High-performance, sturdy, flexible: the C7015 ultra-compact Industrial PC in an IP 65/67 version
Ultra-compact Industrial PC for direct machine integration in IP 65/67

The C7015 is an inexpensive but powerful IP 65/67 device for direct mounting on the machine. In keeping with the current trend, this space-saving universally mountable Industrial PC hardware is perfectly suited to modern Industrie 4.0 concepts. A wide variety of on-board interfaces enables the networking of machine or plant sections in the cloud or other networks. Moreover, the integrated EtherCAT P connection offers undreamt-of possibilities for the direct connection of actuators and sensors via EtherCAT P Box modules with IP 67 protection. The decentralized solving of complex diagnostic or condition monitoring tasks is thus possible. The Beckhoff module motherboard and the housing combination of die-cast zinc and aluminum have been developed in typical Beckhoff style for industrial suitability, long-term availability and reliability. Despite passive cooling, the C7015 is suitable for a temperature range up to +50 °C. On account of its wide variety of interfaces (3 x LAN, 2 x USB, mini DisplayPort), 40 GB M.2 SSD with 3D Flash and integrated Intel Atom® CPU (quad-core at most) with universal multi-core support for TwinCAT 3, the sturdy Industrial PC can be used for simultaneous, high-performance automation, visualization and communication: from the classic machine controller to modern Industrie 4.0 concepts as an edge device.

www.beckhoff.com/C7015

For availability status of the new products see Beckhoff website at: www.beckhoff.com
Measuring just 82 x 127 x 50 mm and combining high computing performance with a fanless design, the new C6025 Industrial PC is an ideal choice for demanding control applications where green, sustainable IT is also a requirement. It is built around the Intel® Core™ i U processors that deliver Core™ i performance capabilities yet consume significantly less power than other processors of the same series. The 8th generation Intel® Core™ i U processors used in the C6025 also offer an advantage which is typical of evolving PC technology: higher performance at the same price point. Thanks to extensive interfaces (3 x LAN, 4 x USB, DisplayPort) the C6025 is suitable for complex automation and communication tasks. With this new addition, the Beckhoff portfolio of industry-ready and long-term available Industrial PCs now spans five CPU performance classes – from ARM through to Intel® Xeon® – for maximum scalability.

- www.beckhoff.com/C60xx
- www.beckhoff.com/C6025

We reserve the right to make technical changes.
An alternative operating system – TwinCAT/BSD – is available for selected Beckhoff Industrial PC platforms. TwinCAT/BSD combines the TwinCAT 3 runtime XAR with FreeBSD, an industrially tested and reliable open source operating system. In addition to multi-core support and a small footprint, TwinCAT/BSD with the Beckhoff Package Server offers a simple option for installing TwinCAT functions and FreeBSD applications or updating the entire system. TwinCAT/BSD supports all TwinCAT functions and additionally enables the use of the modern HTML5-based TwinCAT HMI. The engineering is still carried out with the familiar Microsoft Visual Studio®-based TwinCAT XAE from a Windows development computer. Many well-known Linux programs can also be used with TwinCAT/BSD.

www.beckhoff.com/TwinCAT-BSD

**New high-performance processors for the CX20xx series**

The CX2033 has an AMD Ryzen™ V1202B CPU with 2.3 GHz and 2 cores, while the CX2043 has an AMD Ryzen™ V1807B CPU with 3.35 GHz and 4 cores. In the case of the CX2033 the controller is fanless and has no rotating components. Due to its high power, the CX2043 has a fan with ball bearings and speed monitoring. The AMD Ryzen™ processors combine support for 32-bit and 64-bit operating systems with excellent real-time performance. It is possible to run the many new 64-bit applications yet continue to support existing 32-bit applications and give them a performance boost in the process.

www.beckhoff.com/CX2033
www.beckhoff.com/CX2043
New generation of Industrial PCs with up to 8 processor cores, 128 GB RAM and high-performance SSDs

With the processors Intel® Celeron® G4900 3.1 GHz and Pentium® Gold G5400 3.7 GHz of the 8th generation, high-performance dual-core processors are becoming available for Industrial PCs. In addition, Intel® Core™ processors of the 9th generation with 8 cores are available.

The key benefits:
- basic configuration with Intel® Celeron® G4900 with 3.1 GHz and 4 GB DDR4 RAM
- Intel® Core™ processors of the 9th generation with up to 8 cores
- clock rates between 1.8 and 2.2 GHz for PCs with 3½-inch motherboard and up to 3.1 GHz for ATX motherboard and ultra-compact PCs
- up to 128 GB DDR4 RAM with ATX motherboard
- up to 64 GB DDR4 RAM for ultra-compact PCs and PCs with 3½-inch motherboard
- NVM Express™ SSD for ultra-compact PCs C603x-0070, five times faster than SATA SSDs
- NVM Express™ SSD plug-in card for PCs with ATX motherboard, five times faster than SATA SSDs

www.beckhoff.com/IPC

We reserve the right to make technical changes.
Current transformers (CT) for energy measurement

ELM2742, ELM2744 | Multiplexer, 1 x 4 solid-state relays 48 V AC/DC, 1 A, potential-free make contact

With the ELM274x terminals several sensors or sources can now be connected at the same time to one analog input channel. To this end, the ELM2742 and ELM2744 are equipped with non-wearing solid-state relays (semiconductor switches) as switching elements, which are specially designed for small analog signals. The multi-channel recording of analog signals as well as the flexible switching of various test states is thus simple to achieve without externally connected switches.

www.beckhoff.com/ELM2742
www.beckhoff.com/ELM2744
With the SCT current transformers, Beckhoff completes the energy measurement chain from recording the physical measured value to data transmission in the cloud. The portfolio of the new current transformers covers all relevant applications: for currents from 1 to 5000 A and with versions as ring-type current transformers for new installations or split-core current transformers for flexible retrofitting.

The SCT current transformers offer the possibility of implementing reliable power sensors directly in the field as an integral component of PC-based control technology. Two concepts can be selected, each highly scalable via different designs and performance classes and therefore suitable for a wide variety of applications. The SCT series is extremely diverse, ranging from cost-effective 3-phase transformer sets for building technology to standard industrial transformers for mechanical engineering and solutions for test benches with particularly high accuracy requirements.

www.beckhoff.com/SCTxxxx
**EPP6090 | EtherCAT P display box with navigation switch and operating hours counter**

The EPP6090 display box has an illuminated, low-reflection LC display that displays variable machine data such as status and diagnostic information directly on the box. The two-line display with 16 characters each is freely programmable and automatically switches to scrolling text mode if required.

- display of defined special characters
- resettable time measurement/counter
- non-resettable operating hours counter
- manual/automatic storage intervals

[www.beckhoff.com/EPP6090](http://www.beckhoff.com/EPP6090)

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**EP7402-0057 | 2-channel motor controller box for roller conveyor systems**

The EP7402-0057 EtherCAT Box offers two outputs with integrated controller for the direct connection of 24 V DC conveyor roller motors with max. 3.0 A. Eight additional digital inputs/outputs enable connection of e.g. photoelectric switches and communication between the box modules in operation without PLC. The EP7402-0057 takes over the complete control of a roller motor independently of the manufacturer of conveyor or motor. Maximum rated current, acceleration or deceleration ramps and various other parameters can be configured and allow for a wide range of adaptations to different applications.

Highly dynamic linear servomotors – Made in Germany

The new AL8000 linear motor series offers high peak forces in the smallest of mounting spaces. This is made possible by an optimized product design and a modular coil concept. Especially the modular concept offers great flexibility and adaptability to individual application requirements. The motors made in Germany are characterized by durability and high reliability. Another advantage of the series is a joint cable for the power supply and the temperature contact. This leads not only to reduced material costs, but also to significant time savings for assembly and commissioning.

The new linear motors are fully integrated into the drive system: smooth, continuous support from the component design in the Motion Designer through to commissioning with the Drive Manager 2. The product characteristics of the motors are ideally matched to the AX8000 multi-axis servo system and the AX5000 Digital Compact Servo Drive.

The linear motor assembly kit consists of two components: the linear motor (primary part) and the magnetic plate (secondary part).

- three different overall widths
- developed and produced by the company made in Germany
- high peak forces in the range of 120…6750 N in the smallest of installation spaces
- water cooling optionally

> www.beckhoff.com/AL8000

We reserve the right to make technical changes.
Compact integrated servo drive

AT2000-0233 | Motor module for L-, U-, O- and Z-shaped geometries

The construction kit of the XTS linear transport system contains a new motor module that extends the application possibilities. Due to its shortened design, the available mounting space can be utilized more efficiently and additional geometries can be realized. Through the combination of different radii (22.5°, -22.5°, 45° and 180°) and straights it is possible to optimally adapt the travel path to suit the application. With the new 233 mm short motor modules, the already familiar track layouts can be extended with regard to both the application and the available mounting space. L-, U-, O- and Z-shaped track layouts are now possible.

www.beckhoff.com/XTS

Product announcement
For availability status of the new products see Beckhoff website at: www.beckhoff.com
The integrated AMI812x servo drive combines servomotor, output stage and fieldbus connection in a space-saving design and supports the principle of machines without control cabinets in an unparalleled way. The bundling of the individual components results in a connection level with all interfaces directly on the servo drive, eliminating the need for a separate I/O level.

In combination with a suitable mechanism such as a spindle axis or a linear motor, the XTS Track Management software function enables the direct mechanical movement of XTS track sections. Movers on the track sections can now switch between different XTS systems. For mobile track sections, an air gap is necessary on both sides between the mobile and immobile track sections. A 1 mm shorter motor module with power supply is available especially for this use case. The connector of the motor module is implemented as a rotatable B23 ENP connector. In keeping with the One Cable Automation concept, it combines the communication and energy supply of the motor module in just one cable. For the connection between the motor module and the control cabinet, Beckhoff’s extensive range of accessories includes a choice of different drag-chain-suitable cables to match the connector.

**Connections of the AMI812x**
- M12-Powerinterface for electronic and performance
- M8 bus interface for EtherCAT for simple cascading of the topology
- M8 I/O interface for direct connection of two sensors or actuators

[www.beckhoff.com/AMI81xx](http://www.beckhoff.com/AMI81xx)

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**AT2002-0249, AT2002-0250 | Motor module with plug-in power supply**

In combination with a suitable mechanism such as a spindle axis or a linear motor, the XTS Track Management software function enables the direct mechanical movement of XTS track sections. Movers on the track sections can now switch between different XTS systems.

For mobile track sections, an air gap is necessary on both sides between the mobile and immobile track sections. A 1 mm shorter motor module with power supply is available especially for this use case. The connector of the motor module is implemented as a rotatable B23 ENP connector. In keeping with the One Cable Automation concept, it combines the communication and energy supply of the motor module in just one cable. For the connection between the motor module and the control cabinet, Beckhoff’s extensive range of accessories includes a choice of different drag-chain-suitable cables to match the connector.

[www.beckhoff.com/XTS](http://www.beckhoff.com/XTS)

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We reserve the right to make technical changes.
Easy to configure: the TwinCAT 3 Lighting Solution for DALI 2

With the Lighting Solution, Beckhoff presents a lighting control solution that is easy to configure via web and Excel and simplifies all work steps from engineering to maintenance. All typical lighting controls are integrated, and the number of DALI lines is unlimited. The Lighting Solution is fully web- and HTML-capable, decentrally scalable and can be operated directly via panels. Fast functional changes, address changes, systems expansions or cross-DALI line groupings can be carried out without operating interruptions. Daylight-dependent human centric lighting concepts can also be implemented.

▶ www.beckhoff.com/TF8050
TwinCAT Analytics
One-Click Dashboard

The TwinCAT Analytics product family describes a complete workflow from the acquisition of data to its communication and historization to its analysis and visualization in web-based dashboards. The new One-Click Dashboard feature increases engineering efficiency by automatically generating the web-based analysis interface.

www.beckhoff.com/Analytics

Seamless integration of NI™ hardware and software in Beckhoff’s open control technology

The TwinCAT Engineering TE3700 Beckhoff I/O VIs for LabVIEW™ provides usable VIs in LabVIEW™ that enable the convenient configuration of Beckhoff EtherCAT terminals on the LabVIEW™ EtherCAT master. The TwinCAT 3 function TF3710 Interface for LabVIEW™ provides VIs for LabVIEW™ that enable ADS communication to TwinCAT 3 and TwinCAT 2 runtimes. In addition, a VI is included for the temporal synchronization of LabVIEW™ and TwinCAT via the NTP protocol.

www.beckhoff.com/TE3700
www.beckhoff.com/TF3710

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We reserve the right to make technical changes.
TwinCAT Machine Learning:
Scalable, open and in real time

Machine learning for all areas of automation
Beckhoff now offers a machine learning (ML) solution that is seamlessly integrated into TwinCAT 3. Building on established standards, it brings to ML applications the advantages of system openness familiar from PC-based control. In addition, the TwinCAT solution supports machine learning in real time, allowing it to handle demanding tasks like complex motion control. Its capabilities provide machine builders with an optimum foundation for enhancing machine performance.

The fundamental idea with machine learning is to no longer follow the classic engineering route of designing solutions for specific tasks and then turning these solutions into algorithms, but to enable the desired algorithms to be learned from model process data instead. For data collection, various proven TwinCAT products are available such as e.g. TC3 Database Server TF6420 or TC3 Scope Server TF3300. Training is performed in established frameworks such as MATLAB®, TensorFlow, PyTorch, Scikit-learn, a.o. A trained model can be easily imported into the TwinCAT runtime in a standardized format (ONNX).

In automation technology, this opens up new possibilities as well as optimization potential in such areas as predictive maintenance and process control, anomaly detection, collaborative robotics, automated quality control, and machine optimization.

> www.beckhoff.com/machine-learning

For availability status of the new products see Beckhoff website at: www.beckhoff.com
TwinCAT Cloud Engineering: for all instances and controls

PC-based control offers a central, open and comprehensive machine control platform ideal for delivering highly efficient, IoT-based automation strategies. It enables machines, plants and production lines to be connected in ways that unlock their full efficiency potential across entire processes. In this context, TwinCAT Cloud Engineering adds a new dimension by providing users with an easy means of engineering TwinCAT instances and controllers in the cloud.

The key benefits of TwinCAT Cloud Engineering:
- instantiation and operation as a virtual machine in the cloud
- direct access through the Beckhoff website
- simple, secure access to control hardware
- all the benefits of the TwinCAT architecture
- simplified collaboration
- a choice of user models

www.beckhoff.com/cloud-engineering