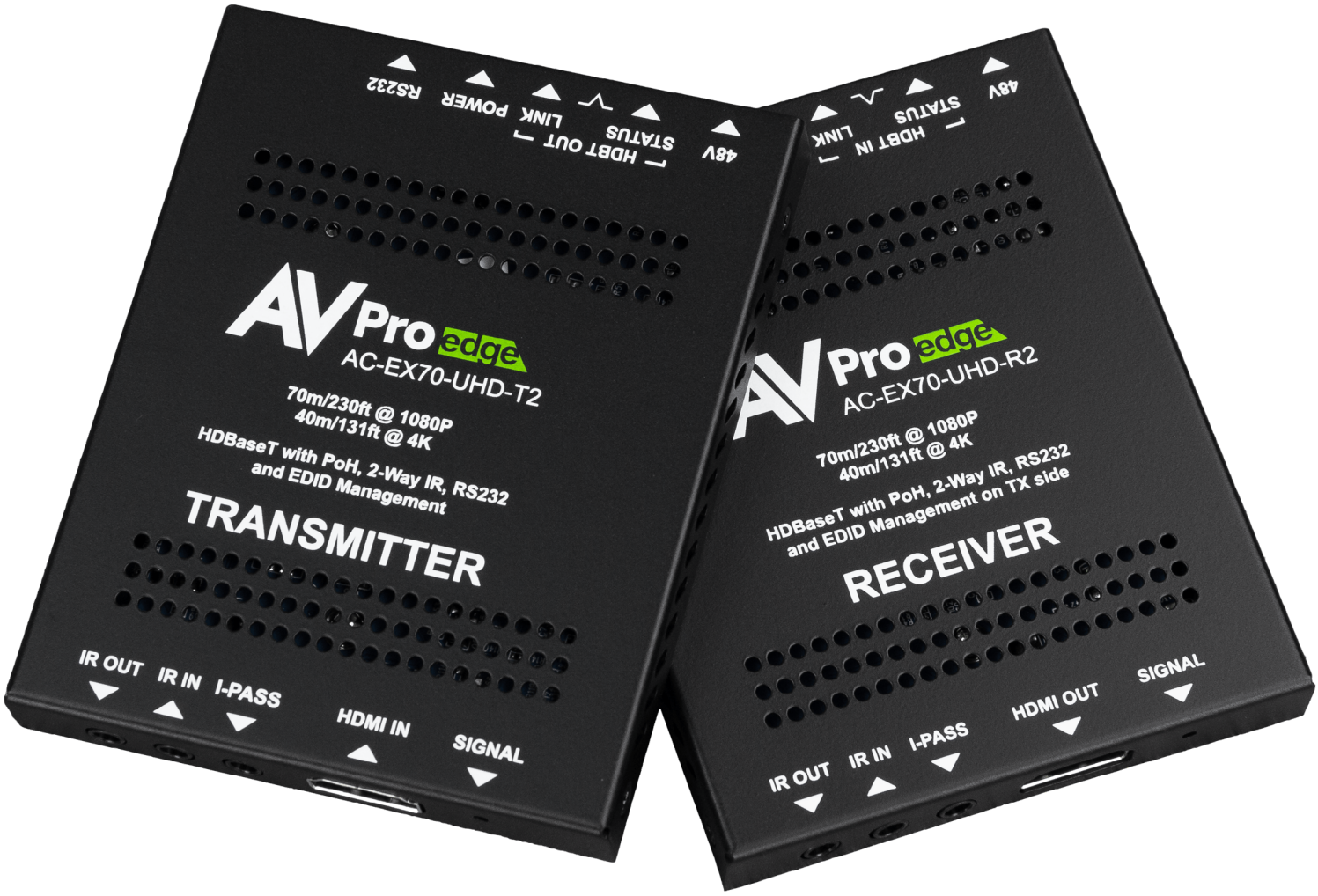
USER MANUAL

Ultra Slim 70 Meter HDMI Via HDBaseT Extender Set with Bi-Directional Power and EDID Management

AC-EX70-UHD-KIT



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Introduction

The AVPro Edge primary extender is the most cost effective, state of the art, and reliable single CAT 70 meter extender on the market today. It solves problems for both commercial and residential markets for distributing high value 4K UHD content from rack to display. With the additional ability to cascade extenders, affordable and reliable HDMI extension is now possible. Additionally AC-EX70-UHD-KIT offers solutions for UHD/HD uncompressed distribution in residential digital entertainment centers, retail stores, AV events that require reliable and long distance distribution, suitable for Data Center, Control Rooms, Conference Rooms, Schools and Corporate Training environment.

Features

- HDMI 2.0
- EDID Management
- 4K60 4:2:0, 4K30 4:4:4
- HDR Support up to 4:2:2 12 Bit
- Ultra Slim (.47 inch/12mm)
- Supports 3D
- HDCP 2.3 & Earlier
- CEC Pass Through
- 70M (230ft) on 1080P (Cat6a)
- Up to 40m (131ft) on 4K (Cat6a)
- 48v PoH (Power Over HDBaseT at either end-, 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

In The Box

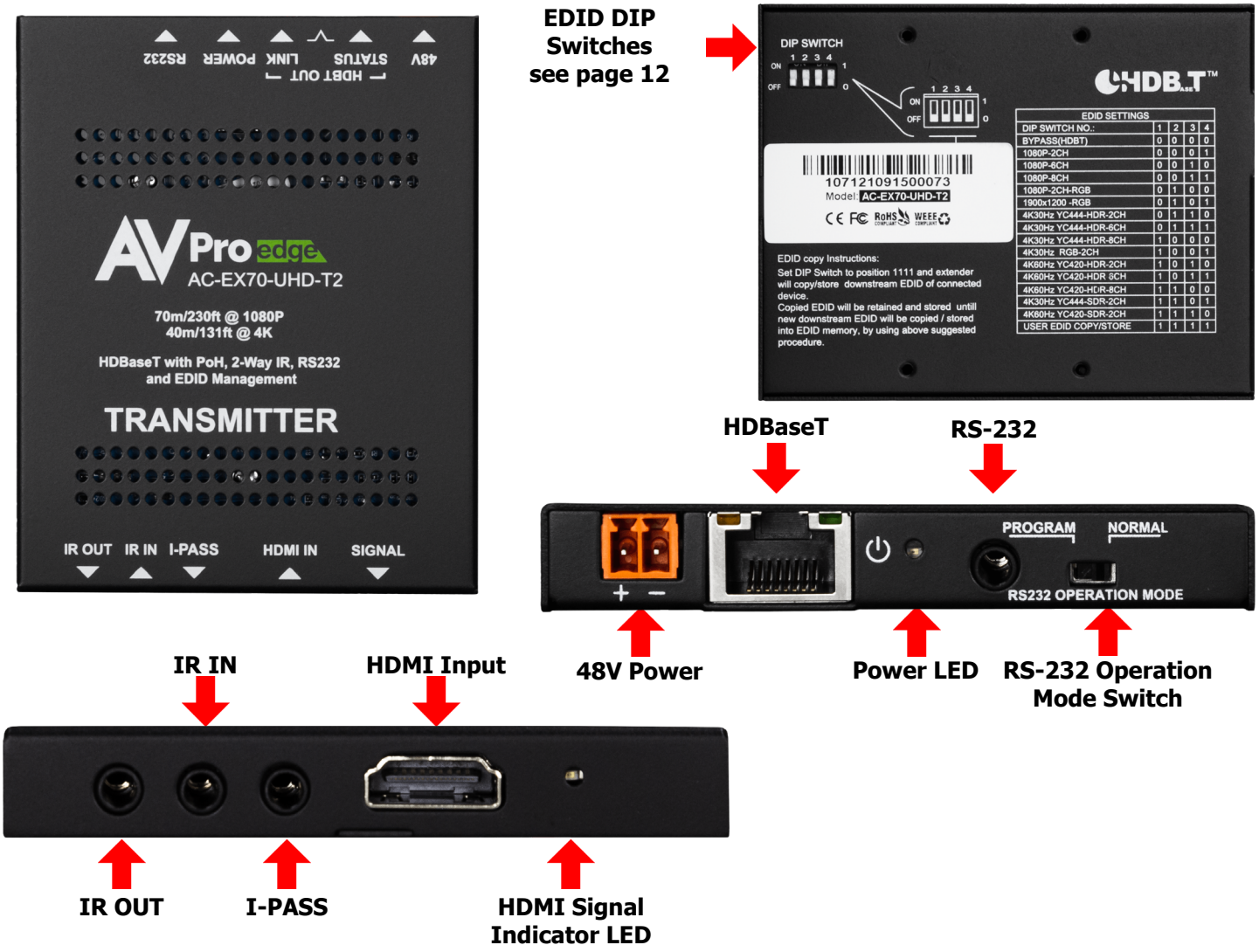
- AC-EX70-UHD-T2 (Transmitter)
- AC-EX70-UHD-R2 (Receiver)
- 48V Power Supply (One supplied as Rx is powered by Tx or vice versa)
- 1 x IR Tx Unit
- 1 x IR Rx Unit
- 3.5mm stereo plug to male DB9 for RS-232 to serial port
- 3.5mm stereo plug to female DB9 for RS-232 to PC
- Mounting Brackets

Specifications

VIDEO:	
VIDEO RESOLUTIONS	UP TO 4K 60HZ 4:2:0 & 4K30 4:4:4
VESA RESOLUTIONS	UP TO 2560X2048 (QSXGA)
HDR FORMATS/RESOLUTIONS	4K24 4:2:2 12 BIT, 4K24 4:2:0 10 BIT
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
DISTANCE:	
HDBASET DISTANCE (4K & HDR)	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 2.3 AND EARLIER
PORTS:	
HDMI (TX & RX)	TYPE A
HDBASET	RJ45 W/ POH FOR HDBASET RECEIVERS
IR RX	3.5MM STEREO (3 CONDUCTOR)
IR OUT & I-PASS	3.5MM MONO (2 CONDUCTOR)
RS232	3.5MM STEREO (3 CONDUCTOR)
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)	7.5 WATTS MAX
POWER SUPPLY - MATRIX	INPUT: AC 100-240V ~ 50/60HZ OUTPUT: DC 48V .5A
DIMENSIONS:	
DIMENSIONS (TX/RX ONLY, HEIGHT/DEPTH/WIDTH)	MM: 12.7 X 80 X 100.3 INCH: 0.5 X 3.15 X 3.95
DIMENSIONS (PACKAGED HEIGHT/DEPTH/WIDTH)	MM: 90 X 135 X 155 INCH: 3.54 X 5.31 X 6.1
WEIGHT (UNIT)	0.68 LBS (0.31 KG)
WEIGHT (PACKAGED)	1.74 LBS (0.79 KG)

*SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE. MASS & DIMENSIONS ARE APPROXIMATE

Transmitter Overview



Indicator Troubleshooting Lights - Transmitter

POWER - On the back by power HDBaseT RJ45 port: (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.

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 SIGNAL LIGHT is flashing, check the following:

- The source. Plug it directly into the display to be sure it's functioning properly.
- Try a longer HDMI cable. Some HDMI cables do not sync well at shorter lengths, a 2 meter minimum is recommended per HDMI Specifications.
- Set the EDID to state #1 (See Page[s] 12).
- Contact AVProEdge if these suggestions do not work.

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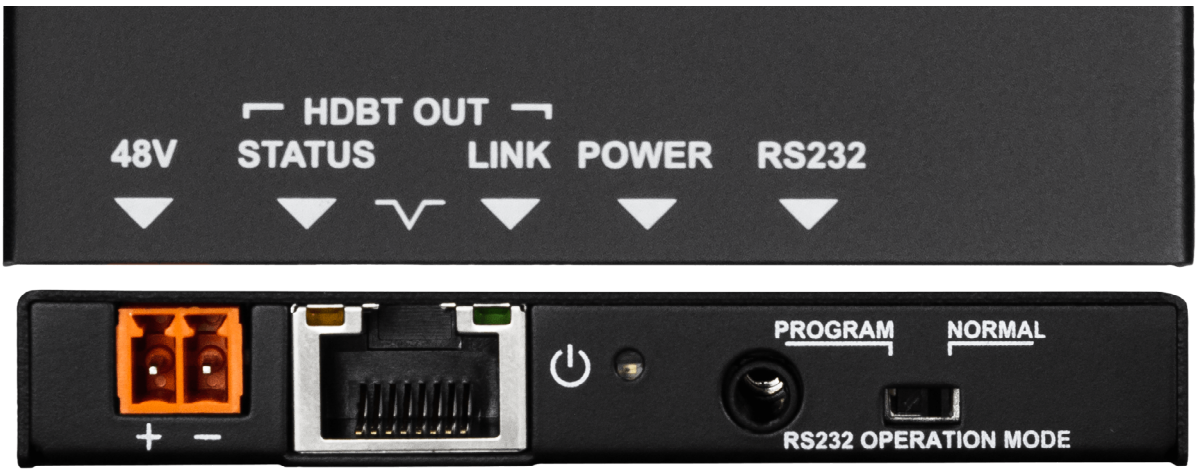
- Try a longer HDMI cable. Some HDMI cables do not sync well at shorter lengths, a 2 meter minimum is recommended per HDMI Specifications.
- Set the EDID to state #1 (See Page[s] 11).
- Contact AVProEdge if these suggestions do not work.

LINK above the RJ45 (HDBaseT) Port: (Green) This indicator shows that the HDBaseT link between the Tx and Rx is intact. This light should ALWAYS be solid. If this light is flashing or not present attempt the following:

- Check the length. The maximum distances are 40m (131ft) on 4K and 70m (230ft) on 1080P.
- Remove any coils of cable and make sure that there is not excess cabling.
- Bypass all patch panels and punch-down blocks.
- Re-terminate connectors. Sometimes, even if a cable tester indicates the run is valid, something may be slightly off.
- Contact AVProEdge if these suggestions do not work.

Status above the RJ45 (HDBaseT) Port: **(Amber)** This indicator shows that theres power present between the Tx and Rx. This light blink steadily indicating everything is OK. If you do not see this light attempt the following:

- Check the length. The maximum distances are 40m (131ft) on 4K and 70m (230ft) on 1080P.
- Remove any coils of cable and make sure that there is not excess cabling.
- Bypass all patch panels and punch-down blocks.
- Re-terminate connectors. Sometimes, even if a cable tester indicates the run is valid, something may be just slightly off.
- Try powering from the Receiver instead of the Transmitter
- Contact AVProEdge if these steps do not work.

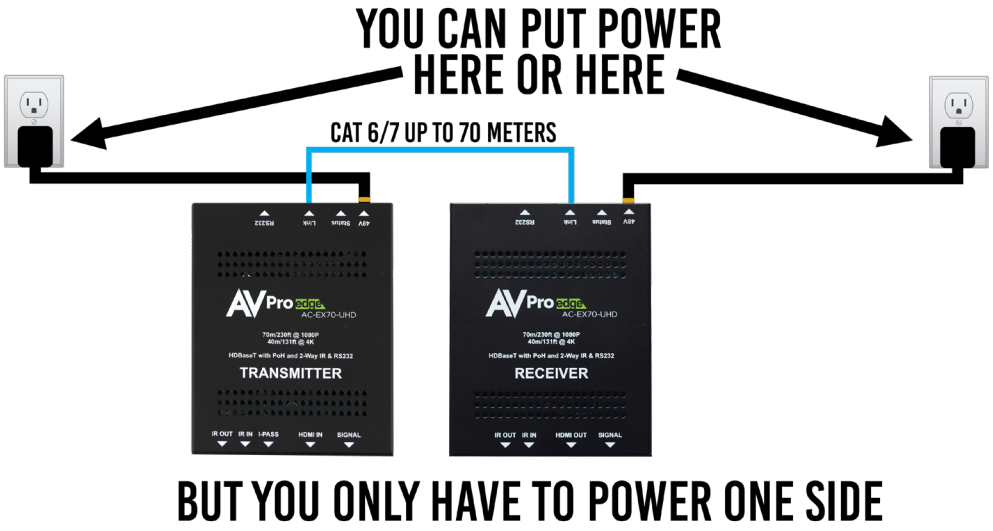


Flashes Steadily

Solid

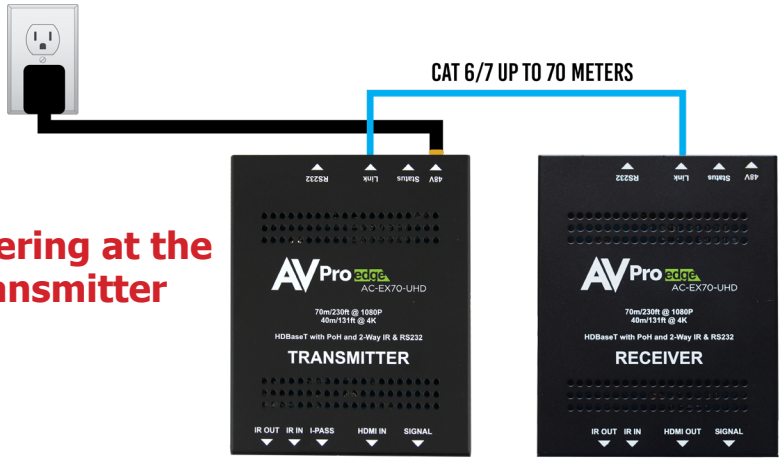
Powering the System Bi-Directional Power: The AC-EX70-UHD-KIT allows you to choose where you power the kit. There are two options:

- Powering at the HDBaseT Tx - The power will be supplied to the Rx through the CAT cable.
- Powering at the HDBaseT Rx - The power will be supplied to the Tx through the CAT Cable (This is known as "Reverse Power)



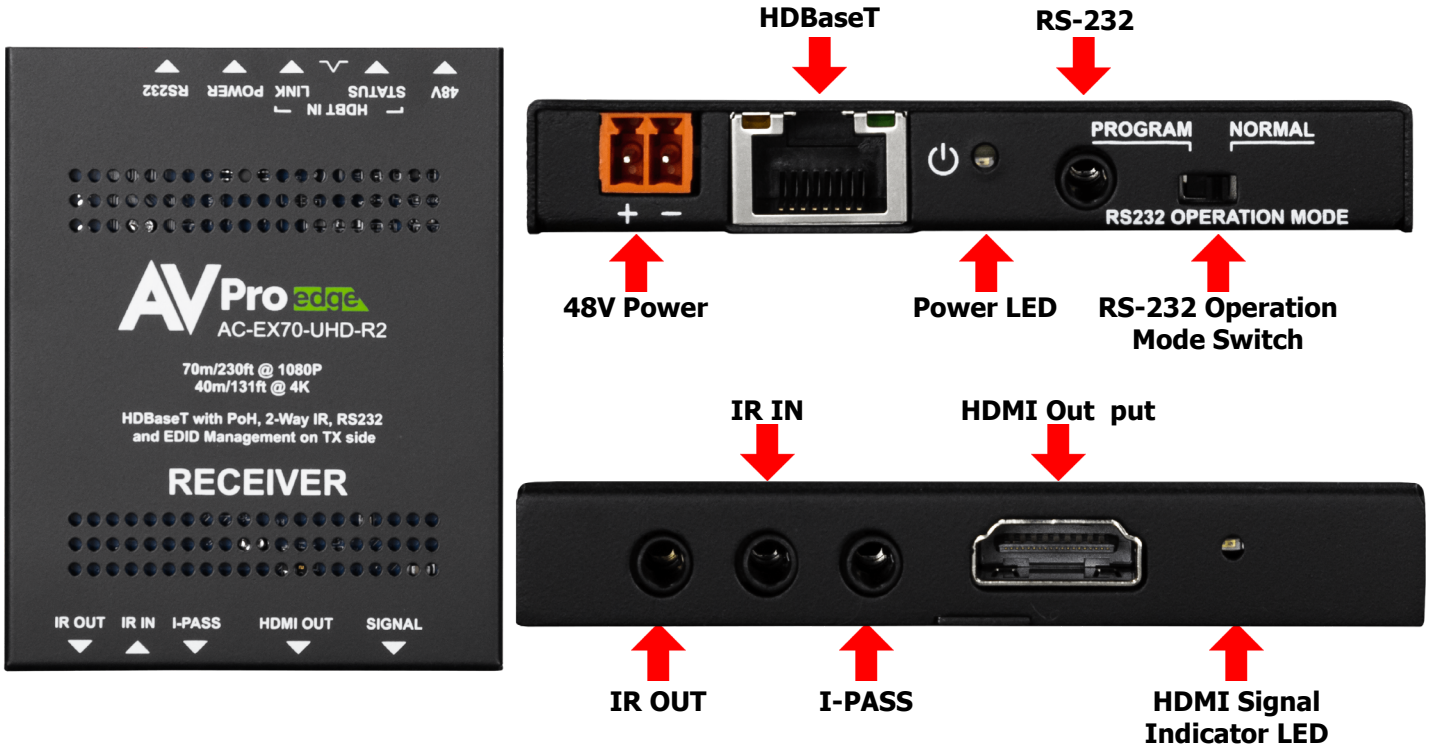
NOTE: There is no button or switch to set the Power Mode. Simply plug the power supply into the Tx or Rx and the kit will electronically know what to do.

Powering at the Reciever



Powering at the Transmitter

Receiver Overview



Indicator Troubleshooting Lights - Receiver

POWER - On the back by power HDBaseT RJ45 port: (Red) This is an indicator that the power is connected. There are only two states for light:

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STATUS - On front by HDMI Port: (Blue) This indicator shows that the HDMI source is connected. The states are:

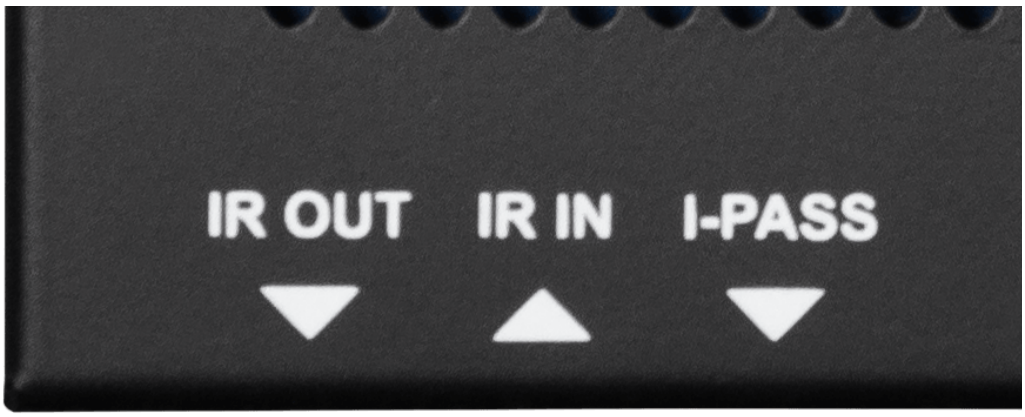
- Light Is On (Solid) = Sync w/ HDMI source is correct and solid.
- Light Is Flashing = The light flashes during the sync process. If it is flashing continuously, a picture may not be present.

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

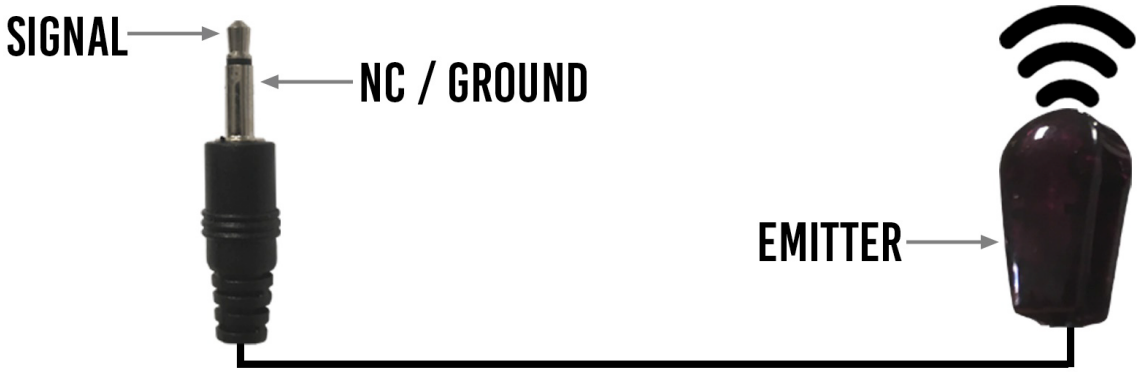
- The source. Plug it directly into the display to be sure it's functioning properly.
- Try a longer HDMI cable. Some HDMI cables do not sync well at shorter lengths, a 2 meter minimum is recommended per HDMI Specifications.
- Set the EDID to state #1 (See Page[s] 12).
- Contact AVProEdge if these suggestions do not work.

IR Configuration

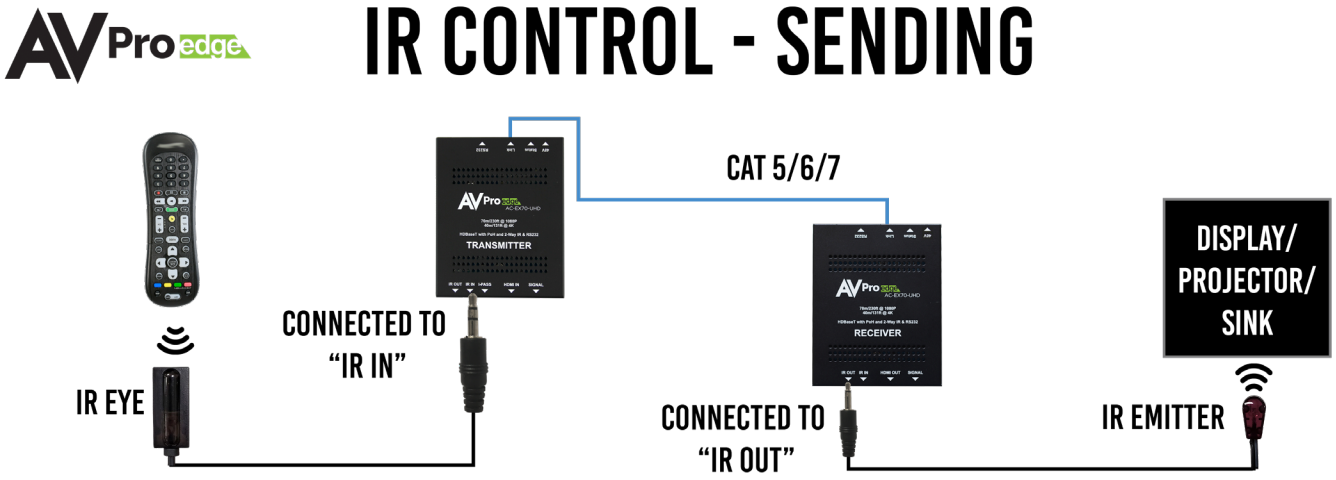
There are three different 3.5mm IR ports located on the Transmitter and Receiver.



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 and IR signal from the source side (TX) down the category cable to the sync (RX) and control the display.



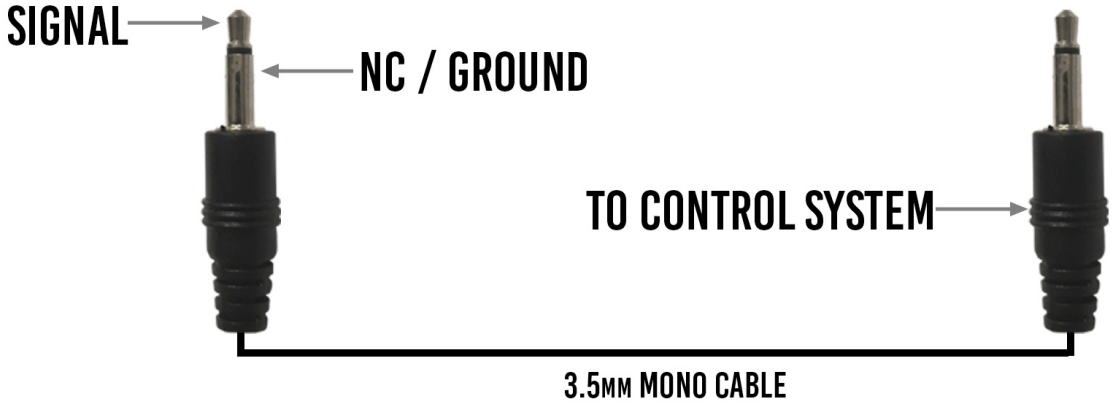
IR IN - This port is designed to accept an IR Receiving Eye/Sensor

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.

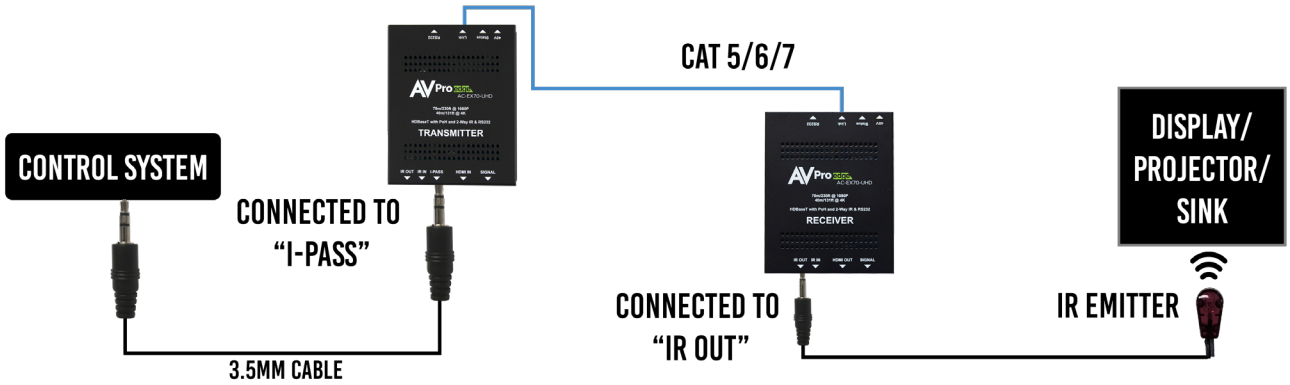
Control System > IPASS (TX) ------IR OUT (RX)

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



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 sink (RX) and control the display.

IR CONTROL - IPASS



EDID Management - Transmitter

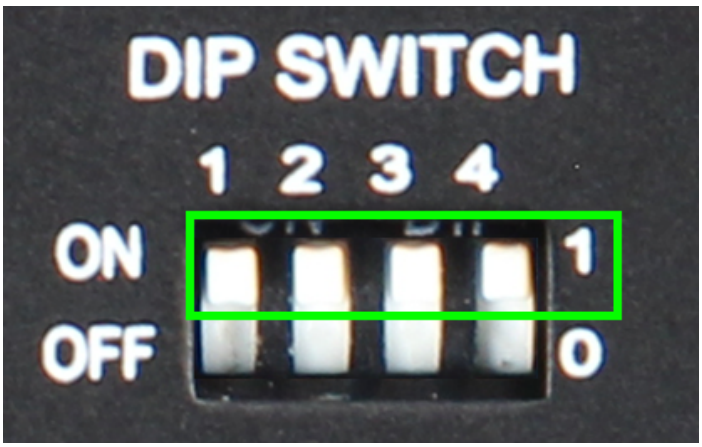
Default out of the box all the dip switches are down (off) "BYPASS (HDBT)"mode. This will pass the EDID of the connected display to the source un-altered.

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[s] 14 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 4 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. All 4 DIP switches do not need to be moved at the same time, moving them individualy or in any combination will copy the EDID from the connected sink device.



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.

Dip Switch Settings

Serial RS-232 Selection:

- Normal (Default) - This is the standard operating mode and allows for RS-232 pass through.
- Program - This is only for updating firmware to the units. For questions on updating firmware, please contact AVPro Edge Technical Support.

To use RS-232 for control signal transmission, connect the supplied RS-232 cables to each end of the extenders RS-232 ports. This serial connection will work bidirectionally as a full featured RS-232 extension cable.

NOTE: The "male" DB9 cable is typically for the display or used with the Rx. The "female" is typically from a PC or control system and used on the Tx.

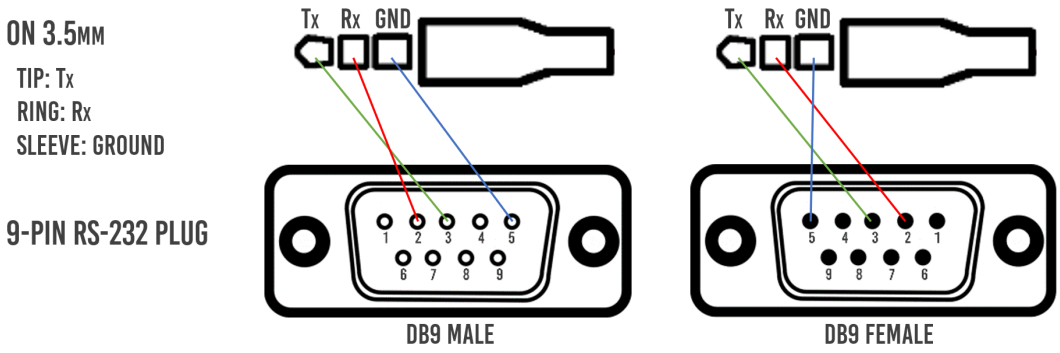
RS-232 Pin-Out

For custom RS-232 cables, the pin-out on the 3.5mm jack for the HDBaseT Tx and Rx is as follows:

- Tip = RS-232 Tx (RS-232 Out/Send)
- Ring = RS-232 Rx (RS-232 In/Receive
- Sleeve = Ground

Typical RS-232 routing requires Rx to Tx and Tx to Rx in straight configurations, meaning you always connect an RS-232 Tx to a RS-232 Rx (and an Rx to Tx). Unless the configuration is "null" or "crossover", then a Tx will connect to Tx and Rx to Rx (although this is rare).

Provided 3.5mm to DB9 cables:



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 Bandwidth Chart below to verify the signal is not exceeding the bandwidth of the Extender kit (limited to 10.2Gbps).

Bandwidth 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 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