

insert align stitch



Heidelberger Druckmaschinen AG (Heidelberg) was awarded with the GATF InterTech Award honoring innovative technologies in 2003 for two post-press solutions; the Stitchmaster ST 400 saddlestitcher and the Magnapak newspaper packaging system. The decision by the independent jury from the world's largest association in the graphics industry "Graphic Arts Technical Foundation (GATF)" for both post-press products emphasizes the special position held by Heidelberg as a provider of solutions for the entire print media industry. Heidelberg has received 20 InterTech Awards since the prize was first awarded in 1978.

The award-winning saddlestitcher Stitchmaster ST 400 is developed and produced in Leipzig by Heidelberg under the direction of manager Christian Breyer. Today, more than 100 machines have already been delivered to customers. Saddlestitchers are mainly used to produce magazines, brochures, etc., from pre-printed and pre-folded booklets. Individual signatures (folded sheets) and the cover are gathered by inserting them inside one another in

“From the concept phase through to development and implementing, an expert contact person was always available for us at B&R. According to the task at hand, we received support from employees at the on-site technical office in Leipzig, from the main Germany office in Bad Homburg and from the headquarters in Eggelsberg. B&R met our demands quickly and flexibly. A true partnership has been formed.”



Andreas Steinert,
head of software development,
Heidelberger Druckmaschinen AG, Leipzig

the desired order, and then stapling them through the centerfold using wire staples. The final operation in this process involves cutting the booklet on three sides. This separates the sheet seams which are not on the back of the booklet, thus giving the booklet its final form. The Stitchmaster ST 400 can also achieve up to 12 mm and is specially designed for the production of magazines and brochures in DIN A3 and A4 formats.

Mobile feeder allows system to adapt to product

The Stitchmaster ST400 has the innovative edge by being the first saddlestitcher in industrial document production, which adapts itself to the product. With the automatic format setting “Ready set”, mobile feeders which can be installed on both sides of the gathering chain and which are each provided with a separate servo drive guarantee the highest degree of flexibility in all print run quantities. They can even handle applications with frequent format changes. Furthermore, the ST 400 is network-capable and can therefore be integrated into the digital workflow of the printing process. With a performance of up to 14,000 cycles per hour, even large job runs can be produced at exceptional quality.

CAN bus connects up to 30 feeder controllers

This new saddlestitcher demanded an individually tailored control technology to position itself quickly and confidently in the market. To meet this demand, Heidelberg performed a thorough market analysis, which led to the decision for B&R. Particularly, the wide range of products including controls, industrial PCs, drive technology, visualizations and software was a perfect match to the job specifications of their machine concept.

Special emphasis of the B&R features was placed on the conception of and the firmware for the CAN protocol for operating the line shaft. All software was developed together with Heidelberg. A cooperative exchange of ideas was practiced throughout the entire process, which ultimately led to highly innovative solutions.

The control concept of the ST400: As a main component, a central CAN bus connects the controller of the stitching machine, which stitches the product in motion, with the up to 30 feeder controllers. In the stitching machine as well as in each feeder, a separate CAN bus handles the communication between the feeder controller and other components such as servo drives, local operating stations and variable speed drives. The positions of a virtual shaft are transmitted every 3ms via the central CAN bus to the feeder controllers using broadcast signals. They then calculate the set posi-





With nearly 24,000 employees in more than 170 countries, **Heidelberger Druckmaschinen AG** (Heidelberg) is the worldwide leader in providing solutions for the print media industry. With their headquarters in the German city of Heidelberg, the company offers products including prepress, a variety of printing processes, finishing and much more.

In the area of post-press (cutting, folding, gathering, binding, stitching), the company is achieving significant growth. Leipzig develops and produces systems for book-binding finishing (i.e. saddlestitchers and thread sealing machines).

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tion in a cam profile function and pass it onto the servo drive. In the meantime, a sophisticated protocol system guarantees the transfer of all other technological data via the same bus. For example, this makes it possible to stop the feed as soon as the next feeder when a faulty sheet is detected. This is something entirely new to the market.

The characteristics of the deterministic multi-task system, which works identically in all systems, provide the answer for solving these complex tasks. Consequentially, the option was used to develop all programs in the high-level language C. This is a decisive advantage for short development times given the complexity of the technological requirements.

Reliable quality control with remote diagnostics

B&R is the right partner for Heidelberg, even for the design of the main operator unit. Heidelberg developed the user interface independently based on a standard operating system. B&R was able to completely meet all the high demands of Heidelberg's design guidelines using a B&R industrial PC and the development of custom components. The ST 400 is operated using a color 10.4" touch screen display with a membrane keypad which makes it easy to preset the format. Control panels on each unit allow the machine to be operated from almost anywhere. Error messages appear in plain text. This

guarantees reliable product and quality monitoring of all machine functions including feeding, gathering, stitching and cutting. Using an internal modem, remote diagnostics are not only possible for the PC resources, but with the help of B&R PVI tools this is also possible for all stations connected via the CAN bus. This solution has already reduced some machine standstill to a minimum.

Flexibility and short preparation time mean customer satisfaction

In December, 2003, the 100th saddlestitcher ST 400 was delivered to the company Buchdruckerei Lustenau in Austria. The manager, Christine Schwarz-Fuchs, sums up the reasons behind choosing the ST 400, from a user's point of view: "Our decision to purchase the Stitchmaster ST 400 was based on the flexibility of the unit and the short preparation times. With this saddlestitcher, the cutting sequence is technically enhanced. We are also expecting an increase in output, since this machine is much faster than our old saddlestitcher." The automated setup procedure with independent servo motors does indeed allow a 50% improvement in preparation time. 



ST400 Stitchmaster

With an innovative concept for gathering, stitching and cutting, the Stitchmaster ST 400 opens up new possibilities for saddle stitching in the area of job printing. A high degree of automation is offered through the automatic format presetting of the entire machine as well as the automatic synchronization of all units with each other. This allows short preparation times and setting changes to be made during operation without interrupting production. The modular concept with five different types of individual feeders with servo drives makes it possible to achieve a variability and flexibility which was not possible before. Optical image recognition systems guarantee error-free products.