EST VisionICE

Scalable Emulator for PowerPC

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Product Summary

EST's complete PowerPC development solution is designed around Motorola's MPC8xx PowerPC processors. This integrated suite of hardware and software tools is designed to streamline the development process and help you get your PowerPC project out the door in record time.

The EST PowerPC Development Solution

EST's robust PowerPC solution includes an arsenal of tools integrated to form a powerful development environment designed for your PowerPC-based project:

- EST's premium visionICE for PowerPC scalable emulation system
- Development boards specifically designed for early hardware and software development and PowerPC chip evaluation
- Crucial point and click Windows or UNIX-based software tools and utilities

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PowerPC Development Solution Components

visionICE for PowerPC

To complete your early development environment, you'll need a full complement of emulation tools. From evaluation boards to Background Mode (BDM) debug tools, to full scale emulators, EST Corp. can provide you with the highest quality support for your embedded project.

The main component of EST's PowerPC development solution is the modular visionICE emulation system, which offers a scalable tool architecture that delivers complete real-time debugging capabilities, a high-powered hardware event and real-time trace/time stamp system, overlay memory, network communication, and plug and play integration with many of today's top source-level debuggers and run-time kernels.

visionICE is a revolutionary development tool because it is the ***only*** environment available today that can meet a whole range of system requirements. With visionICE, high-end in-circuit emulator features and third-party source-level debuggers can be integrated quickly at any stage of product development. The result is an economical and powerful tool that can grow with a project, throughout its lifecycle.

visionICE is the industry's first completely scalable single solution emulator. It's the only system that starts out as a low cost BDM tool, but is not limited to low end features. By

adding various hardware and software modules, visionICE can be enhanced to deliver high-end features for total real-time target control and logic analysis.

visionICE Features

EST's visionICE emulator for PowerPC is comprised of the following components:

- **visionCONTROL**, the base system and target controller for the visionICE emulator. It utilizes on-chip debugging services which are embedded in the MPC8xx cores. These debugging services operate in a similar fashion to the Background Debug Mode of Motorola's 683xx family. On its own, visionCONTROL offers entry-level system debugging which can be upgraded later to a full visionICE system.

- **visionNET** for full Ethernet network support. This high performance option allows shared and remote debugging from anywhere on a LAN. It also significantly reduces the amount of time it takes to download large software images to the target PowerPC.

- **visionEVENT**, which may be added to visionICE when high-end, real-time emulation and logic analysis is required during debugging. visionEVENT provides state-of-the-art event isolation with 64 132-bit hardware breakpoints which may be used to break the processor, or to trigger a fully selectable 128 Kbytes by 96-bit real-time trace buffer. visionEVENT also includes a 48-bit time stamp for precise performance tuning.

visionICE Modules - Overview

visionICE's modular construction features separate interchangeable emulator units, each containing specific feature sets, which work alone or together to deliver just the right amount of power to any size embedded development project. The powerful visionICE environment is comprised of the following four separate components:

- visionCONTROL
- visionEVENT
- visionNET
- visionICE Pod Assembly with optional overlay memory

visionICE Enclosures

visionICE is housed in a two-board (small) or a six-board (large) enclosure. When planning to use visionICE only for target control or production test, you may opt for the small enclosure, which can house any two of the visionCONTROL, visionNET, or visionFLASH modules. If you plan to use visionICE as a high-end emulation system by incorporating the visionEVENT module, you will need the large enclosure. Both enclosures share identical visionCONTROL, visionNET, visionFLASH, and visionMEM cards, making it simple and economical to upgrade your system at any time.

visionCONTROL

visionCONTROL is the heart of the visionICE emulation system. It coordinates all communications and activities between the target system, other visionICE modules, and a source-level debugger (running on a PC or workstation). When used without the EVENT module, visionCONTROL uses Motorola's proven Background Debug Mode (BDM) to deliver a low cost yet incredibly reliable debugging platform.

visionCONTROL supports the entire Motorola PowerPC 8xx microprocessor family. It allows you to download code to your target over its high-speed parallel port, read and write target memory and registers, and set real-time software breakpoints. visionCONTROL also delivers an extensive array of value-added debugging features. It can test hardware with a vast set of diagnostic functions, automatically initialize your target's chip selects from an internal NV-RAM table, and build a statistical profile of your code's performance.

visionCONTROL comes standard with the powerful Open Test Application Programming Interface, which, when combined with the system's abundant array of Flash memory algorithms, makes the visionICE emulator ideal for manufacturing test and repair.

visionNET

visionNET adds full TCP/IP networking capability to visionICE. It boosts productivity for medium and large development groups since its remote debugging capabilities easily allow team members to log into and share tools across the network. And equally

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important, visionNET ensures lightning fast downloads to the whole project, virtually eliminating the down-time caused by slower serial communications.

visionEVENT

visionEVENT is the system's high-end, real-time emulation module. It delivers an unbeatable 'if-then' style trace and event system. Simply plug the EVENT card into visionICE and you've got the raw power of a 128K x 96-bit trace buffer, a 48-bit real-time clock stamp, 32 multi-level hardware comparitors (132-bit breakpoints), and 7 event and trace counters. visionEVENT supports target speeds up to 40 MHz in both 3 and 5 volts.

The visionEVENT card combines its real-time resources to provide pin-point event isolation. Once you've captured a potential bug, visionEVENT gives you the power to search and filter the trace, while the target continues to run in real-time. visionEVENT, like all EST modules, makes upgrading visionICE extremely cost effective. You only pay for an increase in existing functionality, and not a whole new tool set.

visionMEM and the visionICE Pod Assembly

EST's Pod Assembly provides a buffered target adapter for the visionEVENT card. It may be used with most PGA and FQFP processor packages, and also supports a direct plug-in configuration via 2 high-density 80-pin connectors. For an integrated Overlay Memory solution (visionMEM), the visionICE Pod Assembly may contain up to 4 Mbytes of RAM. The overlay memory is available with or without the visionEVENT module.

visionFLASH

The visionICE system allows you to add visionFLASH Flash cards inside the enclosure as a Flash-based disk system in order to store up to 32 Mbytes of code images. By using one or more optional visionICE Flash cards, you can program multiple devices through Background Mode with one single host-based download (where the image remains in the emulator, ready to be copied into Flash as many times as you choose).

visionICE provides dozens of turnkey Flash algorithms for various device families (Intel, AMD, ATMEL, etc.), device types (29400, etc.), bus widths (8-, 16-, 32-bit), and the number of devices you wish to program, increasing its compatibility with your particular development environment.

PowerPC Development Boards

EST's SBC8xx family of development boards are complete evaluation boards specifically designed for MPC8xx chip evaluation and early hardware and software development. They contain everything you need - full-speed RAM, on-board Ethernet, and serial communications - to prototype or evaluate a fully working application based on the PowerPC 8xx family processor. EST's SBC8xx family of development boards currently includes:

- SBC821
- SBC860

SBC8xx Features

Full implementation of Motorola's MPC8xx PowerPC-based microprocessor
Supports target speeds up to 40 MHz
512 Kbytes or 2 Mbytes (32-bit) Fast Static RAM (0 wait states)
1 Mbyte or 4 Mbytes (32-bit) DRAM
1.5 Mbyte (8- or 16-bit) Flash Memory
8K EEPROM (8-bit)
AUI adapter hardwired to SCC channel 1
Two RS232 ports using RJ-11 connectors hardwired to SMC channels 1 and 2
Three 96-pin DIN connectors providing easy access to all processor and I/O pins for off-board development
Two high-density 80-pin connectors for easy connection to visionICE or other logic analyzers without expensive target adapters
BDM-style Debug Port
Status LEDs for power and run
Board support packages available for leading real-time O.S.'s

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Software Support

EST's scalable tool architecture extends beyond hardware components to include software products and third-party software tool chains designed to reduce development time.

CLICK300 for Windows

CLICK300, EST's Windows-based point and click interface, combines all of the power of state-of-the-art C/C++ source-level debugging facilities with the intuitive simplicity of a Windows-based environment.

visionSIM

The visionSIM graphical user interface provides you with a powerful, yet easy, way to configure and program the ColdFire 520x internal registers. visionSIM's menus, dialog boxes, and online help can significantly reduce the time it takes to specify, code, and test SIM and peripheral registers for your target application. Once you have verified a configuration, the emulator and visionSIM will even generate the Assembly Language source code to be linked with the rest of your ROMable boot code.

visionSIM deals with every internal register for your specific microcontroller, although some in more detail than others. Note that all of the registers are segmented into Motorola-defined groups, i.e., the SIM, the TPU, the QSM, etc. Individual register configuration is accomplished by simply double-clicking on the register name in the main visionSIM Register Grid. visionSIM displays a detailed form for the register, which breaks all of its bit fields into easily configurable elements, such as drop down list boxes, text boxes, etc. With its online help, visionSIM eliminates the cumbersome process of thumbing through reference manuals in order to find the meaning of each bit or group of bits and provides details for each of the SIM registers.

visionEVENT Tools for Windows

Bundled with the visionICE emulation system, the visionEVENT Tools for Windows graphical user interface provides the ability to access EST's CLICK300 for Windows source-level debugger's powerful trace and event system through another debugger of your choice.

EST Utilities Panel

The EST Utilities Panel, another convenience product bundled with the visionICE emulator, provides an easy to use, graphical manner in which to perform common utility actions, as well as open peripheral windows for Flash programming, diagnostic functions, and Quick Button Macro configuration. Underlying the graphical interface is a command

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set which is embedded in the visionICE firmware. Using this built-in command language, you can program Flash Memory on your target from any terminal interface.

Open Software Interface

visionICE for PowerPC supports a unique Open Software Interface, which gives developers the freedom to use their preferred software development toolkit. visionICE fully supports Wind River Systems' Tornado/VxWorks environment, Integrated Systems, Inc.'s pSOSystem, Software Development System's SingleStep, and Microtec's XRAY/VRTX.

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