Easy-OBU Project

THE EASY WAY TO BRIDGE GNSS-OUTAGES
Easy-OBU research project in a nutshell: GSA supported international project aimed at an introduction of cheap positioning solution with improved accuracy

- **What are we doing:** We are developing and preparing market introduction of a new On-Board-Unit capable of providing more accurate location information in challenging situations (such as tunnels) at low cost

- **Who we are:** An international consortium consisting of EFKON (AT), pwp-systems (DE), AustriaTech (AT), ITS&S Association (CZ) and ČVUT (CZ)

- **Public support:** The project is partially funded from the 7th Frame Programme of the European Union

This project is funded by the European Union and carried out in the context of the Galileo FP7 R&D programme supervised by the GSA
Short term signal loss is a major challenge for GNSS applications. GNSS systems are currently unable to cope with loss-of-signal situations that are all but uncommon. When signal is lost, the location information becomes unavailable or very imprecise. Even with introduction of Galileo and other new systems, this problem is here to stay.

Solutions for localization precision improvement are available, but at a commercially unviable price point of tens of thousands of Euros per vehicle.
Easy-OBU will apply new technologies and scientific methods to radically cut the cost of the localization information improvement

User focused design and …

• one simple OBU that does not need anything but a power cord to connect with the car
• standard location information (GPS and EGNOS) when GPS is available
• improved location information for loss-of-signal situations when GPS is unavailable

… the technology behind

• Low-cost sensors integrated into the OBU (gyroscope, accelerometer)
• Application of non-causal filtering that delivers great location information improvement even in combination with low-cost sensors
• Open interfaces for integration

Simple, cost effective and commercially attractive solution for location information improvement able to compensate 95% of signal outages and ready for integration into various ecosystems
Easy-OBU can offer location precision improvement to applications that do not insist on real time availability of the location information.

The only limitation of Easy-OBU (and a “price” paid for the low cost of the unit) is availability of the refined positioning data only after a short delay.

Easy-OBU is suitable only for applications that do not necessarily require the improved location information in real time:

- Shortly after leaving the tunnel, but not during the signal loss in the tunnel
- Examples of such applications may include:
  - Fee collection (tolling, parking etc.)
  - Car Sharing pay-per-use models
  - Route controlling (e.g. hazardous goods transport monitoring)
  - Fleet monitoring with analytics that requires a more precise location information
  - Ecological apps (CO₂ monitoring etc.)
The vehicle's position is provided by GPS OBU with GNSS receiver and low cost sensors.

Information is transmitted between OBU and the Back Office via wireless cellular communication.

Back Office with non-causal filtering

Easy-OBU

Easy-OBU project – System Architecture

Call Center

Application Clients

Application Back Office

Application Area
Easy-OBU - System interfaces

• **Interface 1**
  Open interface at the central server
  Used by end-users to access the data
  Data in the central server are application independent
  System application can run in another location

• **Interface 2**
  Open interface inside of OBU
  Specifies the sensor information required by Easy-OBU
  Used by OBU provides to integrate their own OBU into Easy-OBU
Easy-OBU – Performance Parameters

• **Performance parameter:**
  - Availability: > 99.9 %
  - Position accuracy: < 10 m
  - Heading accuracy: < 5 °
  - Velocity accuracy: < 2 km/h
  - Accuracy of distance travelled: < 1 %
  - Time accuracy: < 0.5 s
  - Position update rate: 1 Hz

• **Light weight unit in the vehicle**

• **Small in size (the view through the windscreen is not disturbed)**
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Further project information:
www.easy-obu.eu