HDTV1616HDMI

4K 60 Hz 16x16 HDMI Matrix Switch with R/L & SPDIF Audio & Atmos

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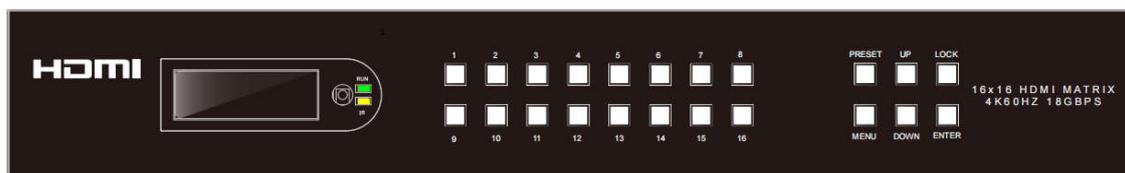
Thank you for purchasing this product. For optimum performance and safety, please read these instructions carefully before connecting, operating or adjusting this product. Please keep this manual for future reference.

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.

Catalogue

1. Features

- 16 x HDMI 2.0 input & 16 x HDMI 2.0 output
- HDMI 2.0 version support 4K@60Hz YUV4:4:4, 18Gbps, Deep color 8bit
- HDCP 2.2/1.4 compliant (follow input)
- Supports Dolby Vision, HDR10, HLG
- Supports LPCM up to 7.1, Dolby Atmos and DTS-X Atmos, 192KHz
- Supports 16 x Analog & 16 x SPDIF Audio Matrix
- Supports Analog Audio Volume control from level 1 ~ 10
- Supports Panel Button with LCD, IR Remote control, RS232 Control, TCP/IP Control
- Supports 4K downscale to 1080p (Only for outputs)
- Supports smart EDID management
- Supports FW updating through RS-232 port

2. Package Contents

1). 1x Main Unit (HDMI Matrix)

2). 1x DC 24V/4A power adapter

3). 1x Remote control

4). 1x IR Receiver cable

5). User manual & Command list (Download in WEB)

6). 1x 3Pin Phoenix terminal plug

7). 1.5U rack design metal case with 2 mounting ear

8). 1x USB2.0 to RS232 upgrade cable

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	18G
Video Format Supported	4K@60Hz,YUV4:4:4 8bit 4k@30Hz/1080P/1080i/720P/576P/480P/576i/480i
HDCP Compliant	HDCP 2.2 and HDCP 1.4
Output Video	HDMI 2.0 Version
Audio Format Supported	LPCM up to 7.1, Dolby Atmos and DTS-X Atmos
Power Consumption	80watts (Max.)
Dimensions	L438xW310xH66 mm
Mass (Main Unit)	5.38 KG

VESA Resolution List

Rate	Resolution	Supported	Mark
60Hz	640×480	√	
	800×600	√	
	1024×768	√	
	1280×768	√	
	1280×1024	√	
	1600×1200	√	
	1400×1050	√	
	1920×1080	√	
	1280×720	√	
	1360×768	√	
	1920×1200	√	

Testing Resolution List

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

4. Panel Descriptions
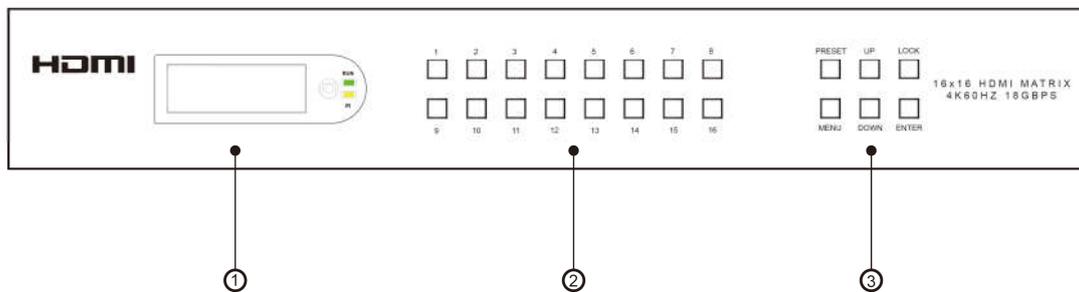
① LCD: Showing Matrix information

② Output button OUT1~16 & Input button IN1~16

(By using UP / DOWN Button to select Output or Input channel)

③ Function button: PRESET; MENU; UP; DOWN; LOCK; ENTER
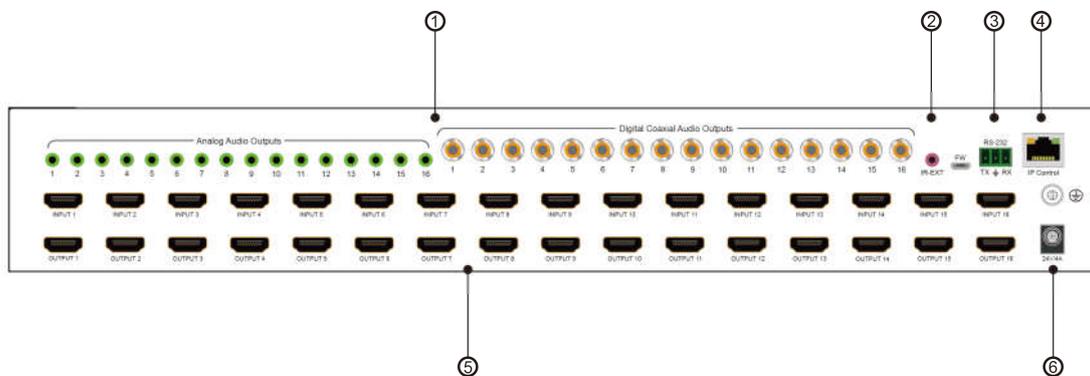
① Analog and Digital Coaxial Audio output ports x16 (supports Audio Matrix)

② IR EXT

③ RS232 port & FW update port

④ TCP/IP port

⑤ Power On/Off

⑥ HDMI inputs x16 & outputs x16

5. Wiring Diagram
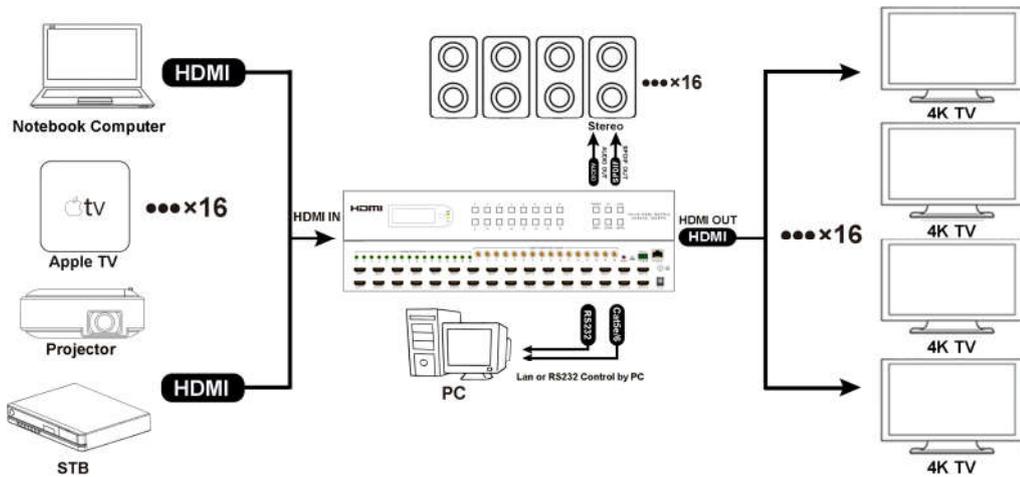
5.1. HDMI Cable Testing:

1080P60Hz YUV 4:4:4

Input / Output	5m	8m	10m	15m
5m	√	√	√	×
8m	√	√	√	×
10m	√	√	√	×
15m	×	×	×	×

4K30Hz YUV 4:4:4

Input / Output	5m	8m	10m	15m
5m	√	√	√	×
8m	√	√	√	×
10m	√	√	√	×
15m	×	×	×	×

4K60Hz YUV 4:4:4

Input / Output	5m	8m	10m	15m
5m	√	√	√	×
8m	√	×	×	×
10m	√	×	×	×
15m	×	×	×	×

6. Input / output channel key operation

Channel	Button method
Any Key	The first operation of the button can wake up the screen and do the command
Output 1-16 Input 1-16	**1: By using UP / DOWN Button to select Output or Input channel** 2: Directly press the number key, such as the output channel 5, press button "5" and press it again to cancel the selection; Long press output to select all channels, and long press again to cancel 3: Directly press the number key, such as input channel 1, and select "1" to press (only when the output port is selected, the input channel number will be valid) Long press means all outputs select current input
PRESET	Shortcut key for calling the preset
MENU	Function Button; Short press to enter the function option or back to previous option
ENTER	Confirm Button: enter function selection mode
UP	Button for UP option
DOWN	Button for NEXT option
LOCK	Long press to LOCK(button blue light on), Long press again to UNLOCK (button blue light off)

7. Video switching operation

7.1. Video switch

The signal switch includes 16 free switching channels, which can be configured as input/output according to the requirements, forming a matrix of 1 x 16 ~ 16 x 1, which can switch any input signal to 1 channel output or all channel output.

The specific operation as follows:

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" + Button "DOWN" + IN number "5" to complete the switch

7.2. Video Control

The Main interface have five sub menu

1. Output Setting

Including 17 sub menu (Output1~16, All). Each sub menu with Video and Audio option

Video supports switching the channels and turn on/off the video signals

Main > Output >

1/17	1/2	
Output1	> Video	>
Output2	> Audio	>
Output3	>	
Output4	>	
Output5	>	

Main > Output > Output 1 > Video >

1/2	1/16	
Source	> Input1	@
Onoff	> Input2	
	Input3	
	Input4	
	Input5	

Main > Output > Output 1 > Video >

2/2	2/2	
Source	> Off	
Onoff	> On	@
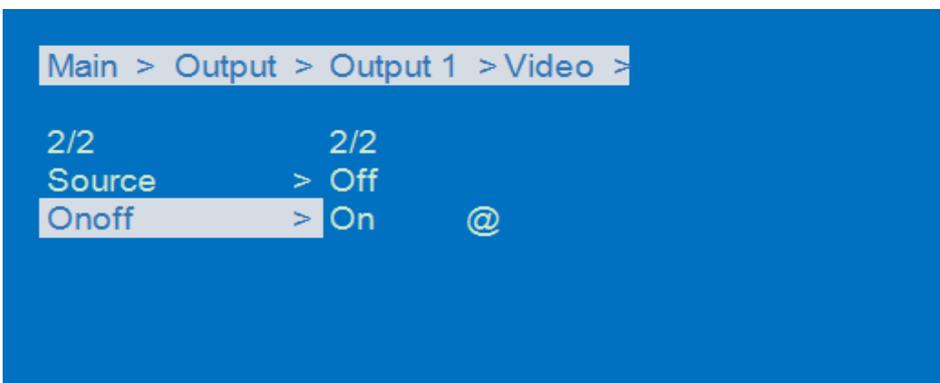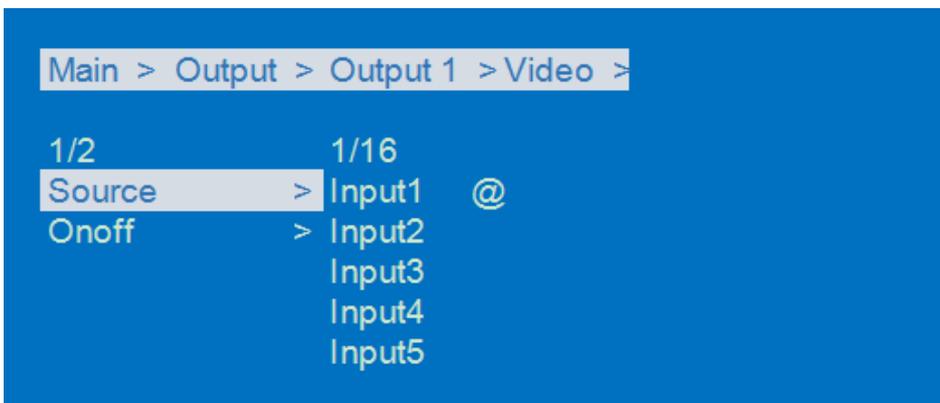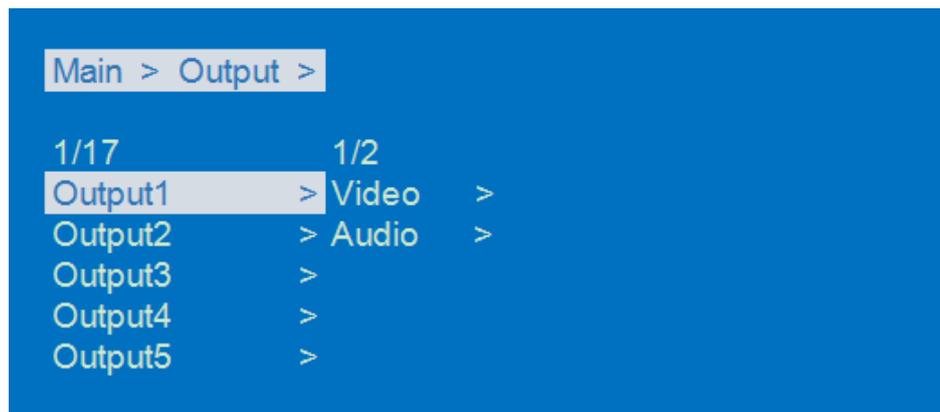
Audio supports turn on/off HDMI / Analog / Digital, Supports switching and Volume Control

Main > Output > Output 1 > Audio >

1/3	1/33	
Source	> Auto	@
Onoff	> Input1	
Volume	> Input2	
	Input3	
	Input4	
	Input5	
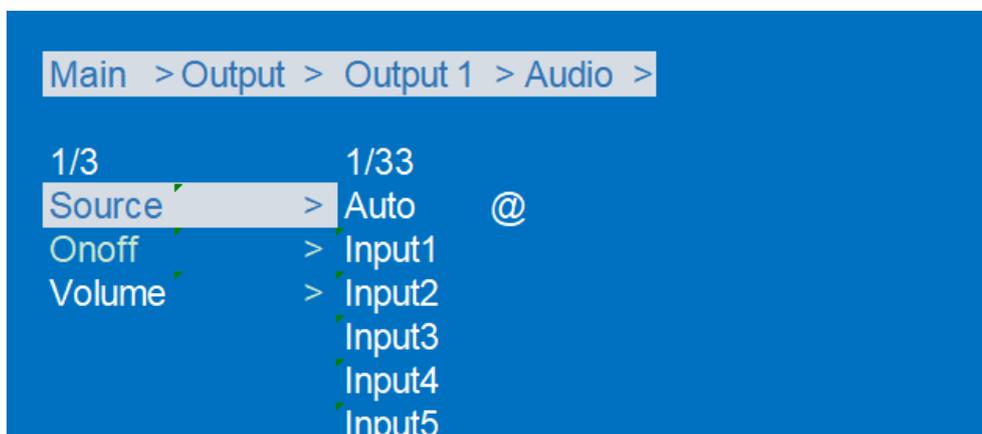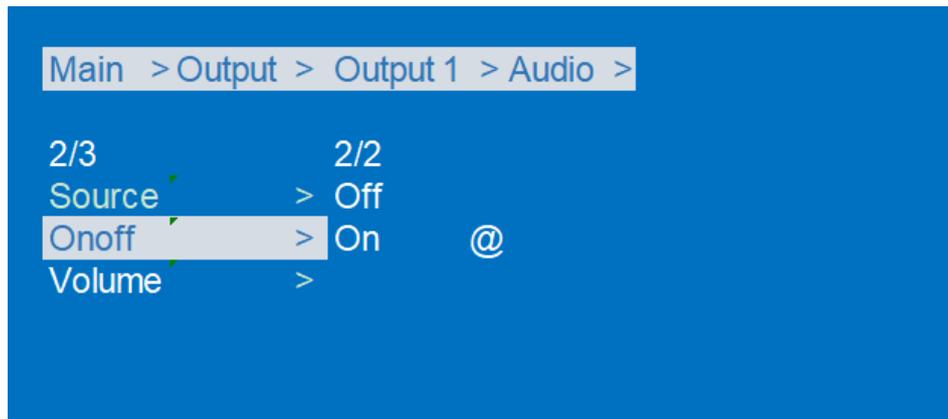
Analog Volume Control

Default analog volume is in level 5, only support in Analog ports. When input change to digital, will be mute.
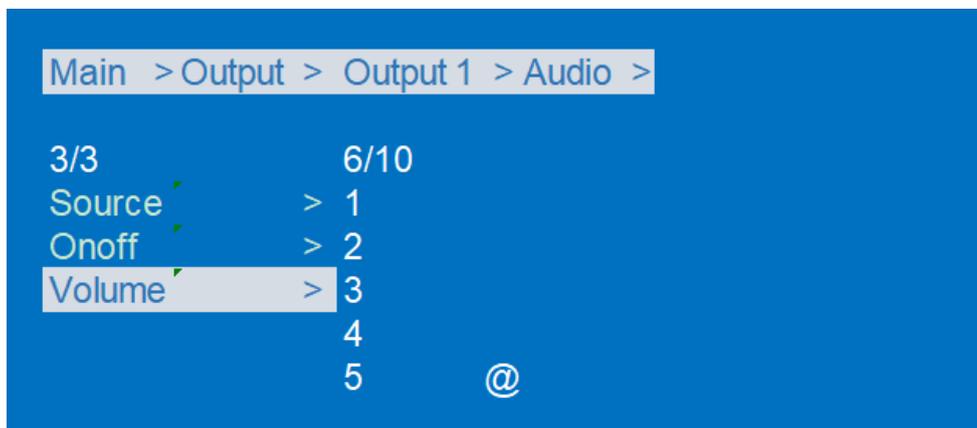
2. Input Setting

Including 17 sub menu (Output1~16, All). Each sub menu with Video and EDID option

Video supports turning on/off the video signals, and won't effect the Audio extraction

EDID including 25 options: 5xDefault, 4xUser, 16x Copy Output

Default-1	4096x2160P@60Hz 444 LPCM2.0	Default-2	4096x2160P@60Hz 420 LPCM2.0
Default-3	4096x2160P@30Hz 444 LPCM2.0	Default-4	1920x1080P@120Hz 444 LPCM2.0
Default 5	1920x1200P@60 444 LPCM2.0		
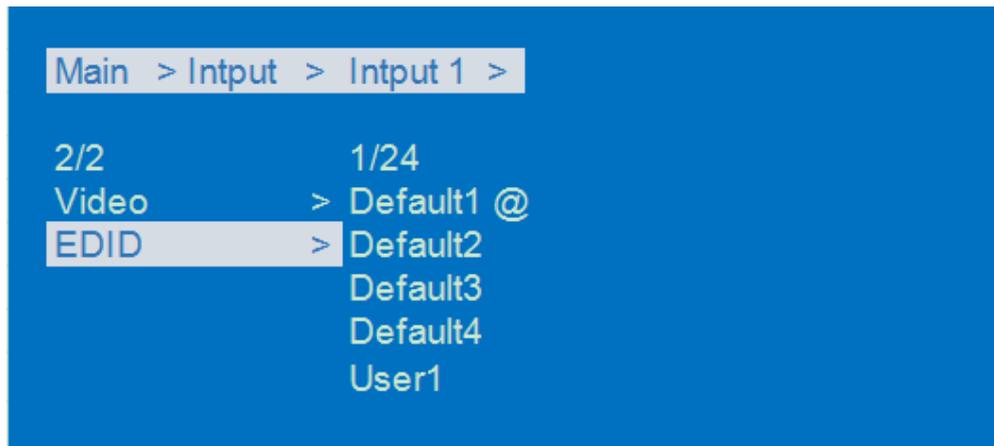
3. Preset setting

Including Clear, Save, Call option. Total support 8 presets.
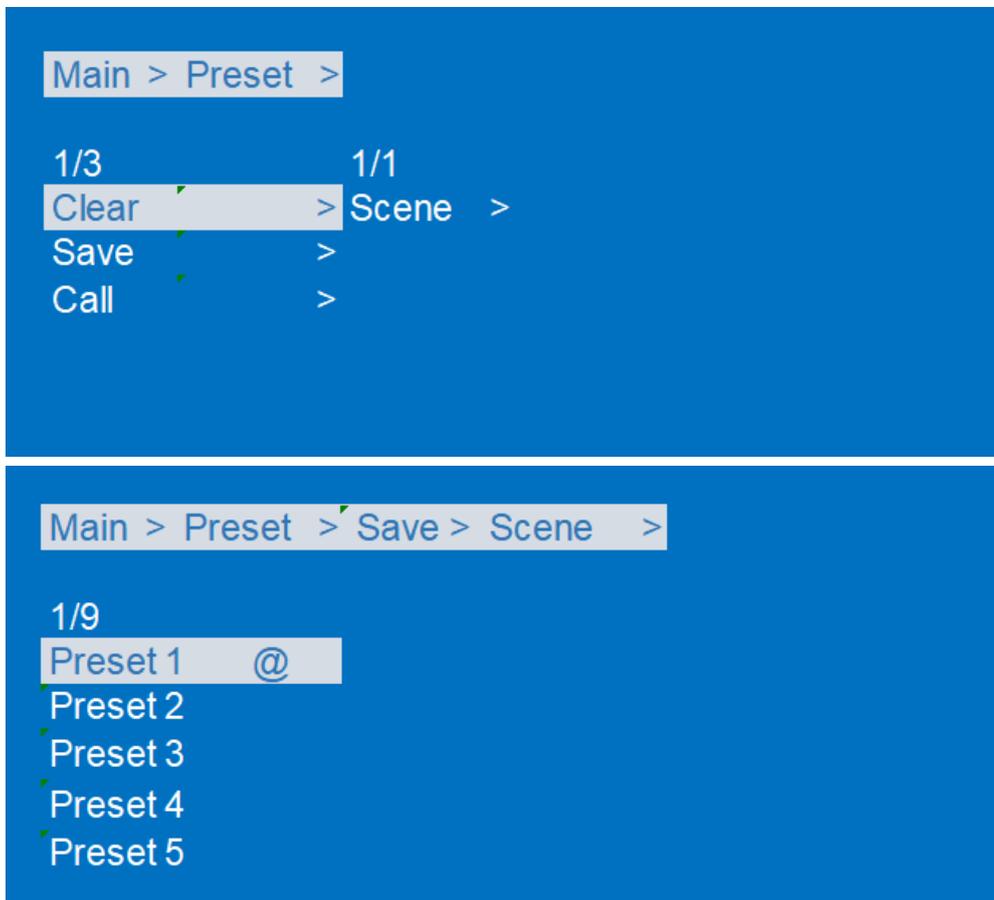
4. Config setting

Including Network, RS-232, User EDID, System

```
Main > Config >

1/3               1/6
Network      >  DHCP      >
RS-232       >  IP        >
System       >  MASK      >
                Gateway   >
                Port      >
```

```
Main > Config > Network > DHCP >

1/2
Off            @  DHCP  :  Off
On                IP    :  192.168.1.168
                  MASK  :  255.255.255.0
                  GW    :  192.168.1.1
                  MAC   :  4658-4E94-B465
```

```
...>>Network > IP > Part 4 >

169/256
164               DHCP :  Off
165               IP   :  192.168.1.168
166               MASK :  255.255.255.0
167               GW   :  192.168.1.1
168            @  MAC  :  4658-4E94-B465
```

```
...>>Network > Port > TCP >

8000/65534
7996              DHCP :  Off
7997              IP   :  192.168.1.168
7998              MASK :  255.255.255.0
7999              GW   :  192.168.1.1
8000           @  MAC  :  4658-4E94-B465
```

Main > Config > RS-232 > Baud >

6/6
9600
19200
38400
57600
115200   @

Main > Config > System >

1/2   1/2
Reboot   >   No   @
Factory   >   Yes

Main > Config > System >

2/2   1/2
Reboot   >   Keep user >
Factory   >   Erease all >

Main >   Config > System   >

1/2   1/2
Keep user   >   No   @
Erease all   >   Yes

*KEEP USER: restore running info.(include video,Audio,EDID,Setup).

*EREASE ALL: reset all default setup functions.

5. Info setting

Including Input, Output, System, LOG

Input: Showing connection status, input resolution, deep color, audio format and HDCP version etc.

Output: Showing TV info.

System: Showing the device info., Versions, Network

LOG: Showing products common information like running time, booting times etc.

```
Main > Info  >  LOG  >

1/1
Common        Time  :  1D 06:32:02
               Boot  :  52
               EXE   :  6912
               ERR   :  0
               TMP   :  52 ℃
```
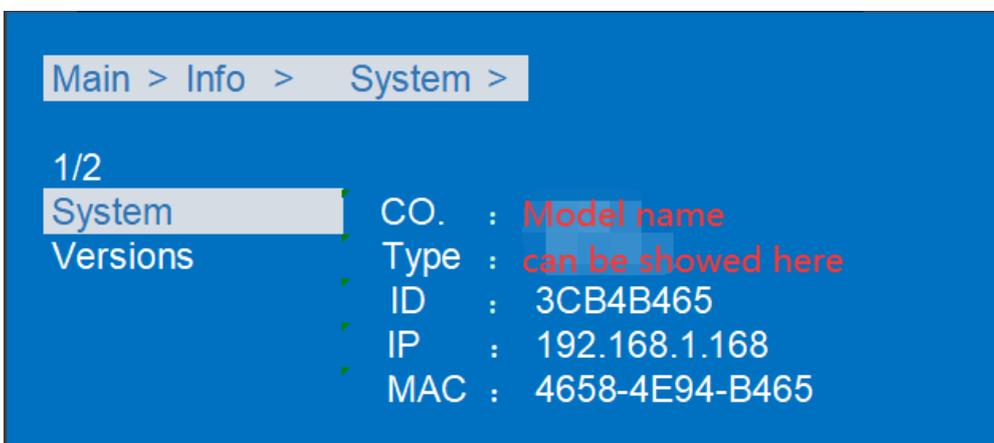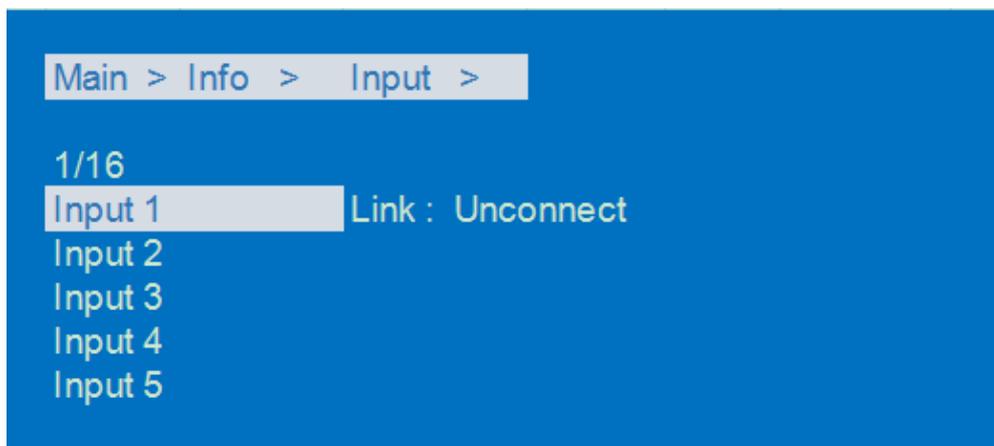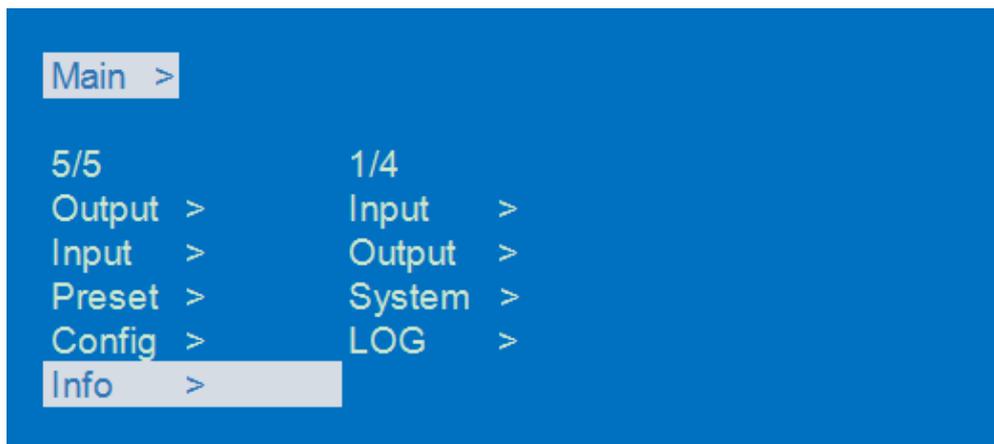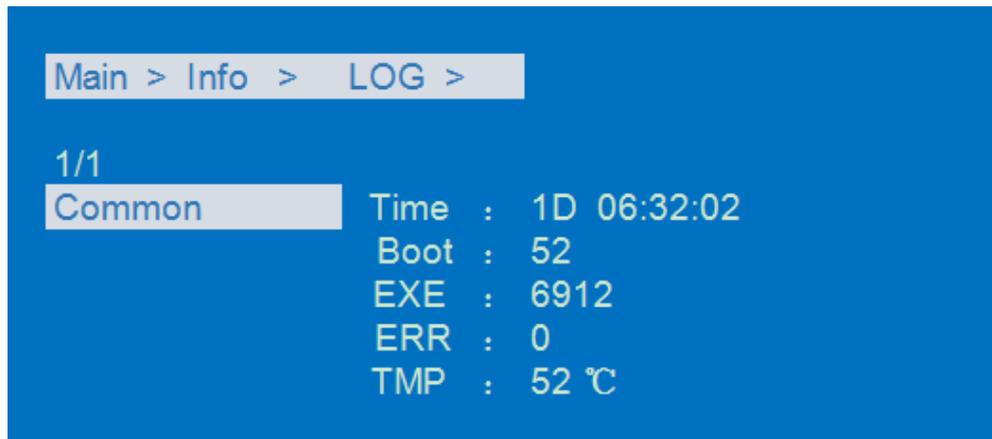
8. Remote Control Description

① Standby Mode

② Lock or Unlock the Panel Button

③ Choose output from 1-16

④ Choose input from 1-16

⑤ Menu (back to previous option) button

⑥ UP button

⑦ Down button

⑧ Enter button
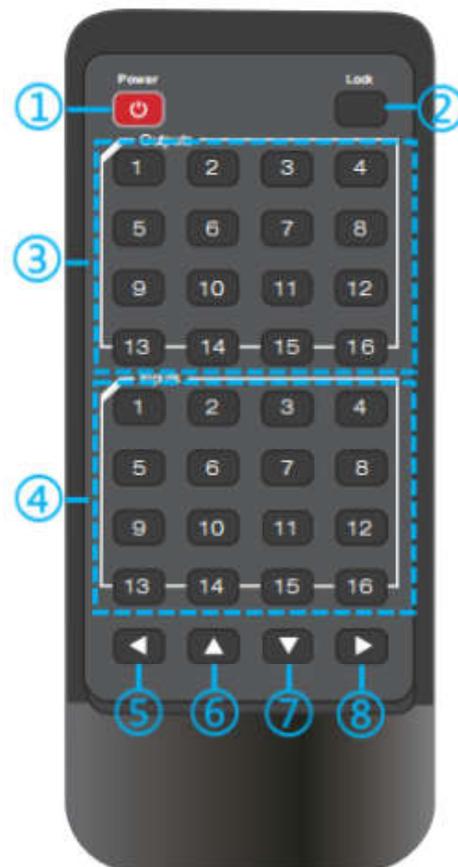
9. RS232 Command Control

<div align="center">***Default DHCP OFF!</div>

Default IP Address	192.168.1.168
TCP Port	5000
UDP Port	5001
Telnet Port	23
Baud Rate	115200

Control software operation:

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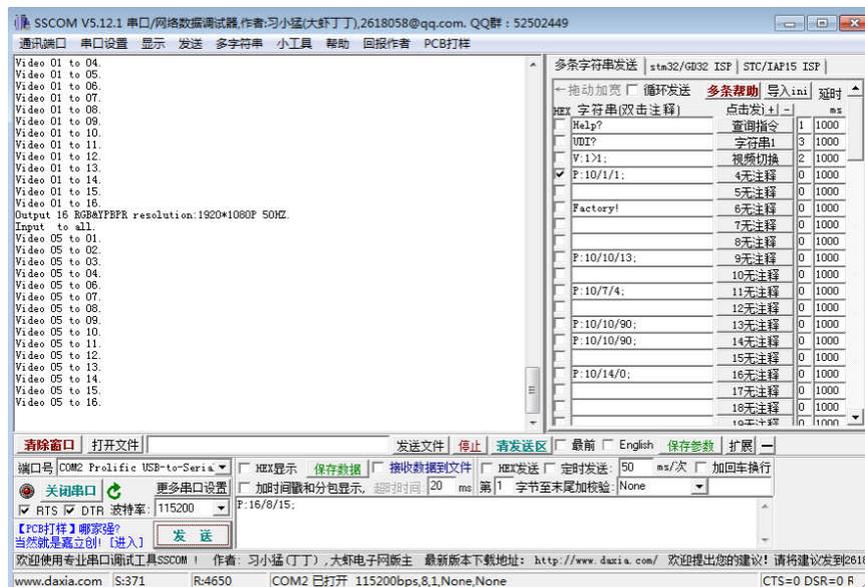
In the parameter config. area, select the serial port number that the serial line connects to the PC

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

Such as changing IP address to be 192.168.1.168:
<mark>Command is: #network ip=192.168.1.168</mark>

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.1-x means specified output(1~16).
3. Command head & Parameter1 & Parameter2... need to add one "SPACE".

The following table is only 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 Mode Switch	#audio_%c	in%d	/	enc=%d
EDID	#EDID_%c	In%d	cfg=%d	/

Please refer to the " Command list" for details.

Example: ALL output switches to input 4.

Operation format: #video_d out0 matrix=4

Supports multi-Outputs selecting, such as: #video_d out3,2,1 source=3

TCP/UDP Control

① Commands are the same as the RS232 commands

② TCP supports command feedback, UDP only for sending commands, no data feedback

③ Can't support PUTTY type's tools

Telnet Control

① "window"+ "R" typing"cmd"+ "Enter"

② Typing: Telnet 192.168.1.168 (According to the correct IP address) + "Enter"

③ User: admin; Password: admin

④ Command: "#cmd" to get the command list

10. Web Control
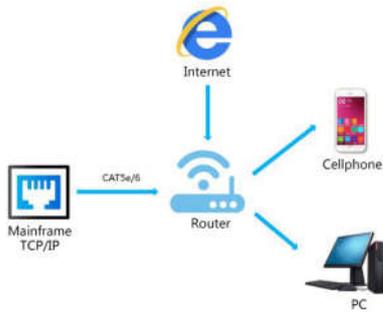
1). Connect the Ethernet port of matrix to the Ethernet port on PC by a crossover cable with RJ45 connectors.

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**.
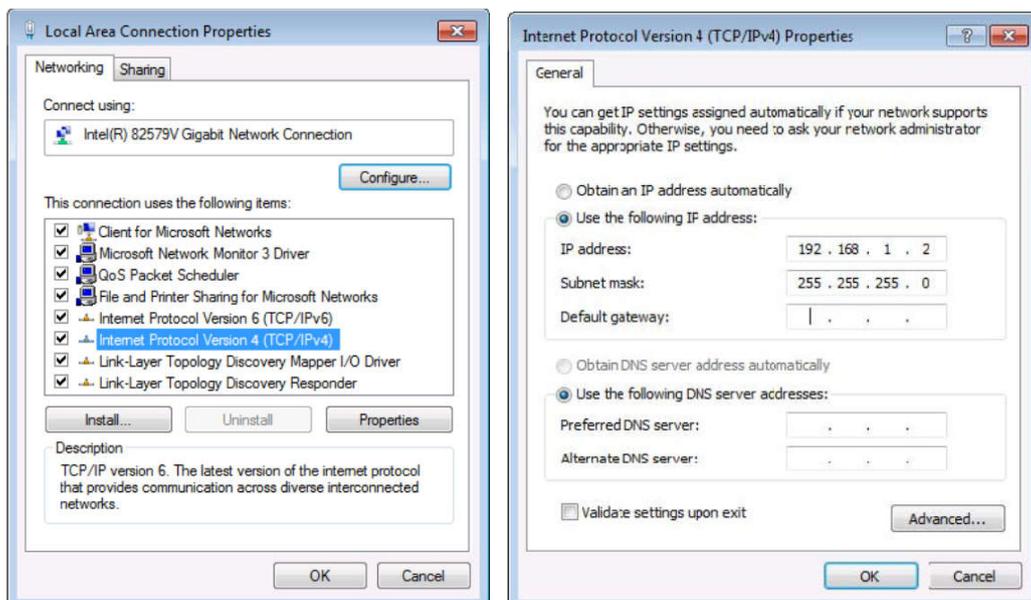
10.1. Enter Web and Control

Enter the default IP address of the matrix: 192.168.1.168
(Not available when DHCP ON)
Account: admin
Password: admin
(If forgetting the account information, sending command: "#factory1"
back to the default account information)

10.2. Status interface:

Input Info & Output Info & Preset Info:
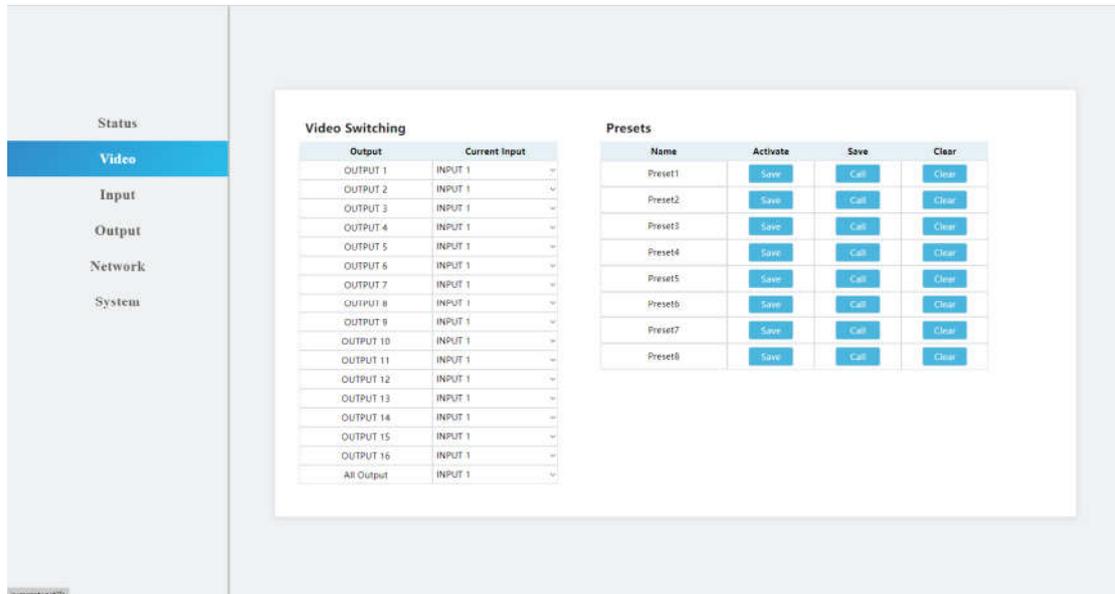
10.3. "Input" interface:

Rename: Double click to revise the input port's name, max 15 characters

Active: Connecting information

EDID: For setting and checking Default EDID, Copy output and User EDID information

USER EDID: Supports saving Default or Output's EDID to User EDID, and using the BIN documents upload to the User EDID
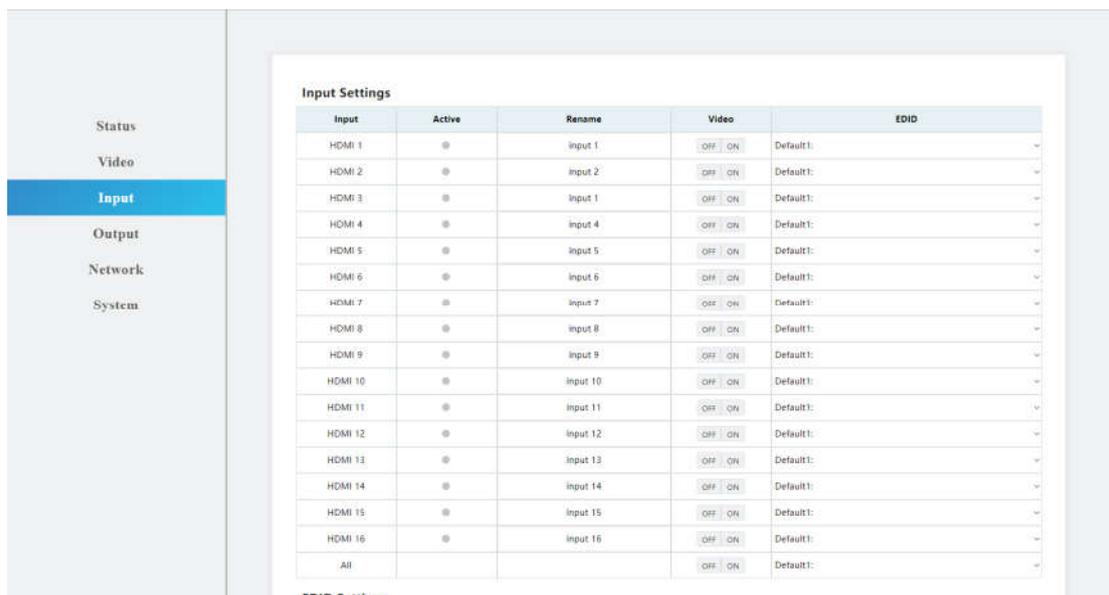
10.4. "Output" interface:

Rename: Double click to revise the output port's name, max 15 characters
Active: Connecting information
Stream: Turn On / off the output signal, won't effect the audio extraction function
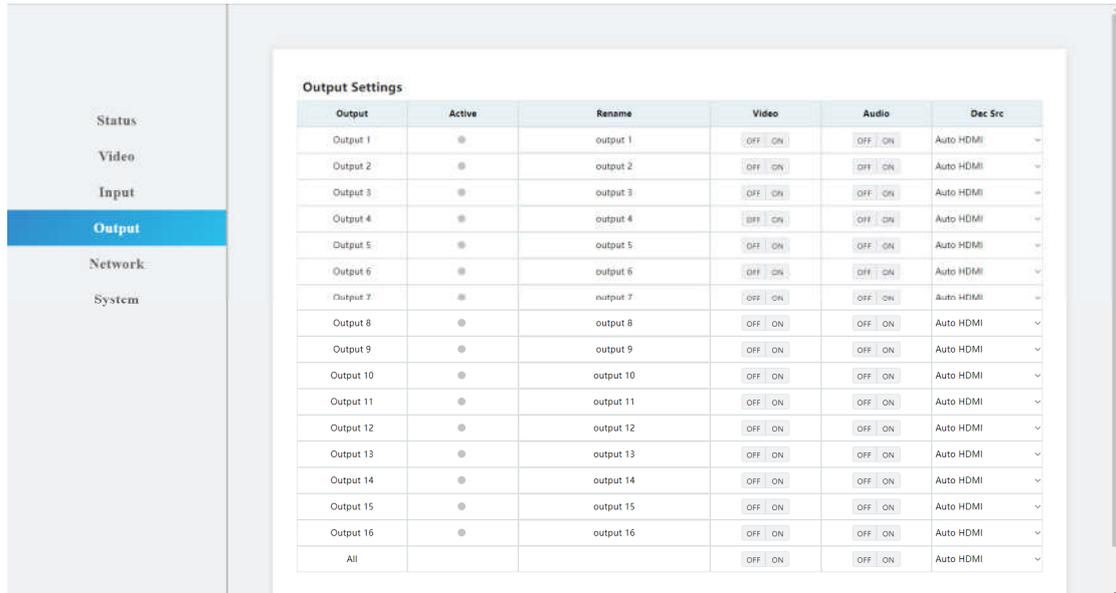
10.5. "Network" interface:

For IP Setting and Web Login Settings, including turn on/off the DHCP and Change user name and PW here.
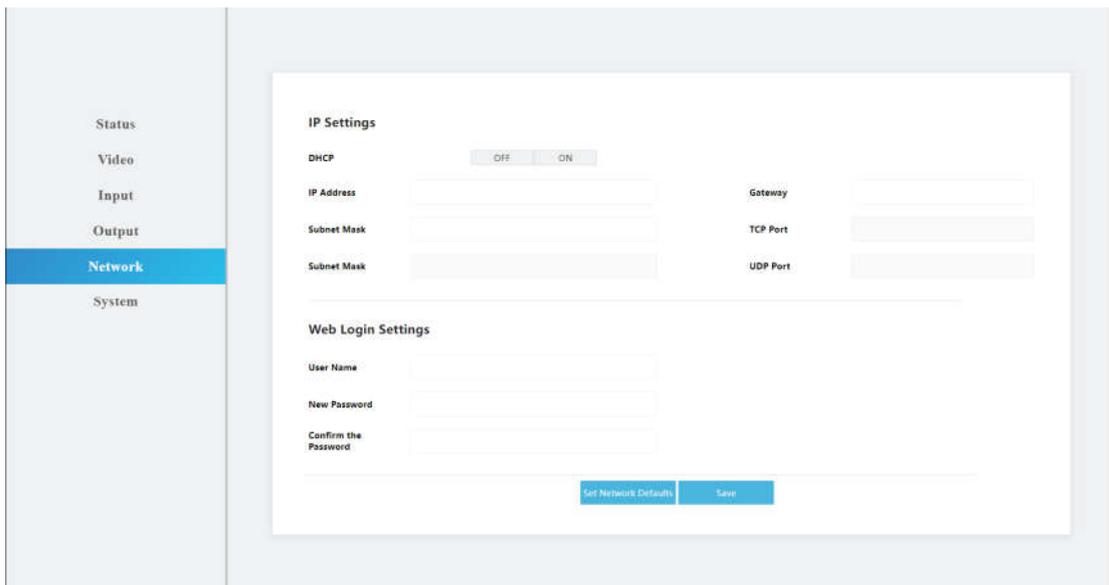
10.6. "System" interface:
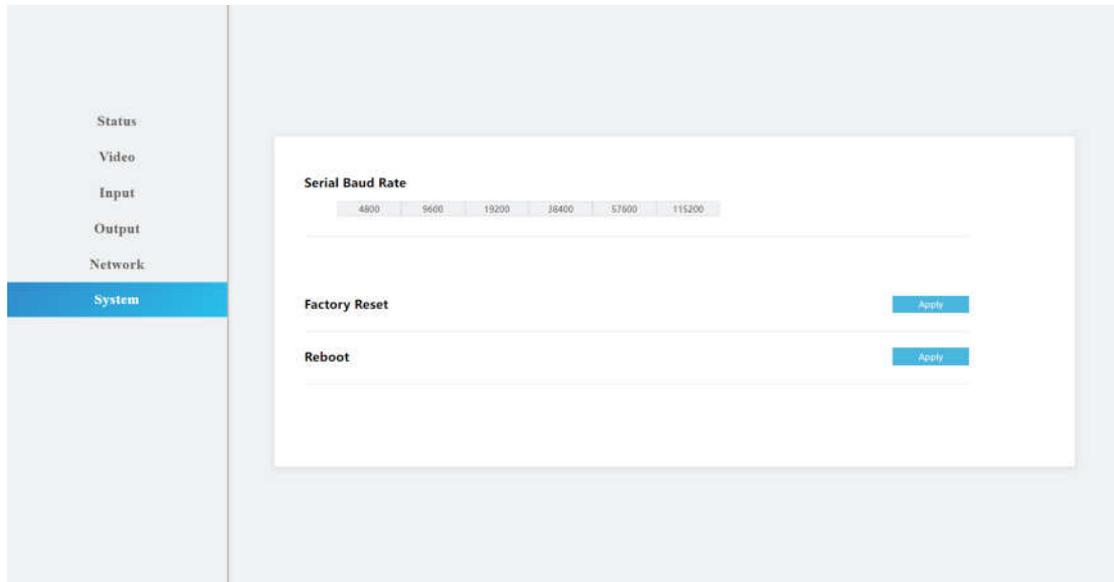
11. FW UPGRADE

First upgrade MCU (layer of application) and then upgrade CPLD, finally upgrade MCU,HTML, (CPLD = C0, HTML = F0, MCU = A1 all support to use USB Micro port for upgrading)

MCU Upgrade:

Open the software UART_ISP_V1.6.exe on PC, select the correct port and baud rate 115200, enter "A1" in Port, then select the path of the program in PATH (XXX. Bin), and click UPDATA to complete the upgrade
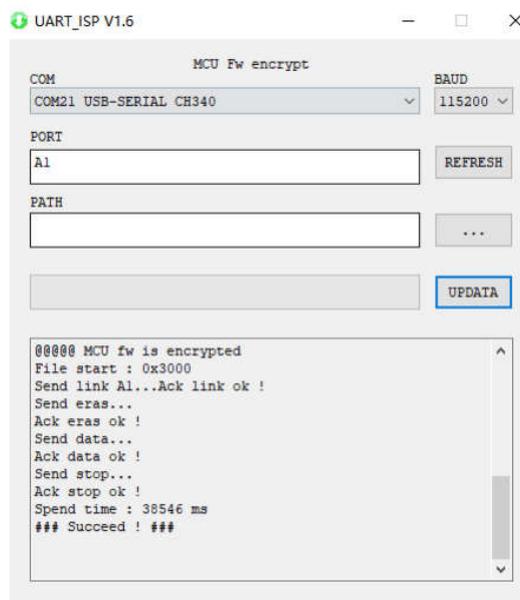
HTML (WEB GUI) Upgrade:

Open the software UART_ISP_V1.6.exe on PC, select the correct port and baud rate 115200, enter "F0" in Port, then select the path of the program (XXX. HTML) in PATH, and click UPDATA to complete the upgrade
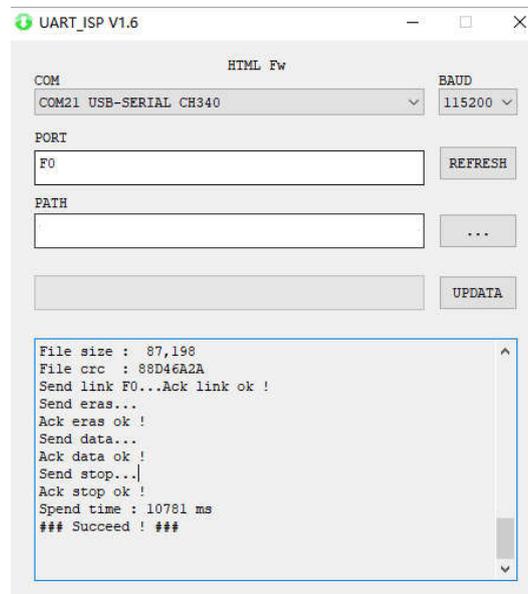
MAINTENANCE

Clean this unit with a soft, dry cloth. Never use alcohol, paint thinner of benzine 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(1)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.