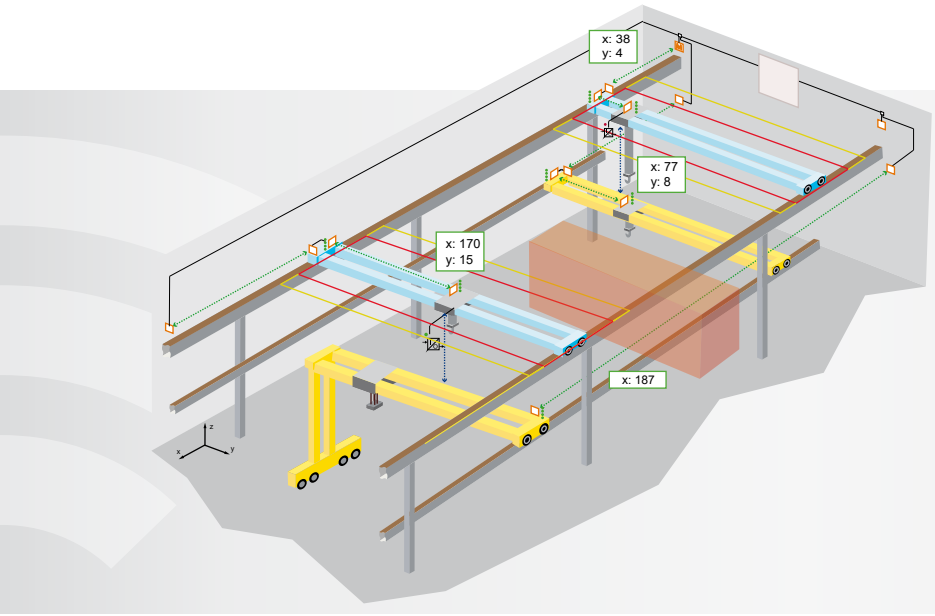


Collision Avoidance for Cranes at Different Heights

CCC Crane Anti-Collision Software and LPR®-1D24

The Collision Control Center (CCC) from Symeo is a modular assistance and management system developed especially for preventing collisions between cranes and objects within the cranes' operation zones.

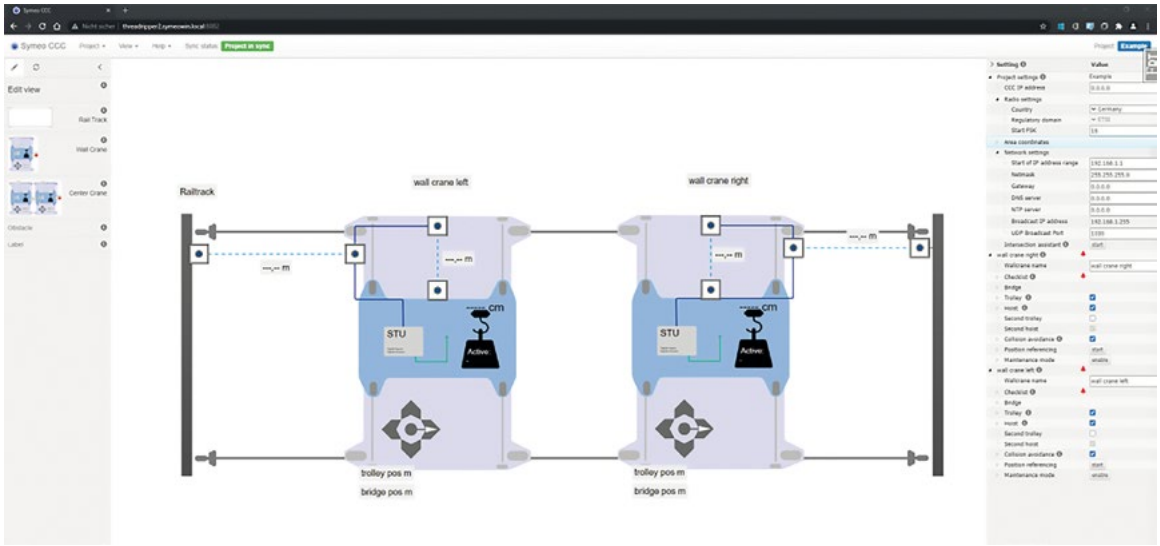
The software makes it easy to configure triggers for warning and stop signals. The system is capable of tracking up to 15 cranes with different dimensions and heights. Permanent or selectable safety zones can be configured in the system for specific projects. For example, overruns in these zones can be reported or completely blocked

All crane movements are monitored in real time. By using the STU (Symeo Telemetry Unit), the crane hook height and 3 different loads can be taken into account to avoid collisions.

The positions and speeds of the cranes and trolleys are measured with the highly reliable LPR®-1D24 wireless system. The individual distance measurement values are displayed in the software interface. This data is transmitted via the integrated LPR® wireless data link or via Ethernet. Symeo's Collision Control Center visualizes and monitors the position, the measurement data and the relay states of all participating objects in real time. It calculates collision warning signals dynamically depending on the crane parameters (speed, acceleration, reaction time, etc.) and sends them to the LPR®-1D24 of the affected crane in order to open the corresponding relay contacts (potential-free).

The Symeo collision warning system does not require or interfere with a WiFi connection.

- **Reliable collision avoidance for cranes at different heights**
- **Flexible configuration for typical crane applications**
- **No central control unit (PLC) required**
- **Crane-to-crane communication via integrated LPR® radio data connection or via Ethernet**
- **Easy access to the CCC via web-based user interface**
- **No WiFi needed**



Symbolic image; configuration via standard tools

- Operation, parameterization and monitoring is done via a web browser.
- Individual cranes which have no power due to maintenance can be temporarily put into maintenance mode in the Collision Control Center in order to maintain the system‘s overall functionality.

Technical Data: CCC Anti-Collision Software for Cranes	
Number of cranes and trolleys	as a standard up to 15
Number of virtual security zones	up to 20
Number of relays addressed per LPR® unit	4
Monitoring of crane hook position	optional, if height sensor signal is available (retrofittable)
Warning/stopping distances	freely configurable
Real-time operation	yes
Data transmission	via LPR® radio channel and Ethernet
Parameterization	no programming skills necessary
System operation monitoring (communication and position)	CCC checks system integrity LPR®-1D24 stations check data integrity
Position detection	LPR®-1D24

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