

USER MANUAL

Ultra Slim 4K HDMI via HDBaseT 70 Meter Extender with
Bi-Directional Power and ARC support

AC-EX70-UHD-ARC



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Introduction

The AC-EX70-UHD-ARC consists of a transmitter and receiver that connect via single CAT-6a/7 UTP/STP. Connecting an HDMI signal to the transmitter allows for sending HDMI signals up to 70 meters at 1080p and up to 40 meters at 4K60 4:2:0, 4K30 4:4:4. This AVPro Edge audio video extender is the most cost-effective, state of the art, and reliable single CAT 70-meter extender on the market today. It solves commercial and residential market problems for distributing high-value 4K UHD content from rack to display with the additional ability to send an audio signal bi-directionally through HDMI's Audio Return Channel (ARC).

Features

- HDMI 2.0
- 4K60 4:2:0, 4K30 4:4:4
- HDR Support up to 4:2:2 12 Bit
- Ultra Slim (.46 inch/11.7 mm)
- Supports 3D
- HDCP 2.2 & Earlier
- CEC Pass Through
- Supports ARC (Audio Return Channel)
- 70M (230ft) on 1080P (Cat6a)
- Up to 40m (131ft) on 4K (Cat6a)
- 48v PoH (Power Over HDBaseT, only one Power Supply Needed)
- I-Pass Feature for control system "pass-through"
- 3-20v protection circuit built in for safe IR transport
- Bi Directional RS232 Transport
- LED Status, Link, Power indication lights
- Use single UTP/STP LAN cable (CAT-6A) with substitute HDMI cable to achieve long distance transmission.
- Supports uncompressed PCM 2- Ch., LPCM 5.1 & 7.1, Dolby Digital, DTS, Dolby TrueHD, DTS HD-Master Audio, Atmos on HDMI
- ESD protection circuitry (Inputs & Outputs) to 7KV
- Can Cascade

In The Box

- AC-EX70-UHD-TX (Transmitter)
- AC-EX70-UHD-RX (Receiver)
- 1x 48V Power Supply (Can be powered at the Rx or Tx)
- 1 x IR Tx Unit
- 1 x IR Rx Unit
- 2 x Mini-Toslink adapters
- 3 Pin Terminal Connectors (For RS-232 Control)
- Mounting Brackets



Specifications

VIDEO:	
VIDEO RESOLUTIONS	UP TO 4K 60HZ 4:2:0 & 4K30 4:4:4
VESA RESOLUTIONS	UP TO DCI 4K (4096X2160)
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)
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
ARC SUPPORT	YES
DISTANCE:	
HDBASET DISTANCE (4K 60 4:2:0)	40 METERS (131 FEET) (CAT 6A)
HDBASET DISTANCE (FULL HD)	70 METERS (230 FEET) (CAT 6A)
HDMI LEAD IN/OUT	UP TO 50 FEET (USING BULLET TRAIN HDMI)
HDMI LEAD IN/OUT (W/ AOC CABLE)	UP TO 130 FEET (USING BULLET TRAIN AOC)
OTHER:	
BANDWIDTH	10.2 GBPS
CEC	YES
HDCP	HDCP 2.2 AND EARLIER
PORTS:	
HDMI	TYPE A
HDBASET	RJ45 W/ POH FOR HDBASET RECEIVERS
IR	3.5MM
AUDIO INPUT/OUTPUT (RX/TX)	3.5MM STEREO / MINI TOSLINK
RS232	3 PIN TERMINAL BLOCK
POWER (TX & RX)	2 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)	12 WATTS MAX
POWER SUPPLY - MATRIX	INPUT: AC 100-240V ~ 50/60Hz OUTPUT: DC 48V 0.5A
DIMENSIONS:	
DIMENSIONS (UNIT ONLY HEIGHT/DEPTH/WIDTH)	MM: 11.7 X 75.2 X 122 INCH: 0.46 X 2.96 X 4.8
DIMENSIONS (PACKAGED HEIGHT/DEPTH/WIDTH)	MM: 86 X 133 X 155 INCH: 3.4 X 5.3 X 6.1
WEIGHT (UNIT)	0.2 LBS (0.09 KG)
WEIGHT (PACKAGED)	1.6 LBS (0.73 KG)
*SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE. MASS & DIMENSIONS ARE APPROXIMATE	

Troubleshooting Lights - Transmitter/Receiver

POWER - On the front (Red).

- Light is ON = Power supply is connected and functioning.
- Light is OFF = Power supply is not connected or there is no power present. Verify connections, power supply, USP, Outlet, etc...

HDBT ACT - On the front (Blue).

- Light is on (Flashing) = Normal operation.
- Light is off = The HDBaseT Chip is not active (verify power).

HDBT LINK - On the front (Blue).

- This indicator shows that the AV HDBaseT Link between the Transmitter and the Receiver is intact. This light should always be solid.

HDMI ACT - On the front (Blue).

- Light is ON (Solid) = Sync with the HDMI Source/Display is correct and solid.
- Light is OFF = There is no HDMI activity detected on the HDMI INPUT/OUTPUT port.



Troubleshooting Lights (HDBaseT Port)

STATUS - On the HDBaseT port, back of the Transmitter/Receiver (Amber).

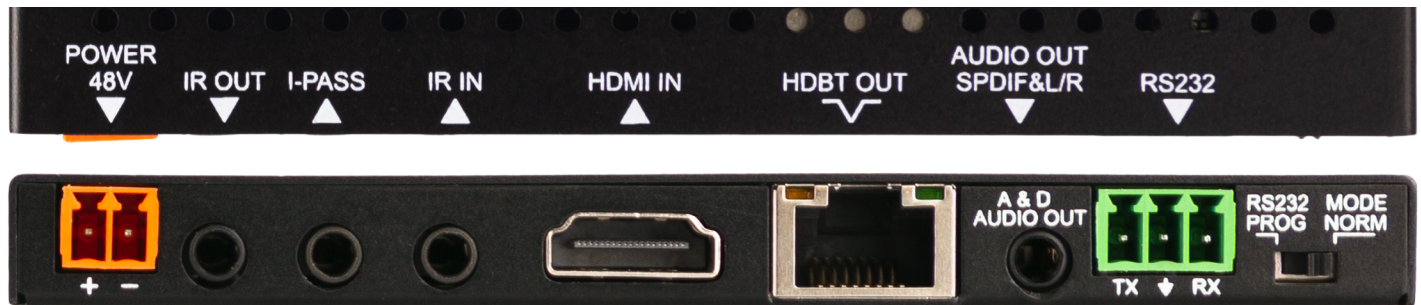
- Light is ON (Flashing) = Normal operation
- Light is OFF = There is no HDBaseT activity.

LINK - On the HDBaseT port, back of the Transmitter/Receiver (Green).

- Light is on (solid) = Normal operation.
- Light is off = There is no communication between the Transmitter and Receiver.



Transmitter Ports



POWER 48V - 2 Pin terminal connector. You can power at either the Transmitter or the Receiver. Power will be provided automatically over the Category cable to the other HDBaseT unit.

IR OUT/I-PASS/IR IN - There are 3 options for IR (examples are under the section "IR CONFIGURATION" Page 8/9).

1. IR OUT: For use with an IR EMITTER (3.5mm).
2. I-PASS: For use with a MONO/STEREO 3.5mm cable directly connected to a control system, to send IR Signals to the remote end.
3. IR IN: For use with an IR Receiving Eye.

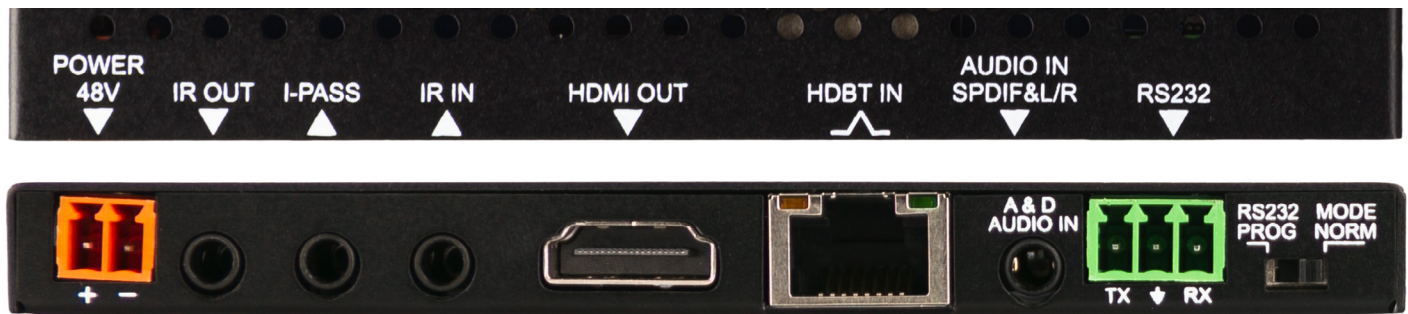
HDMI IN - HDMI Input port (Type A).

HDBT OUT - HDBaseT Output port (RJ45).

AUDIO OUT - 3.5mm Stereo / Mini Toslink Port (see the "EXTRACTED AUDIO" section on page 10 for more details).

RS232 - 3 Pin Terminal Connector (see the "RS-232 CONFIGURATION" section on page 13 for more details).

Receiver Ports



POWER 48V - 2 Pin terminal connector. You can power at either the Transmitter or the Receiver. Power will be provided automatically over the Category cable to the other HDBaseT unit.

IR OUT/I-PASS/IR IN - There are 3 options for IR (examples are under the section "IR CONFIGURATION" Page 8/9).

1. **IR OUT:** For use with an IR EMITTER (3.5mm).
 - **I-PASS:** For use with a MONO 3.5mm cable directly connected to a control system to send IR Signals to the remote end.
 - **IR IN:** For use with an IR Receiving Eye.

HDMI IN - HDMI Input port (Type A).

HDBT OUT - HDBaseT Output port (RJ45).

AUDIO IN - 3.5mm Stereo / Mini Toslink Port (see the "EXTRACTED AUDIO" section on page 10 for more details).

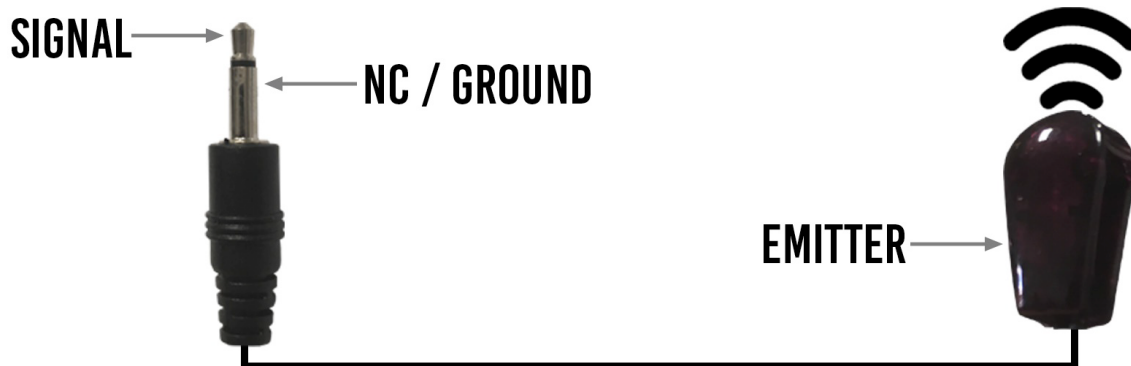
RS232 - 3 Pin Terminal Connector (see the "RS-232 CONFIGURATION" section on page 13 for more details).

IR Configuration

There are three different 3.5mm IR ports located on the Transmitter and Receiver.



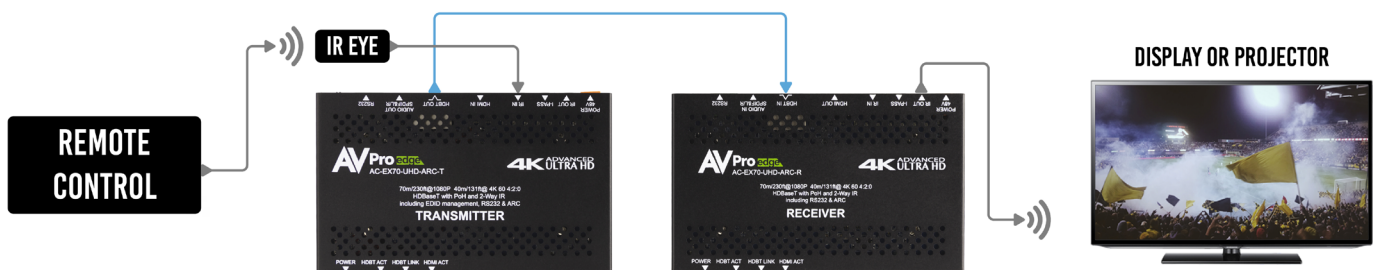
IR OUT - This port is designed to accept an IR Emitter



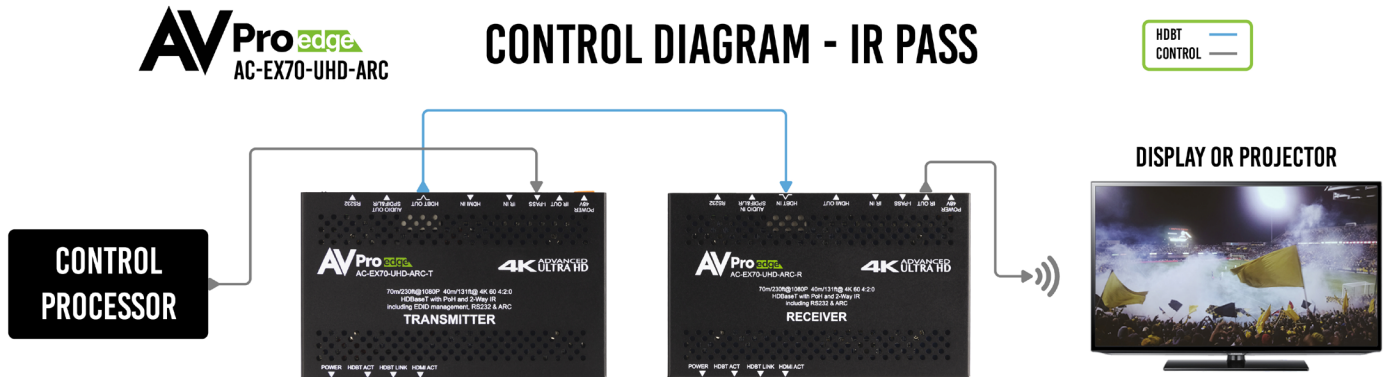
In the example below an IR receiving eye is plugged into the "IR IN" port of the HDBaseT Transmitter, and a IR Emitter is plugged into the "IR OUT" port of the HDBaseT Receiver. This allows you to use an IR Remote control to send an IR signal from the source side (TX) down the category cable to the sync (RX) and control the display.



CONTROL DIAGRAM - IR SENDING



In the example below a control system is plugged into the "IPASS" port of the HDBaseT Transmitter with a 3.5mm mono cable, and a IR Emitter is plugged into the "IR OUT" port of the HDBaseT Receiver. This allows you to send an IR signal from a control system down the category cable to the sync (RX) and control the display.

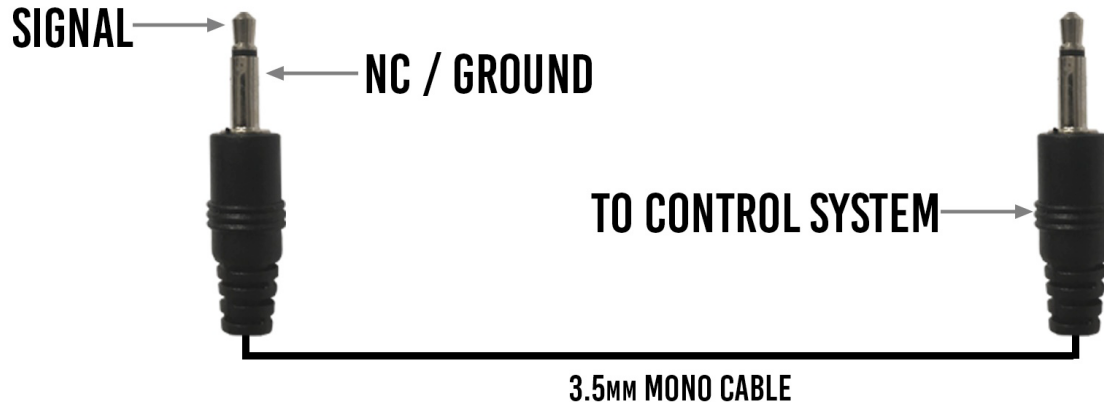


IPASS - This port is designed to be directly connected to a control system via a 3.5mm Mono cable

NOTE: IPASS is only an INPUT. So you can go IPASS in from a control system to IR OUT.

Control System > IPASS (TX) -----IR OUT (RX)

Control System > IPASS (RX) -----IR OUT (TX)



IR OUT - This port is designed to accept an IR Emitter



Audio

The 3.5mm Extracted Audio port on the Transmitter and Receiver is a dual purpose port. It is designed to accept a 3.5mm stereo cable, or a Mini Toslink (x2 adapters included in kit).

- 3.5mm Stereo Cable (not included)
- Mini TOSLINK (x2 adapters included, Toslink cable not included)



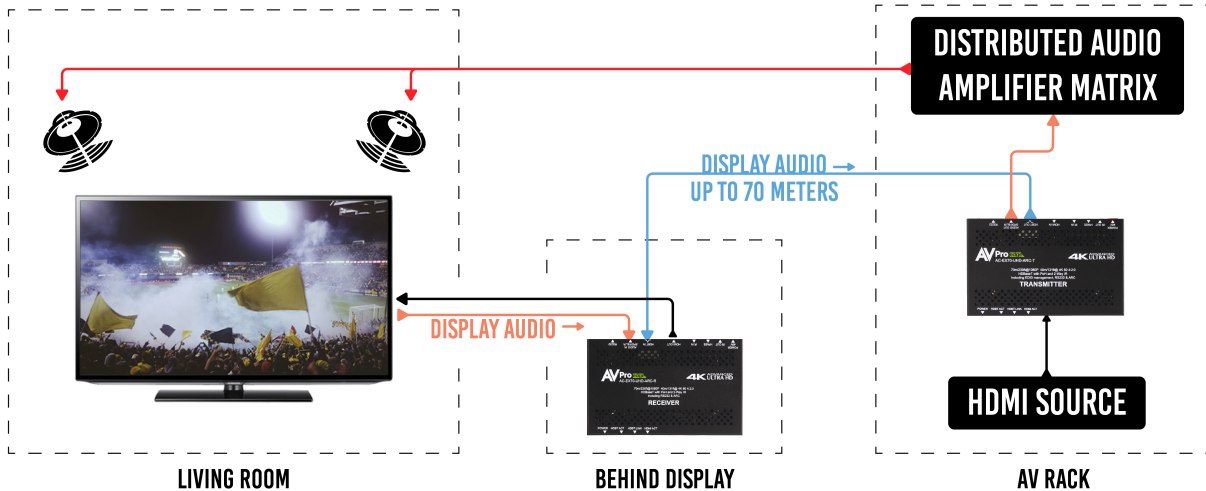
Example of Mini-Toslink adapter (2x included in kit)
(3.5mm Audio Cable and TOSLINK Cable not included.)

In the examples below, the Transmitter sends video to the display, and audio is coming back from the display. The first example shows a display sending audio to the Receiver's SPDIF Audio Input. The Receiver sends audio back to the Transmitter, which extracts it via the SPDIF Audio Output.



LIVING ROOM APPLICATION DIAGRAM

SPDIF/Analog Audio From Display to Audio Distribution

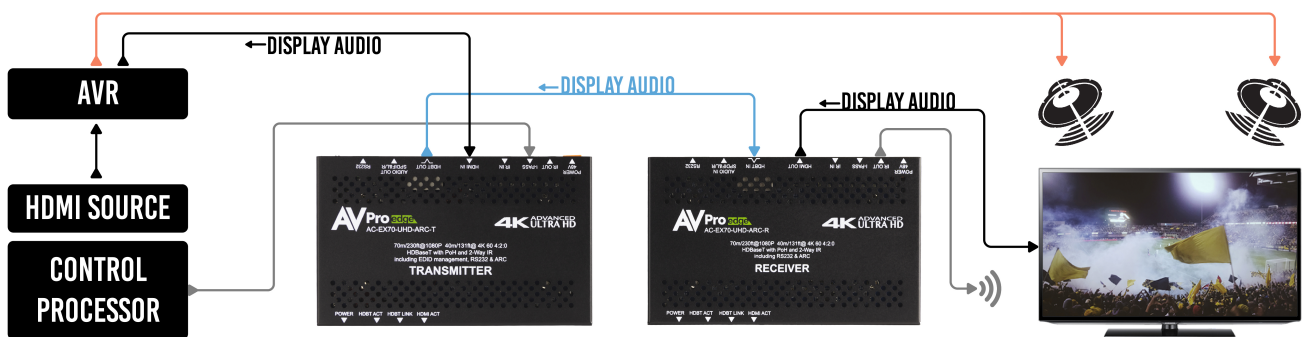


In this example, the HDMI Audio Return Channel (ARC) receives audio from the display. Audio returns to the Receiver from the display and the AV Receiver from the Transmitter with the HDMI ARC.



CONNECTION DIAGRAM

ARC Audio From Display to AV Receiver



EDID Management - Transmitter

Default out of the box all the dip switches are down (off) "BYPASS (HDBT)" mode. This will pass the EDID of the connected display to the source un-altered.

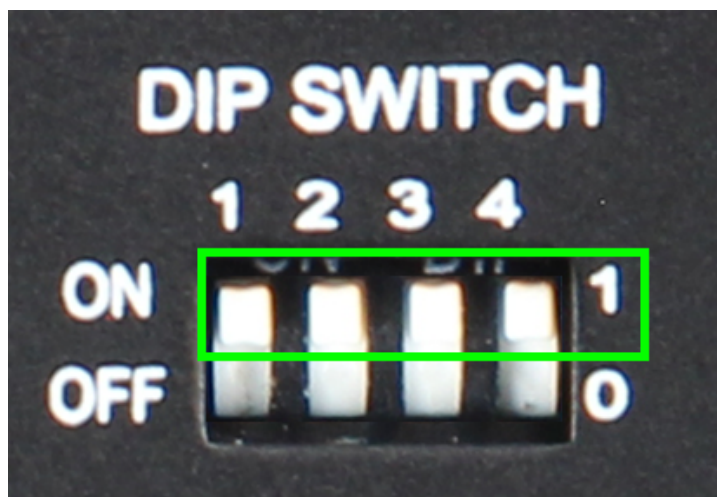
NOTE: This is a 10.2Gbps extender, when in "BYPASS (HDBT)" make sure the source is not sending a signal that exceeds this HDBaseT Extender set. See bandwidth chart located on page 13 for more information.

EDID SETTINGS				
DIP SWITCH NO	1	2	3	4
BYPASS (HDBT)	0	0	0	0
1080P-2CH	0	0	0	1
1080P-6CH	0	0	1	0
1080P-8CH	0	0	1	1
1080P-2CH-RGB	0	1	0	0
1900x1200 - RGB	0	1	0	1
4K30Hz YC444 - HDR - 2CH	0	1	1	0
4K30Hz YC444 - HDR - 6CH	0	1	1	1
4K30Hz YC444 - HDR - 8CH	1	0	0	0
4K30Hz RGB - 2CH	1	0	0	1
4K60Hz YC420 - HDR - 2CH	1	0	1	0
4K60Hz YC420 - HDR - 6CH	1	0	1	1
4K60Hz YC420 - HDR - 8CH	1	1	0	0
4K30Hz YC444 - SDR - 2CH	1	1	0	1
4K60Hz YC420 - SDR - 2CH	1	1	1	0
USER EDID COPY / STORE	1	1	1	1



EDID Copy Instructions

Set the DIP switches to 1 1 1 1 (all Up/On) with the connected sink (display) powered on. This will copy and store the downstream EDID from the sink (display) onto the Transmitter. This will stay until the above procedure is repeated.



RS-232 Configuration

For extending RS-232 communication over the Category cable. For these to pass a signal, both the Transmitter and Receiver need to have the Dip Switch set to Normal Mode, not RS-232 Program.

Default out of the box is MODE NORM (Normal Mode).

RS232 PROG (Program mode for Firmware updating).



Troubleshooting

- Verify Power - Check that the power supply is properly connected and on an active circuit.
 - Verify Connections - Check that all cables are properly connected.
 - TX/RX Indicator Troubleshooting Lights - Pg. 5-6
 - IR Issues - Verify correct connections - P. 8-9
- Note: Visibly flashing Emitters may not function properly, if you are experiencing issue try the IR Cables that come in the box.
- Lights indicate everything is good but still not getting a picture, this may be a bandwidth limitation. See Bandwith Chart below to verify the signal is not exceeding the bandwidth of the Extender kit (limited to 10.2Gbps).

Bandwith Chart

TYPE	RESOLUTION	FRAME RATE (FPS)	COLOUR COMPRESSION	DEEP COLOUR BIT DEPTH	HDR	WIDE COLOR GAMUT (BT2020)	HDMI VERSION	DATA RATE	UHD SERIES
HD	1920x1080	24	4:2:2	8 BIT	NO	NO	1.4	0.75 GBPS	YES
HD	1920x1080	60	4:2:2	8 BIT	NO	NO	1.4	4.45 GBPS	YES
HD	1920x1080	60	4:4:4	16 BIT	NO	NO	1.4	5.91 GBPS	YES
UHD	3840x2160	24	4:2:0	8 BIT	NO	NO	1.4	8.91 GBPS	YES
UHD	3840x2160	24	4:4:4	8 BIT	NO	NO	1.4	8.91 GBPS	YES
4K	4096x2160	24	4:4:4	8 BIT	NO	NO	1.4	8.91 GBPS	YES
UHD OR 4K	3840x2160	60	4:2:0	8 BIT	NO	NO	1.4/2.0	8.91 GBPS	YES
UHD OR 4K	3840x2160	24	4:2:0	10 BIT	YES	YES	2.0(A/B)	8.91 GBPS	YES
UHD OR 4K	3840x2160	24	4:2:2	12 BIT	YES	YES	2.0(A/B)	11.14 GBPS	NO
UHD OR 4K	3840x2160	24	4:4:4	10 BIT	YES	YES	2.0(A/B)	11.14 GBPS	NO
UHD OR 4K	3840x2160	24	4:4:4	12 BIT	YES	YES	2.0(A/B)	13.37 GBPS	NO
UHD OR 4K	3840x2160	60	4:2:0	10 BIT	YES	YES	2.0(A/B)	11.14 GBPS	NO
UHD OR 4K	3840x2160	60	4:2:0	12 BIT	YES	YES	2.0(A/B)	13.37 GBPS	NO
UHD OR 4K	3840x2160	60	4:2:2	12 BIT	YES	YES	2.0(A/B)	17.82 GBPS	NO
UHD OR 4K	3840x2160	60	4:4:4	8 BIT	YES	YES	2.0(A/B)	17.82 GBPS	NO

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 adaptor 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

Support

Should you experience any problems while using this product, first, refer to the Troubleshooting section of this manual before contacting Technical Support. When calling, 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
- Clean this unit with a soft, dry cloth. Never use alcohol, paint thinner or benzene to clean this unit.

Warranty

If your product does not work properly because of a defect in materials or workmanship, AVProEdge (referred to as "the warrantor") will, for the length of the period indicated as below, (Parts/Labor (10) Years), which starts with the date of original purchase ("Limited Warranty period"), at its option either (a) repair your product with new or refurbished parts, or (b) replace it with a new or a refurbished product. The decision to repair or replace will be made by the warrantor. During the "Labor" Limited Warranty period there will be no charge for labor. During the "Parts" warranty period, there will be no charge for parts. You must mail-in your product during the warranty period. This Limited Warranty is extended only to the original purchaser and only covers product purchased as new. A purchase receipt or other proof of original purchase date is required for Limited Warranty service.

This warranty extends to products purchased directly from AVPro or an authorized dealer. AVPro is not liable to honor this warranty if the product has been used in any application other than that for which it was intended, has been subjected to misuse, accidental damage, modification or improper installation procedures, unauthorized repairs or is outside of the warranty period. Please direct any questions or issues you may have to your local dealer before contacting AVPro.

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

[illegible]

Thank you for choosing AVProEdge!

Please contact us with any questions, we are
happily at your service!



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