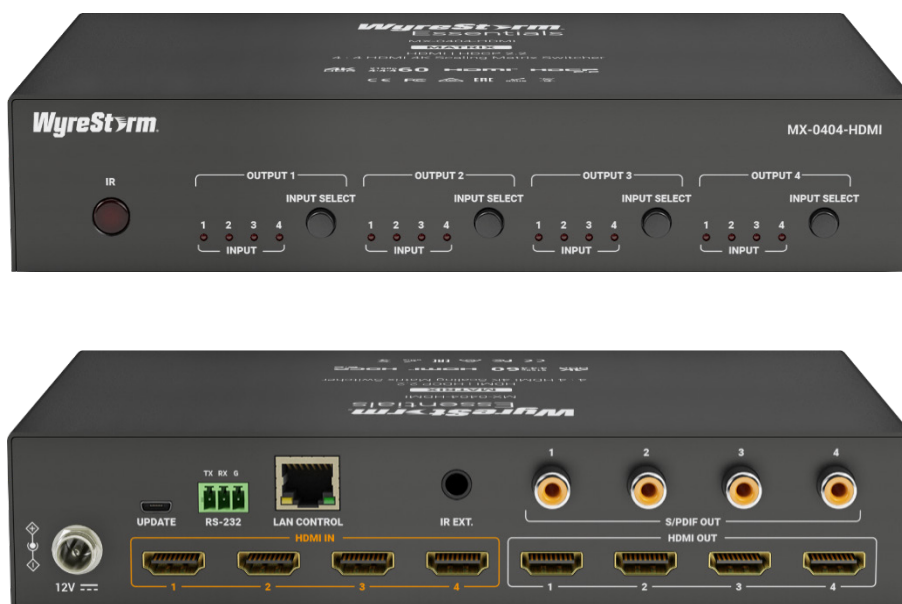




User Manual

v1.0.2

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Overview

This device is a 4 x 4 HDMI matrix switcher supporting 5K ultra wide and super wide resolutions, HDR10, HLG, Dolby Vision and HDCP 2.2 compatibility, allowing four HDMI sources to be switched to four displays. It supports automatic downscaling from 4K to 1080P for each HDMI output. When a source is switched to multiple displays such as one 4K TV display and one 1080P display, the matrix will output 4K video to the 4K TV and downscale 4K video to 1080P video and have it output to the 1080P TV. It also provides digital audio extraction from every HDMI output. The matrix also features output group function and auto switch function for the configured output group, which can be set through API command and web UI. When input source status change is detected, it also supports auto feedback on both web UI and telnet/RS232. The matrix can be controlled through front panel buttons, IR, RS232 and telnet.

Features

- All HDMI inputs and outputs support 5K ultra wide resolutions and super wide resolutions.
- Supports HDR, including HDR 10, HLG, and Dolby Vision.
- HDCP 2.2 compliant.
- Each HDMI output supports downscaling from 4K to 1080P. 4K downscaler can work automatically when the matrix is connected to a 1080P display and can be set to on/off by API commands.
- Supports S/PDIF audio extraction up to 5ch HBR or 2ch PCM from each HDMI output.
- Supports output group setting and auto switch function for the selected group.
- Supports auto feedback via telnet and RS232 when input source status changes.
- Supports input source selection for each output through IR control and front panel buttons.
- Supports API control via RS-232 and telnet.
- Supports firmware update via micro-USB.

Package Contents

- 1 x Matrix
- 1 x DC 12V Power Adapter with US, EU, UK and AU Pins
- 1 x IR Remote
- 1 x IR Receiver (38KHz)
- 1 x Phoenix Male Connector (3.5mm, 3 Pins)
- 2 x Mounting Brackets (with Black, Countersunk Head with Cross Screws)
- 2 x General Mounting Brackets (53--87, with Black, Round Head with Cross Screws)

Specifications

Technical

Input/Output Port	4 x HDMI IN, 4 x HDMI OUT, 1 x RS-232, 1 x IP Control (RJ45), 4 x SPDIF OUT (Digital), 1 x Update (Micro USB), 1 x DC 12V IN
Input/Output Signal Type	HDMI with 5K ultra wide and super wide resolutions, HDR 10, HLG & Dolby Vision, HDCP 2.2 Note: Dolby vision is not supported in downscaler mode.

Input/Output Resolutions	VESA: 800x600 ⁸ , 1024x768 ⁸ , 1280x768 ⁸ , 1280x800 ⁸ , 1280x960 ⁸ , 1280x1024 ⁸ , 1360x768 ⁸ , 1366x768 ⁸ , 1440x900 ⁸ , 1600x900 ⁸ , 1600x1200 ⁸ , 1680x1050 ⁸ , 1920x1200 ⁸ , 5K ultra wide resolutions (up to 5120x2160@30Hz 4:4:4 and 5120x2160@60Hz 4:2:0), 5K super wide resolutions (up to 5120x1440@60Hz 4:4:4 and 5120x1440@30Hz 4:4:4) SMPTE: 720x576P ⁶ , 1280x720P ^{6,7,8} , 1920x1080P ^{2,5,6,7,8} , 3840x2160 ^{2,3,5,6,8} , 4096x2160 ^{2,3,5,6,8} 2 = at 24 Hz, 3 = at 25 Hz, 5 = at 30 Hz, 6 = at 50 Hz, 7 = at 59.94 Hz, 8 = 60 Hz
Audio Format	HDMI IN/OUT: Fully supports audio formats in HDMI 2.0 specification, including PCM 2.0/5.1/7.1, Dolby TrueHD, Dolby Atmos, DTSHD Master Audio and DTS:X Note: 5K (ultra-wide or super-wide) signal transmission supports only 2.0- channel audio. S/PDIF OUT: Supports PCM 2.0/5.1, Dolby digital and DTS up to 5.1ch
Maximum Data Rate	18Gbps
Control Method	Front panel buttons, IR, RS232, Telnet

General

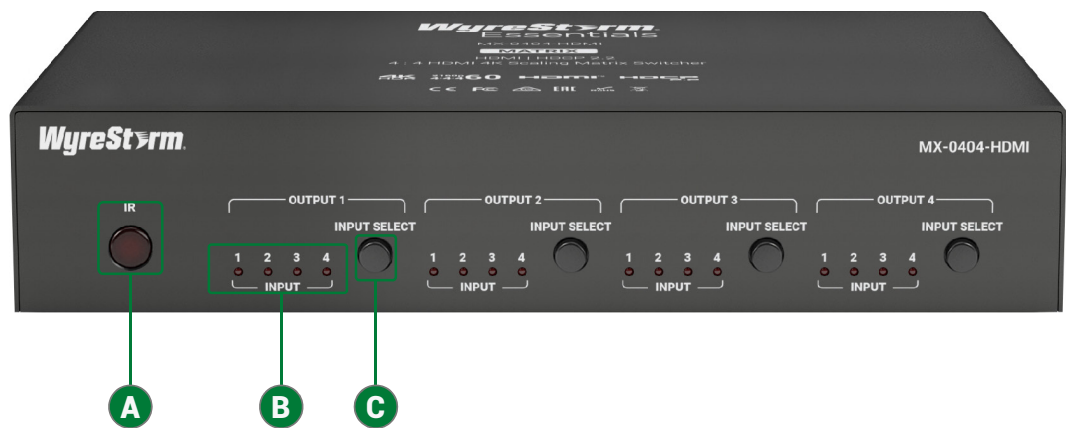
Operating Temperature	0°C to 45°C (32°F to 113°F)
Storage Temperature	-20°C to 70°C (-4°F to 158°F)
Humidity	10% to 90%, non-condensing
ESD Protection	Human-body Model: ±8kV (Air-gap discharge)/ ±4kV (Contact discharge)
Power Supply	DC 12V/2A
Power Consumption (Max)	11W
Device Dimension (W x H x D)	215mm x 42mm x 120.2mm/8.46" x 1.65" x 4.73" (Without mounting brackets)
Product Weight	0.54kg/1.19lbs

Transmission Distance

HDMI	Input: 15m/50ft Output: 10m/33ft	1080P@60Hz 24bpp
	Input/Output: 10m/33ft	4K@30Hz 4:4:4 24bpp 4K@60Hz 4:2:0 24bpp
	Input/Output: 3m/10ft	4K@60Hz 4:4:4 24bpp

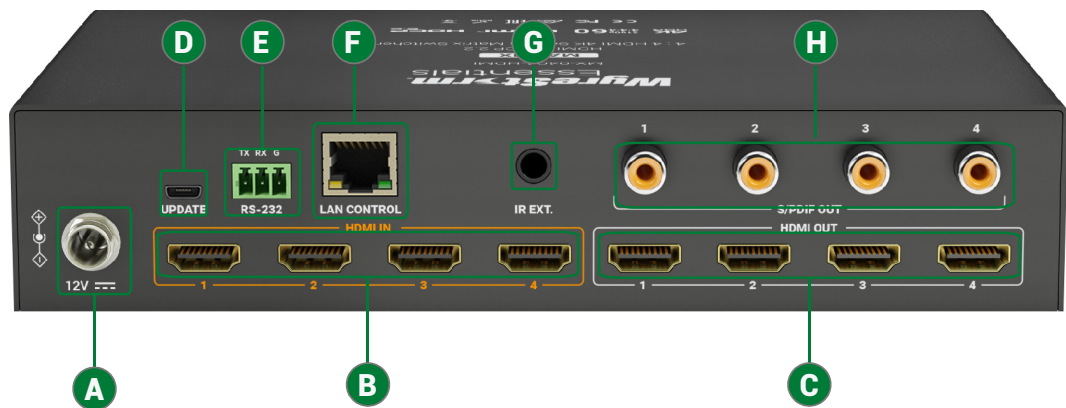
Panel Description

Front Panel



A	IR Window	Receives IR signals from IR remote.
B	INPUT LED 1-4	- On: The corresponding HDMI input is selected. - Off: The corresponding HDMI input is not selected.
C	INPUT SELECT	Input Selection button. Press this button to select an input source for the specific output.

Rear Panel



A	DC 12V	Connect to the DC 12V power adapter provided.
B	HDMI IN 1-4	Connect to HDMI source devices.
C	HDMI OUT 1-4	Connect to HDMI display devices.
D	UPDATE	For firmware update.

E	RS232	Connect to a control PC or control system for RS232 control.
F	LAN CONTROL	Connect to a control PC for Telnet API control.
G	IR EXT.	Connect to the IR receiver cable provided.
H	S/PDIF OUT 1-4	Connect to audio devices (e.g., amplifier) for digital audio de-embedded output from HDMI Out 1-4.

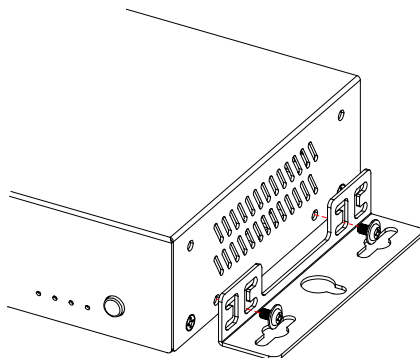
Installation

Note:

- Before installation, ensure the device is disconnected from the power source.
- Two sets of mounting brackets are included in the package, install each of them according to your needs.
- Steps to install the device on a suitable location:

Installation 1:

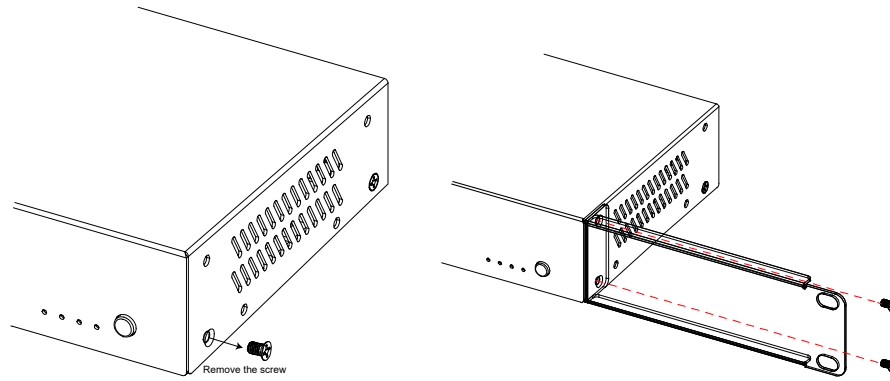
1. Attach the installation bracket to the enclosure using the screws provided in the package separately. The bracket is attached to the enclosure as shown in the following figure.



2. Repeat step 1 for the other side of the device.
3. Attach the brackets to the surface you want to hold the device against using the screws (provided by others).

Installation 2:

1. Remove one screw of the device's side panel, and attach another bracket to the enclosure using the screws provided in the package separately, as shown in the following figure.



2. Repeat step 1 for the other side of the device.
3. Attach the brackets to the surface you want to hold the device against using the screws (provided by others).

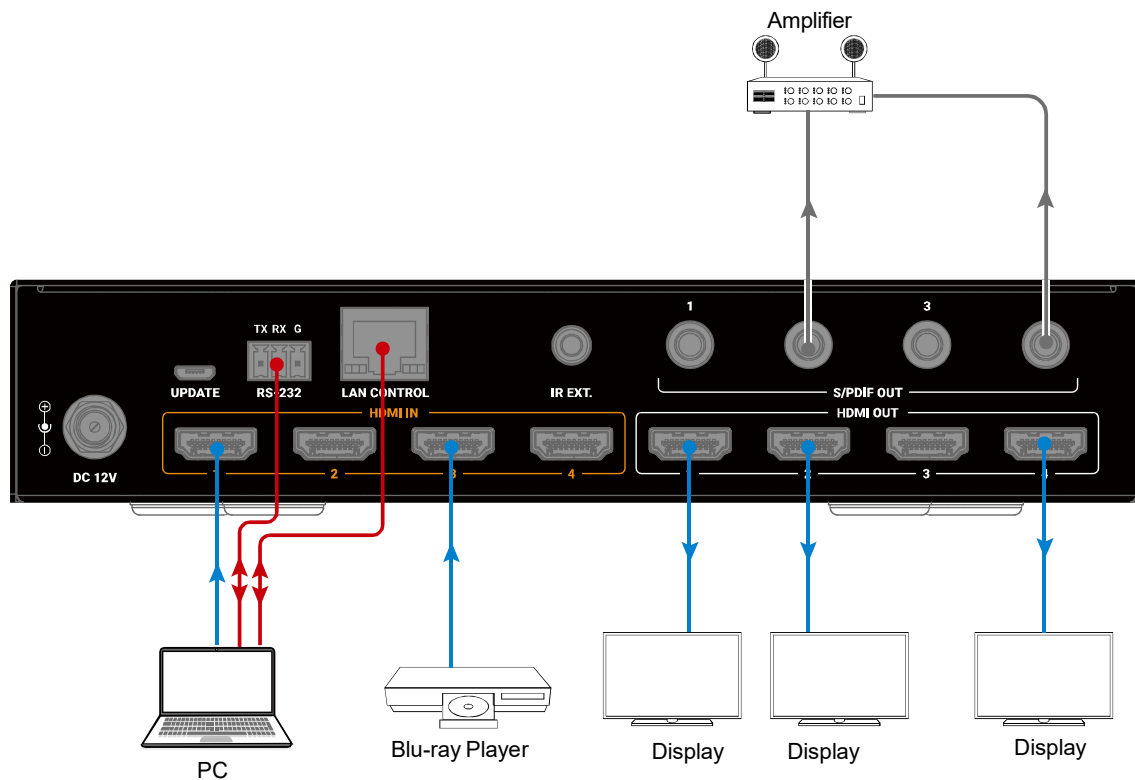
Wiring

Warnings:

- Before wiring, disconnect the power from all devices.
- During wiring, connect and disconnect the cables gently.

Steps for device wiring:

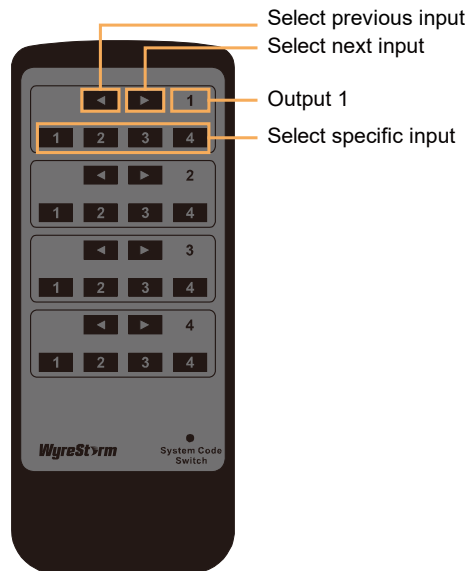
1. Connect HDMI IN
Connect the HDMI sources (e.g., PC, Blu-ray player, Apple TV, 4K media player, etc.) to the HDMI IN 1-4.
2. Connect HDMI OUT
Connect HDMI display devices (e.g., TV, projector, LED/LCD display) to the HDMI OUT 1-4.
3. Connect S/PDIF OUT
Connect audio receivers to the S/PDIF OUT (1-4), the ports can output audio de-embedding from HDMI OUT 1-4.
4. Connect for additional control options:
 - RS232 control: Connect a control PC or control system to RS232 port of the Matrix.
 - IR control: The matrix can be controlled through IR signal by pointing the IR remote provided at IR window directly. Alternatively, connect the IR receiver cable provided to IR Ext. of the matrix for IR extension, and have its head secured in a place accessible to the matrix remote.
 - LAN (Telnet API) control: Connect the control PC to the LAN port of the matrix.
5. Connect the DC 12V power adapter provided.
6. Power on all attached devices.



IR Remote Control

The matrix can be controlled by the IR remote provided. Point the IR remote directly to the Matrix, now you can select input source for each output display.

If IR extension is required, connect the IR receiver to the IR Ext. port at the rear panel of the matrix and ensure the receiver head is accessible to the IR remote. (Note: The IR receiving window on the front panel will remain active when IR receiver is connected to the matrix.)



To select input source for output display:

1. Select the output display from the matrix column 1-4.
2. Point the IR remote to the IR window on the matrix's front panel or the IR receiver connected to the IR Ext. on the rear panel.
3. Press the buttons of the IR remote to select the desired input source.

Virtual IR Code by Default (Matrix Switching Code)

Code	IN1	IN2	IN 3	IN 4
OUT 1	0x80	0x81	0x82	0x83
OUT 2	0x90	0x91	0x92	0x93
OUT 3	0xA0	0xA1	0xA2	0xA3
OUT 4	0xB0	0xB1	0xB2	0xB3

API Control

Advanced users may need to control the matrix using API commands through RS232 or Telnet.

RS232 Control

Connect a control PC to the RS232 port of the matrix. API command for RS232 control is available in the separate document "*API Command Set_MX-0404-HDMI*". A professional RS232 serial interface software (e.g., Serial Assist) may be needed as well.

Before executing the API command through RS232 serial connection, please ensure RS232 port of this device and the control PC are configured correctly.

Baud Rate	115200 bps
Data Bits	8 bits
Parity	None
Stop Bits	1 bit
Flow Control	None

Telnet Control

Connect a control PC to the LAN Control port of the matrix. API command for telnet control is available in the separate document "*API Command Set_MX-0404-HDMI*". A professional telnet control software may be needed as well.

Before sending the API commands through telnet, telnet connection shall be established between the control PC and this device. To connect PC to this device through telnet, use the following command:

telnet ip (port)

- **ip**: The matrix's IP address.
- **port**: The port number for telnet, which is 24. This port number is not required for some telnet control tools or platforms.

By default, this matrix comes with a default IP address of 192.168.11.143. Subnet mask is 255.255.255.0.

For example, if the matrix's IP address is 192.168.11.143, the command to connect to the matrix via telnet shall be:

telnet 192.168.11.143

Web UI Control

The Web UI designed for the matrix is available for basic controls and advanced settings of the device. The Web UI can be accessed through a browser with latest version, e.g., Chrome, Firefox, Safari, Opera, IE, etc.

The default network mode of matrix is static, and the default IP address is 192.168.11.143. Subnet mask is 255.255.0.0.

Get Access to the Web UI

1. Connect the LAN port of the receiver to your PC using a straight UTP cable.
2. Set your PC to the same network segment as the matrix, e.g., 192.168.xxx.xxx, subnet mask 255.255.0.0.
3. Input the IP address in your browser and press Enter. The following window will display.



MX-0404-HDMI

User

Admin

- To implement basic video and audio control of the matrix, click "User" to login as User. When login as User, no password is required.



MX-0404-HDMI

General

Video Matrix Control

Outputs/Inputs	INPUT1	INPUT2	INPUT3	INPUT4
OUTPUT1				
OUTPUT2				
OUTPUT3				
OUTPUT4				
ALL				

Working Error

Auto Switch

Auto Switch

Disabled

Output Group Select

☐ Output 1

☐ Output 2

☐ Output 3

☐ Output 4

Note: when matrix detects ther's a new source,it will auto switch the new input to above selected outputs.

Apply

- If advanced setting is required, click "Admin". Input the username and password to login as admin. Both the default username and password are "admin".



MX-0404-HDMI

User

Admin

Username

Password

Login

☐Remember password



MX-0404-HDMI

General

Advanced Setting

Video Matrix Control

Outputs/Inputs	INPUT1	INPUT2	INPUT3	INPUT4
OUTPUT1				
OUTPUT2				
OUTPUT3				
OUTPUT4				
ALL				

Working

Error

Auto Switch

Auto Switch

Disabled

Output Group Select

☐ Output 1

☐ Output 2

☐ Output 3

☐ Output 4

Note: when matrix detects ther's a new source,it will auto switch the new input to above selected outputs.

Apply

Web UI Introduction

General

1. Video Matrix Control

Video Matrix Control

Outputs/Inputs	INPUT1	INPUT2	INPUT3	INPUT4
OUTPUT1				
OUTPUT2				
OUTPUT3				
OUTPUT4				
ALL				

Working Error

This section manages distribution of input video sources to output displays. Click the button in the table to select the input for the output display (button turns from white to green once selection is done). By default, INPUT 1 routes to OUTPUT 1... INPUT 3 routes to OUTPUT 3, INPUT 4 routes to OUTPUT 4.

ALL: Click to route one input to all outputs.

2. Auto Switch

Auto Switch

Auto Switch

Output Group Select

☐ Output 1 ☐ Output 2 ☐ Output 3 ☐ Output 4

Note: when matrix detects there's a new source, it will auto switch the new input to above selected outputs.

This section allows users to set output group and enable/disable auto switch function for selected output group.

- Auto Switch: Set auto switch function of output group to enable/disable. When it is set to disable, all outputs are not checked by default. When it is set to enable, the selected group supports auto switch function.

Default setting: Disabled.

- Output Group Select: Check the box in front of the output, and then click "Apply" to take effect. These checked outputs are set as a group. These outputs can be mirrored simultaneously to switch input source.

By default, the outputs are unchecked.

Note: When the auto switch function is set to enable, a new input is inserted, the outputs in the checked group will be switched to the new inserted input automatically.

3. Scaler

Scaler

OUTPUT1

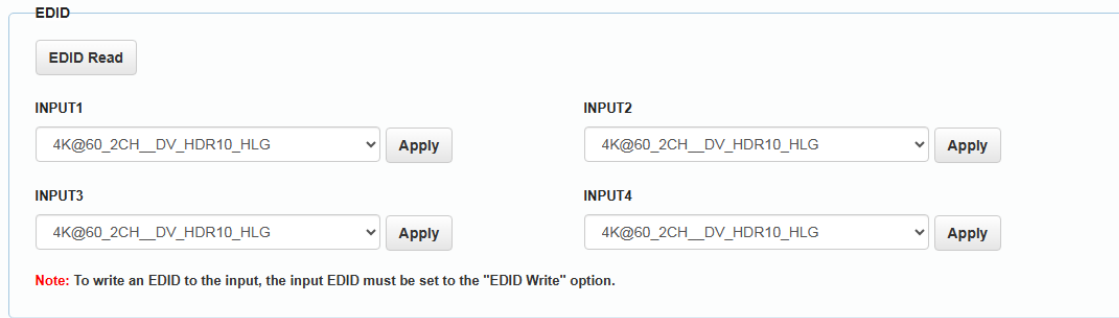
OUTPUT2

OUTPUT3

OUTPUT4

ON/OFF: Click to set the scaler function of the corresponding output to ON/OFF. Default setting: ON

4. EDID



EDID

EDID Read

INPUT1
4K@60_2CH__DV_HDR10_HLG **Apply**

INPUT2
4K@60_2CH__DV_HDR10_HLG **Apply**

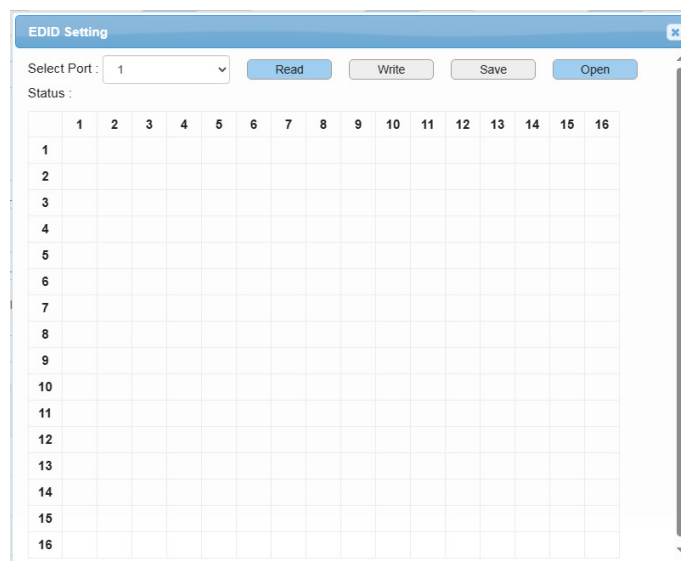
INPUT3
4K@60_2CH__DV_HDR10_HLG **Apply**

INPUT4
4K@60_2CH__DV_HDR10_HLG **Apply**

Note: To write an EDID to the input, the input EDID must be set to the "EDID Write" option.

This section allows users to read EDID, and set EDID for each input.

- EDID Read: Click to enter the following page:



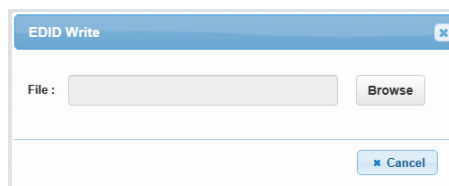
EDID Setting

Select Port : 1 **Read** **Write** **Save** **Open**

Status :

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1																
2																
3																
4																
5																
6																
7																
8																
9																
10																
11																
12																
13																
14																
15																
16																

- Select Port: Select one output/input port from the drop-down menu for EDID setting.
- Read: Click to read EDID of the desired output port.
- Write: Click to write EDID to the selected input port.
- Save As: Save the EDID as a bin file on your local computer.
- Open: Click to open the EDID bin file on your local computer.



EDID Write

File : **Browse**

Cancel

- INPUT1/2/3/4: Select EDID from the drop-down menu for the corresponding input.
Default setting: 4K@60_2CH_DV_HDR10_HLG.

INPUT1

4K@60_2CH_DV_HDR10_HLG

Copy form output 1
Copy form output 2
Copy form output 3
Copy form output 4
4K@60_2CH_DV_HDR10_HLG
4K@30_7.1CH_HDR10_HLG
4K@30_5.1CH_HDR10
4K@30_2CH_HDR10
4K@30_8bit_2CH
1080P@60_2CH_SDR
4K@60_7.1CH_DV_HDR10_HDR10+_HLG
4K@60_7.1CH_SDR
5K Ultra Wide_2CH
5K Super Wide_2CH
EDID Write

- Note:**
- When a 5K EDID is applied, some source devices (such as laptops or PCs) may not automatically switch to 5K output. In this case, please open the device's display or resolution settings menu and manually select the 5K resolution to ensure proper operation.
 - When select “EDID Write”, users will also enter the “EDID Setting” page.

EDID Setting

Select Port : 1

Read

Write

Save

Open

Status :

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1																
2																
3																
4																
5																
6																
7																
8																
9																
10																
11																
12																
13																
14																
15																
16																

5. CEC

CEC					
Output	Command Setting	Manual		Auto	
				On/Off	Delay Time(1~30min)
OUTPUT1	<button>Edit</button>	<button>Display On</button>	<button>Display Off</button>	ON OFF	2 ↑ ↓ Apply
OUTPUT2	<button>Edit</button>	<button>Display On</button>	<button>Display Off</button>	ON OFF	2 ↑ ↓ Apply
OUTPUT3	<button>Edit</button>	<button>Display On</button>	<button>Display Off</button>	ON OFF	2 ↑ ↓ Apply
OUTPUT4	<button>Edit</button>	<button>Display On</button>	<button>Display Off</button>	ON OFF	2 ↑ ↓ Apply

This section allows users to set power on/off commands, control the connected display to power on/off, set auto power function and delay time.

- **Edit:** Click to enter the following window to do command testing, set and save commands of Display On/Off.

Command Setting

Command Testing:

Display On: 40 04

Display Off: 40 36

- **Command Testing:** Input a Display on/off command, and then click "Send" to send it to the selected output to test if it takes effects.
- **Display On/Off:** Input the corresponding CEC command, then click "Save" to save it.

Note: If you want to change CEC commands, please refer to the CEC specification document.

- **Display On/Off:** Click to send the saved Display On command to the connected CEC-enabled display to power on/off it immediately.
- **Auto On/Off:** Click to enable or disable the CEC Auto Control. By default, the auto CEC control is ON.
- **Delay Time (1~30min):** click the up/down arrow to set the time for the display to power off automatically when no signal is present. For example, if Auto control is set as on and the time is set to 2 minutes, the output display will power off automatically when there's no signal at the display for 2 minutes.

6. Audio Mute

Audio Mute

All

OUTPUT1

OUTPUT2

OUTPUT3

OUTPUT4

- **ON/OFF:** Set all audio outputs to mute/unmute.
- **OUTPUT1/2/3/4 (ON/OFF):** Click to set the corresponding audio output to mute/unmute.

Default Setting: OFF (Unmute).

7. Input HDCP Support

The screenshot shows a configuration panel titled "Input HDCP Support". It contains four input sections labeled INPUT1, INPUT2, INPUT3, and INPUT4. Each section has a blue "ON" button and a white text input field.

This section allows users to enable or disable HDCP capability of each input. By default, HDCP Support is switched to ON at each input to allow for HDCP-protected content transmission.

By default, Input HDCP Support is set as ON at each input port.

8. Preset

The screenshot shows a configuration panel titled "Preset". It contains three pairs of buttons: "Save 1" and "Load 1", "Save 2" and "Load 2", and "Save 3" and "Load 3".

This section saves or loads the settings of or to Video Matrix Control section.

- Save: Click to save settings of Video Matrix Control section.
- Load: Click to load settings to Video Matrix Control section.

9. Source Naming

The screenshot shows a configuration panel titled "Source Naming". It contains four input sections labeled Input 1, Input 2, Input 3, and Input 4. Each section has a text input field with the default name "INPUT1", "INPUT2", "INPUT3", or "INPUT4". Below the input fields, there is a red note: "Note: The length of alias name is limited to 15 characters total." At the bottom right, there are "Reset" and "Save" buttons.

This section allows users to change the name of inputs.

- Reset: Click to reset the name changing.
- Save: Click to save the name changing.

10. Zone Naming

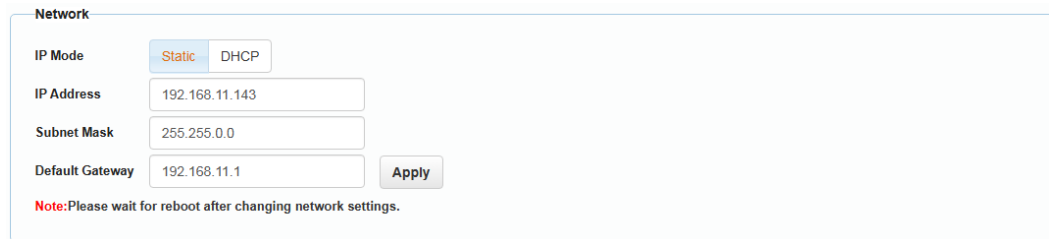
The screenshot shows a configuration panel titled "Zone Naming". It contains four input sections labeled Output 1, Output 2, Output 3, and Output 4. Each section has a text input field with the default name "OUTPUT1", "OUTPUT2", "OUTPUT3", or "OUTPUT4". Below the input fields, there is a red note: "Note: The length of alias name is limited to 15 characters total." At the bottom right, there are "Reset" and "Save" buttons.

This section allows users to change the name of outputs.

- Reset: Click to reset the name changing.
- Save: Click to save the name changing.

Advanced Setting

1. Network



The Network configuration interface shows the IP Mode set to Static. The IP Address is 192.168.11.143, Subnet Mask is 255.255.0.0, and Default Gateway is 192.168.11.1. An Apply button is present. A note at the bottom states: "Note: Please wait for reboot after changing network settings."

This section is to set between the static and dynamic IP address.

- IP Mode:
 - DHCP: When enabled, the IP address of the Matrix is assigned automatically by the DHCP server connected.
 - Static: When enabled, you need to set up the IP address manually.

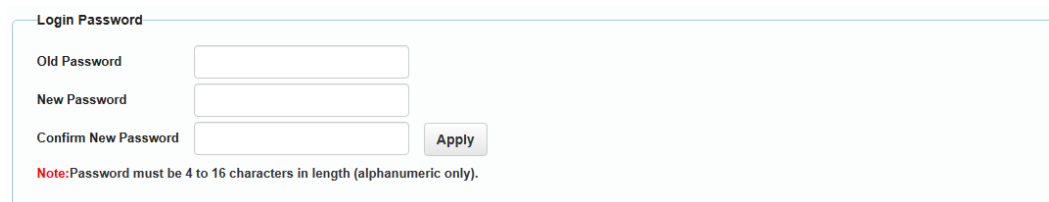
By default, the IP mode is set as Static, and the IP address is 192.168.11.143, subnet mask is 255.255.0.0.

- Save: Click to save and perform the network setting, and the setting change will take effect immediately.

Note:

- When "Static" is selected, please ensure your PC is in the same network segment as the device.
- Please wait for 2-3 minutes for the Matrix's LAN module to reboot and reconnect after the network setting is changed.

2. Login Password



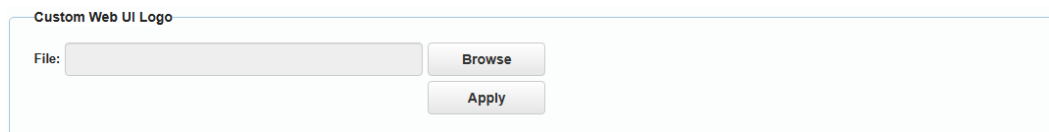
The Login Password configuration interface shows fields for Old Password, New Password, and Confirm New Password. An Apply button is present. A note at the bottom states: "Note: Password must be 4 to 16 characters in length (alphanumeric only)."

This section is where Admin Login Password to be changed.

Note: Password must be 4 to 16 characters in length, alphanumeric only.

By default, Login password is "admin".

3. Custom Web UI Logo

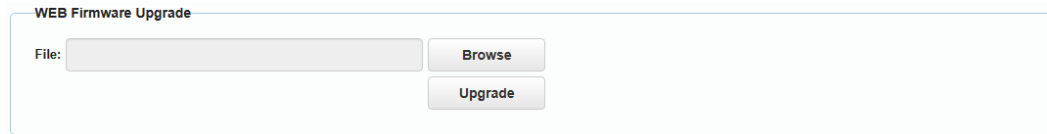


The Custom Web UI Logo configuration interface shows a File input field, a Browse button, and an Apply button.

This section allows you to create your own logo for the Web UI.

To create customized Web UI logo: click "Browse" for the new logo file, and choose "Apply". When the operation is successful, the new logo will appear on the upper left corner of the screen and the login page.

4. WEB Firmware Upgrade

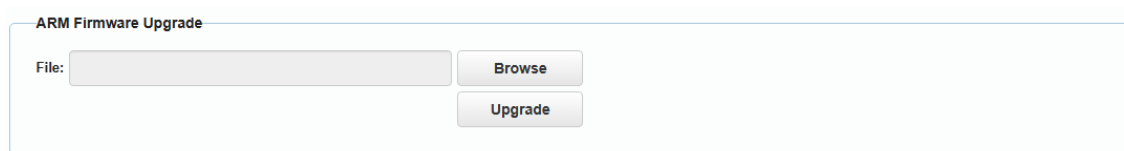


This section allows users to upgrade web UI.

Click "Browse" to upload the web UI upgrade bin file, and then click "Upgrade" to upgrade web UI. Wait for about 30s and then refresh and log in again.

Note: Don't power off the matrix during the upgrading process.

5. ARM Firmware Upgrade

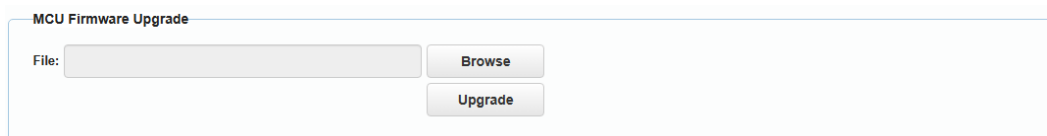


This section allows users to upgrade ARM.

Click "Browse" to upload the ARM upgrade bin file, and then click "Upgrade" to upgrade ARM. The matrix will upgrade and reboot automatically when upgrading ARM is completed. Please wait for about 30s and then refresh and log in again.

Note: Don't power off the matrix during the upgrading process.

6. MCU Firmware Upgrade

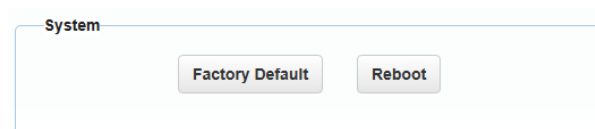


This section allows users to upgrade MCU.

Click "Browse" to upload the ARM upgrade bin file, and then click "Upgrade" to upgrade MCU. The matrix will upgrade and reboot automatically when upgrading MCU is completed. Please wait for about 30s and then refresh and log in again.

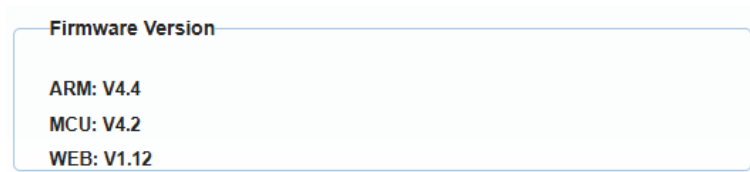
Note: Don't power off the matrix during the upgrading process.

7. System



- Reboot: Click to reboot device.
- Factory Reset: Click to reset the device to factory default.

8. Firmware Version



This section shows the currently firmware version of ARM, MCU and web UI.