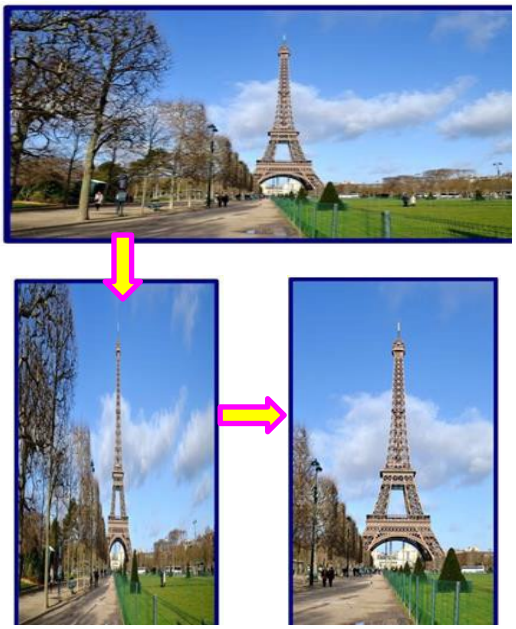


Image Flip & Rotation

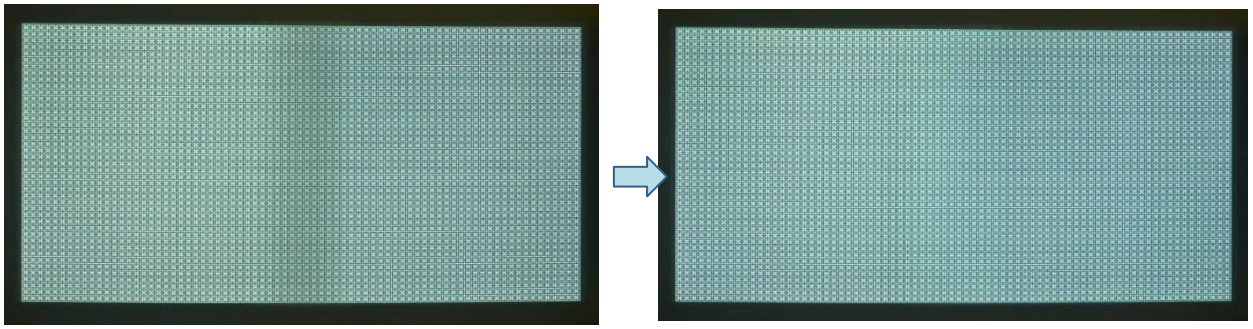
Image 90/270 degrees rotation and flip under 4k/30Hz resolution. Landscape and top/bottom flip support up to 4k/60Hz. After image rotation or flip, user can also adjust the aspect ratio.

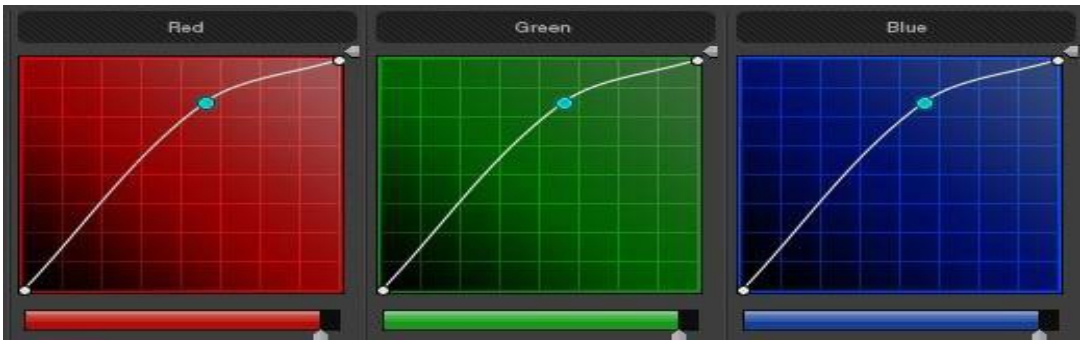




Independent RGB gamma correction

Independent RGB gamma value adjustment in Overlapped region allows more capability to compensate color banding in overlapped region.



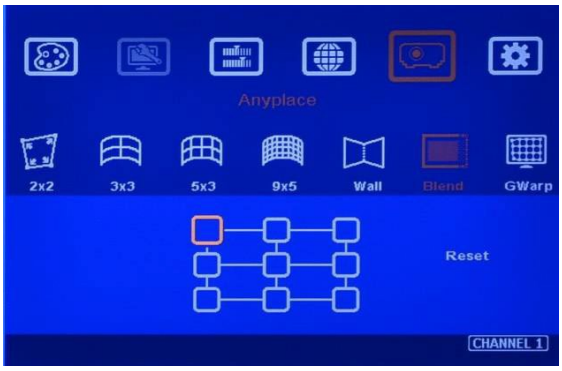


White balance & Color correction

Nine region Black Level Uplift

It can compensate the light leakage in the projectors, especially in low contrast ratio projector under dark working environment. The native contrast ratio is related to projector light leakage and can't be reduced through signal processing. Higher native contrast ratio will have less light leakage. Usually, Laser projector will have high contrast ratio and is the best choice for edge blending system. Separate RGB precise black level uplift can be executed in multiple regions (up to 9) in each output channel at selectable position. 2x2 edge blending system black level uplift can be implemented through 9 regions black level uplif.

Nine regions black level uplift. Each region can set different RGB offset value.



Stretch image and change aspect ratio

Geometry adjustment and Video wall cropping function can compensate image size or change aspect ratio. If adjusting from Video Wall [Overlap] function, the adjusting range is up to +_1800 Px based on source resolution.

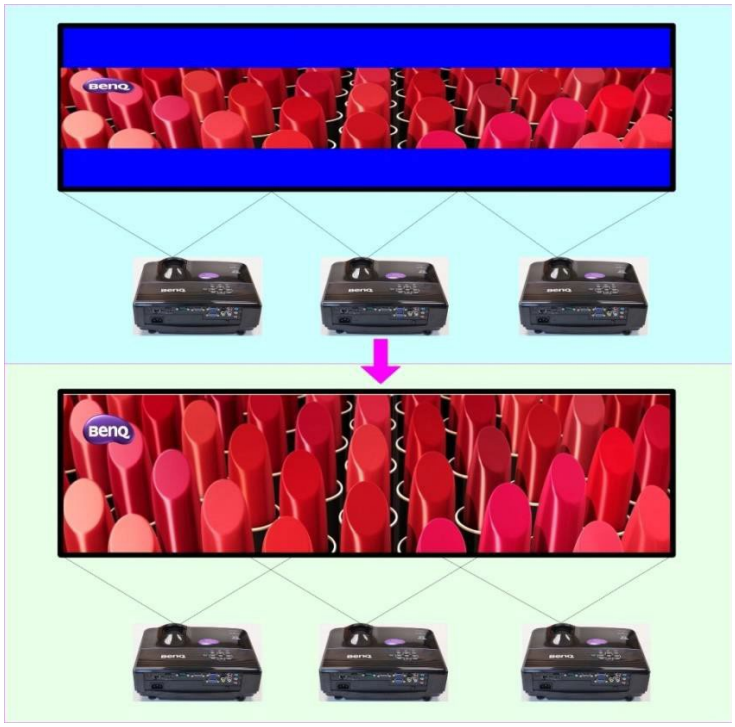


Image stacking to increase the brightness

Edge Mask

There are two edge mask functions in GeoBox. One is image [Shift] and another one is Edge [Mask] under Edge blending menu.

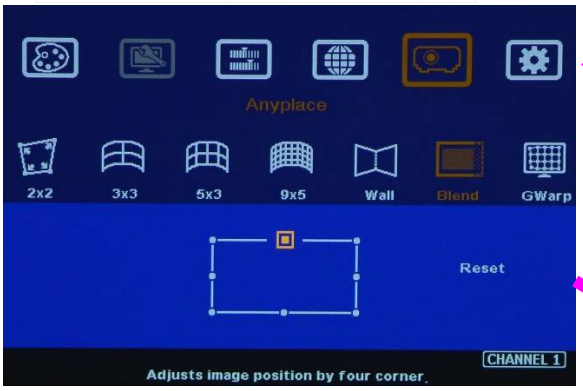
1. [Shift]: Able to do edge mask with black background in each edge up to 500 pixels. The image mask location will follow the image position after geometry alignment.
2. [Edge Mask]: There are 8 control points for edge mask. When user moves the position for each control point it will result many kinds of edge mask pattern. The maximum position adjustment for each control point is +_ 900 pixels.
3. The adjusting range for [Shift] is based on the image position after geometry alignment and the range for [Mask] is calculated from the original edge position before geometry alignment and [Shift] edge adjustment.
4. User can apply both [Shift] + [Mask] at the same time to create more flexible edge mask effect.

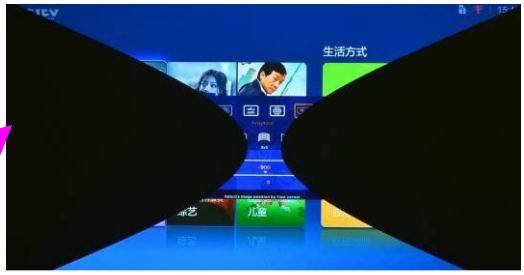
Original Image after geometry alignment

Image [Shift] (Follow geometry curve)

Image [Mask] (executed by 8 control points

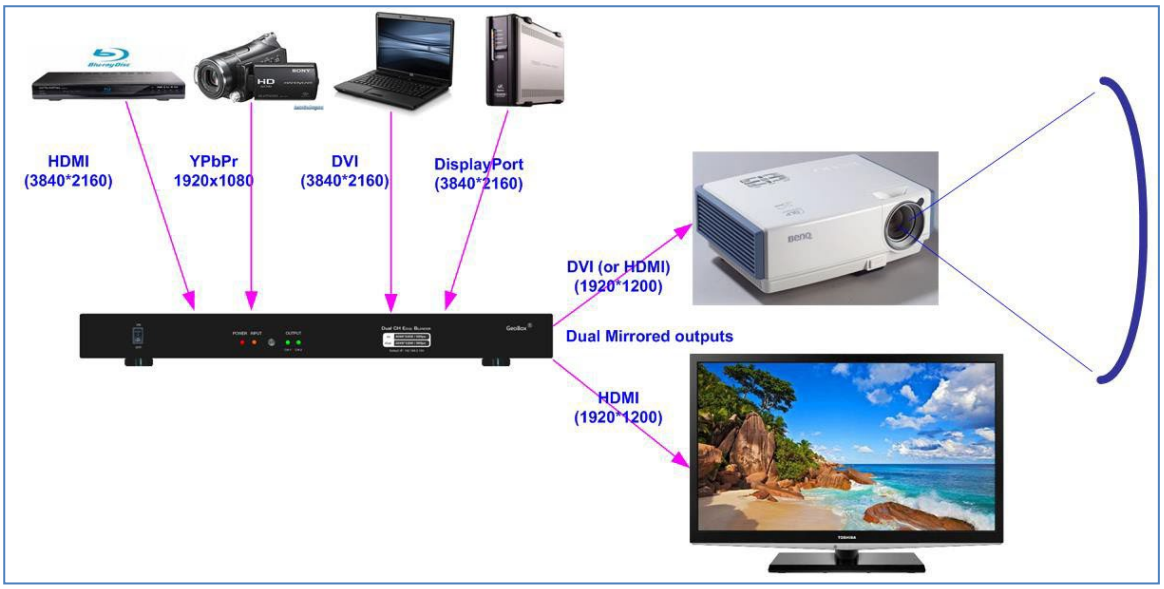
8 point Image [Mask] example





Scaler switcher and format conversion

Two outputs can have different input port, color, geometry, image cropping, rotation angle and output resolution settings for different display devices. Input port can be HDMI, DP and VGA. The output format is progressive RGB via HDMI. Input resolution is up to 7680*1200 @30Hz / 4096*2160 @60Hz with selectable outputs up to 2048x1080 @60Hz.


HDMI
(3840*2160)
YPbPr
1920x1080
DVI
(3840*2160)
DisplayPort
(3840*2160)
DVI (or HDMI)
(1920*1200)
Dual Mirrored outputs
HDMI
(1920*1200)