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Interview

Retrofitting a gravure printing press

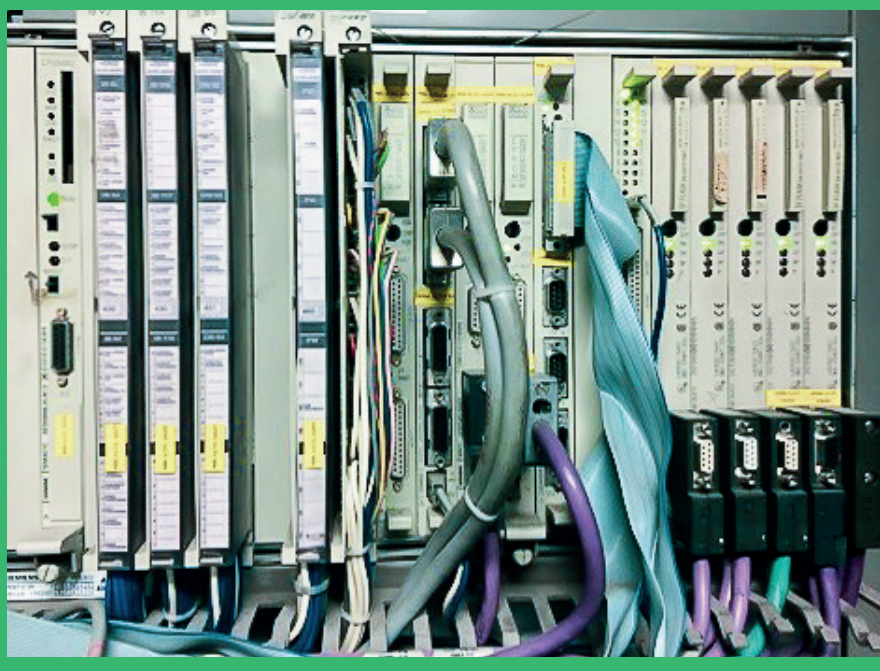
Speaking to Dipl.-Ing. Guido Lebbing, CEO, Lebbing automation & drives GmbH

WHICH AREAS OF A GRAVURE PRINTING MACHINE TYPICALLY REQUIRE A RETROFIT?
The typical gravure market printing machines (manufacturer: Kochsiek) analysed here consist mainly of the following components: non-stop unwinder, infeed unit, relevant number (3-5) print units, line segment, extraction station, and non-stop winder. The Simantic S5 (later S7-400) was usually used as the main control. Drive control was handled via Symadin in conjunction with Simodrive or Masterdrive drive controllers. Register control was external with systems of established manufacturers (e.g. Eltromat, Bobst, or similar).

WHY DO THESE MACHINES NEED RETROFITTING?
The production of Simatic S5 including ET200U/B peripherals, as well as Simadyn and Simodrive/ Masterdrive and the older servo motors (1FT5...) has been discontinued, which makes replacement availability a critical issue as manufacturer support has been largely suspended. For these reasons and because of much stricter safety requirements today, these systems, which were mostly constructed in the years 1980-2010, are now being retrofitted by our team in many locations around the world.

HOW ECONOMIC IS SUCH A RETROFIT?
As the mechanical components – with the exception of those subject to wear – have changed only negligibly over time, they will mostly remain unaffected by the retrofits. The financial burden and time needed for a retrofit are significantly lower in comparison with the investment needed for an entirely new machine.

WHICH COMPONENTS WERE REPLACED IN YOUR EXAMPLE FOR GRAVURE PRINTING MACHINES?
The retrofit described in this document comprised a simple replacement of critical components against those that are now readily available. Our main focus in this project was on the replacement of the old Siemens Masterdrive converter, including Simadyn components, 1FT5 synchronous motors and the control system. Additionally, the machine controls were replaced in their entirety as some of the components in the existing system were no longer available.



HOW LONG DID THIS TAKE?
This retrofit was completed at our customer facility in the US within just 3 months after a 6-month preparation phase. We assembled and pre-wired the required drive controllers and converters on special mounting plates beforehand, so that these could be integrated into the existing control system of the customer very quickly on-site. All components (converters, I/O stations, controls, etc.) were electrified and commissioned beforehand in the workshop. The new machine controls were also implemented in operating panels matching the machine specifications, which were then pre-mounted completely on-site and were then built in after extensive testing. The electro-technical and mechanical retrofit took about a week to complete and the commissioning of all components around two weeks.

A retrofit of this kind could also be completed in stages. Such a step-by-step method could look as follows:

Step 1: replacement Simadyn (a new main CPU (S7 1518F-4PN/DP) will also be installed, but the “old” CPU will also remain)
Step 2: replacement of the S5 and the controls (PP17, TD17)
Step 3: replacement of the drive system (Simodrives, Masterdrives and the “old” servos (1FT5xxx)
Step 4: replacement of ET200B-I/Os
Step 5: replacement of the frequency converters in the fans

Each line and each customer is different and the parameters can be very different, too. Accordingly, it is not possible to determine a general course of action. The fact is, the higher the number of retrofitting steps, the more it is necessary to take the interfaces between the individual steps into account. This means that the optimal path can only be found together with the customer.