

Test Expert – NPI solutions for electronics

Test engineering solutions for PCB Assembly: accelerated test and inspection

Benefits

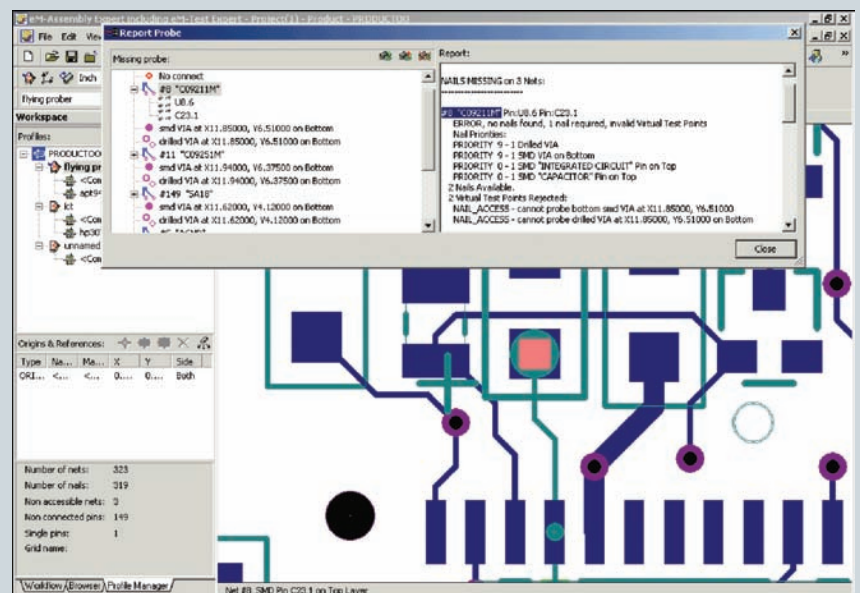
- CAD/BOM recovery up to 60X faster
- Test fixture design and setup 20X faster
- Design for test (DFT) allows upfront debugging of marginal design errors resulting in better process quality
- Test accessibility reports in minutes from job import
- Re-use of test methodologies for project variants reduces time and costs associated with fixture design and equipment programming
- Program mixed test and inspection equipment and technologies on a single platform
- High flexibility in selecting probe strategies allows results in more economical test fixtures

Features

- Import of native CAD from 65 different platforms including nets and traces
- Program generation for 75 different ATE platforms including the leading ICT, AOI, Flying Probe and x-ray machines

Summary

Test Expert software from Siemens PLM Software fully automates test engineering associated with new product introduction processes for PCB Assembly. With more than 1,500 customer sites, Test Expert is the most widely used solution of its kind for electronics manufacturers.



Test Expert is a fully integrated solution that allows electronics manufacturers to go from design to test and inspection in a matter of minutes or hours rather than days.

With its fast, user-programmable, nail/probe selection routine and complementary interactive tools, Test Expert offers complete flexibility and control during fixture design and flying probe selection. Test Expert eases access on dense boards with a global probe offset tool. A nail advisor evaluates fixture cost. Automatic calibration box generation and interactive definition accelerate calibration box placement for optical inspection applications. Test Expert reduces cycle times on variants of the same board

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Features *continued*

- Fully automated design for test offering design and engineering teams upfront accessibility reports on test coverage limitations
- Automated fixture design including user-definable rules for probe and nail selection including panelized boards
- Library editor for modifying attributes for individual electrical devices, physical outlines and parts allowing better accuracy on global probe offsets
- Interactive viewer to cross reference schematic-to-board layout

by managing attributes such as device types, values and tolerances as well as package and pad sizes/shapes. Test Expert automatically generates recipes for more than 75 ICT, flying probe testers, x-ray and AOI machines.

Process-oriented flowchart guides the automated process

The flowchart contains all of the steps in the test/inspection process, guiding the user from CAD and BOM input, through probe selection and fixture design, to program generation. This ensures that the same, tested procedures will be used repeatedly to reduce errors.

Project manager

Test Expert divides the project hierarchically: project, product (family) and job (revision). After selecting the purpose of the project (for example, design for testability, full test or inspection) and specifying an in-house or custom library, Test Expert graphically displays the differences between the revisions of a product.

Variant manager

Users can employ the same fixture for many variants (or versions) of one board. For a minor revision of an existing board, Test Expert defines the changes needed for an existing test fixture. When used before a family of boards is produced, Test Expert automatically generates a universal fixture design that can be used to test all product variants within that family. Test Expert can also display the differences between the variants and specify which attributes are relevant to each variant.

Library checker

Test Expert streamlines data entry by allowing users to check and correct essential missing part attributes listed in the BOM. Defined, optional and mandatory part attributes (electrical and physical units) are color-coded once the machine has been selected, streamlining part data entry.

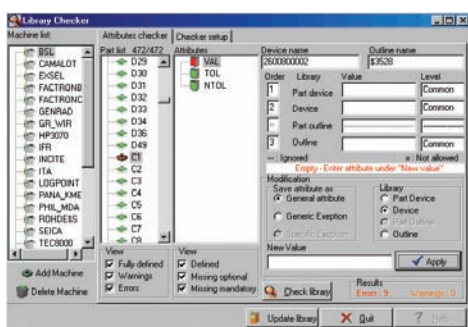
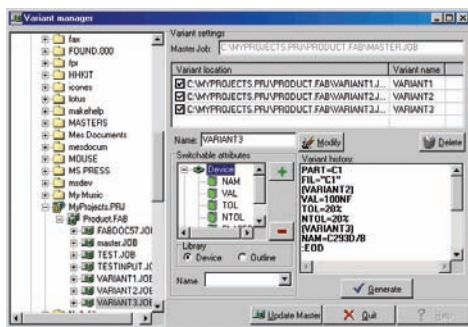
Library editor

The Library Editor is used to add and modify attributes for individual or selected electrical devices, physical outlines and parts. For example, access problems can be eliminated by using a graphics editor to correct polygonal body limits and to fine-tune the global probe offset on SMD lands or stagger them on connectors. Also, complex devices can be split into simple equivalents to avoid the unnecessary creation of test models.

Probe selection/fixture design

User-programmable profiles contain rules for automatic nail/probe selection on in-circuit and flying probe testers, making it easy for test engineers to select probes and design fixtures for single or panelized boards in accordance with in-house standards. Some of the rules include:

- Priorities (for device classes, individual parts, part pins, vias) number of probes per net
- Assignment of a net to a specified tester channel or bank
- Use of test point numbering defined in CAD
- Forcing of probes onto all or selected pins of a given device or part such as ASICs or PALs
- Probing unused pins nail/probe sizes such as 100 mil, 75 mil and 50 mil and shapes like chisel, crown, tulip and spear
- Minimum clearance between probes of the same and different sizes
- Minimum probe to part body clearance
- Minimum probe to board edge clearance
- Relative priority of different probe sizes (typically the larger the probe, the higher the priority in order to maximize contact and minimize fixture cost)
- Tester channel limit
- Wire/multi-point selection



Board accessibility report

Test Expert's recovery of the full CAD data allows probes to be selected and the fixture designed before a single bare board has been manufactured. Test Expert generates a complete, easy to follow accessibility report that can be fed back to design if modifications are required. The report states if no or not enough nail/probe locations were found on each net and indicates why. Examples include: nodes on the net were inaccessible due to solder mask; there are insufficient probe/probe or probe/part body or probe/board edge clearances; the tester channel limit has been exceeded.

Graphics links and search engines

An automatic link between the accessibility report and the CAD graphics makes it easy to view problem nets and decide on corrective action. Search engines for parts, nails, nail shapes, nets and pins facilitate the checking of nail/probe selections.

Interactive nail/probe editor

When there are special requirements, an interactive editor can be used to add, move and delete nails/probes. An automatic checking routine can be enabled to verify that changes made using the editor conform to the rules in the current test profile. Any nails/probes that do not conform to the rules are flagged graphically.

Schematic viewer

Schematic diagrams are recovered in HP-GL format for use during repair and diagnostics applications.

Nail retro-annotation

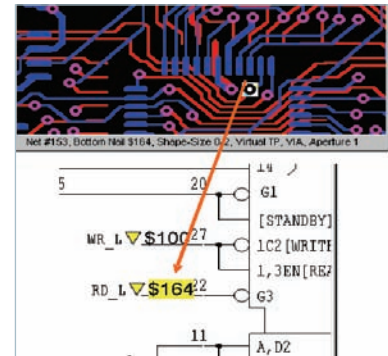
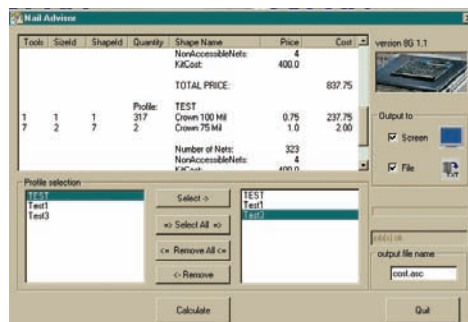
Test Expert graphically displays nails on the PCB layout and allows you to annotate nails back to the schematic. This is helpful for repair because it allows cross-probing of nails between the PCB layout and the schematic viewer.

View Expert for Test

Using the View Expert for Test software, electronics manufacturing personnel and customers of electronics manufacturers can view boards in production. In particular, customers can check that board design data has been correctly received and processed by the manufacturer before boards go into production. Customers can search the database for parts, nets and nails.

Tecnomatix solutions for digital manufacturing

The Tecnomatix® software suite is an end-to-end collaborative solution that enables the planning, design, analysis, optimization and operation of manufacturing processes – letting users create and share manufacturing information across the



enterprise and throughout the supply chain. Tecnomatix solutions help manufacturers implement effective digital manufacturing strategies – from sharing product and process designs, to joint process planning and engineering by teams in distributed locations – helping planners to make decisions such as where, how and with what resources to manufacture products.

Leading manufacturers around the world are adopting Tecnomatix solutions to expand revenue potential by accelerating product introductions, reducing costs, shortening time-to-volume and optimizing production execution.

For more information about Siemens PLM Software solutions, visit www.siemens.com/plm.

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