

BECKHOFF New Automation Technology

The New Automation Technology Advantage



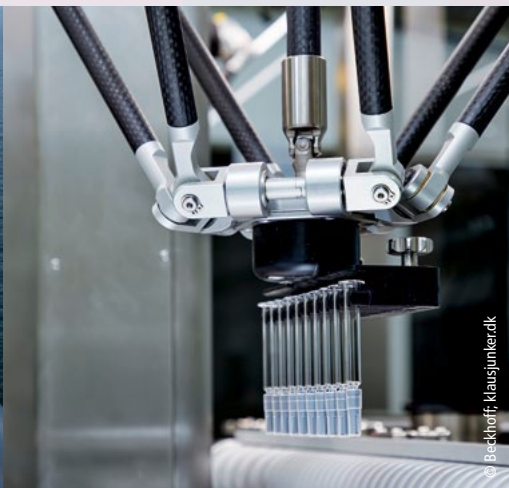
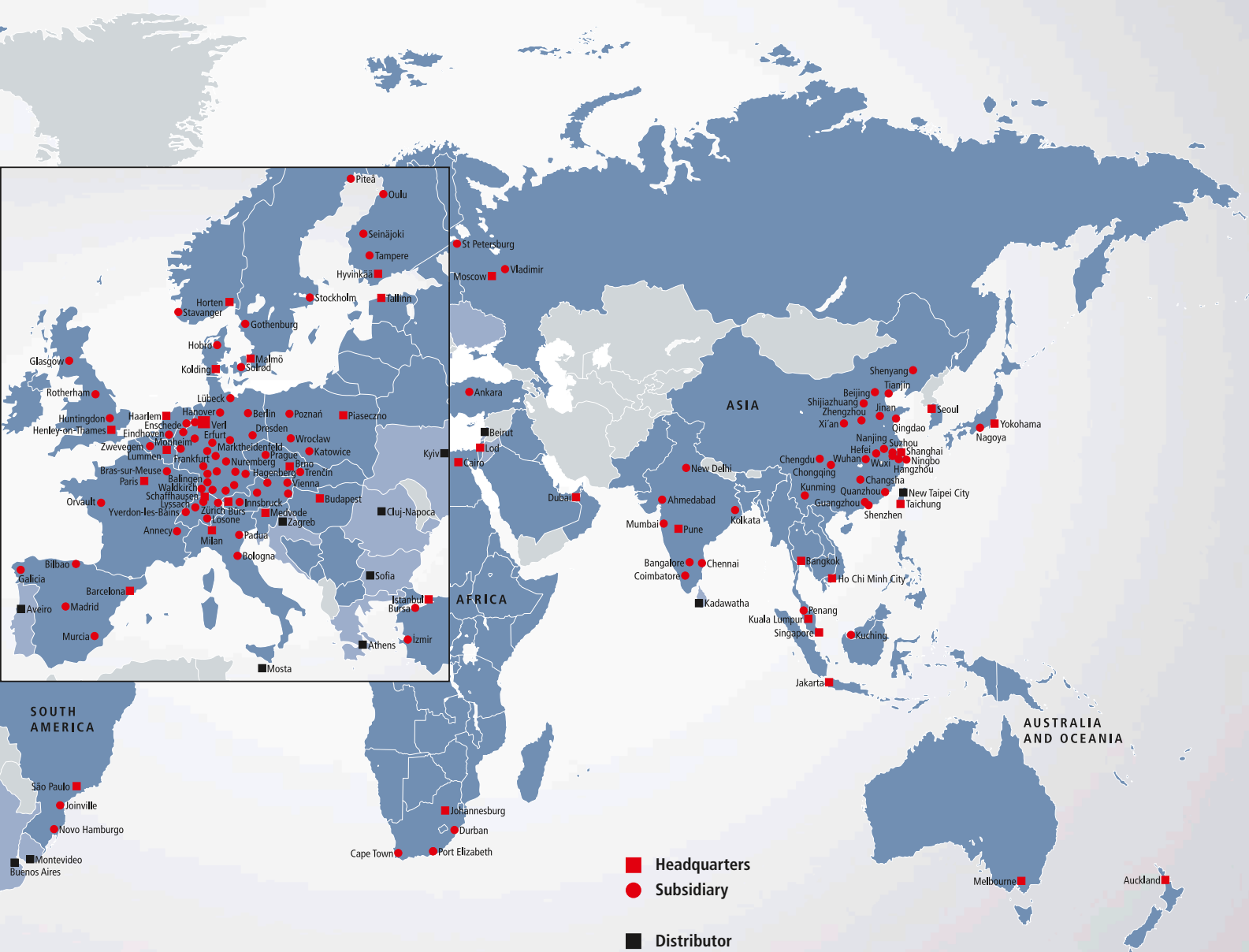
New Automation Technology

Following the company's establishment in 1980, Beckhoff pioneered a control principle that has since defined many of the established standards in automation technology such as PC-based control. The core idea is simple – bundling all automation processes on one CPU, with one universal software platform and one control system. The effect: a seamlessly integrated control platform that enables new application opportunities, thanks to the optimised utilization of increasingly powerful, standard hardware. In addition, users enjoy significant efficiency improvements and a competitive edge gained through their partnership with Beckhoff.

The success of the PC-based control philosophy speaks for itself: Today Beckhoff is represented in more than 75 countries. The company provides a product portfolio that covers all areas of PC-based control technology, and can be scaled to answer all engineering requirements from simple to complex: IPC, I/O, Motion, and Automation software.

► www.beckhoff.com





- Beckhoff implements open PC-based automation systems.
 - Development and production "Made in Germany" quality assurance
 - 2020 Sales: 923 million € (+2 %)
 - Staff worldwide: 4,500
 - Engineers: 1,900
 - Subsidiaries/Branch Offices worldwide: 39
 - Sales Offices Germany: 22
 - Distributors worldwide: >75
- (as of 04/2021)

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 PCs

PCs

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

► www.beckhoff.com/pc

Embedded PCs

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

► 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 IP 20 protection and Fieldbus Box modules in IP 67, 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 Box

- IP 67 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

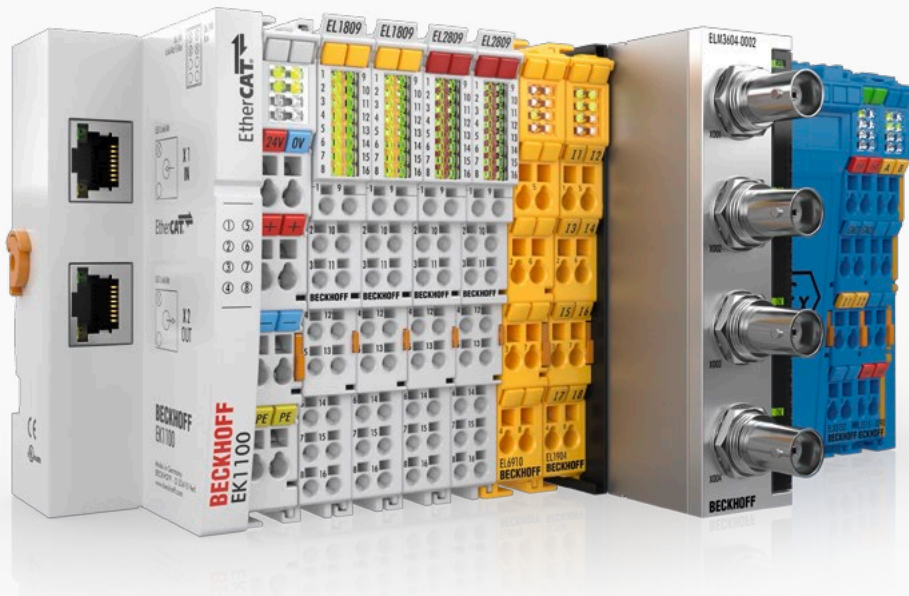
EtherCAT Plug-in Modules

- very compact EtherCAT I/O system in IP 20 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 IP 20 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





EtherCAT Terminals

- IP 20 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
- process technology
- electronic overcurrent protection
- gateways for subordinate fieldbus systems
- TwinSAFE PLC and safety I/Os

► www.beckhoff.com/ethercat-terminal

Fieldbus Box

- open, fieldbus-neutral IP 67 I/O system
 - 12 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

Infrastructure Components

- PC cards for all common fieldbus systems
 - Industrial Ethernet switches
 - EtherCAT junctions and media converters in IP 20 and IP 67 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 system

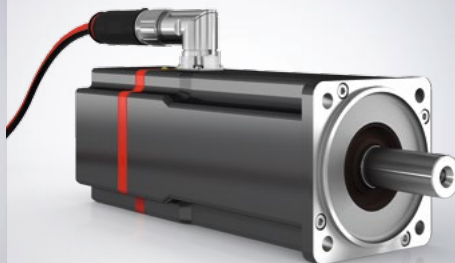
- servo drives directly integrated into the motor
- STO/SS1 safety function as standard; optionally Safe Motion
- minimal derating
- no changes in machine design required

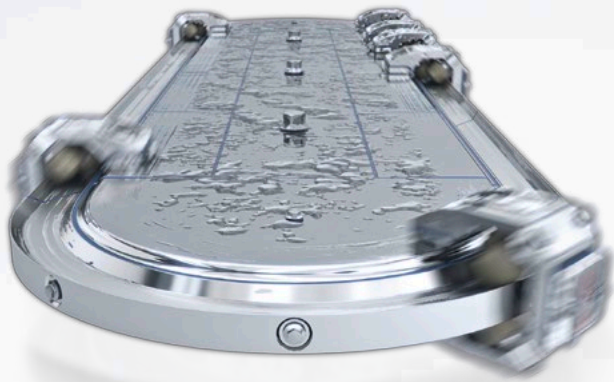
► www.beckhoff.com/distributed-servo-drive-system

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 12500 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 IP 20 or IP 67
- 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

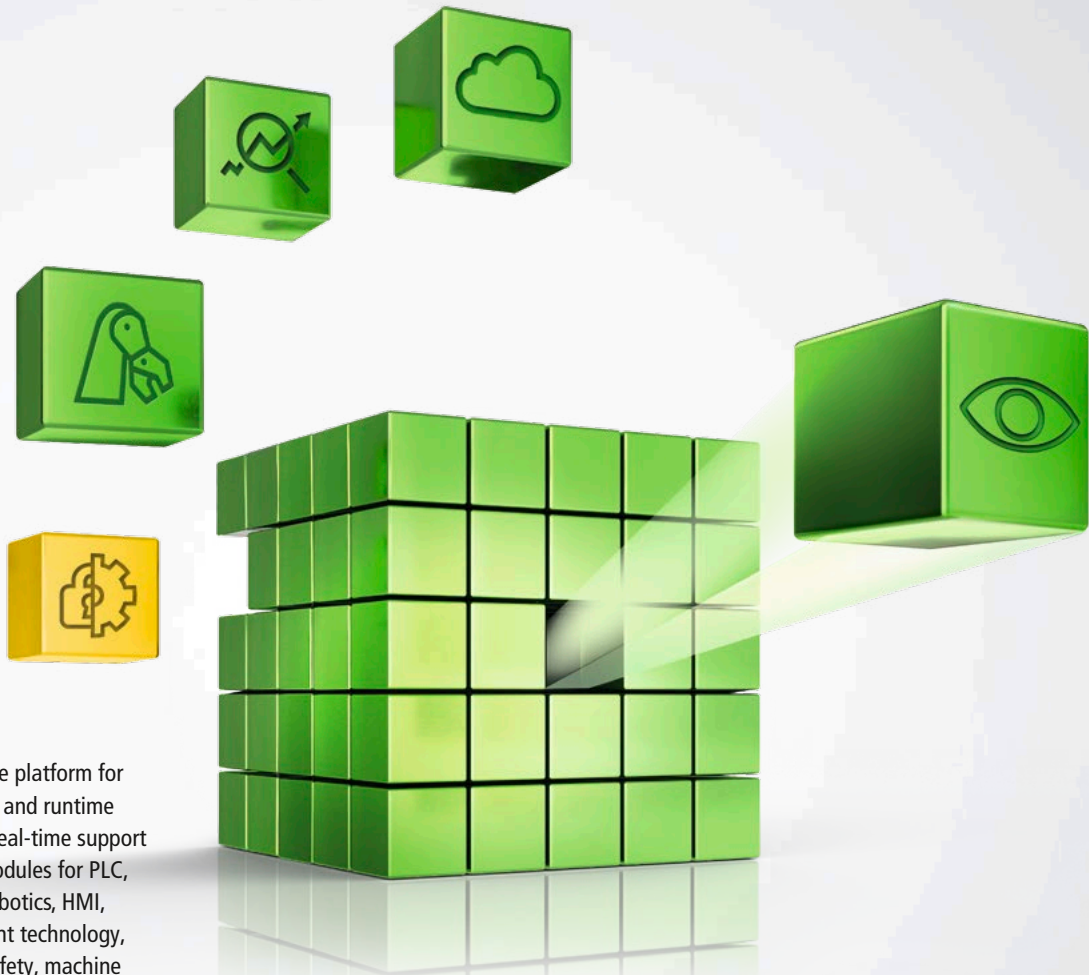
- cycle times from 50 μ s
- multi-core support
- support of 32-bit and 64-bit operating systems
- pre-emptive multitasking

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

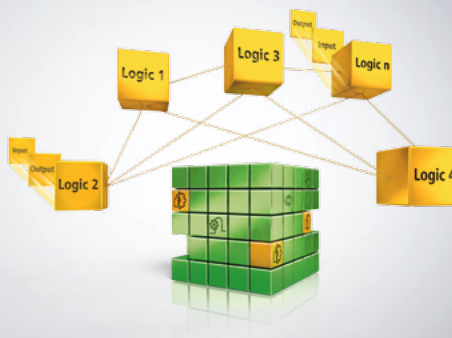
TwinCAT 2

- 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

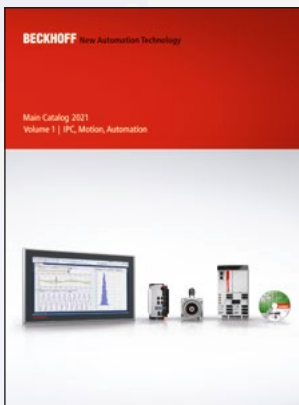
► www.beckhoff.com/twinsafe



- 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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