Digital Signal Processor

# Driving Intelligent Video Solutions with MSC8144

Embedded Intelligent Video Surveillance Solution from Freescale and Aimetis

- Aimetis' VE250: top quality video analytics software, ported on Freescale's MSC8144 quad-core DSP

- Aimetis' AIRA 2005: leading Open IP-Surveillance software platform with integrated video analytics

- Industry-leading, multi-channel solution, supporting up to eight channels on a single MSC8144 DSP

Freescale's MSC8144 Programmable Media Processor Offers Industry-Leading Performance at 4 GHz

- State of the art video analytics

- Advanced video compression and transcoding
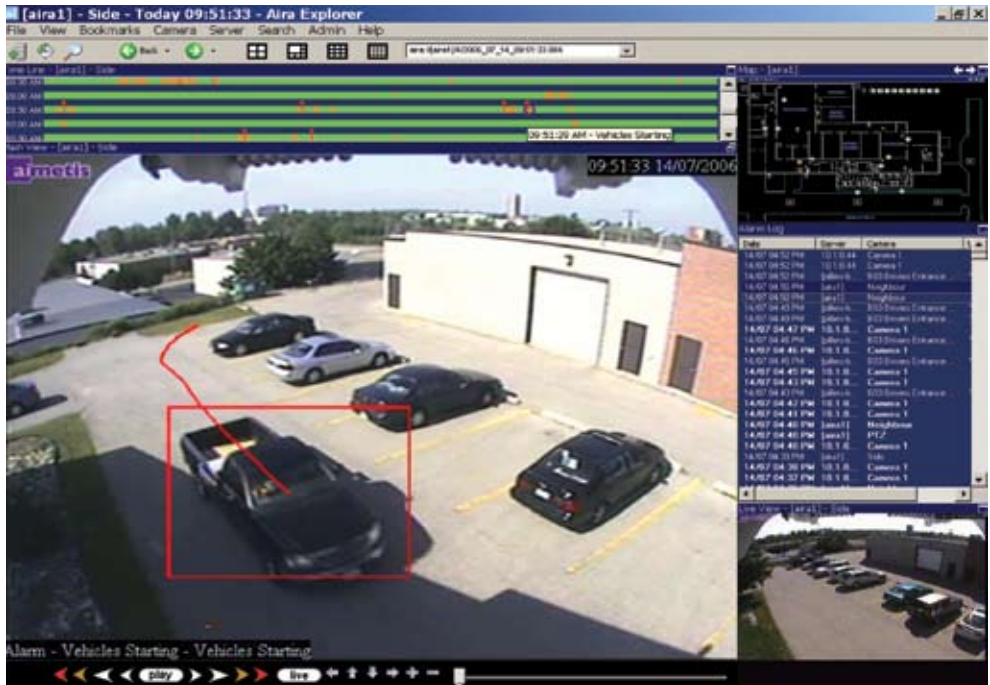
- Lowest cost and power per channel
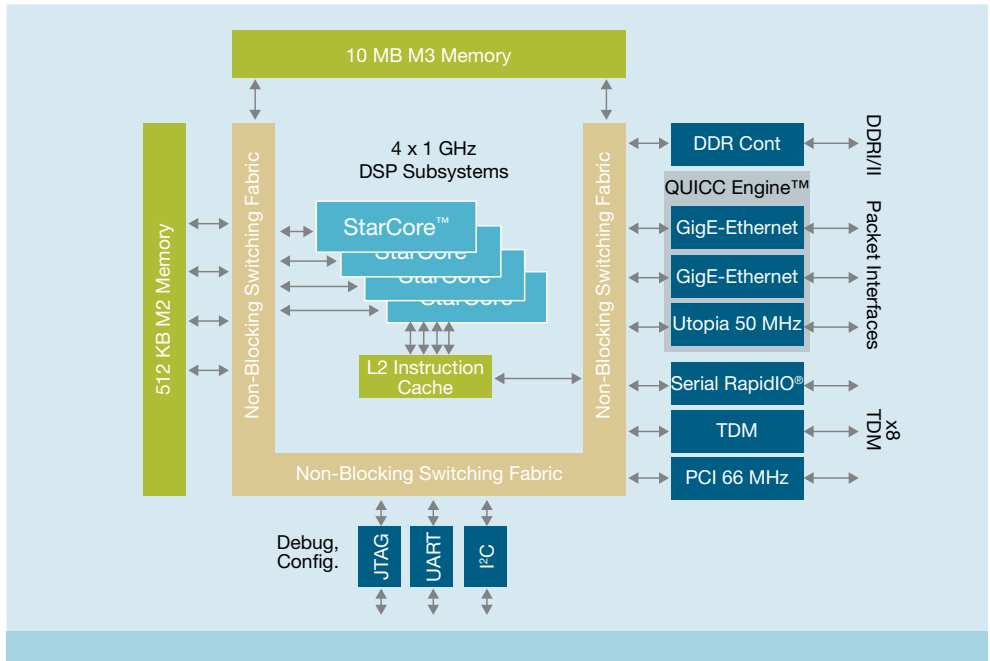
Aimetis VE250—Zero Configuration Motion Tracking

The VE250 is the first VE-series video analytics algorithm to be ported to Freescale's MSC8144 DSP. The VE250 is capable of robust motion tracking in both indoor and outdoor environments and works reliably from any camera angle or height. Its zero configuration makes it suitable for embedded applications on general purpose cameras and video servers.
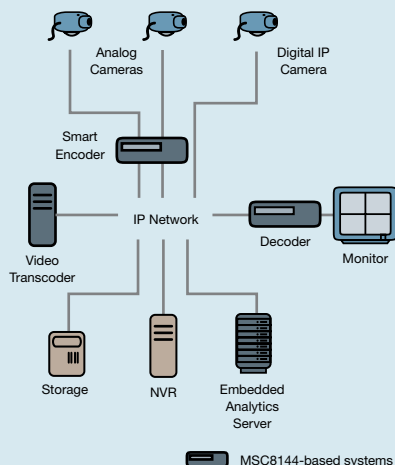
Aimetis AIRA 2005—Open-IP Surveillance Software

AIRA 2005 is the first Open-IP Surveillance software product on the market to natively support "smart" network cameras and video servers with embedded video analytics. Built with analytics in mind, AIRA 2005 integrates Aimetis' VE Series video analytics to provide industry-leading intelligent video solutions.

MSC8144 Block Diagram

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Open-IP Surveillance Systems

The introduction of Open-IP Surveillance systems allows for a host of new features and efficiencies. These include: standard, cost-effective networking, high reliability, availability, accessibility and integration with other security and business applications.

With the proliferation of Open-IP Surveillance systems there is a need to automate a large portion of the video monitoring. This may be done by deploying intelligent video systems that utilize sophisticated algorithmic software to analyze the video stream content (i.e. video analytics). Embedded intelligent systems provide the benefits of lower cost and power, accelerating market acceptance and mass deployment.

The unparalleled compute performance of the MSC8144 multi-channel media processor enables its use in a wide range of security applications. These include video encoders, transcoders, HD smart cameras, analytics servers and digital viewing stations. All of these applications use one or more of the following video algorithms: analytics, encoding/decoding/transcoding and pre- and post-processing. Networking and security (encryption) stacks are also required.

The system diagram shows a robust embedded intelligent Open-IP Surveillance system, highlighting the targeted MSC8144 applications.

Intelligent Embedded Open-IP System

- Analog Cameras
- Digital IP Camera
- Smart Encoder
- IP Network
- Decoder
- Monitor
- Video Transcoder
- Storage
- NVR
- Embedded Analytics Server

MSC8144-based systems

MSC8144 Features

- Four fully programmable StarCore™ SC3400 DSP cores, each running at up to 1 GHz for a 4 GHz-equivalent performance
- Each subsystem includes:
  - SC3400 DSP core architecture optimized for media processing
  - 16 KB instruction cache, 32 KB data cache
  - Memory management unit (MMU) for memory protection and address translation
  - Debug, profiling, interrupt, timers and profiling unit
- 10.5 MB embedded memory—the industry's largest—in a single package

- QUICC Engine™ communications technology—dual RISC-based packet-processing engine
- 128 KB shared L2-cache
- Supports next-generation and legacy interfaces:
  - 1x/4x Serial RapidIO®
  - Packet
    - ·· Dual Ethernet controllers supporting RGMII, SGMII, MII, RMII, SMII
    - ·· UTOPIA L2 50 MHz 8-/18-bit slave, supporting AAL1, AAL2, AAL5 ATM adaptation layers in firmware
  - TDM—2048 DS-0 channels
  - PCI 2.2 32-bit at 66 MHz
- 16-/32-bit DDRI/DDRII at 400 MHz data rate, 32 channels DMA
- Debug, boot, configuration:
  - I²C, UART, EOnCE/JTAG
- Package/voltage/process:
  - 29 mm x 29 mm FCPBGA, 1 mm pitch
  - Core nominal voltage—1V
  - M3 memory voltage—1.2V
  - I/O voltage—1.8V/2.5V/3.3V
  - 90 nm SOI

Development Tools

Freescale CodeWarrior® Tools

- Integrated development environment
- ANSI 'C', 'C++' optimizing compilers
- Source level debugger
- SmartDSP OS multi-core, royalty-free operating system
- Integrated device drivers
- Integrated cycle and functional accurate simulators

Enea® OSEck RTOS

- OSEck real-time kernel
- Preemptive multi-tasking
- Multi-core DSP support
- OSEck soft kernal environment, link handler and illuminator
- Board support package (BSP)

Learn More: For current information about Freescale products and documentation, please visit **www.freescale.com**.

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