

PW8xxC series Edge Blending processor User Guide

PW811C (1 CH), PW822C (2 CH), PW833C (3 CH), PW844C (4 CH)

Input: up to 7680*2160 @30Hz, 7680*1200 @60Hz, 4096*2160 @60Hz

4:4:4 full color sampling

Output: up to 1920*1200 @60Hz, 2048*1080 @60Hz

New generation Warp & Edge blending engine

Full functions for edge blending. No PC is required.

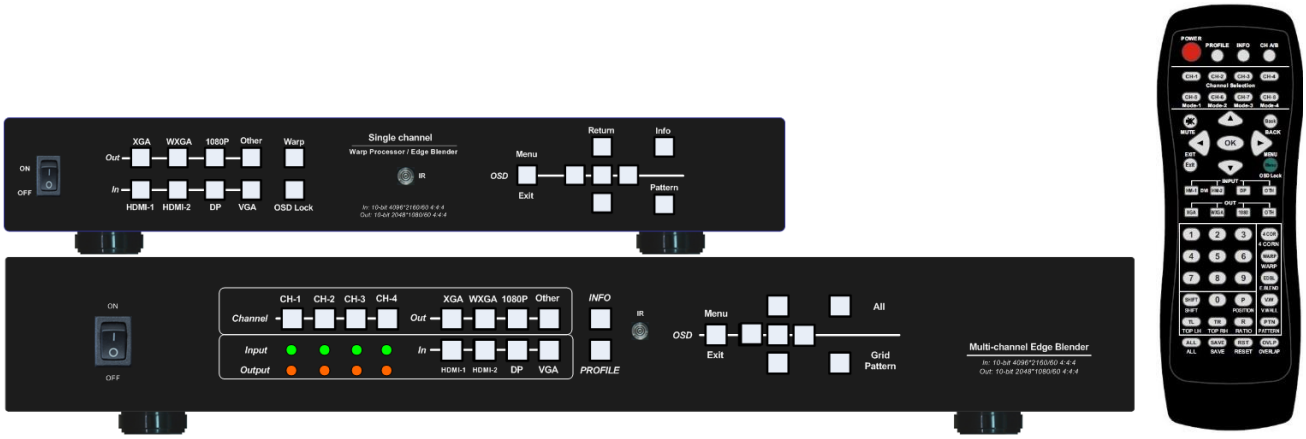


Table of Contents

Introduction..... 4
Outlook..... 5
Chapter 1. How to use IR Remote Controller
1.1. Individual OSD control in multi-unit application..... 7
1.2. OSD menu Lock and Unlock..... 7
Chapter 2. Edge Blending setup procedures
2.1. Importance knowledge
2.1.1. Video quality and signal/content resolution..... 8
2.1.2. Signal source and connection issue..... 8
2.1.3. Important tips for edge blending..... 9
2.1.4. How to select projector for edge blending..... 10
2.2. System connection
2.2.1. Two projector edge blending..... 11
2.2.2. Three projector edge blending..... 12
2.2.3. Four projector edge blending..... 13
2.2.4. More than 4 projectors (multi-units cascaded) 14
2.3. System information and in/out LED indicators..... 15
2.4. Edge blending plan
2.4.1. Determine the quantity of projector..... 16
2.4.2. How to use [NEXIS Edge Blend Calculator]..... 16
2.4.3. Installation data from Calculator Spreadsheet..... 18
2.5. Projector installation..... 19
2.6. Preparation before edge blending setup
2.6.1.Projector settings before edge blending..... 20
2.6.2.NEXIS settings before edge blending..... 20
2.7. Geometry alignment
2.7.1. Geometry alignment via IR controller & OSD..... 21
2.7.2. Linearity Grid Line Adjustment..... 26
2.7.3. Important notice on curved corner display..... 27
2.8. Video Wall setting..... 28
2.8.1. Zoom—split the image..... 28
2.8.2. Pan—assign location..... 29
2.8.3. Overlap—set overlap pixels..... 30

2.9. Edge Blend setting…… 32
2.10. Save/Load User settings
2.10.1. Save User Settings…… 33
2.10.2. Load (Recall) User Settings…… 34
2.11. User settings missing and erased…… 35
2.12. Possible image quality issue
2.12.1. Projector light leakage and black level uplift…… 35
2.12.2. Banding in overlap region…… 39
2.12.3. Image blurred or double images…… 41
2.12.4. Other possible issues in edge blending…… 42
2.12.4.1. Image distortion and content resolution…… 42
2.12.4.2. Limitation in edge blending application…… 43
2.13. Final image quality fine-tune…… 44
Chapter 3. Advanced functions and settings
3.1. EDID setting…… 45
3.2. Geometry alignment via GCT PC Tool…… 46
3.3. System Reset…… 48
3.4. Control system settings—Box ID, RS232, Ethernet…… 49
3.5. PIP/POP—Dual window display…… 51
3.6. Corner Wall geometry alignment…… 54
3.7. Edge Mask…… 56
3.8. Determine overlap region size and pixels…… 58
Chapter 4. Advanced applications
4.1. Flexible display (multi-video) …… 61
4.2. Independent content display…… 61
4.3. Multiple wall immersive display…… 63
4.4. Portrait edge blending…… 68
4.5. Entire aspect ratio adjustment…… 69
4.6. How to support 5k/6k/8k input signal…… 70
4.7. Multiple unit cascade…… 71
Chapter 5. WebGui and GCT PC tool…… 75
5.1. WebGui…… 75
5.2. NEXIS Control Tool (GCT)…… 76
Chapter 6. Miscellaneous settings…… 84
6.1. HDMI vs. DVI Output Signal…… 84
6.2. System Standby and Automatically Turn Off output…… 84
6.3. Change Background Color…… 84
6.4. Turn off splash screen Logo…… 85

Chapter 7. Trouble Shooting

7.1. Front Panel LED indicators…… 86

7.2. No Image in the projector…… 86

7.3. Intermittent or Loss of Input Signal…… 86

7.4. Video Quality Issues…… 87

7.5. Image Position Shift after Installation…… 87

7.6. System Crash and Malfunction…… 88

7.7. Synchronization Issue in the Outputs…… 88

7.8. How to Reduce Projector re-search Input Source…… 88

Chapter 8. Technical Support…… 89

Chapter 9. Safety Precaution and Maintenance…… 89

Specification…… 90

Revision History…… 92

Introduction

PW8xxC series is upgrade model from PW8xxB series. The major difference is to support 17*9 geometry alignment and 120*68 control points fine-tune in IR controller & PC Tool. Complete new GCT PC tool is adopted. It provides more friendly interface for PC tool operation and increase the accuracy. User can swap between GCT and IR control operations at any time. It supports up to 7680*2160/30Hz input resolution without additional settings.

PW8xxC series provides multiple processing modules to control from 1 to 4 projectors in one box. PW811C is integrated with one processing module to control one projector, PW822C for 2 projectors,PW833C for 3 projectors and PW844C for 4 projectors. It was designed for sophisticated edge blending as well as image warping and stacking. One PW844C can execute 4 projector edge-blending without any additional equipment or splitter.Multiple PW8xxC series can be cascaded for large scale display.

4 input ports (2x HDMI, 1x DP, 1x VGA) and 1x HDMI outputs are designed in each processing module. Digital input supports up to 7680*2160 @30Hz, 7680*1200 @60Hz/4096*2160 @60Hz with 4:4:4 full color sampling. Output supports up to WUXGA/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 timings. Programmable EDID can optimize input timing to get the best video result.

Advanced warp technology is embedded in PW8xxC series. User can use IR controller, USB, WebGui and Ethernet to perform edge blending and sophisticated geometry alignment up to 120x68 control points. Linearity Grid Line Adjustment for compete line movement and Corner Wall image adjustment for mapping image at 90 degrees corner are new functions in geometry alignment. Separate R, G, B gamma correction for edge blending region color fine-tune, individual color correction for each output and 9 regions black level uplift to compensate light leakage in the projector are also standard functions in PW8xxC series. Users can see real time geometry and color adjustment to get optimized result.

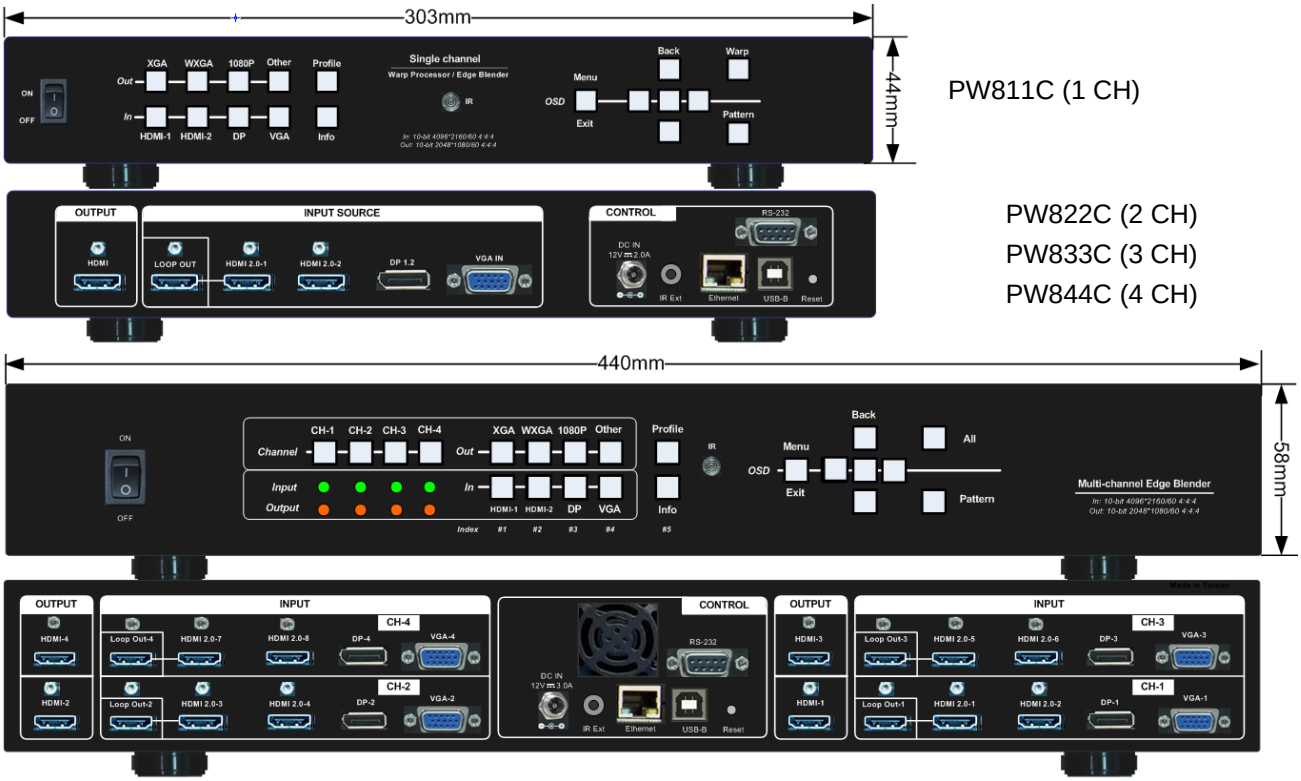
HDMI loop out supports daisy chain connection up to 8k/2k @30Hz / 8k/1k @60Hz and allows large display with multiple units cascaded. Video wall function is to crop and allocate source image for each projector and set overlap pixels for edge blending. Complete curved edge blending can be achieved through remote controller and Ethernet without additional devices except for signal source and projectors.

PIP (picture in picture) and POP (side by side) are standard functions. PIP image size is from 320*180 up to 1920*1200. In one PW844C, user can display up to 8 different input contents on the screen.

PW8xxC series is an ideal solution for simulation. It can connect with inputs from multiple PCs and combine them into one seamless image. Unnecessary image can be masked out. It also provides flexible displays in edge blending system. For a 3x projector edge blending system, user can configure as 1+1+1 independent display,1+2 (two projectors blended) and all-in-one (three projectors blended). 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.

Using PW8xxC series, 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.

Outlook



(The back panel shows 4 CH model—PW844C)

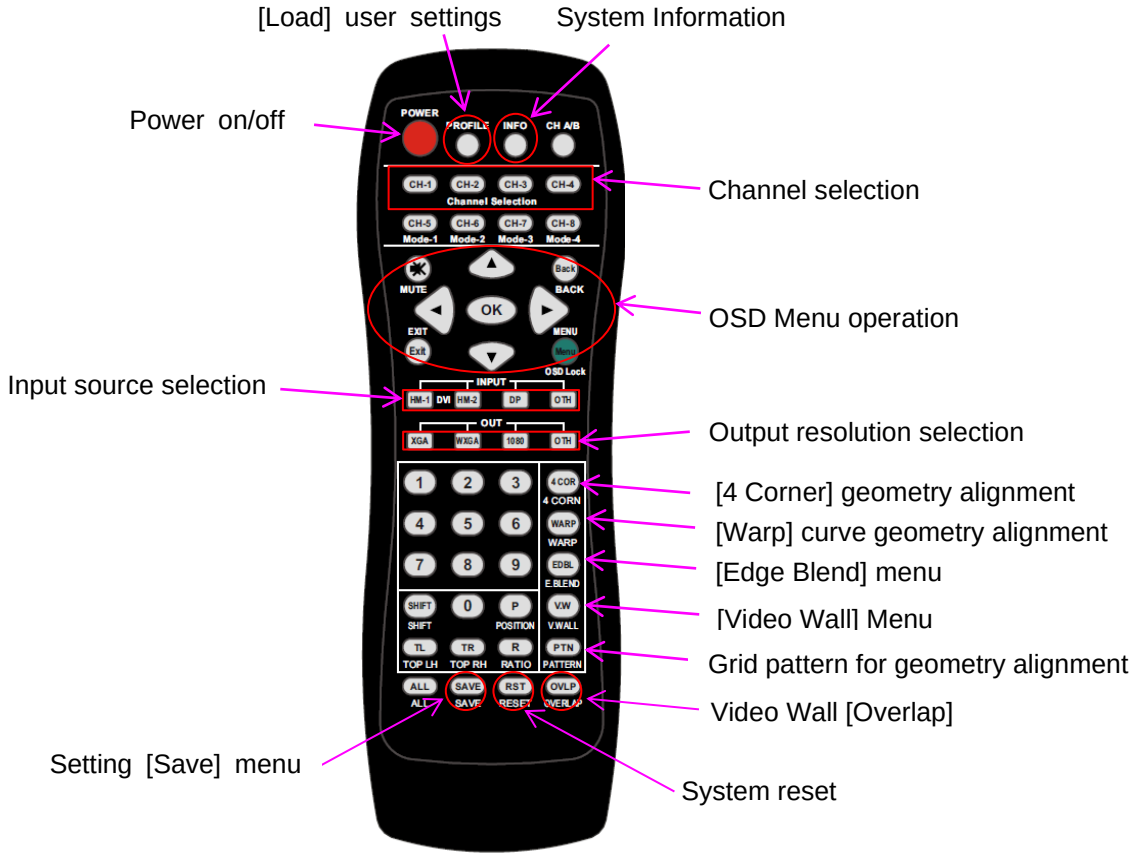
Chapter 1. How to use IR Remote Controller

- IR remote controller has full functions for the operation of PW8xxC series.
- IR receiver is on Front Panel. One 3.5ø mm audio connector for IR extender is located at Back Panel of PW8xxC series. 1.8m IR extension cable is equipped in the packing. User can add audio cable to extend the distance up to more than 20 meters.
- IR remote control system is possible to be interfered and cause abnormal or discontinuous operation. Under this condition, PC Tool via USB or Ethernet operation may be the best choice.





Audio connector for IR extender



1.1. Individual OSD control in multi-unit application

If multiple units of NEXIS is installed together or the IR receiver is put together, in order to avoid interference among multiple NEXIS during the installation, user can set different ID number for each NEXIS under [Options]→ [Setting]→ [Box ID] Menu. Press number keys in Remote Controller to determine which NEXIS can be controlled.

- 851: control NEXIS ID No. 1
- 853: control NEXIS ID No. 3
- 850: to unlock all units and user can control all NEXIS.
- If user presses 851, only ID #1 NEXIS can be controller through OSD. The rest units of NEXIS will be locked. The channel key LED will show blinking light with 1 second interval.

1.2. OSD menu Lock and Unlock

When continuously press [Menu] key in IR Remote Controller or front panel for 5 seconds, the OSD function will be locked and channel key LED will light up with 0.5 second interval. To press [MENU] key for 5 seconds will unlock OSD Lock.

Chapter 2. Edge Blending setup procedures

2.1. Important knowledge

2.1.1. Video quality and signal/content resolution

Main factors to determine the video quality is system resolution and watching distance.

- System resolution is the minimum resolution in the whole pipe line: image content→ signal source→ video processor→ total resolution after edge blending.
- The system resolution will be determined by the lowest one in this pipe line. If user wants to achieve 4k quality, then the whole signal pipe line should be more than 4k.
- Watching distance: If the watching distance is 5M, the image pixel pitch should be less than 5mm. If the screen is 10M and apply FHD (1920*1080) to the system, the image pixel pitch will be 10M/1920=5.2mm. The watching distance should be more than 5M away from the screen to get acceptable video quality.

2.1.2. Signal source and connection issue

a) Possible signal source issue

- The quality for Android media player box is not stable due to different IC solution. It may cause some compatibility issue in different devices.
- User can check the input LED to confirm if the input source is detected by NEXIS or not. If no input LED, please check signal source and connection cable.
- Usually, the input will be 4k signal and output is only WUXGA (FHD). The input signal cable and looping connection cable should be 4k certified. Poor cable quality will cause no image or intermittent display.
- Fiber HDMI cable requires external power supply. If Fiber HDMI system didn't get proper power supply, it will absorb the power from hot-plug pin in HDMI connector and cut off signal connection.
- HDCP should be considered. Please make sure the system is HDCP compliant. NEXIS is HDCP compliant device.

b) **How to solve signal connection issue**

- The input/output LED should be normally displayed. Click [INFO] key to check input/output connection status and resolution.

- If no image displayed, please click [MENU] key to check whether OSD is showed up. If OSD is normally displayed, the hardware and the connection to the projector should be functional.
- If the issue is still existed, please test with below:
  - Replace with 4K certified cable
  - Test with different signal source and monitor to see if it can display normally.
  - Please check signal extender. Different types of signal extender may have different compatibility issues especially in high resolution signal. HDBaseT is recommended for long distance connection.
  - Check the power supply system and direction in signal extender (especially in Fiber HDMI cable).
  - To add HDMI splitter or switcher before NEXIS may solve the system compatibility issue.
  - Sometimes, the output set to DVI mode ([Options]→ [Setting]→ [DVI Output]→ [on]) will solve output signal connection issue because DVI signal has less signal control.

2.1.3. Important tips for edge blending

- The final image of each projector needs to be the same size. Otherwise, the grid will not be aligned.
- The output resolution of the NEXIS must be set the same as the native resolution of the projector, and each channel must be set separately.
- The best signal source resolution is to add all projector resolution together, then deduct the overlap pixels. For example, two 1920 * 1200 projectors are edge-blended horizontally, if the overlap is 20 grids (the preset grid size is 32 pixels), then the best horizontal resolution is (1920 *2) - (20 * 32) = 3200, so the best input resolution is 3200 * 1200. If the PC is set to this resolution, the desktop will not be distorted.
- If the playback content is different from the aspect ratio of the screen, there will be image distortion problem. If the content aspect ratio is the same, even the signal source resolution is not optimized, NEXIS can fill the entire screen with images without distortion.
- The input resolution is determined by the signal source, and NEXIS EDID can provide PC with preferable resolution of NEXIS. If the required source resolution is exceeded 4k/2k, please visit NEXIS website→ Technical [Support]→ [Application note]→ [PC 8k_6k Output Setup Procedures].
- 10 grids or more (each grid is 32 pixels) overlap region is recommended. WXGA or XGA projector should have more than 8 grids. The overlap pixels can be up to 1920 in the horizontal and 1200 pixels in the vertical.
- PW8xxC series can support interlaced signal source (i.e. 1080i). However, if user rotates the image, there will be no 3D motion adaptive de-interlaced function. User may see some small flick image while the input is still image. We recommend applying progressive signal to avoid this kind of issue.
- In the application with short throw ratio projector on curved screen, there will be big image distortion. User needs to apply big geometry alignment and degrade the video quality.

- Image position drift will cause blurred image in overlapped region. For edge blending application, please select projector with less Thermal drift. It can be judge through comparing image position shift between Power on and after 20 minutes running time.
- Mark the final image pattern position. Once the position shift in the future, it can be recovered through [2x2] corner adjustment via remote controller easily.
- Native contrast ratio is important in edge blending. The higher contrast ratio will have less light leakage with less banding in overlapped region under dark environment.
- Ultra-short throw projector is not suitable for edge blending due to big reflection angle and easy to cause color banding effect while watching from different viewing angle, especially under high gain screen or rear projection.
- Select projector models for edge blending in advance will make sure to get the best final quality.
- DLP Laser projector is good for edge blending under dark environment. LCD projector has good color saturation and is suitable for multimedia application at normal ambient light environment.
- During system settings, the output signal may be temporarily lost and cause projector re-searching input signal and the image disappears shortly. User can disable [Frame Sync] function to reduce this kind of effect. After finishing system setup, user needs to set [Frame Sync] at [Normal] position to get perfect synchronization in all output channels.
- The screen Gain value should not be over 1.0 to reduce the chance for banding effect.

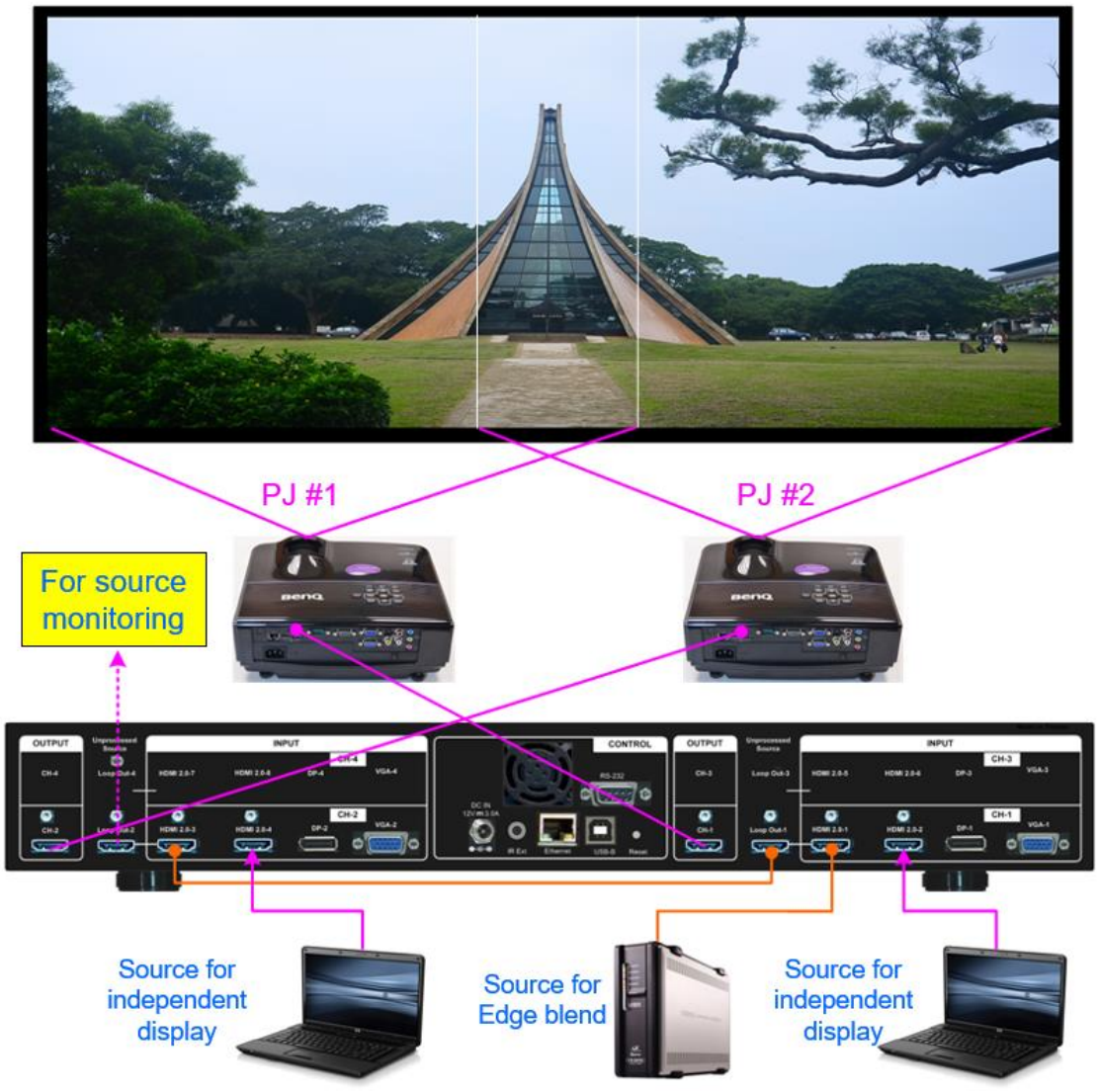
2.1.4. How to select projector for edge blending

- Ultra-short throw ratio projector is not good solution for edge blending
  - Limitation in maximum image size.
  - Close to the screen with big reflection angle. Different viewing angle on overlap area may see different color banding.
  - Focus on single projector application. May not have standard gamma 2.2 for multiple projector application.
  - Poor color uniformity and lose image focus at edge.
  - Not suitable for rear projection screen.
- Higher NATIVE contrast ratio will reduce banding effect due to light leakage under dark environment. Native contrast ratio (full on/full off) is not the same as dynamic contrast ratio.
- Ultra-short throw ratio projector can't be used for curved screen due too big image distortion. Larger throw ratio will have less image distortion.
- To select projector with rigid structure and less thermal drift in image position.
- In normal application, please select Installation projector to get better color uniformity and 2.2 gamma curve. The projector can be no lens shift, edge blending or warp function. If double curve screen is used, projector with warp may help image alignment in extreme alignment case.

- Projector throw ratio will affect installation distance. Longer throw ratio will get better video quality but may affect the free space for visitors or speaker. Usually throw ratio more than 0.6:1 is recommended for edge blending.
- Laser projector has long lamp source life and can be installed at portrait direction to increase image height.

2.2. System connection

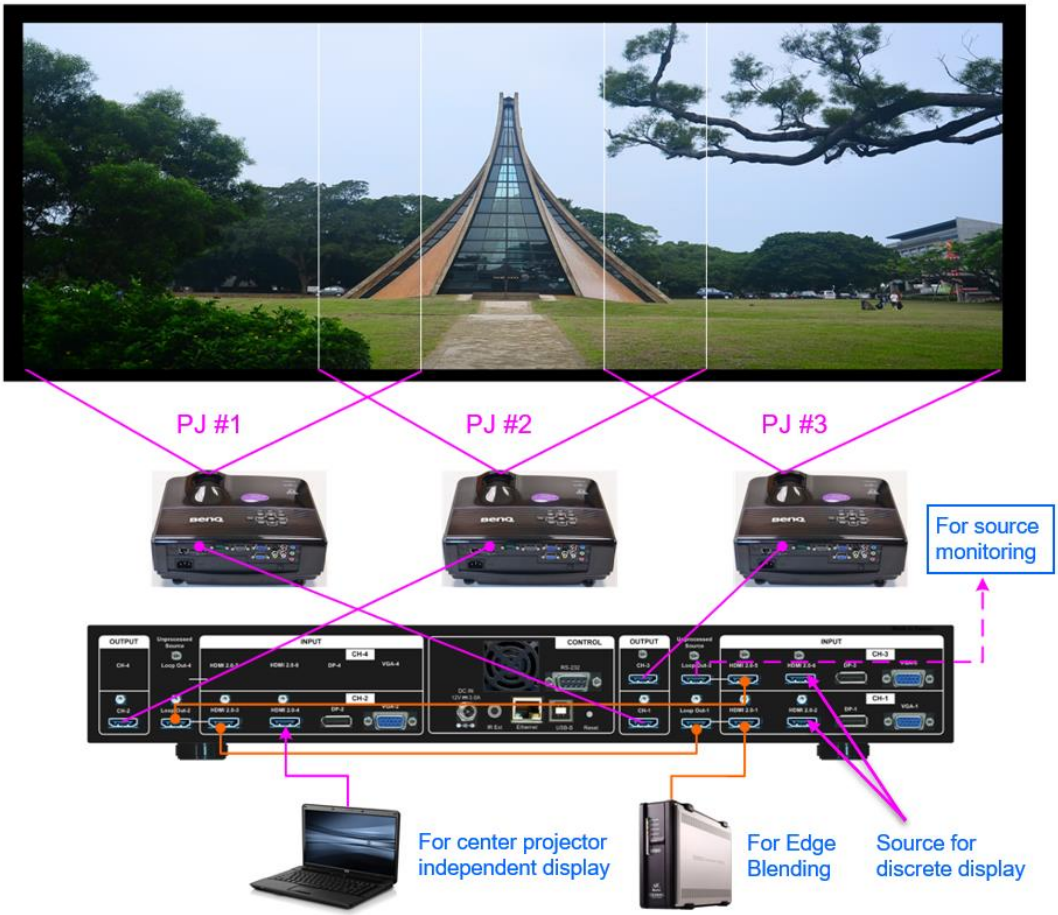
2.2.1. Two projector edge blending



- Source for edge blending: connected to HDMI-1, then loop out to HDMI-3 through loop out-1 port. User can also connect signal to HDMI-3, then loop to HDMI-1. No special sequence is required.
- Source for independent display: connected to HDMI-2 & HDMI-4

- Output-1 connected to Projector 1. Output-2 connected to Projector-2 for convenient operation. Sequence can be changed. Can be determined by Video Wall [PAN] setting.
- Loop out-2 connected to monitor for source content monitoring or daisy chain to next unit.

2.2.2. Three projector edge blending



- Source for edge blending: connected to HDMI-1, loop out to HDMI-3 through loop out-1 port, loop out to HDMI-5 through Loop out-2. Input signal can be connected to CH-2 or CH-3, then looping to other two channels. No special sequence is required.
- Source for independent display: connected to HDMI-2, HDMI-4 & HDMI-6.
- Output-1 connected to Projector 1. Output-2 connected to Projector-2. Output-3 connected to Projector-3. Sequence can be changed. Can be determined by Video Wall [PAN] setting.
- Loop out-3 connected to monitor for source content monitoring.

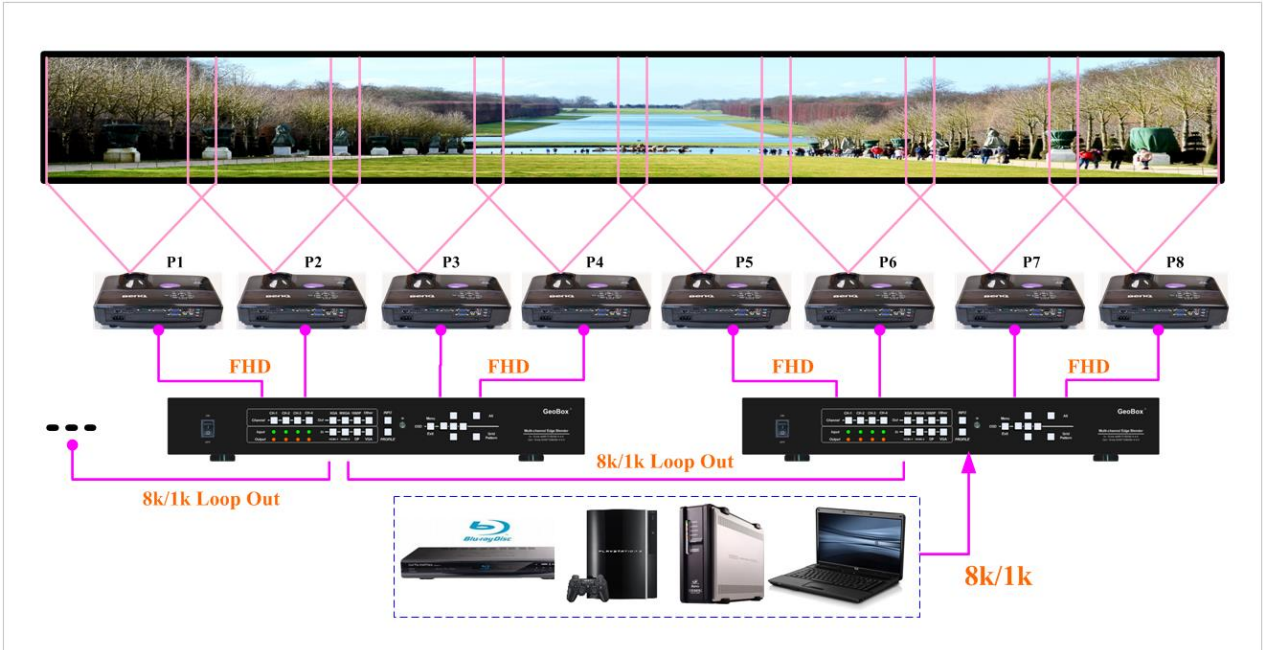
2.2.3. 4 projector edge blending



If 4 projectors are used, please use PW844C. This system diagram shows a different connection way. The input is connected to CH-2 input port, then daisy chain to CH-4/CH-3/CH-1 to feed input signal to all channels. Each output can be connected to any projector without special sequence.

- The input can be connected to any input port near Loop Out port, then looping to other channel without special sequence. The input signal needs to feed to all channels.
- The output connection has no special sequence. The final location can be determined by [Video Wall]→ [Pan].
- Last Loop out port is to supply signal **for multi-unit connection or source signal monitoring.**

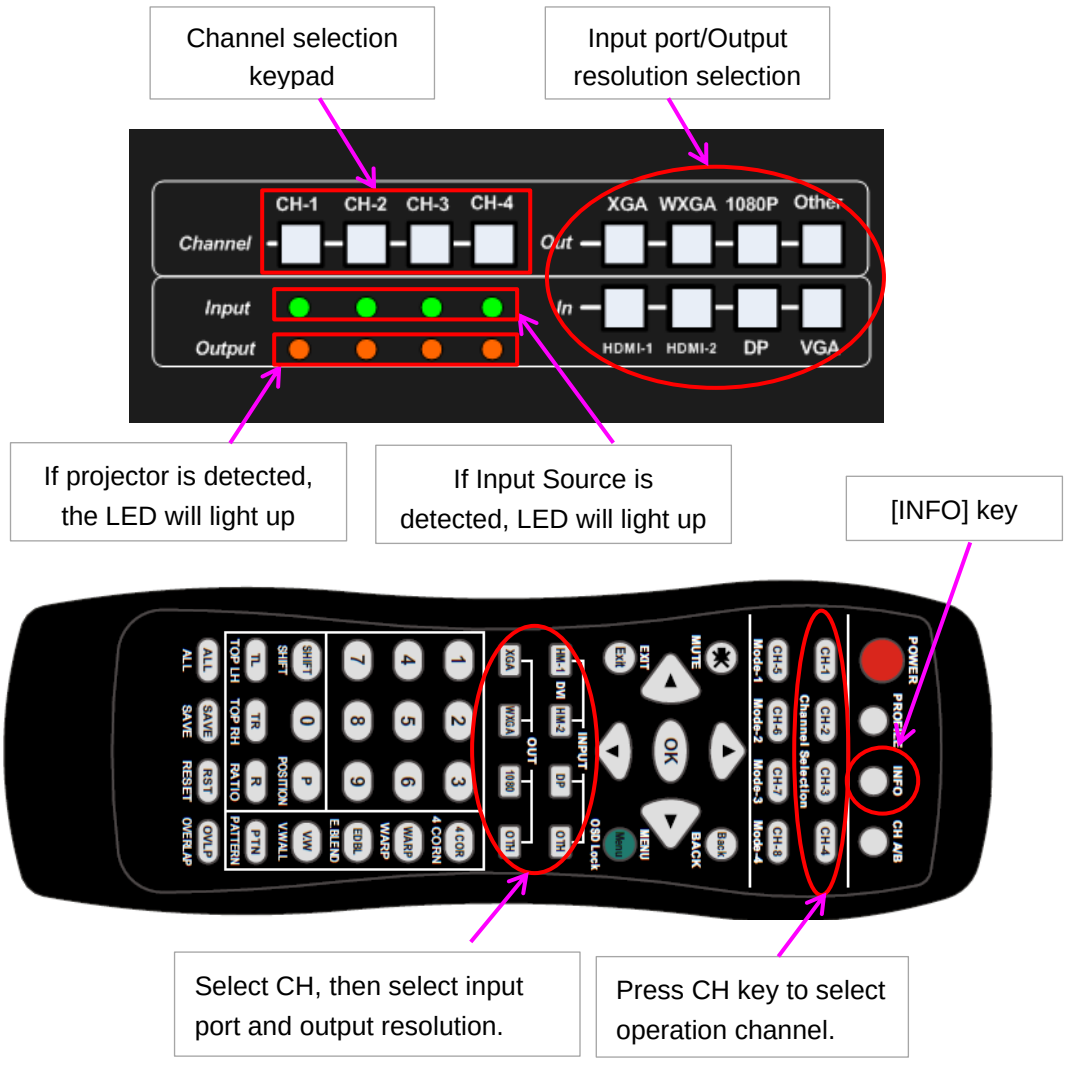
2.2.4. More than 4 projectors (multi-unit cascaded)

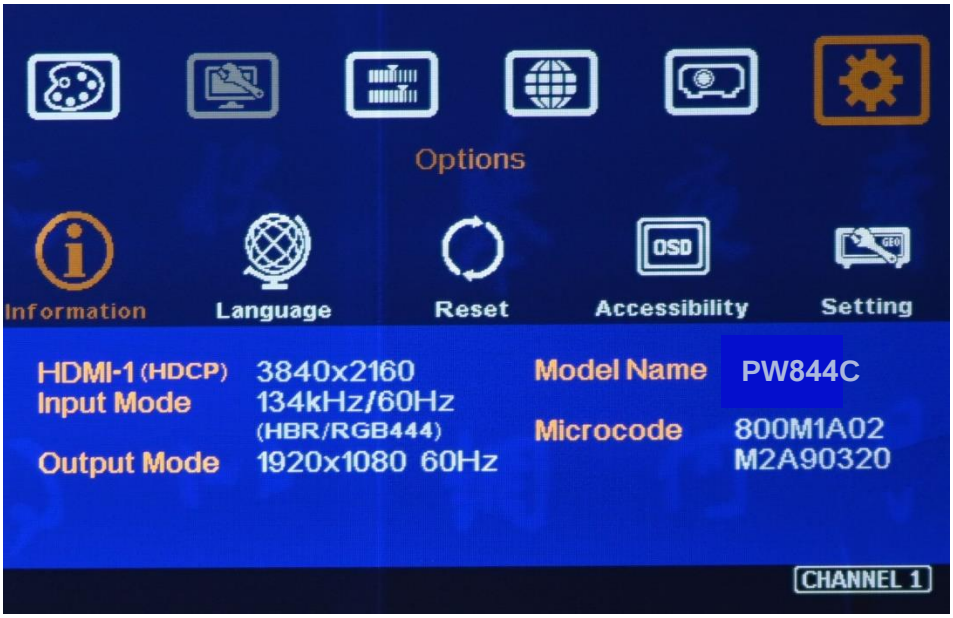


- Multiple units edge blending processors should be used. Different model NEXIS can be cascaded together for any project. For instance, if 5 projector edge blending system is required, user can select 1x PW844C + 1x PW811C, 1x PW833C + 1x PW822C or 1x PW811C +1x G804.
- User needs to feed the same signal source to all channels through Loop Out port.
- The input can be connected to any input port near Loop Out port in the 1st box.
- The finial loop out port in the 1st box needs to connect to the 2nd box input port, then daisy connected to all channels.
- The max. loop out connection is up to 10 projectors. HDMI splitter at the front end is required for more than 10 projectors.
- The output connection has no special sequence. The final location can be determined by [Video Wall]→ [Pan].
- If two or more signal sources are used to increase the system resolution, user needs to create redundant contents between two signal sources by content creation or display card overlap pixel settings (such as Matrox M9148).

2.3. System information and in/out LED indicators

- Once input signal and output ports are properly connected, LED indicator on the front panel will show up. If any of the LED in each channel is not lighted up, please check the in/out connection and cable.
- User can check detailed system information by pressing [INFO] key on remote controller: Select Channel→ press [INFO]→ show system information on OSD.





2.4. Edge blending plan

2.4.1. Determine the quantity of projector

- Rough estimation:

  One WUXGA projector with 5000 Lumens can project an image size of 4M x 2.5M (16:10) with 500 Lux illuminance. The standard image height is 2.5M and can be adjusted by geometry alignment function to get image height between 1.5M to 2.5M. The pixel pitch is around 4000/1920=2.1mm. The ideal watching distance is about 2M.

- Screen size and number of the projector used.
  - Less than 4M screen width: one projector
  - 4M-7M: 2 projectors (Overlap: 1M)
  - 7M-10M: 3 projectors (Overlap: 1M, total 2M)
  - 10M-13M: 4 projectors (Overlap 1M, total 3M)

2.4.2. How to use [NEXIS Edge Blend Calculator]

- Please download [NEXIS Edge Blend Calculator] from below website: **https://bit.ly/3TBfzk8**

- Password is required to open this Excel File. Please contact NEXIS or distributor.

---

a) Case study: 3 projector edge blending

- Screen Size: 6.5m*1.5m with watching distance within 2m (pixel pitch less than 2mm)
- Projector resolution and lumens. 1280*800 (native resolution), 3200 Lum.
- Input signal resolution: 3840*800 (Pixel pitch is 6500mm/3840=1.7mm = 1.7m watching distance, optimized vertical resolution is the same as projector native resolution: 800)
- Number of projectors: 3 projectors
- Overlap pixels and dimension. 8 grids=8*32= 256 pixels (50cm)
- Projector throw ratio: 1.2-1.7 (based on projector spec)

b) [NEXIS Edge Blend Calculator] operation

- Input the data in Yellow column, including Source Resolution, Projector Resolution (NEXIS output resolution), Screen size, Projector throw ratio, Projector Lumens, No. of projector and Overlap Pixels.
- User can try different configurations and select the most cost effective one with a little higher image than required.

NEXIS Edge Blend Calculator

Project basic data

Source resolution (H)	3840	Screen width	6.50	(m)
Source resolution (V)	800	Screen height	1.50	(m)
Projector resolu. (H)	1280	Projector lumen	3200	(Lum)
Projector resolu. (V)	800	Screen Aspect ratio	4.33	(required)

Overlap pixels (32 pixels per grid)		Overlap %	Recommended
Overlap pixel (H)	256	20.0%	20%~40%
Overlap pixel (V)	0	0.0%	25%~40%

Recommended overlap region: Min. 50 cm width

Qty of projector (H)	3	Throw ratio (Min)	1.20
Qty of projector (V)	1	Throw ratio (Max)	1.70

Final output resolution

Horizontal resolution	3328
Vertical resolution	768
Extended pixel (H)	98
Extended pixel (V)	0

Final result checking list (PJT: Projector)

Final Image size (meter)		Final Illuminance Lux (Lum/m2)		Image size for each PJT	
Width	6.50	PJT lumen	3200	Width (m)	2.500
Height	1.56	Final Illumin	819	Height (m)	1.563

Overlap region size		Original aspect ratio		Projector throw distance	
Horiz. (m)	0.500	Projector	1.60	Min (m)	Max (m)
Vertic. (m)	0.000	Final result	4.16	3.00	4.25

* Final mage height should be equal or larger than screen. User can shrink image to have the same image height as screen by GeoBox geometry adjustment.
* Standard luminance is 400-800 Lux for restaurant and big conference room, 1000-1500 Lux for trade show. 3D: 500 Lux (single projector)

Video wall setting value

Position of projector (H)	1	2	3	4	5	6	7	8	9	10
LH edge overlap value	0	98	197	x	x	x	x	x	x	x
RH edge overlap value	197	98	0	x	x	x	x	x	x	x

Position of projector (V)	1	2	3	4	5	6	7	8	9	10
Top edge overlap value	0	x	x	x	x	x	x	x	x	x
BTM edge overlap value	0	x	x	x	x	x	x	x	x	x

c) Guide line for Spreadsheet operation

- **Source resolution**: This source resolution will affect Overlap setting value. User needs to apply the same signal resolution as Excel Spreadsheet while executing [Video Wall]→ [Overlap] setting. After finish the setup, user can apply any other resolution.
- **Projector resolution**: It should be the same as projector native resolution to get the best video quality. This resolution is the output resolution of NEXIS. Each channel should be set separately.

- **Overlap pixels (H)**: To set Overlap pixels when it is horizontal edge blending. Usually, the range is about 20-40% of the projector horizontal resolution. Max. H overlap pixels is 1920 pixels.
- **Overlap pixels (V)**: To set Overlap pixels when it is Vertical edge blending. Usually, the range is about 20-40% of the projector Vertical resolution. It will be zero when it is only horizontal edge blending. Max. vertical overlap pixel is 1200 pixels.

(When change Overlap Pixels, the final image height will also change accordingly. Please select an Overlap Pixel number to get screen height a little more than required. User can use Geometry alignment to draw back the image to required dimension. Adjustment range is up to 40%.)

- **QTY of Projector (H)**: The number of the projector used for horizontal edge blending.
- **QTY of Projector (V)**: The number of the projector used for vertical edge blending.
- **Screen Width**: Required image size in horizontal direction.
- **Screen Height**: Required image size in vertical direction.
- **Projector Lumen**: Based on projector specification.
- **Throw-Ratio (Min.)**: Minimum Throw ratio. Based on projector specification. The result will respond to [Projector throw distance] (installation distance) at the end of the Excel file.
- **Throw**-Ratio (Max.): Maximum Throw ratio. Based on projector specification. If the projector has no ZOOM function, it will have only one throw-Ratio value.

Please note:

- More projectors will reduce image height. Less projector will increase image height but need to use higher lumens projector to get the same illuminance.
- Default grid pattern size is 32x32 pixels. If Overlap pixel is multiple of 32 (i.e. 256, 320, 480…), it will be convenient for setup. In this example, the overlap is 8 grids*32=256 pixels.
- 400-800 Lux (lumens/projection area) is recommended for the environment with ambient light control. For open area, it should be over 1000 Lux.
- Please click [INFO] key in IR controller to check Input (source resolution) and output (projector resolution) and make sure the in/out resolution is the same as Excel Spread sheet before apply Video Wall [Overlap] setting.
- If set FHD output resolution in NEXIS for WUXGA projector, the image height will be lower.

2.4.3. Installation data from Calculator Spreadsheet

- Base on the case study, final image size for each projector is 250cm*1.56cm with Overlap region of 50cm in width.
- The image height should be higher than the required one. User can shrink the vertical height to required dimensions through geometry alignment. The vertical adjustment range in each edge is 600-1200 pixels.

- Optimized content resolution: 3328*800 (This is the ideal resolution to set EDID). It is suggested to select the same vertical resolution (800) as projector native resolution to get the best result.
- Installation distance: 3m-4.25m. It is calculated from throw ratio and image wide for each projector. (2.5m*1.2=3m, 2.5m*1.7=4.25m)
- The final luminance is 819 Lux. It will be enough for indoor environment.
- The overlap value in Video Wall setting:
  - LH Projector: select RH edge: +197 (to crop more 197 pixels for LH projector). These 197 pixels are based on source resolution.
  - Projector (Center): LH edge=+98, RH edge=+99 (total 197)
  - RH Projector: LH edge: +197
- It is allowed to have different overlap pixel among projectors. “Irregular” Spreadsheet is required to calculate the data. It is integrated in the same Edge Blend Calculator.

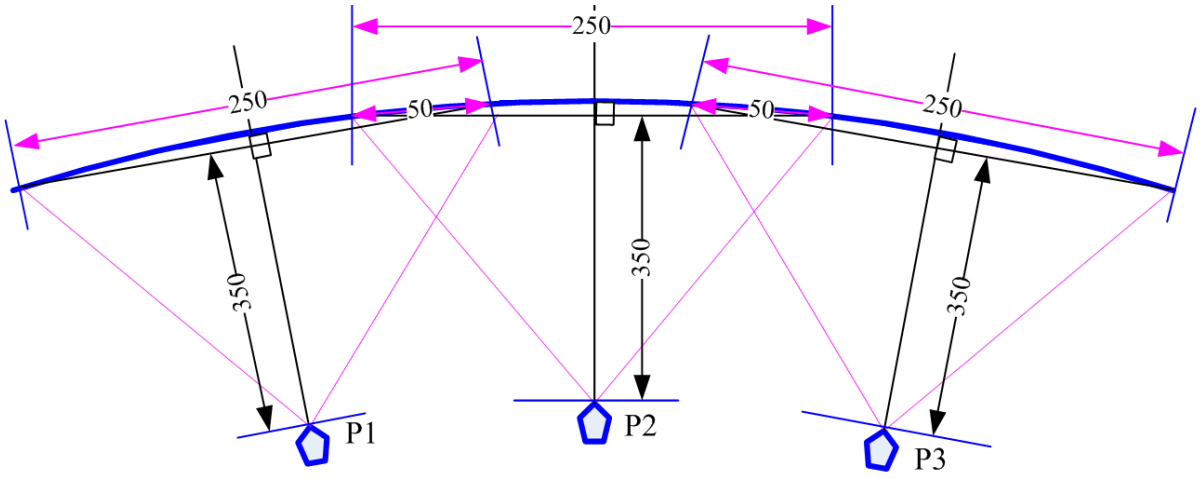
2.5. Projector installation

2.5.1. Installation data from [NEXIS Edge Blend Calculator]

- Image size for each projector: 250cm *156cm
- Overlap region: 50cm
- Installation distance based on throw ratio 1.1-1.7: between 300cm-425cm
- Installation height: install the projector at a position with minimum keystone at both vertical edges.

2.5.2. Mark projection image location for each projector

- Based on the calculation data, user can easily determine the image location for each projector.
- Using laser Level tool and mark the locations for each projector with paper tape, including 4 borders and center line of the screen. The paper tape shall not damage the surface of the screen.



2.5.3. Install the projector

- To install the projector at a location as showed above with the image just a little over required region at any point. Too large image will lose image resolution and brightness.
- Minimum keystone effect will optimize the image quality with less geometry alignment.
- The image height from the projector can be higher than required and user can draw down the image height through geometry alignment. The adjusting range is more than 600 pixels in each edge.



During the installation, Laser Level is a good tool to get correct horizontal and vertical line and make sure each projector can cover correct display

2.6. Preparation before edge blending setup

2.6.1. Projector settings before edge blending

- Please reset all projectors to factory default settings.
- Set to ceiling mount if necessary.
- Select a display mode with gamma 2.2 or standard display mode. After edge blending, if user still sees some banding in overlap region, please select the best one from different display modes.
- If there is color deviation among projectors, please try to correct color difference through projector color adjusting function to let all color as close as possible.
- Enable [multiple projector display] mode if the projector has this setting.
- Turn off Brilliant or Dynamic color function may improve the color banding in overlap region.

2.6.2. NEXIS settings before edge blending

- Use small pin to insert into RESET hole on the back panel of NEXIS for 5 seconds to reset NEXIS to default setting. [Reset] will apply to all channels at the same time.
- If multiple units are used, please set different Box ID in each box for convenient control.
- Select channel number, then select input port and output resolution in each channel separately.
- Set output resolution to be the same as projector native display resolution. Each channel shall set output resolution separately.

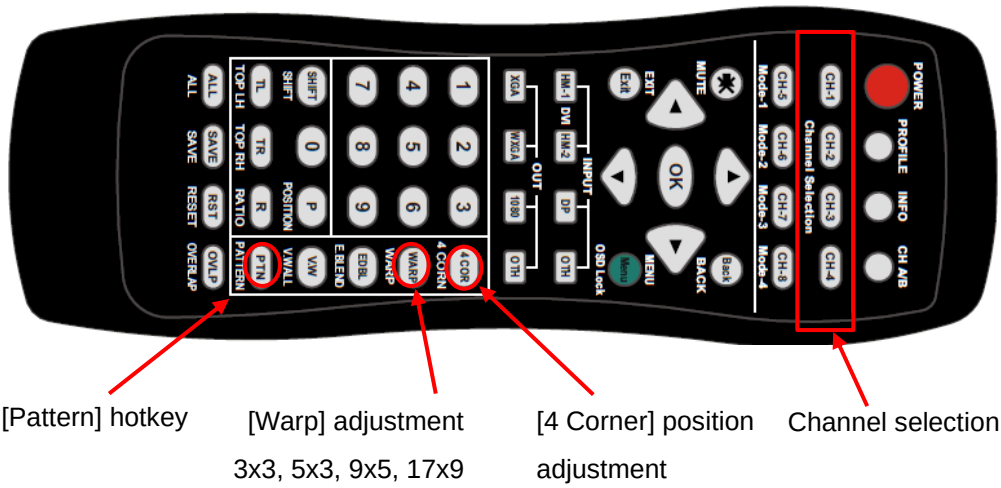
- Check input and output resolution through INFO key on IR controller.
- The signal source for installation should be no less than 1080p to get better accuracy. After installation, user can apply all kind of input timings.
- Check input/output LED indicators and make sure to have correct system connection.
- User can set [Frame Sync] at [Disable] to eliminate [Source Re-Search] in projector during setup. After finish the setup, please set to [Normal] to get synchronization in all outputs.

2.7. Geometry alignment

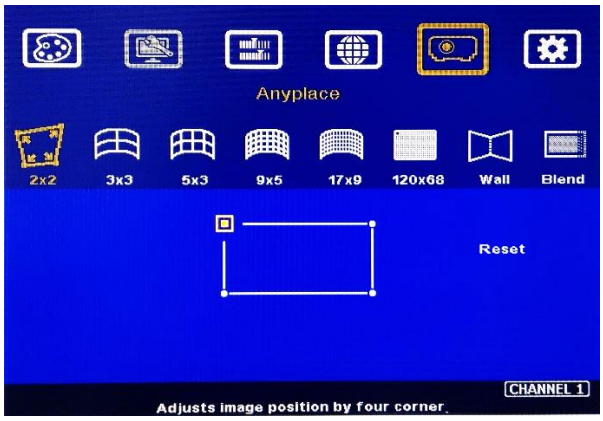
Geometry alignment is to align the image position to let the projection image match the screen and also let image grids between two adjacent projectors be stacked together.

2.7.1. Geometry alignment via IR controller & OSD

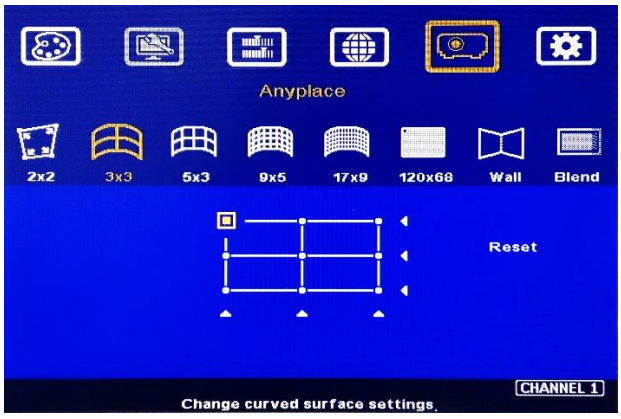




[2x2] 4 Corner adjustment



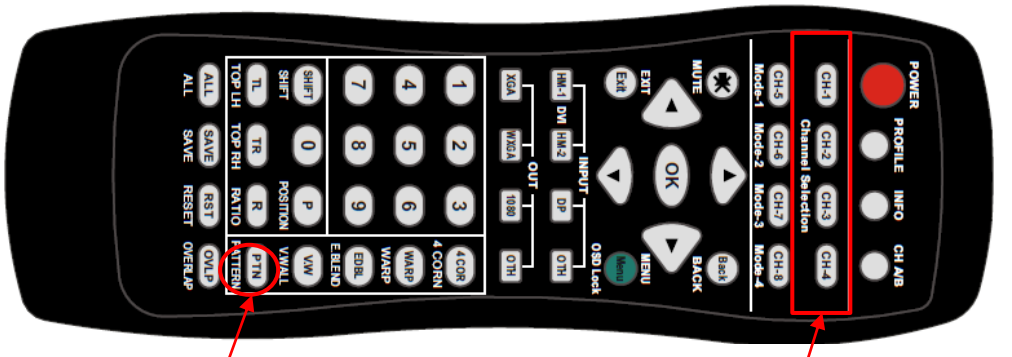
[Warp] adjustment



IR receiver is on the center of front panel. Please be familiar with OSD operation from remote controller, including activating grid pattern, channel switching and hot keys for [Input selection], [Output resolution selection], [4 Corner], [Warp], [Video Wall], [Edge Blend], [Pattern] and [INFO].

- User can install IR extender receiver near screen for easy NEXIS operation (Please add audio extending cable to extend the distance up to 20 meters). If multiple units of NEXIS are used and IR receivers are put together, please set [Box ID] for each NEXIS so that user can control each NEXIS separately through [85x] command. (Please see Section 2)
- Each channel should execute geometry, video wall setting and edge blending setting separately.

a) Select appropriate Grid pattern color



2) Click [PTN] key to open grid pattern, continuously click [PTN] key will change pattern color.

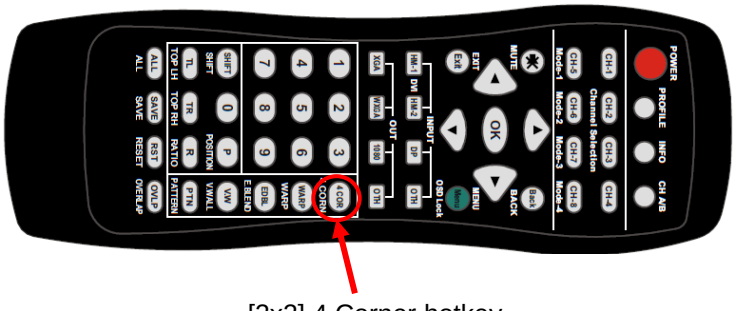
1) Select channel

- The default grid size is 32*32 pixels. User can select different grid size under [Anyplace]→ [Blend]→ [Grid].
- Use channel selection keys and [Pattern] hotkey to show grid patterns in all projectors. Press [Pattern] key again will change grid color.

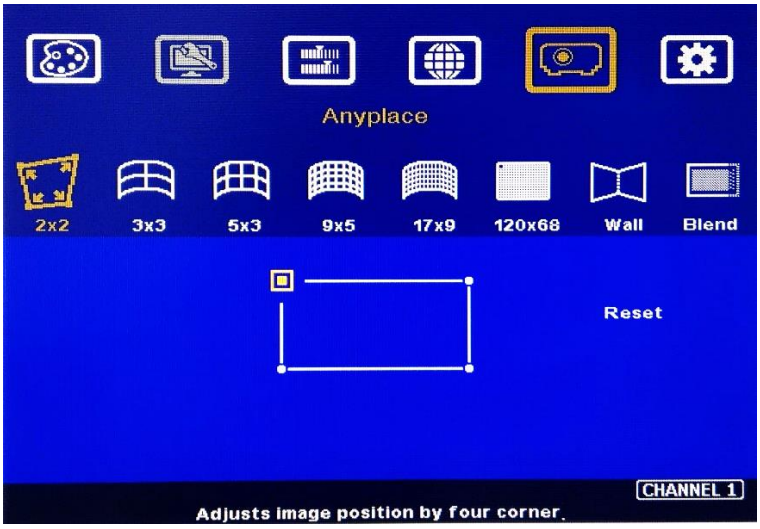
- To set two different pattern colors in adjacent projectors will be more convenient during geometry alignment.
- User can select the last pattern mode [OSD Value + background] and apply external test pattern for geometry alignment.
- If user finds the grid size between adjacent projectors is different. Some possibilities:
  - The projection image sizes between two projectors are different (Zoom setting, projection distance or zoom value is different).
  - NEXIS output resolution settings are not the same.
  - Projector output aspect ratio setting is different.
  - NEXIS is set at [Original AR]. It shall be [Full Screen].
  - Set different grid pattern size in each channel.

b) [2x2] 4 corner geometry alignment

- In most of applications, no need to do keystone correction in the projector before geometry alignment.
- If using short throw ratio projector in curved screen display, the image will have big distortion. Please use projector to do geometry alignment first before NEXIS.
- [2x2] alignment will adjust whole image with the same scaling factor. [Warp] alignment will adjust only some portions of the image.
- Please follow the sequence [2x2]→ [3x3]→ [5x3]→ [9x5]→ [17x9] to do geometry alignment to ensure entire image will have uniform scaling factor.
- Apply [2X2] Corner geometry alignment and draw the corners to pre-marked locations.
- If no pre-marked location, please use [2x2] alignment to let the image in each projector with the same horizontal position and also let the vertical lines without keystone effect.
- All projectors should have the same image size. Measure the image size in each projector, to reduce the size of the larger image and let adjacent projectors have similar grid size and grid number in overlap area.
- If the screen is curved, it is possible to have some image inside or outside the screen after 2x2 adjustment. However, it doesn't matter once the image covers entire screen before 4 corner adjustment. [Warp] alignment can adjust the image position back to required position.

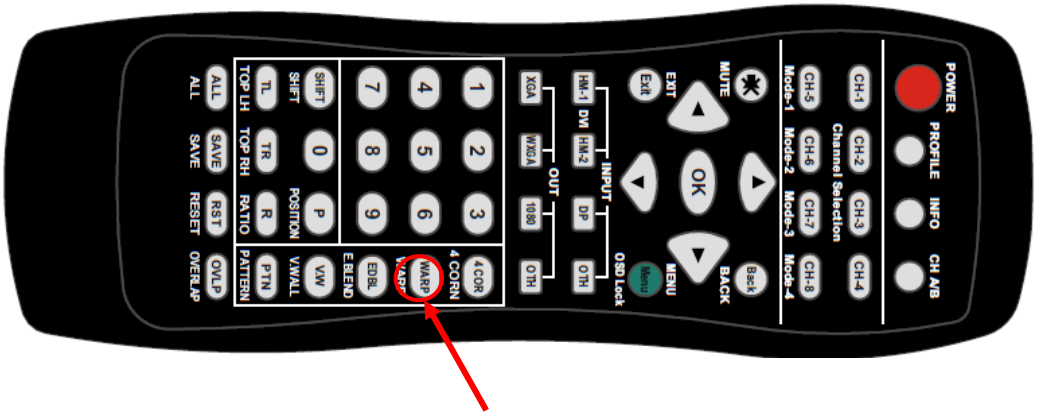


[2x2] 4 Corner hotkey

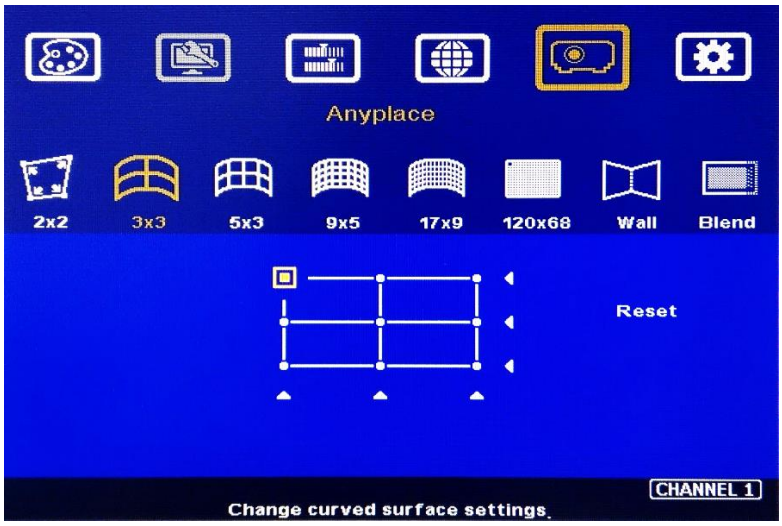


c) [3x3], [5x3], [9x5], [17x9] Warp alignment

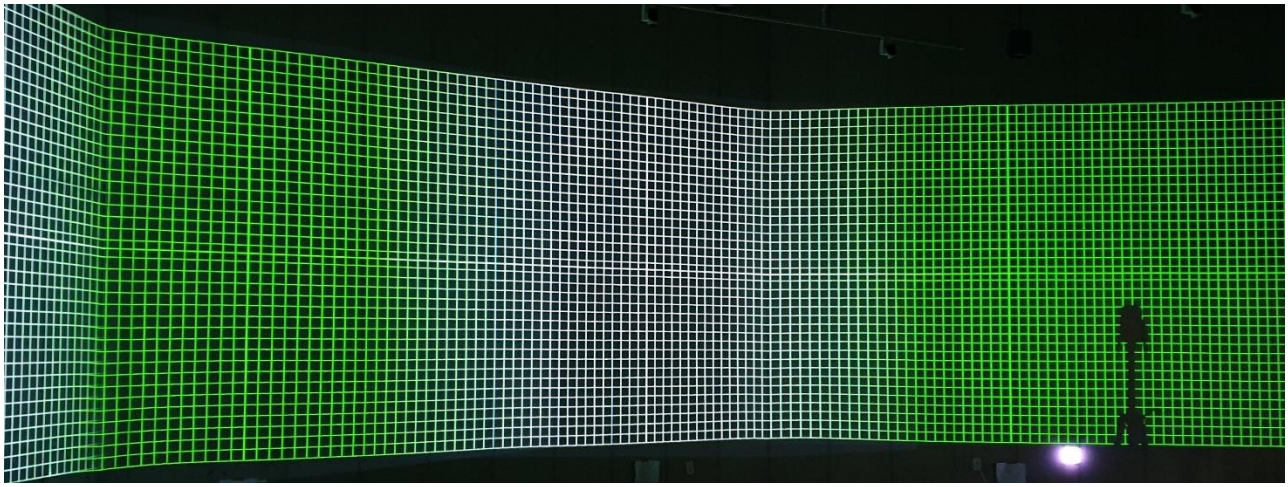
- After finish [2x2] corner alignment, apply [3x3 Curved] geometry alignment to let 9 adjusting points be located at the required position including 4 corners, edge center points and center line position.
- Please use [5X3], [9x5] & [17x9] for further geometry alignment and let all the grids in overlap area with good grid stacking from two projectors.
- For curved screen, the image side edge and center position will have difference grid size. The adjacent projector grid size will also change gradually, user can use Linearity Grid Line adjustment (in next section) to adjust the grid size and correct the image position within shorter time.
- After finish Warp alignment, user can use [2x2] for complete image position fine tune without changing the Warp result. If user executes [3x3] alignment again after [17x9] alignment, [17x9] grid position will be reset and only keep [3x3] grid point information.
- After the above processes, if the grid pattern in edge blending area still can't stack together, user can reduce one or two overlap grids from adjacent projectors to separate the adjusting points in each projector and get more accurate geometry alignment result.
- Geometry alignment range from remote controller can be up to 600 pixels in [2x2] + 600 pixels more in [3x3] for one corner/edge.
- If over NEXIS geometry adjustment range, the image will be broken. Please adjust projector installation position or use projector geometry alignment function to cover some adjustment.
- Ultra-short throw ratio projector is not suitable for curved screen display due to big image distortion. Once user can execute geometry alignment to required position, the image quality will be reduced, especially in the Text mode.
- After geometry alignment, all the grid patterns in overlap region should be stacked together.



[3x3] warp hotkey



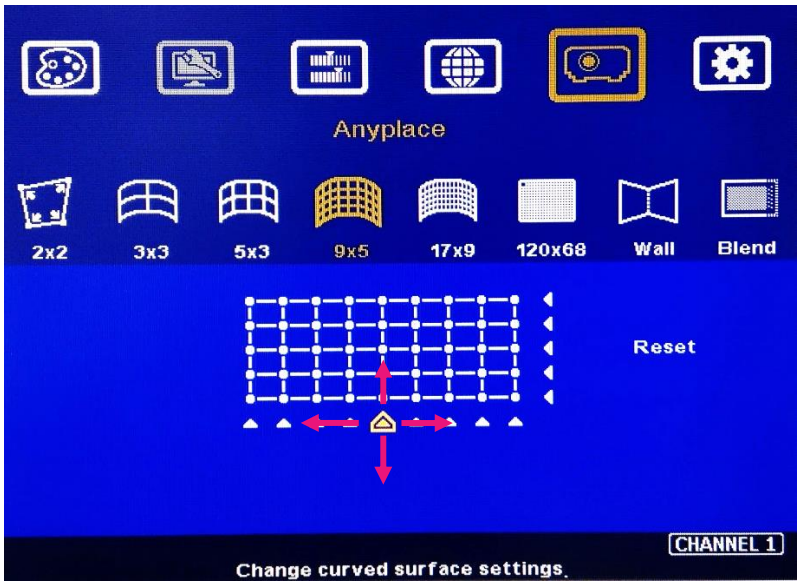
After finish geometry alignment, all the grids in overlap area needs to be perfectly stacked together.



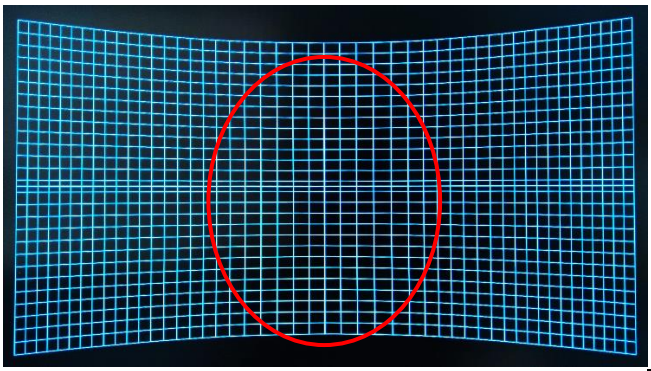
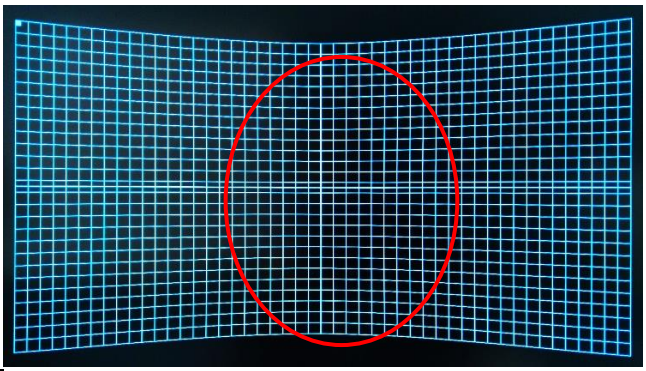
PS. We propose to Save the settings to Profile Index up to this stage because geometry alignment will spend most of the time during the system setup.

2.7.2. Linearity Grid Line adjustment

This function can quickly shift complete pattern grid line in both H&V directions.

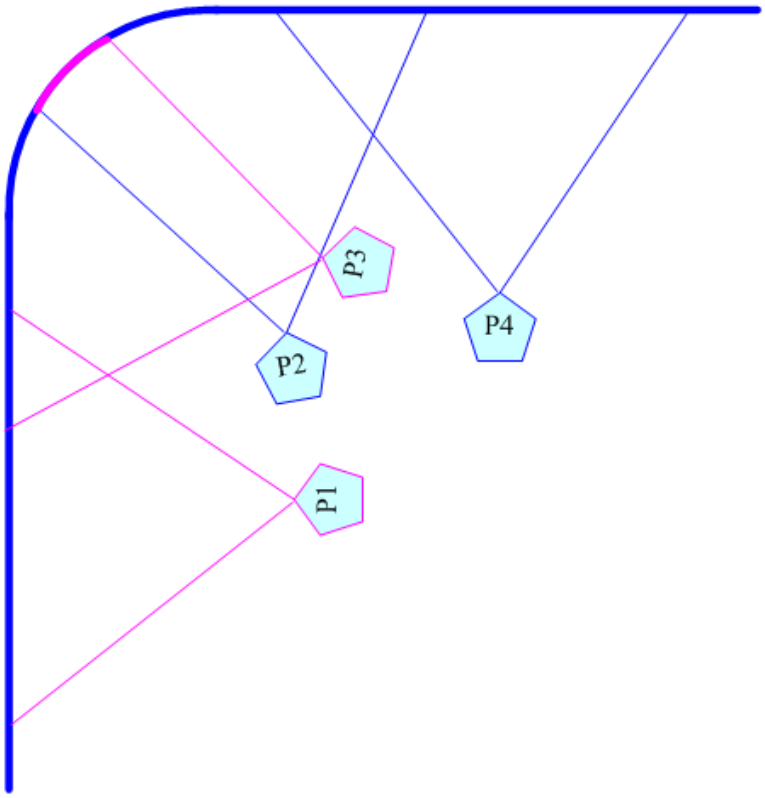


- Linearity grid line adjustment is under [3x3], [5x3], [9x5] & [17x9] warp alignment menu. User can select the control point, then press ENTER to do grid line position adjustment. Each control point can shift the grid lines in both horizontal and vertical directions.
- When user projects the image to curved screen, the image grid size will continuously change—the grid size at the center will be bigger than both sides. Ultra-short throw projector will be more serious. Linearity grid line adjustment is designed to correct this kind of grid line gap difference.
- This function can co-work with Warp and Edge Blending function.

Original projector image on curved screen (The grids size at center will be bigger)	After apply Grid Line Adjustment
	

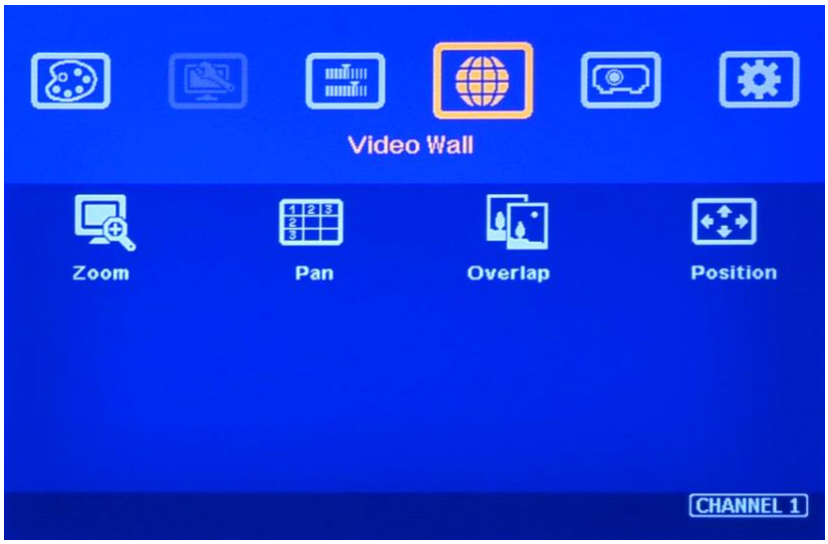
2.7.3. Important notice on curved corner display

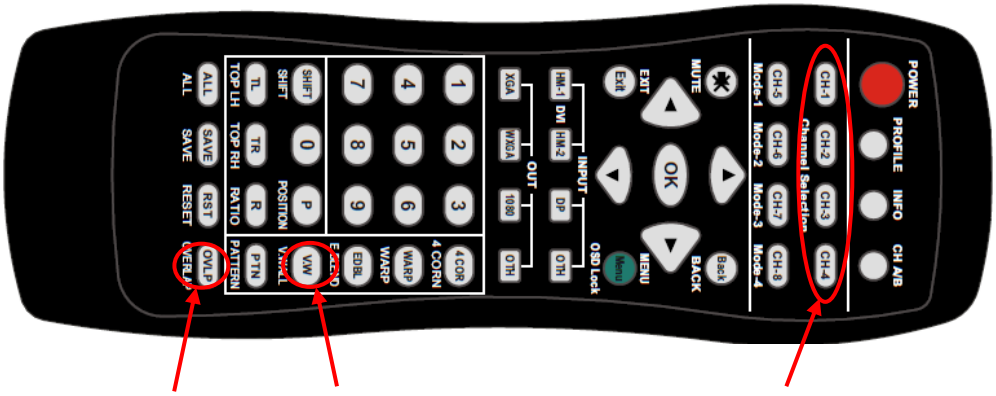
- The video quality in edge blending on curved wall corner is not easy to control due to different projection angles.
- We recommend to apply curve radius larger than 3.0 meters and use a projector with throw ratio larger than 0.8:1. Ultra-short throw ratio projector can't be used.
- If the radius is less than 3.0 meters, we proprose to change the design with rectangular wall. Then user can apply [Corner Wall] alignment or project the image on separate wall from each projector.
- When implement [Corner Wall] adjustment, the warp function will be disable and only 4 corner alignment is available.
- If shorter throw ratio projector is used, to select a projector with warp function will get more flexible geometry alignment range.
- User can use projector warp or keystone correction function to do preliminary alignment before NEXIS alignment to enlarge the flexibility in geometry alignment range.



2.8. Video Wall settings

- The purpose for Video Wall Setting is to split the image and assign specific image to each projector.
  - Zoom: split the image for each projector
  - Pan: assign image location. The location is counted from Left to Right and Top to Bottom.
  - Overlap: set cropping pixels in overlap region.
- Each channel shall execute [Video Wall] settings separately.





[Overlap] hotkey [Video Wall] hotkey Channel selection

2.8.1. Zoom—split the image

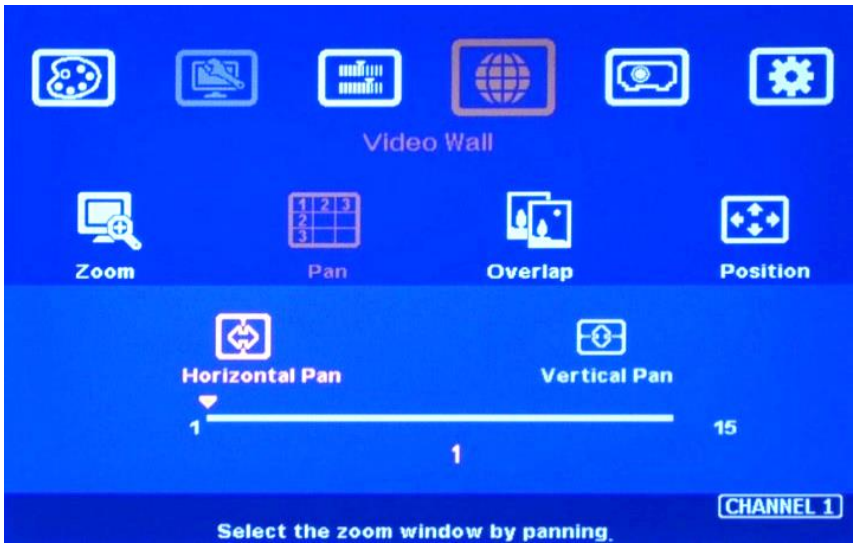
Set the same Zoom value in all channels for landscape display:

- Horizontal Zoom: H=2 (for 2 projectors), H=3 (for 3 projectors), H=4 (for 4 projectors)
- Vertical Zoom: V=1 (for all single layer projector), V=2 (for dual layer projectors)
- After Zoom setting, the image will be enlarged.



2.8.2. Pan—assign location

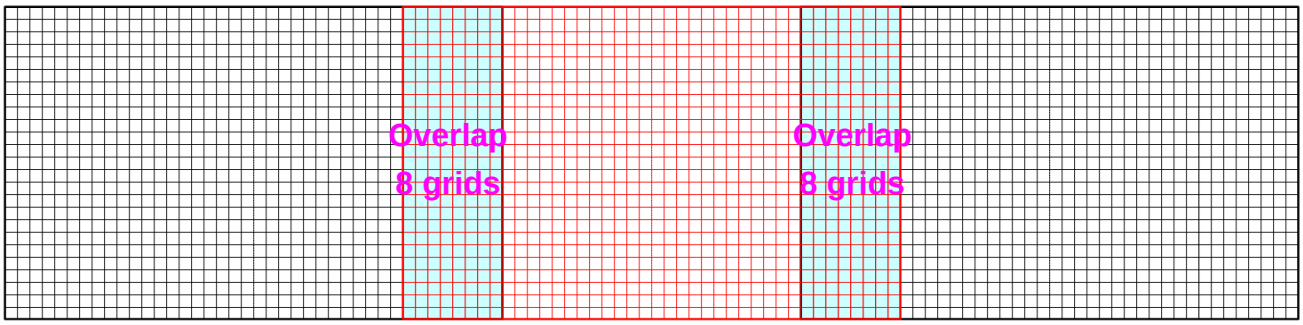
- PAN is to assign the image location for each split section.
- Set Pan value based on projector location counted from LH to RH. For landscape with one layer projector:
  - 1st projector (LH): Horizontal Pan: H=1, Vertical Pan: V=1
  - 2nd projector (Center): H=2, V=1
  - 3rd projector (RH): H=3, V=1
  - 4th projector: H=4, V=1
- For portrait direction from top to bottom: V=1 (for 1st layer), V=2 (for 2nd layer)



2.8.3. Overlap

Cropping the image based on overlap size.

- For landscape edge blending, it will affect RH/LH edge Overlap setting.
- For portrait direction, it will affect Top/Bottom edge Overlap setting.
  - Use Edge Blend Calculator to get actual overlap setting pixels.
  - Below picture shows 8 overlap grids in projector.
  - Each default grid is 32 pixels, 8 grids=32*8=256 pixels.
  - 256 pixels are based on projector resolution but not signal source resolution. The Video Wall [Overlap] setting resolution is based on signal source resolution. It must be calculated from Edge Blend Calculator.
  - If two overlap regions with different grid number, please use irregular Spreadsheet to get Overlap setting pixels under the same Excel file.



- Click [INFO] key in IR controller to check the Input/Output resolution. These resolutions should be the same as [Source resolution] and [Projector resolution] in the Spreadsheet.
- Click [Pattern] to check Overlap pixels (256 Pixels for 8 overlap grid). The pixel number need to be the same as [Overlap Pixel] in the Spreadsheet.

Project basic data

Source resolution (H)	3840	Screen width	6.50	(m)
Source resolution (V)	800	Screen height	1.50	(m)
Projector resolu. (H)	1280	Projector lumen	3200	(Lum)
Projector resolu. (V)	800	Screen Aspect ratio	4.33	(required)

Overlap pixels (32 pixels per grid)		Overlap %	Recommended
Overlap pixel (H)	256	20.0%	20%~40%
Overlap pixel (V)	0	0.0%	25%~40%

Recommended overlap region: Min. 50 cm width

Qty of projector (H)	3	Throw ratio (Min)	1.20
Qty of projector (V)	1	Throw ratio (Max)	1.70

Final output resolution

Horizontal resolution	3328
Vertical resolution	768
Extended pixel (H)	98
Extended pixel (V)	0

Projector Overlap value

Video Wall Overlap setting value

Final result checking list (PJT: Projector)

Final Image size (meter)		Final Illuminance Lux (Lum/m2)		Image size for each PJT	
Width	6.50	PJT lumen	3200	Width (m)	2.500
Height	1.56	Final Illumin	819	Height (m)	1.563

Overlap region size		Original aspect ratio		Projector throw distance	
Horiz. (m)	0.500	Projector	1.60	Min (m)	Max (m)
Vertic. (m)	0.000	Final result	4.16	3.00	4.25

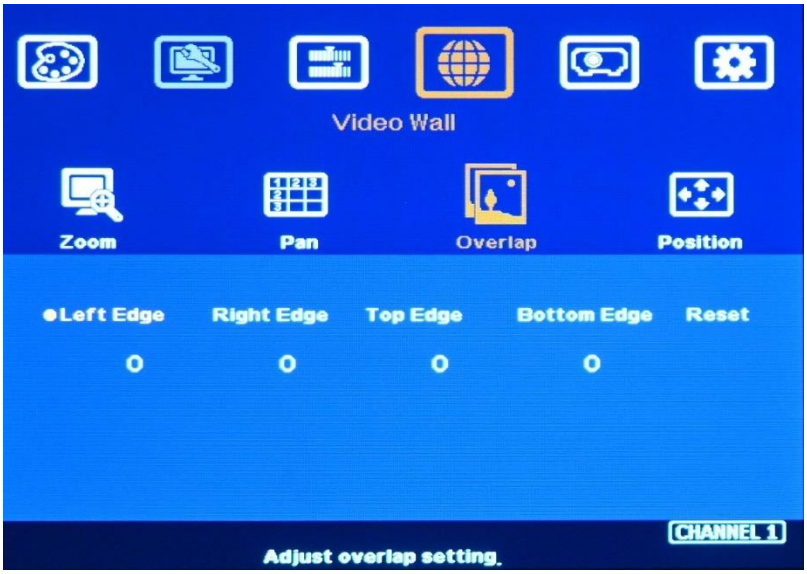
* Final mage height should be equal or larger than screen. User can shrink image to have the same image height as screen by GeoBox geometry adjustment.
* Standard luminance is 400-800 Lux for restaurant and big conference room, 1000-1500 Lux for trade show. 3D: 500 Lux (single projector)

Video wall setting value

Position of projector (H)	1	2	3	4	5	6	7	8	9	10
LH edge overlap value	0	98	197	x	x	x	x	x	x	x
RH edge overlap value	197	98	0	x	x	x	x	x	x	x

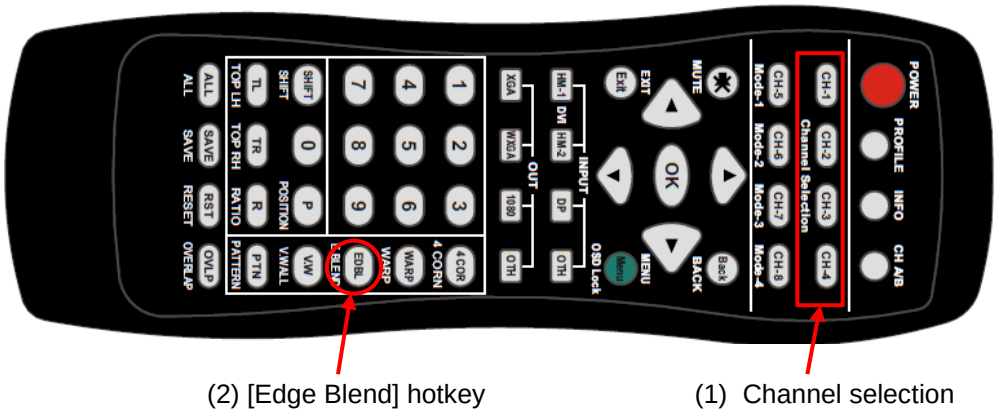
Position of projector (V)	1	2	3	4	5	6	7	8	9	10
Top edge overlap value	0	x	x	x	x	x	x	x	x	x
BTM edge overlap value	0	x	x	x	x	x	x	x	x	x

- Final overlap setting value:
  - Projector 1 (LH): LH edge=0, RH edge=197
  - Projector 2 (Center): LH edge= 98, RH edge= 98
  - Projector 3 (RH): LH edge=197, RH edge=0



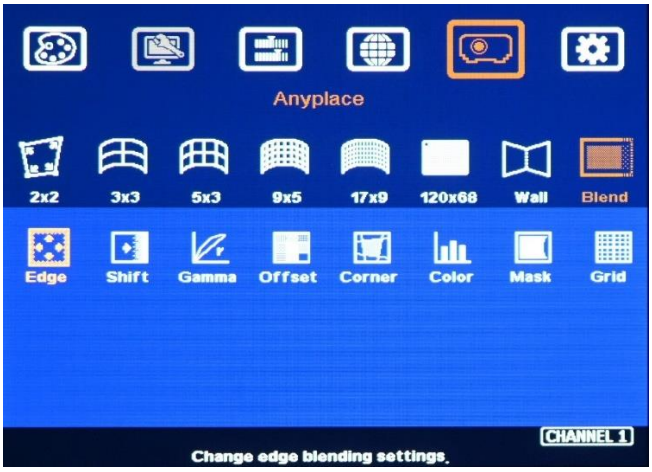
- For dual projector edge blending, user can apply still image, select the Overlap edge and adjust [Overlap] value simultaneously and let the image in edge blending area comes closer till without double image. Two projectors shall have the same value (same cropping range). The difference shall not be over 2 pixels.
- If no Edge Blend Calculator is available for overlap calculation, user can apply NEXIS Video Wall test pattern on the screen, then adjust the Overlap Value to let entire pattern match together.
- If user still sees some blurred image in edge blending area, please increase or decrease [Overlap] value in [Video Wall] setting to improve video quality.
- Please note that projector has Thermal Drift issue (position shift due to different temperature). The image position in power ON stage may be different from the position after 15-20 minutes when the position is stable. Don’t adjust image position during this period until it is stable.

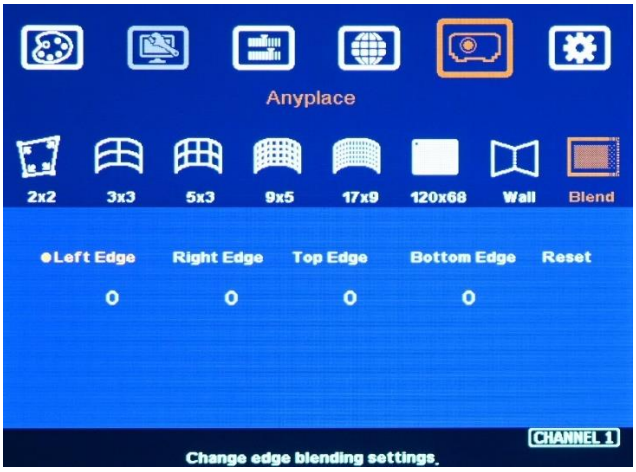
2.9. [Edge Blend] setting



(2) [Edge Blend] hotkey (1) Channel selection

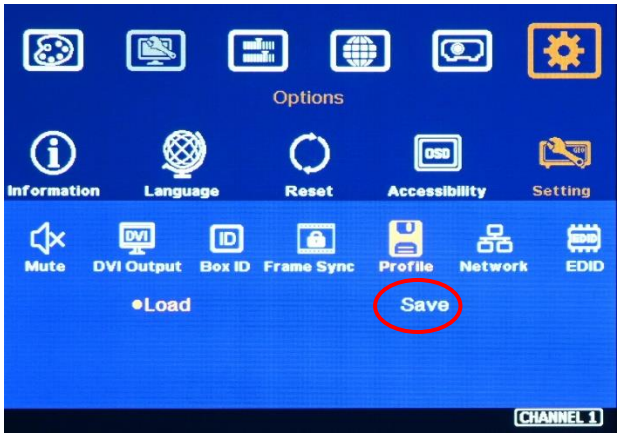
- Select channel and correct Edge for the edge blending. For 3 projector landscape edge blending: LH projector: RH edge, Center projector: RH & LH edge, RH projector: LH edge
- RED and GREEN indicating lines will appear in each channel when increase edge blending pixels. The final setting value will be the same as projector Overlap pixels (256) in this example.
- User needs to adjust the color indicating lines to match together (green to green, red to red) and will see a smooth image.

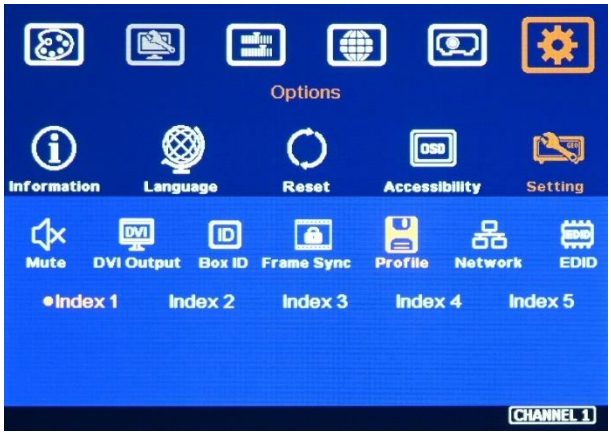




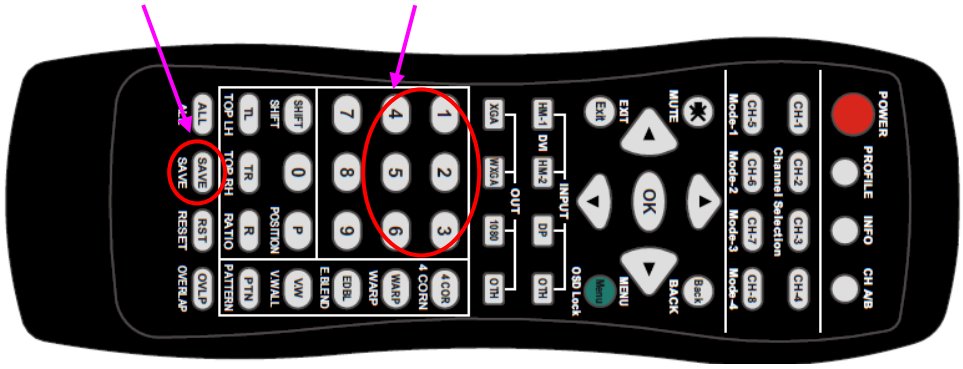
- Remote controller keypad operation:
  - Select channel, click Overlap [OVLP] hotkey → Select [Edge]→ Input [Overlap value] via OSD direction keys→ [OK]
  - Continuously hold OSD Direction key will speed up the input speed.

2.10. Save/Load User Settings





Click [Save] hotkey Then select # key 1-5



2.10.1. Save User Settings

User can save up to 5 settings in PW8xxC series models.

a) Save setting via IR controller

- It will apply to all channels at the same time.
- Click [Save] hotkey→ see [Enter Profile number] message→ if select [Profile Number #2]→ show [Profile #2 Saved] message→ Finish.

b) Save setting via OSD:

- It will apply to selected channel only. Each channel needs to execute separately.
- Select CH→ Open OSD→ [Options]→ [Setting]→ [Profile]→ [Save]→ select [Profile #]→ [Exit]

2.10.2. Load (recall) User Settings

User can recall final setting through IR, RS232, front panel keypad, WebGui, USB or Ethernet.

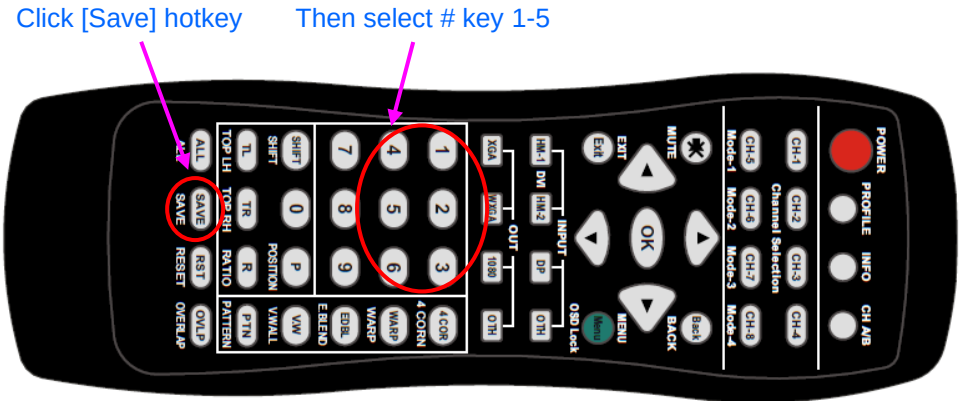
a) Load setting via IR controller

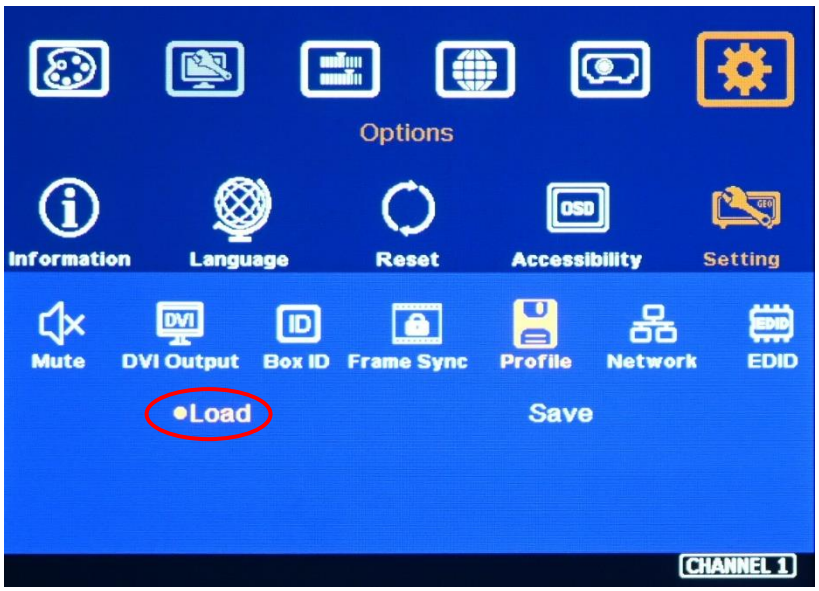
It will apply to all channels at the same time:

Click [Profile] hotkey→ show [Enter Profile number] message→ If select [Profile Number #2]→ Show [Load Profile #2] message → Finish

b) Load setting via OSD

- It will apply to selected channel only. Each channel needs to execute separately.
- Select CH→ Open OSD→ [Options]→ [Setting]→ [Profile]→ [Load]→ select [Profile #]→ [Exit]





2.11. System Settings missing and erased

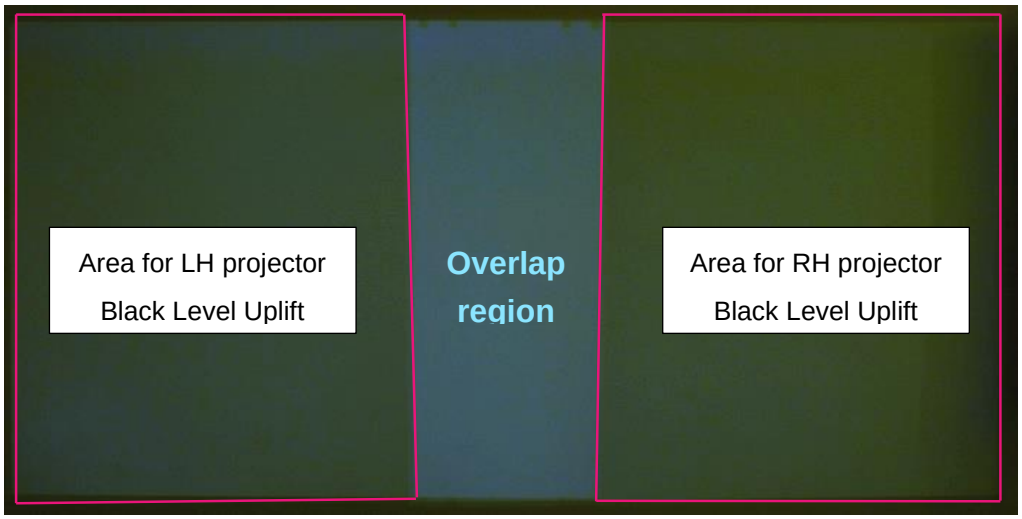
- When user power off the system, PW8xxC series will save user setting without loss even the setting is not saved into Profile Index, unless someone changes it.
- Under below conditions, the settings data inside Profile Index will be kept without missing:
  - When system has been reset from OSD menu, it will take effect for one channel only and the Profile data will not be deleted.
  - Remote controller [Reset] hotkey will take effect for one channel and Profile data will not be erased.
  - When user update new Firmware, it will not affect Profile data.
  - To insert small pin into back panel Reset Hole for 5 seconds will erase all Profile Index data.
  - Under GCT operation, only [Do Factory Reset] will erase all Profile data. The rest operation will only affect single channel settings.

2.12. Possible image quality issues

2.12.1. Projector light leakage and black level uplift

- Projection image background is not pure dark. When two projector background overlapped together, it will create double black level and cause banding effect under dark environment.
- Higher NATIVE contrast ratio projector will have lower light leakage & is good for dark environment application.
- [Black Level Uplift] can adjust background black level in non-overlap area and improve the color difference.

a) Example for two projector Black Level Uplift



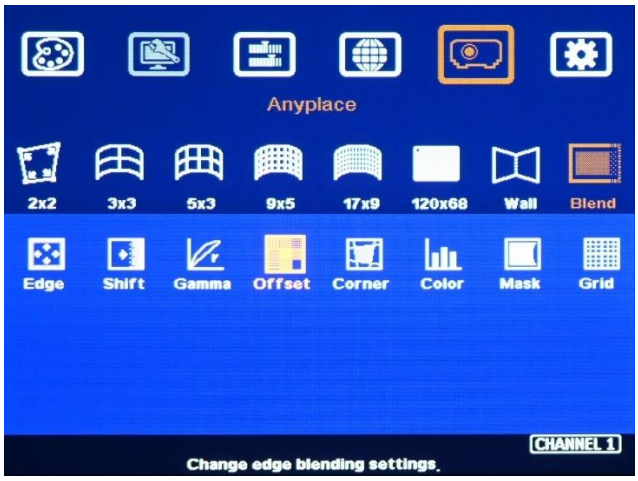
---

b) Create environment for Black Level Uplift

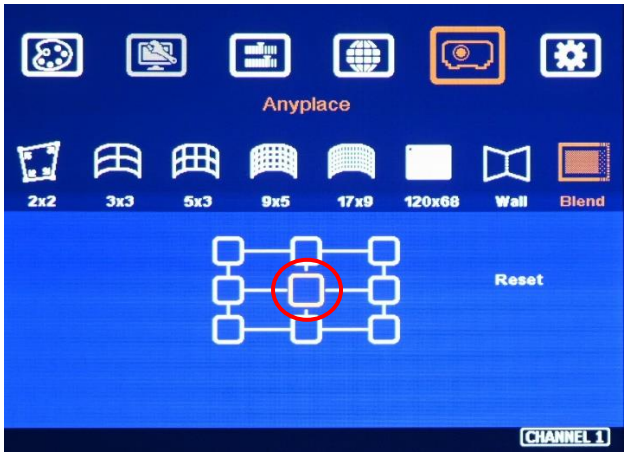
- Turn off ambient light and apply a black background content on the screen. If no black background content, user can disconnect input signal to get black image.
- Projector may have dynamic color adjustment function. If possible, please disable Brilliant color or Dynamic color function.
- Please apply the actual display content and select the location that will show clear light leakage image. It can make sure to get the best result.

c) Select the location for Black Level Uplift

- Select CH-1 (LH projector)
- Activate [Offset] menu: [Anyplace]→ [Blend]→ [Offset]

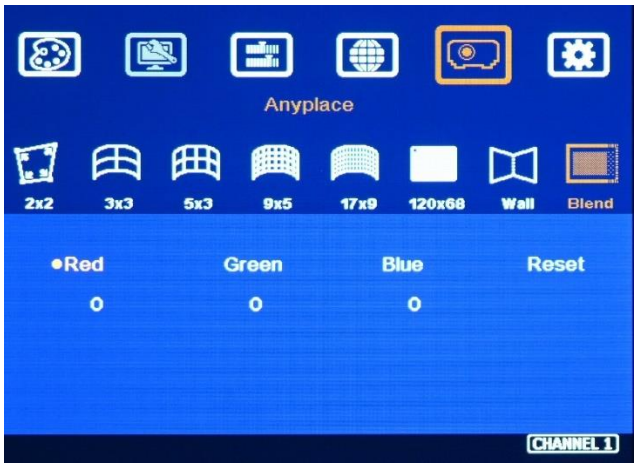


- Click [Offset] menu and select location for Black level Uplift. Usually select center block. In case the overlap region is extremely large or at special location, user may select other location to cover the adjusting area.



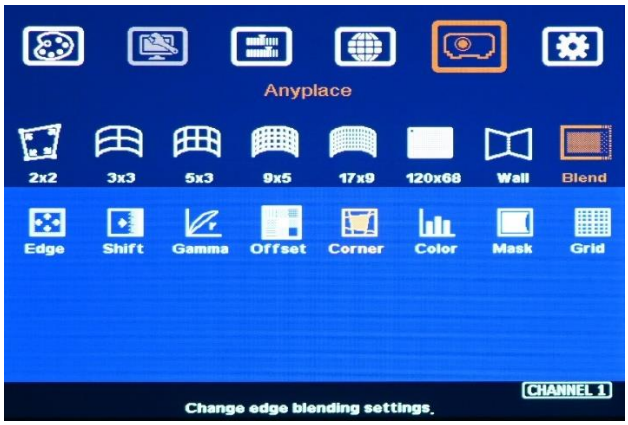
Highlight a color for Black Level Uplift location

Press [OK] and adjust RED color to 150. User will see red color enhancement across entire projection area for the 1st projector, including Overlap area.

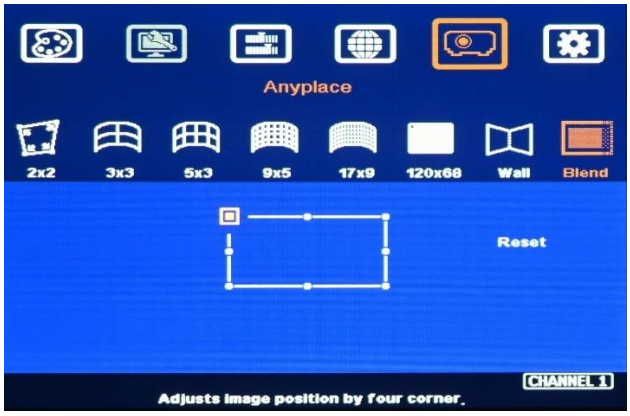


d) Precise Black Level Uplift location adjustment through [Corner] menu

- Click [Back] key in remote controller and select [Corner] menu.



- Click [OK] to get into below menu. There are 8 control points for position alignment.



- For LH projector, start from [Right Edge] (top, middle, bottom) and adjust the highlighted Red color out of Overlap area and let the edge match light leakage edge perfectly.

e) Precise Black Level Uplift color adjustment through [Offset] menu again

Next step is to adjust the color in Black Level Uplift area to be the same as Overlap region.

- Back to [Offset] menu→ Select Center block→ Red→ adjust the value to around 70 for DLP projector or 100 for LCD projector.
- Select Green and Blue color and set similar value as Red color.
- Fine-tune R.G.B color to let LH projector have similar color in overlap and non-overlap area.
- RGB color adjustment range is from 0-255. For DLP projector, the adjusting value in RGB is near 60-90. For LCD projector, the adjusting value is near 80-120. RGB is independent.
- If necessary, Fine-tune the uplift location again by [Corner]. If necessary, please also fine-tune geometry alignment border line position to get perfect result by [Warp] function.

f) Execute second channel Black Level Uplift

Select CH-2 (RH projector), execute the same procedures as CH-1 to finish black level uplift procedures in the second projectors.

g) Final image checking

- After finish black level uplift setting, please apply the content to check the video quality.
- Please make sure to apply the same content and select the right content location and freeze it during Black Level Uplift adjustment. Projector Brilliant color or Dynamic color function may also affect the final result. If necessary, please disable these two functions.

h) More than two projectors Black Level Uplift

If the edge blending system uses more than 3 projectors, the Black Level Uplift for the first and last projectors are the same as two projectors. The center projector needs to execute Black level Uplift at both side edges. Under this condition, user can select the center Block and adjust both side edge location for black level uplift.

i) More information in Black Level Uplift

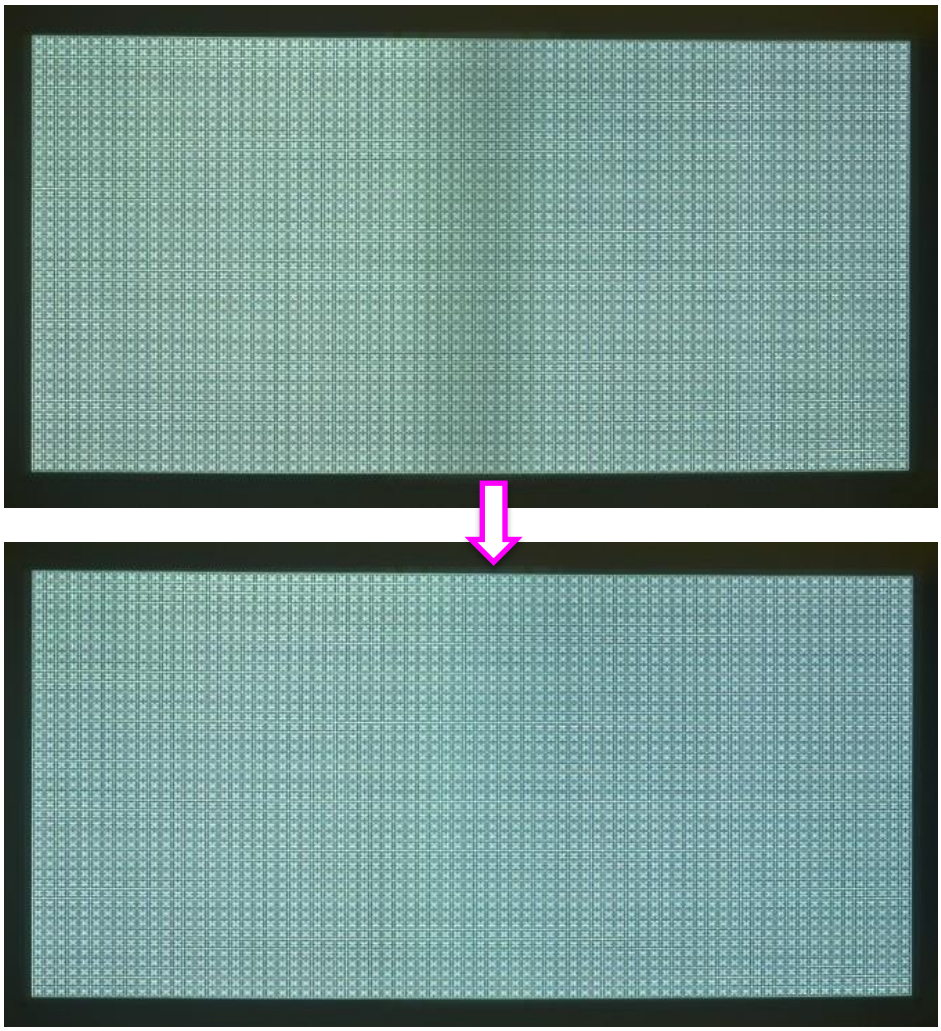
- When user adjust the location of the control points, user will see the change of color uplift position. The region starts from original projection area before geometry alignment.
- The maximum adjustment range is +_900 pixels in vertical direction and +_1200 pixels in horizontal direction.
- Projector display imager (micro display device), such as DMD, LCD and LCOS, will have some image borders due to active display window is not at full range of the imager. In dark

environment, viewer may see a little light leakage in image borders. It is outside active display area and can't be fixed.

- If user finds some position deviation between Black Level uplift border and projector Light Leakage border during [Corner] adjustment, it is caused by poor geometry alignment between two adjacent projectors. Please make sure to have good image grid alignment in that area.

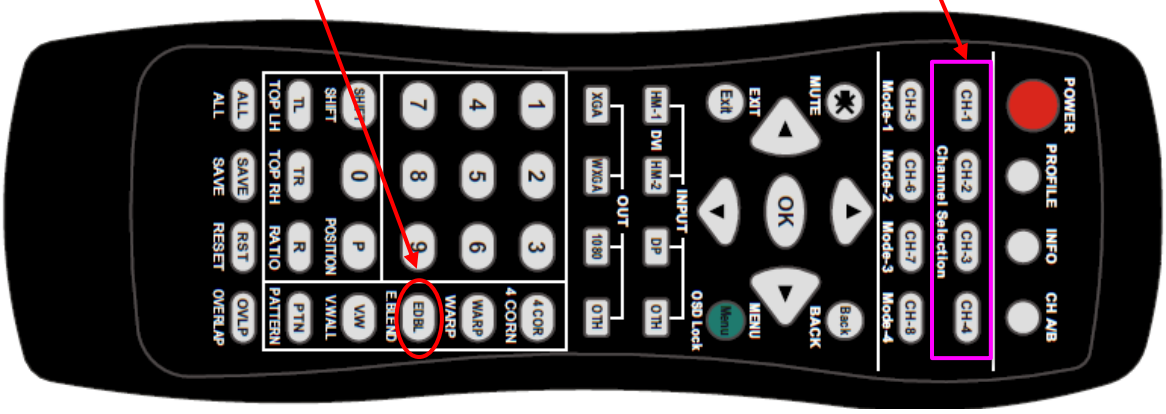
2.12.2. Banding in Overlap region

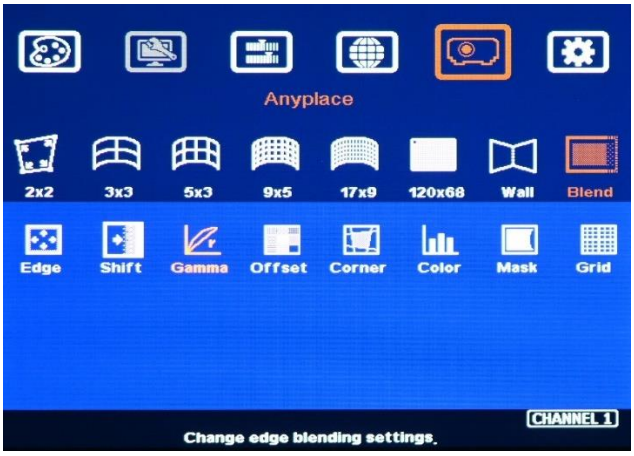
- NEXIS default is 2.2 Gamma curve. If Projector gamma curve is not 2.2 or gamma curve is not accurate, it will cause color banding issue. Please set projector gamma with 2.2 if possible.
- Please make sure all projectors have the same gamma setting and color.
- Replace with different Display mode setting in the projector and select the best Display mode.
- Disable Brilliant Color or Dynamic Color function in projector may improve banding issue.
- If it is still not perfect, please try to do NEXIS gamma adjustment.



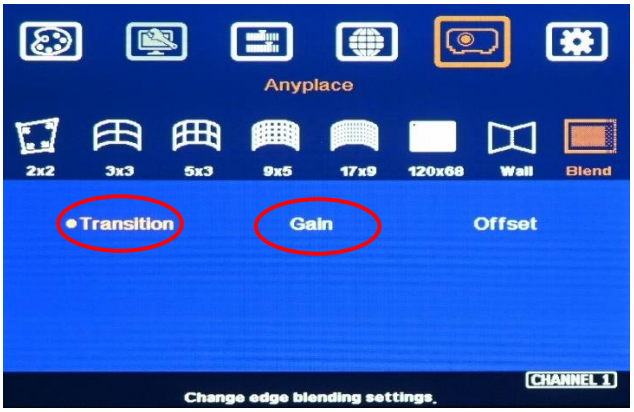
(2) Click [EDBL] (Edge Blend)

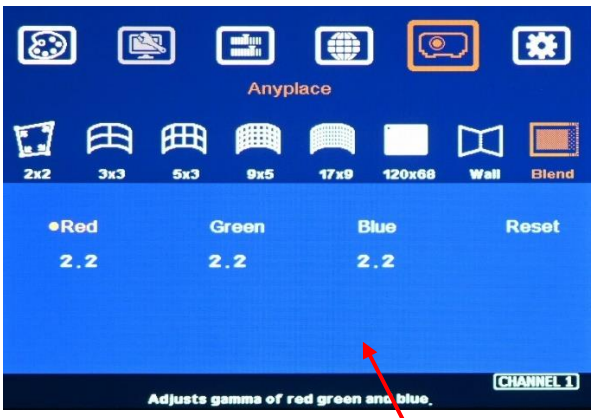
(1) Select Channel





- Select Channel→ click [EDBL] hotkey→ Select [Gamma]→ Select [Transition]→ [Enter]
- If the color banding is too dark, increase the gamma value in R/G/B color in one channel, then execute the same in the nearby channel to see the final result. (Gamma Range: 0.9-3.0)
- If the banding is too bright, decrease the gamma value to test it.
- If the banding only happens in one color, please adjust the gamma in that color.





- If further gamma adjustment is required, please click [Gain].
- [Gain] is to do further gamma curve shape adjustment in each channel.
- The adjusting value in Gain is not related to actual value.
- User needs to see the actual visual effect to determine the value in each channel. Each channel can be different.

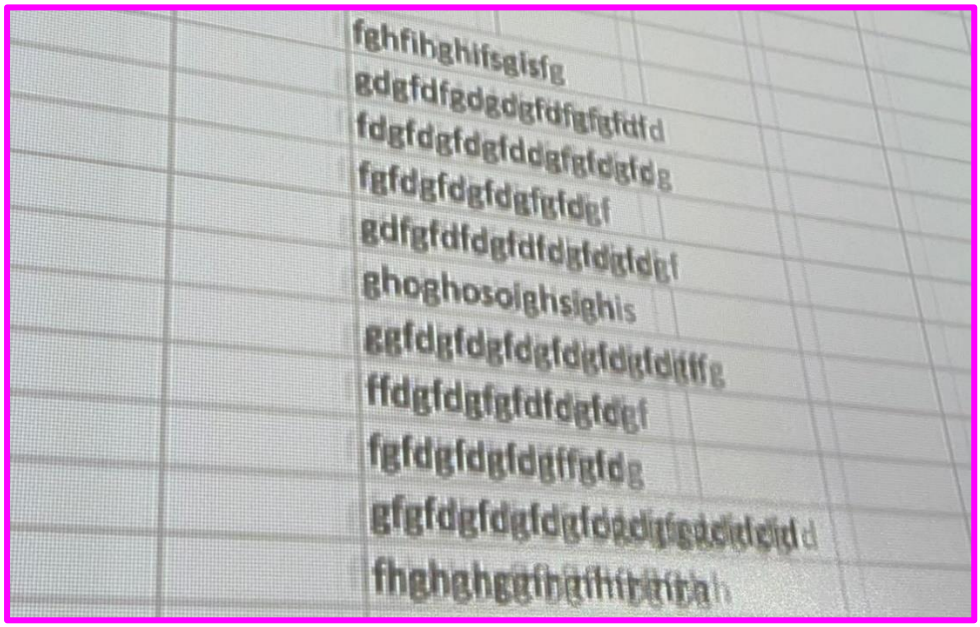
[Gain] menu

Range: 0-100

2.12.3. Image Blurred or double images

a) Below are the possible reasons:

- Projector image drift.
- Image alignment between adjacent projectors are not accurate.
- Wrong setting value in Video wall [Overlap] setting. Recheck Excel Spreadsheet.



b) Projector image drift

- Thermal drift: projector image position may be different during start-up and after 20-30 minutes. It is called thermal drift.
- Projector will have some position shift during new installation and will be stable after at least one month. 1mm projector shift may induce 10x image shift on the screen.
- Position shift after maintenance or earth quake.

c) How to confirm projector position shift

- NEXIS will not change image position for only few pixels. Once it is malfunctional, somefunction will totally not work.
- Turn on projector and connect with single pixel pattern or Excel Spread sheet file directly without going through NEXIS.
- Put some marks on the cross section of the image in the overlap region for each projector.
- Recheck the image position after some time. User can confirm whether the position shift is from projector or not.

2.12.4. Other possible issues in edge blending

a) Image distortion and content resolution

Ideal signal source resolution, content resolution and refresh rate.

- If the content aspect ratio is the same as the screen and the signal source is set at full screen display, the signal source output resolution can be set freely because NEXIS will expand the image to full screen to get no distortion image.
- If the content resolution and signal source output resolution are at ideal resolution, user will get the best video performance.
- Based on the same example in Excel file, 3 WXGA projectors with 256 overlap pixels, the ideal horizontal resolution is (1280*3) - (256*2) = 3328. The screen size is 6.5Mx1.5M. The optimized vertical resolution should be 3328/6.5*1.5=768. It means the ideal signal resolution is 3328*768.
- Projector has native resolution, usually we apply a signal with the same vertical resolution of the projector through complete processing pipe line, it will reduce video scaling up and down and will get better video quality.
- Usually, H&V resolution can have 10% resolution deviation. Because we use WXGA (1280*800) projector, user can select 3328*800 as final input resolution. if WUXGA projector with 480 overlap pixels, the ideal signal horizontal resolution is (1920*3) - (480*2) = 4800. The vertical resolution should be calculated through the dimension of the screen or take 1200 if the aspect ratio is not big difference.
- User can set NEXIS EDID with the required resolution to let PC output the required output resolution.
- NEXIS can also adjust the final aspect ratio through Video Wall Overlap setting. However, it may result black borders or missing some image outside the screen.
- If the content is fast motion or slow-motion panning video, to take 60Hz content and signal source will let the image show much smooth result.
- NEXIS can support up to 7680x2160/30Hz or 7680*1200/60Hz input signal.

None PC signal source:

- In case the signal source is from Media player or game console and has no customized output resolution function, user needs to prepare a content with required resolution or aspect ratio calculated from above and set the player with full screen display. NEXIS will expand theimage to full screen to get no distortion image.
- To set flexible display mode is one method to keep no distortion image under different using condition. (Please see “Flexible display mode” section).

---

b) Limitation in edge blending application

- Edge blending is good for multimedia and Power point presentation but not good for single pixel file such as Excel file or Google browsing because any minor image shift will cause blurred image in overlap area.
- The image aspect ratio will change if the aspect ratio is not the same as screen. Notebook PC 16:9 content is not suitable to display on edge blending system due to big image distortion.
- The easiest way to solve these problems is to set flexible display mode—one display mode with full edge blending and another display mode is to display independent content in each projector. Each projector can be set to display 16:9 image without distortion. Please see below photo.
- The content for all-in-one image needs to have the same aspect ratio as the screen to avoid image distortion.



User also can set full screen or 16:9 display through Video Wall [Overlap] setting.

2.13. Final image quality fine-tune

- The final performance will be a combination of many factors—projector characteristics, projector setting, screen, ambient light and NEXIS setting.
- Please review Section 1.2 and make sure to follow the guidelines.
- Banding in overlap area under dark environment is caused by light leakage in the projector optic system. User needs to apply Black Level Uplift to improve it.
- The factors affect final image quality

Projector:

- Please review Section 1.3 regarding projector selection. It is the most important matter for a good video quality.
- When using ultra-short throw projectors, the reflection angle in overlap area will be very big. Viewer will see different color banding when watch the image from different viewing angle especially the screen gain value is more than 1.0.
- To reserve enough overlap area—0.6m-1.2m in width or 20%-40% (based on single projector native resolution) is recommended.
- To adjust image position of the projector and reduce keystone angle.
- Increase Overlap region & reduce off axis angle
- To reset all projectors with the same settings and gamma 2.2 if available.
- To select Display Mode. Usually Standard, sRGB/Neutral will get better result.
- To disable projector Brilliant color adjustment or Auto/Dynamic color adjustment.
- Try different color settings in the projectors.

NEXIS settings:

- Edge Blending Gamma settings:
  - To execute [Transition] Gamma adjustment: start from one color in one channel first. After see some difference, then adjust other two colors. Try to do the same in the second channel.
  - [Gain] Gamma adjustment: if Transition Gamma adjustment still can't fix the issue, try to adjust Gain Gamma. It will change gamma curve in each projector. Starting from one channel in one color first, then to do other two colors adjustment.
  - [Offset] gamma: When implement black level uplift, [Offset] gamma can change the brightness in overlap region borders if some brightness gap happens between overlap and non-overlap areas.
- [Shift] adjustment: If user sees dark line at the edge of the overlap region, to adjust few pixels (1-10) at "–" value. It will change the color at the border.
- [Color] under [Blend] menu: If user sees background color difference when apply pure white image, user can adjust [Color] to balance background color difference.

- Image Properties: To select Preset Mode to Neutral or Bluish may improve banding condition but it will change whole image color temperature.

Screen: To use lower gain value screen.

- Low gain value screen will improve banding effect in overlap region.
- Short throw projectors with high gain screen may cause banding effect when watch from different viewing angles due to different reflection intensity.
- User needs to carefully select the transparent screen for projection from rear when using ultra-short throw ratio projector. Due to big reflection angle, the transparent screen should be tested before installation.

Chapter 3. Advanced functions and settings

3.1. EDID setting

EDID setting is one of the methods to get the right signal resolution and solve image distortion issue.

- EDID is to tell signal source to output desired signal resolution to the system.
- EDID can be set to different resolution in different channels and input ports.
- If the input is looped to all input port in different modules, user only needs to set the first input port EDID. User can select different EDID directly from OSD list or use [Customize] function to create non-VESA standard timing.
- EDID setting range is H=1024-4080 (8 pixel/step), V= 720-3840 (1 pixel/step).
- If the required input resolution is beyond this range (such as 7680x1200 60Hz), user can set Customized output resolution in PC. NEXIS still can support all kinds of input timings under 600 MHz. It is nothing to do with EDID setting.
- PC or signal source may not follow NEXIS EDID setting due to hardware or software reason.
- Please download [PC 6k/8k Output Setup procedures] under below website: https://bit.ly/3uHXNhS
- PC system will remember the EDID in the first connection and may not follow the resolution in the second setting. Please solve this issue by below ways:
  - Switch to other EDID resolution→ press Enter→ see the result→ switch back to required EDID and check.
  - Select [Customize] menu under [EDID]→ set to the designed resolution→ press Enter. Please note that some resolution timing under [Customize] is reduce blanking signal. It will have lower pixel clock and may affect 3D display.
  - To reset complete system through Insert small PIN into RESET hole for more than 5 seconds to reset the whole system and execute the EDID setting again. PC will treat it as new connection.

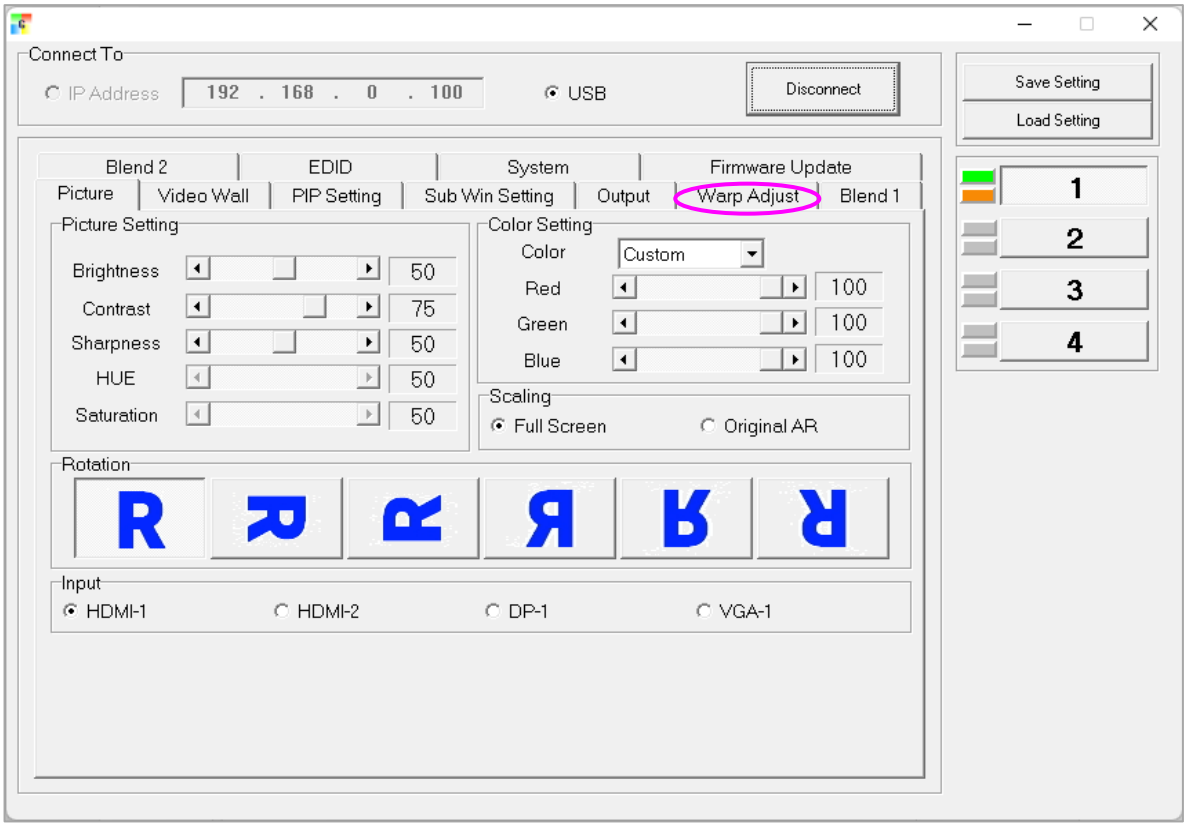
- Please check input/output timings under [INFO] key on remote controller.
- If one PC provides multiple outputs to multiple NEXIS. The settings in PC display card may change the output sequence after PC reboot. Please set different EDID in each NEXIS so that the output resolution setting will not change after PC reboot.

3.2. Geometry alignment via GCT PC tool

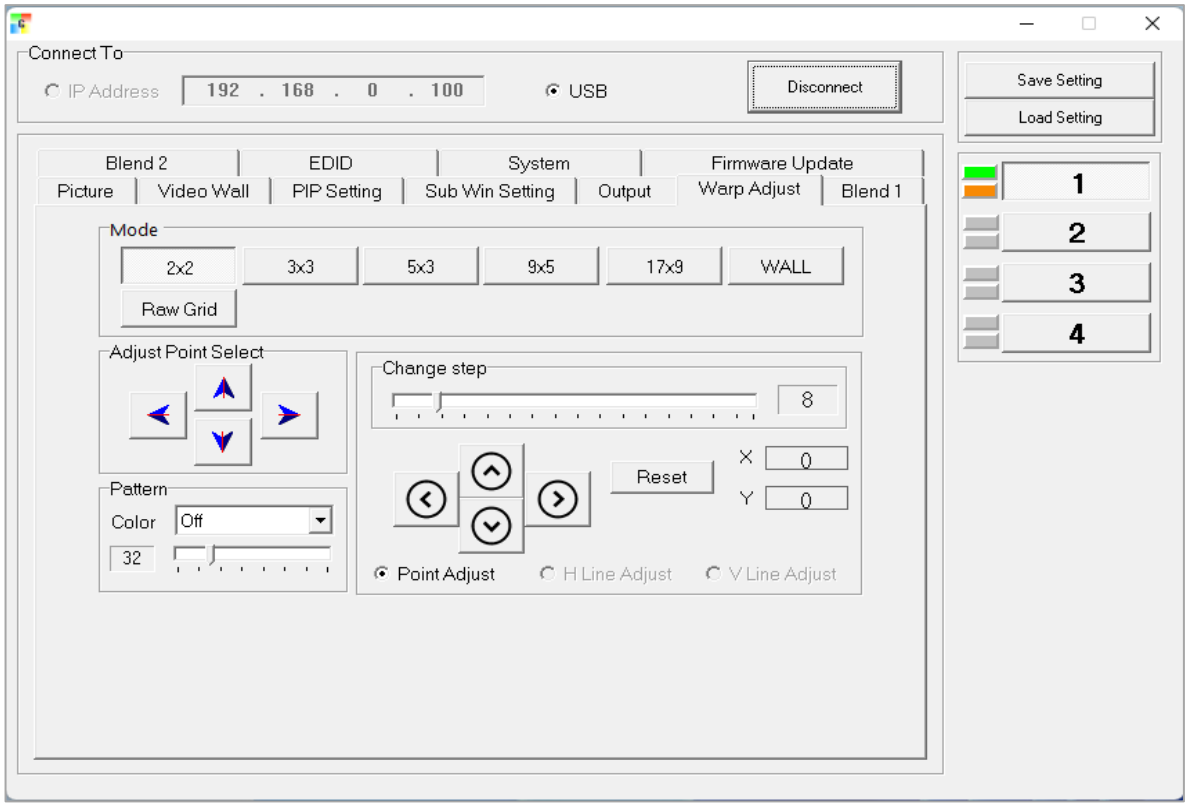
- GCT is a PC tool executed through PC. Once user opens GCT and connects with PC through Ethernet or USB. User can execute edge blending settings through PC keyboard and mouse. After finish the setup, user can save the result to Box and no more PC is required.
- User can backup system settings in PC and copy to other units.
- Firmware and MCU code update can be executed through GCT. User can control multiple units at the same time through different IP address.
- Please see download “GCT PC Tool Quick User Guide” from website under [Support]→ [System control PC Tool].

3.2.1. Geometry alignment through GCT [Warp Adjust]

- After connect GCT with PC through USB or Ethernet connection, once click [Connect], user will see below operation window.



➢ Click [Warp Adjust] menu, user will see below menu.



3.2.2. Shortcut keys for [Warp Adjust]

- [CTRL+ALT+#]: select adjust channel
- [P]: Enable grid pattern with different colors (W, R, G, Y, C, Transparent)
- [CTRL + P]: Disable grid pattern. User can see OSD menu.
- Start from [2x2] alignment, then follow [3x3]→ [5x3]→ [9x5]→ [17x9] sequence for geometry alignment. If go back to lower control point adjustment, it will reset higher control point adjustment. [2x2] alignment will not reset curve adjustment result.
- [M]: Change Adjust mode from [2x2]→ [3x3]→ [5x3]→ [9x5]→ [17x9]
- (PC language shall set to English, otherwise, some hotkey functions may not work)
- Use [CTRL + Arrow] key to select control point.
- Use [Arrow] key to adjust control point position with default step (8 pixels/step)
- Use [Shift + Arrow] key to adjust control point position with 1 pixel/step.
- User can switch OSD menu and GCT control without erase the adjustment data.
- While switching GCT control to OSD, please open OSD through MENU key, then click [Anyplace], OSD will be located at the same geometry alignment menu, such as [9x5] or [17x9]. If user click [Warp] key on remote controller, user will access to [3x3] adjustment and erase all the data above [3x3]. It will have the same situation when switch from OSD menu to GCT.
- We propose to do [Profile Save] before switching to different control method.

3.2.3. Save settings

- We propose user save setup result into Profile at each important step.
- Save Profile under GCT will save the data in all channels at the same time.
- Click [System] tab, select the # under [Save Profile], user will save the setting into Box. User can save up to 5 Profiles. If save into the same profile #, it will be updated to new data.
- The Profile for each channel is separate. User can load Profile data at the same time through [Load Profile] or load the data in each channel individually through OSD menu.
- Click [Save Setting] to save data into PC as backup or copy to another Box. The file type is [BSF]. [Save Setting] will only keep CURRENT settings on the screen and will not include Profile Data. If user wants to copy all Profile Data to another Box. User needs to load the data in each profile and save it into PC separately.
- To copy 5 Profile Data requires 5 BSF files. User can execute [Load Setting] from each BSF file and execute [Save Profile] in new Box in order to transfer all Profile Data into new box.

3.2.4. System Reset

- [CTRL + Shift + R]: Reset selected channel
- [CTRL + Shift + A]: Reset all channels (from CH1-CH4)
- Input / Output resolution and Profile Index settings will remain the same without reset.

3.3. System reset

NEXIS is possible to be interrupted during system setup stage. User can implement reset procedures to reset the system to default condition through below process:

- Use small pin to insert RESET hole at back panel for 5 seconds, user will see [Reset to Default] message. It will apply to all channels at the same time.
- Open OSD menu to reset the system. It will only be functional in one channel.
- User [Reset] hotkey on remote controller will go to Reset OSD menu for one channel only.
- When operating through OSD or remote controller, user can select to reset [Reset All] or only reset [Video Wall setting] or [Anyplace] (geometry) setting.
- Reset from OSD or remote controller will not delete Profile Index data. RESET from RESET Hole on back panel will delete all Profile Index data.



3.4. Control system settings—Box ID, RS232, Ethernet

- Box ID, RS232 and Ethernet settings shall be executed through CH-1. The setting result will be applied to whole unit.
- User can control or operate PW8xxC series settings through Ethernet. Default IP address is 192.168.0.100.
- When multiple units are used at the same time, user can set different IP address in each box so that each box can be controlled independently.

3.4.1. Box ID

- The range of Box ID is 0 ~ 99 for RS232 command.
- If user uses remote controller to execute system operation, the Box ID range is 0 ~ 9.

3.4.2. RS232 setting



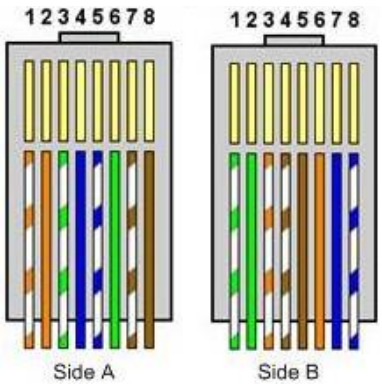
- RS232 is designed with DB-9 connector. User can select baud rate between 11520 and 9600.
- UART protocol for the control via RS-232 or Ethernet is available in the website.

3.4.3. Ethernet

- User needs to connect NEXIS to WiFi Router or switch/hub through RJ45 to LAN port. Then user can control the system through Ethernet.
- Crossover UTP cable can be used for direct connection between PC and NEXIS. User needs to set PC TCP/IPv4 with the same domain segment as NEXIS (for instance, to set IP address at 192.168.0.105) and subnet mask at 255.255.255.0). In some PC, normal UTP cable can be used.
- Open web browser (Google Chrome or Microsoft Edge) and input NEXIS IP address (default is 192.168.0.100), user can see NEXIS WebGui and menu with virtual keys similar to OSD for further system operation. There is no additional software is required.
- If user can't connect the network, please power off/on NEXIS again to let PC detect PW8xxC series network settings.
- User can set DHCP for the connection. If necessary, please [Renew] DHCP to get IP address before network connection through OSD menu.
- GCT PC Tool is another web tool for system setting and operation. It can also update Firmware or MCU code. GCT can be downloaded from NEXIS website under SUPPORT tab.
- Each NEXIS can set different IP address for independent operation and control via the same PC.
- After get into Network setting OSD, please use < > OSD keys to select OSD menu items and use ∧ ∨ OSD keys to change IP address.
- If NEXIS is connected with WiFi Router (through LAN port), user can control NEXIS through WiFi via PC, iPad or mobile phone.
- Default TCP server port is 1266

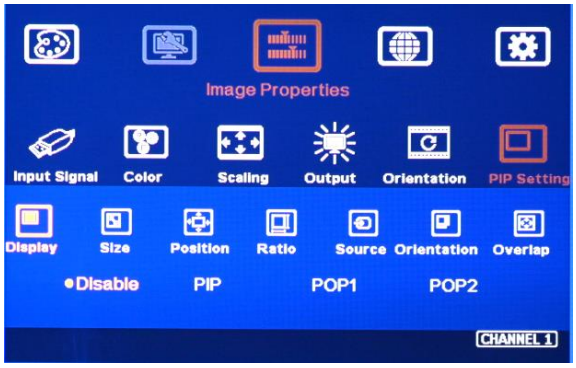


Crossover UTP cable

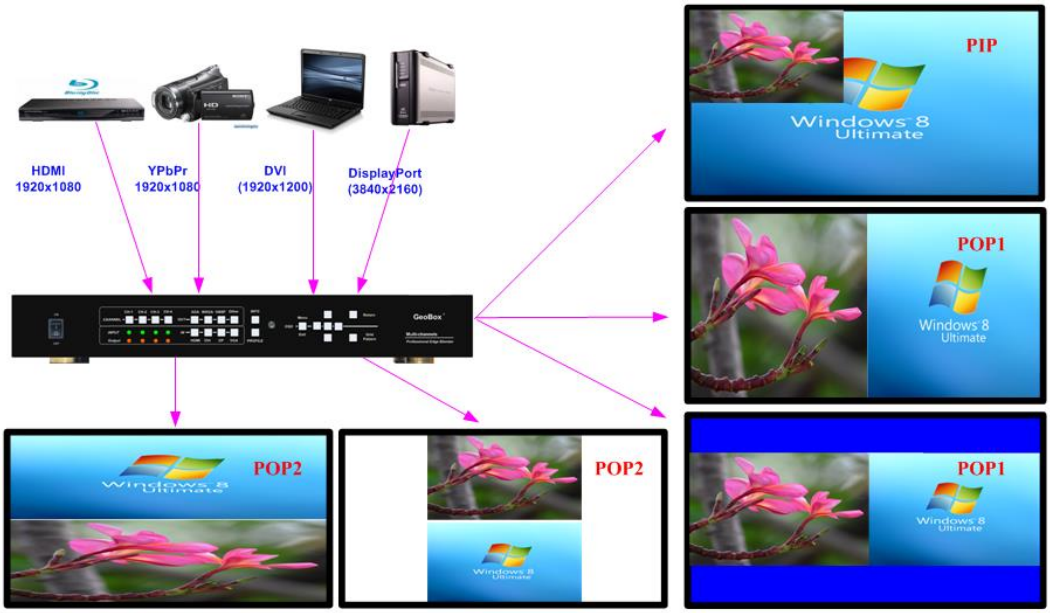


3.5. PIP/POP—Dual window display

Activate dual window display: OSD→ [Image Properties]→ [PIP Settings]→ [Display]



- ✓ PIP: Picture in Picture
- ✓ POP1: Side by Side display
- ✓ POP2: Top/Bottom display
- ✓ 90/270 image rotation is not available under PIP/POP function.
- ✓ Both main and sub-image will go through the same high end video processing.



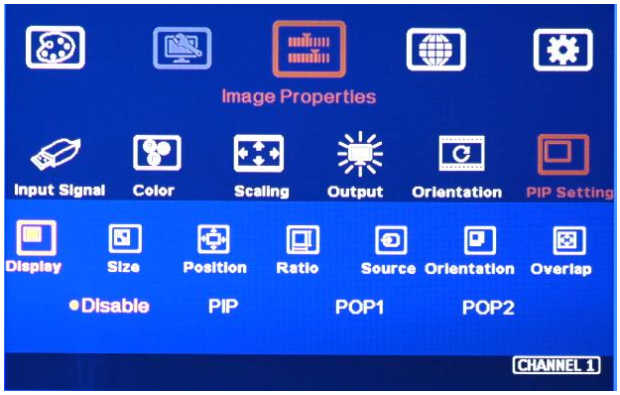
3.5.1. PIP (Picture in picture)

- ➢ Only display in one channel or one projector. If PIP across entire screen is required or 3/4 split views are required, please add one G901 or S901 at the front end.
- ➢ The minimum size of sub-window is 320*180 Pixels and maximum size is 1920*1200 pixels. The size is adjustable.
- ➢ The aspect ratio and image size in PIP can be further adjusted through [Overlap] function under [PIP setting] menu.
- ➢ 90/270 degrees image rotation is not available under PIP display mode.
- ➢ The location of the PIP image can be controlled by OSD menu to any location inside one projector.

3.5.2. POP (PBP) (Picture by picture)

- POP1: Side by Side display, POP2: Top/Bottom display.
- POP window can display full screen image or maintain original image aspect ratio. [Overlap] function can do further aspect ratio adjustment.
- No 90/270 degrees rotation is available.
- POP can only be displayed in one channel or one projector. If POP across entire screen is required. User can apply Flexible display setting to display independent content in each projector. Please see more details in Flexible Display section.

3.5.3. Main Menu under [PIP Setting]



Menu under [PIP setting]:
--Display: enable PIP, POP1, POP2
--Size: set PIP size
--Position: set PIP position
--Ratio: set PIP/POP display aspect ratio
--Source: select input source for PIP/POP
--Orientation: rotate sub-window direction
--Overlap: adjust PIP/POP image cropping area, position and aspect ratio.

a) **[Display]**:

- Disable: disable PIP or POP function
- PIP: select PIP (picture in picture) display function
- POP1: POP mode at Side by Side display mode.
- POP2: POP mode at top/bottom display mode.

b) [Size]: (Only apply to PIP function)

- The size of the PIP image can be adjusted though [Size] OSD menu.
- The minimum PIP size is 320*180 and maximum size of PIP image is 1920*1080 pixels.
- PIP image can be displayed with full screen. Further aspect ratio, image size or cropping area can be further adjusted through [Overlap] function under [PIP Settings] menu.

c) [Position]: (only apply to PIP function)

- The position of PIP image can be adjusted with 100 steps in H&V directions.

- The PIP image will be maintained inside one projector and can't be outside main image.
- Further Pixel by Pixel PIP image position finetune can be done by [Overlap] function.

d) [Source]

- The input source for PIP/POP is selectable. Main image can be selected from [Image Properties]→ [Input Signal] menu or remote controller hot key. Sub-window shall be selected from [Image Properties]→ [PIP Setting]→ [Source] menu.
- Only HDMI + DP, DP+VGA or HDMI+VGA can be selected as PIP/POP sources.
- No two HDMI input sources can be as main and sub-window sources at the same time unless user adds one HDMI to DP adapter to connect HDMI source from DP port.

e) [Ratio]: Set Aspect Ratio in PIP/POP.

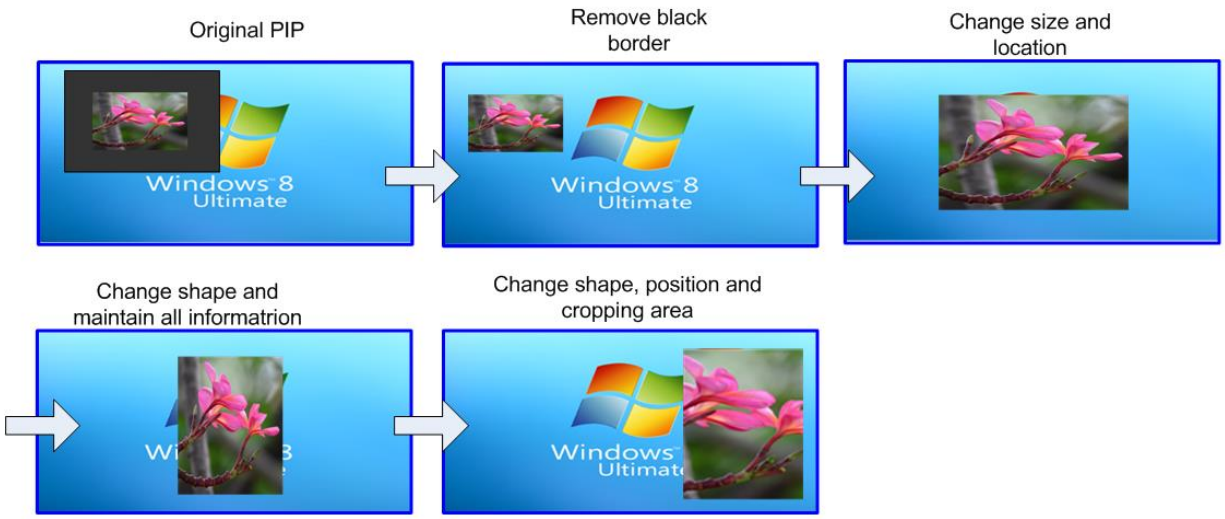
- [Full Screen]: same aspect ratio as main window in PIP.
- Full screen display in POP mode without blanking border.
- [Original AR]: keep the same aspect ratio as sub-window input source.
- POP main image aspect ratio can be adjusted through [Image Properties]→ [Scaling] OSD menu.
- Sub-Window aspect ratio can be adjusted through [Image properties]→ [PIP Setting]→ [Ratio] menu. [PIP setting]→ [Overlap] menu can also adjust the cropping area of sub-window.

f) [Orientation] for PIP/POP

- When PIP/POP is implemented, main image and sub-image can't be rotated at 90/270 degrees. Only 180 degrees rotation or RH/LH image flip and UP/Down flip function can be executed.
- Main image rotation shall be executed from [Orientation] under [Image Properties] menu and Sub-image rotation shall be executed from [PIP setting]→ [Orientation] menu.
- Main and sub-image can be rotated at different directions.
- When main image is 90/270 degrees rotated and user executes PIP/POP function, main image will be returned to normal display direction. Image 180 degrees rotation or flip can still be executed without change.

g) [Overlap]: adjust cropping area and aspect ratio of PIP/POP image

- User can execute further image cropping and aspect ratio change in PIP/POP image.
- After further Overlap adjustment, user can further expand PIP image size from 180*90 pixels up to WUXGA resolution. User can also adjust image size in POP mode.



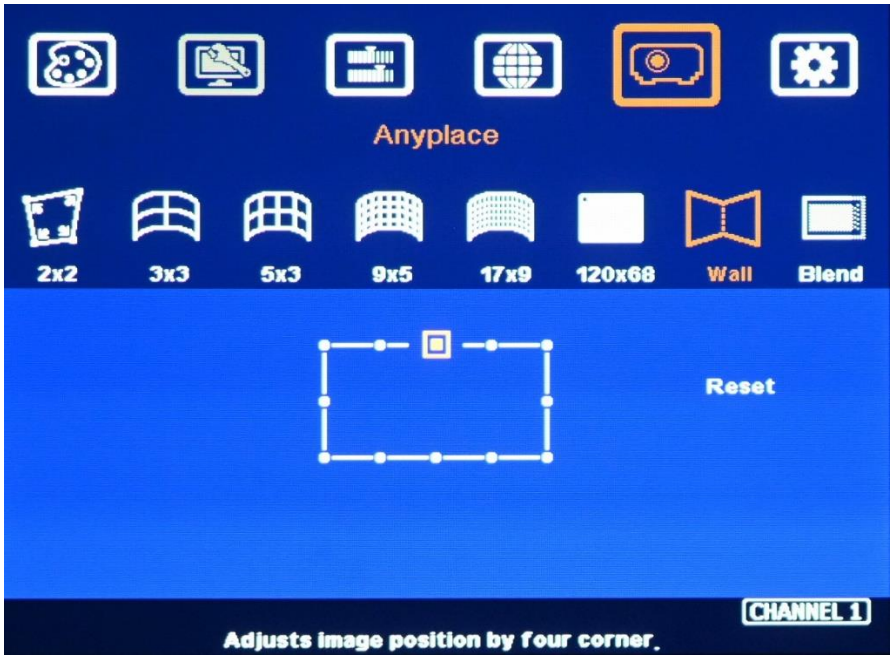
3.6. Corner Wall geometry alignment

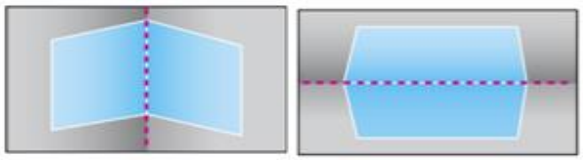
3.6.1. W shape Corner Wall geometry adjustment

Important note: When apply Corner Wall function, all the other geomtry alignment function will be disabled. User can only execute geometry alignment through 10 points of Corner Wall adjustment. 4 corner control points can execute 4 corner alignment same as [2x2] geometry alingment function. Edge Blend function will be still available.

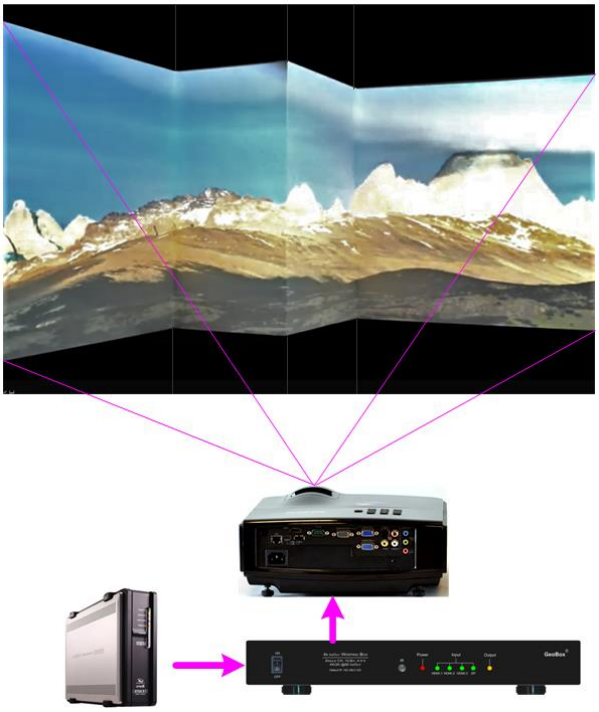
Corner Wall alignment allows user to adjust the image at 90 degree corner wall or images at two sides of the pillar at wall corner through 10 control points across the edge of the image. It can execute horizontal and vertical corner wall alignment. User can only select either horizontal or vertical alignment at one time. This function can co-exist with edge blending function but not warp function. The image position can be adjusted as below:

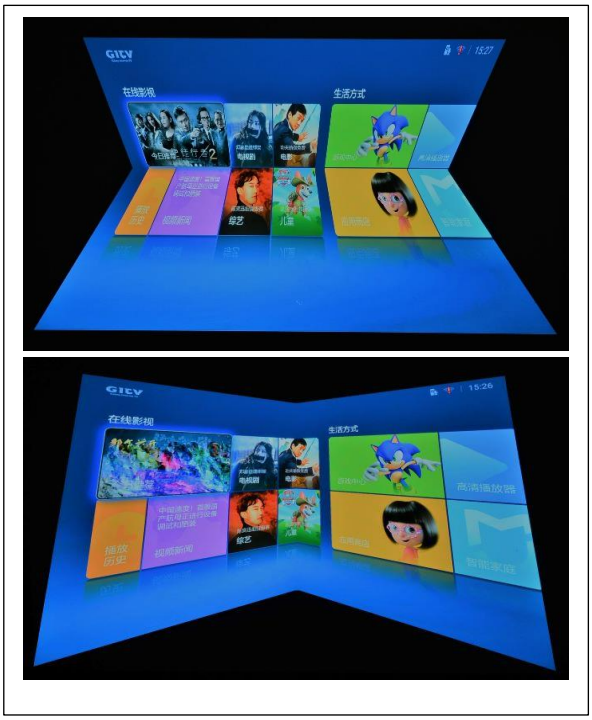
- 4 corner positions of the image. The whole image position will be shifted the with same scaling factor. The adjustment range is 1200 pixels in both H&V directions.
- The rest 6 control points can correct the image position at wall corner or the images at two sides of the pillar at corner wall. It can shift the image positions in horizontal and vertical direction with the control range up to +_1200 pixels.
- User can't use ultra-short throw ratio projector for corner wall application. Otherwise, the image distortion will be too big to be adjusted and may also create focus issue. The ideal projector throw ratio should be larger than 0.8:1.


Anyplace
2x2
3x3
5x3
9x5
17x9
120x68
Wall
Blend
Reset
CHANNEL 1
Adjusts image position by four corner.

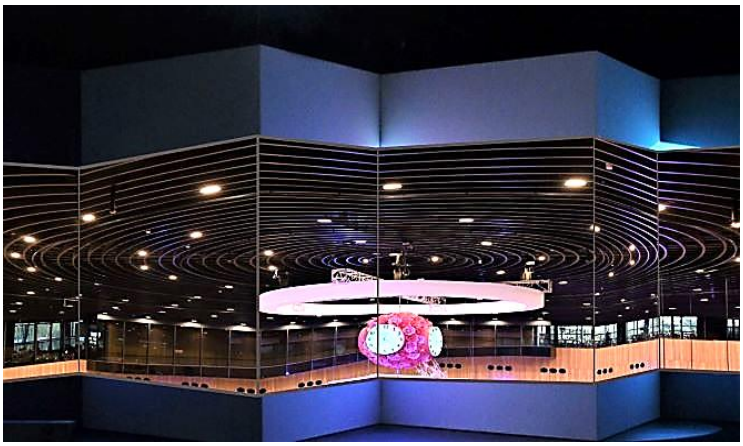












3.6.2. Corner wall application on curved screen

If user wants to implement Corner Wall function on curved screen, user can connect the signal to another G116 or G110 to do warp alignment, then connect the output to another unit for further Corner Wall alignment. Then user can execute curve alignment and Corner Wall adjustment at the same time.

3.6.3. Important notice on curved screen application

The image quality in Corner wall adjustment will be degraded due to big geometry alignment. It is recommended to apply only multimedia content in this kind of applications. User can display the images at different side walls with different projectors to get the best video quality. NEXIS can crop correct image to get the right scaling factor based on the wall dimensions.

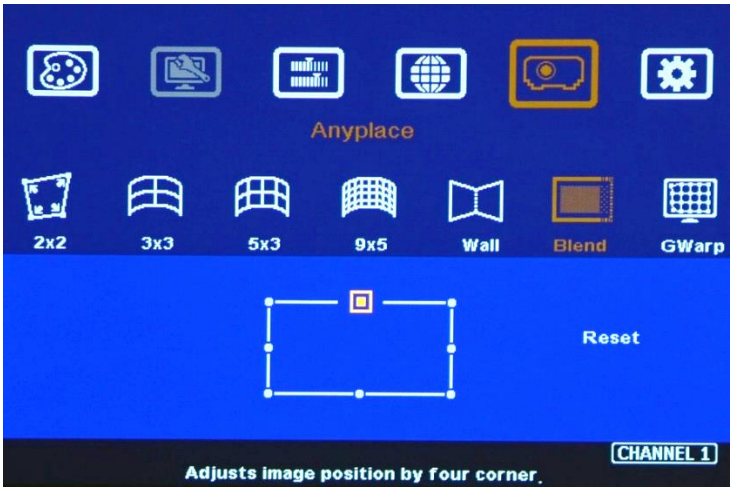
3.7. Edge mask

There are two edge mask functions in PW8xxC series. 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.
- [Edge Mask]: There are 8 control points for edge mask. When user moves the position for each control point, it will result various edge mask effect. The maximum position adjustment for each control point is +_ 900 pixels in H&V directions.
- The starting point for [Shift] is based on the image position after geometry alignment and the starting point for [Mask] is calculated from the original edge position before geometry alignment and before [Shift] edge mask.
- When implement edge mask, OSD menu will be also masked. To implement through GCT will be more convenient without OSD masked issue.









Original Image after geometry alignment

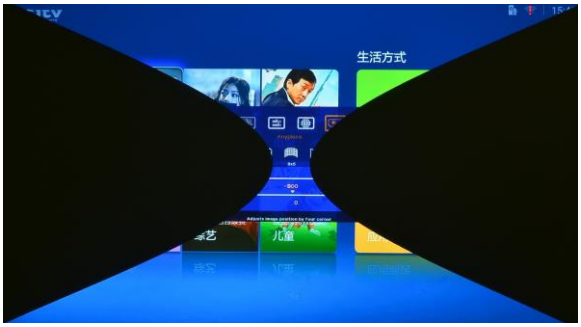


Image [Shift] (Follow geometry curve)



Image [Mask] (executed by 8 control points

Another Image [Mask] example





3.8. Determine overlap region size and pixels

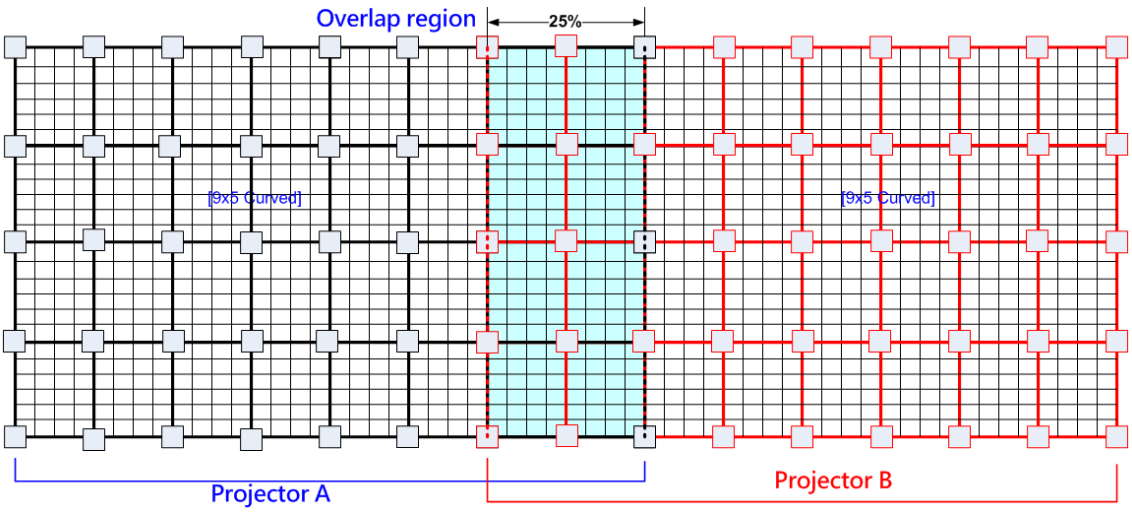
- NEXIS provides an Excel Spreadsheet in the website for user to do edge blending plan.
- During Excel Spreadsheet calculation, user has some flexibility to determine the overlap region size by different projector resolution, lumens, image size and number of projectors.
- The most common overlap region is about 20% to 40% based on single projector native resolution. For 1024*768 projector, the overlap range is 1024*20%~1024*40%=205~409 pixels. NEXIS test pattern default size is 32x32 pixels. Therefore, the final result will be around 7 grids (224 pixels) to 13 grids (416 pixels) for XGA projector and 12 grids (384 pixels) ~ 24 grids (768 pixels) for 1080p & WUXGA projectors. If the projector has accurate color and gamma curve, the overlapped pixel can be lower to 5 grids (160 pixels) in XGA projector. The actual pixel number should be determined based on the required screen size and the projector model used. Under the same screen width, if higher image is required, then the overlap region will be also increased.
- If the overlap pixels are increased, the image height will be also bigger. User can simulate with different overlap pixels (multiples of 32) to get a result that the image height is bigger than required image height with reasonable overlap region dimension between 50cm to 120cm in overlap region. Reasonable overlap region will be easier for overlap color control.
- PW8xxC series maximum edge blend range is H=1920 pixels, V=1200 pixels. The black level compensation range is 900 pixels. If user requires black level uplift compensation and the overlap region is more than 900 pixels, please select the outside black level Block to execute black level uplift. The pixel number is based on native projection area without any adjustment from either projector or NEXIS.If necessary, user can adjust the overlap size through geometry alignment to decrease overlapsize without changing projector location.
- Please note that user can change the grid pattern size from 8 to 120 pixels. Default is 32x32.

3.8.1. Relation between Overlap pixels and geometry alignment accuracy

- Proper selection of Overlap pixels will affect the control points in geometry alignment. If the Overlap pixel is 25% of the projector native resolution (or NEXIS output resolution), it will have less geometry alignment points due to control points in adjacent projectors will be at the same location. If the overlap pixel is not 25% of the projector native resolution, the control points will beat different positions. 37.5% overlap pixel will double the control points of the geometry alignment if compared with 25% overlap and have the best geometry alignment accuracy.
- [9x5 Curved] alignment will cut the horizontal image into 8 sections and the image in each section can be independently adjusted. In different output resolutions, there will be different pixel number in each section: XGA: 1024/8=128, WXGA: 1280/8=160, 1080p: 1920/8=240.
- If the overlap area between two adjacent projectors has the same or multiple number as above, the geometry alignment control points in overlap region will be less. User can reduce one or two grids in each projector (32 or 64 pixels) in overlap area to increase the control points in overlap region for more accurate alignment between adjacent projectors.
- Edge blending on flat screen, it will be easier for geometry alignment. User doesn't need to consider the relation between overlap pixels and geometry alignment accuracy.
- Below figure is an example for [9x5 Curved] alignment in 1024 resolution:

3.8.2. 25% overlap region

The adjusting points in projector A & B will be at the same position in overlap region

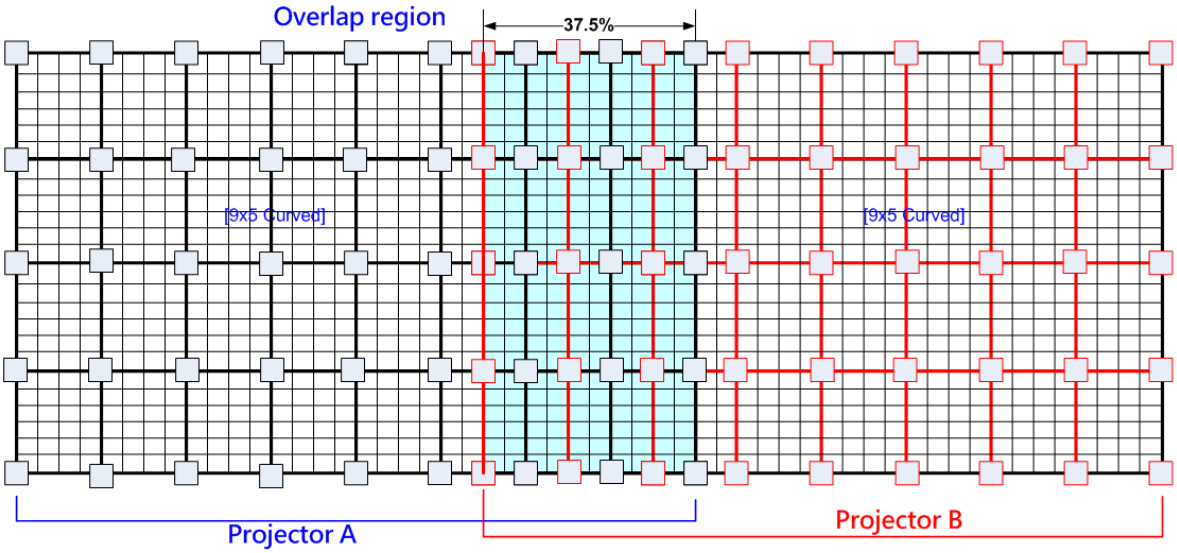


If the overlap is 256 pixels (25%) in XGA resolution, total adjusting points in overlap region are 3*5=15. *The adjusting points in projector A & B will be at the same position in overlap region.* User will have less adjustment flexibility. If increasing two grids (64 pixels) to 320

overlap pixels, user can have 30 adjusting points to get more accurate geometry alignment.

3.8.3. 37.5% overlap region

The adjusting points in projector A & B will be separated in 37.5% overlap region and increase geometry alignment accuracy.



3.8.4. Recommended overlap pixels in different output resolutions

Below is the list for the accuracy of geometry adjustment in different overlap pixels:

NEXIS output resolution	1920*1200	1280*800	1024*768
Min. adjusting flexibility	256/480/704	320/480/640	256/384/512
Max. adjusting flexibility	352/608/832	224/256/384/416/544/576	192/320/448/576

Chapter 4. Advanced applications

4.1. Flexible display

- PW8xxC series allows user to set different multi-window display modes and save into Profile Index. The settings can be recalled through IR controller, RS232, USB or Ethernet.
- User can create 16:9 or 16:10 display window for conventional content display.
- User needs to setup edge blending system and store in Profile Index first, then only need to do some adjustment to get discreate display mode.

Example: 3 projector flexible display



4.2. Independent content display

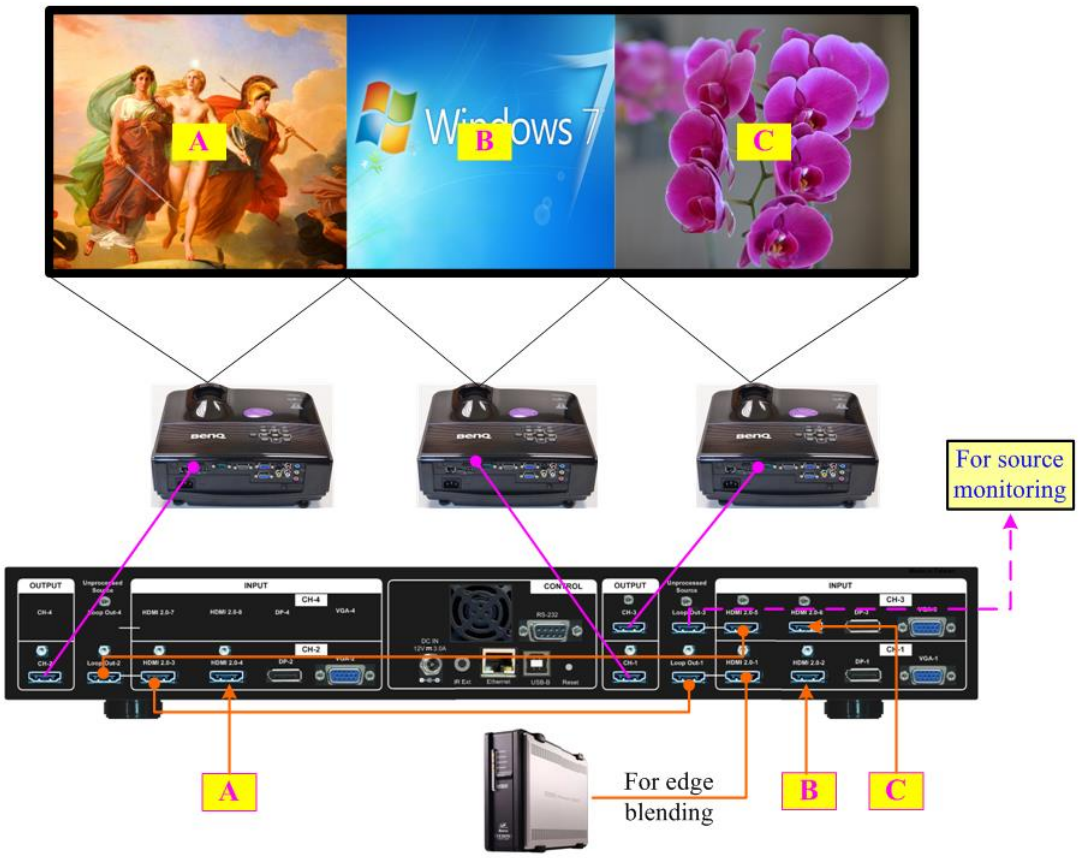
4.2.1. Signal connection

- Connect signal source for edge blending to first channel, then Loop Out to all channels with the same signal through HDMI-1, HDMI-3, HDMI-5, HDMI-7. No special connection sequence is required.
- The signal source for independent display in each channel should be connected to the second HDMI input in each channel-- CH-1: HDMI-2, CH-2: HDMI-4, CH-3: HDMI-6, CH-4: HDMI-8

- For PIP/POP display in each channel should be connected to DP or VGA input port. PIP/POP can't be located across multiple projectors or across entire screen. If across entire screen is required, please add one G901/S901 as front end.

4.2.2. NEXIS settings for discrete content display

- This setup procedures are assumed that user had finished edge blending setting in advance.
- Switch input port to the second HDMI input in each channel.
- Reset Video Wall setting in each channel through IR controller [RESET] key or OSD-- [Options]→ [Reset]→ [Video wall]→ [OK]
- Reset Edge Blending in each channel through IR [EDBL] hotkey or OSD [Anyplace]→ [Blend]→ [Edge]→ [Reset]
- Align image position through [2x2] & [Warp] to eliminate overlap between adjacent projectors.
- User will see discrete content display in each projector.
- User can use Video Wall [Overlap] or Geometry alignment to adjust the top & bottom edge location to get correct aspect ratio.
- Save the final result to second Profile Index.
- Please note that if the overlap region is too big, it will affect the image size for independent display.
- User can use IR controller [Profile] key, RS232, GCT PC tool or WebGui to load back the settings in few seconds.



4.3. Multiple wall immersive display

4.3.1. Ideal image size for immersive display

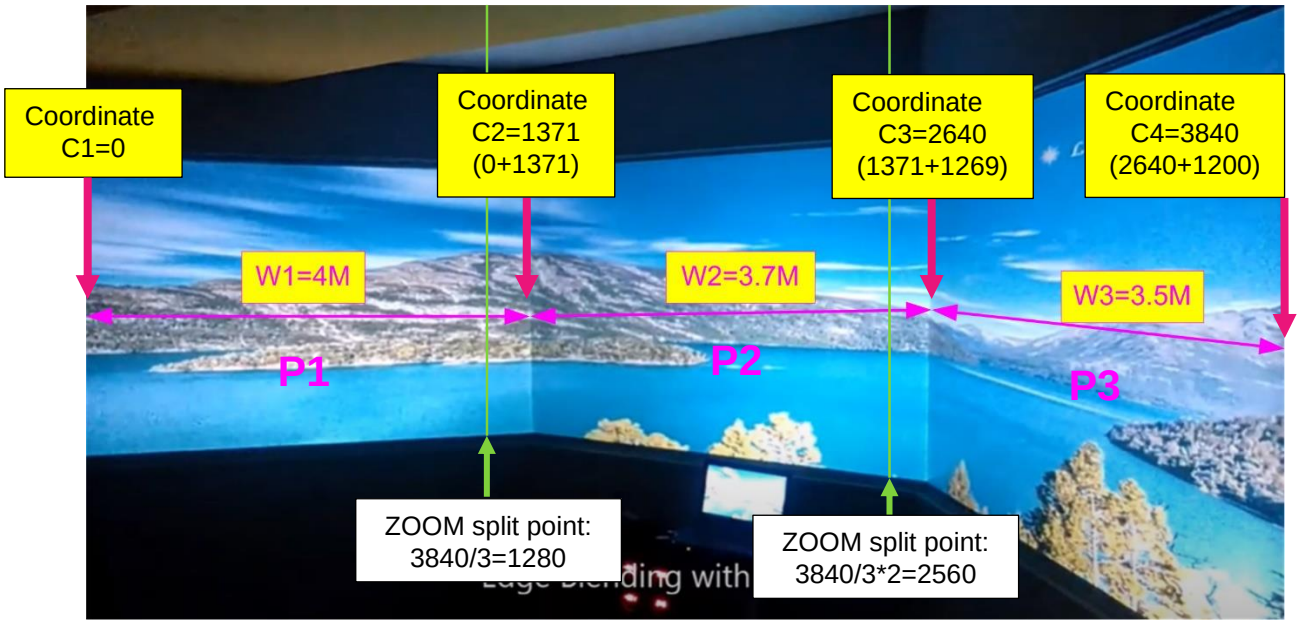
- Installation projector: WUXGA 1920x1200, 5000 Lumens
- Standard image size: 4m*2.5m (16:10 aspect ratio), 4m*2.25m (FHD 16:9)
- Projector area: 4m*2.5m=10 square meters
- Illuminance: 5000/10=500 Lux. Can meet the requirement in most of environment with ambient light control
- Immersive wall dimensions:
  - Width: ideal width is 2.5m-4.8m. Height: 1.5m-3m
  - Projector aspect ratio is 16:10 (1920x1200). FHD: 16:9
  - If the wall width is 4.8m, the image height can be up to 3M (4.8/16*10=3).
  - If the wall width is 2.5m, the image height will be 1.56m (2.5/16*10=1.56)
  - If use FHD projector, the image width is 3.0m, the image height is 188m (3/16*9=1.88)
- Image size adjustment: if the wall dimensions can't match projector aspect ratio, user can use geometry alignment to adjust the image size to meet the screen. The image can be shrunk to 37.5% in both H&V direction. For instance, user can adjust 4m*2.5m (16:10) projector image for the wall with 1.5m~4M in width and 2.5m~0.94m in height.
- If user has multiple walls with wall size between 2.5m-4.0m. it will be the best fit. If the wall size is up to 4.8m, it is still possible to use single projector for one wall to achieve 3m image height. However, user needs to consider the pixel pitch and video quality because the pixel pitch will be 4.8m/1920=2.5mm (similar to LED P2.5). Another consideration is the brightness. For 4.8m*3m, user needs to use 7200 Lumens projector to get the same 500 Lux.
- If the content with dark background, user will see projector light leakage under dark environment. Please select high NATIVE contrast ratio projector to reduce this kind of effect. User can apply black level uplift function to compensate this light leakage.

4.3.2. How to crop image for each wall

- The dimension in each wall can be different. NEXIS can crop required pixels for each wall separately and let the image scaling factor in each wall be the same without distortion.
- Assumption:
  - Wall dimensions (width): A: 4m, B: 3.8m, C: 3.5m, total width: 11.3m
  - Wall height: all the walls need to have the same image dimension to get the same brightness and scaling factor. The max. image width is 4m, it means the image size should be 4m (W)*2.5m(H) (16:10) for all projectors.

- One PW833C processors to control 3 projectors. Each projector projects on one

➢ wall.Below is the example for 3 wall immersive display with different wall width.



4.3.3. Image pixel for each wall

- ➢ Signal source resolution: 3840*1200
- ➢ Horizontal Pixel pitch: 11.2m/3840=2.91667 mm/Pixel
- ➢ Pixels for each wall: Wall-1=4000/2.91667=1371, Wall-2=3700/2.91667=1269, Wall-3 = 35000/2.91667=1200

4.3.4. Geometry Alignment

- ➢ Each channel of PW833C controls one projector for one wall.
- ➢ Apply geometry alignment and let each projector image is located in each wall with the edge to match at the wall corner. The image width must be the same as each wall. The horizontal grid lines should also be aligned together.
- ➢ If geometry range is not enough from NEXIS, please apply projector geometry alignment at the same time.

4.3.5. Video Wall settings

- ➢ Video Wall [ZOOM]: H=3, V=1 for all channels, to split the image into 3 horizontal sections. Each section is 3840/3=1280 pixels.
- ➢ Video Wall [PAN]: to assign the split image to each wall.

Wall-1 (CH-1): H=1, V=1, Wall-2 (CH-2): H=2, V=1, Wall-3 (CH-3): H=3, V=1

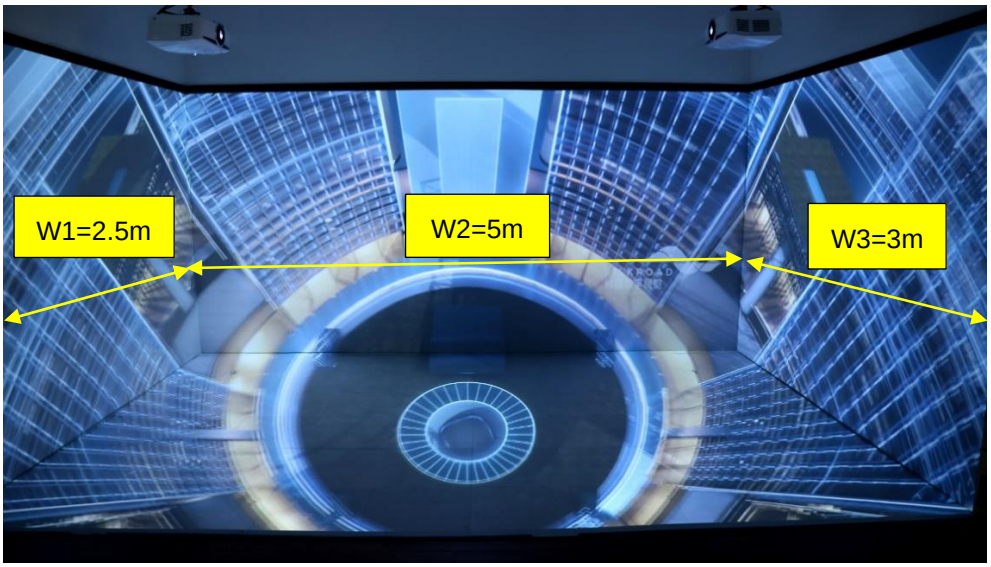
- Video Wall [OVERLAP]: to crop actual pixel for each wall
  - When the ZOOM setting is H=3, it means the signal source is cut into three equal section. Each section will have 3840/3=1280 pixels.
  - Wall-1: required 1371 pixels, Coordinate C2=1371
    Projector A: RH edge: Overlap setting =1371- (3840/3) = +91
  - Wall-2: required 1269 pixels, Coordinate C3=2640
    Projector B: LH edge: Overlap setting= (3840/3)-11371= -91
    Projector B: RH edge: Overlap setting= 2640-(3840/3*2) = +80
  - Wall-3: required 1200 pixels, Coordinate C4=3840
    Projector B: LH edge: Overlap setting= (3840/3*2)-2640= -80
    Projector B: RH edge: Overlap setting= 3840-(3840/3*3) = 0

4.3.6. Immersive Plan Excel File for 3 walls and 3 projectors

- User can use [Immersive Plan-3W3P] Excel file to calculate the overlap setting value. Please download this Excel file from below website: https://bit.ly/3vZQ3si

4.3.7. Immersive system with bigger wall dimension and with floor or ceiling

- Below is the example for immersive system with edge blending and floor display.
- The center wall dimension is up to 5M, we propose to use two projectors with edge blending to get better pixel pitch and video quality.
- For the floor display, it is an independent edge blending with 1-3 projectors to cover the whole floor. The projectors can be installed at landscape or portrait directions. NEXIS can rotation the image to match the projector installation angle.



- Assumption
  - 3 walls display: W1=2.5m, W2=5m, W3=3m
  - Signal source: 3840x1200, NEXIS output resolution: 1920x1200
  - Required image height: 2.5m. The image size for each projector is 4mx2.5m (16:10)
- Usually, 5000 Lum projector can cover 3-4 meters image width. Four projectors are required to cover entire wall screen.
- The dimension of W1 and W2 is only 2.5-3.0 m. User can use one projector for W1 and W2 separately. It is possible to use one projector across two walls and only use 4 projectors for 3 wall display. Due to big geometry alignment and off axle projection, the video quality will be lower. We suggest to stitch the image edge at wall corner to get the best video quality.
- In ideal condition, each projector should have the same projection size to get equal brightness. For 2.5m image height, the image width should be 4m (16:10 aspect ratio).
  - W1: one projector is enough
  - W2: require two projectors with edge blending to cover the space
  - W3: one projector is enough
  - Floor: 1-3 projectors is required. (If use one projector, the image size is 5.0mx3.1m, the brightness and resolution will be a little lower. The installation distance should be also considered. Bigger image requires bigger installation distance.
  - The image in each wall should have the same scaling factor.
  - Total screen dimensions: 2.5+5+3=10.5m
  - Total image width: 3840 pixels
  - Pixel density: 3840/10.5= 365.7 pixels/m
  - Assign source image resolution for each wall to get the same scaling factor.
    - W1 (PJ1) =365.7*2.5= 914 pixels (Projector #1)
    - W2 (PJ2 & PJ3) =365.7*5= 1829 pixels (Projector #2 & #3)
    - W3 (PJ4) =365.7*3= 1097 pixels (Projector #4)
    - Based on the above data, if we describe the image location by coordinate, W1 is from 0 to 914, W2 is from 914 to 2743 (914+1829), W3 is from 2743 to 3840.
- Geometry alignment in W1 & W3.
  - To use geometry alignment to squeeze W1 to 2.5m width & W3 to 3.0m. If geometry range is not enough from NEXIS, please apply projector geometry alignment at the same time.
- Video Wall settings:

  User can set different Video Wall Zoom value for each projector separately. We assume to set Zoom at H=4, V=1 for all projectors.
  - W1: Zoom: H=4, V=1, Pan: H=1, V=1
    Overlap: 3840/4=960, 914-960= -46→ Right Edge = -46. If image size is adjusted to 2.5m by geometry alignment. Left Edge=0.

- W3: Zoom: H=4, V=1, Pan: H=3, V=1,
  Overlap: 3840/4=960, 1097-960= +137→ Left Edge = +137, Other Edge=0
- W2: The image captured for W2 is 1829. User needs to calculate Video Wall Overlap Pixel based on this resolution as signal source. If we want to get 2.5m image height, we need to have 1440 overlap pixels (based on projector resolution), the Video Wall Overlap setting value is 549 pixels (based on signal source resolution).

Source resolution (H)	1829	Screen width	5.00	(m)
Source resolution (V)	1200	Screen height	2.50	(m)
Projector resolu. (H)	1920	Projector lumen	6000	(Lum)
Projector resolu. (V)	1200	Screen Aspect ratio	2.00	(required)

Overlap pixels (32 pixels per grid)		Overlap %	Recommended
Overlap pixel (H)	1440	75.0%	20%~40%
Overlap pixel (V)	0	0.0%	25%~40%

Recommended overlap region: Min. 50 cm width

Qty of projector (H)	2	Throw ratio (Min)	0.50
Qty of projector (V)	1	Throw ratio (Max)	0.80

Final output resolution	
Horizontal resolution	2400
Vertical resolution	1200
Extended pixel (H)	549
Extended pixel (V)	0

* Please apply Overlap pixels with 32x because default grid size for geometry adjustment is based 32x32 for each grid.
*User can change grid size via OSD to any grid size between 8-120 pixels.

Final Image size (meter)		Final Illuminance Lux (Lum/m2)		Image size for each PJT	
Width	5.00	PJT lumen	6000	Width (m)	4.000
Height	2.50	Final Illumin	600	Height (m)	2.500

Overlap region size		Original aspect ratio		Projector throw distance	
Horiz. (m)	3.000	Projector	1.60	Min (m)	Max (m)
Vertic. (m)	0.000	Final result	2.00	2.00	3.20

* Final mage height should be equal or larger than screen. User can shrink image to have the same image height as screen by GeoBox geometry adjustment.
* Standard luminance is 400-800 Lux for restaurant and big conference room, 1000-1500 Lux for trade show. 3D: 500 Lux (single projector)
* Theater: 172 Lux (16 foot-lamberts), SMTP display standard: 377 Lux
* Final brightness of the screen needs to multiple gain value of the screen.
* The actual installation image size should be equal or larger than expected size.
* The best content resolution is the same as Final output resolution in cell D15& D16.

Video wall setting value

Position of projector (H)	1	2	3	4	5	6	7	8	9	10
LH edge overlap value	0	549	x	x	x	x	x	x	x	x
RH edge overlap value	549	0	x	x	x	x	x	x	x	x

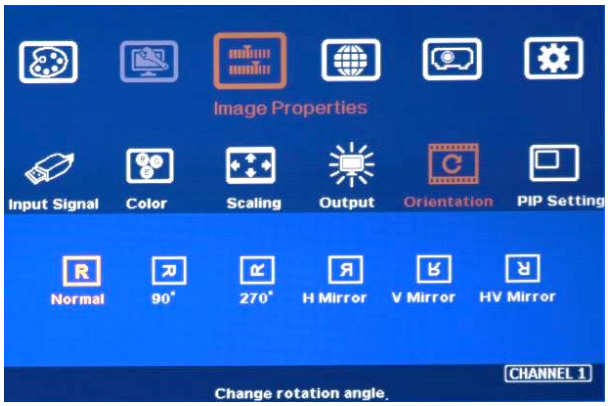
- Based on signal source resolution, the image cropped for PJ2 should be in the range from coordinate 914 to 2377.5 (914+1829/2+549). The image for PJ3 should be in the range from coordinate 1279.5(914+1829/2-549) to 2743 (914+1829=2743).
- PJ2 Video wall setting: Zoom: H=4, V=1, Pan: H=2, V=1. The standard coordinate after Zoom setting will be from 960 (3840/4) to 1920 (960*2), Overlap value will be:
  Left Edge: 960-914= 46, Right Edge: 2377.5-1920= 457.5 (actual 457 or 458)
- PJ3 Video wall setting: Zoom: H=4, V=1, Pan: H=3, V=1. The standard coordinate after Zoom setting will be from 960*2=1920 to 960*3=2880, Overlap value will be:
  Left Edge: 1920-1279.5= 640.5 (actual 640 or 641), Right Edge: 2743-2880= -137
- After finishing video wall settings, user needs to set [Edge Blend] between PJ2 and PJ3 to finish complete system settings.

4.3.8. Immersive Plan Excel File for 3 walls and 4 projectors

➢ User can use [Immersive Plan-3W4P] Excel file to calculate the overlap setting value. Please download this Excel file from below website: https://bit.ly/3BZbBsM

4.4. Portrait edge blending

When executing edge blending, the image will be stretched and the aspect ratio will be changed. In order to reduce aspect ratio change, user can execute portrait edge blending to increase image height. When execute image 90/270 degrees rotation, the input source resolution can be up to 4k/60Hz.



Original image at landscape





- Projector at portrait position to increase image height
- Source image is rotated by NEXIS at 90°
- Zoom: H=3, V=1 in all projectors
- PAN settings are showed in each image.
- Overlap settings: PJ1: Right Edge, PJ2: Left Edge & Right Edge, PJ3: Left Edge

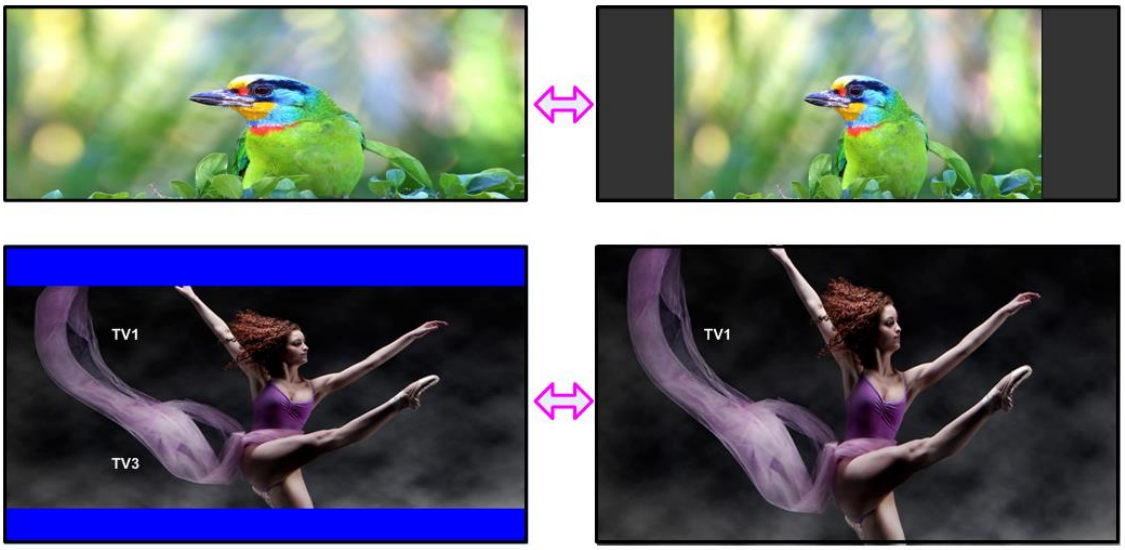
- Some projectors are not suitable to be installed at portrait location. Laser projector has high contrast ratio, no limitation in installation angle and accurate color and gamma curve. It is the best choice for edge blending application.
- PW8xxC series can rotate source image before edge blending. It will be more convenient for user to connect with all kinds of conventional signals without the need to rotate the image in
- advance.When apply portrait edge blending, the NEXIS Excel Spreadsheet calculation also needs to change the output resolution. If the projector is 1920x1200, then user needs to key-in Output Resolution (projector resolution) at 1200x1920.
- The OSD menu will not follow rotated image. Video Wall setting direction will follow actual rotated image direction but not OSD direction.
- All the function settings under [Anyplace] menu will follow OSD menu directions but not follow rotated image direction. The items include geometry alignment & edge blending.
- Except for the directions, all the rest settings will be the same as normal display.
- Image rotation menu is under [Image Properties]

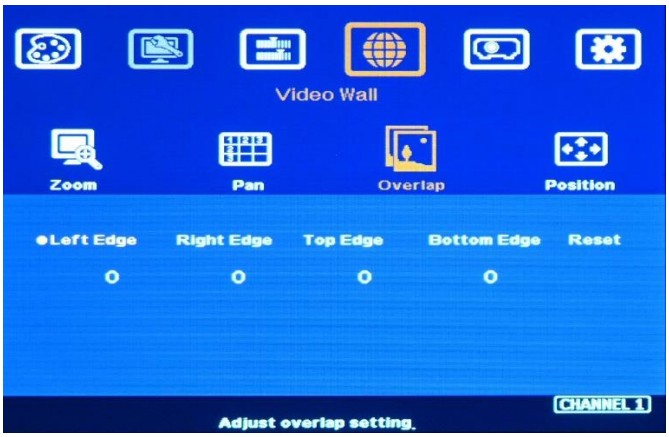
PS1. If using Fujifilm projectors with rotatable lens to project all-in-one image on Ceiling, wall and floor, the location setting (PAN) at 1st and 3rd projectors may be swapped. Please see the image after rotation and Left side projector PAN is H=1.

PS2. When apply portrait edge blending, the installation location of the projector will be near the middle height of the screen. If the projector has lens shift function, projector can be installed at higher location.

4.5. Entire aspect ratio adjustment

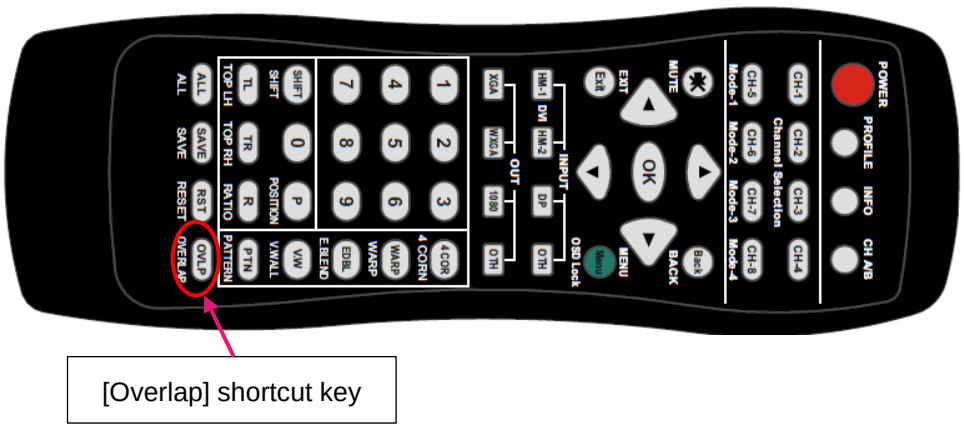
User can change the aspect ratio of the image with black borders or to stretch the image in specific direction to compensate the aspect ratio difference. The Maximum adjustment range is 1800 pixels in each edge. User can adjust [Overlap] value under [Video Wall] menu to change the cropping area and achieve aspect ratio change.





Activate [Overlap] under [Video Wall] menu

- User can select the channel and the edge required for edge shift, then adjust Overlap value to see aspect ratio change.
- The image position shift range is +_1800 pixels in each edge.
- IR controller [Overlap] shortcut key is also available.



- In multiple projector application, when user adjusts Top or Bottom Overlap value in one projector, user needs to adjust the same Overlap value in other projectors to let all projectors has the same scaling factor.
- In two projector edge blending, when user adjusts horizontal aspect ratio, user needs to change Video wall Overlap value with the same number in both projectors until getting clear overlap image. In NEXIS Excel Spreadsheet calculation, if user calculates original Overlap value with 3840 input resolution, after increase 500 pixels in both outside edges in projector 1 (RH edge) and projector 2 (LH Edge), user can shrink the image width. However, the overlap region will become blurred. User needs to re-calculate Overlap value by new input resolution 3840+500*2=4840 to get correct video wall Overlap value. User can also continuously increase overlap value in both projectors to a point that both images can match together.
- The adjustment range of 1800 pixels is calculated according to the signal source resolution. If the signal source is 4k/2k and the adjustment value is 1200 pixels, when switching to 1080p input signal, the adjustment value will be converted to 600 pixels automatically to maintain the same image position. If the input signal source is 1080p and the adjustment value is 1000 pixels, when switching to 4k/2k input signal, the adjustment value should be 2000 pixels. However due to the maximum adjustment value is only 1800 pixels, the final image will follow 1800 pixels but not 2000 pixels for 4k input. It means the image aspect ratio will not the same as 1080p input source.

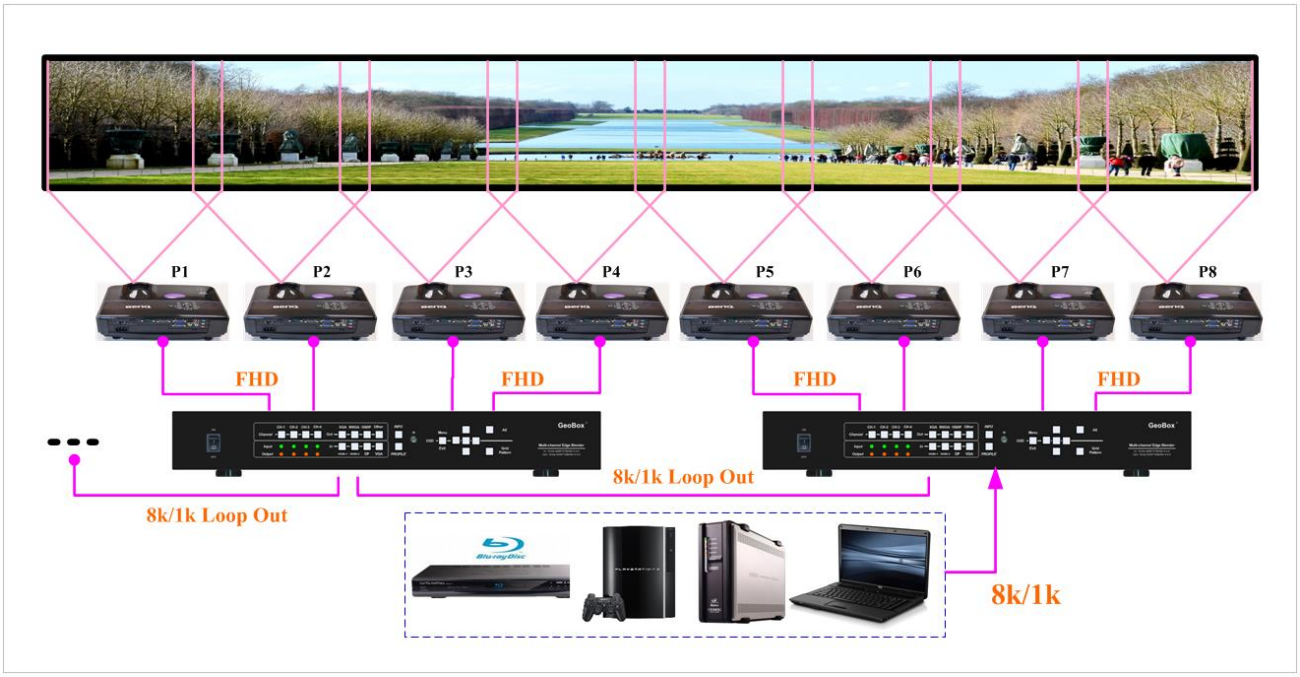
4.6. How to support 5k/6k/8k input signal

PW8xxC series can support input signal up to 7680*2160/30Hz or 7680*1200/60Hz. NEXIS EDID setting isonly up to 3840*2400/60Hz input resolution. Once user requires higher input resolution from PC, user needs to set Customized output timing from PC display card. Please download [PC 8k_6k output setup procedures] application note from NEXIS Website at https://bit.ly/3uHXNhS.

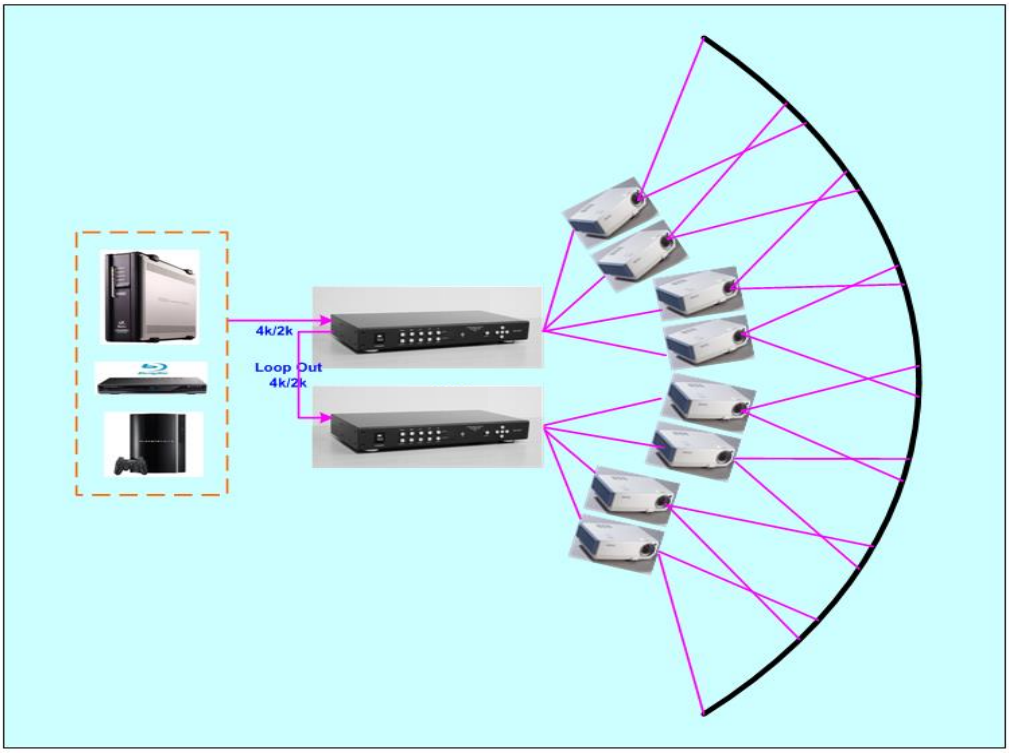
Once PC customized output timing is setup, user needs to connect to the same NEXIS with thesame EDID to let PC output required timing. When the system is turned off, the setting in both PC and NEXIS will not change.

4.7. Multiple unit cascade

4.7.1. System connection in multiple unit edge blending



- Connect input signal to HDMI 1/3/5 or 7 input ports and loop out to next processing channel. The last loop out port needs to connect to next PW8xxC series. No special sequence is required.
- Usually, loop out signal can connect up to 10 processing channels. The maximum number is related to signal resolution and HDMI cable quality. If more channels are required, please add one HDMI splitter at the front end. It will extend to double or triple numbers of processing channels.In
- edge blending application, only HDMI-1/3/5/7 signal can be cascaded through internal HDMI splitter. If user wants to do edge blending with other input ports, please add video distributor at the front end and feeds the signal to all PW8xxC series processing modules. Each PW8xxC series has up to 4 processing modules.
- User can control PW8xxC series through Ethernet, USB or remote controller.
- IF NEXIS is installed in control room, Ethernet control through WiFi will be the most convenient. Notebook, mobile phone and Pad can execute NEXIS setup through WiFi.
- User can set individual Box ID and IP address for easy independent control in each NEXIS.Select
- input port and set NEXIS output resolution to be the same as projector native resolution.User
- needs to apply a signal source while executing video wall [Overlap] value setting. Signal source resolution should be the same as NEXIS Excel Spreadsheet calculation. To apply 4K or higher signal resolution is recommended. After system setup, user can use any input resolution.Press
- [INFO] hotkey to check if the final in/out timings are the same as expected.



Usually, one 4k signal source can be applied for up to 20 meters screen through two PW8xxC series & 6-8 projectors. If bigger screen is required, user can apply multiple signal sources through multiple synchronized media player or multiple output display card to achieve higher system resolution.

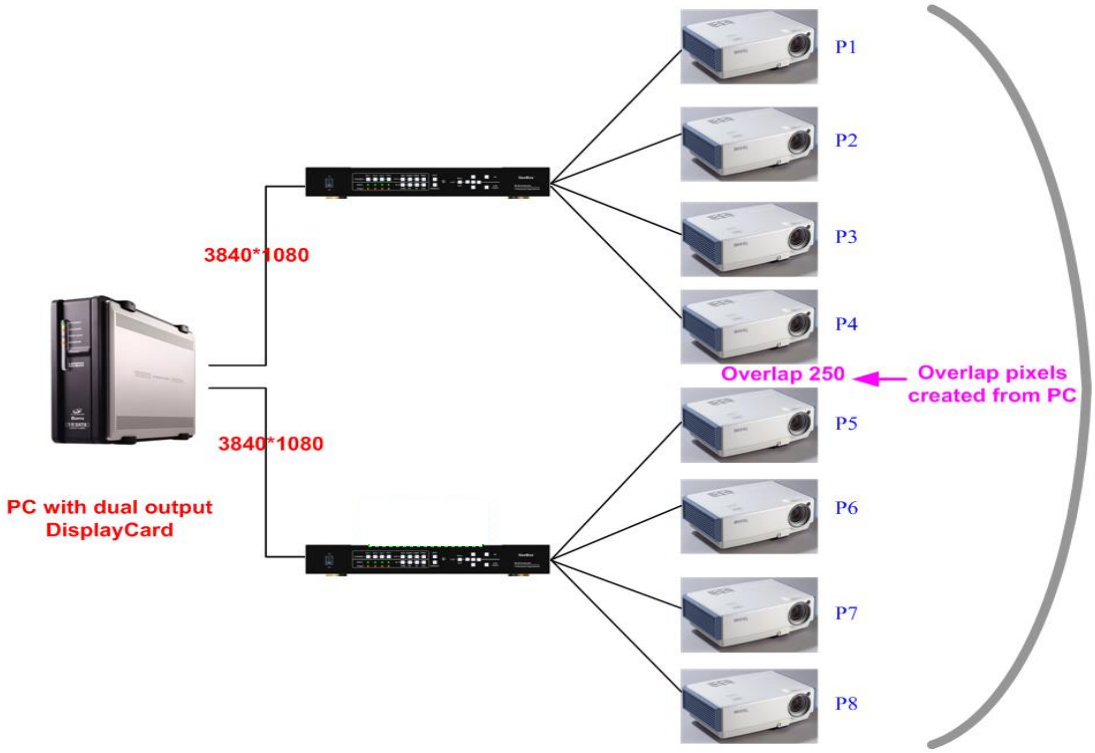
4.7.2. Content overlap setting issue

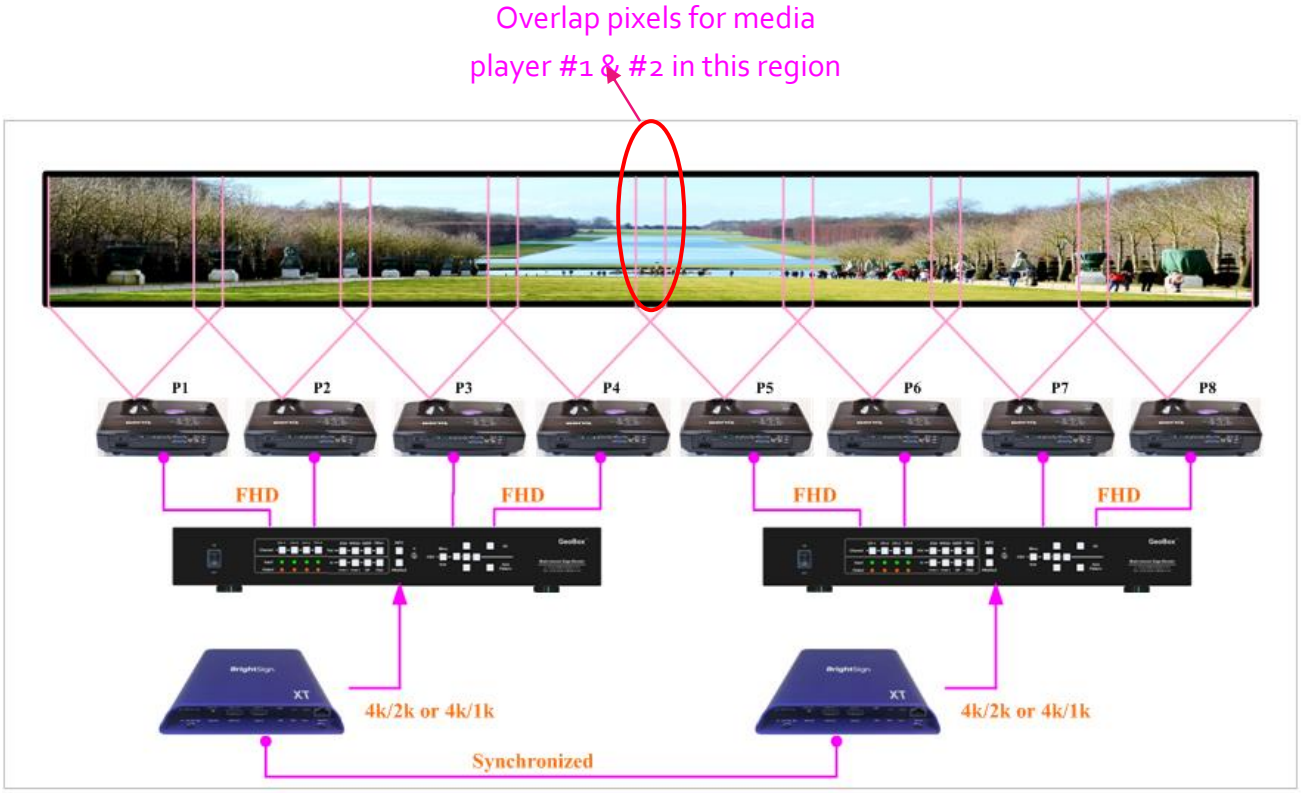
If the system is larger than 20m, usually, multiple 4k signal sources are required to get good enough video resolution. Below are some important points:

- User needs to split the content into different sections and each section is played back by one PC or media player.
- These PC or media player needs to be synchronized.
- NEXIS can crop the right overlap pixel inside one content for each projector but not for the pixel between two independent contents.
- The Overlap content between two independent signal sources shall be handles through below methods:
  - To set Overlap image through PC display card. In this case, the overlap cropping issue will be handled by PC.
  - To cut the content with same content in overlap section for edge blending. The pixel size shall be larger than Overlap region and NEXIS can crop the right pixel for edge blending.

    User can use synchronized media player (such as BrightSign) or low-cost multiple output display card from PC.

- PC display card should be able to set overlap pixel up to 25% of the output resolution among the outputs. User can use display card similar to Matrox TripleHead 2 Go, ATI Display Group, NVidia SLI Surround or NVidia Mosaic mode.





Signal sources output two independent images with redundant data in overlap region

Projectors project the image with the same overlapped content





NEXIS executes Geometry alignment and crops the right pixel based on projector position to do edge blending

4.7.3. Convenient Setting and PC tools in multiple unit application

a) Setup by Remote Controller

- If multiple units are used, user can set different [Box ID] (#1 - #99) or IP address in each Box for individual control. For IR control, the [Box ID] number range is #1 - #9.
- When all PW8xxC series or IR extenders are installed together in the control range of single remote controller, user can do individual PW8xxC series control through below method.
  - Press [851] : all the box OSD will be locked except ID #1. Only ID #1 NEXIS can be operated through OSD menu.
  - Press [853] : all the box OSD will be locked except ID #3. Only ID #3 NEXIS can be operated through OSD menu.
  - Press [850] : all the box OSD will be unlocked and can be operated through remote controller at the same time.

b) Setup by Ethernet

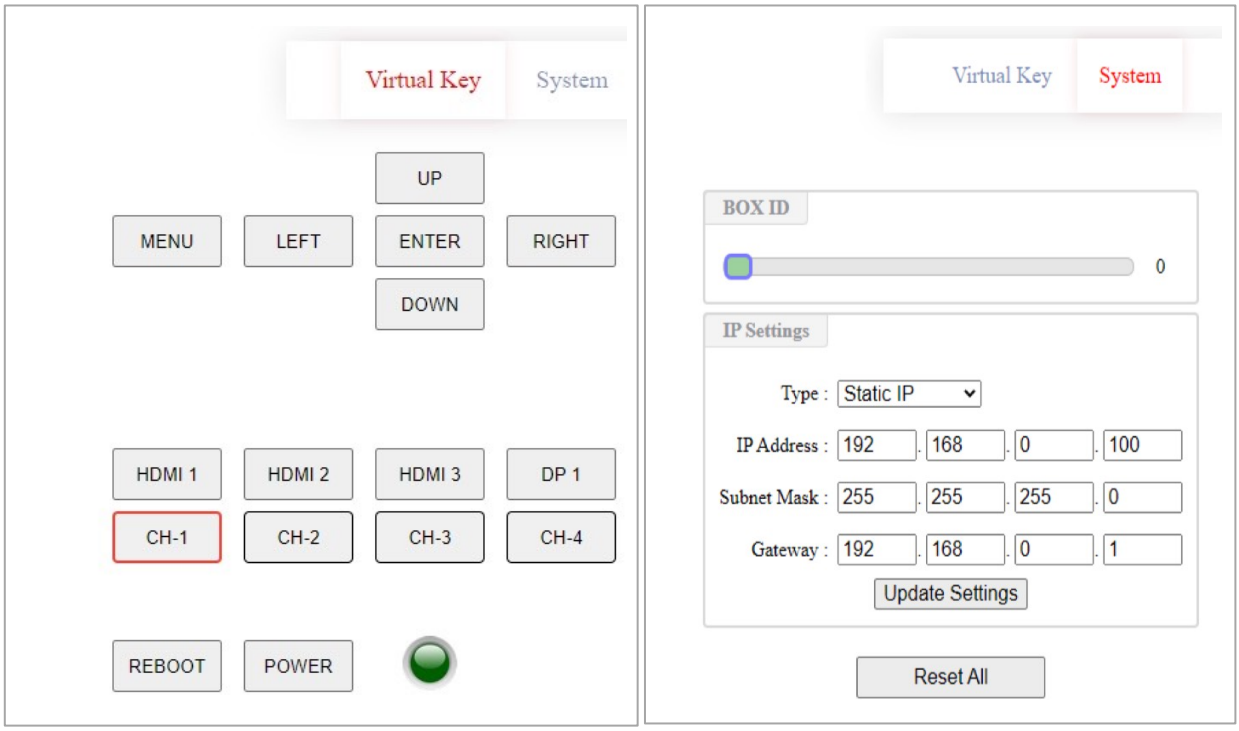
User can connect all PW8xxC series in one Ethernet Router (WiFi Router or switch/hub) through LAN ports and set different Static IP address for each Box, then use WebGui virtual keys or GCT PC tool to control each PW8xxC series independently. Default IP address is 192.168.0.100. TCP Server port is 1266.

Chapter 5. WebGui and GCT PC tool

- WebGui is embedded inside NEXIS. Once user connects NEXIS through Ethernet IP address, user can see virtual key for the operation.
- GCT is standalone PC tool that can be downloaded from NEXIS Website. It is HID interface and can be controlled through USB or Ethernet. No software driver is required.

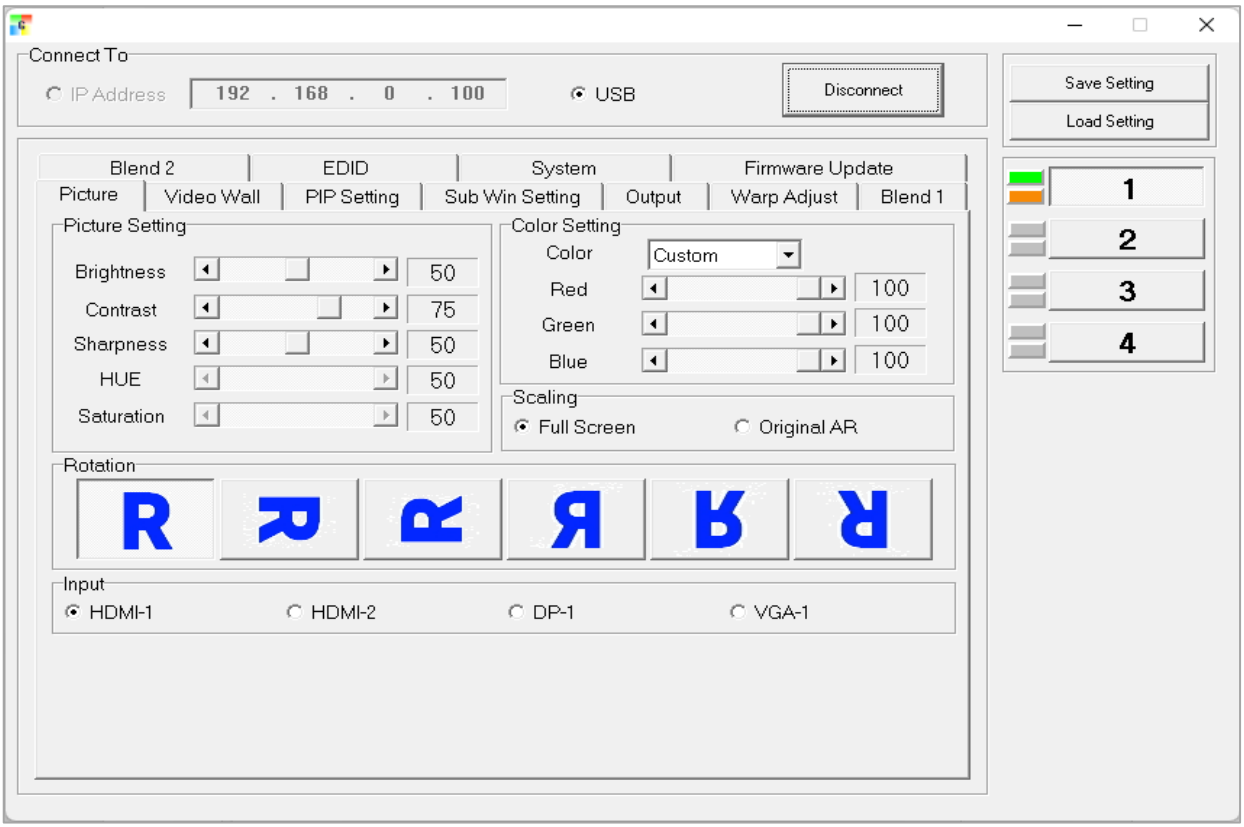
5.1. WebGui

- WebGui is embedded inside PW8xxC series. Once user connects PW8xxC series with PC through Ethernet, user can access WebGui and execute all operation similar to OSD menu through Virtual Keys and OSD Menu. No appropriate software tool is required.
- The connection can go through Ethernet router LAN port, WiFi Router or Cat 5/6 cable. User can set each PW8xxC series with different static IP address in the same domain, then open Google Chrome or Microsoft Edge browser with IP address to access each unit of PW8xxC series for independent operation.There is no limitation in the number of PW8xxC series that can be controller at the same time.
- If the system is connected through UPT cat 5/6 cable between PC and NEXIS, user needs to manually set TCP/IPv4 with the same network segment such as 192.168.0.105 with subnet Mask at 255.255.255.0 and connect through Chrome or Edge.
- User can turn on/off the system through WebGui and see the status through power indicator.



5.2. NEXIS Control Tool (GCT)

- GCT is a PC tool to control and setup PW8xxC series through PC.
- Please download GCT PC and User guide from NEXIS website under SUPPORT tab.
- GCT can be connected through Ethernet or USB. User can use PC keyboard and mouse for the control and can backup system setting in PC or copy to other units.
- Firmware and MCU code update can be executed through GCT. User can control multiple units at the same time through different IP address.

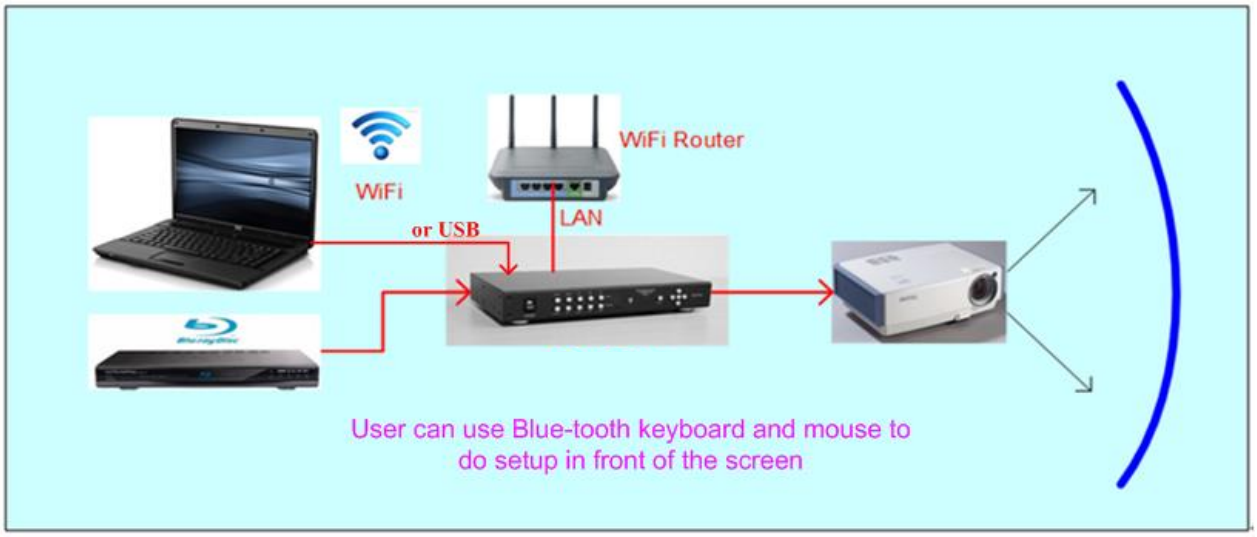


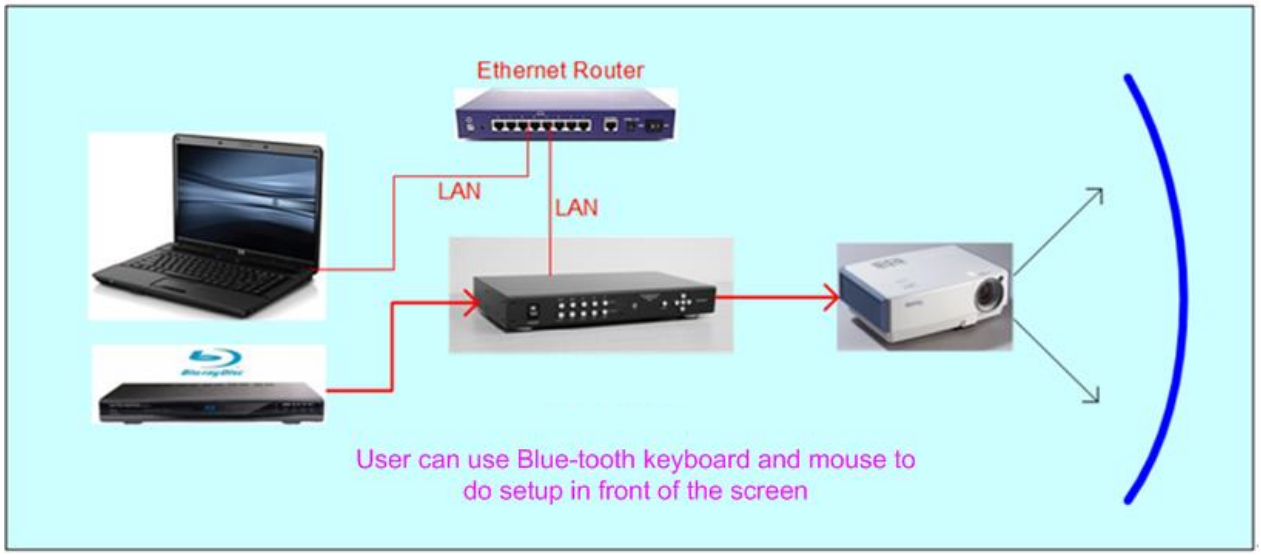
5.2.1. Important concept

- GCT can execute all the functions same as OSD.
- GCT and OSD adjustment is synchronized and will update to the Box immediately. User can control the Box via GCT and OSD at the same time.
- Besides the same functions as OSD, GCT can update Firmware and backup or copy the settings to other units.
- New GCT version needs to match MCU code and FW version. When user apply new GCT and see [MCU code is too old] message, please update new FW & MCU code. Please download from website under SUPPORT tab.
- When user turns off NEXIS, the settings will not change.

5.2.2. Procedures for edge blending via GCT

a) System connection

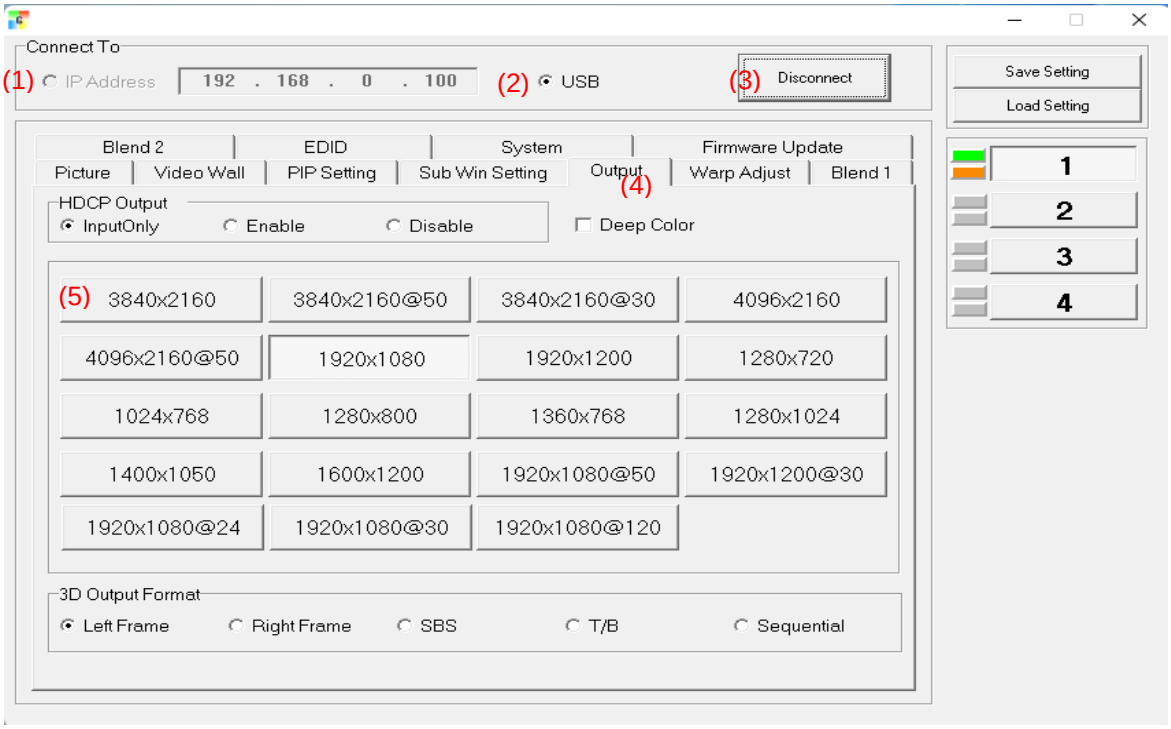




(1) Ethernet: For multiple unit control, please user Ethernet Router for the connection with multiple boxes and set different IP address for the control.

(2) USB: connect with USB-Type B cable.

(3) Open GCT→ Click [Connect]→ user will see green and orange indicators at right hand side. It is to confirm the right connection with PC.



b) <u>Set output resolution</u>

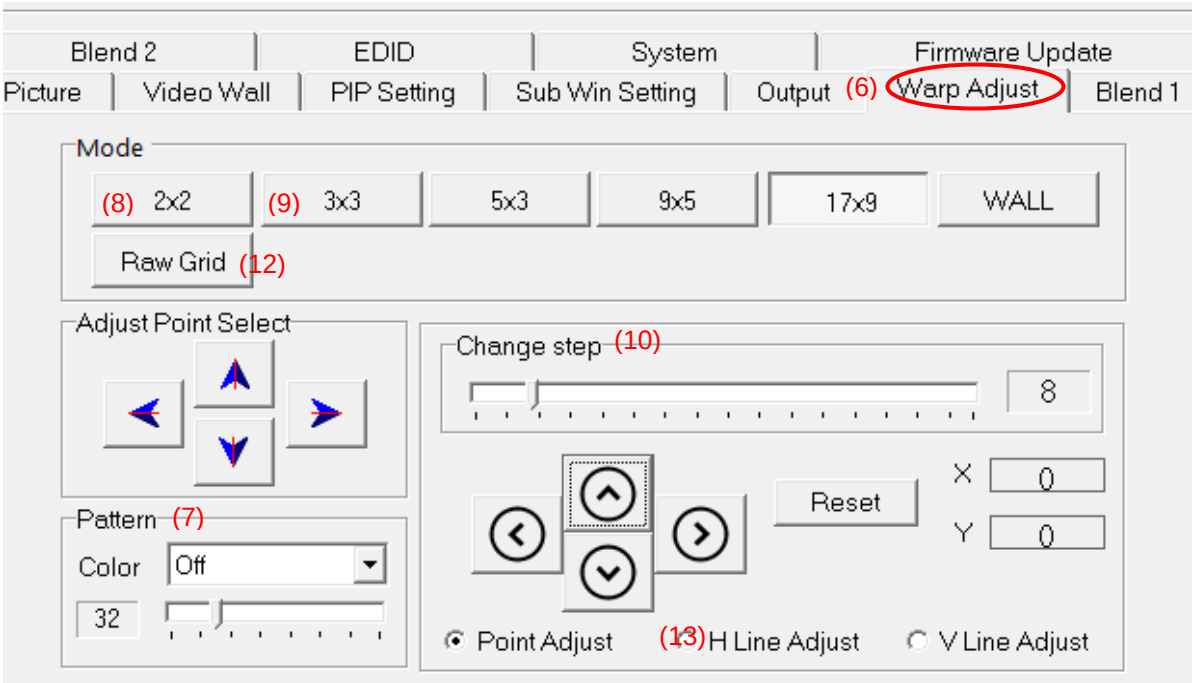
(4) Output resolution should be the same as projector Native Resolution.

(5) Set required output resolution under [Output] menu.

c) <u>[Warp Adjust]: start geometry alignment</u>

All channels should execute geometry alignment at the same time to let grid lines perfect matching.

(6) Click [Warp Adjust] to access below geometry alignment Menu.



(7) Select Pattern color for each channel. Adjacent channel should have different colors.

(8) Start from [2x2] geometry alignment in all channels and let the image in each projector to be located at desired (pre-marked) location.

(9) Following [3x3]→ [5x3]→ [9x5]→ [17x9] in all channels at the same time to let all grid lines in overlap area to be stacked perfectly.

(10) The adjusting step can be selected. User can also use keyboard hotkeys to select: [CTRL+Arrow]: 8 pixels/step. [SHIFT+Arrow]: 1 pixel/step

(11) If finish [17x9] alignment, user can return to [2x2] for further alignment but if return to [5x3], only [below [5x3] warp data will be kept.

(12) [Raw Grid] is for detailed position fine-tune after [17x9]. The maximum adjustment point is 100. After [Raw Grid] alignment, user can go back to [17x9] or [2x2] to do further adjustment. The adjustment points under [Raw Grid] adjustment will remain at the same location without changing by [2x2] or other alignment.

(13) When projecting to curved screen with short throw ratio projector, the image will have bigger grid size at the center and smaller at both sides. User can use Linearity Grid Line adjustment (13) to do the whole line movement. It will reduce the time for the adjustment. This function is available under [3x3] to [17x9] and in both horizontal and vertical lines.

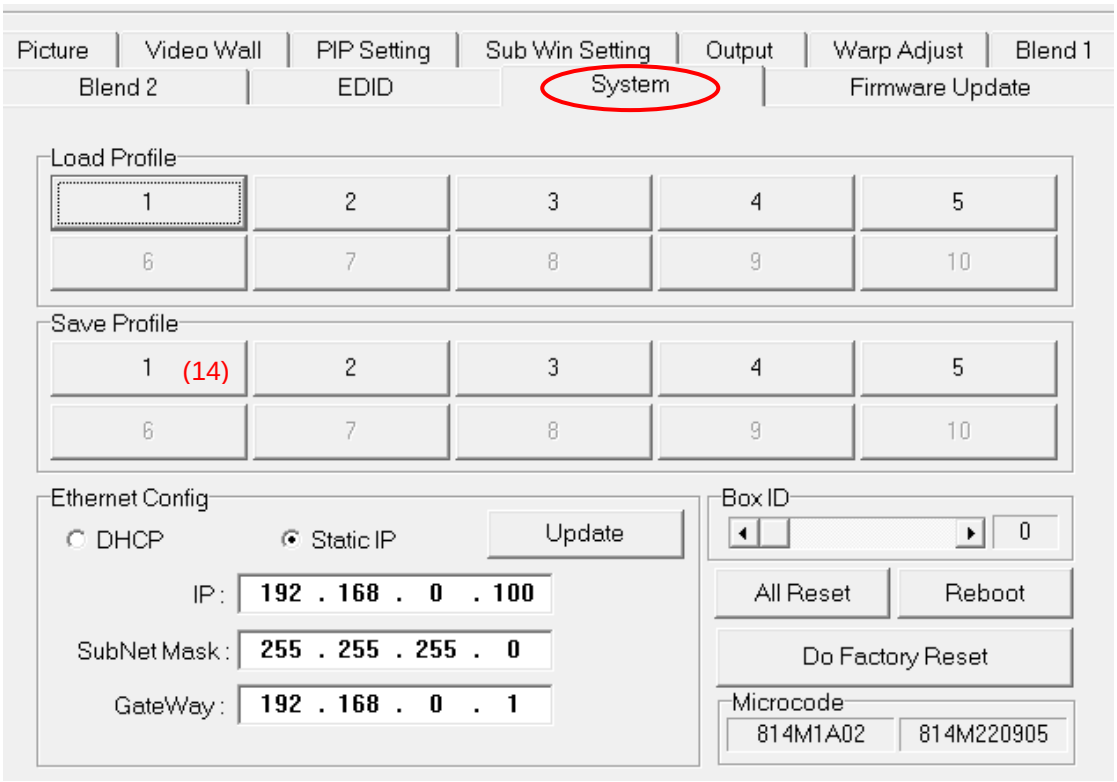
d) Keyboard hotkeys for geometry alignment

Please set PC language in English so that user can use Keyboard hotkeys to execute system operation.

- [CTRL+ALT+#]: select channel
- [M]: Change circularly Warp Adjust mode from [2x2] → [3x3] → [5x3] → [9x5]→ [17x9]→ [Wall]→ [2x2]→ [3x3]…
- [CTRL + Arrow]: Select control point
- [Arrow]: adjust control point position, default is 8 pixels/step.
- [Shift + Arrow]: Geometry adjustment with 1 pixel/step
- [P]: Enable grid pattern with different color
- [CTRL + P]: turn OFF pattern to see OSD menu for the operation by remote controller
- [R]: Reset geometry alignment settings in current mode and channel.
- [U]: undo the last geometry alignment step.

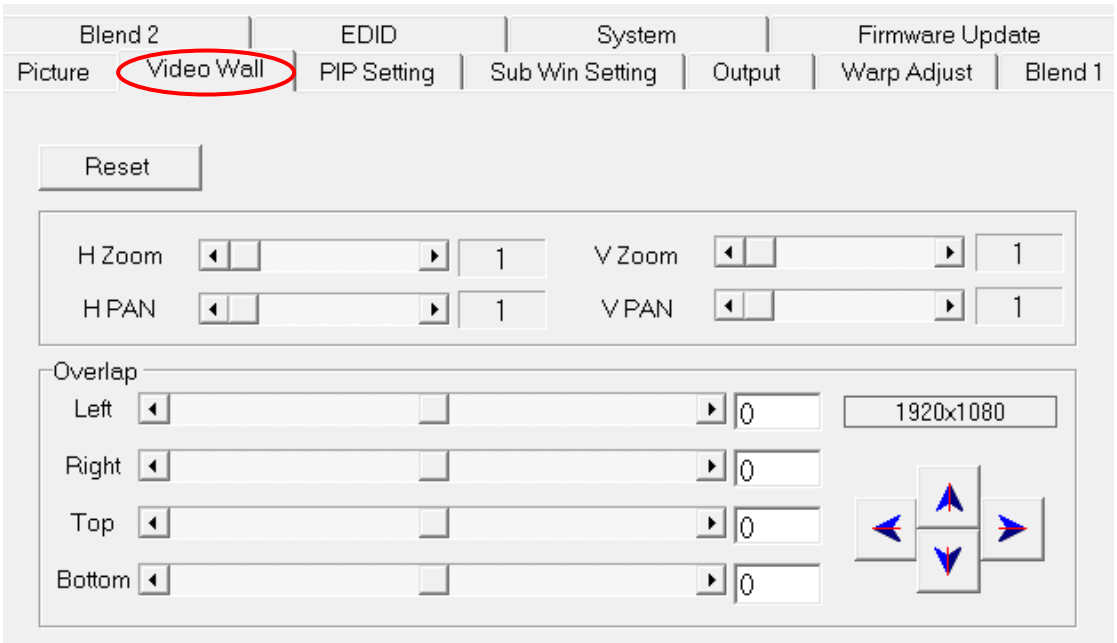
e) Save geometry alignment result temporarily

(14) Geometry alignment take the most of the time. After finishing geometry alignment, please save the result under [System]→ [Save Profile].



f) [Video Wall] settings

- [Video Wall] is to split the image and assign the location for each projector. It will also adjust the overlap pixels for related edges based on the overlap size.
- Please see detailed description in [Video Wall] section,

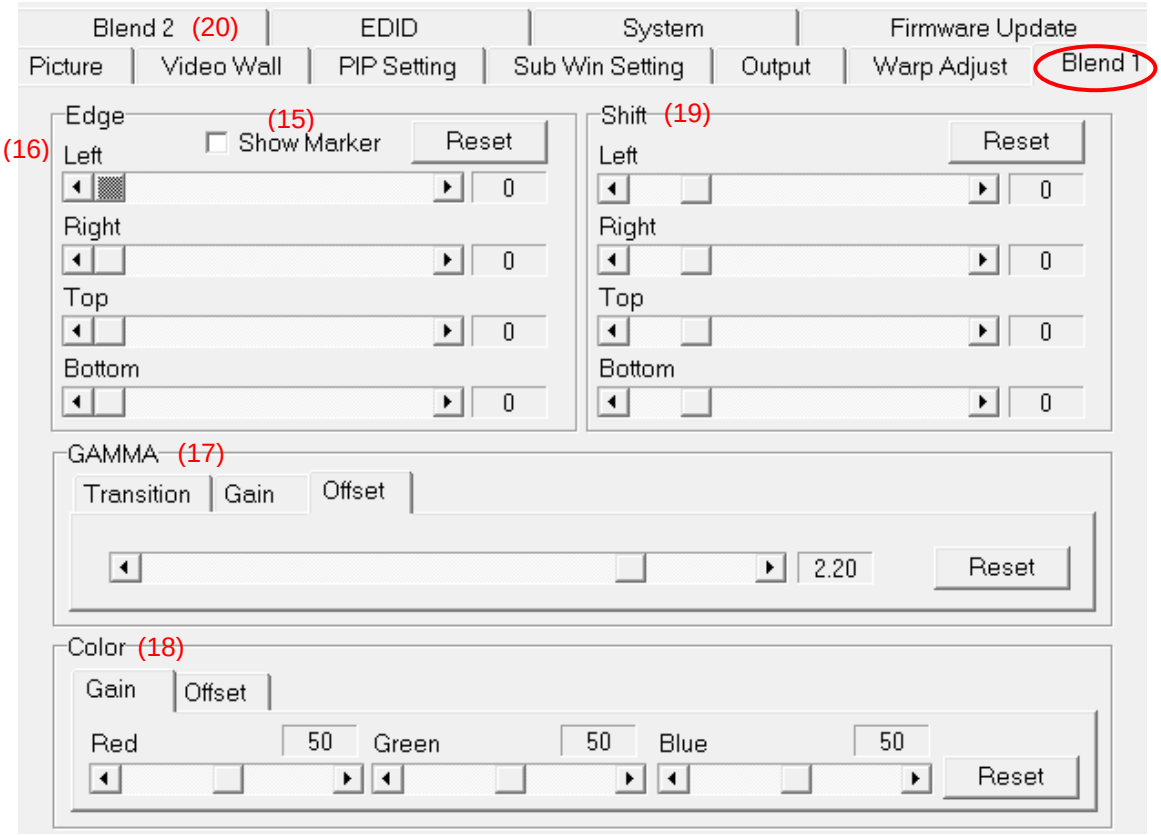


---

g) [Edge Blend] setting

[Edge Blend] is to set seamless edge blending effect between two adjacent projectors.

(15) Click [Show Marker]: green and red lines will show up at both edges in edge blending each region. Please select the edge (16) for each channel and increase the value to let red line and green lines be stacked together. Please see detailed description in [Edge Blend] section.



(17) [Gamma]: for color fine-tune in overlap region.

(18) [Color]: for background color white balance adjustment.

(19) [Shift]: to shift edge blending position in overlap region or edge mask in non-overlap edge.

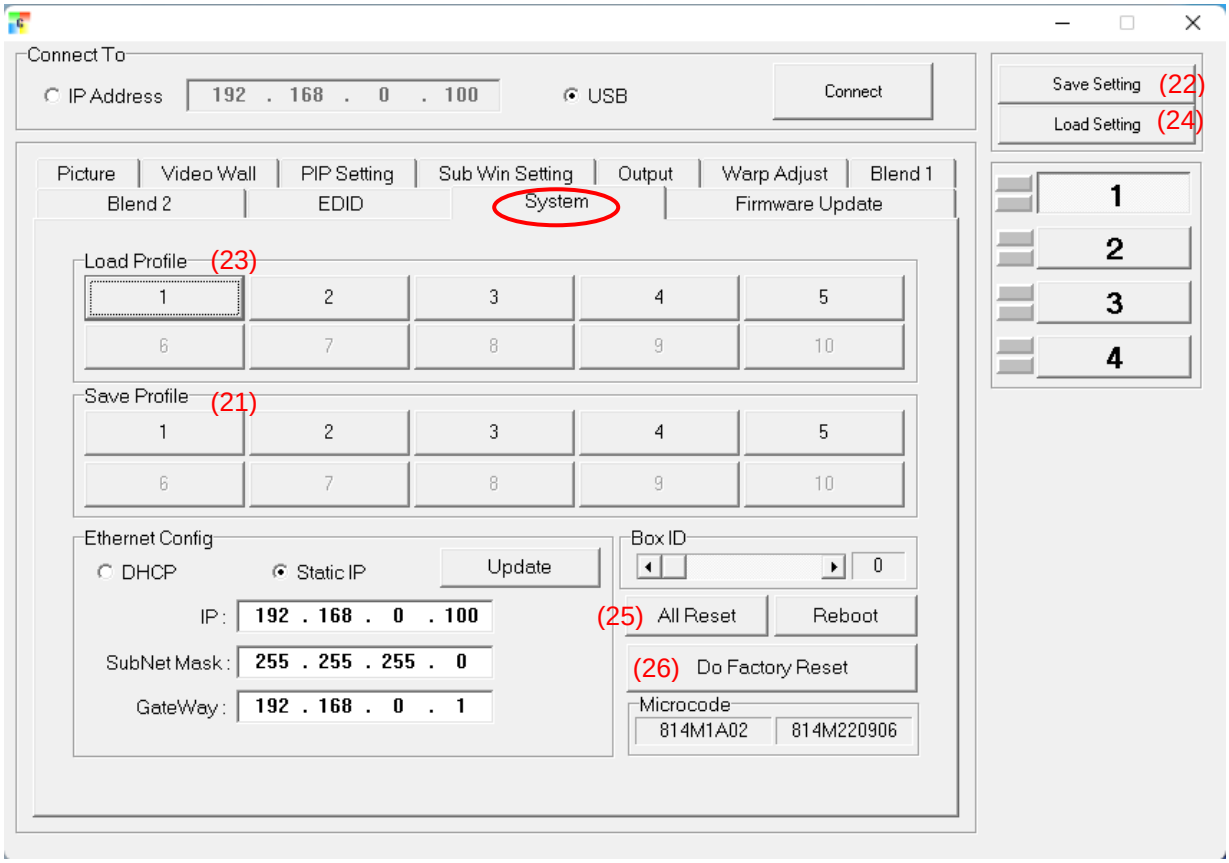
(20) [Edge Mask] and black level uplift is under [Blend 2] (20) menu

h) Save final settings

User can save the final settings into two locations:

(21) [Save Profile]: under [System] menu, user can save the final setting into profile index by selecting number in [Save Profile]

(22) [Save Setting]: it will save current settings into BSF file in PC. It will not include Profile data. This data can be as a backup or copy to another box.



i) Load back final settings

User can load back the final settings from two locations:

(23) [Load Profile]: under [System] menu, user can load the final setting from profile index by selecting number in [Load Profile].

(24) [Load Setting]: it will load the settings from PC BSF file. After load back the data, user needs to save it into Profile Index for permanent storage.

j) System Reset

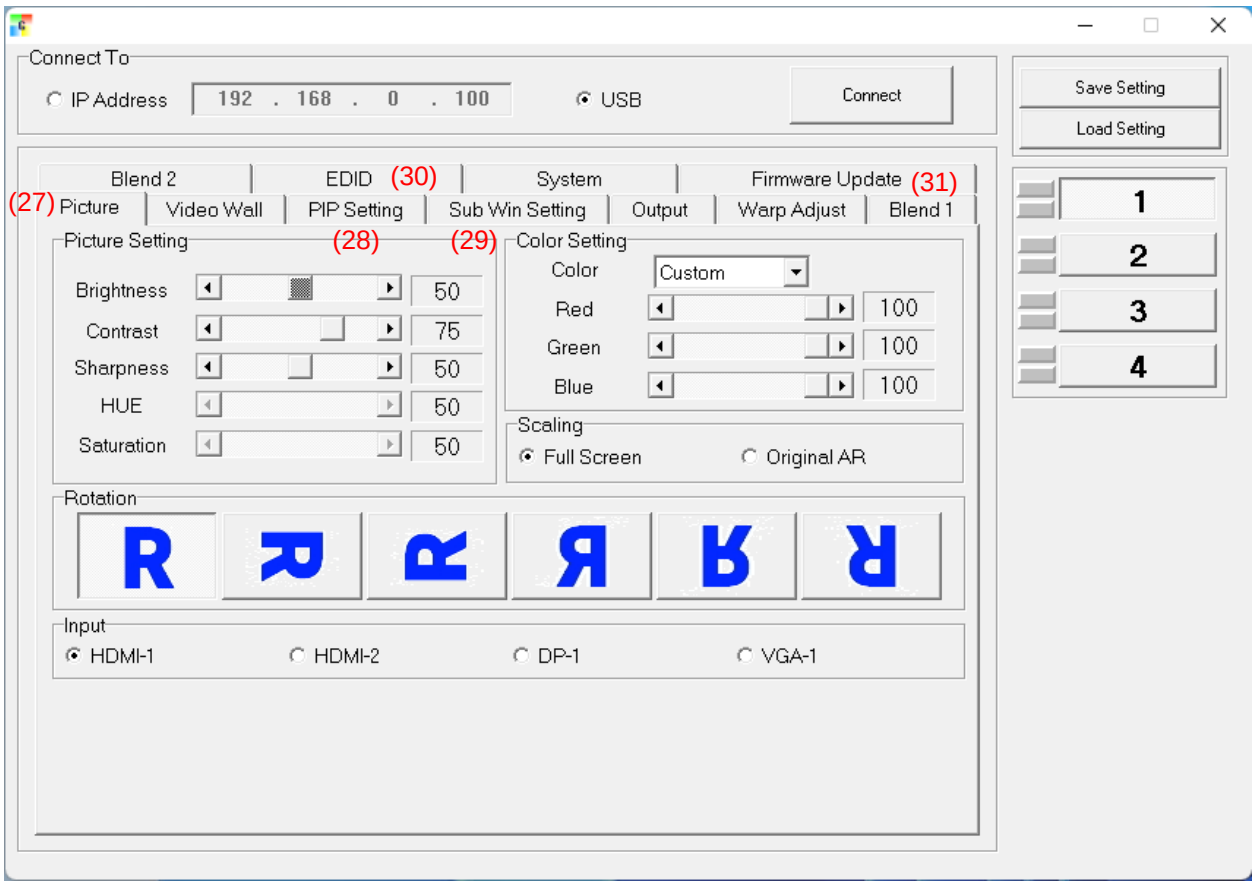
User can load back the final settings from two locations:

(25) [All Reset]: Reset all channel at the same time but not include Profile Index data.

(26) [Do Factory Reset]: reset the system to factory default including profile Index data in all channels. Same function as reset from back panel reset hole.

---

k) Miscellaneous functions



(27) [Picture]: Input selection, image rotation, aspect ratio, color adjustment.

(28) [PIP Setting]: select PIP/POP/3/4 split view types and set PIP size and location.

(29) [Sub Win setting]: select sub-win signal source, rotation, aspect ratio and overlap setting

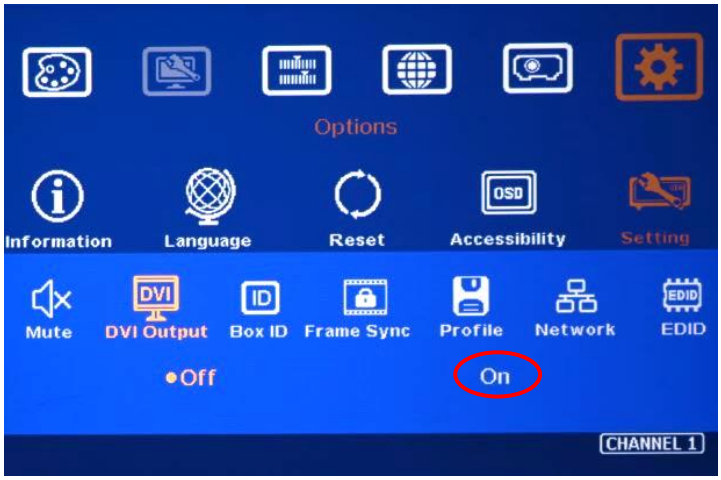
(30) [EDID]: set EDID resolution for each input port

(31) [Firmware update]: update firmware and MCU code. MCU code is for keypad and GCT control.

Chapter 6. Miscellaneous settings

6.1. HDMI vs. DVI Output Signal

- HDMI digital signal is compatible with DVI signal. Most of display devices can support both digital signals. However, some old equipment may have less flexibility in signal compatibility. In this case, user may need to select DVI output format to get normal display in some devices.
- HDMI signal embeds more signal information, such as color space, color sampling, aspect ratio audio and HDCP. Once some information is missing, it will also affect the display. It may cause intermittent or loss of image. Under this condition, user can try to set DVI output. The connection doesn't need to change.



6.2. System Standby and Automatically Turn Off Output

- [Options]→ [Accessibility]→[Standby Time]
- If set [Standby Time] at 60, the system will get into Standby Mode after 60 seconds when no input signal is detected. The output signals from PW8xxC series will also be terminated at the same time. If PW8xxC series detects input signal again (hot plug signal), it will automatically turn on the system.
- If the projector can automatically turn off/on by detecting input signal, user can control signal source to execute entire system on/off control.

6.3. Change Background Color

When no signal input, the system will show blue color background with [Power Saving Mode] message on the screen. User can change background color to black on the screen with no text message on it through [Options]→ [Accessibility]→ Black Screen]→ [On]



6.4. Turn off splash screen Logo

- Use can turn off splash screen Logo through [Options]→ [Accessibility]→ [Logo Time Out] and set the value at “0”. Default setting is 10 seconds.
- It will reduce the boot up time.

Chapter 7. Trouble Shooting

7.1. Front Panel LED indicators

- User should see Input / Output LED lights in each channel. If no light illuminated in specific channel, please check Input / Output connecting cables, signal source & projector in that channel.
- If user sees continuous blinking in some channel LED, it means OSD may be locked. Please press [Menu] key for 5 seconds or press 850 number keys in remote controller to disable [OSD locked].
- If user sees blinking LED on Input/Output LED indicators at the same time with 1 second interval, it means the system gets wrong FW/MCU code or HW failure. User can turn off/on the system again to see if it can solve the issue. User can also update the MCU code and FW through GUU PC tool. If the issue is still existing, user needs to apply RMA and send back the unit to factory for checking.

7.2. No image in the projector

- If user can't see the image, please click [Menu] key to activate OSD. If user can see normal OSD, the system should be normal. Please click [INFO] key to check input and output timings.
- If user can't see the OSD, please change signal source, HDMI cable or display device to find the root cause of the failure.
- HDCP may be the reason for no image. Please make sure display device is HDCP compliant.

7.3. Intermittent or Loss of Input Signal

- Check the HDMI cable quality and make sure all cables are fitted correctly. 4k/60 signal requires high speed certified cables.
- Cable length: Connecting cable length should be as short as possible. Replace a short cable to verify the possible root cause.
- HDCP compliant issues: If the input source or the monitors are not HDCP compliant, it is possible to stop NEXIS from negotiating HDCP link and show intermittent, abnormal or no image. Please check HDCP condition in signal source or display device.
- Resolution issues: check if signal source and connecting cables can provide source signal supported byNEXIS.
- DVI/HDMI signal compatibility: some display devices may only support HDMI or DVI video signal and execute wrong signal format detecting. The default output is HDMI. User can change output with DVI format through [Options]→ [Setting]→ [DVI]→ [On].
- Usually, to swap with different cable, output channel, signal source and projector can verify the root cause for the failure.
- It is possible to have signal compatibility issue. User can add one HDMI splitter/switcher in the

middle to change signal impedance. It may fix the issue.

- We propose to use signal enhanced cable, HDBaseT or Optical Fiber cable for long distance connection. Conventional 4k/60 HDMI can't support more than 10 meters.
- User can connect a monitor at the end of the Loop out port to check signal source stability.
- During system settings, the output signal may be temporarily lost and cause projector re-searching input signal and the image disappears shortly. User can disable [Frame Sync] function to avoid this kind of effect. After finishing system setup, user need to set [Frame Sync] at [Normal] position to get perfect synchronization in all output channels.

7.4. Video quality issues

- Use the highest resolution and number of color bits (RGB 4:4:4) images allowed by PW8xxC series to be used as a signal source whenever possible. Please click INFO key to verify input/output resolution.
- There are a number of lower-quality AV players, the specification and actual output are difference, or because of the use of lower color sampling bits or poor image compression technology, resulting in lower quality or image is not smooth (LAG).
- If the use of H.264/H.265 compressed files, please select a player with hardware decoding to get smooth video quality.
- If the input signal is interlaced signal (interlaced-1080i), and the image is rotated, then the channel will have no [3D Motion adaptive de-interlaced] processing function. If user applies static image source, the output video will have a slight jitter phenomenon. The processing channel quality will be reduced. Use a progressive signal source setting (1080p/2160p) whenever possible.
- Please press [INFO] shortcut key to check the input/output signal settings.

7.5. Image position shift after installation

The position shift in the projector will be enlarged to more than 10x due to projection distance. One mm image shift inside projector may appear 1cm image shift on the screen. User will clearly see blurred effect on overlap region in edge blending setup.

- There will be some image position shift after system setup. The main reasons are as follows:
  - Thermal drift due to projector internal temperature change. When power on the projector, the temperature is lower. After 20-30 minutes, the image position shift may be up to 5-10mm. It will be more obvious in overlap region. Different projector will have different thermal drift range.
  - Stability of mounting system.
  - Projector structure change after installation due to weight and thermal effect.
  - Cable connection and cause weight balance issue.

- Change lamp
- Earth quake or caused by human reasons.

- The first projector image position calibration should be done within one month after installation. The second calibration may be required after 3 months, then every 6 months or once a year.
- If user finds big position shift and doesn't know the real issue. Please follow below procedures to confirm the issue is from NEXIS or not.
  - Turn off NEXIS and open projector internal test pattern.
  - Mark the corner positions of the projector image.
  - Check projector image shift condition after some time with NEXIS in OFF condition.
  - User will clearly identify that the position shift is from NEXIS or not after this procedure.
  - NEXIS is digital processor and will not change image position only for few pixels.

7.6. System Crash and Malfunction

- After FW update, please reset the system through a pin inserting to reset hole on the back panel for 5 seconds to avoid abnormal settings inside the system.
- When the input source is 4:4:4 PC graphics signal, only [Brightness], [Contrast] and [Sharpness] three items under [Picture] menu can be executed. If the input is YUV video source, all the items are functional.
- When implement [Corner Wall] alignment, other geometry functions will be not functional.
- Remote controller may be interfered by environment and can't be smoothly operation.
- When geometry alignment is over the maximum adjusting range, the system may crash. It can be recovered by decreasing adjustment range or system reset.

7.7. Synchronization issue in the outputs

- The input refresh rate should be the same as output refresh rate so that the system can implement Frame Lock to synchronize all the outputs. If the input source is 50Hz with 60Hz output, it is possible to see some lag or frame tear in the display.
- Please make sure to set [Frame Sync] at [Normal] in all channel to ensure all outputs will be synchronized.

7.8. How to reduce projector re-searching input source

User can set [Frame Sync] at [Disable] to reduce [Source Re-search] in projector during setup. After finish the setup, please set to [Normal] to get synchronization in all outputs.

Chapter 8. Technical support

- User can send e-mail to support@mc.co.th together with as much information as possible.
- The following information is required for a swift response.
  - Sink device (projector): type and model number
  - Screen details or specific application details.
  - NEXIS model No. and series No.
  - Details of the signal source and the resolution.
  - Press [Info] key to get System Information and send the data to us, including input/output timing and F/W version.
  - The exact nature of the problem. Please be as detailed as possible.
  - If possible, please attach the Pictures of the issue.
  - Usually, we will response within 24 hours (excluding weekends)
- Please note that if the machine is sent back for repair, user needs to pay for the delivery cost.

Chapter 9. Safety Precaution and Maintenance

9.1. Power Supply

Please connect electric power for all devices in the system from the same Power Distribution Box with correct grounding. Open the power after finishing system connection to reduce the risk for system damage from high floating voltage.

9.2. Working Environment

Please locate PW8xxC series in an environment free from dust, moisture and high temperature with good ventilation.

9.3. Warranty

This device is designed and tested to the highest standards and backed by one years' parts and labor warranty. Warranties are effective upon the first delivery date to the end customer and are non-transferable. Warranty period extension is available up to 5 years through paying extra charges.

9.4. Maintenance and Repair

Apart from what is detailed in User Guide, maintenance should be carried out by competent technician assigned by NEXIS. If PW8xxC series is physically damaged, it should be returned for repair using NEXIS RMA procedures. If the unit is opened by user, it will lose the right for warranty protection.

Specification

- Each box has 1-4 processing modules.
  - PW811C: Single module processor
  - PW822C: Dual module processor
  - PW833C: Triple module processor
  - PW844C: Quad module processor
- Each processing module includes:
  - Input: 2x HDMI2.0b, 1x DP1.2a and 1x VGA
  - Output: 1x HDMI1.4
  - Loop output: 1x HDMI2.0b for daisy chain connection.
- HDCP compliance: Input: HDMI: HDCP V2.2/V1.4, DP: HDCP: V1.3, Output: HDCP V1.4.
- Max. input resolution: 7680*2160 30Hz, 7680*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.
- 15 selectable Outputs: HDMI1.4 up to WUXGA, 2048*1080/60, progressive 4:4:4 RGB.
- 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.
- Maximum geometry adjustment range up to 600 pixels in both H&V directions.
- 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 in H&V directions at each control point.
- Support “W” type Corner Wall adjustment in horizontal and V type in vertical direction. The maximum adjusting range is 1200 pixels.
- Support Linearity Grid Line adjustment for quick H&V line position alignment.
- Embedded video wall function for image split, cropping and edge blend overlapped pixel setting.
- Selectable grid pattern size from 8-120 pixels in H&V direction. 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 all channels.
- Free-run mode provides continuous signal to output, no source searching required in projector when input source change.
- Support xvYCC & 8/10/12-bit deep color processing.
- Support High Dynamic Range (HDR) input signal and convert to SDR in the output.
- Individual color and white balance adjustment in each processing channel.
- Individual 90/180/270 rotation, flip, cropping, scaling & color adjustment in each channel up to 4k/60 input.
- 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 not available when the main image is 90/270 degrees rotation.

- 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, RS232, USB or network.
- ESD Protection: ±15kV (Air-gap discharge), ±8kV (Contact discharge)
- Working environment: 45° C, 10-90% RH
- Control: keypads, IR, RS232, USB, Ethernet
- Save up to 5 system settings. System settings can be stored and backup in PC.
- Power supply: DC: 12V 3.3A
- Max. Power consumption:
  PW811C: 8.4W, PW822C: 14.4W, PW833C: 21.6W, PW844C: 28.8W
- Dimensions (Body only):
  Without protruding parts: PW811C: 303mm*164mm*44mm, PW822C-PW844C: 440mm*190mm*58mm.With protruding parts: PW811C: 303mm*175mm*55mm, PW822C-PW844C:440mm*201mm*69mm
- Weight (Body only): PW811C: 1.5kg, PW822C: 2.5kg, PW833C: 2.6kg, PW844C: 2.8kg