# 4x4 4K HDMI Audio and Video Matrix with Downscaling

EVMX4K4A Product Manual

**EVOLUTION**

## ⚠️ Safety Instructions

For optimum performance and safety, please read these instructions carefully before use and keep this guide for future reference. Please have the part number, serial number, and invoice available when requesting support.

- To prevent an electrical shock, please ensure all devices are properly grounded.
- Place the device in a well-ventilated area and do not block any ventilation openings.
- Do not expose or place device near water - liquid may cause a failure, fire, or eletrical shock.
- Do not place the device on an uneven or unstable surface - a fall may result in a malfunction.
- Never insert anything metallic into the device - this may cause an electrical shock.
- If a third-party power supply is used, please ensure it meets the requirements of this device.

### Additional Resources
Visit the product page at www.vanco1.com for the latest version of this document and other resources.

## Description

The EVMX4K4A is a powerful and versatile 4x4 4K HDMI matrix designed for high-performance AV distribution in professional environments. This matrix supports full 4K@60Hz resolutions with HDR and features four independently switchable outputs with built-in downscaling, allowing for seamless integration with both 4K and 1080p displays. An integrated audio matrix provides flexible analog and digital audio routing and extraction, enabling independent audio distribution alongside video switching. Control is streamlined with built-in IR, RS-232, and IP options, ensuring compatibility with a wide range of control systems. The matrix also offers enhanced compatibility with active optical HDMI cables, delivering reliable long-distance signal transmission. Ideal for conference rooms, residential AV systems, and digital signage applications, the EVMX4K4A ensures robust performance and flexibility.

### Key features:
- 4x4 4K HDMI audio and video matrix switcher
- Supports 4K@60, 4:4:4, HDR resolutions
- HDCP 2.3 compliant
- Integrated audio matrix to route and de-embed analog or digital audio
- Variable volume adjustments available on each L+R output.
- Supports 4K to 1080p downscaling
- Additional 2.5W of power for enhanced Active Optical Cable (AoC) stability
- Controllable by front panel, IR, RS232, and TCP/IP

### Box contents:
(1) EVMX4K4A matrix
(2) Mounting ears with 6 screws
(4) Plastic cushions
(1) IR remote
(1) IR receiver
(1) RS232 cable (3-pin to DB9)
(1) Power adaptor (DC 24V/1.25A)
(1) Quick start guide

# Specifications

Vanco International LLC reserves the right to change the specifications, features, and/or appearance of this product at any time without notice. Visit www.vanco1.com for the lastest versions of the manual and other resources.

| Video | |
|---|---|
| Video Input | 4 x HDMI |
| Video Input Connector | 4 x Type-A female HDMI |
| Video input Video Resolution | Up to 4K@60Hz 4:4:4 |
| Video Output | 4 x HDMI |
| Video Output Connector | 4 x Type-A female HDMI, |
| Video output Video Resolution | Up to 4K@60Hz 4:4:4 |
| HDMI Output | Supports up to 5V/0.5A for AoC cable |
| HDMI Version | HDMI 2.0 |
| HDCP Version | HDCP 2.3 |
| HDMI Audio Signal | LPCM 7.1 audio, Dolby Atmos®, Dolby® TrueHD, Dolby Digital® Plus, DTS:X™, and DTS-HD® Master Audio™ pass-through. |
| **Digital Audio Output** | |
| Output | 4 x Digital S/PDIF audio |
| Output Connector | 4 x Toslink connector |
| Digital SPDIF Audio Format | Supports PCM, Dolby Digital, DTS, DTS-HD |
| Frequency Response | 20 Hz to 20 kHz, ±1dB |
| Max Output level | ±0.05dBFS |
| THD+N | < 0.05%, 20 Hz – 20 kHz bandwidth, 1 kHz sine at 0dBFS level (or max level) |
| SNR | > 90dB, 20Hz-20 kHz bandwidth |
| Crosstalk Isolation | < -70 dB, 10 kHz sine at 0dBFS level (or max level before clipping) |
| Noise | -90dB |
| **Analog Audio Output** | |
| Output | 4 x Analog L/R Audio |
| Output Connector | 4 x L&R (RCA) |
| Digital SPDIF Audio Format | PCM 2CH |
| Frequency Response | 20 Hz to 20 kHz, ±1dB |
| Max output level | 2.0Vrms ± 0.5dB. 2V = 16dB headroom above -10dBV (316 mV) nominal consumer line level signal |
| THD+N | < 0.05%, 20 Hz – 20 kHz bandwidth, 1 kHz sine at 0dBFS level (or max level) |
| SNR | > 80dB, 20Hz-20 kHz bandwidth |
| Crosstalk Isolation | < -80 dB, 10 kHz sine at 0dBFS level (or max level before clipping) |
| L-R Level Deviation | < 0.05 dB, 1 kHz sine at 0dBFS level (or max level before clipping) |
| Frequency Response Deviation | < ± 0.5dB 20Hz - 20KHz |
| Output Load Capability | 1k ohm and higher (supports 10x paralleled 10k ohm loads) |
| Noise | -80dB |

| Control | |
|---|---|
| Control Port | 1 x IR EYE, 1 x RS-232, 1 x FIRMWARE, 1 x TCP/IP |
| Control Connector | 1 x 3.5mm jack, 1 x 3-pin terminal block, 1 x USB-A, 1 x RJ45, |

| General | |
|---|---|
| Transmission Distance | 4K@60Hz 4:4:4 up to 16ft/5m, 4K@60Hz 4:2:0 up to 33ft/10m, and  1080p up to 50ft/15m |
| Bandwidth | 18Gbps |
| Operation Temperature | 23 ~ 131°F / -5 ~ +55°C |
| Storage Temperature | 13 ~ 158°F / -25 ~ +70°C |
| Relative Humidity | 10 - 90% |
| External Power Supply | Input: AC 100~240V, 50/60Hz; |
| Output: DC 24V/1.25A | > 90dB, 20Hz-20 kHz bandwidth |
| Maximum Power Consumption | 18.3W |
| Dimension (W*H*D) | 17" x 1.7" x 9.3" / 436.4mm x 44mm x 236mm |
| Net Weight | 5.7lbs / 2.6kg |

## Video Resolution Downscaling

This product supports video resolution downscaling with the 4K to 1080p downscaling for compatibility.
See chart below for downscaling specifications.

| Control | | | | Output | |
|---|---|---|---|---|---|
| # | Resolution | Refresh | Color Space | Downscale | 1080p Specs |
| 1 | 3840x2160 | 60 | 4:4:4 | Support | 1080p@60Hz 4:4:4 |
| 2 | 3840x2160 | 30 | 4:4:4 | Support | 1080p@30Hz 4:4:4 |
| 3 | 3840x2160 | 24 | 4:4:4 | Support | 1080p@24Hz 4:4:4 |
| 4 | 3840x2160 | 60 | 4:2:0 | Support | 1080p@60Hz 4:4:4 |
| 5 | 3840x2160 | 30 | 4:2:0 | Support | 1080p@30Hz 4:4:4 |
| 6 | 3840x2160 | 24 | 4:2:0 | Support | 1080p@24Hz 4:4:4 |
| 7 | 3840x2160 | 60 | 4:2:2 | Not Support | N/A |
| 8 | 3840x2160 | 30 | 4:2:2 | Not Support | N/A |
| 9 | 3840x2160 | 24 | 4:2:2 | Not Support | N/A |

*Note: Only the last two outputs (output 3 and output 4) have down-scaling functionality.*

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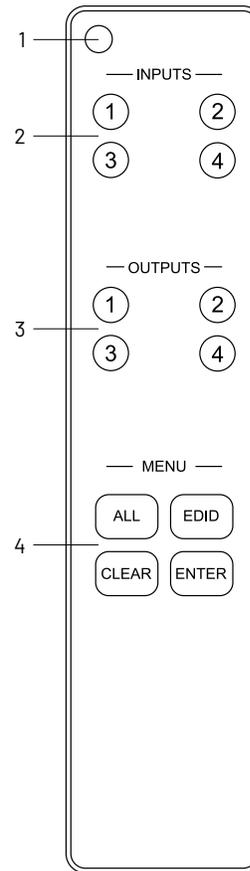# Panel Descriptions
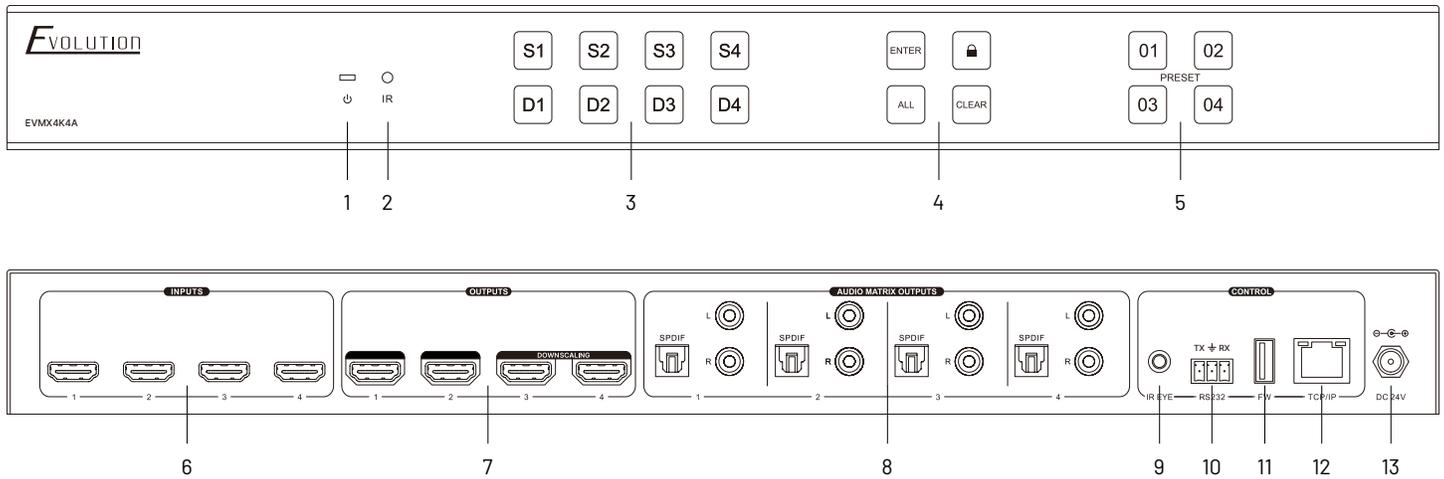


| Front Panel | | |
|---|---|---|
| 1 | Power Indicator | Illuminates green when device is powered on, illuminates red in standby mode. |
| 2 | IR Sensor | Built-in IR sensor, receives IR signal sent from IR remote. |
| 3 | Input & Output Selector Buttons | S1-S4: Total 4 input selector buttons, press one of buttons to switch input source. |
| | | D1-D4: Total 4 output selector buttons, press the buttons to select output channel. |
| 4 | Enter | LOCK: Press and hold this button for 3 seconds to lock/unlock all front buttons. |
| | | ALL: Select all outputs to switch an input to all outputs: Press [S1/2/3/4] + [ALL] + [ENTER] |
| | | CLEAR: Clears actions |
| 5 | Preset | Press and hold the button 1-4 to save the current switching status to the corresponding preset 1-4. Press the button 1-4 to recall the saved preset 1-4. |
| Rear Panel | | |
| 6 | Inputs | HDMI input ports, 4 in total, connects with HDMI sources. |
| 7 | Outputs | 4 in total, connects with HDMI displays. The last 2 HDMI ports have down-scaling functionality. |
| 8 | Audio Matrix Outputs | S/PDIF: audio output ports for de-embedded HDMI audio, 4 in total. |
| | | L&R (RCA): audio output ports for de-embedded HDMI audio, 4 pairs in total. |
| 9 | IR Eye | Connects with external IR receiver for using the IR remote to control the Matrix Switcher. |
| 10 | RS232 | 3-pin terminal block to connect the RS232 control device (e.g. PC) or a device to be controlled by RS232 commands. |
| 11 | FW | USB-A port for updating firmware. |
| 12 | TCP/IP | RJ-45 port to connect the control device (e.g. PC or third-party control system) to control the matrix. |
| 13 | DC 24V | Connect with DC 24V/1.25A power adaptor. |

**IR Remote Control**

The matrix features one built-in IR receiver to receive IR signal from the IR remote to enable IR control. If the external IR receiver or other IR control device needs to be used, the IR EYE port on rear panel can be connected.

| IR Remote | | |
|---|---|---|
| 1 | Standby Mode | Press it to enter/ exit standby mode. |
| 2 | Inputs | Input channel selection buttons, same with the corresponding front panel buttons. |
| 3 | Outputs | Output channel selection buttons, same with the corresponding front panel buttons. |
| 4 | Menu | ALL: Select all inputs/outputs.<br>To convert an input to all outputs:<br>    Example: Input 1 to all Outputs:<br>    Press INPUTS 1 + ALL + ENTER |
| | | EDID management button:<br>1) One input port follows the EDID data from one output port.<br>    Example: Input 2 learns EDID data from output 4:<br>    Press EDID + INPUTS 2 + OUTPUTS 4+ ENTER<br>2) All input ports learn EDID data from one output port.<br>    Example: All input ports learn EDID data from output 3:<br>    Press EDID + ALL + OUTPUTS 3 + ENTER |
| | | CLEAR: Clears actions |
| | | ENTER: Confirm operation |

# Front Panel Control



## Input/Output Switching

The front panel features four input selection buttons and four output selection buttons for switching I/O connection.

1.  To switch 1 input to 1 output:
    Example: Input 1 to Output 3
    Press S1 + D3 + ENTER.

2.  To switch 1 input to outputs 2, 3, and 4:
    Example: Input 1 to Output 2, Output 3, Output 4.
    Press S1 + D2, D3, D4 + ENTER.

3.  To switch 1 input to 4 outputs:
    Example: Convert Input 2 to all outputs
    Press S2 + ALL + ENTER.

*Note: Indicators of the pressed buttons will blink blue three times if the conversion is done, then it will be off. If the conversion failed, they will be off immediately.*

## Input/Output Status

Press OUTPUTS button D1, D2, D3 or D4 to inquire about the corresponding input, and then the indicator of the input button will turn blue.

## LOCK Function

Long press the LOCK button for three seconds, all buttons on the front panel disable to work. Long press the LOCK button for three seconds again to unlock or can unlock the front panel using the GUI.

## PRESET RECALL Function

Press and hold the PRESET 1-4 at least three seconds to save the current switching status to the corresponding preset 1-4.
Press the PRESET 1-4 to recall the saved preset 1-4.

*Note: The matrix switcher supports 9 presets but only preset 1-4 can be saved and recalled by button control. Please manage other preset by GUI control or RS232 control.*

# Connect & Operate

Please reference the diagrams below for how to connect and operate the PA6X series of amplifiers.
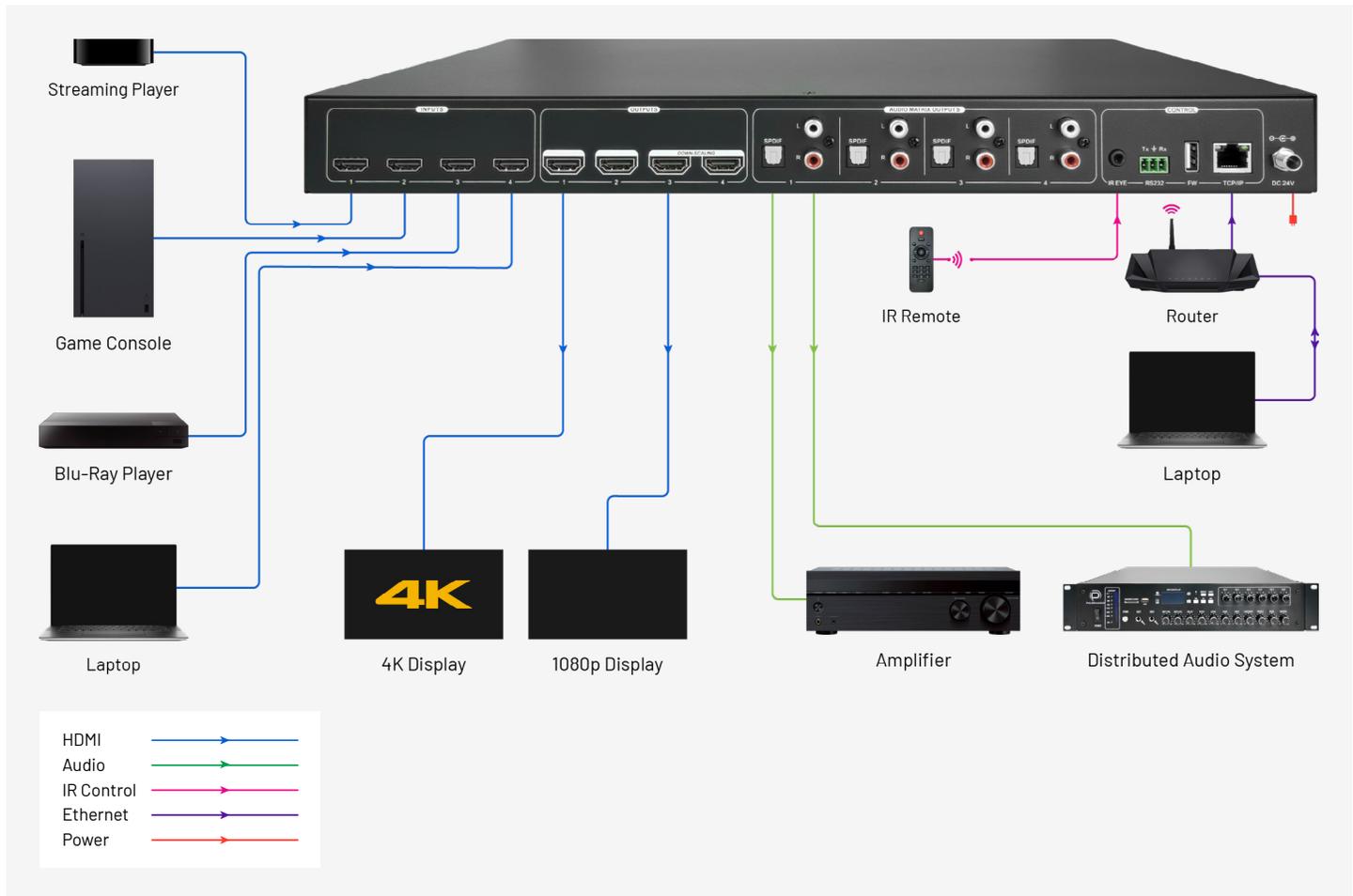


## Connection Diagram

1. Connect up to 4 sources such as a streaming player, video game console, Blu-Ray player, etc. to the HDMI inputs on the unit.

2. Connect up to 4 displays such as an HDTV, projector, etc. to the HDMI outputs on the unit.

3. OPTIONAL: Connect a third party control system via the RS232 port.

4. OPTIONAL: Connect a third party audio system via SPDIF port.

5. Connect the included DC 24V locking power supply.

6. Power up the EVMX4K4A and then the connected components.

*Note: Ensure HDMI cabling is 2.0 compliant or HDMI certified for the best 4K resolution display.*

## CLEAR Button

Press the CLEAR button if you want to withdraw an operation before pressing the ENTER button comes into effect and the matrix will return to the previous state.

## GUI Control

The matrix can be controlled via TCP/IP. The default IP settings are:

>    IP Address: 192.168.0.178
>    Subnet Mask: 255.255.255.0
>    Gateway: 192.168.0.1

Type 192.168.0.178 in the internet browser, it will enter the below log-in webpage:

>    Username: admin
>    Password: admin

Type the username and password, and then click Login to enter the section for video switching.

## Switching Tab

Use the 4x4 button grid on the page to set which inputs are directed to which outputs.

For example, clicking the button on the Input 1 row and Output 1 column, directs input 1 to output 1.

Use the 9 numbered buttons under scene area to save and load layout presets.

- To save a given layout, first click one of the numbered buttons, then click the Save button.

- To load a previously saved layout, first click one of the numbered buttons, then click the Recall button.
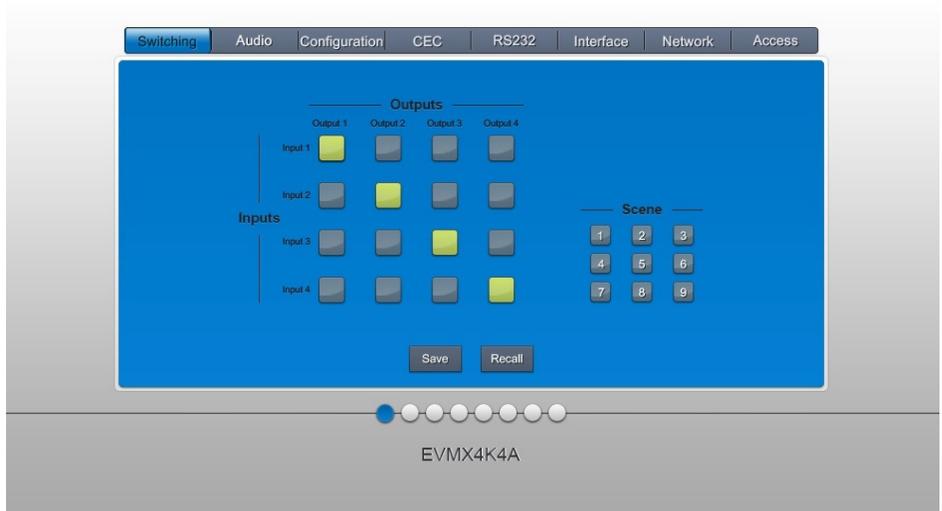
## Audio Tab

### Audio Setting

There are 4 HDMI audio sources that can be selected for 4 digital SPDIF output ports or 4 analog output ports.

| Audio Sources | | |
|---|---|---|
| **Audio Output Ports** | **Input Breakout** | **Output Breakout** |
| SPDIF 1 & Analog 1 | Audio on Input 1 | Audio on Output 1 |
| SPDIF 2 & Analog 2 | Audio on Input 2 | Audio on Output 2 |
| SPDIF 3 & Analog 3 | Audio on Input 3 | Audio on Output 3 |
| SPDIF 4 & Analog 4 | Audio on Input 4 | Audio on Output 5 |

### Audio Volume

Four pairs analog L/R audio to control their volume.

## Confuguration Tab

### EDID Copy

Copy the EDID of the selected output device to one or more input source device.



### EDID Setting

Select the compatible built-in EDID for the selected input source.

Upload user-defined EDID by the below steps:

1. Prepare the EDID file (.bin) on your computer.

2. Select the User-defined.

3. Click the on ⌷.bin⌷ box , and then select the EDID file (.bin).

4. Click Apply to upload the user-defined EDID, then click Confirm to the save setting.



### Output 5V Setting
### (for enhanced AoC stability)

To turn a display on or off, just toggle the output button accordingly.

For example, if you want to turn off the display that connects to OUTPUT 1, just toggle OFF the 'Output 1 5V' from On to Off.

## CEC Tab

If the source(s), and display(s) supports CEC, they can be controlled via the following CEC interface.

**1.  Input Source Device Control**

Select one input source device to be controlled, and then press function buttons.

*Note: It cannot control two or more input sources simultaneously.*



**2. Output Display Device Control**

Select one output device to be controlled, and then press one of the function buttons.

*Note: It cannot control two or more outputs simultaneously.*



## RS232 Tab

- ASCII or HEX command format can be selected.

- Baud Rate: Supports 2400, 4800, 9600, 19200, 38400, 57600 or 115200.

- Command Ending: NULL, CR, LF or CR+LF can be chosen.

- Command: Type the command into the command box to control the third-party device which is connected to the RS232 port of the switcher.

## Interface Tab

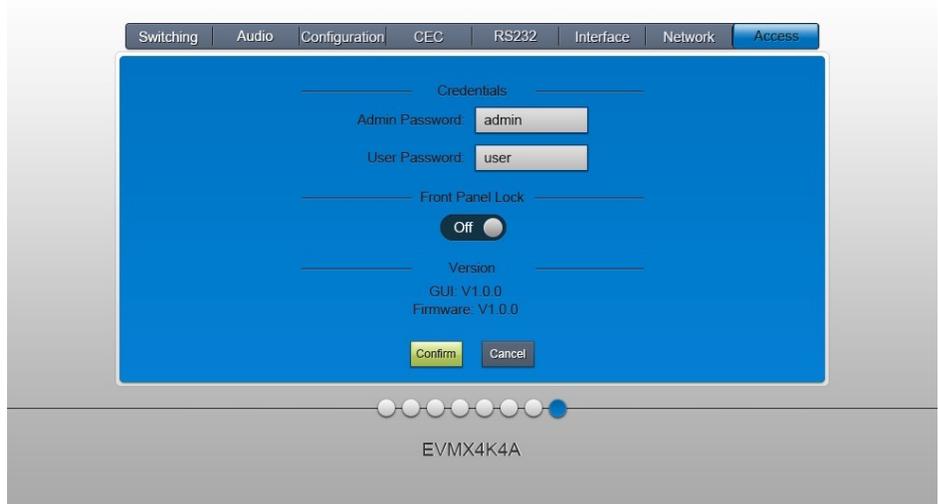- Used to modify the title bar label.
- Used to modify the button labels.



## Network Tab

- Static IP or Dynamic Host Configuration Protocol (DHCP).
- Used to modify the static IP Address, Subnet Mask, and Gateway.



## Access Tab

- Use to modify the login password.
- Lock or unlock the front panel buttons.

## GUI Upgrade

Please visit at http://192.168.0.178:100 for GUI online upgrade.

*Note: If the matrix was provided a different IP address, replace that and add :100 to perform an upgrade.*

Type the username and password (the same as the GUI log-in setting, modified password will be available only after rebooting) to login the configuration interface. After that, click **Administration** in the source menu to get to **Upload Firmware** as shown.

Select the desired update file and press **Apply**, it will start upgrading then.
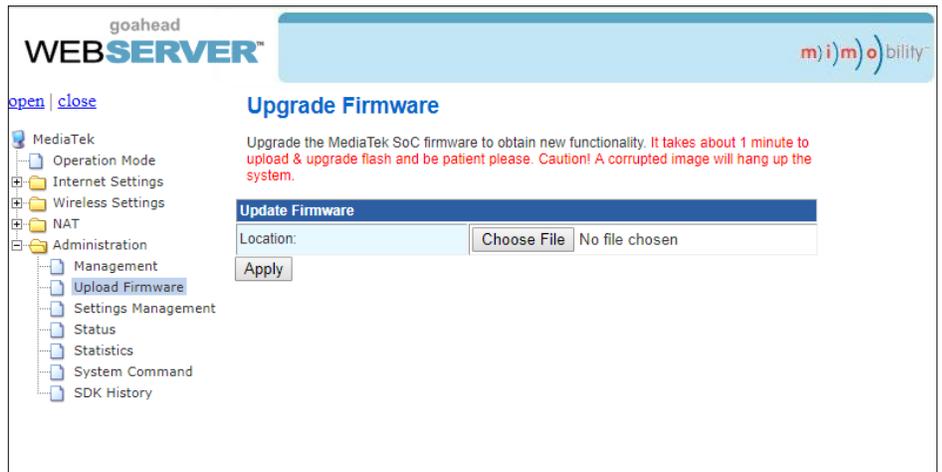
## Troubleshooting & Maintenance

| Problems | Potential Causes | Solutions |
|---|---|---|
| Color loss or no video signal output | The connecting cables may not be connected correctly or it may be broken. | Check whether the cables are connected correctly and are in working condition. |
| | Fail or loose connection. | Make sure the connection is good. |
| No output image when switching | No signal at the input / output end. | Check with oscilloscope or multimeter if there is any signal at the input/ output end. |
| | Fail or loose connection. | Make sure the connection is good. |
| | Input source is with HDCP while the HDCP compliance is switched off. | Send command /%[Y]/[X]:1. or change HDCP compliance status in GUI. |
| | The display doesn't support the input resolution. | Switch to another input source or enable the display to learn the EDID data of the input. |
| Cannot control the device via front panel buttons | Front panel buttons are not responsive and control is locked | Send command /%Unlock; or select unlock in GUI interface to unlock. |
| Cannot control the device via IR remote | The battery has died. | Change for new battery. |
| | The IR remote is broken. | Send it to an authorized dealer for repair |
| | Beyond the effective range of the IR signal or not pointing at the IR receiver. | Adjust the distance and angle and point right at the IR receiver. |
| | The IR receiver connected to IR IN port is not with carrier. | Change for an IR receiver with carrier. |
| Power Indicator remains off when powered on | No power. | Check whether the cables are connected correctly. |
| EDID management does not work normally | The HDMI cable is broken at the output end. | Change for another HDMI cable which is in good working condition. |
| There is a blank screen on the display when switching | The display does not support the resolution of the video source. | Switch again. |
| | | Manage the EDID data manually to make the resolution of the video source automatically compliant with the output resolution. |
| Cannot control the device by control device (e.g. a PC) through RS232 port | Wrong connection. | Check to ensure the connection between the control device and the unit. |
| | Wrong RS232 communication parameters. | Type in correct RS232 communication parameters: Baud rate:9600; Data bit: 8; Stop bit: 1; Parity bit: none |
| | Broken RS232 port. | Send it to authorized dealer for checking. |