RT-LAB | OP4510

Power electronics rapid control prototyping (RCP) system

BDL45-100

SPECIALIZED POWER ELECTRONICS RCP/HIL SIMULATOR

Dimensions: 17” (W) x 10.8” (D) x 3.5” (H)

HIGHLIGHTS

- Optimal power/speed ratio with a powerful combination of CPU/FPGA.
- Fast optimized I/O and a comprehensive library for power electronics applications.
- High precision three-phase PWM capture and generation, and other timed signals (Encoder, Resolver, Hall Effect).

DESCRIPTION

The OP4510 RCP system offers Rapid Control Prototyping (RCP), and provides advanced control systems features compatible with widely-used communication protocols. With this solution, you can bring your power electronics control design testing to the next level.

PURPOSE

Equipped with the latest generation of Intel Xeon four-core processors and a powerful Xilinx Kintex 7 FPGA, the OP4510 delivers raw simulation power for both CPU-based real-time simulation and sub-microsecond time step power electronics simulation. This system delivers the fastest and the most versatile RCP application for power electronics.

APPLICATIONS

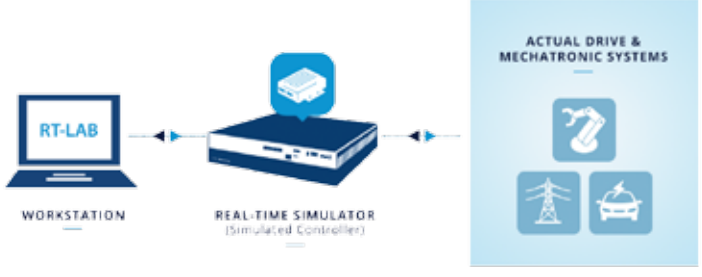
Converter and inverter control, motor drive control, microgrid agent control, generator control, multidrive systems control, Modular Multilevel Converters (MMC) control, power electronics classroom experiments and more.

KEY PERFORMANCE SPECS

- Outer Control Loop Frequency (CPU): < 100 kHz
- Fast control loop Frequency (FPGA): 500 kHz to 10 MHz depending on user code implementation and complexity (the base frequency of the FPGA is 200 MHz)
- Advanced PWM generation: up to 200 kHz, resolution 5 ns

TYPICAL USE CASE

RCP Process



System Configuration	Baseline
HARDWARE	
OP4510 Simulator Intel Xeon CPU - 4 cores - 3.5 GHz, Xilinx FPGA Kintex™-7 325T Connectivity - Ethernet port 10/100/1000 Mbps (2x RJ45). RS232 (DB9), USB2.0, 5-Gbit/s high-speed fiber optic link (4x SFP)	✓
Digital input | 32 channels, 4.5V to 50V, 40 ns high-speed digital I/O	***
Digital output | 32 channels, 5V to 30V, 200 ns to 65 ns	***
Analog input | 16 channels, 16 bits, 500 kS/s, +-20V	***
Analog output | 16 channels, 16 bits, 1MS/s, +-16V	***
Analog input | 16 channels, 2MS/s, 16bits, +-20V	***
Timed generation and measurement firmware | Selectable 32 timed digital inputs and 32 timed digital outputs	***
RS422 Adapter	***
SOFTWARE	
RT-LAB | Real-time simulation software	✓
RT-XSG | RT-XSG toolbox for FPGA real-time simulation	***
COMMUNICATION PROTOCOLS	
CAN bus interface board	***

*** Optional