AVProconnect

User Manual

AC-EX70-UHD

4K HDMI 2.0 Extender
With HDCP 2.2

CE ♻ RoHS 🗑

AVProConnect
3518 N Casco Avenue ~ Sioux Falls, SD 57104
1-877-886-5112 ~ 605-274-6055
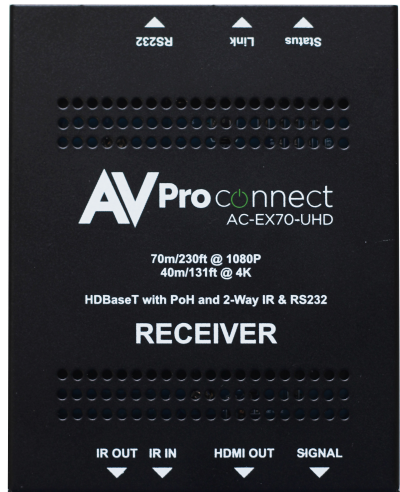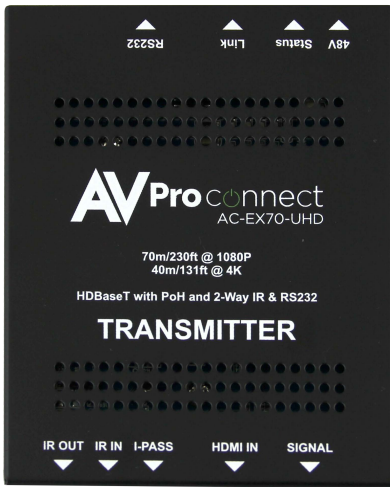**support@avproconnect.com**

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 (131').

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) **POWER**: PoH (Power over HDBaseT) function is intended to power RX from the TX 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 (see procedure on page 7).

AC-EX70-UHD

Applications:

The AVProConnect primary super slim extender is the most cost effective, state of the art and reliable single CAT 70 meter (230ft) extender on the market today and 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.

AC-EX70-UHD Extender Indicator Lights				
Label	Color (Text)	Color (Visual)	State	Meaning
STATUS (Tx & Rx)	Amber		Flashes	Indicates you have power and the unit is functioning properly
LINK (Tx & Rx)	Green		Solid	Indicates the link between the Tx & Rx is present
SIGNAL (On Tx Only)	Red		Solid	Indicates proper and functioning HDMI signal entering the Tx (HDCP, Hot Plug)
SIGNAL (On Rx Only)	Blue		Solid	Indicates receipt of HDMI signal AND proper connection and power from display. *(Note: this blu light flashes during an HDCP handshake event like power on, change sources, etc... This light will be OFF if there is no power to the display. It indicates a COMPLETE successful connection end to end.

AC-EX70-UHD

![AVProconnect logo]

Super Slim HDMI HDBaseT Extender

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

■ Features

- Plug & Play – Field Firmware Updateable
- 10.2 GBPS Video Bandwidth
- Use single UTP/STP LAN cable (CAT-5E/6A) with substitute HDMI cable to achieve long distance transmission.
- UTP/STP cable termination follows the standard of IEEE-568B.
- Transmission distance reaches up to 70 meters (230ft) at 1080P and 4K up to 40 meters (131ft).
- PoH (RX powered by TX)
- HDMI V2.0 supported.
- HDCP2.2 / 1.4 compliant.
- UHD support: 4Kx2K 30Hz or 4Kx2K 60Hz YUV 4:2:0
- LED indicators monitoring power status.
- ESD protection circuitry (Inputs / Outputs) till 7KV.
- Pair of mounting ears (supplied)
- Transfer Bi-directional IR & RS-232
- Can Cascade.

✍ 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

![AVProconnect logo]

■ **What's In The Box?**

① Transmitter Unit P/N_ AC-EX70-UHD-TX.

② Receiver Unit P/N_ AC-EX70-UHD-RX.

③ Operating instructions.

④ 48V DC Power Supply P/N_VDC4805. (In scope of supply only single PS for TX, as RX should be powered from TX to create functional transmission line)

⑤ 1 x IR TX unit (IR emitter cable, for TX or for RX)

⑥ 1 x IR RX unit (IR receiver cable, for TX or for RX)

⑦ 3.5mm stereo plug to male DB9 for connecting RS232 to device serial port.

⑧ 3.5mm stereo plug to female DB9 for connecting RS232 to PC.

📖 **NOTE:** PART NUMBER (Abbreviation as P/N)

■ **Connections and Operations**

1) Connect the HDMI input source (☞such as UHD Blu Ray, HD/ DVD、PS3、STB, UHD/HD Media Players etc.) to AC-EX70-UHD-TX.

2) Connect a CAT-5E/6A cable from UTP/STP output of **AC-EX70-UHD-TX** to UTP input of AC-EX70-UHD-RX.

3) Connect the HDMI sink (☞such as UHD TV, HD-LCD、HD / UHD-DLP）to AC-EX70-UHD-RX.

4) Connect an IR Receiver or Emitter into AC-EX70-UHD-TX

5) Connect an IR Receiver or Emitter into AC-EX70-UHD-RX.

6) Stereo jack 3.5mm acting as RS232 Port can be set for firmware update

(Program) or RS232 control signal transmission (Normal) ☞ Default is set for RS232 Control-Normal).

📖 **Attention:** Please insert and extract HDMI cables with care.

※Setting Dip Switch – Initial Setup/Updating Firmware

1. Selector switch is intended for bypassing RS232 signal or for purpose of firmware update.
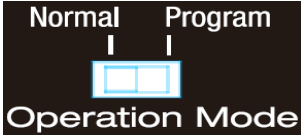
2. Serial RS232 selection: Position "Program" for firmware update, "Normal" for RS232 Command string transmission. Change switch positions to set desired RS232 port function.

※Update instruction:

① In case of need Device Firmware can be upgraded with supplied FW-Upgrade package that contains all software needed for burning and updating the Firmware on the EEPROM.

② Connect an RS232 cable from RS232 port of Extender to PC.

③ Power the unit.

④ Extract the zipped file from the burn package to a directory (e.g. C:\dir_name).

⑤ Browse to the directory (e.g. C:\dir_name\) and double click the batch file UpdateSource.bat (for AC-EX70-UHD-TX) or UpdateSink.bat (for AC-EX70-UHD-RX).

⑥ A short description of the link created between the PC and the board appears on the screen, followed by the update progress report (in %).

⑦ A second stage will be verification of the EEPROM content, also with a verification progress report (in %).

※For Normal RS232 control signal transmission, just connect supplied RS232 cables to each end of the extenders RS232 ports (AC-EX70-UHD-TX and AC-EX70-UHD-RX). This Serial connection will work bidirectionally as a full featured RS232 extension cable.

AC-EX70-UHD

■ Specifications

|	
Video Resolutions	Up to 4K60 4:2:0 & 4K30 4:4:4
VESA Resolutions	Up to 2560x2048 (QSXGA)
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 Subsampeling	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 Digtal, 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 Temprature	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/Depth/Width)	mm: 12 x 100 x 80 (Tx & Rx ea) inch: .47 x 3.93 x 3.15 (Tx & Rx ea)
Weight (Unit)	.45lbs/.20kg (Tx & Rx ea)
Weight (Packaged)	.8lbs/.36kg (Tx & Rx ea)
*Specifications subject to change without notice. Mass & dimensions are approximate	

AC-EX70-UHD

■ RS-232 Configuration

On 3.5 mm
Tip: Tx
Ring: Rx
Sleeve: Ground

9 Pin RS323 Plug

DB9 Male   DB9 Female
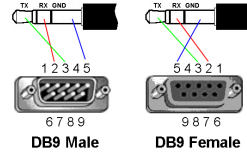
■ IR Configuration

IR can be used in 3 ways:
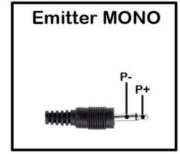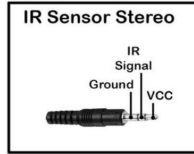
1. **From Rack:** Use an IR Sensor on the AC-EX70-UHD Transmitter (IR In Port) to send IR Signals to the remote end (Receiver) and come out of the IR Out Port with an emitter.

2. **From Remote End:** Use and IR Sensor on the AC-EX70-UHD Receiver (IR In Port) and sen 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.
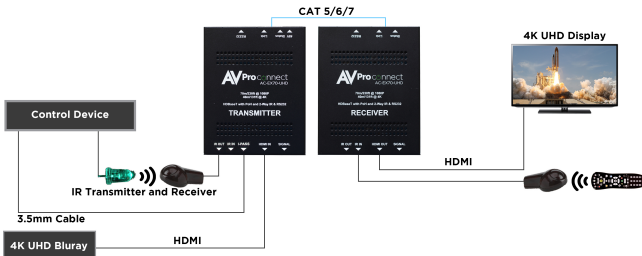
■ Maintenance

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.

● 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.

● Warranty Limits and Exclusions

1) **This Limited Warranty ONLY COVERS failures due to defects in materials or workmanship, and DOES NOT COVER normal wear and tear or cosmetic damage.** The Limited Warranty ALSO DOES NOT COVER damages which occurred in shipment, or failures which are caused by products not supplied by the warrantor, or failures which result from accidents, misuse, abuse, neglect, mishandling, misapplication, alteration, faulty installation, set-up adjustments, misadjustment of consumer controls, improper maintenance, power line surge, lightning damage, modification, or service by anyone other than a Factory Service Center or other Authorized Service, or damage that is attributable to acts of God.

2) **There are no express warranties except as listed under "limited warranty coverage". The warrantor is not liable for incidental or consequential damages resulting from the use of this product, or arising out of any breach of this warranty.** (As examples, this excludes damages for lost time, cost of having someone remove or re-install an installed unit if applicable, travel to and from the service location, loss of or damage to media or images, data or other recorded content. The items listed are not exclusive, but are for illustration only.)

3) **Parts and service, which are not covered by this limited warranty, are on user responsibility.**

Adress:

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Tel: 877-886-5112   605-274-6055

Thank you for choosing AVProConnect!

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