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## Dairy Farmers of America: Putting RFID into Production with OAT tag@source™

Dairy Farmers of America (DFA) is one of America's largest, most progressive and diversified dairy cooperatives, with membership of more than 20,000 family-owned dairy farms in 49 states. DFA markets 34 percent of U.S. milk production, supplying milk, cheese, butter, and other dairy products through brands such as Borden and Kellers Creamery. Facing a customer RFID initiative, DFA was determined to look beyond "slap and ship" approaches in favor of a more cost-effective automated solution able to support growing RFID requirements from Wal-Mart as well as other retailers.

DFA chose OATSystem's tag@source™ – a complete, automated RFID tagging solution that allows DFA to cost effectively apply and verify EPC tags. "OAT's architecture was the most robust and expandable of all the vendors we evaluated," says Bob Tiede, IS Director, DFA. "From WebSphere support to automated failover, it provides the features we were looking for, and handles all EPC and RFID requirements from one end to the other."

DFA commissioned Rush Tracking Systems, a Kansas City-based RFID integrator, to deploy and integrate the OAT tag@source solution into multiple production lines and plants. The first installation went live in December 2005 in DFA's Plymouth, Wisconsin facility, and has proven to be fast, accurate, and highly reliable. A second line was deployed in August 2006 and equipment for additional lines is on order.

OAT's tag@source solution manages all automated tagging operations from DFA's data center in Springfield, Missouri. From this central location, it scales readily to handle additional production lines and plants, using customizable templates that minimize deployment time. The solution also includes

### Customer

Dairy Farmers of America is a cooperative of over 20,000 dairy farmers and one of the largest and most diversified U.S. manufacturers of dairy products and ingredients. In 2005, DFA had sales of \$8.9 billion.

### Business Challenge

Facing a Wal-Mart RFID initiative, DFA was determined to find an RFID solution more aligned with its vision for process efficiency and supply chain automation than rudimentary "slap and ship" approaches.

### Solution

OATSystem's tag@source™, provides a complete, automated RFID tagging solution for applying and verifying EPC tags. Rush Tracking Systems, a Kansas City-based RFID integrator, was commissioned to deploy and integrate the OAT tag@source solution into multiple production lines and plants.

### Results

DFA complies with its RFID requirements on time, and is automatically applying and verifying EPC tags around the clock without increasing headcount and has had no hardware downtime since going live. With performance confirmed, DFA recently deployed automated tagging on a second production line – and has a flexible platform in place to handle future RFID initiatives from Wal-Mart and

OATaxiom's analytics package to identify emerging trends and potential ROI opportunities.

Because of OAT's early involvement with the development and deployment of RFID technology, all OAT products are built on an architecture designed to leverage the unique capabilities of RFID data and link real-time RFID activities at the edge of the enterprise with corporate decision-making.

# Automated EPC Tagging For Dairy Farmers of America: Process Flow

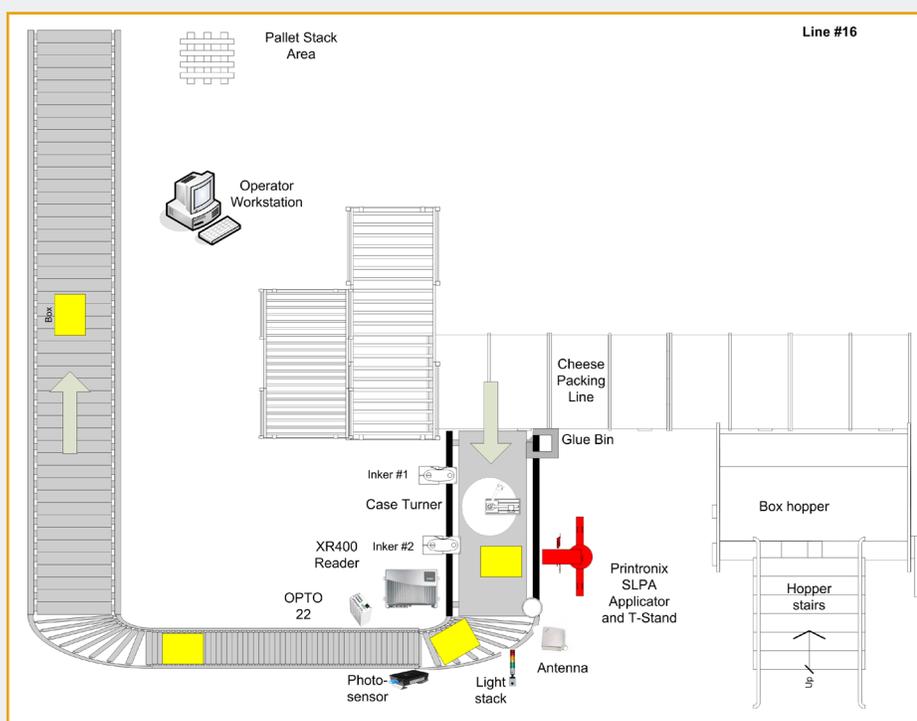
The automated tagging station uses a mobile conveyor that carries the components and can be plugged into any Ethernet hub or access a wireless point as needed. In this example developed for DFA, it is mounted together with an existing printer station, but a variety of configurations are possible.

Let's pick up the action as a case comes off the case packer on a powered conveyor belt:

1. An ink-jet printer (not part of the RFID solution) prints human readable details about the product (name, UPC, case contents, time off the line, etc.). The statement is printed on the long side, the case is turned 90 degrees counterclockwise, and printing is repeated on the short side.
2. The case passes a photo switch attached to a Printronix SLPA 7204 printer applicator and in the next 2.3 seconds is moved into position in front of the applicator tamp.
3. The OAT server manages all EPC number allocations and ensures the printer applicator has the correct number to be applied. The tamp

applies a 4" x 2" tag containing an Alien Squiggle Gen2 inlay. The applicator encodes the EPC on the inlay and prints the RFID data in human readable form on the paper portion of the tag.

4. The case continues onto a skate-wheel conveyor where it passes in front of a bistatic antenna connected to a Symbol XR400 reader. The reader interrogates the inlay and sends the tag ID and timestamp data to the OAT server.
5. The OAT server in DFA's data center in Springfield, MO examines the EPC database to verify that the number is valid for the product on the line.
6. One second later, the case breaks a SICK photosensor attached to an OPTO-22 PLC.
  - If a successful read occurred and the EPC is valid, the OAT server signals the PLC to illuminate the green light on the stack light.
  - If no read occurred or the tag is invalid, the OAT server signals the PLC to illuminate the red light.



## Key Elements

### Software:

- OAT Foundation Suite, including:
  - OATlogic (design environment for RFID workflow logic)
  - OATxpress (captures, filters, and manages edge data based on best practices)
  - OATaxiom (enterprise data management and analytics)

### System Integration:

- Rush Tracking Systems ([rushtrackingsystems.com](http://rushtrackingsystems.com))

### Hardware:

- Printronix 7000r Smart Label Printer Applicator (SLPA) with T-Base mounting stand and U-arm
- Symbol XR400 reader with circular antenna
- OPTO 22 PLC and I/O module
- SICK photosensor
- Cutler Hammer stack light (R/G/A)
- PC with Internet Explorer

## Minimal Operating Costs

The tag@source solution greatly reduces operating costs compared to traditional slap and ship solutions, as Josh Drake, RFID Systems Engineer, explains. “We are very satisfied with the automated tagging because we don’t have to hire workers to stand at the end of the line slapping on labels. We’re saving the cost of at least three full-time people per line.”

The solution also eliminates reliability problems and error rates that bedeviled previous automated tagging systems. “Once you get it set up and calibrated, it keeps on rolling,” says Drake. “We’ve had no hardware downtime since the equipment was deployed in late 2005.” He adds that read errors have dropped dramatically as tag quality has improved – currently one percent or less using Gen2 tags.

Drake adds that the system easily keeps pace with DFA’s production lines. “Right now our fastest line is running about 16 cases per minute, and the applicator has no trouble keeping up. If necessary, we could crank the applicator up to 20-25 cases per minute, so there’s considerable room for growth.”

The system is very easy for line operators to use and requires minimal training. To start a tagging job, the operator accesses the OAT system from their PC using a web interface, enters the product number and production order number, and clicks Start. The cases roll through the tagging station, are read for verification and delivered to the pallet stacking area.

## Scalable and Configurable

When DFA rolled out automated tagging on a second production line, it was tagging product the same

day. OAT’s best practice software templates reduce the cost and time to scale automated tagging to other production lines. The centralized RFID software eliminates the need for in-plant software installations, and associated servers and storage. Once the automated tagging hardware is installed, operators in any location run tagging jobs accessed through a secure web site.

## Advanced Software Architecture

The OAT Foundation Suite is integrated into DFA’s

IT architecture and security framework, providing the high level of control and manageability required of an enterprise application. It runs on servers in DFA’s data center, supporting all production sites while providing full redundancy and failover protection. EPC databases reside in DFA’s storage area network (SAN), eliminating the need to purchase dedicated storage. The software complies with the latest RFID standards and is pre-configured for a variety of deployment options including IBM’s WebSphere RFID infrastructure.

## Future ROI through Analytics

In addition to automated tagging, DFA has invested in

the analytic capabilities of OATaxiom, and is working closely with OAT and Rush Tracking Systems to identify value opportunities from RFID data. “Obviously Wal-Mart’s RFID initiative brought us into the project, but we don’t view this as simply a compliance exercise,” explains Scott Aldridge, Midwest Region Business Manager. “As we become familiar with RFID data from Wal-Mart and what OATaxiom can do, we’re hoping that improved visibility into product movement will help us identify trends and ROI opportunities, including the ability to truly manage by exception.”

### Automated Tagging at DFA The results are in:

**Labor savings:** DFA runs a 24 x 6 1/2 production operation – manual tagging would require hiring three full-time workers per line to slap labels.

**Error rate:** The Gen2 tags have a failure rate of less than 1%.

**Reliability:** No hardware downtime since the tagging system went live in December 2005.

**Tagging speed:** The automated tagging system currently handles 16 cases per minute, and can go faster if needed.

**Simple operation:** To launch an automated tagging job, the line operator simply accesses the OAT system via a web interface, enters the product number and production order number, and clicks Start.

Aldridge cites the example of new item introductions, where speed to shelf is critical. RFID data can instantly show if a store has not received product, or if an item has been received into the back room but hasn't been moved to the sales floor. Armed with this information, DFA will be able to take corrective measures to start selling the product more quickly.

## The Vision Comes to Life

Today, DFA is able to meet its long-term vision for automated RFID tagging and analytics, with proven hardware and a software architecture that supports evolving customer requirements while minimizing additional investment. "As Wal-Mart continues to expand their read-ready stores and distribution centers, we'll be able to expand ourselves to accommodate their tagging needs," concludes Tiede. "We also expect that other customers will decide to introduce similar RFID initiatives, and we'll be ready to support them as well."

## About OAT

OATSystems, Inc. is the recognized RFID framework leader, with software that empowers businesses to achieve competitive advantage from radio-frequency identification (RFID). As a pioneer in the development of RFID technology, OAT has been setting the standards in RFID for over half a decade and is responsible for industry firsts that include the

largest scale and largest scope of deployments, as well as the most innovative approaches to providing enterprise-wide RFID solutions. OAT's multinational client base consists of over 70 customers in retail, CPG, consumer electronics, manufacturing, life sciences, aerospace, and defense. Headquartered in Waltham, MA, OAT has offices in Austin, Chicago, London, and Bangalore and is on the Web at [www.oatsystems.com](http://www.oatsystems.com).

## About Rush Tracking Systems

Rush Tracking Systems is a leading end-to-end RFID systems integrator offering turnkey solutions through a proven, repeatable process based on years of real-world implementation experience. As RFID innovators, implementers, and partners, Rush has used its expertise to generate rapid results for major companies in a wide range of industries. Rush serves as trusted advisor and systems integrator to numerous Fortune 100 companies in CPG, aerospace and defense, manufacturing, life sciences, and government sectors. For more information, visit [www.RushTrackingSystems.com](http://www.RushTrackingSystems.com).



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