Connected Cars – Combining Security and Safety
At Home on All Continents.

### Key figures 2014

<table>
<thead>
<tr>
<th>Metric</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenues in millions of euros</td>
<td>1,731</td>
</tr>
<tr>
<td>Foreign portion (%)</td>
<td>49.0</td>
</tr>
<tr>
<td>EBIT (%)</td>
<td>6.4</td>
</tr>
<tr>
<td>Employees</td>
<td>19,320</td>
</tr>
<tr>
<td>Foreign portion (%)</td>
<td>60.0</td>
</tr>
</tbody>
</table>

**Locations:**

- Over 500 in 69 countries
Revenues by Business Areas.

Connected Cars – Combining Security and Safety

16.09.2015
The World of ICT & Business Solutions.

Revenues in 2014:
Approximately €123 million

Business fields
- IT Services & Cybersecurity
- Telco Solutions, Business & Engineering Services
- Management Consulting
- R&D Management
Agenda.

1. The development of the car
2. New challenges?
3. Possible solutions
4. Next steps?
Development of the car.

- Benz Patent Motorwagen (1886) - Passive security
- Development of engines and mechanical aspects - Passive security
- Development of control units, software and assistant systems - Passive security

- Connection of the car to backend systems and the internet - Active security
- car2X and autonomous driving - Active security
Development Cycle and Challenges.

**Car Development**
- Focus on design, functionality and safety (engineering components)
- Time to market: around 6 years with a facelift after 3 years

**Software Development**
- Focus on functionality
- Time to market less than 1 to 2 years with
  - functional updates every month,
  - (security) patches up to daily

**New Challenges**
- Safety, security for software in cars and data privacy of car users
  - New strategies, processes and technologies required for
    - Security in software development in a multi component environment
    - Combination of security and safety
    - Update processes and regulations for software of cars “on the street”
New Challenges?

- February 2015: The BMW connected drive hack
- July 2015: The Jeep Cherokee hack
- July 2015: Security specialists got access to the infotainment system via DAB
- July 2015: Security specialists hacked the OnStar communication system of GM
- August 2015: Security specialists hacked a Corvette via SMS and the diagnosis port

source: heise.de
Joint solutions.

- The Security and Privacy in Your Car Act
- The Verband der Automobilindustrie (VDA) works on security standards for cars

IN THE SENATE OF THE UNITED STATES

Mr. MARKEY (for himself and Mr. BLUMENTHAL) introduced the following bill; which was read twice and referred to the Committee on

A BILL

To protect consumers from security and privacy threats to their motor vehicles, and for other purposes.

1 Be it enacted by the Senate and House of Representa-
2 tives of the United States of America in Congress assembled,
3 SECTION 1. SHORT TITLE.
4 This Act may be cited as the “Security and Privacy
5 in Your Car Act of 2015” or the “SPY Car Act of 2015”.
6 SEC. 2. CYBERSECURITY STANDARDS FOR MOTOR VEH-
7 CLES.
Next steps.

- Acts and standards may build a common understanding of the topic

- The safety of a car will only be secured in future when
  - using tools and methods of information security
  - based on best practices and experiences of IT industry

- Enforce cooperation in concern of security, safety and data privacy between:
  - Information security departments
  - Development departments and between
  - car manufacturers and
  - automotive suppliers

- Safety and security will be incorporated and cannot furthermore be looked at separately

16.09.2015
Next steps (organisational).

- Build an ISSMS (Information Security and Safety Management System)
- Define a goal/policy for safety and security for software in cars
- Use standards like ISO 27001 and ISO 26262 for governance of security and safety of software components in cars

- Create guidelines for car development like
  - "development of secure safe software"
  - authentication and encrypting of protocols and data
  - ...
- Create guidelines and processes for
  - security in operation (attack detection and countermeasures ...)
  - patch management and update procedures
  - health check and status for software in cars ...

16.09.2015
Next steps (technical).

- Define technical specifications and implement technical safeguards like:
  - secure software development for specific programming languages
  - strong authentication for connections and commands
  - ...

- Test security of in-car systems for:
  - firmware
  - software
  - communication protocols

- Test security of communication channels from and to the car

- Test security of backend systems and applications (also mobile apps) by source code reviews, penetration tests and audits
Conclusion.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>A car is a mobile device in the Internet of things world</td>
<td>02</td>
</tr>
<tr>
<td>03</td>
<td>TÜV Rheinland is a well known partner for the safety of cars and security of IT, so WE can combine safety and security</td>
<td></td>
</tr>
<tr>
<td>04</td>
<td>There is no ready to use approach yet</td>
<td>05</td>
</tr>
</tbody>
</table>

16.09.2015 Connected Cars – Combining Security and Safety
Questions?

Udo Adlmanninger  
TÜV Rheinland i-sec GmbH  
Zeppelinstrasse 1, 85399 Hallbergmoos

T: +49 811 9594 - 146  
M: +49 173 398 23 78  
F: +49 811 9594 - 220  
Udo.adlmanninger@i-sec.tuv.com

www.tuv.com/informationssicherheit