

CargoMon Systems



Product line for the digitized freight wagon



The intelligent transport monitoring solutions company!

History

- Long year basic research on energy self-sufficient telematics and sensor solutions
- Founded in 2009 as a startup from Technical University in Vienna, Austria
- Started with container and trailer monitoring, in recent years moved towards innovative sensor solutions for the rail freight industry

Portfolio:

- Custom made telematics and sensor solutions for transport monitoring
- IoT Platform and data analysis
- System integration
- Research and development for new to marked solutions

That's why we are the ideal partner for you



Because we

- can look back on more than 10 years of experience and maintain long-standing customer relationships
- have equipped tens of thousands of railway wagons, containers and trailers
- constantly research new solutions and develop new-to-the-market equipment
- are always personally available for your concerns and reacting flexibly and quickly to your requirements

Message from the CEO and founder, Stefan Mahlke

As an owner-managed company, we are personally available to our customers at all times and will find a tailored solution even for demanding tasks.



We are proud that among others these customers rely on us:



The complete rail freight wagon telematics and sensor monitoring solution



CargoObserver: Main telematics unit

- GPS/GNSS based positioning
- 2G/4G Mobile Communication
- Move/Stop reporting
- Acceleration Sensor
- Hub for Wireless external Sensors
- Mileage control
- Optional ATEX/IECEX Variants



CargoSense: Wireless Sensor extension:

- Temperature / Humidity inside
- Load Status
- Door Status
- For Intermodal Trailer: Kingpin in Hitch Monitoring
- Precision Weight (<2%),
- Axle and Bearing Monitoring (Pilot Stage)



CargoObserver Product Variants



Product Groups	CargoObserver-Track (High end)	CargoObserver-Track (Intermodal)	CargoObserver-Ex
Main Application Fields	Freight Wagons, Standard ISO Container, Reefer Container	Trailer, Swap Body, Containers, Freight Wagons	Tank Wagons or Tank Trailer & Trucks
Special Features	Smart GPS Tracking, Geofencing and complete Sensor Monitoring 4G IoT / GSM	Smart GPS Tracking, Geofencing, Acceleration Sensor, Rail Mileage 4G IoT / GSM	ATEX and/or IECex compliant Fuel Level Sensor 4G IoT / GSM
Sensoren			
Multi- Satellite GNSS Positioning	✓	✓	✓
Advanced Movement Detection	✓	✓	✓
Geofencing	✓	✓	✓
3-Axis Acceleration	✓	✓	✓
NFC Interface	✓	✓	✓
Temperature	✓	-	-
Decimeter accurate GNSS (2024)	o ⁵	-	-
Bluetooth Low Energy & ITSS2 Ready Sensor Interface	✓	o	✓ ⁴
4-20mA / HART Sensor Interface	-	-	✓ ³
ATEX / IECEx Certified			✓
Solar Rechargeable Supply	✓ ⁵	-	✓ ⁵
Typical Battery Lifetime	6-10 ⁵ Years	5-6 Years	6-8 ⁵ Years

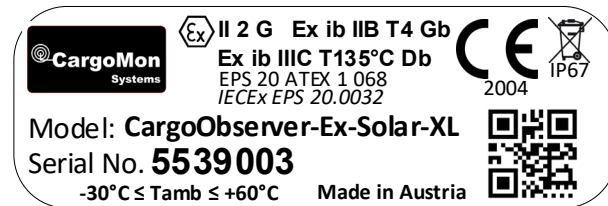
Product Variants

- Track-XXL
- Track-Solar-XL⁵
- Track-L
- Ex-Solar^{3,5}
- Ex-Solar-XL^{4,5}
- Ex-XXL⁴

IECEX + ATEX certified devices for the use in potentially explosive environments



CargoObserver-Ex: Primary Battery powered



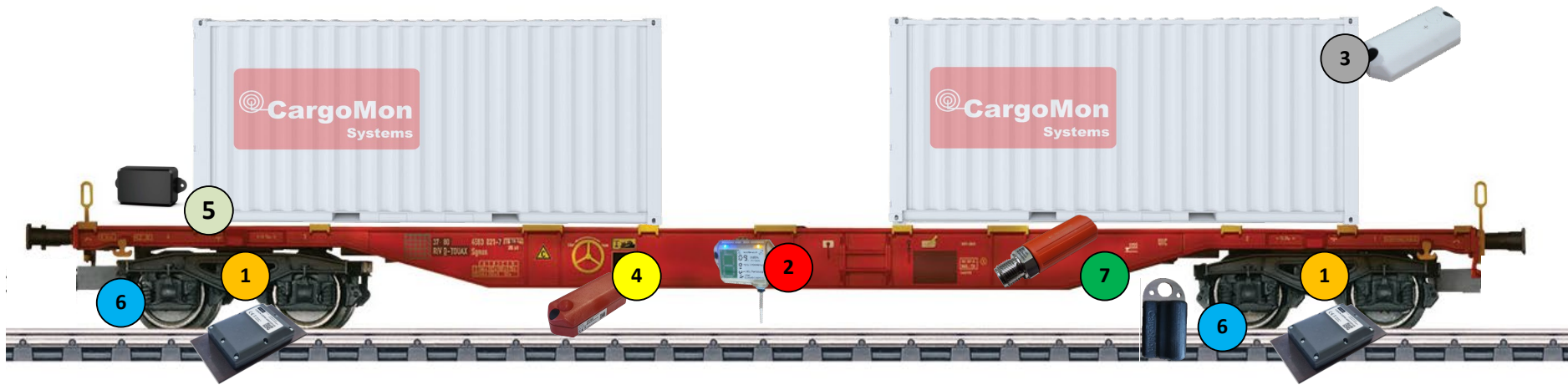
CargoObserver-Ex-Solar-XL:



CargoObserver-Ex-Solar-Sensor:



CargoSense: The complete Wagon Monitoring



- 1** **Cargosense-PrecisionWeight**
Wagon Weight Monitoring Sensor
- 2** **CargoSense-Display**
Weigth/Overlaod Display
- 3** **CargoSense-Multisense**
Inside Waggon/Container Temp, Humidity and Door Sensor
- 4** **CargoSense-Distance**
Status of Handbreak or Loading Status Monitoring
- 5** **CargoSense-TagScanner**
BLE Tag Container Identification and Load Detection
- 6** **CargoSense-Axle** (in pilot stage)
Axle Monitoring (Flat spot, Bearing, Hot Wheel):
- 7** **CargoSense-AirPressure** (in pilot stage)
Break Pressure Monitoring System

Innovative Sensor Technology for the digitized freight wagon of tomorrow



CargoSense	-Multisense	-Distance -TagScanner	-PrecisionWeight	-Axle	-AirPressure	-CargoKing
Special Features	Temperature, Humidity, Door	Load state sensor	<2% Precision Weight measurement	Flat spot detection and bearing faults	Airpressure on Breaking System	Detects correct loading of Trailer
Sensors						
3-Axis Acceleration	✓	✓	✓	✓	-	-
Distance Sensor	-	✓	-	-	-	-
Temperature	✓	-	✓	✓	-	-
Humidity, Dew Point	✓	-	-	-	-	-
Air Pressure	-	-	-	-	✓	-
Kontaktloser Türsensor	✓	-	-	-	-	-
KingPin in Hitch dual Sensor	-	-	-	-	-	✓
Strain Gauge Sensor (DMS)	-	-	✓	-	-	-
Flat spot detection			○	✓		
BLE Tag Scanner	-	✓	-	-	-	-
Bluetooth Low Energy & ITSS2 Ready Interface	✓	✓	✓	✓	✓	✓
Lifetime 6 up to 12 Years	✓	✓	✓	✓	✓	✓

○ Optional / or future
 ✓ Supported by default



CargoSense-PrecisionWeight

The new weight measuring solution

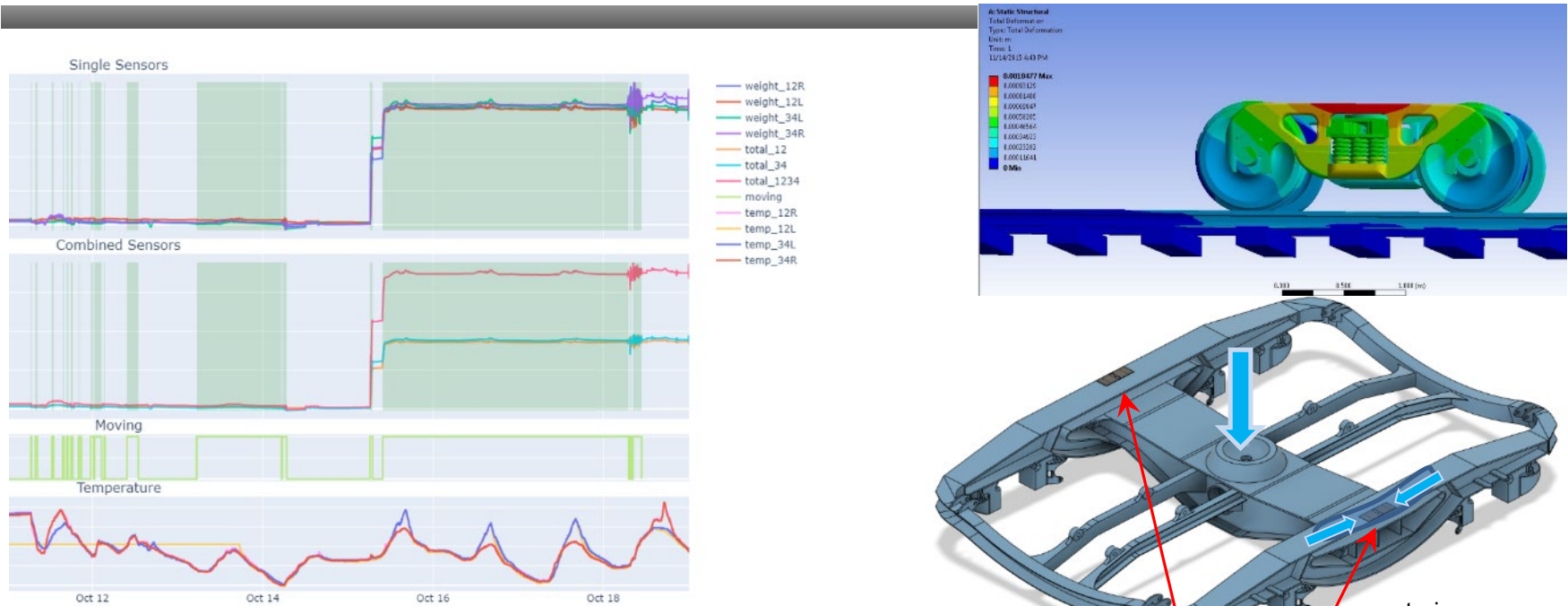


- Principle: strain measurement at bogie with strain gauge sensors
- Optional display can be used for load indication or overload detection
- Mobile phone App can readout weight immediately without connection establishment



CargoSense-PrecisionWeight

A new class of sensors will make freight weighting a thing of the past



- <2% Ton accuracy dependent on installation and calibration type
- Lower cost than competitor solutions
- Additional wheel flat spot detection
- Wireless and easy to install solution



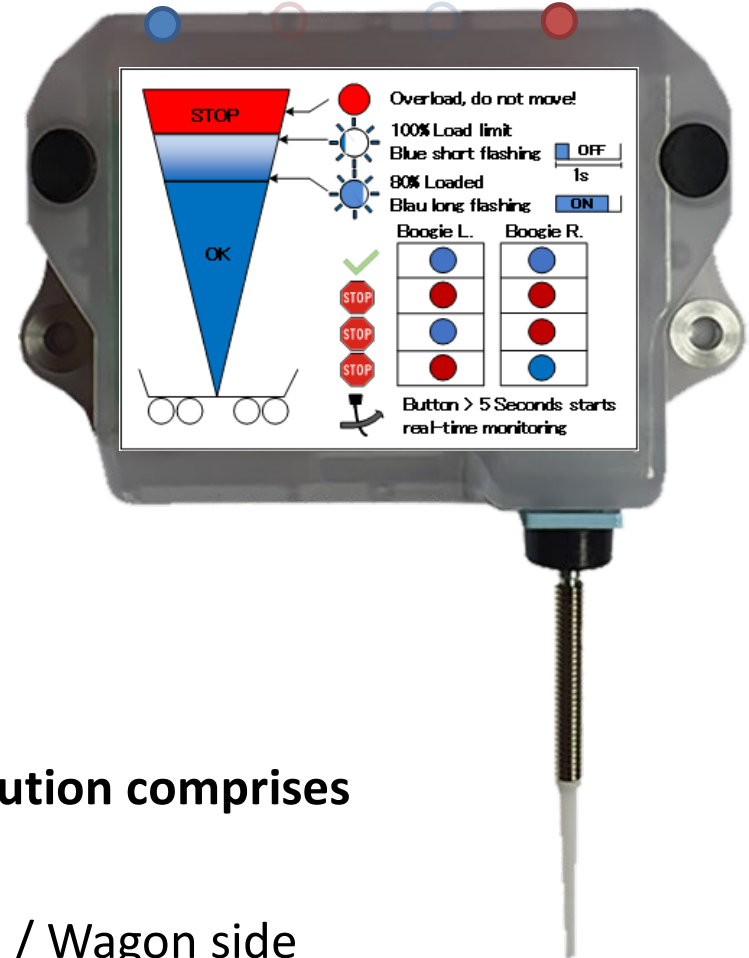
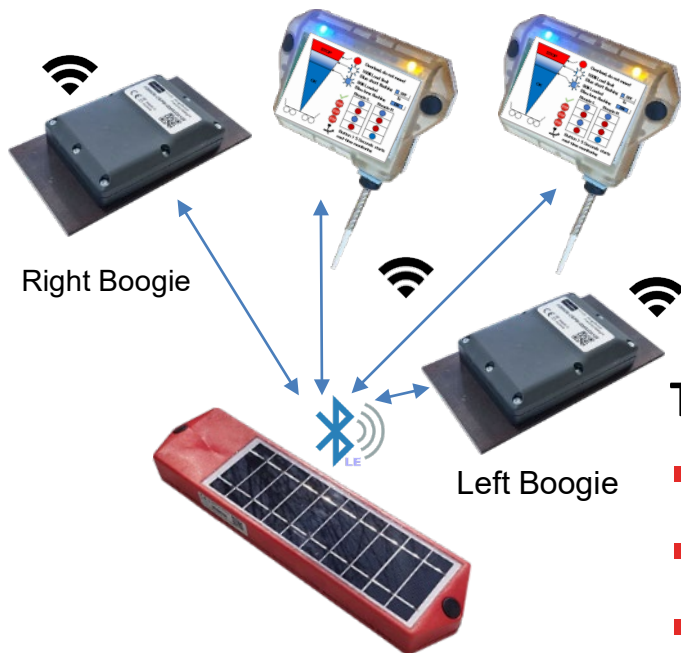
Complete Solution for Weight Monitoring

Telematics controls sensor and displays on both sides of the wagon



CargoSense-Display

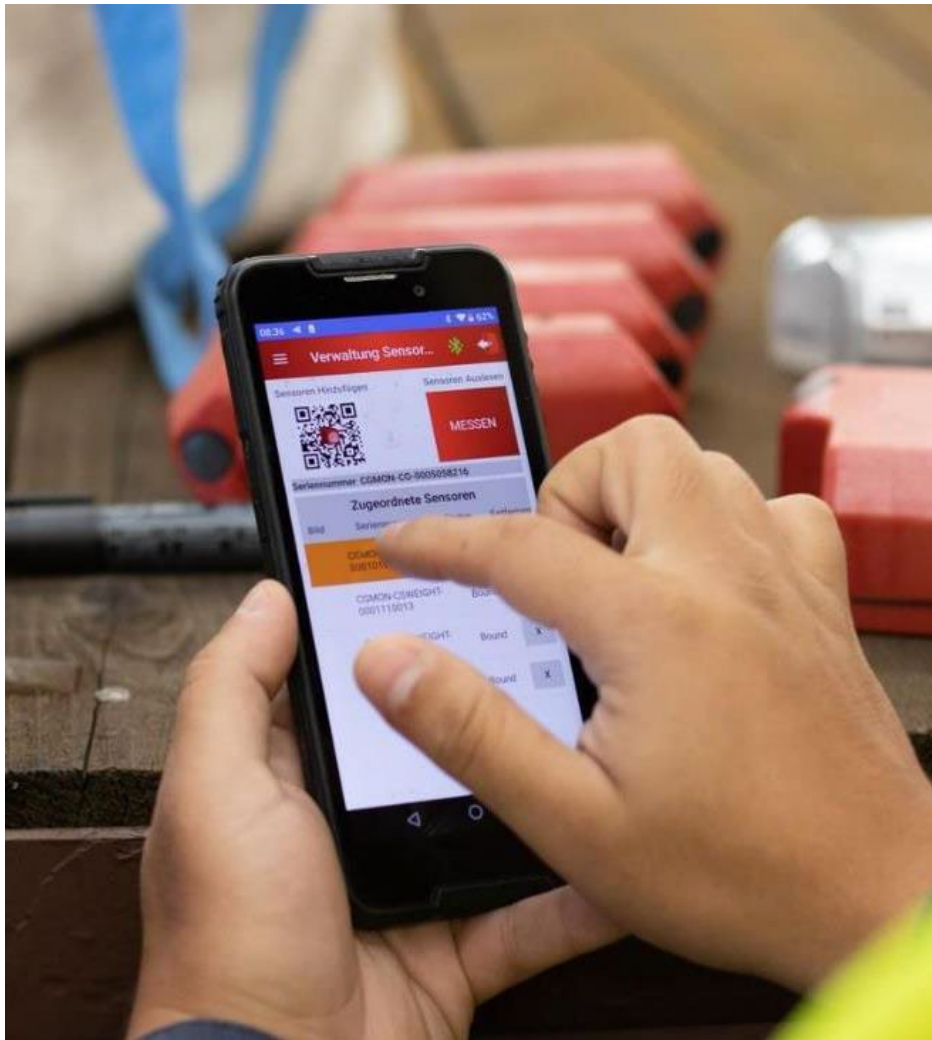
- Shows Load Status per boogie
- Auto shows upon changes
- Shows Overload / Boogie
- Activates real-time mode



The overall Solution comprises

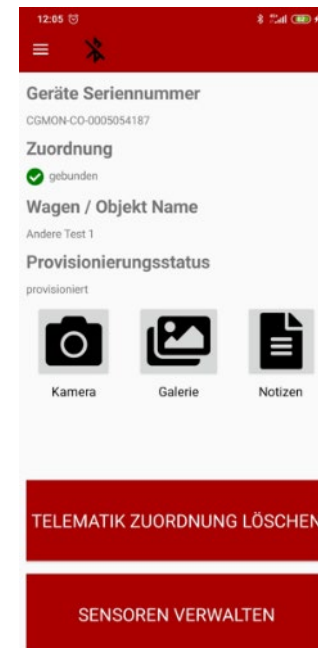
- 2-4 Sensors
- One Display / Wagon side
- Main Telematics unit

IoT Management APP



App Advantages

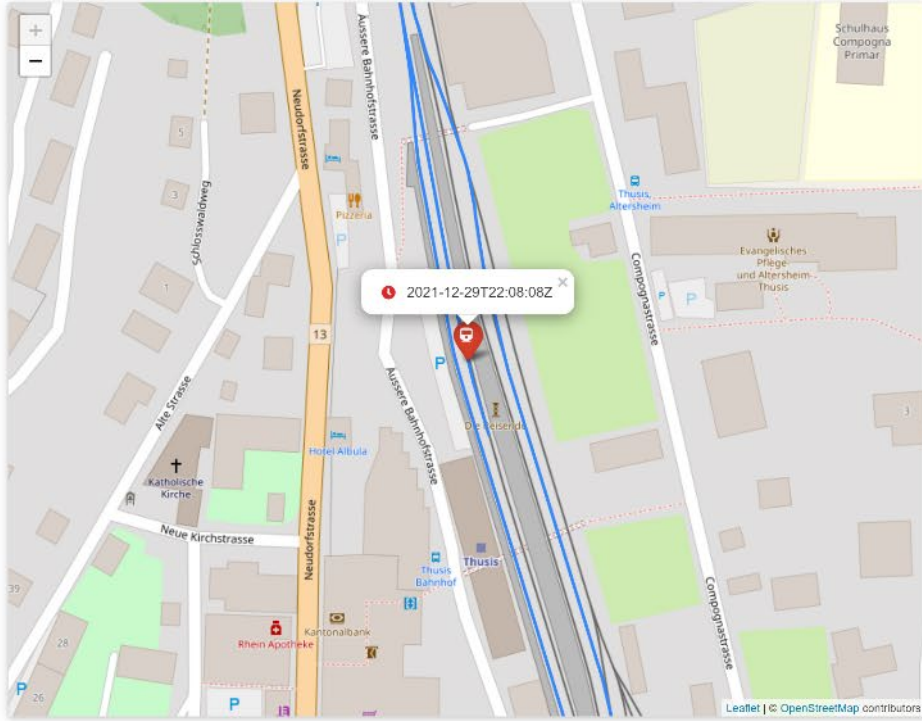
- Quick commissioning
- direct BLE connection to Telematics Unit and all of its sensor locally
- Installation mode with real time connection for:
 - link quality check
 - sensor reading
 - sensor calibration



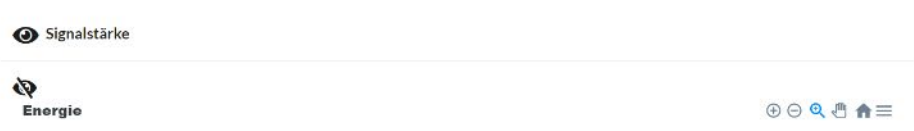
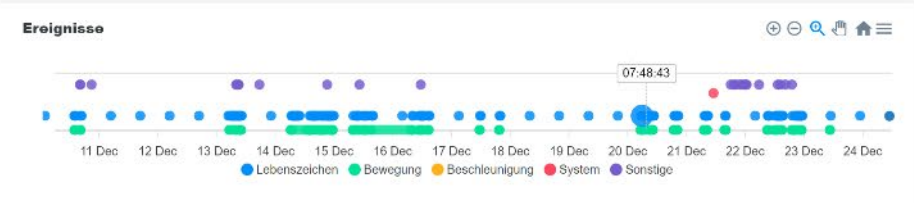
IoT Device Management Platform



CGMON-CO-0005540177
Stillstand
5297 km
4 C°
92 %
-55 dBm
Position
Benutzer Definiert
08.12.2021
31.12.2021



20.12.2021 07:48:43	Location updated
20.12.2021 07:47:00	Lifesign
20.12.2021 07:32:32	Location updated
20.12.2021 07:32:00	Lifesign
20.12.2021 07:17:27	Location updated
20.12.2021 07:16:59	Lifesign



IoT Platform Features



- Fleet Display on map
- 1-click filtering by attributes
- Diagram representation of relevant attributes
- Asset and device dashboard with inter-active exploration of events with positions
- Mileage calculation for freight cars
- CargoObserver device configuration
- Asset type Management
- Dashboard for statistical analysis
- Support for commissioning process
- Open standardized ITSS Interface 1 data interface or customer-specific implementation

Advantages for Wagon owner or Railway undertaking



- Exact location at any time
 - End Customer can see status of freight transport
 - Estimated Time of arrival can be retrieved by combining ERP Data
- Exact mileage of each freight car allows for:
 - Predictive Maintenance, this will reduce service costs
 - Usage and mileages set in agreements can be controlled
- Precise weight measurement allows for proactive overload detection
- Shock alarms can be assigned to locations and identify the root cause
- Cool chain monitoring of temperature on reefer wagon
- Door / Lid sensor: Prevention of theft on closed wagons or tankers

Proved solution: 20.000+ Wagons Installed



and more...

Advantages and Facts

Benefits

- Mileage and location of wagons
- Predictive Maintenance
- Better transparency for customers
- Alarming and data collection for whole transport chain
- Shock detection and damage allocation
- Future prove with rail industry standard wireless sensor interface

Approved system

- 10 years in-field operation experience
- Unique 6-10 years life cycle
- Tuned for reliability and efficiency
- Perfectly customizable
- Continuous research for novel sensors
- Developed and Produced in Austria

