Agilent i1000D Diagnostics Test Set

The Agilent i1000D diagnostics test set (DTS)
provides boundary scan, on-board programming and
general digital test in a desktop form factor that makes it
easy to deploy for a flexible test strategy.

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Overview

Boundary scan test is widely used in current production line test, to perform connectivity test, device programming, or disabling routine to protect devices under certain functional tests.

The Agilent i1000D in-circuit test (ICT) system is designed to serve general ICT purpose with cost-effective press-down type fixtures without compromising the quality of test. The newly designed graphical user interface helps engineers to perform their routine tasks efficiently. The ease of use also means a shortening of the programming and debug time for mass production line test implementation.

To meet the challenges and requirements of having a flexible test strategy for implementation at both the ICT and functional test stations, Agilent now provides a diagnostic application based on the i1000D ICT system - a desktop solution that allows easy and flexible deployment.

The i1000D diagnostics test set (DTS) uses the same hardware engine as the i1000D system in a stand-alone form factor, which can be easily used for off-line R&D validation or serve as an independent programming station for diagnostic functional tests.

The basic configuration of the DTS provides 64 independent digital drivers and receivers. Each channel can be assigned for different purpose. With the innovative anti-interference cabling design, the U9401B-D01 hardware supports superior test signal integrity, which ensures the stability of tests in long wiring environments.

Channel driving 3.3 V clocks

No crosstalk on adjacent channel

Figure 1. Signal integrity is ensured with the i1000D DTS anti-interference cabling design.

Boundary Scan

The i1000D DTS can easily perform boundary scan tests via the pre-defined test option interface.

The user can easily assign a test access port (TAP) to 4 to 5 channels, together with upstream device disabling requirement. After loading a correct boundary scan description language (BSDL) file, the boundary scan test program can be generated by simply selecting the test item in the boundary scan GUI.

Boundary integrity test, connect test, interconnect test, Device High Z, and Agilent's latest Cover-Extend Technology (CET) are now available in the boundary scan test pre-defined category.
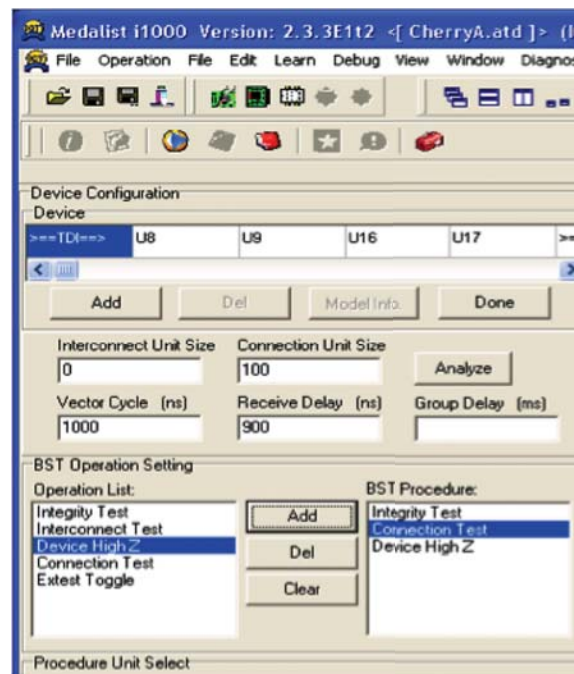

Figure 2. Boundary scan GUI

BSDL Reader

With the easy-to-read BSDL inter-
face, the test engineer can easily
understand the content of the BSDL,
and define which pin to be tested or
removed from test list.

The i1000D DTS now supports the
latest extest-toggle instruction, which
is a customized boundary scan com-
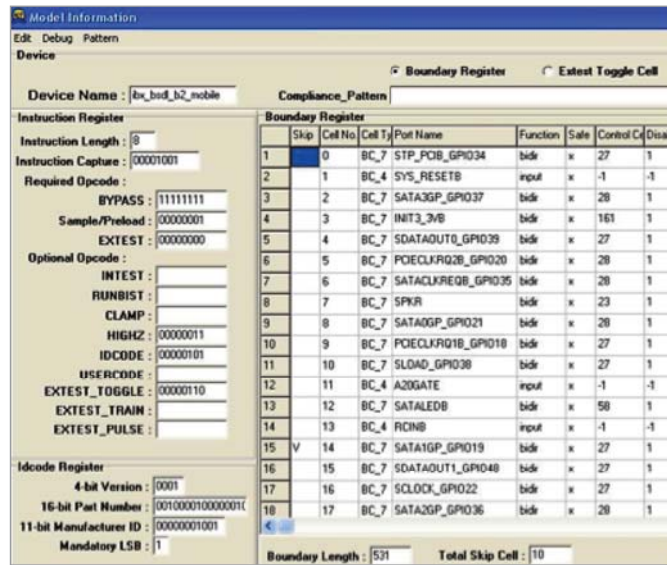mand for vectorless test without bed
of nails.

Figure 3. User-friendly BSDL Reader

Cover-Extend Technology (Optional)

Agilent's award winning Cover-Extend
Technology (CET) is now a supported
option on the U9401B-D02. CET
extends test coverage from boundary
scan devices to adjacent devices with
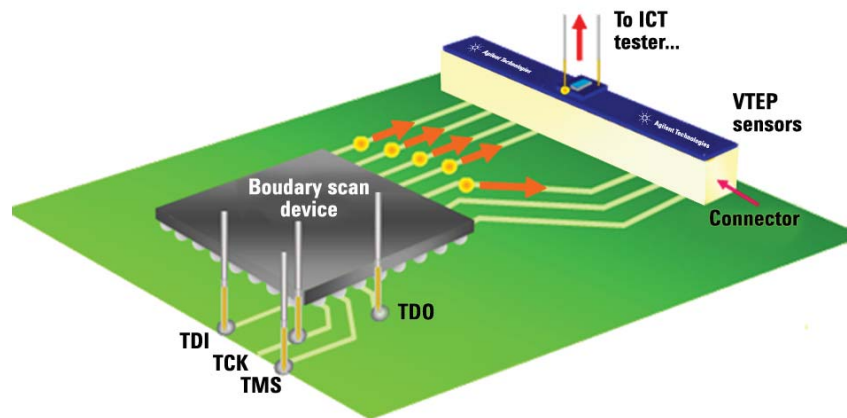the industry's popular vectorless test
solution, VTEP.

Figure 4. Diagrammatic representation of Cover-Extend Technology.

On-Board Programming (I²C and SPI)

With the 64 independent digital drivers and receivers, the i1000D DTS can perform on-board programming.

I²C and SPI, are pre-defined formats in the software interface. The engineer can easily arrange the programming by selecting the device from the ready-to-use list. If the device is not in the list, it can be created by the 'LIB' creation tool .

Support for VCL, PCF Library

Many Agilent i3070/3070 and i1000D ICT programmers are familiar with two digital test library formats, called "VCL" and "PCF" libraries.

The i1000D DTS supports any customized programming as long as there is an associated VCL or PCF library.

Flexible Digital Test

U9401B-D01 supports simple digital tests like TTL, complex tests like XOR Tree Test or any digital test defined by VCL/PCF test, with H02 extension options. A total of 128 digital channels can be used.
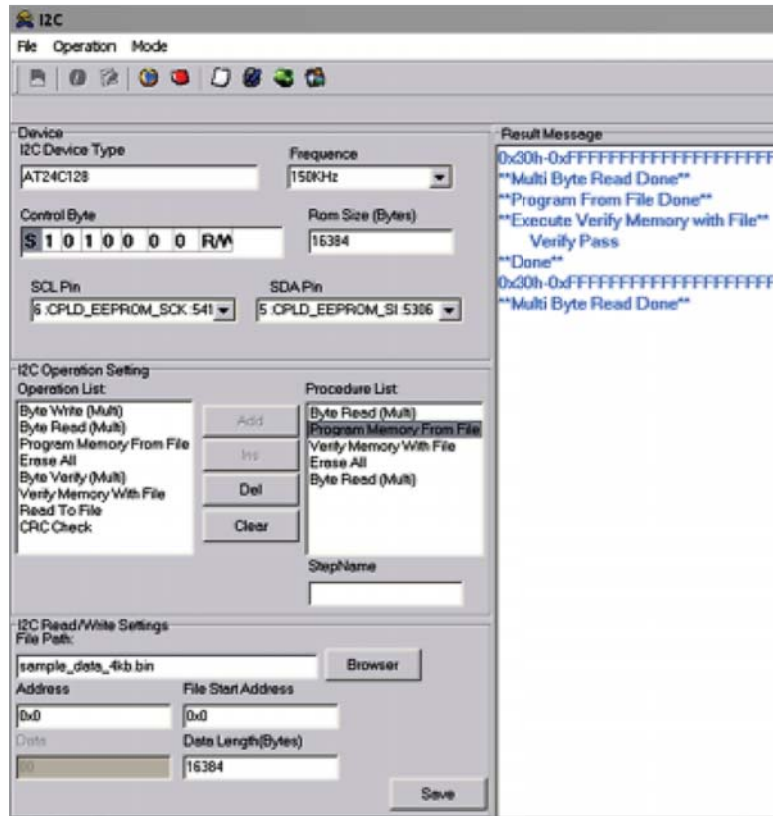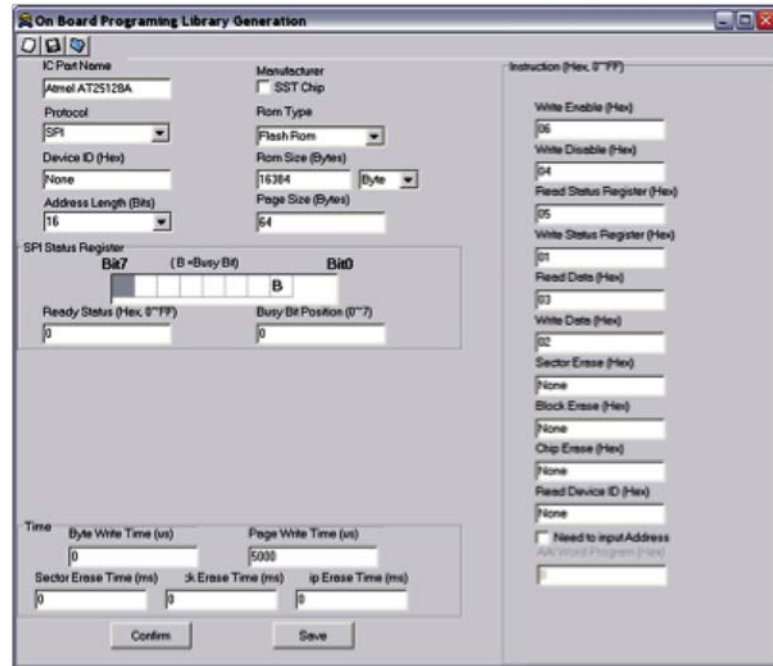

Figure 5. I²C,SPI OBP interface .

Figure 6. I²C and SPI library generator

Software Integration

When the customer needs to integrate boundary scan tests into a functional test station, the programmer can use industry-standard SCPI interface and the Agilent I/O library to integrate the i1000D DTS as part of the required functional test.
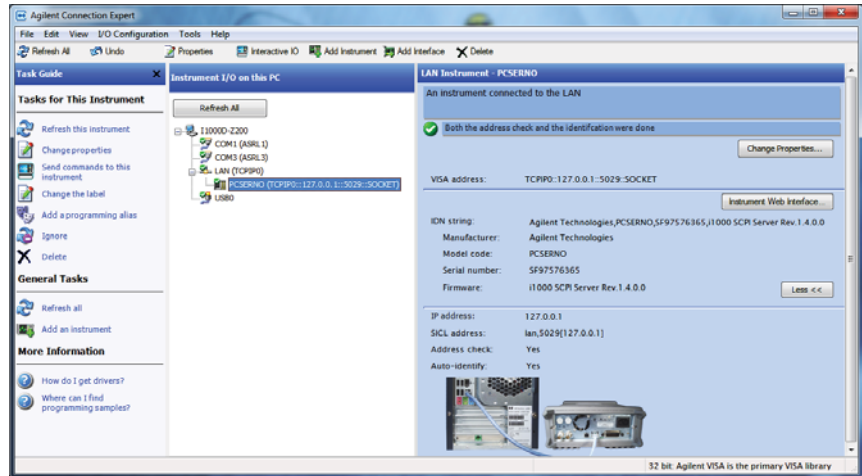

Figure 7. SCPI and Agilent I/O Library.

Signal Layout

Half of the pins are reserved for ground. This is to ensure minimum cross talk among signals. Twisted pair wiring is highly recommended in any cable extension, thus, good signal integrity can be expected.
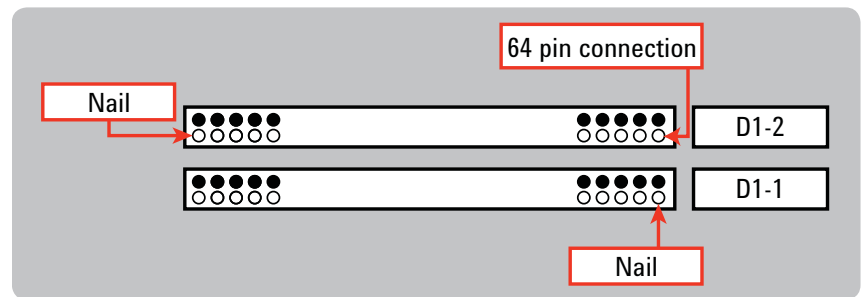

Figure 8. Signal layout in cable connection.

Specifications for i1000D Diagnostic Test Set

Max node count	256
Max digital driver/receiver channels	128
SCPI Command Support	Yes, thru LAN
External power supply control	Yes, thru Agilent IO Library
Agilent VTEP 2.0 Powered	Yes
On Board Programming	Yes
Boundary Scan	Yes, native with interconnect capabilities
Digital Test Library Support	Agilent VCL
Analog component test	Resistors, Capacitors, Inductors, Diodes, FET, and Jumpers.
Voltage measurement	Max 100V
Frequency measurement	200Mhz, 12 sets, with frequency mux card
Digital Driver/Receiver characteristics	
Mutiplexing	1:1, Unmuxed
Per-pin Programmable receiver	0 to 4.85 V
Per-pin Programmable driver	0 to 5 V
Max sink current	Peak 500 mA
Max source current	Peak 500 mA
Pattern rate	Max 2 MPS
Programmable vector cycle	Programmable
Programmable vector cycle resolution	50 ns
Programmable receive delay	Programmable
Programmable receive delay resolution	10 ns

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