

GeoBox

GCT / Webpage User Guide

(For Warp and Edge Blending)

Applicable models:

**UD101/UD102/UD103/UD104/UD101 Lite
M811/M812/M813/M814/M811 Lite**

Sales & Technical support

Web site: www.vigillink.com

E-mail: info@vigillink.com Version: V1.01

Tel: +949-502-4484

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GCT Quick User Guide

- GeoBox Control Tool (GCT) is a PC tool for convenient operation by PC keyboard and mouse through USB or Ethernet connection. GCT supports Windows 7/10/11 but not Mac OS.
- The result in GCT will be executed in GeoBox in real-time. It is the same result as OSD or remote controller operation. **Users can switch operations between the IR controller and GCT at any time.**
- Different GCT versions need to match the MCU code and FW version. When a user applies to the latest version of GCT and sees the [MCU code is too old] message, the user needs to update to the new FW & MCU code.

Applicable models

- UD101, UD102, UD103, UD104, UD101Lite
- M811, M812, M813, M814, M811Lite.

Related Document

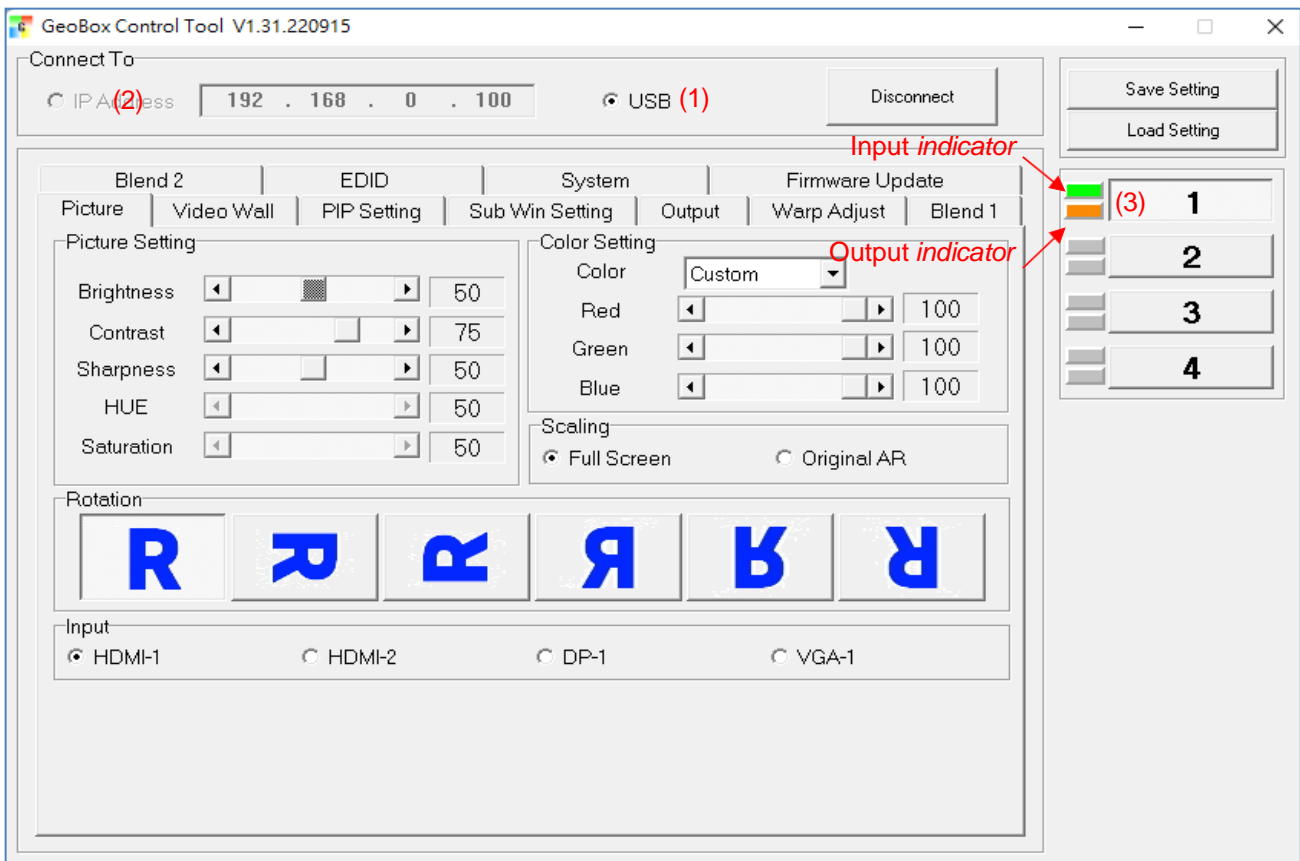
- Please download **[Edge Blend Quick Installation Guide]** from below website to learn the procedures for projector edge blending: <https://bit.ly/3BdQ11y>
- Use **[VNS Edge Blend Calculator]** to get projector installation data. Please download from the below link: <https://bit.ly/3S50Nhy>. The password to open the Excel file is [VNS2022Q1].
- Please download GCT from the website www.geoboxav.com at [Resources] → [Download Center] → [PC Tools/Software] → select [Model #].

Edge Blend setting procedures

1. Before GCT Operation

- Install the projector in the correct position.
- Pre-mark the required image location for each projector.
- Ensure to have the same settings in projectors and each channel in GeoBox. If necessary, please reset the system.

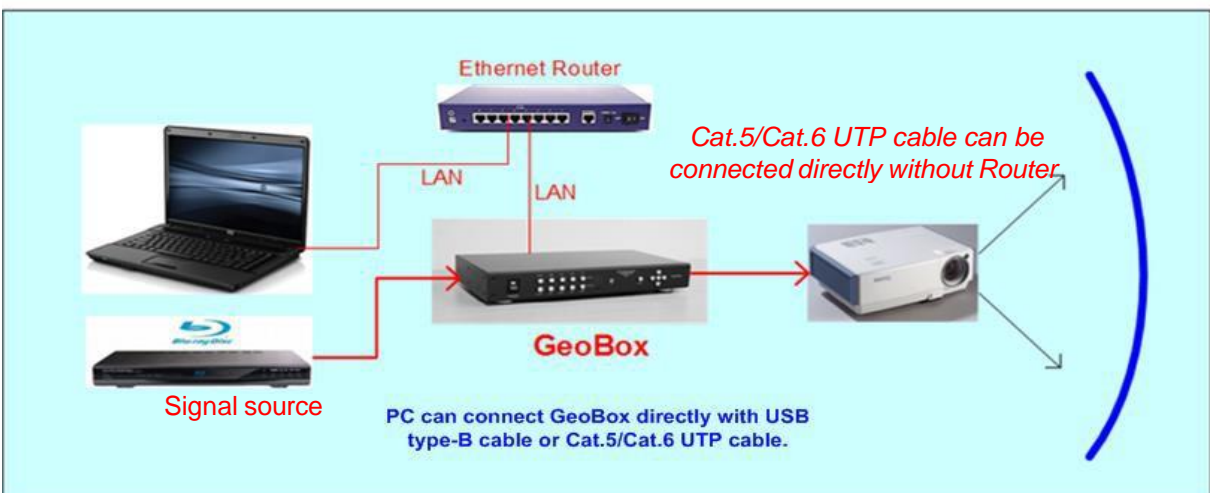
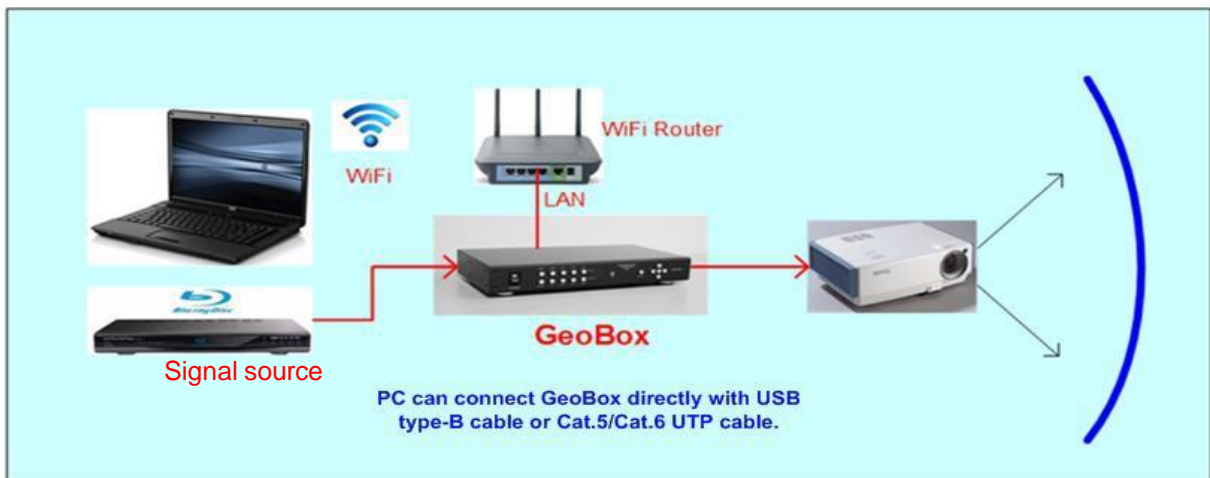
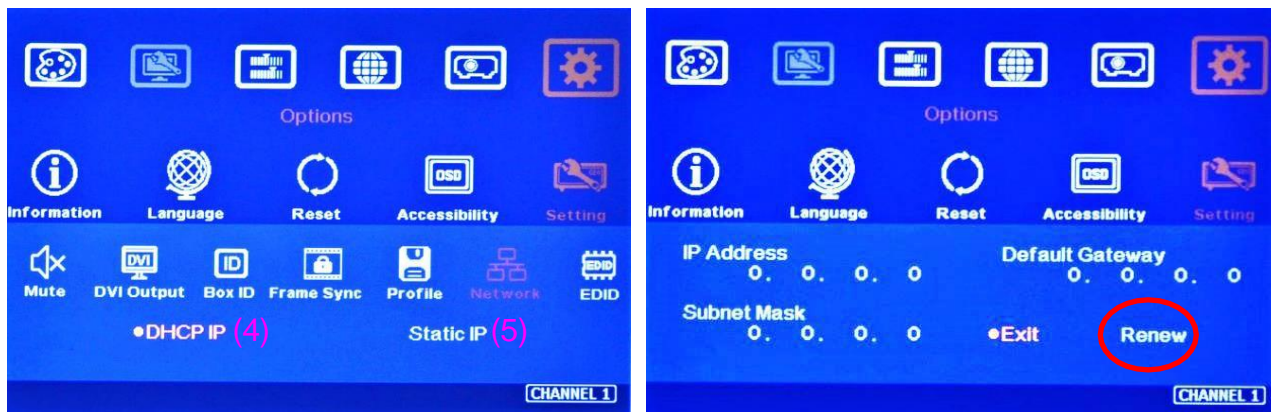
2. System Connection



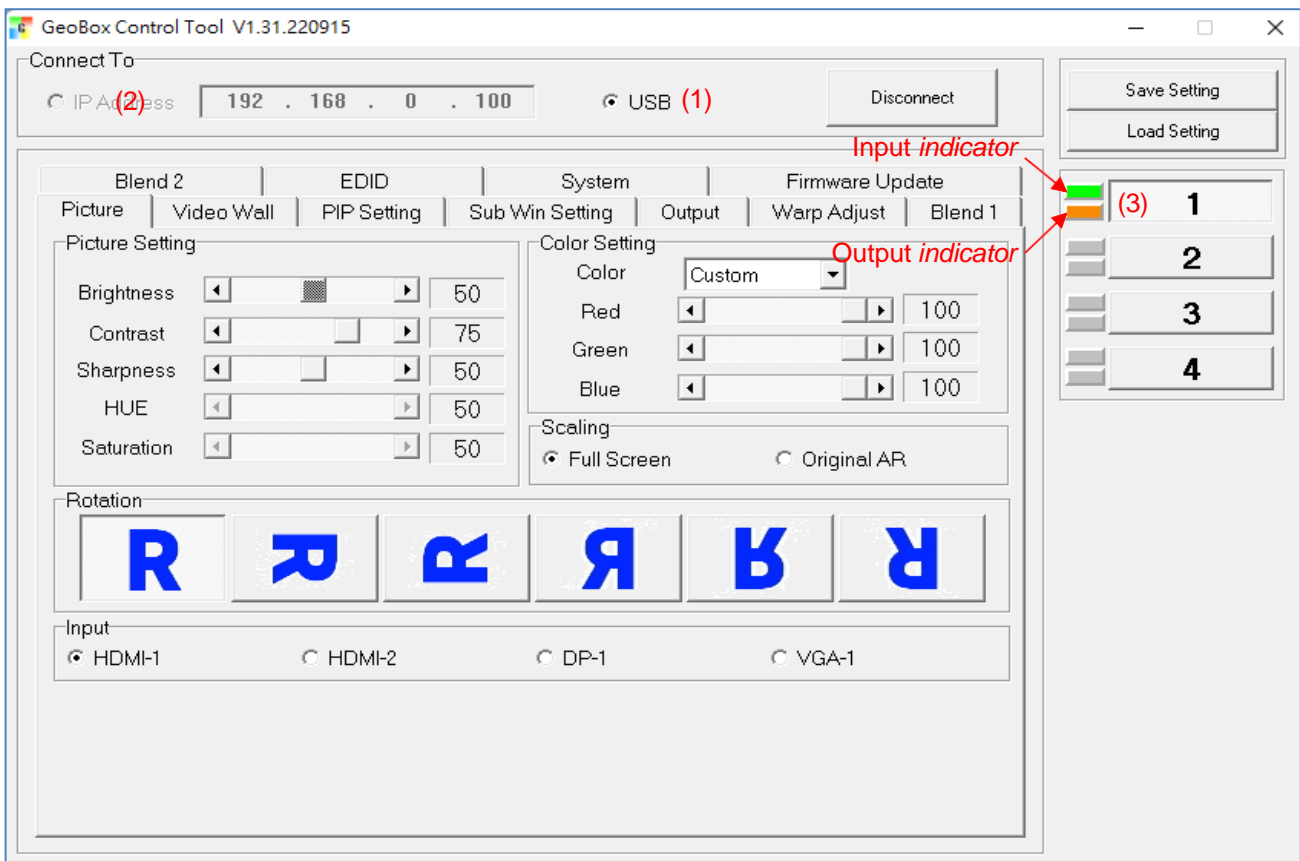
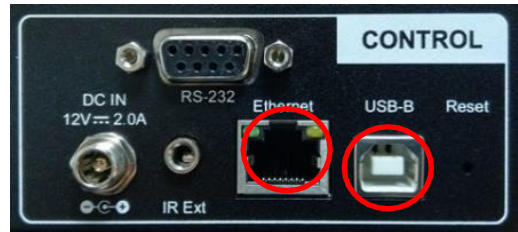
- USB (1): connect with USB-Type B cable, USB HID interface; no driver or APP required.
- Ethernet (2): The user can connect the PC with GeoBox with Cat.5/Cat for a single unit.6 UTP cable directly. For multiple unit control, please use Ethernet Router to connect multiple boxes through the Lan port and set different IP addresses for individual control.
- Open GCT → Click [Connect] → user will see green and orange indicators (3) on the right-hand side. It is to confirm a successful system connection. [Green] is for input, and [Orange] is for output.
- If DHCP (4) is selected, the user can find GeoBox in Network and click to connect. Users can also press [Renew] to get their IP address. Users can input the IP address assigned by Router to get a

connection.

- If Static IP (5) is selected, the user can connect GCT through the default IP Address at <http://192.168.0.100/> to get a connection.
- Users can set different IP addresses in different units to execute separate operations & control.
- When connected to the Wi-Fi Router, the user can control it through any device (Mobile, iPad, PC...) connected with a Wi-Fi router with the identical SSID.
- Users can connect UTP Ethernet cable (or cross-over cable) directly between PC and GeoBox. PC must set the same network segment, such as 192.168.0.105 with Subnet Mask at 255.255.255.0 in TCP/IPv4 for the connection.

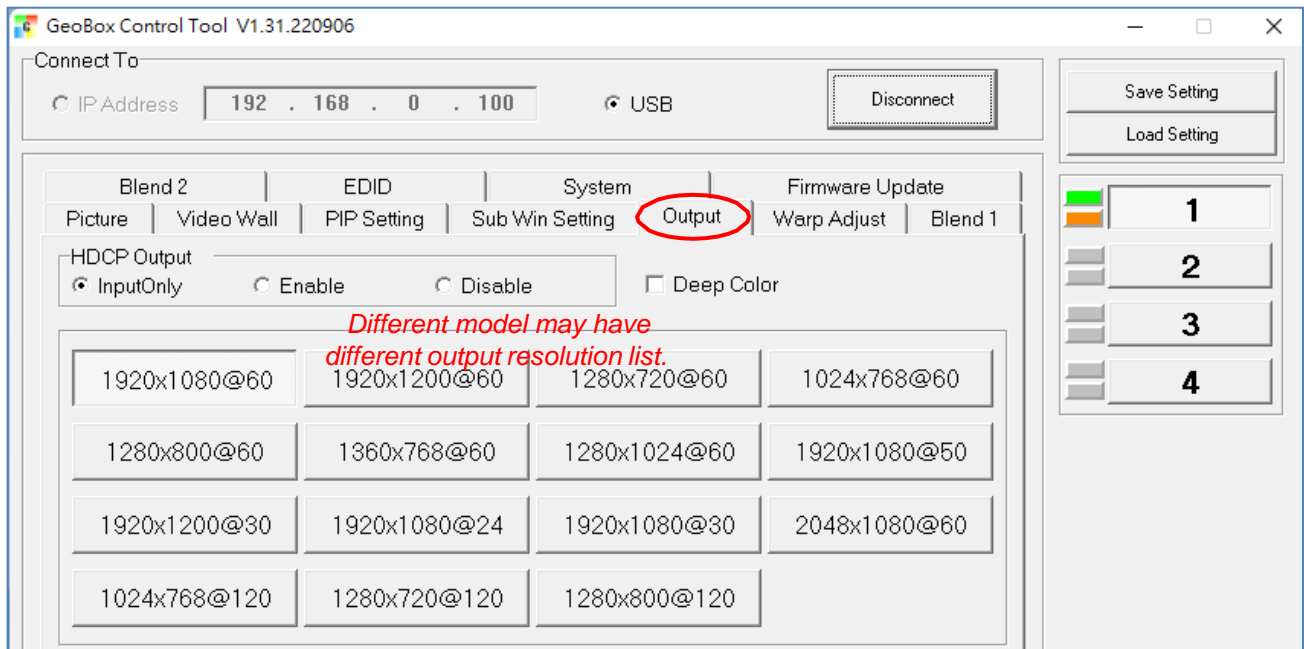


- Users can use a Wi-Fi connection and a Bluetooth keyboard and mouse for convenient operation in front of the screen.
- If the user sees an abnormal display while opening GCT, please press CTRL+ ALT + Delete simultaneously to open Task Manager and terminate the [GCT] application.



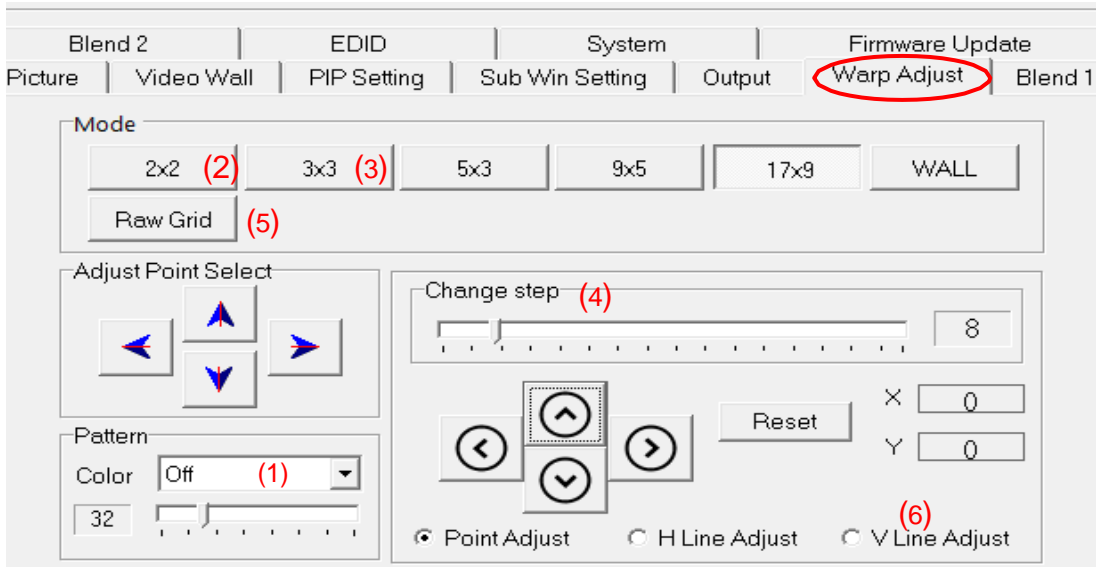
3. Set Output Resolution

- GeoBox output resolution should be the same as the projector's Native Resolution.
- Set the required output resolution in each channel under the [Output] menu separately.



4. Geometry Alignment--[Warp Adjust]

- All channels should execute geometry alignment at the same time to let pattern lines perfectly match.
- Click [Warp Adjust] to access the geometry alignment Menu.



- (1) Click channel → select Pattern color for each channel. Adjacent channels should have different pattern colors for easy alignment.
 - (2) Start with [2x2] geometry alignment in all channels and let the image corners in each projector be located at the desired (pre-marked) location.
 - (3) Following [3x3] → [5x3] → [9x5] → [17x9] in all channels at the same time to let all grid lines in the overlap area be stacked perfectly.
 - (4) The adjusting step can be selected. Users can also use keyboard hotkeys to select: [CTRL+ Arrow]: 8 pixels/step. [SHIFT+ Arrow]: 1 pixel/step
- If finished [17x9] alignment is completed, the user can return to [2x2] for further alignment, but if returned to [5x3], only [2x2], [3x3] & [5x3] warp data will be kept.
 - (5) [Raw Grid] is for exact position fine-tuning after [17x9]. The maximum adjustment point is 100. After [Raw Grid] alignment, users can go back to [17x9] or [2x2] to make further adjustments. The adjustment points under [Raw Grid] adjustment will remain at the exact location without changing by another alignment.
 - (6) When projecting to a curved screen with a short throw ratio projector, the image will have a more extensive grid size at the center and smaller on both sides. Users can use Linearity Grid Line adjustment (6) to move the whole line. It will reduce the time for the adjustment. This function is available from [3x3] to [17x9] and in horizontal and vertical lines.
- Users can switch between GCT and IR controllers for geometry alignment without data loss.

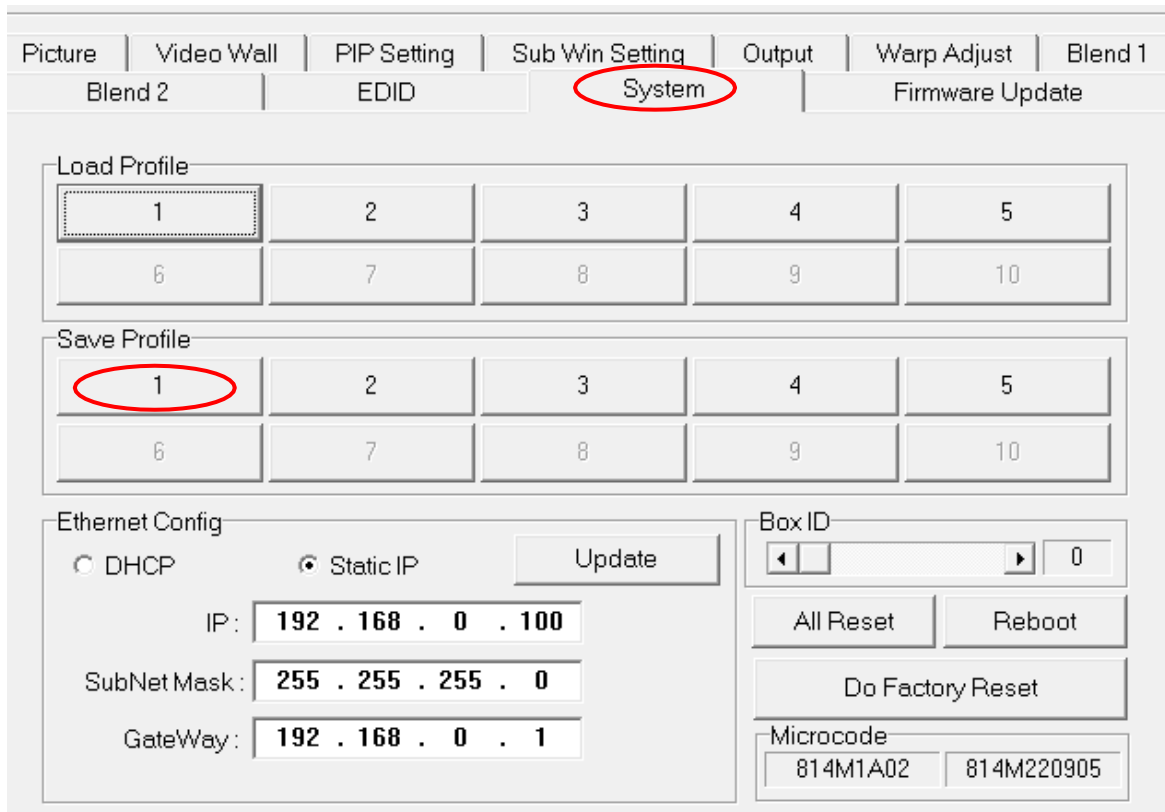
5. Keyboard Hotkeys for geometry alignment

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

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

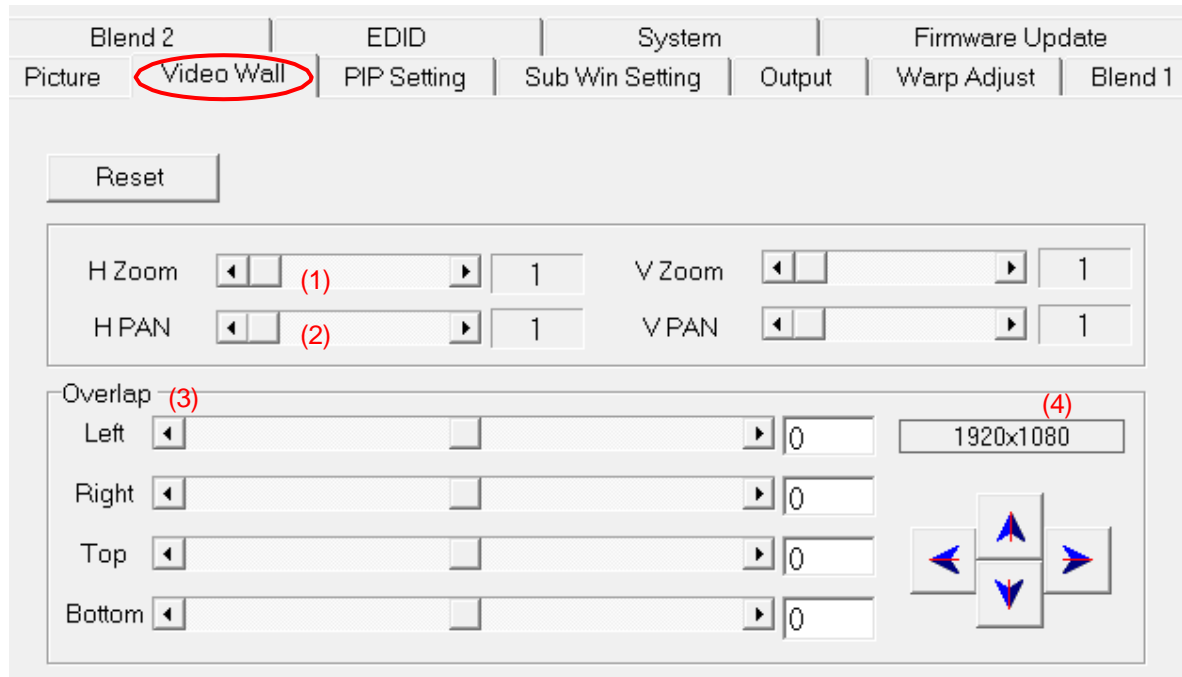
6. Save geometry alignment result temporarily

- Geometry alignment takes most of the time. After finishing the geometry alignment, please save the result under [System]➔ [Save Profile]. Users can select 1~5 to save the result. Some models can be up to 10.
- Clicking the [Save] + # key on the IR controller will simultaneously save the settings in all channels.



7. 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.



- Four major functions:
 - (1) [H Zoom/V Zoom]: Split the image in H&V directions. For 3 projector landscape edge blending, [H Zoom] should be set at 3 in all channels. For 3x2 edge blending, [H Zoom] is 3, and [V Zoom] is 2.
 - (2) [H Pan/V Pan]: assign each split image for each projector. It calculates from Left to Right and Top to Bottom. The LH projector [H Pan] is 1 for three projector landscape edge blending. The center projector [H Pan] is two, and the RH projector [H Pan] is 3.
 - (3) [Overlap]: set overlap pixels for edge blending. The Overlap value is calculated from [VNS Edge Blend Calculator]. Please download this Calculator at <https://bit.ly/3S50Nhy>. The password to open the Excel file is [VNS2022Q1].
 - (4) Show current output resolution. [VNS Edge Blend Calculator] shall use actual input and output resolutions during system setup. Please click the [INFO] key on the IR controller to check the actual input/output resolution.
- Please see the detailed description in [Edge Blend Quick Installation guide].

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%~40%
Overlap pixel (V)	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

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

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

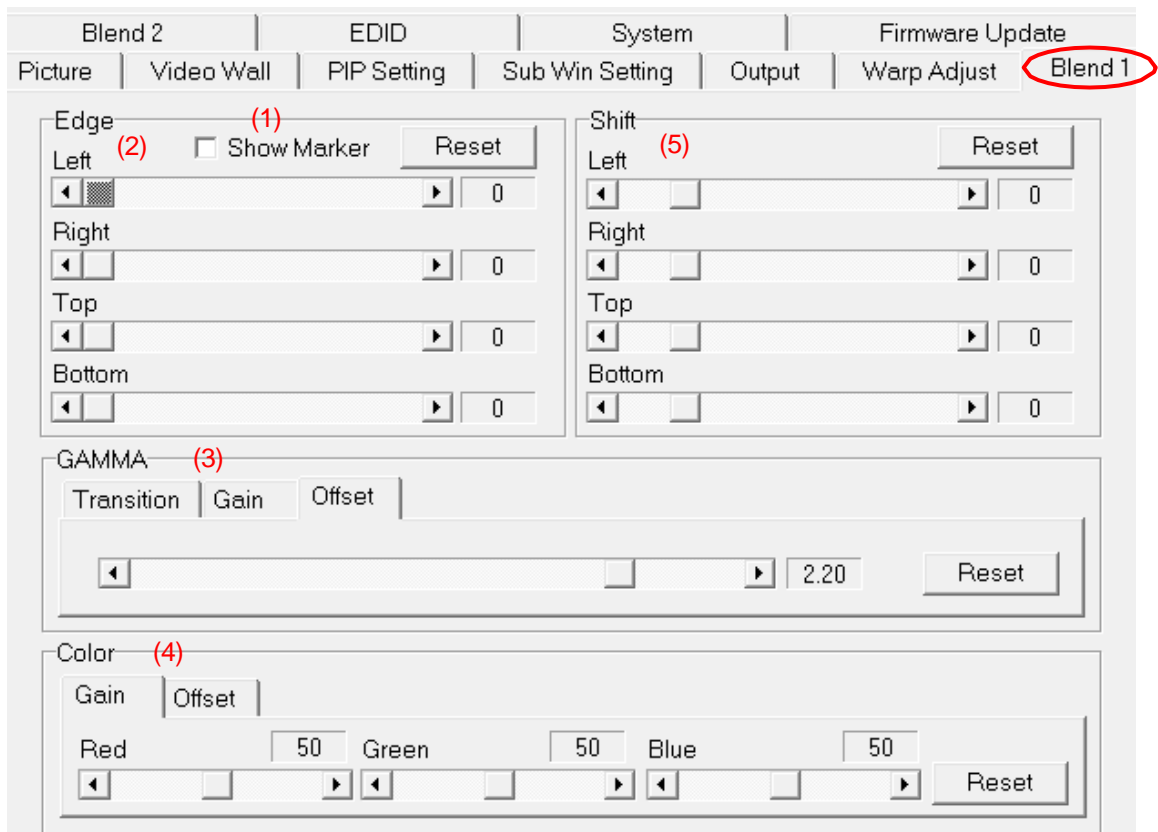
* Final mage height should be equal or larger than screen. User can shrink image to have the same image height as screen by GeoBox geometry adjustment.

* Standard luminance is 400-800 Lux for restaurant and big conference room, 1000-1500 Lux for trade show. 3D: 500 Lux (single projector)

8. Edge Blend Setting

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

- (1) Click [Show Marker]: green and red lines will appear at both edges in each edge blending region.
- (2) Please select the overlap edge in each channel and increase the value to let the red line and green lines be stacked together. The actual value is the same as the projector overlap pixels.
(Default pattern grid is 32 pixels)



- (3) [Gamma]: for color, fine-tune in the overlap region. Please select [Transition] for further color fine-tuning.
- (4) [Color]: for white background balance color adjustment.
- (5) [Shift]: to shift the edge blending position in the overlap region or edge mask in the non-overlap edge.

Please see detailed instructions in [Edge Blend Quick Installation guide].

9. Edge Mask and Black Level Uplift

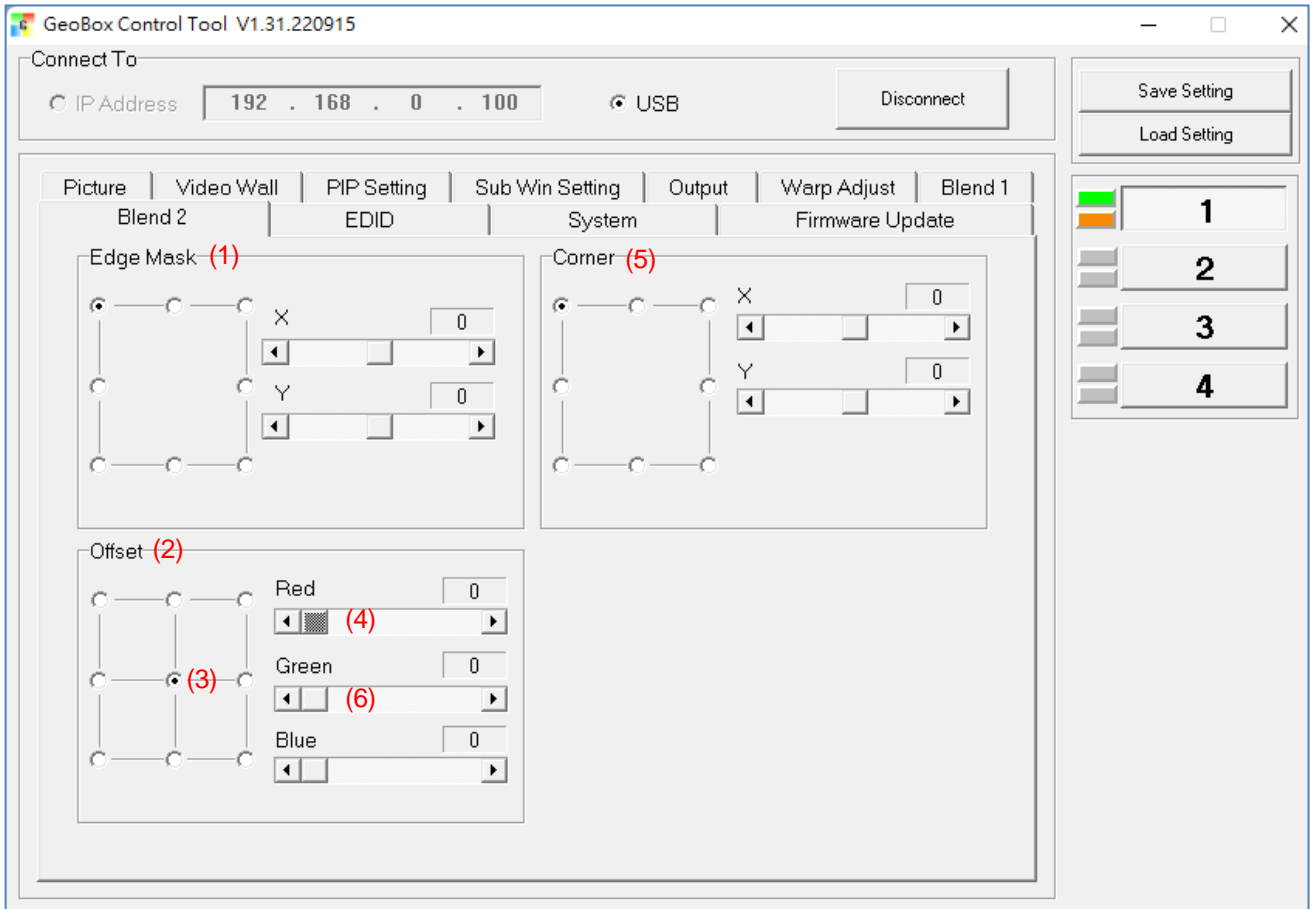
9.1. Edge Mask

- (1) [Edge Mask]: to execute Edge Mask via 8 adjusting points. The maximum adjusting range for each point is 900 pixels in H&V. It starts from the original image location before geometry alignment.

9.2. Black Level Uplift

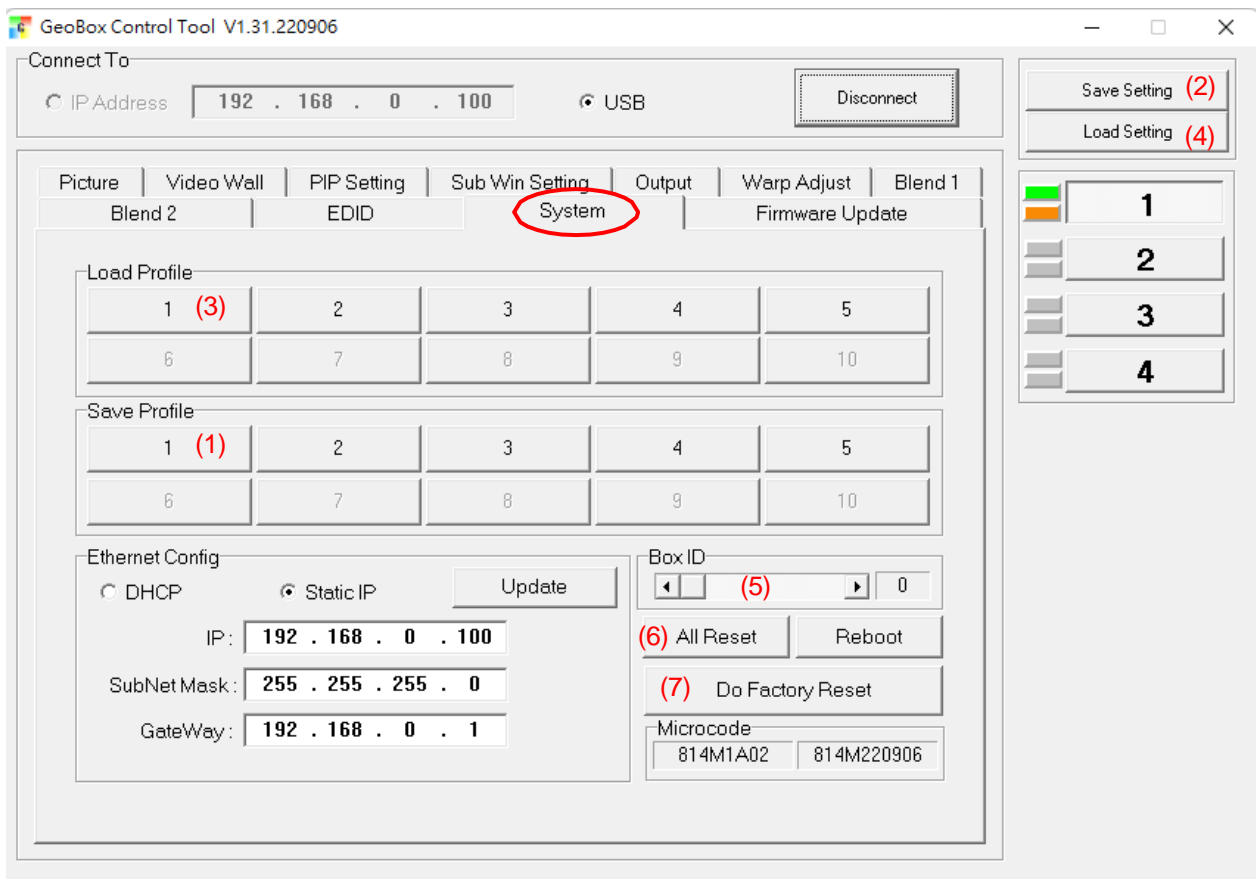
Adjust [offset] (2) in RGB color independently in the non-edge blending area to compensate for the light leakage in the projector's optical system. Below are the procedures:

Provide a dark environment → To select the adjusting region (3) (usually select center point) → To adjust RED color offset (4) to around 150 to see red color over one projector screen → Adjust Black Level Uplift location by [Corner] (5) menu (usually 3 points adjustment is required) → return to [Offset] and select the original region (3) → Adjust RGB color (6) to let the non-overlap region has a similar color as the overlap region (DLP projector is around 70, LCD projector is around 90) → to execute the same procedures for other channels.



10. Save / Back-up User Settings via GCT

- Users can save the final settings in two locations:
 - (1) [Save Profile]: under the [System] menu, the user can save the final setting into Profile Index by selecting a number in [Save Profile]. The settings will be stored directly in the Box permanently. All channels will be saved at the same time. **The [Save] button in the IR controller can execute the same function.**
 - (2) [Save Setting]: it will save current settings into the BSF file on PC but not in the Box. It will not include Profile data. This data can be used as a backup or copied to another box.
- **If the user wants to keep different Profile data on the PC, they must recall each Profile setting and save it to a different BSF file. After loading back, the user must save it to Profile Index again for permanent keeping.**



11. Load Back User Setting via GCT

Users can load back the final settings from two locations:

- (3) [Load Profile]: under the [System] menu, the user can load the final set from the profile index by selecting a number in [Load Profile]. **[Profile] button in the IR controller can execute the same function.**

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

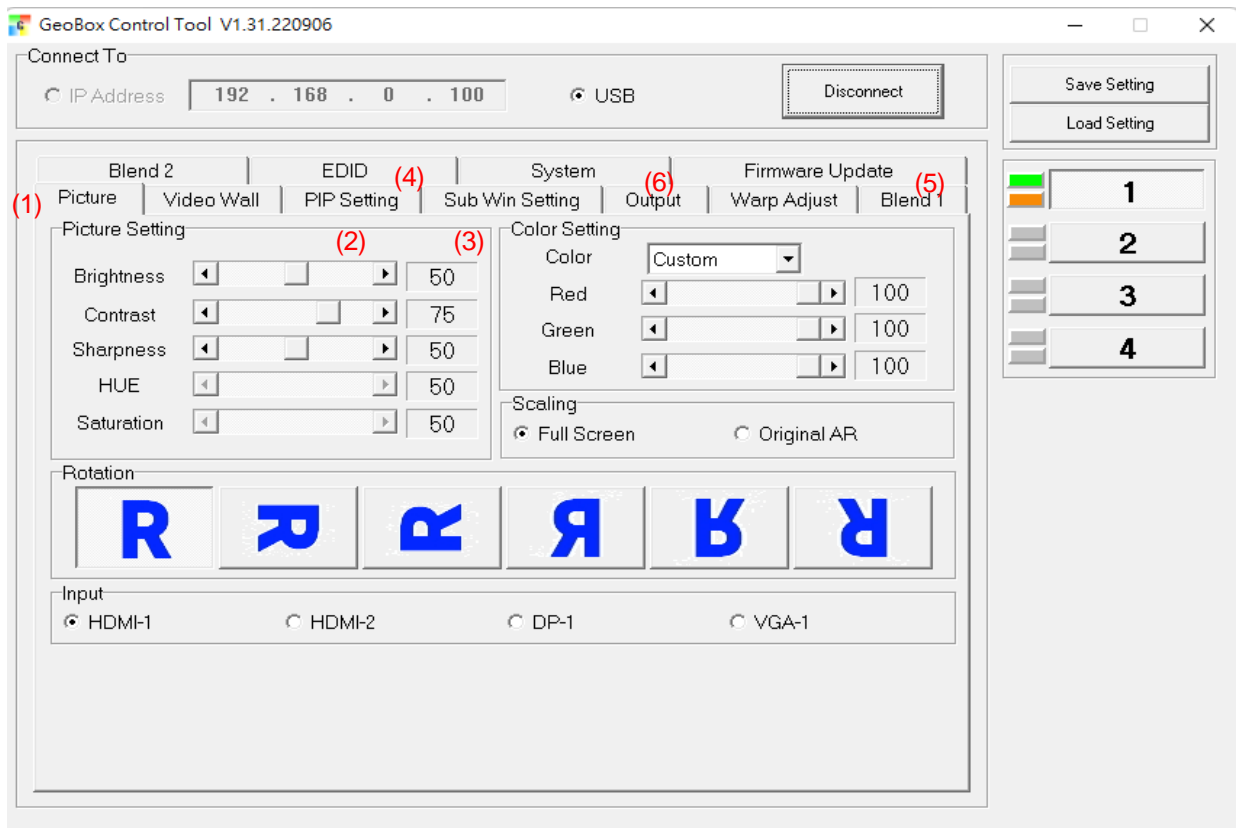
12. Box ID and System Reset

- (5) [Box ID] is for individual RS232 or IR control.
- (6) [All Reset]: Reset all channels simultaneously but do not include Profile Index data.
- (7) [Do Factory Reset]: to clean all the settings in the Box to factory default, including profile Index data in all channels. It is the same function as inserting a pin into the back panel Reset Hole for 5 seconds.

13. Other System Reset

- OSD Reset:
Only reset one channel settings: Activate OSD → [Options] → [Reset] → [Reset All] or only reset [Video Wall] or [Anyplace] (warp data).
- Reset from IR controller: The user can click the [Reset] hotkey in the remote controller to do the selected channel reset. It will show Reset OSD for further selection.
- Reset Hole:
Reset by Reset Hole on the back panel for 5 seconds; it will execute deep System Reset in all channels to factory default settings, including erasing Profile Index data.
- Reset from WebPage:
[Reset All] under [System] in WebPage can reset all channel settings at the same time. It will not erase the data stored in Profile Index.
- Reset from [GCT]:
Three sub-menus under [System] menu:
 - ✓ [All Reset]: The function is the same as OSD reset but will simultaneously reset all channels.
 - ✓ [Reboot]: It will reboot the system, the same as powering OFF/ON the system again.
 - ✓ [Do Factory Reset]: The function is the same as reset from [Reset Hole]. It will execute a deep reset into the factory default value, including erasing the data in Profile Index.

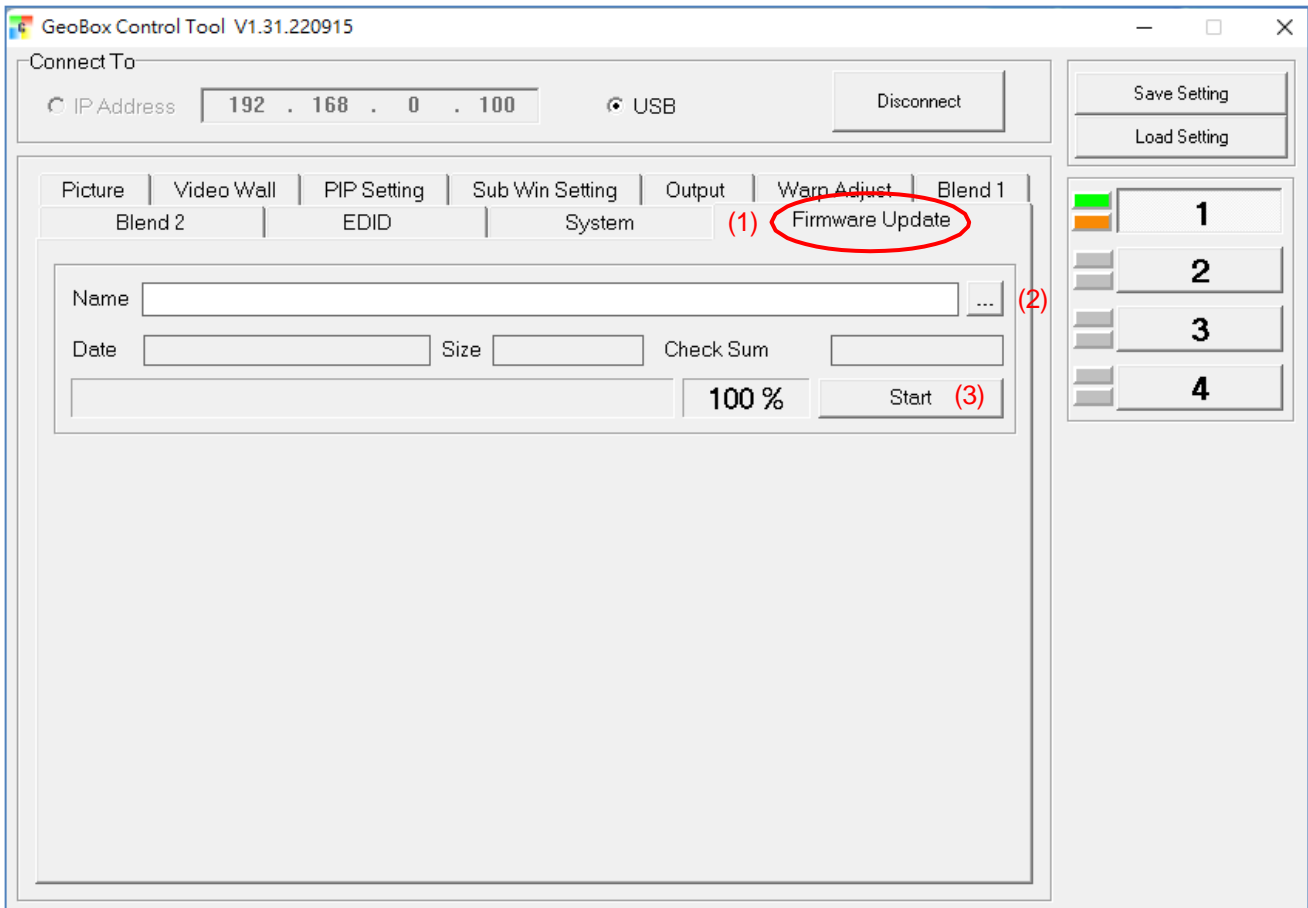
14. Miscellaneous Functions



- (1) [Picture]: Input selection, image rotation, scaling (aspect ratio), color adjustment.
- (2) [PIP Setting]: select PIP/POP/3/4 split view types and set PIP size and location.
- (3) [Sub Win Setting]: select sub-win signal source, rotation, aspect ratio, and overlap setting
- (4) [EDID]: set EDID resolution for each input port
- (5) [Firmware update]: update firmware and MCU code. MCU code is for keypad and GCT control. FW update will not change the Profile setting data. The FW update to 91% will stop checksum checking for some time. Please wait till you see the [Process Done!] message.
- (6) [Output]: Output resolution selection, HDCP control, Deep Color, 3D output format

15. Firmware and MCU code update

Users can update Firmware and MCU code through GCT. The user may not see the FW update status if the GCT is displayed on the 2nd display. Please move GCT to the PC screen for easy checking.



- (1) Click [Firmware Update] to activate the FW update window.
- (2) Click the (2) button and browser .bin file for the update. Please decompress the file into a .bin file if necessary.
- (3) Click [Start] (3) to execute code update.
 - a) We propose to update the MCU code first.
 - b) MCU code update is around 10 seconds. After finishing the MCU code update and clicking the [OK] button, the system will reboot.
 - c) Please re-connect GCT to do the FW update. FW update may be up to 270 seconds for some models. It will stop at 9% for a few seconds and 91% for more than 1 minute to verify the result.
 - d) After finishing the code update, it will show a [Process Done!] message.
 - e) Please click [OK]. The system will reboot automatically and finish the update process.

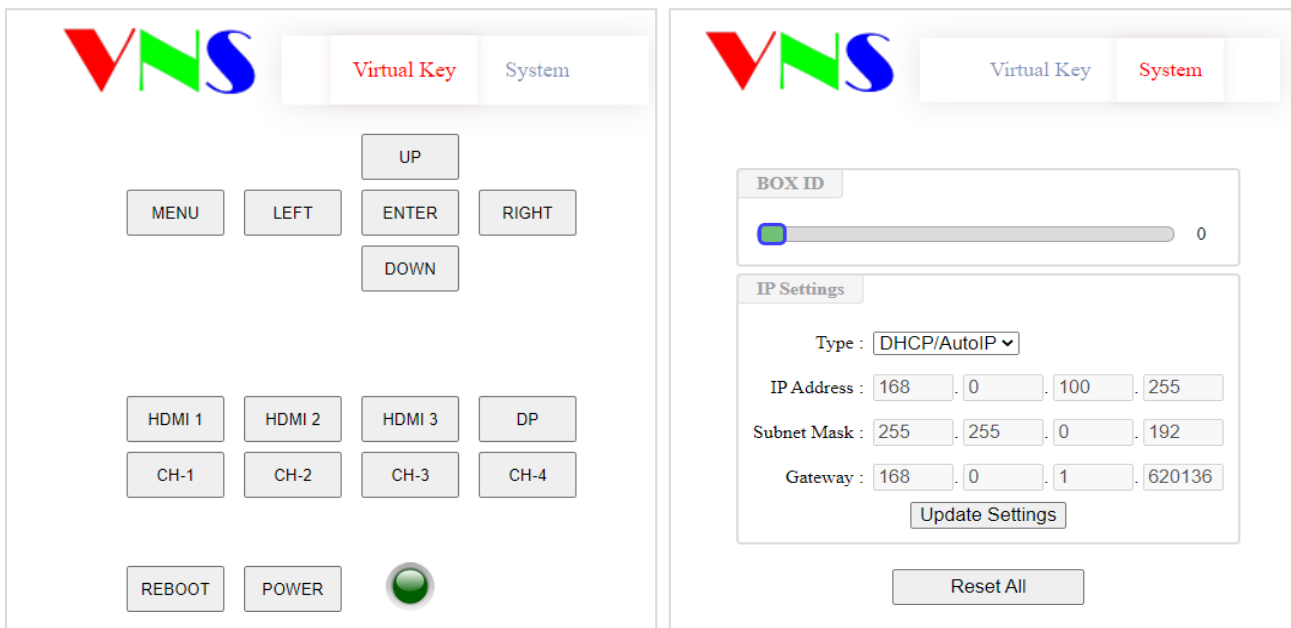
Important notice

- After finishing MCU and FW update, GeoBox will reboot again.
- After booting up the system and seeing an abnormal display image, please use a small Pin to insert the Reset hole again for 5 seconds to erase all unnecessary settings from the system. User will see [Reset to Default] message, and the system will automatically boot up again. **It will erase the settings inside Profile Index.**
- If a user wants to keep Profile Index data, the user can try to neglect the system Reset process through the reset hole unless the user sees abnormal behavior in GeoBox.
- Please do not turn off the power if it fails during the update process. Users can execute FW/MCU update processes again, reconnect the USB, or re-open GCT to execute the update procedure.
- **If the system can't work after the code update or shows a blinking LED light on the front panel when turning on the system, the FW/MCU code may not be suitable for the model. Users can't connect with GCT again and must enter ISP mode to update the code. Please insert a pin into the RESET Hole on the back panel and power on the system. After seeing the flashing LED on the front panel, release the pin (in some cases, a user may not see the flashing LED. User can release the insert pin after 3 seconds). Then the user can link GCT with the system again to do the MCU code and FW update. After finishing the MCU code update, please Power Off/On the system again. Users should see a standard display.**

WebPage User Instruction

System connection and operation

- The user must set PC IPv4 at the same IP segment, such as 192.168.0.105, and Subnet Mask at 255.255.255.0.
- PC can directly connect the Box with UTP Cat.5/Cat.6 cables through the RJ45 connector.
- Users can connect GeoBox through a web browser such as Microsoft Edge or Google Chrome via input default IP address at <http://192.168.0.100/>.
- After connection, the user will see Webpage as below:



- Use the Mouse to click the button to do the operation. Users will see the OSD menu on the screen for further operation. It will be the same as control through the IR controller.
- When a user wants to adjust the geometry position with an immense value, please quickly click with the mouse at the virtual key, and it will increase the adjusting speed to get to the value needed.
- Users can Power ON/OFF the system or reboot the system through Buttons. If the system is powered off, the power indicator will change color to Red. Users can also turn on the power through WebPage.
- Users can set different IP addresses and save final settings into Profile Index through the OSD menu or IR controller [Save] hotkey.
- Webpage's maximum geometry control points are 17x9, the same as the IR controller or GCT operation.
- If the user uses a mobile phone for the operation, it may behave differently in different OS. If meet any trouble, please double-check with a different brand mobile phone.