NEW RFID-BASED PASSPORTS COMING TO MARKET SOON

Wednesday, February 26 will go down in history. For the very first time the new RFID passports were shown publicly during the International Digital Passport & Border Control Fair at the World Trade Center in Stockholm.

During the seminars many important and interesting new items were on the agenda which had been skilfully planned by the organisers, SMARTICWARE (a member of RFID Nordic).

SOME EXAMPLES:

3M showed readers for the new passports. The Royal Swedish Police Force explained how the new passports are made and demonstrated their new camera. The new passports will be on the market from October 1 this year. In practical terms this means that only the Swedish Police Force will be authorized to take pictures of citizens and make the new passports. The cost is estimated to be 400 SEK each.

Speakers from Bundesdruckerei GmbH described how to integrate biometric IDs and contactless chips into different kinds of travel documents such as the RFID passports. The Government of Thailand had representatives in Stockholm who told us about eID programmes in progress. And last on stage was US Customs.

PROSECTION AB told us how to eliminate ID thefts thanks to a recently patented unique Swedish technology. When digitalized, the user's biometric features are immediately encrypted, never to be decrypted again.

At the registration desk delegates were presented with a passport containing a RFID tag as their ID during their visit to the fair. Sogeti and Electron gave us a smart and effective taste of the new reality.

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Debatt

TOWARDS "UBIQUITOUS" RFID

Today we are arranging RFID-conferences and we are founding RFID-organisations. We are talking about an incipient RFID-business. All this is very positive and good but at the same time not lasting.

The reason is as simple as pleasant: RFID will be so well spread that it will turn from a very exciting important new innovation, (well...the technology has existed for long, I know) to some evident thing. In all environments. We have then reached a step in the development – "ubiquitous RFID". You can translate this with "all-over-present RFID". This will be a part of the bigger and broaden term "ubiquitous computing" (all-over-present computer/IT).

We can already see signs of this. Occurrences that associates with the IT-frenzy a couple of years ago and that was making fun of during the IT-depression, is now coming back. This time probably with more strength and to stay. For example, during the fair Consumer Electronics Show in Las Vegas recently, they showed some internet-connected ovens, smart homes, wireless connected digital-cameras etc.

There will be a time, in the near future, when we will not even find it worth mention the fact that every book in every library is marked with RFID, same as all the tools in garages, all wagons on trains, prisoners in prisons, suitcases on the planes, spare-

parts to cars, sweaters at Benetton and so on.... Who will comment today, the fact that a company has got a telephone or that a home has got electricity?

But we are not there yet. First there is a lot of hard work. Questions of standards must be solved, the tags must be a lot cheaper, the hardiness in the systems must increase and also (not least) the technical knowledge at big groups of technicians. Maybe we have to develop better middleware? For some applications we also have to solve the integrity-question. And not to forget, we have to be better in selling the use of RFID in a well marketing-established way.

We have then reached a step in the development – "ubiquitous RFID". You can translate this with "all-over-present RFID".

Today, a lot of myths are being spread about RFID. This is very unfortunate as it may create fear and unrealistic hopes (that will lead to disappointments). One example is that I have seen statements in newspapers about the new RFID-passes "can easily be read in 30 meters distance". These unlucky rumours are based on lack of technical knowledge at the medium but also in a RFID-trade that is not offensive enough when it comes to integrity matters.

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You are welcome to discuss this article further on www.rfidnordic.se

CONTETS:
February 2005

THE SWEDISH PRISON AND PROBATION ADMINISTRATION SELECTED THE CASH CARD PAYMENT SYSTEM

for remand prisons and institutions in Sweden.

Inmates can today use their income from work and studies to buy things in the kiosks at the institutions. But the Prison and Probation Service wants to avoid that inmates use cash in the remand prisons and institutions. This is the reason why the Swedish Prison and Probation Administration decided to start using a cash card system in the kiosks all over the country.

TracTechnology has supplied the cash card payment system to all of Sweden's remand prisons and institutions. This new system is based on RFID technology with passive and coded read/write cards which are read by proximity readers. These cards work better than cards with contact chips and cannot be decoded as the traditional magnetic stripe card. The cards can be charged with a certain amount and can be used as an "electronic wallet". When inmates buy something they simply hold up their cash card to a reader in the kiosk. The reader controls the identity and the balance and then money is

deducted from the card. It is also possible to be able to see a picture of the cardholder on the kiosk system monitor. Transfer of wages and the handling of the system are made centrally from the Swedish Prison and Probation Administration servers to all 85 institutions.

-The institution in Täby, May 2004, was our test, says Christer Boiardt who is project leader at the Swedish Prison and Probation Administration. Since then we have installed the system at one institution at a time. Not only do we avoid business with cash between inmates, but we also reduce the administration and handling. Inmates can only use their wages to buy things in kiosks and automatic machines.

THIS PAYMENT SYSTEM HAS REACHED SEVERAL POSITIVE RESULTS.

The owners of the kiosks have noticed that the cash card payment system has led to an increased sale. Every kiosk has been upgraded with a complete and modern sales system which facilitates the work. The goods are registered with bar-codes and bar-code scanners and a printer for receipts is installed. With the cashless payment system you do not need to handle daily receipts.
The inmates have also been positive

towards the payment system. The shopping goes much faster and the cash card is automatically refilled to the maximum limit after payment of wages.

- It was extra fun to win the Prison and Probation Service's purchasing since our RFID expert, Björn Holmer, is the "father" of this new system. The payment system is a complement to other applications adapted to remand prisons, security companies and institutions. We also think that there are many advantages with proximity technology for internal payment systems for other types of businesses, says Rutger Vannerus, MD TracTechnology. The owner is paid in advance since money is deposited to the card. Proximity cards are more reliable and easier to use than other solutions.

Internal charge cards reduce the handling of cash in businesses as camping and holiday villages and they replace change machines. Cash handling and maintenance of change machines is not of necessity. The same card can in addition to payment be used for access control. The readers with relays do not need to be connected to a computer on payment or entry. The users get "all in one card".

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BAUMER IDENT AUTOMATICALLY IDENTIFIES SAAB CARS

Cars produced by Saab Automobile at Trollhättan in Sweden, are highly sought after for many of their innovative features. Investments in Auto-ID now allow Saab to manufacture all of its numerous car models in a mixed flow environment within the same production line, whilst, at the same time, facilitating in an increase in the overall production capacity.

RF-tagg OIS-P

AUTOMATIC IDENTIFICATION

Through the use of automatic identification technology, every car manufactured by Saab Automotive is given its own unique identity from the moment its life begins. The "identity" is provided in the form of an RFID data tag, which accompanies the car through the whole production plant. This guarantees that the customers receive the car that they have ordered, down to the finest detail.
Saab has selected a Baumer Ident RFID system for operation within the body shop. The data tags communicate with the individual reading stations at long distance, via microwaves. The RFID system withstands disturbances from welding equipment, vibration etc.
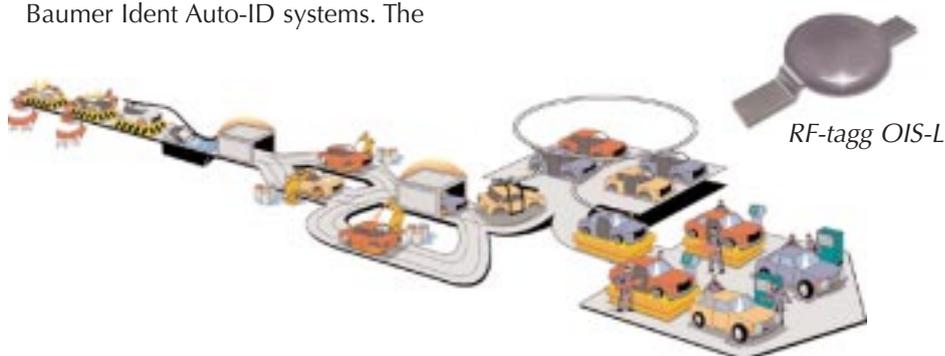Before the paint shop process, Saab exchanges the data tags for punched barcode plates, utilising another Baumer Ident identification system. Along the whole paint shop line, fixed mounted bar code readers identify the punched barcode plates.

In the final assembly area, each car is transported on a carrier with a data tag mounted underneath. Antennas, mounted on the floor in the middle of the line, identify the tag.
The use of Baumer Ident Auto-ID systems throughout the whole production line processes, have supported Saab in providing a modern, rational and flexible manufacturing plant.

MOST CARS IN EUROPE ARE IDENTIFIED BY RFID SYSTEM FROM BAUMER IDENT

Almost 70 % of all cars produced in Europe are manufactured by means of Baumer Ident Auto-ID systems. The systems are used along the whole main production line (body shop, paint shop and final assembly) as well as in the feeder lines etc.

OIS-P is the most frequently used system in the automotive industry but there are several alternatives in the wide range of Baumer RFID systems. Which system to be been selected depends on the requirements regarding e.g. communication range, environmental conditions, high temperatures and memory size in the tag. All Baumer Ident RFID systems are designed for the use in a rough industrial environment and they are insensitive to electromagnetic noise which is generated e.g. by welding robots.

The Baumer RFID systems are in operation in automotive industry in Europe e.g. Audi, BMW, Daimler Chrysler, Ford, Nissan, Opel, Saab, VW and Volvo as well as in several car manufacturing plants around the world e.g. Japan, Korea, South and Central America.

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RF-tagg OIS-L

SAFE TOOL HANDLES THE IN-PASS FOR A SAFER ENVIRONMENT AT BUILDING SITES!

Safe Tool, a company from Jönköping, has developed a simple and smart entrance system for building sites, based on RFID-technique from Texas Instruments. This means that every building worker gets an ID-card with a RFID-transponder that can be read on distance.

The individual just have to pass a RFID-antenna to be registered, the ID-card can stay in the pocket/wallet. The information will then be available locally on the working-place and will also be sent by GSM-connection to a central office.

If an accident should occur (fire or similar) at the working-place, it is possible to see directly which persons that are working in the area at that time. The safety-aspect is the most important area with this system but another useful area is to give the individual access to all the tool-rooms and containers, just by beeing present. As a complement to this entrance-system Safe-Tool has also developed a RFID-concept for marking of tools. With this marking it is very easy

to connect the entrance to the tool-room/container to whom the person is picking out a special tool.

The individual just have to pass a RFID-antenna to be registered, the ID-card can stay in the pocket/wallet.

Below you can see the electronics to the system and a part of the antenna around the door.

NOT WITHOUT PROBLEMS...

The RFID-parts was delivered by Electrona-Sievert AB that also was constructing suitable antennas to be mounted around doors etc. The antennas worked perfectly fine in the laboratory at Electrona-Sievert and at the laboratory at Safe Tools in Jönköping but after beeing installed at

the building site the reading-distance was decreased to just a decimeter and was not working as planned. After a lot of thinking and new tests they found out that a high-tension cable (40kV) to a tranforma-tor-station nearby was running just under the door/antenna. After moving the antenna the system was working just fine again.

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INTERMEC RFID READERS FIRST TO RECEIVE ETSI RFID CERTIFICATION FOR EUROPEAN USE

28 October 2004 – RFID equipment by Intermec Technologies has become the first RFID (radio frequency identification) equipment to comply with the new approved European standard for RFID at UHF. The European Telecommunications Standards Institute (ETSI) is an independent, non-profit organization officially responsible for standardization of information and communication technologies within Europe. Intermec's IF4 and IF5 RFID readers are compliant to ETSI radio standards for operation in Europe, both under the lower power 0.5W erp (EN300 220) standard and the newly established 2.0W erp (EN302 208) RFID standard, which permits higher RF power.

Based in Sophia Antipolis, France, ETSI unites 688 members from 55 countries inside and outside Europe, including manufacturers, network operators, administrations, service providers, research bodies and users. The former ETSI standard allowed only one channel of operation, which provided half the tag range compared to FCC regulations. The new standard provides for ten channels of operation with tag read ranges equivalent to FCC regulations.

"This standard has been developed with the widespread support of the RFID industry," said ETSI Task Group Chairman John Falck. "By introducing new concepts such as 'listen before talk' and 'frequency agile' techniques, the standard permits optimum use of the available spectrum. For the first time, it now will be possible in Europe for RFID at UHF to meet the needs of end-users."

The IF5 currently is being used by METRO AG in Europe as a part of its full-scale RFID rollout.
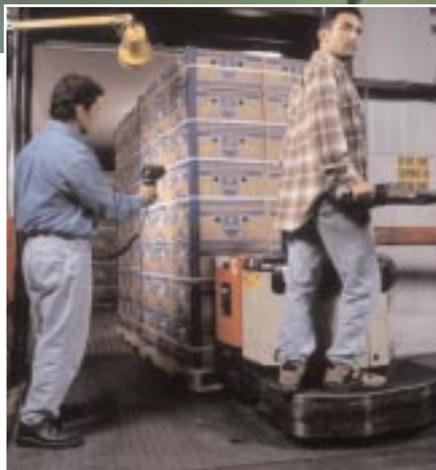
This achievement continues Intermec leadership in obtaining radio approvals, which started in 1999 with the first Passive UHF RFID Reader approved under FCC's Part 15 spread spectrum rules.

"RFID offers powerful capabilities for business process efficiency when used from one end of a supply chain to the other," said Intermec Vice President Scott Medford. "Intermec's commitment to global interoperability means global trading partners can access the benefits of RFID across territorial and frequency boundaries." "This is more than an intent to design to radio standards," said Intermec Chief Technologist Rene Martinez, who leads Intermec's RFID reader design team. "Intermec equipment has successfully passed ETSI's rigorous tests, which are conducted by an independent laboratory. Our equipment now is authorized for sale in a growing list of European countries."

RFID is a complement to industry's current bar code-based tracking systems, allowing companies to automatically track inventory throughout an entire supply chain. RFID automatic data collection typically does not require line of sight or manual scanning as do most bar code-based systems. For example, information from RFID-tagged cases on a pallet can be read automatically using fixed, mobile or handheld readers rather than requiring individual bar code scanning. Read/write RFID tags and labels can be reprogrammed to update the information on each tag as it proceeds through manufacturing and supply chain processes, providing new levels of up-to-date information for timely decision making.

FOCUS ON BUSINESS OPPORTUNITIES

RFID suppliers are using many good reasons to get companies to use RFID technology.

The most published and discussed argument is that of rationalisation of logistic flows for the users business. With that technology from just that supplier, the whole worlds transport economy will change. Probably yes, so it could be. The change of business will be bigger and better with a more balanced mixture of different RFID technologies.

The buyers – those who will use this technology and pay for it – they start to understand that RFID really can add positive effects. There is no one doubting the value of what suppliers expose, although many technical show cases are mediocre. It is a pity because many presumptive users just now are in the phase of "learn more and be convinced".

As supplier you have to take in mind – seat yourself in the chair of the board chairman or CEO - and think of what decision you should have taken, with the existing knowledge of new technology development – to understand the unforeseen consequences this new technology can bring to the business. It is most certain the same amount of negative effects doing it wrong as positive effects doing it right. Unfortunately technicians seldom are generalists with the wide range of knowledge and ability to make that type of analyse. They have the depth within their competence area. That is why they are experts, not CEOs.

All I meet today and talking RFID, are convinced of the excellence and reliability of the technology, of the flexibility allowed, of the new manufacturing processes that will give lower price of RFID tags and readers. But that is not enough to get the RFID wheel start rolling.

It is with RFID as with SMS – when they who have the options to use the service to get the effects they ask for, there will be a ketchup effect. What is missing?

All business has their processes, regardless if it is in the public sector or in the private industry. Almost all persons in leading position will propose those processes are documented. Take into consideration those processes are set up for the exciting business, to make it secured and of the best quality. Few enterprises have their demand of change described as processes.

Business processes with RFID as device looks different and now has to be set up. The starting point is actual business processes well known and recognised of the managers. Those processes have to be modelled to show where RFID comes in and the measurable effects it might have on business value.

The improvement is in distributing the right information, neither more nor less, to tight media or person in the right time. Everybody who has had a job in a production line can imagine the tremendous effect this can have – one of the largest time thieves in all business is "searching for information" and "wait for an answer".

The buyers – those who will use this technology and pay for it – they start to understand that RFID really can add positive effects.

The improvement is in distributing the right information, neither more nor less, to tight media or person in the right time.

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RFID IN THE SKIING TRACK

We are constantly finding new applications for the use of RFid. This time we are in the world of sports....

A big skiing competition, Folksam Cup, is arranged at Rudans Skiing Stadio in Haninge south of Stockholm on February 05-06. Arranger is IK Jordbänningarna in Haninge. This competition takes place 14 days before the World championship so the arranger hope that the swedish skiing elite will participate. The track is almost identical with the World championship-track so this will be very good training for them.

150 persons will participate in this race of 15 km. Every person

will race 5 laps on the track that is 3 km. This means alot of laps and alot of different times to keep track on. To make this possible, every

*RFid-transponder strapped around the ankles*

person gets a RFid-transponder strapped around the ankle. With help from 2 RFid-readers with 3 antennas it is possible to keep track on number of laps, timekeeping for laps and times on the finishing line. All this information is then shown on 2 different computers, 1 for the

timekeeping and 1 for number of laps.

The RFid-reader has coped tests of difference in timekeeping down to about one hundredth of a second which is approximately 10 cm!

This timekeeping-program has developed by Einar Eriksson from IK Jordbänningarna in cooperation with Electrona-Sievert AB that is representing Texas Instruments RFid.

The equipment has a very good durability and snow and rain is no problem.
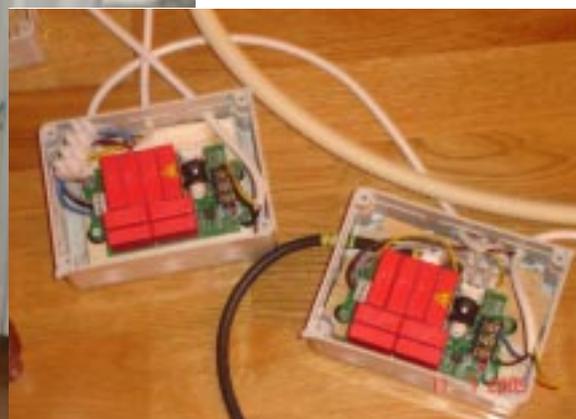
IT ONLY TAKES A CARD TO TRAVEL

All over Sweden, public transport companies are today involved in travel card projects. Many of them are also co-operating on with neighbouring regions, making cross-regional travelling possible on local transit cards.

Throughout Sweden, a large number of local and regional transit companies are today involved in public tenders, evaluating different travel card solutions. Almost all of them are based on the recent RKF technical standard for contactless travel cards, which seems to have served as an excellent catalyst to development in this industry sector.

According to a survey conducted by Card Magazine there is today a mixture of small and large travel card projects taking place in Sweden. Most notably, a number of co-operative procurement efforts have formed across traditional regional borders. There are still problems, though. One of them is putting technology in place – in time. Another is how to integrate railway traffic and local transit systems into a seamless ticketing solution.

RKF STANDARD A CATALYST
Around a year ago, it was hard to get

a good view of travel card development in Sweden. The local transit industry association SLTF (Svenska Lokaltrafikföreningen) and the card-focused sister organisation RKF (Resekortsföreningen) had for years studied technical solutions. But it was not until RKF published its findings in the form of an official recommendation for contactless travel cards – known as the "RKF standard" – that transportation companies had a proper documentation for realizing their plans. The member companies of SLTF have been quick to adopt to the standard, which calls for contactless smart cards equipped with at least dual ticketing interfaces: local ticket types and an electronic purse for cross-border travelling, respectively.

OLD SYSTEMS WILL BE REPLACED
Cards equipped with magnetic strips for swiping have been out on the

Swedish travel market for well over a decade, and several transit companies have also invested in proprietary systems based on smart cards. These system will likely have to be replaced when the RKF standard wins wider acceptance, which is expected to happen in the 2006 – 2008 time frame. By then, installation should have begun on a wider scale in many regions of Sweden. Several of the ongoing tenders seem to have set up a goal to write contracts by early 2005, but system deployment and verification will likely require at least a full year to finish.

CONSORTIUM IN SOUTHERN SWEDEN
In southern Sweden, the regional transport company Skånetrafiken is leading a procurement consortium incorporating transit companies from seven different regions. Besides

Skånetrafiken, members include Blekingetrafiken, Hallandstrafiken, Jönköpings Länstrafik, Kalmar Läns Trafik, Länstrafiken Kronoberg and Länstrafiken Örebro.

Mats Lundberg at Skånetrafiken tells that the aim is to have secured a contract by the end of this year, and to have installations in place and running between 2006 and 2008, depending on region. The procurement is headed by Skånetrafiken but the other member companies will have an option to get the same contractual agreements.

HAVE CO-OPERATED FOR YEARS

Except for Kalmar Läns Trafik, the companies in the consortium are already, since a couple of years, involved in a co-operation based on magnetic cards with an electronic purse usable for cross-border travelling. This co-operation also includes the Skaraborg and Älvsborg regional segments in the transport alliance Västtrafik, as well as Östgötatrafiken. Västtrafik, a group of transport companies covering a large part of western Sweden, is however involved in its own travel card project today, which we have already mentioned, and Östgötatrafiken has decided to make the coming investments alone.

DISTANCE-BASED FARES IN SVEALAND

Another procurement consortium has been formed by regional transport companies in the Svealand part of Sweden, spanning a east-westly zone straight across the country. The consortium has taken the name BIMS (Biljettmaskinupphandling I Mitt-Sverige) and consists of Dalatrafik, Karlstadsbuss, Tåg I Bergslagen, Upplands Lokaltrafik, Värmlandstrafik, Västmanlands Lokaltrafik and X-trafik, the latter running local/regional transit in Gävleborgs län in a region around and north to Gävle.

Bengt Andrén at Dalatrafik says that his company has set the goal to have a RKF standards-based system functional late 2006. Dalatrafik already has a contactless card-based system in place today, and it will likely have to be replaced, since the RKF standard will introduce several advantages over the current system. Besides cross-border travelling he refers to long-awaited features in the ticketing system such as true distance-based travel fares and the possibility to offering individual bonuses to returning, loyal travellers.

WILL INCLUDE RAILWAYS

A special problem arises when cards are to be used for train-travels across the regional borders. In the current situation, where travellers use a mix of magnetic cards and contactless smart cards, it isn't always possible for the carrier to read a card. The interim solution is to print a paper-based receipt for the journey and - in some cases – manually mark a card with the fare period. This is of course set to change when standardized RKF cards are introduced.

SOPHISTICATED SYSTEM

In the four most northern regions of Sweden, the regional transit companies have co-operated for a long time in terms of cross-regional journeys. It started already in the mid-1980's and the companies invested in magnetic card technology in the early 1990's. In 1998, Västernorrlands läns Trafik (marketed under the brand name "Din Tur") transferred ticketing to a contactless solution. Two years later, in March 2000, the company launched a completely new solution, based on contactless cards and a sophisticated fare system continually calculating "best price" for the individual traveller.

Sonja Andersson at Din Tur says that the system can be regarded a complete travel philosophy, very different from what is common today. The card contains a pre-programmed "normal journey" for the traveller. But fares are then issued individually, based on interaction and assumptions from the ticketing system – not on historical data dating back e.g. 30 days or more. Three different discount curves are being used, and the system has showed several possibilities for deploying interesting loyalty applications. One of them is traffic information sent as SMS-messages, another is monthly special gifts for loyal travellers.

THE UNFAITHFUL WILL HAVE TO PAY

- As soon as you are "unfaithful" and use your car you will have to pay a higher price, says Sonja Andersson. Two of the other transport companies in the northern Sweden, Länstrafiken I


Västerbotten and Länstrafiken I Jämtlands Län, have in the last three years invested in the same contactless technology platform as Din Tur. They have, however, not implemented the same type of ticketing

Contact
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DOWNLOAD RFID-PLATFORM FOR FREE!

Now you can build your pilot within days! Stockway, a member of EPC Global, recently launched a peer-to-peer technology based RFID software development platform. Trackway DP is free to developers and is available to download from Stockway's website, www.stockway.fi. With Trackway, developers are free to concentrate on meeting business process needs and are able to create vertical software solutions easily, using all forms of Auto-ID technology cost effectively. Today peer-to-peer technology is widely used in sharing music files over the Internet or in IP telephoning services. Peer-to-peer technology backed by an authentication process offers vast advantages to anyone wishing to share product information securely over the Internet. Any company can immediately start sharing information with its partners without the need for a centralized service structure. Trackway DP enables any
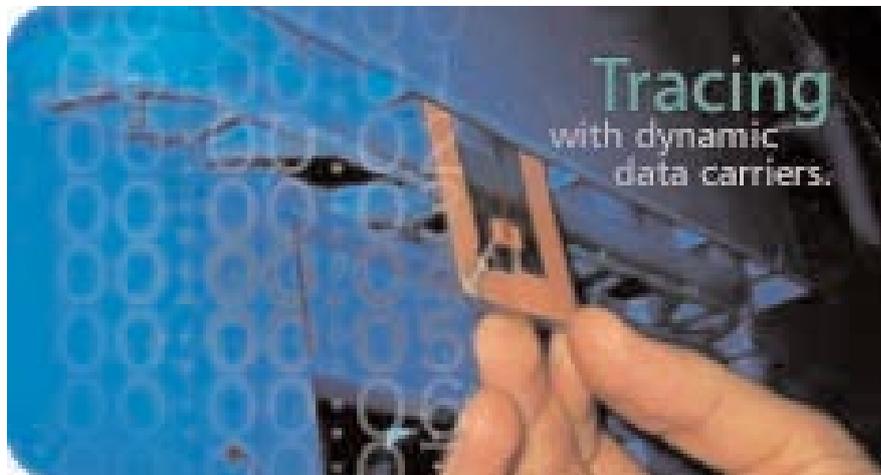
organization in the world to do this fast and efficiently at a low cost. Moreover Trackway is compatible with different readers, bar codes, hardware, and databases, an the DP integrates easily into existing business applications and IT systems without requiring architectural changes. Today Trackway is used for tracking and tra-

cing in Nokia and Stora-Enso. Download your Trackway DP here: www.stockway.fi

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SUN PROVIDES TESTCENTERS FOR RFID

With the use of RFID your products can identify themselfs and tell you where they are. In the value chain. On the storage shelf. On the loading platform. In the store. With this information in your IT-systems you enable a more efficient and profitable supply chain. Since you can get rid of some manual processes you can cut costs. At the same time you may introduce more and tighter controls, with redu-

ced shrinkage and improved delivery quality. And your customers will be ensured they are receiving your original products and not counterfeit copies. Sun Microsystems have used its leading position as IT-infrastructure supplier to create a number of test centers for RFID. The test facilities are aimed at reducing the risk for companies looking to invest in RFID Infrastructure by helping them

test and evaluate various configurations before investing in them. The Test Center is one part of Sun's overall RFID offering which includes Hardware, Software, Services, and Partnerships.

To learn more please contact
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STANDARDS FOR RFID

The chain from tagged object to a database has many links
- the object must have a unique identifier (UID)
- the UID must be stored in a tag
- the tag must have certain properties
- the tag must be able to talk to a reader (and/or writer)
- the reader must be connected to a control unit, which must understand what is being said
- the control unit must be in touch with the back-end system
- and so on

All of these links are candidates for standards. Some are critical, others merely desirable.

CURRENT SITUATION

EPCglobal has recently approved "generation 2" of its rules which cover numbering, storage format, air interface (including frequency), and some of the reader functionality. The specification is only available at the moment for EPCglobal subscribers. Some parts are also the object of a patent case. As soon as the IP problems are solved the specification will be submitted to the ISO process. EPCglobal is also aiming to develop standards for the remaining parts of an RF ID system.

The European Telecommunications Standards Institute, ETSI, has publis-hed a specification for the use of RFID in the frequency band 865 - 868 MHz. The specification is now making its way through translation, etc and will be published as a European Norm (EN) in March. Thereafter member countries (including Sweden) have three months to replace any existing conflicting national standards. According to PTS, a special permit is still required for applications in this frequency band in Sweden.

Within the ISO/IEC there are many standards covering RFID. Most are published and stable and apply from the number in the tag up to the rea-der. The one being most discussed is ISO/IEC 18000-6 which specifies the interface in the 900 MHz band, i.e. the one used by EPCglobal. Neither of the two tag architectures (A and B) is suitable for EPC, who have proposed an architecture C which will be a superset of EPCgeneration 2. The process is stalled as long as EPC cannot or will not release the specification to the ISO committee.

In addition ISO has recently begun an activity for standardizing the upstream interface to a reader

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