

University of Wisconsin Debuts RFID Lab

An open house will mark the completion of the lab, which is being used by Wisconsin companies interested in RFID.

By Mary Catherine O'Connor

August 10, 2005—The University of Wisconsin-Madison RFID Lab is kicking off its grand opening during an open house this week. While the lab has been accessible in various stages of operation since the fall of 2004, the university is describing the event as an inauguration for the lab, noting that this is the first time the facility will be open to the general public. Visitors will get to see demonstrations of RFID applications, such as inline tag application, within a simulated warehouse setting. Public registration to the Aug. 12 event costs \$25, but has been closed due to high demand; the school has set up a waiting list for any future events.

Forty RFID vendors and end users make up the UW RFID Industry Workgroup. Several of them have already used the lab for applied research projects related to tag readability, return-on-investment models and RFID-enabled supply chain processes. Present and future projects include transportation and health care applications, assessments of tags with antennas made of conductive ink, and research on embedding RFID in plastic products and packaging.

The lab includes three test beds: an RFID-enabled portal/dock-door, a high-speed conveyor system, and an antenna design and performance analysis station with an anechoic chamber. Vendors that are members of the workgroup have provided RFID software and hardware systems to the lab. These vendors include Alien Technology, ConnecTerra, RedPrairie, SAMSys, Symbol Technologies, Weber Marking Systems and Zebra Technologies. The lab's conveyor system can operate at a speed of 600 feet per minute (to mimic the speeds at which tagged goods are being read on Wal-Mart's conveyor systems). Workgroup members Dorner Manufacturing and Autologik donated the conveyor, which uses motors and controls provided by member company Rockwell Automation.

"These vendors supply goods to the lab to ensure that it always has state-of-the-art equipment," says Raj Veeramani, UW professor and director of the UW E-Business Consortium, a group that helps Wisconsin companies gain a competitive advantage through e-business. The consortium has a number of areas of focus, including supply chain management. It formed the UW RFID Industry Workgroup two years ago to provide a forum for Wisconsin businesses researching and deploying the technology to develop and transfer innovative and practical ideas around RFID to enhance the competitiveness of Wisconsin businesses. Companies must be members of the E-Business Consortium, which is run in part through membership fees, to participate in the UW RFID Workgroup and have access to the RFID lab. However, companies that are not part of the consortium can use the lab as well, through special arrangements with the consortium.

Veeramani notes that the workgroup is comprised of representatives from SC Johnson & Sons, Kraft and other consumer packaged goods companies coming under retailer and government mandates. But it also includes representatives from a number of companies in other industries, such as paper or plastic production, which are investing in RFID. He adds that workgroup members are focused not just on complying with mandates, but also on integrating RFID in such a way that could improve core business processes. "We have a

team of faculty and business people that are looking at RFID in a comprehensive matter," he says.

RFID labs have been established by a number of other academic institutions, including the [University of Arkansas](#) (see [University Opens RFID Research Center](#)) and the [University of Florida's Institute of Food and Agricultural Sciences \(IFAS\)](#) (see [University Takes a Fresh Approach to RFID](#)). Veeramani says the UW lab's intellectual core competency is centered around physics and engineering. "There are several other universities that have established RFID laboratories, with some having conveyor system and portal stations comparable to ours," he explains. "However, we are not aware of any other university that has substantially invested like we have in installing the technical infrastructure, including a large anechoic chamber, and advanced instrumentation to research RFID application issues from an RF physics and engineering perspective."

That technical infrastructure also includes an antenna measurement system that simulates RF performance in free air and with RF interference, software that can be used to design antennas, and instrumentation to analyze RFID tag performance.

In addition, Veeramani says, the lab is leveraging UW faculty with expertise in specific areas of study, such as packaging, printing technology or distributed sensor networks, to assist in the lab's research into integrating RFID into these areas for business applications. For example, he says, one colleague is studying bacteria sensors that could be used in combination with RFID tags for food safety applications.

The members of the UW RFID Industry Workgroup provide collaborative learning by sharing among its members their real-world experiences with RFID through case studies and vendor-neutral research. The workgroup also conducts RFID research projects, supported by university staff from the electrical, industrial and computer engineering departments, as well as from the university's operational and business management faculty. Moreover, it offers RFID education, both for undergraduates and members of the workforce.

The UW RFID lab will sponsor a two-day, hands-on [RFID executive education seminar](#) on Sept. 22 to 23.

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