

# RFIDnordic.se

INFORMATION CONCERNING RFID IN SCANDINAVIA May 2007

## WHITE, BLACK OR GREY

**The competition within the building trade has for a long time been distorted and unfair. How are the serious craftsmen and building companies going to compete with the 'black' workers?**

This is a big and severe problem for companies, employees but also for the entire national economy. If 'black' work becomes accepted, they make it harder for the serious companies to survive, and if the tax-moral is hollowed, the tax revenues will lessen for the public treasury.

The 'black' jobs must be fought on every level with in the housekeeping business as well as in the commercial market.

### **SERIOUS COMPANIES GET ACCESS TO THE BUILDING ASSIGNMENTS**

Through advance notification, compulsory identification and accounting for the attendance, it will make it more difficult for unauthorized personal to be at the building site. Behind these ideas are ID06.

ID06 has been developed by the building trade in collaboration (BBIS) with; Elektriska Installatörsorganisationen EIO, Glasbranchföreningen, Maskinentreprenörerna, Målaremästarna, Plåtslageriernas Riksförbund, Sveriges byggindustrier och VVS-installatörerna.

Arcona AB wants to participate and influence the current developments in this area. From autumn 2006 to the winter in 2007, an electronic attendance registration pilot project was carried out on the build-

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ding site "Kungshuset" in Stockholm. Avista Time AB and Electrona-Sievert AB were commissioned to deliver a system for electronic attendance registration.

### PILOTPROJECT IN COLLABORATION WITH ARCONA AB

Arcona, in close cooperation with buyers, run all types of construction work in the Stockholm area. The projects are executed by sub-contracting to different area specific suppliers. To ensure Arcona's and their buyer's good reputation the company has high ethical standards on the contracts in their projects

In cooperation with the introduction of the construction industry's attendance system "ID 06", Arcona have joined Avista Time AB in a development project for RFID-registration with specially adapted for joint contracts with many sub-contractors without any own workers.

The project was carried out in Autumn 06 on a reconstruction project, "Kungshuset" in Stockholm, and basically automatically registered all workers part of collective agreements with RFID technology. All the information was stored centrally and kept available for government agencies, accountants and further control. The

System was also integrated with e-mail and text messages, making it an information channel for accidents or changes on site.

The project, has according to project manager Åke Eriksson and site manager Harry Rantala fulfilled all those demands and goals that were set up at the start of the project. The system has worked great. We haven't had any disturbances, forcing us to spend time on running and maintenance. We haven't needed to train any personnel and have been able to withdraw attendance records by the day, week or month.

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# ADAGE AIMS AT INTELLIGENT LOGISTICS

**Adage Solutions has recently closed 3 prestigious deals for intelligent logistics systems based on RFID technology: Englundshus AB, SSAB and Polarbröd. The increase in order stock and the interest around Adage's solutions suggests that intelligent RFID is well on the way to be established within the logistics field.**

Englundshus AB in Kalix will be the first Swedish construction company to use RFID technology. The company supplies prefabricated wooden houses to the whole Swedish market. The houses are delivered in blocks where each block is tagged with RFID. An underground antenna located at the warehouse exit gives an automatic update each time tagged goods leave the area. The system is integrated to existing business system, granting that the system will flag for any item missing in the particular order and thereby granting Englundshus 100% control over the deliveries. Englundshus calculates that the total savings after introducing the system will be 2-4% of the total turnover, which provides a very good Return of Investment. Besides the positive economical results the trust among the customers in Englundshus as a contractor is increased by implementing the system.

Polarbröd has chosen to mount a tag on the pallets that measures and logs a combination of humidity and temperature. As the newly baked bread leaves the oven it is immediately placed in the freezer and the bread needs to be frozen during the whole transportation in order to guarantee the best quality possible. Through the

use of intelligent RFID tags the logistic process will be simplified and at the same time a receipt is created that the bread has been treated within stipulated limits during the transport. The implementation of intelligent logistics serves thereby two purposes: quality insurance of delivery as well as of the products.

As earlier published in RFID Nordic News, Adage has also equipped the SSAB Steel Shuttle (train) with intelligent tags. The Steel Shuttle runs

quality of the ore loaded on the particular car. In addition a spin-off has been created through the SSAB deal: Banverket now orders RFID readers in order to be able to collect data from the same trains but for their own purposes. There are plans to extend the system to include tags fixed on the axis of each car measuring vibrations, in order to create an automatic read of the status of axis and bearings of the cars.

Adage's mission is to deliver complete logistic systems including hard- and software, integration to existing IT systems and support. Due to the fact that Adage's RFID system is based on modules the system is easily scalable and it is simple to adapt the system to the specific functions that each customer requires. Examples of module based functions are measuring and logging of humidity, vibrations, chock, G-forces, temperature or GPS/GPRS modules for positioning purposes.

Intelligent RFID seems to have an increasingly important future within the logistics field, giving increasing possibilities as new demands and specifications are continuously being developed. Adage continuously develops modules containing new customer specific functions in order to meet the markets growing demands.

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between Luleå and Borlänge as well as between Oxelösund and Borlänge. The purpose is to identify the railway cars as well as quantity and quality of the ore transported. Fixed mounted readers are positioned at strategic locations along the railway track, giving the position of where each car is positioned as well as quantity and

# RFID IN CONTROL AT VOLVO PROVING GROUND



**Everyone knows that safety is a hallmark of the Volvo brand. Safety permeates both the company's products and its business operations as a whole. Safety is also very much in evidence at the Volvo Proving Ground, Hälleröd. For more than twenty years, a great deal of thought has gone into how to improve safety at the facility.**

In 1987, we were commissioned to investigate the technical systems that were then available for identifying vehicles within the track system. The aim was to provide automatically controlled access to the tracks via barriers, and to use a computer system to log and indicate which tracks the vehicles were on. This was desirable not only for safety reasons but also to ensure that the tracks were utilised more efficiently.

## REQUIREMENTS

The specification was that the system should be able to cope with:

- An outdoor environment, with big differences in temperature, wet surfaces and very frequent road-salting in winter.
- ID zones separated by long distances from one another and from the central control
- All types of vehicle: cars, trucks, buses and construction equipment.
- No manual activity by the driver.
- Identification at normal vehicle speed, minimum 30 kph.

A further important factor was that the proving ground is located in one of the areas of Sweden most affected by thunderstorms. This had to be taken into account as well.

## INVESTIGATIONS AND PILOT PROJECTS

At a fairly early stage we realised that RFID was the only technology that had any chance of working in practice. We began by running a pilot project with an RFID system in the 2.4 GHz band. This worked well, until it began to snow. At that time, 2.4 GHz technology was not suitable, since

rain and snow affected its operation. But we had learned a valuable lesson. A pilot project must always be run under all types of actual conditions.

We settled instead on an RFID system in the LF band (132 kHz). One major advantage of this approach was that it simplified the reading of the RFID tag. Since we could use electrical cable as the antenna, laid out in a loop and sunk into the asphalt, we were able to lay out the ID zones to suit the actual arrangement of the roadway with regard to access and exit points. One problem that we encountered was the speed, but, with a few creative modifications to the basic settings of the electronics, we were able to perform detailed readings at speeds above 90 kph.

## FROM CONCEPT TO DELIVERY IN SIX MONTHS

In 1989, the project progressed from pilot scheme to roll-out of a turnkey system. The delivery involved a complete traffic-management system:

- An RFID system with identification in 14 ID zones
- A PC solution for control and monitoring, that was also linked to the Volvo business system
- Communication with ID areas using broadband
- All electrical work, camera surveillance and ground installation work
- Documentation and training.

Our approach was successful because we did not regard RFID as something "magical" or strange. We adopted the same methodology as for any other automation and IT system in a production environment. RFID was simply a

complex subset of a complex project; no more, no less.

## WHAT HAS HAPPENED SINCE?

With minor improvements, the system continued to be used in its original form until 2005. Volvo then invested in a new track at the facility, with eight new ID zones. The original electronics were replaced at the same time with up-to-date equipment, and the PC application was updated with a modern interface, operating system and a host of new functions.

So today, almost 20 years after the original delivery, Volvo still has a traffic management system that is the equal of any in the world.

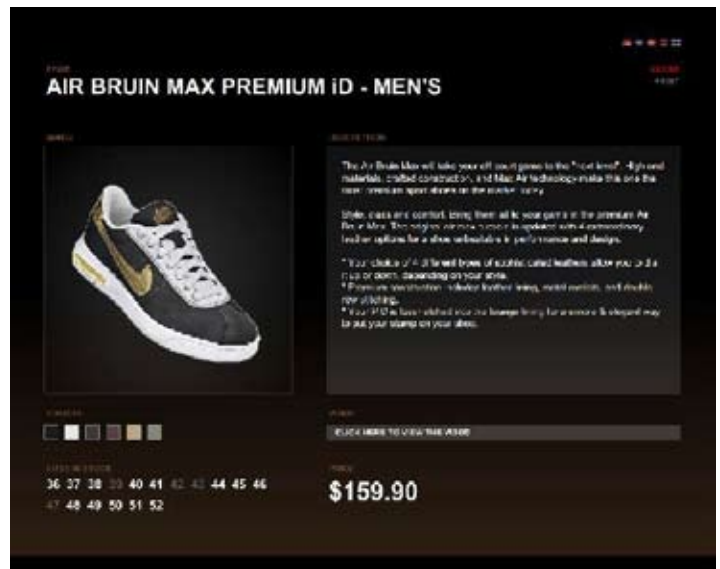
## TOWARDS NEW GOALS ...

We have run a pilot project using GPS in real time to establish whether it is technically possible to visualise not just that a vehicle is on a certain track, but where on the track the vehicle is. This represents a major advance in safety. For safety reasons, it would be really useful to install a function that triggers an alarm if a vehicle runs off the track or makes an unauthorised stop. The pilot project has produced some highly interesting and positive results, which we will now proceed further with. The combination of RFID for access control, GPS for location and an alarm for extraordinary events, is unbeatable.

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# RFID- TECHNOLOGY BEHIND SHOP INFO

In the previous issue we introduced SHOP ON, a self-service register, developed in collaboration with Svensk Handel amongst others. The next product in this series is SHOP INFO, an information terminal based on the RFID-technology that's been developed by HINK Studio and Electrona-Sievert together with Svensk Handel.



It is as simple as it is genius. An RFID-marked product is placed on, or shown to, an RFID-antenna and immediately additional information concerning the product will show on a presentation screen. This can be aimed at almost anything, for example shoes, electronics, chemicals etc.

The information can take many expressions and be presented as video clips, texts in any chosen language, as graphic illustrations, color simulations, links to websites or maybe show the stock in hand. If you connect a printer you can get paper prints with

the information, pictures of the product, technical data, user directions and much more. The possibilities are endless.

"We see many exciting fields of application thanks to the simplicity of this system, says Gunnar Ivansson conceptual architect at Electrona-Sievert. Just imagine being able to get the information you need presented in different languages, watch an instructional film or maybe the products commercial, see the security data or why not bring home a picture of those nice, trainers to show the grandkids. We also see

the possibilities to, for example, via email being able to send the information on and in that way getting rid of all the paper handling concerning manuals, instructions and so on. We're just in the beginning of this exciting development of the information stands of the future."

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## THE VERY FIRST IRANIAN RFID CONFERENCE HAS BEEN PERFORMED IN THE CAPITOL OF IRAN, TEHERAN.

**Does this appeal to you? To penetrate the Iranian market?**

**There are two different markets in Iran one for pure Iranian domestic products and one for imported products. Some is only purchasing Iranian products and others are more interested in the oversea product lines. On this particular conference most of the products was from other countries.**

On the conference the value and forecast given at the RFID conference was that the investments in Iran was estimated to 50 million Euro in the RFID technique only for the coming year. Now there is a question, are they ready for this new technology?

The amazing thing is that there is a high expectation and also know how from many of the delegates at the conference. There is also a high degree of expectation on what this type of techniques can do for the country. One question is, can they import what they want?

The overall feeling was that this conference is pushing the development of the RFID development in Iran. They describe the RFID area as one angel of the IT triangle of in the high technology area.

RFID Sweden was invited to speak about the RFID technique in general and in a limited way demonstrate the high tech possibility with a couple of RFID demonstration systems. Due to the fact that some of the participants had no experience from RFID project, RFID Sweden also had to give some testimony from projects done, among others the airline projects in Confidence International and other logistic areas.

A surprise for Lucas Ahlstrom was that they wanted a presentation on smart-cards and electronic passports without any prior notice before the conference, anyhow this went well.

The Engineer Mehdi Hazrati made a speech about the standardization in the electronic passport and ID-card sector, or as the product is called in Iran, the National identification card. Mr Hazrati has been working in this sector for more than three years in EU focusing on this type of technology.

Dr. Sepehri was responsible for the technical performance of the conference.

It was well organized with a number of delegates and displaying technologic companies.

The second day RFID Sweden had a two hours long work shop with a big audience. The attendants was highly interested and had many questions regarding the RFID technology.

Dr. Zargar was the overall reasonable manager for the whole conference and a big audience was present at bout days.

There is already a number of companies established in Iran that is, in accordance with there own statements, already performing project work in the area.

In conclusion – the market is there – but – there is not an easy task to get established on the Iranian market, you need a good network to success on the Iranian market.



*If you need more information regarding this conference please visit <http://rfid-conf.ir>*

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# RFID WITHIN THE AUTOMOTIVE INDUSTRY FROM AN ODETTE SWEDEN PERSPECTIVE

**During the last two years RFID has come up as a major topic within automotive e-Business associations. Within Europe such activities are handled by Odette International and it's "NO:s" (member organisations like Odette Sweden). Much of what is going is being coordinated with similar bodies in the US and in Japan, through AIAG and JAMA/JAPIA.**

It is worth mentioning that RFID is not new to the automotive industry, the technology has been in use in closed loops for many years and automotive has been and probably still is the largest market segment for RFID products.

What are the applications where automotive could see a potential Business Case? For the moment the list is as follows:

- Returnable container tracking
- Support systems for manufacturing processes
- Parts marking
- Location and distribution of finished vehicles
- Parts marking and counterfeit protection

## RETURNABLE CONTAINER TRACKING

Standardisation within automotive bodies is a step by step process, for the moment there has been a focus on returnable container tracking.

The German automotive industry has made a very detailed pre-study which is now in transition becoming a European and later even global automotive recommendation. On the European level within Odette the work has been concentrated on finding a solution for the use of ISO 18000-6C tags and there is yet not any final result available. There are still issues to be resolved; the most important one is about how to identify an individual container and also about how to combine such a solution with available RFID technology.



Some large companies have started early by making pilots for returnable container tracking based on EPC tags,

results until now differ. Some want to continue evaluating the EPC track while others have the view that EPC does not fit automotive information needs in manufacturing and in logistics processes. It is also pointed at that we would probably have to use paper based processes (Odette Transport Labels) in parallel to RFID for a long time.

There are also differences in views on what the returnable container id should look like. Some say that the "License Plate concept" would be enough while others are asking for adding another code into the id to link to a specific container pool or to a certain type of container.

Once this could be agreed we would then have to look into what kind of technology that could work together with our information requirements. As long as we are talking about active tags there is not a big issue about using them for returnable container identification, most of the necessary standards and recommendations are in place.

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The case is somewhat different when it comes to passive tags. Automotive requirements might be somewhat more complex than what you would normally find within the EPC community. Automotive information entities for Auto Id are mainly based on alphanumeric codes, like ISO Data Identifiers, this also means that more memory is needed in the tags.

Within Odette we believe there is a temporary solution within reach that could be used for "License Plate" data in 18000-6C tags. For more complex returnable container identification schemes as the ones mentioned above, we need 18000-6C tags with more than 96 bits memory.

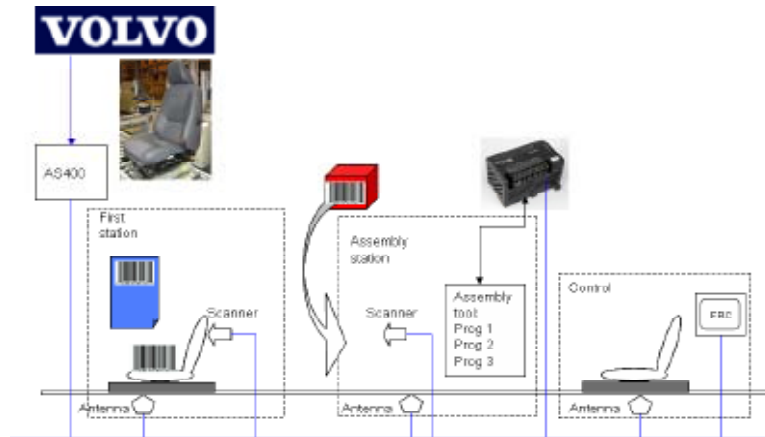
When and how such tags with more memory space will be available is something we do not know for the moment within Odette but we are working on finding out more about this.



### LOCATION AND DISTRIBUTION OF FINISHED VEHICLES

Many companies in automotive have recently invested in locating systems and this is still in progress.

Odette is now creating a project team to work on a recommendation for the tracking of finished vehicles. The scope would be to define how RFID could be used for identification of vehicles. This might be a somewhat less complex issue than returnable



container identification since the identification scheme for finished vehicles is in place and well accepted (the VIN number).

### OTHER APPLICATIONS

As already mentioned there is also other application fields listed but there is no real work going on for the moment. New work items will be taken up when there is enough support from the users.

### SWEDEN

Several of our member companies in Odette Sweden are involved in pilot projects in returnable container tracking and in locating and distribution of finished vehicles. Some examples were presented in our last seminar, presentations are available at <http://www.odette.se/arkiv.asp>.

RFID within the supplier industry Odette Sweden in close cooperation with companies LEAR, Plastal, Nolato and Fehrer has initiated a joint project labelled as "RFIDNU". The project is funded by project members together with NUTEK, a governmental agency for the promotion of SME:s.

The long term scope is improving business performance at suppliers,

short term scope is preparing for large scale usage of RFID through learning, pre-studies and possibly also running pilot projects. What we in the ned will be able to do terms of live pilots is depending on results from the pre-study. We will also have to wait and see what kind of active support IT providers and Technology providers would offer. Such actors have been invited to join as observers, we already have group of observers, some of them even took part in the Kick off meeting.

The pre-study will be undertaken by Auto Id-konsult and we are also bringing the IT University in Gothenburg into the project.

### LINKS

<http://www.odette.se/>  
<http://www.odette.org/>  
<http://www.aiag.org/>  
<http://www.japanauto.com/>  
[http://www.japia.or.jp/public/jsp/japia/g\\_index.jsp](http://www.japia.or.jp/public/jsp/japia/g_index.jsp)

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# UHF SYSTEMS ARE COPING WITH THE CHALLENGES OF RADIO FREQUENCY IDENTIFICATION (RFID)

## Green light for RFID – also on metal

The RFID Technology continues to gain ground – economical tag prices for long range capability as well as comprehensive standardization provide the necessary prerequisites for broad application, also in the area of logistics. Many new users will have to master the considerable technical difficulties during the introduction of the new UHF technology, however. Nevertheless, manufacturers have given the go-ahead, since convincing solutions exist for many of these challenges. This is especially the case for the application of RFID tags to metal surfaces.



*The Simatic RF 640T tag can be directly mounted on metal*

RFID systems have stood the test for many years, as control components in production and as contactless Smart Cards. Up until now, however, systems have been subject to compromise between the cost of the data carriers (tags) and the reading distance from the tag to the RFID antennas: the tags were either too expensive or only short reading distances could be realized. The new UHF systems (Ultra High Frequency) offer a decisive advantage here: They permit reading distances of up to 5 - 6 meters, yet they allow the use of low-cost ("Smart Labels"), which can be applied to paper labels and can be purchased at

prices beginning at around 0.10 euros. As a result, the area of logistics is offered the possibility of new applications, which up until now did not appear profitable owing to the high cost of tags. Admittedly, UHF technology also has its pitfalls. Its first users discovered that environmental parameters substantially influence reading quality. The influence of the material upon which the tag is placed has an even greater influence, however. Two important properties of UHF waves are relevant here. On the one hand, UHF waves are partially reflected during the changeover from one material to another (from air to metal, for instan-

ce). On the other hand, the degree of penetration varies greatly depending on the material used.

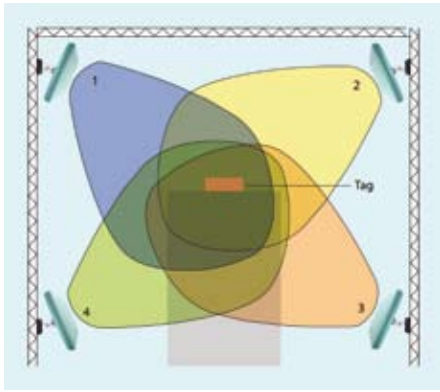
## TAGS CAN BE APPLIED TO METAL

The reflection of UHF waves, particularly on metal, leads to two effects that cause considerable problems in practice. The first effect is that metal can shield the RFID tag, so that it can no longer be "seen" by the reading system. When a pallet has been loaded with at least 3 microwave ovens in 3 rows and stacked in 3 levels, then the microwave oven in the middle is completely shielded by the metal housing of the other units. That means: one tag on the oven in the middle cannot be read. Similar effects occur when a pallet carries mixed packaging. In such cases, blister or vacuum packaging made of metal could cover other items in such a way that their tags can no longer be recognized. In order to solve such problems, various approaches have been developed.

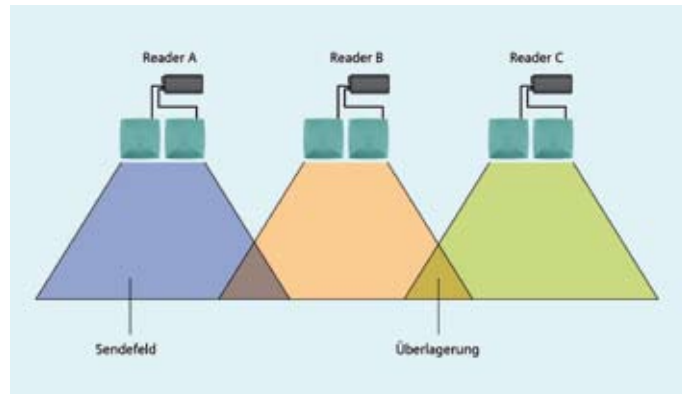
- Through the defined positioning of the RFID on the "sweet spot" (the point of maximum reception and thereby maximum reading rate), shielding can be prevented. However, this requires a certain amount of discipline when the pallets are being loaded, which is not always a possibility.

- A second approach deals with attaching the RFID antennas in connection with the cyclical switchovers of the transmitting antenna. One antenna is used here for each reading

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During adverse environmental conditions, four radio fields are created by the cyclical switchovers of the transmitting antenna



The long range of UHF systems leads to the overlapping of radio fields. Listen Before Talk provides a remedy  
RFID technology can make logistics processes more efficient when several tags can be read at once via batch detection

process to the transmitter, while all other antennas are used as receivers. In the next reading cycle, a different antenna is switched on as transmitter. In practice, this means that the goods are not just detected by one frequency field, but are virtually detected by four different frequency fields having differing alignments.

The second effect occurs when the RFID is directly mounted on metal objects. In this case, a sort of short circuit occurs, caused by the dipole characteristics of the tag antenna. As a result, the RFID chip is no longer being supplied with sufficient energy. This RFID tag then remains hidden for the reader as well. By now, good solutions for this are available as well, such as the "flag tags". In such a case, the antenna of the tag is not affixed planarly, but rather stands out at a 90° angle from the metal surface due to a fold in the label. In this way, reading results can be significantly improved. Special metal tags are mechanically more rugged, however. This type of antenna chip system is especially "adjusted" for mounting on metallic surfaces. Since the bottom of the tag itself is fitted with metallic foil for maintaining the required, defined distance from the antenna to the metal, these tags can be universally used – for instance, on containers, barrels, or lattice boxes. A disadvantage here is the higher price, which is attributable to the more complex manufacturing process and the higher cost of materials.

A similar problem – though having different physical parameters – occurs due to liquids. When a conventional Smart Card is directly attached to a

bottle of water, the reading rate is reduced drastically. The steps taken to remedy the situation are similar to those employed for metal: the use of flag tags or specially set data carriers, as well as defined application at a specified position.

#### DATA ACQUISITION "IN ONE GO"

A special advantage of RFID applications in logistics lies in "batch reading". The idea is not to read each RFID tag in the field individually, but rather to read many tags "in one go". Batch reading ability is not a new attribute as such, but in logistics there are special demands regarding the possible number of tags and the speed of reading. Difficulties here lie with the technical influence that the tags have on each other, as well as with the necessary communications protocol.

With the new RFID standard "EPC Gen-2", however, for which some products have recently become available, these requirements have been met, as demonstrated by the first practical tests. Although the theoretically possible maximum number of simultaneously readable tags has yet to be reached, well over 100 tags can already be read simultaneously under realistic conditions. Although the tags cannot be positioned densely together, small gaps between tags suffice to achieve acceptable results.

Still, action is needed in the area of "dense reader environments". Since the UHF systems have a long range, and since the authorized frequency range in Europe is also used by other radio systems, the result is disturbanc-

es between the systems – for example in large warehouses. In the European regulations of the ETSI (European Telecommunications Standards Institute), the "LBT procedure" (Listen Before Talk) was specified for this reason. First, the RFID system must check whether the selected channel is already in use, and it may only transmit on the channel when it is not being used by another system. Moreover, the RFID reader must again leave the channel after a comparatively short period of time. This concept functions well for a few devices operating in tight spaces. LBT reaches its limits, however, when a larger number of readers (10 stations or more) is involved.

Solutions are currently being sought by various standards committees in order to also be able to use a higher number of readers with a minimum of space. The industry has already submitted a number of sustainable proposals. This subject is currently under discussion in the EU Commission, together with representatives from public authorities, politics and industry, in order to find legal guidelines acceptable to all parties involved.

In summary, manufacturers have meanwhile been able to remove a series of technical hurdles. When operating conditions are controllable – primarily meaning the material with RFID tags or the positioning of the tags – then higher reading rates are no longer a utopian idea. For the challenges that remain, there are interesting innovations and proposed solutions, which provide anticipation of further developments for RFID.

# FIRST EVER APPAREL RFID SOLUTION CENTRE OPENS

**ADT, Salpomec and UPM Raflatac today announce the opening of a unique Apparel Radio Frequency Identification (RFID) Solution Centre. This new facility demonstrates how RFID can significantly enhance supply chain management and in-store retail operations for garment manufacturers, brand owners, retailers and logistics providers.**

"Optimisation of the supply chain is a vital competitive factor for both apparel manufacturers and retailers alike," says John Smith, Vice President of Retail Sales for ADT Europe, Middle East and Africa. "Brand owners want to prevent counterfeiting, manufacturers want to save time and money by streamlining their processes, while retailers seek to improve their in-store and point of sale activities. The whole supply chain has to be transparent and effectively managed to truly help reduce out-of-stock situations and increase sales."

The Apparel RFID Solution Centre, based in Lahti in Finland, is the first facility of its kind anywhere in the world. It is a joint venture between ADT, Salpomec and UPM Raflatac, three world class companies that have been pioneering RFID implementation with early adopters in a number of countries. The Centre brings together all the elements of an RFID enabled apparel supply chain to demonstrate a complete end-to-end solution. This includes source tagging, automatic goods reception, an RFID-based sorting system, replenishment and store inventory management and point of sale analytics and security.

According to Jarkko Kuusisto, Chief Executive Officer of Salpomec: "In increasingly global supply chains, apparel manufacturing often takes place on one continent with the goods being sold in an entirely different location.

This increases the demand for up to date and accurate information throughout the entire supply chain. RFID can deliver this by offering increased levels of information and control."

"By hosting customer visits to the Centre, we can demonstrate that the most advantageous point in the supply chain to attach an RFID tag to a garment is the manufacturing stage," explains Samuli Strömberg, Vice President of Marketing at UPM Raflatac. "In this way, it can include information for the whole supply chain right from the beginning, bringing value to all participants in the chain. In addition to tracking and tracing capabilities, RFID offers a means of brand protection and enhanced marketing opportunities."

The Apparel RFID Solution Centre opened to visitors at the beginning of May. In its first year of operation, it is expected to host visits by up to 100 garment manufacturers, brand owners, retailers and logistics providers.

Visits can be arranged by contacting [rfidsolutioncentre@tycoint.com](mailto:rfidsolutioncentre@tycoint.com), [salpomec@salpomec.fi](mailto:salpomec@salpomec.fi) or [mikko.immonen@upmraflatac.com](mailto:mikko.immonen@upmraflatac.com).

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## NOTES TO EDITORS

### ABOUT ADT

ADT, part of Tyco Fire & Security, designs, installs and services electronic security systems for retail, business and government and home intruder protection and detection systems. Sensormatic® is a leading brand of ADT. In Europe, ADT's products include alarm systems and integrated security applications that link access control, CCTV, electronic article surveillance and source tagging systems. They are used to deter thieves and protect people, goods and property.

### ABOUT SALPOMEK

Salpomec Oy is a Finnish company providing logistic solutions for the garment industry. Over twenty years ago Salpomec introduced the Magic Tube, a revolutionary trolley-less garment handling system. Today, Salpomec offers a complete solution for all garment handling needs, including production systems, sorting, laundry sorting, storage, mezzanines and racking, steam tunnels and bagging machines with the needed intelligence. Salpomec has customers in over 35 countries on five continents, making us a true global expert on garment handling. For your complete logistic solution, please go to [www.salpomec.fi](http://www.salpomec.fi)

### ABOUT UPM RAFLATAC

UPM Raflatac is a world-leading supplier of self-adhesive label materials for a wide variety of needs in product and information labelling. In addition, the company is at the global forefront of the development and high-volume production of HF and UHF radio frequency identification (RFID) tags and inlays. UPM Raflatac has around 2,500 employees and sales of approximately EUR 1 billion in 2006. The company has a global service network consisting of 11 factories on five continents and a broad network of distribution and slitting terminals and sales offices worldwide. UPM Raflatac is part of UPM. Further information is available at [www.upmraflatac.com](http://www.upmraflatac.com).

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