

OP4520 FPGA Processor & I/O Expansion Unit



NEW



PRODUCT HIGHLIGHTS

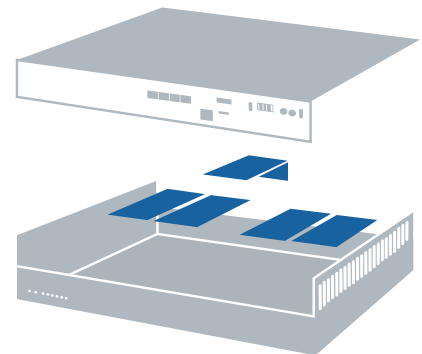
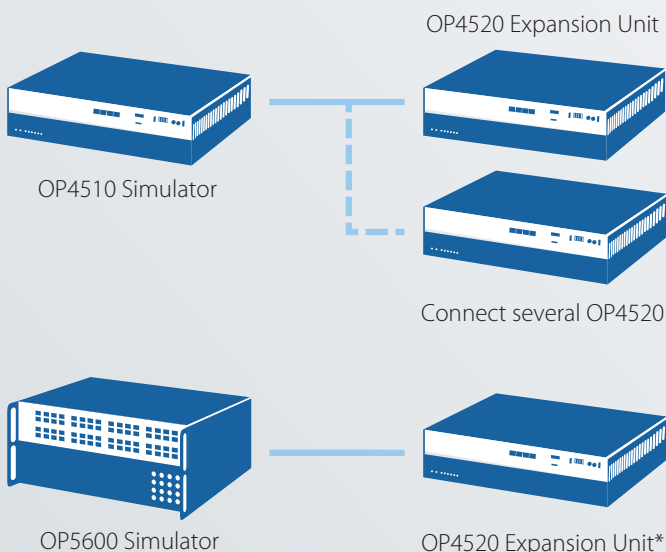
- FPGA, Kintex-7 325T
- 4 SFP ports
- 4 slots for I/O modules such as DIN, DOUT, AIN and AOUT
- 1 slot for an expansion board
- 1 PCIe connector

APPLICATIONS

- Allows you to test remote equipment (optical fiber links)
- Provides I/O Expansion for the OP4510 for high density I/O Controls. (ex: MMC)
- Provides a simpler real-time simulation platform for multi-agent microgrid control strategy
- Increases high speed power electronic simulation capacity by coupling multiple FPGA (Parallel NPC converter, Electrical Ship, UAV)

The OP4520 is an I/O expansion unit within the OP4500 family that uses the Xilinx Kintex-7 FPGA to provide additional inputs and outputs for existing OPAL-RT simulators and expansion units. It can provide up to 128 additional I/Os and offers high speed SFP communication or PCI-Express links that can be used to communicate with OPAL-RT simulators in a variety of configurations.

Maximum Compatibility



The OP4520 accepts any combination of four different I/O modules such as analog in, analog out, digital in and digital out.

* Up to 7 units if using PCIe expansion box

GENERAL SPECIFICATIONS

FPGA	Kintex-7 FPGA, 325T, 326,080 logic cells, 840 DSP slice (Multiplier- adder)
High speed fiber optic interface	4 sockets for optional Small Form-factor Pluggable (SFP&SFP+) 1 to 5 Gbits/s optical cable pairs (Rx/Tx)
OPAL-RT Software compatibility	RT-LAB, eMEGAsim, eFPGAsim, MMC, HYPERSIM and ePHASORsim
FPGA software applications	XILINX System Generator for Simulink, RT-LAB XSG, eHS FPGA electrical circuit solvers, library of floating point functions, resolvers and Finite-Element based motor models and converters
Performance	250 nanoseconds for models executed on the FPGA chips, 10 nanosecond timer resolution
Dimensions & weight	43.2 (W) x 27.4(D) x 8.9cm (H) (17" x 10.8" x 3.5") 5 Kg (2.2 lbs) approx, for laboratory use
Power supply	Universal input and active power factor correction 350W

AVAILABLE I/O SYSTEMS*

TYPE B MODULES

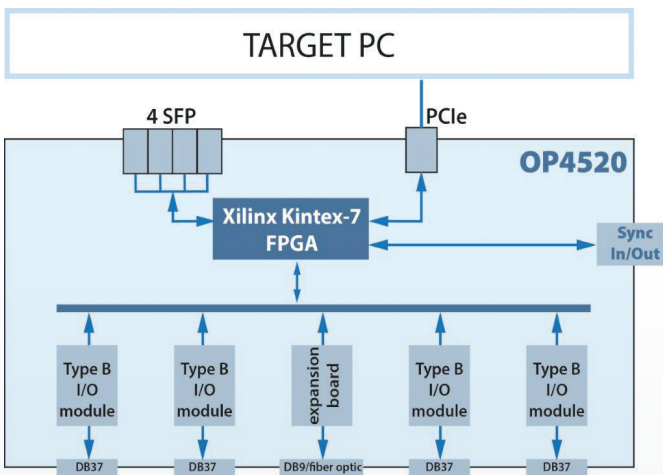
Digital output channels	32 channels, push-pull, 65 nanosecond typical propagation delay, 5V to 30V adjustable by an external voltage supplied by users, 50 mA max, short-circuit protected, Galvanic isolation
Digital input channels	32 channels, 4V to 30V, 3.5mA min, 40 nanosecond typical propagation delay, galvanic isolation with fast Opto-couplers
Analog input converter	16 channels, 16 bits, 2.5 microsecond conversion time for all channels simultaneously, +- 20V true differential input, 400 kOhms input impedance, conversion time directly controlled by the FPGA chip
Analog output converter	16 channels, 16 bits, 1.0 microsecond update time for all channels simultaneously, +- 16V, 10 mA (20 mA with optional fast driver), short-circuit protected, update time directly controlled by the FPGA chip

OPTIONAL EXPANSION MODULES

Digital input/output RS422	2 channels for encoder or 6 PWM in / 6 PWM out or other applications requiring reading or generation of fast differential logic signals, 5V
Optional fiber optic	6Tx / 6Rx 50Mbps channels for digital I/O, and compatible with the ORION protocol developed by OPAL-RT

* Standard configuration includes 32 Dout, 32 Din, 16 Ain, 16 Aout.

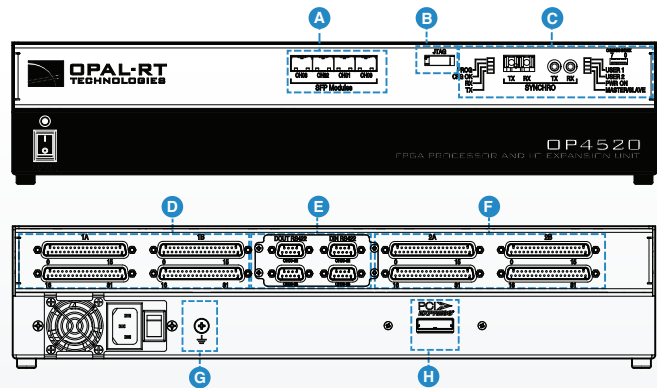
ARCHITECTURE*



The OP4520 is a compact device designed as an expansion part of the OP4510; it has 128 fast I/O channels with signal conditioning, 12 RS422 channels (or low-speed fiber optic channels), and 4 high-speed communication ports (SFPs). PCIe connection uses point-to-point standard PCIe interface between the simulator and the expansion unit, similarly to other OPAL-RT units (OP5600-IO, OP7000, OP5607, OP7020). The OP4520 offers two types of synchronization, either LVDS or fiber optic, making it easier to synchronize with any OPAL-RT device.

I/O AND CONNECTORS

- A** Small Form Factor (SFP) 5Gbits/s optical interface modules connectors
- B** JTAG Connector
- C** Synchronization connectors and status LEDs
- D** DB37 connectors for digital and analog inputs and outputs



- E** Optional expansion module, DB9 connectors for RS422 differential signal inputs and output, or fiber optic connectors
- F** DB37 connectors for digital and analog inputs and outputs
- G** Ground Screw
- H** PCIe Connector

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.