

eHS FPGA-based Power Electronics Toolbox Comparison Charts

eHS Standard

| Features | eHSx32 | eHSx64 | eHSx128 |
|--|---|---|---|
| Targeted platforms | OP4200 (Zynq™ 7030) ¹ OP4512 (Kintex™ 7 410T) | OP4510 (Kintex™ 7 325T) OP4512/OP4610XG/OP4610-IO (Kintex™ 7 410T) OP5607/OP5700/OP5707XG/ OP5707-IO (Virtex™ 7 485T) | OP4510 (Kintex™ 7 325T) OP4512/OP4610XG/OP4610-IO (Kintex™ 7 410T) OP5607/OP5700/OP5707XG/ OP5707-IO (Virtex™ 7 485T) |
| Number of inputs | 32 | 64 | 128 |
| Number of outputs | 32 | 64 | 128 |
| Number of switches | 48 | 72 | 144 |
| Number of Non-Linear/ Variable components | 64 | | |
| LCA capability₂ | Yes | | |
| Maximum number of states₃ | 112 | 168 | 344 |
| Number of resistors | Unlimited | | |
| Switches type supported | IGBT/Diode, Diode, Breaker, Thyristor, Ideal Switch, FET, 2-Lvl Half- Bridge, 3-lvl NPC | | |
| Non-switching devices supported | Resistor, Inductor, Capacitor, Ideal Transformer, Mutual inductance, Serial and Parallel RLC, PI Line, Surge arrester, Variable Serial RL and Parallel RC, Saturable Inductor | | |
| Calculation power | 12.8 GFLOPS | 25.6 GFLOPS | 51.2 GFLOPS |
| Maximum number of parameter sets | From FPGA: Up to 512 scenarios ⁴ From CPU: Unlimited ⁵ | | |
| Compatible circuit editors | OPAL-RT Schematic Editor, SPS Simulink toolbox | | |

¹ This is the last RT-LAB/eHS version that supports the OP4200.

² LCA stands for Loss Compensation Algorithm. This feature optimizes losses for standard topologies such as the two-level and the three-level NPC arm converters.

³ Estimated values. The maximum number of states depends on the number of inputs and outputs that needs to be computed as well. There is no hard coded limit. If the time step required exceeds the solver's limit (4.8us), a compilation error will occur due to overpassing the circuit size limit.

⁴ The number of scenarios on FPGA available for a given circuit depends on the circuit complexity. Scenarios are not supported on the OP4200 target.

⁵ The number of scenarios on CPU available only depends on your memory allocated to MATLAB.

eHS FPGA-based Power Electronics Toolbox Comparison Charts eHS Advanced



| Features | eHSx32 | eHSx64 | eHSx128 |
|--|---|--------|--------------|
| Targeted platforms | OP4512/OP4610XG/OP4610-IO (Kintex™ 7 410T) OP5607/OP5700/OP5707XG/OP5707-IO (Virtex™ 7 485T) | | |
| Number of inputs | 32 | 64 | 128 |
| Number of outputs | 32 | 64 | 128 |
| Number of switches | 48 | 72 | 128 |
| Number of Non-Linear/ Variable components | 16 | 32 | 64 |
| LCA capability ₁ | Yes | | |
| Maximum number of states ₂ | 344 | | |
| Number of resistors | Unlimited | | |
| Switches type supported | IGBT/Diode, Diode, Breaker, Thyristor, Ideal Switch, FET, Cyclo Converter, 2-Lvl Half-Bridge | | |
| Non-switching devices supported | Resistor, Inductor, Capacitor, Ideal Transformer, Mutual inductance, Serial and Parallel RLC, PI Line, Surge arrester, Variable Serial RL and Parallel RC, Saturable Inductor | | |
| Calculation power | limited by time step | | 102.4 GFLOPS |
| Maximum number of parameter sets | From FPGA: Up to 512 scenarios ³ From CPU: Unlimited ⁴ | | |
| Compatible circuit editors | OPAL-RT Schematic Editor | | |

¹ LCA stands for Loss Compensation Algorithm. This feature optimizes losses for standard topologies such as the two-level and the three-level NPC arm converters.

² Estimated values. The maximum number of states depends on the number of inputs and outputs that needs to be computed as well. There is no hard coded limit. If the time step required exceeds the solver's limit (4.8us), a compilation error will occur due to overpassing the circuit size limit.

³ The number of scenarios on FPGA available for a given circuit depends on the circuit complexity.

⁴ The number of scenarios on CPU available only depends on your memory allocated to MATLAB.

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.



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