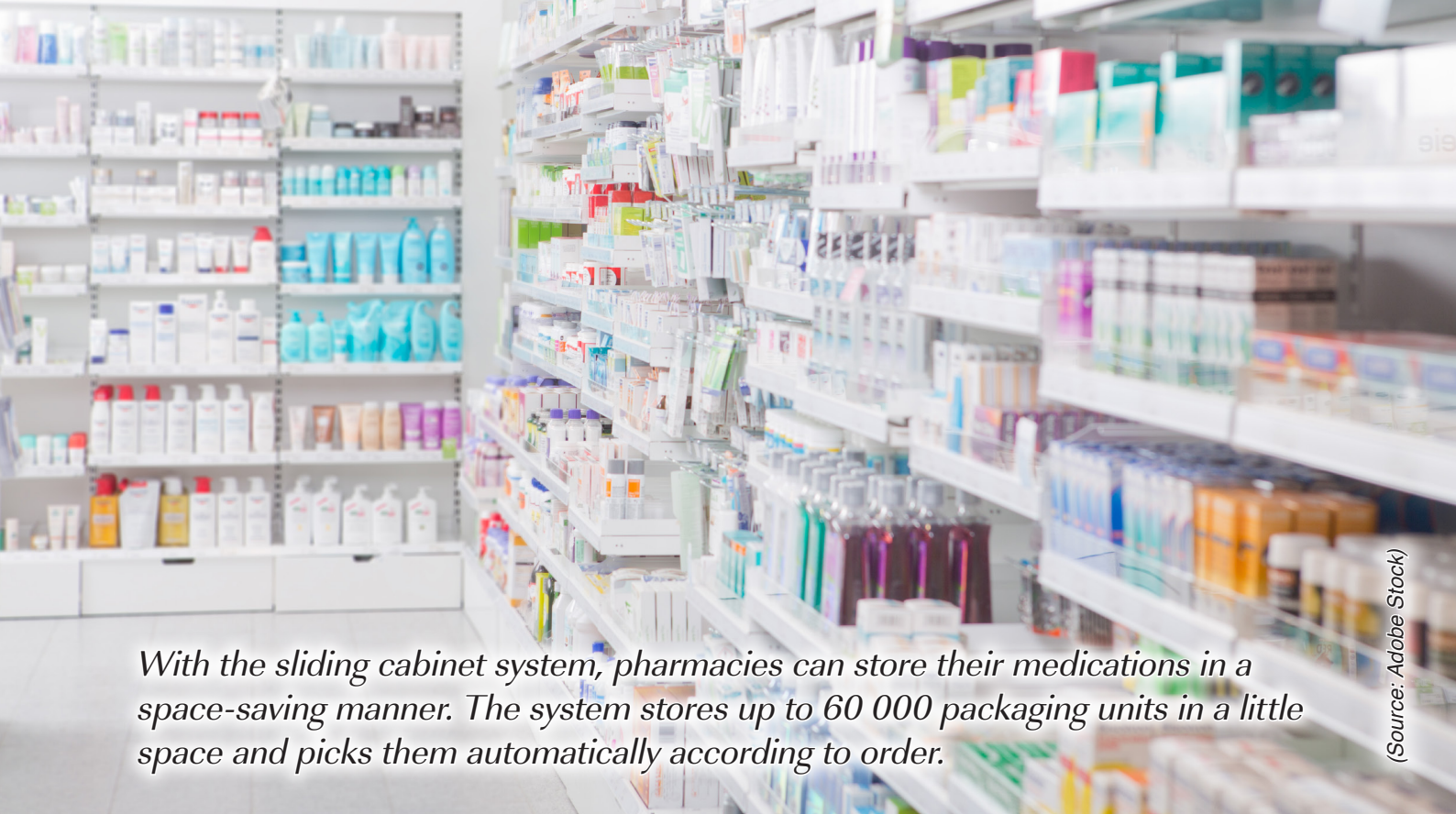


# CAN cables in pharmacy picking systems



(Source: Adobe Stock)

*With the sliding cabinet system, pharmacies can store their medications in a space-saving manner. The system stores up to 60 000 packaging units in a little space and picks them automatically according to order.*

A patient who visits a doctor with an acute complaint usually receives a prescription that they must take to the nearest pharmacy. The logistic performance of the pharmacies that our patient must use (and there are almost 20 000 of them in Germany) often receives insufficient appreciation. A regular pharmacy has about 20 000 medications on hand (large ones have up to 60 000) and receives up to five deliveries each day. Throughput is high, storage is extremely complex, and space is usually limited. That is why picking systems have established themselves: they allow the pharmacy staff to request a medication at the touch of a button and give it to the customer after a very brief waiting period with additional information such as an explanation of the medication.

## Sliding cabinet system

The systems designed by Gollmann Kommissioniersysteme in Halle (Saale), Germany are assuming a prominent place in this market because they are especially compact. Other systems work with fixed channels in which the handling system moves, but Gollmann has developed movable cabinets that open up channels wherever goods are being picked or delivered (Figure 1).

This principle doesn't just save space. It also allows customized adaptation to spatial restrictions in all dimensions. There must be flexibility and reliability despite the pronounced manufacturing complexity. Gollmann meets this requirement with two factors. The company has great in-house vertical integration and engages high-quality

industrial partners as suppliers. After all, the picking systems must not fail, and a single system completes about 15 million movements over the course of 15 years of operation in a pharmacy.

This principle has worked very well for Gollmann. Daniel Gollmann founded the company in 2006. In 2007, the first full business year, the company installed 12 systems. Currently, 250 systems leave the company's large assembly halls each year – that's one every single business day. Sven Ronneberger, the company's technical manager, said: "At the beginning we made fixed versions of our system. Now we are flexible in all dimensions and offer systems that can store 60 000 articles or more. No two systems are alike." Gollmann has been working with Igus for more than ten years in the selection and optimization of moving cables and energy chains.



Figure 1: Gollmann commissioning systems are remarkable for their design that can be adapted to each individual case (Source: Gollmann Kommissioniersysteme)

## Mobile energy supply for individual cabinets and grippers

Each cabinet is driven by a stepper motor that must receive energy and, critically, signals. For instance, each end position is queried with a proximity switch. This means that there are many moving cables (Figure 2) and a corresponding variety of energy chains, since the storage and retrieval unit arm (Figure 3) and the gripper at the end of the arm (Figure 4) require energy.



Figure 2: Each sliding cabinet receives its energy supply and signal routing from an E065 energy chain and Chainflex cables (Source: Igus)

### CAN cables

Early on (in 2007), Gollmann decided to include Igus E065 energy chains and has stuck with them ever since. A short time later, the decision was made to buy the cables from Igus, too. Since Gollmann picking systems use CAN cables to communicate, the focus was on the network cables from the Chainflex product range. CAN is mainly used in automation technology. In addition, CAN systems are also

found in industrially used vehicles such as forklifts or lifting work platforms. CAN cables are available for different fields of application. In general, CAN cables are often installed fixed in machinery and equipment, so that cables with a solid conductor or a flexible conductor consisting of seven strands can be selected.

For applications in the energy chain, it is necessary to use CAN cables with fine stranded wires. In addition, a cable structure tailored to the movement in the energy chain is necessary, so that secure data transmission is guaranteed over the years. This is why Chainflex cables have become established especially in equipment and machines such as robots, packaging machines, production machines, and machine tools.

The Chainflex cable product range offers a variety of CAN cables. In total there are 13 different CAN cable types from seven different cable ranges available for different applications. All CAN cables have been developed for continuous movement in the energy chain. Depending on the requirements, users can choose between different PVC, PUR, and TPE outer jackets. The different cable series offer different performance levels, so that the right cable can be chosen for each application area in order to achieve the maximum service life. All CAN cables have one thing in common: They are subject to the same quality standards. Here it does not matter whether it is a cost-effective cable of the CF888 range, or a cable for the highest demands and smallest bend radii as is the case with the CFBUS. LB range. Therefore, Igus also gives a 36-month functional ▶

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Figure 3: Energy and CAN signals reach the RBG axes through energy chains (Source: Gollmann Kommissioniersysteme)

guarantee on all chainflex CAN cables with a service life of up to 10 million double strokes.

The topic of the maximum transmission length of cables is often underestimated. In general, caution should be exercised, as the maximum cable length can vary greatly depending on the type of cable. A cable for fixed installation always has a lower dampening than flexible cables, which is designed for permanent movements. As a result, the transmission length is lower than with a cable for fixed installation.

Depending on the cable range, Chainflex CAN cables are mechanically designed for travel distances of up to 400 m or more, but the data-rate of the network system decreases with increasing cable lengths. For fixed installation, copper cables can reach up to 500 m. Then the maximum transmission speed is still 125 kbit/s, while with a cable length of 40 m a data transfer rate of 1 Mbit/s is still possible. For flexible CAN cables for the energy chain, experience shows that one cable length can be significantly shorter. Depending on the transmission speed, up to 50 m is possible for a moving CAN cable. However, this length may vary up and down depending on the environmental conditions and application requirements.

Last year, Gollmann ordered almost 30 km of cables from the Chainflex CF211 series alone. A specially developed Chainflex measuring system cable based on the CF211 series provides many advantages in cable processability. Igus developed the entire cable range especially for moving, demanding energy chain use, and tested it under real-world conditions. The company grants a unique guarantee of 36 months or up to 40 million double strokes (for the Chainflex CF298, for instance).

These usage quantities provide representative information about reliability – and the conclusions are clear. Ronneberger said, "In our picking systems delivered worldwide, we have installed more than 20 000 energy chains so far, and they work very reliably, without malfunctions or



maintenance." This is important because the businesses that invest in a Gollmann system are entitled to a "carefree package" in which the manufacturer assumes the responsibility (and costs) for all servicing, including unplanned failures, for the average service life of 15 years. Gollmann, supplements this guarantee with an additional expense allowance and three hours of on-site service anywhere in Germany.

This makes the selection of long-lasting, fail-safe components a question of the pharmacy's own interest, which is why the collaboration began with endurance tests on Igus energy chains and cables at Gollmann's test facility. At the same time, the components were compared, using the parameters specified by Gollmann, to the empirical values Igus has collected from more than 27 years of tests in its 3 800 square meter test laboratory. The tests focus on bend radius, which is often very small because of the compactness of Gollmann systems.

### Standardization does not always cut costs

Originally, Gollmann used only those Igus energy chains and cables that had especially small bend radii and could therefore be used universally. This is reasonable from the point of view of standardization. But two years ago, the design engineers worked with Igus to assess the possibility of using two levels of quality and less robust series for larger bend radii. As such information as a comparative service life calculation showed, this proved helpful, and Gollmann has since saved tens of thousands of euros each year on cable costs.

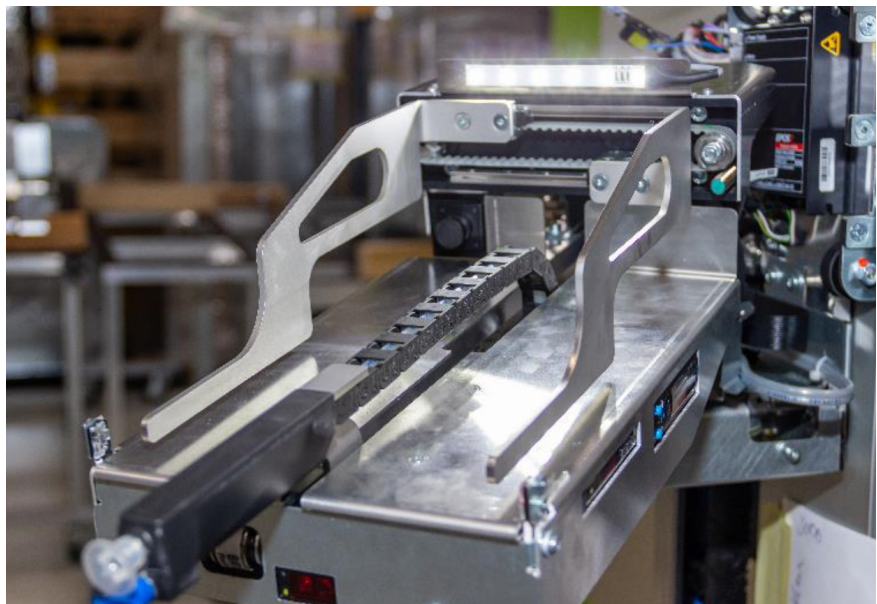


Figure 4: The gripper system is equipped with a E065 chain; The chain also carries a vacuum line for suctioning the packaging to be picked (Source: Igus)

Ronneberger considers such projects important and valuable. "Our Design and Research and Development staff appreciate the open, long-term partnership with Igus. Another advantage, and one that we do not take for granted, is the product training that Igus conducts personally on site." A further optimization project looked at Chainflex cables that are customized for applications such as measuring technology. It improved the cables' connector assembly, reducing costs and assembly time. Assembly effort plays an important role in component selection more generally. "We pay a lot of attention to processability. Chain filling must be convenient, for instance." And with the E065, it is. The cables are simply pressed along the outer radius to the chain interior.

### Creative alternative uses

The picking systems' innovative rolling cabinet concept has attracted interest from outside the pharmaceuticals industry. Ronneberger said: "We are increasingly planning projects for entirely different applications such as managing tens of thousands of samples for a producer of spice mixtures in the food service industry." In another case, a metalworking company is storing turning and milling tools in a Gollmann system. If a tool is worn, the worker retrieves a replacement (if they have user privileges), and the system can track tool service life effectively. A completely new and relatively novel application is pop-up stores that are set up in locations such as shopping centers and can be

used as attractive, space-saving, temporary points of sale. So, ideas are clearly coming not only from Gollmann design engineers, but from sales staff as well. Igus gives Gollmann a moving energy supply and signal routing partner that is just as agile. ◀



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