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Standards
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**VESA Approves DisplayPort
 Version 1.1**

Taking one step closer to a ubiquitous video connectivity standard, the non-profit Video Electronics Standards Association (VESA) (Milpitas, CA; www.vesa.org) announced the approval of the DisplayPort v.1.1 interface standard by its members. The 1.1 version of the standard adds support for High-definition Digital Copy Protection (HDCP v.1.3) required in consumer devices as well as support for audio. The upgrade allows for a single-plug consumer device solution and two-way display connectivity. As a result, supporters think the standard can replace consumer connectors like DVI, and eventually VGA with this efficient, common digital interface solution.

VESA did not say DisplayPort 1.1 would replace HDMI in CE devices, but did point out that DisplayPort 1.1 is a royalty free standard whereas HDMI and LVDS are royalty bearing connection standards.

DisplayPort provides the ability to carry pixels directly from any display source to any LCD panel, simplifying the design complexity and eliminating multiple display standards and chips present today.

Out of the gate the DisplayPort standard blows away alternatives with its 10.8Gbps (that's 2.7 GHz) pipeline. To get there DisplayPort takes advantage of all four available DisplayPort "lanes" supporting a whopping WQXGA resolution (2730x1536-pixels) with 10-bit color from source to display. For the mobile market its low voltage, low power operation and slender form factor makes it laptop and small device friendly (unlike the

bulky connector alternatives). This helps reduce product cost at the manufacturer's end (no interconnects or adaptors to supply, test and certify) and for the consumer, no adaptor plugs to misplace.

Other component level advantages include DisplayPort's reduced EMI through its unique embedded clock architecture. This helps ensure faster time-to-market and helps with testing and compliance issues.

"The benefits of version 1.1 are significant, and will encourage adoption of DisplayPort in new generations of computers and consumer electronics equipment," said Bill Lempesis, VESA executive director. "Our task groups and committees within VESA worked very hard to ensure that DisplayPort 1.1 satisfies the important objectives it is designed for, and as a result, this new version has widespread support among all the leading computer and consumer electronics suppliers." These include DisplayPort sponsors Dell, HP, both known as PC makers, but they are also companies who cross the line into CE devices like flat panel TVs.

On the chipmaker side, VESA said the DisplayPort silicon chip is available and is already being supplied to product developers who will incorporate the DisplayPort connector. Expect these products to hit the market by Q4'07.

Last year, DisplayPort backers held their first "plugfest" interoperability testing event with multiple chip, systems and cable makers present. Participating companies included Agilent, Tektronix, Molex and chip designers Parade and Genesis Microchip. A workshop on DisplayPort drew 65 attendees from 28 companies.

The non-profit VESA is making the technology available throughout the industry as a free-to-use, open and extensible standard. This is unlike most standard's bodies that require membership in the organization to access or implement the standard. (The highest VESA membership fee is \$7K.)

VESA made it clear that DP would be a completely free standard — meaning a company looking to implement the technology does not have to join the association, nor will VESA charge a fee for the standard to non-member companies. This offer is pretty much unheard of with respect to standards development groups. This strategy is clearly aimed at encouraging wide spread adoption.

While there is no fee to simply implement the DP interface, adoptors will need to use the ICs and connectors from the suppliers that hold the IP. For cases where manufacturers want to produce their own chips or use their own connectors, these companies may have to pay a royalty to specific IP owner companies. However, as long as a manufacturer wants to implement the technology into products using parts sourced from "owner" companies, there is no license fee as use of the IP comes with the purchase of the component.

If a manufacturer elects to participate in the voluntarily VESA DisplayPort compliance and compliance logo programs, the VESA group said there will likely be a nominal charge to help cover the cost of the program.

Suffice it to say that, the two standards, VESA's DisplayPort and Silicon Images' HDMI will co-exist for now and VESA sees DP as primarily a PC interface in the short-term. But just how long do you think device manufacturers (and ultimately consumers) will want to keep paying for a connector they can replace at a much lower cost? With DisplayPort 1.1 now ratified and new products in the pipeline for Q4'07 launch, Silicon Image might eventually begin to see there is a distinct difference between "non-profit" and "no profit." --SS

LCD Backlights

Ken Werner

LED BLU Expansion: Notebooks Come First

Apple and Hewlett Packard are expected to introduce notebook PCs with LED BLUs during Q2'07. HP's new LED-based notebooks will feature Microsoft's Vista OS and will aim at high-end, multimedia uses, industry sources said. The sources added that the popularity of using LEDs in BLUs for large-size applications will grow because of the increasing number of U.S. notebook brands that will use them.

Taiwan-based *DigiTimes* bemoaned the fact that most of the LEDs will be sourced from makers such as Cree and Nichia – not from Taiwan sources. The reason is that notebook makers are demanding a luminance of over 1,680 nits, and Taiwan-based makers are not yet producing products that bright, *DigiTimes* said.

AU Optronics (AUO) and Chi Mei Optoelectronics (CMO) will be using some of those LEDs when they enter volume production of LED-lit LCD modules Q2 and Q3, respectively. CMO is expanding more quickly in this segment because it will be launching more models than AUO.

Tony Chen, general manager of the notebook business unit at Asustek, said in late January that the LED-backlit notebook segment will not take off until 2008 at the earliest, according to another story by Wang and Chuang. This seems conservative, but Chen offered a very precise definition of what he meant by "taking off": It's when LED backlighting sources account for 10% of the notebook backlighting market.

The 10% number is a very interesting one indeed. At the Displaybank conference in New York recently, Sunam Lee, Sr. Manager at Samsung SDI noted that once a technology reaches a 10% penetration point in the market, the rise to a 50% point can come quite rapidly. As evidence, he cited the introduction of Color TV in the US. It took 13 years to reach a 10% penetration point, but only 4 years to reach 50%. Similarly, he thinks the 40"+ FPTV market will reach 10% in 2008, 5 years after introduction, then rising to 50% of the market in 3 years.

Chen attached some numbers to the power saving that can be expected with LED backlights. The average power consumption for widescreen 12.1-, 13.3- and 14.1-inch notebooks using LEDs is 1-2W lower than that of notebooks with the same-sized screens using CCFLs. For a power reduction of 1W, Chen said, the battery life of notebooks is increased by 30-45 minutes.

Chen expects the price gap between LED and CCFL is to drop to 120% in 2008, down from 200% now, *DigiTimes* reported.

Notebook panels are getting brighter, which requires more CCFLs per LCD module. As a result, CCFL supply may tighten again in Q3, Chen said. But the actual supply/demand balance will depend on how much CCFL makers expand their manufacturing capacity. –KW

Electronics

John DiLoreto

New Standard Connects Portables to Cars

The Consumer Electronics Association (CEA) said it is working on a new standard to connect portable devices such as MP3 players to cars. CEA said it will adjust the standard currently under development to also allow accessories to connect to the MOST (Media Oriented System Transport) network in a vehicle. The MOST network is said to be gaining prevalence in new vehicles for communication between A/V devices. It is expected to be used in 48% of cars worldwide by 2008.

Development of the portables standard, CEA-2017.1 began last year to allow “command and control” communication between portables and accessories such as speakers. Now the standard will be extended to allow communication with AV systems in MOST cars.

The CEA said connectivity of devices into the car is a “key issue” for the organization, and it called for industry members to participate in the development of these standards.

CEA also announced it is revising standards for home and car audio amplifiers and loudspeaker testing methods. –JD

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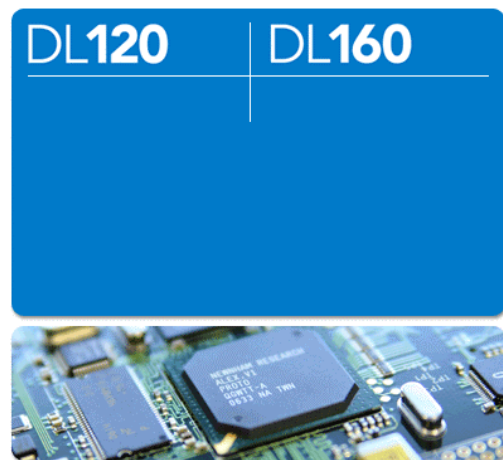
Wired Connections

Steve Sechrist

DisplayLink Launches Wired and Wireless USB IC

DisplayLink Inc. (formerly Newnham Technology) (Palo Alto, CA; www.displaylink.com) announced the DL-120 and DL-160 high-performance chips that link monitors to PCs using USB 2.0 and they have a solution in hand that will support wireless USB connectivity for displays.

The company said its new chips allow monitor manufacturers, PC OEMs and PC accessory companies to develop products for multi-monitor computing including USB-connected monitors, video-enabled USB laptop docks, display connectivity accessories and other devices—and Toshiba agrees. The company just announced Toshiba America Information Systems (TAIS) (Irvine, CA; www.toshiba.com) chose DisplayLink’s network display



technology for the Dynadock family of universal laptop docks to deliver high-resolution graphics and DVD-quality video playback over a USB 2.0 link.

DisplayLink's USB chips are the first to offer high-resolution display connectivity over a USB 2.0 connection. The high performance of the solution means that the user experience with mouse, monitor, and keyboard is comparable to a conventional DVI or VGA-connected monitor. Static images in 32-bit true color are displayed without quality loss or color reduction and full-motion, DVD-quality video plays in real-time.

The DL-120 supports display resolutions up to 1280 x 1024 and the DL-160 extends support up to 1600 x 1200.

“With DisplayLink connectivity, consumers can keep adding monitors, photo frames and other application specific displays to PC's in their work or home environments over USB 2.0 or Wireless USB.” said Hamid Farzaneh, DisplayLink President and CEO. “The new DL-120 and DL-160 offer a high-performance alternatives that will bring multi-display applications into the mainstream.”

The complete DisplayLink solution is comprised of Virtual Graphics Card (VGC) software that runs on a Windows host PC and a Hardware Rendering Engine (HRE) inside of the DL-120 or DL-160 chip. The VGC software processes a stream of display information using the company's proprietary lossless graphics protocol and transmits it over a USB 2.0 or wireless USB link to the HRE chip that reconstructs the image on the display.

The Toshiba Dynadock is an advanced docking station for notebooks with a USB 2.0 port. It allows a consumer to connect a notebook to a monitor, network cable, and essential USB PC accessories with a single USB 2.0 connection.

One Dynadock model is based on the DisplayLink DL-160 chip and supports DVI-connected displays with resolution up to 1680 x 1050 (Widescreen Super Extended Graphics Array - WSXGA+) or 1600 x 1200 (Ultra Extended Graphics Array – UXGA). The DVI capability provides crisp digital output even for notebooks without built-in digital monitor support, providing a cost-effective way to use a standard notebook in these applications.

Another Dynadock model is available for VGA-connected displays and is based on the DisplayLink DL-120 chip. It offers similar connectivity, but supports displays with resolution up to 1280 x 1024, providing an affordable platform for mainstream multi-monitor computing.

“Having a dock that allows them [notebook users] to add a large screen monitor and all of their peripherals with the ease and convenience of USB takes that benefit to the next level. Working with DisplayLink has resulted in a great addition to our product line,” said Doug Sash, director of accessory and services marketing for TAIS Inc., Digital Products Division.

The Dynadocks deliver full 32-bit true color at all display resolutions with high-quality images and DVD-quality video. The docks automatically recognize the monitor type and configuration (EDID), support both standard and widescreen aspect ratios and use the existing notebook display configuration utilities without requiring a separate GUI.

The DisplayLink DL-120 and DL-160 are now available in production. They are the first in a series of display connectivity solutions to come from DisplayLink. The core VGC and HRE technology can be extended to a wide range of standard connectivity technologies such as Ethernet or Wi-Fi to provide new solutions for network connected computer projectors, digital picture frames, computer-based signage, and others.



Formerly Newnham Technology, DisplayLink is a fabless display connectivity IC company, formed in 2003 to enable simple and flexible connections between computers and displays using standard wired and wireless links. The company's technology allows any number of displays to be connected to a single PC. DisplayLink's investors include Atlas Venture, Benchmark Capital, and Esprit Capital. The company is headquartered in Palo Alto, CA, with main R&D and product development activities in Cambridge, UK. –SS

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More than 130M HDMI Devices to Ship in 2007

HDMI Licensing has predicted that more than 130M devices featuring HDMI are expected to be shipped in 2007, according to In-Stat (Scottsdale, AZ; www.instat.com). The licensing agent for the HDMI specification has also announced that more than 500 manufacturers have adopted the standard, a 60% increase since CES in January 2006.

HDMI Licensing, LLC, the agent responsible for licensing the High-Definition Multimedia Interface (HDMI) specification, announced the rapid penetration of HDMI into the PC market with more than 50 HDMI PC products currently available. These include more than ten desktop and notebook PCs, families of HDMI PC monitors from major manufacturers and a broad range of motherboards and graphics cards with HDMI outputs.

The group calls HDMI the de facto standard digital interface for HDTVs and high-definition (HD) consumer electronics products. HDMI is also currently the leading interface for PCs intended for HD content usage, including connection to HDTVs and HD video camcorders, the company says.

Major PC makers, such as Acer, BenQ, Dell/Alienware, Hewlett-Packard (HP), Samsung, Sony and Toshiba, have already announced or delivered desktop and notebook PCs with the HDMI interface.

PCs with HDMI outputs can connect directly to more than 105M HDTVs with HDMI inputs estimated by research firm In-Stat to be in the market by the end of 2007. Because HDMI is backward compatible with the Digital Visual Interface (DVI), the HDMI PCs can also connect directly to the enormous installed base of PC monitors with DVI inputs, which In-Stat estimates at 106M shipped to date since 2002.

Major producers of PC monitors are starting to introduce low-cost HDMI monitors to respond to the recent surge of PCs with HDMI outputs including ViewSonic and LG Electronics. Another manufacturer, BenQ, has introduced four new widescreen LCD gaming monitors with HDMI connections, including a 19-inch model with a price of US\$299, according to HDMI Licensing.

Silicon Image, owner of the HDMI technology said the new Windows Vista O/S is accelerating the adoption of HDMI in the consumer PC market. It contains rich multimedia functions and the ability to access and play back premium HD content from a variety of sources including ATSC tuners, digital cable tuners, HD DVD, and Blu-ray Discs, says HDMI Licensing.

Apple has also included an HDMI connection for the new Apple TV set-top box. The product allows consumers to wirelessly sync and stream high-definition content from a computer so HD movies and TV shows can be viewed on their television sets.



HDMI is the first and only consumer electronics industry-supported, uncompressed, all-digital audio/video interface, claims HDMI Licensing. By delivering crystal-clear, all-digital audio and video via a single cable, HDMI dramatically simplifies cabling and helps provide consumers with the highest-quality home theater experience, it adds. HDMI provides an interface between any audio/video source, such as a set-top box, DVD player, or A/V receiver and an audio and/or video monitor, such as a digital television (DTV), over a single cable. –SS

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About VESA

VESA is an international non-profit corporation led by a Board of Directors, which represents a voting membership of more than 140 corporate members worldwide. VESA supports and sets industry-wide interface standards for the PC, workstation, and consumer electronics industries. VESA promotes and develops timely, relevant, open standards for the display and display interface industry, ensuring interoperability and encouraging innovation and market growth.

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