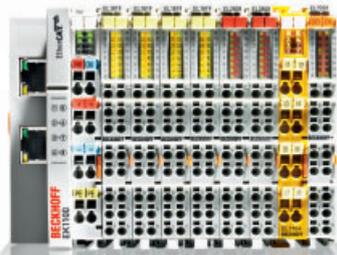


BECKHOFF New Automation Technology

Product Overview | 2017



Industrial PC
Embedded PC



EtherCAT
EtherCAT Terminal
EtherCAT Box
EtherCAT Plug-in Modules
Bus Terminal
Fieldbus Box
Infrastructure Components



Drive Technology



TwinCAT
TwinSAFE



8 Industrial PC, Control Panel

PC Control for all applications

20 Embedded PC

Modular DIN rail IPCs



26 Fieldbus Components

I/Os for all common fieldbus systems



26 EtherCAT

The real-time Ethernet fieldbus



32 EtherCAT Terminal

Ultra high-speed communication



38 EtherCAT Box

High performance for harsh environments



46 EtherCAT Plug-in Modules

Bus Terminals for circuit boards



50 Bus Terminal

The modular fieldbus system for automation



56 Fieldbus Box

The compact IP 67 modules



59 Infrastructure Components

PC Fieldbus Cards, Switches, Media Converters



60 Drive Technology

The drive system for highly dynamic positioning tasks



70 TwinCAT

PLC and Motion Control on the PC



82 TwinSAFE

Open and scalable safety technology

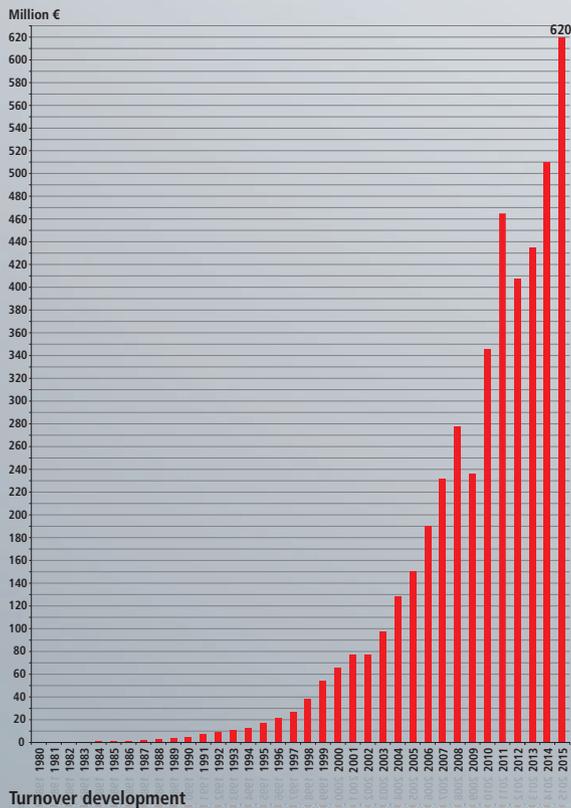




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New Automation Technology

Beckhoff implements open automation systems based on PC Control technology. The product range covers Industrial PCs, I/O and Fieldbus Components, Drive Technology and automation software. Products that can be used as separate components or integrated into a complete and seamless control system are available for all industries. The Beckhoff “New Automation Technology” philosophy represents universal and open control and automation solutions that are used worldwide in a wide variety of different applications, ranging from CNC-controlled machine tools to intelligent building automation.



Beckhoff Automation

- Headquarters Verl, Germany
- Sales 2015: **620 million €**
- Staff worldwide: **3350**
- Sales Offices Germany: **18**
- Subsidiaries/Branch Offices worldwide: **35**
- Distributors worldwide: **in more than 75 countries**

(as of 11/2016)

PC-based control technology

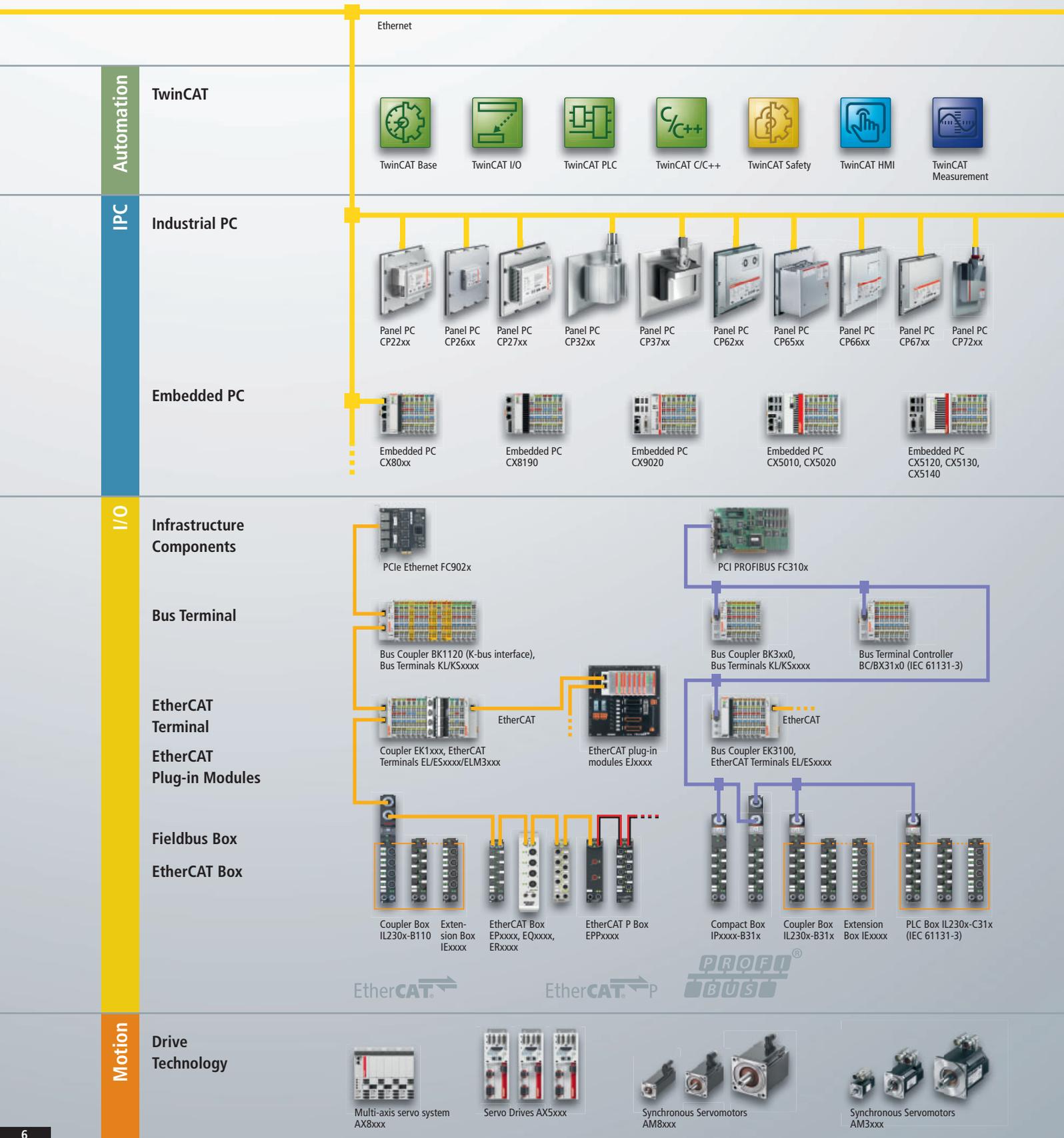
Since the foundation of the company in 1980, continuous development of innovative products and solutions using PC-based control technology has been the basis for the continued success of Beckhoff. Many automation technology standards that are taken for granted today were conceptualised by Beckhoff at an early stage and successfully introduced to the market.

The Beckhoff PC Control philosophy and the invention of the Lightbus system, the Bus Terminals and TwinCAT automation software represent milestones in automation technology and have become accepted as high-performance alternatives to traditional control technology. EtherCAT, the real-time Ethernet solution, makes forward-looking, high-performance technology available for a new generation of leading edge control concepts.

Milestones

- | | | | |
|-------------|--|-------------|---|
| 1982 | P1000 – single-board motion controller | 2008 | XFC – eXtreme Fast Control Technology |
| 1986 | PC Control – first PC-based machine controller | 2009 | HD Bus Terminals – 16-channel terminals in 12 mm |
| 1988 | S1000 – software PLC/NC on PC (DOS) | 2010 | TwinCAT 3 – eXtended Automation Technology |
| 1989 | Lightbus – high-speed fieldbus utilising optical fibre | 2011 | AM8000 – Synchronous Servomotors with One Cable Technology |
| 1990 | All-in-one PC motherboard | 2012 | 2 nd generation of Control Panels – Panel PCs and Control Panels with multi-touch technology |
| 1995 | Bus Terminal – fieldbus technology in terminal block format | 2012 | XTS – eXtended Transport System |
| 1996 | TwinCAT – real-time software package under Windows with PLC and Motion Control functions | 2014 | Many-core control – Industrial server maximises industrial computing power |
| 1998 | Control Panel – remote IPC Control Panels | 2014 | AX8000 – Multi-axis servo system |
| 1999 | Fieldbus Box – the I/O system in IP 67 | 2014 | EtherCAT Plug-in Modules – Bus Terminals for circuit boards |
| 2002 | CX1000 – modular Embedded PCs for DIN rail mounting | 2015 | EtherCAT P – One Cable Automation |
| 2003 | EtherCAT – real-time Ethernet fieldbus system | 2015 | TwinCAT HMI – for platform-independent user interfaces |
| 2005 | TwinSAFE – the compact safety solution | 2016 | EtherCAT measurement modules – system-integrated high-end measurement technology |
| 2005 | AX5000 – EtherCAT Servo Drives | | |
| 2007 | Industrial Motherboards – made in Germany | | |

System overview





TwinCAT Control



TwinCAT Motion



TwinCAT PTP



TwinCAT NC I



TwinCAT CNC



TwinCAT Robotics



TwinCAT Connectivity



TwinCAT Industrie 4.0



TwinCAT Industry specific



Panel PC CP77xx



Panel PC C36xx



19-inch slide-in PC C5xxx



Control cabinet PC C61xx



Built-in Industrial PC C65xx



Control cabinet PC C66xx



Control cabinet PC C60xx



Control cabinet PC C69xx



DVI/USB Extended, CP-Link 4



Built-in Control Panel CP29xx



Control Panel CP39xx



Built-in Control Panel CP69xx



Control Panel CP79xx



Embedded PC CX2020, CX2030, CX2040



Embedded PC CX2042, CX2062, CX2072



PCIe CANopen FC512x



PCI DeviceNet FC520x



Bus Coupler BK5xx0, Bus Terminals KLUK5xxx



Bus Terminal Controller BC/BX5xx0 (IEC 61131-3)



Ethernet Switch CU20xx



PCIe Ethernet FC902x



Bus Coupler BK9xx0, Bus Terminal Controller BC/BX9xx0 (IEC 61131-3)



EtherCAT



Bus Coupler EK9000, EtherCAT Terminals EL/ESxxx



Compact Box IPxxx-B5x0



Compact Box IPxxx-B5x8



Coupler Box IL230x-B5xx



Extension Box IExxxx



Coupler Box IL230x-B90x, PLC Box IL230x-C900 (IEC 61131-3)

CANopen

DeviceNet

Ethernet TCP/IP

ControlNet

CC-Link



Stainless steel servomotors AM88xx



Linear Servomotors ALxxx



Compact Drive Technology



XTS | eXtended Transport System



The IPC Company

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

Whether in the form of an Embedded PC with a compact form-factor for DIN rail mounting, a control cabinet 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 12

- Large model variety
- High computing power
- Display sizes from 7-inch to 24-inch
- Easy installation in control cabinets or on mounting arms
- Customer-specific implementations

► www.beckhoff.com/multi-touch

Multi-touch Control Panels 13

- Large model variety
- Display sizes from 7-inch to 24-inch
- Landscape and portrait orientation
- Easy installation in control cabinets or on mounting arms
- Customer-specific implementations

► www.beckhoff.com/multi-touch

Single-touch Panels 14

- 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





Control cabinet Industrial PC



Embedded PC

Control cabinet Industrial PCs 16

- High computing power
- Industrial-strength housing designs
- Easy installation
- High flexibility in terms of display connections

Embedded PCs 20

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

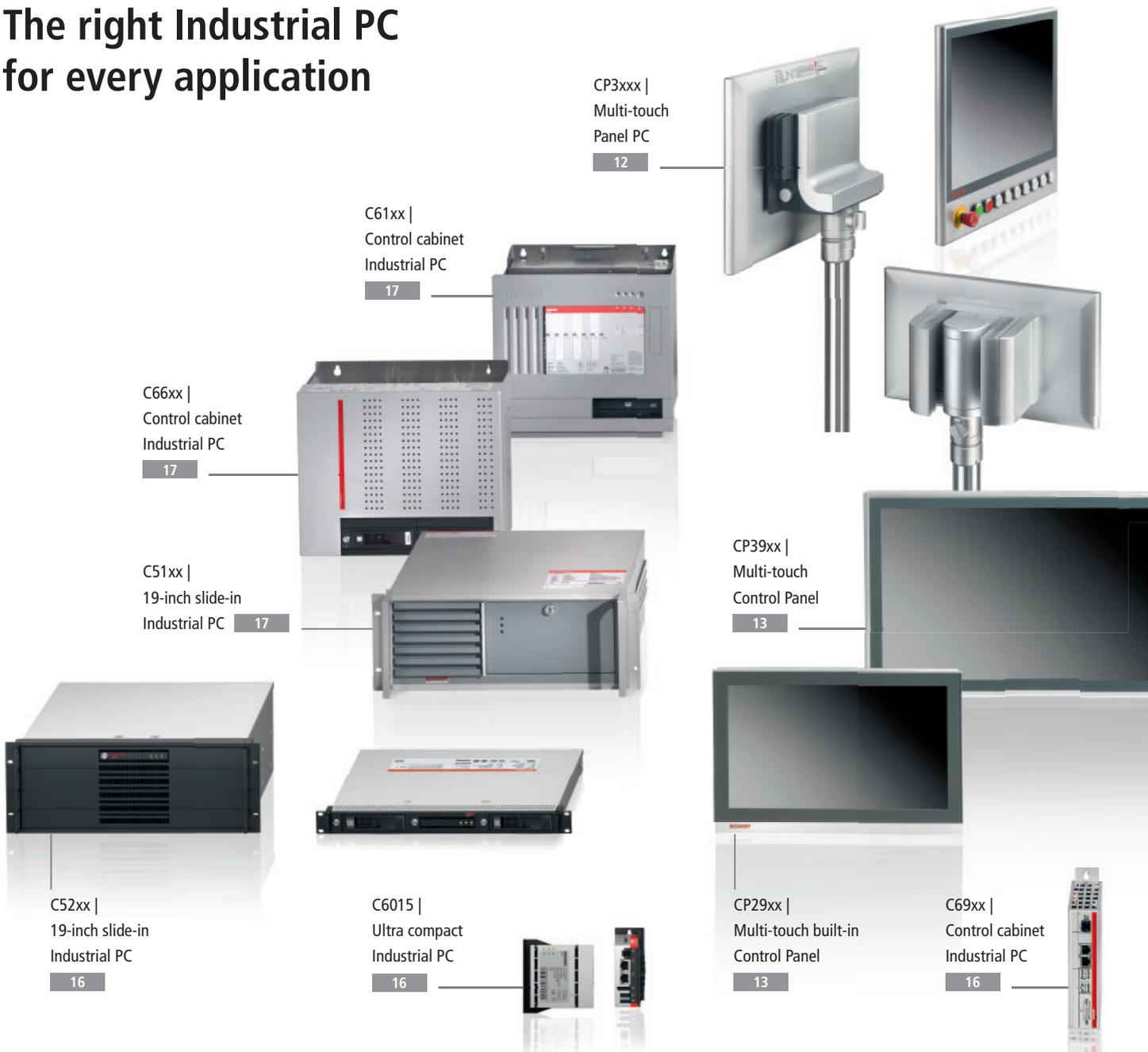
► www.beckhoff.com/Control-cabinet-PC

► www.beckhoff.com/Embedded-PC



- Wide variety of device variants of IPCs and Embedded PCs
- High-performance PCs, featuring a wide range of processors, from Intel® Celeron® to top of the line Core™ i7 processors
- Long-term availability and support of the entire product portfolio
- As the inventor of PC-based control technology, Beckhoff closely cooperates with global technology partners Intel and Microsoft.

The right Industrial PC for every application



Industrial PCs

	ATX motherboard Intel® Core™	3½-inch motherboard Intel® Core™	3½-inch motherboard Intel® Atom™/ Celeron® ULV	3½-inch motherboard ARM Cortex™-A8	Control Panels
Multi-touch Panel PCs/Control Panels		CP22xx CP32xx	CP27xx CP37xx	CP26xx	CP29xx CP39xx
Single-touch Panel PCs/Control Panels	CP65xx C36xx	CP62xx CP72xx	CP67xx CP77xx	CP66xx	CP69xx CP79xx
19-inch slide-in Industrial PCs	C5102	C5210			
Control cabinet Industrial PCs	C6140/C6150 C6240/C6250 C6640/C6650	C6515/C6525			
Compact Industrial PCs		C6920/C6930	C6905/C6915 C6925		

CP2xxx |
Multi-touch
built-in Panel PC 12

CP79xx |
Stainless
steel panel 15

CP6xxx |
Control Panel 15

CP7xxx |
Control Panel 15

CP7xxx |
Panel PC 15

C6670 |
Control cabinet
industrial server 17

C65xx |
Control cabinet
Industrial PC 16

Ultra compact Industrial PC

Compact industrial motherboard
Intel® Atom™
C6015

Control cabinet industrial server

SSI EEB motherboard
Intel® Core™
C6670

Multi-touch Panel PCs



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

	Display	7-inch	11.6-inch	12-inch	15-inch	15.6-inch	18.5-inch	19-inch	21.5-inch	24-inch
	Resolution	800 x 480	1366 x 768	800 x 600	1024 x 768	1366 x 768	1366 x 768	1280 x 1024	1920 x 1080	1920 x 1080
	Format	5:3	16:9	4:3	4:3	16:9	16:9	5:4	16:9	16:9
CP22xx-0000/-0010 – up to Core™ i3/i5/i7	multi-finger touch screen		CP2211	CP2212	CP2215	CP2216	CP2218	CP2219	CP2221	CP2224
CP26xx-0000 – ARM Cortex™-A8	dual-finger touch screen	CP2607	CP2611	CP2612	CP2615	CP2616	CP2618	CP2619	CP2621	CP2624
CP27xx-0000/-0010 – up to Atom™	multi-finger touch screen, only horizontal		CP2711	CP2712	CP2715	CP2716	CP2718	CP2719	CP2721	CP2724

Multi-touch Panel PCs, all sides IP 65

	Display	7-inch	11.6-inch	12-inch	15-inch	15.6-inch	18.5-inch	19-inch	21.5-inch	24-inch
	Resolution	800 x 480	1366 x 768	800 x 600	1024 x 768	1366 x 768	1366 x 768	1280 x 1024	1920 x 1080	1920 x 1080
	Format	5:3	16:9	4:3	4:3	16:9	16:9	5:4	16:9	16:9
CP32xx-0000/-0010 – up to Core™ i3/i5/i7	multi-finger touch screen, only horizontal			CP3212	CP3215	CP3216	CP3218	CP3219	CP3221	CP3224
CP37xx-0010 – up to Atom™	multi-finger touch screen, only horizontal			CP3712	CP3715	CP3716	CP3718	CP3719	CP3721	CP3724

Multi-touch Control Panels



CP29xx



CP39xx

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

	Display	7-inch	11.6-inch	12-inch	15-inch	15.6-inch	18.5-inch	19-inch	21.5-inch	24-inch
	Resolution	800 x 480	1366 x 768	800 x 600	1024 x 768	1366 x 768	1366 x 768	1280 x 1024	1920 x 1080	1920 x 1080
	Format	5:3	16:9	4:3	4:3	16:9	16:9	5:4	16:9	16:9
CP29xx-0000 – DVI/USB Extended interface	multi-finger touch screen	CP2907- 0000	CP2911- 0000	CP2912- 0000	CP2915- 0000	CP2916- 0000	CP2918- 0000	CP2919- 0000	CP2921- 0000	CP2924- 0000
CP29xx-0010 – CP-Link 4*	multi-finger touch screen	CP2907- 0010	CP2911- 0010	CP2912- 0010	CP2915- 0010	CP2916- 0010	CP2918- 0010	CP2919- 0010	CP2921- 0010	CP2924- 0010

Multi-touch Control Panels, all sides IP 65

	Display	7-inch	11.6-inch	12-inch	15-inch	15.6-inch	18.5-inch	19-inch	21.5-inch	24-inch
	Resolution	800 x 480	1366 x 768	800 x 600	1024 x 768	1366 x 768	1366 x 768	1280 x 1024	1920 x 1080	1920 x 1080
	Format	5:3	16:9	4:3	4:3	16:9	16:9	5:4	16:9	16:9
CP39xx-0000 – DVI/USB Extended interface	multi-finger touch screen	CP3907- 0000	CP3911- 0000	CP3912- 0000	CP3915- 0000	CP3916- 0000	CP3918- 0000	CP3919- 0000	CP3921- 0000	CP3924- 0000
CP39xx-0010 – CP-Link 4*	multi-finger touch screen	CP3907- 0010	CP3911- 0010	CP3912- 0010	CP3915- 0010	CP3916- 0010	CP3918- 0010	CP3919- 0010	CP3921- 0010	CP3924- 0010

*For further information on CP-Link 4 see page

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► www.beckhoff.com/multi-touch

Single-touch Panels



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

	Display Resolution Format	5.7-inch 640 x 480 4:3	6.5-inch 640 x 480 4:3	7-inch 800 x 480 5:3	12-inch 800 x 600 4:3	15-inch 1024 x 768 4:3	19-inch 1280 x 1024 5:4
CP62xx – 3½-inch motherboard – up to Core™ i3/i5/i7	without keys function keys numerical alphanumeric				CP6201 CP6211 CP6221 CP6231	CP6202 CP6212 CP6222 CP6232 CP6242	CP6203 CP6213 CP6223 CP6233
CP65xx – ATX motherboard – up to Core™ i3/i5/i7 – 7 slots free	without keys function keys numerical alphanumeric				CP6501 CP6511 CP6521 CP6531	CP6502 CP6512 CP6522 CP6532 CP6542	CP6503 CP6513 CP6523 CP6533
CP66xx – 3½-inch motherboard – ARM Cortex™-A8	without keys function keys numerical alphanumeric	CP6607	CP6609 CP6619 CP6629		CP6601 CP6611 CP6621 CP6631	CP6602 CP6612 CP6622 CP6632	CP6603 CP6613 CP6623 CP6633
CP6606 – 3½-inch motherboard – ARM Cortex™-A8	without keys			CP6606			
CP67xx – 3½-inch motherboard – Celeron™ ULV or Atom™	without keys function keys numerical alphanumeric	CP6707			CP6701 CP6711 CP6721 CP6731	CP6702 CP6712 CP6722 CP6732 CP6742	CP6703 CP6713 CP6723 CP6733
CP6706 – 3½-inch motherboard – Celeron™ ULV or Atom™	without keys			CP6706			
C36xx – ATX motherboard – up to Core™ i3/i5/i7 – 7 slots free	without keys				C3620	C3640	



Single-touch Panel PCs, all sides IP 65

	Display	5.7-inch	6.5-inch	7-inch	12-inch	15-inch	19-inch
	Resolution	640 x 480	640 x 480	800 x 480	800 x 600	1024 x 768	1280 x 1024
	Format	4:3	4:3	5:3	4:3	4:3	5:4
CP72xx – 3½-inch motherboard – up to Core™ i3/i5/i7	without keys				CP7201	CP7202	CP7203
	function keys				CP7211	CP7212	CP7213
	numerical				CP7221	CP7222	CP7223
	alphanumeric				CP7231	CP7232 CP7242	CP7233
CP77xx – CP motherboard – Celeron® ULV	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 65

	Display	5.7-inch	6.5-inch	7-inch	12-inch	15-inch	19-inch
	Resolution	640 x 480	640 x 480	800 x 480	800 x 600	1024 x 768	1280 x 1024
	Format	4:3	4:3	5:3	4:3	4:3	5:4
CP69xx – DVI/USB Extended interface	without keys	CP6907	CP6909	CP6906	CP6901	CP6902	CP6903
	function keys		CP6919		CP6911	CP6912	CP6913
	numerical		CP6929		CP6921	CP6922	CP6923
	alphanumeric				CP6931	CP6932 CP6942	CP6933

Single-touch Control Panels, all sides IP 65

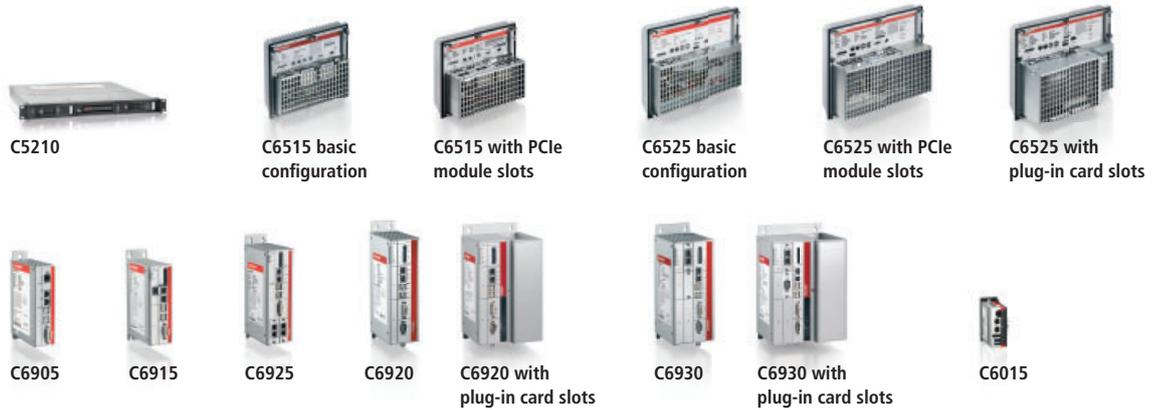
	Display	5.7-inch	6.5-inch	7-inch	12-inch	15-inch	19-inch
	Resolution	640 x 480	640 x 480	800 x 480	800 x 600	1024 x 768	1280 x 1024
	Format	4:3	4:3	5:3	4:3	4:3	5:4
CP79xx – DVI/USB Extended interface	without keys		CP7909		CP7901	CP7902	CP7903
	function keys		CP7919		CP7911	CP7912	CP7913
	numerical		CP7929		CP7921	CP7922	CP7923
	alphanumeric				CP7931	CP7932 CP7942	CP7933
CP79xx-14xx – DVI/USB Extended interface stainless steel housing	without keys,				CP7901-14xx	CP7902-14xx	CP7903-14xx

► www.beckhoff.com/single-touch

We reserve the right to make technical changes.

BECKHOFF New Automation Technology

Control cabinet Industrial PCs



Control cabinet Industrial PCs with 3½-inch motherboard

	Processor	Intel® Atom™	Intel® Celeron® ULV	Intel® Celeron® Intel® Core™ i3/i5/i7 2 nd /3 rd generation	Intel® Celeron® Intel® Core™ i3/i5/i7 4 th generation	Intel® Celeron® Intel® Core™ i3/i5/i7 6 th generation	
19-inch slide-in Industrial PC series C5210	1 Mini PCI slot, 1 rack unit			C5210-0010	C5210-0020	C5210-0030	i
Control cabinet PC series C65xx	1 Mini PCI slot			C6515-0040	C6515-0050	C6515-0060	i
	1 Mini PCI slot, RAID			C6525-0040	C6525-0050	C6525-0060	i
Compact Industrial PC series C69xx, connectors on front	fanless	C6905-0010					
	fanless, 1 CFast card slot	C6915-0010					
	2 PCIe module slots	C6925-0030	C6925-0020				
	1 Mini PCI slot, optional plug-in card slots			C6920-0040	C6920-0050	C6920-0060	i
	1 Mini PCI slot, 2 PCIe module slots, optional plug-in card slots			C6930-0040	C6930-0050	C6930-0060	i

Ultra compact control cabinet Industrial PC with compact industrial motherboard

	Processor	Intel® Atom™	
Ultra compact Industrial PC series C6015	fanless, without slots	C6015	i



Control cabinet Industrial PCs with ATX motherboard

	Processor	Intel® Celeron® Intel® Core™ i3/i5/i7 2 nd /3 rd generation	Intel® Pentium® Intel® Core™ i3/i5/i7 4 th generation	Intel® Pentium® Intel® Core™ i3/i5/i7 6 th generation
19-inch slide-in Industrial PC series C5xxx	7 slots, 4 rack units	C5102-0050	C5102-0060 C5240-0000	C5102-0070 C5240-0010
Control cabinet PC series C61xx, connectors on top	7 slots	C6140-0050 C6150-0050	C6140-0060 C6150-0060	C6140-0070 C6150-0070
Control cabinet PC series C62xx, connectors on front	7 slots	C6240-0050 C6250-0060	C6240-0060 C6250-0070	C6240-0070 C6250-0080
Control cabinet PC series C6640/C6650	7 slots	C6640-0030	C6640-0040	C6640-0050
	7 slots, 2 removable frames	C6650-0030	C6650-0040	C6650-0050

Control cabinet industrial server C6670 with SSI EEB motherboard

	Processor	Dual Intel® Xeon®
Control cabinet industrial server C6670	6 slots, 2 removable frames	C6670-0000

► www.beckhoff.com/Control-cabinet-PC

We reserve the right to make technical changes.

BECKHOFF New Automation Technology

Customisation 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 colours
- 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

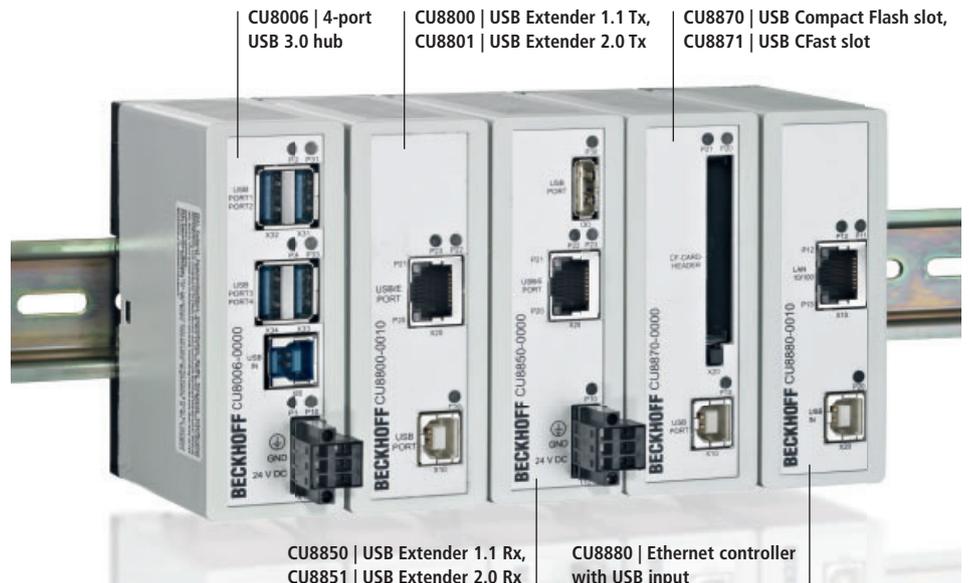


Control Panel with CNC push-button extension

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

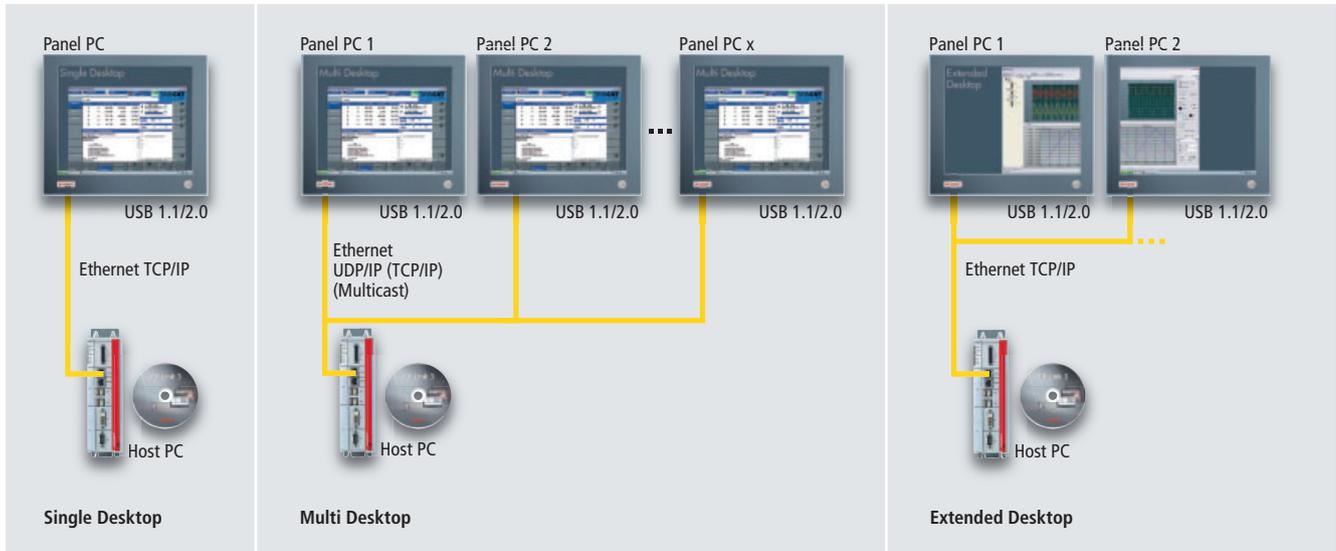
CU8870 | USB Compact Flash slot, CU8871 | USB CFast slot

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

CU8880 | Ethernet controller with USB input

CP-Link 3: Ethernet-based desktop transfer software

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

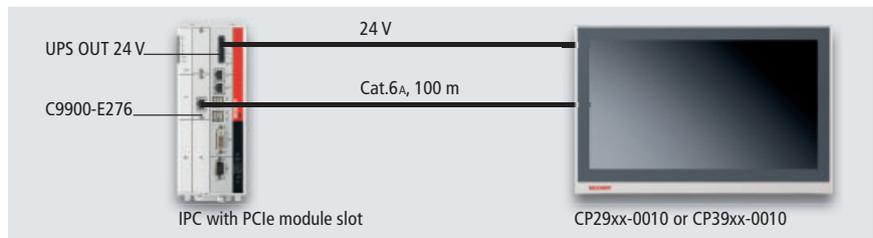


► www.beckhoff.com/CP-Link3

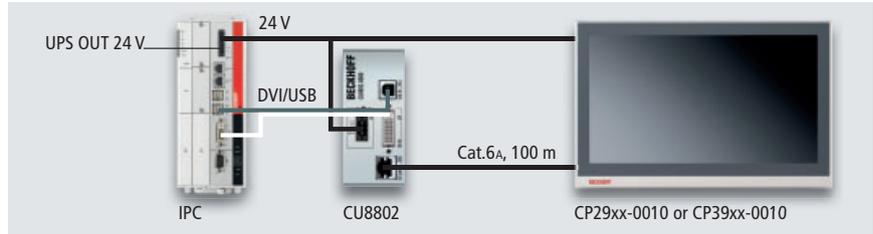
CP-Link 4: The One Cable Display Link

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

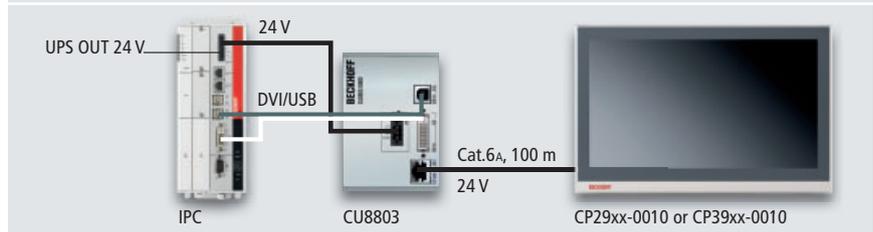
CP-Link 4 – The Two Cable Display Link:
via C9900-E276 PCIe module integrated
in the PC



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



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



► www.beckhoff.com/CP-Link4

Embedded PC



Embedded PC			
Basic CPU	CX80xx	CX8190	 CX9000, CX9010
Processor	32 bit, 400 MHz	ARM Cortex™-A9, 600 MHz	Intel® IXP420 with XScale® technology, clock frequency 266/533 MHz
Flash memory	512 MB microSD (optionally 1 GB, 2 GB or 4 GB)	512 MB microSD (optionally expandable), 1 x microSD card slot	32 MB Flash (internal, not expandable)
Internal main memory	64 MB RAM (internal, not expandable)	512 MB DDR3 RAM	128 MB RAM (internal, not expandable)
Interfaces	1 x USB device (behind the front flap), 1 x RJ45 Ethernet 10/100 Mbit/s (ADS or TCP/IP), 2 x RJ45 (switched) 10/100 Mbit/s (PROFINET)	1 x RJ45 (Ethernet), 2 x RJ45 (RT Ethernet, internal switch), 100 Mbit/s, DVI-D	2 x RJ45 (Ethernet, internal switch), 10/100 Mbit/s
I/O connection	E-bus or K-bus, automatic recognition	E-bus or K-bus, automatic recognition	direct connection for E-bus or K-bus
System interfaces	optionally integrated or via EtherCAT Terminals <input type="checkbox"/>	optionally integrated or via EtherCAT Terminals <input type="checkbox"/>	modularly expandable
DVI/USB	–	–	CX90x0-N010
RS232	CX8080	–	CX9000-N030 CX9010-N030
RS422/RS485	CX8080	–	CX9000-N031 CX9010-N031
Audio	–	–	–
Ethernet	in the basic CPU	in the basic CPU	–
4-port USB hub	–	–	CX90x0-N070
Memory medium	–	–	CX90x0-A001
Fieldbus interfaces	optionally integrated or via EtherCAT Terminals <input type="checkbox"/>	via EtherCAT Terminals	via EtherCAT Terminals
EtherCAT	CX8010 slave	–	–
Lightbus	EL6720 master	EL6720 master	EL6720 master
PROFIBUS	CX8030 master	EL6731 master	EL6731 master
	CX8031 slave	EL6731-0010 slave	EL6731-0010 slave
CANopen	CX8050 master	EL6751 master	EL6751 master
	CX8051 slave	EL6751-0010 slave	EL6751-0010 slave
DeviceNet	EL6752 master	EL6752 master	EL6752 master
	EL6752-0010 slave	EL6752-0010 slave	EL6752-0010 slave
PROFINET RT	CX8093 device	–	–
EtherNet/IP	CX8095 slave	–	–
SERCOS interface	–	–	–
UPS options	1-second UPS	1-second UPS	–

► www.beckhoff.com/Embedded-PC

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



CX9020	CX1010	CX5010, CX5020
ARM Cortex™-A8, 1 GHz	compatible with Pentium® MMX, clock frequency 500 MHz	Intel® Atom™, 1.1/1.6 GHz clock frequency
512 MB microSD (optionally expandable), 2 x microSD card slot	128 MB Compact Flash card (optionally expandable)	128 MB Compact Flash card (optionally expandable)
1 GB DDR3 RAM	256 MB DDR RAM (not expandable)	CX5010: 512 MB RAM (internal, not expandable) CX5020: 512 MB RAM (optional expandable to 1 GB)
2 x RJ45 (Ethernet, internal switch), 10/100 Mbit/s, DVI-D, 4 x USB 2.0, 1 x optional interface	1 x RJ45 (Ethernet), 10/100 Mbit/s	2 x RJ45, 10/100/1000 Mbit/s, DVI-D, 4 x USB 2.0, 1 x optional interface
E-bus or K-bus, automatic recognition	via power supply module (E-bus, K-bus, K-bus/IP-Link)	E-bus or K-bus, automatic recognition
optionally integrated	modularly expandable	optionally integrated
in the basic CPU	CX1010-N010	in the basic CPU
CX9020-N030	CX1010-N030 (COM 1/2) CX1010-N040 (COM 3/4)	CX50x0-N030
CX9020-N031	CX1010-N031 (COM 1/2) CX1010-N041 (COM 3/4)	CX50x0-N031
CX9020-N020	CX1010-N020	CX50x0-N020
in the basic CPU	CX1010-N060	in the basic CPU
in the basic CPU	–	in the basic CPU
2 nd microSD slot in the basic CPU	–	in the basic CPU
optionally integrated or via EtherCAT Terminals	modularly expandable	optionally integrated or via EtherCAT Terminals
CX9020-B110 slave	–	CX50x0-B110 slave
EL6720 master	CX1500-M200 master CX1500-B200 slave	EL6720 master
CX9020-M310 master	CX1500-M310 master	CX50x0-M310 master
CX9020-B310 slave	CX1500-B310 slave	CX50x0-B310 slave
CX9020-M510 master	CX1500-M510 master	CX50x0-M510 master
CX9020-B510 slave	CX1500-B510 slave	CX50x0-B510 slave
EL6752 master	CX1500-M520 master	EL6752 master
EL6752-0010 slave	CX1500-B520 slave	EL6752-0010 slave
CX9020-M930 controller	–	CX50x0-M930 controller
CX9020-B930 device	–	CX50x0-B930 device
CX9020-B950 slave i	–	CX50x0-B950 slave i
–	CX1500-M750 SERCOS II master	–
1-second UPS (optional)	CX1100-0910, -0900	1-second UPS



Embedded PC

Basic CPU	CX5120	CX5130	CX5140
Processor	Intel® Atom™ E3815, 1.46 GHz, 1 core	Intel® Atom™ E3827, 1.75 GHz, 2 cores	Intel® Atom™ E3845, 1.91 GHz, 4 cores
Flash memory	slot for CFast card (card not included), slot for microSD card	slot for CFast card (card not included), slot for microSD card	slot for CFast card (card not included), slot for microSD card
Internal 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, DVI-I, 4 x USB 2.0, 1 x optional interface	2 x RJ45, 10/100/1000 Mbit/s, DVI-I, 4 x USB 2.0, 1 x optional interface	2 x RJ45, 10/100/1000 Mbit/s, 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	optionally integrated	optionally integrated	optionally integrated
DVI/USB	in the basic CPU	in the basic CPU	in the basic CPU
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
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	optionally integrated or via EtherCAT Terminals	optionally integrated or via EtherCAT Terminals	optionally integrated or via EtherCAT Terminals
EtherCAT	CX5120-B110 slave	CX5130-B110 slave	CX5140-B110 slave
Lightbus	EL6720 master	EL6720 master	EL6720 master
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 slave	i CX5130-B950 slave	i CX5140-B950 slave
SERCOS interface	–	–	–
UPS options	1-second UPS	1-second UPS	1-second UPS

► www.beckhoff.com/Embedded-PC

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



CX1020	CX1030
Intel® Celeron® M ULV, 1 GHz clock frequency	Intel® Pentium® M, 1.8 GHz clock frequency
128 MB Compact Flash card (optionally expandable)	128 MB Compact Flash card (optionally expandable)
256 MB DDR RAM (expandable to 512 MB, 1 GB)	256 MB DDR RAM (expandable to 512 MB, 1 GB)
2 x RJ45 (Ethernet, internal switch)	2 x RJ45 (Ethernet, internal switch), 10/100 Mbit/s
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
CX1020-N010	CX1030-N010
CX1020-N030 (COM 1/2)	CX1030-N030 (COM 1/2)
CX1020-N040 (COM 3/4)	CX1030-N040 (COM 3/4)
CX1020-N031 (COM 1/2)	CX1030-N031 (COM 1/2)
CX1020-N041 (COM 3/4)	CX1030-N041 (COM 3/4)
CX1020-N020	CX1030-N020
CX1020-N060	CX1030-N060
–	–
–	–
modularly expandable	modularly expandable
–	–
CX1500-M200 master	CX1500-M200 master
CX1500-B200 slave	CX1500-B200 slave
CX1500-M310 master	CX1500-M310 master
CX1500-B310 slave	CX1500-B310 slave
CX1500-M510 master	CX1500-M510 master
CX1500-B510 slave	CX1500-B510 slave
CX1500-M520 master	CX1500-M520 master
CX1500-B520 slave	CX1500-B520 slave
–	–
–	–
CX1500-M750 SERCOS II master	CX1500-M750 SERCOS II master
CX1100-0920	CX1100-0930



Embedded PC

Basic CPU	CX2020	CX2030	CX2040
Processor	Intel® Celeron® 827E 1.4 GHz, 1 core	Intel® Core™ i7 2610UE 1.5 GHz, 2 cores	Intel® Core™ i7 2715QE 2.1 GHz, 4 cores
Flash memory	4 or 8 GB CFast flash card (optionally expandable)	4 or 8 GB CFast flash card (optionally expandable)	4 or 8 GB CFast flash card (optionally expandable)
Internal main memory	2 GB DDR3 RAM	2 GB DDR3 RAM	4 GB DDR3 RAM
Interfaces	2 x RJ45, 10/100/1000 Mbit/s, DVI-I, 4 x USB 2.0, 1 x optional interface	2 x RJ45, 10/100/1000 Mbit/s, DVI-I, 4 x USB 2.0, 1 x optional interface	2 x RJ45, 10/100/1000 Mbit/s, 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
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
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	optionally integrated or via EtherCAT Terminals	optionally integrated or via EtherCAT Terminals	optionally integrated or via EtherCAT Terminals
EtherCAT	CX2020-B110 slave	CX2030-B110 slave	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-M510 controller CX2040-B510 device
EtherNet/IP	CX2020-B950 slave 	CX2030-B950 slave 	CX2040-B950 slave 
UPS options	CX2100-0904, CX2100-0914	CX2100-0904, CX2100-0914	CX2100-0904, CX2100-0914

► www.beckhoff.com/Embedded-PC

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

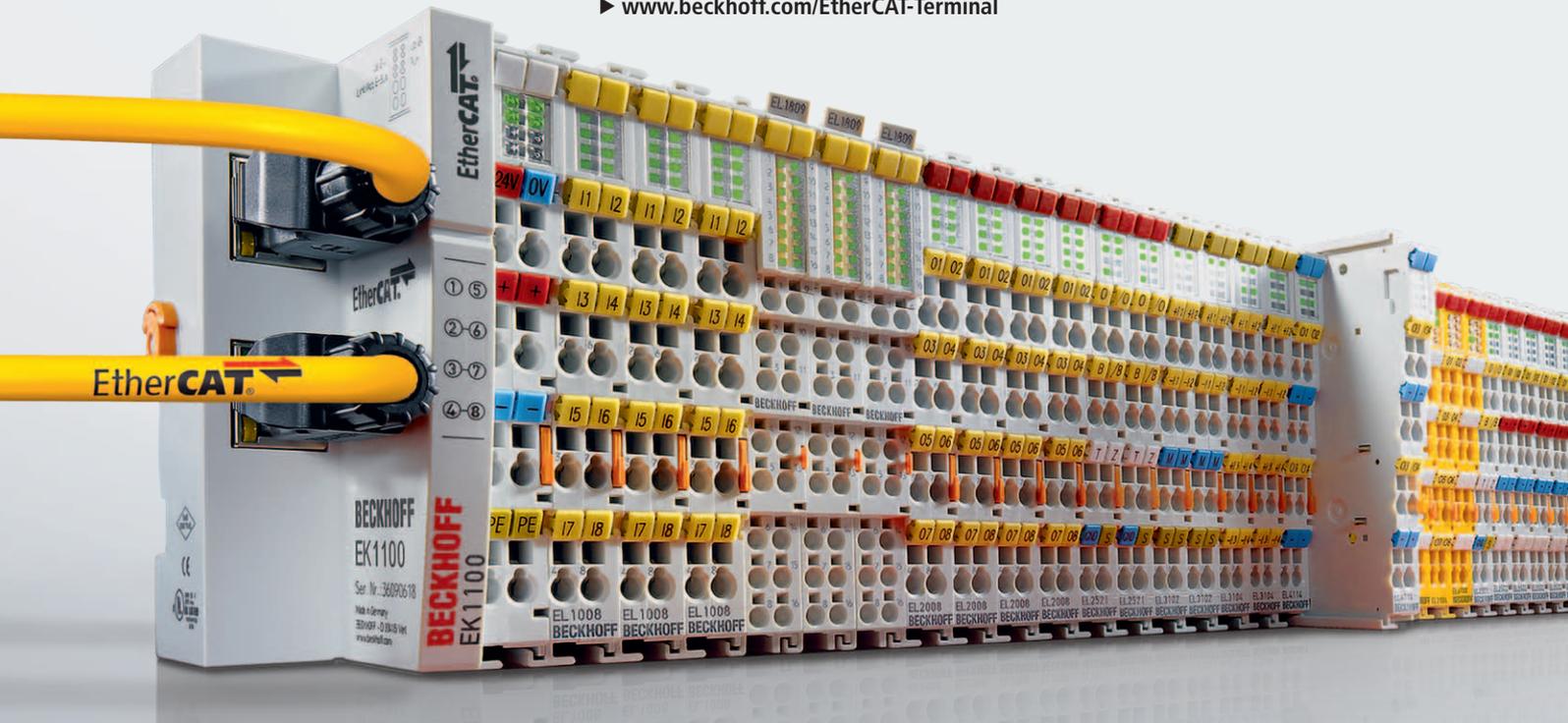


CX2042	i CX2062	i CX2072
Intel® Xeon® D-1529 1.3 GHz, 4 cores	Intel® Xeon® D-1539 1.6 GHz, 8 cores	Intel® Xeon® D-1559 1.5 GHz, 12 cores
slot for CFast card, card not included	slot for CFast card, card not included	slot for CFast card, card not included
8 GB DDR4 RAM (optionally expandable)	8 GB DDR4 RAM (optionally expandable)	8 GB DDR4 RAM (optionally expandable)
2 x RJ45, 10/100/1000 Mbit/s, 4 x USB 3.0, 1 x DVI-I	2 x RJ45, 10/100/1000 Mbit/s, 4 x USB 3.0, 1 x DVI-I	2 x RJ45, 10/100/1000 Mbit/s, 4 x USB 3.0, 1 x DVI-I
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-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
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)
optionally integrated or via EtherCAT Terminals	optionally integrated or via EtherCAT Terminals	optionally integrated or via EtherCAT Terminals
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-M510 controller
CX2042-B930 device	CX2062-B930 device	CX2072-B510 device
CX2042-B950 slave	CX2062-B950 slave	CX2072-B950 slave
CX2100-0914	CX2100-0914	CX2100-0914

EtherCAT Terminals 32

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

► www.beckhoff.com/EtherCAT-Terminal



EtherCAT Box 38

- 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
 ► www.beckhoff.com/EtherCAT-P-Box

EtherCAT Plug-in Modules 46

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

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

Bus Terminals 50

- 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



The I/O Company

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

► www.beckhoff.com/IO

► www.beckhoff.com/EtherCAT



Fieldbus Box 56

- 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

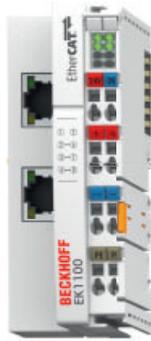
Infrastructure Components 59

- PC cards for all common fieldbus systems
 - Industrial Ethernet switches
 - EtherCAT junctions and media converters in IP 20 and IP 67 ratings
- www.beckhoff.com/Infrastructure-components



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

System overview EtherCAT I/O



EK EtherCAT Coupler series



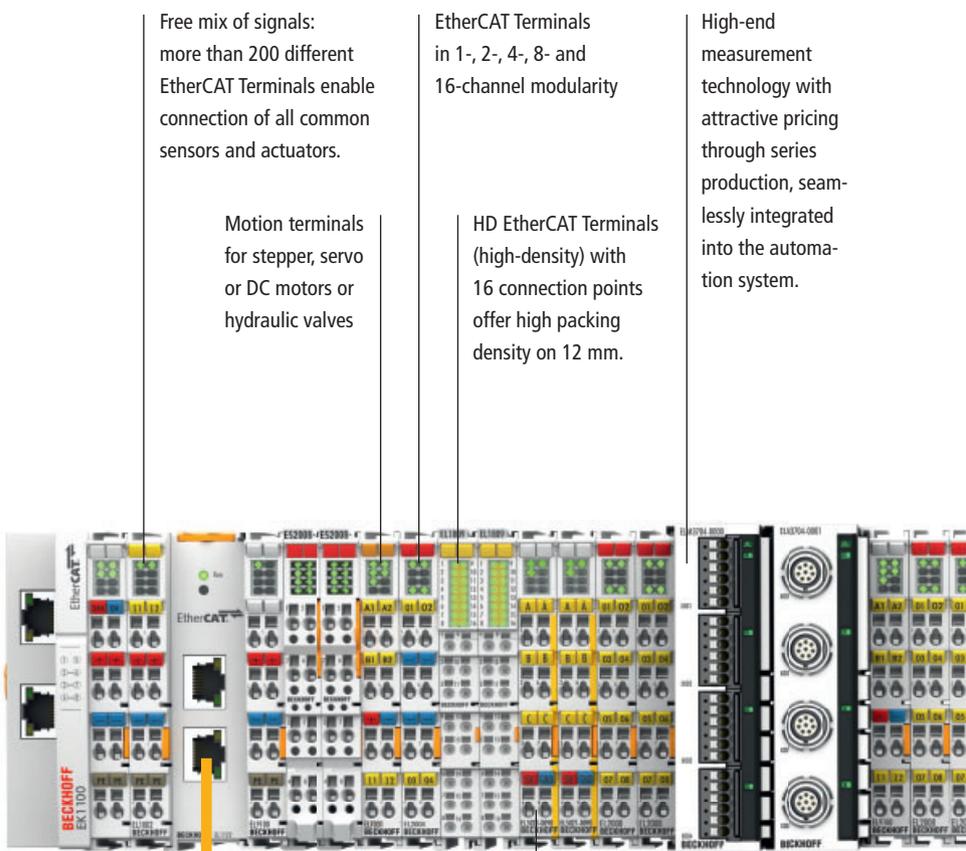
EtherCAT Coupler with integrated digital I/Os



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



Embedded PC series CX, further Embedded PCs see page 20



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

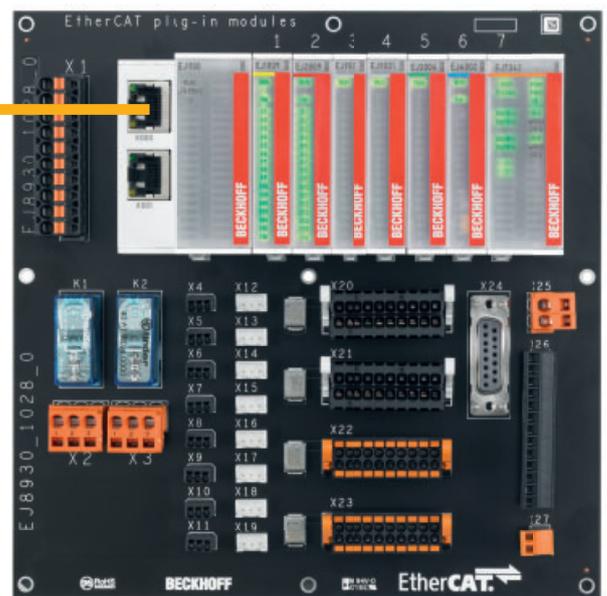
HD EtherCAT Terminals (high-density) with 16 connection points offer high packing density on 12 mm.

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

100 m Industrial Ethernet cable (100BASE-TX)

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)



Product overview fieldbus systems

Fieldbus	EtherCAT Terminal	EtherCAT Box	EtherCAT Plug-in Modules	Bus Terminal		Fieldbus Box		
	Couplers/ Gateways	Modules		Bus Couplers/ PLC Master term. (IEC 61131-3)		Compact Box	Coupler Box	
 EtherCAT	EK1xxx	EPxxxx	EJxxxx	BK1120			IL230x-B110	
	EL6695 bridge terminal	EQxxxx		BK1150				
		ERxxxx		BK1250				
 EtherCAT P	EK13xx	 EPPxxxx						
		EP1312						
 LIGHTBUS	EL6720 master terminal			BK20x0		IPxxxx-B200	IL230x-B200	
 PROFIBUS	EK3100			BK3xx0	BC31x0	IPxxxx-B31x	IL230x-B31x	
	EL6731 master/slave terminal			LC3100	BX3100			
 INTERBUS	EL6740 slave terminal			BK40x0		IPxxxx-B400	IL230x-B400	
 CANopen	EL6751 master/slave terminal			BK51xx	BC5150	IPxxxx-B51x	IL230x-B51x	
				LC5100	BX5100			
 DeviceNet	EL6752 master/slave terminal			BK52x0	BC5250	IPxxxx-B52x	IL230x-B52x	
				LC5200	BX5200			
 ControlNet				BK7000				
 CC-Link				BK7150				
 Modbus				BK73x0	BC7300	IPxxxx-B730	IL230x-B730	
 serCOS <small>the automation bus</small>	EK9700			BK75x0				
 RS485	EL6021, EL6022	EP600x		BK8000	BC8050	IPxxxx-B800	IL230x-B800	
				EPP600x	KL6021	BX8000		
				KL6041				
 RS232	EL6001, EL6002	EP600x		BK8100	BC8150	IPxxxx-B810	IL230x-B810	
				EPP600x	KL6001	BX8000		
				KL6031				
 Ethernet TCP/IP	EK9000			BK9xx0	BC9xxx		IL230x-B90x	
	EL6601, EL6614 switch port				BX9000			
 PROFINET	EK9300	EP9300		BK9xx3			IL230x-B903	
	EL6631 RT controller/device ter.							
	EL6632 IRT controller terminal							
 EtherNet/IP	EK9500			BK9xx5			IL230x-B905	
	EL6652 master/slave terminal							
 USB B				BK9500				
AS-Interface	EL6201			KL62x1				
IO-Link	EL6224	EP622x, EPP6228		KL6224				
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				KL68x1				
BACnet	EL6861							

► www.beckhoff.com/FieldbusComponents

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

EtherCAT Terminal



EtherCAT Couplers

EtherCAT Couplers E-bus	EK1100 ID switch, multimode fibre optic	EK1300 EtherCAT P Coupler	EK1101 ID switch	EK1101-0080 ID switch, Fast Hot Connect	EK1100-0008 M8 connection
	EK1501	EK1501-0010	EK1501-0100	EK1541	
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 in- + 4 outputs, 2 safe inputs + 2 safe outputs	EK1960 TwinSAFE Compact Controller, 20 safe digital inputs, 10 safe digital outputs			
EtherCAT Couplers K-bus	BK1120	BK1150 "Compact"	BK1250 between E-bus and K-bus terminals		
Bus Couplers (for ELxxxx)	EK3100 PROFIBUS EK9700 SERCOS III	EK9000 Ethernet	EK9160 IoT	EK9300 PROFINET RT	EK9500 EtherNet/IP
Extension system and junctions	EK1110 extension end terminal	EK1110-0008 extension end terminal, M8	EK1122 2-port junction	EK1122-0008 2-port junction, M8	EK1122-0080 2-port junction, Fast Hot Connect
	EK1310 extension end terminal, EtherCAT P	EK1322 2-port junction, EtherCAT P	EK1521 multimode fibre optic junction	EK1521-0010 singlemode fibre optic junction	EK1561 POF junction

Embedded PCs with E-bus interface see page [20](#), Infrastructure Components see page [59](#)

EtherCAT Terminal | Digital input: EL1xxx/ES1xxx

Signal	2-channel	4-channel	8-channel	16-channel
5/12/24 V DC	EL1382 24 V DC, thermistor	EL1124 5 V DC	EL1144 12 V DC	
	EL1052 24 V DC, NAMUR			
24 V DC (filter 3.0 ms)	EL1002 type 3	EL1004 type 3	EL1004-0020 > 2500 V	EL1008 type 3
		EL1104 with sensor supply, type 3	EL1804 8 x 24 V, 4 x 0 V, type 3	EL1808 8 x 24 V DC, type 3
		EL1084 negative switching	EL1024 type 2	EL1859 type 3, 8 inputs, 8 outputs, I _{max} = 0.5 A
				EL1088 negative switching
24 V DC (filter 10 µs)	EL1012 type 3	EL1014 type 3	EL1034 potential-free inputs, type 1	EL1018 type 3
		EL1114 with sensor supply, type 3	EL1814 8 x 24 V, 4 x 0 V, type 3	
			EL1094 negative switching	EL1098 negative switching
				EL1889 negative switching
24 V DC (XFC, T_{ON}/T_{OFF} 1 µs)	EL1202 fast input, type 3			EL1258 multi-timestamping
	EL1252 timestamp, type 3			EL1259 8 multi-timestamping inputs and outputs
	EL1262 oversampl., type 3			
24 V DC (safe inputs)		EL1904 TwinSAFE, 4 safe inputs		
48 V DC		EL1134 filter 10 µs, type 1		
120 V AC/DC	EL1712 power contacts			
230 V AC	EL1702 power contacts			
	EL1722 no power contacts			
Counter	EL1502 100 kHz, 32 bit, type 1			
	EL1512 1 kHz, 16 bit, type 1			

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

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

EtherCAT Terminal | Digital output: EL2xxx/ES2xxx, EM2xxx

Signal	2-channel		4-channel	8-channel	16-channel
5 V DC			EL2124 $I_{MAX} = \pm 20$ mA		
12 V DC			EL2024-0010 $I_{MAX} = 2.0$ A		
24 V DC	EL2042 2 x 4 A/1 x 8 A				
24 V DC ($I_{MAX} = 0.5$ A)	EL2002		EL2004 EL2014 with diagnostics	EL2008 EL2808 8 x 0 V	EM2042 D-sub connection EL2872 flat-ribbon cable EL2809 EL2819 with diagnostics
			EL2084 negative switching	EL2088 negative switching EL1859 8 inputs, 8 outputs, filter 3.0 ms, type 3	EL2889 negative switching EL2872-0010 flat-ribbon cable, negative switching
24 V DC ($I_{MAX} = 2.0$ A)	EL2022 EL2032 with diagnostics		EL2024 EL2034 with diagnostics	EL2828	
24 V DC (XFC, $T_{ON}/T_{OFF} 1 \mu s$)	EL2202 push-pull outputs	EL2212 overexcitation, multi-timestamping		EL1259 8 multi-timestamping inputs and outputs	
	EL2252 timestamp	EL2262 oversampling		EL2258 multi-timestamping	
24 V DC (safe outputs)	EL2901 TwinSAFE, 1 safe output	EL2902 TwinSAFE, 2 safe outputs	EL2904 TwinSAFE, 4 safe outputs		
30 V AC/DC ($I_{MAX} = 2.0$ A)			EL2784 EL2794 potential-free	EL2788 EL2798 potential-free	
Relay (up to 230 V AC)	EL2602 $I_{MAX} = 5.0$ A, make contacts, power contacts	EL2622 $I_{MAX} = 5.0$ A, make contacts, no power contacts	EL2624 $I_{MAX} = 2.0$ A, make contacts, no power contacts		
	EL2602-0010 $I_{MAX} = 5.0$ A, make contacts, power contacts, contact- protecting switching	EL2622-0010 $I_{MAX} = 5.0$ A, make contacts, no power contacts, contact- protecting switching			
	EL2612 $I_{MAX} = 2.0$ A, change-over, no power contacts	EL2652 $I_{MAX} = 1.0$ A, change-over, no power contacts			
Triac (12...230 V AC)	EL2712 $I_{MAX} = 0.5$ A, power contacts	EL2722 $I_{MAX} = 1.0$ A, mutually locked outputs			
	EL2732 $I_{MAX} = 0.5$ A, no power contacts				
PWM	EL2502 24 V DC, $I_{MAX} = 0.5$ A				
Frequency output	EL2521 1-channel AB, 0...500 kHz	EL2522 2-channel AB, 1-channel ABC, 0...4 MHz			
Current control	EL2595 1-channel, LED constant current terminal		EL2535 24 V DC, $I_{MAX} = \pm 50$ mA, ± 1 A or ± 2 A		
			EL2545 50 V DC, $I_{MAX} = \pm 3.5$ A		

EtherCAT Terminal | Analog input: EL3xxx/ES3xxx

Signal	1-channel		2-channel			4-channel		5-/8-channel
Multi-function	EL3751 24 bit, 10 ksp/s		ELM3702  24 bit, 10 ksp/s			ELM3704  ELM3704-0001  24 bit, 10 ksp/s 24 bit, 10 ksp/s, LEMO		
±10 V, ±20 mA, 16 bit			EL3112-0011 ±20 mA, differential input			EL3174  EL3174-0002 NAMUR NE43 electrically isolated, NAMUR NE43		
±75 mV, 24 bit			EL3602-0010					
±200 mV			EL3602-0002					
±30 V... ±20 mV			ELM3002  24 bit, 20 ksp/s			ELM3004  24 bit, 10 ksp/s		
0...10 V	EL3061 12 bit	EL3161 16 bit	EL3062 12 bit	EL3162 16 bit		EL3064 12 bit	EL3164 16 bit	EL3068 12 bit
0...30 V, 12 bit			EL3062-0030					
±10 V	EL3001 single-ended, 12 bit		EL3002 single-ended, 12 bit			EL3004 single-ended, 12 bit		EL3008 single-ended, 12 bit
	EL3101 differential input, 16 bit		EL3102 differential input, 16 bit		EL3602 differential input, 24 bit	EL3702 differential input, 16 bit, oversampling	EL3104 differential input, 16 bit	
±20 mA, NAMUR NE43			ELM3102  24 bit, 20 ksp/s			ELM3104  24 bit, 10 ksp/s		
0...20 mA	EL3041 single-ended, 12 bit	EL3141 single-ended, 16 bit	EL3042 single-ended, 12 bit	EL3142 single-ended, 16 bit	EL3742 differential input, 16 bit, oversampling	EL3044 single-ended, 12 bit	EL3144 single-ended, 16 bit	EL3048 single-ended, 12 bit
	EL3011 differential input, 12 bit	EL3111 differential input, 16 bit	EL3012 differential input, 12 bit	EL3112 differential input, 16 bit	EL3612 differential input, 24 bit	EL3014 differential input, 12 bit	EL3114 differential input, 16 bit	
4...20 mA	EL3051 single-ended, 12 bit	EL3151 single-ended, 16 bit	EL3052 single-ended, 12 bit	EL3152 single-ended, 16 bit		EL3054 single-ended, 12 bit	EL3154 single-ended, 16 bit	EL3058 single-ended, 12 bit
	EL3021 differential 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 TwinSAFE SC, 16 bit
±10 mA			EL3142-0010 single-ended, 16 bit					
Thermo- couple/mV	EL3311 16 bit		EL3312 16 bit			EL3314 16 bit	EL3314-0090 TwinSAFE SC, 16 bit	EL3318 16 bit
Resistance thermometer (RTD)	EL3201 16 bit		EL3202 16 bit			EL3204 2-wire, 16 bit	EL3214 3-wire, 16 bit	EL3208 16 bit
						EL3204-0200 16 bit, parameterisable	EL3214-0090 TwinSAFE SC, 16 bit	

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

EtherCAT Terminal | Analog input: EL3xxx/ES3xxx

Signal	1-channel	2-channel	4-channel	5-/8-channel
Resistor bridge	EL3351 EL3356 self-calibration	ELM3502 <u>i</u> 24 bit, 20 ksps	ELM3504 <u>i</u> 24 bit, 10 ksps	
3-phase power measurement		EL3403 500 V AC, 1 A ELM3602 <u>i</u> 24 bit, 50 ksps	EL3413 690 V AC, 5 A EL3433 500 V AC, 10 A	ELM3604 <u>i</u> 24 bit, 20 ksps
Measurement technology/ Condition Monitoring	EL3681 digital multimeter terminal, 18 bit	EL3632 IEPE terminal, acceleration sensors	EL3692 resistance measurement, 10 mΩ...10 MΩ EL3773 power monitoring, 500 V AC EL3783 power monitoring, 690 V AC	EL3255 potentiometer measurement, 5-channel
Pressure measuring	EM3701 differential pressure measuring, -100...+100 hPa	EM3702 relative pressure measuring, 7500 hPa	EM3712 relative pressure measuring, -1000...+1000 hPa	

EtherCAT Terminal | Analog output: EL4xxx/ES4xxx

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 EL4732 16 bit, oversampling	EL4132 16 bit	EL4034 12 bit EL4134 16 bit EL4038 12 bit
0...20 mA	EL4011 12 bit	EL4012 12 bit EL4712 16 bit, oversampling	EL4112 16 bit	EL4014 12 bit EL4114 16 bit EL4018 12 bit
4...20 mA	EL4021 12 bit	EL4022 12 bit EL4122 16 bit	EL4024 12 bit EL4124 16 bit	EL4028 12 bit
±10 mA		EL4112-0010 16 bit		

EtherCAT Terminal | Position measurement: EL/ES5xxx

Signal	1-channel				2-channel
Position measurement	EL5001 SSI encoder interface	EL5001-0011 SSI monitor terminal	EL5021 SinCos encoder interface, 1 V _{PP}	EL5021-0090 SinCos encoder interface, 1 V _{PP} , TwinSAFE SC	EL5002 SSI encoder interface
	EL5101 incremental encoder interface, RS422, 4 million increments/s	EL5101-0010 incremental encoder interface, RS422, 20 million increments/s	EL5101-0011 incremental encoder interface, RS422, oversampling	EL5101-0090 incremental encoder interface, RS422, TwinSAFE SC	EL5032 EnDat 2.2 interface
	EL5151 incremental encoder interface 24 V DC	EL5151-0021 incremental encoder interface 24 V DC, parameterisable 24 V DC output			EL5152 incremental encoder interface 24 V DC

EtherCAT Terminal | Communication: EL/ES6xxx

Signal	1-channel		2-channel	4-channel
Communication	EL6001 RS232, 115.2 kbaud	EL6021 RS422/RS485, 115.2 kbaud	EL6080 memory terminal 128 kbyte	EL6002 RS232, 115.2 kbaud, D-sub
	EL6090 display terminal	EL6070 license key terminal	EL6688 IEEE 1588 master/slave	EL6022 RS422/RS485, 115.2 kbaud, D-sub
	EL6601 switch port			EL6692 EtherCAT bridge
			EL6695 EtherCAT bridge, high performance	EL6614 switch port
Communication (master terminal)	EL6201 AS-Interface	EL6631 PROFINET RT	EL6632 PROFINET IRT	
	EL6652 EtherNet/IP	EL6720 Lightbus	EL6731 PROFIBUS	
	EL6751 CANopen	EL6752 DeviceNet	EL6851 DMX	
	EL6861 BACnet, MS/TP, RS485			
Communication (slave terminal ELxxxx-0010)	EL6631-0010 PROFINET RT	EL6652-0010 EtherNet/IP	EL6731-0010 PROFIBUS	
	EL6740-0010 Interbus	EL6751-0010 CANopen	EL6752-0010 DeviceNet	
	EL6851-0010 DMX			
Safety	EL6900 TwinSAFE Logic	EL6910 TwinSAFE Logic	EL6930 TwinSAFE/PROFIsafe logic and gateway	

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

EtherCAT Terminal | Motion: EL/ES7xxx, EM7xxx

Signal	< 3 A	3...5 A	> 5 A
Servomotor	EL7201-9014 <i>I_{rms}</i> = 2.8 A, 50 V DC, OCT, STO	EL7211-9014 <i>I_{rms}</i> = 4.5 A, 50 V DC, OCT, STO	EL7221-9014  <i>I_{rms}</i> = 7...8 A with ZB8610, 50 V DC, OCT, STO
	EL7201 <i>I_{rms}</i> = 2.8 A, 50 V DC, resolver	EL7211 <i>I_{rms}</i> = 4.5 A, 50 V DC, resolver	ZB8610 fan cartridge for EtherCAT and Bus Terminals
	EL7201-0010 <i>I_{rms}</i> = 2.8 A, 50 V DC, OCT	EL7211-0010 <i>I_{rms}</i> = 4.5 A, 50 V DC, OCT	
Stepper motor	EL7037 <i>I_{MAX}</i> = 1.5 A, 24 V DC, incremental encoder, vector control		EL7047 <i>I_{MAX}</i> = 5.0 A, 50 V DC, incremental encoder, vector control
	EL7031 <i>I_{MAX}</i> = 1.5 A, 24 V DC		EL7041 <i>I_{MAX}</i> = 5.0 A, 50 V DC, incremental encoder
DC motor output stage	EL7332 <i>I_{MAX}</i> = 1.0 A, 24 V DC	EL7342 <i>I_{MAX}</i> = 3.5 A, 50 V DC, incremental encoder	
4-axis interface	EM7004 4 incremental encoders, 32 digital I/Os 24 V DC, 4 analog outputs ±10 V		

EtherCAT Terminal | System terminals: EL9xxx/ES9xxx

Signal	System			
Components for system bus	EL9011 bus end cap	EL9070 shield terminal	EL9080 isolation terminal	EL9195 shield 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	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	
	EL9250 with fuse, with LED	 EL9260 diagnostics, with fuse	 EL9290	
Power supply	EL9410 input 24 V DC, output 5 V DC/2 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	
Filtering and smoothing	EL9540 surge filter terminal for field supply	EL9550 surge filter terminal for system/field supply	EL9576 brake chopper terminal, up to 72 V DC, 155 µF	ZB8110 external ballast resistor

EtherCAT Box



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

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

EtherCAT Box | Digital I/O

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

EtherCAT Box | Analog I/O

Input		M8	M12
±10 V, 0/4...20 mA	2-channel parameterisable, with galvanic isolation, single-ended, 16 bit		EP3162-0002
	4-channel parameterisable, differential input, 16 bit		EP3174-0002 ER3174-0002 EQ3174-0002
	4-channel parameterisable, differential input, 16 bit, TwinSAFE SC		EP3174-0092
	2-channel 2 analog inputs, parameterisable, single-ended, 16 bit, 2 digital control outputs (sink/source type), 24 V DC, short-circuit-proof		EP3182-1002
	4-channel parameterisable, single-ended, 16 bit		EP3184-0002 ER3184-0002
	4-channel parameterisable, single-ended, 16 bit, 2 channels per socket		EP3184-1002 ER3184-1002
Resistance thermometer	4-channel resistance thermometer (RTD), PT100, PT200, PT500, PT1000, Ni100, Ni120, Ni1000, 16 bit		EP3204-0002 ER3204-0002 EQ3204-0002
Thermo-couple/mV	4-channel thermocouple, type J, K, L, B, E, N, R, S, T, U, 16 bit		EP3314-0002 ER3314-0002 EQ3314-0002
Resistor bridge	1-channel resistor bridge, 24 bit, self-calibration		EP3356-0022
Pressure measuring	4-channel differential/absolute pressure measurement, 6 digital inputs, 2 digital outputs, 4 pressure inputs -1...1 bar (differential pressure to fifth connection)	EP3744-0041	
	4-channel differential/absolute pressure measurement, 6 digital inputs, 2 digital outputs, 4 pressure inputs 0...7 bar (differential pressure to fifth connection)	EP3744-1041	
Output		M8	M12
±10 V, 0/4...20 mA	4-channel parameterisable, 16 bit		EP4174-0002 ER4174-0002
	4-channel 2 inputs + 2 outputs, parameterisable, 16 bit		EP4374-0002 ER4374-0002

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

EtherCAT Box | Special functions

Function	M8	M12	Other	
Position measurement	SSI encoder interface 1 MHz, 32 bit		EP5001-0002	
	Incremental encoder interface RS422 32/16 bit, 5 V DC sensor supply		EP5101-0002 ER5101-0002	EP5101-0011 D-sub, 4 million increments/s EP5101-2011 D-sub, 20 million increments/s
	Incremental encoder interface RS422 32/16 bit, 24 V DC sensor supply		EP5101-1002 ER5101-1002	
	Incremental encoder interface 24 V DC 32/16 bit		EP5151-0002 ER5151-0002	
Communication	Serial interface 1-channel, RS232, RS422/RS485, 5 V DC/1 A		EP6001-0002 ER6001-0002	
	Serial interface 2-channel, RS232, RS422/RS485		EP6002-0002 ER6002-0002	
	IO-Link master Class A, 4 ports		EP6224-2022	
	IO-Link master Class B, 4 ports		EP6224-3022	
	IO-Link master Class A, 8 ports		EP6228-0022	
Motion	Stepper motor module $I_{max} = 1.5$ A, 50 V DC, incremental encoder, 2 digital inputs, 1 digital output		EP7041-1002 ER7041-1002	
	Stepper motor module $I_{max} = 5$ A, 50 V DC, incremental encoder, 2 digital inputs, 1 digital output		EP7041-0002 ER7041-0002 EP7041-2002 ER7041-2002 EP7041-3002 ER7041-3002 EP7041-3102	
	DC motor output stage $I_{max} = 3.5$ A, 50 V DC		EP7342-0002 ER7342-0002	
	Multi-functional I/O box 8 digital inputs/outputs, 2 x tachometer input, 2 x 0/4...20 mA input, 1 x 0/4...20 mA output, 1 x 1.2 A PWMi output		EP8309-1022 ER8309-1022	
System	EtherCAT Box 3 decimal ID switches	EP1111-0000		
	EtherCAT junction 2-channel	EP1122-0001		
	EtherCAT P junction 2 ports	EP1312-0001		
	EtherCAT junction 8 ports	EP9128-0021		
	Power distribution 4/4-channel			EP9214-0023 7/8" plug, 7/8" socket
	Power distribution with current measurement/data logging 4/4-channel			EP9224-0023 7/8" plug, 7/8" socket
	PROFINET RT EtherCAT Box EtherCAT Box interface with PROFINET RT		EP9300-0022	
	EtherCAT media converter fibre optic 1-channel			EP9521-0020

EtherCAT P Box



EtherCAT P Box | Digital I/O

Input		4 x M8	8 x M8	16 x M8	4 x M12	8 x M12	Other
24 V DC	4-channel filter 3.0 ms	EPP1004- 0061					
	8-channel filter 3.0 ms		EPP1008- 0001		EPP1008- 0002	EPP1008- 0022	
	8-channel filter 10 µs		EPP1018- 0001		EPP1018- 0002		
	8-channel 2-channel timestamp		EPP1258- 0001		EPP1258- 0002		
	8-channel multi-function input				EPP1518- 0002		
	16-channel filter 3.0 ms			EPP1809- 0021		EPP1809- 0022	
	16-channel filter 10 µs			EPP1819- 0021		EPP1819- 0022	
	16-channel filter 10 µs, D-sub socket, 25-pin						EPP1816- 0008
	16-channel filter 10 µs, D-sub socket, 25-pin, acceleration sensor						EPP1816- 3008
Output		4 x M8	8 x M8	16 x M8	4 x M12	8 x M12	Other
24 V DC	8-channel $I_{MAX} = 0.5 A, \Sigma 3 A$		EPP2008- 0001		EPP2008- 0002	EPP2008- 0022	
	8-channel $I_{MAX} = 2 A, \Sigma 3 A$		EPP2028- 0001		EPP2028- 0002		
	8-channel $I_{MAX} = 2 A, \Sigma 3 A$, with diagnostics		EPP2038- 0001		EPP2038- 0002		
	16-channel $I_{MAX} = 0.5 A, \Sigma 3 A$			EPP2809- 0021		EPP2809- 0022	
	16-channel $I_{MAX} = 0.5 A, \Sigma 3 A$, D-sub socket, 25-pin						EPP2816- 0008
	16-channel $I_{MAX} = 0.5 A, \Sigma 3 A$, 2 x D-sub socket, 9-pin						EPP2816- 0010
	16-channel $I_{MAX} = 0.5 A, \Sigma 3 A$, M16, 19-pin						EPP2816- 0004
	24-channel $I_{MAX} = 0.1 A$, D-sub socket, 25-pin						EPP2817- 0008
25 V AC/ 30 V DC	4-channel relay output				EPP2624- 0002		



EtherCAT P Box | Digital I/O

Combi		4 x M8	8 x M8	16 x M8	4 x M12	8 x M12	Other	
24 V DC	4-channel 4 inputs/outputs, filter 10 μ s, $I_{\text{MAX}} = 0.5$ A	EPP2334- 0061						
	8-channel 4 inputs + 4 outputs, filter 3.0 ms, $I_{\text{MAX}} = 0.5$ A		EPP2308- 0001		EPP2308- 0002			
	8-channel 4 inputs + 4 outputs, filter 10 μ s, $I_{\text{MAX}} = 0.5$ A		EPP2318- 0001		EPP2318- 0002			
	8-channel 4 inputs + 4 outputs, filter 3.0 ms, $I_{\text{MAX}} = 2$ A, $\sum 3$ A		EPP2328- 0001		EPP2328- 0002			
	8-channel 8 inputs/outputs, filter 10 μ s, $I_{\text{MAX}} = 0.5$ A, $\sum 3$ A		EPP2338- 0001		EPP2338- 0002			
	8-channel 8 inputs/outputs, filter 3.0 ms, $I_{\text{MAX}} = 0.5$ A, $\sum 3$ A		EPP2338- 1001		EPP2338- 1002			
	16-channel 16 inputs/outputs, filter 3.0 ms, $I_{\text{MAX}} = 0.5$ A, $\sum 3$ A				EPP2339- 0021		EPP2339- 0022	
	16-channel 16 inputs/outputs, filter 10 μ s, $I_{\text{MAX}} = 0.5$ A, $\sum 3$ A				EPP2349- 0021		EPP2349- 0022	
	16-channel 8 inputs + 8 outputs, filter 10 μ s, $I_{\text{MAX}} = 0.5$ A, $\sum 3$ A, D-sub socket, 25-pin							EPP2316- 0008
	16-channel 8 inputs + 8 outputs, filter 10 μ s, $I_{\text{MAX}} = 0.5$ A, $\sum 3$ A, IP 20 plug							EPP2316- 0003

EtherCAT P Box | Analog I/O

Input		M8	M12
±10 V, 0/4...20 mA	4-channel parameterisable, differential input, 16 bit		EPP3174-0002
	4-channel parameterisable, single-ended, 16 bit		EPP3184-0002
Resistance thermometer	4-channel resistance thermometer (RTD), PT100, PT200, PT500, PT1000, Ni100, Ni120, Ni1000, 16 bit		EPP3204-0002
Thermo- couple/mV	4-channel thermocouple, type J, K, L, B, E, N, R, S, T, U, 16 bit		EPP3314-0002
Pressure measuring	4-channel differential/absolute pressure measurement, 6 digital inputs, 2 digital outputs, 4 pressure inputs -1...1 bar (differential pressure to fifth connection)	EPP3744-0041	
	4-channel differential/absolute pressure measurement, 6 digital inputs, 2 digital outputs, 4 pressure inputs 0...7 bar (differential pressure to fifth connection)	EPP3744-1041	
Output		M8	M12
±10 V, 0/4...20 mA	4-channel parameterisable, 16 bit		EPP4174-0002
	4-channel 2 inputs + 2 outputs, parameterisable, 16 bit		EPP4374-0002

EtherCAT P Box Special functions				
Function		M8	M12	Other
Position measurement	Incremental encoder interface RS422 32/16 bit, 5 V DC sensor supply		EPP5101-0002	EPP5101-0011 D-sub, 4 million increments/s
	Incremental encoder interface RS422 32/16 bit, 24 V DC sensor supply		EPP5101-1002	
	Incremental encoder interface 24 V DC 32/16 bit		EPP5151-0002	
Communication	Serial interface 1-channel, RS232, RS422/RS485, 5 V DC/1 A		EPP6001-0002	
	Serial interface 2-channel, RS232, RS422/RS485		EPP6002-0002	
	IO-Link master Class A, 8 ports		EPP6228-0022	<u>i</u>
Motion	Stepper motor module $I_{max} = 1.5$ A, 50 V DC, incremental encoder, 2 digital inputs, 1 digital output		EPP7041-1002	
	Stepper motor module $I_{max} = 5$ A, 50 V DC, incremental encoder, 2 digital inputs, 1 digital output		EPP7041-3002	
	DC motor output stage $I_{max} = 3.5$ A, 50 V DC		EPP7342-0002	
System	EtherCAT P Box 3 decimal ID switches	EPP1111-0000		
	EtherCAT P junction 3 ports, with feed-in	EPP1322-0001		
	EtherCAT P junction 3 ports, with refresh	EPP1332-0001		
	EtherCAT P junction 3 ports	EPP1342-0001		
	EtherCAT P Box EtherCAT P/EtherCAT connector with power transmission	EPP9001-0060	<u>i</u>	
	EtherCAT P Box 4 x diagnostics (U_s , U_r , I_s , I_r)	EPP9022-0060	<u>i</u>	

EtherCAT Plug-in Modules



EtherCAT Couplers

EtherCAT Couplers E-bus	EJ1100	EJ1101-0022 external connectors, power supply module and optional ID switches
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EtherCAT Plug-in Modules | Digital input: EJ1xxx

Signal	2-channel	4-channel	8-channel	16-channel
5 V DC			EJ1128 <i>i</i>	
24 V DC (filter 3.0 ms)			EJ1008 type 3 EJ1859 type 3, 8 inputs, 8 outputs, I _{max} = 0.5 A	EJ1809 type 3 EJ1889 negative switching
24 V DC (safe inputs)		EJ1914 TwinSAFE, 4 safe inputs <i>i</i>	EJ1918 TwinSAFE, 8 safe inputs <i>i</i> EJ1957 TwinSAFE, 8 safe inputs, 4 safe outputs <i>i</i>	

EtherCAT Plug-in Modules | Digital output: EJ2xxx

Signal	2-channel	4-channel	8-channel	16-channel
24 V DC (I _{max} = 0.5 A)			EJ2008 EJ1859 type 3, 8 inputs, 8 outputs, I _{max} = 0.5 A	EJ2809 EJ2889 negative switching
24 V DC (safe outputs)		EJ2914 TwinSAFE, 4 safe outputs <i>i</i> EJ1957 TwinSAFE, 8 safe inputs, 4 safe outputs <i>i</i>	EJ2918 TwinSAFE, 8 safe outputs <i>i</i>	
PWM	EJ2502 24 V DC, 0.5 A			

EtherCAT Plug-in Modules | Analog input: EJ3xxx

Signal	2-channel	4-channel	8-channel	16-channel
±10 V		EJ3004 single-ended, 12 bit	EJ3108 6 x differential inputs, 2 x single-ended, 16 bit	
0...20 mA			EJ3048 single-ended, 12 bit	
Resistance thermometer (RTD)	EJ3202 16 bit	EJ3214 16 bit		

EN 61131-2 specification ► www.beckhoff.com/EN61131-2

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

EtherCAT Plug-in Modules | Analog output: EJ4xxx

Signal	1-channel	2-channel	4-channel	8-channel
0...10 V		EJ4002 12 bit		
±10 V			EJ4134 16 bit	
0...20 mA				EJ4018 12 bit

EtherCAT Plug-in Modules | Special functions: EJ5xxx, EJ6xxx

Signal	1-channel	2-channel	4-channel	8-channel
Position measurement	EJ5101 incremental encoder interface RS422	EJ5002 SSI encoder interface		
Safety	EJ6910 TwinSAFE Logic			

EtherCAT Plug-in Modules | Motion: EJ7xxx

Signal	3...5 A
Servomotor	EJ7211-0010 $I_{\text{rms}} = 4.5 \text{ A}$, 50 V DC, OCT
Stepper motor	EJ7047 $I_{\text{max}} = 5.0 \text{ A}$, 50 V DC, incremental encoder, vector control
DC motor output stage	EJ7342 $I_{\text{max}} = 3.5 \text{ A}$, 50 V DC, incremental encoder

EtherCAT Plug-in Modules | System: EJ9xxx

Signal	System
System	EJ9001 placeholder module
Power supply and accessories	
24 V DC	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
μF	EJ9576 brake chopper module, up to 72 V DC, 155 μF

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

We reserve the right to make technical changes.

BECKHOFF New Automation Technology

System overview fieldbus I/O



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



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



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



Embedded PC series CX, further Embedded PCs see page 20

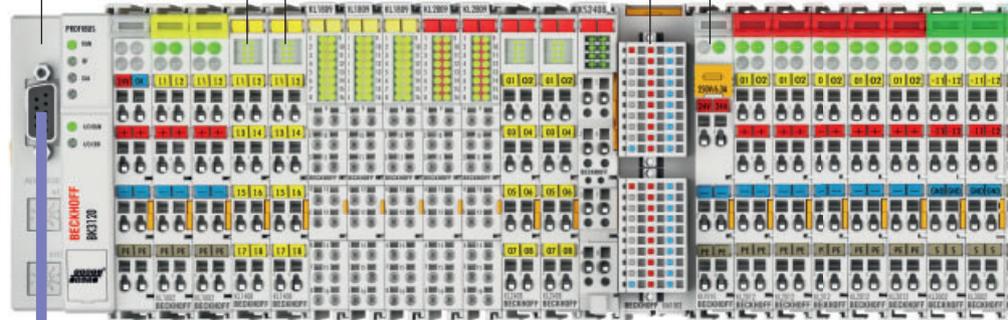
The head station of the Bus Terminals: from Bus Coupler with fieldbus interface to Embedded PC

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

Potential feed terminals enable configuration of different potential groups.

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

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



Compact Box



Coupler Box/
PLC Box



Extension Box modules

IP 67 Fieldbus Box

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 $\pm 0.01\%$

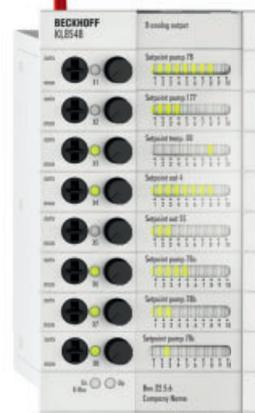
IO-Link box modules



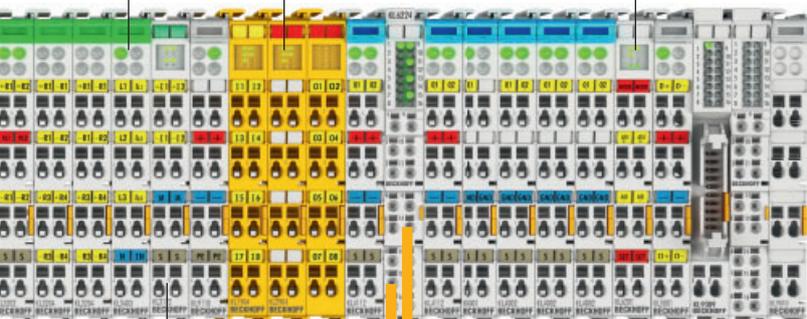
Bus end terminal



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 Terminal



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

► www.beckhoff.com/BusTerminal

Product announcement for availability status see www.beckhoff.com



Embedded PC								
Program memory 256 kbyte	CX80xx	CX900x, CX9010	CX9020	CX1010	CX50xx	CX51xx	CX1020, CX1030	CX20xx
	CX8010		optional ⁽²⁾		optional ⁽²⁾	optional ⁽²⁾		optional ⁽²⁾
				optional ⁽¹⁾			optional ⁽¹⁾	
	CX8030 master		optional ⁽²⁾	optional ⁽¹⁾	optional ⁽²⁾	optional ⁽²⁾	optional ⁽¹⁾	optional ⁽²⁾
BX3100 12 Mbaud	CX8031 slave		optional ⁽²⁾	optional ⁽¹⁾	optional ⁽²⁾	optional ⁽²⁾	optional ⁽¹⁾	optional ⁽²⁾
BX5100	CX8050 master		optional ⁽²⁾	optional ⁽¹⁾	optional ⁽²⁾	optional ⁽²⁾	optional ⁽¹⁾	optional ⁽²⁾
	CX8051 slave		optional ⁽²⁾	optional ⁽¹⁾	optional ⁽²⁾	optional ⁽²⁾	optional ⁽¹⁾	optional ⁽²⁾
BX5200								
		optional ⁽³⁾	optional ⁽³⁾	optional ⁽³⁾	optional ⁽³⁾	optional ⁽³⁾	optional ⁽³⁾	optional ⁽³⁾
BX8000	CX8080	optional ⁽²⁾	optional ⁽²⁾	optional ⁽²⁾	optional ⁽²⁾	optional ⁽²⁾	optional ⁽²⁾	optional ⁽²⁾
BX8000	CX8080	optional ⁽²⁾	optional ⁽²⁾	optional ⁽²⁾	optional ⁽²⁾	optional ⁽²⁾	optional ⁽²⁾	optional ⁽²⁾
BX9000	CX8090	CX9000	CX9020	CX1010	CX5010	CX5120	CX1020	CX2020
	CX8190	CX9010			CX5020	CX5130	CX1030	CX2030
						CX5140		CX2040
								CX2042
								CX2062
								CX2072
	CX8093	optional ⁽³⁾	optional ⁽²⁾	optional ⁽³⁾	optional ^(2,3)	optional ^(2,3)	optional ⁽³⁾	optional ^(2,3)
	CX8095	optional ⁽³⁾	optional ⁽²⁾	optional ⁽³⁾	optional ^(2,3)	optional ^(2,3)	optional ⁽³⁾	optional ^(2,3)

Bus Terminal Digital input: KL1xxxx/KS1xxx						KM1xxx
Signal	2-channel	4-channel	8-channel	16-channel	4-/16-/32-/64-ch.	
5 V DC		KL1124 filter 0.2 ms				
24 V DC (filter 3.0 ms)	KL1002 type 3	KL1104 type 3	KL1304 type 2	KL1408 type 3	KL1809 type 3	
	KL1302 type 2	KL1402 type 3	KL1154 positive/negative switching	KL1184 negative switching	KL1488 negative switching	KL1862 flat-ribbon cable, type 3
	KL1052 positive/negative switching	KL1352 NAMUR	KL1404 4 x 2-wire connection, type 3	KL1804 8 x 24 V, 4 x 0 V, type 3	KL1808 8 x 24 V DC, type 3	KL1889 negative switching
	KL1212 short-circuit-protected sensor supply, type 1	KL1362 break-in alarm			KL1859 8 inputs, 8 outputs, type 3, I _{max} = 0.5 A	KL1862-0010 flat-ribbon cable, type 3, negative switching
24 V DC (filter 0.2 ms)	KL1012 type 3	KL1312 type 2	KL1114 type 3	KL1314 type 2	KL1418 type 3	KL1819 type 3
		KL1412 type 3	KL1164 positive/negative switching	KL1194 negative switching	KL1498 negative switching	KL1872 flat-ribbon cable, type 3
			KL1414 4 x 2-wire connection, type 3	KL1434 4 x 2-wire connection, type 2		
			KL1814 8 x 24 V, 4 x 0 V, type 3			
24 V DC	KL1232 pulse expansion	KL1382 thermistor	KL1904 TwinSAFE, 4 safe inputs			KL1644 manual operation, 4-channel
≥ 48 V DC	KL1032 filter 3.0 ms	KL1712-0060				
120 V AC/DC	KL1712					
230 V AC	KL1702	KL1722 no power contacts	KL1704			
Counter (24 V DC)	KL1501 up/down, 100 kHz	KL1512 up/down, 1 kHz, 16 bit				

Bus Terminal Digital output: KL2xxx/KS2xxx						KM2xxx
Signal	2-channel	4-channel	8-channel	16-channel	2-/4-/16-/32-/64-channel	
5 V DC		KL2124				
24 V DC (I _{max} = 0.5 A)	KL2012	KL2114	KL2408	KL2809	KL2819 with diagnostics	KL2002 16-channel
	KL2032 reverse voltage protection	KL2184 negative switching	KL2488 negative switching	KL2889 negative switching	KL2872 flat-ribbon cable	KL2004 32-channel
		KL2134 reverse voltage protection	KL2808 8 x 0 V	KL2872 flat-ribbon cable		KL2008 64-channel
	KL2212 diagnostics, protected sensor supply	KL2404 4 x 2-wire	KL1859 8 inputs, 8 outputs, filter 3.0 ms, type 3	KL2872-0010 flat-ribbon cable, negative switching		KL2042 16-channel, D-sub connection

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

Bus Terminal Digital output: KL2xxx/KS2xxx					KM2xxx
Signal	1-channel	2-channel	4-channel	8-channel	2-/4-/16-/32-/64-ch.
24 V DC (I _{MAX} = 2.0 A)		KL2022	KL2424 4 x 2-wire	KL2828 8 x 2-wire	
30 V AC/DC (I _{MAX} = 2.0 A), solid state relay			KL2784		
24 V DC		KL2442 2 x 4 A/1 x 8 A	KL2904 TwinSAFE, 4 safe outputs		
Relay 125/400 V AC	KL2631 400 V AC, make contacts	KL2612 125 V AC, change-over			
230 V AC	KL2641 relay, make contacts, manual operation, I _{MAX} = 16 A	KL2602 relay, make contacts, I _{MAX} = 5 A	KL2622 relay, make contacts, no power contacts, I _{MAX} = 5 A		KM2604 relay, I _{MAX} = 16 A, 4-channel
	KL2751 universal dimmer, 300 W	KL2602-0010 relay, make contacts, I _{MAX} = 5 A, contact- protecting switching	KL2622-0010 relay, make contacts, no power contacts, I _{MAX} = 5 A, contact-protecting switching		KM2614 relay, I _{MAX} = 16 A, 4-channel, manual operation
	KL2761 universal dimmer, 600 W	KL2652 relay, change-over, I _{MAX} = 5 A	KL2702 solid state relay, I _{MAX} = 0.3 A		KM2774 triac outputs, I _{MAX} = 1.5 A
	KL2701 solid state relay, I _{MAX} = 3 A	KL2712 triac	KL2722 triac, mutually locked outputs		KM2642 relay, I _{MAX} = 6 A, manual/automatic operation, relay state readable
		KL2732 triac, mutually locked outputs, no power contacts	KL2692 cycle monitoring (watchdog)		KM2652 relay, I _{MAX} = 6 A, manual/automatic operation, switch and relay state readable
PWM		KL2502 24 V DC, I _{MAX} = 0.1 A	KL2512 24 V DC, I _{MAX} = 1 A, negative switching		
		KL2535 I _{MAX} = ±1 A, 24 V DC, current-controlled	KL2545 I _{MAX} = ±3.5 A, 50 V DC, current-controlled		
Frequency output	KL2521				

Bus Terminal Motion: KL2xxx/KS2xxx		
Signal	< 3 A	3...5 A
Stepper motor	KL2531 I _{MAX} = 1.5 A, 24 V DC	KL2541 I _{MAX} = 5.0 A, 50 V DC, incremental encoder
DC motor output stage	KL2532 I _{MAX} = 1.0 A, 24 V DC	KL2552 I _{MAX} = 5.0 A, 50 V DC, incremental encoder
	KL2284 reverse switching, I _{MAX} = 2.0 A, 0...24 V DC	
AC motor speed controller	KL2791 230 V AC, 200 VA, 1-phase AC motor	

► www.beckhoff.com/BusTerminal

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Bus Terminal Analog input: KL3xxx/KS3xxx, KM3xxx					
Signal	1-channel	2-channel	4-channel	8-channel	
0...2 V, 0...500 mV		KL3172 0...2 V, 16 bit, 0.05 %	KL3172-0500 0...500 mV, 16 bit, 0.05 %		
±2 V			KL3182 16 bit, 0.05 %		
0...10 V	KL3061 single-ended, 12 bit	KL3062 single-ended, 12 bit	KL3162 16 bit, 0.05 %	KL3064 single-ended, 12 bit	
				KL3464 single-ended, 12 bit	KL3468 single-ended, 12 bit
±10 V	KL3001 differential input, 12 bit	KL3002 differential input, 12 bit	KL3102 differential input, 16 bit	KL3404 single-ended, 12 bit	KL3408 single-ended, 12 bit
			KL3132 16 bit, 0.05 %		
0...20 mA	KL3011 differential input, 12 bit	KL3041 with sensor supply, 12 bit	KL3012 differential input, 12 bit	KL3112 differential input, 16 bit	KL3044 single-ended, 12 bit
			KL3042 with sensor supply, 12 bit	KL3142 16 bit, 0.05 %	KL3444 single-ended, 12 bit
4...20 mA	KL3021 differential input, 12 bit	KL3051 with sensor supply, 12 bit	KL3022 differential input, 12 bit	KL3122 differential input, 16 bit	KL3054 single-ended, 12 bit
			KL3052 with sensor supply, 12 bit	KL3152 16 bit, 0.05 %	KL3454 single-ended, 12 bit
Resistance thermometer (RTD)	KL3201 PT100...1000, Ni100, 16 bit		KL3202 PT100...1000, Ni100, 16 bit	KL3222 PT100, 4-wire connection, high-precision	KL3204 PT100...1000, Ni100...1000, 2-wire connection
					KL3208-0010 PT1000, Ni1000, NTC 1.8... 100 k, potentiom. 1, 5, 10 kΩ
				KL3214 PT100...1000, Ni100...1000, KTY, 3-wire connection	KL3228 PT1000, Ni1000
Thermo-couple/mV	KL3311 type J, K, L,...U, 16 bit		KL3312 type J, K, L,...U, 16 bit		KL3314 type J, K, L,...U, 16 bit
Resistor bridge	KL3351 strain gauge, 16 bit	KL3356 strain gauge, 16 bit, self-calibration			
Oscilloscope	KL3361 ±16 mV		KL3362 ±10 V		
Measurement technology	KL3681 digital multimeter, 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	

Bus Terminal Analog output: KL4xxx/KS4xxx					KM4xxx
Signal	1-channel	2-channel	4-channel	8-channel	2-channel
0...10 V	KL4001 12 bit, potential-free output	KL4002 12 bit	KL4004 12 bit, no power contacts		KM4602 12-bit manual/automatic operation
			KL4404 12 bit	KL4408 12 bit	
±10 V	KL4031 12 bit, potential-free output	KL4032 12 bit	KL4034 12 bit, no power contacts		
		KL4132 16 bit	KL4434 12 bit	KL4438 12 bit	
			KL4494 12 bit, 2 x input, 2 x output		
0...20 mA	KL4011 12 bit	KL4012 12 bit	KL4414 12 bit	KL4418 12 bit	
		KL4112 16 bit			
4...20 mA	KL4021 12 bit	KL4022 12 bit	KL4424 12 bit	KL4428 12 bit	

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

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

Signal				Signal		
Position measurement	KL5001 SSI encoder interface	KL5051 SSI encoder interface, bidirectional	KL5121 incremental encoder interface with programmable outputs	Safety	KL6904 TwinSAFE Logic Bus Terminal, 4 safe outputs	
	KL5101 incremental encoder interface RS422	KL5151 incremental encoder interface 24 V DC, 1-channel, 32 bit	KL5152 incremental encoder interface 24 V DC, 2-channel, 32 bit		Manual operation	KL8519 16-channel digital input signal module
	KL5111 incremental encoder interface 24 V DC					KL8524 4 x 2-channel digital output, 24 V DC, 0.5 A
Communication	KL6001 serial interface RS232, 19.2 kbaud	KL6031 serial interface RS232, 115.2 kbaud	KL6011 serial interface TTY, 20 mA current loop	Power terminals	KL8528 8-channel digital output, 24 V DC, 0.5 A	
	KL6051 data exchange terminal, 32 bit	KL6021 serial interface RS422/RS485, 19.2 kbaud	KL6041 serial interface RS422/RS485, 115.2 kbaud		KL8548 8-channel analog output, 0...10 V	
	KL6023 wireless adapter for EnOcean radio technology	KL6021-0023 RS485 interface for EnOcean signals	KL6201 AS-Interface master terminal		KL8001 switching capacity 5.5 kW, nominal current 0.9 to 9.9 A, connection mechanism for Siemens contactors (Sirius 3R series)	
	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			

Bus Terminal | System terminals: KL9xxx/KS9xxx

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

Fieldbus Box



Fieldbus Box	Compact Box		Coupler Box		PLC Box	
Fieldbus	Fieldbus Box without IP-Link interface		Fieldbus Box with IP-Link interface		Controller IEC 61131-3 with IP-Link interface	
EtherCAT			IL230x-B110			
LIGHTBUS	IPxxxx-B200		IL230x-B200			
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	
PROFINET			IL230x-B903			
EtherNet/IP			IL230x-B905			

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

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

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

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

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

Fieldbus Box | Compact Box and Extension Box: Special functions

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

► www.beckhoff.com/FieldbusBox



EPIxxxx

ERIxxxx

Fieldbus Box | IO-Link box: Digital I/O

Input		8 x M8	16 x M8	4 x M12	8 x M12
24 V DC	8-channel filter 3.0 ms	EPI1008-0001 ERI1008-0001		EPI1008-0002 ERI1008-0002	
	16-channel filter 3.0 ms		EPI1809-0021 ERI1809-0021		EPI1809-0022 ERI1809-0022
Output		8 x M8	16 x M8	4 x M12	8 x M12
24 V DC	8-channel $I_{MAX} = 0.5 A$	EPI2008-0001 ERI2008-0001		EPI2008-0002 ERI2008-0002	
	16-channel $I_{MAX} = 0.5 A, \Sigma 4 A$		EPI2809-0021 ERI2809-0021		EPI2809-0022 ERI2809-0022
Combi		8 x M8	16 x M8	4 x M12	8 x M12
24 V DC	8-channel 8 inputs/outputs, filter 3.0 ms, $I_{MAX} = 0.5 A$	EPI2338-0001 ERI2338-0001		EPI2338-0002 ERI2338-0002	
	16-channel 16 inputs/outputs, filter 3.0 ms, $I_{MAX} = 0.5 A, \Sigma 4 A$		EPI2339-0021 ERI2339-0021		EPI2339-0022 ERI2339-0022

Fieldbus Box | IO-Link box: Analog I/O

Input		M12
±10 V, 0/4...20 mA	4-channel parameterisable, differential input, 16 bit	EPI3174-0002 ERI3174-0002
Output		M12
±10 V, 0/4...20 mA	4-channel 2 inputs + 2 outputs, parameterisable, 16 bit	EPI4374-0002 ERI4374-0002

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

► www.beckhoff.com/IO-Link-box

Infrastructure Components



PC Fieldbus Cards, switches, port multipliers, junctions, media converters

Fieldbus	PC Fieldbus Cards			Switches, port multipliers		Junctions, media converters	
	PCI	Mini-PCI	PCIe	Ethernet Switches	Port multiplier	EtherCAT junction	EtherCAT media converter fibre optic
LIGHTBUS	FC2001-0000 1-channel			CU2005 5 ports, 10/100 Mbit/s, IP 20	CU2508 real-time Ethernet port multiplier, 10/100/1000 Mbit/s, IP 20	CU1128 8-channel EtherCAT RJ45, IP 20	
	FC2002-0000 2-channel						
PROFINET	FC3101-0000 1-channel	FC3151-0000 1-channel	FC3121 1-channel				
	FC3101-0002 1-channel, 32 kbytes NOVRAM	FC3151-0002 1-channel, 128 kbytes NOVRAM					
	FC3102-0000 2-channel		FC3122 2-channel				
	FC3102-0002 2-channel, 32 kbytes NOVRAM						
CANopen	FC5101-0000 1-channel	FC5151-0000 1-channel	FC5121 1-channel				
	FC5101-0002 1-channel, 32 kbytes NOVRAM	FC5151-0002 1-channel, 128 kbytes NOVRAM					
	FC5102-0000 2-channel		FC5122 2-channel				
	FC5102-0002 2-channel, 32 kbytes NOVRAM						
DeviceNet	FC5201-0000 1-channel	FC5251-0000 1-channel					
	FC5201-0002 1-channel, 32 kbytes NOVRAM	FC5251-0002 1-channel, 128 kbytes NOVRAM					
	FC5202-0000 2-channel						
	FC5202-0002 2-channel, 32 kbytes NOVRAM						
sercos the automation bus	FC7501-0000 1-channel	FC7551-0000 1-channel					
	FC7502-0000 2-channel	FC7551-0002 1-channel, 128 kbytes NOVRAM					
Ethernet	FC9001-0010 1-channel, 10/100 Mbit/s	FC9051-0000 1-channel, 10/100 Mbit/s					
	FC9011-0000 1-channel, 10/100/1000 Mbit/s	FC9151-0000 1-channel, 10/100/1000 Mbit/s					
	FC9002-0000 2-channel, 10/100 Mbit/s		FC9022-0000 2-channel, 10/100/1000 Mbit/s				
	FC9004-0000 4-channel, 10/100 Mbit/s		FC9024-0000 4-channel, 10/100/1000 Mbit/s				
EtherCAT	FC1100 1-channel, slave		FC1121 1-channel, slave				

► www.beckhoff.com/Infrastructure-components

We reserve the right to make technical changes.

BECKHOFF New Automation Technology

The Motion Company



**AX8000 multi-axis
EtherCAT drive**

Servo Drives 62

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

► www.beckhoff.com/Servo-Drives

Synchronous Servomotors 63

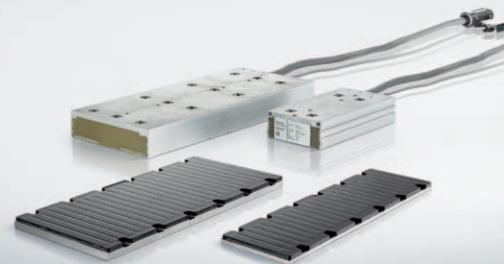
- For demanding positioning tasks
- Highly dynamic behaviour
- Brushless three-phase motors
- Permanent magnet in the rotor

► www.beckhoff.com/Servomotors

Linear Servomotors 64

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

► www.beckhoff.com/Linear-motors



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

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

► www.beckhoff.com/DriveTechnology

Compact Drive Technology 66

- Solutions for up to 8 A in the space-saving I/O system
- Simple connection of stepper, servo, DC or AC motors
- IP 20 or IP 67 connection options
- Matching motors and gearboxes

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

eXtended Transport System XTS 68

- Linear motor on an endless path
- Replaces traditional mechanics with advanced mechatronic solutions
- Software-based functional changes
- Individual product transport with continuous material flow

► www.beckhoff.com/XTS



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

Servo Drives



AX8000



AX5000

Multi-axis servo system

	AX8620	AX8640	AX81xx	AX82xx
Variant/function	power supply module	power supply module	axis module	axis module
Number of axes	side by side mounting in any order taking into account the rated output current	side by side mounting in any order taking into account the rated output current	1	2
Supply voltage	1 x 100...240 V AC 3 x 200...240 V AC 3 x 400...480 V AC	3 x 200...240 V AC 3 x 400...480 V AC	–	–
Rated output current per axis/module	20 A DC	40 A DC	8 A, 18 A	6 A
Motor feedback	–	–	OCT	OCT
Drive-specific safety functions	–	–	order options STO/SS1: AX81xx-0100 Safe Motion: AX81xx-0200	order options STO/SS1: AX82xx-0100 Safe Motion: AX82xx-0200

Digital Compact Servo Drives

	AX51xx	AX52xx
Variant/function	stand-alone	stand-alone
Number of axes	1	2
Supply voltage	wide voltage range 1 x 100...240 V AC** 3 x 100...480 V AC 3 x 400...480 V AC***	wide voltage range 1 x 100...240 V AC 3 x 100...480 V AC
Rated output current per axis/module	1.5 A, 3 A, 6 A, 12 A, 18 A, 25 A, 40 A, 60 A, 72 A, 90 A, 110 A, 143 A, 170 A	1.5 A, 3 A, 6 A
Motor feedback	multi-feedback interface*	multi-feedback interface
Drive-specific safety functions	supplementary products STO/SS1: AX5801 Safe Motion: AX5805, AX5806	supplementary products STO/SS1: AX5801 Safe Motion: AX5805

* multi-feedback interface: OCT only supported up to 40 A

** voltage range: 1-phase operation only supported up to 6 A

*** voltage range: from 60 A at least 3 x 400 V AC necessary

► www.beckhoff.com/Servo-Drives

Synchronous Servomotors



Synchronous Servomotors, OCT

	Flange code						
	F1 40 mm	F2 58 mm	F3 73 mm	F4 87 mm	F5 104 mm	F6 142 mm	F7 197 mm
Standard 400 V AC		AM802x $M_0 = 0.50 \dots 1.20 \text{ Nm}$	AM803x $M_0 = 1.37 \dots 3.22 \text{ Nm}$	AM804x $M_0 = 2.37 \dots 5.65 \text{ Nm}$	AM805x $M_0 = 4.90 \dots 11.4 \text{ Nm}$, up to 15.4 Nm with fan	AM806x $M_0 = 12.8 \dots 29.0 \text{ Nm}$, up to 41.4 Nm with fan	AM807x $M_0 = 29.0 \dots 92.0 \text{ Nm}$, up to 129 Nm with fan
Standard 230 V AC	AM801x $M_0 = 0.20 \dots 0.52 \text{ Nm}$						
Standard 48 V DC	AM811x $M_0 = 0.20 \dots 0.52 \text{ Nm}$	AM812x $M_0 = 0.50 \dots 0.80 \text{ Nm}$	AM813x $M_0 = 1.35 \dots 2.35 \text{ Nm}$	AM8141 $M_0 = 2.40 \text{ Nm}$			
Increased inertia 400 V AC			AM853x $M_0 = 1.37 \dots 3.22 \text{ Nm}$	AM854x $M_0 = 2.37 \dots 5.65 \text{ Nm}$	AM855x $M_0 = 4.90 \dots 11.4 \text{ Nm}$, up to 15.4 Nm with fan	AM856x $M_0 = 12.8 \dots 29.0 \text{ Nm}$, up to 41.4 Nm with fan	
Stainless steel 400 V AC			AM883x* $M_0 = 0.85 \dots 1.85 \text{ Nm}$	AM884x* $M_0 = 1.60 \dots 3.50 \text{ Nm}$	AM885x* $M_0 = 3.10 \dots 6.40 \text{ Nm}$	AM886x* $M_0 = 7.75 \dots 16.7 \text{ Nm}$	

* Please note the different flange size.

Synchronous Servomotors, 2-cable standard

	Flange code							
	F1 40 mm	F2 58 mm	F3 73 mm	F4 87 mm	F5 104 mm	F6 142 mm	F7 197 mm	F8 260 mm
Standard 400 V AC		AM802x $M_0 = 0.50 \dots 1.20 \text{ Nm}$	AM803x $M_0 = 1.37 \dots 3.22 \text{ Nm}$	AM804x $M_0 = 2.37 \dots 5.65 \text{ Nm}$	AM805x $M_0 = 4.90 \dots 11.4 \text{ Nm}$, up to 15.4 Nm with fan	AM806x $M_0 = 12.8 \dots 29.0 \text{ Nm}$, up to 41.4 Nm with fan	AM807x $M_0 = 29.0 \dots 92.0 \text{ Nm}$, up to 129 Nm with fan	
		AM302x $M_0 = 0.87 \dots 1.41 \text{ Nm}$	AM303x* $M_0 = 1.15 \dots 2.79 \text{ Nm}$	AM304x* $M_0 = 1.95 \dots 6.00 \text{ Nm}$	AM305x* $M_0 = 4.70 \dots 14.9 \text{ Nm}$	AM306x* $M_0 = 11.9 \dots 25.0 \text{ Nm}$	AM307x* $M_0 = 29.7 \dots 53.0 \text{ Nm}$	AM308x $M_0 = 75.0 \dots 180 \text{ Nm}$
Standard 230 V AC	AM301x $M_0 = 0.18 \dots 0.41 \text{ Nm}$	AM302x $M_0 = 0.48 \dots 0.87 \text{ Nm}$	AM3031 $M_0 = 1.20 \text{ Nm}$					
Standard 48 V DC	AM311x* $M_0 = 0.21 \dots 0.34 \text{ Nm}$	AM812x $M_0 = 0.50 \dots 0.80 \text{ Nm}$	AM813x $M_0 = 1.35 \dots 2.35 \text{ Nm}$	AM8141 $M_0 = 2.40 \text{ Nm}$				
		AM3121* $M_0 = 0.69 \text{ Nm}$						
Increased inertia 400 V AC			AM853x $M_0 = 1.37 \dots 3.22 \text{ Nm}$	AM854x $M_0 = 2.37 \dots 5.65 \text{ Nm}$	AM855x $M_0 = 4.90 \dots 11.4 \text{ Nm}$, up to 15.4 Nm with fan	AM856x $M_0 = 12.8 \dots 29.0 \text{ Nm}$, up to 41.4 Nm with fan		
				AM354x* $M_0 = 1.90 \dots 4.20 \text{ Nm}$	AM355x* $M_0 = 4.10 \dots 8.60 \text{ Nm}$	AM356x* $M_0 = 11.6 \dots 14.9 \text{ Nm}$		
Stainless steel 400 V AC			AM883x* $M_0 = 0.85 \dots 1.85 \text{ Nm}$	AM884x* $M_0 = 1.60 \dots 3.50 \text{ Nm}$	AM885x* $M_0 = 3.10 \dots 6.40 \text{ Nm}$	AM886x* $M_0 = 7.75 \dots 16.7 \text{ Nm}$		

* Please note the different flange size.

► www.beckhoff.com/Servomotors

We reserve the right to make technical changes.

BECKHOFF New Automation Technology

Linear Servomotors, stepper motors



Linear Servomotors

	AL2000	AL2400	AL2800
Especially suitable for	maximum power density	confined spaces	highest demands on force
Magnetic path width	80 mm	50 mm	130 mm
Cooling	air	air	air, partly water
Speed max.	7 m/s	12 m/s	6 m/s
Force max.	225...1800 N	120...480 N	1800...6750 N
Protection class	IP 64	IP 64	IP 64

Stepper motors

	AS1000	AS2000
Sizes	NEMA17, NEMA23, NEMA34	NEMA23, NEMA34
Resolution	1.8°/200 full steps	1.8°/200 full steps
Encoder	incremental, 1024 lines	incremental, 1024 lines
Standstill torque < 3 A	0.38...0.60 Nm	0.83 Nm
Standstill torque > 3 A	1.20...5.00 Nm	1.37...8.00 Nm
Protection class	IP 43, AS1060: IP 20	IP 54

► www.beckhoff.com/Linear-motors, ► www.beckhoff.com/Stepper-motors

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

Planetary gear units



AG2300



AG2210



AG2800



AG2250



AG1000

Planetary gear units

	AG2300	AG2210	AG2800	AG2250	AG1000
Variant	standard (MF), high-speed (MC)	standard	stainless steel	compact drive technology: servomotors, stepper motors	compact drive technology: stepper motors
Sizes	MF: 7 sizes (060, 075, 100, 140, 180, 210, 240), MC: 6 sizes (075, 100, 140, 180, 210, 240)	5 sizes (LP050, LP070, LP090, LP120, LP155)	3 sizes (HDV015, HDV025, HDV035)	3 sizes (40, 60, 80), each also as angled variant	2 sizes (PM52, PM81)
Max. gear stages	2	2	2	size 40, 60: 2 size 80: 1	1
Gear ratios	14 gear ratios; 1-stage $i = 3, 4, 5, 7, 10$, 2-stage $i = 16, 20, 25, 28$, 35, 40, 50, 70, 100	16 gear ratios; 1-stage $i = 3, 4, 5, 7, 10$, 2-stage $i = 9, 12, 16, 20$, 25, 30, 35, 40, 50, 70, 100	14 gear ratios; 1-stage $i = 3, 4, 5, 7, 10$, 2-stage $i = 9, 12, 16, 20$, 25, 30, 35, 40, 50, 70, 100	13 gear ratios; 1-stage $i = 4, 5, 7, 8, 10$, 2-stage $i = 12, 16, 20, 25$, 32, 35, 40, 64	2 gear ratios; $i = 3, 7$ or 6.75
Protection class	IP 65	IP 64	IP 69K (at 30 bar, according to DIN 40050-9)	IP 54	IP 43, for AS1060: IP 20
Servomotor series	AM8000, AM8500, AM3000, AM3500	AM8000, AM8500, AM3000, AM3500	AM8800	AM8100, AM3100	
Stepper motor series				AS2000	AS1000

► www.beckhoff.com/Planetary-gears

We reserve the right to make technical changes.

BECKHOFF New Automation Technology

Compact Drive Technology



Product group		DC motor output stage			Stepper motor
		< 3 A	3...5 A	> 5 A	< 3 A
I/O	EtherCAT Terminals IP 20	EL7332 $I_{MAX} = 1.0\text{ A}$, 24 V DC	EL7332 + ZB8610 $I_{MAX} = 3.0\text{ A}$, 24 V DC		EL7037 $I_{MAX} = 1.5\text{ A}$, 24 V DC, incremental encoder, vector control
			EL7342 $I_{MAX} = 3.5\text{ A}$, 50 V DC, incremental encoder	EL7342 + ZB8610 $I_{MAX} = 6.5\text{ A}$, 50 V DC, incremental encoder	EL7031 $I_{MAX} = 1.5\text{ A}$, 24 V DC
	EtherCAT Plug-in Modules IP 20		EJ7342 $I_{MAX} = 3.5\text{ A}$, 50 V DC, incremental encoder		
	Bus Terminals IP 20	KL2532 $I_{MAX} = 1.0\text{ A}$, 24 V DC	KL2552 $I_{MAX} = 5.0\text{ A}$, 50 V DC, incremental encoder		KL2531 $I_{MAX} = 1.5\text{ A}$, 24 V DC
	EtherCAT Box Modules IP 67		EP7342-0002 ER7342-0002 $I_{MAX} = 3.5\text{ A}$, 50 V DC		EP7041-1002 ER7041-1002 $I_{MAX} = 5.0\text{ A}$, 50 V DC, incremental encoder
	EtherCAT P Box Modules IP 67		EPP7342-0002 $I_{MAX} = 3.5\text{ A}$, 50 V DC		EPP7041-1002 $I_{MAX} = 1.5\text{ A}$, 50 V DC, incremental encoder
Motion	Flange code F1 (40 mm), N1 (NEMA17)				AS1010 1.0 A, 48 V DC, 0.38 Nm AS1020 1.0 A, 48 V DC, 0.50 Nm
	Flange code F2 (58 mm), N2 (NEMA23)				AS1030 1.5 A, 48 V DC, 0.60 Nm AS2021-wDy0  2.0 A, 48 V DC, 0.80 Nm
	Flange code F3 (72 mm), N3 (NEMA34)				
	Flange code F4 (87 mm)				

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

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



Servomotor

3...5 A	> 5 A	< 3 A	3...5 A	> 5 A
EL7037 + ZB8610 <i>I</i> _{MAX} = 3.0 A, 24 V DC, incremental encoder, vector control		EL7201-9014 <i>I</i> _{MS} = 2.8 A, 50 V DC, OCT, STO	EL7201-9014 + ZB8610 <i>I</i> _{MS} = 4.5 A, 50 V DC, OCT, STO	EL7221-9014 <i>i</i> <i>I</i> _{MS} = 7...8 A with ZB8610, 50 V DC, OCT, STO
EL7047 <i>I</i> _{MAX} = 5.0 A, 50 V DC, incremental encoder, vector control	EL7047 + ZB8610 <i>I</i> _{MAX} = 6.5 A, 50 V DC, incremental encoder, vector control	EL7201-0010 <i>I</i> _{MS} = 2.8 A, 50 V DC, OCT	EL7201-0010 + ZB8610 <i>I</i> _{MS} = 4.5 A, 50 V DC, OCT	
EL7041 <i>I</i> _{MAX} = 5.0 A, 50 V DC, incremental encoder		EL7201 <i>I</i> _{MS} = 2.8 A, 50 V DC, resolver	EL7201 + ZB8610 <i>I</i> _{MS} = 4.5 A, 50 V DC, resolver	
			EL7211-9014 <i>I</i> _{MS} = 4.5 A, 50 V DC, OCT, STO	
			EL7211-0010 <i>I</i> _{MS} = 4.5 A, 50 V DC, OCT	
			EL7211 <i>I</i> _{MS} = 4.5 A, 50 V DC, resolver	
EJ7047 <i>I</i> _{MAX} = 5.0 A, 50 V DC, incremental encoder, vector control			EJ7211-0010 <i>I</i> _{MS} = 4.5 A, 50 V DC, OCT	
KL2541 <i>I</i> _{MAX} = 5.0 A, 50 V DC, incremental encoder				
EP7041-3002				
ER7041-3002 <i>I</i> _{MAX} = 5.0 A, 50 V DC, incremental encoder				
EPP7041-3002 <i>I</i> _{MAX} = 5.0 A, 50 V DC, incremental encoder				
		AM8111-wFyz 2.8 A, 48 V DC, 0.20 Nm, 4000 min ⁻¹	AM8112-wFyz 4.7 A, 48 V DC, 0.38 Nm, 4500 min ⁻¹	
			AM8113-wFyz 4.8 A, 48 V DC, 0.52 Nm, 3000 min ⁻¹	
AS1050 5.0 A, 48 V DC, 1.20 Nm	AS2022-wHy0 <i>i</i> 5.6 A, 48 V DC, 1.50 Nm		AM8121-wFyz 4.0 A, 48 V DC, 0.50 Nm, 3000 min ⁻¹	
AS2023-wGy0 <i>i</i> 5.0 A, 48 V DC, 1.80 Nm	AS2023-wJy0 <i>i</i> 6.4 A, 48 V DC, 2.30 Nm		AM8122-wFyz 4.0 A, 48 V DC, 0.80 Nm, 2000 min ⁻¹	AM8122-wJyz 8.0 A, 48 V DC, 0.80 Nm, 4500 min ⁻¹
AS1060 5.0 A, 48 V DC, 5.00 Nm	AS2041-wHy0 <i>i</i> 5.6 A, 48 V DC, 3.30 Nm		AM8131-wFyz 5.0 A, 48 V DC, 1.35 Nm, 1000 min ⁻¹	AM8131-wJyz 8.0 A, 48 V DC, 1.35 Nm, 1800 min ⁻¹
	AS2042-wHy0 <i>i</i> 5.6 A, 48 V DC, 6.40 Nm			AM8132-wJyz 8.0 A, 48 V DC, 2.35 Nm, 1000 min ⁻¹
	AS2043-wJy0 <i>i</i> 6.5 A, 48 V DC, 8.00 Nm			
				AM8141-wJyz 8.0 A, 48 V DC, 2.40 Nm, 1200 min ⁻¹

XTS | eXtended Transport System



XTS | Motor modules

AT2000-0250	straight	AT2026-0250	curved, with infeed, -22.5° (negative curve, concave, radius constant)
AT2001-0250	straight, with infeed		
AT2020-0250	curved, 22.5° (positive curve, convex, radius constant)	AT2040-0250	curved, 45° (positive curve, convex, radius constant)
AT2021-0250	curved, with infeed, 22.5° (positive curve, convex, radius constant)	AT2041-0250	curved, with infeed, 45° (positive curve, convex, radius constant)
AT2025-0250	curved, -22.5° (negative curve, concave, radius constant)	AT2050-0500	curved, 180° (clothoid)

► www.beckhoff.com/AT2000

XTS | Movers

AT901x-0050-0550	mover suitable for the AT9000/AT9050 guide rail system with magnetic plate set and encoder flag for direct use	AT9011-0070-0550	mover for increased payload suitable for the AT9000/AT9050-0070 guide rail system with magnetic plate set and encoder flag for direct use
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► www.beckhoff.com/AT9011

XTS | Guide rails

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

► www.beckhoff.com/AT9000

XTS | Software

TF5000	TwinCAT TC3 NC PTP 10 Axes	TF5850	TwinCAT TC3 XTS Extension
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► www.beckhoff.com/TF5850

XTS | Starter kits

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

► www.beckhoff.com/XTS

The Automation Company

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

► www.beckhoff.com/Automation

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/TwinCAT3



TwinCAT 3

TwinCAT 3 realises a new approach for the engineering and extends the runtime by many features. The engineering is embedded completely in the Microsoft Visual Studio® framework. This way, C/C++ or MATLAB®/Simulink® are available in a single environment with programming and debugging in addition to the configuration of system, motion, I/O and the IEC 61131 PLC programming languages.

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

The TwinCAT 3 runtime components are available for different platforms.

TwinCAT 3 – Platforms

Example of a TwinCAT 3 performance class:
 C6920 | Control cabinet Industrial PC with Intel® Core™ i3, 2 cores, processor
 TwinCAT 3 performance class: (TC3: 60), corresponds to the TwinCAT 3 platform P60 Mid performance

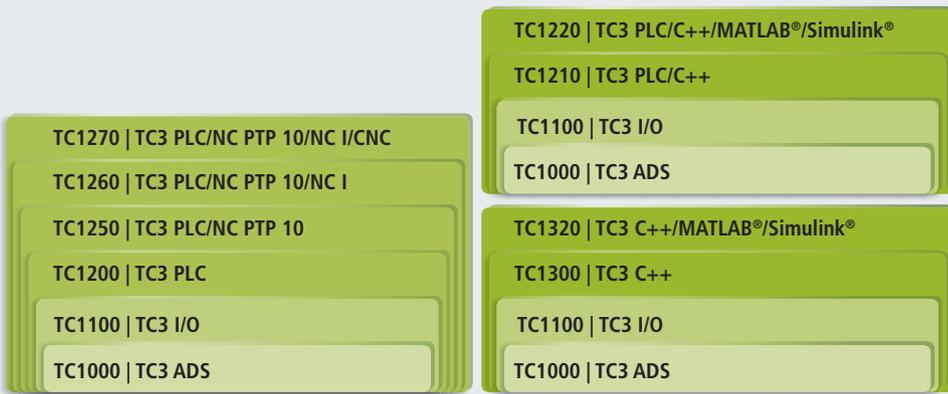
Platform	Performance Class	Processor	Core Count
P20	Economy	ARM, 600 MHz	-
P30	Economy plus	ARM Cortex™-A8, AMD LX800	-
P40	Performance	Intel® Atom™	-
P50	Performance plus	Intel® Celeron® ULV, Intel® Celeron®, Intel® Pentium®	-
P60	Mid performance	Intel® Core™ i3	-
P70	High performance	Intel® Core™ i5	-
P80	Very high performance	Intel® Core™ i7	-
P81	Very high performance	Many Core	5-8 cores
P82	Very high performance	Many Core	9-16 cores
P83	Very high performance	Many Core	17-32 cores
P84	Very high performance	Many Core	33-64 cores
P90	Third-party devices	-	-
P91	-	-	5-8 cores
P92	-	-	9-16 cores
P93	-	-	17-32 cores
P94	-	-	33-64 cores

The controllers shown in the platform categorisation are only example configurations.

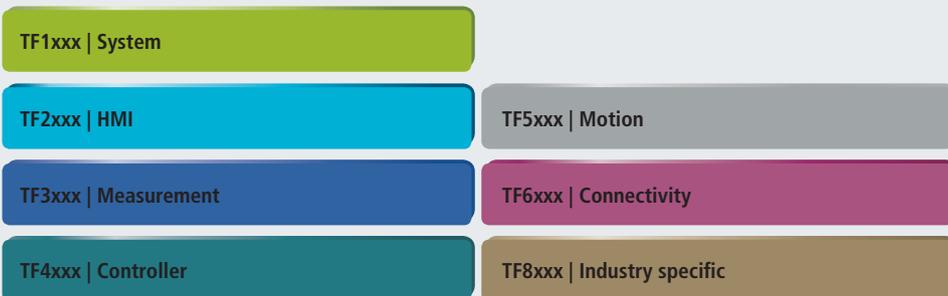
TwinCAT 3 – eXtended Automation Engineering (XAE)

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.

TwinCAT 3 | Engineering

TE1000	TC3 Engineering	TwinCAT 3 engineering environment	
TE1111	TC3 EtherCAT Simulation	easy configurations of simulation environments with several EtherCAT slaves	
TE1120	TC3 XCAD Interface	transfer of existing engineering results from ECAD tools	
TE1200	TC3 PLC Static Analysis	analysis tool that tests PLC software on the basis of coding rules	i
TE1210	TC3 PLC Profiler	analyses the runtime characteristics of a PLC application and identifies time-intensive callups and program sections	i
TE1300	TC3 Scope View Professional	software oscilloscope for the graphical display of data captured from several target systems	
TE1400	TC3 MATLAB®/Simulink® Target	TwinCAT target for MATLAB®/Simulink® for generating TwinCAT 3 modules	
TE1410	TC3 Interface for MATLAB®/Simulink®	communication interface between MATLAB®/Simulink® and the TwinCAT 3 runtime	
TE1420	TC3 Target for FMI	interface for simulation tools that support the Functional Mockup Interface (FMI)	i
TE1500	TC3 Valve Diagram Editor	graphical tool for designing the characteristic curve of a hydraulic valve	
TE1510	TC3 Cam Design Tool	graphic design tool for electronic cam plates	
TE1610	TC3 EAP Configurator	a tool for visualising and configuring communication networks, in which data exchange based on the EtherCAT Automation Protocol (EAP) takes place or is to be established	
TE2000	TC3 HMI	tool for developing platform-independent user interfaces	i
TE35xx	TC3 Analytics Workbench	components (solutions) for online and offline analyses of one or more machines	i

TwinCAT 3 | Base

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

TwinCAT 3 Functions		
System		
TF1800	TC3 PLC HMI	stand-alone tool for displaying visualisations from the PLC development environment
TF1810	TC3 PLC HMI Web	display of visualisations from the PLC development environment in a web browser
TF1910	TC3 UML	UML (Unified Modeling Language) for modelling of PLC software
HMI		
TF2000	TC3 HMI Server	modular web server, includes a client connection and a target connection 
TF2010	TC3 HMI Clients Pack 1	optional package for one further client connection 
TF2020	TC3 HMI Clients Pack 3	optional package for three further client connections 
TF2030	TC3 HMI Clients Pack 10	optional package for ten further client connections 
TF2040	TC3 HMI Clients Pack 25	optional package for 25 further client connections 
TF2050	TC3 HMI Targets Pack 1	optional package for one further control system 
TF2060	TC3 HMI Targets Pack 3	optional package for three further control systems 
TF2070	TC3 HMI Targets Pack 10	optional package for ten further control systems 
TF2080	TC3 HMI Targets Pack 25	optional package for 25 further control systems 
TF2090	TC3 HMI Targets Pack 100	optional package for 100 further control systems 
TF2100	TC3 HMI ADS	server extension for access to TwinCAT target systems via ADS 
TF2110	TC3 HMI OPC UA	server extension for access to TwinCAT target systems or other controllers via OPC UA 
TF2200	TC3 HMI Extension SDK	software development kit (C++/.NET) for programming application-specific solutions 
TF2210	TC3 HMI Recipe Management	server extension for recipe management 
TF2300	TC3 HMI Scope	software oscilloscope for graphic display of time sequences 
Measurement		
TF3300	TC3 Scope Server	data preparation for visual display in the TwinCAT 3 Scope View
TF3500	TC3 Analytics Logger	The TwinCAT Analytics Logger enables the cyclic archiving of the process image. 
TF3510	TC3 Analytics Library	PLC library used for online or offline analysis in the PLC runtime of the TwinCAT Analytics Workbench 
TF3600	TC3 Condition Monitoring Level 1	Condition Monitoring Level 1
TF3601	TC3 Condition Monitoring Level 2	Condition Monitoring Level 2 
TF3900	TC3 Solar Position Algorithm	precise calculation of the sun's position
Controller		
TF4100	TC3 Controller Toolbox	basic controllers (P, I, D), complex controllers (PI, PID), pulse width modulation, ramps, signal generators and filters
TF4110	TC3 Temperature Controller	temperature control for monitoring and controlling different temperature ranges

TwinCAT 3 | Functions

Motion

TF5000	TC3 NC PTP 10 Axes	NC PTP (point-to-point movements) for up to 10 axes	
TF5010	TC3 NC PTP Axes Pack 25	extension of TwinCAT 3 NC PTP to up to 25 axes	
TF5020	TC3 NC PTP Axes Pack unlimited	extension of TwinCAT 3 NC PTP to over 25 axes	
TF5050	TC3 NC Camming	using the TwinCAT NC cam plate functionality (table coupling)	
TF5055	TC3 NC Flying Saw	implementing flying saw functionality	
TF5060	TC3 NC FIFO Axes	implementation of a pre-defined user setpoint generator for an NC axis	
TF5065	TC3 Motion Control XFC	high-precision logging and switching of digital signals in relation to axis positions	
TF5100	TC3 NC I	NC I with 3 interpolating axes and 5 additional axes	
TF5110	TC3 Kinematic Transformation L1	realisation of different kinematic transformations Level 1	
TF5111	TC3 Kinematic Transformation L2	realisation of different kinematic transformations Level 2	
TF5112	TC3 Kinematic Transformation L3	realisation of different kinematic transformations Level 3	
TF5113	TC3 Kinematic Transformation L4	realisation of different kinematic transformations Level 4	
TF5120	TC3 Robotics mxAutomation	direct communication between the PLC and the KUKA KR C4 robot control	
TF5130	TC3 Robotics uniVAL PLC	direct communication between the PLC and the CS8C robotics controller from Stäubli	i
TF5200	TC3 CNC	CNC path control software	
TF5210	TC3 CNC E	CNC path control software export version	
TF5220	TC3 CNC Axes Pack	extension to up to a total of 64 axes/controlled spindles, of which a maximum of 32 can be path axes and a maximum of 12 can be controlled spindles	
TF5230	TC3 CNC Channel Pack	further CNC channel, extension to a maximum of 12 channels, channel synchronisation, axis transfer between channels	
TF5240	TC3 CNC Transformation	transformation functionality (5-axis functionality)	
TF5250	TC3 CNC HSC Pack	extending the CNC with HSC technology (high-speed cutting)	
TF5260	TC3 CNC Spline Interpolation	path programming via splines with programmable spline type, Akima-spline, B-spline	
TF5270	TC3 CNC Virtual NCK Basis	virtual TwinCAT CNC for simulation in a Windows environment	
TF5271	TC3 CNC Virtual NCK Options	virtual TwinCAT CNC for simulation in a Windows environment	
TF5280	TC3 CNC Volumetric Compensation	optional package for compensating geometric machine errors based on an ISO-standardised parametric model	i
TF5290	TC3 CNC Cutting Plus	technology package for extending the CNC functionality for cutting operations	i
TF5410	TC3 Motion Collision Avoidance	collision avoidance and controlled accumulation when operating a number of linearly and/or translationally dependent axes with TC3 NC PTP	
TF5420	TC3 Motion Pick-and-Place	for handling tasks carried out by gantry robots and other kinematics	
TF5800	TC3 Digital Cam Server	fast cam controller with monitoring for various fieldbuses	i
TF5810	TC3 Hydraulic Positioning	algorithms for control and positioning of hydraulic axes	

TwinCAT 3 | Functions

Connectivity

TF6000	TC3 ADS Communication Library	ADS communication components	
TF6100	TC3 OPC UA	access to TwinCAT in accordance with OPC UA with UA server (DA/HA/AC) and UA client (DA)	
TF6120	TC3 OPC DA	access to TwinCAT variables, in accordance with OPC DA and OPC XML DA specification	
TF6220	TC3 EtherCAT Redundancy 250	extension of the TwinCAT EtherCAT master with cable redundancy capability for up to 250 slaves	
TF6221	TC3 EtherCAT Redundancy 250+	extension of the TwinCAT EtherCAT master with cable redundancy capability for more than 250 slaves	
TF6225	TC3 EtherCAT External Sync	extension of the TwinCAT EtherCAT master with an option to synchronise the Beckhoff real-time communication with external signals	
TF6250	TC3 Modbus TCP	communication with Modbus TCP devices (server and client functionality)	
TF6255	TC3 Modbus RTU	serial communication with Modbus end devices	
TF6270	TC3 PROFINET RT Device	communication via PROFINET (PROFINET slave)	
TF6271	TC3 PROFINET RT Controller	communication via PROFINET (PROFINET master)	
TF6280	TC3 Ethernet/IP Slave	communication via EtherNet/IP (EtherNet/IP slave)	
TF6281	TC3 Ethernet/IP Master	communication via EtherNet/IP (EtherNet/IP master)	i
TF6300	TC3 FTP	easy access from TwinCAT PLC to FTP server	
TF6310	TC3 TCP/IP	communication via generic TCP server	
TF6311	TC3 TCP/UDP Realtime	direct access from realtime to Ethernet communication	
TF6340	TC3 Serial Communication	communication via serial Bus Terminals or PC COM ports with the 3964R and RK512 protocol	
TF6350	TC3 SMS/SMTP	sending SMS and e-mails from the PLC	
TF6360	TC3 Virtual Serial COM	virtual serial COM driver for Windows platforms	
TF6420	TC3 Database Server	accessing databases from the PLC	
TF6421	TC3 XML Server	read and write access to XML files from the PLC	
TF6500	TC3 IEC 60870-5-10x	communication according to IEC 60870-101, -102, -103, -104	
TF6510	TC3 IEC 61850/400-25	communication according to IEC 61850 and IEC 61400-25	
TF6600	TC3 RFID Reader Communication	connection of RFID readers to the TwinCAT PLC	
TF6610	TC3 S5/S7 Communication	communication with S5/S7 controllers	
TF6650	TC3 DBC File Import for CAN	reading of DBC file formats	
TF6701	TC3 IoT Communication (MQTT)	provides basic publisher/subscriber-based data connectivity via MQTT	i
TF6710	TC3 IoT Functions	provides connectivity for cloud-based communication services	i
TF6720	TC3 IoT Data Agent	gateway application for data connectivity between TwinCAT runtime and IoT services	i
TF6730	TC3 IoT Communicator	sends process data and push notifications from TwinCAT to smartphones and tablets through a messaging service	i
TF6735	TC3 IoT Communicator App	smartphone and tablet app to receive and visualise live data and push notifications sent from TwinCAT	i

Industry specific

TF8000	TC3 BA Connectivity Library	libraries for programming of Bus Terminals for building automation (DALI, EnOcean, SMI, EIB, LON, M-Bus, GENibus, MP-Bus, DMX and manual operating modules)	
TF8010	TC3 Building Automation Basic	executing basic room automation functions	
TF8040	TC3 Building Automation	software package covering all technical building automation services	
TF8310	TC3 Wind Framework	framework for the development of operational management software for wind turbines	

► www.beckhoff.com/TwinCAT3

We reserve the right to make technical changes.

BECKHOFF New Automation Technology

TwinCAT 2

TX1200 TwinCAT PLC	
PC hardware	standard PC/IPC hardware, no extras
Operating systems	Windows NT/2000/XP/Vista, Windows 7/10, 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, powerful library management, convenient debugging

TX1250 TwinCAT NC PTP	
TwinCAT PLC	inclusive
PC hardware	standard PC/IPC hardware, no extras
Operating systems	Windows NT/2000/XP/Vista, Windows 7/10, 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 (standardised PLCopen Motion Control libraries), convenient axis commissioning menus in the System Manager
Runtime system	NC point-to-point including TwinCAT PLC
Number of axes	up to 255
Axis types	electrical and hydraulic servo drives, frequency converter drives, stepper motor drives, switched drives (fast/crawl axes)
Cycle time	50 µs upwards, typically 1 ms (selectable)
Axis functions	standard axis functions: start/stop/ reset/reference, speed override, special functions: master/slave cascading, cam plates, electronic gearings, online distance compensation of segments, flying saw

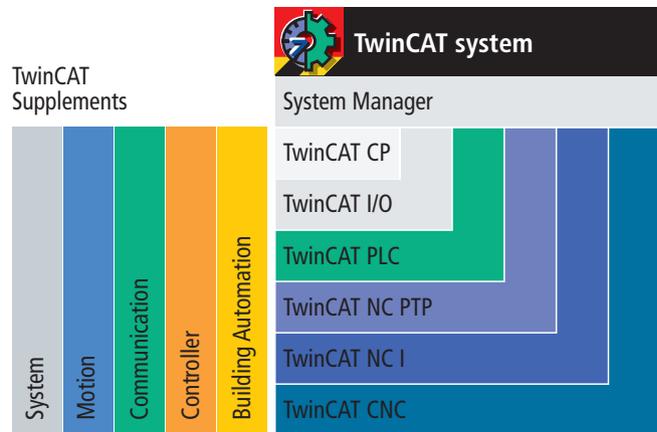
TX1100 TwinCAT I/O	
PC hardware	standard PC/IPC hardware, no extras
Operating systems	Windows NT/2000/XP/Vista, Windows 7, NT/XP/Windows 7 Embedded, CE (only runtime)*
Real-time	Beckhoff real-time kernel

Multi-purpose I/O interface for all common fieldbus systems, PC Fieldbus Cards and interfaces with integrated real-time driver

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

Windows driver for Beckhoff Control Panel

* version-dependent



TX1260 TwinCAT NC I	
TwinCAT PLC	inclusive
TwinCAT NC PTP	inclusive
PC hardware	standard PC/IPC hardware, no extras
Operating systems	Windows NT/2000/XP/Vista, Windows 7/10, 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, zero shifts, tool compensations, M and H functions
Geometries	straight lines and circular paths in 3-D space, circular paths in all main planes, helices with base circles in all main planes linear, circular, helical interpolation in the main lanes and freely definable planes, Bezier splines, look-ahead function
Axis functions	online reconfiguration of axes in groups, path override, slave coupling to path axes, auxiliary axes, axis error and sag compensation, measuring functions
Operation	automatic operation, manual operation (jog/inching), single block operation, referencing, handwheel operation (motion/superposition)

TS511x TwinCAT NC I Options	
Options	TS511x TwinCAT Kinematic Transformation

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

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

TwinCAT 2 Supplements | System

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

TwinCAT 2 Supplements | Controller

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

TwinCAT 2 Supplements | Motion

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

TwinCAT 2 Supplements | Communication

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

TwinCAT 2 Supplements | Communication

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

TwinCAT 2 Supplements | Building Automation

TS8000	TwinCAT PLC HVAC	automation of HVAC and sanitary installations
TS8010	TwinCAT PLC Building Automation Basic	executing basic room automation functions
TS8020	TwinCAT BACnet/IP	communication with the data networks of the building automation and building control systems
TS8035	TwinCAT FIAS Server	communication between TwinCAT PLC and a system using the FIAS standard
TS8036	TwinCAT Crestron Server	communication between a TwinCAT PLC and a Crestron controller
TS8037	TwinCAT Bang & Olufsen Server	communication between a TwinCAT PLC and a Bang & Olufsen audio/video installation
TS8040	TwinCAT Building Automation	software package covering all technical building automation services
TS8100	TwinCAT Building Automation Framework	configuration and commissioning of building automation projects

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TwinSAFE



EL6900



EP1908



AX5000 Servo Drive with AX5805 option card

TwinSAFE		I/O		Drive Technology	
Controller		I/O		Drive Technology	
EtherCAT Terminal	EK1960 TwinSAFE Compact Controller, 20 safe inputs, 10 safe outputs	EtherCAT Terminal	EK1914 EtherCAT Coupler with integrated digital I/Os: 4 inputs + 4 outputs, 2 safe inputs + 2 safe outputs	Option cards	AX5801-0200 TwinSAFE drive option card for AX5000 Servo Drives, drive-integrated safety functions: STO, SS1
	EL6900 TwinSAFE Logic		EL1904 TwinSAFE, 4 safe inputs		AX5805, AX5806 TwinSAFE drive option card for AX5000 Servo Drives, drive-integrated safety functions: STO, SOS, SS1, SS2, SLS, SSM, SSR, SMS, SLP, SCA, SLI, SAR, SMA, SDIp and SDIn
	EL6910 TwinSAFE Logic		EL2901 TwinSAFE, 1 safe output		
	EL6930 TwinSAFE/PROFIsafe logic and gateway terminal		EL2902 TwinSAFE, 2 safe outputs	EL2904 TwinSAFE, 4 safe outputs	
Bus Terminal	KL6904 TwinSAFE Logic Bus Terminal, 4 safe outputs	EtherCAT Box	EP1908 TwinSAFE, 8 safe inputs	EtherCAT Terminal	EL7201-9014 $I_{ms} = 2.8 \text{ A}$, 50 V DC, OCT, STO
		EtherCAT Plug-in Modules	EJ1914 TwinSAFE, 4 safe inputs		EL7211-9014 $I_{ms} = 4.5 \text{ A}$, 50 V DC, OCT, STO
			EJ1918 TwinSAFE, 8 safe inputs		EL7221-9014 $I_{ms} = 7 \dots 8 \text{ A}$ with ZB8610, 50 V DC, OCT, STO
			EJ1957 TwinSAFE, 8 safe inputs, 4 safe outputs		
			EJ2914 TwinSAFE, 4 safe outputs		
			EJ2918 TwinSAFE, 8 safe outputs		
			EJ6910 TwinSAFE Logic		
			Bus Terminal		KL1904 TwinSAFE, 4 safe inputs
		KL2904 TwinSAFE, 4 safe outputs			

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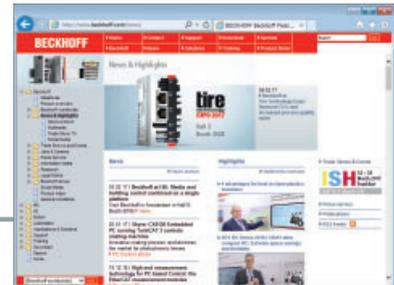
i Product announcement for availability status see www.beckhoff.com

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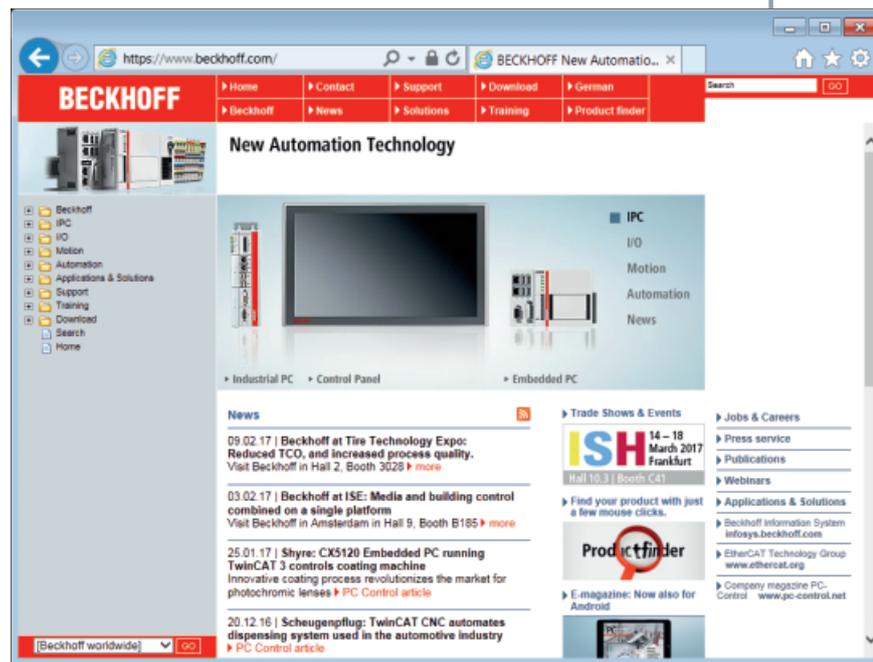
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We reserve the right to make technical changes.

