



RAV-MS-4x2HU-MST
User Manual

RAV-MS-4x2HU-MST

4x2 HDMI and USB-C Matrix Switcher with MST

Magni family of Matrix Switchers



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 to protect and extend the life of your equipment.

Introduction

RAV-MS-4x2HU-MST is a Matrix Switcher with multiple control methods, designed with two HDMI™ and one USB-C (with DP Alt Mode) inputs, two HDMI™ outputs, one USB-C host, one USB-B host, one USB-C device, two USB-A devices, dual 1G Ethernet ports.

Video resolution is up to 4K@60Hz 4:4:4, delivering high-quality visuals for presentations and displays. Audio embedding and de-embedding on a balanced analogue audio interface, ensuring clear and synchronized audio record and playback.

The product also supports USB KVM, RS-232, GPIO, IR and Ethernet switching functions, as well as automatic and manual switching. Automatic signal detection can be used to 'wake' the Matrix Switcher and external devices. It can be controlled via front panel button, RS-232, TCP/IP and Web GUI.

It features multiple interfaces for easy connection between BYOD devices and meeting room devices, providing versatility and enhanced connectivity for presentation environments. It is designed to meet the demands of modern meeting room setups, providing a user-friendly and feature-rich solution for enhanced connectivity and control.

Key Features

- HDCP 2.3 and DP 1.4a compliant.
- 4x2 huddle room switcher with USB-C/HDMI™ input and HDMI™ output.
- USB-C input with DP Alt mode up to 4K60Hz 4:4:4, USB 3.2 Gen 1 (5Gbps), 1G ethernet and 100W charging.
- USB-C input supports MST (Multi-Stream Transport).
- HDMI™ input up to 4K60Hz 4:4:4, as specified in HDMI™ 2.0b.
- Fast switching including auto and manual switching modes.
- Auto switching supports signal detection and 5V detection.
- USB 3.2 Gen 1 (5Gbps) host and local hub.
- USB 3.2 Gen 1 (5Gbps) device with 5V/1.5A power output.
- Support balanced/un-balanced analogue audio embedding to USB or HDMI audio.
- Support balanced/un-balanced analogue audio de-embedding from USB or HDMI™ audio.
- Advanced EDID management.
- User defined welcome screen and no signal display image.
- Dual 1G Ethernet ports with 802.1x and VLAN.
- IR eye for IR learning and control.
- Auto display on/off control.
- External device control via CEC/IR/RS-232/LAN/GPIO.
- Control via front panel buttons, RS-232, TCP/IP and Web GUI control.

Package Contents

1× 4x2 HDMI™ and USB-C with MST Matrix Switcher
1× 24V/7.5A Power Supply
1× IR Blaster Cable (1.5m)
1× 3-pin 3.5mm Phoenix Connector (male)
2× 5-pin 3.5mm Phoenix Connector (male)
1× 6-pin 3.5mm Phoenix Connector (male)
4× Rubber Foot
2× Mounting Ear
4× Machine Screw (M3*5, for rubber feet)
4× Machine Screw (KM3*6, for mounting ears)
1× User Manual

Specifications

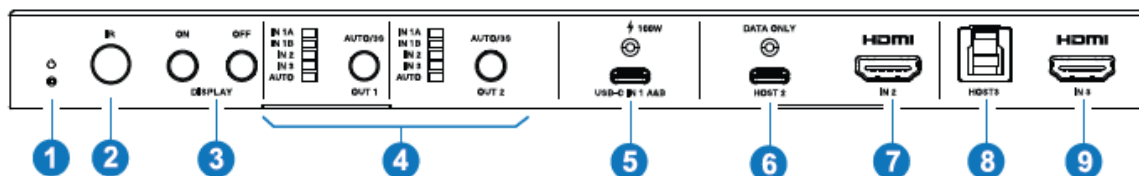
Technical	
HDMI™ Compliance	HDMI™ 2.0b
HDCP Compliance	HDCP 2.3
DP Compliance	DP 1.4a Alt Mode (USB-C input)
USB Compliance	USB 3.2 Gen1 (5Gbps)
Video Bandwidth	18Gbps
Video Network Bandwidth	1G
Video Resolution (Input & Output)	640x480p60Hz, 800x600p60Hz, 1024x768p60Hz, 1280x1024p60Hz, 1360x768p60Hz, 1440x900p60Hz, 1440x1050p60Hz, 1600x1200p60Hz, 720x480i59.94Hz(480i59), 720x480p59.94Hz(480p59), 720x576i50Hz(576i50), 720x576p50Hz(576p50), 1280x720p50Hz(720p50), 1280x720p59.94Hz(720p59), 1280x720p60Hz(720p60), 1920x1080i50Hz(1080i50) 1920x1080i59.94Hz(1080i59), 1920x1080i60Hz(1080i60),1920x1080p23.98Hz(1080p23), 1920x1080p24Hz(1080p24), 1920x1080p25Hz(1080p25), 1920x1080p29.97Hz(1080p29), 1920x1080p30Hz(1080p30), 1920x1080p50Hz(1080p50), 1920x1080p59.94Hz(1080p59), 1920x1080p60Hz(1080p60),3840x2160p23.98Hz(2160p23) 3840x2160p24Hz(2160p24), 3840x2160p25Hz(2160p25), 3840x2160p29.97Hz(2160p29), 3840x2160p30Hz(2160p30), 3840x2160p50Hz(2160p50), 3840x2160p59.94Hz(2160p59), 3840x2160p60Hz(2160p60), 4096x2160p23.98Hz, 4096x2160p24Hz, 4096x2160p25Hz, 4096x2160p29.97Hz, 4096x2160p30Hz, 4096x2160p50Hz, 4096x2160p59.94Hz, 4096x2160p60Hz
Colour Space	RGB, YCbCr_4:4:4, YCbCr_4:2:2, YCbCr_4:2:0
Colour Depth	8/10/12-bit, 8-bit (4K@60Hz, 4:4:4)
HDR	HDR, HDR10, HDR10+, Dolby Vision, HLG

IR Level	5Vp-p	
IR Frequency	20K-60KHz	
Transmission Distance	USB 3.2 Passive Cable: 1.5m/4.9ft HDMI™ Passive Cable: 3m/9.8ft	
Audio Formats	HDMI™/USB-C IN, HDMI™ OUT: LPCM, Dolby Digital/Plus/EX, Dolby True HD, Dolby Atmos, DTS, DTS-EX, DTS-96/24, DTS High Res, DTS-HD Master Audio, DSD Analog Audio IN/OUT: LPCM 2CH (sample rate 32~192kHz)	
Audio In	Input Impedance	20K Ohm balanced 10K Ohm unbalanced
	Input Level	Max 8.2dBu (2Vrms) balanced
	Frequency Response	20Hz to 20kHz (-/+0.5dB)
	Dynamic Range	>90dB@0dBu, 1kHzA-weighted
	Audio S/N Ration	>90dB@0dBu, 1kHzA-weighted
	Audio THD+N	< 0.01% at +4dBu, 1KHz
	Audio Output delay	<1ms
Audio Out	Output Impedance	600 Ohm balanced 300 Ohm unbalanced
	Output Level (Maximum)	Max 8.2dBu (2Vrms) balanced Max 2.2dBu (1Vrms) unbalanced
	Frequency Response	20Hz to 20kHz (-/+1dB)
	Dynamic Range	>90dB@0dBu, 1kHzA-weighted
	Audio S/N Ratio	>90dB@0dBu, 1kHzA-weighted
	Audio THD+N	< 0.067% at +4dBu, 1KHz
	Audio Output Delay	>1ms
ESD Protection	IEC 61000-4-2: ±8kV (Air-gap discharge) & ±4kV (Contact discharge)	

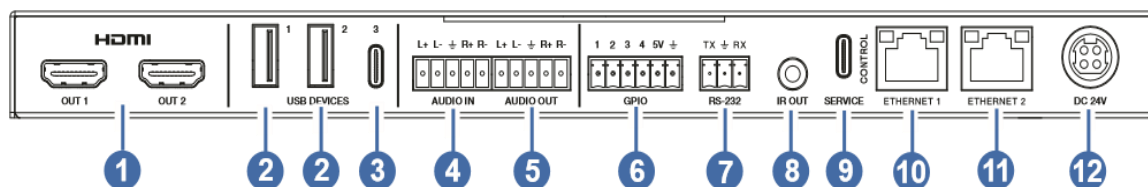
Connection	
Input ports	2× HDMI™ IN [HDMI™ Type A, 19-pin female] 1× USB-C IN [USB-C, 24-pin female] 1× HOST [USB-C, 24-pin female] 1× HOST [USB Type B, 9-pin female] 1× L/R AUDIO IN [5pin-3.5mm phoenix connector]
Output ports	2× HDMI OUT [HDMI™ Type A, 19-pin female] 1× USB DEVICE [USB Type C, 24-pin female] 2× USB DEVICE [USB Type A, 9-pin female] 1× L/R AUDIO OUT [5pin-3.5mm phoenix connector]
Control ports	1× RS-232 [3pin-3.81mm phoenix connector] 1× IR OUT [3.5mm stereo mini jack] 2× LAN [RJ45 connector] 1× GPIO [6pin-3.5mm phoenix connector]

Mechanical	
Housing	Metal Enclosure
Colour	Black
Dimensions	270mm [W] × 130mm [D] × 23mm [H]
Weight	935g
Power Supply	Input: AC 100-240V 50/60Hz, Output: DC 24V/7.5A (US/EU standard, CE/FCC/UL certified)
Power Consumption	42W (without USB-C charging) 150W (with 100W USB-C charging)
Operating Temperature	32 - 104°F / 0 - 40°C
Storage Temperature	-4 - 140°F / -20 - 60°C
Operating Humidity	20%~80% relative humidity, non-condensing
Storage Humidity	10%~90% relative humidity, non-condensing

Operation Controls and Functions



No.	Name	Function Description
1	Power LED	The LED will light in green when the product is working normally, and red when the product is standby.
2	IR	IR signal receiving window. Used for IR learning.
3	DISPLAY ON/OFF	Press to enable or disable the output of display devices. Please refer to "Display Page" in Web GUI for more details.
4	IN1/IN2/IN3/ IN4 AUTO switch button & indicator (OUT1 & OUT2)	- Short press the button to switch the IN1/IN2/IN3/IN4. If IN1/IN2/IN3/IN4 is selected, the corresponding LED will light up. - Long press the button for 3 seconds to enable or disable the auto switching mode. If the auto switching mode is enabled, the corresponding LED will light up.
5	USB-C IN1 A&B	USB-C input port, supporting USB 3.2 Gen 1, DP Alt mode (MST), 1G Ethernet, and up to 100W charging. Note 1: The 1G Ethernet function of this port can be enabled or disabled on System page in Web GUI. If the PC connected to this port needs to be online, the Ethernet should be networked. Note 2: When USB-C IN port is connected to a PC, the USB-C port on PC must support DP Alt mode to transmit video signal.
6	HOST3	USB-C upstream port, connected to a computer.
7	HDMI IN3	HDMI signal input port, connected to a source device.
8	HOST4	USB-B upstream port, connected to a computer.
9	HDMI IN4	HDMI signal input port, connected to a source device.



No.	Name	Function Description
1	HDMI OUT 1/2	HDMI signal output port, connected to a display device.
2	USB DEVICES 1/2	USB-A downstream port, with output power 5V/1.5A. Connects to USB device.
3	USB DEVICES 3	USB-C downstream port, with output power 5V/1.5A. Connects to USB device.
4	L/R AUDIO IN	Analog audio input port, connected to an audio input device such as a microphone. Supports balanced audio input and unbalanced audio input (with a maximum support of 2Vrms). Balanced connection method: L+, L -, GND, R+, R Unbalanced connection method: L+, GND, R+
5	L/R AUDIO OUT	Analog audio output port, connected to an audio output device such as a speaker. Supports balanced audio output (with a maximum support of 2Vrms) and unbalanced audio output (with a maximum support of 1Vrms). Balanced connection method: L+, L -, GND, R+, R Unbalanced connection method: L+, GND, R+
6	GPIO	Used for user-defined function extension.
7	RS-232	RS-232 control port, connected to a PC or control system for API command control on this product or other devices with RS-232 ports.
8	IR OUT	IR signal output port, connected to the IR blaster cable.
9	SERVICE	USB 2.0 type C port, supporting API command control and firmware upgrade.
10	ETHERNET 1	1G Ethernet port, connected to a PC to visit WEB GUI of this product to set the parameters.

11	ETHERNET 2	1G Ethernet port, connected to the router to surf the internet via a computer with USB-C port.
12	DC 24V	DC 24V/7.5A power input port.

Note:

ETHERNET ports support two modes; set via API command and Web GUI page.

Separated Mode (Default): ETHERNET 1 is used for TCP/IP/Web GUI; ETHERNET 2 is used for 1G Ethernet only.

Switch Mode: ETHERNET 1 and ETHERNET 2 are both used for TCP/IP/ Web GUI and 1G Ethernet.

IR Cable Pin Assignment



Web GUI User Guide

The RAV-SW-4x2HU can be controlled by Web GUI.

The operation method is shown as below:

Step 1: Get the current IP Address.

By default network configuration on Ethernet 1 is set to DHCP

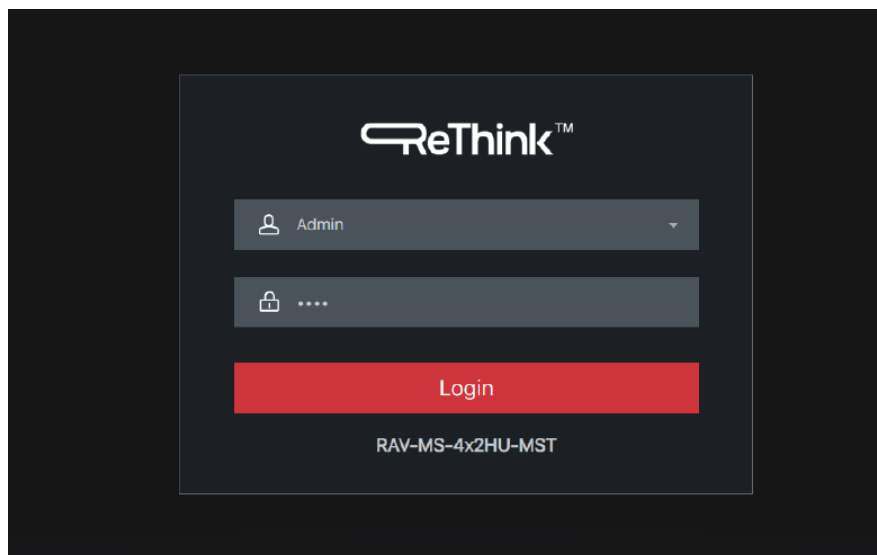
IP address is 192.168.0.100. You can get the current IP address via API command. Send the command "get ip addr" through an ASCII Command tool, and then you'll get the current IP address.

(The IP address is variable, depending on what the specific device returns).

Step 2: Connect the TCP/IP port of the product to a PC and set the IP address of the PC to be in the same network segment with the product.

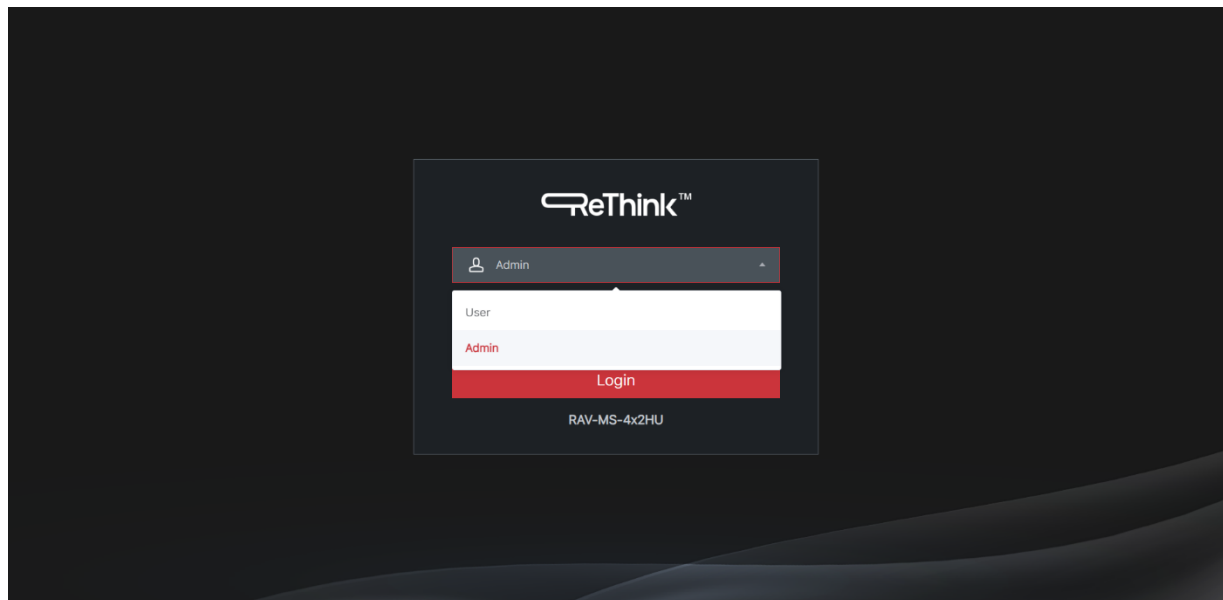
For example, if its IP address is 192.168.62.106, the IP address of PC must be set to 192.168.62.xxx; if its IP address is 192.168.0.100, the IP address of PC must be set to 192.168.0.xxx.

Step 3: Enter the IP address of the product into your browser on the PC. After entering the Web GUI page, there will be a Login page, as shown below:

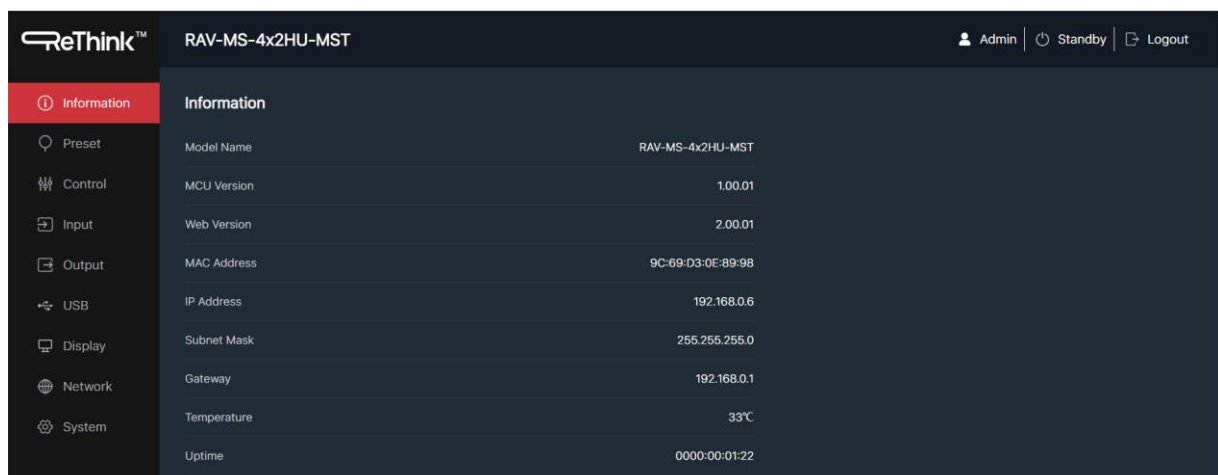


Select the username "Admin", enter the default password "1234".

Select the desired language, and then click "Login". The web page provides the following tabs for navigating the interface:



Information Page

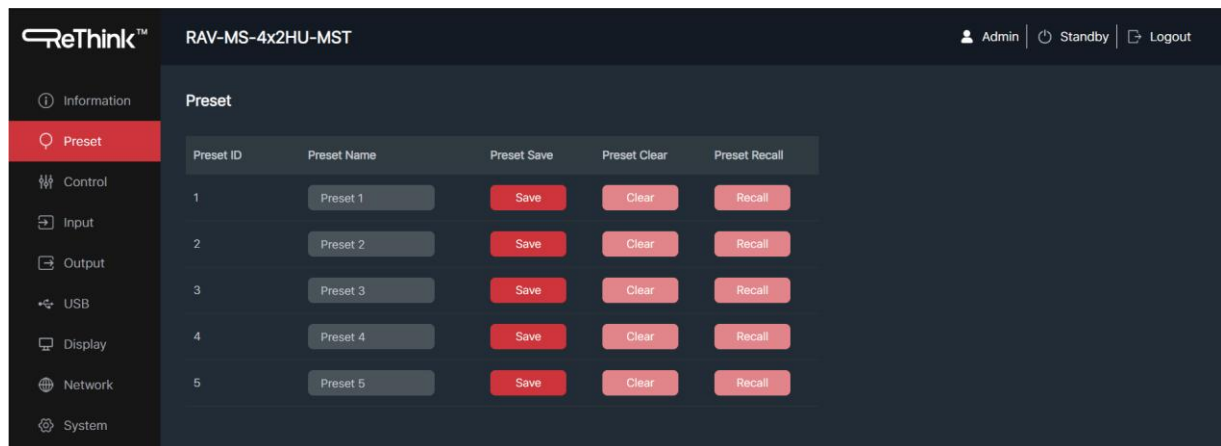


The information page provides basic information about the RAV-MS-4x2HU-MST such as the installed firmware version and network settings of the device.

The buttons at the top right of the web interface are always available:

- Clicking the Logout button will log out of current user.
- Clicking the Standby button will set the matrix to standby mode or power on the device.

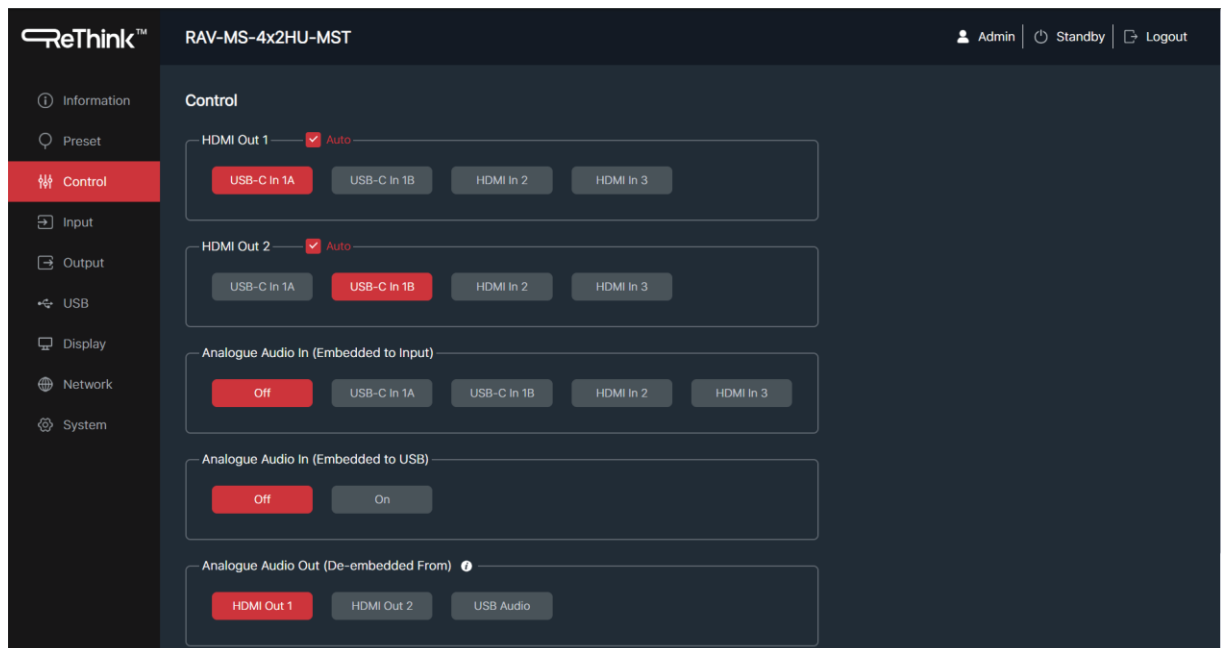
Preset page



You can set up to 5 preset scenes on the Preset page.

- **Preset Name:** You can name the preset scene.
The maximum length of English Name is 32 characters.
- **Preset Save:** Click the Save button to save the scene.
- **Preset Clear:** Click the Clear button to clear the saved scene.
- **Preset Recall:** Click the Recall button to recall the saved scene.

Control Page



The following is available on the Control page:

- **HDMI Out 1/2:** Click "USB-C In 1A", "USB-C In 1B", "HDMI In 2", "HDMI In 3" to select the input channel for HDMI Out 1/2.
If the "Auto" checkbox is ticked, the auto switching mode is enabled.
- **Analogue Audio In (Embedded to Input):**
Off: Click to turn off the audio embedding function.
USB-C In 1A/USB-C In 1B/HDMI In 2/HDMI In 3: Click to embed the audio to the input channel. It will be output on the TV connected to the corresponding HDMI output.
- **Analogue Audio In (Embedded to USB):**
Off: Click to turn off the audio embedding function.
On: Click to turn on the audio embedding function.
Now the microphone input can be selected on the PC which is connected to the Host port when the audio embedding function is enabled.
- **Analogue Audio Out (De-embedded from):**
HDMI Out 1/2: Click to select "HDMI Out 1/2" as the output channel for the de-embedded audio.
USB Audio: Click to select "USB Audio" as the output channel audio de-embedding.
Note: When the audio embedding function (Analogue Audio In) is enabled, the audio de-embedding function (Analogue Audio Out) will not work.
- **Analogue Audio Out:**
Click to increase, decrease or mute the volume.

Input Page

ReThink™ RAV-MS-4x2HU-MST Admin Standby Logout

Input

Input	Name	Cable	Signal	EDID	HDCP
USB-C In 1A	USB-C In 1A	Disconnected	None	1. Auto	On
USB-C In 1B	USB-C In 1B	Disconnected	None	1. Auto	On
HDMI In 2	HDMI In 2	Disconnected	None	1. Auto	On
HDMI In 3	HDMI In 3	Disconnected	None	1. Auto	On

EDID Load

Download EDID From: 1. USB-C In 1A Download

User Defined 1 EDID Load EDID No file chosen Save EDID

User Defined 2 EDID Load EDID No file chosen Save EDID

The following is available on the Input page:

- **Input:** The input channel of this product. USB-C IN1 supports MST and has A and B channels to be managed separately.
- **Name:** You can modify the name if needed up to 16 characters.
- **Cable:** It shows the connection status of the input ports.
- **Signal:** It shows the basic info of the input signal.
- **EDID:** Click the drop-down list to set EDID for each input port.
- **HDCP:** Click the drop-down list to select ON or OFF as required.
- **Download EDID from:** Click the drop-down list to select USB-C In 1 / USB-C In 2 / HDMI In 3 / HDMI In 4 / HDMI Out 1 / HDMI Out 2 for EDID download. Then click the Download button and generate a .bin file.
- **User-Defined EDID:** Click the Load EDID button to upload the defined EDID. Please note that only two user-defined EDID and .bin files are supported. Click the Save EDID button to save the user defined EDID. It will then be displayed in the EDID drop-down list, corresponding to the User Defined 1/User Defined 2.

EDID list table

No.	EDID Mode	No.	Function Description
1	Auto	12	1080P60_444, Audio 7.1CH DTS/DOLBY/HD
2	Copy HDMI Out 1	13	720P60_444, Audio 2CH PCM
3	Copy HDMI Out 2	14	1920x1200, Audio 2CH PCM
4	4K2K60_444, Audio 2CH PCM	15	1680x1050, Audio 2CH PCM
5	4K2K60_444, Audio 5.1CH DTS/ DOLBY	16	1600x1200, Audio 2CH PCM
6	4K2K60_444, Audio 7.1CH DTS/ DOLBY/HD	17	1440x900, Audio 2CH PCM
7	4K2K30_444, Audio 2CH PCM	18	1360x768, Audio 2CH PCM
8	4K2K30_444, Audio 5.1CH DTS/DOLBY	19	1280x1024, Audio 2CH PCM
9	4K2K30_444, Audio 7.1CH DTS/DOLBY/HD	20	1024x768, Audio 2CH PCM
10	1080P60_444, Audio 2CH PCM	21	User Defined 1
11	1080P60_444, Audio 5.1CH DTS/DOLBY	22	User Defined 2

Output Page

Output

Output	Name	Cable	Signal	HDCP	Video Mode	Output Signal
HDMI Out 1	HDMI Out 1	Disconnected	None	2. Force HDCP 1.4	3. Force 1080P	3. AVMUTE
HDMI Out 2	HDMI Out 2	Disconnected	None	4. Signal Management	2. Bypass	2. Off

Internal Pattern

Resolution: 2. 4K50Hz Pattern: 4. Red

Welcome Screen

Welcome Screen: ☒ ON

No Signal Screen: ☒ ON

Display Image: (The image will only display for 30 seconds and then exit automatically.)

Load New Image: No file chosen

Clear Current Image:

The following is available on the Output page:

- **Output:** It shows the information of the output channel, such as name, connection status, HDCP, video mode.

There are four options of HDCP:

Output

Output	Name	Cable	Signal	HDCP	Video Mode	Output Signal
HDMI Out 1	HDMI Out 1	Connected	3840x2160p60Hz YUV 4:4:4 8bit	1. Auto	1. Auto	1. On
HDMI Out 2	HDMI Out 2	Connected	3840x2160p60Hz RGB 8:8:8 8bit	1. Auto	1. Auto	1. On

Internal Pattern

- **Auto:** HDCP version follows the corresponding display device.
- **Force HDCP 1.4:** HDCP 1.4 compliant.
- **Force HDCP 2.2:** HDCP 2.2 compliant.
- **Signal Management:** User-defined mode.

There are four options of Video Mode:

Output						
Output	Name	Cable	Signal	HDCP	Video Mode	Output Signal
HDMI Out 1	HDMI Out 1	Connected	3840x2160p60Hz YUV 4:4:4 8bit	1. Auto	1. Auto	1. On
HDMI Out 2	HDMI Out 2	Connected	3840x2160p60Hz RGB 8:8:8 8bit	1. Auto	1. Auto	1. On
Internal Pattern						

- **Auto:** It means the output resolution is according to the EDID of the corresponding display device.
- **Bypass:** It means the output resolution follows the input source.
- **Force 1080P:** Downscales any 4K signal to 1080p to output.
- **Internal Pattern:** User-defined mode.

There are three options of Output Signal:

Output						
Output	Name	Cable	Signal	HDCP	Video Mode	Output Signal
HDMI Out 1	HDMI Out 1	Connected	3840x2160p60Hz YUV 4:4:4 8bit	1. Auto	1. Auto	1. On
HDMI Out 2	HDMI Out 2	Connected	3840x2160p60Hz RGB 8:8:8 8bit	1. Auto	1. Auto	1. On
Internal Pattern						

- **On:** Turn on the output channel.
- **Off:** Turn off the output channel.
- **AVMUTE:** Mute the output channel.

Internal Pattern:

Resolution: 4K60/4K50/4K25/4K24/1080P60Hz/480P60Hz/576P50Hz

Pattern: 1. Black / 2. Checkboard / 3. Strip / 4. Red / 5. Green / 6. Blue / 7. White / 8. Ramp / 9. Red ramp / 10. Green ramp / 11. Blue ramp / 12. PRBS.

Welcome Screen:

Welcome Screen: Click to turn on or turn off the welcome screen.

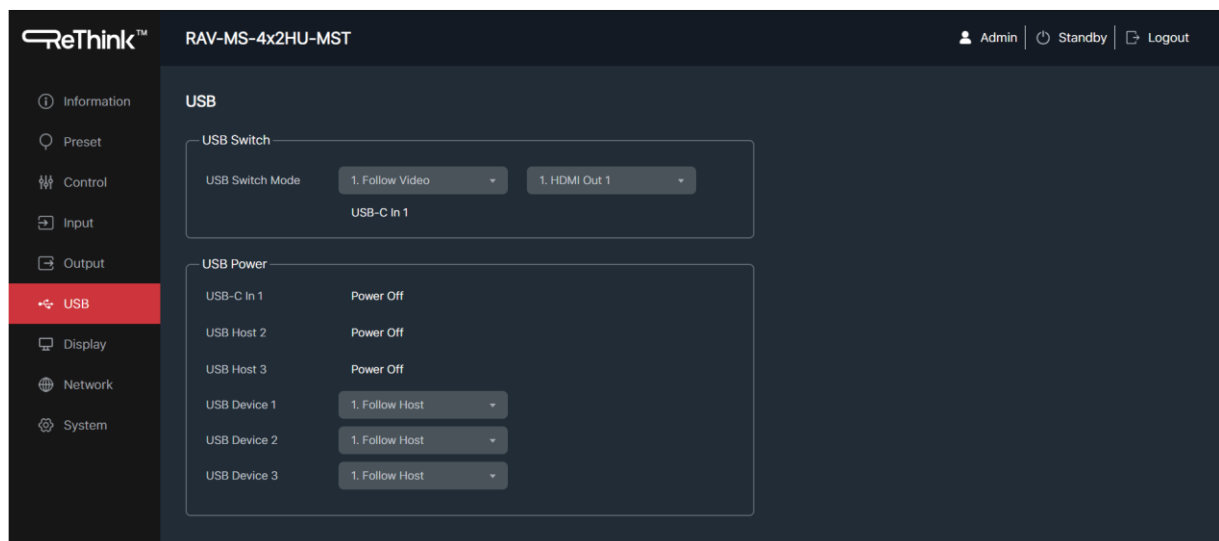
No Signal Screen: If there is no signal in 60 seconds, it will display the welcome screen automatically. You can click to turn on or turn off the no signal screen.

Display Image: Click to display the starting image for 30 seconds and then disappear automatically.

Load New Image: Click to load the image you want and save it.

Clear Current Image: Click to clear the current image.

USB Page



The following is available on the USB page:

- **USB Switch Mode:**

Click the drop-down list to select the mode for HDMI Out 1 or HDMI Out 2:

Follow Video: Follow the video to switch.

Manual Switch: Switch the USB manually as required.

Auto Switch: Switch to the USB port when detecting a signal automatically.

- **USB Power:**

USB-C In 1/USB Host 2/USB Host 3: "Power On" means the power of the upstream device is detected. "Power Off" means the power of the upstream device is not detected.

USB Device 1/2/3: Click the drop-down list to set 5V detection for each USB device.

Follow Host: 5V detection of the USB device follows the connection status of the selected host.

Force 5V Always Output: 5V detection of the USB device is forced to be enabled.

Disable 5V Output: 5V detection of the USB device is forced to be disabled.

Display Page

The screenshot shows the ReThink web interface for the RAV-MS-4x2HU-MST device. The left sidebar contains navigation links: Information, Preset, Control, Input, Output, USB, Display (selected), Network, and System. The main content area is titled 'Display' and contains two sections: 'Display Control' and 'RS-232 Control Settings'.

Display Control is divided into two columns for 'HDMI Out 1' and 'HDMI Out 2'. Each column has the following settings:

- Display Auto Power:** A toggle switch set to 'ON'.
- Auto Power On Timer:** A numeric input field set to '5' with a range of '0~1200 sec'.
- Auto Power Off Timer:** A numeric input field set to '5' with a range of '0~1200 sec'.
- Control Type:** Radio buttons for 'CEC' (selected), 'IR', and 'RS-232'.
- Display Control:** Two buttons, 'Power On' and 'Power Off'.

RS-232 Control Settings is divided into two columns:

- Power On Display:**
 - Format:** Radio buttons for 'ASCII' (selected) and 'Hex'.
 - End Flag:** A dropdown menu set to 'None'.
 - Command 1:** A text input field.
 - Delay:** A numeric input field set to '0' with a range of '0~1200 sec'.
 - Command 2:** A text input field.
- Command Settings:**
 - Baud Rate:** A dropdown menu set to '115200'.
 - Parity Bits:** A dropdown menu set to 'None'.
 - Data Bits:** A dropdown menu set to '8 Bit'.
 - Stop Bits:** A dropdown menu set to '1'.

A 'Save' button is located at the bottom right of the RS-232 Control Settings section.

The following is available on the Display page:

- **Display Control (HDMI Out):**

Display Auto Power: The display device will be powered on or powered off following the product. You can enable or disable this function.

Auto Power On Timer (0~1200seconds): Set the time interval to send the starting command to the display device when this product is powered on.

Auto Power Off Timer (0~1200seconds): Set the time interval to send the shutdown command to the display device when this product is standby.

Control Type: Set the control type of the display device, such as IR, CEC or RS-232.

Display Control: Click to turn on or turn off the auto power on/off function.

- **RS-232 Control Settings:**

The screenshot shows the 'RS-232 Control Settings' window. It is organized into four quadrants:

- Power On Display:** Includes 'Format' (ASCII/Hex), 'End Flag' (None), 'Command 1' (text input), 'Delay' (0, 0-1200 sec), and 'Command 2' (text input). Buttons: Send, Save.
- Command Settings:** Includes 'Baud Rate' (115200), 'Parity Bits' (None), 'Data Bits' (8 Bit), and 'Stop Bits' (1). Button: Save.
- Power Off Display:** Includes 'Format' (ASCII/Hex), 'End Flag' (None), 'Command 1' (text input), 'Delay' (0, 0-1200 sec), and 'Command 2' (text input). Buttons: Send, Save.
- RS-232 General Command:** Includes 'Format' (ASCII/Hex), 'End Flag' (Select), and 'Command' (text input). Button: Send.

Power On/Off Display:

Format: ASCII and Hex

End Flag: None, \r, \n, \r, \n

Command1: Enter the command1 to control the display device.

Delay: The time interval between sending the command1 and Command2.

Command2: Enter the command2 to control the display device.

Send: Click to send the commands.

Save: Click to save the commands.

Command Settings:

Click the drop-down list to set Baud Rate, Parity Bits, Data Bits and Stop Bits, and then click "Save".

RS-232 General Command: Used to control the third-party device via sending serial command.

Format: ASCII and Hex

End Flag: None, \r, \n, \r, \n

Command: Enter the command to control the display device.

- **IR Settings:**

IR Settings

Note: Please use the IR capture window on the front panel of switch box to learn the corresponding power on/off IR code from the IR remote Control of the display. Click "Learn" to start IR learning. Click "Save" to save the captured IR code be displayed in Hex code. Click "Load" to download the CCF code file is also supported.

Power On Display

Learn

Load

Save

Power On

Save As

Power Off Display

Learn

Load

Save

Power Off

Save As

Power On/Off Display:

Learn: Click "Learn" and then let the IR remote aim at IR window on the front panel of this switcher to operate. When learning is finished, the Hex code will display in the text box on the IR Setting page.

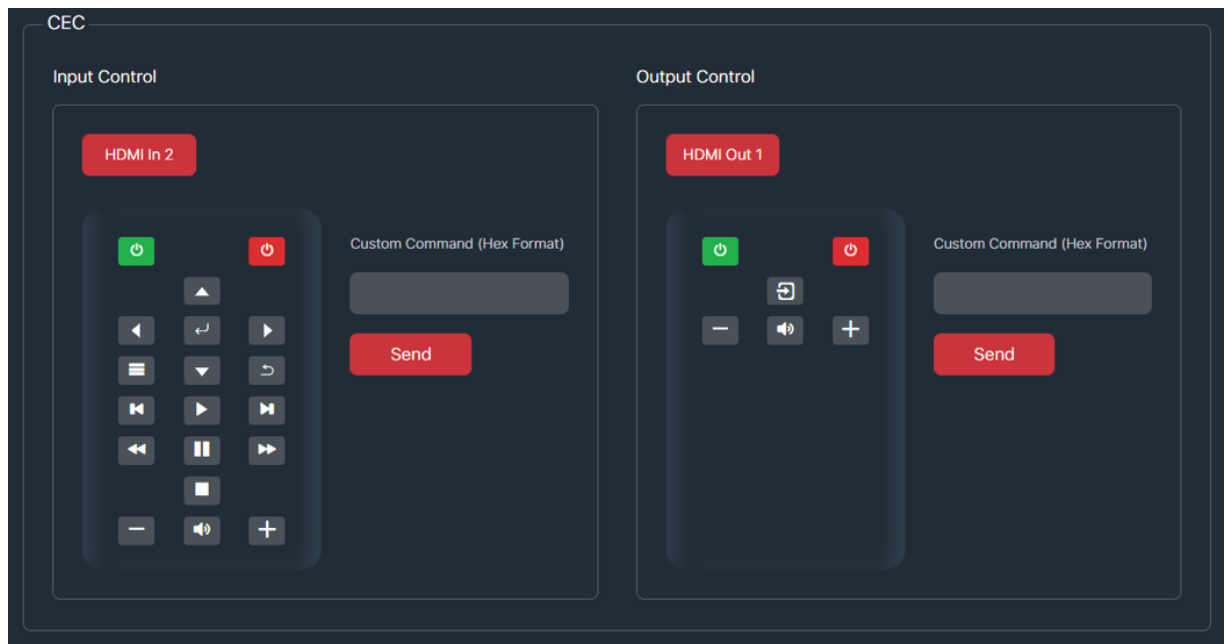
Load: Click to load the CCF code of .bin file.

Save: Click to save the learned IR code.

Power On/Off: Click to send the IR code in the text box.

Save As: Click to save the learned IR code as a .bin file.

- **CEC:**



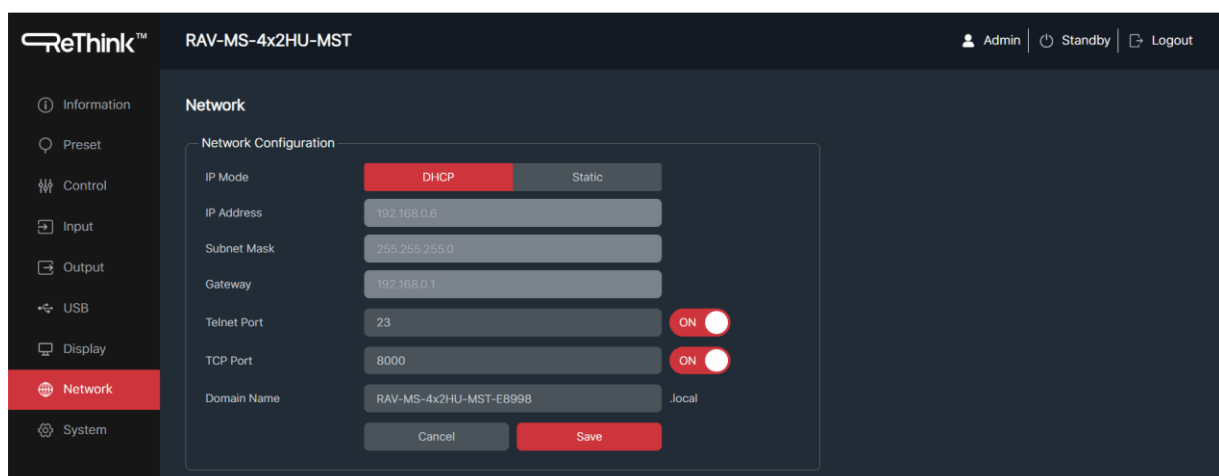
Input Control: Click the buttons to control the source device connected to the HDMI In2 port.

You can also enter a command with Hex format to control.

Output Control: Click the buttons to control the display device connected to the HDMI Out port.

You can also enter a command with Hex format to control.

Network Page



The following is available on the Network page:

- **Network Configuration:**

If the Mode is "Static", you can set manually the IP Address/Gateway/Subnet/Telnet Port/Domain Name as required.

If the Mode is "DHCP", it will search and be filled with the IP Address assigned by the router automatically.

Click "Save" to take effect and click "Cancel" to cancel the setting.

- **802.1x:**

802.1x

802.1x ☐ OFF

Authentication Method EAP-TLS

Username

Client Certificate Browse

Private Key Browse

Private Key Password

Serve Certificate ☐ OFF

CA Certificate Browse

Save

On/Off: Click to turn on or turn off 802.1x.

Authentication Method: EAP-TLS and EAP-MSCHAPv2

Username: Enter a username.

Client Certificate: Click "Browse" to load the client certificate.

Private Key: Click "Browse" to load the private key.

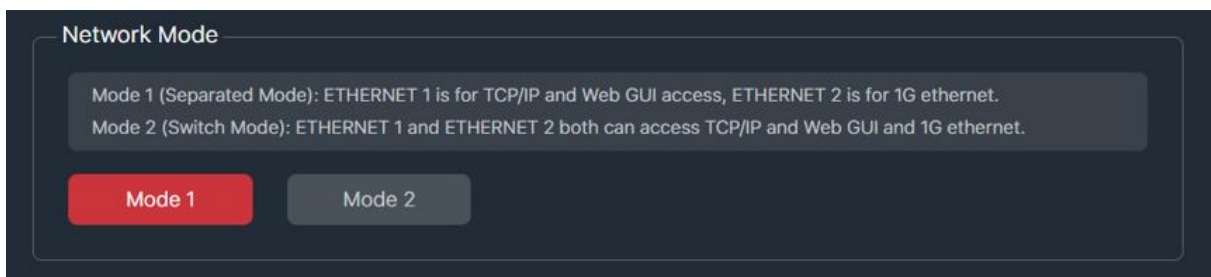
Private Key Password: Set the password.

Serve Certificate: Click to turn on or turn off.

CA Certificate: Click "Browse" to load the CA certificate.

Then click "Save" to save the settings.

- **Network Mode:**



Mode 1 (Separated Mode):

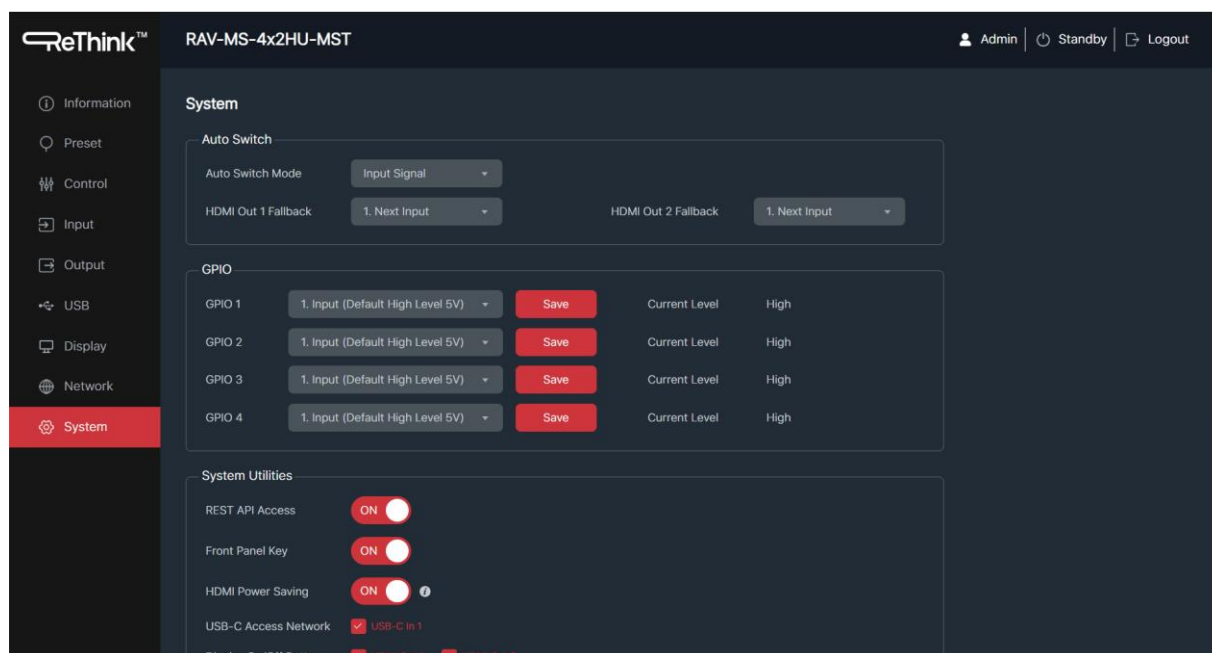
ETHERNET 1 is used for TCP/IP/Web GUI.

ETHERNET 2 is used for 1G Ethernet only.

Mode 2 (Switch Mode):

Both ETHERNET 1 and ETHERNET 2 are used for TCP/IP/Web GUI and 1G Ethernet.

System Page



The following is available on the System page:

- **Auto Switch:**

Auto Switch Mode:

Two modes are supported: Input Signal and Source 5V.

HDMI Out1 / 2 Fallback:

There are six options: Next Input, Previous Input, USB-C In1, USB-C In2, HDMI In3, HDMI In4.

- **GPIO:**

There are four options:

1. Input (default High Level 5V).
2. Input (default Low Level 0V).
3. Output High Level (5V).
4. Output Low Level (0V).

- **System Utilities:**

REST API Access: Turn on or turn off the network access permissions of REST API.

Front Panel Key: Click to turn on or turn off the key function.

HDMI Power Saving: Click to turn on or turn off the function.

If "HDMI Power Saving" is On, 5V power on the HDMI output port will be turned off when all inputs are not connected.

Note: Now the "No Signal Screen" output function is not available if all inputs are not connected.

If "HDMI Power Saving" is Off, 5V power on the HDMI output port will remain, whether or not any input port is connected or disconnected.

USB-C Access Network: If the checkbox is ticked, 1G Ethernet function of the USB-C In1 or USB-C In2 port will be available.

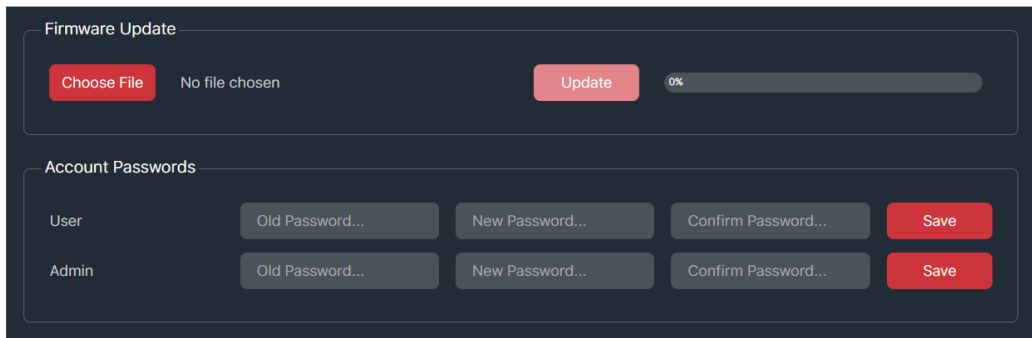
Display On/Off Button: If the checkbox is ticked, the display control on HDMI Out 1 or HDMI Out 2 port will be enabled

Auto Standby Time: Click the drop-down list to set the time to enter into standby mode when no signal is detected.

RS-232 Baud: Select the baud rate.

You can also reboot, restore factory, export settings or import settings via clicking the corresponding buttons.

- **Firmware Update:**



The screenshot shows a dark-themed user interface. The top section is titled "Firmware Update" and contains a red "Choose File" button, the text "No file chosen", a red "Update" button, and a progress bar at 0%. The bottom section is titled "Account Passwords" and contains two rows of input fields. The first row is for "User" and the second row is for "Admin". Each row has three input fields: "Old Password...", "New Password...", and "Confirm Password...", followed by a red "Save" button.

Support update for MCU, Web and Video. Choose the update file first, and then click Update.

- **Account Passwords:**

Enter the correct Old Password, New Password, and Confirm Password, and then click "Save".

Note: Input rules for changing passwords:

- (1) The password can't be empty.
- (2) New Password can't be the same as Old Password.
- (3) New Password and Confirm Password must be the same.

API Command Set

RAV-MS-4x2HU-MST supports API command control using ASCII commands sent to the RS-232 and TCP/IP 8000 ports of the device.

The ASCII command list is shown in the table below.

ASCII Command				
RS-232 Baud rate: 115200, Data bit: 8, Stop bit: 1, Parity bit: none, TCP/IP Port: 8000 The end mark of command is "<CR><LF>".				
x - Parameter 1, y - Parameter 2				
Command	Function Description	Example	Feedback	Default
System Setting				
?	Get the list of all commands	?		List all API commands
help	Get the list of all commands	help		List all API commands
get model	Get device model	get model	RAV-MS-4x2HU-MST	
status	Get device current status	status	Please refer to the note at the end of the list.	
get version	Get firmware version	get version	BOOT: V1.00.01 MCU: V1.00.01 WEB: V1.00.01	
power on	Power on the device	power on	Power: on System initializing... Initialization finished! BOOT: V1.00.01 MCU: V1.00.01 WEB: V1.00.01	
power off	Power off the device	power off	Power: off	
get power	Get current power state	get power	Power: off	

Command	Function Description	Example	Feedback	Default
System Setting				
reboot	Reboot the device	reboot	Reboot... System initializing... Initialization finished! BOOT: V1.00.01 MCU: V1.00.01 WEB: V1.00.01	
reset	Reset system settings to default (Should type "yes" to confirm, "no" to discard)	reset	Sure to reset system settings to default? Type "yes" after next prompt to confirm...	
reset all	Reset system and network settings to default (Should type "yes" to confirm, "no" to discard)	reset all	Sure to reset system and network settings to default? Type "yes" after next prompt to confirm...	
set front button x	Set front button locked on/off x=0: Unlocked x=1: Locked	set front button 0	Button: unlocked	0
get front button	Get front button locked on/off status	get front button	Button: unlocked	
set auto standby time x	Set auto standby time (x=0~5) when input signal is off x=0: Never x=1: 5 min x=2: 10 min x=3: 15 min x=4: 30 min x=5: 60 min	set auto standby time 3	Auto standby time: 15 min	15 min
get auto standby time	Get auto standby time	get auto standby time	Auto standby time: 15 min	
set usbc x access network y	Set USB-C (x=0~1) access network on/off x=0: All USB-C inputs x=1: USB-C input 1 y=0: Off y=1: On	set usbc 0 access network 1	USB-C input 1 access network: on	1

Command	Function Description	Example	Feedback	Default
System Setting				
get usbc x access network	Get USB-C (x=0~1) access network on/off status x=0: All USB-C inputs x=1: USB-C input 1	get usbc 0 access network	USB-C input 1 access network: on	
set gpio x value y	Set GPIO (x=0~4) value (y=1~4) x=0: All GPIOs x=1: GPIO 1 x=2: GPIO 2 x=3: GPIO 3 x=4: GPIO 4 y=1: Input (default High Level 5V) y=2: Input (default Low Level 0V) y=3: Output High Level (5V) y=4: Output Low Level (0V)	set gpio 1 value 1 set gpio 2 value 4	GPIO 1: input (default high level 5v) GPIO 2: output low level (0v)	1
get gpio x	Get GPIO (x=0~4) status x=0: All GPIOs x=1: GPIO 1 x=2: GPIO 2 x=3: GPIO 3 x=4: GPIO 4	get gpio 0	GPIO 1: low GPIO 2: high GPIO 3: low GPIO 3: high	
set baud x	Set RS-232 baud rate to (x=1~6) bps x=1: 4800 x=2: 9600 x=3: 19200 x=4: 38400 x=5: 57600 x=6: 115200	set baud 6	Baudrate: 115200	115200
get baud	Get RS-232 baud rate	get baud	Baudrate: 115200	
get temp	Get device internal temperature	get temp	65C	

get uptime	Get device running time (Day:Hour:Min:Sec)	get uptime	0000:00:13:04	
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Command	Function Description	Example	Feedback	Default
System Setting				
set auto event report x	Set auto event report on/off x=0: Off x=1: On	set auto event report 1	Auto event report: on	1
get auto event report	Get auto event report on/off status	get auto event report	Auto event report: on	
Input Setting				
set input x name y	Set input (x=1~4) name to y (16 characters max) x=1: USB-C input 1A x=2: USB-C input 1B x=3: HDMI input 3 x=4: HDMI input 4	set input 1 name MacBook	USB-C input 1 name: MacBook	USB-C In 1A USB-C In 1B HDMI In 3 HDMI In 4
get input x name	Get input (x=0~4) name x=0: All inputs x=1: USB-C input 1A x=2: USB-C input 1B x=3: HDMI input 3 x=4: HDMI input 4	get input 0 name	USB-C input 1 name: MacBook USB-C input 1B name: Dell Laptop HDMI input 3 name: Apple TV HDMI input 4 name: Roku Player	
get input x connected	Get input (x=0~4) cable connected status x=0: All inputs x=1: USB-C input 1A x=2: USB-C input 1B x=3:	get input 0 connected	USB-C input 1: connected USB-C input 2: connected HDMI input 3: connected	

	HDMI input 3 x=4: HDMI input 4		HDMI input 4: disconnected	
set input x edid y	Set input (x=0~4) EDID (y=1~22) x=0: All inputs x=1: USB-C input 1A x=2: USB-C input 1B x=3: HDMI input 3 x=4: HDMI input 4 y=1: Auto (HDMI Out 1 + HDMI Out 2)			

Command	Function Description	Example	Feedback	Default
Input Setting				
set input x edid y	(Continued) y=2: Copy HDMI Out 1 y=3: Copy HDMI Out 2 y=4: 4K2K60_444, Audio 2CH PCM y=5: 4K2K60_444, Audio 5.1CH DTS/DOLBY y=6: 4K2K60_444, Audio 7.1CH DTS/DOLBY/HD y=7: 4K2K30_444, Audio 2CH PCM y=8: 4K2K30_444, Audio 5.1CH DTS/DOLBY y=9: 4K2K30_444, Audio 7.1CH DTS/DOLBY/HD y=10: 1080P60_444, Audio 2CH PCM y=11: 1080P60_444, Audio 5.1CH DTS/DOLBY	set input 0 edid 1	USB-C input 1 EDID: auto (HDMI out 1 + HDMI out 2) USB-C input 2 EDID: auto (HDMI out 1 + HDMI out 2) HDMI input 3 EDID: auto (HDMI out 1 + HDMI out 2) HDMI input 4 EDID: auto (HDMI out 1 + HDMI out 2)	1

	y=12: 1080P60_444, Audio 7.1CH DTS/DOLBY/HD y=13: 720P60_444, Audio 2CH PCM y=14: 1920x1200, Audio 2CH PCM y=15: 1680x1050, Audio 2CH PCM y=16: 1600x1200, Audio 2CH PCM y=17: 1440x900, Audio 2CH PCM y=18: 1360x768, Audio 2CH PCM y=19: 1280x1024, Audio 2CH PCM y=20: 1024x768, Audio 2CH PCM y=21: User Defined 1 y=22: User Defined 2			
get input x edid	Get input (x=0~4) EDID mode x=0: All inputs x=1: USB-C input 1 x=2: USB-C input 2 x=3: HDMI input 3 x=4: HDMI input 4	get input 0 edid	USB-C input 1 EDID: auto (HDMI out 1 + HDMI out 2) USB-C input 2 EDID: auto (HDMI out 1 + HDMI out 2) HDMI input 3 EDID: auto (HDMI out 1 + HDMI out 2) HDMI input 4 EDID: auto (HDMI out 1 + HDMI out 2)	

Command	Function Description	Example	Feedback	Default
Input Setting				
set user edid x <y>	Set user defined EDID (x=1~2) x=1: User defined 1 x=2: User defined 2 y = 00 FF FF FF(y is 256 bytes EDID data)	set user edid 1 <00 FF FF FF....>	User defined 1 EDID is loaded successfully	
get edid data x	Get EDID data (x=1~8) x=1: USB-C input 1A x=2: USB-C input 1B x=3: HDMI input 3 x=4: HDMI input 4 x=5: HDMI output 1 x=6: HDMI output 2 x=7: User defined 1 x=8: User defined 2	get edid data 1	USB-C input 1 EDID data <00 FF FF FF....>	
set input x hdc y	Set input (x=0~4) HDCP on/off x=0: All inputs x=1: USB-C input 1A x=2: USB-C input 1B x=3: HDMI input 3 x=4: HDMI input 4 y=0: Off y=1: On	set input 0 hdc 1	USB-C input 1A HDCP: on USB-C input 1B HDCP: on HDMI input 3 HDCP: on HDMI input 4 HDCP: on	1
get input x hdc	Get input (x=0~4) HDCP on/off status x=0: All inputs x=1: USB-C input 1 x=2: USB-C input 2 x=3: HDMI input 3 x=4: HDMI input 4	get input 0 hdc	USB-C input 1A HDCP: on USB-C input 1B HDCP: on HDMI input 3 HDCP: on HDMI input 4 HDCP: on	
Output Setting				
set output x name y	Set output (x=1~2) name to y	set output 1 name Sony	HDMI output 1 name:	HDMI Out 1 HDMI

	(16 characters max) x=1: HDMI output 1 x=2: HDMI output 2	TV	Sony TV	Out 2
get output x name	Get input (x=0~2) name x=0: All outputs x=1: HDMI output 1 x=2: HDMI output 2	get output 0 name get output 1 name	HDMI output 1 name: Sony TV HDMI output 2 name: Samsung TV	
get output x connected	Get output (x=0~2) cable connected status x=0: All outputs x=1: HDMI output 1 x=2: HDMI output 2	get output 0 connected	HDMI output 1: connected HDMI output 2: disconnected	
set output x hdcp y	Set output (x=0~2) hdcp mode (y=1~4) x=0: All outputs x=1: HDMI output 1 x=2: HDMI output 2 y=1: Auto (follow sink) y=2: Force HDCP 1.4 y=3: Force HDCP 2.2 y=4: Signal management	set output 0 hdcp 1	HDMI output 1 HDCP: auto HDMI output 2 HDCP: auto	1
get output x hdcp	Get output (x=0~2) hdcp mode x=0: All outputs x=1: HDMI output 1 x=2: HDMI output 2	get output 0 hdcp	HDMI output 1 HDCP: auto HDMI output 2 HDCP: auto	
set output x video y	Set output (x=0~2) video mode (y=1~4) x=0: All outputs x=1: HDMI output 1 x=2: HDMI output 2 y=1: Auto (auto downscale according to display's capability)	set output 0 video 1	HDMI output 1 video: auto HDMI output 2 video: auto	1

	y=2: Bypass y=3: Force 1080P y=4: Internal pattern			
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Command	Function Description	Example	Feedback	Default
Output Setting				
get output x video	Get output (x=0~2) video mode x=0: All outputs x=1: HDMI output 1 x=2: HDMI output 2	get output 0 video	HDMI output 1 video: auto HDMI output 2 video: auto	
set output x signal y	Set output (x=0~2) signal on/ off/avmute (y=1~3) x=0: All outputs x=1: HDMI output 1 x=2: HDMI output 2 y=1: On y=2: Off y=3: AVMute	set output 0 signal 1	HDMI output 1 signal: on HDMI output 2 signal: on	1
get output x signal	Get output (x=0~2) signal status x=0: All outputs x=1: HDMI output 1 x=2: HDMI output 2	get output 0 signal	HDMI output 1 signal: on HDMI output 2 signal: on	
get pattern	Get internal pattern generator resolution and pattern	get pattern	Pattern: 4K60Hz checkboard	
set welcome screen x	Set welcome screen function on/off x=0: Off x=1: On	set welcome screen 1	Welcome screen: on	1

get welcome screen	Get welcome screen function on/off status	get welcome screen	Welcome screen: on	
set no signal screen x	Set no signal after 60s display welcome screen function on/off x=0: Off x=1: On	set no signal screen 1	No signal screen: on	1
get no signal screen	Get no signal display welcome screen function on/off status	get no signal screen	No signal screen: on	
Command	Function Description	Example	Feedback	Default
Output Setting				
set pattern x y	Set internal pattern generator resolution (x=1~7) pattern (y=1~12) x=1: 4K60Hz x=2: 4K50Hz x=3: 4K25Hz x=4: 4K24Hz x=5: 1080P60Hz x=6: 480P60Hz x=7: 576P50Hz y=1: Black y=2: Checkboard y=3: Strip y=4: Red y=5: Green y=6: Blue y=7: White y=8: Ramp y=9: Red ramp y=10: Green ramp y=11: Blue ramp y=12: PRBS	set pattern 1 2	Pattern: 4K60Hz checkboard	
set image display	Set welcome screen image display	set image display	Welcome image display	

set image clear	Clear welcome screen image	set image clear	Welcome image clear	
set output x from y	Set output (x=0~2) from input (y=1~4) x=0: All outputs x=1: HDMI output 1A x=2: HDMI output 1B y=1: USB-C input 1 y=2: USB-C input 2 y=3: HDMI input 3 y=4: HDMI input 4	set output 0 from 1	HDMI output 1: USB-C input 1A HDMI output 2: USB-C input 1B	1A1B

Command	Function Description	Example	Feedback	Default
Video Setting				
get output x from	Get output (x=0~2) from which input x=0: All outputs x=1: HDMI output 1 x=2: HDMI output 2	get output 0 from	HDMI output 1: USB-C input 1A HDMI output 2: USB-C input 1B	
set output x auto switch y	Set output (x=0~2) auto switch on/off x=0: All outputs x=1: HDMI output 1 x=2: HDMI output 2 y=0: Off y=1: On	set output 0 auto switch 1	HDMI output 1 auto switch: on HDMI output 2 auto switch: on	on
get output x auto switch	Get output (x=0~2) auto switch on/off status x=0: All outputs x=1: HDMI output 1 x=2: HDMI output 2	get output 0 auto switch	HDMI output 1 auto switch: on HDMI output 2 auto switch: on	
set output auto switch mode x	Set output auto switch detection mode (x=1~2) x=1: Input signal x=2: Source 5V	set output auto switch mode 1	Auto switch mode: input signal	1

get output auto switch mode	Get output auto switch detection mode	get output auto switch mode	Auto switch mode: input signal	
set output x fallback input y	Set output (x=0~2) fallback input source (y=1~6) when active signal is removed in single source auto switching mode x=0: All outputs x=1: HDMI output 1 x=2: HDMI output 2 y=1: Next input y=2: Previous input y=3: USB-C input 1A y=4: USB-C input 1B y=5: HDMI input 3 y=6: HDMI input 4	set output 1 fallback input 1	HDMI output 1 fallback: next input	1

Command	Function Description	Example	Feedback	Default
Video Setting				
get output x fallback input	Get output (x=0~2) fallback input source x=0: All outputs x=1: HDMI output 1 x=2: HDMI output 2	get output 1 fallback input	HDMI output 1 fallback: next input	
Audio Setting				
set analog audio input x	Set analog audio input embedded to (x=0~4) x=0: Off x=1: USB-C input 1 x=2: USB-C input 2 x=3: HDMI input 3 x=4: HDMI input 4	set analog audio input 0	Analog audio input: off	0
get analog audio input	Get analog audio input embedded to	get analog audio input	Analog audio input: off	

set analog audio input to usb x	Set analog audio input embedded to USB audio on/off x=0: Off x=1: On	set analog audio input to usb 0	Analog audio input to USB: off	1
get analog audio input to usb	Get analog audio input embedded to USB audio on/off status	get analog audio input to usb	Analog audio input to USB: off	
set analog audio output x	Set analog audio deembedded from (x=1~3) x=1: HDMI output 1 x=2: HDMI output 2 x=3: USB audio	set analog audio output 1	Analog audio output: HDMI output 1	1
get analog audio output	Get analog audio deembedded from	get analog audio output	Analog audio output: HDMI output 1	
set analog audio gain x	Set analog audio gain (x=0dB ~ -50dB)	set analog audio gain -5	Analog audio gain: -5dB	0dB
get analog audio gain	Get analog audio gain value	get analog audio gain	Analog audio gain: -5dB	
set analog audio gain+ set analog audio gain+x	Increase analog audio gain +1dB Increase analog audio gain +xdB	set analog audio gain+	Analog audio gain: -4dB Analog audio gain: 0dB	

Command	Function Description	Example	Feedback	Default
Audio Setting				
set analog audio gainset analog audio gain-x	Increase analog audio gain -1dB Increase analog audio gain -xdB	set analog audio gain-	Analog audio gain: -6dB Analog audio gain: -10dB	
set analog audio mute x	Set analog audio mute on/off x=0: Off x=1: On	set analog audio mute 1	Analog audio mute: on	Off

get analog audio mute	Get analog audio mute status	get analog audio mute	Analog audio mute: off	
USB Setting				
get usb host x power	Get USB host (x=0~3) power x=0: All hosts x=1: USB-C input 1 x=2: USB-C input 2 x=3: USB host 3	get usb host 0 power	USB-C input 1 power: on USB-C input 2 power: off USB host 3 power: on	
set usb switch mode x	Set USB switch mode (x=1~3) x=1: Follow video x=2: Manual switch x=3: Auto switch	set usb switch mode 1	USB switch mode: follow video	1
get usb switch mode	Get USB switch mode	get usb switch mode	USB switch mode: follow video	
set usb follow video x	Set USB follow video by output port (x=1~2) x=1: HDMI output 1 x=2: HDMI output 2	set usb follow video 1	USB follow video: HDMI output 1	1
get usb follow video	Get USB follow video by output port	get usb follow video	USB follow video: HDMI output 1	
set usb manual switch x	Set USB manual switch (x=1~4) x=1: USB-C input 1 x=2: USB-C input 2 x=3: USB host 3	set usb manual switch 1	USB manual switch: USB-C input 1	
get usb switch status	Get USB switch status	get usb switch status	USB switch status: USB-C input 1	
set usb device x power	Set USB device (x=0~3) power mode (y=1~3) x=0: All USB device ports x=1: USB device 1 x=2: USB device 2	get usb device 0 power	USB device 1 power: follow host USB device 2 power: follow host	Follow host

	x=3: USB device 3 y=1: Follow host y=2: Force 5V always output y=3: Disable 5V output			
get usb device x power	Get USB device (x=0~2) power mode x=0: All USB device ports x=1: USB device 1 x=2: USB device 2 x=3: USB device 3	get usb device 0 power	USB device 1 power: follow host USB device 2 power: follow host USB device 2 power: follow host	

Command	Function Description	Example	Feedback	Default
Display Control				
set display x power y	Set display (x=0~2) power on/off x=0: All outputs x=1: HDMI output 1 x=2: HDMI output 2 y=0: Off y=1: On	set display 0 power 1	Display 1 power: on Display 2 power: on	
set display x button y	Set display (x=0~2) button on/off control x=0: All outputs x=1: HDMI output 1 x=2: HDMI output 2 y=0: Off y=1: On	set display 0 button 0	Display 1 button: on Display 2 button: on	on
get display x button	Get display (x=0~2) button on/ off control x=0: All outputs x=1: HDMI output 1 x=2: HDMI output 2	get display 0 button	Display 1 button: on Display 2 button: on	
set display x auto power feature y	Set display (x=0~2) auto power feature on/off when system	set display 0 auto power feature 1	Display 1 auto power feature: on Display 2	on

	power on/off x=0: All outputs x=1: HDMI output 1 x=2: HDMI output 2 y=0: Off y=1: On		auto power feature: on	
get display x auto power feature	Get display (x=0~2) auto power feature on/off status x=0: All outputs x=1: HDMI output 1 x=2: HDMI output 2	get display 0 auto power feature	Display 1 auto power feature: on Display 2 auto power feature: on	
set display x auto power on timer y	Set display (x=0~2) auto power on after period time (y=0~1200) when system power on x=0: All outputs x=1: HDMI output 1 x=2: HDMI output 2 y= 0~1200sec	set display 0 auto power on timer 5	Display 1 auto power on timer: 5 sec Display 2 auto power on timer: 5 sec	5 sec
get display x auto power on timer	Get display (x=0~2) auto power on timer x=0: All outputs x=1: HDMI output 1 x=2: HDMI output 2	get display 0 auto power on timer	Display 1 auto power on timer: 5 sec Display 2 auto power on timer: 5 sec	
set display x auto power off timer y	Set display (x=0~2) auto power off after period time (y=0~1200) when system power off x=0: All outputs x=1: HDMI output 1 x=2: HDMI output 2 y= 0~1200sec	set display 0 auto power off timer 5	Display 1 auto power off timer: 5 sec Display 2 auto power off timer: 5 sec	5 sec

get display x auto power off timer	Get display (x=0~2) auto power off timer x=0: All outputs x=1: HDMI output 1 x=2: HDMI output 2	get display 0 auto power off timer	Display 1 auto power off timer: 5 sec Display 2 auto power off timer: 5 sec	
set display x control type y	Set display (x=1~2) power on/ off control type (y[2:0]) x=1: HDMI output 1 x=2: HDMI output 2 y[0]: CEC y[1]: IR y[2]: RS-232 Note: IR and RS-232 can only be used on one output port.	set display 1 control type 111	Display 1 control type: 111	100
get display x control type	Get display (x=0~2) power on/ off control type x=0: All outputs x=1: HDMI output 1 x=2: HDMI output 2	get display 0 control type	Display 1 control type: 111 Display 2 control type: 000	
RS-232 Setting				
set serial setting y	Set serial setting to y=115200- 8n1 Baud rate: 115200/57600/560 00/38400/19200/9600/4800/2 400 Data bits: 7/8 Parity: n(None)/ o(Odd) / e(Even) Stop bits: 1/2	set serial setting 115200-8n1	Serial setting: 115200-8n1	115200- 8n1
get serial setting	Get serial setting	get serial setting	Serial setting: 115200-8n1	

set serial HEX/ASCII <end> <command>	Set serial general command, command format is HEX or ASCII <end>= command end flag, can be null/CR/LF/CR+LF <command>= RS-232 command	set serial ASCII <CR+LF> <VOL+>	Serial: ASCII <CR+LF> <VOL+>	
set serial power on/ off HEX/ ASCII <end> <command1> <delay> <command2>	Set serial power on/off commands, command format is HEX or ASCII <end>= command end flag, can be null/CR/LF/CR+LF <command1>= RS- 232 power on/off command 1 <delay>= 0~1200sec <command2>= RS- 232 power on/off command 2 NOTE: <delay> and <command2> can be NULL	set serial power on ASCII <CR+LF> <PWRON> <10> <INPUT1> set serial power off ASCII <CR+LF> <PWROFF> <10> <LAMPPOFF> set serial power on ASCII <CR+LF> <PWRON> set serial power off ASCII <CR+LF> <PWROFF> set serial power on HEX <null> <11 22> set serial power off HEX <null> <33 44>	Serial power on: ASCII <CR+LF> <PWRON> <10> <INPUT1> Serial power off: ASCII <CR+LF> <PWROFF> <10> <LAMPPOFF> Serial power on: ASCII <CR+LF> <PWRON> Serial power off: ASCII <CR+LF> <PWROFF> Serial power on: HEX <null> <11 22> Serial power off: HEX <null> <33 44>	

get serial power on/off command	Get serial power on/off commands	get serial power on command get serial power off command	Serial power on: ASCII <CR+LF> <PWRON> <10> <INPUT1> Serial power off: ASCII <CR+LF> <PWROFF> <10> <LAMPOFF> Serial power on: ASCII <CR+LF> <PWRON> Serial power off: ASCII <CR+LF> <PWROFF> Serial power on: HEX <null> <11 22> Serial power off: HEX <null> <33 44>	
IR Setting				
set ir power on/off	Set IR power on/off	set ir power on set ir power off	IR power: on IR power: off	

Command	Function Description	Example	Feedback	Default
CEC Setting				
set input x cec <y>	Set input (x=0, x=3~4) CEC command <y> x=0: All inputs x=3: HDMI input 3 x=4: HDMI input 4 y=power on/power off y=menu/select/up/down/left/right/exit y=play/stop/pause/rewind/fast forward/previous/next y=volume up/volume down/mute	set input 3 cec <power on>	HDMI input 3 CEC: power on	
set input x custom cec <y>	Set input (x=0, x=3~4) custom CEC command <y> x=0: All inputs x=3: HDMI input 3 x=4: HDMI input 4 y=custom CEC command (hex format)	set input 3 custom cec <87 01>	HDMI input 3 CEC: <87 01>	
set output x cec <y>	Set output (x=0~2) CEC command <y> x=0: All outputs x=1: HDMI output 1 x=2: HDMI output 2 y=power on/power off y=active source/image view on/text view on y=volume up/volume down/mute	set output 1 cec <power off>	HDMI output 1 CEC: power off	
set output x custom cec <y>	Set output (x=0~2) custom CEC command <y> x=0: All outputs x=1: HDMI output 1 x=2: HDMI output 2	set output 1 custom cec <87 01>	HDMI output 1 CEC: <87 01>	

	y=custom CEC command (hex format)			
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Command	Function Description	Example	Feedback	Default
Preset Setting				
set preset save x	Save the current unit's settings to the specified preset (x=1~5) All settings except network setting. x=1~5: Preset 1 ~ Preset 5	set preset save 1	Preset 1: save	
set preset recall x	Recall a specified preset into unit (x=1~5) All settings except network setting. x=1~5: Preset 1 ~ Preset 5	set preset recall 1	Preset 1: recall	
set preset clear x	Clear a specified preset into unit (x=1~5) All settings except network setting. x=1~5: Preset 1 ~ Preset 5	set preset clear 1	Preset 1: clear	
set preset x name y	Set preset (x=1~5) name to y (16 characters max) x=1~5: Preset 1 ~ Preset 5	set preset 1 name MeetingRoom 1	Preset 1 name: MeetingRoom 1	
get preset x name	Get preset (x=1~5) name x=1~5: Preset 1 ~ Preset 5	get preset 1 name	Preset 1 name: MeetingRoom 1	

Command	Function Description	Example	Feedback	Default
Network Setting				
get ipconfig	Get the Current IP Configuration	get ipconfig	IP mode: DHCP IP address: 192.168.62.106 Subnet mask: 255.255.255.0 Gateway: 192.168.62.1 TCP/IP port: 8000 Telnet port: 23 MAC address: 6C:DF:FB:0C:B3:8E (Static: 169.254.100.200 255.255.0.0 169.254.100.1)	default static IP is 192.168.0.100/255.255.0.0/192.168.0.1
get ip mode	Get network IP mode	get ip mode	IP mode: static	
set ip addr xxx.xxx.xxx. xxx	Set network IP address	set ip addr 192.168.1.100	IP address: 192.168.1.100 (Please use "set net reboot" command to apply new config!) DHCP on, device can't config static address, set DHCP off first.	
get ip addr	Get network IP address	get ip addr	IP address: 192.168.1.100	
set subnet xxx.xxx.xxx. xxx	Set network subnet mask	set subnet 255.255.255.0	Subnet mask: 255.255.255.0 (Please use "set net reboot" command to apply new config!) DHCP on, device can't config subnet mask, set DHCP off first.	

Command	Function Description	Example	Feedback	Default
Network Setting				
get subnet	Get network subnet mask	get subnet	Subnet mask: 255.255.255.0	
set gateway xxx.xxx.xxx. xxx	Set network gateway	set gateway 192.168.1.1	Gateway: 192.168.1.1 (Please use "set net reboot" command to apply new config!) DHCP on, device can't config gateway, set DHCP off first.	
get gateway	Get network gateway	get gateway	Gateway: 192.168.1.1	
set tcp/ipx	Set network TCP/IP port on/off x=0: Off x=1: On	set tcp/ip 1	TCP/IP port: on	1
get tcp/ip	Get network TCP/IP port on/off status	get tcp/ip	TCP/IP port: on	
set tcp/ip port x	Set network TCP/IP port (x=1~65535)	set tcp/ip port 8000	TCP/IP port: 8000	8000
get tcp/ip port	Get network TCP/IP port	get tcp/ip port	TCP/IP port: 8000	
set telnet x	Set network telnet port on/off x=0: Off x=1: On	set telnet 1	Telnet port: on	1
get telnet	Get network telnet port on/off status	get telnet	Telnet port: on	
set telnet port x	Set network telnet port(x=1~65535)	set telnet port 23	Telnet port: 23	23
get telnet port	Get network telnet port	get telnet port	Telnet port: 23	
set net reboot	Reboot network modules	set net reboot	Network reboot... Search for IP, Please wait ...! IP Mode: DHCP	

			IP address: 192.168.62.106 Subnet mask: 255.255.255.0 Gateway: 192.168.62.1 TCP/IP port: 8000	
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Command	Function Description	Example	Feedback	Default
Network Setting				
set net hostname xxxx	Set network hostname to xxxx (x=[32 characters max])	set net hostname xxxx	Hostname: 1234	RAV-MS-4x2-HU-MST + (Mac[3] %16, Mac[4],Mac[5])
get net hostname	Get network hostname	get net hostname	Hostname: 1234	
set net mode x	Set network working mode (x=1~2) x=1: Mode 1 (separated mode), LAN 1 is for TCP/ IP and Web GUI access, LAN 2 is for 1G ethernet. x=2: Mode 2 (switch mode), LAN 1 and LAN 2 both can access TCP/ IP and Web GUI and 1G ethernet.	set net mode 1	Network mode: 1	1
get net mode	Get network working mode	get net mode	Network mode: 1	
Password Setting				
set admin password x	Set admin login password (x=[16 characters max])	set admin password 1234	Admin password: 1234	1234
get admin password	Get admin login password	get admin password	Admin password: 1234	
set user password x	Set user login password (x=[16 characters max])	set user password 1234	User password: 1234	1234

get user password	Get user login password	get user password	User password: 1234	
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Note: The feedback of the command of “r status” is as following.

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Status Info RAV-MS-4x2HU-MST

MCU: V1.00.07 WEB: V2.00.08

Power Key Baud WelcomeScreen NoSignalScreen AutoSwitch_Mode

On On 15200 On On Input_Signal

AutoStandbyTime UsbcAccessNetwork Temp(C) Uptime(Day:Hour:Min:Sec)

15 min USB-C 1/2 38 0000:01:10:08

Input Name Cable Resolution ColorSpace ColorDepth HDCP

USB-C_In1 USB-C In 1A Disconnected None None None Off

USB-C_In2 USB-C In 1B Disconnected None None None Off

HDMI_In3 HDMI In 3 Disconnected None None None Off

HDMI_In4 HDMI In 4 Disconnected None None None Off

EDID

Auto (HDMI Out 1 + HDMI Out 2)

Auto (HDMI Out 1 + HDMI Out 2)

Auto (HDMI Out 1 + HDMI Out 2)

Auto (HDMI Out 1 + HDMI Out 2)

Output Name Cable Resolution ColorSpace ColorDepth HDCP

HDMI_Out1 HDMI Out 1 Connected 1280x720p60 YUV 4:2:2 8 Off

HDMI_Out2 HDMI Out 2 Disconnected None None None Off

VideoMode OutputSignal AutoSwitch From

Auto On Off USB-C_In1

Auto On On USB-C_In1

Analog_Audio_In Analog_Audio_In_To_USB Analog_Audio_Out_From

Off On HDMI_Out1

Analog_Audio_Out_Mute Analog_Audio_Out_Gain

Off 0dB

USB_Switch	Output	USB-C_In1	USB-C_In2	USB_Host3	USB_Host4
Follow Video	HDMI_Out1	Power Off	Power Off	Power Off	Follow Host

USB_Device1	USB_Device2	USB_Device3
Follow Host	Follow Host	Force 5V Always Out

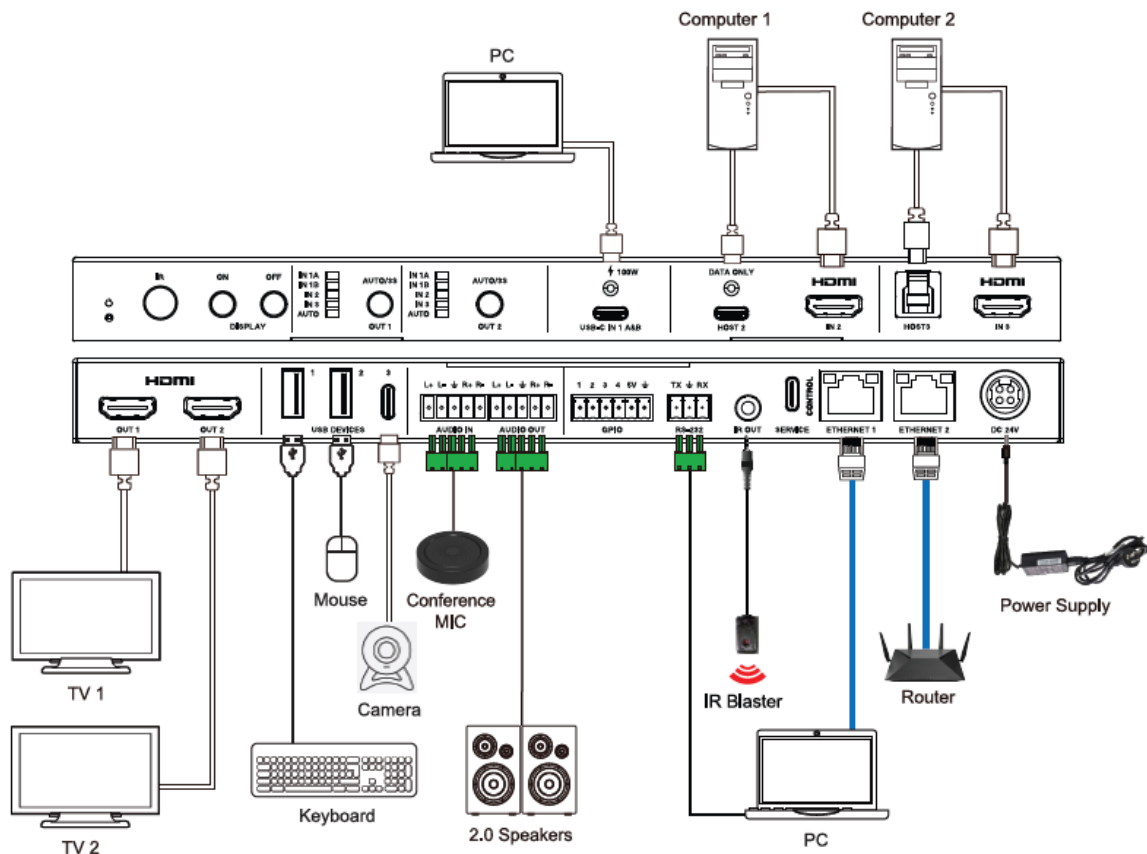
Display_AutoPower	On/Off	Power_On_Time(s)	Power_Off_Time(s)	Control_Mode
HDMI_Out1	On	5	5	CEC
HDMI_Out2	On	5	5	CEC

GPIO1	GPIO2	GPIO3	GPIO4
Input_Low	Input_Low	Input_Low	Input_Low

TCP/IP	Telnet	MAC
8000	0023	9C:69:D3:0E:89:02

DHCP	IP	Gateway	SubnetMask
On	169.254.100.102	255.255.255.000	169.254.100.001

Application Diagram



Mode 1 (separated mode): LAN 1 = TCP/IP/Web GUI, LAN 2 = 1G Ethernet only

Mode 2 (switch mode): LAN 1 and LAN 2 = TCP/IP/Web GUI and 1G Ethernet



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