

BECKHOFF New Automation Technology

The New Automation Technology Advantage



New Automation Technology

Beckhoff implements open automation systems based on PC Control technology. The product range covers Industrial PCs, I/O and Fieldbus Components, Drive Technology and automation software as well as control cabinet-free automation. 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.

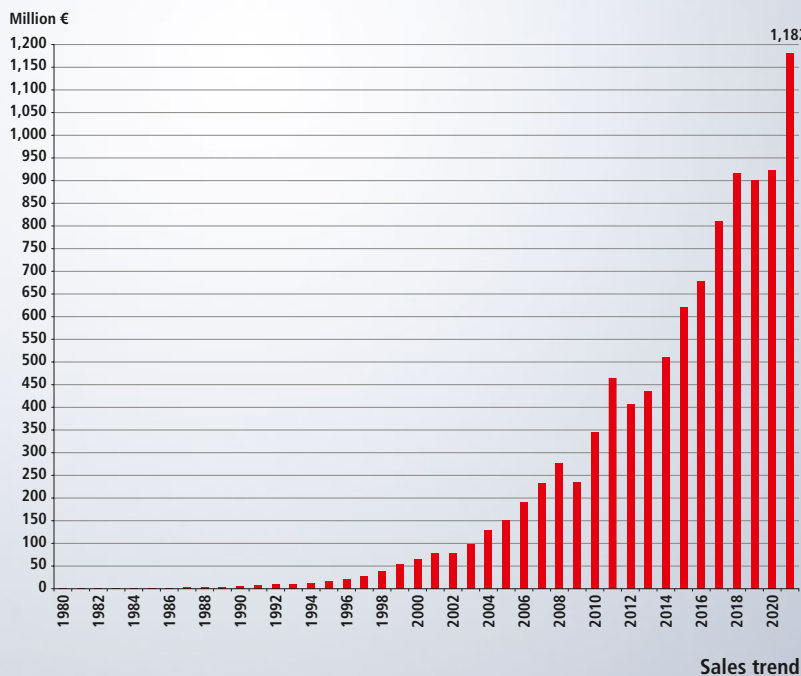
The central divisions of Beckhoff, such as development, production, administration, distribution, marketing, support and service are located at the Beckhoff Automation GmbH & Co. KG headquarters in Verl, Germany. Rapidly growing presence in the international market is taking place through subsidiaries and branch offices. Through worldwide co-operation with partners, Beckhoff is represented in more than 75 countries.

PC-based control technology

Since the foundation of the company in 1980, continuous development of innovative products and solutions using PC-based control technology has been the basis for the continued success of Beckhoff. Many automation technology standards that are taken for granted today were conceptualized by Beckhoff at an early stage and successfully introduced to the market.



The Beckhoff PC Control philosophy and the invention of the Lightbus system, the Bus Terminals and TwinCAT automation software represent milestones in automation technology and have become accepted as high-performance alternatives to traditional control technology. EtherCAT, the real-time Ethernet solution, makes forward-looking, high-performance technology available for a new generation of leading edge control concepts.



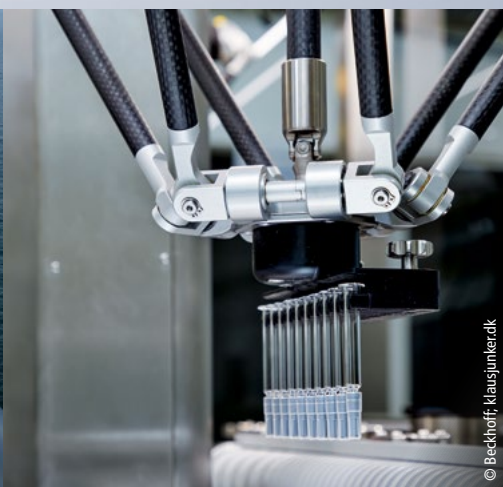
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- Beckhoff implements open PC-based automation systems.
 - Development and production "Made in Germany" quality assurance
 - 2021 global sales: €1.182 billion (+28 %)
 - Employees worldwide: 5,000
 - Engineers: 1,900
 - Subsidiaries/representative offices worldwide: 40
 - Sales offices Germany: 24
 - Distributors worldwide: > 75
- (as of 03/2022)

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

Multi-touch Panel PCs

- large model variety
- high computing power
- display sizes from 7-inch to 24-inch
- easy installation in control cabinets or on mounting arms
- special versions for explosion protection
- customer-specific implementations

► www.beckhoff.com/multi-touch

Multi-touch Control Panels

- large model variety
- display sizes from 7-inch to 24-inch
- landscape and portrait orientation
- easy installation in control cabinets or on mounting arms
- special versions for explosion protection
- customer-specific implementations

► www.beckhoff.com/multi-touch

Single-touch Panels

- Control Panels or Panel PCs
- display sizes from 5.7-inch to 19-inch
- easy installation in control cabinets or on mounting arms
- customer-specific implementations

► www.beckhoff.com/single-touch





Ultra-compact Industrial PC in IP65/67

PCs

- high computing power
- industrial-strength housing designs
- easy installation
- high flexibility in terms of display connections

Embedded PCs

- scalable performance range
- up to 12 cores
- compact design
- direct I/O interface
- modular extension options
- DIN rail mounting

► www.beckhoff.com/pc

► www.beckhoff.com/embedded-pc



- 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 Core™ i7 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.

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

EtherCAT Plug-in Modules

- very compact EtherCAT I/O system in IP20 for plug-in into a circuit board (signal distribution board)
- optimized for high-volume production
- application-specific connector interface
- Use of cable harnesses avoids wiring errors.

► www.beckhoff.com/ethercat-plug-in-modules

Bus Terminals

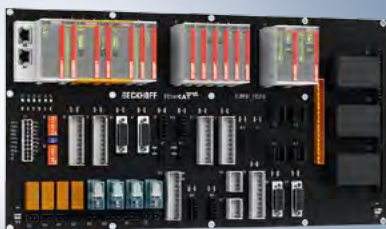
- open, fieldbus-neutral IP20 I/O system
- more than 400 different Bus Terminals
- support for more than 20 fieldbus systems
- gateways for subordinate bus systems
- system-integrated safety I/O terminals available

► www.beckhoff.com/busterminal

Fieldbus Box

- open, fieldbus-neutral IP67 I/O system
- 8 fieldbus systems, 24 signal types
- compact and robust
- can be mounted directly on machines, outside of control cabinets and terminal boxes while reducing machine footprint
- IO-Link box modules for inexpensive point-to-point connections

► www.beckhoff.com/fieldbusbox



EtherCAT Terminals

- IP20 EtherCAT I/O system
- real-time Ethernet performance retained into each terminal
- standard digital and analog signals
- complex automation functions directly in the terminal system
- highly precise measurement technology
- condition monitoring
- drive technology, also in a robust metal housing
- process technology
- electronic overcurrent protection
- gateways for subordinate fieldbus systems
- TwinSAFE PLC and safety I/Os



► www.beckhoff.com/ethercat-terminal



EtherCAT Box

- IP67 EtherCAT I/O system
- high performance for harsh environments
- compact and robust
- can be mounted directly on machines, outside of control cabinets and terminal boxes
- integrated sensor/actuator supply directly via EtherCAT P

► www.beckhoff.com/ethercat-box

Current transformers and power supplies

- for new installations and for retrofitting
- different designs and power classes
- high efficiency
- high reliability
- wide range input

► www.beckhoff.com/sct
 ► www.beckhoff.com/ps

Infrastructure Components

- PC cards for all common fieldbus systems
- Industrial Ethernet switches
- EtherCAT junctions and media converters in IP20 and IP67 ratings
- EtherCAT G/G10 components

► www.beckhoff.com/infrastructure-components



- 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
- Beckhoff is the I/O pioneer, developing the Bus Terminal concept and EtherCAT.

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

Servo Drives

- available as multi-axis system or stand-alone version (1-/2-channel)
- high-speed EtherCAT communication
- nominal current types, up to 170 A
- flexible motor type selection
- optimized for multi-axis applications
- 17 drive-integrated safety functions

► www.beckhoff.com/servo-drives

Distributed Servo Drive systems

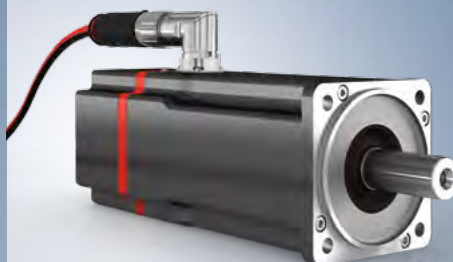
- servo drives directly integrated into the motor
- STO/SS1 safety function as standard; optionally Safe Motion
- minimal derating
- no changes in machine design required

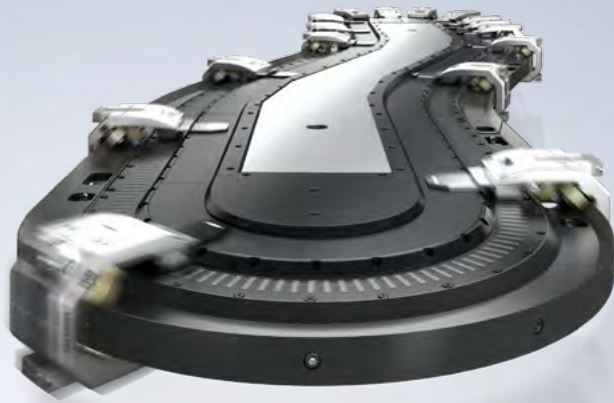
► www.beckhoff.com/distributed-servo-drive-system

Rotary servomotors

- for demanding positioning tasks
- highly dynamic behavior
- brushless three-phase motors
- permanent magnet in the rotor
- 24 bit encoder with SIL 2 safety integration

► www.beckhoff.com/rotary-servomotors





Linear product transport

- linear motor on an endless path
- replaces traditional mechanics with advanced mechatronic solutions
- software-based functional changes
- individual product transport with continuous material flow

► www.beckhoff.com/xts

Planar motor system

- free-floating movers for non-contact movement
- 6 degrees of freedom
- integrated position feedback
- individual machine layout
- ideal for all application areas

► www.beckhoff.com/xplanar



XPlanar®

Translatory servomotors

- direct drives for highly dynamic and maximum accurate positioning applications
- maximum speed up to 12 m/s
- compact product design with peak forces up to 12,500 N
- versatile and modular product concepts

► www.beckhoff.com/translatory-servomotors

Compact drive technology

- high performance in small design
- motors and output stages for the < 48 V DC low voltage range
- servo, BLDC, stepper and DC motor output stages in IP20 or IP67
- smart servo drive with integrated output stage for machines without control cabinets

► www.beckhoff.com/compact-drive-technology



- 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.

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 engineering

- integration into Microsoft Visual Studio®
- wide selection of programming languages: IEC 61131-3, C/C++, MATLAB®/Simulink®, Safety C/FBD
- modular software development
- automatic code generation interface
- link to source code control systems

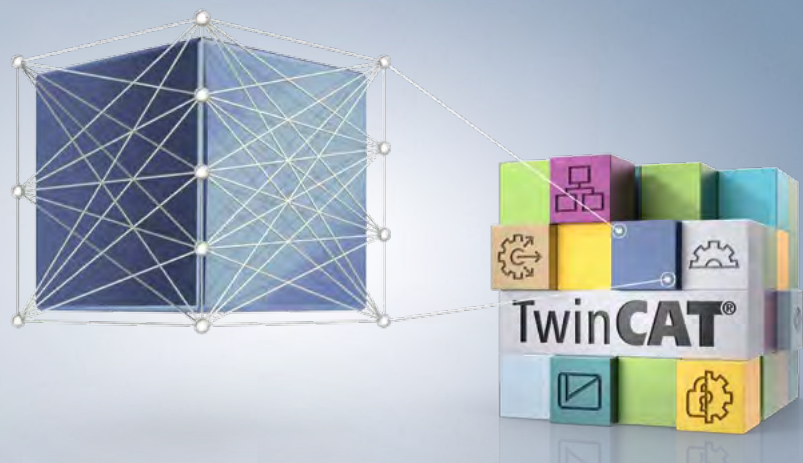
High performance

- cycle times from 50 µs
- multi-core support
- support of 32-bit and 64-bit operating systems
- pre-emptive multitasking

Connectivity

- useable with all fieldbus systems
- open and expandable for IT trends – today and tomorrow
- adheres to industry-specific and standard protocols
- ideal for IoT and cloud computing applications

► www.beckhoff.com/twincat





TwinCAT 3

- one software platform for engineering and runtime
- integrated real-time support
- software modules for PLC, NC, CNC, robotics, HMI, measurement technology, analytics, safety, machine vision, machine learning

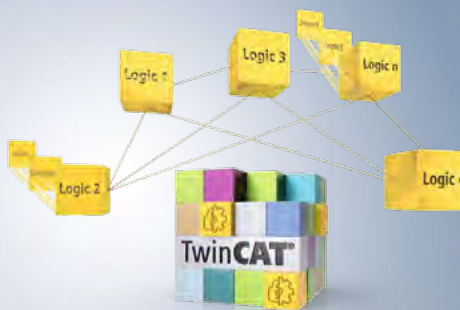
TwinCAT 2

- open, compatible PC hardware
- embedded IEC 61131-3 software PLC, software NC and software CNC
- connection to all common fieldbuses

TwinSAFE

- integrated safety system from I/Os to drives
- compact safety PLC
- certified for solutions up to IEC 61508 SIL 3 and DIN EN ISO 13849-1:2008 PL e
- safety engineering integrated into TwinCAT 3

► www.beckhoff.com/twinsafe



- 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.

For the Beckhoff main catalogs, our company magazine PC Control as well as product, technology and industry brochures please see here:

- ▶ www.beckhoff.com/media
- ▶ www.pc-control.net



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