



Achieving the Unthinkable

Integration of RFID Tags into Luxury Watches



Information Society
Technologies

27 May 2009 – Paul DAVIS, SpaceCode

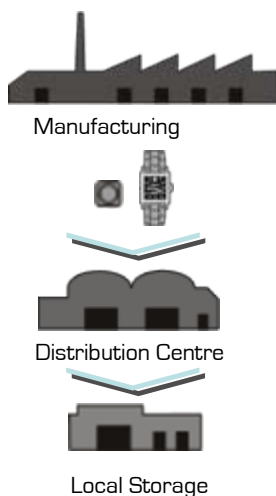


A Branding, Differentiating, Authenticating, Tracking, & Tracing Capability for High Value Watches

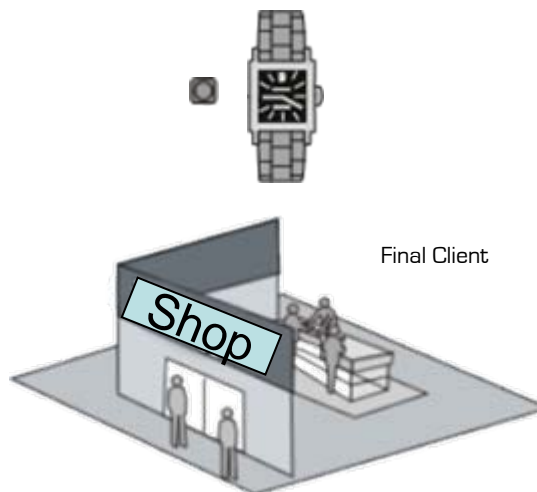


Goals & objectives

- Optimise and improve the reliability of the Supply Chain
- Track & trace the watches
- Optimise the reception of incoming watches at the point of sale
- Improve the inventory through real-time accurate data



- Brand, differentiate, secure and authenticate
- Collect and maintain client data
- Personalise
- Activate the warranty



Fight against the « Grey » market

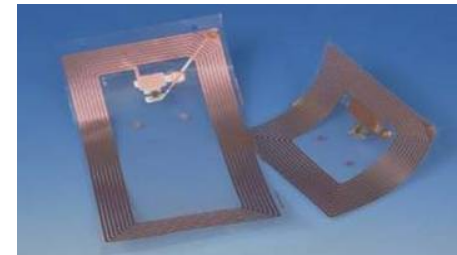
- Track the watch and anticipate the product life-cycle i.e maintenance
- Maintain a record of all data related to the watch



Fight against counterfeit watches

Tag Selection Considerations

- Tag Performance
- Tag Cost
- Tag Standards
- Tag Integration
- Tag Security
- Tag Disposal and Recycling Requirements



- tag **size** required ?
- **overt** or **covert** placement ?
- maximum **read range** required ?
- **simultaneous** reading of multiple tags required - how many ?
- are products on **conveyor belts** - what is the time available to read ?
- how is the **tag applied** – manually, automated applicator or integrated ?
- what are the typical **environmental conditions** ?
 - minimum & maximum temperatures and humidity
 - water, chemicals, solvents (ie washing)
 - certain spectrums of light
 - mechanical impacts
 - shipping/delivery processes
- does the tag need to be **read only** or **read-write** ?
- does anything need to be **printed** on the tag ?
- what is the anticipated **tag life** required ?
- must the tag be **permanent** or removable ?

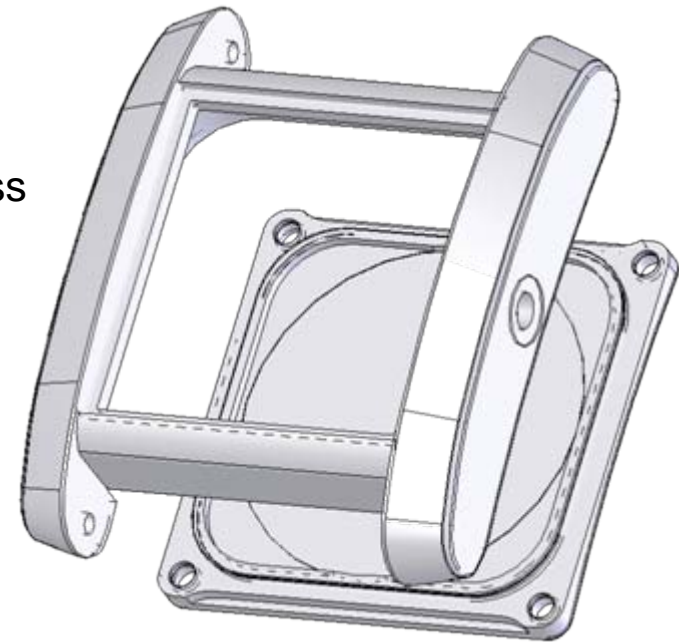
■ Product selection

- A compact watch with a complete metallic box and a quartz movement (battery assist)
- A full size watch with glass box and mechanical movement

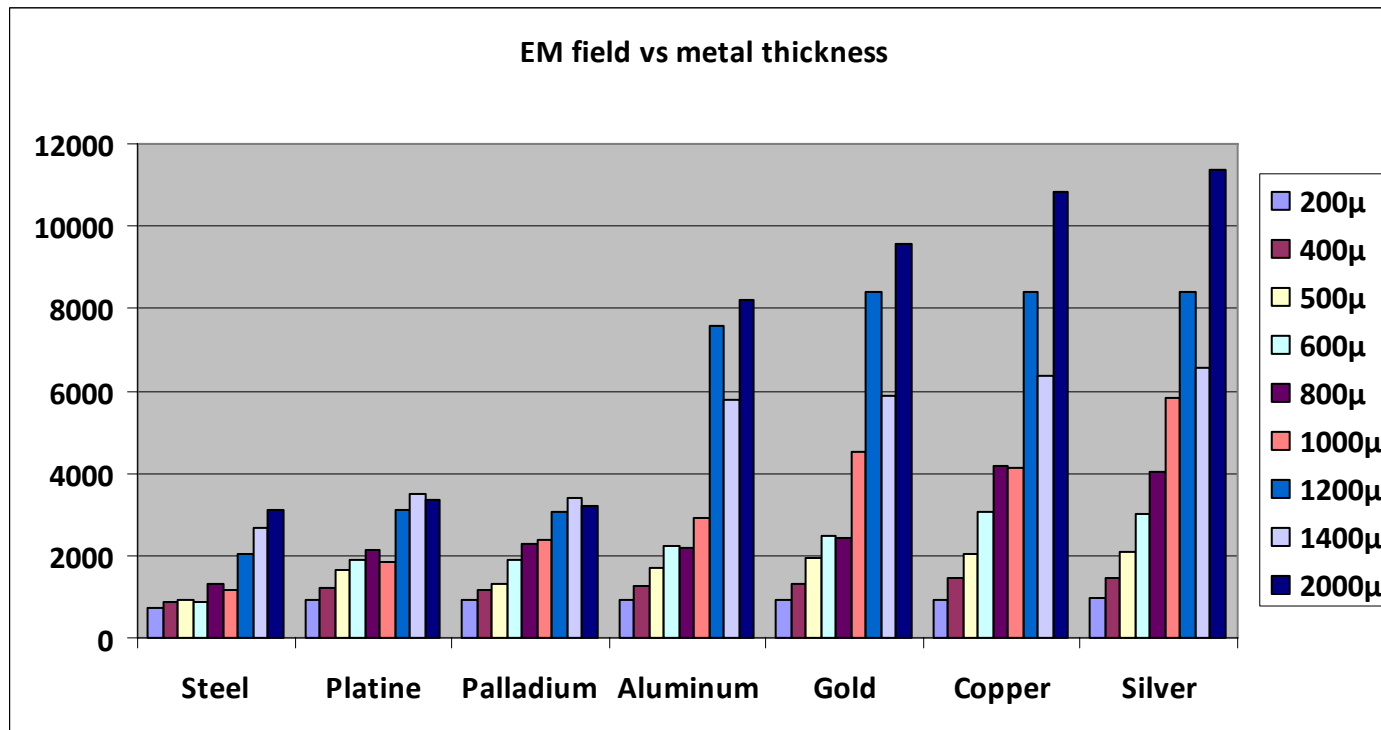
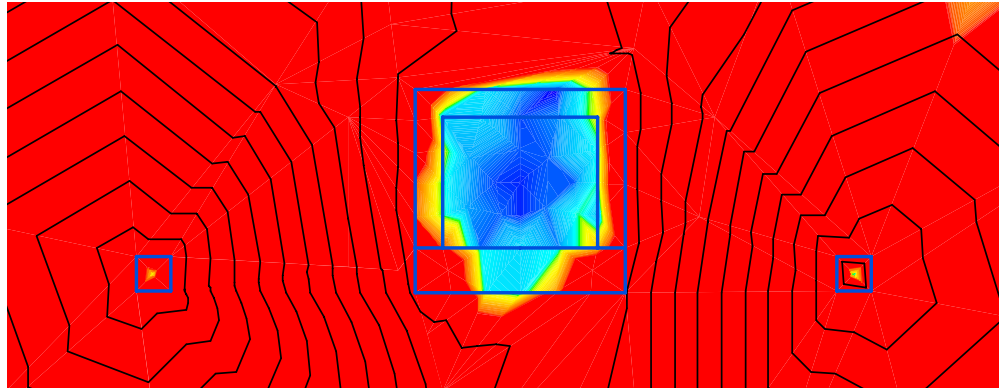


■ Mechanical drawing analysis

- Constraints :
 - Don't modify the watch aesthetic
 - Don't alter the watch function and robustness
 - Leave enough metal for polishing
 - Take into account the metallic parts
 - Build a RFID tag with sufficient sensitivity



Metal impact EM simulation



- Tag integration proposition for the compact watch

The mechanical drawings of the watch are not available for public display due to confidentiality

- Tag integrated into the metal back of the watch
- Outer diameter : 9mm



- Tag integration proposition for the full size watch

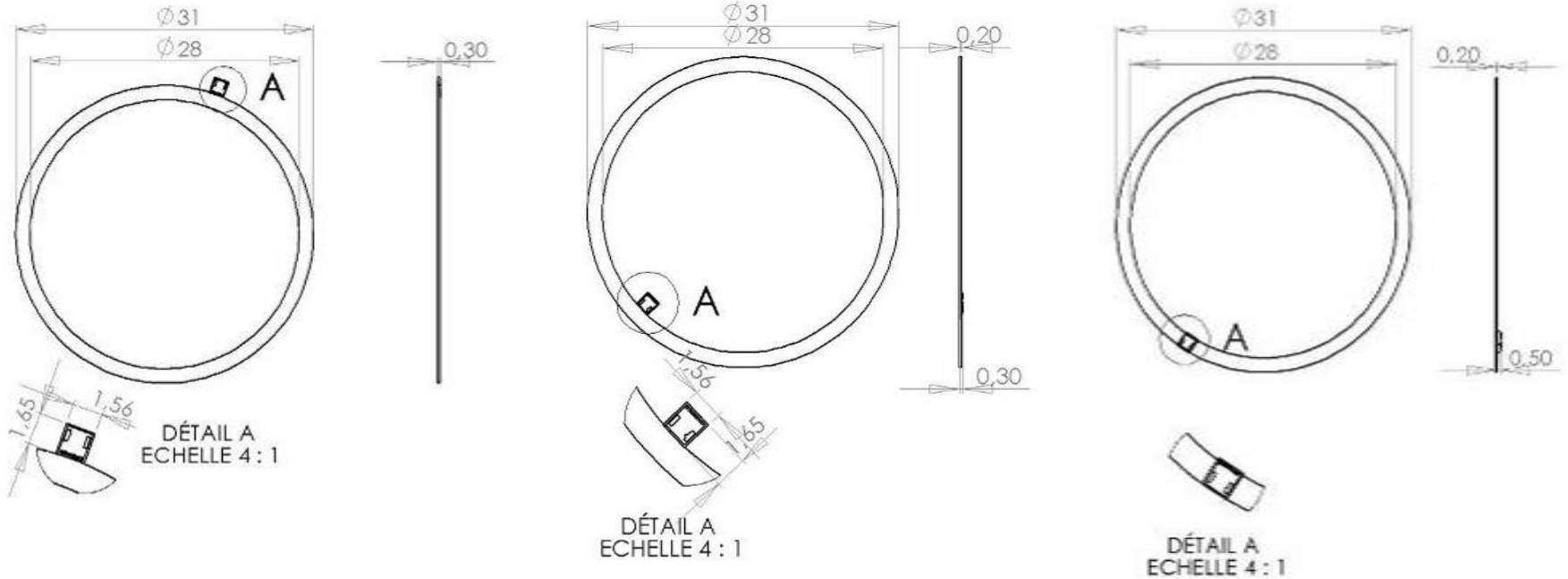
The mechanical drawings of the watch are not available for public display due to confidentiality

Proposed dimension for the groove

- Outside diameter : 31mm
- Inner diameter : 28mm



- Size and tag geometry proposition



- chip tangentially outside the antenna

- chip tangentially inside the antenna

- chip on top of the antenna.

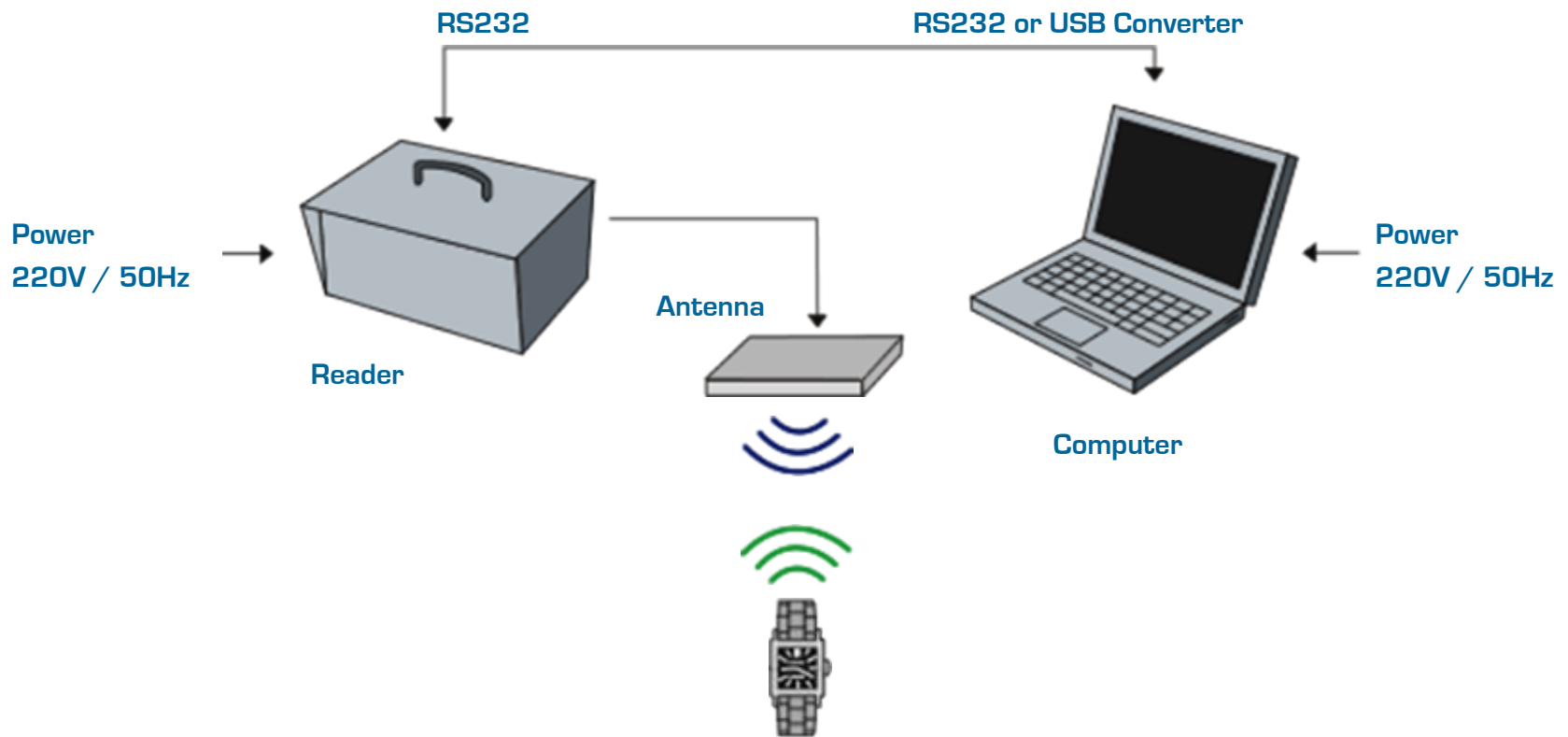
- outer diameter : 31mm

- inner diameter : 28mm

- a hole must be created to place the chip, the hole will make 0,3mm depth and a diameter of 2,5mm

- Technology : **magnetic coupling** at 125kHz
- SpaceCode **air interface** and protocol
- Low **sensitivity** to metallic environment
- Reading **through metallic** parts
- Memory : **unique** 72 bits serial number programmed and locked at factory
- Adjustment of the tag parameters for **advanced performance**
- Tag **protection** using potted epoxy

Prototype System Overview



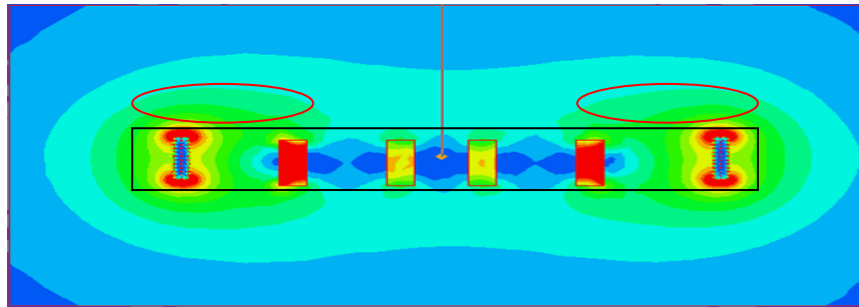
■ Reading station development (prototype A)

- Read the full range of watches using the same protocol
- Specific antenna design
- Read horizontally
- Powerful reader design able
- Reading distance up to a few cm parallel to the antenna



■ Reading station development (prototype B)

- Development of a second station using field concentrator
- Simulation electromagnetic to achieve the best configuration
- Possibility to read a watch horizontally and vertically
- Reading distance up to 5 cm



- **RFID is able to authenticate in challenging environments**
- **Focus on applications where there is a high ROI**
 - High value items
- **Fully understand the business requirements – prioritise requirements**
 - Do not “force fit” the technology
 - Analyse current and “to be” workflows
 - Be aware of the trade-offs
 - Phased deployment
- **Consult with SPACECODE to accelerate your success**

Thank you