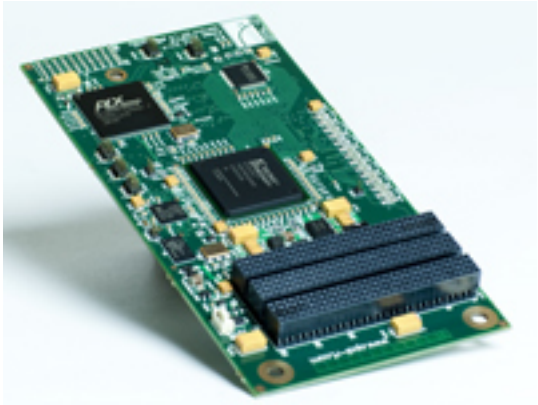
Opal-RT Launches New FPGA-based Reconfigurable I/O and FPGA Development System Integrated with Simulink and RT-LAB



MONTREAL, /PRNewswire/ -- Opal-RT Technologies introduces new additions to the company's OP5000 family of FPGA-based I/O and signal conditioning hardware.

These new products include: the OP5142 Reconfigurable FPGA-based I/O Controller, powered by the Xilinx SPARTAN-3 FPGA processor; the RT-XSG, toolbox for generating custom models for implementation on FPGA devices; and the RT-LAB FPGA Development System.

The launch of these high-performance FPGA development products coincides with the introduction of RT-LAB 10, the latest version of the core technology behind the company's flagship Real-Time Simulator products including eDRIVEsim, eMEGAsim, eFLYsim and the TestDrive ECU Tester. RT-LAB is the open Real-Time Simulation software environment that has revolutionized the way Model-based Design is performed.

The OP5142 Reconfigurable FPGA-based I/O Controller enables distributed execution of Hardware Description Language (HDL) functions and high-speed, high-density digital I/O in real-time models. The OP5142 is optimized for Hardware-in-the-Loop (HIL) simulation applications, and specifically designed for use with Opal-RT's full line of Real-Time Simulator products.

The OP5142 combines the power of the largest SPARTAN-3 FPGA chip with low-latency PCI Express-based communication links, INTEL or AMD multicore processors, Opal-RT's RT-LAB parallel distributed computer platform and Simulink. The use of the SPARTAN-3 FPGA processor has enabled a number of enhancements including the support of more than 128 analog 16-bit converter or 250 discrete I/O channels.

Communication latency with the simulator's main system processor is also improved. The gain of the OP5142 is as much as two to three times faster than standard PCI-based boards. Minimum latency is reduced well below 10

microseconds through the use of a PCI-Express link that facilitates the connection of multiple OP5142 I/O Controllers, while maintaining a very high transfer rate. Unlike other existing simulator architectures, the PCI- Express link is used as a switch and not as a conventional parallel bus. As a result, the PCI Express switch enables the implementation of large simulators equipped with 8 to 24 CPU cores and over two thousand I/O channels, while achieving simulation time-steps below 50 microseconds; a level of performance not previously possible on a PC platform. This feature is particularly important for users developing electrical applications using the RT-XSG 2.0 toolbox, as well as SimPowerSystems.

The RT-LAB FPGA Development System completes Opal-RT's offering of FPGA development solutions. The system includes the OP5431 Passive I/O Interface for the Virtex®-5 ML506 Evaluation Platform, which provides a standalone chassis that enables Opal-RT's OP53xx 16-bit fast analog-to-digital & digital-to-analog converters and discrete signal conditioning modules to interface with the Virtex®-5 ML506 Evaluation Platform. Custom models can be implemented by users and simulated on the ML506 FPGA platform in real-time with physical hardware-in-the-loop, via signal conditioning and conversion modules.

The ML506 is part of a family of FPGA development platforms manufactured by Xilinx Inc. ML506 includes a high-capacity, very-high speed FPGA reprogrammable device along with extended interface capability. Development is now underway on Opal-RT modules which support the Xilinx Virtex-6 FPGA processor.

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