Expanding the limits of High Performance Computing

High Density Compute Accelerator

CA16010
Add up to 81,920 CUDA cores and 10,240 Tensor Cores to any Server with NVIDIA Volta GPU Accelerators

www.onestopsystems.com
The Accelerator is cabled to up to four host computers through PCIe x16 Gen3 connections at up to 512Gb/s bandwidth.

**Cable Specifications**
- Cable Lengths:
  - 0.5m (1.64’)
  - 1.0m (3.28’) (Standard)
  - 1.5m (4.92’)
  - 2.0m (6.56’)
- Circuits ( Loaded): 136
- Gender: Male-Male
- Lock to Mating Part: Yes
- Material — Metal: Zinc Alloy
- Pitch — Mating Interface: 0.80mm (.031”)
- Single Ended: No
- Waterproof/Dustproof: Yes
- Wire Size AWG: 28
- Wire/Cable Type: Round
- Electrical Current — Max per Contact: 1A
- Shielded: Yes
- Voltage — Max: 30v DC

**Bracket:**
- Standard and low profile brackets available
- Two LEDs on bracket:
  - Upstream link status &
  - Downstream link status

**Cable Adapter Specifications**
- PCIe Switch:
  - PLX PEX8733
  - 8.0 GT/s 32-Lane PCI Express Gen 3 Switch
- DMA controller
- SSC Isolation

- PCIe x16 half-height, half-length
- 5.85 x 2.34” (14.85 x 5.94 cm)
- 17W max, 1.5A @ 3.3V, 900mA @ 12V, 250mA @ 3.3V aux
- PCIe x16 Cable connector: Molex 0755810009 per PCI-SIG PCI Express®
  - External Cable Specification 2.0
  - PCI Express add-in card standard

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The all-steel construction, 3U rackmount chassis houses three 3000-watt power supplies, four canisters with four boards each, and an IPMI module. Power is routed from the power supplies to the canisters through a power bus-bar, eliminating bulky wiring harnesses. The modular canisters and power supplies slide into the fixed enclosure, connecting to their respective backplanes.

**3U Rackmount Chassis**

**Enclosure Specifications**
- Dimensions: 17”W x 5.25”H x 38”D
- Supports 16 full-length, full-height, 2-slot PCIe x16 add-in cards
- All 16 boards face the rear of the chassis (no IO bracket access)
- Removable front bezel with air filter
- Optional reverse airflow version available
- Front add-in card and power supply status LEDs
- Front and rear panel system status, alarm and chassis ID LEDs
- Four rear panel PCIe x16 Gen3 cable interfaces
- 4 individually-removable rear fans and 4 canister mounted fans
- Weight: 92lbs when fully populated with 16 GPUs
The High Density Compute Accelerator Adds 1.7 PETAFLOPS of Tensor Performance

The Accelerator is equipped with an IPMI system monitor that remotely monitors the fans, temperature sensors and power supply voltages using redundant Ethernet ports.

The IPMI system management module also controls chassis resources including various popular accelerators. It supports command line or web interface (GUI) and SNMP v2c and v3 protocols as well as RMCP+ protocol.

*Using 16 NVIDIA Tesla V100 PCIe GPUs each at 112 TFLOPS Tensor Performance*
Four Integrated Canisters

Each canister supports four PCIe x16 Gen3 boards and has an intake fan mounted on the front. Canisters are delivered with either NVIDIA GPU accelerators or Intel Xeon Phi coprocessors installed. Ask about other GPU or FPGA options.

Canister Specifications
- (4) PCIe 3.0 x16 double-spaced slots
- (4) 8-Pin 12V power connectors for GPU/PHI AUX power cables
- (1) PCIe 3.0 x16 front accessible network slot
  - Supports 100Gb/s EDR IB HHHL
  - Other network options available
- PCIe 3.0 switch - PEX8796

Redundant Power

The three 3000-watt redundant power supplies convert standard AC power into 12 VDC to provide ample power for all 16 boards.

Power Specifications
- 6000W redundant power subsystem
- Three 3U 3,000-watt front removable, hot-swap supplies
- Each supply measures 1U (1.65” x 2.7” x 28.5”)
- 2+1 redundant with full current sharing operation
- 3,000W each at 208-277VAC, 15A max input
- 1,500W each at 90-124VAC, 15A max input
- 15A breaker and IEC C19 power input at rear for each supply
- +12V and +12V standby voltage outputs
- All +12V power rails shared on copper bus bar delivery system
Compatible GPUs and Coprocessors

NVIDIA Tesla GPUs
- V100 Specs
- P100 Specs
- M40 Specs
- K80 Specs
- M60 Specs

NVIDIA Quadro GPUs
- M6000 12GB Specs
- M6000 24GB Specs

Intel Xeon Phi Coprocessors

AMD FirePro GPUs

The High Density Compute Accelerator is also available in a 4U chassis to accommodate consumer GPUs like the GeForce GTX 1080 that have power connectors on the top of the GPU.
The HDCA enclosure is a 3U rack mountable chassis that is all steel construction. The chassis is 38” deep. The enclosure contains four accelerator canisters and three 3,000-watt power supplies. The HDCA supports up to sixteen full-length, full-height and double-width PCIe cards. It also contains an IPMI 2.0 system monitor and alarming module.

**Main Backplane**
- Four PCIe 3.0 x16 cable inputs to rear of enclosure
- Four PCIe 3.0 x16 high-density connectors to each canister
- Three PCIe 3.0 switches manage PCIe cross connects from cables to canisters
- 2x RJ45 connectors for IPMI v2.0 System Monitor
- 1x HD DB-9 serial port for IPMI network configuration
- Optional RJ45 for basic SYSMON2 chassis monitor (not required when using IPMI System Monitor)
- Supports bus-bar power distribution to the canisters through 8 high-power bladed connectors (2 per canister)
- On board IPMI System Monitor & SYSMON2 connectors

**Power Cords**
- The HDCA ships with C19-C20 15A PDU type power cords
- 240V power cord for PDUs
- OSS Part number: OSS-CBL-PWR-C20-C19-15A-8
- IEC C19 to IEC C20, Straight, 14AWG, 15A, 8’ (2.44m)
- Other power cords available on request

**Cooling**
- Four 80 x 80 x 38mm fans on the rear of the enclosure
- One 80 x 80 x 38mm fan on the front of each canister (4 total)
- All fans are 141CFM each in push-pull configuration
- All fans PWM monitored and speed controlled by the IPMI system monitor
- Rear fans hot-swap from rear of the chassis
- Power supplies separately cooled from internal 25mm fans
- Optional liquid cooling for approved accelerators available

**System Monitoring/Alarming**
- Fully IPMI v2.0 compliant monitoring, control & alarming system
- Temperature
  - Monitors inlet & exhaust temperatures
  - Fan speed auto adjusts by internal air temperature
  - Alarm set-points for over temperature
  - Fans
    - Monitors all system fan tachometers
    - PWM fan speed control from IPMI monitor
    - Alarms for slow or failed fans
  - Power
    - Monitors supply 12C telemetry
    - Monitors output voltage rails
    - Alarms for voltages out of range
    - Alarms for supply Failure
    - Additional Cards
      - Monitors add-in card 12C SM bus
      - Alarms for abnormal card telemetry for approved accelerators Interface
    - CLI or web GUI
    - Supports SNMP and RMCP
    - Remote chassis ID LED control for tagging chassis for service

**Air Filter**
- 30 ppi open cell polyfoam installed in bezel
- Die-cast, removable, washable and replaceable

**Operating Environment**
- Temperature range:
  - Operating: 10°—35°C (10°—30°C for 16 300+W GPUs)
  - Storage: -40°—85°C
- Humidity range:
  - Operating: 20% to 80% relative (non-condensing)
  - Non-operating: 5% to 95% relative (non-condensing)
- Altitude range:
  - Operating: 0 to 10,000 ft.
  - Storage: 0 to 50,000 ft.

**Agency Compliance**
- Certified to meet the following:
  - FCC - Part 15 of the FCC Rules, Class A, 47CFR
  - Canada ICES-003, Issue 4, Class A
  - UL/IEC 60950-1
  - UL/CE/50-1
  - IEC 60950-1 (CB Certificate and CB Test Report)
  - CE Mark (EN55022 Class A, EN60950-1, EN55024, EN61000-3-2, EN61000-3-3)
  - CISPR 22, CISPR 24, Class A
  - CE Emissions 2004-108EC
  - RoHS compliance (Directive 2002/95/EC)
  - CCN NWWG, NWG7

Designed to meet the following certifications with testing currently pending:
- Argentina: IEC60950-1
- Japan: VCCI, Class A
- Australia/New Zealand AS/NZS CISPR 22, Class A

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