GCT / WebPage User Guide

(For Warp and Edge Blending)

Applicable models:

UD101/UD102/UD103/UD104/UD101 Lite
M811/M812/M813/M814/M811 Lite
G812/G814

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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. User can switch operation between IR controller and GCT at any time.
- Different GCT version needs to match MCU code and FW version. When user apply new version GCT and see [MCU code is too old] message, user needs to update to new FW & MCU code.

Applicable models

- UD101, UD102, UD103, UD104, UD101Lite
- M811, M812, M813, M814, M811Lite.
- G812, G814

Related Document

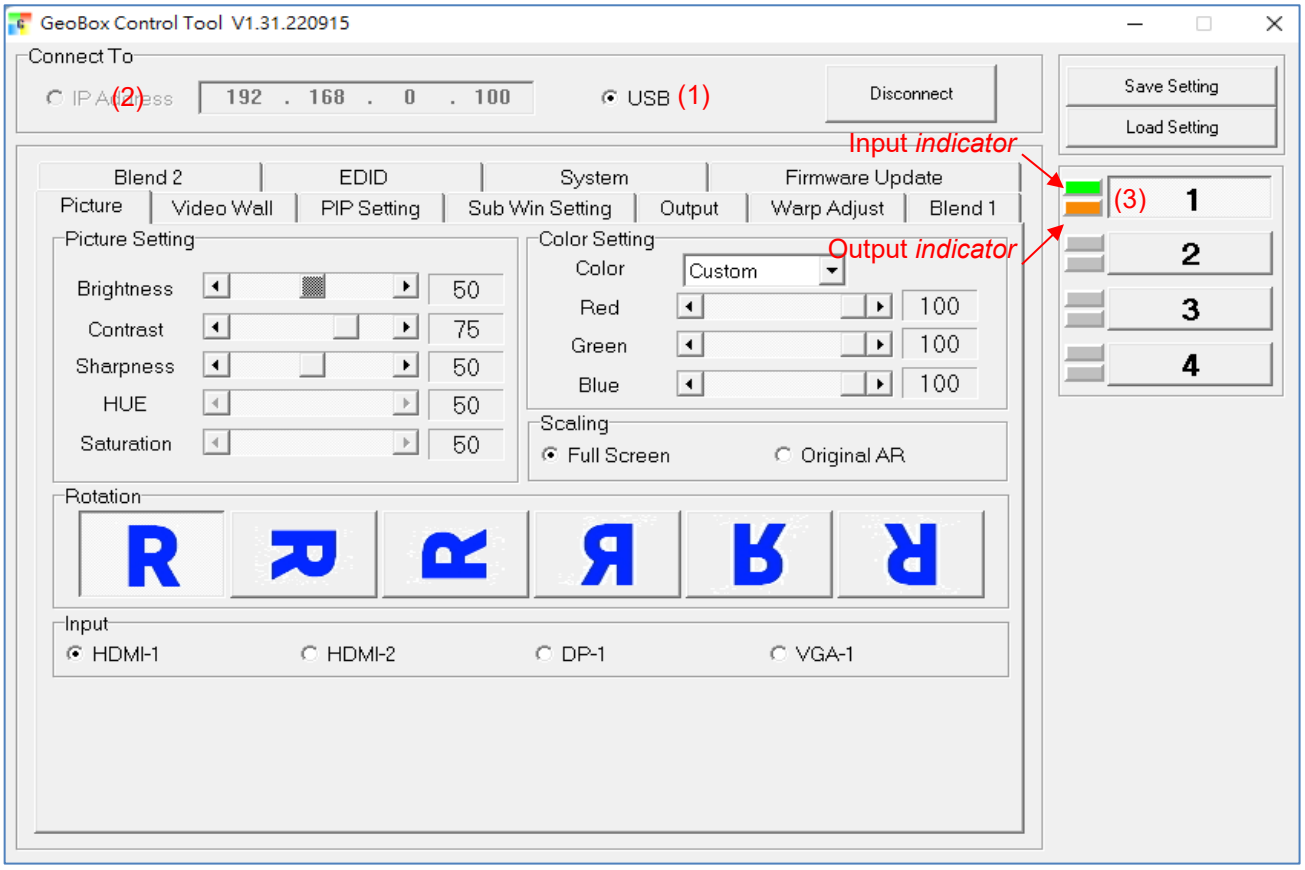
- Please download [Edge Blend Quick Installation Guide] from below website to know the procedures for projector edge blending: https://bit.ly/3BdQ11y
- Use [VNS Edge Blend Calculator] to get projector installation data. Please download from below link: https://bit.ly/3S50Nhy. The password to open Excel file is [VNS2022Q1].
- Please download GCT from website www.vnstw.com at [Support]→ [PC Tool]→ select [Model #].

Edge Blend setting procedures

1. Before GCT Operation

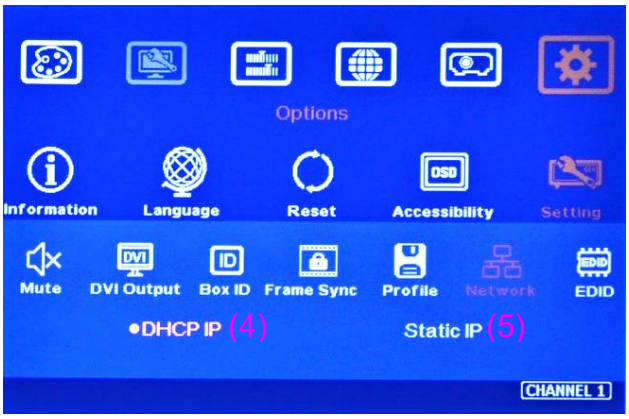
- Install the projector at the right position.
- Pre-mark the required image location for each projector.
- Make sure to have the same settings in projectors and each channel in GeoBox. Set box output with the same native resolution as the projector. If necessary, please reset the system.

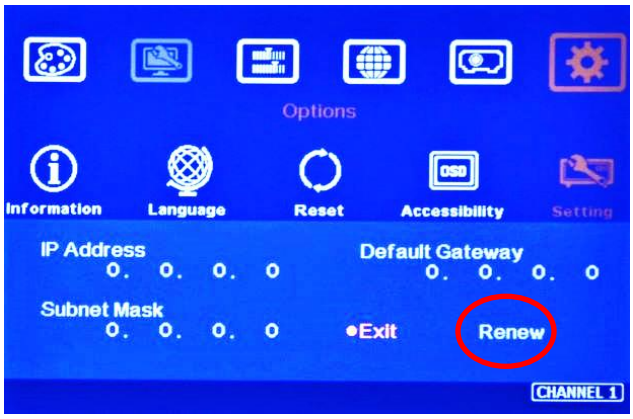
2. System Connection

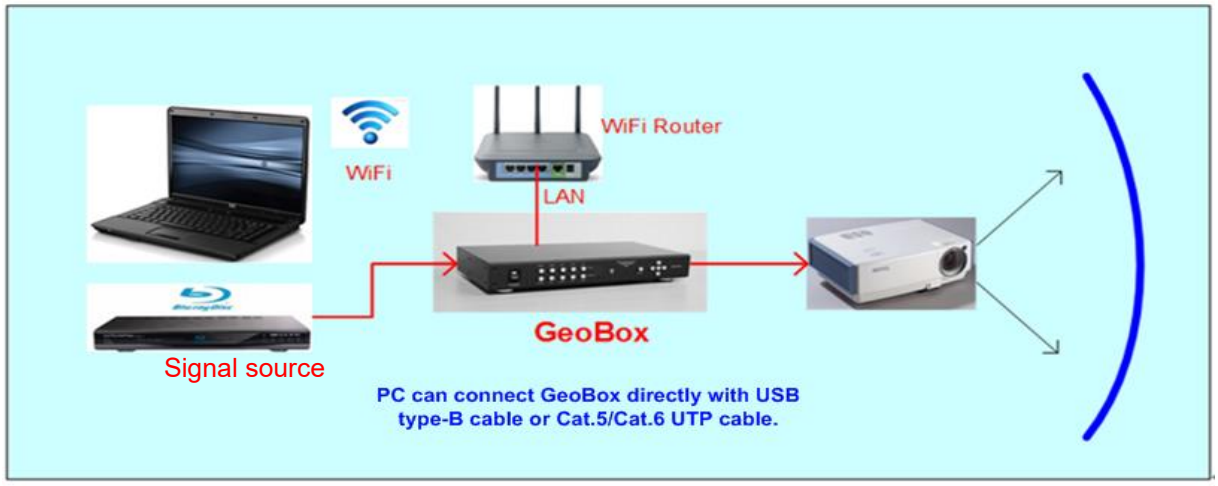


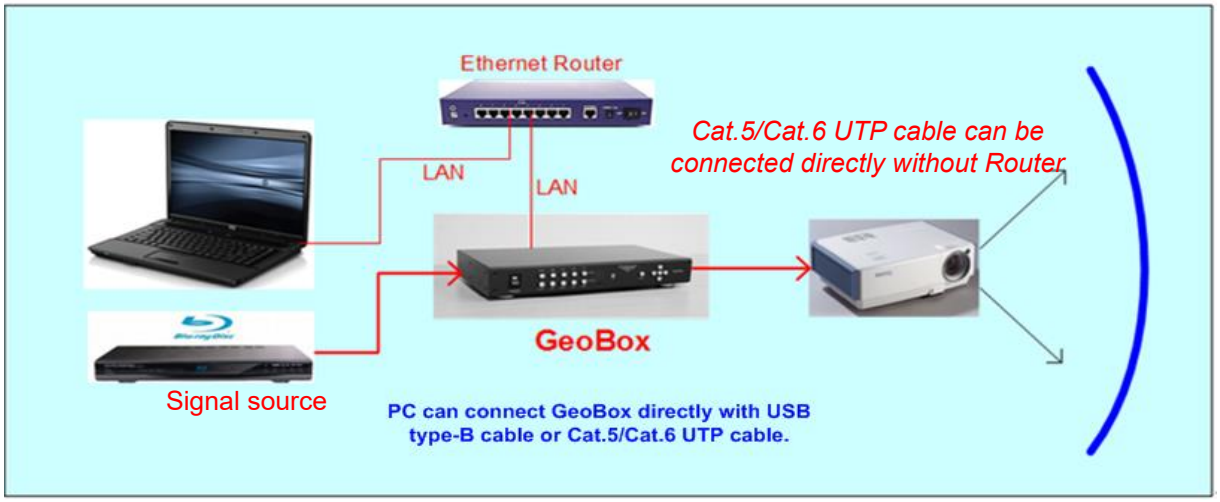
- USB (1): connect with USB-Type B cable, USB HID interface, no special driver or APP is required.
- Ethernet (2): For single unit, user can connect PC with GeoBox with Cat.5/Cat.6 UTP cable directly. For multiple unit control, please use Ethernet Router for the connection with multiple boxes through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

- If Static IP (5) is selected, user can connect GCT through default IP Address at http://192.168.0.100/ to get connection.
- User can set different IP address in different units to execute separate operation & control.
- If WiFi Router is connected, user can control through any device (Mobile, iPad, PC…) which is connected with WiFi router with the same SSID.
- User can connect UTP Ethernet cable (or cross-over cable) directly between PC and GeoBox. PC needs to 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.

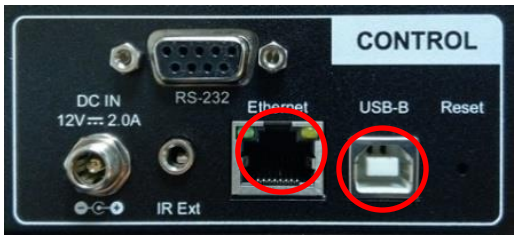


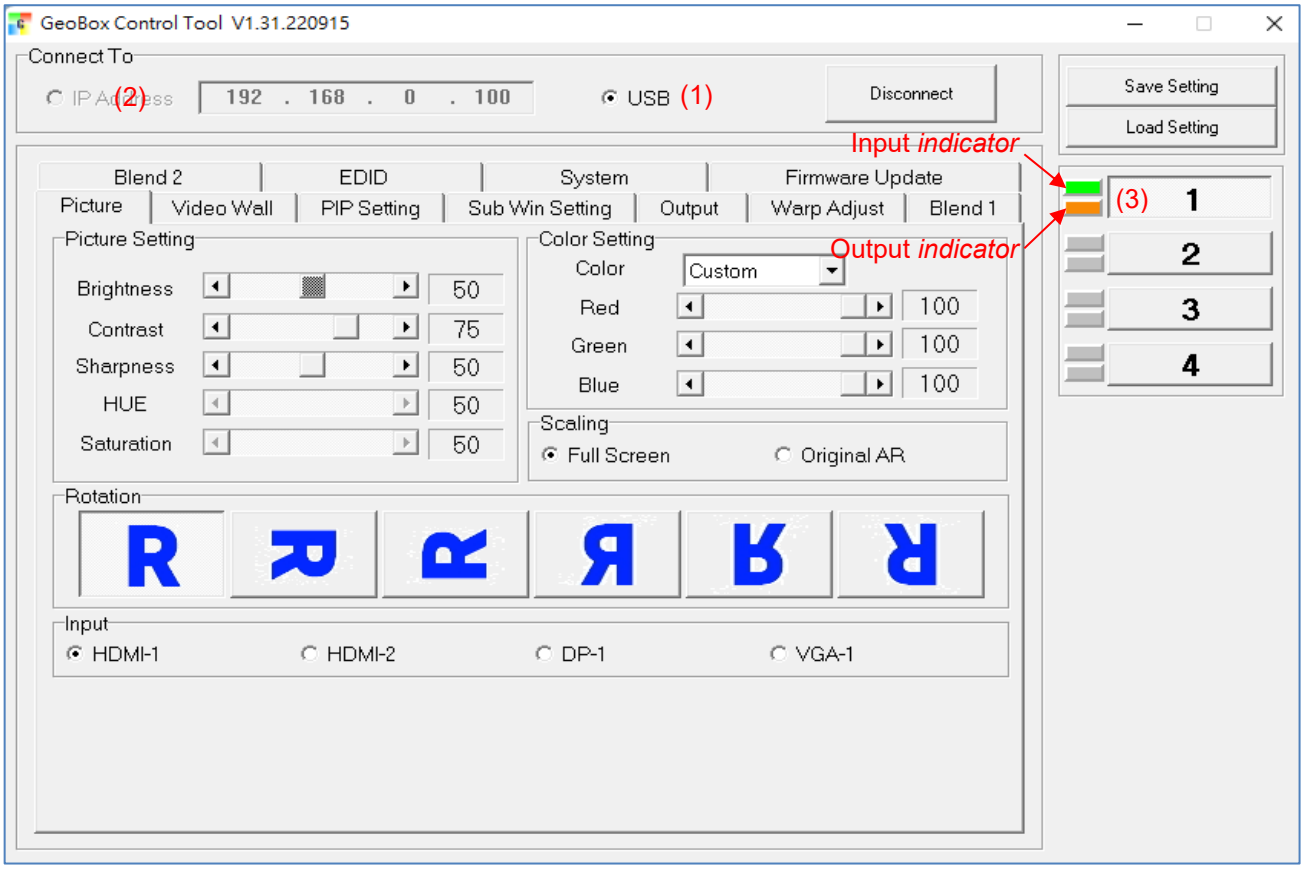






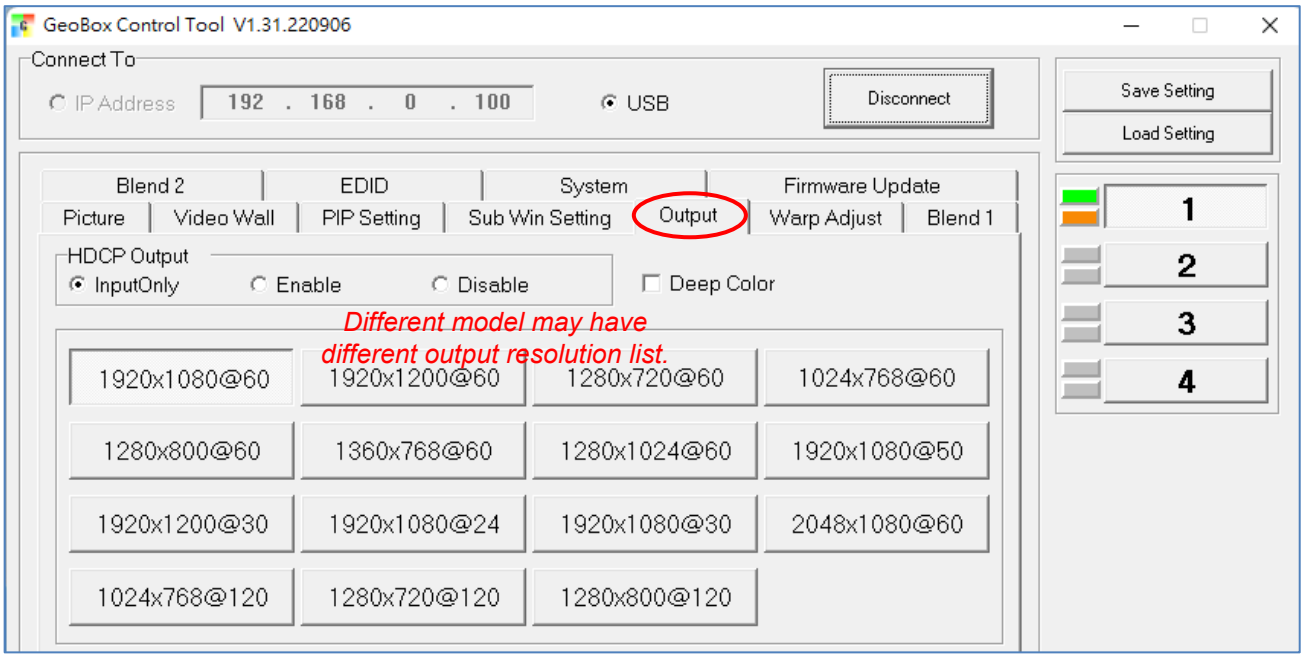
- User can use WiFi connection and Blue-tooth keyboard and mouse for convenient operation in front of the screen.
- If user sees abnormal display while open GCT, please press CTRL+ ALT + Delete at the same time to open Task Manager and terminate [GCT] application.





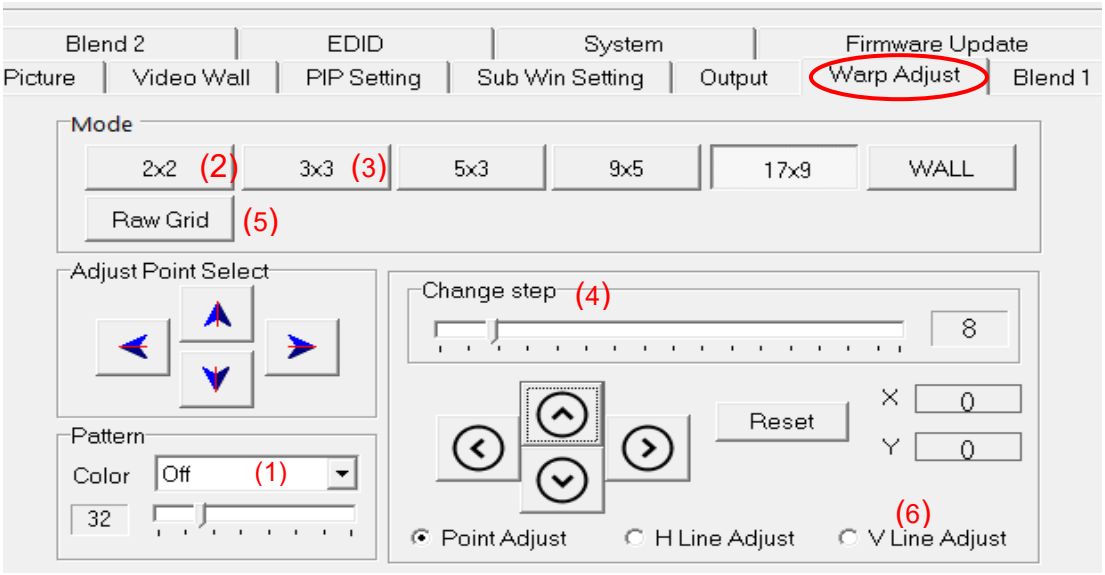
3. Set Output Resolution

- GeoBox output resolution should be the same as projector Native Resolution.
- Set required output resolution under [Output] menu in each channel 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 below geometry alignment Menu.



(1) Click channel→ select Pattern color for each channel. Adjacent channels should have different pattern colors for easy alignment.

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

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

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

- If finish [17x9] alignment, user can return to [2x2] for further alignment but if return to [5x3], only [2x2], [3x3] & [5x3] warp data will be kept.

(5) [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 other alignment.

(6) 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 (6) 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.

- User can switch between GCT and IR controller for geometry alignment without data loss.

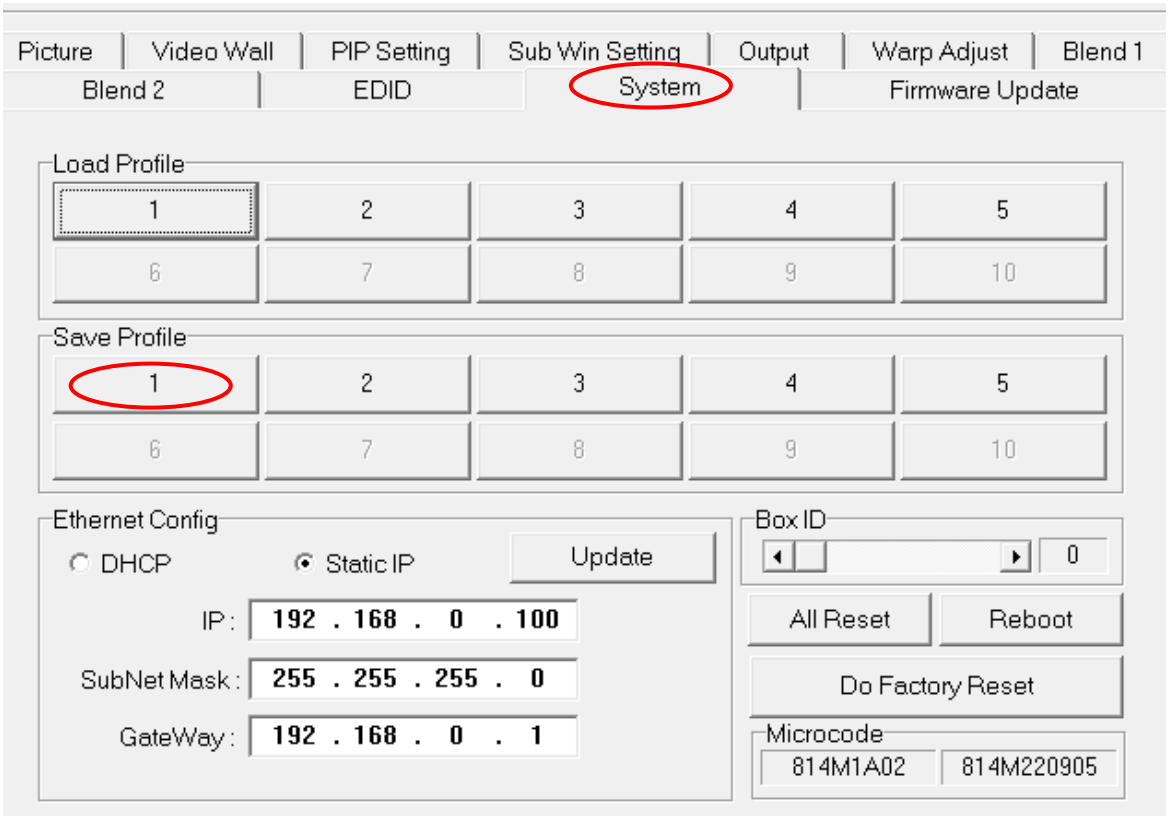
5. Keyboard Hotkeys for geometry alignment

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

- Click GCT [Warp Adjust]→ [Pattern] and select pattern color for each channel.
- [CTRL+ ALT+ #]: select channel
- [M]: Change Warp Adjust mode circularly from [2x2]→ [3x3]→ [5x3]→ [9x5]→ [17x9]→ [Wall]→ [2x2]→ [3x3]→ [5x3]…
- [CTRL + Arrow]: Select 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 different color mode.
- [CTRL + P]: turn OFF pattern to see OSD menu for the operation by IR controller
- [R]: Reset geometry alignment settings in current Warp Adjust mode and channel.

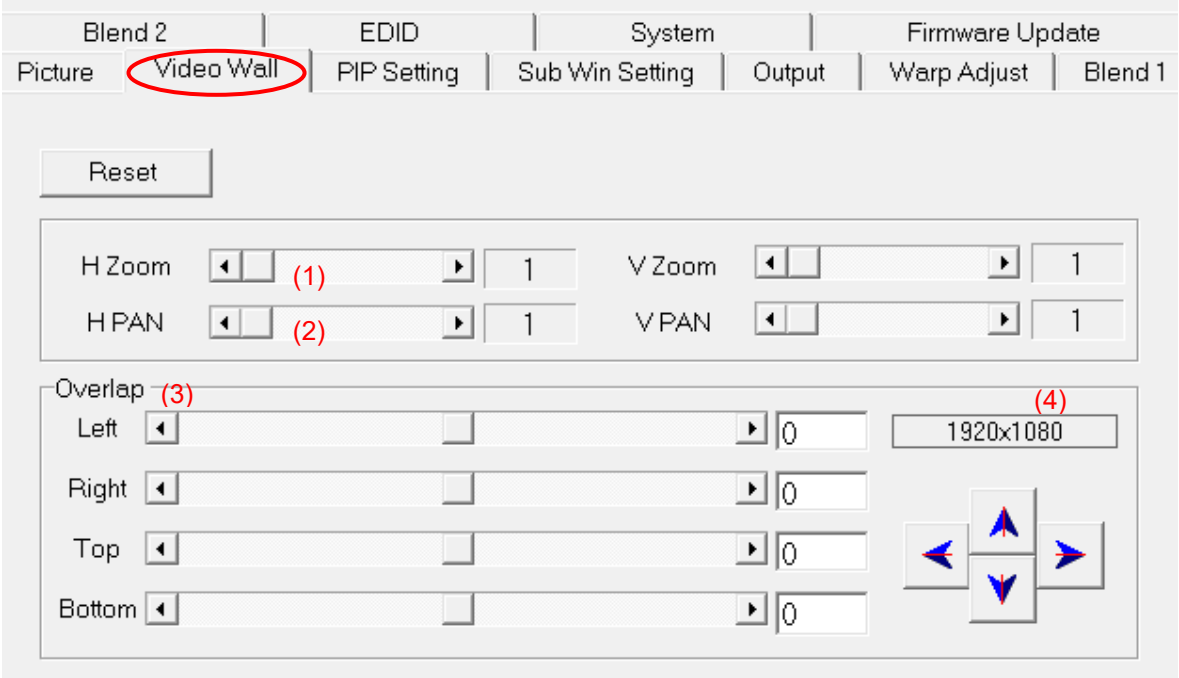
6. Save geometry alignment result temporarily

- Geometry alignment takes most of the time. After finishing geometry alignment, please save the result under [System]→ [Save Profile]. User can select 1~5 to save the result. Some model can be up to 10.
- Click [Save] + # key on IR controller will also save the settings in all channels at the same time.



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 edge 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. For 3 projector landscape edge blending, the LH projector [H Pan] is 1. The center projector [H Pan] is 2 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 Excel file is [VNS2022Q1].
  - (4) Show current output resolution. [VNS Edge Blend Calculator] shall use actual input and output resolutions while system setup. Please click [INFO] key on IR controller to check actual input/output resolution.
- Please see 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	20.0%	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

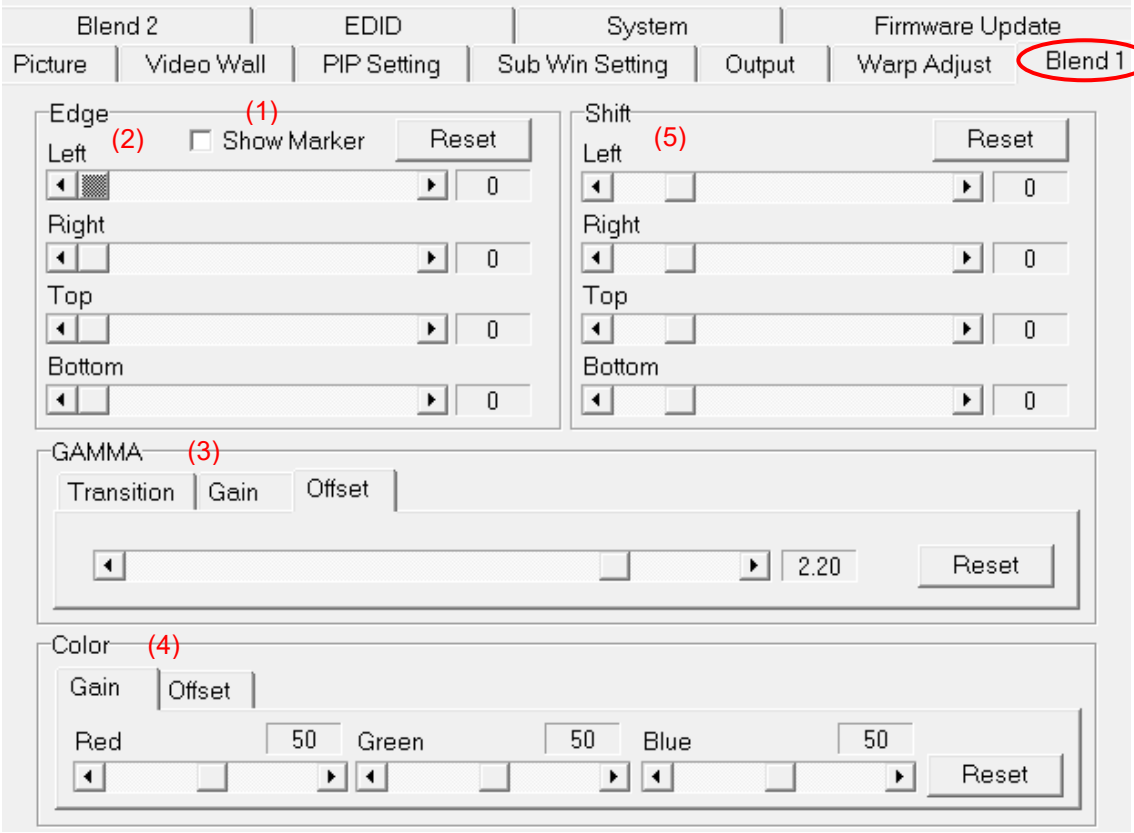
Overlap setting value

8. Edge Blend Setting

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

(1) Click [Show Marker]: green and red lines will show up at both edges in each edge blending region.

(2) Please select the overlap edge in each channel and increase the value to let red line and green lines be stacked together. The actual value is the same as projector overlap pixels. (Default pattern grid is 32 pixels)



(3) [Gamma]: for color fine-tune in overlap region. Please select [Transition] for further color fine-tune.

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

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

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

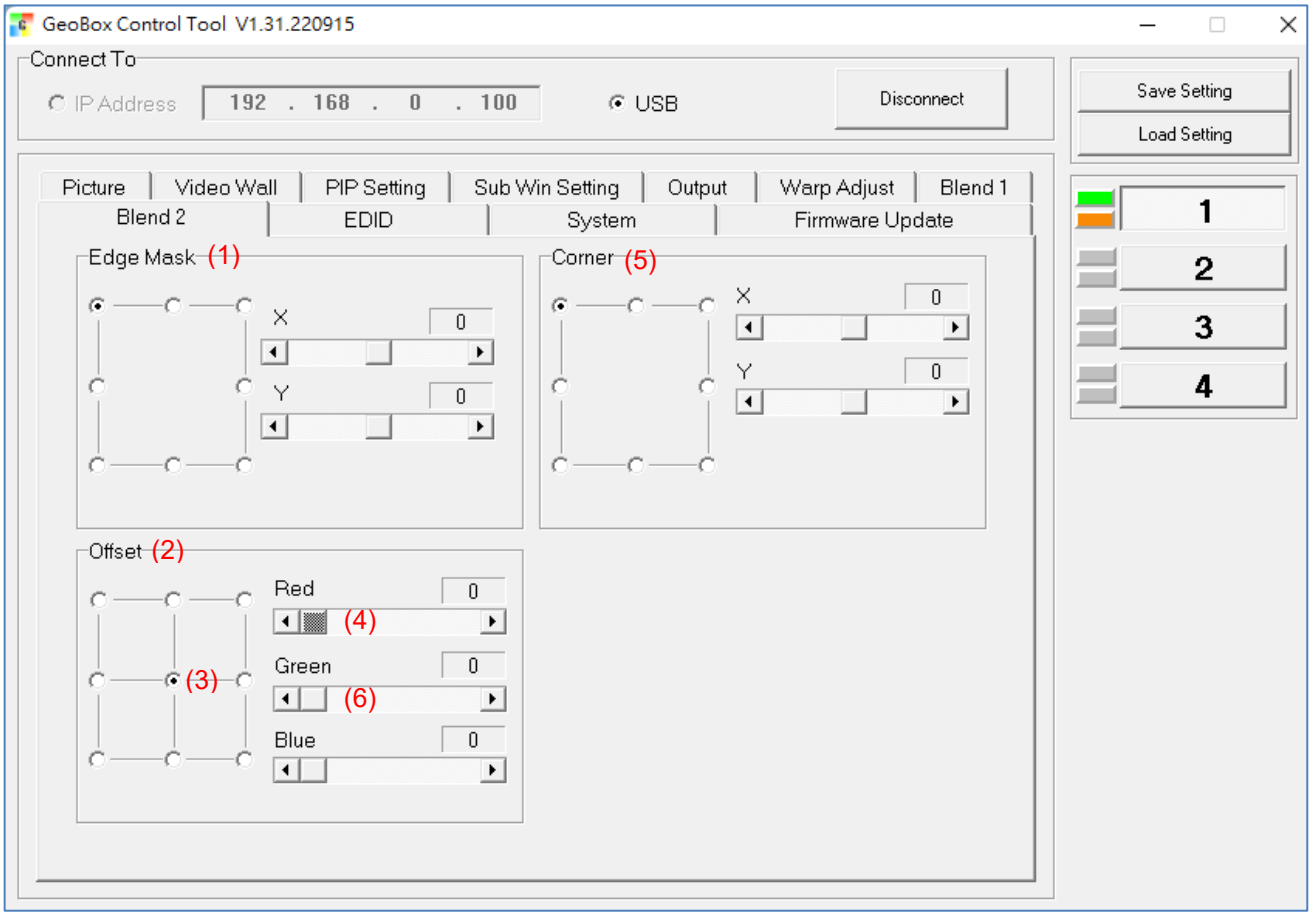
9. Edge Mask and Black Level Uplift

9.1. Edge Mask

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

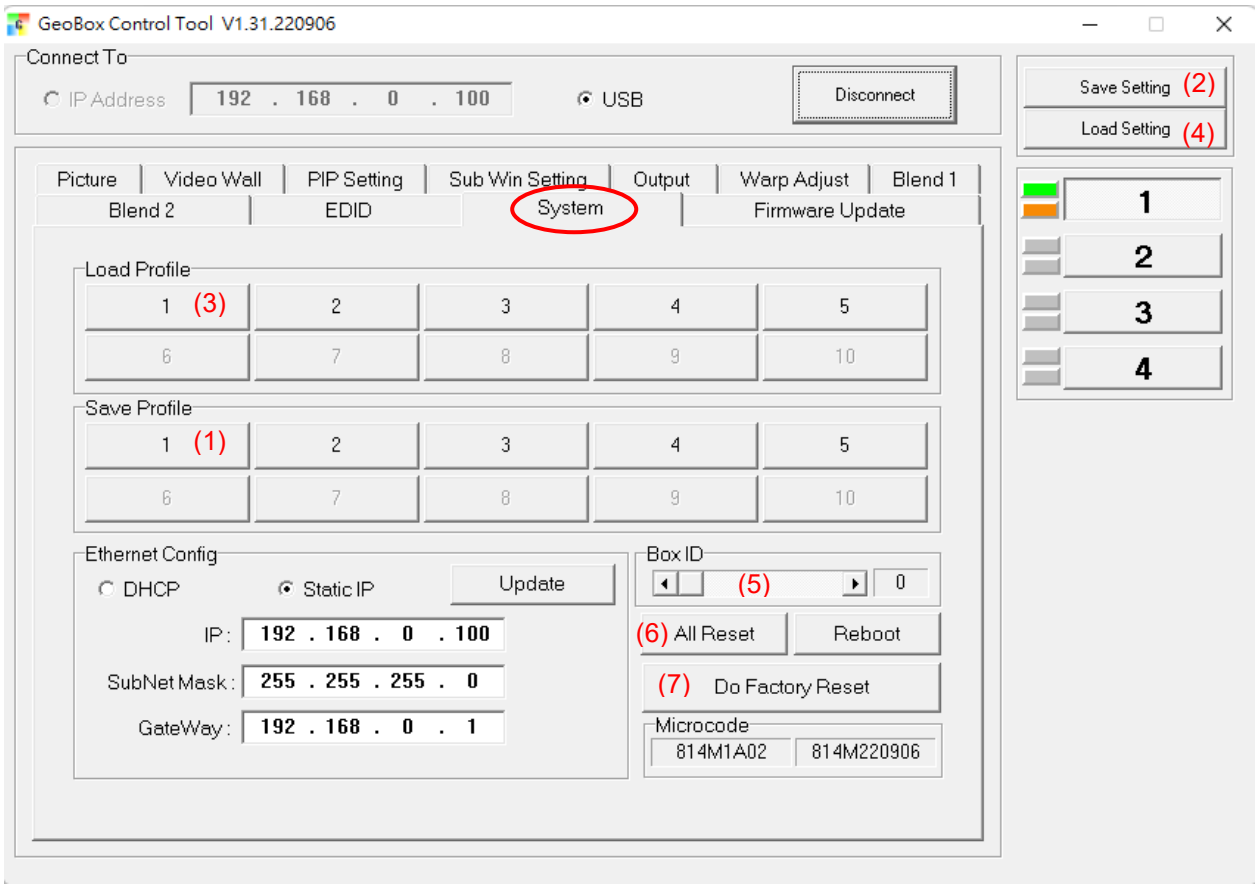
9.2. Black Level Uplift

To adjust [offset] (2) in RGB color independently in non-edge blending area to compensate the light leakage in projector 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 original region (3)→ Adjust RGB color (6) to let non-overlap region has similar color as 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

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



11. Load Back User Setting via GCT

User can load back the final settings from two locations:

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

12. Box ID and System Reset

(5) [Box ID] is for individual RS232 or IR control.

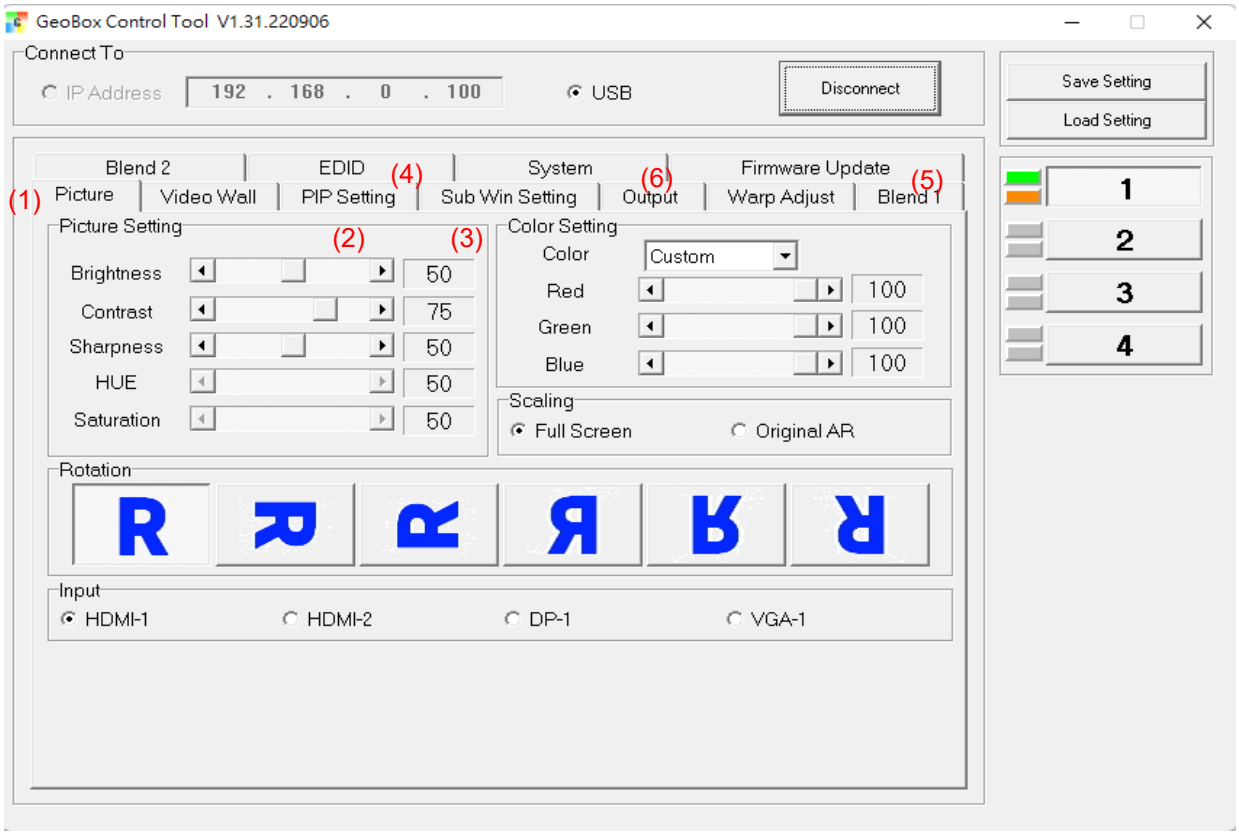
(6) [All Reset]: Reset all channels at the same time but not include Profile Index data.

(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 insert pin into 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: User can click [Reset] hotkey in remote controller to do 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 it will reset all channels simultaneously.
  - ✓ [Reboot]: It will reboot the system same as power OFF/ON the system again.
  - ✓ [Do Factory Reset]: The function is the same as reset from [Reset Hole]. It will execute deep reset into factory default value, including erase 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

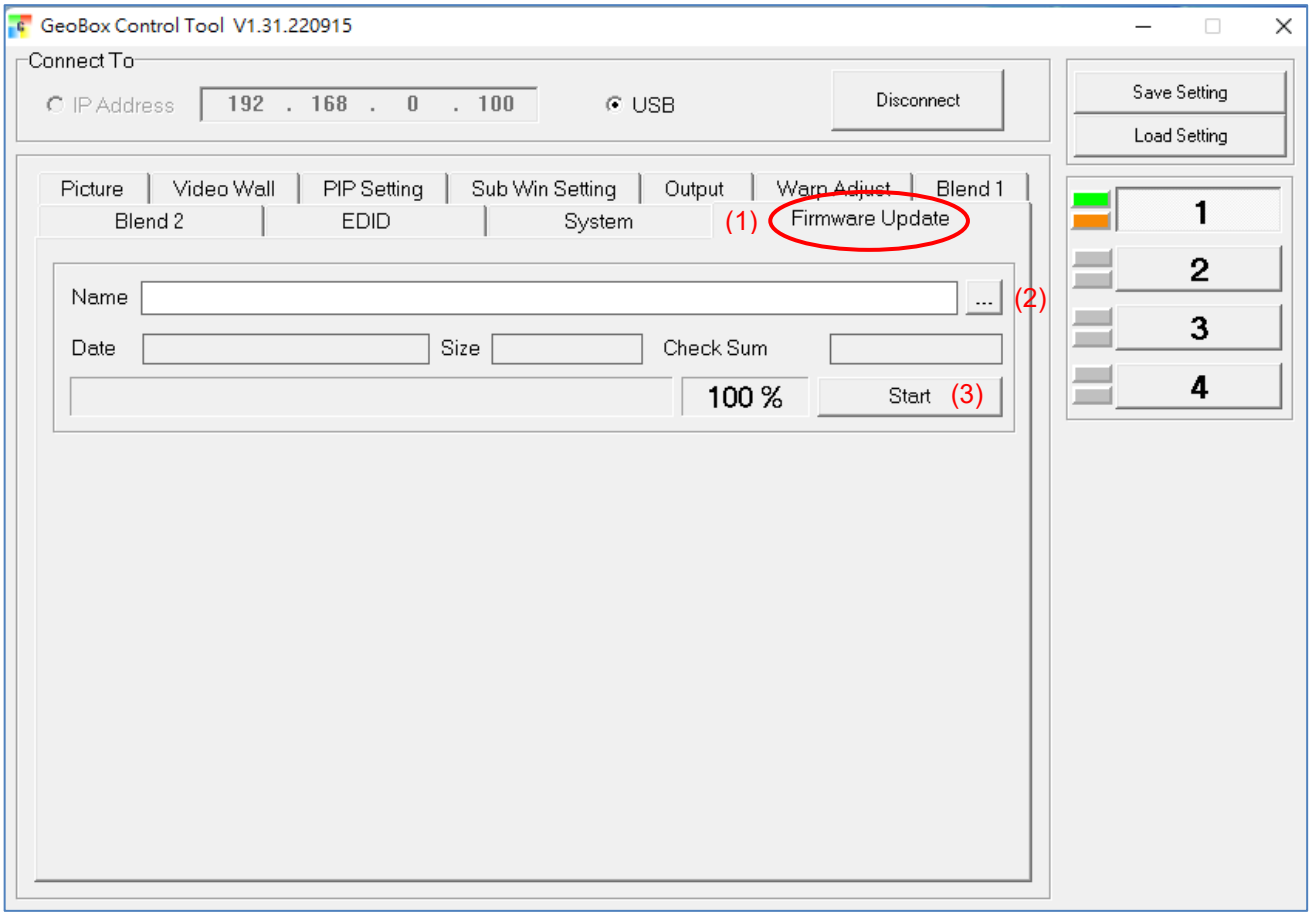
(4) [EDID]: set EDID resolution for each input port

(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. During FW update to 91%, it will stop for checksum checking for some time. Please wait till see [Process Done!] message.

(6) [Output]: Output resolution selection, HDCP control, Deep Color, 3D output format

15. Firmware and MCU code update

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



(1) Click [Firmware Update] to activate FW update window.

(2) Click (2) button and browser .bin file for the update. Please decompressed the file into .bin file if necessary.

(3) Click [Start] (3) to execute code update.

a) We propose to update MCU code first.

b) MCU code update is around 10 seconds. After finish MCU code update and click [OK] button, the system will reboot.

c) Please re-connect GCT to do FW update. FW update may be up to 270 seconds for some models. It will stop at 9% for few seconds and 91% for more than 1 minute to verify the result.

d) After finish code update, it will show [Process Done!] message.

e) Please click [OK], the system will reboot automatically and finish the update process.

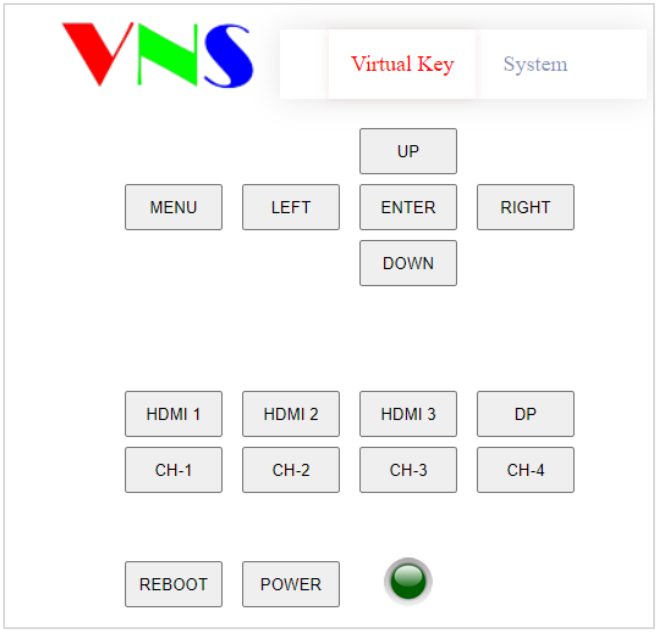
Important notice

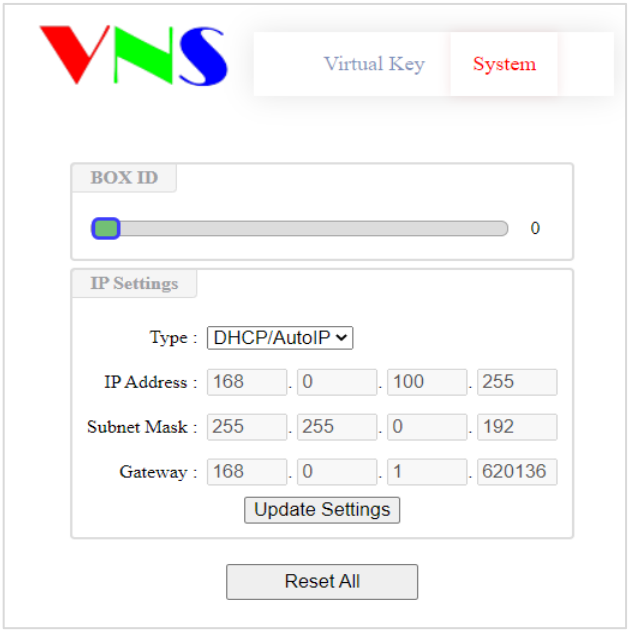
- After finish MCU and FW update, GeoBox will reboot again.
- After boot up the system and see abnormal display image, please use small Pin to insert Reset hole again for 5 seconds to erase all unnecessary settings from the system. User will see [Reset to Default] message and the system will automatically boot up again. It will erase the settings inside Profile Index.
- If user wants to keep Profile Index data, user can try to neglect the process of system Reset through reset hole unless user sees abnormal behavior in GeoBox.
- If fail during update process, please don't turn off the power. User can execute FW/MCU update processes again or reconnect USB and or re-open GCT to execute update procedure again.
- If the system can't work after code update or show blinking LED light on front panel when turn on the system, it is possible that the FW/MCU code is not for the right model. User can't connect with GCT again and needs to get into ISP mode to do code update. Please insert pin into RESET Hole on the back panel and power on the system. After see flashing LED on the front panel, release the pin (in some special case, user may not see flashing LED. User can release the insert pin after 3 seconds). Then user will be able to link GCT with the system again to do MCU code and FW update. After finish the MCU code update, please Power Off/On the system again. User should see normal display.

WebPage User Instruction

System connection and operation

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





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