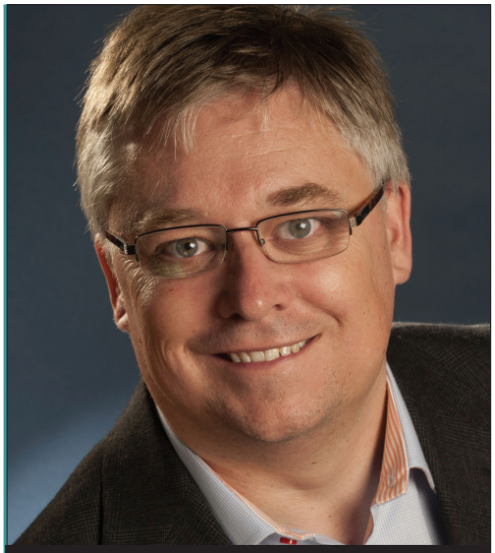

Martin Frederiksen, Managing Director of Military Embedded Computing, Recab UK

GMC Q&A

Consultative customer services

Recab offers bespoke, ruggedized PC and computer-on-module design and production services, and has a proven track record on long-term projects, in collaboration with railway authorities such as TfL. According to Martin Frederiksen, Managing Director of Military Embedded Computing, Recab UK, the company is looking to cut through the incredible range and complexity of computing technology to instead offer thorough, consultative customer services rather than a simple storefront.

Laurence Russell, News and Social Media Editor, Global Military Communications

GMC: The pandemic has had a strong impact in leading innovation through necessity. As a proud supplier of contactless technology for use in consumer interfaces, how have you mobilised to provide for the world at its time of need?

Martin Frederiksen: A lot of the innovation that we've seen emerge in response to the COVID-19 pandemic has been in the making for many years. The pandemic has accelerated a lot of the trends towards enhanced in-field data processing and communication, image recognition, contactless interfaces, and similar technologies. These are underpinned by effective embedded computing systems and components that can provide this functionality.

At Recab UK, we've been supporting the development of new technologies to make the new normal, of social distancing and more comprehensive tracking, manageable. For example, we've seen an increase in projects regarding surveillance, particularly for more accurate facial recognition. Achieving this often requires the use of systems that feature general purpose graphics processing units (GPGPUs) for faster data and image processing. GPGPU is most readily used in applications that typically operate in a stable, and often temperature-controlled, environment, like telecommunications. But we can support the use of GPGPU in more challenging environments, drawing on our extensive experience developing rugged GPGPU solutions for harsh environments, such the military and defence sector.

GMC: Have there been any revelations in the field of sensor equipment, particularly no-touch interfaces under the pandemic, and do you think the widespread adoption of these technologies is a realistic measure to combat future outbreaks?

Martin Frederiksen: Sensor technology has been one of the fastest developing fields of recent decades and the pandemic has demonstrated how this technology

GPGPU AI supercomputer

can fit into our daily personal and professional lives to reduce contact and contamination. Although we are not specialised in the sensor technology itself, the impact that this has on embedded computing is clear. Sensors are only as effective as the computing power behind them to make sense of the sensory data.

One recent development we have seen prompted by the pandemic is the need for ever-increasing ranges for sensor detection or RFID scanning, as well as protection of that data. In healthcare, for example, a greater read distance on key devices can reduce risk of contamination and allow clinicians to scan identification tags quickly in emergency situations. Our partner Jadak recently launched its M3e RFID module, which supports an extended read distance — up to two inches in both low and high-frequency — and features an integrated secure access module (SAM) to handle secure communications and manage security keys for access to private information. This is something we're already seeing interest in from device developers.

The guidelines around how best to prevent future outbreaks are constantly changing as our knowledge of the pandemic develops, and the technology that supports it is evolving accordingly. Generally, touchless interfaces supported by sensors and RFID tagging, location services supported by GPS modules and antennae, and rapid device-to-device communication using systems like Ethernet switches will play a role.

GMC: As we enter the age of automation and the fourth industrial revolution, what is the significance of data analysis to delivering reliable IIoT?

Martin Frederiksen: Data analysis plays a vital role in the Industrial Internet of Things (IIoT). When most people think of IoT or IIoT, they think of data communicated between devices. However, the value in most industrial applications is for systems to make sense of that raw input data. The Fourth Industrial Revolution is moving towards autonomous operations, and we are seeing a lot of interest in GPGPU for artificial intelligence (AI) and machine learning (ML) applications. These require high bandwidth, low latency, and powerful computing capabilities, which is best suited to the NVIDIA GPGPUs that feature in several of the products from ourselves and our partners.

Question: The power of connectivity has made working from ever more remote areas realistic. With further afield and more complex frontiers opening up, what sort of ruggedization requirements are you held to?

Martin Frederiksen: The exact ruggedisation requirements of an application will vary from system to system, depending on the specific market area. We can ruggedize embedded systems in various ways, from using thicker PCBs and robust enclosures to extended temperature range components for harsh environmental conditions, to meet specific regulatory requirements, such as EN50155 for rail environments. One of the most common things we help our customers with is ensuring designs and components meet the expectations of such standards and can be certified quickly.

The ability to meet standards quickly opens up a number of interesting possibilities for system developers, as it means more complex computing can run from remote locations or inhospitable environments. An example would be in the UK's burgeoning offshore wind sector, where we can support remote monitoring of turbine health and near real-time communication of health data with an embedded server. This server might feature a COMexpress type 6 module or a type 7 module, such as those from congatec that are ideally suited to the sector, and support for a high number of input/output connections to support fast connectivity. This largely comes down to ruggedisation alongside expert baseboard design.

Question: You also supply for the defence sector. Have there been any standout achievements for Recab in those markets?

Martin Frederiksen: Defence applications are mission-critical, which means they are highly regulated, and when they reach obsolescence they would ordinarily need to be ripped out in place of a new system. The system itself is expensive, let alone when you consider the re-certification costs and project time.

We have seen some VME and CompactPCI projects in the defence sector where the original product has gone end of life, in which we've been able to significantly reduce cost and project times while extending device lifespan. We have been able to develop a CompactPCI baseboard and plug in a COMexpress module, which can make re-certification easier. This solves the problem of obsolescence and extended the lifecycle of the project by ten years, for significantly reduced cost.

Question: What's the future of embedded communications systems?

Martin Frederiksen: We've seen in the past few years, and more so with the pandemic, that intercommunication of devices is growing in popularity. We are heading the way in which everything will be connected, and this means there will always be a need for embedded communication systems to support this. With this comes an ever-growing need for more computing power.

One interesting effect of this will be more standardisation of technologies. We've seen this begin to take shape with things like the Sensor Open Systems Architecture (SOSA) VPX connector standard in avionics, and generic vehicle architecture (GVA) for land vehicles. This makes it easier to modernise embedded systems and ensure lasting success of embedded applications. We'll see more of these in the future as embedded communication becomes more prevalent. **GMC**

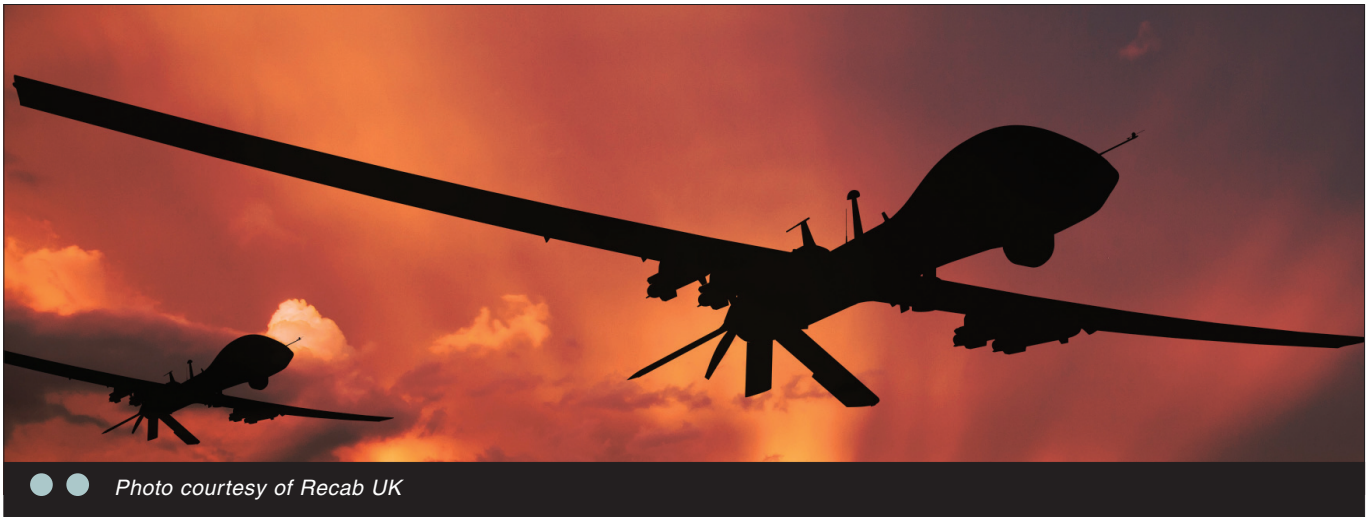

Photo courtesy of Recab UK