



# BUILT TO LAST

Fred Kao examines the growing role of rugged devices in defence operations

**T**echnology has never been more crucial for the defence and military sector, particularly in the current climate. In addition to improving communication and productivity on the battlefield, the latest devices need to support digitisation within the industry by providing greater mobility while offering power, security, reliability and resilience so they remain operational in even the most hostile environments. Beyond mobility and durability, these devices must also provide seamless functionality and versatility for switching between environments. In a hostile situation, connectivity is crucial and the Internet of Military Things (IoMT) is playing a vital role in safeguarding communication between a network of military assets, soldiers on the ground and operational bases. Increasing situational awareness through

digital application and advanced technology is also crucial for protecting forces, reducing their physical and mental workload and keeping them one step ahead of the enemy. Covering all of these factors is a tall order, but the latest rugged technology is already proving a strong return on investment. Through its effective implementation, military defence organisations are already proactively enhancing their ability to embrace digital transformation for optimum operational performance on the battlefield.

Military and defence organisations are constantly adapting their Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) strategies to improve efficiency, operations and decision-making. Adaptability is a core requirement of this technology, which must perform a range of tasks, such as asset management

and repair, diagnostics and maintenance, logistical organisation, flight maintenance and mission control. Rugged devices have radically improved over the past few years to meet this need. Leading manufacturers are producing laptops and tablets that focus on size, weight and power (SWaP), producing smaller, lighter and more intuitive systems. However, this new SWaP focus doesn't mean compromising on performance. Command control systems (CS2) require increasing levels of computing power, so the latest computers still pack in more power for an uninterrupted performance on and off the battlefield. These devices need to operate in all conditions, from sand and snowstorms, to rain and extremely high and low temperatures, all while withstanding drops, knocks and spillages that come with the territory. To meet this demand, modern rugged devices are tested to the highest standards and include both MIL-STD and IP certifications. The latest computers go beyond even these benchmarks, ensuring continued function in explosive atmospheres or where there is solar radiation, salt fog or fungus. These cutting-edge tablets and laptops, for example, incorporate seamless design and fanless functionality for extreme resilience, robustness and durability in the even most uncompromising environments.

Customisation is critical for a constantly evolving sector, so leading manufacturers have incorporated expansion capabilities as standard. This means, rugged laptops and tablets can be expanded to incorporate the latest technology and legacy systems. For example, a rugged laptop can easily be expanded to become a portable cloud or local storage device or server providing immediate and safe analysis, capture and analysis of data for accurate decision-making, such as GIS maps for mission planning. Plug and play expansion capabilities also mean rugged devices can be used as a remote control or radio system for automated technologies such as unmanned aerial vehicles (UAV), drones, or other robots, or could be integrated with other technologies such as thermal imaging, heat sensors or night vision goggles. Aerial drones or unmanned aerial vehicles collect massive amounts of data from their journeys recording live streams for optimum surveillance or inspecting and monitoring mission zones. A central rugged device has the capacity to collect and process this data in real time to provide instant intelligence to teams on the ground. Beyond field operations, these devices can also be used as part of a logistics of warehouse management system, so bases can accurately track mission-critical supplies. An uninterrupted performance has never been more critical than on the battlefield, so these devices offer hot swappable batteries with an ultra-long life of up to 17 hours, drastically extending operational time and meaning soldiers can seamlessly swap in and out of operational duties.

The ability to safely access and transmit sensitive data while in the field is mission critical, so rugged devices must guarantee top secret security classification to protect against cyber hacks, infiltration or other security threats. Data in transit can be a significant risk, so connectivity must be encrypted too. Devices should include a trusted platform module (TPM), which stores RSA encryption keys for hardware authentication and FIPS 104-2 compliance – mandated

by US and Canadian governments and generally accepted worldwide – which means the device has been validated for effective cryptographic hardware. This level of flexible connectivity and advanced wireless capability allows soldiers to communicate whenever and wherever they need to, allowing instant access to data and information and using mobile communications in real time for enhanced situational and operational circumstances. The latest devices are part of 'modern' soldier's equipment and can be used to track locations in the field and feed back to the control centre. More importantly, high-speed voice and radio-activated transmission systems operate with military satellites to enable the secure exchange of large flows of data, while preventing EMC emissions over a given geographical area. Other important security features that can help minimise the threat of a cyber attack include; personalised identification and authentication via fingerprint and smart card readers and RFID. It is also essential that storage devices can be removed easily and rapidly in case of an emergency, so that data can be protected away from the device.

## USING A RUGGED DEVICE, TEAMS CAN GENERATE POWERFUL GRAPHICS FOR DATA VISUALISATIONS

The flexible and secure transmission of real-time data has never been more important to military organisations across the globe, and the latest cutting-edge combat information systems are transforming the operational capability of battle groups. For example, the SCORPION combat information system (SCIS) deployed by the French Army is putting data at the heart of the battlefield by allowing battle groups to connect and share combat information. This allows them to enhance combat capabilities and allow soldiers to quickly adapt to new operational challenges. This information system gives them real-time tactical superiority over the enemy. From the central command post down to combat vehicles, this system brings combatants and weapon systems together, facilitating the transmission and sharing of tactical information. The flexible use of rugged hardware that forms part of the information system means devices can be deployed on military vehicles, including tanks and drones, which serve a control centre function to instantly share friendly and enemy positions via GIS maps. These rugged tablets can also be carried by infantry units, either on a chest mount or in a backpack, alongside radio equipment to allow a 360° view of the battlefield. Crucially, the versatility of this system means that the army can also interact with allied forces, for greater situational analysis and operational planning. This information system is redefining joint combat and the digitised battlespace.

New levels of digitisation and the emergence of Edge computing, AI and 5G support the smooth flow of data across all branches of the military but also support the safety of troops, as the sensing and

**The Internet of Military Things is playing a vital role in safeguarding communication between soldiers on the ground and operational bases**



computing devices worn by soldiers and embedded in their equipment collect a variety of static and dynamic biometric data. The detail of the data collected from cutting-edge rugged devices can also be consolidated and analysed so it can be used immediately to help inform missions and courses of action for teams on the ground, including recovery operations. Using a rugged device, which has the necessary data processing, storage capabilities and functionality, teams can generate powerful graphics for data visualisations. For example, in a disaster recovery situation, teams on the ground can rapidly

## THE LATEST RUGGED TECHNOLOGY IS ALREADY PROVING A STRONG RETURN ON INVESTMENT

access and process high-density data such as 3D graphical mapping and overlay augmented reality for situational awareness and to develop action plans while keeping them agile in often extreme environments. Beyond this, military organisations are integrating robotics and autonomous systems (RAS) into their armoury and weaponry. Protecting troops, improving situational awareness and reducing soldiers' physical and mental workload while gaining ground on the battlefield are key objectives for military organisations. The latest RAS technologies, which incorporate rugged

devices, allow the military to achieve these objectives and make important gains on the enemy, such as securing territories and minimising enemy hits. RAS is becoming a vital tool in facilitating freedom of tactical movement with minimal risk to soldiers. By deploying the latest technology, it's possible to facilitate landmine clearance, undertake rescue operations and dispose of explosives with limited human exposure.

Innovation and digital transformation are shaping the way organisations operate across every industry worldwide, but nowhere is this more prominent than in the military and defence sector. By investing capital now and taking a tech-led approach to how they operate, these organisations are already making gains, from transforming operations and saving resources to boosting efficiency. In addition to delivering real-time, critical data, adopting the latest technology can improve the ability to communicate effectively, which is vital for making tactical decisions and gaining strategic wins. The most successful and dynamic organisations are focusing on C4ISR and the requirement for flexible and versatile systems and networks that improve operations; and recognising that this is where investment is most beneficial. While speed and agility is critical, the growing risk of cyber warfare cannot be underestimated. This is why the latest intelligence systems are designed to meet stringent military standards that protect data in every environment. The most advanced rugged devices are, not only meeting these needs but exceeding them, setting the pace for digital change that can make the difference between life and death ●

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