



Sun Automation

Designed for Success

Results

- 12% overall higher throughput
- 50% decrease in setup time
- Higher printing accuracy
- Off-the-shelf PLCs afford easy plug-and-play installation
- Common components in each machine section to reduce design complications and ease the purchasing process
- Ethernet LAN to support high-speed communication
- Zero custom cables and PC boards
- 50% decrease in cabling between machine sections
- New remote connection for troubleshooting, monitoring and downloading software updates

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Craig Propert
Electrical Design Supervisor
Sun Automation

Fast Impressions

GE Fanuc Control System Speeds Printing Machine

Perfect printing on high-speed presses requires precise positioning. Traditionally, operators control these machines with dials and gears. For each ink color, registration must be aligned in a separate machine section. Registration dials, which spin during operation, can only be read and accurately adjusted when the machine is not printing. With this manual system, setup can take hours to complete and involves a lengthy series of trial runs and modifications. Additionally, achieving accurate registration becomes a tedious process, which must be repeated at the start of every job.

To speed setup and increase accuracy, Sparks, Maryland-based Sun Automation, designed a customer-ordered, highly automated, four-color machine for printing corrugated containers. The customer order challenged the Sun Automation electrical team to design automatic positioning functions throughout machine sections and eliminate mechanical adjustments within a tight, nine-month deadline. The new functions also had to be incorporated into an existing control design that automated select machine processes, such as inking and washing. The team met both the customer specifications and deadline by using a complete, off-the-shelf solution from GE Fanuc, which features Series 90™-30 PLCs, motion control, and CIMPLICITY®* human-machine interface (HMI) supervisory control software.

"To meet our deadline, we needed reliable, off-the-shelf components," says Sun Automation Electrical Design Supervisor Craig Propert. "We chose GE Fanuc because of the company's good reputation in the PLC world."



* Part of Proficy Intelligent Production Solutions from GE Fanuc.

Meeting Design Objectives

According to Propert, the three-person electrical team had several overall design objectives for modifying their current control system and meeting the new customer specifications. With help from application engineers, Sun Automation was able to meet all of their objectives—and more—within the short design cycle. “The applications team went well beyond what was specified in our purchase order,” Propert says. “The technical support staff was knowledgeable and willing to make our design a priority.”

The resulting machine allows operators to record and select 16 position-control axes for faster, more accurate setup. Operators program positions by accessing six PLCs at the new main computer console or individual touch screen displays. The PLCs feature a variety of midsize CPUs, which provide function-block times around one microsecond and have four on-board processors for multitasking with fast throughput.

Once an operator selects an axis from the HMI main computer or touch screen, the digital servo drives adjust the machine’s position. The all-digital system provides the greatest possible resistance to environmental changes, further reduces setup time, and delivers significant throughput advantages.

“The servos cost about 30 percent less than competing models and use about half the space,” Propert says. “These smaller components permitted a tighter design, reducing cabling needs and shielding concerns. Additionally, the GE Fanuc servos are not fixed—like competitors’ modules—and result in much higher resolution.”

Adds Sun Automation Electrical Engineer Ron Fick, “Our preliminary plans incorporated stepper positioning modules. By installing servos, we used less space and increased accuracy without sacrificing any reliability. Purchasing is simplified because the machine uses one common servo size.”

Servos offer higher performance than steppers in terms of positioning accuracy—which is a critical function of the new Sun Automation control system. One space-saving I/O link can drive all the servos in a machine section, while Sun Automation would have needed three modules and an additional DC power supply per section with steppers. The servo system required less wiring to the PLC and, because Sun selected a complete motion control solution, it came with prefinished, plug-in cables.

With the PLC and servo system, operators can precisely adjust machine positioning. Unlike manually adjusted machines with dial increments of 0.03125 inches, Sun Automation allows 0.001-inch adjustments for optimum printing registration. This system increases accuracy because it eliminates the tedious guesswork involved with mechanical control. Resulting printing quality has



increased, and setup time has been reduced by at least 50 percent. Additionally, operators can store customer orders in a database and retrieve them for automatic machine setup and exact positioning during the next production run.

To further simplify machine setup, Sun Automation’s new design incorporates a Windows®-based, graphical HMI. This powerful software offers mission-critical monitoring and control capabilities with technological flexibility. CIMPLICITY HMI offers an integrated development environment that allows the underlying control and the user interface to be designed in a coordinated manner. Application development is simplified because screens can be designed without complex programming, which slowed past machine designs by 50 percent or more. By using the HMI, the Sun Automation team was able to develop 30 screens during the highly productive engineering design and startup period.

These screens can also be viewed from any CIMPLICITY HMI system over Ethernet, which connects all machine sections with a standard, open architecture.

“The application engineers showed us that Ethernet would be a stronger backbone for this particular application and would allow us to take advantage of HMI monitoring and control—as well as modeming in diagnostics—with one network,” says Jim Larson, an electrical engineer with Sun Automation.

With the new Ethernet LAN, Sun Automation can use the HMI to link to the system with a modem, view graphics screens and PLC diagnostics, and modify machine controls. This convenient system facilitates troubleshooting of customer equipment at any location around the world from Sun Automation headquarters.

GE Fanuc Automation Information Centers

USA and the Americas:
1- 800-GE FANUC
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Europe, Middle East and Africa:
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Additional Resources

For more information, please visit the GE Fanuc web site at:

www.gefanuc.com

