Container Terminals

Position Detection

Distance Measurement

Collision Avoidance

Telemetry
Symeo Positioning and Telemetry Solutions for Container Terminals

With local positioning radar and satellite-based systems for Container Handling Equipment (CHE) positioning, Symeo is helping more than 30 major terminals worldwide to optimize their operational and safety processes. These terminals have almost 700 CHE machines equipped with Symeo positioning solutions.

Symeo offers radar- and satellite-based systems for precise short- and long-range distance measurement, seamless position detection and secure collision avoidance applications. Additional information such as load changes and vehicle telemetry data can also be captured in real-time and transmitted to the terminal’s IT system.

All Symeo systems are designed to meet the stringent demands of container terminal operations, which means they must be:

- Robust
- Easy-to-install
- Maintenance-free

Symeo solutions are suitable for all types of Container Handling Equipment (CHE):
- Automated Stacking Cranes (ASCs)
- Rail-Mounted Gantry Cranes (RMGs)
- Rubber-Tired Gantry Cranes (RTGs)
- Empty Handlers
- Reach Stackers
- Top Handlers
- Ship-to-Shore Cranes (STS)
- Straddle Carriers

Symeo position detection, distance measurement, telemetry and collision avoidance sensors can be deployed to optimize processes such as:
- Crane and Vehicle Automation
- Fleet Management
- Anti-Skewing Control
- Warehouse Management
- Loading/Unloading Processes
- Personnel and Equipment Safety

Optimizing Key Operational and Safety Procedures in Container Terminals
Position Detection, Distance Measurement,

Short- and long-range distance measurements with radar

Radar-based Symeo 1D sensors enable centimeter-precise distance measurements over short as well as long distances, indoors and outdoors. Unlike conventional encoders or laser sensors, the Symeo radar technology functions reliably even in harsh weather and environments where sunlight, dirt and dust are common.

- Distance measurement ranging up to 1,000 m
- Unaffected by weather, dirt and vibrations
- Low investment costs
- Exact detection of the spreader lift height

Highly-precise indoor and outdoor position detection with radar

The radar-based LPR®-2D positioning system allows precise position detection for both indoor and outdoor applications even under harshest industrial and environmental conditions. The Symeo positioning sensors are robust, easy to install and well-suited for all types of cranes and vehicles.

- Contactless, highly-precise position detection using radio technology (WiFi-independent)
- Maintenance-free, no wear and tear
- Unlimited range

Exact positioning in the yard with D-GNSS

Symeo position detection systems based on D-GNSS (Differential Global Navigation Satellite Systems) enable reliable outdoor detection of vehicles and cranes in all typical container terminals applications with slot accuracy. The GNSS technology utilizes the GPS and Glonass satellites to provide a high degree of reliability.

- Precise detection of the vehicle, crane and spreader position via D-GNSS
- Robust
- Optimally suited for outdoor applications

Collision Avoidance and Telemetry

Seamless position detection with combined technologies even in critical areas

Due to the combination of radar- and satellite-based positioning technologies, in conjunction with the powerful Symeo SensorFusion Software, highly-accurate positioning is possible even in critical areas of the container terminals where satellite reception is limited, such as

- Between high container stacks
- Near buildings and RTGs/RMGs
- Under STS-crane
- In waterside and landside transfer zones
- Inside logistics warehouses

Secure collision avoidance in container terminals

Symeo offers different solutions for crane and vehicle collision avoidance. The anti-collision solutions range from one radar sensor, which can detect objects as small as a few centimeters, to complete anti-collision systems with analysis software and optical warning signals.

- User-definable warning and stop zones
- Warning signals with the position and movement vectors of all participants that are shown on the display
- Slowing down or stopping the crane movement

Real-time recording and transmission of telemetry and vehicle data

Supplementary information such as the load status and telemetry data of all vehicles can also be recorded. The information is transmitted to the terminal’s IT system using a variety of methods that includes WiFi, mobile radio, wireless modem and the LPR® wireless channel. Typical vehicle data includes:

- Speed
- Driver ID
- Load status
- Energy consumption
### Typical Fields of Application

#### Selected Symeo Products

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#### Symeo Product Features

Almost 700 Container Handling Equipment machines in over 30 major terminals worldwide are equipped with Symeo products that offer a variety of functionality and features:

- Unaffected by contamination, dirt, dust, weather and vibrations
- Suitable for all types of cranes and vehicles
- Precise distance measurements of cranes and vehicles up to 1,000 m
- Exact detection of vehicle, crane, spreader and crane trolley position
- Highly-accurate speed detection of crane trolleys and other vehicles
- Contactless radio-based measurements indoors and outdoors
- Reliable combination of radar- and satellite-based technology for seamless position detection
- Maintenance-free, no wear and tear
- Simple installation and commissioning
- Easy to retrofit
- Standard interfaces
- Compatible with state-of-the art Terminal Operating Systems (TOS)

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Symeo GmbH develops and markets systems for precise and contact-free distance and position measurement, as well as anti-collision solutions for cranes, industrial vehicles and fixed objects. Furthermore, the company develops certified, customer-specific telemetry solutions.

Symeo products are robustly designed and well-suited for applications in harsh industrial environments indoors and outdoors. The products are easy to retrofit and can be used regardless of vehicle or crane type.

The LPR®-sensors with unique patented radio technology are equipped with industry standard interfaces. The company also provides industrial GNSS (Global Navigation Satellite Systems GPS, Glonass and Galileo) receivers that can be combined with LPR® and other movement sensors like encoders and inertial measurement units (IMU).

This combination enables highly available and precise positioning, even under the most adverse conditions and in areas with limited satellite availability.

An international network of Symeo affiliates and partners ensures local support for customers worldwide. Symeo offers a 24/7/365 technical support hotline for subscribers to avoid any downtimes.