

# Complete IIoT Braking System

## PORT CONTAINER GANTRY CRANE

### PROBLEM

The Port of Duisburg, located on the Rhine River in Germany, recently upgraded the entire braking system on one of its large rail-mounted gantry cranes. Accommodating 20,000 ships and 25,000 trains annually, Duisburg is the largest inland port in the world. The port operators wanted to install a new, state-of-the-art IIoT braking system that would allow a predictive maintenance solution to be established on an older container crane. If successful, the system could eventually be installed on all gantry cranes, with lifting capacities up to 55 tons, in the port.

### SOLUTION

The executive management of the port met directly with Stromag to determine if an advanced braking system could be developed. Ultimately, Stromag was selected for the high-priority project based on their superior service support and design flexibility and technologies to deliver a customized IIoT solution that interfaced with the customer's dashboard. Specialized sensors were installed on a TDXB thruster service disc brake and a SHC18 spring-applied, hydraulically-released emergency disc brake. The service brake acts on a disc installed on the high speed shaft of the crane's winch drive. The emergency brake acts on a disc mounted to the gearbox low speed shaft. An SHPU hydraulic power unit and disc/hub assemblies were also supplied.

A Series 51 geared cam limit switch, with a multi-turn absolute encoder, guarantees the safe stopping of the crane's hook. It also provides feedback about the actual positioning, speed and turning direction of the elevated movement. The brake sensors and limit switch encoder exchange data through a PLC via a cloud connection. The advanced IIoT braking system utilizes artificial intelligence to provide many convenience and cost-saving advantages, including remote and augmented maintenance, increased crane availability due to planned downtimes and extended system life due to careful maintenance monitoring.

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### HIGHLIGHTS

- TDXB thruster disc service brake with a max 5,700 Nm braking torque and predictive maintenance option
- SHC18 spring-applied, hydraulically-released emergency disc brake with a max 254,000 Nm braking torque
- Hydraulic power unit
- Series 51 geared cam limit switch combined with bevel gearbox
- Disc and hub assembly
- SIMAN IIoT monitoring system



# Stromag