

RFID NEWS

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MARKET & BUSINESS NEWS

The Real RFID Market - The RFID market is about to see a radical transformation of its structure. The much hyped market for pallet and case tagging largely created by mandates from Western retailers has been a disappointment, with the majority of consumer-goods companies dragging their feet in the face of large costs and the prospect small benefits for most of them. It also seems that the technical and economic issues are proving more intractable than some would like us to believe. But, identity/payment cards, animal tags and passports are now 80% of the RFID market by value and these application areas are booming. The commanding positions in these sectors are held by companies such as Assa Abloy (#1 in RFID; focused on secure access and ID cards), Gemalto (the leader in passports, the third-largest sector), ERG (mainly concerned with transportation and cash-replacement cards), and Savi Technology (military and heavy logistics). All of the companies mentioned have \$100 to 300-million in RFID sales. Allflex, the top in animal tag maker, is rapidly approaching the \$100-million mark. Three years ago the Chinese were scarcely in the RFID business at all; yet this year China is likely to represent the largest market in the world for both RFID tags and their accompanying systems, as deliveries of their national identification card peak.

But, what's in the future? In 10-yeras, the sectors mentioned above will still be among the largest by value of tags sold, with their market value likely to have risen fivefold, but other sectors will be starting to rival them by then in terms of current sales. IDTechEx predicts that pallet and case tagging will start to generate greater revenue at an appropriate time, and there should be one or two profitable suppliers after the changes that are currently taking place in the industry. However, RFID tags for consumer goods will be a \$2.1 billion business, rivaling cards for the top slot by 2017 and well ahead of the value of the pallet market. Military RFID tags will hit \$1 billion, with the associated systems reaching a much larger figure.



Nevertheless, the widespread tagging of consumer goods at item level will only be achieved by tag prices at 0.1 to 2 cents: this means printing the tag directly onto articles, like 85% of barcodes today. Companies such as Sony, Toshiba, Hitachi, Konica Minolta, Pioneer, Asahi Kasei, Samsung, Organic ID, Somark and Vytex are developing ways of achieving this with the leading suppliers of electronics inks such as Nissan Chemical, Sumitomo, Merck and Dai Nippon in close support. *All of these companies see printed RFID as a small part of an enormous opportunity in printed electronics in general.* It is therefore likely that certain players in RFID will fade from sight if they do not participate

in these bigger sectors. Other companies, some of them very large and strategic, will take over much of the action. Which ones? It is still too early to tell.

Alien's New RFID Solutions Center - Alien Technology opens new testing and training



facility, among the most physically impressive in the industry. The center offers companies an attractive new alternative for testing and education, as Alien continues to move beyond being simply a manufacturer of tags and readers. Alien Technology, a provider of RFID tags, readers and related services, opened its new RFID Solutions Center near Dayton, OH, on Monday. The new center features 23,000 square feet of testing and educational space, and will offer companies a broad array of capabilities, technologies and expertise in support of real-world RFID applications. As the number of RFID labs and testing facilities continues to grow, Alien may have upped the ante with the scope of its new center. The facility is organized into different application areas, such as shipping, material handling, and retail in-store applications, which are designed to closely emulate real-world conditions. Each area is supported with a wide range of hardware and software components, including product from Alien's competitors, as well as a long list of providers of tag printers, print and apply machines, material handling equipment (e.g., high speed conveyors, storage racks, stretch wrappers, etc.), RFID middleware and other application software, and other technologies. The initial staff of 12 could double within just a few months, with an ultimate target of 75-100 employees. The company will begin holding most sessions of its popular "RFID Academy" education at the new facility, and provide many services to help companies move "from pilot to fully scaled rollout. The Solution Center features a variety of material handling and storage equipment, including this stretch wrapper with RFID reader for product testing.

AeroScout[®] AeroScout Inc. (San Mateo, CA) is a specialist developer of Wi-Fi-based active RFID solutions and has secured \$21 million in a Series C round led by Menlo Ventures. AeroScout employs 90 developing Wi-Fi-based active RFID solutions. Both Menlo Ventures and Greylock Partners have joined the AeroScout investor syndicate in this round, and existing investors Star Ventures, Pitango, Cisco Systems and Intel Capital also participated. AeroScout will use the funds to expand its sales and marketing for healthcare, manufacturing and logistics applications, as well as its presence in growing international markets. The money is also targeted to support product development. The company's positioning technologies use the wireless infrastructure to locate any standard 802.11b/g enabled laptop, PDA, barcode scanner or RFID reader, as well as battery-powered tags attached to people or any other assets and equipment. The Active RFID and RTLS sectors have shown growth due to their benefits for customers, and AeroScout is well positioned to take advantage of this important market.

How Low Can RFID Prices Go? - The continuing debate about Wal-Mart and its RFID program has once again focused us on tag costs. There's still complaining that high RFID Tag and application costs were large barriers to ROI and adoption. Most observers believe current Electronic Product Code tags are being priced at a level not much if at all

above cost, in an effort to spur the market and establish economies of scale. When tag and reader maker Alien Technology released its filings pursuant to a potential initial public stock offering in 2006 (later cancelled), the company had negative gross margins, meaning it cost more to make the tags than it sold them for. One key question, then, is whether current EPC chipmakers, such as Texas Instruments,



which the primary dynamic is price, and the product itself is rapidly heading towards commodity status. Craig Harmon, president of Q.E.D. Systems and a long time expert in automatic identification technology and standards, doesn't think so. "No one wants to focus on a market where downward pressure on price is the primary driver in the market," Harmon said, "To succeed in such a commodity marketplace, you must still be able to command a price that is a reasonable margin above cost. Constant pressure to reduce price provides no business case in the marketplace [for the tag manufacturer]". This is important for users of RFID too, as the cost to manufacturer will be in the end the real driver of tag pricing, and the lack of participation by some leading tag manufacturers in the basic EPC market may slow technical and price improvements. "This is not a market desired by Texas Instruments or NXP [a spin off of Philips Electronics]. They do not want to sell commodities," Harmon added. "The companies making "any" money selling RFID are those who are NOT selling five cent tags," Harmon also observed." The active, real-time location system, and battery-assisted passive vendors are making some money. Would Lockheed Martin have purchased Savi or Zebra have purchased WhereNet if they were buying a loss leader? Intellex is also moving smartly in the battery-assisted passive/larger memory size market." What do you think is the future of EPC tag pricing? Will larger technology companies want to participate in a tag market that is basically commodity situation, with low margins and differentiation? Let us know your thoughts.

MANUFACTURING

TI Retains Lead as Top RFID Chip Maker - Ten inlay manufacturers have chosen



RFID chips from Texas Instruments to power a range of new tags designed for retail supply chain, asset tracking and authentication applications. They are using TI's EPC Generation 2 (Gen 2) Ultra-High Frequency (UHF) silicon in strap and wafer forms, and its High-Frequency (HF) ISO/IEC 15693 silicon. Checkpoint Systems, Inc. CKP, a manufacturer and marketer RFID-based products, is offering two new EPC Gen 2 labels, using TI silicon and RF antennas. The labels, available in 2 x 4 inch and 4 x 4 inch sizes, also incorporate the new Checkpoint RFID straps. UPM Raflatac, a RFID tags and inlays maker, has developed a new HF inlay to tag consumer products at the item-level using TI's 256-bit ISO/IEC 15693 chip. Other TI chip users include Hana RFID, Mu-Gahat, RCD

Technology, and WaveZero who are using TI Gen 2 silicon and straps to support their inlay manufacturing processes for retail, supply chain, logistics and government applications. RFID inlay companies SAG, Tagstar Systems, and Tatwah Smartech are manufacturing HF inlays for asset tracking applications using TI's new HF-I silicon. Tyco Electronics Corporation is developing RFID tags using TI's HF and UHF silicon. All of the companies will use TI's silicon chips for direct die attach while RCD Technology will use TI's silicon and strap for both direct die and strap attach methods. TI is the world's largest integrated manufacturer of RFID transponders and reader systems.

APPLICATIONS

RFID Payment Chips - Shipments of smart cards and cell phones containing Sony's Felica RFID chip hit 200 million. Over the last five years, the chip has become a de facto standard in Japan and cards containing it are used by millions of people everyday for railroad travel and e-money purchases. In 2004, the chip started getting integrated in cell phones and today, through Felica, owners of those cell phones can make credit card purchases in stores. The next jump is coming soon when Tokyo's subway and private railway and bus operators launch a common travel card based on the Felica platform. The Pasmo system will be interoperable with East Japan Railway Co.'s (JR East's) Suica card, allowing the 35 million people who live in the Tokyo Metropolitan area the ability to travel on more than 100 railway lines and hundreds of bus routes with a single card. Felica is an RFID technology and doesn't need a battery to operate. The "touch-and-go" payments it supports work over a distance of a few centimeters and takes milliseconds for each to complete. In addition to Japan, the technology provides the base for the Octopus subway card in Hong Kong, which has also morphed into an e-money payment system, and the ez-Link transport card in Singapore. Felica is also used in Shenzhen's TransCard, India's TravelCard and Bangkok's Metro Card but has yet to break significantly into European or North American markets.



Tape Trackers - Imation Corp. announced a first-of-its-kind tracking technology that could put an end to the ongoing problem of lost data tapes by using passive RFID tags and Global Positioning System (GPS) tracking systems to remotely locate cartridges, no matter where they are. Imation said it would begin shipping its RFID tape-tracking technology in April 2007. The technology embeds RFID chips in standard tape-cartridge labels, allowing them to be scanned either individually with a handheld device or by placing cases with up to 20 tapes inside on a scanning pad. While the GPS tracking system will not be part of the initial product launch next month, over the next two months, Imation plans to announce when GPS technology will be available in order to locate cartridges no matter where they are. Imation's DataGuard RF Tape Tracking System will be sold as kits that contain one or both scanning devices, stationary and handheld, tracking management software, and a newly designed tape cartridge carrying case that fits most tape cartridge formats. When tapes are scanned through either the Imation DataGuard Scan Station or Imation's DataGuard



Mobile Scanner with docking station, the cartridge ID information is automatically recorded into a workstation. The individual cartridge or case of cartridges is then tracked using B&L Associates Inc.'s VaultLedger or Vertices software. The reader system workstation automatically encrypts and posts the label information to the selected software, which interfaces with a user's own tape management system. The scanning devices are also programmable to locate misfiled or out-of-sequence cartridges via the tape management software. Management software provides list and audit reporting capabilities, which can decrease the amount of time data center personnel spend on managing tape libraries. The VaultLedger or Vertices software can be set up for alerts, so that if a particular tape or group of tape are required for legal discovery, regulatory compliance or other purposes are needed, administrators can be alerted when they are scanned. The DataGuard RF systems will be generally available in April and sold as kits that combine software and hardware, Imation said. Starter kits retail for just under \$40,000 and include a handheld scanner and docking station, management software, 5,000 integrated RFID tags and 10 tape cartridge carrying cases.

Smart Cards - Infineon will provide contactless chips (RFID) MasterCard Global, which are being introduced in 13 countries worldwide, including Taiwan, Malaysia, Australia and the US. Designed to make payment transactions with more convenient magnetic-stripe cards or conventional chip-based cards, the future debit and credit cards will contain a chip featuring a contactless interface and state-of-the-art cryptographic capabilities. At least 400 million chip-based payment cards were issued worldwide in 2006, with MasterCard and Visa programs alone accounting for about 17- million contactless chip cards. According to Frost and Sullivan, the conventional contactless payment smart card market is expected to see a compound annual growth rate of 63% over the next five years.



Spanish Post Office - Sybase iAnywhere announced that Correos, the Spanish Postal Service, has deployed its RFID Anywhere software platform in one of the largest RFID projects in Europe. Using RFID Anywhere, Correos has introduced an RFID control system, called Q-RFID, in 16 Automated Processing Centers throughout Spain and in 4 other bulk Admission Centers, enabling the company to ensure quality control and the traceability of postal deliveries. The state-controlled company required its RFID solution to be integrated into the Correos computer systems, and purchased 13,000 passive electronic labels, installed more than 2,300 permanent antennas, and over 331 readers at 16 centers. The system gives Correos the ability to monitor the status and transit time of a letter at each stage of the delivery process, allowing the company to oversee the entire process and adopt corrective measures when a fault is detected in the system. Correos is one of the earliest to use RFID technology to comply with the standards set by the European Union (ETSI EN 302 208-1 and EPC GEN 2).

Bottle Cap Tags - NEC Corp. and container company Toyo Seikan Kaisha, Ltd. said they have managed to fit a chip and a micro antenna inside the plastic cap. RFID cap is embedded with a passive 2.45 GHz RFID tag with a communication range extends to 10

cm. The design of the 24-mm diameter, butterfly-shaped tag, prevents interference with the RFID signal from any moisture released by the drink. The RFID tag used in the bottle cap was developed by NEC Electronics. The companies plan to start mass-producing the bottle cap at Toyo Seikan Group's Japan Crown Cork Co., Ltd. in 2008. Tokyo Seikan and NEC are jointly exploring the possible RFID tag embedding with metal cans, plastic containers, glass bottles and paper packages, according to the journal. The RFID could also be used to track individual items, consumption patterns and consumer preferences in addition to uses for logistics.



RFID POLETICS/GOVERNEMNT

No EU RFID Roadblock - The EU Commission decided that business should regulate the growing use of RFID. The commissioner believes there should be as little regulation as possible, and there are no plans for laws to limit RFID tags. Some civil-liberties groups charge that personal information could be obtained from private RFID tags in people's pockets, carry-bags or mobile phones as they pass through supermarket checkouts or ticket barriers. The tags are already used to identify dogs in cities. The view is that it's better to under-regulate rather than over-regulate so that this sector can take off. The Commission will work to achieve global RFID data-exchange standards "with Europe in the driving seat". Industry experts estimate one billion were in use last year and up to 500 times as many may be in use by 2016. [Contrast this to California that would have crippled RFID if not for a governor's veto].

EU and RFID - The European Commission has unveiled plans for a radio frequency identification (RFID) strategy for Europe. The move is aimed at boosting the use of RFID technology by business and public services, while addressing concerns about the privacy of personal data. Speaking at the Cebit IT trade show in Hanover, Germany, The Director stated, "The commission's Europe-wide public consultation in 2006 identified a strong lack of awareness and considerable concern among citizens. The commission's RFID strategy will therefore seek to raise awareness, stress the absolute need for citizens to decide how their personal data is used and ensure that Europe removes existing obstacles to RFID's enormous potential." The commission's plans include setting up a RFID stakeholder group to advise it on developing European policy on RFID applications. It also intends to propose amendments to the European E-Privacy Directive to take account of RFID applications, as part of an overhaul of the EU's telecoms regulations. By the end of the year, the commission is also expected to make recommendations to EU members' states on how to tackle the data security and privacy issues arising from RFID technology. The commission will also review RFID research and innovation, radio spectrum availability, standardization, environmental and health issues. Last year more than 1-billion RFID tags were sold worldwide, with sales expected to increase 500-fold over the next 10 years. The European RFID market is estimated to grow from last year's €500m (£333m) to



€7bn (£4.7bn) by 2016. Europe is also a key international centre for RFID research and development.

RFID Drivers Wanted - The state of Washington and the federal Department of Homeland Security plan to jointly develop a driver's license, likely embedded with radio frequency identification (RFID) technology, for use in lieu of a passport for travel to some countries. The state and DHS last week announced plans for a pilot program to develop a license for residents in the state that complies with the recently passed Western Hemisphere Travel Initiative (WHTI) legislation. The federal law, enacted



by Congress in 2004 and currently being phased in, requires that all travelers to and from Canada, Mexico, Central and South America, the Caribbean and Bermuda countries carry a passport or other DHS-approved document to verify their identity. The state and DHS have yet to decide on the technology to be used in the license, but he noted that it would likely include RFID chips. The jointly developed card will cost more than a regular driver's license, which runs at about \$25, but less than a passport, said the spokesman. The new licenses are aimed primarily at residents without passports who travel to Canada for tourism purposes once or twice a year, he said. The complexity of obtaining passports might prevent such travel, he noted. The license will probably comply with the federal REAL ID Act of 2005, whose technology requirements are still in development. The Act calls for the federal government to set guidelines to ensure the accuracy of for state identification documents. The enhanced Washington driver licenses and ID cards are expected to be available by January 2008.

RFI-Delivery - City Link, an express parcel delivery firm, is using RFID technology on 15,000 roll cages to track as many as 300,000 high-value assets during transit. The active RFID tags transmit information over City Link's Wi-Fi network to provide real-time location details direct to its national distribution centre. Real-time visibility has improved both the efficiency and speed of delivery services. This is the first company in the express delivery market to roll out Wi-Fi- based active RFID tag tracking across our business. The implementation has already proven successful in optimizing our overnight trucking schedule and is helping us to continue to improve our industry-leading delivery performance. City Link is looking to extend the technology later this year to provide real-time tracking tailored to individual customers and items. The Wi-Fi-based RFID tags were designed and installed by AeroScout and JDH Consultancy and have an extended battery life. The system, including location software, was installed at its 70 UK locations.



Best Buy International RFID - The company says that it's the single most important thing that's ever happened in the supply chain. The biggest potential of RFID is improving the customer experience. Best Buy is already proving it can keep products in stock better, which keeps more salespeople out on the floor helping customers. In the future, RFID will increase the speed and accuracy of the payment process, and is convinced item level tagging will happen more broadly. The company is RFID-tagging movies and video game DVDs in a pilot program in some stores. Employees can check

on the in-store computer system how many of a specific DVD title should be on the floor and how many are in the backroom based on information picked up by RFID readers. Previously, employees had to scan each DVD case with a handheld barcode reader to get the information they needed to keep products at proper stock level. The system also tells them where specific titles are located in the backroom. Best Buy has seen a revenue increase of 18.7%, and number of units sold is up 14.1%. Best Buy clearly has some advantages with RFID over Wal-Mart, which is also using the technology for reducing out-of-stocks, but is facing some problems getting a critical mass of suppliers on board to tag their cases and pallets with RFID. In distribution centers where Best Buy has RFID, about 80% of pallets coming from suppliers are tagged, Willett said. But Best Buy primarily works with big companies selling big-ticket items, while Wal-Mart deals with many small companies selling products at sometimes very low costs.



Sony is using a combination of RFID and closed circuit video surveillance to improve efficiency and reduce shrinkage at one of its distribution centers. The system, which began as a pilot last year, is for item-level tracking of consumer electronics throughout its Tilburg warehouse in the Netherlands, and expects to see a return on investment (ROI) in less than a year. Amsterdam-based Mieloo & Alexander is the systems integrator on the project, which includes EPCglobal Class 1 Gen2 tags from Raflatac, Symbol Technologies XR480 RFID interrogators from Motorola, IP video surveillance software from Griffid, the Tag Acquisition Processor (TAP) from Reva Systems, and RM6+ RFID printers from Zebra Technologies. Sony tags products for shipment and records the tag IDs at each stage of the shipping process. An automated video system monitors the packages, burns RFID data onto the video image, and indexes the MPEG4 video stream according to the RFID information. The tag-read data and video images are used to verify shipment and provide electronic proof-of-delivery. The tags are attached to the cardboard packaging for each item, and read as workers pick orders for Sony Europe's retail customers. The items are separated by customer and stacked on an RFID-tagged pallet, and then carried by a forklift through an RFID reader portal. The tags are read again during the shrink-wrap process, and as they move through the dock door onto the trucks. Right now, Sony is tagging consumer electronics items like televisions and digital cameras destined for customers in Germany. The combination of item-level tracking and the video images can reduce theft and loss, and help Sony reconcile shipment information with its customers. If an item is lost or damaged in-transit, Sony has a visual record (indexed by serial number) of the condition of the goods when they left the warehouse. Sony has been testing RFID in Europe since 2004 together with Mieloo & Alexander, and may expand the current system to other facilities in the future.

