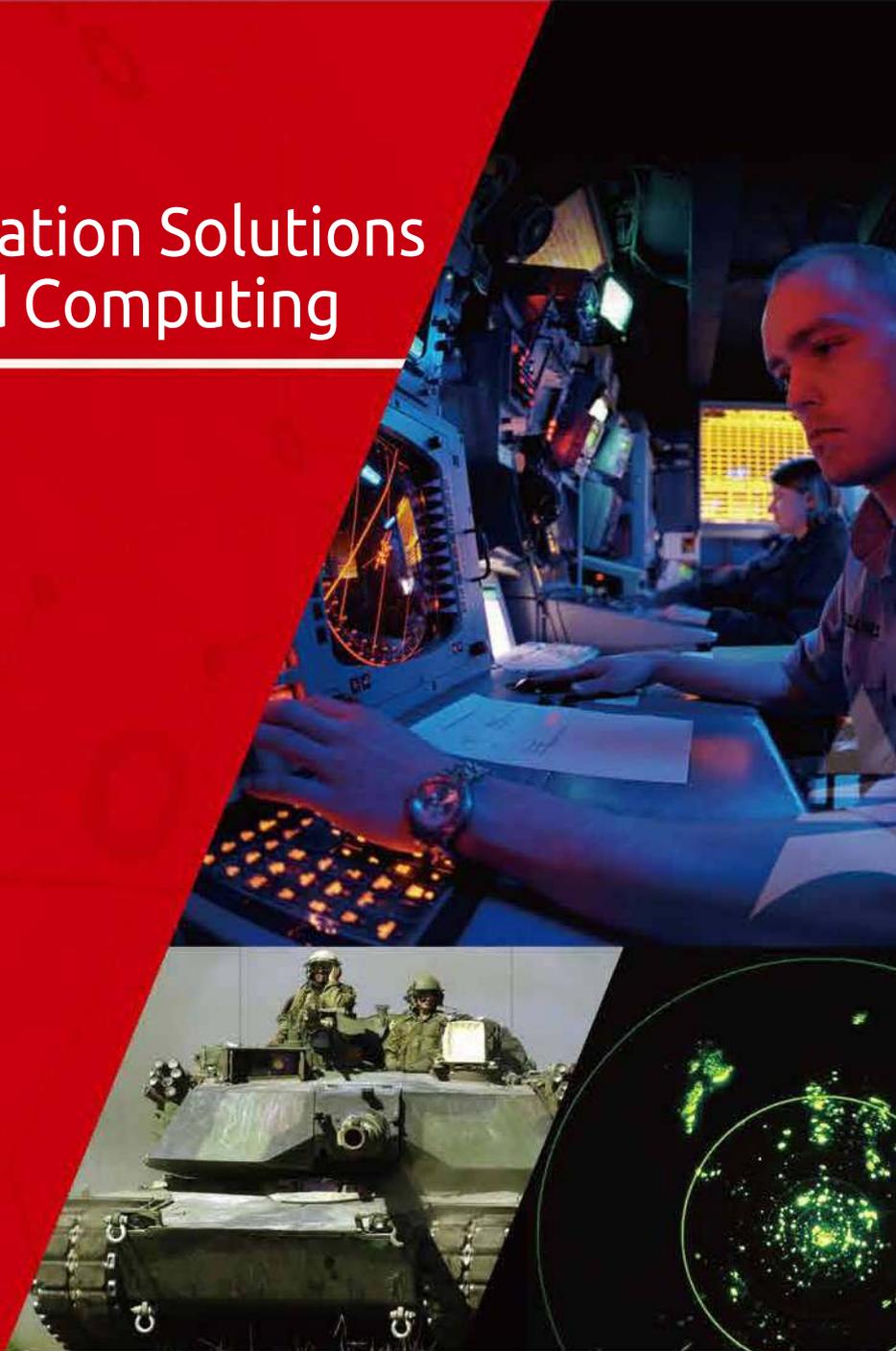


Building Forward Together



# Defense and Aviation Solutions Extreme Rugged Computing

VITA 46 VPX  
VITA 65 OpenVPX  
VITA 75 HPERC Systems  
CompactPCI  
Computer-on-modules  
PC/104



In the Defense arena it is of paramount importance to be able to observe the environment and make fast and reliable decisions, leading to timely action. ADLINK Rugged Systems are part of a larger data-focused message to collect, store, analyse, share from the field to the decision maker.

*In 2010, Lt. Gen. David A. Deptula, then Air Force deputy chief of staff for intelligence, surveillance and reconnaissance was quoted as saying: "We're going to find ourselves in the not too distant future swimming in sensors and drowning in data."* Not only has the number and types of data sources been increasing but the resolution of those sensors has also been increasing, causing a deluge of data to become available across the Defense arena.

Better sensors may provide increased local situational awareness, however the big gains will come from being able to fuse all of the available data into a coherent picture of enemy combatants, over huge areas and extended periods of time.

The military can neither afford the manpower nor tolerate the latency of having all the intelligence data reviewed and analysed manually. Fortunately, as has often been the case, commercial technology is undergoing a similar parallel transformation based on a similar exponential explosion of data.

ADLINK is at the forefront of the Industrial Internet of Things, with local sensor processing nodes, communication infrastructure, Fog and Cloud Computing, and software to securely harness the data generated and processed by this distributed system. Many of these ADLINK products are also relevant to the Defense market, each being suitable in a particular deployment environment.

*ADLINK's wide product portfolio is well suited to deployment in military systems; from small low power modules, through rugged form factors, to Cloud server platforms, ADLINK products serve the entire Data to Decision chain.*

Being a Premier member of the Intel® Internet of Things Solutions Alliance gives unrivalled access to processing technology. *As each CPU technology generation brings increased processing capability for broadly the same electrical power, the capability to deploy greater complexity of applications within a constant SWaP budget increases.* This in turn can fuel the increase in sensor numbers and resolution; the platform can process the sensor stream in real time to extract and disseminate only data of known value, rather than requiring the whole data stream to be transmitted.

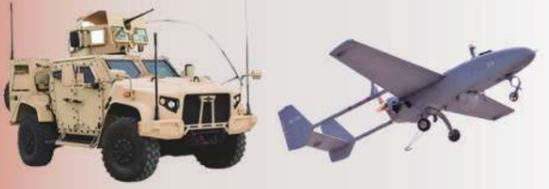
In addition to Intel's relentless roadmap, other technology providers offer complementary and alternative techniques. For example, *NVIDIA's many-core GPUs have transformed some areas of sensor processing, including radar, wide-area surveillance, and hyperspectral imaging, due the inherent suitability of parallel processing on those data sets.* While this parallel processing paradigm has rapidly increased the processing capability within a given SWaP envelope, the real gains are yet to be exploited – the advent of Deep Learning will likely power the next wave of systems capabilities.

Many military programs are already mandating the use of an abstraction mechanism to simplify the dissemination of data, and to provide future-proofing to vehicle programs. The US VICTORY and UK Generic Vehicle Architecture initiatives are such examples, utilising the Open Management Group's Data Distribution Service (DDS) as the foundation of data transmission. DDS provides abstraction of both the data type, and the means of disseminating the data, and is at the heart of ADLINK's Vortex software suite. With a publish-subscribe mechanism based on security rules, new equipment can be easily added to an existing system, advancing its capability and reducing through-life costs.

*ADLINK understands and is committed to providing the platforms that can Collect | Store | Analyse | Share, to enable the transformation from Data to Decision.*

## Rugged Systems, Target Platforms

Collect | Store | Analyse | Share

	<p><b>Rackmount Server</b></p> <ul style="list-style-type: none"> <li>• Private/secure cloud</li> </ul>	
	<p><b>High-density AdvancedTCA</b></p> <ul style="list-style-type: none"> <li>• Workstation virtualization</li> <li>• Naval radar processing</li> </ul>	
	<p><b>Outdoor Extreme Server</b></p> <ul style="list-style-type: none"> <li>• Mobile edge computing</li> </ul>	
	<p><b>VPX, CompactPCI Modular SBC</b></p> <ul style="list-style-type: none"> <li>• Bespoke system integration</li> </ul>	
	<p><b>COTS System</b></p> <ul style="list-style-type: none"> <li>• Rugged GPU-enabled computer</li> </ul>	
	<p><b>Computer-on-module</b></p> <ul style="list-style-type: none"> <li>• Ultra-portable</li> <li>• Lightweight systems</li> </ul>	



## Acquisition, Processing and Dissemination of Data Throughout the Battlefield

ADLINK  
Advanced Analytics  
Computing Solutions

Secure, standards-based data connectivity



## Extreme Rugged Computing for Mission Critical Systems

Sophisticated and diverse technology demands are the hallmarks of modern defense systems, featuring endurance, efficiency and connectivity as proven force multipliers across the spectrum of global defense operations. ADLINK Technology is a strategic asset to prime contractors and systems 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 and technology readiness level (TRL) of defense deployments, providing optimal Size, Weight, Power and Cost (SWaP-C), high bandwidth and proven rugged performance in open architecture COTS-based solutions.



## Originating 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 defense deployments. Further, ADLINK's Extreme Rugged products offer configurability and flexibility to meet the broadest range of defense 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 defense customer needs while enabling value, performance, flexibility and longevity for extended deployments. By offering in-house design with manufacturing, 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.

## Innovative Embedded Products and Capabilities

ADLINK's Extreme Rugged computing platforms have been deployed across the broad spectrum of demanding military, 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, and multiple SATA, 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 defense customers.



- Extreme Rugged computing for mission critical systems
- Validated rugged from the ground up
- Expertise in connected data-focused defense electronics
- Committed leadership in industry's standards
- Certified platforms and products to accelerate time-to-market



## Ground Vehicles: Vetronics

In 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 payload sub-systems that support the ground mission are integrated and controlled via a mission computer. Current ground mobile mission computer design utilizes mature, standards-based technologies to implement an open architecture that meets DoD Information Assurance requirements.



### COM Express Module: Express-SL/SLE

- 6th Gen Intel® Core™, Xeon® and Celeron® Processor with Intel® QM170/HM170/CM236 chipset
- Up to 32GB dual channel ECC or non-ECC DDR4 at 2133 MHz
- 3x DDI channels, 1x LVDS (or 4 lanes eDP), supports up to 3 independent displays
- 8 PCIe x1 and 1 PCIe x16
- GbE, 4x SATA 6 Gb/s, 4x USB 3.0 and 4x USB 2.0
- Supports Smart Embedded Management Agent (SEMA) functions
- Extreme Rugged operating temperature: -40°C to +85°C (build option)



## Air Defense Radar System

Radar systems play a crucial role in air defense, producing vital data for timely location of enemy positions. A lightweight mobile weapons vehicle requires a radar system with high computing performance and data transfer rates in order to carry out automatic target recognition and provide the operator with key information to aid in critical decision making. The system is installed in the limited space available in the vehicle with minimal airflow and must be able to withstand the harsh environments of the battlefield.



### 6U VPX Blade: VPX6000

- Dual quad-core 4th Generation Intel® Core™ i7 processors
- Dual channel DDR3L -1600 ECC soldered memory, 16GB per CPU
- PCIe x8 NTB to P2 per node
- Two 10G-KX4 to P1 per node
- Storage upgrade via mezzanine card with scalable onboard SSD option
- Remote management with Intel® AMT



### 3U VPX Blade: VPX3010

- Up to 12-core Intel® Xeon® Processor D-1500 SoC
- DDR4-2133 soldered ECC SDRAM up to 16GB
- Dual 10G-KR, up to three 1G Ethernet ports
- Up to PCIe x16 Gen3 interface supporting non-transparent bridge
- One XMC expansion slot, PCIe x8 Gen3 with Rear I/O to P2



## Force Protection: Counter Sniper

Protecting our troops in the field is one of the highest priorities of the defense command. Sniper fire is one of the hardest threats to predict and defeat for today's warfighter and requires a new type of countermeasure to focus on detection of enemy fire targeting troops in moving vehicles. With an audio technology to determine the direction and elevation of a sniper target by using only the sound of the sniper's muzzle blast and the supersonic shock wave created by the bullet traveling through the air. This countermeasure effectively enables combat troops to locate a sniper while ignoring sounds similar to that of a gunshot.



### PCI/104-Express SBC: CM-920

- Dual-core 3rd Generation Intel® Core™ Processor
- Up to 4GB industrial grade soldered down ECC DDR3 memory 1600MHz
- 1x HDMI, 1x VGA, and 1x 18/24-bit LVDS display interfaces
- 1x PCIe x16 (Gen 3) and 1x PCIe x4 or 4x PCIe x1 (Gen 2), 2x SATA 6 Gb/s, 2x GbE, 4x USB 2.0, and 2x serial ports
- Extreme Rugged operating temperature: -40°C to +85°C



### PC/104 SBC: CM1-86DX3

- DM&P Vortex86DX3 SoC
- Full ISA bus support
- Up to 2GB DDR3-800MHz memory
- Extreme Rugged operating temperature: -40°C to +85°C



## UAS Payload Computing

Unmanned Aircraft Systems (UAS) provide a quantum leap in the way battlefield information is gathered. As UAS deployments accelerate and evolve, sensor and data processing requirements challenge the performance envelope of small form factor (SFF) High Performance Embedded Computing (HPEC) solutions. Payload computing requirements demand the highest processing power available while presenting the lowest possible SWaP profile. In a typical application, a Payload Computer functions as processing element that provides video or sensor data capture, processing, and compression for subsequent data transmission.



### VITA 75 footprint system: HPERC™

- SWaP efficient sealed SFF system
- Coldplate mounting or passive cooling
- Intel® Core™ i7 dual-core processor
- Quad Gigabit Ethernet
- Available GPGPU on PCIe x16 Gen3



### CompactPCI Blade: cPCI-6940

- Up to 16-core Intel® Xeon® processor D-1500 SoC server grade processor
- Integrated AMD Radeon™ E8860 GPU onboard
- 16GB DDR4-2133 ECC soldered memory & up to 48GB with socket type
- Dual 10G SFP+ ports on front panel (8HP versions)
- PCIe x16 to J4 UHM connector for rear expansion

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