With the support of:

ICT in Transport Logistics Workshop

Outlook on RFID usage in logistic

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An RFID system includes at least four components:

- The TAG (or TRANSPONDER) located on the object to be identified
- The READER (or INTERROGATOR) which can read/write the tag
- The surrounding physical environment
- The IT infrastructure

Components of an RFID system
A little bit of history

- RFID technology was used for the first time from RAF during the Second World War with IFF (Identification Friend or Foe) purposes.
- Late 60’s – Personnel identification in nuclear areas.
- 1977 – Los Alamos laboratories disclose the technology to the public.
- 80’s – First passive Tags and commercial applications.
- 2000 – First Standards and interests from the big corporations.
Why the “RFID boom” only now?

- High read range => new applications
- Low tag’s cost => item level
- Global standards

Big companies interest
(DoD, WalMart, Metro mandates)
Passive tags
### Semipassive tags

**CAEN A927Z**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Details</th>
</tr>
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<tbody>
<tr>
<td>EPC C1G2 (ISO18000-6C) Compatible</td>
<td></td>
</tr>
<tr>
<td>Frequency range</td>
<td>860 MHz ÷ 928 MHz</td>
</tr>
<tr>
<td>Read range</td>
<td>approx. 10m in air (2.5m on metal) @ 2W ERP</td>
</tr>
<tr>
<td>Unique ID plus long EPC code</td>
<td>512 bit</td>
</tr>
<tr>
<td>Memory capacity</td>
<td>8000 samples (16 KBytes)</td>
</tr>
<tr>
<td>Programmable sampling interval</td>
<td></td>
</tr>
<tr>
<td>Programmable temperature thresholds</td>
<td></td>
</tr>
<tr>
<td>Battery life</td>
<td>3 or 5 years</td>
</tr>
<tr>
<td>Temperature range</td>
<td>-20°C to +70°C</td>
</tr>
<tr>
<td>Accuracy</td>
<td>0.1°C @ -10°C to +40°C; 0.2°C in outer range</td>
</tr>
<tr>
<td>Dimensions</td>
<td>130.4x23.4x12.7 mm³</td>
</tr>
<tr>
<td>Battery charge measurement through RF</td>
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</tbody>
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RFID in logistic: case histories

- **SEC** - Safe and Efficient Cargo
- **RLP** (RFID Logistic Pilot) RFIDLab Parma
- **GS1** activity: standardization and pilots
TRACEABILITY OF TRAILERS IN PORT AND LAND TERMINALS

Objectives:

- Speed-up load and unload operations.
- Manage boarding priority electronically.
- Provide real-time information to the driver on terminal and ship availability.
- Avoid unnecessary traffic between the port of Trieste and inland terminals (Fernetti).

Approach:

- Automatic identification of trailers transiting between the motorway, land terminals and the Port of Trieste.
- Internet-based system to manage pre-booking at the Samer port terminal.
RFID tags can be passive, active or semi-active. Passive tags are the less expensive and easy to install. Since they have no battery, they do not need to be replaced over time.

An RFID tag will be applied on the trailers and road-tractors that need to be tracked. The tag is a microchip holding various data, including a code (ID) that univocally identifies the trailer, tractor or container.
SEC 2: Operation of the SEC solution

- Port Authority, Customs (SVAD), GDF
- Motorway gates (Lisert)
- Port terminals (Samer RORO)
- Railways
- Security control data
- Regional server
- Data on carrier, shipper, container, goods
- Real-time data (transit, entrance, exit, load, unload)
- Port entrance
- Embark or park instructions
- Land Terminal (Fernetti)
- Pre-booking, priority reservation
- Carriers
- Movements in real time
- Terminal operators
- Availability for pre-booking

Movements in real time
Pre-booking, priority reservation
Embark or park instructions
Port entrance
Land Terminal (Fernetti)
Regional server
Data on carrier, shipper, container, goods
Security control data
Port Authority, Customs (SVAD), GDF
Motorway gates (Lisert)
Port terminals (Samer RORO)
Railways
RFID Logistics Pilot

Objectives

Technology

✓ Process automation through RFID technology
✓ Performances of RFID devices (tags, readers and software)
✓ EPC Network and related services implementation (EPCIS, ONS and DS)
✓ Transaction Security

Supply Chain Management and collaboration

✓ The impact of RFID and EPC Network visibility on supply chain performances (order fulfillment, flow time, stock outs, promotions, track and trace, etc)
✓ Visibility and supply chain relationships
✓ Business intelligence for value added traceability
RLP: the supply chain

Manufacturer: **PARMACOTTO**
Logistics Base - Mamiano (PR)

Retailer: **Auchan**
Distribution Centre - Calcinate (BG)
Stores - Cumo (BG) Rescaldina (MI)

Technology partners:

- Global RF Lab Alliance
- RF I&I
- SIEMENS
- TOSHIBA
- UPM
- ID-SOLUTIONS
- MOTOROLA
- ORACLE
- PSION TEKLOGIX
- AVERY DENNISON
- CAEN RFID
- Impinj
- INDUSTRIAL PORTALS
- Intermec
RLP: EPC network infrastructure
Pilot Project: Using GS1 SSCC as the UCR in the Wine & Spirits Supply Chain

High level proof of concept on the use of SSCC as the WCO UCR (Unique Consignment Reference) between the UK and Australia.

Manufacturers of wine and spirits, Customs Authorities and GS1 MOs undertook this pilot to prove that the GS1 SSCC Identification Key is suitable for customs purposes in international transactions.

This is significant: a successful trial could lead to the worldwide adoption of the GS1 SSCC as the WCO's UCR.

Some advantages of using GS1 SSCC:
- Links commercial/transport and official export/import documentation
- Improves customs pre-notification
- Many GS1 member companies already use SSCC for pallet identification
- SSCC is adherent to ISO standard (15459)

Participants in the SSCC Wine & Spirits Pilot Project
- World Customs Organization
- HM Revenue & Customs (UK)
- Australian Customs Service
- Wine & Spirits Trade Association (WSTA)
- Constellations (Europe)
- GS1 Global Office
- GS1 UK
- GS1 Australia
- Hardy (Australia)
- Diageo
- TOD (Shipping Agent)
Pilot Project: Using GS1 SSCC as the UCR in the Wine & Spirits Supply Chain

From Hardy's Australia to Constellation UK
- Transportation of bulk wine
- Use of SSCC is already in operations
- Pilot run: dispatch of September – December '06
- Simple scenario: one-to-one consignment-to-shipment relationship

From Diageo Scotland to Diageo Australia
- Transportation of cased strong spirits
- Use SSCC, provision in internal IT system
- Pilot run: dispatch of December '06
- More complex scenario of identification of multiple levels of logistic units (cases and pallets) and linkage to SSCC
How the pilot project began

The context:

- Customs announces the need to create an identification for cross-border shipments - Unique Consignment Reference (UCR)…
- The wine & spirit industry knew there was a GS1 ID Key Serial Shipping Container Code (SSCC) which could do the job…
- Several companies express their willingness to launch a pilot with GS1…

As a result:

Starting in Q1 2006, a group of wine and spirit producers, customs authorities and GS1 MOs undertook a high level proof-of-concept pilot to demonstrate the GS1 ID Key (SSCC) meets Customs requirements in international transactions
GS1 tool box – Identification Numbers

**GTIN - Global Trade Item Number**
- identifies any item or service that might be priced, ordered or invoiced at any point in the supply chain

**SSCC - Serial Shipping Container Code**
- identifies logistic unit, item of any composition established for transport and/or storage which needs to be managed through the supply chain

**GSIN - Global Shipment Identification Number**
- identifies a virtual grouping of logistic units that are sent from one supplier to one customer and relate to one PO/Despatch advice
EURIDICE

- Common infrastructure for logistic and transportation stakeholders
- Shared information and services
- Decentralized decision support
- System architecture based on standards
- Technology integration

Fancier technologies

- Cargo capable of autonomous decisions (intelligent agent),
- Cargo capable to start processes (independent behavior),
- Cargo capable to monitor and register its status,
- Cargo capable to grant access to services (authorization, ETA estimation, data read/write, ..),
- Cargo capable to detect its context (location, user, infrastructure, ..),
- Cargo capable to identify itself.

Wider application
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