RIVYERA X-32G1

A 32 FPGA, High Logic Resource Count

Next Generation Reconfigurable Computer

RIVYERA™

X-32G1

32 FPGA High Logic Resource Count
## Next Generation Reconfigurable Computer

SciEngines is a leading platform provider for massively parallel reconfigurable FPGA based computing platforms. RIVYERA X-32G1 is a direct successor to previous RIVYERAs, it consists of an 8 slot backplane equipped with up to 8 PCIe-based Compute Module Carrier Cards (CMCC). Each CMCC can be equipped with up to 4 FPGA compute modules. The computer backplane is PCIe Gen3 switch based and provides one physical PCI Express x16 connector per CMMC. The backplane and CMCC is compatible with Gen1.1, Gen2 and Gen3 based FPGA compute modules. Each FPGA card provides one Intel® Arria® 10 FPGA equipped with a x4 based connector.

64 GByte of eMMC based FLASH memory per FPGA organised in two banks of 32 GBytes each allow memory intensive applications.

Each RIVYERA has an integrated dual processor mainboard 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 a state of the art based PCI-Express based switch fabric supporting up to Gen3. A Dual Intel® Xeon® Scalable Processor per System allows compute intensive host applications.

Key Features

- 1 to 8 RIVYERA X-32G1 Compute Module Carrier Cards (CMCC) per machine
  - up to 4 Intel Arria 10 GX 1150 Series FPGA-cards per CMCC
  - e.g. G1 FPGA-card: 4 lane PCIe Connector per FPGA card (Gen2)
  - 64 GByte eMMC FLASH per FPGA
    (therefore up to 2 TByte eMMC based Flash per system, if all slots and compute modules installed)

- 2 Intel® Xeon® Scalable Processor series CPUs per RIVYERA computer
  - Alma 8.0 LINUX based operating system
  - two 10/100/1000/10000 Mbit Ethernet interface
  - one 10/100/1000 Mbit Ethernet Interface (for service operation)
  - up to 3 TBbyte* DDR4 ECC

- Gigabit connectivity, unlimited scalability
- Green super-computing at approximately 2000 Watt (depends on configuration)
- Service contracts of up to 7 years duration
- IP-cores and implementation support available
- FPGAs runtime reprogrammable
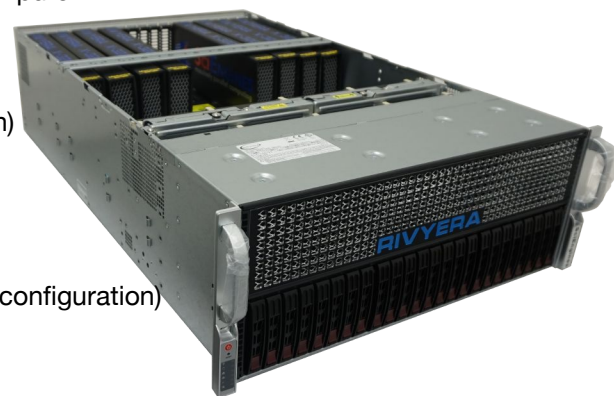
*requires 3DS LRDIMMs and customer specific processors configuration

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Full Specification

Processing

- 1 to 32 FPGAs per System, Intel Arria® 10 GX FPGA with 1150000 Cells each in 20nm technology (e.g. 10AX115H4F34E3SG or 10AX115H4F34E3SGE3)
- two 32 GByte eMMC FLASH per FPGA
- 8 slots backplane for SciEngines Compute Module Carrier Cards equipped with SciEngines' high-throughput interface

Host PC

- Integrated server grade host, configuration depends on model and individual configuration.
- Dual Socket Dual Intel® Xeon® Scalable Processors series
- up to 24 DDR4-2400MHz DIMM slots Up to 24 Hot-swap 2.5" drive bays
- 2 x 10⁄100⁄1000/10000BASE–T RJ–45 ethernet interface
- 1 x10⁄100/1000 BASE–T RJ–45 ethernet Integrated management interface dedicated LAN
- Rear Panel I/O, VGA Port (D-Sub), USB

host default specification

- 2 x Intel® Xeon® Silver 4108 Scalable Processor or better
- 128GByte RAM (4 x 32 GByte DDR4-2400MHz ECC RAM modules) or better
- 1 TByte based SSD or better

(Contact sales for customer specific configuration)

Included Software and API

- Linux-based operating system (typically: Alma 8.0 based, Kernel 3.0 or later)
- SciEngines API (supports multiple design flows including VHDL and C/C++)
- Communication Framework
- Communication Test
- Controller IP-core
- Optional: Quartus Prime Pro 20.2 or later (additional license required)

Form Factor, Power and Thermal Technology

- 8 Hot-swap 92mm cooling fans
- 4 HU 178 x 437 x 737 mm
- 4 Power Supplies 2000W each in (2+2) Redundancy

RIVYERA™ X32G1, SciEngines GmbH

Environmental

- ROHS compliant
- Cooling: Ventilation
- Operation temperature: 10°C ~ 18°C
- Non-operation temperature: 0°C ~ 70°C
- Operating Relative Humidity: 8% to 70% (non-condensing)
- Non-operating Relative Humidity: 5 to 95% (non-condensing)

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, digital copy on system (technical support, support via phone and mail) 1 year warranty
- Optional: Service contracts of up to 7 years duration
- Optional: IP cores

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

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