



# 1. Introduction

## 1.1 General Description

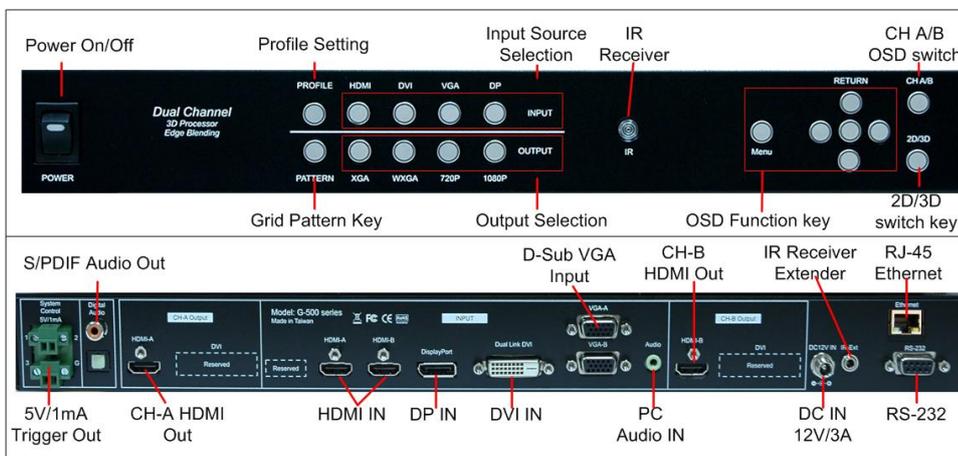
GeoBox G-500 series is a high performance dual channel video signal processor intended as a companion for projector applications. It is a standalone system to implement format conversion, video wall, 3D decoding, flat screen edge blending and geometry adjustment up to 4k/2k input and WUXGA (full HD) output. No video distributor or PC is required in most of the applications.



## 1.2 Major applications:

- a、 The most comfortable professional passive 3D display.
- b、 Convert 1080p 24Hz frame packing and 1080p 120Hz 3D formats for active 3D display.
- c、 Flat screen edge blending.
- d、 6 in / 2 out scaler switcher with frame lock/free-run modes.
- e、 Image stacking to double brightness.

# 2. Outlook and Functions



### 3. Features and Specifications

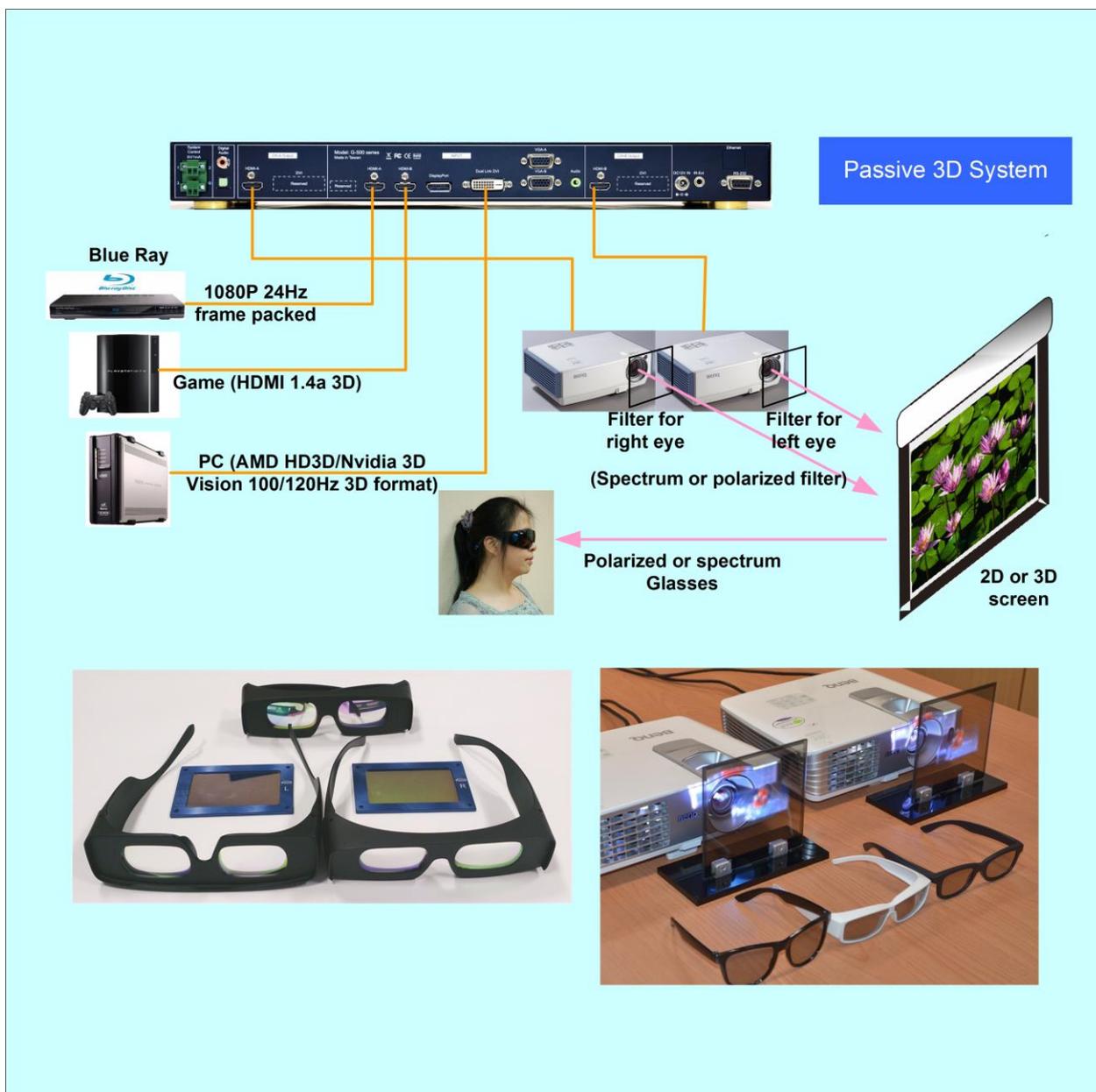
Video Input ports	<ul style="list-style-type: none"> <li>✓ 2x Analog D-Sub VGA up to 205 MHz</li> <li>✓ 1x Dual Link DVI input up to 4k/2k @30Hz or 3840x1080 @60Hz</li> <li>✓ 2x HDMI 1.4a compliant with HDCP 1.3 compliant input (FHD), up to 3840x2160 @30Hz (reduced blanking PC signal)</li> <li>✓ 1x DisplayPort 1.1a up to 4k/2k @30Hz or 3840wx1080 @60Hz</li> <li>✓ Selectable EDID setting for optimized video performance</li> </ul>
Audio input ports	<ul style="list-style-type: none"> <li>✓ Audio jack for PC audio connection</li> <li>✓ HDMI audio processing</li> </ul>
Video Output ports	<ul style="list-style-type: none"> <li>✓ HDMI 1.4a compliant output for video/audio connection</li> <li>✓ Decode 3D formats into signal for left or right eye 3D display</li> </ul>
Audio Output ports	<ul style="list-style-type: none"> <li>✓ Optic and coaxial S/PDIF digital output</li> <li>✓ HDMI output with audio embedded</li> </ul>
Image geometry correction and warp (Anyplace function)	<ul style="list-style-type: none"> <li>✓ Pixel base position and geometry adjustment</li> <li>✓ Multiple image alignments and edge blending</li> <li>✓ Horizontal and vertical keystone correction</li> <li>✓ Pincushion and barrel adjustment for curved screen display</li> <li>✓ Professional Edge Blending video quality</li> <li>✓ Image 180 degrees down flip</li> <li>✓ Image rotation up to 128 degrees</li> </ul>
Video Wall	<ul style="list-style-type: none"> <li>✓ Image split for LCD video wall up to 15x15 displays.</li> <li>✓ Support multi-windows FHD high resolution displays</li> <li>✓ Flexible aspect ratio adjustment</li> <li>✓ Pixel base overlap region control for edge blending.</li> </ul>
Multiple projectors edge blending	<ul style="list-style-type: none"> <li>✓ Pixel base flexible overlay region setting</li> <li>✓ Allow edge blending in all sides of the image on flat screen</li> <li>✓ Up to 15x15 matrix display</li> <li>✓ With multiple edge blending parameter settings to optimize video quality.</li> </ul>
High end video processing and de-interlace	<ul style="list-style-type: none"> <li>✓ 3D motion adaptive video de-interlace</li> <li>✓ Low angle edge smooth algorithm</li> <li>✓ Automatic 3:2 and 2:2 pull-down detection and recovery</li> <li>✓ Independent RGB color adjustment for PC graphics input</li> <li>✓ Digital Brightness, Contrast, Hue, Saturation and Sharpness adjustment for video input</li> <li>✓ True 10-bit data processing</li> <li>✓ 12 bit RGB gamma CLUT</li> </ul>
3D stereoscopic display	Decoding 3D formats from Blue Ray, Set Top Box, PC...for dual projector passive 3D display.

	<ul style="list-style-type: none"> <li>✓ Convert active 3D signal up to 1080p @120Hz for FHD passive 3D display.</li> <li>✓ Support HDMI 1.4a 3D formats, including 1080p/24Hz frame packed, Side by Side, Top-Bottom, Line interleave and frame sequential for passive 3D.</li> <li>✓ Support 3840x1080 side by side and 1080i/60Hz frame packed 3D from Sony FHD camcorder.</li> <li>✓ “Perfect Sync” algorithm for ZERO latency between RH/LH channels to get the most comfortable passive 3D display.</li> <li>✓ Support passive 3D image geometry alignment, curved screen display, image stacking and edge blending.</li> <li>✓ Support DLP-Link 3D Ready or Nvidia 3D Vision active 3D for image warp (for curved screen display), image stacking (enhance brightness) and edge blending (enlarge display screen). The output resolution is limited to XGA/720p 120Hz only.</li> <li>✓ Convert 1080p/24Hz frame packed 3D from Blue Ray or 1080p/120Hz active 3D signal from PC or Nvidia 3D Vision card into 720p/XGA 120Hz output for active 3D display.</li> </ul>
Scaler switcher	<ul style="list-style-type: none"> <li>✓ 6 in/2 out scaler switcher with Frame Lock and Free Run mode for smooth input selection.</li> <li>✓ Two outputs for connection with two display devices.</li> </ul>
Image stacking	Flat and curved image stacking to increase the brightness via pixel base geometry alignment.
Image flip	Image 180 degrees rotation with R/L flip function
Scalability	Preset up to 15x15 displays
System control	<ul style="list-style-type: none"> <li>✓ RS232 connector for system control</li> <li>✓ Optional RJ45 Network control</li> <li>✓ Full function OSD keypad on Front Panel</li> <li>✓ IR remote controller with optional IR receiver extender (to 20m)</li> <li>✓ 3x phoenix connector with 5V/1mA trigger signal output for system control.</li> <li>✓ Quick and easy setting via OSD keypad and IR remote controller.</li> <li>✓ No PC or special software is required.</li> <li>✓ Five profiles settings that can store all custom system settings</li> </ul>
Power supply	<ul style="list-style-type: none"> <li>✓ External DC 12V/3A power supply</li> <li>✓ Auto low power standby mode</li> <li>✓ 3x DC 5V/1mA phoenix connector trigger outputs</li> </ul>
Weight	2.4 Kg
Difference between G-501/G-502	G-502 can do passive 3D edge blending but G-501 can't
Dimensions	440mmL x 200mmD x 45mmH (1U)

## 4. Passive 3D Display

### 4.1 General introduction

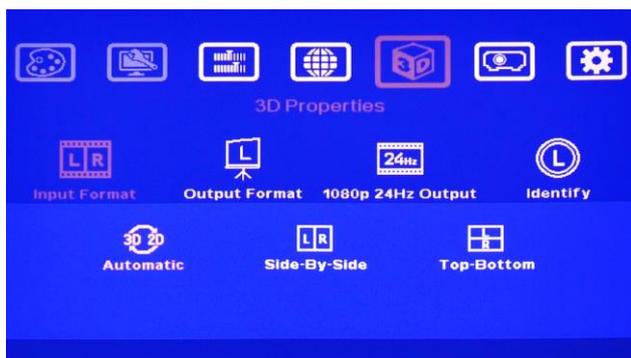
GeoBox will decode 3D format from many kinds of 3D video sources, including Blue Ray DVD, STB, Media player, Game and PC... 3D signal that can be decoded by GeoBox into signals for Right/Left eyes. The signal needs to be displayed through two projectors. Each projector will display signal only for right eye or left eye. User needs to set a polarized filter in front of the projector and also wears polarized glasses. The glasses need to match the polarized filter in front of the projectors so that the right eye can only see the image for right eye and the left eye can only see the image for left eye. 3D screen is also required to preserve the polarization of the light for polarized 3D display. It is possible to use optic spectrum method like Dolby, Infitec or Omega Optical for 3D display without using 3D screen.



## 4.2 System setup for 3D Display

- GeoBox should not put at the side of the projector where the ventilation hot air comes out.
- Two projectors can be put side by side or top/bottom. Closer position for projector lens will reduce geometry adjustment range and reduce the loss of the image resolution and brightness. Usually, top/bottom position will have less image position deviation between two projectors.
- Please make sure hot ventilation air will not affect each other.
- Pairing the polarized filter and glasses so that RH eye can only see the image for RH eye and vice versa.
- Place the polarized filter in front of the projector before geometry adjustment because polarized filter will affect the direction of light from projectors.
- If the screen is flat enough, use [4 Corner] for image alignment. If the screen is curved or not flat enough or projectors are short throw ratio or installed at side by side position, user needs to use [Curved] function to do geometry alignment.

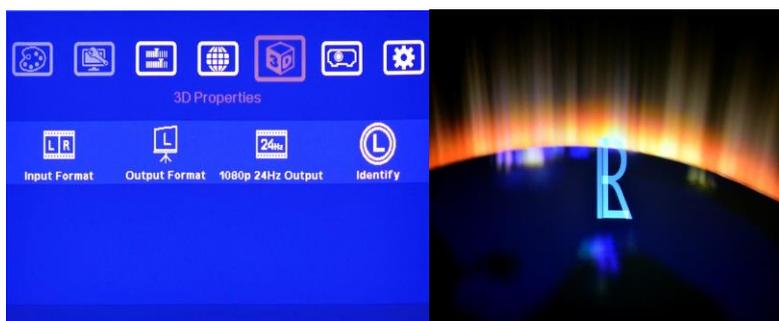
## 4.3 [3D properties] setting



- After geometry adjustment, to activate [3D Properties] and select 3D [Input Format].
- Select [Automatic] if the 3D signal is standard 3D formats from Blue Ray player or sources with 3D flag (Info) inside the signal.
- Select [Side By Side] or [Top-Bottom] based on 3D format of the video sources.



- Select [Output Format] and set RH eye projector with [Right Eye Frame] and LH eye projector with [Left Eye Frame]
- [120Hz output] is for active 3D application. User needs to set the output resolution to XGA or 720P first, then select 120Hz output.



- Activate [Identify] menu to show "R & L" characters on the screen simultaneously to verify the final 3D settings in the system.
- RH eye should see only "R" and LH eye should see only "L".

If still can't verify "R" & "L" characters in both eyes, please check below again:

- a. Is the screen for 3D display?
- b. Are the Glasses and polarized filter the same types and paired for the RH & LH eyes?
- c. Please check from [Output Format] menu and make sure [Right Eye Frame] is set in RH eye projector and [Left Eye Frame] is set to LH eye projector. If not, please swap the [Output Format] settings.
- d. Is the Blue Ray player set to [Auto 3D] or [1080p frame packing] mode to deliver 3D signal out?
- e. If Side by Side or Top-Bottom 3D formats are used, please check the aspect ratio in video source output to make sure GeoBox will receive full screen image.
- f. Is there any HDMI or signal source compatibility issue and only one projector shows image?
- g. Are the HDMI cables qualified and the length not too long?

**After the above procedures, apply 3D signal source and wear 3D glasses, then user can enjoy the most comfortable and healthy 3D system. It is the best solution for children with minimum harm to the eyes.**

#### 4.4 Active 3D applications

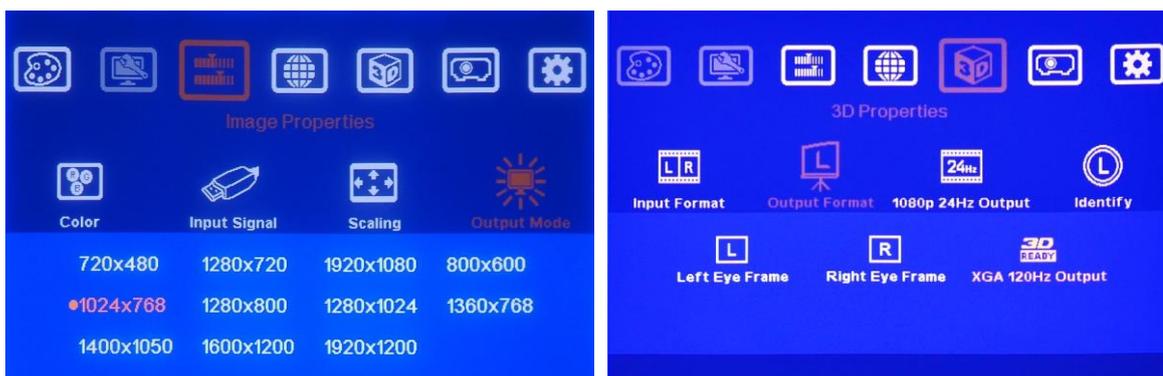
For DLP-Link or Nvidia 3D Vision active 3D display, user needs to provide 100/120Hz signal to projectors that is integrated with either DLP-Link 3D Ready or Nvidia 3D Vision capability. If multiple projectors are used, shutter glasses will only synchronize with one emitter among these 3D Ready projectors. G-500 can convert 1080p 100/120Hz and also 1080p 24Hz frame packed 3D into 720p or XGA 120Hz signals output signal for active 3D display.

Below are the major functions of GeoBox in active 3D applications: (only up to 720P/120Hz)

- a. Geometry adjustment to fit image on curved screen.
- b. Edge blending to enlarge the display with multiple active 3D projectors.
- c. Image stacking to enhance the brightness using multiple active 3D projectors.
- d. Format conversion: Convert Blue Ray 1080p 24Hz frame packed and PC or Nvidia 3D Vision 1080p 120Hz signals for active 3D display.
- e. GeoBox can also convert 1080p 120Hz input into 1080p 60Hz output for passive 3D or 2D display. Side by side or top/bottom 3D formats can't be used because they will be affected by geometry alignment.

#### 4.5 Procedures for active 3D Setting

- a. To select the output resolution in GeoBox to XGA (for XGA projector) or 720P.
- b. To set 3D output format at [XGA 120Hz output] or [720P 120Hz output] under 3D Properties menu.



- If user selects other output resolution except XGA or 720P, [3D Ready] menu will be grayed out and user can't select 120Hz output.
- Projector needs to have 3D Ready DLPLink or Nvidia 3D Vision function. This 3D function needs to be open while playing active 3D.
- It is possible for user to see inverse image in R/L eyes' image. User need to swap R/L signal through projector internal function, active 3D glasses or GeoBox remote. This issue may happen every time when a new playback in the video source.

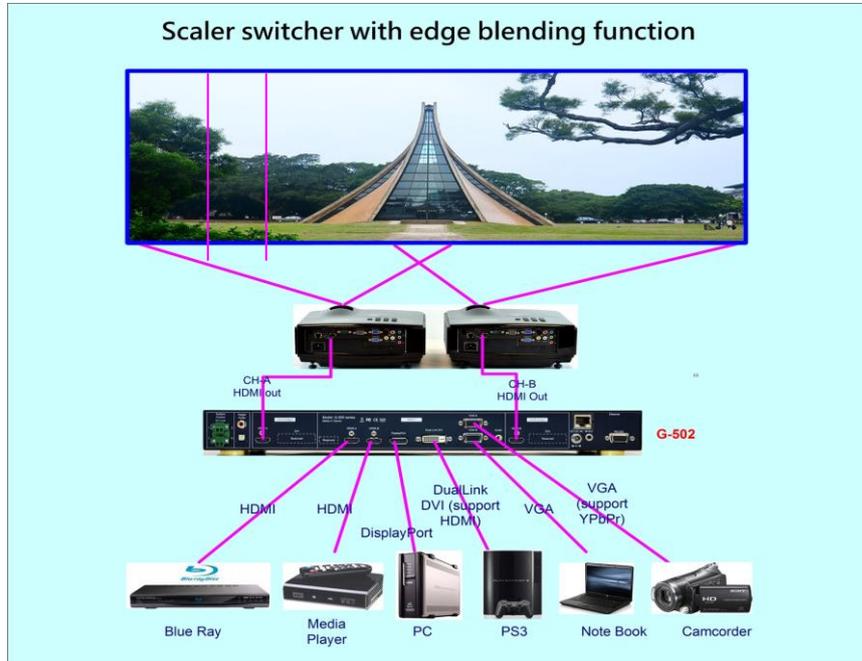
#### 4.6 Other tips for 3D projection settings:

- DLP projector can use either Linear or Circular polarizer system and 3xLCD or LCOS projector can only use Linear polarizer
- Spectrum filter can be used in both DLP or 3xLCD projectors.
- Polarized 3D screen will be coated with metal paint. User can use silver paste coating cloth as temporary screen for 3D test. This kind of cloth is used in umbrella or curtain.
- User needs to pair the filter and glasses. To wear the 3D glasses and take the filter to check, if user can't see through at specific side, direction and rotating angle from RH eye, then this filter should be for RH eye projector. Put the filter in front of the projector with this side face to the screen. For LH eye, go through the same process as to select the right filter. In normal case, with correct side, direction and angle of the filter, user can see through in one eye and can't see through in another eye.
- Tilt of viewer's head will affect 3D effect in linear polarizer system.
- It is necessary to check geometry stacking status between two projectors if user changes the output resolution in GeoBox.
- Please reset Video Wall function before 3D setting. Video Wall may cause malfunction in side by side or Top/Down 3D formats.
- Please set full screen in GeoBox and signal source. Otherwise, no 3D can be seen in side by side 3D.
- To use digital interface for system connection to avoid position shift from VGA input port..
- To press 2D/3D hot key will toggle among side by side, top/bottom image and 2D modes. When the input image is a standard 3D format, this key function will be turned off automatically.
- In side by side 3D format, user may not see complete OSD from the video sources. To switch to 2D mode, user can see complete OSD from the signal sources, then switch back to side by side format through 2D/3D shortcut key.

## 5. Other applications:

### 5.1 Example of scaler switcher with edge blending

GeoBox can simplify the system and no need to add video wall controller or scaler switcher.



### 5.2 Image stacking: to double image brightness

