

BECKHOFF New Automation Technology

Product Overview | 2015



IPC Industrial PC | Embedded PC

I/O EtherCAT | EtherCAT Terminal | EtherCAT Box | Bus Terminal | Fieldbus Box | Infrastructure Components

Motion Drive Technology

Automation TwinCAT | TwinSAFE



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PC Control for all applications

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24 EtherCAT

The real-time Ethernet fieldbus



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Ultra high-speed communication



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High performance for harsh environments



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52 Drive Technology

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66 TwinCAT

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Open and scalable safety technology

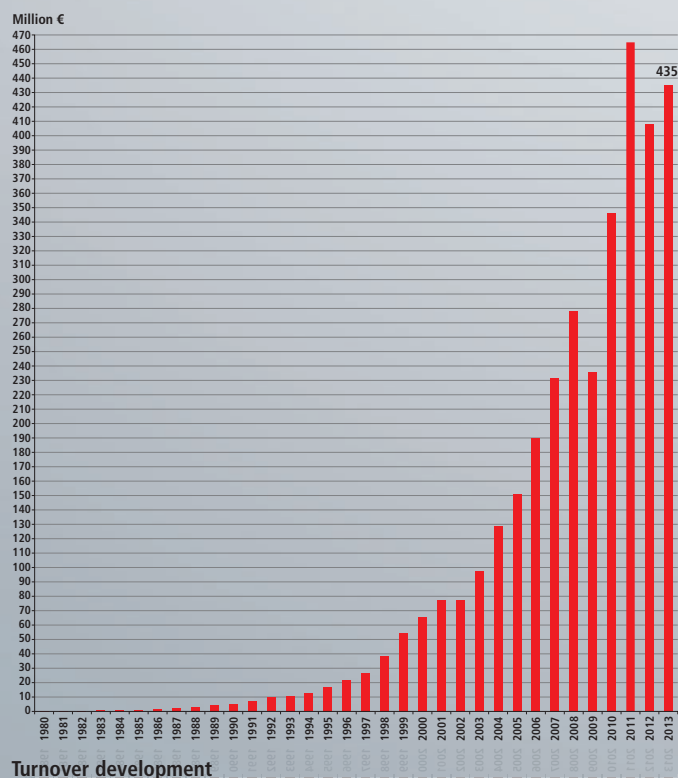




Picture: AREVA Wind/Jan Oelker

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. 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.



Beckhoff Automation

- Headquarters Verl, Germany
- Sales 2013: **435 million €**
- Staff worldwide: **2,700**
- Branch Offices Germany: **11**
- Subsidiaries/Branch Offices worldwide: **34**
- Distributors worldwide: **in more than 70 countries**
(as of 11/2014)

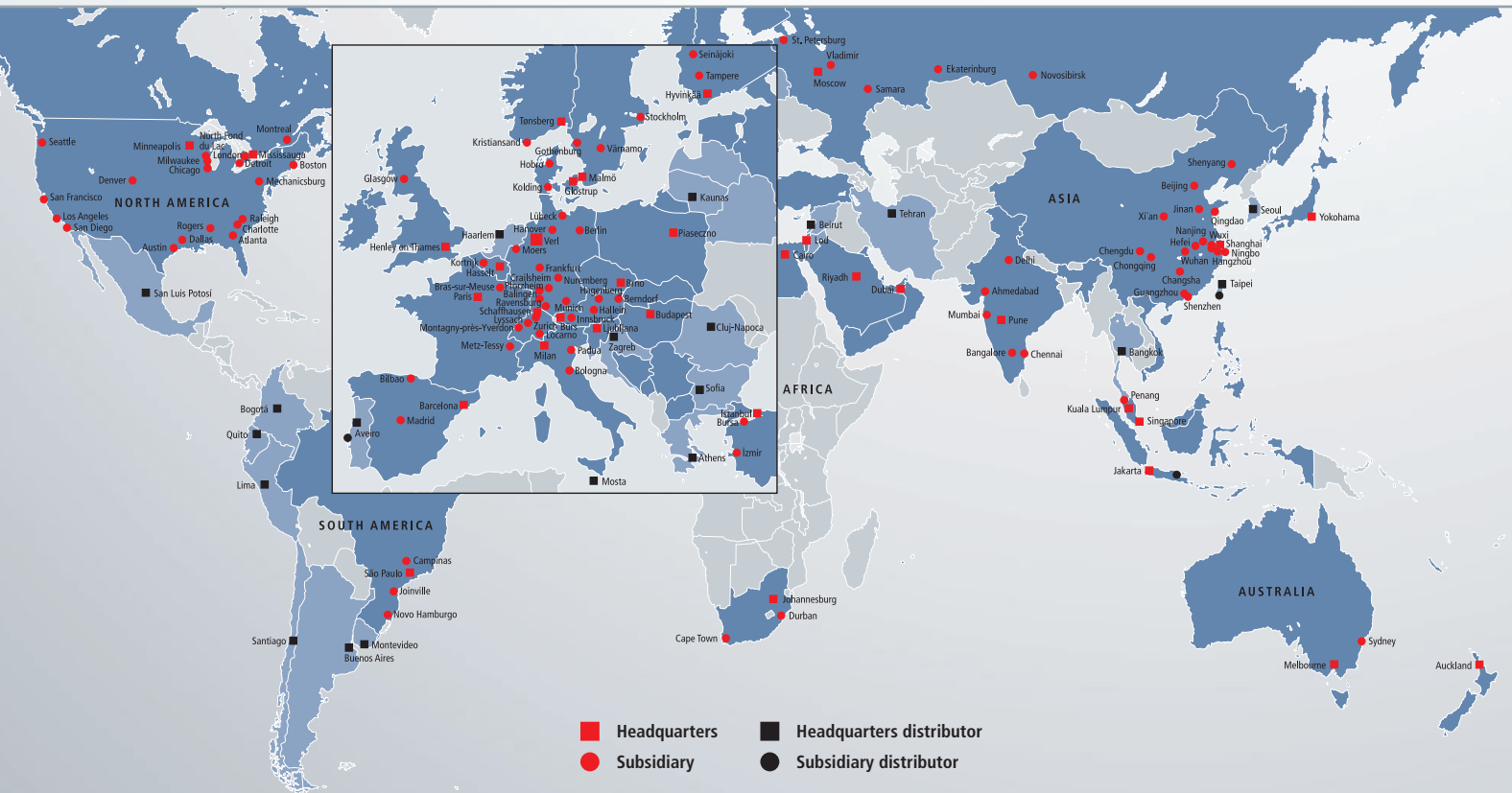
PC-based control technology

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 conceptualised 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.

Milestones

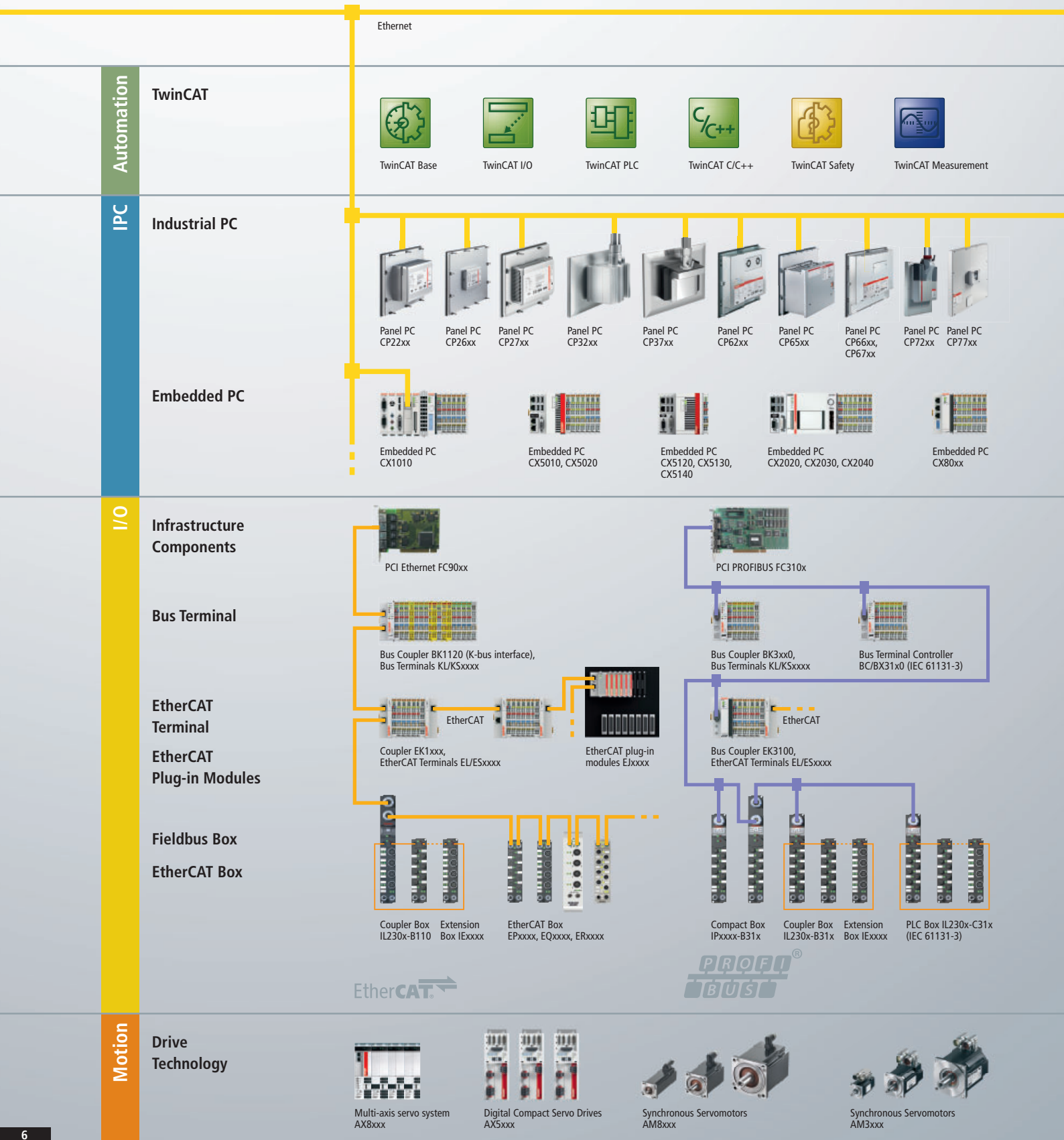
- | | | | |
|-------------|--|-------------|---|
| 1982 | P1000 – single-board motion controller | 2003 | EtherCAT – real-time Ethernet fieldbus system |
| 1986 | PC Control – first PC-based machine controller | 2005 | TwinSAFE – the compact safety solution |
| 1988 | S1000 – software PLC/NC on PC (DOS) | 2005 | AX5000 – EtherCAT Servo Drives |
| 1989 | Lightbus – high-speed fieldbus utilising optical fibre | 2007 | Industrial Motherboards – made in Germany |
| 1990 | All-in-one PC motherboard | 2008 | XFC – eXtreme Fast Control Technology |
| 1995 | Bus Terminal – fieldbus technology in terminal block format | 2009 | HD Bus Terminals – 16-channel terminals in 12 mm |
| 1996 | TwinCAT – real-time software package under Windows with PLC and Motion Control functions | 2010 | TwinCAT 3 – eXtended Automation Technology |
| 1998 | Control Panel – remote IPC Control Panels | 2011 | AM8000 – Synchronous Servomotors with One Cable Technology |
| 1999 | Fieldbus Box – the I/O system in IP 67 | 2012 | 2 nd generation of Control Panels – Panel PCs and Control Panels with multi-touch technology |
| 2002 | CX1000 – modular Embedded PCs for DIN rail mounting | 2012 | XTS – eXtended Transport System |



Worldwide presence on all continents

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 in Austria, Belgium, the Czech Republic, Denmark, Finland, France, Hungary, Italy, Norway, Poland, Russia, Slovenia, Spain, Sweden, Switzerland, Turkey, the United Kingdom, as well as in Australia, Brazil, Canada, China, Egypt, India, Indonesia, Israel, Japan, Malaysia, New Zealand, Saudi Arabia, Singapore, South Africa, the United Arab Emirates and the USA. Through worldwide co-operation with partners, Beckhoff is represented in more than 70 countries.

System overview





TwinCAT Control



TwinCAT Motion



TwinCAT PTP



TwinCAT NC I



TwinCAT CNC



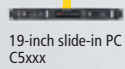
TwinCAT Robotics



TwinCAT Connectivity



Panel PC C36xx



19-inch slide-in PC C5xxx



Control cabinet PC C61xx



Control cabinet PC C62xx



Built-in Industrial PC C65xx



Control cabinet PC C66xx



Control cabinet PC C69xx



DVI/USB Extended



Built-in Control Panel CP29xx



Built-in Control Panel CP69xx



Control Panel CP39xx



Control Panel CP79xx



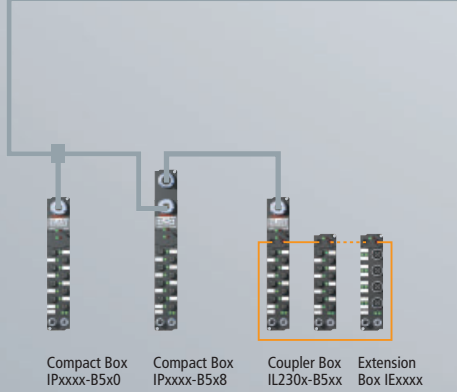
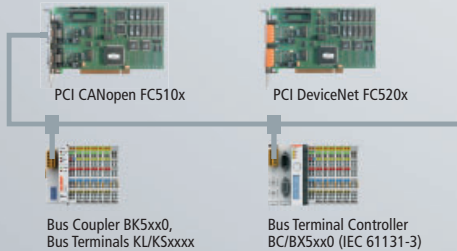
Embedded PC CX9000, CX9010



Embedded PC CX9020

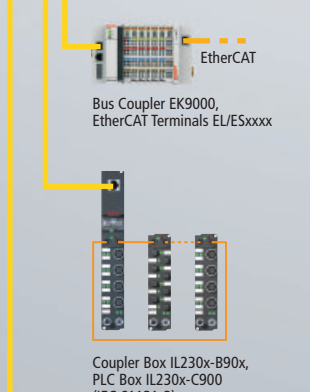
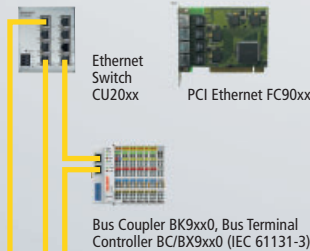


Industrial Motherboards CBxxx



CANopen

DeviceNet



Ethernet TCP/IP



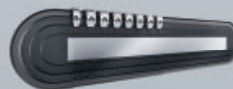
Stainless steel servomotors AM88xx



Linear Servomotors ALxxxx



Compact Drive Technology



XTS | eXtended Transport System

The IPC Company

The Industrial PC (IPC) is the hardware centrepiece 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 IPC, 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

Control cabinet Industrial PCs 16

- Scalable performance range
- Industrial-strength housing designs
- High mechanical durability
- Simple installation
- High flexibility in terms of display connections

► www.beckhoff.com/Control-cabinet-PC

Panel PCs 12

- Scalable performance range
- Single- or multi-touch screen operation options
- Display sizes from 5.7-inch to 24-inch
- Stainless-steel variants for cleanrooms
- Easy installation in control cabinets or on mounting arms

► www.beckhoff.com/Panel-PC

Control Panels 12

- Large model variety
- Single- or multi-touch screen operation options
- Display sizes from 5.7-inch to 24-inch
- Easy installation in control cabinets or on mounting arms
- Customer-specific implementations

► www.beckhoff.com/ControlPanel





Control cabinet Industrial PC



Embedded PC

Embedded PCs 20

- Scalable performance range
- Compact design
- Direct I/O interface
- Modular extension options
- DIN rail mounting

► www.beckhoff.com/Embedded-PC

Industrial motherboards

- Developed and manufactured by Beckhoff
- Long-term availability
- Optimised for EtherCAT
- Numerous interfaces
- Customer-specific BIOS solutions

► www.beckhoff.com/Motherboards



- Highly scalable range of IPCs 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 and support of the entire product portfolio
- As the inventor of PC-based control technology, Beckhoff closely cooperates with global technology partners Intel and Microsoft.

Industrial PC

Control cabinet Industrial PCs 16

Control Panels 12

C61xx |
Control cabinet
Industrial PC 16

C66xx |
Control cabinet
Industrial PC 16

C51xx |
19-inch slide-in
Industrial PC 16

C62xx |
Control cabinet
Industrial PC 16

CP2xxx |
Multi-touch
built-in Panel PC 12

CP7xxx |
Control Panel 13

CP39xx |
Multi-touch
Control Panel 12

CP29xx |
Multi-touch built-in
Control Panel 12

CP32xx |
Multi-touch Panel PC 12

C69xx |
Control cabinet
Industrial PC 16

Panel PCs 12



The right Industrial PC for every application

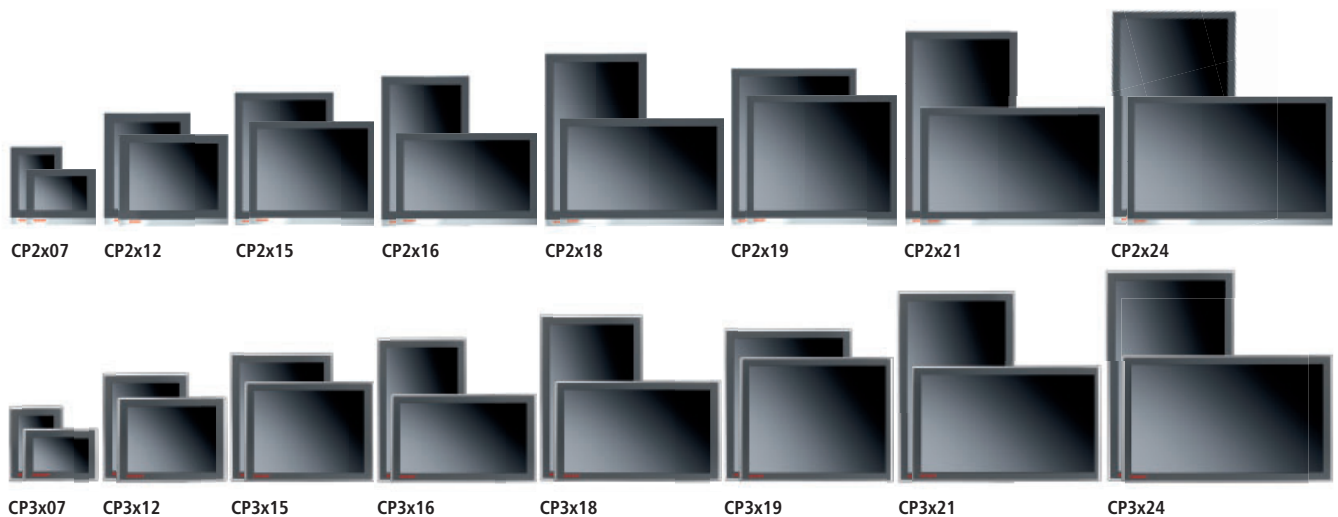
Beckhoff Industrial PCs satisfy industry's demands:

- the right Industrial PC for every controller
- highest performance PCs with Intel® Celeron® up to Intel® Core™ i7 processors
- PCs with low power consumption with Intel® Mobile processors
- open standards following the norm ATX
- components carefully tested to ensure appropriateness for industrial applications
- appealing industrial design housings
- easy access to PC components
- Individual housing construction allows optimum adaptation to controller requirements.
- integration of electromechanical buttons, switches, scanners, handwheels and other components in the Control Panel
- designed for machine-oriented use
- long-term availability of components

► www.beckhoff.com/IPC

BECKHOFF New Automation Technology

Multi-touch Panel PCs and multi-touch Control Panels



Multi-touch Panel PCs and multi-touch Control Panels

	Display Resolution Format	7-inch 800 x 480 16:9.6	12-inch 800 x 600 4:3	15-inch 1024 x 768 4:3	15.6-inch 1366 x 768 16:9	18.5-inch 1366 x 768 16:9	19-inch 1280 x 1024 5:4	21.5-inch 1920 x 1080 16:9	24-inch 1920 x 1080 16:9
Built-in Panel PCs CP22xx-0000/-0010 – up to Core™ i3/i5/i7	multi-finger touch screen		CP2212	CP2215	CP2216	CP2218	CP2219	CP2221	CP2224
Dual-touch built-in Panel PCs CP26xx-0000 – ARM Cortex™-A8	dual-finger touch screen	CP2607	CP2612	CP2615	CP2616	CP2618	CP2619	CP2621	CP2624
Built-in Panel PCs CP27xx-0000/-0010 – up to Atom™	multi-finger touch screen		CP2712 <i>i</i>	CP2715 <i>i</i>	CP2716 <i>i</i>	CP2718 <i>i</i>	CP2719 <i>i</i>	CP2721 <i>i</i>	CP2724 <i>i</i>
Panel PCs CP32xx-0000/-0010 – up to Core™ i3/i5/i7	multi-finger touch screen, only horizontal		CP3212	CP3215	CP3216	CP3218	CP3219	CP3221	CP3224
Panel PCs CP37xx-0010 – up to Atom™	multi-finger touch screen		CP3712 <i>i</i>	CP3715 <i>i</i>	CP3716 <i>i</i>	CP3718 <i>i</i>	CP3719 <i>i</i>	CP3721 <i>i</i>	CP3724 <i>i</i>
Built-in Control Panels CP29xx-0000/-0010	DVI/USB Extended interface	CP2907-0000	CP2912-0000	CP2915-0000	CP2916-0000	CP2918-0000	CP2919-0000	CP2921-0000	CP2924-0000
	CP-Link 4 up to 100 m	CP2907-0010	CP2912-0010	CP2915-0010	CP2916-0010	CP2918-0010	CP2919-0010	CP2921-0010	CP2924-0010
Control Panels CP39xx-0000/-0010	DVI/USB Extended interface	CP3907-0000	CP3912-0000	CP3915-0000	CP3916-0000	CP3918-0000	CP3919-0000	CP3921-0000	CP3924-0000
	CP-Link 4 up to 100 m	CP3907-0010	CP3912-0010	CP3915-0010	CP3916-0010	CP3918-0010	CP3919-0010	CP3921-0010	CP3924-0010

For further information on CP-Link 4 see page 19

► www.beckhoff.com/multi-touch

i Product announcement for availability status see www.beckhoff.com

Single-touch Control Panels



Single-touch built-in Control Panels, front side IP 65

	Display	5.7-inch	6.5-inch	12-inch	15-inch	19-inch
	Resolution	640 x 480	640 x 480	800 x 600	1024 x 768	1280 x 1024
	Format	4:3	4:3	4:3	4:3	5:4
DVI/USB Extended interface, 50 m	without keys	CP6907	CP6909	CP6901	CP6902	CP6903
	function keys		CP6919	CP6911	CP6912	CP6913
	numerical		CP6929	CP6921	CP6922	CP6923
	alphanumerical			CP6931	CP6932	CP6933

Single-touch Control Panels, all sides IP 65

	Display	5.7-inch	6.5-inch	12-inch	15-inch	19-inch
	Resolution	640 x 480	640 x 480	800 x 600	1024 x 768	1280 x 1024
	Format	4:3	4:3	4:3	4:3	5:4
DVI/USB Extended interface, 50 m	without keys		CP7909	CP7901	CP7902	CP7903
	function keys		CP7919	CP7911	CP7912	CP7913
	numerical		CP7929	CP7921	CP7922	CP7923
	alphanumerical			CP7931	CP7932	CP7933

Single-touch Control Panels in stainless steel housing, all sides IP 65

	Display	5.7-inch	6.5-inch	12-inch	15-inch	19-inch
	Resolution	640 x 480	640 x 480	800 x 600	1024 x 768	1280 x 1024
	Format	4:3	4:3	4:3	4:3	5:4
DVI/USB Extended interface, 50 m	without keys			CP7901-14xx	CP7902-14xx	CP7903-14xx

Single-touch Panel PCs



Built-in Panel PCs, front side IP 65

	Display Resolution Format	5.7-inch 640 x 480 4:3	6.5-inch 640 x 480 4:3	7-inch 800 x 480 5:3	12-inch 800 x 600 4:3	15-inch 1024 x 768 4:3	19-inch 1280 x 1024 5:4	
CP62xx-xxxx-0020 – 3½-inch motherboard – Atom™ processor	without keys	CP6207	CP6209		CP6201	CP6202	CP6203	
	function keys		CP6219		CP6211	CP6212	CP6213	
	numerical		CP6229		CP6221	CP6222	CP6223	
	alphanumeric				CP6231	CP6232 CP6242	CP6233	
CP62xx-xxxx-0050/-0060 – 3½-inch motherboard – up to Core™ i3/i5/i7	without keys				CP6201	CP6202	CP6203	
	function keys				CP6211	CP6212	CP6213	
	numerical				CP6221	CP6222	CP6223	
	alphanumeric				CP6231	CP6232 CP6242	CP6233	
CP65xx – ATX motherboard – up to Core™ i3/i5/i7 – 7 slots free	without keys				CP6501	CP6502	CP6503	
	function keys				CP6511	CP6512	CP6513	
	numerical				CP6521	CP6522	CP6523	
	alphanumeric				CP6531	CP6532 CP6542	CP6533	
CP66xx – 3½-inch motherboard – ARM Cortex™-A8	without keys	CP6607	CP6609	CP6606	CP6601	CP6602	CP6603	
	function keys		CP6619		CP6611	CP6612	CP6613	
	numerical		CP6629		CP6621	CP6622	CP6623	
	alphanumeric				CP6631	CP6632	CP6633	
CP67xx-xxxx-0040/-0050 – 3½-inch motherboard – up to Atom™	without keys	CP6707	<i>i</i>		CP6701	<i>i</i>	CP6703	<i>i</i>
	function keys				CP6711	<i>i</i>	CP6713	<i>i</i>
	numerical				CP6721	<i>i</i>	CP6723	<i>i</i>
	alphanumeric				CP6731	<i>i</i>	CP6733	<i>i</i>
						CP6742	<i>i</i>	



CP72xx



CP77xx



CP770x-14xx



C3620



C3640

Panel PCs, all sides IP 65

	Display	6.5-inch	12-inch	15-inch	19-inch
	Resolution	640 x 480	800 x 600	1024 x 768	1280 x 1024
	Format	4:3	4:3	4:3	5:4
CP72xx – 3½-inch motherboard – up to Core™ i3/i5/i7	without keys		CP7201	CP7202	CP7203
	function keys		CP7211	CP7212	CP7213
	numerical		CP7221	CP7222	CP7223
	alphanumeric		CP7231	CP7232 CP7242	CP7233
CP77xx-xxxx-0030 – CP motherboard – up to Atom™	without keys	CP7709	CP7701	CP7702	CP7703
	function keys	CP7719	CP7711	CP7712	CP7713
	numerical	CP7729	CP7721	CP7722	CP7723
	alphanumeric		CP7731	CP7732	CP7733
CP77xx-xxxx-0040 – CP motherboard – Celeron® ULV	without keys		CP7701	CP7702	CP7703
	function keys		CP7711	CP7712	CP7713
	numerical		CP7721	CP7722	CP7723
	alphanumeric		CP7731	CP7732	CP7733
Stainless steel option			CP7701-14xx	CP7702-14xx	CP7703-14xx

Built-in Panel PCs, front side IP 65

	Display	6.5-inch	12-inch	15-inch	19-inch
	Resolution	640 x 480	800 x 600	1024 x 768	1280 x 1024
	Format	4:3	4:3	4:3	5:4
C36xx – ATX motherboard – up to Core™ i3/i5/i7 – 7 slots free	without keys		C3620	C3640	

Control cabinet Industrial PCs



C6515
basic configuration



C6515
with PCIe module slots



C6525
basic configuration



C6525
with PCIe module slots



C6525
with plug-in card slots

Control cabinet Industrial PCs

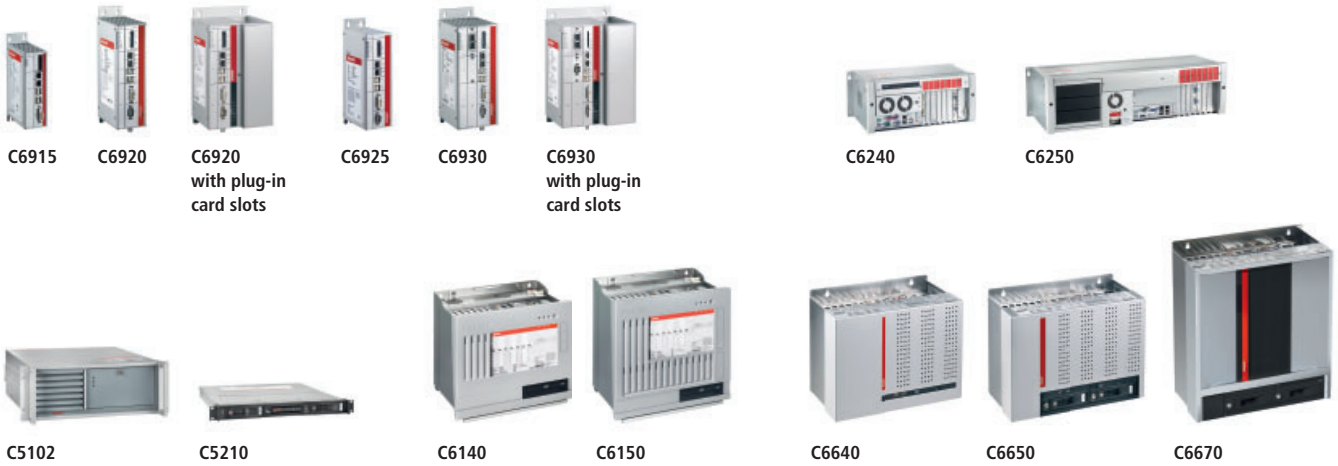
	Motherboard	3½-inch motherboard		
	Processor	Intel® Atom™	Intel® Celeron® ULV	Intel® Celeron®, 1.6 GHz Intel® Core™ i3/i5/i7 2 nd /3 rd generation
19-inch slide-in Industrial PC series C5xxx	7 slots, 4 rack units 1 Mini PCI slot, 1 rack unit			C5210-0010
Control cabinet PC series C61xx, connectors on top	7 slots			
Control cabinet PC series C62xx, connectors on front	7 slots			
Control cabinet PC series C65xx	1 Mini PCI slot			C6515-0040
	1 Mini PCI slot, RAID			C6525-0040
Control cabinet PC series C66xx	7 slots 7 slots, 2 removable frames 6 slots, 2 removable frames			
Control cabinet PC series C69xx, connectors on front	fanless	C6915-0010	<i>i</i>	
	1 Mini PCI slot, fanless	C6915-0000		C6925-0010
	1 Mini PCI slot, optional plug-in card slots			C6920-0040
	2 PCIe module slots	C6925-0030	<i>i</i>	C6925-0020 <i>i</i>
	1 Mini PCI slot, 2 PCIe module slots, optional plug-in card slots			C6930-0040


► www.beckhoff.com/Control-cabinet-PC



Product announcement

for availability status see www.beckhoff.com



ATX motherboard			
Intel® Celeron®, 2.2 GHz Intel® Core™ i3/i5/i7 4 th generation	Intel® Celeron®, 1,6 GHz Intel® Core™ i3/i5/i7 2 nd /3 rd generation	Intel® Pentium®, 2.3 GHz Intel® Core™ i3/i5/i7 4 th generation	Intel® Xeon®
	C5102-0050	C5102-0060	
C5210-0020			
	C6140-0050 C6150-0050	C6140-0060 C6150-0060	
	C6240-0050 C6250-0060	C6240-0060 C6250-0070	
C6515-0050 C6525-0050			
	C6640-0030 C6650-0030	C6640-0040 C6650-0040	
			C6670 
C6920-0050			
C6930-0050			

Options for Panel PCs and Control Panels

Options

- stainless steel housing
- special membrane keyboards
- integration of electro-mechanical keyboards
- flush-mounted touch screen
- adaptation of membrane colours
- integration of customer logos



Ethernet panel with individual front laminate



Stainless steel panel



Stainless steel panel with emergency stop



Customer-specific multi-touch Control Panel



Multi-touch Control Panel for machine tools



Multi-touch Control Panel with push-button extension

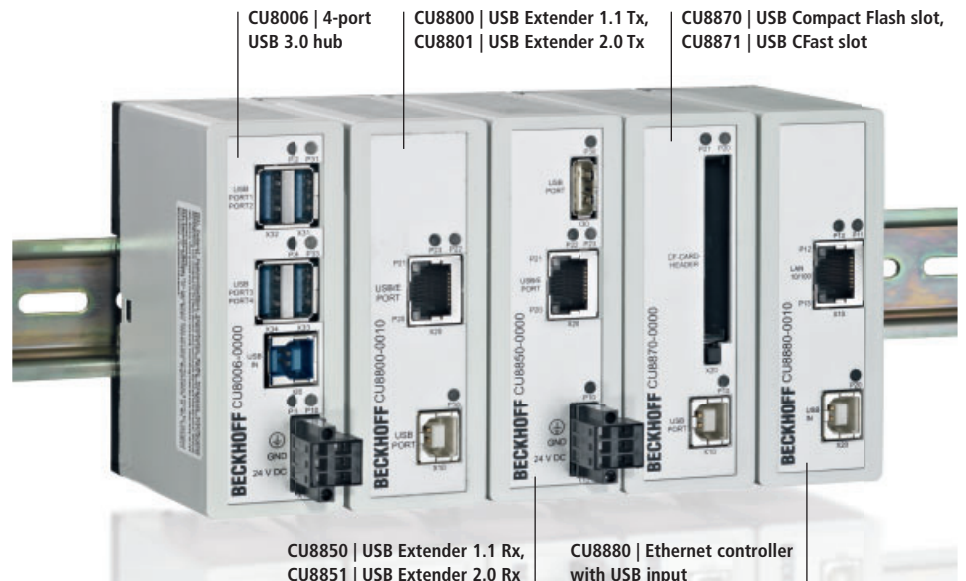


Control Panel with CNC push-button extension

Industrial PC accessories

CU8xxx modules

Different modules enable the use of various technologies in the industrial environment. All modules are intended for DIN rail mounting.



CU8006 | 4-port USB 3.0 hub

CU8800 | USB Extender 1.1 Tx, CU8801 | USB Extender 2.0 Tx

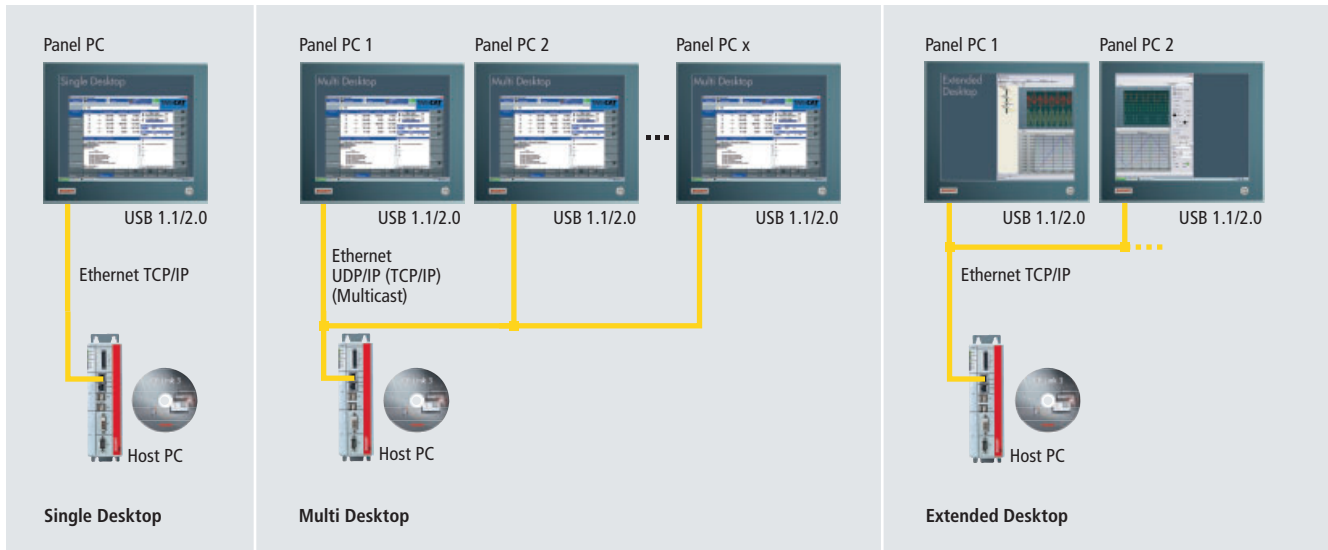
CU8870 | USB Compact Flash slot, CU8871 | USB CFast slot

CU8850 | USB Extender 1.1 Rx, CU8851 | USB Extender 2.0 Rx

CU8880 | Ethernet controller with USB input

CP-Link 3: Ethernet-based desktop transfer software

CP-Link 3 transfers the desktop of a PC via Ethernet to several Panel PCs and the operator mouse and keyboard entries to the host PC. The screen contents are captured by a virtual graphic adapter in the host PC and sent using Ethernet to one or more Panel PCs with Windows operating systems (CE, XP, Windows 7 Embedded Standard or Embedded 7). Networking can be done using cost-effective standard Ethernet cables (CAT 5) which are suitable for drag chains.

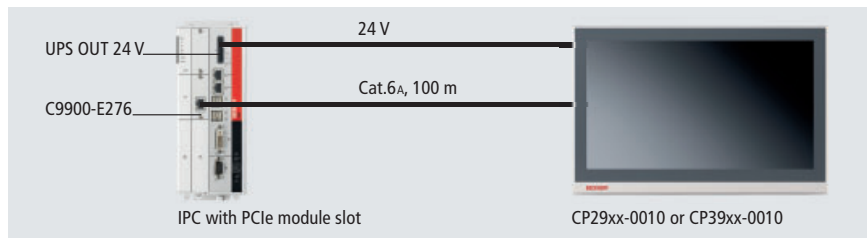


► www.beckhoff.com/CP-Link3

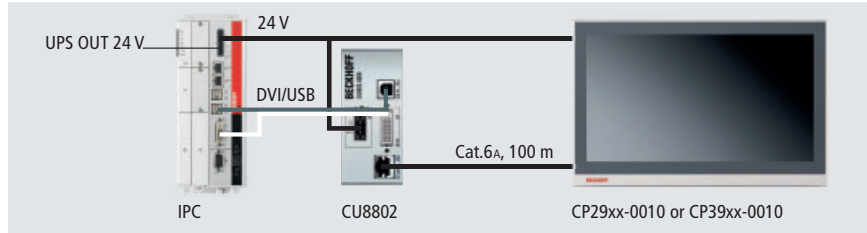
CP-Link 4: The One Cable Display Link

With CP-Link 4 operating panels can be located up to 100 m away from the Industrial PC. The single-cable solution can be used to transfer video signals, USB 2.0 and the power supply in a Cat.6_A cable, thus reducing cable and installation costs. A further benefit is the use of purely passive displays. The CP-Link 4 technology is supported by the new Beckhoff multi-touch panel series CP29xx-0010 (built-in version) and CP39xx-0010 (mounting arm version).

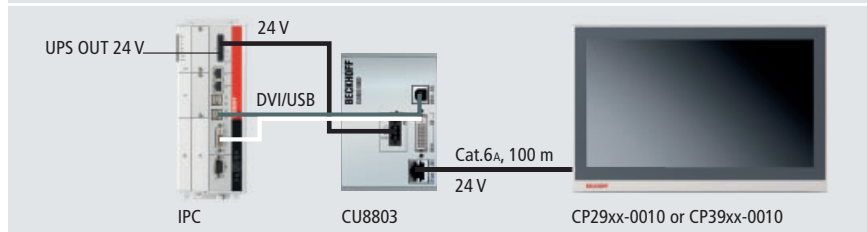
CP-Link 4 – The Two Cable Display Link:
via C9900-E276 PCIe module integrated
in the PC



CP-Link 4 – The Two Cable Display Link:
via CU8802 transmitter box



CP-Link 4 – The One Cable Display Link:
DVI, USB and 24 V via CU8803 transmitter box



► www.beckhoff.com/CP-Link4

Embedded PC



CX80xx



CX90xx



CX9020

Embedded PC			
Basic CPU	CX80xx	CX9000, CX9010	CX9020
Processor	32 bit, 400 MHz, ARM9	Intel® IXP420 with XScale® technology, 266/533 MHz clock frequency, ARM9	ARM Cortex™-A8, 1 GHz
Flash memory	512 MB microSD	32 MB Flash (internal, not expandable)	256 MB microSD (optionally expandable), 2 x microSD card slot
Internal main memory	64 MB RAM (internal, not expandable)	128 MB RAM (internal, not expandable)	1 GB DDR3 RAM
Interfaces	1 x Ethernet 10/100 Mbit/s, 1 x USB device (behind the front flap)	2 x RJ45 (Ethernet, internal switch), 10/100 Mbit/s	2 x RJ45 (Ethernet, internal switch), 10/100 Mbit/s, DVI-D, 4 x USB 2.0, 1 x optional interface
I/O interface	direct connection for K-bus or E-bus, automatic recognition	direct connection for K-bus or E-bus	direct connection for K-bus or E-bus, automatic recognition
System interfaces	optionally integrated or via EtherCAT Terminals	modularly expandable	optionally integrated
DVI/USB	–	CX90x0-N010	in the basic CPU
RS232	CX8080 <i>i</i>	CX9000-N030 CX9010-N030	CX9020-N030
RS422/RS485	CX8080 <i>i</i>	CX9000-N031 CX9010-N031	CX9020-N031
Audio	–	–	CX9020-N020
Ethernet	in the basic CPU	–	in the basic CPU
4-port USB hub	–	CX90x0-N070	in the basic CPU
Memory medium	–	CX90x0-A001	2 nd microSD slot in the basic CPU
Fieldbus interfaces	optionally integrated or via EtherCAT Terminals	via EtherCAT Terminals	optionally integrated or via EtherCAT Terminals
EtherCAT	CX8010 slave	–	CX9020-B110 slave
Lightbus	EL6720 master	EL6720 master	EL6720 master
PROFIBUS	CX8030 master CX8031 slave	EL6731 master EL6731-0010 slave	CX9020-M310 master CX9020-B310 slave
CANopen	CX8050 master CX8051 slave	EL6751 master EL6751-0010 slave	CX9020-M510 master CX9020-B510 slave
DeviceNet	EL6752 master EL6752-0010 slave	EL6752 master EL6752-0010 slave	EL6752 master EL6752-0010 slave
PROFINET RT	CX8093 device	–	CX9020-M930 controller CX9020-B930 device
EtherNet/IP	CX8095 slave <i>i</i>	–	CX9020-B950 slave <i>i</i>
SERCOS interface	CX8097 Sercos III slave <i>i</i>	–	–
UPS	1-second UPS	–	1-second UPS (optional)

► www.beckhoff.com/Embedded-PC



Product announcement

for availability status see www.beckhoff.com



CX1010



CX50xx



CX51xx

CX1010	CX5010, CX5020	CX5120, CX5130, CX5140
Intel® Pentium® MMX-compatible, 500 MHz clock frequency	Intel® Atom™, 1.1/1.6 GHz clock frequency	CX5120: Intel® Atom™ E3815, 1.46 GHz, 1 core CX5130: Intel® Atom™ E3827, 1.75 GHz, 2 cores CX5140: Intel® Atom™ E3845, 1.91 GHz, 4 cores
128 MB Compact Flash card (optionally expandable)	128 MB Compact Flash card (optionally expandable)	slot for CFast and MicroSD card, cards not included
256 MB DDR RAM (internal, not expandable)	CX5010: 512 MB RAM (internal, not expandable) CX5020: 512 MB RAM (optional expandable to 1 GB)	CX5120: 2 GB DDR3 RAM (not expandable) CX5130/40: 4 GB DDR3 RAM (not expandable)
1 x RJ45 (Ethernet), 10/100 Mbit/s	2 x RJ45, 10/100/1,000 Mbit/s, DVI, 4 x USB 2.0, 1 x optional interface	2 x RJ45, 10/100/1000 Mbit/s, DVI-I, 4 x USB 2.0, 1 x optional interface
via power supply module (K-bus, K-bus/IP-Link, E-bus)	direct connection for K-bus or E-bus, automatic recognition	direct connection for K-bus or E-bus, automatic recognition
modularly expandable	optionally integrated	optionally integrated
CX1010-N010	in the basic CPU	in the basic CPU
CX1010-N030 (COM 1/2)	CX50x0-N030	CX51x0-N030
CX1010-N040 (COM 3/4)		
CX1010-N031 (COM 1/2)	CX50x0-N031	CX51x0-N031
CX1010-N041 (COM 3/4)		
CX1010-N020	CX50x0-N020	CX51x0-N020
CX1010-N060	in the basic CPU	in the basic CPU
–	in the basic CPU	in the basic CPU
–	in the basic CPU	in the basic CPU
modularly expandable	optionally integrated or via EtherCAT Terminals	optionally integrated or via EtherCAT Terminals
–	CX50x0-B110 slave	CX51x0-B110 slave
CX1500-M200 master	EL6720 master	EL6720 master
CX1500-B200 slave		
CX1500-M310 master	CX50x0-M310 master	CX51x0-M310 master
CX1500-B310 slave	CX50x0-B310 slave	CX51x0-B310 slave
CX1500-M510 master	CX50x0-M510 master	CX51x0-M510 master
CX1500-B510 slave	CX50x0-B510 slave	CX51x0-B510 slave
CX1500-M520 master	EL6752 master	EL6752 master
CX1500-B520 slave	EL6752-0010 slave	EL6752-0010 slave
–	CX50x0-M930 controller	CX51x0-M930 controller
–	CX50x0-B930 device	CX51x0-B930 device
–	CX50x0-B950 slave	i CX51x0-B950 slave
CX1500-M750 Sercos II master	–	–
CX1100-0910, -0900	1-second UPS	1-second UPS



CX1020



CX1030

Embedded PC

Basic CPU	CX1020	CX1030
Processor	Intel® Celeron® M ULV, 1 GHz clock frequency	Intel® Pentium® M, 1.8 GHz clock frequency
Flash memory	128 MB Compact Flash card (optionally expandable)	128 MB Compact Flash card (optionally expandable)
Internal main memory	256 MB DDR RAM (expandable to 512 MB, 1 GB)	256 MB DDR RAM (expandable to 512 MB, 1 GB)
Interfaces	2 x RJ45 (Ethernet, internal switch)	2 x RJ45 (Ethernet, internal switch), 10/100 Mbit/s
I/O interface	via power supply module (K-bus, K-bus/IP-Link, E-bus)	via power supply module (K-bus, K-bus/IP-Link, E-bus)
System interfaces	modularly expandable	modularly expandable
DVI/USB	CX1020-N010	CX1030-N010
RS232	CX1020-N030 (COM 1/2) CX1020-N040 (COM 3/4)	CX1030-N030 (COM 1/2) CX1030-N040 (COM 3/4)
RS422/RS485	CX1020-N031 (COM 1/2) CX1020-N041 (COM 3/4)	CX1030-N031 (COM 1/2) CX1030-N041 (COM 3/4)
Audio	CX1020-N020	CX1030-N020
Ethernet	CX1020-N060	CX1030-N060
4-port USB hub	–	–
Memory medium	–	–
USB extension	–	–
Fieldbus interfaces	modularly expandable	modularly expandable
EtherCAT	–	–
Lightbus	CX1500-M200 master CX1500-B200 slave	CX1500-M200 master CX1500-B200 slave
PROFIBUS	CX1500-M310 master CX1500-B310 slave	CX1500-M310 master CX1500-B310 slave
CANopen	CX1500-M510 master CX1500-B510 slave	CX1500-M510 master CX1500-B510 slave
DeviceNet	CX1500-M520 master CX1500-B520 slave	CX1500-M520 master CX1500-B520 slave
PROFINET RT	–	–
EtherNet/IP	–	–
SERCOS interface	CX1500-M750 Sercos II master	CX1500-M750 Sercos II master
UPS	CX1100-0920	CX1100-0930



CX2020



CX2030



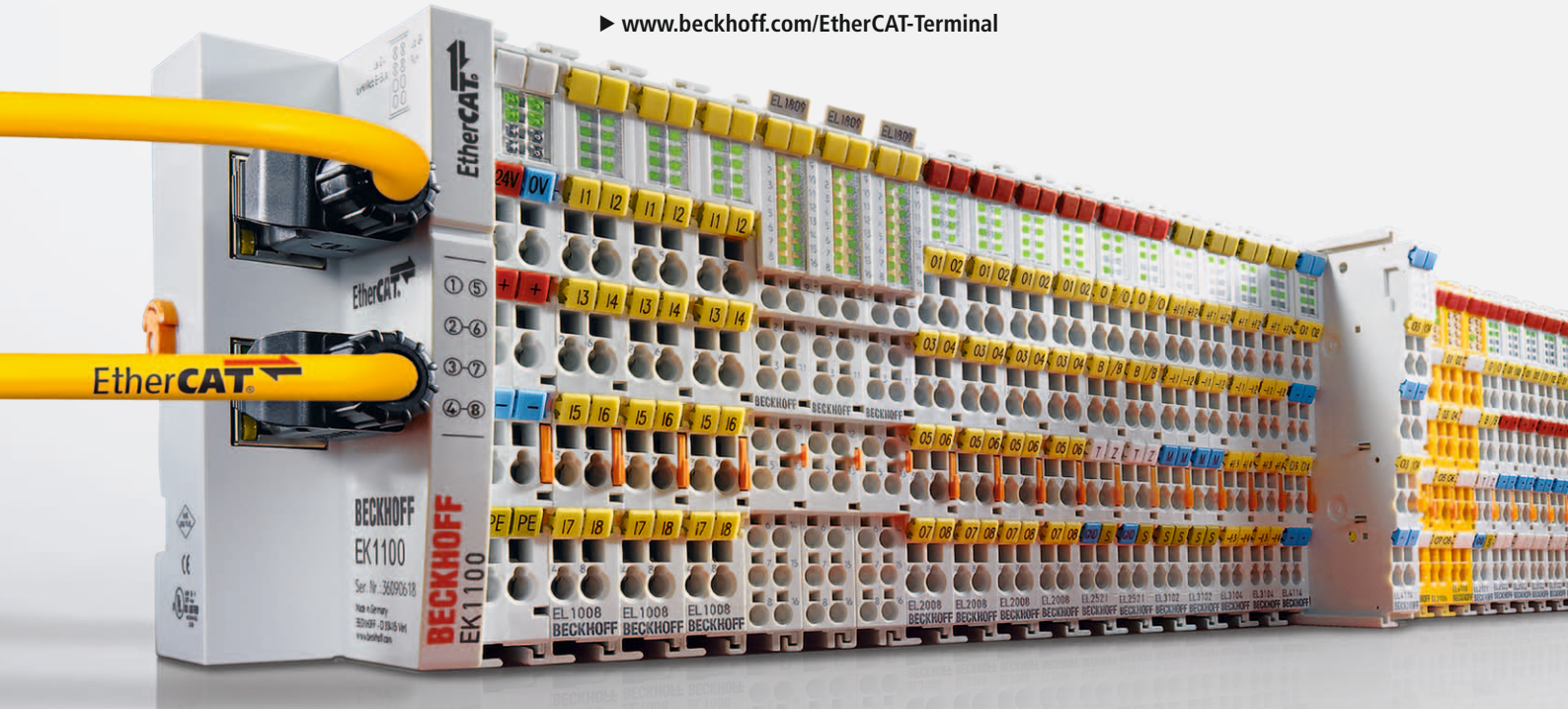
CX2040

CX2020	CX2030	CX2040
Intel® Celeron® 1.4 GHz, 1 core	Intel® Core™ i7 1.5 GHz, 2 cores	Intel® Core™ i7 2.1 GHz, 4 cores
8 GB CFast flash card (optionally extendable)	8 GB CFast flash card (optionally extendable)	8 GB CFast flash card (optionally extendable)
2 GB DDR3 RAM	2 GB DDR3 RAM	4 GB DDR3 RAM
2 x RJ45 (10/100/1,000 Mbit/s), DVI-I, 4 x USB 2.0, 1 x optional interface	2 x RJ45 (10/100/1,000 Mbit/s), DVI-I, 4 x USB 2.0, 1 x optional interface	2 x RJ45 (10/100/1,000 Mbit/s), DVI-I, 4 x USB 2.0, 1 x optional interface
via power supply module (K-bus or E-bus, automatic recognition)	via power supply module (K-bus or E-bus, automatic recognition)	via power supply module (K-bus or E-bus, automatic recognition)
modularly expandable	modularly expandable	modularly expandable
in the basic CPU, 2 nd DVI port as option CX2020-N010	in the basic CPU, 2 nd DVI port as option CX2030-N010	in the basic CPU, 2 nd DVI port as option CX2040-N010
CX2020-N030 or CX2500-0030	CX2030-N030 or CX2500-0030	CX2040-N030 or CX2500-0030
CX2020-N031 or CX2500-0031	CX2030-N031 or CX2500-0031	CX2040-N031 or CX2500-0031
CX2500-0020	CX2500-0020	CX2500-0020
in the basic CPU or CX2500-0060	in the basic CPU or CX2500-0060	in the basic CPU or CX2500-0060
in the basic CPU or CX2500-0070	in the basic CPU or CX2500-0070	in the basic CPU or CX2500-0070
in the basic CPU or CX2550-0010/ CX2550-0020	in the basic CPU or CX2550-0010/ CX2550-0020	in the basic CPU or CX2550-0010/ CX2550-0020
CX2550-0179 (USB 1.1) or CX2550-0279 (USB 2.0)	CX2550-0179 (USB 1.1) or CX2550-0279 (USB 2.0)	CX2550-0179 (USB 1.1) or CX2550-0279 (USB 2.0)
optionally integrated or via EtherCAT Terminals	optionally integrated or via EtherCAT Terminals	optionally integrated or via EtherCAT Terminals
CX2020-B110 slave	CX2030-B110 slave	CX2040-B110 slave
EL6720 master	EL6720 master	EL6720 master
CX2020-M310 or CX2500-M310 master	CX2030-M310 or CX2500-M310 master	CX2040-M310 or CX2500-M310 master
CX2020-B310 or CX2500-B310 slave	CX2030-B310 or CX2500-B310 slave	CX2040-B310 or CX2500-B310 slave
CX2020-M510 or CX2500-M510 master	CX2030-M510 or CX2500-M510 master	CX2040-M510 or CX2500-M510 master
CX2020-B510 or CX2500-B510 slave	CX2030-B510 or CX2500-B510 slave	CX2040-B510 or CX2500-B510 slave
EL6752 master	EL6752 master	EL6752 master
EL6752-0010 slave	EL6752-0010 slave	EL6752-0010 slave
CX2020-M930 controller	CX2030-M930 controller	CX2040-M510 controller
CX2020-B930 device	CX2030-B930 device	CX2040-B510 device
CX2020-B950 slave	CX2030-B950 slave	CX2040-B950 slave
–	–	–
CX2100-0904, CX2100-0914	CX2100-0904, CX2100-0914	CX2100-0904, CX2100-0914

EtherCAT Terminals 32

- IP 20 EtherCAT I/O system
- Real-time Ethernet performance retained into each terminal
- Integration of highly precise measurement technology, condition monitoring and drive technology
- Gateways for subordinate fieldbus systems
- TwinSAFE PLC and safety I/Os

► www.beckhoff.com/EtherCAT-Terminal



Bus Terminals 42

- 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

Fieldbus Box 48

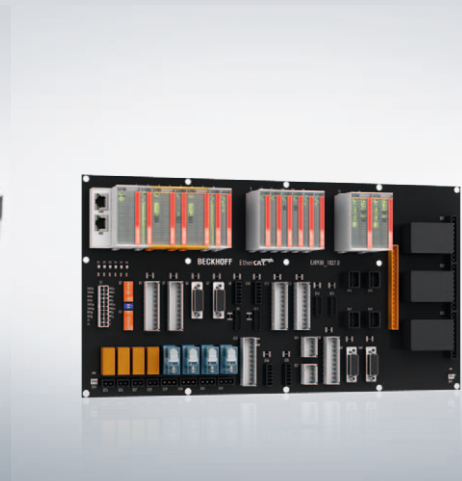
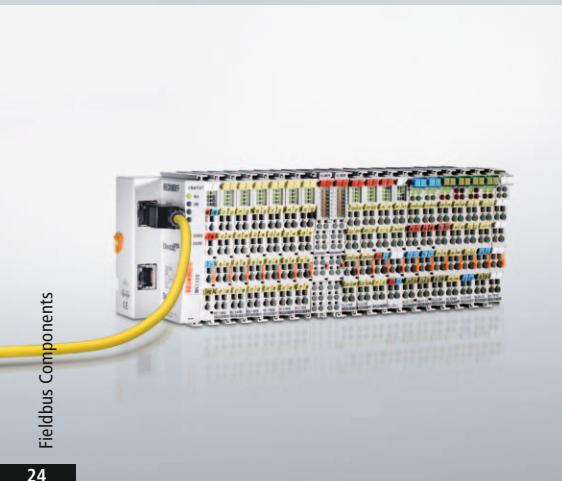
- Open, fieldbus-neutral IP 67 I/O system
- 12 fieldbus systems, 24 signal types
- Compact and robust
- Can be mounted directly on machines, outside of control cabinets and terminal boxes while reducing machine footprint
- IO-Link box modules for inexpensive point-to-point connections

► www.beckhoff.com/FieldbusBox

EtherCAT Plug-in Modules 40

- Very compact EtherCAT I/O system in IP 20 for plug-in into a circuit board (signal distribution board)
- Optimised for high-volume production
- Application-specific connector interface
- Use of cable harnesses avoids wiring errors.

► www.beckhoff.com/EtherCAT-Plug-in-Modules



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 optimised for EtherCAT. Invented by Beckhoff, this real-time Ethernet solution for industrial automation has global acceptance and is characterised 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 36

- 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

▶ www.beckhoff.com/EtherCAT-Box

Infrastructure Components 51

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

▶ www.beckhoff.com/Infrastructure-components



- Comprehensive, modular I/O system for all signal types and fieldbus systems
- Universal product range optimised for EtherCAT
- High investment security: Mature I/O technology based on more than 20 years of success in the field
- Beckhoff is the I/O pioneer, developing the Bus Terminal concept and EtherCAT.

System overview EtherCAT I/O



EK EtherCAT Coupler series



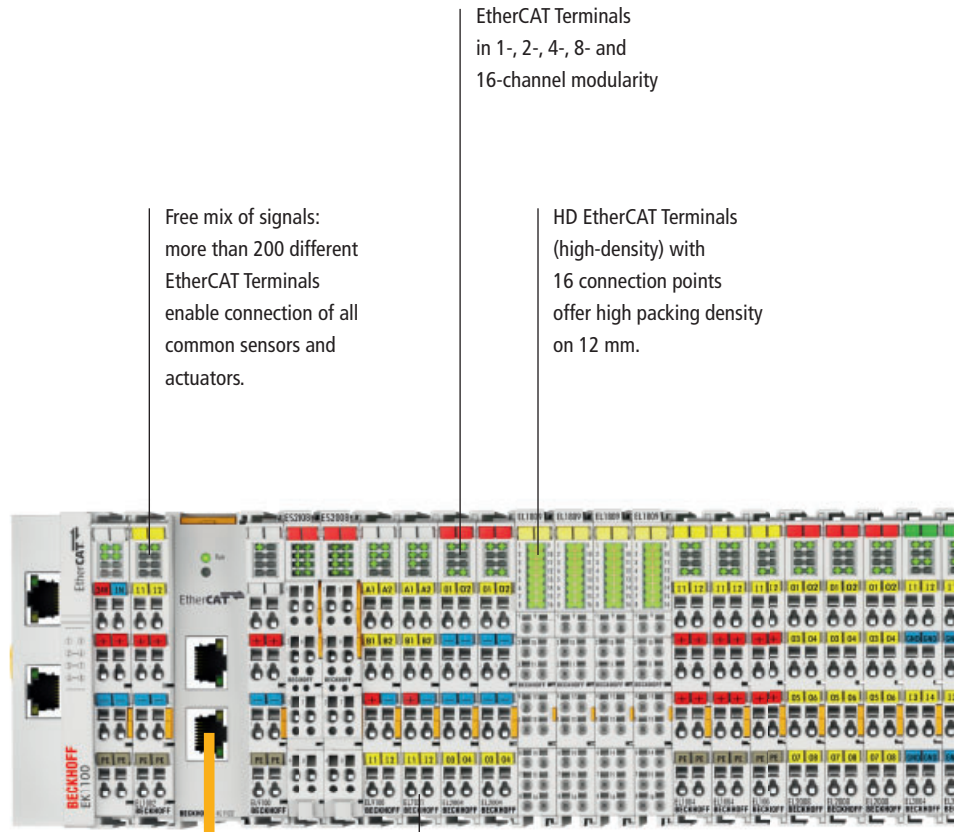
EtherCAT Coupler with integrated digital I/Os



Bus Coupler (e.g. PROFIBUS) for EtherCAT Terminals



Embedded PC series CX, further Embedded PCs see page 20



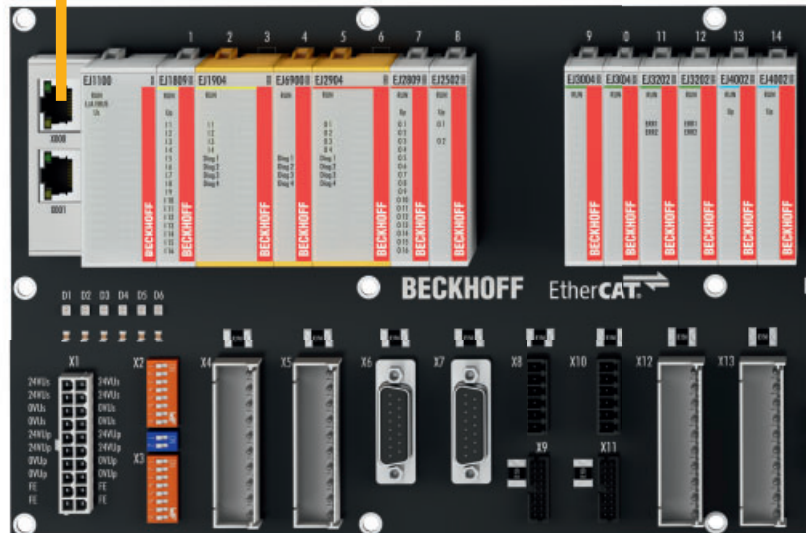
EtherCAT Terminals in 1-, 2-, 4-, 8- and 16-channel modularity

Free mix of signals: more than 200 different EtherCAT Terminals enable connection of all common sensors and actuators.

HD EtherCAT Terminals (high-density) with 16 connection points offer high packing density on 12 mm.

100 m Industrial Ethernet cable (100BASE-TX)

Motion terminals for stepper, servo or DC motors or hydraulic valves



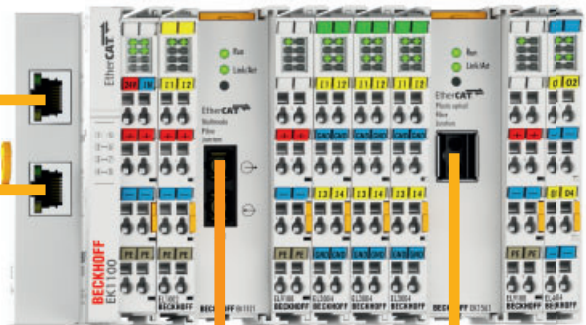
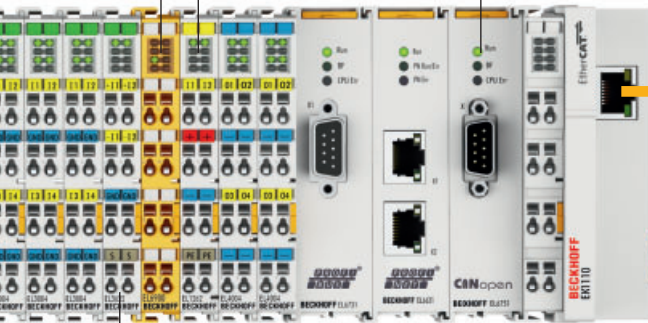
TwinSAFE: safety I/Os and compact Safety PLC for up to 128 safetyrelevant bus devices

Optional fieldbus integration via decentralised fieldbus master/slave terminals

Ultra-fast I/O terminals for I/O response times < 100 µs for fast I/O, oversampling and timestamp

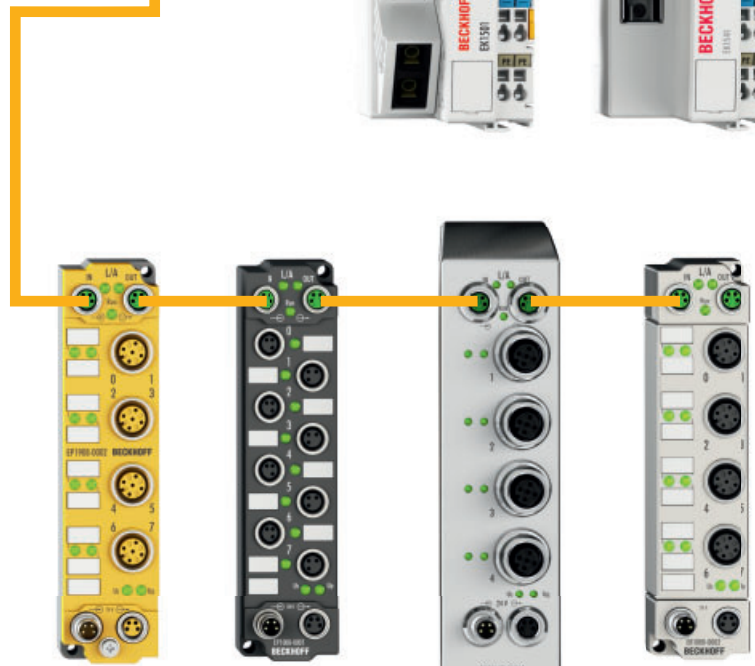
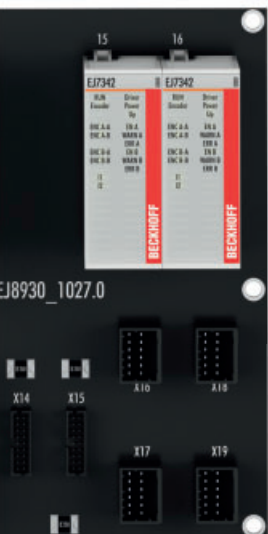
High-speed measurement, high-precision measurement, Condition Monitoring, energy monitoring

EtherCAT plug-in modules: very compact EtherCAT I/O system in IP 20 for plug-in into a circuit board (signal distribution board)



2,000/20,000 m fibre optic (100BASE-FX)

50 m Plastic Optical Fibre (100BASE-FX POF)



IP 67 EtherCAT Box

IP 69K EtherCAT Box (stainless steel)

IP 67 EtherCAT Box (die-cast zinc)

System overview fieldbus I/O



Bus Coupler series BK, the link between Bus Terminals and fieldbus



Bus Terminal Controller series BC with integrated IEC 61131-3 PLC



Bus Terminal Controller series BX with integrated IEC 61131-3 PLC and extended interfaces



Embedded PC series CX, further Embedded PCs see page 20

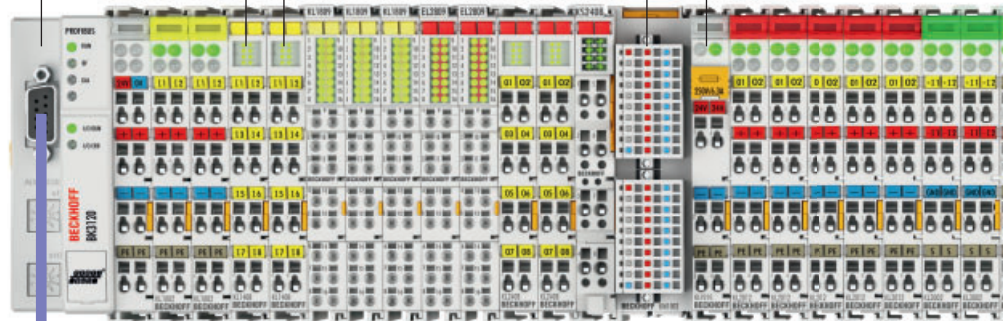
The head station of the Bus Terminals: from Bus Coupler with fieldbus interface to Embedded PC

Free mix of signals: about 400 different Bus Terminals for connection to all common sensors and actuators

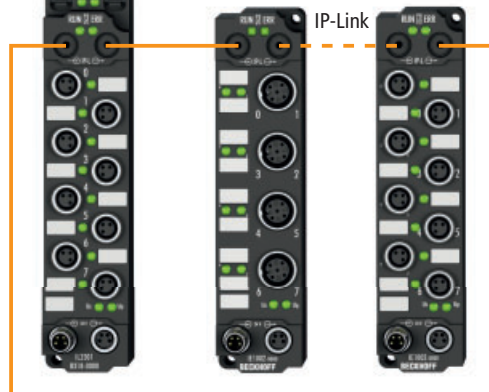
Potential feed terminals enable configuration of different potential groups.

Bus Terminals in 1-, 2-, 4-, 8- and 16-channel modularity

The terminal modules with plug-in wiring combine 16, 32 or 64 digital I/Os within a very small space and with high packing density.



IP 67 Fieldbus Box



Compact Box

Coupler Box/ PLC Box

Extension Box modules

IP-Link

3-phase power measurement capability enables all relevant electrical data of the supply network to be measured.

Communication terminals enable the integration of subsystems such as AS-Interface, RS232 and RS485.

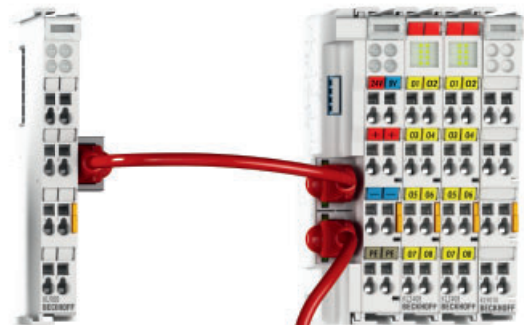
Integrated safety: the TwinSAFE Bus Terminals enable the connection of all common safety sensors and actuators.

Bus Terminals with a maximum measurement error of $\pm 0.01\%$

IO-Link box modules



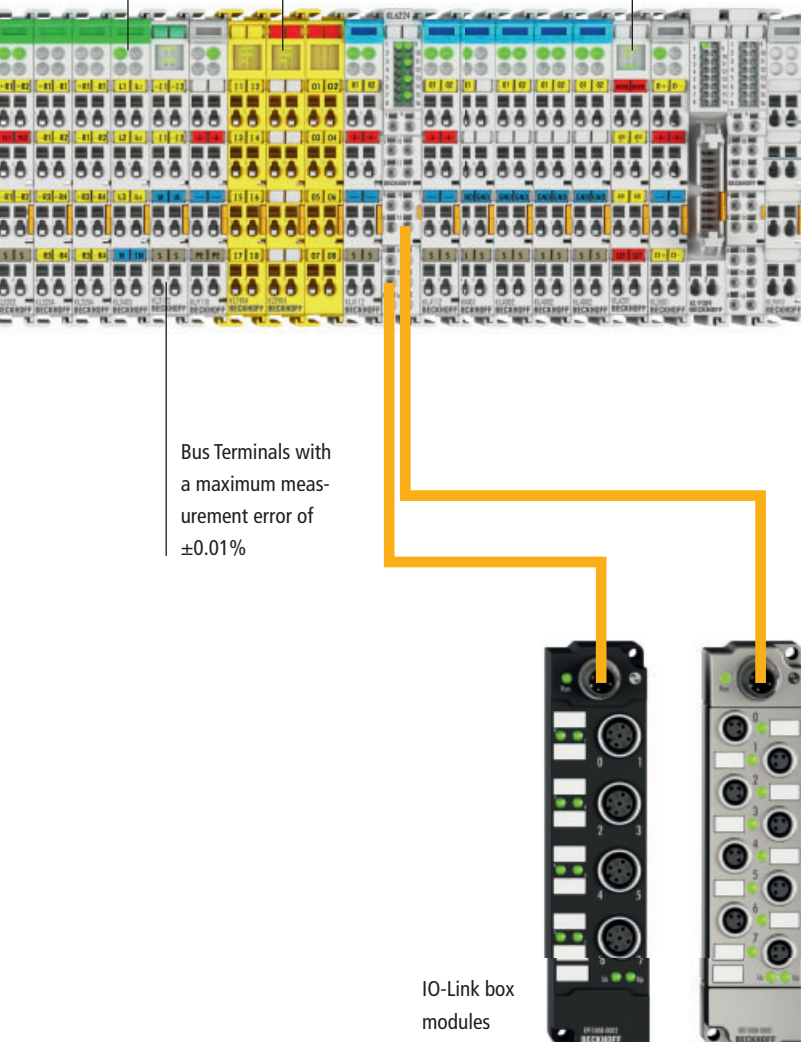
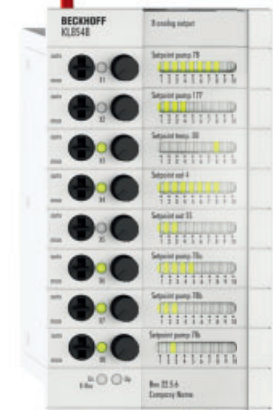
Bus end terminal











The terminal bus extension enables the connection of up to 255 Bus Terminals (instead of 64) to a single station.



Manual operating modules enable switching, controlling and monitoring of digital and analog signals as well as setting and reading of data and values in the event of a controller failure. Process data connection via K-bus interface with K-bus extension (up to 31 modules). Signal connection via KL9309.



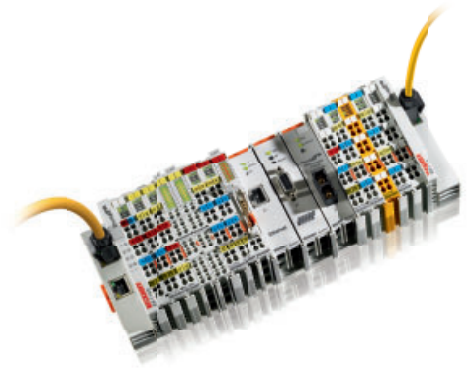
Product overview fieldbus systems

Fieldbus	EtherCAT Terminal	EtherCAT Box	EtherCAT Plug-in Modules	Bus Terminal		Fieldbus Box	
	Couplers/ Gateways	Modules		Bus Cou- plers/Master terminals	PLC (IEC 61131-3)	Compact Box	Coupler Box
 EtherCAT	EK1xxx	EPxxxx	EJxxxx	BK1120			IL230x-B110
	EL6695 bridge terminal	EQxxxx		BK1150			
		ERxxxx		BK1250			
 LIGHTBUS	EL6720 master terminal			BK20x0		IPxxxx-B200	IL230x-B200
 PROFINET	EK3100			BK3xx0	BC31x0	IPxxxx-B31x	IL230x-B31x
	EL6731 master/slave terminal			LC3100	BX3100		
 INTERBUS	EL6740 slave terminal			BK40x0		IPxxxx-B400	IL230x-B400
 CANopen	EL6751 master/slave terminal			BK51xx	BC5150	IPxxxx-B51x	IL230x-B51x
				LC5100	BX5100		
DeviceNet	EL6752 master/slave terminal			BK52x0	BC5250	IPxxxx-B52x	IL230x-B52x
				LC5200	BX5200		
ControlNet				BK7000			
 CC-Link				BK7150			
Modbus				BK73x0	BC7300	IPxxxx-B730	IL230x-B730
SERCOS <small>the automation bus</small>	EK9700			BK75x0			
RS485	EL6021, EL6022	EP600x		BK8000	BC8050 BX8000	IPxxxx-B800	IL230x-B800
RS232	EL6001, EL6002	EP600x		BK8100	BC8150	IPxxxx-B810	IL230x-B810
Ethernet TCP/IP	EK9000			BK9xx0	BC9xxx BX9000		IL230x-B90x
	EL6601, EL6614 switch port						
 PROFINET	EK9300			BK9xx3			IL230x-B903
	EL6631 RT controller/device terminal						
	EL6632 IRT controller terminal						
EtherNet/IP	EK9500			BK9xx5			IL230x-B905
	EL6652 master/slave terminal						
 USB				BK9500			
AS-Interface	EL6201			KL62x1			
IO-Link	EL6224	EP6224		KL6224			
EIB/KNX				KL6301			
LON				KL6401			
MP-Bus				KL6771			
M-Bus				KL6781			
DALI/DSI				KL6811			
IEEE 1588	EL6688						
DMX	EL6851						
EnOcean				KL658x			
SMI				KL68x1			

► www.beckhoff.com/FieldbusComponents

		Fieldbus Modules	Infrastructure Components	Embedded PC	Drive Technology	Accessories
PLC Box (IEC 61131-3)	IO-Link-Box	Modules	Interfaces	Master/Slave	Servo Drives	Connectors/ Cables
		FM33xx-B110	FC90xx, FC11xx	CXxxxx	AX5xxx	ZS1090-000x
			CUxxxx		AX8xxx	ZK1090-9191
			EP9xxx			ZK1090-xxxx
			FC200x	CX1500-M/B200		Z1xxx
IL230x-C31x		FM33xx-B310	FC31xx	CXxxxx		ZB3xxx
				CX2500-M/B310		ZK/ZS1031
						ZB4200
			FC51xx	CXxxxx		ZB51xx
				CX2500-M/B510		ZK/ZS1052
			FC52xx	CX1500-M/B520		ZB52xx
						ZK/ZS1052
				CXxxxx		ZK/ZS1031
			FC75xx	CXxxxx		
				CXxxxx		ZK/ZS1031
IL230x-C810				CXxxxx		ZK/ZS1031
IL230x-C900			FC90xx	CXxxxx		ZS1090
			CU2xxx, CU2508 Ethernet Switch			ZB90x0
			CU2508	CXxxxx		ZK1090-xxxx
						ZS1090
						ZB90x0
						ZK1090-xxxx
			CU2508	CXxxxx		
	EPIxxxx, ERxxxx					

EtherCAT Terminal



EtherCAT Couplers

EtherCAT Couplers E-bus	EK1100	EK1101 ID switch	EK1101-0080 ID switch, Fast Hot Connect		
	EK1501 ID switch, multimode fibre optic	EK1501-0010 ID switch, singlemode fibre optic	EK1541 ID switch, POF		
EtherCAT Couplers E-bus with integrated digital I/Os	EK1814 4 inputs + 4 outputs	EK1818 8 inputs + 4 outputs	EK1828 4 inputs + 8 outputs	EK1828-0010 8 outputs	
	EK1914 4 inputs + 4 outputs, 2 safe inputs + 2 safe outputs	EK1960 TwinSAFE Compact Controller, 20 safe digital inputs, 10 safe digital outputs			
EtherCAT Couplers K-bus	BK1120	BK1150 "Compact"	BK1250 between E-bus and K-bus terminals		
Bus Couplers (for ELxxxx)	EK3100 PROFIBUS <i>i</i>	EK9000 Ethernet <i>i</i>	EK9300 PROFINET RT <i>i</i>	EK9500 EtherNet/IP <i>i</i>	EK9700 Sercos III <i>i</i>
Extension system and junctions	EK1110 extension end terminal	EK1122 2-port junction	EK1122-0080 2-port junction, Fast Hot Connect	EK11322 <i>i</i> 2-port Power over EtherCAT junction	EK1521 multimode fibre optic junction
	EK1521-0010 singlemode fibre optic junction	EK1561 POF junction			

Embedded PCs with E-bus interface see page **20**, Infrastructure Components see page **51**

EtherCAT Terminal | Digital input: EL1xxx/ES1xxx

Signal	2-channel	4-channel	8-channel	16-channel
5/12/24 V DC	EL1382 24 V DC, thermistor	EL1124 5 V DC	EL1144 12 V DC	
24 V DC (filter 3.0 ms)	EL1002 type 3	EL1004 type 3	EL1004-0020 > 2,500 V	EL1008 type 3
		EL1104 with sensor supply, type 3	EL1804 8 x 24 V, 4 x 0 V, type 3	EL1808 8 x 24 V DC, type 3
		EL1084 negative switching	EL1024 type 2	EL1859 type 3, 8 inputs, 8 outputs, I _{max} = 0.5 A
24 V DC (filter 10 µs)	EL1012 type 3	EL1014 type 3	EL1034 potential-free inputs, type 1	EL1018 type 3
		EL1114 with sensor supply, type 3	EL1814 8 x 24 V, 4 x 0 V, type 3	EL1819 type 3
			EL1094 negative switching	EL1098 negative switching
24 V DC (XFC, T_{ON}/T_{OFF} 1 µs)	EL1202 fast input, type 3		EL1258 multi-timestamping	
	EL1252 timestamp, type 3		EL1259 8 multi-timestamping inputs and outputs	
	EL1262 oversampl., type 3			
24 V DC (safe inputs)		EL1904 TwinSAFE, 4 safe inputs	EL1908 <i>i</i> TwinSAFE, 8 safe inputs	
48 V DC		EL1134 filter 10 µs, type 1		
120 V AC/DC	EL1712 power contacts <i>i</i>			
230 V AC	EL1702 power contacts <i>i</i>			
	EL1722 no power contacts <i>i</i>			
Counter	EL1502 100 kHz, 32 bit, type 1			
	EL1512 1 kHz, 16 bit, type 1			

The standard EtherCAT Terminals (ELxxxx) can be optionally ordered as ESxxxx with pluggable wiring level.
EN 61131-2 specification ► www.beckhoff.com/EN61131-2

i **Product announcement** for availability status see www.beckhoff.com

EtherCAT Terminal | Digital output: EL2xxx/ES2xxx, EM2xxx

Signal	2-channel		4-channel	8-channel	16-channel
5 V DC			EL2124 $I_{MAX} = \pm 20 \text{ mA}$		
12 V DC			EL2024-0010 $I_{MAX} = 2.0 \text{ A}$		
24 V DC	EL2042 2 x 4 A/1 x 8 A				
24 V DC ($I_{MAX} = 0.5 \text{ A}$)	EL2002		EL2004	EL2008	EM2042 D-sub connection
				EL2808 8 x 0 V	EL2872 flat-ribbon cable
					EL2809
			EL2084 negative switching	EL2088 negative switching	EL2819 with diagnostics i
				EL1859 8 inputs, 8 outputs, filter 3.0 ms, type 3	EL2889 negative switching
24 V DC ($I_{MAX} = 2.0 \text{ A}$)	EL2022		EL2024	EL2828	
	EL2032 with diagnostic		EL2034 with diagnostic		
24 V DC (XFC, $T_{ON}/T_{OFF} 1 \mu\text{s}$)	EL2202 push-pull outputs	EL2212 overexcitation, multi-timestamping		EL1259 8 multi-timestamping inputs and outputs	
	EL2252 timestamp	EL2262 oversampling		EL2258 multi-timestamping	
24 V DC (safe outputs)	EL2901 i TwinSAFE, 1 safe output	EL2902 i TwinSAFE, 2 safe outputs	EL2904 TwinSAFE, 4 safe outputs		
				EL2798	
Relay (up to 230 V AC)	EL2602 $I_{MAX} = 5.0 \text{ A}$, make contact, power contacts	EL2622 $I_{MAX} = 5.0 \text{ A}$, make contact, no power contacts	EL2624 $I_{MAX} = 2.0 \text{ A}$, make contact, no power contacts		
	EL2612 $I_{MAX} = 2.0 \text{ A}$, change-over, no power contacts	EL2652 $I_{MAX} = 1.0 \text{ A}$, change-over, no power contacts			
Triac (up to 230 V AC)	EL2712 i 12...230 V AC, 0.5 A, power contacts	EL2722 i 12...230 V AC, 1.0 A, mutually locked outputs			
	EL2732 i 12...230 V AC, 0.5 A, no power contacts				
PWM	EL2502 24 V DC, 1.0 A				
Frequency output	EL2521 1-channel AB, 0...500 kHz	EL2522 2-channel AB, 1-channel ABC, 0...4 MHz			
Current control	EL2595 1-channel, LED constant current terminal		EL2535 24 V DC, 50 mA, 1 A or 2 A		
			EL2545 i 50 V DC, 3.5 A		

EtherCAT Terminal | Analog input: EL3xxx/ES3xxx

Signal	1-channel	2-channel	4-channel	8-channel				
±75 mV, 24 bit		EL3602-0010						
±200 mV		EL3602-0002						
0...10 V	EL3061 12 bit	EL3161 16 bit	EL3062 12 bit	EL3162 16 bit	EL3064 12 bit	EL3164 16 bit	EL3068 12 bit	
0...30 V, 12 bit		EL3062-0030						
±10 V	EL3001 single-ended, 12 bit	EL3002 single-ended, 12 bit	EL3004 single-ended, 12 bit	EL3008 single-ended, 12 bit				
	EL3101 differential input, 16 bit	EL3102 differential input, 16 bit	EL3602 differential input, 24 bit	EL3702 differential input, 16 bit, oversampling	EL3104 differential input, 16 bit			
0...20 mA	EL3041 single-ended, 12 bit	EL3141 single-ended, 16 bit	EL3042 single-ended, 12 bit	EL3142 single-ended, 16 bit	EL3742 differential input, 16 bit, oversampling	EL3044 single-ended, 12 bit	EL3144 single-ended, 16 bit	EL3048 single-ended, 12 bit
	EL3011 differential inp., 12 bit	EL3111 differential inp., 16 bit	EL3012 differential inp., 12 bit	EL3112 differential inp., 16 bit	EL3612 differential inp., 24 bit	EL3014 differential inp., 12 bit	EL3114 differential inp., 16 bit	
4...20 mA	EL3051 single-ended, 12 bit	EL3151 single-ended, 16 bit	EL3052 single-ended, 12 bit	EL3152 single-ended, 16 bit		EL3054 single-ended, 12 bit	EL3154 single-ended, 16 bit	EL3058 single-ended, 12 bit
	EL3021 differential inp., 12 bit	EL3121 differential inp., 16 bit	EL3022 differential inp., 12 bit	EL3122 differential inp., 16 bit		EL3024 differential inp., 12 bit	EL3124 differential inp., 16 bit	
±10 mA			EL3142-0010 single-ended, 16 bit					
Thermo- couple/mV	EL3311 16 bit		EL3312 16 bit		EL3314 16 bit	EL3314-0010 24 bit	EL3318 16 bit	
Resistance ther- mometer (RTD)	EL3201 16 bit		EL3202 16 bit		EL3204 2-wire, 16 bit	EL3214 3-wire, 16 bit	EL3208 16 bit	
					EL3204-0200 16 bit, freely parameterisable			
Potentiometer							EL3255 5-channel	
Resistor bridge	EL3351	EL3356 self-calibration						
3-phase power measurement			EL3403 500 V AC, 1 A	EL3413 690 V AC, 5 A	EL3433 500 V AC, 10 A			
Measurement technology	EL3681 digital multimeter terminal, 18 bit			EL3692 resistance measure- ment, 10 mΩ...10 MΩ	EL3773 power monitoring			
Condition Monitoring			EL3632 IEPE terminal, acceleration sensors					

EtherCAT Terminal | Analog output: EL4xxx/ES4xxx

Signal	1-channel	2-channel	4-channel	8-channel
0...10 V	EL4001 12 bit	EL4002 12 bit	EL4004 12 bit	EL4008 12 bit
		EL4102 16 bit	EL4104 16 bit	
±10 V	EL4031 12 bit	EL4032 12 bit	EL4034 12 bit	EL4038 12 bit
		EL4132 16 bit	EL4134 16 bit	
		EL4732 16 bit, oversampling		
0...20 mA	EL4011 12 bit	EL4012 12 bit	EL4014 12 bit	EL4018 12 bit
		EL4112 16 bit	EL4114 16 bit	
		EL4712 16 bit, oversampling		
4...20 mA	EL4021 12 bit	EL4022 12 bit	EL4024 12 bit	EL4028 12 bit
		EL4122 16 bit	EL4124 16 bit	
±10 mA		EL4112-0010 16 bit		

The standard EtherCAT Terminals (ELxxxx) can be optionally ordered as ESxxxx with pluggable wiring level.

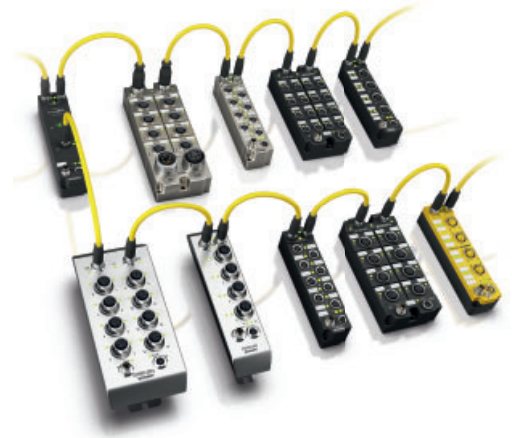
EtherCAT Terminal | Special functions: EL/ES5xxx, EL/ES6xxx, EL/ES7xxx, EM7xxx

Signal	1-channel		2-channel	4-channel	
Position measurement	EL5001 SSI encoder interface	EL5021 SinCos encoder interface, 1 V _{pp}	EL5002 SSI encoder interface		
	EL5001-0011 SSI monitor terminal	EL5101 differential inputs, RS485, incremental encoder interface	EL5032 EnDat 2.2 interface		
Position measurement. (32 bit)		EL5151 24 V DC, incremental encoder interface	EL5152 24 V DC, incremental encoder interface		
Communication	EL6001 RS232, 115.2 kbaud	EL6021 RS422/RS485, 115.2 kbaud	EL6080 memory terminal 128 kbyte	EL6002 RS232, 115.2 kbaud, D-sub	
	EL6090 display terminal	EL6070 licence key terminal	EL6688 IEEE 1588 master/slave	EL6022 RS422/RS485, 115.2 kbaud, D-sub	EL6224 IO-Link master
	EL6601 switch port			EL6692 EtherCAT bridge EL6695 EtherCAT bridge, high performance <i>i</i>	EL6614 switch port
Communication (master terminal)	EL6201 AS-Interface	EL6631 PROFINET RT	EL6632 PROFINET IRT <i>i</i>	EL6652 EtherNet/IP	
	EL6720 Lightbus	EL6731 PROFIBUS	EL6751 CANopen		
	EL6752 DeviceNet	EL6851 DMX			
Communication (slave terminal ELxxx-0010)	EL6631 PROFINET RT	EL6731 PROFIBUS	EL6740 Interbus	EL6652 EtherNet/IP	
	EL6751 CANopen	EL6752 DeviceNet	EL6851 DMX		
Safety	EL6900 TwinSAFE PLC	EL6930 TwinSAFE/ PROFIsafe logic and gateway			
Motion	EL7031 stepper motor terminal, I _{max} = 1.5 A, 24 V DC	EL7041 stepper motor terminal, I _{max} = 5.0 A, 50 V DC, incremental encoder	EL7047 <i>i</i> stepper motor terminal, I _{max} = 5.0 A, 50 V DC, incremental encoder, vector control	EL7342 DC motor output stage, 50 V DC, 3.5 A, incremental encoder	EM7004 4 incremental encoders, 32 digital I/O 24 V DC, 4 analog outputs ±10 V
	EL7201 servomotor terminal 50 V DC, 2.8 A _{RMS}	EL7201-0010 servomotor terminal, 50 V DC, 2.8 A _{RMS} , OCT		EL7332 DC motor output stage, 24 V DC, 1.0 A	
	EL7211 servomotor terminal, 50 V DC, 4.5 A _{RMS}	EL7211-0010 servomotor terminal, 50 V DC, 4.5 A _{RMS} , OCT			

EtherCAT Terminal | System terminals: EL9xxx/ES9xxx

Signal	System	Signal	Potential supply	Power supply and accessories		
System	EL9011 bus end cap	24 V DC	EL9100	EL9410 input 24 V DC, output 5 V DC/2 A	EL9505 input 24 V DC, output 5 V DC, 0.5 A	
	EL9070 shield terminal		EL9110 diagnostic	EL9508 input 24 V DC, output 8 V DC, 0.5 A	EL9510 input 24 V DC, output 10 V DC, 0.5 A	
	EL9080 isolation terminal		EL9200 with fuse	EL9512 input 24 V DC, output 12 V DC, 0.5 A	EL9515 input 24 V DC, output 15 V DC, 0.5 A	
	EL9195 shield terminal		EL9210 diagnostic, with fuse	EL9540 surge filter terminal for field supply	EL9550 surge filter terminal for system/field supply	
Potential distribution terminal	EL9180 2 clamping units per power contact		EL9520 AS-Interface potential supply with filter	EL9560 input 24 V DC, output 24 V DC, 0.1 A with electrical isolation		
	EL9181 2 x 8 terminal points		120... 230 V AC	EL9150 with LED		
	EL9182 8 x 2 terminal points			EL9160 diagnostic <i>i</i>		
	EL9183 1 x 16 terminal points			EL9190		
	EL9184 8 x 24 V DC, 8 x 0 V DC			EL9250 with fuse, with LED <i>i</i>		
	EL9185 4 clamping units at 2 power contacts			EL9260 diagnostic, with fuse <i>i</i>		
	EL9186 8 x 24 V DC	EL9290 with fuse <i>i</i>				
	EL9187 8 x 0 V DC	µF		EL9576 brake chopper terminal, up to 72 V DC, 155 µF		
EL9188 16 x 24 V DC						
EL9189 16 x 0 V DC						

EtherCAT Box



EtherCAT Box Digital I/O						
Input		8 x M8	16 x M8	4 x M12	8 x M12	Other
24 V DC	8-channel filter 3.0 ms	EP1008-0001 ER1008-0001		EP1008-0002 EQ1008-0002 ER1008-0002	EP1008-0022 ER1008-0022	
	8-channel filter 10 µs	EP1018-0001 ER1018-0001		EP1018-0002 ER1018-0002		
	8-channel filter 10 µs, negative switching	EP1098-0001 ER1098-0001				
	8-channel 2-channel timestamp	EP1258-0001 ER1258-0001		EP1258-0002 ER1258-0002		
	8-channel multi-function input			EP1518-0002 ER1518-0002		
	8-channel TwinSAFE, 8 safe inputs			EP1908-0002		
	16-channel filter 3.0 ms		EP1809-0021 ER1809-0021		EP1809-0022 EQ1809-0022 ER1809-0022	
	16-channel filter 10 µs		EP1819-0021 ER1819-0021		EP1819-0022 ER1819-0022	
	16-channel filter 10 µs, D-sub socket, 25-pin					EP1816-0008
	16-channel filter 10 µs, D-sub socket, 25-pin, acceleration sensor					EP1816-3008
Output		8 x M8	16 x M8	4 x M12	8 x M12	Other
24 V DC	8-channel $I_{MAX} = 0.5 A$	EP2008-0001 ER2008-0001		EP2008-0002 EQ2008-0002 ER2008-0002	EP2008-0022 ER2008-0022	
	8-channel $I_{MAX} = 2 A, \sum 4 A$	EP2028-0001 ER2028-0001		EP2028-0002 ER2028-0002		
	8-channel $I_{MAX} = 2.8 A, \sum 16 A$				EP2028-0032 ER2028-1032	
	8-channel $I_{MAX} = 2 A, \sum 4 A$, with diagnostics	EP2038-0001 ER2038-0001		EP2038-0002 ER2038-0002		
	16-channel $I_{MAX} = 0.5 A, \sum 4 A$		EP2809-0021 ER2809-0021		EP2809-0022 EQ2809-0022 ER2809-0022	
	16-channel $I_{MAX} = 0.5 A, \sum 4 A$, D-sub socket, 25-pin					EP2816-0008
	16-channel $I_{MAX} = 0.5 A, \sum 4 A$, 2 x D-sub socket, 9-pin					EP2816-0010
	16-channel $I_{MAX} = 0.5 A, \sum 4 A$, M16, 19-pin					EP2816-0004
	24-channel $I_{MAX} = 0.1 A$, D-sub socket, 25-pin					EP2817-0008
	25 V AC/ 30 V DC	4-channel relay output			EP2624-0002 ER2624-0002	

EPxxxx: industrial housing in IP 67, EQxxxx: stainless steel housing in IP 69K, ERxxxx: zinc die-cast housing in IP 67

EtherCAT Box | Digital I/O

Combi		8 x M8	16 x M8	4 x M12	8 x M12	Other
24 V DC	8-channel 4 input + 4 output, filter 3.0 ms, $I_{max} = 0.5$ A	EP2308-0001 ER2308-0001		EP2308-0002 ER2308-0002		
	8-channel 4 input + 4 output, filter 10 μ s, $I_{max} = 0.5$ A	EP2318-0001 ER2318-0001		EP2318-0002 ER2318-0002		
	8-channel 4 input + 4 output, filter 3.0 ms, $I_{max} = 2$ A	EP2328-0001 ER2328-0001		EP2328-0002 ER2328-0002		
	8-channel 8 input/output, freely configurable, filter 10 μ s, $I_{max} = 0.5$ A	EP2338-0001 ER2338-0001		EP2338-0002 ER2338-0002		
	8-channel 8 input/output, freely configurable, filter 3.0 ms, $I_{max} = 0.5$ A	EP2338-1001 ER2338-1001		EP2338-1002 ER2338-1002		
	16-channel 16 input/output, freely configurable, filter 3.0 ms, $I_{max} = 0.5$ A, $\Sigma 4$ A		EP2339-0021 ER2339-0021		EP2339-0022 EQ2339-0022 ER2339-0022	
	16-channel 16 input/output, freely configurable, filter 10 μ s, $I_{max} = 0.5$ A, $\Sigma 4$ A		EP2349-0021 ER2349-0021		EP2349-0022 ER2349-0022	
	16-channel 8 input + 8 output, filter 10 μ s, $I_{max} = 0.5$ A, D-sub socket, 25-pin					EP2316-0008
	16-channel 8 input + 8 output, filter 10 μ s, $I_{max} = 0.5$ A, IP 20 plug					EP2316-0003

► www.beckhoff.com/EtherCAT-Box

We reserve the right to make technical changes.

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EtherCAT Box | Analog I/O

Input		M8	M12
±10 V, 0/4...20 mA	2-channel parameterisable, with galvanic isolation, differential inputs, 16 bit		EP3162-0002
	4-channel parameterisable, differential input, 16 bit		EP3174-0002 EQ3174-0002 ER3174-0002
	4-channel parameterisable, single-ended, 16 bit		EP3184-0002 ER3184-0002
Resistance thermometer	4-channel resistance thermometer (RTD), PT100, PT200, PT500, PT1000, Ni100, Ni120, Ni1000, 16 bit		EP3204-0002 EQ3204-0002 ER3204-0002
Thermo-couple/mV	4-channel thermocouple, type J, K, L, B, E, N, R, S, T, U, 16 bit		EP3314-0002 EQ3314-0002 ER3314-0002
Resistor bridge	1-channel resistor bridge, 24 bit, self-calibration		EP3356-0022
Pressure measuring	4-channel differential/absolute pressure measurement, 6 digital inputs, 2 digital outputs, 4 pressure inputs -1...1 bar (differential pressure to fifth connection)	EP3744-0041	
	4-channel differential/absolute pressure measurement, 6 digital inputs, 2 digital outputs, 4 pressure inputs 0...7 bar (differential pressure to fifth connection)	EP3744-1041	
Output		M8	M12
±10 V, 0/4...20 mA	4-channel parameterisable, 16 bit		EP4174-0002 ER4174-0002
	4-channel 2 input + 2 output, parameterisable, 16 bit		EP4374-0002 ER4374-0002

EPxxxx: industrial housing in IP 67, EQxxxx: stainless steel housing in IP 69K, ERxxxx: zinc die-cast housing in IP 67

EtherCAT Box | Special functions

Function	M8	M12	Other
Position measurement	Incremental encoder interface 32 or 16 bit, binary, RS485		EP5101-0002 ER5101-0002
	Incremental encoder interface 32 or 16 bit, binary, 24 V sensor supply		EP5101-1002 ER5101-1002
	Incremental encoder interface 32 or 16 bit, binary, 24 V		EP5151-0002 ER5151-0002
Communication	Serial interface 1-channel, RS232, RS422/RS485, 5 V DC/1 A		EP6001-0002 ER6001-0002
	Serial interface 2-channel, RS232, RS422/RS485		EP6002-0002 ER6002-0002
	IO-Link master Class A		EP6224-2022
	IO-Link master Class B		EP6224-3022
Motion	Stepper motor module 50 V DC, 1.5 A, incremental encoder, 2 digital inputs, 1 digital output		EP7041-1002 ER7041-1002
	Stepper motor module 50 V DC, 5 A, incremental encoder, 2 digital inputs, 1 digital output		EP7041-0002 ER7041-0002 EP7041-2002 ER7041-2002 EP7041-3002 ER7041-3002
	DC motor output stage 2-channel, 50 V DC, 3.5 A		EP7342-0002 ER7342-0002
	Multi-functional I/O box 8 digital inputs/outputs, 2 x tachometer input, 2 x 0/4...20 mA input, 1 x 0/4...20 mA output, 1 x 1.2 A PWM output		EP8309-1022 ER8309-1022
System	EtherCAT Box 3 decimal ID switches	EP1111-0000	
	EtherCAT junction 2-channel	EP1122-0001	
	Power distribution 4/4-channel		EP9214-0023 7/8" plug, 7/8" socket
	Power distribution with current measurement/data logging 4/4-channel		EP9224-0023 7/8" plug, 7/8" socket
Infrastructure Components	EtherCAT junction 8 ports	EP9128-0021	
	EtherCAT media converter fibre optic 1-channel		EP9521-0020
	EtherCAT media converter fibre optic 2-channel		EP9522-0020

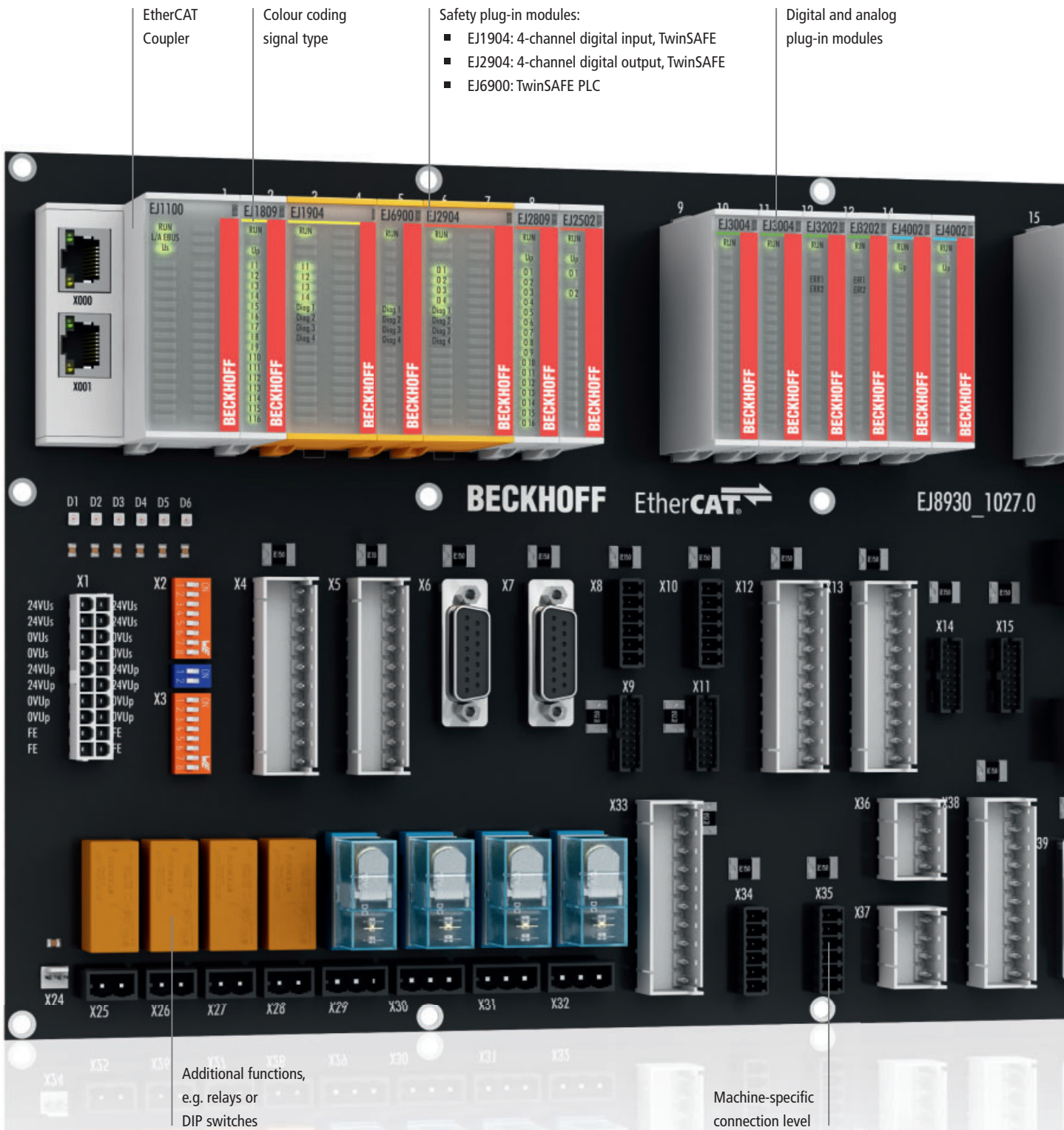
► www.beckhoff.com/EtherCAT-Box

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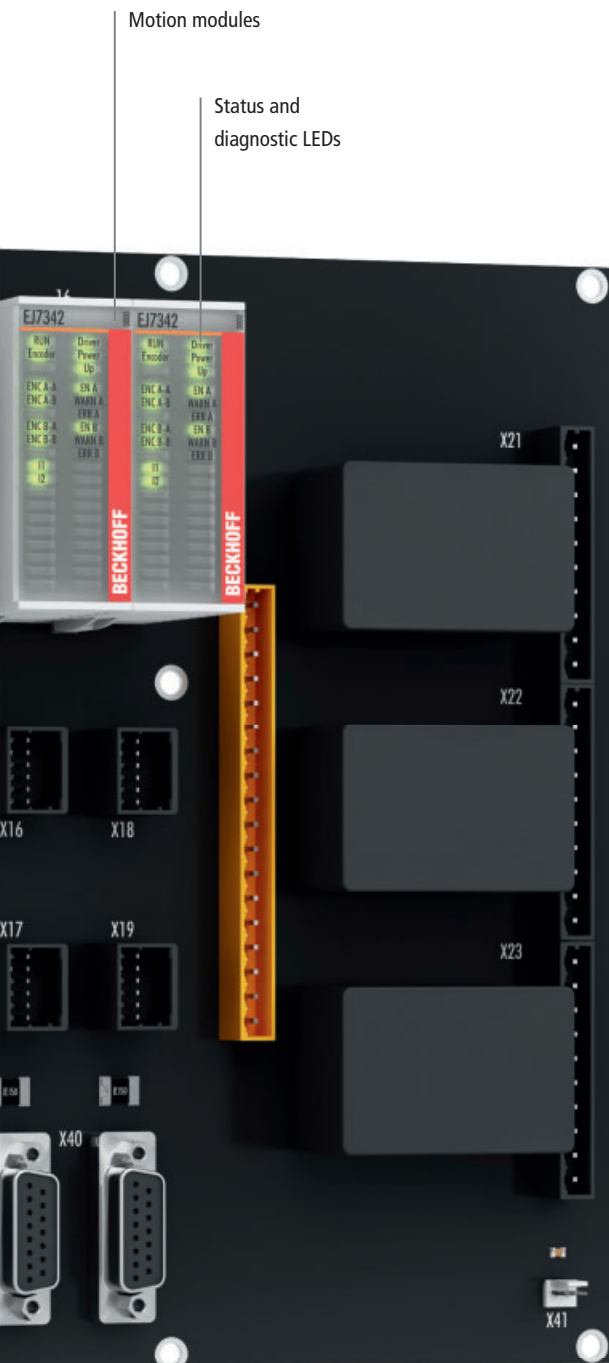
EtherCAT Plug-in Modules

Design example



Highlights

- very compact EtherCAT I/O solution
- made by Beckhoff: the inventor of EtherCAT
- reduced installation costs
- application-specific connector interface
- safety integrated
- use of cable harnesses avoids wiring errors
- modular and flexible
- based on the same technology as the Beckhoff EtherCAT Terminals, the largest EtherCAT I/O portfolio on the market
- optimised for high-volume production
- improved diagnostics



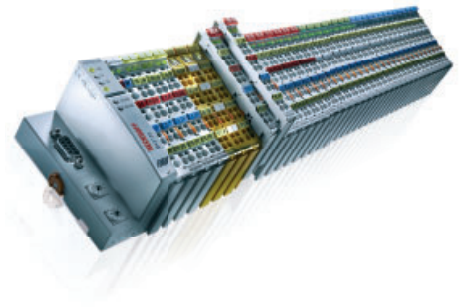
EtherCAT plug-in modules

Almost all of the EtherCAT Terminals can also be manufactured in EJ design as EtherCAT plug-in modules. EJ modules that are not yet available can be developed on a project-specific basis in parallel to the development of the signal distribution board.

► www.beckhoff.com/EtherCAT-Plug-in-Modules

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Bus Terminal



	Bus Coupler					PLC		
Fieldbus slave	Standard	Economy only digital I/Os	Economy plus	Compact	Low Cost only digital I/Os	Controller (IEC 61131-3)		
						Program memory 32/96 kbyte	Program memory 48 kbyte	Program memory 128 kbyte
EtherCAT			BK1120	BK1150 BK1250				
LIGHTBUS	BK2000	BK2010	BK2020					
PROFINET		BK3010 1.5 Mbaud						
	BK3100 12 Mbaud	BK3110 12 Mbaud	BK3120 12 Mbaud	BK3150 12 Mbaud	LC3100 12 Mbaud	BC3100 12 Mbaud	BC3150 12 Mbaud	
			BK3520 12 Mbaud, fibre optic					
INTERBUS	BK4000		BK4020					
CANopen		BK5110	BK5120	BK5150 BK5151	LC5100		BC5150	
DeviceNet	BK5200	BK5210	BK5220	BK5250	LC5200		BC5250	
ControlNet	BK7000							
CC-Link				BK7150				
Modbus	BK7300			BK7350		BC7300	BC8050 BC8150	
serCOS the automation bus	BK7500		BK7520					
RS485	BK8000						BC8050	
RS232	BK8100						BC8150	
Ethernet TCP/IP	BK9000			BK9050		BC9000	BC9050	BC9020
	BK9100 2-channel switch					BC9100 2-channel switch	BC9191 Room Controller	BC9191-0100 Room Controller
								BC9120 2-channel switch
PROFINET	BK9103 2-channel switch			BK9053				
EtherNet/IP	BK9105 2-channel switch			BK9055				
USB	BK9500							

► www.beckhoff.com/BusTerminal

		Embedded PC						
Program memory 256 kbyte	CX80xx	CX900x, CX9010	CX9020	CX1010	CX50xx	CX51xx	CX1020, CX1030	CX20xx
	CX8010		optional ⁽²⁾		optional ⁽²⁾	optional ⁽²⁾		optional ⁽²⁾
				optional ⁽¹⁾			optional ⁽¹⁾	
	CX8030 master		optional ⁽²⁾	optional ⁽¹⁾	optional ⁽²⁾	optional ⁽²⁾	optional ⁽¹⁾	optional ⁽²⁾
BX3100 12 Mbaud	CX8031 slave		optional ⁽²⁾	optional ⁽¹⁾	optional ⁽²⁾	optional ⁽²⁾	optional ⁽¹⁾	optional ⁽²⁾
BX5100	CX8050 master		optional ⁽²⁾	optional ⁽¹⁾	optional ⁽²⁾	optional ⁽²⁾	optional ⁽¹⁾	optional ⁽²⁾
	CX8051 slave		optional ⁽²⁾	optional ⁽¹⁾	optional ⁽²⁾	optional ⁽²⁾	optional ⁽¹⁾	optional ⁽²⁾
BX5200								
		optional ⁽³⁾	optional ⁽³⁾	optional ⁽³⁾	optional ⁽³⁾	optional ⁽³⁾	optional ⁽³⁾	optional ⁽³⁾
	CX8097							
BX8000	CX8080	optional ⁽²⁾	optional ⁽²⁾	optional ⁽²⁾	optional ⁽²⁾	optional ⁽²⁾	optional ⁽²⁾	optional ⁽²⁾
BX8000	CX8080	optional ⁽²⁾	optional ⁽²⁾	optional ⁽²⁾	optional ⁽²⁾	optional ⁽²⁾	optional ⁽²⁾	optional ⁽²⁾
BX9000	CX8090	CX9000	CX9020	CX1010	CX5010	CX5120	CX1020	CX2020
		CX9010			CX5020	CX5130	CX1030	CX2030
						CX5140		CX2040
	CX8093	optional ⁽³⁾	optional ⁽²⁾	optional ⁽³⁾	optional ^(2,3)	optional ^(2,3)	optional ⁽³⁾	optional ^(2,3)
	CX8095	optional ⁽³⁾	optional ⁽²⁾	optional ⁽³⁾	optional ^(2,3)	optional ^(2,3)	optional ⁽³⁾	optional ^(2,3)

Bus Terminal Digital input: KL1xxxx/KS1xxx						KM1xxx
Signal	2-channel	4-channel		8-channel	16-channel	4-/16-/32-/64-ch.
5 V DC		KL1124 filter 0.2 ms				
24 V DC (filter 3.0 ms)	KL1002 type 3	KL1104 type 3	KL1304 type 2	KL1408 type 3	KL1809 type 3	
	KL1302 type 2	KL1402 type 3	KL1154 positive/negative switching	KL1184 negative switching	KL1488 negative switching	KL1862 flat-ribbon cable, type 3
	KL1052 positive/negative switching	KL1352 Namur	KL1404 4 x 2-wire connection, type 3	KL1804 8 x 24 V, 4 x 0 V, type 3	KL1808 8 x 24 V DC, type 3	KL1889 negative switching
	KL1212 short-circuit-protected sensor supply, type 1	KL1362 break-in alarm			KL1859 8 inputs, 8 outputs, type 3, I _{max} = 0.5 A	KL1862-0010 flat-ribbon cable, type 3, negative switching
24 V DC (filter 0.2 ms)	KL1012 type 3	KL1312 type 2	KL1114 type 3	KL1314 type 2	KL1418 type 3	KL1819 type 3
		KL1412 type 3	KL1164 positive/negative switching	KL1194 negative switching	KL1498 negative switching	KL1872 flat-ribbon cable, type 3
			KL1414 4 x 2-wire connection, type 3	KL1434 4 x 2-wire connection, type 2		
			KL1814 8 x 24 V, 4 x 0 V, type 3			
24 V DC	KL1232 pulse expansion	KL1382 thermistor	KL1904 TwinSAFE, 4 safe inputs			KL1819 type 3
≥ 48 V DC	KL1032 filter 3.0 ms	KL1712-0060				KL1819 type 3
120 V AC/DC	KL1712					KL1819 type 3
230 V AC	KL1702	KL1722 no power contacts				KL1819 type 3
Counter (24 V DC)	KL1501 up/down, 100 kHz	KL1512 up/down, 1 kHz, 16 bit				KL1819 type 3

The standard Bus Terminals (KLxxxx) can be optionally ordered as KSxxxx with pluggable wiring level.
EN 61131-2 specification ► www.beckhoff.com/EN61131-2

Bus Terminal Digital output: KL2xxx/KS2xxx						KM2xxx
Signal	1-channel	2-channel	4-channel	8-channel	16-channel	2-/4-/16-/32-/64-ch.
5 V DC			KL2124			
24 V DC (I _{MAX} = 0.5 A)		KL2012	KL2114	KL2408	KL2809	
					KL2819 with diagnostics	KM2002 16-channel
		KL2032 reverse voltage protection	KL2184 negative switching	KL2488 negative switching	KL2889 negative switching	KM2004 32-channel
			KL2134 reverse voltage protection	KL2808 8 x 0 V	KL2872 flat-ribbon cable	KM2008 64-channel
		KL2212 diagnostic, protected sensor supply	KL2404 4 x 2-wire	KL1859 8 inputs, 8 outputs, filter 3.0 ms, type 3	KL2872-0010 flat-ribbon cable, negative switching	KM2042 16-channel, D-sub connection
24 V DC (I _{MAX} = 2.0 A)		KL2022	KL2424 4 x 2-wire	KL2828 8 x 2-wire		
24 V AC/DC (I _{MAX} = 2.0 A), solid state relay			KL2784	KL2798		
24 V DC			KL2794 potential-free			
		KL2442 2 x 4 A/1 x 8 A	KL2904 TwinSAFE, 4 safe outputs			
Relay 125/400 V AC	KL2631 400 V AC, make contact	KL2612 125 V AC, change-over				
230 V AC	KL2641 relay, make contact, manual operation, 16 A	KL2602 relay, make contact	KL2622 relay, make contact, no power contacts			KM2604 relay, 16 A, 4-channel
	KL2751 universal dimmer, 300 W	KL2652 relay, change-over	KL2702 solid state relay, 0.3 A			KM2614 relay, 16 A, 4-channel, manual operation
	KL2761 universal dimmer, 600 W	KL2712 triac	KL2722 triac, mutually locked outputs			KM2774 triac outputs
	KL2701 solid state relay, 3 A	KL2732 triac, mutually locked outputs, no power contacts	KL2692 cycle monitoring (watchdog)			KM2642 relay, 6 A, manual/ automatic operation, relay state readable
						KM2652 relay, 6 A, manual/auto- matic operation, switch and relay state readable
PWM		KL2502 24 V DC, 0.1 A	KL2512 24 V DC, 1.5 A, negative switching			
		KL2535 1 A, 24 V DC, current-controlled	KL2545 3.5 A, 50 V DC, current-controlled			
Frequency outp.	KL2521					
Stepper motor	KL2531 I _{MAX} = 1.5 A					
	KL2541 I _{MAX} = 5 A					
DC motor output stage		KL2532 24 V DC, 1 A	KL2552 50 V DC, 5 A	KL2284 I _{MAX} = 2.0 A, reverse switching		
AC motor speed controller	KL2791 230 V AC, 200 VA					

► www.beckhoff.com/BusTerminal

We reserve the right to make technical changes.

BECKHOFF New Automation Technology

Bus Terminal | Analog input: KL3xxx/KS3xxx, KM3xxx

Signal	1-channel	2-channel	4-channel	8-channel
0...2 V, 0...500 mV		KL3172 0...2 V, 16 bit, 0.05 %	KL3172-0500 0...500 mV, 16 bit, 0.05 %	
±2 V			KL3182 16 bit, 0.05 %	
0...10 V	KL3061 single-ended, 12 bit	KL3062 single-ended, 12 bit	KL3162 16 bit, 0.05 %	KL3064 single-ended, 12 bit
			KL3464 single-ended, 12 bit	KL3468 single-ended, 12 bit
±10 V	KL3001 differential input, 12 bit	KL3002 differential input, 12 bit	KL3102 differential input, 16 bit	KL3404 single-ended, 12 bit
			KL3132 16 bit, 0.05 %	KL3408 single-ended, 12 bit
0...20 mA	KL3011 differential input, 12 bit	KL3041 with sensor supply, 12 bit	KL3012 differential input, 12 bit	KL3112 differential input, 16 bit
			KL3042 with sensor supply, 12 bit	KL3142 16 bit, 0.05 %
			KL3044 single-ended, 12 bit	KL3444 single-ended, 12 bit
			KL3448 single-ended, 12 bit	
4...20 mA	KL3021 differential input, 12 bit	KL3051 with sensor supply, 12 bit	KL3022 differential input, 12 bit	KL3122 differential input, 16 bit
			KL3052 with sensor supply, 12 bit	KL3152 16 bit, 0.05 %
			KL3054 single-ended, 12 bit	KL3454 single-ended, 12 bit
			KL3458 single-ended, 12 bit	
Resistance thermometer (RTD)	KL3201 PT100...1000, Ni100, 16 bit	KL3202 PT100...1000, Ni100, 16 bit	KL3222 PT100, 4-wire connection, high-precision	KL3204 PT100...1000, Ni100...1000, 2-wire connection
				KL3208-0010 PT1000, Ni1000, NTC 1.8...100 k, potentiom. 1, 5, 10 kΩ
				KL3214 PT100...1000, Ni100...1000, KTY, 3-wire connection
				KL3228 PT1000, Ni1000
Thermo-couple/mV	KL3311 type J, K, L,...U, 16 bit	KL3312 type J, K, L,...U, 16 bit		KL3314 type J, K, L,...U, 16 bit
Resistor bridge	KL3351 strain gauge, 16 bit	KL3356 strain gauge, 16 bit, self-calibration		
Oscilloscope	KL3361 ±16 mV	KL3362 ±10 V		
Measurement technology	KL3681 digital multimeter terminal, 18 bit	KL3403 3-phase power measurement terminal, 1 A	KL3403-0010 3-phase power measurement terminal, 5 A	
Pressure measuring	KM3701 differential pressure measuring, -100...+100 hPa	KM3701-0340 differential pressure measuring, up to 340 hPa	KM3702 relative pressure measuring, 7,500 hPa	KM3712 relative pressure measuring, -1,000...+1,000 hPa

Bus Terminal | Analog output: KL4xxx/KS4xxx

Signal	1-channel	2-channel	4-channel	8-channel	2-channel
0...10 V	KL4001 12 bit, potential-free output	KL4002 12 bit	KL4004 12 bit, no power contacts		KM4602 12-bit manual/automatic operation
			KL4404 12 bit	KL4408 12 bit	
±10 V	KL4031 12 bit, potential-free output	KL4032 12 bit	KL4034 12 bit, no power contacts		
		KL4132 16 bit	KL4434 12 bit	KL4438 12 bit	
			KL4494 12 bit, 2 x input, 2 x output		
0...20 mA	KL4011 12 bit	KL4012 12 bit	KL4414 12 bit	KL4418 12 bit	
		KL4112 16 bit			
4...20 mA	KL4021 12 bit	KL4022 12 bit	KL4424 12 bit	KL4428 12 bit	

The standard Bus Terminals (KLxxx) can be optionally ordered as KSxxx with pluggable wiring level.

Bus Terminal | Special functions: KL5xxx/KS5xxx, KL6xxx/KS6xxx, KL8xxx

Signal				Signal	
Position measurement	KL5001 SSI encoder interface	KL5051 bidirectional SSI encoder interface	KL5121 incremental encoder interface with programmable outputs	Manual operation	KL8519 16-channel digital input signal module
	KL5101 differential input, incremental encoder interface	KL5152 32 bit, 2-channel incremental encoder interface	KL5151 32 bit, incremental encoder interface		KL8524 4 x 2-channel digital output, 24 V DC, 0.5 A
	KL5111 incremental encoder interface				KL8528 8-channel digital output, 24 V DC, 0.5 A
Communication	KL6001 serial interface RS232, 19.2 kbaud	KL6031 serial interface RS232, 115.2 kbaud	KL6011 serial interface TTY, 20 mA current loop	Power terminals	KL8548 8-channel analog output, 0...10 V
	KL6051 data exchange terminal, 32 bit	KL6021 serial interface RS422/RS485, 19.2 kbaud	KL6041 serial interface RS422/RS485, 115.2 kbaud		KL8001 switching capacity 5.5 kW, nominal current 0.9 to 9.9 A, connection mechanism for Siemens contactors (Sirius 3R series)
	KL6023 wireless adapter for EnOcean radio technology	KL6021-0023 RS485 interface for EnOcean signals	KM6551 wireless data exchange terminal		
	KL6201 AS-Interface master terminal	KL6211 AS-Interface master terminal with power contacts	KL6224 IO-Link master		
	KL6301 EIB/KNX Bus Terminal	KL6401 LON Bus Terminal	KL6581 EnOcean master		
	KL6583 EnOcean transmitter/receiver	KL6771 MP-Bus master terminal	KL6781 M-Bus master terminal		
	KL6811 DALI/DSI master and power supply terminal	KL6831 SMI terminal, LoVo	KL6841 SMI terminal, 230 V AC		
	KL6904 TwinSAFE Logic Bus Terminal, 4 safe outputs				

Bus Terminal | System terminals: KL9xxx/KS9xxx

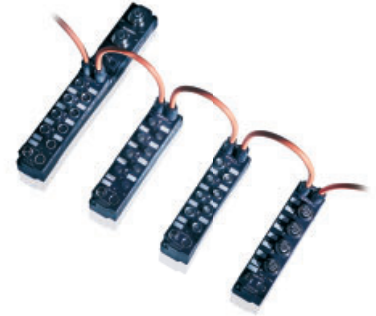
Signal	System		Signal	Potential supply	Power supply and accessories	
System	KL9010 bus end terminal	KL9070 shield terminal	24 V DC	KL9100	KL9400 K-bus power supply, 2 A	
	KL9020 terminal bus extension end terminal	KL9050 terminal bus extension coupler terminal		KL9110 diagnostic	KL9505 output 5 V DC, 0.5 A	
	KL9060 adapter terminal for power terminal KL8xxx	KL9309 adapter terminal for KL85xx manual operating modules		KL9200 with fuse	KL9508 output 8 V DC, 0.5 A	
	KL9080 isolation terminal	KL9195 shield terminal		KL9210 diagnostic, with fuse	KL9510 output 10 V DC, 0.5 A	
Potential distribution terminal	KL9180 2 terminal points per power contact	KL9181 2 x 8 terminal points	50 V DC		KL9512 output 12 V DC, 0.5 A	
	KL9182 8 x 2 terminal points	KL9183 1 x 16 terminal points			KL9515 output 15 V DC, 0.5 A	
	KL9184 8 x 24 V DC, 8 x 0 V DC	KL9185 only 2 power contacts		KL9520 AS-Interface potential supply	KL9528 AS-Interface power supply terminal	
	KL9186 8 x 24 V DC	KL9187 8 x 0 V DC			KL9560 output 24 V DC, 0.1 A	
	KL9188 16 x 24 V DC	KL9189 16 x 0 V DC		120... 230 V AC	KL9150	KL9570 buffer capacitor terminal, 500 µF
	KL9380 mains filter, approx. 1 µF				KL9160 diagnostic	
Filter	KL9540 surge filter terminal for field supply	KL9550 surge filter terminal for system/field supply	Up to 400 V AC	KL9250 with fuse		
	KL9540-0010 surge filter field supply for analog terminals				KL9260 diagnostic, with fuse	
Diode array	KL9300 4 diodes, potential-free	KL9302 7 diodes, common anode		KL9190		
	KL9301 7 diodes, common cathode			KL9290 with fuse		

► www.beckhoff.com/BusTerminal

We reserve the right to make technical changes.

BECKHOFF New Automation Technology

Fieldbus Box



Fieldbus Box	Compact Box		Coupler Box		PLC Box	
Fieldbus	Fieldbus Box without IP-Link interface		Fieldbus Box with IP-Link interface		Controller IEC 61131-3 with IP-Link interface	
EtherCAT			IL230x-B110			
LIGHTBUS	IPxxxx-B200		IL230x-B200			
PROFINET	IPxxxx-B310	IPxxxx-B318 with integrated tee-connector	IL230x-B310	IL230x-B318 with integrated tee-connector	IL230x-C310	IL230x-C318 with integrated tee-connector
INTERBUS	IPxxxx-B400		IL230x-B400			
CANopen	IPxxxx-B510	IPxxxx-B518 with integrated tee-connector	IL230x-B510	IL230x-B518 with integrated tee-connector		
DeviceNet	IPxxxx-B520	IPxxxx-B528 with integrated tee-connector	IL230x-B520	IL230x-B528 with integrated tee-connector		
Modbus	IPxxxx-B730		IL230x-B730			
RS485	IPxxxx-B800		IL230x-B800			
RS232	IPxxxx-B810		IL230x-B810		IL230x-C810	
Ethernet TCP/IP			IL230x-B900		IL230x-B901	IL230x-C900
PROFINET			IL230x-B903			
EtherNet/IP			IL230x-B905			

Fieldbus Box Compact Box and Extension Box: Digital I/O				
Input		8 mm	M8	M12
24 V DC	8-channel filter 3.0 ms	IP1000-Bxxx, IE1000	IP1001-Bxxx, IE1001	IP1002-Bxxx, IE1002
	8-channel filter 0.2 ms	IP1010-Bxxx, IE1010	IP1011-Bxxx, IE1011	IP1012-Bxxx, IE1012
Counter	2-channel up/down counter 24 V DC, 100 kHz			IP1502-Bxxx, IE1502
Output		8 mm	M8	M12
24 V DC	8-channel $I_{max} = 0,5 A$	IP2000-Bxxx, IE2000	IP2001-Bxxx, IE2001	IP2002-Bxxx, IE2002
	8-channel $I_{max} = 2 A, \Sigma 4 A$	IP2020-Bxxx, IE2020	IP2021-Bxxx, IE2021	IP2022-Bxxx, IE2022
	8-channel $I_{max} = 2 A, \Sigma 12 A$	IP2040-Bxxx, IE2040	IP2041-Bxxx, IE2041	IP2042-Bxxx, IE2042
	16-channel $I_{max} = 0.5 A, \Sigma 4 A, D$ -sub socket			IE2808 IE2808-0001
PWM	2-channel PWM, 24 V DC, $I_{max} = 2.5 A$			IP2512-Bxxx, IE2512

Fieldbus Box | Compact Box, Coupler Box, PLC Box and Extension Box: Digital I/O

Combi		8 mm	M8	M12
24 V DC	8-channel 4 input + 4 output, filter 3.0 ms, $I_{MAX} = 0.5 A$	IL2300-Bxxx IL2300-Cxxx IP2300-Bxxx, IE2300	IL2301-Bxxx IL2301-Cxxx IP2301-Bxxx, IE2301	IL2302-Bxxx IL2302-Cxxx IP2302-Bxxx, IE2302
	8-channel 4 input + 4 output, filter 0.2 ms, $I_{MAX} = 0.5 A$	IP2310-Bxxx IE2310	IP2311-Bxxx IE2311	IP2312-Bxxx IE2312
	8-channel 4 input + 4 output, filter 3.0 ms, $I_{MAX} = 2 A, \Sigma 4 A$	IP2320-Bxxx IE2320	IP2321-Bxxx IE2321	IP2322-Bxxx IE2322
	8-channel 4 input + 4 output, filter 0.2 ms, $I_{MAX} = 2 A, \Sigma 4 A$	IP2330-Bxxx IE2330	IP2331-Bxxx IE2331	IP2332-Bxxx IE2332
	16-channel combi input/output, filter 3.0 ms, $I_{MAX} = 0.5 A$	IP2400-Bxxx IE2400	IP2401-Bxxx IE2401	
	16-channel combi input/output, filter 3.0 ms, $I_{MAX} = 0.5 A$, IP 20 connector	IE2403		

Fieldbus Box | Compact Box and Extension Box: Analog I/O

Input		M12
$\pm 10 V$	4-channel differential inputs, 16 bit	IP3102-Bxxx, IE3102
0/4...20 mA	4-channel differential inputs, 16 bit	IP3112-Bxxx, IE3112
Resistance thermometer	4-channel resistance thermometer (RTD), PT100, PT200, PT500, PT1000, Ni100, 16 bit	IP3202-Bxxx, IE3202
Thermocouple/mV	4-channel thermocouple, type J, K, L, B, E, N, R, S, T, U, 16 bit	IP3312-Bxxx, IE3312
Output		M12
$\pm 10 V$	4-channel 16 bit	IP4132-Bxxx, IE4132
0/4...20 mA	4-channel 16 bit	IP4112-Bxxx, IE4112

Fieldbus Box | Compact Box and Extension Box: Special functions

Function		M12	M23
Position measurement	1-channel SSI encoder interface		IP5009-Bxxx, IE5009
	1-channel incremental encoder interface, 1 MHz		IP5109-Bxxx, IE5109
	1-channel SinCos encoder interface		IP5209-Bxxx (1 V _{pp}) IP5209-Bxxx-1000 (11 μA_{pp})
Communication	1-channel serial interface, RS232	IP6002-Bxxx, IE6002	
	1-channel serial interface, 0 ... 20 mA (TTY)	IP6012-Bxxx, IE6012	
	1-channel serial interface, RS422/RS485	IP6022-Bxxx, IE6022	



Fieldbus Box IO-Link Box: Digital I/O					
Input		8 x M8	16 x M8	4 x M12	8 x M12
24 V DC	8-channel filter 3.0 ms	EPI1008-0001 ERI1008-0001		EPI1008-0002 ERI1008-0002	
	16-channel filter 3.0 ms		EPI1809-0021 ERI1809-0021		EPI1809-0022 ERI1809-0022
Output		8 x M8	16 x M8	4 x M12	8 x M12
24 V DC	8-channel $I_{MAX} = 0.5 A$	EPI2008-0001 ERI2008-0001		EPI2008-0002 ERI2008-0002	
	16-channel $I_{MAX} = 0.5 A, \Sigma 4 A$		EPI2809-0021 ERI2809-0021		EPI2809-0022 ERI2809-0022
Combi		8 x M8	16 x M8	4 x M12	8 x M12
24 V DC	8-channel 8 input/output, freely configurable, filter 10 μs , $I_{MAX} = 0.5 A$	EPI2338-0001 ERI2338-0001		EPI2338-0002 ERI2338-0002	
	16-channel 16 input/output, freely configurable, filter 3.0 ms, $I_{MAX} = 0.5 A, \Sigma 4 A$		EPI2339-0021 ERI2339-0021		EPI2339-0022 ERI2339-0022

Fieldbus Box IO-Link Box: Analog I/O		
Input		M12
$\pm 10 V$, 0/4...20 mA	4-channel parameterisable, differential input, 16 bit	EPI3174-0002 ERI3174-0002
Output		M12
$\pm 10 V$, 0/4...20 mA	4-channel 2 input + 2 output, parameterisable, 16 bit	EPI4374-0002 ERI4374-0002

EPIxxxx: industrial housing in IP 67, ERIxxxx: zinc die-cast housing in IP 67

► www.beckhoff.com/IO-Link-box

Infrastructure Components



Infrastructure Components | PC Fieldbus Cards, switches, port multipliers, junctions, media converters

Fieldbus	PCI	Mini-PCI	PCIe	Switches, port multipliers	Junctions, media converters
LIGHTBUS	FC2001-0000 1-channel			Switches	Junctions
	FC2002-0000 2-channel				
PROFINET® BTUST	FC3101-0000 1-channel	FC3151-0000 1-channel	FC3121 1-channel	CU2008 Ethernet Switch with 8 ports, 10/100 Mbit/s, IP 20	EP9128 EtherCAT junction, 8-channel EtherCAT M8, IP 67
	FC3101-0002 1-channel, 32 kbytes NOVRAM	FC3151-0002 1-channel, 128 kbytes NOVRAM			
	FC3102-0000 2-channel		FC3122 2-channel		
	FC3102-0002 2-channel, 32 kbytes NOVRAM				
CANopen	FC5101-0000 1-channel	FC5151-0000 1-channel	FC5121 1-channel	CU2016 Ethernet Switch with 16 ports, 10/100 Mbit/s, IP 20	Media converters
	FC5101-0002 1-channel, 32 kbytes NOVRAM	FC5151-0002 1-channel, 128 kbytes NOVRAM			
	FC5102-0000 2-channel		FC5122 2-channel		
	FC5102-0002 2-channel, 32 kbytes NOVRAM				
DeviceNet	FC5201-0000 1-channel	FC5251-0000 1-channel		CU2208 Ethernet Switch with 8 Gbit ports, 10/100/1000 Mbit/s, IP 20	CU1521-0010 EtherCAT media converter fibre optic (singlemode), IP 20
	FC5201-0002 1-channel, 32 kbytes NOVRAM	FC5251-0002 1-channel, 128 kbytes NOVRAM			
	FC5202-0000 2-channel				
	FC5202-0002 2-channel, 32 kbytes NOVRAM				
sercos the automation bus	FC7501-0000 1-channel	FC7551-0000 1-channel		CU2608 Ethernet Switch with 8 ports, M12, d-coded, 10/100 Mbit/s, IP 67	CU1561 EtherCAT media converter plastic optical fibre, IP 20
	FC7502-0000 2-channel	FC7551-0002 1-channel, 128 kbytes NOVRAM			
Ethernet	FC9001-0010 1-channel, 10/100 Mbit/s	FC9051-0000 1-channel, 10/100 Mbit/s		Port multiplier	EP952x EtherCAT media converters fibre optic (multimode), IP 67
	FC9011-0000 1-channel, 10/100/1000 Mbit/s	FC9151-0000 1-channel, 10/100/1000 Mbit/s			
	FC9002-0000 2-channel, 10/100 Mbit/s		FC9022-0000 2-channel, 10/100/1000 Mbit/s		
	FC9004-0000 4-channel, 10/100 Mbit/s		FC9024-0000 4-channel, 10/100/1000 Mbit/s		
EtherCAT	FC1100 1-channel, slave		FC1121 1-channel, slave		

► www.beckhoff.com/Infrastructure-components

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BECKHOFF New Automation Technology

The Motion Company



**Servomotor AM8000
with One Cable Technology (OCT)**

Compact Digital Servo Drives 54

- Available in 1- or 2-channel Servo Drive versions
- High-speed EtherCAT communication
- Wide range of nominal current types, up to 170 A
- Flexible motor type selection
- Optimised for multi-axis applications

► www.beckhoff.com/Servo-Drives

Compact Drive Technology 64

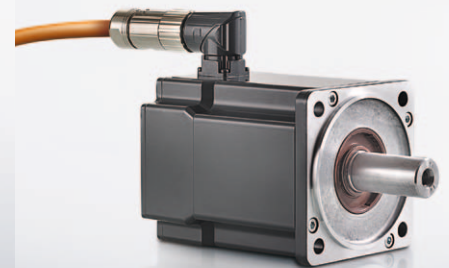
- Solutions for up to 5 A in the space-saving I/O system
- Simple connection of stepper, servo, DC or AC motors
- IP 20 or IP 67 connection options
- Matching motors and gearboxes

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

Synchronous Servomotors 58

- For demanding positioning tasks
- Highly dynamic behaviour
- Brushless three-phase motors
- Permanent magnet in the rotor

► www.beckhoff.com/Servomotors



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/DriveTechnology

Linear Servomotors 63

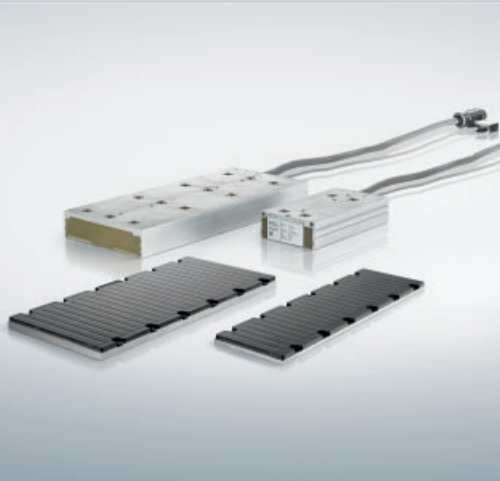
- Ideal for the highest requirements with regard to dynamics and acceleration
- Up to quadruple overload capacity
- No mechanical wear
- Maximum positioning accuracy

► www.beckhoff.com/Linear-motors

eXtended Transport System XTS 65

- 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



- Scalable product range of servo drive technology
- Integrated safety technology in compliance with safety performance level E
- As the pioneer of One Cable Technology and the eXtended Transport System, Beckhoff specialises in manufacturing efficient, space-saving motion solutions.

Drive Technology



AX51xx, AX52xx | Digital Compact Servo Drives

Technical data	AX5101-0000-0x00	AX5103-0000-0x00	AX5106-0000-0x00	AX5201-0000-0200	AX5203-0000-0200	AX5206-0000-0200	AX5112-0000-0x00
Number of channels	1-channel	1-channel	1-channel	2-channel	2-channel	2-channel	1-channel
Rated output current	1 x 1.5 A ⁽¹⁾	1 x 3 A ⁽¹⁾	1 x 6 A ⁽¹⁾	2 x 1.5 A ⁽³⁾	2 x 3 A ⁽³⁾	2 x 6 A ^{(3) (*)}	1 x 12 A ⁽¹⁾
Peak output current	4.5 A ⁽⁴⁾	7.5 A ⁽⁴⁾	13 A ⁽⁴⁾	2 x 5 A ⁽⁴⁾	2 x 10 A ⁽⁴⁾	2 x 13 A ⁽⁴⁾	26 A ⁽⁴⁾
Rated supply voltage	100... 480 V AC	100... 480 V AC	100... 480 V AC	100... 480 V AC	100... 480 V AC	100... 480 V AC	100... 480 V AC
Rated apparent power for S1 operation 400 V (only 3-phase connection)	1.0 kVA	2.1 kVA	4.2 kVA	2.1 kVA	4.2 kVA	8.3 kVA	8.3 kVA
Voltage connection	1...3-phase	1...3-phase	1...3-phase	1...3-phase	1...3-phase	1...3-phase	3-phase
Feedback system	BiSS "B", EnDat, Hiperface, 1 V _{PP} , resolver, OCT, BiSS "C", EnDat 2.2, HTL	BiSS "B", EnDat, Hiperface, 1 V _{PP} , resolver, OCT, BiSS "C", EnDat 2.2, HTL	BiSS "B", EnDat, Hiperface, 1 V _{PP} , resolver, OCT, BiSS "C", EnDat 2.2, HTL	BiSS "B", EnDat, Hiperface, 1 V _{PP} , resolver, OCT, BiSS "C", EnDat 2.2, HTL	BiSS "B", EnDat, Hiperface, 1 V _{PP} , resolver, OCT, BiSS "C", EnDat 2.2, HTL	BiSS "B", EnDat, Hiperface, 1 V _{PP} , resolver, OCT, BiSS "C", EnDat 2.2, HTL	BiSS "B", EnDat, Hiperface, 1 V _{PP} , resolver, OCT, BiSS "C", EnDat 2.2, HTL
Safety	AX5801-0200 ⁽⁶⁾ AX5805-0000 ⁽⁶⁾	AX5801-0200 ⁽⁶⁾ AX5805-0000 ⁽⁶⁾	AX5801-0200 ⁽⁶⁾ AX5805-0000 ⁽⁶⁾	AX5801-0200 ⁽⁶⁾ AX5805-0000 ⁽⁶⁾	AX5801-0200 ⁽⁶⁾ AX5805-0000 ⁽⁶⁾	AX5801-0200 ⁽⁶⁾ AX5805-0000 ⁽⁶⁾	AX5801-0200 ⁽⁶⁾ AX5805-0000 ⁽⁶⁾

⁽¹⁾ at 50 °C (3-phase connection), ⁽²⁾ at 40 °C (3-phase connection), ⁽³⁾ at 50 °C, ⁽⁴⁾ RMS for max. 7 seconds, ⁽⁵⁾ RMS for max. 3 seconds,

⁽⁶⁾ only compatible with AX5xxx-xxxx-x2xx Servo Drives, ^(*) For 1-phase mains the total current is limited to 9 A.

► www.beckhoff.com/AX5000

BECKHOFF New Automation Technology

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AX5160, AX5172



AX5190, AX5191



AX5192, AX5193



AX52xx



AX5101-AX5112



AX5118-AX5140



AX-Bridge

The AX-Bridge quick connection system enables simple and fast connection of several AX5000 devices to form a multi-axis system.

AX5118-0000-0x00	AX5125-0000-0x00	AX5140-0000-0200	AX5160-0000-0200	AX5172-0000-0200	AX5190-0000-0200	AX5191-0000-0200	AX5192-0000-0200	AX5193-0000-0200
1-channel	1-channel	1-channel	1-channel	1-channel	1-channel	1-channel	1-channel	1-channel
1 x 18 A ⁽¹⁾	1 x 25 A ⁽¹⁾	1 x 40 A ⁽¹⁾	60 A ⁽²⁾	72 A ⁽²⁾	90 A ⁽²⁾	110 A ⁽²⁾	143 A ⁽²⁾	170 A ⁽²⁾
36 A ⁽⁴⁾	50 A ⁽⁴⁾	80 A ⁽⁴⁾	120 A ⁽⁵⁾	144 A ⁽⁵⁾	180 A ⁽⁵⁾	165 A ⁽⁵⁾	215 A ⁽⁵⁾	255 A ⁽⁵⁾
100... 480 V AC	100... 480 V AC	100... 480 V AC	100... 480 V AC	100... 480 V AC	100... 480 V AC	100... 480 V AC	100... 480 V AC	100... 480 V AC
12.5 kVA	17.3 kVA	28.0 kVA	42.0 kVA	50.0 kVA	62.0 kVA	76.0 kVA	99.0 kVA	118.0 kVA
3-phase	3-phase	3-phase	3-phase	3-phase	3-phase	3-phase	3-phase	3-phase
BiSS "B", EnDat, Hiperface, 1 V _{PP} , resolver, OCT, BiSS "C", EnDat 2.2, HTL	BiSS "B", EnDat, Hiperface, 1 V _{PP} , resolver, OCT, BiSS "C", EnDat 2.2, HTL	BiSS "B", EnDat, Hiperface, 1 V _{PP} , resolver, OCT, BiSS "C", EnDat 2.2, HTL	BiSS "B", EnDat, Hiperface, 1 V _{PP} , resolver, BiSS "C", EnDat 2.2, HTL	BiSS "B", EnDat, Hiperface, 1 V _{PP} , resolver, BiSS "C", EnDat 2.2, HTL	BiSS "B", EnDat, Hiperface, 1 V _{PP} , resolver, BiSS "C", EnDat 2.2, HTL	BiSS "B", EnDat, Hiperface, 1 V _{PP} , resolver, BiSS "C", EnDat 2.2, HTL	BiSS "B", EnDat, Hiperface, 1 V _{PP} , resolver, BiSS "C", EnDat 2.2, HTL	BiSS "B", EnDat, Hiperface, 1 V _{PP} , resolver, BiSS "C", EnDat 2.2, HTL
AX5801-0200 ⁽⁶⁾ AX5805-0000 ⁽⁶⁾	AX5801-0200 ⁽⁶⁾ AX5805-0000 ⁽⁶⁾	AX5801-0200 ⁽⁶⁾ AX5805-0000 ⁽⁶⁾	AX5806-0000	AX5806-0000	AX5806-0000	AX5806-0000	AX5806-0000	AX5806-0000



AX8520, AX8620 |
Power supply modules,
20 A



AX8540, AX8640 |
Power supply modules,
40 A



AX8108 |
Axis module,
8 A



AX8118 |
Axis module,
18 A



AX8206 |
Double-axis module,
2 x 6 A

AX8000 | Multi-axis servo system: Power supply modules

Technical data	AX8520-0000	AX8540-0000	AX8620-0000	AX8640-0000
Function	power supply module	power supply module	power supply module	power supply module
Rated supply voltage	100...230 V AC (1~) 200...230 V AC (3~)	200...230 V AC (3~)	400...480 V AC (3~)	400...480 V AC (3~)
Rated output current at 40 °C (1-phase connection)	10 A	–	–	–
Rated output current at 40 °C (3-phase connection)	20 A	40 A	20 A	40 A
DC-Link voltage	max. 440 V DC	max. 440 V DC	max. 890 V DC	max. 890 V DC
Braking power (internal/external)	5.4 kW/9.8 kW	10.7 kW/22 kW	21.8 kW/21.8 kW	52.1 kW/43.6 kW

AX8000 | Multi-axis servo system: Axis modules

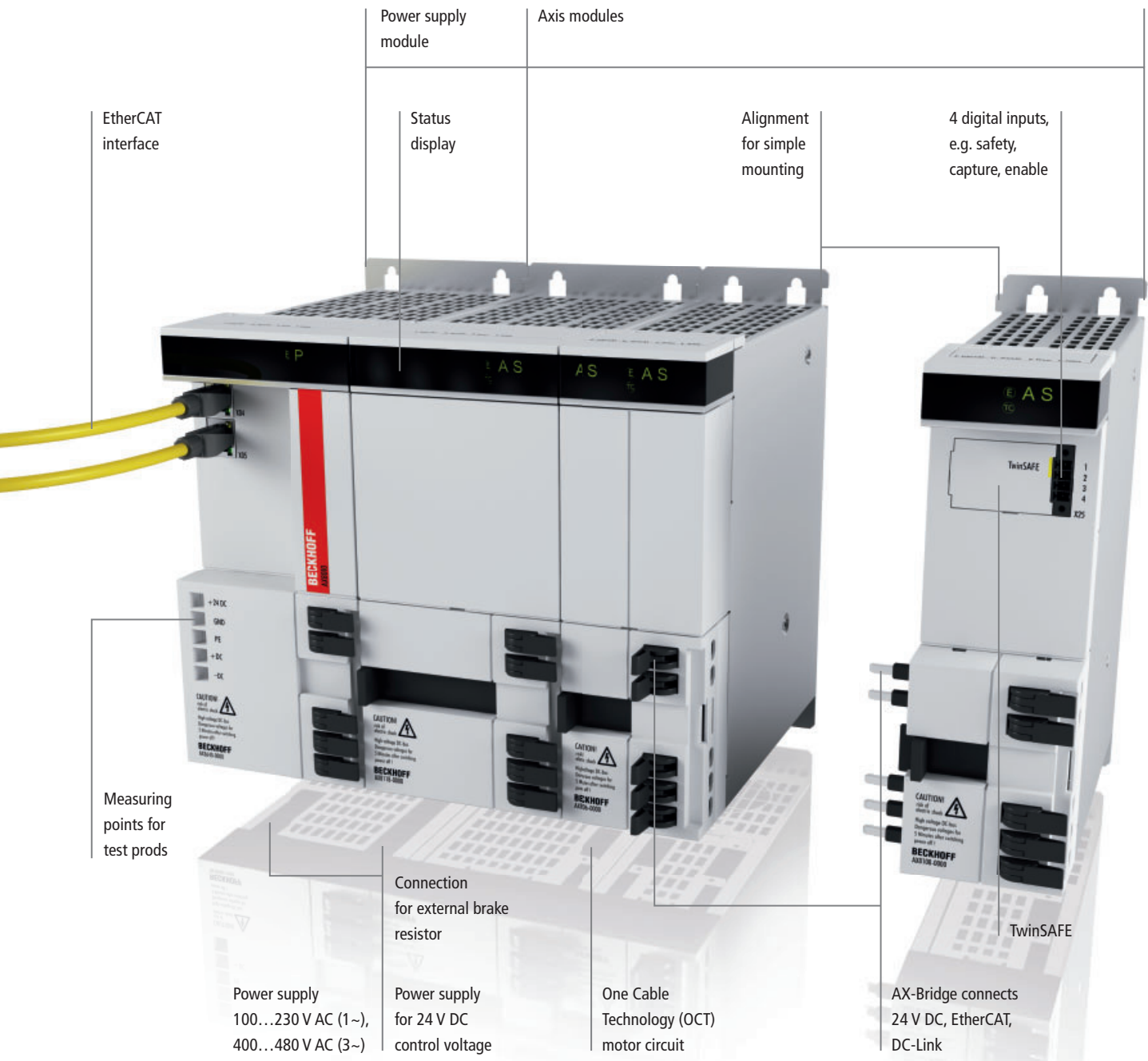
Technical data	AX8108-0000	AX8118-0000	AX8206-0000
Function	axis module	axis module	axis module
Number of channels	1	1	2
Rated output current	1 x 8 A	1 x 18 A	2 x 6 A
Minimum rated channel current at full current resolution	1 A	4 A	1 A
Peak output current	20 A	40 A	14 A 20 A
Current control	1 µs update time, 16 µs cycle time	1 µs update time, 16 µs cycle time	1 µs update time, 16 µs cycle time

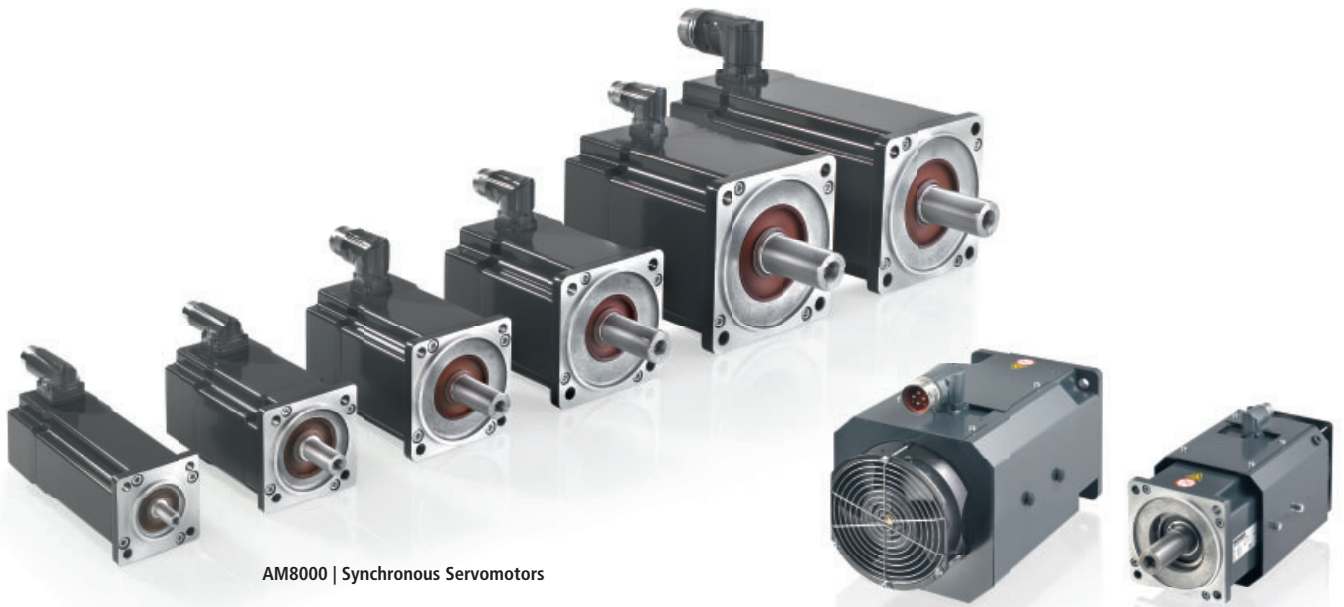
AX8000 | Multi-axis servo system: Option module

Technical data	AX8910-0000
Function	capacitor module/DC link extension module
Capacity	1755 µF

► www.beckhoff.com/AX8000

Product announcement for availability status see www.beckhoff.com





AM8000 | Synchronous Servomotors

AM8000 | Synchronous Servomotors – high-performance type with cooling

AM8000, AM8500 | Synchronous Servomotors with One Cable Technology (OCT)

Data for 230 V AC	AM8011-wByz	AM8012-wCyz	AM8013-wDyz
Standstill torque	0.20 Nm	0.38 Nm	0.52 Nm
Standstill current	0.76 A	1.30 A	1.65 A
Rated speed	8000 min ⁻¹	8000 min ⁻¹	8000 min ⁻¹
Rotor moment of inertia	0.029 kgcm ²	0.048 kgcm ²	0.067 kgcm ²
Rot. mo. of inertia (with brake)	0.052 kgcm ²	0.071 kgcm ²	0.090 kgcm ²

Data for 400 V AC	AM8021-wByz	AM8021-wDyz	AM8022-wDyz	AM8022-wEyz	AM8023-wEyz	AM8023-wFyz	AM8031-wCyz	AM8031-wDyz	AM8031-wFyz
Standstill torque	0.50 Nm	0.50 Nm	0.80 Nm	0.80 Nm	1.20 Nm	1.20 Nm	1.37 Nm	1.38 Nm	1.40 Nm
Standstill current	0.85 A	1.60 A	1.50 A	2.44 A	2.20 A	3.40 A	1.00 A	1.95 A	3.20 A
Rated speed	8000 min ⁻¹	9000 min ⁻¹	8000 min ⁻¹	9000 min ⁻¹	8000 min ⁻¹	9000 min ⁻¹	3000 min ⁻¹	6000 min ⁻¹	9000 min ⁻¹
Rotor moment of inertia	0.134 kgcm ²	0.134 kgcm ²	0.253 kgcm ²	0.253 kgcm ²	0.373 kgcm ²	0.373 kgcm ²	0.462 kgcm ²	0.462 kgcm ²	0.462 kgcm ²
Rot. mo. of inertia (with brake)	0.156 kgcm ²	0.156 kgcm ²	0.276 kgcm ²	0.276 kgcm ²	0.396 kgcm ²	0.396 kgcm ²	0.541 kgcm ²	0.541 kgcm ²	0.541 kgcm ²

Data for 400 V AC	AM8032-wDyz	AM8032-wEyz	AM8032-wHyz	AM8033-wEyz	AM8033-wFyz	AM8033-wJyz	AM8041-wDyz	AM8041-wEyz	AM8041-wHyz
Standstill torque	2.38 Nm	2.37 Nm	2.37 Nm	3.20 Nm	3.22 Nm	3.22 Nm	2.37 Nm	2.45 Nm	2.40 Nm
Standstill current	1.70 A	2.95 A	5.10 A	2.10 A	4.10 A	6.80 A	1.65 A	3.00 A	5.25 A
Rated speed	3000 min ⁻¹	6000 min ⁻¹	9000 min ⁻¹	3000 min ⁻¹	6000 min ⁻¹	9000 min ⁻¹	3000 min ⁻¹	6000 min ⁻¹	8000 min ⁻¹
Rotor moment of inertia	0.842 kgcm ²	0.842 kgcm ²	0.842 kgcm ²	1.22 kgcm ²	1.22 kgcm ²	1.22 kgcm ²	1.08 kgcm ²	1.08 kgcm ²	1.08 kgcm ²
Rot. mo. of inertia (with brake)	0.921 kgcm ²	0.921 kgcm ²	0.921 kgcm ²	1.46 kgcm ²	1.46 kgcm ²	1.46 kgcm ²	1.73 kgcm ²	1.73 kgcm ²	1.73 kgcm ²

Data for 400 V AC	AM8042-wEyz	AM8042-wFyz	AM8042-wJyz	AM8043-wEyz	AM8043-wHyz	AM8043-wKyz	AM8051-wEyz	AM8051-wGyz	AM8051-wKyz
Standstill torque	4.10 Nm	4.10 Nm	4.10 Nm	5.65 Nm	5.65 Nm	5.60 Nm	4.90 Nm	4.90 Nm	4.90 Nm
Standstill current	2.15 A	4.10 A	6.90 A	2.90 A	5.40 A	9.30 A	2.70 A	4.75 A	8.50 A
Rated speed	2500 min ⁻¹	5000 min ⁻¹	8000 min ⁻¹	2500 min ⁻¹	5000 min ⁻¹	8000 min ⁻¹	2500 min ⁻¹	5000 min ⁻¹	8000 min ⁻¹
Rotor moment of inertia	1.97 kgcm ²	1.97 kgcm ²	1.97 kgcm ²	2.87 kgcm ²	2.87 kgcm ²	2.87 kgcm ²	2.24 kgcm ²	2.24 kgcm ²	2.24 kgcm ²
Rot. mo. of inertia (with brake)	2.62 kgcm ²	2.62 kgcm ²	2.62 kgcm ²	3.52 kgcm ²	3.52 kgcm ²	3.52 kgcm ²	2.90 kgcm ²	2.90 kgcm ²	2.90 kgcm ²

*high-performance type with cooling



AM8500 | Synchronous Servomotors with higher moment of inertia



AM8500 | Synchronous Servomotors with higher moment of inertia – high-performance type with cooling

Data for 400 V AC	AM8051-wFyz*	AM8051-wJyz*	AM8051-wLyz*	AM8052-wFyz	AM8052-wJyz	AM8052-wLyz	AM8052-wGyz*	AM8052-wKyz*	AM8052-wNyz*
Standstill torque	6.3 Nm	6.3 Nm	6.3 Nm	8.20 Nm	8.20 Nm	8.20 Nm	10.7 Nm	10.7 Nm	9.9 Nm
Standstill current	3.5 A	5.8 A	11.1 A	3.30 A	6.30 A	11.3 A	4.3 A	8.5 A	13.9 A
Rated speed	2500 min ⁻¹	5000 min ⁻¹	8000 min ⁻¹	2000 min ⁻¹	4000 min ⁻¹	7300 min ⁻¹	2000 min ⁻¹	4000 min ⁻¹	6000 min ⁻¹
Rotor moment of inertia	2.24 kgcm ²	2.24 kgcm ²	2.24 kgcm ²	4.08 kgcm ²	4.08 kgcm ²	4.08 kgcm ²	4.08 kgcm ²	4.08 kgcm ²	4.08 kgcm ²
Rot. mo. of inertia (with brake)	2.90 kgcm ²	2.90 kgcm ²	2.90 kgcm ²	4.74 kgcm ²	4.74 kgcm ²	4.74 kgcm ²	4.74 kgcm ²	4.74 kgcm ²	4.74 kgcm ²

Data for 400 V AC	AM8053-wGyz	AM8053-wKyz	AM8053-wNyz	AM8053-wJyz*	AM8053-wLyz*	AM8053-wPyz*	AM8061-wGyz	AM8061-wJyz	AM8061-wMyz
Standstill torque	11.4 Nm	11.4 Nm	11.4 Nm	15.4 Nm	15.4 Nm	13.3 Nm	12.8 Nm	12.8 Nm	12.8 Nm
Standstill current	4.70 A	8.80 A	15.6 A	6.4 A	11.9 A	18.6 A	4.00 A	7.80 A	13.1 A
Rated speed	2000 min ⁻¹	4000 min ⁻¹	7000 min ⁻¹	2000 min ⁻¹	4000 min ⁻¹	5000 min ⁻¹	1500 min ⁻¹	3000 min ⁻¹	5000 min ⁻¹
Rotor moment of inertia	5.92 kgcm ²	5.92 kgcm ²	5.92 kgcm ²	5.92 kgcm ²	5.92 kgcm ²	5.92 kgcm ²	11.1 kgcm ²	11.1 kgcm ²	11.1 kgcm ²
Rot. mo. of inertia (with brake)	7.04 kgcm ²	7.04 kgcm ²	7.04 kgcm ²	7.04 kgcm ²	7.04 kgcm ²	7.04 kgcm ²	13.4 kgcm ²	13.4 kgcm ²	13.4 kgcm ²

Data for 400 V AC	AM8061-wHyz*	AM8061-wLyz*	AM8061-wNyz*	AM8062-wJyz	AM8062-wLyz	AM8062-wPyz	AM8062-wKyz*	AM8062-wNyz*	AM8062-wRyz*
Standstill torque	17.1 Nm	17.1 Nm	15.5 Nm	21.1 Nm	21.1 Nm	21.1 Nm	29.9 Nm	29.9 Nm	28.1 Nm
Standstill current	5.20 A	10.1 A	15.8 A	6.20 A	12.4 A	20.3 A	8.70 A	17.4 A	28.7 A
Rated speed	1500 min ⁻¹	3000 min ⁻¹	5000 min ⁻¹	1500 min ⁻¹	3000 min ⁻¹	5000 min ⁻¹	1500 min ⁻¹	3000 min ⁻¹	5000 min ⁻¹
Rotor moment of inertia	11.1 kgcm ²	11.1 kgcm ²	11.1 kgcm ²	20.0 kgcm ²	20.0 kgcm ²	20.0 kgcm ²	20.0 kgcm ²	20.0 kgcm ²	20.0 kgcm ²
Rot. mo. of inertia (with brake)	13.4 kgcm ²	13.4 kgcm ²	13.4 kgcm ²	22.3 kgcm ²	22.3 kgcm ²	22.3 kgcm ²	22.3 kgcm ²	22.3 kgcm ²	22.3 kgcm ²

Data for 400 V AC	AM8063-wKyz	AM8063-wNyz	AM8063-wRyz	AM8063-wLyz*	AM8063-wQyz*	AM8063-wTyz*	AM8071-wKyz	AM8071-wNyz	AM8071-wRyz
Standstill torque	29.0 Nm	29.0 Nm	29.0 Nm	41.4 Nm	41.4 Nm	40.1 Nm	31.8 Nm	31.8 Nm	29.0 Nm
Standstill current	8.70 A	17.2 A	29.5 A	11.6 A	24.0 A	39.8 A	9.60 A	17.8 A	28.2 A
Rated speed	1500 min ⁻¹	3000 min ⁻¹	4000 min ⁻¹	1500 min ⁻¹	3000 min ⁻¹	4000 min ⁻¹	1500 min ⁻¹	3000 min ⁻¹	4000 min ⁻¹
Rotor moment of inertia	29.0 kgcm ²	29.0 kgcm ²	29.0 kgcm ²	29.0 kgcm ²	29.0 kgcm ²	29.0 kgcm ²	49.6 kgcm ²	49.6 kgcm ²	49.6 kgcm ²
Rot. mo. of inertia (with brake)	34.9 kgcm ²	34.9 kgcm ²	34.9 kgcm ²	34.9 kgcm ²	34.9 kgcm ²	34.9 kgcm ²	68.3 kgcm ²	68.3 kgcm ²	68.3 kgcm ²

Data for 400 V AC	AM8071-wMyz*	AM8071-wPyz*	AM8071-wTyz*	AM8072-wLyz	AM8072-wPyz	AM8072-wTyz	AM8072-wNyz*	AM8072-wRyz*	AM8072-wUyz*
Standstill torque	42.8 Nm	42.8 Nm	41.2 Nm	54.6 Nm	54.6 Nm	50.0 Nm	80.7 Nm	80.7 Nm	74.0 Nm
Standstill current	12.6 A	23.8 A	41.1 A	11.1 A	20.6 A	37.5 A	16.1 A	29.2 A	53.0 A
Rated speed	1500 min ⁻¹	3000 min ⁻¹	4000 min ⁻¹	1000 min ⁻¹	2000 min ⁻¹	3000 min ⁻¹	1000 min ⁻¹	2000 min ⁻¹	3000 min ⁻¹
Rotor moment of inertia	49.6 kgcm ²	49.6 kgcm ²	49.6 kgcm ²	92.3 kgcm ²	92.3 kgcm ²	92.3 kgcm ²	92.2 kgcm ²	92.2 kgcm ²	92.2 kgcm ²
Rot. mo. of inertia (with brake)	68.3 kgcm ²	68.3 kgcm ²	68.3 kgcm ²	110.9 kgcm ²	110.9 kgcm ²	110.9 kgcm ²	111 kgcm ²	111 kgcm ²	111 kgcm ²

*high-performance type with cooling

Data for 400 V AC	AM8073- wNyz	AM8073- wQyz	AM8073- wTyz	AM8073- wPyz*	AM8073- wRyz*	AM8073- wUyz*	AM8531- wCyz	AM8531- wDyz	AM8531- wFyz
Standstill torque	72.6 Nm	72.6 Nm	70.0 Nm	104 Nm	104 Nm	95.0 Nm	1.37 Nm	1.38 Nm	1.40 Nm
Standstill current	14.7 A	27.9 A	45.6 A	19.8 A	37.4 A	66.5 A	1.00 A	1.95 A	3.20 A
Rated speed	1000 min ⁻¹	2000 min ⁻¹	3000 min ⁻¹	1000 min ⁻¹	2000 min ⁻¹	3000 min ⁻¹	3000 min ⁻¹	6000 min ⁻¹	9000 min ⁻¹
Rotor moment of inertia	134.9 kgcm ²	134.9 kgcm ²	134.9 kgcm ²	135 kgcm ²	135 kgcm ²	135 kgcm ²	1.67 kgcm ²	1.67 kgcm ²	1.67 kgcm ²
Rot. mo. of inertia (with brake)	153.6 kgcm ²	153.6 kgcm ²	153.6 kgcm ²	154 kgcm ²	154 kgcm ²	154 kgcm ²	1.76 kgcm ²	1.76 kgcm ²	1.76 kgcm ²

Data for 400 V AC	AM8532- wDyz	AM8532- wEyz	AM8532- wHyz	AM8533- wEyz	AM8533- wFyz	AM8533- wJyz	AM8541- wDyz	AM8541- wEyz	AM8541- wHyz
Standstill torque	2.38 Nm	2.37 Nm	2.37 Nm	3.20 Nm	3.22 Nm	3.22 Nm	2.37 Nm	2.45 Nm	2.40 Nm
Standstill current	1.70 A	2.95 A	5.10 A	2.10 A	4.10 A	6.80 A	1.65 A	3.00 A	5.25 A
Rated speed	3000 min ⁻¹	6000 min ⁻¹	9000 min ⁻¹	3000 min ⁻¹	6000 min ⁻¹	9000 min ⁻¹	3000 min ⁻¹	6000 min ⁻¹	8000 min ⁻¹
Rotor moment of inertia	2.05 kgcm ²	2.05 kgcm ²	2.05 kgcm ²	2.44 kgcm ²	2.44 kgcm ²	2.44 kgcm ²	4.63 kgcm ²	4.63 kgcm ²	4.63 kgcm ²
Rot. mo. of inertia (with brake)	2.15 kgcm ²	2.15 kgcm ²	2.15 kgcm ²	–	–	–	5.27 kgcm ²	5.27 kgcm ²	5.27 kgcm ²

Data for 400 V AC	AM8542- wEyz	AM8542- wFyz	AM8542- wJyz	AM8543- wEyz	AM8543- wHyz	AM8543- wKyz	AM8551- wEyz	AM8551- wGyz	AM8551- wKyz
Standstill torque	4.10 Nm	4.10 Nm	4.10 Nm	5.65 Nm	5.65 Nm	5.60 Nm	4.80 Nm	4.90 Nm	4.90 Nm
Standstill current	2.15 A	4.10 A	6.90 A	2.90 A	5.40 A	9.30 A	2.70 A	4.75 A	8.50 A
Rated speed	2500 min ⁻¹	5000 min ⁻¹	8000 min ⁻¹	2500 min ⁻¹	5000 min ⁻¹	8000 min ⁻¹	2500 min ⁻¹	5000 min ⁻¹	8000 min ⁻¹
Rotor moment of inertia	5.53 kgcm ²	5.53 kgcm ²	5.53 kgcm ²	6.43 kgcm ²	6.43 kgcm ²	6.43 kgcm ²	8.75 kgcm ²	8.75 kgcm ²	8.75 kgcm ²
Rot. mo. of inertia (with brake)	6.16 kgcm ²	6.16 kgcm ²	6.16 kgcm ²	–	–	–	9.41 kgcm ²	9.41 kgcm ²	9.41 kgcm ²

Data for 400 V AC	AM8551- wFyz*	AM8551- wJyz*	AM8551- wLyz*	AM8552- wFyz	AM8552- wJyz	AM8552- wLyz	AM8552- wGyz*	AM8552- wKyz*	AM8552- wNyz*
Standstill torque	6.30 Nm	6.30 Nm	6.30 Nm	8.20 Nm	8.20 Nm	8.20 Nm	10.7 Nm	10.7 Nm	9.9 Nm
Standstill current	3.5 A	5.8 A	11.1 A	3.30 A	6.30 A	11.3 A	4.3 A	8.5 A	13.9 A
Rated speed	2500 min ⁻¹	5000 min ⁻¹	8000 min ⁻¹	2000 min ⁻¹	4000 min ⁻¹	7300 min ⁻¹	2000 min ⁻¹	4000 min ⁻¹	6000 min ⁻¹
Rotor moment of inertia	8.74 kgcm ²	8.74 kgcm ²	8.74 kgcm ²	10.6 kgcm ²	10.6 kgcm ²	10.6 kgcm ²	10.6 kgcm ²	10.6 kgcm ²	10.6 kgcm ²
Rot. mo. of inertia (with brake)	9.40 kgcm ²	9.40 kgcm ²	9.40 kgcm ²	11.2 kgcm ²	11.2 kgcm ²	11.2 kgcm ²	11.2 kgcm ²	11.2 kgcm ²	11.2 kgcm ²

Data for 400 V AC	AM8553- wGyz	AM8553- wKyz	AM8553- wNyz	AM8553- wJyz*	AM8553- wLyz*	AM8553- wPyz*	AM8561- wGyz	AM8561- wJyz	AM8561- wMyz
Standstill torque	11.4 Nm	11.4 Nm	11.4 Nm	15.4 Nm	15.4 Nm	13.3 Nm	12.8 Nm	12.8 Nm	12.8 Nm
Standstill current	4.70 A	8.80 A	15.6 A	6.4 A	11.9 A	18.6 A	4.00 A	7.80 A	13.1 A
Rated speed	2000 min ⁻¹	4000 min ⁻¹	7000 min ⁻¹	2000 min ⁻¹	4000 min ⁻¹	5000 min ⁻¹	1500 min ⁻¹	3000 min ⁻¹	5000 min ⁻¹
Rotor moment of inertia	12.5 kgcm ²	12.5 kgcm ²	12.5 kgcm ²	12.5 kgcm ²	12.5 kgcm ²	12.5 kgcm ²	48.2 kgcm ²	48.2 kgcm ²	48.2 kgcm ²
Rot. mo. of inertia (with brake)	–	–	–	–	–	–	50.6 kgcm ²	50.6 kgcm ²	50.6 kgcm ²

Data for 400 V AC	AM8561- wHyz*	AM8561- wLyz*	AM8561- wNyz*	AM8562- wJyz	AM8562- wLyz	AM8562- wPyz	AM8562- wKyz*	AM8562- wNyz*	AM8562- wRyz*
Standstill torque	17.1 Nm	17.1 Nm	15.5 Nm	21.1 Nm	21.1 Nm	21.1 Nm	29.9 Nm	29.9 Nm	28.1 Nm
Standstill current	5.20 A	10.1 A	15.8 A	6.20 A	12.4 A	20.3 A	8.70 A	17.4 A	28.7 A
Rated speed	1500 min ⁻¹	3000 min ⁻¹	5000 min ⁻¹	1500 min ⁻¹	3000 min ⁻¹	5000 min ⁻¹	1500 min ⁻¹	3000 min ⁻¹	5000 min ⁻¹
Rotor moment of inertia	48.2 kgcm ²	48.2 kgcm ²	48.2 kgcm ²	57.1 kgcm ²	57.1 kgcm ²	57.1 kgcm ²	57.1 kgcm ²	57.1 kgcm ²	57.1 kgcm ²
Rot. mo. of inertia (with brake)	50.6 kgcm ²	50.6 kgcm ²	50.6 kgcm ²	59.6 kgcm ²	59.6 kgcm ²	59.6 kgcm ²	59.6 kgcm ²	59.6 kgcm ²	59.6 kgcm ²

Data for 400 V AC	AM8563- wKyz	AM8563- wNyz	AM8563- wRyz	AM8563- wLyz*	AM8563- wQyz*	AM8563- wTyz*
Standstill torque	29.0 Nm	29.0 Nm	29.0 Nm	41.4 Nm	41.4 Nm	40.1 Nm
Standstill current	8.70 A	17.2 A	29.5 A	11.6 A	24.0 A	39.8 A
Rated speed	1500 min ⁻¹	3000 min ⁻¹	4000 min ⁻¹	1500 min ⁻¹	3000 min ⁻¹	4000 min ⁻¹
Rotor moment of inertia	66.1 kgcm ²	66.1 kgcm ²	66.1 kgcm ²	66.1 kgcm ²	66.1 kgcm ²	66.1 kgcm ²
Rot. mo. of inertia (with brake)	–	–	–	–	–	–

*high-performance type with cooling

► www.beckhoff.com/AM80xx ► www.beckhoff.com/AM85xx

AM8800 | Stainless steel servomotors



AG2800 | Planetary gear units for AM8800 stainless steel servomotors

AM8800 | Stainless steel servomotors with One Cable Technology (OCT)

Data for 400 V AC	AM8831	AM8832	AM8833	AM8841	AM8842	AM8843
Standstill torque	0.85 Nm	1.40 Nm	1.85 Nm	1.60 Nm	2.60 Nm	3.50 Nm
Standstill current	0.65 A	1.00 A	1.25 A	1.10 A	1.60 A	1.90 A
Rated speed	3000 min ⁻¹	3000 min ⁻¹	3000 min ⁻¹	3000 min ⁻¹	2500 min ⁻¹	2500 min ⁻¹

Data for 400 V AC	AM8851	AM8852	AM8853	AM8861	AM8862	AM8863
Standstill torque	3.10 Nm	4.80 Nm	6.40 Nm	7.75 Nm	12.0 Nm	16.7 Nm
Standstill current	1.80 A	2.10 A	2.80 A	2.53 A	3.70 A	4.90 A
Rated speed	2500 min ⁻¹	2000 min ⁻¹	2000 min ⁻¹	1500 min ⁻¹	1500 min ⁻¹	1500 min ⁻¹

► www.beckhoff.com/AM88xx

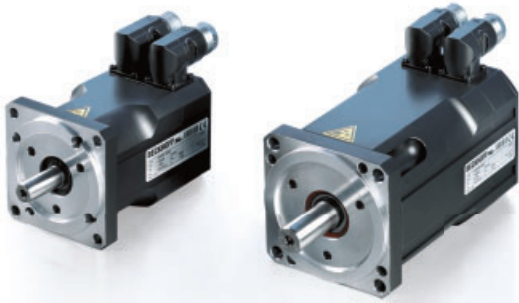
AG2800 | Planetary gear units for AM8800 stainless steel servomotors

Technical data	AG2800-+HDV015Z	AG2800-+HDV025Z	AG2800-+HDV035Z
Gear ratios 1-stage	4/5/7/10	4/5/7/10	4/5/7/10
Gear ratios 2-stage	16/20/25/35/50/70/100	16/20/25/35/50/70/100	16/20/25/35/50/70/100
Acceleration torque	29/32 Nm	72/80 Nm	180/200 Nm
Torsional backlash 1-stage	≤ 10 arcmin	≤ 10 arcmin	≤ 10 arcmin
Torsional backlash 2-stage	≤ 15 arcmin	≤ 15 arcmin	≤ 15 arcmin

► www.beckhoff.com/AG2800

We reserve the right to make technical changes.

BECKHOFF New Automation Technology



AM3500 | Synchronous Servomotors with higher moment of inertia



AG2210 | Planetary gear units for Servomotors AM8000 and AM8500



AM3000 | Synchronous Servomotors



AM3000, AM3500 | Synchronous Servomotors

Technical data	AM301x	AM302x	AM303x	AM304x	AM305x	AM306x	AM307x	AM308x
Standstill torque	0.18... 0.41 Nm	0.48... 1.41 Nm	1.15... 2.79 Nm	1.95... 6.00 Nm	4.70... 14.90 Nm	11.90... 25.00 Nm	29.40... 53.00 Nm	75.00... 180.00 Nm
Standstill current	1.16... 2.40 A	1.39... 2.73 A	1.37... 5.50 A	1.40... 8.80 A	2.75... 12.50 A	4.90... 19.80 A	9.30... 26.20 A	48.00... 67.00 A
Rated speed (n_N)	7000... 8000 min ⁻¹	4500... 8000 min ⁻¹	2000... 7000 min ⁻¹	1500... 6000 min ⁻¹	1500... 6000 min ⁻¹	1500... 6000 min ⁻¹	1500... 4000 min ⁻¹	1800... 2500 min ⁻¹

► www.beckhoff.com/AM30xx

Technical data	AM354x	AM355x	AM356x
Standstill torque	1.9...4.2 Nm	4.1...8.6 Nm	11.6/14.9 Nm
Standstill current	1.7...5.2 A	3.4...6.4 A	10.3/12.5 A
Rated speed (n_N)	3000...6000 min ⁻¹	3000...6000 min ⁻¹	3000 min ⁻¹

► www.beckhoff.com/AM35xx

AG2210 | Planetary gear units for Servomotors AM8000 and AM8500

Technical data	AG2210-+LP050S	AG2210-+LP070S	AG2210-+LP090S	AG2210-+LP120S	AG2210-+LP155S
Gear ratios 1-stage	4/5/7/10	3/4/5/7/10	3/4/5/7/10	3/4/5/7/10	5/10
Gear ratios 2-stage	16/20/25/35/50/ 70/100	9/12/16/20/25/30/ 40/50/70/100	9/12/16/20/25/30/ 40/50/70/100	9/12/16/20/25/30/ 40/50/70/100	25/50/100
Acceleration torque	14 Nm max.	55 Nm max.	125 Nm max.	305 Nm max.	500 Nm max.
Torsional backlash 1-stage	≤ 10 arcmin	≤ 8 arcmin	≤ 8 arcmin	≤ 8 arcmin	≤ 8 arcmin
Torsional backlash 2-stage	≤ 13 arcmin	≤ 10 arcmin	≤ 10 arcmin	≤ 10 arcmin	≤ 10 arcmin

AG2210 planetary gear units also suitable for use with AM3000 and AM3500 servomotors

► www.beckhoff.com/AG2210



AL20xx | Linear Servomotors

AL24xx | Linear Servomotors

AL28xx | Linear Servomotors

AL2000, AL2400, AL2800 | Linear Servomotors

Technical data	AL2003	AL2006	AL2009	AL2012	AL2015	AL2018	AL2024
Speed max.	4 m/s (N), 10 m/s (S)	4 m/s (N), 10 m/s (S)	4 m/s (N), 10 m/s (S)	4 m/s (N), 10 m/s (S)	4 m/s (N), 10 m/s (S)	4 m/s (N), 10 m/s (S)	4 m/s (N), 10 m/s (S)
Peak force 3 sec. (F_P)	225 N	450 N	675 N	900 N	1125 N	1350 N	1800 N
Peak current (I_{Pa})	5 A	6.5 A (N), 15 A (S)	6.5 A (N), 19 A (S)	8 A (N), 26 A (S)	13 A (N), 33 A (S)	13 A (N), 35 A (S)	26 A (N), 52 A (S)

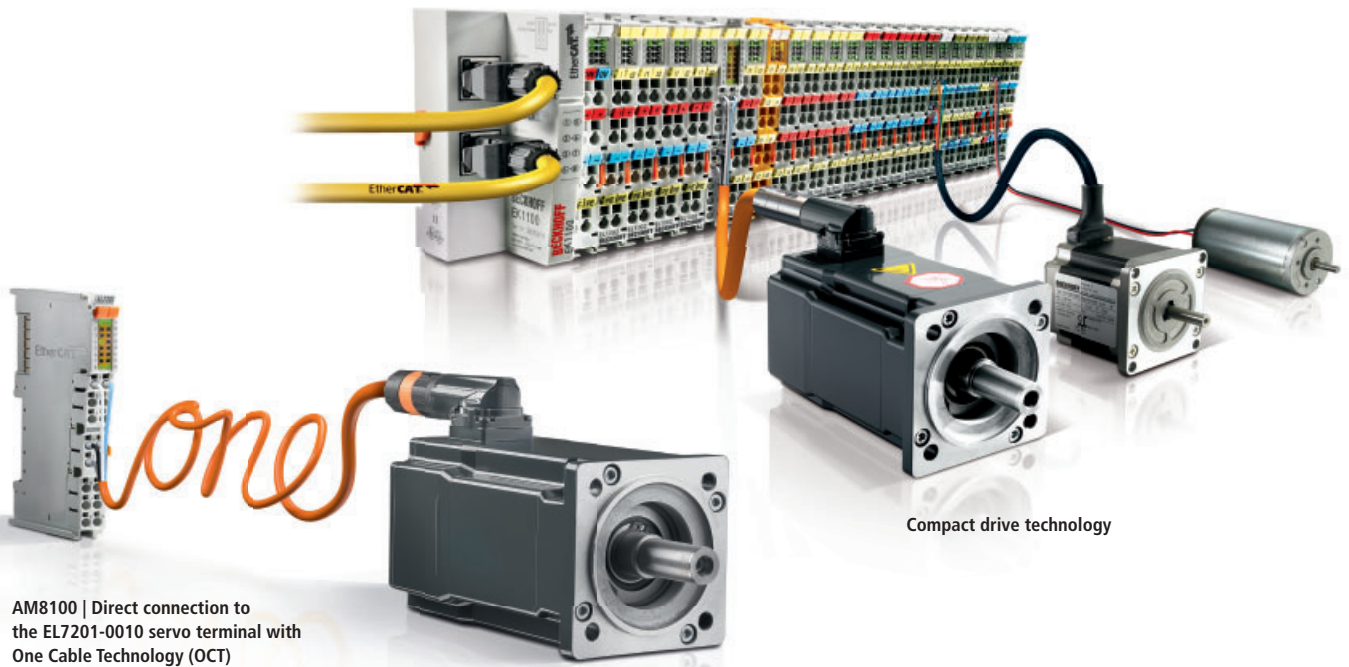
► www.beckhoff.com/AL20xx

Technical data	AL2403	AL2406	AL2412
Speed max.	8 m/s	8 m/s	8 m/s
Peak force 3 sec. (F_P)	120 N	240 N	480 N
Peak current (I_{Pa})	4.1 A	8.2 A	16.4 A

► www.beckhoff.com/AL24xx

Technical data	AL2812	AL2815	AL2830	AL2845
Speed max.	2.5 m/s (N), 6 m/s (S)	2.5 m/s (N), 6 m/s (S)	2.5 m/s (N), 6 m/s (S)	2.5 m/s (N), 6 m/s (S)
Peak force 3 sec. (F_P)	1800 N	2250 N	4500 N	6750 N
Peak current (I_{Pa})	13 A (N), 26 A (S)	13.5 A (N), 33 A (S)	26 A (N), 66 A (S)	41 A (N), 98 A (S)

► www.beckhoff.com/AL28xx



AM8100 | Direct connection to the EL7201-0010 servo terminal with One Cable Technology (OCT)

Compact drive technology

AM8100, AM3100 | Synchronous Servomotors

Data for 50 V DC	AM8111	AM8112	AM8113	AM8121	AM8122	AM8131
Standstill torque	0.20 Nm	0.38 Nm	0.52 Nm	0.50 Nm	0.80 Nm	1.35 Nm
Standstill current	2.8 A	4.7 A	4.8 A	4.0 A	4.0 A	5.0 A
Rated speed	4000 min ⁻¹	4500 min ⁻¹	3000 min ⁻¹	3000 min ⁻¹	2000 min ⁻¹	1000 min ⁻¹

Data for 50 V DC	AM3111	AM3112	AM3121
Standstill torque	0.21 Nm	0.34 Nm	0.69 Nm
Standstill current	3.22 A	3.40 A	4.60 A
Rated speed	3000 min ⁻¹	3500 min ⁻¹	2000 min ⁻¹

► www.beckhoff.com/AM81xx ► www.beckhoff.com/AM31xx

AG2250 | Planetary gear units for Servomotors AM8100

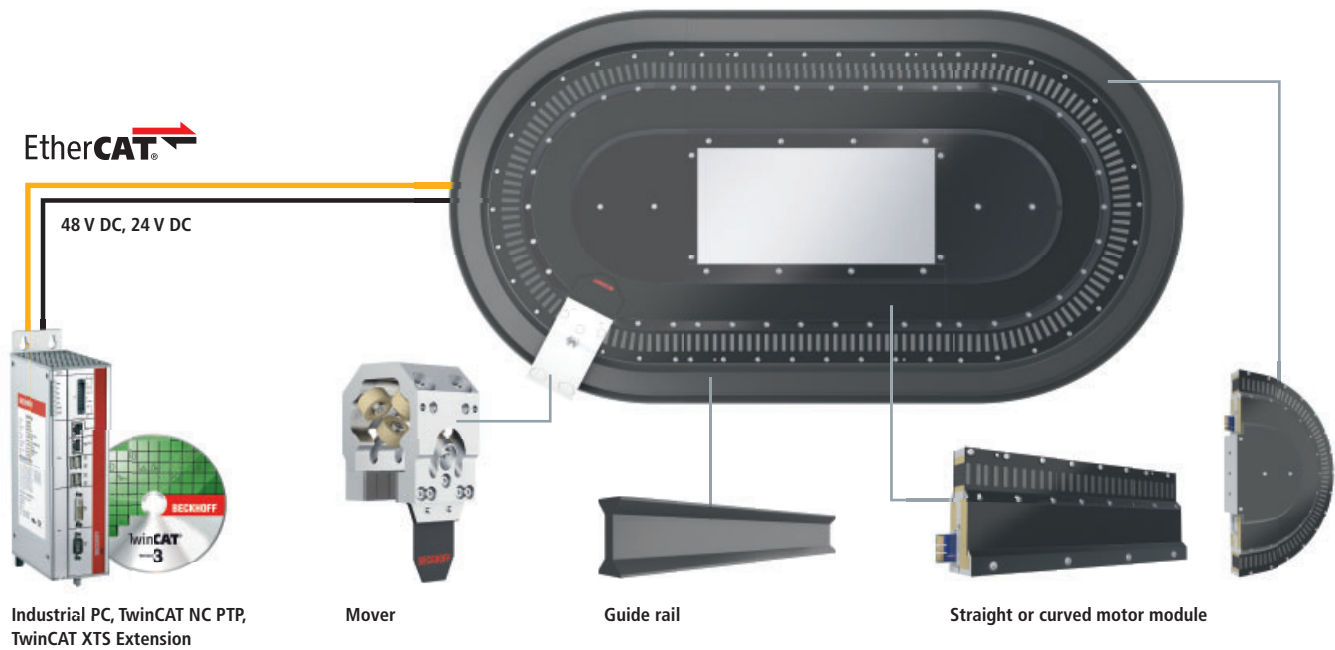
Technical data	AG2250-+PLE40	AG2250-+PLE60	AG2250-+WPLE40	AG2250-+WPLE60
Gear ratios 1-stage	3/4/5/7/8/10	3/4/5/7/8/10	3/4/5/7/8/10	3/4/5/7/8/10
Gear ratios 2-stage	12/16/20/25/32/40/64	12/16/20/25/32/40/64	12/16/20/25/32/40/64	12/16/20/25/32/40/64
Rated torque	max. 20 Nm	max. 44 Nm	max. 20 Nm	max. 44 Nm
Torsional backlash 1-/2-stage	> 15 arcmin/> 19 arcmin	> 10 arcmin/> 12 arcmin	> 21 arcmin/> 25 arcmin	> 16 arcmin/> 18 arcmin

AG2250 planetary gear units also suitable for use with AM3100 servomotors ► www.beckhoff.com/AG2250

AS1000 | Stepper Motors

Technical data	AS1010	AS1020	AS1030	AS1050	AS1060
Rated supply voltage	24...50 V DC	24...50 V DC	24...50 V DC	24...50 V DC	24...50 V DC
Rated current (per phase)	1.00 A	1.00 A	1.50 A	5.00 A	5.00 A
Standstill torque	0.38 Nm	0.50 Nm	0.60 Nm	1.20 Nm	5.00 Nm

► www.beckhoff.com/AS10xx



XTS | eXtended Transport System

XTS | Motor modules

AT2000-0250	straight motor module
AT2001-0250	straight motor module with infeed
AT2020-0250	curved motor module 22.5° (positive curve, convex, radius constant)
AT2025-0250	curved motor module -22.5° (negative curve, concave, radius constant)
AT2050-0500	curved motor module 180° (clothoid)

► www.beckhoff.com/AT2000

XTS | Mover

AT901x-0050	mover suitable for the AT9000/AT9050 guide rail system, optionally with encoder flag for identification of a specific mover
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► www.beckhoff.com/AT9011

XTS | Guide rails

AT9000-xxxx	straight guide rails
AT9100-xxxx	straight guide rails with lock
AT9020-0500	curved guide rail 22.5° (positive curve, convex, radius constant)
AT9025-0500	curved guide rail -22.5° (negative curve, concave, radius constant)
AT9050-0500	curved guide rail 180° (clothoid)

► www.beckhoff.com/AT9000

XTS | Software

TF5000	TwinCAT TC3 NC PTP 10 Axes
TF5850	TwinCAT TC3 XTS Extension

► www.beckhoff.com/TF5850

XTS | Starter kit

AT2000-0500	starter kit small, 500 mm, straight length, 5 movers
AT2000-1000	starter kit medium, 1000 mm, straight length, 10 movers
AT2000-1500	starter kit large, 1500 mm, straight length, 10 movers

► www.beckhoff.com/XTS

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

TwinCAT 68

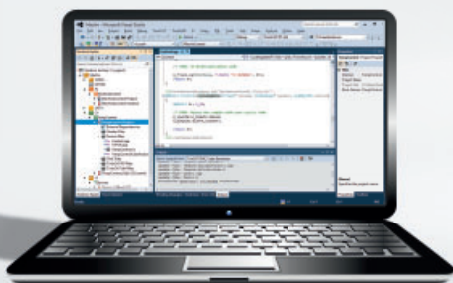
- One software platform for engineering and runtime
- Integrated real-time support
- Software modules for PLC, NC, CNC, robotics, measurement technology, safety

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





TwinCAT automation software

Connectivity

- Useable with all fieldbus systems
- Open and expandable for IT trends – today and tomorrow
- Adheres to industry-specific and standard protocols
- Ideal for cloud computing applications

► www.beckhoff.com/TwinCAT3

TwinSAFE 76

- 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

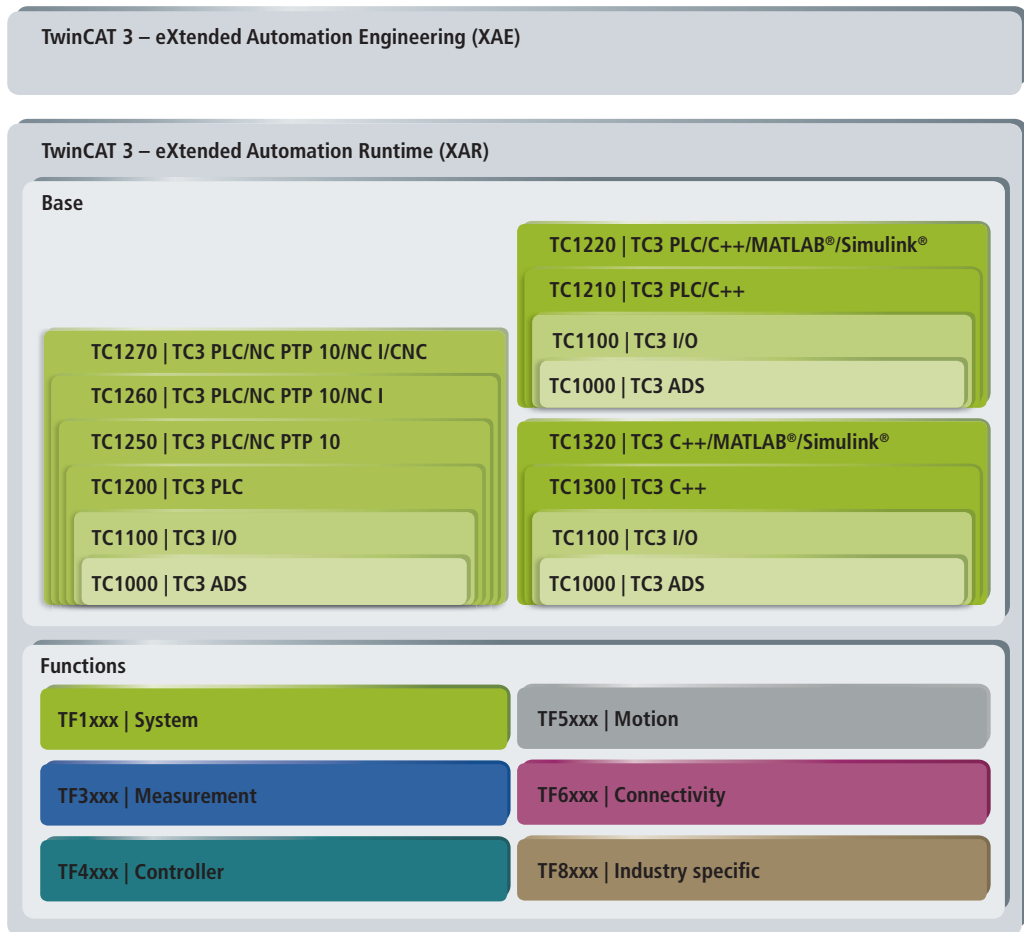


- Efficient, universal engineering
- Programming in different languages
- Open, hardware-independent control system gives freedom of choice in terms of automation and control components.
- Scalable control platform from single- to multi-core CPUs
- All control functions on a single, centralised platform: PLC, motion control, robotics, measurement technology, a.o.

TwinCAT 3

TwinCAT 3 realises a new approach for the engineering and extends the runtime by many features. The engineering is embedded completely in the Microsoft Visual Studio® framework. This way, C/C++ or MATLAB®/Simulink® are available in a single environment with programming and debugging in addition to the configuration of system, motion, I/O and the IEC61131 PLC programming languages.

With these programming languages it is possible to create modules that can be executed in the TwinCAT 3 runtime. The number of modules that can be executed is almost unlimited. The number of tasks in TwinCAT 3 has also been significantly extended. The TwinCAT 3 runtime environment allows modules to be loaded to different cores of a multi-core CPU.



TwinCAT 3 is divided into components. The TwinCAT 3 engineering components enable the configuration, programming and debugging of applications. The TwinCAT 3 runtime consists of further components – basic components and functions. The basic components can be extended by functions.

TwinCAT 3 | Base



TC1000 | TC3 ADS

The TwinCAT Automation Device Specification (ADS) is the medium-independent protocol for the reading and writing of data and for instruction transmission within TwinCAT. An ADS router is made available for communication links. ADS clients can be connected to TwinCAT controllers in the network via ADS.



TC1100 | TC3 I/O

Using TwinCAT I/O, cyclic data can be collected by different fieldbuses in process images. Cyclic tasks drive the corresponding fieldbuses. Various fieldbuses can be operated with different cycle times on one CPU. Applications can directly access the process image. The fieldbuses and the process images are configured in TwinCAT Engineering.



TC1200 | TC3 PLC

TwinCAT PLC realises one or more PLCs with the international standard IEC 61131-3 3rd edition on one CPU. All programming languages described in the standard can be used for programming. Various convenient debugging options facilitate fault-finding and commissioning. PLC program modifications can be carried out at any times and in any size online, i.e. when the PLC is running. All variables are available symbolically by ADS and can be read and written in appropriate clients.



TC1300 | TC3 C++

The TwinCAT 3 C++ runtime environment enables the execution of real-time modules written in C++. Convenient debugging and monitoring options facilitate fault-finding and commissioning. All variables are available symbolically by ADS and can be read and written in appropriate clients.

TwinCAT 3 | Engineering

TE1000	TC3 Engineering	TwinCAT 3 engineering environment	
TE1110	TC3 Simulation Manager	tool for easy configuration of a simulation environment	i
TE1111	TC3 EtherCAT Simulation	easy configurations of simulation environments with several EtherCAT slaves	
TE1120	TC3 XCAD Interface	transfer of existing engineering results from ECAD tools	i
TE1140	TC3 Management Server	central administration of Beckhoff CE controllers	
TE1300	TC3 Scope View Professional	software oscilloscope for the graphical display of data captured from several target systems	
TE1400	TC3 MATLAB®/Simulink® Target	TwinCAT target for MATLAB®/Simulink® for generating TwinCAT 3 modules	
TE1410	TC3 Interface for MATLAB®/Simulink®	communication interface between MATLAB®/Simulink® and the TwinCAT 3 runtime	
TE1500	TC3 Valve Diagram Editor	graphical tool for designing the characteristic curve of a hydraulic valve	
TE1510	TC3 CAM Design Editor	graphic design tool for electronic cam plates	

TwinCAT 3 | Base

TC1000	TC3 ADS	TwinCAT 3 ADS	
TC1100	TC3 I/O	TwinCAT 3 I/O	
TC1200	TC3 PLC	TwinCAT 3 PLC	
TC1210	TC3 PLC/C++	TwinCAT 3 PLC and C++	
TC1220	TC3 PLC/C++/MATLAB®/Simulink®	TwinCAT 3 PLC, C++ and modules generated in MATLAB®/Simulink®	
TC1250	TC3 PLC/NC PTP 10	TwinCAT 3 PLC and NC PTP 10	
TC1260	TC3 PLC/NC PTP 10/NC I	TwinCAT 3 PLC, NC PTP 10 and NC I	
TC1270	TC3 PLC/NC PTP 10/NC I/CNC	TwinCAT 3 PLC, NC PTP 10, NC I and CNC	
TC1275	TC3 PLC/NC PTP 10/NC I/CNC E	TwinCAT 3 PLC, NC PTP 10, NC I and CNC E	
TC1300	TC3 C++	TwinCAT 3 C++	
TC1320	TC3 C++/MATLAB®/Simulink®	TwinCAT 3 C++ and modules generated in MATLAB®/Simulink®	

TwinCAT 3 | Functions

System

TF1800	TC3 PLC HMI	stand-alone tool for displaying visualisations from the PLC development environment	i
TF1810	TC3 PLC HMI Web	display of visualisations from the PLC development environment in a web browser	i

Measurement

TF3300	TC3 Scope Server	data preparation for visual display in the TwinCAT 3 Scope View	
TF3600	TC3 Condition Monitoring Level 1	Condition Monitoring Level 1	
TF3601	TC3 Condition Monitoring Level 2	Condition Monitoring Level 2	i
TF3900	TC3 Solar Position Algorithm	precise calculation of the sun's position	

Controller

TF4100	TC3 Controller Toolbox	basic controllers (P, I, D), complex controllers (PI, PID), pulse width modulation, ramps, signal generators and filters	
TF4110	TC3 Temperature Controller	temperature control for monitoring and controlling different temperature ranges	

Motion

TF5000	TC3 NC PTP 10 Axes	NC PTP (point-to-point movements) for up to 10 axes	
TF5010	TC3 NC PTP Axes Pack 25	extension of TwinCAT 3 NC PTP to up to 25 axes	
TF5020	TC3 NC PTP Axes Pack unlimited	extension of TwinCAT 3 NC PTP to over 25 axes	
TF5050	TC3 NC Camming	using the TwinCAT NC cam plate functionality (table coupling)	
TF5055	TC3 NC Flying Saw	implementing "flying saw" functionality	
TF5060	TC3 NC FIFO Axes	implementation of a pre-defined user setpoint generator for an NC axis	

TwinCAT 3 | Functions

Motion

TF5065	TC3 Motion Control XFC	high-precision logging and switching of digital signals in relation to axis positions
TF5100	TC3 NC I	NC I with 3 interpolating axes and 5 additional axes
TF5110	TC3 Kinematic Transformation L1	realisation of different kinematic transformations Level 1
TF5111	TC3 Kinematic Transformation L2	realisation of different kinematic transformations Level 2
TF5112	TC3 Kinematic Transformation L3	realisation of different kinematic transformations Level 3
TF5113	TC3 Kinematic Transformation L4	realisation of different kinematic transformations Level 4
TF5200	TC3 CNC	CNC path control software
TF5210	TC3 CNC E	CNC path control software export version
TF5220	TC3 CNC Axes Pack	extension to up to a total of 64 axes/controlled spindles, of which a maximum of 32 can be path axes and a maximum of 12 can be controlled spindles
TF5230	TC3 CNC Channel Pack	further CNC channel, extension to a maximum of 12 channels, channel synchronisation, axis transfer between channels
TF5240	TC3 CNC Transformation	transformation functionality (5-axis functionality)
TF5250	TC3 CNC HSC Pack	extending the CNC with HSC technology (high-speed cutting)
TF5260	TC3 CNC Spline Interpolation	path programming via splines with programmable spline type, Akima-spline, B-spline
TF5270	TC3 CNC Virtual NCK Basis	virtual TwinCAT CNC for simulation in a Windows environment
TF5271	TC3 CNC Virtual NCK Options	virtual TwinCAT CNC for simulation in a Windows environment

Connectivity

TF6000	TC3 ADS Communication Library	ADS communication components
TF6100	TC3 OPC UA	access to TwinCAT in accordance with OPC UA with UA server (DA/HA/AC) and UA client (DA)
TF6120	TC3 OPC DA	access to TwinCAT variables, in accordance with OPC DA and OPC XML DA specification
TF6220	TC3 EtherCAT Redundancy 250	extension of the TwinCAT EtherCAT master with cable redundancy capability for up to 250 slaves
TF6221	TC3 EtherCAT Redundancy 250+	extension of the TwinCAT EtherCAT master with cable redundancy capability for more than 250 slaves
TF6225	TC3 EtherCAT External Sync	extension of the TwinCAT EtherCAT master with an option to synchronise the Beckhoff real-time communication with external signals
TF6250	TC3 Modbus TCP	communication with Modbus TCP devices (server and client functionality)
TF6255	TC3 Modbus RTU	serial communication with Modbus end devices
TF6270	TC3 PROFINET RT Device	communication via PROFINET (PROFINET slave)
TF6271	TC3 PROFINET RT Controller	communication via PROFINET (PROFINET master)
TF6280	TC3 Ethernet/IP Slave	communication via EtherNet/IP (EtherNet/IP slave)
TF6281	TC3 Ethernet/IP Master	communication via EtherNet/IP (EtherNet/IP master)
TF6300	TC3 FTP	easy access from TwinCAT PLC to FTP server
TF6310	TC3 TCP/IP	communication via generic TCP server
TF6340	TC3 Serial Communication	communication via serial Bus Terminals or PC COM ports with the 3964R and RK512 protocol
TF6350	TC3 SMS/SMTP	sending SMS and e-mails from the PLC
TF6360	TC3 Virtual Serial COM	virtual serial COM driver for Windows platforms
TF6420	TC3 Database Server	accessing databases from the PLC
TF6421	TC3 XML Server	read and write access to XML files from the PLC
TF6500	TC3 IEC 60870-5-10x	communication according to IEC 60870-101, -102, -103, -104
TF6510	TC3 IEC 61850/400-25	communication according to IEC 61850 and IEC 61400-25
TF6600	TC3 RFID Reader Communication	connection of RFID readers to the TwinCAT PLC
TF6610	TC3 S5/S7 Communication	communication with S5/S7 controllers

Industry specific

TF8000	TC3 BA Connectivity Library	libraries for programming of Bus Terminals for building automation (LON, DALI, ...)
TF8040	TC3 Building Automation	software package covering all technical building automation services

► www.beckhoff.com/TwinCAT3

We reserve the right to make technical changes.

BECKHOFF New Automation Technology

TwinCAT 2

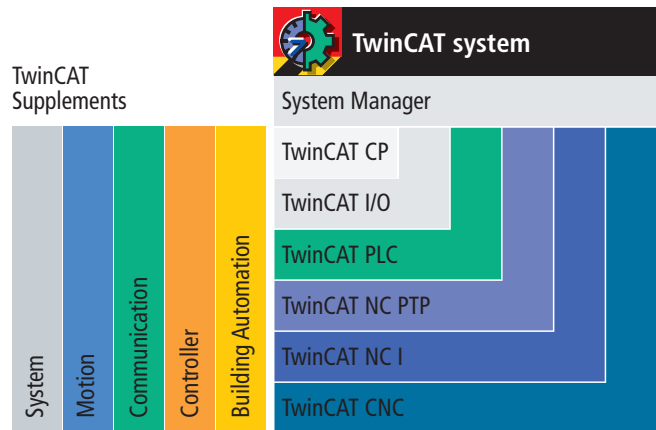
TX1200 TwinCAT PLC	
PC hardware	standard PC/IPC hardware, no extras
Operating systems	Windows NT/2000/XP/Vista, Windows 7, NT/XP/Windows 7 Embedded, CE*
Real-time	Beckhoff real-time kernel
I/O system	EtherCAT, Lightbus, PROFIBUS DP/MC, Interbus, CANopen, DeviceNet, SERCOS, Ethernet
Runtime system	4 multi-tasking PLCs each with 4 tasks in each PLC runtime system, development and runtime systems on one PC or separately (CE: only runtime)
Memory	process image size, flags area, program size, POU size, number of variables only limited by the size of the user memory (max. 2 GB with NT/2000/XP/Vista)
Cycle time	adjustable from 50 µs
Link time	1 µs (Intel® Core™2 Duo) for 1,000 PLC commands
Programming	IEC 61131-3: IL, FBD, LD, SFC, ST, powerful library management, convenient debugging

TX1250 TwinCAT NC PTP	
TwinCAT PLC	inclusive
PC hardware	standard PC/IPC hardware, no extras
Operating systems	Windows NT/2000/XP/Vista, Windows 7, NT/XP/Windows 7 Embedded, CE*
Real-time	Beckhoff real-time kernel
I/O system	EtherCAT, Lightbus, PROFIBUS DP/MC, Interbus, CANopen, DeviceNet, SERCOS, Ethernet
Programming	performed using function blocks for TwinCAT PLC according to IEC 61131-3 (standardised PLCopen Motion Control libraries), convenient axis commissioning menus in the System Manager
Runtime system	NC point-to-point including TwinCAT PLC
Number of axes	up to 255
Axis types	electrical and hydraulic servo drives, frequency converter drives, stepper motor drives, switched drives (fast/crawl axes)
Cycle time	50 µs upwards, typically 1 ms (selectable)
Axis functions	standard axis functions: start/stop/reset/reference, speed override, special functions: master/slave cascading, cam plates, electronic gearings, online distance compensation of segments, "flying saw"

TX1100 TwinCAT I/O	
PC hardware	standard PC/IPC hardware, no extras
Operating systems	Windows NT/2000/XP/Vista, Windows 7, NT/XP/Windows 7 Embedded, CE (only runtime)*
Real-time	Beckhoff real-time kernel
Multi-purpose I/O interface for all common fieldbus systems, PC Fieldbus Cards and interfaces with integrated real-time driver	

TX1000 TwinCAT CP	
PC hardware	standard PC/IPC hardware, no extras
Operating systems	Windows NT/2000/XP/Vista, Windows 7, NT/XP/Windows 7 Embedded*
Real-time	Beckhoff real-time kernel
Windows driver for Beckhoff Control Panel	

* version-dependent



TX1260 TwinCAT NC I	
TwinCAT PLC	inclusive
TwinCAT NC PTP	inclusive
PC hardware	standard PC/IPC hardware, no extras
Operating systems	Windows NT/2000/XP/Vista, Windows 7, NT/XP/Windows 7 Embedded, CE*
Real-time	Beckhoff real-time kernel
I/O system	EtherCAT, Lightbus, PROFIBUS DP/MC, Interbus, CANopen, DeviceNet, SERCOS, Ethernet
Programming	DIN 66025 programs for NC interpolation, access via function blocks from TwinCAT PLC according to IEC 61131-3
Runtime system	NC interpolation, including TwinCAT NC PTP and PLC
Number of axes	max. 3 axes and up to 5 auxiliary axes per group, 1 group per channel, max. 31 channels
Axis types	electrical servo axes, stepper motor drives
Interpreter functions	subroutines and jumps, programmable loops, zero shifts, tool compensations, M and H functions
Geometries	straight lines and circular paths in 3-D space, circular paths in all main planes, helices with base circles in all main planes linear, circular, helical interpolation in the main lanes and freely definable planes, Bezier splines, look-ahead function
Axis functions	online reconfiguration of axes in groups, path override, slave coupling to path axes, auxiliary axes, axis error and sag compensation, measuring functions
Operation	automatic operation, manual operation (jog/inching), single block operation, referencing, handwheel operation (motion/superposition)

TS511x TwinCAT NC I Options	
Options	TS511x TwinCAT Kinematic Transformation

TX1270 TwinCAT CNC	
TwinCAT PLC	inclusive
TwinCAT NC PTP	inclusive
TwinCAT NC I	inclusive
PC hardware	standard PC/IPC hardware, no extras
Operating systems	Windows NT/2000/XP/Vista, Windows 7, Windows NT/XP/Windows 7 Embedded*
Real-time	Beckhoff real-time kernel
I/O system	EtherCAT, Lightbus, PROFIBUS DP/MC, CANopen, DeviceNet, SERCOS, Ethernet
Programming	DIN 66025 programming language with high-level language extensions, access via function blocks from TwinCAT PLC according to IEC 61131-3
Runtime system	CNC, including TwinCAT NC I, NC PTP, PLC
Number of axes/spindles	8 path axes/controlled spindles, max. of 64 axes/controlled spindles (optional), max. 12 channels (optional)
Axis types	electrical servo-axes, analog/encoder interface via fieldbus, digital interface via fieldbus
Interpreter functions	subroutines and jumps, programmable loops, zero shifts, tool compensations, M and H functions, mathematical functions, programming of parameters/variables, user macros, spindle and help functions, tool functions
Geometries	linear, circular, helical interpolation in the main planes and freely definable planes, max. 32 interpolating path axes per channel, look-ahead function
Axis functions	coupling and gantry axis function, override, axis error and sag compensation, measuring functions
Operation	automatic operation, manual operation (jog/inching), single block operation, referencing, block search, handwheel operation (motion/superposition)

TS52xx TwinCAT CNC Options	
Options	TS5220 TwinCAT CNC Axes Pack
	TS5230 TwinCAT CNC Channel Pack
	TS5240 TwinCAT CNC Transformation
	TS5250 TwinCAT CNC HSC Pack
	TS5260 TwinCAT CNC Spline Interpolation

TwinCAT 2 Supplements | System

TS1010	TwinCAT Eventlogger	alarm and diagnostic system for logging events which occur in the TwinCAT system
TS1110	TwinCAT Simulation Manager	simplified preparation and configuration of a simulation environment
TS1120	TwinCAT ECAD Import	importing engineering results from an ECAD program
TS1140	TwinCAT Management Server	central administration of Beckhoff CE control systems
TS1150	TwinCAT Backup	backing up and restoring files, operating system and TwinCAT settings
TS1600	TwinCAT Engineering Interface Server	co-ordinating programming tasks via a central source code management system
TS1800	TwinCAT PLC HMI	displaying visualisations created in PLC Control
TS1800-0030	TwinCAT PLC HMI CE	displaying visualisations created in PLC Control on Windows CE platforms
TS1810	TwinCAT PLC HMI Web	displaying visualisations created in PLC Control in a web browser
TS3300	TwinCAT Scope 2	graphical analysis tool for displaying time-continuous signals
TS3900	TwinCAT Solar Position Algorithm	precise calculation of the sun's position
TS622x	TwinCAT EtherCAT Redundancy	extension of the TwinCAT EtherCAT master with cable redundancy capability
TS6420	TwinCAT Database Server	accessing databases from the PLC
TS6420-0030	TwinCAT Database Server CE	accessing databases from the PLC for Windows CE platforms
TS6421	TwinCAT XML Data Server	reading and writing of XML-based data by the PLC
TS6421-0030	TwinCAT XML Data Server CE	reading and writing of XML-based data by the PLC for Windows CE platforms

TwinCAT 2 Supplements | Controller

TS4100	TwinCAT PLC Controller Toolbox	modules for basic controllers (P, I, D), complex controllers (PI, PID), pulse width modulation, ramps, signal generators and filters
TS4110	TwinCAT PLC Temperature Controller	instanced temperature control function block for monitoring and controlling different temperature ranges

TwinCAT 2 Supplements | Motion

TS1500	TwinCAT Valve Diagram Editor	graphical tool for designing the characteristic curve of a hydraulic valve
TS1510	TwinCAT Cam Design Tool	graphic design tool for electronic cam plates
TS5050	TwinCAT NC Camming	using the TwinCAT NC cam plate functionality (table coupling)
TS5055	TwinCAT NC Flying Saw	implementing "flying saw" functionality
TS5060	TwinCAT NC FIFO Axes	implementation of a pre-defined user setpoint generator for an NC axis
TS5065	TwinCAT PLC Motion Control XFC	high-precision logging and switching of digital signals in relation to axis positions
TS5066	TwinCAT PLC Remote Synchronisation	remote synchronisation
TS511x	TwinCAT Kinematic Transformation	implementation of different kinematic transformations for TwinCAT PTP or TwinCAT NC I
TS5800	TwinCAT Digital Cam Server	software implementation of fast cam controller
TS5810	TwinCAT PLC Hydraulic Positioning	control and adjustment of hydraulic axes


TwinCAT 2 Supplements | Communication

TS6100	TwinCAT OPC UA Server	access to TwinCAT in accordance with OPC UA with UA server (DA/HA/AC) and UA client (DA)
TS6100-0030	TwinCAT OPC UA Server CE	access to TwinCAT in accordance with OPC UA with UA server (DA/HA/AC) and UA client (DA) for Windows CE platforms

TwinCAT 2 Supplements | Communication

TS6120	TwinCAT OPC Server	access to TwinCAT variables in accordance with the OPC DA/OPC XML DA specification
TS6250	TwinCAT Modbus TCP Server	communication with Modbus TCP devices (server and client functionality)
TS6250-0030	TwinCAT Modbus TCP Server CE	communication with Modbus TCP devices (server and client functionality) for Windows CE platforms
TS6255	TwinCAT PLC Modbus RTU	serial communication with Modbus end devices
TS6270	TwinCAT PROFINET RT Device	TwinCAT PROFINET RT device turns every PC-based controller into a PROFINET RT device.
TS6271	TwinCAT PROFINET RT Controller	TwinCAT PROFINET RT controller turns every PC-based controller into a PROFINET RT controller.
TS6280	TwinCAT EtherNet/IP Slave	TwinCAT EtherNet/IP slave turns every PC-based controller into an EtherNet/IP slave.
TS6300	TwinCAT FTP Client	basic access from TwinCAT PLC to FTP server
TS6310	TwinCAT TCP/IP Server	communication via generic TCP servers
TS6310-0030	TwinCAT TCP/IP Server CE	communication via generic TCP servers for Windows CE platforms
TS6340	TwinCAT PLC Serial Communication	communication via serial Bus Terminals or PC COM ports
TS6341	TwinCAT PLC Serial Communication 3964R/RK512	communication via serial Bus Terminals or PC COM ports with the 3964R and RK512 protocol
TS6350	TwinCAT SMS/SMTP Server	sending SMS and e-mails from the PLC
TS6350-0030	TwinCAT SMS/SMTP Server CE	sending SMS and e-mails from the PLC for Windows CE platforms
TS6360	TwinCAT Virtual Serial COM Driver	virtual serial COM driver for Windows and Windows CE platforms
TS6370	TwinCAT DriveCOM OPC Server	fieldbus-independent communication connections between the engineering tool and the drive
TS6371	TwinCAT DriveTop Server	configuring Indramat SERCOS drives with DriveTop software on TwinCAT systems
TS650x	TwinCAT PLC IEC 60870-5-101, -102, -103, -104 Master	implementation of IEC 60870-101, -102, -103 and -104 masters
TS6506-0030	TwinCAT PLC IEC 60870-5-104 Master CE	implementation of IEC 60870-104 masters under Windows CE
TS6507	TwinCAT PLC IEC 60870-5-101, -104 Slave	implementation of IEC 60870-101 and -104 slaves
TS6507-0030	TwinCAT PLC IEC 60870-5-104 Slave CE	implementation of IEC 60870-104 slaves under Windows CE
TS6509	TwinCAT PLC IEC 61400-25 Server	IEC 61400-25 communication
TS6511	TwinCAT PLC IEC 61850 Server	IEC 61850 communication
TS6600	TwinCAT PLC RFID Reader Communication	connection of RFID readers to the TwinCAT PLC
TS6610	TwinCAT PLC S5/S7 Communication	communication with S5/S7 controllers

TwinCAT 2 Supplements | Building Automation

TS8000	TwinCAT PLC HVAC	automation of HVAC and sanitary installations
TS8010	TwinCAT PLC Building Automation Basic	executing basic room automation functions
TS8020	TwinCAT BACnet/IP	communication with the data networks of the building automation and building control systems
TS8035	TwinCAT FIAS Server	communication between TwinCAT PLC and a system using the FIAS standard
TS8036	TwinCAT Crestron Server	communication between a TwinCAT PLC and a Crestron controller
TS8037	TwinCAT Bang & Olufsen Server	communication between a TwinCAT PLC and a Bang & Olufsen audio/video installation
TS8040	TwinCAT Building Automation	software package covering all technical building automation services 
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EL6900



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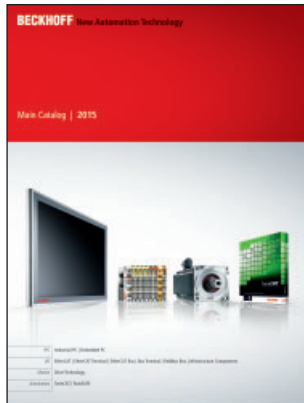


AX5000 Servo Drive with AX5805 option card

TwinSAFE					
Controller		I/O		Drive Technology	
EtherCAT Terminal	EK1960 TwinSAFE Compact Controller, 20 safe inputs, 10 safe outputs	EtherCAT Terminal	EK1914 EtherCAT Coupler with integrated digital I/Os: 4 inputs + 4 outputs, 2 safe inputs + 2 safe outputs	Option cards	AX5801-0000, AX5801-0200 TwinSAFE drive option card for AX5000 Servo Drives, supported safety functions: STO, SS1
	EL6900 TwinSAFE PLC		EL1904 TwinSAFE, 4 safe inputs		AX5805, AX5806 TwinSAFE drive option card for AX5000 Servo Drives, supported safety functions: STO, SOS, SS1, SS2, SLS, SSM, SSR, SMS, SLP, SCA, SLI, SAR, SMA, SDIp and SDIn
	EL6930 TwinSAFE/PROFIsafe logic and gateway terminal		EL1908 TwinSAFE, 8 safe inputs		
Bus Terminal	KL6904 TwinSAFE Logic Bus Terminal, 4 safe outputs	EL2901 TwinSAFE, 1 safe output	EL2902 TwinSAFE, 2 safe outputs		
		EL2904 TwinSAFE, 4 safe outputs	EL2904 TwinSAFE, 4 safe outputs		
		EL2964 TwinSAFE, 1 safe output, 3 potential-free contacts	EL2964 TwinSAFE, 1 safe output, 3 potential-free contacts		
		EtherCAT Box	EP1908 TwinSAFE, 8 safe inputs		
		Bus Terminal	KL1904 TwinSAFE, 4 safe inputs		
		KL2904 TwinSAFE, 4 safe outputs			



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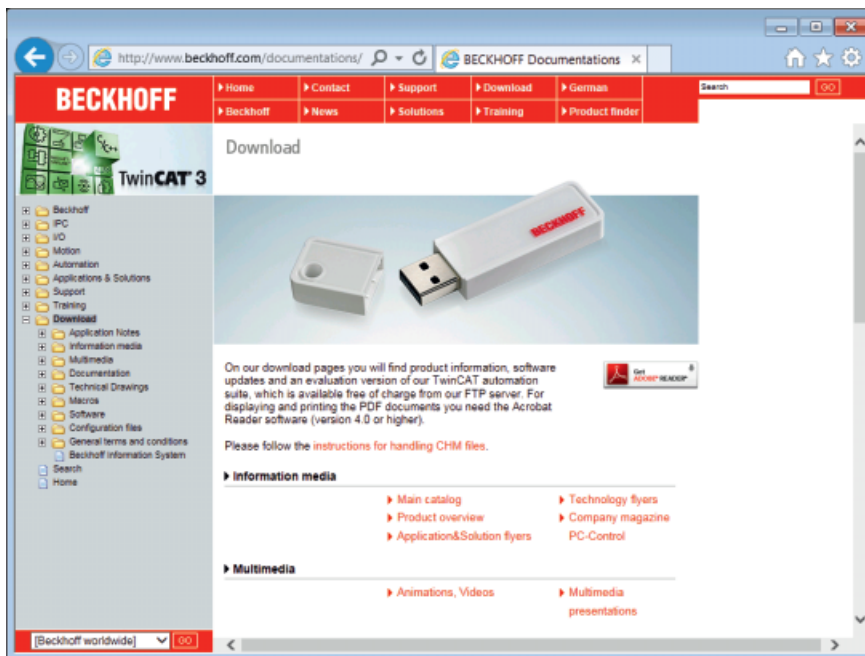
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The online manual

The Beckhoff Information System contains information about the Beckhoff products and technical information, manuals, TwinCAT example codes, a knowledge base and much more.

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TwinCAT automation software can be downloaded as a full version and or as a runtime version. The trial period for the runtime version is seven days.

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In addition to all information contained in the printed catalog, the online service offers additional information, available in the universal PDF or in CHM (Compiled HTML) file format: detailed documentation and manuals for Beckhoff products and software updates, technical drawings and configuration files for fieldbus components.

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