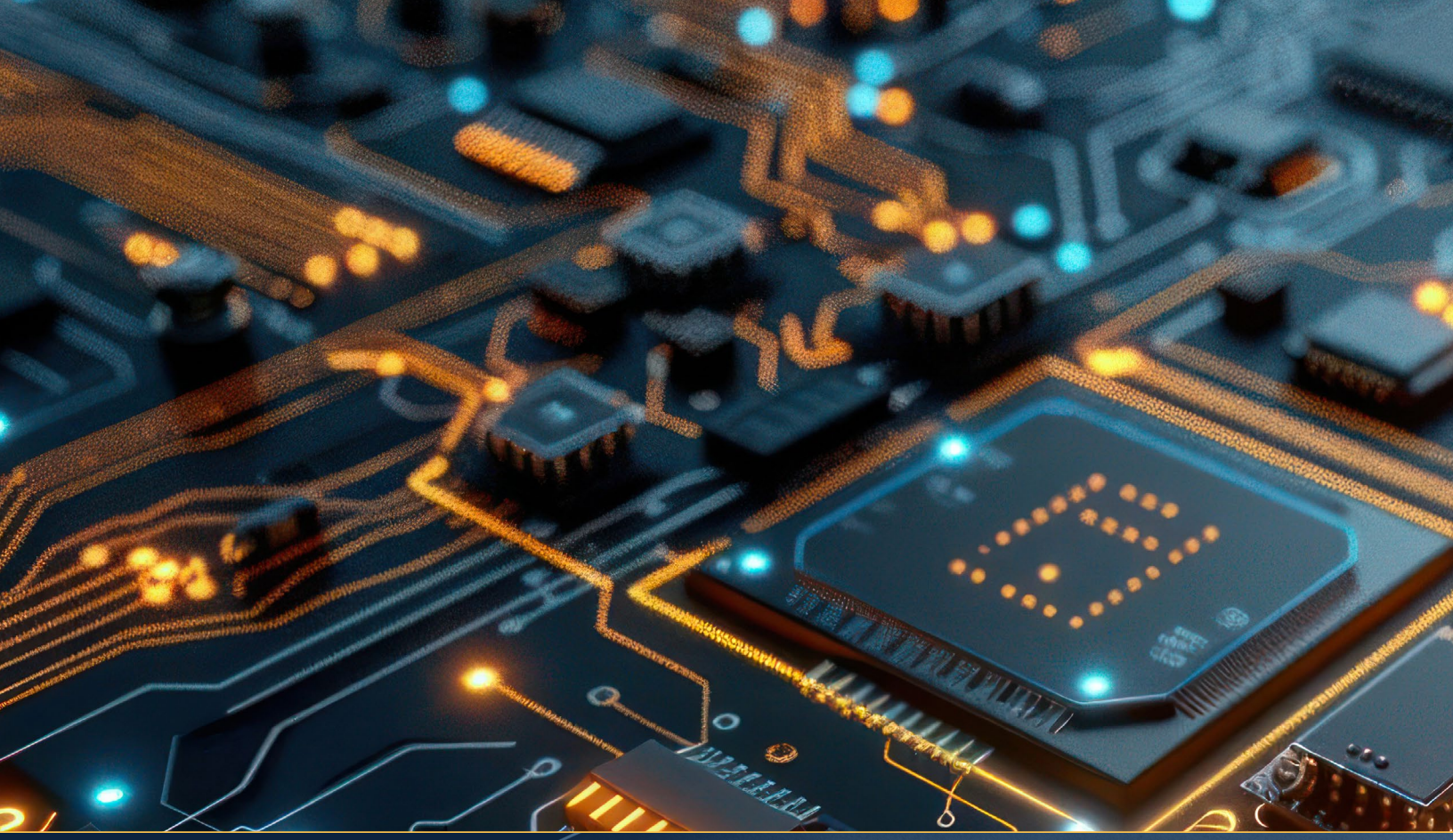


SPS Software

SPS software: The future of power system simulation

Continuity. Performance. Accuracy.

opal-rt.com

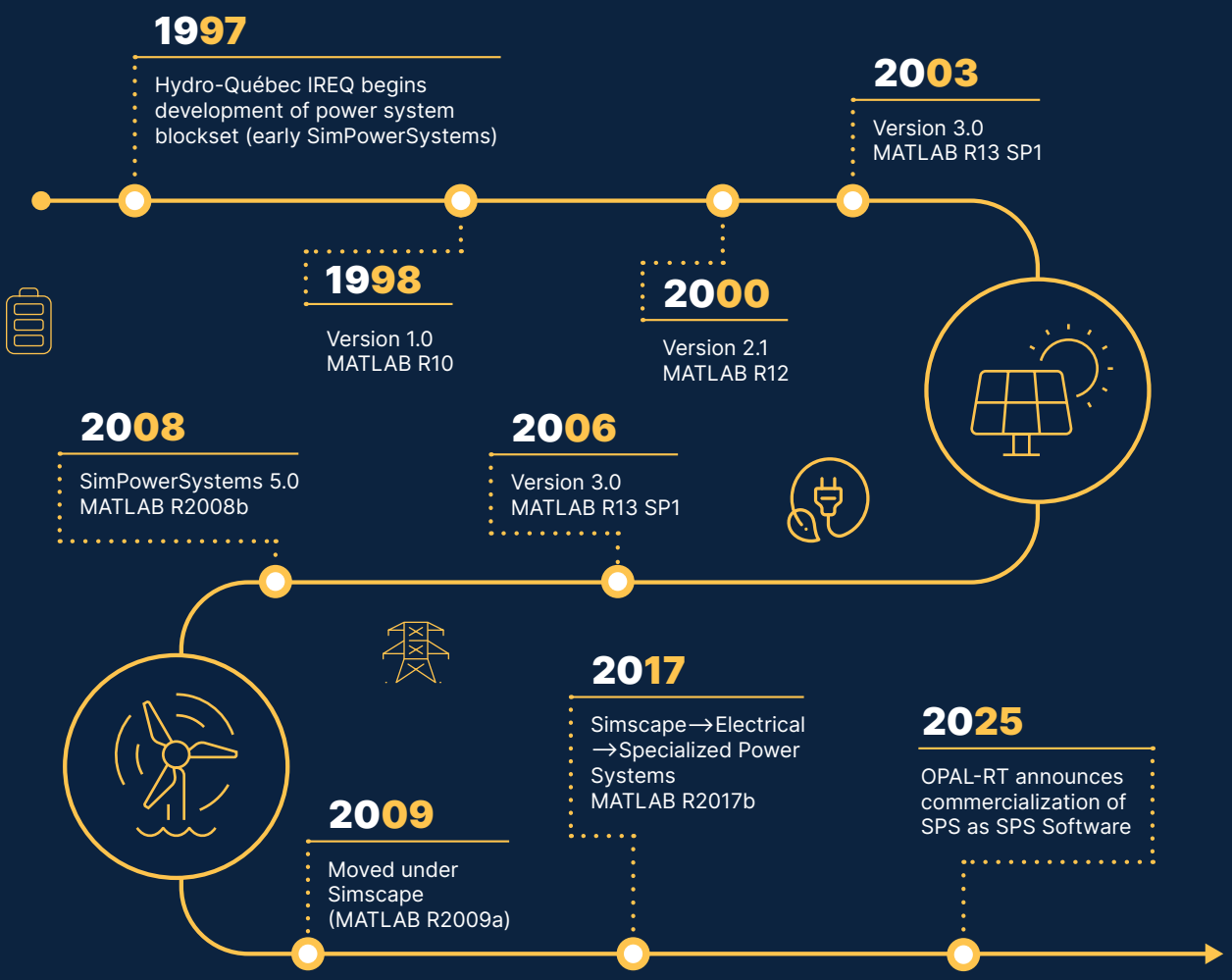
OPAL-RT TECHNOLOGIES

A new era for the SPS community

For over 30 years, SimPowerSystems (SPS) has been a trusted standard for power system modeling in MATLAB/Simulink, supporting engineers and researchers worldwide.

As MathWorks shifts toward Simscape Electrical, SPS users face a critical question: how to preserve existing models, workflows, and expertise without disruption.

SPS Software by OPAL-RT marks a turning point—ensuring continuity while enabling future innovation. More than a platform, it represents a renewed commitment to the SPS community, bringing users and experts together to shape the next generation of power system simulation.



Introducing SPS software by OPAL-RT

Power systems are evolving rapidly

Modern electrical networks are no longer passive—they are dynamic, converter-driven systems shaped by renewables, HVDC, and advanced control strategies. As complexity increases, engineers must simulate faster events, larger systems, and more demanding scenarios—without compromising accuracy or stability.

Simulation is no longer optional—it is mission-critical.

WHAT THIS MEANS FOR YOU

Accuracy you can trust

High-fidelity EMT simulation for modern power systems:

- Precise modeling of switching dynamics and converter behavior
- Reliable results for HVDC, microgrids, and inverter-based systems
- Stable numerical performance—even in large, complex networks

Continuity without compromise

Preserve your models, workflows, and expertise:

- 100% compatibility with existing SPS models
- No migration, no redesign, no retraining
- Full protection of validated engineering work

Performance at scale

Handle growing system complexity efficiently:

- Fast, consistent execution for large EMT simulations
- Optimized solvers for switching and stiff systems
- Faster iteration for design, testing, and validation

Why SPS still matters

Engineering solutions for modern power system simulation

Challenges	Solutions
1. Limited model transparency	**1. Physics-based, transparent modeling** Full visibility into system behavior for easier debugging and control validation.
2. Slow simulation & limited iteration	**2. High-performance EMT simulation** Faster execution enables more scenarios, quicker validation, and shorter development cycles.
3. Complex converter systems at scale	**3. Scalable modeling for large networks** Efficient handling of HVDC, MMC, and grid-scale systems without performance bottlenecks.
4. Risky & costly real-world testing	**4. Safe validation with real-time capabilities** Test controllers and system behavior in a controlled, risk-free environment.
5. Workflow disruption & model migration	**5. Full continuity — no migration required** Reuse existing models, workflows, and expertise without redesign or retraining.

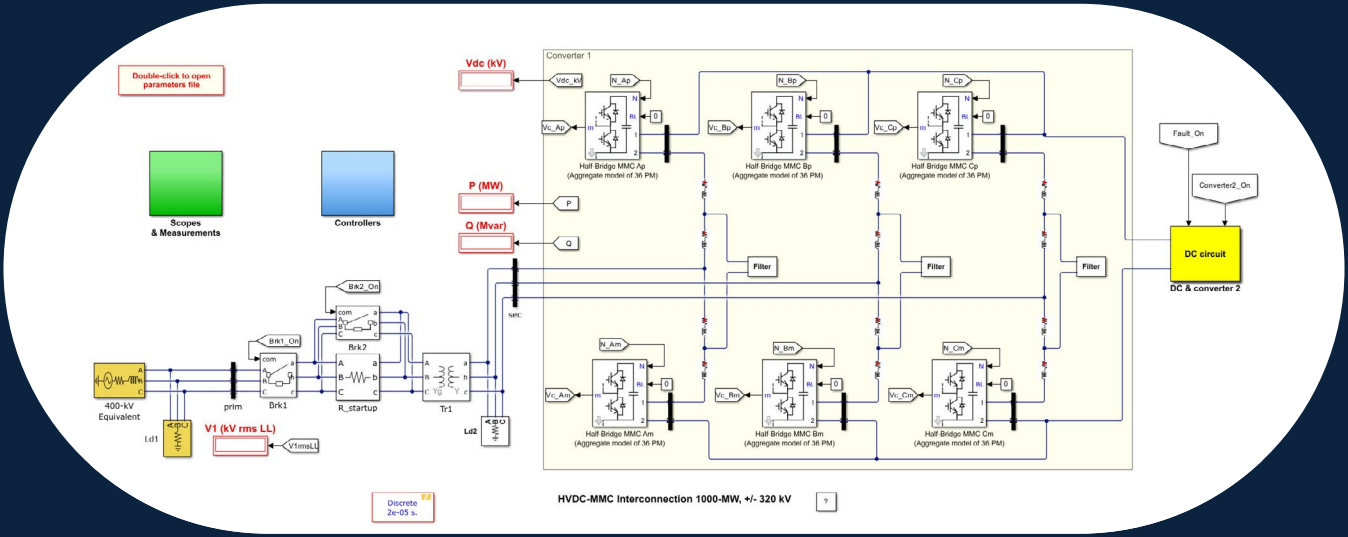
The following comparison provides a clear, engineering-focused view of how SPS Software and Simscape Electrical™ differ across performance, fidelity, and application readiness.

Engineering criteria	SPS Software	Simscape Electrical™
Primary Strength	Large electrical networks and power system EMT simulation	Multiphysics integration with Simscape
Execution Performance	Balanced and efficient for both networks and converters	Often significantly slower for EMT-scale studies
Library Maturity	Extensive, grid-oriented component coverage	Rich library, but navigation and completess vary
Initialization & Load Flow	Robust steady-state initialization and proven workflows	Convergence and unbalance handling still limited
Application Readiness	Strong advantage in HVDC, MMC, transmission, grid studies	More focused on component-level and multi-physics modeling
Example Quality	High-quality, well-documented legacy examples	Growing example base, but quality and robustness vary
User Transition Path	Full continuity through SPS Software	Requires adaptation; conversion tools remain partial

Proof in real systems

CASE EXAMPLE 1

HVDC-MMC system



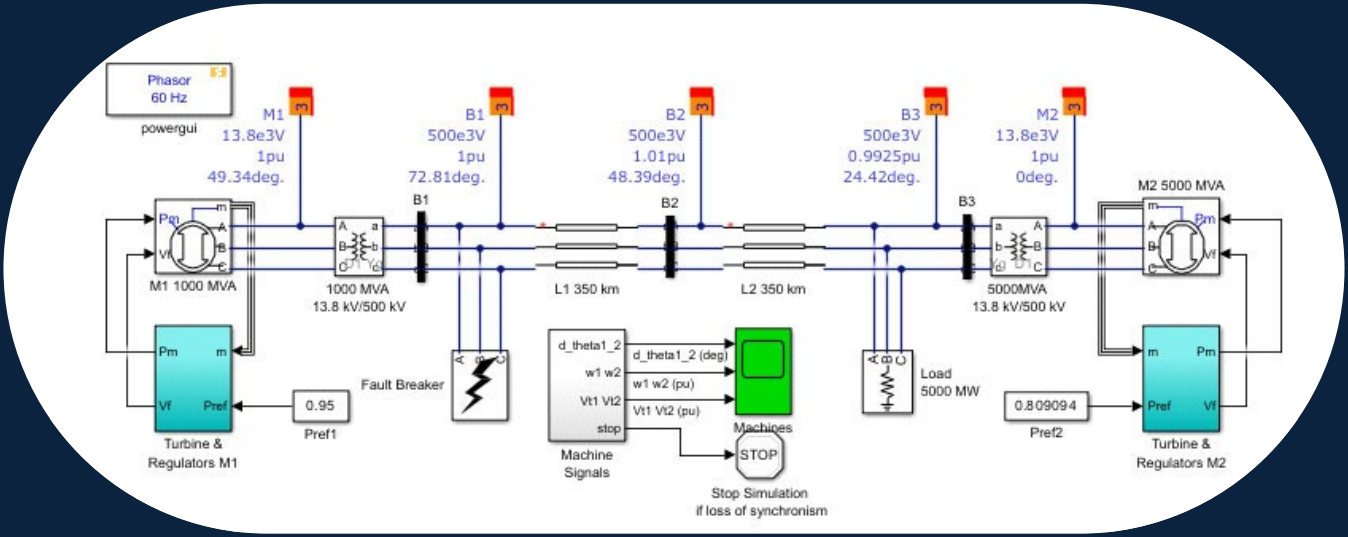
36 x 2 x 6 = 432 switches
2432 = 1.1091x10130 combinations
2216 = 1.0531x1065 combinations

SPS Software enables engineers to simulate complex converter systems efficiently while preserving system behavior.

- Large-scale model with 36 sub-modules per half-arm and 432 switches
- Extremely high number of switching combinations increases model complexity
- Efficient modeling approach simplifies the system without altering its general behavior

CASE EXAMPLE 2

Phasor or EMT simulation



SPS Software enables engineers to use the same model for both phasor and EMT simulations.

- Switch between simulation types by simply changing the solver in the powergui block
- No need to rebuild, duplicate, or adapt the model
- Consistent components, parameters, and workflow across both approaches

A new SPS ecosystem

More than just software, SPS Software is part of a complete ecosystem designed to enhance productivity, collaboration, and long-term success.

Documentation & resources

Modern Documentation

- Up-to-date guides and examples
- Ready-to-use models
- Easy onboarding and learning

User community

Active Global Community

- Engineers and researchers worldwide
- Shared knowledge and best practices
- Real-world applications and insights

AI support (Lisa)

AI-Powered Guidance

- Instant answers to technical questions
- Help with installation and licensing
- Direct connection to experts when needed

Continuous updates

Always Up to Date

- Aligned with MATLAB/Simulink releases
- Ongoing feature improvements
- No disruption to existing workflows

Discover the SPS Opal-RT community.

From simulation to real-time validation

SPS Software extends beyond offline simulation—bringing models into real-time execution with ARTEMiS.

Powered by ARTEMiS

- High-performance real-time EMT simulation
- Optimized for power electronics and large-scale systems
- Parallel computation for speed and scalability

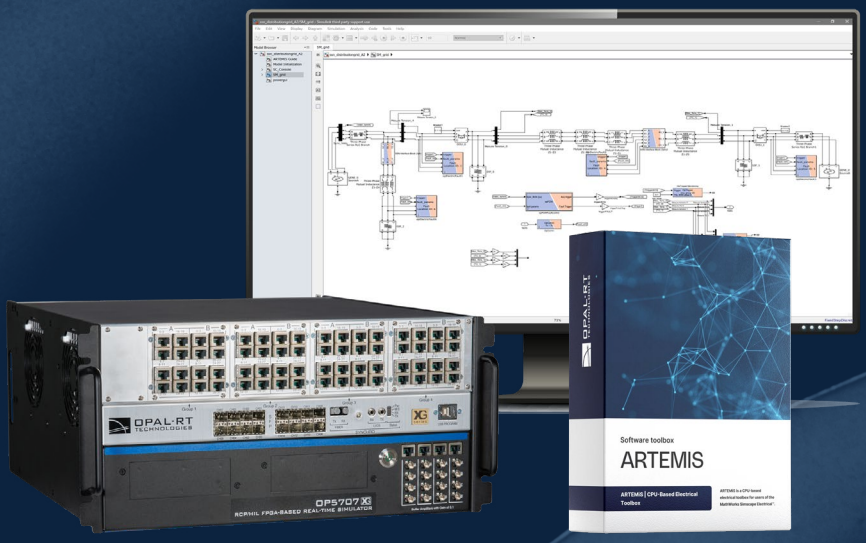
Validate with confidence

- Test real controllers using Hardware-in-the-Loop (HIL)
- Simulate faults and switching events safely
- Validate system behavior before deployment

One continuous workflow

Model → Simulate → Real-Time → Validate → Deploy

Same SPS model. Now running in real time with ARTEMiS.

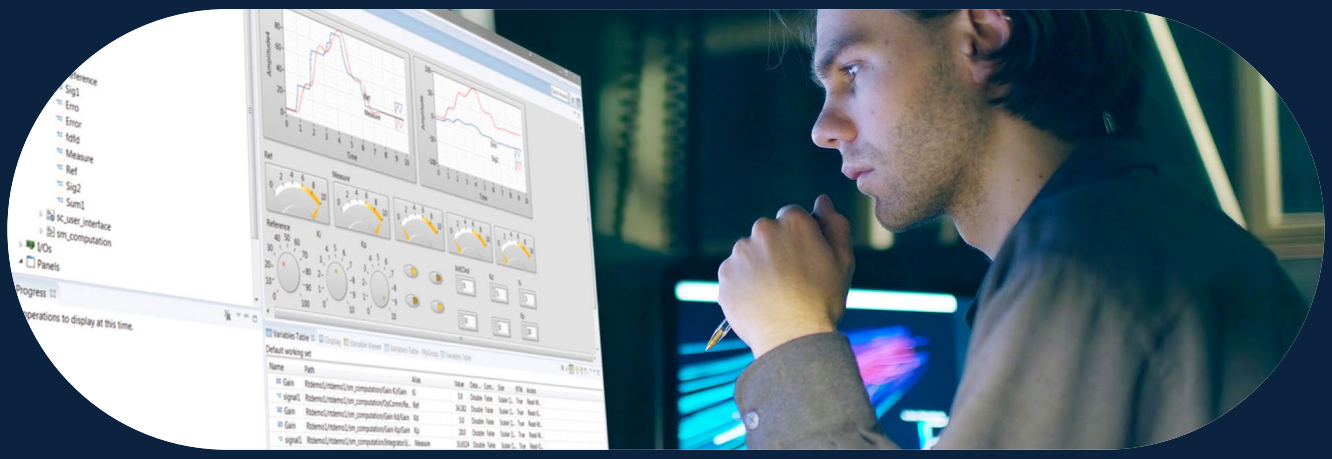


Start your SPS software journey

Seamless migration — no disruption

Same models. Same workflow. Same environment.

Enhanced performance, support, and real-time readiness.



MIGRATION WORKFLOW

1.
Set up access

Create or reset your SPS account

2.
Download

Get latest SPS toolbox (MATLAB add-on)

3.
Install

Install directly in MATLAB (.mltbx)

4.
Activate

Log in via OPAL-RT license portal

5.
Start using

Switch between legacy and new SPS

Flexible licensing

Student

For undergrads and grad students learning through coursework or thesis projects.

Academic

For faculty, teaching labs, and research teams conducting non-commercial work.

Professional

For undergrads and grad students learning through coursework or thesis projects.

Campus Wide

For faculty, teaching labs, and research teams conducting non-commercial work.

LICENSE OPTIONS

Annual

Fixed-term access with updates & support

Perpetual

Lifetime access + optional maintenance

Included with active license

- Regular software updates
- Technical support from experts
- Access to tools, documentation, and community

From installation to simulation in minutes—no migration required.

Start free trial.

Contact OPAL-RT.

Ready to innovate?

For over two decades, OPAL-RT TECHNOLOGIES has been a global leader in real-time simulation and hardware-in-the-loop (HIL) testing. Since 1997, OPAL-RT has empowered engineers and researchers with accessible, innovative, and customized simulation technology—bridging the gap between modeling and real-world applications. By leveraging high-performance computing, OPAL-RT accelerates the development of advanced solutions in energy, automotive, aerospace, and beyond. With our ISO 9001:2015 certification and a strong commitment to sustainable development, we're not just developing technology—we're building a better future, together.

Become part of developing the future and work with the world's leading innovators

Learn about our office culture, our benefits, our hiring process, our partners, and more

Stay in the loop with our events

OPAL-RT is present at numerous industry events around the world, culminating in our yearly RT conferences. These global gatherings provide a platform for industry leaders, researchers, and engineers to exchange knowledge, network, and explore the latest advancements in real-time simulation technology.

Join us to stay ahead of the curve and drive innovation in your field

OPAL-RT TECHNOLOGIES

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