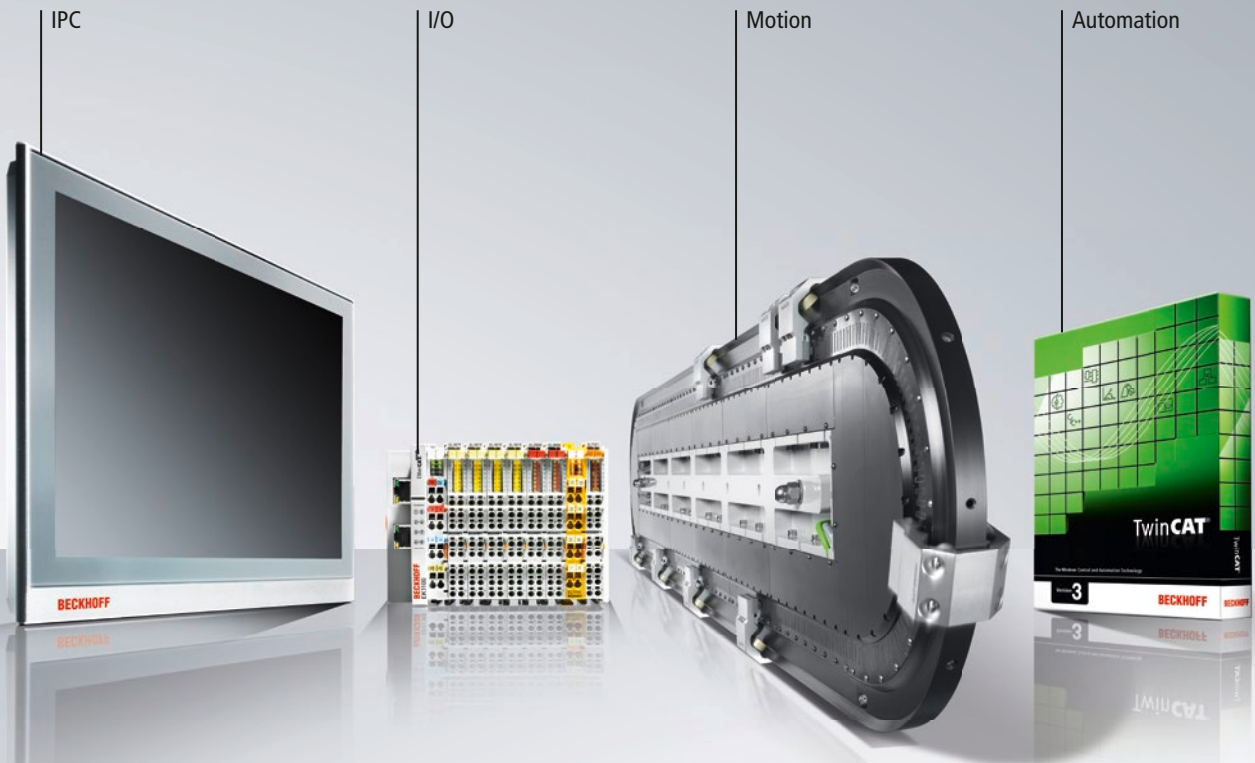


BECKHOFF New Automation Technology

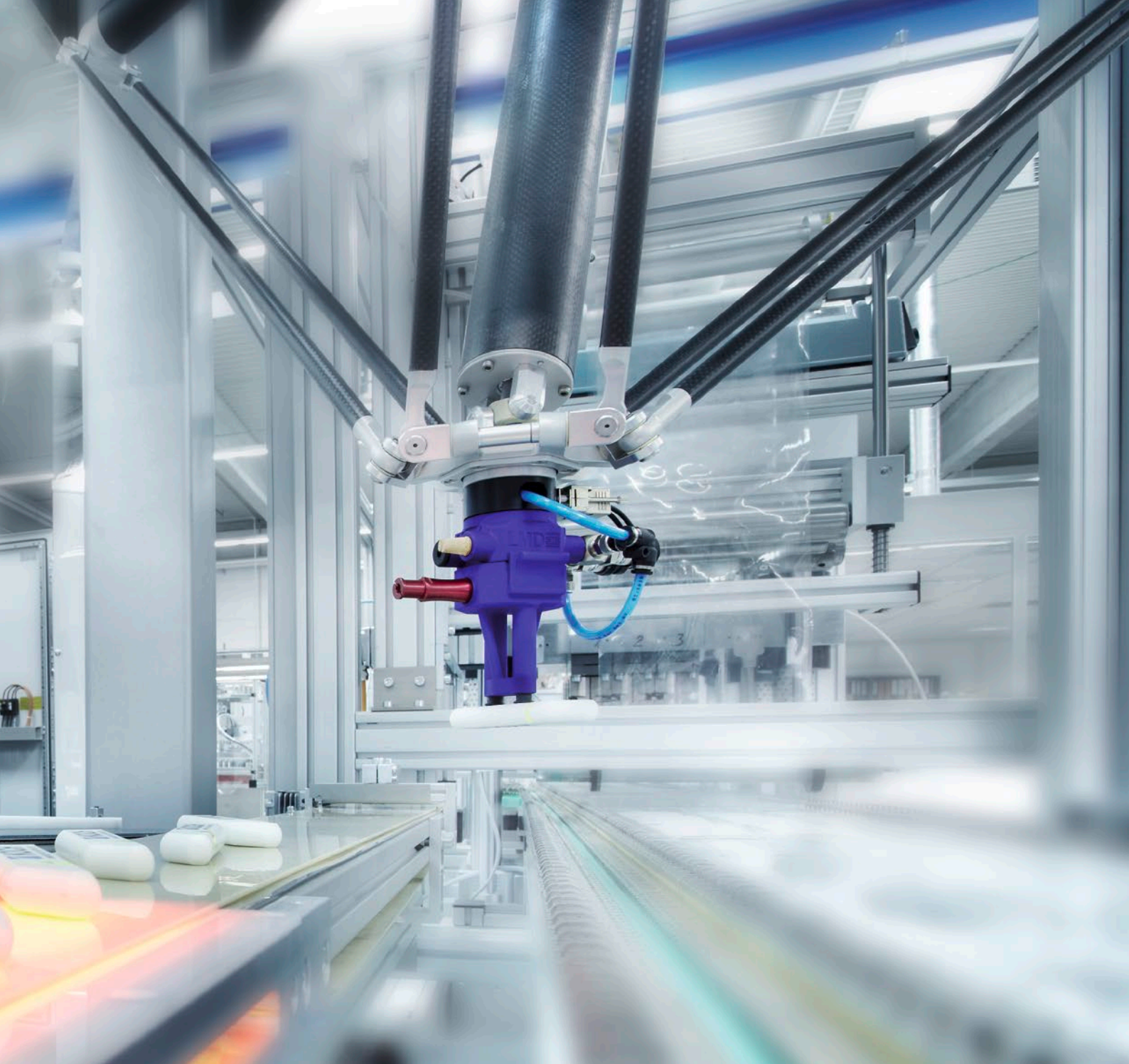
Maximum efficiency and flexibility:
PC-based control for the packaging industry





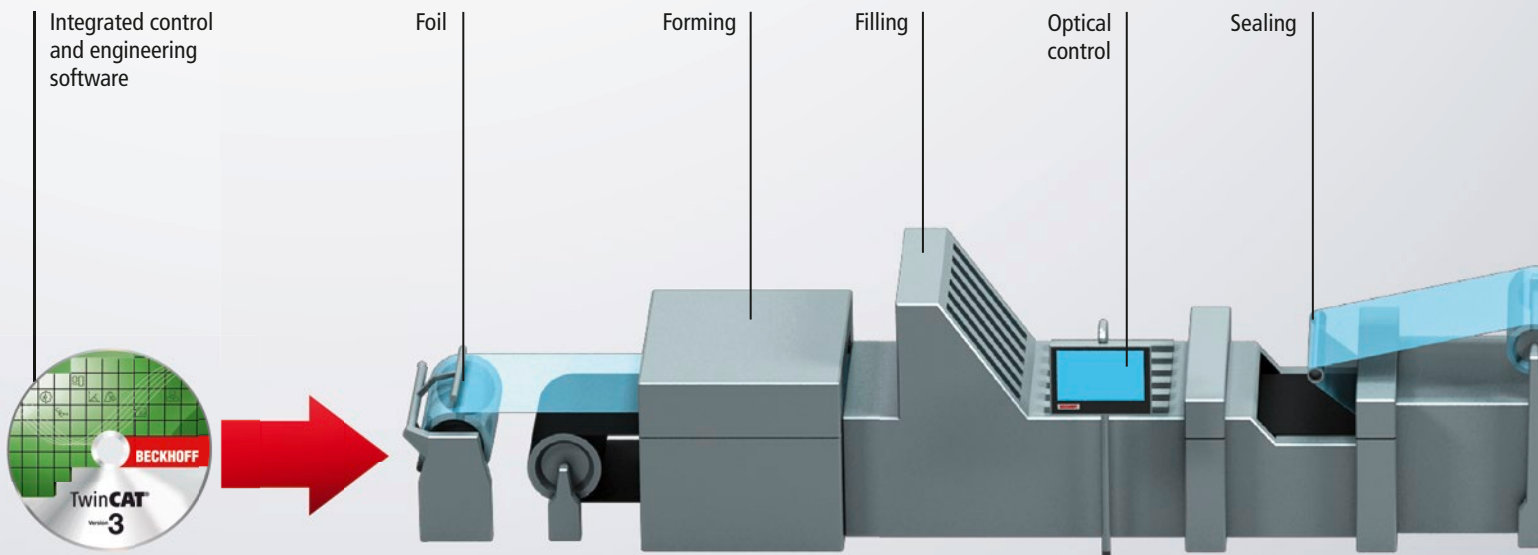
PC-based control, the integrated control platform ...

With its PC- and EtherCAT-based technology, Beckhoff offers a control solution for highly efficient, flexible and compact packaging machines. Because of its openness and its universal design, PC-based control delivers technological and economical benefits. TwinCAT is the standardized software and engineering platform for all automation processes from PLC, motion control and robotics to condition monitoring. All control and drive components offer maximised scalability in terms of performance and form factor. Open hardware and software interfaces allow for consistent communication from the sensor to the cloud. Other benefits include an integrated safety solution and support for common industry standards like FDA, EHEDG, Weihenstephaner Standards, OMAC, and GPM.



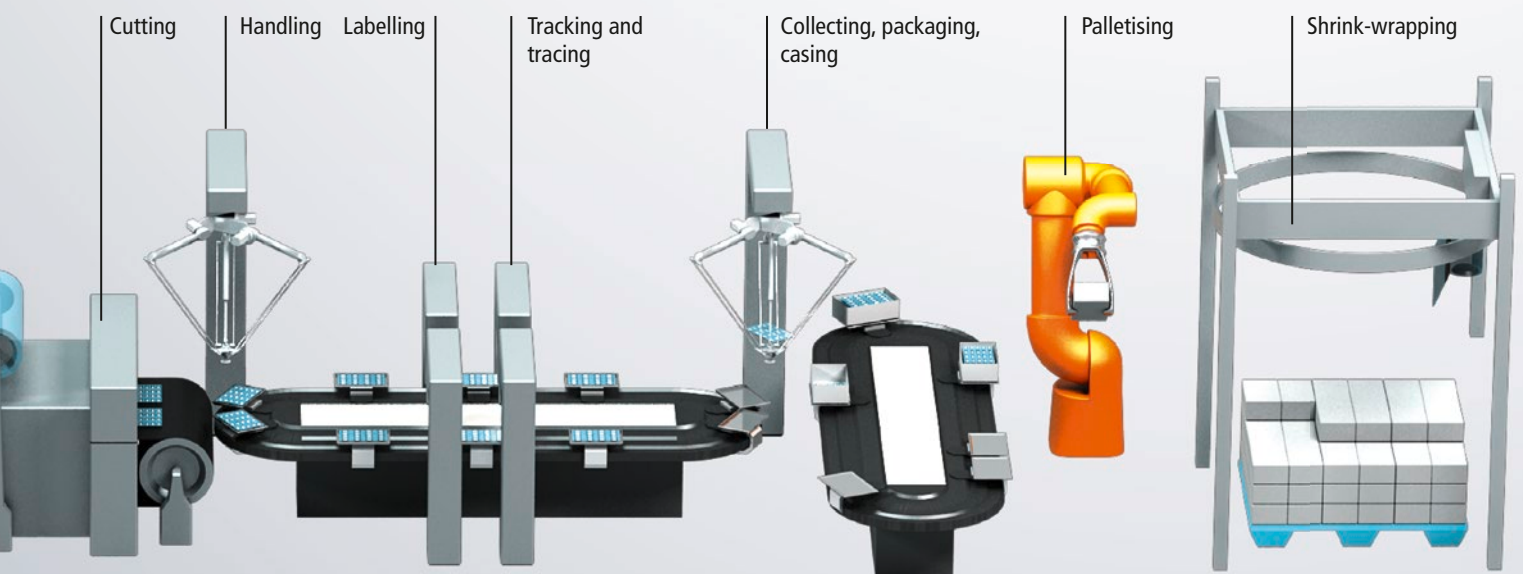
... for highly flexible, resource-efficient packaging machines

Packaging requirements vary from industry to industry and from product to product. What they all have in common, however, is that they focus more and more on quality, flexibility, and most of all resource efficiency. PC-based control technology from Beckhoff makes this possible with its exceptional performance and the openness of the TwinCAT software platform, which integrates all automation functions, including measurement technology and simulation. PC-based control is the ideal solution for applications involving high speed and precision or complex motion control interactions. It also delivers maximum flexibility for applications where packaging systems must be quickly adaptable to changing requirements or be able to easily accommodate new features.



Benefits along the entire line: Integrated PC-based control ...

With PC- and EtherCAT-based control technology from Beckhoff you can automate individual packaging machines as well as entire lines. All steps such as forming, filling, sealing, labelling, collecting, boxing and palletising can be programmed and controlled via a single platform. Optimally coordinated hardware and software interfaces as well as extensive expertise in implementing each process step guarantee a high level of process stability. Applications can be realized by Beckhoff, a solution partner, or the customer himself. The Beckhoff portfolio comprises everything you need for a technologically and financially superior packaging solution.



... from primary to secondary packaging

On the hardware side, Beckhoff offers a modular portfolio of Control Panels, control cabinet PCs and Panel PCs, as well as a complete spectrum of I/O modules (also in high-protection versions) and highly dynamic servo drive solutions. On the software side, our TwinCAT control software with its many libraries for items like stepper control, cam plate functionality, register control or cross-cutting meets all the standard requirements you find in packaging machines. The PackML OMAC standard is also fully supported. With PC-based control, packaging machines are equipped for the needs of today and tomorrow. Requirements like track-and-trace and instant adaptation to variable characteristics of the goods being packaged can be implemented flexibly and economically. At the same time, the PC-based technology provides more computing performance and storage space to meet the constantly rising demands of increasingly complex machines with more and more features.

Resource-efficient packaging: Maximum process speed and precision ...

How can you implement packaging solutions that fill the correct amount while reducing the amount of packaging materials? How can you reduce the energy consumption of the entire process chain? Implementing PC Control ensures that the consumption of resources is reduced to the absolute minimum. What makes the difference is the XFC ("eXtreme Fast Control") technology. With I/O response times of less than 100 μ s, the system scans the machine's status up to 10,000 times per second so that the process can be controlled with exceptional precision and repeat accuracy. With no need for special hardware, XFC implements extremely fast and accurate control solutions for packaging machines.



In combination with the XTS, PC-based control opens the door to new ways of saving on packaging material. The example shown combines the benefits of horizontal and vertical form, fill and seal machines to deliver high process speed and fast tool changes with no mechanical intervention. XFC and the XTS makes it possible to place the seal as closely to the product as possible by synchronizing print marks with the sealing guillotine.

... with minimum material usage

PC- and EtherCAT-based control ensures perfectly synchronized processes and motion control sequences with shorter cycle times for more throughput. The technology's quick and precise response to fiducials makes it possible to save on packaging material, for example by placing products more closely together in blister packs, which reduces the amount of sealing foil needed as well as any waste. And the ability to precisely control the sealing temperature allows you to use thinner plastic films. The fast and highly accurate process control capabilities also let you minimize the wall thickness of PET bottles as well as reduce the amount of paper and aluminium when producing cardboard containers. And the more accurate approximation of the minimum fill level generates significant material and cost savings when packaging high-volume products.

Labeling and grouping unit in a blister packaging line for toothbrushes:

For product or format changes only the easy-to-install blister carriers need to be switched out. As a result, setup change-over times are reduced considerably. The high throughput rate of blisters per minute, requiring the ability to adapt to varying speeds at the labeling station, are great benefits of XTS.

Flexible packaging: Fast and efficient product and format changeovers ...

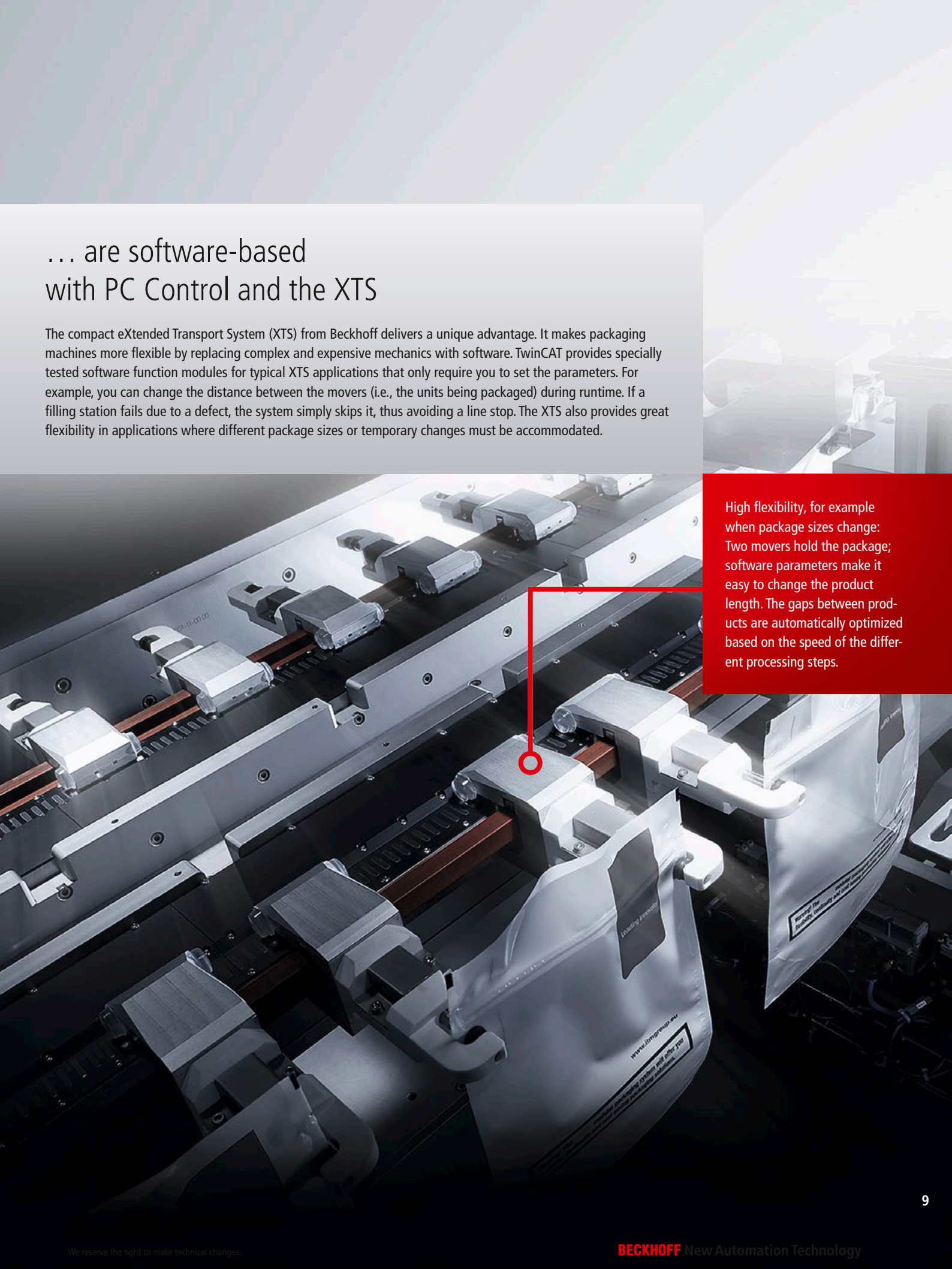
Faster format changeovers, shorter job runs, lot sizes of 1 for on-demand production and the ability to respond quickly to technical problems require a control solution that responds to new requirements with maximum flexibility and minimum effort. This is where the Beckhoff's PC Control philosophy truly shines. The PC-based control platform executes machine setup changeovers due to product or package changes essentially in software by adapting the process parameters. This speeds up the process considerably, resulting in faster product changes and more line efficiency for the operator. Easy format changeovers ensure more productivity even with many short runs.



The XTS lets you handle packages with varying fill levels or format sizes without having to change the machine's mechanics. To implement a special offer like "3 plus 1", you simply change the appropriate parameters with a mouse click so that four instead of three movers transport the items to the packaging station.

... are software-based with PC Control and the XTS

The compact eXtended Transport System (XTS) from Beckhoff delivers a unique advantage. It makes packaging machines more flexible by replacing complex and expensive mechanics with software. TwinCAT provides specially tested software function modules for typical XTS applications that only require you to set the parameters. For example, you can change the distance between the movers (i.e., the units being packaged) during runtime. If a filling station fails due to a defect, the system simply skips it, thus avoiding a line stop. The XTS also provides great flexibility in applications where different package sizes or temporary changes must be accommodated.



High flexibility, for example when package sizes change: Two movers hold the package; software parameters make it easy to change the product length. The gaps between products are automatically optimized based on the speed of the different processing steps.



Control Panel: Multi-touch display and Control Panel



Industrial PC: Control cabinet and Panel PC



Embedded PC: IPC with integrated I/O level

The Beckhoff system for more efficient packaging machines ...

Beckhoff offers control solutions in all performance categories for applications in the packaging industry – from rail-mounted Embedded PCs with integrated I/Os to high-end Industrial PCs with multi-core processors. A wide range of multi-touch panels delivers state-of-the-art operating convenience. With the ability to handle over 400 signal types, the I/O components serve the full spectrum of sensors and actuators. And with TwinSAFE, an integrated safety solution is available for I/O and motion control applications. The drive technology portfolio ranges from compact servo terminals, powerful EtherCAT drives and highly dynamic servo motors with "One Cable Technology" to the XTS linear transport system. TwinCAT integrates engineering environment and controller in a single software platform. For VFFS and HFFS machines, Beckhoff offers a complete solution consisting of a Panel PC with industry-standard operating keys, user interface, I/Os, and compact drive technology.



EtherCAT I/Os: Broad I/O spectrum in IP 20 and IP 67



Highly dynamic servo drive technology



Servo terminals: compact drive technology



XTS: Linear Transport System

TwinCAT: Software for engineering and runtime



TwinSAFE: Integrated safety solution



Linear actuator: With integrated power electronics



... also available in stainless steel for the food industry

For packaging applications in the food, beverage and pharmaceutical industries, Beckhoff offers a complete control solution in stainless steel with hygienic design that meets the strictest sanitation and cleanroom requirements. Control Panels and Panel PC series in high-quality stainless steel housings are suitable for IP 65 conditions. EtherCAT Box I/O modules are also available in stainless steel housings. They meet the requirements of the IP 69K protection class and are designed to be installed directly on the machine. The AM8800 stainless steel servo motors feature protection class IP 67 (IP 69K optional) for use in extremely harsh or corrosive environments. The portfolio of stainless-steel products is complemented by the XTS Hygienic: With water-proof execution in IP 69K protection rating, hygienic design without sharp corners and angles, and resistance against aggressive cleaning agents it is ideal for use in primary packaging applications and the food industry.



Stainless steel EtherCAT Box in IP 69K



Stainless steel servo motor in IP 67 or IP 69K

XTS: Software replaces mechanical components ...

The linear XTS transport system from Beckhoff sets a new milestone in packaging technology. XTS combines the benefits of linear and rotary transport systems. The result: flexible routing that lets you use all the benefits of direct-drive such as high dynamics, positioning accuracy, low oscillation, lack of wear, and low power consumption. Since both straight sections and the curves are used for the material transport, there are no empty trips, making for a faster overall process. And the TwinCAT automation software makes the engineering process easy with its integrated standard features such as automatic accumulation, collision prevention and shock prevention.

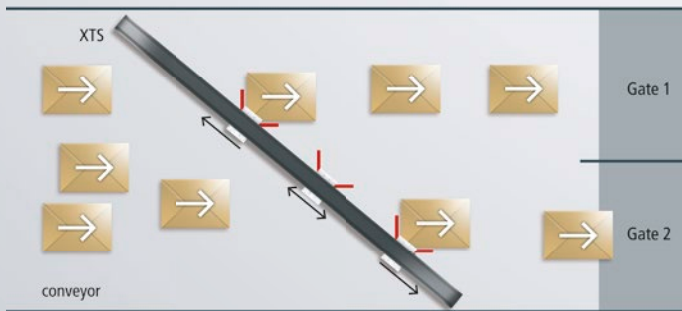
► www.beckhoff.com/XTS



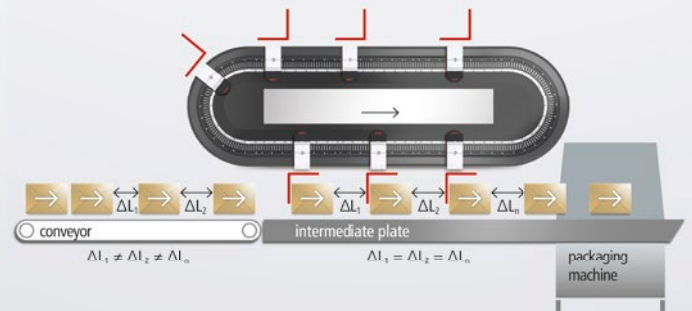
The XTS Hygienic in stainless steel execution with IP 69K protection rating is ideal for use in primary packaging applications and the food industry.

... and reduces the packaging machine's footprint

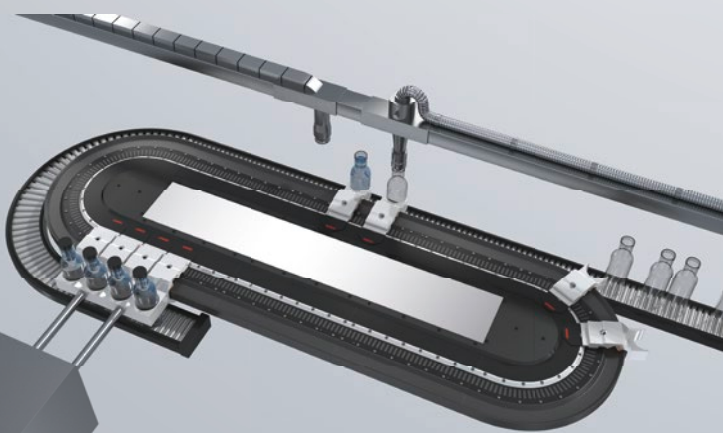
The XTS opens the door to completely new machine designs with smaller footprints. The travel profile no longer requires complex mechanical components, and up to 50 percent lower machine sizes deliver significant cost benefits. Most of all, however, the XTS improves the packaging process: Products can be moved independently, packaging steps can be perfectly synchronized, avoid standstills, and function changes are quick and easy to implement because they are entirely software-based. Product changeovers and cleaning are easy. Maintenance activities are also very efficient, because the control software monitors all movers and recognizes any overloads instantly.



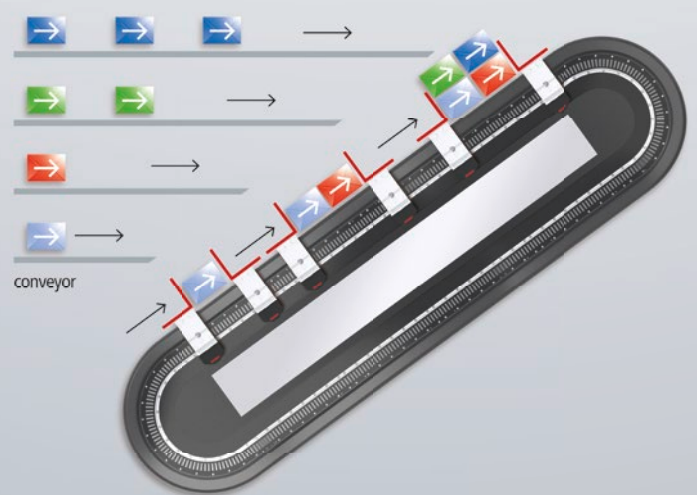
In a distribution system, the XTS splits an incoming product stream into multiple streams (two in this case) inexpensively and with great flexibility.



The XTS makes it easy to implement a feeder with distance adjustment that synchronizes products arriving at different intervals with the downstream process.



As a carousel-type solution, the XTS is ideal for bottling applications that must be able to process a continuous product stream in a discontinuous fashion.



Used as a grouping system, the XTS can easily combine products arriving on multiple conveyor belts into predefined and easily changed groups and move them to the next station.

TwinCAT: One software platform for engineering and runtime ...

The TwinCAT automation software forms the core of the PC-based control platform for PLC, CNC and Robotic. It consists of runtime systems for program execution and the engineering environments for programming, diagnostics and configuration. It features all major programming languages of IEC 61131-3, including its object-oriented enhancements for real-time applications. C/C++ and MATLAB®/Simulink® modules can be integrated into the IEC environment via interfaces or operated independently in the TwinCAT real-time context. Open interface provide easy integration into existing IT structures. Preconfigured packaging software modules for special functions such as dancer control, cam plate, register control and support for PackML standards as defined by the latest version of the OMAC specification simplify the engineering process and shorten development and commissioning times.

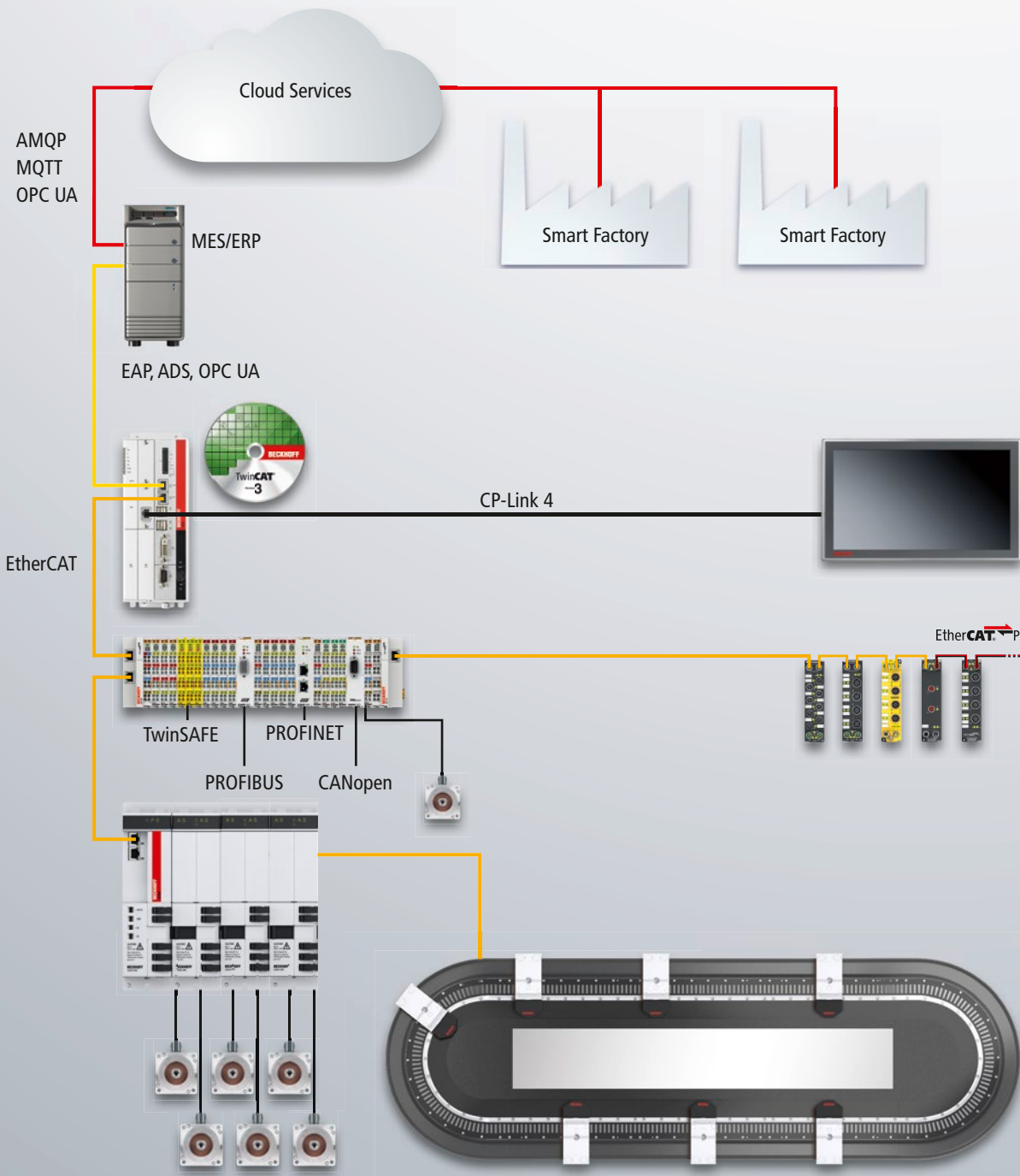
► www.beckhoff.com/TwinCAT



... for all machine types and entire packaging lines

TwinCAT provides packaging machine builders with an integrated engineering environment for any control task. By making full use of the available processor cores, TwinCAT can replace additional hardware such as separate robotics controllers with software and integrate them into the central control platform. The TwinCAT IoT and TwinCAT Analytics software libraries provide basic technologies for the "smart factory". TwinCAT IoT enables secure cloud communication through support for standardised protocols such as OPC UA, MQTT and AMQP. TwinCAT Analytics can be used to analyse big data in the cloud and to support the packaging industry with preventive machine maintenance and optimisation applications.

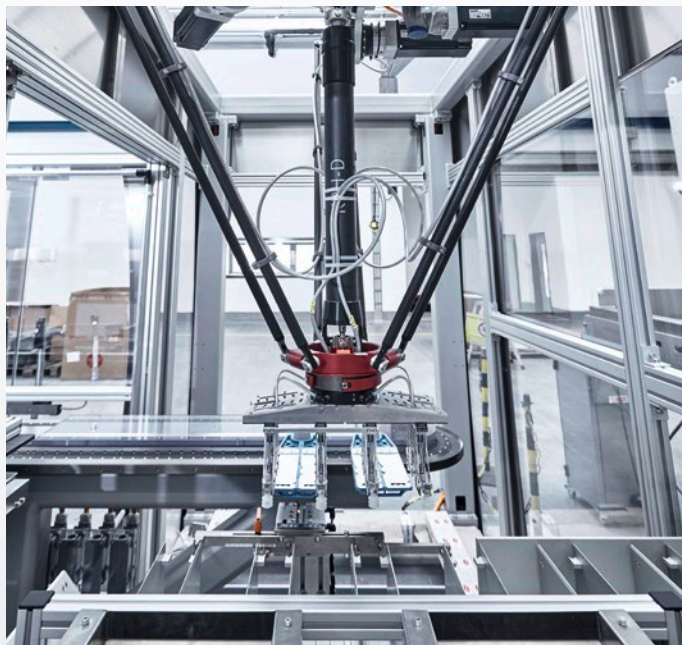
► www.beckhoff.com/industry40



On the factory floor: Packaging solutions from Beckhoff

PC-based control from Beckhoff is in use in packaging machines all over the world. The "Packaging Special" issue of Beckhoff's PC Control magazine shows the diversity of applications on the basis of selected references.

► www.pc-control.net



Koch Pac-Systeme

The XTS (eXtended Transport System) is used at the core of a labeling and grouping unit in a blister packaging line for toothbrushes.

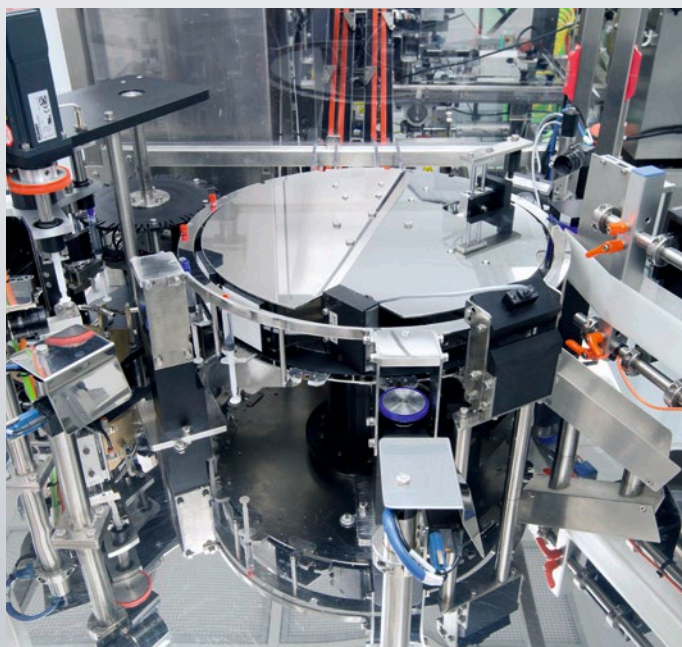
www.koch-pac-systeme.com



Graniten Engineering

XTS optimizes end-of-line packaging machine for the pharma industry.

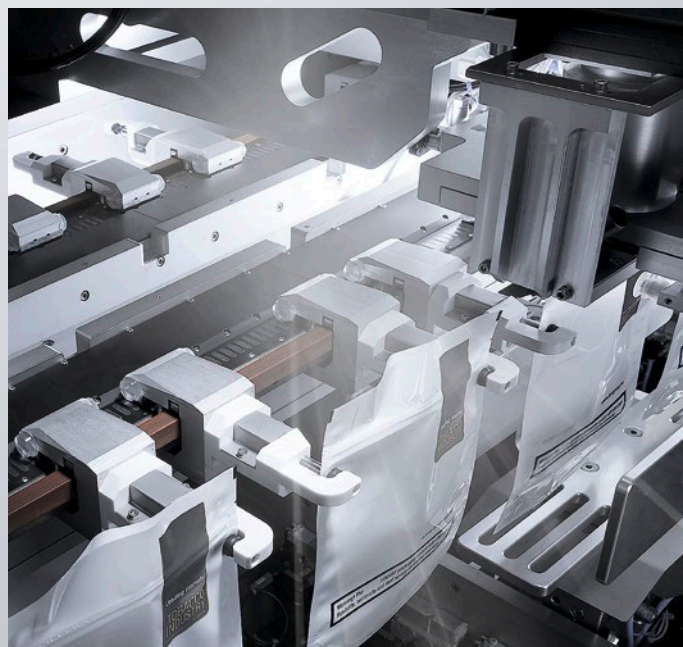
www.graniten.com



Particle Inspection Technologies

Automatic visual inspection solution for syringes and vials.

www.particleinspectiontechnologies.com



Technical Development Corporation

XTS-based machine for forming, filling and sealing stand-up pouches for tobacco packaging.

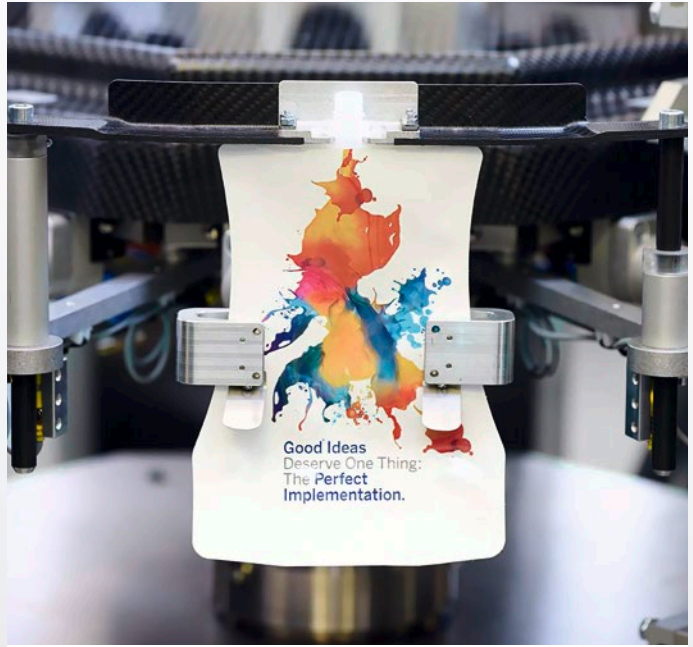
www.itmgroup.eu



MBP Multihead Weighers – PFM Group

PC-based control platform revolutionizes vertical form-fill-seal (VFFS) machine concept.

www.mbp.it/en



Scaldopack

PC-based control ensures highest level of precision in doypack production for liquid food products.

www.scaldopack.be/en/



TVI Entwicklung & Produktion

Automation of flexible and precise meat processing centers.

www.tvi-gmbh.com



MULTIVAC Sepp Hagenmüller

TwinCAT robotic kinematics and servo drive technology for food packaging applications.

www.multivac.com

Beckhoff – New Automation Technology

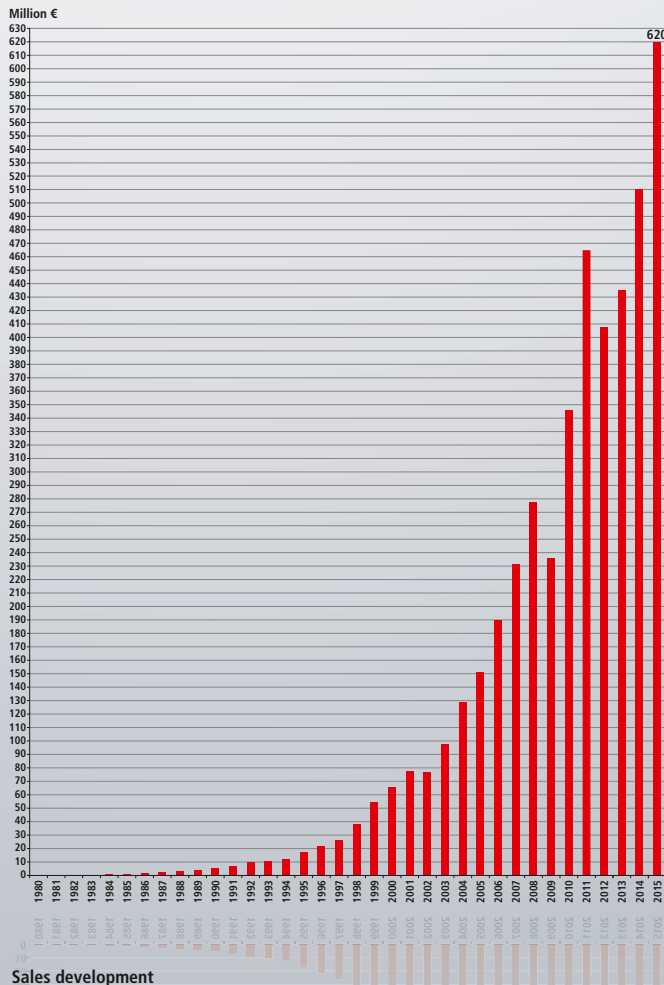
Beckhoff implements open automation systems based on PC Control technology. The product portfolio covers Industrial PCs, I/O and fieldbus components, drive technology and automation software. Products that can be used as separate components or integrated into a complete and seamless control system are available for all industries. The Beckhoff “New Automation Technology” philosophy represents universal and open control and automation solutions that are used worldwide in a wide variety of different applications, ranging from CNC-controlled machine tools to intelligent building automation.

► www.beckhoff.com

Beckhoff at a glance

- Headquarters Verl, Germany
- Sales 2015: 620 Mio. €
- Staff worldwide: over 3,350
- Sales/Technical Offices Germany: 18
- Subsidiaries/Branch Offices worldwide: 35
- Distributors worldwide: in more than 75 countries

(as of 01/2017)

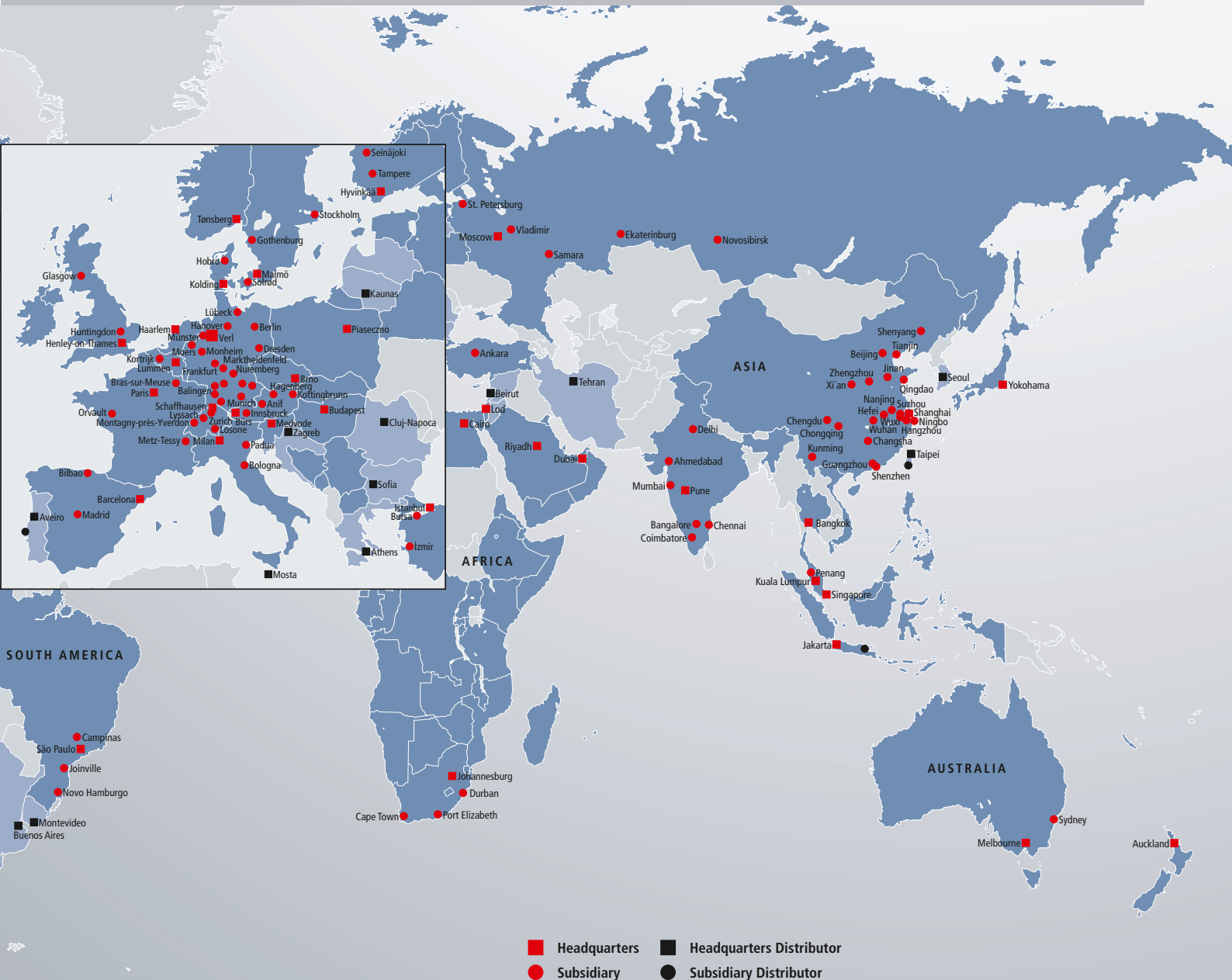


Worldwide presence on all continents

The worldwide presence of Beckhoff in more than 75 countries ensures fast service and support for globally operating customers in their local language. Moreover, geographical proximity helps the company develop an in-depth understanding of the unique technical challenges customers are faced with around the world.

More information

- For more information and industry solutions, visit:
▶ www.beckhoff.com/packaging
- To download Beckhoff catalogues and brochures, go to:
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