TEXAS INSTRUMENTS

RFID NEWS

INTERNATIONAL NEWSLETTER OF THE TI RFID GROUP ISSUE NO. 20, 2000

Baggage Direct –Uses Tag-it™

The World's First RFID-based Baggage Delivery System

Baggage Direct took off at Heathrow Airport on July 27th. Developed by systems integrator KTP Ltd using Texas Instruments' Tag-it™ 13.56MHz smart label technology, the innovative new Baggage Direct service uses smart labels to track and route passenger's luggage from the airport to their hotel freeing passengers from all the hassle of baggage transportation.

Baggage Direct is a new subsidiary formed by BAA and launched with the backing of major partners: United Airlines, Forte Hotels and Lynx Express delivery services.

Baggage Direct's service offers automatic routing and tracking of the baggage from a special Baggage Direct kiosk at the airport direct to the passenger's hotel. The service guarantees delivery to a major London hotel within 3 hours and passengers can use the Internet to check on the whereabouts of their luggage at every stage and verify its final delivery. It is even planned to equip top London hotels with RFID readers that will automatically trigger a text message to the passenger's mobile phone via the Internet telling them that their baggage has safely arrived at the hotel.

"This unique service puts London way ahead in the innovative use of RFID smart label technology to provide totally hassle-free service for passengers," said British Airport Authority's chief executive, Mike Hodgkinson.

Baggage Direct intends to extend the service to all terminals at Heathrow as well as to other UK airports, and then internationally to give passengers a complete high-tech solution to baggage transportation. Baggage Direct is also planning to offer a nationwide UK delivery service before the end of the year via its partnership with Lynx Express, allowing baggage to be delivered anywhere in the country.

The Ease of Speedpass™ at McDonald's® with TI RFID Tags

Customers in the Chicago area can now use their Speedpass tags at select Chicago area McDonald's locations both inside the restaurant and at the drive-thru.

People who want to use this payment method can order a free Speedpass tag from Mobil. When they go to the McDonald's drive-thru window, they simply order their food at the menu board, drive on to the payment window

Continued on page 8.

and

TI Celebrates 10 Year Anniversary of RFID

Emerging from the lab just ten years ago as a promising technology in search of new data collection applications, the billion dollar RFID industry today is as pervasive and as commonly used as the keys in your pocket.

From its beginnings in tracking livestock, RFID technology has moved into hundreds of industrial, commercial and consumer applications affecting hundreds of millions of people's lives worldwide, and driving an industry that is growing by 25% according to Venture Development Corporation.

As a pioneer of this industry, Texas Instruments just celebrated their 10th anniversary. "In the early days, transponders were sold by the thousands," said Dave Slinger, a vice president at Texas Instruments. "Today there are hundreds of millions of transponders deployed worldwide. People literally carry them on their key chains to automatically pay for gas or to protect their cars from theft. They may have a transponder in their car to speed them through a highway toll, or they may wear an RFID employee badge to help protect them in the workplace."

When it was first introduced in 1990, RFID was a little known technology used to identify and

Continued on page 2.

Celebrating 10 Years of RFID History and Vision

Continued from page 1.

Dave Slinger describes a decade of RFID accomplishments.

track livestock and follow pallets through warehouses. Ten years later, RFID:

- Reduces car theft and insurance premiums for 50 million motorists worldwide;
- Provides faster gas and convenience stores purchases for more than 4 million drivers;
- Tracks hundreds of millions of dollars worth of commerce each day from containerized freight yards and warehouses, right to retailer's doors;
- And is improving manufacturing productivity for companies around the world.

An experimental technology just a decade ago, RFID today is being driven by market leaders like Ford, Mobil, Chrysler, and 3M in areas such as automotive security, retail refueling and materials tracking. Pioneering the application of technology, these and other companies are using RFID to create new markets and move out ahead of the competition.

Automotive Security

Back in the early 1990s, car thieves and joy riders were making off with millions of vehicles around the world. High theft rates also meant insurance rates were skyrocketing. At that time, the Ford Motor Company took a dramatic step to thwart would-be thieves with the introduction of an RFID-based anti-theft immobilizer system. What began on the 1994 Ford Escort in Europe is now on 84% of all 2000 model-year Fords, and will be on more than 90% of the company's vehicles by 2004. Other international automotive companies such as Daimler-Chrysler, Hyundai, Mitsubishi, Toyota and Nissan have also adopted the technology.

Retail Refueling

Retail customers have embraced the technology as a faster, easier way to pay for gas and are now using it to buy convenience store items. When Mobil introduced Speedpass three years ago, the industry was undergoing a major shift. Corporations were replacing mom-and-pop filling stations, and competition for customers was heightened. Gas stations were teaming up with everything from grocery stores to banks in an effort to create an easy, one-stop shopping experience. The business became more about driving traffic and repeat sales through customer loyalty. Today RFID is a strong point-of-sale tool for Mobil that has helped form stronger customer relationships.

Materials Tracking

Companies around the world have been using glass capsule transponders embedded in plastic totes, attached to racks and carts for many years to track raw materials, work in process, and products during distribution. The tags allow data to be collected automatically, without human intervention and without human error. With the growing development of standards, these tracking applications will begin to cross company and country boundaries in true supply chain automation.

As part of the celebration, Texas Instruments hosted an anniversary party at Frontline Solutions 2000 in both Chicago and Frankfurt with many old friends who have been contributing to the growth of the industry for all these years as direct customers, systems integrators, and users of TI RFID.

Over 100 invited guests celebrated during the TI party at Frontline Chicago Expo.

Web Site is Upgraded–

Made Easier and More Comprehensive

The web site www.tiris.com was redesigned to be the one-stop informational site on RFID.

The site remains a source for information on TI's RFID products, complete with downloadable brochures, reference guides and application notes on TI's technology and product offerings. Case studies for the many applications and solutions offered by TI can also be found on the site.

"We're continuing to make our RFID technology easier to use and adopt and the Web is a major part of our strategy," said Tony Sabetti, worldwide marketing manager for TI.

A new section was added that focuses on Team Tag-it™, a worldwide program formed by TI to accelerate the development and adoption of RFID smart label solutions. Member information, news and events are available online. Issues of the Team Tag-it quarterly newsletter are downloadable on the site as well.

Click on www.tiris.com

BRAZIL

A Solution to Security Needs of Brazil's Citizens

Schindler Technology, of Rio de Janeiro, Brazil, has been installing access control systems for people and cars using TI RFID since 1998. Since Rio is one of the biggest cities in the world, security is a major concern, particularly in residential buildings where more than 1000 people enter and exit daily.

"We evaluated many RFID providers, and found TI offered the best relation between cost and benefit, said Sigismond Schindler, company owner.

> "e evaluated many RFID providers, and found TI offered the best relation between cost and benefits."

Schindler Technology engineered several new access products around TI. One of these is the SCH31, an interface board that can manage three Micro-readers or three S2000 Readers; passing the identification to the computer using a single serial cable. The first byte transmited is the reader number (1-3). It also has 7 relays controlled by the computer. With only one byte passed from the PC, it can select the relay and establish the time of action between 0 and 3 seconds, after that, the relay goes to the initial position automatically. It releases the software, making it more efficient.

Many of the people access installations use a gate antenna mounted on a wall or gate while individuals carry a keyring tag. With this combination it is easy enough for students to leave the tag right in their backpacks and simply turn around towards the antenna until the gate unlocks.

In the area of vehicle access control, the problem in Rio is to manage garage space. Residential building managers want to prevent residents from parking more cars than the allowed number. A 85 mm batteryfree, low frequency disk transponder is issued to each authorized vehicle. Unauthorized vehicles are not allowed to enter the garage.

"Since this tag has a read range of up to 1.5 meters, it is perfect for cars," said Mr. Schindler. "Other technologies can reach 4 to 6 meters, but the cost for the system is too high. TI is the only company that can reach up to 1.5 m with low cost RFID products.

Handsfree access to garages is fast and convenient.

Our read range record with this tag is 2.10 m," he added.

To date, Schindler has outfitted more than 10 residential buildings with close to 10,000 issued tags.

For more information, contact Sigismond Schindler, Tel: +55-21-493.7990 or 493.7216; or e-mail to sigis@bol.com.br

HOLLAND

AUTOMATIC ACCESS TO FUN AND GAMES

The Dutch company VConsyst, based in Genemuiden is using Texas Instruments RFID systems for access to swimming pools, sports facilities, and health clubs throughout Holland.

At the public pool "de Steur " (Steur means a type of fish) in Zwolle, regular visitors have been issued a RFID tag for the last 4 years to get access to the pool, the lockers, the sauna, the Turkish bath and the restaurant. They receive a tag in the form of a key fob, a card, or an armband that allows access for specified lengths of time, like a monthly pass or a specified numbers of visits. Turnstiles and readers are located at entrances to areas and on lockers.

Automatic access to de Steur pool facilities in Zwolle, The Netherlands.

For regular visitors this means that they don't have to wait in lines and can walk right in. According to the facilities workers one of the main benefits is that they are free from routine ticketing operations and can devote more time to children, disabled and elderly visitors to help them improve their swimming and sporting skills.

With an automatic system, supervisors can get a quick overview of how many people are in the building at any one time and how they are using the facilities. This business information helps the supervisor to make better decisions about management and marketing.

Visitors who have purchased a tag for "de Steur" can also gain access to other pools and sports accommodations in the area. Almost seventy five facilities in Holland are equipped with RFID and another 275 are expected to come on line in the next two to three years.

For more information, contact Henk Westenbrink, VConsyst, Tel: +31383857057, Fax: +31383858525.

USA

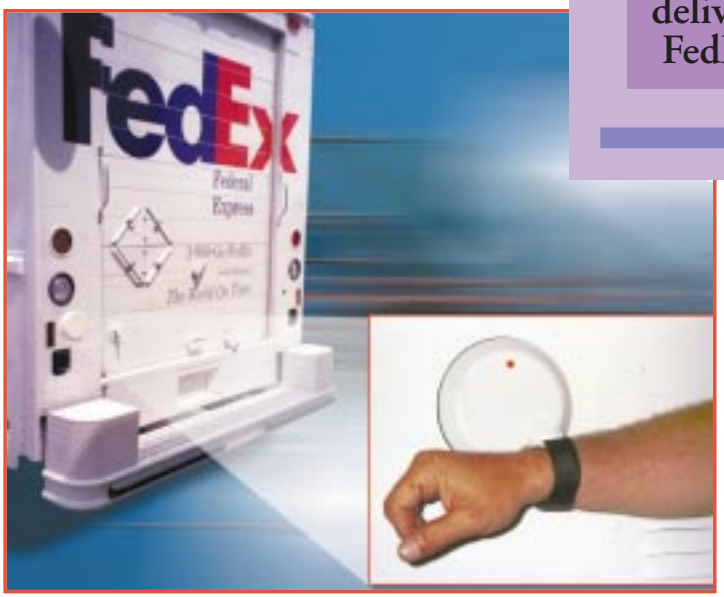
FedEx Speeds Up Delivery with Keyless Entry and Ignition System

FedEx couriers have one less thing to keep track of as they go about the business of delivering millions of packages every day — their keys. The company's couriers are wearing a new keyless entry and ignition system that uses RFID tags from TI embedded within a velcro wristband.

With this new automatic system, FedEx delivery personnel can easily keep track of keys and can secure their vehicles faster along their delivery routes. By the end of 2000, 1,400 FedEx delivery vehicles will be equipped with the new system, and the company plans to roll it out on additional vehicles next year.

"TI's RFID technology makes it easier for our couriers to quickly and securely deliver packages to FedEx customers," said Jim Steffen, chief engineer of vehicle/ground support equipment at FedEx. "The couriers who have used this state-of-the-art equipment say that it shaves critical minutes from delivery times."

> "TI's RFID technology makes it easier for our couriers to quickly and securely deliver packages to FedEx customers."



Couriers wear wristband transponders for efficient access to their trucks.

FedEx couriers drive 2.7 million miles daily in the U.S. alone to ensure the reliable delivery of express parcels from all over the world. With TI's RFID system, they don't have to spend precious time searching for keys or use them to lock and unlock multiple doors to their delivery vehicles. During a driver's route, the RFID wristband need not be removed, making it less likely to be lost. If a wristband transponder is misplaced, its code can be purged from the system and a new code can be reprogrammed in a matter of seconds. With the traditional system, if a driver misplaces his keys, he must wait to have a spare set delivered and the vehicle must be re-keyed at a cost of more than $200 per incident.

The FedEx system consists of one-inch round, disk-shaped RFID transponders, readers mounted at each of the four doors to the delivery vehicle and a reader mounted on the right side of the steering column near the ignition switch. When the courier places his transponder wristband within 7 inches of the readers, the transponder's code is compared to one in the system's memory. If it is a match, the door unlocks for ten seconds. The courier simply pulls on the door handle to enter the vehicle while the three remaining doors stay securely locked to prevent unauthorized entry. To start the vehicle, the driver pushes a button on the right side of the steering column. The courier pushes another button near the start button to turn off the vehicle.

The new FedEx system was custom-designed by Strattec Security Corporation, of Milwaukee, Wis., experts in vehicle locks and RFID immobilizer systems along with Utilimaster Corporation, based in Fort Wayne, Ind., who makes custom-manufactured vehicles for FedEx.

For more information, contact Mike Feucht at Strattec, Tel: (414) 247-3364, Fax: (414) 247-3329.

UK

RFID Helps Xerox Achieve 100% Shipping Accuracy

Xerox, the world's largest photocopier manufacturer, ships about 1/4 million copiers per year from its main European manufacturing facility centre in the UK to destinations all across Europe.

They installed an RFID-based logistics tracking system to ensure 100% shipping accuracy. The company was determined to eliminate any errors from its shipping process because accurate and efficient shipping to all customers is essential for Xerox to maintain a good reputation for service and quality.

Microlise Systems Integration of Nottingham, a leading UK supply chain management solutions provider, worked with software specialist EDS to create the logistics system that uses TI RFID read/write card transponders and read units supplied by distributor, RFID Components.

RFID tagged Xerox copiers pass through gate antennas to ensure they are loaded on the correct truck.

A battery free low frequency tag is attached to the outer packaging of each copier. It is planned to eventually integrate the tags into the copiers themselves to provide more comprehensive lifetime product tracking and identification.

At nine loading bays, RFID readers automatically read the unique code and associated data for each consignment, and match it to the company's vehicle shipping schedule. In the event of a copier being inadvertently loaded onto the wrong truck, an alarm sounds and a display shows the correct vehicle that the copier should be taken to.

"By accurately and reliably identifying and tracking goods throughout distribution, warehousing and shipping, companies such as Xerox can achieve major savings in costs and higher productivity through reduced shipping errors and more efficient handling" said David Hyslop, TI sales manager in the UK.

For more information, contact Graham Lane, RFID Components Ltd., Tel: (0)1234 840102, Fax: (0)1234 840707, e-mail: glane@rfid.co.uk, Website: www.rfid.co.uk

Frost & Sullivan honored TI again with the Market Engineering Leadership Award for the year 2000 which was earlier bestowed on TI in 1998.

The award is given by Frost & Sullivan's Automatic Identification Group and is presented in tandem with the release of their World Radio Frequency Identification (RFID) Markets industry report. Recipients of the award are chosen based on interviews with market participants and Frost & Sullivan's research and consulting work for the RFID industry. Texas Instruments was awarded the number one ranking for the company's identification of market challenges, drivers and restraints, as well as their strategy development and methods of addressing these dynamics.

"RFID technology continues to establish itself in very mainstream markets. Many commercial, consumer and industrial customers are finding RFID an essential technology for enabling their businesses. We are pleased that Frost & Sullivan has recognized our work with this award," said David Slinger, TIRIS vice president.

Each year Frost & Sullivan studies the RFID market by contacting the suppliers, the integrators and the customers to gather data. "The role that Frost & Sullivan plays as an outside observer to our industry is very helpful since there are not many professional research organizations doing this yet," said Susy d'Hont, Market Communications Manager. "We hope that other market research firms will become more active in this way, so that we can all gain better insight into the future," added d'Hont.

> "any commercial, consumer and industrial customers are finding RFID an essential technology for enabling their businesses."

UK

Collecting Tolls On the Move at the Tyne Tunnel, UK

RFID tags help speed up traffic through the busy Tyne Tunnel, a 1.7km road tunnel running under the River Tyne serving the cities of Newcastle, Gateshead and surrounding towns in the north of England.

Since the tunnel was opened in 1967, tolls have traditionally been collected in cash or by tickets. However, with traffic continually growing and presently peaking at around 35,000 vehicles/day, the tunnel operators needed to find new methods. Manual cash collection involves delays. Automatic cash collection is expensive to install and also involves delays while drivers search for the right cash to throw into a collection basket. Tickets are open to abuse by theft or fraud and also involve delays while tickets are inspected. Finally credit card payment involves the driver stopping, opening a window and swiping a card — problematic in British weather. Also credit cards involve a 5% surcharge on every transaction.

All of these problems are overcome by the new AVI system based on TI battery free, low frequency RFID. Tags are attached to the windscreen using a rubber suction cup. Readers at the toll booth ID the tag as the vehicle approaches, check the user's credit account via the host PC, and give a green light in a fraction of a second. A sign under the traffic lights warns the user if credit is low. If credit is zero, the traffic light stays at red and the toll booth operator is instructed to collect cash. If a vehicle goes through without a valid credit, the system alerts the operators and police action can be taken.

> "he system has achieved its main aims of improving traffic flow and reducing congestion with a low installation cost."

Low frequency toll tags eliminate ques at Tyne Tunnel.

Travelers can leave their windows up when using pre-paid RFID tags.

"While cash booths still operate, more and more people are switching to automatic tag operation allowing them to take advantage of dedicated lanes for faster, more convenient payment which also reduces congestion at the cash booths for other users. The system has achieved its main aims of improving traffic flow and reducing congestion with a low installation cost," said Paul Ducker, MD of Paul Ducker Systems, the systems integrator responsible for the system.

Users pre-pay for multiple journeys by having their tag account credited with a fixed amount, and the toll fee is deducted from this credit each time they use the tunnel. Users can top-up their credit over the phone, so there is no need to waste valuable time going to the toll office to renew their credit.

The tag only carries the unique ID of each driver – all customer data, and credit information is held off the card by the computer system. The tag can be immediately de-activated if reported stolen. In addition, all customers receive a monthly statement of toll fees and transaction.

Of the 10,000 TIRIS tags in circulation, some 90% of tags are issued to private users while local businesses find it useful to have multiple tags for company employees administered using a single business account.

For more information, contact Graham Lane, RFID Components Ltd. Tel: (0)1234 840102, Fax: (0)1234 840707.

HANDS-FREE LIFT ACCESS FOR EUROPEAN SKIERS

RFID ski passes mean much faster moving lift lines.

Skiers across Europe are swooshing through access gates and speeding through chair lift lines all without stopping to remove a glove or show a ticket—thanks to the AX400 hands-free access system for ski lifts developed by Austria's TeamAxess.

The system, which has been adopted by European ski resorts including the multinational "Les Portes du Soleil" region in the French and Swiss alps, features Tag-it-based ski passes used for access control and payment.

The new AX400 system is significantly faster and more efficient than traditional ski pass systems and provides convenient, hands-free access for customers. When skiers approach one of the revolving gates near the lift, their valid ski pass is automatically identified allowing them fast entry without stopping to wait in line or fumble with their passes. The credit card sized ski passes don't require line of sight and can be read through clothing, so there's no need to show them or have them stamped.

RFID ski passes can be purchased at the cash desks or via the Internet, cutting down long lines at the cashier. Since the passes are re-useable, they reduce the amount of waste from traditional one-time ski passes with magnetic stripes. The authorization data stored on the card is deleted when the pass is returned.

The AX400 ticketing system consists of three components: the computer inside the cash register which writes the data to the ski pass, the terminal access controller which controls the gate access, and the centralized server responsible for data management. All components are part of a network. Customized software manages the whole system.

For more information, contact Stefan Trautner, TI Sales Manager, Tel: +49 8161 180 4353.

3M Bases Digital Identification System on Tag-it™

Materials Management for Libraries Combines RFID With 3M™ Tattle-Tape™ Security

3M has completed the launch of the 3M Digital Identification System that is revolutionizing how libraries track and secure their materials. According to John Yorkovich, digital technologies marketing manager at 3M Library Systems, "This system further streamlines the flow of materials into, within and out of a library in several ways. Because of the smart label, there is no requirement to locate traditional optical barcode labels and position them correctly, whether at the circulation desk or at the 3M SelfCheck™ System. The system accelerates the check out and check in process, thus making the patron's visit to the library more efficient and the library staff more productive."

"The 3M Digital Identification System is unique in that we haven't simply taken RFID technology and retrofitted it for use in libraries," said Yorkovich. "We have selected TI smart label technology and combined it with our materials flow management components to create a system that offers all the benefits of RFID technology without compromising security," added Yorkovich.

Smart labels on books mean fast and accurate checkout systems.

The new 3M Digital Identification System was recently installed in the Curriculum Materials Library at the University of Nevada Las Vegas and into its state-of-the-art Lied Library that is under construction. The Lied Library will be one of the most technologically advanced libraries in the world.

Library worker quickly scans shelves for lost books.

Read/write smart tags allow library personnel to change the information on a tag when they change the book's status, a capability not offered by bar codes.

The ability to quickly scan shelves helps libraries locate lost or obsolete items and do fast inventory updates. Personnel can also scan items left out on tables to get better information of the materials their clients find most popular.

3M Digital Identification System tags are part of the optimization of an entire checkout, check-in and inventory management process that maximizes security. Other components of the 3M Digital Identification System that maximize materials flow management at libraries are:

- Conversion stations for the transition from optical bar codes to digital identification tags.
- 3M™ SelfCheck™ Systems.
- 3M™ Staff Workstations.
- 3M™ Tattle-Tape™ Security Strips and 3M™ Detection Systems.

3M is the global leader in library security for nearly 30 years, 3M protects literally billions of individual items in thousands of libraries throughout the world.

For more information, contact John Yorkovich, 3M Library Systems Marketing Manager, at 651-736-7168, email: jyorkovich@mmm.com

TEAM TAG-IT™ MEMBERS

More than 40 companies have joined Team Tag-it to provide complete solutions and accelerate the adoption of smart labels.

Product/Service	Company
Labels	Avery Dennison Bielomatik (convertor equipment) Brady Charnwood Label Craft Melzer Mikoh Moore Sihl Securakey (Cards) Schreiner Etiketten Sessions of York *smart*-TEC Torres Ind. E Com. Ltda
Printers	Avery Dennison Brady TEC Zebra Technologies
RFID Readers	AWID Baltech id Systems Feig Moba Securakey

Product/Service	Company
Handheld Terminals	Bancolini id Systems Granite Communications Microlise Engineering Ltd. Opticon Sensors Europe bv. Psion Inc. Symbol Technologies Trion Technology AG
Software	Alpha SW Jex Technologies Thax
Systems/ Integration	3M Library Systems Confidence International AB Data Recognition Inc. Euro Link Metrologic Microlise Engineering Ltd. RFID Components Savi Technology Seal Electronica Ltda Siemens Moby Snyder Electronics

TI Announces Two New Tag-it Products

Two new Tag-it products were announced at Frontline Solutions Europe in November. They are the ISO 15693 Inlays and the Multi-protocol Transceiver IC.

The new Tag-it 13.56MHz inlays are compliant with the ISO/IEC15693 standard which is a global open standard for optimal use under different regulatory and noise environments around the world. The standard also allows for interoperability of tags from multiple manufacturers.

With added memory and functionality, the new ISO compliant chip will be implemented on all Tag-it standard inlay sizes available at 13.56MHz. ISO/IEC 15693 is a global standard for contactless 13.56MHz vicinity cards, and is used in smart labels. The ISO/IEC 15693 protocol is designed to conform to FCC (USA), ETSI (Europe) and MPT (Japan) regulations worldwide, allowing tags to travel around the world under optimal conditions for operation with region specific readers. The ISO/IEC 15693 standard is supported by several semiconductor manufacturers, reader manufacturers and system integrators, and can coexist with other 13.56MHz standards, such as ISO/IEC 14443 for proximity cards. ISO 15693 compliant readers developed to support the ISO inlays will be backward compatible to communicate with current Tag-it inlays.

The Multi-protocol Transceiver IC enables a broad range of 13.56MHz RFID interrogator designs. This low power consumption device supports portable and fixed reader designs that have tight footprint constraints. The IC minimizes onboard power requirements and reduces parts count in the final product. The device enables rapid design of Tag-it, ISO 15693, and ISO 14443-2 (Mode A) proximity and vicinity RFID interrogators. With the addition of a microprocessor, crystal, and a few passive components a full functioning reader can be easily developed. Tag-it ASIC-enabled reader modules can be seamlessly integrated into traditional barcode portable terminals and printers for advanced solutions in product authentication, ticketing, library management and supply chain management.

Stefan Trautner leads Tag-it technical seminar for converters and systems integrators in Freising, Germany. Some of the participating companies included: Sihl, Feig, Eurolink, Melzer, and Meto.

RFID Fuels Faster Convenience Store Purchases

Speedpass™ Goes In-store

Customers using Mobil's Speedpass to fill up their cars, can fuel their bodies just as easily using RFID technology from TI. ExxonMobil recently announced they are extending the RFID-based Speedpass payment system inside participating convenience stores at Mobil-branded service stations nationwide. Consumers using Speedpass at more than 3,500 Mobil convenience stores can enjoy the speed and convenience of purchasing products using their tags without having to open wallets or purses for credit cards or cash. ExxonMobil is also planning to bring Speedpass to Exxon-branded service stations and convenience stores in early 2001 at more than 1,800 locations.

Easy-to-use indoor Speedpass reader units are located on the checkout counter next to cash registers. Customers simply wave their keyring tags over the indicated space on the counter-top reader, where the system recognizes the customer, approves the transaction and automatically issues a receipt. Without the added time spent waiting for credit card transactions to clear or searching for cash, customers make purchases faster and more conveniently.

"This is the first expansion of Speedpass technology for purchases beyond the fuel pumps," said Jim Carter, U.S. regional director for ExxonMobil's Fuels Marketing Company. "Its introduction provides a glimpse of how consumers will shop in the future, and we're proud that we are the first to make this innovative payment technology available to our customers."

The national rollout follows a 69-store trial in St. Louis where customers reported that they valued the increased convenience and simplicity of using RFID for purchases inside stores. ExxonMobil is currently making the Speedpass program available to all approved participating Mobil service stations regardless of the brand name their convenience store operates under.

Introduced at Mobil fuel pumps in 1997, today TI's RFID technology is speeding retail gasoline and product purchases for more than 4 million Speedpass customers. "With the extension of RFID technology from the gas pump to in-store purchases, we're building a strong foundation for the extension of our RFID technology into other retail environments," said Jim Bucklar TI marketing manager.

Speedpass™ goes to McDonald's®

Continued from page 1.

and point the keyring tag at the Speedpass reader. The Golden Arches® light up to indicate that the tag is read. The system automatically bills purchases to the credit/check card of the customer's choice.

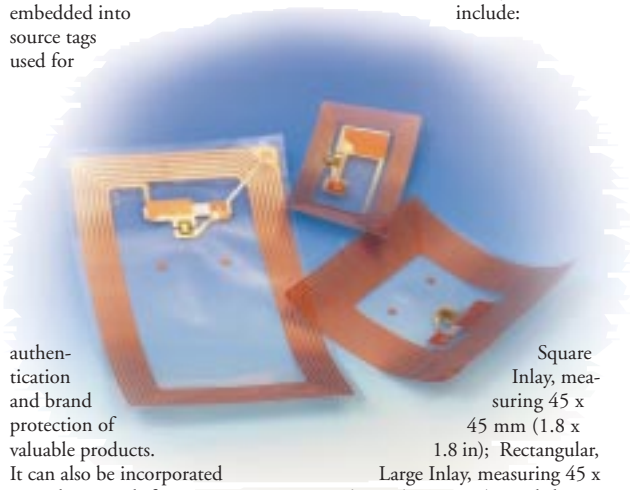
Inside the McDonald's restaurant, the customer places an order and then points the tag at the reader next to the cash register. There are no extra fees when using this method of payment.

This is the first implementation of our RFID technology for customer recognition outside the oil industry," said Jim Bucklar, TI marketing manager, "watch for it to take off with other retailers as well," he added.

Customers point their keyring tag at the Speedpass reader to pay at the drive-thru.

SMART LABEL INLAY FAMILY GROWS

With the addition of the miniature inlay to the Tag-it™ family, we now have a "momma, papa, and baby bear". The small size, rectangular-shaped, mini-inlay can be easily incorporated into smart labels or embedded into source tags used for authentication and brand protection of valuable products. It can also be incorporated into plastic cards for access control, applied to containers and totes for logistics automation, or used to track and manage important insurance, legal, or medical files.



Like the other inlays, the mini model is paper-thin, re-programmable, flexible and capable of being read simultaneously by fixed-position readers or handheld scanners.

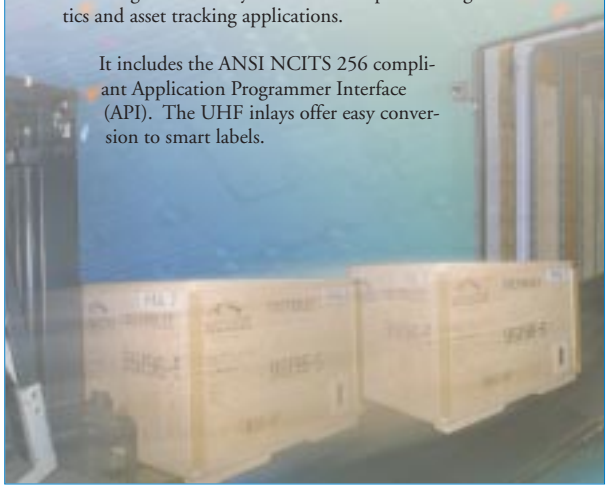
The 3 inlay models include: Square Inlay, measuring 45 x 45 mm (1.8 x 1.8 in); Rectangular, Large Inlay, measuring 45 x 76 mm (1.8 x 3 in); and the Miniature Inlay measuring 22.5 x 38 mm (0.9 x 1.5 in).

All models can be read with the same reader systems.

Targeted to Long Range Supply Chain Applications

The UHF RFID platform leverages existing and emerging allowances in the global UHF bands to deliver breakthrough performance in passive read range. This new UHF band supports a longer reading passive RFID tag and reader system that will open new logistics and asset tracking applications.

It includes the ANSI NCITS 256 compliant Application Programmer Interface (API). The UHF inlays offer easy conversion to smart labels.



Low Frequency RFID Evaluation Kit Now Available Online

The easy-to-assemble-and-use LF Evaluation Kit (134.5 kHz) gives you the opportunity to explore the capabilities of TI's RFID technology.

It includes the robust Series 2000 Reader System, a readout antenna, and a variety of different transponders, plus demonstration software that runs on your desktop computer to allow you to experiment with all the features of the system. The reader requires a 7-14V DC with minimum 1A current power supply. An optional power supply is available for purchase.

LF Evaluation Kit includes what you need to get started.

Part number – RI-K2A-001A

Price: $595.00

Purchase at www.tiris.com by clicking on the eStore.

13.56 MHz Keyring Tag

The 13.56 Keyring tag is targeted at automated payment systems and point-of-sale purchasing in retail environments such as consumer gasoline, quick service restaurants (QSR), or any industry where service is paramount.

The tag can be easily carried on a customer's key ring and provides a more superior level of security than do credit cards with magnetic strip. Eight blocks of 256-bit non-volatile user memory allow for customizing initial data or updating the tag with new data. Each block can be locked to protect data from modification.

Texas Instruments RFID Tracks Containers Throughout Europe

Tracking hundreds of shipping containers across acres and acres of property is a daunting task that can quickly turn order into chaos. But by embedding Texas Instruments RFID transponders into the pavement to create a virtual ID grid, Europe Combined Terminals (ECT) in Rotterdam can track both the transport vehicles as well as the containers they move and stack daily.

In addition to the Port at Rotterdam, ECT also operates a rail terminal in Venlo and inland shipping terminals along the Rhine in Germany. The largest container ships in the world moor alongside these terminals, where containers are unloaded and shipped to small boats, barges, trains, and lorries to continue on to final destinations throughout Europe.

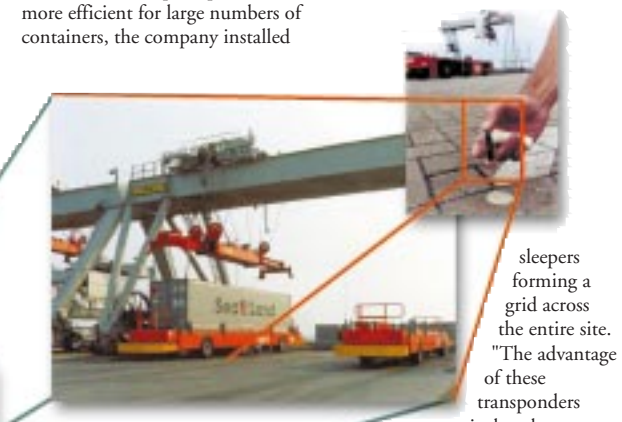
When ships come into port, containers need to be picked up from the quay, transferred to a storage depot, and later moved to a dispatch area. Traditionally, ECT has done this manually without a method of tracking container location – resulting in lost goods, confusion and inconsistent performance. The process also required hundreds of hours of manpower to operate transport vehicles.

A *computerized container transfer system*, based on TI's RFID technology, was adopted by ECT to lower labor costs and provide consistent performance. Under the new system, workers only operate transport vehicles during the first stage of the process. All subsequent transportation and stacking of containers is done using RFID technology.

Rotterdam ship terminal.

Container transport no longer relies on worker availability and unpredictable weather conditions. The ECT automated RFID process works regardless of time of day, rain or shine.

When ECT set out to find a way to make their traditional method of container transport quicker and more efficient for large numbers of containers, the company installed transponders just under the surface of the site to act as navigational and positioning aids for the vehicles and cranes. Conditions underground made the technology vulnerable to damage. In 1993, ECT turned to TI to solve this problem and TI produced a special transponder, housed in glass that protected the device from external threats. The transponders are now used in stacking cranes and railway sleepers forming a grid across the entire site.



Container tracking system based on transponders embedded in asphalt.

"The advantage of these transponders is that they are programmable," said Dick Roos, project engineer for ECT's Delta Container Division. "The system can track container location to the nearest centimeter – providing accuracy not possible without radio frequency."

The RFID-based computerized container transfer system has proved so successful at ECT that a new terminal currently under construction is being equipped with the technology.

For more information, contact Jeroen Bolscher, TI Sales, Tel: +31 546 879409.

TI Launches RFID eStore on www.tiris.com

TI is making it easier for engineers and systems integrators to develop exciting new applications for RFID technology by offering them a convenient way to purchase its RFID products online.

We're pleased to be taking the lead in inspiring new uses for RFID by making the technology available online

Customers can access TI's RFID eStore at www.tiris.com where they'll find RFID products for sale plus downloadable product documents and application notes. TI is initially offering 10 of its field-proven, low frequency, RFID products for sale online to U.S. customers, plus reader modules and antennas, as well as a complete LF Evaluation Kit for $595.

Purchases can be made on the secure site using a credit card. TI is also offering its online customers technical support via email as well as phone support.

"We're pleased to be taking the lead in inspiring new uses for RFID by making the technology available online," said Bill Allen, eMarketing manager, Texas Instruments. "We've seen RFID used for hundreds of different applications from logistics and security to retail and distribution during our 10 years in the industry. We're certain there are engineers and marketers with many more ideas for this inventive technology, who need a way to get started."

TI plans to offer additional RFID products for sale online, expand its eCommerce capabilities to international markets and extend the site's functionality in the near future.

eStore Home Page.

RFID
www.tiris.com
eStore

GERMANY

European Auto Manufacturers Rely on RFID

Texas Instruments RFID technology is revolutionizing the way automotive manufacturers do business. From providing secure access to process and systems software to tracking automobile parts through the manufacturing cycle, transponders are finding new uses within automotive production operations throughout Europe.

Adam Opel AG

Adam Opel AG, one of the world's leading automotive manufacturers, needed a secure but easy way to authorize the many engineers accessing the computerized process controls managing more than 650 welding and adhesive programs. TI RFID not only allows access to authorized personnel, but helps keep a record of changes to manage both quality and productivity.

The RFID-based system controls access to Opel's welding equipment, logs production data, and makes program changes understandable at any point in time before assembly begins. It also protects critical process and system data from unauthorized access during manufacturing. Opel's system consists of a transponder which grants or denies access to individuals based on predetermined parameters. A production history is also logged, so if problems occur they can easily be traced back to who made changes to the system.

Opel has also saved time and materials by incorporating RFID into their manufacturing process and is planning on extending the system to all of its European locations. The company will also integrate additional production facilities using RFID, including adhesive bonding systems and robots, and ultrasonic testing.

MAN Nutzfahrzeuge AG

Another European auto manufacturer, MAN Nutzfahrzeuge AG in Munich, Germany, is using RFID to optimize the production process and materials flow in its manufacturing operations. MAN manufactures tens of thousands of truck and bus cabs every year, and Texas Instruments RFID transponders are speeding productivity, improving the use of warehouse space and helping to increase profits.

Used in MAN's paint shop for driver's cabins, the RFID-based system uses transponders to identify and track the parts throughout the painting process. TI's passive, low-cost transponders were encapsulated in Teflon cylinders to withstand high temperatures and paint mists, then mounted on transport skids as well as trolley clamps, which move the driver's cabins through the production facility. When the driver's cabin is transferred from production to the painting line, the RFID transponder is read and information about the cabin is linked to the chassis number in the FIS (driver's cabin information server) database. The car body is also tracked at the beginning and end of all painting stations. The time it takes to paint the car and for it to dry is determined and the information is used for improving planning and production tasks.

Tags on vehicle parts withstand high temp ovens to automate manufacturing and measure paint processes.

Before RFID was incorporated into the system, it was virtually impossible and extremely expensive to determine how long driver's cabins stayed in the painting and drying process. The time varied depending on the paint color. As a result, some car bodies had to be stored for 2-3 days before they could be supplied to other assembly lines. Because the storage area was stretched over the warehouse, finding car bodies with specific paint characteristics was a very laborious task. With the help of RFID technology, MAN can properly plan space requirements for intermediate storage in their warehouse and their costs are dramatically reduced.

USA

ExxonMobil Corporation Uses RFID for Faster Maintenance Turnaround in Oil Refineries

Oil refineries typically shut down in the fall to perform tedious scheduled maintenance and safety checks that brings production to a standstill and costs 1 million dollars a day. With the current shortage of fuel, any new methods that can decrease downtime can be easily justified.

The ExxonMobil Torrance California Refinery uses RFID tags as a key to an asset tracking initiative for Equipment Health Monitoring (EHM) and daily mechanical integrity inspections. In this application ExxonMobil deployed SAT Corporation's IntelaTrac Automated Field Data Collection and Asset Tracking System. Texas Instruments RFID tags were installed on process plant equipment to verify yard number and process location for improved data integrity and to help with OSHA required Process Safety Management inspections. Equipment types included pumps, motors, valves, and other safety equipment, which must be tracked throughout the process plant equipment life cycle. Additionally, the low frequency multi-page RFID tags are being used to confirm operators properly perform procedures and provide verification that operators are at the correct piece of equipment while collecting data.

With the RFID tags installed, operators make scheduled plant inspections to collect process and mechanical data about equipment using Telxon handheld computers. Once inspections are completed the data is uploaded and synchronized with the plant's Process Historian Database, and Computerized Maintenance Management System over a wireless network utilizing SAT's IntelaTrac Automated Field Data Collection System and synchronization software.

The tags attached to the assets use SAT's Universal Tag Formatting Protocol and Active X Controls to manage data storage and data compression on the RFID tags.

Refinery workers collect data with 40% greater accuracy via RFID tags than by manual methods.

To date, ExxonMobil's Torrance Refinery has collected over 2 million manual data points since the original installation in June of 1999. Prior to implementing the system, the company was averaging about 27,000 data points per month with a DOS based hand-held data collection system. Thus, with the implementation of the new solution, using approximatly 30 hand-held computers and thousands of RFID tags, ExxonMobil is able to collect 10 times more field data with the same resources. Further by deploying the RFID tags for verification of equipment it has been estimated that data is being collected with 40% more accuracy than on previous manual data collection methods.

For more information, contact, Don Frieden, SAT Corporation, Tel: 281-480-2424, Email: dfrieden@sat-corp.com

RFID Tags Revolutionize Rubber Manufacturing

The UK manufacturer of rubber compounds, Trelleborg Industrial AVS faced a major logistics challenge. The company needed a reliable identification, tracking and control system to ensure that any combination of up to 100 pre-mix additives are correctly weighed and ready for use at precisely the right time and at the right place in the process. Any missing components or re-scheduling of production can result in costly delays, wasted batches or, worst of all a batch actually curing during production. Most of all, the company needed a system that could operate reliably in the extremely difficult and rugged environment of an industrial rubber manufacturing plant.

Previously, the company relied on a traditional manual production scheduling system, but this lacked the accuracy and flexibility required to efficiently automate production.

To streamline its manufacturing process,Trelleborg (formerly Metalastik) looked at various solutions including bar-coding and electronic tagging. Bar-coding each bin was rejected as it had limitations with line-of-sight reading, and durability/reliability in an industrial carbon black environment. The final solution was a tagging system based on TI RFID.

The RFID system was designed by John P Waterhouse Co. Ltd, the systems integrator who teamed up with TI, through their distributor RFID Components, to trial tags for non-contact bin identification. The tag selected was a read/write disk tag.

Rubber compound manufacture is an intensive mixing process. A new batch cannot be started until all constituent raw materials, including off-line prepared constituents such as small chemical additives, are correctly proportioned and available. At Trelleborg, there are about one hundred different chemicals that can be added to the process and these are stored in four vertical carousels. The chemicals are selected and manually pre-weighed according to an off-line production schedule and delivered by container to the mixer operator when required. Trelleborg's production runs are usually variable and often short, and this, combined with the large number of additives, results in a difficult-to-manage process. Production schedules can be adversely affected by raw material shortages or changing priorities resulting in frequent revisions to the schedule.

The pre-mix ingredients are stockpile on the factory floor. If the main production schedule needs changing, all the small chemicals ingredients must be rescheduled. This is where the logistics becomes a real challenge and it is easy to see the potential for human error and inefficiency.

While implementing the RFID solution, a fundamental change to the existing production methodology was also made — whereby the off-line small chemical preparation became the main scheduler for the entire process. The key was to identify each small chemical's container during preparation and during its transfer to the mixing line.

Each of 100 small chemical containers is fitted with an RFID disk tag that is unobtrusive, yet robust and can be interrogated/programmed by a fixed reader/programmer unit, even when surrounded by other steel components. One reader/ programmer unit is located at the small chemicals weighing station and another at a point near the end of the container transfer conveyor.

The process begins at the small chemicals weighing station. The operator is prompted, via a display screen, to place an empty additives container onto a platform scale. The tag is interrogated to ensure that the container is not considered by the system to be still in use. If the tag is valid, all erroneous data is erased allowing it to be reused.

The operator is prompted, material-by-material through the complete small chemicals weighing process, until all the ingredients are assembled. In the event that a small chemicals batch cannot be completed, for example, because of a shortage of raw materials, the relevant batch can be suspended and parked as a semi-finished component. At this point the container's tag is programmed with the appropriate part-complete data. At a later date, this batch can be physically retrieved and its container simply placed on the platform scale. The container's tag is now automatically interrogated and the operator prompted to complete the unfinished batch from where the process was suspended.

When a batch has been completed, the tag is programmed with appropriate data for that batch and this uniquely identifies the container and all its constituent chemicals.

The completed container is then manually placed onto a transfer roller conveyor, which transports it to the mixing station at the end of the conveyor. At the same time, a second reader unit interrogates the container's tag. This data is interpreted by the mixer control system, and displayed to the mixer operator who is given the opportunity to accept or reject the particular batch.

If accepted, the container is released and the control system prepares all automatic weighing and mixing sequences according to a specific recipe linked to the data on the tag. Because there is space for three containers at the end of the conveyor, up to three batches can be active at any one time (one weighing, one in transfer and one mixing). This means that not only are all the additives ready for the next batch but batches can be interchanged quite simply by physically removing or even inserting new, giving the improved control and greater flexibility required by Trelleborg Industrial AVS.

The use of RFID has virtually eliminated the possibility of batches with wrong or incomplete additives reaching the final mixing stage, and the system's robustness allows it to cope with even the most arduous environmental conditions.

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For more information on the location of sales offices and our products, see our website at www.tiris.com <http://www.tiris.com>

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