

SIMple® is a powerful library of computational components designed for Altair Activate for modeling and simulation of accurate and high performance physical and logical dynamic systems. It has been used in the last decade to develop high-fidelity simulators of thermal powerplants for large multinational companies, such as Électricité de France and Petrobras, and individual components for a military vessel simulator for the Brazilian Navy. One SIMple® component can be used either as a single model or connected to other components to carry out modeling, calibration and real time simulation of systems, from single equipment to large plants. It is divided in three libraries for different scopes of simulation: SIMple® Thermal, SIMple® Control Systems and SIMple® Power Systems.

Meet SIMple® Power Systems

SIMple® Power Systems is a mono phase AC and DC network library tailor made to perform power flow and electromechanical stability analysis, being also capable to design protection circuits based on IEEE Std C37.2™-2008. The library contains a high-end solver developed and improved in the last 10 years that is fast and reliable and more than 20 blocks already compatible than can simulate both steady and transient state. The user can develop large circuits from power generation to consumption, simulating also power transmission and distribution to final consumers as well as network disturbances. The library was developed to meet the needed requirements to emulate large industrial electrical subsystems with high accuracy and then be used within SIMple's Operators Training Simulators (OTS).

<p>Power flow and electromechanical stability analysis</p>	<p>Real time Simulation with more than 20 blocks already available</p>	<p>Design protection circuits based on IEEE standard</p>
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SIMple® Power Systems was built in compliance with the same standard of SIMple® Thermal and SIMple® Control Systems and has already been used by SIMple® team to develop large thermal powerplant simulators systems with high accuracy. Now, it's been made available for **everyone** through Altair Activate, a multi-disciplinary system simulation software that offers great usability and a large set of features to the final user. Within Altair Activate, SIMple® Power Systems is as easy as a drag and drop to build any system in block diagram format. With currently 23 components, there's a wide range of lightweight models from trivial busbars to 6th order synchronous generators.

Equipment



Relays



Every component in SIMple® Power Systems library is developed to make it suitable to be used for even the most demanding applications – where accuracy and precision are mandatory. It's also extensively parameterizable to fit the user needs to model, calibrate and simulate.

SynchronousGenerator

Parameters Initial Conditions Outputs

Leakage reactance (Xl)	0.15	[p.u.]
Direct axis reactance (Xd)	2.2	[p.u.]
Direct axis transient reactance (X'd)	0.22	[p.u.]
Direct axis sub transient reactance (X''d)	0.18	[p.u.]
Quadrature axis reactance (Xq)	2	[p.u.]
Quadrature axis transient reactance (X'q)	0.4	[p.u.]
Quadrature axis sub transient reactance (X''q)	0.2	[p.u.]
Direct axis open-circuit transient time-constant (T'd0)	8	[s]
Direct axis open-circuit sub transient time-constant (T''d0)	0.02	[s]
Quadrature axis short circuit transient time-constant (T'q0)	0.8	[s]
Quadrature axis short circuit sub transient time-constant (T''q0)	0.03	[s]
Armature resistance	0.0025	[p.u.]
Inertia Constant	8	[s]
Damping Constant	0	[W/(rad.s)]
Frequency	60	[Hz]
Nominal Speed	3600	[RPM]
Nominal Voltage	13800	[V]
Power Base	160	[MVA]

Enable External Mechanical Power
 Enable Excitation Control
 Enable External Shaft Integration

Apply OK Cancel

Do you want to know more?



Talk with our specialists about the library and get to know it in more detail! Feel free to contact us and we will be happy to help you.

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Next story: stay tuned to our publications and get to know **special demos** in the sequence to see what SIMple® libraries are capable to do! Following us will also make you eligible to have access to more demos, user cases developed by our team and special offers!



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