SIMPLIFYING DIGITAL SIGNAGE INSTALLATIONS

HDBaseT uses a single LAN cable.

Through a combination of daisy chain and star topologies using LAN cables, the HDBaseT network eases installation and reduces commercial networking costs dramatically.

BY MICHA RISLING

It is clear by now that high definition (HD) is everywhere. The creation of HD content combined with the evolution of traditional TV viewing has fueled the demand for additional HD content and has not only impacted the home, but also extended to commercial use through digital signage. As the consumption of HD increases and the price of HD displays decreases, systems integrators are facing new challenges regarding the demand for HD-capable installations.
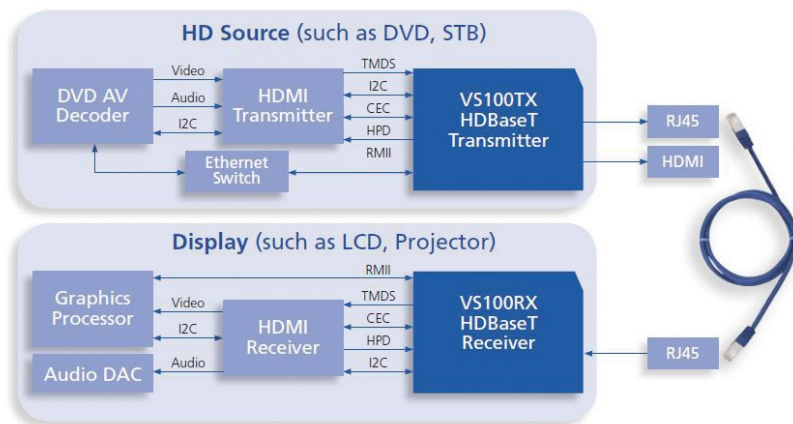
Challenges

Installing an HD-capable system might sound simple, but distributing high-resolution formats such as 1080P over long distances has its challenges. Although installers are familiar with analog system installations, you are now facing a new set of challenges associated with digital system installation. As opposed to distributing analog, sending HD video over long distances raises questions of reliability, ease of installation and cost of deployment.

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100m/328ft CAT5e Cable

5Play™

HDBaseT 5Play convergence via a single 100m/328ft Cat5e/6 LAN cable.

Detailed HDBaseT system function diagram.

The demand to overcome the reliability, cost and distance limitations of existing wired connectivity technologies such as HDMI and fiber, coupled with the fact that compressed content is not suitable for many new installations, leaves the digital signage industry now looking for a new, better technology.

A new connectivity standard, known as HDBaseT, has set out to resolve these challenges by providing a single-cable technology using a familiar connector and cable, delivering HD content in a simple, reliable and cost-efficient manner.

Supported by the HDBaseT Alliance, a cross-industry alliance incorporated on June 14, 2010, by LG Electronics, Samsung Electronics, Sony Pictures Entertainment and Valens Semiconductor, HDBaseT is a consumer electronic (CE) connectivity technology for long-distance transmission of uncompressed HD video, audio, 100BaseT Ethernet, high-power over cable and various controls, via a single, 100m/328ft Cat5e/6 cable with RJ45 connectors.

5Play Convergence

HDBaseT is the first technology to provide 5Play convergence—video, audio, internet, high-power and controls—and enables installers to cut the cables down to one all-inclusive, long-reach LAN cable using the standard RJ45 connector, commonly known for Ethernet LAN connections.

Although HDBaseT was developed as a point-to-point technology, it allows cascading and single-point to multipoint distribution supporting both daisy chain and star. Imagine an airport installation with multiple displays spread throughout the building. The combination of daisy chain and star topologies using LAN cables, which are transporting the HDBaseT feature set, eases the installation and reduces the cost dramatically. This same HD installation can also distribute power to elements along the route and carry Ethernet, which can be further used for WiFi cells.

Controlling the entire HDBaseT-enabled system can also be done easily by using Ethernet or RS232 when ap-

plicable. HDBaseT Alliance founding member Valens Semiconductor offers a reference design that enables customers to easily design systems such as this.

HDBaseT supports TV and PC video formats, including standard, enhanced, high-definition and 3D video, and also supports all standard audio formats.

It delivers Full HD/3D and 2K/4K uncompressed video to a network of devices or as a point-to-point connection. Uncompressed content supports all video sources, including legacy products, accurately renders gaming graphics and features such as electronic program guides (EPGs), and does not degrade video quality or add latency.

100BaseT Ethernet

HDBaseT supports 100Mb Ethernet capabilities, enabling televisions, hifi equipment, computers and other CE devices to communicate with each other and access stored multimedia content, including video, pictures and music.

Sending power over the same Cat5e/6 cable gives installers the option to forgo plugging devices into the wall outlet for power, allowing greater mobility. HDBaseT can power remote TVs and other devices up to 100 watts.

In addition, HDBaseT delivers different types of control signals for different purposes, from CEC to RS232/USB and IR, which operate remote equipment allowing a system to be controlled and monitored easily.

HDBaseT uses an asymmetric method, sending video, audio, Ethernet and controls from source to sink, but only 100Mb are transferred back (Ethernet and controls). Unlike conventional data communication that is a symmetrical application by nature, with a required bit error rate (BER) of at least 10 to the minus 12, the asymmetric nature of HDBaseT is based on an innovative DSP engine and AFE (Analog Front End) architecture. A special line coding scheme was developed to provide a better transfer quality to some kinds of data (audio, controls, Ethernet) without the need to "pay" the protecting

overhead for the video content that consumes most of the bandwidth.

Video Control Signals

HDBaseT also deals with video control signals and the reconstruction of video clocks. These elements are not part of the conventional LAN communication and require deep understanding of uncompressed video interconnects.

The barrier of transferring Full HD over UTP cable is high by any standards, with the additional aspect of video-specific expertise, which usually doesn't exist in classic UTP transceiver vendors. When combined with the special architecture required to achieve the target product cost, this creates a significant barrier for competitors.

As the consumption of, and demand for, high-quality HD content continues to evolve and increase, so does the interest of the end user in enhancing the viewing experience. The need for easy access to premium content increases together with the desire to easily distribute, control and consume the content and enjoy a cohesive commercial or home entertainment experience with an improved look and feel.

HDBaseT answers these needs and delivers significant value to the entire industry, from CE/PC equipment manufacturers and audio/video connectivity product suppliers, through systems integrators and retailers, to installers and consumers.

The HDBaseT Alliance is working to drive HDBaseT as the new digital connectivity standard for multimedia distribution. With support from consumer electronics manufacturers, content providers, systems integrators and organizations, HDBaseT is revolutionizing the distribution of uncompressed HD multimedia content in both the home entertainment and digital signage environment, all via a single LAN cable.

Ambitious Target

HDBaseT has set an ambitious target to enhance the HD experience; whether at home or in digital signage installations, distribution of HD content has never been this easy. An unmatched offering enables the industry to deploy HD systems that are cheaper,

more installation friendly, reliable and are capable of dealing with the new HD video format as well as future 3D content.

The HDBaseT 1.0 specification was finalized in June 2010. Since that time, embedded HDBaseT products using Valens Semiconductor VS100 chips have already hit the market, including products from vendors such as Gefen, Crestron and AMX.

The Alliance invites interested parties to join and to play a pivotal role in defining the future of multimedia transmission and data communication in the consumer electronics, digital signage and content provider industries. For additional information about the HDBaseT Alliance and membership benefits, visit www.hdbaset.org. ∎