



MBO Folding Machines

Ask the Machine – It Has the Answer

The digital era has recently arrived for the more than 500-year-old printing industry, making it necessary for the processing industries to change their way of thinking. This was especially true for traditional bookbinders: Automated, computer-assisted folding machine control is becoming more accepted. MBO Maschinenbau Oppenweiler Binder is a pioneer in the area of computer-controlled folding. This machine manufacturer is one of the leading producers of folding machines and peripheral devices for printers and bookbinderies. Their digital, microprocessor-controlled technology provides an efficient, high-quality solution which is integrated in the digital workflow, reduces preparation times, and groups several processing tasks together.

Experts know: Controlling conventional folding machines requires a high level of technical know-how and experience. Changing the machine setup is a complicated and time-consuming task, even for professionals. Preparation times vary depending on the material and how it is folded. In addition, the trend of customers placing orders for smaller and smaller quantities is still on the rise. This increases unproductive preparation times for post-press operations, causing the folding machines to no longer be profitable. In addition, the know-how and qualifications of highly-paid skilled labor were needed to manually control the folding machines.

With this in mind, new automation solutions were needed in the past few years that had to meet the following requirements in order to succeed: short preparation times, a high degree of process automation, easy operation which didn't require extensive IT or software knowledge, and integration into the complete digital workflow.

Modern Control Concepts Mean New Possibilities

For integration into the workflow, MBO worked together with the automation specialists at B&R to develop the "Navigator-Control" digital controller for buckle folding machines and combination folding machines. For the first time, Navigator-Control combines machine control, production monitoring, and machine adjustments in a single, uniform control management system – fulfilling a requirement that is continually expressed by practitioners. It is important to provide easy operation and handling – automation should speed up processes and not make them overly complex.

Navigator-Control is primarily based on the B&R SYSTEM 2003 control system. A full range of graphic operator panels is available which meet the requirements of the various machine types. "In order to implement such future-oriented projects, we need a partner that can think beyond existing systems. This is possible with an innovative partner like B&R. B&R also offers excellent system support for applications," describes Mr. Klaus Stockos-sa, manager of the electronics department at MBO, the cooperation with B&R. "We also like the fact that B&R offers highly effective high-tech products at a good price/performance ratio."

Networking Provides Flexibility

An important goal during development was being able to find a way to put all MBO machine units into any single machine combination. The solution was a flexible multimaster network based on the CAN bus. This allows the sheets to be monitored, checked, and measured in each of the machines. This saves



The MBO Navigator-Control machine controller is a modern digital microprocessor controller which combines machine control, product monitoring, and the machine configuration into a single control management system.

the operator a lot of manual work. The speed in the folding and delivery units, the setting for the belt, and the speed of the single stream are automatically determined, optimized, and configured. The automation effect of tracking the sheets and checking for folding errors is neither complicated in the application nor requires special knowledge for its integration. This substantially shortens the set-up time on the folding machines while reducing costs enormously. Each folding machine, which can run by itself without constraints, is recognized on the bus by an identification mechanism and is integrated into the total system using flexible node number assignment. A CAN interface handles the data exchange, part of which takes place using B&R's own INA protocol. Standard CAN library functions handle other data exchange.

However, data is not just exchanged between MBO folding machines. Task and presetting data can also be taken from job management systems from other companies. When doing so,

it doesn't matter if the data is in the standardized Job Definition Format (JDF) or not.

Only a few steps are necessary to start the buckle folding machine controller: First, the operator selects the desired output (how many sheets per hour) or the speed of the first folding machine. Then the first reference sheet is measured using a completely automated process. A photocell in front of the first device measures the length of the sheet, while its width is determined by an additional photocell in front of the second machine. From this, the controller calculates the optimal sheet interval as well as the optimal speed to set – regardless of the fold type and the sheet format.

Production can be started using either Automatic mode or timed control. When production is started automatically, the infed speed results from the length of the sheet, the space between them, and the infed delay. When operating with timed control, the length of the sheet and its type (reflecting or stamped material) are deciding factors.

A Simple Graphical Operating Concept

Many users view the simple, graphical operator interface with visual machine configuration data as a particularly positive development. This is where all machine-specific configuration values like buckles, rulers, and rollers are calculated.

In addition to the operator panels with graphics display and function keys, a Provit 5000 Industrial PC from B&R with a 15-inch color monitor and touch screen is available for operating the first folding machine. The visualization is much like a conventional user interface on a PC and not only simplifies operation, but is used to integrate additional software with operating instructions, replacement part lists, circuit diagrams, and error diagnostics just in case. The machine work area even has a knowledge database for folding techniques as well as operator help which can be called at any time. Bookbinders feel secure thanks to reliable, user-friendly support: "Ask the machine, it has the answer."

Proven in Practice

This control system has already been successfully put into use in a number of bookbinderies. Practi-

Navigator-Touch allows the machine to be operated visually. Among other information, it contains PDF-files for operating instructions, replacement parts lists, and circuit diagrams.



tioners like the system because of its high level of security with regard to operating errors, since the controller will not accept incorrect input. They also like the automatic idling mode which automatically ejects the remainder of the sheets when the machine is turned off. For quality control, sheet removal is possible for each folding machine.

To summarize, electronic controllers have become important components of new digital workflows for bookbinding and print processing. Setting up a new assignment in the shortest amount of time while achieving the best possible error-free performance is only possible with their help. The desired effect: Tasks, including smaller print runs, can be done in the shortest amount of time while waste paper is reduced to a minimum. The most important goal of the electronic controller is to always be able to expand control and monitoring processes which run automatically in the background. Not only that, but entering information and operation itself should be as easy as possible. Another advantage: Returning customer tasks can be stored and called up again at any time. **E**



Buckle fold machine from MBO.

Under the name MBO Folding Technology, Maschinenbau Oppenweiler BINDER GmbH & Co. KG founded an entire group of companies with headquarters in Oppenweiler, Germany. With locations in the USA, Portugal, and through their recent majority stake in folding machine manufacturer Herzog + Heymann (Bläfeld, Germany), MBO ranks among the leading providers of folding machines and peripheral devices for the printing and bookbinding industries.

The new high-speed folding machine HSF/1020 took part in and excelled in a feasibility study for finding a way of processing 12,000 sheets per hour – thereby matching the speed of an offset printing press. Also worth mentioning is the new high-efficiency feeder head Vacustar, which retains impressive consistency even at maximum speed while handling difficult paper with higher and lower paper weights. The group offers a wide spectrum of different component products for the production of special printed materials. At the last open house, they introduced a Pick+Place gluing unit. Its demonstration involved the supply and gluing of microjet addressing for a job that also required precisely positioned, personalized chocolate bars to be incorporated into the folded product.