

**Venture Development Corporation
Power Conversion and
Control Practice**



A Bulletin on:

***DEVELOPMENTS IN POWER OVER ETHERNET
AND POE PLUS***

Lack of Final Power over Ethernet Plus Standard Is Not Hindering New Product Introductions

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Lack of Final Power over Ethernet Plus Standard Is Not Hindering New Product Introductions

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The standard for a higher power version of PoE, IEEE 802.3at, is moving closer to becoming finalized, but remains a work-in-progress. This standard, which would allow for PoE-enabled operation of devices requiring more than the 12.95 W permitted by the existing standard, is at least a year away from being ratified by the IEEE. Notwithstanding, vendors of PoE enabling technologies and equipment have not let this roadblock prevent them from introducing pre-at compatible products.

This is not the first time companies have jumped ahead of a standard ratification and introduced new products to the marketplace. In 2005, Intel deployed a WiMAX solution prior to standard ratification.

IEEE 802.11n, the next flavor of Wi-Fi, is another example. There are numerous pre-n products available, despite the fact that ratification is predicted to occur no earlier than first quarter 2008. Companies such as **Trapeze Networks** and **Meru Networks** have introduced pre-standard 802.11n access points (APs), which coincidentally require the power provided by - at Power Sourcing Equipment (PSE) to operate as a PoE-enabled device.

There have been high-power PoE controllers available since last year from **Texas Instruments**, among others. **PowerDsine**, now part of **Microsemi**, introduced 4- and 12-port controllers earlier this year and **Broadcom Corporation** just introduced its first-ever PoE controllers, including one that can support up to 37 W per port.

Yes, multiband WLAN APs will be a main application for PoE Plus, and there are the other oft-mentioned applications - VoIP phones, lighting and laptop chargers - but it will take more creative thinking for PoE Plus to reach the tipping point.

In our previous PoE study, we utilized a screening model that ranked PoE applications based on a higher power standard. This model placed network security cameras and pan-tilt-zoom (PTZ) cameras at the top of the list. Other top-ranked applications included alarm systems, industrial sensors and biometric access control. One might also include RFID readers used for inventory control and asset tracking. In 2006, VDC estimated that the market for RFID hardware exceeded US\$ 1.2 billion and is expected to grow 28% per year through 2010. Much like APs, deployment costs of fixed RFID readers can be significantly reduced by deploying PoE-enabled readers. This cost-savings concept can be expanded beyond fixed readers to retail price scanners and access control, including both RF-based locks and biometrically-controlled locks.

As one industry veteran has commented, it looks like applications could end up driving the standard rather than the other way around.

NEW PRODUCT INTRODUCTIONS – Q2

April 2007

Linear Technology Corporation introduced the LTC4264, a Power over Ethernet controller for high-powered PD applications. The LTC4264 allows users to develop applications that consume up to 35 W for 2-pair applications and up to 70 W for 4-pair applications. The LTC4264 integrates a power MOSFET and sense resistor to provide inrush control. The LTC4264 is one of several recently announced pre-802.3at products.

May 2007

Akros Silicon, Inc. announced the availability of the AS1100 family of PoE devices, including the AS1124 controller for either 802.3af or 802.3at pre-standard power levels. The AS1124 integrates rectification and protection circuitry, a PD controller and a dc-dc controller. The AS1124 is pin compatible with the AS1113, an 802.3af-compliant PD controller.

Broadcom Corporation announced its first Power over Ethernet products, the BCM59101 and BCM59103 4-port PSE controllers. The BCM59101 supports 15.4 W 802.3af applications and the BCM59103 supports pre-802.3at applications with up to 37 W per port. The controllers include integrated power MOSFETs, a dc-dc controller, ac disconnect and LED control circuitry. The products also eliminate the sense resistors on each port, reducing power consumption and heat dissipation. The controllers are pin compatible to allow backward and forward compatibility.

National Semiconductor introduced the LM5072, a PoE PD controller with adjustable output current. The LM5072 is compatible with the existing 802.3af standard but can also provide twice the amount of power through adjustment of the current limit. The device also has converter control outputs that allow the LM5072 to interface with a variety of dc-dc conversion topologies.

At Interop 2007, **Netgear** announced that it will team with **Avaya** to provide SMB IP telephony solutions. Netgear will be providing PoE-capable switches to power Avaya's phones.

Texas Instruments introduced their TPS23841, a high power quad-port Ethernet PSE manager. The TPS23841 is an integrated with switches and sense resistors. It can provide up to 570mA per port.

June 2007

CEM Systems, announced the DIU 220, a Power over Ethernet door interface unit. The DIU 220 uses PoE Plus technology to power a door set, including an access control reader, magnetic lock, door holder, sounder and strobe, all over one Cat5/6 Ethernet cable.

MARKET VIEW – Q2

In our recently published annual service on [Industrial Networking](#), we surveyed wireline industrial network users. In this survey, many more of the respondents indicated they would be purchasing network components with Power over Ethernet (PoE) five years from now than they are currently.

Users of industrial networks were asked how the networking components they purchase are powered and how those they will be purchasing 5 years from now will likely be powered. Respondents were also asked to comment on 10 product categories. Table 1 summarizes their responses:

Table 1 Expected Adoption of PoE Technology in Wireline Networking Devices Purchased For Use in Industrial Facilities (Percent of User Respondents for Each Product Type)			
	<u>Currently</u>	<u>Expected in 2011</u>	<u>Change</u>
Gateways	9%	30%	+21%
Bridges	8%	29%	+21%
Device Servers	5%	19%	+14%
Routers	5%	18%	+13%
Modems	7%	19%	+12%
Console Servers	5%	16%	+11%
Hubs	5%	14%	+9%
Switches	5%	13%	+8%
Fiber Optic Transceivers	10%	14%	+4%
Multiplexers	5%	5%	0%

The median response was 5% on current usage, and 17% on expected usage in 2011, a gain of 12%. It can also be seen that 21% more of the respondents expect to be purchasing PoE gateways and bridges in 5 years than currently. This adoption of Power over Ethernet technology will come at the expense of products with traditional ac-dc cord/cable power sources.

PoE technology allows power to be delivered via Cat 5 Ethernet cable, negating the need for a separate power cord. Network devices sold for use in industrial facilities can benefit from Power over Ethernet for a number of reasons, including:

- Higher reliability – PoE networks have a more reliable power supply for two reasons: First, fewer wires are needed, resulting in a lower probability of accidental power disruption; and second, with a centralized uninterrupted power supply (UPS) each device on a network can have backup power in the event of power loss.
- Lower cost – Electricians do not need to run power lines to new devices on a network.
- Increased flexibility and control – Devices do not need to be located near an ac outlet or power source, and can be monitored, shut down or restarted from a central location.

Network reliability is a major concern for industrial applications so it will not be a surprise to see increased market penetration by PoE in the next few years.

ABOUT VDC

Venture Development Corporation (VDC) is an independent technology market research and strategy consulting firm that specializes in a number of industrial, embedded, component, retail automation, RFID, AIDC, datacom/telecom, and defense markets. VDC has been operating since 1971, when the firm was founded by graduates of the Harvard Business School and Massachusetts Institute of Technology. Today, we employ a talented collection of analysts and consultants who offer a rare combination of expertise in the market research process; experience in technology product and program management; and formal training in engineering and marketing. VDC's clients include thousands of the largest and fastest-growing technology suppliers in the world and the most successful investors participating in the markets we cover.

ABOUT VDC'S POWER CONVERSION AND CONTROL PRACTICE

For more information about VDC's 3rd *Edition of Power over Ethernet: Global Market Opportunity Analysis*, contact:

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Brian is VDC's lead analyst covering the global markets for power conversion and control products. He comes to VDC with a solid technical background and extensive technical product line management experience. His mandate is to apply those skills to executing the high-quality industry analysis and research programs that VDC has become known for, while at the same time expanding our coverage of power markets. Brian will be leading VDC's upcoming research on the market for Power Supply Integrated Circuits.

Brian recently completed VDC's 12th edition of its *Switching Power Supplies: Global Market Demand Analysis*, which focuses on internal ac-dc switching power supplies and dc-dc converters.

Prior to joining VDC, Brian held engineering and product management positions at Analog Devices, a leading semiconductor manufacturer, where he was involved in the development of high-performance analog ICs.

Brian received his BS in electrical engineering from Binghamton University and his MBA from Bentley College.

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