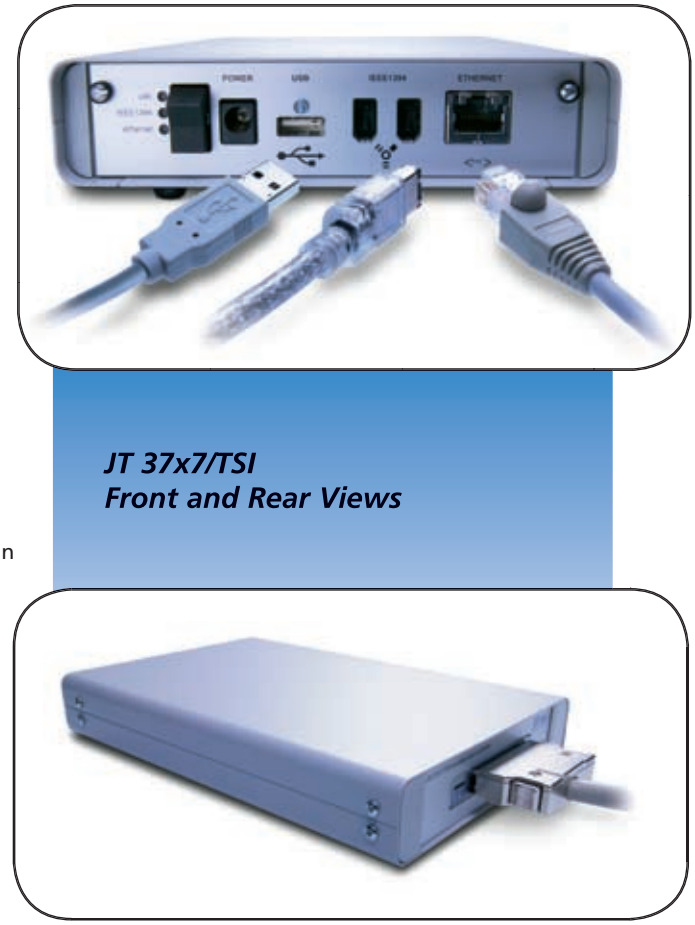
JT 37x7 / TSI DataBlaster™
Boundary-Controller with Auto-Select of Ethernet, Firewire and USB Interfaces

Features

- Scalable architecture allows smooth expansion to match testing and flash ISP application requirements
- One-out-of-three selectable high performance interfaces (Ethernet, USB 2.0 and 1.1, and Firewire)
- Modular hardware and software for easy integration and customized configurations
- Easy to connect to a wide variety of computing platforms for nearly universal connectivity
- Local and network interfaces supported via Ethernet port
- Gang operation for high volume parallel programming and testing using a single controller
- Use of multiple controllers supports very high production throughput
- Automatic matching of TCK speed to maximize chain performance, up to guaranteed 40 MHz continuous data rate
- Programmable TCK speed
- Unlimited target memory width (1 bit to more than 64k bit) for flash programming
- Enhanced Throughput Technology™ (ETT) delivers high volume production capability
- Independent control of 4 TAPs per controller
- Fully application-compatible with JT 3710 DataBlaster (no recompilation needed)
- Supplied with JTAG Technologies JT 2147QuadPOD™ system with programmable signal driver/sensors, high-performance signal integrity and long distance capability
- Fully hardware-compatible with existing POD configurations (PF 2137)



JT 37x7/TSI
Front and Rear Views

Product Overview

JTAG Technologies offers a complete line of products to perform printed circuit board testing and in-system programming in compliance with the IEEE 1149.1 Standard Test Access Port and Boundary-Scan Architecture. This IEEE standard defines a standard 4- or 5-wire electrical interface and control protocol to communicate with the target board, providing improved access to complex, high-density PCBs.

The product line includes the DataBlaster™ family of robust, highly reliable scalable boundary-scan controllers, which serve as the hardware interface between the test and/or programming system and the target electronic assembly that is to be tested or programmed. The JT 37x7/TSI is one of the DataBlaster controllers featuring three different serial interfaces in a single unit.

JTAG Technologies

Triple Serial Interface Boundary-Scan Controllers

Figure 1 depicts a typical boundary-scan application. The controller sends a sequence of serial data vectors to the target board and receives serial data back from the target. On the board, the data input causes electrical testing and device programming to be performed, while the results of the operations are reported via the output stream.

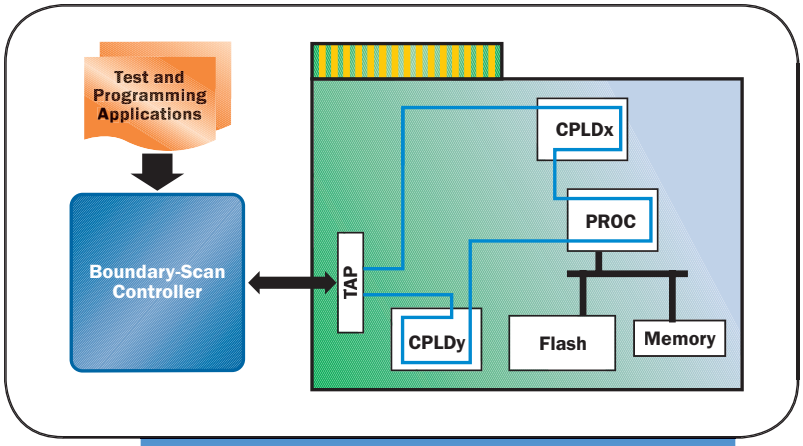


Fig. 1. Typical Test and Programming Application

All JT 37x7 DataBlaster controllers share a common scalable architecture in a variety of performance levels and form factors to support a broad range of operating environments in engineering, manufacturing, and service. All of the controllers are designed and built exclusively by JTAG Technologies for assured system compatibility and life cycle support.

The three DataBlaster performance levels are:

- **JT 3707** —base-level model suitable for board testing, CPLD programming and flash programming of small data blocks in engineering environments. This model can be upgraded to the higher performance JT 3717 by adding the JT 2108 ETT module.
- **JT 3717** —suitable for all applications including in-system programming of CPLDs and moderately-sized flash memories and for board test in manufacturing (low and high volume) and debugging environments. JT 3717 contains 64 Mbit on-board image memory that can be upgraded to JT 3727 by adding the JT 2116 Flash Image module.
- **JT 3727** —suitable for all applications including in-system programming of large flash memories and CPLDs and for board test in manufacturing and debugging environments. JT 3727 contains 128 Mbit on-board flash image memory.

The architecture of the hardware and software products permits applications to be easily ported between development and production, regardless of the controller types. Compilation of an application targets the specific controller architecture, and driver selection determines which hardware form factor is to be used. This portability is valuable in multi-user and multi-department environments.

DataBlaster	Boundary-Scan testing	CPLD programming	Flash programming
JT 3707	√	√	Small data blocks for engineering purposes only
JT 3717	√	√	Moderate size flash for small and large volume production
JT 3727	√	√	All flash applications for small and large volume production

Upgrading from one performance level of the DataBlaster to another is possible by means of the addition of the Enhanced Throughput Technology™ (ETT) and flash image modules to the controllers.

Triple Serial Interface Capabilities

The JT 37x7/TSI DataBlaster allows the user to select one of three high-speed interfaces in a single portable unit:

- Ethernet - 10 Base-T/100 Base-TX UTP for LAN and WAN applications
- USB - Plug-and-Play compatibility with Revision 1.1 (12 Mbits/sec) and 2.0 (480 Mbits/sec) universal sytem bus interfaces
- Firewire - Compatible with IEEE 1394-1995 and IEEE 1394A-2000 100/200/400 Mbits/sec)

JT 37x7/TSI controllers are delivered with the JTAG Technologies' QuadPOD TAP driver / sensor which provides four fully independent programmable PODs to interface to the target board(s). In flash programming applications, a single controller allows true gang programming including individual verification of up to four flash memories. By the use of multiple controllers, each driving four chains, parallel testing and programming can be extended indefinitely.
Each JT 2149 POD provides active line terminations, maintaining the highest possible integrity of critical signals at the point of test. The QuadPOD is connected to the controller via a 1-meter SCSI-2 type cable, and any length extension is possible out to the individual PODs. (More detailed information on the QuadPOD is available in a separate brochure.)
The JT 37x7 DataBlaster controllers are also compatible with PF 2137 versions of the TAP POD, allowing existing production arrangements to be easily supported without impact on fixtures.

Performance

The JT 37x7/TSI includes a built-in, adjustable clock for the TCK signal capable of operating at a sustained 40 MHz. .

The TCK rate is highly adjustable from the maximum speed down to 500 Hz. (Clock rates less than 500 Hz and static operation are supported by use of an external clock.) Normally, the rate is matched automatically to the slowest device on the chain in use. However, TCK can also be programmed in steps whose size varies depending upon the clock range. For example, in the 6.25 - 12.5 MHz range, the step size is 50 kHz, while in the 25 - 40 MHz range, the step size is 200 kHz. The JT37x7 support programming of an unlimited target flash memory width from 1 bit to more than 64k bits.

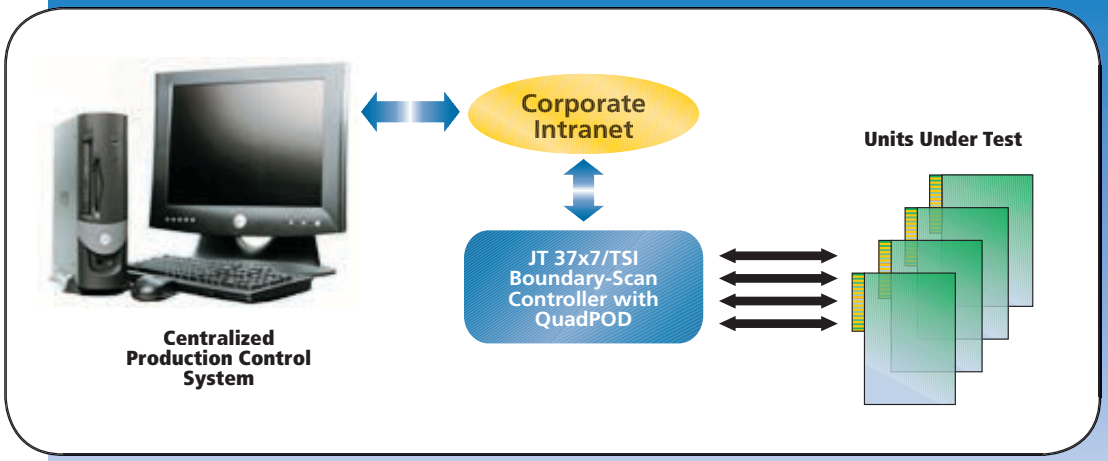


Fig. 2
Network-Based Operation using JT 37x7/TSI

Network Based Operation

Use of the Ethernet interface of the JT37x7/TSI controller allows remote operation of boundary-scan applications, for example across a corporate intranet. This topology can be very beneficial for an enterprise with a centralized engineering facility and multiple far-flung production facilities. Figure 2 illustrates a possible architecture for network-based provisioning of boundary-scan.

Triple Serial Interface Boundary-Scan Controllers

For maximum throughput, dedicated hardware within the DataBlaster delivers test and programming files to the target in a continuous mode, compared to the burst mode found in most other products. DataBlaster performs data compression and decompression on the fly. It is also capable of autonomous operation, allowing control of the boundary-scan operation without intervention from the host computer. Control returns to the host upon completion of the operation.

For flash applications, the image counter consists of two separate counters for source and destination allowing a block of image memory data to be positioned anywhere in the target memory. Further, all DataBlaster controllers support JTAG Technologies' AutoWrite™, a feature that reduces flash programming time by a factor of 2 to 3 via real-time hardware control of the flash write enable line instead of via the boundary-scan chain. DataBlaster also supports other flash-specific control signals, including Vpp Enable (to control optional programming voltages on the target), User0/User1 (user-definable, software-controlled eg. watchdog) and Ready/Busy (for optional use to verify completion of an operation). For static control and monitoring of the target, each JT 2149 TAP POD supports for additional programmable I/O pins.

Ordering information

Product Number	Description	Applications
JT 3707 / TSI	DataBlaster boundary-scan controller	Test, CPLD programming, and limited flash programming in engineering
JT 3717 / TSI	DataBlaster boundary-scan controller	Test, CPLD programming, and moderate size flash programming in production
JT 3727 / TSI	DataBlaster boundary-scan controller	Test, CPLD programming, and large size flash programming in production
JT 2108	Flash ETT module to expand JT 3707 to JT 3717	For enabling the flash programming features plus image memory size of 64Mbit
JT 2116	Flash Image module to expand JT 3717 to JT 3727	To extend the image memory size to 128Mbit

Note: *Other JT37x7 controller form factors are also available: PCI, PXI, Compact PCI/3U, and Compact PCI/6U. Each JT 37x7 DataBlaster controller includes the JT 2147 QuadPOD system with 4 TAP PODs and cables.*

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