



## Robust Radar Positioning of the Crane Bridge and Crane Trolley in a Cement Plant

### The challenge

The Holcim (Schweiz) AG cement factory in Siggenthal manufactures clinker from limestone, an intermediate product in cement production made inside a rotary kiln at high temperatures. The clinker is temporarily stored in a hall together with gypsum and limestone. An overhead crane collects these materials and transports them separately to a cement grinding facility. The crane system had been equipped with the robotics software from automatiX GmbH some time ago. In order to precisely track the crane movements, both companies sought a reliable positioning solution for the crane bridge and crane trolley. One of the special challenges involved the high levels of dust and grime created by the clinker manufacturing process. These environmental conditions made it impossible to utilize laser positioning. Furthermore, mechanical positioning solutions proved to be prone to wear and tear over time.

### The solution

Syмео's radar-based positioning system, which is resistant to dust, dirt and vibrations, continuously tracks the crane bridge and trolley position in the clinker works with centimeter-accuracy and without incurring downtime for any service or cleaning. One pair of LPR®-1DHP 61 GHz sensors capture the crane position, a second pair of sensors capture the trolley position - in real-time and by using the patented LPR® radar technology. The system is completely maintenance-free. The positioning data is captured and processed in an industrial PC via a field bus interface with the robotics database software from automatiX.

### The project's success

Holcim (Schweiz) AG has been using the robust radar positioning system from Syмео at its cement plant since December 2015. Since the installation, downtime caused by mechanical failures or costly maintenance have not occurred. The result is an efficient and reliable robotics system in the clinker hall.

Environmental conditions complicated reliable positioning solutions

Switzerland-based Holcim (Schweiz) AG, a system and solutions provider for cement, gravel and concrete, and automatix GmbH, an automation specialist for crane systems, have been partners for years. At its cement plant in Siggenthal, Holcim (Schweiz) AG has been using the robotics software from automatix to fully automate the crane operation. The complex stockpile management processes can thus be represented on an industrial PC.

To ensure smooth operation of the automatic robotics system, precise and reliable positioning of the crane bridge and trolley is required. The challenge stems from the high levels of dust and grime that collect in the facility during the clinker manufacturing process. Laser positioning was excluded because of its susceptibility to dust and dirt, while mechanical systems proved to be inefficient due to the high maintenance costs.

#### Robust positioning with radar sensors from Symeo

The solution: Two pairs of robust wireless sensors from Symeo ensure maintenance-free, reliable and precise radar positioning of the crane bridge and trolley.

For the crane bridge, one sensor is mounted on the crane itself while the second one is attached to an existing metal beam. The exact position of the crane bridge can be determined with the contactless distance measurements provided by the wireless sensors. With the trolley system, one device is mounted on the crane trol-

ley and another one on the end of the crane bridge. As with the crane bridge, the duration of the 61 GHz wireless signal is measured to determine the distance between the two antennas in real-time. Symeo thus offers a dust- and dirt-resistant, precise real-time locating system that requires no maintenance.

„For us, a major benefit of the radar-based Symeo solution is the high availability of the system, which operates reliably even in our challenging environment,“ says Beat Kappeler, head of electrical maintenance at Holcim (Schweiz) AG.

#### Robotics database software from automatix, including increased processing capacity

The measurement data can be easily integrated into the database via the field bus interface. Thus, the data is available for the robotics software from automatix for analysis purposes.

The automatix software „Offenes Lager“, the robotics software designed especially for robotics warehouse operations, uses additionally the positioning data for product volume monitoring and logging tasks. The software is installed on an industrial PC, which handles the communication with the crane control unit (PLC) via a network. This gives the full automation solution from automatix more computer capacity to optimally calculate the transport orders.

Together, the automatix robotics software and the Symeo positioning system ensure robust, efficient and reliable automated operations in the clinker hall.

#### automatix – Gesellschaft für Automatisierungstechnik mbh

automatix GmbH was founded in 1997 with the idea of implementing an integrated crane robotics system. The automatix software “Offenes Lager” combines IT components, such as database and network, with conventional electronics control technology. By adding modern sensor technology (laser, ultrasound, radar), the system can continuously measure the corresponding fill levels. The software makes it possible to automatically calculate, prioritize and execute optimized transport orders. Manual intervention is possible at any time, but necessary only in special situations. Various data outputs are available, such as online 3D visualizations, daily quantity balances and crane system error reports. Apart from the robotics solution, automatix also offers a 24-hour remote maintenance service and PLC programming. [www.automatix.de](http://www.automatix.de)

#### Holcim (Schweiz) AG

The core business of Holcim (Schweiz) AG, a subsidiary of the globally active building materials company LafargeHolcim, is cement, gravel and concrete. Acting as a system and solutions provider, Holcim (Schweiz) AG guarantees reliable delivery, overall solutions and first-class technical support. Experienced cement and concrete experts develop tailored cement and concrete mixtures. The company has a workforce of around 1,250. [www.holcim.ch](http://www.holcim.ch)

#### Symeo GmbH

Symeo GmbH develops and markets products and solutions for precise, contact-free and maintenance-free position detection, distance measurement and collision avoidance of road/rail vehicles and cranes. Furthermore, the company develops certified, customer-specific telemetry solutions with mobile data transmission. Products from Symeo are designed to be especially robust for applications in rough environments. With its LPR® products, Symeo offers a wireless-based, real-time-capable measurement system that is ideally suited for industrial applications. Symeo has several years of experience in the development of cost-effective, customer-specific industrial solutions on the basis of LPR® and GNSS positioning technology (GNSS = Global Navigation Satellite Systems GPS, Glonass and Galileo).

The company delivers standardized products and complete solutions to system integrators, original equipment manufacturers (OEMs) and end customers worldwide.

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- Contactless, highly-precise and reliable radio position detection in a challenging mining environment
- Radar measurement unaffected by dirt, dust and vibrations
- Robust housing of the radar sensor LPR®-1DHP
- Maintenance- and wear-free
- Simple data integration via field bus interface to the robotics database software from automatix