User Manual

Stoltzen ATHENA 44HB

4x4 HDMI 2.0 HDBaseT Matrix Switcher

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Version: ATHENA 44HB_2019V1.1

Preface

Read this user manual carefully before using the product. Pictures shown in this manual are for reference only. Different models and specifications are subject to real product.

This manual is only for operation instruction, please contact the local distributor for maintenance assistance. The functions described in this version were updated till November, 2019. In the constant effort to improve the product, we reserve the right to make functions or parameters changes without notice or obligation. Please refer to the dealers for the latest details.

FCC Statement

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. It has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a commercial installation.

Operation of this equipment in a residential area is likely to cause interference, in which case the user at their own expense will be required to take whatever measures may be necessary to correct the interference.

Any changes or modifications not expressly approved by the manufacture would void the user's authority to operate the equipment.

SAFETY PRECAUTIONS

To ensure the best performance from the product, please read all instructions carefully before using the device. Save this manual for further reference.

- Unpack the equipment carefully and save the original box and packing material for possible future shipment.

- Follow basic safety precautions to reduce the risk of fire, electrical shock and injury to persons.

- Do not dismantle the housing or modify the module. It may result in electrical shock or burn.

- Using supplies or parts not meeting the specifications of product may cause damage, deterioration or malfunction.

- Refer all servicing to qualified service personnel.

- To prevent fIRe or shock hazard, do not expose the unit to rain, moisture or install this product near water.

- Do not put any heavy items on the extension cable in case of extrusion.

- Do not remove the housing of the device as opening or removing housing may expose you to dangerous voltage or other hazards.

- Install the device in a place with fine ventilation to avoid damage caused by overheat.

- Keep the module away from liquids.

- Spillage into the housing may result in fIRe, electrical shock, or equipment damage. If an object or liquid falls or spills on to the housing, unplug the module immediately.

- Do not twist or pull by force ends of the optical cable. It can cause malfunction.

- Do not use liquid or aerosol cleaners to clean this unit. Always unplug the power to the device before cleaning.

- Unplug the power cord when left unused for a long period of time.

- Information on disposal for scrapped devices: do not burn or mix with general household waste, and please treat them as normal electrical wastes.

Table of Contents

1. Product Introduction

1.1 Introduction to ATHENA 44HB

The ATHENA 44HB is a professional 4x4 HDMI 2.0 HDBaseT matrix switcher! The matrix is a four-input by four-output HDBaseT and HDMI matrix with HDCP 2.2 and up to 4K/UHD@60Hz video support. It transmits 4K video to distances up to 131 feet (40 meters) and 1080p video to distances up to 230 feet (70 meters) over a single CATx Ethernet cable. The four HDBaseT outputs support 24V Power over Cable (PoC) feature, allowing the compatible receivers to draw the IR power from the matrix over the HDBaseT cable.

The matrix switcher features comprehensive EDID management and advanced HDCP handing to ensure maximum functionality with a wide range of video sources.

The matrix switcher not only supports bi-directional IR, RS232 extension but also has IR, RS232, and TCP/IP control options.

The product provides performance in control and transmission, which could be used in a number of different installation scenarios, for example, with computers, for monitoring purposes, large screen displays, conference systems, television education, bank security institutions, etc.

1.2 Features

- 4x4 HDBaseT matrix switcher with audio matrix.
- Fully compliant with the HDMI 2.0 and HDCP 2.2.
- Supports HDMI resolution up to 4K@60Hz 4:4:4, HDR10.
- Features four HDMI outputs for four HDBaseT outputs, and the four HDMI outputs support 4K to 1080p down-scaling.
- The four HDBaseT outputs support 24V PoC, allowing the receivers to draw the IR power from the matrix switcher over the HDBaseT cable.
- Transmits 4K signal to the distance up to 131 feet (40 meters) and 1080p signal to the distance up to 230 feet (70 meters) over a single CATx Ethernet cable.
- Supports audio matrix. Provides four digital SPDIF audio outputs and four analog L+R audio outputs for HDMI input audio de-embedding and HDBaseT output audio de-embedding. Moreover, the four digital SPDIF audio outputs supports ARC audio output from receivers.
- Volume adjustment for analog L+R audio outputs.
- Supports comprehensive EDID management and advanced HDCP handling.
- Controllable via front panel buttons, RS232 local and pass-through, IR local and

pass-through, CEC, and TCP/IP (built-in GUI).

1.3 Package List

- 1x ATHENA 44HB 4x4 HDMI 2.0 HDBaseT matrix switcher
- 2x Mounting Ears with 6 Screws
- 4x Plastic Cushions with 4 Screws
- 1x IR Receiver
- 1x IR Remote
- 1x RS232 Cable (3-pin to DB9)
- 8x 3-pin Terminal Blocks
- 1x Power Cord
- 1x User Manual

Note: Please contact your distributor immediately if any damage or defect in the components is found.

2. Specification

Video Input	
Input	(4) HDMI
Input Connector	(4) Type-A female HDMI
HDMI Input Resolution	Up to 4Kx2K@60Hz 4:4:4, HDR10,1080p 3D
Video Output	
Output	(4) HDBaseT, (4) HDMI
Output Connector	(4) RJ45, (1) Type-A female HDMI
HDMI Output Resolution	Up to 4Kx2K@60Hz 4:4:4, HDR10, 1080p 3D. Supports 4K to 1080p down-scaling.
HDBaseT Output Resolution	Up to 4Kx2K@60Hz 4:2:0
Audio Output	
Output	(4) Stereo analog L+R audio, (4) Digital SPDIF audio
Output Connector	(4) 3-pin terminal blocks, (4) Toslink connectors
Analog L+R Audio Format	Supports PCM
Digital SPDIF Audio Format	Supports PCM, Dolby Digital, DTS, DTS-HD
Local Audio Sampling Rate	Supports 44.1KHz, 48KHz, 96KHz
ARC Audio Sampling Rate	Supports 48KHz, 96KHz
Frequency Response	20Hz – 20KHz, ±3dB
Audio Output Impedance	70Ohms
Max Input Level	**L+R:** 2.0Vrms ± 0.5dB. 2V = 16dB headroom above -10dBV (316mV) nominal consumer line level signal. **SPDIF:**±0.05dBFS.
THD+N	< 0.05% (-80dB), 20Hz – 20KHz bandwidth, 1KHz sine at 0dBFS level (or max level).
SNR	**L+R:** > 80dB, 20Hz - 20KHz bandwidth. **SPDIF: >** 90dB, 20Hz-20 kHz bandwidth.
Crosstalk Isolation	**SPDIF:** < -70 dB, 10KHz sine at 0dBFS level (or max level before clipping). **L+R:** < -80 dB, 10KHz sine at 0dBFS level (or max level before clipping).
L-R Level Deviation	**L+R:** < 0.3dB, 1KHz sine at 0dBFS level (or max level before clipping).
Frequency Response Deviation	< ± 0.5dB 20Hz - 20KHz.
Output Load Capability	**L+R:** 1KΩ and higher (Supports 10x paralleled 10KΩ loads).
Stereo Channel Separation	>70dB@1KHz.
Noise Level	**L+R:** -80dB; **SPDIF:** -90dB

Control Part	
Control port	(4) IR IN, (1) IR ALL IN, (4) IR OUT, (1) IR ALL OUT, (1) IR EYE, (5) RS232, (1) FIRWARE, (1) TCP/IP
Control Connector	(11) 3.5mm jacks, (5) 3-pin terminal blocks, (1) Type-A USB, (1) RJ45
General	
Transmission Mode	HDBaseT
Transmission Distance	1080p ≤ 230 feet (70 meters), 4K@60Hz ≤ 131 feet (40 meters)
Bandwidth	18Gbps
Operation Temperature	-5℃ ~ +55℃
Storage Temperature	-25℃ ~ +70℃
Relative Humidity	10% ~ 90%
External Power Supply	100V~240V AC, 50/60Hz
Power Consumption	65W (Max)
Dimension (W*H*D)	436.4mm x 44mm x 356.6mm
Net Weight	3.3kg

Main Video Resolution Parameters:

Resolution	Frame Rate (Hz)						Bit Depth	Color Space
	24	25	30	50	59.94	60	8 bit, 10bit, 12bit	4:4:4, 4:2:2, RGB
1080P	24	25	30	50	59.94	60	8 bit, 10bit, 12bit	4:4:4, 4:2:2, RGB
1920x1200	-	-	-	50	-	60	8 bit, 10bit, 12bit	4:4:4, 4:2:2, RGB
3840x2160	24	25	30	-	-	-	8 bit, 10bit, 12bit	4:4:4, 4:2:2, RGB
	-	-	-	50	59.94	60	Only 8 bit	4:4:4, 4:2:2, 4:2:0, RGB
4096x2160	24	25	30	-	-	-	8 bit, 10bit, 12bit	4:4:4, 4:2:2, RGB
	-	-	-	50	59.94	60	Only 8 bit	4:4:4, 4:2:2, 4:2:0, RGB

3. Panel Description

3.1 Front Panel

① **LCD Screen:** Presents real-time operation status.

② **Power LED:** Illuminates RED when the device is in standby mode, illuminates GREEN when device is powered on.

③ **IR Sensor and its LED:** Illuminates RED when the IR sensor receives an IR signal from the IR remote to control the matrix switcher. The IR sensor is on the right side of the LED.

④ **INPUT:** Four buttons for input source selection.

⑤ **OUTPUT:** Four buttons for output channel selection.

⑥ **Menu Buttons:**

- LOCK: Lock or unlock the front panel buttons.
- PRESET: Preset setting.
- MENU/↵: Menu or confirm button.
- BACK: Go back to the previous operation.
- UP: Page up.
- DOWN: Page down.

3.2 Rear Panel
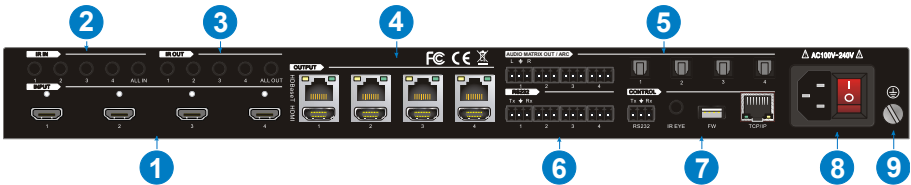
① **INPUT:** Four type-A female HDMI input ports to connect HDMI sources.

② **IR IN:**

- 1~4: Four 3.5mm jacks to connect four IR receivers. Each IR input is

associated with the respective HDBaseT output and cannot be switched separately. It makes up a bi-directional IR transmission with the IR OUT on the corresponding HDBaseT receiver.

- ALL IN: 3.5mm jack to connect the IR receiver to transmit the IR signal from the ALL IN port to all HDBaseT receivers.

③ **IR OUT:**

- 1~4: Four 3.5mm jacks to connect four IR emitters to send the IR signal received from the corresponding HDBaseT receivers.
- ALL OUT: 3.5mm jack to connect the IR emitter to send the IR signal received from all HDBaseT receivers.

④ **OUTPUT:** Four HDBaseT RJ45 outputs to connect the four HDBaseT receivers, and four local HDMI ports to connect local displays.

⑤ **AUDIO MATRIX OUT/ARC:** Four 3-pin terminal blocks and four Toslink connectors to connect speakers or amplifiers for HDMI input audio de-embedding or HDBaseT output audio de-embedding, and the four Toslink connectors can also be used for ARC audio output from HDBaseT receivers. They can make up an audio matrix to be set by front panel buttons, GUI or RS232 commands.

⑥ **RS232:** Four 3-pin terminal blocks to control the third-party devices base on RS232 pass-through feature. There is a one-to-one correspondence between the four RS232 ports and the four RS232 ports of four HDBaseT receivers.

⑦ **CONTROL:**

- RS232: 3-pin terminal block to connect the control device (e.g. PC) to control the matrix switcher by RS232 commands.
- IR EYE: 3.5mm jack to connect IR receiver to control the matrix switcher by the IR remote.
- FW: Type-A USB port for firmware upgrade.
- TCP/IP: RJ45 port to connect the control device (e.g. PC) to control the matrix switcher by GUI.

⑧ **AC100V~240V:** Power port to connect an AC 100V~240V power by the power cord.

⑨ **GROUND:** Connect to earth to ensure the unit is well grounded.

4. System Connection

4.1 Usage Precaution

- Make sure all components and accessories included before installation.
- System should be installed in a clean environment with proper temperature and humidity.
- All of the power switches, plugs, sockets, and power cords should be insulated and safe.
- All devices should be connected before power on.

4.2 System Diagram

The following diagram illustrates typical input and output connections that can be utilized with this matrix switcher:
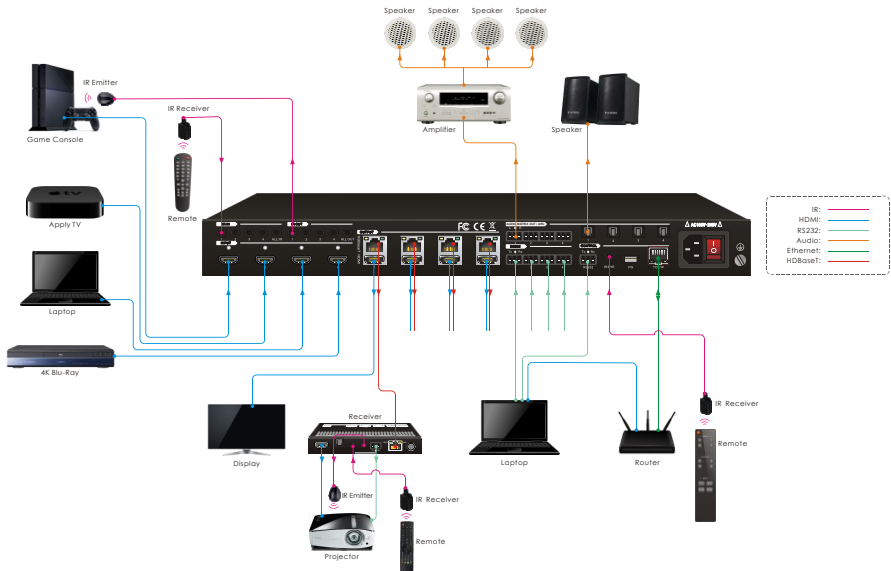
5. Button Control

The matrix switcher can be controlled by using the buttons on the front panel. Whenever a command is accepted, the indicators of all the buttons pressed will blink three times then they will go off. If the command fails, the indicators will go off immediately without blinking.

5.1 Signal Switching

● **Switch an input to an output**

Operation: INPUT# + OUTPUT# + MENU/↵

Example: Switch Input 1 to Output 2:

Press **INPUT 1** [1] → | SWITCH:1 -> | → Press **OUTPUT 2** [2]

→ | SWITCH:1 -> 2 | → Press MENU/↵ to confirm.

Note: *In default status, 4 IR OUT ports correspond with 4 HDMI INPUTS. When you switch an HDMI input, the corresponding IR OUT will be switched synchronously.*
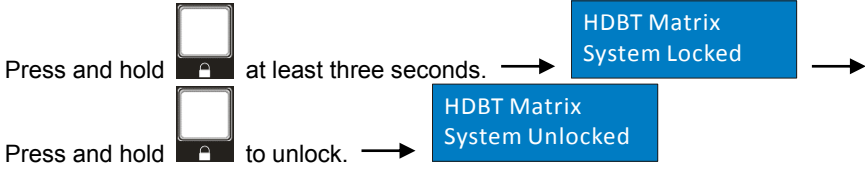
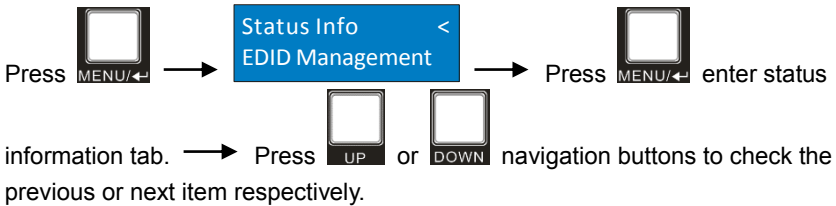● **Switch an input to several outputs**

Operation: INPUT# + OUTPUT# + OUTPUT# +… + MENU/↵

Example: Switch Input 1 to Output 2, 3, and 4.

Press **INPUT 1** [1] → | SWITCH:1 -> | → Press **OUTPUT 2**, **3**, **4**

[2] [3] [4] → | SWITCH:1 -> 2 3 4 | → Press MENU/↵ to confirm.
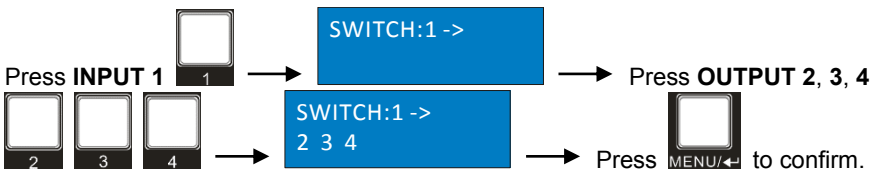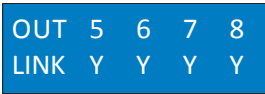
5.2 Panel Button Locking/Unlocking

Press and hold [🔒] at least three seconds. ⟶ HDBT Matrix System Locked ⟶

Press and hold [🔓] to unlock. ⟶ HDBT Matrix System Unlocked

5.3 Status Information Inquiry

Press [MENU/↵] ⟶ Status Info   <
EDID Management ⟶ Press [MENU/↵] enter status

information tab. ⟶ Press [UP] or [DOWN] navigation buttons to check the previous or next item respectively.

LCD Screen	Description
IN 1 1 1 1 OUT 1 2 3 4	Report the signal switching status.
IN 1 2 3 4 LINK Y Y Y Y	Report the connection status of all HDMI input ports. Y means the corresponding input port is connected to a source device, N means there is no connection between the input port and source device.
OUT 1 2 3 4 LINK Y Y Y Y 1~4=HDBaseT output 1~4.	Report the connection status of all HDBT output ports. Y means the corresponding output port is connected to an HDBaseT receiver, N means there is no connection between the output port and HDBaseT receiver.
OUT 5 6 7 8 LINK Y Y Y Y 5~8=HDMI loop output 1~4.	Report the connection status of all HDMI loop output ports. Y means the corresponding output port is connected to a display device, N means there is no connection between the output port and display device.

5.4 EDID Management

The Extended Display Identification Data (EDID) is used by the source device to match its video resolution with the connected display. By default, the four source devices invoke the fifth built-in EDID: 4K@60Hz HDR 2CH.

● **Enter EDID management tab:**

Press [MENU/↵] ⟶ Press [DOWN] to select **EDID Management**. ⟶

| Status Info |
| EDID Management < |

⟶ Press [MENU/↵] enter EDID management tab. ⟶

Press [UP] or [DOWN] navigation buttons to select the below items:
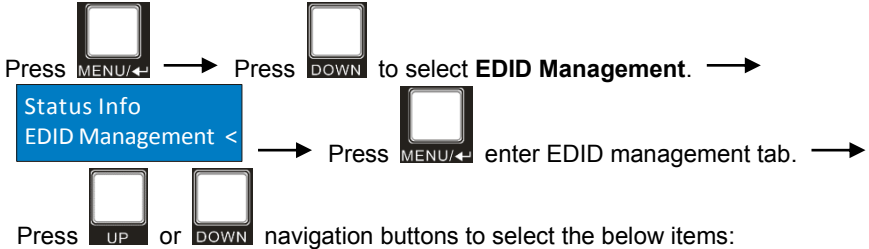
- ✓ Learn HDBT OUT
- ✓ Learn HDMI OUT
- ✓ Built-in EDID

● **To copy the EDID data from one HDBT output to one or several inputs:**

Example: Input 1, 2, 3 and 4 learn the EDID data of HDBT output 2.

| Learn HDBT OUT < |
| Learn HDMI OUT |

Select **Learn HDBT OUT** ⟶ Press [MENU/↵] to confirm.

| PRESS INPUT KEY |
| Learn HDBT OUT 1 |

⟶ Press **OUTPUT 2** [2] ⟶

| PRESS INPUT KEY |
| Learn HDBT OUT 2 |

⟶ Press **INPUT 1**, **2**, **3**, **4.** [1] [2] [3] [4] ⟶

| 1 2 3 4 |
| Learn HDBT OUT 2 |

⟶ Press [MENU/↵] to confirm.
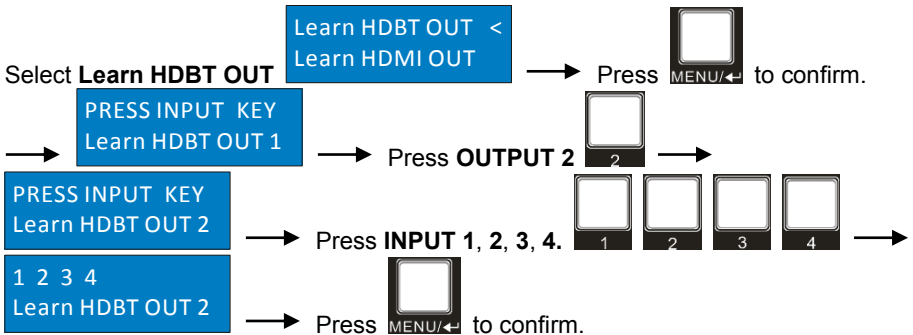
● **To copy the EDID data from one HDMI output to one or several inputs:**

Example: Input 1 and 2 learn the EDID data of HDMI output 4.

Select **Learn HDMI OUT**

```
Learn HDBT OUT
Learn HDMI OUT  <
```

➝ Press MENU/↵ to confirm.

➝

```
PRESS INPUT  KEY
Learn HDMI OUT 1
```

➝ Press **OUTPUT 4** [4] ➝

```
PRESS INPUT  KEY
Learn HDMI OUT 4
```

➝ Press **INPUT 1** and **2**. [1] [2] ➝

```
1  2
Learn HDMI OUT 4
```

➝ Press MENU/↵ to confirm.
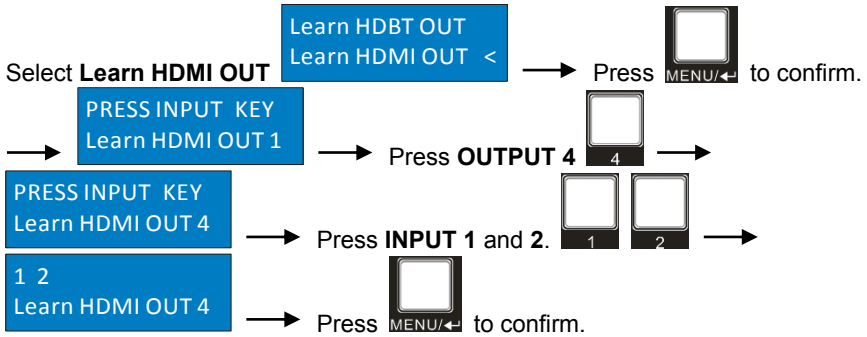
● **To invoke the built-in EDID data:**

There are six types of built-in EDID data can be invoked, as shown as below:

No.	EDID	
	Video	**Audio**
1	1080p	2CH
2	1080p HDR	MultiCH
3	4K@30Hz HDR	2CH
4	4K@60Hz HDR	MultiCH
5 (Default)	4K@60Hz HDR	2CH
6	4K@60Hz HDR	MultiCH
	User Custom	

Example: Input 1 and 2 invoke the built-in EDID data: 4K@30Hz HDR 2CH.

Select **Built-in EDID**

```
Learn HDMI OUT
Built-in EDID     <
```

➝ Press MENU/↵ to confirm.

```
PRESS INPUT  KEY
1080P 2CH         <
```

➝ Press UP or DOWN navigation buttons to select the

built-in EDID to be invoked ➝

```
PRESS INPUT  KEY
4K30HDR 2CH       <
```

➝ Press **INPUT 1** and **2**.

Press MENU/↵ to confirm.
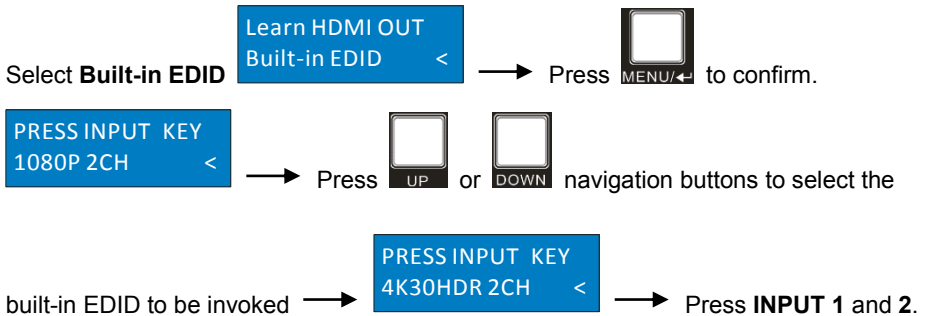
5.5 Audio Setting

The matrix switcher provides four analog L+R audio output ports and four digital SPDIF output ports for audio de-embedding. The audio source selection of these eight audio output ports, and the L+R audio volume can be controlled by the front panel buttons.

● **Audio Source Selection**

There are eight audio sources can be selected for any analog L+R audio output port, and twelve audio sources can be selected for any SPDIF audio output port.
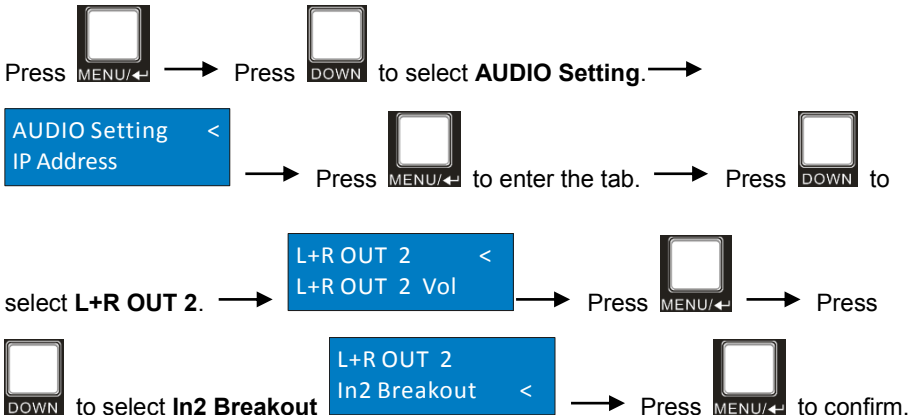
Audio Output Ports	Audio Sources		
	Input Breakout	**Output Breakout**	**ARC**
L+R OUT 1	In1 Breakout	Out1 Breakout	
L+R OUT 2	In2 Breakout	Out2 Breakout	
L+R OUT 3	In3 Breakout	Out3 Breakout	/
L+R OUT 4	In4 Breakout	Out4 Breakout	
SPDIF OUT 1	In1 Breakout	Out1 Breakout	Out1 ARC
SPDIF OUT 2	In2 Breakout	Out2 Breakout	Out2 ARC
SPDIF OUT 3	In3 Breakout	Out3 Breakout	Out3 ARC
SPDIF OUT 4	In4 Breakout	Out4 Breakout	Out4 ARC

Example: Select the HDMI input 2 audio source for the analog L+R output 2.

Press MENU/↵ → Press DOWN to select **AUDIO Setting**. →

 → Press MENU/↵ to enter the tab. → Press DOWN to

select **L+R OUT 2**. → → Press MENU/↵ → Press

DOWN to select **In2 Breakout** → Press MENU/↵ to confirm.

● **L+R Output Audio Volume Control**

Example: Set the audio volume of L+R OUT 2 port.

Press [MENU/↵] ⟶ Press [DOWN] to select **AUDIO Setting**. ⟶

AUDIO Setting   <
IP Address

⟶ Press [MENU/↵] to enter the tab. ⟶ Press [DOWN] to

select **L+R OUT 2 Vol**. ⟶

L+R OUT 2
L+R OUT 2 Vol   <

⟶ Press [MENU/↵] to enter the

setting tab. ⟶

L+R OUT 2 Vol
91

⟶ Press [UP] or [DOWN] to set the

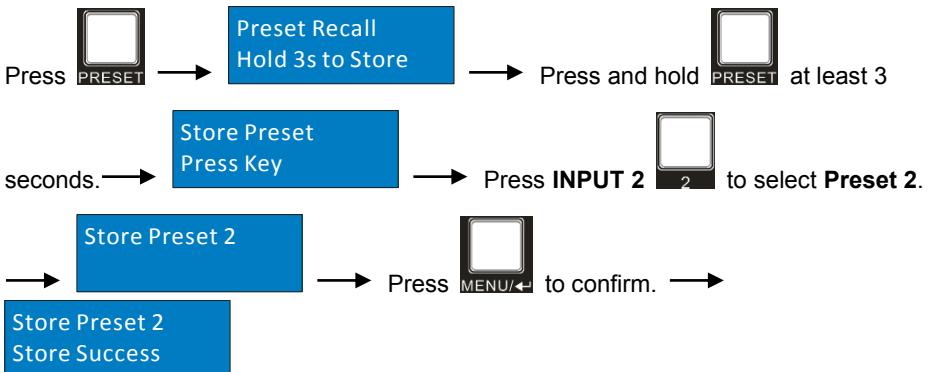volume value. ⟶ Press [MENU/↵] to confirm.
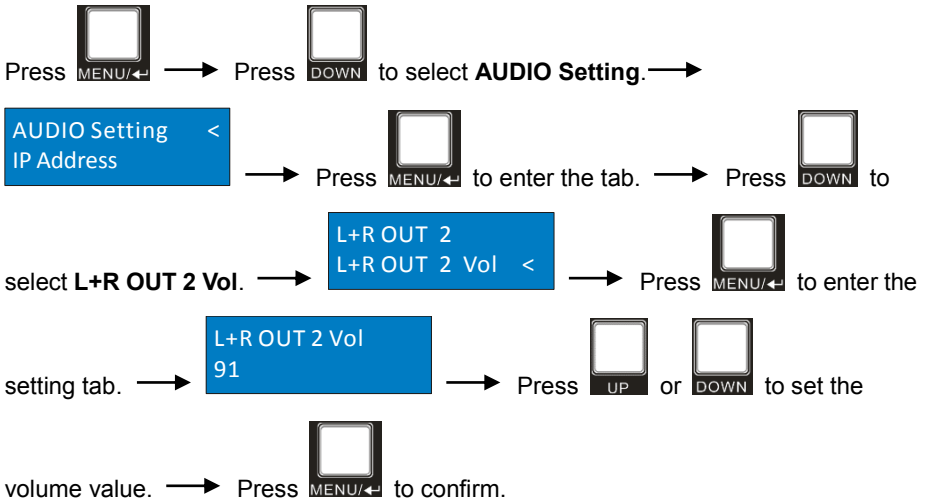
5.6 Preset Setting

Press **PRESET** button can save the current switching routing or load the saved layout preset.

Note: The matrix switcher supports nine presets, but only preset 1~4 can be saved and recalled by button control. Please manage other preset by GUI control or RS232 control.
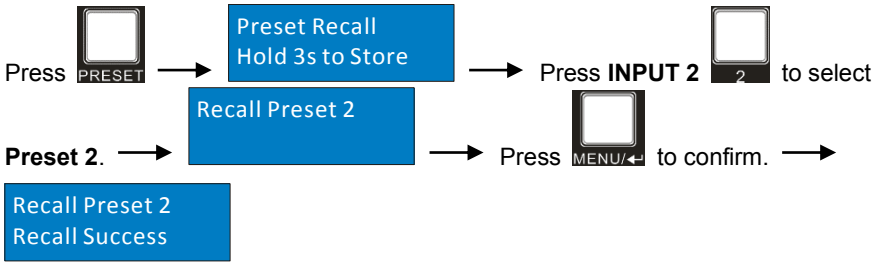
● **Save the current switching routing to a preset**

Example: Save the current switching routing to preset 2.

Press [PRESET] ⟶

Preset Recall
Hold 3s to Store

⟶ Press and hold [PRESET] at least 3

seconds. ⟶

Store Preset
Press Key

⟶ Press **INPUT 2** [2] to select **Preset 2**.

⟶

Store Preset 2

⟶ Press [MENU/↵] to confirm. ⟶

Store Preset 2
Store Success

● **Recall a saved preset**

Example: Recall the saved preset 2.

Press PRESET ⟶ | Preset Recall
Hold 3s to Store | ⟶ Press **INPUT 2** to select

Preset 2. ⟶ | Recall Preset 2 | ⟶ Press MENU/⏎ to confirm. ⟶

| Recall Preset 2
Recall Success |

5.7 IP Address Inquiry

Press MENU/⏎ ⟶ Press DOWN to select IP Address ⟶ | AUDIO Setting
IP Address   < |

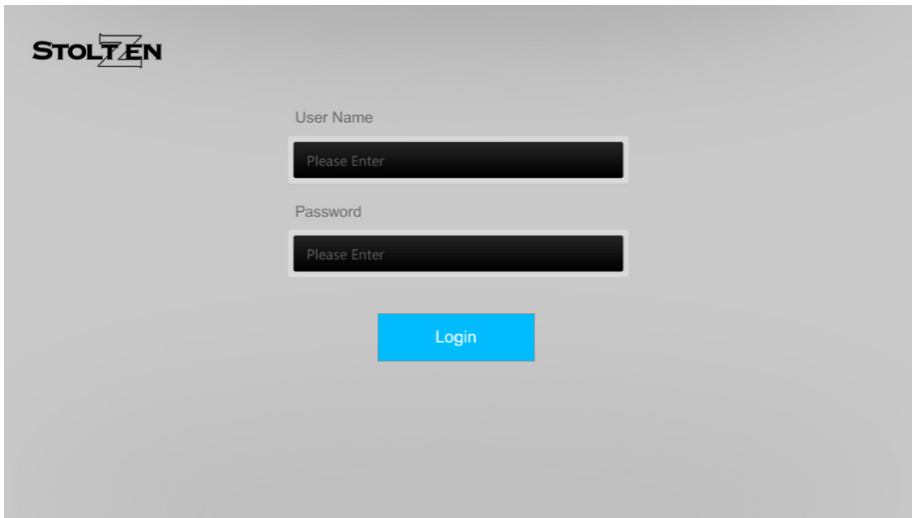⟶ Press MENU/⏎ ⟶ | IP Address
192.168.0.178 |
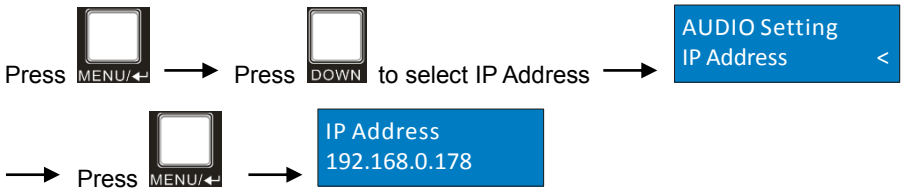
6. GUI Control

The switcher can also be controlled via TCP/IP. The default IP settings are:

IP Address: 192.168.0.178

Subnet Mask: 255.255.255.0

Type *192.168.0.178* in the internet browser, it will enter the below log-in webpage:

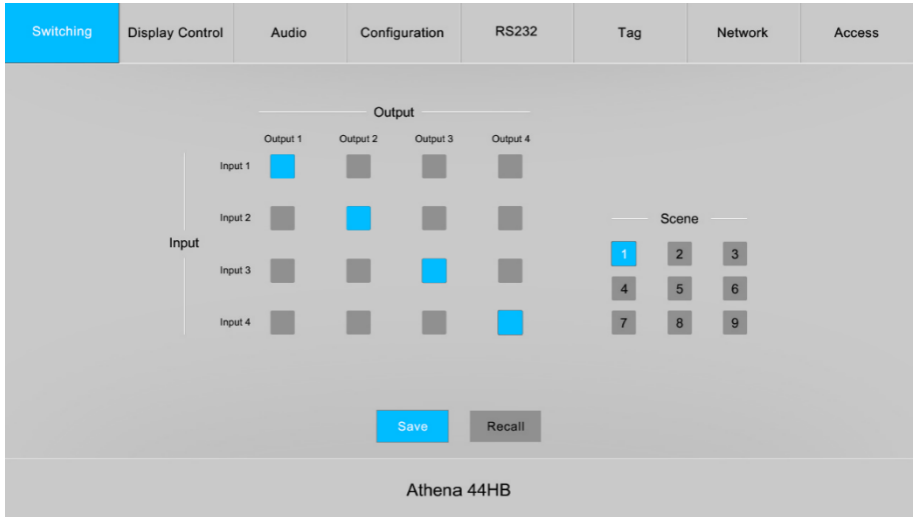There are two selectable usernames:

User Name	Password	Access Tab
admin	admin	All tabs
user	user	**Switching**, **Display Control** and **Audio** tabs

Here we login as "admin" as an example to introduce each GUI tab.

6.1 Signal Switching

Use the 4x4 button grid on the page to set which inputs are directed to which outputs. For example, clicking the button on the Input 1 row and Output 2 column, directs input 1 to output 2.

Use the 9 numbered buttons under scene area to save and load layout presets.

- To save a given layout, first click one of the numbered buttons, then click the **Save** button.
- To load a previously saved layout, first click one of the numbered buttons, then click the **Recall** button.

6.2 Display Control

If the input source devices, HDBaseT output devices and local HDMI output devices support CEC, they can be controlled via the following CEC interface.

1) Input Source Device Control
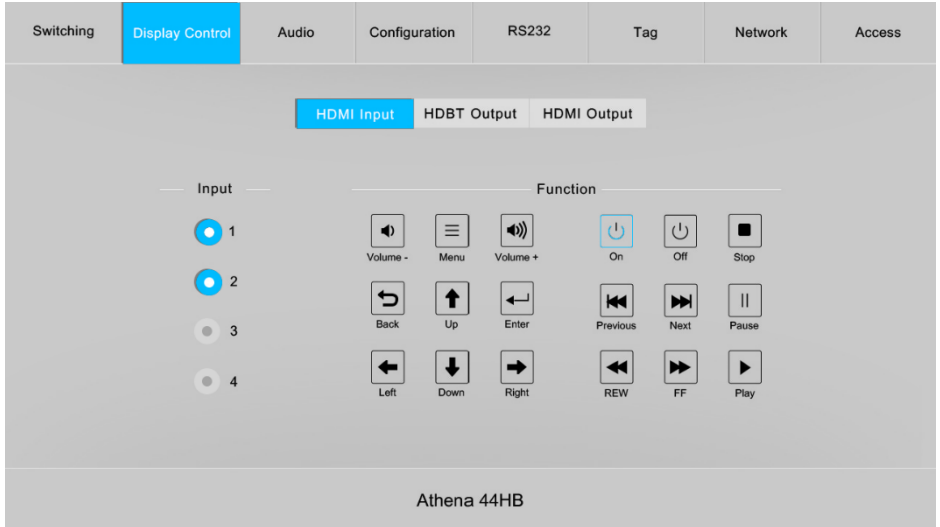
- Select one or several HDMI input source devices to be controlled, and then press function buttons.

2) HDBT Output Device Control
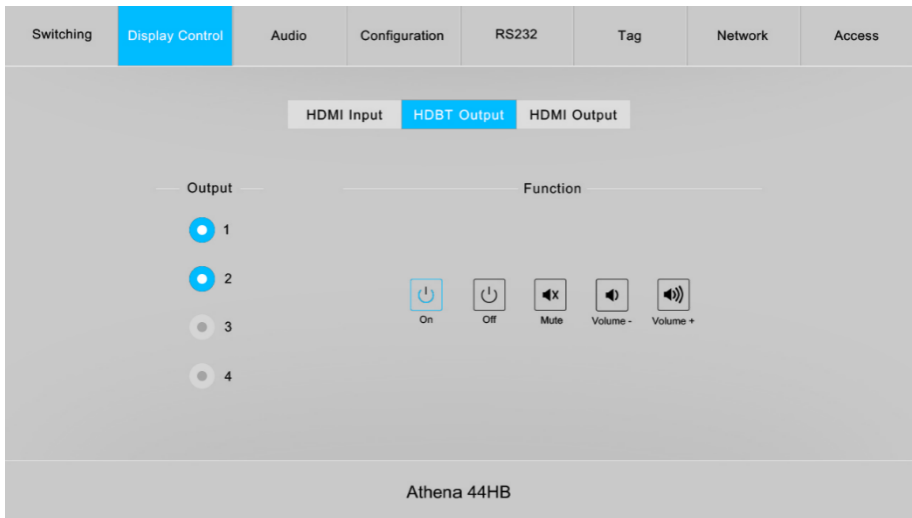
- Select one or several HDBaseT output devices to be controlled, and then press function buttons.

3) HDMI Output Device Control
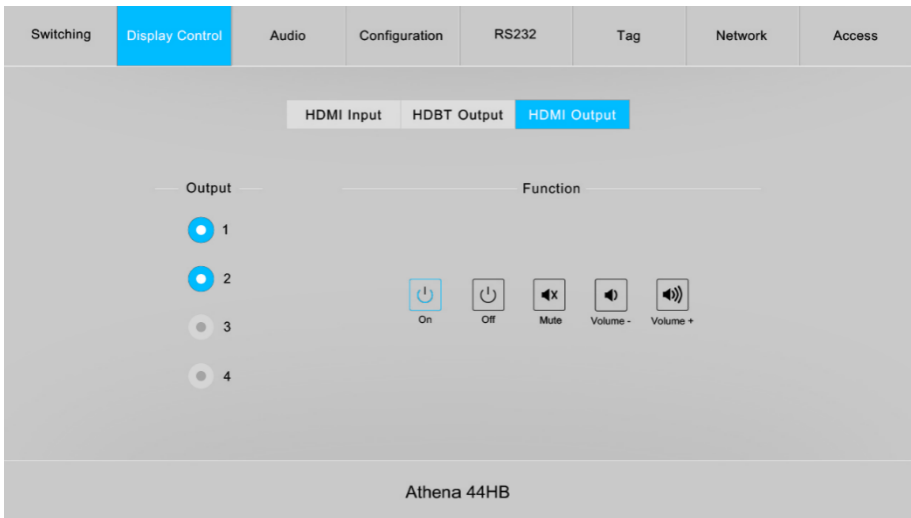
- Select one or several HDMI output devices to be controlled, and then press function buttons.

6.3 Audio Setting

● **Audio Source Selection**

- There are eight audio sources can be selected for four analog L+R audio output ports, and twelve audio sources can be selected for four digital SPDIF output ports.

● **L+R Output Audio Volume Control**

● Adjust L+R output audio volume by the volume bar and the three buttons on the right side.

6.4 Configuration

6.4.1 Down-scaling
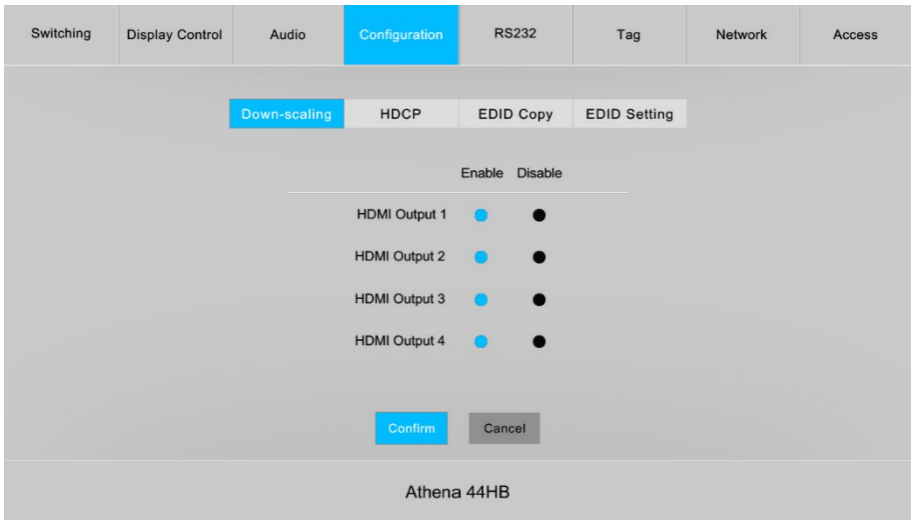
- Enable/disable video resolution down-scaling function of HDMI output 1~4 ports.

  When enable down-scaling, the 4K input can be automatically degraded to 1080p output for compatibility with 1080p display which is connected to the HDMI output port.

6.4.2 HDCP Setting
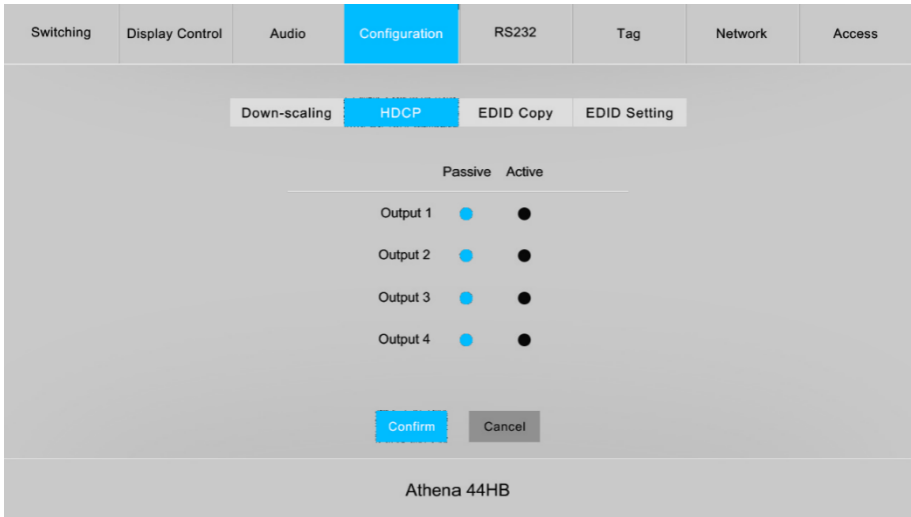
- Set the HDCP mode of HDMI and HDBaseT outputs to **Passive** or **Active**.

Mode	Description
Passive	Automatically follows the HDCP version of source device.
Active (Default)	● If the input video has HDCP content, the HDCP version of HDMI output is HDCP 1.4 for a greater display compatibility. ● If the input video has no HDCP content, the HDMI output has no HDCP.

Click **Confirm** to save any changes or click **Cancel** to cancel any changes that have been made.

6.4.3 EDID Copy

Switching	Display Control	Audio	Configuration	RS232	Tag	Network	Access

Down-scaling   HDCP   EDID Copy   EDID Setting

Input   Output

- 1   HDMI 1   HDBT 1
- 2   HDMI 2   HDBT 2

《《《

- 3   HDMI 3   HDBT 3
- 4   HDMI 4   HDBT 4

All   Confirm   Cancel

Athena 44HB
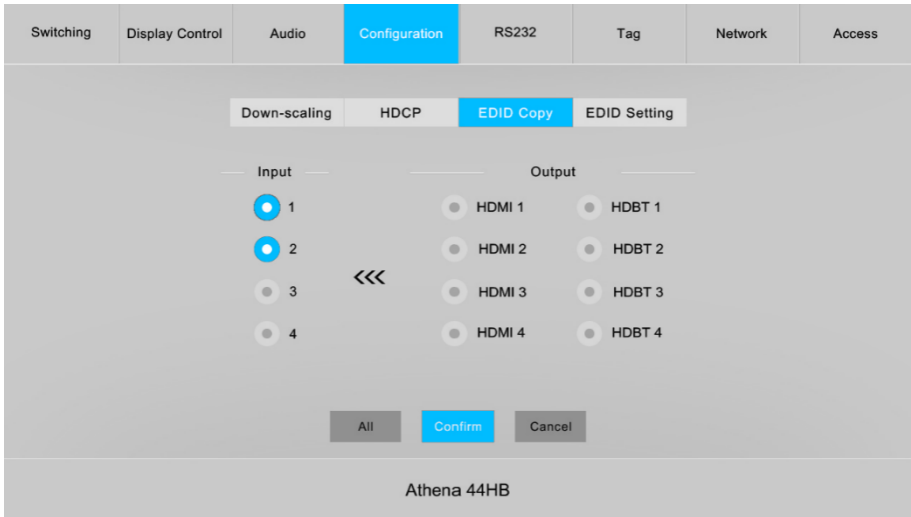
- Copy the EDID data from a single output port to one or several input ports.

Operation:

1) Select one output port.

2) Select one or several input ports. Press **ALL** to select all input ports.

3) Click **Confirm** to save any changes or click **Cancel** to cancel any changes that have been made.

6.4.4 EDID Setting

Click **EDID Setting** to enter the below section to set a predefined EDID for input ports.
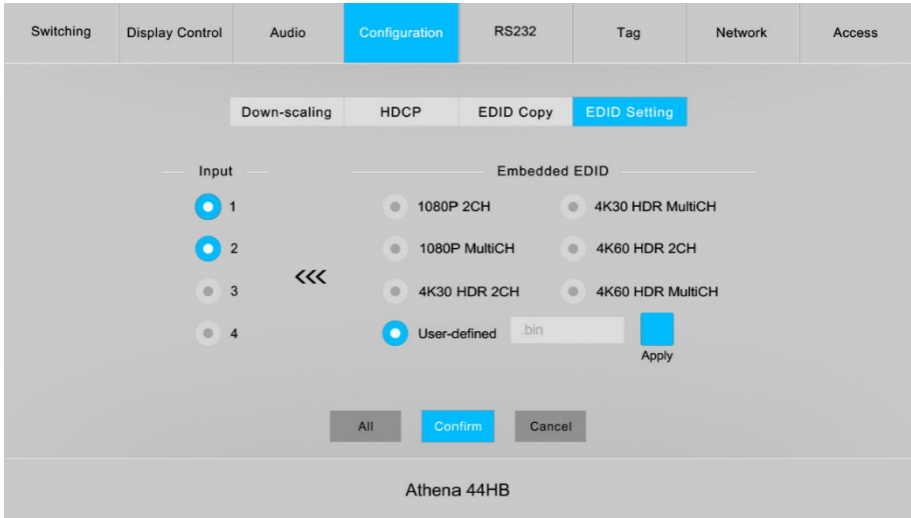
- Select a built-in EDID for one or several input ports.

Operation:

1) Select a built-in EDID.

2) Select one or several input ports. Press **ALL** to select all input ports.

3) Click **Confirm** to save setting.

- Upload user-defined EDID by the below steps:

1) Prepare the EDID file (.bin) on the control PC.

2) Select the **User-defined**.

3) Click the box .bin , and then select the EDID file (.bin) according the tooltip.

4) Click **Apply** to upload the user-defined EDID, and then click **Confirm** to save setting.

6.5 RS232 Control

Switching	Display Control	Audio	Configuration	RS232	Tag	Network	Access

Port

◉ HDBT 1　　○ HDBT 2　　○ HDBT 3　　○ HDBT 4

Baud Rate

◉ 2400　　○ 4800　　○ 9600　　○ 19200

○ 38400　　○ 57600　　○ 115200

Command

[ ]　　　Hex ◉

Send

Athena 44HB

- Send RS232 commands to control third-party devices which are connected to the far-end HDBaseT receivers.

Operation:

1) Select the HDBaseT port which is connected to HDBaseT receiver which must have third-party device attached.

2) Set the baud rate.

3) Typing the commands in the box to control the selected remote third-party device which is connected to HDBaseT receiver. If click the **Hex**, the RS232 commands can be typed with hexadecimal value.

4) Click **Send** to transmit RS232 command to the selected HDBaseT port.

6.6 Tag Setting

- Modify title bar label, LCD readout and button labels.

Click **Confirm** to save any changes or click **Cancel** to cancel any changes that have been made.

6.7 Network Setting

- Static IP or Dynamic Host Configuration Protocol (DHCP).
- Modify the static IP Address, Subnet Mask, and Gateway.

6.8 Access Setting

Switching	Display Control	Audio	Configuration	RS232	Tag	Network	Access

Credentials

Admin Password: admin

User Password: user

Front Panel Lock

ON ||| OFF

Version

GUI : V1.0.0
Firmware: V1.0.0

Confirm   Cancel

Athena 44HB
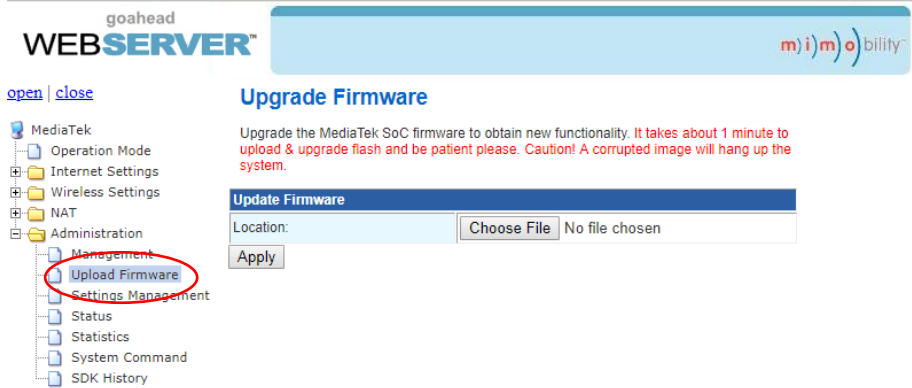
● Reset the login admin and user password.

● Lock or unlock the front panel buttons.

● Get the GUI and firmware version.

Click **Confirm** to save any changes or click **Cancel** to cancel any changes that have been made.

6.9 GUI Upgrade

Please visit at http://192.168.0.178:100 for GUI online upgrade.

Type the username and password (the same as the GUI log-in setting, modified password will be available only after rebooting) to login the configuration interface. After that, click **Administration** in the source menu to get to **Upload Firmware** as shown below:

Select the update file and click **Apply** button, and then it will start upgrade process.

7. IR Control

7.1 IR Remote Control

The matrix switcher has a built-in IR sensor on the front panel for receiving IR control signal from IR remote. In addition, it also provides IR EYE port on the rear panel to connect an external IR receiver for IR local control.

The matrix switcher can be controlled by the below IR Remote:

①   Enter/exit standby mode.

②   Blinking red when a button is pressed.

③   Video source selection buttons.

④   Output channel selection buttons.

⑤   Menu buttons:

- ALL: Select all inputs or all outputs.

- EDID: Enable one or several input sources to manually capture and learn the EDID data of output device.

- CLEAR: Cancel the current operation, if ENTER has not been pressed.

- ENTER: Confirm the desired operation.

Note: The IR receivers which are connected to HDBaseT receivers also can receive the IR signal of the IR remote, so the matrix switcher also can be controlled by the IR remote at the far-end HDBaseT receivers' position. The IR remote-control mode can be enabled or disabled by sending RS232 command "IRRCM[XX]ON."/ "IRRCM[xx]OFF." ([XX]=00~04). Please refer to the 8.3.1 System Control for more details.

7.2 IR Pass-through Control

The matrix switcher supports bi-directional IR pass-through, allowing the devices can be controlled by both source and destination ends. This section provides connection and switching examples to illustrate possible configurations.

7.2.1 Control Local Input Device from Remote

The same basic principle applies when controlling the local input device from the remote location.

● **Control local input device through IR OUT port**

Example: Switch HDMI input 3 to HDBaseT output 4.

Connect an IR receiver to **IR IN** port on the receiver, then connect an IR emitter to the **IR OUT 3** on the matrix switcher. The third input source can be controlled through its corresponding IR output port. The connection diagram shown as below:
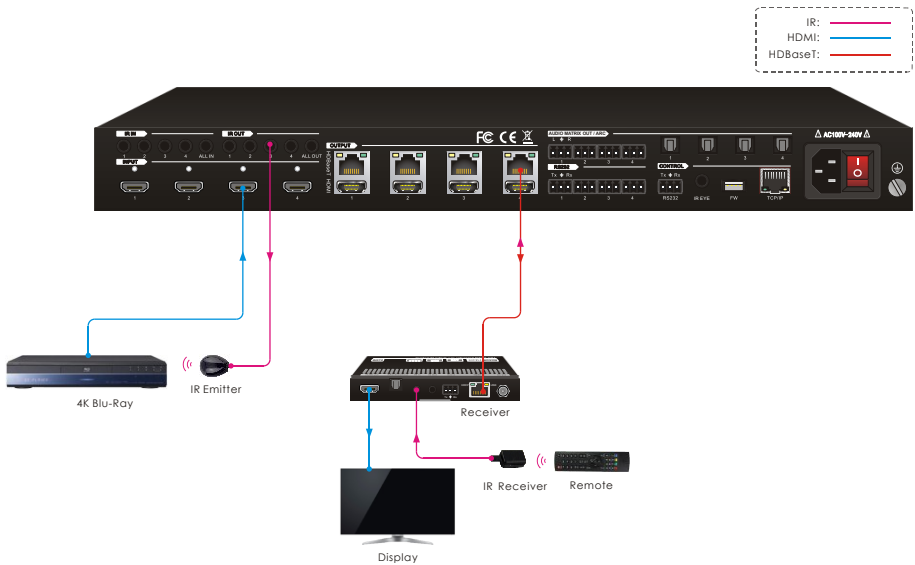
● **Control local input device through IR ALL OUT port**

The emitter can be connected to the **IR ALL OUT** port on matrix switcher to control all local input devices. In this case, the IR receiver must be connected to the **IR IN** port on each connected HDBaseT receiver, as shown in the diagram below:
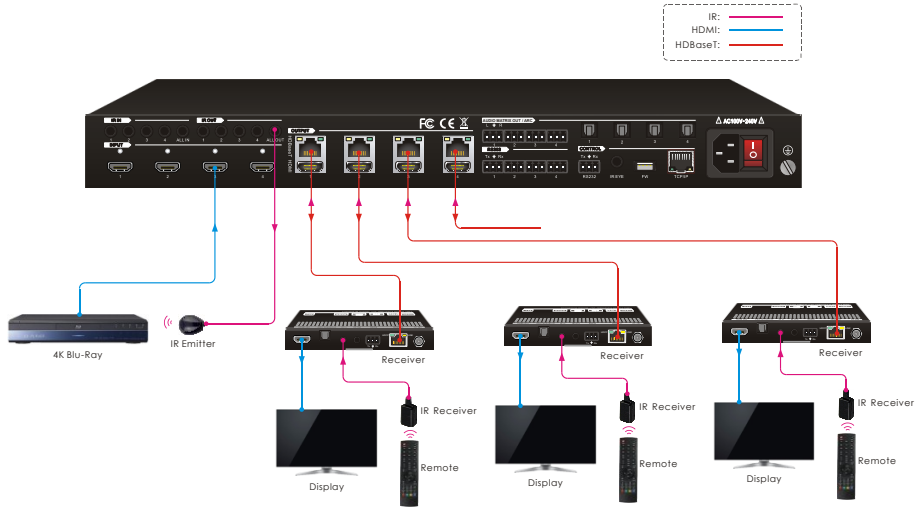
7.2.2 Control Remote Output Device from Local

The remote displays can be controlled from the local matrix switcher location.

● **Control remote device through IR IN port**

Example: Switch HDMI input 3 to HDBaseT output 3.

Connect an IR receiver to **IR IN 3** port on the matrix switcher, then connect an IR emitter to the **IR OUT** on the receiver, as shown in the diagram below:
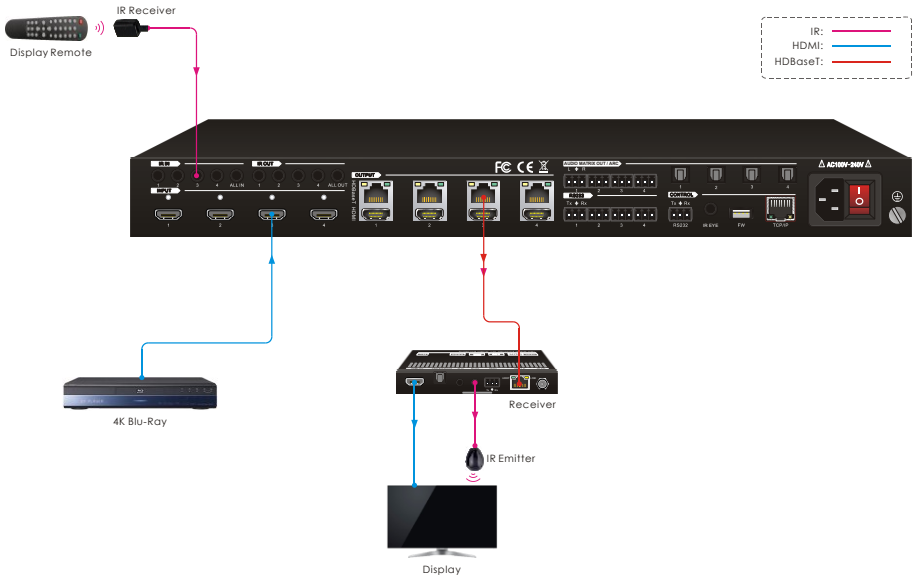
● **Control remote device through IR ALL IN port**

The receiver can be connected to the **IR ALL IN** port on matrix switcher to control all remote output devices. In this case, the IR emitter must be connected to the **IR OUT** port on each connected HDBaseT receiver, as shown in the diagram below:
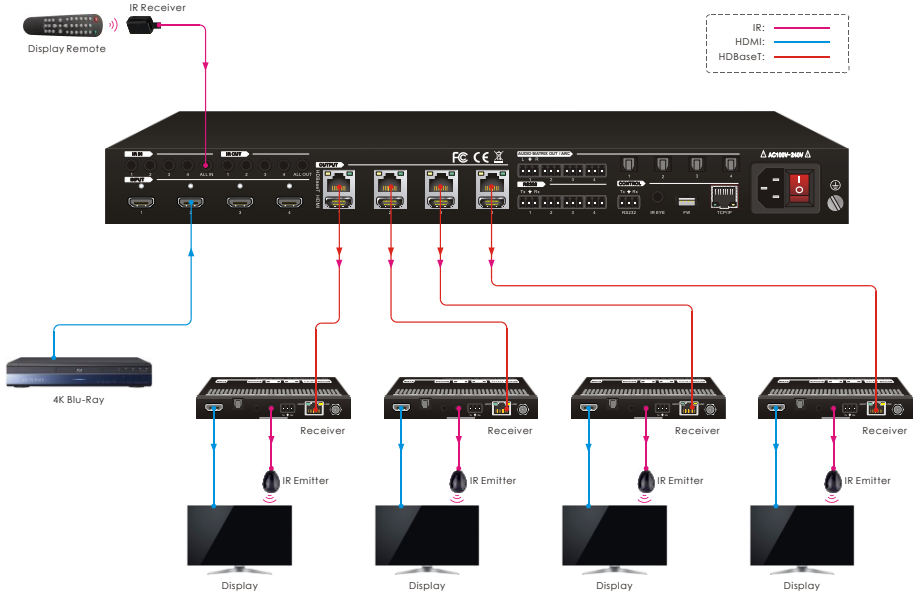
8. RS232 Control

8.1 RS232 Control Connection

8.1.1 Control the Matrix Switcher from Local

To control the matrix switcher from a local PC, the **3-pin to DB9 RS232 Cable** is used to connect between the matrix and PC. The connection diagram is shown as below:

PC
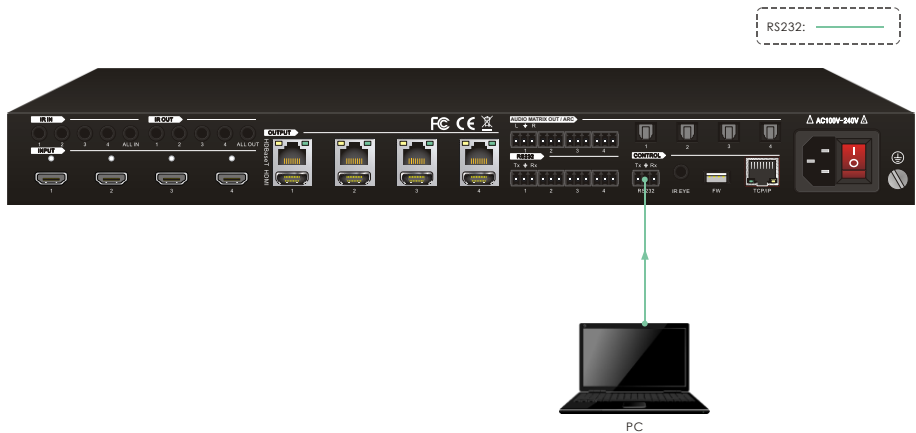
8.1.2 Control the Matrix Switcher from Remote

To control the matrix switcher from remote location, please connect one or more PCs to the **RS232** ports of HDBaseT receivers with the **3-pin to DB9 RS232 Cables**. The matrix switcher can be controlled by any one of PCs, the connection diagram is shown as below:
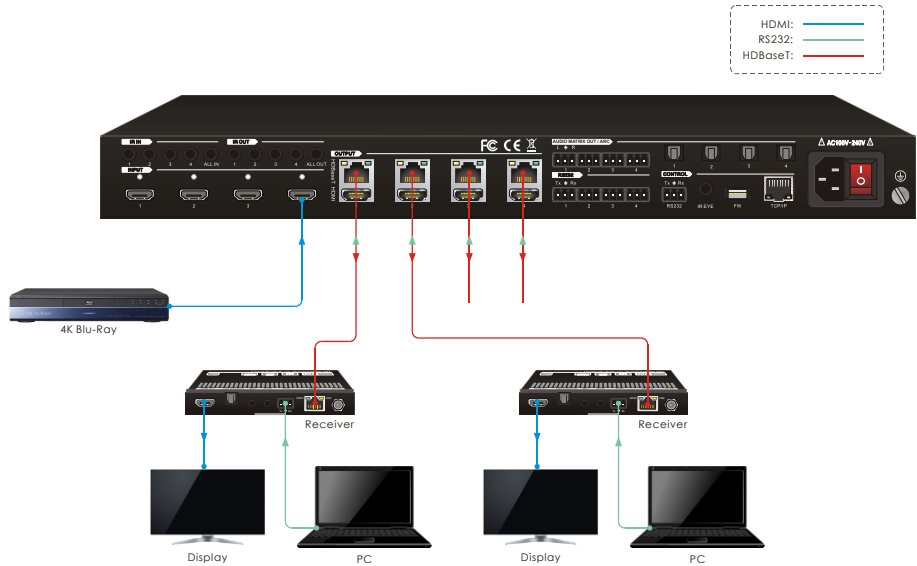
Note: The command "RS232RCM[XX]ON." ([XX]=00~04) needs to be sent to enable or disable this control mode. For example, send the command "RS232RCM00ON." to enable the remote-control mode for all HDBaseT outputs, and send the command "RS232RCM00OFF." to disable the remote-control mode for all HDBaseT outputs. Please refer to the 8.3.1 System Control for more details.

8.1.3 Control the Remote Third-party Device from Local

To control a third-party device from local, first determine which HDBaseT receiver is connected to (1 in the diagram below). Next, connect a PC to the corresponding **RS232** port of matrix switcher with **3-pin to DB9 RS232 Cable**, then connect a third-party device (e.g. projector) to the **RS232** port of the determined HDBaseT receiver. The remote third-party device can be controlled by the local PC, the connection diagram is shown as below:
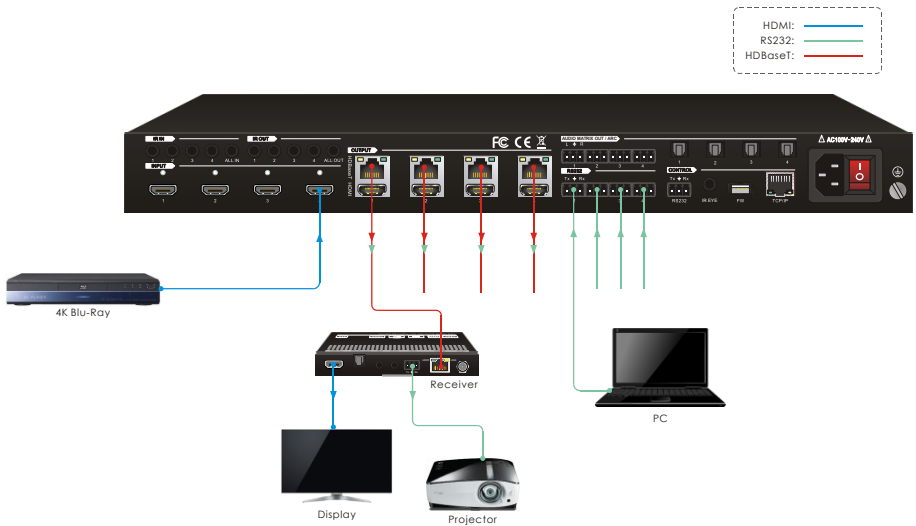
8.1.4 Control the Local Third-party Device from Remote

To control a third-party device from remote, first determine which HDBaseT receiver is connected to (1 in the diagram below). Next, connect a PC to the **RS232** port of HDBaseT receiver with **3-pin to DB9 RS232 Cable**, then connect a third-party device (e.g. projector) to the **RS232** port of matrix switcher. The local third-party device can be controlled by the remote PC, the connection diagram is shown as below:
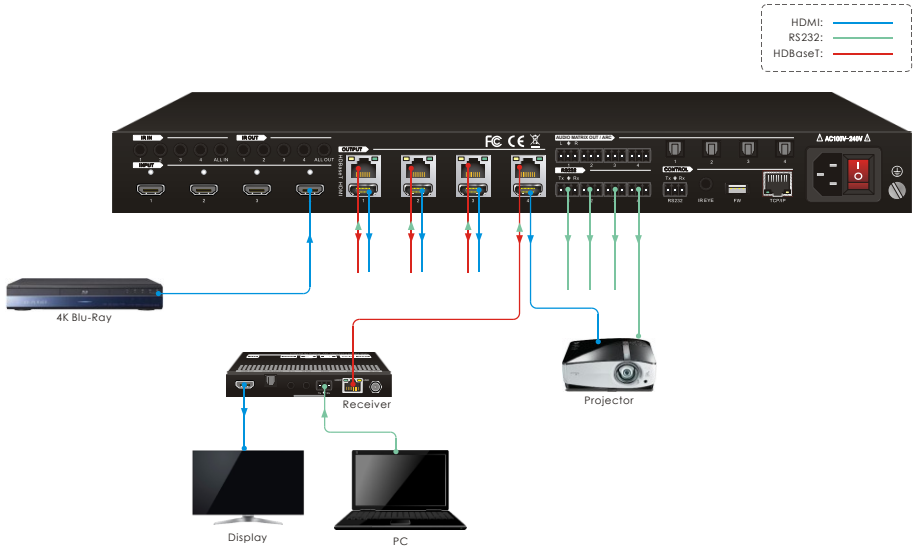
8.2 RS232 Control Software

If the matrix switcher and third-party devices needs to be controlled from PC by an RS232 connection, a RS232 control software should be installed in PC. Here using **CommWatch.exe** as an example. The icon is shown as below:

Double-click the icon to run, and its interface is depicted below:
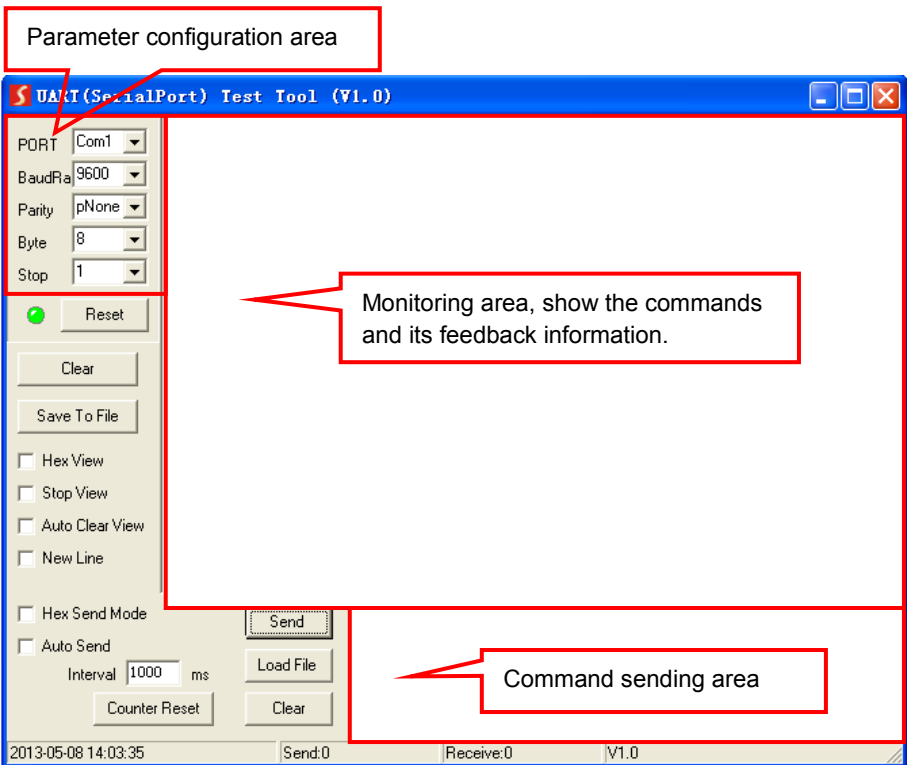
Please set the parameters of COM number, bound rate, data bit, stop bit and the parity bit correctly, and then you are able to send command in command sending area.

8.3 RS232 Commands

When controlling the matrix, the serial port settings for all RS232 commands is:

Baud rate: 9600   Data bit: 8   Stop bit: 1   Parity bit: none

All commands need to be ended with "<CR><LF>".

The matrix switcher can be controlled by sending the following RS232 commands:

8.3.1 System Setting and Query

Command	Description	Command Example and Feedback
#SET_POWER X	power on/power off X=0~1 0，OFF 1，ON	#SET_POWER 1
		@POWER 1 @HDBT Power ON @KEYPAD_LOCK 0
#GET_MATRIX_N AME	Get Matrix Name	#GET_MATRIX_NAME
		@Athena 44HB
#GET_MATRIX_TY PE	Get Matrix Type	#GET_MATRIX_TYPE
		@HDBaseT Matrix
#GET_FIRMWARE _VERSION	Query Control's soft version and Video's soft version	#GET_FIRMWARE_VERSION
		@V1.0.3 @CPLD:V1.0.0 @VideoDriverVersion:V1.0.3
#FACTORY_RESE T	Reset to factory default	#FACTORY_RESET
		@Factory Default
#GET_SYSINFO	Query all statues and settings	#GET_SYSINFO
		@GUI Or RS232 Query Status: @HDBaseT Matrix @Athena 44HB @V1.0.3 @POWER 1 @HDBT Power ON @KEYPAD_LOCK 0 @RS232_BAUD 9600 @192.168.0.178 @Switch Input 3 to Output 1 @Switch Input 3 to Output 2 @Switch Input 3 to Output 3 @Switch Input 3 to Output 4 @Turn ON 5V On HDBT O1

Command	Description	Command Example and Feedback
		@Turn ON 5V On HDBT O1
		@Turn ON 5V On HDBT O1
		@Turn ON 5V On HDBT O1
		@Turn ON 5V On HDMI O1
		@Turn ON 5V On HDMI O1
		@Turn ON 5V On HDMI O1
		@Turn ON 5V On HDMI O1
		@HDMI OUT 1 Down Scale ON
		@HDMI OUT 2 Down Scale ON
		@HDMI OUT 3 Down Scale ON
		@HDMI OUT 4 Down Scale ON
		@RS232 Remote 01 Control MCU OFF
		@RS232 Remote 02 Control MCU OFF
		@RS232 Remote 03 Control MCU OFF
		@RS232 Remote 04 Control MCU OFF
		@IR Remote 01 Control MCU ON
		@IR Remote 02 Control MCU ON
		@IR Remote 03 Control MCU ON
		@IR Remote 04 Control MCU ON
		@Switch HDMI Input 2 Audio to Analog Output 1
		@Analog Output 1 Volume Mute
		@Analog Output 1 Volume at 60
		@Switch HDMI Input 4 Audio to Analog Output 2
		@Analog Output 2 Volume UnMute
		@Analog Output 2 Volume at 56
		@Switch HDMI Output 1 Audio to Analog Output 3
		@Analog Output 3 Volume UnMute
		@Analog Output 3 Volume at 57
		@Switch HDMI Output 3 Audio to Analog Output 4
		@Analog Output 4 Volume UnMute
		@Analog Output 4 Volume at 60
		@Switch HDMI Input 4 Audio to SPDIF Output 1
		@Switch HDMI Input 4 Audio to SPDIF Output 2
		@Switch HDMI Input 4 Audio to SPDIF Output 3
		@Switch HDMI Input 4 Audio to SPDIF Output 4
		@IR Follow Video ON
		@Switch Remote IR Input 1 to Local IR Output 3
		@Switch Remote IR Input 2 to Local IR Output 3
		@Switch Remote IR Input 3 to Local IR Output 3
		@Switch Remote IR Input 4 to Local IR Output 3

Command	Description	Command Example and Feedback
		@IN 1 2 3 4
		@LINK Y Y Y Y
		@OUT 1 2 3 4 5 6 7 8
		@LINK Y N N Y Y Y Y Y
		@H1 EDID From 05 Internal EDID
		@H2 EDID From 05 Internal EDID
		@H3 EDID From 05 Internal EDID
		@H4 EDID From 05 Internal EDID
		@HDBT Output 1 HDCP BYPASS
		@HDBT Output 2 HDCP BYPASS
		@HDBT Output 3 HDCP BYPASS
		@HDBT Output 4 HDCP BYPASS
		@HDMI Output 1 HDCP BYPASS
		@HDMI Output 2 HDCP BYPASS
		@HDMI Output 3 HDCP BYPASS
		@HDMI Output 4 HDCP BYPASS
#SET_KEYPAD_LOCK X	Unlock/Lock front keypad X=0~1 0 - Unlock 1 - Lock	#SET_KEYPAD_LOCK 1
		@KEYPAD_LOCK 1
#SET_GUI_IP:XXX .XXX.XXX.XXX	Set GUI IP	#SET_GUI_IP:192.168.0.178
		@GUI_IP:192.168.0.178
#GET_GUI_IP	Query GUI IP	#GET_GUI_IP
		@192.168.0.178
#SET_RS232_BAUD X	X =3 ~ 7 3 - 9600 4 - 19200 5 - 38400 6 - 57600 7 - 115200	#SET_RS232_BAUD 3
		@RS232_BAUD 9600
#STA_POUT	Query HDMI/HDBT outputs 5V Statue	**#STA_POUT**
		@Turn ON 5V On HDBT O1
		@Turn ON 5V On HDBT O1
		@Turn ON 5V On HDBT O1
		@Turn ON 5V On HDBT O1
		@Turn ON 5V On HDMI O1
		@Turn ON 5V On HDMI O1
		@Turn ON 5V On HDMI O1
		@Turn ON 5V On HDMI O1

Command	Description	Command Example and Feedback
#STA_PHDBT	Query PoC out statue of HDBT	#STA_PHDBT
		@HDBT Power ON
#STA_DS	Query statue of HDMI outputs downscale	#STA_DS
		@HDMI OUT 1 Down Scale OFF
		@HDMI OUT 2 Down Scale OFF
		@HDMI OUT 3 Down Scale OFF
		@HDMI OUT 4 Down Scale OFF
#STA_RS232RCM	Query Remote RX RS232 Control MCU Statue	#STA_RS232RCM
		@RS232 Remote 01 Control MCU OFF
		@RS232 Remote 02 Control MCU OFF
		@RS232 Remote 03 Control MCU OFF
		@RS232 Remote 04 Control MCU OFF
#STA_IRRCM	Query Remote RX IR IN Control MCU Statue	#STA_IRRCM
		@IR Remote 01 Control MCU ON
		@IR Remote 02 Control MCU ON
		@IR Remote 03 Control MCU ON
		@IR Remote 04 Control MCU ON
#STA_IN	Query HDMI Input 5V	#STA_IN
		@IN 1 2 3 4
		@LINK N N N Y
#STA_OUT	Query HDBT/HDMI output HPD 1-4: HDBT out 1-4 5-8: HDMI out 1-4	#STA_OUT
		@OUT 1 2 3 4 5 6 7 8 @LINK N N N Y N N N N
#STA_VIDEO	Query HDMI input of Output's Video	#STA_VIDEO
		@Switch Input 1 to Output 1
		@Switch Input 1 to Output 2
		@Switch Input 1 to Output 3
		@Switch Input 1 to Output 4
#STA_HDCP	Query All HDMI/HDBT HDCP	#STA_HDCP
		@HDBT Output 1 HDCP BYPASS
		@HDBT Output 2 HDCP BYPASS
		@HDBT Output 3 HDCP BYPASS
		@HDBT Output 4 HDCP BYPASS
		@HDMI Output 1 HDCP BYPASS
		@HDMI Output 2 HDCP BYPASS
		@HDMI Output 3 HDCP BYPASS
		@HDMI Output 4 HDCP BYPASS
#STA_ANALOG	Query statue of analog	#STA_ANALOG

Command	Description	Command Example and Feedback
	outputs	@Switch HDMI Input 1 Audio to Analog Output 1
		@Analog Output 1 Volume UnMute
		@Analog Output 1 Volume at 60
		@Switch HDMI Input 2 Audio to Analog Output 2
		@Analog Output 2 Volume UnMute
		@Analog Output 2 Volume at 60
		@Switch HDMI Input 3 Audio to Analog Output 3
		@Analog Output 3 Volume UnMute
		@Analog Output 3 Volume at 60
		@Switch HDMI Input 4 Audio to Analog Output 4
		@Analog Output 4 Volume UnMute
		@Analog Output 4 Volume at 60
#STA_SPDIF	Query statue of SPDIF outputs	#STA_SPDIF
		@Switch HDMI Input 1 Audio to SPDIF Output 1
		@Switch HDMI Input 2 Audio to SPDIF Output 2
		@Switch HDMI Input 3 Audio to SPDIF Output 3
		@Switch HDMI Input 4 Audio to SPDIF Output 4
#STA_IR	Query statue of IR outputs	#STA_IR
		@IR Follow Video ON
		@Switch Remote IR Input 1 to Local IR Output 1
		@Switch Remote IR Input 2 to Local IR Output 2
		@Switch Remote IR Input 3 to Local IR Output 3
		@Switch Remote IR Input 4 to Local IR Output 4
#PresetSta[xx]	query the switch setting of Preset, [xx] preset number, 01-09.	#PresetSta01
		@Preset 01 Sta:
		@O1 H1
		@O2 H1
		@O3 H1
		@O4 H1

8.3.2 Signal Switching

Command	Description	Command Example and Response
#IRFVON	IR switch follow with Video's switch	#IRFVON
		@IR Follow Video ON
#IRFVOFF	IR switch not follow with Video's switch	#IRFVOFF
		@IR Follow Video OFF
#SET IRRI[xx] [YY]	IR switching commands:	#SET IRRI1 IRLO3
		#SET IRRIA IRLO3
		@Switch Remote IR input 1 to local

Command	Description	Command Example and Response
		IR output 3
		@Switch all Remote IR inputs to
		local IR output 3
#IRRCM[xx]ON	Open HDBT Remote RX IR IN Control MCU. [xx]:00-04, 00:all RX's, 01-04:RX1-RX4.	#IRRCM00ON
		@IR Remote 01 Control MCU ON @IR Remote 02 Control MCU ON @IR Remote 03 Control MCU ON @IR Remote 04 Control MCU ON
#IRRCM[xx]OFF	Close HDBT Remote RX IR IN Control MCU. [xx]:00-04, 00:all RX's, 01-04:RX1-RX4.	#IRRCM00OFF
		@IR Remote 01 Control MCU OFF @IR Remote 02 Control MCU OFF @IR Remote 03 Control MCU OFF @IR Remote 04 Control MCU OFF
#PHDBTON	HDBT OUT PoC POWER ON	#PHDBTON
		@HDBT Power ON
#PHDBTOFF	HDBT OUT PoC POWER OFF	#PHDBTOFF
		@HDBT Power OFF
#PresetSave[xx]	Save this Preset [xx] presets number, 01-09.	#PresetSave01
		@Preset 01 Save Success @Preset 01 Sta: @O1 H1 @O2 H1 @O3 H1 @O4 H1
#PresetRecall[xx]	Recall this Preset [xx] presets number, 01-09.	#PresetRecall02
		@Preset 03 Recall: @Switch Input 2 to Output 1 @Switch Remote IR Input 1 to Local IR Output 2 @Switch Input 1 to Output 2 @Switch Remote IR Input 2 to Local IR Output 1 @Switch Input 2 to Output 3 @Switch Remote IR Input 3 to Local IR Output 2 @Switch Input 2 to Output 4 @Switch Remote IR Input 4 to Local IR Output 2

Command	Description	Command Example and Response
#@HDMI O1 **#@HDBT O1** **#@HDMI OA** **#@HDBT OA**	Turn on HDMI/HDBT output 5V. [xx]:HDMI/HDBT Output OA ,all HDMI/HDBT Outputs O1-O4:HDBT/HDMI Output 1-4	#@HDMI O1 @Turn ON 5V On HDMI O1
#$HDMI O1 **#$HDBT O1** **#$HDMI OA** **#$HDBT OA**	Turn off HDMI/HDBT Output 5V. [xx]:HDMI/HDBT output OA, all HDMI/HDBT Outputs O1-O4:HDBT/HDMI Output 1-4	#$HDBT O1 @Turn OFF 5V On HDBT O1

8.3.3 Video and Audio Setting

Command	Description	Command Example and Response
#SET [XX] [YY]	Video switching commands, [XX] is for HDMI inputs: H1, H2, H3, H4. [YY] is for HDMI outputs: O1, O2, O3, O4, OA (all outputs)	#SET H1 O2 #SET H1 OA @Switch Input 1 to Output 2 @Switch Input 1 to Output 1 @Switch Input 1 to Output 2 @Switch Input 1 to Output 3 @Switch Input 1 to Output 4
#SET SPDIF [XX] [YY]	SPDIF audio: [XX] is for HDMI inputs: H1, H2, H3, H4; outputs: O1, O2, O3, O4 ARC from SHE615R: ARC1, ARC2, ARC3,ARC4 [YY] is for SPDIF outputs: S1, S2, S3, S4,SA (all outputs)	#SET SPDIF H1 S1 #SET SPDIF O1 S1 #SET SPDIF ARC1 SA @Switch HDMI Input 1 Audio to SPDIF Output 1 @Switch HDMI output 1 Audio to SPDIF Output 1 @Switch ARC 1 audio to all SPDIF outputs
#SET ANALOG [XX] [YY]	ANALOG audio: [XX] is for HDMI inputs: H1, H2, H3, H4; outputs: O1, O2, O3, O4 [YY] is for Analog outputs: A1, A2, A3, A4, AA (all outputs)	# SET ANALOG H1 A1 @Switch HDMI Input 1 audio to Analog output 1
#[XX] VOLUME [YY]	Volume adjustable [XX] is for ANALOG outputs: A1,	#A1 VOLUME V+ #AA VOLUME 60

	A2, A3, A4. [YY]=="V+" volume up [YY]=="V-" volume up [YY]=="MU":mute [YY]=="UM":unmute [YY]==00-100, volume value	@Analog Output 1 volume up @All Analog Outputs volume at 66

8.3.4 EDID Management

Command	Description	Command Example and Response
#EDIDMInit	Reset factory default EDID to all input ports.	#EDIDMInit
		@All Input EDID Set Default
#EDIDUpgrade [xx]	Upgrade the EDID data of the input port [XX]. [XX]=H1, H2, H3, H4, HA, UD. [XX]=HA, represents all inputs. [XX]=H1~H4, represents HDMI input 1~4. [XX]=UD, upload a user-defined EDID. The EDID can be saved for invoking at any time. When the command applied, system prompts to upload the EDID file (.bin). Operation will be cancelled in 10 seconds. Please disconnect HDBT connection before sending command to ensure the data can be received successfully.	#EDIDUpgrade H1 #EDIDUpgrade UD
		@H1 Upgrade OK By RS232 Or GUI @User Define EDID Upgrade OK By RS232 Or GUI
#EDID [xx] [yy]	The input [XX] recall the embedded EDID [YY]. [XX]=H1, H2, H3, H4, HA. The "HA" represents all inputs. [YY]=01~07. [YY] EDID 01 1080p 2CH 02 1080p MultiCH 03 4K@30Hz HDR 2CH 04 4K@30Hz HDR MultiCH 05 4K@60Hz HDR 2CH	#EDID H3 01
		@H3 EDID Upgrade OK By 01 Internal EDID

Command	Description	Command Example and Response
	06 4K@60Hz HDR MultiCH 07 User-defined EDID	
#EDIDM [xx] [yy]	Copy the EDID data of output [XX] to input [YY]. [XX]=HDMI O1 ~ O4,HDBT O1 ~ O4; [YY]=H1,H2, H3, H4, HA.	#EDIDM HDMI O1　H1 #EDIDM HDMI O1　HA #EDIDM HDBT O1 H1 #EDIDM HDBT O1 HA @H1 EDID Copy from HDMI O1
#/+[X]/[yy]:xxx **#/+[X]/HDBT O1:xxx** **#/+[X]/HDBT OA:xxx**	send data to remote RX [X]: baudrate 1—2400; 2--4800; 3--9600; 4--19200; 5--38400; 6--57600; 7--115200; yy: HDBT outputs, HDBT OA: all HDBT outputs, HDBT O1-HDBT O4:HDBT output 1-HDBT output 4	#/+3/01:123456 @123456
#CMDON/+[X]/[yy]:xxx **#CMDON/+[X]/HDBT O1:xxx** **#CMDON/+[X]/HDBT OA:xxx**	First into POWON statue auto sent data to remote [X] baudrate 1--2400；2--4800； 3--9600；4--19200；5--38400； 6--57600；7--115200； yy: HDBT outputs, HDBT OA: all HDBT outputs, HDBT O1- HDBT O4: HDBT output 1-HDBT output 4	#CMDON/+3/01:123456 Remote:123456 Local:@HDBT O1 CMD_ON Save Success
#CMDOFF/+[X]/HDBT O1:xxx **#CMDOFF/+[X]/HDBT OA:xxx**	First into POWOFF statue auto sent data to remote [X] baudrate 1--2400；2--4800； 3--9600；4--19200；5--38400； 6--57600；7--115200； yy: HDBT outputs, HDBT OA: all HDBT outputs, HDBT O1-HDBT O4:HDBT output 1-HDBT output　4	#CMDOFF/+3/01:123456 Remote:123456 Local:@HDBT O1 CMD_OFF Save Success
#EDIDSTA[xx] **#EDIDSTA H1** **#EDIDSTA HA**	Query the HDMI inputs EDID setting [xx] HDMI inputs， HA: all inputs， H1-H4: HDMI input 1-4	#EDIDSTAHA @H1 EDID From 01 Internal EDID @H2 EDID From 01 Internal EDID

Command	Description	Command Example and Response
	Note： 1.If user defined EDID is empty, then use it will show the default EDID. 2.if EDID from "#EDIDUpgrade" will show "user define EDID "	@H3 EDID From 01 Internal EDID @H4 EDID From 01 Internal EDID

8.3.5 Down-Scaling and RS232 Setting

Command	Description	Command Example and Response
#SET [XX] DS ON	Set local HDMI output down scale OFF [XX] is for HDMI O1, HDMI O2, HDMI O3, HDMI O4, HDMI OA (all HDMI outputs)	#SET HDMI O1 DS ON
		@HDMI OUT 1 Down Scale ON
#SET [XX] DS OFF	Set local HDMI output down scale OFF [XX] is for HDMI O1, HDMI O2, HDMI O3, HDMI O4, HDMI OA (all HDMI outputs)	#SET HDMI O1 DS OFF
		@HDMI OUT 1 Down Scale OFF
#RS232RCM[xx]ON	Open HDBT Remote RX RS232 Control MCU。 [xx]:00-04, 00:all RX's， 01-04:RX1-RX4。	#RS232RCM00ON
		@RS232 Remote 01 Control MCU ON @RS232 Remote 02 Control MCU ON @RS232 Remote 03 Control MCU ON @RS232 Remote 04 Control MCU ON
#RS232RCM[xx]OFF	Close HDBT Remote RX RS232 Control MCU。 [xx]:00-04, 00:all RX's， 01-04:RX1-RX4。	#RS232RCM00OFF
		@RS232 Remote 01 Control MCU OFF @RS232 Remote 02 Control MCU OFF @RS232 Remote 03 Control MCU OFF @RS232 Remote 04 Control MCU OFF

8.3.6 CEC Control

Command	Description	Command Example and Response

#CEC H1 [BB] [CC] [DD]
 #CEC HA [BB] [CC] [DD]
 #CEC HDMI O1 [BB] [CC] [DD]
 #CEC HDMI OA [BB] [CC] [DD]
 #CEC HDBT O1 [BB] [CC] [DD]
 #CEC HDBT OA [BB] [CC] [DD]
	BB: device type (TV:0x40,0x20,0x80;DVD/PLAYER:0x04,0x08;....); example code:
	 #define CEC_ALL_DEVICE_TYPES_TV (0x80)
	 #define CEC_ALL_DEVICE_TYPES_RECORDING_DEVICE (0x40)
	 #define CEC_ALL_DEVICE_TYPES_TUNER (0x20)
	 #define CEC_ALL_DEVICE_TYPES_PLAYBACK_DEVICE (0x10)
	 #define CEC_ALL_DEVICE_TYPES_AUDIO_SYSTEM (0x08)
	 #define CEC_ALL_DEVICE_TYPES_CEC_SWITCH (0x04)
	
	 CC:CEC OPTION(for example 0x44 be equal to Tv's remote contron)
	 eActiveSource =0x82, // follower:TV, switch --> Broadcst , DIRectly address
	 eImageViewOn =0x04, // follower:TV, switch --> Broadcst
	 eTextViewOn =0x0D, // follower:TV
	 eStandBy =0x36, // follower:All --> Broadcst
	 eUserControlPressed =0x44,// follower:All --> Broadcst// be equal to TV remote control
	 DD:data of current option(CC) (example:0x41,VOLUME_UP),This can send combined data, such as two or three groups, or not according to
	 instructions,Up to nine groups;
	
	 typedef enum _CecUiCommand_t // Remote Control Pass-through and UI command codes
	 {
	 CEC_RC_SELECT = 0x00,
	 CEC_RC_UP = 0x01,
	 CEC_RC_DOWN = 0x02,
	 CEC_RC_LEFT = 0x03,
	 CEC_RC_RIGHT = 0x04,
	 CEC_RC_RIGHT_UP = 0x05,
	 CEC_RC_RIGHT_DOWN = 0x06,
		#CEC H3 04 44 4A (DVD in and out of warehouse)
		 #CEC HDBT O3 80 44 6D (TV ON)
		 #CEC HDMI O3 80 44 6C (TV STANDBY)
		
		 @CEC H1 Send Success
		 @CEC HDMI O1 Send Success
		 @CEC HDBT O1 Send Success

CEC_RC_LEFT_UP	= 0x07,	
CEC_RC_LEFT_DOWN	= 0x08,	
CEC_RC_ROOT_MENU	= 0x09,	
CEC_RC_SETUP_MENU	= 0x0A,	
CEC_RC_CONTENTS_MENU	= 0x0B,	
CEC_RC_FAVORITE_MENU	= 0x0C,	
CEC_RC_EXIT	= 0x0D,	
	// 0x0E - 0x1F Reserved	
CEC_RC_0	= 0x20,	
CEC_RC_1	= 0x21,	
CEC_RC_2	= 0x22,	
CEC_RC_3	= 0x23,	
CEC_RC_4	= 0x24,	
CEC_RC_5	= 0x25,	
CEC_RC_6	= 0x26,	
CEC_RC_7	= 0x27,	
CEC_RC_8	= 0x28,	
CEC_RC_9	= 0x29,	
CEC_RC_DOT	= 0x2A,	
CEC_RC_ENTER	= 0x2B,	
CEC_RC_CLEAR	= 0x2C,	
	// 0x2D - 0x2F Reserved	
CEC_RC_CHANNEL_UP	= 0x30,	
CEC_RC_CHANNEL_DOWN	= 0x31,	
CEC_RC_PREVIOUS_CHANNEL	= 0x32,	
CEC_RC_SOUND_SELECT	= 0x33,	
CEC_RC_INPUT_SELECT	= 0x34,	
CEC_RC_DISPLAY_INFORMATION	= 0x35,	
CEC_RC_HELP	= 0x36,	
CEC_RC_PAGE_UP	= 0x37,	
CEC_RC_PAGE_DOWN	= 0x38,	
	// 0x39 - 0x3F Reserved	
CEC_RC_POWER	= 0x40,	
CEC_RC_VOLUME_UP	= 0x41,	
CEC_RC_VOLUME_DOWN	= 0x42,	
CEC_RC_MUTE	= 0x43,	
CEC_RC_PLAY	= 0x44,	
CEC_RC_STOP	= 0x45,	
CEC_RC_PAUSE	= 0x46,	
CEC_RC_RECORD	= 0x47,	
CEC_RC_REWIND	= 0x48,	

```
            CEC_RC_FAST_FORWARD                 = 0x49,
            CEC_RC_EJECT                      = 0x4A,
            CEC_RC_FORWARD                    = 0x4B,
            CEC_RC_BACKWARD                   = 0x4C,
            CEC_RC_STOP_RECORD                = 0x4D,
            CEC_RC_PAUSE_RECORD               = 0x4E,
                                             // 0x4F Reserved
            CEC_RC_ANGLE                      = 0x50,
            CEC_RC_SUB_PICTURE                = 0x51,
            CEC_RC_VIDEO_ON_DEMAND            = 0x52,
            CEC_RC_ELECTRONIC_PROGRAM_GUIDE    = 0x53,
            CEC_RC_TIMER_PGRMING              = 0x54,
            CEC_RC_INITIAL_CONFIGURATION       = 0x55,
            CEC_RC_SELECT_BROADCAST_TYPE        = 0x56,
            CEC_RC_SELECT_SOUND_PRESENTATION    = 0x57,
                                           // 0x58 - 0x5F Reserved
            CEC_RC_PLAY_FUNCTION               = 0x60,
            CEC_RC_PAUSE_PLAY_FUNCTION          = 0x61,
            CEC_RC_RECORD_FUNCTION             = 0x62,
            CEC_RC_PAUSE_RECORD_FUNCTION        = 0x63,
            CEC_RC_STOP_FUNCTION               = 0x64,
            CEC_RC_MUTE_FUNCTION              = 0x65,
            CEC_RC_RESTORE_VOLUME_FUNCTION      = 0x66,
            CEC_RC_TUNE_FUNCTION               = 0x67,
            CEC_RC_SELECT_DISK_FUNCTION         = 0x68,
            CEC_RC_SELECT_AV_INPUT_FUNCTION     = 0x69,
            CEC_RC_SELECT_AUDIO_INPUT_FUNCTION  = 0x6A,
            CEC_RC_POWER_TOGGLE_FUNCTION        = 0x6B,
            CEC_RC_POWER_OFF_FUNCTION           = 0x6C,
            CEC_RC_POWER_ON_FUNCTION            = 0x6D,
                                           // 0x6E - 0x70 Reserved
            CEC_RC_F1_BLUE                    = 0x71,
            CEC_RC_F2_RED                     = 0x72,
            CEC_RC_F3_GREEN                   = 0x73,
            CEC_RC_F4_YELLOW                  = 0x74,
            CEC_RC_F5                        = 0x75,
            CEC_RC_DATA                      = 0x76
                                         // 0x77 - 0x7F Reserved
        } CecUiCommand_t;
```

8.3.7 Command Description and Explanation

| category	Description	Stoltzen's code	Remarks
Video	HDMI Input 1	H1	HDMI inputs
Video	HDMI Input 2	H2	
Video	HDMI Input 3	H3	
Video	HDMI Input 4	H4	
Video	HDMI Output 1	HDMI O1	Need to do setting on HDMI output, such as scaling, HDCP etc.
Video	HDMI Output 2	HDMI O2	
Video	HDMI Output 3	HDMI O3	
Video	HDMI Output 4	HDMI O4	
Video	HDBT Output 1	HDBT O1	Need to do setting on HDBT output, such as sending RS232 to Rx, remove the PoC etc
Video	HDBT Output 2	HDBT O2	
Video	HDBT Output 3	HDBT O3	
Video	HDBT Output 4	HDBT O4	
Video	HDMI & HDBT output 1	O1	Both HDMI & HDBT outputs
Video	HDMI & HDBT output 2	O2	
Video	HDMI & HDBT output 3	O3	
Video	HDMI & HDBT output 4	O4	
SPDIF Audio output	SPDIF Audio output 1	S1	SPDIF audio can output the audio from inputs, outputs or ARC from x.
SPDIF Audio output	SPDIF Audio output 2	S2	
SPDIF Audio output	SPDIF Audio output 3	S3	
SPDIF Audio output	SPDIF Audio output 4	S4	
SPDIF Audio output	All 4 SPDIF outputs	SA	
Analog Audio output	Analog audio output 1	A1	Analog audio can output the audio from inputs, outputs or ARC from Rx.
Analog Audio output	Analog audio output 2	A2	
Analog Audio output	Analog audio output 3	A3	
Analog Audio output	Analog audio output 4	A4	
Analog Audio output	All 4 Analog outputs	AA	
ARC audio	ARC audio 1	ARC1	ARC audio from SHE615R
ARC audio	ARC audio 2	ARC2	
ARC audio	ARC audio 3	ARC3	
ARC audio	ARC audio 4	ARC4	
local IR inputs on Athena 44HB	Local IR input 1	IRLI1	IR inputs on matrix
local IR inputs on Athena 44HB	Local IR input 2	IRLI2	
local IR inputs on Athena 44HB	Local IR input 3	IRLI3	
local IR inputs on Athena 44HB	Local IR input 4	IRLI4	

local IR outputs on Athena 44HB	Local IR output 1	IRLO1	IR outputs on matrix
local IR outputs on Athena 44HB	Local IR output 2	IRLO2	
local IR outputs on Athena 44HB	Local IR output 3	IRLO3	
local IR outputs on Athena 44HB	Local IR output 4	IRLO4	
Remote IR Input on SHE615R	Remote IR input 1	IRRI1	IR inputs on the Receiver SHE615SR
Remote IR Input on SHE615R	Remote IR input 2	IRRI2	
Remote IR Input on SHE615R	Remote IR input 3	IRRI3	
Remote IR Input on SHE615R	Remote IR input 4	IRRI4	
	All 4 Remote IR inputs	IRRIA	
Remote IR output on SHE615R	Remote IR output 1	IRRO1	IR inputs on the Receiver SHE615SR
Remote IR output on SHE615R	Remote IR output 2	IRRO2	
Remote IR output on SHE615R	Remote IR output 3	IRRO3	
Remote IR output on SHE615R	Remote IR output 4	IRRO4	

9. Firmware Upgrade

Please follow the steps as below to upgrade firmware by the **FW** port on the rear panel:

1) Prepare the latest two upgrade files and rename them as "08010000.APP" and "08010000.APS" on PC.

2) Power off the switcher, and connect the **FW** port of switcher to the PC with USB cable.

3) Power on the switcher, and then the PC will automatically detect a U-disk named of "BOOTDISK".

4) Double-click the U-disk, a file named of "READY.TXT" would be showed.

5) Directly copy one of two upgrade files (e.g. "08010000.APP") to the "BOOTDISK" U-disk.

6) Reopen the U-disk to check the filename "READY.TXT" whether automatically becomes "SUCCESS.TXT", if yes, the firmware was updated successfully, otherwise, the firmware updating is fail, the name of upgrade file should be confirm again, and then follow the above steps to update again.

7) Repeat step 5~6 to copy the other upgrade file ("08010000.APS") to the "BOOTDISK" U-disk.

8) Remove the USB cable after firmware upgrade.

9) After firmware upgrade, the switcher should be restored to factory default by sending command.

10. Panel Drawing
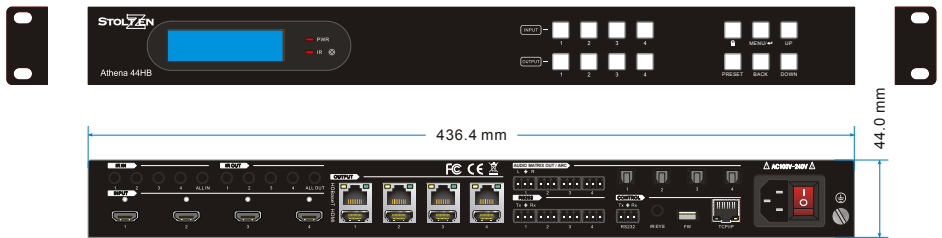
11. Troubleshooting & Maintenance

Problems	Potential Causes	Solutions
Output image with snowflake.	Bad quality of the connecting cable.	Try another high-quality cable.
	Fail or loose connection.	Make sure the connection is good.
No output image when switching.	No signal at the input / output end.	Check with oscilloscope or multimeter if there is any signal at the input/ output end.
	Fail or loose connection.	Make sure the connection is good.
	The product is broken.	Send it to authorized dealer for repairing.
POWER indicator doesn't work or no respond to any operation.	Fail connection of power cord.	Make sure the power cord connection is good.
EDID management does not work normally.	The HDMI cable is broken at the output end.	Change for another HDMI cable which is in good working condition.
Static becomes stronger when connecting the video connectors.	Bad grounding.	Check the grounding and make sure it is connected well.
Cannot control the device by control device (e.g. a PC) through RS232 port.	Wrong RS232 communication parameters.	Type in correct RS232 communication parameters.
	Broken RS232 port.	Send it to authorized dealer for checking.
Cannot control the device by front panel buttons while can control it through RS232 port	The front panel buttons are locked.	Send command **/%Unlock;** to unlock the front panel buttons.

Note: If your problem still remaining after following the above troubleshooting steps, please contact your local dealer or distributor for further assistance.

12. Customer Service

The return of a product to our Customer Service implies the full agreement of the terms and conditions hereinafter. There terms and conditions may be changed without prior notice.

1) **Warranty**
   The limited warranty period of the product is fixed three years.

2) **Scope**
   These terms and conditions of Customer Service apply to the customer service provided for the products or any other items sold by authorized distributor only.

3) **Warranty Exclusion**
   - Warranty expiration.
   - Factory applied serial number has been altered or removed from the product.
   - Damage, deterioration or malfunction caused by:
     - ✓ Normal wear and tear.
     - ✓ Use of supplies or parts not meeting our specifications.
     - ✓ No certificate or invoice as the proof of warranty.
     - ✓ The product model showed on the warranty card does not match with the model of the product for repairing or had been altered.
     - ✓ Damage caused by force majeure.
     - ✓ Servicing not authorized by distributor.
     - ✓ Any other causes which does not relate to a product defect.
   - Shipping fees, installation or labor charges for installation or setup of the product.

4) **Documentation**
   Customer Service will accept defective product(s) in the scope of warranty coverage at the sole condition that the defeat has been clearly defined, and upon reception of the documents or copy of invoice, indicating the date of purchase, the type of product, the serial number, and the name of distributor.

Remarks: Please contact your local distributor for further assistance or solutions.