



NTI® NETWORK
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VEEMUX® Series

SM-4X4-4K18GBA-LCV2

Low-Cost 4K 18Gbps HDMI Video Matrix Switch

Installation and Operating Manual



Front and Rear View of SM-4X4-4K18GBA-LCV2

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CHANGES

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TABLE OF CONTENTS

Introduction.....	1
Materials.....	2
Features and Functions.....	3
Connections.....	5
Operation.....	6
Remote Control Features	6
LCD Panel Control.....	7
Video switch operation:.....	7
Video Switching	8
Turn ON/OFF Output	9
Audio Control Interface	10
Switch Output Audio	10
Audio Extraction Control:.....	11
EDID Setting Interface:	12
Preset Application.....	13
Setup Interface.....	14
Baud rate setting	14
DHCP switch.....	15
Reboot	16
Factory Reset	16
View Information Interface	17
RS232 Control.....	18
Web Control.....	19
Technical Specifications.....	28
Warranty Information.....	28

INTRODUCTION

The VEEMUX® Low-Cost 4K HDMI Matrix Switch routes digital 4Kx2K HDMI video and audio signals from up to four HDMI video sources (computers, Blu-Ray players, satellite receivers, etc) to up to four displays (monitors, 4K TV's, projectors, etc).

Features

- Configure and control the switch through front panel buttons, Ethernet, IR remote control, or RS232.
- Supports Ultra-HD 4Kx2K resolutions (4096x2160 and 3840x2160 @24/30/60Hz YUV 4:4:4) and HDTV resolutions to 1080p.
- Each input can be independently connected to any or all outputs.
- HDCP 2.2 compliant.
- HDMI features supported: HDMI 2.0
 - Dolby TrueHD, DTS-HD Master Audio, Dolby Digital, DTS 7.1 and LPCM
 - YUV 4:4:4
 - HDR
 - 3D
 - Bandwidth up to 600 Mhz (18 Gbps)
 - Lip Sync
- Audio switching follows video switching.
 - HDMI-embedded audio switching (four-channel stereo mixing)
 - L/R analog audio and SPDIF digital audio out ports for each source.
 - For example, if HDMI output 1 video is from HDMI input 3, then it will also receive audio from HDMI input 3. The L/R analog audio output 1 and the SPDIF audio output 1 will receive audio from HDMI input 3 also.
- Configurable built-in EDID table.
- Compact desktop design.

MATERIALS

Materials supplied with this kit:

- NTI SM-4X4-4K18GBA-LCV2 HDMI Matrix Switch
- 110-240VAC, 50 or 60Hz-12VDC/2A AC Adapter
- Remote Control
- IR Receiver Extension Cable
- 5 pcs 3-Terminal plugs for RS232 cable termination and Audio termination
- URL Slip with path to this manual

Materials *Not* supplied but **REQUIRED**:

CATx cable for connection to network

HD-xx-MM Cables for connection of displays

BNC cables for SPDIF connection to speakers

where:

xx is the length of the cable in feet

MM indicates male-to-male connector

Cables can be purchased from Network Technologies Inc by calling **(800) 742-8324** (800-RGB-TECH) in the US and Canada or **(330) 562-7070** (worldwide).

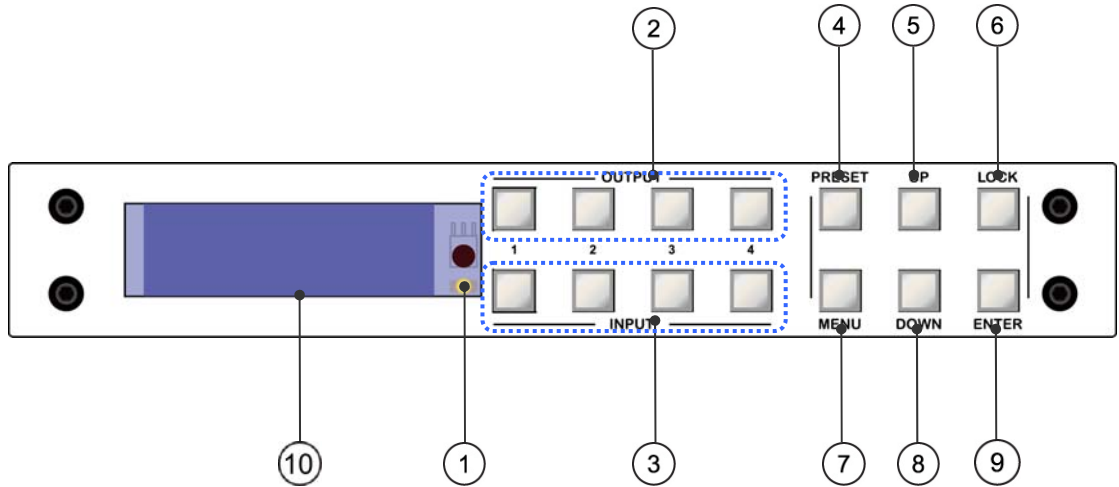
Cables

Interface cables between the video sources/displays and the switch are required for proper operation. Supports cable lengths to 20 feet for 4Kx2K resolutions at 60Hz and lengths to 50 feet for 1080p at 60Hz using passive HDMI cables. Cables longer than 50 feet can be used provided they have a built-in video equalizer (also known as “active HDMI cables”).

- Use HD-xx-MM HDMI cables to connect an HDMI source or display. HD-3/6/10/15-MM supports resolutions to 4K@60Hz.
- HD-25/30/50-MM supports resolutions to 1080p@60Hz.
- Use HD-ACT-xx-MM 4K HDMI Active Cables to connect an HDMI source or display up to 100 feet. HD-ACT-20/25/30/40/50-MM supports resolutions to 4K@60Hz (18 Gbps).
- HD-ACT-60/75/100-MM supports resolutions to 4K@30Hz (10.2 Gbps).
- Use DP-HD-xx-MM to connect a 4K@60Hz DisplayPort computer up to 15 feet.
- Use USB3C-HD4K-xx-MM to connect a 4K@60Hz computer with USB Type C connector up to 10 feet.
- Use DVI-HD-xx-MM cable to connect a DVI source. Supports resolutions to 1080p.
- **Cables not included.**

FEATURES AND FUNCTIONS

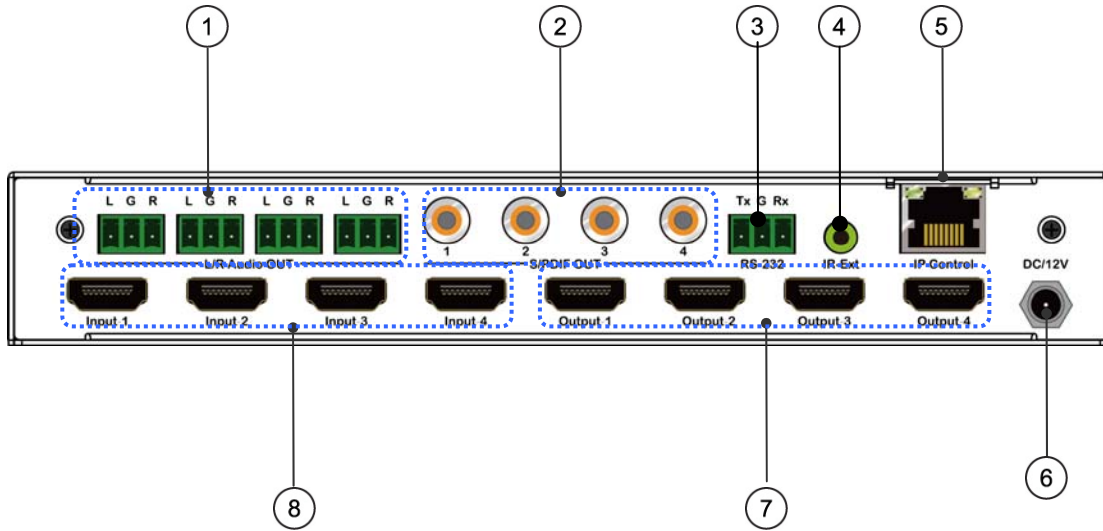
SM-4X4-4K18GBA-LCV2 Front Panel



#	LABEL	INTERFACE	DESCRIPTION
1	None (behind window)	IR Receiver	Sensor for receiving IR signal from Remote Control
2	OUTPUT 1-4	BUTTONS	Press to choose an output, press again to cancel / Press and hold to choose all outputs, press and hold again to cancel all outputs
3	INPUT 1-4	BUTTONS	Press to choose one input (must have already selected an output) / Press and hold to select one input for all outputs
4	PRESET	BUTTON	Momentary press to preset
5	UP	BUTTON	Momentary press to move up in the LCD menu
6	LOCK	BUTTON	Press and hold to lock, press and hold again to unlock When locked, all buttons will be non-responsive except for the Lock button
7	MENU	BUTTON	Press for main menu interface, or to return to the previous menu interface
8	DOWN	BUTTON	Momentary press to move down in the LCD menu
9	ENTER	BUTTON	Momentary press to confirm selection
10	None	LCD SCREEN	For displaying the onboard menu

Note: The Unit can be controlled using front panel buttons, like: video switch, EDID switch, baud rate switch, etc.. When entering into the menu interface, press button(s) within 30 seconds; if you exceed 30 seconds, the LCD screen will return to audio channel interface automatically; if you exceed 60 seconds, the LCD screen will go OFF.

SM-4X4-4K18GBA-LCV2 Rear Panel:

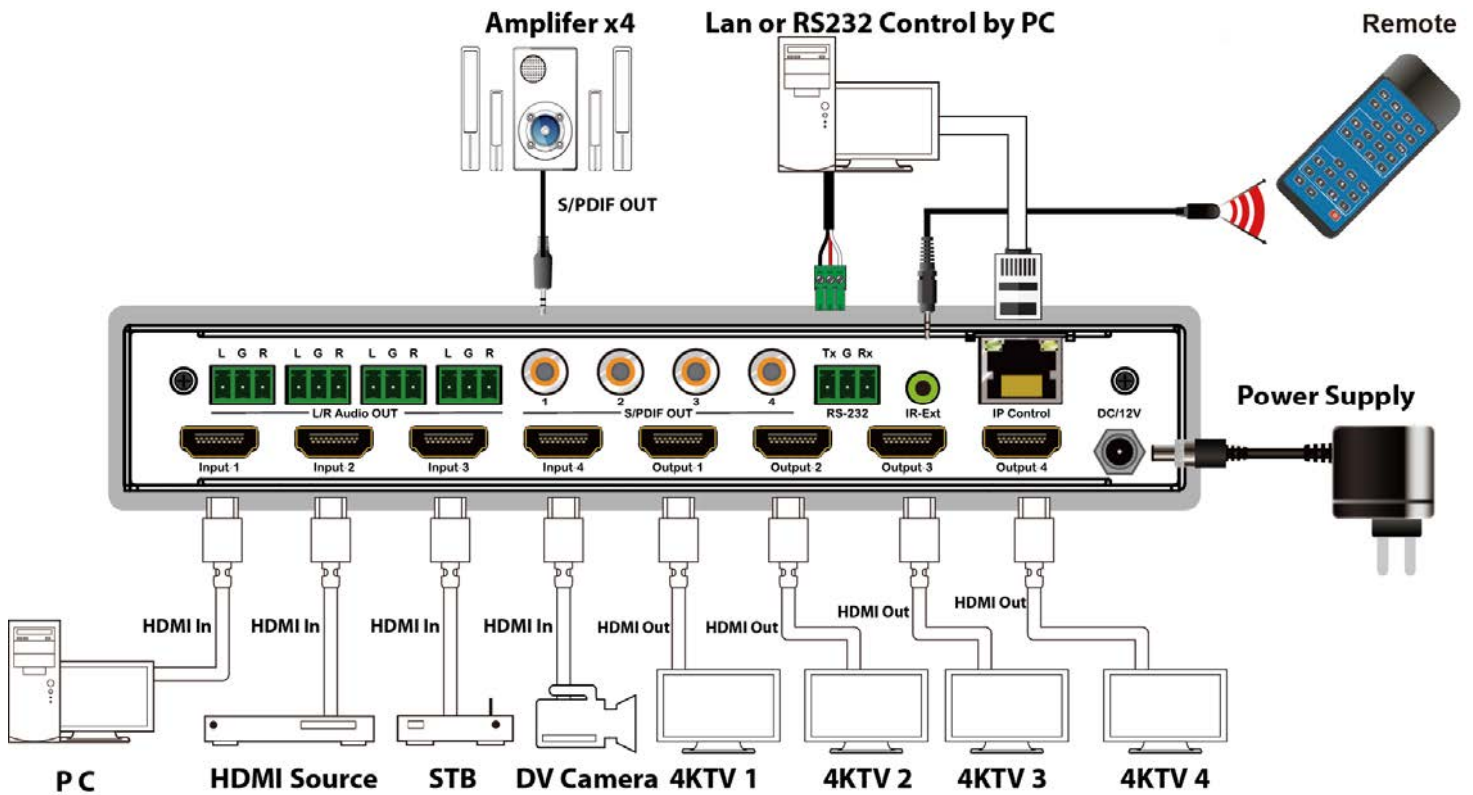


#	LABEL	INTERFACE	DESCRIPTION
1	L/R Audio Out -L/G/R	3-Terminal Blocks	For connecting to analog speakers
2	S/PDIF OUT	BNC connections	For connecting to S/PDIF type speakers
3	RS232 Tx/G/Rx	3-Terminal Block	For connection to RS232 terminal
4	IR-Ext	3.5mm Jack	For connection of IR Receive extension cable
5	IP Control	RJ45 Female	For connection to Computer or Ethernet Switch
6	DC/12V	DC Power Jack	For connection of DC power supply
7	Output 1-4	HDMI Female	For connection of display devices
8	Input 1-4	HDMI Female	For connection of HDMI sources

CONNECTIONS

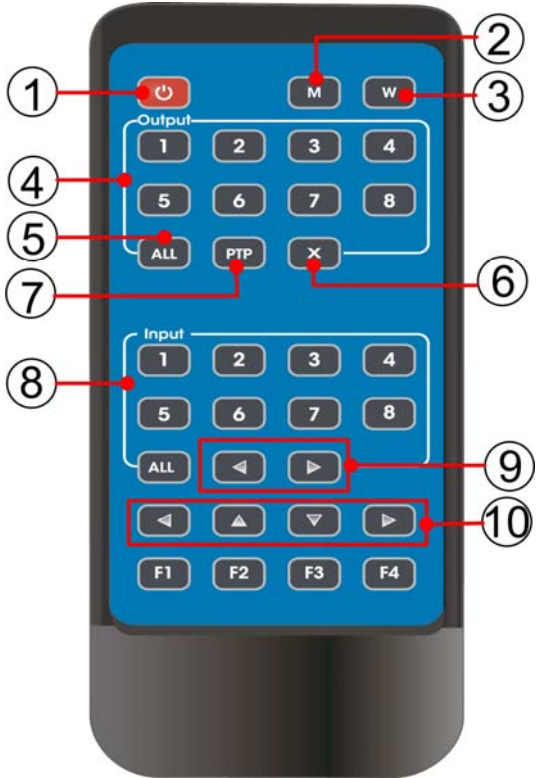
1. Connect HDMI video and audio source devices to the Input ports of the matrix
2. Connect HDMI Output ports to Televisions or other HDMI sink devices.
3. Optional: connect an RS232 cable from a computer's RS232 port.
4. Optional: connect an Ethernet cable from the TCP/IP port on the matrix to a local area network.
5. Connect the 12V POWER supply (provided) to the DC power socket.

Application Diagram



OPERATION

Remote Control Features



1. Power ON/Standby.
2. M: Mute the HDMI output audio
3. W: Lock remote control
4. Output 1-4
5. All outputs select INPUT-y:
 - a. Press ALL button
 - b. Press INPUT-y button (y means 1 to 4 of the Inputs), then INPUT-y is switched to ALL OUTPUTS.
6. Turn OFF the Output channel
7. PTP button: Mirror all Inputs and Outputs (Ex. Input 1 to output 1, input 2 to output 2, etc)
8. Input 1-4 (press Output-x then Input-y):
9. Switching Input left or right
10. Up and down, left and right for the menu page on the LCD

Remote Control Usage

Note: All buttons require only a momentary press, there is no function for a long press

Power ON/Standby: a short press will put the matrix in Standby mode,

- the LCD screen will display "System Shutdown",
- HDMI output 5V will disconnect and
- Display devices will be without image.

Press momentarily again to wake the matrix switch, the HDMI output will return to normal.

Video switch: Output+Input (example:Output1+Input2 = switch Output1 to Input1)

Mute HDMI output audio: Output+M (example:Output1+M= Mute Output1 audio)

Lock Remote Control: short press "W" to lock, short press again to unlock.

Turn OFF output channel: Output+X (example: Output1 + X= Output1 turns to a black screen, Output+X again to return to normal)

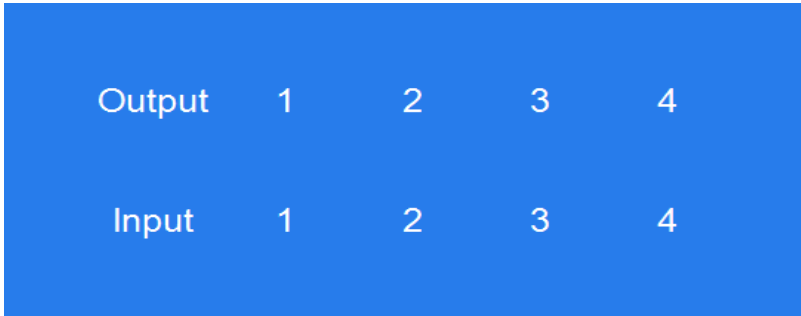
Switching input left or right: Output + <(>) = the input source connecting to Output 1 will be switched to the previous or next available input. For example- Input1,3 and 4 have signal and Output1 is now connecting to Input1. Press Output1 + >, this will switch the source to Input3. Press it again and it will switch to Input4. Press it again and it will switch to Input1).

LCD Panel Control

Video switch operation:

Signal switching includes 4 switching channels, which can be randomly configured as input/output according to requirements to form a 1x4~4x4 matrix. It can switch any input signal to 1 channel output or all channels output.

Operation format: "output channel"+"input channel", or long press "input channel"



Output	1	2	3	4
Input	1	2	3	4

For example:

1. Switch output1 to input4

Operation: press output1+input4 to complete the switch

2. Output2,1,3 switch to input 2

Operation:press output2,1,3+input2 to complete the switch

3. Switch All outputs to input4

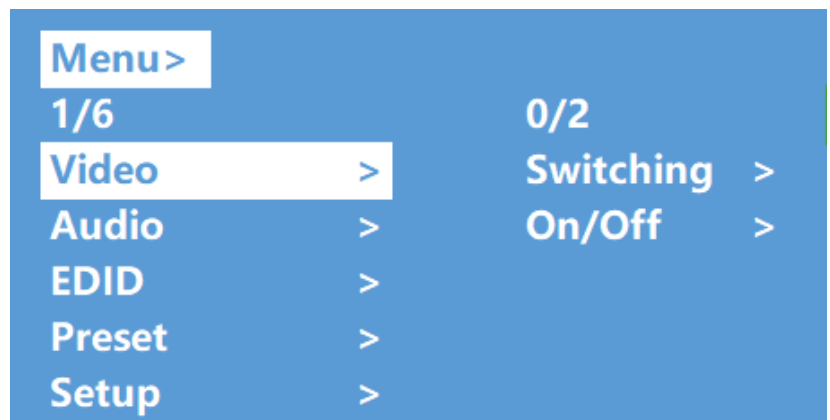
Operation: long press output4+long press input4 to complete the switch

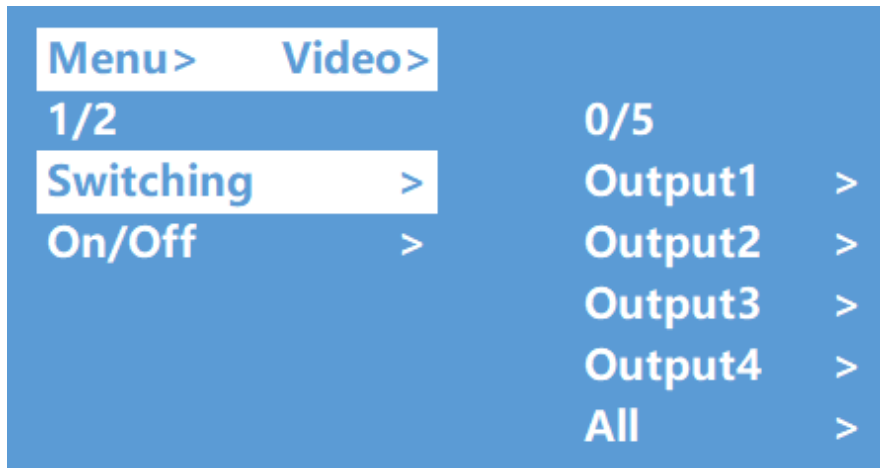
Note: Press output+input to switch; you can then press another input button to switch to a different input (you don't need to repeatedly press the output (if you exceed 10 seconds between button presses you will need to press an output again)

Video control:

There are 2 sub-menus in the video interface:

- 1.switching
- 2.On/Off

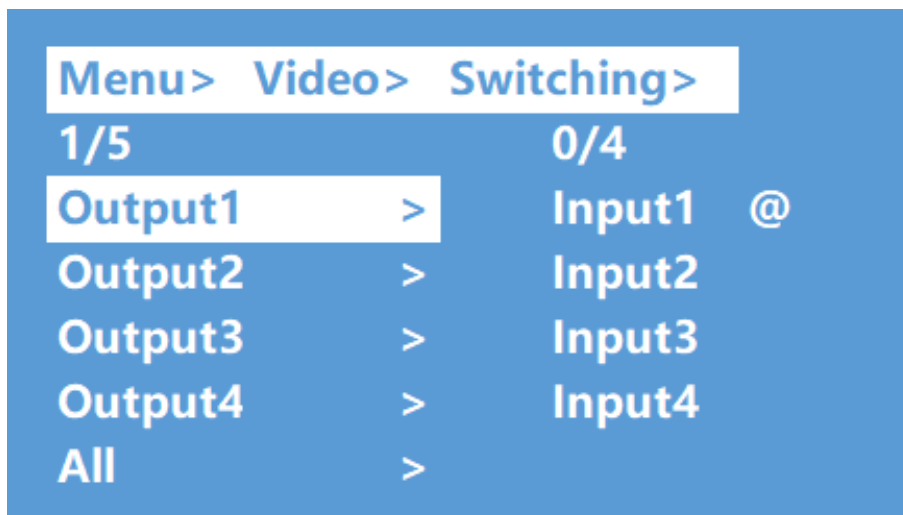




Video Switching

Operation:

1. Select "Video" in the main menu, press "ENTER" button.
2. Press "up and down" button to choose "Switching" .
3. Press "ENTER" to enter the next sub-menu
4. Press the "up and down" button to select "Output1~4" ("All" means switching all outputs)
5. Press "ENTER" to enter the next sub-menu
6. Press the "up and down" button to select the input
7. Press "ENTER" button to complete video switching

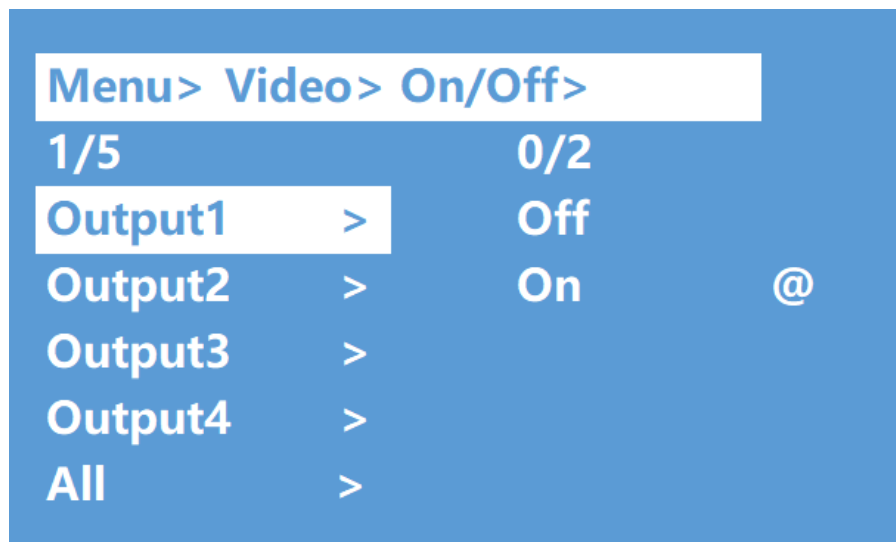
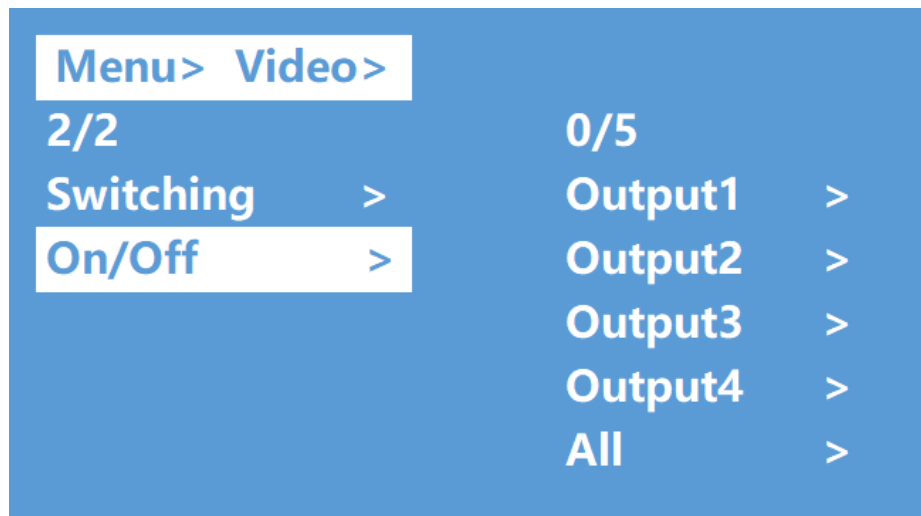


Turn ON/OFF Output

You can turn ON/OFF any output port, or turn ON/OFF all output ports. Output video is ON by default

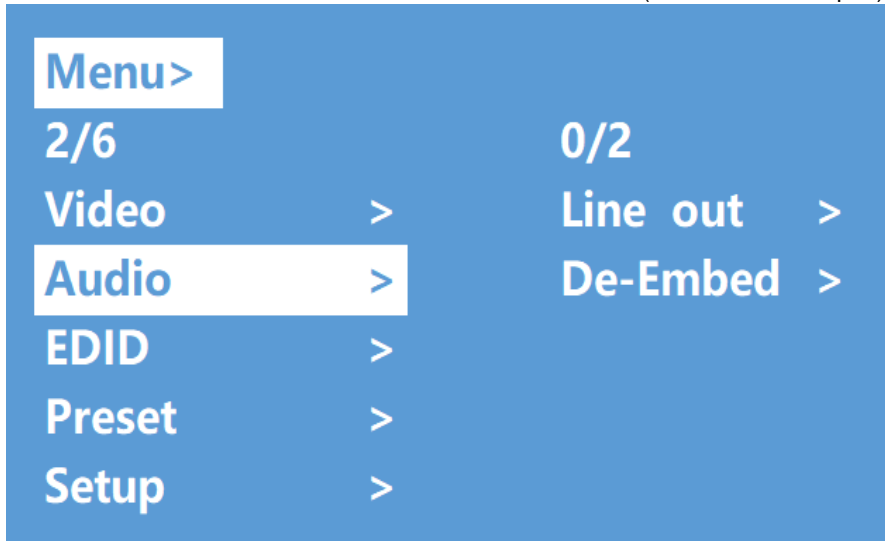
Operation:

1. In the main menu, select "Video" and press "ENTER" button
2. Press "up and down" button to select "On/Off"
3. Press "ENTER" button to enter the next sub-menu
4. Press "up and down" button to select "output1-4" (All means for all outputs)
5. Press "ENTER" to enter the next sub-menu
6. Select Output-HDMI1~4, press "ENTER" button to enter the next sub-menu
7. Press the "up and down" button to select "Off" or "On"
8. Press "ENTER" button to confirm that the output port is to switch ON/OFF.



Audio Control Interface

There are 2 sub-menus in audio control interface: Line out and De-Embed (both are default open)



Switch Output Audio

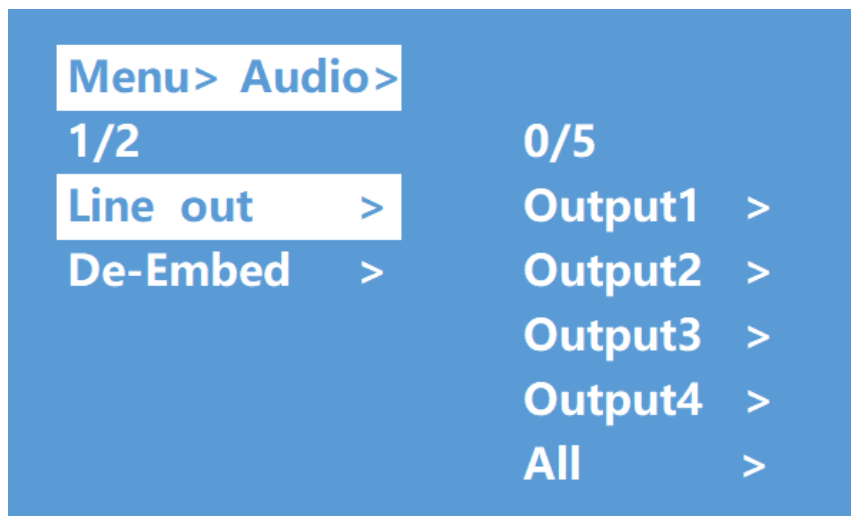
“Line out” means switch HDMI output audio ON/OFF, with which you are able to mute the TV sound from any one channel HDMI output.

Operation:

1. Select “Audio” in the main menu and press the “ENTER” button.
2. Press “up and down” button to select “Line out”, press “ENTER” button. You are now able to select output1-4 or all outputs by pressing “up and down” button, press “ENTER” button to choose “ON” and “OFF”

example: mute sound of TV which is connected to HDMI output1

Operation: “Audio”+“ENTER”+“Line out”+“Output1-HDMI1”+“Off”, will return to upper-menu after “ENTER” .



Audio Extraction Control:

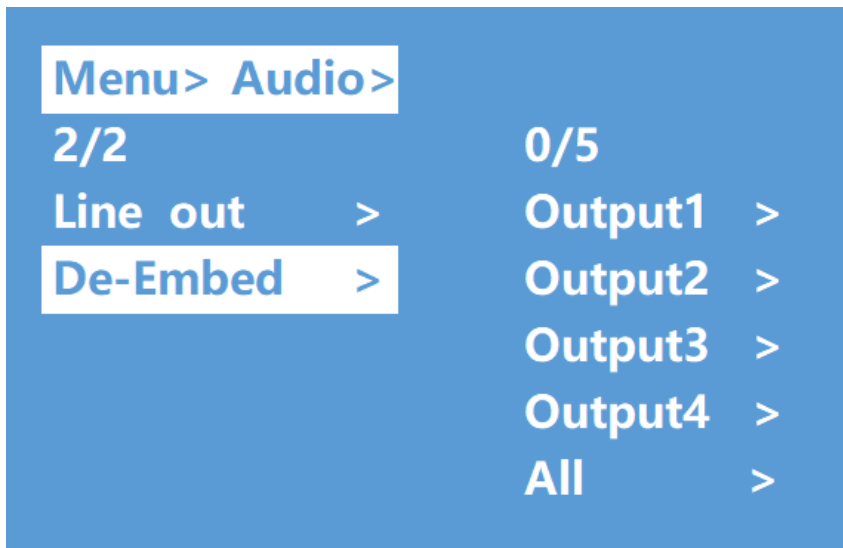
“De -Embed” enables you to set the output audio (for both analog and SPDIF audio). You can select any one Channel audio output or mute.

Operation:

- 1. Select “Audio” in main menu and press ”ENTER” button.
- 2. Press “up and down” button to select “De -Embed”, press “ENTER” button, the background of the selected turn to white. You can select output1-4 or All via pressing “up and down” button, press “ENTER” button to choose ”On” and “Off”

example: Turn off audio extraction of HDMI output1,

Operation: “Audio”+“ENTER”+“De -Embed”+“Output1”+“Off”, will return to upper-menu after “ENTER”

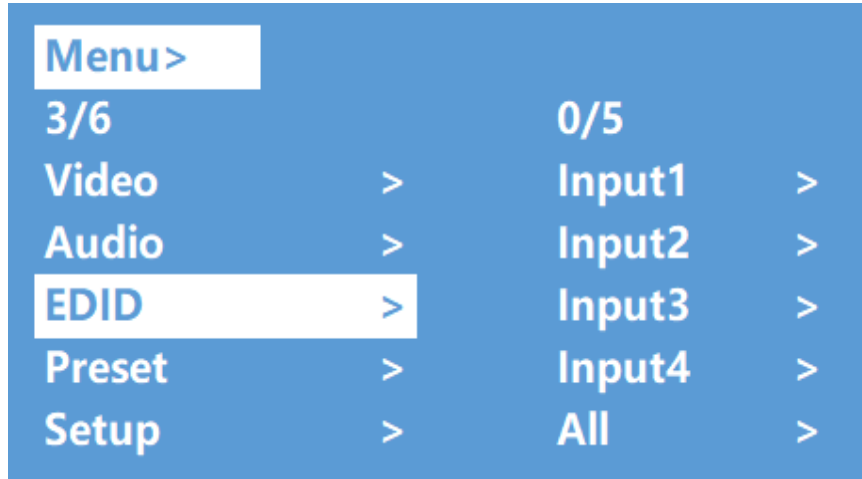


EDID Setting Interface:

EDID management: User EDID, built-in EDID, Copy EDID mode.

The default EDID is "Default1" for all input channels.

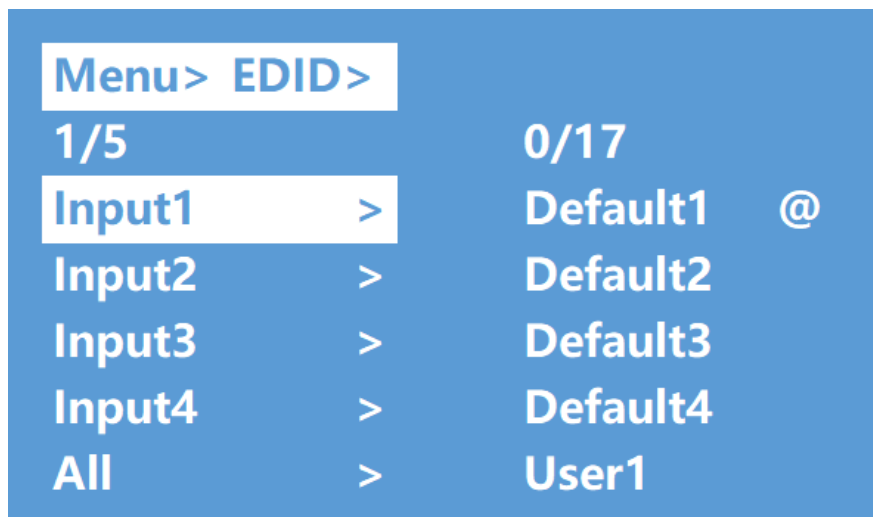
Default1	4K60 444-LPCM: 2.0, HDR:HLG	Default2	4K60 420-LPCM: 2.0, HDR:None
Default3	4K30 444-LPCM: 2.0, HDR:None	Default4	1080P60 444-LPCM: 2.0, HDR:None

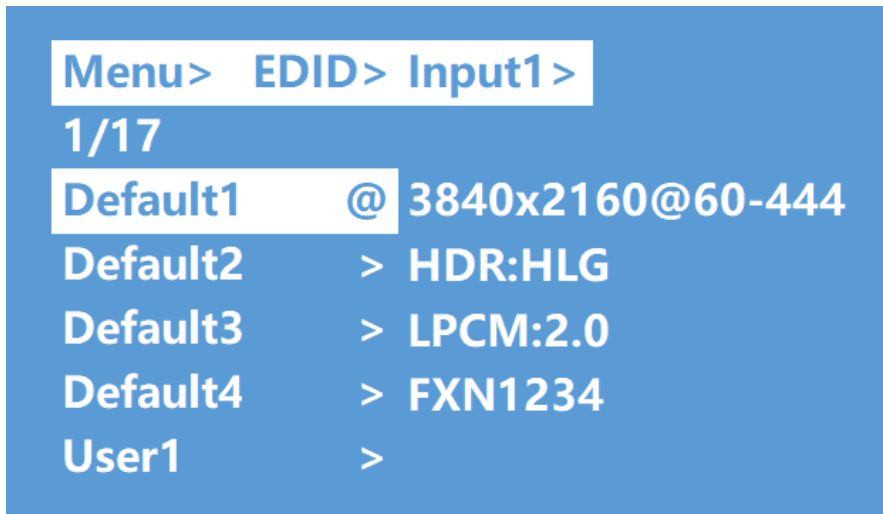


Example: Switch Input1 to Default1 EDID:

Operation :

1. Select "EDID" in main menu and press "ENTER" button
2. Press "up and down" button to select "Input 1"(All means for all inputs)
3. Press "ENTER" button to enter the next sub-menu
4. Press "up and down" button to select "Default1", press "ENTER" to complete the setting
5. Behind the selected EDID, it will show the maximum supported resolution, audio format and audio channel.



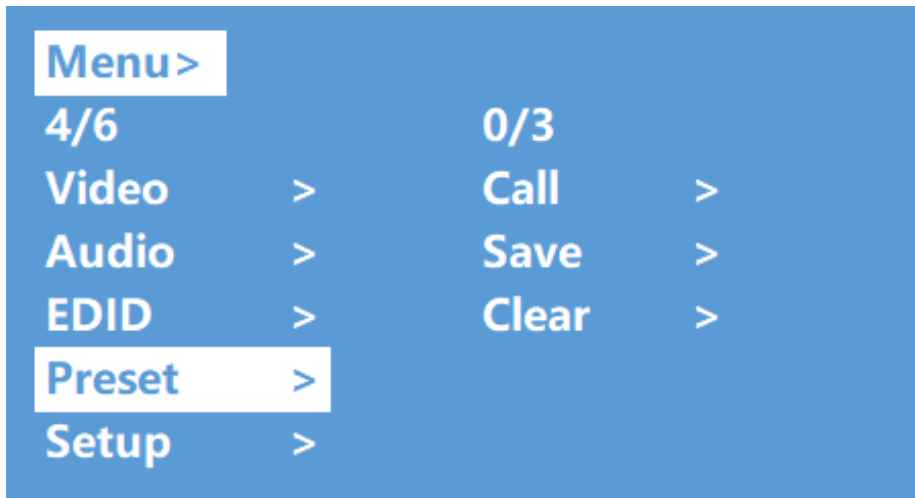


Preset Application

Preset interface can save the current video, audio, EDID, system settings, etc..., there are 8 slots available for preset configurations. They can be configured through web, command, panel buttons, and recall.

Preset control interface has three sub-menu:

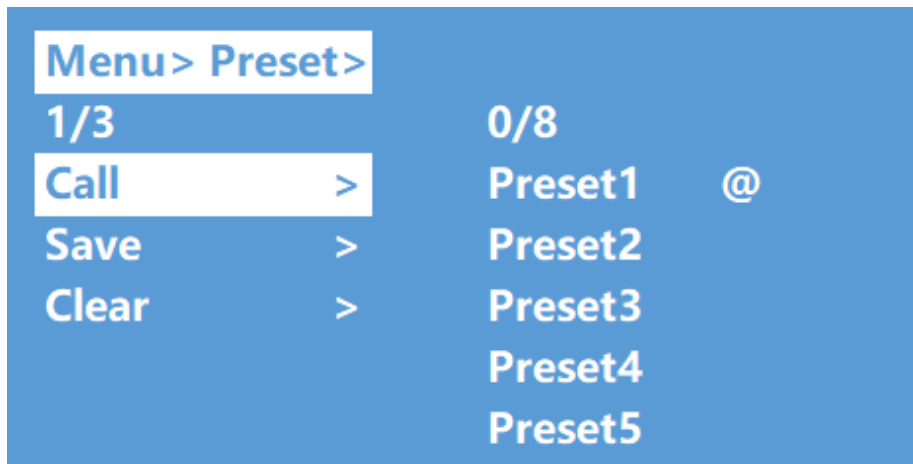
- > Call scene
- > Save scene
- > Clear scene



Operation:

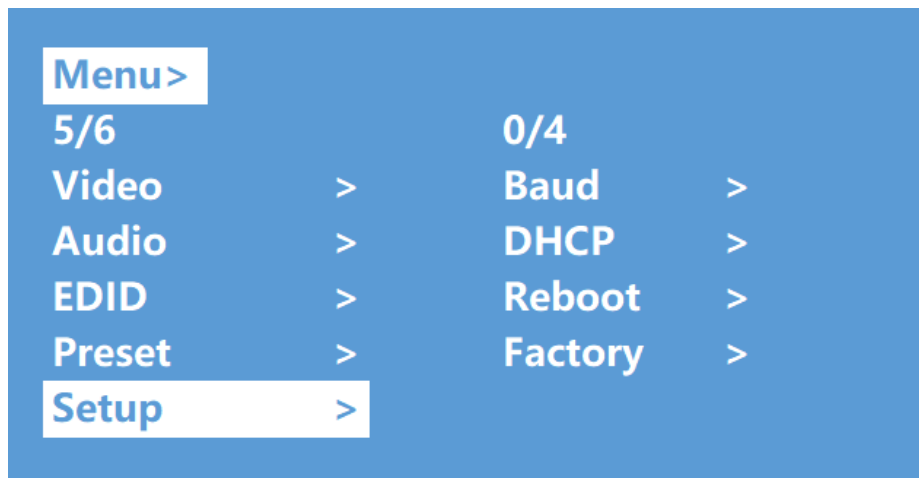
Select "Preset" in main menu and short press "ENTER" button to enter preset interface; then you can call, save and clear preset.

- Save preset: select Save-> any one of Preset1~8->ENTER.
- Call preset: Call->any of the saved Preset1~8->ENTER.
- Clear preset: Clear->any of the saved Preset1~8->ENTER (the saved preset will return to the default).



Setup Interface

Setup Interface can set serial port Baud Rate, DHCP ON/OFF, device Reboot and Factory Reset.

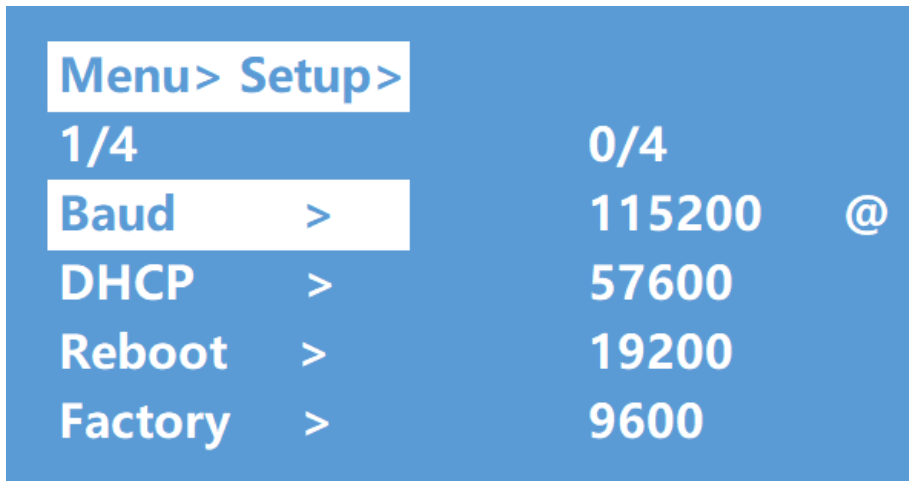


Baud rate setting

There are 4 options for baud rate setting: 9600,19200,57600,115200. The default serial port baud rate is 115200
The example below is setting baud rate to 9600.

Operation:

1. Select "Setup" in main menu and press "ENTER" button.
2. Press "up and down" button to select "Baud"
3. Press "ENTER" to enter the next sub-menu.
4. Press "up and down" button to select "9600"
5. Press "ENTER" to complete the setting

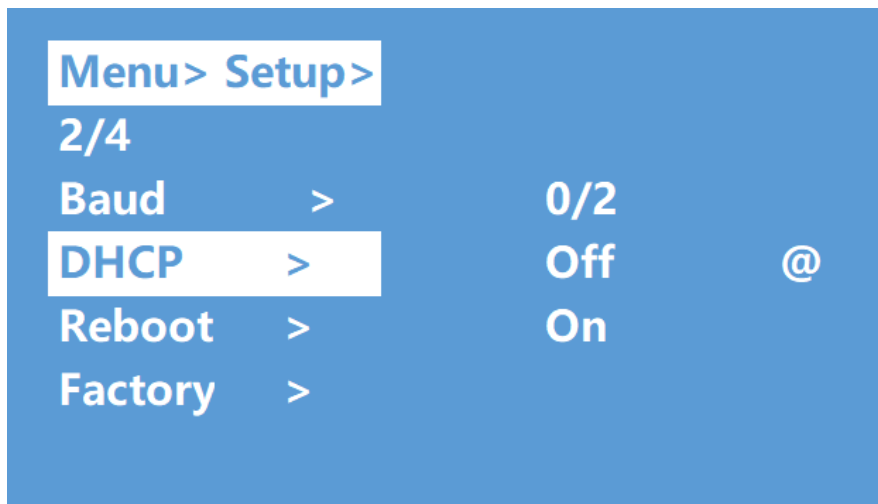


DHCP switch

DHCP On = dynamic IP address; DHCP Off = static IP address (default is DHCP Off)

DHCP On operation:

1. Select "Setup" in main menu and press "ENTER" button.
2. Press "up and down" button to select "DHCP" setting
3. Press "ENTER" to enter the next sub-menu.
4. Press "up and down" button to select "On"
5. Press "ENTER" to open DHCP to allocate IP address automatically.

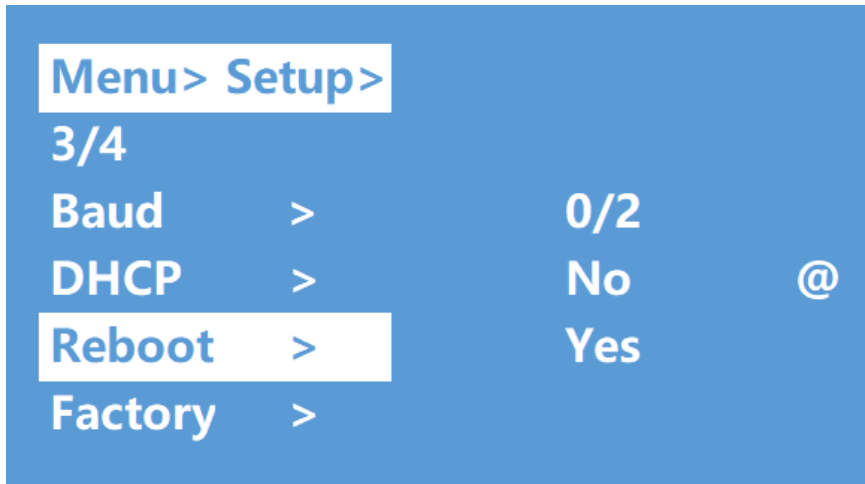


Reboot

Reboot the device.

Operation:

1. Select "Setup" in main menu and press "ENTER" button
2. Press "up and down" button to select "Reboot"
3. Press "ENTER" to enter the next sub-menu.
4. Press "up and down" button to select "Yes"
5. Press "ENTER" to complete reboot device.



Factory Reset

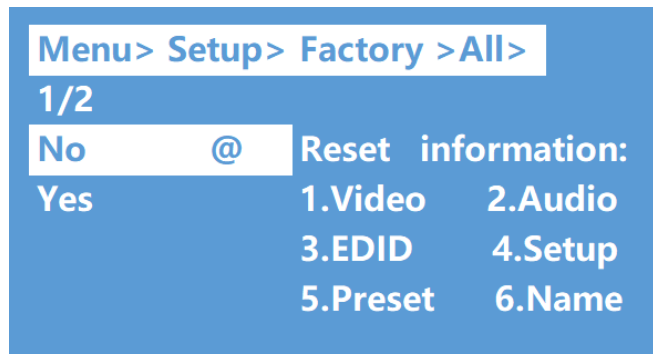
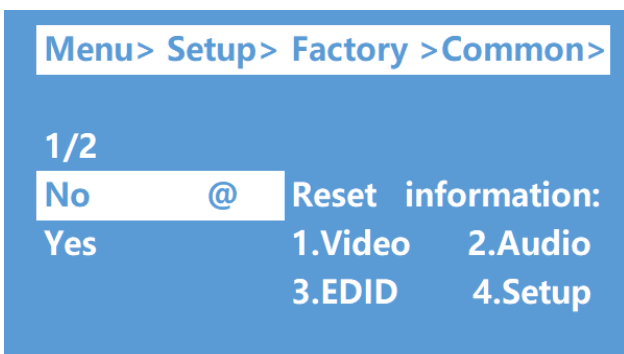
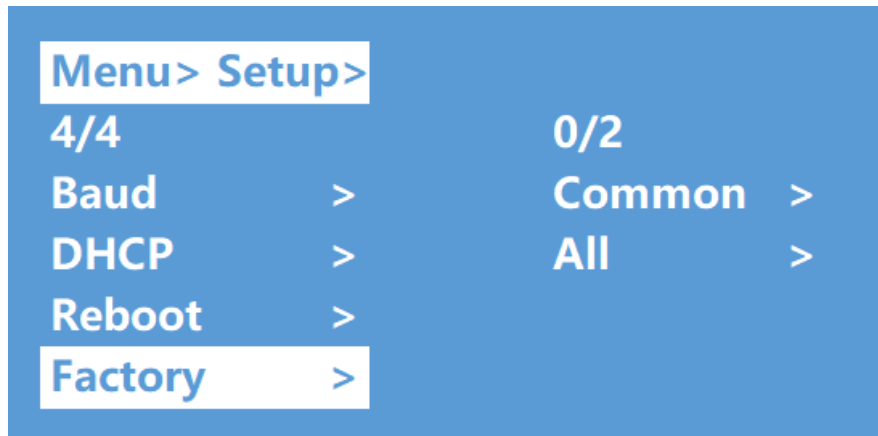
You can use this feature to restore the matrix to the initial factory settings. There are two factory settings:

Factory Common: Provides a factory reset for video switch, EDID, audio and settings (IP address can't be factory reset when under "common").

Factory All: Provides a factory reset for video switch, EDID, audio, settings, presets and the device name.

Example: Factory All operation:

1. Select "Setup" in main menu and press "ENTER" button
2. Press "up and down" button to select "Factory"
3. Press "ENTER" to enter the next sub-menu.
4. Press "up and down" button to select "ALL" and press "ENTER" button
5. Press "up and down" button to select "Yes" and press "ENTER" button



View Information Interface

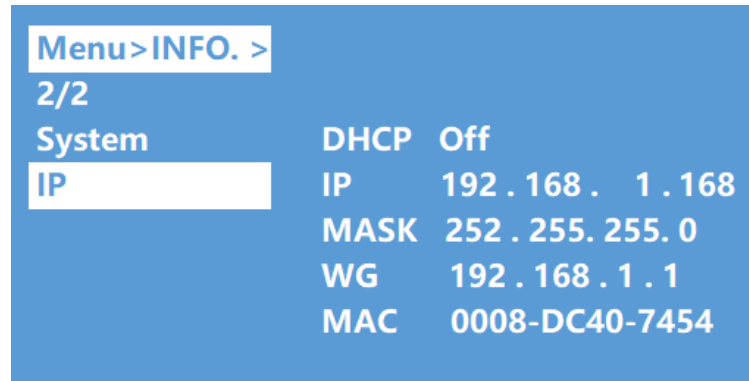
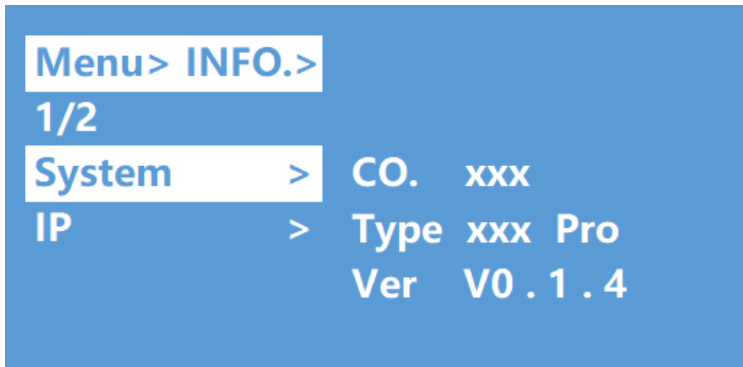
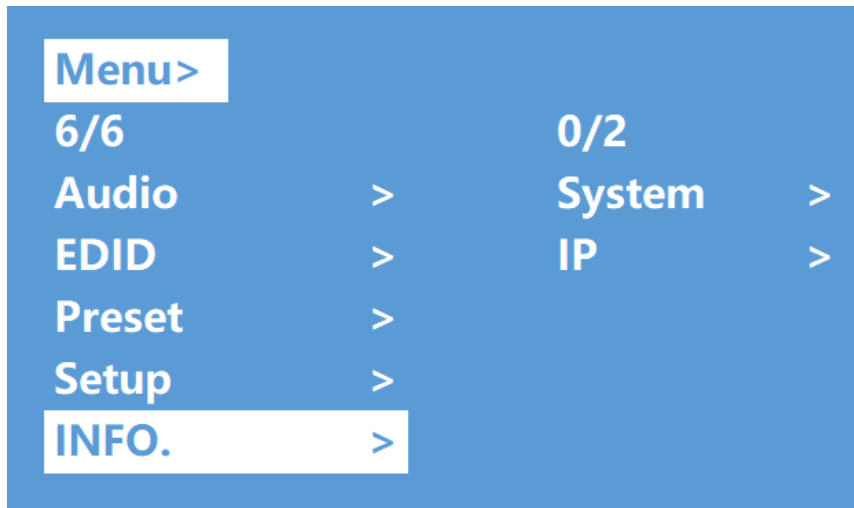
View IP and System Information.

System interface: View company name, device name and version information

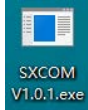
IP interface: View device IP address, MAC address and DHCP status.

Operation:

1. Select "INFO" in main menu and press "ENTER" button
2. Press "up and down" button to select "System" or "IP", background will turn white when selected
3. Press "ENTER" to enter the next sub-menu, then you can view device information.



RS232 CONTROL

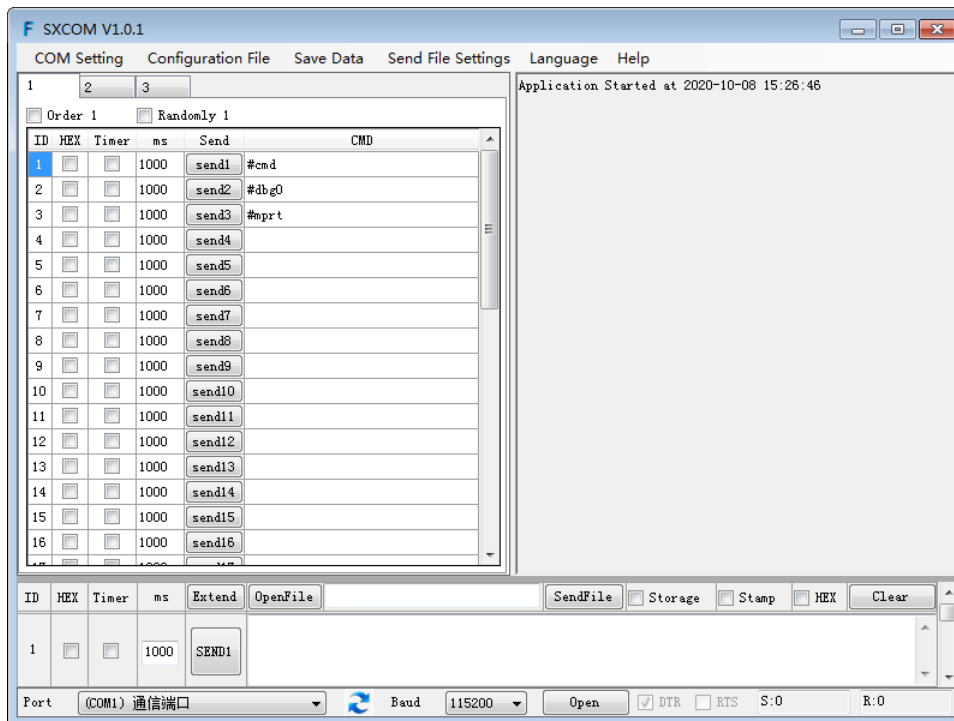
1. Open CommUart Assistant.  (This can be downloaded from <https://www.networktechinc.com/4k-matrix-switch.html>)

2. Comport setting:

Choose correct COM port settings that connect to a computer in the parameter configuration area

Baud Rate:	115200 bps(Default)
Parity:	None
Data Bit:	8 bit
Stop Bit:	1 bit

Enter Port Command in Send options.



Command List

1. All commands start with “#”
2. “_” the underline cannot be omitted.

Command head, Parameter and target need to add one “SPACE”.

The following table is only an example. Please refer to the list of instructions you received with the software download.

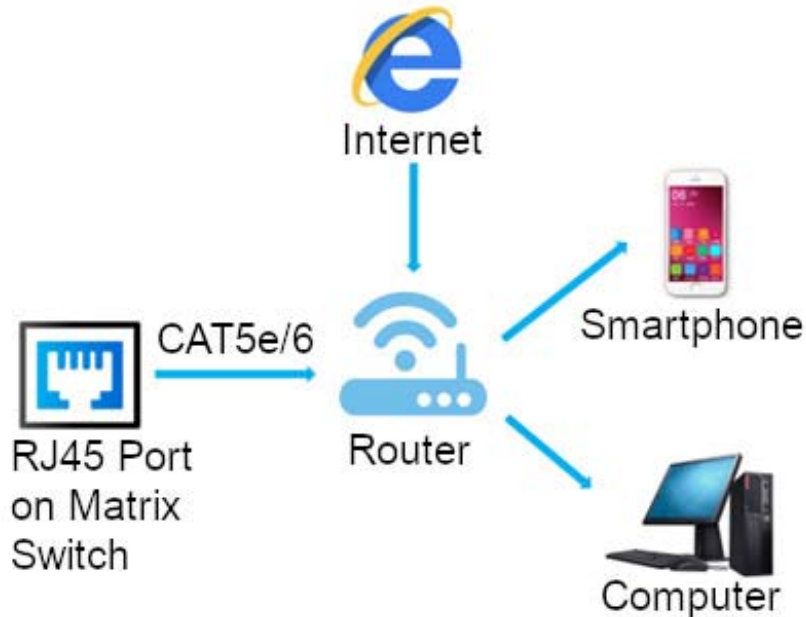
Type	Format	Value	Regulation
Command head	#cmd	without	
Description	Can be used to search command, after receiving command, the system will feedback all open command format fields		
Example1	#cmd		
	Search all open command		

WEB CONTROL

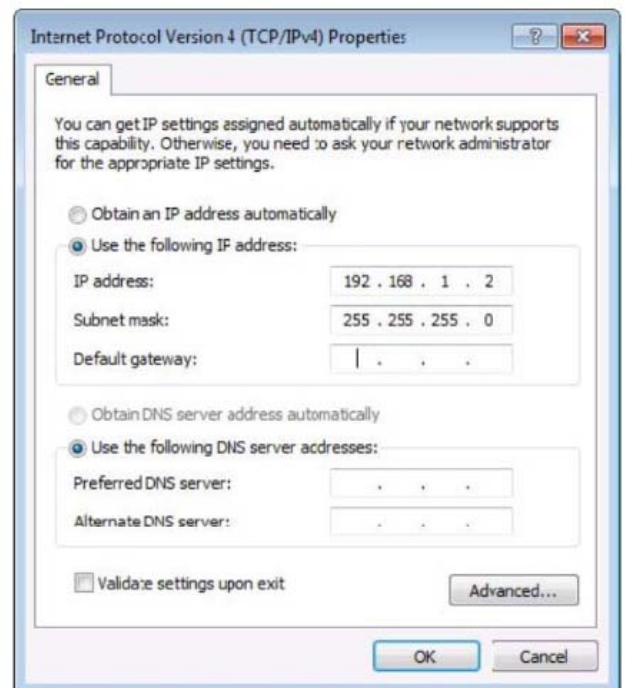
If DHCP (page 14) is set to ON, you will not need to change the IP address of the computer. Only do this if DHCP is set to OFF.

Change IP address of the computer

Before configuring the matrix through the website, it is necessary to configure the IP address of the computer to be attached to the matrix (mainly to ensure that the computer and the matrix are set in the same network segment).



1. Open the network control center and set the computer's IP address:
2. Choose to use Static IP, with the IP address set to 196.168.1.x (x ranges from 0 to 254, but cannot be the same as the matrix's IP address),
3. Subnet mask set to 255.255.255.0
4. Gateway set to 192.168.1.1



Log in by browser

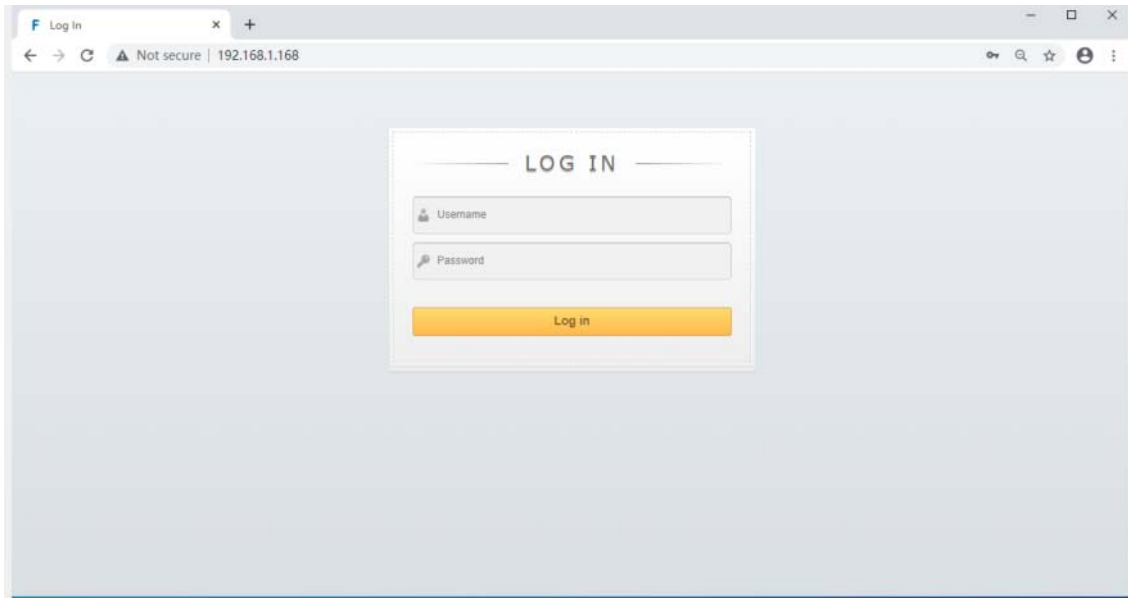
Default IP address for log-in: 192.168.1.168 (if DHCP is set to "OFF"). If DHCP is "ON", check the IP address from "Menu" -> "INFO" -> "IP" (see page 16).

Type in user name and password

default user name: admin

default password: admin

Note: we suggest to use newer version of Google, Firefox, IE11 browser for better compatibility.



Video Interface:

output : 01 >> 02, 01 means input, 02 means output, All means all outputs

Operation steps:

Click 01 >> 01 or All, then click input 01~04.

example: switching input1 to output 4; Click "04 >> 04" first, then click "01".

input: 01~04 means HDMI input 1~4.

OFF: close output channel, click "OFF" to close output channel; Click "ON" to close this function. The default is "OFF"

Store: preset1~preset8. Recall:call the preset; Save:save the preset

Operation steps:

1) Call preset: preset1 + Recall, call preset1

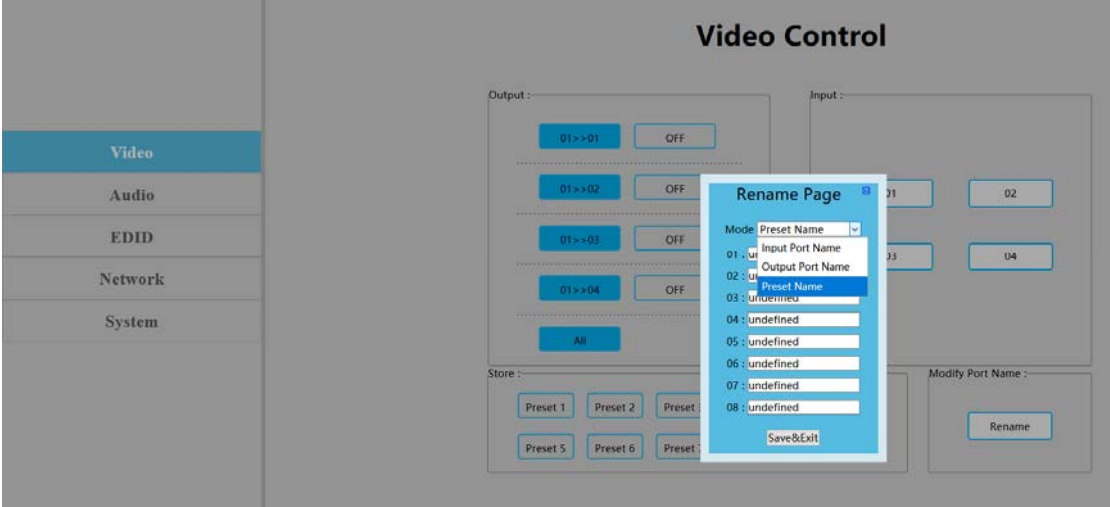
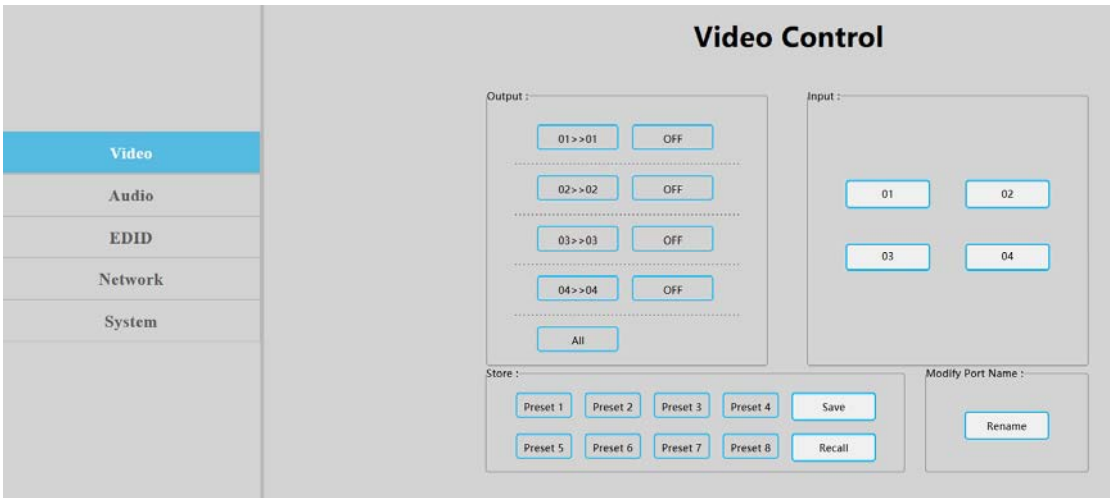
2) Save preset : preset2 + Recall, save preset2

Modify Port Name:

Click to choose the input or output port, enter a name in input box, then click "Save&Exit".

Click to choose preset, enter a name in input box, then click "Save&Exit".

Note: Rename limitations :1~15 letters, numbers or underlines.



Audio Interface

Click output1-4 HDMI : mute HDMI output audio ;

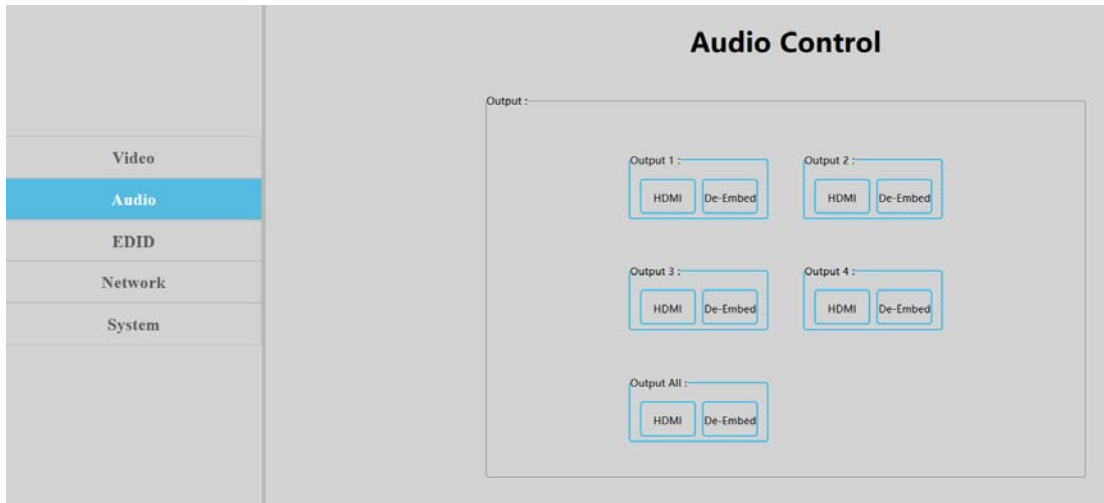
Operation: **example:** mute audio of the TV connected to HDMI output1

Click output1 HDMI, color will change and TV will have video but no audio. Re-click to un-mute the audio.

Click output1-4 De-Embed : turn OFF audio extraction function, also mute SPDIF and analog audio at the same time.

Operation : **example:** turn OFF HDMI output1 audio extraction

Click output1 De-Embed, color will change and there will be no audio for analog and SPDIF out. Re-click to un-mute audio



EDID Interface

1. Input : 00>>Input1 , 00~16= EDID number , Input1~4 = HDMI input1~4
2. Output : 00~03=default EDID , 04~07 =user EDID , 08~11=copy EDID , 12~15=input EDID , 16=Temp EDID , refer to below for more details :

00	4K60 444-LPCM: 2.0, HDR:HLG	01	4K60 420-LPCM: 2.0, HDR:None
02	4K30 444-LPCM: 2.0, HDR:None	03	1080P60 444-LPCM: 2.0, HDR:None
04	User1	05	User2
06	User3	07	User3
08	Copy HDMI out1	09	Copy HDMI out2
10	Copy HDMI out3	11	Copy HDMI out4
12	Copy input1	13	Copy input2
14	Copy input3	15	Copy input4
16	Default is empty, need to save EDID to device to take effect, doesn't support power-off memory		

EDID Information : show EDID here: click “00>>Input1” or “00:Default1”, will show resolution, audio, audio channel, HDR and serial number.

Edit User EDID : Click “Edit User EDID” , choose default, user, copy, input EDID on “EDID Edit Page” to save to User1-4. The EDID will be saved in memory even if the matrix switch is powered OFF.

Operation :

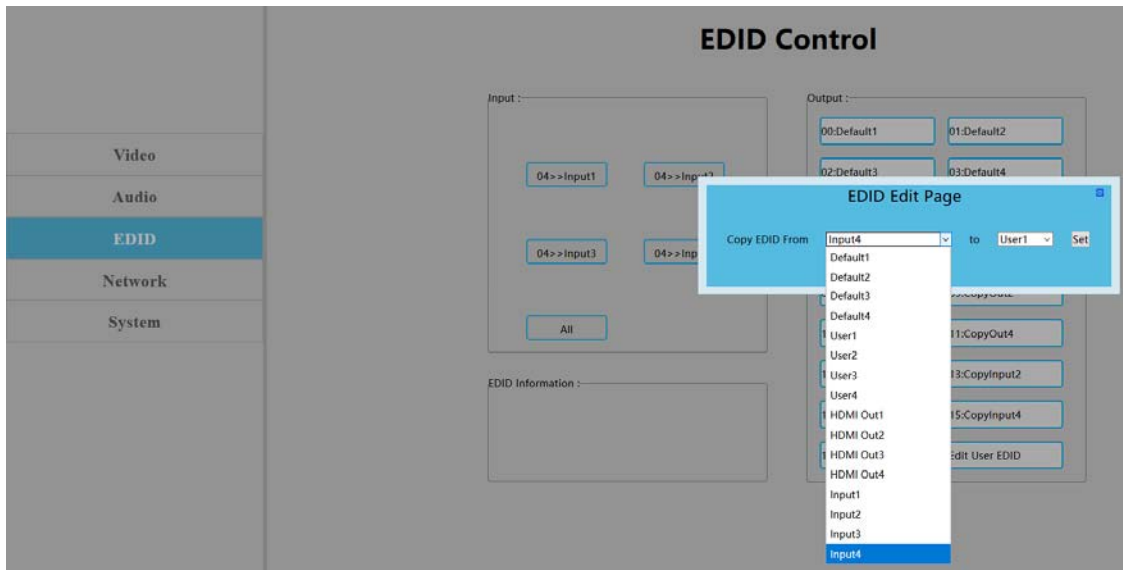
HDMI input1 to use second default EDID

click “00>>Input1” , then click “01:Default2”.

Save copy HDMI out1 to User1:

choose ”default1” in “EDID Edit Page”, then choose “User1” and click “Set” to finish.





Network Interface

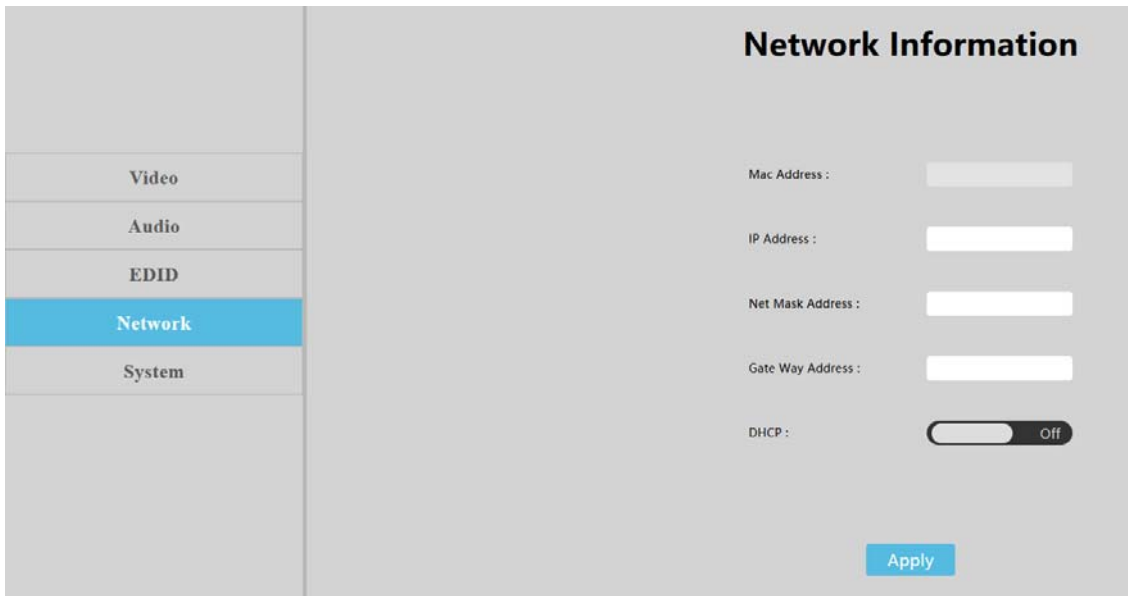
MAC address can not be modified, this is for display only.

Static IP: Click DHCP switch (DHCP Off), you can modify IP address, then click the “Apply” button. It will countdown. If the device IP address is the same as client IP, it will re-login to the web interface. If unable to refresh automatically, then you will need to resubmit form manually.

Dynamic IP: Click DHCP switch (DHCP On), the IP address will be assigned by router and turn to grey, it can not be modified, but it can display current IP address information.

IP address/Net Mask address/Gate Way address can be modified only when DHCP is Off, it can not be modified when DHCP is On

The Default IP address:192.168.1.168



System Setting Interface:

1. System Setting :

Reboot: Click to reboot device

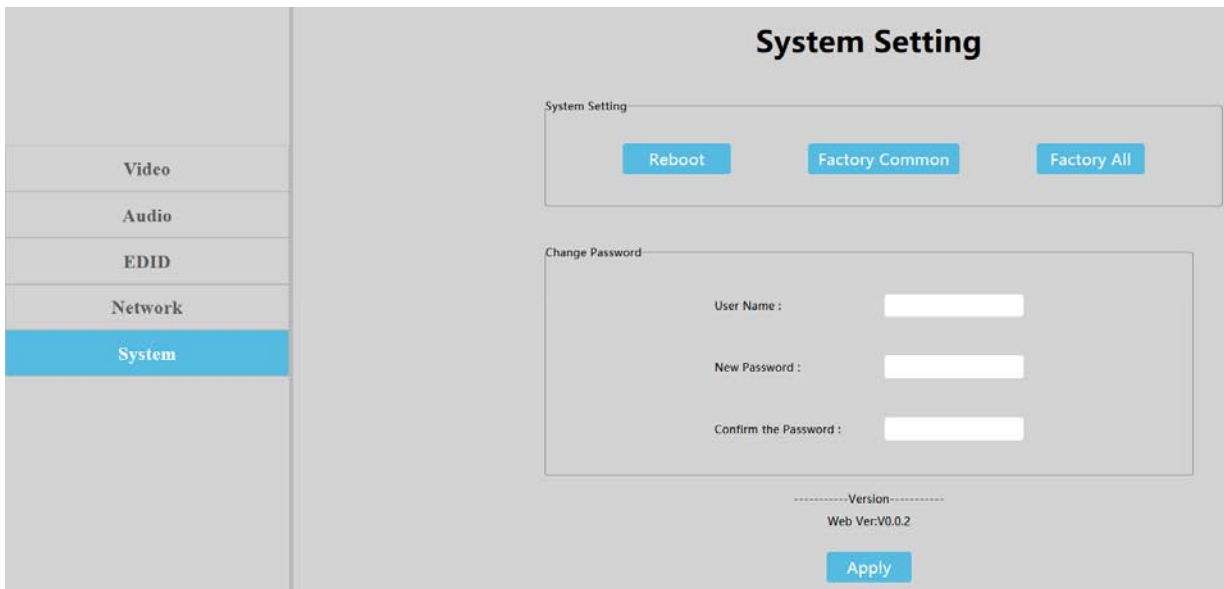
Factory Common: Click to reset device for partial functionality;

Factory All: Click to reset device completely;

- "Reboot" will not clear user set parameters;
- "Factory common" will not clear Network and Preset parameters;
- "Factory all" will reset everything to default.

2. Change Password : Change user name and password, then click "Apply".

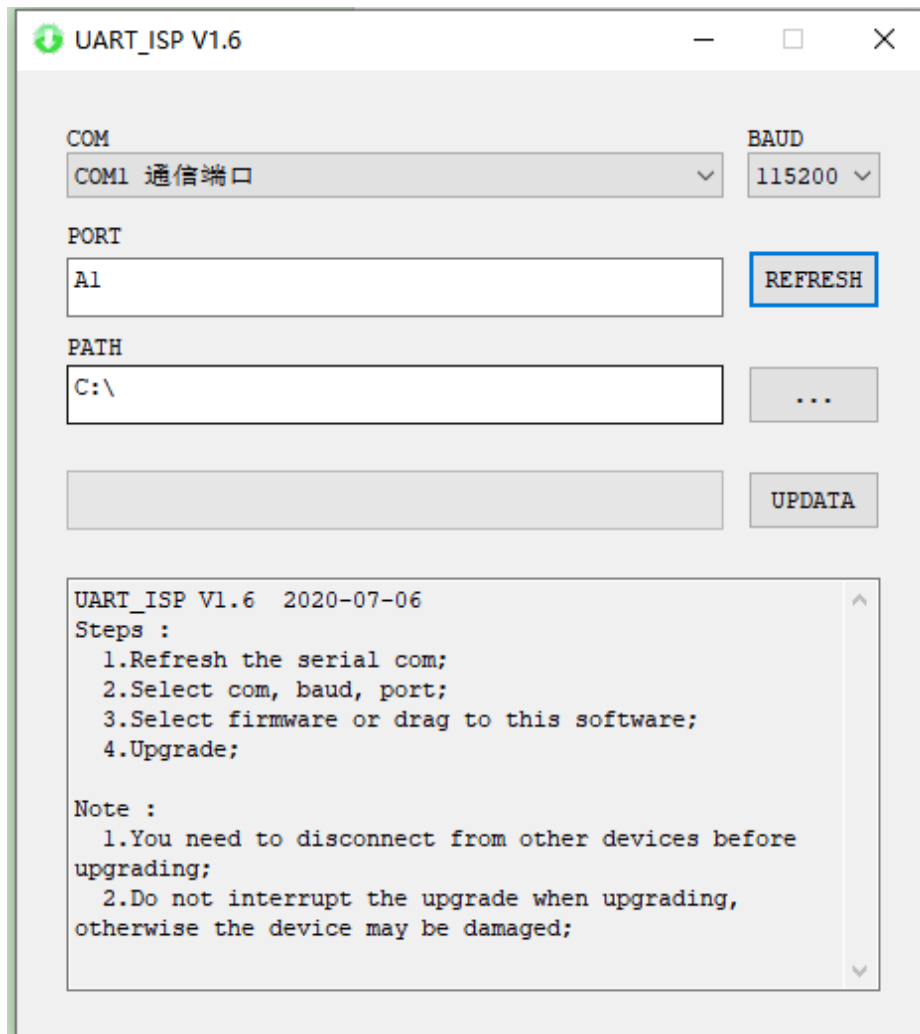
Note: The user name and password fields only support 6~15 letters, numbers or underlines



Firmware Upgrade

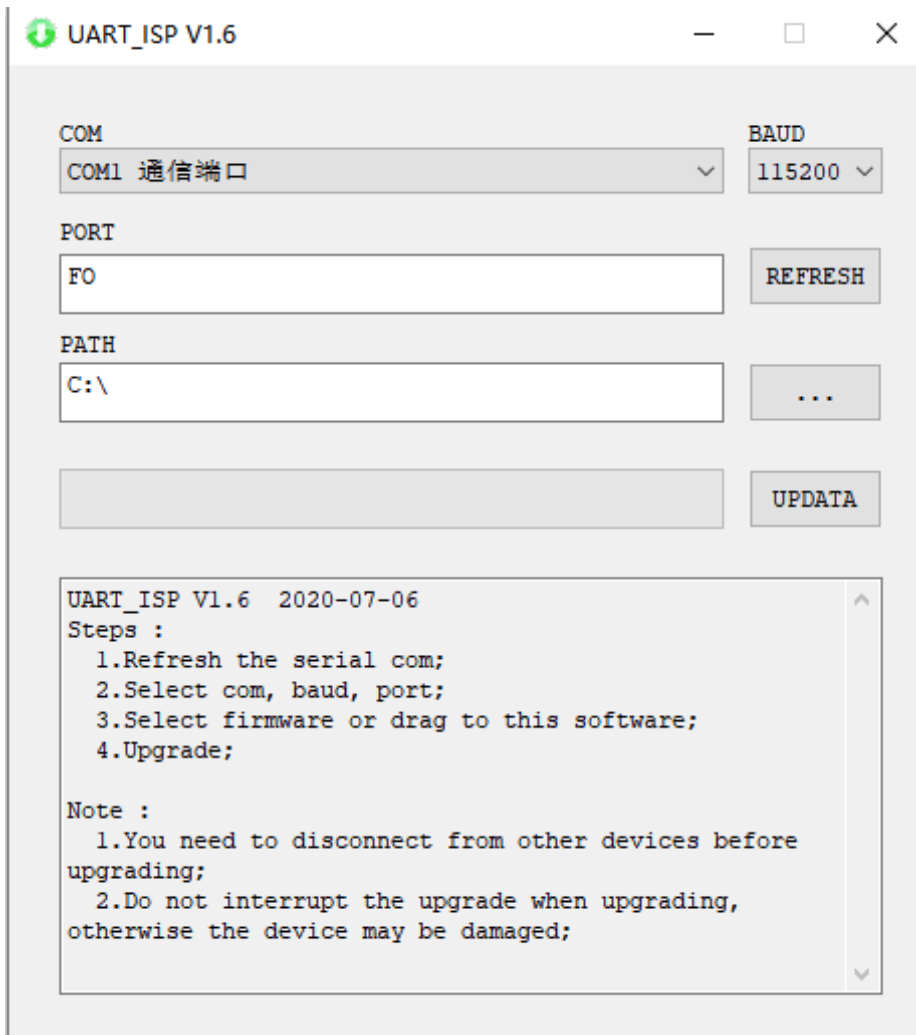
MCU application layer upgrade

1. Connect unit to computer with USB2.0 to RS232 cable.
2. Open software"UART_ISP_V1.x.exe",
3. Select the correct port,
4. Set baud rate at 115200,
5. Type "A1" in PORT block
6. Select PATH and enter path to the software file,
7. Then click UPDATA to finish upgrading.



Web Firmware Upgrade:

1. Connect unit to PC with USB2.0 to RS232 cable
2. Open software "UART_ISP_V1.6.exe",
3. Select correct port,
4. Set baud rate at 115200,
5. Type "F0" in PORT block
6. Select PATH and enter path to the software file
7. Then click UPDATA to finish upgrading.



TECHNICAL SPECIFICATIONS

Video Input Ports	4x HDMI Female
Video Output Ports	4x HDMI Female
HDMI Supported	HDMI 2.0
HDCP Compliant	HDCP2.2 and HDCP1.4
Bandwidth	18 Gbps
Supported common resolutions	4096x2160@60Hz 3840x2160@60Hz 1920x1200@60Hz 1920x1080@144Hz
Color Format	RGB, YCbCr 4:4:4, YCbCr 4:2:2, and YCbCr 4:2:0
Color Depth	Up to 12-bit color (36-bit deep color)
Audio Format Supported	PCM 2.0, LPCM 2.0/5.1/7.1, Dolby True HD, Dolby Digital, Dolby Atmos, DTS-HD master audio
RS-232 serial port	3 pin terminal block connector
Ethernet port (IP control)	RJ45, female
IR Ext port	3.5mm stereo jack
Operating Temperature	32°F to 104°F (0° to 40°C)
Storage Temperature	14 to 122°F (-10 to 50°C)
Operating Humidity	5 to 90%RH (Non-Condensing)
Power Supply	Input 100-240V 50/60Hz ; Output 12V 2A
Power consumption	14W(Max)
Weight	0.47kg
Size (In.) WxDxH	8.51 x 5.06 x 1.34 in (216.20 x 128.50 x 34.00 mm)
Default IP	192.168.1.168
Approvals	CE, FCC, RoHS

WARRANTY INFORMATION

The warranty period on this product (parts and labor) is two (2) years from the date of purchase. Please contact Network Technologies Inc at **(800) 742-8324** (800-RGB-TECH) or **(330) 562-7070** or visit our website at <http://www.networktechinc.com> for information regarding repairs and/or returns. A return authorization number is required for all repairs/returns.