ethereal CS-44MQ 4×4 HDMI 2.0 18Gbps Matrix Switcher User Manual

Contents

ethereal CS-44MQ 4×4 HDMI 2.0 18Gbps Matrix Switcher

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 shocks, lighting strikes, etc. Use of surge protection systems is highly recommended in order to protect and extend the life of your equipment.

Introduction

This high-performance HDMI Matrix Switcher can switch any of these 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 for 1080p. De-embedded audio as analog LIR and coaxial is available for both outputs. The ARC function can return display device audio to coaxial port output only. Advanced EDID management is supported. With its 118Gbps bandwidthand the additional features with the latest HDMI standards. This switcher can be controlled from the front panel, RS-232, IR remote, or TCP/IP.

Features

- HDMI 2.0, HDCP 2.2 / HDCP 1.4, and DVI 1.0 compliant
- Four 18G HDMI 2.0 video inputs support up to 4K60 444 resolution
- Four 18G HDMI 2.0 video outputs support up to 4K60 444 resolution
- Four outputs can be individually scaled for 4K—+1080p
- De-embedded audio to analog UR 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

Package Contents

Qty	Item
1	4×4 HDMI 2.0 18Gbps Matrix Switcher
	12V/2.5A Locking Power Adapter
	IR Remote
2	Mounting Ears
	38KHz IR Receiver Cable (1.5 meters)
	3-pin Phoenix Connector
	User Manual

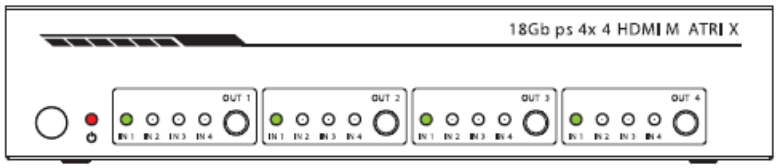
Specifications

Technical	
HDMI Compliance	HDMI 2.0
HDCP Compliance	HDCP 2.2 and HDCP 1.4
Video Bandwidth	18 Gbps
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 to 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
HOR Support	HDR10, HDR10+. Dolby Vision, HLG
ESD Protection	Human-body Model: ±8kV (Air-gap discharge), ±4kV (Contact discharge)
Connections	
Input Ports	4xHDMIType A [19-pin female]
Output Ports	4x HDMI Type A [19-pin female] 4xl/ R audio out [3.5mm Stereo Mini-jack] 4xCOAX audio out [RCA]
Control ports	1x TCP/IP [RJ45] 1x RS-232[3-pin phoenix connector] 1x IR EXT [3.5mm Stereo Mini-jack]

Mechanical			
Housing	Metal Enclosure		
Color	Black		
Dimensions	220mm (W)x105mm (D)x44mm (H)		
Weight	792g		
Power Supply	Input: AC100-240V 50/60Hz Output: DC12V/2.5A (Locking connector)		
Power Consumption	1OW (max), 1.56W (Standby)		
Operating Temperature	0°c – 40°c *1* 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	3011 / 10M	42ft / 15M
The use of a “Premium High Speed HDMI” cable is highly recommended.			

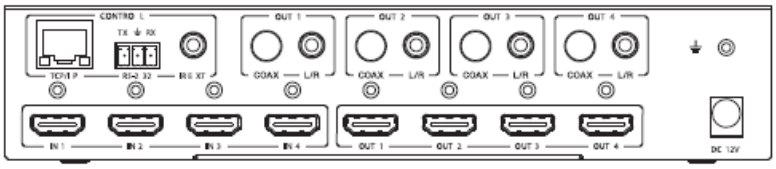
Operation Controls and Functions

Front Panel



IR Sensor	of the switcher.
POWER LED	The red LED indicates that the unit is powered.
OUT 1 / OUT 2 / OUT 31OUT 4 Button	Press to select the desired input.
IN 1 IN2 / IN3 / IN4 LED	Green LED indicates when the input is selected for respective output.

Rear Panel



TCP/IP (RJ45)	control or access the built-in Web GUI.
RS-232	3-pin pluggable connector for RS-232 control of the Switcher.
IR EXT	IR eye input for IR control of the Switcher.
Coaxial Audio OUT 1 *1* OUT *2 1* OUT 3 1 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 / OUT4	3.5mm Mini-jack connector for stereo audio output from HDMIOUT 1 / OUT 2 / OUT 3 / OUT 4.
Earthing Point	Screw terminal for earthing the Switcher.
HDMI Input 1 to 4	HDMI Source inputs 1 to 4.
HDMI Output 1 to 4	HDMI outputs for displays 1 to 4.
DC 12V IN	DC 12V input for 12V 2.5A PSU.

Connecting to the Switcher

- Connect the desired HDMI input sources.
- Connect the desired HDMI display devices.
- Connect any CONTROL inputs that may be required: TCP/IP, RS-232, or IR IN.
- Connect any audio devices to either the Coaxial or L/R outputs.
- Connect the 12V DC PSU-

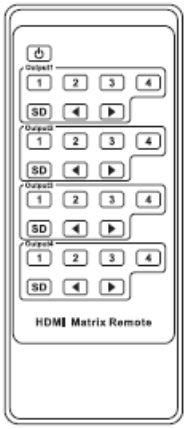
Using the Switcher
Power LED and Standby Mode

The Power LED provides the following indications:

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

Selecting Inputs
Manual Selection of the inputs is done by briefly pressing the OUT 1 / OUT 2 / OUT 3 / OUT 4 button repeatedly for that channel until the desired input is selected.

IR Remote



⏻	Power on the Switcher or set it to standby mode.
Output 1 (Output 2 / 3 / 4)	
1/2/3/4	Select the desired input source to Output 1 port output, the corresponding green LED on the front panel illuminates.
SD	Switch downscale or bypass mode to the Output 1 port output.
◀ ▶	Select the last or next the desired input source to Output 1 port output, the corresponding green LED on the front panel illuminates.

WARNING – INGESTION HAZARD: This product contains a button cell or coin battery

- Battery model: CR2025
- Battery nominal voltage: 3.0V
- Remove and immediately recycle or dispose of used batteries according to local regulations and keep away from children. Do NOT dispose of batteries in household trash or incinerate them.
- Even used batteries may cause severe injury or death.
- Call a local poison control center for treatment information.
- Non-rechargeable batteries are not to be recharged.
- Do not force, discharge, recharge, disassemble, heat above 70 C / 158 F, or incinerate. Doing so may result in injury due to venting, leakage, or explosion, resulting in chemical burns.
- Ensure the batteries are installed correctly according to polarity (+ and -).
- Do not mix old and new batteries, different brands or types of batteries, such as alkaline, carbon-zinc, or rechargeable batteries.
- Remove and immediately recycle or dispose of batteries from equipment not used for an extended period of time according to local regulations.
- Always completely secure the battery compartment.
- If the battery compartment does not close securely, stop using the product, remove the batteries, and keep them away from children.

Using the Bulit-In Web GUI Interface

The Switcher has a built-in Web interface to provide a means of controlling or configuring various settings. There are six pages available, each of which will be outlined in detail in the following sections:
The six pages are:

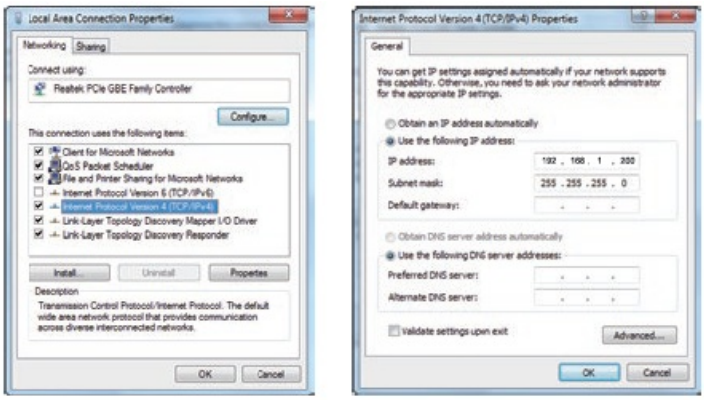
1. Status — Display information about the firmware and IP setting.
2. Video — Switch the desired input source to output and set the preset.
3. Input — Display information about the input signal and EDID setting.
4. Output — Display information about the output signal and scaler option.
5. Network — Allow basic network setting management and login options.
6. System — Panel lock, beep, serial baudrate setting, and firmware update.

Note these six pages are only accessible in Admin mode, when User mode is used only the Status and Video pages are available.
To access the Web interface, enter the IP address of the switcher into the address bar of any web brower. The default IP address is 192.168.1.100.

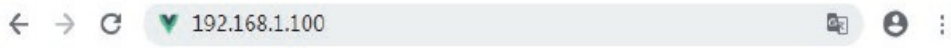
Please see the following operation method.

Note that if the IP address of the switcher is not known, use the RS-232 command given in the Network Setting section “r ip addr!” to discover the current IP address or set the switcher to factory default status and IP address restores to default 192.168.1.100.

1. **Step 1:** The TCP/IP port on the rear panel is directly connected to a PC with an IJTP cable.
2. **Step 2:** Set your PC IP address to the same network segment with Switcher, for instance set PC IP address to 192.168.1.200 and Subnet mask to 255.255.255.0.



3. **Step 3:** Enter the Switcher’s IP address into your browser on PC to enter the Web GUI page.

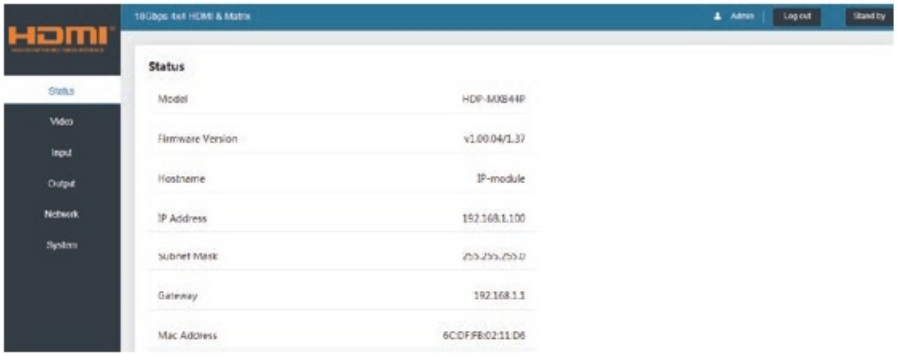


Select the username from the list and enter the password. The de au passwords are:

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 Model name, the installed firmware version and the network setting. This page is visible in both User and Admin modes.



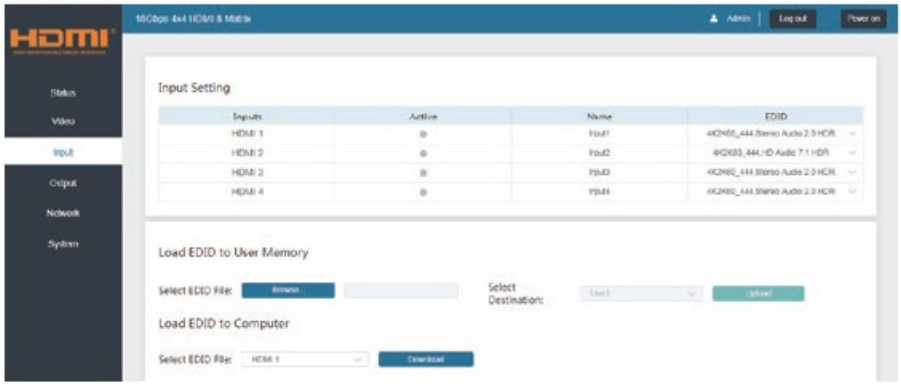
The buttons at the top right of the web interface are always available and provide the following functions:

- The Log Out button will disconnect the current user from the tisplay of the log-in screen.
- The Power on button changes the power status of the Switcher between On and Stand-by mode.

Video page
The Video page allows the selection of the input source and set the presets.

To this preset setting, first you need to select the desired input source to four output ports. Then click the Save button to save the setting. When you clickthe line Set button, this preset you have saved will be used. The Clear button will clear the preset. There are four presets setting available.

Input page
The Input page provides information about which inputs are connected and have a signal present. The inputs can be giving more meaningful names, if desired. The EDID column provides a list of EDID options for each 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

- 10801, Stereo Audio 2.0
- 10801, Dolby/DTS 5.1
- 10801, 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 _TX _ 2
- COPY_ FROM _ TX 3
- COPY FROM TX 4

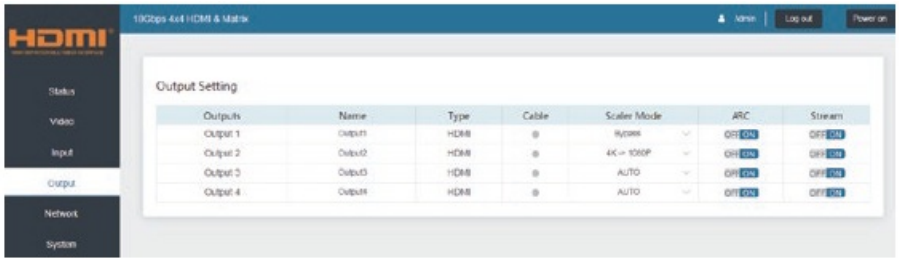
This page also provides a means of sending a binary EDID file to either

User 1 or User 2 EDID memories:

1. Select the binary EDID file on your PC by clicking on the Browse button.
2. Select either User I or User 2 from the drop-down list.
3. Click the Upload button.

The EDID data from any input or from the User 1 and User 2 locations can be read and stored on your PC.

Output page
The outputs can also be assigned meaningful names if desired. The Output page provides information about the signal status of the outputs.



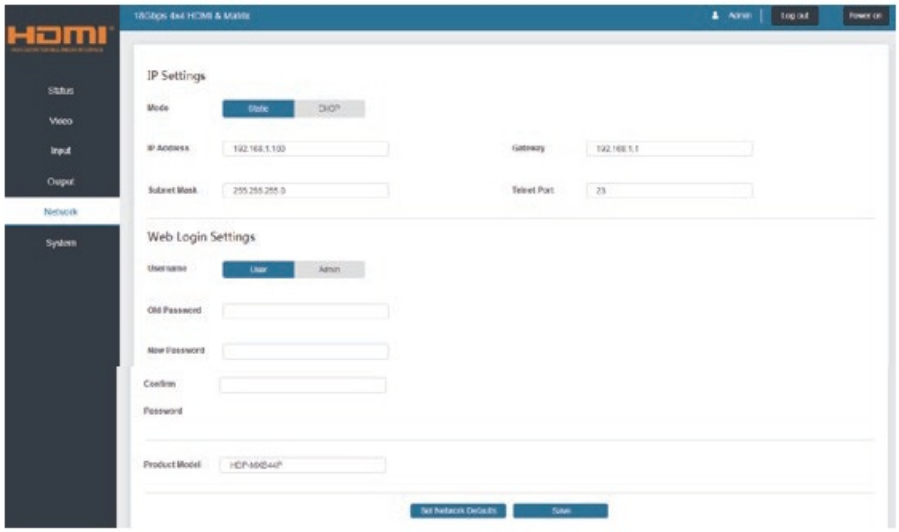
The Scaler mode menu provides the following options:

Bypass	Follow the input source. (Pass-through)
4K-> 1080P	Downscale to 1080p if needed.
AUTO	Scaler to match the display requirements .

- The ARC buttons enable or disable the display device audio to the coaxial audio outputs. If the ARC function enables, the L/R audio port will have no voice output simultaneously.
- The Stream buttons enable or disable the output signal for the respective output.

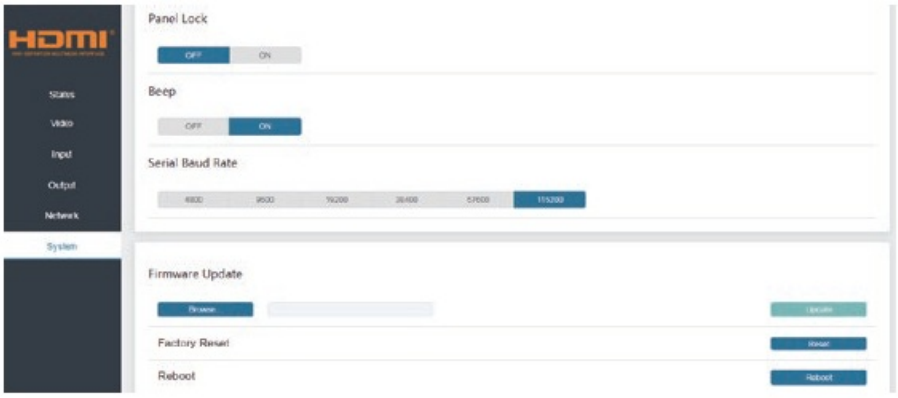
Network page

- The Network page allows the configuration of the network settings.
- *Note that the IP address boxes are only accessible when the Mode button is set to Static.*
- The login passwords can be changed on this page.
- *Note that any changes to this page will require the new details into the web browser and/or the log in screen.*



System page

- The system page allows setting of the panel lock and beep on/off, control RS-232 port baud rate.
- This page is also used to install new firmware updates, restore the factory default settings, and reboot the Switcher.



API control command

The Switcher can also be controlled by RS-232. Connect a PC by using a serial cable and open any Of a Serial Command tool on the PC such as Comm Operator, Docklight or hercules, etc to send command for controlling the Switcher. Please see the following connection diagram.

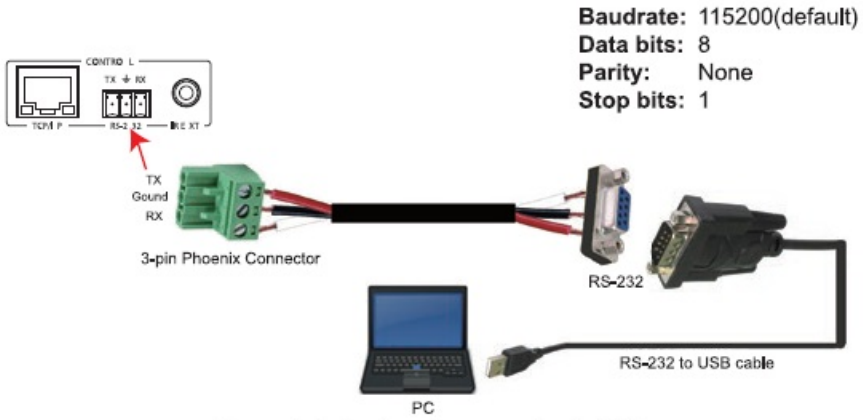


Figure 1: 3-pin phoenix connector to USB

Important:

1. All messages sent to the Switcher must be terminated with an exclam- ation 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 by 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 list about the product is shown 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.

RS-232Command	Function Description	Feedback
Power		
s power z!	**power on/off the device,z=0- 1(z=O power off, z=1 power on)**	**power on** **System Initializing.. Initialization Finished! Power off**
rpower!	get current power state	power on /power off
s reboot!	Reboot the device	Reboot.. System Initializing.. **Initialization Finished!**
SYSTEM Setup		
help!	Lists all commands	
rtype!	Get device model	HDP-MXB44P
r status!	**Get the device's 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** the **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/Disablebuzzer function,z=0- 1(z=0 beep o , ff z=1 beep on)	beepon / 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 the switch state between all output ports and the input port to preset z, z=1-8	Save to preset 1

s recall preset zl	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 infomation, z=1-8	**video /audio crosspoint**
s baud rate xxx!	Set the serial port baud rate of the RS02 module, z=(11 5200,57600,38400,19200,9600,4800)	Baudrate:115200
r baud rate’	Get the serial port baud rate of the RS02 module	Baudrate:115200
s id z!	Set the control ID of the product, z=000-999	id 888
Output Setting		
sin 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 o ut 1 stream
Routy stream! **r hdmi y scaler**!	Get output y stream status, y=0-4(0=all) Get HDMI output y port output mode y=0-4(0=all)	**Enable 1 stream** Set HDMI 1 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 outp ut 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		
	. .	IN1 EDID: 4K2K60_444,
		Stereo Audio 2.0
		IN2 EDID: 4K2K60_444,
redid in x!		Stereo Audio 2.0 I N 3 EDID: 4K 2KG_0 444,

	Get EDID status of the input x, x=0-4(0=all inputs)	Stereo Audio 2.0
		IN4 EDID: 4K2K60_444,
		Stereo Audio 2.0
redid data hdmi yl	Get the EDID data of the HDMI output y port, y=1-4	EDID: 00 FF FF FF FF FF FF 0 0.

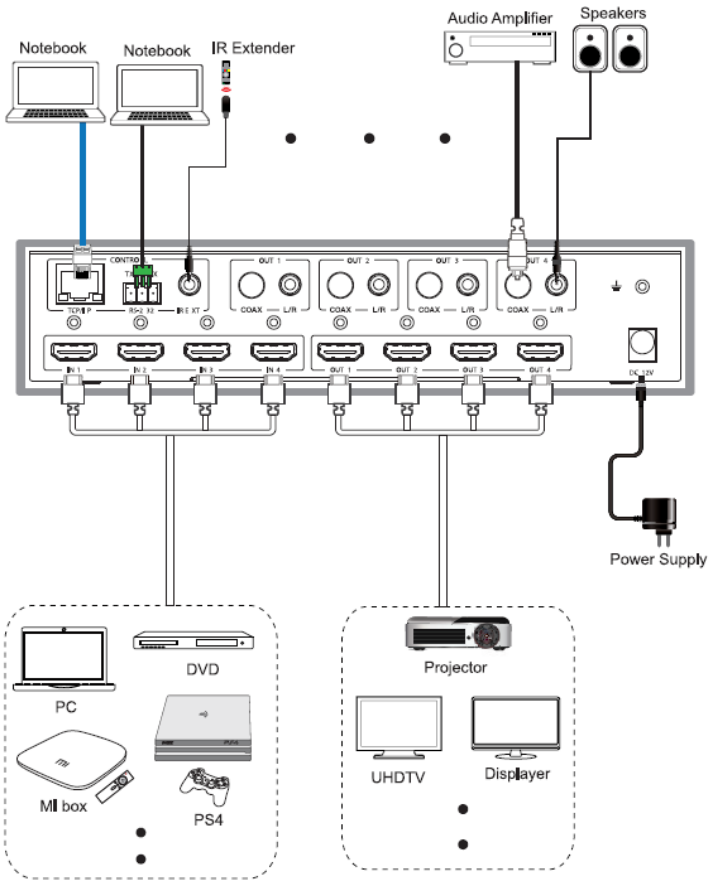
s edid in x from z!	Set input x EOIO from default EOIO z, x=0-4(0=all),z=1-23 ,1 1080p,Stereo Audio 2.0 ,2 1080p, Oolby /OTS 5.1 3, 1080p,HO Audio 7.1 ,4 1080i,Stereo Audio 2.0 5, 1080i, Oolby/OTS 5.1 6, 1080i,HO Audio 7.1 7, 30, Stereo Audio 2.0 8, 30 ,0olby /OTS 5.1 9, 30, HO Audio 7.1 1,0 4K2K30_444, Stereo Audio 2.0 1,1 4K2K30_444,0olby /OTS 5.1 1,2 4K2K30_444,HOAudio 7.1 1,3 4K2K60_420, Stereo Audio 2.0 1,4 4K2K60_420,0olby/OTS 5.1 1,5 4K2K60_420,HOAudio 7.1 16, 4K2K60_444,Stereo Audio 2.0 17, 4K2K60_444,0olby/OTS 5.1 18, 4K2K60_444,HO Audio 7.1 19, 4K2K60_444, Stereo Audio 2.0 HOR 20, 4K2K60_444,0olby/OTS 5.1 HOR 21, 4K2K60_444, HO Audio 7.1 HOR 22, USER1 23, USER2 24, Copy_From_Hdmi_Tx_1 25, Copy_From_Hdmi_Tx_2 26, Copy_From_Hdmi_Tx_3 27, Copy_From_Hdmi_Tx_4	IN1 EOI0:1080p, Stereo Audio 2.0
Network setting		

r ipconfig!	Get the Current IP Configauration	**JP 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=B000 , telnet port=10**
r mac addr!	Get network MAC address.	**Mac address: 00:1C:91:03:80 :01**
SipModee Z!	Set network IP mode to static IP or OHC P, z=0-1 (z=O Static, z=1 OHCP)	Set IP mode: Static. **Please use "s net reboot!" c ommand or repower device** t o apply new config!**RIP**
p mode!	Get network IP mode	IP mode: Static
ip addr xxx.xxx. **xxx.xxx!**	Set the network IP address.	**Set IP address: 192.168.1. 10 0 Please use "s net reboot!" command or repower device to apply new config! DHCP o n,** **De device can't configure a s tatic address; set DHCP off f irst.**

r ipaddr!	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
		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=B000** **telnet port= 10**

Note that you can send 'RS232 command' to control the Switcher via Serial Command tool. The 'Function description' explains the function of the command. The "Feedback" displays whether the command is successful or not and feedback the information you need to,

Application Example



Documents / Resources

	ethereal CS-44MQ 4x4 HDMI 2.0 18Gbps Matrix Switcher [pdf] User Manual CS-44MQ 4x4 HDMI 2.0 18Gbps Matrix Switcher, CS-44MQ, 4x4 HDMI 2.0 18Gbps Matrix Switcher, 2.0 18Gbps Matrix Switcher, Matrix Switcher, Switcher

References

- User Manual