

Product Bulletin

XDS560™ Emulator

As applications become more complex and time-to-market pressures continue to build, designers of real-time embedded applications are turning to Texas Instruments to provide the solutions that can streamline and accelerate the development process. This is particularly true in the case of debugging, which is perhaps the most critical, yet often least predictable stage of software development.

TI has been committed to providing its DSP customers with cutting-edge debug tools since inventing JTAG emulation in 1988, now the embedded systems industry standard, and the launch of its first emulator, the XDS510™ Emulator, shortly thereafter. TI emulators save valuable development time by enabling both easy control of the embedded target processor, and important visibility into the application, letting software engineers understand what changes are taking place inside the processor.

To address the added complications of real-time debugging, TI

was the first in the industry to introduce Real-Time Data Exchange (RTDX™) technology in 1998. RTDX provides asynchronous and multiplexed exchange of data between the executing target system and the development host, enabling application visibility in real-time. As DSP processor and application speeds increase, TI is committed to providing new emulation and debugging capabilities

that meet the needs of today's highest-performance applications. The latest incarnation of this commitment is the XDS560 PCI Bus JTAG Scan-Based Emulator.

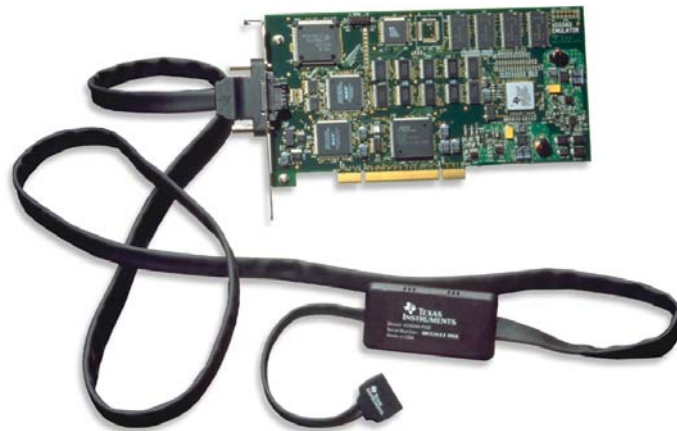
The XDS560 PCI Bus JTAG Scan-Based Emulator

The XDS560 Emulator represents a quantum leap forward in emulation technology, addressing the problem of “vanishing visibility,” which is the increasing inability to

Key Benefits/Features

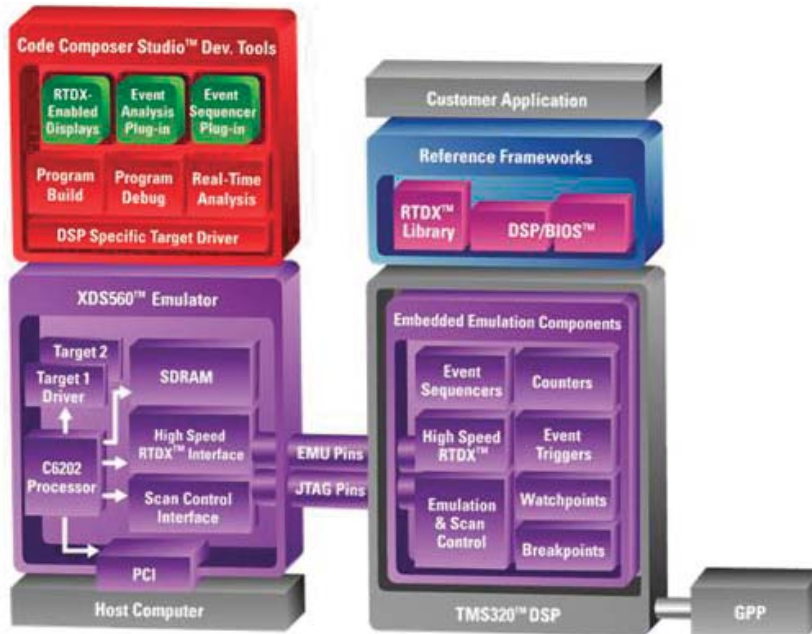
- **Real-time visibility speeds time to market**—High-speed RTDX™, with real-time data transfer rates of up to more than 2 MBytes per second
- **Increase productivity through faster start-up for larger applications**—Code download speeds up to half a MByte per second
- **Quickly find and fix intermittent real-time problems**—Real-time, non-intrusive breakpoint and actionpoint capabilities via Advanced Event Triggering with Event Sequencing
- **Preserve existing emulation investment**—Upward-compatible with existing XDS510™ emulators

XDS560 Emulator



XDS560 Emulator with flexible cable and credit-card-sized pod is available now in the eStore.

XDS560 Block Diagram



TI offers fully integrated emulation and debugging from target to host.

see and debug the internal behavior of embedded processors due to industry trends such as higher processor speeds, greater integration, and larger on-chip caches. The XDS560™ is providing real-time emulation and debugging support for all of the high-performance TMS320C6000™, TMS320C5000™ and TMS320C2000™ DSPs and OMAP™ chipsets that TI recommends for new designs. The XDS560 features include:

- **High-Speed RTDX™ Data Link**—Delivering data rates of up to more than 2 MBytes/second (MBps) for real-time visibility, up to 100 times faster than existing forms of RTDX, high-speed RTDX provides bi-directional data transfer with a minimum of CPU cycle intrusion on the target. It enables

important real-time visibility into the target application, making erroneous behavior clearly visible. The benefit of high-speed RTDX is that its unprecedented data bandwidth enables visibility into a new range of high-bandwidth applications, such as video transfer and Asymmetric Digital Subscriber Line (ADSL) modems, as well as multichannel or multiprocessing versions of lower-bandwidth applications.

By comparison, data exchange rates of previous emulators offered visibility only into much slower applications such as low bit-rate audio transfer and analog modems.

- **Faster code download speeds**—Real-time developers don't like to be kept waiting, and as applications become

steadily larger, the time spent waiting for embedded code to be downloaded to the target gets longer. To solve this, the XDS560 introduces code download speeds that are up to 8× faster than the XDS510, reaching speeds of more than 500 KBytes/second. This level of performance saves time and boosts productivity by helping developers stay focused on their task—building embedded DSP applications.

- **Advanced Event Triggering**—This is the ability to detect complex combinations of target processor events, and then perform actions. It can:

- Set hardware breakpoints and watchpoints,
- Count many kinds of events, and
- Detect very precise debugging sequences

This is accomplished with a series of emulation resources that are dedicated to detecting bus events, counting events, and sequencing events, and are embedded in enabled TI target processors. Because these capabilities are built directly into the target processor, they have no overhead in terms of either CPU cycles or memory, and thus all of the Advanced Event Triggering features are both fully real time, and completely non-intrusive. Three levels of Advanced Event Triggering interfaces help everyone from new to experienced embedded system developers debug their real-time systems with just the right

features. The benefit of this is faster time to market, by allowing difficult intermittent real-time software problems to be found, analyzed and fixed much more quickly and easily.

- Intuitive Drag-and-Drop Event Sequencer**—The most sophisticated Advanced Event Triggering capability is the Event Sequencer, a powerful debugging tool that addresses the most difficult debugging situations. Using the Event Sequencer developers can define a sequence of states that must occur in the flow of their application code before a problem manifests itself. This is done simply by dragging and dropping variables and locations from the debugger source code display, and combining them with logical operations and familiar IF-THEN-ELSE logic. The application then runs normally, at full speed, while the Event Sequencer logic is continuously evaluated in real time until all of these conditions are met, and an action is triggered, such as halting the processor, driving a pin high or low, or another action supported by the target processor. The Event Sequencer offers a very precise capability which is essential in tracking down the intermittent real-time bugs that can (and often do) occur only once every few hours, days or weeks, of continuous operation.

- Convenient, Flexible Design**—The XDS560™ Emulator connects to the host through the high-performance

industry-standard PCI bus. A highly flexible 1.5-meter cable with a low-profile cable pod reduced to the size of a credit card provides a lightweight, flexible connection to the target system, making connections to even tightly packaged target boards simple. Auto-sensing voltage capabilities range from 5 V down to 0.5 V, supporting future generations of low-voltage DSPs and microcontrollers. A user-selectable auto-ranging clock for the IEEE 1149.1 (JTAG) serial test bus enables the emulator to find the optimum frequency for the target hardware.

- Full Compatibility with TI's Existing XDS510 Emulators**—TI's large installed base of XDS510-class customers can move from the XDS510 to the XDS560 with very little apparent change, using their same target boards with the existing 14-pin JTAG connectors. The XDS560 features are a superset of the XDS510™, but include all of the same XDS510-class functions that TI developers expect—typically with substantially higher performance. In this way, designers can protect their software and board investments and avoid expen-

sive and time-consuming reengineering.

- Extensive Third-Party Support**—A key part of the real-time eXpressDSP™ Software strategy is TI's large network of third parties. Numerous emulation third parties have worked with TI in the past to build XDS510-compatible emulators, and now both these companies and new third parties have joined TI in building XDS560-compatible emulators, adding substantial value by supporting developers with communications variants including USB, Ethernet, and other interfaces. XDS560-class emulator variants that are available include those listed in the table below. See the TI DSP Village for information on the latest XDS560-class emulators that are available from TI third parties.

How to Get Started

TI's XDS560 Emulator is available today and can be purchased from TI's eStore. Check out the XDS560 web page to get more information and to link to TI's eStore: www.dspvillage.ti.com/xds560info. Additional information, application notes, white papers and online training are also available on this site.

XDS560-Compatible Emulators

Company	Product	Interface
Signum Systems	JDSnet-560	Ethernet adapter (for TI XDS560)
EWA/Blackhawk	USB 560	USB
Kane Computing	Predator-II	Ethernet
Wintech Digital	560LAN	Ethernet
Wintech Digital	560PCI	PCI
DSP Research	FleXDS 560+	PCI

TI Worldwide Technical Support

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TI Semiconductor Product Information Center Home Page

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Indonesia 001-801-10 -800-800-1450
Korea 080-551-2804 -
Malaysia 1-800-800-011 -800-800-1450
New Zealand 000-911 -800-800-1450
Philippines 105-11 -800-800-1450
Singapore 800-0111-111 -800-800-1450
Taiwan 0800-006800 -
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