

# HYPERSIM

## REAL-TIME SIMULATION FOR THE POWER SYSTEMS OF TOMORROW

**HYPERSIM** is the most advanced system for simulating three-phase electro-magnetic and electro-mechanical transients, and for studying complex phenomenon involving interaction between several controls, protection, HVDC and FACTS systems.

**HYPERSIM** is built on an open architecture, high-speed parallel processing and modular scalability to deliver standard real-time simulators designed to meet the evolving needs of the most demanding utilities and manufacturers.

Based on decades of research by Hydro-Quebec on one of the world's most renowned transmission power systems, **HYPERSIM** is used every day in extremely demanding situations and is constantly updated to increase performance, reliability and ease of use.



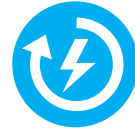
## Power

Simulate the largest of power systems, over 1000, 3-phase buses, in real-time on a single simulator without sacrificing precision.



## Performance

Benefit from the best price/performance ratio on the digital real-time simulation market.



## Efficiency

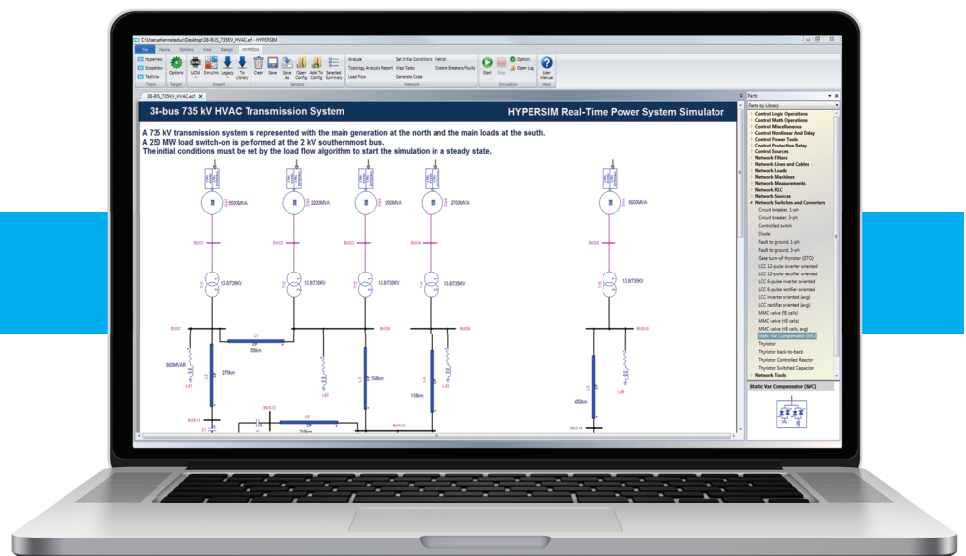
Use HYPERSIM in combination with eFPGAsim to simulate power grids on a CPU and very fast power electronics such as MMC converters on FPGA in real-time.

# APPLICATIONS

- Synchrophasor and PMU
- HVDC and MMC control
- Microgrids
- Protection Systems
- Cybersecurity
- On-Board Power Systems

# SOFTWARE ENVIRONMENT

## HYPERSIM

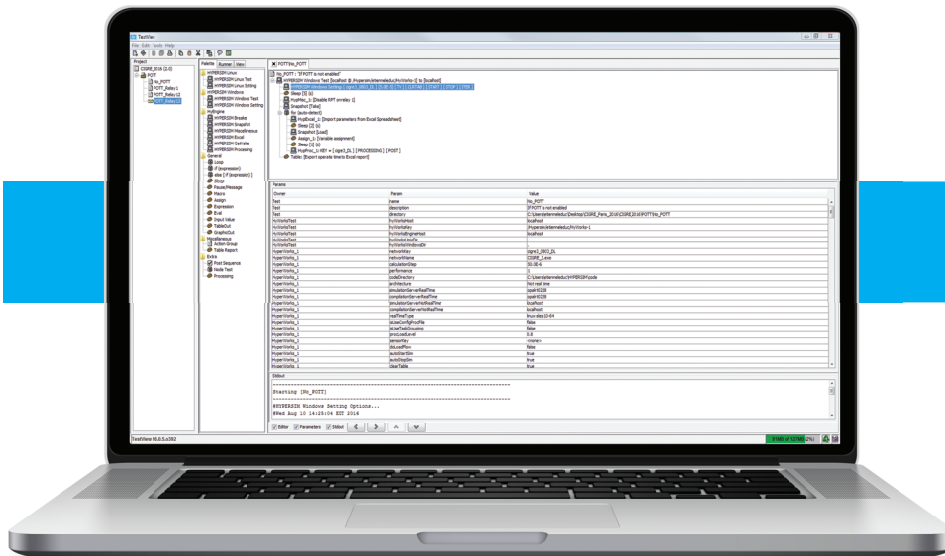


HYPERSIM offers an intuitive, Windows based, software interface that enables engineers to build complex topologies and quickly tackle operational and reliability issues. Users can import models directly from Simulink or create a new model using the rich component library. HYPERSIM, includes an advanced modeling tool, complete with a rich library of more than 300 validated power system components and controllers that enables users to design the simulated model.

HYPERSIM automatically analyzes the power system topology and determines sharing of processing power to ensure the best simulation speed over multiple processors. This key feature facilitates and reduces the time required to prepare large models.

## HIGHLIGHTS

- Automatic task mapping of network on to the available CPU
- Automatic code generation/compilation
- Very powerful simulation engine providing precise results
- Simulation in real-time or off-line using multi-CPU
- Simulation of MATLAB/Simulink control models



## TESTVIEW

TestView is an automatic test management system integrated within HYPERSIM allowing you to automate test sequences and perform thousands of statistical, random and Monte Carlo tests with no user intervention and for overnight execution. Waveforms corresponding to worst cases can be stored, based on specified criteria for offline analysis.

Users can also now import parameters and export reports directly in Excel and benefit from its analysis and editing tools.

## HIGHLIGHTS

- Test reproducibility
- Open API
- Automatic reporting
- Post analysis data calculation (ex.: calculation of the maximum peak voltage of 1000 tests)



# SCOPEVIEW



ScopeView is an offline and online tool used for signal visualization, data analysis and monitoring. A rich set of features provides the ability to perform advanced signal processing and analysis. This tool is optimized for the power system engineer's typical workflow and it behaves like a virtual oscilloscope and a spectral analyzer. It can also interact with the simulation process by initiating disturbance sequence through circuit breaker switching operations.

ScopeView also lets users create, load and save custom templates to help consolidate data even faster, compare results and repeat tests. ScopeView's ease of use lets the user focus on the results, rather than working on complex scripts for viewing data.

## HIGHLIGHTS

- Visualization and processing of data originating from simulation.
- Execution of mathematical functions, such as mathematical operations, spectral density, frequency response, coherence, and more.
- Graphical manipulation including zoom, superimposition, tracking cursor, etc.
- Template and layout are available to simplify the reporting process.
- Data import/export in many formats: MATLAB, CSV, COMTRADE, etc.

# HARDWARE

OPAL-RT's unique approach integrates parallel, distributed computing with commercial-off-the-shelf technologies, to offer an unmatched combination of performance, openness and affordability. All simulators are based on a modular and flexible design and can be fully customized to meet specific I/O requirements.



## 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, aircraft and various industries, as well as R&D centers and universities.