

RCP TESTING SIMULATOR



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



 RT-LAB



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	RT-LAB OP4200 Small all-purpose RCP system	RT-LAB OP4510 Power electronics RCP system	RCP SYSTEM for fast simulation on CPU & FPGA
Part Number	OP42BDL-RCP-SPS	OP45BDL-RCP-SPS	-
APPLICATIONS			
Speed/position control loop validation	✓	✓	✓
Current control loop validation	***	***	✓
Model-In-the-Loop, Software-in-the-Loop, Hardware-In-the-Loop simulations	✓	✓	✓
Processor in the Loop simulation	✓ (Zynq®)	-	-
Signal generator	✓	✓	✓
Data acquisition	✓	✓	✓
HIGHLIGHTS			
Outer control loop frequency (CPU)	< 10 kHz	< 100 kHz	< 100 kHz
Fast control loop frequency (with optional FPGA RT-XSG blockset)	< 1 MHz (option)	< 1 MHz (option)	< 1 MHz
Advanced PWM generation (up to 200 kHz, resolution 5 ns)	✓	✓	✓
RCP Firmware for power electronics - ADC/PWM synchronization	✓	✓	✓
Sensor models (Encoder, Resolver, Hall Effect)	✓	✓	✓

*** Optional

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FPGA electric machine library (PMSM, IM, SRM motor models)	N/A	***	✓
Co-simulation CPU/FPGA	✓ (1 CPU Core)	✓ (4 CPU Cores)	✓ (up to CPU 40 cores)
Simulink modeling	✓	✓	✓
Protective relay, PMU and SmartGrid IED prototyping	-	✓	✓
Electric drive control prototyping	***	***	✓
SOFTWARE			
RT-LAB Real-time Simulation Software	✓	✓	✓
RT-XSG toolbox for FPGA real-time simulation	***	***	***
TECHNICAL SPECIFICATIONS			
Chassis	OP4200	OP4510	OP5030 or OP5700
CPU	Dual-core ARM® Processor Cortex® A9 1 GHz	4 Cores XEON E5 3.5Ghz	Up to 40 cores XEON E5 or E7
FPGA	Kintex™-7 FPGA, 125K LUT	Kintex™-7 FPGA, 325T	Virtex®-7 FPGA, 485T
Maximum I/O boards per chassis	Up to 4	Up to 4	8
Remote I/O expansion capabilities (HSL)	✓	✓	✓
Analog output 16 channels, 1 MS/s, 16-bit	***	***	***
Analog input 16 channels, 2 MS/s, 16-bit	***	***	***
Analog input 16 channels, 500 kS/s, 16-bit	***	***	***
Digital input 32 channels, 40 ns high-speed digital I/O	***	***	***
Digital output 32 channels, 65 ns high-speed digital I/O	***	***	***
Fast optical interface, 1 to 5 Gbits/s	2 ports	4 ports	16 ports
USB 2.0	1 port	2 ports	2 ports

*** Optional

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Optional RS422, fiber optic or synchronization modules	-	***	-
Remote I/O expansion capabilities	✓	✓	✓
Default RJ45 Ethernet ports	1 port	2 ports	2 ports
Additional RJ45 Ethernet ports (for IEC 61850 and other Ethernet-based protocols)	-	*** (2)	*** (4)
RS232, up to 250kbps, full duplex per channel	2	1	-
COMMUNICATIONS PROTOCOLS			
CAN Bus, 1Mbps, half duplex per channel (option)	2 channels ***	4 channels ***	-
LIN (v1.3, v2.0)	-	***	***
Industrial protocols (Modbus, Profibus, EtherCAT)	-	***	***
Sensing protocols (BiSS-C, Endat, SSI, I2C, SPI)	***	***	***

*** Optional