

# 444 EXTENDERS

40M, 70M & 100M 18Gbps 4K60 (4:4:4) HDBaseT EXTENDERS WITH ICT

## QUICK START GUIDE

AVPro Edge presents our 18Gbps over copper HDMI extender. Using ICT (Invisible Compression Technology) 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.

There are 3 different models in the 444 Extender series. Each step up in the series not only supports longer distances, but also upgraded features. Each extender kit consists of two main pieces, a transmitter (Tx) and a receiver (Rx). The majority of this Quick Start Guide refers to the AC-EX40-444-KIT. You will find specific information pertaining to the AC-EX70-444-KIT and the AC-EX100-444-KIT towards the end of the guide. This guide will walk you through the following topics:

- INSTALLATION
- EDID MANAGEMENT
- SCALING
- TEST PATTERN GENERATOR
- IR CONTROL SIGNALS
- RS232 CONTROL SIGNALS
- AUDIO EXTRACTION
- ETHERNET (AC-EX70-444-KIT & AC-EX100-444-KIT ONLY)
- USB EXTENSION (AC-EX100-444-KIT ONLY)
- TROUBLESHOOTING



AC-EX40-444-KIT



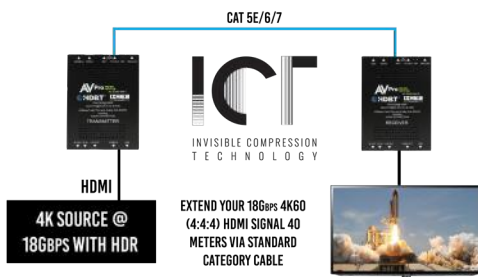
AC-EX70-444-KIT



AC-EX100-444-KIT

### INSTALLATION OF THE EXTENDER:

1. Install a CAT5e (or better) cable between the display and the source (be sure to follow local low voltage code. This varies state to state).
2. The Tx has an HDMI input. Connect this to the output of the source with an 18Gbps HDMI cable.
3. The Rx has an HDMI output. Connect this to the input of the display with an 18Gbps HDMI cable.
4. Both the Tx and Rx have an RJ45 HDBT connector. Connect each end of the installed Category cable to these ports.
5. Both the Tx and Rx have an orange 2 pin power connector. You only need to power the Rx or the Tx, not both. You will notice that the Rx has a switch labeled "POE". This indicates where power originates from. If you power the Tx, be sure this switch is in the "Tx" position, and if you power the Rx be sure that the switch is in the "Rx" position.



\*NOTE - Only use the included power supply.



## EDID MANAGEMENT:

EDID management allows you to manage the input device (typically the display) to request specific video resolutions and/or audio codecs from a source.

Using a paper clip, pick tool, or pen, press the "SETTING" button on the Tx to toggle between different preset EDIDs. The following choices are available:

1. EDID BYPASS - LED flashes 1 time
2. 1080P 2CH - LED flashes 2 times
3. 1080P 8CH - LED flashes 3 times
4. 4K/60Hz/420/3D/2CH - LED flashes 4 times
5. 4K/60Hz/420/3D/8CH - LED flashes 5 times
6. 4K/60Hz/3D/2CH/HDR - LED flashes 6 times
7. 4K/60Hz/3D/8CH/HDR - LED flashes 7 times
8. USER EDID - LED flashes 8 times

You can copy the EDID from the display or another device and apply it to the USER EDID. While in USER EDID (8), press and hold the "SETTING" button for 4 seconds. The EDID will be applied automatically.

\*NOTE - When changing settings such as EDID, the POWER light will flash on the AC-EX40-444. the AC-EX70-444-KIT and AC-EX100-444-KIT have a dedicated LED next to the "SETTING" button.

## SCALING:

The built in scaler can scale 4k (and HDR) down to 1080p. A common application for this is when you have a 4k distributed system, but one of the displays is only 1080p. You can use the extender to scale down the resolution to one display without having to reduce the resolution of the entire system.

While using any EDID setting EXCEPT the USER EDID, press and hold the SETTING button for 4 seconds to toggle between scaler modes.

1. Normal mode (no scaling) - LED flashes 1 time
2. Downscale mode (4k to 2k) - LED flashes 2 times

## TEST PATTERN GENERATOR (TX ONLY):

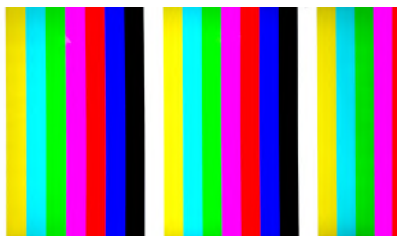
The Test Pattern Generator can be used for testing and troubleshooting infrastructure, cables, and signal path.

1. Remove power from the Tx
2. Press and hold "SETTING"
3. Power up the Tx
4. After 4 seconds you will see this color bar pattern on the display

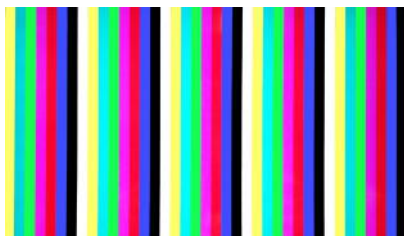
When in the Test Pattern Generator mode, you can quick press the "SETTING" button to toggle between 2K and 4K resolution.

- 2K/1080p - LED flashes 1 time (you will see 3 sets of color bars on the display)
- 4K/2160p - LED flashes 2 times (you will see 5 sets of color bars on the display)

## 1080P TEST PATTERN



## 4K TEST PATTERN



### CONTROL SIGNALS:

The 444 series extenders can pass control signals from one device to another via IR and RS232.

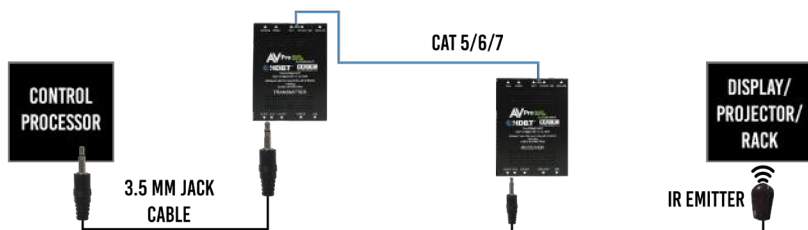
### IR CONTROL SIGNALS

IR control signals can be sent 3 different ways:

1. From the rack using a control system (Control4, Crestron, etc):
  - a) Plug one end of a 3.5mm mono cable into the control system
  - b) Plug the other end of the 3.5mm mono cable into the "IR IN" on the Tx
  - c) Plug the IR emitter into the "IR OUT" of the Rx
  - d) Place the IR emitter on or near the IR receiver of the display or device that you'd like to control
  - e) Be sure that the IR MODE switch on the Tx is set to "I-PASS"



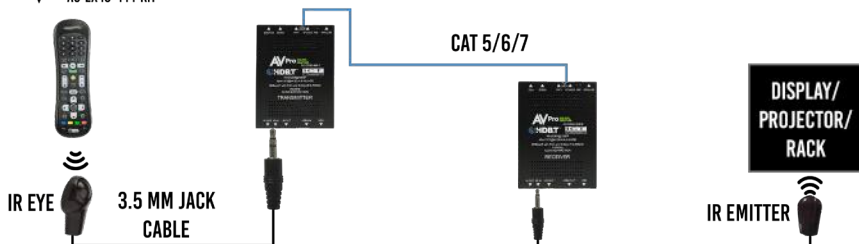
## 444 EXTENDER I-PASS IR CONTROL



2. From the rack using IR:
  - a) Plug the IR eye/receiver into "IR IN" on the Tx
  - b) Plug the IR emitter into the "IR OUT" on the Rx
  - c) Place the IR emitter on or near the IR receiver of the display or the device that you'd like to control
  - d) Be sure that the IR MODE switch on the Tx is set to "IR-EYE"
3. From the display end using IR:
  - a) Plug the IR eye/receiver into the "IR IN" of the Rx
  - b) Plug the IR transmitter into the "IR OUT" of the Tx
  - c) Place the IR emitter on or near the IR receiver of the device that you'd like to control
  - d) Be sure that the IR MODE switch on the Tx is set to "IR-EYE"

\*NOTE - Only use the IR receiver and emitter that come with the 444 Extender kit

# 444 EXTENDER IR CONTROL

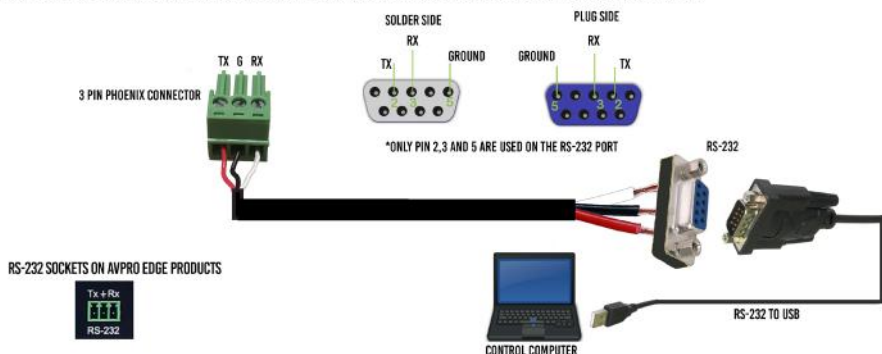


## RS232 CONTROL SIGNALS:

Both the Tx and Rx have a 3 pin connector labeled "RS232". You can easily make a control cable using a DB9 cable

# 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

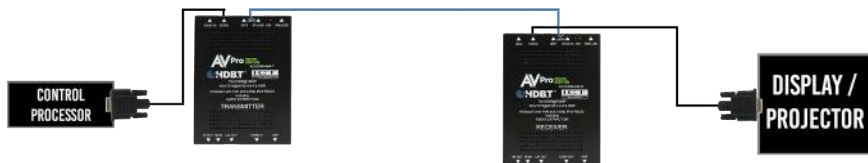


RS232 control signals can be sent 2 different ways:

1. From the rack using a control system (Control4, Crestron, etc) to the display
2. From the display back to the rack

When ultra long RS232 communication is needed (live events, churches, etc) AVPro recommends using the 444 Extender Kit for control signals.

# 444 EXTENDER RS-232 CONTROL



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

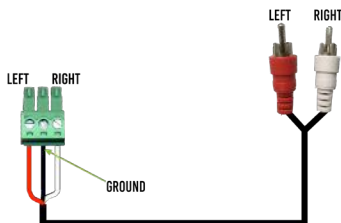
## AUDIO EXTRACTION:

This feature will allow you to extract 2ch audio from the source in order to send audio signals to an amplifier or AVR.

\*NOTE - This feature only works if the audio from the source is set to 2ch PCM. If downmixing is needed, check out the AVPro AC-ADM-AUHD or the AC-ADM-COTO

You can make a cable, or a premade cable can be purchased separately (AC-CABLE-3PIN-2CH). Follow the diagram below if you are making your own cable.

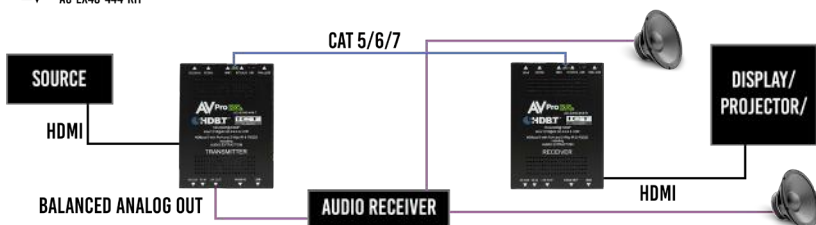
1. Plug the 3 pin connector into either the Tx or Rx (the audio port on both the Tx and the Rx are always active). The port is labeled "L/R OUT PCM Only".
2. Plug the L/R stereo cables into the audio input of an amplifier or AVR.
3. Set the audio output of the source to 2CH PCM



\*NOTE - The AC-EX100-444-KIT supports audio extraction, but uses a Toslink cable instead of a L/R analog stereo cable

**AVPro edge**  
AC-EX40-444-KIT

## 444 EXTENDER AUDIO EXTRACTION

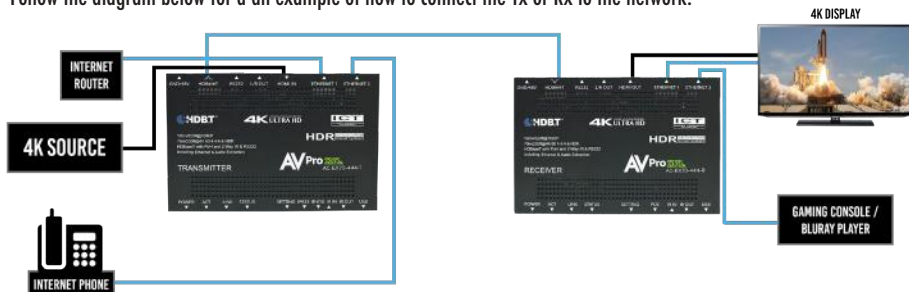


## ETHERNET (AC-EX70-444-KIT & AC-EX100-444-KIT ONLY):

The AC-EX70-444-KIT and AC-EX100-444-KIT adds Ethernet passthrough. This will allow you to hardwire a device or devices to the network. Hardwiring typically improves reliability and speed, especially when streaming high bandwidth content.

This feature is plug and play. The Ethernet ports are always active as long as one of four ports is connected to the network (the Tx or Rx will act as an Ethernet hub).

Follow the diagram below for an example of how to connect the Tx or Rx to the network:



## USB EXTENSION (AC-EX100-444-KIT ONLY):

In addition to Ethernet passthrough, the AC-EX100-444-KIT adds USB extension and supports ARC (Audio Return Channel).

-USB extension will allow you to control a computer 100 meters away with a keyboard or mouse, connect a USB camera, connect a hard drive or thumb drive; the options are endless!

-ARC enables a TV to send audio upstream to an AVR or surround sound processor. The AC-EX100-444-KIT can send the ARC signal from the Rx all the way back to the Tx.

### TO USE USB EXTENSION:

1. Plug the device that you'd like to extend (keyboard, mouse, camera, etc) into the "USB HOST" connection on the Tx (\*NOTE this is a USB type "B" connector. You may need an adaptor to fit your specific device).



2. The Rx has 4 USB connections. This is where you plug in the device that you'd like to control (PC, TV, etc).



### TO USE ARC:

1. Using an HDMI cable that supports ARC, plug the output of the AVR into "HDMI IN" on the Tx.
2. Using an HDMI cable that supports ARC, connect the display's input into "HDMI OUT" on the Rx
3. On both the Tx and Rx, be sure to flip the "AUDIO OUT" switch to "ARC"



\*NOTE - Be sure that the device (ex. AVR) and TV both support ARC, and that ARC is turned on in each device. These settings can usually be found in the "Audio Settings" menu, but you can always check the owner's manual to be sure.

\*NOTE - The AC-EX100-444-KIT supports audio extraction, but uses a Toslink cable instead of a L/R analog stereo cable



## TROUBLESHOOTING:

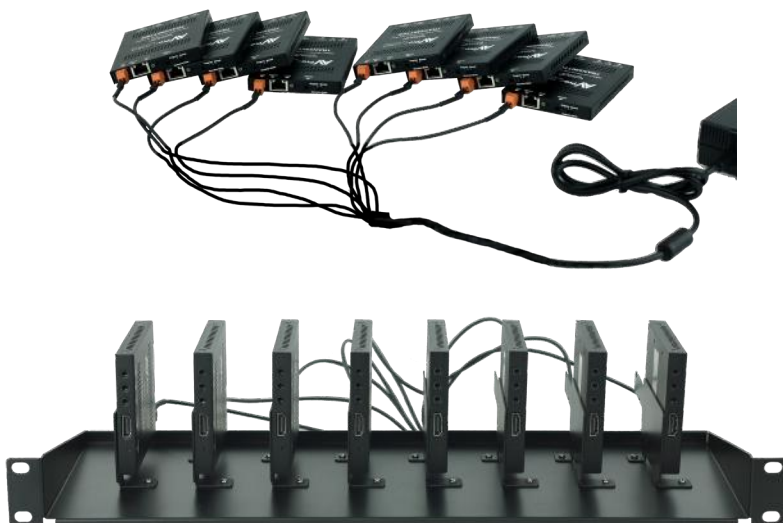
Having problems? Here are some general troubleshooting tips that may help:

1. Try different HDMI cables. A defective HDMI cable can bring the entire system down.
2. If using short HDMI cables (.5m, 1m) try a longer cable. Some short HDMI cables do not sync well.
3. Use the built in Test Pattern generator to confirm that the infrastructure is passing a signal
4. Re-terminate the Category cable (even if a cable tester indicates that the cable is passing signal).
5. Avoid RJ45EZ connectors
6. Check the Category cable length. It may be too long.
7. Remove any excess Category cable, and be sure that it is not twisted or damaged.
8. Bypass any patch panels or punch-down blocks
9. If you are powering the Rx with the power supply and the Tx is not getting power, try plugging the power supply into the Tx instead. Be sure to double check the POE switch on the extender
10. If you are still having issues after troubleshooting, feel free to contact our Tech Support department.

**\*NOTE -** The Tx and Rx in each extender kit do have LEDs that can help you troubleshoot each unit. Since each model has a slightly different set of LED indicators, refer to the "Indicator Troubleshooting Lights" section of owner's manual of the specific model that you are working with.

## CLEAN UP YOUR RACK WITH AVPRO EDGE'S SQUID RACK AND POWER SUPPLY

Regardless of the model of the extender kit, you can power up to 8 Rx or Tx units with a single power supply. You can also mount these units in a rack for a clean installation. Visit [AVProedge.com](http://AVProedge.com) for pricing and availability.



**HAVE A QUESTION OR NEED ASSISTANCE?  
DON'T HESITATE TO CONTACT US!**

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**USA TOLL FREE: 877-886-5112**

**EMAIL: [SUPPORT@AVPROEDGE.COM](mailto:SUPPORT@AVPROEDGE.COM)**

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