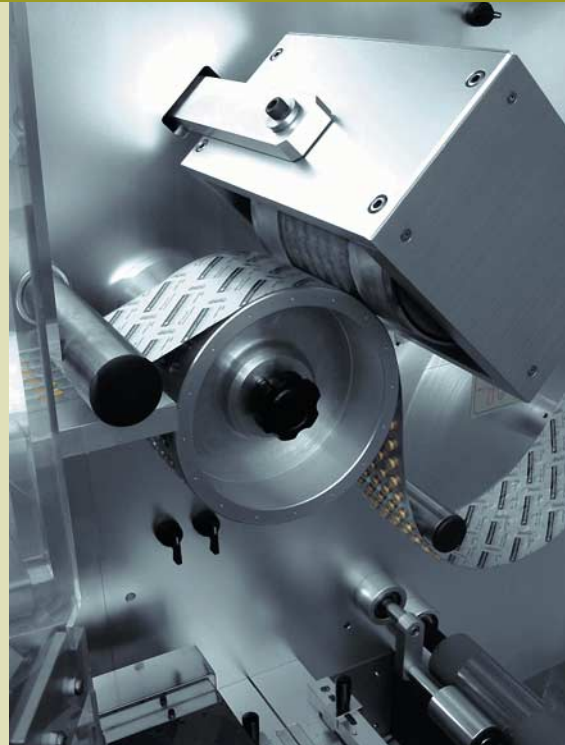


Ministar-R200 blister packaging system with new control technology



→ Hoong-A Corporation is one of the leading manufacturers of blister packaging systems in Korea. In order to be able to cope with strong competitive pressure and continuously increasing demands in terms of productivity and quality, the company decided to use a single source solution for the control system of their Minister-R200. This system consists of an Industrial PC, Control Panel, I/O components, servo motors, drives and TwinCAT software PLC/NC – all from Beckhoff.



Last year, with an estimated market volume of around \$1 billion, the packaging industry represented a 2% share of Korea's national GDP and has become one of the country's fastest growing industries, right after the automotive industry.

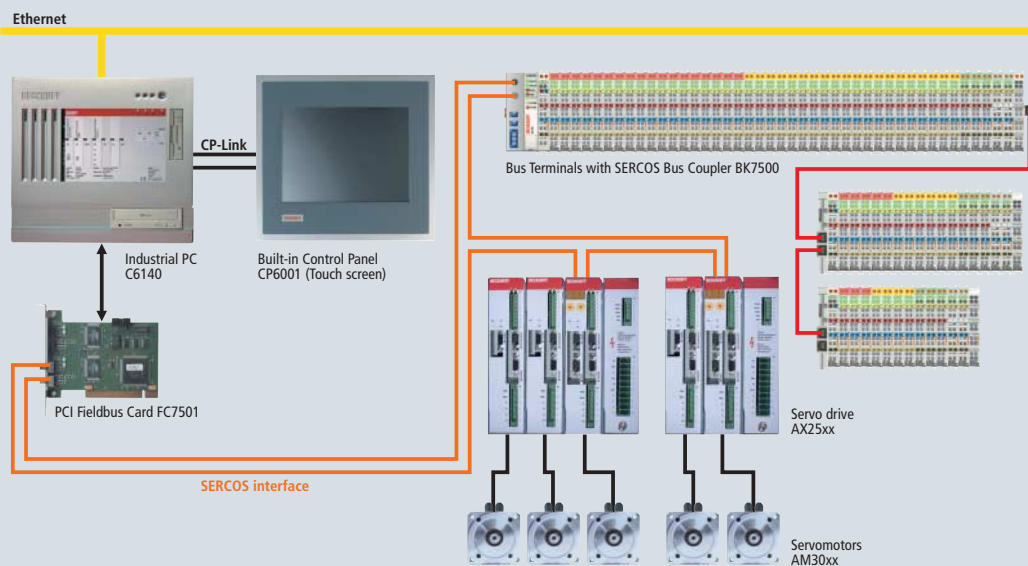
Although Hoong-A's Minister product family has been used in pharmaceutical, healthcare and hardware applications worldwide for the past 30 years, the market demands machines with ever-higher productivity and quality. "Each year we have invested 8 to 10% of our turnover into R&D in order to comply with market demand for high-speed packaging machines with balcony-type construction," said Mr. Shin-Young Kang, president of Hoong-A Corp.

The project was code-named "R200," and internal discussions about the functions and performance of the Minister-R200 began. "First, we specified the basic requirements for the R200. Following the world-wide trend, we decided to use a balcony-type design with clearly separated production and driving sections according to the cGMP standard (current Good Manufacturing Practice)," said R&D manager, Mr. Eun-Sik Kang. The decision to use a PC-based control platform for the R200 was based on several factors: "First of all, we wanted to reduce the number of control elements in the overall system as well as the time required for the conversion of downstream equipment such as cartoning machines and pillow packs." A touchscreen with Control Panel was added for ease of operation. "The major PLC and PC manufacturers and suppliers provide a wide range of PC-based control solutions. We decided to use the complete solution from Beckhoff with everything from the software to the I/O components," explained Jeong-Ho

Yeo, manager of Hoong-A's electrics division. Another important deciding factor was the reliable technical support offered locally by the Beckhoff partner Tri-TEK. PC-based control solutions from Beckhoff are growing in use in South Korea, for example, in the machine construction and semiconductor sectors. "This was convincing for us – as was the comprehensive product portfolio, from I/O components and TwinCAT to the new EtherCAT real-time Ethernet technology," said Jeong-Ho Yeo.

The budget for the 15 month development of the R200, which involved 20 mechanical and electrical engineers, was \$2 million." The Minister-R200, which has a maximum production capability of 200 blisters per minute in single lane operation, has four sections:

1. **Forming section:** Plate thermoforming by air blowing. Sandwich-type pre-heating opens when the machine stops. Optionally, the forming station can be equipped with cold forming functions and "plug assist."
2. **Product feeding zone:** The feeding zone is designed to enable different feeding facilities depending on product specification, including camera-based detection systems.
3. **Drum sealing:** A continuous motion drum sealing system ensures uniform web feeding through slower line speed in the feeding section.



Control system overview with Beckhoff PC-based Control



Hoong-A Corporation

Established in 1970, Hoong-A Corporation is regarded as a leading manufacturer of blister packaging machines for pharmaceutical, healthcare and hardware applications. Hoong-A is committed to maintaining its position in the industry by investing in an ongoing, dedicated new product research and development program to provide their customers with the highest level of quality in blister packaging.

Hoong-A also offers a variety of options and accessories which can be installed on their system or integrated into a packaging line to maximize your investment and increase productivity, such as bar code readers, vision systems, reject devices, centralized PLC controls, in-line printers, sequence flow controls and cartoners.



4. Perforation, advancing and punching: Perforation (or slitting) works in conjunction with emboss coding. Roller advancing is accomplished with servo motors. There is also punching with lowering of the blister packs for collation and discharge of waste.

Hoong-A has no doubt about the success of the Ministar-R200. Mr. Shin-Young Kang, president of Hoong-A Corp., said, "In May 2004 the machine was introduced with great success at the Korean packaging fair (KOPACK), and we have already secured several customers." "With presentations in Chicago at Pack Expo in November, 2004 and at the same time at "Biotech & Pharm, China" in Beijing, and in April 2005 at "Interpack" in Düsseldorf, Germany, we intend to open up international markets for the Ministar-R200."

Ministar-R200 is a compact design model. Hoong-A Corporation has plans for a new system offering twice the performance.

The control technology

The Ministar-R200 blister packaging machine features seven compact AX2500 type Servo Drives from Beckhoff, which are connected with the control PC via SERCOS interface. The TwinCAT automation software deals with control tasks. TwinCAT offers all the functions required for controlling the complex procedures that run this machine, both on the PLC and NC side.

Via electronic cam plates, the axes are coupled with a virtual master axis that specifies the production speed. The cam plates are recalculated for the respective blisters being produced. The thermal forming process for the PVC material results in small deviations from the ideal shape. The blisters are therefore measured during operation, and the measurement results are used to adapt the cam plates online. The drive concept enables high-precision position control, and, therefore, precise material guidance.