SIMPLIFIED RM44C 4×4 HDMI 2.0 18Gbps Matrix Switch with Scaling Outputs User Manual

RM44C
4×4 HDMI 2.0 18Gbps Matrix Switch
with scaling outputs

Contents

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User Manual

Thank you for purchasing this product
The Simplified MFG RM44C is designed to provide years of reliable service. At Simplified MFG, we want the experience with this device to be the best possible and are committed to helping achieve that experience.
Surge protection device recommended
This product contains sensitive electrical components that may be damaged by electrical spikes, surges, electric shock, lightning strikes, etc. The use of surge protection systems is highly recommended in order to protect and extend the life of your equipment.

Introduction

The RM44C is an 18G HDMI video matrix switch with 4 HDMI inputs and 4 scaling HDMI outputs. Each input and output supports up to 4K60 444 HDMI 18G video. The outputs can be individually scaled for 1080p or 10.2Gbps compatibility (labeled as HDBaseT in the menu). De-embedded audio as analog L+R and optical SPDIF (TosLink) is available for both outputs. The RM44C Matrix can also automatically control the display device using RS232, CEC, or IR when the last input signal is lost, or when the first video input is detected. The RM42C can be controlled from the front panel, RS232, IR, or IP commands.

Features

- HDMI 2.0b (18Gbps), HDCP 2.2 / HDCP 1.4, and DVI 1.0 compliant
- Four 18G HDMI 2.0b inputs supporting up to 4K60 444 resolution
- Four 18G HDMI 2.0b outputs supporting up to 4K60 444 resolution
- Outputs can be individually scaled for 4K→1080p or 10.2 Gbps (HDBaseT mode)
- Four sets of audio breakouts analog (3.5mm) and SPDIF (Coax) outputs, for each HDMI output
- ARC decoding to the SPDIF (Coax) audio outputs only
- Built-in Web GUI for LAN control
- Four methods of control: Front panel, RS232, IR, and IP

Package Contents

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

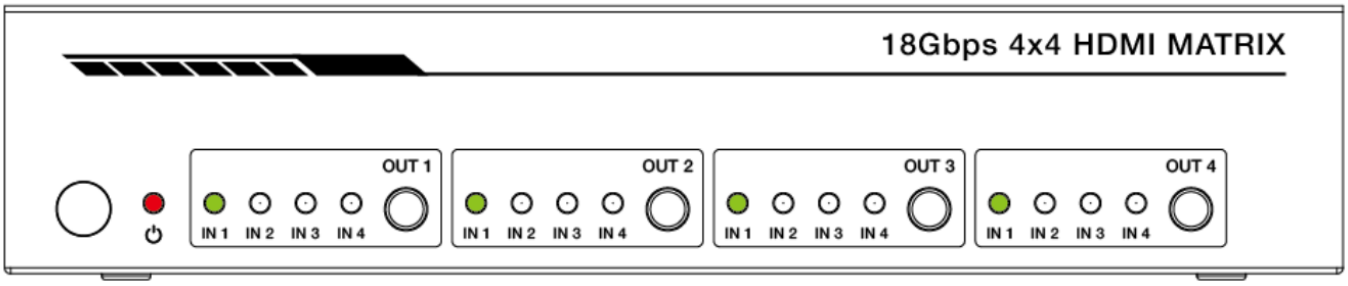
HDMI Audio Formats	PCM2.0/5.1/7.1CH, Dolby Digital/Plus/EX, Dolby True HD, DTS, DTS-EX,DTS-96/24, DTS High Res, DTS-HD Master Audio, DSD
Coax Audio Formats	PCM2.0, Dolby Digital / Plus, DTS 2.0/5.1
L/R Audio Formats	PCM2.0CH
HDR Support	HDR10, HDR10+. Dolby Vision, HLG
ESD Protection	Human-body Model: ±8kV (Air-gap discharge), ±4kV (Contact discharge)
Connections	
Input Ports	4×HDMI Type A [19-pin female]
Output Ports	4×HDMI Type A [19-pin female] 4×L/R audio out [3.5mm Stereo Mini-jack] 4×COAX 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)×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)

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 a “Premium High-Speed HDMI” cable is highly recommended.			

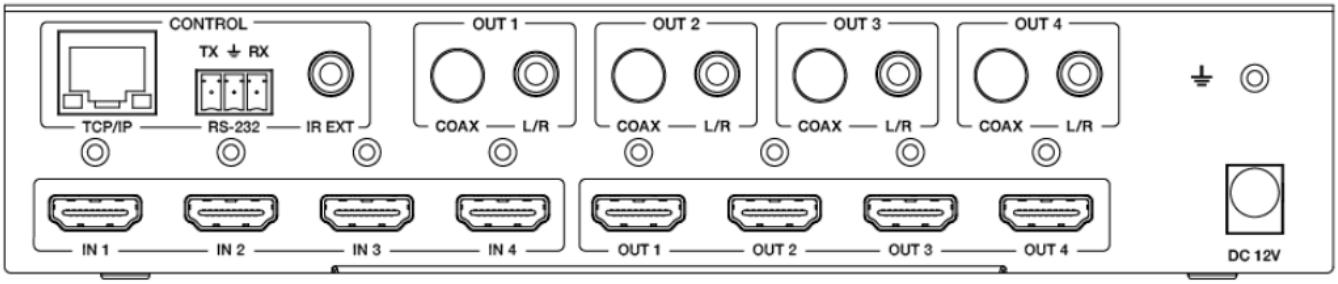
Operation Controls and Functions

5.1 Front Panel



Name	Function description
IR Sensor	IR input for remote control of the switcher.
POWER LED	Red LED indicates that the unit is powered.
OUT 1 / OUT 2 / OUT 3 / OUT 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.

5.2 Rear Panel



Name	Function description
TCP/IP (RJ45)	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 Switcher.
IR EXT	IR eye input for IR control of the Switcher.
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.
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.

5.3 Connecting to the Matrix Switch

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

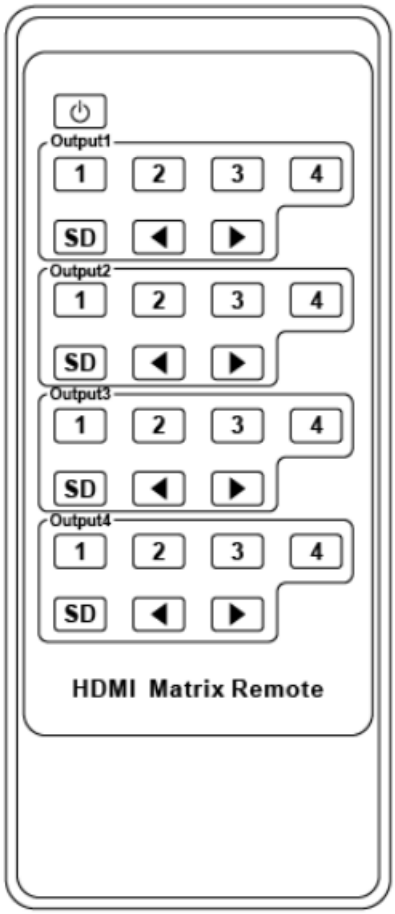
5.4 Operating the Matrix Switch
5.4.1 Power LED and Standby Mode
The Power LED provides the following indications:

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 or IR Remote, or from the Web GUI interface.

5.4.2 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, and the corresponding green LE D on the front panel illuminates.
SD	Switch downscale or bypass mode to the Output 1 port output.
◀ ▶	Select the last or next desired input source to Output 1 port output, and the correspondin g green LED on the front panel illuminates.

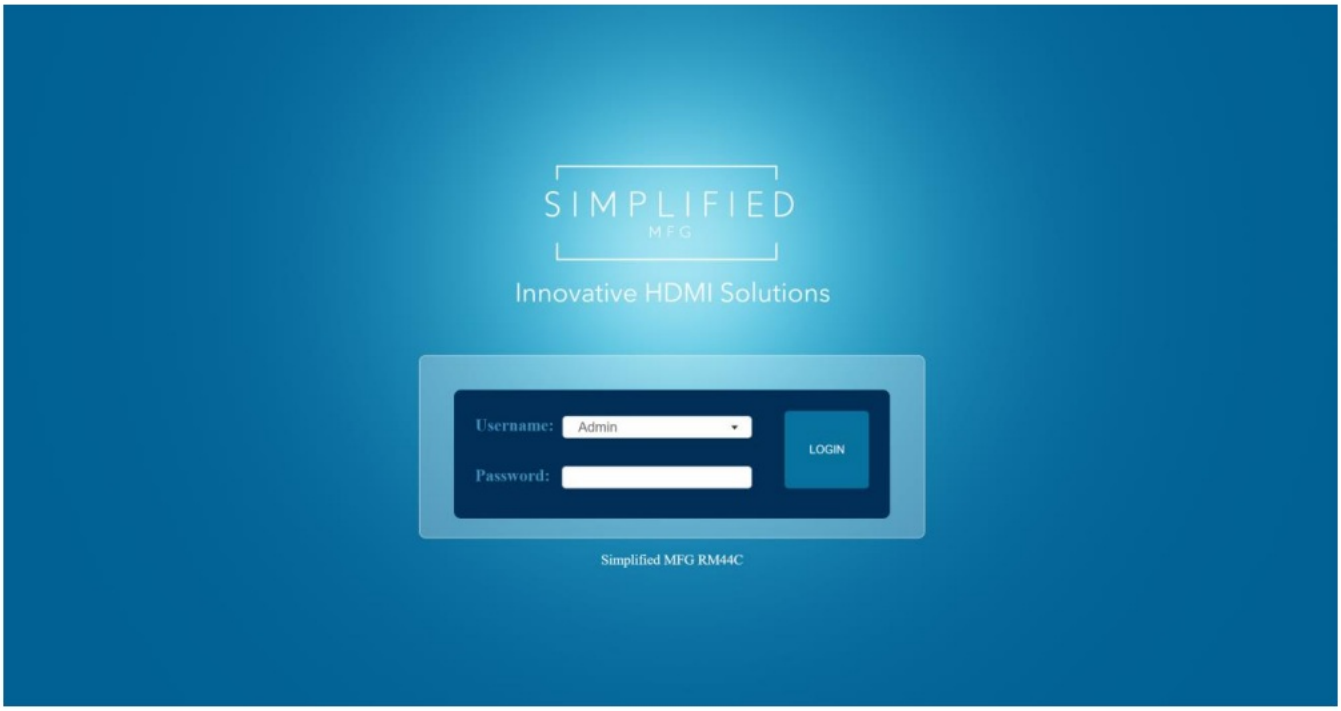
Using the Web GUI Interface

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 settings.
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 baud rate 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 browser. The default IP address is set to DHCP. 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 address!” to discover the current IP address or use a network scan tool such as Fing.|
Enter the Switcher’s IP address into your browser on the PC to enter the Web GUI page.
After entering the IP address the following log in screen will appear:



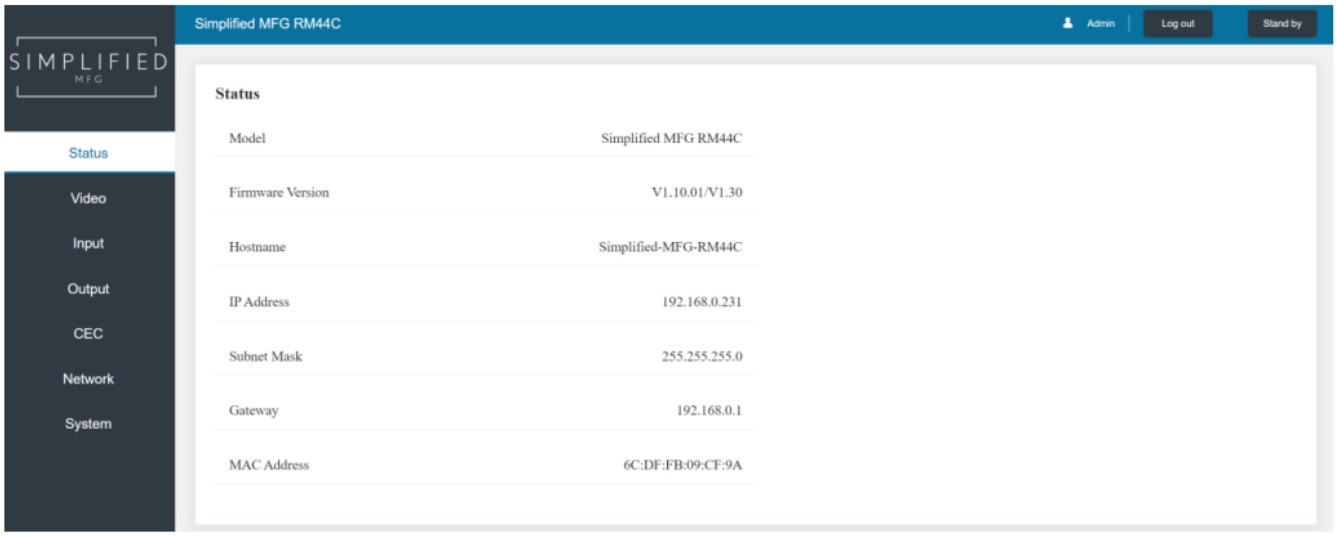
Select the Username from the list and enter the password. The default passwords are:

Username	User	Admin
Password	user	admin

After entering the log in 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.

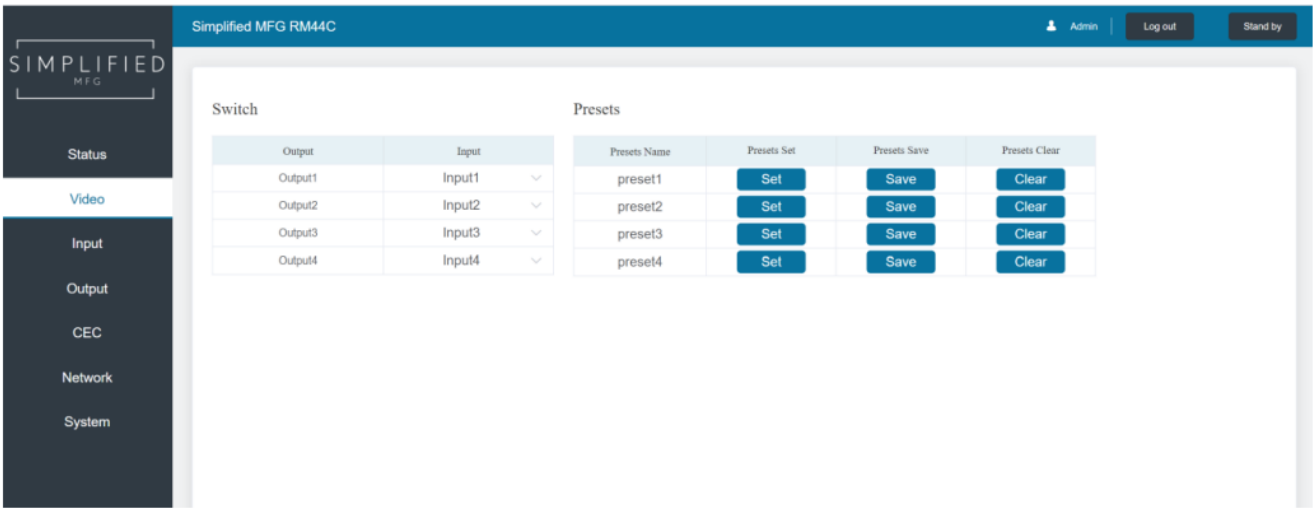


The buttons at the top right of the web interface are always available and provide the following function:

- The Log out button will disconnect the current user from display the login screen.

  The Power on the button changes the power status of the matrix between On and Stand-by mode.
- Video page

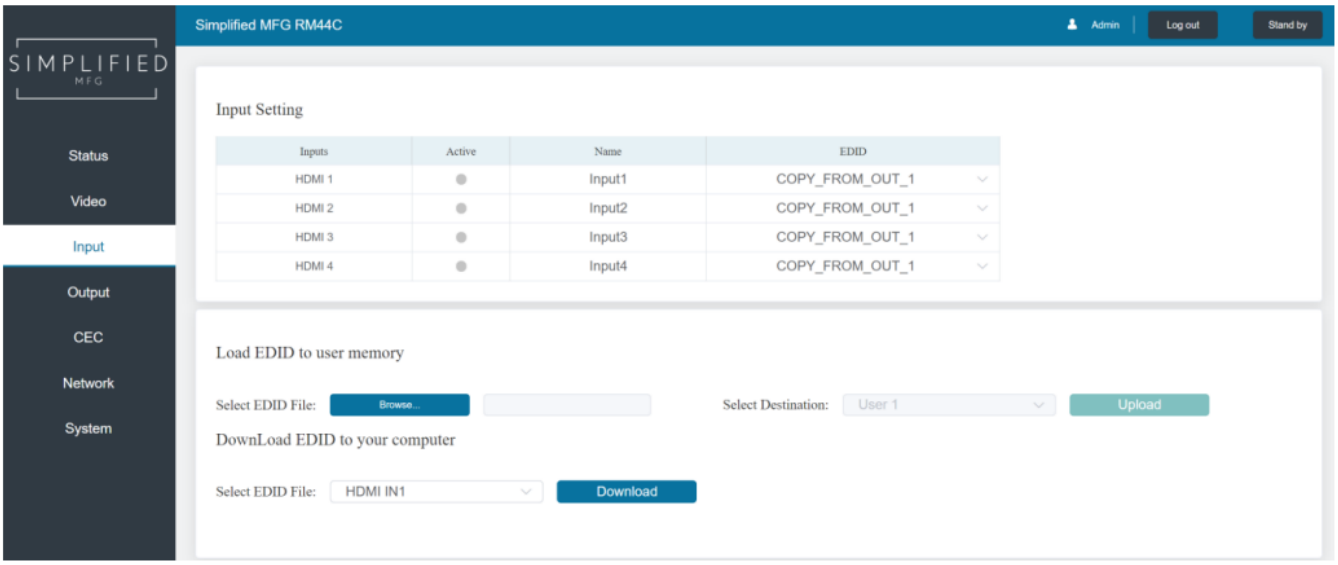
  The Video page allows selection of the inputs source and set the presets.



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 click the 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 given more meaningful names if desired. The EDID column provides a list of EDID options for each individual input.



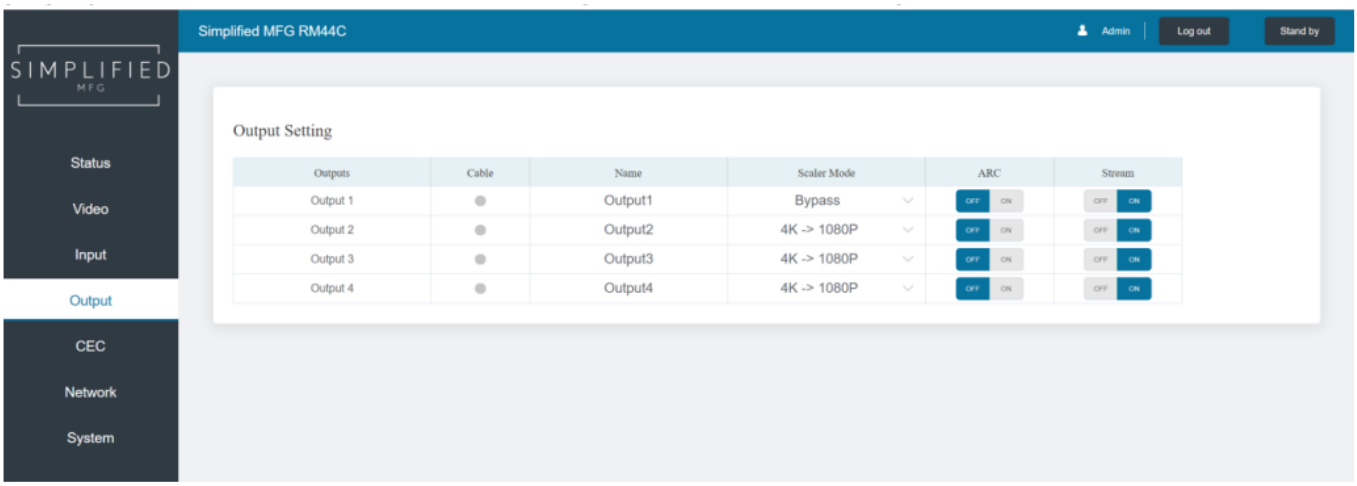
The following EDID options are available in any of the EDID drop-down lists:
1080P, Stereo Audio 2.0
1080P, Dolby/DTS 5.1
1080P, HD Audio 7.1
1080I, Stereo Audio 2.0
1080I, Dolby/DTS 5.1
1080I, HD Audio 7.1
3D, Stereo Audio 2.0
3D, Dolby/DTS 5.1
3D, HD Audio 7.1
4K2K30Hz_444 Stereo Audio 2.0
4K2K30Hz_444 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:

1. Select the binary EDID file on your PC by clicking on the Browse button.
2. Select either User 1 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:

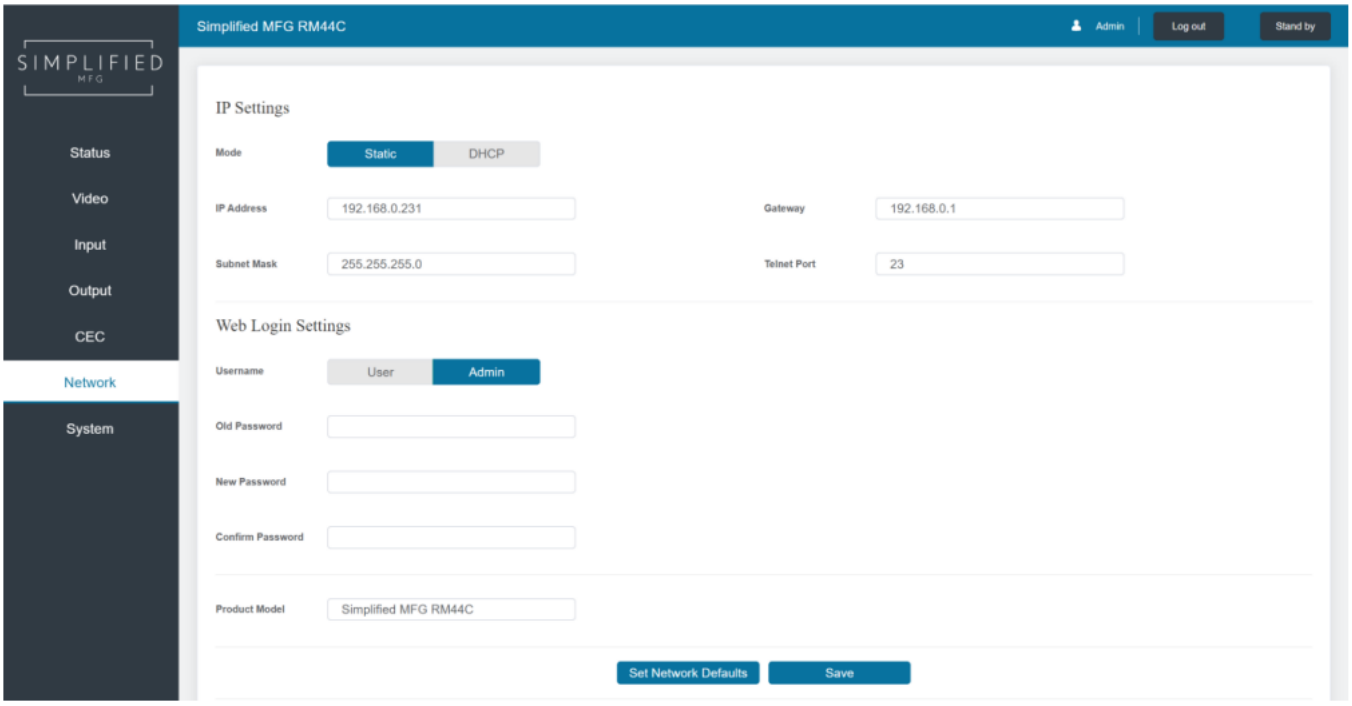
Bypass	Follow the input source. (Pass-through)
4K→1080P	Downscale to 1080p, if needed.
AUTO	Scaler to match the display requirements.

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.

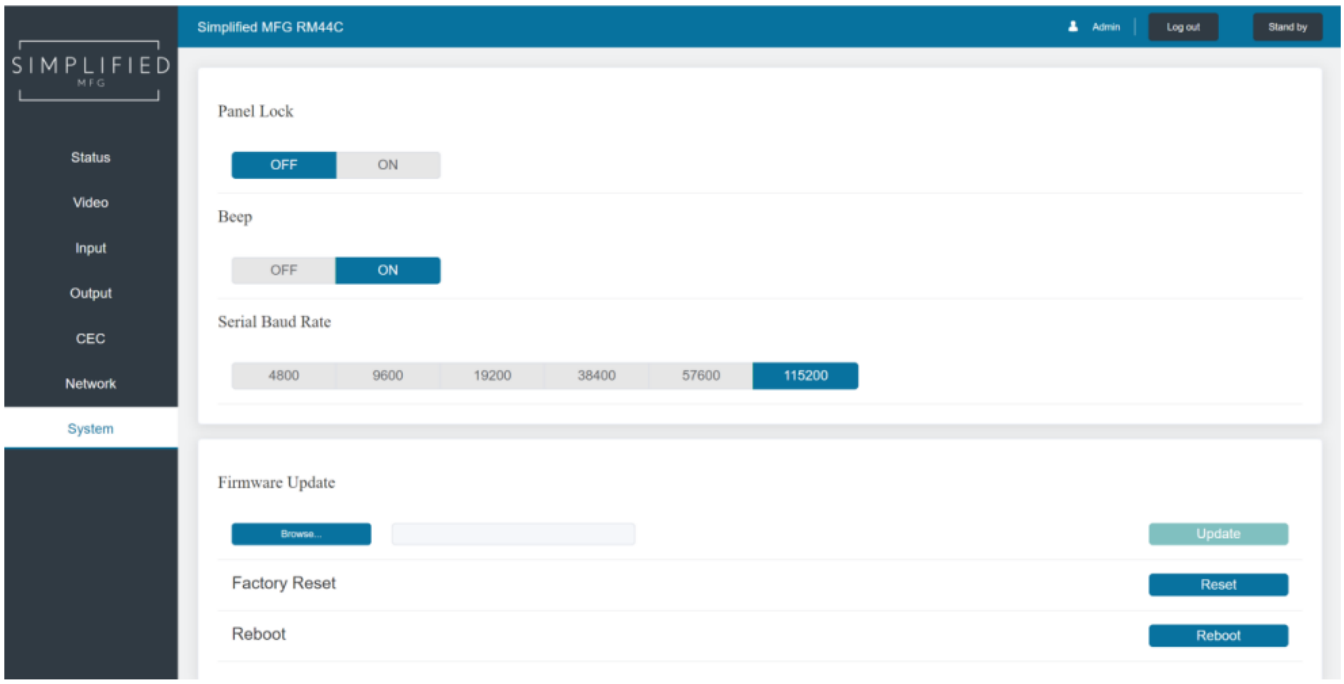
The login passwords can be changed on this page.
Note that any changes to this page will require new details in the web browser and/or the login screen.



- System page

  The system page allows the setting of the panel to lock and beeps on/off, controlling the RS-232 port baud rate.

  This page is also used to install the new firmware updates, restore the factory default settings and reboot the Matrix.



API control command

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

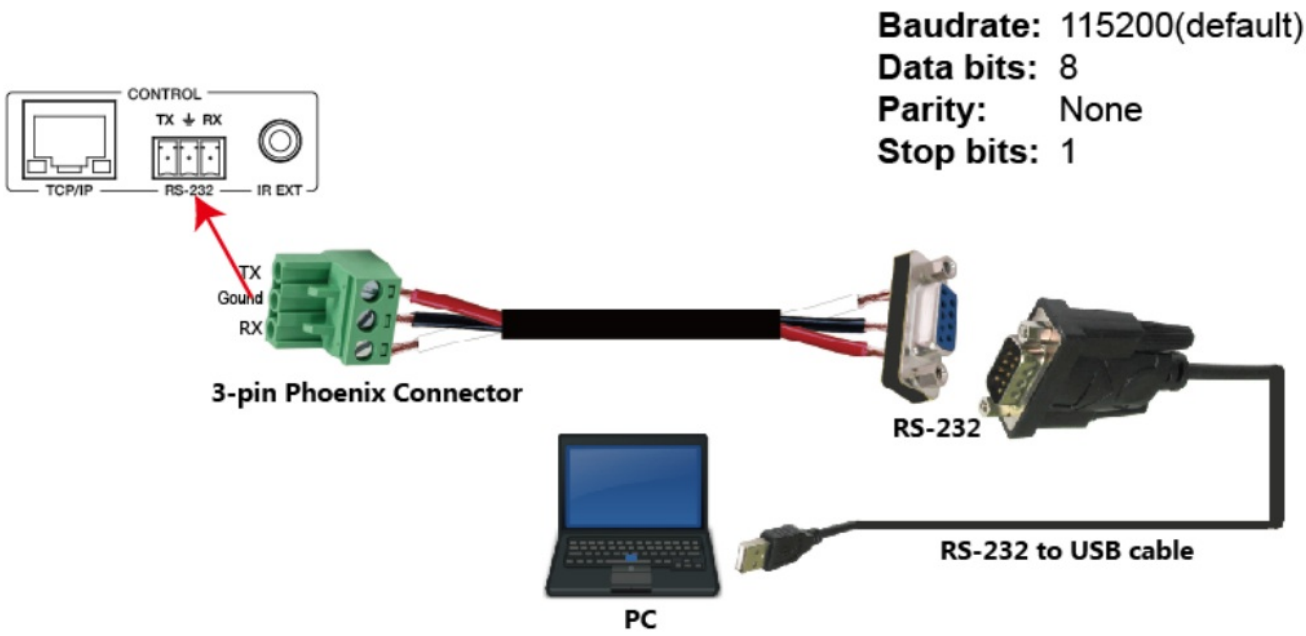


Figure 1: 3-pin phoenix connector to USB

Important:

1. All messages sent to the 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 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 device is shown as below.

ASCII Command		
Serial port protocal: Baud rate 115200 (default), Data bits: 8bit, Stop bits:1, Check bit: None TCP/IP protocal port: 8000 The x, y, z and XXX are parameters.		
RS-232 Commands	**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 Setup		
help!	Lists all commands	
r type!	Get device model	HDP-MXB44P
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 panelbutton,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=(115200,57600,38400,192 00,9600,4800)	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 s tream
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 =Au to)	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=al l)	hdmi out1 arc on
EDID Setting		
r edid in x!	Get EDID status of the input x, x=0~4(0=all inp uts)	IN1 EDID: 4K2K60_444, Stereo Au dio 2.0 IN2 EDID: 4K2K60_444, Stereo Au dio 2.0 IN3 EDID: 4K2K60_444, Stereo Au dio 2.0 IN4 EDID: 4K2K60_444, Stereo Au dio 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 1080p,Dolby/DTS 5.1 3 1080p,HD Audio 7.1 4 1080i,Stereo Audio 2.0 5 1080i,Dolby/DTS 5.1 6 1080i,HD Audio 7.1 7 3D,Stereo Audio 2.0 8 3D,Dolby/DTS 5.1 9 3D,HD Audio 7.1 10 4K2K30_444,Stereo Audio 2.0 11 4K2K30_444,Dolby/DTS 5.1 12 4K2K30_444,HD Audio 7.1 13 4K2K60_420,Stereo Audio 2.0	IN1 EDID:1080p,Stereo Audio 2.0

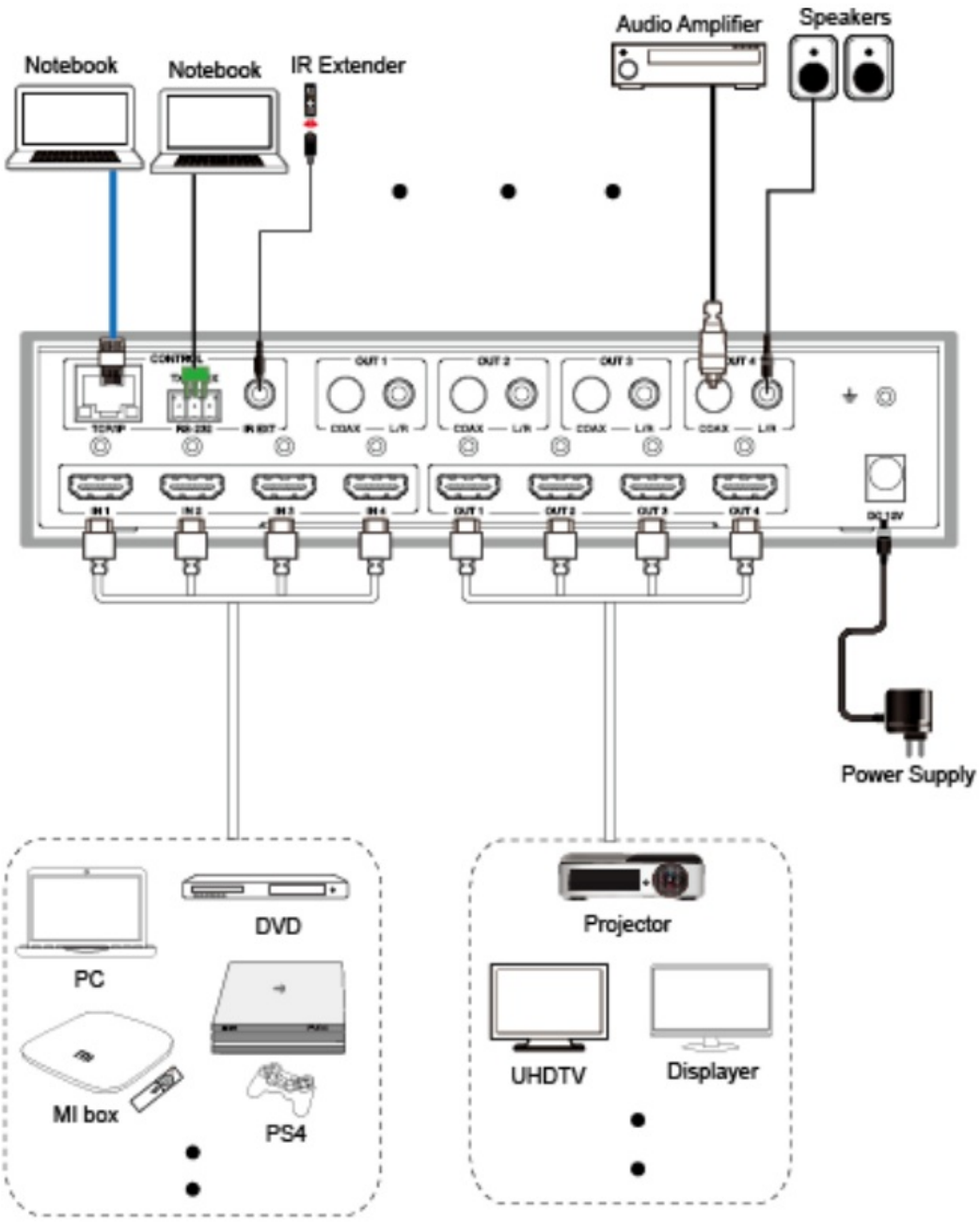
	14 4K2K60_420,Dolby/DTS 5.1 15 4K2K60_420,HD Audio 7.1 16 4K2K60_444,Stereo Audio 2.0 17 4K2K60_444,Dolby/DTS 5.1 18 4K2K60_444,HD Audio 7.1 19 4K2K60_444,Stereo Audio 2.0 HDR 20 4K2K60_444,Dolby/DTS 5.1 HDR 21 4K2K60_444,HD Audio 7.1 HDR 22 USER1 23 USER2 24 Copy_From_Hdmi_Tx_1 25 Copy_From_Hdmi_Tx_2 26 Copy_From_Hdmi_Tx_3 27 Copy_From_Hdmi_Tx_4	
Network setting		
r ipconfig!	Get the Current IP Configauration	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 to “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 the ‘RS232 command’ to control the Matrixr via the Serial Command tool. The ‘Function description’ explains the function of the command. The “Feedback” displays whether the command sends success or not and feedback on the information you need.

Application Example



Warranty Information

Should you feel that this product does not function adequately due to defects in materials or workmanship, we (referred to as “the warrantor”) will, for the length of the period indicated below (starting from the original date of the purchase) either a) repair the product with new or refurbished parts. Or b) Replace the product with a new or refurbished product. All Simplified MFG products are covered by a 3-year PARTS and LABOR warranty. During this period there will be no charge for unit repair, eplacement of unit components or replacement of the product if deemed necessary. The decision to repair or replace is made by the warrantor. The purchaser must mail in the product during the warranty period. This limited warranty only covers the product purchased as new and is extended to the original purchaser only. It is nontransferrable to subsequent owners, even during the warranty period. A purchase receipt or other proof of purchase date is required for the limited warranty service.

Contact Information
Sales and Tech Support
P. 833-HDMI-411 (833-436-4411)
E. **info@simplifiedmfg.com**

Simplified MFG • 550 W Baseline Rd Ste 102-121 • Mesa AZ 85210

RM44C
HDMI 2.0b (18Gbps) 4×4 Matrix Switch
With Scaling Outputs

The RM44C is a compact, robust 4K2K (18Gbps) 4×4 matrix switch. This switch has 4 HDMI Inputs and 4 HDMI Outputs, it is a true matrix and can be controlled via RS232, IP, manually, or via the supplied IR remote. Each output has scaling capability making this matrix easier to install with, unlike displays. Other features include very fast switch times, ARC, audio breakouts, a metal mounting bracket to make this unit mount as a 1 RU device, and a CEC control circuit that can switch other devices on and off.

Features:

- HDMI 2.0b (18Gbps)
- HDR 8/10/10+ & Dolby Vision™ Support
- All outputs have scaling
- Compact size
- Supports all versions of MultiChannel Audio with audio breakout and
- Sophisticated Control of other devices in the system
- 3-Year Warranty

Specifications:

Technical	
HDMI Compliance	HDMI 2.0b
HDCP Compliance	HDCP 2.2 / HDCP 1.4

Video Bandwidth	18 Gbps
Video Resolutions	up to 4K2K@50/60Hz (YUV4:4:4),4K2K@30Hz,1080P@120Hz, and 1080P 3D@60Hz
Color Space	RGB, YCbCr 4:4:4, YCbCr 4:2:2
Color Depth	8-bit, 10-bit, 12-bit
HDMI Audio Formats (Pass-through)	LPCM 2/5.1/7.1CH, Dolby Digital, DTS 5.1, Dolby Digi-tal+, Dolby TrueHD, DTS-HD Master Audio, Dolby Atmos, DTS:X
ESD Protection	Human body model — ±8kV (air-gap discharge) & ±4kV (contact discharge)
Connections	
Inputs	4x HDMI Type A [19-pin female]
Outputs	4x HDMI Type A [19-pin female] 4x 3.5mm mini-jack audio connectors 4x Coaxial SPDIF
Control Ports	1xLAN [RJ45] 3xRS232 [3-Pin Phoenix Connector] 1×3.5mm mini-jack [IR input]
Mechanical	

Housing	Metal Enclosure
Color	Black
Dimensions	220mm [8.66] (W) x 105mm [4.13] (D) x 44mm [1.8] (H)
Weight	792g / 28 Oz.
Power Supply	Input: AC100 – 240V 50/60Hz Output: DC 12V/2.5A (US/EU standards, CE/FCC /UL cer- tified)
Power Consumption	10W (Max)
Operation Temperature	32 – 104°F / 0 – 40°C
Storage Temperature	-4 – 140°F / -20 – 60°C
Relative Humidity	20 – 90% RH (no condensation)

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Documents / Resources

	**SIMPLIFIED RM44C 4x4 HDMI 2.0 18Gbps Matrix Switch with Scaling Outputs** [pdf] User Manual RM44C 4x4 HDMI 2.0 18Gbps Matrix Switch with Scaling Outputs, RM44C, 4x4 HDMI 2.0 18Gbps Matrix Switch with Scaling Outputs, 4x4 HDMI 2.0 18Gbps Switch with Scaling Outputs, Matrix Switch with Scaling Outputs, Switch with Scaling Outputs, Matrix Switch, Switch

References

- Simplified MFG Cutting Edge HDMI Solutions