

# BECKHOFF New Automation Technology

News | 01'2016



# NEWS



Ether**CAT**<sup>®</sup> P



## C6670 | Many-core control Control cabinet industrial server

In combination with TwinCAT 3, two Intel® Xeon® processors, each with 6, 12 or 18 cores on one motherboard with two Gigabit Ethernet controllers and a powerful graphics card produce a machine or plant controller that offers computing power for completely new ideas. Apart from the extremely high performance, up to 2048 GB DDR4 RAM, one PCIe Gen2 x4, one PCIe Gen3 x8 and four PCIe Gen3 x16 plug-in card slots are also available for several interface cards for video evaluation. Long-term availability is ensured for the processors and the motherboard.

► [www.beckhoff.com/C6670](http://www.beckhoff.com/C6670)

## News | Industrial PC



## 11.6-inch displays complement widescreen multi-touch panels

The product range of the CP2xxx and CP3xxx multi-touch panel series is completed by 11.6-inch devices with a resolution of 1366 x 768 in 16:9 format. The widescreen displays are available as built-in Panel PCs as well as Control Panels (built-in and IP 65 variants). Like all Beckhoff multi-touch panels, they feature a high-quality aluminium housing milled from a solid block with metal perimeter protection for the display front. With the new display size the range of application now offers a total of nine device options: 7-inch, 11.6-inch, 12-inch, 15-inch, 15.6-inch, 18.5-inch, 19-inch, 21.5-inch and 24-inch.

The multi-touch panel series offers maximum flexibility: different display sizes, 4:3 or widescreen, built-in or IP 65 mounting arm installation.

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



## **i** C6905-0010 | “Economy” control cabinet Industrial PC Intel® Atom™ with up to four cores



With the C6905 “Economy” control cabinet PC the C69xx series has been supplemented by a device for applications in the compact and medium performance class. The fanless C6905 Industrial PC has been designed for control cabinet installation. The compact aluminium housing comes equipped with a 3½-inch motherboard with Intel® Atom™ with up to four cores. All PC connections are located at the front of the housing.

► [www.beckhoff.com/C6905](http://www.beckhoff.com/C6905)

## **i** CP6706 | 7-inch “Economy” Panel PC Intel® Atom™ with up to four cores

With its highly integrated 3½-inch motherboard, the CP6706 built-in Panel PC is ideally suited for use in machine construction and plant engineering, for example with the TwinCAT automation software under Windows Embedded Compact 7 or Windows Embedded Standard 7. The CP6706 is conceived for installation in the front of a control cabinet and has a 7-inch touch screen display. Equipped with an Intel® Atom™ with up to four cores and a CFast card the CP6706 contains no rotary components. The CP6706 is supplied with a 24 V power supply unit. The CFast card and the lithium battery of the system clock are accessible from the rear in the connector bracket.

► [www.beckhoff.com/CP6706](http://www.beckhoff.com/CP6706)





## **i** EtherCAT P | Ultra-fast communication and power in one cable

EtherCAT P combines communication and power in a single 4-wire standard Ethernet cable. The 24 V DC supply of the EtherCAT P slaves and of the connected sensors and actuators is integrated:  $U_S$  (system and sensor supply) and  $U_P$  (peripheral voltage for actuators) are electrically isolated from each other and can each supply a current of up to 3 A to the connected components.

At the same time, all the benefits of EtherCAT, such as freedom in topology design, high speed, optimum bandwidth utilisation, telegram processing on-the-fly, highly precise synchronisation, extensive diagnostics functionality, etc. are all retained.

Accessories for EtherCAT P components include pre-assembled cables, cables sold by the metre and connectors for assembly in the field.

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

### Highlights

- One Cable Connection: EtherCAT and 2 x 24 V DC ( $U_P$ ,  $U_S$ ) on just 4 wires
- daisy-chained power supply through EtherCAT P devices
- reduced material and assembly costs
- minimised installation space for drag-chains, control cabinets and machine footprint
- scalable connector family from 24 V to 600 V and up to 64 A
- lowered connection costs with outstanding EtherCAT performance
- flexible network topology of EtherCAT is retained

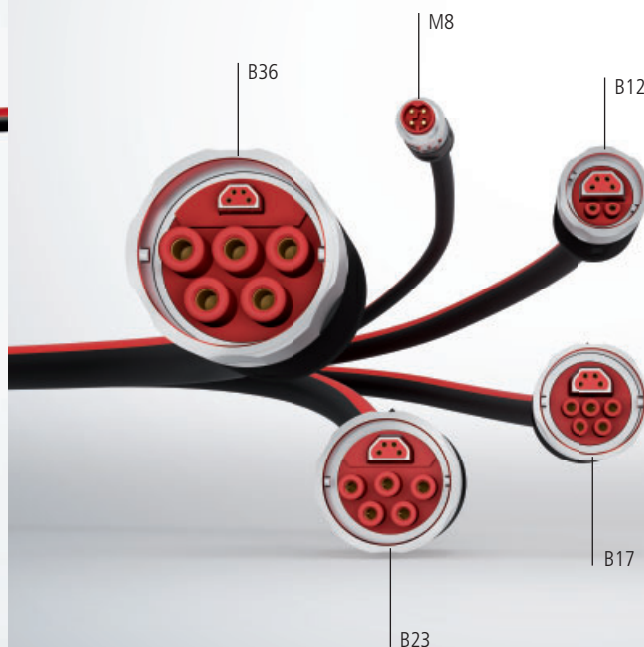
## News | I/O



EtherCAT<sup>®</sup>  P



EtherCAT<sup>®</sup>  P



The different sizes of the connector family cover all applications from the 24 V I/O level to drives with 400 V AC or 600 V DC and a current of up to 64 A.





## TwinSAFE SC (TwinSAFE Single Channel)

With the aid of the TwinSAFE SC technology it is possible to make use of standard signals for safety tasks in any network or fieldbus. To do this, EtherCAT Terminals from the areas of analog input, position measurement or

communication (4...20 mA, incremental encoder, IO-Link, etc.) are extended by the TwinSAFE SC function. The data from these extended EtherCAT Terminals is fed to the TwinSAFE Logic, where they undergo safety-

related multi-channel processing. In the Safety Logic the data originating from different sources is analysed, checked for plausibility and submitted to a "voting". This is done by certified function blocks such as Scale, Compare/Voting (1oo2, 2oo3, 3oo5), Limit, etc. For safety reasons, however, at least one of the data sources must be a TwinSAFE SC component. The remainder of the data can originate from other standard Bus Terminals, drive controllers or measuring transducers. In this way, it is possible to use all the process data existing in the system for the safety technology.

With the aid of the TwinSAFE SC technology it is typically possible to achieve a safety level equivalent to PL d/Cat. 3 in accordance with EN ISO 13849-1 or SIL 2 in accordance with EN 62061.

► [www.beckhoff.com/TwinSAFE-SC](http://www.beckhoff.com/TwinSAFE-SC)



## News | I/O



### EJ7xxx | Servo, stepper and DC motors directly integrated into the I/O system

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** for stepper motors with medium performance range

**EJ7211-0010 | Servomotor module** with integrated One Cable Technology (OCT) offers high servo performance in a very compact design for motors of the AM8100 series up to 4.5 A<sub>RMS</sub>.

**EJ7342 | 2-channel DC motor output stage** enables direct operation of two DC motors and is galvanically isolated from the E-bus.

**EJ9576 | Brake chopper module** contains high-performance capacitors for stabilising supply voltages.

► [www.beckhoff.com/EJ7047](http://www.beckhoff.com/EJ7047)

► [www.beckhoff.com/EJ7211-0010](http://www.beckhoff.com/EJ7211-0010)

► [www.beckhoff.com/EJ7342](http://www.beckhoff.com/EJ7342)

► [www.beckhoff.com/EJ9576](http://www.beckhoff.com/EJ9576)



# 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,  $0 \dots 10$  V,  $0 \dots 5$  V
- current measurement:  $\pm 20$  mA,  $4 \dots 20$  mA,  $0 \dots 20$  mA, NAMUR NE43
- resistance measurement:  $0 \dots 5$  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 $\Omega$

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



## EL3174 | 4-channel analog input terminals

The EL3174 and EL3174-0002 analog input terminals have four individually parameterisable inputs. Signals in the range from  $-10/0$  to  $+10$  V or  $-20/0/+4$  to  $+20$  mA can be processed via each channel. Each channel should be set by the controller to U or I mode via CoE. With a technical measuring range of  $\pm 107$  % of the nominal range, the terminal also supports commissioning with sensor values in the limit range. The four differential inputs of the EL3174-0002 are electrically isolated against each other and against the fieldbus (2,500 V DC).



► [www.beckhoff.com/EL3174](http://www.beckhoff.com/EL3174)  
 ► [www.beckhoff.com/EL3173-0002](http://www.beckhoff.com/EL3173-0002)



The flexible gateway between different worlds of control in IP 67

The EP9300-0022 EtherCAT Box connects PROFINET RT networks to the EtherCAT Box modules (EPxxxx, EQxxxx and ERxxxx) and converts the telegrams from PROFINET RT to EtherCAT. One station consists of an EP9300-0022 and any number of EtherCAT Box modules. In EtherCAT, the PROFINET RT box has at its disposal a lower-level, powerful and ultra-fast I/O system with a large selection of modules. The EP9300-0022 supports the PROFINET RT profile and fits seamlessly into PROFINET RT networks.

► [www.beckhoff.com/EP9300](http://www.beckhoff.com/EP9300)

## i AX8000 | Multi-axis servo system

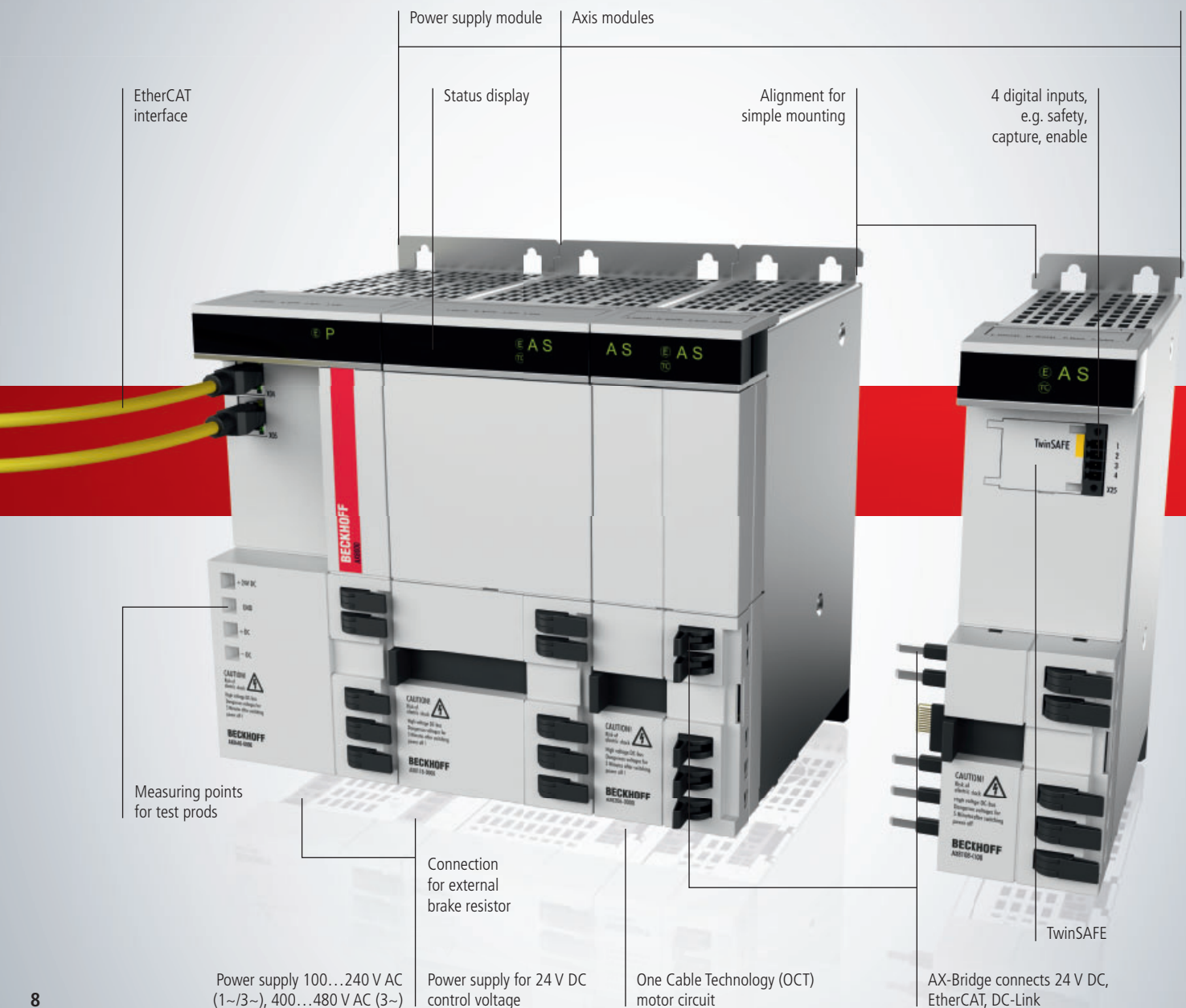
The AX8000 multi-axis servo system greatly simplifies the implementation of multi-channel drive solutions. The required number of 1-channel or 2-channel axis modules are attached to the central supply module. The modules are connected without screws or tools using the built-in AX-Bridge quick connection system, which is based on spring-loaded terminals. The 1-axis and 2-axis modules can optionally be equipped with TwinSAFE for safe drive technology.

The EtherCAT-based AX8000 multi-axis servo system combines powerful FPGA technology with multi-core ARM processors. An optional TwinCAT 3 runtime enables programming in C++, IEC 61131 and MATLAB®/ Simulink®. The new multi-channel current control technology realizes extremely short sampling and response times. The entirely hardware-implemented current controller combines the advantages of

analog and digital control technology: reaction to a current deviation from the setpoint value is possible within 1 µs; the velocity controller cycle time is around 16 µs at a switching frequency of 32 kHz. The processing of EtherCAT process data (actual and setpoint values) is carried out without a processor almost without delay in the hardware, so that the minimum EtherCAT cycle time is only 62.5 µs.

The AX8000 multi-axis servo system supports OCT, the One Cable Technology for power and feedback from Beckhoff. In connection with the servomotors from the AM8000 series, the wiring is reduced to the standard motor cable, via which the feedback signals are also transmitted.

► [www.beckhoff.com/AX8000](http://www.beckhoff.com/AX8000)





# XTS: New motor modules for even more production flexibility

With new motor modules, the high flexibility of the eXtended Transport System (XTS) has been increased yet again. The straight and curved motor modules (180°) are supplemented by new variants with a radius of 22.5° or 45° with or without feed. Matching guide rails are also available for the new motor modules. The range of applications can now be further extended:

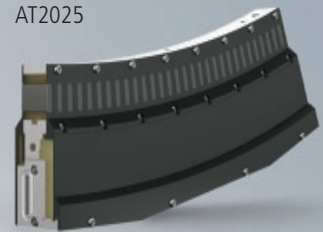
- individual track layouts
- flexible rotary indexing table
- full circle with movers running around the outside

- full circle with movers running around the inside
- polygon, circle segments connected with straight sections
- step- and S-shaped track layouts
- rounded-off rectangle with a freely selectable size

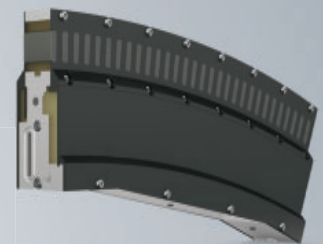
► [www.beckhoff.com/AT2000](http://www.beckhoff.com/AT2000)

► [www.beckhoff.com/AT9000](http://www.beckhoff.com/AT9000)

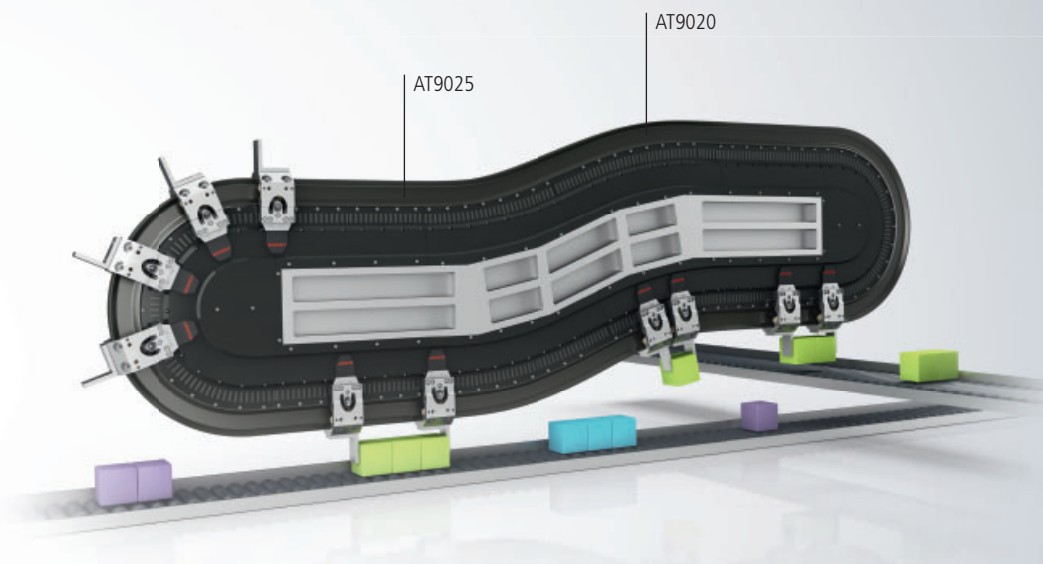
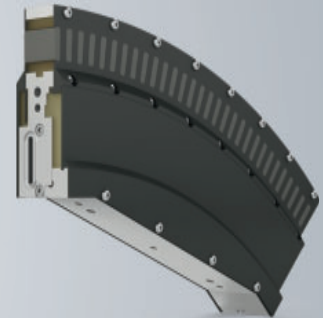
AT2025



AT2020



AT2040



## News | Motion

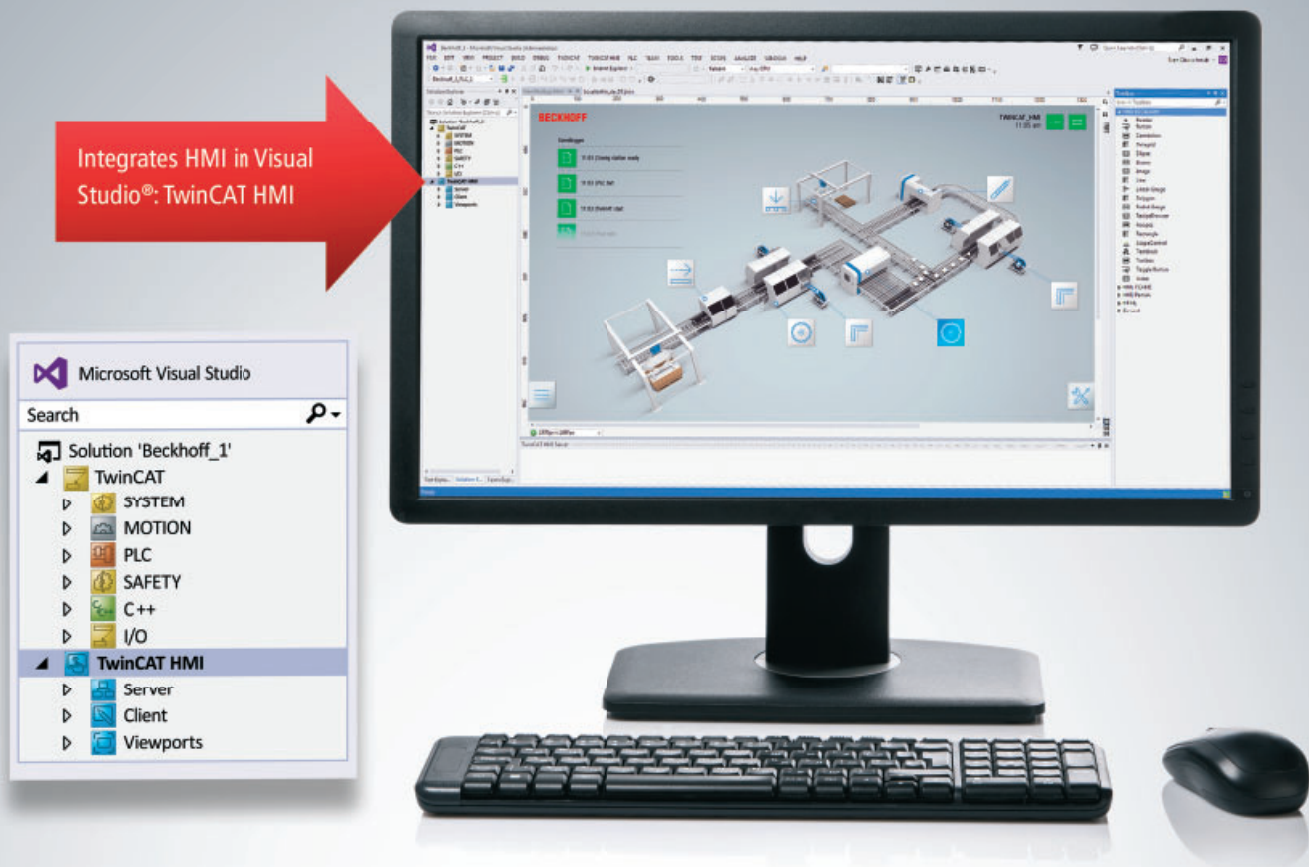
### XTS: New mover for increased payload

The new AT9011-0070-0550 mover provides an increased payload due to its overall length of 70 mm and larger rollers. The standard rail can be used for traveling in straight lines, adapted rails are necessary for traveling around corners. Therefore, a mixed operation of movers of different sizes is only possible when traveling in straight lines. Like all other XTS movers, the AT9011-0070-0550 is made of a light and strong aluminium alloy. The rollers allow backlash-free travel on the straights and in the curves thanks to their arrangement. The coating of the rollers causes minimum

running noise and is particularly low-wear without lubrication of the guide rail. The attractive forces of the magnetic plates are largely balanced by the opposed arrangement, so that the rollers and the rail do not have to absorb the comparatively high attractive forces of the magnets. The encoder flag for determining position is robust due to glass fibre reinforcement and of low tare weight. Its geometric centre determines the position signal for the motor module.

► [www.beckhoff.com/AT9011](http://www.beckhoff.com/AT9011)





## 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 the proprietary systems for engineering and communication and their use on certain operating systems, Beckhoff employs IT standards such as Microsoft Visual Studio® for the engineering, HTML5 for the design and Websockets and HTTPS for the secure communication. The user interface can be executed on any HTML5-capable browser, irrespective of the operating system, resolution or display. Beckhoff has thus created a future-proof, open and high-performance solution for Industry 4.0 HMI concepts.

#### Highlights

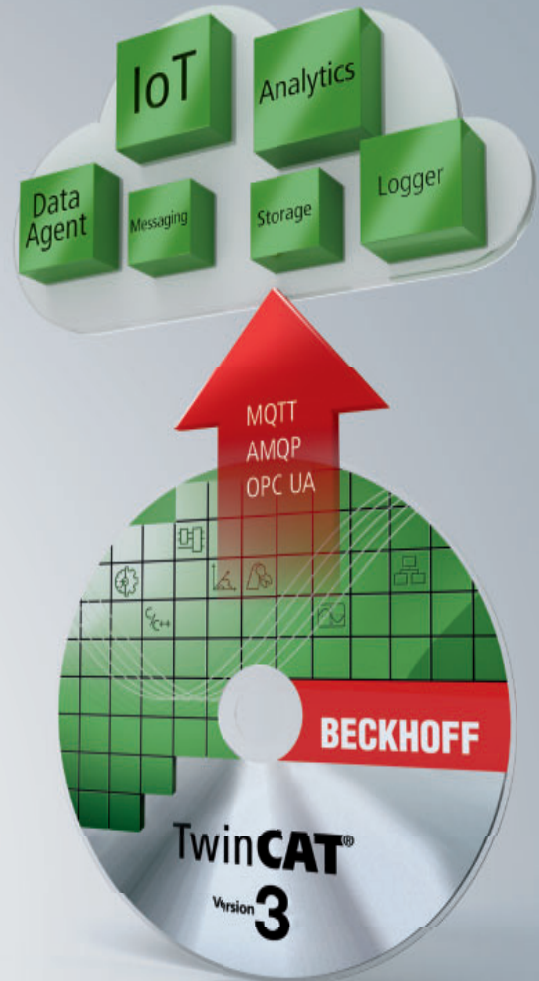
- efficient engineering, integration in Visual Studio®
- platform-independence
- web-based (HTML5, JavaScript)
- powerful architecture
- modular expandability
- high-level programming language integration

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

## **i** TwinCAT Analytics for Industry 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
  - TF3520 | TC3 Analytics Cloud Storage
- [www.beckhoff.com/TwinCAT-Industry40](http://www.beckhoff.com/TwinCAT-Industry40)



Windows Azure™  
Amazon Web Services™  
Beckhoff Cloud Services

MQTT  
AMQP  
OPC UA



I/O Signals, Fieldbus

## **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.

- TF670x | TC3 IoT Communication
- TF671x | TC3 IoT Functions
- TF672x | TC3 IoT Data Agent
- TF6730 | TC3 IoT Communicator
- TF6735 | TC3 IoT Communicator App

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



This flyer gives a short overview of the new products; for further information see the Beckhoff News catalog 01'2016 or

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



### Products online

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



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Main catalog



PC Control magazine

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