

The brains behind container crane brawn

Industry: Transportation
Product: BOXER-6616



Introduction

Shipping serves as the backbone of the modern, consumer-driven economy, and an estimated 90% of everything we buy has spent time at sea inside a shipping container.

Transporting freight by sea is safer, more environmentally friendly, and far cheaper than moving it by road, rail, or air. To underline just how economical shipping can be, it's common for fish caught in northern Europe to be packed into containers and shipped to China for processing before making the return voyage to be sold in European supermarkets.

None of this would be possible, though, without a global network of ports equipped with heavy-duty cranes that combine precision engineering with the strength to repeatedly lift and carry shipping containers weighing up to nearly 30 tons. With cargo ships running to strict schedules, container cranes have to work efficiently and are often called into service 24 hours a day, seven days a week. Any downtime they suffer creates massive logistical headaches and could end up costing their owners millions.

Customer challenges

When a leading industrial technology developer was upgrading the automation and electrical systems it installed in some of the world's biggest cranes, it needed an embedded controller rugged enough to work in the toughest environments while also supplying the computing power necessary to support advanced sensors and machine vision systems.

Extreme temperatures

Cranes are used in some of the hottest and coldest parts of the world, and their embedded controllers are fitted high off the ground in small control rooms that lack air conditioning. They experience extremes of heat and cold that would cripple most computing systems, so the company needed an effective wide temperature solution.



Unstable power sources

Any controller installed in the field will suffer from highly unstable electricity supplies with DC voltages that can drop, surge, or even momentarily stop altogether. This would be problematic for any application, but controller shutdown in a crane system would be a logistical and safety nightmare.

Vibrations

Controllers deployed within machines that pick up and set down huge loads are subjected to shocks and vibrations that would disarm moving parts such as fans and shake loose cables and unfastened connections.

Peripheral requirements

To maximize crane and operator efficiency, the company uses a series of sensors and cameras in its electrical and automation systems. Cameras give operators a view from the handling tool that picks up containers, and sensors can monitor variables such as wind speed and direction, the weight of the payload being carried, and the proximity of the handling tool to containers about to be picked up.

All this information can be fed back to the operator and shown on an HMI display. The more information they have at their disposal, the more quickly and accurately operators can complete their work.

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AAEON's solution

AAEON has years of experience developing embedded controllers for industrial applications and has the technological capabilities needed to meet the company's requirements. The company chose AAEON's BOXER-6616 for this project due to its slim profile, ruggedized design, rich I/O interface, and the power of its Intel[®] Pentium N4200 Processor or Celeron[®] N3350 Processor.

Wide temperature support

The BOXER-6616 is a low-power device that utilizes durable components and thermal spread design techniques to withstand extreme temperatures. The controller's chassis serves as a heatsink, and its distinctive, ridged design gives it a much greater surface area allowing it to disperse more heat. As a result of these measures, the controller has an operating temperature range of -15°C-60°C.

Wide DC input support

Power and space constraints make the use of a backup battery untenable, but the BOXER-6616 is fitted with advanced, oversized capacitors that can hold power and allow the system to manage fluctuations in current. AAEON engineers also redesigned the power board to meet a client requirement that the controller's DC input range should extend from 9 to 34V.

Vibration resistant

The BOXER-6616 has a tough chassis to help it withstand any direct impacts, and internally, it's built without any moving parts that might be vulnerable to vibrations. The device has sturdy SSD storage instead of an HDD, and any component connections are screwed into place. On request, the entire system can be made without the use of cables.

An extendable system

The BOXER-6616's standard I/O configuration includes two LAN ports, four USB 3.0 ports, six COM ports, support for VGA and HDMI displays, and a remote power/reset switch. Along with its full- and half-sized Mini-Card expansion slots, the controller is equipped to support all the sensors and cameras the company wanted to use as part of its system.

Impact

By utilizing the power of the AAEON BOXER-6616, the company was able to develop a far-reaching system to help crane operators work faster and more safely than ever before. In addition, the controller's reliability and ease of maintenance ensure that end users can maximize profits by keeping equipment downtime to a minimum.

Using this system, the company has secured contracts for crane systems around the world. As customer demands in this industry continue to grow and cargo handlers demand greater power and sophistication from crane controllers, you can put your trust in AAEON to develop computing platforms to keep the global economy moving forward.



ABOUT AAEON

Established in 1992, AAEON has become one of the leading designers and manufacturers of advanced industrial and embedded computing platforms. Committed to innovative engineering, AAEON provides Industry 4.0 integrated solutions, hardware and intelligent automated services for premier OEM/ODMs and system integrators worldwide, as well as IoT solution platforms that seamlessly consolidate virtual and physical networks. Reliable and high quality computing platforms include industrial motherboards and systems, industrial displays, rugged tablets, PC/104, PICMG and COM modules, embedded SBCs, embedded controllers, network appliances and related accessories. AAEON also offers customized end-to-end services from initial product conceptualization and product development through to volume manufacturing and after-sales service programs. It is also committed to continuously redefining and harmonizing the management and development processes of the industry.

With a constant pursuit of innovation and excellence, AAEON became a member of the ASUS group in 2011, further strengthening its leadership fueled by advanced technology from ASUS and leveraging resources within the group. AAEON is poised to offer more diversified embedded products and solutions at higher quality standards to meet world-class design and manufacturing demands in the years to come.

AAEON is an Associate member of the Intel[®] Internet of Things Solutions Alliance.

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