

USER MANUAL

Ultra Slim 70m (100m HD) 4K60 4:4:4, HDR HDBaseT Extender
Audio Extraction, EDID Management, Scaling & Ethernet



AVPro Edge's 70-meter 4K transmitter can support long-distance runs of high bandwidth data signals over standard category cable. Professional AV installers will use this device anytime they need to send HDMI signals long distances. This device will convert the HDMI signal into an HDBaseT type that distributes uncompressed video data through walls and underground to areas that are not easily reached.

This device works perfectly with any HDBaseT TV, projector, or AVR, but even more so works with AVPro Edges scaling HDBaseT Receiver (AC-EX70-SC2-R). When paired together you are in full control of the video signals that are passing through, you can input a full 4K60 signal, but scale it to a standard 720p for legacy TVs and projectors.

This transmitter uses ICT Technology to fit the full 4K60 (4:4:4) signal over a single piece of category cable, we do this by lightly compressing any signal over 10.2Gbps to fit through the category pipeline. Because this compression is engineered to not affect the picture quality, you have a near-lossless image on the screen.

Product Overview

- AC-EX70-444-TNE2 ~ HDBaseT Transmitter w/IR and RS-232

Features

- HDMI 2.0(a/b)
- 18Gbps Bandwidth Support (Using ICT)
- 4K60 (4:4:4)
- 12-bit Support
- Full HDR (HDR, HDR10+, and HLG) and Dolby Vision Support
- HDCP 2.2 & Earlier Supported
- EDID Management and EDID emulate
- L/R Audio Extraction on Tx
- CEC Pass Through
- 3D Support
- Ultra Slim (.47 inch/12mm)
- Bidirectional RS232 Transport
- LED Status, Link, Power indication lights
- 100M (330ft) On 1080P, Up to 70m (230ft) on 4K (Cat6a)
- Bi-Directional PoE (ieee)
- Rugged, long-life chassis
- RS232 Control form local or remote
- Single UTP/STP LAN cable (CAT-5E/6A) for all signals (Shielded Cat6 recommended)
- ESD protection circuitry (Inputs / Outputs) till 7KV.
- Transfer IR & RS-232 signals from Tx to Rx
- I-Pass Feature for control system "pass-through IR"
- 3-20v protection circuit built-in for safe IR transport
- Compatible with HDBaseT displays, projectors, AVR's
- Supports uncompressed PCM 2- Ch., 5.1, 7.1, Dolby Digital, DTS, Dolby TrueHD, DTS HD-Master Audio, Atmos.

Whats in the box

- AC-EX70-444-TNE2 (Transmitter)
- 1 × 48V Power Supply
- 1 × IR Tx Unit1
- 1 × IR Rx Unit
- 2 × 3 Pin Terminal blocks for Audio and RS232 Ports
- 2 × Mounting Brackets
- 4 × Screws

***NOTE: Optional 3PIN to STEREO Audio Cables available for purchase "AC-CABLE-3PIN-2CH"**

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 (24/30 FRAMES), HLG, DOLBY VISION
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)
DOWN SCALING	4K (AND HDR) DOWN TO 1080P
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 (2CH PORT)	PCM 2 CH (NO DOWNMIX)
DISTANCE:	
HDBASET (CAT) DISTANCE (4K)	70 METERS / 230 FEET (CAT 6A)
HDBASET (CAT) DISTANCE (FULL HD)	100 METERS / 330 FEET (CAT 6A)
HDMI LEAD IN/OUT (4K60 4:4:4)	UP TO 50 FEET (USING BULLET TRAIN HDMI)
HDMI LEAD IN/OUT (W/ AOC CABLE) (4K60 4:4:4)	UP TO 130 FEET (USING BULLET TRAIN AOC)
OTHER:	
BANDWIDTH	18 GBPS (USES ICT ABOVE 10.2 GBPS SIGNALS)
HDCP	HDCP 2.2 AND EARLIER
PORTS:	
HDMI (TX & RX)	TYPE A
HDBASET	RJ45 W/ POH FOR HDBASET RECEIVERS
AUDIO (EXTRACTED ANALOG) (TX & RX)	3 PIN TERMINAL BLOCK (UNBALANCED) EACH
IR TX (TX & RX)	3.5MM MONO (2 CONDUCTOR) EACH
IR RX (TX & RX)	3.5MM STEREO (3 CONDUCTOR) EACH
RS232 (TX & RX)	3 PIN TERMINAL BLOCK EACH
POWER (TX & RX)	2 PIN TERMINAL BLOCK EACH
ETHERNET (TX & RX)	2X RJ45 CONNECTIONS EACH (10/100)
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: 157 X 103 X 12 INCH: 6.18 X 4.04 X 0.47
DIMENSIONS (PACKAGED HEIGHT/DEPTH/WIDTH)	MM: 203 X 165 X 91 INCH: 8 X 6.5 X 3.6
WEIGHT (UNIT)	0.4 LB/0.13 KG
WEIGHT (PACKAGED)	2 LBS/0.90 KG
*SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE. MASS & DIMENSIONS ARE APPROXIMATE	

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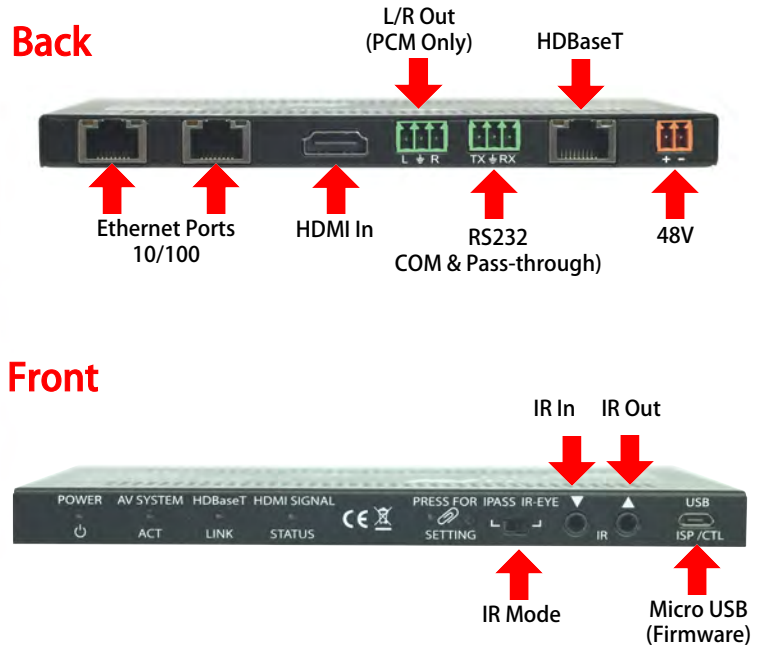
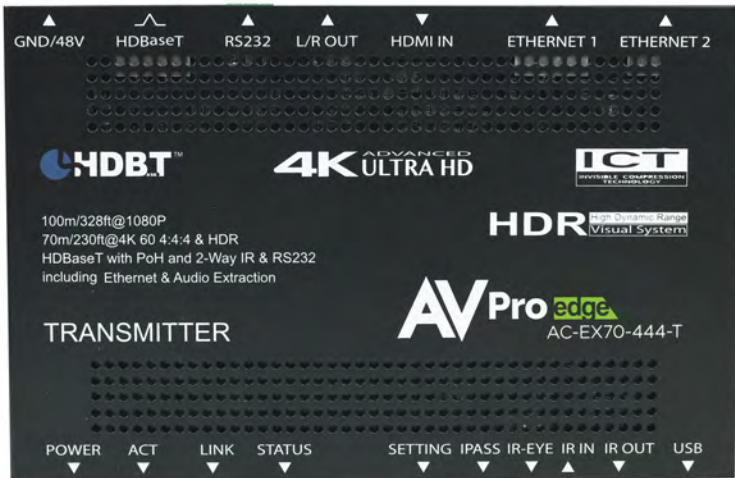
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■ The Transmitter



Indicator Troubleshooting Lights on the Transmitter:

POWER - On the front: (Red) This is an indicator that the power is connected. There are only two states for light:

- Light Is On = Power supply is connected and functioning.
- Light Is Off = Power supply is not connected or there is no power present. (In order to have power: check the power supply, USP, Outlet, etc...)

AV SYSTEM ACT - On the front: (Blue) This is an indicator of activity on the link - this light will blink randomly as data is sent/received.

HDBaseT LINK - On the front: (Blue) This is an indicator that that the RJ45 HDBaseT Link is stable. This light should always be SOLID.

HDMI SIGNAL STATUS - On the front: (Blue) This indicator shows that the HDMI source is connected.

The states are:

- Light Is On (Solid) = Sync w/ HDMI source is correct and solid.
- Light Is Flashing = The light flashes during the sync process. If it is flashing continuously, a picture may not be present.

If the **BLUE HDMI SIGNAL STATUS LIGHT** is flashing, check the following:

1. The source. Plug it directly into the display to be sure it's functioning properly.
2. Try a longer HDMI cable. Some HDMI cables do not sync well at shorter lengths.
3. Set the EDID to state #1 (See below).
4. If these suggestions do not work, enable the "Test Pattern" (See Below). If you see the pattern, the problem is between the source and the transmitter, please try a different source.
5. Contact AVProEdge if these suggestions do not work.

Indicator Troubleshooting Lights on the Transmitter cont.:

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

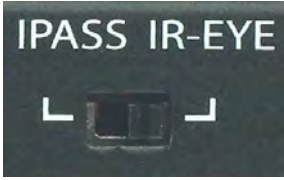
If this light is flashing or not present attempt following:

1. Check the length. The maximum distances are 70m (230ft) on 4K and 100m (330ft) 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.
 - a. **Standard RJ45 ends are recommended. Pass through style types can cause interference/crosstalk**
5. Contact AVProEdge if these suggestions do not work.

STATUS- Above RJ45 (HDBT) Port: (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 you do not see this light, attempt the following:

1. Check the length. The maximum distances are 70m (230ft) on 4K and 100m (330ft) 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 just slightly off.
 - a. **Standard RJ45 ends are recommended. Pass through style types can cause interference/crosstalk**
5. Try powering from the Receiver instead of the Transmitter (See Receiver page for more about PoE direction).
6. Contact AVProEdge if these steps do not work.

Functions & Setup of the Transmitter:



IR Mode Slide Switch: (On Front) This is used to select a preferred IR Mode - There are two modes:

- IR-EYE - The IR Input will be configured to operate with an IR Receiver Eye.
- I-PASS - The IR Input will be configured to safely operate with a direct connection from a control system using a mono or stereo 3.5mm cable. It's protected @ 3v-20v. Default mode is IR-EYE.

Using the Setting Button: (On Front) The setting button can be pressed in different combinations based on what is needed. The status light on the front will flash based on the selection. The selections are in series, meaning, for example, if you are on selection 5 (listed below), you can come back later and press it again to move you to 6, 7, 8, 1, 2, etc... Using an ink pen is best to press the button.

The SETTING BUTTON is located just to the right of the to the left of the symbol.



symbol, and the SETTING INDICATOR LED is just

EDID Management: GEN2

(Indicated by part number AC-EX70-444-T-2)

4 LED lights on the board inside the chassis (see below) Corresponding light will be solid, the others will flash



EDID SETTINGS		
LED STATUS	1 - ON	0 - OFF
1080P 2CH	1	0 0 0
1080P 8CH	0	1 0 0
4K 60 4:2:0 3D 2CH	1	1 0 0
4K 60 4:2:0 3D 8CH	1	0 1 0
4K 60 3D 2CH HDR	0	1 1 0
4K 60 3D 8CH HDR	1	1 1 0
USER EDID	0	0 0 1

■ COPY DEVICE EDID

While in the USER EDID state (8), press and hold the setting button (for 4 seconds) in order to copy the EDID from the connected display or downstream device to the user EDID and it will apply automatically.

Why do this?

This is commonly used when there is a need for a specific, known EDID that the installer may prefer. It can also be used if you want to bypass an EDID of an AVR or another connected device. (IE, plug the extender kit directly into a display and COPY the EDID. Plug it back into an AVR that may not have a current/good EDID).

Scaler Setting:

While in ANY state besides the USER EDID state, press and hold the setting button (for 4 seconds) to toggle the scaler mode.

The options are:

1. Normal Mode(ICT Mode) --- LED Flashes 1 Time
2. Down Scaler Mode (4K->2K) --- LED Flashes 2 Times

Functions & Setup of the Transmitter Cont:

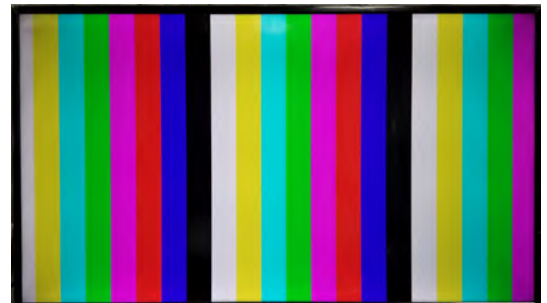
Test Pattern Generator:

Press and hold the setting button (for 4 seconds) while powering up the transmitter. You should see the color bar pattern to the right on screen. When in this mode, you can quick press to toggle the resolution.

Quick press the setting button---Select the test pattern timing.

- 1080P --- LED Flashes 1 Time (3 sets of color bars, example to the right)
- 4K --- LED Flashes 2 Times (5 sets of color bars)

***NOTE: This can be useful for checking your cabling and for troubleshooting. You can also ensure you have sufficient distance based on the resolution as well.**



Long Range Mode: 150m (500ft) on up to 1080P 8-BIT

1. Enable Test Pattern Mode - Press and hold settings button for 4 seconds while powering up the transmitter.
2. In Test Pattern Mode - Press and hold the settings button for 4 seconds to enable/disable Long Range Mode
 - a. Flash Once - Disabled
 - b. Flash Twice - Enabled
3. Reboot the extender, Long Range Mode is now active,.



Ethernet Lights & Usage:

Ethernet usage is very straight-forward. It is used for driving network communication over the HDBaseT link. The purpose of these ports is to act as a "Hub", if you plug one port into a router all the other ports on both the Tx & Rx now have access to the network.

Usage Examples:

- Supplying a hardwire Ethernet connection to video zones for on-device streaming and/or local gaming devices and players.
- Supplying server based content from a server to a remote display.
- Supplying a zone with a hardwired Ethernet connection for a Wi-Fi access-point in remote zones.

Usage is plug-&-play - the ports are always active and so long as ONE of the FOUR combined ports between the Tx and Rx is connected to the network the other three have access.

Ethernet Indicator Lights:

- **AMBER** - This indicates and Ethernet connection is made, and the connection is stable. This should be SOLID.
- **GREEN** - This indicates that there is activity on the line. This light flashes randomly as data is transmitted. If this light is steady OFF there is no data coming through or you may need to reset the Ethernet router.

Functions & Setup of the Receiver:



POE Slide Switch: (On Front) This is used to select how you want to PoE is to be directed. There are two options (you are choosing where the power is ORIGINATING from):

- TX (Default)= You will need to power the TRANSMITTER, the receiver will be powered over the CAT Cable (Default).
- RX = You will need to power the RECEIVER, the transmitter will be powered over the CAT Cable from the receiver (This is called "Reverse Power").

Using the Setting Button: (On Front) The SETTING BUTTON is located just to the left of the POE switch. This button can be used to enable/disable the built in Test Pattern Generator.

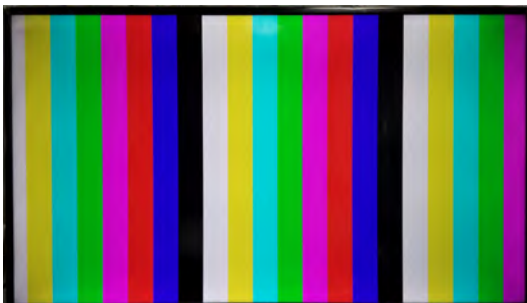
Test Pattern Generator:

Press and hold the setting button (for 4 seconds) while powering up the receiver. If you are powering from the transmitter side, to power cycle the receiver unplug the HDBaseT Category cable. You should see the color bar pattern appear the right on screen. When in this mode, you can quick press the settings button to toggle the two resolutions. To Disable, power cycle the receiver.

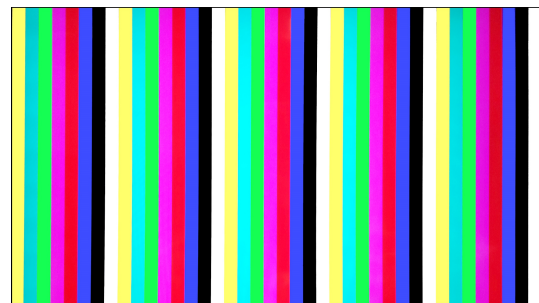
Quick press the setting button---Select the test pattern timing.

- 1080P --- LED Flashes 1 Time (3 sets of color bars, example below)
- 4K --- LED Flashes 2 Times (5 sets of color bars, example below)

***NOTE:** This can be useful for checking your cabling and for troubleshooting. You can also ensure you have sufficient distance based on the resolution as well.



1080P Test Pattern



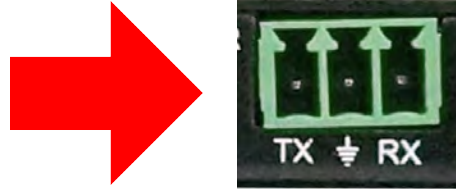
4K Test Pattern

■ RS-232 Configuration

RS-232 can be used to pass control signals bi-directionally to & from any RS-232 compatible device. This is commonly used to route control signals in the following way:

1. Control System --> Display/Projector (ie, Power On/Off)
2. Display/Projector --> Control System (ie, Display Status, Volume Status etc...)
3. When ultra long-range serial communication is needed (think concerts, live events). Use the extender.

The unit comes with 3 pin connectors to allow for any wire an integrator would like. The pin out configuration Left=TX, Center=Ground, Right=RX and looks like this:

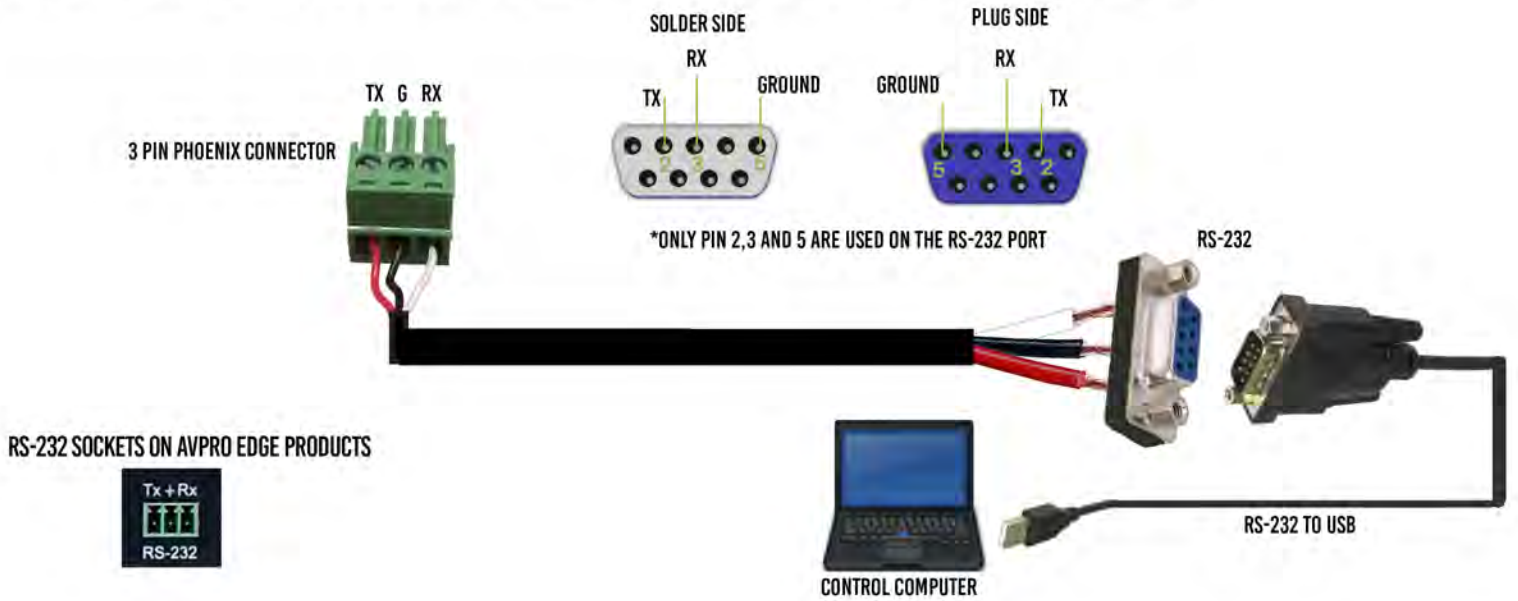


This is how the cable should look. If using the AC-CABLE-3.5-DB9F (Female) or AC-CABLE-3.5-DB9M (Male), the colors will be the same. With any other cable, please follow Tx, G, Rx as shown below. See RS-232 cable preparation diagram below



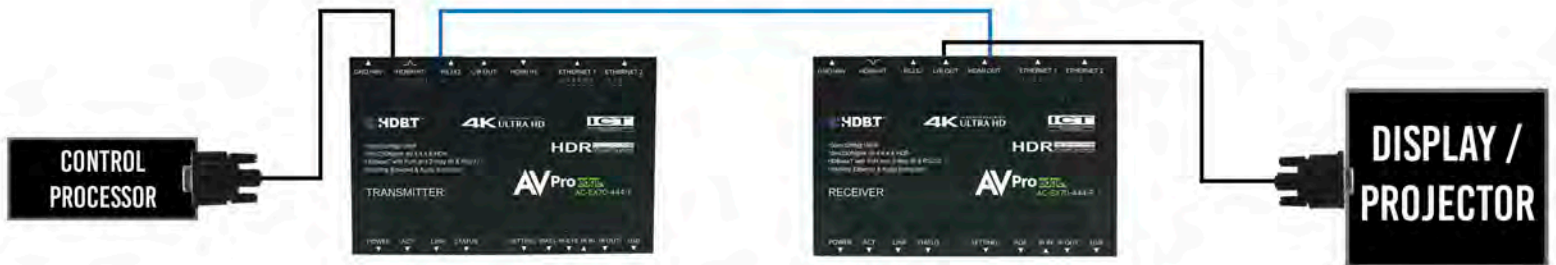
RS-232 CABLE FOR AVPRO EDGE

IN ORDER TO CONNECT YOUR COMPUTER 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 Sample Application

444 EXTENDER RS-232 CONTROL



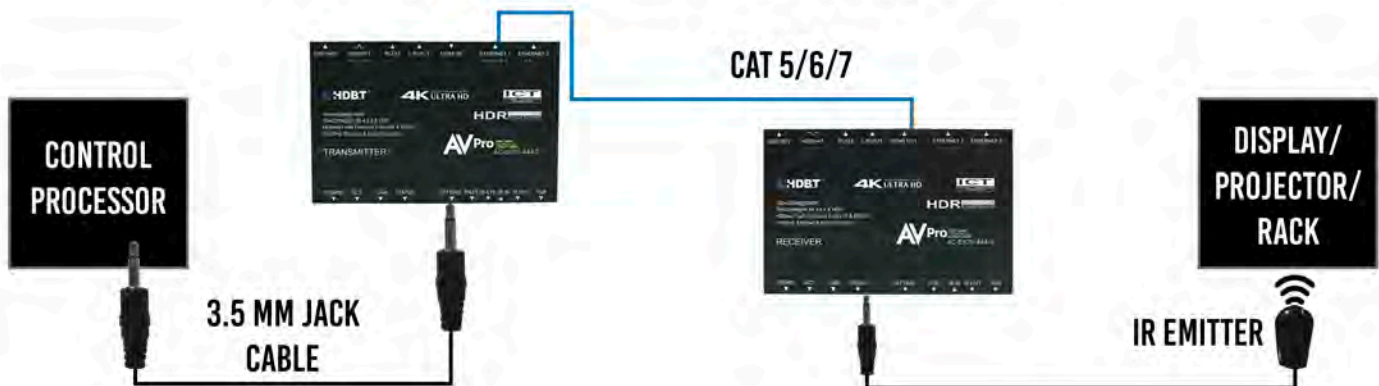
RS-232 CONTROL IS BI-DIRECTIONAL SO YOU ARE ABLE TO RECEIVE FEEDBACK

■ IR Configuration

IR can be used in three ways:

1. **From Rack (Control System Direct):** Plug a MONO 3.5mm cable into an emitter port of any control system directly into the "IR IN" port on the AC-EX40-444 Transmitter to pass IR signals directly to the remote end. NOTE - Be sure the IR MODE Slide Switch is set to "I-PASS" on the Transmitter
2. **From Rack (Using IR-EYE):** Plug an IR-Receiver Eye into the "IR IN" of the AC-EX40-444 Transmitter in order to pass infrared signals generated from a device or IR Remote. NOTE - Be sure the IR MODE Slide Switch is set to "IR-EYE" on the Transmitter.
3. **From Remote End:** Use an IR-Receiver Eye on the AC-EX40-444 Receiver (IR In Port) in order to send IR signals BACK to the rack and out of the TRANSMITTER IR Out Port with an emitter.

I-PASS IR CONTROL



IR CONTROL



■ *IR Connections to AC-EX70-444-T (Transmitter)*



IR INPUT
(Receiver Eye)



IR OUTPUT
(IR Emitter)

■ *IR Connections to AC-EX70-444-R (Receiver)*



IR INPUT
(Receiver Eye)



IR OUTPUT
(IR Emitter)

***NOTE: For best results, only use the provided IR EYE's and Emitters**



■ *Audio Extraction on AC-EX70-444-TNE*

A feature that is always active on the AC-EX70-444 (Tx and Rx) is Audio Extraction. This feature extracts PCM Audio (2ch) from the source device in order to be run to a separate amplifier or AVR. BOTH of the audio ports are always active (on Tx & Rx). NOTE - These ports ONLY work if the source is 2ch. If downmixing is needed, check out AC-AVDM-AUHD or AC-ADM-COTO.

To use the ports:

1. Simply plug a 3 pin terminal block into the port on the Tx or Rx (both are always active) and make your own cable assembly.
2. There is an option to buy pre-made unbalanced 3-pin to RCA Female cables from www.avprostore.com

NOTE: The source device needs to output PCM audio in order for the feature to work. This can be done by using the on-board EDID management or setting the source as such.

■ *Audio Extraction Routing Diagram*

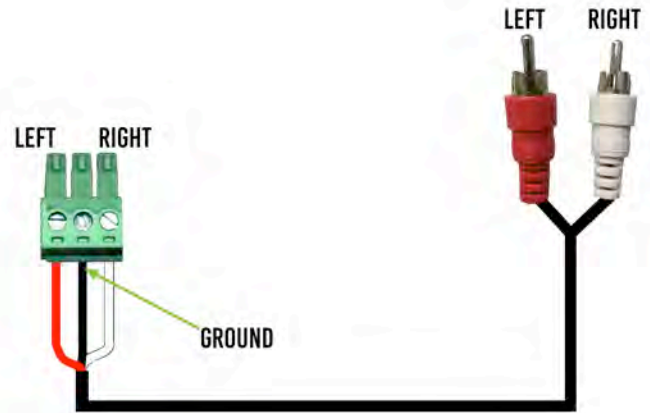


4K60 70M EXTENDER AUDIO EXTRACTION



■ Stereo Cable Preparation

***NOTE: Pre-made audio cables can be purchased.
The part number is: AC-CABLE-3PIN-2CH.**



■ Using Ethernet:

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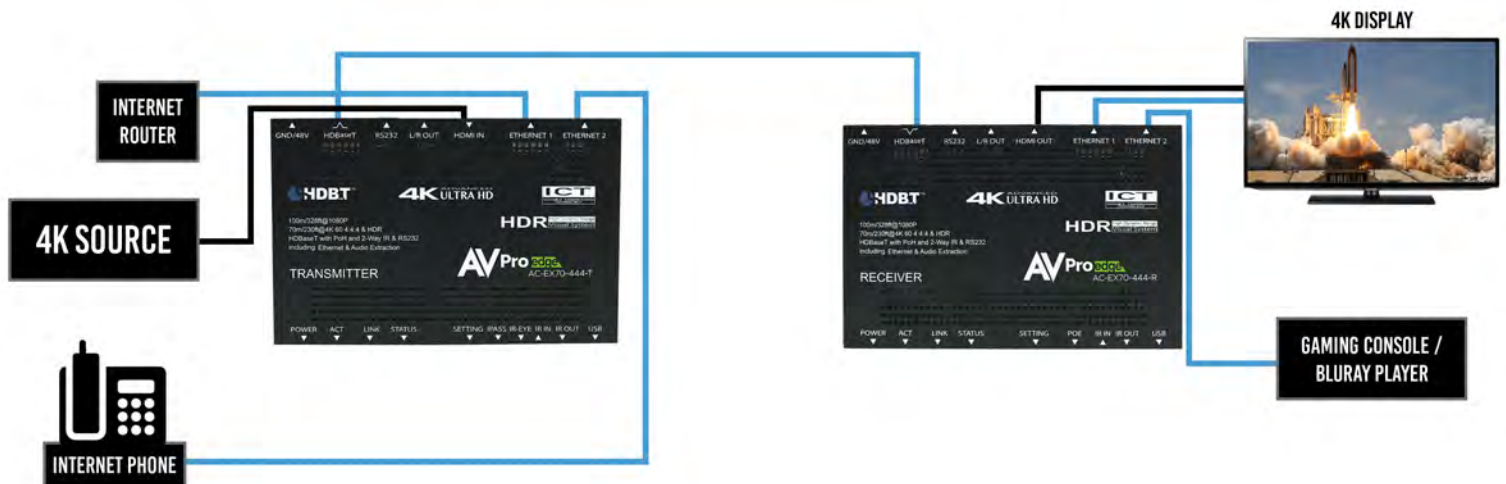
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Usage is plug-&-play - the ports are always active and so long as ONE of the FOUR combined ports between the Tx and Rx is connected to the network the other three have access.

Ethernet Indicator Lights:

- **AMBER** - This indicates and Ethernet connection is made, and the connection is stable. This should be SOLID.
- **GREEN** - This indicates that there is activity on the line. This light flashes randomly as data is transmitted. If this light is steady OFF there is no data coming through or you may need to reset the Ethernet router.



■ *Troubleshooting*

- Verify Power - Pg. 5 & 9
 - Verify POE Switch is correct - Pg. 11
- Verify Connections - Check that all cables are properly connected
 - TX Indicator Troubleshooting Lights -Pg. 5-6
 - RX Indicator Troubleshooting Lights -Pg. 9-10
- Not passing video, this may be an EDID issue. Out of the box the default is EDID BYPASS. Try a canned EDID or copy the connected displays EDID - Pg. 8

- IR Issues - Verify correct connections - P.14 & 15
 - Visibly flashing Emitters may not function properly, try the IR Cables that come in the box

- Extracted Audio Issues - Pg.16-17
 - Verify Source is set to output 2ch PCM
 - **Note: This unit does NOT downmix**
- Still having issues, contact us
 - Support Direct - +1-605-977-3477
+1-605-274-6055
 - Submit a support request ticket
 - <https://support.avproedge.com/hc/en-us/requests/new>

▪ ***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

▪ *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.

Thank you for choosing AVProEdge!

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



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