

BECKHOFF New Automation Technology

Product Overview | 2021



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Order no. DK111x

**Main Catalog 2021
Volume 1 | IPC, Motion,
Automation**



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**Main Catalog 2021
Volume 2 | I/O**



Order no. DK130x

News Catalog

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IPC



10 The IPC Company

I/O



30 The I/O Company

Motion

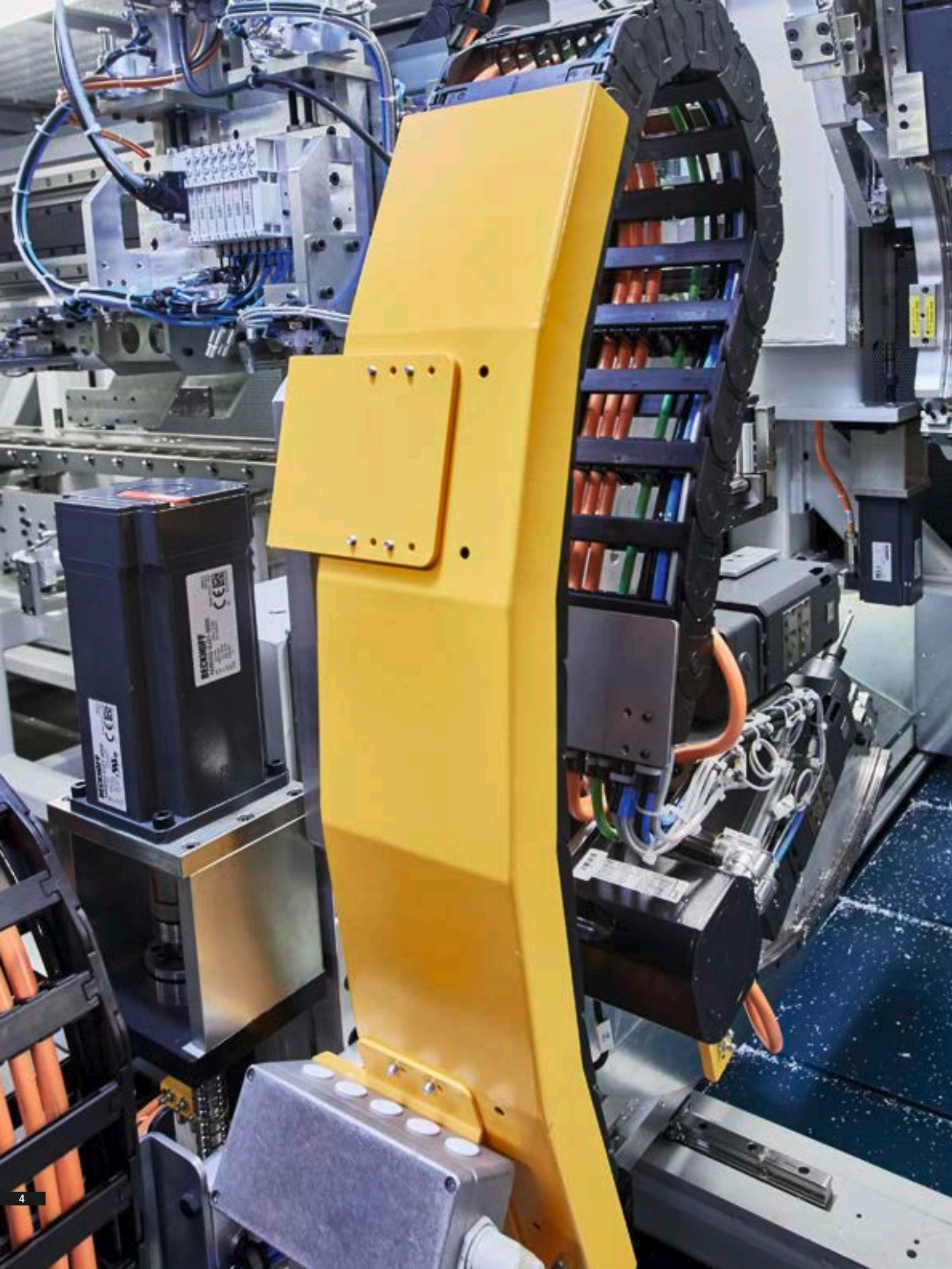


74 The Motion Company

Automation



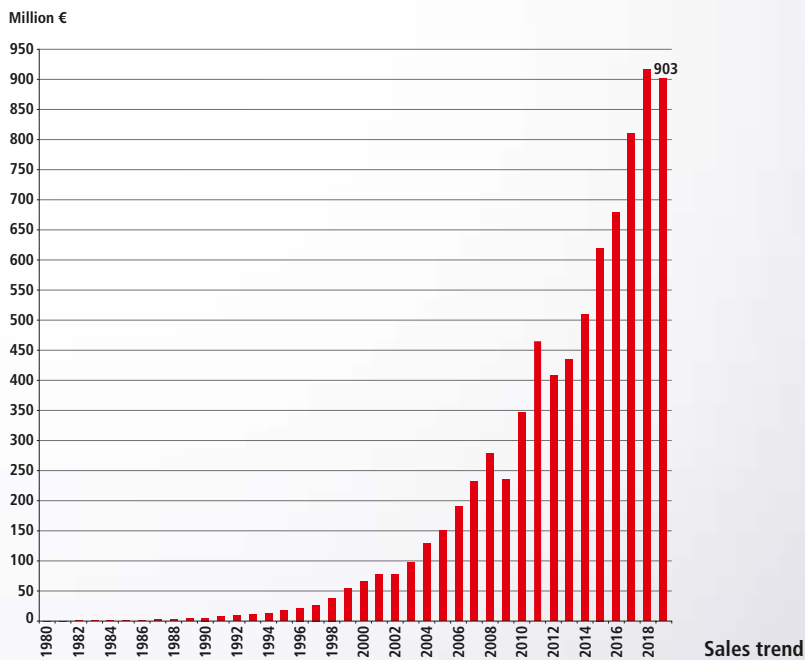
90 The Automation Company



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.



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.

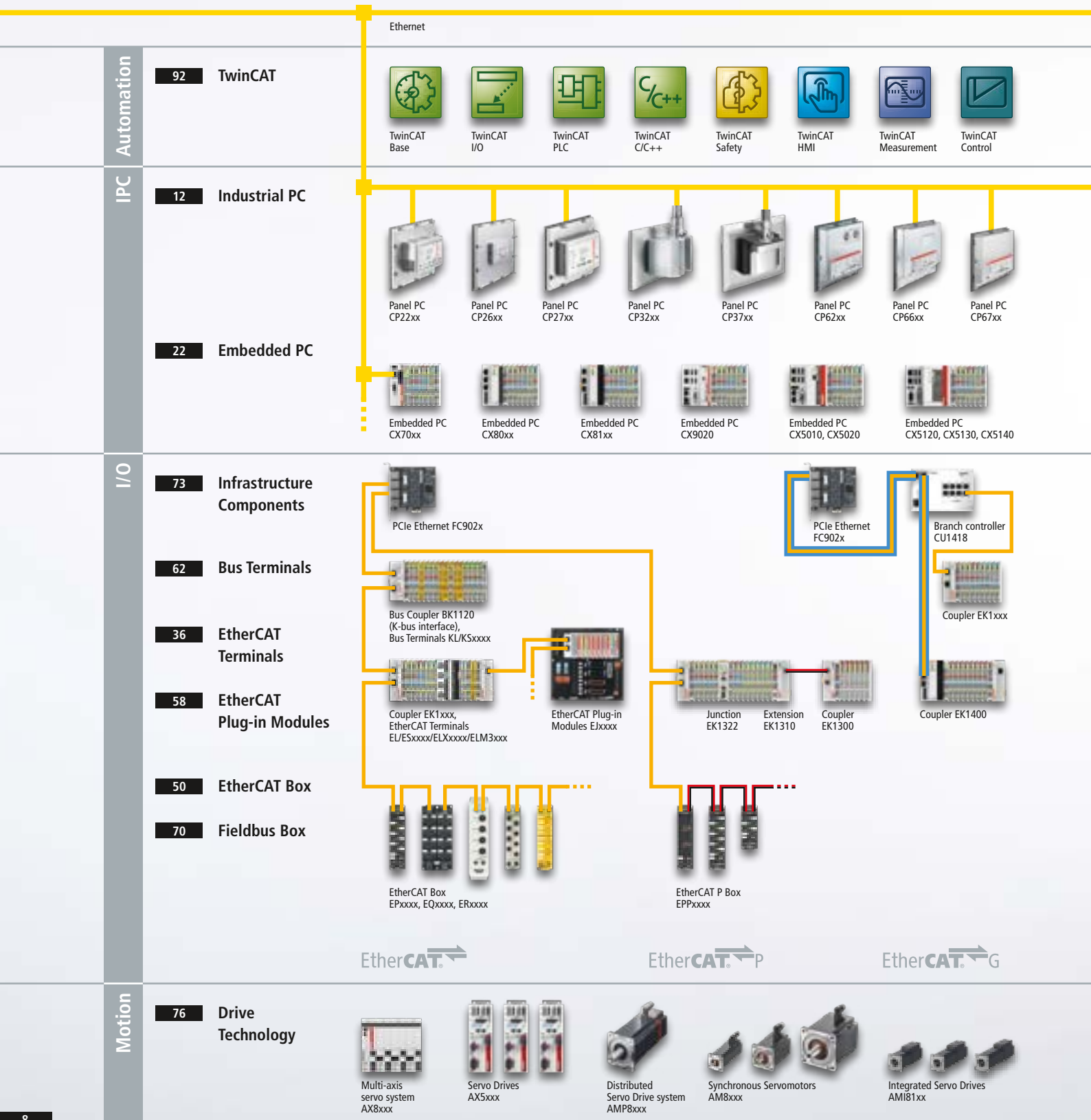


Milestones

- 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





TwinCAT Speech



TwinCAT Vision



TwinCAT Motion



TwinCAT PTP



TwinCAT NC I



TwinCAT CNC



TwinCAT Robotics



TwinCAT Connectivity



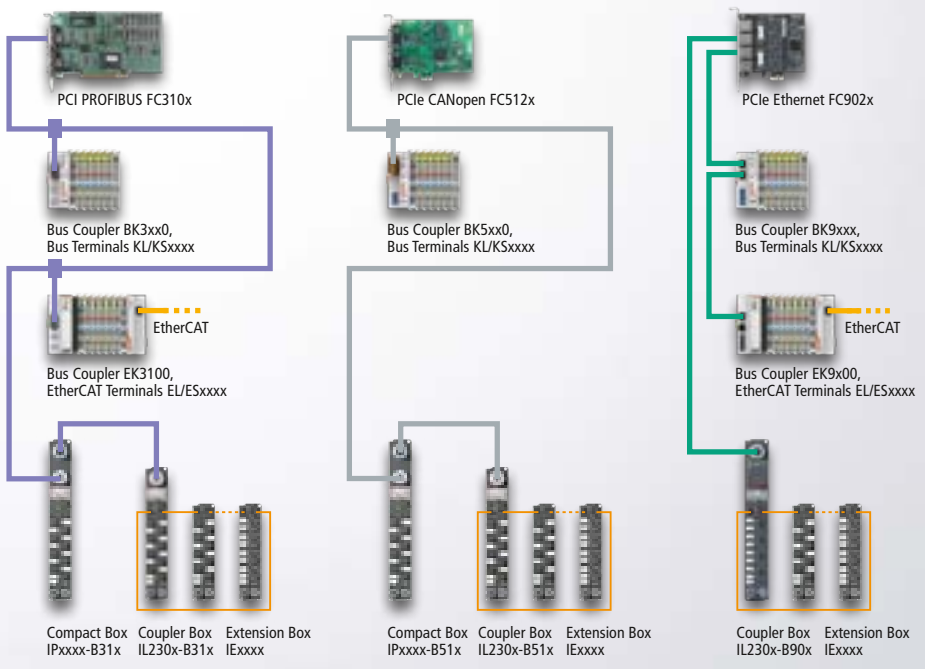
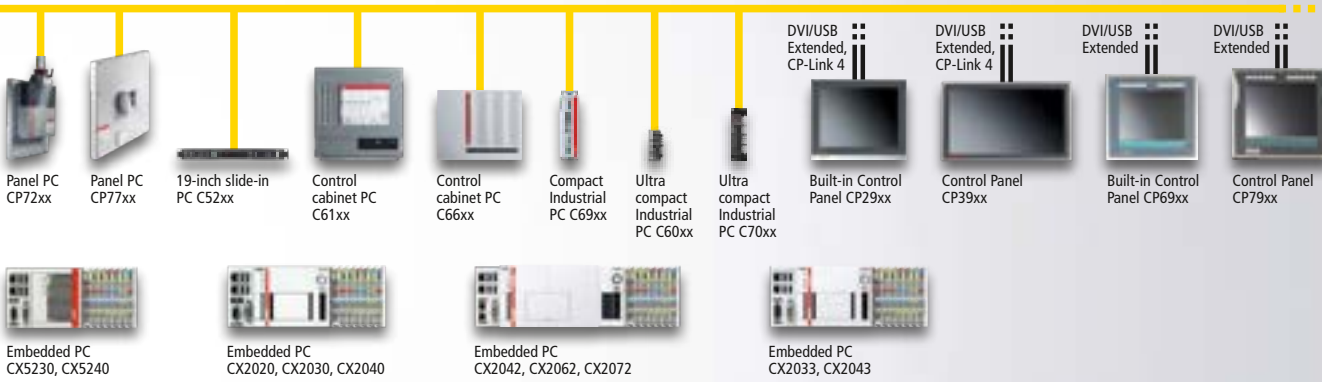
TwinCAT Industrie 4.0



TwinCAT Industry specific



TwinCAT BACnet



EtherCAT, CANopen, CC-Link, DeviceNet, Ethernet TCP/IP, EtherNet/IP, INTERBUS, LIGHTBUS, Modbus, PROFIBUS, PROFINET, RS232, RS485, SERCOS the automation bus, BACnet, DALI, 4S, DMX, EIB/KNX, enocean, IO-Link, LON, M-Bus, MP+BUS M-BUS COMPATIBLE, OPC UA, PTP/IEEE 1588



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

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Embedded PCs 22

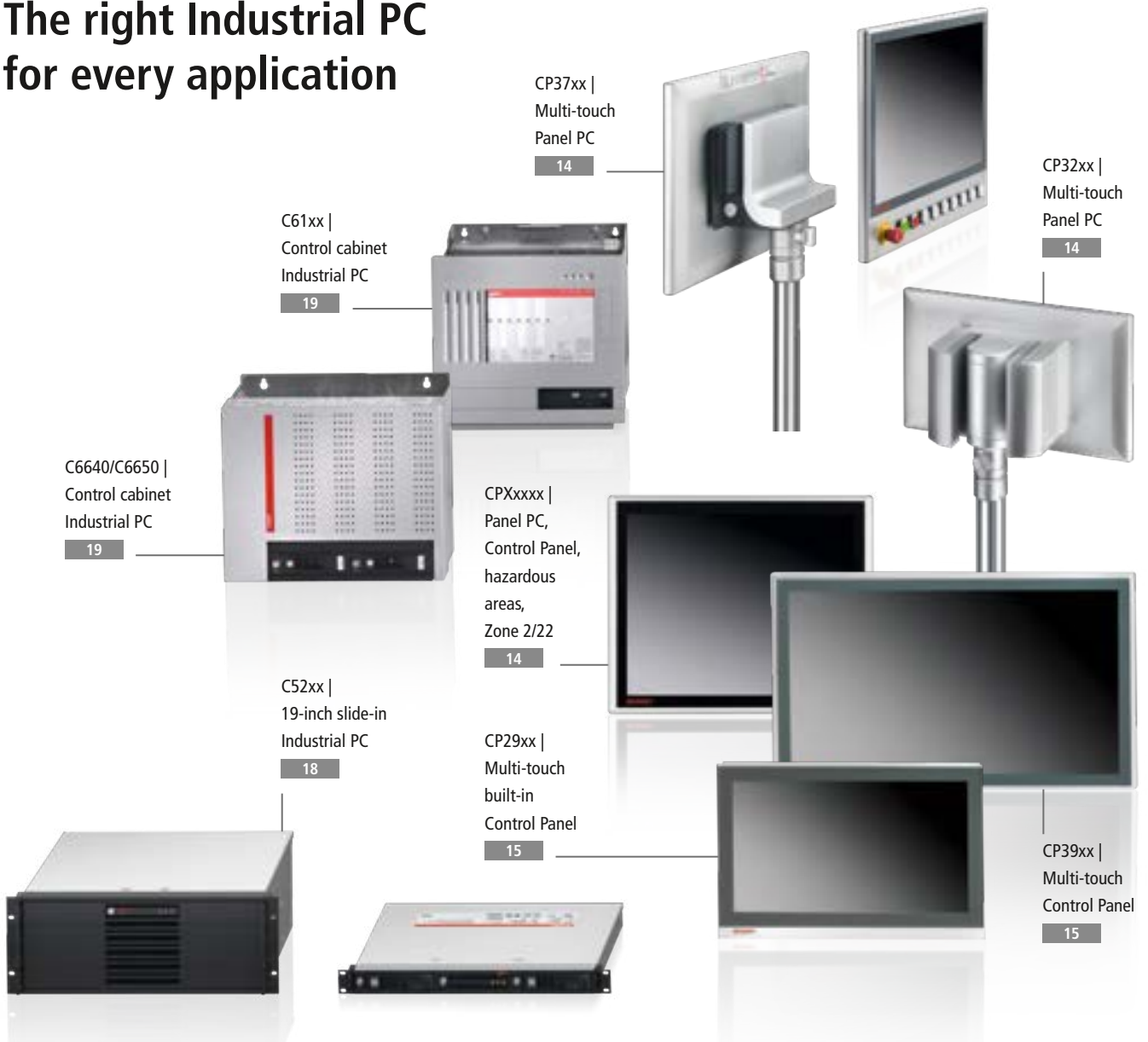
- scalable performance range
- up to 12 cores
- compact design
- direct I/O interface
- modular extension options
- DIN rail mounting

► 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					



CP2xxx |
Multi-touch
built-in Panel PC 14

CP790x-
14xx |
Stainless steel
Control Panel 17

CP6xxx |
Built-in
Control Panel 17

CP7xxx |
Panel PC 17

CP7xxx |
Control Panel 17

C65xx |
Compact
Industrial PC 18

C69xx |
Compact
Industrial PC 18

C7015 |
Ultra-compact
Industrial PC 19

C60xx |
Ultra-compact
Industrial PC 18

C6670 |
Control cabinet
industrial server 19

Control cabinet industrial server

SSI EEB motherboard
2 x Intel® Xeon®
C6670

Multi-touch Panel PCs

► www.beckhoff.com/multi-touch



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

	Display	7-inch	12-inch	12.1-inch	15-inch	15.6-inch	18.5-inch	19-inch	21.5-inch	24-inch
	Resolution	800 x 480	800 x 600	1280 x 800	1024 x 768	1366 x 768	1366 x 768	1280 x 1024	1920 x 1080	1920 x 1080
	Format	5:3	4:3	16:10	4:3	16:9	16:9	5:4	16:9	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	7-inch	12-inch	12.1-inch	15-inch	15.6-inch	18.5-inch	19-inch	21.5-inch	24-inch
	Resolution	800 x 480	800 x 600	1280 x 800	1024 x 768	1366 x 768	1366 x 768	1280 x 1024	1920 x 1080	1920 x 1080
	Format	5:3	4:3	16:10	4:3	16:9	16:9	5:4	16:9	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	7-inch	12-inch	12.1-inch	15-inch	15.6-inch	18.5-inch	19-inch	21.5-inch	24-inch
	Resolution	800 x 480	800 x 600	1280 x 800	1024 x 768	1366 x 768	1366 x 768	1280 x 1024	1920 x 1080	1920 x 1080
	Format	5:3	4:3	16:10	4:3	16:9	16:9	5:4	16:9	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	7-inch	12-inch	12.1-inch	15-inch	15.6-inch	18.5-inch	19-inch	21.5-inch	24-inch
	Resolution	800 x 480	800 x 600	1280 x 800	1024 x 768	1366 x 768	1366 x 768	1280 x 1024	1920 x 1080	1920 x 1080
	Format	5:3	4:3	16:10	4:3	16:9	16:9	5:4	16:9	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



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
	alphanumeric					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
	alphanumeric					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
	alphanumeric					CP6731	CP6732 CP6742	CP6733
CP6706, CP6700 – 3½-inch motherboard – Intel® Celeron® ULV or Atom®	without keys			CP6706	CP6700			



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 – 3½-inch motherboard – up to Intel® Core™ i3/i5/i7	without keys					CP7201	CP7202	CP7203
	function keys					CP7211	CP7212	CP7213
	numerical					CP7221	CP7222	CP7223
	alphanumeric					CP7231	CP7232 CP7242	CP7233
CP77xx – CP motherboard – Intel® Celeron® ULV or Atom®	without keys					CP7701	CP7702	CP7703
	function keys					CP7711	CP7712	CP7713
	numerical					CP7721	CP7722	CP7723
	alphanumeric					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 – DVI/USB Extended interface*	without keys	CP6907	CP6909	CP6906	CP6900	CP6901	CP6902	CP6903
	function keys		CP6919			CP6911	CP6912	CP6913
	numerical		CP6929			CP6921	CP6922	CP6923
	alphanumeric					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 – DVI/USB Extended interface*	without keys		CP7909			CP7901	CP7902	CP7903
	function keys		CP7919			CP7911	CP7912	CP7913
	numerical		CP7929			CP7921	CP7922	CP7923
	alphanumeric					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 6 th /7 th generation	Intel® Celeron®, Intel® Pentium®, Intel® Core™ i3/i5/i7 8 th /9 th generation
C5210, 19-inch slide-in Industrial PCs	1 rack unit			C5210-0030	C5210-0040
C65xx	fanless fanless, RAID			C6515-0060 C6525-0060	C6515-0070 C6525-0070
C69xx, compact Industrial PCs, connectors on front	fanless fanless, 1 CFast card slot fanless, 2 PCIe module slots optional plug-in card slots 2 PCIe module slots, optional plug-in card slots	C6905-0010 C6905-0020 C6915-0010 C6915-0020 C6925-0030 C6925-0040	C6925-0020	C6920-0060 C6930-0060	C6920-0070 C6930-0070

Control cabinet Industrial PCs with compact industrial motherboard

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



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 6 th /7 th generation	Intel® Celeron®, Intel® Pentium®, Intel® Core™ i3/i5/i7 8 th /9 th 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

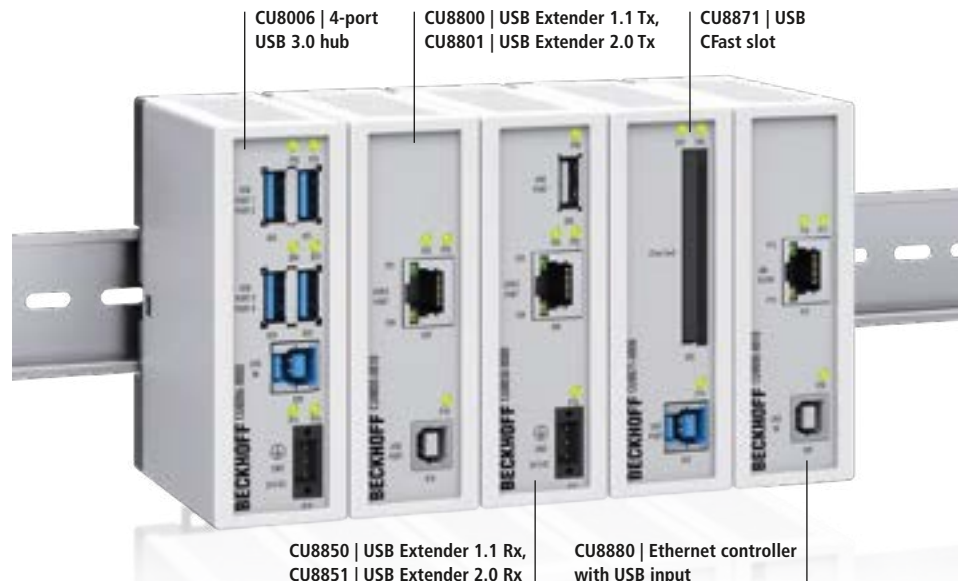


Control Panel with CNC push-button extension

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.



CU8006 | 4-port USB 3.0 hub

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

CU8871 | USB CFast slot

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

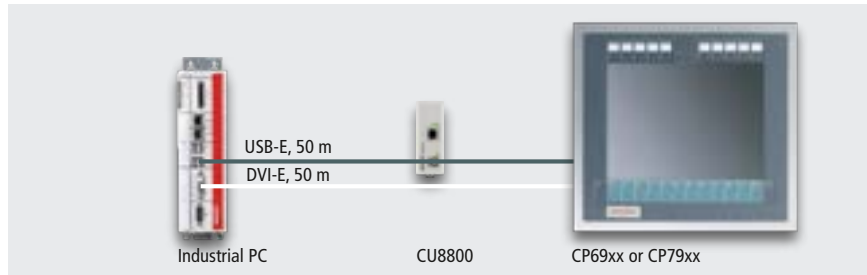
CU8880 | Ethernet controller with USB input

DVI/USB Extended

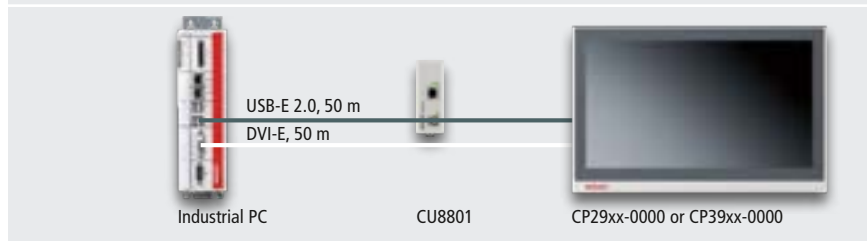
The DVI/USB Extended technology enables remote panel operation at a distance of up to 50 m from the PC. The DVI graphics signal is directly transmitted from the PC via DVI E cable. A signal processor in the Control Panels restores the DVI signal after it a distance of 50 m. For connection of the CP69xx 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



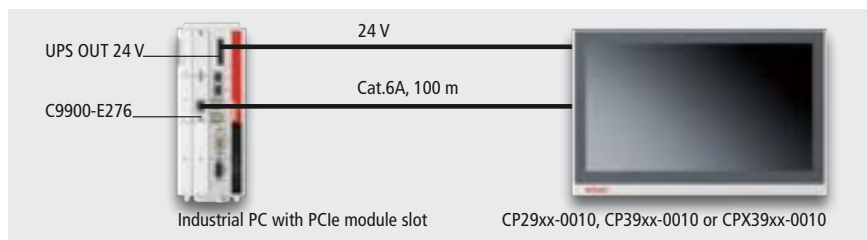
DVI/USB Extended 2.0
for CP29xx-0000 or CP39xx-0000
via the CU8801 transmitter box



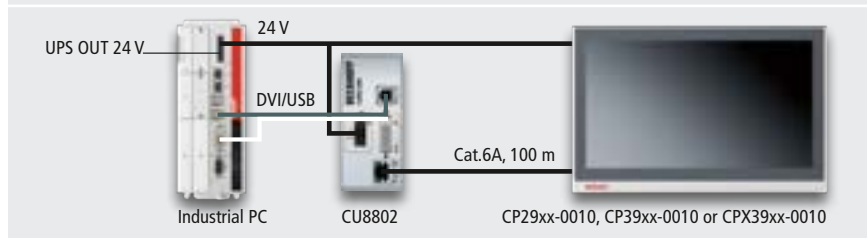
CP-Link 4: The One Cable Display Link

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.

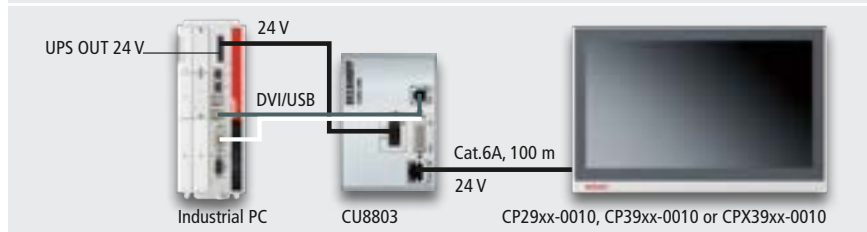
CP-Link 4 – The Two Cable Display Link:
via C9900-E276 PCIe module integrated
in the PC



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	<i>i</i> 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



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
2 nd 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 CX5120-B110 slave	CX5130-M112 2 x master CX5130-B110 slave	CX5140-M112 2 x master CX5140-B110 slave
PROFIBUS	CX5120-M310 master CX5120-B310 slave	CX5130-M310 master CX5130-B310 slave	CX5140-M310 master CX5140-B310 slave
CANopen	CX5120-M510 master CX5120-B510 slave	CX5130-M510 master CX5130-B510 slave	CX5140-M510 master CX5140-B510 slave
DeviceNet	EL6752 master EL6752-0010 slave	EL6752 master EL6752-0010 slave	EL6752 master EL6752-0010 slave
PROFINET RT	CX5120-M930 controller CX5120-B930 device	CX5130-M930 controller CX5130-B930 device	CX5140-M930 controller 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, 2 nd DVI port as option CX5230-N010	in the basic CPU, 2 nd 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, 2 nd DVI port as option CX2020-N010	in the basic CPU, 2 nd DVI port as option CX2030-N010	in the basic CPU, 2 nd DVI port as option CX2040-N010
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 CX2020-B110 slave	CX2030-M112 2 x master CX2030-B110 slave	CX2040-M112 2 x master CX2040-B110 slave
Lightbus	EL6720 master	EL6720 master	EL6720 master
PROFIBUS	CX2020-M310 or CX2500-M310 master CX2020-B310 or CX2500-B310 slave	CX2030-M310 or CX2500-M310 master CX2030-B310 or CX2500-B310 slave	CX2040-M310 or CX2500-M310 master CX2040-B310 or CX2500-B310 slave
CANopen	CX2020-M510 or CX2500-M510 master CX2020-B510 or CX2500-B510 slave	CX2030-M510 or CX2500-M510 master CX2030-B510 or CX2500-B510 slave	CX2040-M510 or CX2500-M510 master CX2040-B510 or CX2500-B510 slave
DeviceNet	EL6752 master EL6752-0010 slave	EL6752 master EL6752-0010 slave	EL6752 master EL6752-0010 slave
PROFINET RT	CX2020-M930 controller CX2020-B930 device	CX2030-M930 controller CX2030-B930 device	CX2040-M930 controller 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, 2 nd DVI port as option CX2042-N010	in the basic CPU, 2 nd DVI port as option CX2062-N010	in the basic CPU, 2 nd 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, 2 nd DVI port as option CX2033-N010	in the basic CPU, 2 nd 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 CX2033-B110 slave	CX2043-M112 2 x master CX2043-B110 slave
Lightbus	EL6720 master	EL6720 master
PROFIBUS	CX2033-M310 or CX2500-M310 master CX2033-B310 or CX2500-B310 slave	CX2043-M310 or CX2500-M310 master CX2043-B310 or CX2500-B310 slave
CANopen	CX2033-M510 or CX2500-M510 master CX2033-B510 or CX2500-B510 slave	CX2043-M510 or CX2500-M510 master CX2043-B510 or CX2500-B510 slave
DeviceNet	EL6752 master EL6752-0010 slave	EL6752 master EL6752-0010 slave
PROFINET RT	CX2033-M930 controller CX2033-B930 device	CX2043-M930 controller 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

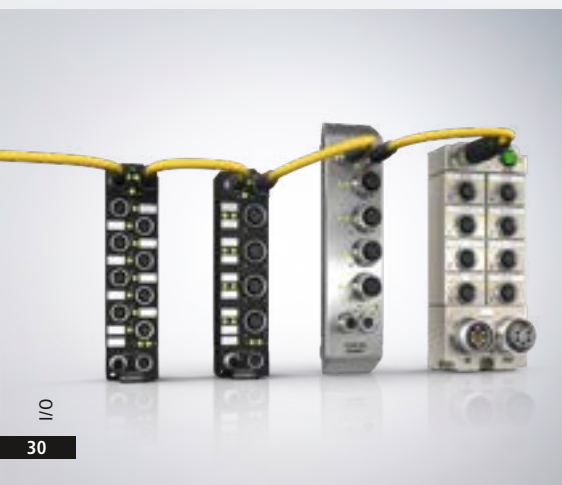
- IP 67 EtherCAT I/O system
 - high performance for harsh environments
 - compact and robust
 - can be mounted directly on machines, outside of control cabinets and terminal boxes
 - integrated sensor/actuator supply directly via EtherCAT P
- www.beckhoff.com/ethercat-box

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



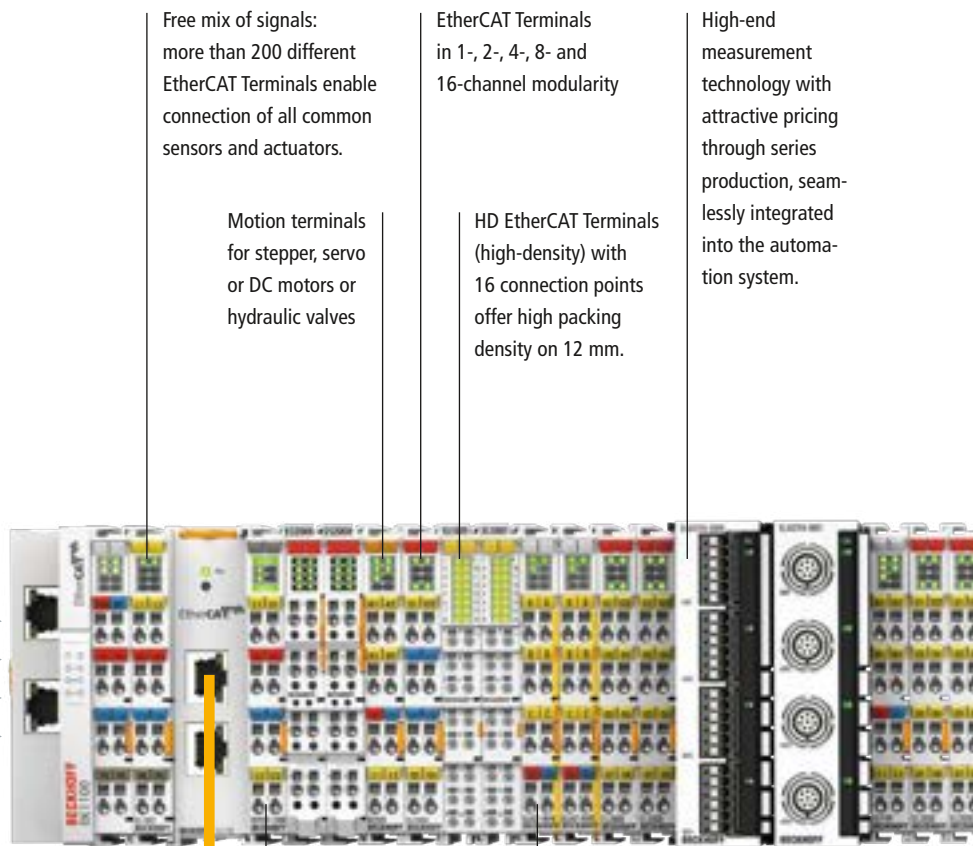
EtherCAT Coupler with integrated digital I/Os



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

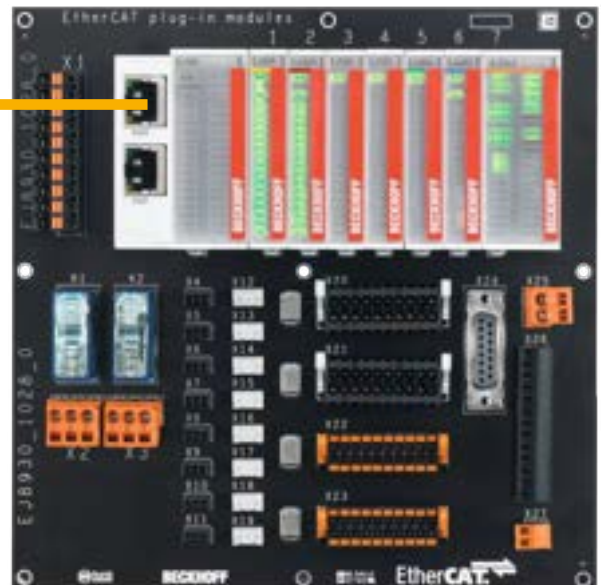
HD EtherCAT Terminals (high-density) with 16 connection points offer high packing density on 12 mm.

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>i</i>		BK7150		
Modbus	EK9000			BK7350		IPxxxx-B730
serCOS				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	EL6601, EL6614 switch port	EP6601	<i>i</i>	BK9xx0	BC9xxx	
		switch port			BX9000	
PROFINET	EK9300	EP9300		BK9xx3		
	EL6631 RT controller/device					
	EL6632 IRT controller	<i>i</i>				
EtherNet/IP	EK9500			BK9xx5		
	EL6652 scanner/adapter					
AS-Interface	EL6201			KL62x1		
IO-Link	EL6224 master	EP622x,	EJ6224	KL6224 master		
		EPP6228 master	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					






			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 CUxxxx EP9xxx	CXxxxx CXxxxx-M112	AX8000 AX5000 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	
IL230x-B800				FC75xx	CXxxxx CXxxxx	
IL230x-B810	IL230x-C810				CXxxxx	
IL230x-B90x	IL230x-C900			FC90xx CU2xxx, CU2508 Ethernet Switch	CXxxxx	
IL230x-B903				CU2508	CXxxxx	
IL230x-B905				CU2508	CXxxxx	
		EPxxxx, ERxxxx 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 EtherCAT G	EK1000 Ethernet/TSN	i	i
	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
 EK9160 IoT (MQTT, OPC UA)	
EtherNet/IP	EK9500 100 Mbit/s
Modbus	EK9000 100 Mbit/s
 EK3100 12 Mbaud	
 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 <small>T_{ON}/T_{OFF} 1 µs, timestamping</small>	EL1124 <small>filter 0.05 µs</small>				
	EL1262-0050 <small>T_{ON}/T_{OFF} 1 µs, oversampling</small>					
12 V DC		EL1144 <small>filter 10 µs</small>				
24 V DC, filter 3.0 ms	EL1002 <small>type 3</small>	EL1004 <small>type 3</small>	EL1008 <small>type 3, 1-wire</small>	EL1809 <small>type 3</small>		
		EL1104 <small>type 3, with sensor supply</small>	EL1804 <small>type 3, 8 x 24 V, 4 x 0 V</small>	EL1808 <small>type 3, 8 x 24 V DC, 2-wire</small>	EL1852 <small>type 3, 8 inputs, 8 outputs, I_{max} = 0.5 A, flat-ribbon cable</small>	EL1859 <small>type 3, 8 inputs, 8 outputs, I_{max} = 0.5 A</small>
		EL1084 <small>ground switching</small>	EL1024 <small>type 2</small>	EL1088 <small>ground switching</small>	EL1862 <small>type 3, flat-ribbon cable</small>	EL1862-0010 <small>flat-ribbon cable, ground switching</small>
					EL1889 <small>ground switching</small>	
24 V DC, filter 10 µs	EL1012 <small>type 3</small>	EL1014 <small>type 3</small>	EL1034 <small>type 1, potential-free inputs</small>	EL1018 <small>type 3</small>	EL1819 <small>type 3</small>	
		EL1114 <small>type 3, with sensor supply</small>	EL1814 <small>type 3, 8 x 24 V, 4 x 0 V, 3-wire</small>		EL1872 <small>type 3, flat-ribbon cable</small>	EL1872-0010 <small>flat-ribbon cable, ground switching</small>
			EL1094 <small>ground switching</small>	EL1098 <small>ground switching</small>	EL1899 <small>ground switching</small>	
24 V DC, XFC: T _{ON} /T _{OFF} 1 µs	EL1202 <small>type 3</small>					
	EL1252 <small>type 3, timestamping</small>	EL1254 <small>type 3, timestamping</small>		EL1258 <small>multi-timestamping</small>	EL1259 <small>8 inputs, 8 outputs, multi-timestamping, I_{max} = 0.5 A</small>	
	EL1262 <small>type 3, oversampling</small>			EL1258-0010 <small>multi-timestamping, ground switching</small>		
24 V DC, counter	EL1502 <small>type 1, 100 kHz, 32 bit</small>					
	EL1512 <small>type 1, 1 kHz, 32 bit</small>					
24 V DC, safe input		EL1904 <small>TwinSAFE, 4 safe inputs</small>	EL2911 <small>TwinSAFE Logic, 4 safe inputs, 1 safe output</small>	EL1918 <small>TwinSAFE Logic, 8 safe inputs</small>		
48 V DC		EL1134 <small>type 1</small>				
120 V AC/DC	EL1712 <small>power contacts</small>					
120 V DC	EL1712-0020 <small>power contacts</small>					

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 <i>i</i>			
	EL1722 no power contacts <i>i</i>			
220 V DC	EL1702-0020 power contacts <i>i</i>			
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 $I_{max} = \pm 20 \text{ mA}$		
12 V DC			EL2024-0010 $I_{max} = 2.0 \text{ A}$		
24 V DC, $I_{max} = 0.5 \text{ A}$		EL2002 4-wire	EL2004 2-wire	EL2008 1-wire	EL2809 $I_{max} = 0.5 \text{ A}$ 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, $I_{max} = 0.5 \text{ A}$
			EL2084 ground switching	EL2088 ground switching	EL2889 ground switching EL1852 type 3, 8 inputs, 8 outputs, $I_{max} = 0.5 \text{ A}$, flat-ribbon cable
24 V DC, $I_{max} = 2.0 \text{ A}$		EL2022 4-wire	EL2024 3-wire	EL2828	
		EL2032 with diagnostics	EL2034 with diagnostics		
			EL2044 with extended diagnostics		
24 V DC, $I_{max} = 4.0 \text{ A}/8.0 \text{ A}$		EL2042 2 x 4.0 A/1 x 8.0 A			
24 V DC, XFC: $T_{ON}/T_{OFF} 1 \mu\text{s}$		EL2202 push-pull outputs	EL2212 overexcitation, multi-timestamping	EL2258 multi-timestamping	EL1259 8 inputs, 8 outputs, multi-timestamping, $I_{max} = 0.5 \text{ A}$
		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.

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 <u>i</u> $I_{max} = 1.0 A$, change-over, no power contacts, reed relays		
		EL2652 $I_{max} = 1.0 A$, change-over, no power contacts			
Triac (12...230 V AC)		EL2712 <u>i</u> $I_{max} = 0.5 A$, power contacts	EL2722 <u>i</u> $I_{max} = 1.0 A$, mutually locked outputs		
		EL2732 <u>i</u> $I_{max} = 0.5 A$, 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, $I_{max} = \pm 50 mA$, $\pm 1 A$, $\pm 2 A$	EL2535-0005 24 V DC, $I_{max} = \pm 5 A$		
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 <u>i</u> 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 4...20 mA, single-ended, 16 bit, HART	i	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 24 bit, 10 ksps, LEMO	i

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

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 <i>i</i> 24 bit, 1 ksps, push-in	ELM3348-0000 <i>i</i> 24 bit, 1 ksps, push-in	
					EL3314-0010 24 bit	ELM3344-0003 <i>i</i> 24 bit, 1 ksps, push-in, Mini-TC universal	ELM3348-0003 <i>i</i> 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 <i>i</i> 24 bit, 1 ksps, push-in		ELM3544-0000 <i>i</i> 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  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  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.

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 incremental encoder interface, RS422, TTL, 2 x 24 V DC push-pull outputs	i	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 PROFINET IRT, controller	i EL6652 EtherNet/IP, scanner/ adapter terminal	EL6224 IO-Link, master
	EL6711-0010 CC-Link, slave	i 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, PROFI-safe master and slave support	EL6930 TwinSAFE Logic, PROFI-safe slave support			

EL7xxx | EtherCAT Terminals, motion

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

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 ELMxxx, 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 diagnostics	EL9190 any voltage up to 230 V	EL9250 with fuse, with LED	EL9260 diagnostics, with fuse
	EL9290 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



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	
	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
	PS3011-2440-0000 24 V DC, 40 A DC, 1-phase		PS3031-2440-0000 24 V DC, 40 A DC, 3-phase	

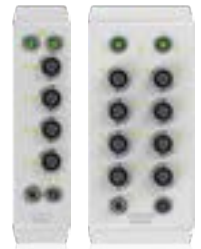
EtherCAT Box



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	EP2809-0022 ^(1, 2) 8 x M12
				EP2816-0004 M16, 19-pin
				EP2816-0003 connector with spring-loaded system
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	
				EP2816-0008 D-sub, 25-pin
24 V DC, $I_{max} = 0.5 A$, $\Sigma 16 A$				EP2816-0010 2 x D-sub, 9-pin
				EP2817-0008 D-sub, 25-pin
24 V DC, $I_{max} = 2.8 A$, $\Sigma 16 A$			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
		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
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

EPxxx: industrial housing in IP 67, ⁽¹⁾also as ERxxx: zinc die-cast housing in IP 67, ⁽²⁾also as EQxxx: stainless steel housing in IP 69K

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 tachometer 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	<table border="0"> <tr> <td>EP1122-0001 EtherCAT, 2-channel</td> <td>EP1312-0001 EtherCAT P, 2-channel</td> <td>EP9128-0021 EtherCAT, 8 x M8</td> </tr> </table>	EP1122-0001 EtherCAT, 2-channel	EP1312-0001 EtherCAT P, 2-channel	EP9128-0021 EtherCAT, 8 x M8
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, $I_{max} = 0.5 \text{ A}$, 3.0 ms	EPP2308-0002 4 x M12, 4 inputs + 4 outputs, $I_{max} = 0.5 \text{ A}$, 3.0 ms	EPP2316-0003 8 inputs + 8 outputs, $I_{max} = 0.5 \text{ A}$, connector with spring-loaded system, 10 μs	EPP2316-0008 8 inputs + 8 outputs, $I_{max} = 0.5 \text{ A}$, D-sub, 25-pin, 10 μs	
		EPP2318-0001 8 x M8, 4 inputs + 4 outputs, $I_{max} = 0.5 \text{ A}$, 10 μs	EPP2318-0002 4 x M12, 4 inputs + 4 outputs, $I_{max} = 0.5 \text{ A}$, 10 μs			
		EPP2328-0001 8 x M8, 4 inputs + 4 outputs, $I_{max} = 2 \text{ A}$, 3.0 ms	EPP2328-0002 4 x M12, 4 inputs + 4 outputs, $I_{max} = 2 \text{ A}$, 3.0 ms			
	24 V DC, in-/outputs		EPP2338-0001 8 x M8, 8 in-/outputs, $I_{max} = 0.5 \text{ A}$, 10 μs	EPP2338-0002 4 x M12, 8 in-/outputs, $I_{max} = 0.5 \text{ A}$, 10 μs	EPP2339-0021 16 x M8, 16 in-/outputs, $I_{max} = 0.5 \text{ A}$, 3.0 ms	EPP2339-0022 8 x M12, 16 inputs/outputs, $I_{max} = 0.5 \text{ A}$, 3.0 ms
		EPP2334-0061 4 x M8, 4 inputs/outputs, $I_{max} = 0.5 \text{ A}$, 10 μs	EPP2338-1001 8 x M8, 8 in-/outputs, $I_{max} = 0.5 \text{ A}$, 3.0 ms	EPP2338-1002 4 x M12, 8 in-/outputs, $I_{max} = 0.5 \text{ A}$, 3.0 ms	EPP2349-0021 16 x M8, 16 in-/outputs, $I_{max} = 0.5 \text{ A}$, 10 μs	EPP2349-0022 8 x M12, 16 inputs/outputs, $I_{max} = 0.5 \text{ A}$, 10 μs
					EPP2339-0003 16 inputs/outputs, $I_{max} = 0.5 \text{ A}$, 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	
Accelerometers	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
Incremental encoder interface 24 V DC	EPP5151-0002 32/16 bit	EPP5101-0011 32/16 bit, 5 V DC sensor supply, 4 million increments/s

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 

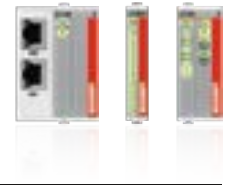
EPP7xxx | EtherCAT P Box, motion

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

EPPxxxx | EtherCAT P Box, system

Function			
Identification	EPP1111-0000 with ID switch		
EtherCAT P diagnostics	EPP9022-0060 4 x diagnostics (U, U _r , I, I _r)		
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, U _r , I, I _r), 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 μ s	
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 μ s			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 $I_{max} = \pm 20$ 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 EJ1957 TwinSAFE Logic, 8 safe inputs, 4 safe outputs	EJ2918 TwinSAFE Logic, 8 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

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	<i>i</i>
Resistance thermometer (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 $I_{ms} = 4.5 \text{ A}$, 48 V DC, OCT
		EJ7211-9414 $I_{ms} = 4.5 \text{ A}$, 48 V DC, OCT, STO, TwinSAFE SC
Stepper motor	EJ7031 $I_{max} = 1.5 \text{ A}$, 24 V DC	EJ7037 $I_{max} = 1.5 \text{ A}$, 24 V DC, incremental encoder, vector control
		EJ7041-0052 $I_{max} = 5.0 \text{ A}$, 48 V DC
		EJ7047 $I_{max} = 5.0 \text{ A}$, 48 V DC, incremental encoder, vector control
DC motor output stage		EJ7342 $I_{max} = 3.5 \text{ A}$, 48 V DC, incremental encoder
BLDC		EJ7411 $I_{ms} = 4.5 \text{ A}$, 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



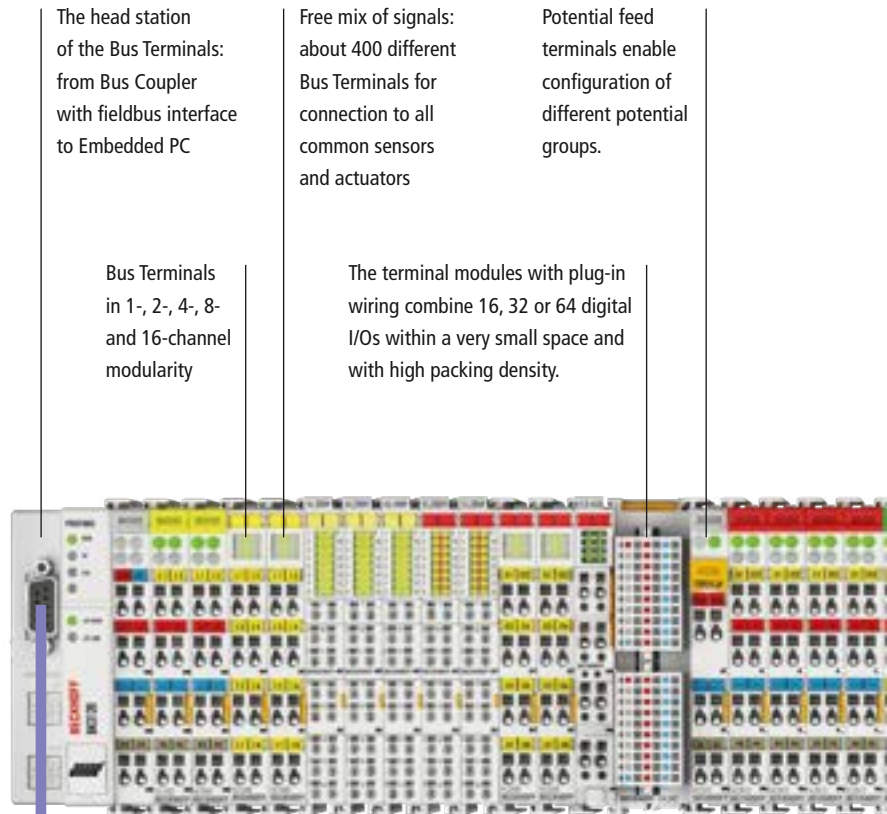
Bus Terminal Controller series BC with integrated IEC 61131-3 PLC



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



Embedded PC series CX, further Embedded PCs see page 22



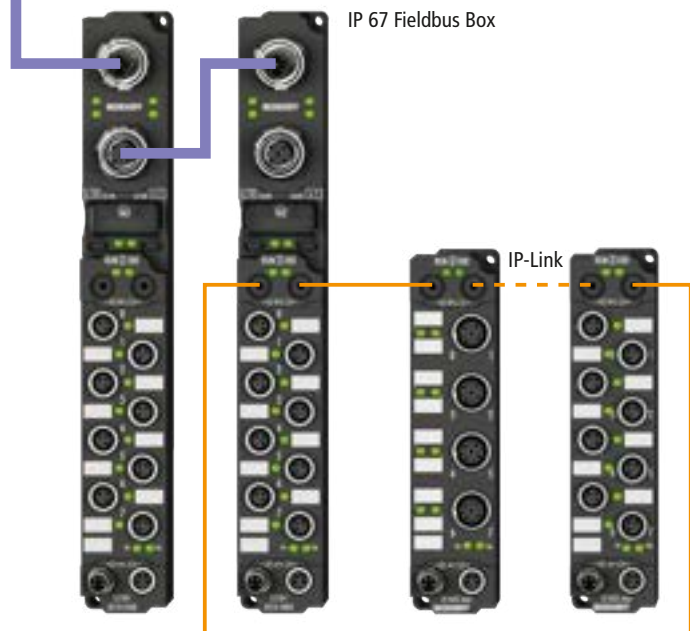
The head station of the Bus Terminals: from Bus Coupler with fieldbus interface to Embedded PC

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

IP-Link

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

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

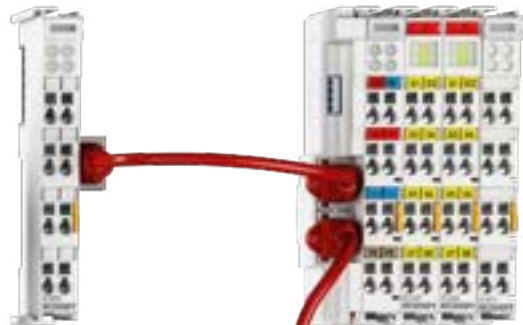
Integrated safety: the TwinSAFE Bus Terminals enable the connection of all common safety sensors and actuators.

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

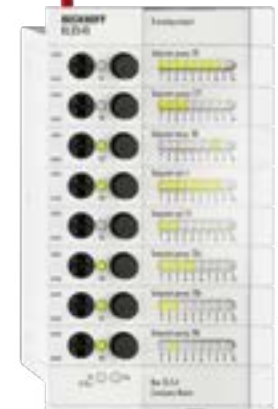
IO-Link box modules



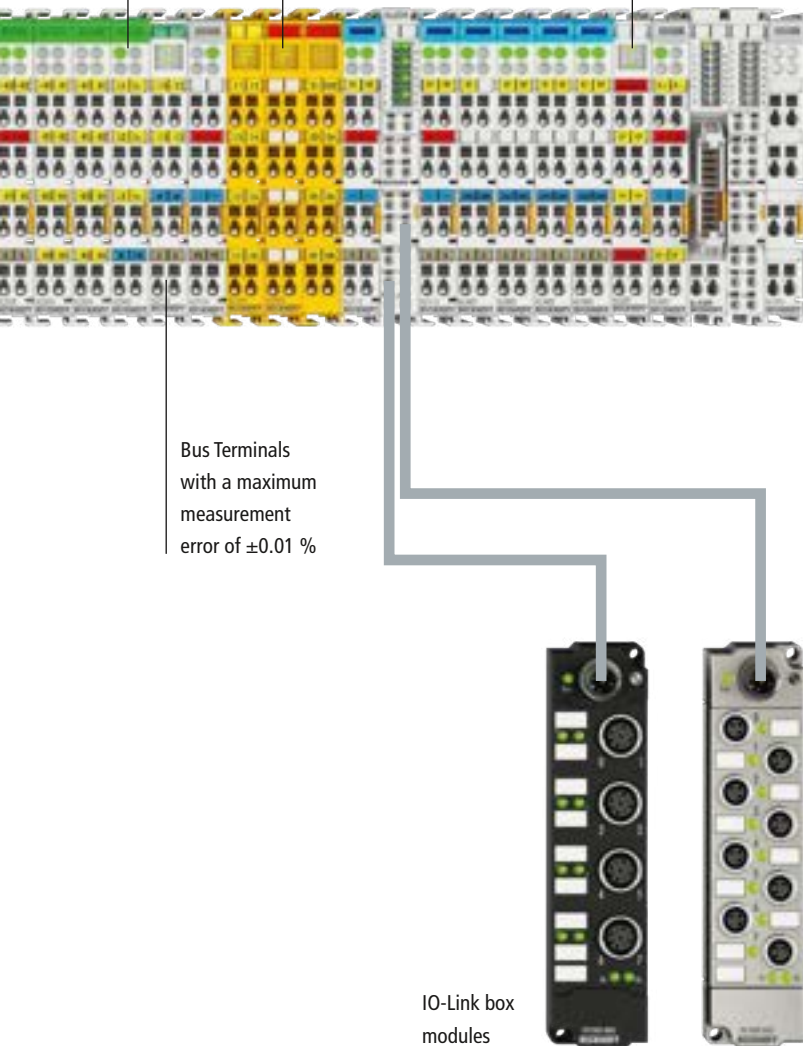
Bus end terminal



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



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



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 BK9100 2-channel switch		BK9050
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 BK3520 12 Mbaud, fibre optic	BK3150 12 Mbaud
PROFIBUS NET	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 BC9100 2-channel switch	BC9020 BC9120 2-channel switch	BX9000
		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>I</i> _{max} = ±20 mA			
24 V DC, <i>I</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>I</i> _{max} = 0.5 A	
					KL2872 flat-ribbon cable	
					KL2872-0010 flat-ribbon cable, ground switching	
24 V DC, <i>I</i> _{max} = 2.0 A		KL2022	KL2424 4 x 2-wire	KL2828 8 x 2-wire		
24 V DC, <i>I</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>I</i> _{max} = 2.0 A			KL2784			
			KL2794 potential-free	KL2798 potential-free		
230 V AC solid state relay	KL2701 <i>I</i> _{max} = 3 A	KL2702 <i>I</i> _{max} = 0.3 A				
Relay (up to 400 V AC)	KL2641 make contact, manual operation, <i>I</i> _{max} = 16 A	KL2602 make contact, <i>I</i> _{max} = 5 A	KL2622 make contact, no power contacts, <i>I</i> _{max} = 5 A	KL2634 make contact, 250 V AC/30 V DC		KM2604 <i>I</i> _{max} = 16 A, 4-channel
		KL2602-0010 make contact, <i>I</i> _{max} = 5 A, contact- protecting switching	KL2622-0010 make contact, no power contacts, <i>I</i> _{max} = 5 A, contact- protecting switching			KM2614 <i>I</i> _{max} = 16 A, 4-channel, manual operation
		KL2652 change-over, <i>I</i> _{max} = 5 A				KM2642 <i>I</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>I</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 mutually locked outputs	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 $I_{max} = \pm 1 A$, 24 V DC, current-controlled	KL2545 $I_{max} = \pm 3.5 A$, 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
±10 V	KL3001 differential input, 12 bit	KL3002 differential input, 12 bit	KL3102 differential input, 16 bit KL3132 16 bit, 0.05 %	KL3404 single-ended, 12 bit KL3408 single-ended, 12 bit
0...20 mA	KL3011 differential input, 12 bit KL3041 with sensor supply, 12 bit	KL3012 differential input, 12 bit KL3042 with sensor supply, 12 bit	KL3112 differential input, 16 bit KL3142 16 bit, 0.05 %	KL3044 single-ended, 12 bit KL3444 with sensor supply, single-ended, 12 bit
4...20 mA	KL3021 differential input, 12 bit KL3051 with sensor supply, 12 bit	KL3022 differential input, 12 bit KL3052 with sensor supply, 12 bit	KL3122 differential input, 16 bit KL3152 16 bit, 0.05 %	KL3054 single-ended, 12 bit 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 KL3204-0030 NTC (10 kΩ) KL3214 Pt100...1000, Ni100...1000, KTY, 3-wire connection
				KL3208-0010 Pt1000, Ni1000, NTC 1.8...100 k, potentiom. 1, 5, 10 kΩ 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 KM3701-0340 differential pressure, up to 340 hPa	KM3702 relative pressure, 7500 hPa	KM3712 relative pressure, -1000...+1000 hPa	
Power measurement, > 500 V		KL3453 690 V AC, 5 A, extended functionalities		

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

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	
	KL6904 TwinSAFE Logic, 4 safe outputs		
Safety			

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)
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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, Σ 4 A				IE2808 D-sub
24 V DC, I _{max} = 2 A, Σ 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, Σ 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, $I_{max} = 2 A, \sum 4 A$	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, $I_{max} = 2 A, \sum 4 A$	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
$\pm 10 V$	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
$\pm 10 V$	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, $I_{max} = 0.5 A,$ $\Sigma 4 A$			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, $I_{max} = 0.5 A,$ $\Sigma 4 A$			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
$\pm 10 V,$ 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
$\pm 10 V,$ 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

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	EP9128-0021 EtherCAT, 8 x M8	CU1423 junction, 3 x RJ45	
	CU1124 junction, 4 x RJ45	CU1128 junction, 8 x RJ45		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				
PROFINET	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

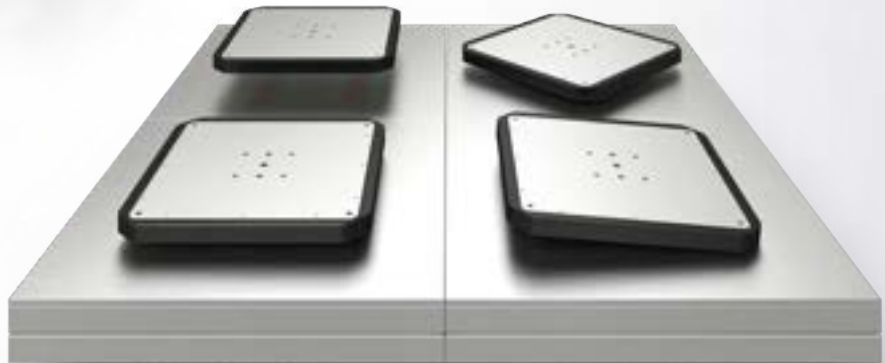
- linear motor on an endless path
- replaces traditional mechanics with advanced mechatronic solutions
- software-based functional changes
- individual product transport with continuous material flow

► 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

► www.beckhoff.com/translatory-servomotors

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 combined power supply and axis module 25 A, feedback: OCT, multi-feedback interface, TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion	i AX8540 combined power supply and axis module 40 A, feedback: OCT, multi-feedback interface, TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion	i
Option modules	AX8810 capacitor module	AX8820 energy recovery module	i AX8831 coupling module, 1-channel i AX8832 coupling module with two outputs i

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} , BISS C resolver						AX5721 1 x EnDat 2.2, BISS C		AX5702 EnDat 2.1, Hiperface, BISS B, SinCos 1 V _{pp} , BISS C 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							



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 inertia

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



AM8800 | Stainless steel servomotors with hygienic design

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

AM3000 | Servomotors

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

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



AL2000 | Linear servomotors

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

AA3033 | Electric cylinders (400 V AC)

Peak force	Flange code 75 mm
> 5000... 15000 N	AA3033 F _p = 12500 N, F _c = 3240 N

AA2500 | Tubular motors (400 V AC)

Peak force	Continuous force ≥ 300 N
> 500... 1500 N	AA2518 F _p = 1050 N, I _p = 15 A, F _c = 300 N

AA1000 | Linear actuators (48 V DC)

Peak force	Continuous force ≥ 300 N	Continuous force > 150 N
> 500... 1500 N	AA1121 F _p = 800 N, F _c = 300 N	AA1821 F _p = 800 N, F _c = 160 N

Compact Drive Technology

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

AM8100 | Servomotors for compact drive technology

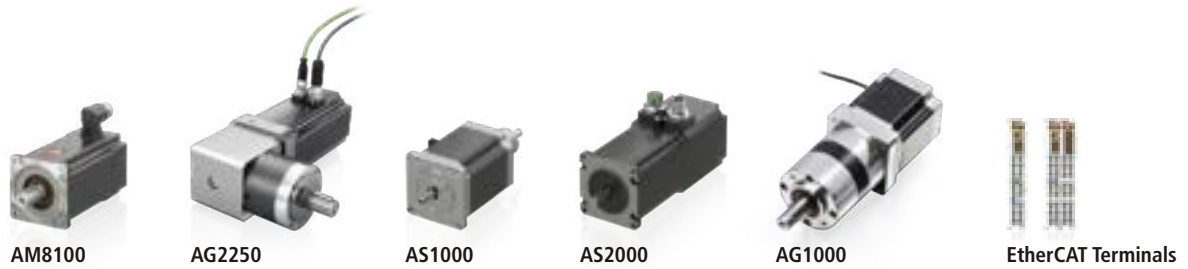
Flange code	Motor length 1	Motor length 2	Motor length 3
F1 (40 mm)	AM8111 M ₀ = 0.20 Nm	AM8112 M ₀ = 0.38 Nm	AM8113 M ₀ = 0.52 Nm
F2 (58 mm)	AM8121 M ₀ = 0.50 Nm	AM8122 M ₀ = 0.80 Nm	AM8123 M ₀ = 1.20 Nm
F3 (72 mm)	AM8131 M ₀ = 1.30...1.35 Nm	AM8132 M ₀ = 2.37...2.40 Nm	AM8133 M ₀ = 3.2 Nm
F4 (87 mm)	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

Flange code	Rated current (per phase)						
	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		



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>I_{ms}</i> = 4.5 A, 48 V DC	
			ELM7211-9018 <i>I_{ms}</i> = 4.5 A, 48 V DC, Safe Motion	
			ELM7212-9016 <i>I_{ms}</i> = 2 x 4.5 A, 48 V DC	ELM7222-9016 <i>I_{ms}</i> = 2 x 8.0 A, 48 V DC
			ELM7212-9018 <i>I_{ms}</i> = 2 x 4.5 A, 48 V DC, Safe Motion	ELM7222-9018 <i>I_{ms}</i> = 2 x 8.0 A, 48 V DC, Safe Motion
	EL7201-0010 <i>I_{ms}</i> = 2.8 A, 48 V DC, OCT	EL7211-0010 <i>I_{ms}</i> = 4.5 A, 48 V DC, OCT	ELM7221-9016 <i>I_{ms}</i> = 8 A, 48 V DC	ELM7231-9016 <i>I_{ms}</i> = 16 A, 48 V DC
	EL7201 <i>I_{ms}</i> = 2.8 A, 48 V DC, resolver	EL7211 <i>I_{ms}</i> = 4.5 A, 48 V DC, resolver	ELM7221-9018 <i>I_{ms}</i> = 8 A, 48 V DC, Safe Motion	ELM7231-9018 <i>I_{ms}</i> = 16 A, 48 V DC, Safe Motion
	EL7201-9014 <i>I_{ms}</i> = 2.8 A, 48 V DC, OCT, STO	EL7211-9014 <i>I_{ms}</i> = 4.5 A, 48 V DC, OCT, STO	EL7221-9014 <i>I_{ms}</i> = 7...8 A with ZB8610, 48 V DC, OCT, STO	
Stepper motor	EL7031 <i>I_{max}</i> = 1.5 A, 24 V DC	EL7041 <i>I_{max}</i> = 5.0 A, 48 V DC, incremental encoder		
	EL7031-0030 <i>I_{max}</i> = 2.8 A, 24 V DC	EL7041-0052 <i>I_{max}</i> = 5.0 A, 48 V DC		
	EL7037 <i>I_{max}</i> = 1.5 A, 24 V DC, incremental encoder, vector control	EL7047 <i>I_{max}</i> = 5.0 A, 48 V DC, incremental encoder, vector control		
		EL7047-9014 <i>I_{max}</i> = 5.0 A, 48 V DC, incremental encoder, vector control, STO		
DC motor output stage	EL7332 <i>I_{max}</i> = 1.0 A, 24 V DC	EL7342 <i>I_{max}</i> = 3.5 A, 48 V DC, incremental encoder		
	BLDC		EL7411 <i>I_{ms}</i> = 4.5 A, 48 V DC	
			EL7411-9014 <i>I_{ms}</i> = 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>I_{rms}</i> = 4.5 A, 48 V DC, OCT, STO suitable
Stepper motor		EP7047-0032  EP7047-1032 <i>I_{max}</i> = 5.0 A, 48 V DC, STO suitable <i>I_{max}</i> = 5.0 A, 48 V DC
	EP7041-1002⁽¹⁾ <i>I_{max}</i> = 1.5 A, 48 V DC, incremental encoder, 2 digital inputs, 1 digital output	EP7041-0002⁽¹⁾ <i>I_{max}</i> = 5 A, 48 V DC, incremental encoder, 2 digital inputs, 1 digital output
		EP7041-2002⁽¹⁾ <i>I_{max}</i> = 5 A, 48 V DC, incremental encoder, 2 digital inputs, 1 digital output, motor connection via plug
		EP7041-3002⁽¹⁾ <i>I_{max}</i> = 5 A, 48 V DC, incremental encoder, for high-speed applications, encoder system (24 V DC encoder)
		EP7041-3102 <i>I_{max}</i> = 5 A, 48 V DC, incremental encoder, for high-speed applications, encoder system (5 V DC encoder)
		EP7041-4032  <i>I_{max}</i> = 5.0 A, 48 V DC, BiSS C encoder
DC motor output stage		EP7342-0002⁽¹⁾ <i>I_{max}</i> = 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>I_{max}</i> = 1.5 A, 48 V DC, incremental encoder	 EPP7041-3002 <i>I_{max}</i> = 5.0 A, 48 V DC, incremental encoder
DC motor output stage		EPP7342-0002  <i>I_{max}</i> = 3.5 A, 48 V DC


EJ7xxx | EtherCAT Plug-in Modules, motion

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

KL2xxx | Bus Terminals, motion

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

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



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	i 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 i
	AT2041 45° curved segment, with connection cables for infeed	ATH2041 45° curved segment, with straight infeed i
	AT2042 45° curved segment, with plug connector for infeed	ATH2042 45° curved segment, with angled infeed i
180° curved segment, clothoid	AT2050 180° curved segment, without infeed	ATH2050 180° curved segment, without infeed
		ATH2051 180° curved segment, with straight infeed



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

► www.beckhoff.com/twincat





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

► www.beckhoff.com/twinsafe



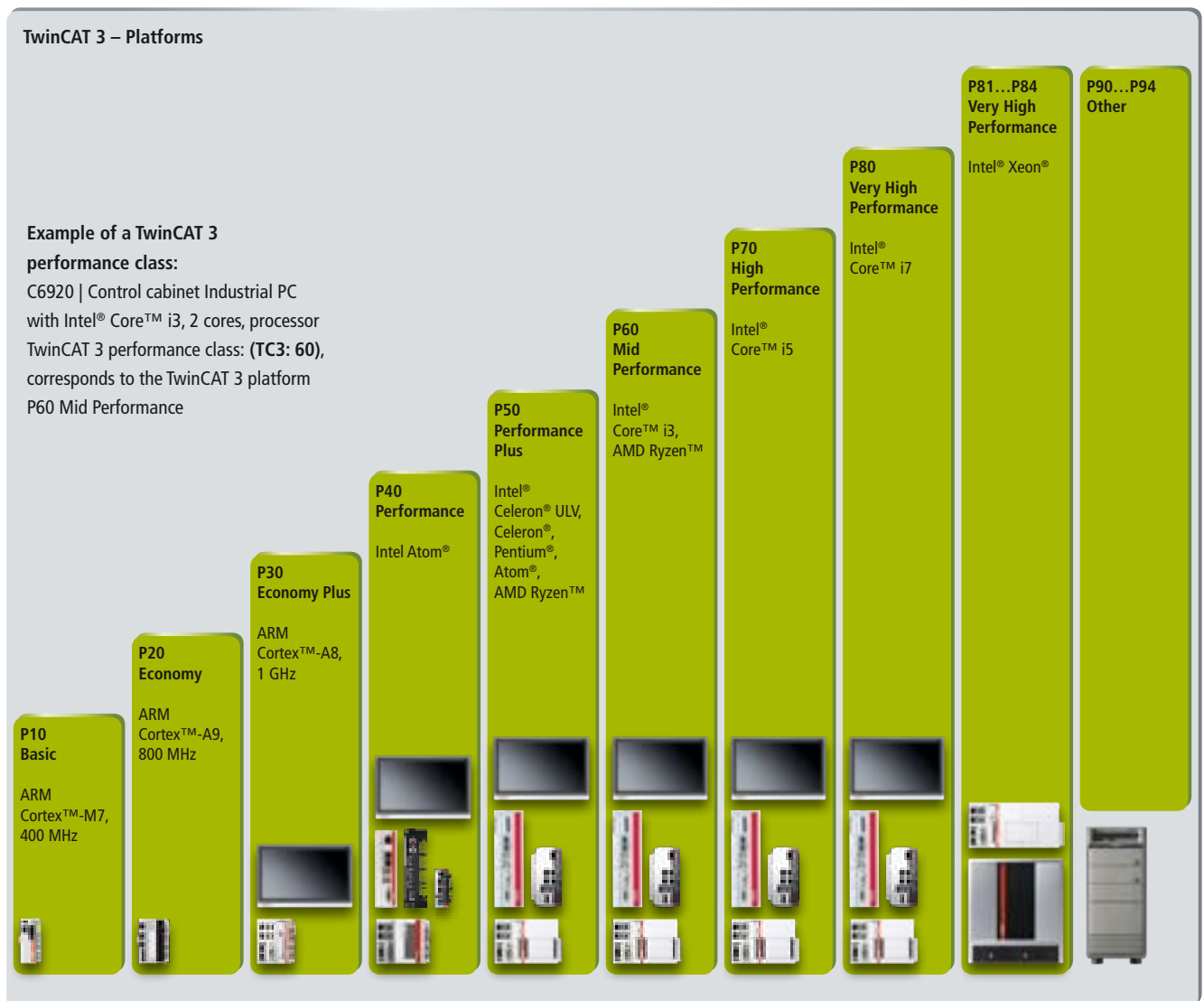
- efficient, universal engineering
- programming in different languages
- Open, hardware-independent control system gives freedom of choice in terms of automation and control components.
- scalable control platform from single- to multi-core CPUs
- all control functions on a single, centralized platform: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

TwinCAT 3

► www.beckhoff.com/twincat

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.

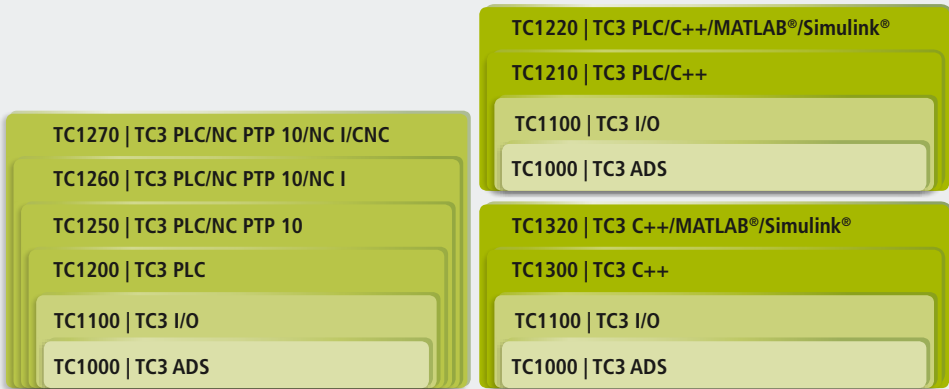


The controllers integrated in the platform categorization are only example configurations.

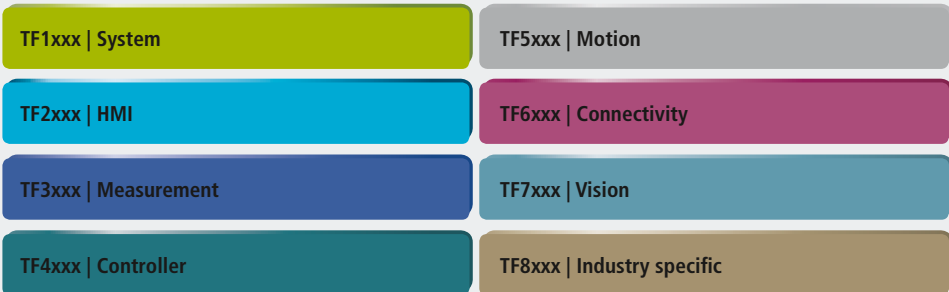
TwinCAT 3 – eXtended Automation Engineering (XAE)

TwinCAT 3 – eXtended Automation Runtime (XAR)

Base



Functions



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	i
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	i
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)	i
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	

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

[i](#)

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 i
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 i
TC3 DBC File Import for CAN	TF6650	reading of DBC file formats i
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

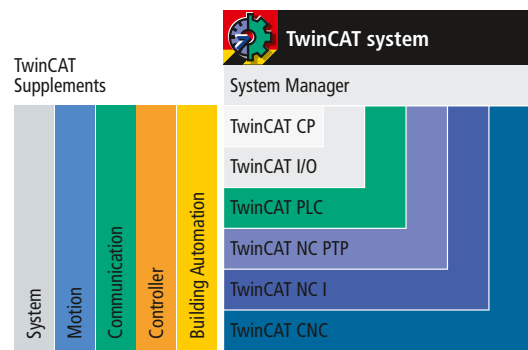
TX1200 | TwinCAT 2, TwinCAT PLC

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, zershifts, 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	<table border="0"> <tr> <td>TS5220 TwinCAT CNC Axes Pack</td> <td>TS5250 TwinCAT CNC HSC Pack</td> </tr> <tr> <td>TS5230 TwinCAT CNC Channel Pack</td> <td>TS5260 TwinCAT CNC Spline Interpolation</td> </tr> <tr> <td>TS5240 TwinCAT CNC Transformation</td> <td></td> </tr> </table>	TS5220 TwinCAT CNC Axes Pack	TS5250 TwinCAT CNC HSC Pack	TS5230 TwinCAT CNC Channel Pack	TS5260 TwinCAT CNC Spline Interpolation	TS5240 TwinCAT CNC Transformation	
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	



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 ⓘ $M_0 = 2.40 \dots 2.50 \text{ Nm}$, TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion	AMP8042 ⓘ $M_0 = 4.10 \text{ Nm}$, TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion	AMP8043 ⓘ $M_0 = 5.70 \text{ Nm}$, TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion
			AMP8051 ⓘ $M_0 = 4.00 \dots 4.90 \text{ Nm}$, TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion	AMP8052 ⓘ $M_0 = 7.80 \dots 8.20 \text{ Nm}$, TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion	AMP8053 ⓘ $M_0 = 9.10 \dots 11.00 \text{ Nm}$, 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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