Boundary-Scan Without Boundaries™

**CORELIS**

An *EWA* Company

# Corelis' ScanPlus Keeps Rapid2 On Track



## Daresbury Laboratory

- Months of extensive commissioning now no longer required
- Interconnect testing more than 32,000 PCB nets in seconds
- Automatic test pattern generation

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*Corelis' boundary-scan test tool, ScanPlus, finds manufacturing defects in complex high-speed data acquisition cards and enables scientific project to keep to schedule.*

### CORELIS

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Engineers at Daresbury Laboratory are using Corelis' boundary-scan tool, ScanPlus to validate the interconnect including memory interconnect between hundreds of ICs on a number of complex 19 inch (12U) data acquisition cards for the laboratory's Rapid2 project. The cards are 10-layer PCBs, populated both sides, and many of the components used are packaged in ball-grid-arrays (BGAs), making probe testing impossible.

By performing automated boundary-scan tests, ScanPlus can validate the PCB's interconnect (more than 32,000 nets connecting more than 1800 components) in a matter of seconds. This and ScanPlus' ability to marry boundary-scan description language (BSDL) models of the card's components with the design's netlist, means comprehensive tests and programming files are created automatically.

Andy Hill, Systems Commissioner in Daresbury Laboratory's Instrumentation Department commented, "The data acquisition cards are extremely complex and, if they don't function correctly when they come back from manufacture, we can't 'buzz' them out because the majority of critical nets run between BGA packaged devices and never surface."

The Rapid2 project, set to acquire data from position sensitive X-ray detectors (used in scientific experiments) and due for completion in early 2002, ran into problems earlier this year

when prototype cards failed to function correctly. As the engineers at Daresbury had no access to nets running between BGAs, it was impossible to validate the interconnect.

"The data acquisition prototype cards implemented only a partial boundary-scan chain," recalled Hill, "but this was used only to program the design's PLDs. When the prototypes came back from manufacture and didn't function correctly, we suspected that the BGAs hadn't seated properly but had no way of proving it. We even X-rayed the devices but this told us little as, whilst it's possible to see the solder balls, you don't know for a fact that they're in good electrical contact with the PCB's pads."

Several weeks were spent during the summer of 2001 writing functional software to exercise parts of the prototypes, but—as Rapid2 requires 16 data acquisition cards—it soon became clear to the Instrumentation Department that they could not test all cards in this fashion and keep to the project's tight timescales. To this end, the ADC design was updated to include a full boundary-scan chain. Hill explained, "This means that we can now effectively 'buzz' the cards out from within the devices on the cards and prove a) that all devices are present and correct and b) that the interconnect between components is electrically sound."

A number of boundary-scan tool vendors and their solutions were assessed during the summer of 2001, but out of all of these, only Corelis promised the fastest solution and smoothest integration (with Daresbury's CAD tools).

Hill concluded, "Thanks to Corelis' ScanPlus system, and the ease with which it integrated with our CAD tools to automatically generate thorough and comprehensive boundary-scan test patterns, the Rapid2 project is now back on schedule."

## About Corelis

Corelis, Inc., a subsidiary of Electronic Warfare Associates, Inc., offers bus analysis tools, embedded test tools, and the industry's broadest line of JTAG/boundary-scan software and hardware products combining exceptional ease-of-use with advanced technical innovation and unmatched customer service. Corelis' development and test tools are used by companies such as Agilent, Dell, IBM, Intel, Microsoft, Lockheed Martin, Rockwell Collins, Hewlett-Packard, Motorola, Qualcomm, Nokia, Panasonic, TI, Ford, Broadcom, Ericsson, and many others. Corelis products are found globally in every industry developing or manufacturing electronic products.

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