SciEngines
massively parallel computing

DATASHEET


# RIVYERA S6-LX150

128 FPGA Next Generation Reconfigurable Computer
with Dual Intel® Xeon® Scalable Processor per System

# RIVYERA™
# S6-LX150

128 FPGA Next Generation Reconfigurable Computer

**RIVYERA**, developed as a direct successor to COPACOBANA, consists of a 16-slot backplane equipped with 16 FPGA-cards. Each of the FPGA-cards carries up to 8 high-performance FPGAs interconnected by a high-throughput bus system.

Using 128 Spartan–6 LX150 FPGAs in its standard configuration, RIVYERA S6-LX150 takes application-specific computing to a new level and provides high-density supercomputing resources to a wide audience. Providing local RAM, RIVYERA offers sufficient memory for all types of computation and data.

Each RIVYERA has an integrated off–the–shelf eATX-based high-performance PC that can be used for heterogenous computing and acts as an interface to the rest of the network. The PC and the FPGA supercomputer can be internally connected through up to four PCI-Express*-based interface cards.

Dual Intel® Xeon® Scalable Processor per System allow compute intensive host applications.

* (optional; further upgrades possible)
*** 128 FPGA setup
**** bto


## Key Features

- 8 to 128 Spartan-6 LX150 FPGAs per machine
- up to 30000 CPU cores performance (application-specific)
- up to 65 GB distributed DDR3 memory, 4 TB distributed SDHC
- Gigabit connectivity, unlimited scalability
- Green super-computing at 1280 Watt***
- IP-cores and implementation support available
- Mixed FPGA setups are supported; individual addressing of FPGAs as well as broadcasting possible; FPGAs runtime reprogrammable

**Application-specific computing for all areas with extraordinary processing requirements.**

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# Full Specification

## Processing

- 8 to 128 FPGAs per RIVYERA
- Xilinx Spartan-6 LX150 (XC6SLX150)
- different FPGA models possible as custom development option
- 512 MByte DDR3-333 RAM per FPGA
- optional: 32 GByte SDHC FLASH per FPGA
- 16 slots backplane for cards equipped with SciEngines' high-throughput interface
- 1 one lane PCI-Express Gen-1 based interface card, optional: Up to 4 PCIe interface cards possible

## Host PC

- off-the-shelf server-grade PC, up to Dual Intel® Xeon® Scalable Processor per System (e.g. Intel Xeon Silver 4208
- up to 16 DDR4-2666MHz DIMM slots e.g. 3 x Micron MTA36ASF4G72LZ-2G6
- 2 x 10⁄100⁄1000/10000BASE–T RJ–45 ethernet interface
- ASPEED AST2500 based IPMI
- Rear Panel I/O, VGA Port (D-Sub), USB (offered interface depends on configuration and selected host)

## Included Software and API

- Linux based operating system (typically: AlmaLinux 8 or later)
- SciEngines API (supports multiple design flows including VHDL and C/C++)
- API compatible with Xilinx ISE and all major synthesis design flows
- Communication Framework
- Communication Test
- Controller IP core
- Application development software
- Optional: Xilinx ISE 14.7 or later (additional license required)

## Form Factor, Power and Thermal Technology

- 4 HU (175mm), 19-inch (447mm), full size (840mm)
- Weight: depends on configuration, e.g. 57 pounds (26.1 kg) base configuration
- Output power: 1280W (redundant power supply)
- optional 3000W power supply available
- Line voltage: Universal input (100V to 240V AC), power factor corrected
- Maximum input current: 32.0A (100V to 120V) or 16.0A (200V to 240V)
- Frequency: 50Hz to 60Hz, single phase
- Fits EIA–310–D–compliant, industry–standard 19-inch four–post racks and cabinets

## Environmental

- ROHS compliant
- Cooling: Ventilation
- Operating Temperature: 10° to 30° C (50° to 90°F)
- Non-operating Temperature: -40° to 70° C (-40° to 158° F)
- Operating Relative Humidity: 8% to 70% (non-condensing)
- Non-operating Relative Humidity: 5 to 95% (non-condensing)
- Optional: Military quality hardware

## Ordering, Deliverables and Service

- RIVYERA, incl. integrated PC
- Rack mounting hardware
- Power cords and I/O cable (depends on option)
- Printed and electronic documentation
- API, Examples, Drivers and Utilities CD–ROM
- 30 days product support (technical support, support via phone and mail) 1 year warranty
- Optional: IP cores

**Additional information available at**
**www.SciEngines.com or info@SciEngines.com**

## Imprint

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