



HORUS200

19" 1U RACK-MOUNT FANLESS COMPUTER
WITH INTEL® XEON® D PROCESSOR
COMPUTER



POWER AUTOMATION COMPUTER

- Design for reliability under demanding MIL-STD-810G Thermal, Shock, Vibration, Humidity/EMI/EMC conditions
- Ultra-High Performance Intel® Xeon® D-1587 (2.3GHz, 16 cores, 32 threads)
- Up To 128GB DDR4 ECC RDIMM
- Hardware Secure Erase

Features

● Ultra-High Performance Intel® Xeon® Processor

Broadwell DE:

The Intel® Xeon® processor D-1500 product family is Intel's third-generation 64-bit system on a chip (SOC) and the first Intel® Xeon® SoC based on Intel® 14 nm silicon technology. This lineup offers hardware and software scalability from two up to sixteen cores, making it the perfect choice for a broad range of high-performing, low-power solutions that will bring intelligence and Intel® Xeon® reliability, availability, and serviceability (RAS) to the edge. For applications where space is a premium, an integrated Platform Controller Hub (PCH) technology and Intel® Ethernet in a ball grid array (BGA) package offer an inspiring level of design simplicity. The Intel® Xeon® processor D-1500 product family is offered with a seven-year extended supply life and 10-year reliability for Internet of Things designs.

Enhanced performance per watt:

The Intel Xeon processor D-1500 product family delivers exceptional value and unmatched performance density per watt with Intel® Xeon® processor in a SoC package. Its TDP of ~19W to 65W, industry-leading 14 nm process technology and a compute-only design make it ideal for meeting the diverse needs of customers seeking mid-range low-power, high-density solutions.

Expanded hardware and software scalability:

The Intel Xeon processor D-1500 product family boasts hardware and software scalability from two to sixteen cores in a thermal design power (TDP) of ~19W to 65W. Utilizing similar development tools and processes as Intel® Core,™ Intel® Atom,™ and other Intel Xeon processors, the Intel Xeon processor D-1500 product family delivers broad application compatibility and software consistency from the data center to the edge. The reliable Intel® x86 64-bit software support helps save time, cost, and validation.

Integrated SoC solution:

Save on engineering time and cost thanks to the efficiency of a one-chip solution offered by the Intel Xeon processor D-1500 product family. It brings the performance and advanced intelligence of Intel Xeon processors into a dense, lower-power system-on-a-chip. It removes board design complexity by integrating Platform Controller Hub technology and Intel® Ethernet, and by utilizing an integrated heat spreader and a BGA package to meet TDP targets.

Enabling more IoT Use Cases:

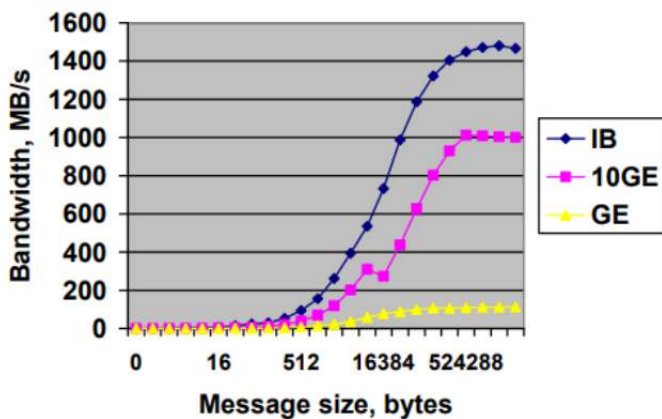
The Intel® Xeon® processor D-1500 product Family drives a host of new IoT opportunities for a wide range of environments, while addressing real-time optimization, and workload consolidation. Its temperature rating spans from -40° C to 85° C operating ambient conditions, which establishes new possibilities for Intel® architecture in markets that require robust products, like aerospace and industrial.



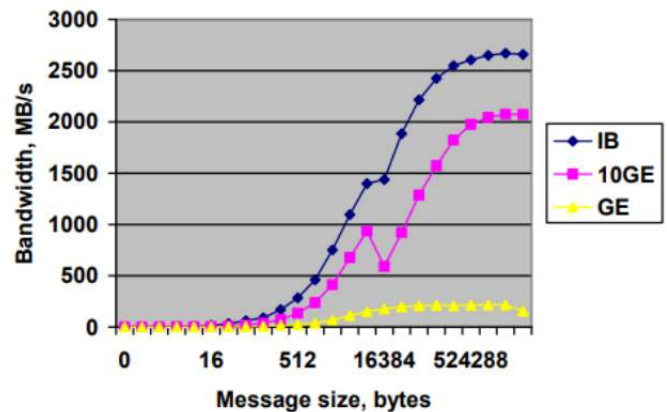
- **Dual 10-Gigabit Ethernet + Quad Gigabit Ethernet**

The Intel® Ethernet Connection X557 family is a 10 Gigabit Ethernet (GbE) copper networking Physical Layer (PHY) for workstation, server, and embedded designs that have critical space and power constraints. And for Network Interface Cards (NICs) and LAN on Motherboard (LOM) applications that require 10GBASE-T capability.

Ping-Pong Bandwidth



Exchange Bandwidth



- **Swappable CMOS Battery**

If the computer date has reset to the BIOS manufacturer date, epoch, or a default date such as 1990, 2000 or 2005, it is a good indication that the CMOS battery is failing or is already bad. This 1U Rack-mount computer has an easy to replace swappable battery tray. Pull the tray fully out of the computer and you'll see a coin-cell battery. Using new CR2032 battery, replace and push the tray back into the computer and lock screw.



- **Dual Removable Solid-State Disk**

An ultra durable metal casing provides efficient protection Easy handle, quickly and easily swap Maintenance and replacement conveniences. Easy remove and insert of dual 2.5in SATA hard drives from single drive bay. This rugged SATA hard drive swap bay allows you to install two 2.5in SATA hard drives (HDD) or solid state drives (SSD)



- **MIL-STD-1275/704 Power supply with Voltage transient protections**

To enhance reliability, HORUS200 is designed for rugged extremes. durable metal casing with an isolated MIL-STD-1275, MIL-STD 704 and DO-160 power supply in an IP50 (dustproof) ultra durable metal / aluminum chassis that protects against vehicle/aircraft voltage surges, spikes and transients is well suited for the strictest military requirement and deliver optimal performance in harsh conditions.

The GAIA Hi-Rel DC/DC CONVERTER it also provides Undervoltage Lockout

(UVLO), Output Over Current Protection (OCP), Output Overvoltage Protection (OVP) and Over Temperature Protection (OTP) to made robust and safe to use.

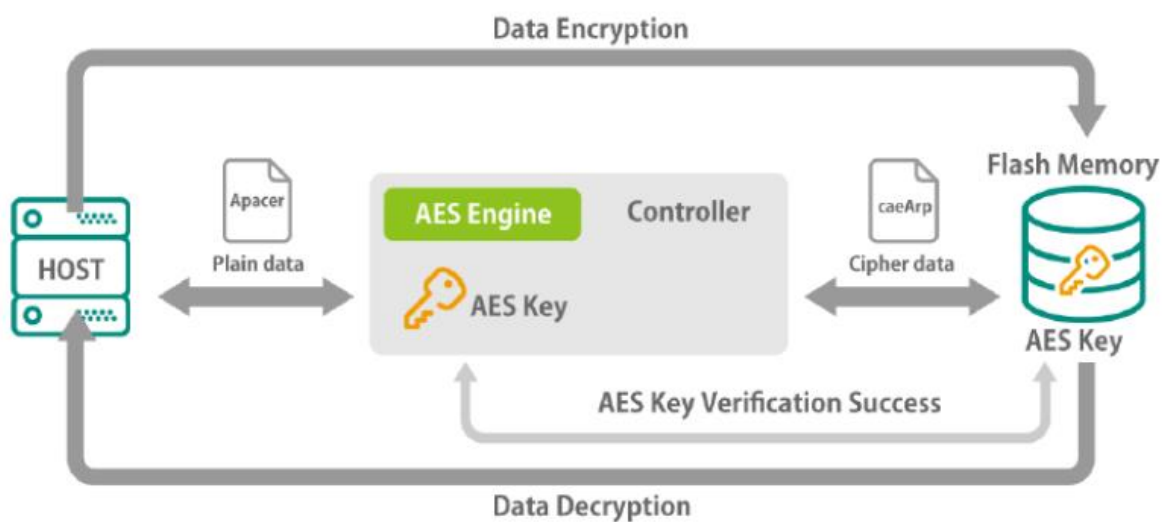


- **Hardware Secure Erase**

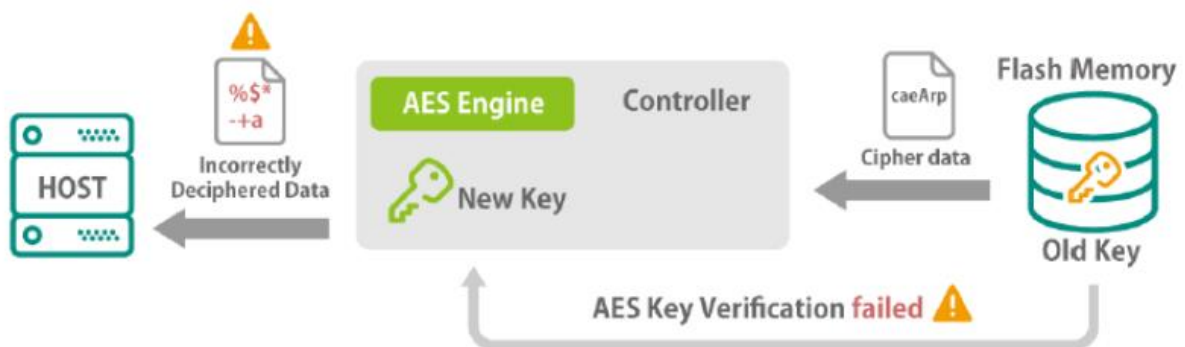
All the data stored on a drive protected by AES encryption needs to be decrypted by a matching AES key before it can be read. The real advantage of AES encryption is that the key is automatically generated during production and provides an instant protection mechanism. And since it is a 256-bit key, the chance of it being brute-forced is practically impossible. The Hardware Secure Erase (Instant AES Key change) function, as shown in below. When an Instant Key change command is issued, a new key will be generated to replace the original key stored in the flash

memory less than a second. Since the new key does not match the old one, when the host is attempting to access the data present in the flash memory, the data will be irretrievable due to AES key authentication failure. The data has not been erased in the conventional sense of all the bits being rewritten as ones or zeros, but it is functionally unreadable and therefore completely protected. The Instant Key change function is that it can be activated in a hardware trigger activated.

- Open protection cap
- Press button for destroyed SSD AES key
- Data/partition becomes unrecognizable



Typical implementation of AES encryption/decryption



Data unreadable after execution of AES Key change command

Features

SYSTEM

High Performance Processor	Intel® Xeon® Processor D-1587 (Frequency 1.7GHz, Turbo Boost Frequency up to 2.3GHz), 16-Core, 32 Thread Support, 24MB SmartCache. Build-in Turbo Boost Technology 2.0, VPro and Hyper-Threading support.
Memory type	4 x DIMMs Up to 128GB ECC RDIMM DDR4 2133MHz
Chipset	SoC, integrated with CPU

DISPLAY

Graphics Processor	ASPEED AST2400
Resolution	Up to 1920x1200@60Hz 32bpp

STORAGE

HDD/SSD	2 x 2.5" SSD
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ETHERNET

Ethernet	Quad Gigabit Ethernet via Intel® i350-AM2 Dual 10GBase-T LAN via Intel®X557-AT2 Realtek RTL8201N PHY (dedicated IPMI)
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REAR I/O

USB	2 x USB 2.0 Ports
Serial Port	1 x RS-232 Port
Ethernet	2 x 10/100/1000 Gigabit Ethernet
DC-IN	1 x Rugged Souriau Connector (8ST7-08G98PN)

FRONT I/O

Button	1 x Secure Erase Button (SSD2 support AES Secure Erase) 1 x Power Switch with Dedicated LED
USB	2 x USB 3.0 Ports
Ethernet	2 x 10/100/1000 Gigabit Ethernet 2 x 10GBase-T Ethernet 1 x IPMI
Dedicated LED	1 x Red LED (OVHT) 5 x Green LEDs (2 x LAN, 1 x PWR, 1 x SSD, 1 x RDY)
SSD/HDD Tray	1 x Dual 2.5" HDD/SSD Easy Swap Tray
CMOS Battery Tray	1 x Removable CR2032 CMOS Battery Tray

POWER REQUIREMENT

Power Input	MIL-STD-1275, MIL-STD 704 and DO-160 power supply ,12 to 40V (150W max)
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APPLICATIONS, OPERATING SYSTEM

Applications	Commercial and Military Platforms Requiring Compliance to MIL-STD-810G Embedded Computing, Process Control, Intelligent Automation and manufacturing applications where Harsh Temperature, Shock, Vibration, Altitude, Dust and EMI Conditions. Used in all aspects of the military.
Operating System	Windows 10 64Bit, Windows Server 2008 R2, Windows Server 2012 R2, Windows Server 2016, Ubuntu14.04, Fedora 20/23, RedHat Linux EL 7.1/7.2, Vmware ESXi 6.0, ESXi 6.5

PHYSICAL

Dimension (W x D x H)	430 x 385 x 44.6mm (16.92" x 15.16" x 1.76")
Weight	10.6 Kg (23.37lbs)
Chassis	SECC + Aluminum Alloy, Corrosion Resistant
Finish	Anodic aluminum oxide (Color Iron gray)
Cooling	Natural Passive Convection/Conduction. No Moving Parts
Ingress Protection	IP50

ENVIRONMENTAL

MIL-STD-810G Test	Operating Tests	
	Low Temperature	Method 502.4 Procedure 2 0°C, 4 hours, change rate: ≤ 20°C.
	High Temperature	Method 501.4 Procedure 2 +50°C, 4 hours, change rate: ≤ 20°C.
	Humidity	Method 507.4 85%-95% RH without condensation, 24 hours/ cycle, conduct 10 cycle.
	Vibration	Method 514.5 Category 4, figure 514.5C-3 5-500Hz, Vertical 2.20Grms, 40mins x 3axis.

	Shock	Method 516.5 Percedure 1	20 Grms, 11ms, 3 axes.
Non-Operating Tests			
	Low Temperature Storage	Method 502.4	-33°C, 4 hours, change rate: $\leq 20^{\circ}\text{C}$.
	High Temperature Storage	Method 501.4 Procedure 1	+71°C, 4 hours, change rate: $\leq 20^{\circ}\text{C}$.
	Vibration	Method 514.5 Category 4, figure 514.5C-3	5-500Hz, Vertical 2.20Grms, 40mins x 3axis.
	Shock	Method 516.5	20 Grms, 11ms, 3 axes.
Reliability	No Moving Parts; Passive Cooling. Designed & Manufactured using ISO 9001/2000 Certified Quality Program.		
EMC compliance	MIL-STD-461E : CE102 basic curve, 10kHz - 30 MHz RE102-4, (1.5 MHz) -30 MHz - 5 GHz RS103, 1.5 MHz - 5 GHz, 50 V/m equal for all frequencies EN 61000-4-2: Air discharge: 8 kV, Contact discharge: 6kV EN 61000-4-4: Signal and DC-Net: 1 kV EN 61000-4-5: Leads vs. ground potential 1kV, Signal und DC-Net: 0.5 kV EN 61000-4-2: Air discharge: 8 kV, Contact discharge: 6kV EN 61000-4-4: Signal and DC-Net: 1 kV EN 61000-4-5: Leads vs. ground potential 1kV, Signal und DC-Net: 0.5 kV EN 61000-4-2: Air discharge: 8 kV, Contact discharge: 6kV EN 61000-4-4: Signal and DC-Net: 1 kV EN 61000-4-5: Leads vs. ground potential 1kV, Signal und DC-Net: 0.5 kV EN 55022, class A EN 61000-4-3: 10V/m CE		
Operating Temperature	0 to 50°C		
Storage Temperature	-40 to 85°C		

Dimension

