



G111 Mini Warping Box Datasheet

(Single channel)

Input: up to HDMI 1.4, 3840*2160 @30Hz

4:4:4 full color sampling

Output: Up to WUXGA @60Hz, 2048*1080/60Hz

Warping up to 17x9 control points

Image cropping

Image rotation



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Introduction

G111 is mini warping box. It was designed for image warping as well as image cropping, rotation and stacking. The major application is for image de-warp for medical devices and optical devices, image from wide angle lens or 180 degrees lens, projector curved screen display and image distortion adjustment for Ultra-short throw ratio projector.

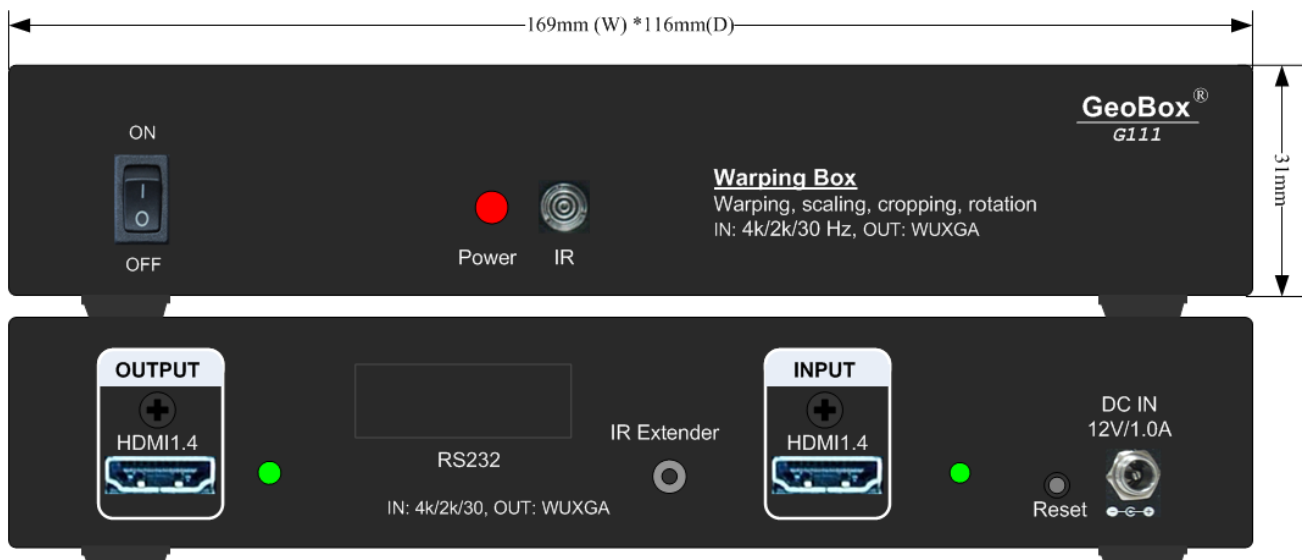
One HDMI 1.4 input port and 1x HDMI1.4 output port are designed in each box. Max. input resolution is up to 3840*2160 @30Hz with 4:4:4 full color sampling. Output supports up to 1920*1200 @60Hz. It is integrated with 10-bit high end processor, motion adaptive de-interlace, low angle smooth algorithm, 3:2/2:2 pull-down and supports non-VESA standard input timing. **Programmable EDID** can optimize input timing to get the best video result.

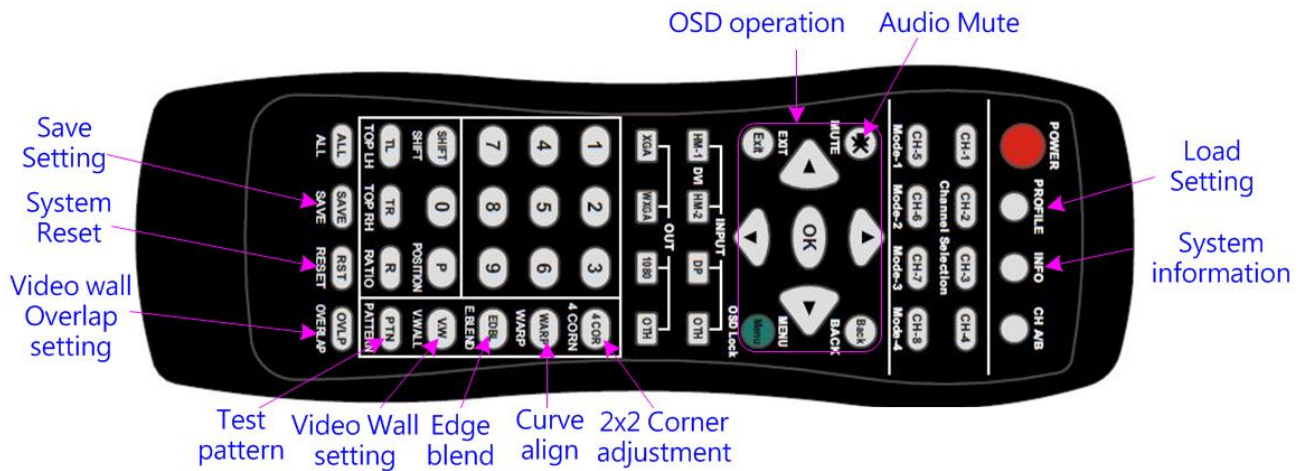
Advanced warp technology is embedded in G111. User can use IR controller to perform sophisticated geometry alignment up to 17x9 control points. Linearity Grid Line Adjustment and Corner Wall image adjustment for mapping image at 90 degrees corner is embedded in geometry alignment. In extreme curved screen edge blending system, user can add G111 before each projector to provide more geometry alignment range.

Video wall function is to crop source image for display devices and set overlap pixels for edge blending.

User can install display device at portrait position without rotating source image. The aspect ratio of the final image can be adjusted to meet the required aspect ratio. It provides an ideal solution to display Mobile phone/iPad native image at portrait monitor.

G111 provides easy configuration, low entry barrier, cost effective, reliable and flexible edge blending solution.





Difference between G116 & G111

Function	G116	G111
Input port	2x HDMI 2.0, 1x DP, 1x VGA	1x HDMI 1.4
Max. input resolution	4096 x 2160 @60 fps, 4:4:4, 600MHz, HDCP 2.2 °	3840*2160 @30 fps, 4:4:4, 300MHz, HDCP 1.4
Output port	1x HDMI 1.4, up to WUXGA/2048x1080/60Hz	Same
Loop out port	1x 4k/60 HDMI 2.0 loop out	N/A
8 points Edge Mask	Yes	N/A
System control	IR/Keypad/RS232/USB/Ethernet	IR remote controller
PC Tool	Gwarp3 and WebGui	No PC Tool
FW update	Using PC Tool	End user can't update FW
FW backup and copy	Using PC Tool	N/A
Geometry alignment	Remote controller up to 9x5, PC Tool up to 17x17	Remote controller up to 17x9
Corner Wall adjustment	V type	W type
Setting storage	5 settings	10 settings
Dimension & weight	303*164*44mm, 1.51kg	169*116*31mm, 0.51kg

Specification

- ✧ Input: 1x HDMI 1.4
- ✧ Output: 1x HDMI 1.4
- ✧ HDCP compliance: Input: HDMI: HDCP V1.4, Output: HDCP V1.4.
- ✧ Max. input resolution: 3840*2160/30 Hz, 300MHz
- ✧ 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.
- ✧ 15 selectable Outputs: HDMI 1.4 up to WUXGA/60Hz, 2048*1080/60Hz, progressive 4:4:4, RGB.
- ✧ 2 frames system latency: 33ms (@V=60Hz)
- ✧ Warp engine for geometry alignment up to 17x9 grid control points.
- ✧ Maximum geometry adjustment up to +_600 pixels in both H&V directions in each corner.
- ✧ Support Corner Wall adjustment in H&V at flexible location.
- ✧ Support Linearity Grid Line adjustment for quick H&V group line position alignment.
- ✧ Embedded video wall function for image split, cropping and aspect ratio adjustment.
- ✧ Selectable grid pattern size from 8-120 pixels in H&V directions. Default is 32*32 pixels.
- ✧ Selectable grid pattern color with optional transparency to see background image for external pattern.
- ✧ Flexible aspect ratio adjustment in each edge up to +_1800 pixels position shift.
- ✧ 10-bit processor, 3:2:2:2 cadence, low angle smooth algorithm, high quality scaling engine.
- ✧ 3D motion adaptive de-interlace.
- ✧ Frame lock function to get perfect synchronized outputs in multiple unit application.
- ✧ Frame rate conversion and 50Hz in/out function to eliminate image frame drop or repeat.
- ✧ Color and white balance adjustment.
- ✧ Image 90/180/270 rotation, flip, cropping, scaling & color adjustment up to 4k/30Hz.
- ✧ Selectable and programmable EDID in the range: H=1024-3840, V=720-2400.
- ✧ User can save up to 10 settings and can be recalled by remote controller.
- ✧ ESD Protection: ±8kV (Air-gap discharge), ±4kV (Contact discharge)
- ✧ Working environment: 45° C, 10-90% RH
- ✧ Control: keypads, IR, RS232
- ✧ System settings can be stored and backup in PC.
- ✧ Power supply: DC: 12V 1.0A
- ✧ Max. Power consumption: DC 12V 0.4A
- ✧ Dimensions (Body only): 169mm*116mm*31mm.
- ✧ Weight (Body only): 0.52kg
- ✧ CE/FCC/RoHS Certified
- ✧ 2 Year Warranty, paid extension available up to 5 years.

Function and features

A. Each box includes below input and output port

1. Input: 1x HDMI 1.4.
 - Support up to 384*2160 @30Hz with 4:4:4 chroma sampling without compression.
 - Connect with various video sources and support none VESA standard input resolution.
2. Output port: 1x HDMI 1.4. Selectable output resolutions: XGA, WXGA, 1280x720, 1280x1024, 1366x768, 1920x1080 (24/30/50/60Hz), 1920x1200 (30/60Hz), 2048x1080/60, 1024x768 @120Hz, 1280x720 @120Hz, 1280x800 @120Hz.

B. Image warp, geometry alignment

1. Selectable grid pattern size for geometry alignment from 8-120 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. Integrated with full function IR remote controller. Manual geometry alignment via Remote controller up to 17*9 control points with H=+_1200 pixels and V=+_1200 adjustment range in full HD output (4 corners + warp adjustment).
4. W type 12 control point Corner Wall geometry alignment up to 900 pixels adjustment range in each control point.
5. Linearity grid line adjustment for quick image alignment on curved screen.

C. High end 10-bit video processor

1. 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 color adjustment function, including brightness, contrast, hue, saturation, preset color mode and independent RGB gain adjustment.

D. Video wall function

1. Image cropping and location assignment for each projector.
2. Image pixel cropping range is up to +_1800 pixels for image position shift, aspect ratio adjustment, and video wall bezel compensation.
3. Create overlap pixels for projector edge blending.

E. Image rotation and flip

1. Image 90/180/270 degrees rotation, flip and mirror up to 4k/30Hz input resolution.
2. Image flip in Front/Rear, Left/Right and Top/Bottom directions.
3. Able to display mobile/iPad image on portrait monitor with flexible aspect ratio adjustment.
4. No 3D motion adaptive de-interlace function while the image is 90/270 degrees rotated.

F. System control and other features

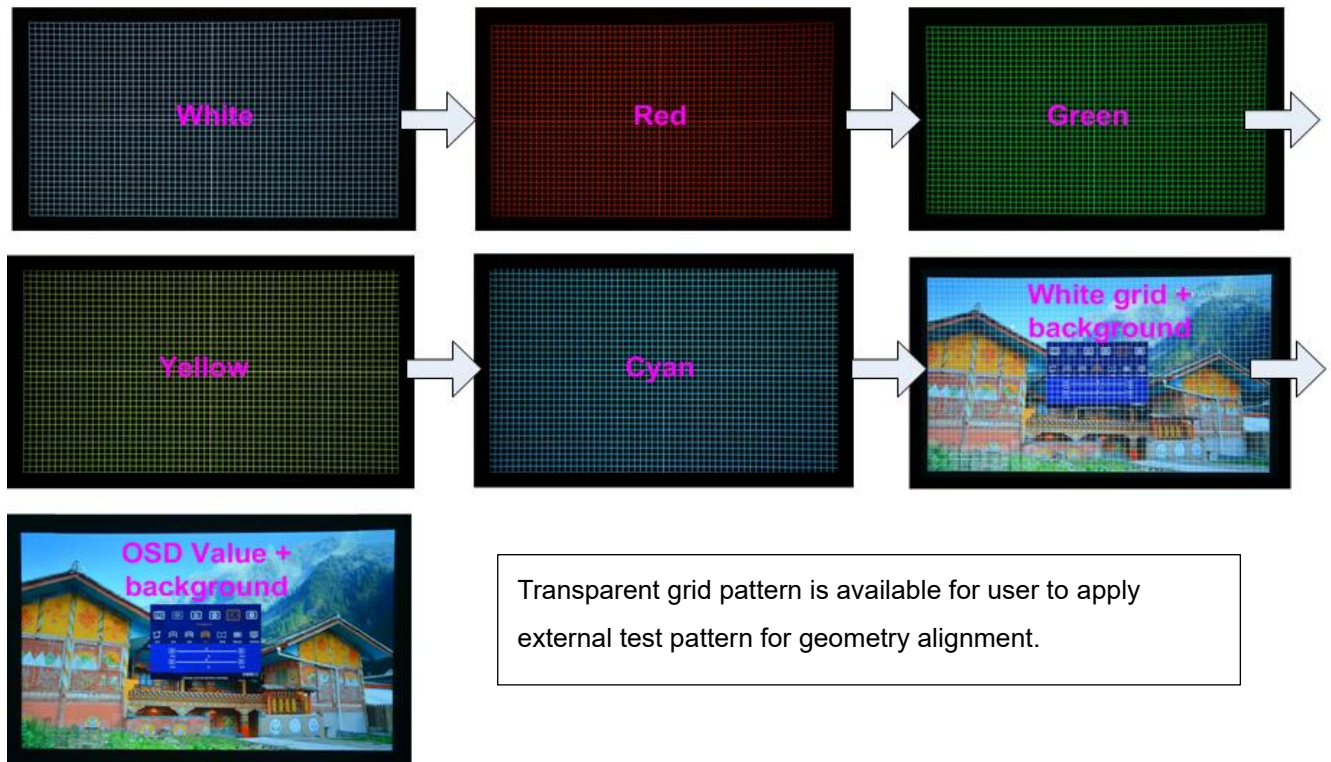
1. Professional design and reliable for 7/24 working condition.
2. Operation temperature: 0-40° C. Relative humidity: 10%-90% non-condensing.
3. Full function OSD by front panel keypad and IR controller.
4. Firmware update should be done in the factory.
5. Internal grid pattern with selectable color and grid size for easy geometry alignment.
6. User can select blue or black background color when no input signal is detected.
7. Programmable EDID in the range at H=1024~3840, V=720~2400.
8. BOX ID for convenient multiple unit control at the same time.
9. User can save up to 10 settings and can be recalled by IR controller.
10. 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 the system through the control in signal source.

G. Main applications

1. Image distortion correction for ultra-short throw ratio projector.
2. Projector curved screen display.
3. Projector corner wall display.
4. De-warp for medical devices and optical devices.
5. Fisheye camera de-warp for surveillance system.
6. Wide angle lens and fish-eye lens image correction.
7. Projector lateral color chromatic aberration correction.
8. Image rotation.
9. Mobile/iPad native image display on portrait monitor with aspect ratio correction.
10. Image aspect ratio adjustment.
11. Image scaler: Resolution scaling up and down.
12. Crop specific image area for LED, projector and monitor.
13. User friendly geometry alignment to simplify projector edge blending system.
14. To enlarge geometry alignment range for extreme curved screen display.

Feature illustration

Variable Grid Patterns for geometry alignment

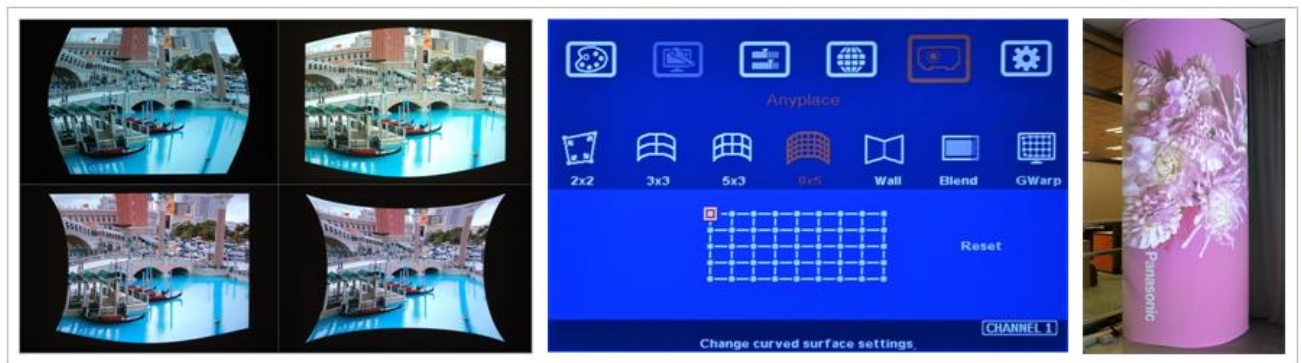


Selectable grid pattern size for geometry alignment

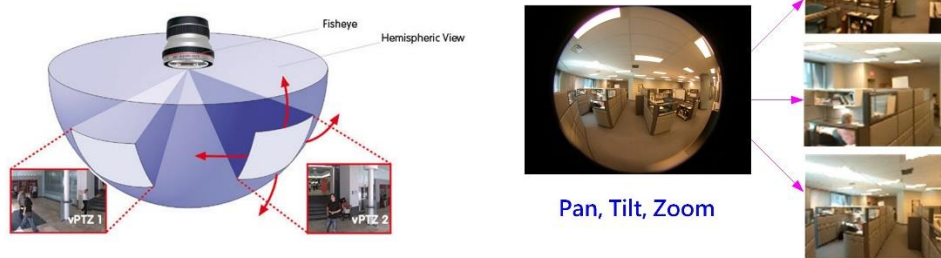
The pixel size in grid pattern for geometry alignment is selectable to meet high end simulation system geometry alignment requirements. The grid size in both horizontal and vertical directions is adjustable from 8 to 120 pixels with 1-pixel increasement. H&V grid size will be the same. User can select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



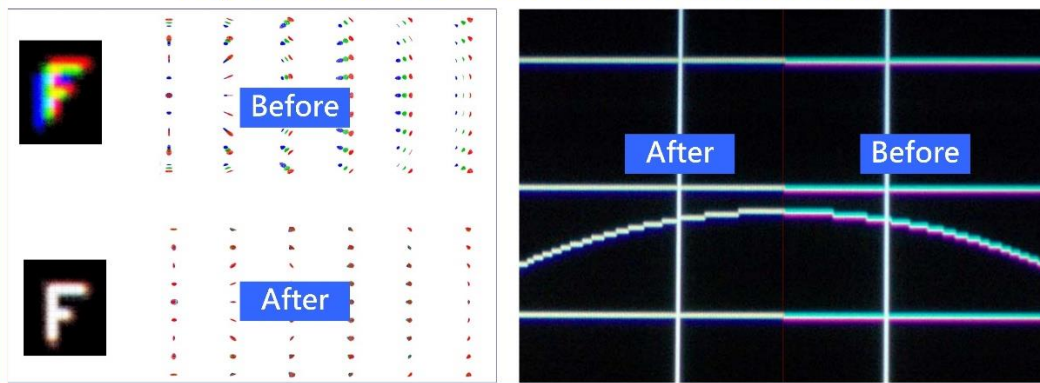
Image geometry alignment and warp



Fisheye camera de-warp for surveillance application



Projector lateral color chromatic aberration correction

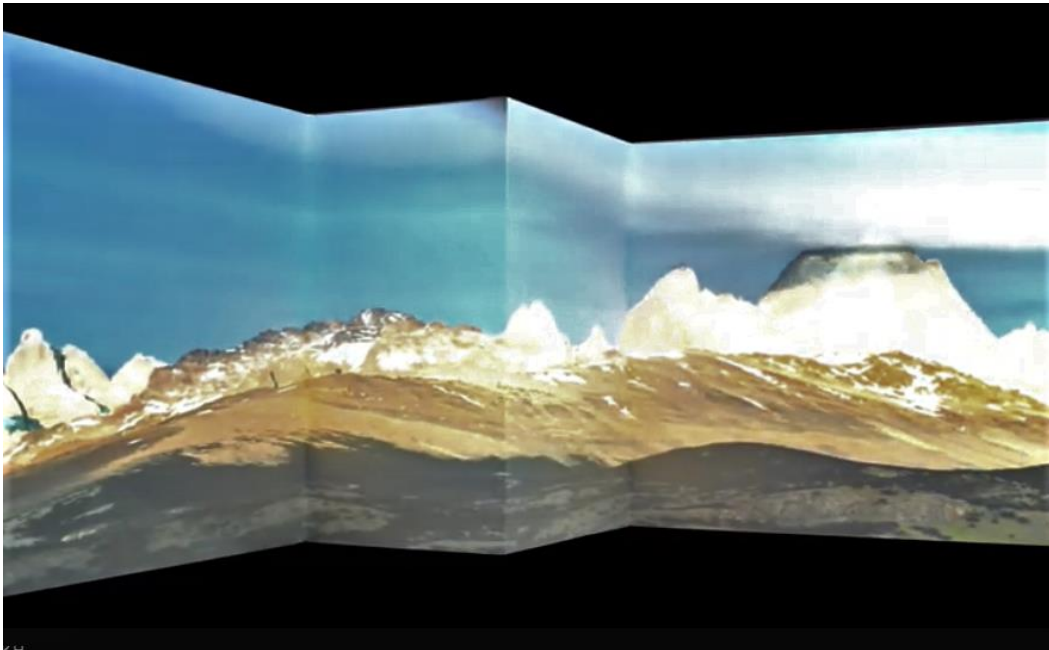


User needs to use three units of G111 to do warp adjustment in RGB separately

“W” type Corner wall Alignment & Display

Corner Wall alignment function is functional either in horizontal or vertical direction. There are 5 control points in two horizontal edges and 3 control points in two vertical edges. Each control point can adjust up to 900 pixels in H&V directions. User can only select either horizontal or vertical Corner Wall adjustment. 4 Corner position alignment are still available with Corner Wall adjustment for easy image mapping and system setup.

W type Corner Wall adjustment through one projector

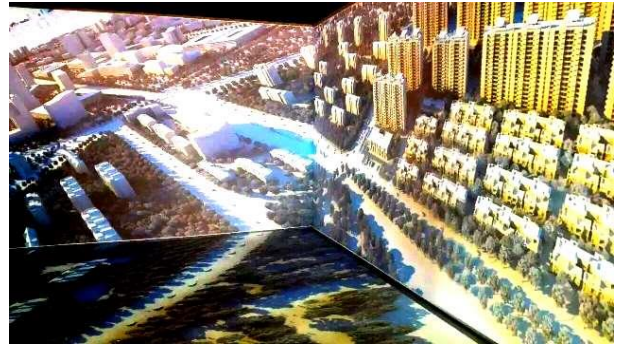


In Horizontal and Vertical directions



At any location but not only at center





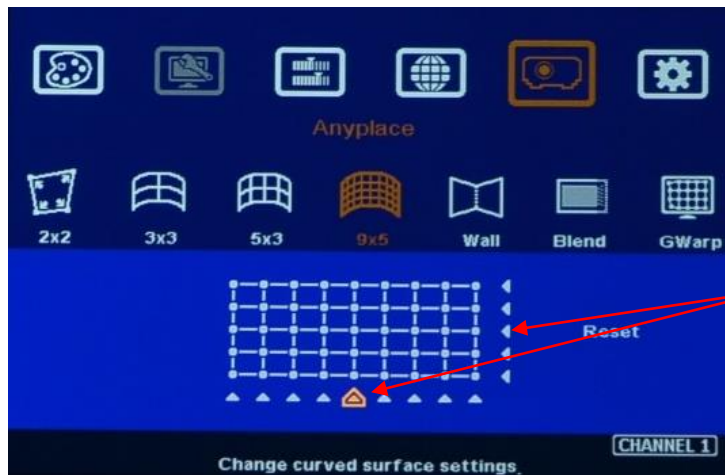
Single projector application. G111 can crop the right image for each wall.



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 make complete image with the same scaling factor. Another application is to do quick and precise images alignment for projector edge blending system.

1. Able to be executed only through remote controller.
2. It can be applied to both horizontal and vertical directions.
3. Linearity grid line adjustment OSD menu is under 3x3, 5x3, 9x5 & 17x9 warp alignment menu.
4. Linearity grid line adjustment can be executed together with other warp alignment at the same time.



Control point for Linearity Grid
Line Adjustment

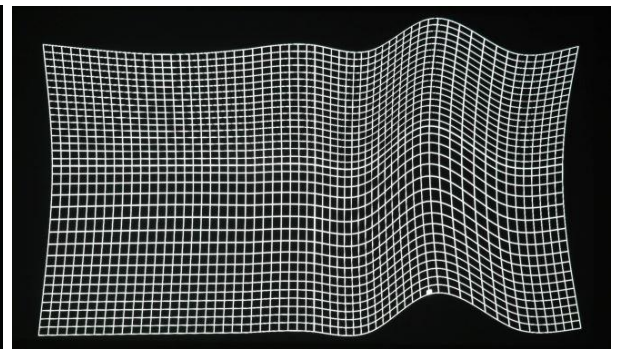
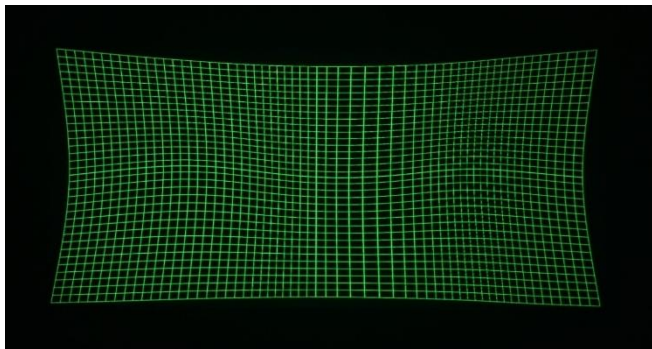
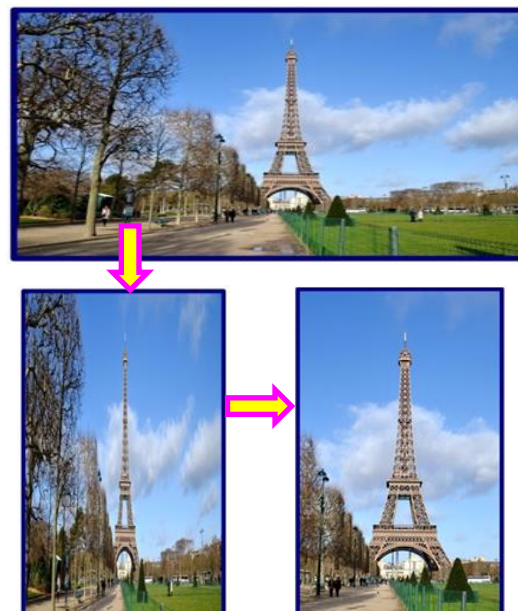


Image Flip & Rotation

Image 90/180/270 degrees rotation and flip up to 4k/60Hz resolution. After image rotation or flip, user can also adjust the aspect ratio.





Stretch image and change aspect ratio

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

