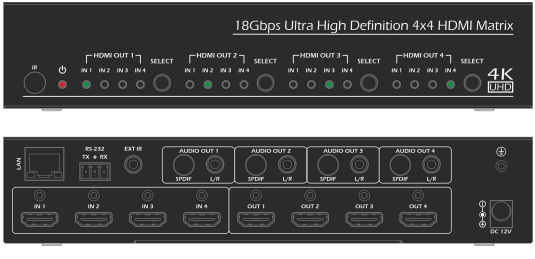
adertech

VS-U4H-44



18Gbps Ultra High Definition 4x4 HDMI Matrix
User Manual Version 1.1

Thank you for purchasing this product

We have done everything possible to ensure that our equipment pleases our consumers. When solving any problems in the operation and connection ADERTECH equipment, it is best to contact authorized companies and specialists who work with our equipment. Our equipment is intended for professional use, so you have professional skills in using such equipment. ADERTECH is a manufacturer of a wide range of multimedia solutions.

Surge protection device recommended

This product contains sensitive electrical components that may be damaged by electrical spikes, surges, electric shock, lighting 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. Introduction

This high performance 4×4 HDMI 4K 18Gbps Matrix can switch any of four HDMI 2.0 sources to four HDMI 2.0 displays. Each input and output supports up to 4K60 444 resolution and HDCP 2.2. The outputs can be individually scaled (4K→1080p). De-embedded audio can be output through analog L/R and coaxial audio output ports. The ARC function can return display device audio to coaxial port output only. Advanced EDID management is supported. This Matrix supports 18Gbps bandwidth and the additional features with latest HDMI standards. It can be controlled from the front panel, RS-232, IR remote, or TCP/IP.

2. Features

- ☆ HDMI 2.0, HDCP 2.2 / HDCP 1.4 and DVI 1.0 compliant
- ☆ Video resolution is up to 4K2K@60Hz (YUV 4:4:4)
- ☆ Support 18Gbps video bandwidth
- ☆ Four outputs can be individually scaled (4K→1080p)
- ☆ De-embedded audio to analog L/R and Coaxial ports output
- ☆ ARC audio return to the coaxial ports output only
- ☆ Built-in Web GUI for TCP/IP control
- ☆ Advanced EDID management supported
- ☆ Four methods of control: Front panel, RS-232, IR remote and TCP/IP
- ☆ Compact design for easy and flexible installation

3. Package Contents

Qty	Item
1	4×4 HDMI 4K 18Gbps Matrix
1	12V/2.5A Locking Power Adapter
1	IR Remote
2	Mounting Ears
1	38KHz IR Receiver Cable (1.5 meters)
1	3pin-3.81mm Phoenix Connector
4	Machine Screws (KM3*4)
1	User Manual

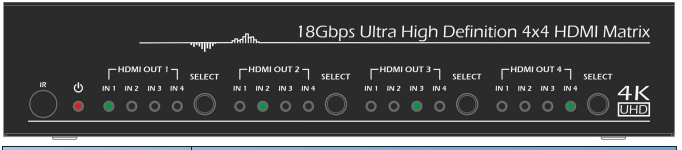
4. Specifications

Technical	
HDMI Compliance	HDMI 2.0
HDCP Compliance	HDCP 2.2 and HDCP 1.4
Video Bandwidth	18Gbps
Video Resolution	4K2K 50/60Hz 4:4:4 4K2K 50/60Hz 4:2:0 4K2K 30Hz 4:4:4 1080p, 1080i, 720p, 720i, 480p, 480i All HDMI 3D TV formats All PC resolutions including 1920 x 1200
Output Scaling	4K→1080p
3D Support	Yes
Color Space	RGB, YCbCr4:4:4, YCbCr4:2:2, YCbCr 4:2:0
Color Depth	8-bit, 10-bit, 12-bit [1080P, 4K30Hz, 4K60Hz (YCbCr 4:2:0)] 8-bit [4K60Hz (YCbCr 4:4:4)]
HDMI Audio Formats	PCM2.0/5.1/7.1CH, Dolby Digital/Plus/EX, Dolby True HD, DTS, DTS-EX,DTS-96/24, DTS High Res, DTS-HD Master Audio, DSD
Coaxial Audio Formats	PCM2.0, Dolby Digital / Plus, DTS 2.0/5.1
L/R Audio Formats	PCM2.0CH
HDR Support	HDR10, HDR10+. Dolby Vision, HLG
ESD Protection	Human-body Model: ±8kV (Air-gap discharge), ±4kV (Contact discharge)
Connections	
Input Ports	4 x HDMI Type A [19-pin female]
Output Ports	4 x HDMI Type A [19-pin female] 4 x L/R audio out [3.5mm Stereo Mini-jack] 4 x COAX audio out [RCA]
Control ports	1 x TCP/IP [RJ45] 1 x RS-232 [3-pin phoenix connector] 1 x IR EXT [3.5mm Stereo Mini-jack]

Mechanical			
Housing	Metal Enclosure		
Color	Black		
Dimensions	220mm (W)×105mm (D)×44mm (H)		
Weight	792g		
Power Supply	Input: AC100~240V 50/60Hz Output: DC12V/2.5A (Locking connector)		
Power Consumption	10W (Max), 1.56W (Standby mode)		
Operating Temperature	0°C ~ 40°C / 32°F ~ 104°F		
Storage Temperature	-20°C ~ 60°C / -4°F ~ 140°F		
Relative Humidity	20~90% RH (non-condensing)		
Resolution / Cable Length	**4K60 - Feet / Meters**	**4K30 - Feet / Meters**	**1080P60 - Feet / Meters**
HDMI IN / OUT	10ft / 3M	30ft / 10M	42ft / 15M
The use of "Premium High Speed HDMI" cable is highly recommended.			

5. Operation Controls and Functions

5.1 Front Panel



Name	Function Description
IR Receiver Window	IR input for remote control of the Matrix.
POWER LED	Red LED indicates that the unit is powered on.
OUT 1/2/3/4 button	▪ Short press to circularly select the desired input source IN 1/2/3/4 for OUT 1/2/3/4 port output. ▪ Press OUT 1/2/3/4 button for 3 seconds to switch Scaler mode for the OUT 1/2/3/4 port.
IN 1/2/3/4 LED	When IN 1/2/3/4 port is selected as the input channel for OUT 1/2/3/4 port, the corresponding green LED will be on.

5.2 Rear Panel



Name	Function Description
TCP/IP	Control port for TCP/IP control or accessing the built-in Web GUI.
RS-232	3-pin pluggable connector for RS-232 control of the Matrix.
IR EXT	If the IR receiver window of the unit is blocked or the unit is installed in a closed area out of infrared line of sight, the IR receiver cable can be inserted to the "IR EXT" port to receive the IR remote signal.
Coaxial Audio OUT 1 / OUT 2 / OUT 3 / OUT 4	RCA connector for coaxial audio output from HDMI OUT 1 / OUT 2 / OUT 3 / OUT 4.
L/R Audio OUT 1 / OUT 2 / OUT 3 / OUT 4	3.5mm Mini-jack connector for stereo audio output from HDMI OUT 1 / OUT 2 / OUT 3 / OUT 4.
GND	Screw terminal for earthing the Matrix.
IN 1/2/3/4 port	HDMI signal input port, connected to HDMI source device such as DVD or PS4 with an HDMI cable.
OUT 1/2/3/4 port	HDMI signal output port, connected to HDMI display device such as TV or monitor with HDMI cable.
DC 12V	DC 12V input for 12V 2.5A PSU.

5.3 Connecting to the Matrix

1. Connect the desired HDMI input sources.
2. Connect the desired HDMI display devices.
3. Connect the desired control devices: TCP/IP, RS-232 or IR IN.
4. Connect audio devices to either the Coaxial or L/R audio output ports.
5. Connect the 12V DC power supply.

5.4 Using the Matrix

5.4.1 Power LED and Standby Mode

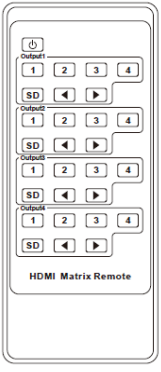
The Power LED provides the following indications:

Color	Description
Red	The Matrix is active and fully controllable.
Off	The Matrix is in standby mode, this state can be changed by using API commands, IR Remote or Web GUI.

5.4.2 Selecting Inputs

Select the signal source for the output port by pressing the OUT 1 / OUT 2 / OUT 3 / OUT 4 button on the front panel (cyclic selection mode) until the corresponding input source LED lights up.

6. IR Remote



⏻	Power on the Matrix or set it to standby mode.
Output 1/2/3/4	
1/2/3/4	Select the desired input source IN 1/2/3/4 for the OUT 1/2/3/4 port output, the corresponding green LED on the front panel will be on.
SD	Switch downscale or bypass mode for the OUT 1/2/3/4 port output.
◀ ▶	Select the last or next the desired input source to OUT 1/2/3/4 port output, the corresponding green LED on the front panel will be on.

7. Web GUI Operation Guide

The Matrix comes with built-in Web interfaces to provide a way to control or configure various Settings. There are seven pages, each of which is detailed in the following sections.

1. **Status** – Display information about the firmware and IP setting.
2. **Video** – Switch the desired input source to output and set the preset.
3. **Input** – Display information about the input signal and EDID setting.
4. **Output** – Display information about the output signal and scaler option.
5. **CEC** – Perform CEC management.
6. **Network** – Basic network settings management and Web login settings.
7. **System** – Panel lock, beep, serial baud rate setting and firmware update.

Note: All the above seven pages can be accessed in **Admin** mode.
Meanwhile, only the **Status** and **Video** pages are accessible in **User** mode.

To access the Web interface, please enter the IP address of the Matrix into the web browser on PC. The default IP address is **192.168.1.100**. You can get the current Matrix IP address via RS-232 control. Send the ASCII command " r ipconfig!" through a Serial Command tool, then you'll get the feedback information as shown below.

```
[11:00:55.617]发→◇r ipconfig!
□
[11:00:55.710]收←◆IP Mode: DHCP
IP:192.168.61.103
Subnet Mask:255.255.255.0
Gateway:192.168.61.1
Mac address:6c-df-fb-03-d5-e0
TCP/IP port=65534
telnet port=998
```

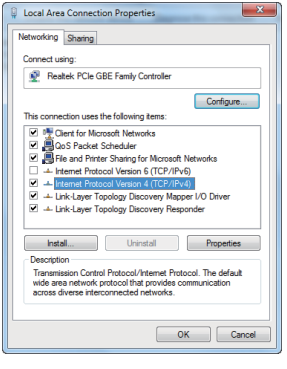
IP:192.168.61.103 in the above figure is the current Matrix IP address (this IP address is variable, depending on what the specific machine returns).

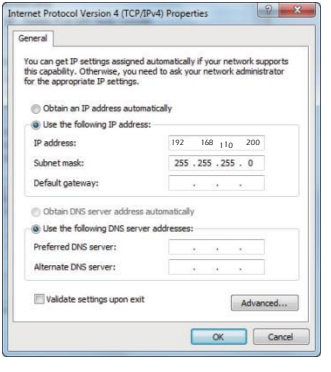
For the details of RS-232 control, please refer to "8. RS-232 Control Command".

Follow the steps below to access the Web GUI:

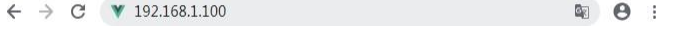
Step 1: Connect the TCP/IP port of the Matrix to a PC with an UTP cable.

Step 2: Set the IP address of the PC to be in the same network segment with Matrix, for instance, set PC IP address to 192.168.1.200 and Subnet mask to 255.255.255.0.

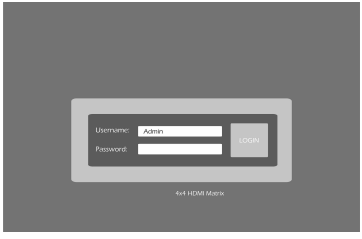




Step 3: Enter the Matrix's IP address into your browser on the PC to enter Web GUI page.



After entering the Web GUI page, there will be a Login page, as shown below:



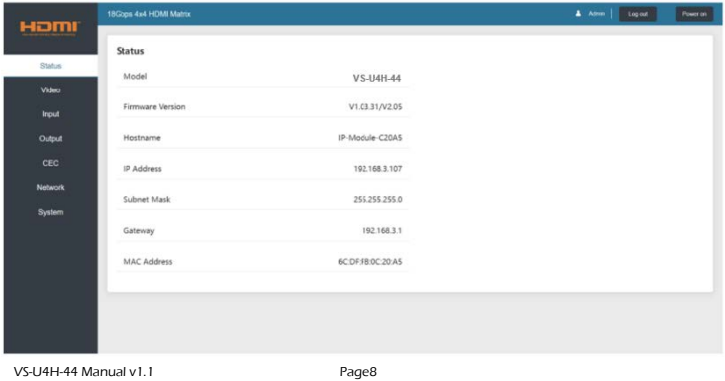
Select the username and language from the drop-down list and enter the password. The default passwords are:

Username	**User**	**Admin**
Password	**user**	**admin**

After entering the login details, click the LOGIN button and the following Status page will appear.

■ Status page

The Status page provides basic information about the product, such as Model name, the installed firmware version and the network setting. This page is visible in both User and Admin modes.

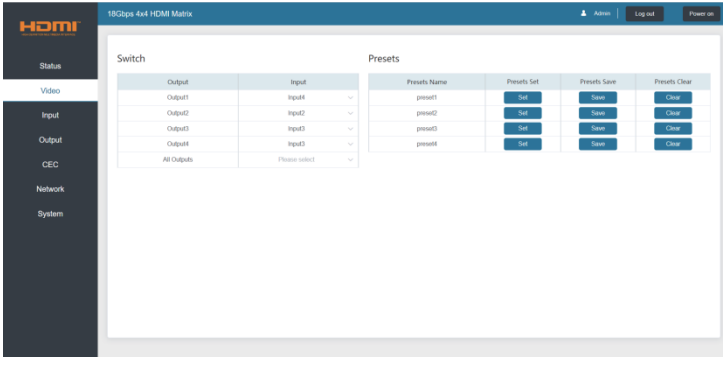


The buttons at the top right of the web interface are always available and provide the following function:

- **Log out:** Click this button to log out the system, and it will switch to the login page.
- **Power on:** Click this button to change the status of the Matrix between "Power on" and "Stand by" mode.

■ Video page

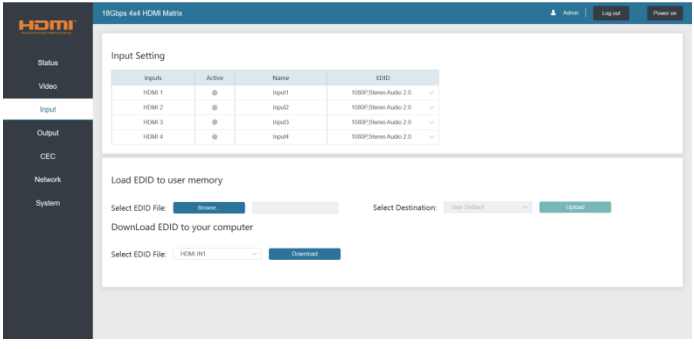
The Video page allows you to select input sources and set presets.



For preset setting, you first need to select the desired input sources for the four output ports. Then click the **Save** button to save the setting. Click the **Set** button to use the preset that you saved. Click the **Clear** button to clear the preset. Up to 4 presets can be saved.

■ Input page

The Input page shows the name and connection status of the input channel, and the name can be modified by entering the corresponding name in the input box. The EDID column provides a list of EDID options for each individual input.



The following EDID options are available in any of the EDID drop-down lists:

1080P, Stereo Audio 2.0 1080P, Dolby/DTS 5.1
1080P, HD Audio 7.1
1080I, Stereo Audio 2.0
1080I, Dolby/DTS 5.1
1080I, HD Audio 7.1
3D, Stereo Audio 2.0
3D, Dolby/DTS 5.1
3D, HD Audio 7.1
4K2K30Hz_444 Stereo Audio 2.0

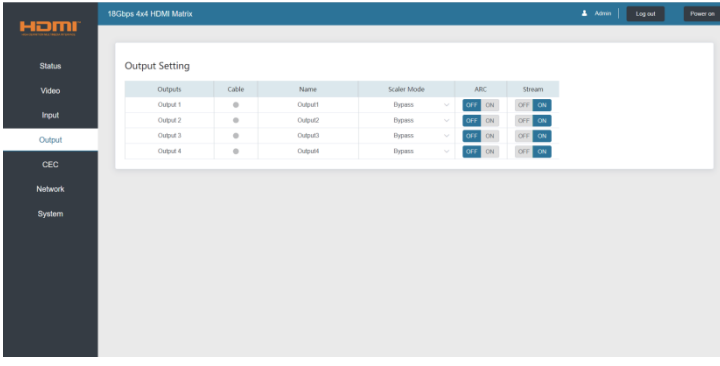
4K2K30Hz_444 Dolby/DTS 5.1
4K2K30Hz_444 HD Audio 7.1
4K2K60Hz_420 Stereo Audio 2.0
4K2K60Hz_420 Dolby/DTS 5.1
4K2K60Hz_420 HD Audio 7.1
4K2K60Hz_444 Stereo Audio 2.0
4K2K60Hz_444 Dolby/DTS 5.1
4K2K60Hz_444 HD Audio 7.1
4K2K60Hz_444 Stereo Audio 2.0 HDR
4K2K60Hz_444 Dolby/DTS 5.1 HDR
4K2K60Hz_444 HD Audio 7.1 HDR
USER_1
USER_2
COPY_FROM_TX_1
COPY_FROM_TX_2
COPY_FROM_TX_3
COPY_FROM_TX_4

This page also provides a means of sending a binary EDID file to either **User 1** or **User 2** EDID memories:
Step 1. Select the binary EDID file on your PC by clicking the **Browse** button. Step 2. Select either **User 1** or **User 2** from the drop-down list.
Step 3. Click the **Upload** button.

The EDID data of any input channel or the **User 1** / **User 2** can be read and stored on your PC.

■ Output page

The Output page shows the name and connection status of the output port, and the name can be modified by entering the corresponding name in the input box.

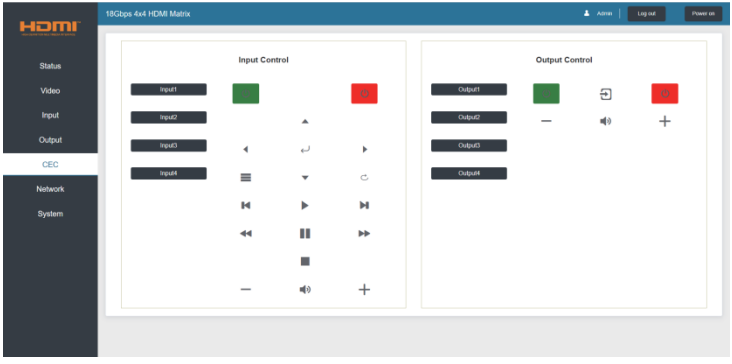


The **Scaler** mode menu provides the following options:

Bypass	The output resolution follows the input source. (Pass-through)
4K→1080P	The output resolution is downscaled from 4K to 1080p.
AUTO	Scale automatically to match the display requirements.

Click ON/OFF button of **ARC** to enable or disable the audio return function. When the ARC function is enabled, the returned audio from the display device will be output through the coaxial audio port, but the L/R audio port will be mute. Click ON/OFF button of **Stream** to enable or disable the signal output for the corresponding output port.

■ CEC Page



You can perform CEC management on this page:

- **Input Control:** You can control the operation of each input source by pressing the icons on the page.
(You can control multiple inputs simultaneously.)
- **Output Control:** You can control the operation of each display, such as power on/off, volume +/-, active source switching.
(You can control multiple outputs simultaneously.)

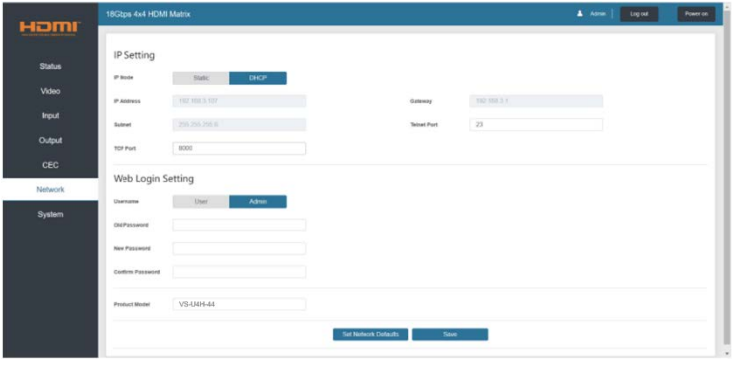
■ Network page

The Network page allows you to configure the IP Settings and modify the Web login password.

NOTES:

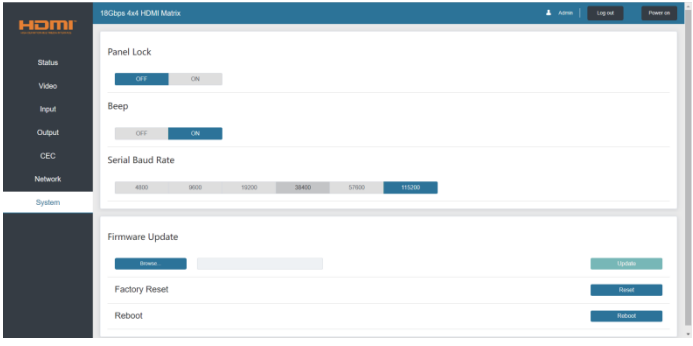
(1) The IP Settings is configurable only when the IP Mode is set to **Static**.

(2) After modifying any settings on this page, it will redirect to the Web browser home page or the Web GUI login page. You need to log in the Web GUI again with the new settings.



■ System page

The System page allows you to set panel lock/unlock, beep on/off, select serial baud rate, update firmware, restore factory default settings and reboot the Matrix.



8. RS-232 Control Command

The Matrix can also be controlled by RS-232 command. Connect the RS-232 port of Matrix to a PC with serial cables, and open a Serial Command tool (such as Comm Operator, Docklight or hercules, etc.) on the PC to send ASCII command to control the Matrix. The connection diagram is as follows.

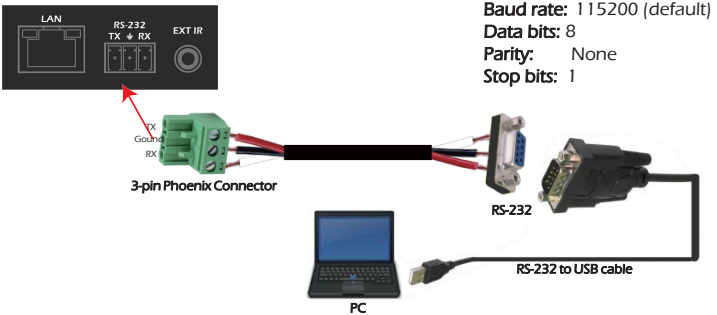


Figure 1: 3-pin phoenix connector to USB

Important Notes:

1. All commands sent to the Matrix must be terminated with an exclamation mark (!). Any carriage return that is present after the end of the command will be ignored.
2. All spaces shown in the commands are required.
3. All response messages are terminated with a CR/LF sequence.
4. When all four inputs are requested by the same command, the response will report each input on a separate line.
5. When four outputs are requested by the same command, the response will report each output on a separate line.

The ASCII command list about the product is shown as below.

ASCII Command

Serial port protocol: Baud rate: 115200 (default), Data bits: 8bit, Stop bits:1, Check bit: None
TCP/IP protocol port: 8000
The x, y, z and XXX are parameters. ! is the delimiter.

ASCII Command	Function Description	Feedback
Power		
s power z!	power on/off the device,z=0~1(z=0 power off, z=1 power on)	power on System Initializing... Initialization Finished! power off
r power!	get current power state	power on /power off
s reboot!	reboot the device	Reboot... System Initializing... Initialization Finished!
System Setting		
help!	Lists all commands	
r type!	Get device model	VS-U4H-44
r status!	Get device current status	Get the unit all status: power, beep, lock, in/out connection, video/audio crosspoint, edid, scaler,hdcp, network status
r fw version!	Get Firmware version	MCU FW version x.xx.xx
r link in x!	Get the connection status of the x input port, x=0~4(0=all)	HDMI IN1: connect
r link out y!	Get the connection status of the y output port, y=0~4(0=all)	HDMI OUT1: connect
s reset!	Reset to factory defaults	Reset to factory defaults System Initializing... Initialization Finished!
s beep z!	Enable/Disable buzzer function,z=0~1(z=0 beep off, z=1 beep on)	beep on / beep off
r beep!	Get buzzer state	beep on / beep off
s lock z!	Lock/Unlock front panel button,z=0~1(z=0 lock off,z=1 lock on)	panel button lock on panel button lock off
r lock!	Get panel button lock state	panel button lock on/off
s save preset z!	Save switch state between all output port and the input port to preset z, z=1~8	save to preset 1
s recall preset z!	Call saved preset z scenarios, z=1~8	recall from preset 1

s clear preset z!	Clear stored preset z scenarios,z=1~8	clear preset 1
r preset z!	Get preset z information, z=1~8	video/audio crosspoint
s baud rate xxx!	Set the serial port baud rate of RS02 module, z=(115200,57600,38400,19200,9600,4800)	Baudrate:115200
r baud rate!	Get the serial port baud rate of RS02 module	Baudrate:115200
s id z!	Set the control ID of the product, z=000~999	id 888
Output Setting		
s in x av out y!	Set input x to output y， x=1~4， y=0~4 (0=all)	input 1 -> output 2
r av out y!	Get output y signal status y=0~4(0=all)	input 1 -> output 1 input 2 -> output 2 ..... input 4 -> output 4
s out y stream z!	Set output y stream on/off, y=0~4(0=all) z=0~1 (0:disable,1:enable)	Enable out 1 stream Disable out 1 stream
r out y stream!	Get output y stream status, y=0~4(0=all)	Enable out 1 stream
s hdmi y scaler z!	Set hdmi output y port output scaler mode, y=0~4 (0=all), z=1~3(1=bypass,2=4k->1080p,3=Auto)	hdmi 1 set to bypass mode
r hdmi y scaler !	Get hdmi output y port output mode y=0~4(0=all)	hdmi 1 set to bypass mode
s hdmi y hdcp z!	Set hdmi output y port hdcp status y=0~4(0=all) z=0~1(1=active,0=off)	hdmi 1 hdcp active
r hdmi y hdcp!	Get HDCP status of HDMI out y, y=0~4(0=all)	hdmi 1 hdcp active
Audio Setting		
s hdmi y arc z!	Turn on/off arc of HDMI output y， y=0~4(0=all) z=0~1(z=0,off,z=1 on)	hdmi output 1 arc on hdmi output 1 arc off
r hdmi y arc!	Get the arc state of HDMI output y， y=0~4(0=all)	hdmi out1 arc on
EDID Setting		
r edid in x!	Get EDID status of the input x, x=0~4(0=all inputs)	IN1 EDID: 4K2K60_444, Stereo Audio 2.0 IN2 EDID: 4K2K60_444, Stereo Audio 2.0 IN3 EDID: 4K2K60_444, Stereo Audio 2.0 IN4 EDID: 4K2K60_444, Stereo Audio 2.0
r edid data hdmi y!	Get the EDID data of the hdmi output y port, y=1~4	EDID : 00 FF FF FF FF FF FF 00 .....

s edid in x from z!	Set input x EDID from default EDID z, x=0~4(0=all),z=1~23 1, 1080p,Stereo Audio 2.0 2, 11080p,Dolby/DTS 5.1 3, 11080p,HD Audio 7.1 4, 11080i,Stereo Audio 2.0 5, 11080i,Dolby/DTS 5.1 6, 11080i,HD Audio 7.1 7, 13D,Stereo Audio 2.0 8, 13D,Dolby/DTS 5.1 9, 13D,HD Audio 7.1 10, 14K2K30_ 444,Stereo Audio 2.0 11, 14K2K30_ 444,Dolby/DTS 5.1 12, 14K2K30_ 444,HD Audio 7.1 13, 14K2K60_ 420,Stereo Audio 2.0 14, 14K2K60_ 420,Dolby/DTS 5.1 15, 14K2K60_ 420,HD Audio 7.1 16, 14K2K60_ 444,Stereo Audio 2.0 17, 14K2K60_ 444,Dolby/DTS 5.1 18, 14K2K60_ 444,HD Audio 7.1 19, 14K2K60_444,Stereo Audio 2.0 HDR 20, 14K2K60_444,Dolby/DTS 5.1 HDR 21, 14K2K60_444,HD Audio 7.1 HDR 22, 1USER1 23, 1USER2 24, 1Copy_From_Hdmi_Tx_1 25, 1Copy_From_Hdmi_Tx_2 26, 1Copy_From_Hdmi_Tx_3 27, 1Copy_From_Hdmi_Tx_4	IN1 EDID:1080p,Stereo Audio 2.0
Network setting		
r ipconfig!	Get the Current IP Configuration	IP Mode: Static, IP: 192.168.1.72 Subnet Mask: 255.255.255.0, Gateway: 192.168.1.1 Mac address: 00:1C:91:03:80:01 TCP/IP port=8000, telnet port=10
r mac addr!	Get network MAC address	Mac address: 00:1C:91:03:80:01
s ip mode z!	Set network IP mode to static IP or DHCP, z=0~1 (z=0 Static, z=1 DHCP)	Set IP mode:Static. Please use "s net reboot!" command or repower device to apply new config!
r ip mode!	Get network IP mode	IP mode: Static
s ip addr xxx.xxx.xxx.xxx!	Set network IP address	Set IP address:192.168.1.100 Please use "s net reboot!" command or repower device to apply new config! DHCP on, Device can't config static address, set DHCP off first.

r ip addr!	Get network IP address	IP address:192.168.1.100
s subnet xxx.xxx.xxx.xxx!	Set network subnet mask	Set subnet Mask:255.255.255.0 Please use "s net reboot!" command or repower device to apply new config! DHCP on, Device can't config subnet mask, set DHCP off first.
r subnet!	Get network subnet mask	Subnet Mask:255.255.255.0
s gateway xxx.xxx.xxx.xxx!	Set network gateway	Set gateway:192.168.1.1 Please use "s net reboot!" command or repower device to apply new config! DHCP on, Device can't config gateway, set DHCP off first.
r gateway!	Get network gateway	Gateway:192.168.1.1
s tcp/ip port x!	Set network TCP/IP port (x=1~65535)	Set tcp/ip port:8000
r tcp/ip port!	Get network TCP/IP port	tcp/ip port:8000
s telnet port x!	Set network telnet port(x=1~65535)	Set telnet port:23
r telnet port!	Get network telnet port	telnet port:23
s net reboot!	Reboot network modules	Network reboot... IP Mode: Static IP: 192.168.1.72 Subnet Mask: 255.255.255.0 Gateway: 192.168.1.1 Mac address: 00:1C:91:03:80:01 TCP/IP port=8000 telnet port=10

NOTE: that you can send 'ASCII Command' to control the Matrix via Serial Command tool. The 'Function Description' explains function about the command. The "Feedback" displays whether the command sends success or not and feedback the information you need.

9. Application Example

