

HYPERSIM® | OP4510

Comprehensive power grid simulator and protection system HIL testing for research and education

BDL45-411

DESIGNED BY POWER
SYSTEM ENGINEERS,
FOR POWER SYSTEM
ENGINEERS



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

HIGHLIGHTS

- One-line diagram schematic editor.
- Suitable for network tests with up to 30 single-phase nodes and 10 three-phase buses.
- Specialized test automation tool for protection.

DESCRIPTION

Provide large and complex model-based or basic functional test scenarios, while simultaneously supporting an array of inputs and outputs for unsurpassed connectivity. This solution provides advanced real-time monitoring, control, and protection capabilities.

PURPOSE

This solution tests your protection control relay using HYPERSIM models in closed loop for detailed EMT simulation. It also lets you see the behavior of the grid based on the relay under test in real-time.

APPLICATIONS

Protection function testing via analog and digital interfaces or IEC61850 sampled value and GOOSE, protection scheme testing (including virtual relay library), events analysis.

KEY PERFORMANCE SPECS

- Control loop minimum delay: 5 μ s
- Model minimum time step: 3 μ s
- Run offline simulations
- Maximum entry-level network size: 30 single-phase nodes on 1 core
- COMTRADE playback

TYPICAL USE CASE

HIL 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

Timed generation and measurement firmware | Selectable 32 timed digital inputs and 32 timed digital outputs

Dual-port Gigabit Ethernet interface card

Time synchronization card, GPS, IEEE 1588, 1PPS, IRIG-B

SOFTWARE

HYPERSIM Editor | Windows-based model editing software

✓

HYPERSIM HX30 | Real-time simulation of up to 30 nodes (10 x 3-phase buses)

✓

ScopeView for HYPERSIM HX30 | Waveform visualization and analysis software

✓

TestView for HYPERSIM HX30 | HYPERSIM® Test automation tool

TestView Function 121 | TestView test sequence add-on for distance protection relay (IEC 60255-100)

COMMUNICATION PROTOCOLS

IEC 61850-8-1 GOOSE/Sampled Values/SV data integrity manipulation

C37.118 slave/master

DNP3 slave/master

Modbus slave/master