

User Manual

AC-EX70-UHD

4K HDMI 2.0 Extender
with HDCP 2.2



AVProconnect

Introduction

The AC-EX70-UHD is a super slim 70 meter (230ft) HDMI via HDBaseT extender over single CAT-5e/6a/7 UTP/STP.

Key benefits of using AC-EX70-UHD:

1. **EXTEND 4K HDMI:** The length of manufactured HDMI cable is unchangeable after it is made and they are unreliable after about 25FT. Additionally, HDMI connectors can only be terminated in specialized factory environment due to its extremely high frequencies and high density. This does not allow installers or users to remake or make cables on a DIY basis. CAT-5E/6A cables are available widely and can be reworked easily by the installer or end-user.
2. **DISTANCE:** By using AC-EX70-UHD, the transmission distance for HD 1080P is up to 70 meters (230') and UHD 4K resolution the distance reaches an impressive 40 meters (115').
3. **CASCADE:** AC-EX70-UHD features HDMI signal equalization and amplification. This allows for a "daisy chain" of AC-EX70-UHD extenders for extremely long-distance transmission. Up to 8 layers with HDCP and using your own non-HDCP content, unlimited!
4. **CONTROL:** IR & RS-232 are bidirectional and can control the sources from the sinks or vice versa.
5. **BI-DIRECTIONAL POWER:** PoH (Power over HDBaseT) function is intended to power RX from the TX or TX from the RX and the advantage of lightweight (160 gram) super-slim extender is to be mounted anywhere where space is at a premium.
6. **FIELD UPDATES:** Should a firmware update be necessary it can be accomplished in the field
7. **I-PASS:** Plug you Control System emitter ports directly into the IR port on the transmitter (via mono 3.5mm cable) for clean and reliable IR pass through, our unique VPC (Voltage Protection Circuit) allows you to do this without wear and tear on the sensitive electronics inside.

AC-EX70-UHD-KIT

Product Overview (Model Number: AC-EX70-UHD)

Applications:

The AVProConnect 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 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
- 4K60 4:2:0, 4K30 4:4:4
- HDR Support up to 4:2:2 12 Bit (24/30 frames)
- Dolby Vision Support
- Ultra Slim (.47 inch/12mm)
- Supports 3D
- HDCP 2.2 & Earlier
- CEC Pass Through
- 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-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
- ESD protection circuitry (Inputs & Outputs) to 7KV
- Can Cascade

AC-EX70-UHD-KIT

Notice:

AVProConnect reserves all the right to make changes in the hardware, packaging and any accompanying documentation without prior written notice.

Warning

To reduce the risk of fire, electric shock or product damage:



1. Do not expose this device to rain, moisture, dripping or splashing and ensure that no objects filled with liquids are placed on or near the devices



6. Clean this device with a dry cloth only.



2. Do not install or place this unit in a bookcase, built-in cabinet or in another confined space. Ensure the unit is well ventilated.



7. Unplug this device during lightning storms or when unused for long periods of time.



3. To prevent risk of electric shock or fire hazard due to overheating, do not obstruct the unit's ventilation openings with newspapers, tablecloths, curtains, and similar items.



8. Protect the power cord from being walked on or pinched particularly at plugs.



4. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.



9. Only use attachments / accessories specified by the manufacturer.



5. Do not place sources of naked flames, such as lighted candles, on the unit.



10. Refer all servicing to qualified service personnel.

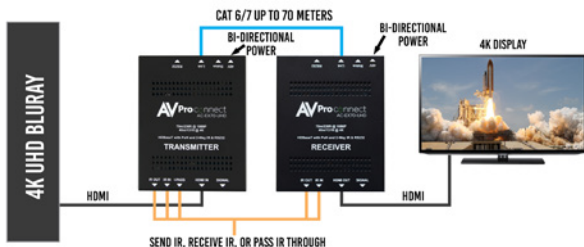
AC-EX70-UHD-KIT

What's in the box?

- Transmitter Unit P/N_ AC-EX70-UHD-TX
- Receiver Unit P/N_ AC-EX70-UHD-RX
- Operating instructions
- 48V DC Power Supply P/N_VDC4805 (single PSU supplied as only one is needed to power either the Tx or Rx)
- 1 x IR TX unit (IR emitter cable, for TX or for RX)
- 1 x IR RX unit (IR receiver cable, for TX or for RX)
- 3.5mm stereo plug to male DB9 for connecting RS232 to device serial port
- 3.5mm stereo plug to female DB9 for connecting RS232 to PC

NOTE: PART NUMBER (Abbreviation as P/N)

Basic Connections and Operations



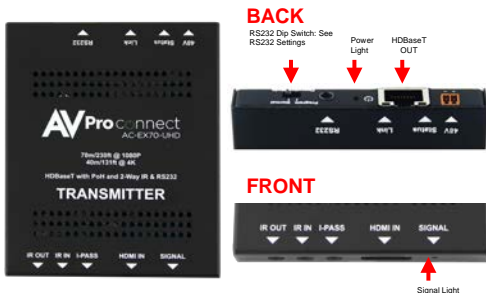
AC-EX70-UHD-KIT

Specifications

Video Resolutions	Up to 4K60 4:2:0 & 4K30 4:4:4
VESA Resolutions	Up to 2560x2048 (OSXGA)
HDR Resolutions	4K24 4:2:2 12 bit, 4K24 4:2:0 10 bit
Color Space	YUV, 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 12 bit w/ 4K
Audio Formats Supported	PCM 2.0 Ch, LPCM 5.1 & 7.1, Dolby Digital, DTS 5.1, Dolby Digital Plus, Dolby TrueHD, DTS-HD Master Audio, Dolby Atmos
Distance 1080P	70M (230 Feet)
Distance 4K & HDR	40M (131 Feet) (Best results with CAT6a/7)
Bandwidth	10.2 Gbps
CEC	Yes
HDCP	HDCP 2.2 and Earlier
Operating Temperature	23 to 95°F (-5 to 35°C)
Storage Temperature	-4 to 140°F (-20 to 60°C)
Humidity Range	5-90% RH (No Condensation)
Power Consumption	7.5 Watts
Power Supply	Input: AC 100-240V~50/60Hz Output: DC 48V .5A (Wall Version) Output: DC 48V .625A 92-piece (Table Top Version)
Dimensions (Unit only - height/ width/depth)	mm: 12 x 100 x 80 (Tx & Rx each) inch: .47 x 3.93 x 3.15 (Tx & Rx each)
Weight (Unit)	.45lbs / .20kg (Tx & Rx each)
Weight (Packaged)	.8lbs / .36kg (Tx & Rx each)
*Specifications subject to change without notice.	

AC-EX70-UHD-KIT

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...)

SIGNAL - 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. Contact AVProConnect if these suggestions do not work.

AC-EX70-UHD-KIT

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 intact. 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.
5. Contact AVProConnect 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.
5. Try powering from the Receiver instead of the Transmitter (See Receiver page for more about PoE direction).
6. Contact AVProConnect if these steps do not work.

Powering the System

Bi-Directional Power - The AC-EX70-UHD-KIT allows you to choose where you power the system. You have to power options:

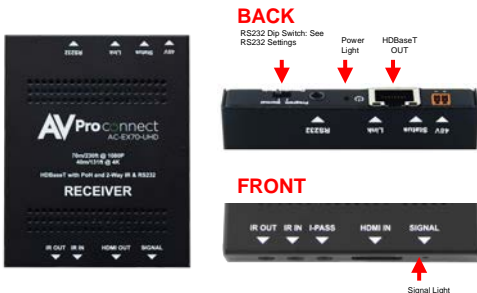
1. From the HDBaseT Tx - In this mode power will be supplied to the Rx through the CAT cable.
2. From the HDBaseT Rx - In this mode power will be supplied to the Tx through the CAT Cable (This is known as "Reverse Power")

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



AC-EX70-UHD-KIT

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...).

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. Contact AVProConnect if these steps do not work.

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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 intact. 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.
5. Contact AVProConnect 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.
5. Try Powering from the Receiver instead of the Transmitter (See Receiver page for more about PoE direction).
6. Contact AVProConnect if these suggestions do not work.

Powering the system:

Bi-Directional Power - The AC-EX70-UHD-KIT allows you to choose where you power the system. You have to power options:

- From the HDBaseT Tx - In this mode power will be supplied to the Rx through the CAT cable.
- From the HDBaseT Rx - In this mode 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 mode - Simply plug the power supply into the Tx or Rx and the system know what to do.



AC-EX70-UHD-KIT

RS-232 Configuration

Setting Dip Switch



Serial RS232 Selection:

- Normal (Default) - This is the standard operating mode and allows for RS232 pass through.
- Program - This is only for firmware updating the units. For questions on updating the firmware please contact AVProConnect.

To use RS232 for control signal transmission, connect supplied RS232 cables to each end of the extenders RS232 ports. This Serial connection will work bi-directionally as a full featured RS232 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.

RS232 Pin-out

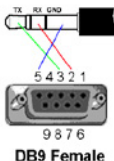
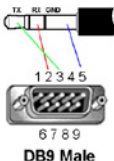
For custom RS232 cables the pin-out on the 3.5mm jack for the HDBaseT Tx and Rx is as follows:

- TIP = RS232 Tx (RS232 OUT/SEND)
- RING = RS232 Rx (RS232 IN/RECEIVE)
- SLEEVE = Ground

Typical RS232 routing requires Rx --> Tx and Tx--> Rx in straight configurations, meaning you always connect a RS232 Tx to a RS232 Rx (and a Rx to Tx). **UNLESS** the configuration is "NULL" or "Crossover" the a Tx will connect to Tx and Rx to Rx (This is rare.)

Provided 3.5mm to DB9 Cables:

On 3.5 mm
Tip: Tx
Ring: Rx
Sleeve: Ground
9 Pin RS232 Plug



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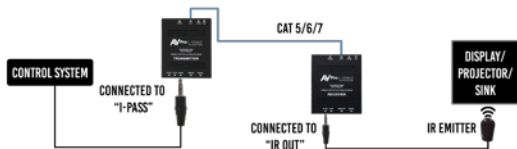
IR Configuration

IR can be used in 3 ways:

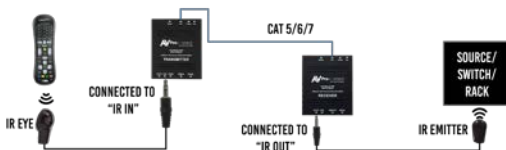
1. **From Rack:** Use an IR Sensor on the AC-EX70-UHD Transmitter (IR In Port) to send IR Signals to the remote end (Receiver) and come out of the IR Out Port with an emitter.
2. **From Remote End:** Use an IR Sensor on the AC-EX70-UHD Receiver (IR In Port) and send IR Signals BACK to the rack and come out of the TRANSMITTER IR Out Port with an emitter.
3. **Control System Direct:** Plug an MONO 3.5mm cable into an emitter port of any control system directly into the "I-PASS" Port on the AC-EX70-UHD Transmitter to send pass IR Signals directly to the remote end.



IR CONTROL - IPASS



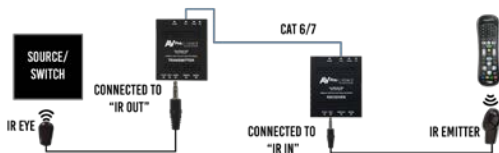
IR CONTROL - SENDING



AC-EX70-UHD-KIT



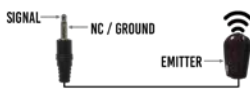
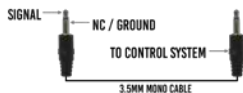
IR CONTROL - RECEIVING



IR Connections to AC-EX70-UHD-T (Transmitter)

IR IN Direct Connect (I-PASS)

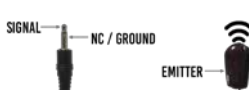
IR OUT Emitter (Non-Flashing)



IR Connections to AC-EX70-UHD-R (Receivers)

IR IN (IR-EYE Only)

IR OUT Emitter (Non-Flashing)



AC-EX70-UHD-KIT

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, AVProConnect (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 AVProConnect!

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



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