

Customer Success Story: Heila Cranes S.p.A.

Market segment
Marine



Making ship crane building faster, safer and more efficient

Location:
Reggio Emilia, Italy

Challenge:
To build one of the world's largest offshore cranes, featuring control architecture, back-up power, and an effective lighting system with minimized wiring dimensions, while reducing delivery, installation and maintenance time.

Solution:
Control architecture using an XP500 industrial computer, XC-CPU202 series PLC and XI/ON decentralized inputs / outputs, Eaton 9355 Marine uninterruptible power supply, and an Eaton CEAG lighting system.

Results:
DA safe and reliable integrated solution that reduced wiring and installation time by 10%, lighting energy consumption by 45%, compared with incandescent lights, and maintenance costs by 50%. Manual Overload Protection System (MOPS) functionality is guaranteed by the UPS in the case of blackouts, ensuring more accurate troubleshooting.

"Thanks to our ability to provide remote assistance coupled with Eaton's fast delivery times, and ability to ship spare parts basically anywhere in the world, we're able to minimize the downtime incurred by our clients."

Giovanni Bertozzi, Heila

Background

For over 35 years, Heila Cranes S.p.A. has been a global leader in the construction of customized marine cranes. Heila, which is based in Poviglio, Reggio Emilia, Italy, has over the last twenty years specialized in the production of cranes for the marine and offshore sector, and is about to finalize the construction of one of the largest offshore cranes currently available for the European market near the port city of Ravenna, Italy.

In order to ensure reduced installation and delivery times, greater safety and energy efficiency, as well as lower maintenance costs, the company turned to an integrated solution designed by the automation division of Heila's engineering department using Eaton components. This includes an innovative control architecture, UPS and lighting systems.

Challenge

Heila Cranes was commissioned by Stemat, a company based in Rotterdam, the Netherlands, to build a crane for the Stemat Spirit, a container ship that is used to transport material and equipment for offshore wind farms in the North Sea. The crane, model HR4070/30-2BJ with Active Heave Compensation, has a lifting capacity of 4,000 tons, a maximum outreach of 34 meters and a maximum height of 42 meters.

As the crane is intended for offshore use, in a remote area exposed to extreme weather conditions, the project offered Heila the opportunity to adopt innovative design and engineering solutions. These included the need to minimize delivery, installation and maintenance times, allowing the customer to avoid inconvenient downtime costing over €100,000 per day.

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"As they will be working in the open ocean, where the rapid provision of assistance and spare parts is often out of the question, the Stemat Spirit needed a reliable solution that is able to guarantee immediate support when required," explained Giovanni Bertozi, Lead Automation Engineer at Heila. "Having already worked with Eaton in the past, we are perfectly aware of their global presence and of the high quality and wide range of their products."

These include PLC, safety lighting and UPS, allowing us to equip our cranes with a complete solution which can ensure extreme reliability and safety."

In particular, Heila was required to provide the crane with a control architecture which would allow remote monitoring and rapid installation, as well as a UPS capable of ensuring MOPS operation in the event of a blackout. The latter requirement is imposed by the EN 13852-1 European standard and by DNV GL, the world's leading certification body in the maritime sector.

For safety reasons, Heila's offshore crane also needed an effective lighting system for all walkways. This had to be capable of guaranteeing high energy efficiency and low maintenance costs.

Given the limited space on board, Heila was also forced to minimize the wiring and installation dimensions of electrical devices. In addition, the components used had to be sturdy and able to endure harsh environmental and climatic conditions.

Solution

The solution consists of a control architecture comprising an XP500 industrial PC, an XC-CPU202 series PLC and XI/ON decentralized inputs/outputs capable of supporting both CANopen fieldbus and Ethernet-based fieldbus as needs demand.

The XI/ON remote I/O consists of modular input/output signal field stations, and is installed on a DIN rail. The system can be quickly and easily installed thanks to the compact design with base-mounted modules, with a DIN rail installation that allows wiring to be independent of the module (base-mounted), and the use of push-in type spring clamps, which do not require the use of a screwdriver. Wiring is also streamlined and kept to a minimum, allowing Heila to interlink functional units in a timely manner.

The extended memory and performance – 1.65 GHz processor and dual core CPU — of the XP500 industrial PC offers a fast processing speed and reduced footprint. These features help simplify data logging, which is essential when it comes to identifying a structural failure and tracing the problem, as well as during an investigation (in case of accidents), without the need for an auxiliary PC. All this keeps the system running at top speed. Moreover, thanks to its performance, the PC does not require a cooling fan, making the system compact and less exposed to lock-up as there are no moving parts.

The Eaton PC was also designed for environments constantly exposed to the elements, such as the North Sea, and is equipped with anti-glare display glass, aluminum housing and a

sturdy scratch-resistant panel that is waterproof and chemical-resistant.

In order to facilitate PC and PLC utilization and reduce potential human error, projected capacitive touch (PCT) technology, combined with Codesys software, offers an extremely intuitive interface. The multi-touch function allows the user to engage the on-screen function fields using more than one finger or with both hands, similar to a tablet or smartphone.

Continuous operation is also guaranteed during a blackout as Eaton has installed on the HR4070/30-2BJ crane the Eaton 9355 Marine UPS, one of the few UPS products on the market that is certified EN 13852-1 and by DNV GL for MOPS operations. This device allows for load recovery so that operations in progress can be completed in the event of a blackout.

Additionally, thanks to its compact design with internal batteries, the Eaton 9355 Marine UPS does not require Heila to provide an external compartment cabinet, thereby allowing a smaller footprint. These factors have made it possible to incorporate a UPS into the boom of the crane, thus further reducing the amount of wiring.

The Eaton CEAG lighting system, equipped with high-efficiency, energy-saving, light-emitting diodes (LED) floodlights, also contributes to the sleek dimensions of the UPS.

Lower energy consumption also makes it possible to employ a smaller UPS to ensure continuous lighting during a blackout, even for a system with more lights than would normally be installed.

Results

By adopting these solutions, Heila estimates that wiring and installation now take more than 10% less time to perform.

"When dealing with operators in the marine sector, you realize that limiting installation time is crucial. The Eaton control architecture uses a single unit with multiple inputs and outputs, making installation quick and easy without any complicated interlinking," said Bertozi.

Bertozi also estimated that the use of energy-efficient LED lights will enable the customer to achieve energy savings in the order of 45% compared with incandescent lights, while slashing maintenance costs by 50%, and guarantee an average life of at least 30,000 hours. This translates into four years' free of maintenance.



The Eaton 9355 Marine UPS allows for load recovery so that operations in progress can be completed in the event of a blackout



The extended memory and performance – 1.65 GHz processor and dual core CPU — of the XP500 industrial PC offers a fast processing speed and reduced footprint