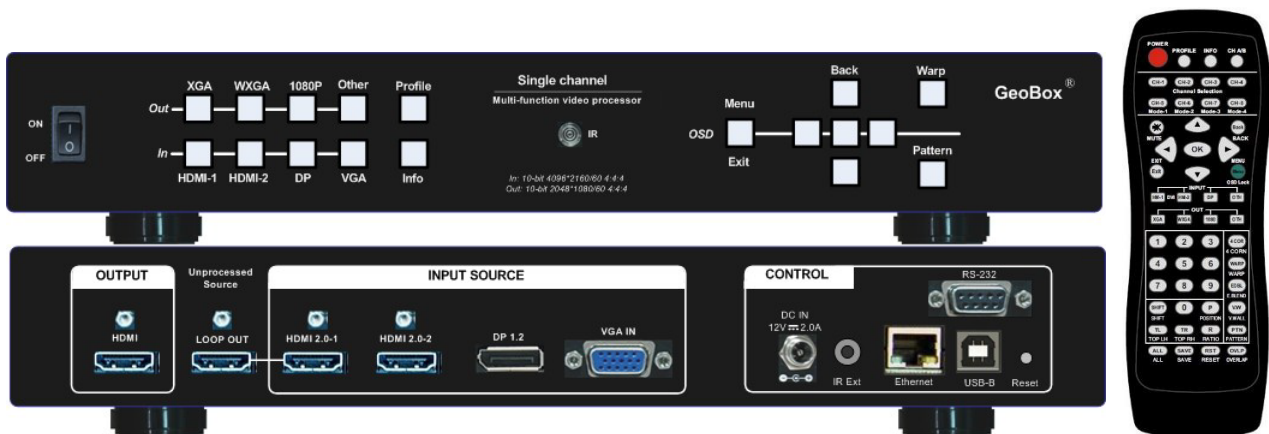


GeoBox

M811L Multi-function Warping Box Datasheet

*Input: up to 7680*2160 @30Hz, 5760*1200 @60Hz,
4096*2160 @60Hz, 4:4:4 full color sampling
Output: 2048*1080 @60Hz*

- *Single channel*
- *Image warp & geometry alignment*
 - *Edge mask*
 - *PIP/POP*
- *Image rotation and flip*
- *Image anyplace cropping*



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(The product specifications are subject to change without notice)

Introduction

M811 Lite (M811L) is an upgraded model from the G116 series. The significant difference is to support 17*9 geometry alignment and 120*68 control points fine-tuning in the IR controller & PC Tool. A completely new GCT PC tool has been adopted. It provides a more friendly interface for PC tool operation and increases accuracy. Users can swap between GCT and IR control operations at any time. It supports up to 7680*2160/30Hz input resolution without additional settings.

M811L is a multi-purpose warping box with multiple functions for projector display. Multi-units can be cascaded for large-scale display.

4 input ports (2x HDMI, 1x DP, 1x VGA) and 1x HDMI output port are designed in M811L. The digital input supports up to 7680*2160 @30Hz and 5760*1200 @60Hz with 4:4:4 full-color sampling. Output supports up to 2048*1080 @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 timing. Programmable EDID can optimize input timing to get the best video result.

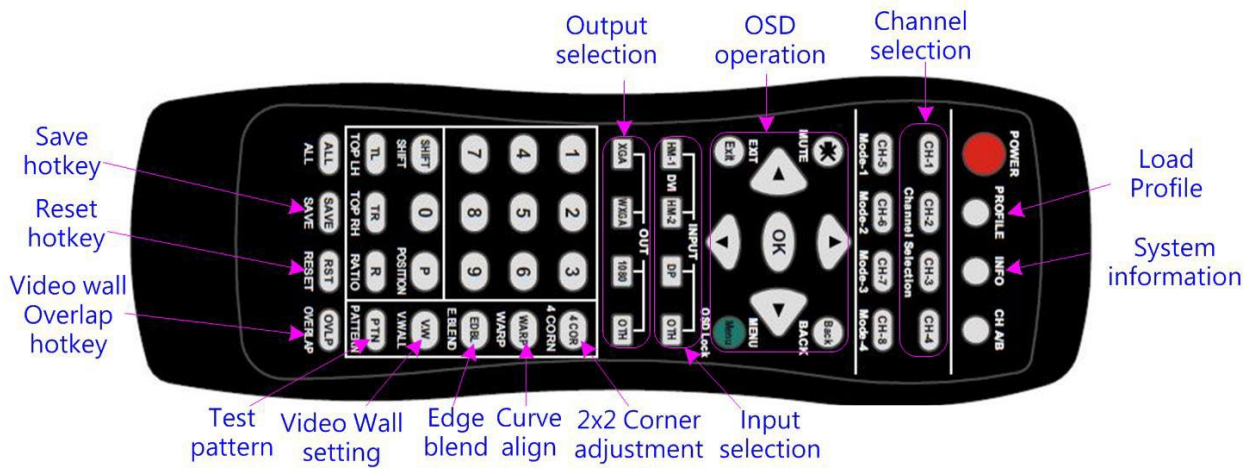
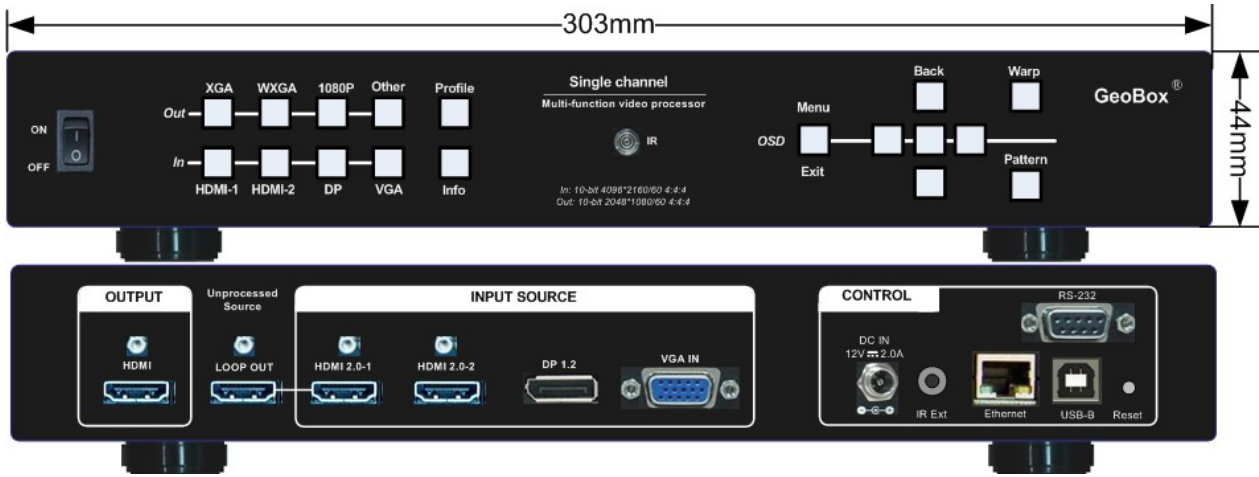
Advanced warp technology is embedded in M810. Users can use an IR controller, USB, Webpage, and Ethernet to perform edge blending and sophisticated geometry alignment up to 120x68 control points. Linearity Grid Line Adjustment for complete line move up to the 17x9 control point and “W” type Corner Wall image adjustment are new functions in geometry alignment. The video wall function is to split and allocate source images. The overlap function crops the image at the desired location, shifts the image position, and changes the aspect ratio.

HDMI loop out is designed for signal source monitoring and multi-unit daisy chain connection.

PIP (picture in picture) and POP (Picture outside Picture) are standard functions in M811L. PIP image size is from 320*180 to 1920*1200 with flexible position and aspect ratio adjustment. The overlap function allows further image size, aspect ratio, and cropping area adjustment in the PIP window.

M811L is an ideal processor for image stacking, geometry alignment, PIP, POP, image format conversion, de-interlacing, image rotation, and mobile mirror images displayed on portrait TV. It provides easy configuration, low entry barriers, and cost-effective, reliable, and flexible solutions.

Outlook and remote controller



Feature difference between M811 Lite & G116

1. Outlook: Same as G116. The only difference is the model #.
2. Input/Output ports: same as G116
3. Functions: M811L will keep all the functions of G116 and add more.
4. New GCT (GeoBox Control Tool) is adopted in M811L.
 - GCT is a standard PC tool for all new GeoBox models, including G90x, UD10x, M810, S901, and S914.
 - Operated via USB or Ethernet
 - GCT setup results will be executed in the Box in real-time.
 - Users can switch between GCT and IR control without data loss.
 - Reduced Save and Load setting time under PC operation.
 - Users can back up and copy the settings to different units.
5. New features:
 - Warp function:
 - IR controller up to 17x9 grid control points.
 - Pixel position fine-tune up to 120x68 grid control point through IR controller and GCT.
 - Linearity grid line adjustment up to 17*9 control points.
 - “W” type corner wall adjustment.: adjust the image to match the square pillar at the wall corner.
6. Input: up to 7680x1200/60Hz, 7680*2160/30Hz, RGB 4:4:4 without additional settings

Specification

- ✧ Input: 2x HDMI 2.0b, 1x DP1.2a and 1x VGA
- ✧ Output: 1x HDMI 1.4b
- ✧ Loop output: 1x HDMI 2.0b for cascade.
- ✧ HDCP compliance: Input: HDMI: HDCP V2.2/V1.4, DP: HDCP: V1.3, Output: HDCP V1.4.
- ✧ Max. input resolution: 7680*2160 @30Hz, 5760*1200 @60Hz, 4096*2160 @60Hz
- ✧ 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.
- ✧ Output up to 2048*1080/60, progressive 4:4:4 RGB, 15 selectable Output resolutions.
- ✧ 2 frames system latency: 33ms (@V=60Hz)
- ✧ Warp engine for geometry alignment up to 17*9 control points in IR control and GCT PC Tool.
- ✧ 120x68 grid pixel position fine-tune. Each control point can be adjusted with 1/4 pixel/step and moved up to 12.5 pixels adjustment range. Maximum adjusting points are 100 points. Up to 12.5 pixels adjustment range. Maximum adjusting points are 100 points.
- ✧ Geometry adjustment ranges up to 600 pixels in both H&V directions.
- ✧ Support Corner Wall adjustment in H&V at the flexible location.
- ✧ Support Linearity Grid Line adjustment for quick H&V line position alignment.
- ✧ Edge Mask with 8 control points up to 900 pixels at each control point in H&V directions.
- ✧ Embedded video wall function for image split, cropping, and position adjustment.

- ✧ Selectable grid pattern size from 8-120 pixels in H&V direction. The 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 while multiple units are cascaded.
- ✧ Support xvYCC & 8/10/12-bit deep color processing.
- ✧ Individual color adjustment in each processing channel.
- ✧ Individual 90/180/270 rotation, flip, cropping, scaling & color adjustment.
- ✧ PIP/POP function with PIP image size from 320*180 up to 1920*1200 resolution with flexible position and adjustable aspect ratio. This function is unavailable when the main image is 90/270 degrees in rotation.
- ✧ Selectable and programmable EDID in the range: H=1024-3840, V=720-2400.
- ✧ Users can save up to 5 settings and be recalled by remote controller, RS232, USB, or network.
- ✧ ESD Protection: ±15kV (Air-gap discharge), ±8kV (Contact discharge)
- ✧ Working environment: 40° C, 10-90% RH
- ✧ Control: keypads, IR, RS232, USB, Ethernet
- ✧ Power supply: DC: 12V 2A, Max. Power consumption: 12V/0.7A, 8.4W
- ✧ Dimensions (Body only):
Without protruding parts: 303mm*164mm*44mm.
With protruding parts: 303mm*175mm*55mm
- ✧ Weight (Body only): 1.5kg
- ✧ CE/FCC/RoHS Certified
- ✧ 30-Month Warrant.

Function and feature:

A. Input / Output

- Input: 2x HDMI, 1xVGA, 1x DisplayPort.
 - HDMI & DisplayPort support 7680*2160 @30Hz, 5760*1200 @60Hz with 4:4:4 chroma 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 up to 120Hz.
- Output ports: 1x 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: 1x HDMI 2.0b, same as the source signals up to 8k/2k @30Hz / 4096*2160 @60Hz.

B. Image warp and geometry alignment

- Selectable grid pattern size for geometry alignment from 8-120 pixels in H&V. Default size is 32*32 pixels.
- With complete 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.
- Warp engine for geometry alignment up to 17*9 control points in IR control and GCT PC Tool.
- 120x68 grid pixel position fine-tune. Each control point can be adjusted with 1/4 pixel/step and moved up to 12.5 pixels adjustment range. Maximum adjusting points are 100 points.
- The geometry alignment range (4 corners + warp adjustment) is up to H=+_ 1200 pixels and V=+_ 1200 pixels in total HD output.

C. Linearity Grid Line Adjustment

- Support Linearity Grid Line adjustment for quick H&V line position alignment.
- This function can be implemented with 3x3, 5x3, 9x5, and 17x9 warp alignments.

D. “W” shape Corner Wall Alignment

Support “W” type Corner Wall adjustment in horizontal and V type in the vertical direction. The maximum adjusting range is 1200 pixels.

E. Simultaneously PC Tool and IR controller setup

PC Tool and IR controller can work simultaneously and swap operations anytime. The result will be executed into the Box in real time.

F. 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 an 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.

G. High-end 10-bit video processing

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

H. PIP/POP

- This function can only be implemented in one projector. If PIP/POP across the entire screen is required, please add one S901 at the front end. It will also have a seamless switcher and PIP/POP/MultiViewer functions.
- PIP (picture in picture): with flexible PIP size (320*180 to 1920*1200), location, and aspect ratio.
- POP (Picture outside picture): side by side or Top/Bottom images with full screen or maintain source signal aspect ratio.
- The Overlap function can further adjust PIP sub-image size, cropping area, position, and aspect ratio.
- Limitation:
 - When implementing PIP/POP function, the primary signal source can't be rotated at 90/270 degrees
 - Source: only one HDMI source can be displayed on PIP/POP screen. Another source shall be DP or VGA.

I. Video Wall function

- Image cropping and location assignment for each projector.
- The 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.
- Serve as video wall controller for irregular video wall display up to 15x15 matrix displays from the single signal source.

J. 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.
- When executing 90/270 degrees image rotation, no PIP/POP function is available.
- No 3D motion adaptive de-interlace function while the image is 90/270 degrees rotated. We propose to apply a progressive signal source to get the best video quality.

K. 120Hz signal output for active 3D display

Support frame sequential FHD 120Hz input signal. After warp and edge blending, output XGA, 720P, or WXGA 120Hz signal for multiple projectors in an active 3D display application

L. System control and other features

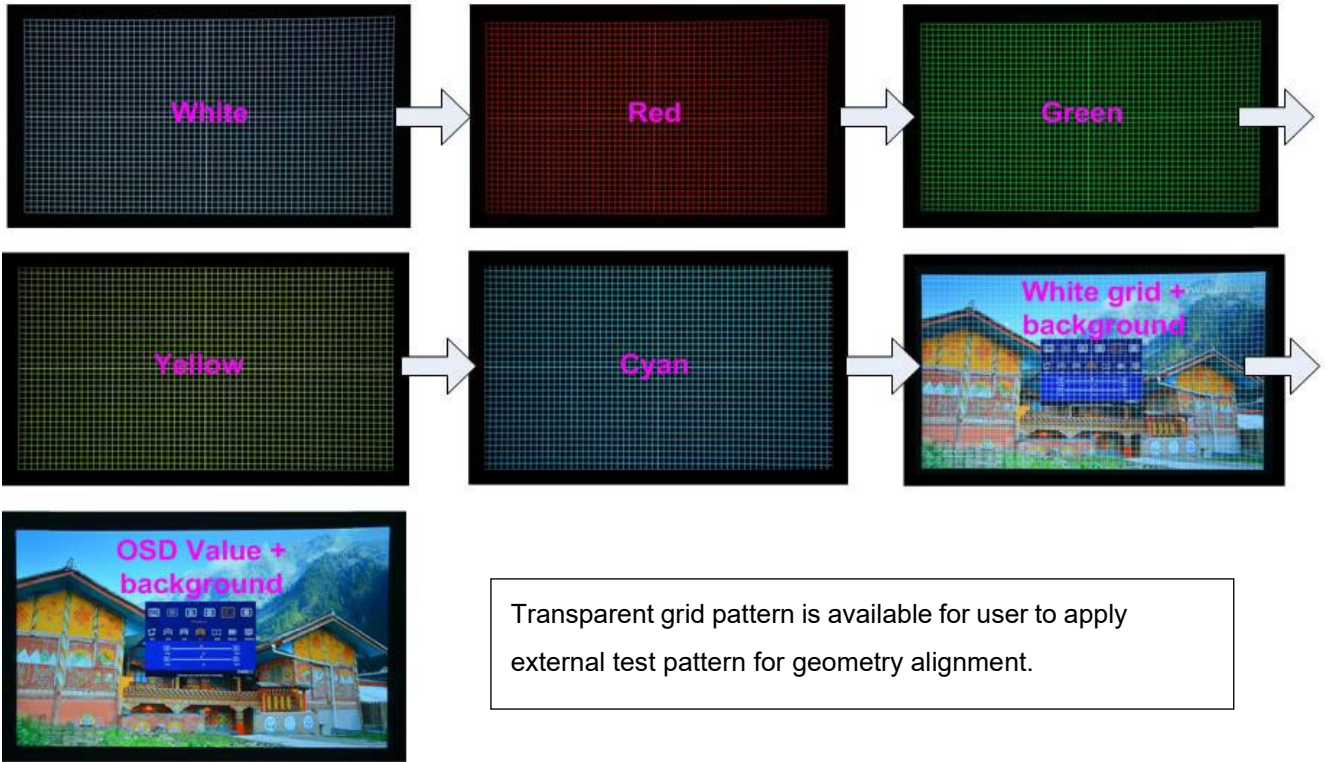
- Entire function operation by front panel keypad, WebPage, IR, and Ethernet (Including through WiFi by PC, Mobile, or iPad).
- Firmware update via USB or Ethernet.
- GCT PC tool can control multiple processors simultaneously through USB or Ethernet.
- Internal grid pattern with selectable color and grid size for easy geometry alignment.
- RS232 & Ethernet control system is compatible with most control systems.
- Users can select blue or black background color when no input signal is detected.
- Programmable EDID in the range of H=1024~3840, V=720~2400.
- BOX ID and programmable IP address for convenient multiple unit control simultaneously.
- Users can save up to 5 settings and be recalled by remote controller, RS232, USB, or network.
- System settings can be backup to PC or 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. Users can power ON/OFF the system through the control in the signal source.

Applications

- The projector is displayed on a curved screen with a small company logo. It is suitable for golf simulation and big-screen game applications.
- Change the aspect ratio of the screen to meet the required screen size.
- The display mirror image of a mobile phone or iPad on a portrait monitor for game or commercial applications.
- PIP/POP to add second video content on the screen with flexible image size, aspect ratio, and position adjustment.
- Stacking multiple projectors to increase the brightness of the image.
- Crop any size and location of the image for the display.
- Image rotation for portrait display without rotating image source.
- Correct image distortion in ultra-short throw ratio projector application.
- Edge mask to remove the unnecessary images at the edge.
- Smooth display projection image on 90 degrees wall corner.

Feature illustration

Variable Grid Patterns for geometry alignment

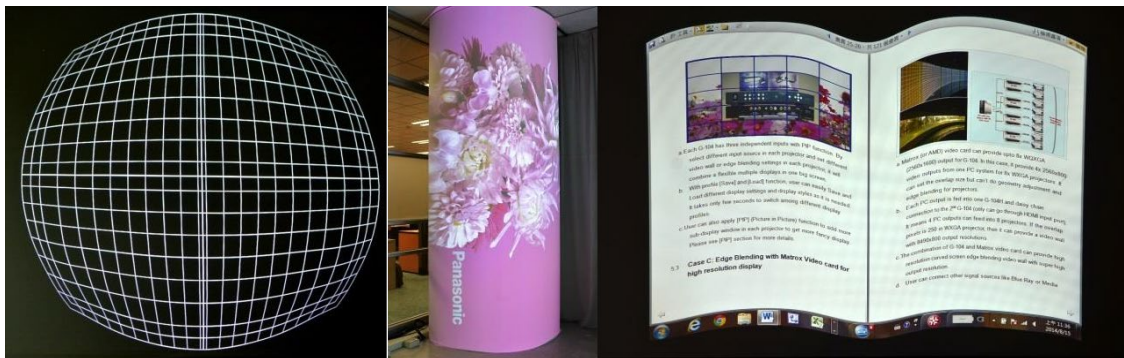
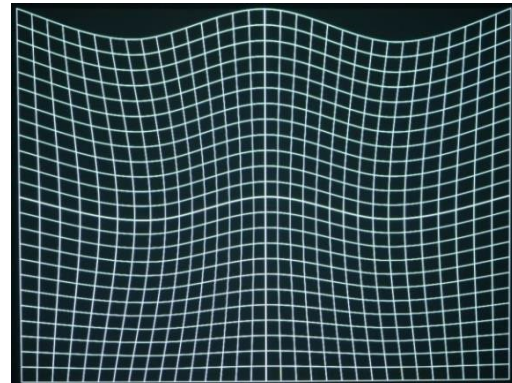


Selectable grid pattern size for geometry alignment

The pixel size in the grid pattern for geometry alignment is selectable. The grid size in horizontal and vertical directions is adjustable from 8 to 120 pixels with a 1-pixel increment. H&V grid size will be the same. Users can select grid size under the [Anyplace] menu.



Image geometry alignment and warp



“W” shape Corner wall Alignment & Display

The Corner Wall alignment function is functional either in the horizontal or vertical direction. Corner Wall geometry alignment ranges up to 1200 pixels in 4 corner positions and at the edge center in H&V directions. The curvature point position can be shifted ± 1200 pixels. Example for horizontal adjustment: the control point can be moved down to 1200 pixels, and the curvature point can be ± 1200 pixels away from the center point in the horizontal line. 4 Corner position alignment and Edge Blend function are still available with Corner Wall adjustment for easy image mapping and system setup.

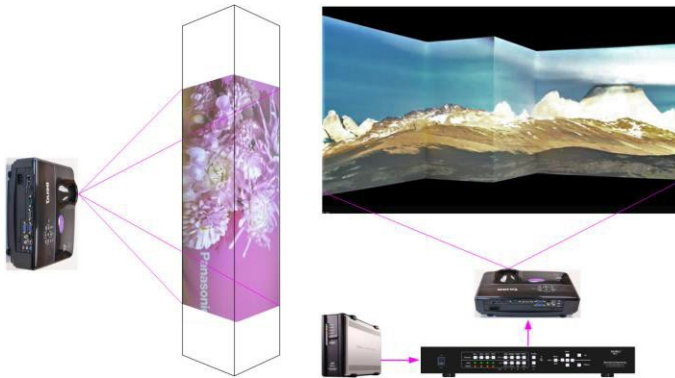
In Horizontal and Vertical directions



At any location but not only at the center



One projector Corner Wall application



Two projector Corner Wall application



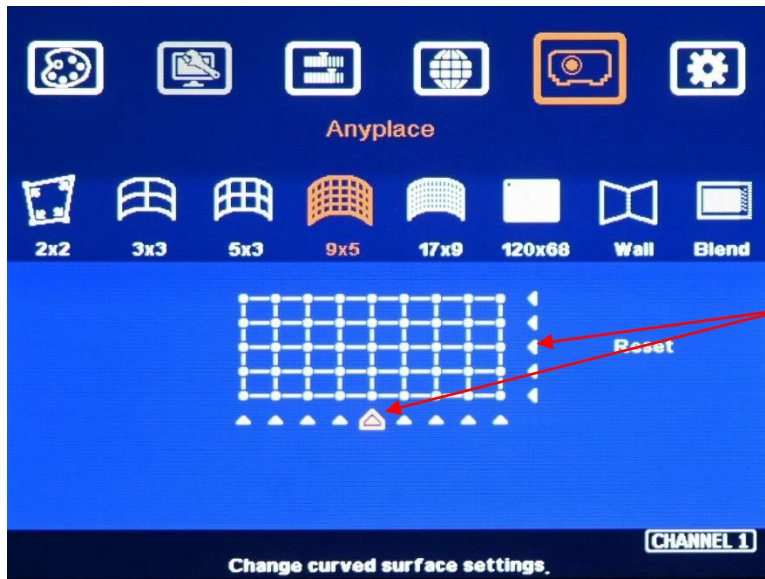
Other corner wall applications



Linearity grid line adjustment

When a projector projects an image on a curved screen, the image will change the grid size gradually and cause different scaling factors on the center and both sides. Linearity grid line adjustment is to compensate for this kind of effect and make a complete image with the same scaling factor. This function can be executed only through a remote control.

1. It can be applied to both horizontal and vertical directions.
2. The operation OSD menu is under 3x3, 5x3 & 9x5 warp alignment menu. The result can be further adjusted by the Gwarp3 PC tool for detailed 17x17 image position fine-tuning.
3. Linearity grid line adjustment can be executed with warp alignment simultaneously.



Control point for Linearity Grid
Line Adjustment

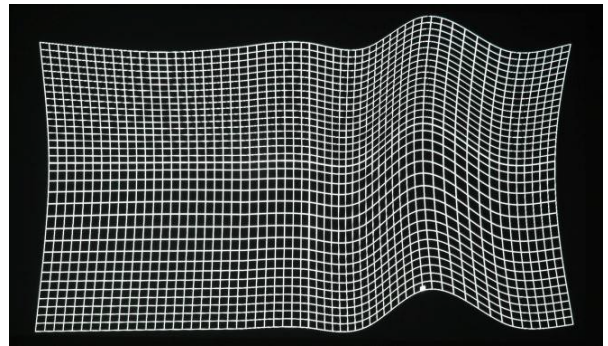
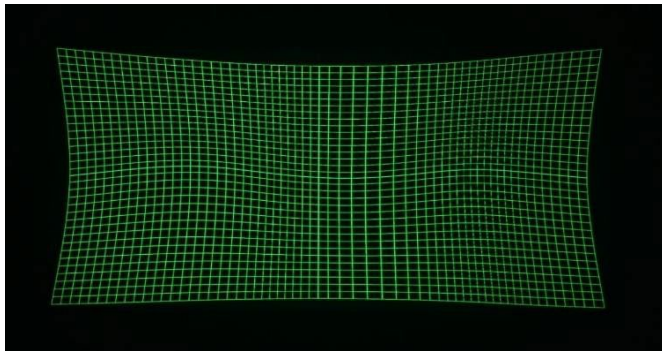
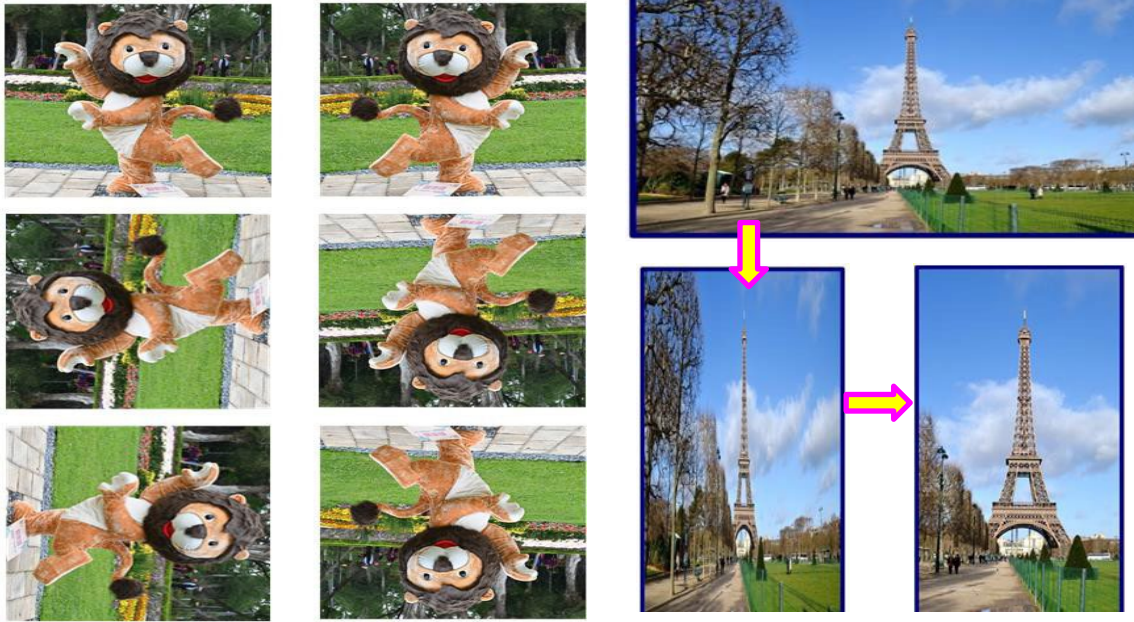
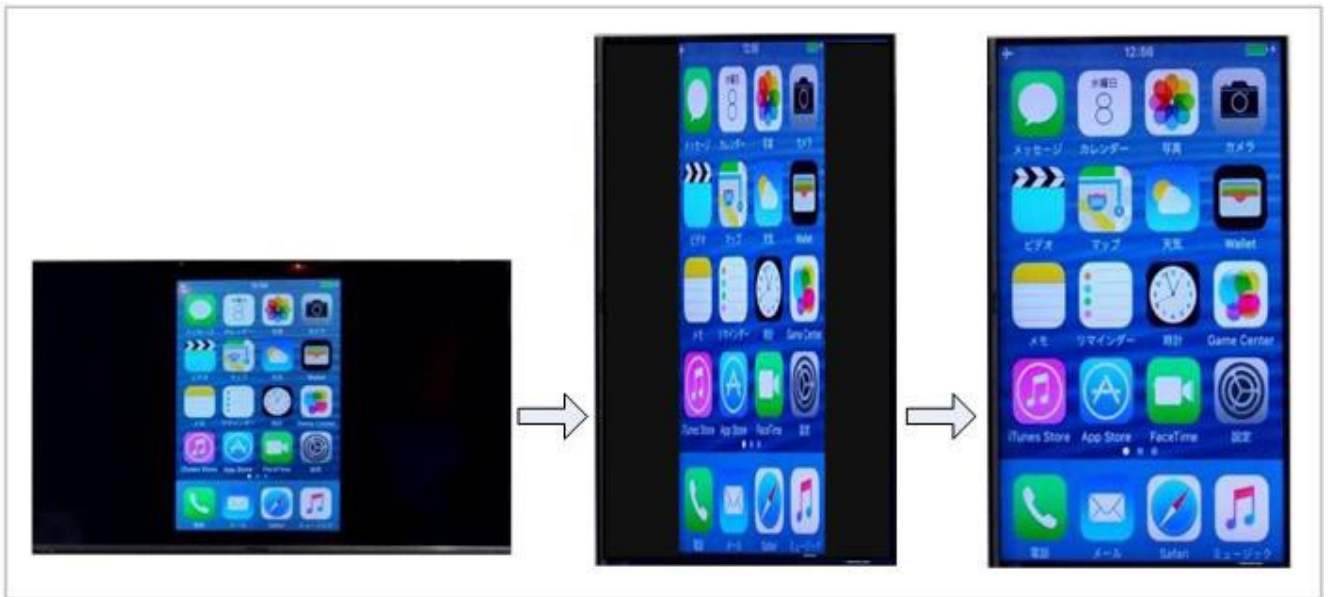


Image Flip & Rotation

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



To show mobile phone/iPad mirrored image at portrait TV.



Edge Mask

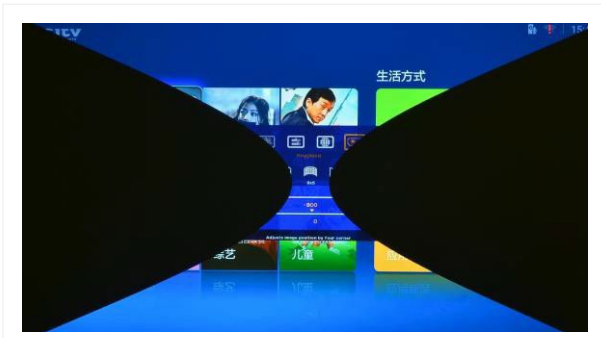
8 control points to define the area for the edge mask. It can work together with geometry alignment to get various edge mask effects.

Original image

Geometry adjustment + edge mask

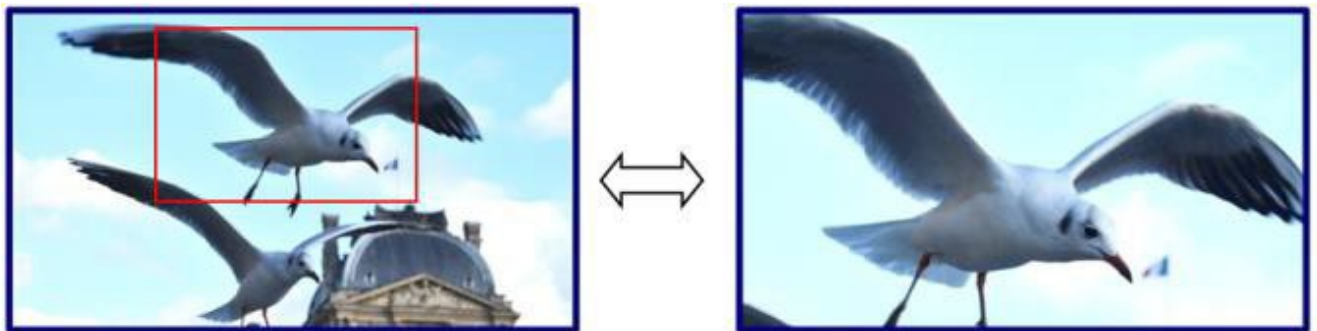


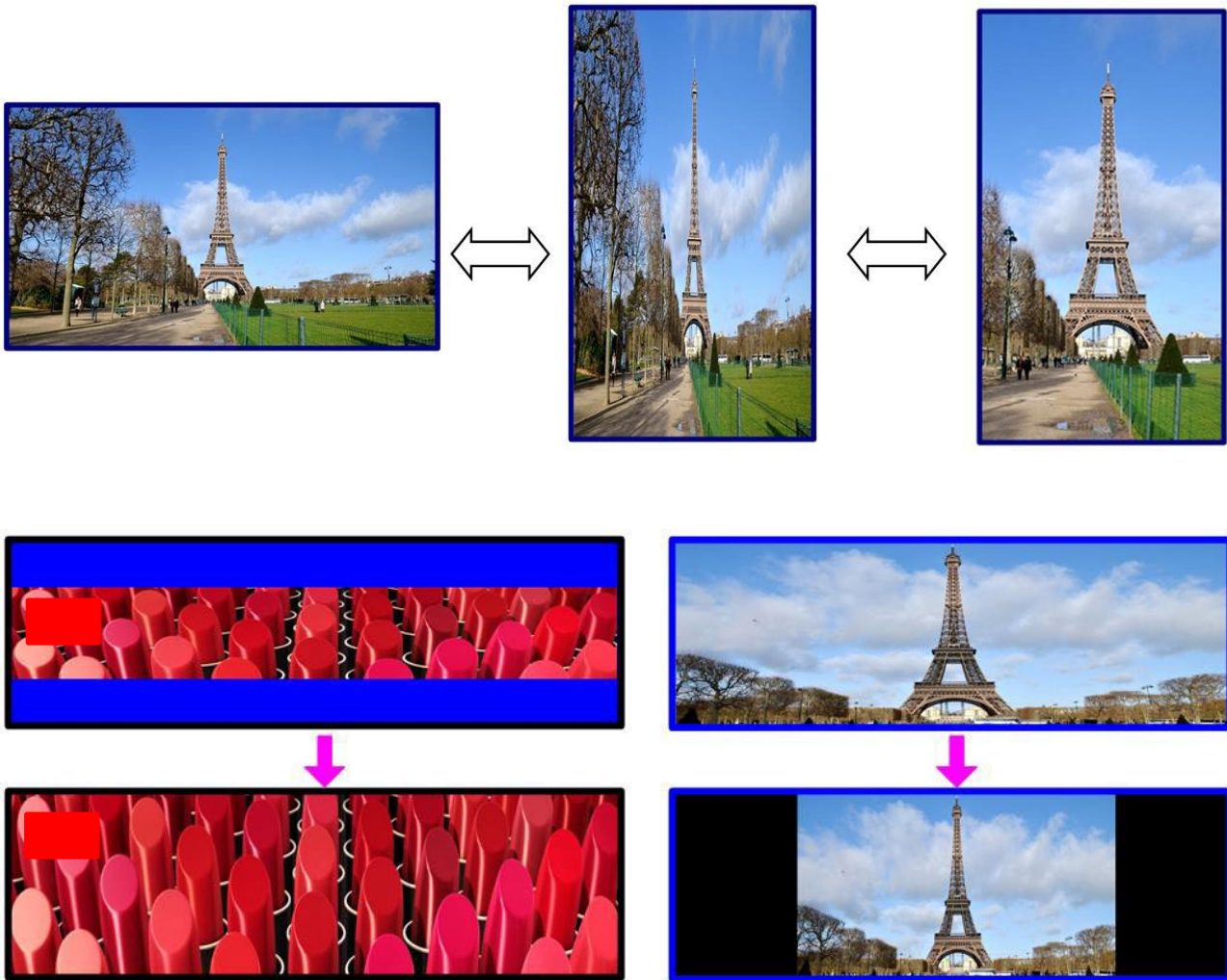
Edge mask up to 900 pixels



Stretch image, shift position, and change the aspect ratio

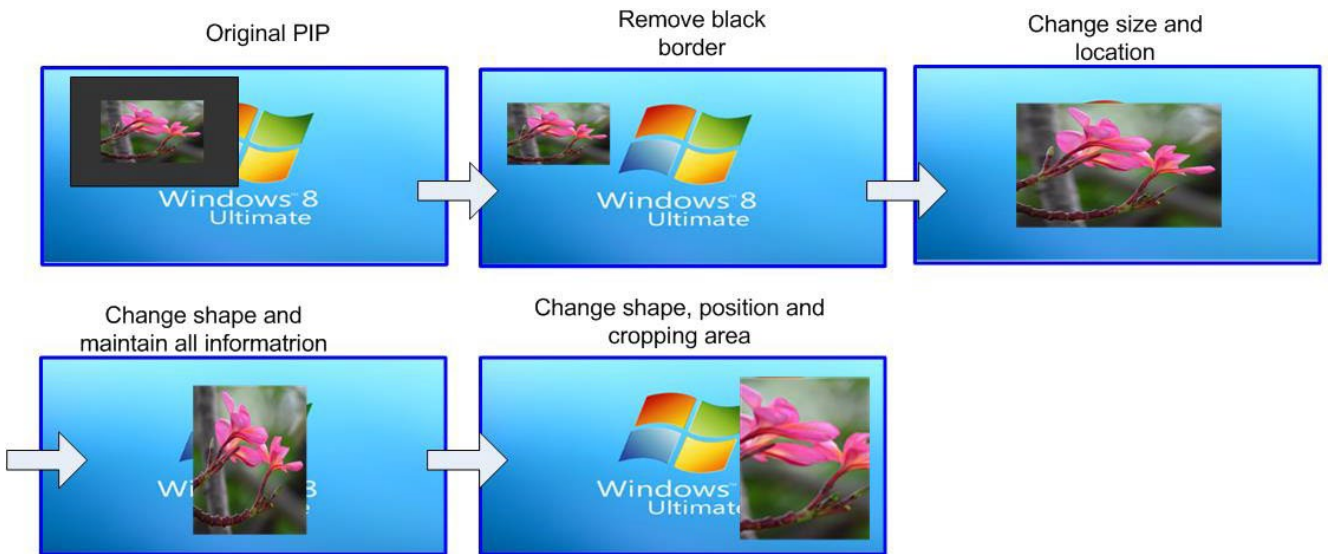
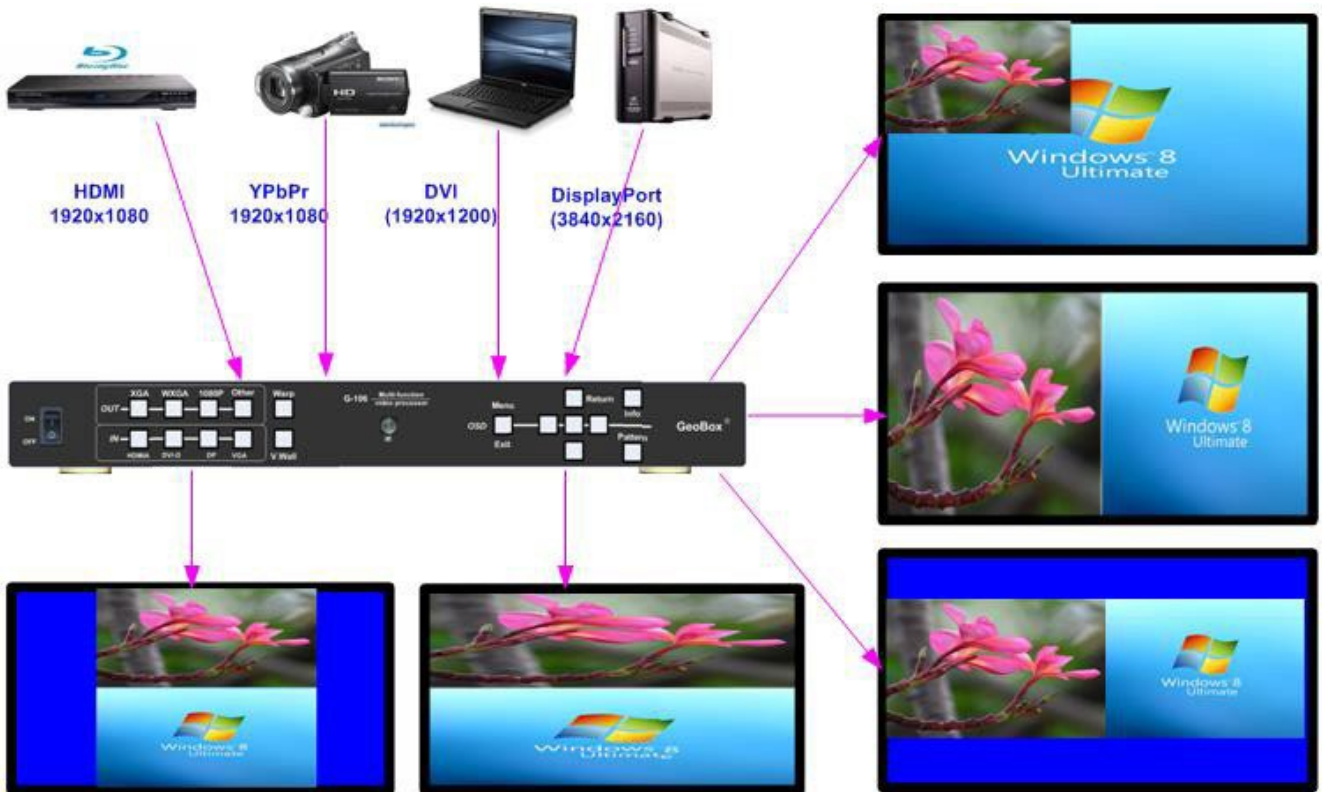
Geometry adjustment and Video wall cropping function can compensate for image size, position shift, or change in aspect ratio. The adjusting range is up to 1800 pixels on each edge based on the signal source.





PIP/POP function

M810 is designed with PIP/POP function in each processing module. Each processing module can display two contents in PIP (Picture in Picture) or POP (Picture outside picture) styles. Users can select two contents among HDMI, DP & VGA for PIP/POP display but can't simultaneously select two HDMI input signals. The PIP image can be with variable sizes from 320*180 to 1920*1200 resolution. The location is flexible across the entire display zone in each projector. The POP images can be Side by Side or in the Top/Bottom position with full screen or keep the original aspect ratio.



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