



**i** Gerhard Schubert GmbH

Gerhard Schubert GmbH is a medium-sized family business, currently employing 900 people worldwide. Schubert builds highly flexible packaging and filling machines, plus thermoforming, filling and closing machines for products of any type from a variety of industries. Packaging any product is easy and manageable using TLM (Top Loading Machine) systems from Schubert. Schubert also provides a comprehensive service program for its TLM packaging machine systems.

# Sercos replaces Signalbus

For many years, a bus developed internally by Schubert going by the name of Signalbus has been used to link controllers in TLM packaging machines.

Every 2 milliseconds, 8,000 signals are transmitted deterministically by the Signalbus. Data transfer for programs and log books at a rate of 50,000 bits per second occurs at the same time. Last year, the first TLM machines with the 5th generation of our VMS packaging machine controller were delivered.

The new VMS modules now communicate via Sercos instead of Signalbus. Sercos is a standardized, real time-capable Ethernet bus with the advantages of an Ethernet bus for data transmission and, at the same time, guaranteed deterministic transmission of signals.

The Sercos transfer rate is 100 million bits per second, which was absolutely inconceivable for industrial environments just 10 years ago. Thanks to this 100 million-bits-per-second capability, the transfer rates could be increased considerably in comparison to the Signalbus. 16,000 signals per millisecond and 10 million data bits per second can now be transmitted, which corresponds to a four-to 200-fold increase in performance.

Figure below shows the control architecture of the VMS. A separate VMS module is responsible for controlling the functions of each sub-machine. The link between the VMS



Ring topology with Sercos

module and automation components within the sub-machine is made via a local Sercos ring. The automation components consist of NC drives, positioning drives, frequency converters, scanners, cameras, I/O terminals, valve blocks, rotary transducers and devices from other manufacturers, e.g. gluing mechanisms. A separate global Sercos ring handles the VMS module links.

In TLM machines, Sercos is only used in the form of ring structures. This enables the location of a fault to be reliably localized and indicated should a component fail or a line be interrupted, as every subscriber is accessible from two sides. The ring structure also enables the use of redundant components, which means that the machine could also continue with production if a bus subscriber doesn't fail.

This is a requirement for picker lines, for example, in order to achieve availability of nearly 100%. As a communication standard for linking devices from different manufacturers, Sercos has in the meantime become widely distributed. Today, more than 4 million real-time nodes are used in over 500,000 applications.



Examples of a Schubert TLM packaging machine



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