SAXONY-ANHALT GALILEO TEST BED FOR INNOVATIVE LOGISTICS

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Background: Saxony-Anhalt Galileo Transport Initiative

Agreement between Otto von Guericke University Magdeburg and Saxony-Anhalt Ministry of State Development and Transportation and Ministry of Education and Culture signed in the presence of the Institute for Automation and Communication ifak and the Fraunhofer Institute for Factory Operation and Automation IFF
The Galileo Test Field in Magdeburg

Telematic Test Fields
Magdeburg & Halle

Technology Museum

Ministry of State Development and Transportation

Industrial and Hansa Port

Galileo Development Lab
600m² floor space
3000m² open lot
Located at Magdeburg’s Port of Science

• Otto von Guericke University
• Ifak
• Fraunhofer IFF
• VDTC

Quelle Bilder: ifak - Institut für Automation und Kommunikation e.V. Magdeburg, Magdeburger Hafen GmbH, Fraunhofer IFF
Objectives of the Galileo Test Field

- Work focused on in-state transportation and logistics
- Consolidation of developments in the automotive sector, logistics, rail transportation and mobile terminals intended to fundamentally support GNSS solutions
- Continuous testing of developments from companies in the state and region under different boundary conditions (e.g. time variable satellite configurations and different ambient influences)
- Consultation with relevant transportation, logistics and communication committees and associations on integrating the test field in applied and academic research
Fields of Action

- **Transportation**
  - Cooperative systems based on car-to-infrastructure and car-to-car communication
  - Dependable localization and navigation systems based on GNSS employing further sensor systems for car, truck and rail vehicle applications
  - Mobility services for mobile terminals
  - Systems to optimize the flow of public transportation

- **Logistics**
  - Utilization of regional traffic management networks for public transportation and commercial transport
  - Testing of systems and applications for highly accurate localization and tracking of goods and vehicles in urban areas
  - Testing of systems for communication between goods, vehicles and infrastructure
  - Development of new value added services for special logistics solutions (care-cool-fresh – safe-secure-live) based on good and vehicle localization systems

- **Communication**
  - Combined testing and analysis of overall systems produced by combining satellite navigation and wireless communication
  - Setup of a test environment that provides systems for satellite and terrestrial localization and navigation, RFID, car2X communication, wireless local and portable communication systems (WLAN, Bluetooth) and mobile radio communication and analysis and measuring systems
Classification of Logistics Assets in the Galileo Test Field

- Interchangeable trailers and roll containers for courier express shipping service
- ULD: Designed as intelligent containers (SmartBox) with integrated RFID read technology (mode stirrer concept)
- Chemical containers

Intelligence

- GPS/GSM
  - Interchangeable trailers
  - ULD
  - Commercial vehicles
- WLAN for indoor localization and communication
  - Interchangeable trailers
  - ULD
- RFID
  - Individual shipments in the ULD, Interchangeable trailers and roll containers
  - Chemical containers on chemical pallets
  - Infrastructure with RFID read systems (RFID tunnel, wall, robot)
Handling Processes Outdoors and in the Port

Localization of:
- Freight
- Containers
- Handling equipment
- Individuals

Transponder localization of individuals

Portal crane with transponder technology on gripper

Container with GPS/GSM

ABATEC system for highly accurate reference localization of freight

Quelle: Magdeburger Hafen GmbH
Research

- Interchangeable trailer handling without forklifts
  - Usability of interchangeable trailers in urban settings

- Use of airport systems for courier express shipping service
  - Transferability of airfreight technology (e.g. castor deck, small volume ULD)

- Identification of goods in interchangeable trailers and other containers
  - Automatic RFID identification of individual shipments
  - Automatic RFID identification of individual shipments in a container (SmartBox principle)
  - Automatic RFID identification of individual shipments captured by appropriate infrastructure (RFID tunnel gate, RFID wall)

- Automated handling (loading and unloading of goods in interchangeable trailers and on pallets)
  - Automated logistical handling combined with identification technology (RFID antenna on robot gripper)

- Integrated localization and identification of logistics assets
  - Analysis of interfaces (indoor ↔ outdoor // change of container // complete shipment ↔ individual shipments)
Low-volume commercial transport concept (1)

Width: 2,00 m
Length: 2,60 m
Heigth: 2,40 m

4 swap body equate to one large truck
Low-volume commercial transport concept (2)
Potential and Impact (1)

- Time savings:
  - Economically expedient and sustainable step for German R&D and industries involved in research
  - Early stage development of applications
  - Independence from the progress of Galileo
  - The unique selling point: the combination of transportation, logistics, communication and Galileo

- Basic financing for construction and equipment of € 1.8 Million shall be extended to an anticipated project volume of € 30 – 50 Million (excluding commercialization)

- 35 to 40 research and development jobs shall be created in Saxony-Anhalt
Traffic engineering and transfer of telematic technologies to end use in Central Germany

Innovation system in Saxony-Anhalt

- Consumers and operators shall be oriented toward the future (participation and experience in lead projects)
- Telematics furnish an opportunity for local action
- The integration of companies shall strengthen the region
- Knowledge-intensive spin-offs shall be founded at the Otto von Guericke University

The test field is expected to enjoy a reputation as the logical partner for horizontal cooperation in Germany and the European Union
Thank you for your attention!

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