NI targets semiconductor test with Productronica 2009 introductions

The suite of new software-defined products are optimized for use with NI LabView graphical system design software.

By Rick Nelson, Editor in Chief -- Test & Measurement World, November 10, 2009

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MUNICH, GERMANY—National Instruments chose Productronica 2009 (November 10–13, **productronica.com/de**) held here this week to introduce 10 new PXI products that expand the capabilities of PXI for mixed-signal semiconductor test. The suite of new software-defined products, which are optimized for use with NI LabView graphical system design software, includes four HSDIO (high-speed digital I/O) instruments, two digital switches, two enhanced RF instruments, a SMU (source-measure unit), and specialized digital-vector file importing software. The new NI PXI Semiconductor Suite incorporates numerous new features including 200-MHz single-ended digital I/O, 10-pA current resolution, rapid multiband RF measurements, DC/digital switching, and WGL (Waveform Generation Language) and IEEE 1450 STIL (Standard Test Interface Language) file importing capability.

Speaking in advance of this week's **Productronica introduction**, Scott Savage, NI's market development manager for semiconductor test, touted NI customers' success in using LabView and PXI hardware for semiconductor validation and characterization. He specifically cited the efforts of ON Semiconductor (**www.onsemi.com**), of ST-Ericsson (**www.stericsson.com**) in conjunction with Mesulog (**www.mesulog.fr**) and Saphir (**www.saphir.fr**), and of researchers at the University of Applied Science working in cooperation with Austriamicrosystems (**www.austriamicrosystems.com**) as evidence to support the applicability of NI's approach to semiconductor test applications.

The new PXI semiconductor suite further targets such applications and specifically addresses the testing of common semiconductor devices such as ADCs, DACs, power-management ICs, wireless ICs, and MEMS (microelectromechanical systems) devices. Savage said that because of its breadth of functionality, the suite delivers higher throughput, greater flexibility, and faster development time compared with traditional box instrumentation and ATE (automatic test equipment) solutions often used for characterization, validation, and production test of these semiconductor devices.

The NI PXIe-654x family of HSDIO instruments includes four new modules that offer single-ended clock rates up to 200 MHz and data rates up to 400 Mbps, making it possible for engineers to test high-speed chip designs and accommodate faster custom communication protocols. Digital modules in this family include several additional features such as bidirectional communication, real-time bit comparison, double data rate capability, multiple timing delays for different I/O lines, and the ability to select from 22 different voltage levels, from 1.2 to 3.3 V. These new digital I/O devices expand the NI PXI-654x, PXI-655x, and PXI-656x series high-speed digital offerings to a total of 10 PXI instruments with single-ended and LVDS voltage capabilities up to 200 MHz.

The new NI PXI-4132 high-precision SMU delivers current sensitivity down to 10 pA. It features remote (four-wire) sensing and external guarding on a single output to provide up to ±100-V capability in a single PXI slot. The SMU also offers an onboard hardware-sequencing engine for hardware-timed, high-speed curve traces and the ability to trigger and synchronize multiple PXI-4132 SMUs over the PXI backplane. The PXI-4132 complements the existing NI PXI-4130 power SMU, which provides a four-quadrant, 40-W output (±20 V, ±2 A).

The new NI PXI-2515 and NI PXIe-2515 digital switches further enhance the suite of PXI products by helping engineers to multiplex precision DC instrumentation directly onto HSDIO lines connected to the chip under test. The new switches also provide improved signal connectivity for parametric measurements while maintaining signal integrity on high-speed digital edges.

The new NI PXIe-5663E and NI PXIe-5673E 6.6-GHz RF PXI Express vector signal analyzer and vector signal generator offer increased measurement speed through fast and deterministic changes in RF configurations using a new feature called RF List Mode to reduce test time. With the new functionality, engineers can download preconfigured instrument parameters to rapidly cycle through different RF configurations.

The PXI Semiconductor Suite also introduces a capability for importing WGL and STIL digital vector formats to streamline design-to-test integration when using NI PXI high-speed digital products. The result of collaboration between NI and Test Systems Strategies Inc. (TSSI, **www.tessi.com**), the new TSSI TD-Scan for National Instruments software enables semiconductor test engineers to import WGL and STIL simulation vectors into PXI systems, a task which previously required custom software development. An evaluation version of the WGL/STIL software tool, which supports all NI PXI-654x, PXI-655x, and PXI-656x HSDIO series of products, is available through **www.ni.com**. A full version is available for purchase directly from TSSI.

Readers can visit **www.ni.com/automatedtest/semiconductor/suite.htm** to learn more about the PXI Semiconductor Suite and how Analog Devices and others are using PXI and LabView to reduce their chip test costs.

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« Back | **Print**

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