Application Story

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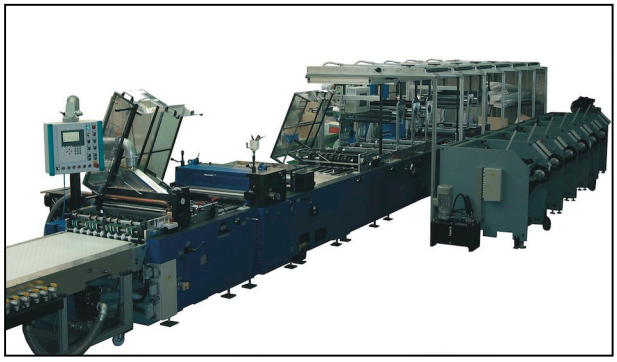
Kollmorgen Automation Suite™ delivers dynamic performance to maximize productivity of fully automated modular paper processing machine

The RC-500J jumbo roll collator, manufactured by the German-based Jakob Graphic Services GmbH, is raising the bar when it comes to processing a wide variety of printed continuous paper products.



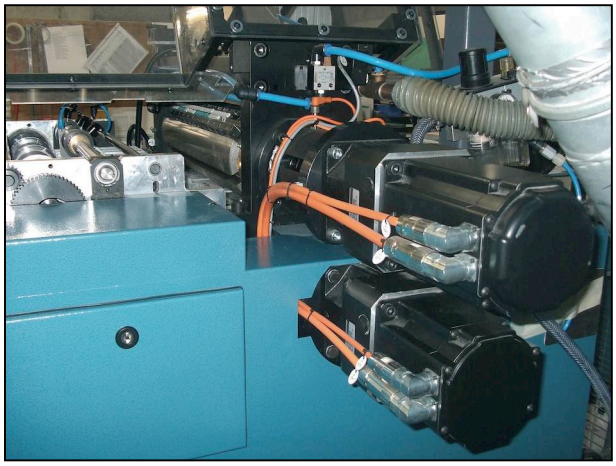
The RC-500J can automatically collate, glue, label, fold and cut insurance forms, mailers with cut inserts, brochures with or without a finish, calendars and similar printed matter. These machines deliver precise operation during highly-dynamic processes, and quickly adapt to new tasks with an extremely simple and quick changeover system. In fact, servo cutter format adjustments, and even wholesale changes, can be carried out in just seconds. The heart of the RC-500J is the Kollmorgen Automation Suite™ (KAS). In addition to powerful Kollmorgen servo technology, the KAS software package plays a vital role in speeding development and commissioning with radically simplified programming and completely virtual simulations.

Most customers have a comprehensive range of printed paper products, and changeover and setup times significantly reduce machine efficiency. With that in mind, Jakob Graphic Services wanted to develop a machine that not only provided high-level functionality with sound construction, but that delivered simplified operation with rapid machine retooling. They quickly determined that cutting-edge servo technology would deliver the performance and functionality the company needed to make the RC-500J a truly groundbreaking automated paper collating solution, and they partnered with Kollmorgen to provide the solution.

High-level flexibility is a must for the Jakob roll collator

The RC-500J enables users to produce continuous form sheets, individual sheets and mailing products more quickly and efficiently than ever before. The maximum roll diameter is 50", and the roll

width can range from 100 to 500 mm. The collated webs can then, for example, be crimped, glued or stitched. Crimping tools connect the webs. After cross cutting, accelerator belts are used to convey the streams to a shingle conveyor. Once a specified number of streams has been reached, the streams are automatically stacked for packaging.



Unlike traditional machines, the RC-500J eliminates the need to change the cylinders and gearwheels used for producing various paper formats because the drive control of the cross cutting or perforating cylinder occurs without a shaft, via servo motors.

Customized formats are ready for use in the freely programmable control unit. Format changeover is executed at the touch-screen display. Further technical features of the roll collator include, among other functions:

- Electronic row gluing valves that enable gluing applications at short switching frequencies
- Various slitting units can also be realized for cutting off sprocket hole strips
- The ability to integrate additional equipment such as pre-sorters, labelers, laser and ink-jet systems, number printing units or pocket folding units

Retooling times at the servo cutter offer room for improvement

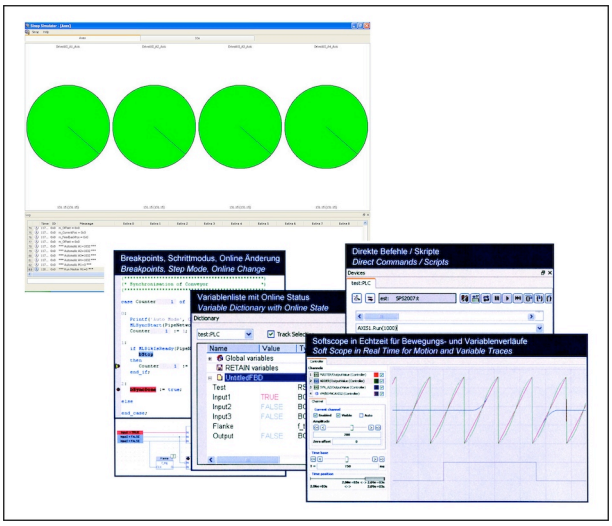
The developers at Jakob Graphic Services GmbH are convinced that the lynchpin of During machine development, the primary design challenge was to ensure that the cylinder – irrespective of the printing format – would allow for variable cut-off formats of the supplied printed continuous paper webs, along with easily executable adjustments. Even between individual sections it had to be possible to carry out further adjustments to handle such challenges as asymmetric formats during processing.

As an example, this functionality would ensure that the size of a 378 mm format calendar block would be increased by 50 mm during continuous printing so that a common inch format could be applied in the process. Although the servo cutter cylinder would be set to 24 in., it would need to be electronically reprogrammed to 17 in. to ensure the said 50 mm would be cut off. Adjustments between the blades or cuts always result in acceleration or deceleration. However, the separating cuts always occur in synchronization with the paper web speed to maximize productivity for the system operator. The Kollmorgen Automation Suite satisfies these needs, while providing Jakob Graphic Services

recognized that the opportunities provided by the Kollmorgen software and hardware support for not just existing, but future applications as well.

"The crucial factor for the decision to go with the Kollmorgen Automation Suite was that the Motion Control, PLC and HMI/SCADA functionalities – in our case on an industrial PC - are available via a single processor. This standard tool allows the cost-effective introduction of company-specific know-how and tailored solutions for individual applications," explains Ulrich Jakob, design engineering and technical manager at Jakob Graphic Services GmbH. "Furthermore, it radically speeds up programming and commissioning, and increases machine performance."

Kollmorgen Automation Suite – scalable system with standardized development environment



Kollmorgen Automation Suite is rooted in the company's tried and tested, highly intuitive "PipeNetwork" programming language. It is a scalable system with a standardized development platform that directly links all three main functions of a control system – HMI, PLC and Motion Control – in a common development and software environment. The integrated development tools include a complete set of IEC 61131-3-editor programs (AS, FUP, KOP, ST and AWL) and a quick compiler program. This radically simplified programming, coupled with the complete simulation in offline mode of Motion Control and PLC during development and debugging, considerable reduces programming and commissioning time. KAS runs under a real-time operating system linked to Windows XPe so that common visualization software packages can be connected directly.

The extensive KAS functions allow the application technician to program the application quickly, transparently and with perfect performance output during system-supported visual project engineering. The entire machine can be quickly programmed by simply describing its functions and the mechanical relationships between components, with the aid of graphical description blocks. An extensive motion library is available for the graphical PipeNetwork editor to complete this task. All the machine's internal processes, no matter how complex, can be simulated to determine the optimum settings and eliminate problems prior to commissioning, with the results loaded directly into the control system.

"With KAS we've found an ideal servo-technical solution for our existing and future processing machines, ensuring they satisfy the high performance demands of our customers. The resulting

technical characteristics are significant for Jakob machines, and create a unique selling point. Time-consuming manual retooling or setup measures are a thing of the past thanks to the electronic servo technology. The time saved with this new procedure has proven to be very profitable. Setbacks caused by errors are excluded, and commissioning has become a 'formal procedure'," says Hans-Peter Jakob, sales manager and general manager at Jakob Graphic Services GmbH. "Moreover, it is highly beneficial to have an 'everything from one source' partner – from fully digital servo amplifiers, servo motors, Motion Control, PLC to visualization (HMI) and touch-screen display."

ABOUT KOLLMORGEN

Kollmorgen is a leading provider of motion systems and components for original equipment manufacturers (OEMs) around the globe. With over sixty years of motion control design and development expertise, Kollmorgen delivers breakthrough solutions unmatched in performance, reliability and ease-of-use. Through world-class knowledge in motion, industry-leading quality, and deep expertise in linking and integrating standard and custom products, Kollmorgen provides OEMs with the competitive advantage they need to succeed. For more information, please visit **www.kollmorgen.com**

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