



The absolute opposite of ordinary

G112 Mini Edge Blending Processor 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

Edge blending



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Introduction

G112 is curved screen edge blending processor. It was designed for edge blending as well as image warping, rotation and stacking. Multiple units of G112 can execute big scale edge blending system.

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 G112. User can use IR controller, front panel keypad or RS232 to perform edge blending and 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. Separate R, G, B gamma correction for edge blending region color fine-tune is also standard functions in G112.

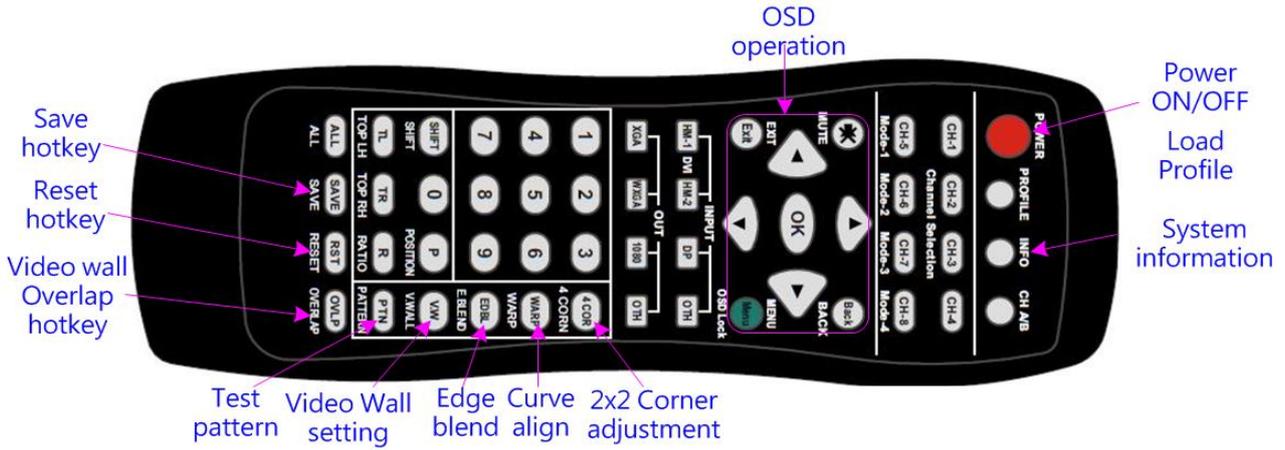
Video wall function is to crop and allocate source image for each projector and set overlap pixels for edge blending. User can add one HDMI splitter and multiple units of G112 to implement flat and curved screen edge blending through remote controller and IR controller.

Edge mask function is for user to execute further image edge mask to cut off unnecessary image without change the image scaling factor.

User can also execute edge blending with projector at portrait position without rotating source image to increase image height. It is a good fit with laser projector without the limitation in installation angle.

G112 provides easy configuration, low entry barrier, cost effective, reliable and flexible edge blending solution.





Difference between M801 & G112		
Function	M801	G112
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	NO
Black level uplift	Black level update in 9 regions	NO
8 points Edge Mask	Yes	NO
System control	IR/Keypad/RS232/USB/Ethernet	IR/Keypad/RS232
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	NO
Geometry alignment	Remote controller up to 9x5, PC Tool up to 17x17	Remote controller up to 17x9
Corner Wall adjustment	V type	W type
Dimension & weight	303*164*44mm, 1.51kg	169*116*31mm, 0.52kg

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.
- ✧ Edge blending at 4 edges up to H=1920 pixels, V=1200 pixels with independent RGB gamma correction.
- ✧ Edge Mask following the result of geometry alignment up to 500 pixels.
- ✧ 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 overlapped pixel setting for edge blending.
- ✧ 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 5 settings and can be recalled by remote controller, keypad or RS232.
- ✧ 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 and edge blending

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. Each box controls one projector and can be cascaded to support up to 225 projectors.
4. 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).
5. W type 12 control point Corner Wall geometry alignment up to 900 pixels adjustment range in each control point.
6. Four direction edge blending up to H=1920, V=1200 overlapped pixels for flat, curved & cylindrical screens.
7. Independent RGB gamma selection for edge blending color fine.
8. 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, independent RGB gain adjustment and white balance correction.

D. Edge mask

Image [Shift] to execute edge mask up to 500 pixels following the image profile after geometry adjustment.

E. 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, bezel compensation and creating overlap region for edge blending.

F. 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.

G. System control and other features

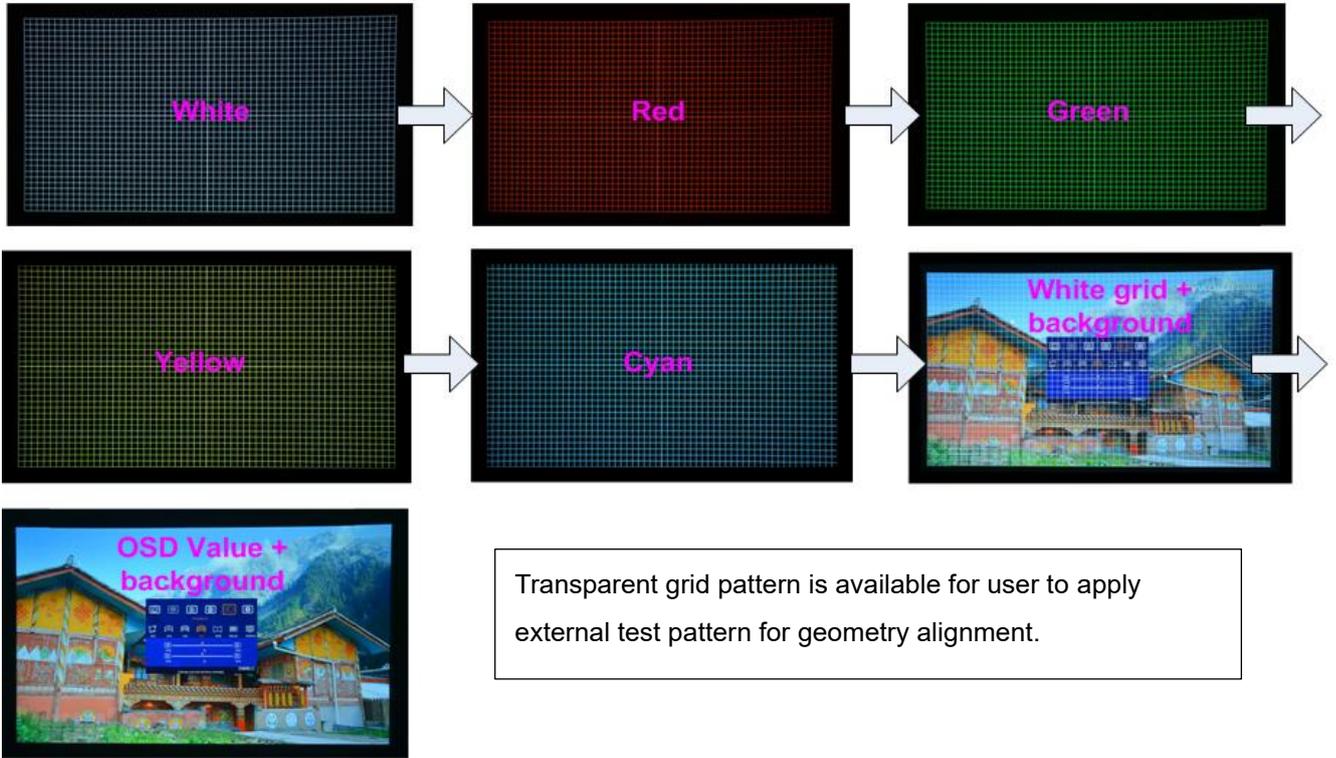
1. Professional design and reliable for 7/24 working condition.
2. Operation temperature: 0-45° C. Relative humidity: 10%-90% non-condensing.
3. Full function OSD by front panel keypad and IR controller.
4. Firmware update should be done in the factory.
5. Internal grid pattern with selectable color and grid size for easy geometry alignment.
6. RS232 control system compatible with most of control system.
7. User can select blue or black background color when no input signal is detected.
8. Programmable EDID in the range at H=1024~3840, V=720~2400.
9. BOX ID for convenient multiple unit control at the same time.
10. User can save up to 10 settings and can be recalled by IR controller, RS232 and keypad.
11. 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.

H. Main applications

1. Multiple projector edge blending.
2. Image distortion correction for ultra-short throw ratio projector.
3. Projector curved screen display.
4. Image rotation.
5. Mobile/iPad native image display on portrait monitor with aspect ratio correction.
6. Image aspect ratio adjustment.
7. Image scaler: Resolution scaling up and down.
8. Crop specific image area for LED, projector and monitor.

Feature illustration

Variable Grid Patterns for geometry alignment

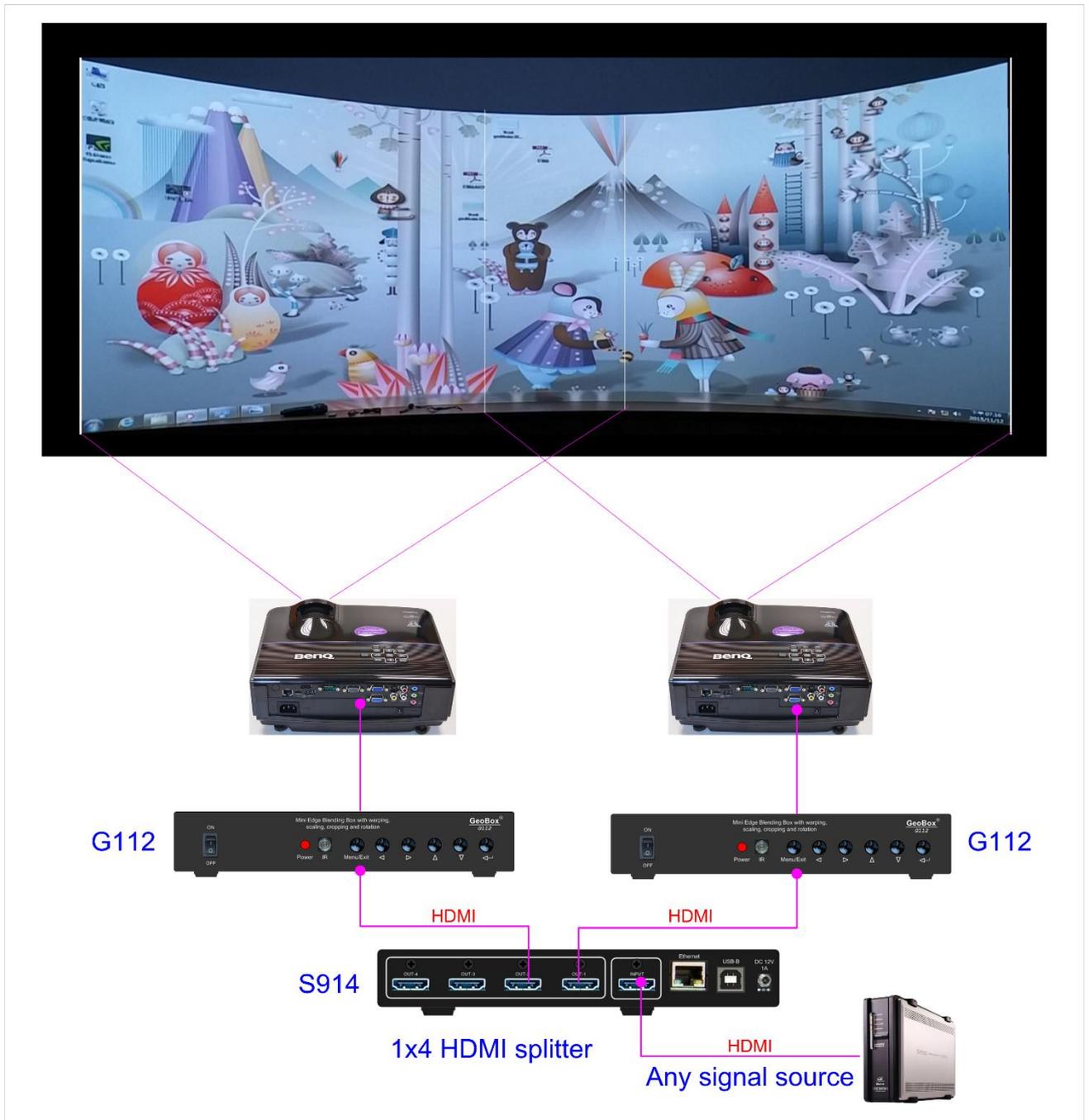


Selectable grid pattern size for geometry alignment

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 increase. H&V grid size will be the same. User can select grid size under [Edge Blend] menu.



Edge blending system connection

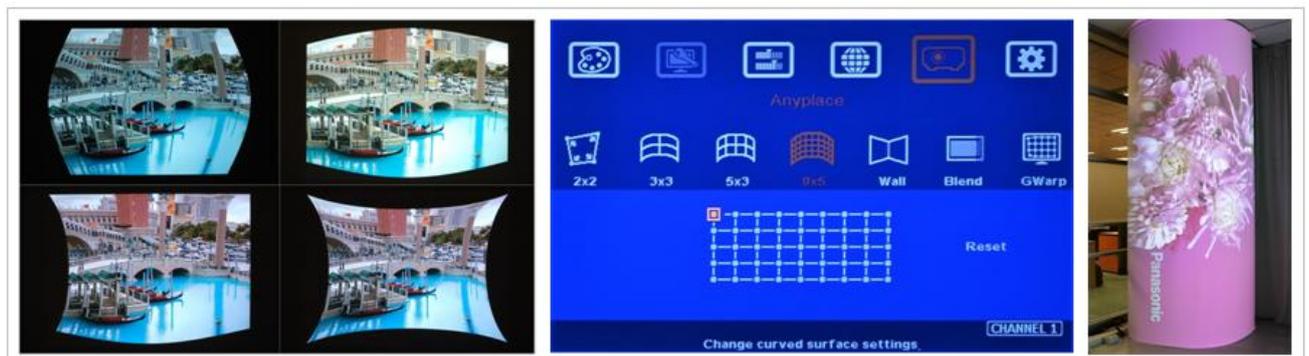


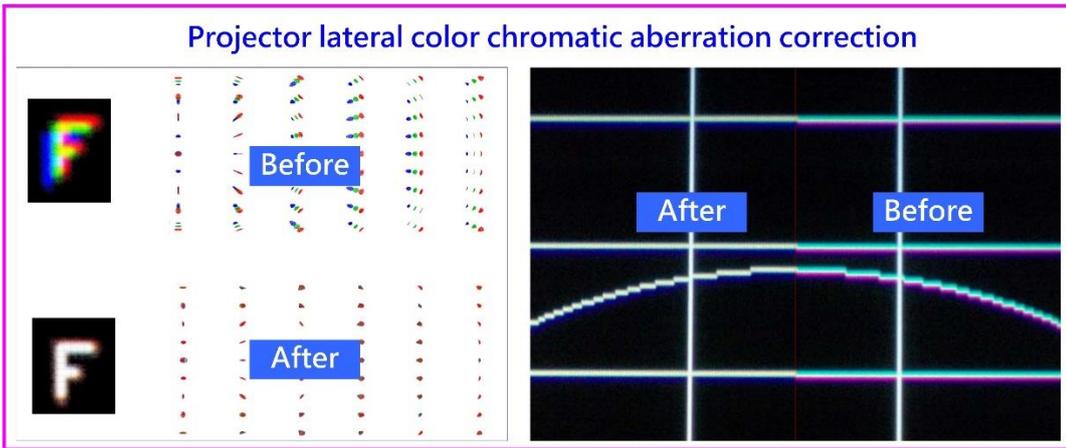
Maximum projectors for horizontal and vertical edge blending are 15 projectors each.

Edge blending on flat and curved screen



Image geometry alignment and warp





User needs to use three units of G111/G112 to do warp adjustment in RGB separately

Edge Mask

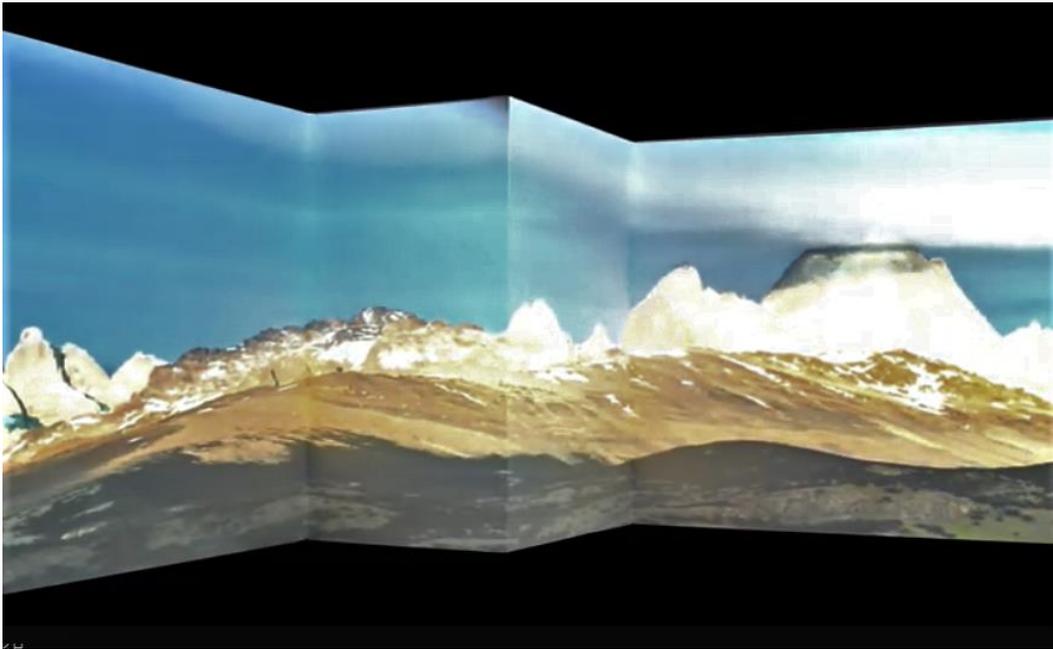
Edge mask functions is integrated in G112. User can use [Shift] function under [Edge Blend] menu to do edge mask up to 500 pixels in each edge. The adjusting range in [Shift] is based on the image position after geometry alignment. The image shape of the mask region also follows the profile of the image after geometry alignment.



“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 and Edge Blend function are still available with Corner Wall adjustment for easy image mapping and system setup.

W type Corner Wall adjustment through one projector

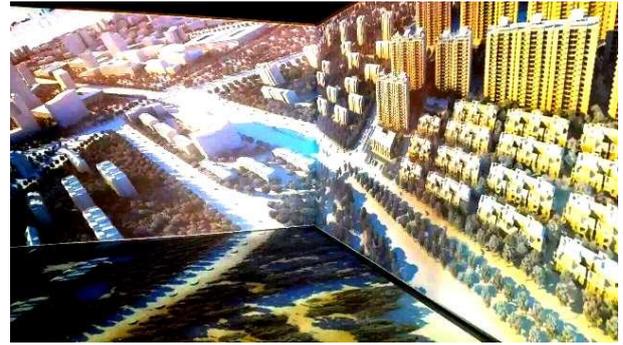


In Horizontal and Vertical directions



At any location but not only at center





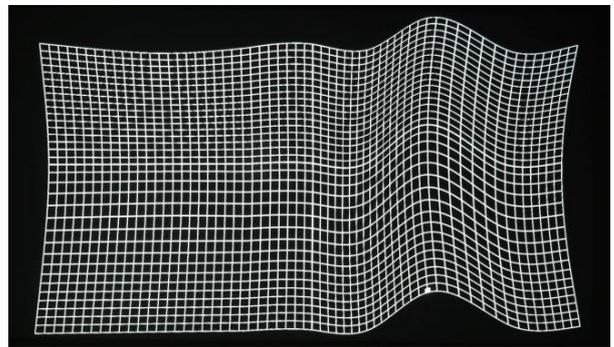
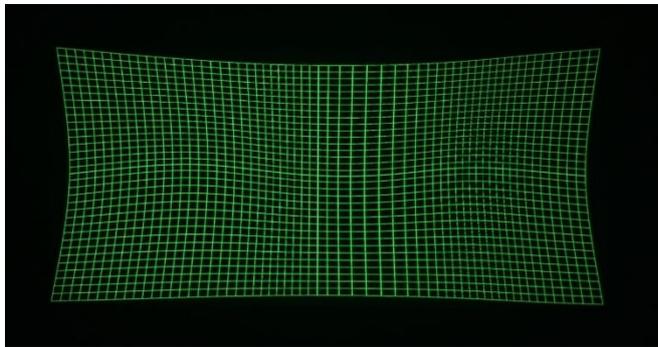
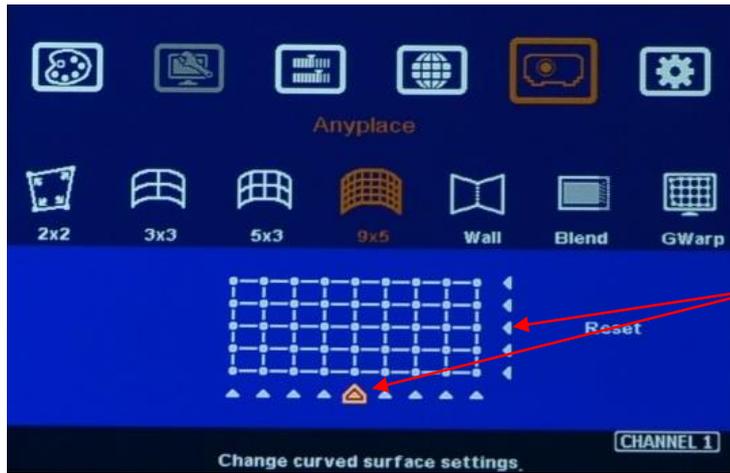
Single projector application



Linearity grid line adjustment

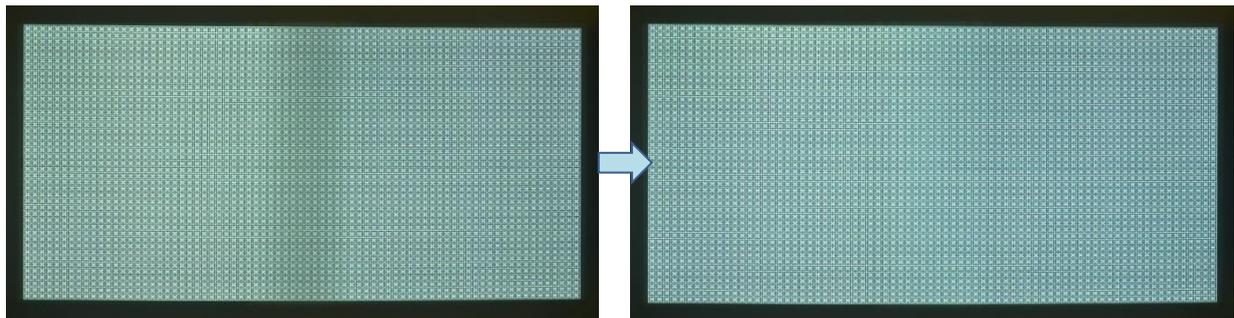
When projector projects image on curved screen, the image will change the grid size gradually and cause different scaling factor on the center and both sides. Linearity grid line adjustment is to compensate this kind of effect and make complete image with the same scaling factor. Another application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

1. Able to 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 & 17x9 warp alignment menu. The result can be further adjusted by 17x9 image position fine tune.
4. Linearity grid line adjustment can be executed together with warp alignment & edge blending at the same time.



Independent RGB gamma correction

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



Flexible display

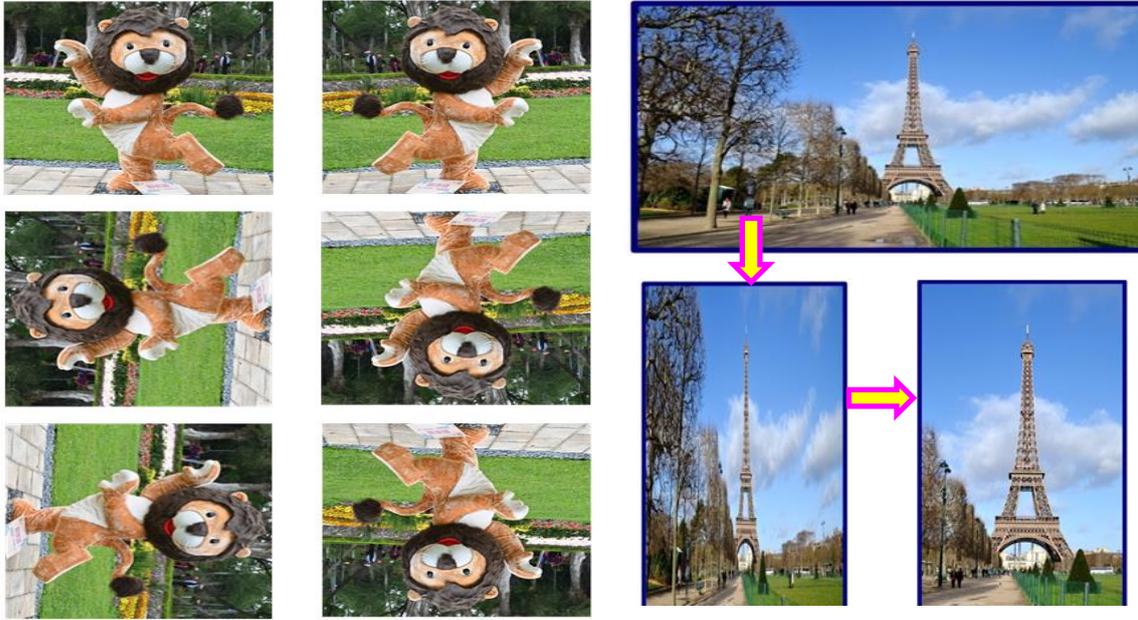
Multiple boxes can have below flexible display functions:

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 90/180/270 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.

