Customer story

Teltronic

OSE Empowers Highly Secured New Generation TETRA Handets!

Teltronic, a leading manufacturer of radio communications systems, has selected Enea's OSE™ real-time operating system for their next-generation TETRA Communication Terminals. The terminals are used in public emergency service organizations such as police, rescue, and fire departments, and also in business-critical environments such as transport and utilities.

The development of the HTT-500 handset was a strategic project for Teltronic, completing the company's family of TETRA products, which are used in control centers, infrastructure systems, mobile and handheld devices.

Teltronic faced a variety of challenges in developing their new handsets. First, they had to create a new hardware platform that would provide the high levels of performance, upgradeability and flexibility needed to support long-life-cycle professional radio products. Unlike cell phones, professional radios are typically used for years before they are traded up for newer models.

Teltronic's second major challenge was to increase its transmission power to three watts, which would give its radios a distinct advantage over competitive radios offering just one watt of power. The additional power would also enable Teltronic radios to provide a wider coverage area and guarantee high-quality communications for emergency responders. Because these users, such as police forces, fire brigades and emergency service providers, work much of the time in noisy outdoor environments, high volume and outstanding audio quality are essential.

Teltronic's final challenge was to deliver its performance upgrades with minimal power consumption, thereby enabling its units to operate longer between recharges. All of these objectives had to be met in a timely fashion, at a competitive cost, and with an eye towards flexibility and future upgradeability. In addition, the platform had to support future firmware upgrades for new services, applications, and customer-specific configurations. Teltronic was able to meet and surpass all of these objectives by utilizing Enea's OSE real-time operation system (RTOS) as the system software platform.

Technical Details

To maximize performance and minimize power consumption for its new terminals, Teltronic chose OMAP as the target processor. OSE was selected as the system software RTOS for OMAP's RISC CPU core. Teltronic utilized its own proprietary kernel on OMAP's DSP core to manage low-level baseband algorithms.

Teltronic's HTT-500 terminals leverage three key OSE capabilities to reduce power consumption. First is OSE's small footprint, which reduces RAM requirements. Second is its embedded power management capability, which enables OSE to place the CPU and peripherals in a low-power sleep mode when then they are idle. Third is its support for the FlashFX file system, which reduces RAM requirements by enabling OMAP applications to execute-in-place out of flash. OSE's flash support also enhances reliability by enabling the HTT-500 to save parameters in real-time without interfering with the execution of other more critical processes (TETRA stack, DSP communications, etc.).

To enhance scalability, the HTT-500 takes advantage of OSE's dynamic download capability, which

> *"We chose OSE for its OMAP™ platform support and ability to meet the strict specifications required for our next-generation products. The solution is particularly well adapted to wireless handsets that need to combine robustness and flexibility with reduced memory and power consumption."*
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> Alfredo Calderon, Head of TETRA Terminals Development Area

enables new programs to be downloaded to devices in real-time as they operate in the field. Dynamic download greatly increases flexibility, enabling equipment providers to make bug fixes and even terminal upgrades on the fly. It could even be used in the future by customers to deploy their own software. To ensure reliable download, the HTT-500 takes advantage of OSE's memory protection facilities, which ensure that new applications do not corrupt the kernel or existing applications as they are downloaded.

"Teltronic's decision to invest in our technology fortifies our position as the market leader in secure wireless communication solutions," said Karl Gustav Niska, vice president of product management at Enea.

OSE Messaging Makes it Easy to Port TETRA Stack

In order to take advantage of OSE's advanced capabilities, Teltronic had to migrate its TETRA protocol stack, developed for the company's generation MDT-400 mobile platform, from Teltronic's proprietary kernel to OSE. Greatly simplifying this migration was the tremendous similarity between the TETRA and OSE architectures, both of which utilize message passing for internal and external communications.

OSE's message-passing model is ideal for layered protocols like TETRA because it enables programmers to visualize each layer as an object sending information to neighbouring (upper and lower) layers. Strictly speaking, TETRA layers do not map directly to OSE processes. But they were designed to be independent, have their own data and functions, and utilize a communications interface based on messages. This commonality greatly simplified the migration of the TETRA stack to OSE.

All About Teltronic

Since 1974, Teltronic (based in Zaragoza, Spain) has been dedicated to the design and manufacture of radio communication equipment and systems. Teltronic offers sophisticated mobile and handheld terminals, as well as radio and line dispatchers for voice and data transmission in both conventional and digital mobile radio systems. Teltronic also offers infrastructure products such as TETRA that are used by public safety and security organizations (i.e., police, fire, ambulance), transport companies (i.e., automatic vehicle location, remote control and telemetry), large industrial companies, utilities, private radio companies, and public trunking networks.

Teltronic's portfolio includes the NEBULA infrastructure, which is based on TETRA's Ethernet-over-IP technology, and terminals, which provide encryption, GPS and GSM-dual capabilities. Teltronic also offers a dispatching center with a digital switch that supports VoIP operation and interfaces to a wide range of other radio networks (conventional, MPT-1327, GSM, etc) and telephone networks (ISDN, PBX, etc).

More details at www.teltronic.es.

More About OSE for OMAP Technology

OSE is a memory-protected RTOS optimized for high-availability, high-reliability distributed communications systems. Utilizing the hardware memory management facilities of the OMAP platform, OSE provides a firewall that enhances reliability and availability by preventing kernel and application processes from corrupting each other. OSE features a power management system that extends battery life, a crash-safe file system with flash support, and a complete networking solution with TCP/IP and other networking/security protocols. It also features dynamic download capability, which enhances mobile device flexibility by enabling new applications to be downloaded to systems as they operate in the field.

About Enea

Enea is the leading supplier of real-time operating systems, middleware, development tools, database technology and professional services for high-availability distributed multiprocessing applications such as telecommunications infrastructure, mobile devices, medical instrumentation, and automobile control/infotainment. Enea's flagship operating system, OSE is deployed in approximately half of the worlds 3G mobile phones and base stations. Enea has over 500 employees and is listed on the Nordic Exchange. For further information on Enea, please visit www.enea.com. Enea is ISO 9001 certified.

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