



Supply Chain Technology

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Key RFID Developments

Larger Players Rolling Out Gen 2. This past month DHL and Walgreens made public disclosures regarding meaningful Gen 2 deployments. While it has been well known that these two players have been working with RFID, this is the first time either organization has indicated meaningful progress and publicly supported RFID. We view this as a positive indicator given the many other companies that have been piloting Gen 2 may perhaps be close to seeing increased rollout activity.

Apparel and IT Asset Management Remain Promising. At RFID World, we clearly heard good enthusiasm given the strong activity levels in apparel and IT asset management. We are seeing more vendor resources dedicated to these areas. American Apparel is looking to completely deploy RFID by the end of 2009, and we are hearing of several strong pilots in Europe and Latin America that could see rollouts in 2009. We are also seeing more formal standards development process and increased pilot activity in IT asset management. We expect to see increased activity ahead of full standardization.

Software Weak, But Increased Development Apparent. Perhaps the largest issue we hear arising from vendors, system integrators and end users is the weak software capability associated with Gen 2 and many BAP applications. Many view the applications as lacking a robust capability and are concerned with the ability to achieve any meaningful scale. However, Software vendors and system integrators are increasing levels of resources with respect to application advancement.

Sam's Club Mandate. Sam's Club mandate of adding pallet tagging at six new distribution centers and case level tagging at its De Soto, Texas will begin October 30, and the overall intent by suppliers whether or not to comply seems to be mixed. A good portion of suppliers expect to comply, while some are willing to pay the Sam's non-compliance charge of \$2.00 per pallet. Many of these players view the technology still as cost prohibitive, but are working to understand some benefit. A few suppliers are truly dragging their feet to see the level of commitment by Sam's.

HF Development Continues. We are seeing more product development around the ISO 14443 Type A&B standard as well as ISO 15693, and more evidence by carriers that NFC is a desired technology by end users, particularly for ease of payment and coupons. We expect to see increases in pilot activity in this area. We are also encouraged to hear that the Gen 2 version of HF continues to progress with ISO; most industry players indicate publication could happen by September of 2009.

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RFID Hardware News and Comment

We are seeing three key trends within the product area, including more development around the ISO 14443 Type A&B standard for readers and tags, an increased offering of firmware upgrades for Gen 2, and a new round of product development/segmentation for Gen 2 hardware. This edition discusses a few of these new offerings, and we expect to see higher functionality and lower-cost readers in the next nine months, particularly given the release of new tag silicon from Impinj and Alien. In addition, the upcoming release of new reader silicon by Impinj will likely provide a step function decrease in price and increase in performance for mobile readers and reader modules. While many believe the equipment works well, we continue to hear objections from key markets that suggest that the price to performance is not quite there. We expect that gap will be closed within the next year, and will be in parallel with new software development activity.

Tags and Readers

Motorola announced a new European mobile RFID reader product and enhancements to two existing products. The company introduced a new reader platform on the company's MC9090-G mobile computer offering that meets European ETSI 302-208 standards. The product has integrated reading and writing capability using a linear antenna to offer longer read ranges for Motorola's targeted markets, retail, manufacturing, and transportation and logistics. The product also offers a traditional bar code scanner. Motorola is focused on work in process, retail item level inventory management, asset management and baggage/cargo tracking applications. The MC9090-G RFID handheld reader will be available by mid-September and list priced at \$4,995.

The company also received certification for its RD5000 mobile reader product in Malaysia, Thailand, Hong Kong and Singapore. Additional certifications for China and Taiwan are expected by year end. The RD5000 is a full-function reader/antenna combination that uses Wi-Fi connectivity and can be run on battery power for applications where cabling is not desired. The RD5000 lists for \$4,995.

Motorola also announced a firmware upgrade for its XR440, XR450 and XR480 fixed reader products that provide three key enhancements. First, it will enable compliance with the LLRP (low level reader protocol) standard, which will allow for improved network connectivity and management. Second, it provides ETSI 302-208 standard compliance in Europe. Third, it offers increased read/write memory support to 512 bits for Gen 2. The firmware will be offered through a free Internet download by October.

Zebra demonstrated the RP4T mobile RFID printer/encoder at RFID World, and expects to introduce the product during 4Q08. The product offers thermal transfer or direct thermal printing options and can encode embedded Gen 2 tags.

ThingMagic announced a firmware upgrade to enhance performance of its Mercury 5 and M5e readers by lowering channel hop time and raising the link data rate. The upgrade also provides support for the CCC (China Compulsory Certification) standard in China.

Confidex introduced the Steelwave Micro, a Gen 2 based tag for the tracking of IT assets. The tag was designed for on-metal applications, measures 1.5" x 0.5" and has a reported read range of 2.5-3.0 meters. Confidex also introduced the Confidex Casey, a general-purpose Gen 2 RFID label that features a water-resistant synthetic face paper label.

Rfidium announced the availability of its "Choctaw" Gen 2 tag for box and pallet tagging applications. The tag has a dual dipole configuration, with the antenna constructed from aluminum, and thus meets RoHS requirements. On corrugate, the tag has a read range up to 6 meters. The inlay uses Impinj Monaco/64 product and operates from 860MHz to 960MHz. The company also announced its "Leprechaun" tag for box and pallet applications. The tag uses an aluminum tag and is RoHS compliant.

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Metalcraft introduced its "RFID Windshield" tag, a 4"x1" 512 bit Gen 2 ruggedized tag for vehicle-based access control and asset tracking applications. The standard product is based on the KSW Windshield RFID inlay, which does not require a foam separator. Metalcraft also offers the product featuring inlays from Alien and Avery Dennison. Metalcraft indicates read range is over 18 feet. The Windshield tag offers customized printing and up to four colors. Pricing is between \$52.11 and \$254.16 per 100 inlays depending on quantity and number of colors (the \$52.10 pricing is for orders exceeding 100,000 units).

Favite, a Taiwanese company that traditionally specializes in Automatic Optical Inspection (AOI) and Measurement Machines, has developed a Gen 2 based RFID reader module, the FS-GM201. The product is based on the R1000 chipset. Favite also announced its plan to introduce a Gen 2 based tag, the FAVTAG – UHF1. The product offers 128 kilobits of EEPROM. Samples are expected early next year.

Texas Instruments introduced its RF-HCT-WRC5-KP221 HF chip for multiple contactless applications. The chip is ISO 14443B compliant and offers up to five applications from multiple parties. Applications might include payment, loyalty card, membership, secure ID and access control. The chips also offer Triple DES and SHA-1 encryption capability. TI will focus on the retail, and corporate and education campus environments, particularly in Latin America and Asia. TI also announced the TRF796x reader integrated circuit, which is ISO/IEC 14443 compliant that will enable customers to develop a contactless tag and reader solution.

3M introduced its Mobile ID reader for travel applications, which includes 3M based software combined with Psion Teklogix's WORKABOUT PRO mobile computer product to capture passengers' identity documents and applicable biometric data. The mobile computer enables edge processing of this data against manifests or watch lists. 3M indicated that the product has been used by the Swiss Border Guard for specific passport applications. The product comes standard

with scanning technology and offers an optional HF RFID reader component, which is ISO 14443 Type A & B compliant.

Intelligent announced its smartBlade product for library applications, an HF fixed reader product that is capable of locating books on a shelf to within 30 cm. The shelf can also determine inventory at any given time and thus can provide information on what products have been added or removed. The product is expected to be available in December 2008. Intelligent also announced it would provide the source tagging for all BBC books and Audiobooks to libraries requiring such pre-tagging.

KSW Microtec introduced VarioSens, an HF tag with integrated temperature sensor. The tag is ISO 15693 compliant and offers password protection for both configuration and reading processes. The tag contains both a unique ID number and additional data space.

Sokymat Automotive introduced its Tough Operation Performance (TOP) disc transponder for ruggedized industrial applications, including those where chemical or extreme temperature swings exist. The circular form factor tag operates at 125kHz, and has dimensions of 34mm in diameter and 6mm in thickness. The tag is being targeted at the logistics and warehouse markets.

HID Global announced the introduction of three new reader products in its SmartID platform, which offer ISO 14443A MIFARE/DESFire compatibility. The base product is the SmartID ISO 14443 reader or reader/writer. The SmartTRANS ISO 14443 (13.56 MHz) and 125KHz (HID Prox) reader, with also supports FIPS 201 applications, and the SmartTouch ISO 14443 Biometric reader, which offers a field fingerprint authentication.

We are increasingly seeing security solutions advanced in the RFID market given sensitive information that can be carried on a tag, and importance of many goods. Important applications that require enhanced security include government documents, legal and medical

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documents, anti-counterfeiting/brand protection, pharmaceuticals and other high-value items. Start-up Verayo recently introduced a new chipset, the Vera X512H, that thwarts cloning by leveraging each chips' unique "electronic fingerprint," which is very difficult to replicate. The technology was developed at MIT and is referred to as Physical Unclonable Functions (PUF). Verayo has a license to produce such PUF based chips. Verayo is a fables chip company and is using 0.18 micron technology; according to Verayo, the Vera X512H is commercially available. The Vera X512H is compliant with ISO 14443 Type A and includes a 64 bit unique tag ID and 512 bit WORM memory.

Ekahau introduced four new tags for its associated Wi-Fi based active RFID system which enables two-way communication. The T301D leverages this capability by offering a text display where messages can be received and sent, and thus creates a combination RTLS platform and pager network. The T301i offers a Wi-Fi based call button feature for industrial replenishment applications. The T301T integrates a temperature sensor into the RTLS to support cold chain solutions. The T301T operates between -200°C and +200°C. The T301Ex is designed for use on oil and gas environments for asset tracking and personnel safety applications. Tags are available today in limited quantities with full-volume production slated for 4Q08.

RFID Software News and Comment

Perhaps the largest issue we hear arising from vendors, system integrators and end users is the weak software capability associated with Gen 2 and many BAP applications. Many view the applications as lacking a robust capability and are concerned with the ability to achieve any meaningful scale. As we discuss in more detail in the briefs section, we believe the outlook for middleware perhaps at its most stable, while we are also seeing increased resource deployment towards building applications. Please note below some of the recent introductions by software providers for the Gen 2 market. In addition, we believe many of the edge appliances will provide the necessary capability for scale. Software associated with active applications is considered to be very good given the relatively longer time that software has been in development.

Xterprise announced its Clarity-ARS (Advanced Retail Solution) product for the retail apparel market. Xterprise is leveraging item-level tagging operations conducted in the last three years to create applications that aid in automated receipt and out-of-stock management as well as sorting, security and cycle counting applications. Xterprise has developed these applications built on Microsoft's BizTalk platform and has enabled integration to POS, ERP and back office systems.

RedPrairie announced it has incorporated RFID capabilities into its Yard management system, which is a module of its core Warehouse Management System product. The Yard system allows RFID tracking of truck trailers at entry and exit gates as well as with fixed or mobile readers within the yard. The system can be used to locate trailers, inventory the yard or to monitor yard movement and report confirmed moves as well as rule based exceptions allowing for more active management of yard operations.

SkyeTek, traditionally more of an embedded products company, has introduced MetaFi, a sales chain software application product. We expect SkeyTek is in the process of altering its business model to become more of a software-focused company. The MetaFi product

will be targeted towards direct store delivery, vendor managed inventory, medical device and service inventory applications. SkyeTek indicated the MetaFi solution leverages RFID and wireless capabilities.

PowerID has signed agreements with five system integrators to bolster the implementation of its Gen 2 based BAP tag offering, including Intelliwave Technologies, Rush Tracking Systems, Synergy, Venture Research and Xterprise. Power ID does not offer readers or software and therefore, uses partners to deliver its tag offerings. Power ID's BAP products offer an extended read range due to the addition of an organic battery with 2-3 year life. Power ID offers their tags for between \$0.75 and \$3.00 depending on volume into applications where traditional passive technology cannot provide sufficient read range for higher value assets.

Swire Oilfield Services and Aker Solutions announced they have completed an initial exchange of asset information using Electronic Product Code Information Service (EPCIS) on top of the respective company's mobile logistics solution, which in both cases is Phalanx. Swire and Aker participate in the oil and gas segment as trading partners and hope to gain increased asset visibility to be able to allocate equipment not yet returned, thus improving asset utilization.

NCR sold Transition Works, a middleware asset management package, to Bridgelogix. NCR had written down the Transition Works asset value in 4Q07.

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Industry Commentary

As we close in on the final quarter of 2008, we are seeing several encouraging signs of progress in the Gen 2, NFC, and active areas. In Gen 2, DHL and Walgreen's, big names in logistics and retail/Pharma, recently announced notable expansion activity. We are also seeing more formal standards development process and increased pilot activity in IT asset management; in addition, apparel continues to move forward with several 2009 rollouts possible. While the progress with Gen 2 is positive, we continue to monitor a host of objections from some end users, which center around increased performance and a decreased price and an elevation in software capability.

In general HF and NFC, we are seeing more product development around the ISO 14443 Type A&B standard as well as ISO 15693, and more evidence by carriers that NFC is a desired technology by end users, particularly for ease of payment and coupons. We expect to see increases in pilot activity in this area. We are also encouraged to hear that the Gen 2 version of HF continues to progress with ISO; most industry players are indicating publication could happen by September of 2009.

We are seeing good activity in oil and gas for active and BAP solutions. We also see increased opportunity for active RFID, in the chemical and brewery industries, particularly in Asia and Europe. These industries have key assets that need tracking over vast areas, and in the case of oil and gas and chemical, personnel safety is a key consideration and increasing application. Many of these activities have returnable assets and we are seeing increased evidence that improved asset utilization and field inventory intelligence will help drive interest by manufacturers, distributors and customers/retailers.

RFID World Summary

The RFID World trade show was held September 8-10 in Las Vegas and while the attendance was noticeably light, we saw good activity

between business and solution partners. Many vendors also indicated that they had positive visits from resellers and end users. These conversations demonstrated good understanding of the technology and largely centered on solving business problems, which continues a trend we have seen in the past several months. We had the opportunity to meet with a number of hardware and software vendors, system integrators and end users. The following is a summary of our key take-aways from the conference.

With respect to activity levels, there continues to be good enthusiasm in apparel and IT asset management, given activity levels. We are clearly seeing increased levels of resource deployment into these segments in terms of business development and application advancement. We discuss these verticals in more detail below. In recent RFID Monthly editions, we have discussed a growing interest in automated vehicle registration tracking, which appears to be progressing. While at the show, we heard that Mexico may be close to rolling out a larger scale, 5M-10M unit project that will feature high-end Gen 2 tags. Our understanding is that a decision could be made as early as October.

Several vendors also indicated that despite the California e-pedigree push back, the top 15-20 pharma manufacturers continue to pilot both HF and UHF products. Most understand that serialization will help supply chain track and trace, but given large profit margins they tend not to have pain and, therefore, lack a sense of urgency. The one use case that the Pharma manufacturers see providing good value is shipping accuracy, and we expect to see further testing. One other use case we see as valuable, but surprisingly receives little attention, is hospital medicine dispensing, which has received increased attention in the past several months, particularly with the high-profile case where actor Dennis Quaid's twin babies were given the wrong dosage of heparin. Most of the current procedures rely on multiple checks by nurses and doctors, which are subject to human error, particularly given the fast pace and the high strain associated with the job. In our view, RFID represents a strong technological solution to

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augment the current procedures by adding an automated check to the human element. Properly implemented, RFID seems to be a fairly effective way to ensure that the right drug in the right dose is being dispensed. We also heard at the show that other medical applications are seeing good traction, particularly specimen and implantable tracking. We are seeing new product developments for these applications and expect sensor technology will be a new product addition.

Our conversations at the show also confirmed several challenges to increased adoption. Most notably, we continue to see a general consensus that application software is weak, and that scalability given current software might be challenging. While we agree that the status of RFID related software is poor, we are encouraged with two factors that should create more development by larger application providers and independent software vendors (ISV's). First, we believe application providers/ISV's increasingly believe that stable middleware platforms now exist, particularly given Microsoft's entrance, and the acquisition of Oat by a larger, more well-known player in Checkpoint. Both products are deemed to be scalable. We believe Microsoft will make a larger push in the CPG, apparel and manufacturing markets over the coming year. Second, given the apparent increases in opportunities in apparel, IT asset management, food traceability, returnable logistics and healthcare, we are seeing resource deployment among ISV's/application providers/system integrators towards developing increasingly robust application packages on top of key middleware packages.

We also heard several renewed concerns regarding intellectual property given that relevant IP is spread among many industry players, yet the communication has been minimal. Our concern is that industry momentum could be slowed significantly if such IP holders elected to seek damages from IP infringement.

Sam's Club

Sam's Club mandate of adding pallet tagging at six new distribution centers and case level tagging at its De Soto, Texas will begin October 30, and the overall intent by suppliers whether or not to comply seems to be mixed. Based on our conversations with end users and system integrators, we believe there are three general classes of supplier. The first is the group that is deferring projects on the assumption that Sam's Club will "blink like Wal-Mart did" and, therefore, they don't plan on doing incremental tagging. The second group is the suppliers who believe Sam's is serious, but don't have big volume, therefore, it is easier to continue to absorb the \$2.00 per pallet charge. The third is a supplier that also believes Sam's is serious, and has too much volume to absorb the \$2.00 per pallet charge and, therefore, will provide source tagging. The vast majority of suppliers still view the application as costing well in excess of any derived benefit. However, we see a good number of suppliers from groups two and three as putting forth their best efforts to derive an internal benefit from the compliance tagging through an incremental use case, such as inventory management.

Assuming Sam's enforces its mandate, which they have recently reiterated, we see three key issues surfacing from a supplier view. First, there will be an immediate test by suppliers to understand the data in order to ensure Sam's is collecting the data, that the data is integrated with back-end systems, and that the data can be shared with supplier partners. We believe the lack of capability by Wal-Mart to fully capture and share data to supplier non-compliance from its previous mandates. Second, by January 2009, both case-level and item-level tagging will be required for seven distribution centers, substantially increasing the volume. We expect several suppliers that were absorbing charges will likely begin applying tags. If this does not happen, we are concerned that Sam's will not have enough capability to provide the source tagging service without employing a third party, and we have not heard of any effort in this regard. An alternative by Sam's will be to raise the non-compliance tagging charge. Third,

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suppliers may now be in a position to have to tag all cases or to create a second set of stock-keeping units for Sam's Club products. Those suppliers with relatively low volumes and easy-to-tag products (i.e., limited RFID interference) can manually place tags on Sam's cases and pallets at distribution. This process will necessitate in most cases creating new stock-keeping units (i.e., regular products and RFID tagged regular products – management and execution systems will need to account for these goods separately). However, those suppliers with high Sam's volumes or that have difficult to tag goods (i.e., high water or metal content) may find it more practical to begin tagging all products immediately following case assembly in order to take advantage of the automated processes that reduce labor and provide more accurate label placement. Keep in mind, with difficult to tag goods, small movements in label placement can impact readability by over 50%.

Apparel

Last month we discussed good activity in apparel, which we believe continues based on recent conversations with industry participants. We are seeing vendors dedicate more resources towards these opportunities, and we are clearly seeing an interest by software vendors, including independents, to devote more resources towards building up apparel solutions. Most use cases continue to be focused on out of stocks, inventory management, security and cycle counts.

We are hearing of several pilots taking place with more than 100,000 units annually; most are occurring in Europe and Latin America. We believe many pilots have received a good ROI and companies are now looking to confirm results by expanding pilot activity to a new department or a new store. We expect many of these pilots will reach conclusion by year end and we could see some rollout activity in 2009. The most noteworthy rollout has been American Apparel, which has seen good inventory accuracy (>99%) and labor savings (>60 hours/week/store), and expects to expand to roughly 250 stores by the end of 2009. American Apparel is vertically integrated model that sells

a limited amount of items seems to fit RFID well in that its operations are complex and that managing out of stocks is important.

Another announced rollout is with Swiss retailer, Manor, which has deployed RFID to improve warehouse inventory tracking, outbound shipping accuracy and store receiving accuracy and processes. The current effort includes Manor's Hochdorf and Mohlin distribution centers as well as the eight stores serviced by those locations. Manor has contracted with its consolidator in Asia to source tag case shipments of apparel and sport items with Gen 2 disposable tags in an effort to improve shipping/receipt accuracy and reduce labor. Tagged outbound goods are scanned and an ASN is sent to the appropriate distribution center. As goods are received, a scan checks the delivery against the ASN. Volumes at this time amount to roughly 500,000 units per year. At the DC, goods are placed into an RFID tagged tote that is slated for store delivery. Items placed in the tote are associated with the tote RFID tag, and at shipment another ASN is created. Again, at store arrival, the shipment is checked against the ASN. Importantly, Manor is seeking to improve asset utilization with respect to its 150,000 totes, which were often not returned on a timely basis. Each DC is equipped with between 5-10 Sirit reader portals, while each store has 1-3 portals. Each portal is supported with a Reva TAP for edge processing. In addition to reader management, each Reva TAP supports ASN comparison, general workflow handling processes and transaction processing to the Oracle ERP system. Rodata provided the middleware, application layer, and integration with workflows and Manor's Oracle ERP system. We expect Manor will expand their rollout activity in 2009, up to its full 72 stores and 5 million tagged items per year.

IT Asset Management

The process to create standards for key IT asset management use cases centers around tracking and inventory management has been launched by the Financial Services Technology Consortium (FSTC). The FSTC has heard from member companies on how RFID might help

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them, and commissioned a benchmark study that confirmed the usability of RFID. The study was conducted by ODIN Technologies and identified performance parameters and set minimum tag performance specifications. According to the FSTC, Motorola is also contributing test information. We expect parameters from these studies will be a component of the finished standard. The FSTC continues to expect the standard will be completed by year end in draft form for submission to ISO. We believe the work conducted by the FSTC and the development of this standard can be leveraged by a wide number of data centers in industries outside of financial services.

Wells Fargo has been a leader in moving forward with this effort and has already deployed a laptop check out application. We believe Wells, along with Bank of America and the Federal Deposit Insurance Corporation, are conducting significant amounts of due diligence, and we expect these, and other, players will move forward with increased pilot activity in parallel with standard development. With respect to concerns with the existing financial turmoil, most of the current issues have been with investment banks and insurers that were heavily exposed to mortgage backed securities, and where short-term financing, a critical component of these operations, became increasingly less available. By contrast, the commercial banks are relatively more stable, and while some have meaningful mortgage and construction exposure, most are in a good position as evidenced by their abilities to acquire ailing financial institutions or financial assets. Wells Fargo and Bank of America are considered two of the most stable banks in the U.S.

Baggage Tracking

Despite the challenges the airlines face and the decline in baggage as a result of incremental baggage charges by the airlines, we continue to see a reasonable opportunity to use RFID to enhance bag tagging operations.

We had a chance to tour McCarran Airport's RFID baggage system, which only incorporates a small portion of the baggage supply chain. At McCarran, RFID is essentially used to sort and ensure that all bags went through the bomb detection scanning process while on an automated conveyer system. Using bar code was not a viable solution given the poor scanning rates. In most airports, the bomb detection scanning process occurs on the check-in floor, which is manually intensive. Given McCarran's volume, this approach could not be accomplished as the required number of units and TSA personnel would have consumed the entire check-in floor space. RFID allowed McCarran to move this process off of the check-in floor and into the back office operations. The TSA funded a good portion of the front end cost; however, McCarran believes the ROI would be positive in terms of space savings and check-in efficiency even if the funding had come from McCarran. McCarran is still using Gen 1, but expects to upgrade to Gen 2 once its supply of Gen 1 tags runs out in the next year. The upgrade to Gen 2 will allow closer spacing, and thus will be able to increase the productivity on its fixed equipment investment of conveyor sortation equipment.

We see two areas of possible leverage. First, the carriers don't really take advantage of the sourcing tagging by McCarran, and we expect this will change, albeit slowly. Reader infrastructure is relatively inexpensive, and we expect the carriers can begin to learn and derive efficiency at least on a small scale. According to the *Wall Street Journal*, the rate of mishandled bags by the eight major carriers is 28% higher than it was ten years ago. As a result, carriers are currently investing in mobile computing and bar coding to help improve efficiency and on-the-fly communication. We think RFID could help reinvent the transfer, delay and exception processes used today and make the system move far smoother. Second, we see the hotels as possibly sharing the tag cost with McCarran and source tagging at the hotel as an added customer service. This would allow hotels to easily store and locate luggage from crowded luggage rooms, or to have luggage automatically forwarded to the airport. Such a program would also maintain a more rigorous chain of custody.

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There are roughly 60 airports world wide with total passengers exceeding 10M. We estimate each of these airports would need between 250-350 readers if fully equipped, and have roughly two billion passengers each year. Assuming 50% of passengers check baggage, the unit tag opportunity would be one billion annually.

Standards, Industry Policy, and Government

The RFID Security Alliance (RFIDSA) announced its formation as an industry group that will help promote industry education and discussion of key privacy and security issues with respect to RFID. We view this as a positive development. Recall, our view is that privacy is important, but that laws and regulations should punish bad actions or behavior, not regulate the technology. In addition, we believe there exists a market opportunity for companies to develop application-specific secure RFID solutions. The new alliance intends to devote resources towards education, legislative involvement, industry communication regarding security and the development of key terms and metrics, which we view as a precursor to more involved security standards. Founding members of the alliance include AWID, GraniteKey, MIKOH Corporation, NeoCatena Networks, QLM Consulting, SecureRF Corporation, Sensitel, Sybase, Veratag and Verayo. The RFIDSA has already begun industry discussions on key RFID risks, including tag cloning, tag data manipulation, tag viruses, POS hacker attacks and physical tag tampering as well as security surrounding RFID infrastructure.

The State of New York now offers general availability of an Enhanced Drivers License (EDL), which is vicinity RFID enabled to meet the Western Hemisphere Travel Initiative requirements for travel between the U.S., Canada, Mexico, Bermuda and the Caribbean.

Passive/BAP RFID Applications

Walgreens has effectively deployed an RFID system at its new distribution system in Anderson, South Carolina. As items are picked

for individual store shipment, bar codes are scanned and the item is placed in a tote, which is tagged with an RFID label. The resulting relationship between the bar code scanned items and the RFID enabled totes allows Walgreen's system to automatically scan every shipment loaded on to a truck for transportation to the individual store to ensure that the right shipment is loaded on to the correct truck. Mis-shipments are very costly considering potential out of stocks and expense of corrective action, and have occurred with some degree of regularity given the size and complexity of Walgreen distribution centers; the Anderson location has over 170,000 totes, 45 shipping doors and serves over 700 stores. At capacity, the distribution center will ship roughly 80,000 cases daily. Legacy systems required manual bar coding, physical checks, significant amounts of paper and manual data entry at shipment. With the RFID system, no manual interface and no paper is necessary as shipping manifests are loaded into Blue Vector edge appliances at the dock door, which enables fast verification against RFID reads. The system verifies the correct tote, item quantities, dock door/truck and proper loading schedule. All transactions are fed into the Walgreen's WMS. In addition to improved shipping accuracy, the RFID enabled totes allow workers to more rapidly identify the locations of mis-placed totes.

DHL announced that all shipments into the 89 Metro Cash & Carry stores in France will be equipped with Gen 2 tags amounting to roughly 1.3 million pallets per year. DHL will tag all shipments in five of its food logistics centers and read each pallet during the loading process to create a shipping confirmation and provide ASN data to each store. Upon arrival, the pallets are again read and the arrival data is checked against the ASN. DHL has indicated increased efficiency and precision in the loading process. DHL will begin the project this upcoming fall.

Santa Fe Optical, a small three-store eyeglass provider in Austin, Texas has deployed RFID to reduce theft of designer frames, which was becoming an increasing problem. RFID was used instead of traditional EAS as customers needed an unobtrusive way to try on the frames, which improves the likelihood of purchase. To gain leverage on

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the system, the store now plans to add a second RFID enabled use case, more physical inventory counts, with the hope of reducing labor and improving inventory mix. Santa Fe Optical is using Avery Dennison tags.

The 2008 BELGIAN F1 GRAND PRIX will enable each entry ticket with HF RFID to thwart forged tickets and improve access control. Security personnel will have RFID enabled mobile computers that provide ticket information including serial ID, seat location, access authorization and parking location. TOSHIBA TEC's B-SX4 printers created the 300,000 tickets for the event and RFIDEA provided the system design and integration services.

Contactless

ViVOtech announced they are part of an NFC coupon delivery and payment pilot in Singapore. The pilot is being conducted in conjunction with NETS, an electronic payment provider, SingTel a telecommunications and data provider, and United Overseas Bank, a Singaporean commercial bank. The product offering allows consumers to download coupons from smart posters or billboards (i.e., that offer information in an NFC format), and then redeem these coupons at the store, all on a contactless basis. The system also provides for the ability to purchase items using SingTel mobile phones equipped with NFC using a stored value account. There are more than 500 merchants participating in this pilot program.

UK service provider O2 released a study where 78% of people trying NFC capabilities on their phone would be interested in using the contactless capability if available on a regular basis given the convenience. The trial took place between November 2007 and May 2008 involving 500 participants. Participants were given an NFC enabled Nokia handset, which could be used with payment terminals at certain retailers and with public transportation. Eighty seven percent of participants indicated that the availability of NFC would likely impact their decision making when purchasing a new mobile phone.

Active News and Comment

Bursped, a Hamburg, Germany freight forwarder announced a payback of less than 12 months through the implementation of a UWB based RTLS system in its 13,500M² (roughly 143,000 ft²) distribution center that handles around 3,000 shipments per day. The company had been regularly using significant amounts of labor to search for individual shipments that were not in the proper location, resulting in higher cost and incomplete shipments. This search included physical on the floor time as well as time to search video of the center floor. The company employed eseg Deutschland to develop a real-time locating system that matches work flow timing to the video monitoring system. Using 160 cameras and an Ubisense system to monitor 20 fork lifts and 140 entrance gates, Brusped has indicated that labor related to searches is now minimal resulting in higher productivity and improved morale.

RFTechnologies announced the installation of its Safe Place Pediatric and Infant Security solution at Waukesha Memorial Hospital just outside of Milwaukee. The system places alerts when applied tags are removed, cut or pass by key choke points to protect over 2,300 babies each year at the hospital. Signals are transmitted every 10 seconds.

Partnerships

Impinj will use Rfidium to develop and test near-field UHF inlay prototypes according to application specific customer requirements. Rfidium may also provide high-volume manufacturing for successful products. Rfidium also announced support for Impinj's new Monza 3 silicon product.

Ascom Wireless and Ekahau announced a partnership that will enable Ascom's i75 voice over WiFi handset to be tracked using Ekahau's real time locating system technology leveraging existing WiFi networks. The product is primarily targeted for the manufacturing and healthcare

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industries and features an emergency “man down” button which provides an alert and location information.

Precision Dynamics Corporation (PDCs) and FreedomPay announced an agreement to offer cashless solutions to water parks, hotels and resorts using PDCs RFID enable wristband and FreedomPay’s stored value accounts. PDC has HF products based on ISO 14443A or ISO 15693-3 HF standards.

Corporate News

I.D. Systems announced in late August it was increasing its 2008 target revenue to \$26M from \$24M as a result of new orders for its wireless industrial vehicle management system. The company cited two European automotive manufacturers that began pilots in Spain and France for the Wireless Asset Net industrial fleet management system, and two heavy equipment manufacturers in the U.S. that ordered PowerKey vehicle monitoring system. In addition, ID Systems announced in mid-August that Wal-Mart placed an order to increase the number of stores using the Wireless Asset Net system from 21 to 50.

Gemalto announced it will acquire the MULTOS card operating system, MULTOS brand, the Key Management Authority and associated intellectual property from Keycorp. Gemalto paid roughly 1.0x revenue of 15M euros. Gemalto is seeking further enhance security for the installed base of reader and other intelligent devices by adding post-issuance activation capability. The company believes this offering will be an important component in mobile payment and NFC applications.

Fluensee has added Jay Gardner as vice president of sales and business development. Gardner has most recently been an advisor to venture firm DFJ Mercury. Prior to that, Gardner held several sales and operational positions at BMC software over an eight year period, and

also had a 10 year sales history at IBM. Gardner launched BMC's software as a service (SaaS) offering, which is relevant to Fluensee given its new SaaS capabilities from the Trenstar acquisition.

Confidex announced three new appointments to its Board of Directors, including Reijo Malhaniemi, President and CEO of power products company Efore Oyj, as Chairman of Confidex. Linwood Lacy, former CEO of Ingram Micro and Micro Warehouse, and Christer Forsstrom former CEO of Electrolux Group, were also added as directors. These appointments increase Confidex’s board to seven members.

Omnitrol recently hired Clayton Reed as Vice President Sales. Reed most recently held sales positions at Cisco Systems and before that at IBM and Data General.

Intelligent hired Bernard Greiner as Business Development Manager for France. Greiner was previously sales manager of STid.

Better OnlineSolutions (BOS) completed a private placement for \$1,000,000 in capital. The company issued 816,327 shares (equivalent to 6.3% of outstanding shares) at \$1.225 each. The investor also acquired 408,000 warrants, exercisable in two years at \$1.475 per share. BOS also agreed to sell its New World Brands stock holdings for \$875,000. Roughly \$25,000 in holdings will be sold each month beginning in September 2008, through March 2011.

RFID Excellence in Business Awards 2008

RFID Revolution spearheaded for the second year the RFID Excellence in Business Awards, offering winners in six different categories, which in 2008 included, “Excellence in RFID Implementation,” “Excellence in RFID Pilot,” “Excellence in RFID Technology,” “RFID Visionary of the Year,” “Most Innovative RFID Application” and “Protecting the Environment.”

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The Excellence in RFID Implementation was awarded to the U.S. DoD Radio Frequency In-Transit Visibility Network, which leverages Savi's 433MHz active solution to monitor 35,000 daily cargo shipments in 45 countries using 4,220 read points. Similar deployments have occurred with allied NATO military operations, and the total savings over a 15-year span is believed to be "several hundred million dollars."

Kimberly Clark won the Excellence in RFID Pilot using PINC Solution's Gen 2 based RTLS system and Motorola readers in conjunction with GPS technology to monitor truck trailers in the yard at KC's largest manufacturing facility. The pilot resulted in reduced labor search times, faster loading times and less yard clutter. Most importantly, the system prevented line shutdowns as a result the inability to locate raw materials.

The Excellence in RFID Technology was presented to Sensormatic for its iREAD platform, which offers an integrated RFID/EAS (electronic article surveillance) combination. The iREAD allows hundreds of antenna read points using a single reader and thus enables a perpetual storewide inventory system. The system also provides POS security. The dual technology tags are reusable and thus drive down the per transaction cost below \$0.01 assuming standard 250 uses.

The RFID Visionary of the Year went to Victor Vega, Director, IC & Tag Product Marketing at Alien Technology given his training efforts as the developer of Alien Academy, industry IP contributions and industry longevity.

The Most Innovative RFID Application went to SkyeTek who developed an application that provided assistance to the visually impaired. The system used RFID to tag different objects, with a reader that was connected to a speech engine and portable audio player. Not only can

the system identify the item, but also offer item detail or usage instructions.

The Protecting the Environment Award went to the Hawaii State Department of Agriculture for its food traceability system that helps quickly isolate food contamination issues. The project piloted fruits and vegetables from several farms, through a large distributor and into several local retailers. Information sharing was conducted through a web interface. Motorola provided hardware, while Lowry Computer provided key software and integration.

Events

EPC Connection 2008 will take place in Chicago, October 14-16 at the Donald Stephens convention center. The EPC Connection event is designed to meet the educational, buying and networking needs of executives and technologists looking to leverage EPC technology to boost sales, cut costs and improve the way their companies do business. Key conference tracks will include manufacturing, supply chain, EPC in defense and retail supplier implementation. To learn more, visit www.epcconnection.com.

UCLA's Wireless Internet for Mobile Enterprise Consortium will be hosting an RFID Executive Forum on October 15, 2008. The forum will bring together global experts from various industry segments to discuss how RFID is impacting their business with respect to business process, finance and accounting systems, inventory management, people management and operations management. To learn more, or to register, please visit the WINMEC web at <http://www.winmec.ucla.edu/rfid/2008/>. On October 16, WINMEC will host an academic forum on researching RFID for the future, with a discussion on technologies, applications and business models.

RFID Briefs

AIDC 100 is a not-for-profit; self-sustaining, non-political, international organization of automatic identification and data capture (AIDC) professionals will host its annual symposium for executives at Merrimack College in North Andover, MA on October 15, 2008. This day-long event will feature actual business problems, solutions, and application examples such as automatic ID technology usage with national security issues, healthcare, retail, manufacturing, transportation, energy, and more. The format will include presentations and discussion panels. Symposium attendees will also tour Merrimack's newly established RFID/automatic ID technology lab. For more event information including registration, visit <http://aidc100.org/08meeting.htm>

The "III International RFID Symposium of Business Solutions" will take place October 21-23 in San Paulo, Brazil. The event will provide an overview of the latest developments in RFID, with a strong international perspective. Attendees will learn about the advantages of the technology, and more importantly will hear from presenters that have enabled increased productivity in their companies by using RFID as a key tool. Discussions will provide insight into RFID's many different uses, overcome obstacles, and show you how and where to start investing. To learn more, please visit www.simposiorfid.com.br

Table of Key RFID Providers

Company Name	Ticker	Semi-Conductors	Inlays/Tags	Readers	Printers/Encoders	Networking	Software	Integration/Services
3M Company	MMM		X	X			X	X
AbeTech	Private							X
Accenture	ACN							X
Acsis	Private						X	X
Aeroscout	Private		X	X			X	X
Alien	Private	X	X	X				X
Ambient ID	Private							X
Applied Wireless	Private			X				
AssetPulse	Private						X	X
Atmel	ATML	X						
Avery Dennison	AVY		X					
Axcess	AXSI		X	X			X	
Bentonville Int'l Group	Private						X	X
BlueStar	Private							X
Blue Vector	Private				X	X	X	
BOS	BOSC							X
Brady Corp	BRC		X		X			
Checkpoint Systems	CKP		X	X			X	
CIM Bar Code	Private							X
Cisco	CSCO				X			
Computer Sciences Corp.	CSC							X
Confidex	Private		X					
Danaher (Accu-Sort)	DHR							X
Datalogic	DAL		X	X				
Dover (Datamax)	DOV				X			
Digital Angel	DOC		X	X				
Domino-ISG	Private							X
Ekahau	Private		X	X		X	X	X
EM Microelectronic Marin	UHR.DE	X						
Entigral Systems*	Private						X	X
Feig Electronic	Private		X	X				
Fluensee	Private						X	X
George Schmitt & Co.	Private		X		X			
Globe Ranger	Private						X	X
Goliath Solutions	Private		X	X				
Hewlett-Packard	HPQ							X
ASSA-ABLOY (HID)	ASSA		X	X				
HK Systems	Private							X
IBM	IBM						X	X
ID Systems	IDSY		X	X			X	
Identec Solutions	Private		X	X			X	X
Impinj Inc.	Private	X		X				
Infineon	IFX	X						
Intel Corporation	INTC					X		X
Intellex	Private	X	X	X				
Intermec	IN		X	X	X			X
IPICO	RFD.TSX	X	X	X				
Lexmark	LXK				X			
Lowry Computer	Private		X		X		X	X
Kennedy Group	Private		X		X		X	X
Magellan Technology	Private		X	X			X	
Manhattan Associates	MANH						X	X
MARKEM	Private		X					X
MIKOH	MIK.ASX		X					X
Miles Technologies	Private							X
Mojix	Private			X			X	

Company Name	Ticker	Semi-Conductors	Straps / Inlays / Tags	Readers	Printers/Encoders	Networking	Software	Integration/Services
Moore Wallace	RHD		X					
Motorola (Symbol)	MOT			X				X
Nashua	NSHA		X					
noFilis	Private					X	X	
NXP	NXP	X						
OATSystems, Inc.	Private						X	
Odin	Private							X
Omnirol	Private					X	X	
Omron Corporation	OMRNF.PK		X	X				
Oracle	ORCL					X	X	X
Panatrack, Inc.	Private						X	X
PINC	Private		X	X			X	X
Plitek	Private		X					
Power ID	Private	X	X					X
Precision Dynamics	Private		X	X				
Printronic	Private				X			
Red Prairie	Private						X	X
Reva Systems	Private					X		
RF Code	Private		X	X			X	
RF Technologies	Private		X	X			X	
Rfid, Inc.	Private		X	X				
RFID Global Solution	Private						X	X
Rush Tracking Systems	Private							X
SAP	SAP						X	X
Sato	Japan		X		X			
SAVR Communications	Private		X					
Lockheed (Savi)	LMT		X	X		X	X	X
ScanSource Inc.	SCSC							X
Sealed Air	SEE		X	X			X	X
Siemens	SI		X	X		X		X
SimplyRFID	Private						X	X
Sirt	SI.TSX		X	X			X	X
SkyeTek	Private			X				
Sovereign Tracking Sys.	Private		X	X			X	X
STMicronics	STM	X	X					
Sun Microsystems	SUNW						X	X
Tagsys	Private	X	X	X			X	X
Texas Instruments	TXN	X	X					
ThingMagic	Private			X				
Toppan Printing	7911		X	X	X			
Toshiba TEC	Japan		X		X			
Roper (TransCore)	ROP		X	X				X
TrenStar Inc.	Private						X	X
Tyco (Sensormatic)	TYC		X	X				X
Unitech	Private			X				
UPM Raflatac	UPM		X					
Venture Research, Inc	Private				X		X	X
Verichip	CHIP	X	X					
Verisign	VRSN					X	X	X
Vuance LTD	VUNC		X	X			X	X
Vue Technology	Private						X	X
Wavetrend	Private		X	X			X	X
WJ Communications	WJCI			X				
Xterprise	Private						X	X
Zebra Technologies	ZBRA		X	X	X		X	X

Source: Company Information and Robert W. Baird & Co.

Comparable RFID Valuation

COMPARABLE RFID VALUATION
Analysis of Selected Ratios and Current Market Multiples
(in millions, except per share amounts)

Ticker	Company ⁽¹⁾	Fiscal Year End	Latest Quarter	Shares ⁽²⁾	Price Per Share 7/16/2008	Market Value of Equity	Debt ⁽³⁾	Enterprise Value	Book Value	52 Week Price	
										Low	High
<u>Wireless Infrastructure:</u>											
RIMM	Research In Motion Ltd.	2/28/2008	5/31/2008	562.7	\$98.27	\$55,291.8	7.4	\$54,096.6	3933.5671	\$80.20	\$148.13
GRMN	Garmin	12/31/2008	6/30/2008	217.0	\$32.59	7,071.4	0.0	6,204.2	2482.6858	\$30.73	\$125.68
ELMG	EMS Technology (LXE)	12/31/2008	6/30/2008	15.6	\$21.40	333.4	11.2	228.7	252.55009	\$19.85	\$33.23
NVTL	Novatel Wireless Inc.	12/31/2008	6/30/2008	32.6	\$5.86	191.0	0.3	65.0	201.64663	\$5.80	\$27.20
IDSY	ID Systems Inc.	12/31/2008	6/30/2008	11.0	\$8.88	97.8	0.0	75.7	71.670001	\$5.50	\$14.75
<u>IT Solutions/Software:</u>											
ACN	Accenture Ltd.	8/31/2008	5/31/2008	595.9	\$36.22	\$21,584.3	6.7	\$19,136.2	2107.1385	\$31.91	\$42.32
IBM	International Business Machines Corp.	12/31/2008	6/30/2008	1385.2	\$115.19	159,565.1	34,232.0	180,449.0	28973.873	\$97.04	\$130.93
MANH	Manhattan Associates Inc.	12/31/2008	6/30/2008	24.9	\$23.00	572.7	0.0	490.8	184.80835	\$21.00	\$30.50
SAP	SAP AG	12/31/2008	6/30/2008	1198.2	\$54.02	64,726.4	39.4	60,423.5	9496.3325	\$43.00	\$59.86
JAVA	Sun Microsystems Inc.	6/30/2008	6/30/2008	752.0	\$8.78	6,602.6	1,265.0	5,151.6	5567.8772	\$8.32	\$25.04
UIS	Unisys Corp.	12/31/2008	6/30/2008	353.9	\$3.54	1,252.8	1,063.6	1,865.1	347.98633	\$3.04	\$7.90
VRSN	Verisign	12/31/2008	6/30/2008	222.8	\$25.14	5,602.4	1,263.2	4,886.8	504.6585	\$25.00	\$42.50
<u>Data Capture:</u>											
ZBRA	Zebra Technologies Corp.	12/31/2008	6/30/2008	66.4	\$28.58	\$1,896.9	0.0	\$1,733.6	912.53294	\$27.50	\$39.09
IN	Intermec, Inc.	12/31/2008	6/30/2008	61.2	\$18.81	1,151.0	0.0	959.9	499.06567	\$15.09	\$27.48
AVY	Avery Dennison	12/31/2008	6/30/2008	98.4	\$45.41	4,467.8	2,371.2	6,756.4	2109.9269	\$40.05	\$59.68
BRC	Brady Corp.	7/31/2008	4/30/2008	54.1	\$33.86	1,832.7	500.0	2,091.2	970.97923	\$28.00	\$40.29
CKP	Checkpoint Systems Inc.	12/31/2008	6/30/2008	39.8	\$19.55	778.1	143.9	799.4	615.06731	\$17.97	\$30.50
<u>Components/Semi-Conductors:</u>											
IFX	Infineon Technologies AG	9/30/2008	6/30/2008	749.7	\$8.26	\$6,192.8	2,179.5	\$8,140.0	6536.3016	\$6.26	\$17.24
PHG	Koninklijke Philips Electronics NV	12/31/2008	6/30/2008	1090.7	\$29.26	31,914.1	6,159.0	31,244.3	33908.99	\$29.09	\$45.57
STM	STMicroelectronics NV	12/31/2008	6/30/2008	899.8	\$12.23	11,004.1	2,466.0	10,449.1	9573	\$9.88	\$17.36
CHIP	Verichip	12/31/2008	6/30/2008	10.1	\$0.45	4.6	15.6	15.6	25.590999	\$0.42	\$4.84
TXN	Texas Instruments Inc.	12/31/2008	6/30/2008	1343.2	\$21.91	29,429.8	0.0	27,073.3	10009.58	\$21.49	\$37.17
<u>Networking/Telecom</u>											
INTC	Intel Corporation	12/31/2008	6/30/2008	5818.0	\$19.36	\$112,636.5	2,067.0	\$99,296.4	41342.167	\$18.05	\$27.99
MOT	Motorola Inc.	12/31/2008	6/30/2008	2263.1	\$7.65	17,312.7	4,116.0	14,238.3	15233.177	\$6.62	\$19.68
CSCO	Cisco Systems Inc.	7/31/2008	7/31/2008	6100.0	\$22.38	136,518.0	6,893.0	113,017.6	33498.443	\$20.56	\$34.24
NOK	Nokia Oyj	12/31/2008	6/30/2008	3846.0	\$20.08	77,226.7	2,138.6	64,070.1	27323.936	\$18.84	\$42.22
QCOM	Qualcomm Inc.	9/30/2008	6/30/2008	1646.0	\$46.82	77,065.7	0.0	69,844.8	15754.57	\$35.17	\$56.88
SI	Siemens AG	9/30/2008	6/30/2008	914.2	\$96.48	88,202.3	24,072.4	96,260.8	52852.196	\$93.36	\$160.37
ERIC	LM Ericsson	12/31/2008	6/30/2008	3180.1	\$10.33	32,850.0	4,263.8	26,968.0	20916.242	\$8.52	\$20.98

(1) Information Provided by Factset.

(2) Excludes options

(3) Net debt equals total debt (including capital leases) plus preferred stock at book value plus minority interest minus cash and short term investments

(4) Book value equals total shareholders' equity less preferred stock at book value

** Incomplete metrics as a result of recent IPO

Comparable RFID Valuation

COMPARABLE RFID VALUATION
Analysis of Selected Ratios and Current Market Multiples
(in millions, except per share amounts)

Ticker	Company ⁽¹⁾	Latest Twelve Month Results					Latest Twelve Month Margins					Debt to:		EBIT to:
		Net Sales	Gross Profit ⁽²⁾	EBITDA	EBIT	Net Income ⁽³⁾	Gross Profit ⁽²⁾	EBITDA	EBIT	Net Income ⁽³⁾	Total Cap.	EBITDA	Int	
Wireless Infrastructure:														
RIMM	Research In Motion Ltd.	\$7,170.0	\$3,537.0	\$2,373.1	\$2,176.7	\$1,293.9	49.3%	33.1%	30.4%	18.0%	0%	0.3%	NA	
GRMN	Garmin	\$3,521.2	\$1,588.1	\$1,059.2	\$997.3	\$855.0	45.1%	30.1%	28.3%	24.3%	0%	0.0%	24,325.2	
ELMG	EMS Technology (LXE)	\$305.9	\$119.0	\$33.5	\$22.7	\$19.2	38.9%	11.0%	7.4%	6.3%	4%	33.3%	12.9	
NVTL	Novatel Wireless Inc.	\$403.8	\$119.2	NA	NA	\$38.8	29.5%	NA	NA	9.6%	0%	0.4%	NA	
IDSY	ID Systems Inc.	\$20.0	\$9.9	-\$6.2	-\$6.8	-\$7.3	49.2%	-31.1%	-33.9%	-36.7%	0%	NA	(2,264.7)	
IT Solutions/Software:														
ACN	Accenture Ltd.	\$24,326.1	\$6,875.1	\$3,034.5	\$3,034.5	\$1,243.1	28.3%	12.5%	12.5%	5.1%	0%	0.2%	127.8	
IBM	International Business Machines Corp.	\$104,307.0	\$45,247.0	\$22,800.0	\$17,372.0	\$10,418.0	43.4%	21.9%	16.7%	10.0%	45%	155.6%	11.2	
MANH	Manhattan Associates Inc.	\$348.4	\$181.3	\$63.8	\$50.6	\$30.8	52.0%	18.3%	14.5%	8.8%	0%	0.0%	NA	
SAP	SAP AG	\$17,135.0	\$11,765.8	NA	NA	\$2,824.2	68.7%	NA	NA	16.5%	0%	0.9%	NA	
JAVA	Sun Microsystems Inc.	\$13,880.0	\$6,455.0	\$1,623.0	\$837.0	\$403.0	46.5%	11.7%	6.0%	2.9%	18%	77.9%	27.9	
UIS	Unisys Corp.	\$5,570.1	\$1,330.6	\$577.7	\$188.3	-\$79.1	23.9%	10.4%	3.4%	-1.4%	74%	354.3%	2.3	
VRSN	Verisign	\$1,359.9	\$929.0	\$379.7	\$186.7	-\$144.7	68.3%	27.9%	13.7%	-10.6%	45%	332.7%	5.2	
Data Capture:														
ZBRA	Zebra Technologies Corp.	\$950.9	\$453.2	\$214.7	\$181.4	\$110.1	47.7%	22.6%	19.1%	11.6%	0%	0.0%	719.9	
IN	Intermec, Inc.	\$894.4	\$357.4	\$81.1	\$66.1	\$24.3	40.0%	9.1%	7.4%	2.7%	0%	0.0%	10.3	
AVY	Avery Dennison	\$6,868.5	\$1,862.5	\$850.8	\$581.8	\$303.5	27.1%	12.4%	8.5%	4.4%	37%	279.4%	4.3	
BRC	Brady Corp.	\$1,488.9	\$725.9	\$266.3	\$207.1	\$109.4	48.8%	17.9%	13.9%	7.3%	35%	187.8%	7.7	
CKP	Checkpoint Systems Inc.	\$913.1	\$377.1	\$101.7	\$74.3	\$58.4	41.3%	11.1%	8.1%	6.4%	13%	141.1%	17.6	
Components/Semi-Conductors:														
IFX	Infineon Technologies AG	\$8,829.7	\$1,909.9	\$927.6	-\$459.0	-\$473.5	21.6%	10.5%	-5.2%	-5.4%	22%	235.0%	(9.8)	
PHG	Koninklijke Philips Electronics NV	\$42,523.5	\$15,262.6	NA	NA	\$6,718.8	35.9%	NA	NA	15.8%	5%	137.0%	NA	
STM	STMicroelectronics NV	\$10,177.0	\$3,700.0	NA	NA	-\$477.0	36.4%	NA	NA	-4.7%	18%	111.5%	NA	
CHIP	Verichip	\$33.3	\$19.6	-\$8.2	-\$10.6	-\$11.9	59.0%	-24.5%	-31.8%	-35.7%	30%	NA	(6.4)	
TXN	Texas Instruments Inc.	\$13,843.0	\$7,395.0	\$4,770.0	\$3,779.0	\$2,641.0	53.4%	34.5%	27.3%	19.1%	0%	0.0%	NA	
Networking/Telecom														
INTC	Intel Corporation	\$39,945.0	\$21,961.0	\$15,803.0	\$11,199.0	\$6,976.0	55.0%	39.6%	28.0%	17.5%	4%	13.1%	207.4	
MOT	Motorola Inc.	\$33,987.0	\$9,573.0	\$1,730.0	\$857.0	-\$105.0	28.2%	5.1%	2.5%	-0.3%	21%	237.8%	2.5	
CSCO	Cisco Systems Inc.	\$39,540.0	\$24,985.0	\$11,189.0	\$9,445.0	\$7,333.0	63.2%	28.3%	23.9%	18.5%	17%	56.4%	27.1	
NOK	Nokia Oyj	\$82,363.1	\$25,868.3	\$13,909.8	\$11,832.1	\$10,521.5	31.4%	16.9%	14.4%	12.8%	1%	15.4%	NA	
QCOM	Qualcomm Inc.	\$10,114.0	\$6,896.0	\$4,095.0	\$3,659.0	\$3,303.0	68.2%	40.5%	36.2%	32.7%	1%	0.0%	159.1	
SI	Siemens AG	\$120,054.4	\$34,815.3	\$13,323.5	\$11,694.5	\$5,228.3	29.0%	11.1%	9.7%	4.4%	25%	163.8%	9.2	
ERIC	LM Ericsson	\$30,488.1	\$11,656.1	\$5,501.4	\$4,476.1	\$3,381.9	38.2%	18.0%	14.7%	11.1%	14%	77.5%	16.1	
Mean							43.8%	15.8%	11.0%	5.8%	14.4%			
Median							44.2%	15.1%	13.1%	6.9%	4.9%			
High							68.7%	40.5%	36.2%	32.7%	74.3%			
Low							21.6%	-31.1%	-33.9%	-36.7%	0.0%			

(1) Information Provided by Factset.

(2) Before depreciation and amortization.

(3) Represents income from continuing operations before extraordinary items.

* Numbers not available as systems are still in the process of being updated following earnings reports.

** Incomplete metrics as a result of recent IPO

Comparable RFID Valuation

COMPARABLE RFID VALUATION
Analysis of Selected Ratios and Current Market Multiples
(in millions, except per share amounts)

Ticker	Company ⁽¹⁾	LTM		Cal. Year Ended 2006		Cal. Year Ended 2007		Growth Rate ⁽²⁾	PEG Ratio	Price to:				Book Value	Dividend Yield
		EPS	P/E	EPS ⁽²⁾	P/E	EPS ⁽²⁾	P/E			Net Sales	EBITDA	EBIT	Net Inc		
<u>Wireless Infrastructure:</u>															
RIMM	Research In Motion Ltd.	\$2.71	36.3x	\$0.97	101.1x	\$2.07	47.5x	34.8%	1.4	15.6	23.3x	25.4x	42.7x	14.1	0.0%
GRMN	Garmin	\$4.13	7.9	\$2.35	13.9	\$3.80	8.6	14.3%	0.6	4.5	6.7	7.1	8.3	2.8	2.3%
ELMG	EMS Technology (LXE)	\$1.30	16.5	\$0.81	26.4	\$1.24	17.3	20.0%	0.9	2.8	9.9	14.7	17.3	1.3	0.0%
NVTL	Novatel Wireless Inc.	\$0.77	7.6	\$0.01	586.0	\$1.19	4.9	19.8%	0.2	1.6	NA	NA	4.9	0.9	0.0%
IDSY	ID Systems Inc.	-\$0.62	(14.3)	\$0.11	80.7	-\$0.36	(24.7)	17.0%	(1.5)	9.9	(15.7)	(14.4)	-13.3	1.4	0.0%
<u>IT Solutions/Software:</u>															
ACN	Accenture Ltd.	\$2.48	14.6x	\$1.73	20.9x	\$2.20	16.5x	14.0%	1.2	3.1x	7.1x	7.1x	17.4	10.2	1.2%
IBM	International Business Machines Corp.	\$8.11	14.2	\$6.06	19.0	\$7.13	16.2	11.6%	1.4	3.5	7.0	9.2x	15.3	5.5	1.7%
MANH	Manhattan Associates Inc.	\$1.29	17.8	\$1.08	21.3	\$1.30	17.7	15.0%	1.2	3.2	9.0	11.3	18.6	3.1	0.0%
SAP	SAP AG	\$2.35	23.0	\$2.01	26.9	\$2.19	24.7	14.3%	1.7	5.5	NA	NA	22.9	6.8	1.4%
JAVA	Sun Microsystems Inc.	\$0.50	17.6	-\$0.08	(109.8)	\$0.63	13.9	9.0%	1.5	1.0	4.1	7.9	16.4	1.2	0.0%
UIS	Unisys Corp.	-\$0.16	(22.1)	-\$0.81	(4.4)	-\$0.23	(15.4)	9.3%	(1.7)	0.9	2.2	6.7	-15.8	3.6	0.0%
VRSN	Verisign	-\$1.20	(21.0)	\$0.96	26.2	\$1.02	24.6	21.7%	1.1	6.0	14.8	30.0	-38.7	11.1	0.0%
<u>Data Capture:</u>															
ZBRA	Zebra Technologies Corp.	\$1.65	17.3x	\$1.56	18.3x	\$1.65	17.3x	14.5%	1.2	4.2x	8.8x	10.5x	17.2	2.1	0.0%
IN	Intermec, Inc.	\$0.60	31.4	\$0.38	49.5	\$0.40	47.0	15.5%	3.0	3.2	14.2	17.4	47.3	2.3	0.0%
AVY	Avery Dennison	\$3.02	15.0	\$3.78	12.0	\$3.91	11.6	13.3%	0.9	2.4	5.3	7.7	14.7	2.1	3.6%
BRC	Brady Corp.	\$2.25	15.0	\$2.04	16.6	\$2.16	15.6	9.5%	1.6	2.5	6.9	8.8	16.8	1.9	1.8%
CKP	Checkpoint Systems Inc.	\$1.43	13.7	\$1.00	19.6	\$1.39	14.1	17.0%	0.8	2.1	7.7	10.5	13.3	1.3	0.0%
<u>Components/Semi-Conductors:</u>															
IFX	Infineon Technologies AG	-\$0.75	-11.0x	-\$0.51	-16.3x	-\$0.47	-17.5x	8.0%	(2.2)	3.2x	6.7x	-13.5x	-13.1	0.9	0.0%
PHG	Koninklijke Philips Electronics NV	\$4.61	6.3	\$1.09	26.8	\$5.21	5.6	NA	NA	2.1	NA	NA	4.7	0.9	3.7%
STM	STMicroelectronics NV	\$0.08	152.9	\$0.83	14.7	\$0.77	15.9	12.0%	1.3	3.0	NA	NA	-23.1	1.1	2.9%
CHIP	Verichip	-\$1.23	(0.4)	-\$1.21	(0.4)	-\$1.36	(0.3)	NA	NA	0.2	(0.6)	(0.4)	-0.4	0.2	0.0%
TXN	Texas Instruments Inc.	\$1.99	11.0	\$1.69	13.0	\$1.83	12.0	14.9%	0.8	4.0	6.2	7.8	11.1	2.9	1.8%
<u>Networking/Telecom</u>															
INTC	Intel Corporation	\$1.21	16.0x	\$0.86	22.5x	\$1.18	16.4x	11.8%	1.4	5.1x	7.1x	10.1	16.1	2.7	2.9%
MOT	Motorola Inc.	-\$0.02	(382.5)	\$1.19	6.4	\$0.24	31.9	10.5%	3.0	1.8	10.0	20.2	-164.9	1.1	2.6%
CSCO	Cisco Systems Inc.	\$1.30	17.2	\$1.20	18.7	\$1.43	15.6	15.1%	1.0	5.5	12.2	14.5	18.6	4.1	0.0%
NOK	Nokia Oyj	\$2.33	8.6	\$1.27	15.8	\$2.01	10.0	12.4%	0.8	3.0	5.6	6.5	7.3	2.8	4.2%
QCOM	Qualcomm Inc.	\$2.05	22.8	\$1.73	27.0	\$2.06	22.8	19.7%	1.2	11.2	18.8	21.1	23.3	4.9	1.4%
SI	Siemens AG	\$7.43	13.0	\$4.57	21.1	\$6.10	15.8	21.4%	0.7	2.5	6.6	7.5	16.9	1.7	2.4%
ERIC	LM Ericsson	\$0.95	10.9	\$1.12	9.2	\$1.02	10.2	10.0%	1.0	2.8	6.0	7.3	9.7	1.6	4.1%
Mean			1.7x		37.3x		13.6x	15.1%	0.9x	4.0x	7.6x	9.6x	3.9	3.5	1.3%
Median			14.4		19.0		15.6	14.3%	1.1	3.1	7.0	8.8	14.7	2.1	1.2%
High			152.9		586.0		47.5	34.8%	3.0	15.6	23.3	30.0	47.3	14.1	4.2%
Low			(382.5)		(109.8)		(24.7)	8.0%	(2.2)	0.2	(15.7)	(14.4)	(164.9)	0.2	0.0%

(1) Information Provided by Factset.

(2) Based on mean Multex estimates. EPS estimates are calendarized for comparison purposes.

(3) Cal. Year Ended 2004 P/E divided by Multex's estimated mean five year growth rate.

* Numbers not available as systems are still in the process of being updated following earnings reports.

** Incomplete metrics as a result of recent IPO

Glossary of RFID Terms

Active RFID Tag – The tag has an internal power source (i.e., a battery), which allows for significantly longer read ranges. Primarily used to track large, high-value assets such as intermodal shipping containers. Active tags are significantly larger and more expensive (\$25-\$250 per unit) than passive tags.

Air Interface – The communication protocol between the tag and reader. Passive tags at UHF are standardized around the Generation 2 protocol; HF is seeking a similar standard. Some active tags are increasingly communicating with standardized Wi-Fi networks (IEEE 802.11x), however, active continues to see several proprietary air interface protocols.

Antenna – Attached to chips on tags and an integral part of a reader; antennas are devices that send and receive radio frequency (electromagnetic) energy.

Anti-Collision – A component of the air-interface protocol that prevents tag data from multiple tags in the read area from interfering (colliding) with each other. Also prevents multiple readers in close proximity from interfering with each other. This is a key component to the Generation 2 standard.

Battery Assisted Passive (also semi-passive) – Passive tags that offer a small battery to boost signal strength, or improve tag sensor capability. The battery generally goes into sleep mode until required. Referred to as Class 3 products; a standard is expected in early 2008.

Class 0 – Class 0 refers to a proprietary air interface protocol for passive UHF tags. Class 0 is read only, while a subsequent protocol, Class 0 Plus, offers read/write capability. This protocol is largely obsolete with Gen 2.

Class 1 – Class 1 refers to a proprietary air interface protocol for passive UHF tags. Class 1 offers read/write capability. Class This protocol is largely obsolete with Gen 2.

Closed Loop Solution – Set of readers and tags intended for a particular application having specific, well defined start and end point. Generally seen in tracking work in process or reverse logistics operations.

DoD Mandate – A mandate to all 43,000+ DoD suppliers, announced in June of 2003, to employ RFID. The DoD issued a timetable specifying when RFID will be required (by products into specified DoD depots). The timetable has been somewhat fluid given DoD budget dollars are focused on existing operations in Iraq and Afghanistan.

Dual Di-Pole – A tag that essentially has two antennas, reducing the sensitivity to orientation and increasing read capability.

Electronic Product Codes (EPC) – The code that resides on an RFID tag that is unique to each product. The code contains manufacturer and product

information as well as an individualized serial number. EPCs are maintained by EPCglobal.

Encode and Apply – A step up from “Slap and Ship,” where labels are encoded and applied on a more automated basis. Slightly more capital intensive, but more operationally efficient than slap and ship.

Encoder – Device that transmits and writes data on to an RFID tag. Used extensively in printers and label applicators for product shipments. Encoders are generally RFID reader modules developed for a printing or other encoding application.

Environmental Factors – Typically discussed with respect to UHF products, which can be affected by many factors including the presence of metal, liquids, significant reader activity, other RF “noise,” etc. These factors require process controls in terms of tag and reader placement. Readers also need proper adjustment for a given environment.

EPC Global – The body responsible for RFID standards creation; formed originally as a joint venture between the Uniform Code Council (UCC) and the Electronic Article Numbering Association (EAN). EPC Global is responsible for RFID standards development and for promoting vertical RFID solution development.

EPC Network – Developed by the Auto-ID center, this Internet-based system allows supply chain participants to retrieve data associated with an EPC through the Internet. The network remains in an emerging phase, and is administered by EPC Global.

Fluidic Self Assembly (FSA) – A proprietary process developed to rapidly attach chips to straps. The process uses a fluid bath to place small chips on a substrate for strap attachment. This process continues to be developed.

Generation 2 – The RFID air interface standard for supply chain shipments using UHF. The Gen 2 standard was approved in December 2004 by EPC Global, and has since received international approval by ISO as 18000-6C. EPCglobal is working to create a similar standard for HF.

High Frequency (HF) RFID – RFID products that use the 13.56MHz band, which is not regulated by any government. This frequency generally allows read ranges of 4-8 feet, and is not affected by environmental factors such as liquid due to magnetic coupling. The existing ISO 15963 standard is different from the Gen 2 protocol. We expect a new EPC-based standard by the end of 2007. HF has historically been used in contactless payment and item level tracking applications.

Glossary of RFID Terms

Hybrid (semi-active) RFID Tag – Tag that incorporates a smaller internal power supply, which is triggered by reader action. After interrogation, the tag resumes a passive stance.

ISO – International Organization for Standardization is a network of the national standards institutes of 148 countries, on the basis of one member per country, with a Central Secretariat in Geneva, Switzerland, that coordinates the system. ISO is not government affiliated. EPC Global is an ISO member and has received ISO approval for the Generation 2 standard.

Kill Command – A code within the RFID tag that once activated will permanently disable the tag. Intended to limit consumer tracking after purchase for privacy protection.

Low Frequency (LF) RFID – RFID products that use the 125Kz band. Products that use this frequency are generally smaller and cheaper as read ranges are short, typically less than 12 inches. Security access and control and contactless payment are typical applications.

Mandate Requirements – Primarily refers to an edict put in place by retailers, most notably Metro, Wal-Mart and the DoD, requiring that certain types of shipments (mostly deliveries at the case and pallet level) use RFID for tracking purposes. The Metro mandate is the only one that imposes a charge for non-compliance.

Metro Mandate – German based retailer that is piloting Gen 2 based RFID at 229 German based stores. Suppliers are required to tag all pallets by October 1, 2007 or face a charge of approximately 2 euros per pallet. Case level tagging is expected in 2008. Metro, the worlds 5th largest retailer, operates roughly 2,400 stores in Europe and Asia.

Middleware – A specific class of software that offers several levels of functionality. Middleware acts as a data filter, eliminating duplicate reads so that the host system maintains accurate records and is not inundated with excessive data. Middleware also ensures that the RFID data formatting “maps up” with the host system data structure.

Optional User Memory – Additional bits memory available on a tag that can be used by any member of the supply chain as they see fit (i.e., routing information). Intended to allow for increased tracking efficiency.

Parallel Integrated Chip Assembly (PICA) – A proprietary process developed by Symbol (Motorola) to rapidly assemble chips to tags. The process uses small punches to extract a chip from the wafer and attach the chip to the tag antenna using a single motion. The process remains in test stages, and Motorola no longer produces tags.

Passive RFID Tag – A tag that receives its power supply from the reader upon interrogation. Used primarily in supply chain applications, these tags tend to be small in size and relatively inexpensive compared to active tags.

Pilots – Testing done by companies seeking RFID solutions, primarily for supply chain applications. Consumer product companies under mandate requirements are seeking ways to increase the value add to themselves in addition to meeting mandate compliance, which requires evaluation of equipment and internal business processes.

Portal – A door or other point in a facility surrounded by fixed RFID readers to identify and track the flow of product. Dock doors are a typical example.

Reader – Also known as an interrogator. Typically a network-based device and antenna configuration, which reads the information contained on an RFID tag. In passive operations, the reader supplies the tag with power. Readers can be fixed position for dock door or other portal applications, or embedded into mobile computing devices for in store or exception reporting requirements.

Rollout – When pilots provide sufficient evidence of a strong return on investment, companies are expected to deploy (rollout) the technology into greater parts of their internal operations or external supply chain partners. This process is expected to result in significant growth for the RFID industry.

Slap and Ship – Refers to placing an RFID tagged bar code label on products immediately before shipment. The process is typically done on an exception basis for products requiring compliance labeling. Slap and Ship is not labor efficient and allows virtually no incremental value add to the supplier; however, the up-front capital investment is small.

Strap – Component of a tag or inlay that connects the microchip to the antenna. The purpose of the strap is largely to make the manufacturing process of antenna attachment easier and faster.

Tag – Also referred to as transponder or transponder tag, which is typically affixed to an item for tracking purposes. Composed of a semi-conductor chip and antenna held together in a substrate. Each tag has a manufacturer installed unique identification number as well as additional few bits to many kilobits of incremental memory. Passive tags receive energy from the reader, while active tags have an internal power supply.

UID – Unique Identification is a DoD based numbering scheme to identify a broad range of high-value assets. RFID is not necessarily required, but is

Glossary of RFID Terms

preferred in many UID applications. UID applications typically require more than 256 bits of memory.

Ultra High Frequency (UHF) RFID – RFID products that use the 868MHz to 950MHz frequency band, which is regulated by governments. This frequency allows read ranges of 8-30 feet (2x-4x of HF), but can be heavily affected by environmental factors, including liquids and metals.

Wal-Mart Mandate – Wal-Mart mandated that its top 600 suppliers ship products with Gen 2 RFID tags identifying each pallet and case to up to 1,400 stores by the end of 2007. As part of this program, Wal-Mart continues to conduct pilots to determine ROI.

Write Once Read Many (WORM) – Used to describe an RFID tag that allows only one set of data to be written on to it. Typically used in applications where security is a concern.

Appendix – Important Disclosures and Analyst Certification

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