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Welcome to this
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 edition of the
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As an established web portal for the International Defence & Aerospace Industry, we strive to provide a comprehensive and detailed listing of Military Equipment Suppliers, Products and Services. This magazine is designed to keep you up-to-date with latest news and events within the Defence Industry's Governing Bodies, Organisations and Companies.

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RELIABLE ELECTRIC POWER ON-DEMAND, ANYWHERE

ELECTRICITY DIRECT FROM COMBAT AND TACTICAL VEHICLES DELIVERS MOBILE COMBAT POWER NEEDS IMMEDIATELY

As innovative capabilities are added to tactical and combat vehicles, there is a critical need for additional electrical power to support them. That need for more power will increase as more modern and power-hungry technologies are added to mounted and unmounted systems.

To solve the growing power gap, the vehicles soldiers use can be transformed into mobile power generators with minimal changes that don't affect the performance of the vehicle. The result is mission-assured power, generated directly from the vehicle's powertrain; enabling clean, reliable power to use for greater threat detection, lethality range extension and freedom of maneuver while recharging mission equipment. Power is always at the ready.

Threats in the Gulf region require maximum preparedness as adversarial capabilities continue to grow. Battle formations in some cases could be confronted with an equivalent match of firepower and strategy. Forces now must contend with the need to shoot and communicate while on the move to counter the threat. Moving large power generators while conducting a tactical mission can leave these formations vulnerable to a quick-moving enemy.

Hauling power generators on the battlefield to support the tactical mission's power demand is no longer conducive to enabling a dominant position. Being mobile is necessary for defeating your adversary and dominating the battlespace.

The U.S. Army is recognizing these power needs and has positioned its Maneuver strategy towards the understanding that combat vehicles need substantial electrical power upgrades to conduct more independent operations against stronger growing adversaries.

In the UAE, the Defense Forces are modernizing and updating their C5-ISR, Mission and Weapons systems with more advanced technology. These systems all have a common and critical need for high-reliability and high-quality, electrical power for persistent operations in all tactical



environments. The need to sense, detect and defeat threats at longer distances requires more electrical power.

A Fast Solution for a Growing Power Gap

Leonardo DRS and Allison Transmission have jointly developed and delivered a power generation machine, packaged within the vehicle's powertrain, to support both mounted and dismounted troops with the capability to execute all of their capabilities.

The technology, On Board Vehicle Power (OBVP), generates up to 125kW of electrical power for any mission need: command post, Electronic Warfare, Special Forces, vehicle mission equipment packages, and more.

The small but powerful generator is integrated inside the transmission's bell housing which creates substantial additional electrical power for the vehicle which can also be exported outside of the vehicle without compromising platform performance.

In its basic automotive powertrain configuration, such as in the Navistar MaxxPro or Nimr platforms, the vehicles only have so much power to devote to mission critical systems. The Leonardo DRS/Allison Onboard Vehicle Power system has been specifically designed, tested and delivered to address the increasing need for more electrical power to support expeditionary and mission-critical needs.

It gives warfighters power when they need it right from their own vehicle while supporting a range of platforms including



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power-hungry Command Post On-The-Move vehicles, and can be adapted into vehicles designed for special operations missions that require high-reliability, mission-assured clean power.



Leonardo DRS and Allison Transmission OBVP design uses a Transmission Integral Generator (TIG)

with power producing capabilities from 30 kW up to 125 kW integrated into an Allison 3000 or 4000 series transmission. The OBVP system was designed to maintain the existing driveline length and can be installed as a complete factory-new transmission/generator unit or as a retrofit kit. No additional belts, bearings or shafts are added. The TIG encompasses the same volume as the standard transmission and converts mechanical energy into electrical energy directly from the vehicle's engine, the most efficient way to generate electrical power.

The OBVP TIG system offers commanders immediate operational power capability On-the-Move or At the Halt and does not frontload the engine like alternator solutions do. The TIG is maintenance free and when in operation, becomes a force multiplier that extends battlefield mobility and reduces the logistical footprint.

Strong Industrial Partnerships in the UAE

With a long legacy of design, development and partnership experience, the UAE has a strong industrial base to develop on-board vehicle power technology into its fleet of combat and tactical vehicles.

Vehicles such as the UAE Defense Forces MaxxPro fleet are a natural candidate for this power-gap technology because of the existing Navistar and UAE support partnership that also brings together AMS – Bin Hilal as their preferred UAE industrial partner.

Tied together, the substantial industrial facilities, a high caliber of engineering, manufacturing and support capabilities are in place within the UAE to help deliver effective OBVP upgrades to the UAE MaxxPro fleet.

Leonardo DRS has a growing engineering base in the UAE. In early 2019, Leonardo DRS opened a new Systems Engineering Facility at Tawazun Industrial Park (TIP). The focus of this new facility is to support the delivery of a range of C4I solutions from integrated network and application agnostic tactical systems for Land and Naval environments to discrete products and capabilities such as Cyber Secure Tactical Mission Computers and Thermal Weapon Sights (TWS). The On Board Vehicle Power (OBVP) capability will be supported out of the same facility ensuring that the core knowledge and knowhow required to deliver UAE based support is in place from the start.

The Leonardo DRS vision is to establish a capability that compliments and collaborates with existing UAE based businesses and government agencies to build a deeply rooted and sustainable engineering led base interleaved with existing

world class businesses such as AMS-Bin Hilal and Allison.

Maximize Disaster Aid Support Teams

With a rich legacy of humanitarian aid assistance, the United Arab Emirates brings a range of emergency services and crisis response tools around the world and within its own borders, saving lives with modern services.

Mobile hospitals, crippled villages and infrastructure all need power immediately to have a successful emergency response. Generators do the job but require more logistics, manpower, maintenance, and fuel to depend on them.

The Leonardo DRS/Allison On-Board Vehicle Power system has an obvious application in the area of Emergency Services and associated humanitarian aid and disaster recovery. OBVP-equipped vehicles can rapidly deliver much needed electrical power to national infrastructure such as hospitals, pharmacies, emergency medical triage facilities, gas stations, water treatment facilities etc. while normal electrical services are established or repaired.

In the case where generators cannot make it through remote or heavily damaged regions, rugged vehicles with OBVP technology built-in can bring reliable, clean and constant power anywhere you need it. This additional life-saving tool will revolutionize disaster aid units.



Award-Winning Technology

Recently, the Leonardo DRS/Allison On-Board Vehicle Power system was awarded a top award from the 2020 Military & Aerospace Electronics Innovators Awards. The Platinum award, the highest Military & Aerospace Electronics Innovators award honor, recognized a, "superb innovation, characterized by a groundbreaking approach to meeting a need and a new level of performance, efficiency, ease-of-use," according to the judging panel.

The technology is proving itself as experts and military leaders begin to see the fast-approaching need for more electric power generated right from the vehicle.



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Leonardo DRS has also been awarded U.S. military contracts to integrate OBVP into prototype Command Post Integrated Infrastructure mounted platforms and Terminal High Altitude Area Defense (THAAD) missile battery command and control, and launcher vehicles. The system improvements will give air defense operators immediate access to electrical power directly from a vehicle's power train as part of modernization efforts around the service.

Summary

Today, electrical power generation must be considered as part of the heart of every modern weapon system lethality upgrade, sensor fusion package and extended-range tactical network connectivity requirements to achieve the mission objectives.

The electrical power gap is real. Warfighters do not need to be worried whether they have enough mobile power while training or fighting – they need to focus on winning the fight or completing the mission.

The technology is real and available today to solve the problem of weapon systems going down or operational readiness suffering because of a lack of basic power.

OBVP has been tested, exercised and proven to be a highly reliable, low technical risk technology. OBVP equipped vehicles to improve the operational adaptability of ground forces by providing mobile, expeditionary power when speed, range, agility, and flexibility are critical to mission success.

As the Army adds capability to its vehicles, the available power must be considered not just for what we want to power today, but for what and how the service needs to power into the future.

To see the Leonardo DRS/Allison On-Board Vehicle Power system in a live demonstration visit the Leonardo DRS booth at IDEX in February 2021 or learn more at LeonardoDRS.com/OBVP.

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As part of its sustainability commitment, rose plastic now offers a range of packaging solutions manufactured from sugar cane and PCR (Post-Consumer Recycled).

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SEE IT IN ACTION

Q&A with Peter Simson, Director, Tyron Runflat.

In the constantly evolving theatre of operations, saving and protecting lives in high mobility vehicles is critical.

Recent changes have seen the focus shift increasingly to urban operations where wheeled vehicles have a major advantage over tracked, heavily-armoured vehicles. The line between wheeled or tracked vehicles has further broadened with the significant growth of ultra-manoeuverable 6x6 and 8x8 wheeled platforms.

Tyron Runflat helps military operators overcome the challenges associated with maintaining manoeuvrability in environments where tyre strike is a constant threat, whether via ballistic attack or simply rapid deflation. Tyron's All-Terrain Runflats manage the durability and capability of wheeled vehicles to run on one or more deflated tyres, ensuring the strategic safety and protection of personnel and the mobility of ground forces.

Q: What is a runflat?

Simson: All-Terrain Runflat technology goes back some 40 years, with the intent to give a wheeled vehicle with one or more tyres deflated the potential to continue to manoeuvre to a place of safety, over any terrain.





Q: How Do They Work?

Simson: Mounted to the rim and inside the tyre, they fill a percentage of the internal air capacity of a tyre. On rapid deflation, the tyre will run on the runflat insert instead of collapsing directly onto the wheel rim, which will cause a lack of traction.

Q: There are multiple types of runflats available – which is the best kind?

Simson: The main kinds of runflats are rubber, composite or plasticised materials for All-Terrain Runflats for use on military, security and 4x4 vehicles. Here at Tyron we primarily produce rubber runflats, as we consider this to be the best material for the task.

Q: What are the advantages of rubber?

Simson: Rubber absorbs shock from impingement caused by curb strikes, potholes and operating in generally hostile environments. It also drastically reduces the vibration and stresses that are transmitted through the runflat to the wheels, axles and drive shafts allowing you to continue with little change to the handling of the vehicle whilst retaining a degree of comfort for the driver and passengers. As a compliant material, rubber also prevents damage caused to the tyre from impingement between the runflat and the inside of the tyre – all

of which are documented issues that leading tyre manufactures have sent out circulars in regard to.

Q: Do Tyron All-Terrain Runflats meet Finabel standards?

Simson: Yes, they exceed them, thanks to our beadlock technology. Without adequate compression of the tyre beads against the flanges of the wheel (beadlock), the vehicles are incapacitated with deflated tyres. With only the 'drag' from the deflated tyres, the wheels will slip inside the tyres on level ground, let alone trying to negotiate any obstacles or inclines. Military vehicles are required to be able to continue their mission and/or return to base with one or more of the vehicle's tyres deflated. Therefore, the military Finabel 20.A.5 and A.20.A Standards demand a guaranteed minimum runflat performance of 50km, preferably 75km; and a minimum of two hours off-road negotiating hills and obstacles like curb strikes with two tyres deflated. Our rubber runflats are over manufactured in width to allow for the manufacturing tolerances of the wheels and tyres, ensuring tyre bead compression during the installation, guaranteeing the beadlock.

Q: What logistical requirements do Tyron runflats have?

Simson: We have developed our modular, multi-piece runflat, the Tyron ATR-MP, specifically to keep logistical requirements low. Typical one-piece systems require a large hydraulic press to insert or remove the runflat from the assembly when changing tyres. This requires the wheel and tyre assembly - or indeed the whole vehicle - to be taken to a base with the appropriate equipment on site. Or in many cases, the logistical challenges and costs include freighting the assemblies to a third-party base or even another country. Our patented Tyron ATR-MP, however, is designed to be fitted and removed with standard workshop tools in the field. Not only do they make large, heavy, and expensive hydraulic machines obsolete, they significantly reduce the costs of logistics mentioned above, and the significantly reduced vehicle down time means the soldier remains best supported and protected.

For more information on the range of Tyron Runflat solutions please email: peter@tyron.com
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in  

High frequency chip equalizers offer excellent slope linearity

Smiths Interconnect's new CEX series provides optimized solutions for gain variation over frequency.

Smiths Interconnect, a leading provider of technically differentiated electronic components, subsystems, microwave and radio frequency products announced the release of its new CEX Series of High Frequency Surface Mount Chip Equalizers optimized to offer precise compensation for unwanted gain variation over frequency in an RF signal chain.

The CEX Series of High Frequency Surface Mount Chip Equalizers is designed to offer customers a configurable design approach to get the right solution for specific frequency range and slope, fitting a wide range of requirements up to 40 GHz with a maximum slope of 4dB.

"The CEX series of chip equalizers complements our existing line of SMT high frequency board level components pushing the boundaries of size, weight and power with each new design and expanding our offering for Space, Defence and

Communication systems", says Bruce Valentine, VP of Business Development.

CEX Series of high frequency SMT chip equalizers are a totally passive solution with multiple slope and band





The CEX Series is suitable for multiple markets, applications and offers :

- Configurable design approach providing optimized solutions for gain variation over frequency.
- Multiple slope options (1-4 dB) and excellent slope linearity (± 0.25 dB or better).
- Typical Voltage Standing Wave Ratio at 1.5:1 max and low insertion loss at 1 – 1.25 dB max.
- Frequency offering up to 40 GHz supporting a wide array of markets and applications.
- Proven thin and thick film process technology providing small size, light-weight and level of power in a cost-effective, easy-to-implement surface mount solution.
- Electrical and thermal performances tested through simulation analysis and real-life tests to ensure Series qualification.

options allowing RF designers to reach more precise compensation as the Series offers linear gain equalizers with a positive slope. The product's uniqueness stands out against competitors with its customization capability in terms of both frequency range and slope.

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MADE IN

USA

PPM Systems Supplies Custom Filters to British Army

PPM Systems has designed and produced 90 custom filters for the British Army spectrum team based at Blandford Camp to support the Army's Battlefield Tactical Communication and Information Systems (BATCIS) programme to upgrade its capability.



The custom filters include multiple designs of narrow band cavity filters in band pass and band stop versions.

They are an important element that allow for increased co-location and integration of systems onto common platforms. The use of filters reduces intermodulation and out of band noise, providing optimum signal levels and traffic throughput.

Paul Cotterill, PPM Systems Business Development

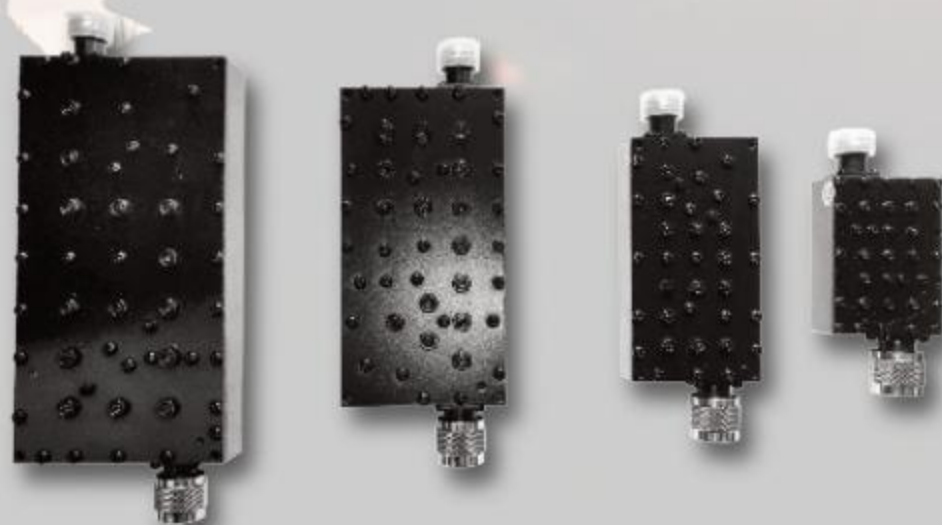
Manager, said: *"This was a significant order for high quality filters across 30 custom types and is a good example of PPM's rapid design capability to supply these types of filters."*

Cavity filters are ideal where low insertion loss and medium to high power handling is required with high selectivity and out of band rejection.

PPM Systems can supply custom filters in a range of designs and technologies including: lumped element (LC), cavity and comb filters, microstrip, ceramic coaxial and helical filters.

To find out more about the products, please visit

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Rugged Video Processing and Distribution from Vision4ce



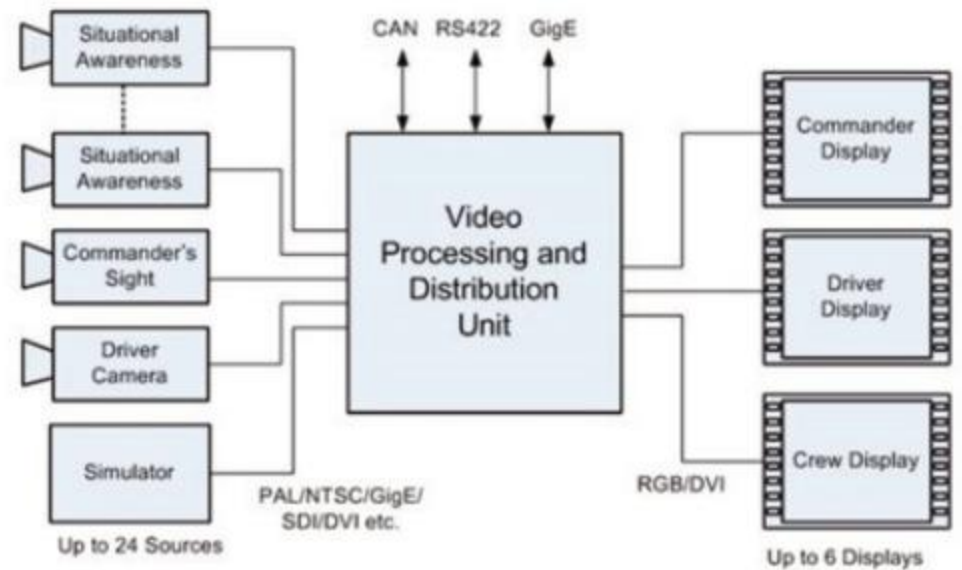
A range of computers, designed for harsh environments, optimised for image and video processing, including tracking and classification of objects using Artificial Intelligence algorithms.



The GRIP Video Processing and Distribution units (VPDU) from Vision4ce are rugged high performance computer platforms based on industrial PC hardware which is packaged in sealed enclosures for use in harsh environment applications.

The range includes high performance Intel Core i7 CPUs and can also include NVIDIA or AMD GPUs to support complex graphics requirements or high-performance computing applications using GPGPU processing.

The GRIP VPDU's incorporate unique video processing



hardware that facilitates processing and distribution of video in systems comprising multiple video sources which need to be processed and routed to multiple video displays.

For example, the VPDU can support Intel latest generation multi core i7 mobile processors, with an AMD GPU to drive up to 6 output displays. The VPDU has a flexible input architecture, which is modular and allows the VPDU to be tailored to support multiple video capture devices in digital and analogue formats as well as multiple communication interfaces such as Ethernet, serial & CAN Bus.

Video Processing and Distribution Options

Image	Product	Size	Data Interfaces	Video Inputs	Video outputs	Processing	Features
	VPDU	287mm x 340mm x 101mm	4 x RS232/485 2 x GigE 1 x CAN 2 x USB2.0	24 diverse video Analog & digital RGB, PAL/NTSC, SDI (SMPTE 292) DVI-D, CamerLink, GigEV	6 diverse video RGB, DVI -D, DP	Intel CPU AMD GPU	Low latency output and distribution
	VPDU 10	293mm x 242mm x 89mm	1 x RS422 1 x RS232 4 x GigE 1 x CAN 4 x USB2.0	24 x HD -SDI (SMPTE 292)	4 x HD -SDI 1 x DVI-D 1 x PAL	Intel CPU NVIDIA GPU FPGA	Very low latency output and distribution
	VPDU 20	293mm x 230mm x 88mm	4 x RS422 5 x GigE 1 x USB2.0 1 x CAN	Any two from: 2 x PAL/NTSC 2 x YPbPr 4 x HD -SDI	4 x PAL/NTSC/ YPbPr 4 x HD -SDI 1 x DVI-D	Intel CPU NVIDIA TX2	Very low latency output and distribution
	VPDU 30	191mm x 172mm x 58mm	2 x Ethernet	2 x USB3.0	2 x DVI	DUAL NVIDIA TX2	Includes 4 port Ethernet switch
	VPDU 90 (Embedded Video Processor)	125mm x 98mm x 71mm	2 x RS232/422/485 4 x GigE 4 x USB3.0 4 x USB2.0	2 x HD -SDI (SMPTE 292)	1 x HD-SDI 1 x VGA 1 x DVI-D	Intel CPU	Very low latency output and distribution
	VPDU 100 (Embedded Video Processor)	100mm x 100mm x 20mm	3 x RS422 1 x GigE 1 x CAN 1 x USB2.0	Any two from: 2 x PAL/NTSC 2 x YPbPr 4 x SD/HD/3G -SDI	4 x PAL/NTSC/ YPbPr 4 x HD -SDI 1 x HDMI	NVIDIA TX2	Very low latency output and distribution

Software Options

GRIP VPDU can be supplied with a range of Vision4ce software solutions.

FrameWorkx

Customers can purchase FrameWorkx which allows them to easily build their own image processing system, with a collection of video sources and sinks which can be combined with any number of image processing blocks to create a custom pipeline to meet the specific needs of their application.

The proposed framework provides video capture and display functionality and also includes an API definition for the implementation of alternative image enhancement algorithms. The API allows the customer to develop their own C++ processing libraries and then use the framework to input video frames and output video and symbology to the selected video output.

DART Software

The VPDU has the option of the DART software, an image processing software library for Intel or ARM processor platforms under a Windows or Linux operating system. A video tracker analyses video image sequences from a sensor system (one or more cameras), mounted on a servo-controlled pedestal (platform) to keep the camera pointing at the nominated person or object. In this context, a Tracker has two primary processing functions:

- Detecting and locating objects of interest in the video image (object location)
- Controlling the platform (Pan and Tilt) position and rate such that the camera follows the designated object (Pan and Tilt Control).

AI Classification

Vision4ce's Deep Neural Network based classification application runs on GPUs powered by NVIDIA's Tensor core architecture. It can benefit all manned and unmanned systems that require real-time multi-target object detection and classification technology.

With our dedicated in-house deep learning team, Vision4ce can assist with the entire deep learning process: Data collection, analysis, architecture selection, customisation, training and debugging, optimisation and runtime accelerators.

Video Management Software

The Video Management software (VMS) is a comprehensive tool enabling the complete system control of electro-optical (EO) systems. The application is comprised of a number of standard software modules that can be custom configured to meet the end user requirements. This modular approach enables the rapid and cost-effective deployment of sophisticated video management solutions with customers only needing to purchase those modules required for their custom application. The VMS includes bespoke operator interfaces.

A range of libraries based on the Vision4ce GRIP VMS software are available including:

- BIT
- Low latency video capture and display
- Video detection and tracking
- Video compression, streaming and recording
- Image fusion
- Ballistic computation
- Panoramic image formation

Customisation

The Vision4ce VPDU range is designed to simplify customisation of the hardware and software to satisfy user specific performance, electrical and mechanical requirements.

For more information about the Video Processing Display Unit please feel free to call us on:

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- Flexible design architecture
- Suitable for autonomous vehicle applications
- Wide range of software options
- DART software library for target detection and tracking
- FrameworkX for open software framework
- Comprehensive video management system functionality
- Artificial Intelligence based target classification
- Multiple and flexible video interfaces
- Military standard specifications (including gun shock)



For more information visit:

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VME Technologies

Overview

VME started development in the early 1980s, and was standardized in 1987 as a computer bus standard for use in embedded applications. It was very widely deployed in a range of industrial, research, semiconductor process control, transport, medical and defense applications worldwide. Many of these applications have migrated to more modern and higher bandwidth architectures. VME continues to be a widely installed architecture, particularly in the defense market.

Standards

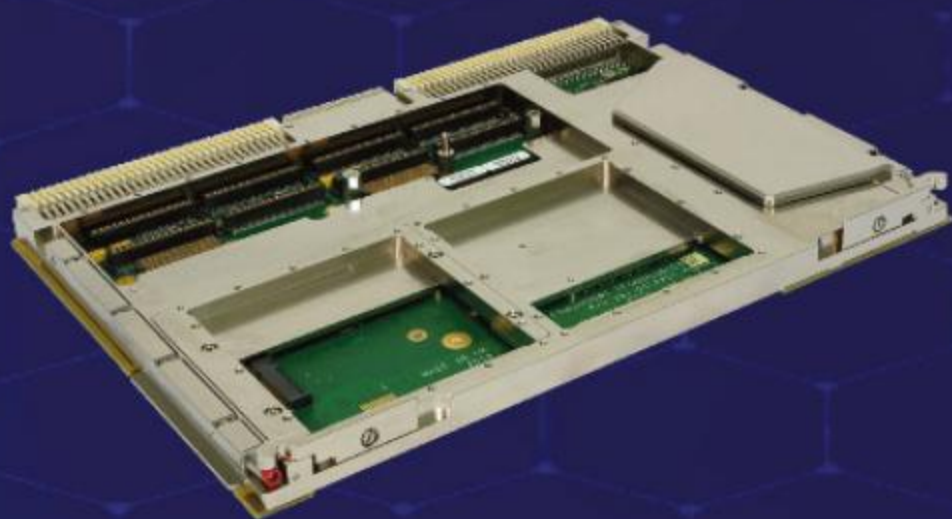
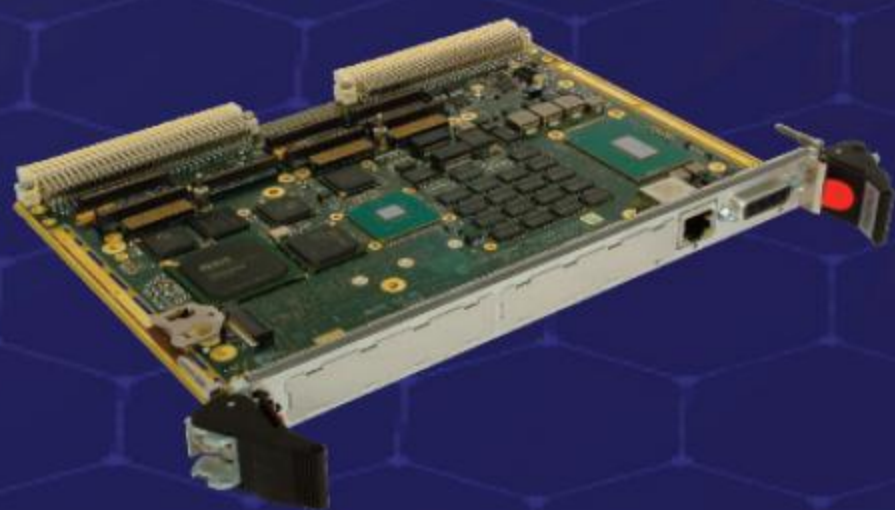
The VME specification, owned by the VITA standards body, was designed with the aim to specify the electrical and mechanical system characteristics required to design devices that will reliably and unambiguously communicate with other VME boards so that the system architect can optimize cost and/or performance without affecting compatibility. The specification itself establishes a framework for parallel bus computer architectures that can implement single and multiprocessor systems.

Comparison

Concurrent Technologies VME processor boards support the popular VME64 topology with MBLT transfers for up to 40Mbyte per second transfer rates. Whilst significantly slower than the Gbyte per second transfer rates that are common with modern serial fabric systems like VPX, many VME systems today use the VMEbus interface for basic setup and control and use Gigabit Ethernet connections on the front panel for better performance. It is very easy to set up multiprocessing systems with Concurrent Technologies VME processor boards as they can be configured as the System Controller to provide bus arbitration, a VME master supporting off board accessible memory or a VME slave.

Benefits

To support the typical defense applications, Concurrent Technologies VME boards are designed and tested to operate in and withstand a number of harsh environmental factors including: vibration, shock and extended temperature ranges. It is generally easy for a user to swap an old board with a newer one, often with minimal application and configuration changes. Technology transitions are a low risk solution for a mid-life upgrade or life cycle extension much simpler than replacing the whole system with a new architecture. Also, VME can be cost effective for I/O based systems that don't need high throughput transfers.



Not looking for a VME product?

Concurrent Technologies have a wide range of VPX, AdvancedMC and CompactPCI Boards available to suit your critical application needs

Click here to see Concurrent Technologies' full product portfolio



Avon Protection launch intelligent heated undersuit

Avon Protection are pleased to announce the launch of the Core Intelligent, a heated undersuit which maintains diver body temperature in all water conditions.

Global Militaries are realising the impact of Non-Freezing Cold Injury (NFCI) and its effect to both training and operations.

In the diving sphere the prevalence and diagnosis of this injury is on the rise, particularly with the adoption of diver propulsion systems and underwater vehicles.

The Core Intelligent undersuit is designed specifically to combat Non-Freezing Cold Injuries, and in turn, protect and maintain a diver's operational effectiveness. This new capability is highly versatile and can be deployed to combat exposure in all environments, both sea and land. Core Intelligent consists of several autonomous heating zones located on the torso, hands and feet. Utilising active sensing, each zone is monitored by a sensor and can be heated individually or all at once to maintain the diver's body temperature.

Compatible with both wet and drysuit diving systems or for use as a surface under-garment (small boat work etc.) Core Intelligent's capability is the result of close collaboration with key military users and partnership with market leading industry manufacturer Santi.

Commenting on the launch Kevin Gurr, Maritime Technology Officer, at Avon Protection, said: ***"Understanding the requirements of users has been the key to the successful development of the Core Intelligent undersuit; creating an intelligent thermal solution where users don't have to compromise on mission endurance, decompression management or manoeuvrability. At Avon Protection we are continuously working with our customers worldwide to design, develop and deliver world leading capability to guarantee their safety and to equip them with the latest technology."***

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Twelve-month extension of battery supply contract for Lincad from Team Leidos.

Battery manufacturer and supplier, Lincad, is celebrating a twelve-month extension of its battery supply contract with defence and logistics specialists, Team Leidos.

The contract is to continue supplying a range of primary batteries for distribution to British armed forces deployed around the world.

The batteries are mostly lithium chemistry, with many used in mission-critical applications. They are therefore required to conform to exacting UK Defence Standards. Lincad has invested further in its battery testing facilities to ensure that product supplied continues to maintain these required standards. Lincad also provides Team Leidos expertise in packing and labelling, ensuring suitable packaging for various transport modes, which includes full adherence with IATA transportation regulations.

The original three-year contract with Team Leidos began in Q1 2018. After demonstrating good performance during the contract, Leidos has agreed to extend the contract until Q4 2021.

Peter Slade, Joint Managing Director at Lincad, says of the contract extension:

"We are delighted to continue working with Team Leidos for another twelve months. With the UK military's involvement in managing the coronavirus pandemic, it is more important than ever that our frontline personnel are fully supported, and Lincad is proud to be part of that supply chain."

Team Leidos was founded to ensure continuous supply of mission-critical equipment and global expertise to the UK defence industry. The organisation is assisting in implementing the Ministry of Defence's Logistic Commodities and Services (Transformation (LCS[T])) programme, designed to improve the UK's defence supply chain.

www.lincad.co.uk



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Changing Demands for Highly Mobile Troop Technologies

As today's military force plans for a future, facing near-peer adversaries, they will see demands for rapid ground troop maneuvers, high end surveillance onboard each warrior, rapid communication and secure data transmission.

Bob Stanton

Director of Technology - Omnetics



Command control centers depend on constant-position-intelligence and tactical data, situation awareness regarding the battle-space operations in environments with electronic warfare threats. Miniature electronic sensors, detectors, transmitters and ruggedized wiring must be designed specifically to work on the active battlefield during high shock, vibration, and extreme environmental exposure. Fortunately, the new support equipment can operate on very low voltage and low current while operating advanced high speed CMOs and or GaN, (Gallium Nitride), circuits that process and transmit data at gigahertz speeds. Omnetics designs ruggedized military cable systems that are specifically built for continuous signal integrity with EMI protection in these unique applications. New cable and connector systems are focused on extremely rugged performance to fill a wide range of ground-based defense devices. Hand-launched UAVs with on-board surveillance cameras can send information back to portable control lap-tops. In addition to image displays on-the-ground, the soldier can direct remote controlled artillery to avoid personal running into harm's way. Special light weight cable and connectors are designed to military based SWaP, (small, low weight with power) specifications that insure high quality signal integrity during the operation. One example, is in the use of Mil. Specification 32139 Nano-D connectors and 32 AWG Teflon® insulated wiring pairs that survive the high shock and constant vibration experienced during UAV flight.

Ground troop electronics are employed by Future Soldier systems as well as the new Nett Warrior program. Constant monitoring of personal data of each warrior, as well as maintaining a flow of communication and position reporting is required. LIDAR electro-



optic systems have greatly extended the accuracy of portable weapon efficiency for our ground based troops. The weapon-capable interconnection cables are designed to match the higher speeds of these LIDAR photo-ranging and measurement scopes. New rifle scopes are being wired onto various mounted weapons to offer multispectral-vision for target acquisition, aiming and data collection. Omnetics also designs military interconnects for routing data from the weapon back to the control packs on our dismounted soldiers. In these cases, connector ruggedness and rapid device change is critical during field operations. USB 3.0 systems are the most used high speed digital system in the field today, because of small size, readily adaptable electronics and software systems that can be easily shielded from outside noise and EMI or Cyber interference. Specially designed low form factor micro-circular USB connectors are built with military-rated contacts for the battlefield applications. For example, micro-circular cable and connectors are used on the Black Diamond data management systems currently being used by dismounted soldiers. Since, signal quality is critical at high speed USB, the cable is contained within a field-qualified cable, shielded inside the jacket, designed to handle the speed as well as survive the open environmental exposure of the battlefield. Note, the Black Diamond connector systems is a Military Custom design that contains both power and signal processing within one interconnect system to save size and weight. The circular cable and connector is formed to allow easy routing and to provide easy mate and de-mate with gloves or bare hands when needed.

Providing constant ground-support and communications from orbiting satellites above has become a key tactical strategy to successful coordination of multiple battlefield operations on the ground. Omnetics Nano-d connectors are used regularly for



military space satellite systems from above. The Nano-d connector is an industry standard and is small in size and weight, retains contact through shock and vibration as well as being sealed with low-outgassing polymers that meet the NASA space materials specifications. Small satellites contain today's new single-board computers that provide multiple format signals and handle a multitude of data collection, image storage, and communications to and from earth. The Army's satellite management plan now includes the use of SpaceX- "Starlink" satellite constellation for improved signal quality. These satellites orbit at LEO, (low elevation orbit), to support their Defense GPs Systems. LEO satellites are lower cost, more accurate and less susceptible to jamming because they are closer to earth. Also the combining of LEO satellite data with MEO, (mid-earth orbital), satellites, has improved positioning accuracy and is used for directing ground based autonomous weapons.

Adapting connectors to newer and more advanced military requirements has become a serious design challenge that goes beyond the old "quote-a-spec" method of the past. The wide range of applications of a "one-connector-design", not fit all new systems! Today, a designer can review his circuit demand for electronics, mechanical use and survival to help select connectors to fit and perform more advanced technology. This process of configuring connectors to application-specific functions, begins with a review of the equipment it will be applied to. Cable requirements will vary from mobile instruments, ground troop electronics and even military space systems.

Standard and COTs connectors can be considered and analyzed to find a similar design to fit the need and during early stages of design work, the COTs connectors can be used in bread-boarding prototype circuits to save time and cost of development. Significant advantages occur when the COTs or small changes of connectors will suffice. Military level COTs connectors are built with the quality of materials and processes that can shorten the design time and give early expectations of longer life and performance. When changes in shape or size, are required, a "solid-model" of the new connector will be quickly completed by the manufacturer and sent to the system designer. An on-line work session with the solid-model engineer is available to speed up the process. After design completion, connector fabrication can be transferred directly to smart tooling machines or a 3-D model is fabricated and sent to the designer for final approval.

Omnetics has worked directly with and supplied many military teams in the U.S and throughout the world for over 30 years. See Omnetics online at www.omnetics.com or call the sales team or call for a direct designer interface, it's we do.

OMNETICS

CONNECTOR CORPORATION

SCHROTH®**Mine Blast & Utility Seat Systems**

The **SCHROTH** Mine Blast Protected Seat Systems are tubular lightweight systems with a unique resettable Energy Absorbing (EA) system designed into the seat.

The EA design and technology comes from the years of experience **SCHROTH** has with energy management in seatbelt systems. The design of the seat gives the occupant not only excellent protection in a mine blast event, but also offers excellent protection in the event of an accident or impact. The All Belts to Seat (ABTS) design allows the vehicle manufacturer to optimize the installation of the seat within the hull. An integrated footrest can also be incorporated into the seating system for additional lower-leg protection. The unique **SCHROTH** EA technology is tunable to match the size and weight of the vehicle as well as the level of protection required and the available space within the vehicle interior. The EA is also designed to reset itself and offer high levels of protection for the secondary (slam down) event.



The Mine Blast protected seating system is available in two versions:

- **SU-62 compact forward- or rear-facing seat**
- **SU-63 side-facing seat with full or side specific headrest for exceptional side impact protection**

The **SCHROTH** seating comes standard with an ECE certified lightweight 4-point harness restraint. Restraint systems with ECE complaint 5-point seatbelts are also available.

SCHROTH offers the ideal system for military personnel & troop transport configurations.



KEY FEATURES


- Quick release, wall-mounted interface
- Modular construction
- Spring Loaded Self-Folding, storable seat pan
- Foldable backrest

CUSTOM APPLICATIONS

Our lightweight seat systems may be adapted to many ground vehicle applications. We can assist with interface, integration, installation and ergonomic requirements as well as any vehicle specific seat modifications that may be required.

CONTACT:

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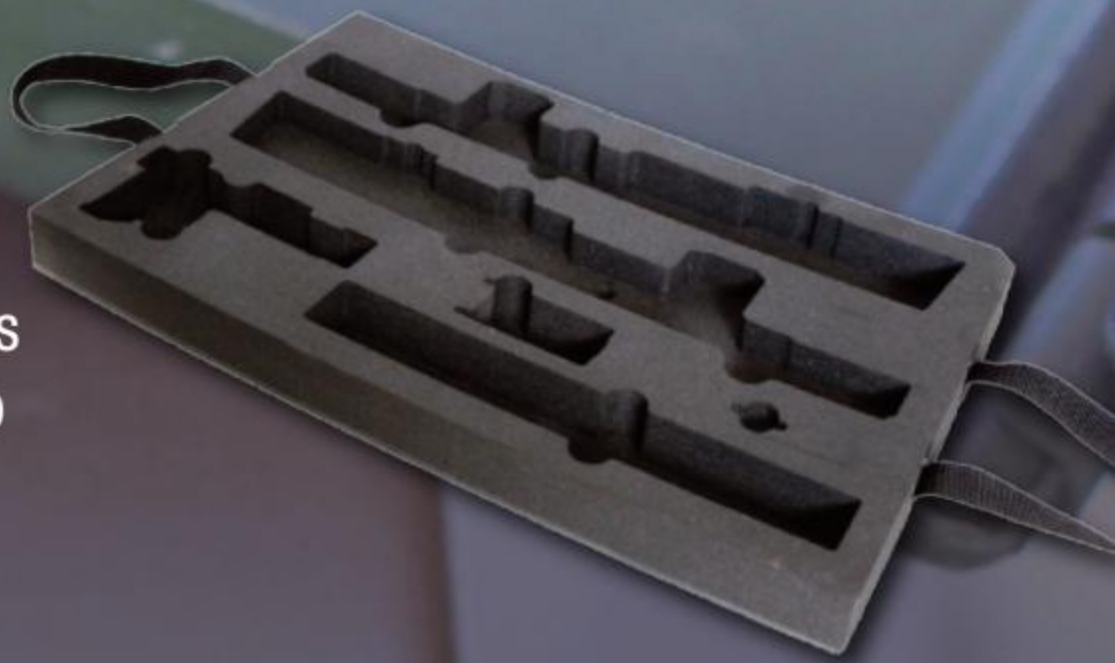


MILITARY & DEFENCE FOAM PACKAGING

Military foam packaging demands a much greater attention to detail than commercial packaging solutions. A large amount of military cargo requires careful packaging and handling due to the sensitive materials.

The equipment must be protected from physical impacts, climate changes and any biochemical hazards too. Military equipment is often transported around the world, which is why the defence foam packaging needs to be of the highest quality to ensure safe transportation.

Kewell Converters take into account the likelihood of physical impact and others factors in the transportation of sensitive goods. That's why our military foam packaging is produced to the highest possible standard and we take all of these things into consideration. Our expert team has a great deal of experience in producing military foam packaging for all kinds of purposes.



OUR MANUFACTURING PROCESS

We understand the needs for high-quality military foam packaging and manufacture products for this purpose.

Kewell Converters Ltd. manufactures foams that meet or exceed the following military requirements:

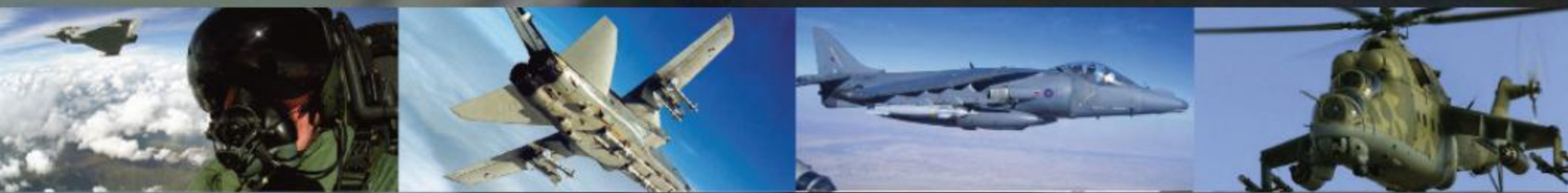
- Foam for general purpose packaging.
- High density foam for general purpose packaging.
- Foam for explosive compatible packaging.

MILITARY FOAM APPLICATIONS

We supply high performance protection for applications such as helmet inserts or aircraft ejector seats. In addition to which we supply packaging, case inserts and bespoke foam parts for applications such as ordinance packing & protection, weapons carriage and bespoke designed flight cases and inserts machined to fine tolerance when accuracy is critical. Our engineered military foam is perfect for these applications as it has a number of properties that make it the ideal material. This includes the low mass, energy absorption, durability, strength under compression and tension that engineered foam packaging offers.

Static dissipative and conductive foams also find many applications in the military sector.





FOR PROTECTION, PERFORMANCE & DURABILITY

MILITARY GRADE FOAMS - FOR PROTECTION, PERFORMANCE AND DURABILITY

Advantages

- Tested and approved
- Light weight
- Energy absorbent
- Long-life durability
- Low odour
- Explosives compatible
- Static dissipative and conductive
- High impact resistance
- High tear strength
- High tensile strength
- High resistance to compression set

For 'mission critical' packaging

- Ordnance protection
- Missile cradles
- Weapons case inserts
- Rifle case inserts
- Ruggedised case inserts
- Electronics device protection
- Flight case fitments

For high performance protection

- Personnel protection
- Body armour
- Helmet inserts
- Aircraft ejection seats
- Tool control inserts
- Sleeping mats
- Buoyancy devices
- Punctureproof' marine fenders

For the very best defence foam packaging then speak to us about the right foam application for your military foam packaging or aviation requirement. Our defence foam packaging is made out of the highest quality closed cell foam materials. Major international aviation and defence OEM's trust Kewell to deliver and you can too. So, when failure is just not an option Kewell Converters are here to help!

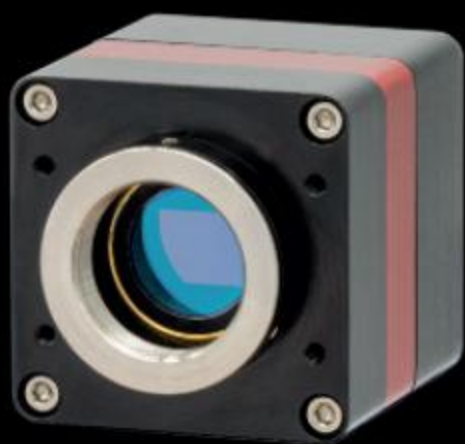


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Next Generation Low Light Camera Technology

*Mark Donaghy, VP Sales & Marketing
at Raptor Photonics*

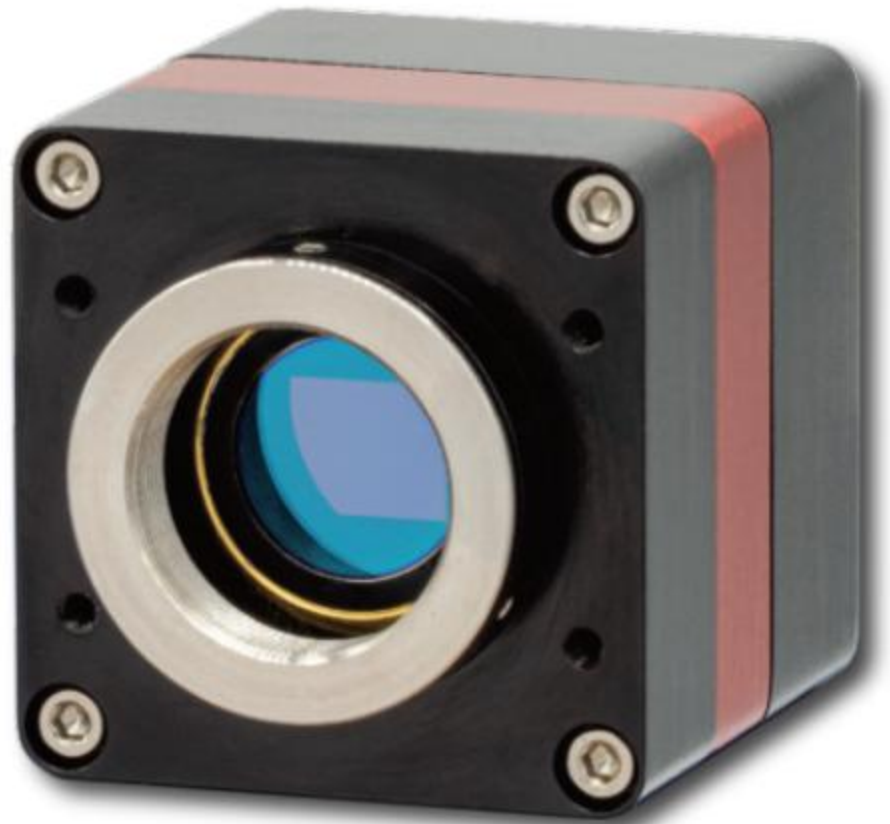
Raptor Photonics is a UK-based specialist camera company, developing ruggedized, SWaP enabled camera cores and systems for the surveillance and defence markets.

Our customers are primes, government organisations (Government Labs other NATO customers) and systems integrators.

Seeing in low light is desirable over a broad spectrum of environmental conditions. Raptor cameras are compact and rugged, operating in harsh climates. This is essential for customers who quite often put the cameras into “mission critical” applications, which run 24/7. Raptor now has cameras and systems being used underwater, on land, in the air and even in space—where Raptor cameras are used in low-orbit cube satellites for earth observation and 5G telecommunication networks.

SWIR Camera technology

Raptor’s camera technology enables users to see subject matter in very low levels of light. Since its inception, Raptor has been a leading player in the design and development of SWIR cameras using InGaAs sensors. Many applications that are difficult to perform using visible light are made possible with SWIR imaging, enabling the user to “see beyond the visible.” Unlike mid-wave infrared (MWIR) and longwave infrared (LWIR) light, which is emitted from the object itself, SWIR is similar to visible light in that photons are reflected or absorbed by an object. The reflective nature of SWIR light provides the strong contrast needed for higher-resolution imaging. Ambient starlight and background radiance (nightglow) are natural emitters of



Owl 1280 Vis-SWIR camera

SWIR and provide excellent illumination for low-light or night-time imaging, including imaging through fog, haze and water vapors.

The cameras are capable of imaging from 600 nm to 1700 nm. Raptor’s family of InGaAs focal plane arrays offer different resolutions and pixel pitches along with cooling, readout and interface alternatives, providing a range of options for customers requiring visible and SWIR imaging. Low-noise electronics and readout integrated circuit (ROIC) design ensuring high quality images. Furthermore, Raptor is certified to the ISO 9001:2015 standard.



SWIR Monocular

SWIR Monocular

Raptor has developed a handheld ultra-compact multi-functional tactical SWIR monocular which operates in zero light conditions, greatly enhancing vision at night or in dust, fog, smoke conditions as well as full day time operation. It offers countermeasure capability in that it detects all FoF (Friend or Foe) LTD (Laser Target Designator) wavelengths. It is ideal for special operations personnel, offering a compact, lightweight, rugged, and reliable solution.

It can be handheld or weapon mounted, allowing for both passive day and night vision and See Spot Detection (Laser Target designation) for any battlefield laser, from 600nm to 1700nm. The full system is rugged, small and ideal for field application. The system comes with an integrated 1550nm laser illuminator (not detectable by GEN II or III monocular or NVG) for discrete covert night vision application. It is light weight, pocket-sized developed to provide precise and accurate target acquisition during day and night operations.

Next generation CMOS technology

Raptor has recently launched a family of next generation CMOS based digital cameras offering superb night vision capability. There are two options offering SVGA and HD resolution, both are mono, global shutter compact camera core in low light performance. The camera is SWaP optimised and designed to Mil Spec (-40°C to +75°C) standards. It is perfect for integrating into gimbals and turrets and there are many custom



Hawk 800 CMOS Camera

options for OEMs including electronics, mechanics, extended operational temperature as well as digital video outputs.

OEM Capabilities

Raptor is working with many major OEMs and instrumentation companies globally across a wide range of applications, who need custom designs to meet their exact imaging and detection requirements. We work collaboratively to understand their camera needs and develop robust solutions through a detailed project management system. We design and develop core camera platforms which can then be customised / tailored to address specific requirements. Our quality, reliability, flexibility, and fast delivery make us a very attractive solution for OEMs.

For further information on any of these products or our camera capabilities please visit our website

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The TwinDeck

Full side access container with additional mid-deck for double floor space. Divide contents easily with less stacking with the benefit of easy access from side-door.



Tri/ Bi/ Quad-Con Units

Each set of units join to form a TEU [Twenty Foot Equivalent], which can be transported as normal, then separated and moved on location.



Event Reefer Container

Contains additional features to standard Reefer including: easy-open emergency release doors, chequer plate flat flooring, thermal door curtain, lighting and ramp.



The BlizzardStore

Containerised expandable and modular large scale refrigeration unit. Can be upsized and downsized. Cost effective and faster alternative to permanent solution.



Dual Temperature Reefer

Reefer with freezer and chiller section running simultaneously. Movable partition wall, side-door for access to both sides, flat flooring. Available in 20ft and 40ft.

50 unforgettable years of CP Cases

2021 marks the big 50th milestone for CP Cases. It has been a long and interesting road to the 50-year milestone, a journey that we are proud to share with you in this momentous of year.



The company started off its journey in the Rock 'n' Roll Live Events industry back in the '60s. Founders Peter Ross and Chris Sherwin saw a gap in the UK/ European market for the need of more ruggedised and protective cases, and decided to take the entrepreneurial steps to developing innovative engineering; with CP Cases inducted as a registered business in 1971.

Peter and Chris continued to build on their network within the Live Events and music touring industry, supplying to big named clients and creating a name for themselves. CP Cases has since evolved its experience and skillset of flight cases to focus more on a customised offering of designing and manufacturing protective cases and 19" racks; now specialising predominantly in the Defence, Medical and Broadcast sectors. CP Cases also work within the Energy & Marine and Police & Security and keeps its connections within the Live Events sector too.

A key feature of CP Cases' growth story has been our innovative thinking and broad understanding of our customers working environment. Combining that with our deep knowledge and expertise in material selection and 50 years hands on experience in manufacturing processes. This enables us to provide the ideal product that matches perfectly the performance and budget requirements.

'Thank you to our CP family'

The CP family has continued to cultivate in people and in partners over the years. Our amazing retention of staff and partners really does highlight our quality of work and company ethos. We work collaboratively with our partners to achieve the perfect end result. We feel now is a perfect excuse to celebrate each and every staff member and every partner for the hard work and loyalty that has helped us on the road to 50 years.

Like every company, there has been a number of hurdles that we have had to overcome (if now is anything to go by); but our passion, innovation and talented team of people has helped address those challenging times and transform them into positives. We are confident that we can continue this into our future thinking and keep on delivering inventive technology to fit to our customers' requirements.

Keep up-to-date

If you wish to keep up-to-date with our pioneering journey over the last 5 decades please Subscribe to our Newsletter. We will be sending out monthly, never before seen content delving into the milestone moments of each decade. Come and celebrate the 50 unforgettable years of CP Cases with us.

For more information, please visit our website.

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What's All The Noise About?

Radar, SATCOM, airborne communications, GPS, telemetry – these and other military systems rely on high performance crystal oscillators to perform effectively and reliably.

They are the heartbeat of the system, generating the frequency – the timing reference signal – that the system requires to function. They are designed to perform under any and all environmental conditions that the system may encounter, providing mission critical performance at all times. To do so, noise in the system, *phase noise* to be precise, must be addressed.

Phase noise is a phenomenon which is present on every oscillator output spectrum, and it often defines the specifications that are achievable in a given system. High phase noise present in the local oscillator of a receiver will limit the sensitivity required to detect very low power signals, such as weak signal returns from a distant target.

Data communications systems used in military applications often require that the signal be multiplied to a higher frequency. And because noise degrades exponentially, it is necessary to start with as little phase noise as possible.

While an ideal oscillator would generate a pure, noise-free sine wave, all oscillators produce noise due to active devices in the circuit. This noise arises from rapid, short term random phase fluctuations that cause instabilities.

Phase noise components in the system then spread the power of the carrier signal to adjacent frequencies resulting in noise sidebands. These sidebands subsequently mask weak signals close to the carrier frequency.

Phase noise is usually given in units of dBc/Hz. This represents the noise power relative to the carrier contained in a 1Hz bandwidth, centered at certain offsets from the carrier. The phase noise spreads out equally on either side of the carrier but according to IEEE definition, only one side is measured - hence the designation SSB, or *single sideband* phase noise.

Many advancements have been achieved in the recent decades, particularly in the phase noise performance of crystal oscillators and with the methods of measurement. These have, in turn, enabled system innovation and performance previously thought to be impossible.

Summary

Phase noise is an important and often limiting factor in determining the performance capabilities of most systems. The actual critical specification limits are highly application specific and design engineers must evaluate what maximum phase noise levels can be tolerated without affecting system performance. Care should be taken, however, not to over-specify as this can result in a more complex, higher cost unit than is needed.

Visit www.greenrayindustries.com for additional information and technical resources.



✦ **Missile Guidance** ✦ **Smart Munitions** ✦ **SATCOM** ✦ **Telemetry** ✦ **Airborne Communications** ✦
✦ **Radar** ✦ **Portable Communications** ✦ **GPS** ✦ **Detection & Identification** ✦

The Ultra-low Phase Noise Reference Source for Mission Critical Apps.

Greenray's YH1485 OCXO has been designed as a reference source for demanding communications, radar, instrumentation and military applications that require very low phase noise in order to optimize system sensitivity.

The ultra-low phase noise YH1485 delivers phase noise performance below -170 dBc/Hz and excellent short and long term stability for reference requirements.

The YH1485 features a 1" square, hermetic package and supply voltage of +15 or +12VDC. Optional reduced acceleration sensitivity – down to $5 \times 10^{-10}/g$ in the worst axis – is also available to satisfy high shock or vibration environments and improve overall system performance.

For information about the YH1485 OCXO and our full line of high performance oscillators, call Greenray at +1 717-766-0223. You can also visit us at www.greenrayindustries.com.

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Phase Noise vs. Vibration Testing
Award-winning Quality, On-Time Delivery & Customer Service



✦ Missile Guidance ✦ Smart Munitions ✦ SATCOM ✦ Telemetry ✦ Airborne Communications ✦
✦ Radar ✦ Portable Communications ✦ GPS ✦ Detection & Identification ✦



TRIFIBRE

SPECIALISED CASING AND PACKAGING

OUR GUIDE TO CASES & PACKAGING FOR HEAVY PRODUCTS



Choosing the most effective packaging when shipping large or heavy-duty products can be difficult so we have put together a guide of considerations and potential solutions to help you ensure your item arrives safe and without damage.

Things to Consider When Shipping Large or Heavy Items

Weight

Whatever you are shipping the weight is a key consideration. Whilst we want to avoid adding unnecessary weight to your shipment the construction and wall material must be able to bear the weight of your product to prevent failure in transit and potential damage.

Fragility

A more fragile item that requires precise calibration or can be easily damaged or scratched will require more protection on the inside of the packaging or case as well as more resistance to bumps and impact in transit.

Size

An item that is both large and heavy may limit your options for suitable packaging which may require a custom fabricated container for example over a moulded waterproof case.

Handling

Large or heavy items are usually more difficult to place or remove from their packaging, as a result the design of the case or packaging needs to allow this to be done easily and without risk of damaging the product during loading and unloading. In addition, it's important to consider how the packaging itself will be handled for example using a forklift, hoists or heavy-duty castors.

Shipping Method

The mode of transport you need to ship your item to its destination can be a factor in the type of material used in the packaging to ensure your item is not damaged during transit. Your shipment may travel via truck, water, air freight or a mixture of various types of transportation each with different forces and elements to contend with.

Destination

Some destinations limit certain materials from being used in your product and its packaging. The case or packaging you use also may need to stand up to extreme temperatures and environments.

Heavy Duty Cases and Packaging for Large and Heavy Items

Heavy Duty Flight Cases

Heavy Duty Flight Cases can be designed and built to your specification. Our heavy duty Flight Cases are built to last using aluminium extrusions and strong steel fittings. Flightcases can be built using a variety of different high quality wall materials and be specified in a way to best suit the available handling. Our heavy duty flight cases are all built in the uk with the contents in mind.

Wooden Crates

Wooden crates are simple, recyclable and cost-effective solutions. Whilst they may not be as pretty or have the longevity and flexibility of a flight case they are an ideal solution on a budget or less long term use. It's important to ensure that whoever you use to manufacture wooden crates that high quality materials are used. Our wooden crates are made from high quality wood and built in the uk to protect against the rigours of transport.

Steel Racks and Containers

Steel racks and containers provide amazing strength and longevity ensuring they stand the test of time as well as transport. Our custom steel containers are durable against high impact, vibrations and extreme elements. We can design racks or containers specific to your requirements taking into consideration handling and logistics.

Moulded Cases

Our large range of moulded cases from the likes of MAX, SKB and Peli as well as our in house manufactured rotational moulded cases come with the assurance of a lifetime guarantee. Both Injection Moulded cases, and Rotational Moulded cases are available. They are resistant against extreme environments and provide ultimate protection to your product. There is a good reason that these sorts of cases are regularly trusted by military organisations to ship and protect defence equipment all over the world!

Interior Packaging for Large Items

It's vital that your product does not move around within its packaging in transit. Trifibre use a variety of methods including blocking materials, high density foam padding, flyware and internal mounting brackets to ensure your product is safe from damage.

www.trifibre.co.uk



PEARSON ENGINEERING TO SUPPLY 1500 TRACK WIDTH MINE PLOUGHS TO INDIAN ARMY

Pearson Engineering is pleased to announce that the company is now under contract to supply over 1500 Track Width Mine Ploughs (TWMP) to the Indian Ministry of Defence.

The order, which will see the Pearson plough integrated with the T-90 S/SK tank, will be delivered in partnership with BEML Limited.

With previous experience in integrating counter-mine capabilities with the T-72, T-90, Arjun Mk1 Main Battle Tank and BMP-2 Armoured Vehicles, Pearson Engineering is proud to be a current supplier to the Indian Army.

Dr. Deepak Kumar Hota, Chairman and Managing Director of BEML said, "We are proud to be associated with MoD to enhance the combat capabilities of the Indian Army. This is another example of BEML's capability to meet the specific requirements for our armed forces. BEML signifies the true spirit of Make in India".

Mr Richard Beatson, Business Development Director at Pearson Engineering said, "We are delighted to have received this important order alongside our partners at BEML. Having been committed to developing capability for India for many years, we

look forward to further developing our relationships, both with the end-user and Indian industry."

The track width mine plough will enable the Indian Army's T-90 tanks to move through mined areas, whilst remaining highly mobile. Pearson Engineering has a long heritage in the supply and integration of mine ploughs to Armed Forces around the world.

BEML is a leading multi-technology company that plays a pivotal role in serving India's core sectors of Defence, Rail, Power, Mining and Construction by offering world class products from state-of-the art manufacturing facilities located across India.

Pearson Engineering is based at the Armstrong Works in Newcastle upon Tyne. The site, formerly the home of Vickers Defence, has long historic links with India, having previously supplied Vijayanta Main Battle Tanks for the Indian Armoured Corps.

www.pearson-eng.com



**PEARSON
ENGINEERING**



Scalable battlefield mobility

New products from Pearson Engineering. Threat-Sense and Threat-Pathway provide military vehicles with the ability to detect and displace scatterable-mines.

pearson-eng.com

Scatterable-mine detect and displace capability allows any military vehicle to overcome rising threat.



With a focus on organic and scalable battlefield mobility, Pearson Engineering has released its latest product developments Threat-Sense and Threat-Pathway. Designed to provide military vehicles with capability to both detect and displace scatterable-mines, the unique systems have been developed to overcome the fatal challenges to mobility which were seen only a couple of years ago in the Donbass region of Ukraine and which present a rising threat to all military vehicles, both armoured and non-armoured. The systems are designed to be used together, or separately, dependent on existing capabilities and requirements from different nations.

Threat-Sense, the detect component, uses artificial intelligence to identify surface laid threats. Deep learning algorithms developed by the company's team of software engineers can detect anti-tank and anti-personnel mines and indicate to operators in varying environmental conditions where threats are present. Crucially, by analysing the insights provided by the system, the most viable route out of the threat can be found. The fully passive system simultaneously analyses video streams in real-time from visual and thermal cameras mounted on the vehicle. If any threats from a pre-programmed and trainable library are detected in either the visible or infrared spectrums, they are highlighted on a screen fitted within the vehicle and an audible warning is sounded. The system serves as a tool to reduce the cognitive effort required of the operator without overriding human decision making, ultimately allowing them to take on a broader range of tasks to maintain battlefield advantage.

Where no safe route is possible, Threat-Pathway, the displace component of the system, can be rapidly deployed from under-armour. Whilst more akin to a product from Pearson Engineering's existing range of proven front-end equipment (FEE), Threat-Pathway has been developed to be carried by any military vehicle, rather than a dedicated engineer variant. Without impacting vehicle mobility, the new capability allows self-extraction from air delivered scatterable mines and supports freedom of manoeuvre when a minefield is encountered. At approximately 250kg for a typical IAV, Threat-Pathway is designed to be used in an urgent scenario where mobility has been stalled and independent manoeuvre is the only option. The equipment can be removed after use and is considered a life-saving consumable that can be easily replaced. With all military vehicles able to carry the system, it also serves to reduce the adversary's expectation of how armed forces might be fixed by scatterable mine attacks. Further, the self-extraction capability will reduce reliance on engineer capable platforms and units and hence improve the doctrine of 'march divided and fight united'. Threat-Pathway has been designed to provide full width clearance including at full steering lock and can follow ground contours in undulating terrain.



Threat-Sense



Threat-Pathway



Scatterable Mine Detect and Displace Systems

G&H launches the StingRay NightCrawlIR HD CZ motorized MWIR lens series

The StingRay
NightCrawlIR™
series represents
a revolution in
cost and
performance in
the HD MWIR
lens market



Building on decades of heritage in the midwave infrared market, G&H presents a no-compromise approach to conquering today's demanding thermal imaging requirements.

Purpose-built from the ground up for the demands of high resolution applications, our NightCrawlIR™ series utilizes unique aperture-specific foreoptics and a modular base to maximize performance without breaking the budget.

Each lens in the series is ruggedized for tactical application with a sealed front lens flange interface and additional features for convenient payload, enclosure, and dewar installation.

All NightCrawlIR lenses ship standard with our StingWare™ controller featuring metric zoom, metric focus, and active athermalization functionalities. The controller leverages integrated hardware on the lens cells to minimize system hysteresis to accurately and repeatedly report back exact focal length and object distances. This means never losing steps, no drift over temperature. Absolute position always.

Key Features

- Aperture specific configurations – no extenders
- Ruggedized for tactical application: IP67 at front lens. Optional DLC coating
- 19-22 mm cold shield heights supported
- Supports up to 16.4 mm HD image formats

Key Benefits

- StingWare™ controller included on all lenses – Metric zoom and focus mechanism and athermal compensation
- Fully configurable controller interface with multiple communication protocols and adaptable for power supplies from 12-24 V

Applications

- Border surveillance and security
- Land vehicles
- Fixed wing/rotary aircraft

Contact G&H Keene (StingRay) today and a representative from our technical sales team will respond within 24 hours.

www.stingrayoptics.com/nightcrawlir

EMAIL: info@gandh.com



OUT WITH THE OLD, IN WITH THE NEW.

As part of Horstman's continued growth and investment, old machines (pictured below) are departing and making way for newer ones, with greater capability, capacity and throughput.



Bidding farewell to this machine, which has supported Horstman well throughout the years, having been installed back in 1997; it supported multiple programmes during its lifetime running in excess of 40,000 hours.

Horstman's latest acquisition is with the installation of a brand new HCN6800 plus a 6 Pallet extension to the current Pallettech system.

The new HCN6800 is configured to match the current HCN6800 cell, creating a fully flexible pallet system, capable of continuous manufacturing around the clock.

This investment unlocks the potential to manufacture more of Horstman's products than ever before of our production quantities and including new and exciting designs of Hydropneumatic Suspension Systems.

In addition, Horstman are also excited to announce that we have now taken possession of and installed an LK Metrology Altera M 25.15.12 CMM. This has been coupled with the latest Renishaw PH10MQ head and SP25M probing, allowing us to have the scanning ability which can acquire several hundred surface points per second, enabling measurement of form as well as size and position down to bore depths of 400mm.

This latest investment in technology is in line with Horstman's desire to remain at the forefront of high precision and integrity engineering.

The new machine additions allows Horstman to provide and offer to our customers the guaranteed service in design and production that has come to be expected and for years to come.



Horstman

www.horstmangroup.com

Horstman Defence Systems Limited | Locksbrook Road | Bath | BA1 3EX | UK





DECENTRALISED TRAINING AND OPERATIONAL READINESS DURING LOCKDOWN

It would be a fair assumption that very few in the world today have been left unaffected by the global Coronavirus crisis.

Moreover, the unfortunate truth is that the suffering caused has the potential to have a significant and sustained impact on the way we live and work.

In this time of national need many nations turn to their armed forces for support. Where this is the case the load is often borne by our medics and logisticians, those with the transferable skills and experience to easily reinforce our response. In fact, part of the U.K.'s Military Assistance to Civil Authorities, or MACA, response has been the deployment of military medical personnel to London's Nightingale hospital¹. Similarly, at the height of the crisis, the US Navy deployed the USNS Comfort & USNS Mercy to New York and California respectively to increase their hospital capacity².

Outside of the immediate benefit to a nation, a secondary result of these actions is that the personnel deployed in support gain valuable experience in crisis response. Ultimately, they become better at their jobs and their operational readiness increases. But what of the rest of the force?

A Military's requirement to respond to conventional threats remains; even while the pandemic takes an inevitable toll on personnel³ and the measures necessary to prevent further transmission impede its daily rhythm.

An article published in AUSAExtra's April 20 edition explores the effects the Coronavirus pandemic is having on the US military. It notes, significantly, that the

increased dispersion of units – a strategy employed in response to a growing adversarial ability to attack a concentrated force – has had the secondary effect of reducing transmission and increasing resilience. Essentially, they are institutionally social distancing.

However, it is not enough just to isolate and hibernate. A modern, professional military should seek to turn this, like any, crisis to their advantage. They must ensure that, should this pandemic persist, or another emerges in the future, they are able to independently maintain their readiness. Critical to this is access to high-quality, localised training facilities. Moreover, these facilities must be easy to use, maintain variety and allow for the gamut of complex military operations to be undertaken. Where a force is able to conduct regular and quality training, in spite of the prevailing conditions, considerable weight is added to any assertion that a force can maintain its readiness. In addition, this unit will emerge from isolation stronger and more cohesive than before. Ready, when needed, for the next crisis.

About 4GD

4GD Specialise in high-tech, reconfigurable and immersive CQB Facilities. Each SmartFacility® follows the core tenets of decentralisation, empowerment and immersion. To learn more about the SmartFacility®, please visit

www.4GD.co.uk

or email

info@4gd.co.uk

1. <https://news.sky.com/story/coronavirus-military-chief-helping-build-londons-nightingale-hospital-on-mission-to-save-lives-11966605>

2. <https://www.defense.gov/Explore/News/Article/Article/2134688/usns-mercy-usns-comfort-receiving-patients-in-la-new-york-city/>

3. The guardian reports that 9.1% of the UK Armed Forces are absent due to illness, self-isolation or support to loved ones.



Optimising connector design for the military industry


There's more to it than you might think



Very few components are subjected to extreme conditions in the same way as connectors used in the military industry.

Here, Ammar Lokhandwalla, customer application engineer at connector specialist PEI-Genesis, discusses how to optimise connector design for military applications.

Cables and connectors used in military applications must endure extreme conditions. Whether it's the rapid temperature fluctuations and changes in humidity, to persistent vibration, impacts and signal interference, they must operate reliably to ensure their users can get the job done.



Take the industry-standard D38999, for example. This is a military-specification connector that was originally designed in the 1970s and is now on its third-generation design. Like other connectors of its kind, it's made up of a few basic components: a hard outer shell, a neoprene rubber insert with holes to house the contacts, and sometimes a backshell on the outer housing that provides additional shielding and durability.

Material considerations

A primary consideration for engineers is the choice of materials. For example, although copper offers better electrical and thermal conductivity, aluminium is cheaper and easier to form and plate.

So, while copper is suited to high-voltage industrial applications where heat dissipation and conductivity are vital, aluminium is better in military applications where weight and corrosion-resistance are more important. Furthermore, aluminium can undergo plating to improve its corrosion-resistance, provide further electromagnetic shielding and to meet camouflage requirements.

For example, some military applications use olive-

drab green, a colour that was historically achieved with a toxic cadmium coating. In recent years, this has been replaced with a black zinc nickel plating that meets RoHS and REACH regulations.

Design early, design once

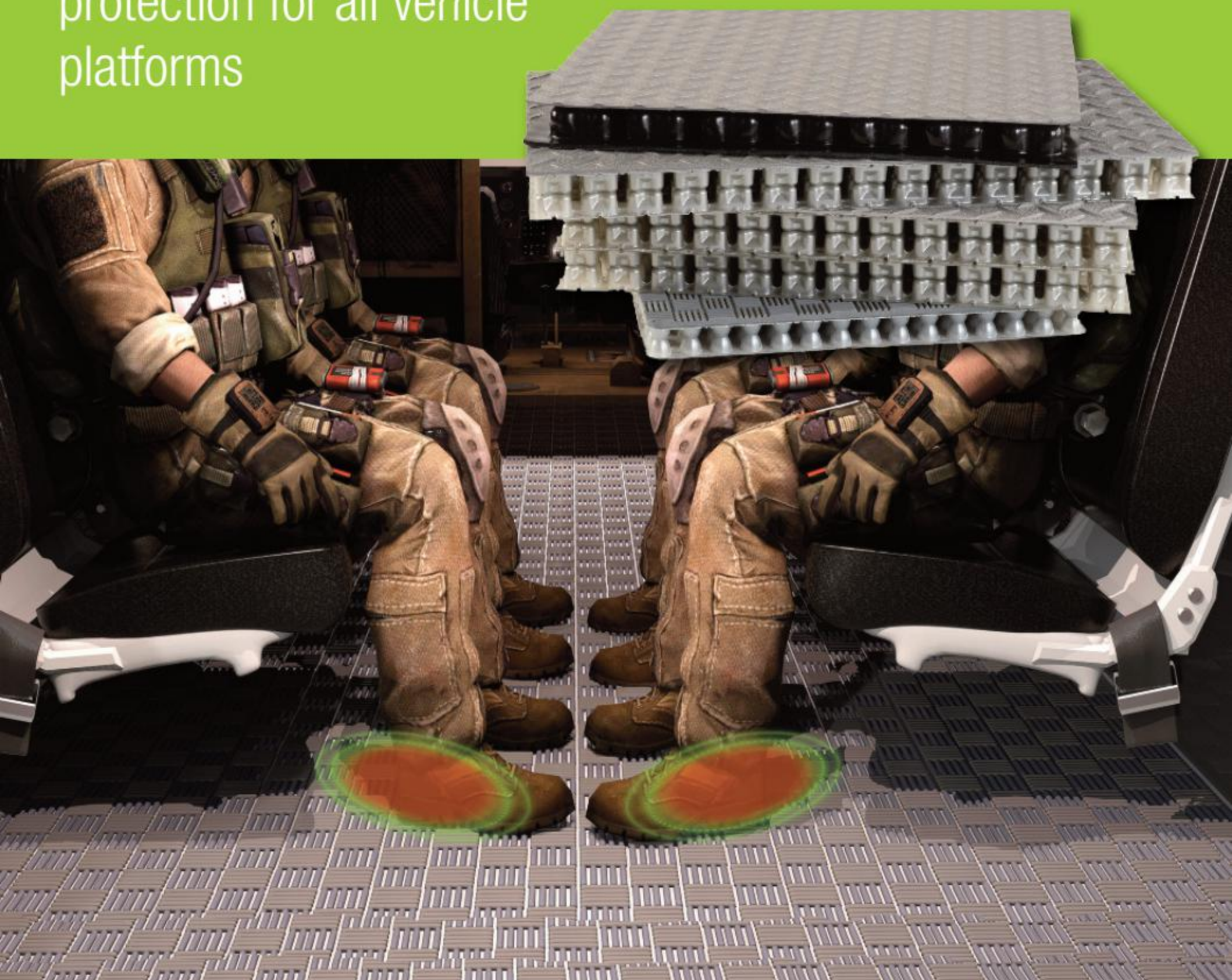
One of the biggest mistakes I see manufacturers make is considering connector design too late in the design process. This often means that a product's time to market is delayed while the design is reworked.

It's important to remember that your connector may have physical design constraints like a minimum wire-gauge or number of contacts, so it's vital to consult with your connector supplier early in the process. At PEI-Genesis, we've made this easy by offering customers a 3D wire model of the connector that customers can drop into their design to see if it fits. If it doesn't, our engineering team can help redesign it to meet the specification. To find out more, visit;

www.peigenesis.com

TSS joined SKYDEX in Showcasing Life-Saving Blast Mitigation Solutions and Presented at International Armoured Vehicles 2021 Virtual Conference

Defence community and military leaders benefited from industry insights presentation on the importance of blast protection for all vehicle platforms



TSS International B.V, Armour Mobility Specialist, on 2 February 2021 joined their partner SKYDEX for a joint presentation at the International Armoured Vehicles (IAVs) 2021 virtual conference.

TSS is the premier European integration partner for SKYDEX and its next generation, life-saving solutions for blast mitigation. TSS offers industry leader services as they work with vehicle manufacturers to perform sophisticated evaluation and modelling including Finite Element Analysis for survivability performance.

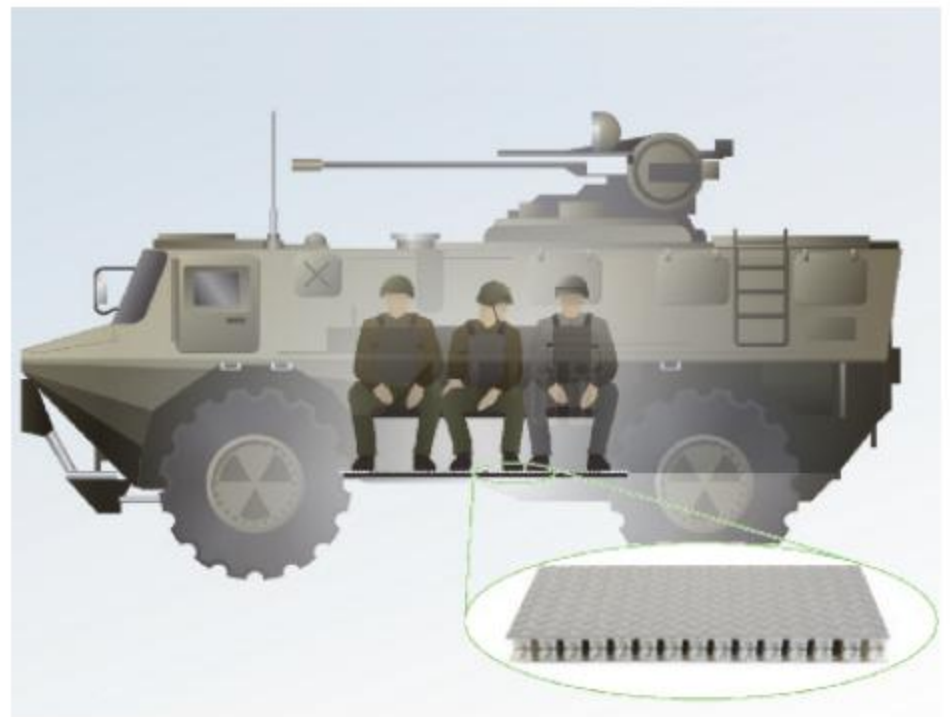
Recognised as the world's premier event for the armoured vehicle community, the IAVs conference gathers defence leaders and features exceptional speakers to share perspectives on the latest technologies, trends and concepts for land vehicles and force protection. As presenters, TSS & SKYDEX represent a select group of extraordinary companies who are at the forefront of innovation in the protection space. On February 2 at 1330 GMT, the team presented an industry insights session which was focused on armour platform blast protection.

"We're excited to have had the opportunity to participate in the annual International Armoured Vehicles Conference this year to and connect with leaders from the armoured community despite the challenges of the pandemic," said Rowland Wright, Business Development Manager at SKYDEX. *"Our industry insights session gave us the opportunity to highlight the benefits of our blast mitigation solutions for armoured vehicle designers and offered a closer look at the incredible technology which is engineered to enhance occupant survivability. The company's advanced materials solve a range of protection challenges for all vehicle platforms and protect the lives of their users."*

Louis Huijzen, Managing Director of TSS adds to that: *"In close collaboration with SkyDex and our clients, we have been able to gain valuable insights into the threats in the field and how they can concretely be reduced to acceptable levels. We are very happy to have been able to share these insights with the audience at IAV."*

For the first time, the IAVs event was hosted online due to the ongoing uncertainty surrounding COVID-19. Although the conference had pivoted to a virtual environment it continued to deliver an outstanding level of content and feature expanded conversations plus new sessions about C4i, Amphibious Vehicle capability, robotics and autonomy, to name a few.

For more information on TSS and additional information about SKYDEX blast mats, blast seating solution and how these help armoured vehicles platforms enhance their occupant survivability, please visit www.tssh.com or contact TSS via sales@tssh.com. Also contact TSS for the possibility to schedule a one-on-one presentation of the IAV-session.



About TSS

TSS International B.V. is an ISO9001:2015-certified family business, focused on delivering mobility solutions for (armoured) speciality vehicles. Since its first deliveries of runflat inserts to OEMs in the 1980s, it has broadened its product portfolio over the years by adding protected fuel tanks, heavy duty wheels, vehicle intercoms & emergency lighting and central tyre inflation systems.

From its base in the Netherlands, TSS supplies its products to vehicle converters and armourers all over the world. TSS seeks to add value through its expertise and by tailoring solutions to keep vehicles moving under the toughest of conditions.

TSS International B.V. is proud to have SkyDex to its product range and further improve the survival chances of police, special forces, peace keeping missions and humanitarian aid organisations worldwide.

About SKYDEX

Founded in 2001 and based in Centennial, Colorado, SKYDEX is a global leader in advanced impact mitigation and energy absorption solutions. From armored vehicles to bomb suits, helmets and body protection, SKYDEX is driven by a single purpose: "Protecting People and Things That Matter." With technical expertise and proprietary geometries, advanced SKYDEX materials are used to protect hundreds of thousands of lives across a wide range of applications, such as vehicle protection, marine performance, sports protection, blast and ballistics, work wear/PPE, electronics and more. Backed by a passionate team of engineers and incredible technologies, SKYDEX solutions outperform traditional materials. To learn more, visit www.skydex.com



The Will-Burt Company to Participate in IDEX 2021

Q★E★A★M
QUICK ERECTING ANTENNA MAST
MTS

The Will-Burt Company is attending the International Defense Exhibition and Conference (IDEX) located in Abu Dhabi, February 21-25, 2021.

Participating in IDEX is an opportunity to present the strengths of our company and connect with government departments, businesses, and armed forces internationally. IDEX is hosted at the Abu Dhabi National Exhibition Center (ADNEC) comprised of 12 indoor exhibition halls, outdoor display space, and live demonstrations for all types of equipment, vehicles, and more.

While this is an in-person event, Will-Burt will be taking all precautions and following guidelines to keep our employees safe during the COVID-19 pandemic. Enhanced measures of sanitation, social-distancing, temperature checks, and the use of facemasks are put in place by the ADNEC and will be followed by all Will-Burt employees attending the tradeshow.

Demonstrating the latest technology in land, sea, and air defense systems.



The Will-Burt Company booth is in the German Pavilion and showcasing the GEROH KVR Cable Driven Mast, the SPM Spindle Mast, the Stiletto AL, and the RLS Mast. The IDEX is also an opportunity to debut the QEAM MTS for its first public demonstration.

The Quick Erecting Antenna Mast (QEAM) MTS Series is a lightweight and transportable telescopic mast that is fast to deploy by a hand-operated lift system or with the optional electric lift system. This field mast is suited for antennas and other payloads that require a stable elevation from 3 to 15 meters and features built-in vertical keyways to minimize payload twists for high pointing accuracy.

The QEAM MTS Series meets all environmental requirements for MIL-STD-810 and exceeds demands of the mission. More model specifications can be found on our website under telescopic mast options.

About The Will-Burt Company:

The Will-Burt Company (www.willburt.com), headquartered in Orrville, Ohio, USA, is the world's premier manufacturer of mobile telescoping masts, towers, trailer systems, and pan and tilt positioners. We offer virtually every mobile payload elevation solution and full integration services for defense, government, first responders, telecommunications, energy production and other markets. Will-Burt also offers contract manufacturing, metal fabrication, powder-coating, and rapid prototyping services. Will-Burt is an international company with offices and manufacturing in the USA, United Kingdom, Germany, Turkey, and Singapore. All manufacturing locations are backed by a certified ISO 9001:2015 Quality Management System. Incorporated in 1918, Will-Burt is 100% employee-owned and is classified as a small business.

willburt.com



THE VIPER - Type

‘A highly comfortable and cost effective antiviral coverall which doesn’t harm the environment’

Reusable antiviral coverall

OPEC CBRNe has developed an Antiviral coverall - the VIPER - Type 4, which offers full protection against viruses including COVID-19 and its variants.

The VIPER - Type 4 can be laundered up to 30 times and protects against contaminated liquids, aerosol particulates, blood and blood borne pathogens and, airborne and depository viruses such as COVID-19.

The VIPER - Type 4 provides the user with a reusable PPE option which combines comfort and dexterity with high protection in one solution, benefitting both the user and the environment.

How does it do this?

By using the latest membrane technology and design features derived from our CBRN suits.

Why is it important?

End users have been telling us that current disposable coveralls are uncomfortable and cause the wearer to overheat. Buyers have been telling us that they would like to move to a more environmentally friendly solution which is also cost effective.

Who is OPEC CBRNe?

A British based design and manufacturer of level C CBRN and antiviral suit systems with a strong appetite to innovate.

While we have a manufacturing presence on three continents, we also have the flexibility to service a range of minimum order quantities.



4



Contact us...

For more information on the VIPER - Type 4 or any of our other systems contact us at:

info@opeccbrne.com
+44 (0) 192 555 2929
www.opeccbrne.com



25th
ANNIVERSARY

www.adventuretactical.com

This past year has been challenging for many across the globe. The pandemic has affected all aspects of life: reaching families, borders, the economy, and businesses both large and small.

Adventure Lights Inc. – a business located in Beaconsfield, Quebec, Canada – has been fortunate to have been able to weather much of the storm. The company has created state-of-the-art research and development facilities that allow us to both improve existing capabilities while developing new cutting-edge technologies.

The company has won numerous awards, including four consecutive Innovation Awards in Canada, a Congressional Award for Program delivery with NAVAIR and a Tech Connect Defence Innovation Award. With our direct inhouse manufacturing and research and development capabilities, Adventure Lights new innovations are now available in both our new and established product lines.

In 2018 Adventure Lights launched **Adventure Tactical Inc.** and brought its associated company Quantum Marine Ltd. to the forefront of the Search and Rescue industry with significant contract wins. As part of our steady growth initiative and expansion across product lines, these respective companies have become known industry standards in record time.

While adopting the *Extreme Products for Extreme Conditions®* slogan, Adventure Lights is now focused on supplying products to the Outdoor Sports and Recreation enthusiast, while Adventure Tactical Inc. focuses on distributing Positive Identification Solutions to those on the front lines. Adventure Tactical will also continue to supply Landing and Drop Zone Lighting Systems for deployment, evacuation, and supply in harsh environments. Quantum Marine Ltd.'s main focus continues to be that of serving the SAR community with a substantial focus on waterborne operations.

With the expansion of the Adventure Lights' umbrella, comes the introduction of one of the most sophisticated I.F.F. Helmet Lights on the market, **the Trilobyte™**, available exclusively through Adventure Tactical Inc.



The Trilobyte™ launched at IDEX2019, quickly gained rapid adoption, and set a new industry standard. It caught the eye of the Defense and Security community globally and set-in motion purchase orders that the company is rapidly fulfilling. During 2020, the Trilobyte™ became one of the most highly sought, and deployed, I.F.F. solutions in the world.

In a time where NATO countries and their allies are focusing on Future Soldier Systems and Programs, the Trilobyte™ was tested and immediately adopted in East Asia as part of their Soldier Enhancement Program and will continue to be used for the next five years. In some Scandinavian countries the Trilobyte™ has been purchased as a complement to our venerable VIP and VIPIR product. As many militaries are currently upgrading their technology with new vision systems the Trilobyte is being adopted to provide best in class features and capabilities for current and future soldier initiatives. While you are reading this, more countries continue to adopt our technologies to enhance the safety of their soldiers and law enforcement officers across the globe.

The Trilobyte™, with its unique lightweight design, delivers unparalleled performance compared to other products in its category. The light boasts features such as Auto-Synchronization, Programming and Playback, Early Laser Warning Systems, Multiple Colour Outputs as well as NIR and SWIR outputs. While some features are documented others remain unshared, except for use with some of the world's most exclusive and Elite Special Forces Teams.

The Adventure Lights group instills a culture of durability, dependability and innovation in its people and products that exceeds that of our competitors. This has been proven repetitively over our 25-year history. Our **VIP™** and **VIPIR™** products have become iconic with Special Forces and are still in active service after over two decades. This legendary product first hit the market in 1996, and like the Trilobyte™ today, the VIPIR™ became the standard for Special Forces.



The VIPIR™ continues to be unsurpassed in durability, versatility, and effectiveness in action – it remains the clear choice when compared to everything else in its category – and many Militaries continue to purchase this product built on the trust they have in its performance.

In 2020, Adventure Tactical, in collaboration with FinnProtec, was able to secure one of the most sought-after contracts published by the Finnish Ministry of Defence in recent years. The Minister of Defence authorised the Defence Forces Logistics Command to sign contracts for the procurement of weapon lights, helmet lights and Identification Friend or Foe beacons for soldiers. The procurement was preceded by extensive field tests conducted in Finland in which the suitability and compatibility of over 25 products were evaluated. These procurements were included in the national defence development programme and are part of the overall infantry night combat capability development. These procurements are aimed at building infantry troops' ability to fight at night, especially in poor visibility conditions. The I.F.F. Beacon chosen was our venerable VIPIR™. The first products will be delivered by the end of 2021 and taken into use starting from 2022. The overall value of this procurement is more than EUR1 million.

These are mere examples of the success that our group has been reaping, quietly (we are Canadian after all). As we celebrate our 25th anniversary, we also celebrate maintaining both our build quality and technology lead. From Personnel recovery and Identification Systems to Vehicle Identification & Safety Systems, and through our Expeditionary Landing and Drop Zones, the Adventure Lights group of companies offers a complete solution to many challenges.

While we continue to deliver trailblazing technologies to enhance soldier safety, we also pride ourselves in being socially and environmentally responsible. We have recently added a Renewable Energy Man Portable Power System which helps reduce battery waste on the front lines as well as help the user maximize their power sources. This initiative directly reduces the quantities of batteries purchased, reduces waste, and saves hundreds of thousands of dollars.

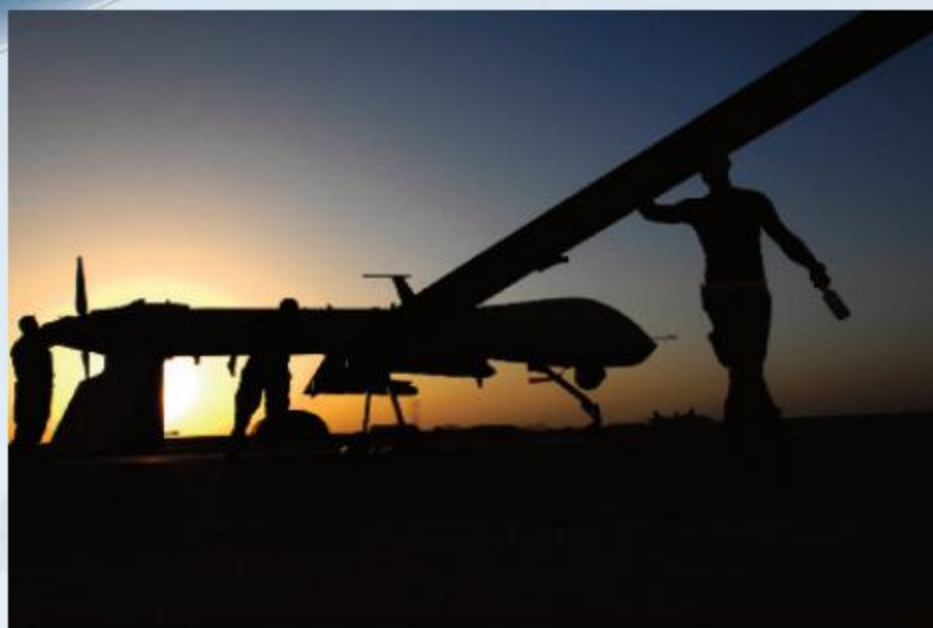
On our 25th Anniversary, we are proud to be one of the oldest companies in our industry and want to thank all those who have trusted our brand, on the battlefield at home and abroad. Your enhanced safety is our continued goal whether it is at sea, in the air, or on land – When Success is Vital™ we are there to help provide solutions to successfully complete the mission.

Interface Concept

ComEth4412a –SOSA™-aligned 3U VPX hybrid PCIe and Gigabit Ethernet Switch.

Interface Concept, leader in the design and manufacturing of COTS embedded boards and systems, is introducing the ComEth4412a, a 3U VPX dual plane hybrid PCIe Gen 3 and 40 Gigabit Ethernet Switch, designed in alignment with the SOSA™ (Sensor Open Systems Architecture) technical standard.





The ComEth4412a is controlled through an intuitive interface available as a command line (CLI) or graphical user interface (GUI), in addition to SNMP. This interface is running on the on-board management processor and is part of Interface Concept's feature-rich layer 2/3 switch management stack called "Switchware" which supports various communication protocols.

The ComEth4412a is available in standard, extended and rugged grades in air-cooled and conduction-cooled versions.

This leading-edge hybrid switch combines 2 separate switches: the Expansion/Data Plane Switch supports up to six 4-lane PCI Express Gen 1/2/3 ports with support for Upstream, Downstream and Non-Transparent modes. The Control Plane Switch is a state-of-the-art managed L2+/L3 Ethernet switch capable of supporting up to 12 Ethernet ports operating at 1, 10 or 40 Gigabits per second.

With its non-blocking architecture, the ComEth4412a is ideally suited to handle high-speed and heterogeneous PCI Express and Ethernet data flows in highly integrated Low-SWaP (Size, Weight and Power) systems. The ComEth4412a 3U VPX board has been developed in alignment with the SOSA™ Technical Standard and is compliant with the SOSA/VITA 65.0 switch profile SLT3-SWH-6F8U-14.4.15.

"The ComEth4412a is the next generation of our field-proven ComEth4410a, with enhanced Ethernet and PCI Express performance capabilities, together with new supported functions such as IEEE 1588 PTP. Furthermore, with the ComEth4412a, Interface Concept is excited to complete its SOSA™- aligned product portfolio available to sensor system designers for defense." said Franck Lefèvre, Interface Concept's Sales Director.

INTERFACE CONCEPT is a leader in the design and manufacturing of high-performance embedded board and systems, aimed at ground, naval, air and industrial applications. The company markets Commercial-Off- The- Shelf (COTS) products, based on industrial standards (3U/6U VPX, cPCI, VME, FMC, XMC, PMC) and high-end technologies. Product portfolio includes Gigabit Ethernet switches, Single Board Computers, FPGA processing boards, Analog and digital acquisition mezzanine cards (ADC/DAC), and 2D/3D graphic solutions.

www.interfaceconcept.com





DESIGN, PRINT & WEB SOLUTIONS

For more than a decade, the Defence Design Agency (DDA) has worked with defence and aerospace clients worldwide, bringing shared expertise and knowledge of the defence industry for the benefits of our clients.

We have a team of talented web designers, graphic designers and copywriters on hand, to do justice to the quality and excellence of your products with stylish and accurate marketing collateral.

Whether it's printed material which looks more vibrant than your current offering, some compelling content written and designed into a press release or a download, or you're looking for help with a new website or exhibition stand, we can certainly help you.

The management team behind DDA is shared with MS&T – we know

from talking to our customers in the industry that creative marketing probably isn't something which comes naturally to you. If you have your own team, that's fine. But many defence businesses would love to be able to outsource the marketing and design work to a trusted partner who understands the industry and also has avenues on hand to get the brand out there. That's where we come in.

Take a look at our services below and visit the dedicated pages for more information about what we do, who we've worked with and for some testimonials from our many satisfied customers. We're sure you'll find us a reliable partner.

Here's how we can help:

Events and Exhibitions

We know how difficult it can be to show your wares off worldwide – the logistics is hard enough without worrying about design and technicalities. Let us take the burden off your shoulders. Organising events and exhibitions around the world can be a trying experience. From liaising with various suppliers in different countries, transporting products to a specific place at a set time, to organising stands... if you add in technical and creative demands as well, it can be a challenge, to say the least. That's why many of our clients prefer to pass the responsibility for exhibition display management and design over to us. We'll coordinate every aspect of the build – from registration and fee negotiation, to electrics, lighting, furniture designing and printing. Let us work with you as your creative partner,



so you have a faultless stand when you arrive at the show.

On design, DDA's graphics team can create bespoke graphics for any event, at any size, giving your products the impact they deserve. We'll work closely with you on design, editing imagery, on layout and printing.

Brochures and Data Sheets

They're one of your most important sales tools, but they're often neglected. Make them sing! We'll turn your documents into dynamic collateral which does justice to your products. Often neglected, brochures and data sheets are one of the most important sales tools a company can produce. Done right they're informative and engaging, communicating important information about your products' key features.

Easy to download digitally, brochures and data sheets work well when printed as a tactile and engaging piece of sales and marketing collateral. They're really important.

So why not create something which matches the quality of your product? DDA has a back catalogue of stunning, bespoke brochures and data sheets which we have produced for our defence clients. We have a team of professional graphic designers and print managers with years of experience, on hand and ready to work with you to achieve your required goal.

Things to consider are your target audience and the key benefits which need communicating. We can help you draw those out, then complement our advice with compelling copy, concise product specifications and stunning technical illustrations to maximise impact.

We're happy to enhance your existing collateral within your current brand guidelines or, if you want, we can help you develop something completely new.

Websites

Sales prospects will increasingly end up here as a first introduction to your products, so you need to strike the right first impression. We can host, design and maintain your website so it does what you need it to. Increasingly, websites are the first port-of-call for potential customers. All too often they're clunky, hard to navigate and lacking in style – an inferior representation on the quality products they're supposed to support.

DDA has supplied custom built websites to a range of small and

medium-sized defence companies and associations. The process starts by establishing and articulating your requirements and goals, so our designers can create conceptual ideas before instructing our experienced developers on how to execute the build process.

A good website is one of several key elements of your digital marketing strategy. We'll help you find something which properly represents your brand, a one-of-a-kind site which is tailored to your specific requirements.

And websites shouldn't be stagnant – they need to be updated as your offering changes. So we can provide ongoing hosting, management and maintenance packages so that your site remains fresh and relevant.

Adverts and Editorials

It's a competitive world out there and it's hard to attract eyes and keep them focused. We can help draw attention to your products and provide written content which tells the right story. How do you make your products stand out from the crowd – the one which eyes rest on, while a reader is flicking around a website, online publication or a print magazine?

Creating an advert or an editorial which has genuine impact is no simple feat. If you're trying to sell a product, promote a brand or highlight company news, DDA has the creative insight and industry experience to create something with real impact that engages with your customers.

Adverts which are designed with style to communicate key messages to potential customers. Editorials which pull in and engage readers, raising brand awareness while telling them a story at the same time. It's tricky stuff to get right, but we can help.



EVENTS & EXHIBITIONS | BROCHURES & DATA SHEETS | LOGOS & BRANDING | WEBSITES | ADVERTS & EDITORIALS

For more information on how the Defence Design Agency could help with your next project, contact us now for a friendly chat to discuss your requirements.

Telephone **+44 (0) 1392 881545**

Email **tony.nutt@militarysystems-tech.com**

or, visit **www.militarysystems-tech.com/design**

Outstanding!

Tony and his team have been outstanding. The design, management and communication from start to finish has been second to none.

Mr Steve Kennon,
Head of Business
Development,
VALENT Applications



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Vehicle

LED Lighting Solutions

Oxley designs and manufactures LED lighting and night vision solutions for use on military operations. LED technology offers cost, weight and energy savings along with improved reliability and a higher MTBF over existing technology.



The range includes IR Driving Lights, Interior Dome Lights, Gooseneck Task Lights and Compact Search Lights. Oxley innovation ensures reliable and proven products that meet the latest power and EMC protection requirements.



TEXELIS



Partner in mobility for **off-road vehicles**
of today & tomorrow

A CHRISTMAS PRESENT FOR RNAS YEOVILTON AND THE RNCMSUET "THE DUNKER"

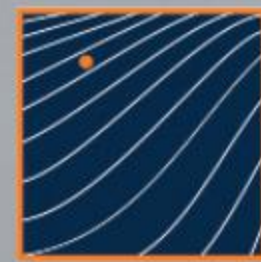
2 Survival Systems Limited METS® Delivered to RNCMSUET via Santa's present store

In a contract placed in June 2020, the UK Ministry of Defence (MOD) ordered two Helicopter Underwater Escape Training Systems (HUETS) from Survival Systems Limited (SSL), based in Dartmouth, Nova Scotia, Canada, for delivery to the Royal Navy Centre for Maritime SERE and Underwater Escape Training (RNCMSUET). Manufacture is now complete, and the units have been sent to the North Pole ready for Santa to deliver.



The two HUETS requirements will be met by SSL's proprietary Modular Egress Training Simulator (METS®); a Model 5 represents the WILDCAT and similar aircraft. To represent the MERLIN and similar aircraft SSL provided a Model 40.

To help Santa with his deliveries, the units were shipped to Yeovilton by international ISO Flat rack, rather than Santa's sleigh. Regrettably the reindeer towing this load were unable to move as fast as



**Survival
Systems
Limited**

when towing the sleigh, and the units arrived in January, still with a Christmas feel, and covered in frost. Commissioning and training commenced on arrival of the units and is now complete.

Paul Douglas, President and Chief Executive Officer of SSL, commented on the delivery said ***“My thanks to all at SSL, MoD and the RN for the way in which we have been able to get on and deal with this order. For all of us working; under different COVID regimes and time zones, often from unfamiliar locations, and with different working patterns, has been a challenge. Everyone has risen to it with understanding and flexibility. Well done to all concerned.”***

www.survivalsystemsgroup.com



Enhancing Special Operations Forces Capability by Prioritising Equipment Performance, Safety and Reliability

Deploying maritime Special Operations Forces (SOF) has always presented significant challenges. These challenges are further compounded when insertion and extraction is undertaken at sea. In today's geopolitical environment, the response to evolving threats demands a rapid, flexible, and robust capability. As a consequence, now, more than ever, SOF requires reliable, safe and rapidly deployable advanced technology with integrated solutions to ensure they are able to complete their missions efficiently and effectively. To optimise capability, reduce operational risk, and enhance mission success, all potential operational eventualities must be considered. The performance of the equipment necessary to support these eventualities must therefore meet the very highest standards of safety and reliability, as once submerged, the life of the SOF Operator and mission success are literally dependent upon it.

Crossing the 'water-gap' has typically been undertaken by raiding craft, which although discrete, are not covert and are readily detected by modern surveillance systems. To mitigate compromise, maritime special operations forces have employed Swimmer Deliver Vehicles (SDVs); free flooding submersible craft that remain submerged throughout their operation. Despite being covert, such systems are relatively slow and place significant physiological and psychological stress upon the Operator, who might be submerged for extended periods in cold water.

JFD Ortega's craft is a four-man free flooding submersible which incorporates advanced on-board sensors, navigation, life support and communication suites designed to minimise Operator, and Crew fatigue, providing safe and accurate positioning day and night, regardless of environmental conditions. In addition to this craft, JFD offers a full suite of special operations maritime vehicles such as the multi-mode SEAL Carrier and submersible Torpedo SEAL, also readily deployed by land, sea or air.

Development, testing and trials of JFD's SDVs initially took place in the Stockholm archipelago, Baltic Sea, and the waters off the West coast of Scotland, UK. These temperate and sub-arctic climates demonstrate their functionality in low temperature waters. Recent enhancements and intensive testing have now conclusively demonstrated vehicle performance in environments at the other end of the environmental spectrum such as the tropics.

Using unrivalled submarine engineering expertise, combined with maritime SOF operational experience, JFD ensures those working under the toughest environmental conditions have high performance maritime vehicles that are designed, built, and tested to the highest industry related safety standards.

In addition to cutting-edge, first-in-class combat submersibles, JFD has harnessed its 'state of the art' Underwater Life Support technology to further enable today's special operations forces. Whether the mission calls for extended mixed-gas duration or the ability to safely conduct multiple excursions, JFD can pair the hyper-enabled SOF Operator of today with a delivery platform and life support system that safely and reliably maximize mission success.

Confidence and success under pressure: JFD delivers.



confidence under pressure

jfdglobal.com



CRITICAL MISSION SUCCESS REQUIREMENTS

Stealth, Safety & Reliability

When the mission requires navigating and transiting the most unforgiving environment, you need to be confident the method of insertion will deliver you safely and dependably, undetected, and ready to complete your mission.

JFD Ortega's craft is a 4-man, free flooding combat submersible designed for covert insertion and extraction of Special Operations Forces. Operating with ultra-low detectability, it is designed and built for the uniquely demanding requirements associated with maritime special operations.



confidence under pressure

jfdglobal.com



Flexzorb®
Defence

75+ YEARS OF PROTECTION

ACTIVATED CARBON INNOVATION

ACTIVATED CARBON CLOTH FOR THE DEFENCE SECTOR

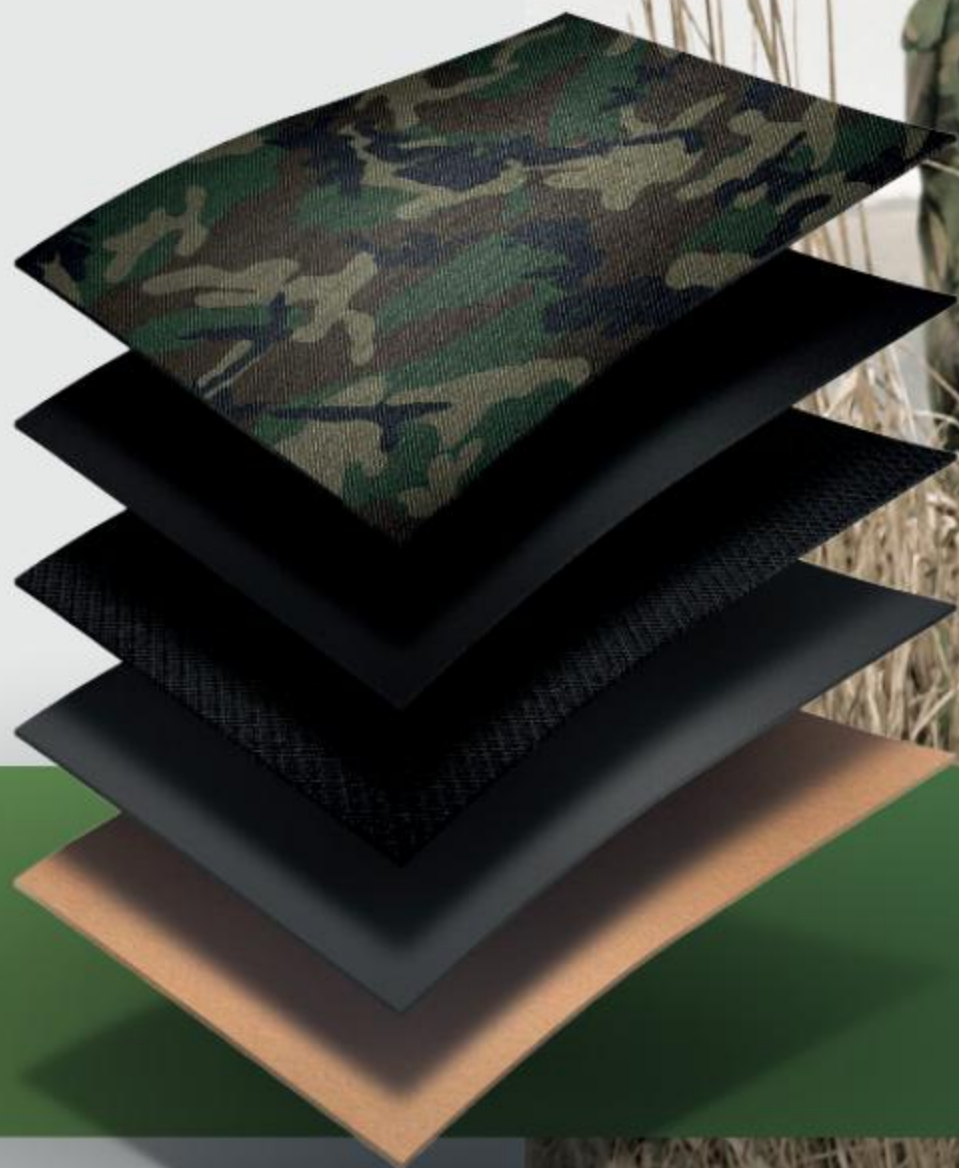
Flexzorb™ - The flexible, lightweight protective textile that is widely used by many of the world's leading defence vendors, making us the leading provider of activated carbon cloth for defence applications.

Lightweight and breathable, Flexzorb is used in a range of defence applications, including:

- CBRN Respirator filtration media
- CBRN Personal protective equipment (PPE)
- CBRN decontamination wipes
- Missile decoy media
- Phosphine gas adsorption media

WHEN FAILURE ISN'T AN OPTION

Chemviron, the European Operation of Calgon Carbon Corporation, has a long history of protecting and defending troops with our activated carbon products, and we remain committed to providing adsorbents to combat chemical warfare agents. In an environment where there is no room for failure, why wouldn't you rely on products that have been used and trusted for over half a century?





Macro D:

The Rectangular Connector Displacing 38999

Delivering all of the benefits of a traditional d-shaped connector in a larger format, AirBorn's Rocket Series Macro-D connector is the latest in D-shaped connectors to hit the military electronics scene.

Designed to allow systems engineers to utilize more contacts in less space than a traditional military circular connector, the Rocket Series allows three Macro-D connectors to fit in the same footprint of a 38999 connector.

"The Rocket Macro-D offers ability for significantly better utilization of available space so the designer bring more signal and/or power into their system in less real estate than a 3899 can offer." explained David Koenig, Product Manager for AirBorn's Rocket Series. *"using the Rocket family of connectors requires less panel space allowing the user overall electronic box to reduce in size and ultimately saving size, weight and cost."*

Rectangular Means Cost, Weight, and Footprint Savings

When establishing your desired pin count, comparing circular to rectangular connectors often reveals a staggering amount of savings in terms of footprint, weight, — and ultimately cost.



Efficiencies discovered in the beginning design stages always equate to more economical designs on the back end.

It should be noted that circular connectors are required for gloved-hand installations, as used by astronauts in space applications. However, in a military application, that requirement isn't necessary and AirBorn's rectangular Rocket connectors are the solution for space, weight, and cost savings. In the example above, we are able to fit 750, 24 awg. I/O contacts in the same space as 450 I/O contacts, when housed in a circular D38999 body.



Macro Ruggedness & Reliability: Keys to Surviving Harsh Environments

When it comes to durability in the face of unforgiving conditions, RockJet Series connectors always rise to the challenge. Whether enduring the extreme shock and vibration of rocket launches, military aviation, or the intense temperature fluctuations inherent with conditions faced by armored vehicles, RockJet connectors are designed to withstand all of that and much more.

Looking for a rugged and reliable replacement for a D38999 circular, look no further than AirBorn's RockJet family of connectors. With the quality that AirBorn's customers can count on and space-flight heritage, RockJet Series connectors set the standard for Macro D reliability.

Field Proof & Future Proof with Crimp-Removable Contacts

The 38999 specification calls for crimp-removable contacts by definition and you'll find the feature on the RockJet Series Macro-D as well.

Crimp-removable contacts facilitate quick repairs of in the event of a damaged contact or cable assembly without sacrificing the entire connector. The contact can simply be replaced making it ideal field repairs while deployed abroad.

The removable contact style also allows easy upgrades to electronic systems without overhauling the entire BUS system.

"While crimping is often preferred for high vibration environments or where ultra-reliability is mission critical, it also makes sense in military applications that may have several generations of upgraded electronics," said Robert

Kleinschmidt, vice president for AirBorn's military and defense business. *"The removable contact allows existing wiring to be upgraded without having to tear out the entire bus system. It's a flexible, yet rugged contact system for the defense market."*

Widely known for its vast range of Micro D and Nano D connectors, AirBorn introduced the Macro D connector to the defense market after the rugged connector format launched into popularity within the Space Industry.

"When you look at the requirements of military and space electronics systems there's quite a bit of overlap when it comes to shock and vibration specifications," Kleinschmidt explained. *"When we saw satellite engineers looking for alternatives to 38999, we realized the cost, space and weight savings that come with Macro D were also very appealing to design engineers at our military customers."*

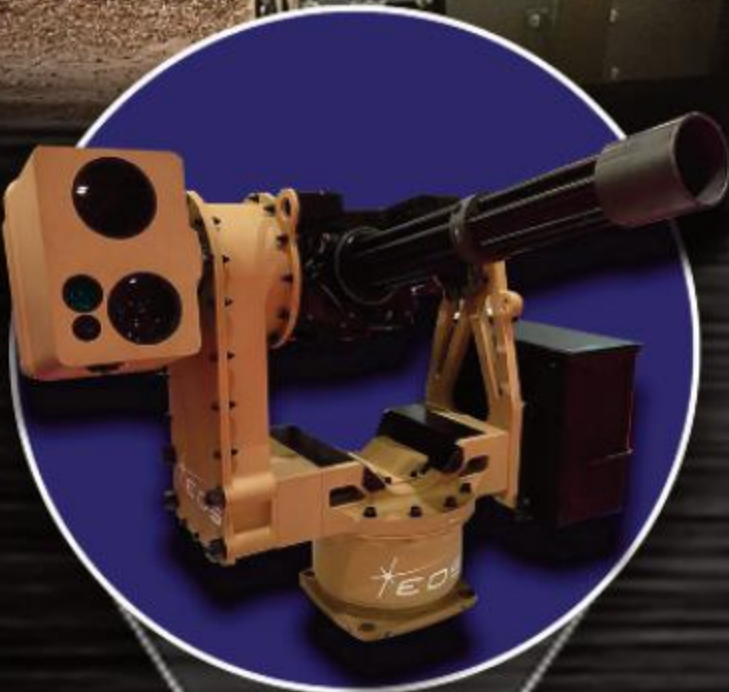
While the 38999 will still be necessary for certain applications the Macro D connector offers designers a way to reduce the physical size of their system without sacrificing ruggedness or reliability.

 **AirBorn**

cs@airbornint.com
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ULTRA LIGHT PRECISION



THE R150 REMOTE WEAPON SYSTEM

- | 100% probability of a 5 round burst hit on a target at 1km
- | 5.56mm-12.7mm firing capability
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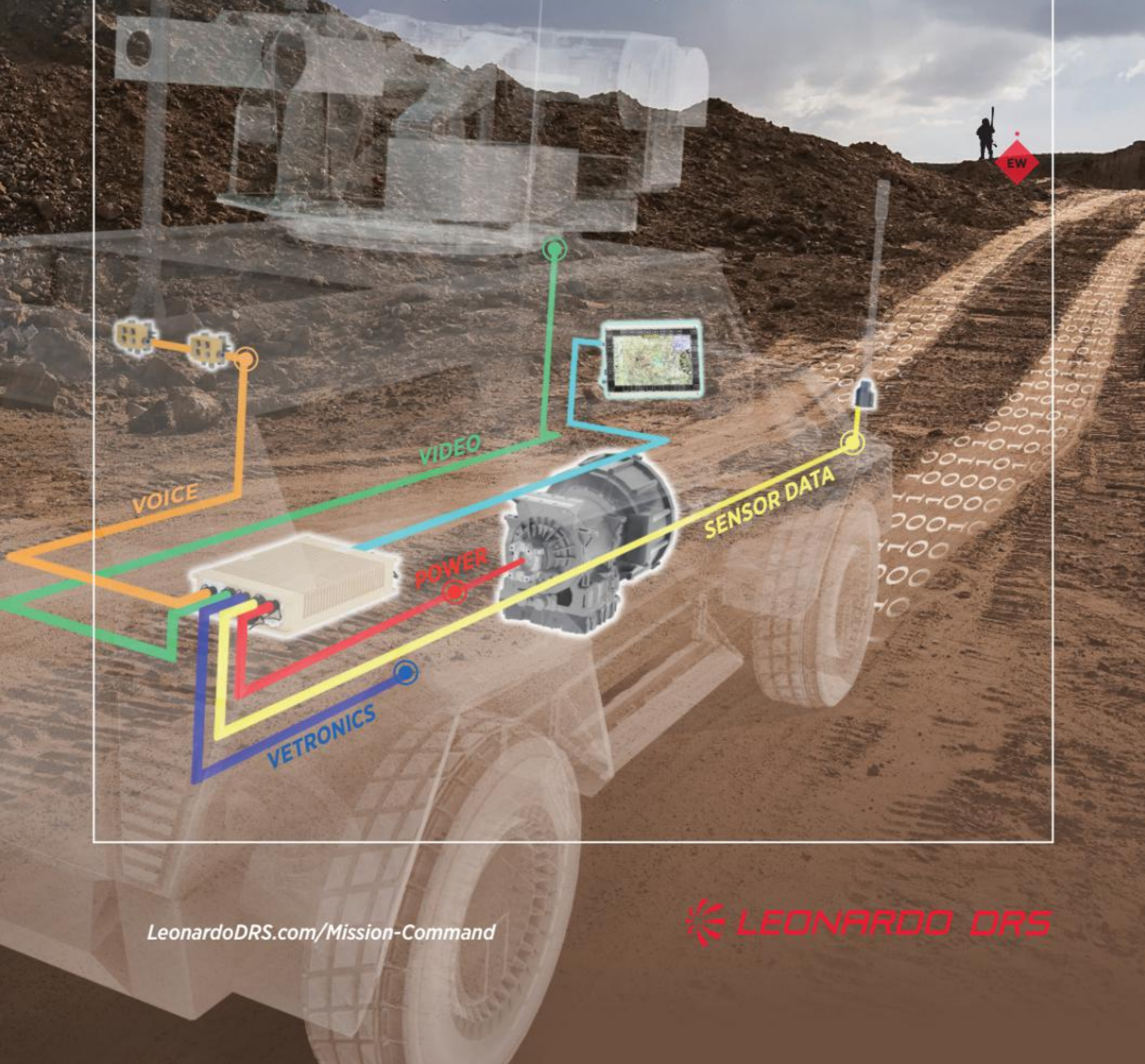


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Fully-integrated networking, communication, power generation and cyber-protected systems deliver the tactical advantage in the toughest environments. Comprised of our Data Distribution Unit (DDU) Tactical Computer, GVA Displays, Vehicle Intercom System, Titan On Board Vehicle Power system and the seamless integration of mission-essential C4 applications and sensors, Leonardo DRS delivers scalable, platform-agnostic mission systems that offer your soldiers the advantage in every domain.



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