



**Eureka Navigation Solutions AG**

**Intelligent telematic systems for freight wagons**  
**Lucerne 23<sup>rd</sup> of October 2015**

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## Motivation for ViWaS telematics developments



*... compared to ...*



**> 85% of Trucks are equipped with**

- (precise) mileage counters
- transmission of wear & tear data
- remote diagnostics
- fleet management telematics
- and also a drivers mobile phone

**Freight wagons are equipped with**

- nothing.. 😞

*Why nothing? ...*

- *not necessary?*
- *too expensive?*

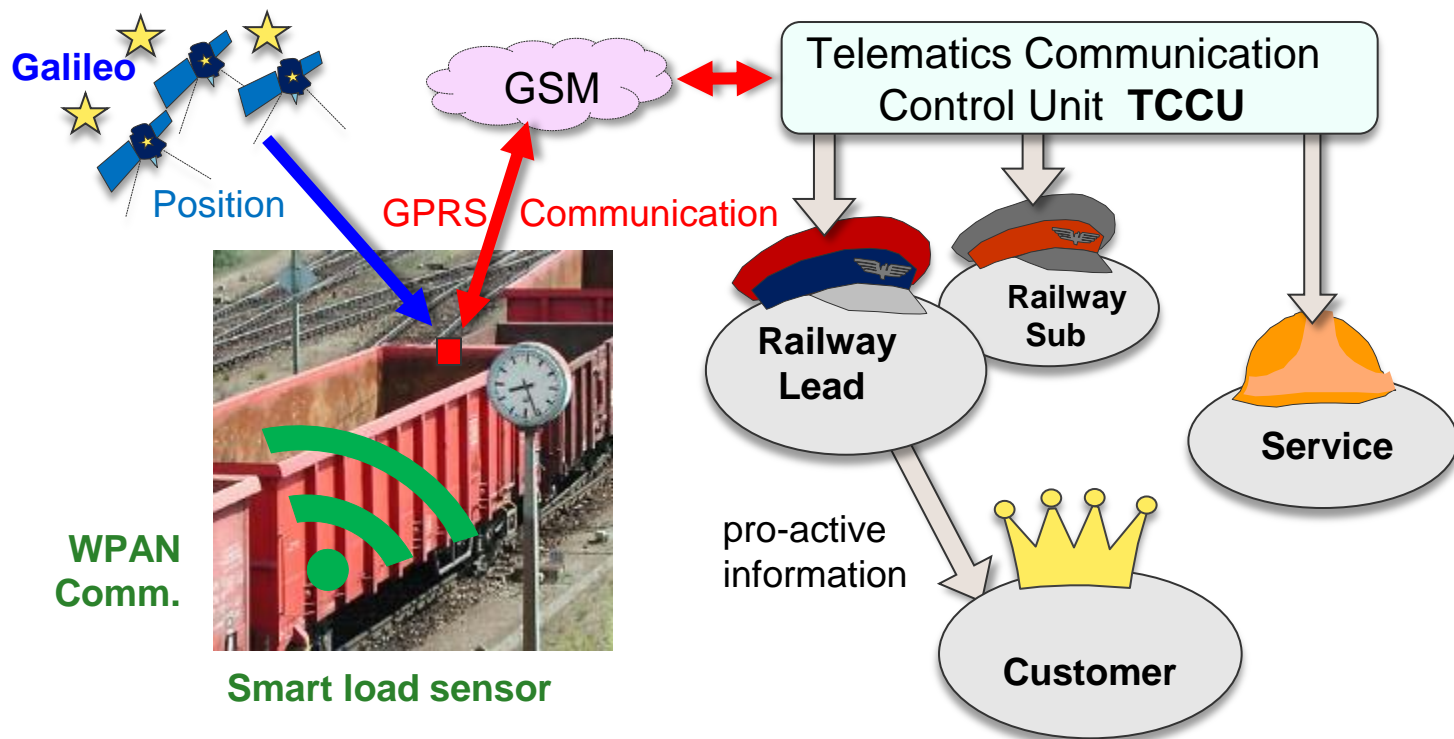
**Trucks are monitored in real-time,  
even with redundant communication**

**Wagons are only checked during  
train forming, and  
sometimes by control stations**



## Eureka's contribution to the ViWaS Project

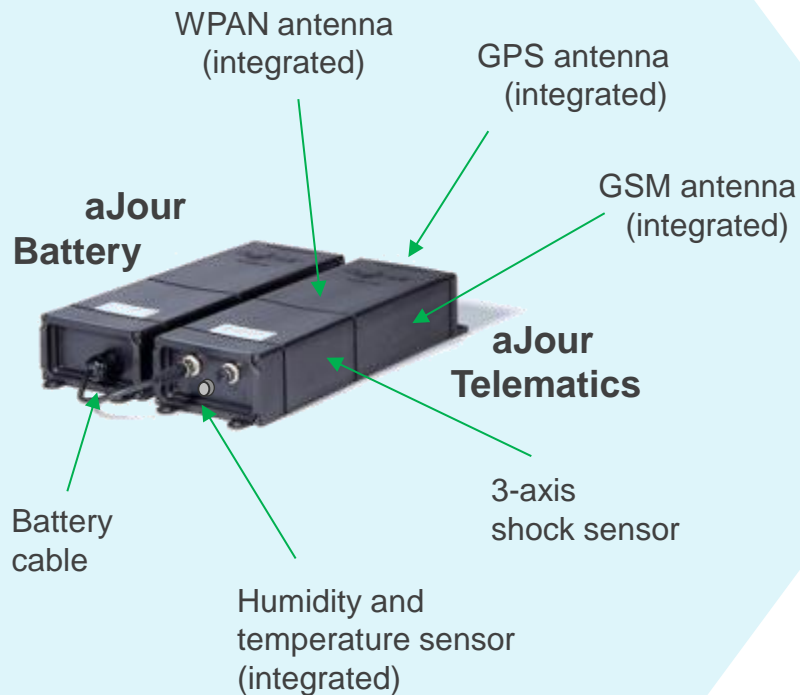
1. New ViWaS Telematics Hardware (TCO cost -50%)
2. Wireles wagon communication and smart load sensor
3. TCCU – Telematics Communication Control Unit





## ViWaS concept for telematics, battery und installation

### Separated telematics and battery



### Holder-Bracket



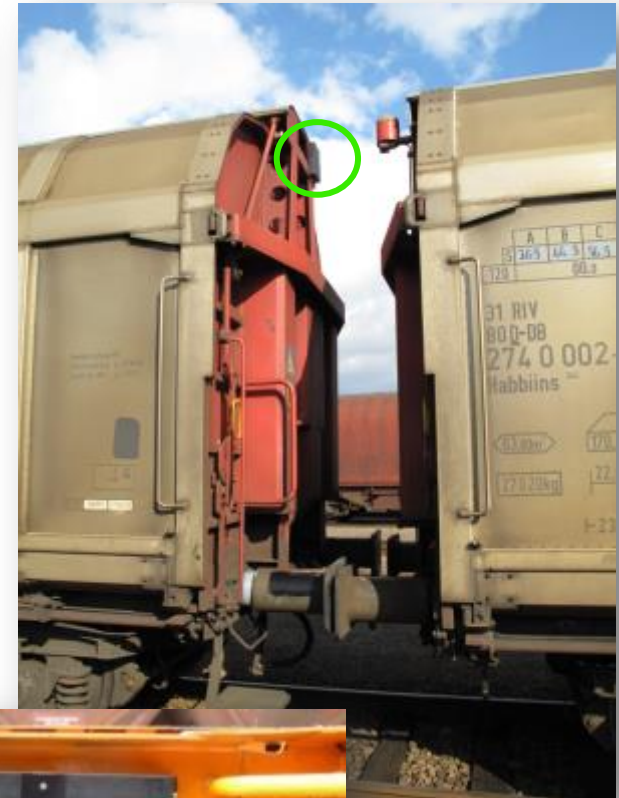
### Different telematics holder

- ✓ Simple pre-installation at the wagon
- ✓ Simple installation (e.g. by mobile service)
- ✓ Protection against theft and vandalism
- ✓ Simple battery exchange by mobile service





## ViWaS telematics – installations at various wagon types



## Functional user requirements for wagon telematics



- Interval messages
- Scheduled messages



- Start/Stop messages
- Standstill > # Std.



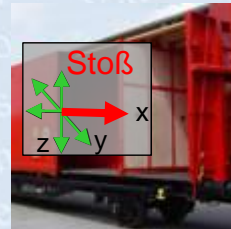
Manual requests of position and status



- Geo-fencing
- Departure / arrival
- Border crossing



Mileage monitoring wagon / wheelset



Shock messages  
## g XYZ-impact

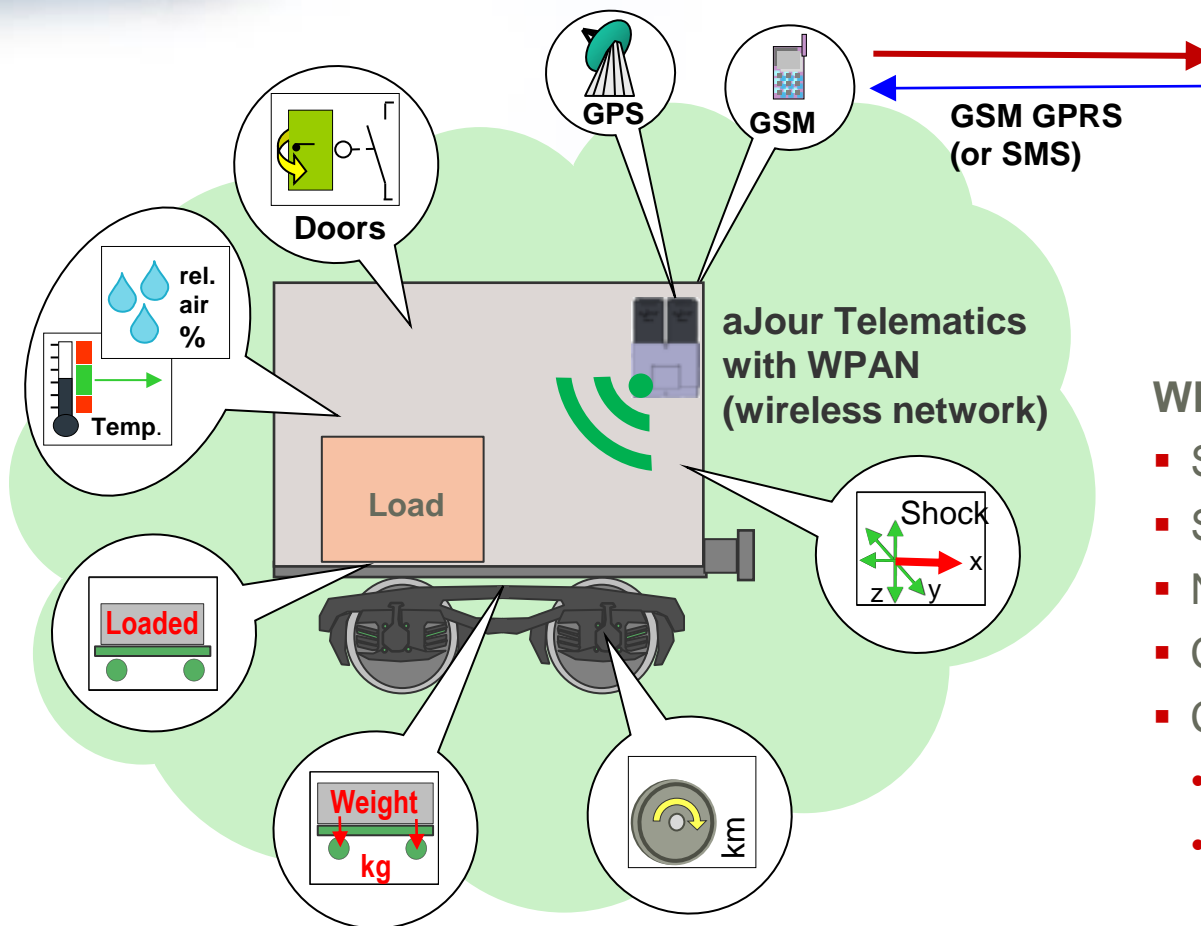


- Humidity ##, # % rF und dew point alarm
- Temperature ##, # °C Temperature alarm



- Loaded / empty
- Wagon overload
- Load weight

## Extension by sensors / wireless sensors



- Sensor-Identifikation
- Sensor-Data
- Sensor-Events
- Sensor-Parameters
- Sensor-Software Updates

## WPAN - wireless wagon network

- Simple installation of sensors
- Simple extension with sensors
- No cable break / no cable theft
- Costs only a fraction of a cable
- Communication also to
  - WPAN HotSpots
  - WPAN MobileSpots

aJour Telematics for wagons are equipped with WPAN





## ConnTAG - the universal WPAN wireless sensor



### Features:

- Measurements with internal and external sensors (various sensors possible)
- Event messages or cyclic messages
- Identification and data transmission 50 – 200 m to aJour Telematics or HotSpot

### Applications:

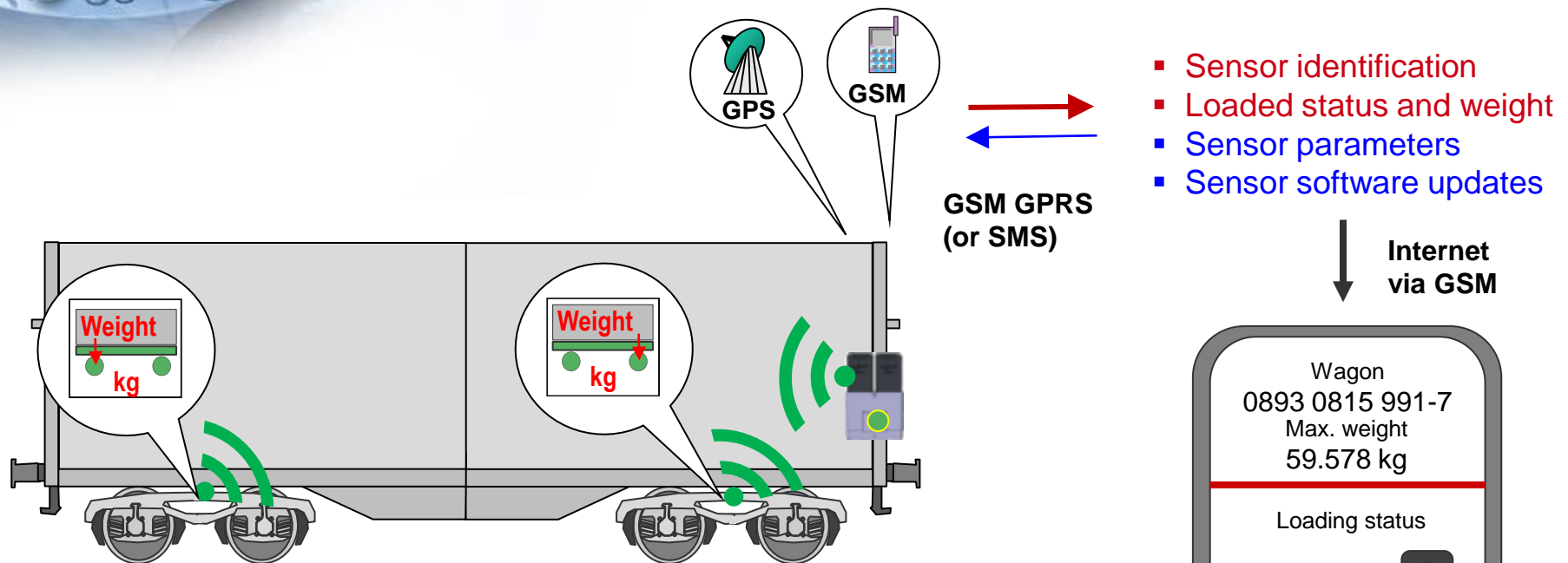
- RFID positioning 50 - 200 m (long range)
- Temperature and humidity measurement
- Loaded / empty status acquisition
- Overweight detection and alarming
- Weight measurement

*Smaller than a cigarette pack  
Many years of battery operation  
IP 69K, ATEX in preparation*

Autonomous data acquisition and communication – “invisible” and easy to install



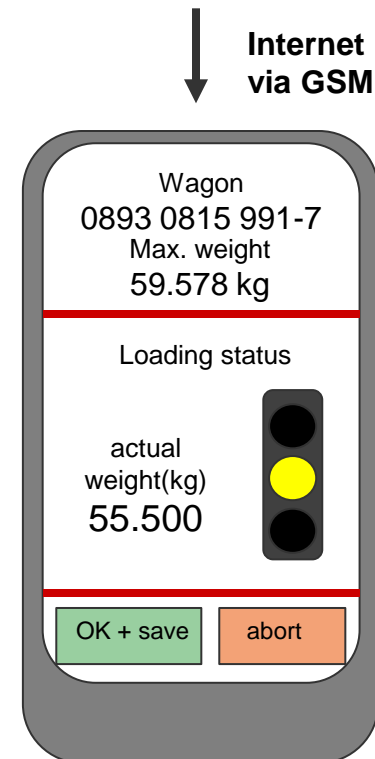
## Loading Sensor (new ViWaS Development)



- Sensor identification
- Loaded status and weight
- Sensor parameters
- Sensor software updates

### Functionality:

- Automated loaded / empty detection
- Manual or automated over-weight detection
- Weight measurement during loading
- Loading assistant on smartphones / tablets



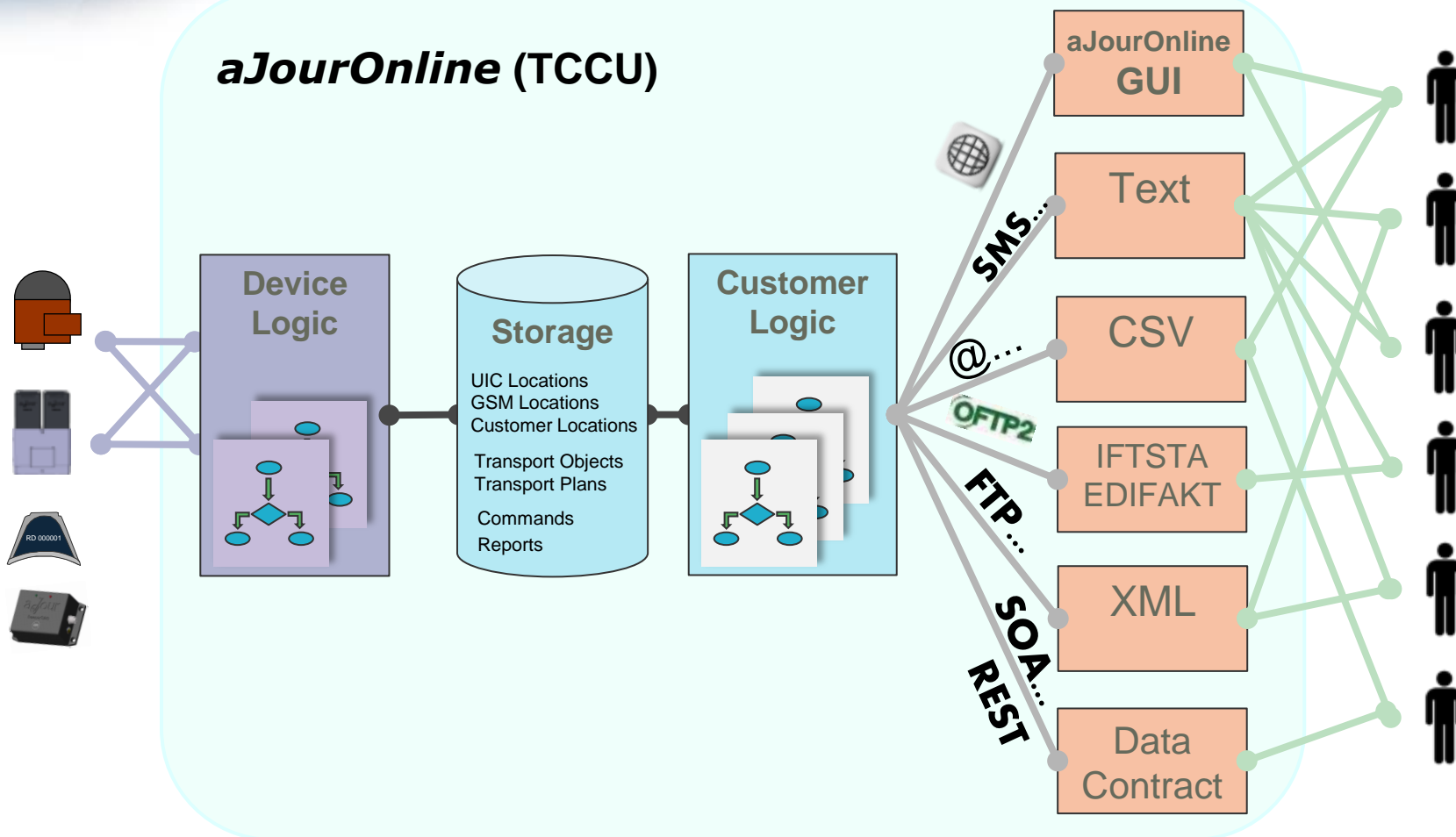
**Loading assistant**



## Installation and intensive testing of the Load Sensor



## ***aJourOnline* (TCCU)**




... aJourOnline offers data interfaces for various stakeholders





## aJourOnline – the customer individual tracking portal



powered by **eureka**

Esilva | [Log Out](#) | [Change Password](#)

Surveillance
Mountables
Devices
Objects
Rail
Areas

Customer: DBSR-Demo    Wagon pool: Only from this pool    Wagon class: Only from this class    Wagon number: Only this wagon

Reload

Wagon number	Device ID	Last positioning	Last location	Is travelling	Load status	Wagon class	Last shock	Generator	Temperature	Pump	Operations	Wagon pool	Humidity (%)
3180 4675 178-6	<a href="#">CS02098</a>	04/05/2015 07:55:30	<a href="#">Eberswalde DB-Schadwagen für Werk</a>			Shimms	29/04/2015 09:09:07		Underrun: 19.9 °C			Mustervagen BA 722	55.7 (%)
Demo Device	<a href="#">CS02129</a>	09/04/2015 11:25:14	<a href="#">NEUGILCHING</a>			DBSR-Demo	09/04/2015 11:24:34		Overrun: 10.2 °C			Test pool	43.3 (%)

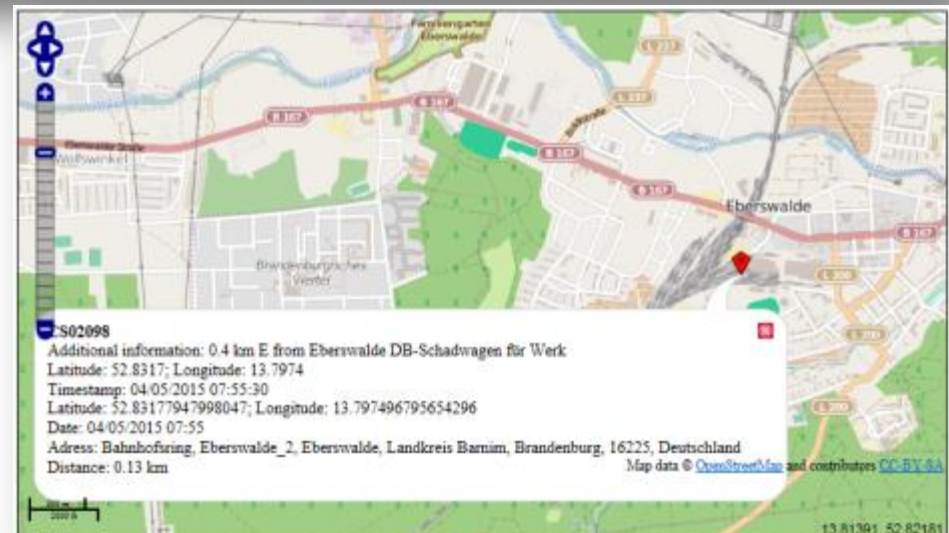
1

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2 items in 1 pages

### aJourOnline tracking portal

- Save user identification
- Selection of telematics devices / - groups
- List of GPS positions, sensor data, UIC stations
- Position history in digital map
- Definition of user locations
- Export of position list and data to Excel





## Examples of Goods, Dispatching and Asset Information

### Goods information

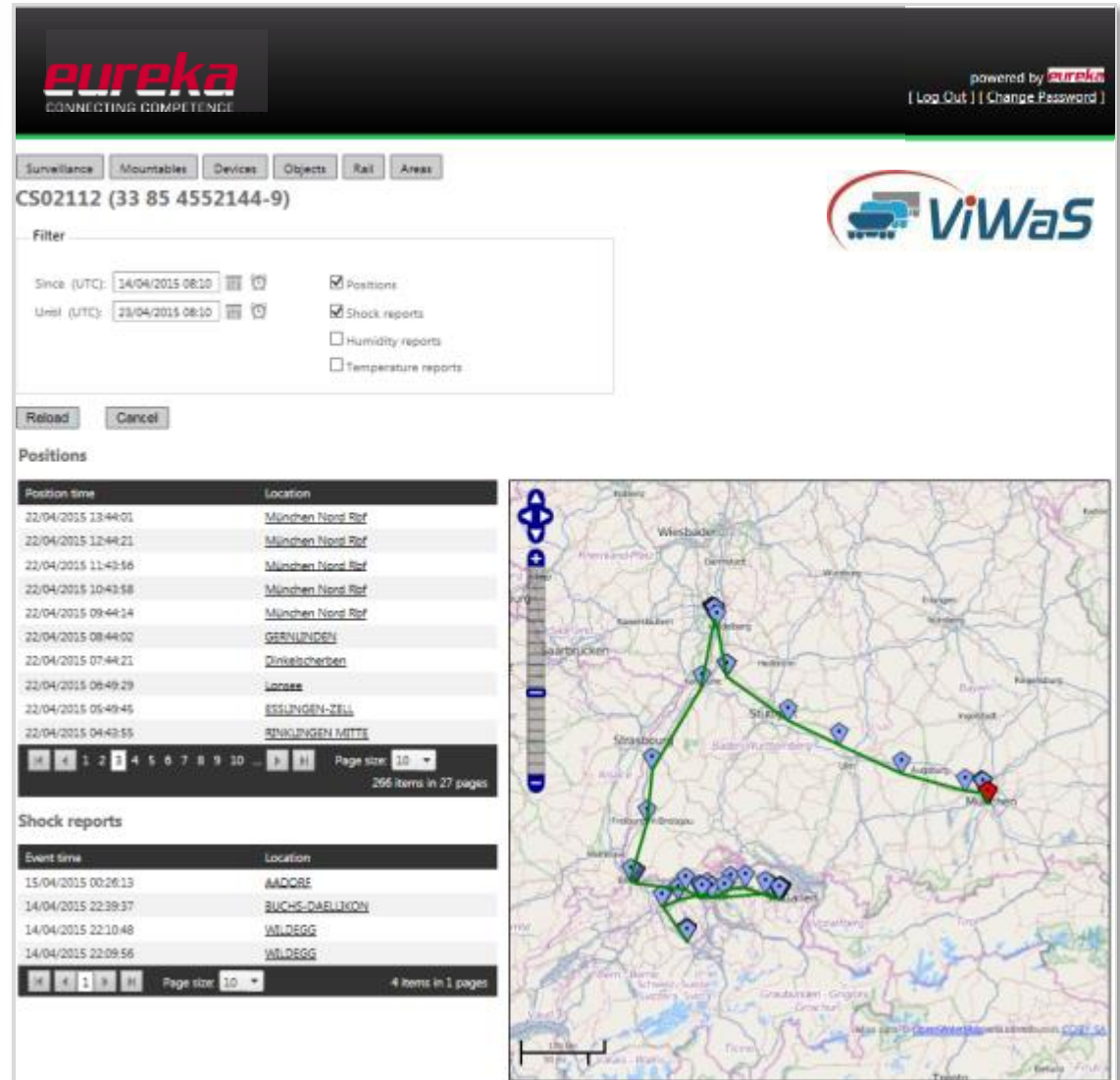
- Temperature / humidity
- 3 D shock
- Loading weight
- Arrival at destination

### Dispatching information

- Position / time, UIC station
- Motion, heading, km/h
- Actual departure / arrival time
- Loaded / empty
- Unloading time / demurrage
- Round trip duration

### Asset information

- Mileage wagon / wheelset
- Wheel blocking / flat wheel
- 3D-shock, overweight?
- Stopover for maintenance
- Energy consumption kW/h



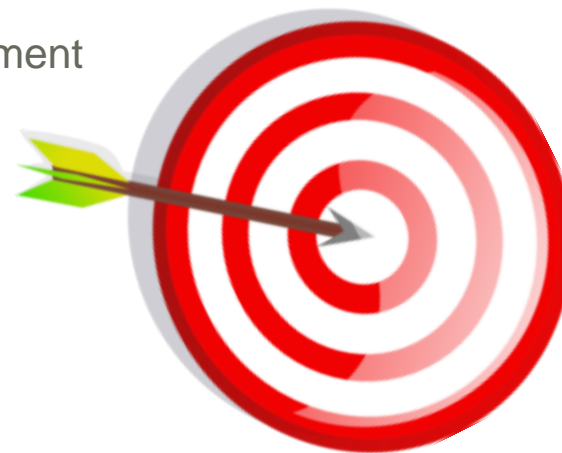


**aJour®**



## **ViWaS goals 100 % reached!**

- ✓ **New ViWaS generation of telematics is in series production**
- ✓ **Smart Sensor “ConnTAG” for wagon weighing is in field testing**
- ✓ **TCCU = “aJourOnline” is developed and in live operation**
  - for several railways (e.g. DB Schenker), wagon keepers and operators
  - with data services using XML, EDIFACT, SMS, Mail, ... (ITSS soon)
- ✓ **50 % cost reduction (TCO\* for 6 years) exceeded by far**
  - \* Total Cost of Ownership
  - Investment in telematics and sensor equipment
  - Installation cost and effort
  - GSM communication cost (by flat-rate)
  - aJourOnline and data-service





## ViWaS telematics improves Single Wagon Load traffic



*... compared to ...*



> 85% of Trucks are equipped with

- (precise) mileage counters
- transmission of wear & tear data
- remote diagnostics
- fleet management telematics
- and also a drivers mobile phone

Freight wagons can be equipped with

- wagon and wheelset monitoring
- supervision of sensitive goods
- Assistance for maximum loading
- pro-active information of delays

Trucks are monitored in real-time,  
even with redundant communication

**Get ready for Industry 4.0 !**



**Contact details**



*... stay a7our<sup>®</sup>*

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