BECKHOFF New Automation Technology

Product Overview | **2021**

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Order no. DK111x

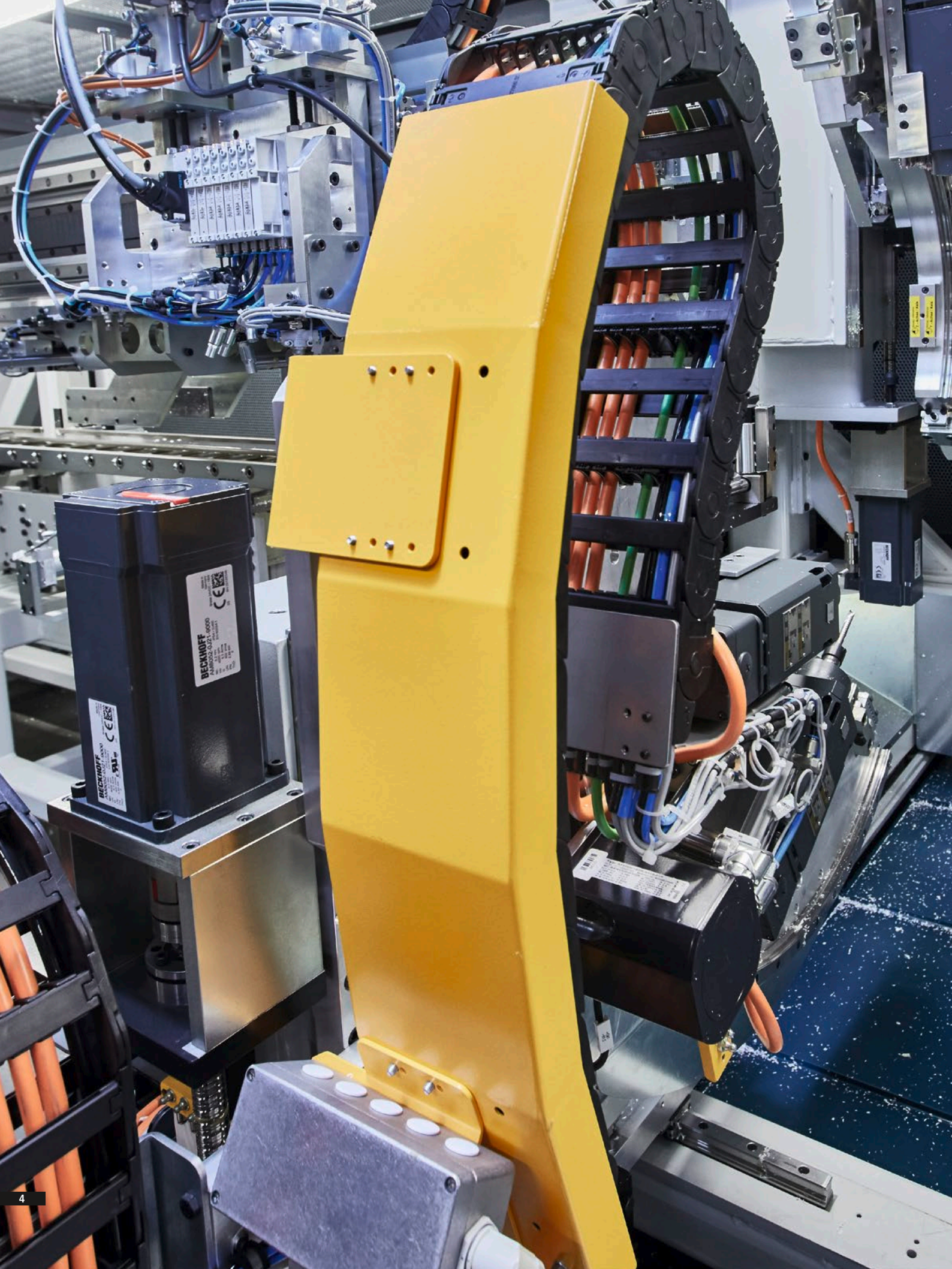
Main Catalog 2021 Volume 1 | IPC, Motion, Automation

Order no. DK112x

Main Catalog 2021 Volume 2 | I/O

Order no. DK130x

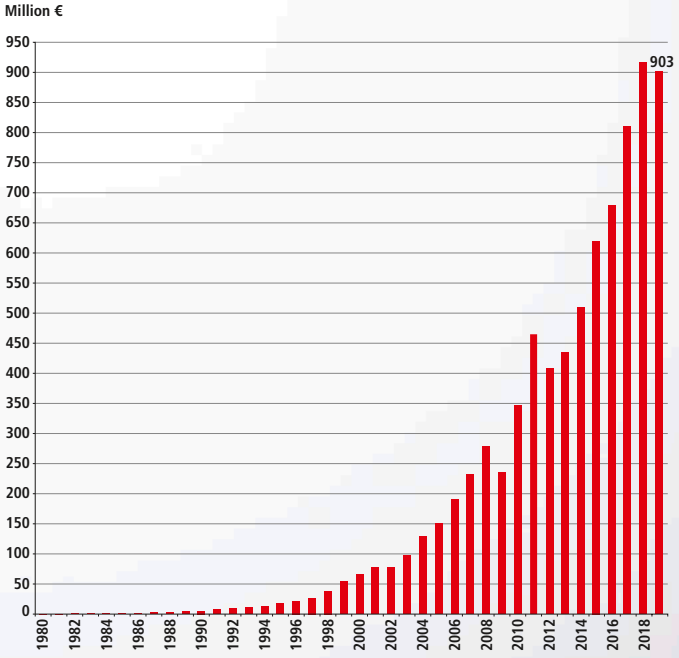
News Catalog


BECKHOFF

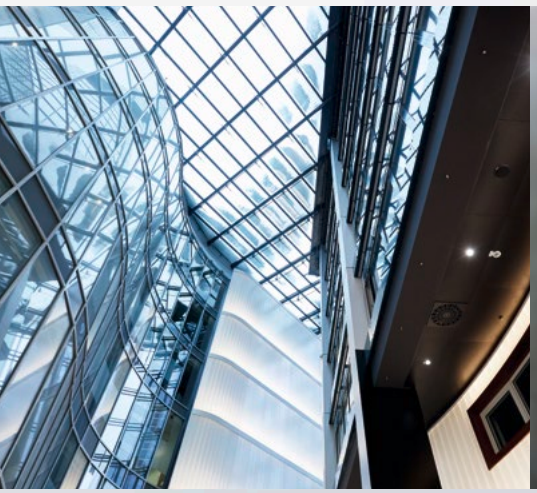
New Automation Technology

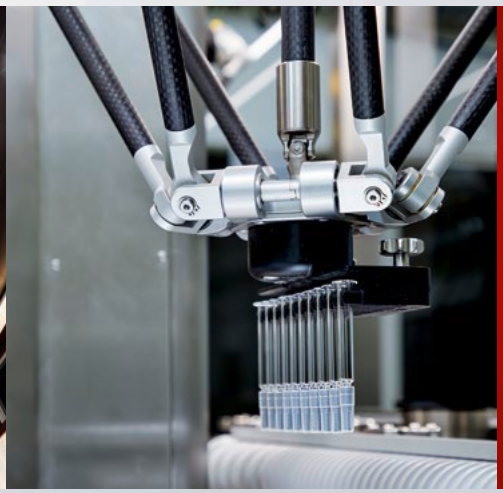
Beckhoff implements open automation systems based on PC Control technology. The product range covers Industrial PCs, I/O and Fieldbus Components, Drive Technology and automation software. Products that can be used as separate components or integrated into a complete and seamless control system are available 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.

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. Through worldwide co-operation with partners, Beckhoff is represented in more than 75 countries.



Sales trend





Beckhoff Automation

- **Headquarters: Verl, Germany**
- **Sales 2019: 903 million € (-1 %)**
- **Staff worldwide: 4,350**
- **Sales offices Germany: 23**
- **Subsidiaries/branch offices worldwide: 39**
- **Distributors worldwide: 75**

(as of 04/2020)

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 conceptualized 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
1986 PC Control – first PC-based machine controller
1988 S1000 – software PLC/NC on PC (DOS)
1989 Lightbus – high-speed fieldbus utilizing optical fibre
1990 All-in-one PC motherboard
1995 Bus Terminal – fieldbus technology in terminal block format
1996 TwinCAT – real-time software package under Windows with PLC and motion control functions
1998 Control Panel – remote IPC Control Panels
1999 Fieldbus Box – the I/O system in IP 67
2002 CX1000 – modular Embedded PCs for DIN rail mounting
2003 EtherCAT – real-time Ethernet fieldbus system
2005 TwinSAFE – the compact safety solution
2005 AX5000 – EtherCAT Servo Drives
2007 Industrial Motherboards – made in Germany
2008 XFC – eXtreme Fast Control Technology
2009 HD Bus Terminals – 16-channel terminals in 12 mm
2010 TwinCAT 3 – eXtended Automation Technology
2011 AM8000 – Synchronous Servomotors with One Cable Technology
2012 2nd generation of Control Panels – Panel PCs and Control Panels with multi-touch technology
2012 XTS – eXtended Transport System
2014 Many-core control – industrial server maximizes industrial computing power
2014 AX8000 – multi-axis servo system
2014 EtherCAT Plug-in Modules – Bus Terminals for circuit boards
2015 EtherCAT P – One Cable Automation
2015 TwinCAT HMI – for platform-independent user interfaces
2015 TwinCAT IoT – for simple cloud communication
2015 TwinCAT Analytics – recording and analysis of process data
2016 EtherCAT measurement modules – system-integrated high-end measurement technology
2017 Process technology – system-integrated solutions for explosion protection requirement
2017 C60xx – the generation of ultra-compact IPCs
2017 AMP8000 – Distributed Servo Drive system
2017 TwinCAT Vision – machine vision integrated into automation technology
2018 Embedded PCs with ARM Cortex™-M7 processor
2018 EtherCAT G – Ultimate I/O Performance
2018 XPlanar – Flying Motion
2019 C70xx – multi-core Industrial PCs in IP 65/67
2019 TwinCAT Machine Learning – scalable, open and in real time
2019 TwinCAT Cloud Engineering – smart engineering directly in the cloud
2020 AL8000 – highly dynamic, modular linear servomotors
2020 PSxxxx power supplies – compact, strong, reliable

System overview

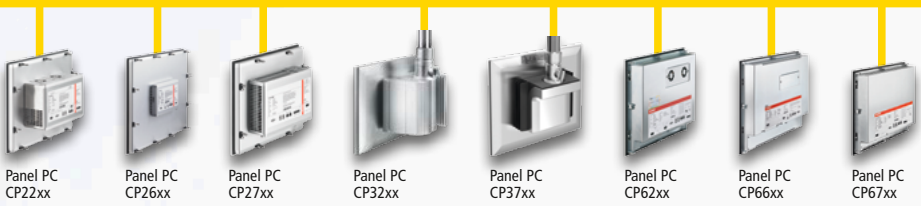
Ethernet

Automation

92 **TwinCAT**

IPC

12 **Industrial PC**



22 **Embedded PC**

I/O

73 **Infrastructure Components**

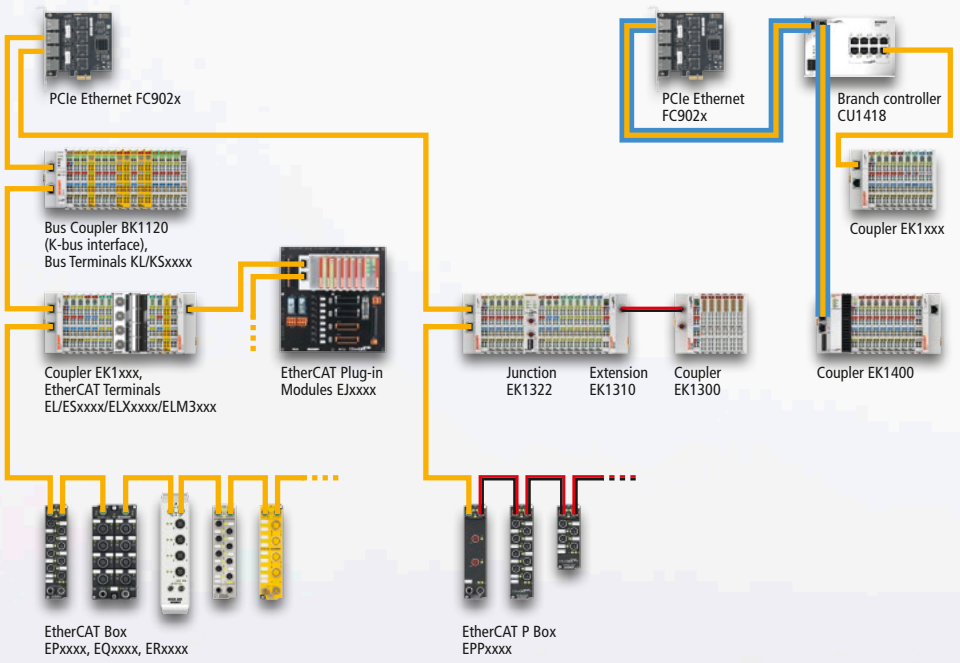
62 **Bus Terminals**

36 **EtherCAT Terminals**

58 **EtherCAT Plug-in Modules**

50 **EtherCAT Box**

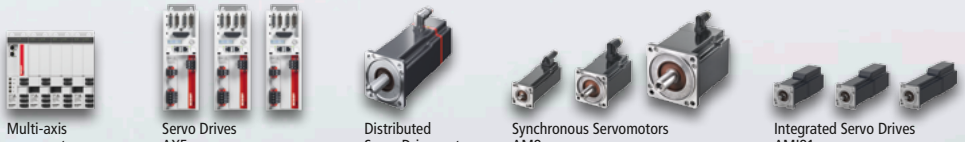
70 **Fieldbus Box**

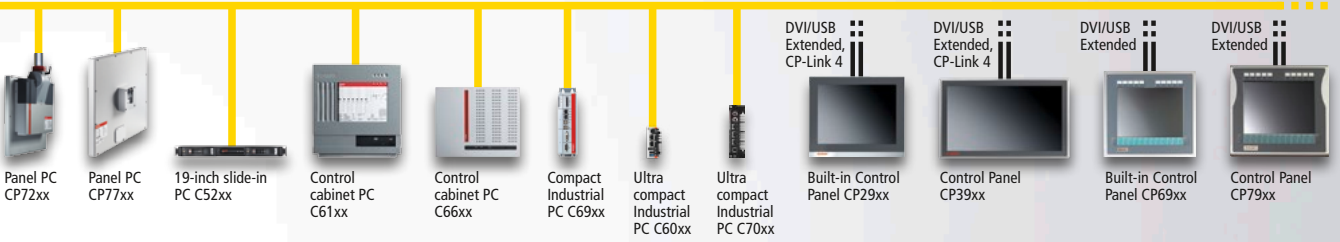


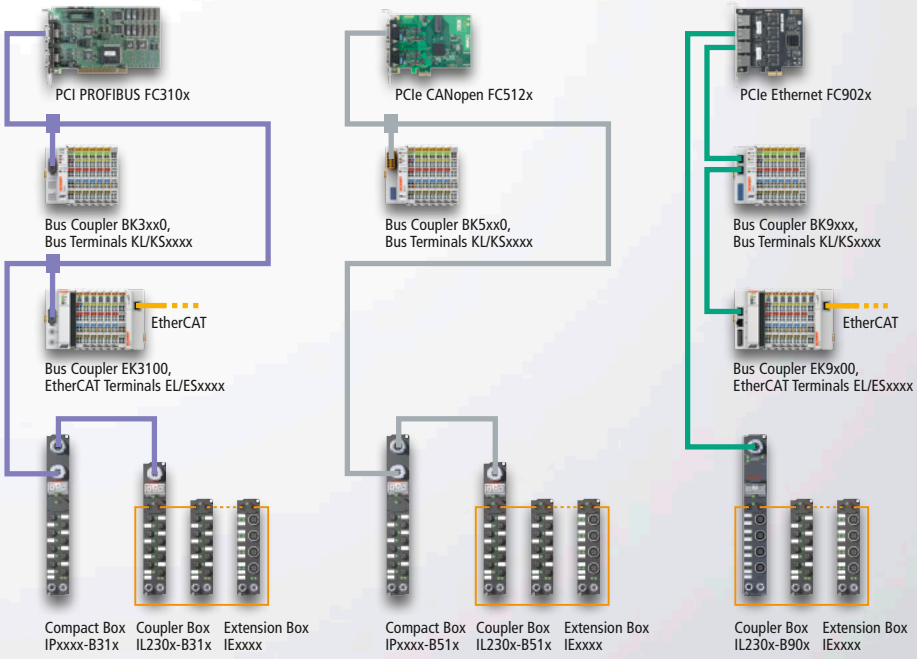
EtherCAT EtherCAT P EtherCAT G

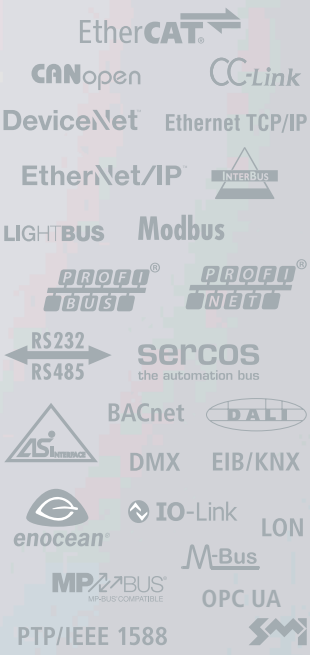
Motion

76 **Drive Technology**

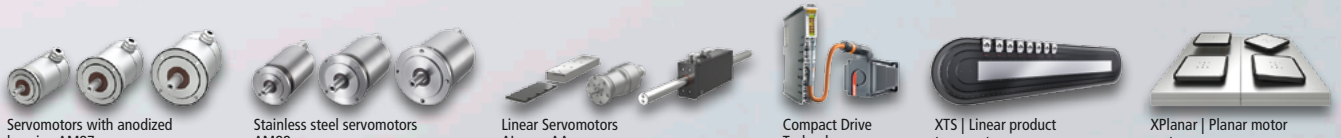








PROFIBUS CANopen PROFINET EtherNet/IP



The IPC Company

The Industrial PC (IPC) is the hardware centerpiece of PC-based control technology. Beckhoff supplies Industrial PCs suitable for any application, which are based on open standards, enabling individual configuration to meet a wide range of control requirements.

Whether in the form of an Embedded PC with a compact form-factor for DIN rail mounting, a control cabinet PC, or as a Panel PC, in-house motherboard development enables Beckhoff to respond quickly to IT trends and customer-specific requirements.

▶ **www.beckhoff.com/ipc**

Multi-touch Panel PCs 14

- large model variety
- high computing power
- display sizes from 7-inch to 24-inch
- easy installation in control cabinets or on mounting arms
- special versions for explosion protection
- customer-specific implementations

▶ **www.beckhoff.com/multi-touch**

Multi-touch Control Panels 15

- large model variety
- display sizes from 7-inch to 24-inch
- landscape and portrait orientation
- easy installation in control cabinets or on mounting arms
- special versions for explosion protection
- customer-specific implementations

▶ **www.beckhoff.com/multi-touch**

Single-touch Panels 16

- Control Panels or Panel PCs
- display sizes from 5.7-inch to 19-inch
- easy installation in control cabinets or on mounting arms
- customer-specific implementations

▶ **www.beckhoff.com/single-touch**

Ultra-compact Industrial PCs

PCs 18

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

▶ **www.beckhoff.com/pc**

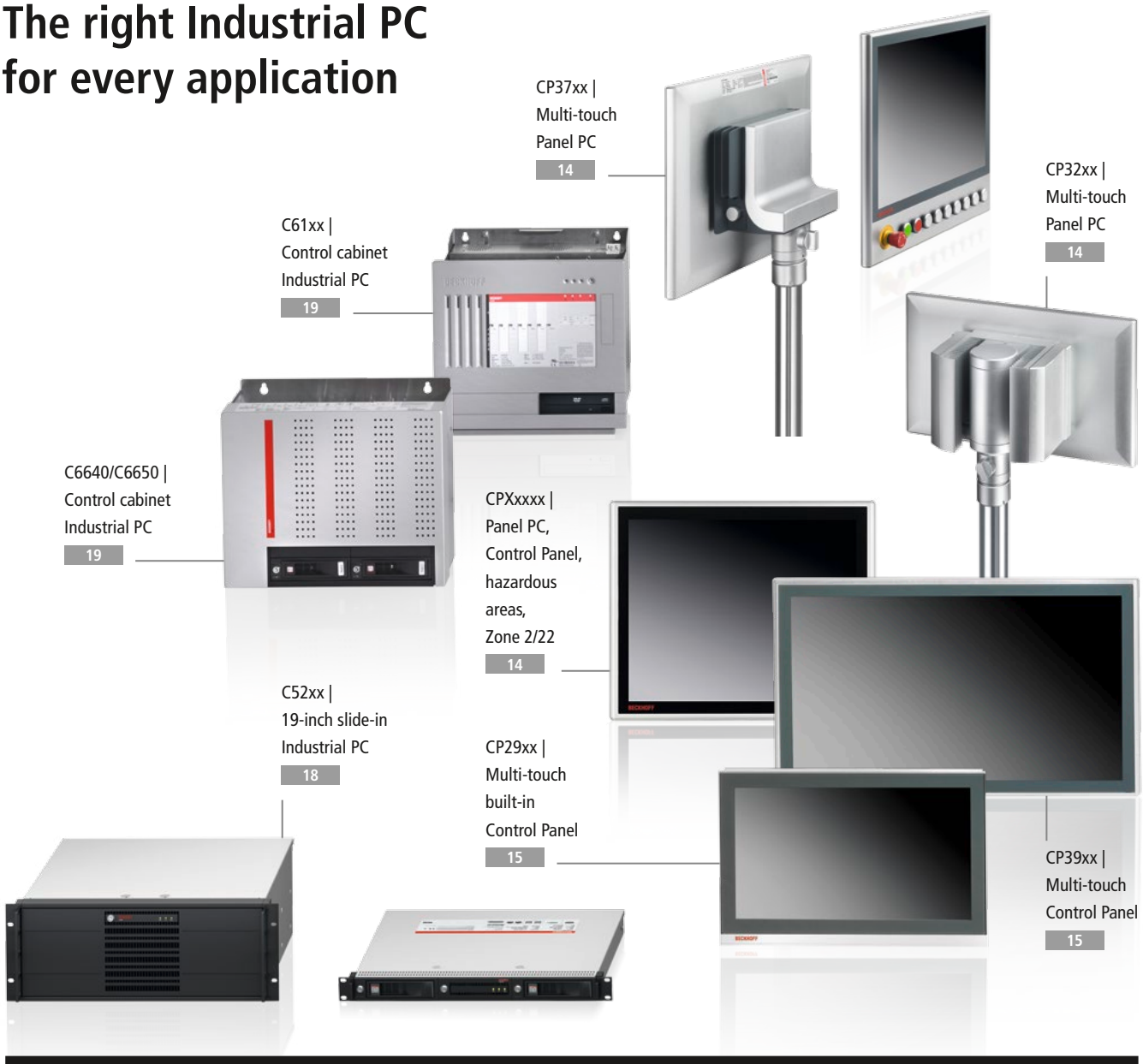
Embedded PCs 22

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

▶ **www.beckhoff.com/embedded-pc**

- **large model variety of Industrial PCs and Embedded PCs**
- **high-performance PCs, featuring a wide range of processors, from Intel® Celeron® to top of the line Core™ i7 processors**
- **long-term availability of all Industrial PCs and Embedded PCs**
- **As the inventor of PC-based control technology, Beckhoff closely cooperates with global technology partners Intel and Microsoft.**

The right Industrial PC for every application



Industrial PCs

	Compact motherboard Intel® Core™	Compact motherboard Intel Atom®	ATX motherboard Intel® Core™	3½-inch motherboard Intel® Core™	3½-inch motherboard Intel Atom®/ Intel® Celeron® ULV	3½-inch motherboard ARM Cortex™-A8	Control Panel
Multi-touch Panel PCs/Control Panels				CP22xx CP32xx	CP27xx/CPX27xx CP37xx/CPX37xx	CP26xx	CP29xx/CPX29xx CP39xx/CPX39xx
Single-touch Panel PCs/Control Panels		 CP77xx		CP62xx CP72xx	CP67xx	CP66xx	CP69xx CP79xx
19-inch slide-in Industrial PCs			C5240	C5210			
Control cabinet Industrial PCs	C6025 C6027 C6030 C6032	C6015 C6017	C6140/C6150 C6240/C6250 C6640/C6650	C6515/C6525 C6920/C6930	C6905/C6915 C6925		
IP 65 Industrial PCs		C7015					

Control cabinet industrial server

SSI EEB motherboard 2 x Intel® Xeon®
C6670

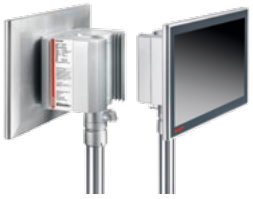
Multi-touch Panel PCs

▶ **www.beckhoff.com/multi-touch**

CP22xx

CP26xx

CP27xx



CP32xx

CP37xx

Multi-touch built-in Panel PCs, front side IP 65

	Display Resolution Format	7-inch 800 x 480 5:3	12-inch 800 x 600 4:3	12.1-inch 1280 x 800 16:10	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
CP22xx – up to Intel® Core™ i3/i5/i7	multi-finger touch screen		**CP2212**	**CP2213**	**CP2215**	**CP2216**	**CP2218**	**CP2219**	**CP2221**	**CP2224**
CP26xx – ARM Cortex™-A8	dual-finger touch screen	**CP2607**	**CP2612**	**CP2613**	**CP2615**	**CP2616**	**CP2618**	**CP2619**	**CP2621**	**CP2624**
CP27xx – Intel® Celeron® ULV or Atom®	multi-finger touch screen, only horizontal		**CP2712**	**CP2713**	**CP2715** **CPX2715**	**CP2716**	**CP2718**	**CP2719** **CPX2719**	**CP2721** **CPX2721**	**CP2724**

Multi-touch Panel PCs, all sides IP 65

	Display Resolution Format	7-inch 800 x 480 5:3	12-inch 800 x 600 4:3	12.1-inch 1280 x 800 16:10	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
CP32xx – up to Intel® Core™ i3/i5/i7	multi-finger touch screen, only horizontal		**CP3212**		**CP3215**	**CP3216**	**CP3218**	**CP3219**	**CP3221**	**CP3224**
CP37xx – Intel Atom®	multi-finger touch screen, only horizontal		**CP3712**	**CP3713**	**CP3715** **CPX3715**	**CP3716**	**CP3718**	**CP3719** **CPX3719**	**CP3721** **CPX3721**	**CP3724**
CP37xx-1600-0020 – Intel Atom®	multi-finger touch screen, only horizontal, fanless without cooling fins				**CP3715-1600-0020**	**CP3716-1600-0020**	**CP3718-1600-0020**	**CP3719-1600-0020**	**CP3721-1600-0020**	**CP3724-1600-0020**

Multi-touch Control Panels

▶ **www.beckhoff.com/multi-touch**

CP29xx

CP39xx

CP39xx-14xx-0010

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

	Display Resolution Format	7-inch 800 x 480 5:3	12-inch 800 x 600 4:3	12.1-inch 1280 x 800 16:10	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
CP29xx-0000 – DVI/USB Extended interface*	multi-finger touch screen	CP2907-0000	CP2912-0000	CP2913-0000	CP2915-0000 CPX2915-0000	CP2916-0000	CP2918-0000	CP2919-0000 CPX2919-0000	CP2921-0000 CPX2921-0000	CP2924-0000
CP29xx-0010 – CP-Link 4*	multi-finger touch screen	CP2907-0010	CP2912-0010	CP2913-0010	CP2915-0010	CP2916-0010	CP2918-0010	CP2919-0010	CP2921-0010	CP2924-0010

Multi-touch Control Panels, all sides IP 65

	Display Resolution Format	7-inch 800 x 480 5:3	12-inch 800 x 600 4:3	12.1-inch 1280 x 800 16:10	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
CP39xx-0000 – DVI/USB Extended interface*	multi-finger touch screen	CP3907-0000	CP3912-0000	CP3913-0000	CP3915-0000	CP3916-0000	CP3918-0000	CP3919-0000	CP3921-0000	CP3924-0000
CP39xx-0010 – CP-Link 4*	multi-finger touch screen	CP3907-0010	CP3912-0010	CP3913-0010	CP3915-0010 CPX3915-0010	CP3916-0010	CP3918-0010	CP3919-0010 CPX3919-0010	CP3921-0010 CPX3921-0010	CP3924-0010
CP39xx-14xx-0010 – CP-Link 4*	multi-finger touch screen, stainless steel housing			CP3913-14xx-0010		CP3916-14xx-0010	CP3918-14xx-0010			

*For further information on DVI/USB Extended and CP-Link 4 see page 21

Single-touch Panels

▶ **www.beckhoff.com/single-touch**

CP62xx

CP66xx

CP67xx

Single-touch built-in Panel PCs, front side IP 54/65

	Display	5.7-inch	6.5-inch	7-inch	10.1-inch	12-inch	15-inch	19-inch
	Resolution	640 x 480	640 x 480	800 x 480	1024 x 600	800 x 600	1024 x 768	1280 x 1024
	Format	4:3	4:3	5:3	17:10	4:3	4:3	5:4
	Protect. class front	IP 65	IP 65	IP 54	IP 54	IP 65	IP 65	IP 65
CP62xx – 3½-inch motherboard – up to Intel® Core™ i3/i5/i7	without keys					CP6201	CP6202	CP6203
	function keys					CP6211	CP6212	CP6213
	numerical					CP6221	CP6222	CP6223
	alphanumerical					CP6231	CP6232 CP6242	CP6233
CP66xx – 3½-inch motherboard – ARM Cortex™-A8	without keys	CP6607	CP6609			CP6601	CP6602	CP6603
	function keys		CP6619			CP6611	CP6612	CP6613
	numerical		CP6629			CP6621	CP6622	CP6623
	alphanumerical					CP6631	CP6632	CP6633
CP6606, CP6600 – 3½-inch motherboard – ARM Cortex™-A8	without keys			CP6606	CP6600			
CP67xx – 3½-inch motherboard – Intel® Celeron® ULV or Atom®	without keys	CP6707				CP6701	CP6702	CP6703
	function keys					CP6711	CP6712	CP6713
	numerical					CP6721	CP6722	CP6723
	alphanumerical					CP6731	CP6732 CP6742	CP6733
CP6706, CP6700 – 3½-inch motherboard – Intel® Celeron® ULV or Atom®	without keys			CP6706	CP6700			

Without keys

Function keys

Numeric keyboard

Alphanumeric keyboard

With PLC keys on the sides

CP72xx

CP77xx

CP69xx

CP79xx

CP790x-14xx, stainless steel

Single-touch Panel PCs, all sides IP 65

	Display	5.7-inch	6.5-inch	7-inch	10.1-inch	12-inch	15-inch	19-inch
	Resolution	640 x 480	640 x 480	800 x 480	1024 x 600	800 x 600	1024 x 768	1280 x 1024
	Format	4:3	4:3	5:3	17:10	4:3	4:3	5:4
CP72xx	without keys					CP7201	CP7202	CP7203
– 3½-inch motherboard	function keys					CP7211	CP7212	CP7213
	numerical					CP7221	CP7222	CP7223
– up to Intel® Core™ i3/i5/i7	alphanumerical					CP7231	CP7232 CP7242	CP7233
CP77xx	without keys					CP7701	CP7702	CP7703
– CP motherboard	function keys					CP7711	CP7712	CP7713
– Intel® Celeron® ULV or Atom®	numerical					CP7721	CP7722	CP7723
	alphanumerical					CP7731	CP7732	CP7733

Single-touch built-in Control Panels, front side IP 54/65

	Display	5.7-inch	6.5-inch	7-inch	10.1-inch	12-inch	15-inch	19-inch
	Resolution	640 x 480	640 x 480	800 x 480	1024 x 600	800 x 600	1024 x 768	1280 x 1024
	Format	4:3	4:3	5:3	17:10	4:3	4:3	5:4
	Protect. class front	IP 65	IP 65	IP 54	IP 54	IP 65	IP 65	IP 65
CP69xx	without keys	CP6907	CP6909	CP6906	CP6900	CP6901	CP6902	CP6903
– DVI/USB Extended interface*	function keys		CP6919			CP6911	CP6912	CP6913
	numerical		CP6929			CP6921	CP6922	CP6923
	alphanumerical					CP6931	CP6932/42	CP6933

Single-touch Control Panels, all sides IP 65

	Display	5.7-inch	6.5-inch	7-inch	10.1-inch	12-inch	15-inch	19-inch
	Resolution	640 x 480	640 x 480	800 x 480	1024 x 600	800 x 600	1024 x 768	1280 x 1024
	Format	4:3	4:3	5:3	17:10	4:3	4:3	5:4
CP79xx	without keys		CP7909			CP7901	CP7902	CP7903
– DVI/USB Extended interface*	function keys		CP7919			CP7911	CP7912	CP7913
	numerical		CP7929			CP7921	CP7922	CP7923
	alphanumerical					CP7931	CP7932/42	CP7933
CP790x-14xx – DVI/USB Extended interface*	without keys, stainless steel housing					CP7901-14xx	CP7902-14xx	CP7903-14xx

*For further information on DVI/USB Extended see page 21

PCs

▶ **www.beckhoff.com/pc**

C5210

C65x5
basic configuration

C65x5 with
PCIe module slots

C6525 with
plug-in card slots

C69xx

C69x0 with
plug-in card slots

C60xx

Control cabinet Industrial PCs with 3½-inch motherboard

	Processor	Intel Atom®	Intel® Celeron® ULV	Intel® Celeron®, Intel® Pentium®, Intel® Core™ i3/i5/i7 6th/7th generation	Intel® Celeron®, Intel® Pentium®, Intel® Core™ i3/i5/i7 8th/9th generation
C5210, 19-inch slide-in Industrial PCs	1 rack unit			**C5210-0030**	**C5210-0040**
C65xx	fanless			**C6515-0060**	**C6515-0070**
	fanless, RAID			**C6525-0060**	**C6525-0070**
C69xx, compact Industrial PCs, connectors on front	fanless	**C6905-0010** **C6905-0020**			
	fanless, 1 CFast card slot	**C6915-0010** **C6915-0020**			
	fanless, 2 PCIe module slots	**C6925-0030** **C6925-0040**	**C6925-0020**		
	optional plug-in card slots			**C6920-0060**	**C6920-0070**
	2 PCIe module slots, optional plug-in card slots			**C6930-0060**	**C6930-0070**

Control cabinet Industrial PCs with compact industrial motherboard

	Processor	Intel Atom®	Intel® Celeron®, Intel® Core™ i3/i5/i7 8th generation, series U	Intel® Celeron®, Intel® Pentium®, Intel® Core™ i3/i5/i7 6th/7th generation	Intel® Celeron®, Intel® Pentium®, Intel® Core™ i3/i5/i7 8th/9th generation
C60xx	fanless, without slots	**C6015-0010** **C6015-0020**	**C6025-0000**		
	optional interfaces and/or an optional 1-second UPS	**C6017-0010** **C6017-0020**	**C6027-0000** i		
	up to 2 M.2 SSDs and/or 2 PCIe compact module slots			**C6030-0060** **C6032-0060**	**C6030-0070** **C6032-0070**

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

C7015

C5240

C6140

C6150

C6240

C6250

C6640

C6650

C6670

IP 65 Industrial PCs with compact industrial motherboard

	Processor	Intel Atom®
C70xx, IP 65	fanless	**C7015-0020**

Control cabinet Industrial PCs with ATX motherboard

	Processor	Intel® Celeron®, Intel® Pentium®, Intel® Core™ i3/i5/i7 6th/7th generation	Intel® Celeron®, Intel® Pentium®, Intel® Core™ i3/i5/i7 8th/9th generation
C5240, 19-inch slide-in Industrial PCs	7 slots, 4 rack units	**C5240-0010**	**C5240-0020**
C61xx, connectors on top	7 slots	**C6140-0070** **C6150-0070**	**C6140-0080**
C62xx, connectors on front	7 slots	**C6240-0070** **C6250-0080**	**C6240-0080**
C6640/C6650, connectors on top	7 slots	**C6640-0050**	**C6640-0060**
	7 slots, 2 removable frames	**C6650-0050**	**C6650-0060**

Control cabinet industrial server with SSI EEB motherboard

	Processor	2 x Intel® Xeon® Scalable
C6670	6 slots, 2 removable frames	**C6670-0010**

Customization options for Panel PCs and Control Panels

- stainless steel housings
- special membrane keyboards
- integration of electro-mechanical keyboards
- flush-mounted touch screens
- adaptation of membrane colors
- integration of customer logos

Built-in 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

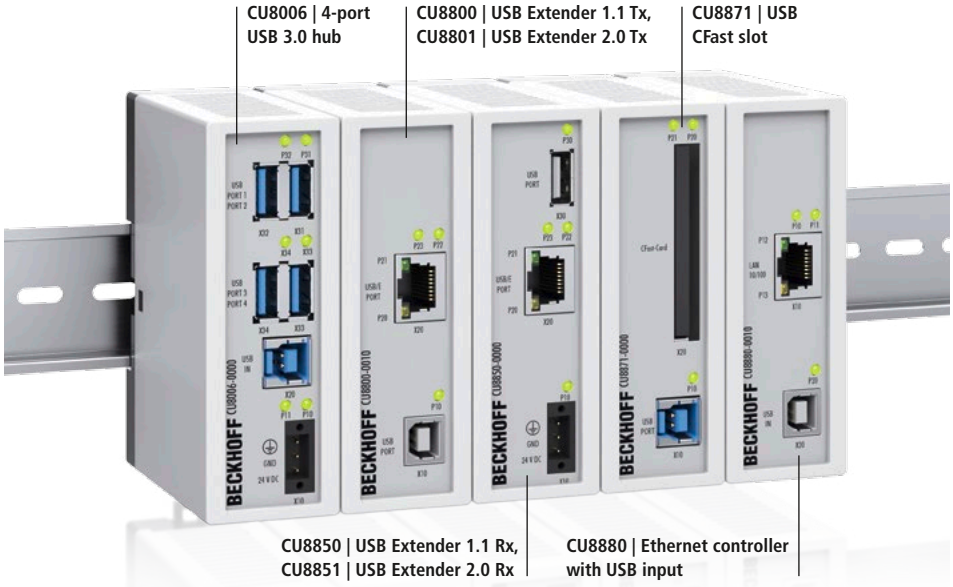
Multi-touch Control Panel with push-button extension

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.

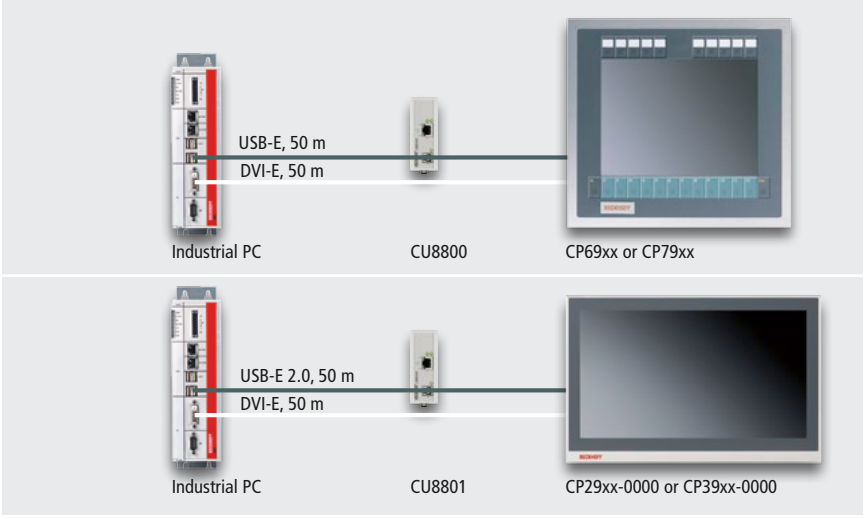


DVI/USB Extended

The DVI/USB Extended technology enables remote panel operation at a distance of up to 50 m from the PC. The DVI graphics signal is directly transmitted from the PC via DVI E cable. A signal processor in the Control Panels restores the DVI signal after it a distance of 50 m. For connection of the CP69xx and CP79xx Control Panels, a CU8800 USB Extender box is connected to an USB port of the PC. The signal is transmitted by the CU8800 USB Extender (USB-E) via Cat.5 cable over 50 m max. and is reconverted by the Control Panel into USB 1.1 with 12 Mbit/s.

For the CP29xx-0000 and CP39xx-0000 Control Panels, the USB signal from the PC is converted into USB Extended 2.0 by the USB Extender box CU8801, transmitted to the Control Panel via Cat.5 cable over 50 m max. to be reconverted into USB 2.0 with 480 Mbit/s. An USB hub in the Control Panel enables the connection of two external USB devices such as a keyboard or USB stick, in addition to touch screen and push-button extension.

**DVI/USB Extended
for CP69xx or CP79xx via
the CU8800 transmitter box**

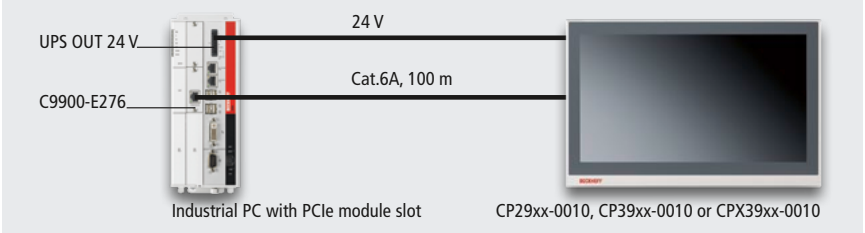


**DVI/USB Extended 2.0
for CP29xx-0000 or CP39xx-0000
via the CU8801 transmitter box**

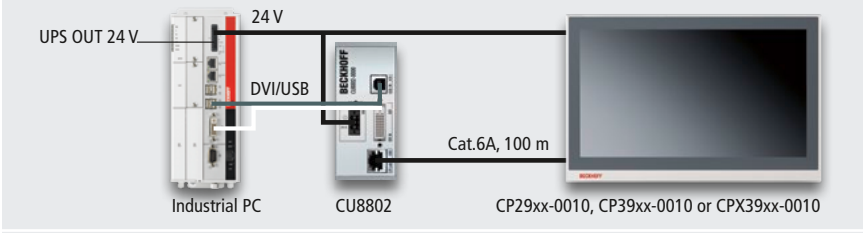
CP-Link 4: The One Cable Display Link

With CP-Link 4 operating panels can be located up to 100 m away from the Industrial PC. The one cable solution can be used to transfer video signals, USB 2.0 and the power supply in a Cat.6A cable, thus reducing cable and installation costs. The CP-Link 4 technology is supported by the Beckhoff multi-touch Control Panel series CP29xx-0010 for installation inside the wall of a control cabinet, CP39xx-0010 for mounting arm installation and CPX39xx-0010 for use in hazardous areas, Zone 2/22.

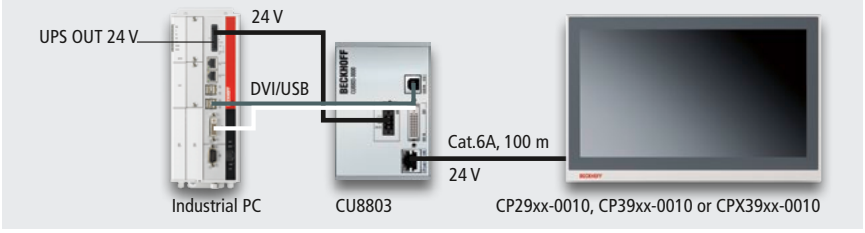
**CP-Link 4 – The Two Cable Display Link:
via C9900-E276 PCIe module integrated
in the PC**



**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

▶ **www.beckhoff.com/embedded-pc**

Embedded PC			
Basic CPU	**CX70xx**	**CX80xx**	**CX81xx**
Processor	ARM Cortex™-M7, 480 MHz	ARM9, 400 MHz	ARM Cortex™-A9, 800 MHz
Flash memory	512 MB microSD (optionally 1 GB, 2 GB, 4 GB or 8 GB)	slot for microSD card, 512 MB included (expandable)	slot for microSD card, 512 MB included (expandable)
Main memory	32 MB SDR (internal, not expandable)	64 MB DDR2 RAM (not expandable)	512 MB DDR3 RAM (not expandable)
Interfaces	programming interface: 1 x Ethernet 10/100 Mbit/s (RJ45)	1 x RJ45 10/100 Mbit/s, 1 x USB device (behind the front flap), fieldbus interface	1 x RJ45 10/100 Mbit/s, bus interface
I/O connection	E-bus or K-bus, automatic recognition	E-bus or K-bus, automatic recognition	E-bus or K-bus, automatic recognition
System interfaces	**integrated**	**integrated**	**integrated**
DVI/USB	–	–	–
RS232	CX7080	CX8080	CX8180
RS422/RS485	CX7080	CX8080	CX8180
Audio	–	–	–
Ethernet	in the basic CPU	in the basic CPU	in the basic CPU
4-port USB hub	–	–	–
Memory medium	in the basic CPU	in the basic CPU	in the basic CPU
Fieldbus interfaces	**expandable via EtherCAT Terminals**	**integrated or expandable via EtherCAT Terminals**	**integrated or expandable via EtherCAT Terminals**
EtherCAT	EL6695 slave	CX8010 slave	CX8110 slave
PROFIBUS	EL6731 master	CX8030 master	EL6731 master
	EL6731-0010 slave	CX8031 slave	EL6731-0010 slave
CANopen	EL6751 master	CX8050 master	EL6751 master
	EL6751-0010 slave	CX8051 slave	EL6751-0010 slave
DeviceNet	EL6752 master	EL6752 master	EL6752 master
	EL6752-0010 slave	EL6752-0010 slave	EL6752-0010 slave
PROFINET RT	EL6631 controller	CX8093 device	EL6631 controller
	EL6631-0010 device		EL6631-0010 device
EtherNet/IP	EL6652 scanner	CX8095 adapter	EL6652 scanner
	EL6652-0010 adapter		EL6652-0010 adapter
UPS options	–	**1-second UPS**	**1-second UPS**

Product announcement for availability status see www.beckhoff.com

	CX9020	CX5010	CX5020
	ARM Cortex™-A8, 1 GHz	Intel Atom® Z510, 1.1 GHz clock frequency	Intel Atom® Z530, 1.6 GHz clock frequency
	2 x slot for microSD card, 512 MB included (expandable)	slot for Compact Flash card, 128 MB included (expandable)	slot for Compact Flash card, 128 MB included (expandable)
	1 GB DDR3 RAM (not expandable)	512 MB RAM (not expandable)	512 MB RAM (expandable ex factory to 1 GB)
	2 x RJ45 10/100 Mbit/s (internal switch), 1 x DVI-D, 4 x USB 2.0, 1 x optional interface	2 x RJ45 10/100/1000 Mbit/s, 1 x DVI-D, 4 x USB 2.0, 1 x optional interface	2 x RJ45 10/100/1000 Mbit/s, 1 x DVI-D, 4 x USB 2.0, 1 x optional interface
	E-bus or K-bus, automatic recognition	E-bus or K-bus, automatic recognition	E-bus or K-bus, automatic recognition
	integrated	**integrated**	**integrated**
	in the basic CPU	in the basic CPU	in the basic CPU
	CX9020-N030	CX5010-N030	CX5020-N030
	CX9020-N031	CX5010-N031	CX5020-N031
	CX9020-N020	CX5010-N020	CX5020-N020
	in the basic CPU	in the basic CPU	in the basic CPU
	in the basic CPU	in the basic CPU	in the basic CPU
	2nd microSD slot in the basic CPU	in the basic CPU	in the basic CPU
	integrated or expandable via EtherCAT Terminals	**integrated or expandable via EtherCAT Terminals**	**integrated or expandable via EtherCAT Terminals**
	CX9020-B110 slave	CX5010-B110 slave	CX5020-B110 slave
	CX9020-M310 master	CX5010-M310 master	CX5020-M310 master
	CX9020-B310 slave	CX5010-B310 slave	CX5020-B310 slave
	CX9020-M510 master	CX5010-M510 master	CX5020-M510 master
	CX9020-B510 slave	CX5010-B510 slave	CX5020-B510 slave
	EL6752 master	EL6752 master	EL6752 master
	EL6752-0010 slave	EL6752-0010 slave	EL6752-0010 slave
	CX9020-M930 controller	CX5010-M930 controller	CX5020-M930 controller
	CX9020-B930 device	CX5010-B930 device	CX5020-B930 device
	CX9020-B950 adapter	CX5010-B950 adapter	CX5020-B950 adapter
	1-second UPS (optional)	**1-second UPS**	**1-second UPS**



Embedded PC

Basic CPU	CX5120	CX5130	CX5140
Processor	Intel Atom® E3815, 1.46 GHz	Intel Atom® E3827, 1.75 GHz	Intel Atom® E3845, 1.91 GHz
Flash memory	slot for CFast card and microSD card, cards not included	slot for CFast card and microSD card, cards not included	slot for CFast card and microSD card, cards not included
Main memory	2 GB DDR3 RAM (not expandable)	4 GB DDR3 RAM (not expandable)	4 GB DDR3 RAM (not expandable)
Interfaces	2 x RJ45 10/100/1000 Mbit/s, 1 x DVI-I, 4 x USB 2.0, 1 x optional interface	2 x RJ45 10/100/1000 Mbit/s, 1 x DVI-I, 4 x USB 2.0, 1 x optional interface	2 x RJ45 10/100/1000 Mbit/s, 1 x DVI-I, 4 x USB 2.0, 1 x optional interface
I/O connection	E-bus or K-bus, automatic recognition	E-bus or K-bus, automatic recognition	E-bus or K-bus, automatic recognition
System interfaces	integrated	integrated	integrated
DVI/USB	in the basic CPU	in the basic CPU	in the basic CPU
DisplayPort	–	CX5130-N011	CX5140-N011
RS232	CX5120-N030	CX5130-N030	CX5140-N030
RS422/RS485	CX5120-N031	CX5130-N031	CX5140-N031
Audio	CX5120-N020	CX5130-N020	CX5140-N020
Ethernet	in the basic CPU	in the basic CPU	in the basic CPU
Power over Ethernet	–	–	–
4-port USB hub	in the basic CPU	in the basic CPU	in the basic CPU
Memory medium	in the basic CPU	in the basic CPU	in the basic CPU
Fieldbus interfaces	integrated or expandable via EtherCAT Terminals	integrated or expandable via EtherCAT Terminals	integrated or expandable via EtherCAT Terminals
EtherCAT	CX5120-M112 2 x master	CX5130-M112 2 x master	CX5140-M112 2 x master
	CX5120-B110 slave	CX5130-B110 slave	CX5140-B110 slave
PROFIBUS	CX5120-M310 master	CX5130-M310 master	CX5140-M310 master
	CX5120-B310 slave	CX5130-B310 slave	CX5140-B310 slave
CANopen	CX5120-M510 master	CX5130-M510 master	CX5140-M510 master
	CX5120-B510 slave	CX5130-B510 slave	CX5140-B510 slave
DeviceNet	EL6752 master	EL6752 master	EL6752 master
	EL6752-0010 slave	EL6752-0010 slave	EL6752-0010 slave
PROFINET RT	CX5120-M930 controller	CX5130-M930 controller	CX5140-M930 controller
	CX5120-B930 device	CX5130-B930 device	CX5140-B930 device
EtherNet/IP	CX5120-B950 adapter	CX5130-B950 adapter	CX5140-B950 adapter
UPS options	1-second UPS	1-second UPS	1-second UPS

CX5230	CX5240
Intel Atom® x5-E3930, 1.3 GHz, 2 cores	Intel Atom® x5-E3940, 1.6 GHz, 4 cores
slot for CFast card and microSD card, cards not included	slot for CFast card and microSD card, cards not included
4 GB DDR4 RAM (internal, not expandable)	8 GB DDR4 RAM (internal, not expandable)
2 x RJ45 10/100/1000 Mbit/s, 1 x DVI-D, 4 x USB 3.0, 1 x optional interface	2 x RJ45 10/100/1000 Mbit/s, 1 x DVI-D, 4 x USB 3.0, 1 x optional interface
E-bus or K-bus, automatic recognition	E-bus or K-bus, automatic recognition
modularly expandable	**modularly expandable**
in the basic CPU, 2nd DVI port as option CX5230-N010	in the basic CPU, 2nd DVI port as option CX5240-N010
CX5230-N011	CX5240-N011
CX5230-N030 or CX2500-0030	CX5240-N030 or CX2500-0030
CX5230-N031 or CX2500-0031	CX5240-N031 or CX2500-0031
CX2500-0020	CX2500-0020
in the basic CPU or CX2500-0060	in the basic CPU or CX2500-0060
CX2500-0061	CX2500-0061
in the basic CPU or CX2500-0070	in the basic CPU or CX2500-0070
in the basic CPU	in the basic CPU
integrated or expandable via EtherCAT Terminals	**integrated or expandable via EtherCAT Terminals**
CX5230-M112 2 x master	CX5240-M112 2 x master
CX5230-B110 slave	CX5240-B110 slave
CX5230-M310 or CX2500-M310 master	CX5240-M310 or CX2500-M310 master
CX5230-B310 or CX2500-B310 slave	CX5240-B310 or CX2500-B310 slave
CX5230-M510 or CX2500-M510 master	CX5240-M510 or CX2500-M510 master
CX5230-B510 or CX2500-B510 slave	CX5240-B510 or CX2500-B510 slave
EL6752 master	EL6752 master
EL6752-0010 slave	EL6752-0010 slave
CX5230-M930 controller	CX5240-M930 controller
CX5230-B930 device	CX5240-B930 device
CX5230-B950 adapter	CX5240-B950 adapter
1-second UPS	**1-second UPS**



Embedded PC

Basic CPU	CX2020	CX2030	CX2040
Processor	Intel® Celeron® 827E 1.4 GHz	Intel® Core™ i7 2610UE 1.5 GHz	Intel® Core™ i7 2715QE 2.1 GHz
Flash memory	20 GB or 40 GB CFast flash card (depending on the operating system), optionally extendable	20 GB or 40 GB CFast flash card (depending on the operating system), optionally extendable	20 GB or 40 GB CFast flash card (depending on the operating system), optionally extendable
Main memory	2 GB DDR3 RAM (expandable ex factory to 4 GB)	2 GB DDR3 RAM (expandable ex factory to 4 GB)	4 GB DDR3 RAM (not expandable)
Interfaces	2 x RJ45 10/100/1000 Mbit/s, 1 x DVI-I, 4 x USB 2.0, 1 x optional interface	2 x RJ45 10/100/1000 Mbit/s, 1 x DVI-I, 4 x USB 2.0, 1 x optional interface	2 x RJ45 10/100/1000 Mbit/s, 1 x DVI-I, 4 x USB 2.0, 1 x optional interface
I/O connection	via power supply module (E-bus or K-bus, automatic recognition)	via power supply module (E-bus or K-bus, automatic recognition)	via power supply module (E-bus or K-bus, automatic recognition)
System interfaces	**modularly expandable**	**modularly expandable**	**modularly expandable**
DVI/USB	in the basic CPU, 2nd DVI port as option CX2020-N010	in the basic CPU, 2nd DVI port as option CX2030-N010	in the basic CPU, 2nd DVI port as option CX2040-N010
DisplayPort	CX2020-N011	CX2030-N011	CX2040-N011
RS232	CX2020-N030 or CX2500-0030	CX2030-N030 or CX2500-0030	CX2040-N030 or CX2500-0030
RS422/RS485	CX2020-N031 or CX2500-0031	CX2030-N031 or CX2500-0031	CX2040-N031 or CX2500-0031
Audio	CX2500-0020	CX2500-0020	CX2500-0020
Ethernet	in the basic CPU or CX2500-0060	in the basic CPU or CX2500-0060	in the basic CPU or CX2500-0060
10G Ethernet	–	–	–
Power over Ethernet	CX2500-0061	CX2500-0061	CX2500-0061
4-port USB hub	in the basic CPU or CX2500-0070	in the basic CPU or CX2500-0070	in the basic CPU or CX2500-0070
Memory medium	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
USB extension	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)
Fieldbus interfaces	**integrated or expandable via EtherCAT Terminals**	**integrated or expandable via EtherCAT Terminals**	**integrated or expandable via EtherCAT Terminals**
EtherCAT	CX2020-M112 2 x master	CX2030-M112 2 x master	CX2040-M112 2 x master
	CX2020-B110 slave	CX2030-B110 slave	CX2040-B110 slave
Lightbus	EL6720 master	EL6720 master	EL6720 master
PROFIBUS	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
CANopen	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
DeviceNet	EL6752 master	EL6752 master	EL6752 master
	EL6752-0010 slave	EL6752-0010 slave	EL6752-0010 slave
PROFINET RT	CX2020-M930 controller	CX2030-M930 controller	CX2040-M930 controller
	CX2020-B930 device	CX2030-B930 device	CX2040-B930 device
EtherNet/IP	CX2020-B950 adapter	CX2030-B950 adapter	CX2040-B950 adapter
UPS options	**CX2100-0904, CX2100-0914**	**CX2100-0904, CX2100-0914**	**CX2100-0914**

CX2042	CX2062	CX2072
Intel® Xeon® D-1527 2.2 GHz, 4 cores	Intel® Xeon® D-1548 2.0 GHz, 8 cores	Intel® Xeon® D-1567 2.1 GHz, 12 cores
slot for CFast card, card not included	slot for CFast card, card not included	slot for CFast card, card not included
8 GB DDR4 RAM (expandable ex factory to 64 GB)	8 GB DDR4 RAM (expandable ex factory to 64 GB)	8 GB DDR4 RAM (expandable ex factory to 64 GB)
2 x RJ45 10/100/1000 Mbit/s, 1 x DVI-I, 4 x USB 3.0, 1 x optional interface	2 x RJ45 10/100/1000 Mbit/s, 1 x DVI-I, 4 x USB 3.0, 1 x optional interface	2 x RJ45 10/100/1000 Mbit/s, 1 x DVI-I, 4 x USB 3.0, 1 x optional interface
via power supply module (E-bus or K-bus, automatic recognition)	via power supply module (E-bus or K-bus, automatic recognition)	via power supply module (E-bus or K-bus, automatic recognition)
modularly expandable	**modularly expandable**	**modularly expandable**
in the basic CPU, 2nd DVI port as option CX2042-N010	in the basic CPU, 2nd DVI port as option CX2062-N010	in the basic CPU, 2nd DVI port as option CX2072-N010
CX2042-N011	CX2062-N011	CX2072-N011
CX2042-N030 or CX2500-0030	CX2062-N030 or CX2500-0030	CX2072-N030 or CX2500-0030
CX2042-N031 or CX2500-0031	CX2062-N031 or CX2500-0031	CX2072-N031 or CX2500-0031
–	–	–
in the basic CPU or CX2500-0060	in the basic CPU or CX2500-0060	in the basic CPU or CX2500-0060
CX2042-N067 or CX2042-N167	CX2062-N067 or CX2062-N167	CX2072-N067 or CX2072-N167
CX2500-0061	CX2500-0061	CX2500-0061
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)
integrated or expandable via EtherCAT Terminals	**integrated or expandable via EtherCAT Terminals**	**integrated or expandable via EtherCAT Terminals**
CX2042-M112 2 x master	CX2062-M112 2 x master	CX2072-M112 2 x master
CX2042-B110 slave	CX2062-B110 slave	CX2072-B110 slave
EL6720 master	EL6720 master	EL6720 master
CX2042-M310 or CX2500-M310 master	CX2062-M310 or CX2500-M310 master	CX2072-M310 or CX2500-M310 master
CX2042-B310 or CX2500-B310 slave	CX2062-B310 or CX2500-B310 slave	CX2072-B310 or CX2500-B310 slave
CX2042-M510 or CX2500-M510 master	CX2062-M510 or CX2500-M510 master	CX2072-M510 or CX2500-M510 master
CX2042-B510 or CX2500-B510 slave	CX2062-B510 or CX2500-B510 slave	CX2072-B510 or CX2500-B510 slave
EL6752 master	EL6752 master	EL6752 master
EL6752-0010 slave	EL6752-0010 slave	EL6752-0010 slave
CX2042-M930 controller	CX2062-M930 controller	CX2072-M930 controller
CX2042-B930 device	CX2062-B930 device	CX2072-B930 device
CX2042-B950 adapter	CX2062-B950 adapter	CX2072-B950 adapter
–	–	–

Embedded PC

Basic CPU	CX2033	CX2043
Processor	AMD Ryzen™ V1202B 2.3 GHz	AMD Ryzen™ V1807B 3.35 GHz
Flash memory	slot for CFast card	slot for CFast card
Main memory	8 GB DDR4 RAM (expandable ex factory to 16 GB)	8 GB DDR4 RAM (expandable ex factory to 16 GB)
Interfaces	2 x RJ45, 10/100/1000 Mbit/s, DVI-D, 4 x USB 3.1 Gen. 2, 1 x optional interface	2 x RJ45, 10/100/1000 Mbit/s, DVI-D, 4 x USB 3.1 Gen. 2, 1 x optional interface
I/O connection	via power supply module (E-bus or K-bus, automatic recognition)	via power supply module (E-bus or K-bus, automatic recognition)
System interfaces	**modularly expandable**	**modularly expandable**
DVI/USB	in the basic CPU, 2nd DVI port as option CX2033-N010	in the basic CPU, 2nd DVI port as option CX2043-N010
DisplayPort	CX2033-N011	CX2043-N011
RS232	CX2033-N030 or CX2500-0030	CX2043-N030 or CX2500-0030
RS422/RS485	CX2033-N031 or CX2500-0031	CX2043-N031 or CX2500-0031
Audio	CX2500-0020	CX2500-0020
Ethernet	in the basic CPU or CX2500-0060	in the basic CPU or CX2500-0060
Power over Ethernet	CX2500-0061	CX2500-0061
4-port USB hub	in the basic CPU or CX2500-0070	in the basic CPU or CX2500-0070
Memory medium	in the basic CPU or CX2550-0010/ CX2550-0020	in the basic CPU or CX2550-0010/ CX2550-0020
USB extension	CX2550-0179 (USB 1.1) or CX2550-0279 (USB 2.0)	CX2550-0179 (USB 1.1) or CX2550-0279 (USB 2.0)
Fieldbus interfaces	**integrated or expandable via EtherCAT Terminals**	**integrated or expandable via EtherCAT Terminals**
EtherCAT	CX2033-M112 2 x master	CX2043-M112 2 x master
	CX2033-B110 slave	CX2043-B110 slave
Lightbus	EL6720 master	EL6720 master
PROFIBUS	CX2033-M310 or CX2500-M310 master	CX2043-M310 or CX2500-M310 master
	CX2033-B310 or CX2500-B310 slave	CX2043-B310 or CX2500-B310 slave
CANopen	CX2033-M510 or CX2500-M510 master	CX2043-M510 or CX2500-M510 master
	CX2033-B510 or CX2500-B510 slave	CX2043-B510 or CX2500-B510 slave
DeviceNet	EL6752 master	EL6752 master
	EL6752-0010 slave	EL6752-0010 slave
PROFINET RT	CX2033-M930 controller	CX2043-M930 controller
	CX2033-B930 device	CX2043-B930 device
EtherNet/IP	CX2033-B950 adapter	CX2043-B950 adapter
SERCOS	–	–
UPS options	**CX2100-0914**	**CX2100-0914**

CX1010	CX1020	CX1030
compatible with Intel® Pentium® MMX, clock frequency 500 MHz	Intel® Celeron® M ULV, 1 GHz clock frequency	Intel® Pentium® M, 1.8 GHz clock frequency
slot for Compact Flash card, 128 MB included (expandable)	slot for Compact Flash card, 128 MB included (expandable)	slot for Compact Flash card, 128 MB included (expandable)
256 MB DDR RAM (not expandable)	256 MB DDR RAM (expandable ex factory to 1 GB)	256 MB DDR RAM (expandable ex factory to 1 GB)
1 x RJ45 10/100 Mbit/s	2 x RJ45 10/100 Mbit/s (internal switch)	2 x RJ45 10/100 Mbit/s (internal switch)
via power supply module (E-bus, K-bus, K-bus/IP-Link)	via power supply module (E-bus, K-bus, K-bus/IP-Link)	via power supply module (E-bus, K-bus, K-bus/IP-Link)
modularly expandable	**modularly expandable**	**modularly expandable**
CX1010-N010	CX1020-N010	CX1030-N010
–	–	–
CX1010-N030 (COM 1/2)	CX1020-N030 (COM 1/2)	CX1030-N030 (COM 1/2)
CX1010-N040 (COM 3/4)	CX1020-N040 (COM 3/4)	CX1030-N040 (COM 3/4)
CX1010-N031 (COM 1/2)	CX1020-N031 (COM 1/2)	CX1030-N031 (COM 1/2)
CX1010-N041 (COM 3/4)	CX1020-N041 (COM 3/4)	CX1030-N041 (COM 3/4)
CX1010-N020	CX1020-N020	CX1030-N020
CX1010-N060	CX1020-N060	CX1030-N060
–	–	–
–	–	–
in the basic CPU	–	–
–	–	–
modularly expandable	**modularly expandable**	**modularly expandable**
–	–	–
EL6695 slave	EL6695 slave	EL6695 slave
CX1500-M200 master	CX1500-M200 master	CX1500-M200 master
CX1500-M310 master	CX1500-M310 master	CX1500-M310 master
CX1500-B310 slave	CX1500-B310 slave	CX1500-B310 slave
CX1500-M510 master	CX1500-M510 master	CX1500-M510 master
CX1500-B510 slave	CX1500-B510 slave	CX1500-B510 slave
CX1500-M520 master	CX1500-M520 master	CX1500-M520 master
CX1500-B520 slave	CX1500-B520 slave	CX1500-B520 slave
–	–	–
–	–	–
CX1500-M750 SERCOS II master	CX1500-M750 SERCOS II master	CX1500-M750 SERCOS II master
CX1100-0910, -0900	**CX1100-0920**	**CX1100-0930**

The I/O Company

Beckhoff supplies a complete range of fieldbus components for all common I/O and bus systems. With Bus Terminals offering IP 20 protection and Fieldbus Box modules in IP 67, a comprehensive range of devices is available for a wide variety of signal types and fieldbus systems. In addition to components for conventional bus systems, Beckhoff offers an integrated product range optimized for EtherCAT. Invented by Beckhoff, this real-time Ethernet solution for industrial automation has global acceptance and is characterized by outstanding performance and simple handling. The result is high-precision machine and plant control and significantly increased production efficiency.

▶ **www.beckhoff.com/io**

▶ **www.beckhoff.com/ethercat**

EtherCAT Box 50

- IP 67 EtherCAT I/O system
- high performance for harsh environments
- compact and robust
- can be mounted directly on machines, outside of control cabinets and terminal boxes
- integrated sensor/actuator supply directly via EtherCAT P

▶ **www.beckhoff.com/ethercat-box**

EtherCAT Plug-in Modules 58

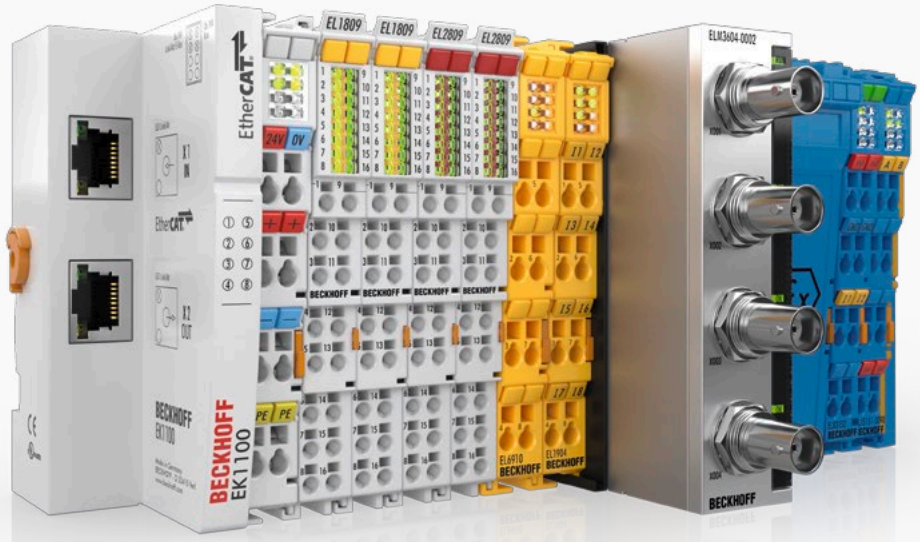
- very compact EtherCAT I/O system in IP 20 for plug-in into a circuit board (signal distribution board)
- optimized for high-volume production
- application-specific connector interface
- Use of cable harnesses avoids wiring errors.

▶ **www.beckhoff.com/ethercat-plug-in-modules**

Bus Terminals 62

- open, fieldbus-neutral IP 20 I/O system
- more than 400 different Bus Terminals
- support for more than 20 fieldbus systems
- gateways for subordinate bus systems
- system-integrated safety I/O terminals available

▶ **www.beckhoff.com/busterminal**



EtherCAT Terminals 36

- IP 20 EtherCAT I/O system
- real-time Ethernet performance retained into each terminal
- standard digital and analog signals
- complex automation functions directly in the terminal system
- highly precise measurement technology
- condition monitoring
- drive technology
- process technology
- electronic overcurrent protection
- gateways for subordinate fieldbus systems
- TwinSAFE PLC and safety I/Os

▶ **www.beckhoff.com/ethercat-terminal**

Fieldbus Box 70

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

▶ **www.beckhoff.com/fieldbusbox**

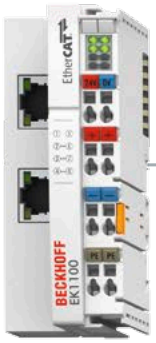
Infrastructure Components 73

- PC cards for all common fieldbus systems
- Industrial Ethernet switches
- EtherCAT junctions and media converters in IP 20 and IP 67 ratings
- EtherCAT G/G10 components

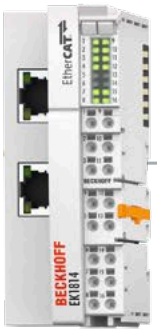
▶ **www.beckhoff.com/infrastructure-components**

- **comprehensive, modular I/O system for all signal types and fieldbus systems**
- **universal product range optimized for EtherCAT**
- **high investment security: mature I/O technology based on more than 25 years of success in the field**
- **Beckhoff is the I/O pioneer, developing the Bus Terminal concept and EtherCAT.**

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 22

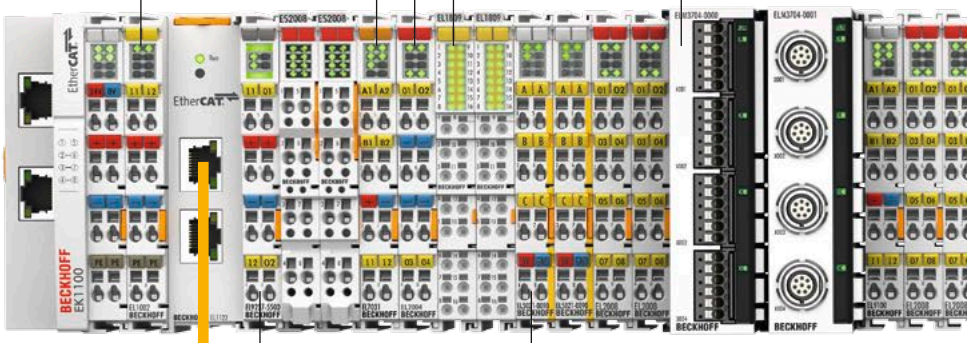
Free mix of signals: more than 200 different EtherCAT Terminals enable connection of all common sensors and actuators.

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

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

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

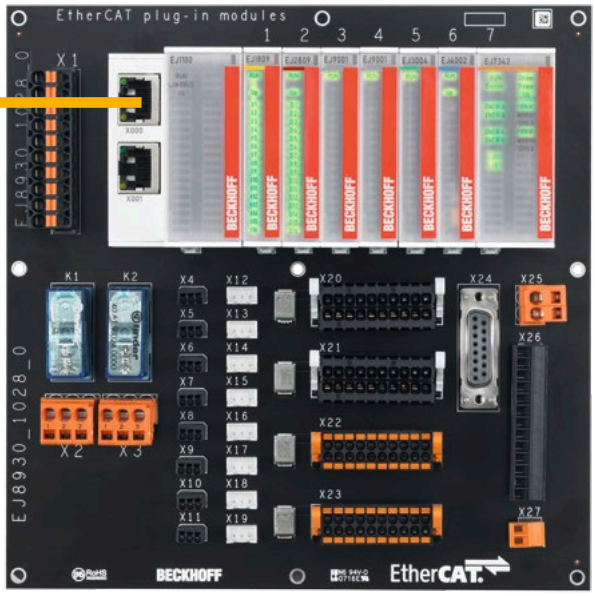
High-end measurement technology with attractive pricing through series production, seamlessly integrated into the automation system.



100 m Industrial Ethernet cable (100BASE-TX)

Integrated electronic overcurrent protection for safeguarding of potential groups incl. monitoring function

With the aid of the TwinSAFE SC technology it is possible to make use of standard signals for safety tasks in any network or fieldbus.

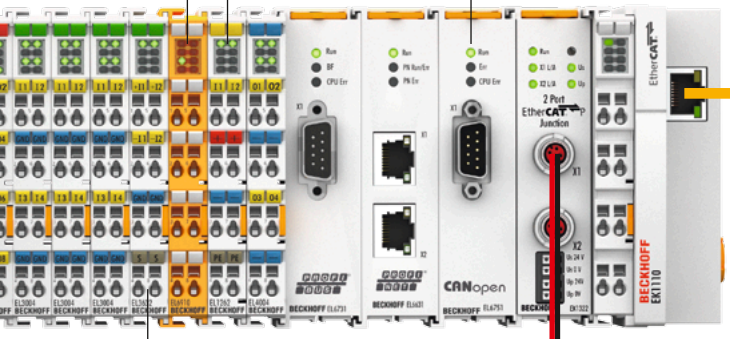


EtherCAT plug-in modules: very compact EtherCAT I/O system in IP 20 for plug-in into a circuit board (signal distribution board)

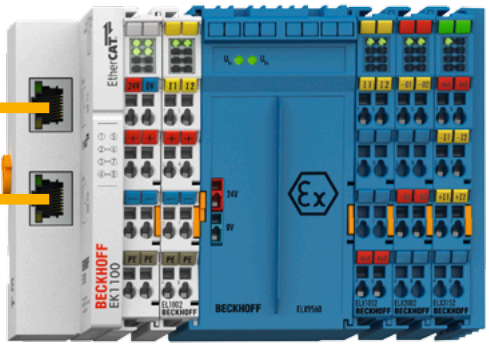
TwinSAFE: safety I/Os and compact Safety PLC for up to 212 safety-relevant bus devices

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

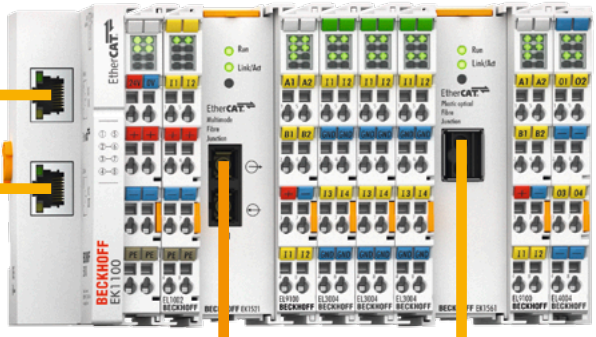
Optional fieldbus integration via decentralized fieldbus master/ slave terminals



High-speed measurement, high-precision measurement, condition monitoring, energy monitoring



ELX terminals: direct connection of intrinsically safe sensors and actuators



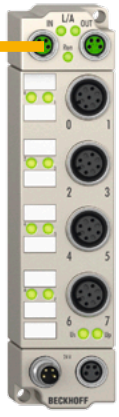
2000/20,000 m fibre optic (100BASE-FX)

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

IP 67
EtherCAT P
Box

IP 67
EtherCAT
Box

IP 69K EtherCAT Box
(stainless steel)



IP 67
EtherCAT Box
(die-cast zinc)

Product overview fieldbus systems

Fieldbus	EtherCAT Terminals	EtherCAT Box	EtherCAT Plug-in Modules	Bus Terminals		Fieldbus Box
	Couplers/Gateways	Modules		Bus Couplers/ Master terminals	PLC (IEC 61131-3)	Compact Box
EtherCAT	EK1xxx, EKM1xxx	EPxxxx	EJxxxx	BK1120		
	EL6695 bridge	ERxxxx		BK1150		
		EQxxxx		BK1250		
EtherCAT P	EK13xx	EPPxxxx				
		EP1312				
LIGHTBUS	EL6720 master			BK20x0		IPxxxx-B200
PROFIBUS	EK3100			BK3xx0	BC3150	IPxxxx-B31x
	EL6731 master/slave				BX3100	
INTERBUS	EL6740-0010 slave			BK40x0		IPxxxx-B400
CANopen	EL6751 master/slave			BK51xx	BC5150	IPxxxx-B51x
					BX5100	
DeviceNet	EL6752 master/slave			BK52x0	BX5200	IPxxxx-B52x
CC-Link	EL6711-0010 slave i			BK7150		
Modbus	EK9000			BK7350		IPxxxx-B730
sercos the automation bus				BK75x0		
RS485	EL6021, EL6022	EP600x	EJ6002	BK8000	BC8050	IPxxxx-B800
		EPP600x		KL6021	BX8000	
				KL6041		
RS232	EL6001, EL6002	EP600x	EJ6002	BK8100	BC8150	IPxxxx-B810
		EPP600x		KL6001	BX8000	
				KL6031		
Ethernet TCP/IP				BK9xx0	BC9xxx	
	EL6601, EL6614 switch port	EP6601 i switch port			BX9000	
PROFINET	EK9300	EP9300		BK9xx3		
	EL6631 RT controller/device					
	EL6632 IRT controller i					
EtherNet/IP	EK9500			BK9xx5		
	EL6652 scanner/adapter					

AS-Interface	EL6201			KL62x1		
IO-Link	EL6224 master	EP622x, EPP6228 master	EJ6224 master	KL6224 master		
EIB/KNX				KL6301		
LON				KL6401		
MP-Bus				KL6771		
M-Bus				KL6781		
DALI/DSI				KL6811		
DALI-2				KL6821		
IEEE 1588	EL6688					
DMX	EL6851					
EnOcean				KL658x		
SMI				KL6841		
BACnet	EL6861					

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

			Fieldbus Modules	Infrastructure Components	Embedded PC	Drive Technology
Coupler Box	PLC Box (IEC 61131-3)	IO-Link box	For thermo-couples/mV	Interfaces	Master/Slave	Servo Drives
IL230x-B110			FM33xx-B110	FC90xx, FC11xx	CXxxxx	AX8000
				CUxxxx	CXxxxx-M112	AX5000
				EP9xxx		AMI8100
IL230x-B200				FC200x	CX1500-M200	
IL230x-B31x	IL230x-C31x		FM33xx-B310	FC31xx	CXxxxx	
					CX2500-M/B310	
IL230x-B400						
IL230x-B51x				FC51xx	CXxxxx	
					CX2500-M/B510	
IL230x-B52x				FC52xx	CX1500-M/B520	
IL230x-B730					CXxxxx	
				FC75xx	CXxxxx	
IL230x-B800					CXxxxx	
IL230x-B810	IL230x-C810				CXxxxx	
IL230x-B90x	IL230x-C900			FC90xx	CXxxxx	
				CU2xxx, CU2508 Ethernet Switch		
IL230x-B903				CU2508	CXxxxx	
IL230x-B905				CU2508	CXxxxx	
		EPIxxxx, ERIxxxx devices				

EtherCAT Terminals

▶ www.beckhoff.com/ethercat-terminal

EK1xxx, BK1xx0 | EtherCAT Couplers

	EtherCAT				EtherCAT P	EtherCAT G	Ethernet/TSN
EtherCAT Couplers E-bus	**EK1100** 2 x RJ45	**EK1101** ID switch	**EK1101-0010** ID switch, Extended Distance	**EK1101-0080** ID switch, Fast Hot Connect	**EK1300** EtherCAT P	**EK1400** i EtherCAT G	**EK1000** i Ethernet/TSN
	EK1100-0008 M8 connection	**EK1101-0008** ID switch, M8 connection		**EKM1101** ID switch and diagnostics			
	EK1501 ID switch, multimode fibre optic	**EK1501-0010** ID switch, singlemode fibre optic	**EK1501-0100** ID switch, multimode fibre optic to RJ45	**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 standard inputs, 4 standard outputs, 2 safe inputs, 2 safe outputs	**EK1960** TwinSAFE Logic, 20 safe inputs, 24 safe outputs					
EtherCAT Couplers K-bus	**BK1120** Bus Coupler (Economy plus)	**BK1150** Bus Coupler (Compact)	**BK1250** E-bus to K-bus interface				
Extensions	**EK1110** extension end terminal	**EK1110-0008** extension end terminal, M8	**EK1110-0043** EtherCAT EJ coupler, CX and EL terminal connection	**EK1110-0044** EtherCAT EJ coupler, CX and EL terminal connection, EtherCAT junction	**EK1310** EtherCAT P extension with feed-in		
Junctions	**EK1122** 2-port junction	**EK1122-0008** 2-port junction, M8	**EK1121-0010** 1-port junction, Extended Distance	**EK1122-0080** 2-port junction, Fast Hot Connect	**EK1322** EtherCAT P junction with feed-in		
	EK1521 multimode fibre optic junction	**EK1521-0010** singlemode fibre optic junction		**EK1561** POF junction			

EKxxxx | Bus Couplers

Fieldbus	Standard
IoT	**EK9160** IoT (MQTT, OPC UA)
EtherNet/IP	**EK9500** 100 Mbit/s
Modbus	**EK9000** 100 Mbit/s
PROFIBUS®	**EK3100** 12 Mbaud
PROFINET®	**EK9300** 100 Mbit/s

Embedded PCs with E-bus interface see page 22, Infrastructure Components see page 73

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

EL1xxx | EtherCAT Terminals, digital input

Signal	2-channel	4-channel		8-channel	16-channel	
5 V DC	**EL1252-0050** T_{ON}/T_{OFF} 1 µs, timestamping	**EL1124** filter 0.05 µs				
	EL1262-0050 T_{ON}/T_{OFF} 1 µs, oversampling					
12 V DC		**EL1144** filter 10 µs				
24 V DC, filter 3.0 ms	**EL1002** type 3	**EL1004** type 3		**EL1008** type 3, 1-wire	**EL1809** type 3	
		EL1104 type 3, with sensor supply	**EL1804** type 3, 8 x 24 V, 4 x 0 V	**EL1808** type 3, 8 x 24 V DC, 2-wire	**EL1852** type 3, 8 inputs, 8 outputs, I_{max} = 0.5 A, flat-ribbon cable	**EL1859** type 3, 8 inputs, 8 outputs, I_{max} = 0.5 A
		EL1084 ground switching	**EL1024** type 2	**EL1088** ground switching	**EL1862** type 3, flat-ribbon cable	**EL1862-0010** flat-ribbon cable, ground switching
					EL1889 ground switching	
24 V DC, filter 10 µs	**EL1012** type 3	**EL1014** type 3	**EL1034** type 1, potential-free inputs	**EL1018** type 3	**EL1819** type 3	
		EL1114 type 3, with sensor supply	**EL1814** type 3, 8 x 24 V, 4 x 0 V, 3-wire		**EL1872** type 3, flat-ribbon cable	**EL1872-0010** flat-ribbon cable, ground switching
			EL1094 ground switching	**EL1098** ground switching	**EL1899** ground switching	
24 V DC, XFC: T_{ON}/T_{OFF} 1 µs	**EL1202** type 3					
	EL1252 type 3, timestamping	**EL1254** type 3, timestamping		**EL1258** multi-timestamping	**EL1259** 8 inputs, 8 outputs, multi-timestamping, I_{max} = 0.5 A	
	EL1262 type 3, oversampling			**EL1258-0010** multi-timestamping, ground switching		
24 V DC, counter	**EL1502** type 1, 100 kHz, 32 bit					
	EL1512 type 1, 1 kHz, 32 bit					
24 V DC, safe input		**EL1904** TwinSAFE, 4 safe inputs	**EL2911** TwinSAFE Logic, 4 safe inputs, 1 safe output	**EL1918** TwinSAFE Logic, 8 safe inputs		
48 V DC		**EL1134** type 1				
120 V AC/DC	**EL1712** power contacts					
120 V DC	**EL1712-0020** power contacts					

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

EL1xxx | EtherCAT Terminals, digital input

Signal	2-channel	4-channel	8-channel	16-channel
120… 230 V AC	**EL1702** power contacts			
	EL1722 no power contacts			
220 V DC	**EL1702-0020** power contacts			
Thermistor	**EL1382**			
NAMUR	**EL1052**	**EL1054**		
Ex i, NAMUR	**ELX1052**	**ELX1054**	**ELX1058**	

EL2xxx | EtherCAT Terminals, digital output

Signal	1-channel	2-channel	4-channel	8-channel	16-channel	
5 V DC			**EL2124** I_{max} = ±20 mA			
12 V DC			**EL2024-0010** I_{max} = 2.0 A			
24 V DC, I_{max} = 0.5 A		**EL2002** 4-wire	**EL2004** 2-wire	**EL2008** 1-wire	**EL2809** I_{max} = 0.5 A	**EM2042** D-sub connection
			EL2014 with diagnostics	**EL2878-0005** flat-ribbon cable, with diagnostics	**EL2872** flat-ribbon cable	**EL2872-0010** flat-ribbon cable, ground switching
				EL2808 8 x 0 V	**EL2819** with diagnostics	**EL1859** type 3, 8 inputs, 8 outputs, I_{max} = 0.5 A
			EL2084 ground switching	**EL2088** ground switching	**EL2889** ground switching	**EL1852** type 3, 8 inputs, 8 outputs, I_{max} = 0.5 A, flat-ribbon cable
24 V DC, I_{max} = 2.0 A		**EL2022** 4-wire	**EL2024** 3-wire	**EL2828**		
		EL2032 with diagnostics	**EL2034** with diagnostics			
			EL2044 with extended diagnostics			
24 V DC, I_{max} = 4.0 A/8.0 A		**EL2042** 2 x 4.0 A/1 x 8.0 A				
24 V DC, XFC: T_{ON}/T_{OFF} 1 µs		**EL2202** push-pull outputs; **EL2212** overexcitation, multi-timestamping		**EL2258** multi-timestamping	**EL1259** 8 inputs, 8 outputs, multi-timestamping, I_{max} = 0.5 A	
		EL2252 timestamping; **EL2262** oversampling				
Ex i, 24 V DC		**ELX2002** 45 mA		**ELX2008** 30 mA		
24 V DC, safe output	**EL2911** TwinSAFE Logic, 4 safe inputs, 1 safe output	**EL2912** TwinSAFE Logic, 2 safe outputs	**EL2904** TwinSAFE, 4 safe outputs			

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

Product announcement for availability status see www.beckhoff.com

EL2xxx | EtherCAT Terminals, digital output

Signal	1-channel	2-channel		4-channel	8-channel	16-channel
30 V AC/ 48 V DC solid state relay, I_{max} = 2.0 A				**EL2784**	**EL2788**	
				EL2794 potential-free	**EL2798** potential-free	
Relay (up to 250 V AC)		**EL2602** I_{max} = 5.0 A, make contact, power contacts	**EL2622** I_{max} = 5.0 A, make contact, no power contacts	**EL2624** I_{max} = 2.0 A, make contact		
		EL2602-0010 I_{max} = 5.0 A, make contact, power contacts, contact-protecting switching	**EL2622-0010** I_{max} = 5.0 A, make contact, no power contacts, contact-protecting switching	**EL2634** I_{max} = 4.0 A, make contact, 250 V AC/30 V DC, no power contacts		
		EL2612 I_{max} = 2.0 A, change-over, no power contacts	**EL2642** i I_{max} = 1.0 A, change-over, no power contacts, reed relays			
		EL2652 I_{max} = 1.0 A, change-over, no power contacts				
Triac (12…230 V AC)		**EL2712** i I_{max} = 0.5 A, power contacts	**EL2722** i I_{max} = 1.0 A, mutually locked outputs			
		EL2732 i I_{max} = 0.5 A, no power contacts				
PWM		**EL2502** push-pull outputs, separate frequency can be set for each channel	**EL2502-0010** push-pull outputs, separate frequency can be set for each channel, timestamping			
		EL2535 24 V DC, I_{max} = ±50 mA, ±1 A, ±2 A	**EL2535-0005** 24 V DC, I_{max} = ±5 A			
Frequency output	**EL2521** 1-channel AB, 0…500 kHz, RS422	**EL2522** 2-channel AB, 1-channel ABC, 0…4 MHz				
Current control, LED control	**EL2595** LED constant current terminal					
	EL2596 24 V DC					
	EL2596-0010 i 48 V DC					
Multiplexer		**ELM2742-0000** 2 x multiplexer, 1 x 4 solid-state relays		**ELM2744-0000** 4 x multiplexer, 1 x 4 solid-state relays		
		ELM2642-0000 2 x multiplexer, 1 x 4 reed relays		**ELM2644-0000** 4 x multiplexer, 1 x 4 reed relays		

EL3xxx | EtherCAT Terminals, analog input

Signal	1-channel		2-/3-channel		4-channel		5-/6-/8-channel
±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	**EL3104** differential input, 16 bit		
			EL3702 differential input, 16 bit, oversampling				
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			**EL3062-0030** 12 bit				
±30 V… ±20 mV			**ELM3002-0000** 24 bit, 20 ksps, push-in		**ELM3004-0000** 24 bit, 10 ksps, push-in		
±200 mV			**EL3602-0002** differential input, 24 bit				
±150 mV			**EL3702-0015** differential input, 16 bit, oversampling				
±75 mV			**EL3602-0010** differential input, 24 bit				
±10 V/ 0…20 mA					**EL3174** 16 bit, NAMUR NE43	**EL3174-0002** 16 bit, electrically isolated, NAMUR NE43	
					EL3174-0032 16 bit, electrically isolated, NAMUR NE43, ±3 V	**EL3174-0090** 16 bit, NAMUR NE43, TwinSAFE SC	**ELM3146-0000** 24 bit, 1 ksps, push-in
			ELM3142-0000 24 bit, 1 ksps, push-in		**ELM3144-0000** 24 bit, 1 ksps, push-in		**ELM3148-0000** 24 bit, 1 ksps, push-in
0…20 mA	**EL3041** single-ended, 12 bit	**EL3141** single-ended, 16 bit	**EL3042** single-ended, 12 bit	**EL3142** single-ended, 16 bit	**EL3044** single-ended, 12 bit	**EL3144** single-ended, 16 bit	**EL3048** single-ended, 12 bit
	EL3011 differential input, 12 bit	**EL3111** differential input, 16 bit	**EL3742** differential input, 16 bit, oversampling	**EL3012** differential input, 12 bit	**EL3014** differential input, 12 bit	**EL3114** differential input, 16 bit	
			EL3112 differential input, 16 bit	**EL3612** differential input, 24 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 input, 12 bit	**EL3121** differential input, 16 bit	**EL3022** differential input, 12 bit	**EL3122** differential input, 16 bit	**EL3024** differential input, 12 bit	**EL3124** differential input, 16 bit	
		EL3621-0020 differential input, 24 bit	**EL3182** single-ended, 16 bit, HART			**EL3124-0090** 16 bit, TwinSAFE SC	
Ex i, 0/4…20 mA	**ELX3181** 4…20 mA, single-ended, 16 bit, HART		**ELX3152** 0/4…20 mA, single-ended, 16 bit	**ELX3152-0090** 0/4…20 mA, single-ended, 16 bit, TwinSAFE SC	**ELX3184** i 4…20 mA, single-ended, 16 bit, HART		**ELX3158** 4…20 mA, single-ended, 16 bit
±20 mA			**EL3112-0011** differential input, 16 bit	**ELM3102-0000** 24 bit, 20 ksps, NAMUR NE43, push-in	**ELM3104-0000** 24 bit, 10 ksps, NAMUR NE43, push-in		
Multi-function	**EL3751** 24 bit, 10 ksps	**EL3751-0004** 24 bit, 10 ksps	**ELM3702-0000** 24 bit, 10 ksps, push-in		**ELM3704-0000** 24 bit, 10 ksps, push-in	**ELM3704-0001** i 24 bit, 10 ksps, LEMO	

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

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

EL3xxx | EtherCAT Terminals, analog input

Signal	1-channel	2-/3-channel	4-channel	5-/6-/8-channel
Thermo-couple/mV	**EL3311** 16 bit	**EL3312** 16 bit	**EL3314** 16 bit; **EL3314-0090** 16 bit, TwinSAFE SC	**EL3318** 16 bit
			EL3314-0002 24 bit, electrically isolated; **ELM3344-0000** 24 bit, 1 ksps, push-in	**ELM3348-0000** 24 bit, 1 ksps, push-in
			EL3314-0010 24 bit; **ELM3344-0003** 24 bit, 1 ksps, push-in, Mini-TC universal	**ELM3348-0003** 24 bit, 1 ksps, push-in, Mini-TC universal
Ex i, thermo-couple/mV		**ELX3312** 2-wire connection, 16 bit; **ELX3312-0090** 2-wire connection, 16 bit, TwinSAFE SC	**ELX3314** 2-wire connection, 16 bit; **ELX3314-0090** 2-wire connection, 16 bit, TwinSAFE SC	
Resistance thermometer (RTD)	**EL3201** 16 bit	**EL3202** 16 bit	**EL3204** 2-wire, 16 bit	**EL3208** 16 bit
			EL3204-0162 2-wire, 16 bit, 2 x RTD, 2 x ±10 V; **EL3204-0200** 16 bit, universal input for RTD	**EL3208-0010** Pt1000, Ni1000, NTC 1.8…100 k, potentiom. 1, 5, 10 kΩ
			EL3214 3-wire, 16 bit; **EL3214-0090** 16 bit, TwinSAFE SC	**EL3218** 3-wire, 16 bit
Ex i, resistance thermometer (RTD)		**ELX3202** RTD for 2-, 3- and 4-wire connection, 16 bit; **ELX3202-0090** RTD for 2-, 3- and 4-wire connection, 16 bit, TwinSAFE SC	**ELX3204** RTD, 2-wire connection, 16 bit; **ELX3204-0090** RTD, 2-wire connection, 16 bit, TwinSAFE SC	
Measurement bridge (SG)	**EL3351** 16 bit; **EL3356** self-calibration	**ELM3502-0000** 24 bit, 20 ksps, push-in	**ELM3504-0000** 24 bit, 10 ksps, push-in	
	EL3356-0010 24 bit, 10 ksps; **EL3356-0090** TwinSAFE SC	**ELM3542-0000** 24 bit, 1 ksps, push-in	**ELM3544-0000** 24 bit, 1 ksps, push-in	
Ex i, measurement bridge (SG)	**ELX3351** 24 bit; **ELX3351-0090** 24 bit, TwinSAFE SC			
Measurement technology	**EL3681** digital multimeter terminal, 18 bit	**EL3692** resistance measurement, 100 mΩ…10 MΩ		**EL3255** potentiometer measure-ment, 5-channel
Ex i, measurement technology		**ELX3252** potentiometer measure-ment, 16 bit		
Condition monitoring/ IEPE		**EL3632** 16 bit, 50 ksps; **ELM3602-0000** 24 bit, 50 ksps, push-in	**ELM3604-0000** 24 bit, 20 ksps, push-in	
		ELM3602-0002 24 bit, 50 ksps, BNC	**ELM3604-0002** 24 bit, 20 ksps, BNC	
Pressure measuring	**EM3701** differential pressure, ±100 hPa	**EM3702** relative pressure, 7500 hPa; **EM3712** relative pressure, ±1000 hPa		
Power measurement, ≤ 500 V		**EL3403** 500 V AC, 1 A; **EL3423** 480 V AC/DC, 1 A, Economy		
		EL3433 500 V AC, 10 A; **EL3443** 480 V AC/DC, 1 A, extended functionalities		**EL3446** distributed power measurement
		EL3443-0010 480 V AC/DC, 5 A, extended functionalities; **EL3443-0011** 480 V AC/DC, 100 mA, extended functionalities		
		EL3443-0013 480 V AC/DC, 333 mV, extended functionalities		

EL3xxx | EtherCAT Terminals, analog input

Signal	1-channel	2-/3-channel		4-channel	5-/6-/8-channel
Power measurement, > 500 V		EL3413 690 V AC, 5 A			
		EL3453 690 V AC, 5 A, extended functionalities	EL3453-0100 i 690 V AC, 5 A, extended functionalities		
Mains monitor, ±480 V		EL3483 480 V AC/DC	EL3483-0060 480 V AC/DC, with voltage measurement		
Power monitoring, ≤ 500 V		EL3773 500 V AC/DC, 10 ksps			
Power monitoring, > 500 V		EL3783 690 V AC, 20 ksps	EL3783-0100 i 130 V AC, 20 ksps		

EL4xxx | EtherCAT Terminals, analog output

Signal	1-channel	2-channel		4-channel		8-channel
0…10 V	EL4001 12 bit	EL4002 12 bit	EL4102 16 bit	EL4004 12 bit	EL4104 16 bit	EL4008 12 bit
±10 V	EL4031 12 bit	EL4032 12 bit	EL4132 16 bit	EL4034 12 bit	EL4134 16 bit	EL4038 12 bit
		EL4732 16 bit, oversampling				
0…20 mA	EL4011 12 bit	EL4012 12 bit	EL4112 16 bit	EL4014 12 bit	EL4114 16 bit	EL4018 12 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		
Ex i, 0/4…20 mA	ELX4181 single-ended, 16 bit, HART			ELX4154 single-ended, 16 bit		
±10 mA		EL4112-0010 16 bit				

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

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

EL5xxx | EtherCAT Terminals, position measurement

Signal	1-channel			2-channel	
Absolute position measurement	**EL5001** SSI encoder interface	**EL5001-0011** SSI monitor interface	**EL5001-0090** SSI encoder interface, TwinSAFE SC	**EL5002** SSI encoder interface	**EL5032** EnDat 2.2 interface
				EL5032-0090 EnDat 2.2 interface, TwinSAFE SC	**EL5042** BiSS C interface
				EL5072 inductive displacement sensor interface, LVDT	
Incremental position measurement	**EL5021** SinCos encoder interface, 1 V_{PP}	**EL5021-0090** SinCos encoder interface, 1 V_{PP}, TwinSAFE SC			
	EL5101 incremental encoder interface, RS422, TTL, 1 MHz	**EL5101-0010** incremental encoder interface, RS422, 5 MHz	**EL5101-0011** incremental encoder interface, RS422, 5 MHz, oversampling	**EL5102** incremental encoder interface, RS422, TTL, Open Collector, 5 MHz	**EL5112** incremental encoder interface, RS422, TTL, Open Collector, 5 MHz, 2 x AB/1 x ABC
	EL5101-0090 incremental encoder interface, RS422, TTL, 1 MHz, TwinSAFE SC	**EL5131** i incremental encoder interface, RS422, TTL, 2 x 24 V DC push-pull outputs		**EL5122** incremental encoder interface, TTL, Open Collector, 1 MHz, 2 x AB	
	EL5151 incremental encoder interface, 24 V HTL, 100 kHz	**EL5151-0021** incremental encoder interface, 24 V HTL, 100 kHz, 1 x 24 V DC output	**EL5151-0090** incremental encoder interface, 24 V HTL, 100 kHz, TwinSAFE SC	**EL5152** incremental encoder interface, 24 V HTL, 100 kHz	
Ex i, incremental position measurement	**ELX5151** incremental encoder interface, NAMUR	**ELX5151-0090** incremental encoder interface, NAMUR, TwinSAFE SC			

EL6xxx | EtherCAT Terminals, communication

Signal	1-channel			2-channel		4-channel
System	**EL6070** license key terminal	**EL6080** memory terminal 128 kbyte	**EL6090** display terminal			
Serial	**EL6001** RS232, 115.2 kbaud	**EL6021** RS422/RS485, 115.2 kbaud		**EL6002** RS232, 115.2 kbaud, D-sub	**EL6022** RS422/RS485, 115.2 kbaud, D-sub	
EtherCAT/ Ethernet	**EL6601** switch port	**EL6688** IEEE 1588 master/slave		**EL6692** EtherCAT bridge	**EL6695** EtherCAT bridge, high performance	**EL6614** switch port
Master/slave, slave function -0010	**EL6201** AS-Interface, master	**EL6631** PROFINET RT, controller/device terminal		**EL6632** i PROFINET IRT, controller	**EL6652** EtherNet/IP, scanner/ adapter terminal	**EL6224** IO-Link, master
	EL6711-0010 i CC-Link, slave	**EL6720** Lightbus, master	**EL6731** PROFIBUS DP, master/slave			**EL6224-0090** IO-Link, TwinSAFE SC, master
	EL6740-0010 Interbus, slave	**EL6751** CANopen, master/slave	**EL6752** DeviceNet, master/slave			
	EL6851 DMX, master/slave	**EL6861** BACnet, MS/TP, RS485, master				
Safety	**EL6900** TwinSAFE Logic	**EL6910** TwinSAFE Logic, PROFIsafe master and slave support	**EL6930** TwinSAFE Logic, PROFIsafe slave support			

EL7xxx | EtherCAT Terminals, motion

Motor type	< 3 A	3…5 A	> 5 A	16 A
Servomotor			**ELM7211-9016** i I_{rms} = 4.5 A, 48 V DC	
			ELM7211-9018 i I_{rms} = 4.5 A, 48 V DC, Safe Motion	
			ELM7212-9016 i I_{rms} = 2 x 4.5 A, 48 V DC	**ELM7222-9016** i I_{rms} = 2 x 8.0 A, 48 V DC
			ELM7212-9018 i I_{rms} = 2 x 4.5 A, 48 V DC, Safe Motion	**ELM7222-9018** i I_{rms} = 2 x 8.0 A, 48 V DC, Safe Motion
	EL7201-0010 I_{rms} = 2.8 A, 48 V DC, OCT	**EL7211-0010** I_{rms} = 4.5 A, 48 V DC, OCT	**ELM7221-9016** i I_{rms} = 8 A, 48 V DC	**ELM7231-9016** i I_{rms} = 16 A, 48 V DC
	EL7201 I_{rms} = 2.8 A, 48 V DC, resolver	**EL7211** I_{rms} = 4.5 A, 48 V DC, resolver	**ELM7221-9018** i I_{rms} = 8 A, 48 V DC, Safe Motion	**ELM7231-9018** i I_{rms} = 16 A, 48 V DC, Safe Motion
	EL7201-9014 I_{rms} = 2.8 A, 48 V DC, OCT, STO	**EL7211-9014** I_{rms} = 4.5 A, 48 V DC, OCT, STO	**EL7221-9014** I_{rms} = 7…8 A with ZB8610, 48 V DC, OCT, STO	
Stepper motor	**EL7031** I_{max} = 1.5 A, 24 V DC	**EL7041** I_{max} = 5.0 A, 48 V DC, incremental encoder		
	EL7031-0030 I_{max} = 2.8 A, 24 V DC	**EL7041-0052** I_{max} = 5.0 A, 48 V DC		
	EL7037 I_{max} = 1.5 A, 24 V DC, incremental encoder, vector control	**EL7047** I_{max} = 5.0 A, 48 V DC, incremental encoder, vector control		
		EL7047-9014 i I_{max} = 5.0 A, 48 V DC, incremental encoder, vector control, STO		
DC motor output stage	**EL7332** I_{max} = 1.0 A, 24 V DC	**EL7342** I_{max} = 3.5 A, 48 V DC, incremental encoder		
BLDC		**EL7411** I_{rms} = 4.5 A, 48 V DC		
		EL7411-9014 i I_{rms} = 4.5 A, 48 V DC, STO		
4-axis interface	**EM7004** 4 incremental encoders, 32 digital I/Os 24 V DC, 4 analog outputs ±10 V			

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

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

EL9xxx | EtherCAT Terminals, system

Signal	System				
Components for system bus	**EL9011** bus end cover	**EL9012** bus end cover for power and E-bus contacts	**ELM9012** bus end cover for ELMxxxx, black	**ELX9012** bus end cover for ELX, blue	**EL9930** PROFIsafe, segment end terminal
	EL9195 shield terminal	**EL9070** shield terminal	**EL9080** isolation terminal		
Potential distribution	**EL9180** 2 clamping units per power contact	**EL9181** 2 x 8 terminal points	**EL9182** 8 x 2 terminal points	**EL9183** 1 x 16 terminal points	**EL9184** 8 x 24 V DC, 8 x 0 V DC
	EL9185 4 clamping units at 2 power contacts	**EL9185-0010** 4 clamping units at 2 power contacts, potential supply function	**EL9186** 8 x 24 V DC	**EL9187** 8 x 0 V DC	**EL9188** 16 x 24 V DC
	EL9189 16 x 0 V DC				
Potential supply, 24 V DC	**EL9100**	**EL9110** diagnostics	**EL9200** with fuse	**EL9210** diagnostics, with fuse	**EL9520** AS-Interface potential supply with filter
Potential supply, 120… 230 V AC	**EL9150** with LED	**EL9160** i diagnostics	**EL9190** any voltage up to 230 V	**EL9250** i with fuse, with LED	**EL9260** i diagnostics, with fuse
	EL9290 i with fuse				
Overcurrent protection, 24 V DC	**EL9221-xxxx** 1-channel	**EL9222-xxxx** 2-channel	**EL9227-xxxx** 2-channel, extended functionalities		
Power supply	**EL9410** input 24 V DC, output 5 V DC/2 A	**ELM9410** input 24 V DC, output 5 V DC/2 A	**ELX9410** power supply terminal for E-bus refresh, 1 A	**EL9505** input 24 V DC, output 5 V DC/0.5 A	**EL9508** input 24 V DC, output 8 V DC/0.5 A
	EL9510 input 24 V DC, output 10 V DC/0.5 A	**EL9512** input 24 V DC, output 12 V DC/0.5 A	**EL9515** input 24 V DC, output 15 V DC/0.5 A	**EL9560** input 24 V DC, output 24 V DC/0.1 A with electrical isolation	**ELX9560** power supply, 24 V DC, electrically isolated
Filtering and smoothing	**EL9540** surge filter terminal for field supply	**EL9540-0010** surge filter terminal for field supply, onshore and offshore areas	**EL9550** surge filter terminal for system/field supply	**EL9550-0010** surge filter terminal for system/field supply, onshore and offshore areas	**EL9550-0012** surge filter terminal for system/field supply with up to 10 A
	EL9570 buffer capacitor terminal, 500 µF, 48 V DC	**EL9576** brake chopper terminal, up to 72 V DC, 155 µF			

Product overview current transformers

► www.beckhoff.com/sct

SCT1111

SCT21xx

SCT1xxx | Mini ring-type current transformers

Primary current	Max. diameter round conductor 7.6 mm
0…32 to 0…64 A AC	**SCT1111** accuracy class 1

SCT2xxx | Ring-type current transformers

Primary current	Max. diameter round conductor 25.7 mm	31.8 mm	43.7 mm	54.7 mm	70 mm
0…60 to 0…500 A AC	**SCT2111** accuracy class 1				
0…125 to 0…600 A AC	**SCT2121** accuracy class 0.5				
0…600/ 0…750 A AC		**SCT2211** accuracy class 1			
		SCT2221 accuracy class 0.5			
0…800/ 0…1000 A AC			**SCT2311** accuracy class 1		
			SCT2321 accuracy class 0.5		
0…1250/ 0…1500 A AC			**SCT2411** accuracy class 1		
			SCT2421 accuracy class 0.5		
0…2000 A AC				**SCT2515** accuracy class 1	
				SCT2525 accuracy class 0.5	
0…2500 A AC					**SCT2615** accuracy class 1
					SCT2625 accuracy class 0.5

SCT32xx

SCT61xx

SCT3xxx | 3-phase ring-type current transformers

Primary current	Max. diameter round conductor 13.5 mm	18 mm	22 mm
0…50 to 0…150 A AC	**SCT3111** accuracy class 1		
0…125/ 0…150 A AC	**SCT3121** accuracy class 0.5		
0…100 to 0…250 A AC		**SCT3215** accuracy class 1	
0…250 to 0…600 A AC			**SCT3315** accuracy class 1

SCT6xxx | Split-core current transformers

Primary current	Max. diameter round conductor 18.5 mm	27.9 mm	42.4 mm	2 x 42.4 mm
0…60 to 0…150 A AC	**SCT6101** accuracy class 3			
0…200/ 0…250 A AC	**SCT6311** accuracy class 1			
	SCT6321 accuracy class 0.5			
0…300 to 0…500 A AC		**SCT6411** accuracy class 1		
0…400/ 0…500 A AC		**SCT6421** accuracy class 0.5		
0…600/ 0…750 A AC			**SCT6615** accuracy class 1	
			SCT6625 accuracy class 0.5	
0…800/ 0…1000 A AC				**SCT6715** accuracy class 1
				SCT6725 accuracy class 0.5

SCT72xx

SCT01xx

SCT7xxx | Busbar split-core current transformers

Primary current	Max. diameter round conductor 20 mm	50 mm	80 mm
0…100/ 0…200 A AC	SCT7105 accuracy class 3		
0…250/ 0…400 A AC	SCT7115 accuracy class 1		
0…400 A AC	SCT7125 accuracy class 2		
0…500/ 0…600 A AC		SCT7215 accuracy class 1	
		SCT7225 accuracy class 2	
0…750 to 0…1500 A AC			SCT7315 accuracy class 1
			SCT7325 accuracy class 2
0…1500/ 0…5000 A AC			SCT7415 accuracy class 1
			SCT7425 accuracy class 2

SCT0xxx | Coil current transformers

Primary current	Primary conductor for connection	
0…1 to 0…30 A AC	SCT0111 accuracy class 1	SCT0121 accuracy class 0.5

Product overview power supplies

▶ www.beckhoff.com/ps

PS1000 | Power supplies

Output current	Output voltage 24 V DC (1-phase)	48 V DC (1-phase)	24 V DC (3-phase)	48 V DC (3-phase)
2.5 A	PS1111-2402-0002 24 V DC, 2.5 A DC, 1-phase			
3.8 A	PS1111-2403-0000 24 V DC, 3.8 A DC, 1-phase, NEC			
	PS1111-2403-0002 24 V DC, 3.8 A DC, 1-phase			
5 A	PS1021-2405-0000 24 V DC, 5 A DC, 1-phase			
10 A	PS1011-2410-0000 24 V DC, 10 A DC, 1-phase			
20 A	PS1011-2420-0000 24 V DC, 20 A DC, 1-phase			

PS2000 | Power supplies

Output current	Output voltage 24 V DC (1-phase)	48 V DC (1-phase)	24 V DC (3-phase)	48 V DC (3-phase)
5 A	PS2001-2405-0000 24 V DC, 5 A DC, 1-phase			
10 A	PS2001-2410-0000 24 V DC, 10 A DC, 1-phase	PS2001-4810-0000 48 V DC, 10 A DC, 1-phase	PS2031-2410-0000 24 V DC, 10 A DC, 3-phase	
20 A	PS2001-2420-0000 24 V DC, 20 A DC, 1-phase			

PS3000 | Power supplies

Output current	Output voltage 24 V DC (1-phase)	48 V DC (1-phase)	24 V DC (3-phase)	48 V DC (3-phase)
10 A				PS3031-4810-0001 48 V DC, 10 A DC, 3-phase
20 A	PS3001-2420-0001 24 V DC, 20 A DC, 1-phase	PS3011-4820-0000 48 V DC, 20 A DC, 1-phase	PS3031-2420-0001 24 V DC, 20 A DC, 3-phase	PS3031-4820-0000 48 V DC, 20 A DC, 3-phase
40 A	PS3011-2440-0000 24 V DC, 40 A DC, 1-phase		PS3031-2440-0000 24 V DC, 40 A DC, 3-phase	

EtherCAT Box


EPxxxx


ERxxxx


EQxxxx

EP1xxx | EtherCAT Box, digital input

Signal	8-channel		16-channel	
24 V DC, filter 3.0 ms	**EP1008-0001**[1] 8 x M8	**EP1008-0002**[1, 2] 4 x M12	**EP1809-0021**[1] 16 x M8	**EP1809-0022**[1, 2] 8 x M12
		EP1008-0022[1] 8 x M12		**EP1809-0042** 8 x M12, EtherCAT M12
24 V DC, filter 10 µs	**EP1018-0001**[1] 8 x M8	**EP1018-0002**[1] 4 x M12	**EP1819-0021**[1] 16 x M8	**EP1819-0022**[1] 8 x M12
			EP1816-0003 connector with spring-loaded system	
			EP1816-0008 D-sub, 25-pin	**EP1816-3008** D-sub, 25-pin, acceleration sensor
24 V DC, ground switching	**EP1098-0001**[1] 8 x M8			
24 V DC, timestamping	**EP1258-0001**[1] 8 x M8, 2-channel timestamping	**EP1258-0002**[1] 4 x M12, 2-channel timestamping		
24 V DC, counter		**EP1518-0002**[1] 4 x M12, multi-function input		
24 V DC, safe input	**EP1908-0002** TwinSAFE, 8 safe inputs	**EP1918-0002** TwinSAFE Logic, 8 safe inputs		

EP2xxx | EtherCAT Box, digital output

Signal	4-channel	8-channel		16-channel		24-channel
24 V DC, I_{max} = 0.5 A		**EP2008-0001**[1] 8 x M8	**EP2008-0002**[1, 2] 4 x M12			
			EP2008-0022[1] 8 x M12	**EP2809-0021**[1] 16 x M8	**EP2809-0022**[1, 2] 8 x M12	
				EP2816-0003 connector with spring-loaded system	**EP2816-0004** M16, 19-pin	
				EP2816-0008 D-sub, 25-pin	**EP2816-0010** 2 x D-sub, 9-pin	**EP2817-0008** D-sub, 25-pin
24 V DC, I_{max} = 2.0 A		**EP2028-0001**[1] 8 x M8	**EP2028-0002**[1] 4 x M12			
		EP2038-0001[1] 8 x M8, with diagnostics	**EP2038-0002**[1] 4 x M12, with diagnostics			
24 V DC, I_{max} = 0.5 A, ∑ 16 A					**EP2809-0042** 8 x M12, EtherCAT M12	
24 V DC, I_{max} = 2.8 A, ∑ 16 A			**EP2028-0032** 8 x M12			
			ER2028-1032 8 x M12			
24 V DC, safe output		**EP2918-0032** TwinSAFE Logic, 8 safe outputs				
25 V AC/ 30 V DC	**EP2624-0002**[1] relay output, 4 x M12					

EPxxxx: industrial housing in IP 67, [1]also as ERxxxx: zinc die-cast housing in IP 67, [2]also as EQxxxx: stainless steel housing in IP 69K

EP23xx | EtherCAT Box, digital combi

Signal	8-channel		12-channel	16-channel		
24 V DC, inputs + outputs	**EP2308-0001**[1] 8 x M8, 4 inputs + 4 outputs, I_{max} = 0.5 A, 3.0 ms	**EP2308-0002**[1] 4 x M12, 4 inputs + 4 outputs, I_{max} = 0.5 A, 3.0 ms		**EP1859-0042** 8 x M12, 8 inputs + 8 outputs, I_{max} = 0.5 A, EtherCAT M12, 3.0 ms		
	EP2318-0001[1] 8 x M8, 4 inputs + 4 outputs, I_{max} = 0.5 A, 10 µs	**EP2318-0002**[1] 4 x M12, 4 inputs + 4 outputs, I_{max} = 0.5 A, 10 µs		**EP2316-0003** 8 inputs + 8 outputs, I_{max} = 0.5 A, connector with spring-loaded system, 10 µs	**EP2316-0008** 8 inputs + 8 outputs, D-sub, 25-pin, 10 µs	
	EP2328-0001[1] 8 x M8, 4 inputs + 4 outputs, I_{max} = 2 A, 3.0 ms	**EP2328-0002**[1] 4 x M12, 4 inputs + 4 outputs, I_{max} = 2 A, 3.0 ms				
24 V DC, in-/outputs	**EP2338-0001**[1] 8 x M8, 8 in-/outputs, I_{max} = 0.5 A, 10 µs	**EP2338-0002**[1] 4 x M12, 8 in-/outputs, I_{max} = 0.5 A, 10 µs		**EP2339-0021**[1] 16 x M8, 16 in-/outputs, I_{max} = 0.5 A, 3.0 ms	**EP2339-0022**[1, 2] 8 x M12, 16 in-/outputs, I_{max} = 0.5 A, 3.0 ms	
	EP2338-1001[1] 8 x M8, 8 in-/outputs, I_{max} = 0.5 A, 3.0 ms	**EP2338-1002**[1] 4 x M12, 8 in-/outputs, I_{max} = 0.5 A, 3.0 ms		**EP2339-0121** 16 x M8, 16 in-/outputs, I_{max} = 0.5 A, 3.0 ms, ground switching	**EP2339-0003** 16 in-/outputs, I_{max} = 0.5 A, connector with spring-loaded system, 3.0 ms	**EP2339-0042** 8 x M12, 16 in-/outputs, I_{max} = 0.5 A, ∑ 16 A, EtherCAT M12, 3.0 ms
				EP2349-0021[1] 16 x M8, 16 in-/outputs, I_{max} = 0.5 A, 10 µs	**EP2349-0022**[1] 8 x M12, 16 in-/outputs, I_{max} = 0.5 A, 10 µs	
Safety, safe in-/outputs			**EP1957-0022** TwinSAFE Logic, 8 safe inputs, 4 safe outputs			

EP3xxx | EtherCAT Box, analog input

Signal	1-channel	2-channel	4-channel	
±10 V, ±20 mA		**EP3162-0002** parameterizable, electrically isolated, single-ended, 16 bit		
±10 V, 0/4…20 mA			**EP3174-0002**[1, 2] parameterizable, differential inputs, 16 bit	**EP3174-0092** parameterizable, differential inputs, 16 bit, TwinSAFE SC
		EP3182-1002 2 analog inputs, parameterizable, single-ended, 16 bit, 2 digital control outputs (sink/source type), 24 V DC, short-circuit proof	**EP3184-0002**[1] parameterizable, single-ended, 16 bit	**EP3184-1002**[1] parameterizable, single-ended, 16 bit, 2 channels per socket
Resistance thermometer (RTD)			**EP3204-0002**[1, 2] Pt100, Pt200, Pt500, Pt1000, Ni100, Ni120, Ni1000, 16 bit	
Thermocouple/mV			**EP3314-0002**[1, 2] type J, K, L, B, E, N, R, S, T, U, 16 bit	
Measurement bridge (SG)	**EP3356-0022** 24 bit, self-calibration			
Condition monitoring/IEPE		**EP3632-0001** 16 bit		
Accelerometers		**EP3752-0000** 2 x 3 axes		
Pressure measuring			**EP3744-0041** 4 pressure inputs -1…1 bar (differential pressure to fifth connection)	**EP3744-1041** 4 pressure inputs 0…7 bar (differential pressure to fifth connection)

EP4xxx | EtherCAT Box, analog output

Signal	4-channel
±10 V, 0/4…20 mA	**EP4174-0002**[1] parameterizable, 16 bit

EP43xx | EtherCAT Box, analog combi

Signal	4-channel	8-channel
±10 mA, ±20 mA	**EP4314-1002** 2 inputs + 2 outputs, parameterizable per channel, 2 digital inputs, 24 V DC/3.0 ms	
±10 V, 0/4…20 mA	**EP4374-0002**[1] 2 inputs + 2 outputs, parameterizable, 16 bit	**EP4378-1022** 4 inputs + 4 outputs, U/I parameterizable per channel, 8 digital I/Os, 24 V DC/3.0 ms

EP5xxx | EtherCAT Box, position measurement

Function	M12	D-sub
SSI encoder interface	**EP5001-0002** 1 MHz, 32 bit	
Incremental encoder interface RS422	**EP5101-0002**[1] 32/16 bit, 5 V DC sensor supply, 4 million increments/s	**EP5101-0011** 32/16 bit, 5 V DC sensor supply, 4 million increments/s
	EP5101-1002[1] 32/16 bit, 24 V DC sensor supply	**EP5101-2011** 32/16 bit, 5 V DC sensor supply, 20 million increments/s
Incremental encoder interface 24 V DC	**EP5151-0002**[1] 32/16 bit	

EP6xxx | EtherCAT Box, communication

Function	1-channel	2-channel	4-channel	8-channel	Other
System	**EP6070-0060** license key module				
Serial interface	**EP6001-0002**[1] RS232, RS422/RS485, 5 V DC/1 A	**EP6002-0002**[1] RS232, RS422/RS485			
EtherCAT/ Ethernet	**EP6601-0002** switch port				
IO-Link master			**EP6224-2022** Class A	**EP6228-0022** Class A	
			EP6224-0042 Class A, EtherCAT M12	**EP6228-0042** Class A, EtherCAT M12	
			EP6224-3022 Class B	**EP6228-3032** Class B	
				EP6228-3132 4 x Class A, 4 x Class B	
				EP6228-3142 4 x Class A, 4 x Class B, EtherCAT M12	
2 x 16 character display					**EP6090-0000** display box

EPxxxx: industrial housing in IP 67, [1]also as ERxxxx: zinc die-cast housing in IP 67, [2]also as EQxxxx: stainless steel housing in IP 69K

Product announcement for availability status see www.beckhoff.com

EP7xxx | EtherCAT Box, motion

Motor type	< 3 A	> 3 A	
Servomotor		**EP7211-0034** I_{rms} = 4.5 A, 48 V DC, OCT, STO suitable	
Stepper motor		**EP7047-0032** I_{max} = 5.0 A, 48 V DC, STO suitable	**EP7047-1032** I_{max} = 5.0 A, 48 V DC
	EP7041-1002[(1)] I_{max} = 1.5 A, 48 V DC, incremental encoder, 2 digital inputs, 1 digital output	**EP7041-0002**[(1)] I_{max} = 5 A, 48 V DC, incremental encoder, 2 digital inputs, 1 digital output	**EP7041-2002**[(1)] I_{max} = 5 A, 48 V DC, incremental encoder, 2 digital inputs, 1 digital output, motor connection via plug
		EP7041-3002[(1)] I_{max} = 5 A, 48 V DC, incremental encoder, for high-speed applications, encoder system (24 V DC encoder)	**EP7041-3102** I_{max} = 5 A, 48 V DC, incremental encoder, for high-speed applications, encoder system (5 V DC encoder)
		EP7041-4032 I_{max} = 5.0 A, 48 V DC, BiSS C encoder	
DC motor output stage		**EP7342-0002**[(1)] I_{max} = 3.5 A, 48 V DC	
Motor controller		**EP7402-0057** for roller conveyor systems	

EP8xxx | EtherCAT Box, special functions

Function	8-channel
Multi-function box	**EP8309-1022**[(1)] 8 digital inputs/outputs, 2 x tacho input, 2 x 0/4…20 mA input, 1 x 0/4…20 mA output, 1 x 1.2 A PWMi output

EPxxxx | EtherCAT Box, system

Function			
Identification	**EP1111-0000** 3 decimal ID switches		
Junctions	**EP1122-0001** EtherCAT, 2-channel	**EP1312-0001** EtherCAT P, 2-channel	**EP9128-0021** EtherCAT, 8 x M8
Power distribution	**EP9214-0023** 4/4-channel, 7/8"	**EP9224-0023** 4/4-channel, 7/8", with current measurement and data logging	
	EP9221-0057 1-channel, ENP B17, ENP to EtherCAT P	**EP9224-0037** 4-channel, ENP B17, ENP to EtherCAT P	**EP9224-2037** 4-channel junction, with power supply, ENP B17
PROFINET RT EtherCAT Box	**EP9300-0022** EtherCAT Box interface with PROFINET RT		
EtherCAT media converters fibre optic	**EP9521-0020** 1-channel, multimode		
Brake chopper box	**EP9576-1032** up to 72 V DC		

EtherCAT P Box

▶ **www.beckhoff.com/ethercat-p-box**

EPP1xxx | EtherCAT P Box, digital input

Signal	4-channel	8-channel		16-channel	
24 V DC, filter 3.0 ms	**EPP1004-0061** 4 x M8	**EPP1008-0001** 8 x M8	**EPP1008-0002** 4 x M12	**EPP1809-0021** 16 x M8	**EPP1809-0022** 8 x M12
			EPP1008-0022 8 x M12		
24 V DC, filter 10 µs		**EPP1018-0001** 8 x M8	**EPP1018-0002** 4 x M12	**EPP1819-0021** 16 x M8	**EPP1819-0022** 8 x M12
				EPP1816-0008 D-sub, 25-pin	**EPP1816-3008** D-sub, 25-pin, acceleration sensor
				EPP1816-0003 connector with spring-loaded system	
24 V DC, timestamping		**EPP1258-0001** 8 x M8, 2-channel timestamping	**EPP1258-0002** 4 x M12, 2-channel timestamping		
24 V DC, counter			**EPP1518-0002** 4 x M12, multi-function input		

EPP2xxx | EtherCAT P Box, digital output

Signal	4-channel	8-channel		16-channel	24-channel
24 V DC, I_{max} = 0.5 A		**EPP2008-0001** 8 x M8	**EPP2008-0002** 4 x M12		
			EPP2008-0022 8 x M12	**EPP2809-0021** 16 x M8	
				EPP2809-0022 8 x M12	
				EPP2816-0008 D-sub, 25-pin	**EPP2817-0008** D-sub, 25-pin
				EPP2816-0010 2 x D-sub, 9-pin	
				EPP2816-0004 M16, 19-pin	
24 V DC, I_{max} = 2.0 A		**EPP2028-0001** 8 x M8	**EPP2028-0002** 4 x M12		
		EPP2038-0001 8 x M8, with diagnostics	**EPP2038-0002** 4 x M12, with diagnostics		
25 V AC/ 30 V DC	**EPP2624-0002** relay output, 4 x M12				

EPP23xx | EtherCAT P Box, digital combi

Signal	4-channel	8-channel		16-channel	
24 V DC, inputs + outputs		**EPP2308-0001** 8 x M8, 4 inputs + 4 outputs, I_{max} = 0.5 A, 3.0 ms	**EPP2308-0002** 4 x M12, 4 inputs + 4 outputs, I_{max} = 0.5 A, 3.0 ms	**EPP2316-0003** 8 inputs + 8 outputs, I_{max} = 0.5 A, connector with spring-loaded system, 10 µs	**EPP2316-0008** 8 inputs + 8 outputs, I_{max} = 0.5 A, D-sub, 25-pin, 10 µs
		EPP2318-0001 8 x M8, 4 inputs + 4 outputs, I_{max} = 0.5 A, 10 µs	**EPP2318-0002** 4 x M12, 4 inputs + 4 outputs, I_{max} = 0.5 A, 10 µs		
		EPP2328-0001 8 x M8, 4 inputs + 4 outputs, I_{max} = 2 A, 3.0 ms	**EPP2328-0002** 4 x M12, 4 inputs + 4 outputs, I_{max} = 2 A, 3.0 ms		
24 V DC, in-/outputs		**EPP2338-0001** 8 x M8, 8 in-/outputs, I_{max} = 0.5 A, 10 µs	**EPP2338-0002** 4 x M12, 8 in-/outputs, I_{max} = 0.5 A, 10 µs	**EPP2339-0021** 16 x M8, 16 in-/outputs, I_{max} = 0.5 A, 3.0 ms	**EPP2339-0022** 8 x M12, 16 inputs/outputs, I_{max} = 0.5 A, 3.0 ms
	EPP2334-0061 4 x M8, 4 inputs/outputs, I_{max} = 0.5 A, 10 µs	**EPP2338-1001** 8 x M8, 8 in-/outputs, I_{max} = 0.5 A, 3.0 ms	**EPP2338-1002** 4 x M12, 8 in-/outputs, I_{max} = 0.5 A, 3.0 ms	**EPP2349-0021** 16 x M8, 16 in-/outputs, I_{max} = 0.5 A, 10 µs	**EPP2349-0022** 8 x M12, 16 inputs/outputs, I_{max} = 0.5 A, 10 µs
				EPP2339-0003 16 inputs/outputs, I_{max} = 0.5 A, connector with spring-loaded system, 3.0 ms	

EPP3xxx | EtherCAT P Box, analog input

Signal	2-channel	4-channel
±10 V, 0/4…20 mA		**EPP3174-0002** parameterizable, differential input, 16 bit
		EPP3184-0002 parameterizable, single-ended, 16 bit
Resistance thermometer (RTD)		**EPP3204-0002** Pt100, Pt200, Pt500, Pt1000, Ni100, Ni120, Ni1000, 16 bit
Thermo-couple/mV		**EPP3314-0002** type J, K, L, B, E, N, R, S, T, U, 16 bit
Condition monitoring/ IEPE	**EPP3632-0001** 16 bit	
Acceler-ometers	**EPP3752-0000** 2 x 3 axes	
Pressure measuring		**EPP3744-0041** 4 pressure inputs -1…1 bar (differential pressure to fifth connection)
		EPP3744-1041 4 pressure inputs 0…7 bar (differential pressure to fifth connection)

EPP4xxx | EtherCAT P Box, analog output

Signal	4-channel
±10 V, 0/4…20 mA	**EPP4174-0002** parameterizable, 16 bit

EPP43xx | EtherCAT P Box, analog combi

Signal	4-channel
±10 mA, ±20 mA	**EPP4314-1002** 2 inputs + 2 outputs, parameterizable per channel, 2 digital inputs, 24 V DC/3.0 ms
±10 V, 0/4…20 mA	**EPP4374-0002** 2 inputs + 2 outputs, parameterizable, 16 bit

EPP5xxx | EtherCAT P Box, position measurement

Function	M12		D-sub
SSI encoder interface	**EPP5001-0002** 1 MHz, 32 bit		
Incremental encoder interface RS422	**EPP5101-0002** 32/16 bit, 5 V DC sensor supply, 4 million increments/s	**EPP5101-1002** 32/16 bit, 24 V DC sensor supply	**EPP5101-0011** 32/16 bit, 5 V DC sensor supply, 4 million increments/s
Incremental encoder interface 24 V DC	**EPP5151-0002** 32/16 bit		

EPP6xxx | EtherCAT P Box, communication

Function	1-channel	2-channel	8-channel	Other
Serial interface	**EPP6001-0002** RS232, RS422/RS485, 5 V DC/1 A	**EPP6002-0002** RS232, RS422/RS485		
IO-Link master			**EPP6228-0022** Class A, 8 ports	
2 x 16 character display				**EPP6090-0000** display box

EPP7xxx | EtherCAT P Box, motion

Motor type	< 3 A	> 3 A
Stepper motor	**EPP7041-1002** I_{max} = 1.5 A, 48 V DC, incremental encoder	**EPP7041-3002** I_{max} = 5.0 A, 48 V DC, incremental encoder
DC motor output stage		**EPP7342-0002** I_{max} = 3.5 A, 48 V DC

EPPxxxx | EtherCAT P Box, system

Function			
Identification	**EPP1111-0000** with ID switch		
EtherCAT P diagnostics	**EPP9022-0060** 4 x diagnostics (U_S, U_P, I_S, I_F)		
Converter EtherCAT P to EtherCAT	**EPP9001-0060** EtherCAT P/EtherCAT connector with power transmission		
Junctions	**EPP1322-0001** 3 ports, with feed-in	**EPP1332-0001** 3 ports, with refresh	**EPP1342-0001** 3 ports
Supply module EtherCAT to EtherCAT P	**EPP1321-0060**		
Power distribution ENP to EtherCAT P	**EP9221-0057** 1-channel, ENP B17	**EP9224-0037** 4-channel, ENP B17	
TwinSAFE SC	**EPP9022-9060** 4 x diagnostics (U_S, U_P, I_S, I_F), TwinSAFE SC		

EtherCAT Plug-in Modules

EJ11xx | EtherCAT Couplers

EtherCAT Couplers E-bus	**EJ1100** EtherCAT Coupler, 2 x RJ45	**EJ1101-0022** EtherCAT Coupler, external: connectors, power supply module and optional ID switches
Extension system and junctions	**EK1110-0043** EtherCAT EJ coupler, CX and EL terminal connection	**EK1110-0044** EtherCAT EJ coupler, CX and EL terminal connection, EtherCAT junction
	EJ1122 2-port junction, external: connectors	

EJ1xxx | EtherCAT Plug-in Modules, digital input

Signal	4-channel	8-channel	16-channel
3.3 V DC/ 5 V DC		**EJ1128** filter 0.05 µs	
24 V DC, filter 3.0 ms		**EJ1008** type 3	**EJ1809** type 3
			EJ1859 type 3, 8 inputs, 8 outputs, I_{max} = 0.5 A
			EJ1889 ground switching
24 V DC, filter 10 µs			**EJ1819** type 3
24 V DC, safe input	**EJ1914** TwinSAFE Logic, 4 safe inputs	**EJ1918** TwinSAFE Logic, 8 safe inputs	
		EJ1957 TwinSAFE Logic, 8 safe inputs, 4 safe outputs	

EJ2xxx | EtherCAT Plug-in Modules, digital output

Signal	1-channel	2-channel	4-channel	8-channel	16-channel
3.3 V DC/ 5 V DC				**EJ2128** I_{max} = ±20 mA	
24 V DC, I_{max} = 0.5 A				**EJ2008**	**EJ2809**
					EJ2889 ground switching
					EJ1859 type 3, 8 inputs, 8 outputs, I_{max} = 0.5 A
24 V DC, safe output			**EJ2914** TwinSAFE Logic, 4 safe outputs	**EJ2918** TwinSAFE Logic, 8 safe outputs	
			EJ1957 TwinSAFE Logic, 8 safe inputs, 4 safe outputs		
PWM		**EJ2502** 24 V DC, 0.5 A			
Frequency output	**EJ2521-0224** 24 V DC, 1 A				

EJ3xxx | EtherCAT Plug-in Modules, analog input

Signal	2-channel	4-channel	5-channel	8-channel
±10 V		**EJ3004** single-ended, 12 bit		
		EJ3104 differential input, 16 bit		**EJ3108** 6 x differential inputs, 2 x single-ended, 16 bit
0…10 V				**EJ3068** single-ended, 12 bit
0…20 mA				**EJ3048** single-ended, 12 bit
4…20 mA				**EJ3058** single-ended, 12 bit

Product announcement for availability status see www.beckhoff.com

EJ3xxx | EtherCAT Plug-in Modules, analog input

Signal	2-channel	4-channel	5-channel	8-channel
Thermo-couple/mV				**EJ3318** type J, K, L…U, 16 bit
Potentiometer			**EJ3255** 16 bit	
Resistance ther-mometer (RTD)	**EJ3202** 16 bit	**EJ3214** 16 bit		

EJ4xxx | EtherCAT Plug-in Modules, analog output

Signal	2-channel	4-channel	8-channel
0…10 V	**EJ4002** 12 bit	**EJ4004** 12 bit	**EJ4008** 12 bit
±10 V	**EJ4132** 16 bit	**EJ4134** 16 bit	
0…20 mA			**EJ4018** 12 bit
4…20 mA		**EJ4024** 12 bit	

EJ5xxx | EtherCAT Plug-in Modules, position measurement

Signal	1-channel		2-channel
Absolute position measurement			**EJ5002** SSI encoder interface
Incremental position measurement	**EJ5101** incremental encoder interface, RS422, TTL, 1 MHz	**EJ5151** incremental encoder interface, 24 V HTL, 100 kHz	

EJ6xxx | EtherCAT Plug-in Modules, communication

Signal	1-channel	2-channel	4-channel	
Master		**EJ6002** serial interface RS232, RS485 or RS422	**EJ6224** IO-Link	**EJ6224-0090** IO-Link, TwinSAFE SC
Safety	**EJ6910** TwinSAFE Logic			

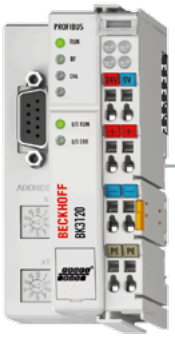
EJ7xxx | EtherCAT Plug-in Modules, motion

Motor type	< 3 A		3…5 A	
Servomotor			**EJ7211-0010** I_{rms} = 4.5 A, 48 V DC, OCT	**EJ7211-9414** I_{rms} = 4.5 A, 48 V DC, OCT, STO, TwinSAFE SC
Stepper motor	**EJ7031** I_{max} = 1.5 A, 24 V DC	**EJ7037** I_{max} = 1.5 A, 24 V DC, incremental encoder, vector control	**EJ7041-0052** I_{max} = 5.0 A, 48 V DC	**EJ7047** I_{max} = 5.0 A, 48 V DC, incremental encoder, vector control
DC motor output stage			**EJ7342** I_{max} = 3.5 A, 48 V DC, incremental encoder	
BLDC			**EJ7411** I_{rms} = 4.5 A, 48 V DC	

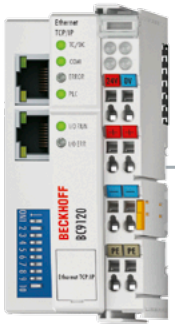
EJ9xxx | EtherCAT Plug-in Modules, system

Signal	Power supply and accessories		System
Power supply	**EJ9400** input 24 V DC, E-bus power supply, 2.5 A	**EJ9404** input 24 V DC, E-bus power supply, 12 A	
	EJ9505 input 24 V DC, output 5 V DC, 0.5 A		
Filtering and smoothing	**EJ9576** brake chopper module, up to 72 V DC, 155 µF		
System			**EJ9001** placeholder module

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 22

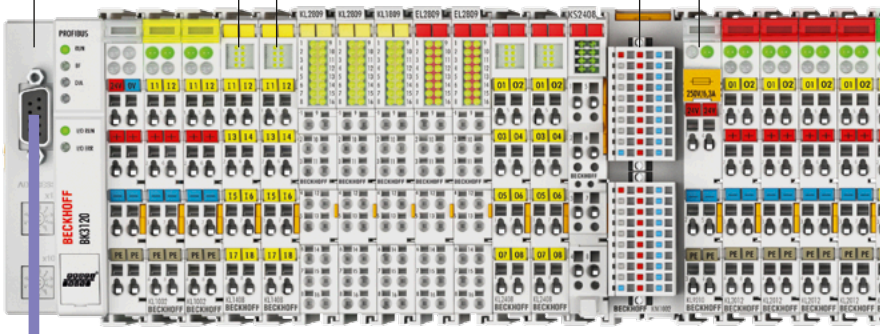
The head station of the Bus Terminals: from Bus Coupler with fieldbus interface to Embedded PC

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

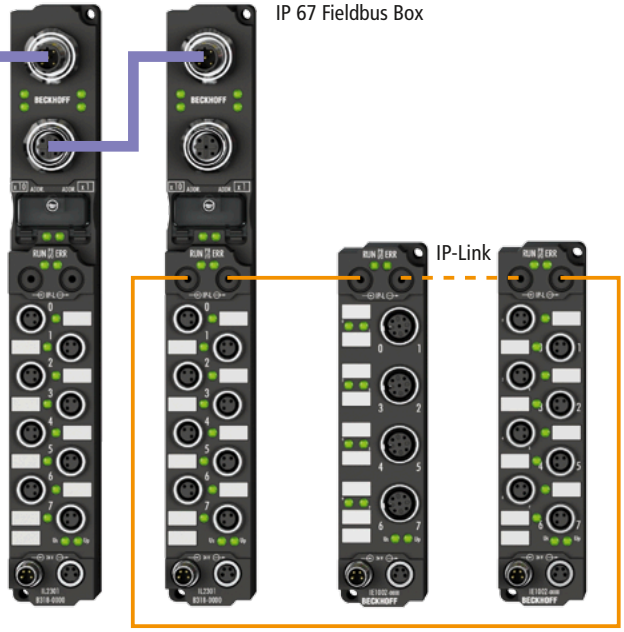
Potential feed terminals enable configuration of different potential groups.

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

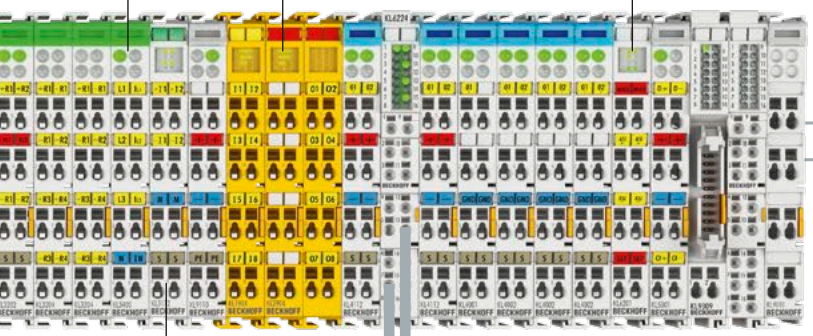
Coupler Box/ PLC Box

Extension Box modules

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

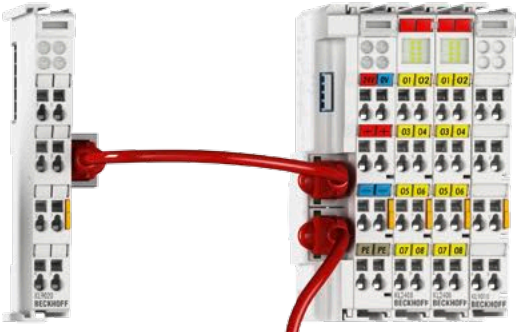
Communication terminals enable the integration of subsystems such as AS-Interface, RS232 and RS485.

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

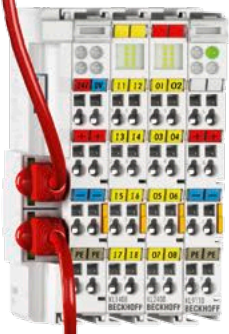


Bus Terminals with a maximum measurement error of ±0.01 %

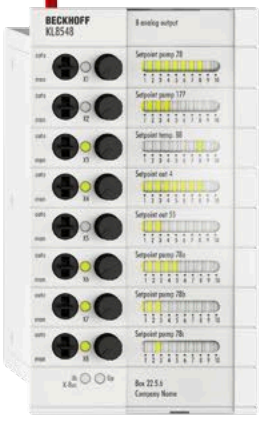
Bus end terminal



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



IO-Link box modules



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.

Bus Terminals

▶ **www.beckhoff.com/busterminal**

BKxxxx | Bus Couplers

Fieldbus	Standard	Economy plus	Compact
EtherCAT		BK1120	BK1150
			BK1250 E-bus to K-bus interface
Ethernet TCP/IP	BK9000		BK9050
	BK9100 2-channel switch		
EtherNet/IP	BK9105 2-channel switch		BK9055
CANopen		BK5120	BK5150
			BK5151
CC-Link			BK7150
DeviceNet	BK5200	BK5220	BK5250
INTERBUS	BK4000	BK4020	
LIGHTBUS	BK2000	BK2020	
Modbus			BK7350
PROFIBUS	BK3100 12 Mbaud	BK3120 12 Mbaud	BK3150 12 Mbaud
		BK3520 12 Mbaud, fibre optic	
PROFINET	BK9103 2-channel switch		BK9053
RS232	BK8000		
RS485	BK8100		
sercos the automation bus	BK7500	BK7520	

BCxxxx, BXxxxx | Bus Terminal Controllers

Fieldbus	Programm storage 32/96 kbyte	48 kbyte	64/96 kbyte	128 kbyte	256 kbyte
Ethernet TCP/IP		BC9050	BC9000	BC9020	BX9000
			BC9100 2-channel switch	BC9120 2-channel switch	
		BC9191 Room Controller		BC9191-0100 Room Controller, RS485 interface	
CANopen		BC5150			BX5100
DeviceNet		BC5250			BX5200
Modbus	BC7300				
PROFIBUS	BC3100 12 MBaud	BC3150 12 Mbaud			BX3100 12 Mbaud
RS232		BC8150			
RS485		BC8050			BX8000

KL1xxx | Bus Terminals, digital input

Signal	2-channel		4-channel		8-channel	16-channel	KM1xxx
5 V DC			**KL1124** filter 0.2 ms				
24 V DC, filter 3.0 ms	**KL1002** type 3		**KL1104** type 3	**KL1804** type 3, 8 x 24 V, 4 x 0 V	**KL1808** type 3, 8 x 24 V DC	**KL1809** type 3	**KM1002** 16-channel, type 1
	KL1402 type 3	**KL1302** type 2	**KL1404** type 3, 4 x 2-wire connection	**KL1304** type 2	**KL1408** type 3		**KM1004** 32-channel, type 1
	KL1052 positive/ground switching		**KL1154** positive/ground switching	**KL1184** ground switching	**KL1488** ground switching	**KL1889** ground switching	**KM1008** 64-channel, type 1
	KL1212 type 1, short-circuit protected sensor supply	**KL1362** break-in alarm				**KL1859** type 3, 8 inputs, 8 outputs, I_{max} = 0.5 A	
						KL1862 type 3, flat-ribbon cable	
						KL1862-0010 type 3, flat-ribbon cable, ground switching	
24 V DC, filter 0.2 ms	**KL1012** type 3	**KL1412** type 3	**KL1114** type 3	**KL1814** type 3, 8 x 24 V, 4 x 0 V	**KL1418** type 3	**KL1819** type 3	**KM1012** 16-channel, type 1
		KL1312 type 2		**KL1314** type 2			**KM1014** 32-channel, type 1
			KL1414 type 3, 4 x 2-wire connection	**KL1434** type 2, 4 x 2-wire connection			**KM1018** 64-channel, type 1
			KL1164 positive/ground switching	**KL1194** ground switching	**KL1498** ground switching		
						KL1872 type 3, flat-ribbon cable	
24 V DC	**KL1232** pulse expansion	**KL1382** thermistor	**KL1904** TwinSAFE, 4 safe inputs				**KM1644** 4-channel, manual operation
24 V DC, counter	**KL1501** type 1, 100 kHz, 32 bit	**KL1512** type 1, 1 kHz, 16 bit					
≥ 48 V DC	**KL1032** 48 V DC, filter 3.0 ms	**KL1712-0060** 60 V DC					
120 V AC/DC	**KL1712**						
230 V AC	**KL1702**	**KL1722** no power contacts	**KL1704**				
NAMUR	**KL1352**						

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

KL2xxx | Bus Terminals, digital output

Signal	1-channel	2-channel		4-channel	8-channel	16-channel	KM2xxx
5 V DC				KL2124 I_{max} = ±20 mA			
24 V DC, I_{max} = 0.5 A		KL2012 short-circuit proof		KL2114 short-circuit proof	KL2808 8 x 0 V	KL2809 reverse voltage protection	KM2002 16-channel
		KL2032 reverse voltage protection		KL2134 reverse voltage protection			KM2004 32-channel
				KL2404 4 x 2-wire	KL2408 reverse voltage protection		KM2008 64-channel
		KL2212 diagnostics, protected sensor supply				KL2819 with diagnostics	KM2042 16-channel, D-sub connection
				KL2184 ground switching	KL2488 ground switching	KL2889 ground switching	
						KL1859 type 3, 8 inputs, 8 outputs, I_{max} = 0.5 A	
						KL2872 flat-ribbon cable	
						KL2872-0010 flat-ribbon cable, ground switching	
24 V DC, I_{max} = 2.0 A		KL2022		KL2424 4 x 2-wire	KL2828 8 x 2-wire		
24 V DC, I_{max} = 4.0 A/8.0 A		KL2442 2 x 4 A/1 x 8 A					
24 V DC, safe output				KL2904 TwinSAFE, 4 safe outputs			
30 V AC/ 48 V DC solid state relay, I_{max} = 2.0 A				KL2784			
				KL2794 potential-free	KL2798 potential-free		
230 V AC solid state relay	KL2701 I_{max} = 3 A	KL2702 I_{max} = 0.3 A					
Relay (up to 400 V AC)	KL2641 make contact, manual operation, I_{max} = 16 A	KL2602 make contact, I_{max} = 5 A	KL2622 make contact, no power contacts, I_{max} = 5 A	KL2634 make contact, 250 V AC/30 V DC			KM2604 I_{max} = 16 A, 4-channel
		KL2602-0010 make contact, I_{max} = 5 A, contact-protecting switching	KL2622-0010 make contact, no power contacts, I_{max} = 5 A, contact-protecting switching				KM2614 I_{max} = 16 A, 4-channel, manual operation
		KL2652 change-over, I_{max} = 5 A					KM2642 I_{max} = 6 A, manual/automatic operation, relay state readable
	KL2631 400 V AC, make contact	KL2612 125 V AC, change-over	KL2692 cycle monitoring (watchdog)				KM2652 I_{max} = 6 A, manual/automatic operation, switch and relay state readable

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

KL2xxx | Bus Terminals, digital output

Signal	1-channel	2-channel		4-channel	8-channel	16-channel	KM2xxx
Triac (12…230 V AC)		**KL2712**	**KL2722** mutually locked outputs				**KM2774** I_{max} = 1.5 A
		KL2732 mutually locked outputs, no power contacts					
PWM		**KL2502** 24 V DC, I_{max} = 0.1 A	**KL2512** 24 V DC, I_{max} = 1.5 A, ground switching				
		KL2535 I_{max} = ±1 A, 24 V DC, current-controlled	**KL2545** I_{max} = ±3.5 A, 50 V DC, current-controlled				
Frequency output	**KL2521** 1-channel AB, 0…500 kHz, RS422						
Current control, dimmer control	**KL2751** universal dimmer, 300 W						
	KL2761 universal dimmer, 600 W						

KL2xxx | Bus Terminals, motion

	< 3 A		3…5 A
Stepper motor	**KL2531** I_{max} = 1.5 A, 24 V DC		**KL2541** I_{max} = 5.0 A, 48 V DC, incremental encoder
DC motor output stage	**KL2532** I_{max} = 1.0 A, 24 V DC	**KL2284** reverse switching, I_{max} = 2.0 A, 0…24 V DC	**KL2552** I_{max} = 5.0 A, 48 V DC, incremental encoder
AC motor speed controller	**KL2791** 230 V AC, 200 VA, 1-phase AC motor		

KL3xxx | Bus Terminals, analog input

Signal	1-channel	2-/3-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 with sensor supply, 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	**KL3408** single-ended, 12 bit
			KL3132 16 bit, 0.05 %		
0…20 mA	**KL3011** differential input, 12 bit	**KL3012** differential input, 12 bit	**KL3112** differential input, 16 bit	**KL3044** single-ended, 12 bit	**KL3448** single-ended, 12 bit
	KL3041 with sensor supply, 12 bit	**KL3042** with sensor supply, 12 bit	**KL3142** 16 bit, 0.05 %	**KL3444** with sensor supply, single-ended, 12 bit	
4…20 mA	**KL3021** differential input, 12 bit	**KL3022** differential input, 12 bit	**KL3122** differential input, 16 bit	**KL3054** single-ended, 12 bit	**KL3458** single-ended, 12 bit
	KL3051 with sensor supply, 12 bit	**KL3052** with sensor supply, 12 bit	**KL3152** 16 bit, 0.05 %	**KL3454** with sensor supply, 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
				KL3204-0030 NTC (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	
Measurement bridge (SG)	**KL3351** 16 bit				
	KL3356 16 bit, self-calibration				
Oscilloscope	**KL3361** ±16 mV	**KL3362** ±10 V			
Measurement technology	**KL3681** digital multimeter, 18 bit	**KL3403** power measurement, 3-phase, 1 A	**KL3403-0010** power measurement, 3-phase, 5 A		
Pressure measuring	**KM3701** differential pressure, -100…+100 hPa	**KM3702** relative pressure, 7500 hPa	**KM3712** relative pressure, -1000…+1000 hPa		
	KM3701-0340 differential pressure, up to 340 hPa				
Power measurement, > 500 V		**KL3453** i 690 V AC, 5 A, extended functionalities			

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

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

KL4xxx | Bus Terminals, analog output

Signal	1-channel	2-channel	4-channel	8-channel	KM4xxx
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	

KL5xxx | Bus Terminals, position measurement

Signal	1-channel	2-channel
Absolute position measurement	KL5001 SSI encoder interface	
	KL5051 SSI encoder interface, bidirectional	
Incremental position measurement	KL5101 incremental encoder interface, RS422, TTL, 1 MHz	
	KL5111 incremental encoder interface, 24 V HTL, 250 kHz, 16 bit counter	
	KL5151 incremental encoder interface, 24 V HTL, 100 kHz, 32 bit counter	KL5152 incremental encoder interface, 24 V HTL, 100 kHz, 32 bit counter
	KL5121 incremental encoder interface, 24 V HTL, path control, 250 kHz	

KL6xxx | Bus Terminals, communication

Signal			
Serial interfaces	**KL6001** RS232, 19.2 kbaud	**KL6031** RS232, 115.2 kbaud	**KL6011** TTY, 20 mA current loop
	KL6051 data exchange terminal, 32 bit	**KL6021** RS422/RS485, 19.2 kbaud	**KL6041** RS422/RS485, 115.2 kbaud
Subsystems	**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	**KL6821** DALI-2 multi-master and power supply terminal	
	KL6831 SMI terminal, LoVo	**KL6841** SMI terminal, 230 V AC	
Safety	**KL6904** TwinSAFE Logic, 4 safe outputs		

KL85xx | Bus Terminals, manual operation modules

Technology	4-channel	8-channel	16-channel	Other
Manual operation modules	**KL8524** 4 x 2-channel digital output, 24 V DC, 0.5 A	**KL8528** digital output, 24 V DC, 0.5 A	**KL8519** digital input signal module	**KL8500** placeholder module
		KL8548 analog output, 0…10 V		
System				**KL9309** adapter terminal for manual operating modules

KL8xxx | Bus Terminals, power

For Siemens contactors (Sirius 3R series)	**KL8001** switching capacity 5.5 kW, nominal current 0.9…9.9 A, connection mechanism for Siemens contactors (Sirius 3R series)

KL9xxx | Bus Terminals, system

Signal	System		Potential supply	Power supply and accessories
System	**KL9010** bus end terminal	**KL9070** shield terminal		
	KL9020 terminal bus extension end terminal	**KL9050** terminal bus extension coupler terminal		
	KL9060 adapter terminal for power terminal KL8xxx	**KL9309** adapter terminal for manual operating modules		
	KL9080 isolation terminal	**KL9195** shield terminal		

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

KL9xxx | Bus Terminals, system

Signal	System		Potential supply	Power supply and accessories
Potential distribution terminals	**KL9180** 2 terminal points per power contact	**KL9181** 2 x 8 terminal points		
	KL9182 8 x 2 terminal points	**KL9183** 1 x 16 terminal points		
	KL9184 8 x 24 V DC, 8 x 0 V DC	**KL9185** only 2 power contacts		
	KL9186 8 x 24 V DC	**KL9187** 8 x 0 V DC		
	KL9188 16 x 24 V DC	**KL9189** 16 x 0 V DC		
	KL9380			
Filter	**KL9540** surge filter terminal for field supply			
	KL9540-0010 surge filter field supply for analog terminals	**KL9550** surge filter terminal for system/field supply		
Diode arrays	**KL9300** 4 diodes, potential-free			
	KL9301 7 diodes, common cathode	**KL9302** 7 diodes, common anode		
24 V DC			**KL9100**	**KL9400** K-bus power supply, 2 A
			KL9110 diagnostics	**KL9505** output 5 V DC, 0.5 A
			KL9200 with fuse	**KL9508** output 8 V DC, 0.5 A
			KL9210 diagnostics, with fuse	**KL9510** output 10 V DC, 0.5 A
				KL9512 output 12 V DC, 0.5 A
				KL9515 output 15 V DC, 0.5 A
			KL9520 AS-Interface potential supply	**KL9528** AS-Interface power supply terminal
				KL9560 output 24 V DC, 0.1 A
50 V DC				**KL9570** buffer capacitor terminal, 500 µF
120… 230 V AC			**KL9150**	
			KL9160 diagnostics	
			KL9250 with fuse	
			KL9260 diagnostics, with fuse	
			KL9190 any voltage up to 230 V AC	
			KL9290 with fuse	

Fieldbus Box and IO-Link box

▶ **www.beckhoff.com/fieldbusbox**

Fieldbus Box	Compact Box		Coupler Box		PLC Box	
Fieldbus	Fieldbus Box without IP-Link interface		Fieldbus Box with IP-Link interface		Controller for TwinCAT 2 (IEC 61131-3) with IP-Link interface	
EtherCAT			IL230x-B110			
LIGHTBUS	IPxxxx-B200		IL230x-B200			
PROFIBUS	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			

IP1xxx-Bxxx | Fieldbus Box, digital input

Signal	2-channel	8-channel		
24 V DC, filter 3.0 ms		IP1000-Bxxx[1] 8 x 8 mm	IP1001-Bxxx[1] 8 x M8	IP1002-Bxxx[1] 4 x M12
24 V DC, filter 0.2 ms		IP1010-Bxxx[1] 8 x 8 mm	IP1011-Bxxx[1] 8 x M8	IP1012-Bxxx[1] 4 x M12
Counter	IP1502-Bxxx[1] up/down counter 24 V DC, 100 kHz			

IP2xxx-Bxxx | Fieldbus Box, digital output

Signal	2-channel	8-channel			16-channel
24 V DC, I_{max} = 0.5 A		IP2000-Bxxx[1] 8 x 8 mm	IP2001-Bxxx[1] 8 x M8	IP2002-Bxxx[1] 4 x M12	
24 V DC, I_{max} = 0.5 A, ∑ 4 A					IE2808 D-sub
24 V DC, I_{max} = 2 A, ∑ 4 A		IP2020-Bxxx[1] 8 x 8 mm	IP2021-Bxxx[1] 8 x M8	IP2022-Bxxx[1] 4 x M12	
24 V DC, I_{max} = 2 A, ∑ 12 A		IP2040-Bxxx[1] 8 x 8 mm	IP2041-Bxxx[1] 8 x M8	IP2042-Bxxx[1] 4 x M12	
PWM, I_{max} = 2.5 A	IP2512-Bxxx[1] 4 x M12				

[1]also as IExxxx: Extension Box, [2]also as ILxxxx-Bxxx: Coupler Box, [3]also as ILxxxx-Cxxx: PLC Box

IP23/24xx-Bxxx | Fieldbus Box, digital combi

Signal	8-channel			16-channel		
24 V DC, filter 3.0 ms, I_{max} = 0.5 A	**IP2300-Bxxx**[1, 2, 3] 8 x 8 mm, 4 inputs + 4 outputs	**IP2301-Bxxx**[1, 2, 3] 8 x M8, 4 inputs + 4 outputs	**IP2302-Bxxx**[1, 2, 3] 4 x M12, 4 inputs + 4 outputs	**IP2400-Bxxx**[1] 8 x 8 mm, 8 inputs/outputs	**IP2401-Bxxx**[1] 8 x M8, 8 inputs/outputs	**IE2403** IP 20 plug
24 V DC, filter 0.2 ms, I_{max} = 0.5 A	**IP2310-Bxxx**[1] 8 x 8 mm, 4 inputs + 4 outputs	**IP2311-Bxxx**[1] 8 x M8, 4 inputs + 4 outputs	**IP2312-Bxxx**[1] 4 x M12, 4 inputs + 4 outputs			
24 V DC, filter 3.0 ms, I_{max} = 2 A, ∑ 4 A	**IP2320-Bxxx**[1] 8 x 8 mm, 4 inputs + 4 outputs	**IP2321-Bxxx**[1] 8 x M8, 4 inputs + 4 outputs	**IP2322-Bxxx**[1] 4 x M12, 4 inputs + 4 outputs			
24 V DC, filter 0.2 ms, I_{max} = 2 A, ∑ 4 A	**IP2330-Bxxx**[1] 8 x 8 mm, 4 inputs + 4 outputs	**IP2331-Bxxx**[1] 8 x M8, 4 inputs + 4 outputs	**IP2332-Bxxx**[1] 4 x M12, 4 inputs + 4 outputs			

IP3xxx-Bxxx | Fieldbus Box, analog input

Signal	4-channel
±10 V	**IP3102-Bxxx**[1] differential inputs, 16 bit
0/4…20 mA	**IP3112-Bxxx**[1] differential inputs, 16 bit
Resistance thermometer	**IP3202-Bxxx**[1] Pt100, Pt200, Pt500, Pt1000, Ni100, 16 bit
Thermo-couple/mV	**IP3312-Bxxx**[1] type J, K, L, B, E, N, R, S, T, U, 16 bit

IP4xxx-Bxxx | Fieldbus Box, analog output

Signal	4-channel
0/4…20 mA	**IP4112-Bxxx**[1] 16 bit
±10 V	**IP4132-Bxxx**[1] 16 bit

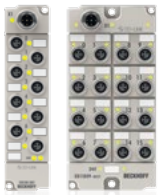
IP5xxx-Bxxx | Fieldbus Box, position measurement

Function	M12	
SSI encoder interface	**IP5009-Bxxx**[1]	
Incremental encoder interface RS422	**IP5109-Bxxx**[1] 1 MHz	
SinCos encoder interface	**IP5209-Bxxx** 12-pin	**IP5209-Bxxx-1000** 9-pin

IP6xxx-Bxxx | Fieldbus Box, communication

Function			
Serial interfaces	**IP6002-Bxxx**[1] RS232	**IP6012-Bxxx**[1] 0…20 mA (TTY)	**IP6022-Bxxx**[1] RS422/RS485

EPIxxxx



ERIxxxx

EPI1xxx | Fieldbus Box, IO-Link box, digital input

Signal	8-channel		16-channel	
24 V DC, filter 3.0 ms	EPI1008-0001[1] 8 x M8	EPI1008-0002[1] 4 x M12	EPI1809-0021[1] 16 x M8	EPI1809-0022[1] 8 x M12

EPI2xxx | Fieldbus Box, IO-Link box, digital output

Signal	8-channel		16-channel	
24 V DC, I_{max} = 0.5 A	EPI2008-0001[1] 8 x M8	EPI2008-0002[1] 4 x M12		
24 V DC, I_{max} = 0.5 A, ∑ 4 A			EPI2809-0021[1] 16 x M8	EPI2809-0022[1] 8 x M12

EPI23xx | Fieldbus Box, IO-Link box, digital combi

Signal	8-channel		16-channel	
24 V DC, filter 3.0 ms, I_{max} = 0.5 A	EPI2338-0001[1] 8 x M8	EPI2338-0002[1] 4 x M12		
24 V DC, filter 3.0 ms, I_{max} = 0.5 A, ∑ 4 A			EPI2339-0021[1] 16 x M8	EPI2339-0022[1] 8 x M12

EPI3xxx | Fieldbus Box, IO-Link box, analog input

Signal	4-channel	8-channel
±10 V, 0/4…20 mA	EPI3174-0002[1] parameterizable, differential input, 16 bit	EPI3188-0022 parameterizable, single-ended, 16 bit

EPI4xxx | Fieldbus Box, IO-Link box, analog output

Signal	4-channel
±10 V, 0/4…20 mA	EPI4374-0002[1] 2 inputs + 2 outputs, parameterizable, 16 bit

EPIxxxx: industrial housing in IP 67, [1]also as ERIxxxx: zinc die-cast housing in IP 67

Product announcement for availability status see www.beckhoff.com

Infrastructure Components

▶ **www.beckhoff.com/infrastructure-components**

CUxxxx, EPxxxx | EtherCAT components

	100 Mbit/s, IP 20		100 Mbit/s, IP 67	1 Gbit/s, IP 20	
Junctions	**CU1123** junction, 3 x RJ45	**CU1123-0010** junction, 3 x RJ45, Extended Distance		**CU1423** junction, 3 x RJ45	
	CU1124 junction, 4 x RJ45	**CU1128** junction, 8 x RJ45	**EP9128-0021** EtherCAT, 8 x M8	**CU1411** branch controller, 1 port	**CU1418** branch controller, 8 ports
Media converters	**CU1521** 1-channel, multimode/singlemode	**CU1561** 1-channel, POF	**EP9521-0020** 1-channel, multimode		

CUxxxx, EPxxxx | Ethernet switches/components

	100 Mbit/s, IP 20			100 Mbit/s, IP 67	1 Gbit/s, IP 20
Switches	**CU2005** 5-port, RJ45	**CU2008** 8-port, RJ45	**CU2016** 16-port, RJ45	**CU2608** 8-port, M12 (D-coded)	**CU2208** 8-port, RJ45
Media converters	**CU1521** 1-channel, multimode/singlemode	**CU1561** 1-channel, POF		**EP9521-0020** 1-channel, multimode	

CUxxxx | Ethernet port multiplier

	1 Gbit/s
Multiplier	**CU2508** 1 x RJ45 (+ 8 x RJ45: 100 Mbit/s)

FCxxxx | PCI and PCIe fieldbus cards

Fieldbus	PCI		PCIe		Mini PCI	Mini PCIe
EtherCAT	**FC1100** 1-channel, EtherCAT slave		**FC1121** 1-channel, EtherCAT slave			
Ethernet TCP/IP	**FC9004** 4 x RJ45, 10/100 Mbit/s	**FC9002** 2 x RJ45, 10/100 Mbit/s	**FC9024** 4 x RJ45, 1 Gbit/s		**FC9051** 1 x RJ45, 10/100 Mbit/s	**FC9071** Gigabit Ethernet PC interface card
	FC9011 1 x RJ45, 1 Gbit/s	**FC9001-0010** 1 x RJ45, 10/100 Mbit/s	**FC9022** 2 x RJ45, 1 Gbit/s		**FC9151** 1 x RJ45, 1 Gbit/s	
LIGHTBUS	**FC2001** 1-channel	**FC2002** 2-channel				
PROFIBUS	**FC3101** 1-channel	**FC3102** 2-channel	**FC3121** 1-channel	**FC3122** 2-channel	**FC3151** 1-channel	**FC3161** 1-channel
CANopen	**FC5101** 1-channel	**FC5102** 2-channel	**FC5121** 1-channel	**FC5122** 2-channel	**FC5151** 1-channel	
DeviceNet	**FC5201** 1-channel	**FC5202** 2-channel			**FC5251** 1-channel	
sercos the automation bus	**FC7501** 1-channel	**FC7502** 2-channel			**FC7551** 1-channel	

The Motion Company

In combination with the motion control solutions offered by the company's TwinCAT automation software, Beckhoff Drive Technology provides an advanced, all-inclusive drive system. PC-based control technology from Beckhoff is ideally suited for single- and multi-axis positioning tasks with high dynamic requirements.

The AX5000 and AX8000 Servo Drive series with high-performance EtherCAT communication offer the best-possible performance and dynamics. Servomotors with One Cable Technology (OCT), combining power and feedback systems into one standard motor cable, reduce material and commissioning costs.

▶ **www.beckhoff.com/motion**

Servo Drives 76

- available as multi-axis system or stand-alone version (1-/2-channel)
- high-speed EtherCAT communication
- nominal current types, up to 170 A
- flexible motor type selection
- optimized for multi-axis applications
- 17 drive-integrated safety functions

▶ **www.beckhoff.com/servo-drives**

Distributed Servo Drive system 77

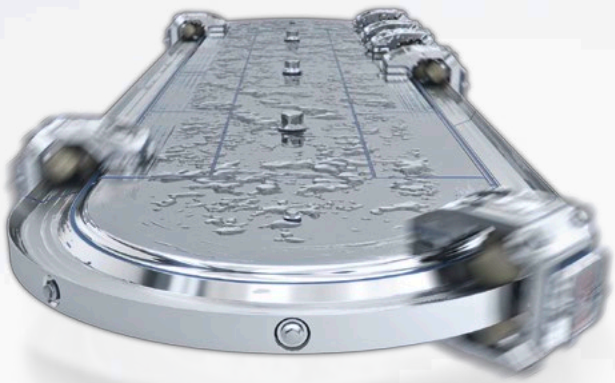
- servo drives directly integrated into the motor
- STO/SS1 safety function as standard; optionally Safe Motion
- minimal derating
- no changes in machine design required

▶ **www.beckhoff.com/distributed-servo-drive-system**

Rotary servomotors 78

- for demanding positioning tasks
- highly dynamic behavior
- brushless three-phase motors
- permanent magnet in the rotor
- 24 bit encoder with SIL 2 safety integration

▶ **www.beckhoff.com/rotary-servomotors**



Linear product transport 88

- linear motor on an endless path
- replaces traditional mechanics with advanced mechatronic solutions
- software-based functional changes
- individual product transport with continuous material flow

▶ **www.beckhoff.com/xts**

Planar motor system 87

- free-floating movers for non-contact movement
- 6 degrees of freedom
- integrated position feedback
- individual machine layout
- ideal for all application areas

▶ **www.beckhoff.com/xplanar**

XPlanar®

Translatory servomotors 82

- direct drives for highly dynamic and maximum accurate positioning applications
- maximum speed up to 12 m/s
- compact product design with peak forces up to 12500 N
- versatile and modular product concepts

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Compact Drive Technology 84

- high performance in small design
- motors and output stages for the < 48 V DC low voltage range
- servo, BLDC, stepper and DC motor output stages in IP 20 or IP 67
- smart servo drive with integrated output stage for machines without control cabinets

▶ **www.beckhoff.com/compact-drive-technology**

- **scalable product range of servo drive technology**
- **integrated safety technology in compliance with safety performance level PL e, integrated into compact Drive Technology up to safety performance level PL d**
- **As the pioneer of One Cable Technology and the eXtended Transport System, Beckhoff specializes in manufacturing efficient, space-saving motion solutions.**

Servo Drives

▶ **www.beckhoff.com/servo-drives**

AX8000

AX5000

AX8000 | Multi-axis Servo System

Function				
Power supply module	**AX8620** 20 A DC	**AX8640** 40 A DC		
Axis modules	**AX8108** single-axis module 8 A, feedback: OCT, multi-feedback interface, TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion	**AX8118** single-axis module 18 A, feedback: OCT, multi-feedback interface, TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion	**AX8206** dual-axis module 2 x 6 A, feedback: OCT, multi-feedback interface, TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion	
Combined power supply and axis modules	**AX8525** i combined power supply and axis module 25 A, feedback: OCT, multi-feedback interface, TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion	**AX8540** i combined power supply and axis module 40 A, feedback: OCT, multi-feedback interface, TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion		
Option modules	**AX8810** capacitor module	**AX8820** i energy recovery module	**AX8831** i coupling module, 1-channel	**AX8832** i coupling module with two outputs

AX5000 | Digital Compact Servo Drives

Function	1-channel						2-channel		
Servo Drives	**AX5101** 100…480 V AC, 1.5 A	**AX5103** 100…480 V AC, 3 A	**AX5106** 100…480 V AC, 6 A	**AX5112** 100…480 V AC, 12 A			**AX5201** 100…480 V AC, 2 x 1.5 A	**AX5203** 100…480 V AC, 2 x 3 A	**AX5206** 100…480 V AC, 2 x 6 A
	AX5118 100…480 V AC, 18 A	**AX5125** 100…480 V AC, 25 A	**AX5140** 100…480 V AC, 40 A						
	AX5160 3 x 400…480 V AC, 60 A	**AX5172** 3 x 400…480 V AC, 72 A	**AX5190** 3 x 400…480 V AC, 90 A	**AX5191** 3 x 400…480 V AC, 110 A	**AX5192** 3 x 400…480 V AC, 143 A	**AX5193** 3 x 400…480 V AC, 170 A			
Encoder option cards	**AX5701** EnDat 2.1, Hiperface, BiSS B, SinCos 1 V_{PP}, resolver	**AX5721** 1 x EnDat 2.2, BiSS C					**AX5702** EnDat 2.1, Hiperface, BiSS B, SinCos 1 V_{PP}, resolver	**AX5722** 2 x EnDat 2.2, BiSS C	
TwinSAFE safe drive technology	**AX5801** drive-integrated safety functions: STO, SS1	**AX5805** drive-integrated safety functions: Safe Motion, for AX5x01 to AX5140	**AX5806** drive-integrated safety functions: Safe Motion, for AX5160 to AX5193						

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

Distributed Servo Drive system

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

AMI8100,
rear view

AMP8000 | Distributed servo drives (400 V AC)

Flange code	Motor length 1	Motor length 2	Motor length 3	Motor length 4
F4 (87 mm)	AMP8041 M_0 = 2.40…2.50 Nm, TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion	AMP8042 M_0 = 4.10 Nm, TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion	AMP8043 M_0 = 5.70 Nm, TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion	
F5 (104 mm)	AMP8051 M_0 = 4.80…4.90 Nm, TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion	AMP8052 M_0 = 7.80…8.20 Nm, TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion	AMP8053 M_0 = 9.10…11.00 Nm, TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion	AMP8054 M_0 = 14.0 Nm, TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion

AMP8600 | Distributed power supply modules

Function			
Supply modules	AMP8620-2005-0000 20 A DC for 400…480 V AC supply voltage, 5-channel, 24 V DC power supply	AMP8620-2005-0100 20 A DC for 400…480 V AC supply voltage, 5-channel, 24 V DC power supply, with regen resistor	AMP8620-2005-0200 20 A DC for 400…480 V AC supply voltage, 5-channel, 24 V DC power supply, with connector for external regen resistor

AMP8800 | Decentralized distribution module

Function	
Distribution module	AMP8805-1000-0000 5-channel, 24 V DC power supply

AX8800 | Coupling modules

Function	1-channel	2-channel
Coupling modules	AX8831	AX8832

AMI8100 | Compact integrated Servo Drives (48 V DC)

Flange code	Motor length 1	Motor length 2	Motor length 3
F2 (58 mm)	AMI8121 M_0 = 0.48 Nm	AMI8122 M_0 = 0.78 Nm	AMI8123 M_0 = 1.00 Nm

Rotary servomotors

▶ **www.beckhoff.com/rotary-servomotors**

AM8000 | Servomotors

Flange code	Motor length 1	Motor length 2	Motor length 3	Motor length 4
F1 (40 mm)	AM8011 M_0 = 0.20 Nm	AM8012 M_0 = 0.38 Nm	AM8013 M_0 = 0.52 Nm	
F2 (58 mm)	AM8021 M_0 = 0.50 Nm	AM8022 M_0 = 0.80 Nm	AM8023 M_0 = 1.20 Nm	
F3 (72 mm)	AM8031 M_0 = 1.37…1.40 Nm	AM8032 M_0 = 2.37…2.38 Nm	AM8033 M_0 = 3.20…3.22 Nm	
F4 (87 mm)	AM8041 M_0 = 2.37…2.45 Nm	AM8042 M_0 = 4.10 Nm	AM8043 M_0 = 5.60…5.65 Nm	
F5 (104 mm)	AM8051 M_0 = 4.80…6.30 Nm	AM8052 M_0 = 8.20…10.7 Nm	AM8053 M_0 = 11.4…15.4 Nm	AM8054 M_0 = 13.8…17.2 Nm
F6 (142 mm)	AM8061 M_0 = 12.8…17.1 Nm	AM8062 M_0 = 21.1…29.9 Nm	AM8063 M_0 = 29.0…41.4 Nm	AM8064 M_0 = 35.0…49.0 Nm
F7 (197 mm)	AM8071 M_0 = 31.8…42.8 Nm	AM8072 M_0 = 54.6…80.7 Nm	AM8073 M_0 = 70.0…104 Nm	AM8074 M_0 = 92.0…129 Nm

AM8500 | Servomotors with increased rotor moment of intertia

Flange code	Motor length 1	Motor length 2	Motor length 3
F3 (72 mm)	AM8531 M_0 = 1.37…1.40 Nm	AM8532 M_0 = 2.37…2.38 Nm	AM8533 M_0 = 3.20…3.22 Nm
F4 (87 mm)	AM8541 M_0 = 2.37…2.45 Nm	AM8542 M_0 = 4.10 Nm	AM8543 M_0 = 5.60…5.65 Nm
F5 (104 mm)	AM8551 M_0 = 4.80…6.30 Nm	AM8552 M_0 = 8.20…10.7 Nm	AM8553 M_0 = 11.4…15.4 Nm
F6 (142 mm)	AM8561 M_0 = 12.8…17.1 Nm	AM8562 M_0 = 21.1…29.9 Nm	AM8563 M_0 = 29.0…41.1 Nm

AM8700 | Servomotors with anodized housing

Flange code	Motor length 1	Motor length 2	Motor length 3
R3 (89 mm)	AM8731 M_0 = 1.38 Nm	AM8732 M_0 = 2.37 Nm	AM8733 M_0 = 3.22 Nm
R4 (114 mm)	AM8741 M_0 = 2.45 Nm	AM8742 M_0 = 4.10 Nm	AM8743 M_0 = 5.65 Nm
R5 (134 mm)	AM8751 M_0 = 4.90 Nm	AM8752 M_0 = 8.20 Nm	AM8753 M_0 = 11.40 Nm
R6 (189 mm)	AM8761 M_0 = 12.80 Nm	AM8762 M_0 = 21.10 Nm	AM8763 M_0 = 29.00 Nm

AM8000

AM8500

AM8000, AM8500 with fan

AM8700

AM8800

AM3000

AM8800 | Stainless steel servomotors with hygienic design

Flange code	Motor length 1	Motor length 2	Motor length 3
R3 (89 mm)	AM8831 M_0 = 0.85 Nm	AM8832 M_0 = 1.40 Nm	AM8833 M_0 = 1.85 Nm
R4 (114 mm)	AM8841 M_0 = 1.60 Nm	AM8842 M_0 = 2.60 Nm	AM8843 M_0 = 3.50 Nm
R5 (134 mm)	AM8851 M_0 = 3.10 Nm	AM8852 M_0 = 4.80 Nm	AM8853 M_0 = 6.40 Nm
R6 (189 mm)	AM8861 M_0 = 7.75 Nm	AM8862 M_0 = 13.1 Nm	AM8863 M_0 = 16.7 Nm

AM3000 | Servomotors

Flange code	Motor length 1	Motor length 2	Motor length 3	Motor length 4	Motor length 5
F1 (40 mm)	AM3011 M_0 = 0.18 Nm	AM3012 M_0 = 0.31 Nm	AM3013 M_0 = 0.40…0.41 Nm		
F2 (58 mm)	AM3021 M_0 = 0.48 Nm	AM3022 M_0 = 0.84…0.87 Nm	AM3023 M_0 = 1.13…1.16 Nm	AM3024 M_0 = 1.38…1.41 Nm	
F3 (72 mm)	AM3031 M_0 = 1.15…1.20 Nm	AM3032 M_0 = 2.00…2.10 Nm	AM3033 M_0 = 2.71…2.79 Nm		
F4 (87 mm)	AM3041 M_0 = 1.95…2.06 Nm	AM3042 M_0 = 3.35…3.53 Nm	AM3043 M_0 = 4.70…4.82 Nm	AM3044 M_0 = 5.76…6.00 Nm	
F5 (104 mm)	AM3051 M_0 = 4.70…4.79 Nm	AM3052 M_0 = 8.43…8.60 Nm	AM3053 M_0 = 11.37…11.60 Nm	AM3054 M_0 = 14.1…14.9 Nm	
F6 (142 mm)		AM3062 M_0 = 11.9…12.2 Nm	AM3063 M_0 = 16.6…17.0 Nm	AM3064 M_0 = 20.4…21.0 Nm	AM3065 M_0 = 24.3…25.0 Nm
F7 (197 mm)		AM3072 M_0 = 29.4…30.0 Nm	AM3073 M_0 = 41.6…42.0 Nm	AM3074 M_0 = 51.9…53.0 Nm	
AM308x		AM3082 M_0 = 75.0 Nm	AM3083 M_0 = 130.0 Nm	AM3084 M_0 = 180.0 Nm	

Planetary gear units

▶ **www.beckhoff.com/planetary-gears**

AG2300 | High-end planetary gear units with output shaft

Sizes	Design straight
SP060	AG2300-+SP060S nominal output torque 21…40 Nm
SP075	AG2300-+SP075S nominal output torque 41…106 Nm
SP100	AG2300-+SP100S nominal output torque 76…277 Nm
SP140	AG2300-+SP140S nominal output torque 127…581 Nm
SP180	AG2300-+SP180S nominal output torque 289…1162 Nm
SP210	AG2300-+SP210S nominal output torque 728…2200 Nm
SP240	AG2300-+SP240S nominal output torque 1344…3784 Nm

AG2400 | High-end planetary gear units with output flange

Sizes	Design straight
TP004	AG2400-+TP004S nominal output torque 26…48 Nm
TP010	AG2400-+TP010S nominal output torque 77…126 Nm
TP025	AG2400-+TP025S nominal output torque 169…304 Nm
TP050	AG2400-+TP050S nominal output torque 316…607 Nm
TP110	AG2400-+TP110S nominal output torque 861…1408 Nm
TP300	AG2400-+TP300S nominal output torque 1354…2353 Nm
TP500	AG2400-+TP500S nominal output torque 2800…4400 Nm

AG2800 | Planetary gear units in hygienic design

Sizes	Design straight
HDV015	AG2800-+HDV015S nominal output torque 15…16 Nm
HDV025	AG2800-+HDV025S nominal output torque 35…40 Nm
HDV035	AG2800-+HDV035S nominal output torque 90…100 Nm


AG2300


AG2400


AG2800


AG3210


AG3300


AG3400

AG3210 | Economy planetary gear units

Sizes	Design straight
NP005	AG3210-+NP005S nominal output torque 5.1…6.5 Nm
NP015	AG3210-+NP015S nominal output torque 17…21 Nm
NP025	AG3210-+NP025S nominal output torque 40…50 Nm
NP035	AG3210-+NP035S nominal output torque 100…130 Nm
NP045	AG3210-+NP045S nominal output torque 200…350 Nm

AG3300 | Economy planetary gear units

Sizes	Design straight
NPS015	AG3300-+NPS015S nominal output torque 17…21 Nm
NPS025	AG3300-+NPS025S nominal output torque 40…50 Nm
NPS035	AG3300-+NPS035S nominal output torque 100…130 Nm
NPS045	AG3300-+NPS045S nominal output torque 200…350 Nm

AG3400 | Economy planetary gear units with output flange

Sizes	Design straight
NPT005	AG3400-+NPT005S nominal output torque 5.1…6.5 Nm
NPT015	AG3400-+NPT015S nominal output torque 17…21 Nm
NPT025	AG3400-+NPT025S nominal output torque 40…50 Nm
NPT035	AG3400-+NPT035S nominal output torque 100…130 Nm
NPT045	AG3400-+NPT045S nominal output torque 200…350 Nm

Translatory servomotors

▶ **www.beckhoff.com/translatory-servomotors**

AL8000 | Highly dynamic linear servomotors

Peak force	Overall width W2 (50 mm)	Overall width W4 (80 mm)	Overall width W6 (130 mm)
≤ 500 N	**AL8021** F_{max} = 120 N, I_{max} = 7.3 A, v_{max} = 12 m/s	**AL8041** F_{max} = 230 N, I_{max} = 7.2 A, v_{max} = 7 m/s	
	AL8022 F_{max} = 240 N, I_{max} = 7.3 A, v_{max} = 12 m/s	**AL8042** F_{max} = 460 N, I_{max} = 7.2 A, v_{max} = 7 m/s	
	AL8024 F_{max} = 480 N, I_{max} = 12 A, v_{max} = 12 m/s		
> 500… 1500 N	**AL8026** F_{max} = 720 N, I_{max} = 12 A, v_{max} = 10 m/s	**AL8043** F_{max} = 690 N, I_{max} = 7.2/12 A, v_{max} = 3.5/7 m/s	
		AL8044 F_{max} = 920 N, I_{max} = 7.2/15 A, v_{max} = 3.5/7 m/s	
		AL8045 F_{max} = 1150 N, I_{max} = 12/24 A, v_{max} = 3.5/7 m/s	
		AL8046 F_{max} = 1380 N, I_{max} = 12/24 A, v_{max} = 3.5/7 m/s	
> 1500 N		**AL8048** F_{max} = 1840 N, I_{max} = 15/29 A, v_{max} = 3.5/7 m/s	**AL8064** F_{max} = 1800 N, I_{max} = 12/24 A, v_{max} = 3/6 m/s
			AL8065 F_{max} = 2250 N, I_{max} = 15/24 A, v_{max} = 3/6 m/s
			AL8066 F_{max} = 2700 N, I_{max} = 18/42 A, v_{max} = 3/6 m/s
			AL806A F_{max} = 4500 N, I_{max} = 24/72 A, v_{max} = 3/6 m/s
			AL806F F_{max} = 6750 N, I_{max} = 42/100 A, v_{max} = 3/6 m/s

Product announcement for availability status see www.beckhoff.com

AL8000 AL2000 AA3033 AA2518 AA1121 AA1821

AL2000 | Linear servomotors

Continuous force	Winding type S		Winding type N | S				
≤ 500 N	**AL2003** Fp = 225 N, Ip = 5 A, Fc = 75 N		**AL2006** Fp = 450 N, Ip = 6.5/15 A, Fc = 200 N				
	AL2403 Fp = 120 N, Ip = 4.1 A, Fc = 45 N	**AL2406** Fp = 240 N, Ip = 8.2 A, Fc = 90 N					
	AL2412 Fp = 480 N, Ip = 16.4 A, Fc = 240 N						
> 500… 1500 N			**AL2009** Fp = 675 N, Ip = 6.5/19 A, Fc = 300 N	**AL2012** Fp = 900 N, Ip = 8/26 A, Fc = 400 N	**AL2015** Fp = 1125 N, Ip = 13/33 A, Fc = 500 N	**AL2018** Fp = 1350 N, Ip = 13/33 A, Fc = 600 N	**AL2418** Fp = 720 N, Ip = 12.3 A (N), 25.1 A (S), Fc = 360 N
> 1500 N			**AL2812** Fp = 1800 N, Ip = 13/26 A, Fc = 760 N	**AL2815** Fp = 2250 N, Ip = 13.5/33 A, Fc = 950 N	**AL2818** Fp = 2700 N, Ip = 19.6/41 A, Fc = 1140 N	**AL2830** Fp = 4500 N, Ip = 26/66 A, Fc = 2000 N	**AL2845** Ip = 41/98 A, Fc = 2850 N	**AL2024** Fp = 1800 N, Ip = 26/52 A, Fc = 800 N

AA3033 | Electric cylinders (400 V AC)

Peak force	Flange code 75 mm
> 5000… 15000 N	**AA3033** Fp = 12500 N, Fc = 3240 N

AA2500 | Tubular motors (400 V AC)

Peak force	Continuous force ≥ 300 N
> 500… 1500 N	**AA2518** Fp = 1050 N, Ip = 15 A, Fc = 300 N

AA1000 | Linear actuators (48 V DC)

Peak force	Continuous force ≥ 300 N	Continuous force > 150 N
> 500… 1500 N	**AA1121** Fp = 800 N, Fc = 300 N	**AA1821** Fp = 800 N, Fc = 160 N

Compact Drive Technology

▶ **www.beckhoff.com/compact-drive-technology**

AM8100 | Servomotors for compact drive technology

Flange code	Motor length 1	Motor length 2	Motor length 3
F1 (40 mm)	AM8111 M_0 = 0.20 Nm	AM8112 M_0 = 0.38 Nm	AM8113 M_0 = 0.52 Nm
F2 (58 mm)	AM8121 M_0 = 0.50 Nm	AM8122 M_0 = 0.80 Nm	AM8123 M_0 = 1.20 Nm
F3 (72 mm)	AM8131 M_0 = 1.30…1.35 Nm	AM8132 M_0 = 2.37…2.40 Nm	AM8133 M_0 = 3.2 Nm
F4 (87 mm)	AM8141 M_0 = 2.40 Nm	AM8142 M_0 = 3.9 Nm	

AG2250 | Planetary gear units for servo and stepper motors

Sizes	Design straight	Design angled
PLE40	AG2250-+PLE40 nominal output torque 5…20 Nm	
PLE60	AG2250-+PLE60 nominal output torque 15…44 Nm	
PLE80	AG2250-+PLE80 nominal output torque 38…120 Nm	
WPLE40		AG2250-+WPLE40 nominal output torque 4.5…20 Nm
WPLE60		AG2250-+WPLE60 nominal output torque 14…44 Nm
WPLE80		AG2250-+WPLE80 nominal output torque 38…120 Nm

ASxxxx | Stepper motors

	Rated current (per phase)						
Flange code	1.00 A	1.50 A	2.00 A	5.00 A	5.60 A	6.50 A	5.60 A | 6.40 A
N1 (NEMA17/ 42 mm)	AS1010 0.40 Nm						
	AS1020 0.5 Nm						
N2 (NEMA23/ 56 mm)		AS1030 0.6 Nm	AS2021 0.8 Nm		AS2022 1.50 Nm		AS2023 1.8 Nm | 2.3 Nm
N3 (NEMA34/ 86 mm)				AS1050 1.2 Nm	AS2041 3.3 Nm	AS2043 8.0 Nm	
				AS1060 5.0 Nm	AS2042 6.4 Nm		

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


AM8100


AG2250


AS1000


AS2000


AG1000


EtherCAT Terminals

AG1000 | Planetary gear units for AS1000 stepper motors

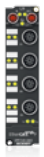
Sizes	Design straight
PM52	**AG1000-+PM52.i** nominal output torque 4 Nm
PM81	**AG1000-+PM81.i** nominal output torque 20 Nm

EL7xxx | EtherCAT Terminals, motion

Motor type	< 3 A	3…5 A	> 5 A	16 A
Servomotor			**ELM7211-9016** I_{rms} = 4.5 A, 48 V DC	
			ELM7211-9018 I_{rms} = 4.5 A, 48 V DC, Safe Motion	
			ELM7212-9016 I_{rms} = 2 x 4.5 A, 48 V DC	**ELM7222-9016** I_{rms} = 2 x 8.0 A, 48 V DC
			ELM7212-9018 I_{rms} = 2 x 4.5 A, 48 V DC, Safe Motion	**ELM7222-9018** I_{rms} = 2 x 8.0 A, 48 V DC, Safe Motion
	EL7201-0010 I_{rms} = 2.8 A, 48 V DC, OCT	**EL7211-0010** I_{rms} = 4.5 A, 48 V DC, OCT	**ELM7221-9016** I_{rms} = 8 A, 48 V DC	**ELM7231-9016** I_{rms} = 16 A, 48 V DC
	EL7201 I_{rms} = 2.8 A, 48 V DC, resolver	**EL7211** I_{rms} = 4.5 A, 48 V DC, resolver	**ELM7221-9018** I_{rms} = 8 A, 48 V DC, Safe Motion	**ELM7231-9018** I_{rms} = 16 A, 48 V DC, Safe Motion
	EL7201-9014 I_{rms} = 2.8 A, 48 V DC, OCT, STO	**EL7211-9014** I_{rms} = 4.5 A, 48 V DC, OCT, STO	**EL7221-9014** I_{rms} = 7…8 A with ZB8610, 48 V DC, OCT, STO	
Stepper motor	**EL7031** I_{max} = 1.5 A, 24 V DC	**EL7041** I_{max} = 5.0 A, 48 V DC, incremental encoder		
	EL7031-0030 I_{max} = 2.8 A, 24 V DC	**EL7041-0052** I_{max} = 5.0 A, 48 V DC		
	EL7037 I_{max} = 1.5 A, 24 V DC, incremental encoder, vector control	**EL7047** I_{max} = 5.0 A, 48 V DC, incremental encoder, vector control		
		EL7047-9014 I_{max} = 5.0 A, 48 V DC, incremental encoder, vector control, STO		
DC motor output stage	**EL7332** I_{max} = 1.0 A, 24 V DC	**EL7342** I_{max} = 3.5 A, 48 V DC, incremental encoder		
BLDC		**EL7411** I_{rms} = 4.5 A, 48 V DC		
		EL7411-9014 I_{rms} = 4.5 A, 48 V DC, STO		
4-axis interface	**EM7004** 4 incremental encoders, 32 digital I/Os 24 V DC, 4 analog outputs ±10 V			

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

EtherCAT Box modules



EtherCAT P Box modules

EtherCAT Plug-in Modules

Bus Terminals

EP7xxx | EtherCAT Box, motion

Motor type	< 3 A	> 3 A	
Servomotor		**EP7211-0034** I_{rms} = 4.5 A, 48 V DC, OCT, STO suitable	
Stepper motor		**EP7047-0032** I_{max} = 5.0 A, 48 V DC, STO suitable	**EP7047-1032** I_{max} = 5.0 A, 48 V DC
	EP7041-1002[1] I_{max} = 1.5 A, 48 V DC, incremental encoder, 2 digital inputs, 1 digital output	**EP7041-0002**[1] I_{max} = 5 A, 48 V DC, incremental encoder, 2 digital inputs, 1 digital output	**EP7041-2002**[1] I_{max} = 5 A, 48 V DC, incremental encoder, 2 digital inputs, 1 digital output, motor connection via plug
		EP7041-3002[1] I_{max} = 5 A, 48 V DC, incremental encoder, for high-speed applications, encoder system (24 V DC encoder)	**EP7041-3102** I_{max} = 5 A, 48 V DC, incremental encoder, for high-speed applications, encoder system (5 V DC encoder)
		EP7041-4032 I_{max} = 5.0 A, 48 V DC, BiSS C encoder	
DC motor output stage		**EP7342-0002**[1] I_{max} = 3.5 A, 48 V DC	
Motor controller		**EP7402-0057** for roller conveyor systems	

EPxxxx: industrial housing in IP 67, [1]also as ERxxxx: zinc die-cast housing in IP 67, [2]also as EQxxxx: stainless steel housing in IP 69K

EPP7xxx | EtherCAT P Box, motion

Motor type	< 3 A	> 3 A
Stepper motor	**EPP7041-1002** I_{max} = 1.5 A, 48 V DC, incremental encoder	**EPP7041-3002** I_{max} = 5.0 A, 48 V DC, incremental encoder
DC motor output stage		**EPP7342-0002** I_{max} = 3.5 A, 48 V DC

EJ7xxx | EtherCAT Plug-in Modules, motion

Motor type	< 3 A		3…5 A	
Servomotor			**EJ7211-0010** I_{rms} = 4.5 A, 48 V DC, OCT	**EJ7211-9414** I_{rms} = 4.5 A, 48 V DC, OCT, STO, TwinSAFE SC
Stepper motor	**EJ7031** I_{max} = 1.5 A, 24 V DC	**EJ7037** I_{max} = 1.5 A, 24 V DC, incremental encoder, vector control	**EJ7041-0052** I_{max} = 5.0 A, 48 V DC	**EJ7047** I_{max} = 5.0 A, 48 V DC, incremental encoder, vector control
DC motor output stage			**EJ7342** I_{max} = 3.5 A, 48 V DC, incremental encoder	
BLDC			**EJ7411** I_{rms} = 4.5 A, 48 V DC	

KL2xxx | Bus Terminals, motion

	< 3 A		3…5 A
Stepper motor	**KL2531** I_{max} = 1.5 A, 24 V DC		**KL2541** I_{max} = 5.0 A, 48 V DC, incremental encoder
DC motor output stage	**KL2532** I_{max} = 1.0 A, 24 V DC	**KL2284** reverse switching, I_{max} = 2.0 A, 0…24 V DC	**KL2552** I_{max} = 5.0 A, 48 V DC, incremental encoder
AC motor speed controller	**KL2791** 230 V AC, 200 VA, 1-phase AC motor		

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

Product announcement for availability status see www.beckhoff.com

XPlanar | Planar motor system

▶ **www.beckhoff.com/xplanar**

Tile

Starter kits

Movers

XPlanar | Planar motor system

Movers	**APM4220-0000-0000** 0.4 kg payload	**APM4330-0000-0000** 1.5 kg payload	**APM4330-0001-0000** 1.0 kg payload, stainless steel	**APM4550-0000-0000** 4.2 kg payload
Tile	**APS4322-0000-0000** 4 active areas			
Starter kits	**APS9000** 6 (2 x 3) APS4322 planar motor tiles, 2 APM4330 movers, Industrial PC, software, pre-installed, ready for operation	**APS9001** 12 (4 x 3) APS4322 planar motor tiles, 4 APM4330 movers, Industrial PC, software, pre-installed, ready for operation		

XTS | Linear product transport

▶ **www.beckhoff.com/xts**

Standard
motor modules

Hygienic
motor modules

XTS | Motor modules

Design form	XTS Standard	XTS Hygienic
Straight	**AT2000** straight, without infeed	**ATH2000** straight, without infeed
	AT2001 straight, with connection cables for infeed	**ATH2001** straight, with infeed
	AT2002 straight, with plug connector for infeed	**ATH2002** straight, with angled infeed
22.5° curved segment, in 250 mm for Ø 1273 mm	**AT2020** 22.5° curved segment, without infeed	
	AT2021 22.5° curved segment, with connection cables for infeed	
-22.5° curved segment, in 250 mm for Ø 1273 mm	**AT2025** -22.5° curved segment, without infeed	
	AT2026 -22.5° curved segment, with connection cables for infeed	
45° curved segment, in 250 mm for Ø 637 mm	**AT2040** 45° curved segment, without infeed	**ATH2040** 45° curved segment, without infeed
	AT2041 45° curved segment, with connection cables for infeed	**ATH2041** 45° curved segment, with straight infeed
	AT2042 45° curved segment, with plug connector for infeed	**ATH2042** 45° curved segment, with angled infeed
180° curved segment, clothoid	**AT2050** 180° curved segment, without infeed	**ATH2050** 180° curved segment, without infeed
		ATH2051 180° curved segment, with straight infeed

Product announcement for availability status see www.beckhoff.com

Standard guide rails

Hygienic guide rails

Standard movers

Hygienic movers

Standard starter kits

XTS | Guide rails

Design form	XTS Standard	XTS Hygienic
Straight	**AT9000** straight, without lock	**ATH9000** straight, without lock
	AT9100 straight, with lock	**ATH9100** straight, with lock
		ATH9200 straight, connector
45° curved segment, for Ø 637 mm	**AT9040** 45° curved segment, without lock	
180° curved segment, clothoid	**AT9050** 180° curved segment, without lock	**ATH9050** 180° curved segment

XTS | Movers

Material	XTS Standard	XTS Hygienic
Aluminium	**AT9011** mover, 6 rollers	**ATH9013** aluminium mover
	AT9012 mover, 12 rollers	
	AT9001 magnetic plate sets	
Stainless steel		**ATH9011** stainless steel mover
		ATH9001 hygienic magnetic plate sets

XTS | Starter kits

	Mover 70 mm length
Small	AT2000-0500-0070
Medium	AT2000-1000-0070
Large	AT2000-1500-0070

The Automation Company

Beckhoff offers comprehensive system solutions in numerous performance classes for all areas of automation. The control technology is exceptionally scalable – from high-performance Industrial PCs to mini-PLCs – and can be adapted precisely to application-specific requirements. TwinCAT automation software integrates real-time control with PLC, NC and CNC functions in a single feature-filled package.

▶ **www.beckhoff.com/automation**

Efficient engineering
- integration into Microsoft Visual Studio®
- wide selection of programming languages: IEC 61131-3, C/C++, MATLAB®/Simulink®, Safety C/FBD
- modular software development
- automatic code generation interface
- link to source code control systems

High performance
- cycle times from 50 µs
- multi-core support
- support of 32-bit and 64-bit operating systems
- pre-emptive multitasking

Connectivity
- useable with all fieldbus systems
- open and expandable for IT trends – today and tomorrow
- adheres to industry-specific and standard protocols
- ideal for IoT and cloud computing applications

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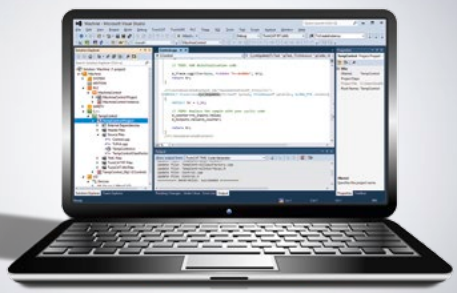

TwinCAT 3 92

- one software platform for engineering and runtime
- integrated real-time support
- software modules for PLC, NC, CNC, robotics, HMI, measurement technology, analytics, safety, machine vision, machine learning

TwinCAT 2 98

- open, compatible PC hardware
- embedded IEC 61131-3 software PLC, software NC and software CNC
- connection to all common fieldbuses

TwinSAFE 102

- 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

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- **efficient, universal engineering**
- **programming in different languages**
- **Open, hardware-independent control system gives freedom of choice in terms of automation and control components.**
- **scalable control platform from single- to multi-core CPUs**
- **all control functions on a single, centralized platform: PLC, motion control, robotics, measurement technology, a.o.**

TwinCAT 3

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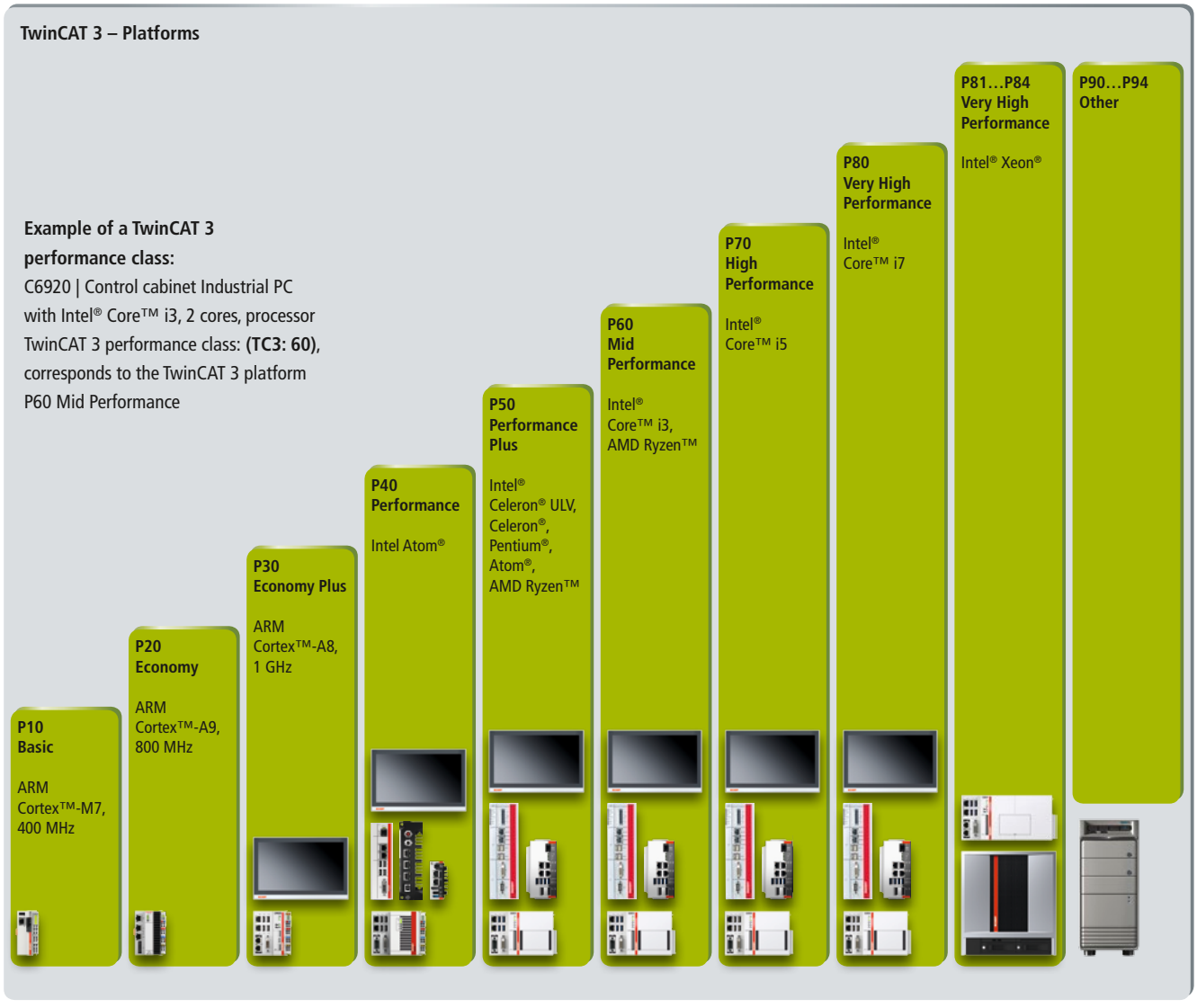
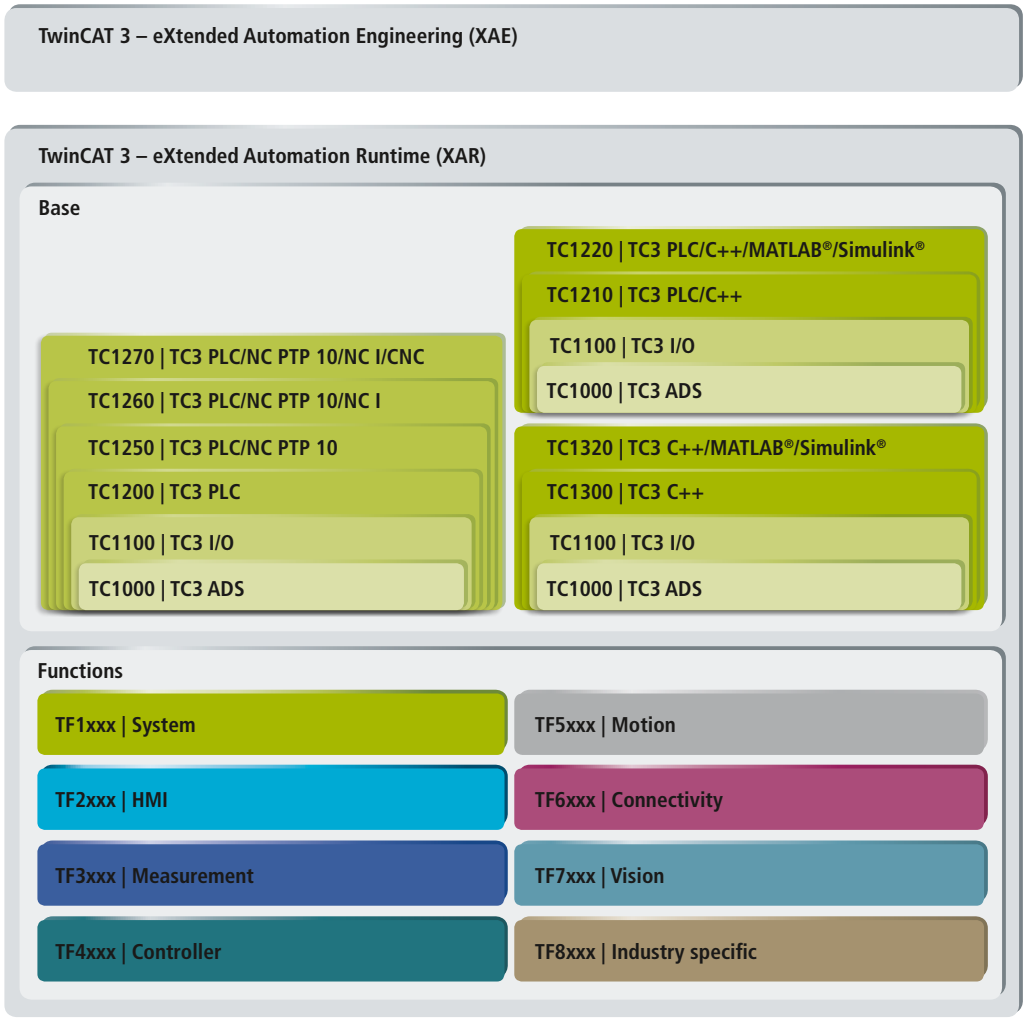
The TwinCAT 3 runtime components are available for different platforms. The platform levels correspond to the various TwinCAT 3 performance classes of the Beckhoff PCs. The TwinCAT 3 performance class of a Beckhoff PC depends on the configuration and the technical data of the PC (including the processor).

The following overview shows the various TwinCAT 3 platforms. The controllers integrated in the platform classifications represent sample configurations. The TwinCAT 3 performance class required for a TwinCAT 3 Runtime component can be found in the product description of the respective Beckhoff PC.



The controllers integrated in the platform categorization are only example configurations.



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.

TExxxx | TwinCAT 3, Engineering

TC3 Engineering	**TE1000**	TwinCAT 3 engineering environment
TC3 Realtime Monitor	**TE1010**	tool for precise diagnostics and optimization of the runtime behavior of tasks in the TwinCAT 3 runtime
TC3 EtherCAT Simulation	**TE1111**	easy configurations of simulation environments with several EtherCAT slaves
TC3 XCAD Interface	**TE1120**	interface between ECAD tools and TwinCAT 3
TC3 CAD Simulation Interface	**TE1130**	link between TwinCAT and a 3D CAD system for SiL simulation
TC3 PLC Static Analysis	**TE1200**	analysis tool that tests PLC software on the basis of coding rules
TC3 Scope View Professional	**TE1300**	software oscilloscope for the graphical display of data captured from several target systems
TC3 Filter Designer	**TE1310**	graphic engineering tool for determining coefficient digital filters
TC3 Target for Simulink®	**TE1400**	TwinCAT target for Simulink® for generating TwinCAT 3 modules
TC3 Target for MATLAB®	**TE1401**	TwinCAT target for MATLAB® for generating TwinCAT 3 modules
TC3 Interface for MATLAB®/Simulink®	**TE1410**	communication interface between MATLAB®/Simulink® and the TwinCAT 3 runtime
TC3 Target for FMI	**TE1420**	interface for simulation tools that support the Functional Mockup Interface (FMI)
TC3 Valve Diagram Editor	**TE1500**	graphical tool for designing the characteristic curve of a hydraulic valve
TC3 Cam Design Tool	**TE1510**	graphic design tool for electronic cam plates
TC3 EAP Configurator	**TE1610**	a tool for visualizing and configuring communication networks, in which data exchange based on the EtherCAT Automation Protocol (EAP) takes place or is to be established
TC3 HMI Engineering	**TE2000**	tool for developing platform-independent user interfaces
TC3 Analytics Workbench	**TE3500**	complete solution for 24/7 monitoring of machines and systems incl. visualization on analysis dashboards
TC3 Analytics Service Tool	**TE3520**	process data analysis tool for commissioning and service technicians
TC3 Motion Designer	**TE5910**	TC3 Motion Designer for drive dimensioning
TC3 Drive Manager 2	**TE5950**	for commissioning the AX8000, AX5000, AMI8100, AMP8000 or the I/O components EL72xx, EP72xx and EJ72xx

TC1xxx | TwinCAT 3, Base

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

TF1xxx | TwinCAT 3, Functions, System

TC3 PLC HMI	**TF1800**	stand-alone tool for displaying visualizations from the PLC development environment
TC3 PLC HMI Web	**TF1810**	display of visualizations from the PLC development environment in a web browser
TC3 UML	**TF1910**	UML (Unified Modeling Language) for modeling of PLC software

Product announcement for availability status see www.beckhoff.com

TF2xxx | TwinCAT 3, Functions, HMI

TC3 HMI Server	TF2000	modular web server, includes a client connection and a target connection
TC3 HMI Clients Packs	TF20x0	optional extension of the TC3 HMI Server with up to 100 additional client connections
TC3 HMI Targets Packs	TF20xx	optional extension of the TC3 HMI Server with up to 100 additional control systems
TC3 HMI OPC UA	TF2110	server extension for access to TwinCAT target systems or other controllers via OPC UA
TC3 HMI Extension SDK	TF2200	software development kit (C++/.NET) for programming application-specific solutions
TC3 HMI Scope	TF2300	software oscilloscope for graphic display of time sequences

TF3xxx | TwinCAT 3, Functions, Measurement

TC3 Scope Server	TF3300	data preparation for visual display in the TwinCAT 3 Scope View
TC3 Analytics Logger	TF3500	The TwinCAT Analytics Logger enables the cyclic archiving of the process image.
TC3 Analytics Library	TF3510	PLC library used for online or offline analysis in the PLC runtime of the TwinCAT Analytics Workbench
TC3 Analytics Storage Provider	TF3520	IoT client: interface to one or more storage facilities for raw and analysis data from various sources
TC3 Analytics Runtime	TF3550	license bundle for the operation of an analytics application including HMI dashboard created with Analytics Workbench
TC3 Analytics Runtime Base	TF3551	license bundle for the operation of an analytics application created with Analytics Workbench
TC3 Analytics Controller Packs	TF356x	extension of the TC3 Analytics Workbench for the analysis of up to 128 additional controllers
TC3 Condition Monitoring	TF3600	PLC library for the implementation of condition monitoring for machines
TC3 Power Monitoring	TF3650	TwinCAT Power Monitoring PLC library
TC3 Filter	TF3680	PLC library for implementing digital filters
TC3 Interface for LabVIEW™	TF3710	enables the exchange of data between LabVIEW™ and the TwinCAT runtime
TC3 Machine Learning Inference Engine	TF3800	execution module of trained classical machine learning algorithms
TC3 Neural Network Inference Engine	TF3810	execution module of trained neural networks
TC3 Solar Position Algorithm	TF3900	precise calculation of the sun's position

TF4xxx | TwinCAT 3, Functions, Controller

TC3 Controller Toolbox	TF4100	basic controllers (P, I, D), complex controllers (PI, PID), pulse width modulation, ramps, signal generators and filters
TC3 Temperature Controller	TF4110	temperature control for monitoring and controlling different temperature ranges
TC3 TwinCAT Speech	TF4500	enables the multilingual input and output of queries or information implemented in an industrially compatible way

TF5xxx | TwinCAT 3, Functions, Motion

TC3 NC PTP 10 Axes	TF5000	NC PTP (point-to-point movements) for up to 10 axes
TC3 NC PTP Axes Pack 25	TF5010	extension of TwinCAT 3 NC PTP to 25 axes
TC3 NC PTP Axes Pack unlimited	TF5020	extension of TwinCAT 3 NC PTP to 255 axes
TC3 NC Camming	TF5050	providing the cam plate functionality (table coupling) of TwinCAT NC
TC3 NC Flying Saw	TF5055	providing flying saw functionality
TC3 NC FIFO Axes	TF5060	providing a FIFO interface for setpoint generation of an NC axis group
TC3 Motion Control XFC	TF5065	high-precision logging and switching of digital signals in relation to axis positions

TF5xxx | TwinCAT 3, Functions, Motion

TC3 NC I	TF5100	NC I with 3 interpolating path axes and 5 auxiliary axes
TC3 Kinematic Transformation L1	TF5110	realization of different kinematic transformations Level 1
TC3 Kinematic Transformation L2	TF5111	realization of different kinematic transformations Level 2
TC3 Kinematic Transformation L3	TF5112	realization of different kinematic transformations Level 3
TC3 Kinematic Transformation L4	TF5113	realization of different kinematic transformations Level 4
TC3 Robotics mxAutomation	TF5120	direct communication between the PLC and a KUKA robot control
TC3 Robotics uniVAL PLC	TF5130	direct communication between the PLC and a Stäubli robot control
TC3 CNC	TF5200	CNC path control software
TC3 CNC E	TF5210	CNC path control software export version
TC3 CNC Axes Pack	TF5220	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
TC3 CNC Measurement	TF5225	optional package of CNC cycles that supports the measurement of tools or workpieces directly on the machine
TC3 CNC Channel Pack	TF5230	further CNC channel, extension to a maximum of 12 channels, channel synchronization, axis transfer between channels
TC3 CNC Transformation	TF5240	transformation functionality (5-axis functionality)
TC3 CNC Kinematic Optimization	TF5245	optional CNC package that optimizes the determination of kinematic parameters for rotary axes in 5-axis kinematics
TC3 CNC HSC Pack	TF5250	extending the CNC with HSC technology (high-speed cutting)
TC3 CNC Spline Interpolation	TF5260	path programming via splines with programmable spline type, Akima-spline, B-spline
TC3 CNC Virtual NCK Basis	TF5270	virtual TwinCAT CNC for simulation in a Windows environment
TC3 CNC Virtual NCK Options	TF5271	virtual TwinCAT CNC for simulation in a Windows environment
TC3 CNC Volumetric Compensation	TF5280	extension for compensating geometric machine errors based on an ISO-standardized parametric model
TC3 CNC Cutting Plus	TF5290	technology package for extending the CNC functionality for cutting operations
TC3 Motion Collision Avoidance	TF5410	collision avoidance and controlled accumulation when operating a number of linearly and/or translationally dependent axes with TC3 NC PTP
TC3 Motion Pick-and-Place	TF5420	for handling tasks carried out by gantry robots and other kinematics
TC3 Planar Motion	TF5430	enables efficient and intelligent implementation of individual XPlanar applications
TC3 Hydraulic Positioning	TF5810	algorithms for control and positioning of hydraulic axes
TC3 XTS Extension	TF5850	integration of the XTS transport system into TwinCAT 3
TC3 XPlanar	TF5890	calculation of the mover position, precise position control, as well as monitoring and diagnostics

TF6xxx | TwinCAT 3, Functions, Connectivity

TC3 ADS Monitor	TF6010	recording and diagnostics functions for the communication of TwinCAT systems
TC3 JSON Data Interface	TF6020	interface for the exchange of data in JSON format between the TwinCAT system and custom applications
TC3 OPC UA	TF6100	access to TwinCAT in accordance with OPC UA with UA server (DA/HA/AC) and UA client (DA)
TC3 EtherCAT Redundancy 250	TF6220	extension of the TwinCAT EtherCAT master with cable redundancy capability for up to 250 slaves
TC3 EtherCAT Redundancy 250+	TF6221	extension of the TwinCAT EtherCAT master with cable redundancy capability for more than 250 slaves
TC3 EtherCAT External Sync	TF6225	extension of the TwinCAT EtherCAT master with an option to synchronize the Beckhoff real-time communication with external signals
TC3 Modbus TCP	TF6250	communication with Modbus TCP devices (server and client functionality)
TC3 Modbus RTU	TF6255	serial communication with Modbus end devices
TC3 PROFINET RT Device	TF6270	communication via PROFINET (PROFINET slave)
TC3 PROFINET RT Controller	TF6271	communication via PROFINET (PROFINET master)
TC3 EtherNet/IP Adapter	TF6280	communication via EtherNet/IP (EtherNet/IP adapter)
TC3 EtherNet/IP Scanner	TF6281	communication via EtherNet/IP (EtherNet/IP scanner)

TF6xxx | TwinCAT 3, Functions, Connectivity

TC3 FTP Client	TF6300	easy access from TwinCAT PLC to FTP server
TC3 TCP/IP	TF6310	communication via generic TCP/IP server
TC3 TCP/UDP Realtime	TF6311	direct access from real-time to Ethernet communication
TC3 Serial Communication	TF6340	communication via serial Bus Terminals or PC COM ports with the 3964R and RK512 protocol
TC3 SMS/SMTP	TF6350	sending SMS and e-mails from the PLC
TC3 Virtual Serial COM	TF6360	virtual serial COM driver for Windows platforms
TC3 Database Server	TF6420	accessing databases from the PLC
TC3 XML Server	TF6421	read and write access to XML files from the PLC
TC3 IEC 60870-5-10x	TF6500	communication according to IEC 60870-101, -102, -103, -104
TC3 IEC 61850/IEC 61400-25	TF6510	communication according to IEC 61850 and IEC 61400-25
TC3 RFID Reader Communication	TF6600	connection of RFID readers to the TwinCAT PLC
TC3 S7 Communication	TF6620	enables TCP/IP based communication with variables of a Siemens S7 controller
TC3 DBC File Import for CAN	TF6650	reading of DBC file formats
TC3 IoT Communication (MQTT)	TF6701	provides basic publisher/subscriber-based data connectivity via MQTT
TC3 IoT Functions	TF6710	provides connectivity for cloud-based communication services
TC3 IoT Data Agent	TF6720	gateway application for data connectivity between TwinCAT runtime and IoT services
TC3 IoT Data Agent Packs	TF672x	extension of the TC3 IoT Data Agent for up to 256 additional ADS target runtimes or OPC UA namespaces
TC3 IoT Communicator	TF6730	sends process data and push notifications from TwinCAT to smartphones and tablets through a messaging service
TC3 IoT Communicator App	TF6735	smartphone and tablet app to receive and visualize live data and push notifications sent from TwinCAT
TC3 IoT HTTPS/REST	TF6760	basic functions for HTTP/HTTPS communication in the form of a PLC library providing the ability to address REST APIs as a client

TF7xxx | TwinCAT 3, Functions, Vision

TC3 GigE Vision Connector	TF700x	interface for the configuration and integration of GigE Vision cameras directly into TwinCAT
TC3 Vision Base	TF7100	extensive PLC library with a large number of widely varying functions and algorithms for solving image processing tasks
TC3 Vision Matching 2D	TF7200	extension to find and compare objects based on learned references, contours, feature points or other properties
TC3 Vision Code Reading	TF7250	functions for reading various 1D and 2D codes
TC3 Vision Metrology 2D	TF7300	detection of edges, holes and circular arcs as well as the determination of lengths, distances, diameters, angles and coordinates, all with sub-pixel accuracy

TF8xxx | TwinCAT 3, Functions, Industry specific

TC3 HVAC	TF8000	library covering all technical systems in building automation
TC3 Building Automation Basic	TF8010	license for the use of a PLC library for execution of basic functions in the field of room automation
TC3 BACnet	TF8020	communication with data networks of building automation and building control systems
TC3 Building Automation	TF8040	software package covering all technical building automation services
TC3 Lighting Solution	TF8050	software package for simple commissioning of DALI lighting controllers
TC3 Wind Framework	TF8310	framework for the development of operational management software for wind turbines
TC3 AES70 (OCA)	TF8810	communication library for the operation of a system as an OCA (Open Control Architecture) controller or OCA device in an OCA network

TwinCAT 2

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TX1000 | TwinCAT 2, TwinCAT CP

PC hardware	standard PC/IPC hardware, no extras
Operating systems	Windows 7/10, Windows Embedded WES2009/WES7*
Real-time	Beckhoff real-time kernel

Windows driver for Beckhoff Control Panel

TX1100 | TwinCAT 2, TwinCAT I/O

PC hardware	standard PC/IPC hardware, no extras
Operating systems	Windows 7/10, Windows CE*
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

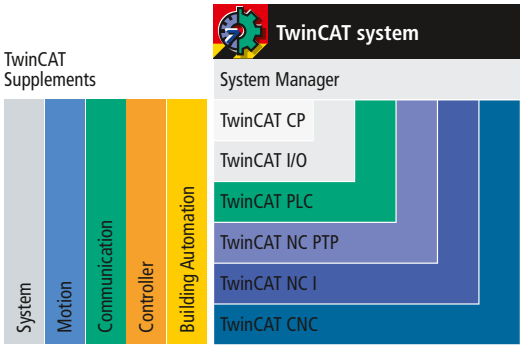
TX1200 | TwinCAT 2, TwinCAT PLC

PC hardware	standard PC/IPC hardware, no extras
Operating systems	Windows 7/10, Windows 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)
Programming	IEC 61131-3: IL, FBD, LD, SFC, ST, CFC, powerful library management

TX1250 | TwinCAT 2, TwinCAT NC PTP

TwinCAT PLC	inclusive
PC hardware	standard PC/IPC hardware, no extras
Operating systems	Windows 7/10, Windows 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 (standardized 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, velocity override, special functions: master/slave cascading, cam plates, electronic gearings, online distance compensation of segments, flying saw

*Version-dependent/older operating system versions are available on request from our service department.



TX1260 | TwinCAT 2, TwinCAT NC I

TwinCAT PLC	inclusive			
TwinCAT NC PTP	inclusive			
PC hardware	standard PC/IPC hardware, no extras			
Operating systems	Windows 7/10, Windows 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, zeroshifts, tool compensations, M and H functions			
Geometries	straight lines and circular paths in 3D space, circular paths in all main planes, helixes 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)			
Options	**TS511x**	TwinCAT Kinematic Transformation		

TX1270 | TwinCAT 2, TwinCAT CNC

TwinCAT PLC	inclusive			
TwinCAT NC PTP	inclusive			
TwinCAT NC I	inclusive			
PC hardware	standard PC/IPC hardware, no extras			
Operating systems	Windows 7/10*			
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			
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)			
Options	**TS5220**	TwinCAT CNC Axes Pack	**TS5250**	TwinCAT CNC HSC Pack
	TS5230	TwinCAT CNC Channel Pack	**TS5260**	TwinCAT CNC Spline Interpolation
	TS5240	TwinCAT CNC Transformation		

TSxxxx | TwinCAT 2, Supplements, System

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

TS4xxx | TwinCAT 2, Supplements, Controller

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

TSxxxx | TwinCAT 2, Supplements, Motion

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

TS6xxx | TwinCAT 2, Supplements, Communication

TwinCAT OPC UA Server	TS6100	access to TwinCAT in accordance with OPC UA with UA server (DA/HA/AC) and UA client (DA)
TwinCAT Modbus TCP Server	TS6250	communication with Modbus TCP devices (server and client functionality)
TwinCAT PLC Modbus RTU	TS6255	serial communication with Modbus end devices
TwinCAT PROFINET RT Device	TS6270	TwinCAT PROFINET RT device turns every PC-based controller into a PROFINET RT device.
TwinCAT PROFINET RT Controller	TS6271	TwinCAT PROFINET RT controller turns every PC-based controller into a PROFINET RT controller.
TwinCAT EtherNet/IP Adapter	TS6280	TwinCAT EtherNet/IP Adapter turns every PC-based controller into an EtherNet/IP adapter.
TwinCAT FTP Client	TS6300	basic access from TwinCAT PLC to FTP server
TwinCAT TCP/IP Server	TS6310	communication via generic TCP servers
TwinCAT PLC Serial Communication	TS6340	communication via serial Bus Terminals or PC COM ports
TwinCAT PLC Serial Communication 3964R/RK512	TS6341	communication via serial Bus Terminals or PC COM ports with the 3964R and RK512 protocol
TwinCAT SMS/SMTP Server	TS6350	sending SMS and e-mails from the PLC
TwinCAT Virtual Serial COM Driver	TS6360	virtual serial COM driver for Windows and Windows CE platforms
TwinCAT DriveCOM OPC Server	TS6370	fieldbus-independent communication connections between the engineering tool and the drive
TwinCAT DriveTop Server	TS6371	configuring Indramat SERCOS drives with DriveTop software on TwinCAT systems
TwinCAT PLC IEC 60870-5-101, -102, -103, -104 Master	TS650x	implementation of IEC 60870-101, -102, -103 and -104 masters
TwinCAT PLC IEC 60870-5-101, -104 Slave	TS650x	implementation of IEC 60870-101 and -104 slaves
TwinCAT PLC IEC 61400-25 Server	TS6509	IEC 61400-25 communication
TwinCAT PLC IEC 61850 Server	TS6511	IEC 61850 communication
TwinCAT PLC RFID Reader Communication	TS6600	connection of RFID readers to the TwinCAT PLC

TS8xxx | TwinCAT 2, Supplements, Building Automation

TwinCAT PLC HVAC	TS8000	automation of HVAC and sanitary installations
TwinCAT PLC Building Automation Basic	TS8010	executing basic room automation functions
TwinCAT BACnet/IP	TS8020	communication with the data networks of the building automation and building control systems
TwinCAT FIAS Server	TS8035	communication between TwinCAT PLC and a system using the FIAS standard
TwinCAT Crestron Server	TS8036	communication between a TwinCAT PLC and a Crestron controller
TwinCAT Building Automation	TS8040	software package covering all technical building automation services
TwinCAT Building Automation Framework	TS8100	configuration and commissioning of building automation projects

TwinSAFE

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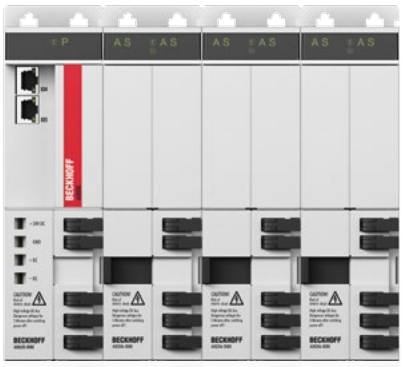
EK1960

EJ1914

TwinSAFE hardware, I/O

	Input	Dedicated Logic	Output	Input and Logic	Logic and Output	Input, Logic and Output
EtherCAT Terminals	**EK1914** 4 standard inputs, 4 standard outputs, 2 safe inputs, 2 safe outputs	**EL6900** TwinSAFE Logic	**EK1914** 4 standard inputs, 4 standard outputs, 2 safe inputs, 2 safe outputs	**EL1918** TwinSAFE Logic, 8 safe inputs	**EL2912** TwinSAFE Logic, 2 safe outputs	**EK1960** TwinSAFE Logic, 20 safe inputs, 24 safe outputs
	EL1904 TwinSAFE, 4 safe inputs	**EL6910** TwinSAFE Logic, PROFIsafe master and slave support	**EL2904** TwinSAFE, 4 safe outputs			**EL2911** TwinSAFE Logic, 4 safe inputs, 1 safe output
		EL6930 TwinSAFE Logic, PROFIsafe slave support				
EtherCAT Box	**EP1908-0002** TwinSAFE, 8 safe inputs			**EP1918-0002** TwinSAFE Logic, 8 safe inputs	**EP2918-0032** TwinSAFE Logic, 8 safe outputs	**EP1957-0022** TwinSAFE Logic, 8 safe inputs, 4 safe outputs
EtherCAT Plug-in Modules		**EJ6910** TwinSAFE Logic		**EJ1914** TwinSAFE Logic, 4 safe inputs	**EJ2914** TwinSAFE Logic, 4 safe outputs	**EJ1957** TwinSAFE Logic, 8 safe inputs, 4 safe outputs
				EJ1918 TwinSAFE Logic, 8 safe inputs	**EJ2918** TwinSAFE Logic, 8 safe outputs	
Bus Terminals	**KL1904** TwinSAFE, 4 safe inputs		**KL2904** TwinSAFE, 4 safe outputs		**KL6904** TwinSAFE Logic, 4 safe outputs	

Product announcement for availability status see www.beckhoff.com



AX8000

TwinSAFE hardware, Drive Technology

	Output		Input, Logic and Output			
AX5000, TwinSAFE drive option card for AX5000 servo drive	**AX5801** drive-integrated safety functions: STO, SS1					
	AX5805 drive-integrated safety functions: Safe Motion, for AX5x01 to AX5140	**AX5806** drive-integrated safety functions: Safe Motion, for AX5160 to AX5193				
AX8000, multi-axis servo drives			**AX8108** single-axis module 8 A, feedback: OCT, multi-feedback interface, TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion	**AX8118** single-axis module 18 A, feedback: OCT, multi-feedback interface, TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion	**AX8206** dual-axis module 2 x 6 A, feedback: OCT, multi-feedback interface, TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion	
			AX8525 combined power supply and axis module 25 A, feedback: OCT, multi-feedback interface, TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion	**AX8540** combined power supply and axis module 40 A, feedback: OCT, multi-feedback interface, TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion		
AMP8000, distributed servo drive			**AMP8041** M_0 = 2.40…2.50 Nm, TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion	**AMP8042** M_0 = 4.10 Nm, TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion	**AMP8043** M_0 = 5.70 Nm, TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion	
			AMP8051 M_0 = 4.00…4.90 Nm, TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion	**AMP8052** M_0 = 7.80…8.20 Nm, TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion	**AMP8053** M_0 = 9.10…11.00 Nm, TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion	**AMP8054** M_0 = 14.0 Nm, TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion

TwinSAFE software

TC3 Safety Editor	**TE9000**	implementing of safety applications in graphical environment
TwinSAFE Loader/User	**TE9200**	TwinSAFE command line tools: Loader for downloading/customizing safety projects at runtime; User for handling user management of TwinSAFE logic components
TwinSAFE Logic Simulator	**TE9100**	virtual commissioning of a safety application based on the TwinCAT 3 Safety Editor

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