

Electro-Com and TI-RFid Supply Chain RFID Applications.

The supply chain is at an RFID-EPC crossroads and you're getting ready to set your company on the right course to EPC (Electronic Product Code) deployment. The RFID market may look like uncharted territory for some. **Texas Instruments** (represented in Australia by Electro-Com Australia Pty Ltd) has been down the road a time or two over the past fifteen years. TI has improved supply chain business processes for hundreds of companies deploying more than 400 million RFID tags and countless readers for pioneers building new markets and companies grabbing a competitive edge.

After all the marketing hype and technology claims, what you really need is a partner who can deliver an RFID solution that's ready today – and who'll be there to support you tomorrow. **Texas Instruments RFid Systems** (TI-RFid) are synonymous with deploying innovative RFID applications and have produced RFID solutions that have helped companies like Marks & Spencer, Gap Inc., Fagleaves.com and Goldwin Sportswear build real returns on their RFID investment.

Time equals more than just money when you're dealing with perishable items like refrigerated food, fresh produce, or date-sensitive products like pharmaceuticals. Using RFID technology helps manufacturers and retailers ensure the quality of their products throughout the supply chain and boosts margins as spoilage and waste are dramatically reduced. An RFID-enabled supply chain also means that information like time and date coding, temperature readings, and critical inspection data at every point in the distribution chain are cataloged and stored directly on the RFID tag. A faster supply chain means reducing waste, and ensuring the quality and integrity of your products.



Moving from bar codes to reusable RFID 13.56MHz smart labels, Marks & Spencer, one of Europe's largest retailers, is pioneering the largest RFID supply chain deployment the market has seen to date - 3.5 million tags. Using **TI-RFid** technology to link fifty chilled food suppliers to more than 350 stores across the UK, the company is moving perishable refrigerated foods more quickly and accurately through the supply chain from dispatch and sorting to pick-up and distribution. Marks & Spencer is seeing real ROI today across its new RFID powered supply chain. The system's capital cost is less than one tenth of the annual cost of using barcodes. Reading food trays, dollies and roll cages 83 percent faster at each point in the supply chain, RFID speeds handing and distribution, reduces waste and keeps a more accurate and real-time watch on its inventory.

Streamlining Warehousing and Distribution

Every touch point along the supply chain brings extra labor and expense – and the risk of mistakes. The wrong product goes to the wrong location. Missed delivery dates slow down a manufacturing operation. Labor-intensive distribution, order fulfillment and delivery all add layers of costs, and the potential for expensive errors.



RFID automates many of these laborious steps and processes, like sorting and pick-pack and-ship, and streamlines delivery scheduling and processing. Accurate, automatic data collection means the right products are getting into the right distribution channels, and last-minute changes don't create bottlenecks in your supply chain.

The booming success of their online intimate apparel business sent Fagleaves.com looking for new ways to boost efficiency at their centralized pick-and-ship fulfillment center. Combining RFID with a Java-based warehouse management solution now allows Fagleaves to optimize fulfillment workflow,



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improving order accuracy and reducing costly customer returns. Intelligent trolleys with RFID-enabled totes let staff quickly and accurately fill up to 24 complete orders in a single pass through the distribution center – boosting efficiency and getting the right products to the customers on time.

In the vast halls of the Bloemeneiling Holland flower auction, 6,000 growers generate 32,000 transactions, with orders being shipped to 2,000 buyers locally and abroad each day -- all before 11:00 am. To correctly pack and ship this blossoming cargo, **TI-RFid** tags identify 100,000 trolleys as part of sophisticated automated logistics and tracking system. As trolleys move along miles of electric track and orders are picked, **TI's** RFID tags are read by antennas in the floor communicating timely data to logistics software. Personnel can pinpoint the exact location of an order, its contents, and how quickly it will arrive at the dock door for shipping.

TI-RFid technology connects all phases of the supply chain, from resourcing and manufacturing to inventory and distribution. Whether your business needs to identify and manage raw materials, manufactured goods, or products in transit, RFID creates real time information links that speed production, improve quality and streamline delivery.

Unilever, the 25th largest company in the world, uses RFID technology from TI as the backbone of a smart pallet system designed to revolutionize how consumer products are moved, handled and tracked in their warehousing facilities. The TI-RFid based system solves the problem of management information connected to the flow of materials. At the heart of the system is a small transponder mounted at the bay doors in the warehouse through which pallets pass. When a pallet reaches the loading bay, another transponder lets the computer know which trailer it has entered. When the trailer is full, the truck scale automatically compares the total weight of its load with the individual pallet weights the computer has in memory, and signals any discrepancy. The RFID system has raised productivity by increasing the number of pallets handled daily and guaranteeing the validity of information about material movement.

Tracking Material Movement In and Out of a Warehouse

Chevrolet Creative Services uses a "red light, green light" system based on TI-RFid to control and track the 3,500 crates coming and going from their Wixom, Michigan storage warehouse. The crates contain materials needed for specific tradeshow. RFID tags are now mounted on each crate carrying a unique ID. The bay doors are equipped with RFID readers and readout antennas are located in the floor. When a crate passes over the antenna on its way to being loaded onto a truck, the tag ID is compared to a manifest held in a host database. If the ID matches the database info-a green light signals "go" to ship the crate. A "no match" activates a red light. The database also records the time and date.

Chevrolet has realized the benefits of eliminating the human error factor inherent in their old manual system with paper manifests, eliminating emergency shipping charges and greater speed and efficiency and better record-keeping.

Generally, when relying on traditional systems--every time items are moved from one point to another, the pallets on which they are loaded have to be stopped to enable labels to be human read or have their barcodes scanned. With RFID tags, the information is read without the need to stop the pallets, saving time. Also, traditional systems require staff to key in information introducing errors. With tags, manpower can be reduced and errors eliminated. Tags also allow companies to quickly trace back to where errors might have occurred, containing the damage, and in the event of a product recall, reducing risk to the consumer.



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Protecting Valuable Products During Distribution

A bonded warehouse in the UK stores expensive single malt whiskies which are subject to theft even by the warehouse employees. Pallets carrying these stocks are also subject to being misplaced in error, thus delaying on time deliveries. To prevent these problems, it was necessary to ensure that forklift trucks moving pallets would pass correctly along pre-set routes. Deviations might mean that employees were taking product off to a hiding location intentionally for later theft, or were just misplacing stock in error. To create this security system, the company built a grid of transponders suspended from the ceiling. The forklift trucks are equipped with RFID readers. Routing details are downloaded to the forklift truck from a central computer via a radio frequency communication link. This includes correct loading location, exact sequence of transponders along the route, and the delivery bay location. If the on-board reader detects deviations, the truck is immobilized and a supervisor is needed to reset the vehicle. Automatic weighing is also used in combination with the system.

Food Manufacturing Automation

United Biscuits produces biscuits, cakes, and prepared foods in their Ashby, U.K. plant. This is a rigorous environment for any automatic ID technology because it is full of moisture, metal and variable temperatures. RFID is working successfully to control raw materials movement, and the weighing, mixing and baking processes. United Biscuits has mounted a TI-RFid tag on each bin, which provides a unique assigned number. The tags are read at the beginning of processes to ensure that no errors occur. Overhead displays signal to operators when everything is functioning correctly, or when a problem comes up. RFID provides the benefits of improved accuracy and efficiency of manufacturing processes, better tracking of products, and complete, error free reporting.

Improving Chip Manufacturer's Yields

Motorola, SGS Thomson and Wacker are among the companies using TI-RFid technology in a patented, turnkey system developed by US Company Fluoroware, Inc. The system, called FluoroTrac, is used by the semiconductor industry to eliminate product misprocessing, improve operator efficiency and increase equipment usage.

- **Eliminates Misprocessing**
With as many as 800 "read points" for each wafer carrier RFID eliminates mistakes in tracking wafers from one step to the next.
- **Improves Operator Efficiency**
By automatically identifying the product at each step, the FluoroTrac system eliminates the need for an operator to scan products or key-in an ID number or an access code.
- **Increases Equipment Use**
The FluoroTrac system enables information on equipment usage to be generated so that management can more easily eliminate bottlenecks and smooth production flows.

RFID--Key to Container Positioning System at Port of Singapore

The Port of Singapore (PSA) tracks many thousands of multi-ton cargo containers daily, and also manages arrivals and departures of up to 50 ships. The smallest error might send a container to the wrong destination in the shipyard, resulting in delayed departures or incomplete shipments.

To avoid these problems, PSA spent close to \$910 million in 1993 on development projects. Included in this upgrade effort, was to install thousands of RFID transponders into the asphalt to create a multi-dimensional grid. A centralized EDI system manages the placement and location of containers as they are offloaded into the port shipyard, based on X, Y, Z coordinates that are derived from the unique ID codes in the tags.



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About Texas Instruments RFid Systems

Texas Instruments Radio Frequency Identification (TI-RFid™) Systems is an industry leader in radio frequency identification (RFID) technology and the world's largest integrated manufacturer of RFID tags, smart labels and reader systems. With more than 400 million tags manufactured, TI-RFid technology is used in a broad range of applications worldwide including access control, automotive, document tracking, livestock, product authentication, retail, sports timing, supply chain, ticketing and wireless payment. For more information, visit the company's Web site at www.ti-rfid.com

Texas Instruments Incorporated provides innovative DSP and analogue technologies to meet our customers' real world signal processing requirements. In addition to Semiconductor, the company's businesses include Sensors & Controls, and Educational & Productivity Solutions. TI is headquartered in Dallas, Texas and has manufacturing, design or sales operations in more than 25 countries. Texas Instruments is traded on the New York Stock Exchange under the symbol TXN. More information is located on the World Wide Web at www.ti.com.

About Electro-Com (Australia) Pty Ltd

Electro-Com is Australian owned and operated company located in Melbourne, Australia. Electro-Com has been supplying radio frequency identification readers and tags to markets such as animal identification, access control and logistics management and is a leading supplier of Electro-mechanical components, control products, electrical switchgear and electronic enclosures. For more information visit the company's website at www.electrocom.com.au.

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