

# POWER ELECTRONICS

This table provides a comparison and visual summary of core features between several entry-level power electronics testing bundles.



	eHS32 Solver   OP4200 Introductory power electronics HIL simulator	eHS64 Solver   OP4510 Power electronics HIL simulator	eHS128 Solver   OP5707 The most powerful solution on the market
Part Number	OP42BDL-PE-EHS	OP45BDL-PE-EHS	-
<b>APPLICATIONS</b>			
Single inverter	✓	✓	✓
DC-DC converter	✓	✓	✓
2 x 3 Level back-back (48 switches)	✓	✓	✓
Dual inverter; DC-DC converter; electric motors	-	✓	✓
Hybrid Car drive	-	✓	✓
Dual NPC converter	-	✓	✓
Train drive (4 motors; converter stages; transformers)	-	-	✓
Multiple converters coupled together (scalable UPS system, micro grids, etc.)	-	✓	✓
MMC Converter (up to 512 levels, 2 terminals, 6000 sub-modules)	-	*** 256 levels; two terminals; 3,000 sub-modules	*** 512 levels; two terminals; 6,000 sub-modules
<b>HIGHLIGHTS</b>			
Oversized solver running on FPGA: no need to decouple your models.	Up to 48 coupled switches on 1 FPGA core	Up to 72 coupled switches on 1 FPGA core	Up to 144 coupled switches on 1 FPGA core
Generic and configurable FPGA solver: no need to use VHDL coding or recompile firmware.	✓	✓	✓

\*\*\* Optional

Specialized power system solver to optimize real-time performance of Simscape Power Systems (CPU simulation)  - Includes the fastest, most accurate solvers for eMEGASIM applications. ARTEMiS solvers and algorithms eliminate artificial delays, while using advanced decoupling techniques for added speed and efficiency.	N/A	***	***
Switching frequency	Up to 200 KHZ	Up to 200 KHZ	Up to 200 KHZ
Test scenarios for automated testing and repeatability	Up to 512	Up to 512	Unlimited (Python, C API)
Control loop minimum delay	1.5 $\mu$ s	1.5 $\mu$ s	1.5 $\mu$ s
Model minimum time step	100 $\mu$ s (CPU), 125 ns (FPGA)	3 $\mu$ s (CPU), 125 ns (FPGA)	3 $\mu$ s (CPU), 125 ns (FPGA)
Co-simulation CPU/FPGA	✓ (1 CPU Core)	✓ (4 CPU Cores)	✓ (Up to 40 CPU Cores)
Machine library PMSM, BLDC, Vdq Model, Induction Machine, Switched Reluctance Machine	N/A	2 machines instances	4 machines instances

## SOFTWARE

RT-LAB   Real-time Simulation Software	✓	✓	✓
Multi editor compatibility: reuse your current models made in SimPowerSystems®, PLECS®, PSIM® or NI MULTISIM®	✓	✓	✓
Supports the Simscape Power Systems & SimPowerSystems® library	N/A	✓	✓
eHS power electronic solver toolbox	eHS32	eHS64	eHS128
ARTEMiS: power electronics/power system solver license	N/A	***	eMEGASIM 1 to 40 Cores Fx
FPGA blockset development system	***	***	***

## TECHNICAL SPECIFICATIONS

Chassis	OP4200	OP4510	OP5700
CPU	Dual-core ARM® Processor Cortex® A9 1 GHz	4 Cores XEON E5 3.5Ghz	XEON E5 3.2Ghz up to 40 Cores
FPGA	Kintex 7 - 7030 - 125K LUT	Kintex 7 - 325T	Virtex 7
Maximum I/O cards per chassis	Up to 4 cards	up to 4 cards	Up to 8 cards
Remote I/O expansion capabilities (HSL)	✓	✓	✓

\*\*\* Optional

Analog Output   16 channels, 16bits, 1 MS/s, +/-16V	***	***	***
Analog Input   16 channels, 16 bits, 2MS/s, +/-20V	***	***	***
Analog Input   16 channels, 16 bits, 500 kS/s, +/-20V	***	***	***
Digital Input   32 channels, 4.5V to 50V, 40 ns	***	***	***
Digital Output   32 channels, 5V to 30V, 65 ns	***	***	***
Fast optical interface, 1 to 5 Gbits/s	2 ports	4 ports	16 ports
Optional RS422, fiber optic or synchronization modules	-	✓	-
Default RJ45 Ethernet ports	1 port	2 ports	2 ports
Additional RJ45 Ethernet ports (for IEC 61850 and other Ethernet-based protocols)	-	2 ports ***	4 ports ***
RS232, up to 250kbps, full duplex per channel	2	1	1
<b>COMMUNICATIONS PROTOCOLS</b>			
CAN Bus, 1Mbps, half duplex per channel	2 channels ***	4 channels ***	4 channels ***

\*\*\* Optional