EUROTECH

> APPLICATION STORY

Data Capture for Afghanistan Forces

Eurotech has supplied an essential component for a data capture system installed in army vehicles for British forces in Afghanistan. The sophisticated system plays a critical role in the detection of Improvised Explosive Devices (IEDs), which have become an increasingly deadly weapon for the Taliban.

Eurotech and IA Technology

British troops in Afghanistan rely heavily on the latest technology to protect them in the field. For instance, armoured personnel carriers which perform a wide range of operational duties for the coalition forces carry an impressive array of electronic equipment to provide information on the status of the vehicle and to identify potential threats surrounding it.

The monitoring and interpretation of this data requires robust and sophisticated computerisation for data capture and communication. This can provide a life-critical early warning to military personnel operating in a hostile environment, maybe far from base and with limited backup from friendly forces available.

Electronic design specialists IA Technology, based in Hereford, are experts in data capture systems and they recently undertook an Urgent Operational Requirement (UOR) on behalf of the Ministry of Defence (MoD) destined for the British army stationed in Afghanistan. An essential component of these systems was the Eurotech ISIS Processor Board, together with its range of peripheral modules relating to power supply and communication. In order to meet a delivery deadline of only six weeks, Eurotech worked in close cooperation with IA Technology to ensure the design and delivery process went as smoothly as possible from start to finish.

IA Technology has a strong reputation within the defence sector and has specific skills in prototype development, life critical system design, data capture analysis Radio Frequency (RF) solutions and Force Protection. The company is also an agent for MoD UORs, which gave them the capabilities and resources to deal with the fast turnaround on this project, launched in July for delivery at the end of August 2009

"Rigorous tests were also carried out to ensure that the equipment was fully dust and vibration resistant"

Essential Monitoring

The data capture equipment covers a wide range of systems which in turn cover many controls and functions within the military vehicle. These relate to communications, electronics, engine management and a host of general applications. Data capture also links in with the life saving technologies so vital to soldiers on operational duty, including detection of IEDs.

The number of casualties in the International Security Force (ISAF) has been growing as the result of IEDs, which have proved a lethal weapon for Taliban fighters. They fall into three basic categories:

- Roadside IEDs, where a hidden insurgent detonates a device by wire
- Remote detonation, where explosive devices are set off by radio or mobile phone signal
- Landmines, buried below the road surface and detonated by the pressure of a passing vehicle

In 2008, there were 3,276 IED attacks in Afghanistan, a 45% increase over 2007. July 2009 saw 828 IED incidents, the highest level since the war began. BBC News Defence Correspondent Caroline Wyatt noted in September that 75% of the year's fatalities in the Taliban stronghold of Helmand had been as a result of IEDs.

The British have about 6,000 troops in Helmand and a further 3,000 in neighbouring Kandahar and have suffered significant losses and injuries as a result of increased IED attacks in Afghanistan. Part of the MoD's £700 million equipment package for Afghanistan includes Wolfhound heavy armoured support trucks

and Warthog cross country vehicles to replace the controversial lightly armoured Vikings.

However, armoured protection has to be weighed up against the need for speed and mobility. In addition, the Taliban have shown themselves capable of adapting their technology to probe new levels of defence. This stresses the importance of electronics in maintaining vehicle security and protecting the troops performing their hazardous patrols and convoy operations.

Combined Defence Experience

Experience in telecommunications and systems integration gives IA Technology particular expertise in the development and application of equipment to protect forces against the threat of IEDs. Defence is also one of Eurotech's core market sectors, and the company produces a range of off-the-shelf commercial (COTS) products for airborne, shipboard, vehicle mounted and handheld applications.

"The speed required by the MoD for delivery on this project meant that, as a COTS product, the ISIS embedded board was ideal for us. We had never worked with Eurotech before and we found them very helpful. Our software engineers linked with their team to write the programmes for the data capture system and they were fully involved with the project at all stages to help us meet the tight deadline."

Marc Ashton, Defence Business Manager of IA Technology

The ISIS processor board features a fanless design with the Intel Atom Processor in a robust, ultra-small package providing exceptional performance per watt. In fact, ISIS offers all the functionality and connectivity that was previously only available in larger more power-hungry systems. This combination of high performance and small dimensions (ISIS processor module 100mm x 67mm) makes it ideal for use in an armoured personnel carrier, where space is at a premium.

Modules utilised for monitoring equipment within the vehicles included standard power supply, communications board, RS232 control board plus a 32 channel GPIO general purpose interface board. The system is well suited to withstand the potentially extreme weather conditions encountered in Afghanistan, with an operating temperature resistance ranging from 0°C to +70°C.

Where Quality is Critical

The nature of this type of military project emphasises the need for a flawless finished product with no margin for error. This requires close consultation with the end user and attention to detail throughout the project from all concerned, not leaving quality assurance to the factory production stage alone.

IA Technology and Eurotech were involved with a wide range of tests to ensure that the system would provide the highest level of performance on active service. Marc Ashton explained that fully waterproof field enclosures were specifically designed and tested for the system. "Rigorous tests were also carried out to ensure that the equipment was fully dust and vibration resistant and that no electromechanical interference could be caused by the equipment to any vehicle operating systems," he said.