



# IMPACT

## You Can Hear Me Now: New Wireless Testing Device Improves Product Quality and Saves Time and Money

It's happened to all of us—the dropped cell phone call, usually as you navigate through an office building or down a busy street. Wireless product developers are constantly battling the challenge of signal strength in the changing world around us, conducting expensive, time-consuming tests to simulate the various environments that affect this technology. Now, Ukalta Engineering Corporation, a startup company founded by five graduate students and a post-doctoral fellow from the University of Alberta, is commercializing new wireless test equipment to help developers get quality products out to consumers more quickly and cost effectively.



Ukalta founders pose in front of their new office space at official opening of the TEC Centre, the business incubator facility of TEC Edmonton.

Ukalta's flagship product, a fading channel simulator, is based on research developed through a collaboration of two labs within the University of Alberta—one with expertise in wireless communications, the other in circuit hardware design. "Our multi-disciplinary environment is one of the foundations on which Ukalta Engineering is built," says Chief Operating Officer Leendert van den Berg. "Having knowledge and expertise from both domains allows for the optimization of the theory for hardware implementation, allowing for more significantly efficient designs."

When simulated with software models, accurate fading channel simulation of different radio propagation scenarios and conditions is a computationally-daunting process, requiring a large cluster of computers. Ukalta's fading channel simulator technology uses field-programmable gate array (FPGA) technology, reconfigurable hardware provided by CMC Microsystems that is dramatically faster than regular software simulations, completing tests in minutes instead of days.

For scenarios such as ad-hoc networks, Ukalta's simulator can also accommodate over a thousand signal propagation paths on a single FPGA, compared to the one or two dozen paths offered by current available products. And, adds van den Berg, it is far more cost-effective for suppliers to use. "Our product is much more affordable and flexible than those currently available. Developers can get a faster turnaround time during the testing process, allowing for better product performance and a shorter time to market."

CMC provides a range of products and services to the University of Alberta to support this initiative, including computer workstations, FPGA developments boards, and hardware simulation and tools. Two of the startup company's partners regularly work with CMC for guidance and support.

At the initial stage, Ukalta is working on a release of its fading channel simulator that it will sell or license as an intellectual property core. Several other products for wireless domain will follow. All this activity can continue while maintaining easy contact with the university.

"Many graduates in our field have had to move to California to do this type of work," says van den Berg. "Thanks to the support of the University of Alberta, our mentors and CMC, we're optimistic that our Canadian company will become profitable in the next year, and will continue to grow to become a leader in wireless testing products." *cmc*