ICTSB Seminar on RFID standardization

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Technical standards issues:
• Air interface protocols

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RFID Air Interface Standards

Overview

- What is being standardised?
- Why are there many standards?
- Who is doing the work?
- Data Carrier
- Data Carried

RFID Air Interface Standards

Richard Rees

- Chair BSI IST/34 Automatic ID Techniques
- UK HoD to ISO IEC JTC1 SC31
- President, Scanology
- Past member of EAN UK Board

RFID Standards - scope

- Building Block Technology Standards (ISO)
  - Air interface
  - Testing
  - Architecture standards
  - Data structure
- Application Standards (ISO, EPCg, IATA, AIAG, DoD, etc) – hardware/software/data
- Item, People, Animal
- Regulatory – Health & Safety, Spectrum sharing

Air Interface – what is it?

- Protocol defining how tags and readers
  - Recognise each other
  - communicate with each other
  - Deal with message collision
- Allows interoperability
- Manages co-habitation of different systems

RFID Powering techniques

- **Passive Tag**

  - collects power from reader energy field

  - Chip modulates reflected energy (like radar)

- **Battery Assisted Tag**

  – Same as passive, but battery on board

  – Energy absorbed by water, reflected by metal

  – UHF, Microwave

RFID Air Interface Standards

Just one standard…..?

No - many

RFID Coupling techniques

- **Inductive**
  - Short range (10-70 cms)
  - Unaffected by water/flesh
  - LF, HF, (and now UHF)
- **Beam/Propagating**
  - Long Range (c 4-5 meters)
  - Energy absorbed by water, reflected by metal
  - UHF, Microwave
  - High data rates

RFID Air Interface Standards

ISO 18000 series – Item ID air interface

- 18000-1: Generic parameters for global RFID
- 18000-2: < 135 KHz (LF) passive
- 18000-3: 13.56 MHz passive: two modes
- 18000-4: 2.45 GHz (MW) passive/active
- 18000-6: 860-960 MHz (UHF): 3 parts
- 18000-7: 433 MHz active

RFID Air Interface Standards

ISO 18000-6

- Parts A/B/C
- C is aligned with EPCg C1G2
- Battery assist
- Sensors
- TOTAL
  - Tag Talks Only

RFID Air Interface Standards

TOTAL

- ## Reader Talks First (RTF/ITF)
  - Function rich
  - High bandwidth
  - High power
  - Low channel efficiency

- ## TOTAL
  - Tag Only Talks First After Listening
  - Simple back to basics tag
  - Low bandwidth
  - High channel efficiency

Testing - Interoperability

- ISO 18046 performance test methods
- ISO 18047 conformance test methods
- EPCg certification program

RFID Air Interface Standards

And many more to come

- Dual Frequency (125Khz/6.8MHz
- Active tags
- Sensors IEE1415 – sensor networks
- SAW

RFID Air Interface Standards

- ## Data Carrier
  - Carrier is cost and is temporary
- ## Data Carried
  - Data is value and is timeless