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INFORMATION CONCERNING RFID IN SCANDINAVIA Nov 2007

FINNISH FASHION COMPANY NP COLLECTION

## IMPLEMENTS RFID TECHNOLOGY WITH UPM RAFLATAC UHF TAGS

**NP Collection has become the first fashion company in Scandinavia to pilot an RFID-based total supply chain solution.**

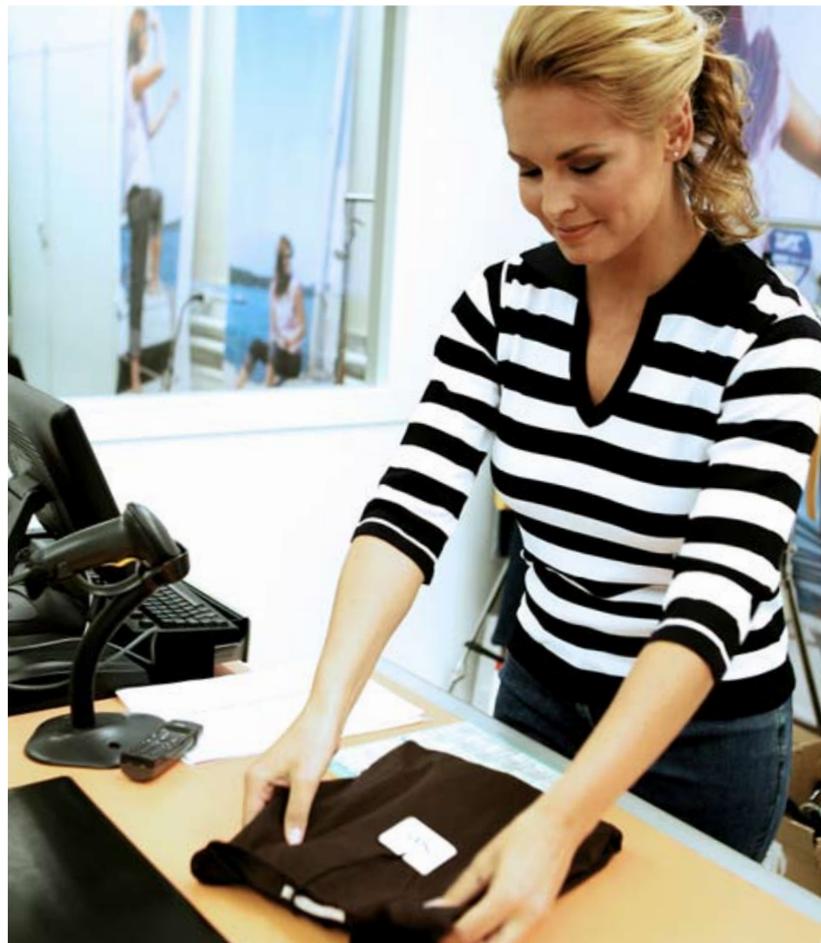
The pilot started in June 2007 with the aim of improving the efficiency of the company's supply chain logistics. As NP Collection is in the process of opening its own chain of stores and expanding its global purchasing network, it needs a powerful supply chain administration tool. The RFID tags are attached to NP's garments at the manufacturing site to enable tracking and data collection throughout the supply chain. In the first phase of the pilot the garments are RFID-tagged at a manufacturing site in Europe. Starting January 2008, garments manufactured in China will also be tagged, enabling NP Collection to track all of its garments with RFID technology.

With RFID technology, NP Collection is able to follow each stage of the supply chain in real-time, which results in significant cost savings and increases accuracy both in logistics and manufacturing. The company knows exactly what garments are being manufactured, which are on their way to Finland and which retail shops are expecting shipments.

In addition to tracking the supply chain, NP Collection's item-level RFID solution covers the receipt and dispatch of goods, inventory management and point-of-sale functions. Now the company can even carry out daily inventory to see what products are on the shelves and which require replenishment. In retail shops, real-time product information can be used to plan shelf space usage before the goods have arrived.

"We've been following the development of RFID technology for many years. By this spring we'd become convinced that now is the right time to implement it," says Mr Risto Rosendahl, Managing Director of NP Collection. "Thanks to our state-of-the-art RFID solution, the product handling rate has improved tenfold and human error has been eliminated. We expect to reach ROI in six months."

The RFID supply chain solution used by NP Collection is provided through collaboration between several compa-



nies. The integration services are provided by the Finnish companies RDN, Salpomec and Vilant, while logistics functions are supplied by Itella. UPM Raflatac is delivering the RFID tags, which are converted into labels by SML. The readers and antennas are supplied by ADT.

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# WOLIS WIRELESS ONLINE LOADING INFORMATION SYSTEM

**"FOR THIRTY YEARS I HAVE BEEN BLIND!"** Olle said a few days before his retirement. Olle has been driving a loader in the mine for over thirty years. He was of course one of the persons who carried out the pilot tests of the loading system Wolis at the mining company LKAB.

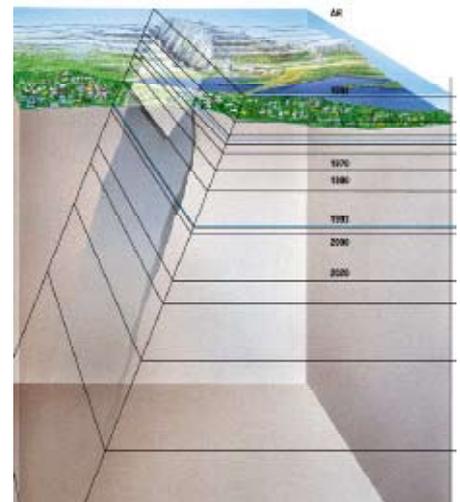
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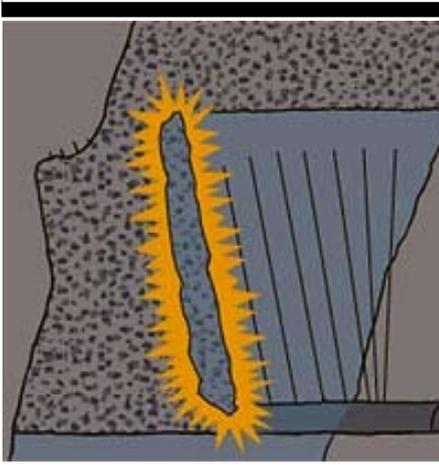
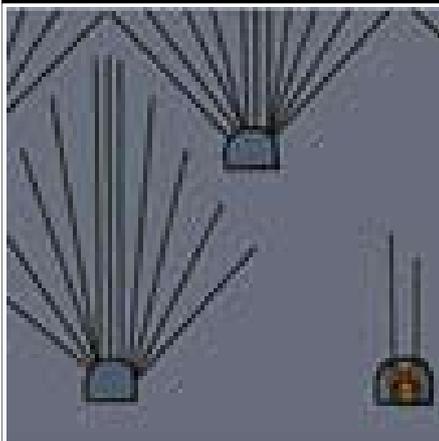
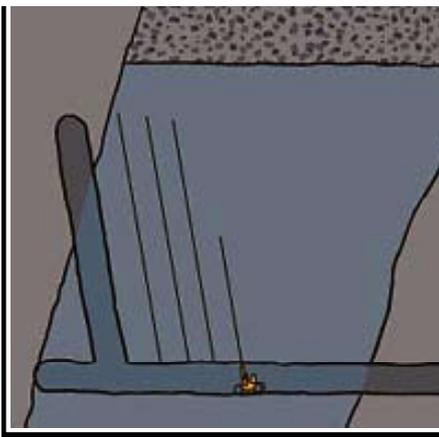
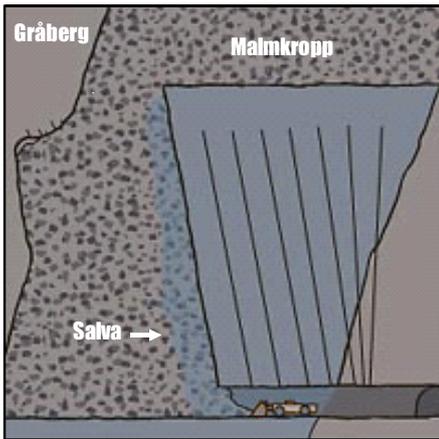
25 to 30 loaders are rolling in triple-shift in Europe's largest and smallest iron ore mines. These machines are driven by skilled personal that manoeuvre the beasts in narrow drifts at high speed. The largest machine weighs 80 tons and has a bucket capacity of 25 tons. Some rumours say that the record is in excess of 50 tons, yet this has not been confirmed, but it is not totally unbelievable.

Quarrying, which started with an open-cast mine at the end of the 19th century, is today completely based underground. This means that tunnel systems are created through the ore body where drill rigs drill upwards, with up to 60 m long holes in a fan-shaped pattern.



Each pattern contains 10-14 drill holes with a diameter of approximately 15 centimetres. Every drill hole is filled with a large charge of explosives. Five

CONTINUE >>



to ten charges are blasted every night, which gives 8-12 thousand tons of iron ore per charge. After the blasting, loading is started from the blasted patterns. This continues until all the iron ore from the pattern has been taken out.

Personnel in the leading position has for a long time had the ambition to make the loading personal more involved in the whole quarrying process and not as it has been for a long time, partly isolated units, where decisions are made based more on feelings than on facts. The ambition has throughout the years been successful in many ways, but unfortunately failed in some parts.

Attempts to gather information about the process has been made. The numbers of buckets loaded from the blasts in the ore body has been counted manually. This gives a good total for the whole loading, but also, this method can differ a lot between separate loaders. Information has also been spread in many ways. "Böne"-möten, that's what the morning meetings are called, has been held. Papers have been spread out among the drivers so they shall have enough information. Unfortunately this method doesn't work because the drivers need updated information.

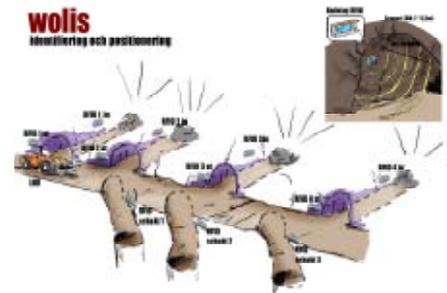
The next step was to weigh every bucket by measuring hydraulic pressure and transform that to weights. This has been done with a so called bucket scale. The scale has been connected to a memory stick and with the help of the driver; data has been transferred to the follow-up system at the end of the shift. The driver has at the same time been given access to information from the follow-up system so that he is able to create a survey of how far the loading work has progressed.

"Information shall be collected where it's created and be delivered where it's needed"

The solution in this case is that information about loading are collected

both from the loader and the follow-up system and delivered to the drivers in the loader where they shall make their decisions according to the rules that have been agreed upon. This is where WOLIS steps in.

Every drift (loading place) and shaft (unloading place) has been provided with RFID tags. The tags have been connected to the walls and the electronic identity has via the follow-up systems been coded to loading- and unloading places known by the follow-up systems.



The figure above shows schematically how RFID tags has been placed in the drift system.

**Every loader has been provided with a:**

- RFID reader which in high speed can decide the loaders logical position.
- Loader computer which through a local network in the loader can communicate with the RFID reader through TCP/IP. The computer also has a radio network (WLAN 802.11G) in order to through TCP/IP be able to communicate with the follow-up systems





The bucket scale has been connected to the Loader computer through RS-232 interface.

This means that the loader computer can collect all information about what's happening in the drift. Information about how many and how heavy buckets are being transported. When and where loading are taking place and of course when and where unloading is performed. All of this can the system later on, when driving through a place with radio contact (which is a science in it self, in this environment) synchronise with the follow-up systems. A lot of information can be transferred to the loaders down in the drift during this synchronisation. The entire collection and synchronisation of information is tak-

ing place automatically, without the aid of the driver.

When the loader is started, the help systems are started automatically. When the systems have been started the driver gets an information picture on the screen of the loader computer. This picture contains information which the driver easily can confirm; i.e. verify that the system finds the right area in the mine.

When the driver takes the loader to the first loading place Wolis will position it self and immediately visualize the loading place on the drivers screen. The driver will immediately see how much has been loaded earlier from this place and an estimate of how much is left. The driver can also see what has been loaded; i.e. how much iron the earlier loadings contained. The geological cross section of the blasted pattern will also be shown to the driver. All these values are important to the driver in order to make the right

decision about when the loading from this place shall be stopped. If the decision is made to early the iron ore will be difficult to find later. If the decision is made to late the production process will be strained due to large segments of granite. A simple rule has been defined: If you have loaded more than 80% of the theoretical amount of iron ore and the iron content is beneath 30% and falling, you shall terminate the loading from this pattern and make the drift ready for a new blast.

After the first month of pilot testing a follow-up was made of the results from loaders with Wolis in comparison to the loaders without Wolis. One question that was asked was; how great share of the finished load patterns followed the simple rule that had been defined. The comparison was carried out in two different places of the mine.

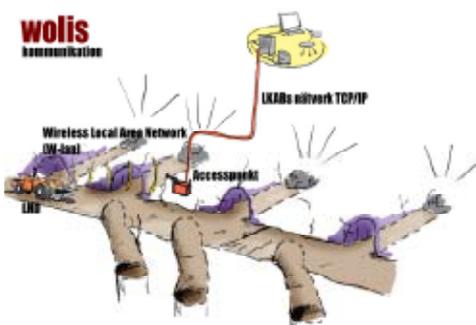
It was established that with a better support it was easier to decide according to facts.

Arera	Without Wolis	With Wolis
Aliansen	50 % followed the rule	75 % followed the rule
Viri	23 % followed the rule	77 % followed the rule

One worry was that the iron content should sink when the total amount of ore from each pattern increased. A comparison was made for the period before, during and after the test period.

Period	Loading extent (%)	Iron content (%)
Before test period	121	48
During test period	170	48
After test period	121	48

During the test period a peak content of iron was measured at 54 % mean value for one day. Except for this the iron content was unchanged with Wolis. However the loading extent



The figure above shows how the access point of the radio network has been placed in the drift system.

increased from 121 to 170 % immediately when Wolis was introduced. The loading extent dropped immediately when the test period was over. This meant that from corresponding blasted patterns more ore was loaded without an increase of investments.

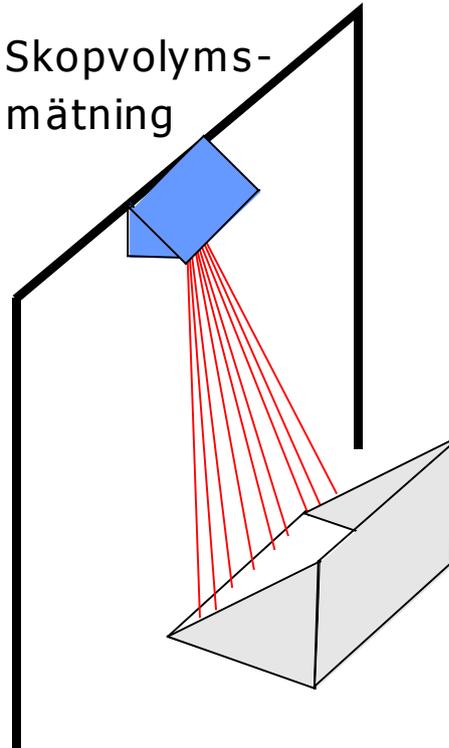
In addition, 15 minutes of administrative work at every ending and beginning of a shift have been saved. Now the driver can concentrate on driving the loader through the narrow drifts at high speed. And further more. The process control has improved. The driver of the loader has become more involved in the process.

**"BUT FINALLY I CAN SEE",**

Olle 62 said and went on his well-earned retirement a few days later.

The changing of the process did not stop when Olle retired. Beyond the development of Wolis, the system has been put in operation in full scale in the mines in Malmberget and during next year the expansion of the system will continue with the mine in Kiruna. Still, there are improvements to be done, such as calculation of iron contents, which to day is achieved through the knowledge of:

## Skopvolym- mätning



- the weight in the bucket
- the density on granite
- the density on iron
- the estimated mean volume in the bucket

The last-mentioned has been proven to give incorrect values in some situations. The use of lasers with rotating mirrors that can scan the bucket and

with help of ingenious algorithms calculate the buckets "exact" loaded volume is under consideration. The thought is to implement this through a volume measuring station which is placed at the unloading station where a laser scanner recognize the bucket and will be able to calculate the loaded volume by sending out thousands of laser beams per second. By calculating angles and distances identification of a bucket is possible. The laser can identify how much material it is in the bucket by scanning the surface. This method is expected to improve the iron content measurement even more and take parts of our mines further in to the era of information technology.

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# MOBILE PHONES IN NORWAY SOON TO HAVE SAME PAYMENT FUNCTIONALITY AS CARDS

**Norwegian consumers will soon be able to use mobile phones as a convenient alternative to payment cards when making payments in shops.**

DnB NOR and Telenor, represented by Telenor Nordic and Telenor Research and Innovation, are working with MasterCard World Wide to enable consumers to make 'contactless' payments via their mobile phones, using cutting-edge MasterCard® PayPass™ technology.

*"As opposed to today's technology, the new, contactless technology can be adapted for mobile phones just as well as for payment cards,"*

*says Peer Theien, senior vice president, Group Payments and Infrastructure, DnB NOR.*

Carlos Rodriguez, general manager, Nordic Region, MasterCard Europe, commented:

"We're delighted that DnB NOR and Telenor have chosen MasterCard® PayPass to power the next generation of payments, with the launch of the first mobile trial of its kind in the

Nordic region. The innovative combination of mobile and contactless payments gives consumers the choice of a new way to pay for everyday items that is faster, safer and more convenient than cash."

## TESTING IN SPRING 2008

DnB NOR, Telenor and MasterCard will test the technology among consumers and in shops in strategic places in the Oslo city centre, starting in the first half of 2008.

"Once the testing starts, it will be the first of its kind in the Nordic region and among the first in the world based on standardised components," says Hanne Sjurson, group manager, e-ID and e-Payments, Telenor.

She adds that the solution will be based on established standards in the Norwegian market, i.e. mobile phones equipped with NFC (Near Field Communication) SIM cards for secure storage of the payment program and personal data, and the MasterCard® PayPass payment solution.

## INTERNATIONAL TREND

New payment solutions based on contactless technology are being launched in markets throughout the world, including Europe, the US and

Asia. The solutions are promoted by the large payment networks, such as MasterCard which as of 3Q2007 already has 19 million PayPass cards in use at over 73,000 merchants in 20 countries across the globe, and major mobile network stakeholders like GSM Association (GSMA).

## STRATEGIC COOPERATION

DnB NOR and Telenor are cooperating on future payment solutions and are at the forefront with respect to ap- purtenant technology and solutions.

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# AN EASY ENTRY INTO THE RFID-WORLD

**To provide an easy way for its suppliers to add RFID capabilities to their shipment, the German company Metro has released guidelines for RFID Starter Kits. Logopak, as a Metro solution partner, is now offering starter kits for all the levels.**

The kits are aimed at allowing companies interested in RFID technology to select an entry level suited to their needs. These range from curiosity in the technology to full-automatic, high volume shipments. All are based on the GS1 recommendations and EPC Global's Gen 1 Class 2 Standard.

## RFID STARTER KIT A

Consists of an industrial tabletop printer VLP 210 RFID standalone with integrated RFID write and read equipment, a barcode scanner and one roll each of A6 RFID-Labels and fitting thermal foil. The labels are conforming to the GS1 recommendation.

## RFID STARTER KIT B

The same as Kit A with additional RFID-Reader Gate with control unit and Ethernet connection, a white / green / red light indicator and ERP interface. The reader gate is equipped with five antennas and allow Listen-Before-Send.

## RFID STARTER KIT C

As A and B with an EPCIS interface and will be available when the EPC service EPCIS becomes available.



*A fully automatic print-and-apply system, the 920 RFID Tag-on-Demand, is able to apply a label to 1, 2, or 3 sides of the pallet. Which side is tagged with the RFID label can be selected via software. Without change of consumables it is possible to put RFID tags to none, some or all of the pallets.*

Mats Bállazs, Managing Director of Logopak West, who is the main contact with Metro said "Due to the increased requirements in the Auto-Id market for RFID we are now happy to be able to meet all the different levels of demands. In addition to the already delivered machines this has resulted in several orders for new machines".

For those customers with a higher labeling volume requirement, making the manual approach impossible, Logopak offers all the Starter Kits with a fully automatic print-and-apply system. Both the manual approach

with a tabletop printer and the fully automatic allows use of the GS1 recommended A6 label, the standard SSCC A5 pallet label or A4. A3 is optionally available. To allow the operation of the production line for receivers wanting the RFID-tag as well as those not requiring it, the Logopak Tag-on-Demand concept allows the software to select whether or not to apply an RFID-tag without changing consumables. Thus a production line can continue to be used for all customers transparently and without manual interaction.

When the pallet contains a "difficult" goods, for example water based or packaged in metallic based materials, the Flag-Tag is recommended to increase the reading distance of the RFID-tags. This means that the part of the label that contains the RFID-Tag is angled 90° from the surface it is mounted on, thus increasing the distance between the content of the pallet and the tag-antenna.

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## ON MOVE

**Gunnar Ivansson** och **Stefan Tjerngren**, have sold Electrona-Sivert and are now free consultants in RFID solutions and economics.

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# STORA ENSO RELIES ON WISTEQ'S UHF-RFID TECHNOLOGY

**Stora Enso has made a decision to use Wisteq's UHF-RFID cards for access control at their Anjalankoski mills in Kymenlaakso, Finland. This is the first time in Finland that UHF-RFID will be used for large-scale factory access control.**

A total of 2000 cards will be in use by the end on June 2007 for monitoring the staff access in the mill area. The cards can be used for monitoring not only those on foot but also those who enter the area on mopeds or motor-bikes.

"Wisteq's knowhow in the field convinced us. They could also meet our tight schedule in this project," says Pentti Lajunen, Electrical Planning Engineer at Stora Enso Anjalankoski Mills in Kymenlaakso.

The Anjalankoski mills comprise two areas and have a total of seven gates.

"The mill area is idyllic with many old buildings, including an old school and a church, but from the access control point of view, it's extremely challenging," explains Lajunen.

He believes, however, that UHF-RFID technology is well suited for them and that it is about challenge conven-

tional technologies for access control as it is proving to be not only reliable and cost-efficient but also handy in use. Lajunen explains: "Since these cards can be read from several meters away, all you have to do is to walk in through a gate instead of having to stop by the reader."

Wisteq's WTUG-C1 card is a rigid and passive transponder. It is most commonly used for access control but can also be used in plastic containers. The card can be rewritten up to a 100,000 times.

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# THE RFID NORDIC SCHOLARSHIP 2007 TO DANMARK

**" This paper looks into the possibilities for localization of RFID tags, within the interrogator read field, using native technology features. As there are several standards, essentially different in the underlying physical principles, only passive UHF tags, compliant with ISO18000-6/GEN2 are considered.**



Considering the established communication format, first a simple reader array is proposed, implementing activation separation. The array is simulated to optimize performance. Then an experimental set-up is built to assess the suggested, antenna configuration. The results from this activation field tests, are compared with a typical commercial implementation.

A channel sounder is then used to measure the responses of the two antenna arrays, using an actual tag antenna, with the chip removed. Most typical situations are considered,

including deterministic shape objects and random shape objects, as well as different tag positions and polarizations.

Finally a simple signal processing algorithm, that determines the positions of passing tags, is applied to the measured data. An order of wavelength accuracy is achieved."

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**IF YOU WANT TO FOLLOW THE EXITING DEVELOPMENT JUST WATCH WWW.RFIDNORDIC.SE AND GIVE YOUR OWN COMMENTS.**

If you want to be a member of the RFID Nordig organisation just give us a call on +46 8 662 31 95

**Welcome**

# RFID i Norden

RFID: Radio Frequency Identification

The 2008 meeting-place for anyone with interest in learning more about the business use of RFID

Time: February 6 – 7, 2008 Place: Kista Science Tower, Stockholm

## DAY 1

International lecturers will tell about the Return of Investment (ROI) as a result of the use of RFID applications.

- 12:30 - 13:00 Registration & Business exhibition
- 13:00 - 13:15 Moderator **Lucas Åhlström**, RFIG
- 13:15 - 13:55 **Alan Jones**, EGS Solutions Ltd  
RFID in Maintenance  
*Not only a 'record' of work carried out but total asset management made extremely easy*
- 13:55 - 14:35 **Simon Holloway**, Bloor Research RFID  
– from tags to applications *RFID the true partnership market*
- 14:35 - 15:10 Coffee break & Business exhibition
- 15:10 - 15:50 **Olivier Desjeux**, INGECOM  
Active Tags and Geo-localization  
*A true automatic inventory can now be a reality*
- 15:50 - 16:30 **Olavi Meriläinen**, Wisteq Oy  
UHF-RFID in access control  
*New possibilities to Stora Enso*
- 16:30 - 17:10 **Anders Boman**, Identec Solutions *ROI achieved with RFID within transport logistics and within manufacturing industry*
- 18.30 Drinks
- 19.00 **GALA BANQUET**
- 20.30 Award Ceremony, "Guldtaggen", **Lucas Åhlström**



## DAY 2

- 08:30 - 09:00 Registration & Business exhibition
- 09:00 - 12:00 Three conferences:
- Industry
  - Trade
  - Services

**Price:** SEK 2 995, 10% discount for RFID Nordic members

**Further information and application:** [http://events.packnet.se/o8\\_rfid](http://events.packnet.se/o8_rfid)

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