

Case Study - G3 Ethernet Fieldbus technology increases production rates and reduces operational costs



▲
State-of-the-art design technology provides flexibility to meet future modification demands on specialty equipment

A leading manufacturer of custom automation and high-precision specialty equipment contacted JHFoster to assist in the redesign of an existing printer plate insertion machine. The goal was not only to increase reliability, but to simplify and speed up the production capability of their current product offering.

CHALLENGES

Printing processes, such as offset lithography, use printing plates to transfer images to paper or other substrates. Printing facilities are very interested in equipment that not only prints faster, but also decreases the machine's setup time when changing plate size. In the past, this was a very time consuming process resulting in higher printing costs. After thorough review of the current machine operation, automation specialists from JHFoster concluded that the primary issue revolved around the varying thicknesses of the existing printer plates and the need to apply consistent pressure regardless of thickness. These varying thicknesses resulted in a load resistance that was not consistent and would ultimately result in inaccurate positioning.

“
Advanced control and monitoring capabilities led to increased production rates and simplified operation
”

SOLUTIONS AND BENEFITS

After reviewing possible solutions, two types of components were identified – electric and/or pneumatic. Since each option had its advantages, it was determined that a combination of both pneumatic and electric components would be able to address all the issues in a cost effective and simplified fashion. In order to achieve the goals of the project, the new approach would require the control and monitoring of all the individual components including 40 pneumatic actuators, 8 electronic regulators and 80 sensors with cables. The magnitude of the design dictated the need for an Ethernet capable open architecture, high-level communication network that provided high-speed, high-throughput capabilities with built-in flexibility.

The solution to accommodate the high level of control and flexibility required was the application of G3 Ethernet Fieldbus technology. The G3 air valve technology with its high level of diagnostic and control capability, modular design and advanced wiring concept would successfully integrate both the pneumatic and electrical requirements. Key features of the G3 Ethernet Fieldbus technology is the built-in plug-and-play wiring concept and multiple monitoring screens that incorporate built-in digital diagnostic capabilities. These features greatly simplify the design and reduce overall set up time.

RESULTS

The G3 valve technology exceeded all expectations of the redesign project. The advanced control and monitoring capabilities made it possible to increase production rates and simplify the operation, resulting in reducing operational costs along with increased reliability and quality improvements. Additional benefits of the G3 valve technology included the flexibility to allow for future modifications and enhancements necessary to meet the demands associated with high performance requirements within the printing industry.