

BOUNDARY SCAN MANUFACTURING STATION

PRODUCT OVERVIEW

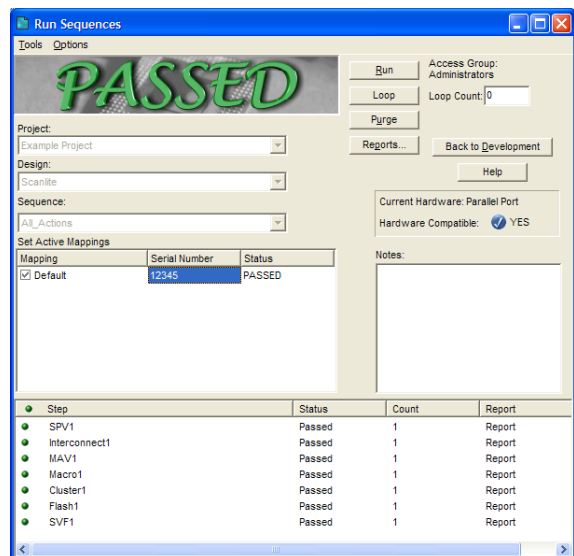
ScanWorks® Boundary Scan Manufacturing Station is an easy-to-use and effective way to implement boundary-scan-based test and in-system programming in a manufacturing environment. Building on the extensive test development capabilities of the ScanWorks Boundary Scan Development Stations, a Boundary Scan Manufacturing Station delivers the full benefits of your efforts developing boundary-scan tests for prototype debug by enabling the re-use of these tests in manufacturing.

VECTOR AND PROGRAM CREATION

Test vector creation begins with any of the automated or procedural methods provided in the ScanWorks, Boundary Scan Test Development or Programming Stations. These stations automatically generate test vectors for a scan path infrastructure and the boundary-scan accessible interconnects on the path. Once the test and programming vectors have been created, they are organized as a test program by ScanWorksAPIs, which functions in conjunction with LabVIEW, LabWindows, Test Stand, Agilent (HP)-VEE, Visual Basic, Tcl, Perl, C, C++, C#, and other tools that create test programs. The test programs, which are called actions by ScanWorks, can also be organized into a sequence that contains multiple actions. Actions and sequences can be applied with a

simple operator interface that comes with all ScanWorks Stations.

When the functionality of the vectors and programs has been verified, they are exported to manufacturing as a single compressed file. This file has design information that includes the boundary-scan controller hardware parameter settings such as the test clock (TCK) frequency needed to support this particular design. The design information also can include information that lets you control the level of access your test engineers, technicians and operators have to the data. For more information on vector or program creation, refer to the descriptions of the ScanWorks Boundary Scan Test Development or Programming Stations on the ASSET web site.



TEST APPLICATION

When the test program is complete, you are ready to set up your manufacturing application software and hardware. The ScanWorks Boundary Scan Manufacturing Station can use any type of boundary-scan controller hardware regardless of the controller that was used to develop the tests. ScanWorks supports several types of controllers including the high-performance, multi-port PCI-410 controller, or the cost-effective, single-port PCI-100 or USB-100 controllers for single units under test (UUTs). For more information on ScanWorks controllers, refer to the descriptions on our web site.

To apply tests on a ScanWorks Boundary Scan Manufacturing Station, test vectors and programs are imported from one of the development stations. Your boundary-scan controller hardware is automatically set to support the requirements of the UUT. If your manufacturing station uses a boundary-scan controller that supports multiple UUTs, the controller TAP resource connected to each UUT to be tested must be specified. You then apply the test programs and acquire responses from the unit(s) being tested. The response vectors can be analyzed immediately as go/no-go tests or diagnostics can be performed on the test failures. The response vectors can also be saved for diagnosis later on a ScanWorks Boundary Scan Diagnostic & Repair Station.

USER INTERFACE

Included with the manufacturing test application software is a user interface that allows you to import existing sequences and apply them to the unit being tested. Once a sequence is selected, the actions within that sequence are displayed along with their status. If sequence notes were included when the sequence was created, the notes are shown in the notes field. If you

wish to, you can add a serial number for the unit to which the sequence is applied. This serial number appears in the sequence log. The results are shown in the window at the top of the dialog box. Additional details are shown next to each action in the list. A standard report displays a sequence log that shows the results of each step and links to the detailed information for that step.

OPTIONS

Several optional features such as diagnostic capabilities can be added to a ScanWorks Boundary Scan Manufacturing Station, enabling its use as a repair station when not in use as a manufacturing station. These features include Interconnect Pin-level Diagnostics and Graphical Fault Highlighting.

INTERCONNECT PIN-LEVEL DIAGNOSTICS

A manufacturing station includes interconnect diagnostics to the net-level. In many cases, depending on the level of boundary-scan access available, a defect can be isolated to a specific pin, saving many hours of manual diagnostics and avoiding the replacement of the wrong component. The pin-level diagnostic report will identify the most likely location of the defect as well as all the connections to the pin.

The screenshot shows the ScanWorks software interface. At the top, a large red 'FAILED' banner is visible. Below it, a 'Log and Reports' window is open, displaying a 'Sequence Execution History Report'. The report title is 'Sequence Execution History Report' and the subtitle is '[[1/21/2003 9:50:33 AM], Sequence Result: Failed Project: Example Project, Sequence: Scanlite Sequence, Design: Scanlite'. The report includes a table with the following data:

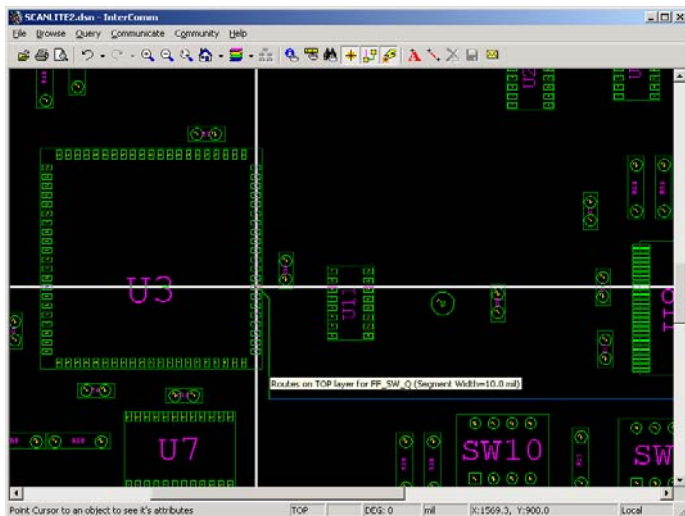
Test Name	Iteration	Log(s)	Result
SPV1	1	seqb1111.log	Pass
Interconnect1	1	seqb1211.log Interconnect1121_res.xml Interconnect1121_res	Failed

The Pin-Level Diagnostic report can be viewed as either a text file or in HTML format. It can be saved as an XML or XSL file for use by data management tools. It also includes links from each connection to the net to a graphical view of the board layout or schematic in ScanWorks' Design Browser. A fragment of a pin-level diagnostic report is shown below.

Driving Pin	U7-5
Location	Net: N109746
	Pins: SW6-2 ↔ U7-5 ↔ SW6-1 ↔ U8-49 ↔ U7-7 ↔
Description:	Net may be shorted to
	Net(s): N108324
	Pin(s): U7-9 U8-47

GRAPHICAL FAULT HIGHLIGHTING

The Graphical Fault Highlighting feature gives you access to a graphical view of the board layout using the powerful Design Browser. Interconnect test and Memory Access Verification test reports are linked to the layout view by clicking on a pin or net in the report. Cross hairs pinpoint the location of the pin or net in the layout view and the Design Browser gives access to all of the available information about that pin as well as showing the exact routing of the net connected to that pin. You can easily locate the



suspected pin on the actual board being tested and quickly inspect it for obvious defects. You can cross-highlight the layout view to a schematic view to see the functional logic associated with the pin. ScanWorks' integrated Design.

TESTING MULTIPLE UUTS

With the addition of the Multi-Card/Multi-Pod option and the hardware to support it, a ScanWorks Boundary Scan Manufacturing Station can test more than one UUT at a time. A system configured with multiple PCI-410 controller cards and pods can test as many as 24 UUTs at once. Some applications such as flash programming are done concurrently, while other test that are less time-intensive, such as interconnect tests, are usually done sequentially. ScanWorks automatically selects the best method of application.

The PCI-100 controllers can be connected to multiple scan paths using the Four TAP Buffer/Pod. With this pod any one scan path can be selected individually for fast access or more than one scan path can be combined logically into one path for more efficient interconnect testing.

Highlights

- Low-cost, run-time only application
- Ability to re-use previously generated test vectors in a manufacturing environment
- Ability to diagnose failures quickly and easily
- Diagnostic and repair features
- Supports testing of multiple PCBs or scan paths