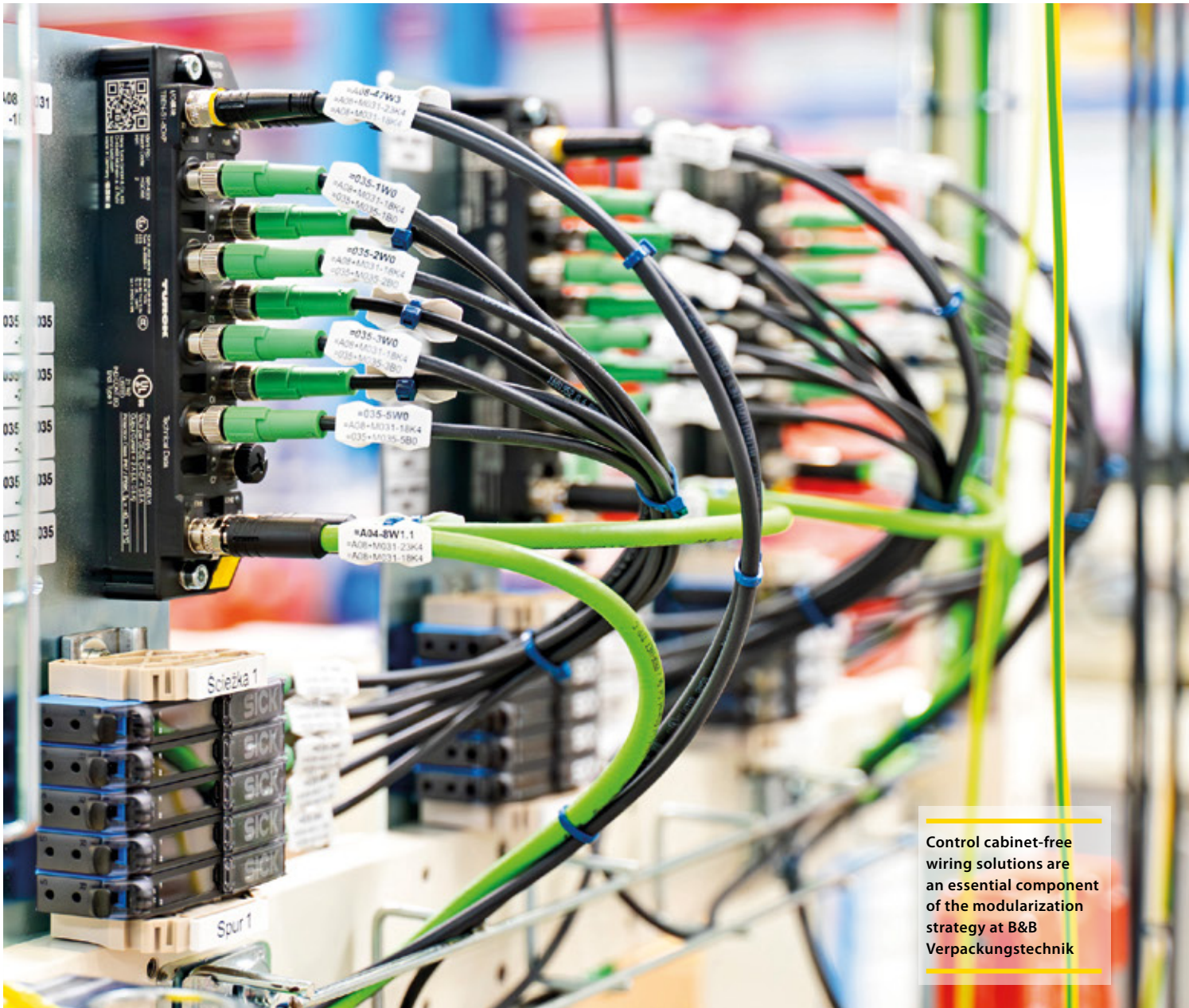




Control cabinet-free wiring solutions are an essential component of the modularization strategy at B&B Verpackungstechnik

From Cable Harnesses to Data Streams

B&B Verpackungstechnik relies on modular machine concepts with decentralized I/O technology from TURCK – for greater efficiency, flexibility, and digitalization

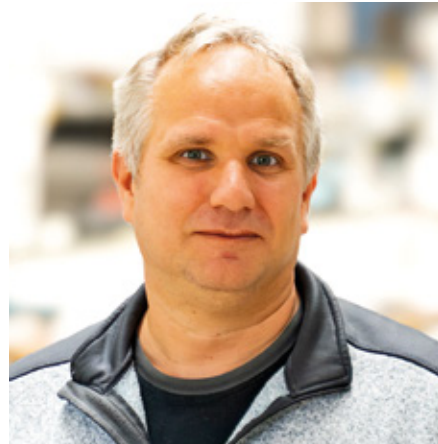
Tradition meets innovation: B&B Verpackungstechnik GmbH in Hopsten manufactures highly specialized bagging and end-of-line packaging machines – tailor-made for customers worldwide. The owner-managed company stands for quality, flexibility, and creative engineering. But even in an environment

based on decades of experience, technical change is indispensable.

When Tobias Emsmann started at B&B Verpackungstechnik a few years ago, the world of machine electrics looked very different: terminal boxes dominated, thick cable harnesses ran through the machine frames, and

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B&B Verpackungstechnik GmbH in Hopsten develops bag making and end-of-line packaging machines and relies on a modular machine concept with decentralized I/O and safety technology from TURCK. By using robust IP67 modules directly on the machine, the company significantly reduces wiring costs and speeds up setup, commissioning and service. The new architecture creates the basis for end-to-end digitalization – including remote maintenance, scalability and efficient service worldwide.



every change meant effort – expensive, error-prone, inflexible. Traditional wiring with terminal boxes and cable harnesses hampered efficiency and flexibility. The path to machines that were easy to assemble and service led through consistent modularization – technically, organizationally, and structurally. The goal was a modular machine concept to streamline machines and processes. “We had machines where the wiring alone took several hundred hours,” recalls the electrical engineer. “That was not only expensive, but also prone to errors – and it severely limited our flexibility.”

Decentralized I/O modules as the key to modularization

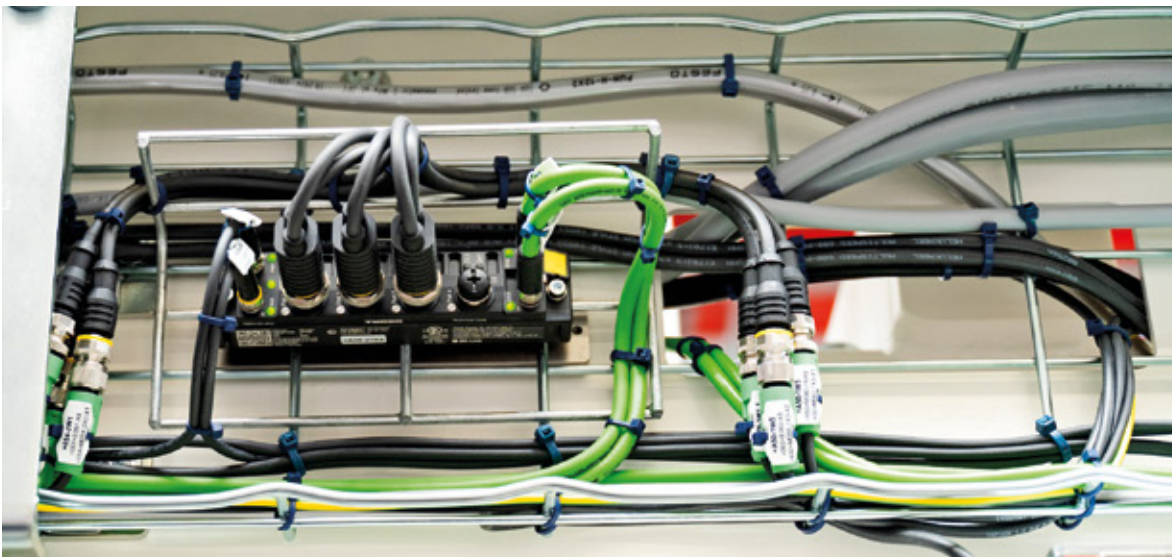
Together with his team, Emsmann developed the new machine concept. Instead of central terminal boxes, decentralized I/O modules were to be installed directly in the machine environment. “We wanted to move away from rigid control cabinet thinking,” he says. “Our machines should be modular in design – like a modular system that can be flexibly adapted.” In its search for a future-proof automation solution, B&B initially remained manufacturer-neutral. Emsmann and his team specifically looked for I/O modules that capture signals directly in the field. They chose TURCK’s

»We save up to 240 electrician hours per machine – that was one of our major pain points.«

Tobias Emsmann | B&B Verpackungstechnik

robust IP67 TBEN-L and TBEN-S block modules, partly because of their Ethernet multiprotocol capability, as they support both Profinet and Ethernet/IP.

In addition to digital I/Os, the new solution also had to be able to capture analog signals decentrally, because a central element in packaging at B&B is edge shrinking: This involves blowing hot air onto the film so that it fits snugly around the product. The hot air blowers must be precisely controlled via analog inputs and outputs.



The variety of TURCK I/O modules and the coverage of all required signal types were decisive factors in the collaboration

Ultimately, TURCK also impressed in terms of functional safety: the TBPn hybrid safety modules enable the flexible integration of safety-related Profisafe and classic Profinet signals on a single module – including IO-Link. “I approached the selection process independently of any particular manufacturer – and ended up with TURCK,” explains Emsmann.

Up to 240 electrician hours saved per machine

The changeover was a major undertaking. But it was worth it: cable lengths were drastically reduced, troubleshooting was simplified – and, according to Emsmann, B&B now saves up to 240 electrician hours per machine. The company documented production and design in detail and was able to clearly quantify the difference between classic and decentralized design. “In the past, it was a huge effort to prepare a machine for shipping. Today, we build them modularly, disconnect the connections – and they are ready for use again on site in no time.”

The new architecture not only facilitates assembly but also transport and commissioning. In Hopsten, the machines are completely assembled, tested, and then

disassembled into modules suitable for transport. On site, they can be quickly reassembled thanks to pluggable connections – without time-consuming rewiring. Technicians also benefit in the event of servicing: modules can be easily replaced without having to delve deep into the electrical system.

Flexibility through IO-Link and multiprotocol

Another advantage of the TURCK solution is the Ethernet multi-protocol capability of the modules. Whether Siemens or Rockwell – the same modules work in different control environments. In addition, B&B uses IO-Link for connecting intelligent sensors and control elements. This reduces the number of variants in the warehouse and improves diagnostics during operation.

Although every machine at B&B is custom-built, the company relies on consistent standardization. Macro projects in Eplan, modular assemblies, and uniform I/O modules help to manage complexity. Even with different control systems, the field cabling remains largely identical – an advantage for design, purchasing, and service.

On this type of machine, you can still see the bulky electrical boxes at the top, which are gradually being replaced by decentralized wiring





TURCK's consistent multi-protocol strategy also pays off in the field of safety technology, as demonstrated here by the TBIP safety module for EtherNet/IP and CIP Safety

Digitalization and traceability: from clipboards to paperless manufacturing

With decentralized I/O technology, B&B has not only modernized its machine architecture but also created the basis for end-to-end digitalization. A central element is the use of Eplan eView in assembly. "We no longer have any paper in the assembly hall," says Emsmann. "The fitters work with tablets. When they change a cable or the bus route, they report this back digitally. We see it immediately in Eplan." This real-time feedback improves transparency and efficiency. Changes no longer have to be documented by hand and transferred later – they flow directly into the planning data.

The path to this point was not without hurdles. "At first, we lacked routine," admits Emsmann. "Many colleagues had been wiring terminal boxes for years – knowledge of the new technology first had to spread. But with growing experience, acceptance is increasing – and the advantages are becoming apparent. Despite initial hurdles, the team is convinced that they are on the right track. Digital traceability, remote maintenance, and the integration of service information in real time create a new level of quality in machine support – both internally and externally. "If a customer says today, 'I'd like another light barrier at this point,' it's no longer necessary to send out an electrician," says Emsmann. "The service technician can do it himself, and we provide remote support."

Customer benefits and competitive advantage

At B&B, digitalization is not an end in itself, but a strategic tool for working faster and more flexibly. For customers, this means that machines are delivered faster, are available for longer, and are easier to upgrade. Service calls can also be carried out more efficiently. If the customer grants access, service

technicians can connect to the system remotely for diagnosis or troubleshooting. This gives B&B a clear competitive advantage, especially in times of skilled labor shortages and rising cost pressures.

Partnership on equal terms

Close coordination with TURCK was crucial during the modularization process – especially when integrating the safety modules and communicating with different control systems. "There were many small things that had to be coordinated between the software and hardware at the beginning. But once contact between the experts was established, things moved quickly," summarizes Emsmann. He is satisfied with the support: "The support team always took good care of us." The combination of technical expertise and a trusting partnership was the basis for the project's success.

What began with a packaging machine is now being extended to other machine types. Bagging machines and combination systems are also set to benefit from the decentralized architecture in the future. The experience gained from the pilot project is being directly incorporated into further development. The company is already testing new modules and technologies – for example, for decentralized protection or for controlling adjustment motors. Condition monitoring and energy monitoring are also planned. The goal is a fully digitized, flexible, and maintenance-friendly machine platform.

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