BECKHOFF New Automation Technology

News 05'2025

Efficiency in operation:
The Next multi-touch panel generation

Rethinking power measurement:
Easy installation, deep insights

Economy AX1000 servo drives and
AF1000 variable frequency drives

PLC++

TwinCAT®

TwinCAT PLC++:
Next generation
PLC technology

Discover all our product developments, extensions and innovations at

▶ www.beckhoff.com/product-news

The IPC Company

The Industrial PC (IPC) is the hardware centerpiece of PC-based control technology. Beckhoff supplies Industrial PCs suitable for any application, which are based on open standards, enabling individual configuration to meet a wide range of control requirements.

Whether in the form of an Embedded PC with a compact form-factor for DIN rail mounting, a control cabinet PC, or as a Panel PC, in-house motherboard development enables Beckhoff to respond quickly to IT trends and customer-specific requirements.

▶ www.beckhoff.com/ipc

- large model variety of Industrial PCs and Embedded PCs
- high-performance PCs, featuring a wide range of processors, from Intel® Celeron® to top of the line Intel® Core™ i9 processors
- long-term availability of all Industrial PCs and Embedded PCs
- As the inventor of PC-based control technology, Beckhoff closely cooperates with global technology partners Intel and Microsoft.

Efficiency in operation:
The Next multi-touch panel generation

ℹ The Next multi-touch panel series is advanced and cost-optimized, and further expands the diversity of Beckhoff's broad portfolio. As usual, this generation of control panels and panel PCs offers convenient operation thanks to advanced multi-touch technology, a high-quality look and feel, and a wide choice of formats and options.

Advantages:
- contemporary, elegant design and high-quality workmanship
- high-quality industrial displays with multi-finger touch function
- high-end panels for demanding human-machine interface and control tasks
- developed and manufactured in-house, entirely in Germany

▶ www.beckhoff.com/next-panel-generation
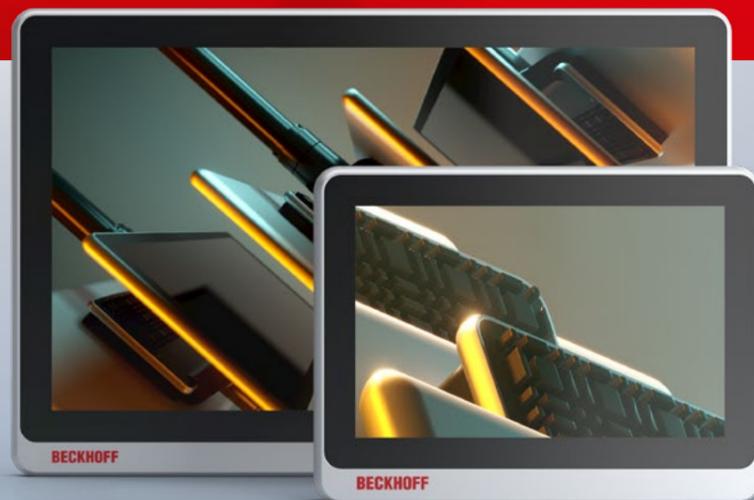
Next multi-touch control panels in a smart design

ℹ Beckhoff introduces control panels from the Next multi-touch panel generation: the CP49xx built-in control panels as well as the CP59xx control panels for mounting arm installation.
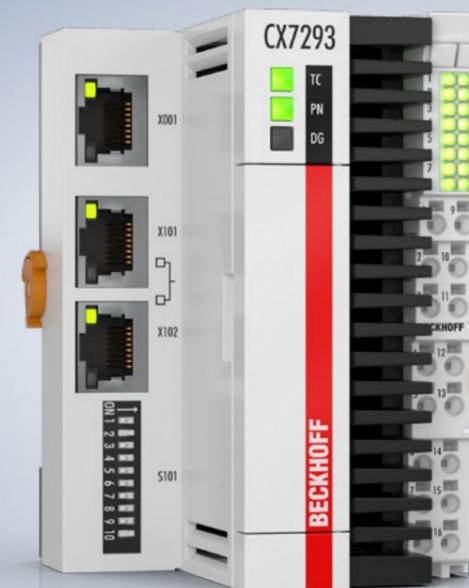
Advantages:
- IP20 and IP65-protected versions for any environment
- for direct mounting on a VESA monitor mount by the customer
- can be directly mounted on a 48 mm round tube with a mounting arm
- diagonals from 7 to 23.8 inches

▶ www.beckhoff.com/cp49xx
▶ www.beckhoff.com/cp59xx

Embedded PCs for BACnet/IP and PROFINET RT device extend the CX7000 series

ℹ Two new devices with Arm® Cortex®-A9 processor (720 MHz) are added to the CX7000 series:
- CX7291: with BACnet/IP
- CX7293: with PROFINET RT device

The basic configuration has a slot for a microSD card, an Ethernet interface as well as eight integrated multi-functional inputs and four integrated multi-functional outputs.

▶ www.beckhoff.com/cx7291
▶ www.beckhoff.com/cx7293

The I/O Company

Beckhoff supplies a complete range of fieldbus components for all common I/O and bus systems. With Bus Terminals offering IP20 protection and Fieldbus Box modules in IP67, a comprehensive range of devices is available for a wide variety of signal types and fieldbus systems. In addition to components for conventional bus systems, Beckhoff offers an integrated product range optimized for EtherCAT. Invented by Beckhoff, this real-time Ethernet solution for industrial automation has global acceptance and is characterized by outstanding performance and simple handling. The result is high-precision machine and plant control and significantly increased production efficiency.

▶ www.beckhoff.com/io
▶ www.beckhoff.com/ethercat ▶ www.ethercat.org

- comprehensive, modular I/O system for all signal types and fieldbus systems
- universal product range optimized for EtherCAT
- high investment security: mature I/O technology based on more than 25 years of success in the field
- EtherCAT communication has been proven in practice for 20 years and is a worldwide standard.

High-performance analog I/Os

ℹ The range of analog multi-functional terminals is extended by the new EL4172 and EL4174 10 V/20 mA outputs, which cover even the most demanding applications.

The EL417x series outputs bipolar signals of ±10 V and ±20 mA with a measuring range of 107%, enabling the transmission of atypical setpoints such as error information. Thanks to their powerful self-supply, the terminals drive current loads of up to 750 ohms. For the first time, analog feedback measurement via EtherCAT provides feedback on overloads, cable breaks or short circuits.

Each output can be parameterized individually and, with 16-bit resolution and 10 ksps, also supports dynamic positioning processes via distributed clocks. The EL4172 compensates for voltage drops in 4-wire mode and offers galvanically isolated channels for applications with potential differences.

The EtherCAT Terminals of the EL3x7x and EL4x7x families thus offer versatile solutions for basic to demanding applications.

▶ www.beckhoff.com/el307x-el4x7x
▶ www.beckhoff.com/multi-io
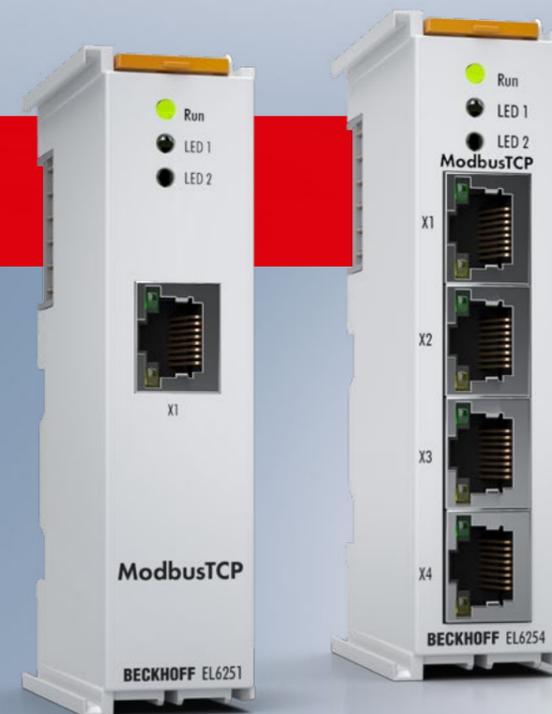
Modbus TCP devices into EtherCAT

ℹ The EL6251 and EL6254 Ethernet Modbus TCP terminals enable distributed connection of any Modbus TCP devices to the EtherCAT Terminal network. They can work either as a Modbus client and as a Modbus TCP server – or as both simultaneously. The user can access up to eight connections, which can be used flexibly. The IP address of the connected Modbus server can be changed by the PLC during operation. Modbus TCP devices can be connected via an Ethernet port (EL6251) or four Ethernet ports (EL6154).

▶ www.beckhoff.com/el6251
▶ www.beckhoff.com/el6254

Rethinking power measurement:
Easy installation, deep insights
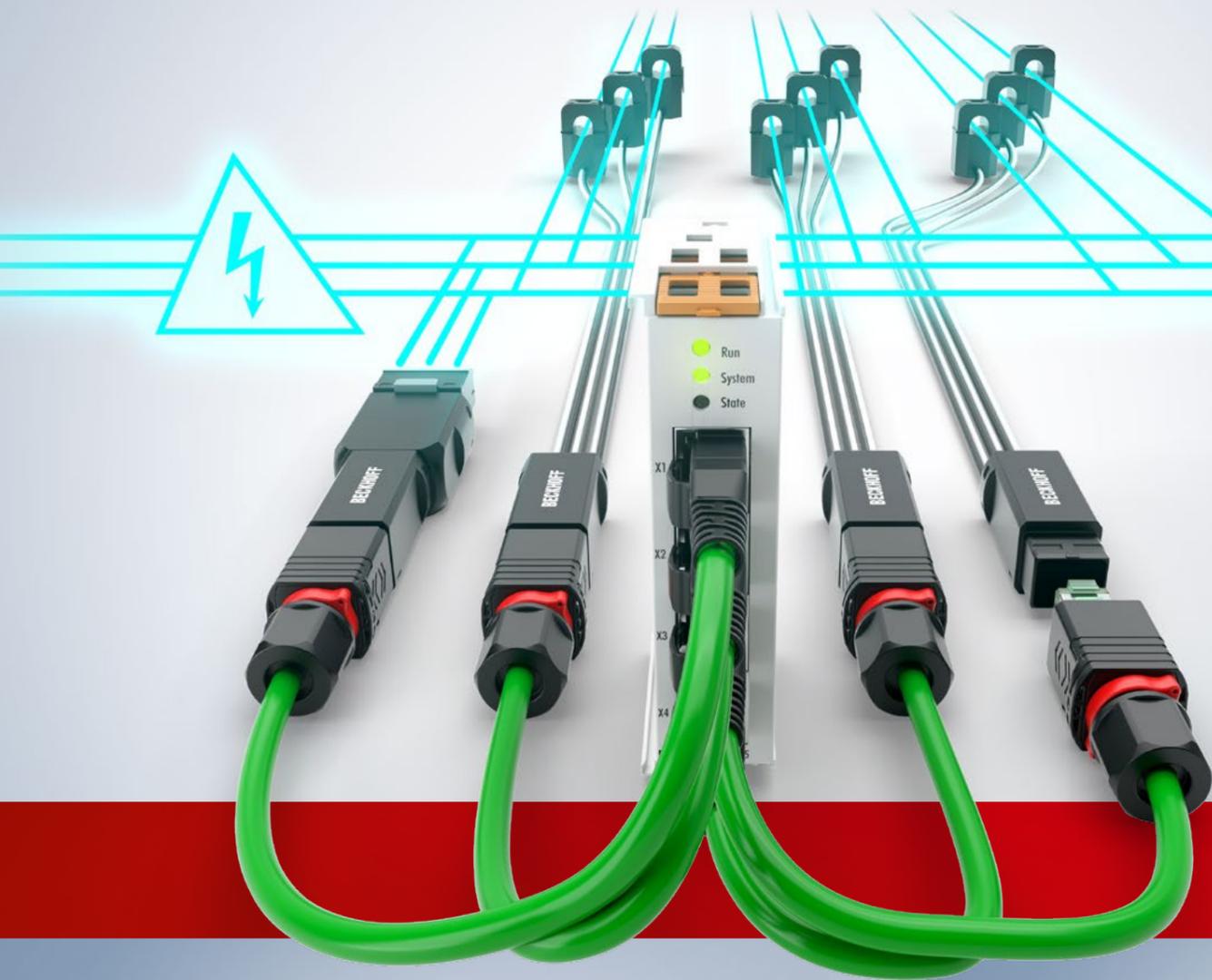
ℹ The EL3475 EtherCAT Terminal is a 12-channel analog input module with 24-bit resolution and an input voltage of 333 mV that provides precise measurements in supply grids. Four RJ45 connections make for easy installation of current and voltage transformers. Automatic configuration is carried out using pluggable SCL6xxx series split-core current transformers with electronic nameplates. Thanks to the distributed power measurement technology, only one voltage measurement is required to calculate real power values from all current inputs.

The SVL1xxx voltage transformer allows all primary conductor voltages to be recorded simultaneously and also has an electronic nameplate, meaning that once the system has been mechanically plugged together, no additional configuration is necessary.

▶ www.beckhoff.com/el3475
▶ www.beckhoff.com/scl6xxx
▶ www.beckhoff.com/svl1xxx
▶ www.beckhoff.com/power-measurement

Seamless EJ series connection with EtherCAT P

ℹ The EJ1321 connects the compact EJ modules with EtherCAT P devices and opens up new possibilities in the automation environment. Thanks to the P-coded M8 socket on the PCB, the IP67 devices from the field can easily be connected to the EJ series. The EJ1321 is the perfect addition to the IP67 EtherCAT P Box modules with ID switches and is ideal for use in the semiconductor industry.

▶ www.beckhoff.com/ej1321

Basic identification and addressing with ID switch

ℹ In modular, often dynamic systems such as hot connect groups, individual devices within a network must be uniquely addressed. Products with rotary selection switches make it quick and easy to assign addresses that identify the device within the system. The new EtherCAT Box and EtherCAT P Box modules feature three hexadecimal rotary addressing switches. This allows an individual address to be set from 0 to 4095, providing unique identification regardless of mounting position, as is required for some device profiles in certain industries such as the semiconductor industry.

▶ www.beckhoff.com/ep-id-switch
▶ www.beckhoff.com/epp-id-switch
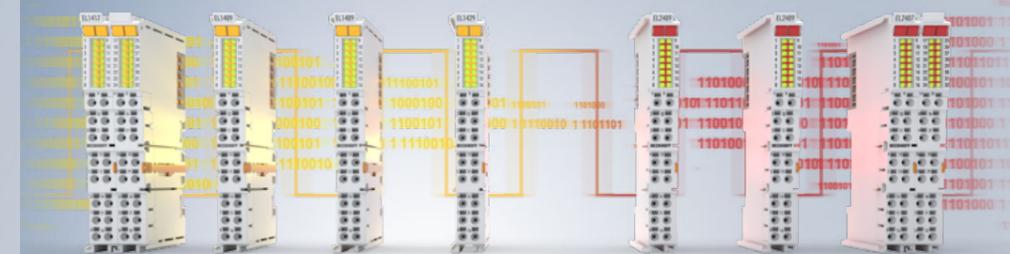
Familiar features for maximum flexibility

ℹ The new EL14xx and EL24xx EtherCAT Terminals complement the digital input and digital output portfolio and combine familiar functionality with an optimized circuit architecture. The use of advanced components, among other things, ensures future-proofing and guarantees long-term availability. These product families – now with up to 32 channels – offer maximum flexibility for standard applications with basic functionality.

▶ www.beckhoff.com/el1xxx
▶ www.beckhoff.com/el2xxx

We reserve the right to make technical changes.

The Motion Company

In combination with the motion control solutions offered by the company's TwinCAT automation software, Beckhoff Drive Technology provides an advanced, all-inclusive drive system. PC-based control technology from Beckhoff is ideally suited for single- and multi-axis positioning tasks with high dynamic requirements.

The AX5000 and AX8000 Servo Drive series with high-performance EtherCAT communication offer the best-possible performance and dynamics. Servomotors with One Cable Technology (OCT), combining power and feedback systems into one standard motor cable, reduce material and commissioning costs.

▶ www.beckhoff.com/motion

- scalable product range of servo drive technology
- integrated safety technology in compliance with safety performance level PL e, integrated into compact drive technology up to safety performance level PL d
- As the pioneer of One Cable Technology and the eXtended Transport System, Beckhoff specializes in manufacturing efficient, space-saving motion solutions.

Economy servo drive for small to medium power ratings

ℹ With the AX1000, Beckhoff is expanding its servo drive portfolio with a particularly cost-efficient series in the rated current range from 1.65 to 6.9 A. The AX1000 is available in two different versions: in the low power range with a single-phase supply of 1 x 110 V AC...240 V AC from 1.65 to 6.9 A and in the higher power range with a three-phase supply of 3 x 208 V AC...480 V AC from 3.4 to 6.9 A. Both versions are available as single-axis and dual-axis versions. The devices support AM8000 series synchronous servomotors with One Cable Technology (OCT), as well as asynchronous and reluctance motors. Despite the compact design, power supply, DC link capacitors and ballast circuit are integrated. In addition, the servo drive generates its 24 V control voltage from the DC link, eliminating the need for a power supply.

The AX1000 is fully integrated into TwinCAT via EtherCAT and offers convenient design, commissioning, and diagnostics. Various feedback options enable high precision in demanding applications. All common tools available (Drive Manager 2, Autotuning, Bode Plot or cogging compensation) can be used.

▶ www.beckhoff.com/ax1000

Economy variable frequency drive for the entry-level range

i In the power range from 370 W to 3 kW, the new AF1000 series variable frequency drive complements the Beckhoff portfolio with particularly cost-efficient drive amplifiers. The compact, highly integrated devices are suitable for implementing drive axes with synchronous, asynchronous and reluctance motors without feedback system. The AF1000 is available in two different versions: with a single-phase supply of 1 x 110 V AC...240 V AC in the power range from 370 W to 1.5 kW and a three-phase supply of 3 x 208 V AC...480 V AC in the power range from 750 W to 3 kW. Both versions are available as single-axis and dual-axis versions. Despite the compact design, power supply, DC link capacitors and ballast circuit are integrated. In addition, the variable frequency drive generates its 24 V control voltage from the DC link, eliminating the need for a power supply.

The AF1000 is fully integrated into TwinCAT via EtherCAT and offers convenient design, commissioning, and diagnostics. As with all Beckhoff servo drives, TwinCAT 3 Drive Manager 2 serves as the commissioning tool.

▶ www.beckhoff.com/af1000

Compact, integrated stepper motor drive for control cabinet-free machines

The ASI8100 integrated stepper motor drives are being expanded by another size with four different lengths. The new size enables holding torques of 0.75 to 2.5 Nm in IP54 housing and thus extends the application options for the ASI8100 in a power range of up to 250 watts. As an EtherCAT slave, the ASI8100 can be placed directly on the machine completely control cabinet-free and without an upstream I/O level, thanks to the integrated stepper motor output stage and fieldbus connection. It is ideal for compact and space-saving machine designs.

▶ www.beckhoff.com/asi8100

XTS EcoLine motor module: Proven benefits, full compatibility, lower costs

i With the XTS EcoLine motor modules, the modular XTS system makes intelligent product handling even more economical. The new modules offer 95% of the technical properties of the proven motor modules with the same claim to reliability and robustness.

The 500 mm XTS EcoLine motor modules are a cost-effective alternative for processes that do not require minimum values for accuracy or product spacing. Thanks to their full compatibility, it is also possible to combine them with the high-precision motor modules of the known design, for example to implement pure transport lines without process stations.

▶ www.beckhoff.com/xts-ecoline
▶ www.beckhoff.com/at2200
▶ www.beckhoff.com/at2202

Standard motor module

55% invest/meter
95% functionalities
200% length

EcoLine motor module

AM8000 servomotors with Beckhoff Smart System Diagnosis (B/SSD) for predictive maintenance

As an option, the AM8000/AM8300/AM8500/AM8700 and AM8800 series servomotors are available with the innovative Beckhoff Smart System Diagnosis. With B/SSD, it is possible to monitor the state of systems and servomotors in real time with minimal effort. Precise measurement of vibration, humidity and temperature directly in the motor provides the basis for statistical evaluation with TwinCAT Analytics and effective predictive maintenance. This allows machine conditions and processes to be monitored and any necessary action to be taken in a timely manner to ensure efficient operation and maximum machine uptime.

B/SSD uses the proven One Cable Technology (OCT), which eliminates the need for additional sensors and sensor cables and significantly reduces wiring work.
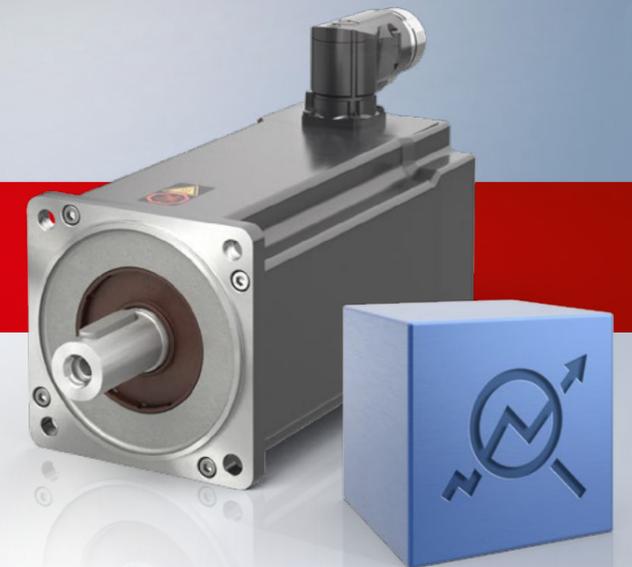
Thanks to full integration in TwinCAT Analytics, live data and historical data can be recorded, clearly visualized and processed into valuable information with B/SSD for machine optimization. Vibration measurements can be performed as an average value (RMS), with peak values (Peak-Peak) or statistically (Kurtosis) up to ±50g.

▶ www.beckhoff.com/b-ssd
▶ www.beckhoff.com/twincat-analytics

The Automation Company

Beckhoff offers comprehensive system solutions in numerous performance classes for all areas of automation. The control technology is exceptionally scalable – from high-performance Industrial PCs to mini-PLCs – and can be adapted precisely to application-specific requirements. TwinCAT automation software integrates real-time control with PLC, NC and CNC functions in a single feature-filled package.

▶ www.beckhoff.com/automation

- efficient, universal engineering
- programming in different languages
- Open, hardware-independent control system gives freedom of choice in terms of automation and control components.
- scalable control platform from single- to multi-core CPUs
- all control functions on a single, centralized platform: PLC, motion control, robotics, measurement technology, a.o.
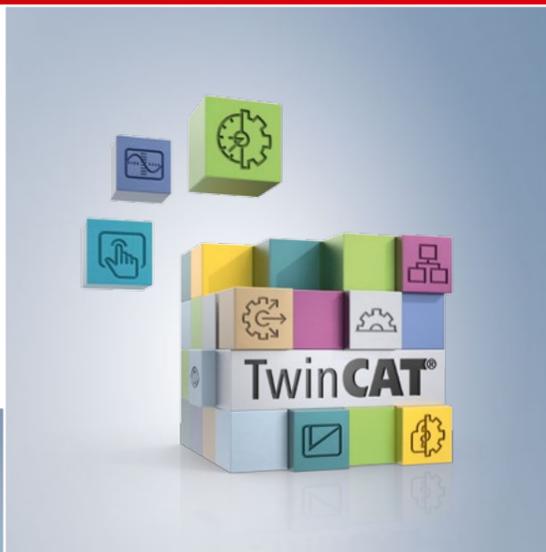
TwinCAT PLC++: Next generation PLC technology

[i] TwinCAT PLC++ is a completely new development from Beckhoff that integrates seamlessly into TwinCAT. TwinCAT PLC++ is based on the languages described in IEC 61131-3. Thanks to the advanced compiler technology and the new architecture used, a significant leap in engineering and runtime performance can be achieved.

This way, Beckhoff is consistently pursuing the principle of merging automation and IT. Although the company has retained familiar and proven features, it has redeveloped key components of the development environment such as editors and compilers based on IT models.

What's more, Beckhoff has placed particular emphasis on the possibility of using DevOps principles to implement continuous integration and continuous deployment, focusing on the specific needs of users. This results in a PLC that is not only technically extremely advanced, but also optimally tailored to practical requirements with increased user-friendliness and deep embedding in the TwinCAT world.

▶ www.beckhoff.com/twincat-plcpp

[i] **Automation made easy: AI-assisted engineering with TwinCAT CoAgent**
Beckhoff takes TwinCAT Engineering to the next level by seamlessly integrating advanced technology directly into TwinCAT projects with the latest innovative version of TwinCAT Chat: TwinCAT CoAgent. The agents provide effective support for a wide range of tasks, from precise code suggestions and smart code optimization to automatic creation of comprehensive documentation. The content generated by TwinCAT CoAgent can easily be integrated into established TwinCAT projects once it has been checked by a user.

In addition, TwinCAT CoAgent provides direct access to Beckhoff's comprehensive documentation and supports development of user-friendly HMI controls. This means that user interfaces can be designed and configured faster and more intuitively than ever before.

TwinCAT CoAgent revolutionizes and simplifies the engineering workflow, saves valuable time, cuts costs, and optimizes the use of resources. The name "CoAgent" underscores Beckhoff's pioneering role in implementing intelligent agents and simultaneously emphasizes that this tool is a partner that acts as a personal digital assistant.

▶ www.beckhoff.com/twincat-coagent

Sophisticated CNC machining on the move with TwinCAT 3 CNC Conveyor Tracking

TF5264 TwinCAT 3 CNC Conveyor Tracking enables the machining process to be synchronized with a conveyor belt. This means that moving workpieces that are larger than the actual working area of the machine can also be processed. Potential areas of application include laser processing and handling workpieces, e.g. as with pick-and-place.

The working area of a machine can be made smaller, even if the workpieces remain the same size, and the part throughput can be increased. In addition, the material is better utilized in continuous processing on the move. This reduces waste compared to conventional machining on stationary workpieces.

▶ www.beckhoff.com/tf5264
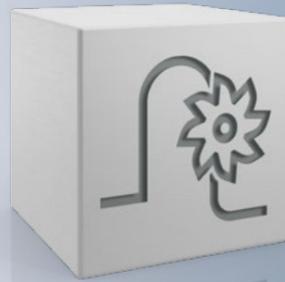
Linux®-based real-time control with TwinCAT

i With the TwinCAT Runtime for Linux®, Beckhoff is opening up new application possibilities for real-time control. In the future, several TwinCAT Runtimes will be able to be execute on one industrial PC for the first time, enabling users to combine different system parts on one large computer, for example. This simplifies both programming and diagnostics.

TwinCAT Runtime for Linux® is based on Beckhoff's own Linux® distribution, which expands the choice of operating systems in addition to Windows and TwinCAT/BSD. Initially, the new CX82x0 and CX9240 Arm®-based Embedded PCs will be offered with Linux® runtime. The Beckhoff Linux® distribution will then be successively rolled out for all new industrial and embedded PCs.

▶ www.beckhoff.com/linux

Virtual PLC with Beckhoff
In conjunction with the EK1000 EtherCAT Coupler, the TwinCAT Runtime for Linux® enables the implementation of a virtual PLC. Several TwinCAT runtimes can be operated as a container on a server PC in a data center in a resource-efficient and lightweight manner. Communication with the EtherCAT segments takes place via EtherCAT over Ethernet.

▶ www.beckhoff.com/virtualplc

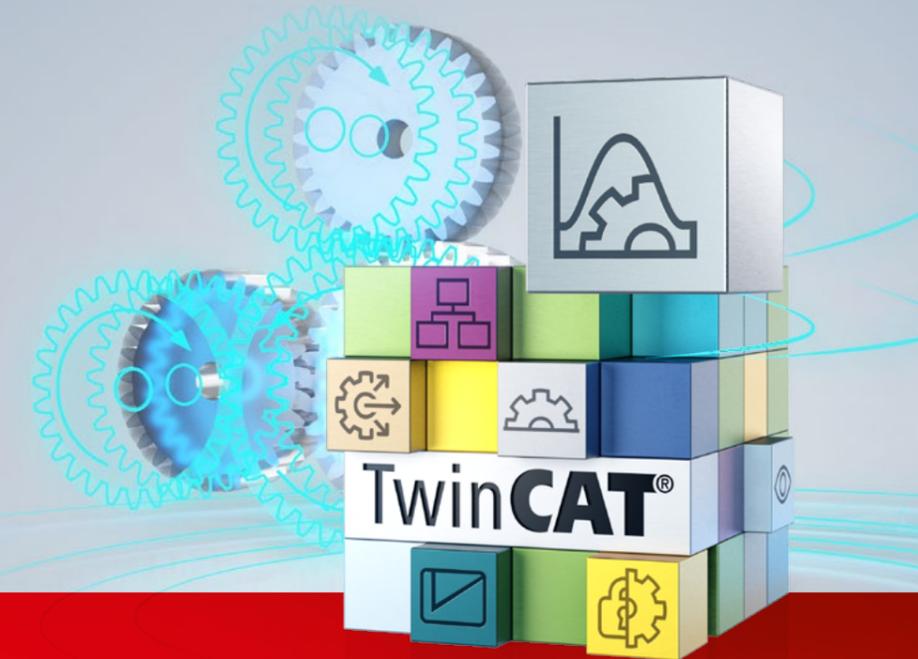# Next generation of motion control with TwinCAT MC3

i Motion control is an established and essential component of TwinCAT and is successfully used in many projects across industries.

TwinCAT MC3 is the next generation of motion control. All the successful features of the previous TwinCAT NC2 motion control solution are also present in the latest generation of the TwinCAT MC3. TwinCAT MC3 is thus fully integrated into the TwinCAT system. Axes continue to be abstracted so that programming is independent of the hardware and axes can be simulated.

However, the new modular architecture of TwinCAT MC3 is a crucial advantage. This includes multi-core and multi-task support with the option to synchronize movement across all CPU cores. In addition, there is no longer a fixed limit on the number of axes in the new generation. These vital features make TwinCAT MC3 a high-performance tool in the motion software solution field.

▶ www.beckhoff.com/twincat-mc3

High-performance CNC solutions for EDM and additive manufacturing

i Beckhoff simplifies the specific application of TwinCAT 3 CNC (TF5200) in the field of electrical discharge machining (EDM) and additive manufacturing with two new functions and two additional technology packages:

TF5262 TwinCAT 3 CNC Online Adaption enables the implementation of customer-specific interpolation functions in C++ and their integration into the real-time stack of the TwinCAT CNC via TcCOM interfaces.

TF5263 TwinCAT 3 CNC Extended Interpolation allows two independent interpolation paths to be programmed within a CNC channel (two-path programming) and provides functions for synchronization and compensation of the paths.

The technology package TF5291 TwinCAT 3 CNC AM Plus extends TwinCAT CNC with functions for predictive control of external processes, as is usual in additive manufacturing.

TF5292 TwinCAT 3 CNC EDM Plus is a special technology package that combines the functions of TF5262, TF5263 and TF5291 and thus provides the optimum basis for PC-based control of sophisticated wire-cutting and die-sinking EDM machines.

▶ www.beckhoff.com/tf5200
▶ www.beckhoff.com/tf5262
▶ www.beckhoff.com/tf5263
▶ www.beckhoff.com/tf5291
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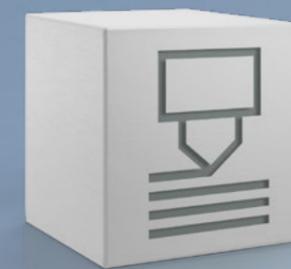
New Automation Technology

Beckhoff implements open automation systems using proven PC-based control technology. The main areas that the product range covers are industrial PCs, I/O and fieldbus components, drive technology, automation software, control cabinet-free automation, and hardware for machine vision. Product ranges that can be used as separate components or integrated into a complete and mutually compatible control system are available for all sectors. Our New Automation Technology stands for universal and industry-independent control and automation solutions that are used worldwide in a large variety of different applications, ranging from CNC-controlled machine tools to intelligent building control.

Since Beckhoff's foundation in 1980, the development of innovative products and solutions on the basis of PC-based control technology has been the foundation of the company's continued success. We recognized many standards in automation technology that are taken for granted today at an early stage and successfully introduced to the market as innovations. Beckhoff's philosophy of PC-based control as well as the invention of the Lightbus system and TwinCAT automation software are milestones in automation technology and have proven themselves as powerful alternatives to traditional control technology. EtherCAT, the real-time Ethernet solution, provides a powerful and future-oriented technology for a new generation of control concepts.

Beckhoff Automation at a glance
- 2024 global sales: €1.17 billion
- Headquarters: Verl, Germany
- Managing owner: Hans Beckhoff
- Employees worldwide: 5,300 (March 2025)
- Engineers: 2,000
- Subsidiaries/representative offices worldwide: 41
- Sales offices in Germany: 23
- Representatives worldwide: > 75

Beckhoff Automation
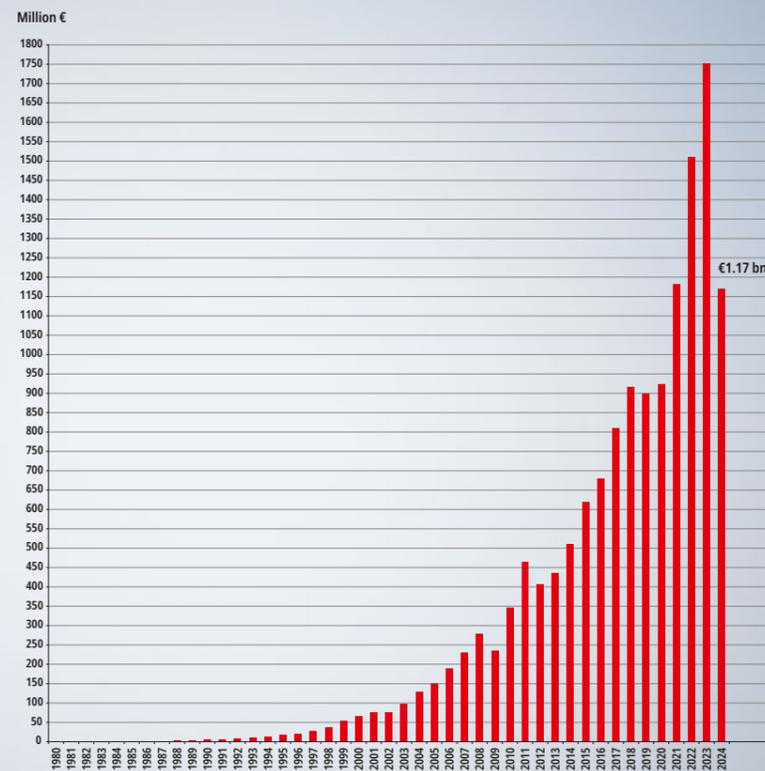
Sales from 1980 through 2024.
Status: March 2025

Worldwide presence on all continents
The corporate headquarters of Beckhoff Automation GmbH & Co. KG in Verl, Germany, is the site of the central departments such as development, production, administration, sales, marketing, support and service. Beckhoff's presence in the international market is guaranteed by its subsidiaries. Beckhoff is represented in more than 75 countries by worldwide cooperation partners.

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More about Beckhoff

Company

Global presence

Events & dates

Jobs

Products

Industries

Support

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