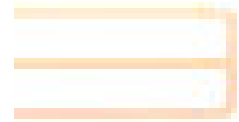


# RFID READER



Volume 1, Issue 4  
July, 2006



### Inside this issue:

Testing Process - Case Level	2
New Door Portal	2
Conveyor Upgrade	2
Lab Count	2
Sponsor Highlights	3
Student Profile	3
Lab Sponsors	4

To request a copy of this newsletter by mail or by email contact:

[rfid@walton.uark.edu](mailto:rfid@walton.uark.edu)

## More Findings on Impact of RFID on Out of Stocks Released

RFID has the greatest impact on a critical category of products—those that sell between 7 and 15 units per day—according to further analysis by University of Arkansas researchers on the impact of RFID on out-of-stock products at select Wal-Mart stores.

Further breakdown based on sales velocity demonstrated that RFID reduced out of stocks by

- 32% for products that

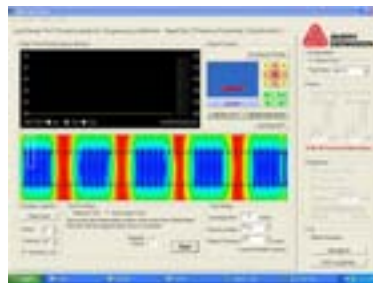
- sold .1-.2 items per day
- 32% (.2-.3 items per day)
- 20% (.3-.5 items per day)
- 36% (.5-1 items per day)
- 29% (1-3 items per day)
- 32% (3-7 items per day)
- 62% (7-15 items per day)

Overall, a 30% reduction in out of stocks for products selling between .1 and 15 units per day was found.

The full report can be downloaded (free) from: <http://itri.uark.edu>

## Test Cube Analyzer Update

In past issues of the Reader, the Avery Dennison Test Cube was introduced as a key component of the testing process in the lab. Specifically, the Test Cube is used to help identify the optimal tag location for the product being tested. The picture below illustrates the type of output that can be produced by the Test Cube. In this case, the image is of a box of canned product. The red zones indicate the “hot spot” on the product, meaning it is the spot in which the tag would see its highest response rate. Note how the Test Cube almost produces an ‘x-ray’ of the product — since water and metal affect UHF read rates, the best spot to tag this particular product is vertically in the airspace between cans.



## Lab Hosts Asset Tracking Meeting

Members of the National Property Management Association (NPMA) met for the Natural State Chapter Meeting at the RFID lab. The NPMA is a professional organization who oversees the effective and efficient management of fixed-assets at local, state, and federal government agencies, colleges, universities, medical facilities, and private industries. The NPMA is interested in seeing how RFID can be used in tracking assets such as laptops and other small expensive items which can easily be removed from offices, schools and other workplaces.



## Testing Process—Case Level

This month's *spotlight on testing* performed in the lab is the case level process. When the lab starts its testing for the product, they carry out a series of static tests with the Avery Dennison Test Cube to determine the candidate optimal location(s) for tag placement (article on page 1).

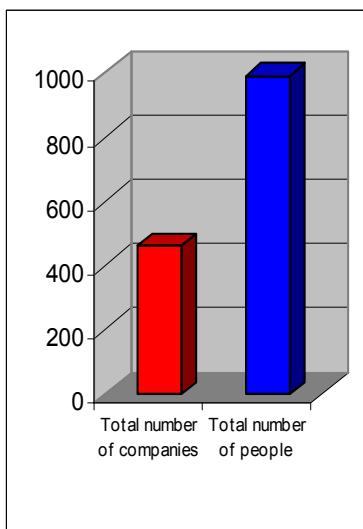
The temperature and humidity are measured and the desired readers are turned on, then a spectrum analysis is recorded of the read field. The products are placed on the conveyor, and from there 50 to 100 data points are collected per location. Up to 6 different tag locations are tested depending on the product, and the data is collected for analysis. When the product is being analyzed, the lab looks at it from a simple *read* or *misread* view. This means that the data recorded is whether or not the tag showed up at all.

The test order form is then completed, including all the percentages, and the company for whom the product is being tested decides on the proper course of action regarding tag placement, tag type, etc. For more information about the 'Compliance Package' for case testing, contact Justin Patton at [jpatton@walton.uark.edu](mailto:jpatton@walton.uark.edu).

## Lab Count Update

Lab visitors as of June 30, 2006

Total number of people: 990  
Total number of companies: 460



## New Door Portal

The University of Arkansas has installed a new door portal that is placed over the entrance of the lab. The portal, which consists of just one antenna and a reader, is conveniently placed above the entrance and can be used to see who or what is entering and exiting the lab.

The antenna will only pick up those objects or people who have tags programmed by the UofA and placed on them. The antenna picks up the tag and reports back to the reader, which in turn reports to a computer connected to it. The tags are pre-assigned to a picture of an employee, for example. As the employee enters and exits the lab his/her image is displayed. The system is also used to welcome visiting groups to the lab.



## Conveyor Upgrade

The Hytrol conveyor system, which the lab uses to conduct testing to simulate a production line and distribution center setting, is undergoing a Central Processing Upgrade, which will allow the system to provide many more diverse control options. This enhancement will allow the lab to easily change communication modes to accommodate all the different induction methods required by the diverse vendors of RFID equipment.

This will also make the process of switching conveyor settings, such as speed, to match the standards each company has easily manageable. The upgrade does this by giving the processor the ability to use five programming languages, which will streamline the code.



\*Turn to the next page for more on the Conveyor

**Sam M. Walton**  
**College of Business**

**RFID Research Center**  
Director: Dr. Bill Hardgrave  
Phone: (479) 575-6099  
Email:  
bhardgrave@walton.uark.edu

**RFID Lab**  
2700 S. Armstrong Road  
Dock 28  
Fayetteville, AR 72701  
Lab Manager: Justin Patton  
Phone: (479) 718-3650  
Cell: (479) 236-5890  
Email: jpatton@walton.uark.edu

<http://itri.uark.edu/rfid>

## Symbol Apex Unit

With the help of Symbol Technologies, the RFID lab now has a fully operational Gen 2 mobile reader. This unit, called the Apex, will allow a pallet of product to be read as the pallet driver pulls into the product to load it on to a truck, or move it throughout the warehouse. It can also be used on shelves or other convenient locations to track inventory.



The Apex achieves this by its compact design, having the reader and antenna as one unit that is a little over a foot in diameter. From there, you can remote screen into the reader, and through the wireless capabilities of the Apex, have it send the data to the inventory control system for constant tracking.

## Conveyor Cont'd

One of the options that this Hytrol Conveyor offers, is the ability to directly attach a reader to the RS-232 port into the PLC-Controller. This will allow the user to specify up to 500 sku's of data put directly into the PLC mainframe, and from there the boxes once they are recognized by the reader, be sorted into their proper lane. The lab is currently still testing the procedure that is involved with hooking up the reader to the PLC, and will be publishing response time to the conveyor system while running at 600 ft. per minute.

Along with the software upgrade, the new processor will allow the conveyor to run testing at 710 ft. per minute.



### Colby Backes

A computer specialist for the RFID lab, Colby Backes has spent over a year watching RFID software develop from the ground up. Starting first as a lab tester, Colby gained hands-on experience with the equipment and processes. Realizing the industry's complete lack of testing tools he began building web interfaces for han-

dling RFID data as well as automated reporting and analysis.

Currently, Colby is an undergraduate business student majoring in International Business Economics. He has studied the Japanese language and culture for over five years, earning a minor in Japanese Business Language last fall.

Colby's interests now include web-based data rich software. "Due to

the overall lack of standards, RFID has forced the need for software to accept dynamic changing data." Colby utilizes a host of programming platforms including Java, PHP, ASP, VB, XML and Actionscript. He has now gone on to start his own web development company Configure, and hopes to go into the RFID industry after graduating this summer.

Contact Colby at [www.configureonline.com](http://www.configureonline.com)

## Student Profile

## Company Testing

Have the University of Arkansas RFID Lab do testing for your company product. We offer pallet, case, conveyor, and sweet-spot testing to make sure that your product is as RF friendly as possible. We also provide in-depth reports that will make it easy to see what your company needs to do to achieve RFID compliance.

Contact Justin Patton at [jpatton@walton.uark.edu](mailto:jpatton@walton.uark.edu) to set of a conference call.

---

## *Strategic Sponsors*

ACNielsen  
Cisco-Eagle, Inc.  
Deloitte Consulting, LLP  
Hytrol Conveyor Co., Inc.  
Intel Corp.  
Intel Solution Services  
Microsoft Corporation  
Symbol Technologies

## *Business Sponsors*

ABF Freight System, Inc.  
Campbell Soup Co.  
E. & J. Gallo Winery  
Hanna's Candle Co.  
JBHunt Transport Services, Inc.  
Tyson Foods, Inc.  
Wal-Mart Stores, Inc.

## *Lab Sponsors*

Alien Technology  
Avery-Dennison  
epcSolutions, Inc.  
Hugg & Hall  
IBM, Inc.  
Loftware  
Markem  
Moore Wallace  
OATSystems, Inc.  
Omron Electronics LLC  
Paxar  
Printronic  
RFID Global Solution, Inc.  
RFID Journal  
ThingMagic  
Weber Marking Systems  
UPM Raflatac  
Zebra Technologies Corp.  
Zero Mountain

---

### Company RFID Training

The University of Arkansas is now hosting company training at the U of A RFID lab. Bring the RFID team from your company and have them get a in-depth overview of how your companies product performs in an RIFD environment. Bring a minimum of five people from your company, and for 1500 dollars per person, get hands on experience over a 2 day course.



For more information about becoming a sponsor of the RFID Research Center, contact:

Dr. Bill Hardgrave  
Director, RFID Research Center  
Sam M. Walton College of Business  
University of Arkansas  
Fayetteville, AR 72701  
bhardgrave@walton.uark.edu  
(479) 575-6099