

# A shared design philosophy: CCww and Mentor's Nucleus RTOS pair-up for next-generation development of wireless protocol stacks

Communications Consultants Worldwide, Ltd. (CCww) is an established wireless solutions provider of protocol-stack IP and reference designs used by leading handset developers. Founded in 2000, the United Kingdom-based company quickly established a solid reputation for comprehensive design and support services, enabling its customers to deliver innovative products for the Global System for Mobile (GSM) communications, which serves over 86% of the world's cellular market. The company also provides General Packet Radio Service (GPRS) and enhanced GPRS (EGPRS) wireless transport applications that use IP protocols over the Internet.

In addition, CCww manages conformance testing and product optimization for machine-to-machine (M2M) applications, so the company is immersed in providing leading-edge technologies to help their customers design and manufacture state-of-the-art products.

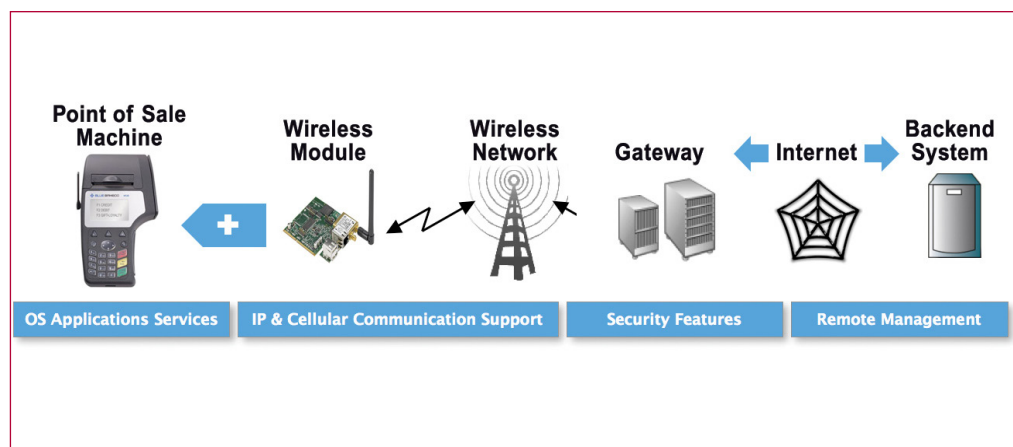
## Providing value-add services

Providing value-add services, Richard Carter, CCww's Managing Director/CEO and founder, designed

the first GSM telephone over twenty years ago, so he understands the needs of his customers who range from device manufacturers to system integrators. CCww is comprised of technology experts, such as Richard, who provide consultative services and cost-effective

## The importance of the Nucleus RTOS

When asked how commercial embedded software and development tools are used at CCww, Richard expressed that using a real-time operating system (RTOS) is essential for any



*M2M systems today share a few basic characteristics. The devices (in this case a PoS device) are generally connected to a wireless network, which is often located in a remote area with limited accessibility. These devices, while operating within their defined network, collect useful data, process the information, and then transmit the data to a back-end system.*

technologies to help their customers develop and deliver products faster. “Our goal is to maximize our customer’s value with leading-edge cellular platforms, reference designs, software, and ready-to-use modules,” stated Richard. “Our complete range of protocol stack IP is proven on leading chipsets, and we can help analyze, integrate, and test our customer’s design for performance and interoperability success.”

protocol stack development. He first used the Mentor Graphics® Nucleus® RTOS back in 1993 for one of the first GSM chipsets, and recognizes the importance of using a reliable RTOS for multi-tasking performance of the chipset. “The Nucleus kernel is proven to be stable and reliable, providing easy access to source code for modifications, in a small footprint,” stated Richard. “Mentor’s embedded tools match our

own design philosophy – by maximizing performance, they are easy to use, provide excellent documentation, and support our customers’ source code.”

Richard added that CCww is currently using the Nucleus RTOS along with Nucleus middleware components TCP/IP network and PPP stack on a 3G protocol stack and may be adding Nucleus Flash File System in the future.

The company will be evaluating other Mentor development technologies like the EDGE™ Development Suite including the EDGE SimTest environment. As CCww’s director, Richard is constantly seeking new tools and services to advance technology innovation. “We’ve also been involved with Mentor’s technology centers in Egypt and Pakistan on an application framework platform, which will enable us to develop new portable devices.”

CCww is exploring more complete solutions for their customers beyond wireless protocol stacks, with M2M modules and reference designs as the company’s newest endeavor.

### Addressing the growing demands of M2M technology

M2M communications of electronic data between a wireless remote device and a back-end IT infrastructure is fast

cutting-edge of M2M, making significant inroads for software developers. One such M2M customer application includes a wireless module embedded in a vehicle, a cellular data link from the module to a computer server (or database), and a software application that enables data analysis, reporting, and interactions. This is just one example of the next-generation development Richard is pursuing for

CCww, and embedded technologies from vendors like Mentor Graphics can help Richard realize his product and services roadmap.

Richard added that when it came to licensing and seeking technical support, his dealings with Mentor support and sales were beneficial to CCww’s

success as well. “Mentor Graphics provides a reliable and scalable RTOS and embedded tool technologies,” said Richard, “and has a good reputation in EDA and embedded systems.”

*“Mentor’s embedded tools match our own design philosophy – by maximizing performance, they are easy to use, provide excellent documentation, and support our customers’ code.”*



— RICHARD CARTER  
MANAGING DIRECTOR/CEO  
CCWW

emerging. The exploding growth of cellular and new types of wireless technology has enabled M2M technology to advance and become more readily available to manufacturers around the world. CCww is on that

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