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**New PSIA Standard Sets IP Security Cameras for Fast Growth**

by TK
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Despite advances in IP video, codecs, analytics, storage and display, the security video camera market has remained stubbornly analog. While IP cameras offer numerous advantages over analog for surveillance video -- including lower cost signal transport (Cat-5 vs. RG-6/59), ability to do analytics, and compressed storage with instant retrieval (versus analog tape) -- IP camera technology is still in the "early adopters" stage of the growth curve. The reasons include inertia, proprietary digital standards that require customers to purchase same-brand equipment throughout a system, and the continued lower bill of materials for analog cameras and CCTV (closed circuit television) technology.

Today's security video market is similar to where private branch exchange (PBX) telephone equipment was before VoIP (voice over IP) standards became prevalent. A huge base of analog equipment was aleady installed, and phone manufacturers had introduced proprietary digital PBX systems. Then VoIP standards came along and very quickly, everything moved to IP PBX's and media gateways. Security video is about to make a similar transition.

The security video industry has taken a big step towards the creation of interoperable standards through a new trade association -- the Physical Security Interoperability Alliance -- and the recent release of PSIA 1.0. This new standard enables IP camera manufacturers to build IP cameras and other components that can be readily incorporated into larger systems. It allows system integrators to plug in IP cameras from different brands with almost the same simplicity as plugging in analog cameras.

PSIA's members include makers of security cameras, content management systems, video management software, access control and system integrators. Founding members include Adesta LLC, ADT Security Services, Cisco Systems, CSC, DVTel, GE Security, Honeywell, IBM, IQinVision, Johnson Controls, March Networks, ObjectVideo, Orsus, Panasonic, Pelco, Santa Clara Consulting Group, Texas Instruments, Verint and Vidyo. (The PSIA spec can be seen at www.psiaalliance.org, along with a list of current members.) PSIA is dedicated to open standards, and new members are always welcome.

**The Physical Security Interoperability Alliance**

Without any standards for IP surveillance video cameras until now, it's no wonder that so many different and incompatible technologies have been deployed (see Figure 1.) A Pelco camera with OV Video Analytics, for example, cannot connect to a network video recorder intended for Bosch Video Analytics. Each is a walled garden. The video management system must also provide for access control, remote viewing and network storage, where each manufacturer has historically used its own protocols.

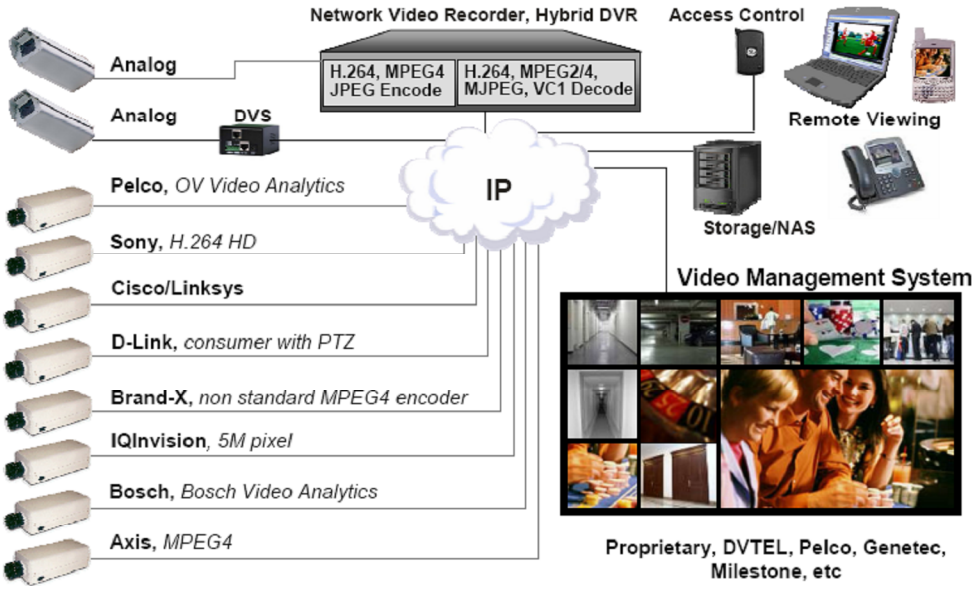


*Fig. 1 - The IP Video Management Challenge: With today's mix of proprietary systems, it's a challenge getting equipment from different brands to work together.*

The benefits of industry-wide standards include faster overall growth, lower barriers to entry for new manufacturers, greater choice for system integrators, and spurring innovation.

PSIA was formed to create standards for the security camera market. It currently consists of four main specifications. The IPMD specification covers system, streaming, PTZ (pan-tilt-zoom), diagnostics, and custom features. The Video Analytics specification covers analytics and events. The Content Management specification covers recording and management, while the Area Control Specification covers access and intrusion.

PSIA specifications may embrace multiple standards, such as for video codecs, where different applications may best be served by H.264, MPEG-4, MJPEG, VC-1, etc. One way of thinking of PSIA is as a standard for delivering the advanced functionality of IP security video: How to select a codec, how to select resolution, how to handle analytics, etc.

Some surveillance applications may call for simultaneous multicodec and/or multi-resolution streaming. A tri-streaming scenario might require recording HD while displaying SD and capturing still frames with no temporal compression.

PSIA makes it possible for equipment from different vendors to work together harmoniously. In addition to publishing and promoting the spec, PSIA is also providing sample code, VMS implementations, and offering interoperability validation.

With PSIA 1.0, manufacturers who have been waiting on the sidelines of IP security video have good reason to jump in. The market for surveillance video continues to expand, and now manufacturers no longer need to create a complete integrated system -- they can start by making a single component, such as a camera or recorder. For smaller companies, though, the challenges of designing such components from scratch can be complex and extremely time consuming. A production-ready reference design can overcome this hurdle by enabling a manufacturer to rapidly begin making PSIA compliant components.

**TI DM365 and PSIA-Compliant IP Surveillance Video Reference Designs**

Two new reference designs recently released by Texas Instruments in conjunction with Appro Photoelectron Inc. and UD Works are both PSIA compliant, and make it extraordinarily easy for new companies to quickly enter this expanding market. (TI estimates the reduction in development time for an IP camera from about 160 man-months to just four man-months!) These reference designs, built around the TI TMS320DM365 digital media processor based on DaVinci™ technology, reflect the state of the art in terms of building highly competitive IP surveillance video products.

**IP Camera Reference Design**

The IP Camera reference design (see Fig. 2) can have an estimated EBOM (electronics bill of materials, which includes power supply and management and all electronics) as low as $40, depending on options. It features an Aptina 5-megapixel CMOS image sensor, has multicodec support for H.264 and MPEG-4 at 1080p (or 720p at full frame rate), MJPEG, VC-1, MPEG-2, and is optimized for low-light performance. It consumes less than three watts using Power over Ethernet, it fits on a 65 x 50mm board, and incorporates an integrated video analytics hardware connector. The reference design's software includes a complete Linux-based IP camera application with free source code and royalty-free, production ready codecs included.

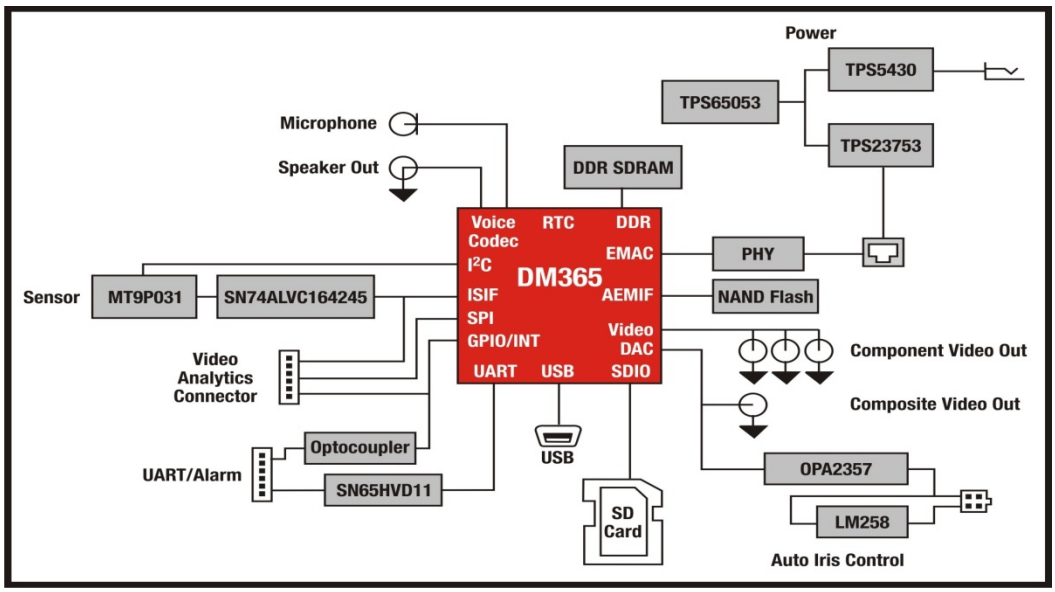


*Figure 2 - IP Camera reference design based on TI DM365 processor from Appro Photoelectron Inc.*

This IP camera design also benefits from TI's fifth generation ISP solution, which provides video stabilization, face detection, noise filtering, auto white balance, auto focus, auto exposure and edge enhancement, as well as other video quality enhancements for image improvements and added intelligent video processing. It's available from Appro Photoelectron Inc. (reference design DM365IPNC-MT5, $795).

**DVR Reference Design**

The Digital Video Recorder reference design (see Fig. 3) pairs the DM365 with a TI TVP5158 multi-channel video decoder with integrated audio, and can encode D1 video at up to 65 frames per second, or decode up to eight CIF channels. It handles simultaneous record, playback, storage, streaming and display, with multicodec support. The estimated EBOM for this PSIA-compliant DVR is $60.

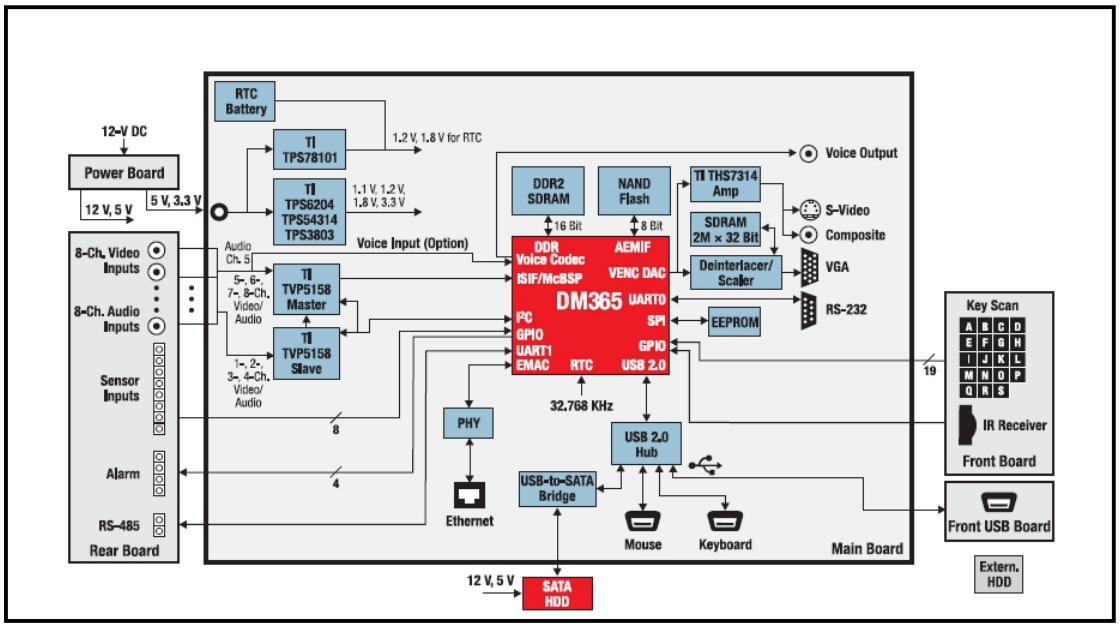


*Fig. 3 - DVR Reference Design based TI DM365 processor from UD Works*

Hardware features include storage of compressed input (SATA & USB), streaming of compressed input (Ethernet), local display support up to 800x600 resolution, local user interface support, and PTZ camera support. Software features include a multi-codec system that allows triple stream per channel (H.264, MPEG-4 and MJPEG) for real-time signal processing, storage, streaming and display, audio/video adjustment tools, and video timestamp support. A Windows PC-based VMS GUI app is included too, as well as a Software Development Kit that provides for easy customization. It's available from UD Works (reference design DM365DVR-UD1, $1195).

The DM365 enables manufacturers to build once, deploy many with a single platform. Numerous variations on the IP camera (IP camera, CCTV camera IP converter), and on the DVR (DVR, Network Video Recorder, Digital Video Server) are possible.

**Get Started in Security Video**
Whether you're looking to enter this market without any modification to a reference design, or want to add your own custom features, PSIA interoperability means your products can connect to many others. PSIA is beginning to hold interoperability test sessions. All companies are welcome to join PSIA and to participate in testing, as well as to work on future versions of the PSIA spec.

For anyone thinking about entering the IP surveillance camera market, the PSIA 1.0 spec makes the opportunity significantly better. It may provide just what's needed to move IP cameras from early adopters, to the early majority -- which is when sales of IP cameras will peak.

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