

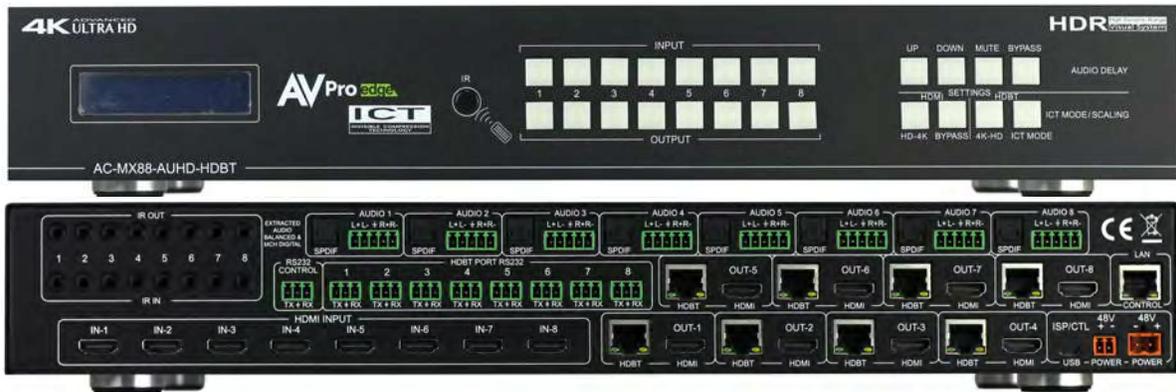
# User Manual

18 Gbps True 4K60 4:4:4 4x4 HDMI Matrix w/ Mirrored 18Gbps (Using ICT) HDBaseT Outputs. 70 Meters 4K 60 4:4:4 & HDR / 100 Meters 1080P. Dual Audio De-Embedding, Scaling & Audio Delay.

## AC-MX44-AUHD-HDBT



## AC-MX88-AUHD-HDBT



## AC-MX88-AUHD-HDBT-GEN2



The AC-MX44/88-AUHD-HDBT is a true HDMI/HDBaseT matrix switch. This unit includes 4/8 HDMI inputs, and 4/8 HDMI/HDBaseT output blocks. These output blocks include a HDBaseT and HDMI port, these ports are mirrored, and both are active. This Matrix supports HDMI 2.0(a/b), HDCP 2.2, up to 4K video resolution, and up to 18 Gbps bandwidth. We are able to pass 18Gbps through category cable by using the new HDBaseT technology we have developed called "ICT", learn more about ICT below. This switch allows any source (Blu-ray, UHD Blu-ray, satellite receiver, game consoles, PCs, etc ... ) to be shown on any of the connected displays. This matrix equalizes and amplifies the output to ensure the HDMI signal can be transmitted through long HDMI cables without loss of quality.

Audio Delay is "On-Board" so you can manage lip-sync issue before it is a problem. Also with built in Scalers you don't have to forfeit that 4K signal just because you have a couple older displays. All that with Full EDID management allows maximum flexibility with today's wide mixture of sources and displays.

This is an ideal solution for digital entertainment centers, HDTV retail, show sites, data centers, schools, conference and training centers and more!

## Features:

- HDMI 2.0(a/b)
- 18Gbps Uncompressed Bandwidth Support on HDMI
- 18 Gbps wit ICT on HDBaseT outputs
- 4K60 4:4:4 Support
- Full HDR Support (HDR 10 & 12 Bit)
- Dolby Vision, HDR10+ and HLG Support
- HDCP 2.2 (and all earlier versions supported)
- 1080p > 4K Up Scaling on HDMI outputs
- 4K > 1080P Down Scaling on HDBaseT outputs
- Advanced EDID Management
- IR, RS-232 and LAN Control Options
- Digital Toslink Out (7CH PCM, DD, DD+, DTS, DTS-MA)
- Balanced Analog Out (2CH PCM)
- Audio Delay for Digital & Analog Out
- HDBaseT Compatibility mode for mixed systems! (More below)
- Driver Support for Crestron, C4, RTI, ELAN and more!!!
- Extracted Audio Now Supports DD+, DTS Master Audio on Toslink
- Extracted Audio Now Has 3 Operating Modes. Bound to Input, Bound to Output, or Independent Matrix
- Built in Test Pattern on Each Output to Verify Infrastructure

## Easy to use:

- Install in seconds
- Feature rich
- Powerful EDID management
- Front Panel Control
- IR Remote
- IR & RS-232 Control
- LAN Control

## In The Box:

- AC-MX44-AUHD-HDBT Matrix Switch
- IR Remote Control
- IR Extension Cable
- 48v Power Supply
- RS-232 terminal blocks
- Rack ears

## Quick Installation:

1. Connect the HDMI input sources (Blu-ray, Set Top Box, etc...) to the AC-MX44/88-AUHD-HDBT.
2. Connect the HDMI output devices (AVR, Display, Distribution Amplifier, Extender) to the ACQUICK-MX44/88-AUHD-HDBT.
3. Power on the sources.
4. Connect the power supply into the AC-MX44/88-AUHD-HDBT.
5. Turn on output devices/displays.
6. Use the front panel controls, supplied IR remote or free PC software to control the switch.

## Specifications

VIDEO:	
VIDEO RESOLUTIONS	UP TO 4K 60HZ 4:4:4
VESA RESOLUTIONS	UP TO DCI 4K (4096X2160)
HDR FORMATS/RESOLUTIONS	420, 422, 444 (10 AND 12 DEEP COLOR) HDR10, HDR10+, DOLBY VISION, HLG
COLOR SPACE	YUV (COMPONENT), RGB (CSC: REC. 601, REC. 709, BT2020, DCI, P3 D6500)
CHROMA SUBSAMPLING	4:4:4, 4:2:2, 4:2:0 SUPPORTED
DEEP COLOR	UP TO 16 BIT (1080), UP TO 12 BIT (4K)
SCALERS (HDMI) PER OUTPUT OPTIONAL	1080P TO 4K (RESOLUTIONS ONLY, FRAMRATE STAYS THE SAME)
SCALERS (HDBASET) PER OUTPUT OPTIONAL	4K TO 1080P (RESOLUTIONS ONLY, FRAMRATE STAYS THE SAME)
AUDIO:	
AUDIO FORMATS SUPPORTED HDMI	PCM 2.0 CH, LPCM 5.1 & 7.1, DOLBY DIGITAL, DTS 5.1, DOLBY DIGITAL PLUS, DOLBY TRUEHD, DTS-HD MASTER AUDIO, DTS-X, DOLBY ATMOS
AUDIO FORMATS SUPPORTED EXTRACTED (TOSLINK)	PCM 2.0 CH, LPCM 6 CH, LPCM 7 CH, DOLBY DIGITAL, DOLBY DIGITAL PLUS, DTS- MASTER AUDIO
AUDIO FORMATS SUPPORTED EXTRACTED (2CH PORT)	PCM 2 CH (NO DOWNMIX)
AUDIO EXTRACTION LOCATION	BIND TO INPUT, BIND TO OUTPUT, OR MATRIX (INDEPENDENT)
AUDIO DELAY (PER OUTPUT, EXTRACTED)	UP TO 630MS
DISTANCE:	
HDBASET OUT (4K60 4:4:4 & HDR) W/AC-EX70-444-RNE	70 METERS / 230 FEET (CAT 6A)
HDBASET OUT (1080P) W/AC-EX70-444-RNE	100 METERS / 330 FEET (CAT 6A)
HDBASET OUT (4K60 4:2:0 MAX) W/AC-EX70-UHD-R	40 METERS / 131 FEET (CAT 6A)
HDBASET OUT (1080P) W/AC-EX70-UHD-R	70 METERS / 230 FEET (CAT 6A)
HDMI IN/OUT (4K60 4:4:4)	UP TO 50 FEET (USING BULLET TRAIN HDMI)
HDMI IN/OUT (W/ AOC CABLE) (4K60 4:4:4)	UP TO 130 FEET (USING BULLET TRAIN AOC)
OTHER:	
BANDWIDTH HDMI	18 GBPS UNCOMPRESSED
BANDWIDTH HDBASET	18 GBPS (USES ICT ABOVE 10.2 GBPS SIGNALS)
HDCP	HDCP 2.2AND EARLIER
PDH FOR RECEIVERS (NO NEED TO POWER RECEIVERS)	YES, ALL OUTPUTS
CONTROL:	
PORTS	LAN, RS232, IR
DRIVERS	C4, RTI, ELAN, CRESTRON, URC (FOR MORE INFORMATION - SEE DRIVERS PAGE ON AVPROEDGE.COM/DRIVERS)
PC SOFTWARE	YES
LAN WEBS	YES
PORTS:	
HDMI	TYPE A
HDBASET	RJ45 W/ PDH FOR HDBASET RECEIVERS
LAN	RJ45 W/ WEB INTERFACE/ CONTROL
AUDIO (EXTRACTED DIGITAL)	TOSLINK
AUDIO (EXTRACTED ANALOG)	5 PIN TERMINAL BLOCK (BALANCED)
IR RX	3.5MM STEREO (3 CONDUCTOR)
RS232	3 PIN TERMINAL BLOCK
ENVIRONMENTAL:	
OPERATING TEMPERATURE	23 TO 125°F (-5 TO 51°C)
STORAGE TEMPERATURE	-4 TO 140°F (-20 TO 60°C)
HUMIDITY RANGE	5-90% RH (NO CONDENSATION)
POWER:	
POWER CONSUMPTION (TOTAL)	38 WATTS MAX
POWER SUPPLY - MATRIX	INPUT: AC 100-240V ~ 50/60HZ OUTPUT: DC 48V 1.5A
DIMENSIONS:	
DIMENSIONS (UNIT ONLY - HEIGHT/DEPTH/WIDTH)	MM: 50.8 X 256 X 441.33 INCH: 2 X 10.07 X 17.375
DIMENSIONS (PACKAGED LENGTH/WIDTH/HEIGHT)	MM: 88.9 X 393.7 X 495.3 INCH: 3.5 X 15.5 X 19.5
RACK UNITS	1 UNIT
WEIGHT (UNIT)	8 LBS (3.5 KG)
WEIGHT (PACKAGED)	11 LBS (5 KG)
*SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE. MASS & DIMENSIONS ARE APPROXIMATE	

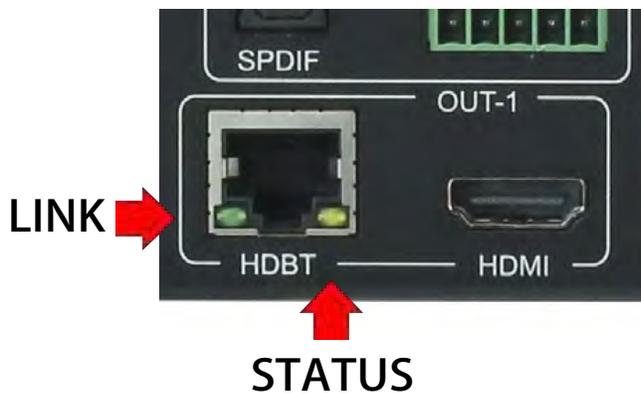
### Device Overview:

- Definition - Matrix switches provide the ability to route any input to any output or to multiple outputs at any time. Depending on the model, a matrix switch can route HD, UHD or AUHD content in this manner. Additionally, since most venues have both, audio zones and video zones, the requirement to breakout or strip off the audio is often necessary and has become almost a standard feature on most matrix switches.
- Control – Matrix switches are generally controlled via a third-party controller (like Control 4, RTI, Crestron, etc...). Many integrators want ready-made drivers for their control system in order to make programming and deployment easier.
- Matrix Switches are widely used in both, Commercial and Residential Applications.

### Front & Rear Panel:



### HDBaseT Port Indicator lights:

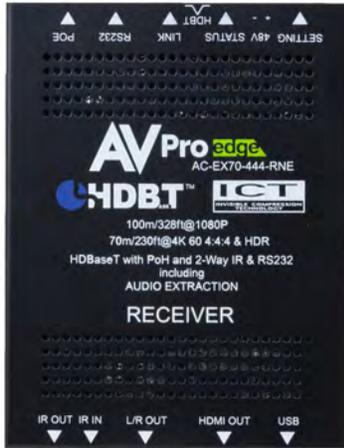


## Compatible Receivers:

### AC-EX70-444-RNE: (W/ICT)

- 70M 4K 60 4:4:4 & HDR
- 100M 1080P

NOTE: This receiver is 18Gbps with ICT



### AC-EX70-UHD-R:

- 40M 4K 60 4:2:0
- 70M 1080P

NOTE: This receiver is limited to 10.2 Gbps



### AC-EX70-SC2-R: (W/ICT)

- 70M 4K 60 4:4:4 & HDR
- 100M 1080P
- Built in SC2 scaling

NOTE: This receiver is 18Gbps with ICT



### AC-CX100-RAMP

- 70M 4K 60 4:4:4 & HDR
- 100M 1080P

NOTE: The HDBT INPUT is limited to 10.2Gbps

### Indicator Troubleshooting Lights on the HDBaseT Port on Matrix and Receiver:

**LINK - Above RJ45 (HDBT) Port & Below it on the Matrix: (Green)** This indicator shows that the AV HDBT link between the Tx and Rx is in tact. This light should ALWAYS be solid.

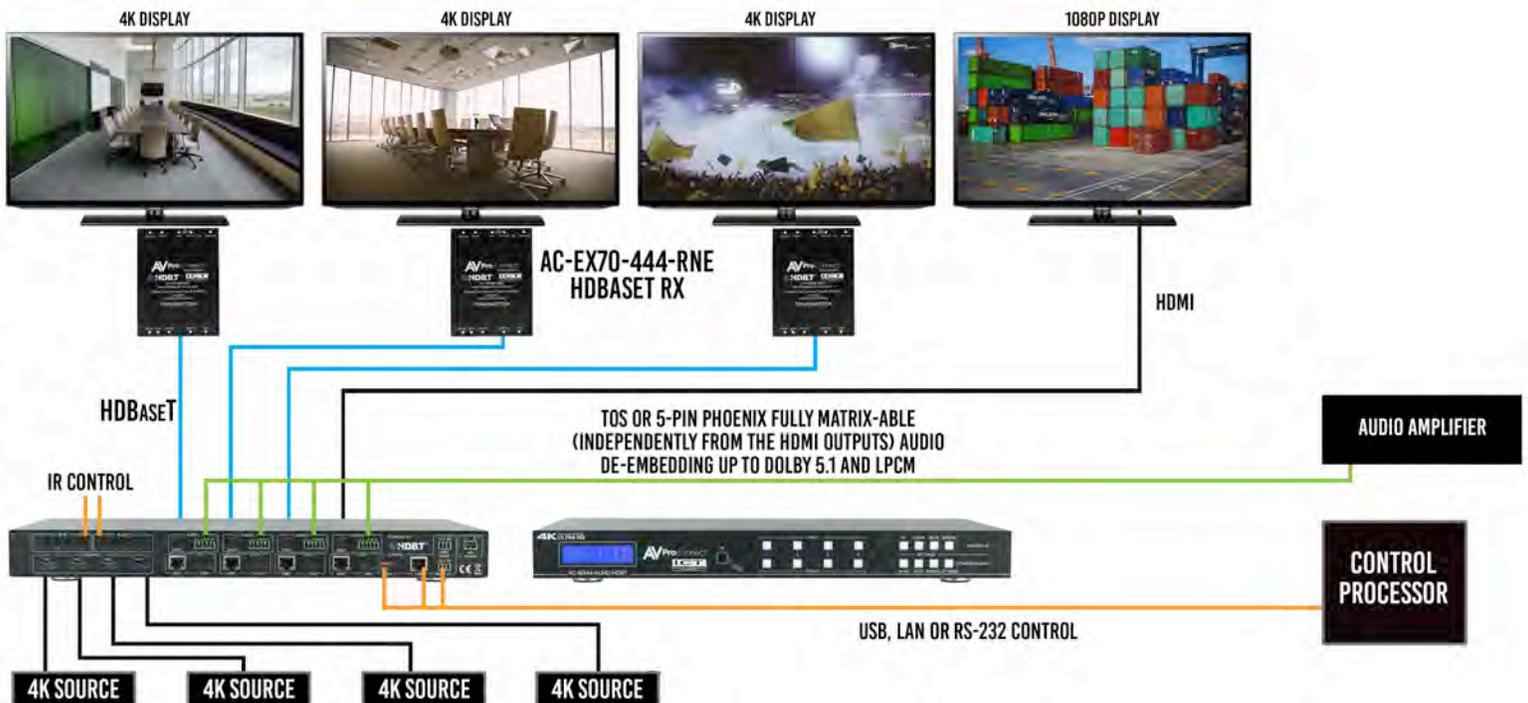
**STATUS- Above RJ45 (HDBT) Port & Below it on the Matrix: (Amber)** This is an indicator showing that the power is present between the Transmitter and Receiver. This light ALWAYS BLINKS steadily indicating everything is OK.

If the lights are not as discussed above - please check the following:

1. Check the length. The maximum distances and resolution compatibilities are:
  - a. AC-EX70-444-RNE ~ 70m (230ft) on 4K 60 4:4:4 & HDR and 100m (330ft) on 1080P
  - b. AC-EX70-SC2-R ~ 70m (230ft) on 4K 60 4:4:4 & HDR and 100m (330ft) on 1080P
  - c. AC-EX70-UHD-R ~ 40m (131ft) on 4K 60 4:2:0 (NO HDR) and 70m (230ft) on 1080P
  - d. AC-CX100-RAMP ~ 40m (131ft) on 4K 60 4:2:0 (NO HDR) and 70m (230ft) on 1080P
2. Remove any coils of cable and make sure that there is not excess cabling.
3. Bypass all patch panels and punch-down blocks.
4. Re-terminate connectors. Sometimes, even if a cable tester indicates the run is valid, something may be slightly off.
5. Contact AVProEdge if these suggestions do not work.

## Common Application Diagram & What Is ICT:

THIS 4X4 MATRIX HAS 4 HDMI INPUTS AND FEATURES DUAL MIRRORED HDMI AND HDBASET OUTPUTS FOR A TOTAL OF 8 PORTS. THE HDBASET OUTPUT IS UTILIZING ICT (INVISIBLE COMPRESSION TECHNOLOGY), GIVING IT THE ABILITY TO DELIVER 18GBPS FULL 4K60 (4:4:4) SIGNALING OVER STANDARD CATEGORY CABLE. IT DOES THIS BY USING AVPROCONNECTS PROPRIETARY ENCODING ALGORITHM INSIDE THE MATRIX, AND DECODING ALGORITHM INSIDE THE AC-EX70-444-RNE HDBASET RECEIVERS.



## Full List of Quick Commands From Front Panel:

Parameter	How To	Options
Switching Control	<ol style="list-style-type: none"> <li>1. Press the OUTPUT button you want to switch.</li> <li>2. Press the desired INPUT button.</li> </ol>	
EDID Setup	<ol style="list-style-type: none"> <li>1. Press and hold (3 seconds) the INPUT button of the source you want to set the EDID for.</li> <li>2. Use the "UP" &amp; "DOWN" buttons that have lit up to navigate to your desired EDID setting.</li> <li>3. Quick press the same INPUT button to lock in the selection.</li> </ol>	See Page 12 in the manual for a full list of available EDIDs.
Scaling Control	<ol style="list-style-type: none"> <li>1. Press and hold (3 seconds) the OUTPUT button that you would like to scale.</li> <li>2. The Bottom row of buttons on the right hand side of the machine light up, allowing you to make your selection.</li> </ol>	<ul style="list-style-type: none"> <li>- HD --&gt;4K</li> <li>- 4k --&gt; HD</li> <li>- AUTO (Detects Display)</li> <li>- BYPASS (No Scaling)</li> </ul>
Audio Delay Control	<ol style="list-style-type: none"> <li>1. Press and hold (3 seconds) the OUTPUT button that you would like to delay/mute</li> <li>2. The TOP row of buttons on the right hand side of the machine light up, allowing you to make your selection.</li> </ol>	<ul style="list-style-type: none"> <li>- UP</li> <li>- DOWN</li> <li>- MUTE (Turns off audio)</li> <li>- BYPASS (No Delay)</li> </ul>
Set Extracted Audio Bindings	<ol style="list-style-type: none"> <li>1. Press and hold (3 seconds) the BYPASS button on the audio settings (top right set of buttons).</li> <li>2. Press the "UP" &amp; "DOWN" buttons to switch between the desired settings.</li> <li>3. Press the BYPASS button again to set the selection.</li> <li>4. Press the BYPASS button again to exit.</li> </ol> <p><i>Note: If "Matrix" is selected, you will be able to route audio. Please see "Extracted Audio Switching"</i></p>	<ul style="list-style-type: none"> <li>- Bind to OUTPUT</li> <li>- Bind to INPUT</li> <li>- Matrix</li> </ul> <p><i>Note: Send switching commands from the front panel by selecting "Matrix" when in audio mode.</i></p>
Extracted Audio Switching	<ol style="list-style-type: none"> <li>1. Press and hold (3 seconds) the BYPASS button on the audio settings (top right set of buttons).</li> <li>2. The screen will say "Matrix"</li> <li>3. Quick press the BYPASS button again to enter Extracted Audio Switching, to switch <ul style="list-style-type: none"> <li>- Press the OUTPUT you would like to change</li> <li>- Press the INPUT you would like to route to the previously selected OUTPUT</li> </ul> </li> <li>4. When finished, press the BYPASS button again in order to exit.</li> </ol>	<p><i>Note: Audio switching commands are ONLY available from the front panel when the audio mode is set to "MATRIX".</i></p> <p><i>Note: The web interface may be easier for active, live, switching.</i></p>
Initialize Test Pattern Output	<ol style="list-style-type: none"> <li>1. Press and hold (3 seconds) the desired INPUT &amp; OUTPUT buttons together</li> <li>2. Repeat step 1 to turn off the test pattern</li> </ol>	Example: Pressing and holding INPUT 1 & OUTPUT 1 at the time for 3 seconds will generate a test pattern out of OUTPUT 1
Toggle DHCP Mode	1. Press and hold (3 seconds) INPUT 1 & INPUT 4 together	Toggles DHCP OFF/ON
View Network Settings	1. Press and hold (3 seconds) INPUT 3 & INPUT 4 together	<p>The Screen will flash the following:</p> <ul style="list-style-type: none"> <li>- Device IP</li> <li>- Host IP</li> <li>- Subnet Mask</li> <li>- MAC Address</li> </ul>
View Firmware Versions	1. Press and hold (3 seconds) INPUT 2 & INPUT 4 together	

**NOTE: A factory reset may be performed by pressing and holding the following 4 buttons together at the same time for 10 seconds.**

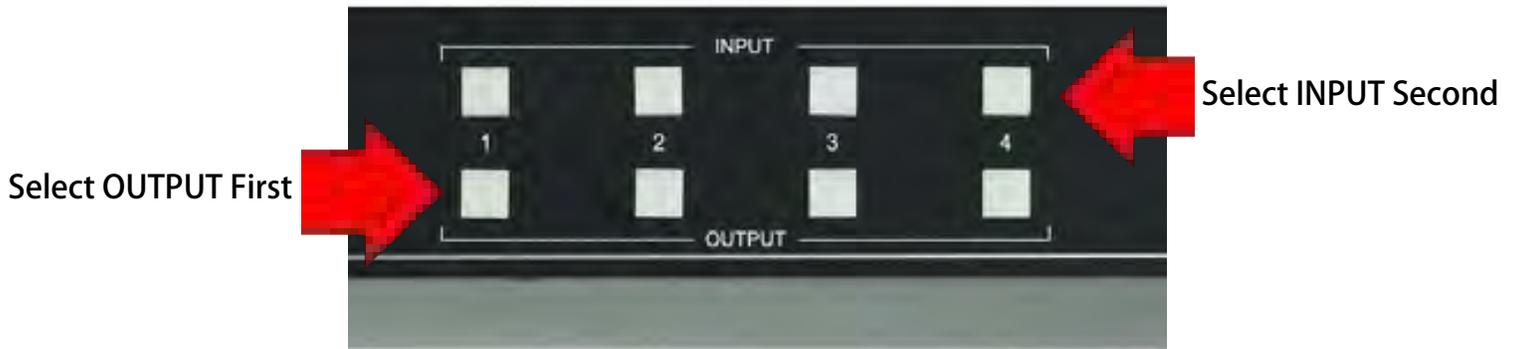
- HD-->4K (Scaler Settings)
- 4K-->HD (Scaler Settings)
- MUTE (Audio Delay Settings)
- BYPASS (Audio Delay Settings)

## Front Panel Control

### Switching:

The AC-MX44-AUHD-HDBT can be switched from the front panel by selecting the OUTPUT button first and then selecting the INPUT button:

1. Press the button (1 through 4) on the bottom row that corresponds with the OUTPUT (Display, or Sink Device) you would like to send to a source.
2. Once pressed, the switch will illuminate the OUTPUT button that you have selected, along with the INPUT row (as pictured), indicating that it is ready for you to select the INPUT.
3. Select the desired INPUT.



**Figure 1 – Switching with the front panel controls. NOTE: Select the OUTPUT and then the INPUT.**

### Scaler Control:

The AC-MX44-AUHD-HDBT has scalers built into every output. The HDBaseT Port can be DOWNSCALED and the HDMI Port can be UPSCALED. The scalers are set on the OUTPUT side of the switch and each can have separate settings. Control the scaler:

- HD-4K (Scales 1080P to 2160P - On HDMI Port Only)
- ICT Mode (Enables ICT Compression mode on HDBT Port) - **DEFAULT**
- 4K-HD (Scales 2160P to 1080P - On HDBT Port Only)
- AUTO (Automatically detects capabilities of attached display - for HDBT Port Only)
- BYPASS (There will be no scaling set)

NOTE: When using a non ICT receiver the unit automatically applies HDBT-C mode when ICT mode is selected, which reduces 10-18Gbps content to 9Gbps for legacy infrastructures. This mode maintains 4K resolution, but removes HDR.



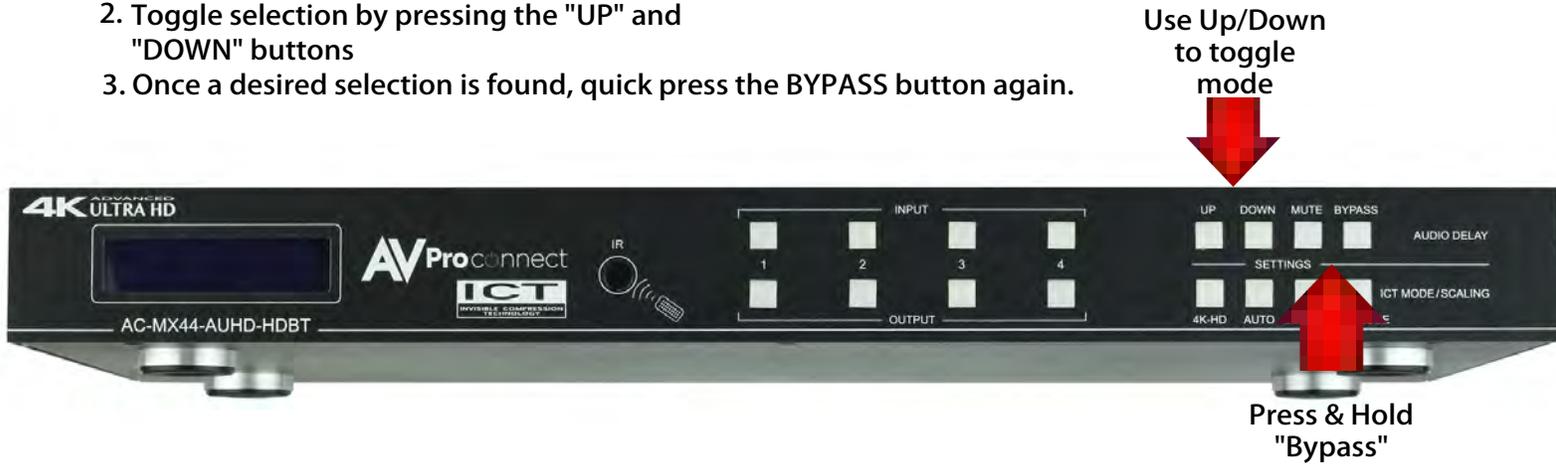
## Audio Binding Setup:

The AC-MX44-AUHD-HDBT can be configured to extract audio in 3 ways

- Bind to OUTPUT(Default)
- Bind to INPUT
- Matrix

To Set:

1. Press and hold (3 sec) BYPASS from the audio settings (top right of machine).
2. Toggle selection by pressing the "UP" and "DOWN" buttons
3. Once a desired selection is found, quick press the BYPASS button again.



## Audio Matrix Control:

Once in "Matrix" mode for audio, the extracted audio routing on the AC-MX44-AUHD-HDBT can be controlled from the front panel:

To Control:

1. Press and hold (3 sec) BYPASS button from the audio settings (top right of machine).
2. Make sure the screen says "Matrix" and quick press the BYPASS button again in order to enter the AUDIO MATRIX.
3. Press the desired extracted audio OUTPUT.
4. Press the INPUT for the desired audio source.
5. Quick press BYPASS button again to exit audio matrix .



## Audio Delay Control:

The AC-MX88/44-AUHD has an Audio Delay feature built-in. Audio Delay is set on the extracted audio OUTPUT (Digital and Analog) of the switch and each can have separate settings. The Audio Delay has 4 controls:

- UP (Increase Delay)
- Down (Decrease Delay)
- MUTE (The audio will be muted)
- BYPASS (There will be no delay set)

\*Delay settings are in increments of 90 milliseconds. Settings are: 90MS, 180MS, 270MS, 360MS, 450MS, 540MS or 630MS. Control this feature from the front panel:

1. Press and hold the OUTPUT number for which you want to delay the audio.
2. The available options will light up (as pictured).
3. Press UP, DOWN, MUTE or BYPASS to control the delay.
4. The current setting will be indicated on the LCD screen.

STEP 2:  
Choose the  
Delay Setting



The LCD Screen  
Shows Current  
Status

STEP 1:  
Press and hold the desired extracted  
audio output you want to delay

## Audio Output Logic and Cable Prep:

You can extract audio from toslink or balance 2CH Audio. Audio outputs are an un-decoded output. This means that what goes in, is what goes out.

2CH Balanced Audio Port - Supports 2CH PCM audio only, which is ideal for 2 Channel systems and zoned audio systems. No Down-mixing see AC-ADM-AUHD or AC-ADM-COTO

Toslink Audio Port - Supports PCM, LPCM (up to 7CH), Dolby Digital, Dolby Digital Plus, DTS, DTS-HD, DTS Master Audio, which is ideal for multi-channel audio systems and older AVR's that do not support 18Gbps.

Need to down-mix for combination, uncompressed and 2CH systems? Check out the AC-ADM-AUHD and AC-ADM-COTO.

You can use balanced analog outputs in a balanced system, but you can also prep a cable as shown below to convert to a traditional 2CH unbalanced (L/R) system. You can also purchase pre-made cables (AC-CABLE-5PIN-2CH)



\*make sure ground is always connected

### Audio Wiring Diagram:



## EDID Management:

This matrix has 29 factory defined EDID settings. It also has 3 user defined EDID memories. The user EDID memories are independent to each input and can be set differently. The user defined EDID can be uploaded using the free PC Control software or RS-232. In addition, you can choose to read the EDID from the desired output and the captured EDID will automatically store and overwrite the EDID in "USER EDID 1" and will be applied to the selected source.

By default, the matrix is set to a 1080P EDID, this is to maximize plug and play capability. When using 4K sources, you will want to define a 4K EDID on each input (or read from the display).

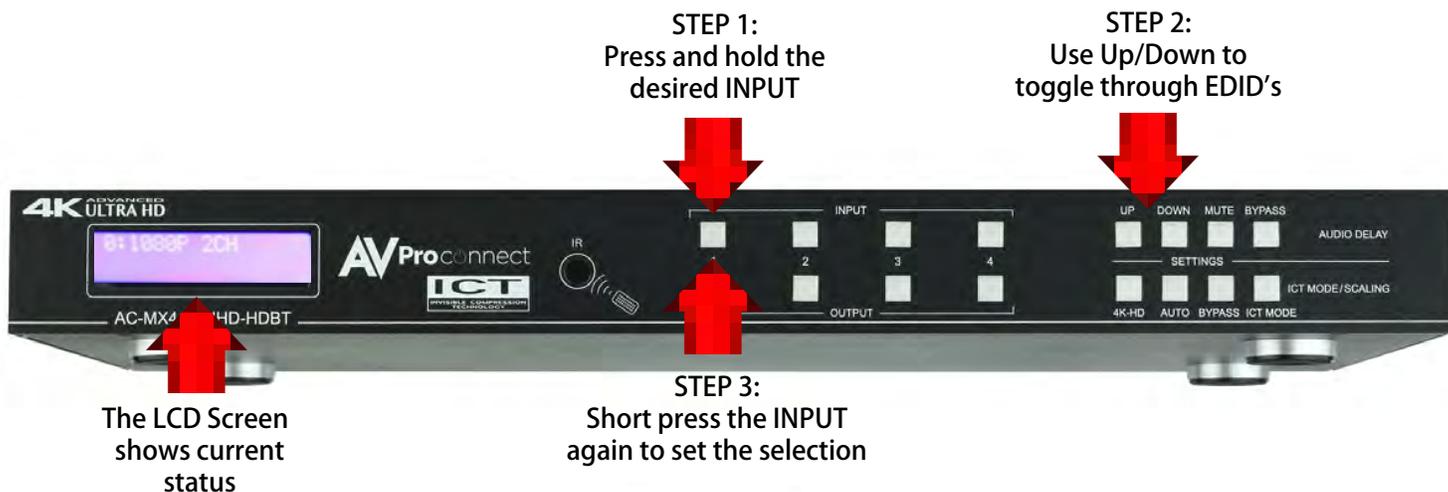
To Change the EDID setting:

1. Press and hold (for 3 seconds) the INPUT you want to change.
2. The "UP" and "DOWN" button's will illuminate (as pictured below), and the LCD will show the active EDID.
3. Toggle through the EDID options by pressing up or down repeatedly.
4. Press the "INPUT" you had selected in order to apply the EDID (this will still be illuminated).

These are the pre-defined EDID settings that you can toggle through:

- |                       |                           |
|-----------------------|---------------------------|
| 1. 1080P_2CH          | 17. 1080P_8CH_HDR         |
| 2. 1080P_6CH          | 18. 1080P_3D_2CH_HDR      |
| 3. 1080P_8CH          | 19. 1080P_3D_6CH_HDR      |
| 4. 1080P_3D_2CH       | 20. 1080P_3D_8CH_HDR      |
| 5. 1080P_3D_6CH       | 21. 4K30HZ_3D_2CH_HDR     |
| 6. 1080P_3D_8CH       | 22. 4K30HZ_3D_6CH_HDR     |
| 7. 4K30HZ_3D_2CH      | 23. 4K30HZ_3D_8CH_HDR     |
| 8. 4K30HZ_3D_6CH      | 24. 4K60HzY420_3D_2CH_HDR |
| 9. 4K30HZ_3D_8CH      | 25. 4K60HzY420_3D_6CH_HDR |
| 10. 4K60HzY420_3D_2CH | 26. 4K60HzY420_3D_8CH_HDR |
| 11. 4K60HzY420_3D_6CH | 27. 4K60HZ_3D_2CH_HDR     |
| 12. 4K60HzY420_3D_8CH | 28. 4K60HZ_3D_6CH_HDR     |
| 13. 4K60HZ_3D_2CH     | 29. 4K60HZ_3D_8CH_HDR     |
| 14. 4K60HZ_3D_6CH     | 30. User EDID 1           |
| 15. 4K60HZ_3D_8CH     | 31. User EDID 2           |
| 16. 1080P_2CH_HDR     | 32. User EDID 3           |
| 17. 1080P_6CH_HDR     |                           |

\*You may also copy EDID from any output and apply to any input, simply select "Copy EDID from Output x" (x=1-4). This will copy the EDID from the display attached and store it into "User EDID 1" and apply it to the input you have selected.



## Display IPData:

In order to see the current IP settings, press and hold (for 3 seconds) INPUT3 and INPUT4 buttons simultaneously. This screen will change every 3 seconds showing additional settings (host, netmask, router IP). NOTE: This screen always starts with the current IP address of the matrix:



HOST IP:  
192.168.001.239

**In order to toggle DHCP on and off, press and hold (for 3 seconds) the INPUT 1 and INPUT 4 buttons simultaneously.**

In order to prevent potential IP problems, most IP settings have to be managed in the Free PC Software or by using RS-232 commands.

***NOTE: The default IP address is 192.168.001.239 (as pictured above).***

## Quick Network Connect to Web Interface:

Use the following steps to quickly and immediately connect to the matrix switch:

1. Connect the LAN port into an active router port.
2. On most networks you can simply type the Default IP address into any web browser. The Default IP Address is 192.168.1.239.

If you are on a closed network or non-standard, the following may work better when using DHCP:

1. Use an Ethernet cable to connect the LAN port on the switch to an unused, active port on the router.
2. Enable DHCP by pressing the INPUT 1 and INPUT 4 buttons simultaneously for 3 seconds.
3. Wait 5 seconds, then press and hold (for 3 seconds) the INPUT 3 and INPUT 4 buttons simultaneously. The display will show the assigned IP address.
4. Input the IP Address into any web browser.

Setting a Static IP:

- Once connected, you can use the web interface to set a static IP address.
- A static IP can also be set by using the RS-232 software or a direct command (see RS-232 below for more information).

## Web Interface: Switching

Use this page to switch between inputs and outputs from the web interface.

	IN1	IN2	IN3	IN4
OUT1	IN1	IN2	IN3	IN4
OUT2	IN1	IN2	IN3	IN4
OUT3	IN1	IN2	IN3	IN4
OUT4	IN1	IN2	IN3	IN4
ALL	IN1	IN2	IN3	IN4

AC-MX44-AUHD-HDBT  
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## Web Interface: Video Setting



### HDMI Video Scaler Modes:

With the video scaler mode, you can scale each HDMI output independently

- **BYPASS** = Bypass - Scaler is disabled (Default)
- **HD-4K** = 2K --> 4K - If the incoming signal is 1080P it will be upscaled to 4K.

### HDBT Video Scaler Modes:

With the video scaler mode, you can scale each HDBaseT output independently

- **4K-HD** = 4K --> 2K - If incoming signal is 4K, it will be downscaled to 1080P or 1900x1200 depending on the input format.
- **ICT MODE** = ICT Mode (Enables ICT (18G) Compression mode on HDBT Port) - **DEFAULT**

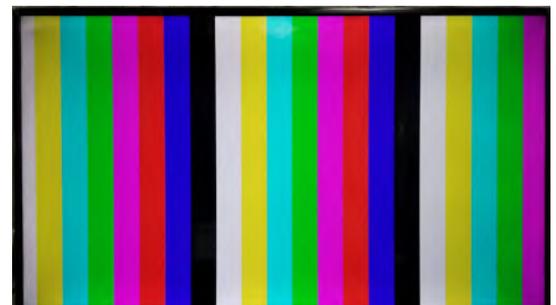
### Image Enhancement:

The Image Enhancement feature will add extra sharpness to edges in the image. This effect may be desirable for presentations in corporate or classroom environments. **NOTE:** Image Enhancement only works when upscaling from 2k to 4k.

- **W** = Weak - Minimum level of enhancement
- **M** = Medium - Medium level of enhancement
- **S** = Strong - Strongest setting for image enhancement
- **OFF** = None - Feature disabled

### OutputSignalGenerator:

The Output Signal Generator will output an internally stored 1080p color bar test pattern (see the image on the right) to test infrastructure. It can be turned on and off for each output, but remember to turn it off to resume normal functionality.



## Web Interface: Audio Settings



### EX-Audio Delay:

This setting allows the user to change the audio delay to overcome lip-sync issues when using audio separate from HDMI. The user can choose from the above options in milliseconds. Bp = Bypass or No Delay. Delay can be different per audio output port.

### Audio Status:

This allows the user to turn ON and OFF the extracted audio output. When this is set to OFF the audio is muted from the extracted port.

### Audio Matrix:

This allows the user to route the audio in a matrix fashion for the extracted audio ports.

NOTE: The Audio Matrix Function only works if "MATRIX" is selected on the right (See next explanation).

### Ex-Audio Matrix Mode:

This allows the user to set a binded audio setting or set the extracted audio to Matrix. The options are:

- **Bind to Input** - The extracted audio port is always fixed to a specific input. For example, when a source is plugged into INPUT 1, OUTPUT 1 will always have the audio signal from INPUT 1. This will happen regardless of which input is selected for OUTPUT 1
- **Bind to Output (Default)** - The extracted audio always follows the corresponding HDMI output. For example, in this mode AUDIO OUT 1 and HDMI OUT 1 are the same (Switched Together).exa
- **Matrix** - You can set to "Matrix" and it will allow routing of the audio as a separate, stand-alone "Matrix". This allows use of the "Audio Matrix" buttons pictured above.

Web Interface: EDID Manage

**EDID Manage:**

Using the built-in EDID manager, a multitude of EDID's can be set for each input, and each input can be assigned a different EDID. This should be used to optimize or to manage infrastructure.

The EDID options are:

- |                       |                           |
|-----------------------|---------------------------|
| 1. 1080P_2CH          | 17. 1080P_8CH_HDR         |
| 2. 1080P_6CH          | 18. 1080P_3D_2CH_HDR      |
| 3. 1080P_8CH          | 19. 1080P_3D_6CH_HDR      |
| 4. 1080P_3D_2CH       | 20. 1080P_3D_8CH_HDR      |
| 5. 1080P_3D_6CH       | 21. 4K30HZ_3D_2CH_HDR     |
| 6. 1080P_3D_8CH       | 22. 4K30HZ_3D_6CH_HDR     |
| 7. 4K30HZ_3D_2CH      | 23. 4K30HZ_3D_8CH_HDR     |
| 8. 4K30HZ_3D_6CH      | 24. 4K60HzY420_3D_2CH_HDR |
| 9. 4K30HZ_3D_8CH      | 25. 4K60HzY420_3D_6CH_HDR |
| 10. 4K60HzY420_3D_2CH | 26. 4K60HzY420_3D_8CH_HDR |
| 11. 4K60HzY420_3D_6CH | 27. 4K60HZ_3D_2CH_HDR     |
| 12. 4K60HzY420_3D_8CH | 28. 4K60HZ_3D_6CH_HDR     |
| 13. 4K60HZ_3D_2CH     | 29. 4K60HZ_3D_8CH_HDR     |
| 14. 4K60HZ_3D_6CH     | 30. User EDID 1           |
| 15. 4K60HZ_3D_8CH     | 31. User EDID 2           |
| 16. 1080P_2CH_HDR     | 32. User EDID 3           |
| 17. 1080P_6CH_HDR     |                           |

\*You can copy the EDID from any output and apply it to any input. Select "Copy EDID from Output x" (x=1-8). This will copy the EDID from the display and apply it to the selected input. The new EDID will be stored as "USER EDID1"



## Web Interface: System Settings



**IP Setting**

MAC Address:

Host IP Address:

Subnet Mask:

Router IP Address:

TCP Port:

DHCP
  Static IP

**Port Alias Setting**

OUT1	<input type="text" value="OUT1"/>	IN1	<input type="text" value="IN1"/>
OUT2	<input type="text" value="OUT2"/>	IN2	<input type="text" value="IN2"/>
OUT3	<input type="text" value="OUT3"/>	IN3	<input type="text" value="IN3"/>
OUT4	<input type="text" value="OUT4"/>	IN4	<input type="text" value="IN4"/>

### IP Settings:

Set network settings such as:

- Static IP
- Subnet Mask
- Router IP
- TCP Port
- Enable DHCP

### Port Alias Settings:

Rename inputs and outputs for easy management. Each custom name is limited to eight (8) characters.

## Web Interface: IR Routing

	IN1	IN2	IN3	IN4
OUT1	IN1	IN2	IN3	IN4
OUT2	IN1	IN2	IN3	IN4
OUT3	IN1	IN2	IN3	IN4
OUT4	IN1	IN2	IN3	IN4
ALL	IN1	IN2	IN3	IN4

### IP Switch:

This allows you to route the IR Signals on the IR outputs manually if you want to fix a specific route

## IR Control:

For IR Control there is an IR Window on the front face of the device.



## IR Remote Control:

When routing HDMI, the matrix can be controlled by using the IR remote supplied with the product.

The labels on the left are the OUTPUT numbers.

The left arrow button decrements to the next input port, and the right arrow increments to the next input port.

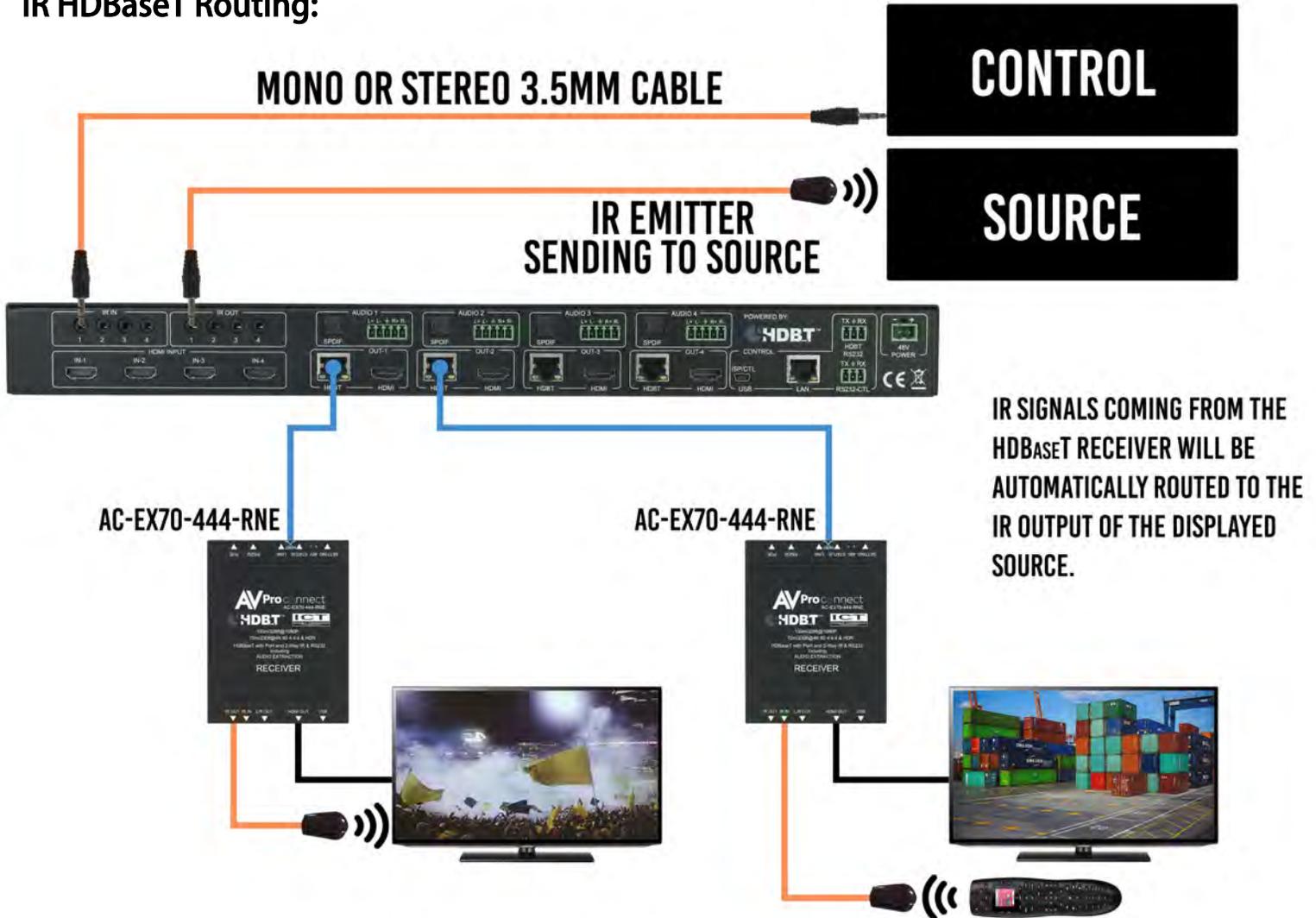
The numbers are for selecting a desired INPUT.



## 2 WAYS FOR IR SWITCH CONTROL



## IR HDBaseT Routing:



## IR NOTES (On the Matrix):

1. By default the **IR IN** is routed to the corresponding HDBaseT Output number (ie. IR IN #1 --> HDBaseT Output 1, IR IN #2 --> HDBaseT Output 2, etc...)
2. By default the **IR OUT** is automatically routed with the active source (ie. If you are watching INPUT 3 on HDBaseT OUTPUT 1, when you point a remote at an IR Receiver on the HDBaseT Rx connected the signal will be routed to IR OUT 3)
3. Each **IR IN** can be routed in any way you like (One to one or one to many) by using the command SET IRC EXT SW x1.x2.x3.x4 (See below).
4. Each **IR OUT** can be routed manually as well using the command SET IRC OUTx VS INy. This can also be controlled by the Web Interface

## IR NOTES (On the HDBaseT Receiver):

1. **IR OUT** = IR Emitter for sending signals to a Display or Projector (Note - Use Provided Emitters)
2. **IR IN** = For sending IR signals back to the Matrix for switching AND to send IR signals to the IR OUT on the Matrix - by default the IR OUT on the matrix is automatically routed with the active source (ie. If you are watching INPUT 3 on HDBaseT OUTPUT 1, when you point a remote at an IR Receiver on the HDBaseT Rx connected the signal will be routed to IR OUT 3)

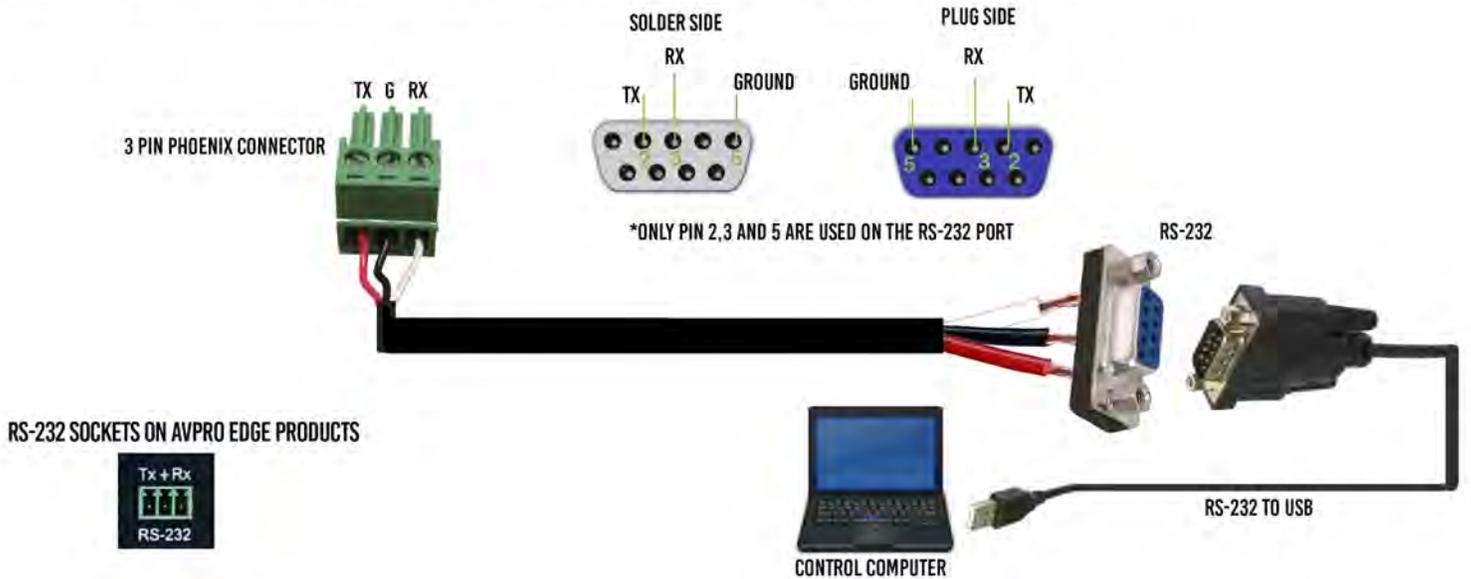


RS-232 Commands cont.:

= Input Setup Commands:		=
= SET INx EDID y	: Set Input x EDID{x=[0~4](0=ALL), y=[0~32]}	=
= 0:1080P_2CH(PCM)	1:1080P_6CH	2:1080P_8CH
= 3:1080P_3D_2CH(PCM)	4:1080P_3D_6CH	5:1080P_3D_8CH
= 6:4k30Hz_3D_2CH(PCM)	7:4k30Hz_3D_6CH	8:4k30Hz_3D_8CH
= 9:4K60Hz(Y420)_3D_2CH(PCM)	10:4K60Hz(Y420)_3D_6CH	11:4K60Hz(Y420)_3D_8CH
= 12:4K60Hz_3D_2CH	13:4K60Hz_3D_6CH	14:4K60Hz_3D_8CH
= 15:1080P_2CH(PCM)_HDR	16:1080P_6CH_HDR	17:1080P_8CH_HDR
= 18:1080P_3D_2CH(PCM)_HDR	19:1080P_3D_6CH_HDR	20:1080P_3D_8CH_HDR
= 21:4K30Hz_3D_2CH(PCM)_HDR	22:4K30Hz_3D_6CH_HDR	23:4K30Hz_3D_6CH_HDR
= 24:4K60Hz(Y420)_3D_2CH(PCM)_HDR	25:4K60Hz(Y420)_3D_6CH_HDR	26:4K60Hz(Y420)_3D_8CH_HDR
= 27:4K60Hz_3D_2CH(PCM)_HDR	28:4K60Hz_3D_6CH_HDR	29:4K60Hz_3D_8CH_HDR
= 30:USER1_EDID	31:USER2_EDID	32:USER3_EDID
= SET INx EDID CY OUTy HP	: Copy HDMI Output y EDID To Input x(USER1 BUF){x=[0~4](0=ALL), y=[1~4]}	=
= SET INx EDID CY OUTy TP	: Copy HDBT Output y EDID To Input x(USER1 BUF){x=[0~4](0=ALL), y=[1~4]}	=
= SET INx EDID Uy DATAz	: Write EDID To User y Buffer of Input x{x=[0~4](0=ALL), y=[1~3],z=[EDID Data]}	=
= GET INx EDID	: Get Input x EDID Index{x=[0~4](0=ALL)}	=
= GET INx EDID y DATA	: Get Input x EDID y Data{x=[1~4],y=[0~32]}	=
-----		-----
= Network Setup Command:		=
= SET RIP xxx.xxx.xxx.xxx	: ( xxx=[000-255], zzzz=[0001~9999]	=
= SET HIP xxx.xxx.xxx.xxx	: Set Route IP Address to xxx.xxx.xxx.xxx	=
= SET HIP xxx.xxx.xxx.xxx	: Set Host IP Address to xxx.xxx.xxx.xxx	=
= SET NMK xxx.xxx.xxx.xxx	: Set Net Mask to xxx.xxx.xxx.xxx	=
= SET TIP zzzz	: Set TCP/IP Port to zzzz	=
= SET DHCP y	: Set DHCP {y=[0~1](0=Dis,1=Enable)}	=
= GET RIP	: Get Route IP Address	=
= GET HIP	: Get Host IP Address	=
= GET NMK	: Get Net Mask	=
= GET TIP	: Get TCP/IP Port	=
= GET DHCP	: Get DHCP Status	=
= GET MAC	: Get MAC Address	=
-----		-----
= IR Route Setup Command:		=
= SET IR EXT SW x1.x2.x3.x4	: Set IR Extender Switch {x1~x4=[0-1](0=Disable,1=Enable)}	=
= GET IR EXT SW	: Get IR Extender Switch Status	=
-----		-----
= RS232 Route Setup Command:		=
= SET RS PTH OUTx LENy BRz	: Set RS232 Pass Through to Outputx {x=[0-4](0=ALL),y=[1~100],	=
	z=[0~5](0=9600,1=14400,2=19200,3=38400,4=57600,5=115200)}	=
-----		-----
= IR Code Setup Command		=
= SET IR SYS xx.yy	: Set IR Custom Code{xx=[00-FFH],yy=[00-FFH]}	=
= SET IR OUTx Iny CODE zz	: Set IR Data Code{x=[1~4],y=[1~4],zz=[00-FFH]}	=
= GET IR SYS	: Get IR Custom Code	=
= GET IR OUTx Iny CODE	: Get IR Data Code	=
-----		-----

# RS-232 CABLE FOR AVPRO EDGE

IN ORDER TO CONNECT YOUR COMPTER TO THE SWITCH BY RS-232 YOU NEED TO MAKE YOUR OWN CABLE WITH ONE END A PHOENIX CONNECTOR AND THE OTHER END A RS-232 PORT. YOUR COMPUTER DOESN'T HAVE A RS-232 INPUT, GET A USB CONVERTER (AS SHOWN BELOW), AND PLUG THE USB END TO ANY COMPUTER



## RS-232 to HDBaseT Output Receivers:

### RS232 Broadcast Mode:

RS232 Broadcast Mode is a very simply way to implement things like "ALL ON" and "ALL OFF" for displays in a system. Broadcast Mode allows you simply pass RS232 signals through without having to use advanced routing details like baud rate. To send broadcast RS232 commands you must simply plug into the "HDBT" RS232 port and send the commands there.

NOTE: For Broadcast Mode baud rate does not matter, this will be set by the device sending the RS232 Signal (i.e Control Processor) - RS232 command is sent to ALL open ports.

For Advanced RS232 Routing see the RS232 section later in the manual



Broadcast RS232 commands to all HDBaseT Outputs

## Device Addresses When Using Serial Communication:

*NOTE: Only set device address when cascading multiple units together and using RS232 as your control method! You also have to send the device address when doing advanced routing while sending commands by serial (next page) even if it is default "A00". You NEVER use device addresses when using IP control or TELNET*

When using serial communication it is good to be aware of the devices "Address" You will want to know the device address as this will determine which unit will receive a command.

All devices are addressed "A00" by default and if you are using just one device you do not need to place this in front of the serial command.

EX1: If you have a standalone unit and are using serial control you can just send a command without the address:

"SET OUT1 VS IN3" ----This will set Output 1 to Input 3

EX2: If you have two units in a "stack" you have to label them A01 and A02, so a command will look like:

"A02SET OUT1 VS IN3" ----This will set Output 1 to Input 3 ON SWITCH TWO. Also, please note that there is no "space" between the address and the command

To set and device address you can use the PC Control Software or send the command "SET ADDR xx" (xx = 01 through 99)

### Advanced RS232 Routing:

In addition to doing RS232 "Broadcast" (Described in the beginning of the manual) you can route RS232 commands to a single specific output. This allow for finite control of displays and the ability to create specific zones. You can send advanced routing commands:

1. By directly plugging a serial cable into the "RS232-CTL" port on the Matrix. Sending Telnet commands via the LAN Port.



To do Advanced Routing, send RS232 signals here

OR



Send TELNET Commands through LAN

## How to route RS232 Commands when using serial:

The routing command is very straight forward but you have to take care to make sure you format it correctly. The main thing to consider before you begin:

1. You are actually sending 2 commands (route & device command) so depending on what you are using to send the command the format varies slightly - We show some examples below.
2. You have to know the baud rate of the device you are sending the command to.
3. For "hybrid" ASCII commands, you may have to convert the numbers to the decimal value.

Ex: If the command is "ka 00 01" you only send "ka 0 1" **The Command:**

The first command is your "route" and it looks like this: **AxxSET RS PTH OUTx LENx BRx**

A = Device Address (use this even if using a single unit, just put 00) OUT = The Output you want to route the forthcoming command to

LEN = Forthcoming command length - for ASCII this includes EVERY character including spaces. For HEX it includes only the BYTE count.

Ex1: If the ASCII command is "ka 0 1" the length is 6. Count spaces. NOTE: You can exceed the length by 2 if unsure. If you exceed the length by more than 2 it will not work.

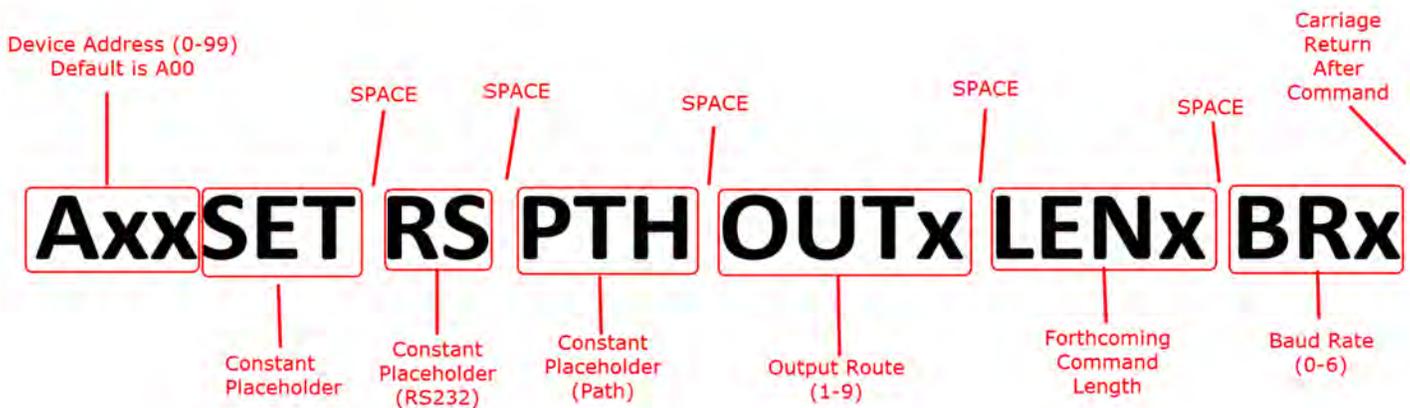
Ex2: If HEX command is "6B 68 20 30 20 31" the length is 6. Do not count spaces. Again, you can exceed by 2.

BR = Baud Rate of the device you are sending to - You use a single digit to replace "x" and they are:

0 - 9600, 1 - 14400, 2 - 19200, 3 - 38400, 4 - 57600, 5 - 115200

There is a carriage return immediately following this command.

After this command you immediately follow it with the command you want to send to the device (no spaces). That command is then followed by another carriage return.



## Command Examples:

### Using A Terminal Program (RS232):

In the following example we are using a program called MYUART Assist. We make this program freely available from [www.avproedge.com](http://www.avproedge.com).

You will notice in the example that it is on 2 lines. This is because you have to separate the commands with a return.

The command below was sent through the HDBaseT Rx on Output 5 to successfully "Power On" a LG TV.

The firmware will send a command acknowledgment at 57600 to the extender. This shows up as "RS DEV MUX 0.0.0.0.0.0.0.0" , if the end device is receiving at 57600. The Matrix itself also sends an acknowledgment commands SET RS PTH OUT5 LEN10 to confirm the rout was set and command sent.



```
A00SET RS PTH OUT5 LEN6 BRO
ka 0 1
```

### Using TELNET (IP):

You can also send these commands by TELNET. When sending TELNET you **do not** send the "Axx" portion of the command. Here is an example command that has been tested:

Green = Route Command

Red = Command to be sent to device

```
"\rSET RS PTH OUT3 LEN10 BRO\r\n\rka 0 1\r\n\r"
```

This example will send the string "\n\rka 0 1\n\r" at 9600 baud to the extender on output #3.

Note that "\n" and "\r" need to be replaced by the literal newline (\n) and carriage-return (\r) characters (hex 0x0a 0x0d). How this is done is dependent on what the control system does, later you see examples from On Controls that uses HEX for commands. The leading and trailing "\r" are for the 9x9 firmware to be able to sync and parse the command correctly. The leading and trailing \n\r are for the end device to be able to parse the command. Because we added 2 characters on each end of the string, I also added 4 to the overall length.

The firmware will send a command acknowledgment at 57600 to the extender. This shows up as "RS DEV MUX 0.0.0.0.0.0.0.0" , if the end device is receiving at 57600. The Matrix itself also sends an acknowledgment commands SET RS PTH OUT5 LEN10 to confirm the rout was set and command sent.

## Using TELNET (IP): On Controls Examples

Green = Route Command

Red = Command to be sent to device

This first example is when sending an ASCII Command

```
\x0DA01SET RS PTH OUT1 LEN17 BR4\x0D\x0A\x0DSET OUT4 VS IN5\x0A\x0D\x0D
```

You can also convert to pure HEX and send a command this way:

```
\x0A\x41\x30\x31\x53\x45\x54\x20\x52\x53\x20\x50\x54\x48\x20\x4F\x55\x54\x31\x20\x4C\x45\x4E\x31\x37\x20\x42\x52\x34\x0D\x0A\x53\x45\x54\x20\x4F\x55\x54\x32\x20\x56\x53\x20\x49\x4E\x32\x0D\x0A
```

A hybrid ascii-hex combo:

Notice one less carriage return at the end of the string - because the device we were sending to did not require a carriage return at the end of the command:

```
\x0DSET RS PTH OUT1 LEN13 BR5\x0D\x0A\x0D\xAA\x02\x00\x07\x00\x00\x00\x00\x10\x03\x00\x3A\x0A\x0D
```

## ▪ Maintenance

To ensure reliable operation of this product as well as protecting the safety of any person using or handling this device while powered, please observe the following instructions.

- Use the power supplies provided. If an alternate supply is required, check voltage, polarity and that it has sufficient power to supply the device it is connected to.
- Do not operate these products outside the specified temperature and humidity range given in the above specifications.
- Ensure there is adequate ventilation to allow this product to operate efficiently.
- Repair of the equipment should only be carried out by qualified professionals as these products contain sensitive components that may be damaged by any mistreatment.
- Only use this product in a dry environment. Do not allow any liquids or harmful chemicals to come into contact with these products.
- Clean this unit with a soft, dry cloth. Never use alcohol, paint thinner or benzene to clean this unit.

## ▪ Damage Requiring Service

The unit should be serviced by qualified service personnel if:

- The DC power supply cord or AC adapter has been damaged
- Objects or liquids have gotten into the unit
- The unit has been exposed to rain
- The unit does not operate normally or exhibits a marked change in performance
- The unit has been dropped or the housing damaged

## Safety Instructions:

To ensure reliable operation of this product and to protect the safety of any person(s) handling this device while powered, please observe the following instructions:

1. Use the power supplies provided. If an alternate supply is required, check voltage, polarity and that it has sufficient power to supply the device that it's connected to.
2. Do not operate this product outside the specified temperature and humidity range given in the above specifications.
3. Ensure there is adequate ventilation to allow this product to operate efficiently.
4. Repair of the equipment should only be carried out by qualified professionals as these products contain sensitive equipment that may be damaged by mistreatment.
5. Only use this product in a dry environment. Do not allow any liquids or harmful chemicals to come into contact with this product.
6. Due to the weight and physical size of this matrix switch, correct handling and lifting should be observed at all times in order to minimize the risk of injury.

## After Sale Service

1. Should you experience any problems while using this product, first, refer to the Troubleshooting section in this manual before contacting Technical Support.
2. When calling Technical Support, the following information should be provided:
  - Product name and model number
  - Product serial number
  - Details of the issue and any conditions under which the issue is occurring.
3. This product has a ten-year standard warranty, beginning from the date of purchase as stated on the sales invoice. Online registration of this product is required to activate the full three-year extended warranty. For full details please refer to our terms and conditions.
4. Product warranty is automatically void under any of the following conditions:
  - The product is already outside of its warranty period.
  - Damage to the product due to incorrect usage or storage.
  - Damage caused by unauthorized repairs.
  - Damage caused by mistreatment of the product.
5. Please direct any question or issues you may have to your local dealer before contacting AVProEdge.



## ▪ Troubleshooting

- Verify Power - The LCD screen on the front of the matrix should be lit up when power is applied. Check that both power supplies are connected to the matrix and powered
- Verify Connections - Check that all cables are properly connected
- Issues with one INPUT/OUTPUT - Swap ports/cables/etc to help narrow down if the issue stays with the input/output/etc
  - Follows the device, then it may be an EDID issue. Default out of the box is a 1080p 2ch. Try another canned EDID or use the COPY FROM OUTx command to copy the connected displays EDID - Pg.12, 17, 23
- Issues with 4k but 1080p or less is working
  - Verify all connected devices are capable of the signal you are sending





Thank you for choosing AVProEdge!

Please contact us with any questions. We are happy to be of service!



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