VNS GeoBox

The absolute opposite of ordinary

G802 Dual Channel Edge Blender Datasheet

Input: up to 4096*2160 @60Hz, 7680*1200 @30Hz 4:4:4
Output: 2048*1080 @60Hz
New generation Warp & Edge blending engine

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Introduction

G802 is a dual channel professional curved screen edge blending processor designed for sophisticated edge blending as well as image warping, stacking, projection mapping…etc.

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 @60Hz 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. User can perform sophisticated geometry alignment and curved screen edge blending through remote controller, WebGui, USB or Ethernet. Maximum geometry control point is 17x17 grids. Linearity Grid Line Adjustment and Corner Wall image adjustment for mapping image at 90 degrees corner is a new function in geometry alignment. Separate RGB gamma correction for edge blending color fine-tune, 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 colour adjustment to get optimized result.
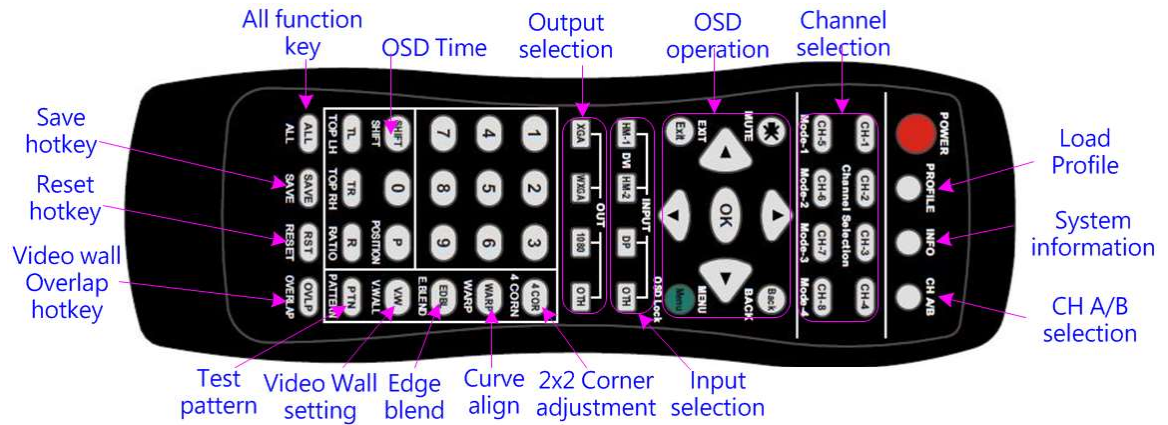
HDMI 2.0 loop out supports daisy chain connection up to 7680*1080 @30Hz and allows large display with multiple units cascaded. Video wall function in G802 is to crop and allocate source image for each projector and set overlap pixels for edge blending. Complete curved screen edge blending can be achieved through remote controller or Ethernet without PC software, video distributor and splitter.

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

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

Dual power supply system is embedded in G802. User can use either AC power 100V-240V power supply or DC 12V 2A power supply with external DC 12V power adapter. When apply AC power supply, user will have one DC 12V 1A output for signal extender. Standard delivery will be packed with AC power cord only.

Save hotkey · Reset hotkey · Video wall Overlap hotkey · All function key · OSD Time · Output selection · OSD operation · Channel selection · Load Profile · System information · CH A/B selection · Test pattern · Video Wall setting · Edge blend · Curve align · 2x2 Corner adjustment · Input selection

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 @60fps, 7680*1200 @30Hz.
- Output: 2x HDMI up to 2048x1080/60 & WUXGA
- 1x HDMI 2.0 loop out ports for multiple unit cascade & daisy chain connection
- Geometry alignment up to 9x5 grid points via remote controller and 17x17 points via PC Tool.
- Maximum geometry adjustment range is up to 1200 pixels in both horizontal and vertical directions.
- Edge blending at 4 edges up to H=1920 pixel, V=1200 pixels with independent RGB gamma correction and 9 areas black level uplift.
- Support Corner Wall adjustment in H&V at flexible location with the same image scaling factor.
- Support Linearity Grid Line adjustment for quick H&V line position alignment.
- Embedded full function video wall function for image split, cropping and overlap pixel setting.
- Support non-VESA standard input timings
- Selectable output up to 2048*1080 60Hz.
- 4:4:4 Chroma sampling, 30 Color bits, 12-bit RGB gamma CLUT
- Support sRGB & xvYCC color processing & 8/10/12-bit deep color
- System settings can be stored and backup.
- Selectable grid pattern size from 8-120 pixels in H&V direction. Default is 32*32 pixels.
- 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.
- 50Hz in/out & frame rate conversion.
- 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
- Phase lock and free-run modes for quicker mode change
- High Dynamic Range (HDR) support: SMPTE ST-2084, SMPTE ST-2086
- 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 degree rotation and flip only available under 4k/30Hz input resolution.
- Embedded HDMI & SPDIF audio outputs
- Selectable and programmable EDID
- 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: max. 11w
- Working environment: 45°C, 10-90% RH
- Control: IR, RS232, WebGui & PC tool for USB & Ethernet
- Dimensions: 440mm*180mm*45mm, Weight: 2.1k*g*
- CE/FCC/RoHS/Green Certified
- 2 Year Warranty, paid extension available up to 5 years

Function and features:

A. Input and output:

1. Input ports: 2x HDMI, 1xVGA, 1x DisplayPort 。
   - HDMI & DisplayPort support 4096*2160 @60Hz, 7680*1200 @30Hz with 4:4:4 sampling without compression. VGA supports up to WUXGA or 205MHz analog input signal.
   - Connect with variable video sources and support none VESA standard input resolution.
2. Output ports: 2x HDMI. Selectable output resolutions: 720x480、XGA、WXGA、1280x1024、1366x768、1400x1050、1600x1200、1920x1080 (24/30/50/60Hz)、2048x1080/60 & 1920*1200/60。
3. Loop out port: 1x HDMI (supports 4096*2160@60Hz & 3840x2400@60Hz)

B. Image warp, geometry alignment and edge blending

1. Selectable grid pattern size for geometry alignment from 8-100 pixels in H&V. Default size is 32*32 pixels.
2. 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.
3. Each unit controls dual projectors and can be cascaded to support unlimited number of projectors.
4. 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 corner + warp adjustment).
5. 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 in full HD output through USB or Ethernet. After finishing geometry alignment, the parameters can be stored inside GeoBox and no more PC tool is needed.
6. Corner wall geometry alignment at 90 degrees corner wall up to 900 pixels adjustment range in H&V directions with up to 1200 pixels position adjustment in horizontal direction.
7. 4 directions edge blending up to H=1920, V=1200 overlapped pixels for flat, curved & cylindrical screens.
8. Independent RGB gamma selection for edge blending color fine.
9. Precise black level uplift at multiple selected areas (up to 9) to compensate light leakage in the projector.
10. White balance and individual color correction for each projector.
11. Fine pixel color uniformity adjustment across entire image.

C. High end 10-bit video processor

1. 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.
2. Complete colour adjustment function, including brightness, contrast, hue, saturation, preset colour mode, independent RGB color adjustment and white balance correction.

D. 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 each control points.

E. Video wall function

1. Image cropping and location assignment for each projector.

2. Overlap pixel adjustments up to +_1800 pixels for image cropping, position shift, bezel compensation, creating overlap region for edge blending and aspect ratio adjustment.

3. Serve as video wall controller for irregular video wall display up to 15x15 matrix display from single input source.

F. Image rotation and flip

Image 90/270 degrees rotation, mirror and flip under 4k/30Hz input. In other conditions, flip and rotation supports up to 4k/60Hz input.

G. System synchronization

There are three synchronization modes:

1. Frame Lock: for multiple output synchronization

2. Phase Lock: Quicker mode change

3. Free-Run: continuous output signal while mode change. No re-searching input source in the projector.

H. System control and other features

1. 1U housing for easy rack installation. Professional design and reliable.

2. Operation temperature: 0-45°C. Relative humidity: 10%-90% non-condensing.

3. Replace high price projector with low cost projector and achieve the same functionality.

4. Full function OSD by IR remote controller.

5. Full function system setup through USB, WebGui or Ethernet (Including through WiFi by Mobile or iPad)

6. Firmware update via USB or Ethernet.

7. Gwarp3 PC tool can control multiple processors simultaneously through USB or Ethernet.

8. Internal grid pattern with selective color for easy geometry alignment.

9. RS232 & Ethernet system control compatible with most of control system.

10. User can select blue or black background color when no input signal is detected.

11. Programmable EDID in the range at H=1024~3840, V=720~2400.

12. BOX ID and programmable IP address for convenient multiple unit control at the same time.

13. User can save up to 5 user settings and can be recalled by remote controller, RS232, USB or network.

14. Automatic power ON/OFF through input signal control. While no input signal is detected, it will shut down output automatically. User can power ON/OFF complete system through the control in signal source.

15. AC & DC dual Power supply systems. Provide DC 12V 1A output for signal extender while using AC.

16. Dimension and weight: 440x180x45mm, 2.1kg (Body only)

Other features

Selectable Grid Pattern for geometry alignment
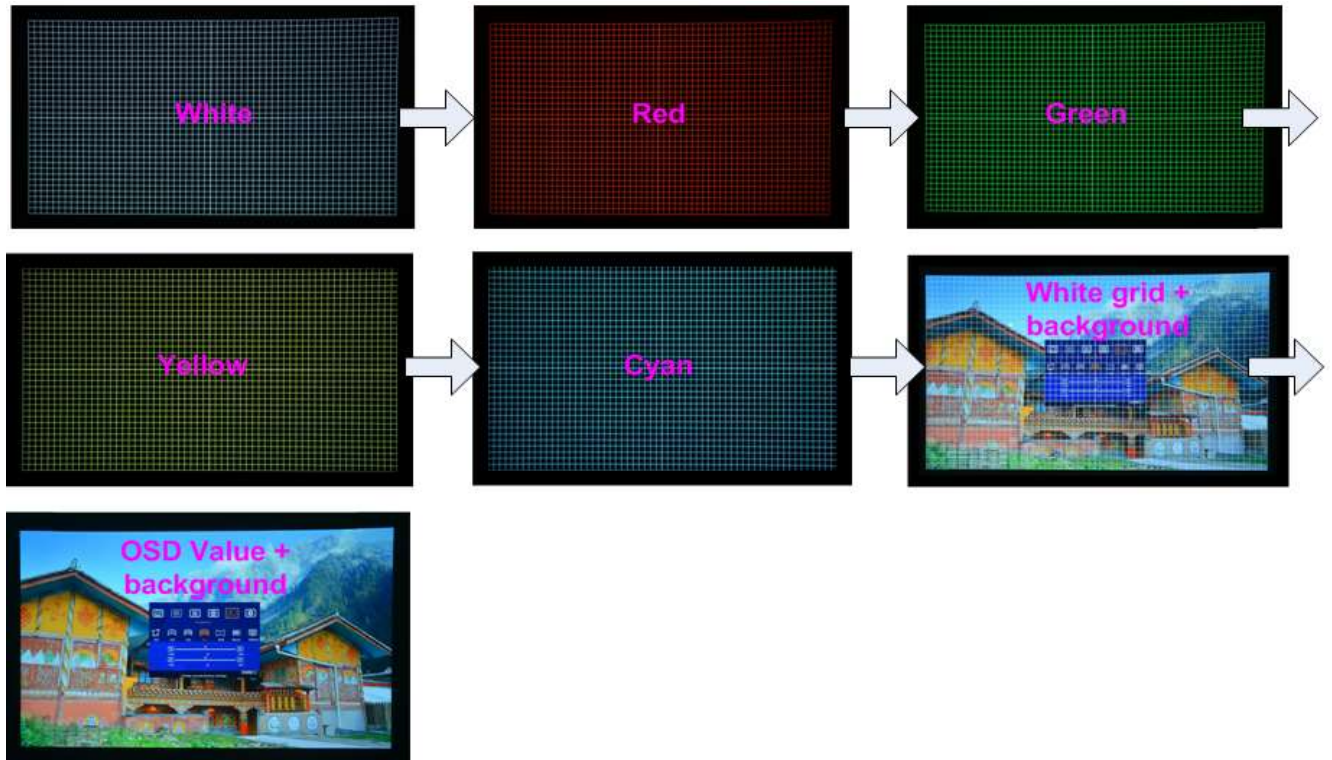
Selectable grid pattern size

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 increase. While select 120 pixel grid size, the grid location will align 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 daisy chain connection

No additional equipment is required.
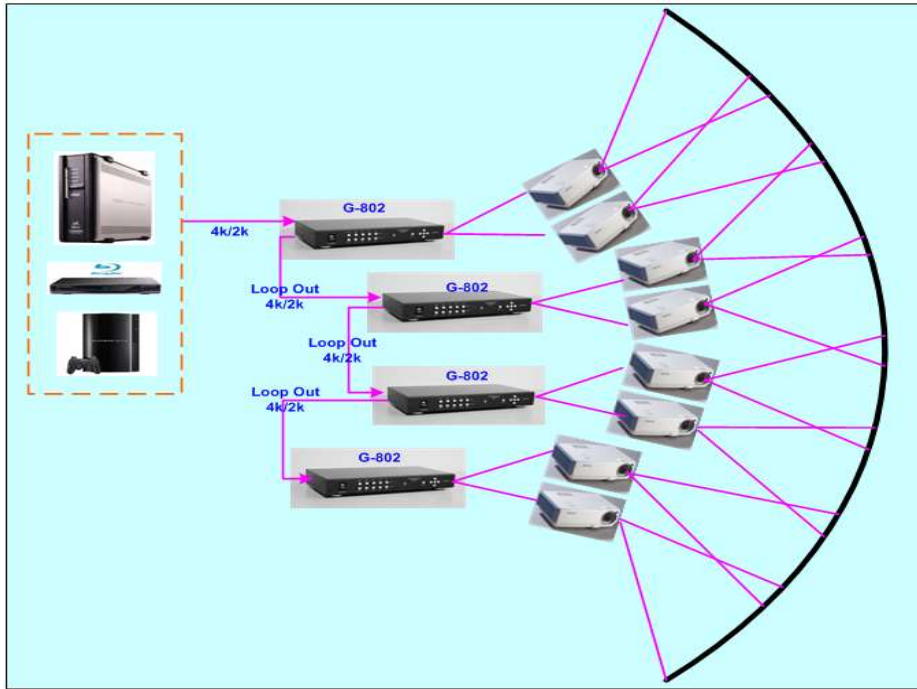
Image geometry alignment and warp
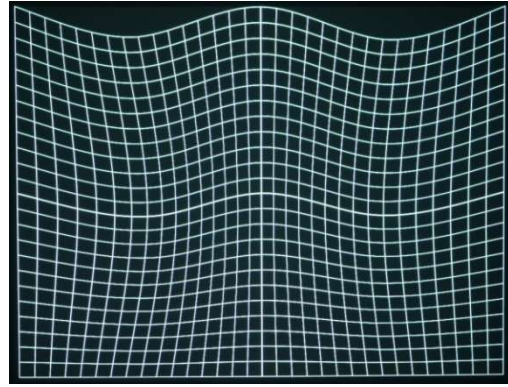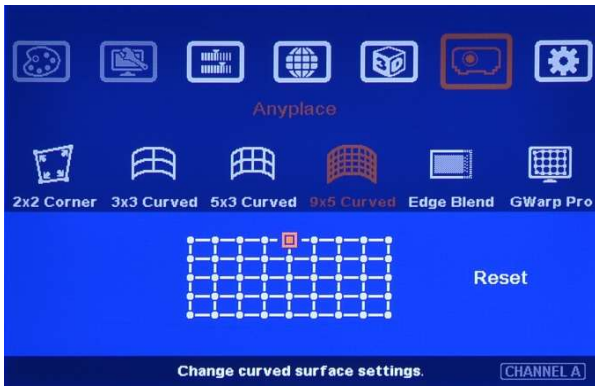
Edge blending on flat and curved screen

Corner wall Alignment & Display

Corner wall alignment function is functional in both horizontal and vertical direction at any location. 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 1200 pixels position adjustment in horizontal direction. Example for horizontal adjustment: the control point can be moved down to 900 pixels and the corner point can be +_1200 pixels away from the center point in horizontal line. Corner position alignment and Edge Blend function are still available with Corner Wall adjustment for easy image mapping and system setup.
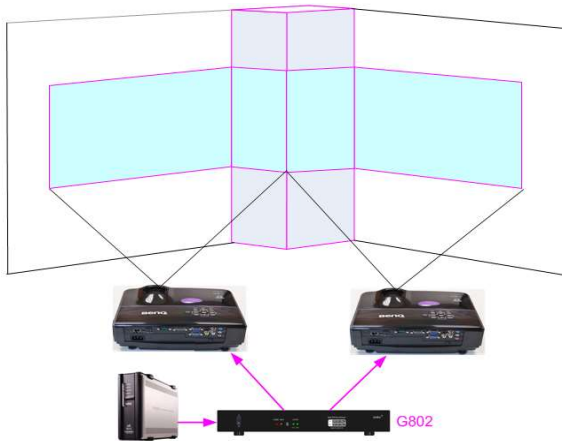
In Horizontal and Vertical directions   **At selectable location but not only at center**

Two projector corner wall application   **Three projector corner wall application**
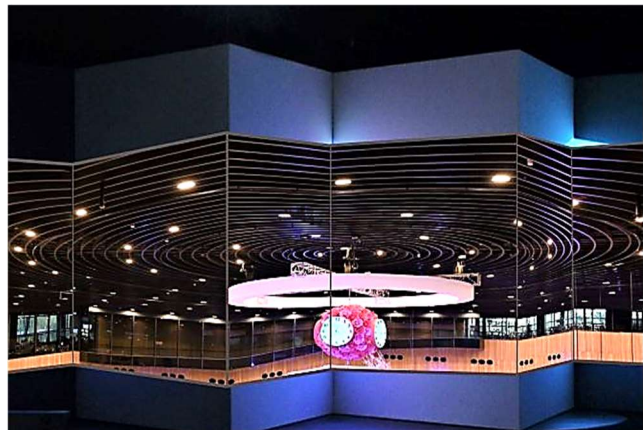
Another corner wall application examples

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.

1. This function can be executed through remote controller and Gwarp3 PC tool and applied to both horizontal and vertical directions.
2. The maximum adjusting points are 3x3 to 17x17 in both horizontal & vertical directions through Gwarp3.
3. If operation by remote controller, the operation OSD menu is under 9x5 warp alignment menu.
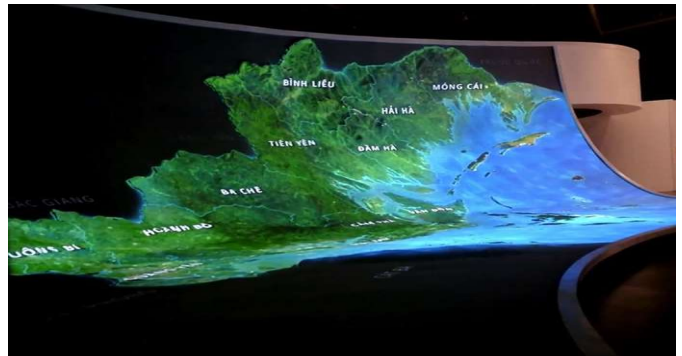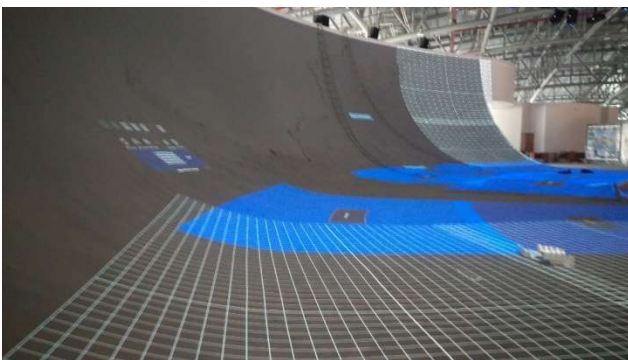4. Linearity line adjustment can be executed together with warp alignment & edge blending at the same time.
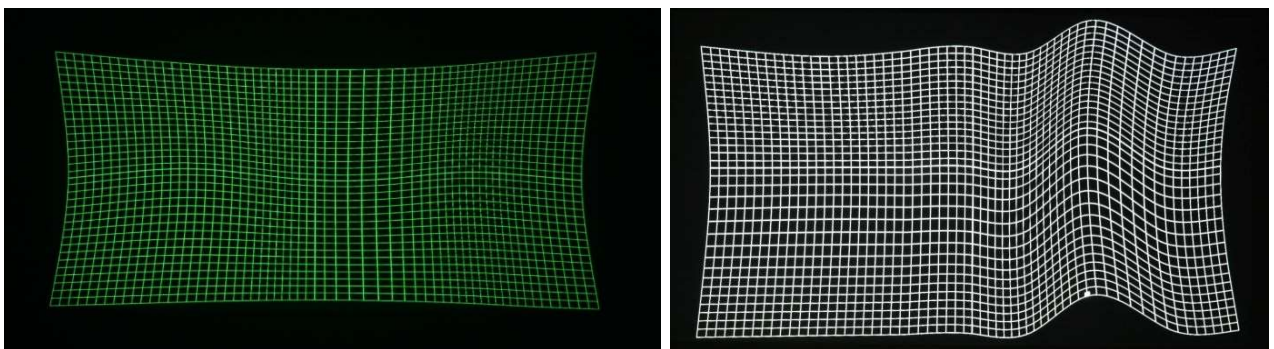
Virtual reality display
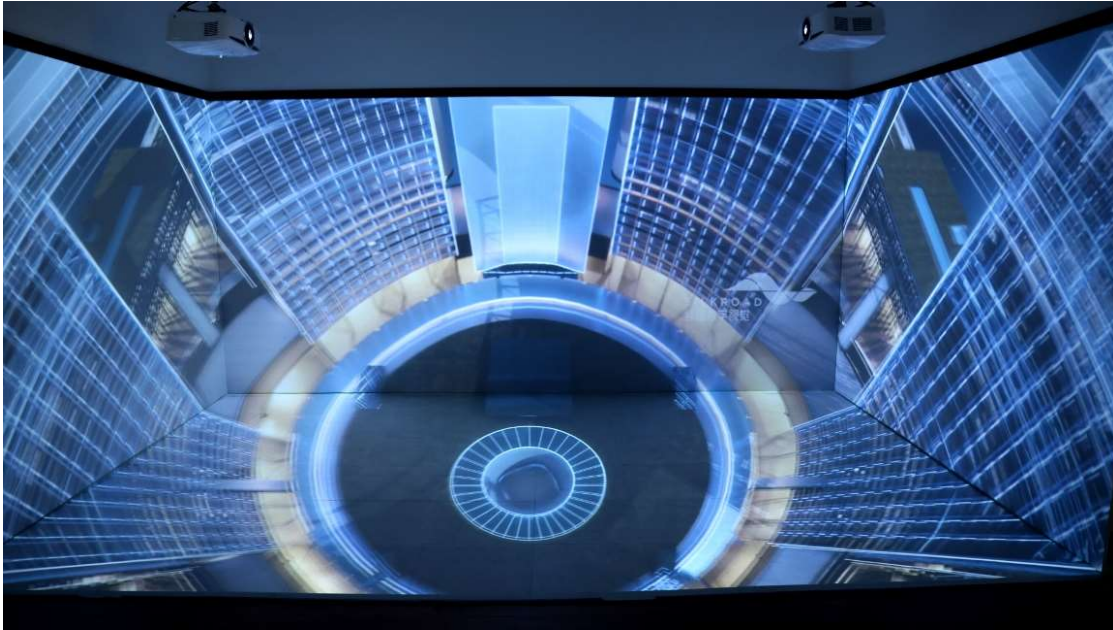
Immersive system with 3 walls and one floor

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 projector at portrait to increase image height.

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.
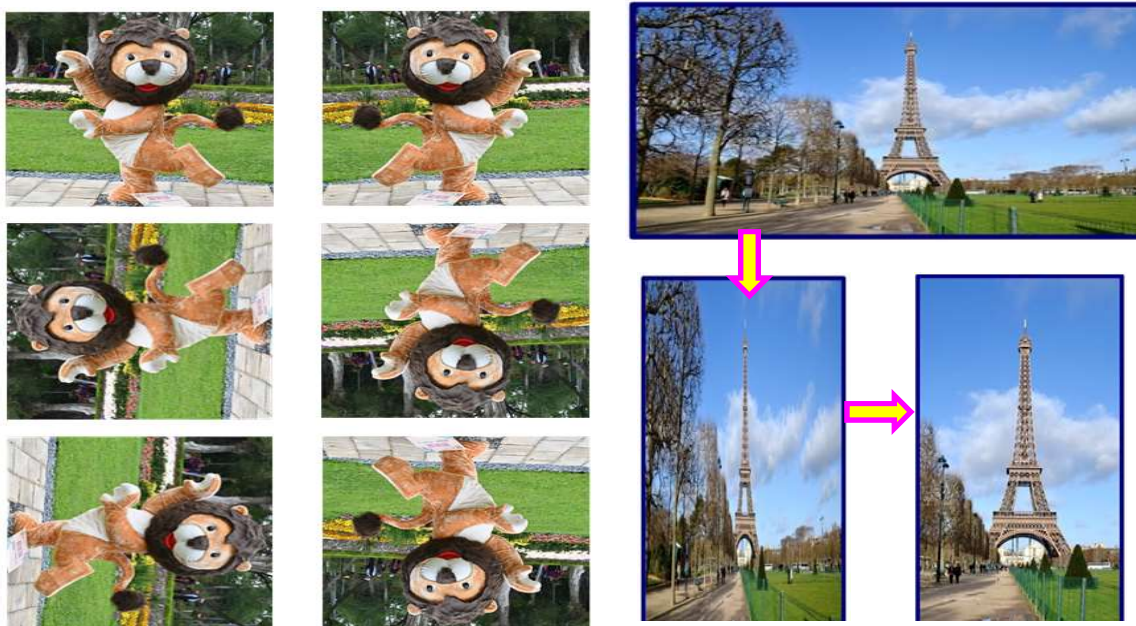
Independent RGB gamma correction

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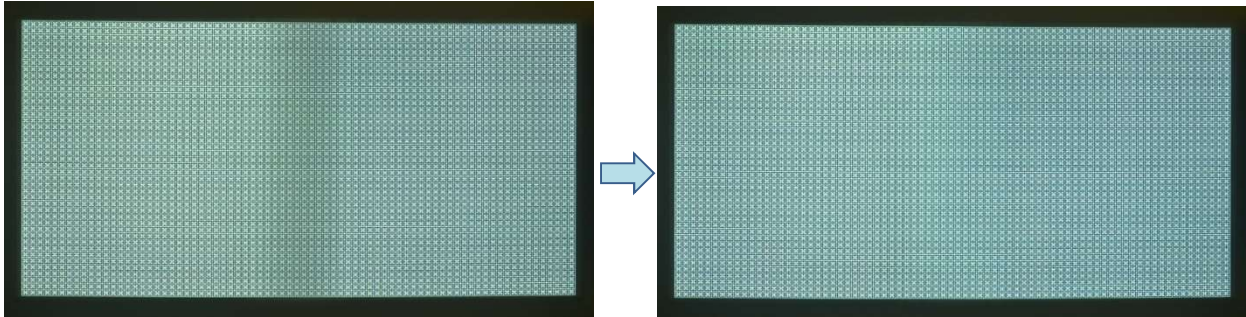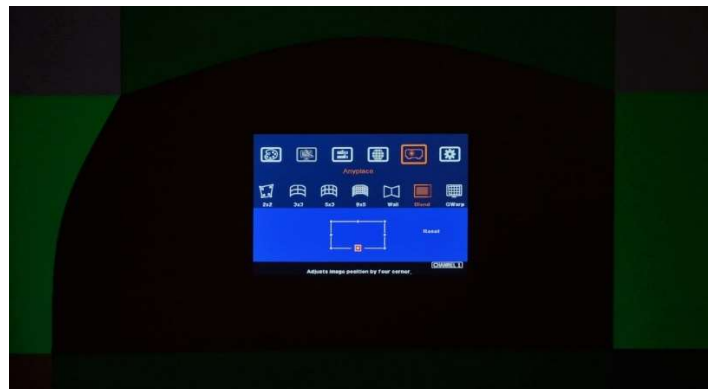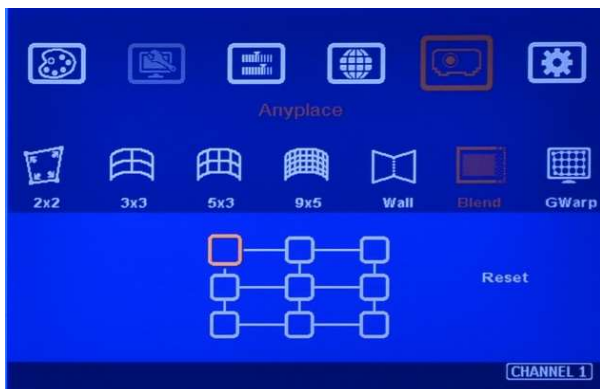

White balance & Color correction

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. 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 evel uplift.

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.
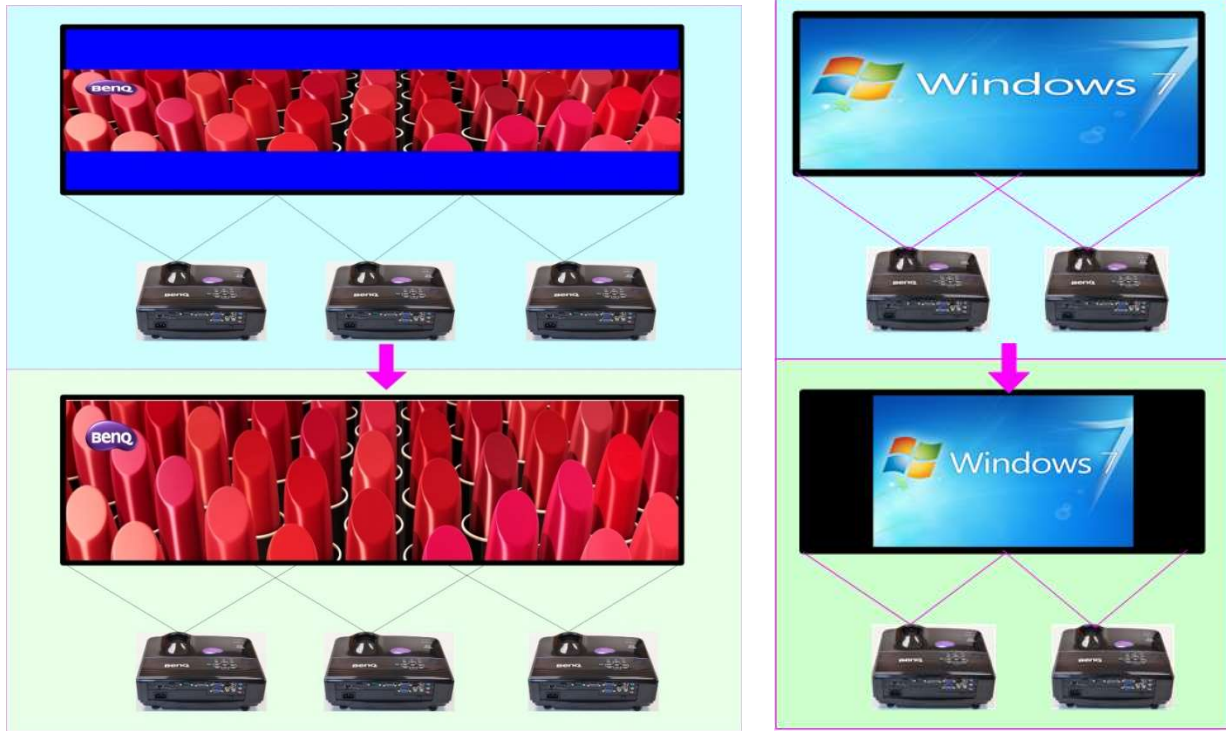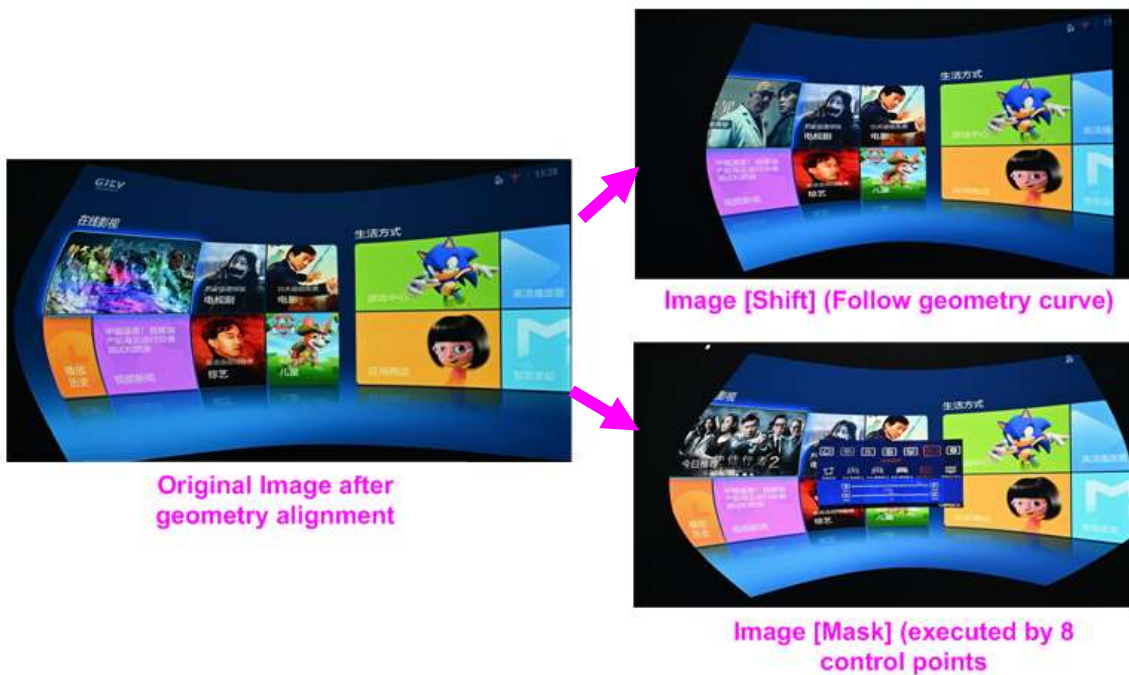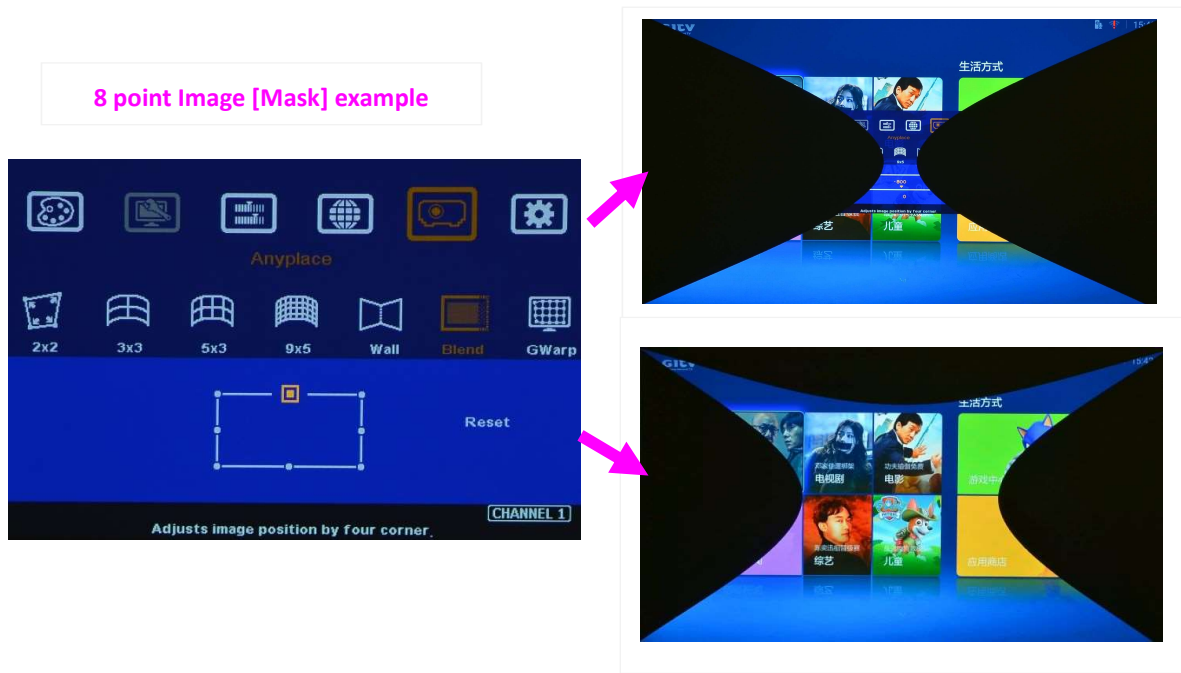
Image stacking

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 settings for different display devices. Input up to 4096x2160 @60Hz with selectable outputs up to 2048x1080 @60Hz.