

Emerging Video Apps Need Programmability and Flexibility

By Pradeep Bardia

The demand for digital video applications has grown considerably over the last few years and should continue to do so. However, a major problem for equipment manufacturers is that by and large their products don't meet the various existing video coding standards, much less accommodate emerging standards.

Hence the two major features needed today for the successful deployment of new digital video equipment are software programmability and system flexibility.

Programmability enables consumers to download different video codec formats directly onto their end products. System flexibility enables them to switch from one digital media standard to another or even run several simultaneously.

Four distinct markets for digital video equipment exist today: video telephony, including video conferencing and IP-based video telephones; surveillance—networked intelligent cameras and digital video recorders; consumer streaming-media appliances, including set-top boxes, personal video recorders, and digital media receivers; and professional-grade broadcast systems, including broadcast-quality encoders and multiplexers, which process many channels of streaming video; as well as video transport and delivery in head-end systems.

No one standard could meet the different requirements of all these applications. As a result, several video compression technologies are currently used. Video telephony systems are based primarily on the ITU H.263 standard. Surveillance systems use ISO JPEG/MJPEG and MPEG-4. Consumer streaming-media appliances use ISO MPEG-2,

along with proprietary video codec technologies. Professional-grade broadcast systems support MPEG-2. In addition, the emerging Windows Media Series 9 standard, from Microsoft, and the H.264 Main Profile are challenging MPEG-2 and MPEG-4, respectively.

Because new standards are continually being developed, products must be able to be upgraded easily via quick software downloads. By making that possible, software programmability increases a digital video product's shelf life. It also increases its viability in the North American, European, Japanese, and Asian markets—as a manufacturer could launch the same hardware but with different software for each one. As an added benefit, it lowers the manufacturer's overhead, since the customers themselves install the software patch or codec upgrade, obtained over the Internet, rather than having it done by a company technician, reducing the cost of support, troubleshooting, and new upgrades.

Chips that support video for these applications also simultaneously support audio and network streaming technologies. If the chips are fully software-programmable, products based on them enable customers to select any audio codec and any streaming format at any time, as well.

Take video conferencing. The sluggish emergence of this application is due not only to slow broadband growth and limited available bandwidth, but also to the video compression technology standards on which it was based: ITU H.261 and H.263. The latest video conferencing products now support the newer H.264 standard, which uses half the bandwidth required by the earlier standards, offers excellent video quality, and supports video streaming as well as many error-resilient features. Because the previous-generation products didn't support the new standard, OEMs whose products weren't software-programmable had to design a new board or a new product that provides backward compatibility for the H.261 and H.263 standards, as well as H.264 support.

Indeed, the most up-to-date digital video equipment in all four geographic markets now incorporate software programmability and system flexibility. Powered by digital media processors, these products are fully software-programmable and -upgradable.



Pradeep Bardia is the video solutions marketing manager for Texas Instruments, Inc.'s Digital Signal Processing Group in Stafford, Texas.

IMPORTANT NOTICE

Texas Instruments Incorporated and its subsidiaries (TI) reserve the right to make corrections, modifications, enhancements, improvements, and other changes to its products and services at any time and to discontinue any product or service without notice. Customers should obtain the latest relevant information before placing orders and should verify that such information is current and complete. All products are sold subject to TI's terms and conditions of sale supplied at the time of order acknowledgment.

TI warrants performance of its hardware products to the specifications applicable at the time of sale in accordance with TI's standard warranty. Testing and other quality control techniques are used to the extent TI deems necessary to support this warranty. Except where mandated by government requirements, testing of all parameters of each product is not necessarily performed.

TI assumes no liability for applications assistance or customer product design. Customers are responsible for their products and applications using TI components. To minimize the risks associated with customer products and applications, customers should provide adequate design and operating safeguards.

TI does not warrant or represent that any license, either express or implied, is granted under any TI patent right, copyright, mask work right, or other TI intellectual property right relating to any combination, machine, or process in which TI products or services are used. Information published by TI regarding third-party products or services does not constitute a license from TI to use such products or services or a warranty or endorsement thereof. Use of such information may require a license from a third party under the patents or other intellectual property of the third party, or a license from TI under the patents or other intellectual property of TI.

Reproduction of information in TI data books or data sheets is permissible only if reproduction is without alteration and is accompanied by all associated warranties, conditions, limitations, and notices. Reproduction of this information with alteration is an unfair and deceptive business practice. TI is not responsible or liable for such altered documentation.

Resale of TI products or services with statements different from or beyond the parameters stated by TI for that product or service voids all express and any implied warranties for the associated TI product or service and is an unfair and deceptive business practice. TI is not responsible or liable for any such statements.

Following are URLs where you can obtain information on other Texas Instruments products and application solutions:

Products		Applications	
Amplifiers	amplifier.ti.com	Audio	www.ti.com/audio
Data Converters	dataconverter.ti.com	Automotive	www.ti.com/automotive
DSP	dsp.ti.com	Broadband	www.ti.com/broadband
Interface	interface.ti.com	Digital Control	www.ti.com/digitalcontrol
Logic	logic.ti.com	Military	www.ti.com/military
Power Mgmt	power.ti.com	Optical Networking	www.ti.com/opticalnetwork
Microcontrollers	microcontroller.ti.com	Security	www.ti.com/security
		Telephony	www.ti.com/telephony
		Video & Imaging	www.ti.com/video
		Wireless	www.ti.com/wireless

Mailing Address: Texas Instruments
Post Office Box 655303 Dallas, Texas 75265