G24 HDMI User Guide

This user guide provides basic instructions for setting up SEADA G24 HDMI video wall controllers using its management software.

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1. Product Introduction

1.1. Product profile

The G24 HDMI version of video wall controller accepts up to 2 HDMI inputs and displays them on 4 different displays, each with a resolution up to 4K@60fps 4:4:4. G24 HDMI not only allows the user to display a single input across all four screens, but also to display different input videos onto different screens working like a matrix switcher. Moreover, it also supports analogue L/R audio and digital SPDIF audio output.

1.2. Product capability

- Two HDMI 2.0 inputs with embedded audio
- Four HDMI 2.0 outputs with embedded audio
- Each input and output support resolutions up to 4K@60Hz 4:4:4
- Support up and down scaling on each output
- Support 180º rotation
- Support PIP on video wall
- Support 2 channels HDMI loop out
- Support daisy chain
- Balanced analog audio output
- L/R analog audio output
- Toslink digital audio outputs
- Support audio embedded and de-embedded
- Support Bezel Compensation
- Support CEC management
- Support EDID management
- Custom pre-set layouts
- HDCP compliant
- Support adjusting display settings such as contrast and saturation remotely
- Controllable via IP/serial port

1.3. Specifications

| Technical	
HDMI Compliance	HDMI 2.0
HDCP Compliance	HDCP 2.2/1.4
RS-232	Baud rate: 57600, data bit: 8, Stop bit: 1, no parity
Input Video Formats	4096x2160p 24/25/30/50/60Hz 1400x1050 60Hz 3840x2160p 24/25/30/50/60Hz 1366x768 60Hz 1080p 24/25/30/50/60Hz 1360x768 60Hz 1080i 50/60Hz 1280x1024 60Hz 1920x1200 60Hz 1280x960 60Hz 1680x1050 60Hz 1280x800 60Hz 1600x1200 60Hz 1024x768 60Hz 1440x900 60Hz 1280x720p50/60Hz
Audio Format	2.0 channel, 5.1 channel, LPCM, Dolby, AC3, DTS
ESD Protection	Human-body Model: ±8kV (Air-gap discharge), ±4kV (Contact discharge)
Mechanical	
Housing	Metal Enclosure
Color	Black
Dimensions	218mm (W)×146mm (D)×43mm (H)
Weight	2Kg
Supply Voltage	+12V/3A
Power Consumption	25W (Max)
Operating Temperature	0°C ~ 40°C / 32°F ~ 104°F
Storage Temperature	-20°C ~ 70°C / -4°F ~ 158°F
Relative Humidity	10%~50% RH (non-condensing)

2. Hardware Overview

2.1. Front Panel
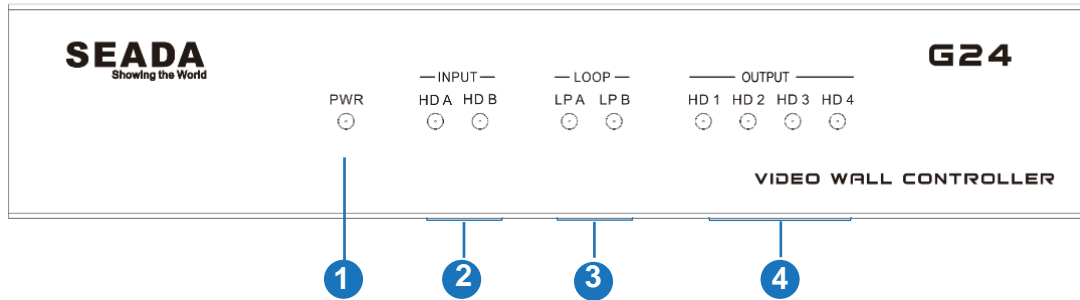
| No.	Name	Function Description
1	Power LED	Power LED will be on when the unit is powered on.
2	INPUT LED	The LED will be on when the corresponding HDMI input port is connected to active HDMI source device.
3	LOOP LED	The LED will be on when the corresponding LOOP OUT port is connected to HDMI display device.
4	OUTPUT LED	The LED will be on when the corresponding HDMI output port is connected to HDMI display device.

2.2.   Rear Panel
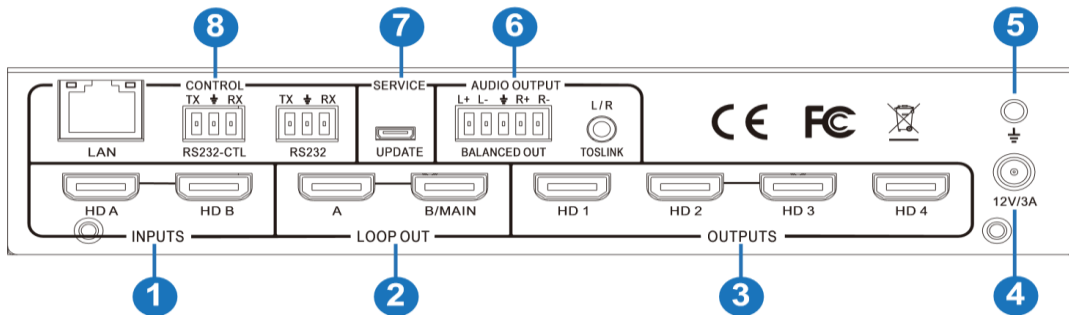
No.	Name	Function Description
1	INPUTS	HDMI signal input ports, connect to HDMI source devices
2	LOOP OUT	HDMI signal loop out ports. Loop out HDMI A/B signal to downstream.
3	OUTPUTS	HDMI signal scaling output for video wall.
4	12V/3A	DC 12V/3A power supply port.
5	GND	Ground the product housing.
6	AUDIO OUTPUT	TOSLINK: • Analog L/R audio output: 3.5mm Stereo Jack • Digital SPDIF audio output
		BALANCED OUT: 5-pin phoenix connector, 20Hz ~ 20kHz, 1.5Vrms max.
7	SERVICE	Firmware update port
8	CONTROL	LAN: Unit IP control RS232-CTL: Unit RS232 control RS232: Loop out from RS232-CTL

3. Connection Setup

3.1. RS232 wiring

RS-232 control, baud rate 57600, 3-Pin Phoenix connector

3 Pins Phoenix Connector

Female RS232

RS232 to USB
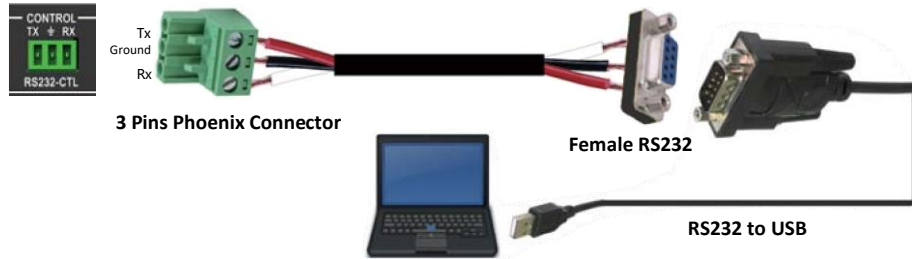
3.2. RS232 and Ethernet Connection

Connect the G24 HDMI unit with the control PC using either CAT cable or wired serial cable.

4. G24 Software User Guide

Users can run the G24H.exe software directly without installation. Software can be downloaded from the SEADA website. Double click the G24H software to get the UI as below:
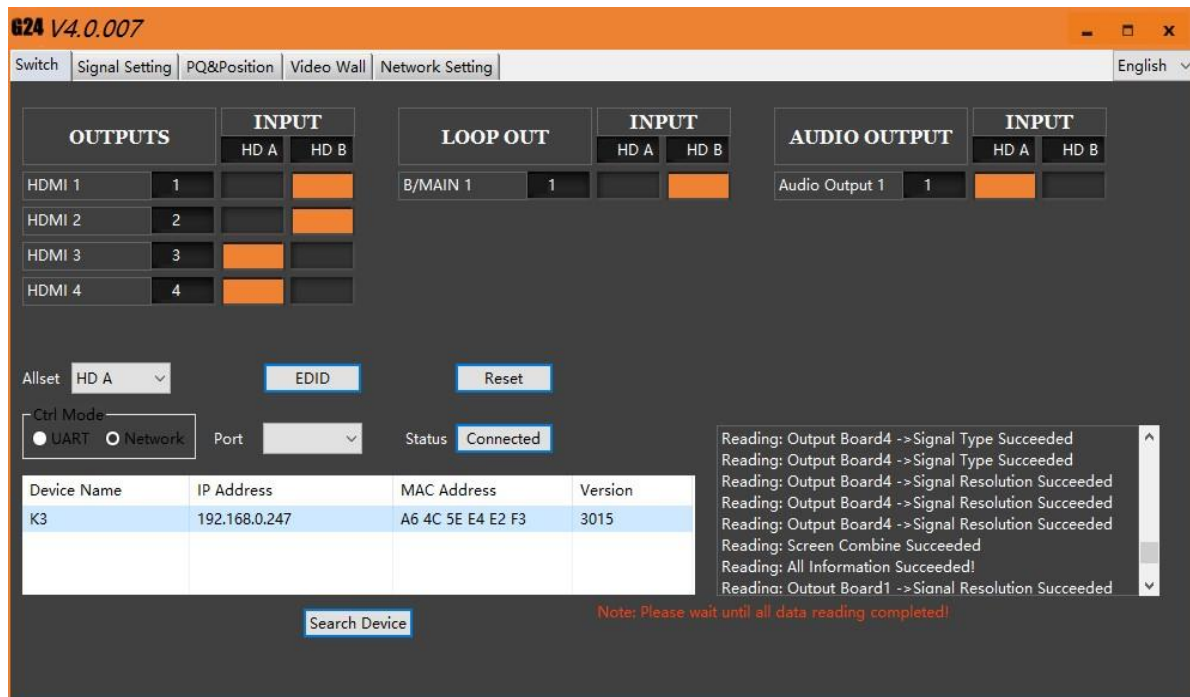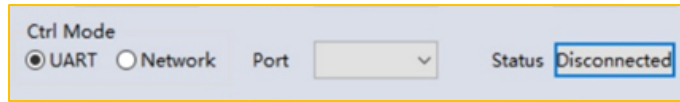

There are **5** main tabs in this software to help users set up and control the G24 HDMI video wall controller.

4.1.   Matrix Switch

Users can connect the G24 HDMI device to control PC and set up the device as matrix switcher in this section.

4.1.1. Connect to the G24 HDMI via UART for RS232

Connect the G24 HDMI to the control PC with a serial cable (see 3.1 for cable wiring)

 If the software was connected via UART (RS232) last time, software will connect to the G24 HDMI automatically via RS232. If it was used at Network last time, a 'Network Timeout' error message will be shown on screen and users need to set up as below for RS232 connection in the software

•   Choose 'UART' instead of 'Network'

•   Select the COM port from the Port dropdown menu

•   Press 'Disconnected' button to connect

The software will check all the parts of the device. A 'Read data succeeded' dialog box will be shown on screen when finished.
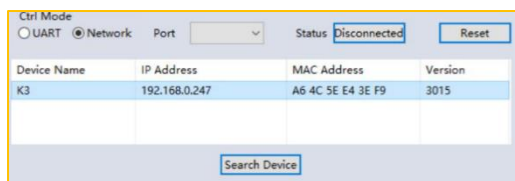
4.1.2. Connect to the G24 HDMI via Network

The default IP address for G24 HDMI controller is **192.168.0.247**, Users need to change the IP address of the control PC to the same network segment as the G24 HDMI.
• Change the **'Obtain an IP address automatically'** to **'Use the following IP address'** to set up a **static** IP address of **TCP/IPv4** in **Ethernet Properties**

➢IP address: any address between **192.168.0.2** and **192.168.0.254** except the address which has been taken by the G24 HDMI
➢Subnet mask: **255.255.255.0,** Default Gateway: **192.168.0.1**

Connect the G24 HDMI with a CAT cable to the control PC (cable included in the package)
If the software was connected via Network last time, software will connect to the G24 HDMI automatically via network. If it was used at serial port last time, a 'Please select COM port' error message will be shown on screen and users need to set up as below for Network connection in the software
• Choose **'Network'** instead of **'UART'**
• Press **'Search Device'** button to find the G24 HDMI on the network
• Highlight the device Press **'Disconnected'** button to connect

4.1.3. Matrix Switch Routing

Users can switch and assign different inputs to the selected outputs in the matrix. The name of the output can also be changed by selecting the default name – HDMI 1 and replacing it with the chosen name.


Users need to disable the video wall mode (Cancel the splicing) to enable the matrix switcher mode

- **LOOP OUT**: Choose input source for B/MAIN output port.
- **AUDIO OUTPUT**: Choose audio source for balanced audio output and Mini Toslink output

4.1.4. Allset, Recall, Save As and Reset
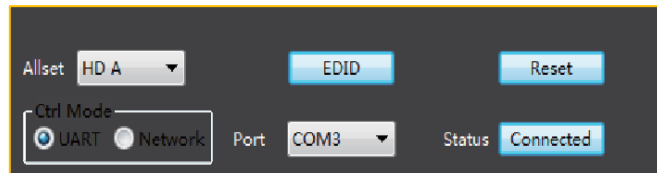
- The **Allset** dropdown menu helps the users select a single input to be displayed on all of the screens (i.e. Allset HD A would display Input A on Output 1, Output 2, Output 3 and Output 4)
- **Reset**: Reset the unit to default factory configuration.
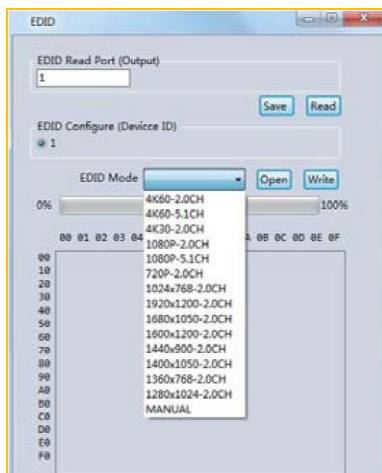
- **EDID**:
- ✓ **Read:** read the EDID of the selected output
- ✓ **Save:** save the displayed EDID after 'Read'
- ✓ **Open:** open an EDID from previous saved EDID
- ✓ **Write:** write the current displayed EDID onto selected input to customized input EDID

4.2.   Signal setting
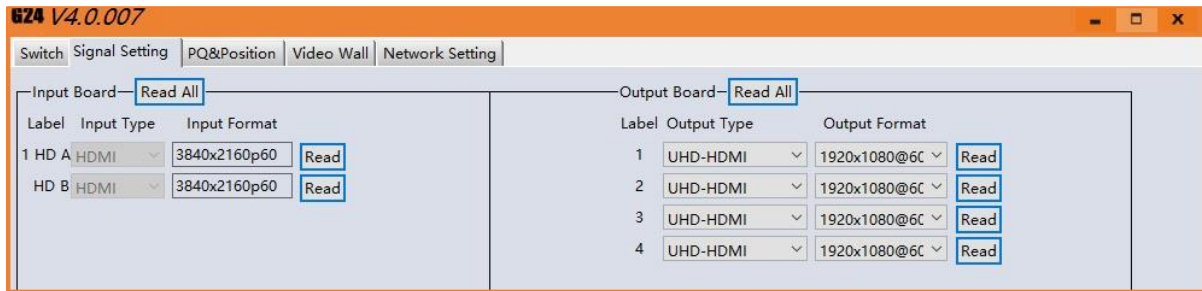
Signal Settings tab, users can use the **'Read All'** function button to recognize the type and resolution automatically. Additionally, you can also manually read one Input/output at a time – pressing the **Read** button next to the selected input will only read that input alone.

I.   **Input Type** Shows the input video sources type (HDMI or DVI)

II.   **Input Format** Shows the resolution of the input video sources

III.   **Output Type**

• **UHD-HDMI** Set the respective output signal to HDMI without HDCP.
• **UHD-DVI** Set the respective output signal to DVI, with no audio output
• **UHD-HDMI 1.4** Set the respective output signal to HDMI with HDCP 1.4 compliance.
• **UHD-HDMI 2.2** Set the respective output signal to HDMI with HDCP 2.2 compliance.

IV.   **Output Format**

Users can manually change the output resolution here to match the requirement of the receiving side (the default setting is 1920 x 1080@60, there are total 14 preset resolutions to choose from)
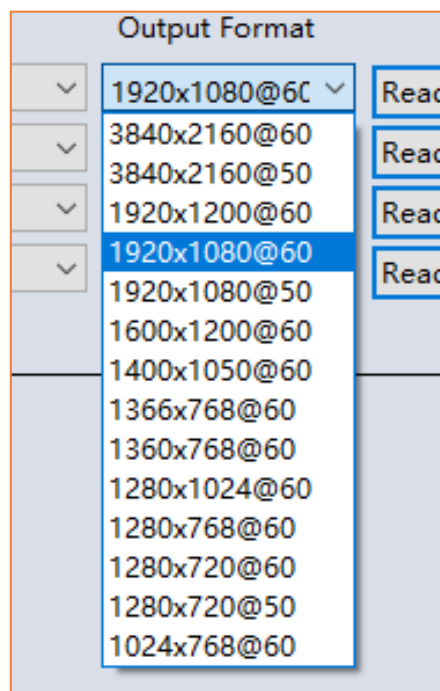
4.3. Fine Tune:PQ
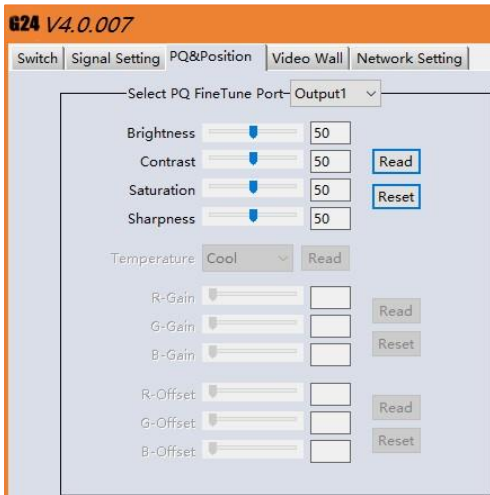
This section allows the user to fine-tune the settings of their screen from the G24H software.

The dropdown menu at the top of the section allows the user to select which screen to apply the settings to.

The read option reads the settings of the monitor/screen that are already in place and adjusts the values in the software, while the reset button will reset the settings to their default after they have been manually adjusted.

4.4. Video Wall
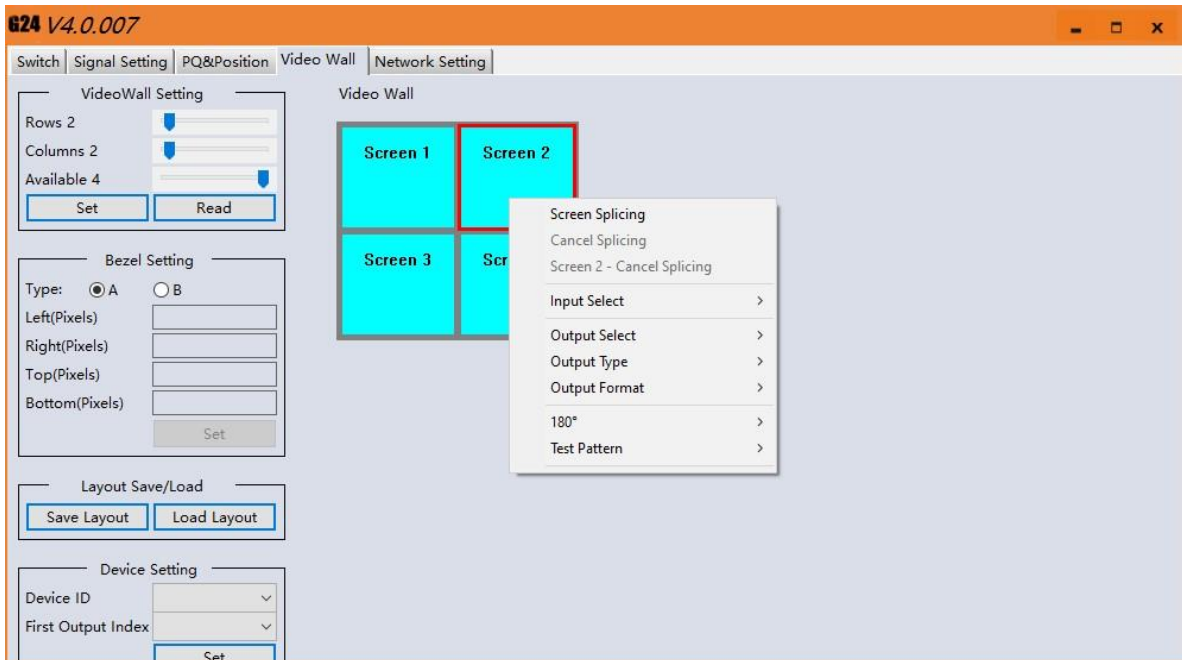
uses can set up the video wall layouts and signal configuration in this section

4.4.1. Video Wall Layout Setup
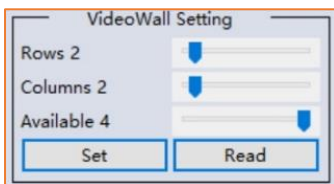
Users can set up the layout of the video wall in 'VideoWall Setting' by simply choosing how many rows and columns the video wall consists of. Total screens amount is up to 4 for one G24 HDMI video wall controller.

4.4.2. Creating the video wall

Click to select the screen, then drag & select the screens to splice, right-click, and click Screen splicing to form a video wall.

- **Screen Splicing** - This combines the selected screens into one and displays the selected input across all the splicing screens. For example, in the setup below 2x2, if all of them are spliced, then the input selected by the user will be displayed across all the 4 screens (Note: this is not the same as duplicating a single input on each output).
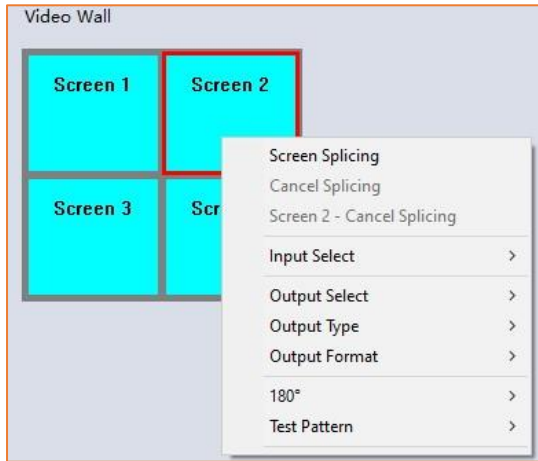
- **Cancel Splicing –** This will cancel the video wall and revert to the matrix switching mode.
- **Screen – Cancel Splicing –** Remove the single screen x from the video wall to allow the displaying another full frame image within the video wall configuration
- **Input Select –** Use the sub-menu to select the input to display on the video wall or the secondary input image shown in the above example.
- **Output Select –** The user can control which screen should be mapped to which output (only available in matrix mode)
- **Output Type –** Allows the user to adjust the type of the output (only in matrix mode)
- **Output Format –** Controls the resolution of the output (only available in matrix mode)
- **180° –** Rotate the selected screen 180°.
- **Test Pattern –** To display Color Bar pattern on the screen

4.4.3. Bezel Correction

Users can set up the bezel correction for the video walls here to compensate the frame of the screens to make the whole video wall look like one large screen without any distortion. Users can either use **pixels of the screen frame width** or **millimeter of the screen display area** to set up the bezel correction here
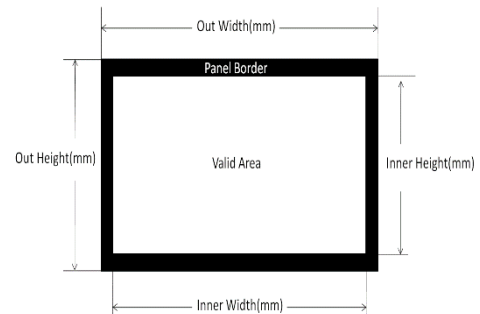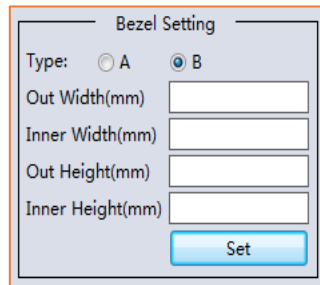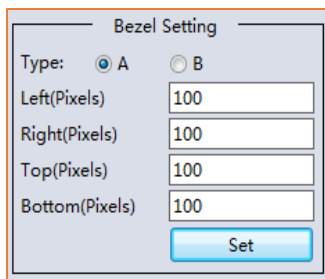
4.4.4. Save and Load Pre-set Layout
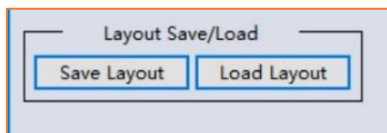
The user can save the video wall preset layouts and load it later via the **Save Layout** and **Load Layout** dropdown menu. Users can save up to 10 preset layouts here. Users also can recall these preset layouts via 3rd party controller though IP or RS232

4.4.5. Daisy Chain

Users can set up the daisy chain for multi units of G24 to achieve a big video wall (up to 16x16). A four units daisy chain to form a 4x4 video wall will be used as an example below.

I. Set up the Devices' ID and First Output Index

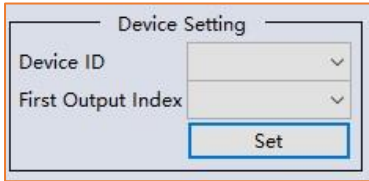Users need to configure each unit with unique ID and output Index to enable control software to be able to recognize and control them in one system.

All units come with default Device ID:1 and First Output Index:1. Users only need to set up from 2nd G24.

	Device ID	First Output Index
G24 unit 1	1	1
G24 unit 2	2	5
G24 unit 3	3	9
G24 unit 4	4	13

First Output Index = 1 + (N-1) *4, N is the device ID

Noted: Any unit with Device ID being more than 1, G24 control software will not be able to connect it individually since the software will try to find device with ID 1 first. However, users are still able to change the Device ID and First Output Index without being connected properly.

II. Serial Ports Connection

Users are only able to use Serial port to connect and control the G24 units when they are working in daisy chain mode.

	RS232-Control Port	RS232 Port
G24 unit 1	To PC/Laptop	To RS232-Control port on unit2
G24 unit 2	To RS232 port on unit1	To RS232-Control port on unit3
G24 unit 3	To RS232 port on unit2	To RS232-Control port on unit4
G24 unit 4	To RS232 port on unit3	

Note: Please make sure the serial cable between G24 units is cross wired. Tx to RX, G to G and RX to TX

III.   HDMI Cables Connections

Input1   **Input2**
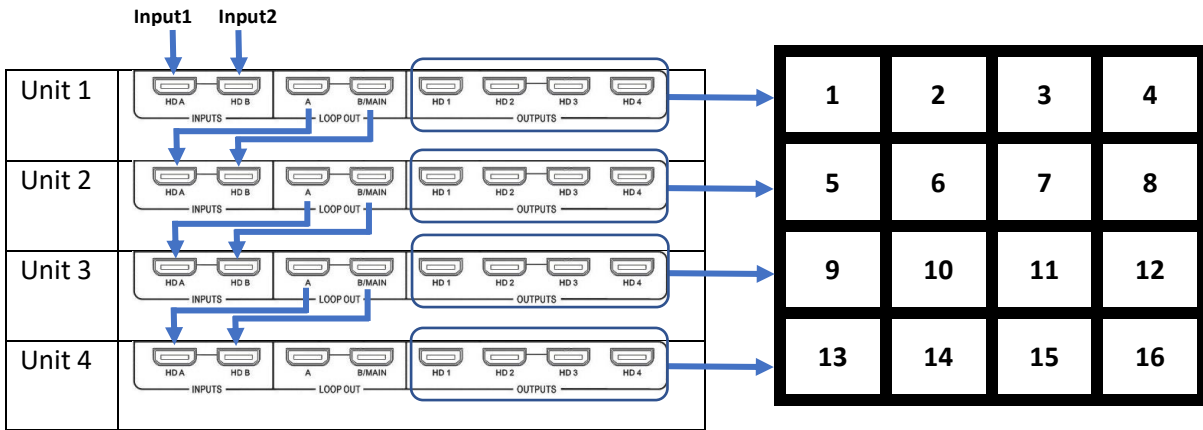
Connect all the inputs with video sources and outputs with video wall screens using professional AV HDMI cables.

IV.   Setup in the Software
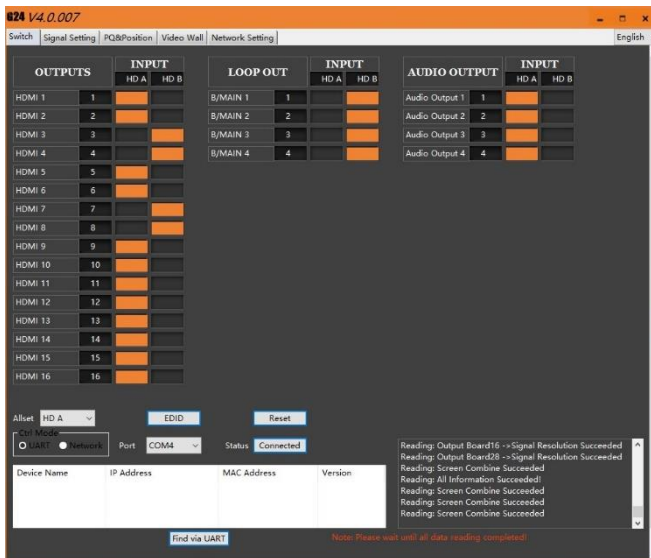
Run the G24 software and connect through RS232-control on device 1 and software will detect all 4 G24 and display 16 outputs in the software like below.
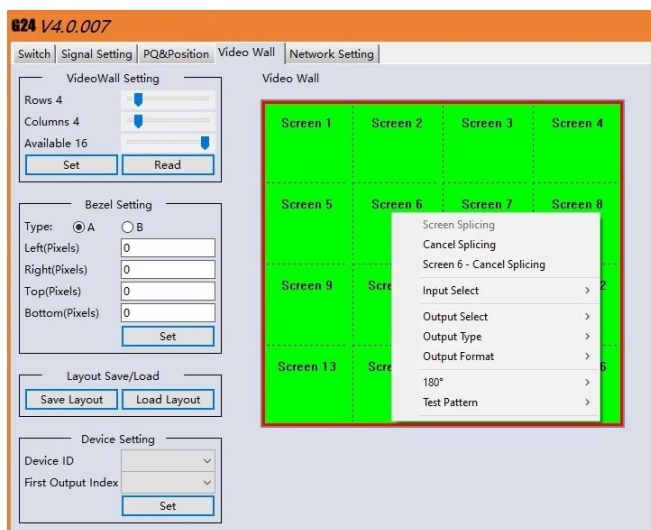
In Video Wall, set up the desired video wall layout by choosing the correct Rows and Columns in Video Wall Setting.

4.5.   Network Setting
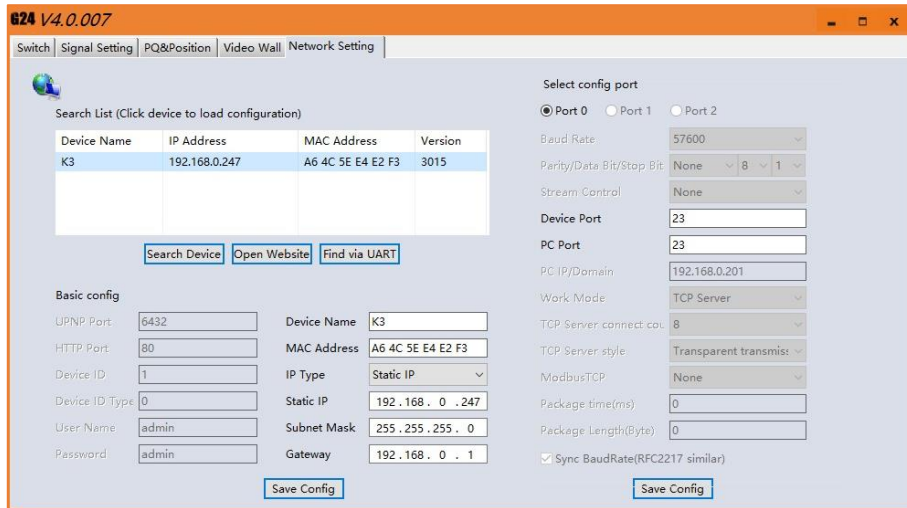
Users can find all the device network information in this section and do the modification if needed.

Users can change the IP address of this unit in this section to fit the network requirement of controlling system.

The device port here is for TCP/IP controlling from any 3rd party controller. Default is 23 and recommend to keep it unchanged unless it is necessary.

5. Command Lines

All the ASCII commands given in this section use the following RS232 port settings:

- Baud Rate: 57600
- Data Bits: 8
- Parity: None
- Stop Bits: 1

All the ASCII RS232 commands given in this section can also be sent to the LAN port using the following settings:

- Default IP Address: 192.168.0.247
- Default Network Mask: 255.255.255.0
- Default Gateway: 192.168.0.1
- Port: 23

Notes:

- All commands in this section are always terminated with the ASCII carriage-return character, 0x0d. This is represented by the ↵ symbol in each command.
- All responses are always terminated with the ASCII carriage-return and line-feed sequence (0x0d 0x0a).
- All spaces shown in the command are required. Lowercase letters are used as value placement indicators, the required value or identifier is given in the Details panel for each command.

5.1.   Recall/Save Preset Layouts of Video Wall

Operation type (3 byte)	Spacer (1 byte)	Target (N bytes)	Spacer (1 byte)	Command type (10 bytes)	Command parameters (1/2/3 bytes)	Command tail (1 byte)
SET/GET	Space	SYS	Space	ROUTE-MODE	x/xx/xxx x is the mode value	↵ This is ASCII carriage return 0x0d

A. **GET (Recall) the route mode saved before:**
   For example, GET (Recall) the video wall preset layout 1
   Send: GET SYS ROUTE-MODE 1↵   **Receive:** SYS ROUTE-MODE 1

B. **SET (Save) current route to a mode:**
   For example: SET (Save) current layout to preset layout 1
   Send: SET SYS ROUTE-MODE 1↵   **Receive:** SYS ROUTE-MODE 1

5.2.   Matrix Video Routing

Operation type (3 byte)	Spacer (1 byte)	Target (N bytes)	Spacer (1 byte)	Command type (10 bytes)	Command parameters (N bytes)	Command tail (1 byte)
SET	Space	INx/INxx/INxxx x is the input port number For example, IN1/IN01/IN001	Space	VIDEO	OUTa [OUTb OUTc …] or ALL	↵ This is ASCII carriage return 0x0d

- **Set video route: Input port-x/xx/xxx switch to output port-a/b/c…, or all output ports**
  For example: SET video route: Input port 1 switch to output port 1
  Send: SET IN1 VIDEO OUT1↵   **Receive:** IN1 VIDEO OUT1
  For example: SET video route: Input port 1 switch to all output ports
  Send: SET IN1 VIDEO ALL↵   **Receive:** IN1 VIDEO ALL

5.3.   Audio out Selection

Operation type (3 byte)	Spacer (1 byte)	Target (N bytes)	Spacer (1 byte)	Command type (10 bytes)	Command parameters (N bytes)	Command tail (1 byte)
SET	Space	INx/INxx/INxxx x is the input port number For example, IN1/IN01/IN001	Space	AUDIO-ROUTE	LR	↵ This is ASCII carriage return 0x0d

- **Set audio from input x to LR and TOSLINK out**
  For example: SET audio from Input port 1 LR and TOSLINK out
  Send: SET IN1 AUDIO-ROUTE LR↵   **Receive:** IN1 AUDIO-ROUTE LR

5.4. Choose Input Source for B/MAIN Output Port

Operation type (3 byte)	Spacer (1 byte)	Target (N bytes)	Spacer (1 byte)	Command type (10 bytes)	Command parameters (N bytes)	Command tail (1 byte)
SET	Space	INx/INxx/INxxx x is the input port number For example, IN1/IN01/IN001	Space	LOOP-OUT	MAIN	↵ This is ASCII carriage return 0x0d

- **Choose Input Source for B/MAIN Output Port**
  For example: SET video from Input port 2 to B/MAIN loop out
  Send: SET IN2 LOOP-OUT MAIN↵   **Receive:** IN2 LOOP-OUT MAIN

5.5. Read Device IP Address

Operation type (3 byte)	Spacer (1 byte)	Target (N bytes)	Spacer (1 byte)	Command type (10 bytes)	Command parameters (N bytes)	Command tail (1 byte)
GET	Space	SYS	Space	IP		↵ This is ASCII carriage return 0x0d

For example, GET the device IP (MAC: A64C5EE4E2FB)
Send: GET SYS IP↵   Receive: SYS IP A64C5EE4E2FB STATIC,192.168.0.247,255.255.255.0,192.168.0.1

6. Troubleshooting

6.1. No Connection

6.1.1. Ensure the G24 HDMI is powered up

6.1.2. Ensure the PC and G24 HDMI at the same IP group

6.1.3. Ensure the right connection mode is selected (IP or RS232)

6.1.4. No Signal sign or black screen will be shown on screen when no video input is applied.

6.2. No Output

6.2.1. Ensure the video source is on

6.2.2. Ensure the video source device sends the signal out (G24 HDMI INPUT statue LED light will be on if input video signal presents)

6.3. Black screen

6.3.1. Ensure the G24 HDMI and screens are powered up

6.3.2. Ensure the connection to screens are OK

6.3.3. Ensure the screens on correct channel (DVI or HDMI)

6.3.4. Ensure that the inputs are assigned correctly (i.e. Input 1 on Output 1, Input 2 on Output 2 etc.

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