OP5600
Real-Time Digital Simulator

The OP5600 simulator consists of an upper section that contains analog and digital I/O signal modules and a bottom section which contains the multi-core processor computer and FPGA that runs RT-LAB or HYPERSIM real-time simulation software platform. The OP5600 can be used either as a desktop system or rack-mounted as part of a network of OPAL-RT simulators communicating throughhigh-speed PCI-e links.
It also comes with 6 PCI expansion slots to add I/Os and communication devices from other third parties I/O modules (CAN, LIN, FlexRay, ARINC, MIL-STD-1553, RS-232, GPIB, Profibus, reflective memory and more), thus providing more flexibility.

Product Highlights

- Contains a powerful real-time target computer equipped with up to 12 3.3-GHz processor cores with Red Hat Linux
- Two user-programmable FPGA-based I/O management options available, powered by the Xilinx: Spartan-3 or powerful Virtex-6 FPGA
- Available expansion slots accommodate up to 8 signal conditioning and analog /digital converters modules with 16 or 32 channels each for a total of 128 fast analog or 256 discrete or a mix of analog and digital signals
- Acts as a single-target system or can be networked into a multiple-target PC cluster for complex applications capable of implementing large models with more than 3000 I/O channels and a time step below 10 micros
- Offers versatile monitoring, with RJ45 and mini-BNC on the front side, and DB37 standard connectors on the back side to connect user equipment for HIL simulation and testing

Typical Applications

The OP5600 chassis enables you to conduct a number of real-time simulation applications, including:

- Hardware-In-the-Loop testing
- Rapid Control Prototyping
- FPGA development projects

Complex power grids, micro-grids, wind farms, hybrid vehicles, more electrical aircrafts, electrical ships and power electronic systems can be simulated in real-time with time steps as low as 10 microseconds or less than 250 nanoseconds for some subsystems to achieve the best simulation accuracy.

High Speed Communication Links

- Protocols are based on customer requirement and built on top of standard Aurora or Gigabit Ethernet communication layers
- PCI Express: High-speed serial computer expansion bus standard

I/O Cards

The maximum number of modules depends on the type of FPGA connected with the I/O modules:
Spartan 3 (OP5142): can process 8 Modules
ML605: can process 6 Modules
1 - Standard modules
2 - Type B modules

Several power electronic manufacturers are now using OPAL-RT real-time digital simulators instead of expensive and less flexible analog test benches."
Jean Bélanger, OPAL-RT CEO & CTO

OPAL-RT TECHNOLOGIES

From Imagination... to Real-Time

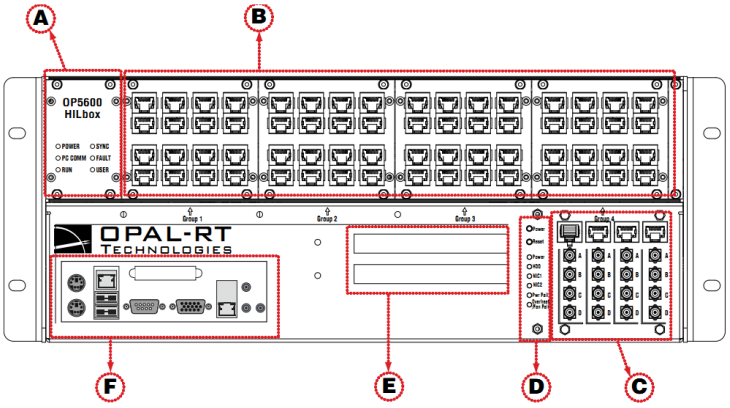
General Specifications

Product name	OP5600 HIL BOX
I/O connectors	**Spartan 3:** 4 panels of 4 DB37F connectors / **Virtex 6:** 3 panels of 4 DB37F connectors
Monitoring connectors	**Spartan 3:** 4 panels of RJ45 connectors / **Virtex 6:** 3 panels of RJ45 connectors
PCI slots	2 PCI / 4PCIe
Carrier board	Spartan 3 configuration: 8 mezzanines Virtex 6 configuration: 6 mezzanines
Hard disk	250 Gb, 7200 rpm, SATA
Dimensions (HxWxD)	48.3 x 45.7 x 17.8cm (19" x 18" x 7")

Configuration Options

Spartan 3 (OP5142)	Option 1: With processor motherboard configuration (2.4 or 3.3 GHz), up to 12 cores (Standard) Option 2: Without target computer. With external PCIe Extender cable x1 Option 3: Without target computer. With PCIe fiber optic remote
Virtex 6 (ML605)	Option 1: With target computer configuration (2.4 or 3.3 GHz), up to 12 cores Option 2: Without target computer. With external PCIe Extender cable x8 Option 3: Without target computer. With PCIe fiber optic remote

I/O and connectors



A Inactive section

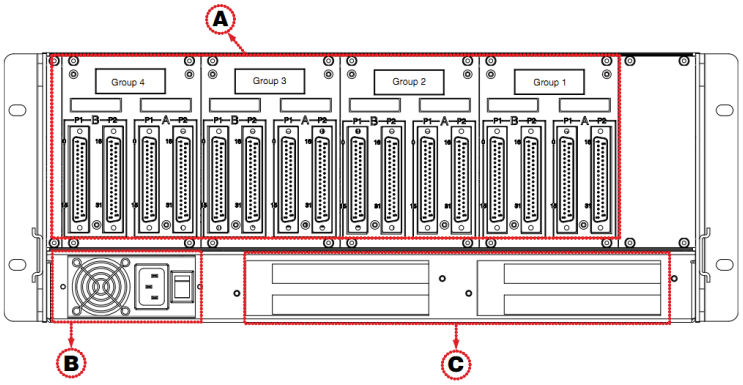
B 4 panels of RJ45 connectors provide connections to monitor output from mezzanine I/O boards

C Monitoring RJ45 connectors with mini-BNC terminals

D Target computer monitoring interface

E Optional PCI or PCIe connector slots

F Standard computer connectors



A DB37F I/O connectors

B Power connector and power On/Off switch

C Optional PCI or PCIe connector slots

NOTE: TECHNICAL DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE.

About OPAL-RT TECHNOLOGIES

OPAL-RT is the world leader in the development of PC/FPGA Based Real-Time Digital Simulator, Hardware-In-the-Loop (HIL) testing equipment and Rapid Control Prototyping (RCP) systems to design, test and optimize control and protection systems used in power grids, power electronics, motor drives, automotive industry, trains, aircrafts and various industries, as well as R&D centers and universities.

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