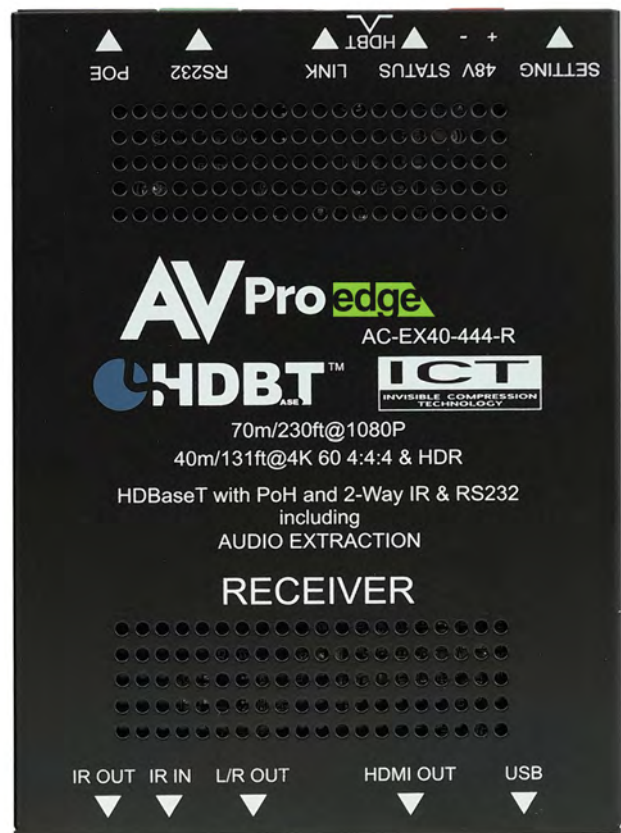
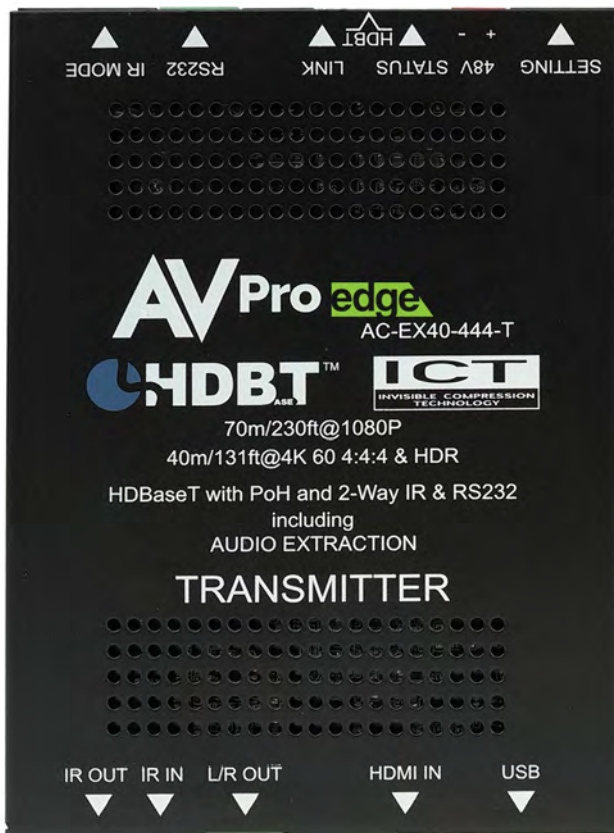


USER MANUAL

AC-EX40-444-KIT

Ultra Slim 40m (70m HD) 4K60 4:4:4, HDR
HDBaseT Extender Audio Extraction, EDID
Management, Scaling



AVPro Edge presents its first 18Gbps over copper extender. Using ICT (Invisible Compression Technology) we have achieved what was thought to be impossible. We can deliver a virtually lossless high bandwidth 4K HDR signal with support for all signals up to 18Gbps. Deep Color and HDR Metadata remain intact making the transmission free of artifacts like banding. Other similar devices will deliver a sub-par image that has very visible banding and color shifting.

Product Overview

Model Numbers:

- **AC-EX40-444-T** ~ HDBaseT Transmitter w/ Audio Extraction, IR, RS-232, EDID, Test Patterns and Scaler
- **AC-EX40-444-R** ~ HDBaseT Receiver w/ IR, RS-232, Test Patterns

- HDMI 2.0(a/b)
 - 18Gbps Bandwidth Support (Using ICT)
 - Ultra Slim (.47 inch/12mm)
 - Up to 4K60 4:4:4 Support
 - Full HDR Support (HDR 10 & 12 Bit)
 - HDR, HDR10+ and HLG Support
 - 4K --> 1080P Down-scaling for mixed systems
 - EDID Management and EDID emulate
 - 4K & HD Test Patterns built into Tx and Rx for troubleshooting
 - L/R Audio Extraction on Tx and Rx
 - HDCP 2.2 (and all earlier versions supported)
 - CEC Pass Through
 - 3D Support
 - 70M (230ft) on 1080P (Cat6a)
 - Up to 40m (131ft) on 4K (up to 4K60 4:4:4, HDR) (Cat6a)
 - Bi-directional 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-5E/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
- AC-EX40-444-T (Transmitter)
 - AC-EX40-444-R (Receiver)
 - 48V Power Supply (One supplied)
 - 1 x IR Tx Unit
 - 1 x IR Rx Unit
 - 4x 3 Pin Terminal blocks for Audio and RS232 Ports
 - Mounting Ears
 - ***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+, 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)
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 2.0 CH (NO DOWNMIXING)
DISTANCE:	
HDBASET (CAT) DISTANCE (4K)	40M (131 FEET)
HDBASET (CAT) DISTANCE (FULL HD)	70M (230 FEET)
HDMI LEAD IN/OUT (UP TO 4K60 4:4:4)	UP TO 50 FEET (BULLET TRAIN HDMI)
HDMI LEAD IN/OUT (W/ AOC CABLE) (UP TO 4K60 4:4:4)	UP TO 130 FEET (W/ BULLET TRAIN AOC)
OTHER:	
BANDWIDTH	18 GBPS
HDCP	HDCP 2.2 AND EARLIER
PORTS:	
HDMI (TX & RX)	TYPE A
AUDIO (EXTRACTED ANALOG) (TX & RX)	3 PIN TERMINAL BLOCK (UNBALANCED)
IR TX (TX & RX)	3.5MM MONO (2 CONDUCTOR)
IR RX (TX & RX)	3.5MM STEREO (3 CONDUCTOR)
RS232 (TX & RX)	3 PIN TERMINAL BLOCK
POWER (TX & RX)	2 PIN TERMINAL BLOCK
ENVIRONMENTAL:	
OPERATING TEMPRATURE	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)	9 WATTS MAX PAIR
POWER SUPPLY	INPUT: AC 100-240V ~ 50/60HZ OUTPUT: DC 12V 2A (WALL VERSION)
DIMENSIONS:	
DIMENSIONS (SINGLE UNIT ONLY, TX OR RX ARE SAME) (LENGTH/WIDTH/HEIGHT) (TX OR RX EACH ALONE)	MM: 129 X 92 X 12 INCH: 5.05 X 3.62 X 0.47
DIMENSIONS (PACKAGED LENGTH/WIDTH/HEIGHT) (KIT)	MM: 203 X 165 X 91 INCH: 8 X 6.5 X 3.6
WEIGHT (UNIT) (TX OR RX EACH ALONE)	0.3LBS (0.13KG)
WEIGHT (PACKAGED)	2LBS (0.90KG)
*SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE. MASS & DIMENSIONS ARE APPROXIMATE	

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Specifications..... 3

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IR Configuration..... 13-14

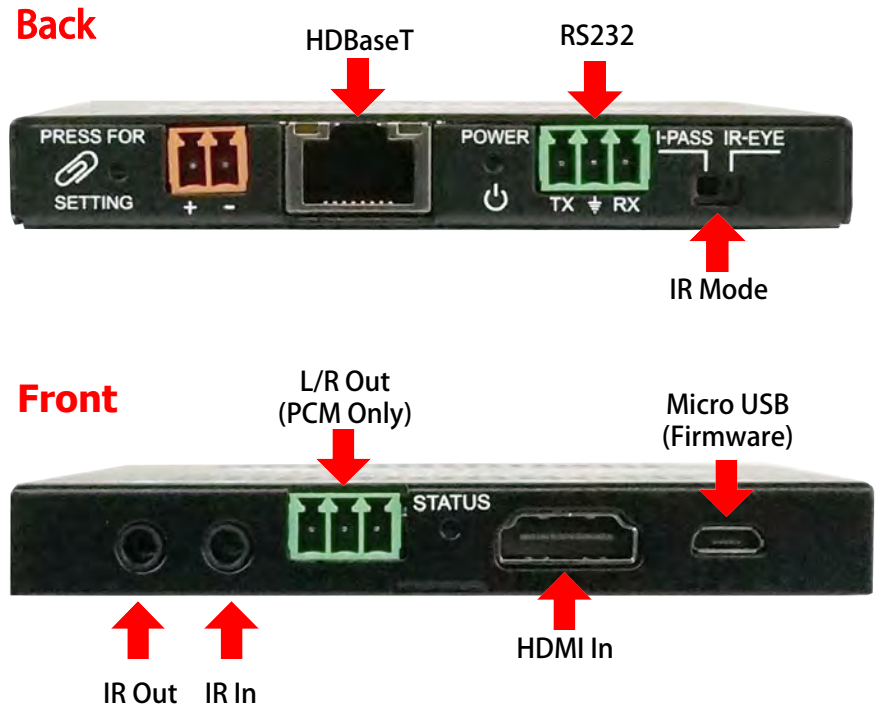
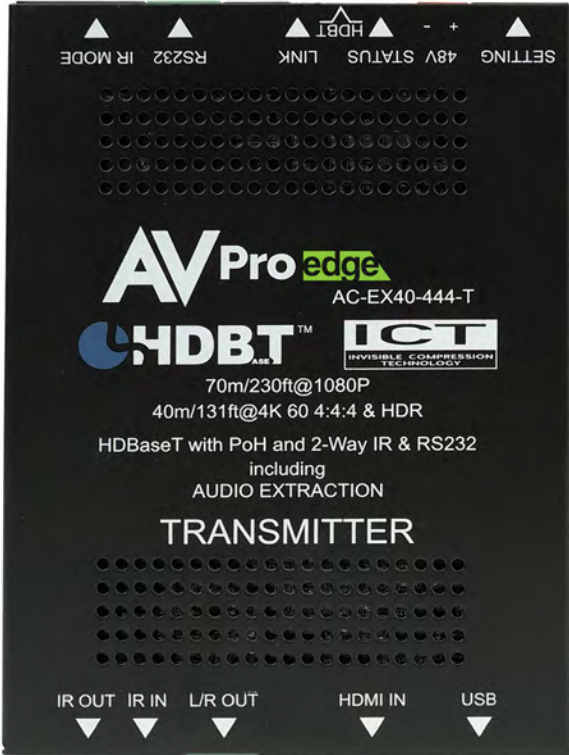
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■ The Transmitter



Indicator Troubleshooting Lights on the Transmitter:

POWER - On the back by power supply input: (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...)

*LED also flashes when using the settings button described below.

STATUS - On front by HDMI Port: (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 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 40m (131ft) on 4K 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.
 - 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 40m (131ft) on 4K 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 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 Back) This is used to select a preferred IR Mode:

- 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. This is protected from 3v-20v. Default mode is IR-EYE.

Using the Setting Button: (On Back) 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... An ink pen is best to press the button.

The POWER LED is the indicator LED.

EDID Management:GEN1

Quick press to select EDID

1. EDID BYPASS --- LED Flashes 1 Time (Default, from downstream device)
2. 1080P_2CH --- LED Flashes 2 Times
3. 1080P_8CH --- LED Flashes 3 Times
4. 4K60HzY420_3D_2CH --- LED Flashes 4 Times
5. 4K60HzY420_3D_8CH --- LED Flashes 5 Times
6. 4K60Hz_3D_2CH_HDR--- LED Flashes 6 Times
7. 4K60Hz_3D_8CH_HDR --- LED Flashes 7 Times
8. USER EDID --- LED Flashes 8 Times

EDID Management:GEN2

***NOTE:(Indicated by part number AC-EX40-444-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
EDID BYPASS	1 0 0 0
1080P 2Ch	0 1 0 0
1080P 8Ch	1 1 0 0
4K 60 420 3D 2Ch	0 0 1 0
4K 60 420 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 (Power LED will flash twice) 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.:

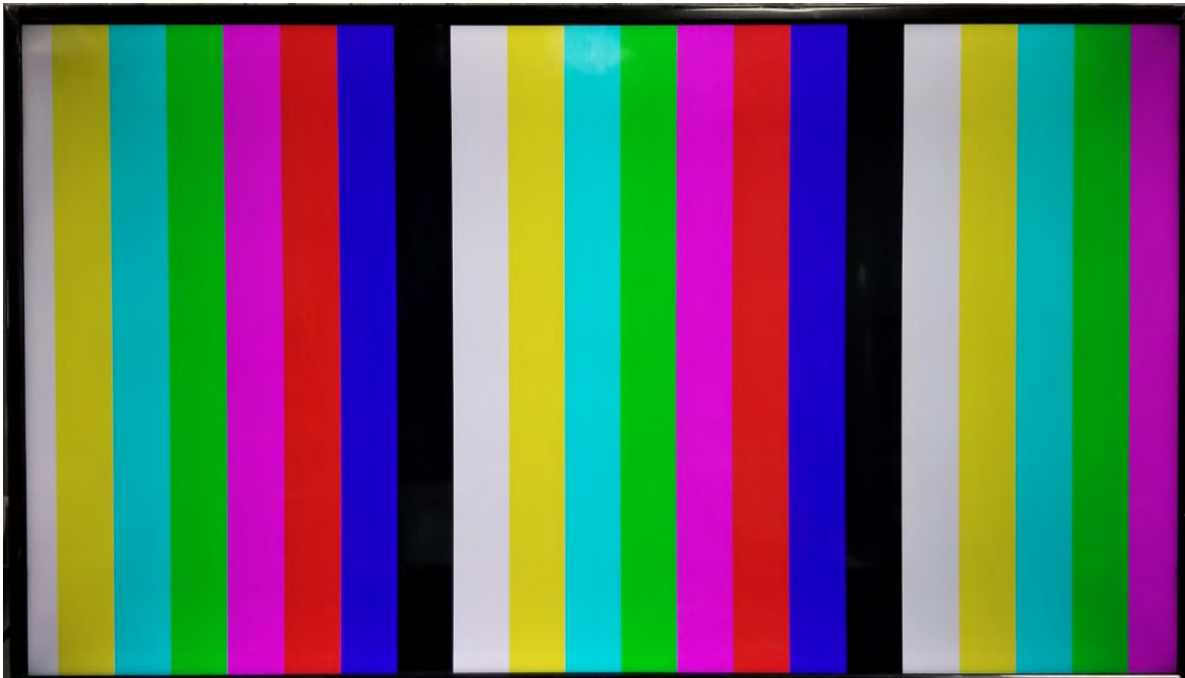
Test Pattern Generator:

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.

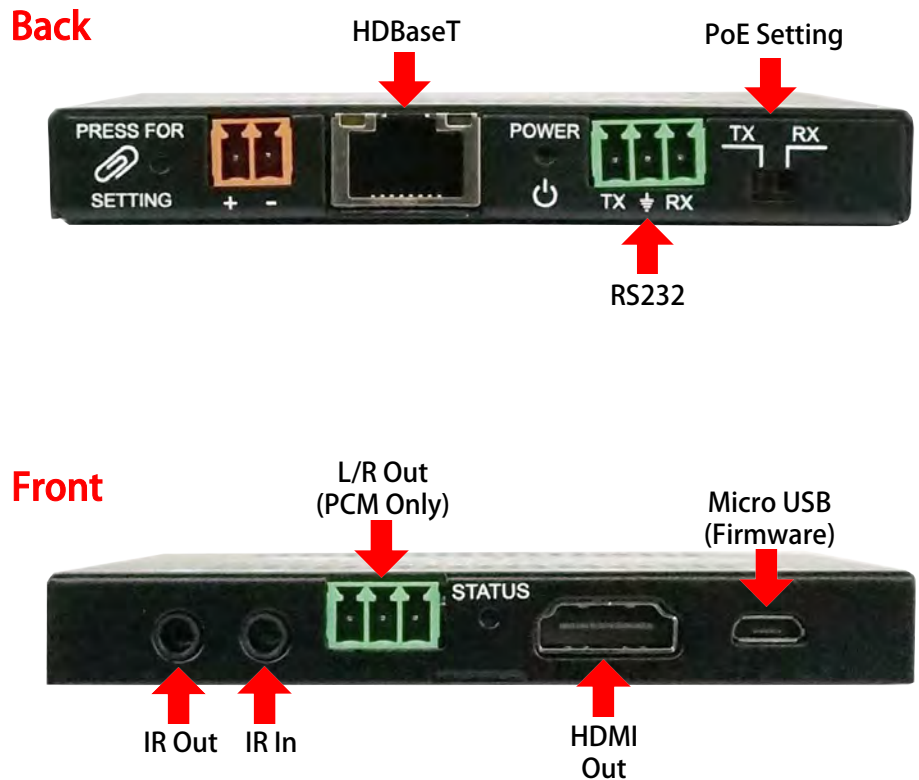
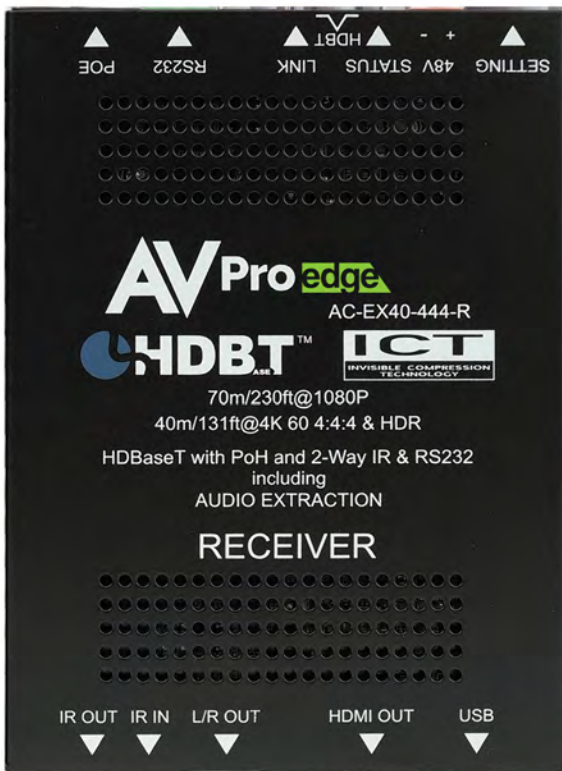
Quick press the setting button---Select the test pattern timing

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

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.



■ The Receiver



Indicator Troubleshooting Lights on the Receiver:

POWER - On the back by the power supply input: (Red) This indicator shows 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 no power present. - (In order to have power try checking the power supply, USP, Outlet, etc...).

***LED flashes when using the settings button described below.**

STATUS - On the front by HDMI port: (Blue) This indicator shows that the HDMI Display, Projector or sink is connected. The states are:

- Light Is On (Solid) = Sync w/ HDMI source is valid and solid.
- Light Is Flashing = The light flashes during the sync process. If it is flashing continuously, you may still have a picture, but it is indicating that the Rx is correcting a BE (Bit Error) to make the picture show on the display.

Things to check if **BLUE HDMI STATUS LIGHT** is flashing AND you have no picture:

1. The display to make sure it is working properly (plug source or generator into display directly).
2. Try a different HDMI Input - Some have different functions/capabilities per display.
3. Try a longer HDMI cable. Some HDMI cables do not sync well at shorter lengths.
4. If these suggestions do not work, enable the "Test Pattern" (See Below). If you see the pattern, the problem is before the Rx, please try a different source or EDID on the Tx. You can also try to scale the TX to 1080P (see transmitter functions above).
5. Contact AVProEdge if these steps do not work.

Indicator Troubleshooting Lights on the Receiver cont.:

LINK - Above RJ45 (HDBT) Port: (Green) This indicator shows that the AV HDBT link between the Transmitter and Receiver is in tact. This light will ALWAYS be solid. If this light is flashing or not present do the following:

1. Check the length. The maximum distances are 40m (131ft) on 4K 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.
 - 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 indicator shows that the power is present between the Transmitter and Receiver. This light ALWAYS BLINKS steadily indicating everything is correct. If you do not see this light, try the following:

1. Check the length. The maximum distances are 40m (131ft) on 4K 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.
 - 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 suggestions do not work.

Functions & Setup of the Receiver:

PoE Mode Slide Switch: (On the back) 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 = 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 (This is called "Reverse Power").

Using the Setting Button: (On the back) The setting button can be pressed in different combinations based on what you want to do. The status light on the front will flash based on your selection. The POWER LED is the indicator LED.

***Note: Only count the flashes, it will pause and then go solid.**

Test Pattern Generator:

Press and hold the setting button (for 4 seconds) while powering up the transmitter. The color bar pattern, as seen to the right will appear. When in this mode, you can short press to toggle the resolution.

Quick press---Select the test pattern timing

- 1080P --- LED Flashes 1 Time
- 4K --- LED Flashes 2 Time

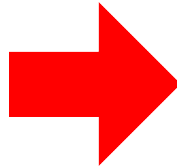
This is useful for checking cabling and for troubleshooting. It will check the link between the Rx and the display/sink.

■ RS-232 Configuration

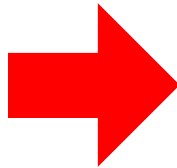
RS-232 can be used to pass control signals bi-directionally to & from any RS-232 compatible device. This is commonly used to route control signals in the following way:

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 at (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:

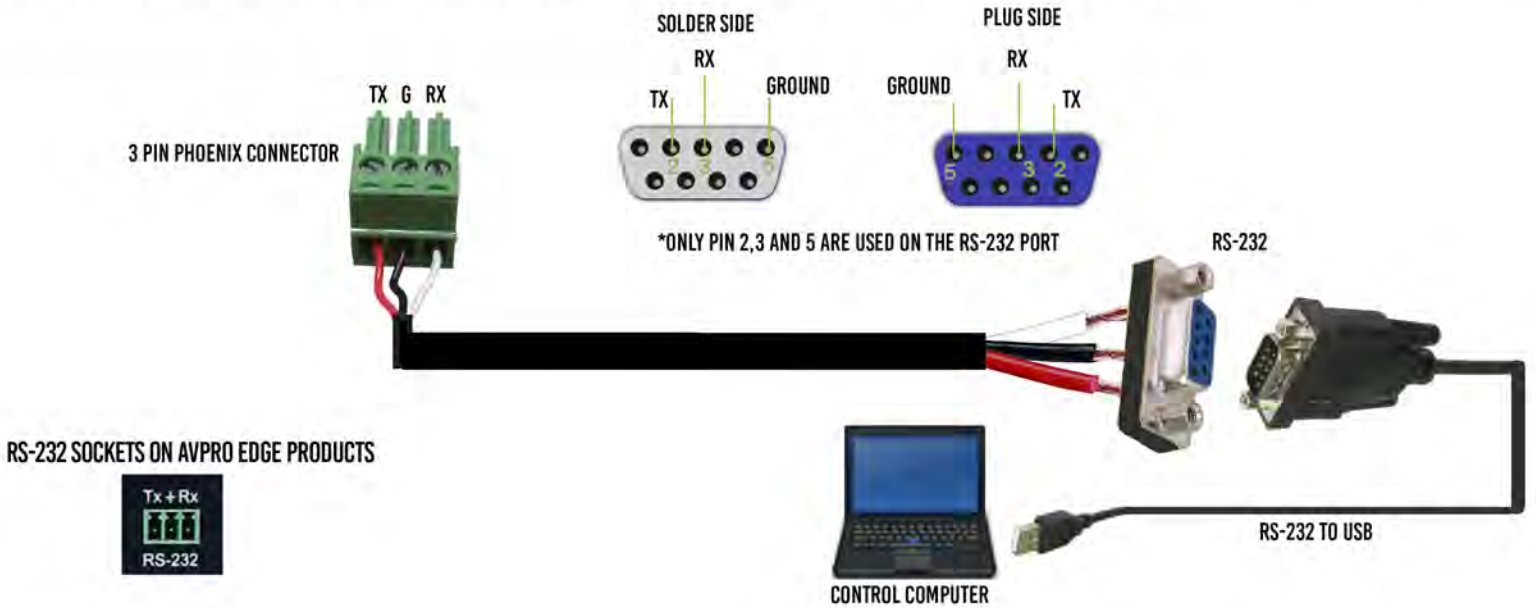


This is how the cable should look. If using the AC-CABLE-3.5-DB9F (Female) or AC-CABLE-3.5-DB9M (Male), the colors will be the same. With any other cable, please follow Tx, G, Rx as shown above. A RS-232 cable preparation diagram is on the next page.



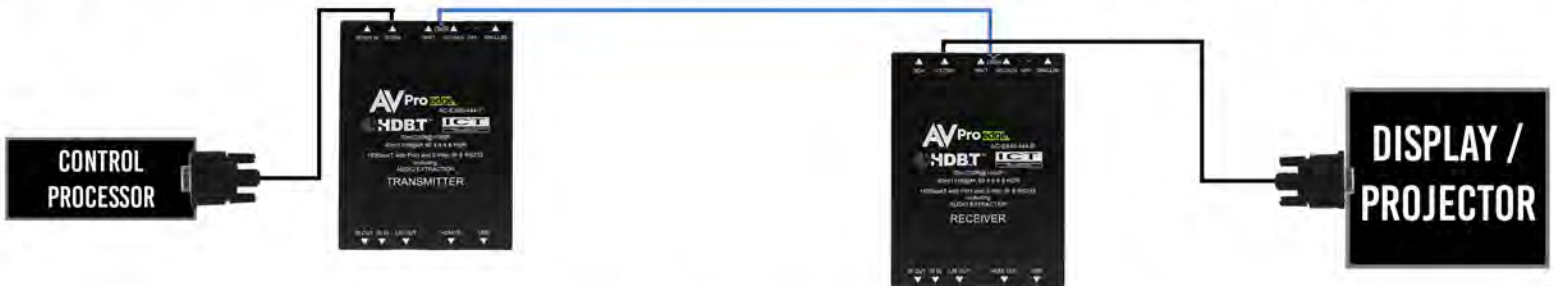
RS-232 CABLE FOR AVPRO EDGE

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

AVPro edge AC-EX40-444-KIT 444 EXTENDER RS-232 CONTROL



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

■ Audio Extraction on AC-EX40-444

A feature that is always active on the AC-EX40-444 (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:

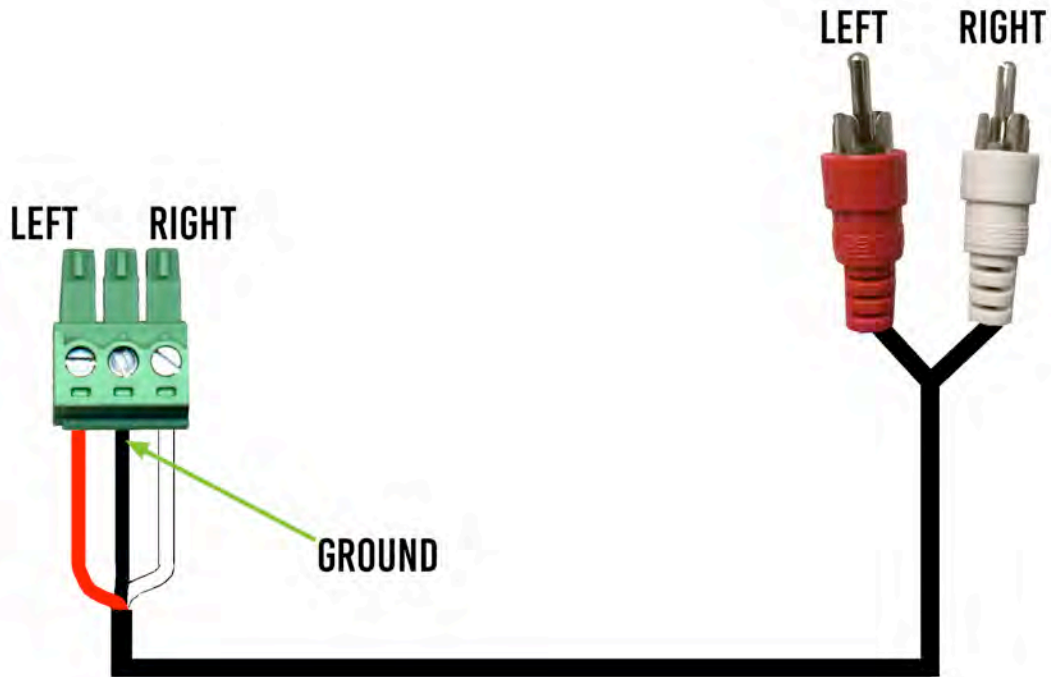
1. Simply plug a 3 pin terminal block into the port on the Tx or Rx (both are always active) and make your own cable assembly.
2. There is an option to buy pre-made unbalanced 3-pin to RCA Female cables (AC-CABLE-3PIN-2CH) see image on page 14.

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



■ Stereo Cable Preparation



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



■ IR Configuration

IR can be used in three ways:

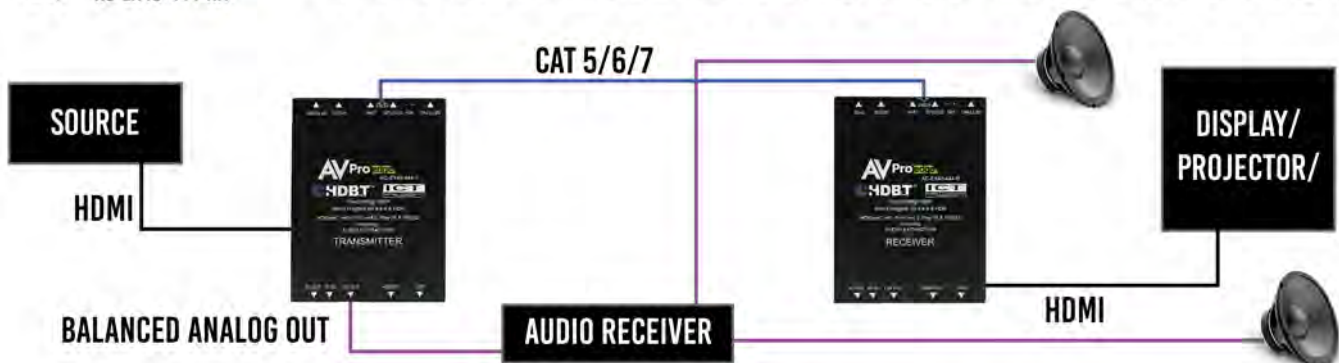
1. **From Rack (Control System Direct):** Plug a MONO 3.5mm cable into an emitter port of any control system directly into the "IR IN" port on the AC-EX40-444 Transmitter to pass IR signals directly to the remote end. NOTE - Be sure the IR MODE Slide Switch is set to "I-PASS" on the Transmitter
2. **From 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.



444 EXTENDER I-PASS IR CONTROL

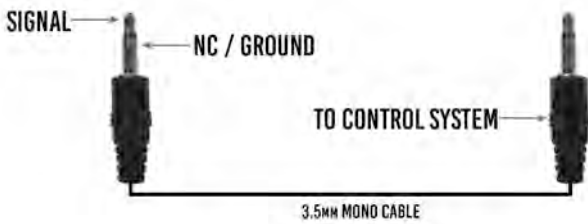


444 EXTENDER AUDIO EXTRACTION



■ IR Connections to AC-EX40-444-T (Transmitter)

IR IN Direct Connect (I-PASS)



IR OUT Emitter (Non-Flashing)



■ IR Connections to AC-EX40-444-R (Receivers)

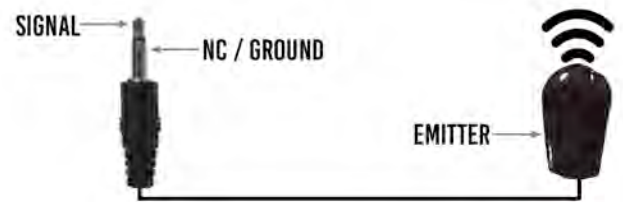
IR IN w/ Receiver Eye ("IR-EYE" MODE)



IR IN (IR-EYE Only)



IR OUT Emitter (Non-Flashing)



▪ 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.

▪ Troubleshooting

- Verify Power -
 - Verify Red Power LED is on, Transmitter - Pg. 5
 - Verify Red Power LED is on, Receiver - Pg. 9
- Verify Connections - Check that all cables are properly connected
 - TX Indicator Troubleshooting Lights - Pg. 5 - 6
 - RX Indicator Troubleshooting Lights - Pg. 9 - 10
- Verify signal from TX to display by enabling the TEST PATTERN Generator - Pg. 8
 - Test Pattern works but source still not displaying, try another canned EDID. Default out of the box is EDID BYPASS, try a different EDID or copy the EDID from the display - Pg. 6 - 7
- Extracted Audio Issues - Pg.13 - 14
 - Verify Source is set to output 2ch PCM
***NOTE: This unit does NOT downmix**
- IR Issues - Verify correct connections - P.15 - 16
 - Visibly flashing Emitters may not function properly, try the IR Cables that come in the box
- Still having issues, contact us
 - Support Direct - +1-605-977-3477
 - All inquiries - +1-605-274-6055
 - Submit a support request ticket
 - <https://support.avproedge.com/hc/en-us/requests/new>

Thank you for choosing AVProEdge!

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



AVProEdge
2222 E 52nd St N ~ Sioux Falls, SD 57104

1-877-886-5112 ~ 605-274-6055
support@avproedge.com