



AMS Retrofits a Four Color Press for Improved Reliability, Quality, and Productivity

PhotoCraft, a Portland, Oregon-based printing company has been producing high-end commercial graphics for over 20 years. Recently, Bill Patten, general manager of PhotoCraft, approached Applied Motion Systems to see what could be done to improve a large format four color screen printing press.

The press is unique in that it produces high quality screen prints on a broad range of media up to six by seven feet. The production from this press is vital to PhotoCraft's business, yet the problems associated with running the press routinely created quality and productivity problems, making it difficult for PhotoCraft to maintain delivery schedules.

Many Challenges

AMS engineers conducted a complete audit of the press and met with machine operators and production managers to identify key problem areas that needed to be addressed. The manufacturer of the press, an Italian company, was now defunct. The original documentation package was poorly translated and lacking detail.

In addition, there were no source files available for the PLC or the HMI. The electrical schematics were incomplete and the drawings that did exist did not match the as-built configuration of the press. Many control features had been disabled because of failed components, and a variety of mechanical components failed on a regular basis. It was a long list with a lot of challenges – and the prevailing sentiment among the operators was that the machine belonged in the scrap yard.

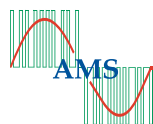
Yet the underlying press structure and process were sound. Many of the problems could be addressed through careful implementation of relatively simple changes to mechanical and software elements of the machine.

Building an Intelligent Solution

The most significant improvements to the machine involved eliminating many of the mechanically-actuated machine functions that had been the source of numerous breakdowns. These elements were replaced with programmable servo actuators to simplify the mechanical makeup of the machine while providing a higher degree of flexibility in configuring the screen printing process.

This was especially true at the color stations where AMS engineers designed a new method for peeling the screen away from the substrate after the print squeegee stroke. This had formerly been done through mechanical linkages and pneumatic actuators that proved to be unreliable. The original fixed linkage design –even when it worked properly– rarely produced the optimum peel profile for a given screen/print size.

AMS upgraded HMI and PLC components in addition to adding sensors to detect common problems identified by the operators. Machine alarms are now announced in English with clear instructions for fixing the root cause of the alarm. All code listings are thoroughly documented and drawings have been corrected and updated so that future support of the machine is easier for someone unfamiliar with the machine.



Printing Press Upgrade

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The production demands for the press required a phased installation. AMS first upgraded the PLC to allow Ethernet communications in addition to installing a closed-loop ACVector drive on the main drivetrain. Next, AMS installed the newly designed peel mechanism and servo drive on the first color section. This provided a low risk approach, allowing a timely install and debug period. Software and mechanical elements were optimized on this prototype unit and the machine operated in this way while the mechanical components were manufactured for the subsequent three color sections.

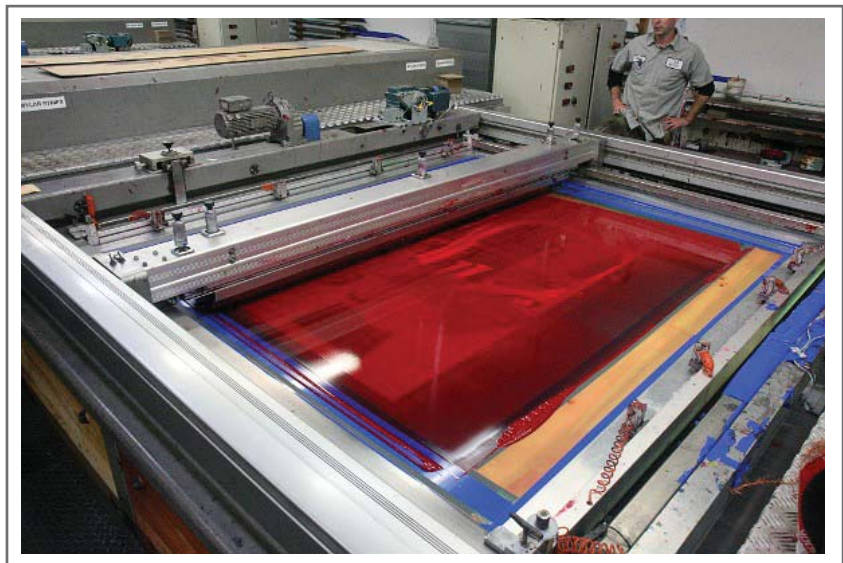
During each phase of the installation, AMS staff interfaced with electrical contractors and inspectors to ensure that all work was performed safely, correctly, and efficiently.

Final installation of the remaining color sections and improved indexing drive system went smoothly with minimal production interruption. At total of ten motors now operate under closed-loop servo control where only four had been used previously.

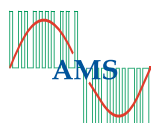
Exceptional Results

End results? This machine and its operators have a decidedly different attitude – and it is a good one! Production rates on many runs are over double the previous rates and print quality is consistently high throughout each run, dramatically reducing scrap rates and making short run jobs much more profitable.

The press now runs a single shift during the week, where two or more shifts had previously been required. The challenge now is not getting the printing jobs done, but instead, selling the additional capacity of the machine. “I like this kind of problem” says Bill Patten. “Your guys did a great job!”



AMS thrives on developing solutions to process and production challenges. What can we do for you?



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