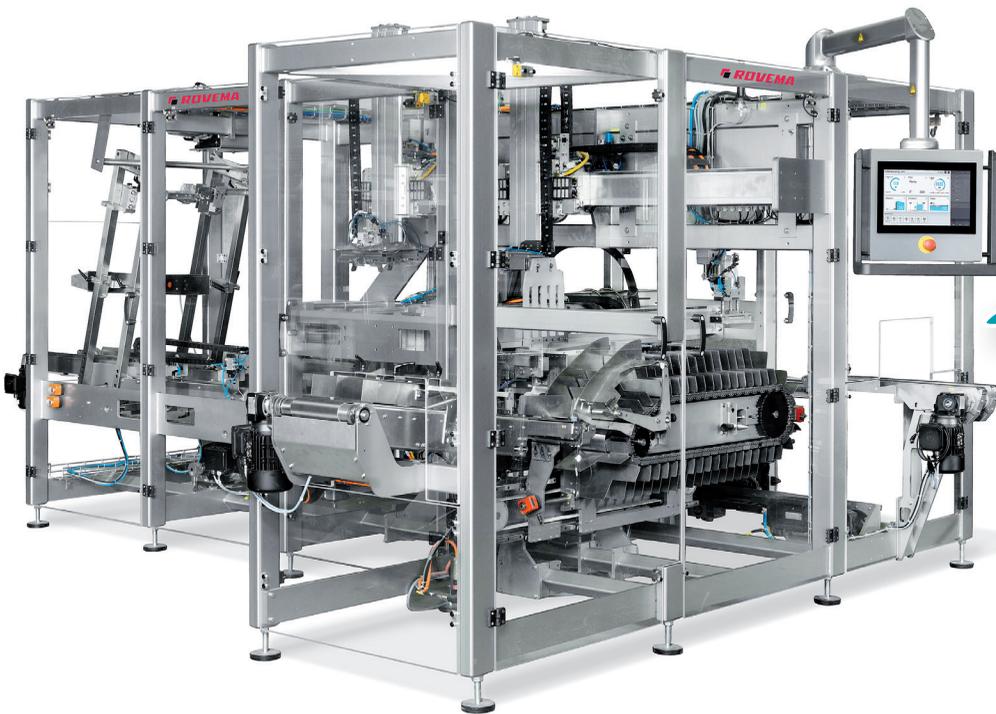


Electronic position indicators for baby formula packaging application

Edited by **Mike Santora** • Associate Editor



The ETIL end-of-line packaging machine for trays with lids enables a precise and product-friendly packaging process. Electronic SIKO position indicators for monitored size changeover can be integrated as an option.

To ensure that form, fill and seal, and cartoning machines can be used flexibly, a system must be optimally adapted to changing packaging formats. ROVEMA, a manufacturer of packaging systems in the food sector, relies on monitored size changeover using the AP10 electronic position indicators with IO link from SIKO, a specialist for industrial measurement and drive technology.

Powdered milk formula for babies is a sensitive product that must be filled gently and safely into appropriate foil bags and outer packaging. The packaging logistics behind it must be thought through to the smallest detail. ROVEMA offers comprehensive turn-key-systems for packaging processes such as these — from primary packaging in tubular bags to secondary packaging for sales and tertiary packaging for transport.

It is essential to have as much flexibility as possible in complex plant systems, despite specific product characteristics, to be able to produce different variants of products, tubular bag, and carton sizes. Size changeovers for various packaging formats must be smooth to ensure production processes are as efficient and

Design Notes

Electronic position indicators AP10 from SIKO for size changeovers: The status LEDs light up green, as the actual and target values match precisely.



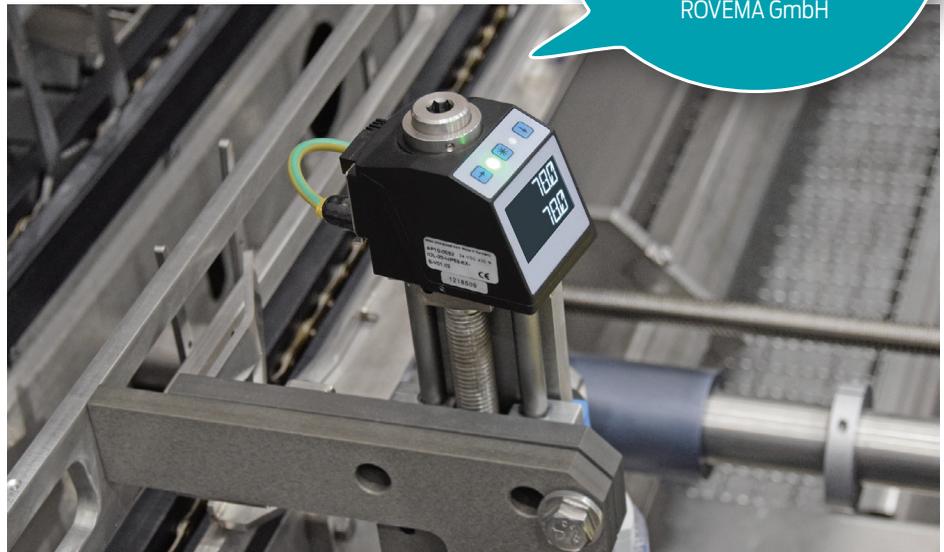
The AP10 position indicators enable fast size changeovers and ensure greater process reliability.
ROVEMA GmbH

reliable as possible. Here, Rovema relies on SIKO's AP10 electronic position indicators with IO link interface for monitored and reliable size changeover, both for cartoning machines and for form-fill-seal machines.

Up to 40 adjustment points may be necessary to adapt all functions to a product variant within turn-key system such as this, as designed by ROVEMA for packaging infant formula. Changeover that relies on purely mechanical position indicators is highly susceptible to errors and inaccuracies. Similar competitor products were already being used before ROVEMA turned to SIKO's electronic solution; however, they required an additionally integrated controller. This was more complicated to connect and also the more expensive solution. The AP10 from SIKO with IO link interface saves the costs for the controller and makes it much easier to integrate the position indicators as IO link devices into the machine control system.

Ingo Hamel, Head of Innovation R&D at ROVEMA, explains:

"IO link is a communication standard that is becoming increasingly widespread in the automation sector and is already being used more and more by us as an interface for sensors and actuators. It was therefore obvious to think about this for the size changeover. We already have longstanding constructive cooperation in the field of mechanical position indicators."



Moritz Müller, Product Manager PositionLine at SIKO, was pleased to act on the suggestion: "We were also already working with IO link and thus developed the AP10 with an IO link interface."

Infant formula is packaged in powder form in pack sizes ranging from 200 to 800 grams in the entire plant mentioned at the beginning. The powder is first filled into corresponding bags in parallel in two form fill and seal machines and then fed on two tracks to a horizontal cartoning machine. Here, one or two bags are placed in a folding box and provided with a dosing spoon before the box is closed. The ready-to-load boxes are then taken to the final packaging machine and packed into a transport carton. The last station is

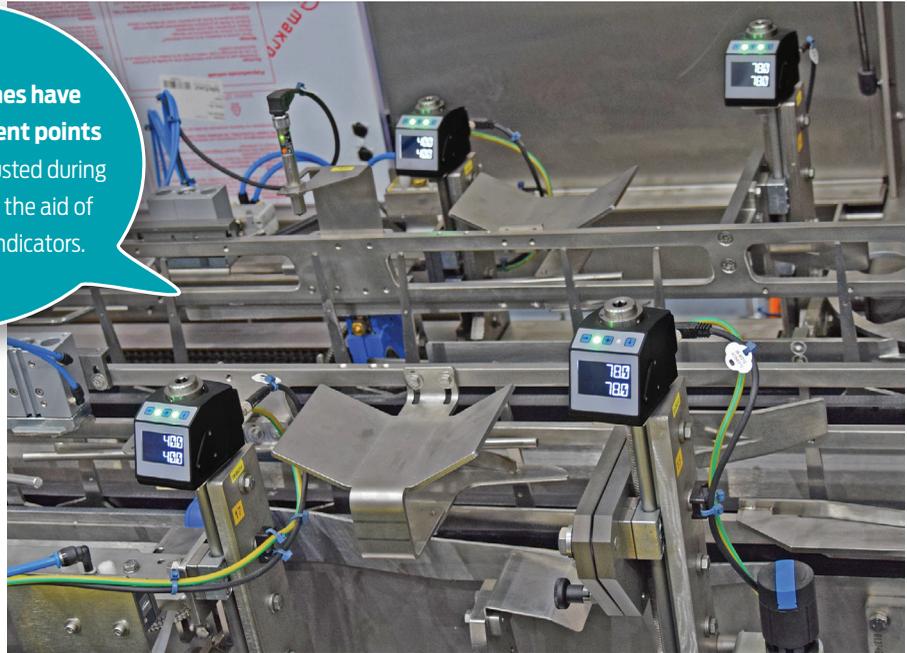
Design Notes

Cartoning machines have numerous adjustment points that can be easily adjusted during size changeover with the aid of electronic position indicators.

the customer's palletizing system.

All 40 adjustment points along the line must always be adapted to the new dimensions according to the respective packaging sizes. Most of the adjustment points are located in the cartoner and end-of-line packaging area, less so in the tubular bag machine. When a new size is needed, the corresponding recipe is selected in the controller, whereby all electronic position indicators receive the new setpoints directly via the IO link interface and display them clearly on the backlit display. The LEDs of the displays immediately switch to red, as the current position is now no longer correct. The operator then goes on to mechanically adjust all corresponding points to the new values — another ergonomic advantage: The AP10 indicates the direction to the setpoint via the LEDs and the LCD with corresponding arrows, making it easy to visualize where the operator must go. If the position and setpoints then match exactly, the LED display changes to green: Position reached. This is how all the red position indicators are moved to start the new product. The advantages are no more paperwork and lists of values to tick off and document. All values are already available electronically and are transmitted directly to the position indicators. Changeover is faster as well as safer because the feedback of the LED lights is clear. The system can only be restarted if all the corresponding position indicators light up green.

In this case, the position indicators for the setpoints are given a specific tolerance range based on a nominal value. The operator has the possibility of making fine adjustments within this and the position indicators light up green. If



the operator leaves the area, the display switches to red. This margin can be advantageous in the event of packaging material fluctuations in the carton area. If the temperature of the hot-melt glue fluctuates or a cardboard box is slightly more creased, it may be useful to slightly adjust the guides or a contact pressure by a folding tool, for example. According to Hamel, this fine adjustment is welcomed by the operators who know the plant and product best: "The tolerance range allows the operators to make an independent assessment of the situation and gives them scope for action. This makes the processes more efficient and the employee feels involved."

IO link is a communication standard that is gaining ground internationally. Those who use IO link for their automation benefit from many advantages. As a standardized communication protocol that is subject to an international standard, IO link is manufacturer-independent. Accordingly, devices and masters can be developed as communication participants. Integration is possible via simple point-to-point connections at the lowest network level and the wiring effort is low compared to fieldbus interfaces. The AP10 displays are regarded as IO link devices, each of which is connected to an IO link master, which

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usually has eight ports. From the master, communication with the controller is via another high-performance protocol; in this case, SERCOS III (EtherNet/IP is also frequently used by ROVEMA).

Moritz Müller explains the reasons for not using EtherNet/IP throughout for communication, for example: "IO link is the much more cost-effective interface, which also makes significantly lower demands on the wiring and is thus also easily connected."

Hamel confirms the easy integration: "We were very pleased that the first commissioning worked right away — without a lot of cabling work and with simple parameterization and integration into the control system." According to Moritz Müller, there is also a simple diagnostic function. IO link quickly shows which device may have a fault or needs to be optimized. For this purpose, the position indicators can be exchanged during operation without having to open up an entire network ring. The affected

device can be disconnected and replaced by a new one thanks to the star-shaped plug connection to the IO link master. The parameterization can then be loaded directly from the IO link master into the new (identical) device and thus accepted.

Electronic position indicators for monitored size changeover are optionally available for all ROVEMA machines and systems. The end-user of the packaging plant for infant formula had all 40 adjustment points equipped with AP10 displays, because the ROVEMA benefits are obvious: faster changeover times and much less documentation effort, because everything is electronically stored and retrievable. The most important advantage is the significantly increased process reliability due to the red/green LED system; incorrect settings can no longer occur. About 50% of ROVEMA users choose this option for monitored size changeover in cartoning and end packaging technology. **DW**

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