

# TRICON



## **SMMART**

**System for Mobile Maintenance Accessible in Real Time**

RFID SysTech'07  
June 12th to June 13th 2007, Duisburg – Fraunhofer IMS

# About Tricon

- TRICON designs and implements customized RFID solutions
- Our core competences are consulting, engineering and system integration
- TRICON is part of the Trierenberg Holding AG
  - A special paper processing high technology group employing 1200 people worldwide
  - Over 100 employees solely in the RFID field



- Our customers include:



SMMART received research funding from the Community's 6th FP. This reflects only the author's views. The Community is not liable for any use that may be made of the information contained therein.

# Introduction to SMMART Project

## Key figures

- Integrated R&D project
- Launched in November 2005 and planned to run for 3 years.
- Overall budget of around 25 millions €
- Partly co-funded by the European Commission under the FP6 joint IST and NMP priority

## Project partners

- Coordinated by Turbomeca
- Consortium of 24 partners, well balanced between large industry leaders, small and medium enterprises and research centres from across Europe



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# Objectives of the project

## Project focus

- Mainly focussed on the aeronautics, road and maritime transport sectors
- Provision of optimized monitoring of complex components' lifecycle with integrated information systems

## Key Objectives

- To monitor in real-time the usage and maintenance data throughout the lifecycle of critical sub-assemblies of a vehicle
- To optimise maintenance management through a worldwide network
- To provide new services: advanced troubleshooting tool, global configuration control, resource planning tool
- To remotely exchange information between all life-cycle stakeholders in a timely, secure and trusted environment
- To provide end-to-end visibility of the logistic supply chain
- To improve industrial and logistic traceability
- To optimise maintenance and logistic planning
- To further improve transportation safety

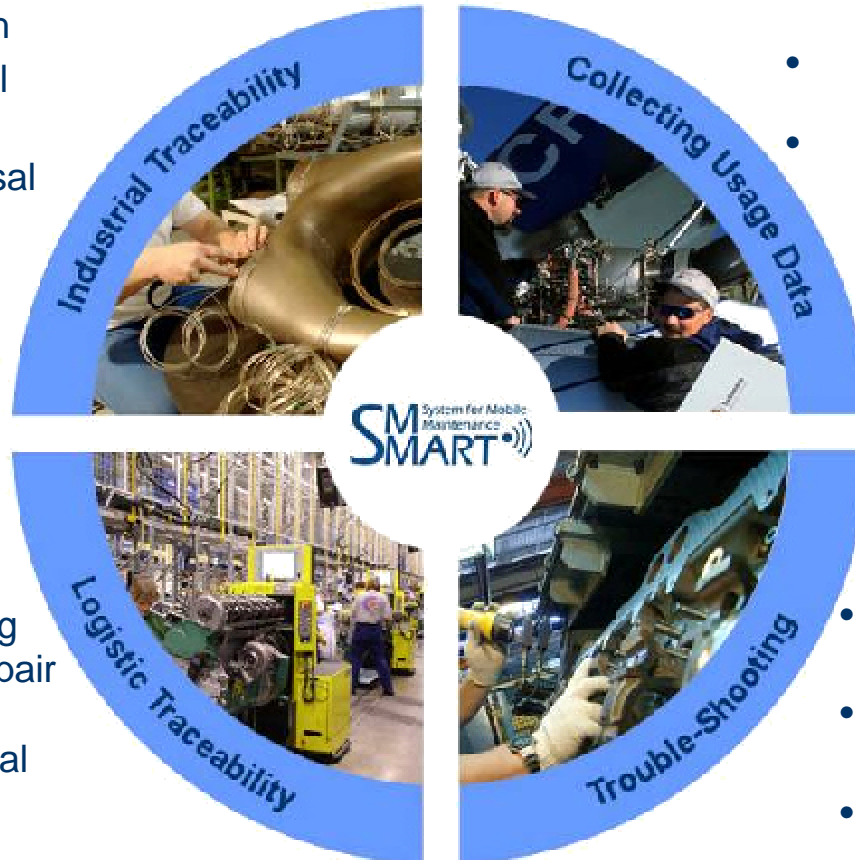


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# Fields of activity

- Inspection workbench
- Multi-sites operational scheduling
- Multi solutions proposal
- Multi maintenance levels and multi sites information tracking



- Engine Configuration Management
- Engine and Parts Monitoring

- Tracking and Tracing in production and repair processes
- Reallocation of critical spare parts

- Troubleshooting Guidance
- Global Configuration Control
- WW Resource Planning



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# RFID as key technology

## Logistics Traceability – Tracking and Tracing

- RFID tagging of new as well as spare parts
- Automated tracking in logistics units like production, repair and spare parts centers
- Provision of online data on stock levels as basis for optimal resource planning
- Automated validation of sourcing and re-distribution options with re-allocation tools
- Technical Breakthrough: Development of low-cost RFID tags that will offer optimal performance in the given – often metallic – environment of the logistics processes

## Collecting Usage Data – Engine Configuration Management

- RFID tagging of various engine modules and critical components
- Determination of current engine configuration with Data Concentrator Unit (DCU) on the helicopter
- Additional collection of usage data with Wireless Sensor Networks
- Provision of engine status information to service and maintenance personal
- Technological breakthrough: Development of robust RFID tags that will withstand the harsh environmental conditions and offer optimal performance in the metallic environment



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# Key Challenges for RFID

## Engine Configuration Management

- Temperature and Temperature gradient
- Cumbersome metallic environment
- Size and weight
- Cleaner process
- Reliability and life duration
- Power supply

## Tracking and Tracing

- Different process requirements in Engine manufacturing and Engine repair
- Prize
- Size
- Standardization
- Metallic environment



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# Interim R&D results

## Engine Configuration Management

- Various technologies were evaluated for their usability in the given environment
  - SAW
  - Active RFID
  - hybrid RFID
- Hybrid RFID (LF triggered, UHF active communication) has shown promising results in field tests
  - Reliable read performance in metallic environment
  - Best coverage of all tags on the engine
  - Reasonable system costs
- Necessary modifications for engine usage
  - Tag Miniaturization
  - Temperature Resistance (mechanical housing, data retention) for some parts
  - Power Supply



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## Interim R&D results

### Tracking and Tracing – Production scenario

- Considered technologies:
  - HF RFID
  - UHF passive RFID
  - UHF active RFID
  - hybrid RFID
- Open logistics processes require passive technologies due to tag volume
- Tests in realistic scenarios showed promising results with UHF passive according to EPC C1G2 standard
  - Reliable read performance on packaging of metal parts
  - Read ranges suitable for RFID Gate applications
  - Reasonable system (tag) costs

### Tracking and Tracing – Repair scenario

- Closed loop processes allow the usage of active technology
- Enhanced read results are anticipated due to better penetration of metal environment
- Tests will be carried out in realistic environment to evaluate the additional benefits



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# Roadmap

State of the art analysis	✓
Functional specification	✓
Technical specification	✓
System development and implementation	✓
M18 demonstration (lab environment)	✓
System Development and Implementation	M19-M30
Integration into overall SMMART system	M19-M30
M30 demonstration (onsite)	M30
Demonstrator and breakthrough validation	M30-M36



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# Thank you!

**For any further information:**

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**Related websites:**

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[www.tricon-rfid.com](http://www.tricon-rfid.com)



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