



Exact positioning for Rail Cargo Austria

The Challenge

Amid growing intermodal traffic, Rail Cargo Austria AG wanted to enhance the efficiency and throughput optimization in its Wels container terminal. For this purpose, the handling of loading units (containers, swap containers, semitrailers) between road and rail had to be automatically detected and shown on the terminal operating system on-site. From unloading and interim storage to loading, the need to ensure reliable tracking of containers was key: within freely mobile reach stackers as well as rail-mounted gantries (RMG).

The Solution

The reach stackers and RMG cranes were equipped with Symeo differential GPS (D-GPS). A local GPS reference station ensures the required positional accuracy (accurate to within ± 1 m). Via additional ultrasound and inductive sensors, load changes on the reach stackers are detected. The positioning system is designed to be flexible and expandable at any time with non-satellite based LPR[®]-2D, which can help iron out any subsequent signal white spots that emerge in areas where GPS signal reception is poor (e.g. close to high buildings). The transmission of the measurement data via ZigBee broadcasts eliminates the need for complex cabling on the telescopic boom of the reach stacker.

The Project's Success

Since mid-2009, Wels has used the Symeo container positioning solution in the first rail cargo terminal, throughout which availability of 99.9% has been achieved. Due to the success and thanks to the potential of the Symeo system to also be flexibly adapted to locally differing circumstances, this application is currently being implemented at additional terminals of the Rail Cargo Austria group.

The strict requirement:

A reliable, maintenance-free, highly accurate positioning system

In view of the growth in intermodal traffic, Rail Cargo Austria sought ways of enhancing the efficiency and throughput in its Wels container terminal, where up to 800 trucks and a similar number of goods wagons can be handled. The basis for an automated solution had to be the transmission of precise position data of all loading units to the terminal operating system – covering the entire process from unloading and interim storage up to loading.

The logistics company commissioned Symeo GmbH, as a specialist in industry positioning solutions, to plan and implement the complete sensor solution required. The Symeo system provides continuously exact position data of the reach stackers and RMG cranes and detects all load changes (dropping and picking up of load units) and the size of the load unit transported. The data is transmitted to the super ordinate terminal operating system allowing for tracking of the transported goods during the entire logistics process without manual interaction.

The challenge in this process was ensuring the exact position detection of the reach stackers and, since these (unlike rail bound cranes) move freely around the terminal, the orientation as well. Withstanding mechanical stresses when unloading as well ensuring the reliability of the sensors under all weather conditions were additional challenges. Likewise, the system had to be capable of handling special cases like GPS signal interruption.

Robust sensors for reach stackers

and cranes

In Wels, Symeo equipped a total of 5 reach stackers and 2 cranes with D-GPS receivers. During load changes, robust, inductive and ultrasound sensors on the reach stackers are used to detect the container size as well as the pick-up and drop-off of loads. To avoid the installation of additional cables along the telescopic boom of the straddle carrier, the positional data and other sensor data measured at the end of the telescopic boom, are transmitted via ZigBee radio to the data processing unit in the driver's cabin. ZigBee radio can operate interference-free with an 802.11 wifi network. The data are then made available to the terminal operating system for further processing.

Symeo D-GPS for system integrity

Following the assembly of system components and the warehouse management integration, the setting-up of the positioning system went smoothly. The required accuracy for the positioning measurement data of within 1 m could be verified while maintaining 99,9% availability. "We are delighted with the solution", explains Erich Possegger of Rail Cargo Austria. "All technical and operational specifications were met. Symeo has proven itself as a competent and reliable partner and complied with all performance and scheduling requirements."

Wels operates as the first Rail Cargo Austria terminal to be equipped with the Symeo solution. Currently, the system is now also being rolled out for other RCA terminals.

Rail Cargo Austria

Rail Cargo Austria AG, headquartered in Vienna, was founded in 2004 as a subsidiary of the goods traffic division of the Austrian Federal Railway and is part of the Austrian Federal Railways group. The company has since expanded to become a multinational logistics concern engaged in wide-ranging activities. Each year, the wide network of this service provider handles around 90 million tons of goods and generates around 2.5 billion Euros in revenue, 2 billion of which for its own goods traffic. Rail Cargo Austria operates a total of 18 intermodal container terminals domestically and overseas to handle goods transferred between rail and road. www.railcargo.at

Symeo

Symeo GmbH develops and markets systems for highly accurate position detection and distance measurement, as well as complete anti-collision solutions for cranes and industrial vehicles. Symeo products are extremely robust and hence ideal for applications in rugged industrial environments, indoors as well as outdoors.

Symeo offers wireless real-time systems based on LPR® and D-GPS technology. By combining both technologies and inertial sensors etc., to also compensate for GPS signal losses.

Symeo systems operate regardless of the vehicle or crane type used, which makes them optimally suited for retrofitting onto existing installations. Based on years of experience, Symeo also provides system planning and integration into existing crane and vehicle control systems as well as the development of customized data communication concepts.

Symeo supplies end customers, system integrators and OEMs and works with has worldwide partners for global sales and service.

- Robust D-GPS solution with >99% availability in Wels
- For accurate container location (accuracy < 1 m)
- Flexible D-GPS system, expandable with LPR® for areas without reliable GPS reception
 - Simple to retrofit
- Optimized for rugged industrial environments and reliable operation regardless of weather and prevailing ambient conditions
- Maintenance-free, open system with a high level of automation
- Clearance of up to 800 trucks and 800 goods wagons daily

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