micromax technology | ADLINK

Reliable Design, Extreme Performance
For Payload and Mission Computing Requirements

Rugged Platforms

VITA 46 VPX
VITA 65 OpenVPX
VITA 75 HPERC Systems

2016

Table of Contents

About ADLINK

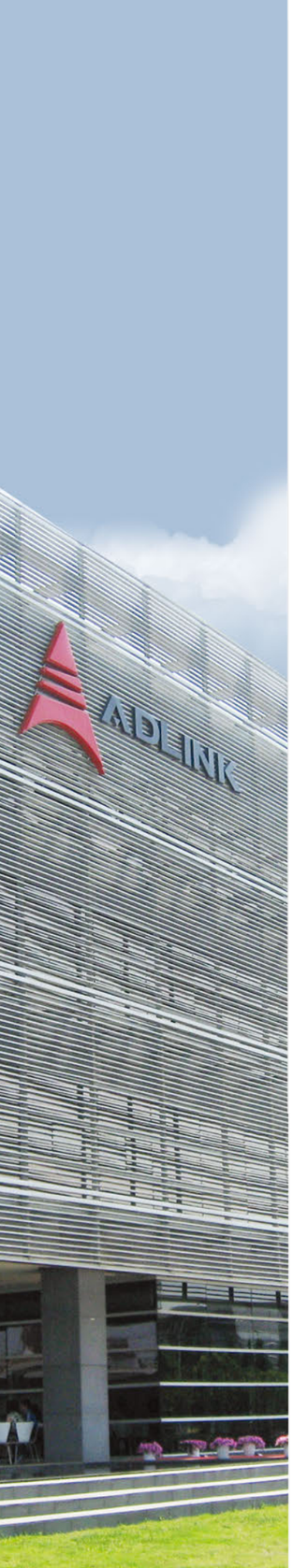
A Global Company ..... P 2

Applications

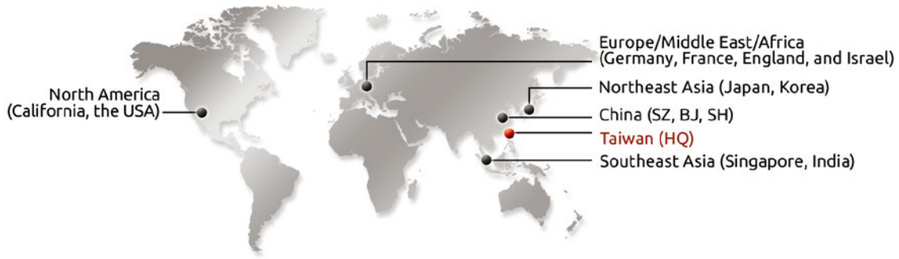
Defense ..... P 6
Payload and Mission Requirements ..... P 8

Selection Guides

VPX ..... P 10
VPX Processor Blades ..... P 12
Graphics Cards & Modules ..... P 13
VPX Rear Transition Modules, Test Frames, Backplanes ..... P 14
Extreme Rugged Systems ..... P 16
HPERC ..... P 17



A Global Company



ADLINK, a manufacturer of embedded computing technology, leads the field with integration of computing power, rugged design, high availability, and industrial I/O. Dedicated to test & measurement, industrial automation, defense and aerospace, gaming, communications, medical, and transportation applications, ADLINK has made a name for itself providing reliable products of superior quality for cost-effective solutions, allowing our customers around the world to significantly reduce time-to-market burdens while increasing their competitive edge.

By providing leading-edge application-ready platforms and industrial building blocks, ADLINK empowers our customers, allowing them to minimize total cost of ownership (TOC) with customization and system integration advantages, keeping manufacturing costs low and extending product lifecycles.

ADLINK is a Premier Member of the Intel® Internet of Things Solutions Alliance and is active in several standards organizations, including the PCI Industrial Computer Manufacturers Group (PICMG), the PXI Systems Alliance (PXISA), and the Standardization Group for Embedded Technologies (SGET).

ADLINK is a global company with headquarters in Taiwan; manufacturing in Taiwan and China; R&D and integration in Taiwan, China, the US, and Germany; and an extensive network of worldwide sales and support offices. ADLINK is ISO-9001, ISO-14001, ISO-13485 and TL9000 certified and is publicly traded on the TAIEX Taiwan Stock Exchange (stock code: 6166). ADLINK products are currently available in over 40 countries across 5 continents, supported by worldwide distribution networks and offices and over 1,600 employees.

Products and Services

Modular Computing

With the combined experience and technical knowledge of ADLINK, Ampro Computers and LiPPERT Embedded Computers, ADLINK is able to provide a wide range of Computer-on-Modules and Small Form Factor (SFF) Single Board Computers. Our Extreme Rugged product lines have wide operating temperature ranges and meet MIL-STD shock and vibration specifications.

- Computer-on-Modules:
  COM Express | SMARC | Qseven | ETX
- SFF Single Board Computers :
  PCI/104 | PC/104-Plus | PCI/104-Express | Mini-ITX

Being a holistic solution, ADLINK's SEMA cloud offers users the entire infrastructure required. Customers do not need to develop their own cloud solution, avoiding laborious checking of hardware compatibility, finding a suitable cloud server, implementing data encryption or developing proprietary communication protocols.

In addition to individual devices, it includes encrypted data transfer to our cloud infrastructure and an intuitive graphical user interface (GUI) to monitor and/or control devices from any location at any time via the Internet.

- Industrial Grade Cloud Solution : SEMA Cloud

Display & Computing

ADLINK's display and computing product segment (DCPS) is committed to providing our customers the best user experience with products for Medical, Industrial, and Logistics applications, including panel PCs, touchscreen monitors, and tablets that meet the demanding requirements of these industries and provide ease of use and protection from extreme environmental hazards.

- Idustrial Monitors and Panel Computers | Medical Monitors and Panel Computers | Rugged Tablets

Embedded Computing

ADLINK works closely with Intel® to ensure that we develop and introduce innovative computing technologies by implementing embedded computing roadmaps and selecting computer solutions that best fit our target markets. This enables ADLINK to provide the highest quality and performance products with the long life cycles required by our embedded computing customers.

Our range of products includes:

- Network Appliances
- Extreme Outdoor Servers
- Media Cloud Servers
- AdvancedTCA
- 6U/3U CompactPCI Platforms
- VPX Blades and Development Kits
- Extreme Rugged Systems
- Embedded Flash Storage

Measurement & Automation

ADLINK's is dedicated to providing reliable, top quality products for industrial I/O control, motion control, digital imaging, data acquisition, and modular instrument applications. Our comprehensive portfolio of measurement and automation products, application ready platforms, and easy-to-use software packages, with integrated value-added service, continually meet and exceed customer requirements for industrial automation systems, machine vision systems, and automated test and measurement equipment.

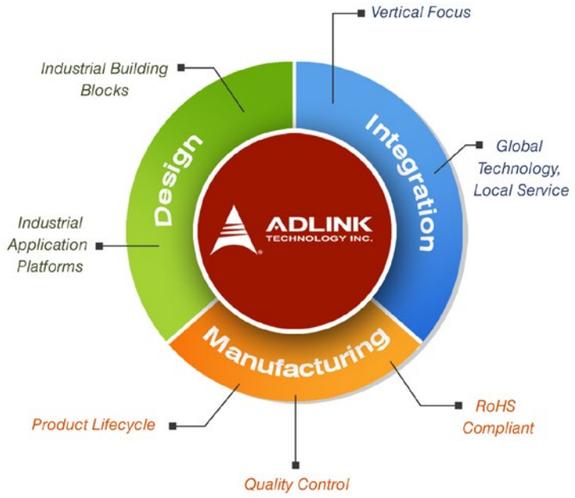
- PXI & Modular Instruments | Data Acquisition | Machine Vision | GPIB & Bus Expansion | Motion Control | Distributed I/O | Fanless Embedded Computers | Handheld computers

Design and Manufacturing Services

To fulfill your requirement of high quality, cost-effective products, with quick time to market in product development, ADLINK has established and assembled a Design and Manufacturing Services team to cater to the specific demands that off-the-shelf products could not meet.

From embedded computers, data acquisition cards, and CompactPCI systems to related software packages, our DMS design team has the expertise to rapidly prototype upon the approval of finalized specifications. In addition, the winning of ISO-9001 certification ensures the exactitude of our research and development procedures with the highest product quality.

ADLINK owns and operates the manufacturing facilities in our Asia headquarters. Complete capabilities include our own PCB layout teams, SMT lines, system integration, and test capabilities. In short, ADLINK controls the whole manufacturing process, from layout and design to prototyping and volume production.



Customer Services

ADLINK is not only devoted to providing local service worldwide, but also to providing convenient online service. The following services are available around the clock on the internet.

eRMA

ADLINK customers can send their RMA requests via our eRMA system. After obtaining an RMA number, you can track your RMA status online at any time.

Partner Center

The ADLINK Partner Center is specifically designed for worldwide sales and marketing support to allow our global sales representatives and distributors access to real-time product and marketing information and materials as soon as they are released at ADLINK headquarters. More than a resource database, the ADLINK Partner Center will also facilitate your business in serving customers.

Ask An Expert

This is the place to get help for ADLINK products. 'Ask an Expert' provides answers to commonly asked questions, or you can click on the 'Ask a Question' tab to contact ADLINK's knowledgeable staff about a specific product or issue. ADLINK AAE (Ask an Expert) is available 24/7 online and is staffed by dedicated professionals who are available to address customers' needs and answers question. All issues and comments are recorded into a database and can be tracked/ reviewed at anytime. ADLINK customers are invited to access the AAE system at: http://www.adlinktech.com/AAE

Environmental Protection Policy

ADLINK implemented a Green Product Policy in May 2004 to align the purchasing and use of green products meeting requirements from international environment protection statutes. Environmental protection is a top priority for the management at ADLINK. Measures have been taken to ensure that our products have little impact on the environment. In addition to planning a leadless process, the affect on the environment of components and raw materials will also be reduced. The Green Product concept has been built into our new product development system to ensure protection of the environment and continued business success.

RoHS Compliant Computing

ADLINK is committed to fulfill its social responsibility to global environmental preservation through compliance with the European Union's Restriction of Hazardous Substances (RoHS) directive, which restricts the use of harmful substances such as lead, mercury and cadmium in new equipment.

Most end-user applications in which ADLINK products are used do not require RoHS compliance. However, ADLINK will actively work with customers whose products are not RoHS exempt under category 8 or category 9 classifications. Our lead-free production line and process, including solder paste, solder bar and process control parameters, has been developed and standardized in our manufacturing system.

Conflict Free Minerals Policy

ADLINK will not knowingly procure material supplies and components that contain minerals that directly or indirectly finance or benefit armed groups in the Democratic Republic of Congo (DRC) or an adjoining country.

We urge our suppliers to support this policy in their own procurement guidelines and provide us with accurate country of origin information.

ADLINK shall:

- Comply fully with requests from EICC-GeSI.
- Conduct a reasonable country of origin inquiry to clarify the origins of the Gold, Tantalum, Tungsten and Tin used in our products.
- Establish reasonable objectives and targets with a goal of ascertaining and minimizing ADLINK's risk. With a goal of continuous improvement for our Conflict Free Minerals Program, develop a means to measure objectives and targets. ADLINK will also review, revise and report these measures, and overall program updates, on an annual basis.
- Empower all employees, suppliers, vendors and contractors to take ownership in complying with the Conflict Free Minerals Policy and to escalate risks in the supply chain to management's attention.
- Effectively communicate to all employees this Conflict Free Minerals Policy and our Conflict Free Minerals Program.

Management Flow

The management flow of ADLINK's Green Policy begins during the development stage of a product. Only parts and raw materials that meet RoHS requirements are sourced. Our engineers specifically design products using only qualified components. A lead-free process ensures that manufactured products are "green." Green products do not contain environmentally hazardous elements and can easily be recycled.

REACH Declaration

The Registration, Evaluation, Authorization and Restriction of Chemicals Regulation 1907/2006, commonly referred to as "REACH", is Europe's new chemicals legislation. The products that we supply are non-chemical products and under normal and reasonable use, they will not release harmful substance. Furthermore, we will immediately inform you in correspondence to REACH-Article 33 if any substance of content (as from a content of >0.1%) in our products will be classified alarming by the European Agency for Chemicals ECHA.

Defense

Sophisticated and diverse technology demands are the hallmarks of modern military systems, featuring endurance, efficiency and connectivity as proven force multipliers across the spectrum of global military operations. ADLINK Technology is a strategic asset to prime contractors and technology integrators competing in this arena – supporting agile acquisition initiatives, and addressing military design challenges fueled by dramatic increases in sensor data volume and processing requirements as well as ongoing mandates for greater integration in manned and unmanned systems. Capitalizing on a rugged design pedigree spanning more than 25 years of military design advancements and leadership, ADLINK's Extreme Rugged products meet the rigors of military deployments with high-tech ready levels providing optimal Size, Weight, Power and Cost (SWaP-C), high bandwidth and proven rugged performance in open architecture COTS-based solutions.

Rugged by Design

ADLINK's Rugged by Design process means all Extreme Rugged products are subjected to MIL-STD shock, vibration, and temperature testing during the product development process, not simply re-qualified after the fact. This purpose-built approach ensures performance, availability and reliability optimized for the rigors of mission-critical embedded environments.

Extensive voltage and temperature margin tests validate ADLINK's Extreme Rugged products during the development process, including full MIL-STD-810 shock and vibration testing. ADLINK's ISO- and TUV-certified development process features Highly Accelerated Life Testing (HALT), and all Extreme Rugged products are available with conformal coating.

ADLINK's Extreme Rugged products address the full spectrum of military industrial supply principles, including design revision control, component referencing, and the longevity of supply so essential to military deployments. Further, ADLINK's Extreme Rugged products offer configurability and flexibility to meet the broadest range of military program requirements. Assuring rugged design while protecting development resources and time-to-market, ADLINK can expertly modify existing offerings or develop new solutions to defined specifications using our proven Rugged by Design methodologies and ISO quality assurance process.

Long-Term Military Design Success

Inherited from Ampro Computers, ADLINK's reputation is founded on the design and development of high performance embedded computing solutions for rugged deployment. Our mandate is to solve rugged design challenges, maintaining high responsiveness to military customer needs while enabling value, performance, flexibility and longevity for extended deployments. By offering in-house design with manufacturing — a service combination as valuable as it is rare in our industry — we maximize rugged design capabilities and capitalize on smart design principles that integrate both hardware and software to facilitate better performance, faster time-to-market and reduced risk and cost of ownership.

Committed Standards Leadership

ADLINK is vigorous in developing standards and then integrating them into market-leading products. Illustrated through ADLINK's comprehensive support of CompactPCI and VPX products, ADLINK has been innovating and delivering standards-based CompactPCI products for more than 15 years.

ADLINK supports COTS technology and open systems, offering flexible technologies and platforms. Deployable as system ingredients or ready-to-go systems that ensure optimal rugged performance, ADLINK products blend hardware and software elements into intelligent platforms that enable a tangible competitive edge in time-to-market.

Rugged Innovation, Value and Performance

ADLINK was founded to deliver innovation, value and competitive edge to our customers, capitalizing on our rugged design pedigree and culture of creativity to develop smarter embedded technologies and platforms. ADLINK is your complete supplier of Extreme Rugged products featuring military grade requirements.Our extensive lines of systems, platforms and products deliver optimized SWaP, thermal management and price/performance value in standards-based COTS and MOTS (modified COTS) solutions.

Innovative Embedded Products and Capabilities

ADLINK's Extreme Rugged computing platforms have been deployed across the broad spectrum of demanding military environments, supporting applications such as missile command and control, in-vehicle tactical displays for communications systems and portable weapon terminals optimized for mobile deployment. Extreme Rugged solutions are highly versatile and ideal for force protection applications such as counter-sniper systems and image processing applications enabling image stabilization for naval and sub-sea missions.

ADLINK's rugged products and platforms also offer a wide range of internal and external I/O, storage and networking options, including internal PCIe (Gen 3) data buses, multiple display technologies (HDMI, VGA, LVDS), GPIO, multiple SATA interfaces and USB and Gigabit Ethernet ports. ADLINK's world-class technical support ensures convenient accessibility to our team of highly skilled customer hardware and software support engineers. Our support team is expertly trained and knowledgeable in the applications and concerns of our military customers.

Related Products

VPX6000

Rugged 6U VPX Processor Blade with 4th Generation Intel® Core™ i7

VPX3010

Rugged 3U VPX Processor Blade with Intel® Xeon® Processor D-1500

HPERC-IBR Series

High Performance Extreme Rugged System with Intel® Core™ i7 Processor

Payload and Mission Requirements

High Performance Rugged Computing Solutions that Meet or Exceed the Payload Computing Requirements

Processing, I/O, and Storage - A mobile payload computer must possess advanced high performance embedded computing characteristics, flexible networking capabilities, and industry standard I/O without exceeding the available size, weight, and power (SWaP), and cooling. All storage and system functions must be capable of supporting DoD IA requirements. And all of this must be delivered in a ruggedized, standards-based platform with a low power design that doesn't limit payload computing performance.

Thwarting improvised explosive devices (IEDs) with ground penetrating radar is a challenge for today's small form factor payload computing solutions. In future armored fighting vehicles, the processing performance required for IED detection as part of an electronic warfare solution will increase ten-fold. To be effective, ground mobile payload computer design requires a mature, rugged, highly reliable, standards-based computing architecture that meets DoD Information Assurance (IA) and intense application performance requirements.

In a ground vehicle, the Ground Mobile Payload Computers are the processing engines for the network of sensors and applications that make up IED detection. A payload computer must process enough sensor data in near real-time to enable counter measures to protect the warfighters.

As vehicle speeds increase beyond 15 to 20 mph, single compute engine capabilities fall short. System advancements in coupling Intel® and GPGPU processing architectures are required to meet the increase in vehicle speeds. A payload computer must support faster networking speeds to fully network the sub-system and support system scaling and failover. In addition, payload computers must be rugged, requiring MILSTD-810G for a shock and vibration profile following method 514.6.

Balanced SWaP2C2 - A ground mobile payload computer is often integrated in a vehicle later in the design cycle and constrained by available space. The choice of a ground mobile payload computer is driven by a balance between its size, weight, and power, performance, cooling, and cost (SWaP2C2), and sophisticated power management that reduces onboard power consumption is a necessity. Ground payload computing solutions should be cost-effective, built on industry standards, and successfully balance the SWaP2C2 equation.

Products for Mobile Mission Computers, Ranging from Single Board Computers (SBCs) through to Complete Embedded Systems

IIn today's armored fighting vehicle, the integration of vehicle electronic sub-systems for command, control, communications, computers, intelligence, surveillance, reconnaissance (C4ISR) and electronic warfare (EW) components, as well as power generation and distribution, are referred to as vetronics. The multiple sub-systems that support the ground mission are integrated and controlled using a Ground Mobile Mission Computer. Ground mobile mission computer design requires a mature, rugged, highly reliable, standards-based computing architecture that meets DoD Information Assurance (IA) requirements.

As the singular command and control display computer in a ground vehicle, the ground mobile mission computer is the network and application integration point. A mission computer embeds display controls for all vehicle processing, covering vetronics such as C4ISR and EW payloads, diagnostics, and power management. A mission computer must support multiple display interfaces, as well as Gigabit Ethernet and CAN bus, to fully network the sub-systems and support system scaling and failover. The mission computer must be rugged— MILSTD-810G of a shock and vibration profile following method 514.6—yet present the lowest possible power and cooling profile. It must also scale to support myriad displays and control applications and offer connectivity that complies with DoD IA requirements.

I/O and Processing - A ground mobile mission computer must possess I/O flexibility, networking capabilities, and the right level of processing without taxing the available size, weight, and power (SWaP), and cooling available for the task. Driven by the need for specialized I/O to integrate between vectronic functions, a good mission computer must be flexible and configurable to match the ground mobile platform demand. To support flexible mission planning and configuration, removable storage and USB ports are a must. All storage and system functions must also offer the option to support DoD IA requirements. And all of this must be delivered in a ruggedized, standards-based platform with a low power, convection cooled design.

Rugged by Design - Validated Rugged from the Ground Up

ADLINK rugged hardware solution designs are validated to meet MIL-STD requirements during the development process, including:

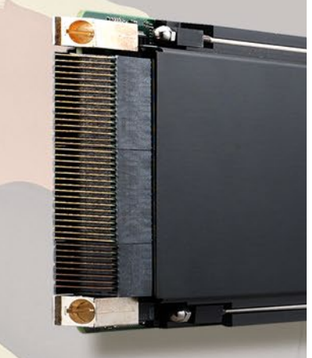
- **MIL-STD-461** is a DoD standard that defines the requirements for the control of electromagnetic interference characteristics of subsystems and equipment
- **MIL-STD-810** is a DoD test method standard for environmental engineering considerations and laboratory tests

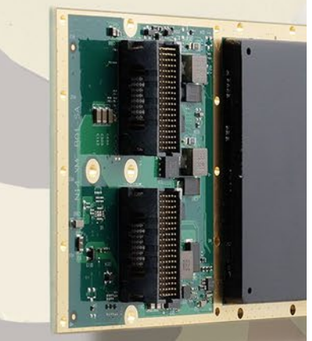
Extreme Rugged

Our Extreme Rugged boards and systems are designed for harsh environments from the ground up. To support the extremes of shock, vibration, humidity, and temperature, care is given to component selection, circuit design, PCB layout and materials, thermal solutions, enclosure design, and manufacturing process. Robust test methods, including Highly Accelerated Life Testing (HALT), ensure optimal product design phases and meet stringent requirements such as -40°C to +85°C operating temperature range, MIL-STD, shock & vibration, and long-term reliability.

EXTREME RUGGED

Thermal		Extreme Rugged Operating Temperature: -40°C to +85°C
Environmental	Immersion	ANSI/IEC 60529-2004 IP-67 Watertight (Ingress Protection)
	Humidity	95% at 60°C
	Shock	• MIL-STD-810G, Method 516.6, Procedure I - Functional Shock (40g shock) • MIL-STD-810G, Method 516.6, Procedure V - Crash Hazard Shock Test (75g shock)
	Vibration	• EN50155 • MIL-STD -810G- Table 514.6C-X Category 9 (Helicopter Vibration) • MIL-STD -810G- Table 514.6C-10 Category 11 (Rail Cargo Vibration) • MIL-STD -810G- Table 514.6D-9 Category 21 (Shipboard Vibration) • MIL-STD -810G- Table 514.6C-VI Category 4 (Composite-Wheeled Vehicle Vibration) • MIL-STD-810G, Method 514.6, Annex C, Category 7 - Vibration: Jet Aircraft
	EMI/EMC	• MIL-STD-461F ▫ CE101 Conducted Emissions, Power Leads, 30 Hz to 10 kHz ▫ CE102 Conducted Emissions, Power Leads, 10 kHz to 10 MHz ▫ CS115 Conducted Susceptibility, Bulk Cable Injection, Impulse Excitation ▫ RS101 Radiated Susceptibility, Magnetic Field, 30 Hz to 100 kHz ▫ RS103 Radiated Susceptibility, Electric Field, 2 MHz to 40 GHz ▫ CS101 Conducted Susceptibility, Power Leads, 30 Hz to 150 kHz ▫ RE101 Radiated Emissions, Magnetic Field, 30 Hz to 100 kHz
	Temperature	• MIL-STD -810G-510.5 Procedure II (High Temperature) • MIL-STD-810G, Method 501.5, Procedure II - High Temperature • MIL-STD-810G, Method 502.5, Procedure I and II - Low Temperature • MIL-STD-810G, Method 503.5, Procedure I - Thermal Shock
Altitude	Altitude	• 50,000 ft. • MIL-STD-810G, Method 500.5, Procedure II - Low Pressure Altitude





VPX

The Versatile Performance Switching (VPX) standard, also known as VITA 46, defines Eurocard form factor systems supporting switched fabrics over a new high speed connector. Intended for embedded systems that meet the extremely harsh environments of military applications where size, weight, and power (SWaP) are critical, ADLINK's VPX line of commercial off-the-shelf (COTS) products enable fast deployment with reduced development burden and costs compared to proprietary systems.

ADLINK VPX multi-processor high performance blades are available in both 3U and 6U form factors. All ADLINK VPX products are Extreme Rugged and suitable for mission-critical signals intelligence, radar, and Intelligence, Surveillance and Reconnaissance (ISR) applications in the most demanding battlefield environments.

All VPX products are fully validated and certified by ADLINK before delivery, and with the VPX Starter Kit including test frame, peripheral card, RTM and BSP, system integrators can quickly and efficiently develop and deploy systems that deliver great reliability with fast time-to-market.

VPX™ VPX REDI™ OpenVPX™

Rugged and Reliable Design, Extreme Performance

Design Capabilities

ADLINK VPX blade hardware designs strictly follow VITA 46 and OpenVPX standards. Simulation tools reduce design and development risks before PCB images are generated and components are carefully chosen to ensure the final product can withstand the extreme environments of today's military applications.

Thermal and Mechanical

The VITA 48 standard enables quick and efficient thermal dissipation to the card edge and mechanical designs that meet MIL-STD-810 standards ensure that our VPX products are rugged enough to withstand extreme shock and vibration. ADLINK's VPX products support wide temperature range operation up to -40°C to +85°C.

Validation and Production

ADLINK has over 20 years of experience in industrial and embedded computing. ADLINK's advanced testing and manufacturing facilities are ISO-9001, ISO-14001, ISO-13485 and TL9000 certified, ensuring consistency and the highest possible product quality and reliability. Conformal coating protection is available to enhance product reliability and lifecycle. Highly Accelerated Life Testing (HALT) ensures reliability for use in critical missions.

Applications

Intelligence, Surveillance and Reconnaissance (ISR)

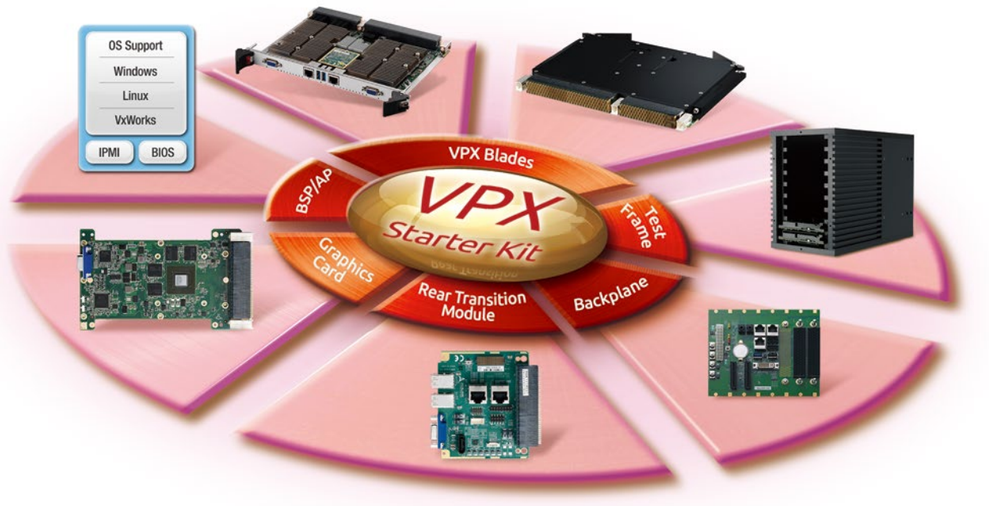
ADLINK VPX products utilize multi-core, multi-thread processors to synchronously handle multiple tasks during critical observation missions. Fast and efficient data collection and processing gets information to those who need it in a timely manner. ADLINK's GPGPU blade brings extremely powerful parallel processing power to the rugged, compact VPX form factor, allowing highly efficient real time processing of high bandwidth sensor data. ADLINK's range of VPX products allow flexible configurations to cope with a wide range of situations and environments.

Military Radar Solutions

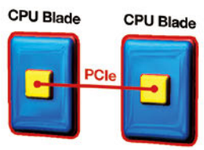
ADLINK VPX high performance blades are ideal for developing rugged, SWaP-optimized and high density radar solutions that provide realtime control and monitoring capabilities for critical missions. Our VPX blades are built to withstand the extreme conditions encountered in battlefield scenarios including temperature, shock and vibration, and provide the processing power to deliver intelligence based on sensor, computation and networking technologies which are critical in modern conflicts.

VPX Starter Kit

ADLINK provides VPX development solutions to help customers reduce technical risks, development time and costs. The ADLINK VPX Starter Kit provides the necessary hardware and standard BIOS/firmware for system verification, board-to-board communication validation, and software compatibility testing.

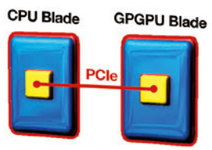


ADLINK's VPX Starter Kit enables board-to-board communication validation



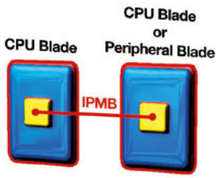
NTB Validation

Non-Transparent Bridge testing uses the backplane to verify NTB functionality and allocate resources between boards



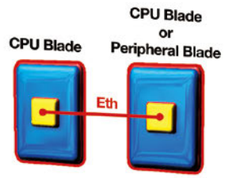
GPGPU Validation

Connection between processor blade and GPGPU blade over PCIe interface to enhance graphics processing performance



IPMI Validation

IPMI provides management and monitoring capabilities independent of the host system's CPU, firmware, BIOS and operating system



Ethernet Validation

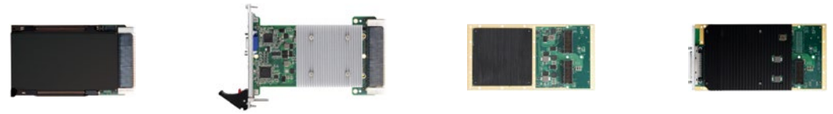
Ethernet connection for board-to-board communication tests transfer rates for mission allocation

VPX Processor Blades

6U/3U Processor Blades

Model Name		VPX6000-DR	VPX6000-DA	VPX6000-SA	VPX3010-SR VPX3010-SA	VPX3001-SR	VPX3000-SR
Form Factor		VPX 6U	VPX 6U	VPX 6U	VPX 3U	VPX 3U	VPX 3U
Thermal Solution		Conduction cooled	Air cooled	Air cooled	Conduction / air cooled	Conduction cooled	Conduction cooled
CPU and Core Logic	CPU	Dual quad-core 4th Gen Intel® Core™ i7-4700EQ		Single quad-core 4th Gen Intel® Core™ i7-4700EQ	Intel® Xeon® D-1500 Family	Single quad-core 3rd Gen Intel® Core™ i7-3612QE	Single quad-core 3rd Gen Intel® Core™ i7-3612QE
	Max. Freq. (power)	3.4GHz(47W) per node		3.4GHz(47W)	1.5GHz(45W)	2.1GHz(35W)	2.1GHz(35W)
	Chipset	QM87		QM87	-	QM77	QM77
System Management	IPMI Support	Yes		Yes	Yes	Yes	Yes
PCIe Switch	Controller	IDT 32-lane PCIe Gen2 switch		IDT 32-lane PCIe Gen2 switch	PCIe x8 Gen3	PLX 16-lane PCIe Gen2 switch	PLX 16-lane PCIe Gen2 switch
Memory	Type	Dual Channel DDR3L-1600 per node		Dual Channel DDR3L-1600	Dual Channel DDR4-2133	Dual Channel DDR3-1333	Dual Channel DDR3-1333
	Max. Memory	16GB per node		16GB	16GB	8GB	8GB
	ECC	Yes		Yes	Yes	Yes	Yes
Storage	Type	Onboard SLC NAND flash		Onboard SLC NAND flash	Onboard SLC NAND flash	Onboard SLC NAND flash	Onboard SLC NAND flash
	Capacity	32GB per node		32GB	32GB	32GB	32GB
Display	Graphics Controller	Intel® HD Graphics 4600		Intel® HD Graphics 4600	SM750	Intel® HD Graphics 4000	Intel® HD Graphics 4000
	Interface	Two DVI/HDMI to rear per node	Two DVI/HDMI to rear per node One VGA to front panel per node	Two DVI/HDMI to rear One VGA to front panel	One VGA	One VGA to P2	Single channel DVI to P2 One VGA to P2
OpenVPX Specification	Slot Profile	SLT6-PAY-4F1Q2U2T-10.2.1		SLT6-PAY-4F1Q2U2T-10.2.1	SLT3-PAY-2F2U-14.2.3 SLT3-PAY-2F2T-14.2.5	SLT3-PAY-2F2U-14.2.3 SLT3-PAY-2F2T-14.2.5	SLT3-PAY-2F2U-14.2.3
	Module Profile	MOD6-PAY-4F1Q2U2T-12.2.1-8		MOD6-PAY-4F1Q2U2T-12.2.1-8	MOD3-PAY-2F2U-16.2.3-3 MOD3-PAY-2F2T-16.2.5-3	MOD3-PAY-2F2U-16.2.3-3 MOD3-PAY-2F2T-16.2.5-3	MOD3-PAY-2F2U-16.2.3-3
	Data Plane	Two 10G-KX4 to P1 per node		Two 10G-KX4 to P1	Two PCIe x4 or one PCIe x8	Two PCIe x4 or one PCIe x8	Two PCIe x4 or one PCIe x8
	Expansion Plane	One PCIe x8 or two PCIe x4 (Gen2) to P2 per node		One PCIe x8 or two PCIe x4 (Gen2) to P2	-	-	-
	Control Plane	Two 1000BASE-T to P5 for Node A Two 1000BASE-T to P6 for Node B Two 1000BASE-KX/BX to P5 for Node A Two 1000BASE-KX/BX to P6 for Node B		One 1000BASE-T(RJ-45) Two 1000BASE-T to P5 for Node A Two 1000BASE-KX/BX to P5 for Node A	One 1000BASE-T and two 1000BASE-BX or Two 1000BASE-T	One 1000BASE-T and two 1000BASE-BX or Two 1000BASE-T	One 1000BASE-T to P1 Two 1000BASE-BX
I/O	XMC	-		-	XMC site supporting PCIe x8 XMC I/O supporting X8d+X12d	XMC site supporting PCIe x8 XMC I/O supporting X24s+X8d+X12d	XMC site supporting PCIe x8 XMC I/O supporting X8d+X12d
	Ethernet	Two 1000BASE-T to P5 for Node A Two 1000BASE-T to P6 for Node B Two 1000BASE-KX/BX to P5 for Node A Two 1000BASE-KX/BX to P6 for Node B	One 1000BASE-T(RJ-45) to front panel per node Two 1000BASE-T to P5 for Node A Two 1000BASE-T to P6 for Node B Two 1000BASE-KX/BX to P5 for Node A Two 1000BASE-KX/BX to P6 for Node B	One 1000BASE-T(RJ-45) Two 1000BASE-T to P5 for Node A Two 1000BASE-KX/BX to P5 for Node A	Two 10G-KR, one 1000BASE-T and two 1000BASE-BX or Two 1000BASE-T	One 1000BASE-T and two 1000BASE-BX or Two 1000BASE-T	One 1000BASE-T to P1 Two 1000BASE-BX
	SATA	Three SATA 6Gb/s to rear per node		Two SATA 6Gb/s to rear	One SATA 6Gb/s to P1	One SATA 6Gb/s to P1	Two SATA 6Gb/s to P1 One SATA 3Gb/s to P2
	USB	Two USB 3.0 to rear per node Two USB 2.0 to rear per node	Two USB 3.0 to rear per node Two USB 2.0 to rear per node One USB 3.0 to front panel per node	Two USB 3.0 to rear Two USB2.0 to rear One USB 3.0 to front panel	One USB 3.0 to P1 Two USB 2.0 to P1 and One USB 3.0 to P2 One USB 2.0 to P2	Two USB 2.0 to P1	One USB 3.0 to P1 One USB 2.0 to P1
	Serial	One RS-232/422/485 serial port to rear per node		One RS-232/422/485 serial port to rear	One RS-232 to P1 One RS-232/422 to P2	One RS-232 to P1 One RS-232 to P2	One RS-232 and One RS-422 to P2
	Audio	Line-in and Line-out to rear per node		Line-in and Line-out to rear	-	-	Line-in and Line-out to P1
	PS/2	PS/2 Keyboard mouse to rear per node		PS/2 Keyboard mouse to rear	-	-	-
Operating Systems	Windows	Windows 7 32/64-bit, Windows 7 Embedded		Windows 7 32/64-bit, Windows 7 Embedded	Windows 7 32/64-bit, Windows 7 Embedded	Windows 7 32/64-bit, Windows 7 Embedded	Windows 7 32-bit, Windows 7 Embedded
	Linux	Red Hat 6.5		Red Hat 6.5	Red Hat 6.2	Red Hat 6.2	Red Hat 6.2
	VxWorks	VxWorks 6.9		VxWorks 6.9	VxWorks 6.9	VxWorks 6.9	VxWorks 6.9
Environmental	Operating Temp.	-40°C to 75°C (at wedge lock)	-40°C to 75°C (ambient)	-40°C to 75°C (ambient)	-40°C to 75°C (at wedge lock)	-40°C to 75°C (at wedge lock)	-40°C to 75°C (at wedge lock)

Graphics Cards & Modules



3U VPX Graphics Cards / XMC Graphics Modules

Model Name		VPX3G10-R	VPX3G10-A	XMC-G745-R	XMC-G745-A
Form Factor		VPX 3U	VPX 3U	XMC	XMC
Thermal Solution		Conduction cooled	Air cooled	Conduction cooled	Air cooled
GPU	GPU	NVIDIA GT745M	NVIDIA GT745M	NVIDIA GT745M	NVIDIA GT745M
	Core Freq. (max.)	548MHz	548MHz	548MHz	548MHz
	CUDA Cores	384	384	384	384
System Management	IPMC Support	Yes	Yes	No	No
Memory	Type	GDDR5 4Gbps	GDDR5 4Gbps	GDDR5 4Gbps	GDDR5 4Gbps
	Memory	2GB	2GB	2GB	2GB
	Memory Bandwidth	64GB/sec	64GB/sec	64GB/sec	64GB/sec
	Memory Interface	128-bit	128-bit	128-bit	128-bit
Graphics Support	OpenGL	4.4	4.4	4.4	4.4
	OpenCL	1.2	1.2	1.2	1.2
	DirectX	11.1	11.1	11.1	11.1
Display Interfaces	DVI	Four single link DVI-D to P2	Four single link DVI-D to P2	Four single link DVI-D to P16	Four single link DVI-D to front panel by VHDCI connector
	DVI Resolution	1920 x 1200	1920 x 1200	1920 x 1200	1920 x 1200
	VGA	One VGA to P2	One VGA to front panel	One VGA to P16	-
	VGA Resolution	2048 x 1536	2048 x 1536	2048 x 1536	-
	Video Input	RS-170 (via RTM)	RS-170 (via RTM)	-	-
OpenVPX Specification	Slot Profile	SLT3-PER-2F-14.3.1	SLT3-PER-2F-14.3.1	N/A	N/A
	Module Profile	MOD3-PER-2F-16.3.1-3	MOD3-PER-2F-16.3.1-3	N/A	N/A
	Data Plane	PCIe Gen3 x16 (x8/x4/x1) to P1	PCIe Gen3 x16 (x8/x4/x1) to P1	N/A	N/A
XMC Specification	XMC Site (P15)	N/A	N/A	PCIe x8 (Gen3)	PCIe x8 (Gen3)
	XMC I/O (P16)	N/A	N/A	Four single link DVI-D signal One VGA signal	-
Operating Syatems	Windows	Windows 8 Windows 7	Windows 8 Windows 7	Windows 8 Windows 7	Windows 8 Windows 7
	Linux	Red Hat 6.5	Red Hat 6.5	Red Hat 6.5	Red Hat 6.5
	VxWorks	-	-	-	-
Environmental	Operating Temp.	-40°C to 75°C (at wedge lock)	-40°C to 75°C (ambient)	-40°C to 75°C	0°C to 55°C (ambient)

VPX RTMs & Test Frames

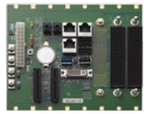
VPX Rear Transition Modules

Model Name	VPX-R6000L1		VPX-R6000L2		VPX-R3010L1		VPX-R3010L2		VPX-R3001		VPX-R300	
Form Factor	VPX 6U				VPX 3U				VPX 3U		VPX 3U	
Compatibility	VPX6000-DA, VPX6000-SA				VPX3010				VPX3001		VPX3000	
Location	Faceplate	Onboard	Faceplate	Onboard	Faceplate	Onboard	Faceplate	Onboard	Faceplate	Onboard	Faceplate	Onboard
GbE	1000BASE-T per node 1000BASE-BX per node 10GbE per node	1x 10GbE per node	1000BASE-BX per node	1000BASE-T per node	2x 1000BASE-BX	2x 1000BASE-T	-	-	2x 1000BASE-T	2x 1000BASE-T	1000BASE-BX	1000BASE-T
PCIe	-	-	1x PCIe x8 per node	2x PCIe x1 per node	-	-	1x PCIe x16	1x PCIe x1	-	-	-	-
Display	1x HDMI per node	-	-	1x HDMI per node	VGA	-	-	-	VGA	-	DVI-I	-
USB 3.0	1x USB 3.0 per node	-	-	1x USB 3.0 per node	1	2	-	-	-	-	1	-
USB 2.0	-	2x USB 2.0 per node	-	-	-		-	-	-	2	1	-
SATA	-	3x SATA per node	-	-	-	3	-	-	-	1	-	2
XMC	-	-	-	-	-		-	-	-	1	-	1
COM	1x RS-232 per node	1x RS-232/ 422 per node	-	-	-	1x RS-232 1x RS-422	-	-	-	2x RS-232	-	1x RS-232 1x RS-422
GPIO	-	8x GPIO per node	-	-	-	8x GPIO	-	-	-	6	-	4
Audio	-	1x Line-in/ out per node	-	-	-	-	-	-	-	-	-	Line-in/out
KB/MS	-	1x KB/MS per node	-	-	-	-	-	-	-	-	-	-
Others	-	JTAG for VPX per node TAG for IPMC per node	-	-	-	1x SMBus 1x JTAG	-	-	-	1x SMBus 1x JTAG	-	-

Test Frames

Form Factor		VPX 6U Test Frame	VPX 3U Test Frame
Test Frame Specifications	Type	19" Test Frame compliant with VITA 46 and OpenVPX	3U Test Frame compliant with VITA 46 and OpenVPX
	Dimensions	310.3mm (H) x 482.8mm (W) x 282.9mm (D)	209.9mm (H) x142.6mm (W) x 276.28mm (D)
	Blade Support	Air cooled and/or conduction cooled	Conduction cooled
	Backplane Support	Up to 10 slots for VPX 6U blades	Up to 9 slots for VPX 3U blades
	RTM Support	Yes	Yes
	Cooling	Front: 3x 120mm fans with 82.4CFM Rear: 4x 60mm fans with 25CFM	Passive fins
	Power	AC Power Supply 85-265 AC Two 600W (redundant) + one 650W	External ATX power
Power Specifications	600W	85-264V, 47-63Hz AC input 600W +12V 50A output (with 250LFM airflow) Redundant power supply	User defined
	650W	85-264V, 47-63Hz AC input 650W output (with 300LFM airflow) +12V 50A; +5V 30A; +3.3V 14A; +12V 5A	User defined
Environmental	Operating Temp.	-40°C to 55°C	-40°C to 85°C (at wedge lock)

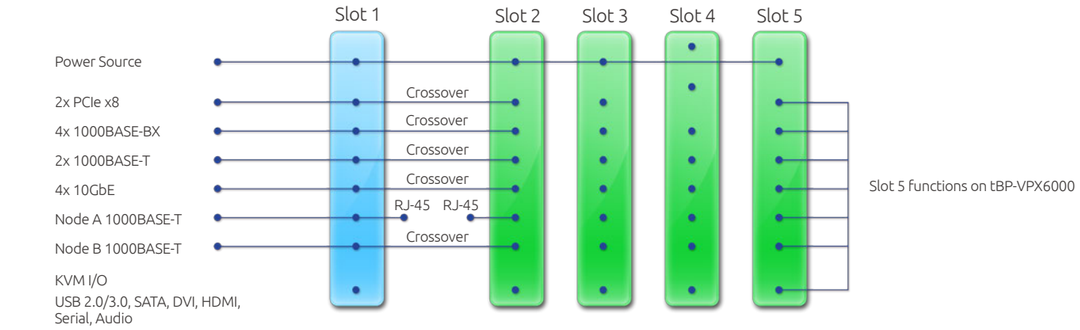
VPX Backplanes



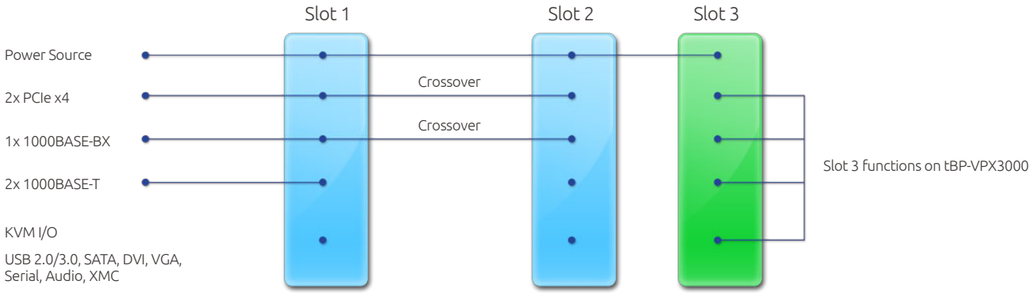
VPX Backplanes

Model Name	tBP-VPX6000	tBP-VPX3000
Form Factor	VPX 6U	VPX 3U
Compatibility	VPX6000	VPX3000
Slots	5	3
Slot Profile	SLT6-PAY-4F1Q2U2T-10.2.1	SLT3-PAY-2F2U-14.2.3
GbE	2x 10GbE per node, 3x 1000BASE-T per node	1x 1000BASE-T
PCIe	1x PCIe x1 per node	2x PCIe x4
Display	2x HDMI per node	1x DVI-I
USB 3.0	2x USB 3.0 per node	1
USB 2.0	2x USB 2.0 per node	1
SATA	3x SATA per node	2
XMC	1x XMC Site node A (PCIe x8)	1x XMC I/O x8d + x12d
COM	2x RS-232/422 per node	1x R-S232, 1x RS422
GPIO	8x GPIO per node (LED Mode)	-
Audio	1x Line-in/out per node	1x Line-in, 1x Line-out
KB/MS	1x KB/MS per node	-
Power	1x 24-pin ATX power, 1x 4-pin power, power screw support	1x 24-pin ATX power, power screw support
Others	I/O signals routed from 5th slot only, 1x JTAG for VPX per node, 1x JTAG for IPMC per node Push Button, System Reset, Mask Reset, Node-A Reset, Node-B Reset, Node-A Power, Node-B Power, System Power	I/O signals routed from 3rd slot only

tBP-VPX6000 Block Diagram



tBP-VPX3000 Block Diagram



Extreme Rugged Systems

HPERC™

The ADLINK HPERC™ (High Performance Extreme Rugged Computer) series is a rugged, compact, highly reliable and efficient system that meets challenging SWaP (size, weight and power) requirements for modern ground and aerial vehicle applications. Designed to meet the VITA 75 specification, the HPERC™ series is a fully-sealed Extreme Rugged COTS computing platform with 3rd generation Intel® Core™ i7 processor and optional GPGPU parallel processing engine, suitable for space-constrained unmanned vehicle applications that demand intense computation and extreme ruggedness*.

ADLINK HPERC™ systems are designed for fast integration into custom rugged embedded applications, delivering quick time-to-market advantages to OEM customers and reducing development costs. Providing great scalability and flexibility, HPERC™ systems are available with a range of processors and memory capacity, and feature uniquely-keyed MIL-DTL-38999 connectors. Board Support Packages (BSPs) are provided to support a variety of operating systems, which can be pre-loaded onto optional internal 2.5" solid state drives.

HPERC systems are fully qualified to MIL-STD-810G and MIL-STD-461F, assuring systems integrators of product quality and reducing risk.

*With removable solid state drives, and optional expansion capabilities, HPERC offers and unprecedented level of capability and flexibility.

VITA 75: A Winning Solution for Unmanned Systems

When designing unmanned vehicles, the key to realizing the benefits of small form factor (SFF) computing systems lies in leveraging open standards to meet the requirements of the end user. The VITA 75 specification defines a compact, box-level standard based heavily on Voice of the Customer research, focusing on both the size and the level of ruggedization of the operating environment. VITA 75 has sacrificed some of the modularity of card cage architectures in order to improve SWaP characteristics and realize a higher level of integration and improved thermal dissipation. The result is a game-changing improvement in design for rugged embedded UAV/ UGV applications that enhances vehicle performance and improves the ability to collect and process the massive volume of information required to command today's theater of operations.

Extreme Rugged HPERC™ Systems				
Model Name	**HPERC-IBR-HC**	**HPERC-IBR-HH**	**HPERC-IBR-MC**	**HPERC-IBR-MH**
CPU	3rd Generation Intel® Core™ i7	3rd Generation Intel® Core™ i7	3rd Generation Intel® Core™ i7	3rd Generation Intel® Core™ i7
Memory	8 or 16GB ECC DDR3L 1333	8 or 16GB ECC DDR3L 1333	8 or 16GB ECC DDR3L 1333	8 or 16GB ECC DDR3L 1333
Internal Expansion	MXM 3.1A(PCIe x16 Gen3) PCI/104-Express Type 2 (PCIe x12 Gen2) Mini PCIe Card (PCIe x1 Gen2)	MXM 3.1A (PCIe x16 Gen 3) PCI/104-Express Type 2 (PCIe x12 Gen 2) Mini PCIe Card (PCIe Gen2 x1)	MXM 3.1 (PCIe x16 Gen3) PCI/104-Express Type 2 (PCIe x12 Gen2) Mini PCIe Card (PCIe x1 Gen2)	MXM 3.1A (PCIe x16 Gen 3) PCI/104-Express Type 2 (PCIe x12 Gen 2) Mini PCIe Card (PCIe Gen2 x1)
SATA	2x internal SATA 6Gb/s, 2x external SATA 3Gb/s	2x internal SATA 6Gb/s, 2x external SATA 3Gb/s	2x internal SATA 3Gb/s	2x internal SATA 3Gb/s
Storage	2x field-removable 2.5" SSD (up to 1 TB), 1x field-removable SDHC (up to 64GB)	2x field-removable 2.5" SSD (up to 1 TB), 1x field-removable SDHC (up to 64GB)	2x field-removable 2.5" SSD (up to 1 TB), 1x field-removable SDHC (up to 64GB)	2x field-removable 2.5" SSD (up to 1 TB), 1x field-removable SDHC (up to 64GB)
Networking	4x GbE	4x GbE	4x GbE	4x GbE
Interfaces	2x DVI, 1x HDMI, 1x VGA, 7x RS-232/422, 8x digital IO 4x USB 2.0, 2x USB 3.0, 1x amplified stereo output, 1x stereo input	2x DVI, 1x HDMI, 1x VGA, 7x RS-232/422, 8x digital IO 4x USB 2.0, 2x USB 3.0, 1x amplified stereo output, 1x stereo input	2x DVI, 1x VGA, 7x RS-232/422, 6x USB 2.0, 1x amplified stereo output, 1x stereo input	2x DVI, 1x VGA, 7x RS-232/422, 6x USB 2.0, 1x amplified stereo output, 1x stereo input
Operating Systems	Windows 7 64-bit or Linux preinstalled (BSP support for WES 7 32/64-bit, VxWorks 6.9.3.1)	Windows 7 64-bit or Linux preinstalled (BSP support for WES 7 32/64-bit, VxWorks 6.9.3.1)	Windows 7 64-bit or Linux preinstalled (BSP support for WES 7 32/64-bit, VxWorks 6.9.3.1)	Windows 7 64-bit or Linux preinstalled (BSP support for WES 7 32/64-bit, VxWorks 6.9.3.1)
Power Input	10 to 36 VDC	10 to 36 VDC	10 to 36 VDC	10 to 36 VDC
Cooling	Baseplate Conduction	Free Air Convection	Baseplate Conduction	Free Air Convection
Environment	MIL-STD-810 shock/vibration; MIL-STD-461F EMI/EMC; corrosion resistant; IP67 rated	MIL-STD-810 shock/vibration; MIL-STD-461F EMI/EMC; corrosion resistant; IP67 rated	MIL-STD-810 shock/vibration; MIL-STD-461F EMI/EMC; corrosion resistant; IP67 rated	MIL-STD-810 shock/vibration; MIL-STD-461F EMI/EMC; corrosion resistant; IP67 rated
Operating Temperature	-40°C to +85°C	-40°C to +75°C	-40°C to +85°C	-40°C to +75°C
Form Factor & Dimensions	VITA 75.22 Conductive Coldplate 63.5 x 150 x 203.4 mm	VITA 75.21 Finned Passive Convection 100 x 150 x 203.4 mm	VITA 75.22 Conductive Coldplate 63.5 x 150 x 203.4 mm	VITA 75.21 Finned Passive Convection 100 x 150 x 203.4 mm
Weight	3.12 kg	4.24 kg	3.12 kg	4.24 kg

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