

Cranes with Brains

BL67 remote I/Os work reliably in huge gantry cranes from ABB – the modular fieldbus system withstands even the highest physical stresses

In operation, they make containers weighing thousands of tons appear to levitate. The meter high rectangular blocks seem to glide effortlessly from their storage locations to awaiting freight trains or goods carriages. Facades the height of houses are built only a few meters apart out of stacked freight containers awaiting further shipment. Automated rail-mounted gantry cranes (ARMG) or double rail-mounted gantry cranes are regarded as the workhorses among the industrial “weightlifters”.

Gantry cranes move millions of tons of freight around the world daily. Behind this enormous transport effort is hidden a considerable amount of high-tech. Gantries with track widths of over 40 meters run virtually always automatically and can weigh

between 200 and 350 tons. They can raise freight containers to lofty heights of over 20 meters. In conjunction with automatic transport systems, gantry cranes achieve a genuine tour de force in terms of freight logistics. Sophisticated automation and accessory systems ensure smooth goods handling in all major seaports.

ABB Crane Systems is one of the leading suppliers of gantry crane technology. As part of a major project, ABB is currently supplying automation systems and electrical equipment for more than 100 ship-to-shore cranes intended to increase productivity in numerous Asian ports. Function tests and final assembly are carried out at the Shanghai Zhenhua Port Machinery Company (ZPMC) in China, the largest crane manufacturer in the world. By the end

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Tireless workhorse:
Gantry cranes move millions and millions of tons around the world daily



of 2008, ABB had delivered 29 ARMG, two RMG and seven ship-to-shore cranes for the port of Busan, South Korea, alone. Additional projects include 20 unmanned, track-based container gantries for the Taipei Port Container Terminal Corporation in Taiwan, as well as 42 similar units and twelve ship-to-shore cranes with dual hoist systems for Hanjin Shipping, which are to be supplied for the Busan New Port in South Korea.

Reliable and safe

ABB Cranes stand for safety and reliability. It's no wonder, then, that the project managers take great care in selecting all plant components. After all, only if every individual part provides its service reliably can the entire system function reliably.

Part of this overall system is the remote I/O technology from Turck, which ensures reliable connections between the field devices and the controller level in the 73 automated gantry cranes in the port of Busan. "The fact that we opted for the Turck BL67 I/O modules is due to their high vibration resistance, as well as their drop and topple

characteristics," comments Åke Adolfson, manager of Systems Engineering & Commissioning at ABB Crane Systems. The reason for the demanding requirements: Despite sophisticated controller technology, collisions between the head blocks of the cranes and the containers can still occur. The technology must be able to reliably and durably withstand the acceleration forces produced in these cases.

The modular BL67 I/O system was manufactured with IP67 protection especially for use under extreme conditions. It consists of a gateway and expansion modules. The gateways are used for communication with the fieldbus in use and are currently available for Profibus-DP, DeviceNet, CANopen and Ethernet. Up to 32 expansion modules can be connected to the gateway. The basic modules are passive components and are simply snap-fitted into the system. This produces a compact and mechanically stable unit that can be expanded at any time. Thanks to the compact design of all BL67 components, the fieldbus nodes can be mounted in direct proximity of sensors and actuators without taking up a lot of space. ■

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Åke Adolfson
ABB Crane Systems



Quick read

Automatic rail-mounted gantry cranes are the tireless industrial "workhorses", handling millions of tons of freight worldwide and operating virtually entirely automatically. So that these giants function trouble-free, ABB Crane Systems has added remote I/Os from Turck to its own I/O solution. High vibration resistance, as well as resistance to impacts, tipped the scales in favor of the BL67 series.



Tough: Turck's BL67 remote I/O system can take the impacts and vibrations from the gantry cranes