

Application story

Industry: Machine Building
Products: Servo/Motion

Blu-ray – movie enjoyment thanks to SINGULUS

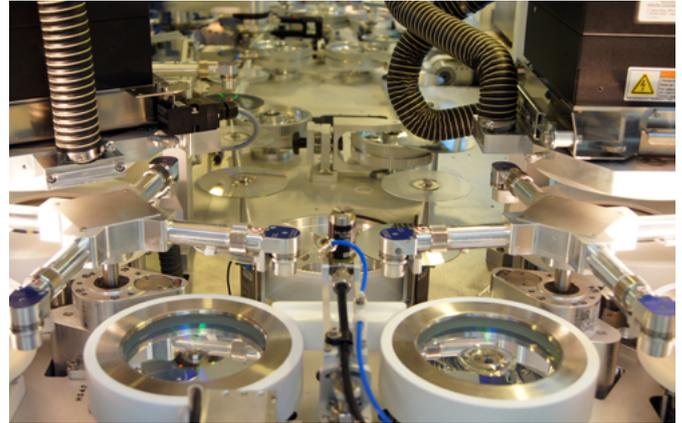
Manufacturers of optical discs, e.g. DVDs and Blu-ray discs, are obliged to turn out large volumes of discs at high speed at busy times, such as when a new film comes out, or for the Christmas rush. This makes high demands on the machinery involved in respect of precisely controlled individual processes, the quality of their results and the perfect integration of these processes into the overall production sequence.

In 1999 SINGULUS TECHNOLOGIES AG (SINGULUS), a leading manufacturer of duplication systems for CDs, DVDs and Blu-ray discs, was looking for an automation partner, who could help to meet growing demands in CD production. It chose Mitsubishi Electric. Experts from the headquarters in Japan and from the German Branch in Ratingen provided support from the start of the hardware implementation and the programming. Meanwhile, the company also produces systems for the manufacture of Blu-ray discs and relies on technology from Mitsubishi Electric for its BLULINE II production system, too.

BLULINE II can turn out 20,000 Blu-ray discs per day in a four-second cycle and has a footprint of just 17 m². The high number of complex process steps, such as embossing data in a wet lacquer (wet embossing), sputtering (cathode sputtering: deposition of thin layers in a vacuum) and the application of further thin, extremely homogeneous connecting and protective layers, poses special challenges. The interplay between processes executed under atmospheric conditions and in a vacuum is another key factor.

The components from Mitsubishi Electric take control of the entire automation of the system. 45 axes in all, consisting of 45 motors and servo-controllers, are guided by a motion controller via the SCCNET III bus system. They move centrifuges, metering valves and rotation and lifting axes. Reaction times in the order of milliseconds are required for all movements to ensure the desired cycle rates of the system as a whole.

Thanks to automation components from a single supplier, the synchronisation works particularly well. The motion controller is responsible for the overall movement management of the 45 axes in just 1.77 milliseconds. To achieve extremely thin layers,



“ At the time we were looking for a new supplier who could act as a one-stop manufacturer for us of high-performance components with a long service life. Mitsubishi Electric fulfils these criteria and also offers a matching portfolio of hardware and technical support.”

Stephan Hotz, Director Sales & Marketing Asia,
SINGULUS TECHNOLOGIES AG

miniature high-speed motors with very short acceleration and deceleration times are used. The auto-tuning facility between amplifier and motor to compensate for mechanical influences and the operating system, as well as the software for the controller, are also from Mitsubishi Electric.

To date SINGULUS has installed over 95,000 components from Mitsubishi Electric in all its duplication machines since 1999, and virtually all of them are still working perfectly.