

GeoBox

UD100 UHD Edge Blender Datasheet

UD101 (1 CH), UD102 (2 CH), UD103 (3 CH), UD104 (4 CH)

The World's First UHD Edge Blender with Multiview Function

Input: up to 7680*2160 @30Hz, 4096*2160 @60Hz, 4:4:4 full color sampling

Output: up to 4096*2160 @60Hz

The new generation 4K warp & edge blending engine, quick
and seamless input swap.

Full functions for edge blending. **No PC or splitter is required.**

Full functions all in one box, simple and easy to use.



Sales & Technical support

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Introduction

UD100 is designed for 4k UHD projector edge blending on flat, curved, and 360 degrees screens with the structure to provide multiple processing modules to control from one to four 4k projectors. UD101 is integrated with one processing module to control one projector, UD102 for 2 projectors, UD103 for 3 projectors, and UD104 for 4 projectors. It is designed for high resolution, sophisticated edge blending, image warping, stacking, and edge mask. UD100 also has MultiViewer function. UD104 can display up to 16 discrete contents through 4 projectors. All GeoBox edge blender can be cascaded for large scale display without PC or additional devices. In 5 projector edge blending system, user can use 1x UD104+1x UD101 or 1x UD102+1x UD103 to achieve the same result.

Each processing channel (processing module) has 3x HDMI 2.0b and, 1x DP 1.4 input port, one HDMI 2.0 output and one HDMI 2.0 Loop through the port. All inputs support up to 7680*2160 @30Hz and 7680*1200 @60Hz input resolution with 4:4:4 full-color sampling. DisplayPort input can support up to 7680*4320 @30Hz. Output supports up to 4096*2160 @60Hz. It is integrated with a 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 timings. Programmable EDID can optimize input timing to get the best video result.

Advanced warp technology is embedded in UD100. Users can use front panel keypads, IR controller, USB, WebGui, and Ethernet to perform edge blending and sophisticated geometry alignment up to 120x68 control points. Linearity Grid Line Adjustment for complete line movement and Corner Wall image adjustment for mapping image at 90 degrees corner are integrated. Separate R, G, and B gamma correction for edge blending region color fine-tuning, individual color correction for each output, and 9 regions black level uplift to compensate for light leakage in the projector are standard functions in UD100. Users can see real-time geometry and color adjustment to get an optimized result.

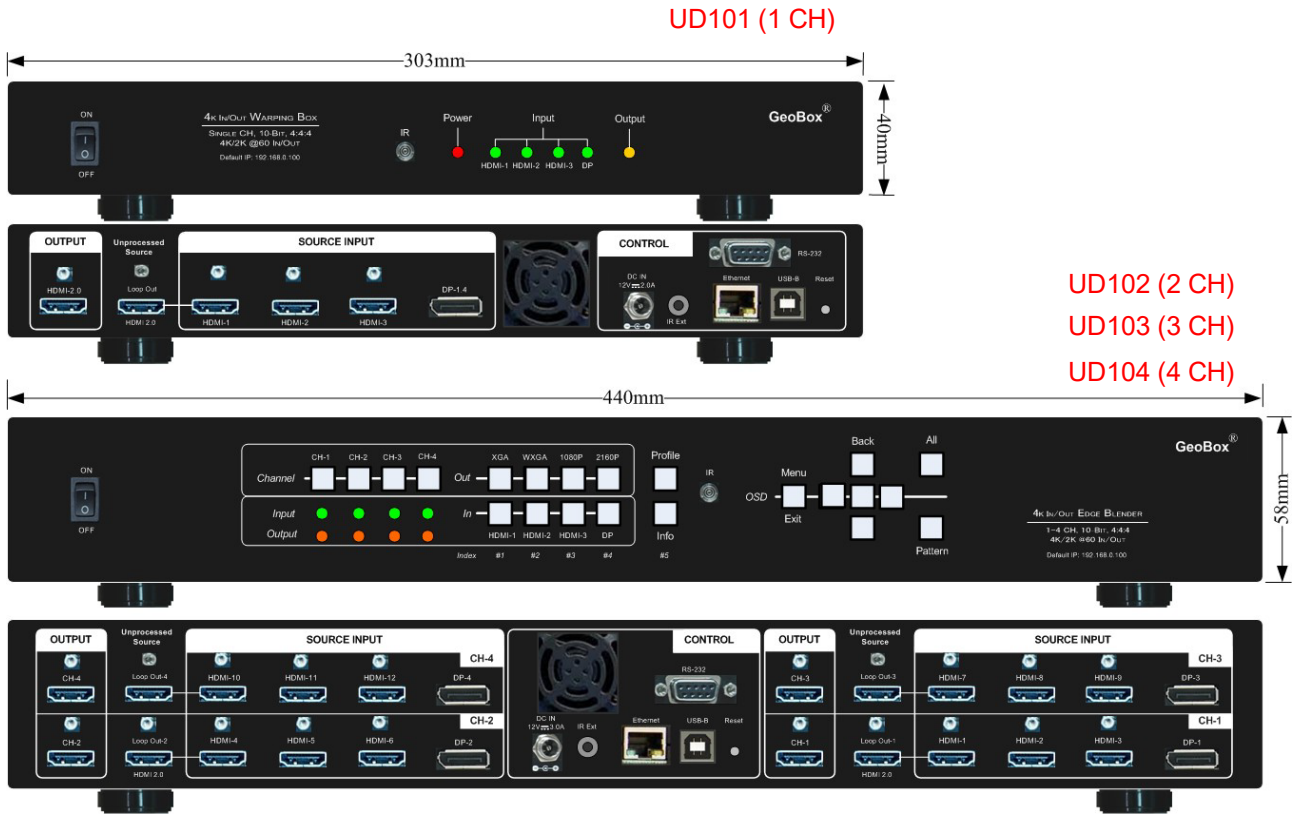
HDMI loop out supports daisy chain connection with the exact input resolution and allows large display with multiple units cascaded. The video wall function crops allocates source images for each projector, and sets overlap pixels for edge blending. Complete curved edge blending can be achieved through the front panel keypad, remote controller, USB, and Ethernet.

PIP (picture in picture), POP (side by side), and 3/4 split view MultiViewer functions are built-in. PIP image size is from 320*180 up to 1920*1200. Quick, seamless main/sub images swap. In one UD104, the user can display multiple windows (up to 16 different input contents) on the screen from one UD104. Image 90/180/270 degrees rotation and flip are embedded in UD100. It provides flexible system configuration.

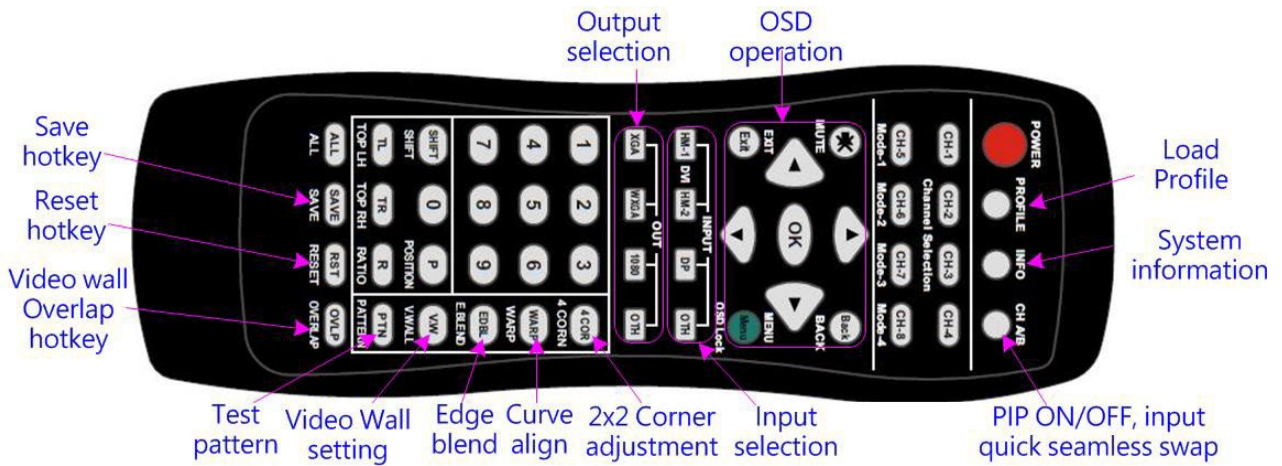
UD100 is an ideal solution for simulation. It can connect with inputs from multiple PCs and combine them into one seamless image. Unnecessary images can be masked out. It also provides flexible displays in an edge blending system. For a 3x projector edge blending system, the user can configure a 1+1+1 independent display, 1+2 (two projectors blended), and all-in-one (three projectors blended). Users can also execute edge blending with a projector at the portrait position without rotating the source image to increase image height. It is a good fit with a laser projector without limitation in installation angle.

Using UD100, 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, and cost-effective, reliable, and flexible solutions.

Outlook



(This back panel shows 4 CH model--UD104)



Specification

- Each model has 1-4 processing modules.
 - UD101: a single processing module
 - UD102: dual processing modules
 - UD103: 3 processing modules
 - UD104: 4 processing modules
- Each processing module includes:
 - Input: 3x HDMI 2.0b, 1x DP1.4, input can be seamless switching within processing module.
 - Output: 1x HDMI 2.0
 - Loop output: 1x HDMI 2.0b for audio, monitoring, and daisy chain connection.
- HDCP compliance: Input: HDMI: HDCP V2.2/V1.4, DP: HDCP: V1.3, Output: HDCP V2.0/V1.4.
- Max. input resolution: DisplayPort: 7680*4320 @30Hz, HDMI: 7680*2160 @30Hz, 7680*1200 @60Hz, 4096*2400 @50Hz, 4096*2160 @60Hz. Max. pixel clock: 600MHz.
- Input supports progressive and interlaced RGB/YUV signal, 4:4:4 Chroma sampling, up to 30 Color bits.
- Support non-VESA standard input timings for easy connection with various signal sources.
- 16 preset Outputs: up to 4096*2160 @60Hz, progressive 4:4:4 RGB. Max. pixel clock: 600MHz.
- 1:1 pixel to pixel native image display with original quality.
- 2 frames system latency: 33ms (@V=60Hz)
- Warp engine for geometry alignment up to 120x68 control points.
- Maximum geometry adjustment up to 1200 pixels in both H&V directions for each corner.
- Support W shape Corner Wall adjustment in H&V directions up to +_1200 pixels.
- Support Linearity Grid Line adjustment for quick H&V line position alignment. It is good for the line gap adjustment on curved screen display.
- Edge blending at 4 edges up to H=1920 pixels, V=1200 pixels with independent RGB gamma correction.
- 9 regions black level uplift to compensate light leakage from projector optical system.
- Edge Mask following the result of geometry alignment up to 500 pixels.
- Edge Mask with 8 control points up to 900 pixels (1800 pixels when output resolution is 4k/2k) at each control point in H&V directions.
- Embedded video wall function for image allocation, split, cropping, edge blending overlap pixel setting and aspect ratio adjustment.
- Selectable geometry alignment grid size from 8-120 pixels in H direction. Default is 32*32 pixels.
- Selectable grid pattern color with optional transparency to allow user to apply external test pattern.
- Flexible aspect ratio adjustment in each edge up to +_1800 pixels position shift.
- OSD menu location is adjustable.
- 10-bit processor, 3:2/2:2 cadence, low angle smooth algorithm, high quality scaling engine.
- 3D motion adaptive de-interlace.
- Passive 3D: Decode 3D input signal into RH/LH eye frame output for passive 3D display.
- 3D format conversion: Convert Line interleaved, Frame packed 3D signal into Side by Side, Top/Bottom and frame sequential output format for passive 3D and active 3D displays.
- Frame lock function to get perfect synchronized outputs in multi-unit application.
- Frame rate conversion and 50Hz in/out function to eliminate image frame drop or repeat.
- Support xvYCC & 8/10/12-bit deep color processing.
- Automatically support HDR 10 input signal processing with SDR full color RGB 4:4:4 output.
- Individual color and white balance adjustment in each processing channel.

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- 90/180/270 rotation, flip, cropping, scaling & color adjustment up to 4k/2k 60Hz input signal. User can do more rotation angle fine-tune through geometry alignment.
 - PIP/POP function with PIP image size from 320*180 up to 1920*1200 resolution with flexible position and adjustable aspect ratio. 2/3/4 split view is integrated within each channel.
 - Selectable and programmable EDID in the range: H=1024-4080, V=720-3840.
 - User can save up to 10 settings and recall by front panel keypads, remote controller, RS232, USB or network.
 - ESD Protection: ±8kV (Air-gap discharge), ±4kV (Contact discharge)
 - Working environment: 45° C, 10-90% RH
 - Control: keypads, IR, RS232, USB, Ethernet
 - System settings can be stored and backup in PC.
 - CE/FCC/RoHS Certified
 - Power supply: DC 12V 2A-5A
 - 30 month Warranty
 - Max. Power consumption: UD101: DC 12V/1.1A, 13.2W, UD102: 12V/2.1A, 25.2W, UD103: 12V/3.1A: 37.2W UD104: 12V/4.1A, 49.2W
 - Dimensions and weight (Body only):
Without protruding parts: UD101: 303mm*190mm*40mm, 1.2kg
UD102-104: 440mm*190mm*58mm, UD102: 2.5kg, UD103: 2.7kg, UD104: 2.9 kg

Function and features

A. Structure

Each UD10x consists of 1-4 processing modules. UD101 is integrated with one processing module to control one projector, UD102 for 2 projectors, UD103 for 3 projectors and UD104 for 4 projectors. Multiple UD100 can be cascaded to control big scale display system.

B. Input and output

Each processing module has below Input/Output ports:

- Input: 3x HDMI 2.0b (600 MHz), 1x DisplayPort 1.4 (1080MHz)
 - Support 7680*2160 @30Hz, 7680*1200 @60Hz/4096*2160 @60Hz with 4:4:4 chroma sampling.
 - DisplayPort input supports up to 7680x4320 @30Hz input resolution.
 - Connect with various video sources and support none VESA standard input resolution.
 - Support progressive and interlaced input signals.
 - Seamless switching function within each channel is possible.
- Output ports: 1x HDMI2.0b (Max. 600 MHz). Preset output resolutions: 1024x768, 1280x720, 1280x800, 1280x1024, 1360x768, 1400x1050, 1600x1200, 1920x1080 (50/60Hz), 1920x1200 (30/60Hz), 3840x2160 (30/50/60Hz), 4096x2160 (50/60Hz).
 - Loop out port: 1x HDMI 2.0b, same as source signal from nearby HDMI input port up to 8k/2k (2k/8k) @30Hz / 4096*2160 @60Hz.
 - All outputs are RGB 4:4:4 progressive signals.
 - Selectable 8-bit/10-bit Deep Color mode for each output port.
 - Automatically detect and process HDR B T. 2020 input signal and output with full color 4:4:4 RGB SDR signal.

C. Image geometry alignment and warp

- Test pattern grid size for geometry alignment is from 8-120 pixels in H&V. Default is 32*32 pixels.
- With full functions for quick 4 corner alignment, vertical and horizontal keystone correction, Pincushion & Barrel adjustment, image warp and 90/180/270 degrees rotation and flip.
- Each channel controls one projector and can be cascaded to support unlimited number of projectors.
- Integrated with full function IR remote controller. Manual geometry alignment via Remote controller up to 120*68 control points.
- GCT PC tool is available for warp and geometry alignment up to 17*9 control points through USB or Ethernet. After finishing geometry alignment, the parameters can be stored inside PC or GeoBox. No more PC tool is needed.
- Geometry adjustment range:
 - Geometry alignment range is based on keystone angle in horizontal and vertical direction. The maximum geometry alignment range is about 40° horizontal keystone and 35° vertical keystone in combination of all geometry alignment, including 2x2 and warp alignment.

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- 2x2: each control point (4 corners) can be moved up to H=+_600 pixels and V=+_600 pixels. It is about H=600/3840 and V= 600/2160 position shift when the output is 4k/2k output resolution. If the output resolution is 1920*1080, it will have bigger keystone angle. The adjustment range will be still about H=+_600 pixels and V=+_600 pixels before image crush. It is about H=600/1920 and V= 600/1080 position shift.
 - 3x3: each control point (total 9 control points) can be moved up to H=+_600, V=+_600 pixels. If user applies both H&V adjustment, the range will be lower.
 - 2x2 and 3x3 can be executed at the same time but the combination of the geometry alignment will be limited to H=+_1200 pixels and V=+_1200 pixels for each control point.
 - When user applies both H&V direction geometry alignment, the adjustment range may be reduced. User will see abnormal display (some noise or image crush). While the image is crushed, user can return the adjustment value or adjust adjacent control points to let the image back to normal.
 - The major geometry alignment should be done through 2x2 and 3x3. Other warp function such as 5x3, 9x5, 17x9 and 120x68 alignments are for position fine-tune purpose only. Geometry alignment shall follow 2x2→3x3→5x3→9x5→17x9→120x68 sequence. If user executes 120x68 and back to 9x5, only 9x5 warping data will be kept.
 - 2x2 is independent and it can combine warp result in 3x3, 5x3, 9x5, 17x9. However, it will reset 120x68 grid point warp result and only keep up to 17x9 warp result.
 - If user executes geometry alignment to some extent with 2160P output resolution and switch back to 1080p output resolution, the image may crush due to bigger geometry alignment angle. If switch from low output resolution to high input resolution, the image will not crush.
 - W shape Corner Wall geometry alignment: up to 1200 pixels adjustment range in 12 control positions at H/V directions. The image distortion range at wall corner depends on the throw ratio of the projector. Longer throw ratio will have less image distortion and easier for Corner Wall alignment. W shape corner adjustment can correct the image in both sides of the pillar at wall corner.
 - Linearity grid line adjustment: User can use this function to move the position of a group of vertical lines or horizontal lines simultaneously. The major purpose is to move complete line position or smooth the gaps in image horizontal or vertical lines in curved screen display. Usually, user will see smaller grid line size at both sides of the curved screen. User can use this function to let all grid lines with the same gap quickly.
 - Embedded test pattern grid size is editable from 8-120 pixels in both H&V directions.
 - User can select different color in the test pattern and can also apply external test pattern from signal source.

D. Edge blending

- Four direction edge blending up to H=1920, V=1200 overlapped pixels for flat, curved & cylindrical screens.
- Independent RGB gamma selection for edge blending color fine.
- White balance adjustment to correct background color in each projector.

E. Black level uplift

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

F. High end 10-bit video processing

- 10-bit high end processor with 3D motion adaptive de-interlace, low angle smooth algorithm and 3:2:2 film mode detecting and recovery function.
- Complete color adjustment function, including brightness, contrast, hue, saturation, preset color temperature and independent RGB gain adjustment.

G. PIP/POP, MultiViewer

- [PIP]: Picture in Picture display with any two inputs in each channel.
- [SBS]: Side by Side display.
- [Top/Bottom]: Top/Bottom display.
- [SBS 2/1]: 2/3:1/3 side by side display with monitor at landscape position
- [POP3]: One image at LH side and two top/bottom images at RH side in landscape monitor.
- [POP4]: One image at Top and two images at bottom in landscape monitor.
- [3X SBS]: Three split views at landscape with the flexibility to adjust center image size from 1/6 to 5/6 of horizontal size.
- [3X T/B]: Three split views at portrait with full screen or original aspect ratio selection.
- [4x Split]: Four split view multi-viewer. (Monitor at landscape only)
- [4x T/B]: Four split view with one image at top and three small images at bottom.
- PIP (picture in picture): with flexible PIP size (320*180 to 1920*1200), location and aspect ratio.
- Except [4x split] & [4x T/B] functions, all the other PIP/POP functions can support monitor at portrait and landscape position. Sub- images also support rotation and flip up to 4k/2k 60Hz.
- Cropping function is available in PIP and POP image for further location, size and aspect ratio adjustment as well as creating image borders with black or blue color.
- Main and sub-image color can be further adjusted to get optimized video quality.
- All the inputs for main and sub-images can be up to 4k/2k 60Hz 4:4:4 signals.

H. Native 1:1 image display mode

When single content is displayed on the screen, user has below choices for the display:

- [Full screen]: to display the content with full screen. The image will be scaled to full screen no matter the input is with what kind of aspect ratio.
- [Original AR]: to display content with original aspect ratio. If 4:3 input content is displayed on 16:9 monitor, it will keep 4:3 image aspect ratio with vertical full screen on the monitor.
- [1:1]: to display native pixel to pixel image at the center of the screen. When XGA image is displayed on 16:9 monitor, it will show up pixel to pixel XGA image at the center of the monitor without scaling to

keep original image quality.

- Further image cropping and aspect ratio adjustment is still available

I. Quick PIP ON/OFF and two input seamless swap

- User can use remote controller [CH A/B] hotkey to turn ON/OFF PIP image.
- If the output resolution is set to FHD or 1920x1200, user can assign one input signal to main and another signal to PIP channel and execute quick input seamless swap through this function.

J. Video wall function

- Image cropping, split and location assignment for each projector.
- Video Wall overlap functions up to +_1800 pixels in H&V direction in each edge for below functions:
 - Image cropping and position adjustment.
 - Set overlap pixel for edge blending.
 - Aspect ratio adjustment.

K. Image rotation and flip

- Image 90/180/270 degrees rotation, flip and mirror up to 4k/60Hz input resolution.
- Image flip in Front/Rear, Left/Right and Top/Bottom directions.
- No 3D motion adaptive de-interlace function while the image is 90/270 degrees rotated. Please apply progressive signal to get the best video quality.

L. Edge Mask

Image [Shift] to execute edge mask up to 500 pixels following the image profile after geometry adjustment and [Edge Mask] with 8 adjustment points to provide irregular shape edge mask with random edge position up to 900 pixels in each control point. These two functions can be executed at the same time.

M. 3D functions

- Passive 3D: Decode 3D input signal into RH/LH eye frame output for passive 3D display.
- 3D format conversion: Convert Frame packed, Line interleaved input signal into Side by Side, Top/Bottom and frame sequential output signal for passive 3D and active 3D displays.

N. Various color adjustment

- Independent R.G.B color gain adjustment.
- Preset color temperature: Standard, Reddish, Bluish
- Brightness, contrast, Hue, saturation and sharpness adjustment.
- Under Edge blending, user can execute separate RGB white balance adjustment.

O. System control and other features

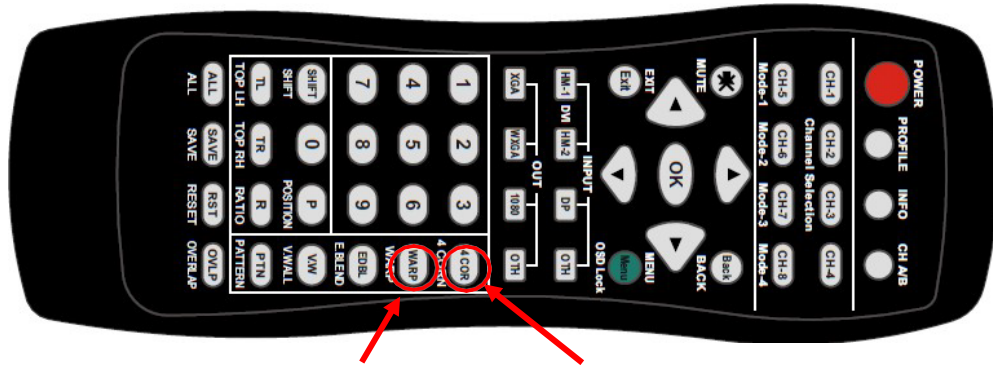
- Full function OSD through front panel keypads, WebGui or IR.
- Firmware update via USB or Ethernet.
- GCT PC tool can control multiple processors simultaneously through USB or Ethernet.

- RS232 & Ethernet control system compatible with most of control system.
- User can select blue or black background color when no input signal is detected.
- Programmable EDID in the range at H=1024-4080, V=720-3840.
- BOX ID and programmable IP address for convenient multiple unit control at the same time.
- User can save up to 10 settings and can be recalled by remote controller, RS232, USB or network.
- System settings can be backup in PC, USB device and copied to another unit.
- Automatic power ON/OFF through input signal control. While no input signal is detected, it will shut down output automatically. If it detects input signal again, it will automatically output signal to display devices. User can power ON/OFF the system through the control in signal source.

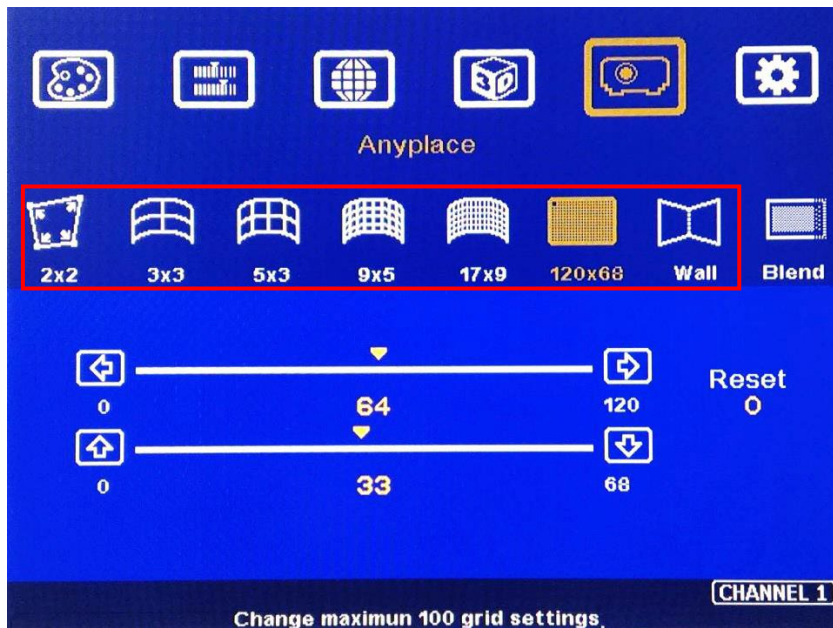
Feature illustration

A. Geometry alignment menu

- User can execute geometry alignment through remote controller, OSD, WebGui or PC tool.
- The control point is 120x68 with remote controller & PC Tool.

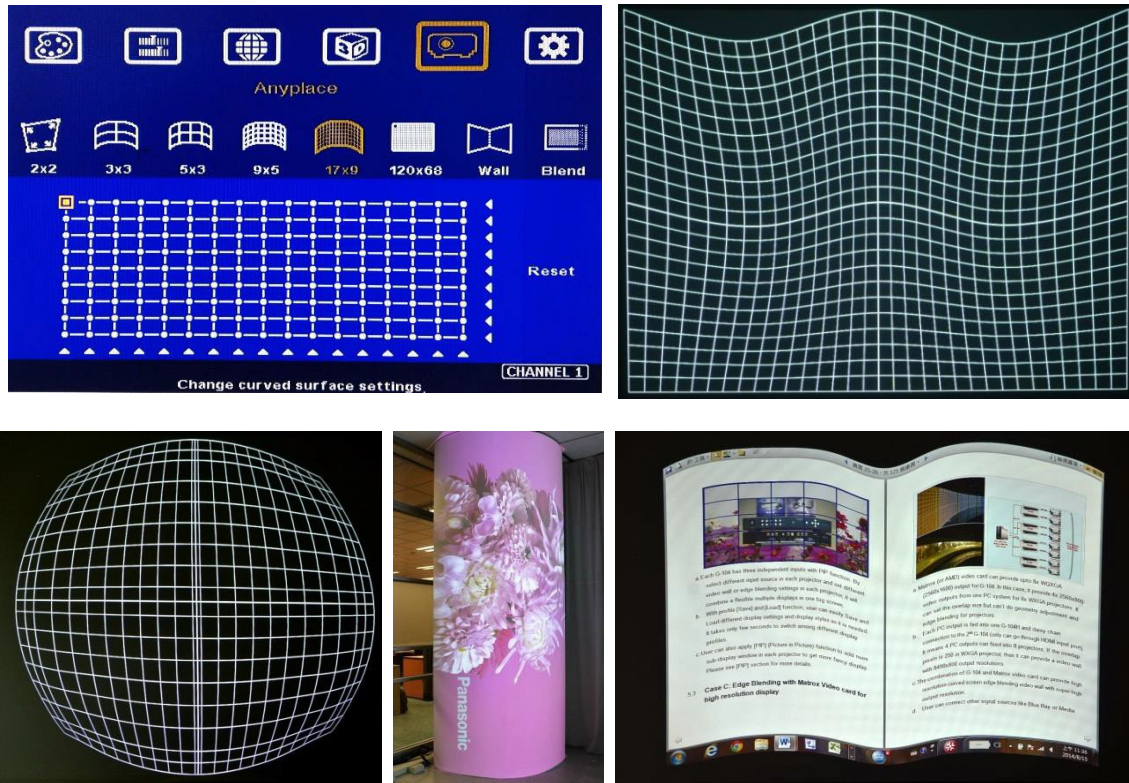


[3x3], [5x3], [9x5], [17x9], [120x68] Warp hotkey [2x2] 4 Corner alignment hotkey



B. Image geometry alignment and warp

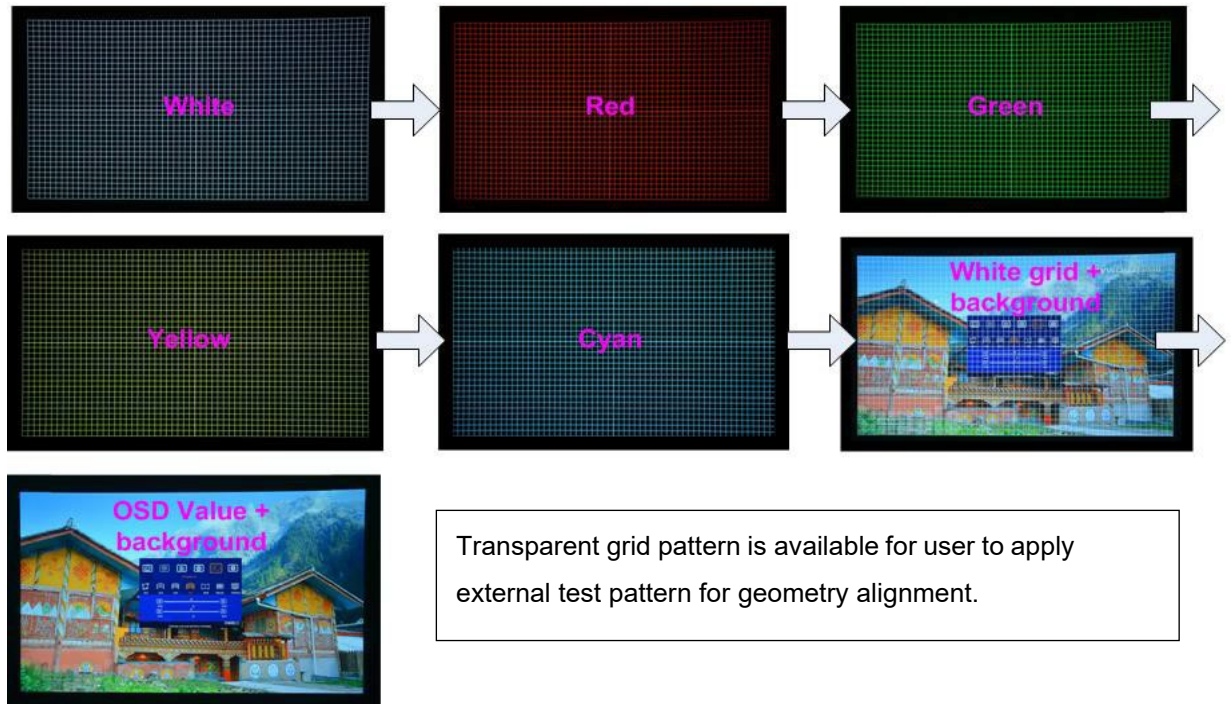
User should follow [2x2]→ [3x3]→ [5x3]→ [9x5]→ [17x9]→ [120x68] sequence to do geometry alignment to get smooth scaling factor in the image in all regions.



C. Variable Grid Patterns for geometry alignment

Grid pattern is required for geometry alignment. User can activate test pattern through [Pattern] hotkey in remote controller or through WebGui and GCT PC tool.

- The default grid size is 32*32 pixels. User can select different grid size from 8-120 pixels. Each channel can be set separately.
- There are 6 pattern styles for user to select. When user presses [Pattern] key, it will circulate from [White]→ [Red]→ [Green]→ [Yellow]→ [Cyan]→ [White grid + background]→ [OSD menu + Background]
- If user wants to apply his own test pattern, please select the last transparent pattern mode to show up user pattern.
- User can select different pattern color for each projector while doing image geometry alignment.
- User can see geometry adjusting value when select [Background + OSD] display style.



D. Selectable grid pattern size for geometry alignment

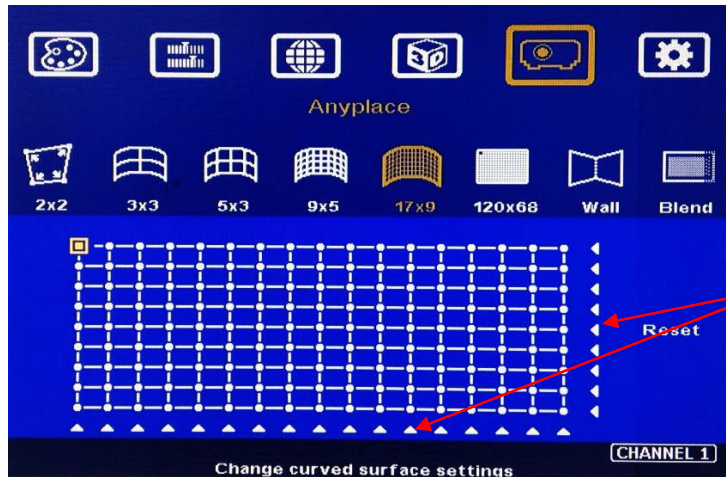
- The grid size in both horizontal and vertical directions is from 8 to 120 pixels with 1-pixel increasement. H&V grid size will be the same.
- Default grid size for both H&V directions are 32x32.



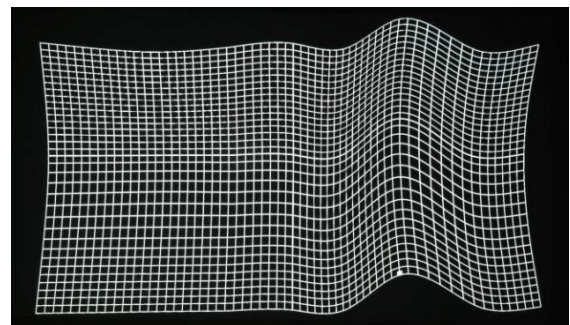
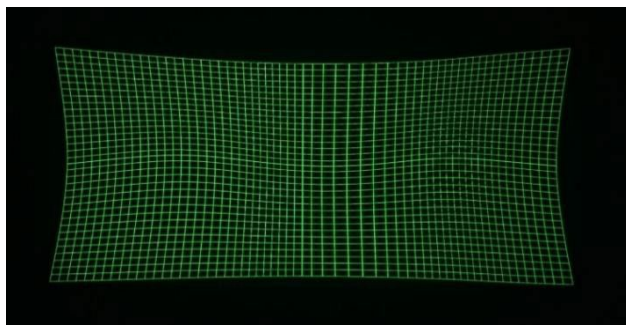
E. Linearity grid line adjustment

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 make complete image with the same scaling factor. This function can be executed only through OSD menu operation.

1. It can be applied to both horizontal and vertical directions.
2. The operation OSD menu is under [3x3], [5x3], [9x5] & [17x9] warp alignment menu. The result can be further adjusted by PC tool for image position fine tune.
3. Linearity grid line adjustment can be executed together with warp alignment at the same time.

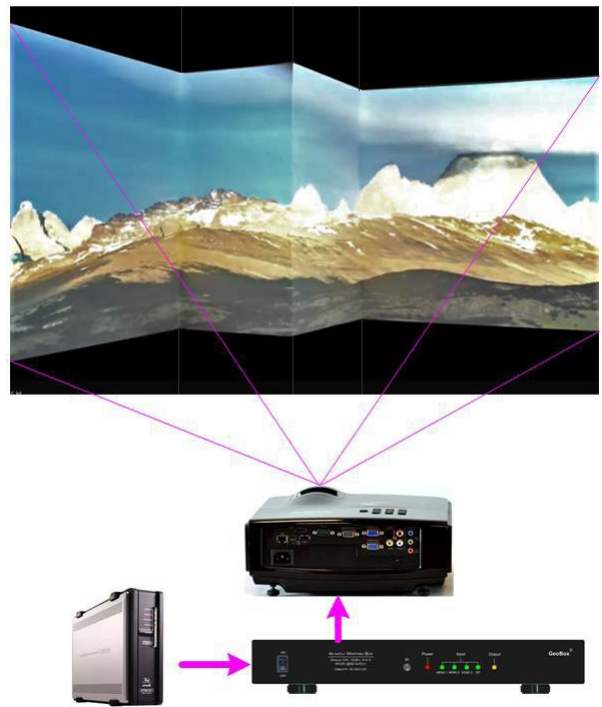
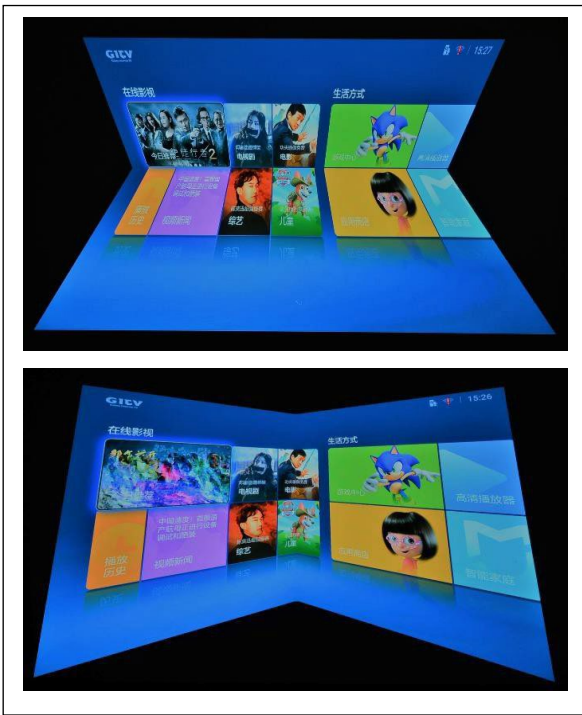
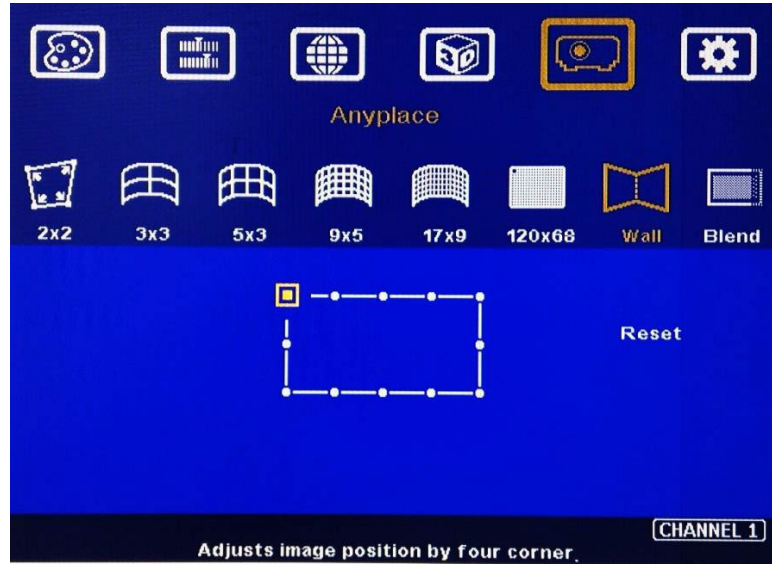


Control points for Linearity Grid
Line Adjustment at H&V



F. W shape Corner wall Alignment

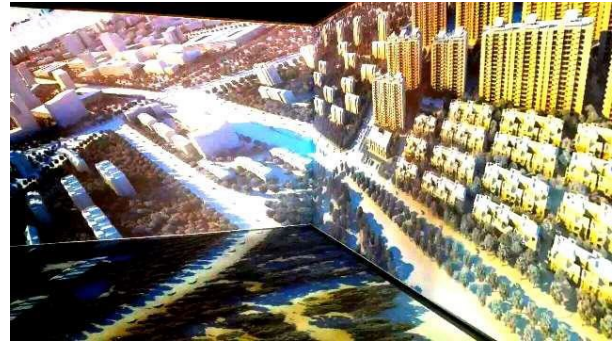
- Corner Wall alignment function is functional either in horizontal or vertical direction. 12 control points across entire edges are integrated. Corner Wall geometry alignment range up to ± 1200 pixels in each control point in H&V directions. 4 Corner position alignment is integrated in these 12 control points. The function is similar to 4 corner geometry alignment to let complete image shift position with the same scaling factor. The other 8 control points are for geometry alignment for the corner wall image. Edge Blend function are still available when user implements Corner Wall adjustment. Other geometry alignment and Warp function will be disabled when Corner Wall alignment is enabled.
- W shape Corner Wall alignment can correct the image on both sides of the pillar at wall corner.



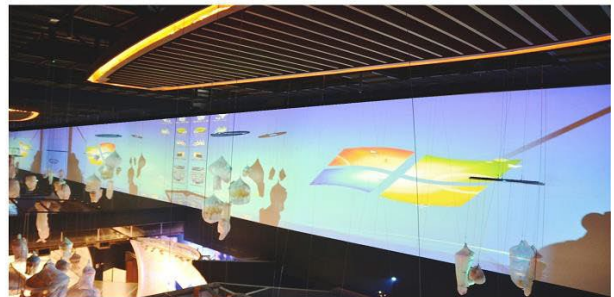
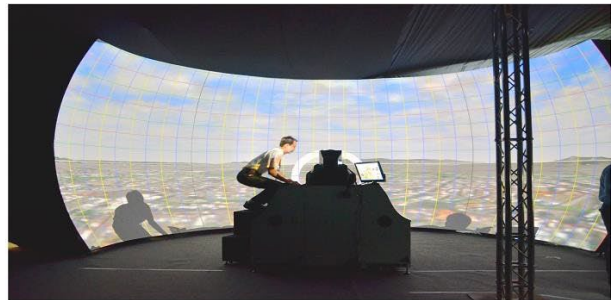
Three projector Corner Wall application



Another Corner Wall application examples

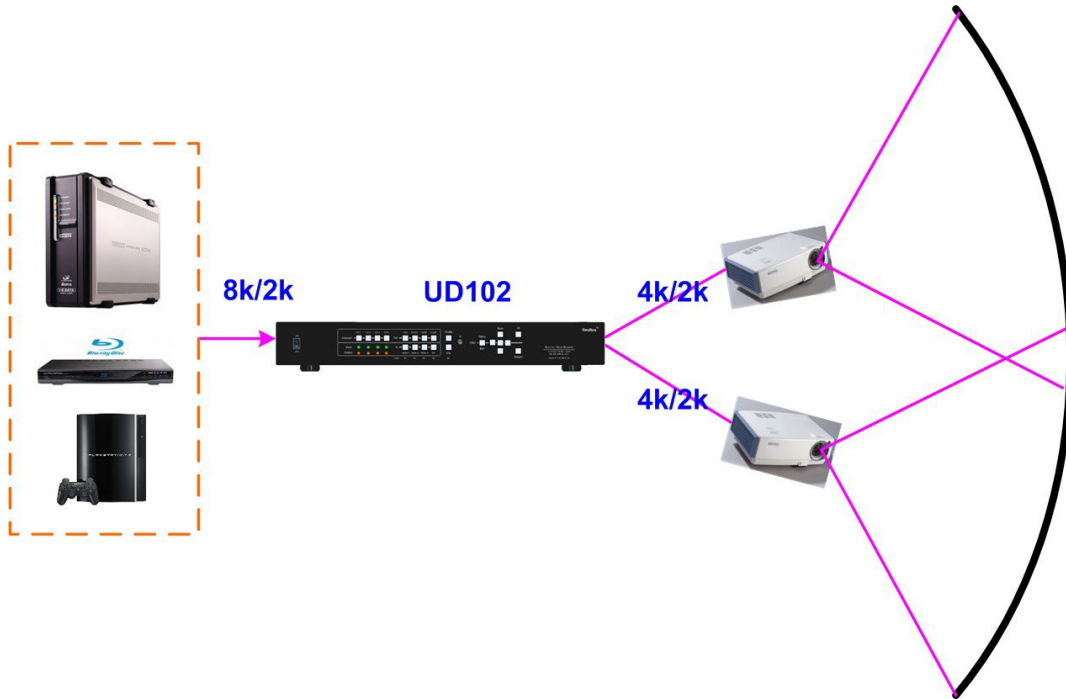


Edge blending on flat and curved screen

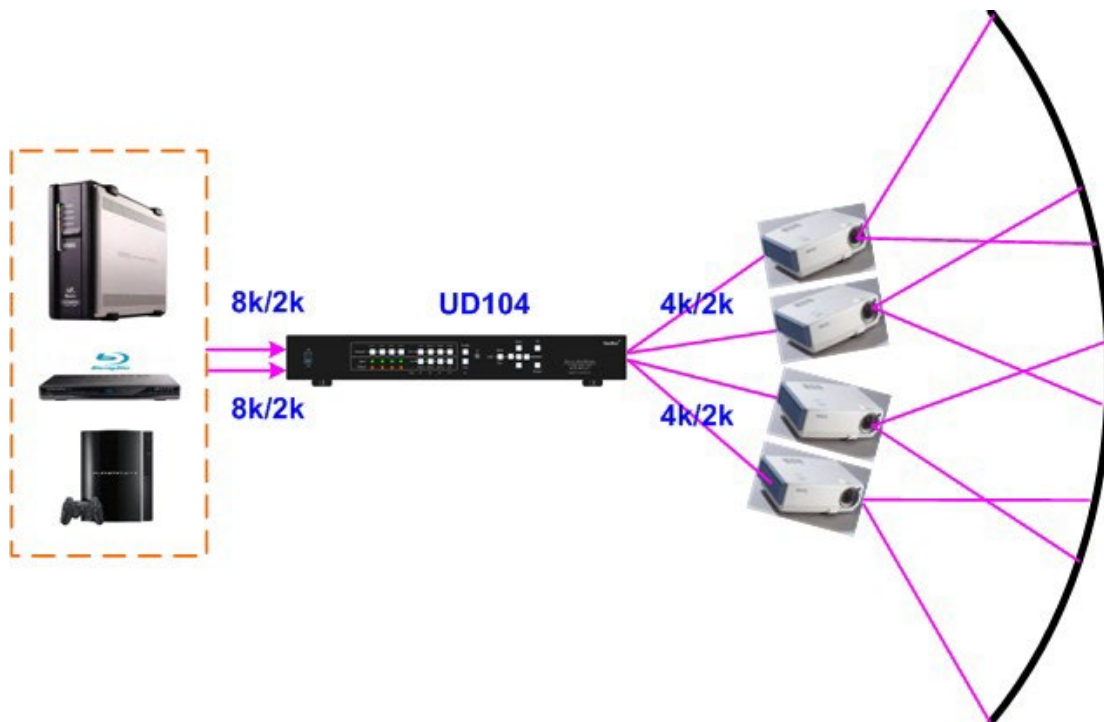


G. System connection

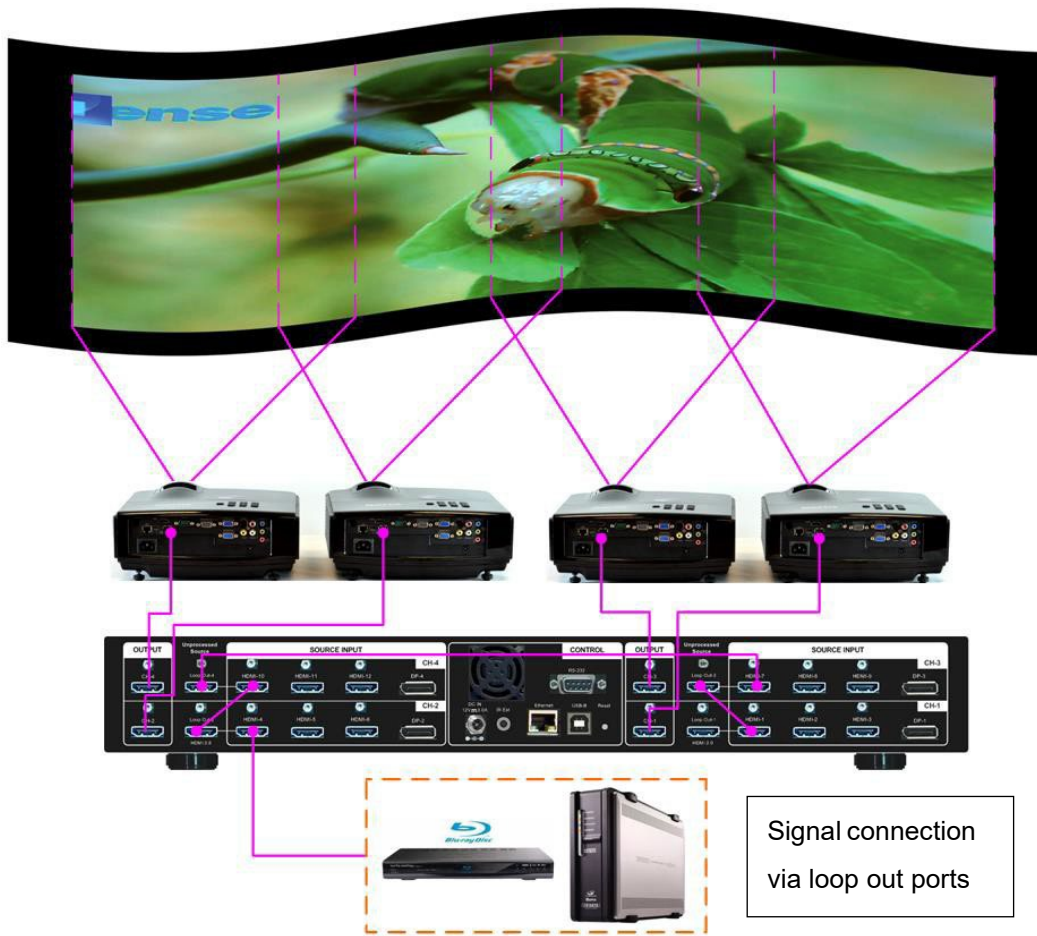
True 8k/2k Edge blending with two 4k projectors (Total resolution: 7680*2160)



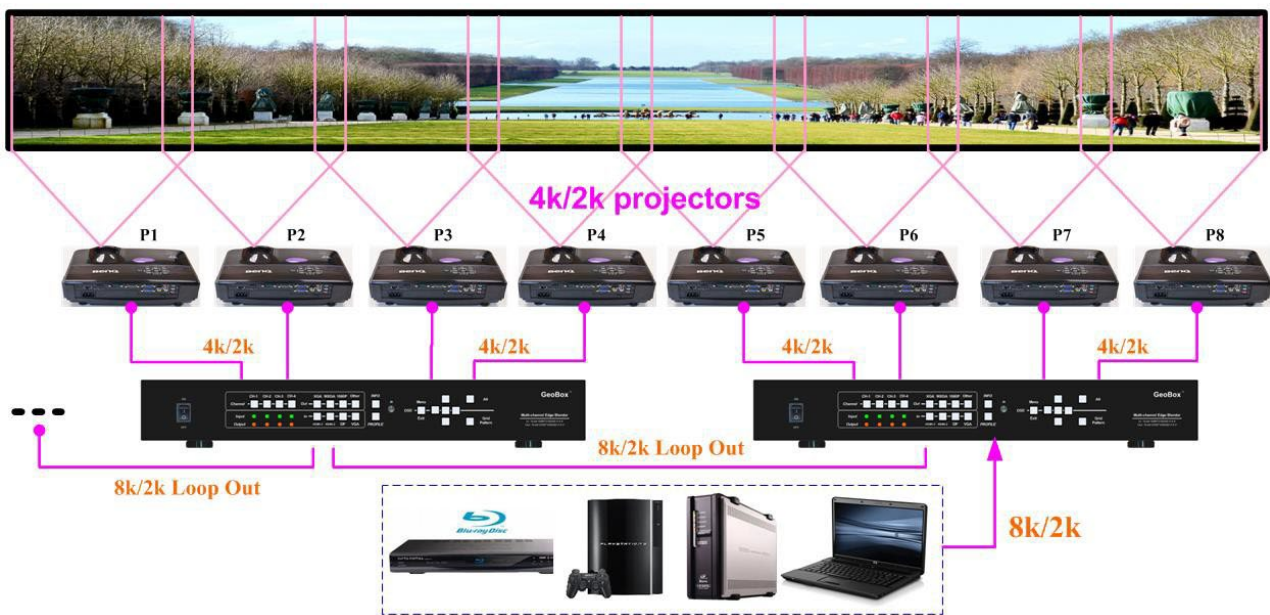
8k/2k Edge blending with four 4k projectors (Total resolution: 15360*2160)



Detailed system connection



Multiple Unit cascade connection



H. Immersive display

Immersive system with 3 walls & one floor



I. Big scale display



J. Flexible display

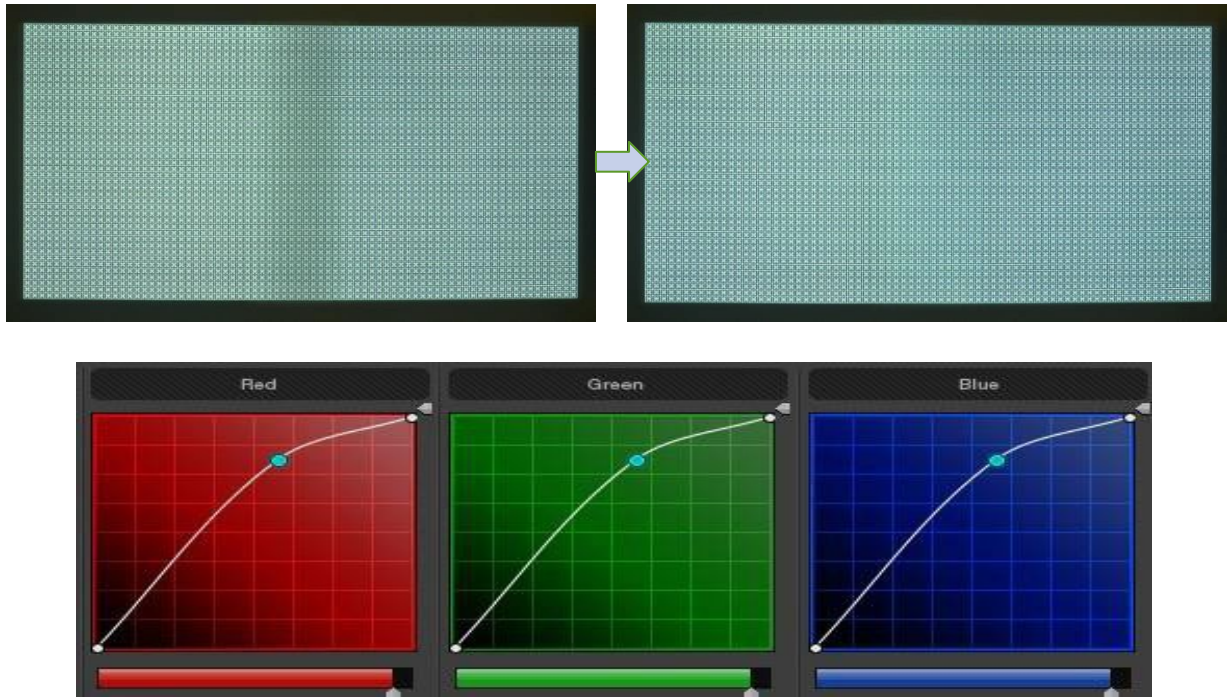
One UD100 has below flexible display functions:

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.
5. PIP/POP in each projector.



K. Independent RGB gamma correction for edge blending color fine-tune

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



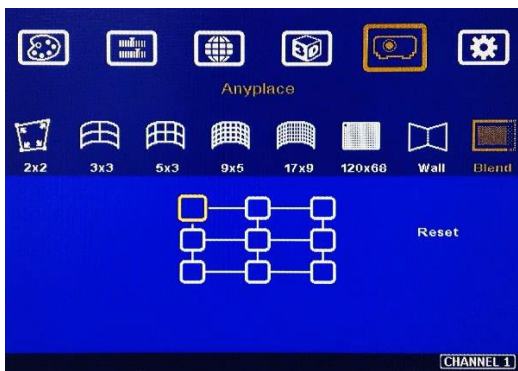
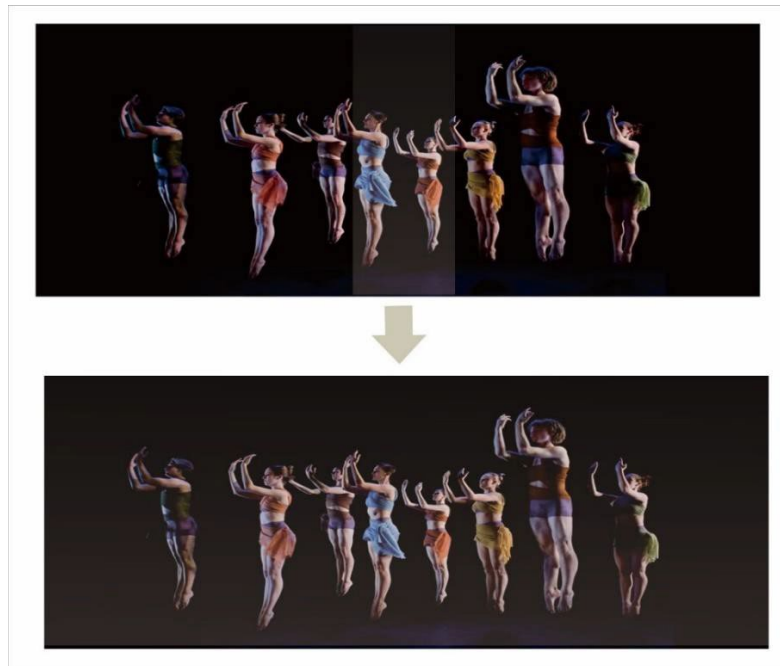
L. White balance & Color correction

Each channel can be adjusted separately through RGB Gain and Offset value.



M. 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 higher native 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 uplift.

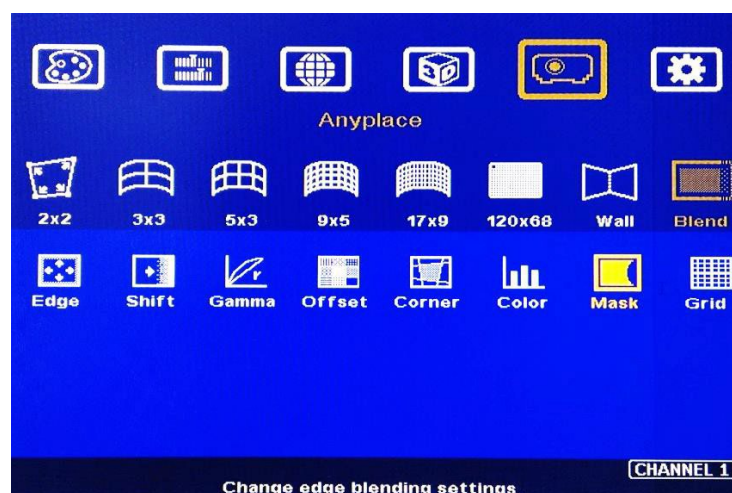
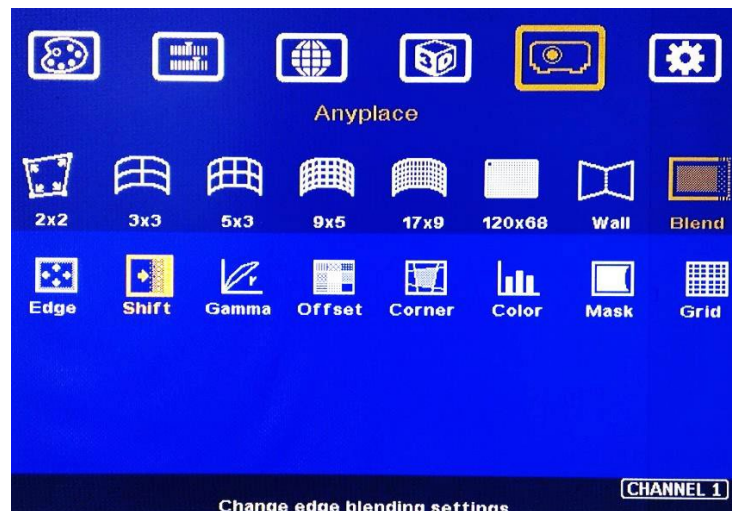


Nine regions black level uplift. Each region can set different RGB gain and offset.

N. Edge Mask

There are two edge mask functions in UD100. One is image [Shift] and another one is Edge [Mask] under Edge blending menu.

- [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.
- [Edge Mask]: 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.
- The adjusting range in [Shift] is based on the image position after geometry alignment and the range in [Mask] is calculated from original edge position before geometry or before [Shift] adjustment. Both functions can be implemented at the same time.





Original Image after geometry alignment

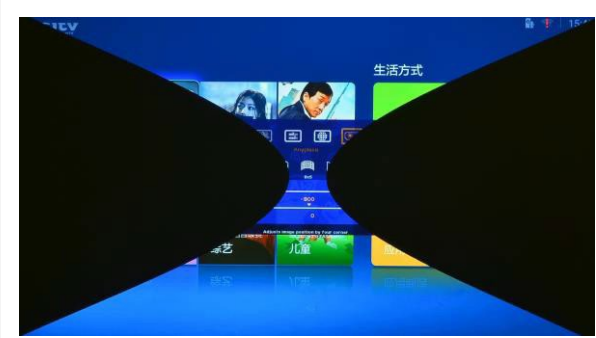


Image [Shift] (Follow geometry curve)



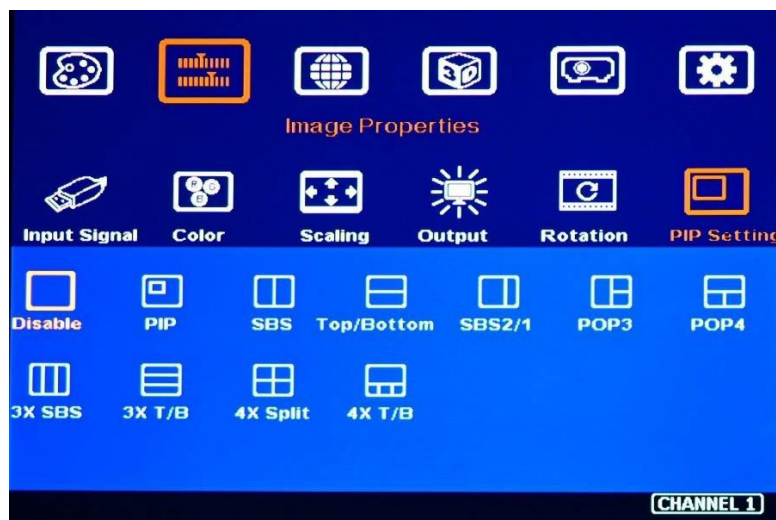
Image [Mask] (executed by 8 control points)

Example: Another Image [Mask]

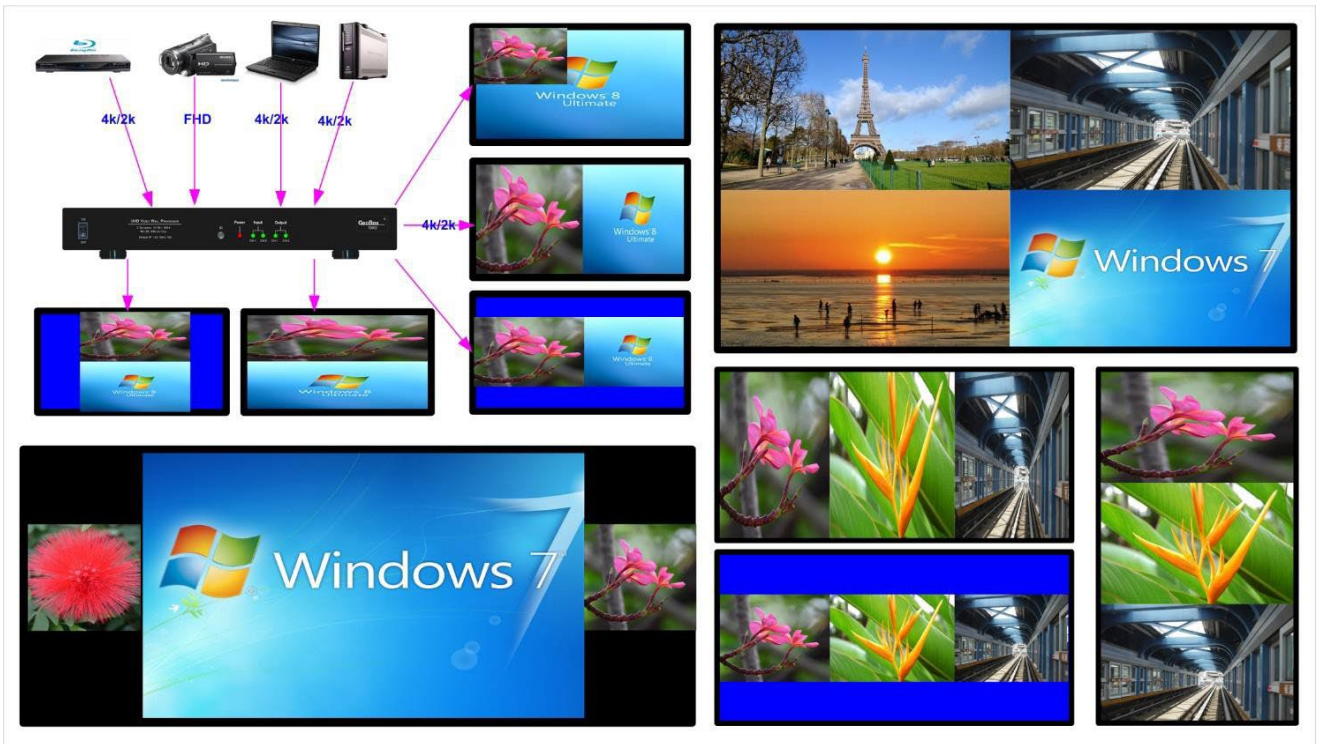


O. PIP/POP function

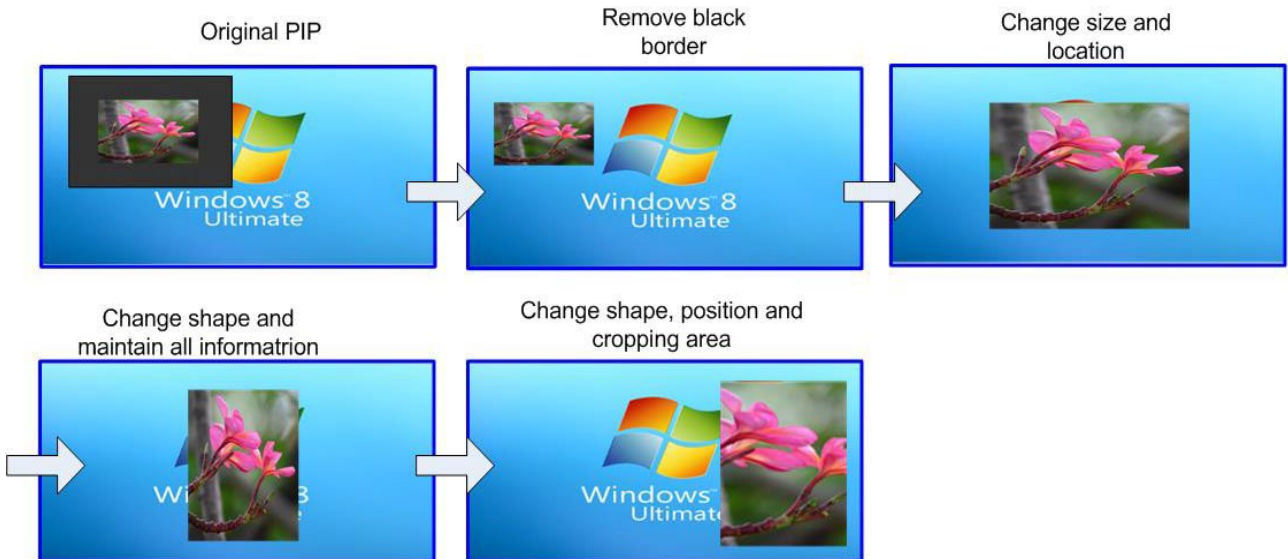
- [PIP]: Picture in Picture display with any two inputs in each channel.
- [SBS]: Side by Side display.
- [Top/Bottom]: Top/Bottom display.
- [SBS 2/1]: 2/3:1/3 side by side display with monitor at landscape position
- [POP3]: One image at LH side and two top/bottom images at RH side in landscape monitor.
- [POP4]: One image at Top and two images at bottom in landscape monitor.
- [3X SBS]: Three split views at landscape with the flexibility to adjust center image size. Center image size can be from 1/6 to 5/6 of the screen horizontal size.
- [3X T/B]: Three split views at portrait with full screen or original aspect ratio selection.
- [4x Split]: Four split view multi-viewer. (Monitor at landscape only)
- [4x T/B]: Four split view with one image at top and three small images at bottom.
- PIP (picture in picture): with flexible PIP size (320*180 to 1920*1200), location and aspect ratio.
- Except [4x split] & [4x T/B] functions, all the other PIP/POP functions can support monitor at portrait and landscape position. Sub- images also support rotation and flip up to 4k/2k 60Hz.
- Cropping function is available in PIP and POP image for further location, size and aspect ratio adjustment as well as creating image borders with black or blue color.
- All the inputs for main and sub-images can be up to 4k/2k 60Hz 4:4:4 signals.



All PIP/POP functions



Cropping function through Overlap adjustment

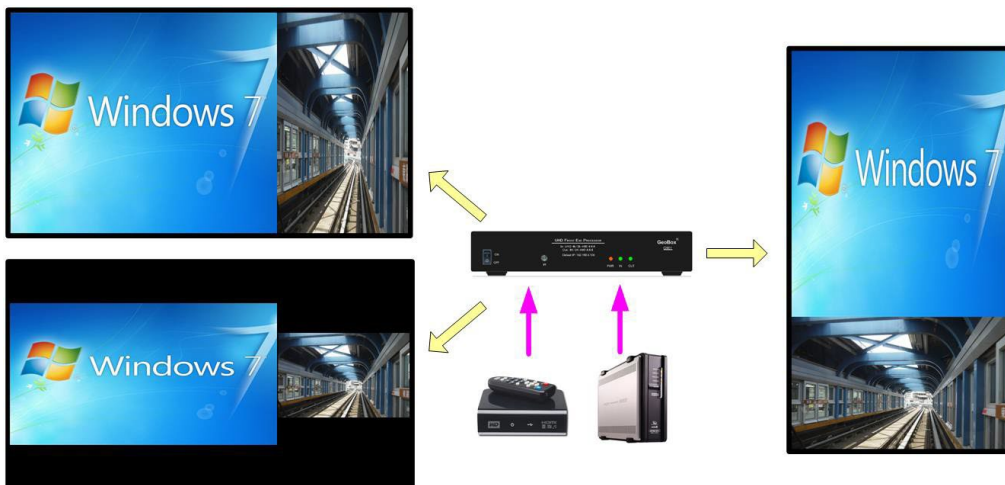


P. MultiViewer function

3 split views



User can change the installation angle of the monitor and rotate the image to get different layout patterns.

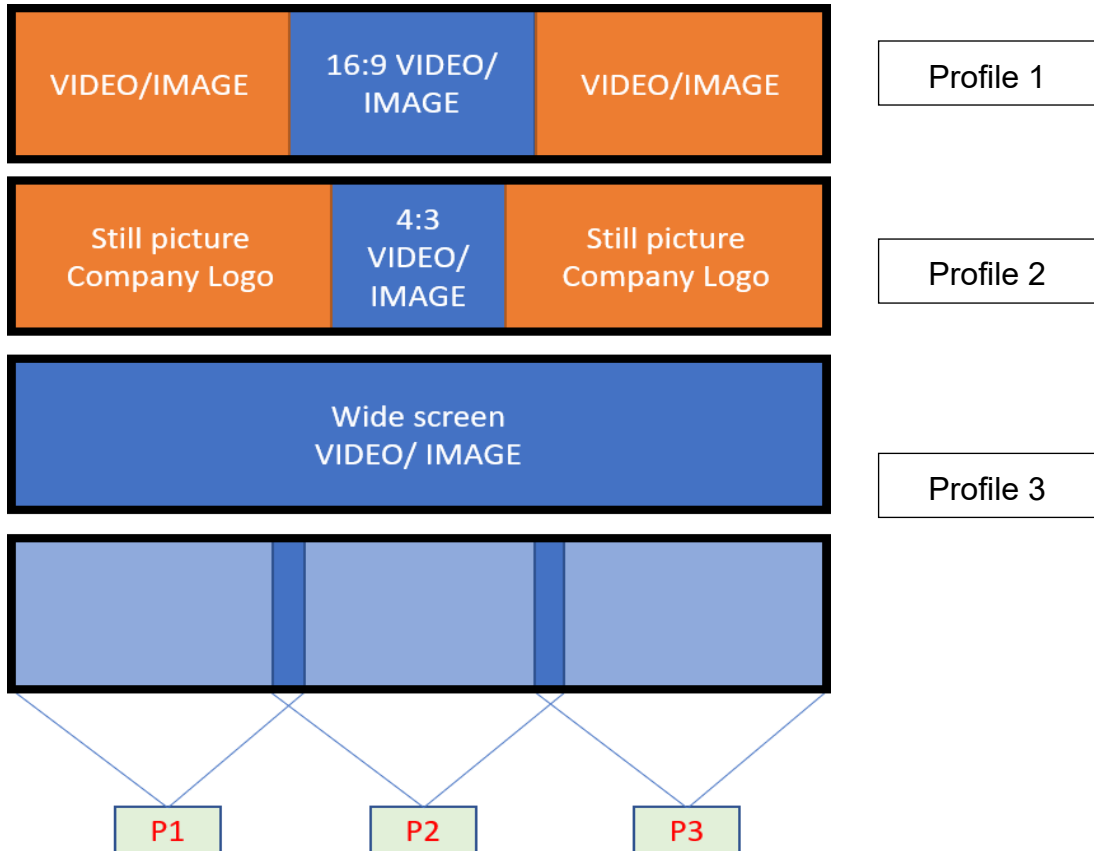


4 split views (One signal shall come from DisplayPort)



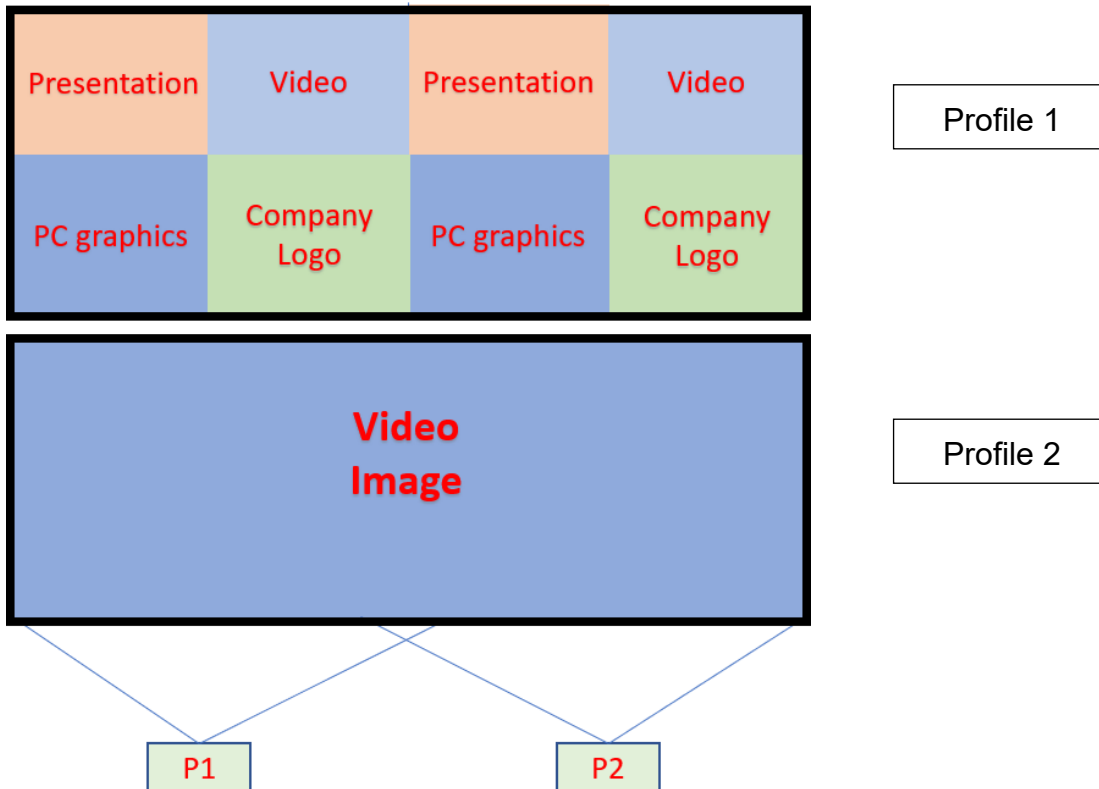
One UD104 to implement flexible 3 split view configuration

1st channel to implement 3 split views, then output the signal for 3 projector edge blending.
 Center image size can be adjusted from 1/6 to 5/6 in horizontal direction. Different Profile settings can be recalled at any time.



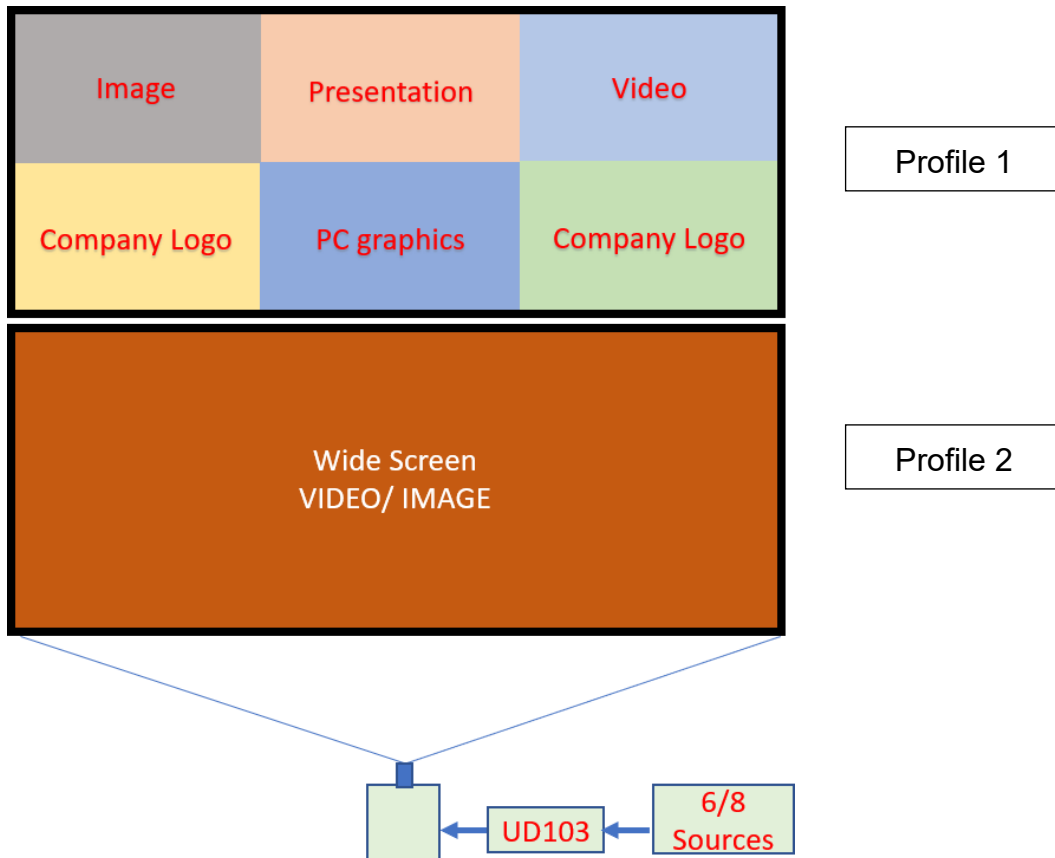
6/8 split view from one UD102 with two projectors

Each channel can implement 4 split view windows and combine them side by side will create Profile 1 image. If two projector edge blending is required, user can feed the same signal to both channels and execute edge blending.



6/8 split view from one UD103 with one projector

One channel can implement maximum up to 4 split views. Multiple channels can be cascaded for more display windows. Below 6 or 8 split views can be implemented through one UD103. First two channels to execute two 3 or 4 split views, then output to the 3rd channels to combine them into 6/8 split views and output to the projector.

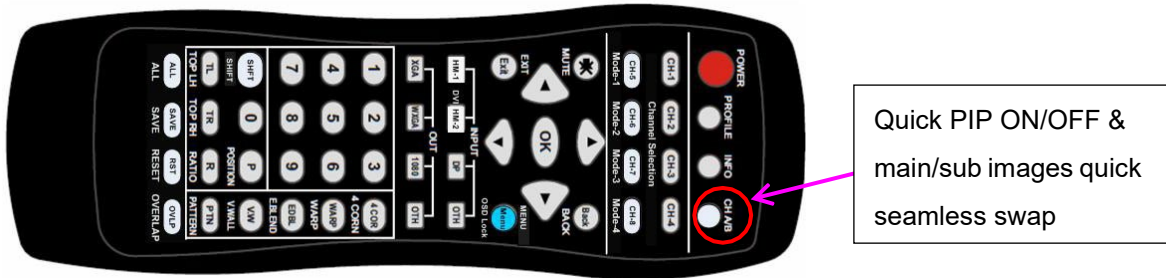


PS.

1. User can add G900 at the front end to execute MultiViewer function for the content, then output 4k image to UD100 for further edge blending. It may save some cost in some application.
2. For two projector 6 split views, user can use one UD102 to achieve it.
3. For one projector 4 split views, user can use one UD101 to achieve it.

Q. Quick PIP ON/OFF and two input quick seamless swap

- CH A/B key in remote controller can execute quick PIP image on/off in each channel.

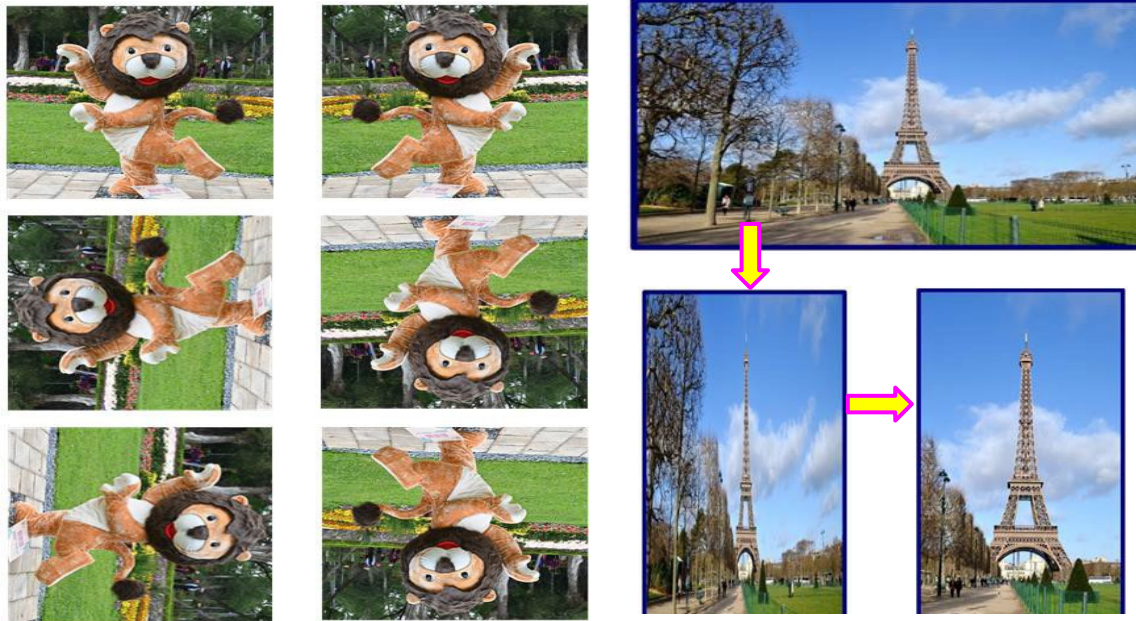


- When the output resolution is set to 1920x1200 or 1920x1080, user can add full screen PIP image on top of main image. User can click [CH A/B] key to turn on/off PIP image to swap main/sub-images seamlessly.
- This image swap can be applied to any two inputs in each channel. Please select channel selection key and assign one input to main image and another input to PIP image, then click [CH A/B] key to execute seamless quick swap between these two inputs.



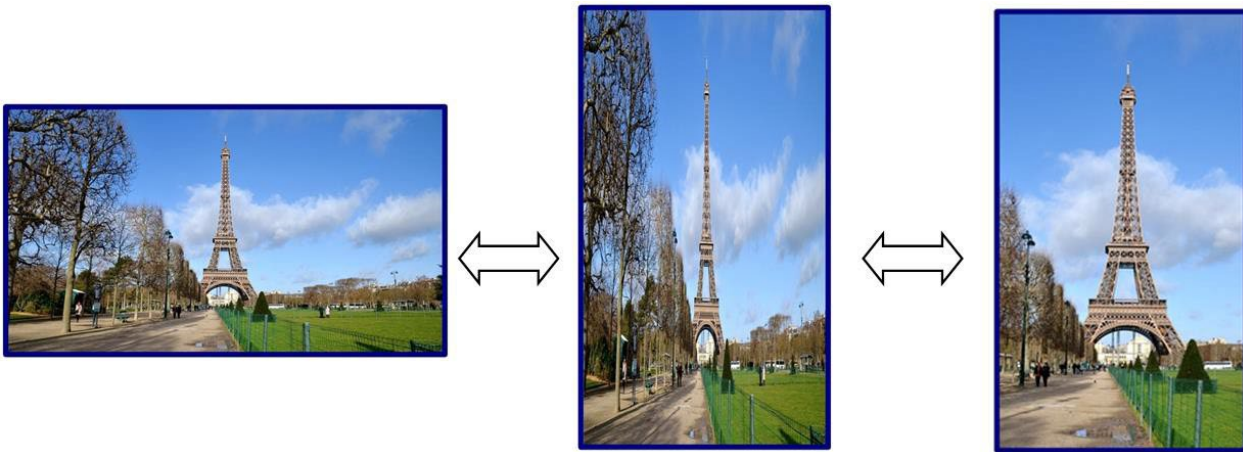
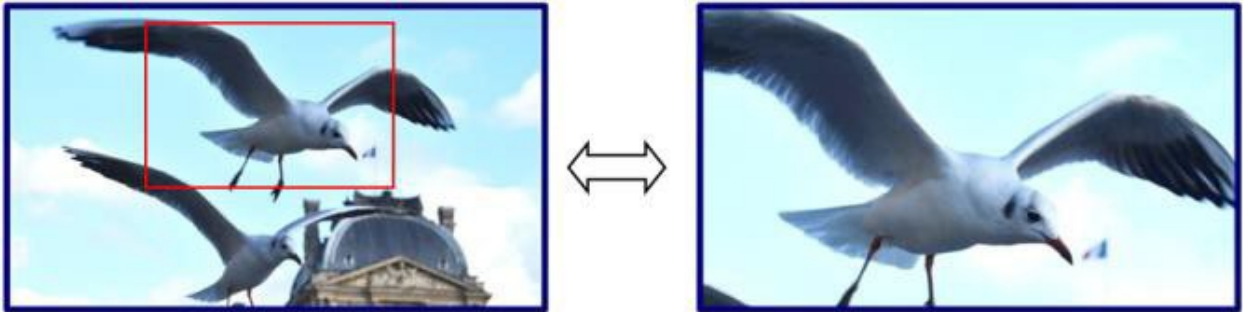
R. Image Flip & Rotation in main and PIP/POP (Sub-images)

Image 90/180/270 degrees rotation and flip up to 4k/60Hz resolution in both main and sub-image independently. After image rotation or flip, user can also adjust the aspect ratio and cropping area.



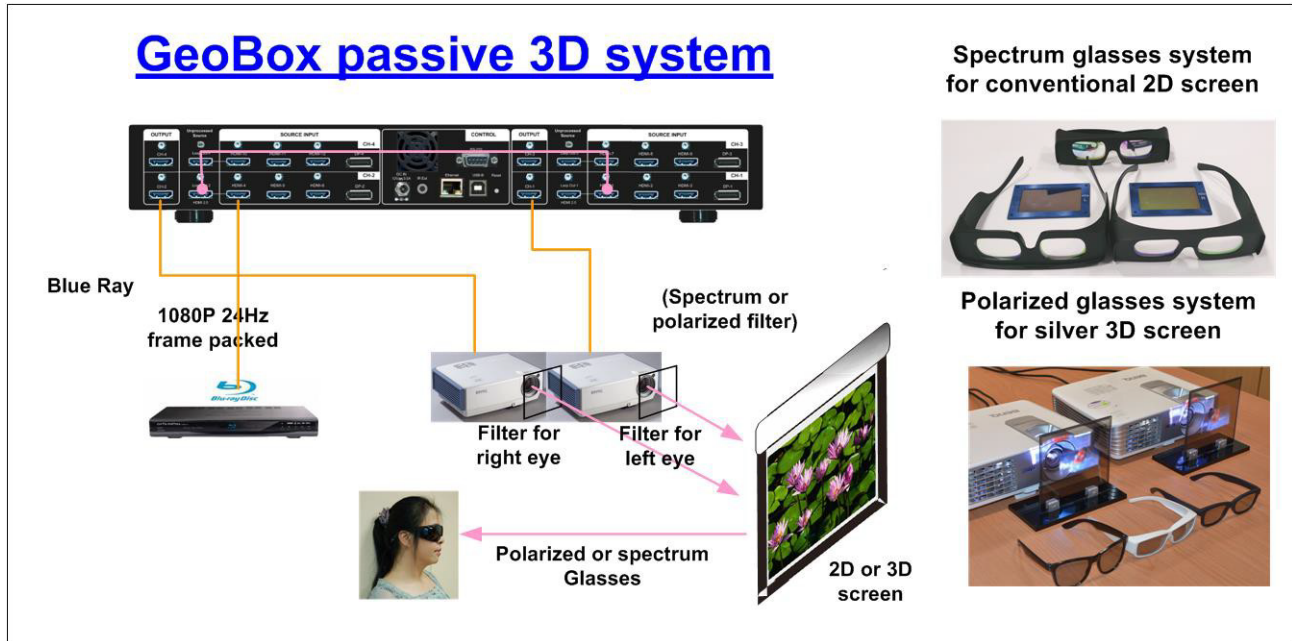
S. Stretch image, shift position and change aspect ratio

Geometry adjustment and Video wall cropping function can compensate image size, position shift or change aspect ratio. The adjusting range is up to 1800 pixels in each edge based on signal source.



T. Passive 3D application

UD100 can decode Line interleaved, side by side, Top/Bottom, frame sequential and frame packed 3D from Blue Ray DVD player into RH/LH eye frames for passive 3D display. User can use either silver coating screen or normal 2D screen through different filter and glasses system.



U. Active 3D application

UD100 can convert Line interleaved from medical display and frame packed 3D from Blue Ray DVD player into Side by Side, Top/Bottom or Frame Sequential 3D format output signal for 3D display devices, including FHD 120Hz for 4K UHD projector active 3D display.

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