

90m 4x4 HDMI Seamless Matrix Extender with 4 HDMI loop out Support 4K60hz YUV4:4:4, POC,Videowall

OPERATION MANUAL



Thank you for purchasing this product. For optimum performance and safety, please read these instructions carefully before connecting, operating or adjusting this product. Please keep this manual for future reference.

SURGE PROTECTION DEVICE RECOMMENDED

This product contains sensitive electrical components that may be damaged by electrical spikes, surges, electric shock, lightning strikes, etc. Use of surge protection systems is highly recommended in order to protect and extend the life of your equipment.

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1. Features

- 4 x HDMI input, 4 x HDMI output & DSC(POC) out, 4 x HDMI Loop out
- Support 4K@60Hz YUV4:4:4,18Gbps,deep color max 12bit
- Support Extending video signal distances up to 70m under 4K60Hz,and 90m under 1080p@60hz over single Cat6 Ethernet cable
- Support seamless switching
- Support 2×2 videowall and cascade to create up to 10×10 videowall
- Support 180° rotation and mirror function
- Support wide-band Bi-Direction IR routed control(38~56KHz)
- HDCP 2.2/1.4 compliant(follow input)
- Ethernet port support Telnet,UDP,Http,TCP/IP protocol
- Support 4x Analog Audio out extraction
- Support Panel Button with LCD, IR Remote, RS232 command, WEB GUI for Control
- Support 4K downscale to 1080p
- Support smart EDID management
- Support DC12V power supply,support 4 x POC power output
- Support micro USB for FW updating

2. Package Contents

- 1). 1x Main Unit (HDMI Matrix Extender)
- 2). 4x Power cable & 1x DC/12V power adapter
- 3). 1x Remote controller
- 4). 9xIR Transmitter cables, 9x Wide-Band IR Receiver cables
- 5). 1x CD for user manual & Command list
- 6). 10x Mounting ear

3. Specifications

Operating Temperature Range	-5 to +40°C(23 to +104 °F)
Storage Temperature Range	-10 to +60°C(-14 to +140 °F)
Operating Humidity Range	5 to 90 % RH (no condensation)
Input Video Signal	0.5-1.0 volts p-p
Input DDC Signal	5 volts p-p (TTL)
Bandwidth	18Gbit/s
Video Format Supported	4K@60Hz,YUV4:4:4 12bit 4k@30Hz/1080P/1080i/720P/576P/480P/576i/480i
HDCP Compliant	HDCP 2.2 and HDCP 1.4
Output Video	HDMI 2.0 /1.4 Version
Audio Format	PCM2.0
Maximum Transmission Distance	70m under 4K60hz,90m under 1080p60hz
Power Consumption	40watts (Max.)
Dimensions	Matrix: L438 x W220.2 x H44 mm Receiver: L110.2xW68.3xH18 mm
Mass (Main Unit)	5.38 KG

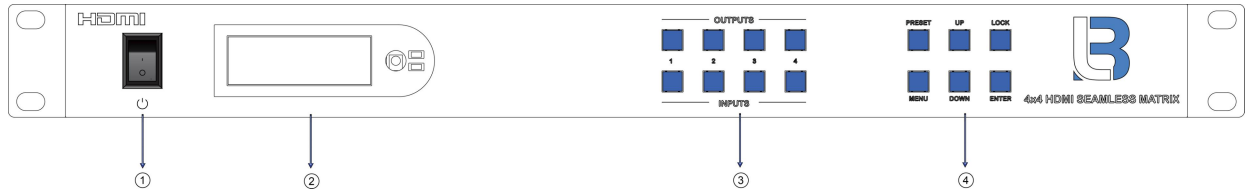
VESA Resolution List

Rate	Resolution	Supported	Mark
60Hz (8bit)	640×480	√	
	800×600	√	
	1024×768	√	
	1280×768	√	
	1280×1024	√	
	1600×1200	√	
	1680×1050	√	
	1920×1080	√	
	1280×720	√	
	1360×768	√	

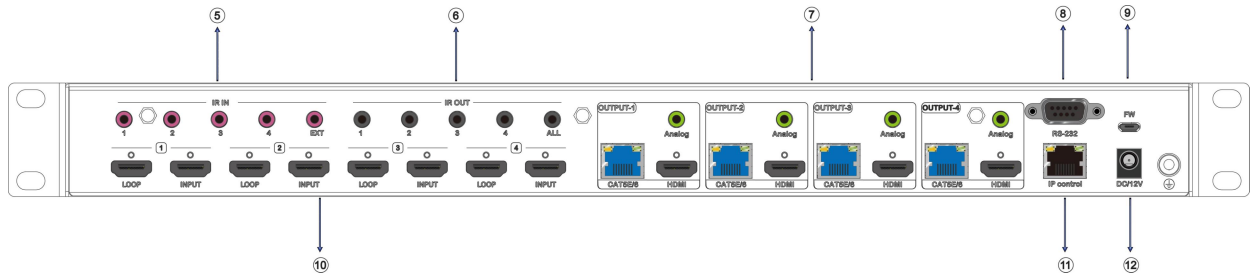
Testing Resolution List

Rate	I/P	Resolution	Supported	Mark
50Hz (8bit)	I	576i	×	
	P	576P	√	
	P	720P	√	
	P	1080P	√	
	I	1080i	√	
	P	4K2K	√	
60Hz /59.94Hz (8bit)	I	480i	×	
	P	480P	√	
	P	720P	√	
	P	1080P	√	
	P	4K2K	√	
30/29.97Hz (8bit)	P	720P	√	
	P	1080P	√	
	P	4K2K	√	
24Hz (8bit)	P	720P	√	
	P	1080P	√	
	P	4K2K	√	
25Hz (8bit)	P	720P	√	
	P	1080P	√	
	P	4K2K	√	

4. Panel Descriptions

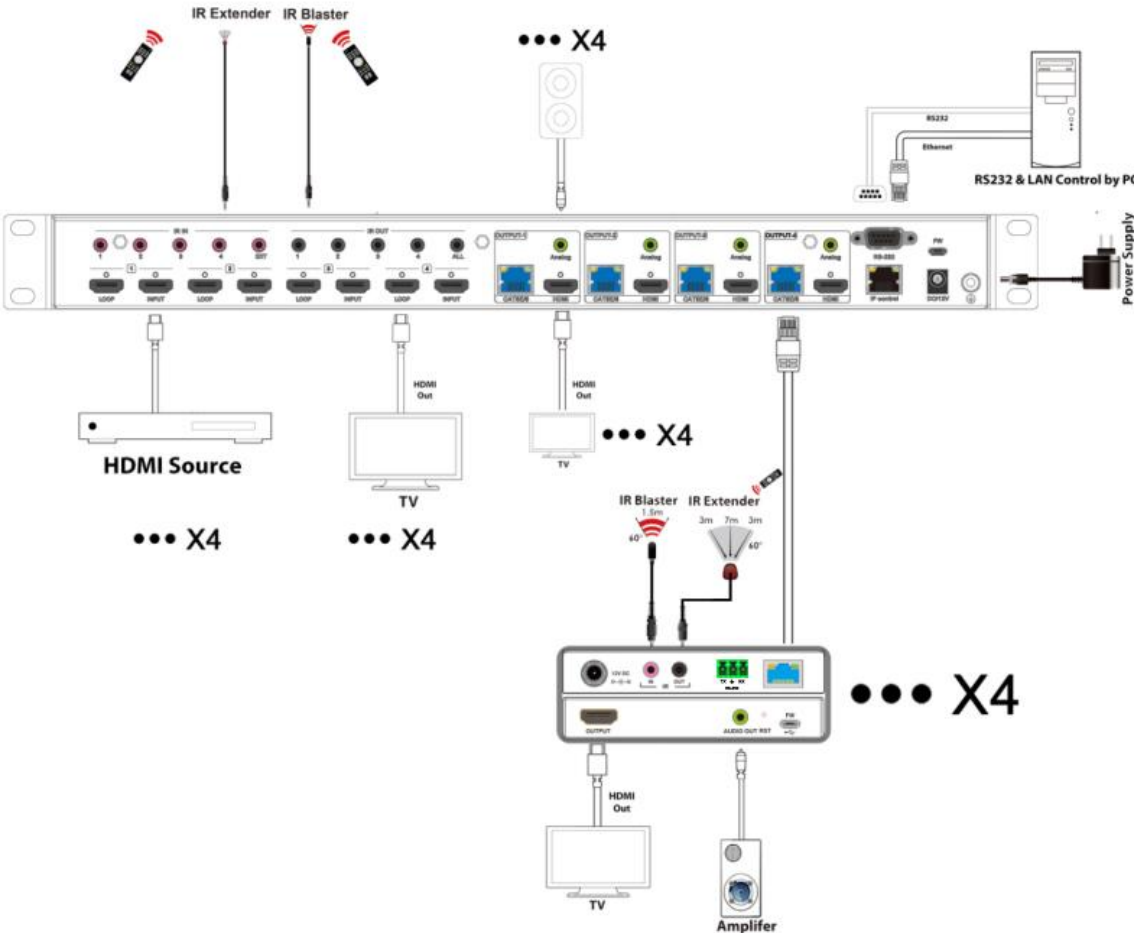


- ① Power On/Off
- ② LCD: Showing Matrix information
- ③ Output button OUT1~4 & Input button IN1~4
- ④ Function button: PRESET; MENU; UP; DOWN; LOCK; ENTER



- ⑤ IR input port x4 & Ext in
- ⑥ IR output port x4 & All out
- ⑦ Analog Audio out x4, Ethernet output x4 & HDMI out x4
- ⑧ RS232 port
- ⑨ FW update port
- ⑩ HDMI input x4 & HDMI loop out x4
- ⑪ Ethernet port for IP control
- ⑫ DC/12V Power supply

5. Wiring Diagram



6. Input / output channel key operation

Button	Button operation and function
OUTPUTS	Directly press number button to choose output,press it again to cancel the selection
INPUTS	After choose the output,directly press number button to switch the source
PRESET	Save,call,clear preset
UP	Press for UP option in OSD Menu,long press for UP option fastly
DOWN	Press for DOWN option in OSD Menu,long press for DOWN option fastly
MENU	Return to previous Menu,call up OSD Menu display,long press back to main Menu
ENTER	Enter next Menu
LOCK	Long press 3s to LOCK, Long press 3s again to UNLOCK

7. Video switching operation

7.1. Video switch

The signal switch includes 4 free switching channels, which can be configured as input/output according to the requirements, forming a matrix of 1 x 4 ~ 4 x 1, which can switch any input. Signal to 1 channel output or all channel output.

The specific operation as follows:

Output	1	2	3	4
Input	1	2	3	4

Switch the input to the output

Operation format: "output channel" + "input channel"

For Example: Output port 1 switch to input 5

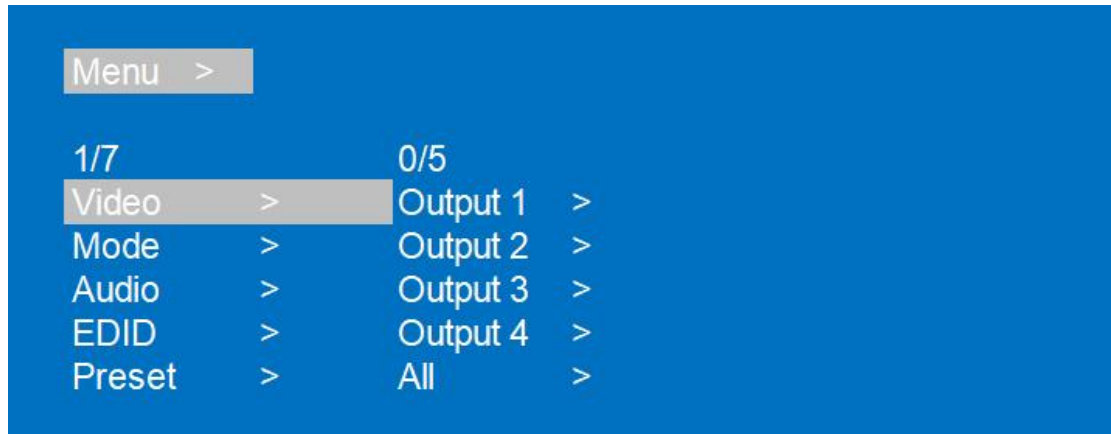
Operation: Press OUT number "1" + IN number "5" to complete the switch

Long press 3s for "input channel" button, then all output switch to this input (Device enter 2x2

videowall mode automatically)

7.2. Video Control

Press “MENU” button on panel,enter the main menu interface:



1. Video: switch signal/source
2. Mode: switch mode
3. Audio: audio setup
4. EDID: EDID setup
5. Preset: preset setup
6. Setup: parameter setup
7. INFO.: information query

Operation:use “UP” “DOWN”button to choose,press MENU button to return,press ENTER to confirm option

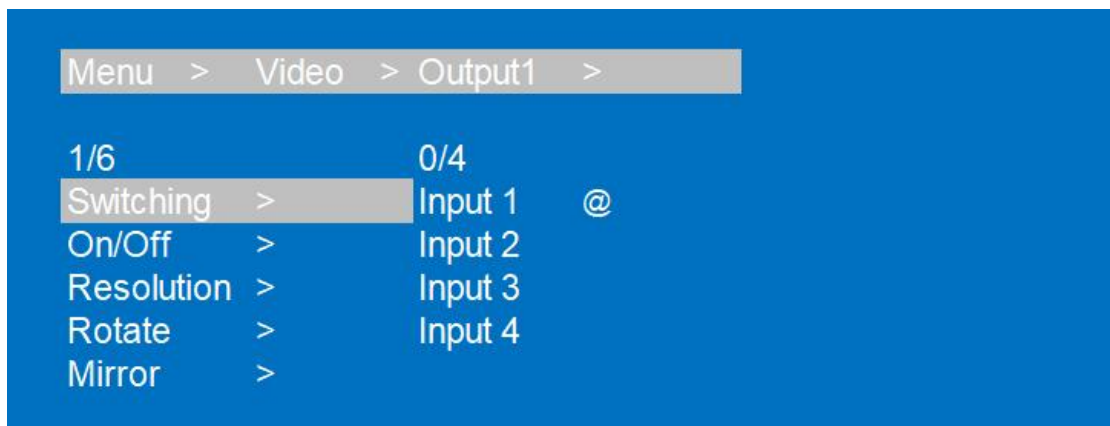
The specific operation as follows:

Video includes 5 subitems,Output1~4,ALL,each subitem include 6 subitems:Switching,On/off,Resolution,Rotate(180 degree),Mirror,Advanced(setup).

1.Video Switch

Switch any output to one input or all outputs to the same input.

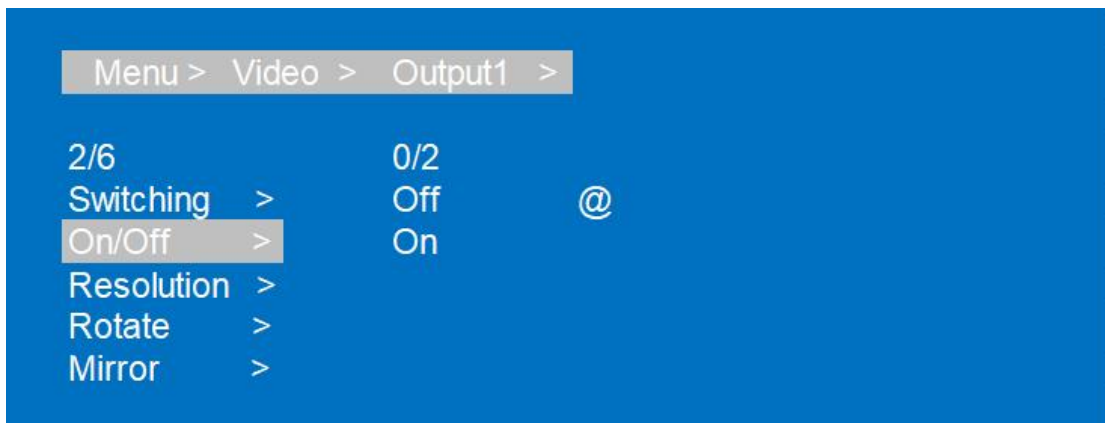
- ①Select “Video” in the menu and press “ENTER”
- ②Select “Output1” and press “ENTER”
- ③Then use “UP” “DOWN” button,press “Switching” enter next page
- ④Press “UP” “DOWN” to select the input
- ⑤Press “ENTER” , Switching Done



2. On/Off

Turn on/off any output video or all outputs video

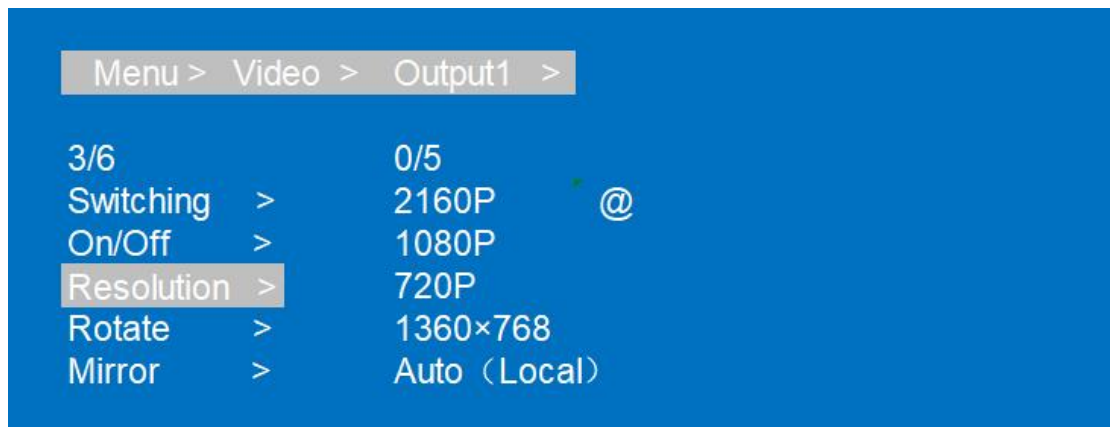
- ①Select "Video" in the menu and press "ENTER"
- ②Then use "UP" "DOWN" button to select "Output" or "ALL"
- ③Press "ENTER" enter next page
- ④Press "UP" "DOWN" button to select "On/Off"
- ⑤Press "ENTER" to enter next page
- ⑥Press "UP" "DOWN" to select "On" or "Off"
- ⑦Click "OK" to confirm , output video turn on/off Done



3.Resolution

Choose the resolution for any output video or for all outputs video,default 2160p.

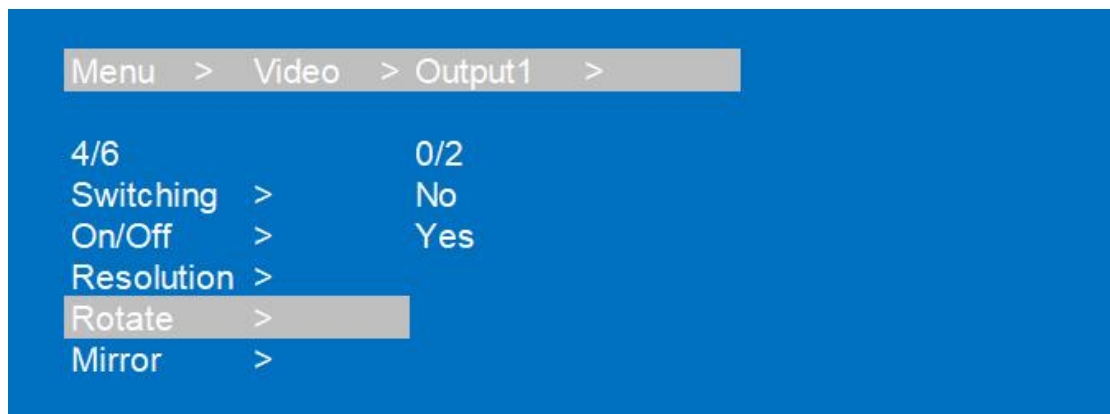
- ①Select "Video" in the menu and press "ENTER"
- ②Then use "UP" " DOWN" button to select "Output1" or "ALL"
- ③Press "ENTER" enter next page
- ④Press "UP" " DOWN" button to select "Resolution"
- ⑤Press "ENTER" to enter next page
- ⑥Press "UP" " DOWN" to select:2160P,1080P,720P,1360X768 and AUTO(Local)
- ⑦Press "ENTER" ,Done



4.Rotate

Choose the Rotate for any output video or for all outputs video,clockwise rotation(180 degree)

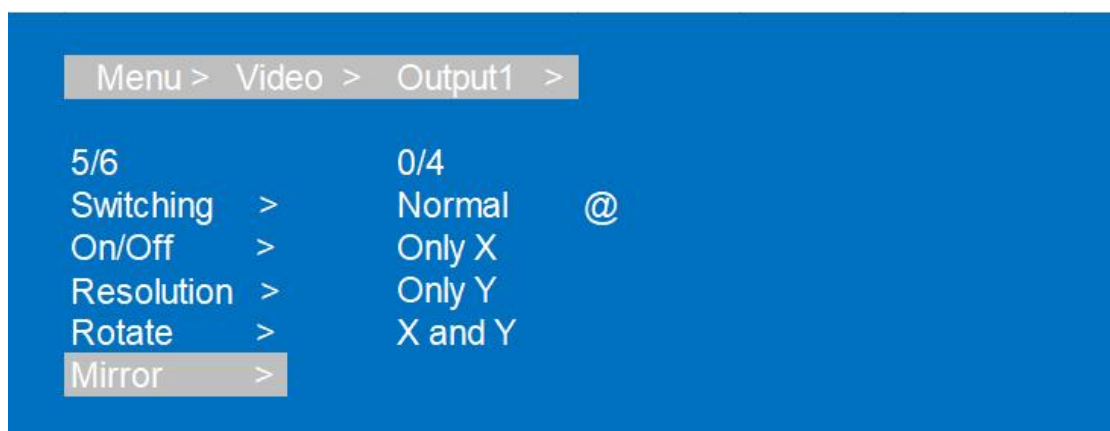
- ①Select "Video" in the menu and press "ENTER"
- ②Then use "UP" " DOWN" button to select "Output1" or "ALL"
- ③Press "ENTER" enter next page
- ④Press "UP" " DOWN" button to select "Rotate"
- ⑤Press "ENTER" to enter next page
- ⑥Press "UP" " DOWN" to select "Yes" or "No"
- ⑦Press "ENTER" ,Done



5.Mirror

Choose the Mirror for any output video or for all outputs video,include 4 options:Normal(default,not mirror),Only X(Horizontal Mirror),Only Y(Vertical Mirror),X and Y(Horizontal Vertical Mirror,180 degree rotate).

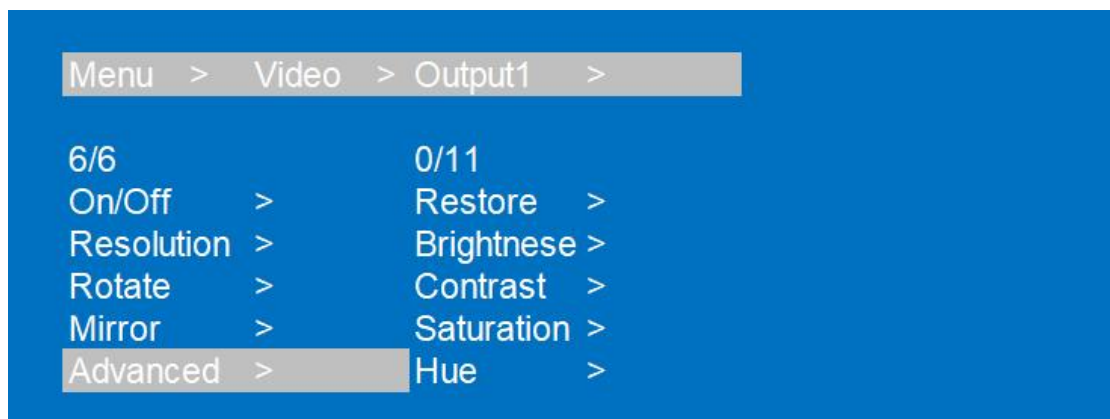
- ①Select "Video" in the menu and press "ENTER"
- ②Then use "UP" " DOWN" button to select "Output1" or "ALL"
- ③Press "ENTER" enter next page
- ④Press "UP" " DOWN" button to select "Mirror"
- ⑤Press "ENTER" to enter next page
- ⑥Press "UP" " DOWN" to select any option
- ⑦Press "ENTER" ,Done



6.Advanced

Choose the Advanced for any output video or for all outputs video/image,to do setup for video,include:

- Restore: reset all setup data of color
- Brightness
- Contrast
- Saturation(saturability)
- Hue (color)
- R_Gain,G_Gain,B_Gain
- R_Offset,G_Offset,B_Offset

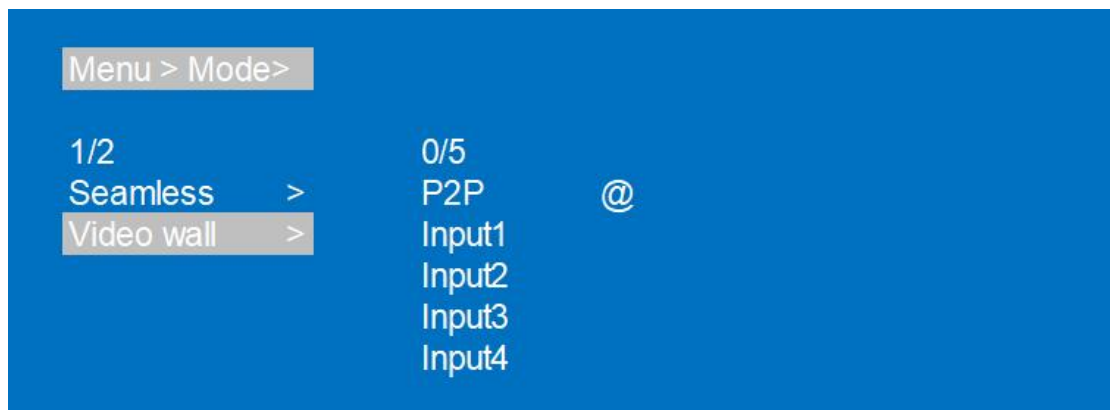


- ①Select "Video" in the menu and press "ENTER"
- ②Then use "UP" " DOWN" button to select "Output1" or "ALL"
- ③Press "ENTER" enter next page
- ④Press "UP" " DOWN" button to select "Advanced"
- ⑤Press "ENTER" to enter next page
- ⑥Press "UP" " DOWN" to select "Yes" or "No"
- ⑦Press "ENTER" ,Done

7.3. Mode Control

Mode include:

1. Seamless matrix mode;
2. Video-wall mode;

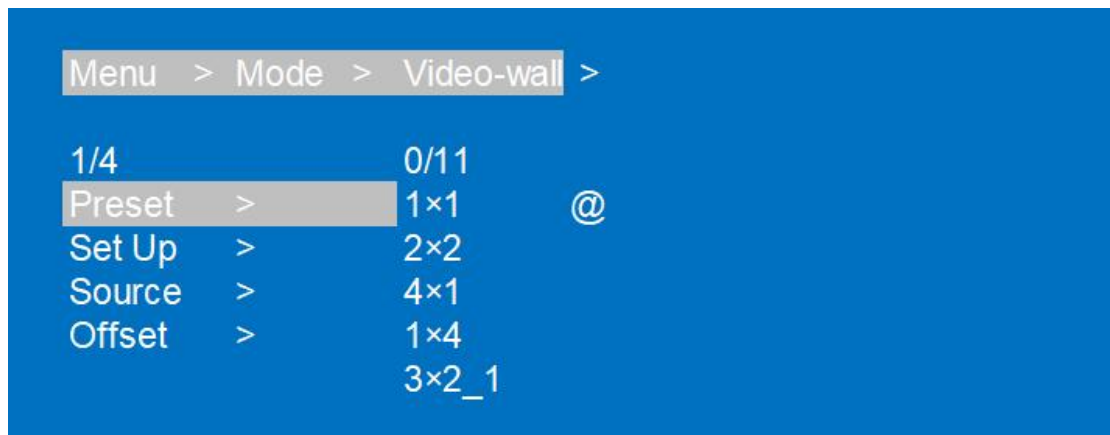


- ①Select "Mode" in the menu and press "ENTER"
- ②Then use "UP" " DOWN" button to select "Seamless"
- ③Press "ENTER" enter next page
- ④Press "UP" " DOWN" button to select "Input" (the 1st option is P2P mode)
- ⑤Press "ENTER" ,Done

- Videowall

Include:Preset,Set up,Source,Offset

✧ Preset: have total 11 options,click to select the preset you need.



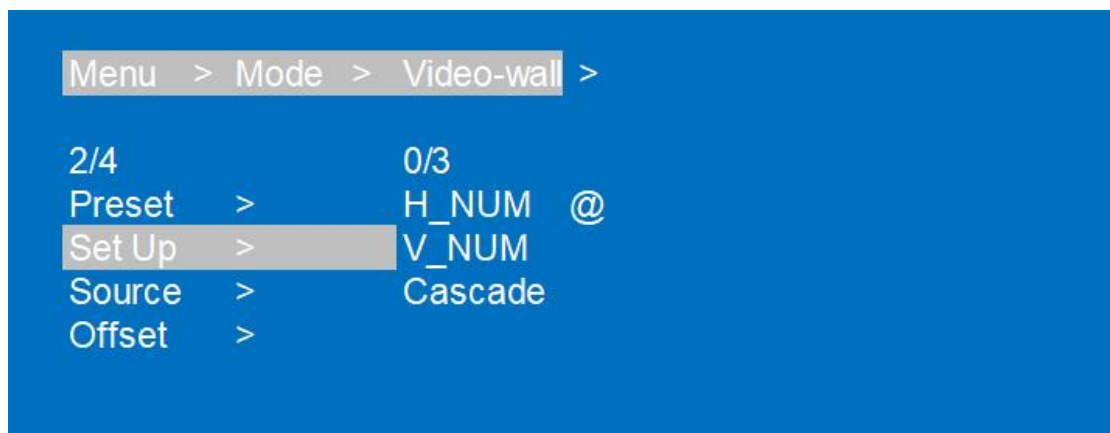
- ①Select "Video wall" in the menu and press "ENTER"
- ②Then use "UP" " DOWN" button to select "Preset"
- ③Press "ENTER" to confirm
- ④Press "UP" " DOWN" button to select preset scene
- ⑤Press "ENTER" ,switch preset scene done

✧ Set up (videowall size setup)

H_NUM:the number for horizontal screens,option 1~10 (default 1)

V_NUM:the number for vertical screens,option 1~10 (default 1)

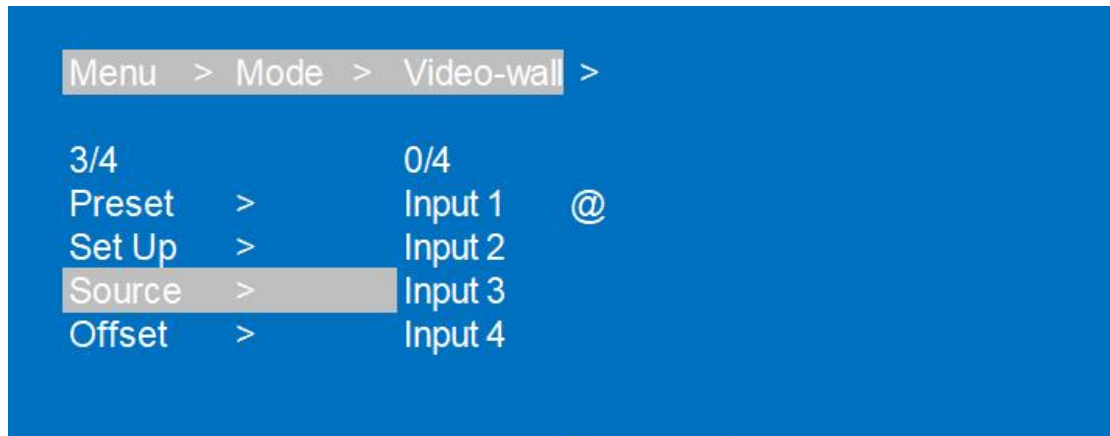
Cascade:the layer at which the device is in the cascade,option 1~25(default 1)



- ①Select "Video wall" in the menu and press "ENTER"
- ②Then use "UP" " DOWN" button to select "Set up"
- ③Press "ENTER" to confirm
- ④Press "UP" " DOWN" button to select submenu
- ⑤Press "ENTER" , done

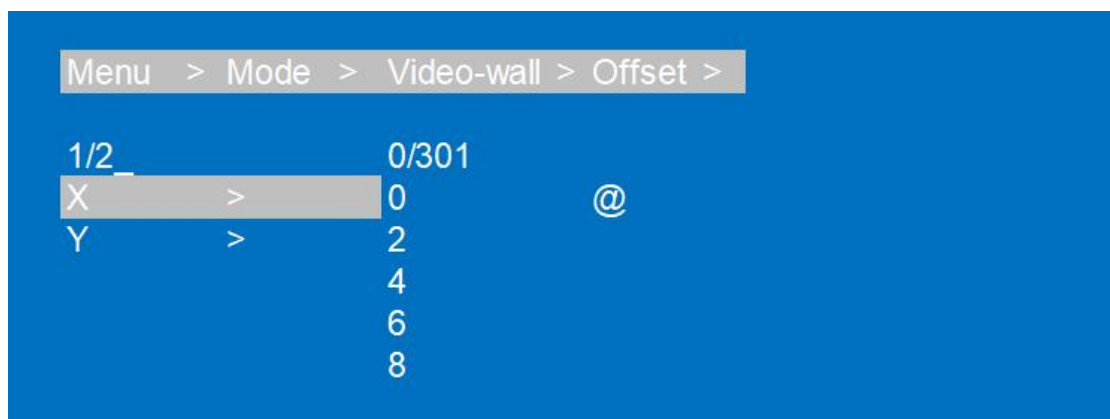
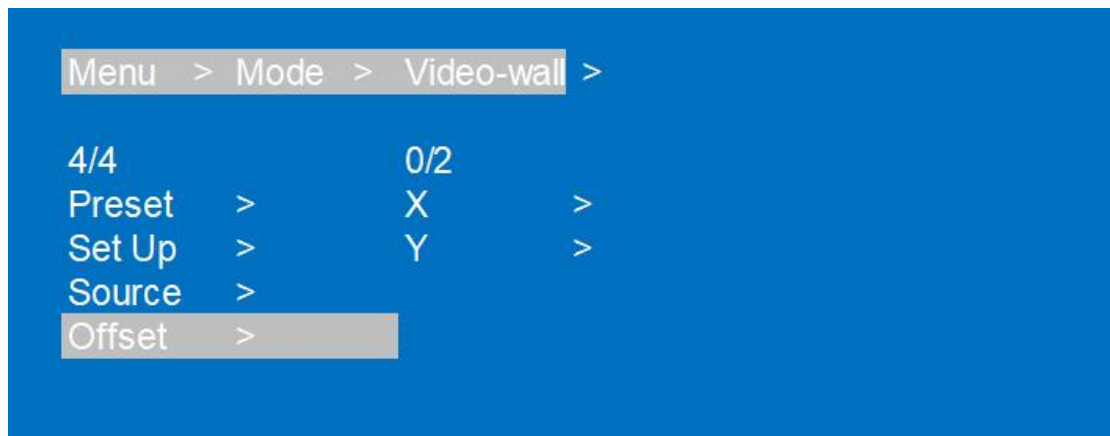
✧ Source

Switch input source for videowall



✧ Offset

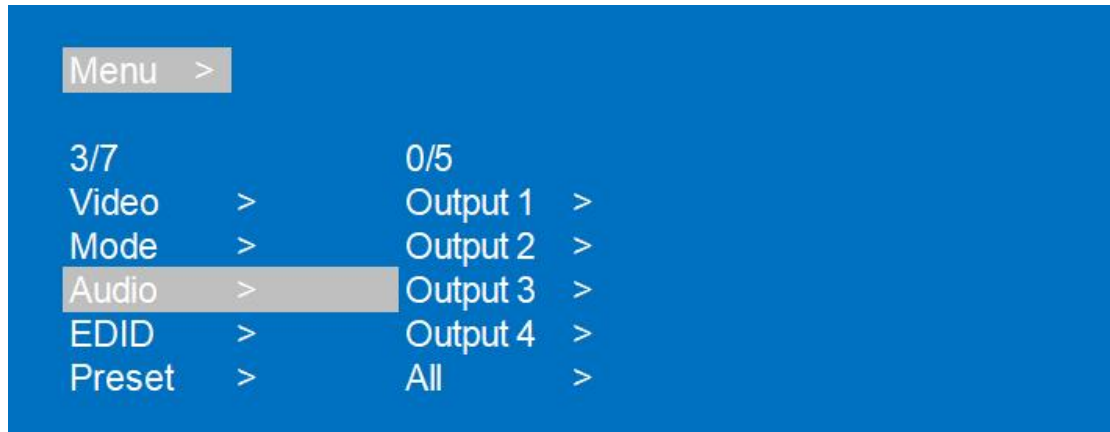
Horizontal and vertical margin settings for videowall



- ①Select "Video wall" in the menu and press "ENTER"
- ②Then use "UP" " DOWN" button to select "Offset"
- ③Press "ENTER" to confirm
- ④Press "UP" " DOWN" button to select "X" or "Y" (0~600 for option)
- ⑤Press "ENTER" , done

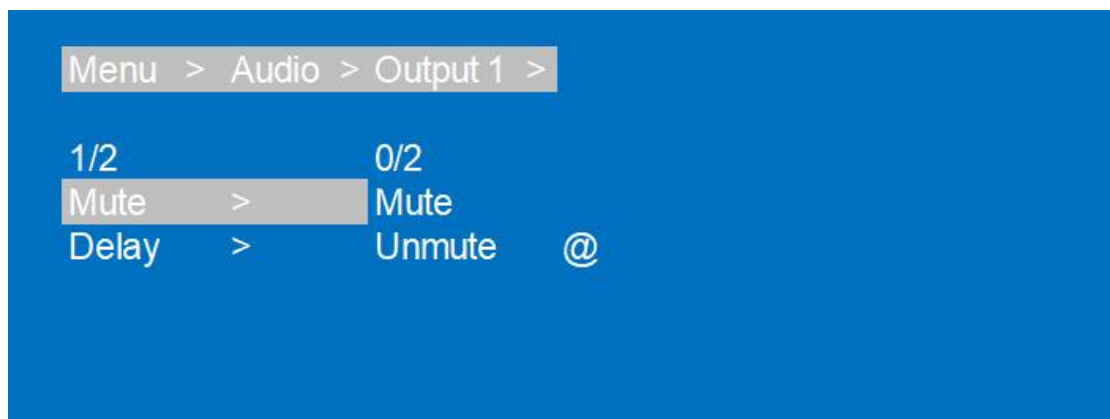
7.4.Audio Setup

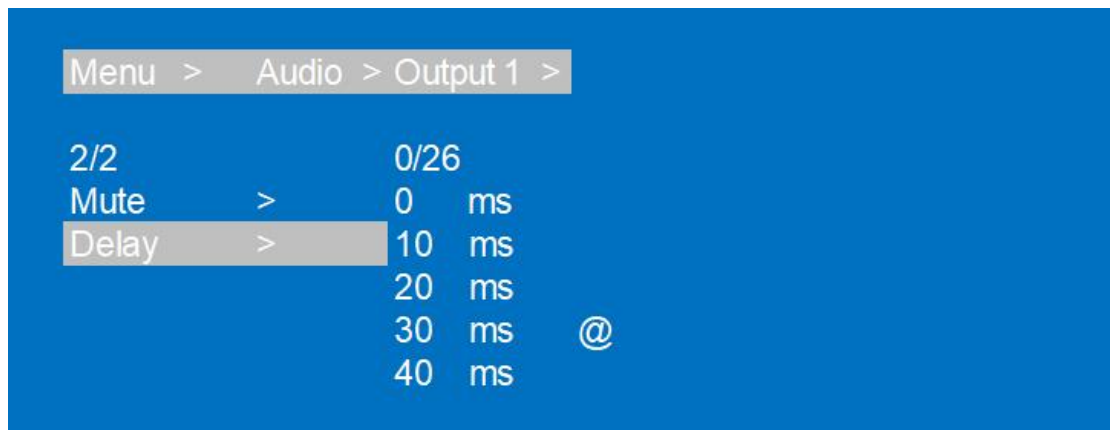
Can choose Mute,Unmute or Delay for Output1~4 and All outputs



For example,if we set Output1 to Unmute (Delay 30),operation steps:

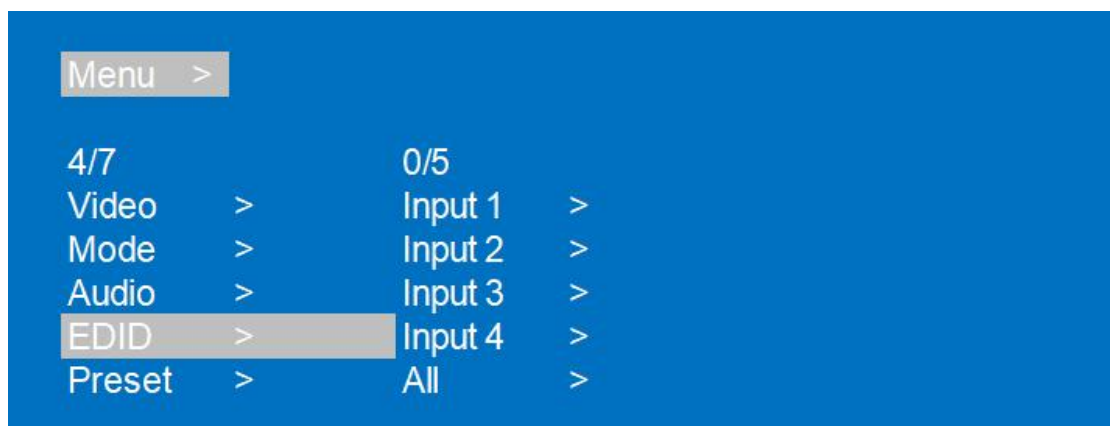
- ①Select "Audio" in the menu and press "ENTER"
- ②Then use "UP" " DOWN" button to select "Output1"
- ③Press "ENTER" to next submenu
- ④Press "UP" " DOWN" button to select "Delay"
- ⑤Press "ENTER" , and select number "30" (default 30)
- ⑥Press "ENTER" ,done





7.5.EDID Setup

Can set EDID for each input port,can select build-in EDID:1080P,4K30,4K60-444,4K60-220



For example,if we set build-in EDID 1080P for input1

Operation steps:

- ①Select "EDID" in the menu and press "ENTER"
- ②Then use "UP" " DOWN" button to select "input1"

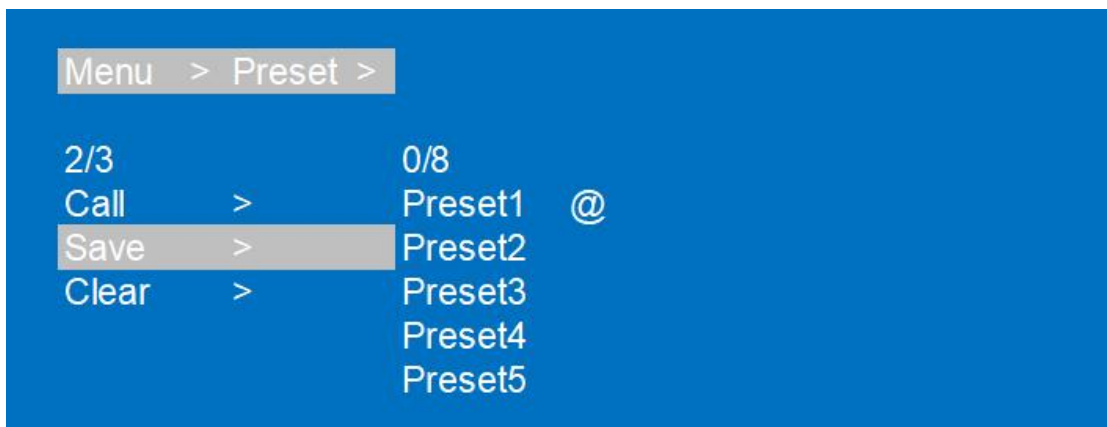
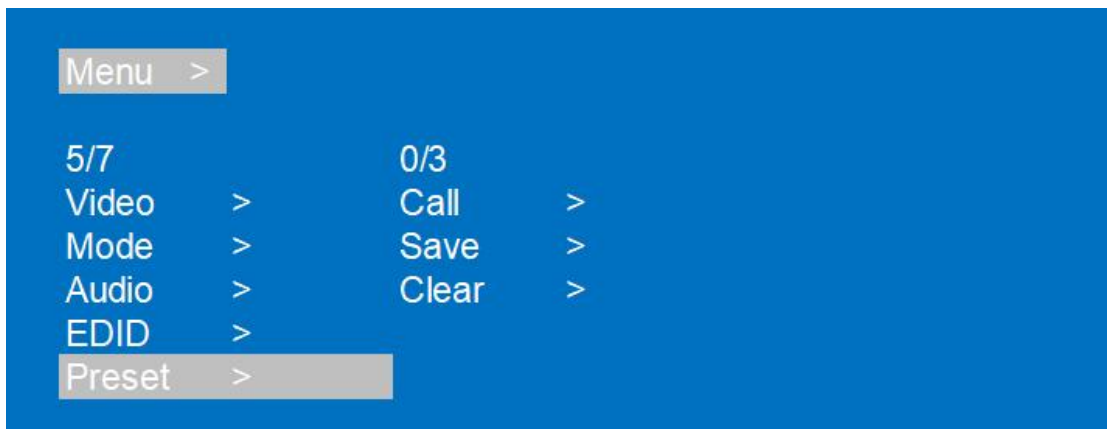
- ③Press "ENTER" to next submenu
- ④Press "UP" " DOWN" button to select "1080P"
- ⑤Press "ENTER" , done

7.6.Preset

1. Call preset
2. Save preset
3. Clear preset

Can save total 8 different scenes for preset,can rename for preset in Web page,clear preset will back to default preset

(Default preset is P2P mode)



7.7.Setup

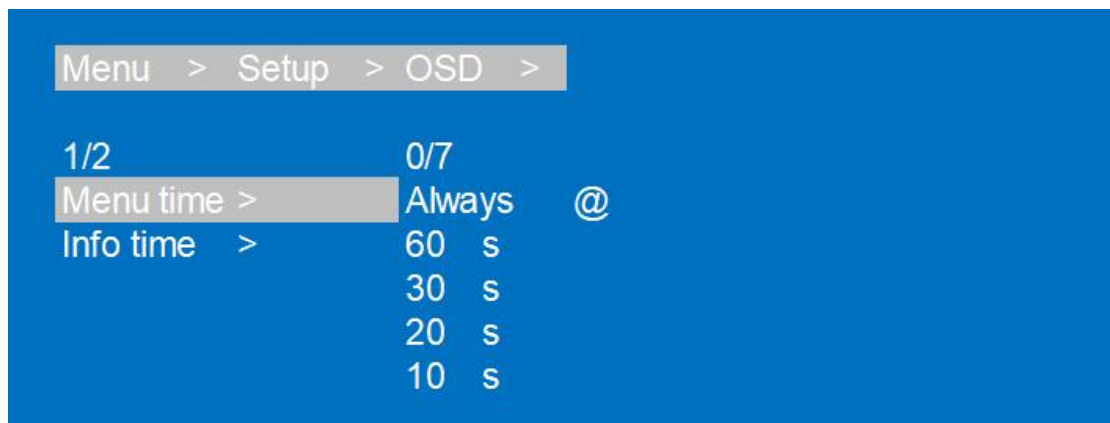
7.7.1.OSD setup

Menu time,Info time(resolution info)

1.Menu time:Always,60s,30s,20s,10s,5s,3s

If select "Always",then menu OSD will not close;

If select "10s",menu OSD will hide automatically;

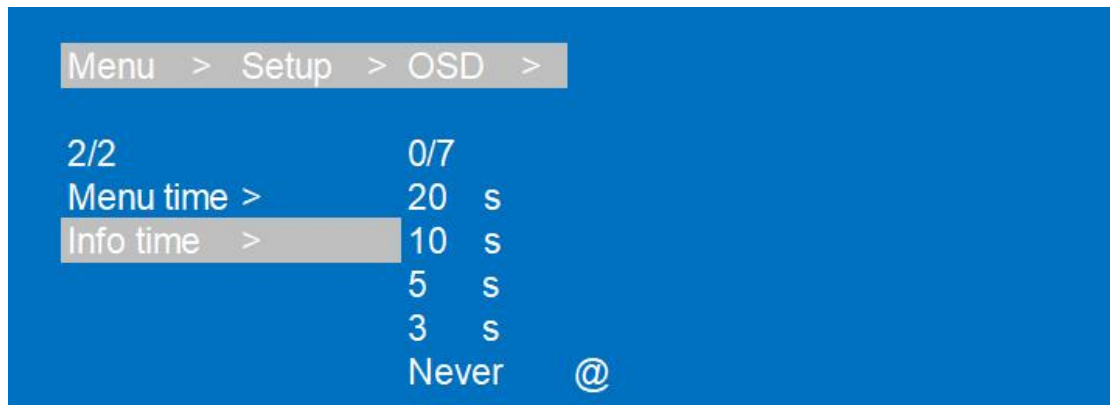


2. Info time

Resolution info OSD time setup: Always, 60s, 30s, 20s, 10s, 5s, 3s, Never.

If select “Never”, OSD will not display;

If select “10s”, menu OSD will hide automatically;



7.7.2. Baud

Baudrate setup: 9600, 19200, 57600, 115200 (default)



Operation steps:

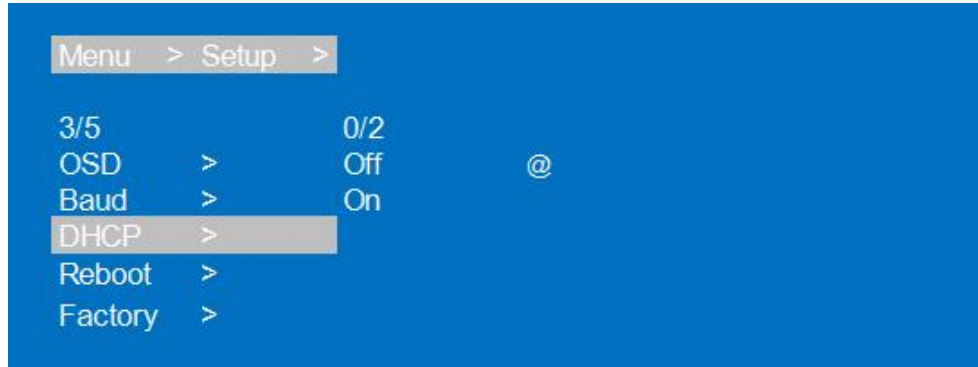
- ① Select “Setup” in the menu and press “ENTER”
- ② Then use “UP” “DOWN” button to select “Baud”
- ③ Press “ENTER” to next submenu

④Press "UP" " DOWN" button to select baudrate

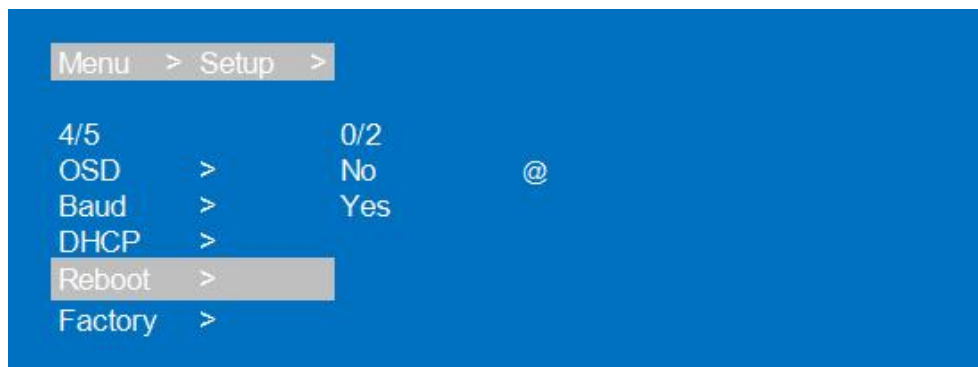
⑤Press "ENTER" , done

7.7.3.DHCP

- DHCP Off: static(default)
- DHCP On: dynamic

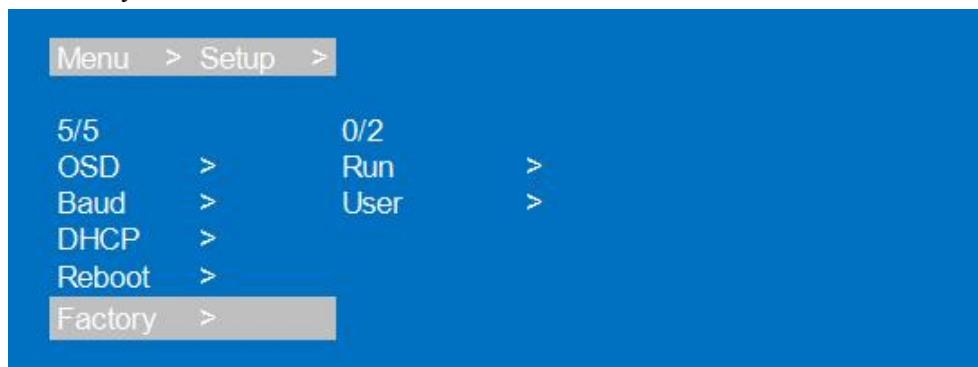


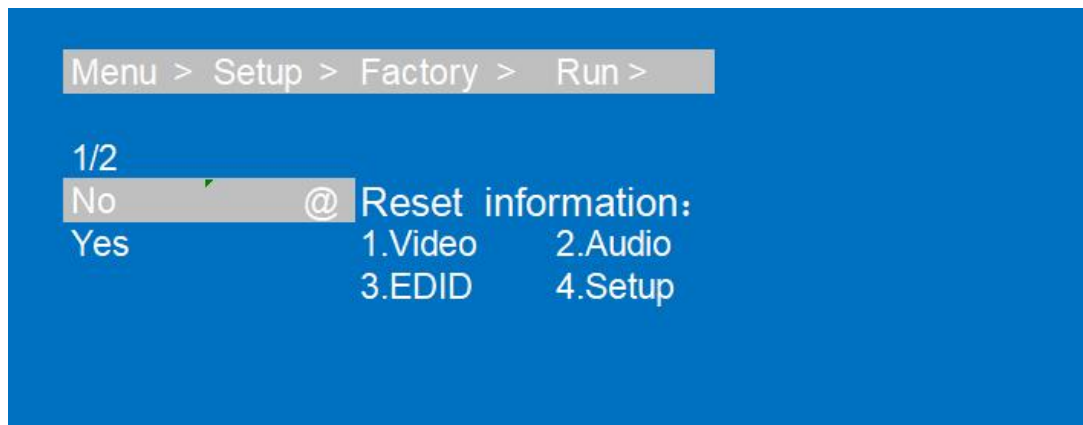
7.7.4.Reboot



7.7.5.Factory Reset

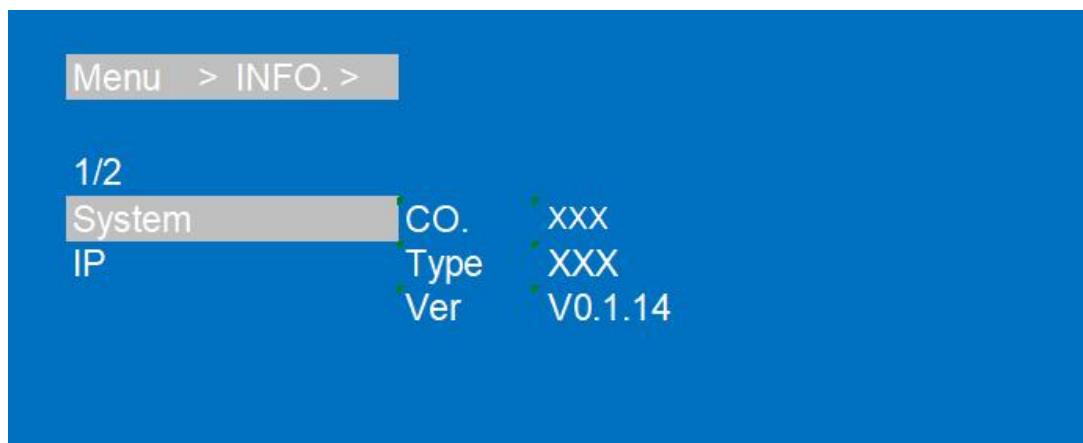
1. Factory-Run:reset running data(cannot reset to default for preset you have saved)
2. Factory-User:reset-all

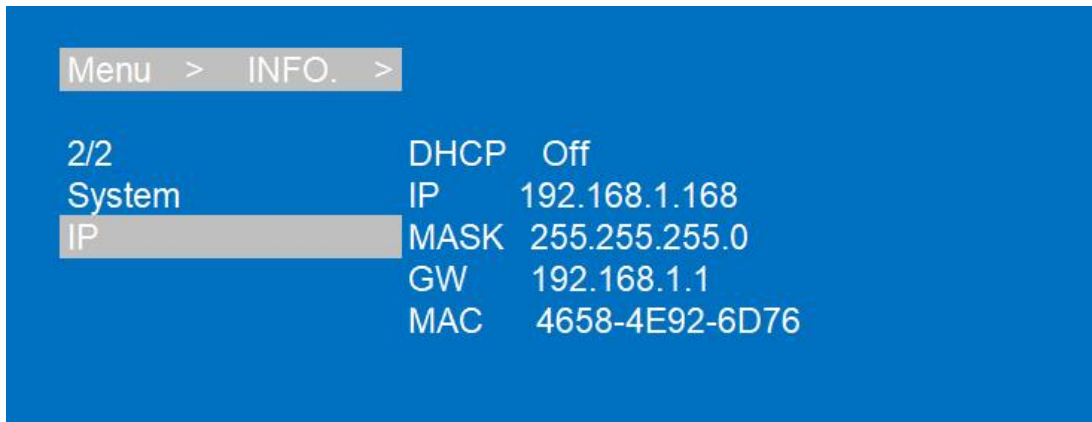














7.8.INFO.


Query device info,such as IP info,system info,default IP:192.168.1.168






8. Remote Control Description

-  Standby Mode
-  Mute/ Unmute
-  Switch to upper/last input signal
-  Switch to next input signal
-  Main Menu
-  Up
-  Back to previous Menu
-  Enter
-  Enter
-  Down

-  Display/Hide OSD Menu

-  Menu



Quick Button 1~4 to select input/output
(button 5~9 no function)



9. IR system

The matrix can pass the IR signal through the IR system to the HDMI source or pass the IR signal from the HDMI source to the HDMI sink



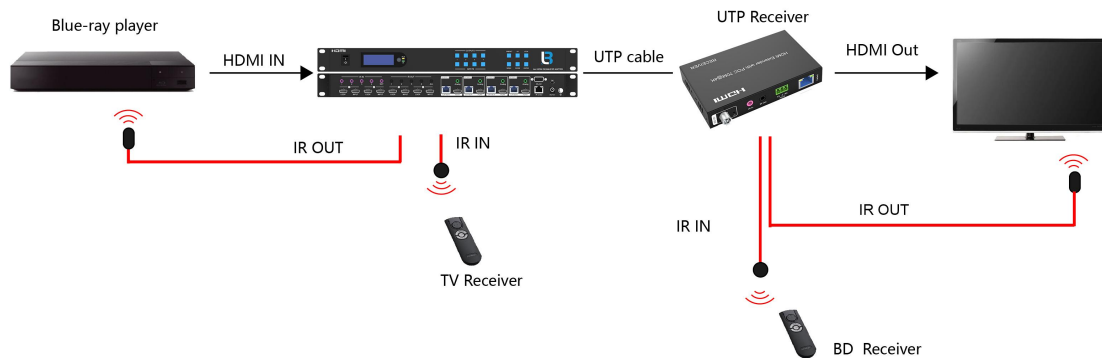
Dual way IR using:

Step1: "IR IN" is for UTP output, "IR OUT" is for input channel

Step2: "IR IN ALL" Controlled by all input IR; "IR OUT ALL" Controlled by all output IR.

Step3: Receiver support connect with IR receiver to control the Matrix by remote

Step4: Matrix IR channel "IR IN ALL" support connect with IR-RX cable to control the Matrix by remote



10. RS232 Pass Through & Command Control

Control software operation:

Use the USB convert RS232 cable to connect matrix and PC.

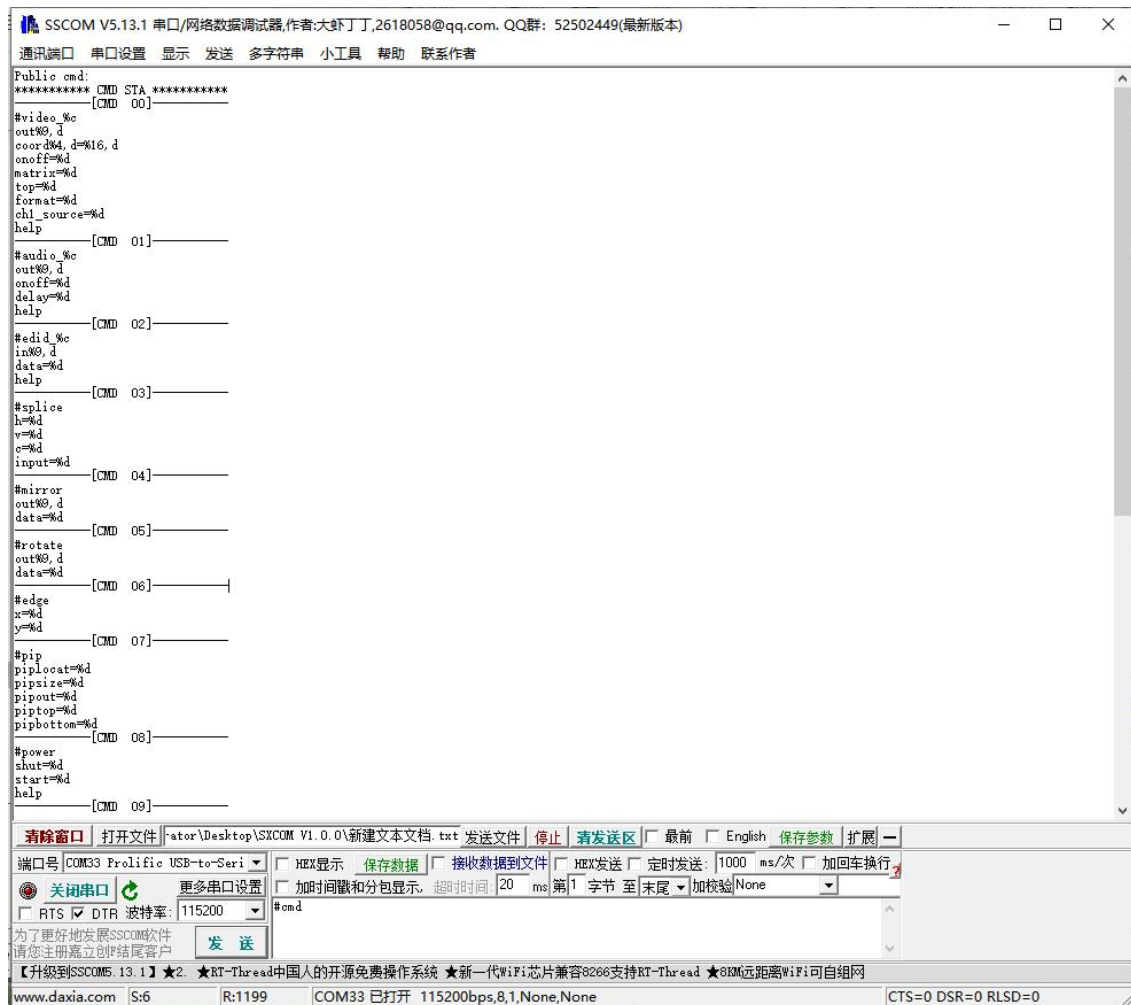
The serial control software is illustrated with SSCOM32 as an example.

Basic Settings:



Double-click the software in the installation package to run specifically (as shown in figure 1 below) and install the RS232 software on the computer.

Enter the main interface of the software, as shown in the figure below.



In the parameter configuration area, select the serial port number that the serial line connects to the PC

Baud rate: 115200 (default)

Data location: 8.

Stop bit: 1

Check bit: no

Then can input commands in the command input area to control the local or remote receiver

Instructions:

1. All commands start from “#”, command head “%c”: “d” parameters, “l” lock, “s” save.
2. The “_” in the commands cannot omit. Parameter: %d: 0 means ALL outputs. 1-x means specified output(1~4).
3. Command head & Parameter1 & Parameter2... need to add one “SPACE”.
4. “/”:means not use this parameter.

The following table is only for an example. Please refer to the list of instructions.

Instruction description	instruction	parameter 1	parameter 2	parameter 3
Video switch	#video_%c	out%d	in%d	matrix=%d
Audio	#audio_%c	out%d	onoff=%d	delay=%d
EDID	#EDID_%c	In%d	data=%d	/

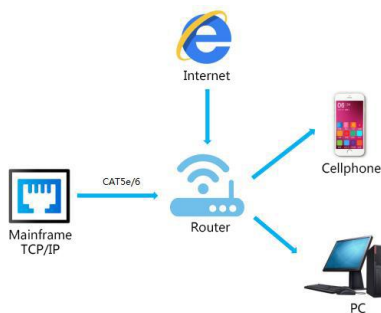
Please refer to the " Command list" for details.

Example:

Operation format: #splice input=3 h=2 v=3 g=2

(It means switch to input3,videowall mode 3×2,device in 2nd level,)

11. Web Control

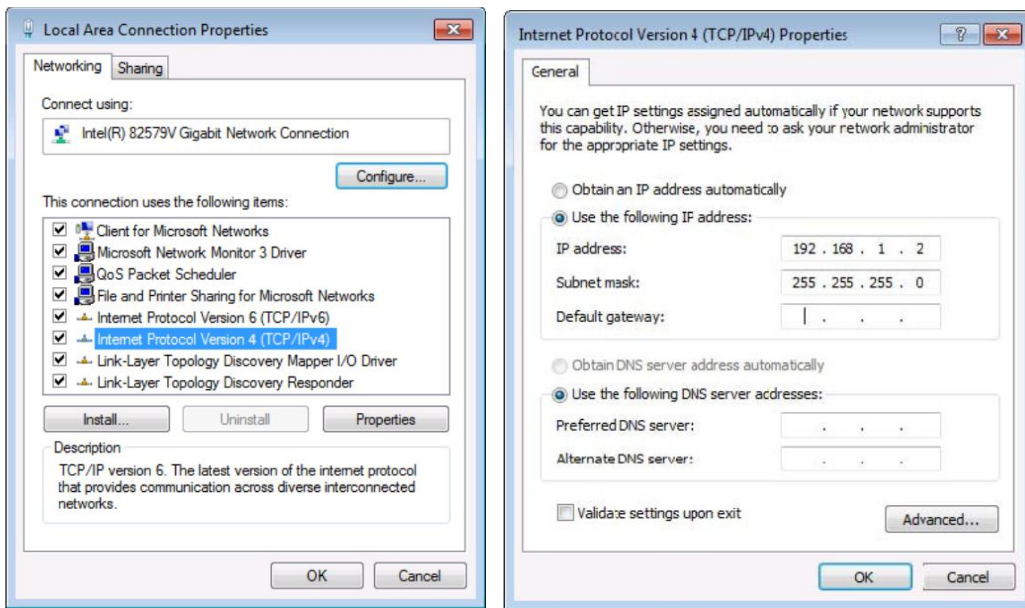


- 1). Connect the Ethernet port of matrix to the Ethernet port on PC by a crossover cable with RJ45 connectors.
- 2). Configure your PC as follows:
 - ① Click **Start > Control Panel > Network and Sharing Center.**
 - ② Click **Change Adapter Settings.**
 - ③ Highlight the network adapter you want to use to connect to the device and click **Change settings of this connection.**
- 3). The local Area commotion properties window for Network selection appears as below:
- 4). Click the Highlight **Internet Protocol Version 4 (TCP/IPv4).**
- 5). Click **Properties.**
- 6). Select **Use the following IP Address** for static IP addressing and fill in the details.

For TCP/IPv4 you can use any IP address in the range 192.168.1.1 to 192.168.1.255 (excluding 192.168.1.168).

- 7). Click **OK.**
- 8). Click **Close.**

Default IP Address: 192.168.1.168
MASK: 255.255.255.0
Gateway:192.168.1.1
MAC:4658-4E92-6D76

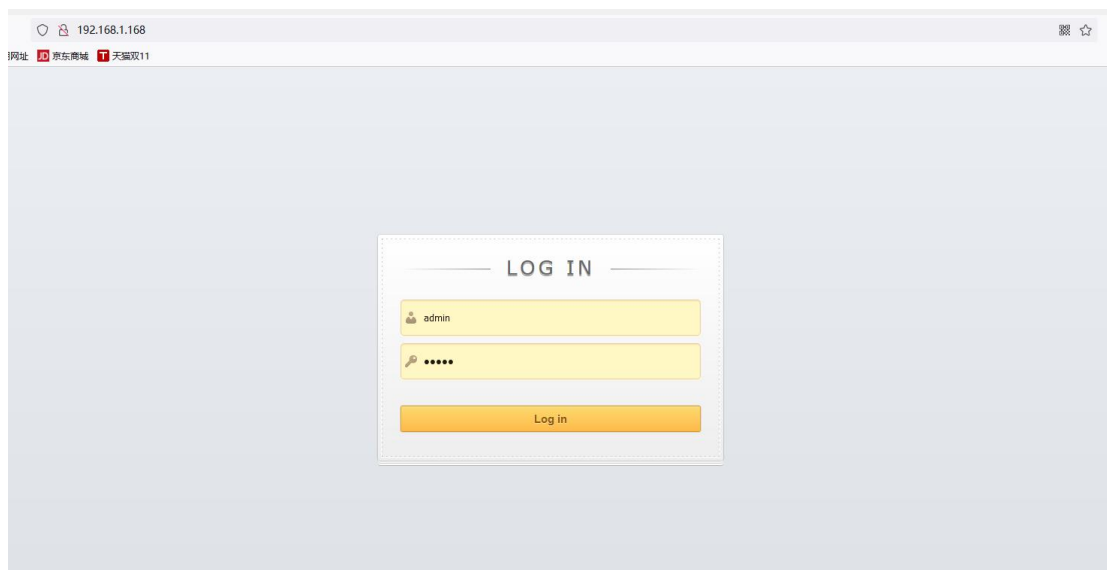


11.1. Enter Web and Control

Enter the default IP address of the matrix: 192.168.1.168 (or by http://sxlogin/)

Account: admin

Password: admin



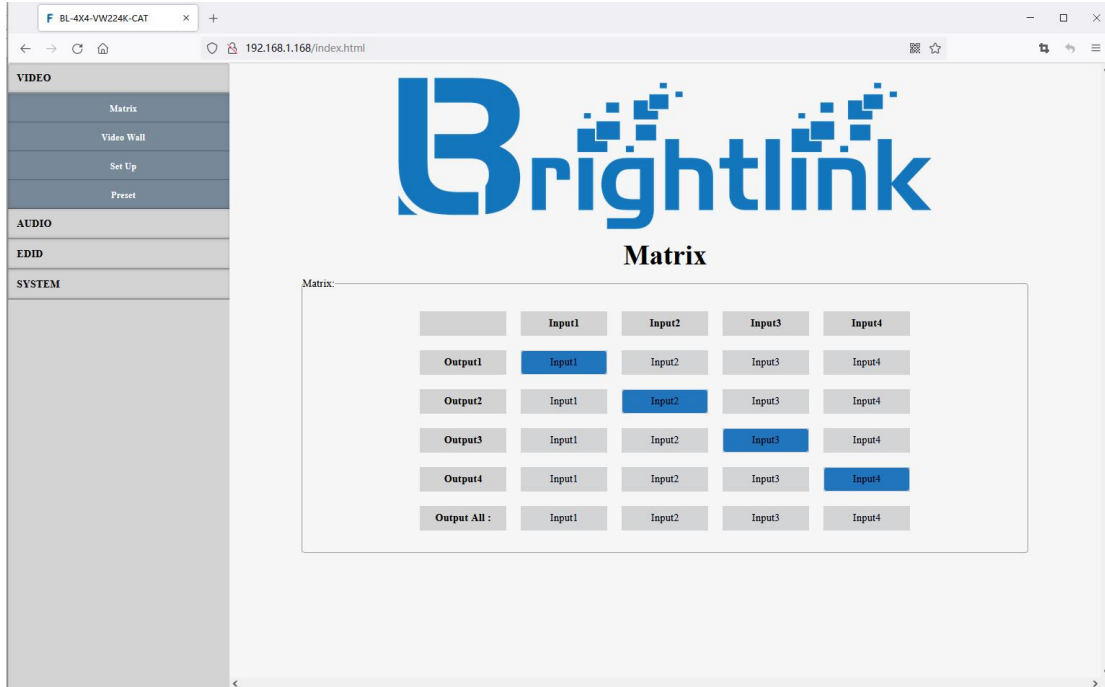
(Suggest to use Google, firefox, Apple with newer version browser)

11.2. VIDEO interface:

- Matrix
- Video wall
- Set up
- Preset

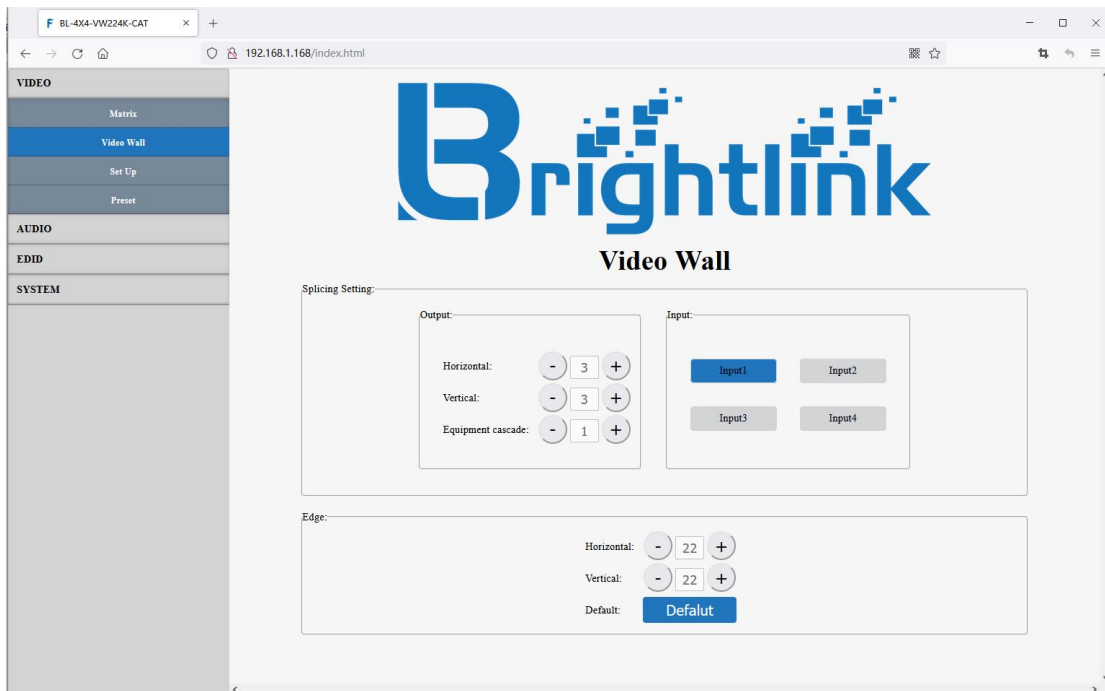
11.2.1. Matrix interface

To show current input/output status and switch input for output.



11.2.2.Video wall interface

To do splicing setting of videowall(the Qty number of horizontal/vertical screens),cascade layers,switch input for videowall,horizontal and vertical edge settings.

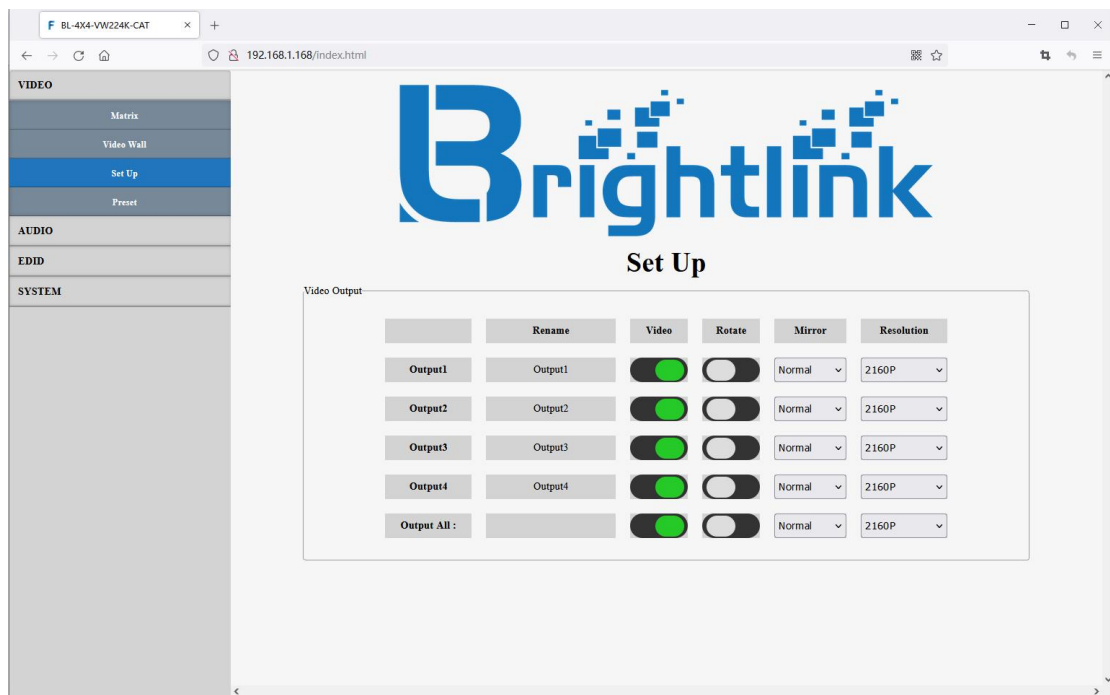


Operation instructions:

- ① Click Horizontal/Vertical “-” “+” to set the number of screens,option 1~10,default 1;
- ② (Once you change the number of the screens,device enter videowall mode automatically)
- ③ “Equipment cascade” means the layer at which this device is in the cascade;
- ④ “Input” area to select input1~4 for videowall;
- ⑤ “Edge Horizontal/Vertical” range option:0~600,default 22(3.5mm)

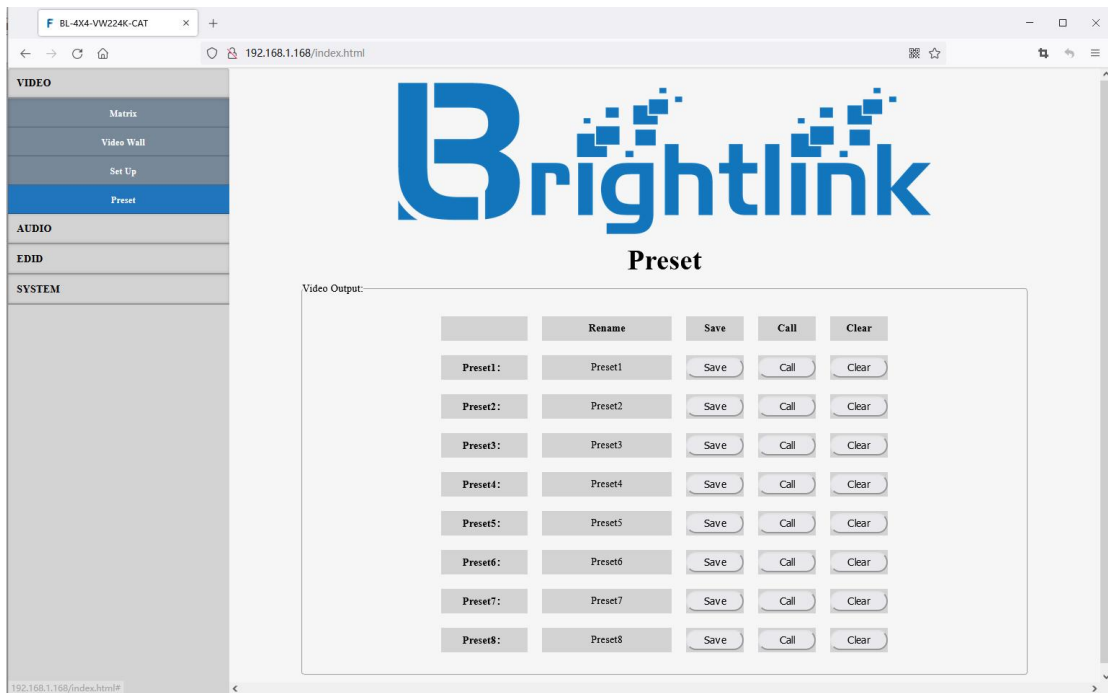
11.2.3.Set up interface

Double click to rename for output,video switch on/off,rotate switch on/off,mirror setup,resolution setup for output.



11.2.4.Preset interface

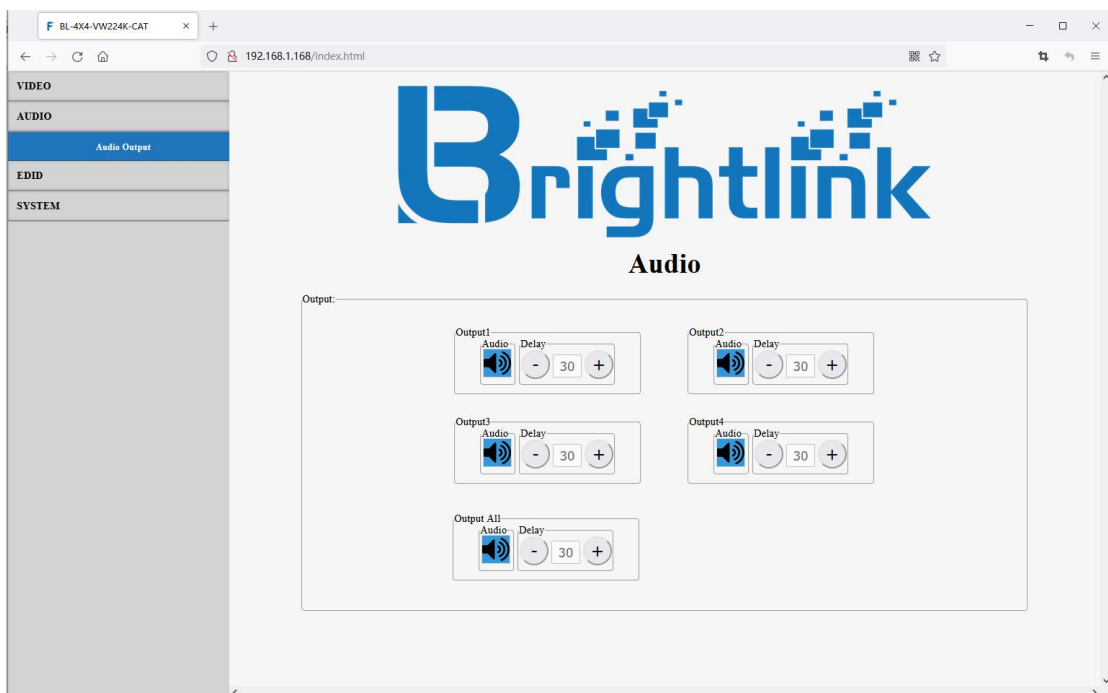
Double click to rename for preset,save/call/clear preset.



11.3.Audio

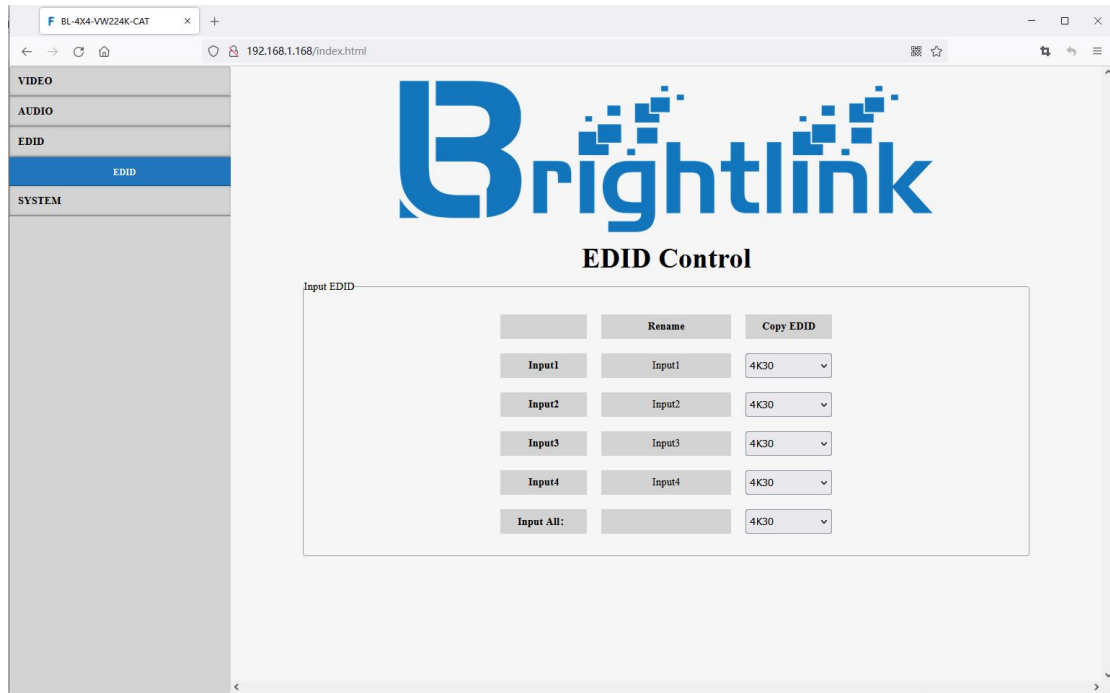
11.3.1. Audio output interface

To switch audio of output, and adjust audio delay for output.



11.4.EDID interface

Double click to rename input and set build-in EDID(1080P, 4K30, 4K60-444, 4K60-220).



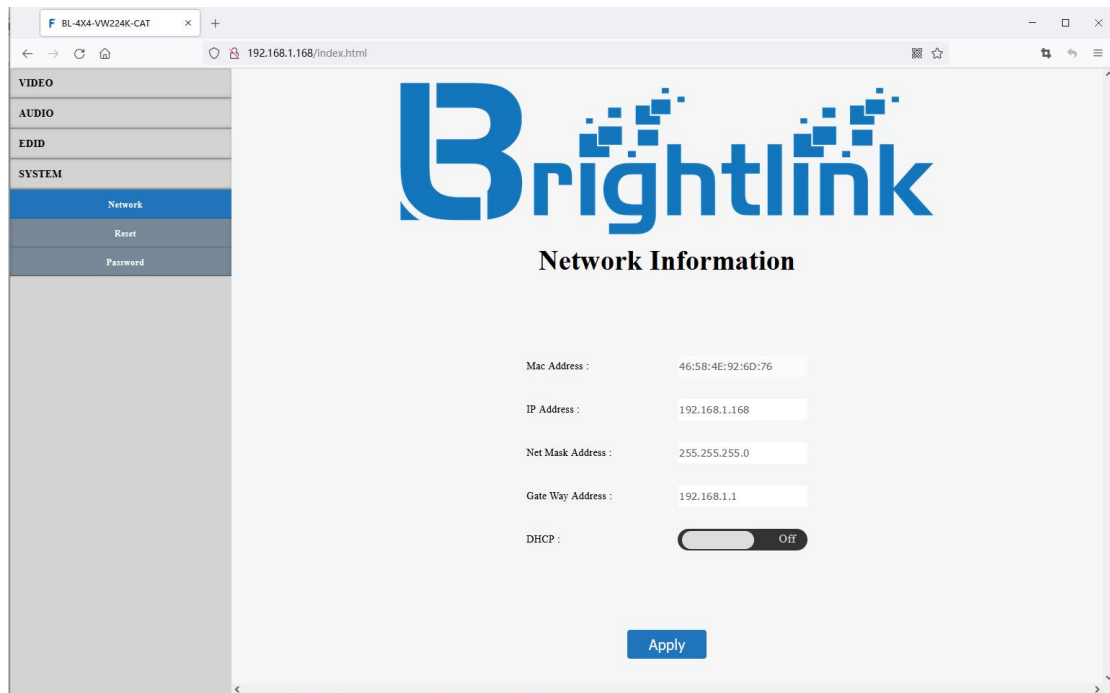
11.5.SYSTEM interface

- Network
- Reset
- Password

11.5.1.Network interface

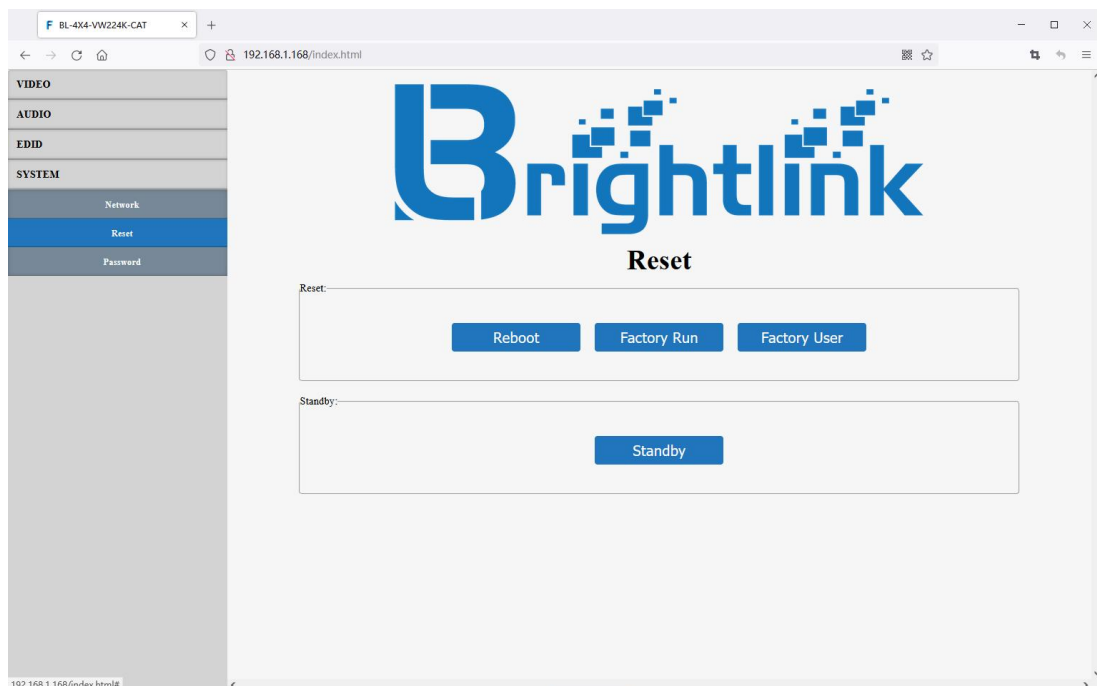
To setup and display IP information.

- ✧ MAC address:cannot modify,just to display;
- ✧ IP address:
- ✧ Static IP:click DHCP switch to"DHCP off",to use static IP,can modify static IP address then click"Apply",will reload Web interface after 8s time;
- ✧ Dynamic IP:click DHCP switch to"DHCP ON",to use dynamic IP,cannot modify IP address,just to display current IP address;



11.5.2.Reset interface

- To reboot device and factory reset.
- Reboot
- Factory Run:restore factory settings of running data(include Video,Audio,EDID,Setup)
- Factory User:restore all settings
- Standby

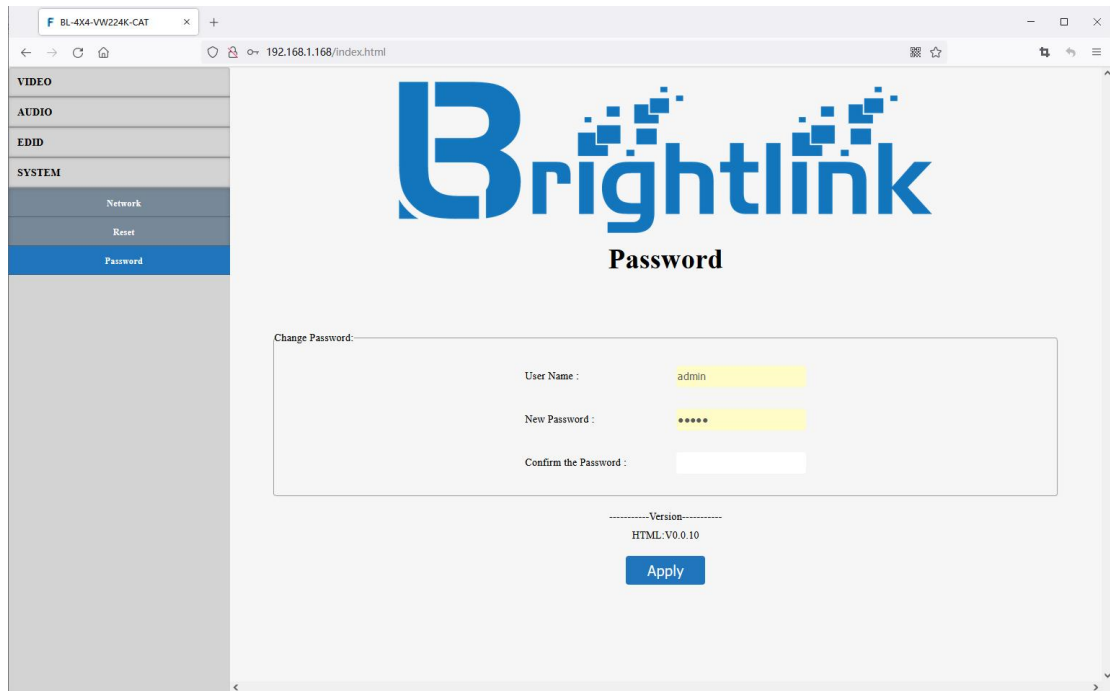


11.5.3.Password interface

To change log in password,only can modify password for current log in account.

Default account &password:admin

(support only 5 to 15 characters:letters, digits, and underlines)



12. Firmware Upgrade

First upgrade MCU (layer of application) and then upgrade CPLD, finally upgrade HTML (web page), (CPLD, HTML, MCU all support to use USB Micro port for upgrading)

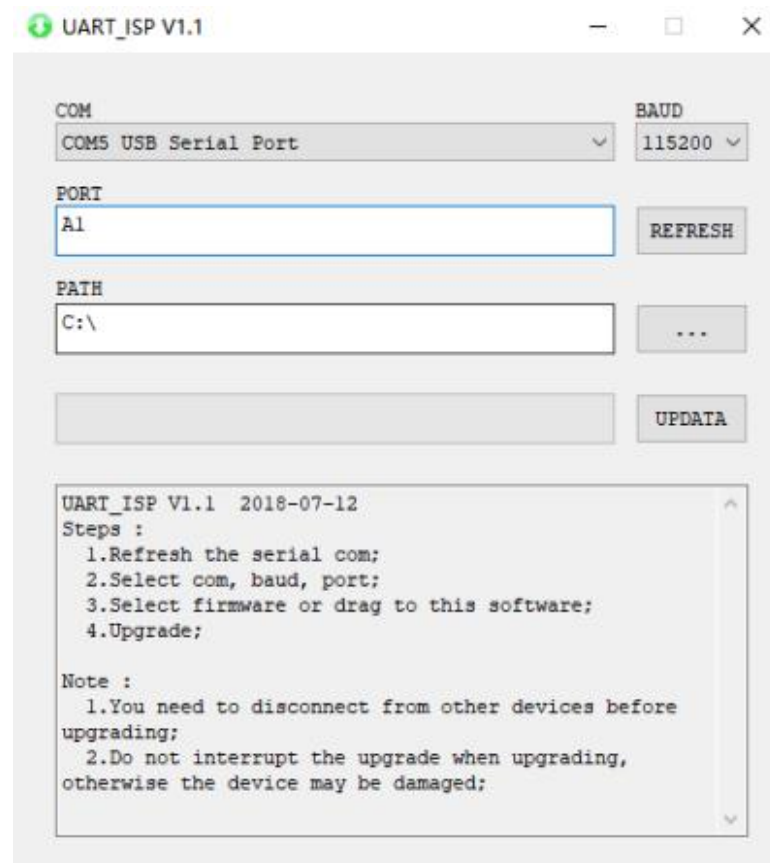
A1 means MCU

C0 means CPLD

F0 means HTML

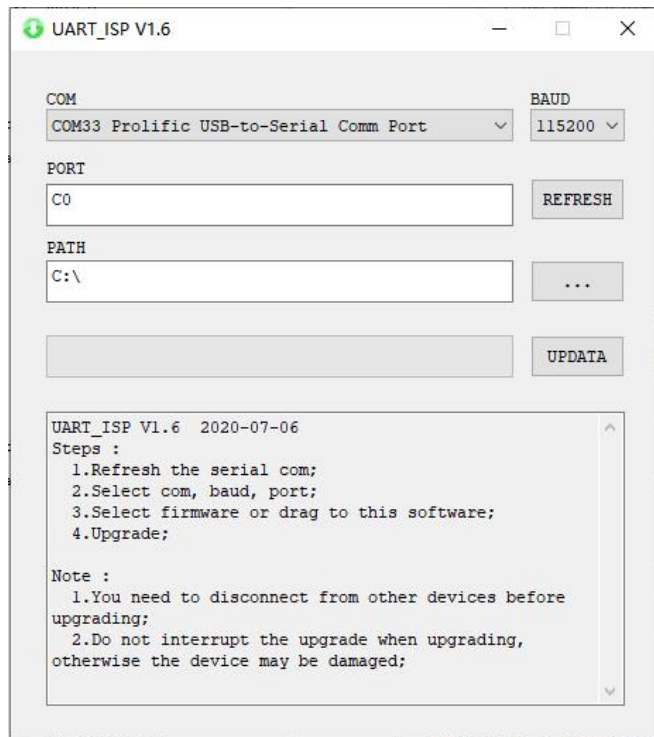
12.1. MCU Upgrade(A1):

Open the software UART_ISP.exe on PC, select the correct port and baud rate 115200, enter "A1" in Port, then select the path of the program in PATH (BL_4x4VW224K60_GD32F303VG_V0.1.5_8BC3B4BA.bin), and click UPDATA to complete the upgrade



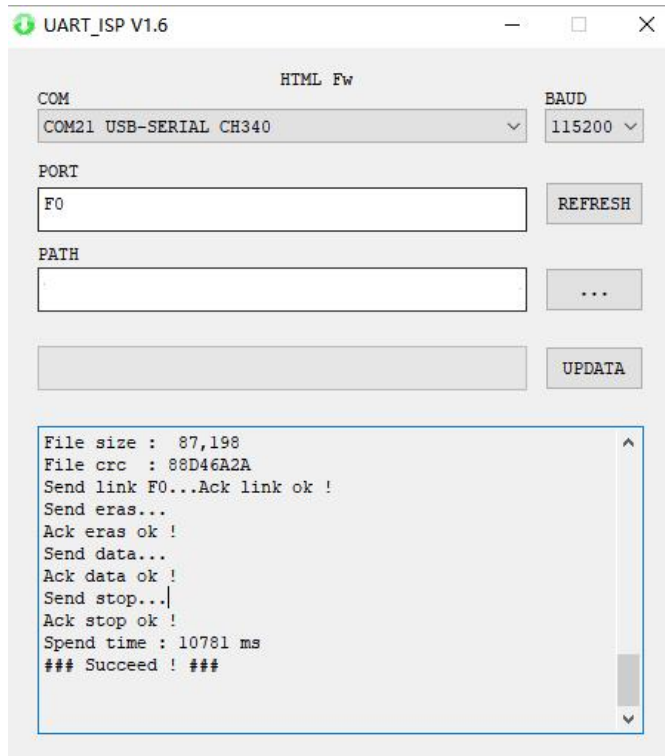
12.2. CPLD Upgrade:

Open the software UART_ISP.exe on PC, select the correct port and baud rate 115200, enter "C0" in Port, then select the path of the program (BL_4x4VW224K60_EF2L15LG100B_V0.1.2_06BDD4E6.vme) in PATH, and click UPDATA to complete the upgrade.



12.3. HTML (WEB GUI) Upgrade:

Open the software UART_ISP.exe on PC, select the correct port and baud rate 115200, enter "F0" in Port, then select the path of the program (BL-4X4-VW224K60-CAT60-CAT_HTML_V0.0.4.html) in PATH, and click UPDATA to complete the upgrade.



MAINTENANCE

Clean this unit with a soft, dry cloth. Never use alcohol, paint thinner or benzene to clean this unit.

PRODUCT SERVICE

(1) Damage requiring service:

The unit should be serviced by qualified service personnel if:

- (a) The DC power supply cord or AC adaptor has been damaged;
- (b) Objects or liquids have gotten into the unit;
- (c) The unit has been exposed to rain;
- (d) The unit does not operate normally or exhibits a marked change in performance;

The unit has been dropped or the cabinet damaged.

(2) **Servicing Personnel:** Do not attempt to service the unit beyond that described in these operating instructions. Refer all other servicing to authorized servicing personnel.

(3) **Replacement parts:** When parts need replacing ensure the servicer uses parts specified by the manufacturer or parts that have the same characteristics as the original parts. Unauthorized substitutes may result in fire, electric shock, or other Hazards.

(4) **Safety check:** After repairs or service, ask the servicer to perform safety checks to confirm that the unit is in proper working condition.

WARRANTY

If your product does not work properly because of a defect in materials or workmanship, our Company (referred to as "the warrantor") will, for the length of the period indicated as below,

(Parts(2)Year, Labor(90) Days) which starts with the date of original purchase ("Limited Warranty period"), at its option either(a) repair your product with new or refurbished parts, or (b) replace it with a new of a refurbished product. The decision to repair or replace will be made by the warrantor.

During the "Labor" Limited Warranty period there will be no charge for labor.

During the "Parts" warranty period, there will be no charge for parts. You must mail-in your product during the warranty period. This Limited Warranty is extended only to the original purchaser and only covers product purchased as new. A purchase receipt or other proof of original purchase date is required for Limited Warranty service.