



## Precise, secure, expandable: LPR® at Burchardkai

### The challenge

At the Burchardkai container terminal (CTB), of the Hamburger Hafen und Logistik AG (HHLA), the laser and GPS-based systems previously used to determine the position of the straddle carriers were at their limits: availability was restricted to a single type of vehicle and with limited available in the yard. The need to further increase productivity and the change in requirements caused by the new automatic storage area required a change of system. The new system had to reliably determine the position of all container handling equipment (CHE) in use, everywhere in the yard: also for the first time in highly critical areas under ship unloading cranes, and in the transfer zones to the automatic storage area.

### The solution

The CHE were equipped with Symeo LPR® receivers. Stationary LPR® transponders required to determine the position were mounted on existing lighting poles. The position is determined directly on the vehicle. All positioning data is now available to the terminal operating system of HHLA for further processing. The first systems are in operation since early 2010. LPR® will now be progressively rolled out for the remaining fleet of over 120 vehicles and cranes.

### The project's success

The new LPR® system detects the position of the CHE of differing heights up to an accuracy of 0.2 m and allows therefore the detection of each single container: reliable whatever the weather, throughout the facility, even under the ship unloading cranes and in the back-reach area. Even areas poorly served to date are securely covered by the new LPR® system, with verifiable availability and reliability clearly exceeding 99 percent.

All this has helped HHLA significantly boost its capacity and efficiency in the container harbor.

## Robust, economical ...

The LPR® system from Symeo means that the sensors at Burchardkai operate on a new basis: their operation is unaffected by dirt, vibrations, harsh climate or other disruptive factors. The patented LPR® technology also boasts a unique industry-first local radio location solution, which enables an unlimited number of objects to be detected highly accurately and at an equally high measuring frequency.

Flexible expandability was also important to HHLA and a key requirement for Symeo-solution: With only minimal effort in terms of migration and upgrading, the LPR® system could be installed onto the straddle carriers without technical adaptation. In addition, the system also facilitates any future changes in the shape and size of areas to be covered. Symeo components are configurable in allowing the output of position values in the desired data format directly via a standard interface to the terminal operating IT.

## ... and completely secured

The LPR® receiver now detects the absolute position and orientation of the straddle carrier on a continuous basis: As soon as it picks up or unloads a container, the data are transmitted to the HHLA control centre. The container movements conveyed to the latter assist in the automated management of all 16,000 container slots at Burchardkai, and maximize the logistical efficiency. LPR® generates highly accurate positional data in all terminal areas equipped. The LPR® transponders are simply mounted onto existing

light poles. Unlike with GPS, LPR® allows to increase availability of the position signal by installing additional LPR® transponders if needed. With D-GPS a position signal availability of only 74 percent could be achieved at Burchardkai. With LPR® for the first time, this figure exceeded 99 percent through out the entire terminal. „The acceptance tests showed that the Symeo system meets the requirements in terms of accuracy and availability. We are delighted with the competent approach and professional implementation by Symeo”, commends Ulf Bockelmann, Technology Manager in the CTB.

## Precise positioning processes

Since the new system detects all movements without exception, it combines considerable process flexibility (manually operated vehicles) with more efficient automation. Thanks to the highly accurate positional data, complex logistical processes can now be controlled in a more transparent and efficient manner: the new system is even capable to detect the straddle carrier position under the quay cranes with container and lane accuracy.

## Central monitoring and service

Since LPR® operates without moving or optical parts, this eliminates the need for regular maintenance. Centrally, server based, the state of all components and the position of the straddle carriers is determined and visualized to maintenance personal via a graphical user interface: All operationally relevant system data can be shown at the click of a mouse, and the HHLA service can maintain the system via on-site support. Additional vehicles can be equipped with LPR® at any time without interruption of the terminal operation.

## Hamburger Hafen and Logistik AG (HHLA)

The Hamburger Hafen and Logistik AG (HHLA), founded in 1866 as the state quay administration, operates the Burchardkai Container Terminal (CTB) what at 1.4 km<sup>2</sup> is the largest container handling facility in Hamburg. 27 container bridges operate here on around 5,000 vessels each year. Daily, they load and unload up to 1,100 railway carriages; while similar volumes are also handled by truck. In addition to the newly automated Yard Gantry system, 120 straddle carriers and 7 empty container handlers are also available. The 16,000 available slots of the containers, require a finely-tuned logistical system to manage both incoming and outgoing containers efficiently. [www.hhla.de](http://www.hhla.de)

## Symeo GmbH

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's patented LPR® offers a wireless and real-time system for precise positioning and distance measurement that is ideally suited for industrial applications. Symeo also provides industrial GNSS receivers that can be combined with LPR® and other motion and inertial sensor systems, enabling highly available and precise positioning even under the most adverse conditions and in areas with limited satellite availability.

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 worldwide partners for global sales and service.

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- Symeo LPR® positions each vehicle to within  $\pm 20$  cm accuracy
- Precision for 16,000 container slots
- Uniform coverage without any white spots (even in the edge area of the terminal or when foggy)
- Over 99 percent availability, up to 20 measurements per second per vehicle
- Clearly enhanced efficiency and increased volume of cargo
- Reduced maintenance and repair requirements