



4U Industrial Workstation

X-Ray Product Line Inspection for NDT



Captec delivered a robust industrial computing platform for a manufacturer of automated non-destructive testing systems. The solution supports real-time X-ray inspection on production lines, combining reliable 24/7 operation, consistent performance and long-term availability to meet the demands of high-throughput factory environments.

The customer manufactures NDT systems that use imaging and X-ray technology to inspect components in real time on automated production lines. Their equipment relies on continuous computing performance to maintain throughput, detect defects quickly and ensure product quality, requiring industrial-grade platforms that operate reliably in demanding, high-volume factory environments.

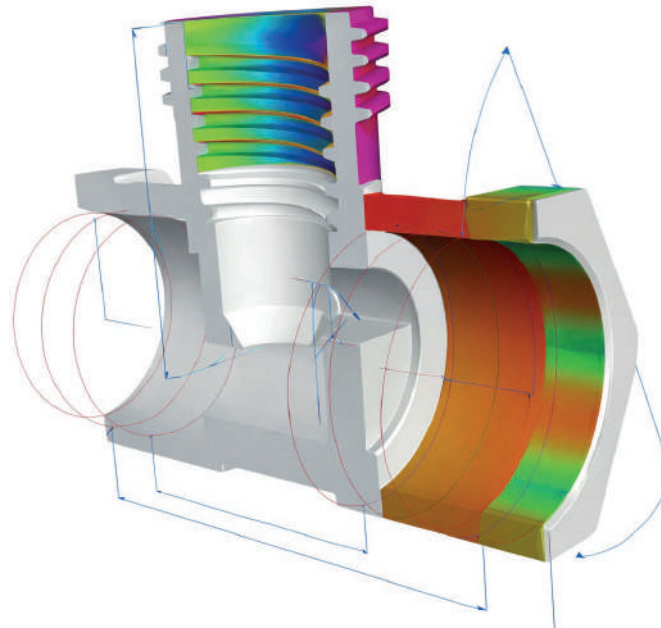


The Challenge

The customer required a computing platform that could be installed in a variety of production line configurations while remaining cost-effective. The system needed versatile mounting options so the same design could support multiple installation types without mechanical redesign.

The computers had to operate continuously in harsh factory environments, with exposure to heat and airborne contaminants, while maintaining the processing performance needed to meet demanding imaging requirements. Compatibility with customer-specific I/O cards was essential to interface with imaging hardware and control systems.

Product availability and longevity were also critical. The application depended on consistent configurations and long-term supply to minimize recertification effort. In addition, the customer required built-in fault tolerance to achieve high uptime and fast recovery from any failures, helping to minimize costly production downtime.



The Solution

Captec designed and manufactured a custom 2U chassis and mounting bracket to give the customer a single computing platform for its production line inspection systems. The mechanical design provided a stable, cost-effective solution that could be used across different machines with a consistent specification.

To support operation in factory environments, the computers were fitted with front-accessible fan filters and engineered to operate within a wide operating temperature range. This combination allowed the systems to continue functioning in areas where heat and airborne contaminants are present. Latest generation processors were selected to provide the performance required by the inspection application.

Custom PCI and PCIe slot layouts were implemented to support the customer's preferred I/O cards, so the computers could connect directly to their existing hardware. Long-life components were chosen throughout the system to reduce the frequency of part changes and the associated need for re-testing and re-validation.

By combining the custom mechanical design, environmental protection, and controlled component selection, Captec delivered a computing platform suited to continuous non-destructive testing in production line environments.



The Outcome

Several hundred units of the customized computing system were supplied, all delivered within the agreed timeframe, enabling the customer to deploy its production line inspection systems in accordance with tight project schedules. The common chassis and mounting bracket reduced installation complexity across multiple machine types and improved the physical stability of the computers once installed.

The design and specification by Captec of long-life components and controlled configurations have reduced the need for frequent engineering changes and associated compliance checks, lowering the cost and effort of keeping the systems current. The combination of qualified parts, environmental protection through fan filters, and appropriate thermal design contributed to reliable 24/7 operation in factory conditions, reducing the likelihood of computer-related downtime.

Over more than three years of use, the systems maintained the performance and reliability required for continuous non-destructive testing on production lines. This supported consistent inspection quality and timely detection of issues in manufactured parts. The successful delivery and in-service performance strengthened the relationship between the customer and Captec and has led to repeat orders for the same computing platform to support further deployments of the inspection systems within their group.



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