

Wal-Mart Using RFID to Monitor Vehicles at Its DCs

The system is helping the retailer increase productivity at a dozen of its distribution centers, through improved utilization of the vehicles and their drivers.

By Mary Catherine O'Connor

Feb. 26, 2008—To track lift trucks and other vehicles at a dozen of its distribution centers in the United States, Wal-Mart has been using an RFID-based system made by New Jersey-based I.D. Systems.

"Wal-Mart accomplished two major objectives [by deploying the system]," says Gene Merlo, I.D. Systems' VP of North American sales. "It increased productivity [inside its DCs using the system], and it improved utilization of vehicles inside the DCs." The retailer began with an initial test at a single distribution center in late 2005, then rolled it out to a small group of DCs in 2006 and a third, larger one last year.

The I.D. Systems' vehicle management system (VMS) consists of a battery-powered 915 MHz RFID transceiver built into a vehicle asset communicator (VAC)—a small computer that mounts onto a lift truck or other vehicle. The VAC uses a proprietary air-interface protocol to communicate data to I.D. Systems receivers, known as Wireless Asset Managers, mounted throughout a DC. The number of these receivers installed at a particular DC varies depending on the facility's size. The Wireless Asset Managers then pass the data they collect to I.D. Systems software running on a central server within the facility, either via a wireless or wired (Ethernet) link.

The software processes each tag's location and sensor data, and can tell DC managers everything from where a specific vehicle is located within the facility, to who is driving the vehicle, whether it is carrying a load and if it requires maintenance. It can also save and aggregate this data for each vehicle to provide lifecycle visibility.

At the start of a shift, Merlo says, a Wal-Mart driver must undergo a number of interactions with a vehicle's VAC before he can operate that vehicle. First, the driver presents his personnel badge to the VAC. The built-in RFID interrogator reads the badge's embedded passive RFID tag, and the VAC transmits the identity data to a central server in order to determine whether the driver is authorized to operate that specific vehicle.

If the driver has authorization and is the first person to drive the car on any given shift, Merlo says, the VAC's display screen then directs that individual to make a number of safety checks on the vehicle, in compliance with U.S. Department of Labor's Occupational Safety and Health Administration (OSHA) rules. Such checks are done partially through computerized diagnostic checks with the vehicle engine, and partially through manual inspections. The driver must check the brakes and inspect for leaks or broken parts. "It's similar to the checks a pilot makes on an airplane before a flight," Merlo explains.

Once a driver is operating a vehicle, a weight sensor linked to the VAC monitors that vehicle's cargo area—the forklift, for instance—to determine whether it is carrying a load. When the sensor indicates a load is

in transit, this is indicated in the data the VAC sends upstream. All of this data translates into a valuable management tool that Wal-Mart managers can employ to improve a DC's productivity, Merlo says, whether through better supervision or management of employees, or via better allocation of vehicles.

"If [a DC has] 100 vehicles and 80 people signed onto vehicles, [managers] know 20 trucks are idle," Menlo says. "But what if only 40 of those are in motion and 40 are idle? The manager can then see that an employee is paid for eight hours a day and is in motion six hours a day, and can see how often that employee is moving a load, and then compare all of this data to the output of another employee. So now managers can compare performance and tasks and then get the industrial engineers involved, and see how they should be assigning resources to peak usage of those resources."

This could translate into reducing the number of vehicles in a DC's fleet, Menlo says, or alter how they are used. "Forklifts can cost between \$10,000 and \$25,000," he states, so effective management of the fleet can lead to significant operational savings. Prior to deploying vehicle management system, I.D. Systems reports, Wal-Mart used its warehouse management system to help it monitor the productivity of its vehicle operators, but the worker performance information provided by that system was less comprehensive.

RELATED_ARTICLES According to Menlo, Wal-Mart has done extensive testing of the vehicle management system, both in a lab setting and in the DCs, and the VACs never suffer from RF interference stemming from other RF systems Wal-Mart uses, such as EPC Gen 2 hardware used for product tracking, or from existing wireless LANs.

I.D. Systems has also deployed its vehicle management system for the U.S. Postal Service (see [USPS Uses RFID to Manage Vehicles, Drivers](#)).

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