Functional test reaches further with XJTAG boundary scan

"Intrinsic Quality, a trusted supplier of test-engineering solutions to exacting customers, chose XJRunner as the boundary scan instrumentation for its NightHawk© PC-based functional tester, benefiting from easy integration with LabWindows™/CVI, compact USB connectivity, and powerful test capabilities that enabled NightHawk to fulfil a complex automotive project."

Intrinsic Quality (IQ) of Illinois, USA, is a developer of functional and in-circuit test solutions, with over 25 years experience delivering innovative, high-productivity solutions for its customers. The company's NightHawk functional tester is a self-contained PC-based system that tightly integrates several instruments using LabWindows/CVI software. These include an analogue function generator, a high-speed digital scope, and boundary scan using XJTAG's XJRunner system.

The NightHawk can communicate with the instruments using many different standards, in this project USB was selected. This has enabled IQ to achieve a compact and portable package. "XJRunner is the ideal boundary scan instrumentation for NightHawk, combining small physical size, low operating power and USB connectivity," comments Jim Hill, Director of Sales at IQ. "Moreover, unlike some other systems, XJRunner does not require purchase of additional enhancements to achieve a useable implementation."

IQ has recently completed a project for a large US automotive company using NightHawk to test production controller boards used in the transmission system of a hybrid commercial vehicle. The boards are built around the MPC555 PowerPC processor, incorporating RAM and Flash ICs, an FPGA, multiple serial interfaces, CAN communications, and large numbers of digital and analogue I/Os. The customer's test specifications required each unit to undergo In-Circuit Test (ICT) followed by functional testing. The functional

tests were to be performed after a conformal coating had been applied.

"This is a complex and expensive board, and a significant percentage of the circuits are untestable using ICT alone," explains Jim Hill. "With XJTAG as part of the NightHawk functional tester, we have been able to test these circuits successfully. XJTAG also overcomes the challenges of testing after conformal coating, by enabling access to internal points without probing."

On the production floor, the assembly under test is carefully powered up and test firmware is loaded into the processor flash. The firmware is then used to carry on a tester-processor dialogue in which the tester provides both analogue and digital stimuli to the board and commands the processor to report back its response.

Much of the transmission controller can be tested using this type of dialogue. However, some key circuits not connected to the processor remained untestable. By passing communications and control to XJRunner, IQ's engineers were able to reach these circuits using a similar dialogue approach.

"XJRunner allows us to control large numbers of devices on the

board by setting pins that are accessible via the scan chain. We can then read the results we need via the tester's instrumentation," explains Jim Hill, adding. "The XJTAG software enables us to use this dialogue approach to test both input and output circuits. It's more than just an external runtime module, and works well with LabView/CVI™ to provide an easy integration of mixed XJTAG and native CVI instrumentation commands."

Jim Hill sums up, "XJTAG has provided the best combination of powerful software, an extremely competitive price, and the greatest ease of integration."

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opinion
**Larry Raymond
President
IQ**

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"With XJRunner as part of our NightHawk functional tester, we have been able to test otherwise unreachable circuits successfully, and read the outputs via the tester's own instrumentation. The system is more than just an external runtime module, and works well with LabView/CVI to provide an easy integration of mixed XJTAG and native CVI instrumentation commands."

Data Bank — *IQ*

Company	Intrinsic Quality LLC. HQ USA
Nature of business	Functional testing, fault diagnosis, ICT development, test consulting
Main product	BarnOwl and NightHawk Functional Testers, Genrad / Teradyne ICT Solutions
Customers	Industries including automotive, military, aerospace, transport, telecom…
Location	Chicago, USA
Incorporated	1984
Web site	www.intrinsicquality.com