Electronic Architecture and System Engineering for Integrated Safety Systems

The enabling technology for the introduction of integrated safety systems
Motivation - Integrated Active and Passive Safety

For further improvements an integrated approach is needed
Active and passive safety systems will converge

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Components of future safety systems

Active Safety

Passive Safety

Environment Detection

Vehicle to Vehicle Communication

Vehicle to Road Infrastructure Communication

Gateways

Redundancies

Safety-Function x

Safety-Function y

Telematics

Supplier 1

OEM

Supplier 2
Challenges for future integrated safety systems

- Integration of domain (Cabin, Chassis, powertrain) overlapping safety functions with high dependability
- Handling of high system complexity
- Integration and multi-usage of environment sensing (e.g. night-vision or pre-crash sensing)
- Integration of telematics services for safety systems

EASIS Approach

Develop a standardised in-vehicle electronic architecture and a standardised system engineering approach for integrated safety systems

Provide an enabling technology for the introduction of integrated safety systems
Objectives and expected outcomes

- A modular scalable E/E-architecture for active, passive and integrated safety systems
- Standardised signal and functional interfaces to environment detection systems, telematics, powertrain, chassis, and HMI
- Embedded system safety analysis
- Prototype implementation and validators
- Means to handle high system complexity in the development process
- Provision of a migration path into existing automotive system architectures
- Provision of a high availability and safety even in case of single component failures
- Preparation for standardisation
Consortium

**OEMs**
DaimlerChrysler, DAF Trucks, Fiat (CRF), Opel, PSA, Renault, Volvo

**Suppliers**
Bosch, ContiTeves, Lear, Motorola, Philips, Valeo, ZF

**Tool suppliers**
DECOMSYS, dSPACE, ETAS, Vector

**Universities/ Research Institutes**
Offis, MIRA, University Duisburg/Essen
Organisational Information

> Costs 9.400 TEURO
> Funding 5.000 TEURO
> Workload 673 Person month
> Starting Date January 1, 2004
> Duration 3 years
> Coordinator Vera Lauer, DaimlerChrysler

> Contract signed December 22, 2003
> Kick-Off meeting January 14 - 15, 2004
EASIS Project Roadmap & Structure

Veesa Study - DC (Vehicle e-safety Architecture)
WP 0: Integrated Safety Requirements - Valeo
WP 1: Software Architecture - Volvo
WP 2: Hardware Architecture - CRF
WP 3: System Dependability - Bosch
WP 4: Processes and Tools - ZF
WP 5: Validation, Exploitation and Dissemination - DC
WP 6: Projekt Co-ordination and Management - DC

Q1/03 Q1/04 Q1/05 Q1/06 Q1/07
## EUCAR Program Integrated Safety

### EASIS Part of EUCAR Program “Integrated Safety”
as a transversal architecture support for safety functions

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<tr>
<th>AIDE</th>
<th>EASIS</th>
<th>PReVENT</th>
<th>Advanced Protective Systems</th>
<th>GST: On-line Safety Services</th>
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**OEMs:**
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**Co-ordinator:**
- EASIS Part of EUCAR Program “Integrated Safety” as a transversal architecture support for safety functions

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