

Always correctly packed

The packaging industry is constantly introducing new methods for protecting, conserving and presenting high-quality foodstuffs and consumer goods. For this reason, this industrial branch is always on the cutting edge with the most modern machines and system concepts. This is paired with the fact that the highest performance is required for the automation architecture and components. Often, new ideas for control are born in the packaging industry that indirectly influence many other industrial branches. It's no wonder that leading packaging corporations quickly came into contact with ETHERNET Powerlink. The lofty requirements of this industry are ideally met using this proven real-time Ethernet solution.

How perfectly ETHERNET Powerlink works in practical applications can be seen, for example, by checking out the leading manufacturer of film welding machines. **Lemo Maschinenbau GmbH**, which belongs to Jagenberg AG, develops and builds (among other things) systems used to produce plastic bags, pouches and sacks of all kinds. The machines are manufactured and distributed for all current trends in film technology.

One of the latest Lemo innovations is the DKT/CT packaging system with 19 positioning axes for welding plastic carrying bags in various formats. The axes are networked via ETHERNET Powerlink and coupled together using electronic cam profiles and gear functions. The cycle time is 800 μ s with better than 1 μ s precision. All drives also have to run in perfect unison at different clock rates. This requires the highest degree of synchronicity, angular precision and speed rigidity for all servo motors.

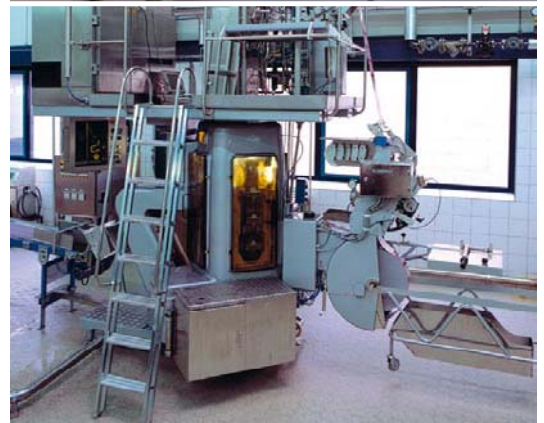
Dieter Baudach, assistant manager for development and responsible for elec-

trical construction, describes why they decided to use Powerlink:

"We like the exceptionally low jitter and the extremely high data transfer speeds.

This makes it possible to guarantee the highest film quality as well as extremely fast data exchange throughout the system."

Most importantly, the synchronization of the axes can take place in true real-time. Dieter Baudach on this topic: "The machine can even be configured while it is running. In other words, a drive can be reconfigured by the operator relative to another drive even when a drive is turning – the electronic gear function is used for this operation." The speed of all servo motors can be controlled synchronously so that production speed can be adjusted. Baudach states: "When processing plastic film, it is absolutely critical that the material transport takes place simultaneously and consistently for all drives. This is the only way to ensure that the form of film is not affected and that excessive stretching



or straining does not occur." The Lemo DKT/CT has since been successfully marketed worldwide.

KMK Maschinen AG in Switzerland is part of the PackSys Global corporation, a worldwide manufacturing group producing special machines for the packaging industry. KMK develops and produces machines for manufacturing plastic and laminate tubes. One of their main areas of expertise is the compression forming of polymers (PE and others) in tube heads and simultaneous connection with the tube body to create a finished tube. This patented procedure allows tubes to be produced in an extremely cost-effective and efficient manner.

ETHERNET Powerlink is used at KMK Maschinen AG to network the new HPM tube heading machine. "The dynamic requirements of the system were no longer able to be handled by the fieldbus," explains Graduate Engineer Julius Läubli, project manager for electronics at KMK Maschinen AG.

With this network, up to 15 drives and



top left: KMK's tube heading machine produces 120 tubes per minute.

top right: Innovations from Tetra Pak set the pace of the packaging market for liquid foodstuffs and beverages.



bottom left: Tetra Pak will use ETHERNET Powerlink during the further development of the existing packaging machine generation.

bottom right: Flexible machines used to produce plastic bags ensure that Lemo Maschinenbau GmbH remains on top in the market.

four distributed I/O stations will be synchronized in the final stage.

“With an 800 μs cycle time for data exchange, we are on the safe side. The low cabling requirements using standard products from the IT world guarantee modular expandability and reduces maintenance and service work. Wiring is also minimized in the machine room.”

Connecting the machine in a factory network is also being discussed. ETHERNET Powerlink is based on Internet standards which already allow complete communication on all levels of the factory. Once the HPM is used throughout the world, efficient maintenance and service concepts will be needed. Problem-free electronic maintenance via the Internet or modem is guaranteed up to the drive and I/O levels using Ethernet protocols. Automation components can be clearly and easily monitored and programmed using any interface and from any point in the world, as if the technician were standing right next to the machine.

Since 1952, Tetra Pak has specialized in packaging of liquid foodstuffs and beverages. Today, according to their own definition, the corporation focuses on “more than just packaging”. Tetra Pak develops efficient processes and modern designs and, when needed, handles complete filling system for hundreds of different types of packaging - from cartons to plastic bottles.

Tetra Pak's success is based on their innovative strength. Tetra Pak Research & Development AB in Lund, Sweden is a separate body in the Tetra Pak corporation responsible for following market trends and technical advancements in order to guarantee an advantage. In the middle of the selection phase for the architecture of strategically important machine platforms for the future, Tetra Pak R&D found out about B&R and ETHERNET Powerlink. The precision and performance of the system quickly convinced the Tetra Pak team to have a closer look at the technology. Together with B&R engineers, ETHER-

NET Powerlink was thoroughly tested on a very demanding test platform with 50 axes and 2000 I/O points. In the end, the network not only met the current requirements, it also left room for future advancements.

The selection procedure was the start of close cooperation between Tetra Pak's R&D team in Lund and B&R.

This cooperation will greatly influence future machine concepts and will soon result in the manifestation of completely new future-oriented packaging systems from Tetra Pak. 