



# Lexar Media leverages the power of mobile RFID to streamline manufacturing and warehouse operations



With the Motorola RD5000 Mobile RFID Reader installed on forklifts, Lexar Media forklift operators can be sure that each pallet they select is part of the right order. In the event the operator inadvertently tries to stage the pallet at the wrong dock door, an alert sounds to notify the driver of the pending error. As a result, the company has been able to eliminate errors — and costly mis-ships.

## Company overview

All over the world, people use Lexar Media products to store or transfer multimedia or any kind of electronic data. This leading marketer and manufacturer of NAND flash memory products offers memory cards, USB flash drives, card readers and ATA controller technology for the digital photography, consumer electronics, industrial and communications markets. Lexar is also an original equipment manufacturer (OEM) for industry giants such as Kodak. A subsidiary of Micron Technology, Inc., the global company has operations in the United States as well as Australia, China, England, and Japan. The company's technology is licensed to industry leaders including Olympus Corporation, Samsung Electronics Co. Ltd., SanDisk Corporation and Sony Corporation.

## The challenge: improve efficiency and accuracy in shipping operations

Lexar Media was seeking a technology solution that would resolve two major business issues:

- Strengthen collaboration across the supply chain to provide the information needed to enable more timely and better informed decision making
- Improve the accuracy and efficiency of warehouse operations

The solution needed to eliminate the high volume of shipping errors — customers were receiving orders with missing product, or product that belonged to another customer. These shipping errors came at a high price — dissatisfied high-profile customers as well as the high direct and indirect costs of the mis-ship, which involved return shipping, re-stocking costs and the costs to process the order a second time. And the solution also needed to offer maximum scalability to accommodate the company's extremely large volumes — over two million packages of products representing 30 million individual units are shipped each year to Wal-Mart alone.

Lexar Media had already volunteered to become one of Wal-Mart's early RFID adopters. But in place of simple slap-and-ship compliance, the company sought an enterprise-wide solution that would enable real-time order management, optimization of logistics operations and real-time monitoring of all distribution center operations to improve overall business agility — and customer response times.

## Customer profile

# Lexar™

### Company

Lexar Media

### Location

Facilities in Fremont, CA;  
Surrey, England; Tokyo, Japan; North Sydney, Australia;  
Shanghai, People's Republic of China

### Industry

Manufacturing and Wholesale Distribution

### Motorola Products

RD5000 Mobile RFID Reader

### Application

KeyTone's SmartDC - Distribution Visibility Platform integrated with SAP's Warehouse Management System (WMS)

### Partner

KeyTone Technologies

### Benefits

- 100% accuracy in shipments — elimination of mis-ships
- Improved customer service and satisfaction levels
- Improved throughput at dock doors
- Reduced labor costs through improved warehouse worker productivity
- Faster invoicing cycles
- Faster cash-to-cash cycle time for improved profitability
- Better staff utilization
- Cost-effective Sarbanes-Oxley compliance
- Real-time business information for better decision-making
- Granular dock-to-shelf order tracking for better manufacturing demand forecasting
- Ability to scale up and down to meet seasonal demands — without requiring additional investment

## The before scenario

As orders were received, pickers selected product off the shelves to build the pallets and fulfill the order. While customers might order the same product — for example, a one GB memory card — different retailers might have different packaging requirements. Each pallet might contain as many as 200 small boxes of product, each with 10 or 20 individual cards. An order might consist of a total of 30 pallets, often going to different locations for the same retailer (for example, the single order might be shipped to the New York, Chicago and Los Angeles distribution houses for a given retailer).

Even though product might be packaged differently to meet customer requirements, the packages look remarkably the same. In addition, only the product on the outside of the pallet was visible. And then there was the added chaos of a short shipping window — trucks arrive to pick up shipments at the end of the workday, with many shippers offering only a two hour window for loading. Factor in the large volume of shipments, each with a large volume of pallets, and this combination of conditions frequently resulted in mistakes at the dock door where the wrong pallet was loaded onto the wrong truck. The end result was the delivery of orders that either contained the wrong product or were incomplete.

## The solution: mobile RFID technology for real-time order tracking and verification

Motorola partner KeyTone Technologies was brought in to provide an RFID solution that would provide real-time visibility into the breadth and depth of information required to streamline distribution operations, as well as meet various retail mandates. Motorola's RD5000 mobile RFID readers were deployed in two areas: at the dock doors and on warehouse forklift trucks. And KeyTone's SmartDC – Distribution Visibility Platform enabled the integration of captured RFID data with the SAP Warehouse Management Systems (WMS) of third party logistic providers. The result is a new level of visibility — orders are now visible from fulfillment through shipping.

Now, upon arrival, carriers are assigned a specific dock door. After parking at the dock door, the driver checks in at the computer terminal associated with that dock door. The driver then enters in a variety of information that enables granular tracking of orders all the way to the retail dock, including carrier name, driver name, license plate number, vehicle ID, destination and more.

With real-time visibility into dock door activity, warehouse supervisors can promptly assign outbound shipments to the various trucks shortly after they arrive. Forklift operators are then assigned the task of locating and delivering a specific order number to its assigned dock. As each pallet in the order is selected, the RD5000 reader interrogates the pallet and verifies that it is associated with that order. In the event a forklift operator attempts to stage the wrong pallet for a given dock door, an alert sounds, successfully preventing the occurrence of errors in the fulfillment and shipping process.

The resulting rich data repository enables the matching of order and shipping information, providing Lexar with proof of shipment and the ability to easily trace missing shipments. In addition to the date and time a shipment was picked up, Lexar also knows which truck and operator loaded the order. For any given order that has left the dock, Lexar now has a wealth of information to perform analytics that help the company understand how to further streamline operations, including customer purchase order number, order and ship date, dock door, carrier, driver, time the shipment was loaded onto the truck, how long that shipment took to load, the product ordered, the product shipped, and the number of pallets shipped.

## The benefits

Lexar's RFID solution has exceeded the company's expectations, delivering benefits that reach well beyond the desired improvements in the shipping function.

### Benefits at the dock door

At the dock door, the company achieved all expected benefits, including:

**Elimination of errors:** RFID has provided Lexar with the ability to automate the reconciliation of orders. The interrogation of the pallet and contents enables automatic verification that the right product is set for shipment to the right customer, significantly reducing QA/inspection time. And the ability to tie the pallet license plate to a specific dock ensures that the right pallet is placed on the right truck, reducing mis-shipments.

**Improved customer satisfaction:** Customer satisfaction is improved — shipments always contain exactly what was ordered, and arrive on time.

**Reduced costs:** The elimination of mis-ships eliminated the associated costs.

**Improved productivity:** Before RFID was implemented, Lexar needed three workers at dock doors to verify that orders contained the right product and were loaded onto the right truck. The automation of RFID reduced that staff to one half-time person, enabling the re-assignment of workers to more critical tasks — an effective increase in throughput without additional costs.

**Improved efficiency at the dock door:** RFID's process automation reduced load times, enabling the more efficient movement of trucks in and out of the dock. Supervisors are instantly notified when a truck has arrived — no more waiting for a paper trail. And load verification is now completed in seconds via the RFID reader instead of minutes with labor intensive paperwork.

**No training required:** The easy-to-use intuitive system never takes more than a few clicks to execute any action, eliminating training and any associated cost.

### Benefits beyond the dock door

Additional benefits the Motorola RFID solution delivered included:

**Cost-effective Sarbanes-Oxley compliance:** The Sarbanes-Oxley regulation dictates that suppliers can only invoice customers when proof of shipment of the entire order is in hand. Tracking this information without RFID was very time consuming, since multiple shipments are common for the large orders. For example, for an order of 3000 units, 2500 units might leave the facility one day, and the remainder might leave the following day. Since invoices cannot be issued until there is proof of shipment for the entire order, tracking this information via paper-and-pen was cumbersome, time-consuming and costly. But with RFID, proof of shipment and proof of delivery for all shipped orders is available with just a few keystrokes — and within seconds of the truck leaving the dock.

**Shorter invoice and cash-to-cash cycle times:** With real-time visibility into orders that have shipped, invoices can be issued more rapidly and the company receives payment sooner, improving overall profitability.

**Better management of staff:** Visibility into the number of alarms issued to workers enables supervisors to better manage staff. Supervisors can see who is in need of additional training and proactively improve the productivity of individual workers.

**Better decision-making:** The real-time data capture eliminates the prior lag time between when an event occurred and when it was visible in the warehouse management system. The ability to manipulate the real-time information into meaningful reports enables tighter management of manufacturing production, warehouse inventory and all associated staff, further reducing costs and improving profitability.

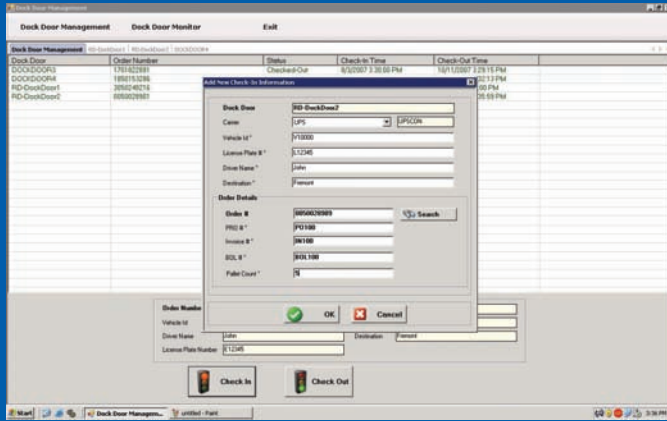
**Granular dock-to-shelf order tracking:** In RFID-enabled Wal-Mart distribution centers, orders can be tracked all the way from the time the product is built to the time it arrives on the shelf. The resulting visibility into the inventory at the store level enables better product demand forecasting.

### Mobility in RFID — a key enabler

Senior Logistics Analyst, Lee Mar of Lexar Media comments on the benefits of mobility in RFID solutions: "Our first RFID solution was based on fixed readers that were permanently installed at specific dock doors — but the lack of flexibility drove us to search for another solution that could better meet our needs. The answer was Motorola's RD5000 mobile RFID reader. The brilliant marriage of RFID with mobility enabled us to easily move our RFID readers as needed — we can now reconfigure our RFID solution on the fly. This capability allows us to easily scale up and down to meet the demands of seasonal spikes — all with our existing infrastructure investment. Instead of choking dock doors during peaks, we simply move more readers to enable more dock doors with RFID functionality. As a result, regardless of demand, we are always able to keep orders shipping smoothly and on a timely basis — even during 'Black Friday'."

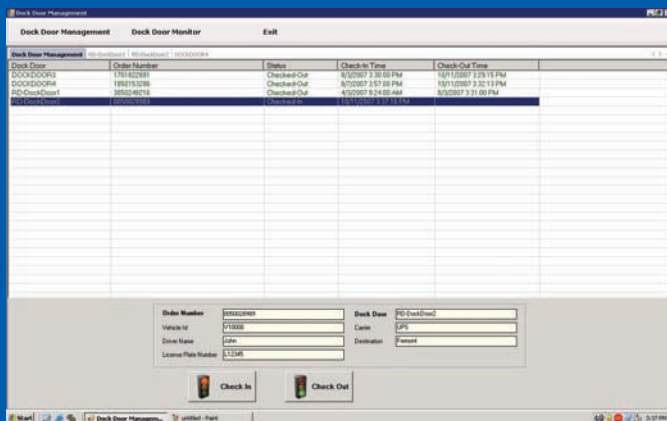
# Improving visibility, agility and efficiency of operations with Motorola RFID and KeyTone's SmartDC – Distribution Visibility Platform

## Carrier check-in



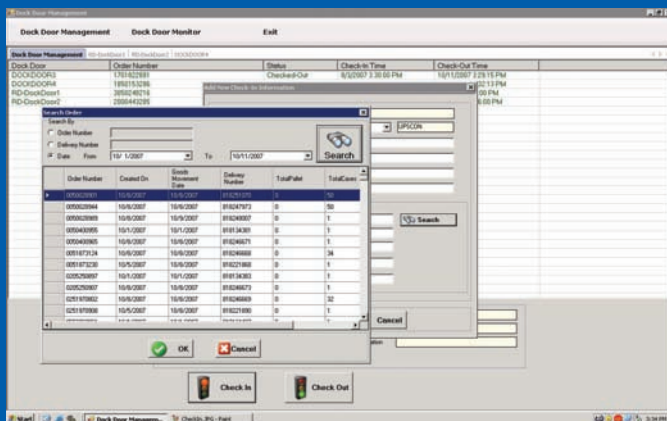
As carriers arrive, they are assigned a specific dock door. Drivers then check in at the computer terminal associated with the dock door, entering in a variety of information including carrier name, driver name, license plate number, vehicle ID, destination and order number. Order information collected through RFID is matched to the record, providing a new level of visibility. Now, in just a few keystrokes, the company can locate any order — easily tracking product from fulfillment through to shipping.

## Load verification



Process automation with RFID reduces load times, enabling the more efficient movement of trucks in and out of the dock. Supervisors can instantly see when a truck has arrived — no more waiting for a paper trail. And load verification is now completed in seconds via the RFID reader — instead of minutes with labor intensive paperwork — enabling supervisors to verify that the right load is on the right truck.

## Order inquiry/search



Real-time status and the history of any order are available at the press of a few keys, ensuring that employees always have the information they need to respond to customer queries on status.

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Lee Mar, Senior Logistics Analyst  
Lexar Media

In addition, mobility also enables a critical capability for Lexar Media that would not be possible with a fixed reader. Continued Mar, “Only through the ability to place the RFID reader on a forklift and move it to the point of process activity are we able to automate and expand the verification process to ensure that forklift operators are not only selecting the right pallet, but also placing that pallet on the right truck.”

### Why Motorola and KeyTone?

Lexar Media chose Motorola and KeyTone for several reasons:

The Motorola RD5000 and KeyTone’s application integrated seamlessly into the existing IT infrastructure, enabling the company to more fully leverage existing IT investments. In addition, the solution also integrated into Lexar’s existing business processes, minimizing disruption in day-to-day operations and paving the way for a rapid realization of benefits.

Said Edwin Winder, Executive Vice President of KeyTone Technologies, “The RD5000 is truly the next generation in RFID readers, extending visibility beyond the dock doors to anywhere inside the facility. It is the only RFID reader that can move from fixed to mobile deployment without a major change in environment, software or hardware. In addition, the standards-based platform enabled us to easily develop the software to meet all of Lexar Media’s requirements — including the ability to enter a new SKU number and begin receiving shipments in under an hour.”

In addition, the RD5000 offered the rugged construction required in a manufacturing and warehouse environment. Says Mar, “The name Motorola says it all — quality. And the RD5000 lives up to that name, delivering reliable performance in spite of daily abuse on the manufacturing and warehouse floor.”

In closing, Mar commented, “Our Motorola and KeyTone RFID solution allowed us to take RFID to the next level, delivering a new level of business agility...and a definite competitive edge.”

### Future RFID plans

Due to the success of this deployment, plans are already in the works for future RFID developments. The company already has ‘smart docks’ which can determine if the wrong pallet is being loaded onto a truck. Now the company is looking to create the ‘smart warehouse’, expanding beyond the outbound

shipping process to include the inbound putaway process as well. Readers installed either on the shelf or on the forklift will prevent errors in the put-away process — just as they prevent errors in the shipping process today.

Another phase will enable real-time inventory management. As product is pulled from the shelf to fulfill orders, the remaining quantity will be written to the tag, providing real-time visibility into inventory on the shelf, allowing the company to further ‘lean’ manufacturing and warehouse operations.

For more information on how Motorola’s RFID solutions can help your company achieve competitive advantage, please visit us on the web at [www.symbol.com/rfid](http://www.symbol.com/rfid), or access our global contact directory at [www.symbol.com/contact](http://www.symbol.com/contact)

### About our partner: KeyTone

KeyTone Technologies is a recognized leader in RFID solutions for clients in manufacturing, distribution, transportation & logistics, financial services, and aerospace & defense. With in-depth experience and comprehensive solutions, KeyTone has distinguished itself by delivering real value while simplifying the adoption of RFID. KeyTone knows how to make RFID work for the benefit of its customers, from providing end-to-end visibility through all manufacturing and distribution processes to the tracking of material and human assets. KeyTone’s solutions help create and sustain superior performance by improving visibility, agility and efficiency of operations.



Headquartered in Santa Clara, California, KeyTone enjoys an impressive customer base including, Seagate, Micron (formerly Lexar Media) and Mann Packing and an equally strong partner community including Motorola (formerly Symbol), Zebra Technologies, Intellex, Escort Memory Systems (a Datalogic subsidiary), Weber Marking, and Satyam Computer Services.

To learn more, please visit [www.keytonetech.com](http://www.keytonetech.com)



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CASE STUDY: Lexar Media