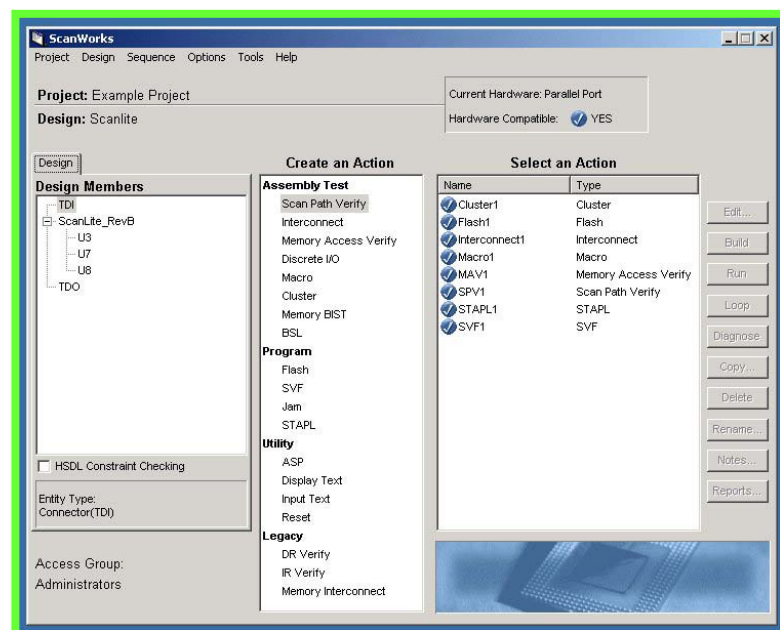


## SCANWORKS® BOUNDARY SCAN DEVELOPMENT STATION

The ScanWorks Boundary Scan Development Station is the most powerful set of boundary-scan development and application tools available. It not only includes all the tools you'll need to quickly generate the tests needed to verify that the board was assembled correctly, but it also includes the software necessary to apply tests and diagnose faults to the pin level. In addition, you get tools to organize and manage your test data, control who has access to the data, APIs to create custom applications and user interfaces, support for system-level testing, support for the programming of PLDs and flash memories, and features to make you much more productive. A Boundary Scan Development Station is also the basic platform for adding other types of testing and programming operations, including IEEE 1149.6

High-Speed Interface Testing, IEEE 1532 Concurrent In-System Configuration, CPU functional emulation testing, and integration with any in-circuit tester (ICT), manufacturing defect analyzer (MDA), or flying probe tester (FPT).

Boundary scan (JTAG) verifies the assembly of a printed circuit board (PCB) by testing the connections between devices (interconnects) to determine whether they work as intended. Effective and safe interconnect testing requires knowledge of the entire design, not just the boundary scan devices. The automatic test pattern generation (ATPG) tools must know if there is any possibility of creating contention between boundary scan and non-boundary scan signal drivers as it creates patterns to test the



board interconnects. If the ATPG tools do not have all the information needed they will ask you to provide the information in the form of non-boundary scan (NBS) model. NBS models define the IO characteristics of device pins connected to boundary scan nets. ASSET provides an on-line library of over 10,000 NBS models to keep you productive.

The ScanWorks boundary scan ATPG tools also needs information about the connections between devices on the boards, as well as information about the types of devices used. This information is imported directly from the CAD design data used to build the boards. Virtually any CAD data format commonly used today is supported.

The CAD data is also used to display either a schematic or layout view of the board to help visualize the available test coverage or to help pin point defects when they are detected by the boundary scan tests. Fault coverage and fault data are automatically highlighted by clicking on links the appropriate reports.

The ScanWorks boundary scan tools are provided in an integrated development environment that includes everything you need to develop tests, debug and optimize the tests, apply the tests and diagnose the results.

ScanWorks boundary scan tools include several productivity enhancing features such as automated scan path discovery, a scan path design wizard, automatic NBS model assignments, automated build/make operations to update designs after changes are made, and automatic test sequence generation to create production tests.

ScanWorks boundary scan tools support both very simple and very complex scan path configurations. A scan path may consists of a few boundary scan devices in a simple static (fixed) scan path or many boundary scan devices connected in a hierarchical, dynamic scan path using devices such as National Semiconductor's ScanBridges, Texas Instruments' ASP and LASPs or Firecron's Gateway devices. ScanWorks boundary scan tools automatically manage these complex scan paths ensuring they are configured exactly the same when tests are applied as they were when the tests were generated. It also supports multiple scan paths enabling you to map specific test resources such a JTAG controller test port to a specific scan path of a board.

ScanWorks boundary scan tools keep all the information and data related to a specific project organized to make it easy for you to keep track of it. Within a project you can develop tests as many different board designs as you need, and maintain each version separately. When moving from development to manufacturing, you can easily create a single compressed file that contains all the data needed for manufacturing and load it on your ScanWorks Boundary Scan Manufacturing Station. The compressed file also provides a convenient means to archive various version of your project.

The ScanWorks Boundary Scan Development Station is enabled for use by FLEXlm, the defacto industry standard licensing tools. ASSET's use of FLEXlm allows you to get the best value from your investment in boundary scan tools by enabling you to configure the licenses as single user licenses that guarantee access to a license, or as networked licenses that can be shared around the world by an entire corporation. Licenses can be set up for perpetual use or for use for

a limited term enabling you to configure licenses to match your business needs.

ScanWorks boundary scan tools support all the types of test and programming operations that you will need to test and program your boards. They are referred to as “Actions” and include:

- Scan path verification
- Interconnect testing
- Memory interconnect testing for SRAM, DRAM, DDR2 and some DDR3 memories
- Support for custom tests written in Visual Basic, or JScript
- Application of tests in SVF or STAPL formats
- Test or preconditioning operations that use non-boundary scan signal called discrete IO signals
- In-system programming of FPGAs and CPLDs with SVF, and STAPL programming files
- In-system programming via an SPI or I2C bus
- In-system programming of IEEE 1532 programming files (Optional)
- On-board programming of NOR and NAND Flash memories (Optional)
- Interconnect testing of IEEE 1149.6 High Speed Serial Interface signals (Optional)
- Application of functional test scripts created by ScanWorks CPU emulation tools (Optional)

ScanWorks boundary scan tools include the process automation scripting API that enables you to accomplish almost anything you can do in the user interface in a custom test application. The process automation scripting feature makes ScanWorks boundary scan features available through some of the most common languages used by test engineers. Whether using an interpreted language like Tcl, Perl, or Visual Basic or a compiled language such as C++ or C#, you can create and control the software objects exposed by the scripting interface. Process

automation scripting uses Microsoft's Component Object Model (COM). This makes the objects available to any language that supports COM. The Process Automation scripting API is also available as a LabView Virtual Instrument Library, making it easy to integrate with existing test executives that use national Instruments LabVIEW or TestStand.

ScanWorks boundary scan tools generate tests independently of the type of JTAG controller hardware to be used to apply the tests (except for special cases where unique features are needed, such as DIO or multi-TAP applications). You can easily switch between the USB-100, the PCI-100, the PCI-410, or the RIC-1000 JTAG controllers without rebuilding or modifying the tests.

As tests are generated for your board test coverage reports are created to keep you informed of the coverage available with the current set of tests. Individual reports for each test type can be combined into a comprehensive report that describes the total coverage available with boundary scan. The coverage information is provided as percentages of all possible covered faults or as raw data that can be used to calculate and create reports that match your corporate reporting methods.

Interactive debug tools are available to help optimize tests during test generation or to help diagnose faults after the tests are applied. For scan path verification, interconnect testing and memory access verification you can view both the stimulus and response data on a scan-by-scan basis to help isolate the fault. For flash programming you can interactively write to and read from the device to verify operation.

Once your tests are generated and optimized, you can create a sequence of tests for manufacturing. You can

use the process automation scripting API to create a custom sequence or you can automatically create a sequence in the boundary scan development environment. You simply add the available tests to a list in the order in which they are to be applied, and specify any pre or post-condition flow control parameters, such as stop on fail, loop 'n' times, repeat if fail etc. Sequences can be tested within the development environment and then exported to a ScanWorks Boundary Scan Manufacturing Station for use in production.

## Summary

This is a high level review of the primary features of the ScanWorks Boundary Scan Development Station. Many features such as User Access Control, Bus Manager, and external test resource management were not described. Please contact your ScanWorks sales representative for more information on specific features or for a personalized analysis of how ScanWorks Boundary Scan Development Station can solve your particular board test problem.