

## Installing HDBaseT in AV Projects: **What You Need To Know**

Large-format video displays are all around us, and have become a prevalent part of our daily lives. Used in classrooms, hospitals, hotels, and the enterprise, these large displays are driving the need for higher resolution, moving beyond today's high of 1080p. Ultra high-definition TV with 4K resolution is regarded as the next standard delivering 2160p format at 3840 x 2160 pixel density. Digital signals for these displays are increasingly sensitive and consume greater bandwidth — that's why having the optimal cabling infrastructure in place is paramount.

HDBaseT™ is a key technology that enables category cabling installations out to large-format displays. HDBaseT 5Play™ extends HDMI® video and audio, 100BaseT Ethernet, control, and power up to 100 meters on a single category-rated twisted-pair cable. Category cable is not only faster and simpler to install than traditional HDMI® cables, it is also more cost effective.

Considering installing an AV infrastructure with HDBaseT? On the next page are some general words of advice...

### HDBaseT™ 5Play™ at a Glance

**Simultaneous transmission of 5 functions over a single category cable up to 100m (328 ft)**

#### 1. HD Video

Full HDMI: HD/3D and 2K/4K uncompressed video

#### 2. Audio

Full audio including Dolby Digital, DTS, Dolby TrueHD, and DTS HD-Master Audio formats

#### 3. Ethernet

Supports 100Mb Ethernet Channel

For connecting devices to the local area network, can also be utilized to enable IP control of devices

#### 4. Control

Control via bi-directional RS-232 and IR Channels

#### 5. Power over HDBaseT (PoH)

Power extenders from either the source or display end with certified bi-directional PoH extenders

Complies with IEEE802.3at-2009 "PoE+"

# 1. Consider the Application and Installation Environment

Ask the following questions:

## Should I use HDBaseT Class A or Class B equipment?

HDBaseT™ with Class A equipment supports all 5Play™ features up to 100 meters. Extenders supporting the Ethernet channel can send IP to a wireless access point and to a display. Class B equipment is a cost-effective solution for installs of 70 meters or less, and for applications where Ethernet functionality is not required.

**Are there any power considerations?** Power over HDBaseT (PoH) is a variation of Power over Ethernet (PoE+). Certified bi-directional PoH transmitter and receiver extenders can be powered from either the source or the display end of the link, adding flexibility to the installation and eliminating the need to install an additional electrical outlet. A word of warning: be aware of “Power over Category cable” (PoC)

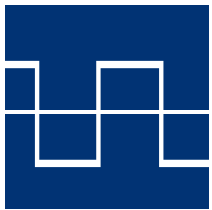


devices that may not comply with the PoH specification. These can lead to incompatibility or equipment damage.

**Where will the AV link go?** Even if it is a simple point-to-point link — to a conference table or projector — make sure to consider the effect on distance capability, which

can be reduced by numerous connection points. If possible, install the link with a maximum of four connections. If you are distributing links to displays throughout a facility, consider home runs over daisy chaining, as this supports powered devices and future repurposing of cabling. In this scenario, be aware of the affects of alien crosstalk in bundles, even over short distances. If you're planning on using an existing cable infrastructure, test the cabling and connectivity to ensure links meet TIA performance standards.

## 2. Understand the Signal Characteristics



AV signals over HDBaseT look much like the data signals you encounter every day — they are just a little less forgiving. HDBaseT is packet based like Ethernet, but it doesn't have a retransmission mechanism, so there is no recovery from packet errors. You can avoid pixilation or complete video dropout due to packet errors by using the right cabling. Which brings us to the next point.

## 4. Select the Right Media and Components

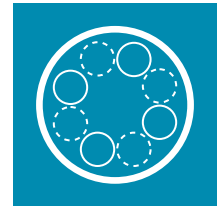
To ensure the best HDBaseT installation, use only HDBaseT certified components. These products are tested by the HDBaseT Alliance and will ensure full compatibility and 5Play performance. Also, as mentioned earlier, we recommend using Cat 6A cabling with alien crosstalk prevention technology as the backbone of the cabling system. It is able to protect signals in cable bundles from alien crosstalk issues. This is also especially important if the cable will be adjacent to other cables in the same pathways. Cat 6A also supports the higher bandwidth signals such as 4K, for a future-proof installation and best return on infrastructure investment.

Leviton offers a complete IT/AV System for HDBaseT applications, including HDMI extenders and Cat 6A connectivity and cable. This system can be installed, tested, and verified as a Cat 6A 10GBASE-T link, and is certified to HDBaseT Alliance Standards.



## 3. Recognize the Capabilities of Twisted-Pair Cabling

The HDBaseT Alliance specifies Cat 5e, Cat 6 UTP, and Cat 6A UTP cabling as supported media types. But these category ratings will deliver varying performance results, depending on the type of installation, video resolution, and distance. While Cat 5e channels can carry HDBaseT signals in an isolated point-to-point link, they do not support HDBaseT in real-world high-density installations with adjacent data or HDBaseT channels.



Leviton testing finds use of Cat 5e in these applications can lead to high packet error rates and total link loss, as the channels are not designed for resistance to alien crosstalk. Even Cat 6 cables can be limited in carrying HDBaseT signals when adjacent to other cables carrying HDBaseT. We recommend Cat 6A with alien crosstalk prevention technology such as the CX6850 Cat 6A Premium+ UTP System to support HDBaseT signals that are in the presence of multiple disturbers, including other HDBaseT signals and 10 GbE.

You can learn more about our HDBaseT solutions at [Leviton.com/ITAV](http://Leviton.com/ITAV)