SPRINT 4510 AFTS
Mixed Signal Flying Probe Test System

PRACTICAL INNOVATIONS IN FLYING PROBE TEST TECHNOLOGY
Key Features:

- Advanced, proven architecture based on 3-phase linear platen motors with air bearings for high speed, accurate, reliable and wear-free operation
- 4 identical flying probes with 6° probing angle
- Quick and easy test program generation from CAD or Gerber data
- Precision analog test
- Power-off Open Pin Detection on ICs, connectors, and other devices
- Board power on test
- Boundary scan (JTAG) test
- Mixed signal function test using external instruments
- On-board device programming
- Automated Optical Inspection (AOI)
- Advanced fault coverage report generator
- Statistical Process Control (SPC)
- Panelized board test
- Fixed stationary probes
- Advanced Fiducial Recognition system
- Barcode reader system
- Board Marking System
- SMEMA compatible operation
- Best value and quick return on investment

PRACTICAL INNOVATIONS IN FLYING PROBE TEST TECHNOLOGY

There are many challenges in building densely populated electronic circuit boards. Maintaining high quality, keeping low volume production costs under control, and meeting aggressive time schedules force manufacturers to adopt lean yet effective test and quality assurance measures in their production processes.

Flying probe testers have few restrictions on access, require no test fixtures, and can test boards with virtually unlimited number of nets, allowing test developers to turn a program around in a short time. For these reasons and more, flying probe testers have become indispensable tools in today’s electronic manufacturing systems.

Operating in hundreds of plants across the world, the Sprint 4510 has been selected by original equipment manufacturers (OEMs) and electronic manufacturing service (EMS) companies alike to meet their most demanding operational requirements.

Sprint 4510 is a fourth generation flying probe tester. New capabilities and features have been designed in to tackle the next generation of test and QA challenges in electronic manufacturing.
ADVANCED MACHINE ARCHITECTURE
AT THE FOUNDATION OF SPRINT 4510

Surface linear motor systems with freedom of movement in X and Y directions provide the most advanced architecture for flying probe testers. Sprint’s monoplanar head arrangement allows four identical probes to contact target boards with high precision and at an optimal probing angle. Precise surface linear motors independently move the four, equal-length, equal angle probes on the same plane over the unit-under-test (UUT). A precisely controlled air gap separates motors from platens, thus providing true wear-free operation. Similar to stepper motors, linear platen motors require no feedback and operate with precision. All probes have equal geographic accessibility to the board. Better fault coverage is obtained through increased flexibility in probe usage.

An automatically adjusting printed circuit board conveyor securely aligns and clamps boards in place. A fiducial camera confirms and automatically adjusts head motion for board alignment errors.
BOUNDARY SCAN ON SPRINT 4510
FLYING PROBE TESTER

Boundary Scan test (JTAG) is a test methodology based on IEEE 1149.1 standard. Compliant Semiconductors, when installed on a circuit board, allow the interconnecting nets and digital clusters such as memory devices to be tested using a simple external physical set-up. Boundary Scan (JTAG) also offers a comprehensive board-level protocol for programming flash and other programmable devices.

Integration of boundary scan test into the flying probe environment translates into important advantages:

- Dramatic increase in test coverage by combined use of flying probe and boundary scan resources
- More efficient shorts test using flying probes and higher throughput
- Reusable Boundary Scan test patterns

Boundary Scan Features on Sprint 4510

- Standard dual Boundary Scan ports
- Factory integrated high-speed boundary scan controller with fully programmable TCK and drive levels
- Standard Digital I/O lines
- Optional additional boundary scan controlled digital I/Os
- Boundary scan infra-structure test
- Interconnect test, digital and analog cluster test, memory test
- Flash and in-system device programming (ISP)
- Intelligent graphical diagnostics
ADVANCED FUNCTION TEST SYSTEM (AFTS)

Advanced Function Test expands the capabilities of the Sprint 4510 beyond basic manufacturing process test. External commercially available instruments integrate directly with the Sprint 4510 and signal lines are routed to fixed or flying probes through software control.

Each instrument's graphical user interface (GUI) provides an intuitive representation of the instrument controls and functions. Configuring instruments for a measurement is as simple as setting the dials. Once the parameters for a particular measurement are configured, program steps within the Sprint 4510 environment flow seamlessly. Instrument drivers are based on Interchangeable Virtual Instrument (IVI) protocols thus allowing easy and fast instrument replacement.

AFTS Features:

- Dual Instrument Rack - 19 inch
- Support for PCI, PXI, GPIB and USB2.0 programmable instruments
- Precision low noise auto-ranging modular power supplies
  - Standard support for up to 4 user power supplies, expandable as required
  - Voltage ranges of 5V to 60V and current ranges of 1A to 20A per power supply
  - Series/parallel wiring of power supplies provides up-to 240V or 80A
  - 25 different power supply modules to choose from
  - Quick replacement of power supply units
  - Full programmability from power supply GUI or Sprint 4510 software environment
- Digital Storage Scope - 100 MHz, 1 GS/s, programmable from Sprint 4510 GUI and instrument front panel
- Arbitrary Waveform Generator - 20 MHZ, programmable from Sprint 4510 GUI and instrument front panel
- Test resources routed to Flying and Stationary probes
- Vision controlled fixed probe placement
- Power-on mixed signal testing
- IVI drivers and technical support for user selected instruments
SHORT PROGRAM DEVELOPMENT TIME

Short programming cycles and high system flexibility make Sprint 4510 the ideal choice for production ramp-up, prototyping, and low to medium volume production testing.

Sprint 4510 is designed for programming speed. Board CAD data can be turned into a working test program in a few hours! Rapid test program development starts with the Sprint’s easy-to-use, intuitive graphic user interface and Automatic Program Generation (APG) software. Fully integrated CAD translation software is used to generate the test program data directly from most common CAD packages or Gerber files. Where CAD files or Gerber data are not available, test programs can be generated manually using a populated sample of the product to be tested. The program development process is controlled through a graphic flow diagram. Program generation is automatic and often requires minimum debugging. The circuit analysis software identifies parallel components, assigns guard points automatically, and deals with many circuit configurations.

SPRINT 4510 INTUITIVE SOFTWARE ENVIRONMENT

Automatic Program Generation software:

- Step by step guided automatic program generation scheme
- Support for 40 plus industry standard CAD formats
- Review board testability and circuit access
- Correction of CAD and addition of ECO data
- Topology driven automatic guard generation
- Device Library management software
- Dual sided program optimization

CAD Driven Automatic Program Generation
Test Debug Tools:

- Powerful intuitive debugging environment
- Changeable measurement mode
- Stop-on fail, repeat, and loop
- Measure and stimulus swapping
- Measurement delay setting
- Global and step specific probe setup
- Graphical topology navigator

Test Coverage Reporter:

- Generates a comprehensive coverage report
- Partitions the coverage report by device types and test methods
- Drill downs reporting from category to device to device pin
- Integrates top and bottom side test coverage
- Accumulates and logs measurement data

Production Test Software:

- Password protected user administration
- Flexible data collection and log files
- Statistical Process Control Tools
- Bar Code reader
- Board Marking System
- Graphical Repair station software
- Multicolor ticket printer
**SpeedPlus™**

SpeedPlus testing is a method of reducing test times by engaging bottom side fixed position probes when performing analog tests. The use of up to 9 fixed probes on the bottom side of the UUT allows the software step optimizer to sequence tests in an order that will provide maximum testing in each movement.

**Motion Optimizer**

Sprint’s Motion Optimizer gives the programmer the ability to sort tests into logical groups for debugging, then resort the steps to a production ready lean runtime format. The Sprint4510 with its Tandem Test Mode (TTM) enable the machine to perform up to six measurements with one movement of the 4 flying probes. With the addition of SpeedPlus and bottom side probing this number increases by four with every additional fixed probe such that by adding nine fixed probes the tester can effectively test up to 42 steps with only one movement.

**Open-Pin-Detect**

Acculogic Open-Pin-Detect (OPD) toolset for power-off “Vectorless” detection of open pins on digital and mixed-signal devices is an important test capability. OPD provides fast programming and comprehensive manufacturing process fault coverage.

**D-Scan** and **C-Scan** Vectorless tests extend fault coverage to any IC, including BGAs and ICs with heat sinks, as well as connectors and polarized capacitors. D-Scan, which is available on any combination of Flying and Fixed probes, uses protection (parasitic) diodes built into many devices to test failing pins. One stationary probe is required per power supply node.

C-Scan is available on all four Flying heads and uses a capacitive coupling technique to check for open pins on ICs with no protection diodes. It can be used to check for opens on connectors and orientation of polarized capacitors. Each C-Scan probe assembly includes one retractable capacitive sensor.
Automatic Optical Inspection (AOI)

Vision test automatically inspects for presence, absence, and orientation of ICs, bypass capacitors, and components that are not electrically testable. Vision test is fully integrated with the Sprint 4510 APG and enhances overall fault coverage.

Comprehensive Fault Coverage Reporting

Sprint 4510 Fault Coverage Reporter automatically analyses board topology and the test program, and reports on the effectiveness of the test. Reports are compatible with Microsoft Excel format for further analysis and presentation. The coverage report starts with a summary by component type, test technique and status of test. The drill down capability allows users to examine each device on a pin-by-pin basis, thus providing a full view of the overall program fault coverage.
StatManagerSPC™ Statistical Process Control Software

StatManagerSPC software is a powerful statistical process control (SPC) tool that analyzes and identifies variations in test results due to variations in process environment. Using a series of measurements made repeatedly on a single board or on batches of production boards, developers are able to identify measurements that are least stable. They can then examine these measurements for root causes of instability and then alleviate these causes. StatManagerSPC allows developers to analyze test variance due to noise, component variation, drift, and system variance. Test limits can be updated automatically under user control to obtain solid production-ready tests.
GENERAL SPECIFICATIONS:

System Dimensions
• 1690 mm (width) x 1430 mm (depth) x 1670 mm (height)
• 66 inches (width) x 56.3 inches (depth) x 65 inches (height)

Weight
• 1100 kg (2420lbs)

Options:

Open-Pin-Detect vectorless tool suite
• C-Scan with four sensors
• D-Scan all heads

Vision Test:
• Test for orientation, missing, wrong component
• User graphic device library

Power-up Testing
• Boundary Scan Test and Device Programming (two ports)
• Advance Function Test System (AFTS)
• Timer Counter and Function Generator

Full System Specifications Available at request. Specifications are continuously improved and updated, contact your local sales channel for a complete specification.
ACCULOGIC YOUR GLOBAL PARTNER IN AUTOMATED TEST
ISO 9001: 2000 REGISTERED COMPANY

- Mixed Signal Flying Probe Systems
- Boundary Scan (JTAG)
- In-Circuit Test
- Automated Optical Inspection
- Application Specific Functional Test
- Quality Management Software
- Application Development Services
- Training Services