U9401B

Medalist i1000D in-circuit tester (ICT)

Introduction

The Keysight Medalist i1000D In-Circuit Tester (ICT) redefines digital testing by bringing electronic manufacturers easy-to-use and affordable testing for digital devices.

The Keysight Medalist i1000D is now even better. Improving from its previous state of an analog-only ICT, the new digital release of the system now features per-pin programmable digital cards and a whole new set of intuitive software graphical user interfaces (GUIs) that make programming and development effortless.

With its new digital capabilities, the Medalist i1000D can now perform digital PCF/ VCL library-based testing, Boundary scanning, and I2C/ SPI serial programming on a simple, low-cost, long-wired test fixture. This presents an excellent opportunity for customers looking for better test coverage without any increase in cost.

The i1000D's digital subsystem harnesses the simplicity and power of the industry-leading Medalist i3070 ICT to allow customers to adjust test speeds, drive, and receive voltages with just a few mouse clicks.



KEYSIGHT

System Highlights

Ease of use

Retaining all the simple yet intuitive features of the earlier U9401/2A model, the new Medalist i1000D software adds to its arsenal with new features that make developing and debugging digital tests as easy as ABC.

Following a typical Manufacturing Defects Analyzer's development model, the user can get a fixture and program up and running in just a few days. When a digital test is required, simply assign the test libraries and power supplies using the new Developer GUI and let the i1000D software do the rest.

Simplified graphical user interfaces (GUIs) allow users to quickly make changes to individual tests during debugging with a comprehensive set of menus and buttons, complete with AutoDebug features. This allows inexperienced users to start using the system quickly.

With the Medalist i1000D, unpowered passive analog components can be debugged with the click of a button, so even someone with limited ICT experience can perform a complete analog test debug in hours.

AutoDebug fine-tunes tests so boards pass reliably in production. Statistical measures (CPK) are employed to determine the stability of the test. This automatic feature can reduce the normal debug process, which takes days, to just a few hours.

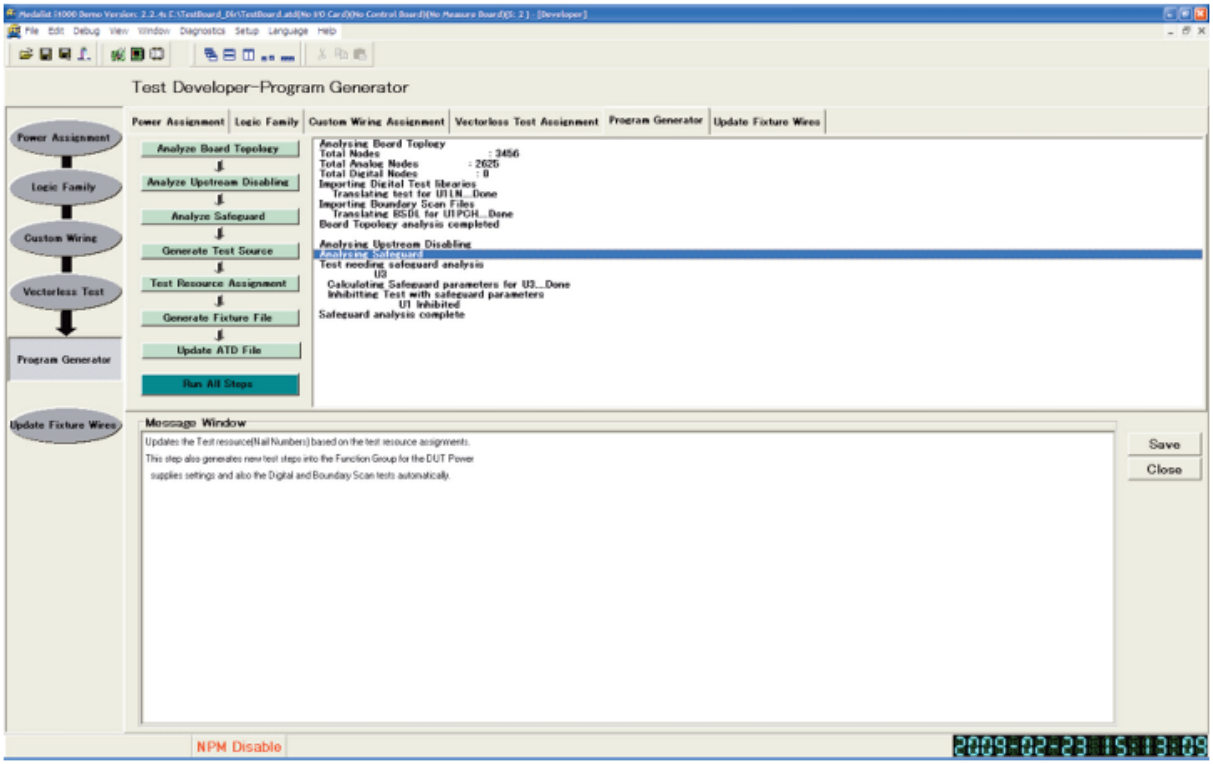

Figure 1. Easy-to-use Test Developer GUI enables even inexperienced users to deploy a fixture and program in just a few days.

Many users view Digital tests as complex and difficult to understand and debug. With the i1000D, things are different. The digital debug GUI leverages the control and flexibility of the legendary i3070 PushButton debug GUI, allowing engineers and technicians to have full control of the digital test parameters and test source codes, yet making it easy to understand. This is achieved by transforming the complicated digital test source code lines into simple, easy-to-understand graphical waveforms. Engineers and technicians performing debugging are shielded from the massive lines of code.

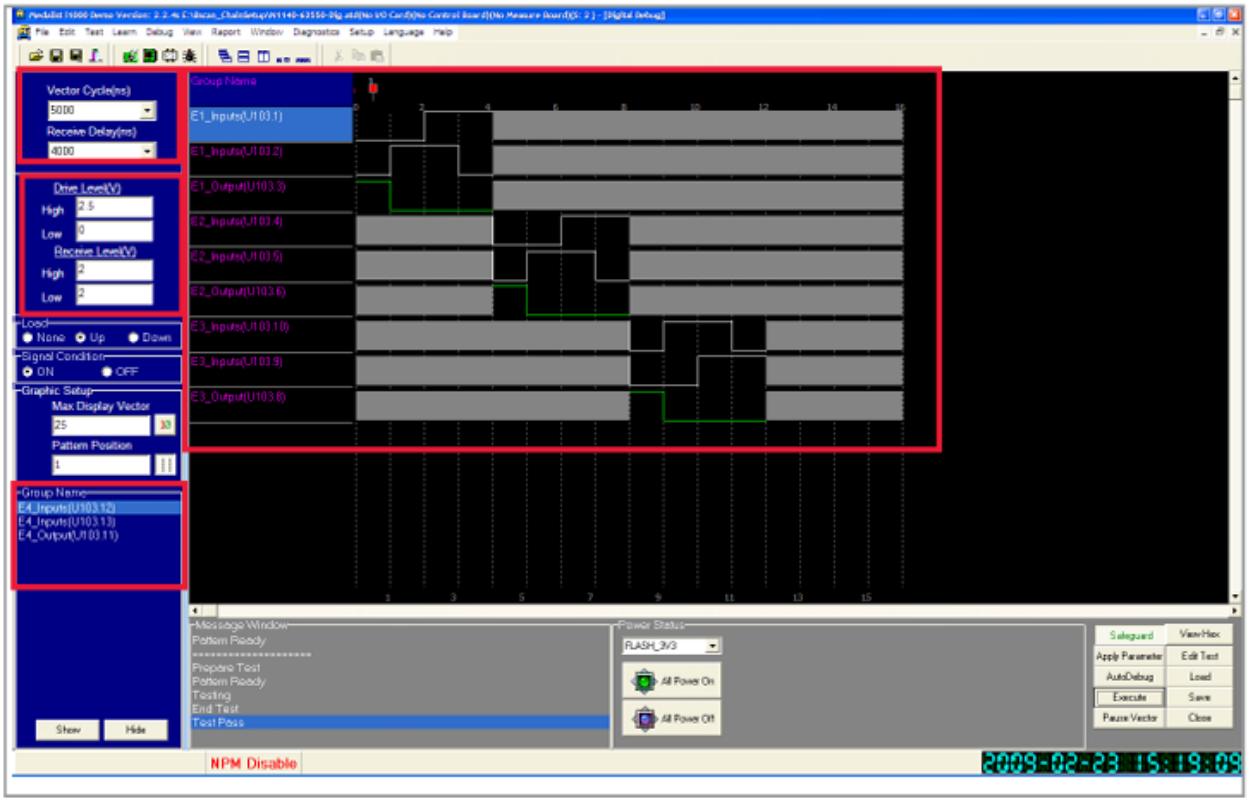

Figure 2. Digital Debugging is made easy on the Medalist i1000D with a graphical interface.

VTEP v2.0 Powered Test Suite

Manufacturers facing tough time-to-market pressures can have peace of mind that with the i1000D, they have access to the best vectorless test solutions to help them quickly find defects on digital devices.

The i1000D comes with Keysight's award-winning Medalist VTEP v2.0 Powered vectorless test suite. This suite comprises Network Parameter Measurement, iVTEP, and the original Medalist VTEP technology. This powerful suite surpasses the traditional Keysight Testjet capabilities and has been proven to provide better test coverage than traditional digital library tests.

Cover-Extend Technology

The Medalist i1000D is Cover-Extend ready. In Cover-Extend technology, test coverage is no longer limited by test accessibility or library availability. With Cover-Extend, VTEP tests can be performed on devices without needing physical test access, thus lowering fixture costs and reducing the number of required test points on the printed circuit board assembly.

Network Parameter Measurement

Network Parameter Measurement technology detects defects on power and ground pins, while iVTEP focuses on ultra-low value measurement of signal pins (< 5fF) on Integrated Circuits (ICs). Furthermore, having the original Medalist VTEP as its core means enabling measurements that are 4X more sensitive and 5X better in standard deviation. As technology advances with shrinking packages and faster signaling speeds, VTEP v2.0 is necessary to meet today's challenges and beyond.

Automatic Guard

The automatic guard feature is a tool for the production test engineer and test programmer. It automatically selects different guard points based on board topology for the user during the debug process. This eliminates the need for the user to manually check the schematics for each possible guard point, hence significantly reducing the overall debug time.

Complete Boundary Scan Test Capabilities

Putting even more ICT power in the hands of its users, Keysight has equipped the i1000D with full boundary scan capabilities, from the Standard Boundary Scan and Connect test to the Interconnect test. These capabilities help satisfy manufacturers' test needs for Boundary scan-enabled devices and will ensure manufacturers are geared for the future when there will be an increased need to test Intel®-based peripheral control hubs and processors.

Fixturing

Long-wired MDA press-down fixtures are not suitable for digital tests. Is this true or false?

While it is commonly perceived to be true, the Medalist i1000D proves this wrong.

The Medalist i1000D runs digital tests using a traditional MDA-style long-wired press-down fixture. Boundary Scan tests, Serial Programming, and Library-based tests all run without a glitch. Users now have a test solution that is simple and effective while keeping their operational costs down with the MDA-style fixtures.



Figure 3. No cross-talk on adjacent channels.

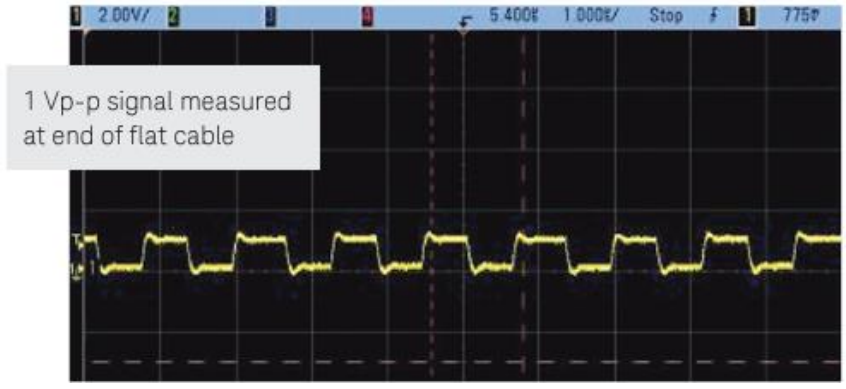

Figure 4. Low signal loss.

Specifications

Standard software and firmware features

Open/short testing	Shorts pin groups learning.
Analog testing	Yes
Vectorless testing	VTEP v2.0
I2C programming capability	Yes
SPI programming capability	Yes
Boundary scan capability	Yes
Frequency measurement	Yes
AC/DC voltage testing	Yes
Number of analog guarding points	10
First pass yield report	Yes
Quality Test CPK Report	Yes
Component-level coverage report	Yes
Yield enhancement test	Yes
Limited access tools	• Keysight Medalist Bead Probe Technology • Keysight Cover-Extend
Panel test	Yes
Relay-level diagnostics tool	Built-in
SPC quality tool	Yes

Software product

VTEP v2.0 test suite	Test development software for vectorless test extended performance
Cover-Extend Technology	Extending test coverage to devices without test access using VTEP

Modules and pin cards

Pin cards	• Un-multiplexed analog 128-channel • Un-multiplexed hybrid 64-channel
Analog stimulus card	Measurement Board
Control card	System control board
Number of modules	Single module design which supports up to a total of 28 pin cards. This supports up to a total of 3456 node counts.

64-channel hybrid pin card

Resource per card	Unmuxed 64 channels per card
Programmable receiver	0 to 4.85 V
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

Power supplies

DUT power supplies	• 0 V to +20 V • 0 V to –14 V	
High-voltage DUT power supplies	• 10 V to +100 V • 0 V to –14 V	
Number of supply channel	Normal	High voltage
• Programmable 0 to 5 V @ 20 A	• Two	• One
• Programmable 0 to 14 V @ 10 A	• None	• One
• Programmable 0 to 20 V @ 4 A	• One	• None
• Programmable 0 to –14 V @ 5 A	• One	• One
• Programmable 10 to 100 V @ 10 mA	• None	• One
N6700 DUT Power supply unit	• 4 x programmable channels • 0 to 50 V @ 5 A per channel	
Over-voltage protection	Yes	
Over-current protection	Yes	
System power supplies	• AC 200 V – 240 V • 10 A	

Software specifications

Operating system	Windows 7 32-bit
Support languages	• English • Simplified Chinese • Traditional Chinese • (Supports localization)
Vectorless test technology	• VTEP v2.0 Test Suite (Includes VTEP, iVTEP and NPM) • Cover-Extend • Extest Toggle
Board/Fixture graphics display	
	• Nails location graphic • Pins location graphic • Device location graphic
Probe pin locator	Pin locator with guided probed
Runtime yield display	Real-time FPY (First Pass Yield) display at runtime
Yield enhancement tool	• Auto retest • Auto test cycle repeat
Debug interface	Spreadsheet layout for easy test options selections
AutoDebug	AutoDebug on analog unpowered test and VTEP v2.0
Scalability	Single module design of up to 28 slots
Failure message printer	Uses serial port interface (Printer not included)
Shipping and installation assistance	Included (Keysight authorized representative)
Capacitor discharge protection	Yes
Fixture types supported	Long-wire press-down type

Hardware specifications

Maximum nodes	3456
Pin card	• Un-multiplexed analog 128 channels • Un-multiplexed hybrid 64 channels
Printer	Dot-Matrix TM-U220 Series

Keysight enables innovators to push the boundaries of engineering by quickly solving design, emulation, and test challenges to create the best product experiences. Start your innovation journey at www.keysight.com.

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