

# BECKHOFF New Automation Technology

News | 01'2017



# NEWS



## **i** C5240 | 19-inch slide-in Industrial PC

The C5240 Industrial PC expands the C52xx Industrial PC series by a variant with four height units and a large number of PCI and PCIe plug-in card slots in 24 V DC or 100 to 240 V AC versions. It is designed for installation in a 19-inch rack and is equipped with components of the highest performance class according to the ATX standard. A Beckhoff Industrial Motherboard is used with Intel® Celeron®, Pentium®, Core™ i3, i5 or i7 processors of the sixth generation. The C5240 is ideally suited for use in machine and plant engineering, for example with TwinCAT automation software running on Windows 7 Professional, Windows 7 Ultimate, Windows Embedded Standard 7 or Windows 10 IoT Enterprise.

► [www.beckhoff.com/C5240](http://www.beckhoff.com/C5240)



## News | Industrial PC

### **i** CP6906-0001-0000 | “Economy” built-in Control Panel with DVI/USB Extended interface



The CP6906 “Economy” Control Panel expands the IPC entry-level class by a built-in Control Panel with DVI/USB extended interface. The panel is designed for installation in the front of a control cabinet and has a 7-inch touch screen display. Ideally combined with the compact Embedded PCs from the CX series or the C6xxx Industrial PCs, this results in an inexpensive PC/panel system. The CP6906 is supplied with a 24 V power supply. The integrated DVI/USB Extended technology enables remote panel operation at a distance of up to 50 m from the PC.

► [www.beckhoff.com/CP6906](http://www.beckhoff.com/CP6906)

## **i** C6015 | Ultra compact IPC



The demands of automation technology on Industrial PC hardware are varied and nowadays extend beyond classic automation functions such as e.g. powerful CPUs and EtherCAT compatibility. Advanced Industrie 4.0 concepts additionally demand space-saving Industrial PC solutions, which are extremely flexible to install coupled with competitive prices.

With the C6015 "Economy" Industrial PC for control cabinet installation, Beckhoff is extending its existing range of entry-level products by the currently most compact Industrial PC. Besides an excellent price-performance ratio, the IPC offers all common industry standard features such as a high temperature range, EtherCAT compatibility and high resistance to vibration and shocks. Equipped with an integrated Intel® Atom™ CPU with up to four cores, it provides high performance reserves. Only processors from the Embedded line with long-term availability are used in the C6015 series, ensuring a future-proof investment for the user. Both the new module motherboard and the combined die-cast zinc and aluminium housing have been newly developed to ensure the high quality Beckhoff is well-known for, such as industrial compatibility, reliability and products made in Germany.

With universal multi-core support, the C6015 can be used simultaneously for high-performance

automation, visualisation and communication applications. Its flexible installation options with virtually free orientation of the PC allow various installation scenarios, even in the tightest of spaces. Despite passive cooling, the C6015 is suitable for a temperature range up to +55 °C. Moreover, with a mounting space of just 82 x 82 x 40 mm, it is more compact than the previous C6905 series IPCs by a factor of three. With 30 GB 3D MLC M.2 SSD storage and Windows Embedded Compact 7 operating system, it is fully operational in the basic configuration. Windows 7 or Windows 10 operating systems are optionally available.

TwinCAT 3, the latest version of the Beckhoff automation software that was specially developed for support of multi-core processors, can fully utilise the two-core and four-core processors of the new PC generation in the same way as TwinCAT 2 with its single-core support.

The C6015-0010 Industrial PC represents the most compact IPC entry-level class in the Beckhoff portfolio, and it is considerably less expensive than the currently most affordable Beckhoff x86 PC, enabling price-savings of 25 % or more (depending on the configuration).

► [www.beckhoff.com/C6015](http://www.beckhoff.com/C6015)



## **i** Faster processors for ATX Industrial PCs with 6<sup>th</sup>-generation Intel® Core™ i3, i5 and i7

The latest Intel® Celeron®, Pentium® and Core™ i3, i5, i7 processors of the 6<sup>th</sup> generation are now available for all ATX Industrial PCs. An Intel® Celeron® processor is used in the basic configuration of the PC, while the Intel® Pentium®, Core™ i3, i5 and i7 processors are available as options. The new processors enable up to 40 % higher computing power in the same housing. Computing powers of up to 3.7 GHz per core are thus available for the first time in the industrial environment. Users benefit either from high performance reserves they desire or in an increased performance of their existing application.

Windows 7 Professional, Ultimate and Embedded Standard in the 32-bit and 64-bit versions as well as Windows 10 IoT Enterprise LTSB in the 32-bit or 64-bit version are offered as operating systems.

Beckhoff uses exclusively processors from the Embedded line with long-term availability and is introducing them in all ATX Industrial PC series.

► [www.beckhoff.com/IPC](http://www.beckhoff.com/IPC)



## News | Industrial PC

## **i** 6<sup>th</sup>-generation Intel® Core™ i3, i5 and i7 also for Industrial PCs with 3½-inch motherboard

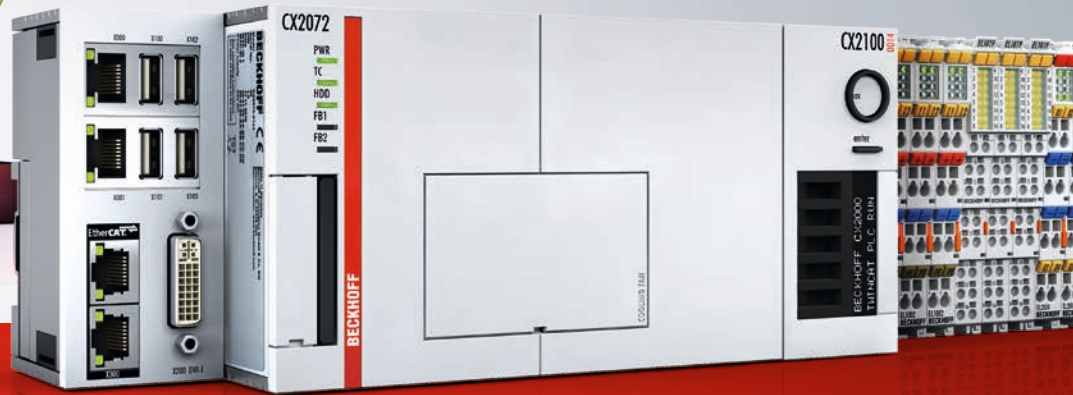
The Intel® Celeron®, Pentium® and Core™ i3, i5, i7 processors of the 6<sup>th</sup> generation are now also available for Industrial PCs with a 3½-inch motherboard. An Intel® Celeron® processor is used in the basic PC configuration, while the Intel® Pentium®, Core™ i3, i5 and i7 processors are available as options. Exactly like with 4<sup>th</sup>-generation processors, Windows 7 Professional, Ultimate and Embedded Standard as well as Windows 10 IoT Enterprise LTSB are offered as operating systems in the 32-bit and 64-bit versions for the 6<sup>th</sup>-generation processors. Beckhoff exclusively uses processors from the Embedded line providing long-term availability and is introducing them in all Industrial PC series with 3½-inch motherboards.



► [www.beckhoff.com/IPC](http://www.beckhoff.com/IPC)



## **i** Performance leap for Embedded PCs – 12 cores on the DIN rail



Providing multi-core performance on the DIN rail, the new Embedded PCs from the CX2000 series make very powerful industrial control systems possible.

The CX2042 has an Intel® Xeon® CPU with a clock rate of 1.3 GHz (four cores), the CX2062 an Intel® Xeon® CPU with a clock rate of 1.6 GHz (eight cores) and the CX2072 an Intel® Xeon® CPU with a clock rate of 1.5 GHz (12 cores). A fan with ball bearings and speed monitoring is integrated into all basic CPU modules. In addition to the CPU, the basic modules also contain the main memory with a size of 8 GB RAM, optionally available with up to 32 GB. The controller boots from a CFast flash memory card where both the operating system as well as user programs and data are stored.

The CPU has an internal 128 kB NOVRAM, which acts as a persistent data memory if no UPS is used.

Microsoft Windows 10 IoT Enterprise LTSB 64 bit is used as operating system.

The use of TwinCAT 3 allows automation tasks to be distributed across the various cores of the Intel® Xeon® CPU.

All system modules from the CX2000 series for left- or right-sided functional extensions can also be connected to the new Embedded PCs. Internally the modules are connected via PCI Express and can be plugged to the CPU in the field.

The power supply for the CPU module comes from a CX2100-0014 or CX2100-0914 power supply module. Up to two mass storage modules (either CX2550-0010 CFast modules or CX2550-0020 2½-inch SSD modules) can be plugged in between the power supply unit and the CPU, allowing the use of up to three mass storage devices in total.

► [www.beckhoff.com/CX2000](http://www.beckhoff.com/CX2000)



## i CX8190 | Embedded PC for Ethernet

The CX8190 is a controller with two Ethernet ports, one of which is switched to two RJ45 sockets. It supports protocols such as:

- real-time Ethernet
- ADS UDP/TCP
- EtherCAT Automation Protocol (EAP)

K-bus or E-bus terminals can be attached as required; the CX8190 automatically recognises the type of I/O system connected during the start-up phase. The control system is programmed with TwinCAT 3 via the fieldbus interface or the additional Ethernet interface.

► [www.beckhoff.com/CX8190](http://www.beckhoff.com/CX8190)

## News | Industrial PC

### CX2900-0107 | Device modification for fulfillment of ATEX Certification



With the optional CX2900-0107 device modification, the CX9020, CX5120, CX5130 and CX5140 Embedded PCs fulfill the ATEX Certification II 3 G Ex nA II T4 Gc and II 3 D Ex tc IIIC T135 °C Dc. The pre-mounted wire bow as well as the modification and repositioning of the device label enable usage of the Embedded PCs in hazardous areas of ATEX Zone 2.

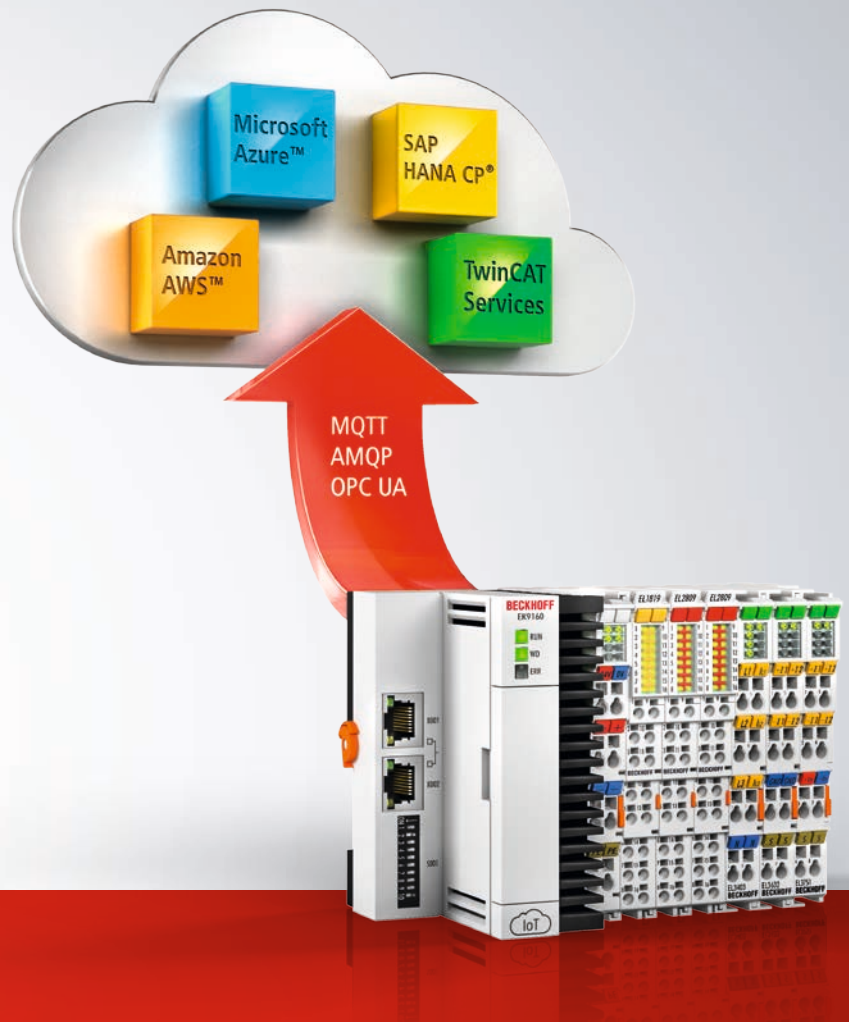
- [www.beckhoff.com/CX9020](http://www.beckhoff.com/CX9020)
- [www.beckhoff.com/CX51xx](http://www.beckhoff.com/CX51xx)



## **i** EK9160 | IoT Coupler

The EK9160 Coupler provides direct connectivity for EtherCAT I/Os to the Internet of Things (IoT) without the need for a control program. It converts the E-bus signal representation to different IoT communication protocols and enables in this way the simple and standardised integration of I/O data into cloud-based communication and data services. Neither a controller nor prior programming is necessary. The I/O data transmission can be parameterised in a user-friendly configuration dialog of the integrated web server providing access via any browser. The required cloud services and security functions (authentication, encryption, etc.) can also be conveniently configured using a browser. Following parameterisation, the coupler autonomously transmits the digital or analog I/O values to the cloud service, including timestamp. To safeguard against data loss in the event of network failures, a local buffer is available for the transmitted I/O data.

► [www.beckhoff.com/EK9160](http://www.beckhoff.com/EK9160)



## **i** Relay terminals for contact-protecting switching

The EL26x2-0010 (EtherCAT Terminals) and KL26x2-0010 (Bus Terminals) relay terminals are designed for soft switching at the zero voltage crossing to protect the contacts and are particularly suitable for capacitive loads such as LED lamps. They have two relays each of which has a single contact. The power contacts of the EL2622-0010 and KL2622-0010 are not looped through.

- [www.beckhoff.com/EL2602-0010](http://www.beckhoff.com/EL2602-0010)
- [www.beckhoff.com/EL2622-0010](http://www.beckhoff.com/EL2622-0010)
- [www.beckhoff.com/KL2602-0010](http://www.beckhoff.com/KL2602-0010)
- [www.beckhoff.com/KL2622-0010](http://www.beckhoff.com/KL2622-0010)



## **i** EL6861 | 1-channel BACnet MS/TP interface RS485, D-sub connection

The EL6861 serial interface enables the connection of BACnet MS/TP devices (Master-Slave/Token-Passing) via an RS485 interface. Up to 32 MS/TP devices (up to 64 if ultra-low power transceivers are used) can be connected. The EL6861 interface can only be used in combination with TwinCAT, since the BACnet MS/TP driver integrated in TwinCAT implements the communication via the MS/TP protocol (BACnet Revision 12). The configuration is also done in TwinCAT. The RS485 interface guarantees high immunity to interference through electrically isolated signal transmission. The EL6861 provides 1 x 5 V DC at 20 mA (electrically isolated, short-circuit-proof) from the E-bus supply for use with the bias resistors (network bias).

► [www.beckhoff.com/EL6861](http://www.beckhoff.com/EL6861)





## **i** EtherCAT measurement modules – extremely accurate, fast and robust

With the new device series for high-end measurement technology, ultra precise, fast and robust measurement modules will become an even more integrated part of PC-based control solutions. The new EtherCAT measurement modules can be directly integrated into the modular EtherCAT communication system and combined with the extensive portfolio of more than 500 other EtherCAT Terminals. New metal housings optimise shielding and cooling in measurement technology applications. At the same time, the durable housings provide enhanced flexibility at the interface level, such as for LEMO or BNC plug connectors or for push-in as a quickly customisable standard solution. Measurement accuracy of 100 ppm at 23 °C, precise synchronisation of < 1 µs, and the high sampling rate of up to 50,000 samples per second guarantee high-quality data acquisition.

### Reliable measurement technology meets industrial requirements:

- up to 50,000 samples per second
- measurement accuracy of 100 ppm at 23 °C
- metal housings for optimum heat dissipation
- extremely robust – ideal for harsh environments
- flexible connector front-end: LEMO, BNC, push-in
- pretreated in the factory for high-quality measurement results
- integrated connection and functional diagnostics
- optional factory calibration certificate

► [www.beckhoff.com/measurement-modules](http://www.beckhoff.com/measurement-modules)



Fast:

Basic models feature up to 50,000 samples per second with 24-bit resolution

Precise timing:

Exact  $< 1 \mu\text{s}$  synchronisation with EtherCAT distributed clocks, both internally and externally with a superordinate clock

Precise values:

Measurement accuracy of 100 ppm and better with high temperature stability, depending on the measurement range

Proactive:

Integrated connectivity and functional diagnostics ensure long-term operating reliability



#### EtherCAT measurement modules

- ELM3704, ELM3702 | Multi-functional input
- ELM3004, ELM3002 | Voltage measurement
- ELM3104, ELM3102 | Current measurement
- ELM3504, ELM3502 | Measuring bridge analysis
- ELM3604, ELM3602 | IEPE analysis



## **i** EL3783 | Power monitoring oversampling terminal for alternating voltages up to 690 V AC

The EL3783 EtherCAT Terminal is a power monitoring I/O terminal used for state monitoring of a 3-phase AC voltage system. For each phase, voltage up to 400/690 V<sub>eff</sub> and current up to 1 A<sub>eff</sub>/5 A<sub>eff</sub> are sampled as instantaneous values with a resolution of 16 bits. The six channels are measured simultaneously based on the EtherCAT oversampling principle with a temporal resolution of up to 50 µs and then passed on to the control system. The control system has sufficient computing power for true RMS or performance calculations and complex custom algorithms based on the measured voltages and currents. Through the oversampling principle, the terminal is able to measure at significantly shorter intervals than the cycle time of the control system. AC and DC parameters must be connected and measured with a common reference potential.

Through the feature "ExtendedRange", the user has the full technical measuring range available at up to 130 % of the specified nominal measuring range. The EL3783 supports distributed clocks and can therefore measure synchronously with other EtherCAT devices. In combination with EL6688 it can be synchronised via IEEE 1588 to external clocks. The terminal can also be operated without distributed clocks.

► [www.beckhoff.com/EL3783](http://www.beckhoff.com/EL3783)

## News | I/O

### Input terminal for HART-capable field devices

The EL3182 analog input terminal for HART-capable field devices supplies measuring transducers located in the field and transmits their analog measuring signals electrically isolated to the automation device. With a technical measuring range of  $\pm 107\%$  of the nominal range, the terminal also supports commissioning with sensor values in the limit range and the evaluation according to NAMUR NE43. The HART (Highway Addressable Remote Transducer) protocol enables two-way communication through digital data transfer via the analog 4...20 mA wiring. The advantages of the simple and robust 4...20 mA interface are combined with the diagnostic and parameterisation options of a digital interface. The power contacts of the EL3182 can optionally be supplied with operating voltage in the standard way or via a power feed

terminal (EL9xxx) with electrical isolation. The input electronics are independent of the supply voltage of the power contacts. The reference potential for the inputs is the 0 V power contact. The EtherCAT Terminal indicates the signal state by means of light emitting diodes. Error LEDs signal overload and wire breakage, in addition to which LEDs provide information about the state of the HART communication and signal any communication errors.

► [www.beckhoff.com/EL3182](http://www.beckhoff.com/EL3182)



**HART**  
COMMUNICATION PROTOCOL



# EL3751 | 1-channel multi-functional input for measurement technology, 24 bit, 10 ksp/s

The EL3751 analog input terminal is part of the new generation of analog EtherCAT measurement terminals. The nominal measuring range of the input channel can be comprehensively parameterised, both electrically and on the software side:

- voltage measurement:  $\pm 5$  mV to  $\pm 30$  V (incl.  $\pm 10$  V), 0...10 V, 0...5 V
- current measurement:  $\pm 20$  mA, 4...20 mA, 0...20 mA, NAMUR NE43
- resistance measurement: 0...5 k $\Omega$
- electrical resistance R in 2-/3-/4-wire connection
- RTD measurement in 2-/3-/4-wire connection
- strain gauge/load cell:  $\frac{1}{4}$  bridge (350  $\Omega$  + 120  $\Omega$ ),  $\frac{1}{2}$  bridge ( $\pm 16$  mV/V) and full bridge ( $\pm 32$  mV/V) with integrated supply in 2-/3-/4-/5-/6-wire connection
- potentiometer: min. 1 k $\Omega$

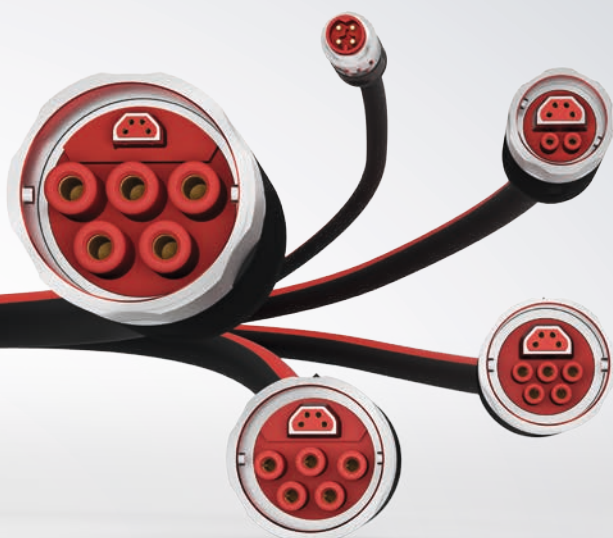
In the EL3751-0020 variant, the terminal can be ordered with a calibration certificate that covers all measurement ranges.

► [www.beckhoff.com/EL3751](http://www.beckhoff.com/EL3751)



< 1  $\mu$ s synchronisation  
100 ppm at 23 °C  
24 bit  
up to 50,000 samples/s

## **i** One Cable Automation: A matching connector for every performance class



The One Cable Automation (OCA) concept is based on a single EtherCAT P cable that integrates communication and power supply and enables end-to-end connection of components, terminal boxes and machine modules. With a uniform design across all sizes, the ECP and ENP connector families for OCA are available for all applications ranging from 24 V DC at the I/O level up to drives with 400 V AC or 630 V AC/850 V DC and 64 A.

The ECP connectors are designed to provide an integrated 24 V DC power supply in the trapezoidal core element according to the EtherCAT P specification, while ENP connectors are designed for EtherCAT/Ethernet applications without integrated 24 V DC power supply.

► [www.beckhoff.com/io-accessories](http://www.beckhoff.com/io-accessories)



## **i** EPPxxxx | EtherCAT P Box modules in IP 67

The EtherCAT P Box modules cover the typical range of requirements for IP 67 I/O signals: digital inputs with different filters (3.0 ms or 10  $\mu$ s), digital outputs with 0.5 A output current, combination modules with digital inputs and outputs, analog inputs and outputs with 16-bit resolution, as well as thermocouple and RTD inputs.

In addition, various EtherCAT P Box modules are available for system tasks such as encoder inputs or serial interfaces.

The new EPPxxxx-006x EtherCAT P Box modules with dimensions of only 30 mm x 86 mm x 26.5 mm (W x H x D) are suitable for use in applications where there is very little space available.

- EPP1004-0061 | 4 digital inputs, 24 V DC, 3.0 ms
- EPP2334-0061 | 4 digital inputs, 24 V DC, 3.0 ms, or outputs 24 V DC,  $I_{MAX} = 0.5$  A
- EPP9001-0060 | EtherCAT P/EtherCAT, ECP/EC connector with power transmission
- EPP9022-0060 | 2 x diagnostics (Us, Up)

► [www.beckhoff.com/EtherCATP](http://www.beckhoff.com/EtherCATP)

## News | I/O

### **i** EPP6228-0022 | IO-Link master

The EPP6228 IO-Link module enables connection of up to eight IO-Link devices, e.g. IO-Link box modules, actuators, sensors or combinations thereof. A point-to-point connection is used between the module and the device. The EtherCAT P Box is parameterised via the EtherCAT master. IO-Link is designed as an intelligent link between the fieldbus level and the sensor, wherein parameterisation information can be exchanged bidirectionally via the IO-Link connection. The parameterisation of the IO-Link devices with service data can be done from TwinCAT via ADS or very conveniently via the integrated IO-Link configuration tool.

In addition to the IO-Link channels, the EPP6228 features eight digital inputs on pin 2 of the respective M12 socket. In the standard setting, the IO-Link channels C/Qx of the EPP6228 accept both IO-Link devices and standard sensors with 24 V DC.

The IO-Link box modules in industrial (EPIxxxx) or die-cast zinc housing (ERIxxxx) enable simple integration of further sensor signals, locally in the field via a simple sensor cable and which are then transferred collectively to the IO-Link master.

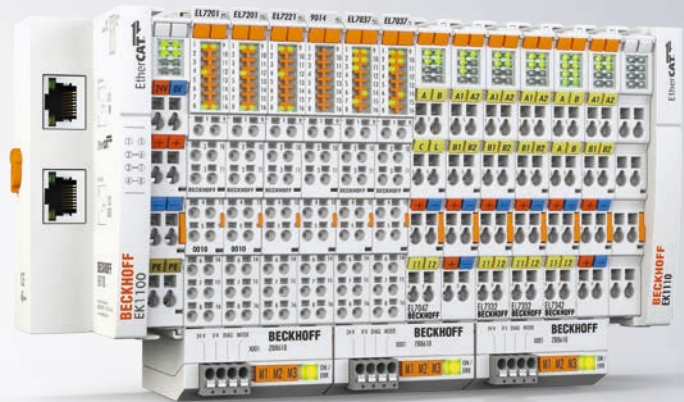


► [www.beckhoff.com/EPP6228](http://www.beckhoff.com/EPP6228)

# Performance increase of the EL7xxx motion terminals through ZB8610 fan cartridge

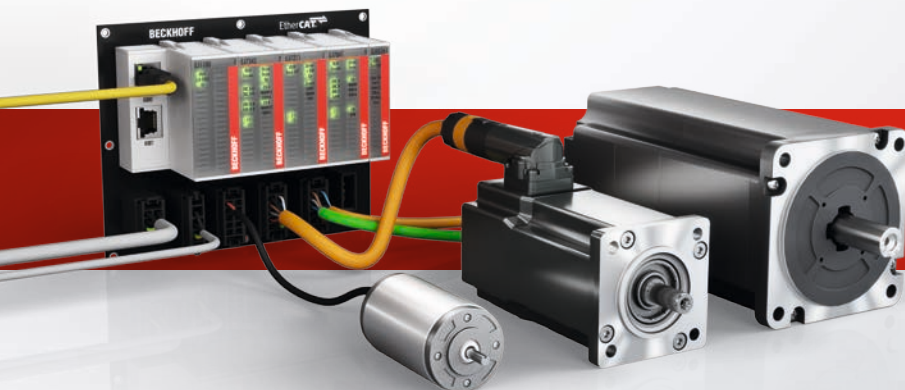
The output power of the already available motion terminals for servo, stepper and DC motors can be further increased when used with the ZB8610 fan cartridge. First, this allows more powerful motors to be driven, so that the areas of use of compact drive technology could be extended by new application possibilities. Secondly, space savings of up to 50 % can be achieved, because the use of the fan cartridge may allow the 12-mm motion terminal to be selected instead of having to resort to the 24-mm motion terminal.

The values given in the table can be achieved with the respective motion terminal in conjunction with the ZB8610 fan cartridge in continuous operation and under full load.



► [www.beckhoff.com/compact-drive-technology](http://www.beckhoff.com/compact-drive-technology)

Max. output current	Without fan cartridge	With fan cartridge
<b>For stepper motors</b>		
EL7047	5.0 A	6.5 A
EL7037	1.5 A	3.0 A
<b>For servomotors</b>		
EL7221-9014	–	8.0 A <sub>RMS</sub> , 490 W
EL7211-xxxx	4.5 A <sub>RMS</sub> , 276 W	–
EL7201-xxxx	2.8 A <sub>RMS</sub> , 171 W	4.5 A <sub>RMS</sub> , 276 W
<b>For DC motors</b>		
EL7342	3.5 A	6.5 A
EL7332	1.0 A	3.0 A



News | I/O

## i EtherCAT plug-in module range is continuously expanded

In combination with the wide range of available motors and gears the EJ7xxx EtherCAT plug-in modules enable the implementation of compact and affordable drive solutions for standard applications with medium and high volume production.

- EJ7047 | Stepper motor module
- EJ7211-0010 | Servomotor module
- EJ7342 | 2-channel DC motor output

Further new EtherCAT plug-in modules:

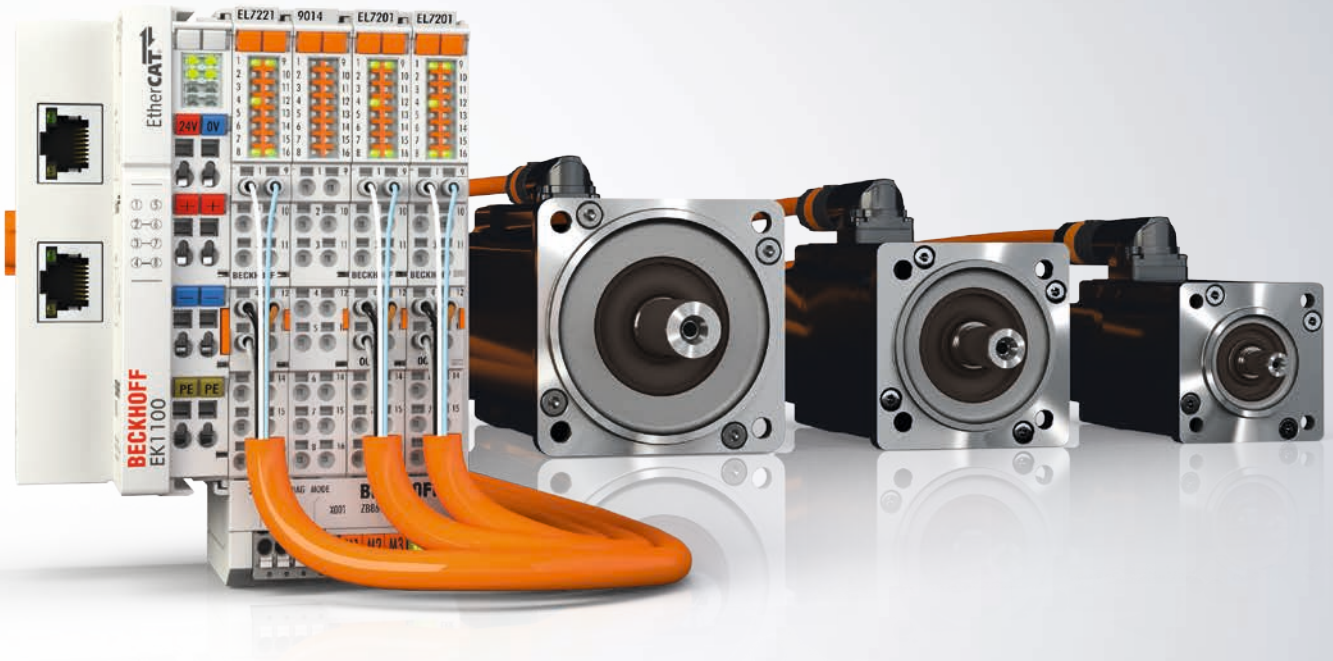
- EtherCAT Coupler with external plugs, power supply module and optional ID switches

- input module, 5 V DC
- 8-channel analog input/output 0...20 mA
- SSI encoder interface
- incremental encoder interface
- power supply modules
- TwinSAFE modules
- TwinSAFE Logic

► [www.beckhoff.com/EtherCAT-plug-in-modules](http://www.beckhoff.com/EtherCAT-plug-in-modules)



## **i** EL7221-9014 | Servomotor terminal with OCT and STO, 50 V DC, 7...8 A<sub>RMS</sub>



## News | Motion

The EL7221-9014 servomotor EtherCAT Terminal with integrated One Cable Technology (OCT) offers powerful servo performance in a very compact design for motors from the AM8100 series up to 8 A<sub>RMS</sub>. OCT combines a motor cable and an absolute feedback system in a single cable. The integrated electronic type plate of the AM81xx motors can be read in by the servo terminal to configure the motor parameters automatically. Thus, commissioning of the motors as well as cabling are minimised. The high-performance control technology supports fast and highly dynamic positioning tasks. Monitoring of numerous integrated parameters offers maximum operational reliability. EtherCAT, as a high-performance system communication, and CAN-over-EtherCAT (CoE), as the application layer, enable ideal interfacing with PC-based control

technology. 16 LEDs indicate status, warning and error messages as well as possibly active limitations. The specified output power is attained in operation with the ZB8610 fan cartridge. For operation without a fan cartridge, the EL7211-9014 is recommended. The EL7221-9014 enables the user to implement the safety function STO (Safe Torque Off) that corresponds to a Cat 3, PL d safety level according to DIN EN ISO 13849-1:2015.

► [www.beckhoff.com/EL7221-9014](http://www.beckhoff.com/EL7221-9014)



## AM8074 | New motor length for more performance

The highly dynamic AM8000 servomotors are characterised by high energy efficiency and low costs. The motor series offers overlapping torque ranges across all flange sizes, allowing the best suited combination of servo drive and motor to be selected for every application.

The flange size F7 (AM807x) is supplemented by a further motor length: The new winding types with standstill torques of 92 Nm and 129 Nm (variant with external ventilation) cover the rated torque range from 19.1 to 93 Nm and complete the AM807x size for optimally coordinated, powerful drive solutions. As usual, there is a choice of a low-speed or high-speed winding in addition to the standard windings. Based on the drive axis requirements, the AX5000 servo drive can be selected according to the standstill current, which, for example with the low-speed winding, enables considerable cost savings. The high-speed winding can be used in applications with fast acceleration and/or high rated speed requirements. If necessary, the power density of the motors can be further increased with external axial ventilation.

Due to the high currents, not all coil types are available with One Cable Technology (OCT) via M40 speedtec® plug. For connection a terminal box is used if the current exceeds 40 A. The known options feather key or sealing ring are available for selection. Ready-made connecting cables and specially tailored planetary gears round off the range.

► [www.beckhoff.com/AM8000](http://www.beckhoff.com/AM8000)



## AS20xx | Stepper motors

The new AS2000 stepper motors in IP 54 protection shrink the gap to the AM8000 high-performance servomotor. The seven models with a performance range from 0.8 to 8 Nm comply with international standards (NEMA 23 and NEMA34) and offer improved scalability and an ideal dimensioning of the stepper motor axis.

- scalable series: 7 motors with a performance range from 0.8 up to 8 Nm
- flange sizes N2 (NEMA23) and N3 (NEMA34)
- use under harsh environmental conditions (IP 54)
- high-power M12 screwtype connector for easy, standardised cabling
- torsion-proof, integrated encoder (1024 inc/rev) for vector control
- ideal dimensioning with the TC3 Motion Designer
- plug-and-play: easy commissioning with the TC3 Drive Manager
- plug-and-play also for accessories: matching cables, gears, flanges

► [www.beckhoff.com/AS2000](http://www.beckhoff.com/AS2000)



## News | Motion

### **i** AA1121-0000 | Linear actuator with integrated power electronics

The linear actuator sets new standards for the electronic control of valves and linear adjusting units. With a lifting height of 10 mm and a peak power of 800 N, new standards are achieved with regard to the power density of linear actuators. The complete adjusting axis is defined with a size of only 49 x 49 x 92 mm (flange square x overall length).

The linear actuator is equipped with integrated power electronics that is controlled simply and extremely fast via EtherCAT. For easy commissioning the well-known Drive Manager can be used. A continuous moment of 150 N can be generated with the actuator. Accelerations of 7 m/s<sup>2</sup> and linear speeds of 100 mm/s allow exceptionally short control cycles. Mounting via a B5 flange is possible without special tools in the tightest of spaces. The shaft is provided as standard with an M8x1 external thread, on which commercially available adaptors such as ball heads or tensioning hooks common in pneumatic/hydraulic applications can be mounted.

For connection in the protective low voltage range < 48 V DC a robust M12 plug can be used. The field-bus connections for EtherCAT IN/OUT are realised with M8 plugs. An absolute stroke measuring system is integrated, allowing an accuracy of 0.01 mm to be achieved so that previously necessary limit switches are not required.

In comparison with conventional pneumatics, the linear actuator achieves a much higher positioning accuracy, resulting in higher process safety. This holds above all for distributed systems. Depending on the application, the use of an electronic actuator can save up to 75 % energy in comparison with pneumatic actuators, so that the linear actuator enables a rapid return on investment.

Beckhoff supplies the necessary preassembled cables and the software to go with the actuators.

► [www.beckhoff.com/AA1121](http://www.beckhoff.com/AA1121)

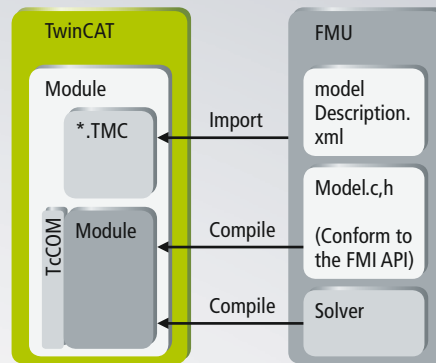


## TE1420 | TC3 Target for FMI

The TC3 Target for FMI provides an interface for simulation tools that support the Functional Mockup Interface (FMI). The interface enables the generation of TwinCAT 3 runtime modules, which can be instantiated and parameterised in the TwinCAT 3 engineering environment.

Models exported with FMI 2.0 – both Model Exchange and Co-Simulation – are supported. There are already a number of solvers available in TwinCAT 3 that can be used for the calculations for models exported as Model Exchange.

► [www.beckhoff.com/TE1420](http://www.beckhoff.com/TE1420)



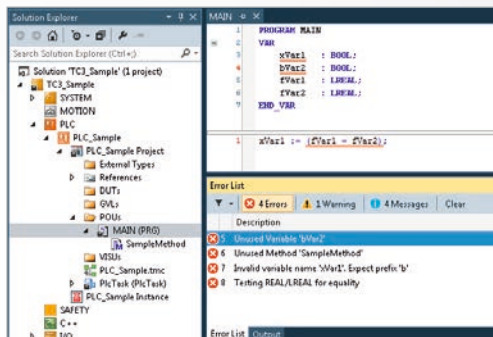
## News | Automation

### TE1200 | TC3 PLC Static Code Analysis

With the integration of the static code analysis, a further tool is available in TwinCAT 3.1 that supports the PLC software development process.

The static code analysis is an analysis tool that tests PLC software on the basis of coding rules and identifies potential weak points of an implementation even during the development stage. The analysis extends from checking compliance with naming conventions through to examining the use of objects and operators. Easier readability and an improved program structure are achieved through the analysis. Furthermore, the user's attention is drawn to possibly unintentional and faulty implementations, so that these program points can be optimised at an early stage.

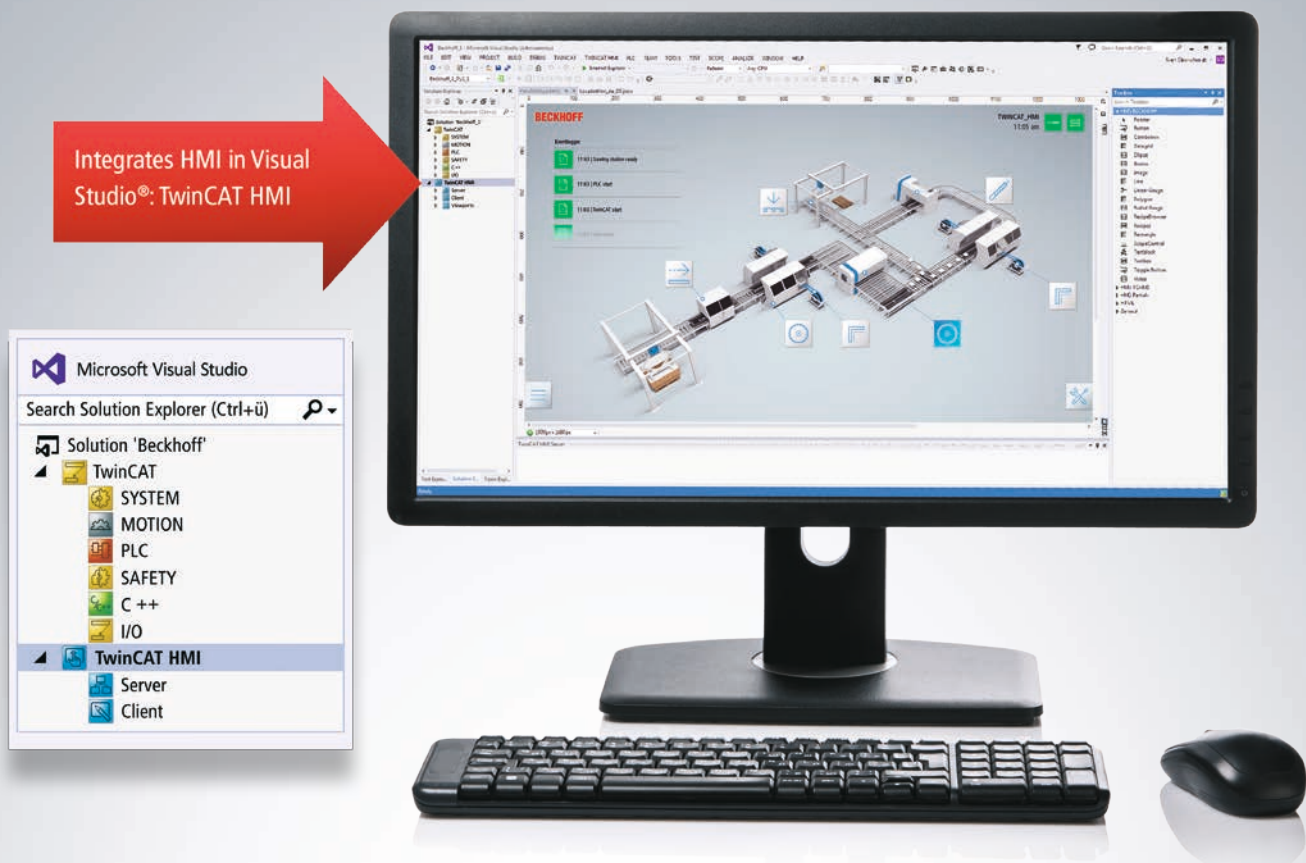
► [www.beckhoff.com/TE1200](http://www.beckhoff.com/TE1200)



### TE1210 | TC3 PLC Profiler

Through dynamic measurement of the time response, it is possible with the help of the TC3 PLC Profiler to analyse the runtime behaviour of a PLC application and to identify time-consuming call-ups and program sections. Runtime difficulties can be revealed and software optimisation potentials identified on the basis of these results.

► [www.beckhoff.com/TE1210](http://www.beckhoff.com/TE1210)



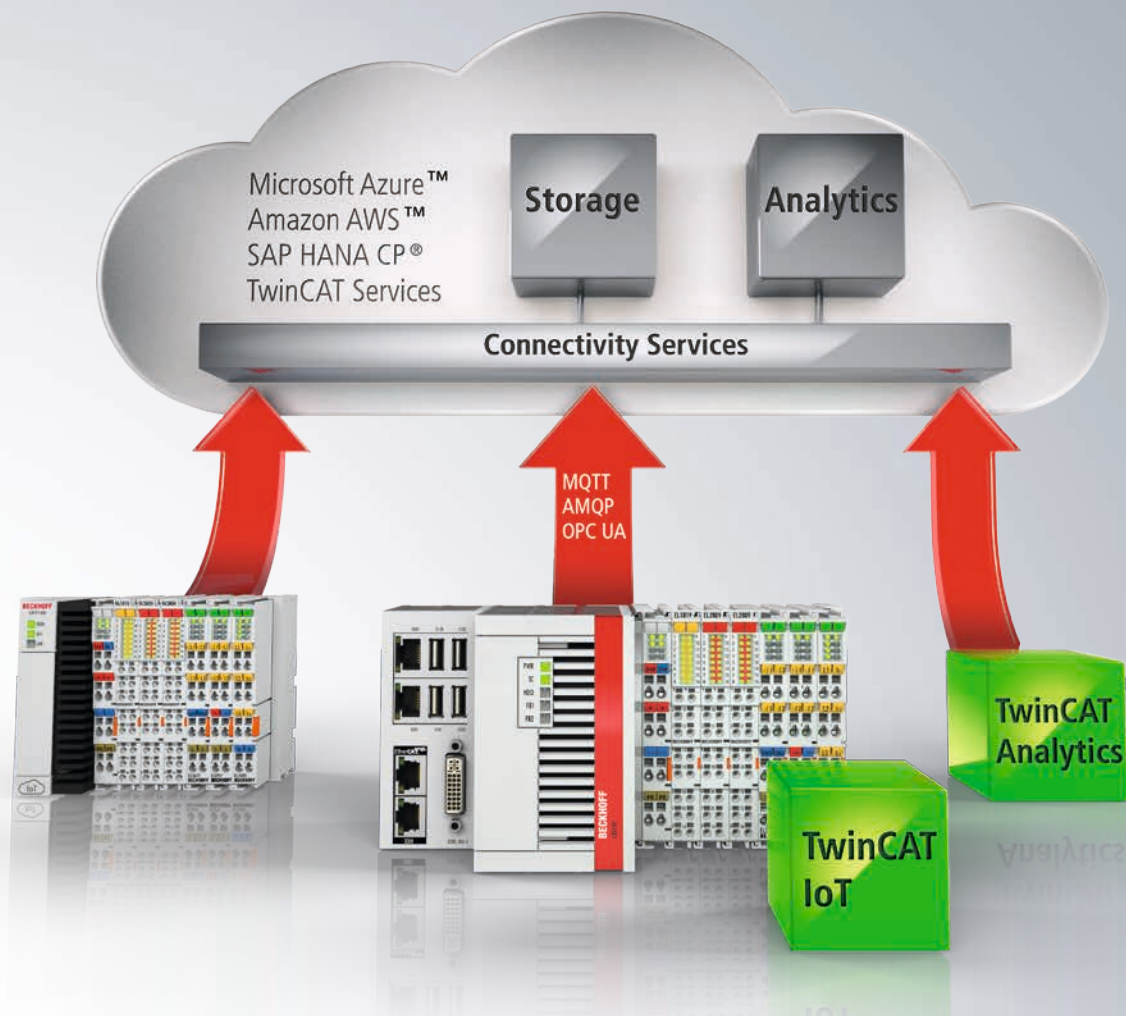
## News | Automation

### **i** TwinCAT HMI: Simple, open and extensible

The new TwinCAT HMI ushers in a paradigm shift in the field of HMI software. Instead of proprietary systems for the development and the runtime under certain operating systems, Beckhoff employs standards such as Microsoft Visual Studio® for the engineering, HTML5 for the design and TLS for the secure communication. The user interface can be executed on any HTML5-capable browser, irrespective of the operating system, resolution or display size. Beckhoff has thus created a future-proof, open and extensible solution for Industrie 4.0 HMI concepts.

- efficient engineering, integration in Visual Studio®
- platform-independence
- web-based (HTML5, JavaScript)
- powerful architecture
- modular expandability
- high-level programming language integration (C++, .NET)
- TE2000 | TC3 HMI
- TF2000 | TC3 HMI Server
- TF20xx | TC3 HMI Clients Pack
- TF20xx | TC3 HMI Targets Pack
- TF2100 | TC3 HMI ADS
- TF2110 | TC3 HMI OPC UA
- TF2200 | TC3 HMI Extension SDK
- TF2300 | TC3 HMI Scope

► [www.beckhoff.com/TwinCAT-HMI](http://www.beckhoff.com/TwinCAT-HMI)



## **i** TwinCAT IoT

The TwinCAT 3 IoT products within the TwinCAT Connectivity product family provide the user with various functions for exchanging process data over standardised communication protocols and for the targeted access to the data and communication services of cloud service providers.

- TF6701 | TC3 IoT Communication (MQTT)
- TF6710 | TC3 IoT Functions
- TF6720 | TC3 IoT Data Agent
- TF6730 | TC3 IoT Communicator
- TF6735 | TC3 IoT Communicator App

► [www.beckhoff.com/TwinCAT-IoT](http://www.beckhoff.com/TwinCAT-IoT)

## **i** TwinCAT Analytics for Industrie 4.0

TwinCAT Analytics saves the process data locally, on the server or in the cloud in synchronisation with the machine cycle. All data are recorded and serve as the basis for extensive analyses; this enables new predictive maintenance technologies and minimises machine downtimes.

- online and offline state analysis
- predictive maintenance
- pattern recognition
- machine optimisation
- long-term archiving
- TE35xx | TC3 Analytics Workbench
- TF3500 | TC3 Analytics Logger
- TF3510 | TC3 Analytics Library

► [www.beckhoff.com/TwinCAT-Industrie40](http://www.beckhoff.com/TwinCAT-Industrie40)



This flyer gives a short overview of the new products; for further information see the Beckhoff News catalog 01'2017 or

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



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