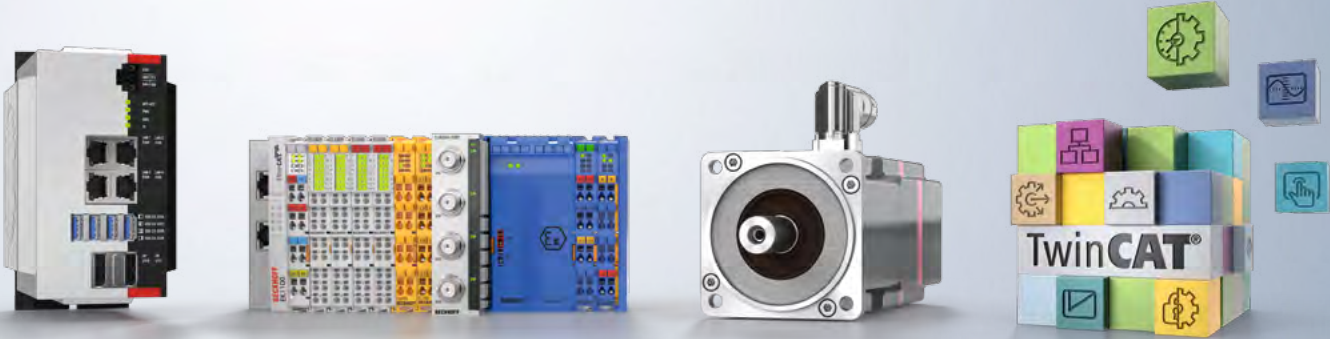


# BECKHOFF New Automation Technology

## Product Overview | 2023



IPC



10 The IPC Company

I/O



30 The I/O Company

Motion



76 The Motion Company

Automation



96 The Automation Company

MX-System



**NEW**

112 The System Company

Vision



**NEW**

124 The Vision Company

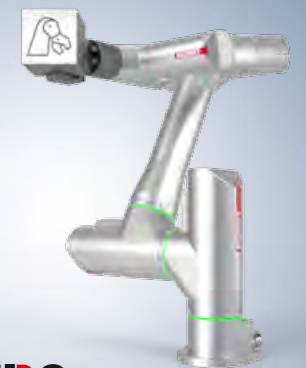
# New Automation Technology



Beckhoff implements open automation systems using proven PC-based control technology. The main areas that the product range covers are industrial PCs, I/O and fieldbus components, drive technology, automation software, control cabinet-free automation, and hardware for machine vision. Product ranges that can be used as separate components or integrated into a complete and mutually compatible control system are available for all sectors. Our New Automation Technology stands for universal and industry-independent control and automation solutions that are used worldwide in a large variety of different applications, ranging from CNC-controlled machine tools to intelligent building control.

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

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

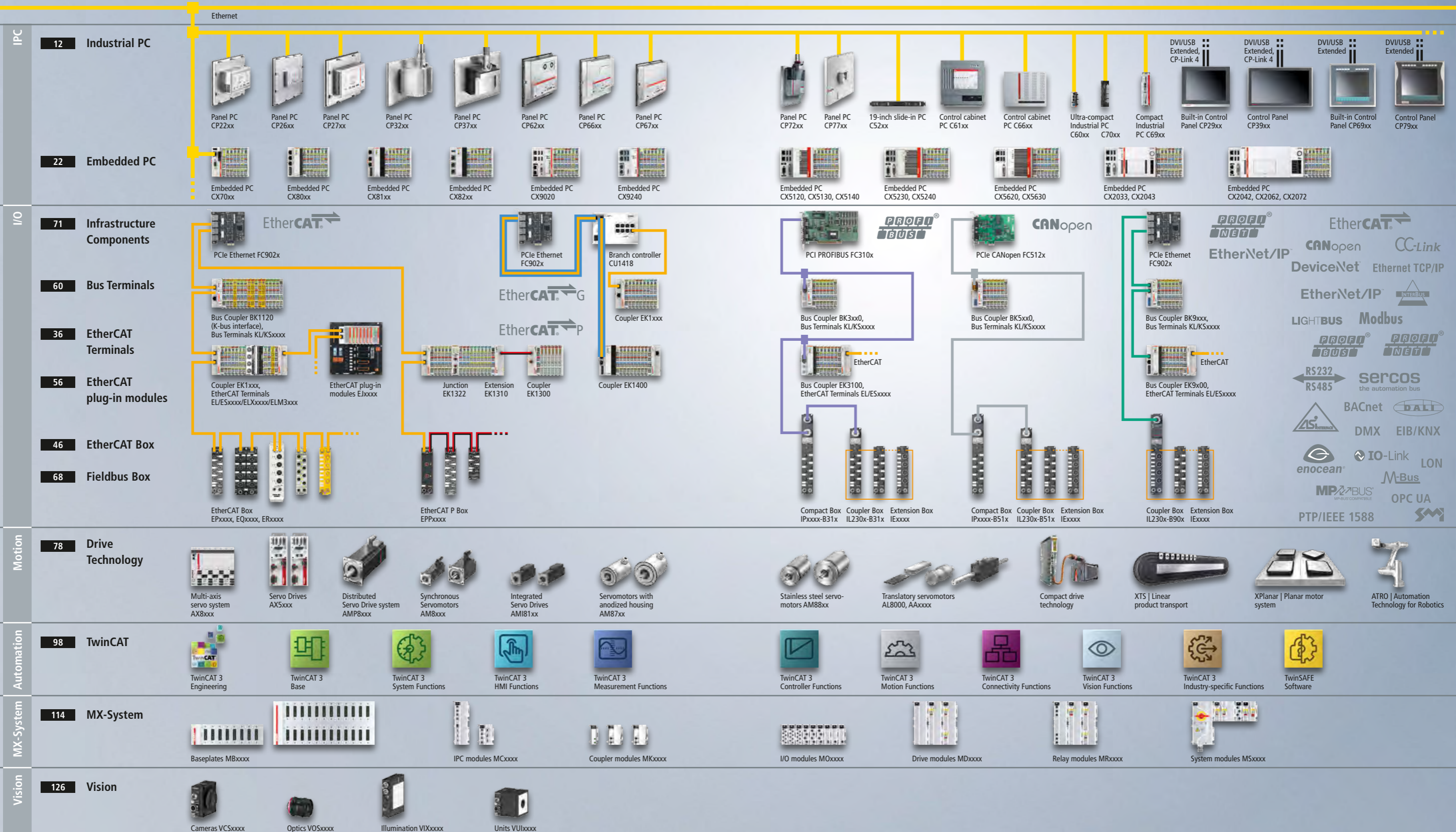


**MX-System**

**ATRO**



# System overview



# The IPC Company

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

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

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



Ultra-compact Industrial PC in IP65/67

## Multi-touch Panel PCs 14

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

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

## Multi-touch Control Panels 15

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

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

## Single-touch Panels 16

- Control Panels or Panel PCs
- display sizes from 5.7-inch to 19-inch
- easy installation in the front of a control cabinet or on mounting arms
- customer-specific implementations

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

## PCs 18

- scalable performance range
- highest computing power
- industrial-strength housing designs
- multiple features
- high flexibility in terms of display connections

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

## Embedded PCs 22

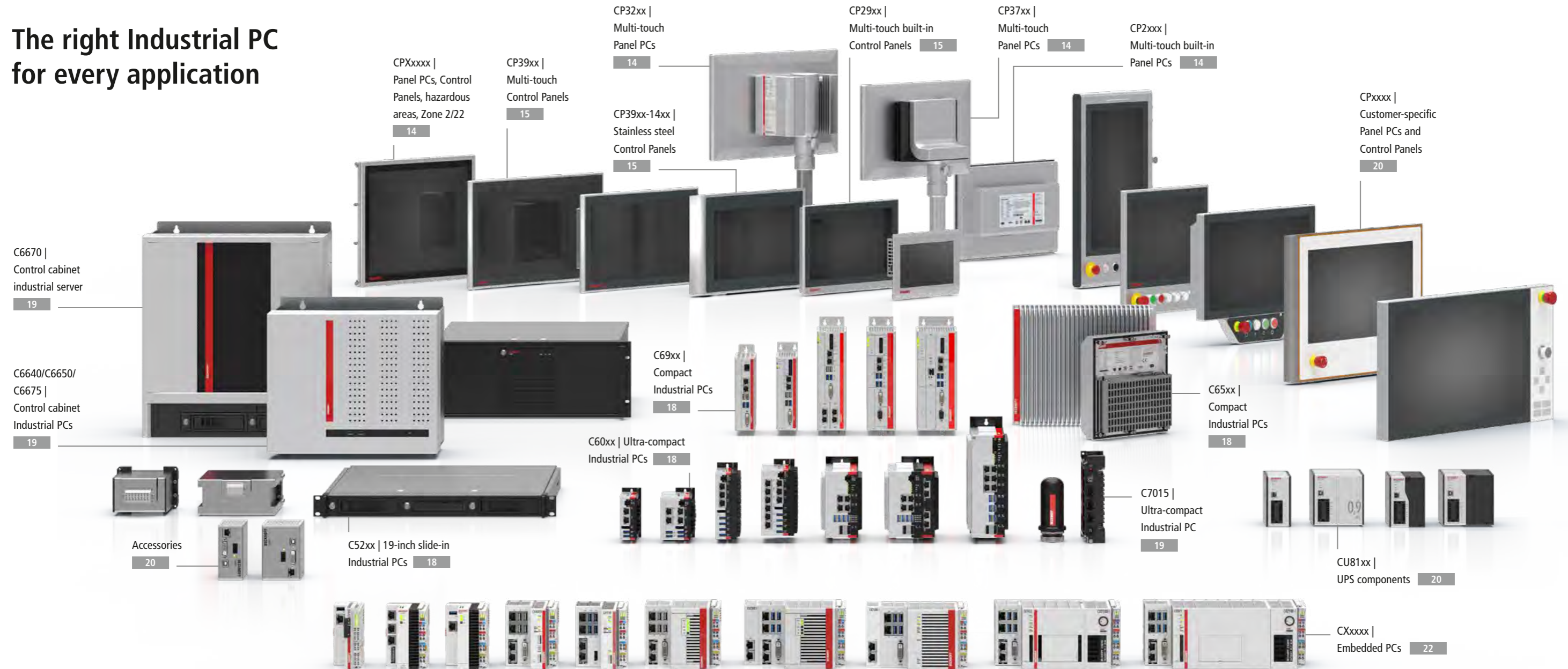
- scalable performance range
- up to 12 cores
- compact design
- direct I/O interface
- modular extension options
- DIN rail mounting

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



- large model variety of Industrial PCs and Embedded PCs
- high-performance PCs, featuring a wide range of processors, from Intel® Celeron® to top of the line Core™ i9 processors
- long-term availability of all Industrial PCs and Embedded PCs
- As the inventor of PC-based control technology, Beckhoff closely cooperates with global technology partners Intel and Microsoft.

# The right Industrial PC for every application



Industrial PCs							
	Compact motherboard Intel® Core™	Compact motherboard Intel Atom®	ATX motherboard Intel® Core™	3½-inch motherboard Intel® Core™	3½-inch motherboard Intel Atom®	3½-inch motherboard ARM Cortex™-A8	Control Panel
Multi-touch Panel PCs/Control Panels				CP22xx CP32xx	CP27xx/CPX27xx CP37xx/CPX37xx	CP26xx	CP29xx/CPX29xx CP39xx/CPX39xx
Single-touch Panel PCs/Control Panels		CP77xx		CP62xx CP72xx	CP67xx	CP66xx	CP69xx CP79xx
19-inch slide-in Industrial PCs			C5240	C5210			
Control cabinet Industrial PCs	C6025	C6015	C6140/C6150	C6515/C6525	C6905/C6915		
	C6027	C6017	C6240/C6250	C6920/C6930	C6925		
	C6030		C6640/C6650				
	C6032		C6675				
	C6040						
IP65 Industrial PCs		C7015					

Control cabinet industrial server	
SSl EEB motherboard	
2 x Intel® Xeon®	
C6670	

# Multi-touch Panel PCs

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



Multi-touch built-in Panel PCs, front side IP65										
	Display	7-inch	12-inch	12.1-inch	15-inch	15.6-inch	18.5-inch	19-inch	21.5-inch	24-inch
	Resolution	800 x 480	800 x 600	1280 x 800	1024 x 768	1366 x 768	1366 x 768	1280 x 1024	1920 x 1080	1920 x 1080
	Format	5:3	4:3	16:10	4:3	16:9	16:9	5:4	16:9	16:9
<b>CP22xx</b> – up to Intel® Core™ i3/i5/i7	multi-finger touch screen		CP2212	CP2213	CP2215	CP2216	CP2218	CP2219	CP2221	CP2224
<b>CP26xx</b> – ARM Cortex™-A8	dual-finger touch screen	CP2607	CP2612	CP2613	CP2615	CP2616	CP2618	CP2619	CP2621	CP2624
<b>CP27xx</b> – Intel® Celeron® ULV or Atom®	multi-finger touch screen, only horizontal		CP2712	CP2713	CP2715 CPX2715	CP2716	CP2718	CP2719 CPX2719	CP2721 CPX2721	CP2724

Multi-touch Panel PCs, all sides IP65										
	Display	7-inch	12-inch	12.1-inch	15-inch	15.6-inch	18.5-inch	19-inch	21.5-inch	24-inch
	Resolution	800 x 480	800 x 600	1280 x 800	1024 x 768	1366 x 768	1366 x 768	1280 x 1024	1920 x 1080	1920 x 1080
	Format	5:3	4:3	16:10	4:3	16:9	16:9	5:4	16:9	16:9
<b>CP32xx</b> – up to Intel® Core™ i3/i5/i7	multi-finger touch screen, only horizontal		CP3212		CP3215	CP3216	CP3218	CP3219	CP3221	CP3224
<b>CP32xx-1600</b> – up to Intel® Core™ i3/i5/i7	multi-finger touch screen, only horizontal, mounting arm adapter selectable				CP3215-1600	CP3216-1600	CP3218-1600	CP3219-1600	CP3221-1600	CP3224-1600
<b>CP37xx</b> – Intel Atom®	multi-finger touch screen, only horizontal		CP3712	CP3713	CP3715 CPX3715	CP3716	CP3718	CP3719 CPX3719	CP3721 CPX3721	CP3724
<b>CP37xx-1600</b> – Intel Atom®	multi-finger touch screen, only horizontal, fanless without cooling fins				CP3715-1600-0020	CP3716-1600-0020	CP3718-1600-0020	CP3719-1600-0020	CP3721-1600-0020	CP3724-1600-0020

# Multi-touch Control Panels

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



Multi-touch built-in Control Panels, front side IP65										
	Display	7-inch	12-inch	12.1-inch	15-inch	15.6-inch	18.5-inch	19-inch	21.5-inch	24-inch
	Resolution	800 x 480	800 x 600	1280 x 800	1024 x 768	1366 x 768	1366 x 768	1280 x 1024	1920 x 1080	1920 x 1080
	Format	5:3	4:3	16:10	4:3	16:9	16:9	5:4	16:9	16:9
<b>CP29xx-0000</b> – DVI/USB Extended interface*	multi-finger touch screen	CP2907-0000	CP2912-0000	CP2913-0000	CP2915-0000 CPX2915-0000	CP2916-0000	CP2918-0000	CP2919-0000 CPX2919-0000	CP2921-0000 CPX2921-0000	CP2924-0000
<b>CP29xx-0010</b> – CP-Link 4*	multi-finger touch screen	CP2907-0010	CP2912-0010	CP2913-0010	CP2915-0010	CP2916-0010	CP2918-0010	CP2919-0010	CP2921-0010	CP2924-0010

Multi-touch Control Panels, all sides IP65										
	Display	7-inch	12-inch	12.1-inch	15-inch	15.6-inch	18.5-inch	19-inch	21.5-inch	24-inch
	Resolution	800 x 480	800 x 600	1280 x 800	1024 x 768	1366 x 768	1366 x 768	1280 x 1024	1920 x 1080	1920 x 1080
	Format	5:3	4:3	16:10	4:3	16:9	16:9	5:4	16:9	16:9
<b>CP39xx-0000</b> – DVI/USB Extended interface*	multi-finger touch screen	CP3907-0000	CP3912-0000	CP3913-0000	CP3915-0000	CP3916-0000	CP3918-0000	CP3919-0000	CP3921-0000	CP3924-0000
<b>CP39xx-0010</b> – CP-Link 4*	multi-finger touch screen	CP3907-0010	CP3912-0010	CP3913-0010	CP3915-0010 CPX3915-0010	CP3916-0010	CP3918-0010	CP3919-0010 CPX3919-0010	CP3921-0010 CPX3921-0010	CP3924-0010
<b>CP39xx-14xx-0010</b> – CP-Link 4*	multi-finger touch screen, stainless steel housing			CP3913-14xx-0010		CP3916-14xx-0010	CP3918-14xx-0010			

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



# Single-touch panels

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



CP62xx

CP66xx

CP67xx

## Single-touch built-in Panel PCs, front side IP54/65

	Display	5.7-inch	6.5-inch	7-inch	10.1-inch	12-inch	15-inch	19-inch
	Resolution	640 x 480	640 x 480	800 x 480	1024 x 600	800 x 600	1024 x 768	1280 x 1024
	Format	4:3	4:3	5:3	17:10	4:3	4:3	5:4
	Protect. rating front	IP65	IP65	IP54	IP54	IP65	IP65	IP65
<b>CP62xx</b> – 3½-inch motherboard – up to Intel® Core™ i3/i5/i7	without keys					CP6201	CP6202	CP6203
	function keys					CP6211	CP6212	CP6213
	numerical					CP6221	CP6222	CP6223
	alphanumeric					CP6231	CP6232	CP6233
						CP6242		
<b>CP66xx</b> – 3½-inch motherboard – ARM Cortex™-A8	without keys	CP6607	CP6609			CP6601	CP6602	CP6603
	function keys		CP6619			CP6611	CP6612	CP6613
	numerical		CP6629			CP6621	CP6622	CP6623
	alphanumeric					CP6631	CP6632	CP6633
<b>CP6606, CP6600</b> – 3½-inch motherboard – ARM Cortex™-A8	without keys			CP6606	CP6600			
<b>CP67xx</b> – 3½-inch motherboard – Intel® Celeron® ULV or Atom®	without keys	CP6707				CP6701	CP6702	CP6703
	function keys					CP6711	CP6712	CP6713
	numerical					CP6721	CP6722	CP6723
	alphanumeric					CP6731	CP6732	CP6733
						CP6742		
<b>CP6706, CP6700</b> – 3½-inch motherboard – Intel Atom®	without keys			CP6706	CP6700			



Without keys

Function keys

Numeric keyboard

Alphanumeric keyboard

With PLC keys on the sides



CP72xx

CP77xx

CP69xx

CP79xx

CP790x-14xx, stainless steel

## Single-touch Panel PCs, all sides IP65

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

## Single-touch built-in Control Panels, front side IP54/65

	Display	5.7-inch	6.5-inch	7-inch	10.1-inch	12-inch	15-inch	19-inch
	Resolution	640 x 480	640 x 480	800 x 480	1024 x 600	800 x 600	1024 x 768	1280 x 1024
	Format	4:3	4:3	5:3	17:10	4:3	4:3	5:4
	Protect. rating front	IP65	IP65	IP54	IP54	IP65	IP65	IP65
<b>CP69xx</b> – DVI/USB Extended interface*	without keys	CP6907	CP6909	CP6906	CP6900	CP6901	CP6902	CP6903
	function keys		CP6919			CP6911	CP6912	CP6913
	numerical		CP6929			CP6921	CP6922	CP6923
	alphanumeric					CP6931	CP6932/42	CP6933

## Single-touch Control Panels, all sides IP65

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

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

# PCs

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



## Control cabinet Industrial PCs with 3½-inch motherboard

	Processor	Intel Atom®	Intel® Celeron®, Intel® Pentium®, Intel® Core™ i3/i5/i7 6 <sup>th</sup> /7 <sup>th</sup> generation	Intel® Celeron®, Intel® Pentium®, Intel® Core™ i3/i5/i7 8 <sup>th</sup> /9 <sup>th</sup> generation	Intel® Celeron®, Intel® Core™ i3/i5/i7 11 <sup>th</sup> generation
<b>C5210, 19-inch slide-in Industrial PCs</b>	1 rack unit		C5210-0030	C5210-0040	C5210-0050 <i>i</i>
<b>C65xx</b>	fanless fanless, RAID		C6515-0060 C6525-0060	C6515-0070 C6525-0070	C6515-0080 <i>i</i> C6525-0080 <i>i</i>
<b>C69xx, compact Industrial PCs, connectors on front</b>	fanless fanless, 1 CFast card slot fanless, 2 PCIe module slots optional plug-in card slots 2 PCIe module slots, optional plug-in card slots	C6905-0010 C6905-0020 C6915-0010 C6915-0020 C6925-0030 C6925-0040		C6920-0060 C6930-0060	C6920-0070 C6930-0070 C6920-0080 <i>i</i> C6930-0080 <i>i</i>

## Control cabinet Industrial PCs with compact industrial motherboard

	Processor	Intel Atom®	Intel® Celeron®, Intel® Core™ i3/i5/i7 8 <sup>th</sup> generation, series U	Intel® Celeron®, Intel® Pentium®, Intel® Core™ i3/i5/i7 6 <sup>th</sup> /7 <sup>th</sup> generation	Intel® Celeron®, Intel® Pentium®, Intel® Core™ i3/i5/i7 8 <sup>th</sup> /9 <sup>th</sup> generation	Intel® Celeron®, Intel® Core™ i3/i5/i7 11 <sup>th</sup> generation	Intel® Celeron®, Intel® Pentium®, Intel® Core™ i3/i5/i7/i9 12 <sup>th</sup> generation
<b>C60xx</b>	fanless, without slots  optional interfaces and/or an optional 1-second UPS up to 2 M.2 SSDs and/or 2 PCIe com- pact module slots up to 2 M.2 SSDs	C6015-0010 C6015-0020  C6017-0010 C6017-0020  C6027-0000	C6025-0000			C6025-0010 <i>i</i>  C6027-0010 <i>i</i> C6030-0080 <i>i</i> C6032-0080 <i>i</i>	C6030-0060 C6032-0060  C6030-0070 C6032-0070  C6040-0090 <i>i</i>

## IP65 Industrial PCs with compact industrial motherboard

	Processor	Intel Atom®
<b>C70xx, IP65</b>	fanless	C7015-0020

## Control cabinet Industrial PCs with ATX motherboard

	Processor	Intel® Celeron®, Intel® Pentium®, Intel® Core™ i3/i5/i7 6 <sup>th</sup> /7 <sup>th</sup> generation	Intel® Celeron®, Intel® Pentium®, Intel® Core™ i3/i5/i7 8 <sup>th</sup> /9 <sup>th</sup> generation
<b>C5240, 19-inch slide-in Industrial PCs</b>	7 slots, 4 rack units	C5240-0010	C5240-0020
<b>C61xx, connectors on top</b>	7 slots	C6140-0070 C6150-0070	C6140-0080
<b>C62xx, connectors on front</b>	7 slots	C6240-0070 C6250-0080	C6240-0080
<b>C6640/C6650, connectors on top</b>	7 slots  7 slots, 2 removable frames	C6640-0050  C6650-0050	C6640-0060  C6650-0060
<b>C6675, connectors on top</b>	7 slots, 2 removable frames		C6675-0060

## Control cabinet industrial server with SSI EEB motherboard

	Processor	2 x Intel® Xeon® Scalable
<b>C6670</b>	6 slots, 2 removable frames	C6670-0010

# Customization options for Panel PCs and Control Panels

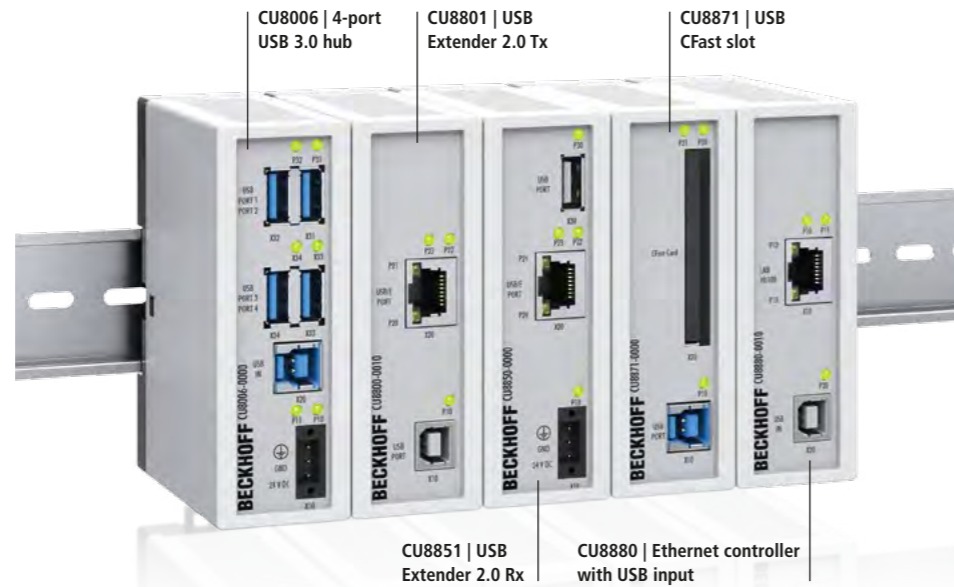
- stainless steel housings
- special membrane keyboards
- integration of electro-mechanical keyboards
- flush-mounted touch screens
- adaptation of membrane colors
- integration of customer logos



# Industrial PC accessories

## CU8xxx modules

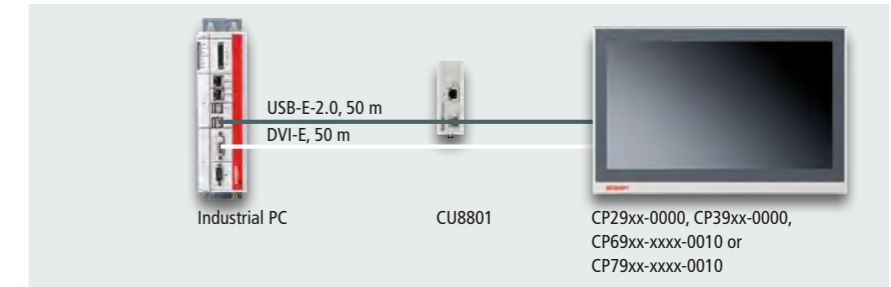
Different modules enable the use of various technologies in the industrial environment. All modules are intended for DIN rail mounting. In addition, there are a variety of uninterruptible power supplies (UPS).



## DVI/USB Extended

The DVI/USB Extended technology enables remote panel operation at a distance of up to 50 m from the industrial PC. The DVI graphics signal is directly transmitted from the PC via a DVI-E cable. A signal processor in the Control Panel restores the DVI signal after a distance of 50 m. For the CP29xx-0000, CP39xx-0000, CP69xx-xxxx-0010 and CP79xx-xxxx-0010 Control Panels, the USB signal from the PC is converted into USB Extended 2.0 by the CU8801 USB Extender box, transmitted to the Control Panel via a Cat.5 cable over 50 m max. to be reconverted into USB 2.0 with 480 Mbit/s. A USB hub in the Control Panel enables the connection of two external USB devices such as a keyboard or USB stick, in addition to touch screen and push-button extension.

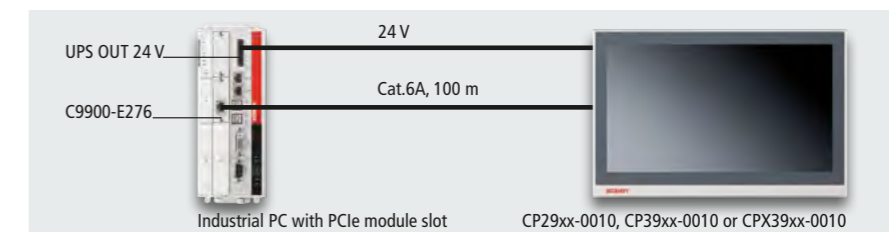
DVI/USB Extended 2.0 for CP29xx-0000, CP39xx-0000, CP69xx-xxxx-0010 or CP79xx-xxxx-0010 via the CU8801 transmitter box



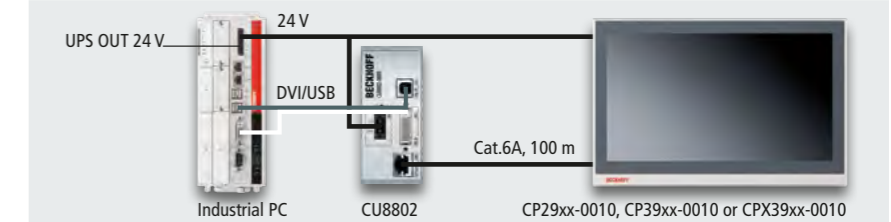
## CP-Link 4: The One Cable Display Link

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

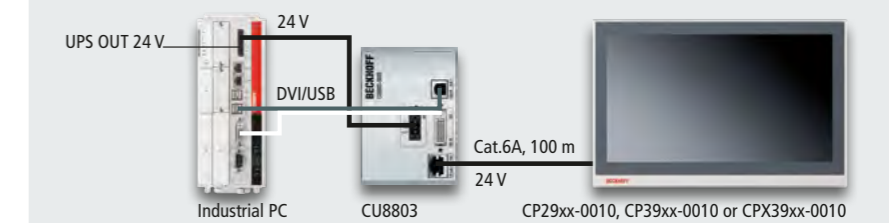
CP-Link 4 – The Two Cable Display Link: via C9900-E276 PCIe module integrated in the PC



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



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



► [www.beckhoff.com/cp-link4](http://www.beckhoff.com/cp-link4)

# Embedded PC

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



Embedded PC								
Basic CPU	CX70xx	CX80xx	CX81xx	CX82xx	<i>i</i> CX9020	CX9240	<i>i</i> CX5010	CX5020
<b>Processor</b>	ARM Cortex™-M7, 480 MHz	ARM9, 400 MHz	ARM Cortex™-A9, 800 MHz	ARM Cortex™-A53, 1.2 GHz	ARM Cortex™-A8, 1 GHz	ARM Cortex™-A53, 1.2 GHz	Intel Atom® Z510, 1.1 GHz clock frequency	Intel Atom® Z530, 1.6 GHz clock frequency
<b>Flash memory</b>	512 MB microSD (optionally 1 GB, 2 GB, 4 GB or 8 GB)	512 MB microSD (optionally expandable)	slot for microSD card, 512 MB included (expandable)	slot for microSD card, card not included	2 x slot for microSD card, 512 MB included (expandable)	slot for microSD card, card not included	slot for Compact Flash card, 128 MB included (expandable)	slot for Compact Flash card, 128 MB included (expandable)
<b>Main memory</b>	32 MB SDR (internal, not expandable)	64 MB DDR2 RAM (not expandable)	512 MB DDR3 RAM (not expandable)	1 GB LPDDR4 RAM (not expandable)	1 GB DDR3 RAM (not expandable)	2 GB LPDDR4 RAM (not expandable)	512 MB RAM (not expandable)	512 MB RAM (expandable ex factory to 1 GB)
<b>Interfaces</b>	1 x RJ45 10/100 Mbit/s, 1 x USB 2.0, 1 x bus interface	1 x RJ45 10/100 Mbit/s, 1 x USB device (behind the front flap), 1 x bus interface	1 x RJ45 10/100 Mbit/s, 1 x bus interface	1 x RJ45 10/100/1000 Mbit/s, 1 x USB 3.0	2 x RJ45 10/100 Mbit/s (internal switch), 1 x DVI-D, 4 x USB 2.0, 1 x optional interface	2 x RJ45 10/100/1000 Mbit/s, 1 x DisplayPort, 4 x USB 3.0, 1 x optional interface	2 x RJ45 10/100/1000 Mbit/s, 1 x DVI-D, 4 x USB 2.0, 1 x optional interface	2 x RJ45 10/100/1000 Mbit/s, 1 x DVI-D, 4 x USB 2.0, 1 x optional interface
<b>I/O connection</b>	E-bus or K-bus, automatic recognition	E-bus or K-bus, automatic recognition	E-bus or K-bus, automatic recognition	E-bus or K-bus, automatic recognition	E-bus or K-bus, automatic recognition	E-bus or K-bus, automatic recognition	E-bus or K-bus, automatic recognition	E-bus or K-bus, automatic recognition
<b>System interfaces</b>	integrated	integrated	integrated	integrated	integrated	integrated	integrated	integrated
<b>DVI/USB</b>	–	–	–	–	in the basic CPU	–	in the basic CPU	in the basic CPU
<b>RS232</b>	CX7080	CX8080	CX8180	CX8280	CX9020-N030	CX9240-N030	CX5010-N030	CX5020-N030
<b>RS422/RS485</b>	CX7080	CX8080	CX8180	CX8280	CX9020-N031	CX9240-N031	CX5010-N031	CX5020-N031
<b>Audio</b>	–	–	–	–	CX9020-N020	–	CX5010-N020	CX5020-N020
<b>Ethernet</b>	in the basic CPU	in the basic CPU	in the basic CPU	in the basic CPU	in the basic CPU	in the basic CPU	in the basic CPU	in the basic CPU
<b>4-port USB hub</b>	–	–	–	–	in the basic CPU	in the basic CPU	in the basic CPU	in the basic CPU
<b>Memory medium</b>	in the basic CPU	in the basic CPU	in the basic CPU	in the basic CPU	2 <sup>nd</sup> microSD slot in the basic CPU	in the basic CPU	in the basic CPU	in the basic CPU
<b>Fieldbus interfaces</b>	expandable via EtherCAT Terminals	integrated or expandable via EtherCAT Terminals	integrated or expandable via EtherCAT Terminals	integrated or expandable via EtherCAT Terminals	integrated or expandable via EtherCAT Terminals	integrated or expandable via EtherCAT Terminals	integrated or expandable via EtherCAT Terminals	integrated or expandable via EtherCAT Terminals
<b>EtherCAT</b>	EL6695 slave	CX8010 slave	CX8110 slave	CX8210 slave	CX9020-B110 slave	CX9240-B110, CX9240-B140 slave	CX5010-B110 slave	CX5020-B110 slave
<b>PROFIBUS</b>	EL6731 master	CX8030 master	EL6731 master	EL6731 master	CX9020-M310 master	CX9240-M310 master	CX5010-M310 master	CX5020-M310 master
	EL6731-0010 slave	CX8031 slave	EL6731-0010 slave	EL6731-0010 slave	CX9020-B310 slave	CX9240-B310 slave	CX5010-B310 slave	CX5020-B310 slave
<b>CANopen</b>	EL6751 master	CX8050 master	EL6751 master	EL6751 master	CX9020-M510 master	CX9240-M510 master	CX5010-M510 master	CX5020-M510 master
	EL6751-0010 slave	CX8051 slave	EL6751-0010 slave	EL6751-0010 slave	CX9020-B510 slave	CX9240-B510 slave	CX5010-B510 slave	CX5020-B510 slave
<b>DeviceNet</b>	EL6752 master	EL6752 master	EL6752 master	EL6752 master	EL6752 master	EL6752 master	EL6752 master	EL6752 master
	EL6752-0010 slave	EL6752-0010 slave	EL6752-0010 slave	EL6752-0010 slave	EL6752-0010 slave	EL6752-0010 slave	EL6752-0010 slave	EL6752-0010 slave
<b>PROFINET RT</b>	EL6631 controller	CX8093 device	EL6631 controller	EL6631 controller	CX9020-M930 controller	CX9240-M930 controller	CX5010-M930 controller	CX5020-M930 controller
	EL6631-0010 device		EL6631-0010 device	EL6631-0010 device	CX9020-B930 device	CX9240-B930 device	CX5010-B930 device	CX5020-B930 device
<b>EtherNet/IP</b>	EL665x scanner	CX8095 adapter	EL665x scanner	CX8290 adapter	EL665x scanner	EL665x scanner	EL665x scanner	EL665x scanner
	EL665x-0010 adapter		EL665x-0010 adapter		EL665x-0010 adapter	EL665x-0010 adapter	EL665x-0010 adapter	EL665x-0010 adapter
<b>UPS options</b>	–	1-second UPS	1-second UPS	1-second UPS	1-second UPS (optional)	1-second UPS	1-second UPS	1-second UPS



## Embedded PC

Basic CPU	CX5120	CX5130	CX5140	CX52xx	CX56xx
<b>Processor</b>	Intel Atom® E3815, 1.46 GHz	Intel Atom® E3827, 1.75 GHz	Intel Atom® E3845, 1.91 GHz	CX5230: Intel Atom® x5-E3930, 1.3 GHz, 2 cores, CX5240: Intel Atom® x5-E3940, 1.6 GHz, 4 cores	CX5620: AMD Ryzen™ R1102G, 1.2 GHz, CX5630: AMD Ryzen™ R1505G, 2.4 GHz
<b>Flash memory</b>	slot for CFast card and microSD card, cards not included	slot for CFast card and microSD card, cards not included	slot for CFast card and microSD card, cards not included	slot for CFast card and microSD card, cards not included	M.2 SSD (SATA) and microSD card (storage media not included)
<b>Main memory</b>	2 GB DDR3 RAM (not expandable)	4 GB DDR3 RAM (not expandable)	4 GB DDR3 RAM (not expandable)	CX5230: 4 GB DDR4 RAM (internal, not expandable), CX5230: 8 GB DDR4 RAM (internal, not expandable)	CX5620: 4 GB DDR4 RAM, CX5630: 8 GB DDR4 RAM
<b>Interfaces</b>	2 x RJ45 10/100/1000 Mbit/s, 1 x DVI-I, 4 x USB 2.0, 1 x optional interface	2 x RJ45 10/100/1000 Mbit/s, 1 x DVI-I, 4 x USB 2.0, 1 x optional interface	2 x RJ45 10/100/1000 Mbit/s, 1 x DVI-I, 4 x USB 2.0, 1 x optional interface	2 x RJ45 10/100/1000 Mbit/s, 1 x DVI-D, 4 x USB 3.0, 1 x optional interface	2 x RJ45 10/100/1000 Mbit/s, 1 x DVI-D, 4 x USB 3.0, 1 x optional interface
<b>I/O connection</b>	E-bus or K-bus, automatic recognition	E-bus or K-bus, automatic recognition	E-bus or K-bus, automatic recognition	E-bus or K-bus, automatic recognition	E-bus or K-bus, automatic recognition
<b>System interfaces</b>	<b>integrated</b>	<b>integrated</b>	<b>integrated</b>	<b>modularly expandable</b>	<b>modularly expandable</b>
<b>DVI/USB</b>	in the basic CPU	in the basic CPU	in the basic CPU	in the basic CPU, 2 <sup>nd</sup> DVI port as option CX52x0-N010	in the basic CPU or CX56x0-N010
<b>DisplayPort</b>	–	CX5130-N011	CX5140-N011	CX52x0-N011	CX56x0-N011
<b>RS232</b>	CX5120-N030	CX5130-N030	CX5140-N030	CX52x0-N030 or CX2500-0030	CX56x0-N030 or CX2500-0030
<b>RS422/RS485</b>	CX5120-N031	CX5130-N031	CX5140-N031	CX52x0-N031 or CX2500-0031	CX56x0-N031 or CX2500-0031
<b>Audio</b>	CX5120-N020	CX5130-N020	CX5140-N020	CX2500-0020	CX2500-0020
<b>Ethernet</b>	in the basic CPU	in the basic CPU	in the basic CPU	in the basic CPU or CX2500-0060	in the basic CPU or CX2500-0060
<b>Power over Ethernet</b>	–	–	–	CX2500-0061	CX2500-0061
<b>4-port USB hub</b>	in the basic CPU	in the basic CPU	in the basic CPU	in the basic CPU or CX2500-0070	in the basic CPU or CX2500-0070
<b>Memory medium</b>	in the basic CPU	in the basic CPU	in the basic CPU	in the basic CPU	in the basic CPU
<b>Fieldbus interfaces</b>	<b>integrated or expandable via EtherCAT Terminals</b>	<b>integrated or expandable via EtherCAT Terminals</b>	<b>integrated or expandable via EtherCAT Terminals</b>	<b>integrated or expandable via EtherCAT Terminals</b>	<b>integrated or expandable via EtherCAT Terminals</b>
<b>EtherCAT</b>	CX5120-M112 2 x master CX5120-B110 slave	CX5130-M112 2 x master CX5130-B110 slave	CX5140-M112 2 x master CX5140-B110 slave	CX52x0-M112 2 x master CX52x0-B110 slave	CX56x0-M112 2 x master CX56x0-B110 slave
<b>PROFIBUS</b>	CX5120-M310 master CX5120-B310 slave	CX5130-M310 master CX5130-B310 slave	CX5140-M310 master CX5140-B310 slave	CX52x0-M310 or CX2500-M310 master CX52x0-B310 or CX2500-B310 slave	CX56x0-M310 or CX2500-M310 master CX56x0-B310 or CX2500-B310 slave
<b>CANopen</b>	CX5120-M510 master CX5120-B510 slave	CX5130-M510 master CX5130-B510 slave	CX5140-M510 master CX5140-B510 slave	CX52x0-M510 or CX2500-M510 master CX52x0-B510 or CX2500-B510 slave	CX56x0-M510 or CX2500-M510 master CX56x0-B510 or CX2500-B510 slave
<b>DeviceNet</b>	EL6752 master EL6752-0010 slave	EL6752 master EL6752-0010 slave	EL6752 master EL6752-0010 slave	EL6752 master EL6752-0010 slave	EL6752 master EL6752-0010 slave
<b>PROFINET RT</b>	CX5120-M930 controller CX5120-B930 device	CX5130-M930 controller CX5130-B930 device	CX5140-M930 controller CX5140-B930 device	CX52x0-M930 controller CX52x0-B930 device	CX56x0-M930 controller CX56x0-B930 device
<b>EtherNet/IP</b>	EL665X scanner EL665x-0010 adapter	EL665X scanner EL665x-0010 adapter	EL665X scanner EL665x-0010 adapter	EL665X scanner EL665x-0010 adapter	EL665X scanner EL665x-0010 adapter
<b>UPS options</b>	1-second UPS	1-second UPS	1-second UPS	1-second UPS	1-second UPS



Embedded PC					
Basic CPU	CX2030	CX2040	CX2042	CX2062	CX2072
<b>Processor</b>	Intel® Core™ i7 2610UE 1.5 GHz	Intel® Core™ i7 2715QE 2.1 GHz	Intel® Xeon® D-1527 2.2 GHz	Intel® Xeon® D-1548 2.0 GHz	Intel® Xeon® D-1567 2.1 GHz
<b>Flash memory</b>	20 GB or 40 GB CFast flash card (depending on the operating system), optionally extendable	20 GB or 40 GB CFast flash card (depending on the operating system), optionally extendable	slot for CFast card, card not included	slot for CFast card, card not included	slot for CFast card, card not included
<b>Main memory</b>	2 GB DDR3 RAM (expandable ex factory to 4 GB)	4 GB DDR3 RAM (not expandable)	8 GB DDR4 RAM (expandable ex factory to 64 GB)	8 GB DDR4 RAM (expandable ex factory to 64 GB)	8 GB DDR4 RAM (expandable ex factory to 64 GB)
<b>Interfaces</b>	2 x RJ45 10/100/1000 Mbit/s, 1 x DVI-I, 4 x USB 2.0, 1 x optional interface	2 x RJ45 10/100/1000 Mbit/s, 1 x DVI-I, 4 x USB 2.0, 1 x optional interface	2 x RJ45 10/100/1000 Mbit/s, 1 x DVI-I, 4 x USB 3.0, 1 x optional interface	2 x RJ45 10/100/1000 Mbit/s, 1 x DVI-I, 4 x USB 3.0, 1 x optional interface	2 x RJ45 10/100/1000 Mbit/s, 1 x DVI-I, 4 x USB 3.0, 1 x optional interface
<b>I/O connection</b>	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)	via power supply module (E-bus or K-bus, automatic recognition)	via power supply module (E-bus or K-bus, automatic recognition)
<b>System interfaces</b>	modularly expandable	modularly expandable	modularly expandable	modularly expandable	modularly expandable
<b>DVI/USB</b>	in the basic CPU, 2 <sup>nd</sup> DVI port as option CX2030-N010	in the basic CPU, 2 <sup>nd</sup> DVI port as option CX2040-N010	in the basic CPU, 2 <sup>nd</sup> DVI port as option CX2042-N010	in the basic CPU, 2 <sup>nd</sup> DVI port as option CX2062-N010	in the basic CPU, 2 <sup>nd</sup> DVI port as option CX2072-N010
<b>DisplayPort</b>	CX2030-N011	CX2040-N011	CX2042-N011	CX2062-N011	CX2072-N011
<b>RS232</b>	CX2030-N030 or CX2500-0030	CX2040-N030 or CX2500-0030	CX2042-N030 or CX2500-0030	CX2062-N030 or CX2500-0030	CX2072-N030 or CX2500-0030
<b>RS422/RS485</b>	CX2030-N031 or CX2500-0031	CX2040-N031 or CX2500-0031	CX2042-N031 or CX2500-0031	CX2062-N031 or CX2500-0031	CX2072-N031 or CX2500-0031
<b>Audio</b>	CX2500-0020	CX2500-0020	–	–	–
<b>Ethernet</b>	in the basic CPU or CX2500-0060	in the basic CPU or CX2500-0060	in the basic CPU or CX2500-0060	in the basic CPU or CX2500-0060	in the basic CPU or CX2500-0060
<b>10G Ethernet</b>	–	–	CX2042-N067 or CX2042-N167	CX2062-N067 or CX2062-N167	CX2072-N067 or CX2072-N167
<b>Power over Ethernet</b>	CX2500-0061	CX2500-0061	CX2500-0061	CX2500-0061	CX2500-0061
<b>4-port USB hub</b>	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 CX2500-0070	in the basic CPU or CX2500-0070
<b>Memory medium</b>	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	in the basic CPU or CX2550-0010/ CX2550-0020	in the basic CPU or CX2550-0010/ CX2550-0020
<b>USB extension</b>	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)	CX2550-0179 (USB 1.1) or CX2550-0279 (USB 2.0)	CX2550-0179 (USB 1.1) or CX2550-0279 (USB 2.0)
<b>Fieldbus interfaces</b>	integrated or expandable via EtherCAT Terminals	integrated or expandable via EtherCAT Terminals	integrated or expandable via EtherCAT Terminals	integrated or expandable via EtherCAT Terminals	integrated or expandable via EtherCAT Terminals
<b>EtherCAT</b>	CX2030-M112 2 x master CX2030-B110 slave	CX2040-M112 2 x master CX2040-B110 slave	CX2042-M112 2 x master CX2042-B110 slave	CX2062-M112 2 x master CX2062-B110 slave	CX2072-M112 2 x master CX2072-B110 slave
<b>Lightbus</b>	EL6720 master	EL6720 master	EL6720 master	EL6720 master	EL6720 master
<b>PROFIBUS</b>	CX2030-M310 or CX2500-M310 master CX2030-B310 or CX2500-B310 slave	CX2040-M310 or CX2500-M310 master CX2040-B310 or CX2500-B310 slave	CX2042-M310 or CX2500-M310 master CX2042-B310 or CX2500-B310 slave	CX2062-M310 or CX2500-M310 master CX2062-B310 or CX2500-B310 slave	CX2072-M310 or CX2500-M310 master CX2072-B310 or CX2500-B310 slave
<b>CANopen</b>	CX2030-M510 or CX2500-M510 master CX2030-B510 or CX2500-B510 slave	CX2040-M510 or CX2500-M510 master CX2040-B510 or CX2500-B510 slave	CX2042-M510 or CX2500-M510 master CX2042-B510 or CX2500-B510 slave	CX2062-M510 or CX2500-M510 master CX2062-B510 or CX2500-B510 slave	CX2072-M510 or CX2500-M510 master CX2072-B510 or CX2500-B510 slave
<b>DeviceNet</b>	EL6752 master EL6752-0010 slave	EL6752 master EL6752-0010 slave	EL6752 master EL6752-0010 slave	EL6752 master EL6752-0010 slave	EL6752 master EL6752-0010 slave
<b>PROFINET RT</b>	CX2030-M930 controller CX2030-B930 device	CX2040-M930 controller CX2040-B930 device	CX2042-M930 controller CX2042-B930 device	CX2062-M930 controller CX2062-B930 device	CX2072-M930 controller CX2072-B930 device
<b>EtherNet/IP</b>	EL665x scanner EL665x-0010 adapter	EL665x scanner EL665x-0010 adapter	EL665x scanner EL665x-0010 adapter	EL665x scanner EL665x-0010 adapter	EL665x scanner EL665x-0010 adapter
<b>UPS options</b>	CX2100-0904, CX2100-0914	CX2100-0914	–	–	–



Embedded PC					
Basic CPU	CX2033	CX2043	CX1010	CX1020	CX1030
Processor	AMD Ryzen™ V1202B 2.3 GHz	AMD Ryzen™ V1807B 3.35 GHz	compatible with Intel® Pentium® MMX, clock frequency 500 MHz	Intel® Celeron® M ULV, 1 GHz clock frequency	Intel® Pentium® M, 1.8 GHz clock frequency
Flash memory	slot for CFast card	slot for CFast card	slot for Compact Flash card, 128 MB included (expandable)	slot for Compact Flash card, 128 MB included (expandable)	slot for Compact Flash card, 128 MB included (expandable)
Main memory	8 GB DDR4 RAM (expandable ex factory to 16 GB)	8 GB DDR4 RAM (expandable ex factory to 16 GB)	256 MB DDR RAM (not expandable)	256 MB DDR RAM (expandable ex factory to 1 GB)	256 MB DDR RAM (expandable ex factory to 1 GB)
Interfaces	2 x RJ45, 10/100/1000 Mbit/s, 1 x DVI-D, 4 x USB 3.1 Gen. 1, 1 x optional interface	2 x RJ45, 10/100/1000 Mbit/s, 1 x DVI-D, 4 x USB 3.1 Gen. 1, 1 x optional interface	1 x RJ45 10/100 Mbit/s	2 x RJ45 10/100 Mbit/s (internal switch)	2 x RJ45 10/100 Mbit/s (internal switch)
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, K-bus, K-bus/IP-Link)	via power supply module (E-bus, K-bus, K-bus/IP-Link)	via power supply module (E-bus, K-bus, K-bus/IP-Link)
System interfaces	modularly expandable	modularly expandable	modularly expandable	modularly expandable	modularly expandable
DVI/USB	in the basic CPU, 2 <sup>nd</sup> DVI port as option CX2033-N010	in the basic CPU, 2 <sup>nd</sup> DVI port as option CX2043-N010	CX1010-N010	CX1020-N010	CX1030-N010
DisplayPort	CX2033-N011	CX2043-N011	–	–	–
RS232	CX2033-N030 or CX2500-0030	CX2043-N030 or CX2500-0030	CX1010-N030 (COM 1/2) CX1010-N040 (COM 3/4)	CX1020-N030 (COM 1/2) CX1020-N040 (COM 3/4)	CX1030-N030 (COM 1/2) CX1030-N040 (COM 3/4)
RS422/RS485	CX2033-N031 or CX2500-0031	CX2043-N031 or CX2500-0031	CX1010-N031 (COM 1/2) CX1010-N041 (COM 3/4)	CX1020-N031 (COM 1/2) CX1020-N041 (COM 3/4)	CX1030-N031 (COM 1/2) CX1030-N041 (COM 3/4)
Audio	CX2500-0020	CX2500-0020	CX1010-N020	CX1020-N020	CX1030-N020
Ethernet	in the basic CPU or CX2500-0060	in the basic CPU or CX2500-0060	CX1010-N060	CX1020-N060	CX1030-N060
Power over Ethernet	CX2500-0061	CX2500-0061	–	–	–
4-port USB hub	in the basic CPU or CX2500-0070	in the basic CPU or CX2500-0070	–	–	–
Memory medium	in the basic CPU or CX2550-0010/ CX2550-0020	in the basic CPU or CX2550-0010/ CX2550-0020	in the basic CPU	–	–
USB extension	CX2550-0179 (USB 1.1) or CX2550-0279 (USB 2.0)	CX2550-0179 (USB 1.1) or CX2550-0279 (USB 2.0)	–	–	–
Fieldbus interfaces	integrated or expandable via EtherCAT Terminals	integrated or expandable via EtherCAT Terminals	modularly expandable	modularly expandable	modularly expandable
EtherCAT	CX2033-M112 2 x master CX2033-B110 slave	CX2043-M112 2 x master CX2043-B110 slave	– EL6695 slave	– EL6695 slave	– EL6695 slave
Lightbus	EL6720 master	EL6720 master	CX1500-M200 master	CX1500-M200 master	CX1500-M200 master
PROFIBUS	CX2033-M310 or CX2500-M310 master CX2033-B310 or CX2500-B310 slave	CX2043-M310 or CX2500-M310 master CX2043-B310 or CX2500-B310 slave	CX1500-M310 master CX1500-B310 slave	CX1500-M310 master CX1500-B310 slave	CX1500-M310 master CX1500-B310 slave
CANopen	CX2033-M510 or CX2500-M510 master CX2033-B510 or CX2500-B510 slave	CX2043-M510 or CX2500-M510 master CX2043-B510 or CX2500-B510 slave	CX1500-M510 master CX1500-B510 slave	CX1500-M510 master CX1500-B510 slave	CX1500-M510 master CX1500-B510 slave
DeviceNet	EL6752 master EL6752-0010 slave	EL6752 master EL6752-0010 slave	CX1500-M520 master CX1500-B520 slave	CX1500-M520 master CX1500-B520 slave	CX1500-M520 master CX1500-B520 slave
PROFINET RT	CX2033-M930 controller CX2033-B930 device	CX2043-M930 controller CX2043-B930 device	–	–	–
EtherNet/IP	EL665x scanner EL665x-0010 adapter	EL665x scanner EL665x-0010 adapter	EL665x scanner EL665x-0010 adapter	EL665x scanner EL665x-0010 adapter	EL665x scanner EL665x-0010 adapter
SERCOS	–	–	CX1500-M750 SERCOS II master	CX1500-M750 SERCOS II master	CX1500-M750 SERCOS II master
UPS options	CX2100-0914	CX2100-0914	CX1100-0910, -0900	CX1100-0920	CX1100-0930

# The I/O Company

Beckhoff supplies a complete range of fieldbus components for all common I/O and bus systems. With Bus Terminals offering IP20 protection and Fieldbus Box modules in IP67, a comprehensive range of devices is available for a wide variety of signal types and fieldbus systems. In addition to components for conventional bus systems, Beckhoff offers an integrated product range optimized for EtherCAT. Invented by Beckhoff, this real-time Ethernet solution for industrial automation has global acceptance and is characterized by outstanding performance and simple handling. The result is high-precision machine and plant control and significantly increased production efficiency.

- ▶ [www.beckhoff.com/io](http://www.beckhoff.com/io)
- ▶ [www.beckhoff.com/ethercat](http://www.beckhoff.com/ethercat)

## EtherCAT plug-in modules 56

- very compact EtherCAT I/O system in IP20 for plug-in into a circuit board (signal distribution board)
  - optimized for high-volume production
  - application-specific connector interface
  - Use of cable harnesses avoids wiring errors.
- ▶ [www.beckhoff.com/ethercat-plug-in-modules](http://www.beckhoff.com/ethercat-plug-in-modules)

## Bus Terminals 60

- open, fieldbus-neutral IP20 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](http://www.beckhoff.com/busterminal)

## Fieldbus Box 68

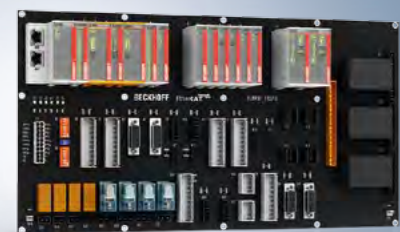
- open, fieldbus-neutral IP67 I/O system
  - 8 fieldbus systems, 24 signal types
  - compact and robust
  - can be mounted directly on machines, outside of control cabinets and terminal boxes while reducing machine footprint
  - IO-Link box modules for inexpensive point-to-point connections
- ▶ [www.beckhoff.com/fieldbusbox](http://www.beckhoff.com/fieldbusbox)

## Infrastructure Components 71

- PC cards for all common fieldbus systems
  - Industrial Ethernet switches
  - EtherCAT junctions and media converters in IP20 and IP67 ratings
  - EtherCAT G/G10 components
- ▶ [www.beckhoff.com/infrastructure-components](http://www.beckhoff.com/infrastructure-components)

## Current transformers and power supplies 72

- for new installations and for retrofitting
  - different designs and power classes
  - high efficiency
  - high reliability
  - wide range input
- ▶ [www.beckhoff.com/sct](http://www.beckhoff.com/sct)  
▶ [www.beckhoff.com/ps](http://www.beckhoff.com/ps)



## EtherCAT Terminals 36

- IP20 EtherCAT I/O system
- real-time Ethernet performance retained into each terminal
- standard digital and analog signals
- complex automation functions directly in the terminal system
- highly precise measurement technology
- condition monitoring
- drive technology, also in a robust metal housing
- process technology
- electronic overcurrent protection
- gateways for subordinate fieldbus systems
- TwinSAFE PLC and safety I/Os



▶ [www.beckhoff.com/ethercat-terminal](http://www.beckhoff.com/ethercat-terminal)



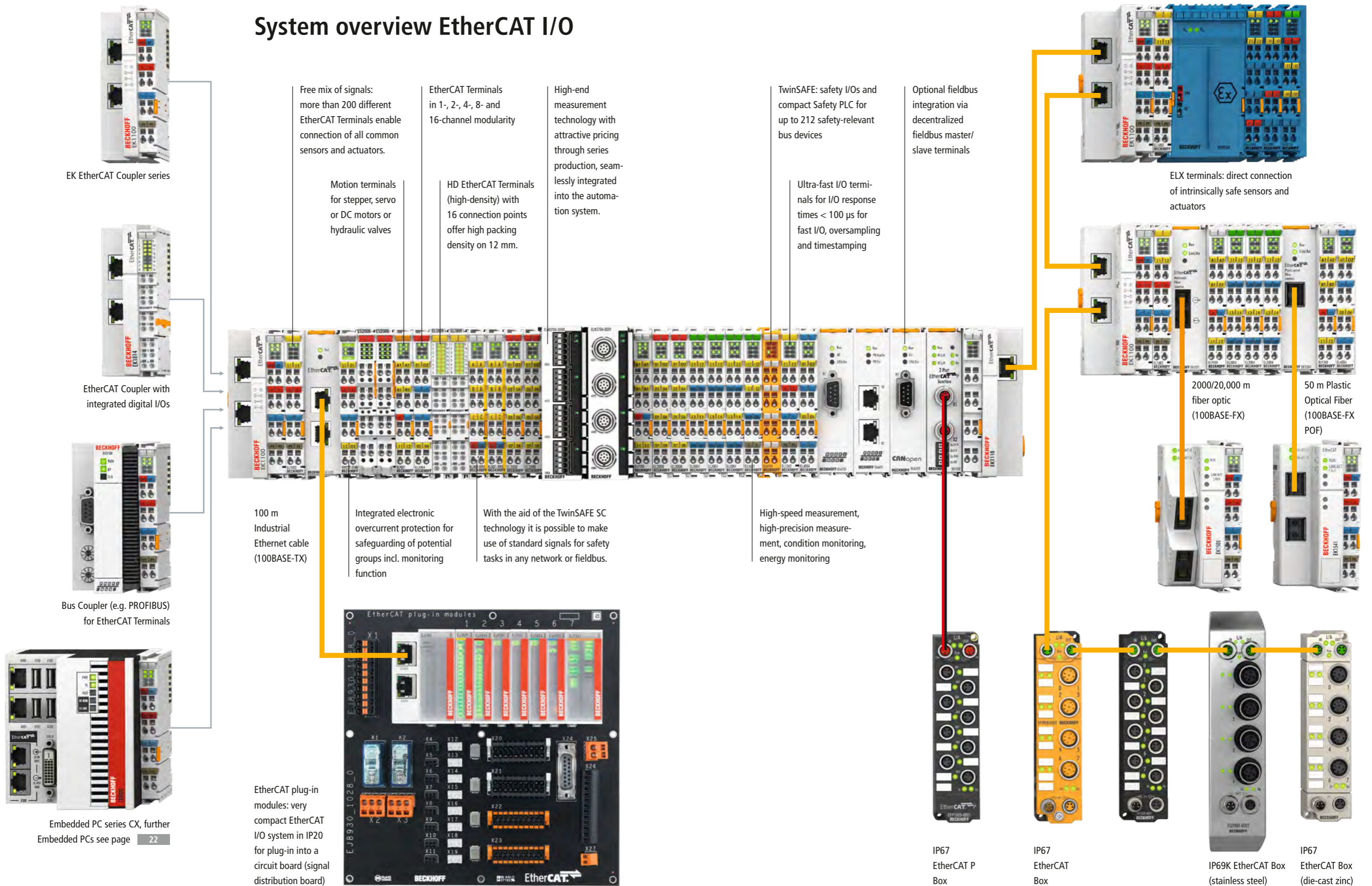
## EtherCAT Box 46

- IP67 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](http://www.beckhoff.com/ethercat-box)

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



# System overview EtherCAT I/O



# Product overview fieldbus systems

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

Fieldbus	EtherCAT Terminals	EtherCAT Box	EtherCAT Plug-in Modules	Bus Terminals	Fieldbus Box	Fieldbus Modules	Infrastructure Components	Embedded PC	Drive Technology			
	Couplers/Gateways	Modules		Bus Couplers/ Master terminals	PLC (IEC 61131-3)	Compact Box	Coupler Box	IO-Link box	For thermo- couples/mV	Interfaces	Master/Slave	Servo Drives
EtherCAT	EK1xxx, EKM1xxx	EPxxxx	EJ1xxx	BK1120			IL230x-B110		FM33xx-B110	FC90xx, FC11xx	CXxxxx	AX8000
	EL6695 bridge	ERxxxx		BK1150						CUxxxx	CXxxxx-M112	AX5000
		EQxxxx		BK1250						EP9xxx		AMI8100
EtherCAT P	EK13xx	EPPxxxx										
		EP1312										
LIGHTBUS	EL6720 master			BK2020						FC200x	CX1500-M200	
PROFIBUS	EK3100			BK3xx0	BC3150	IPxxxx-B31x	IL230x-B31x		FM33xx-B310	FC31xx	CXxxxx	
	EL6731 master/slave				BX3100						CX2500-M/B310	
	EL6740-0010 slave			BK40x0								
CANopen	EL6751 master/slave			BK51xx	BC5150	IPxxxx-B51x	IL230x-B51x			FC51xx	CXxxxx	
					BX5100						CX2500-M/B510	
DeviceNet	EL6752 master/slave			BK52x0	BX5200	IPxxxx-B52x	IL230x-B52x			FC52xx	CX1500-M/B520	
CC-Link	EL6711-0010 slave	i		BK7150								
Modbus	EK90x0			BK7350							CXxxxx	
SERCOS				BK75x0						FC75xx	CXxxxx	
	EL1262-0010	i	EP600x	EJ2522	BK8000	BC8050					CXxxxx	
RS485	EL6021, EL6022		EPP600x	EJ5112	KL6021	BX8000						
				EJ6002	KL6041							
RS232	EL6001, EL6002		EP600x	EJ6002	BK8100	BC8150					CXxxxx	
			EPP600x		KL6001	BX8000						
				KL6031								
Ethernet TCP/IP	EL6601, EL6614	EP6601		BK9xx0	BC9xxx		IL230x-B90x			FC9xxx	CXxxxx	
	switch port	switch port			BX9000					CU2xxx, CU2508		
PROFINET	EK93x0	EP9300		BK9xx3			IL230x-B903			CU2508	CXxxxx	
	EL663x RT controller/device											
	EL663x IRT controller	i										
EtherNet/IP	EK95x0			BK9xx5			IL230x-B905			CU2508	CXxxxx	
	EL665x scanner/adapter											
AS-Interface	EL6201			KL62x1								
IO-Link	EL6224	EP622x,	EJ6224	KL6224				EPIxxxx,				
	master	EPP6228	master	master				ERIxxxx				
		master						devices				
KNX/EIB				KL6301								
LON				KL6401								
MP-Bus				KL6771								
M-Bus				KL6781								
DALI/DSI				KL6811								
DALI-2				KL6821								
IEEE 1588	EL6688											
DMX	EL6851											
EnOcean				KL658x								
SMI				KL6841								
BACnet	EL6861											

# EtherCAT Terminals

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



EK1xxx, BK1xx0   EtherCAT Couplers							
	EtherCAT		EtherCAT P	EtherCAT G	Ethernet/TSN		
EtherCAT Couplers E-bus	<b>EK1100</b> 2 x RJ45	<b>EK1101</b> ID switch	<b>EK1101-0010</b> ID switch, Extended Distance	<b>EK1101-0080</b> ID switch, Fast Hot Connect	<b>EK1300</b> EtherCAT P	<b>EK1400</b> EtherCAT G	<b>EK1000</b> Ethernet/TSN
	<b>EK1100-0008</b> M8 connection	<b>EK1101-0008</b> ID switch, M8 connection		<b>EKM1101</b> ID switch and diagnostics			
	<b>EK1501</b> ID switch, multi-mode fiber optic	<b>EK1501-0010</b> ID switch, single-mode fiber optic	<b>EK1501-0100</b> ID switch, multi-mode fiber optic to RJ45	<b>EK1541</b> ID switch, POF			
EtherCAT Couplers E-bus with integrated digital I/Os	<b>EK1814</b> 4 inputs + 4 outputs	<b>EK1818</b> 8 inputs + 4 outputs	<b>EK1828</b> 4 inputs + 8 outputs	<b>EK1828-0010</b> 8 outputs			
	<b>EK1914</b> 4 standard inputs, 4 standard outputs, 2 safe inputs, 2 safe outputs	<b>EK1960</b> TwinSAFE Logic, 20 safe inputs, 24 safe outputs					
EtherCAT Couplers K-bus	<b>BK1120</b> Bus Coupler (Economy plus)	<b>BK1150</b> Bus Coupler (Compact)	<b>BK1250</b> E-bus to K-bus interface				
Extensions	<b>EK1110</b> extension end terminal	<b>EK1110-0008</b> extension end terminal, M8	<b>EK1110-0043</b> EtherCAT EJ coupler, CX and EL terminal connection	<b>EK1110-0044</b> EtherCAT EJ coupler, CX and EL terminal connection, EtherCAT junction	<b>EK1310</b> EtherCAT P extension with feed-in		
Junctions	<b>EK1122</b> 2-port junction	<b>EK1122-0008</b> 2-port junction, M8	<b>EK1121-0010</b> 1-port junction, Extended Distance	<b>EK1122-0080</b> 2-port junction, Fast Hot Connect	<b>EK1322</b> EtherCAT P junction with feed-in		
	<b>EK1521</b> multi-mode fiber-optic junction	<b>EK1521-0010</b> single-mode fiber-optic junction		<b>EK1561</b> POF junction			

EKxxxx   Bus Couplers		
Fieldbus	Standard	
	<b>EK9160</b> IoT (MQTT, OPC UA)	
EtherNet/IP	<b>EK9500</b> 100 Mbit/s	<b>EK9520</b> 100/1000 Mbit/s
Modbus	<b>EK9000</b> 100 Mbit/s	<b>EK9020</b> 100/1000 Mbit/s
	<b>EK3100</b> 12 Mbaud	
	<b>EK9300</b> 100 Mbit/s	<b>EK9320</b> 100/1000 Mbit/s

Embedded PCs with E-bus interface see page 22, Infrastructure Components see page 71

**Product announcement** for availability status see [www.beckhoff.com](http://www.beckhoff.com)

EL1xxx   EtherCAT Terminals, digital input						
Signal	2-channel	4-channel	8-channel	16-channel		
5 V DC	<b>EL1252-0050</b> <small>T<sub>ON</sub>/T<sub>OFF</sub> 1 µs, timestamping</small>	<b>EL1124</b> filter 0.05 µs				
	<b>EL1262-0010</b> <small>T<sub>ON</sub>/T<sub>OFF</sub> 0.1 µs, oversampling</small>					
	<b>EL1262-0050</b> <small>T<sub>ON</sub>/T<sub>OFF</sub> 1 µs, oversampling</small>					
12 V DC		<b>EL1144</b> filter 10 µs				
24 V DC, filter 3.0 ms	<b>EL1002</b> type 3	<b>EL1004</b> type 3	<b>EL1008</b> type 3, 1-wire	<b>EL1809</b> type 3		
		<b>EL1104</b> type 3, with sensor supply	<b>EL1804</b> type 3, 8 x 24 V, 4 x 0 V	<b>EL1808</b> type 3, 8 x 24 V DC, 2-wire	<b>EL1852</b> type 3, 8 inputs, 8 outputs, I <sub>max</sub> = 0.5 A, flat-ribbon cable	<b>EL1859</b> type 3, 8 inputs, 8 outputs, I <sub>max</sub> = 0.5 A
		<b>EL1084</b> ground switching	<b>EL1024</b> type 2	<b>EL1088</b> ground switching	<b>EL1862</b> type 3, flat-ribbon cable	<b>EL1862-0010</b> flat-ribbon cable, ground switching
24 V DC, filter 10 µs	<b>EL1012</b> type 3	<b>EL1014</b> type 3	<b>EL1034</b> type 1, potential- free inputs	<b>EL1018</b> type 3	<b>EL1819</b> type 3	
		<b>EL1114</b> type 3, with sensor supply	<b>EL1814</b> type 3, 8 x 24 V, 4 x 0 V, 3-wire		<b>EL1872</b> type 3, flat-ribbon cable	<b>EL1872-0010</b> flat-ribbon cable, ground switching
			<b>EL1094</b> ground switching	<b>EL1098</b> ground switching	<b>EL1899</b> ground switching	
24 V DC, XFC: T <sub>ON</sub> /T <sub>OFF</sub> 1 µs	<b>EL1202</b> type 3					
	<b>EL1252</b> type 3, timestamping	<b>EL1254</b> type 3, timestamping		<b>EL1258</b> multi-timestamping	<b>EL1259</b> 8 inputs, 8 outputs, multi-timestamping, I <sub>max</sub> = 0.5 A	
	<b>EL1262</b> type 3, oversampling			<b>EL1258-0010</b> multi-timestamping, ground switching		
24 V DC, counter	<b>EL1502</b> type 1, 100 kHz, 32 bit					
	<b>EL1512</b> type 1, 1 kHz, 32 bit					
24 V DC, safe input		<b>EL1904</b> TwinSAFE, 4 safe inputs	<b>EL2911</b> TwinSAFE Logic, 4 safe inputs, 1 safe output	<b>EL1918</b> TwinSAFE Logic, 8 safe inputs		
48 V DC		<b>EL1134</b> type 1				

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

We reserve the right to make technical changes.

**BECKHOFF** New Automation Technology

EL1xxx   EtherCAT Terminals, digital input				
Signal	2-channel	4-channel	8-channel	16-channel
120 V AC/DC	EL1712 power contacts			
120 V DC	EL1712-0020 power contacts			
120... 230 V AC	EL1702 power contacts EL1722 no power contacts			
220 V DC	EL1702-0020 power contacts			
Thermistor	EL1382			
NAMUR	EL1052	EL1054		
Ex i, NAMUR	ELX1052	ELX1054	ELX1058	

EL2xxx   EtherCAT Terminals, digital output					
Signal	1-channel	2-channel	4-channel	8-channel	16-channel
5 V DC			EL2124 $I_{max} = \pm 20$ mA		
12 V DC			EL2024-0010 $I_{max} = 2.0$ A		
24 V DC, $I_{max} = 0.5$ A		EL2002 4-wire	EL2004 2-wire	EL2008 1-wire	EL2809 $I_{max} = 0.5$ A EM2042 D-sub connection
			EL2014 with diagnostics	EL2878-0005 flat-ribbon cable, with diagnostics	EL2872 flat-ribbon cable EL2872-0010 flat-ribbon cable, ground switching
				EL2808 8 x 0 V	EL2819 with diagnostics EL1859 type 3, 8 inputs, 8 outputs, $I_{max} = 0.5$ A
			EL2084 ground switching	EL2088 ground switching	EL2889 ground switching EL1852 type 3, 8 inputs, 8 outputs, $I_{max} = 0.5$ A, flat-ribbon cable
24 V DC, $I_{max} = 2.0$ A		EL2022 4-wire	EL2024 2-wire	EL2828	
		EL2032 with diagnostics	EL2034 with diagnostics		
			EL2044 with extended diagnostics		
24 V DC, $I_{max} = 4.0$ A/8.0 A		EL2042 2 x 4.0 A/1 x 8.0 A			
24 V DC, XFC: $T_{ON}/T_{OFF} 1$ $\mu$ s		EL2202 push-pull output	EL2212 overexcitation, multi-timestamping	EL2258 multi-timestamping	EL1259 8 inputs, 8 outputs, multi-timestamping, $I_{max} = 0.5$ A
		EL2252 timestamping	EL2262 oversampling		
Ex i, 24 V DC		ELX2002 45 mA	ELX2792 $I_{max} = 0.5$ A AC/1 A DC, change-over contact	ELX2008 30 mA	
24 V DC, safe output	EL2911 TwinSAFE Logic, 4 safe inputs, 1 safe output	EL2912 TwinSAFE Logic, 2 safe outputs	EL2904 TwinSAFE, 4 safe outputs		

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

EL2xxx   EtherCAT Terminals, digital output					
Signal	1-channel	2-channel	4-channel	8-channel	16-channel
30 V AC/ 48 V DC solid- state relay, $I_{max} = 2.0$ A			EL2784	EL2788	
Relay (up to 250 V AC)		EL2602 $I_{max} = 5.0$ A, make contact, power contacts	EL2622 $I_{max} = 5.0$ A, make contact, no power contacts	EL2624 $I_{max} = 2.0$ A, make contact	
		EL2602-0010 $I_{max} = 5.0$ A, make contact, power contacts, contact- protecting switching	EL2622-0010 $I_{max} = 5.0$ A, make contact, no power contacts, con- tact-protecting switching	EL2634 $I_{max} = 4.0$ A, make contact, 250 V AC/30 V DC, no power contacts	
		EL2612 $I_{max} = 2.0$ A, change-over, no power contacts	EL2642 $I_{max} = 1.0$ A, change-over, no power contacts, reed relays		
		EL2652 $I_{max} = 1.0$ A, change-over, no power contacts			
Triac (12...230 V AC)	EL2712 $I_{max} = 0.5$ A, power contacts	EL2722 $I_{max} = 1.0$ A, mutually locked outputs			
		EL2732 $I_{max} = 0.5$ A, no power contacts			
PWM		EL2502 push-pull output, separate frequency can be set for each channel	EL2502-0005 plastic optical fibre, separate frequency can be set for each channel		
		EL2502-0010 push-pull output, separate frequency can be set for each channel, timestamping			
		EL2535 24 V DC, $I_{max} = \pm 50$ mA, $\pm 1$ A, $\pm 2$ A	EL2535-0005 24 V DC, $I_{max} = \pm 5$ A		
Frequency output	EL2521 1-channel AB, 0... 500 kHz, RS422	EL2522 2-channel AB, 1-channel ABC, 0...4 MHz			
LED control	EL2595 48 V DC, 300...700 mA, current control		EL2564 5...48 V DC, 4 A, RGBW, common anode		
	EL2596 24 V DC, 3 A, pulse > 25 $\mu$ s, current control		EL2564-0010 8...48 V DC, 3 A, RGBW, common cathode		
	EL2596-0010 48 V DC, 3 A, pulse > 25 $\mu$ s, current control		EL2574 pixel LED, 2048 individu- ally addressable LEDs		
Multiplexer		ELM2742-0000 2 x multiplexer, 1 x 4 solid-state relays	ELM2744-0000 4 x multiplexer, 1 x 4 solid-state relays		
		ELM2642-0000 2 x multiplexer, 1 x 4 reed relays	ELM2644-0000 4 x multiplexer, 1 x 4 reed relays		

### EL3xxx | EtherCAT Terminals, analog input

Signal	1-channel		2-/3-channel		4-channel		5-/6-/8-channel
<b>0...10 V, standard signal</b>	EL3061 12 bit	EL3161 16 bit	EL3062 12 bit	EL3162 16 bit	EL3064 12 bit	EL3164 16 bit	EL3068 12 bit
<b>0...±10 V, standard signal</b>	EL3001 single-ended, 12 bit		EL3002 single-ended, 12 bit		EL3004 single-ended, 12 bit		EL3008 single-ended, 12 bit
	EL3101 differential input, 16 bit		EL3102 differential input, 16 bit		EL3602 differential input, 24 bit		EL3104 differential input, 16 bit
<b>0...±75 mV</b>			EL3702 differential input, 16 bit, oversampling				
			EL3602-0010 differential input, 24 bit				
<b>0...±150 mV</b>			EL3702-0015 differential input, 16 bit, oversampling				
<b>0...±200 mV</b>			EL3602-0002 differential input, 24 bit				
<b>0...30 V</b>			EL3062-0030 12 bit				
<b>0...±30 V</b>			ELM3002-0000 24 bit, 20 ksps, push-in		ELM3004-0000 24 bit, 10 ksps, push-in		
<b>0...±1200 V</b>			ELM3002-0205 <i>i</i> 24 bit, 50 ksps, galv. isolated, 4 mm				
<b>0...20 mA, standard signal</b>	EL3041 single-ended, 12 bit	EL3141 single-ended, 16 bit	EL3042 single-ended, 12 bit	EL3142 single-ended, 16 bit	EL3044 single-ended, 12 bit	EL3144 single-ended, 16 bit	EL3048 single-ended, 12 bit
	EL3011 differential input, 12 bit	EL3111 differential input, 16 bit	EL3012 differential input, 12 bit	EL3142-0010 single-ended, ±10 mA, 16 bit	EL3014 differential input, 12 bit	EL3114 differential input, 16 bit	
			EL3112 differential input, 16 bit	EL3612 differential input, 24 bit			
			EL3742 differential input, 16 bit, oversampling	EL3182 single-ended, 16 bit, HART			
<b>4...20 mA, standard signal</b>	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	
<b>0...±20 mA</b>			EL3621-0020 differential input, 24 bit		EL3124-0090 16 bit, TwinSAFE SC		
			EL3112-0011 differential input, 16 bit		ELM3102-0000 24 bit, 20 ksps, NAMUR NE43, push-in		ELM3104-0000 24 bit, 10 ksps, NAMUR NE43, push-in
<b>0...±10 V/±20 mA, standard signal</b>			EL3072 12 bit, NAMUR NE43		EL3074 12 bit, NAMUR NE43		
			EL3172 16 bit, NAMUR NE43		EL3174 16 bit, NAMUR NE43	EL3174-0002 16 bit, electrically isolated, NAMUR NE43	
					EL3174-0090 16 bit, NAMUR NE43, TwinSAFE SC		ELM3146-0000 24 bit, 1 ksps, push-in
			ELM3142-0000 24 bit, 1 ksps, push-in		ELM3144-0000 24 bit, 1 ksps, push-in		ELM3148-0000 24 bit, 1 ksps, push-in

The standard EtherCAT Terminals (EL3xxx) can be optionally ordered as ESxxx with pluggable wiring level.

### EL3xxx | EtherCAT Terminals, analog input

Signal	1-channel	2-/3-channel	4-channel	5-/6-/8-channel			
<b>0...±3 V/ 0...±20 mA</b>			EL3174-0032 16 bit, electrically isolated, NAMUR NE43, ±3 V				
<b>0...±60 V</b>			EL3174-0042 <i>i</i> 16 bit, electrically isolated, NAMUR NE43				
<b>0...±60 V/ 0...±20 mA</b>		ELM3102-0100 24 bit, 20 ksps, push-in, galv. isolated					
<b>Multi-function</b>	EL3751 24 bit, 10 ksps	EL3751-0004 24 bit, 10 ksps	ELM3702-0000 24 bit, 10 ksps, push-in	ELM3702-0101 24 bit, 10 ksps, galvanically isolated, LEMO	ELM3704-0000 24 bit, 10 ksps, push-in	ELM3704-0001 24 bit, 10 ksps, LEMO	
<b>Temperature measurement, resistance thermometer, RTD</b>	EL3201 16 bit	EL3201-0010 16 bit, high-precision	EL3202 16 bit	EL3202-0010 16 bit, high-precision	EL3204 2-wire, 16 bit	EL3208 16 bit	
					EL3204-0162 2-wire, 16 bit, 2 x RTD, 2 x ±10 V	EL3204-0200 16 bit, universal input for RTD	EL3208-0010 Pt1000, Ni1000, NTC 1.8...100 k, potentiom. 1, 5, 10 kΩ
					EL3214 3-wire, 16 bit	EL3214-0090 16 bit, TwinSAFE SC	EL3218 3-wire, 16 bit
					ELM3244-0000 <i>i</i> 24 bit, high-precision, 1 ksps, push-in	ELM3246-0000 <i>i</i> 24 bit, high-precision, 1 ksps, push-in	
<b>Temperature measurement, thermocouple, mV</b>	EL3311 16 bit		EL3312 16 bit		EL3314 16 bit	EL3314-0090 16 bit, TwinSAFE SC	EL3318 16 bit
					EL3314-0002 24 bit, electrically isolated	EL3314-0010 24 bit	
					ELM3344-0000 24 bit, 1 ksps, push-in	ELM3348-0000 24 bit, 1 ksps, push-in	
					ELM3704-1001 24 bit, 10 ksps, push-in, TC adjustment	ELM3344-0003 24 bit, 1 ksps, push-in, Mini-TC universal	ELM3348-0003 24 bit, 1 ksps, push-in, Mini-TC universal
<b>Measurement bridge, strain gauge</b>	EL3351 16 bit	EL3356 self-calibration	ELM3502-0000 24 bit, 20 ksps, push-in		ELM3504-0000 24 bit, 10 ksps, push-in		
	EL3356-0010 24 bit, 10 ksps	EL3356-0090 TwinSAFE SC	ELM3542-0000 <i>i</i> 24 bit, 1 ksps, push-in		ELM3544-0000 <i>i</i> 24 bit, 1 ksps, push-in		
<b>Measurement technology</b>	EL3681 digital multimeter terminal, voltage/current, 18 bit		EL3692 resistance measurement, 100 mΩ...10 MΩ			EL3255 potentiometer measurement, 5-channel	
<b>Acceleration measurement, position, vibration, condition monitoring, IEPE</b>		EL3632 16 bit, 50 ksps	ELM3602-0000 24 bit, 50 ksps, push-in	ELM3604-0000 24 bit, 20 ksps, push-in			
			ELM3602-0002 24 bit, 50 ksps, BNC	ELM3604-0002 24 bit, 20 ksps, BNC			
<b>Pressure measuring</b>	EM3701 differential pressure, ±100 hPa	EM3702 relative pressure, 7500 hPa	EM3712 relative pressure, ±1000 hPa				
<b>Power measurement, ≤ 500 V</b>		EL3403 500 V AC, 1 A	EL3423 480 V AC/DC, 1 A, Economy				
		EL3433 500 V AC, 10 A	EL3443 480 V AC/DC, 1 A, extended functionalities				

### EL3xxx | EtherCAT Terminals, analog input

Signal	1-channel	2-/3-channel	4-channel	5-/6-/8-channel	
Power measurement, ≤ 500 V		EL3443-0010 480 V AC/DC, 5 A, extended functionalities	EL3443-0011 480 V AC/DC, 100 mA, extended functionalities		
		EL3443-0013 480 V AC/DC, 333 mV, extended functionalities	EL3444 <i>i</i> distributed power measurement, galv. isolated	EL3446 distributed power measurement	
Power measurement, > 500 V		EL3413 690 V AC, 5 A			
		EL3453 690 V AC, 5 A, extended functionalities	EL3453-0100 130 V AC, 5 A, extended functionalities		
Mains monitor, ±480 V		EL3483 480 V AC/DC	EL3483-0060 480 V AC/DC, with voltage measurement		
Power monitoring, ≤ 500 V		EL3773 500 V, 1 A AC/DC, 10 ksp/s			
Power monitoring, > 500 V		EL3783 690 V AC, 5 A AC, 20 ksp/s	EL3783-0100 130 V AC, 5 A AC, 20 ksp/s		
Ex i, 0/4...20 mA, standard signal	ELX3181 4...20 mA, single-ended, 16 bit, HART	ELX3152 0/4...20 mA, single-ended, 16 bit	ELX3152-0090 0/4...20 mA, single-ended, 16 bit, TwinSAFE SC	ELX3184 4...20 mA, single-ended, 16 bit, HART	ELX3158 4...20 mA, single-ended, 16 bit
Ex i, temperature measurement, resistance thermometer RTD		ELX3202 RTD, 2-, 3- and 4-wire, 16 bit	ELX3202-0090 RTD, 2-, 3- and 4-wire, 16 bit, TwinSAFE SC	ELX3204 RTD, 2-wire, 16 bit	ELX3204-0090 RTD, 2-wire, 16 bit, TwinSAFE SC
Ex i, temperature measurement, thermocouple, mV		ELX3312 2-wire, 16 bit	ELX3312-0090 2-wire, 16 bit, TwinSAFE SC	ELX3314 2-wire, 16 bit	ELX3314-0090 2-wire, 16 bit, TwinSAFE SC
Ex i, measurement technology	ELX3351 strain gauge, 24 bit	ELX3351-0090 strain gauge, 24 bit, TwinSAFE SC	ELX3252 potentiometer measurement, 16 bit		

### EL4xxx | EtherCAT Terminals, analog output

Signal	1-channel	2-channel	4-channel	8-channel		
0...10 V	EL4001 12 bit	EL4002 12 bit	EL4102 16 bit	EL4004 12 bit	EL4104 16 bit	EL4008 12 bit
±10 V	EL4031 12 bit	EL4032 12 bit	EL4132 16 bit	EL4034 12 bit	EL4134 16 bit	EL4038 12 bit
		EL4732 16 bit, oversampling				
0...20 mA	EL4011 12 bit	EL4012 12 bit	EL4112 16 bit	EL4014 12 bit	EL4114 16 bit	EL4018 12 bit
		EL4712 16 bit, oversampling				
4...20 mA	EL4021 12 bit	EL4022 12 bit		EL4024 12 bit		EL4028 12 bit
		EL4122 16 bit		EL4124 16 bit		
Ex i, 0/4...20 mA	ELX4181 single-ended, 16 bit, HART			ELX4154 single-ended, 16 bit		
±10 mA		EL4112-0010 16 bit				

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

*i* Product announcement for availability status see [www.beckhoff.com](http://www.beckhoff.com)

### EL5xxx | EtherCAT Terminals, position measurement

Signal	1-channel	2-channel			
Absolute position measurement	EL5001 SSI encoder interface	EL5001-0011 SSI monitor interface	EL5001-0090 SSI encoder interface, TwinSAFE SC	EL5002 SSI encoder interface	EL5032 EnDat 2.2 interface
			EL5032-0090 EnDat 2.2 interface, TwinSAFE SC	EL5042 BISS C interface	
			EL5072 inductive displacement sensor interface, LVDT		
Incremental position measurement	EL5021 SinCos encoder interface, 1 V <sub>pp</sub>	EL5021-0090 SinCos encoder interface, 1 V <sub>pp</sub> , TwinSAFE SC			
	EL5101 incremental encoder interface, RS422, TTL, 1 MHz	EL5101-0010 incremental encoder interface, RS422, 5 MHz	EL5101-0011 incremental encoder interface, RS422, 5 MHz, oversampling	EL5102 incremental encoder interface, RS422, TTL, open collector, 5 MHz	EL5112 incremental encoder interface, RS422, TTL, open collector, 5 MHz, 2 x AB/1 x ABC
	EL5101-0090 incremental encoder interface, RS422, TTL, 1 MHz, TwinSAFE SC	EL5131 <i>i</i> incremental encoder interface, RS422, TTL, 2 x 24 V DC push-pull outputs		EL5122 incremental encoder interface, TTL, open collector, 1 MHz, 2 x AB	
	EL5151 incremental encoder interface, 24 V HTL, 100 kHz	EL5151-0021 incremental encoder interface, 24 V HTL, 100 kHz, 1 x 24 V DC output	EL5151-0090 incremental encoder interface, 24 V HTL, 100 kHz, TwinSAFE SC	EL5152 incremental encoder interface, 24 V HTL, 100 kHz	EL5162 <i>i</i> incremental encoder interface, 24 V HTL, 100 kHz, 2 x ABC
Ex i, incremental position measurement	ELX5151 incremental encoder interface, NAMUR	ELX5151-0090 incremental encoder interface, NAMUR, TwinSAFE SC			

### EL6xxx | EtherCAT Terminals, communication

Signal	1-channel	2-channel	4-channel			
System	EL6070 license key terminal	EL6080 memory terminal 128 kbyte	EL6090 display terminal			
Serial	EL6001 RS232, 115.2 kbaud	EL6021 RS422/RS485, 115.2 kbaud	EL6002 RS232, 115.2 kbaud, D-sub	EL6022 RS422/RS485, 115.2 kbaud, D-sub		
EtherCAT/Ethernet	EL6601 switch port	EL6688 IEEE 1588 master/slave	EL6689 <i>i</i> synchronization via GNSS	EL6692 EtherCAT bridge	EL6695 EtherCAT bridge, high performance	EL6614 switch port
Master/slave, slave function -0010	EL6201 AS-Interface, master	EL6631 PROFINET RT, controller/device terminal	EL6632 PROFINET IRT, controller	EL6633 <i>i</i> PROFINET RT, controller/i-device	EL6224 IO-Link, master	
	EL6711-0010 <i>i</i> CC-Link, slave	EL6720 Lightbus, master	EL6731 PROFIBUS DP, master/slave	EL6633-0010 <i>i</i> PROFINET RT, device	EL6634 <i>i</i> PROFINET IRT, controller	EL6224-0090 <i>i</i> IO-Link, TwinSAFE SC, master
	EL6740-0010 Interbus, slave	EL6751 CANopen, master/slave	EL6752 DeviceNet, master/slave	EL6652 EtherNet/IP, scanner/ adapter terminal	EL6653 <i>i</i> EtherNet/IP, scanner/ adapter terminal	
	EL6761 <i>i</i> ISO 15118 powerline, charge controller	EL6851 DMX, master/slave	EL6861 BACnet, MS/TP, RS485, master	EL6653-0010 <i>i</i> EtherNet/IP, adapter terminal		
Safety	EL6900 TwinSAFE Logic	EL6910 TwinSAFE Logic, PROFIsafe master and slave support	EL6930 TwinSAFE Logic, PROFIsafe slave support			

We reserve the right to make technical changes.

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## EL7xxx | EtherCAT Terminals, motion

Motor type	< 3 A	3...5 A	> 5 A	16 A
Servomotor			<b>ELM7211-0010</b> I <sub>ms</sub> = 4.5 A, 48 V DC	
			<b>ELM7211-9016</b> I <sub>ms</sub> = 4.5 A, 48 V DC, TwinSAFE Logic	<a href="#">i</a>
			<b>ELM7211-9018</b> I <sub>ms</sub> = 4.5 A, 48 V DC, Safe Motion, TwinSAFE Logic	<a href="#">i</a>
			<b>ELM7212-0010</b> I <sub>ms</sub> = 2 x 4.5 A, 48 V DC	<b>ELM7222-0010</b> I <sub>ms</sub> = 2 x 8.0 A, 48 V DC
			<b>ELM7212-9016</b> I <sub>ms</sub> = 2 x 4.5 A, 48 V DC, TwinSAFE Logic	<b>ELM7222-9016</b> I <sub>ms</sub> = 2 x 8.0 A, 48 V DC, TwinSAFE Logic
			<b>ELM7212-9018</b> I <sub>ms</sub> = 2 x 4.5 A, 48 V DC, Safe Motion, TwinSAFE Logic	<b>ELM7222-9018</b> I <sub>ms</sub> = 2 x 8.0 A, 48 V DC, Safe Motion, TwinSAFE Logic
			<b>ELM7221-0010</b> I <sub>ms</sub> = 8 A, 48 V DC	<b>ELM7231-0010</b> I <sub>ms</sub> = 16 A, 48 V DC
	<b>EL7201-0010</b> I <sub>ms</sub> = 2.8 A, 48 V DC, OCT	<b>EL7211-0010</b> I <sub>ms</sub> = 4.5 A, 48 V DC, OCT	<b>ELM7221-9016</b> I <sub>ms</sub> = 8 A, 48 V DC, TwinSAFE Logic	<b>ELM7231-9016</b> I <sub>ms</sub> = 16 A, 48 V DC, TwinSAFE Logic
	<b>EL7201</b> I <sub>ms</sub> = 2.8 A, 48 V DC, resolver	<b>EL7211</b> I <sub>ms</sub> = 4.5 A, 48 V DC, resolver	<b>ELM7221-9018</b> I <sub>ms</sub> = 8 A, 48 V DC, Safe Motion, TwinSAFE Logic	<b>ELM7231-9018</b> I <sub>ms</sub> = 16 A, 48 V DC, Safe Motion, TwinSAFE Logic
	<b>EL7201-9014</b> I <sub>ms</sub> = 2.8 A, 48 V DC, OCT, STO	<b>EL7211-9014</b> I <sub>ms</sub> = 4.5 A, 48 V DC, OCT, STO	<b>EL7221-9014</b> I <sub>ms</sub> = 7...8 A with ZB8610, 48 V DC, OCT, STO	
Stepper motor	<b>EL7031</b> I <sub>max</sub> = 1.5 A, 24 V DC	<b>EL7041</b> I <sub>max</sub> = 5.0 A, 48 V DC, incr. enc.		
	<b>EL7031-0030</b> I <sub>max</sub> = 2.8 A, 24 V DC	<b>EL7041-0052</b> I <sub>max</sub> = 5.0 A, 48 V DC		
	<b>EL7037</b> I <sub>max</sub> = 1.5 A, 24 V DC, incr. enc., vector control	<b>EL7047</b> I <sub>max</sub> = 5.0 A, 48 V DC, incr. enc., vector control		
		<b>EL7047-9014</b> I <sub>max</sub> = 5.0 A, 48 V DC, incr. enc., vector control, STO	<a href="#">i</a>	
	<b>EL7062</b> I <sub>max</sub> = 3 A, 5 V DC, incr. enc.	<a href="#">i</a>		
DC motor output stage	<b>EL7332</b> I <sub>max</sub> = 1.0 A, 24 V DC	<b>EL7342</b> I <sub>max</sub> = 3.5 A, 48 V DC, incr. enc.		
		<b>EL7411</b> I <sub>ms</sub> = 4.5 A, 48 V DC		
BLDC motor		<b>EL7411-9014</b> I <sub>ms</sub> = 4.5 A, 48 V DC, STO	<a href="#">i</a>	
	4-axis interface	<b>EM7004</b> 4 incr. enc., 32 digital I/Os 24 V DC, 4 analog outputs ±10 V		

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

## EL8xxx | EtherCAT Terminals, multifunctional

Multi-functional	<b>EL8601-8411</b> 8 x digital-input, 1 x counter, 4 x digital-output, 2 x PWM, 1 x analog-input, 1 x analog-output, 1 x encoder	<a href="#">i</a>
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## EL9xxx | EtherCAT Terminals, system

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

# EtherCAT Box

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EP1xxx   EtherCAT Box, digital input				
Signal	8-channel		16-channel	
24 V DC, filter parameterizable 0...100 ms			EP1839-0022	<i>i</i>
			8 x M12, with diagnostics	
24 V DC, filter 3.0 ms	EP1008-0001 <sup>(1)</sup>	EP1008-0002 <sup>(1, 2)</sup>	EP1809-0021 <sup>(1)</sup>	EP1809-0022 <sup>(1, 2)</sup>
	8 x M8	4 x M12	16 x M8	8 x M12
24 V DC, filter 10 µs	EP1018-0001 <sup>(1)</sup>	EP1018-0002 <sup>(1)</sup>	EP1819-0021 <sup>(1)</sup>	EP1819-0022 <sup>(1)</sup>
	8 x M8	4 x M12	16 x M8	8 x M12
24 V DC, ground switching			EP1819-0005	<i>i</i>
			16 x M8, 4-pin	
24 V DC, timestamping	EP1258-0001 <sup>(1)</sup>	EP1258-0002 <sup>(1)</sup>	EP1816-0003	
	8 x M8, 2-channel timestamping	4 x M12, 2-channel timestamping	connector with spring-loaded system	
24 V DC, counter			EP1816-0008	EP1816-3008
			D-sub, 25-pin	D-sub, 25-pin, acceleration sensor
24 V DC, safe input	EP1908-0002	EP1918-0002		
	TwinSAFE, 8 safe inputs	TwinSAFE Logic, 8 safe inputs		
Ex i, NAMUR	EPX1058-0022	<i>i</i>		
	8 x M12			

EPxxxx: industrial housing in IP67, <sup>(1)</sup>also as ERxxxx: zinc die-cast housing in IP67, <sup>(2)</sup>also as EQxxxx: stainless steel housing in IP69K

EP2xxx   EtherCAT Box, digital output						
Signal	4-channel	8-channel	16-channel	24-channel		
24 V DC, I <sub>max</sub> = 0.5 A			EP2008-0001 <sup>(1)</sup>	EP2008-0002 <sup>(1, 2)</sup>	EP2839-0022	<i>i</i>
			8 x M8	4 x M12	8 x M12, with diagnostics	
24 V DC, I <sub>max</sub> = 0.5 A, Σ 16 A			EP2008-0022 <sup>(1)</sup>	EP2809-0021 <sup>(1)</sup>	EP2809-0022 <sup>(1, 2)</sup>	
			8 x M12	16 x M8	8 x M12	
24 V DC, I <sub>max</sub> = 2.0 A			EP2816-0003	EP2816-0004	EP2816-0008	EP2817-0008
			connector with spring-loaded system	M16, 19-pin	D-sub, 25-pin	D-sub, 25-pin
24 V DC, I <sub>max</sub> > 2.0 A, Σ 16 A			EP2816-0010	EP2816-0008	EP2809-0042	
			2 x D-sub, 9-pin	8 x M12, with diagnostics, EtherCAT M12		
24 V DC, safe output			EP2028-0001 <sup>(1)</sup>	EP2028-0002 <sup>(1)</sup>		
			8 x M8	4 x M12		
25 V AC/30 V DC			EP2038-0001 <sup>(1)</sup>	EP2038-0002 <sup>(1)</sup>		
			8 x M8, with diagnostics	4 x M12, with diagnostics		
24 V DC, safe output			EP2038-0042	EP2028-0032		
			8 x M12, with diagnostics, EtherCAT M12	8 x M12		
24 V DC, safe output			ER2028-1032	EP2918-0032		
			8 x M12	TwinSAFE Logic, 8 safe outputs		
25 V AC/30 V DC			EP2624-0002 <sup>(1)</sup>			
			relay output, 4 x M12			

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### EP23xx | EtherCAT Box, digital combi

Signal	8-channel		12-channel	16-channel	
24 V DC, inputs + outputs	EP2308-0001 <sup>(1)</sup>	EP2308-0002 <sup>(1)</sup>		EP1859-0042	
	8 x M8, 4 inputs + 4 outputs, I <sub>max</sub> = 0.5 A, 3.0 ms	4 x M12, 4 inputs + 4 outputs, I <sub>max</sub> = 0.5 A, 3.0 ms		8 x M12, 8 inputs + 8 outputs, I <sub>max</sub> = 0.5 A, EtherCAT M12, 3.0 ms	
	EP2318-0001 <sup>(1)</sup>	EP2318-0002 <sup>(1)</sup>		EP2316-0003	EP2316-0008
	8 x M8, 4 inputs + 4 outputs, I <sub>max</sub> = 0.5 A, 10 μs	4 x M12, 4 inputs + 4 outputs, I <sub>max</sub> = 0.5 A, 10 μs		8 inputs + 8 outputs, I <sub>max</sub> = 0.5 A, connector with spring-loaded system, 10 μs	8 inputs + 8 outputs, D-sub, 25-pin, 10 μs
	EP2328-0001 <sup>(1)</sup>	EP2328-0002 <sup>(1)</sup>			
	8 x M8, 4 inputs + 4 outputs, I <sub>max</sub> = 2 A, 3.0 ms	4 x M12, 4 inputs + 4 outputs, I <sub>max</sub> = 2 A, 3.0 ms			
24 V DC, in-/outputs	EP2338-0001 <sup>(1)</sup>	EP2338-0002 <sup>(1)</sup>		EP2339-0021 <sup>(1)</sup>	EP2339-0022 <sup>(1), 2)</sup>
	8 x M8, 8 in-/outputs, I <sub>max</sub> = 0.5 A, 10 μs	4 x M12, 8 in-/outputs, I <sub>max</sub> = 0.5 A, 10 μs		16 x M8, 16 in-/outputs, I <sub>max</sub> = 0.5 A, 3.0 ms	8 x M12, 16 in-/outputs, I <sub>max</sub> = 0.5 A, 3.0 ms
	EP2338-1001 <sup>(1)</sup>	EP2338-1002 <sup>(1)</sup>		EP2339-0121	EP2339-0003
	8 x M8, 8 in-/outputs, I <sub>max</sub> = 0.5 A, 3.0 ms	4 x M12, 8 in-/outputs, I <sub>max</sub> = 0.5 A, 3.0 ms		16 x M8, 16 in-/outputs, I <sub>max</sub> = 0.5 A, 3.0 ms, ground switching	8 x M12, 16 in-/outputs, I <sub>max</sub> = 0.5 A, ∑ 16 A, EtherCAT M12, 3.0 ms
		EP2338-2002		EP2349-0021 <sup>(1)</sup>	EP2349-0022 <sup>(1)</sup>
		4 x M12, 8 in-/outputs, I <sub>max</sub> = 0.5 A, 10 μs		16 x M8, 16 in-/outputs, I <sub>max</sub> = 0.5 A, 10 μs	8 x M12, 16 in-/outputs, I <sub>max</sub> = 0.5 A, 10 μs
Safety, safe in-/outputs			EP1957-0022		
			TwinSAFE Logic, 8 safe inputs, 4 safe outputs		

EPxxxx: industrial housing in IP67, <sup>(1)</sup>also as ERxxxx: zinc die-cast housing in IP67, <sup>(2)</sup>also as EQxxxx: stainless steel housing in IP69K

### EP3xxx | EtherCAT Box, analog input

Signal	1-channel	2-channel	4-channel	8-channel
±10 V, ±20 mA		EP3162-0002 parameterizable, electrically isolated, single-ended		
±10 V, 0/4...20 mA			EP3174-0002 <sup>(1), 2)</sup> parameterizable, differential inputs	EP3174-0092 parameterizable, differential inputs, TwinSAFE SC
		EP3182-1002 2 analog inputs, parameterizable, single-ended, 2 digital control outputs (sink/source type), 24 V DC, short-circuit proof	EP3184-0002 <sup>(1)</sup> parameterizable, single-ended	EP3184-1002 <sup>(1)</sup> parameterizable, single-ended, 2 channels per socket
Resistance thermometer (RTD)			EP3204-0002 <sup>(1), 2)</sup> Pt100, Pt200, Pt500, Pt1000, Ni100, Ni120, Ni1000	
Thermocouple/mV			EP3314-0002 <sup>(1), 2)</sup> type J, K, L, B, E, N, R, S, T, U	
Measurement bridge (SG)	EP3356-0022 24 bit, self-calibration			
Condition monitoring/IEPE		EP3632-0001		
Accelerometers		EP3752-0000 2 x 3 axes		
Pressure measuring			EP3744-0041 4 pressure inputs -1...1 bar (differential pressure to fifth connection)	EP3744-1041 4 pressure inputs 0...7 bar (differential pressure to fifth connection)
Ex i, 4...20 mA			EPX3184-0022 4 x M12, single-ended, HART	EPX3158-0022 8 x M12, single-ended

### EP4xxx | EtherCAT Box, analog output

Signal	4-channel
±10 V, 0/4...20 mA	EP4174-0002 <sup>(1)</sup> parameterizable

### EP43xx | EtherCAT Box, analog combi

Signal	4-channel	8-channel
±10 V, 0/4...20 mA	EP4374-0002 <sup>(1)</sup> 2 inputs + 2 outputs, parameterizable	EP4378-1022 4 inputs + 4 outputs, U/I parameterizable per channel, 8 digital I/Os, 24 V DC/3.0 ms
±10 V	EP4304-1002 2 inputs + 2 outputs, single-ended, 2 digital inputs, 24 V DC, 10 µs	<i>i</i>
±20 mA	EP4314-1002 2 inputs + 2 outputs, single-ended, 2 digital inputs, 24 V DC, 10 µs	

### EP5xxx | EtherCAT Box, position measurement

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

### EP6xxx | EtherCAT Box, communication

Function	1-channel	2-channel	4-channel	8-channel	Other
System	EP6070-0060 license key module				
Serial interface	EP6001-0002 <sup>(1)</sup> RS232, RS422/RS485, 5 V DC/1 A	EP6002-0002 <sup>(1)</sup> RS232, RS422/RS485			
EtherCAT/Ethernet	EP6601-0002 switch port				
IO-Link master			EP6224-0002 Class A		
			EP6224-2022 Class A	EP6228-0022 Class A	
			EP6224-0042 Class A, EtherCAT M12	EP6228-0042 Class A, EtherCAT M12	
			EP6224-3002 Class B		
			EP6224-3022 Class B	EP6228-3032 Class B	
				EP6228-3132 4 x Class A, 4 x Class B	
			EP6228-3142 4 x Class A, 4 x Class B, EtherCAT M12		
2 x 16 character display					EP6090-0000 display box

### EP7xxx | EtherCAT Box, motion

Motor type	< 3 A	> 3 A	
Servomotor		EP7211-0034 $I_{max} = 4.5 A, 48 V DC, OCT, STO$ suitable	
Stepper motor		<i>i</i> EP7047-1032 $I_{max} = 5.0 A, 48 V DC, STO$ suitable	
	EP7041-1002 <sup>(1)</sup> $I_{max} = 1.5 A, 48 V DC$ , incremental encoder, 2 digital inputs, 1 digital output	EP7041-0002 <sup>(1)</sup> $I_{max} = 5 A, 48 V DC$ , incremental encoder, 2 digital inputs, 1 digital output	EP7041-2002 <sup>(1)</sup> $I_{max} = 5 A, 48 V DC$ , incremental encoder, 2 digital inputs, 1 digital output, motor connection via plug
		EP7041-3002 <sup>(1)</sup> $I_{max} = 5 A, 48 V DC$ , incremental encoder, for high-speed applications, encoder system (24 V DC encoder)	EP7041-3102 $I_{max} = 5 A, 48 V DC$ , incremental encoder, for high-speed applications, encoder system (5 V DC encoder)
		EP7041-4032 $I_{max} = 5.0 A, 48 V DC$ , BiSS C encoder	<i>i</i>
DC motor	EP7342-0002 <sup>(1)</sup> $I_{max} = 3.5 A, 48 V DC$		
BLDC motor	EP7402-0057 for roller conveyor systems, 24 V DC, EtherCAT junction	EP7402-0167 for roller conveyor systems, 48 V DC	

### EP8xxx | EtherCAT Box, multifunctional

Function	8-channel	12-channel
Multi-functional	EP8309-1022 8 digital inputs/outputs, 2 x tachometer input, 2 x 0/4...20 mA input, 1 x 0/4...20 mA output, 1 x 1.2 A PWM output	EP8601-0022 8 x digital-input, 1 x counter, 4 x digital-output, 2 x PWM, 1 x analog-input, 1 x analog-output, 1 x encoder

### EPxxxx | EtherCAT Box, system

Function			
Identification	EP1111-0000 3 decimal ID switches		
Junctions	EP1122-0001 EtherCAT, 2-channel	EP1312-0001 EtherCAT P, 2-channel	EP9128-0021 EtherCAT, 8 x M8
Power distribution	EP9208-1035 8-channel, M12 L coded, 7/8"	EP9214-0023 4/4-channel, 7/8"	EP9224-0023 4/4-channel, 7/8", with current measurement and data logging
	EP9221-0057 1-channel, ENP B17, ENP to EtherCAT P	EP9224-0037 4-channel, ENP B17, ENP to EtherCAT P	EP9224-2037 4-channel junction, with power supply, ENP B17
			<i>i</i>
PROFINET RT EtherCAT Box	EP9300-0022 EtherCAT Box interface with PROFINET RT		
EtherCAT media converters fiber optic	EP9521-0020 1-channel, multi-mode		
Brake chopper box	EP9576-1032 up to 72 V DC		

EPxxxx: industrial housing in IP67, <sup>(1)</sup>also as ERxxxx: zinc die-cast housing in IP67, <sup>(2)</sup>also as EQxxxx: stainless steel housing in IP69K

# EtherCAT P Box

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## EPP1xxx | EtherCAT P Box, digital input

Signal	4-channel	8-channel	16-channel
24 V DC, filter 3.0 ms	EPP1004-0061 4 x M8	EPP1008-0001 8 x M8	EPP1008-0002 4 x M12 EPP1008-0022 8 x M12
24 V DC, filter 10 µs		EPP1018-0001 8 x M8	EPP1018-0002 4 x M12 EPP1819-0021 16 x M8 EPP1819-0005 16 x M8, 4-pin EPP1816-0008 D-sub, 25-pin EPP1816-3008 D-sub, 25-pin, acceleration sensor EPP1816-0003 connector with spring-loaded system
24 V DC, timestamping		EPP1258-0001 8 x M8, 2-channel timestamping	EPP1258-0002 4 x M12, 2-channel timestamping
24 V DC, counter			EPP1518-0002 4 x M12, multi-function input

## EPP2xxx | EtherCAT P Box, digital output

Signal	1-channel	4-channel	8-channel	16-channel	24-channel
24 V DC, $I_{max} = 0.5 A$			EPP2008-0001 8 x M8 EPP2008-0002 4 x M12 EPP2008-0022 8 x M12	EPP2809-0021 16 x M8 EPP2809-0022 8 x M12	
24 V DC, $I_{max} = 2.0 A$			EPP2028-0001 8 x M8 EPP2028-0002 4 x M12 EPP2038-0001 8 x M8, with diagnostics EPP2038-0002 4 x M12, with diagnostics	EPP2816-0008 D-sub, 25-pin EPP2816-0010 2 x D-sub, 9-pin EPP2816-0004 M16, 19-pin	EPP2817-0008 D-sub, 25-pin
25 V AC/ 30 V DC		EPP2624-0002 relay output, 4 x M12			
Current control, LED control	EPP2596-0002 24 V DC				

## EPP23xx | EtherCAT P Box, digital combi

Signal	4-channel	8-channel	16-channel
24 V DC, inputs + outputs		EPP2308-0001 8 x M8, 4 inputs + 4 outputs, $I_{max} = 0.5 A, 3.0 ms$	EPP2308-0002 4 x M12, 4 inputs + 4 outputs, $I_{max} = 0.5 A, 3.0 ms$
			EPP2316-0003 8 inputs + 8 outputs, $I_{max} = 0.5 A$ , connector with spring-loaded system, 10 µs EPP2316-0008 8 inputs + 8 outputs, $I_{max} = 0.5 A$ , D-sub, 25-pin, 10 µs
		EPP2318-0001 8 x M8, 4 inputs + 4 outputs, $I_{max} = 0.5 A, 10 µs$	EPP2318-0002 4 x M12, 4 inputs + 4 outputs, $I_{max} = 0.5 A, 10 µs$
		EPP2328-0001 8 x M8, 4 inputs + 4 outputs, $I_{max} = 2 A, 3.0 ms$	EPP2328-0002 4 x M12, 4 inputs + 4 outputs, $I_{max} = 2 A, 3.0 ms$
24 V DC, in-/outputs		EPP2338-0001 8 x M8, 8 in-/outputs, $I_{max} = 0.5 A, 10 µs$	EPP2338-0002 4 x M12, 8 in-/outputs, $I_{max} = 0.5 A, 10 µs$
			EPP2339-0021 16 x M8, 16 in-/outputs, $I_{max} = 0.5 A, 3.0 ms$ EPP2339-0022 8 x M12, 16 in-/outputs, $I_{max} = 0.5 A, 3.0 ms$
		EPP2338-2002 4 x M12, 8 in-/outputs, $I_{max} = 0.5 A, 10 µs$	EPP2349-0021 16 x M8, 16 in-/outputs, $I_{max} = 0.5 A, 10 µs$ EPP2349-0022 8 x M12, 16 in-/outputs, $I_{max} = 0.5 A, 10 µs$
	EPP2334-0061 4 x M8, 4 inputs/outputs, $I_{max} = 0.5 A, 10 µs$	EPP2338-1001 8 x M8, 8 in-/outputs, $I_{max} = 0.5 A, 3.0 ms$	EPP2338-1002 4 x M12, 8 in-/outputs, $I_{max} = 0.5 A, 3.0 ms$ EPP2339-0003 16 inputs/outputs, $I_{max} = 0.5 A$ , connector with spring-loaded system, 3.0 ms

### EPP3xxx | EtherCAT P Box, analog input

Signal	2-channel	4-channel
±10 V, 0/4...20 mA, standard signal		EPP3174-0002 parameterizable, differential inputs
		EPP3184-0002 parameterizable, single-ended
4...20 mA, standard signal		EPP3184-0802 single-ended, HART
Temperature measurement, resistance thermometer RTD		EPP3204-0002 Pt100, Pt200, Pt500, Pt1000, Ni100, Ni120, Ni1000
Temperature measurement, thermocouple, mV		EPP3314-0002 type J, K, L, B, E, N, R, S, T, U
Measuring bridge, strain gauge		EPP3504-0023 24 bit, 10 ksps, push-in
Acceleration measurement, position, vibra- tion, condition monitoring, IEPE	EPP3632-0001 16 bit, 50 ksps, 2 x M8	
	EPP3752-0000 2 x 3 axes	
Pressure measuring		EPP3744-0041 4 pressure inputs -1...1 bar (differential pressure to fifth connection)
		EPP3744-1041 4 pressure inputs 0...7 bar (differential pressure to fifth connection)

### EPP4xxx | EtherCAT P Box, analog output

Signal	4-channel
±10 V, 0/4...20 mA	EPP4174-0002 parameterizable

### EPP43xx | EtherCAT P Box, analog combi

Signal	4-channel
±10 V, 0/4...20 mA	EPP4374-0002 2 inputs + 2 outputs, parameterizable
±10 V	EPP4304-1002 <i>i</i> 2 inputs + 2 outputs, single-ended, 2 digital inputs, 24 V DC, 10 µs
±20 mA	EPP4314-1002 2 inputs + 2 outputs, single-ended, 2 digital inputs, 24 V DC, 10 µs

### EPP5xxx | EtherCAT P Box, position measurement

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

### EPP6xxx | EtherCAT P Box, communication

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

### EPP7xxx | EtherCAT P Box, motion

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

### EPPxxxx | EtherCAT P Box, system

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

# EtherCAT plug-in modules



► [www.beckhoff.com/ethercat-plug-in-modules](http://www.beckhoff.com/ethercat-plug-in-modules)

## EJ11xx | EtherCAT Couplers

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

## EJ1xxx | EtherCAT plug-in modules, digital input

Signal	4-channel	8-channel	16-channel
3.3 V DC/5 V DC		<b>EJ1128</b> filter 0.05 µs	
24 V DC, filter 3.0 ms		<b>EJ1008</b> type 3	<b>EJ1809</b> type 3
			<b>EJ1859</b> type 3, 8 inputs, 8 outputs, I <sub>max</sub> = 0.5 A
			<b>EJ1889</b> ground switching
24 V DC, filter 10 µs			<b>EJ1819</b> type 3
24 V DC, filter 1 µs	<b>EJ1254</b> type 3, timestamping		
24 V DC, safe input	<b>EJ1914</b> TwinSAFE Logic, 4 safe inputs	<b>EJ1918</b> TwinSAFE Logic, 8 safe inputs	
		<b>EJ1957</b> TwinSAFE Logic, 8 safe inputs, 4 safe outputs	

## EJ2xxx | EtherCAT plug-in modules, digital output

Signal	1-channel	2-channel	4-channel	8-channel	16-channel
3.3 V DC/5 V DC				<b>EJ2128</b> I <sub>max</sub> = ±20 mA	
24 V DC, I <sub>max</sub> = 0.5 A		<b>EJ2262</b> oversampling		<b>EJ2008</b>	<b>EJ2809</b>
					<b>EJ2889</b> ground switching
					<b>EJ1859</b> type 3, 8 inputs, 8 outputs, I <sub>max</sub> = 0.5 A
24 V DC, safe output			<b>EJ2914</b> TwinSAFE Logic, 4 safe outputs	<b>EJ2918</b> TwinSAFE Logic, 8 safe outputs	
			<b>EJ1957</b> TwinSAFE Logic, 8 safe inputs, 4 safe outputs		
PWM		<b>EJ2502</b> 24 V DC, 0.5 A	<b>EJ2564</b> 5...48 V DC, 3 A, RGBW, common anode		
Frequency output	<b>EJ2521-0224</b> 24 V DC, 1 A	<b>EJ2522</b> 24 V DC, 50 mA			

## EJ3xxx | EtherCAT plug-in modules, analog input

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

## EJ3xxx | EtherCAT plug-in modules, analog input

Signal	2-channel	4-channel	5-channel	8-channel
Thermocouple/mV				<b>EJ3318</b> type J, K, L...U, 16 bit
Potentiometer			<b>EJ3255</b> 16 bit	
Resistance thermometer (RTD)	<b>EJ3202</b> 16 bit	<b>EJ3214</b> 16 bit		

## EJ4xxx | EtherCAT plug-in modules, analog output

Signal	2-channel	4-channel	8-channel
0...10 V	<b>EJ4002</b> 12 bit	<b>EJ4004</b> 12 bit	<b>EJ4008</b> 12 bit
±10 V	<b>EJ4132</b> 16 bit	<b>EJ4134</b> 16 bit	
0...20 mA			<b>EJ4018</b> 12 bit
4...20 mA		<b>EJ4024</b> 12 bit	

## EJ5xxx | EtherCAT plug-in modules, position measurement

Signal	1-channel	2-channel
Absolute position measurement		<b>EJ5002</b> SSI encoder interface
		<b>EJ5042-0010</b> BISS-C interface
Incremental position measurement	<b>EJ5021</b> SinCos encoder interface, 1 V <sub>pp</sub>	<b>EJ5101</b> incremental encoder interface, RS422, TTL, 1 MHz
	<b>EJ5151</b> incremental encoder interface, 24 V HTL, 100 kHz	<b>EJ5112</b> incremental encoder interface, RS422, TTL, open collector, 5 MHz, 2 x AB/1 x ABC

## EJ6xxx | EtherCAT plug-in modules, communication

Signal	1-channel	2-channel	4-channel
System	<b>EJ6070</b> license key module		
	<b>EJ6080</b> memory module 128 kbyte		
Master		<b>EJ6002</b> serial interface RS232, RS485 or RS422	<b>EJ6224</b> IO-Link
			<b>EJ6224-0090</b> IO-Link, TwinSAFE SC
Safety	<b>EJ6910</b> TwinSAFE Logic		

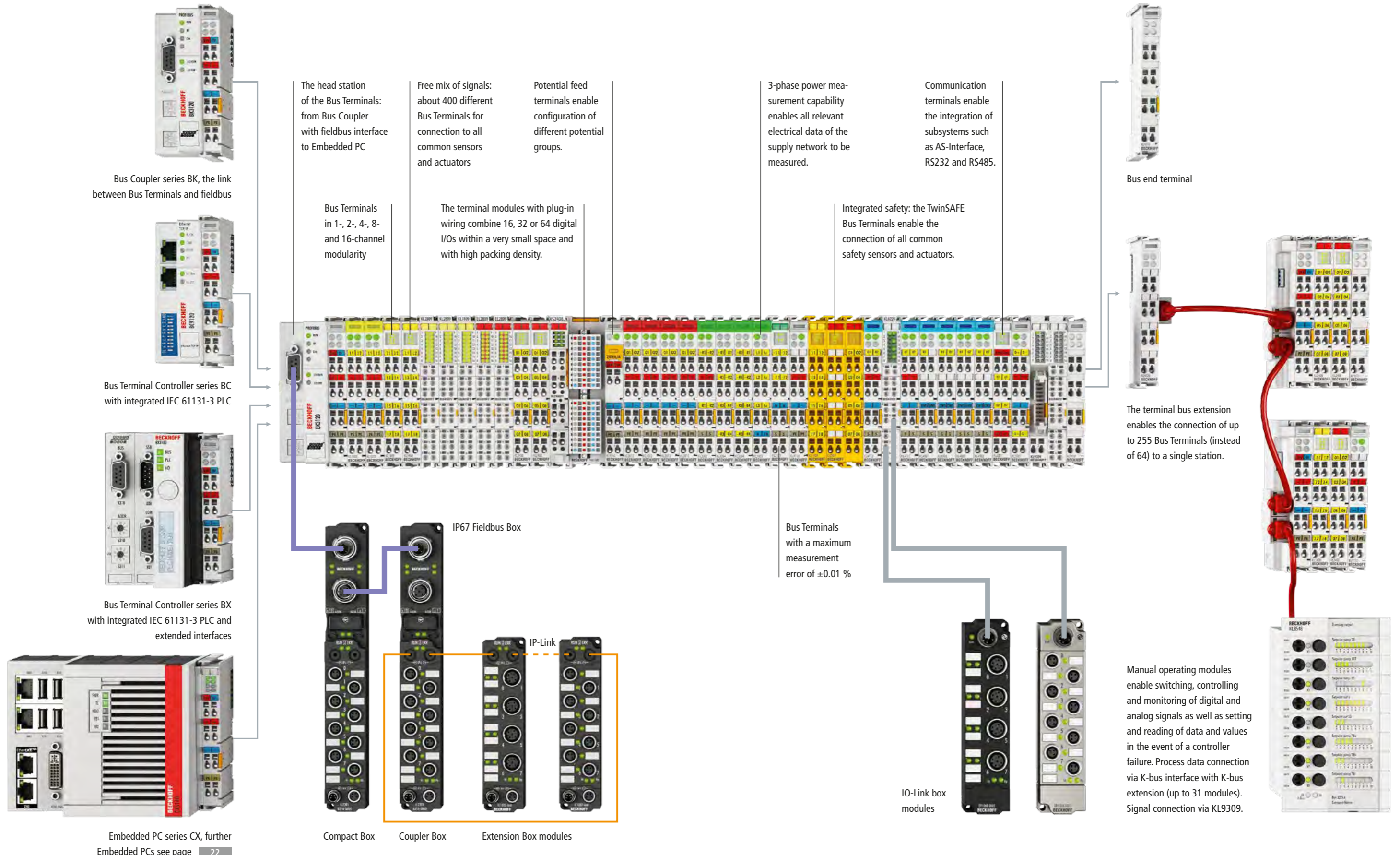
## EJ7xxx | EtherCAT plug-in modules, motion

Motor type	< 3 A	3...5 A
Servomotor		<b>EJ7211-0010</b> I <sub>ms</sub> = 4.5 A, 48 V DC, OCT
		<b>EJ7211-9414</b> I <sub>ms</sub> = 4.5 A, 48 V DC, OCT, STO, TwinSAFE SC
Stepper motor	<b>EJ7031</b> I <sub>max</sub> = 1.5 A, 24 V DC	<b>EJ7037</b> I <sub>max</sub> = 1.5 A, 24 V DC, incremental encoder, vector control
		<b>EJ7041-0052</b> I <sub>max</sub> = 5.0 A, 48 V DC
		<b>EJ7047</b> I <sub>max</sub> = 5.0 A, 48 V DC, incremental encoder, vector control
DC motor output stage		<b>EJ7334-0008</b> I <sub>max</sub> = 3.0 A, 24 V DC, incremental encoder
		<b>EJ7342</b> I <sub>max</sub> = 3.5 A, 48 V DC, incremental encoder
BLDC		<b>EJ7411</b> I <sub>ms</sub> = 4.5 A, 48 V DC

## EJ9xxx | EtherCAT plug-in modules, system

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

# System overview fieldbus I/O



# Bus Terminals

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



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

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

KL1xxx   Bus Terminals, digital input							
Signal	2-channel	4-channel	8-channel	16-channel	KM1xxx		
5 V DC		KL1124 filter 0.2 ms					
24 V DC, filter 3.0 ms	KL1002 type 3	KL1104 type 3	KL1804 type 3, 8 x 24 V, 4 x 0 V	KL1808 type 3, 8 x 24 V DC	KL1809 type 3	KM1002 16-channel, type 1	
	KL1402 type 3	KL1302 type 2	KL1404 type 3, 4 x 2-wire connection	KL1304 type 2	KL1408 type 3	KM1004 32-channel, type 1	
	KL1052 positive/ground switching		KL1154 positive/ground switching	KL1184 ground switching	KL1488 ground switching	KL1889 ground switching	KM1008 64-channel, type 1
	KL1212 type 1, short-circuit protected sensor supply	KL1362 break-in alarm				KL1859 type 3, 8 inputs, 8 outputs, I <sub>max</sub> = 0.5 A	
						KL1862 type 3, flat-ribbon cable	
						KL1862-0010 type 3, flat-ribbon cable, ground switching	
24 V DC, filter 0.2 ms	KL1012 type 3	KL1412 type 3	KL1114 type 3	KL1814 type 3, 8 x 24 V, 4 x 0 V	KL1418 type 3	KL1819 type 3	KM1012 16-channel, type 1
		KL1312 type 2		KL1314 type 2			KM1014 32-channel, type 1
			KL1414 type 3, 4 x 2-wire connection	KL1434 type 2, 4 x 2-wire connection			KM1018 64-channel, type 1
			KL1164 positive/ground switching	KL1194 ground switching	KL1498 ground switching		
						KL1872 type 3, flat-ribbon cable	
24 V DC	KL1232 pulse expansion	KL1382 thermistor	KL1904 TwinSAFE, 4 safe inputs				KM1644 4-channel, manual operation
24 V DC, counter	KL1501 type 1, 100 kHz, 32 bit	KL1512 type 1, 1 kHz, 16 bit					
≥ 48 V DC	KL1032 48 V DC, filter 3.0 ms	KL1712-0060 60 V DC					
120 V AC/DC	KL1712						
230 V AC	KL1702	KL1722 no power contacts	KL1704				
NAMUR	KL1352						

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

KL2xxx   Bus Terminals, digital output						
Signal	1-channel	2-channel	4-channel	8-channel	16-channel	KM2xxx
5 V DC			KL2124 <i>I</i> <sub>max</sub> = ±20 mA			
24 V DC, <i>I</i> <sub>max</sub> = 0.5 A		KL2012 short-circuit proof	KL2114 short-circuit proof	KL2808 8 x 0 V	KL2809 reverse voltage protection	KM2002 16-channel
		KL2032 reverse voltage protection	KL2134 reverse voltage protection			KM2004 32-channel
			KL2404 4 x 2-wire	KL2408 reverse voltage protection		KM2008 64-channel
		KL2212 diagnostics, protected sensor supply			KL2819 with diagnostics	KM2042 16-channel, D-sub connection
			KL2184 ground switching	KL2488 ground switching	KL2889 ground switching	
					KL1859 type 3, 8 inputs, 8 outputs, <i>I</i> <sub>max</sub> = 0.5 A	
					KL2872 flat-ribbon cable	
				KL2872-0010 flat-ribbon cable, ground switching		
24 V DC, <i>I</i> <sub>max</sub> = 2.0 A		KL2022	KL2424 4 x 2-wire	KL2828 8 x 2-wire		
24 V DC, <i>I</i> <sub>max</sub> = 4.0 A/8.0 A		KL2442 2 x 4 A/1 x 8 A				
24 V DC, safe output			KL2904 TwinSAFE, 4 safe outputs			
30 V AC/ 48 V DC solid-state relay, <i>I</i> <sub>max</sub> = 2.0 A			KL2784			
			KL2794 potential-free	KL2798 potential-free		
230 V AC solid-state relay	KL2701 <i>I</i> <sub>max</sub> = 3 A	KL2702 <i>I</i> <sub>max</sub> = 0.3 A				
Relay (up to 400 V AC)	KL2641 make contact, manual operation, <i>I</i> <sub>max</sub> = 16 A	KL2602 make contact, <i>I</i> <sub>max</sub> = 5 A	KL2622 make contact, no power contacts, <i>I</i> <sub>max</sub> = 5 A	KL2634 make contact, 250 V AC/30 V DC		KM2604 <i>I</i> <sub>max</sub> = 16 A, 4-channel
		KL2602-0010 make contact, <i>I</i> <sub>max</sub> = 5 A, contact- protecting switching	KL2622-0010 make contact, no power contacts, <i>I</i> <sub>max</sub> = 5 A, contact- protecting switching			KM2614 <i>I</i> <sub>max</sub> = 16 A, 4-channel, manual operation
		KL2652 change-over, <i>I</i> <sub>max</sub> = 5 A				KM2642 <i>I</i> <sub>max</sub> = 6 A, manual/ automatic operation, relay state readable
	KL2631 400 V AC, make contact	KL2612 125 V AC, change-over	KL2692 cycle monitoring (watchdog)			KM2652 <i>I</i> <sub>max</sub> = 6 A, manual/ automatic operation, switch and relay state readable

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

KL2xxx   Bus Terminals, digital output						
Signal	1-channel	2-channel	4-channel	8-channel	16-channel	KM2xxx
Triac (12...230 V AC)		KL2712	KL2722 mutually locked outputs			KM2774 <i>I</i> <sub>max</sub> = 1.5 A
		KL2732 mutually locked outputs, no power contacts				
PWM		KL2502 24 V DC, <i>I</i> <sub>max</sub> = 0.1 A	KL2512 24 V DC, <i>I</i> <sub>max</sub> = 1.5 A, ground switching			
		KL2535 <i>I</i> <sub>max</sub> = ±1 A, 24 V DC, current-controlled	KL2545 <i>I</i> <sub>max</sub> = ±3.5 A, 50 V DC, current-controlled			
Frequency output	KL2521 1-channel AB, 0...500 kHz, RS422					
Current con- trol, dimmer control	KL2751 universal dimmer, 300 W					
	KL2761 universal dimmer, 600 W					

KL2xxx   Bus Terminals, motion		
Motor type	< 3 A	3...5 A
Stepper motor	KL2531 <i>I</i> <sub>max</sub> = 1.5 A, 24 V DC	KL2541 <i>I</i> <sub>max</sub> = 5.0 A, 48 V DC, incremental encoder
DC motor output stage	KL2532 <i>I</i> <sub>max</sub> = 1.0 A, 24 V DC	KL2284 reverse switching, <i>I</i> <sub>max</sub> = 2.0 A, 0...24 V DC
		KL2552 <i>I</i> <sub>max</sub> = 5.0 A, 48 V DC, incremental encoder
AC motor speed controller	KL2791 230 V AC, 200 VA, 1-phase AC motor	



### KL3xxx | Bus Terminals, analog input

Signal	1-channel	2-/3-channel	4-channel	8-channel
0...2 V, 0...500 mV		KL3172 0...2 V, 16 bit, 0.05 %	KL3172-0500 0...500 mV, 16 bit, 0.05 %	
±2 V			KL3182 16 bit, 0.05 %	
0...10 V	KL3061 single-ended, 12 bit	KL3062 single-ended, 12 bit	KL3162 16 bit, 0.05 %	KL3064 single-ended, 12 bit
			KL3464 with sensor supply, single-ended, 12 bit	KL3468 single-ended, 12 bit
±10 V	KL3001 differential input, 12 bit	KL3002 differential input, 12 bit	KL3102 differential input, 16 bit	KL3404 single-ended, 12 bit
			KL3132 16 bit, 0.05 %	KL3408 single-ended, 12 bit
0...20 mA	KL3011 differential input, 12 bit	KL3012 differential input, 12 bit	KL3112 differential input, 16 bit	KL3044 single-ended, 12 bit
	KL3041 with sensor supply, 12 bit	KL3042 with sensor supply, 12 bit	KL3142 16 bit, 0.05 %	KL3444 with sensor supply, single-ended, 12 bit
4...20 mA	KL3021 differential input, 12 bit	KL3022 differential input, 12 bit	KL3122 differential input, 16 bit	KL3054 single-ended, 12 bit
	KL3051 with sensor supply, 12 bit	KL3052 with sensor supply, 12 bit	KL3152 16 bit, 0.05 %	KL3454 with sensor supply, single-ended, 12 bit
Resistance thermometer (RTD)	KL3201 Pt100...1000, Ni100, 16 bit	KL3202 Pt100...1000, Ni100, 16 bit	KL3222 Pt100, 4-wire connection, high-precision	KL3204 Pt100...1000, Ni100...1000, 2-wire connection
			KL3204-0030 NTC (10 kΩ)	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	
Measurement bridge (SG)	KL3351 16 bit			
	KL3356 16 bit, self-calibration			
Oscilloscope	KL3361 ±16 mV	KL3362 ±10 V		
Measurement technology	KL3681 digital multimeter, 18 bit			
Pressure measuring	KM3701 differential pressure, -100...+100 hPa	KM3702 relative pressure, 7500 hPa	KM3712 relative pressure, -1000...+1000 hPa	
	KM3701-0340 differential pressure, up to 340 hPa			
Power measurement		KL3403 power measurement, 3-phase, 1 A	KL3403-0010 power measurement, 3-phase, 5 A	
		KL3453 690 V AC, 5 A, extended functionalities		

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

### KL4xxx | Bus Terminals, analog output

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

### KL5xxx | Bus Terminals, position measurement

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

## KL6xxx | Bus Terminals, communication

Signal			
Serial interfaces	<b>KL6001</b> RS232, 19.2 kbaud	<b>KL6031</b> RS232, 115.2 kbaud	<b>KL6011</b> TTY, 20 mA current loop
	<b>KL6051</b> data exchange terminal, 32 bit	<b>KL6021</b> RS422/RS485, 19.2 kbaud	<b>KL6041</b> RS422/RS485, 115.2 kbaud
Subsystems	<b>KL6201</b> AS-Interface master terminal	<b>KL6211</b> AS-Interface master terminal with power contacts	<b>KL6224</b> IO-Link master
	<b>KL6301</b> KNX/EIB Bus Terminal	<b>KL6401</b> LON Bus Terminal	
	<b>KL6581</b> EnOcean master	<b>KL6583</b> EnOcean transmitter/receiver	
	<b>KL6771</b> MP-Bus master terminal	<b>KL6781</b> M-Bus master terminal	
	<b>KL6811</b> DALI/DSI master and power supply terminal	<b>KL6821</b> DALI-2 multi-master and power supply terminal	
	<b>KL6831</b> SMI terminal, LoVo	<b>KL6841</b> SMI terminal, 230 V AC	
	<b>KL6904</b> TwinSAFE Logic, 4 safe outputs		

## KL85xx | Bus Terminals, manual operation modules

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

## KL8xxx | Bus Terminals, power

For Siemens contactors (Sirius 3R series)	<b>KL8001</b> switching capacity 5.5 kW, nominal current 0.9...9.9 A, connection mechanism for Siemens contactors (Sirius 3R series)
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## KL9xxx | Bus Terminals, system

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

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

## KL9xxx | Bus Terminals, system

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

We reserve the right to make technical changes.

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# Fieldbus Box and IO-Link box

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



Fieldbus Box	Compact Box	Coupler Box
Fieldbus	Fieldbus Box without IP-Link interface	Fieldbus Box with IP-Link interface
EtherCAT		IL230x-B110
PROFIBUS	IPxxxx-B310	IPxxxx-B318 with integrated tee-connector
CANopen	IPxxxx-B510	IPxxxx-B518 with integrated tee-connector
DeviceNet	IPxxxx-B520	IPxxxx-B528 with integrated tee-connector
Ethernet TCP/IP		IL230x-B900
PROFINET		IL230x-B903
EtherNet/IP		IL230x-B905

IP1xxx-Bxxx   Fieldbus Box, digital input	2-channel	8-channel
Signal		
24 V DC, filter 3.0 ms		IP1001-Bxxx <sup>(1)</sup> 8 x M8
24 V DC, filter 0.2 ms		IP1011-Bxxx <sup>(1)</sup> 8 x M8
Counter	IP1502-Bxxx <sup>(1)</sup> up/down counter 24 V DC, 100 kHz	IP1002-Bxxx <sup>(1)</sup> 4 x M12
		IP1012-Bxxx <sup>(1)</sup> 4 x M12

IP2xxx-Bxxx   Fieldbus Box, digital output	2-channel	8-channel	16-channel
Signal			
24 V DC, I <sub>max</sub> = 0.5 A		IP2001-Bxxx <sup>(1)</sup> 8 x M8	IP2002-Bxxx <sup>(1)</sup> 4 x M12
24 V DC, I <sub>max</sub> = 0.5 A, Σ 4 A			IE2808 D-sub
24 V DC, I <sub>max</sub> = 2 A, Σ 4 A		IP2021-Bxxx <sup>(1)</sup> 8 x M8	IP2022-Bxxx <sup>(1)</sup> 4 x M12
24 V DC, I <sub>max</sub> = 2 A, Σ 12 A		IP2041-Bxxx <sup>(1)</sup> 8 x M8	IP2042-Bxxx <sup>(1)</sup> 4 x M12
PWM, I <sub>max</sub> = 2.5 A	IP2512-Bxxx <sup>(1)</sup> 4 x M12		

<sup>(1)</sup>also as IExxxx: Extension Box, <sup>(2)</sup>also as ILxxxx-Bxxx: Coupler Box

IP23/24xx-Bxxx   Fieldbus Box, digital combi	8-channel	16-channel
Signal		
24 V DC, filter 3.0 ms, I <sub>max</sub> = 0.5 A	IP2301-Bxxx <sup>(1, 2)</sup> 8 x M8, 4 inputs + 4 outputs	IP2302-Bxxx <sup>(1, 2)</sup> 4 x M12, 4 inputs + 4 outputs
24 V DC, filter 0.2 ms, I <sub>max</sub> = 0.5 A	IP2311-Bxxx <sup>(1)</sup> 8 x M8, 4 inputs + 4 outputs	IP2312-Bxxx <sup>(1)</sup> 4 x M12, 4 inputs + 4 outputs
24 V DC, filter 3.0 ms, I <sub>max</sub> = 2 A, Σ 4 A	IP2321-Bxxx <sup>(1)</sup> 8 x M8, 4 inputs + 4 outputs	IP2322-Bxxx <sup>(1)</sup> 4 x M12, 4 inputs + 4 outputs
24 V DC, filter 0.2 ms, I <sub>max</sub> = 2 A, Σ 4 A	IP2331-Bxxx <sup>(1)</sup> 8 x M8, 4 inputs + 4 outputs	IP2332-Bxxx <sup>(1)</sup> 4 x M12, 4 inputs + 4 outputs

IP3xxx-Bxxx   Fieldbus Box, analog input	4-channel
Signal	
±10 V	IP3102-Bxxx <sup>(1)</sup> differential inputs, 16 bit
0/4...20 mA	IP3112-Bxxx <sup>(1)</sup> differential inputs, 16 bit
Resistance	IP3202-Bxxx <sup>(1)</sup>
thermometer	Pt100, Pt200, Pt500, Pt1000, Ni100, 16 bit
Thermo-couple/mV	IP3312-Bxxx <sup>(1)</sup> type J, K, L, B, E, N, R, S, T, U, 16 bit

IP4xxx-Bxxx   Fieldbus Box, analog output	4-channel
Signal	
0/4...20 mA	IP4112-Bxxx <sup>(1)</sup> 16 bit
±10 V	IP4132-Bxxx <sup>(1)</sup> 16 bit

IP5xxx-Bxxx   Fieldbus Box, position measurement	M12
Function	
SSI encoder interface	IP5009-Bxxx <sup>(1)</sup>
Incremental encoder interface RS422	IP5109-Bxxx <sup>(1)</sup> 1 MHz
SinCos encoder interface	IP5209-Bxxx 12-pin
	IP5209-Bxxx-1000 9-pin

IP6xxx-Bxxx   Fieldbus Box, communication			
Function			
Serial interfaces	IP6002-Bxxx <sup>(1)</sup> RS232	IP6012-Bxxx <sup>(1)</sup> 0...20 mA (TTY)	IP6022-Bxxx <sup>(1)</sup> RS422/RS485

# Infrastructure Components

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



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

Signal	8-channel		16-channel	
24 V DC, filter 3.0 ms	EPI1008-0001 <sup>(1)</sup> 8 x M8	EPI1008-0002 <sup>(1)</sup> 4 x M12	EPI1809-0021 <sup>(1)</sup> 16 x M8	EPI1809-0022 <sup>(1)</sup> 8 x M12

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

Signal	8-channel		16-channel	
24 V DC, I <sub>max</sub> = 0.5 A	EPI2008-0001 <sup>(1)</sup> 8 x M8	EPI2008-0002 <sup>(1)</sup> 4 x M12		
24 V DC, I <sub>max</sub> = 0.5 A, ∑ 4 A			EPI2809-0021 <sup>(1)</sup> 16 x M8	EPI2809-0022 <sup>(1)</sup> 8 x M12

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

Signal	8-channel		16-channel	
24 V DC, filter 3.0 ms, I <sub>max</sub> = 0.5 A	EPI2338-0001 <sup>(1)</sup> 8 x M8	EPI2338-0002 <sup>(1)</sup> 4 x M12		
24 V DC, filter 3.0 ms, I <sub>max</sub> = 0.5 A, ∑ 4 A			EPI2339-0021 <sup>(1)</sup> 16 x M8	EPI2339-0022 <sup>(1)</sup> 8 x M12

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

Signal	4-channel	8-channel
±10 V, 0/4...20 mA	EPI3174-0002 <sup>(1)</sup> parameterizable, differential input, 16 bit	EPI3188-0022 parameterizable, single-ended, 16 bit

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

Signal	4-channel
±10 V, 0/4...20 mA	EPI4374-0002 <sup>(1)</sup> 2 inputs + 2 outputs, parameterizable, 16 bit

EPIxxxx: industrial housing in IP67, <sup>(1)</sup>also as ERxxxx: zinc die-cast housing in IP67



## CUxxxx, EPxxxx | EtherCAT components

	100 Mbit/s, IP20		100 Mbit/s, IP67	1 Gbit/s, IP20	
<b>Junctions</b>	CU1123 junction, 3 x RJ45	CU1123-0010 junction, 3 x RJ45, Extended Distance		CU1423 junction, 3 x RJ45	<u>i</u>
	CU1124 junction, 4 x RJ45	CU1128 junction, 8 x RJ45	EP9128-0021 EtherCAT, 8 x M8	CU1411 branch controller, 1 port	<u>i</u> CU1418 branch controller, 8 ports
<b>Media converters</b>	CU1521 1-channel, multi-mode/single-mode	CU1521-0020 1-channel, SFP slot	<u>i</u> EP9521-0020 1-channel, multi-mode		
	CU1561 1-channel, POF				

## CUxxxx, EPxxxx | Ethernet switches/components

	100 Mbit/s, IP20		100 Mbit/s, IP67	1 Gbit/s, IP20	
<b>Switches</b>	CU2005 5-port, RJ45	CU2008 8-port, RJ45	CU2016 16-port, RJ45	CU2608 8-port, M12 (D-coded)	CU2208 8-port, RJ45
<b>Media converters</b>	CU1521 1-channel, multi-mode/single-mode	CU1561 1-channel, POF		EP9521-0020 1-channel, multi-mode	

## CUxxxx | Ethernet port multiplier

	1 Gbit/s
<b>Multiplier</b>	CU2508 1 x RJ45 (+ 8 x RJ45: 100 Mbit/s)

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**BECKHOFF** New Automation Technology

# Current transformers

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



SCT1111



SCT21xx



SCT32xx



SCT5564



SCT61xx



SCT72xx



SCT01xx

## SCT1xxx | Mini ring-type current transformers

Primary current Max. diameter round conductor  
7.6 mm

0...32 to  
0...64 A AC SCT1111  
accuracy class 1

## SCT2xxx | Ring-type current transformers

Primary current Max. diameter round conductor  
25.7 mm | 31.8 mm | 43.7 mm | 54.7 mm | 70 mm

0...60 to  
0...500 A AC SCT2111  
accuracy class 1

0...125 to  
0...600 A AC SCT2121  
accuracy class 0.5

0...600/  
0...750 A AC SCT2211  
accuracy class 1

SCT2221  
accuracy class 0.5

0...800/  
0...1000 A AC SCT2311  
accuracy class 1

SCT2321  
accuracy class 0.5

0...1250/  
0...1500 A AC SCT2411  
accuracy class 1

SCT2421  
accuracy class 0.5

0...2000 A AC SCT2515  
accuracy class 1

SCT2525  
accuracy class 0.5

0...2500 A AC SCT2615  
accuracy class 1

SCT2625  
accuracy class 0.5

## SCT3xxx | 3-phase ring-type current transformers

Primary current Max. diameter round conductor  
13.5 mm | 18 mm | 22 mm

0...50 to  
0...150 A AC SCT3111  
accuracy class 1

0...125/  
0...150 A AC SCT3121  
accuracy class 0.5

0...100 to  
0...250 A AC SCT3215  
accuracy class 1

0...250 to  
0...600 A AC SCT3315  
accuracy class 1

## SCT5xxx | Differential current transformers

Primary current Diameter transformer opening 70 mm

0...100 and  
0...300 A SCT5564  
residual current measuring range 0.4 A or 2 A

## SCT6xxx | Split-core current transformers

Primary current Max. diameter round conductor  
18.5 mm | 27.9 mm | 42.4 mm | 2 x 42.4 mm

0...60 to  
0...150 A AC SCT6101  
accuracy class 3

0...200/  
0...250 A AC SCT6311  
accuracy class 1

SCT6321  
accuracy class 0.5

0...300 to  
0...500 A AC SCT6411  
accuracy class 1

0...400/  
0...500 A AC SCT6421  
accuracy class 0.5

0...600/  
0...750 A AC SCT6615  
accuracy class 1

SCT6625  
accuracy class 0.5

0...800/  
0...1000 A AC SCT6715  
accuracy class 1

SCT6725  
accuracy class 0.5

## SCT7xxx | Busbar split-core current transformers

Primary current Max. diameter round conductor  
20 mm | 50 mm | 80 mm

0...100/  
0...200 A AC SCT7105  
accuracy class 3

0...250/  
0...400 A AC SCT7115  
accuracy class 1

0...400 A AC SCT7125  
accuracy class 2

0...500/  
0...600 A AC SCT7215  
accuracy class 1

SCT7225  
accuracy class 2

0...750 to  
0...1500 A AC SCT7315  
accuracy class 1

SCT7325  
accuracy class 2

0...1500/  
0...5000 A AC SCT7415  
accuracy class 1

SCT7425  
accuracy class 2

## SCT0xxx | Coil current transformers

Primary current Primary conductor for connection

0...1 to  
0...30 A AC SCT0111  
accuracy class 1

SCT0121  
accuracy class 0.5

# Power supplies

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



## PS1000 | Power supplies

Output current	Output voltage	48 V DC (1-phase)	24 V DC (3-phase)	48 V DC (3-phase)
2.5 A	PS1111-2402-0002			
	24 V DC, 2.5 A DC, 1-phase			
3.8 A	PS1111-2403-0000			
	24 V DC, 3.8 A DC, 1-phase, NEC			
	PS1111-2403-0002			
	24 V DC, 3.8 A DC, 1-phase			
5 A	PS1061-2405-0000			
	24 V DC, 5 A DC, 1-phase, AC 200...240 V			
	PS1021-2405-0000			
	24 V DC, 5 A DC, 1-phase			
10 A	PS1061-2410-0000			
	24 V DC, 10 A DC, 1-phase, AC 200...240 V			
	PS1011-2410-0000			
	24 V DC, 10 A DC, 1-phase			
20 A	PS1061-2420-0000			
	24 V DC, 20 A DC, 1-phase, AC 200...240 V			
	PS1011-2420-0000			
	24 V DC, 20 A DC, 1-phase			

## PS2000 | Power supplies

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

## PS2000 | Power supplies with EtherCAT

Output current	Output voltage	48 V DC (1-phase)	24 V DC (3-phase)	48 V DC (3-phase)
10 A	PS2001-2410-1001			
	24 V DC, 10 A DC, 1-phase, EtherCAT			
	PS2001-4810-1001			
	48 V DC, 10 A DC, 1-phase, EtherCAT			
20 A	PS2001-2420-1001			
	24 V DC, 20 A DC, 1-phase, EtherCAT			

## PS3000 | Power supplies

Output current	Output voltage	48 V DC (1-phase)	24 V DC (3-phase)	48 V DC (3-phase)
10 A	PS3001-2410-0001			
	24 V DC, 10 A DC, 1-phase			
	PS3031-4810-0001			
	48 V DC, 10 A DC, 3-phase			
20 A	PS3001-2420-0001			
	24 V DC, 20 A DC, 1-phase			
	PS3011-4820-0000			
	48 V DC, 20 A DC, 1-phase			
	PS3031-2420-0001			
	24 V DC, 20 A DC, 3-phase			
40 A	PS3011-2440-0000			
	24 V DC, 40 A DC, 1-phase			
	PS3031-2440-0000			
	24 V DC, 40 A DC, 3-phase			

## PS9000 | Buffer modules

Output current	Input voltage	48 V DC
20 A	PS9011-2420-0001	
	24 V DC, 20 A, 200 ms	
	PS9031-4820-0001	
	48 V DC, 20 A, 100 ms	
40 A	PS9011-2440-0000	
	24 V DC, 40 A, 160 ms	

## PS9400 | Redundancy modules

Output current	Input voltage	24...56 V DC
20 A	PS9401-2420-0000	
	In: 2 x 10 A	
40 A	PS9401-2440-0000	
	In: 2 x 20 A	
	PS9421-4840-0000	
	In: 2 x 20 A	

# The Motion Company

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

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

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

## Servo Drives 78

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

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

## Distributed Servo Drive systems 80

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

► [www.beckhoff.com/distributed-servo-drive-system](http://www.beckhoff.com/distributed-servo-drive-system)

## Rotary servomotors 82

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

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

## Translatory servomotors 86

- direct drives for highly dynamic and maximum accurate positioning applications
- maximum speed up to 12 m/s
- compact product design with peak forces up to 12,500 N
- versatile and modular product concepts

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

## Compact drive technology 88

- high performance in small design
- motors and output stages for the < 48 V DC low voltage range
- servo, BLDC, stepper and DC motor output stages in IP20 or IP67
- smart servo drive with integrated output stage for machines without control cabinets

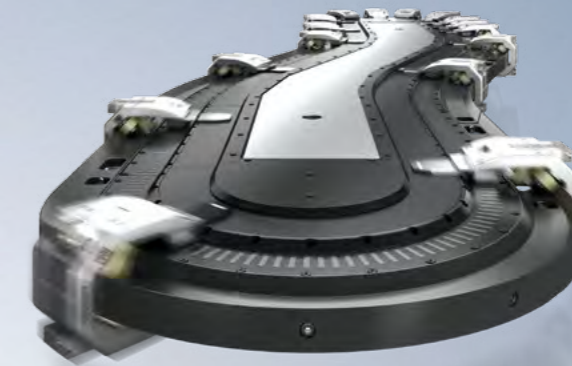
► [www.beckhoff.com/compact-drive-technology](http://www.beckhoff.com/compact-drive-technology)



## Linear product transport 94

- 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](http://www.beckhoff.com/xts)



## Planar motor system 93

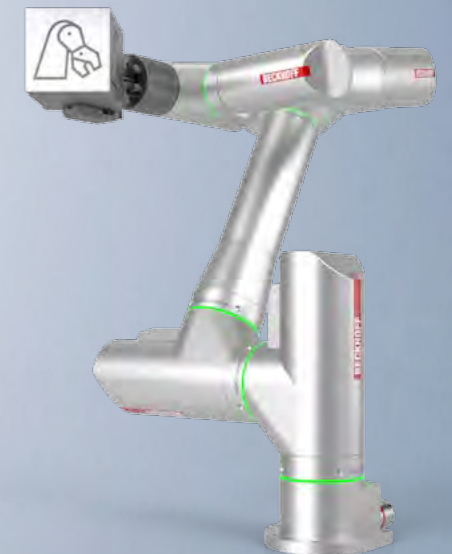
- free-floating movers for non-contact movement
- 6 degrees of freedom
- integrated position feedback
- individual machine layout
- ideal for all application areas

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

## ATRO: Automation Technology for Robotics

- modular industrial robot system
- limitless combinations due to easily pluggable motor and link modules
- endlessly rotating axes due to internal media feed
- complete integration into the control platform
- standardized interfaces

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



## ATRO

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

# Servo Drives

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



AX8000

## AX8000 | Multi-axis servo system

Function			
<b>Power supply modules</b>	<b>AX8620</b> 20 A DC	<b>AX8640</b> 40 A DC	
<b>Power supply modules DC</b>	<b>AX8600</b> 50 A DC, for supply voltage 24...680 V DC		
<b>Axis modules</b>	<b>AX8108</b> single-axis module 8 A, feedback: OCT, multi-feedback interface, TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion	<b>AX8118</b> single-axis module 18 A, feedback: OCT, multi-feedback interface, TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion	<b>AX8206</b> dual-axis module 2 x 6 A, feedback: OCT, multi-feedback interface, TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion
<b>Combined power supply and axis modules</b>	<b>AX8525</b> combined power supply and axis module 25 A, feedback: OCT, multi-feedback interface, TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion	<b>AX8540</b> combined power supply and axis module 40 A, feedback: OCT, multi-feedback interface, TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion	
<b>Option modules</b>	<b>AX8810</b> capacitor module	<b>AX8820</b> energy recovery module	<b>AX8831</b> coupling module, 1-channel
			<b>AX8832</b> coupling module with two outputs



AX5000

## AX5000 | Digital Compact Servo Drives

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



# Distributed Servo Drive systems

► [www.beckhoff.com/distributed-servo-drive-system](http://www.beckhoff.com/distributed-servo-drive-system)



AMI8100,  
rear view

## AMP8000 | Distributed servo drives (400 V AC)

Flange code	Motor length 1	Motor length 2	Motor length 3	Motor length 4
<b>F3 (72 mm)</b>	<b>AMP8031</b> M <sub>0</sub> = 1.36...1.38 Nm, nn = 3000...9000 min <sup>-1</sup> , TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion	<b>AMP8032</b> M <sub>0</sub> = 2.35...2.37 Nm, nn = 3000...9000 min <sup>-1</sup> , TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion	<b>AMP8033</b> M <sub>0</sub> = 3.10...3.15 Nm, nn = 3000...8000 min <sup>-1</sup> , TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion	
<b>F4 (87 mm)</b>	<b>AMP8041</b> M <sub>0</sub> = 2.35...2.40 Nm, nn = 3000...8000 min <sup>-1</sup> , TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion	<b>AMP8042</b> M <sub>0</sub> = 3.84...4.10 Nm, nn = 2500...7000 min <sup>-1</sup> , TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion	<b>AMP8043</b> M <sub>0</sub> = 5.30...5.40 Nm, nn = 2500...5000 min <sup>-1</sup> , TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion	
<b>F5 (104 mm)</b>	<b>AMP8051</b> M <sub>0</sub> = 4.40...4.60 Nm, nn = 2500...8000 min <sup>-1</sup> , TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion	<b>AMP8052</b> M <sub>0</sub> = 7.60 Nm, nn = 2000...4000 min <sup>-1</sup> , TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion	<b>AMP8053</b> M <sub>0</sub> = 9.60...10.2 Nm, nn = 2000...4000 min <sup>-1</sup> , TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion	<b>AMP8054</b> M <sub>0</sub> = 11.8 Nm, nn = 2000 min <sup>-1</sup> , TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion

## AMP8500 | Distributed servo drives with increased rotor moment of inertia (400 V AC)

Flange code	Motor length 1	Motor length 2	Motor length 3
<b>F3 (72 mm)</b>	<b>AMP8531</b> M <sub>0</sub> = 1.36...1.38 Nm, nn = 3000...9000 min <sup>-1</sup> , TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion	<b>AMP8532</b> M <sub>0</sub> = 2.35...2.37 Nm, nn = 3000...9000 min <sup>-1</sup> , TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion	<b>AMP8533</b> M <sub>0</sub> = 3.10...3.15 Nm, nn = 3000...8000 min <sup>-1</sup> , TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion
<b>F4 (87 mm)</b>	<b>AMP8541</b> M <sub>0</sub> = 2.35...2.40 Nm, nn = 3000...8000 min <sup>-1</sup> , TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion	<b>AMP8542</b> M <sub>0</sub> = 3.84...4.10 Nm, nn = 2500...7000 min <sup>-1</sup> , TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion	<b>AMP8543</b> M <sub>0</sub> = 4.70...5.40 Nm, nn = 2500...7000 min <sup>-1</sup> , TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion
<b>F5 (104 mm)</b>	<b>AMP8551</b> M <sub>0</sub> = 4.40...4.60 Nm, nn = 2500...8000 min <sup>-1</sup> , TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion	<b>AMP8552</b> M <sub>0</sub> = 5.60...7.60 Nm, nn = 2000...7300 min <sup>-1</sup> , TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion	<b>AMP8553</b> M <sub>0</sub> = 9.60...10.2 Nm, nn = 2000...4000 min <sup>-1</sup> , TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion

## AMP8600 | Distributed power supply modules

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

## AMP8800 | Decentralized distribution module

Function			
<b>Distribution module</b>	<b>AMP8805-1000-0000</b> 5-channel, 24 V DC power supply		

## AX8800 | Coupling modules

Function	1-channel	2-channel
<b>Coupling modules</b>	<b>AX8831</b>	<b>AX8832</b>

## AMI8100 | Compact integrated Servo Drives (48 V DC)

Flange code	Motor length 1	Motor length 2	Motor length 3
<b>F2 (58 mm)</b>	<b>AMI8121</b> M <sub>0</sub> = 0.48 Nm	<b>AMI8122</b> M <sub>0</sub> = 0.78 Nm	<b>AMI8123</b> M <sub>0</sub> = 1.00 Nm

# Rotary servomotors

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



AM8000



AM8500



AM8000, AM8500  
with fan



AM8700



AM8800

AM8000   Servomotors				
Flange code	Motor length 1	Motor length 2	Motor length 3	Motor length 4
<b>F1 (40 mm)</b>	<b>AM8011</b> M <sub>0</sub> = 0.20 Nm, nn = 8000 min <sup>-1</sup>	<b>AM8012</b> M <sub>0</sub> = 0.38 Nm, nn = 8000 min <sup>-1</sup>	<b>AM8013</b> M <sub>0</sub> = 0.52 Nm, nn = 8000 min <sup>-1</sup>	
<b>F2 (58 mm)</b>	<b>AM8021</b> M <sub>0</sub> = 0.50 Nm, nn = 8000...9000 min <sup>-1</sup>	<b>AM8022</b> M <sub>0</sub> = 0.80 Nm, nn = 8000...9000 min <sup>-1</sup>	<b>AM8023</b> M <sub>0</sub> = 1.20 Nm, nn = 8000...9000 min <sup>-1</sup>	
<b>F3 (72 mm)</b>	<b>AM8031</b> M <sub>0</sub> = 1.37...1.40 Nm, nn = 3000...9000 min <sup>-1</sup>	<b>AM8032</b> M <sub>0</sub> = 2.37...2.38 Nm, nn = 3000...9000 min <sup>-1</sup>	<b>AM8033</b> M <sub>0</sub> = 3.20...3.22 Nm, nn = 3000...9000 min <sup>-1</sup>	
<b>F4 (87 mm)</b>	<b>AM8041</b> M <sub>0</sub> = 2.37...2.45 Nm, nn = 3000...8000 min <sup>-1</sup>	<b>AM8042</b> M <sub>0</sub> = 4.10 Nm, nn = 2500...8000 min <sup>-1</sup>	<b>AM8043</b> M <sub>0</sub> = 5.60...5.65 Nm, nn = 2500...8000 min <sup>-1</sup>	<b>AM8044</b> M <sub>0</sub> = 7.10 Nm, nn = 2500...5000 min <sup>-1</sup>
<b>F5 (104 mm)</b>	<b>AM8051</b> M <sub>0</sub> = 4.80...6.30 Nm, nn = 2500...8000 min <sup>-1</sup>	<b>AM8052</b> M <sub>0</sub> = 8.20...10.7 Nm, nn = 2000...7300 min <sup>-1</sup>	<b>AM8053</b> M <sub>0</sub> = 11.4...15.4 Nm, nn = 2000...7000 min <sup>-1</sup>	<b>AM8054</b> M <sub>0</sub> = 13.8...17.2 Nm, nn = 2000...4000 min <sup>-1</sup>
<b>F6 (142 mm)</b>	<b>AM8061</b> M <sub>0</sub> = 12.8...17.1 Nm, nn = 1400...5000 min <sup>-1</sup>	<b>AM8062</b> M <sub>0</sub> = 21.1...29.9 Nm, nn = 1400...5000 min <sup>-1</sup>	<b>AM8063</b> M <sub>0</sub> = 29.0...41.4 Nm, nn = 1400...4000 min <sup>-1</sup>	<b>AM8064</b> M <sub>0</sub> = 35.0...49.0 Nm, nn = 1500...4000 min <sup>-1</sup>
<b>F7 (197 mm)</b>	<b>AM8071</b> M <sub>0</sub> = 31.8...42.8 Nm, nn = 1500...4000 min <sup>-1</sup>	<b>AM8072</b> M <sub>0</sub> = 54.6...80.7 Nm, nn = 1000...3000 min <sup>-1</sup>	<b>AM8073</b> M <sub>0</sub> = 70.0...104 Nm, nn = 1000...3000 min <sup>-1</sup>	<b>AM8074</b> M <sub>0</sub> = 92.0...129 Nm, nn = 1000...3000 min <sup>-1</sup>

AM8500   Servomotors with increased rotor moment of inertia			
Flange code	Motor length 1	Motor length 2	Motor length 3
<b>F3 (72 mm)</b>	<b>AM8531</b> M <sub>0</sub> = 1.37...1.40 Nm, nn = 3000...9000 min <sup>-1</sup>	<b>AM8532</b> M <sub>0</sub> = 2.37...2.38 Nm, nn = 3000...9000 min <sup>-1</sup>	<b>AM8533</b> M <sub>0</sub> = 3.20...3.22 Nm, nn = 3000...9000 min <sup>-1</sup>
<b>F4 (87 mm)</b>	<b>AM8541</b> M <sub>0</sub> = 2.37...2.45 Nm, nn = 3000...8000 min <sup>-1</sup>	<b>AM8542</b> M <sub>0</sub> = 4.10 Nm, nn = 2500...8000 min <sup>-1</sup>	<b>AM8543</b> M <sub>0</sub> = 5.60...5.65 Nm, nn = 2500...8000 min <sup>-1</sup>
<b>F5 (104 mm)</b>	<b>AM8551</b> M <sub>0</sub> = 4.80...6.30 Nm, nn = 2500...8000 min <sup>-1</sup>	<b>AM8552</b> M <sub>0</sub> = 8.20...10.7 Nm, nn = 2000...7300 min <sup>-1</sup>	<b>AM8553</b> M <sub>0</sub> = 11.4...15.4 Nm, nn = 2000...7000 min <sup>-1</sup>
<b>F6 (142 mm)</b>	<b>AM8561</b> M <sub>0</sub> = 12.8...17.1 Nm, nn = 1400...5000 min <sup>-1</sup>	<b>AM8562</b> M <sub>0</sub> = 21.1...29.9 Nm, nn = 1400...5000 min <sup>-1</sup>	<b>AM8563</b> M <sub>0</sub> = 29.0...41.1 Nm, nn = 1400...4000 min <sup>-1</sup>

AM8700   Servomotors with anodized housing			
Flange code	Motor length 1	Motor length 2	Motor length 3
<b>R2 (77 mm)</b>	<b>AM8721</b> M <sub>0</sub> = 0.5 Nm, nn = 8000 min <sup>-1</sup>	<b>AM8722</b> M <sub>0</sub> = 0.8 Nm, nn = 8000 min <sup>-1</sup>	<b>AM8723</b> M <sub>0</sub> = 1.2 Nm, nn = 8000 min <sup>-1</sup>
<b>R3 (89 mm)</b>	<b>AM8731</b> M <sub>0</sub> = 1.38 Nm, nn = 6000 min <sup>-1</sup>	<b>AM8732</b> M <sub>0</sub> = 2.37 Nm, nn = 6000 min <sup>-1</sup>	<b>AM8733</b> M <sub>0</sub> = 3.22 Nm, nn = 6000 min <sup>-1</sup>
<b>R4 (114 mm)</b>	<b>AM8741</b> M <sub>0</sub> = 2.45 Nm, nn = 6000 min <sup>-1</sup>	<b>AM8742</b> M <sub>0</sub> = 4.10 Nm, nn = 5000 min <sup>-1</sup>	<b>AM8743</b> M <sub>0</sub> = 5.65 Nm, nn = 5000 min <sup>-1</sup>
<b>R5 (134 mm)</b>	<b>AM8751</b> M <sub>0</sub> = 4.90 Nm, nn = 5000 min <sup>-1</sup>	<b>AM8752</b> M <sub>0</sub> = 8.20 Nm, nn = 4000 min <sup>-1</sup>	<b>AM8753</b> M <sub>0</sub> = 11.40 Nm, nn = 4000 min <sup>-1</sup>
<b>R6 (189 mm)</b>	<b>AM8761</b> M <sub>0</sub> = 12.80 Nm, nn = 3000 min <sup>-1</sup>	<b>AM8762</b> M <sub>0</sub> = 21.10 Nm, nn = 3000 min <sup>-1</sup>	<b>AM8763</b> M <sub>0</sub> = 29.00 Nm, nn = 3000 min <sup>-1</sup>

AM8800   Stainless steel servomotors in hygienic design			
Flange code	Motor length 1	Motor length 2	Motor length 3
<b>R3 (89 mm)</b>	<b>AM8831</b> M <sub>0</sub> = 0.85 Nm, nn = 3000 min <sup>-1</sup>	<b>AM8832</b> M <sub>0</sub> = 1.40 Nm, nn = 3000 min <sup>-1</sup>	<b>AM8833</b> M <sub>0</sub> = 1.85 Nm, nn = 3000 min <sup>-1</sup>
<b>R4 (114 mm)</b>	<b>AM8841</b> M <sub>0</sub> = 1.60 Nm, nn = 3000 min <sup>-1</sup>	<b>AM8842</b> M <sub>0</sub> = 2.60 Nm, nn = 2500 min <sup>-1</sup>	<b>AM8843</b> M <sub>0</sub> = 3.50 Nm, nn = 2500 min <sup>-1</sup>
<b>R5 (134 mm)</b>	<b>AM8851</b> M <sub>0</sub> = 3.10 Nm, nn = 2500 min <sup>-1</sup>	<b>AM8852</b> M <sub>0</sub> = 4.80 Nm, nn = 2000 min <sup>-1</sup>	<b>AM8853</b> M <sub>0</sub> = 6.40 Nm, nn = 2000 min <sup>-1</sup>
<b>R6 (189 mm)</b>	<b>AM8861</b> M <sub>0</sub> = 7.75 Nm, nn = 1500 min <sup>-1</sup>	<b>AM8862</b> M <sub>0</sub> = 13.1 Nm, nn = 1500 min <sup>-1</sup>	<b>AM8863</b> M <sub>0</sub> = 16.7 Nm, nn = 1500 min <sup>-1</sup>

# Planetary gear units

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



AG2300



AG2400



AG2800



AG3210



AG3300



AG3400

## AG2300 | High-end planetary gear units with output shaft

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

## AG2400 | High-end planetary gear units with output flange

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

## AG2800 | Planetary gear units in hygienic design

Sizes	Straight design
HDV015	AG2800-+HDV015S nominal output torque 15...16 Nm
HDV025	AG2800-+HDV025S nominal output torque 35...40 Nm
HDV035	AG2800-+HDV035S nominal output torque 90...100 Nm

## AG3210 | Economy planetary gear units

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

## AG3300 | Economy planetary gear units

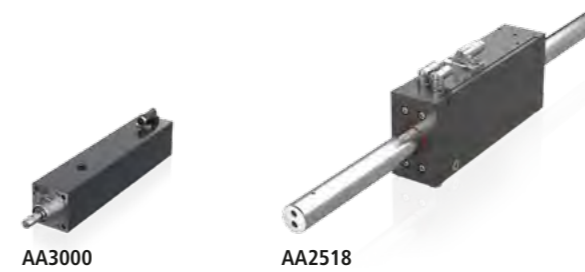
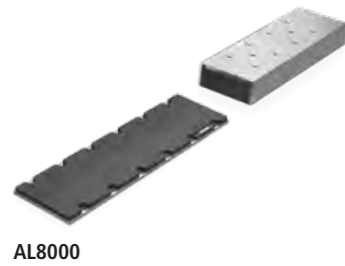
Sizes	Straight design
NPS015	AG3300-+NPS015S nominal output torque 17...21 Nm
NPS025	AG3300-+NPS025S nominal output torque 40...50 Nm
NPS035	AG3300-+NPS035S nominal output torque 100...130 Nm
NPS045	AG3300-+NPS045S nominal output torque 200...350 Nm

## AG3400 | Economy planetary gear units with output flange

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

# Translatory servomotors

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



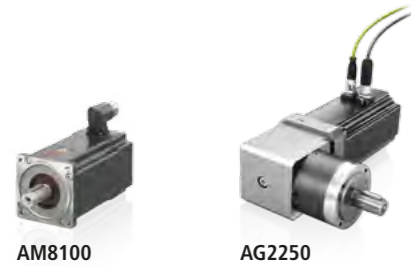
AL8000   Highly dynamic linear servomotors			
Peak force	Overall width W2 (50 mm)	Overall width W4 (80 mm)	Overall width W6 (130 mm)
≤ 500 N	<b>AL8021</b> F <sub>max</sub> = 120 N, I <sub>max</sub> = 7.3 A, V <sub>max</sub> = 12 m/s	<b>AL8041</b> F <sub>max</sub> = 230 N, I <sub>max</sub> = 7.2 A, V <sub>max</sub> = 7 m/s	
	<b>AL8022</b> F <sub>max</sub> = 240 N, I <sub>max</sub> = 7.3 A, V <sub>max</sub> = 12 m/s	<b>AL8042</b> F <sub>max</sub> = 460 N, I <sub>max</sub> = 7.2 A, V <sub>max</sub> = 7 m/s	
	<b>AL8024</b> F <sub>max</sub> = 480 N, I <sub>max</sub> = 12 A, V <sub>max</sub> = 12 m/s		
> 500... 1500 N	<b>AL8026</b> F <sub>max</sub> = 720 N, I <sub>max</sub> = 12 A, V <sub>max</sub> = 10 m/s	<b>AL8043</b> F <sub>max</sub> = 690 N, I <sub>max</sub> = 7.2/12 A, V <sub>max</sub> = 3.5/7 m/s	
		<b>AL8044</b> F <sub>max</sub> = 920 N, I <sub>max</sub> = 7.2/15 A, V <sub>max</sub> = 3.5/7 m/s	
		<b>AL8045</b> F <sub>max</sub> = 1150 N, I <sub>max</sub> = 12/24 A, V <sub>max</sub> = 3.5/7 m/s	
		<b>AL8046</b> F <sub>max</sub> = 1380 N, I <sub>max</sub> = 12/24 A, V <sub>max</sub> = 3.5/7 m/s	
> 1500 N		<b>AL8048</b> F <sub>max</sub> = 1840 N, I <sub>max</sub> = 15/29 A, V <sub>max</sub> = 3.5/7 m/s	<b>AL8064</b> F <sub>max</sub> = 1800 N, I <sub>max</sub> = 12/24 A, V <sub>max</sub> = 3/6 m/s
			<b>AL8065</b> F <sub>max</sub> = 2250 N, I <sub>max</sub> = 15/24 A, V <sub>max</sub> = 3/6 m/s
			<b>AL8066</b> F <sub>max</sub> = 2700 N, I <sub>max</sub> = 18/42 A, V <sub>max</sub> = 3/6 m/s
			<b>AL806A</b> F <sub>max</sub> = 4500 N, I <sub>max</sub> = 24/72 A, V <sub>max</sub> = 3/6 m/s
			<b>AL806B</b> F <sub>max</sub> = 4950 N, I <sub>max</sub> = 29 A, V <sub>max</sub> = 3 m/s
			<b>AL806F</b> F <sub>max</sub> = 6750 N, I <sub>max</sub> = 42/100 A, V <sub>max</sub> = 3/6 m/s

AA3000   Electric cylinders (400 V AC)			
Peak force	Flange code 58 mm	Flange code 75 mm	Flange code 110 mm
3125... 6250 N	<b>AA3023</b> F <sub>c</sub> = 700/1400 N		
6250... 12,500 N		<b>AA3033</b> F <sub>c</sub> = 1850/3700 N	
12,500... 25,000 N			<b>AA3053</b> F <sub>c</sub> = 3200/6400 N

AA2500   Tubular motors (400 V AC)	
Peak force	Continuous force ≥ 300 N
> 500... 1500 N	<b>AA2518</b> F <sub>p</sub> = 1050 N, I <sub>p</sub> = 15 A, F <sub>c</sub> = 300 N

# Compact drive technology

► [www.beckhoff.com/compact-drive-technology](http://www.beckhoff.com/compact-drive-technology)



AM8100   Servomotors for compact drive technology			
Flange code	Motor length 1	Motor length 2	Motor length 3
<b>F1 (40 mm)</b>	AM8111 M <sub>0</sub> = 0.20 Nm	AM8112 M <sub>0</sub> = 0.38 Nm	AM8113 M <sub>0</sub> = 0.52 Nm
<b>F2 (58 mm)</b>	AM8121 M <sub>0</sub> = 0.50 Nm	AM8122 M <sub>0</sub> = 0.80 Nm	AM8123 M <sub>0</sub> = 1.20 Nm
<b>F3 (72 mm)</b>	AM8131 M <sub>0</sub> = 1.30...1.35 Nm	AM8132 M <sub>0</sub> = 2.37...2.40 Nm	AM8133 M <sub>0</sub> = 3.2 Nm
<b>F4 (87 mm)</b>	AM8141 M <sub>0</sub> = 2.40 Nm	AM8142 M <sub>0</sub> = 3.9 Nm	

AG2250   Planetary gear units for servo and stepper motors		
Sizes	Straight design	Angled design
<b>PLE40</b>	AG2250-+PLE40 nominal output torque 5...20 Nm	
<b>PLE60</b>	AG2250-+PLE60 nominal output torque 15...44 Nm	
<b>PLE80</b>	AG2250-+PLE80 nominal output torque 38...120 Nm	
<b>WPLE40</b>		AG2250-+WPLE40 nominal output torque 4.5...20 Nm
<b>WPLE60</b>		AG2250-+WPLE60 nominal output torque 14...44 Nm
<b>WPLE80</b>		AG2250-+WPLE80 nominal output torque 38...120 Nm



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

AG1000   Planetary gear units for AS1000 stepper motors	
Sizes	Straight design
<b>PM52</b>	AG1000-+PM52.i nominal output torque 4 Nm
<b>PM81</b>	AG1000-+PM81.i nominal output torque 20 Nm

AA3100   Electric cylinders (48 V DC)		
Peak force	Flange code 58 mm	Flange code 75 mm
2500... 5000 N	AA3123 F <sub>c</sub> = 700/1400 N	<a href="#">i</a>
5800... 11,600 N		AA3133 F <sub>c</sub> = 1850/3700 N <a href="#">i</a>

AA1000   Linear actuators (48 V DC)		
Peak force	Continuous force ≥ 300 N	Continuous force > 150 N
> 500... 1500 N	AA1121 F <sub>p</sub> = 800 N, F <sub>c</sub> = 300 N	<a href="#">i</a> AA1821 <a href="#">i</a> F <sub>p</sub> = 800 N, F <sub>c</sub> = 160 N



EtherCAT Terminals

EL7xxx   EtherCAT Terminals, motion				
Motor type	< 3 A	3...5 A	> 5 A	16 A
Servomotor			<b>ELM7211-0010</b> <i>I<sub>ms</sub></i> = 4.5 A, 48 V DC	
			<b>ELM7211-9016</b> <i>I<sub>ms</sub></i> = 4.5 A, 48 V DC, TwinSAFE Logic	<b>i</b>
			<b>ELM7211-9018</b> <i>I<sub>ms</sub></i> = 4.5 A, 48 V DC, Safe Motion, TwinSAFE Logic	<b>i</b>
			<b>ELM7212-0010</b> <i>I<sub>ms</sub></i> = 2 x 4.5 A, 48 V DC	<b>ELM7222-0010</b> <i>I<sub>ms</sub></i> = 2 x 8.0 A, 48 V DC
			<b>ELM7212-9016</b> <i>I<sub>ms</sub></i> = 2 x 4.5 A, 48 V DC, TwinSAFE Logic	<b>ELM7222-9016</b> <i>I<sub>ms</sub></i> = 2 x 8.0 A, 48 V DC, TwinSAFE Logic
			<b>ELM7212-9018</b> <i>I<sub>ms</sub></i> = 2 x 4.5 A, 48 V DC, Safe Motion, TwinSAFE Logic	<b>ELM7222-9018</b> <i>I<sub>ms</sub></i> = 2 x 8.0 A, 48 V DC, Safe Motion, TwinSAFE Logic
			<b>ELM7221-0010</b> <i>I<sub>ms</sub></i> = 8 A, 48 V DC	<b>ELM7231-0010</b> <i>I<sub>ms</sub></i> = 16 A, 48 V DC
	<b>EL7201-0010</b> <i>I<sub>ms</sub></i> = 2.8 A, 48 V DC, OCT	<b>EL7211-0010</b> <i>I<sub>ms</sub></i> = 4.5 A, 48 V DC, OCT	<b>ELM7221-9016</b> <i>I<sub>ms</sub></i> = 8 A, 48 V DC, TwinSAFE Logic	<b>ELM7231-9016</b> <i>I<sub>ms</sub></i> = 16 A, 48 V DC, TwinSAFE Logic
	<b>EL7201</b> <i>I<sub>ms</sub></i> = 2.8 A, 48 V DC, resolver	<b>EL7211</b> <i>I<sub>ms</sub></i> = 4.5 A, 48 V DC, resolver	<b>ELM7221-9018</b> <i>I<sub>ms</sub></i> = 8 A, 48 V DC, Safe Motion, TwinSAFE Logic	<b>ELM7231-9018</b> <i>I<sub>ms</sub></i> = 16 A, 48 V DC, Safe Motion, TwinSAFE Logic
	<b>EL7201-9014</b> <i>I<sub>ms</sub></i> = 2.8 A, 48 V DC, OCT, STO	<b>EL7211-9014</b> <i>I<sub>ms</sub></i> = 4.5 A, 48 V DC, OCT, STO	<b>EL7221-9014</b> <i>I<sub>ms</sub></i> = 7...8 A with ZB8610, 48 V DC, OCT, STO	
Stepper motor	<b>EL7031</b> <i>I<sub>max</sub></i> = 1.5 A, 24 V DC	<b>EL7041</b> <i>I<sub>max</sub></i> = 5.0 A, 48 V DC, incr. enc.		
	<b>EL7031-0030</b> <i>I<sub>max</sub></i> = 2.8 A, 24 V DC	<b>EL7041-0052</b> <i>I<sub>max</sub></i> = 5.0 A, 48 V DC		
	<b>EL7037</b> <i>I<sub>max</sub></i> = 1.5 A, 24 V DC, incr. enc., vector control	<b>EL7047</b> <i>I<sub>max</sub></i> = 5.0 A, 48 V DC, incr. enc., vector control		
		<b>EL7047-9014</b> <i>I<sub>max</sub></i> = 5.0 A, 48 V DC, incr. enc., vector control, STO	<b>i</b>	
		<b>EL7062</b> <i>I<sub>max</sub></i> = 3 A, 5 V DC, incr. enc.	<b>i</b>	

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



EtherCAT Box modules

EL7xxx   EtherCAT Terminals, motion				
Motor type	< 3 A	3...5 A	> 5 A	16 A
DC motor	<b>EL7332</b> <i>I<sub>max</sub></i> = 1.0 A, 24 V DC	<b>EL7342</b> <i>I<sub>max</sub></i> = 3.5 A, 48 V DC, incr. enc.		
BLDC motor		<b>EL7411</b> <i>I<sub>ms</sub></i> = 4.5 A, 48 V DC		
		<b>EL7411-9014</b> <i>I<sub>ms</sub></i> = 4.5 A, 48 V DC, STO	<b>i</b>	
4-axis interface	<b>EM7004</b> 4 incr. enc., 32 digital I/Os 24 V DC, 4 analog outputs ±10 V			

EP7xxx   EtherCAT Box, motion			
Motor type	< 3 A	> 3 A	
Servomotor		<b>EP7211-0034</b> <i>I<sub>ms</sub></i> = 4.5 A, 48 V DC, OCT, STO suitable	
Stepper motor		<b>EP7047-0032</b> <i>I<sub>max</sub></i> = 5.0 A, 48 V DC, STO suitable	
	<b>EP7041-1002<sup>(1)</sup></b> <i>I<sub>max</sub></i> = 1.5 A, 48 V DC, incremental encoder, 2 digital inputs, 1 digital output	<b>EP7041-0002<sup>(1)</sup></b> <i>I<sub>max</sub></i> = 5 A, 48 V DC, incremental encoder, 2 digital inputs, 1 digital output	<b>EP7041-1032</b> <i>I<sub>max</sub></i> = 5.0 A, 48 V DC <b>i</b> <b>EP7041-2002<sup>(1)</sup></b> <i>I<sub>max</sub></i> = 5 A, 48 V DC, incremental encoder, 2 digital inputs, 1 digital output, motor connection via plug
		<b>EP7041-3002<sup>(1)</sup></b> <i>I<sub>max</sub></i> = 5 A, 48 V DC, incremental encoder, for high-speed applications, encoder system (24 V DC encoder)	<b>EP7041-3102</b> <i>I<sub>max</sub></i> = 5 A, 48 V DC, incremental encoder, for high-speed applications, encoder system (5 V DC encoder)
	<b>EP7041-4032</b> <i>I<sub>max</sub></i> = 5.0 A, 48 V DC, BiSS C encoder	<b>i</b>	
DC motor	<b>EP7342-0002<sup>(1)</sup></b> <i>I<sub>max</sub></i> = 3.5 A, 48 V DC		
BLDC motor		<b>EP7402-0057</b> for roller conveyor systems, 24 V DC, EtherCAT junction	
		<b>EP7402-0167</b> for roller conveyor systems, 48 V DC	

EPxxxx: industrial housing in IP67, <sup>(1)</sup>also as ERxxxx: zinc die-cast housing in IP67, <sup>(2)</sup>also as EQxxxx: stainless steel housing in IP69K

# XPlanar | Planar motor system

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



EtherCAT P Box modules



EtherCAT plug-in modules



Bus Terminals

## EPP7xxx | EtherCAT P Box, motion

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

## EJ7xxx | EtherCAT plug-in modules, motion

Motor type	< 3 A	3...5 A	
Servomotor		EJ7211-0010 <i>I</i> <sub>ms</sub> = 4.5 A, 48 V DC, OCT	EJ7211-9414 <i>I</i> <sub>ms</sub> = 4.5 A, 48 V DC, OCT, STO, TwinSAFE SC
Stepper motor	EJ7031 <i>I</i> <sub>max</sub> = 1.5 A, 24 V DC	EJ7037 <i>I</i> <sub>max</sub> = 1.5 A, 24 V DC, incremental encoder, vector control	EJ7041-0052 <i>I</i> <sub>max</sub> = 5.0 A, 48 V DC EJ7047 <i>I</i> <sub>max</sub> = 5.0 A, 48 V DC, incremental encoder, vector control
DC motor output stage		EJ7334-0008 <i>I</i> <sub>max</sub> = 3.0 A, 24 V DC, incremental encoder	EJ7342 <i>I</i> <sub>max</sub> = 3.5 A, 48 V DC, incremental encoder
BLDC		EJ7411 <i>I</i> <sub>ms</sub> = 4.5 A, 48 V DC	

## KL2xxx | Bus Terminals, motion

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

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

*i* Product announcement for availability status see [www.beckhoff.com](http://www.beckhoff.com)



Movers



Tile

Starter kits

## XPlanar | Planar motor system

Movers	APM4220-0000-0000 0.4 kg payload	APM4221-0000-0000 1.0 kg payload	<i>i</i> APM4330-0000-0000 1.5 kg payload	APM4330-0001-0000 1.0 kg payload, stainless steel <i>i</i>
	APM4550-0000-0000 4.2 kg payload	APM4230-0000-0000 0.8 kg payload	<i>i</i> APM4350-0000-0000 3.0 kg payload	<i>i</i>
Tile	APS4322-0000-0000 4 active areas			
Accessories	APM9001-0000-4xxx ID bumper, 90-degree mover rotation			
Starter kits	APS9000 6 (2 x 3) APS4322 planar motor tiles, 2 APM4330 movers, Industrial PC, software, pre-installed, ready for operation	APS9001 12 (4 x 3) APS4322 planar motor tiles, 4 APM4330 movers, Industrial PC, software, pre-installed, ready for operation		

We reserve the right to make technical changes.

**BECKHOFF** New Automation Technology

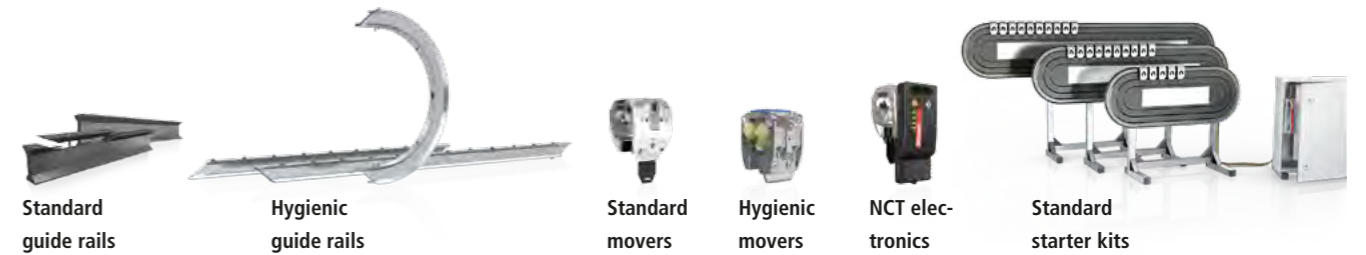
# XTS | Linear product transport

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



Standard motor modules

Hygienic motor modules



Standard guide rails

Hygienic guide rails

Standard movers

Hygienic movers

NCT electronics

Standard starter kits

XTS   Motor modules		
Design form	XTS Standard	XTS Hygienic
Straight	<b>AT2000</b> straight, without infeed	<b>ATH2000</b> straight, without infeed
	<b>AT2001</b> straight, with connection cables for infeed	<b>ATH2001</b> straight, with infeed
	<b>AT2002</b> straight, with plug connector for infeed	<b>ATH2002</b> straight, with angled infeed
	<b>AT2100</b> straight, without infeed, with integrated NCT functionality	<b>i</b>
	<b>AT2102</b> straight, with plug connector for infeed, with integrated NCT functionality	<b>i</b>
22.5° curved segment (Ø 1273 mm)	<b>AT2020</b> 22.5° curved segment, without infeed	
	<b>AT2021</b> 22.5° curved segment, with connection cables for infeed	
-22.5° curved segment (Ø 1273 mm)	<b>AT2025</b> -22.5° curved segment, without infeed	
	<b>AT2026</b> -22.5° curved segment, with connection cables for infeed	
45° curved segment (Ø 637 mm)	<b>AT2040</b> 45° curved segment, without infeed	<b>ATH2040</b> 45° curved segment, without infeed
	<b>AT2041</b> 45° curved segment, with connection cables for infeed	<b>ATH2041</b> 45° curved segment, with straight infeed
		<b>ATH2042</b> 45° curved segment, with angled infeed
180° curved segment (clothoid)	<b>AT2050</b> 180° curved segment, without infeed	<b>ATH2050</b> 180° curved segment, without infeed
		<b>ATH2051</b> 180° curved segment, with straight infeed

XTS   Guide rails		
Design form	XTS Standard	XTS Hygienic
Straight	<b>AT9000</b> straight, without lock	<b>ATH9000</b> straight, without lock
	<b>AT9100</b> straight, with lock	<b>ATH9100</b> straight, with lock
45° curved segment (Ø 637 mm)	<b>AT9040</b> 45° curved segment, without lock	
	<b>AT9050</b> 180° curved segment, without lock	<b>ATH9050</b> 180° curved segment
180° curved segment (clothoid)		<b>ATH9200</b> straight, connector

XTS   Movers		
Material	XTS Standard	XTS Hygienic
Aluminum	<b>AT9011</b> mover, length 70 mm	<b>AT9014</b> mover, length 55 mm or 70 mm, spring-loaded
	<b>AT9001</b> magnetic plate sets	<b>ATH9013</b> mover, length 75 mm
Stainless steel		<b>ATH9011</b> mover, length 75 mm
		<b>ATH9001</b> magnetic plate sets

XTS   NCT electronics			
	Version		
Basic electronics	<b>AT8200-1000-0100</b> with housing, without mover	<b>AT8300-1100-0100</b> with housing, mounted on AT9014-1070-0550 mover	<b>AT8300-1200-0100</b> with housing, mounted on AT9014-1070-1550 mover (mover 1)

XTS   Starter kits			
	Mover 55 mm length	Mover 70 mm length	With NCT functionality
Small	AT2000-0500-0055	AT2000-0500-0170	AT2100-0011-0001
Medium	AT2000-1000-0055	AT2000-1000-0170	AT2100-0012-0001
Large	AT2000-1500-0055	AT2000-1500-0170	AT2100-0032-0001



# 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](http://www.beckhoff.com/automation)



## TwinCAT 3 98

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

## Efficient engineering

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

## High performance

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

## Connectivity

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

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

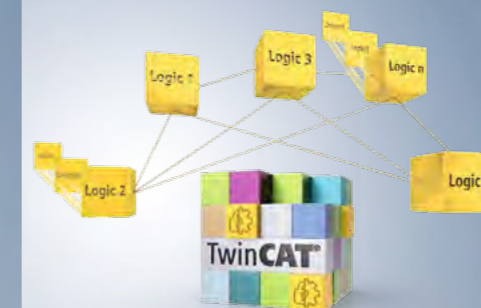
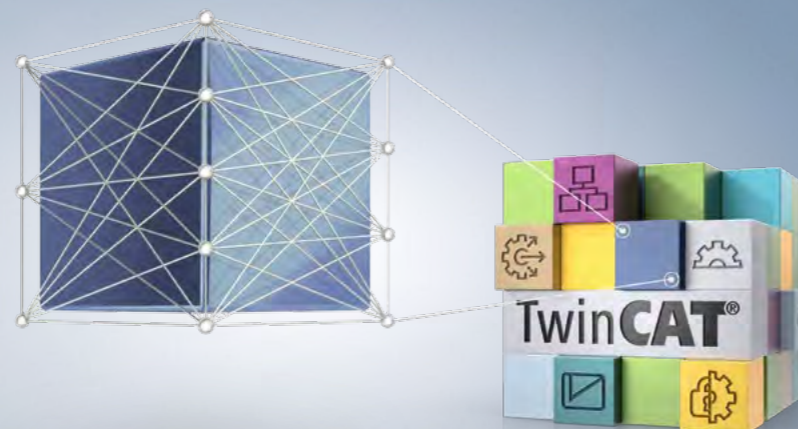
## TwinCAT 2 106

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

## TwinSAFE 110

- integrated safety system from I/Os to drives
- compact safety PLC
- certified for solutions up to IEC 61508 SIL 3 and DIN EN ISO 13849-1:2008 PL e
- safety engineering integrated into TwinCAT 3

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



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

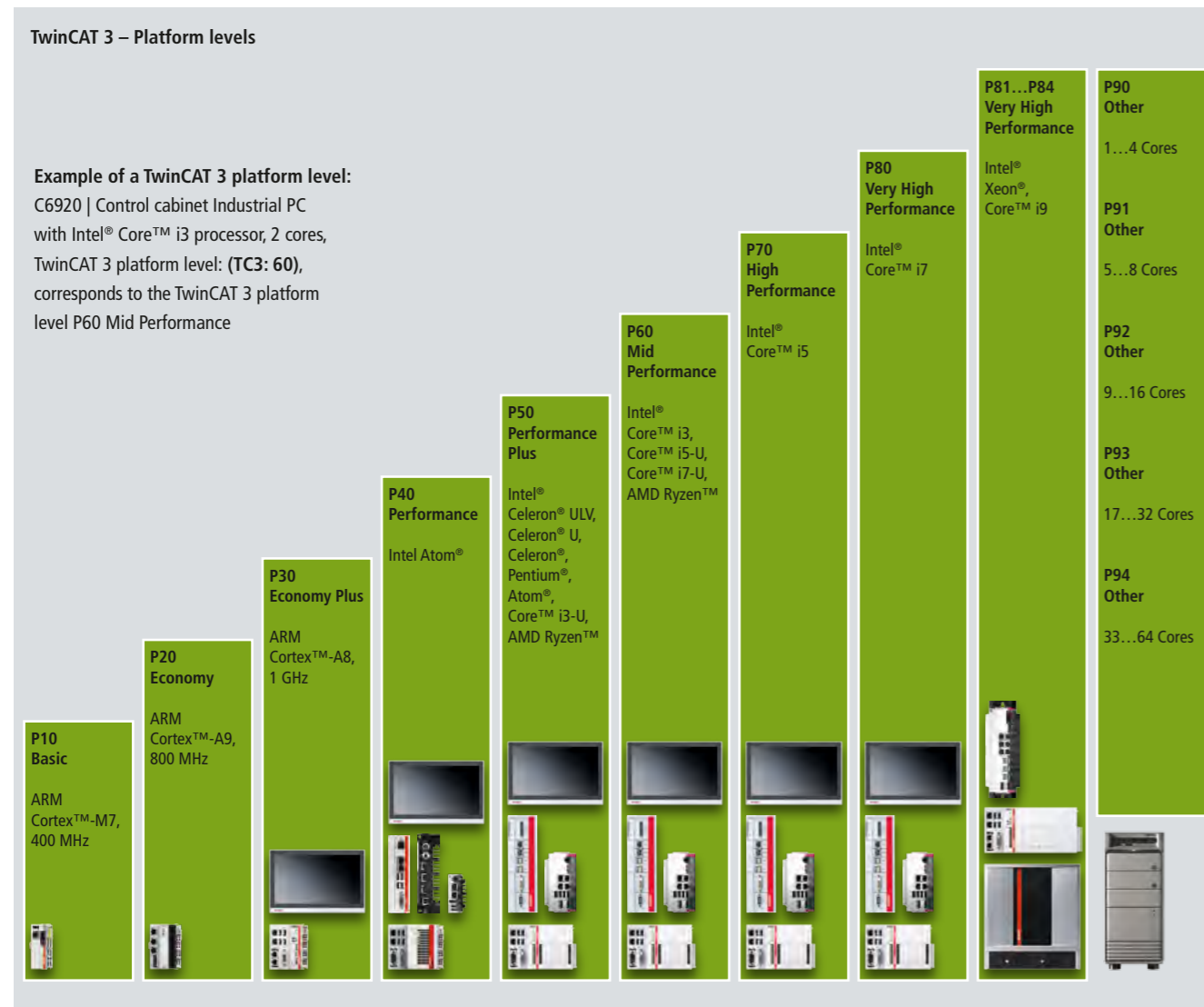
# TwinCAT 3

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

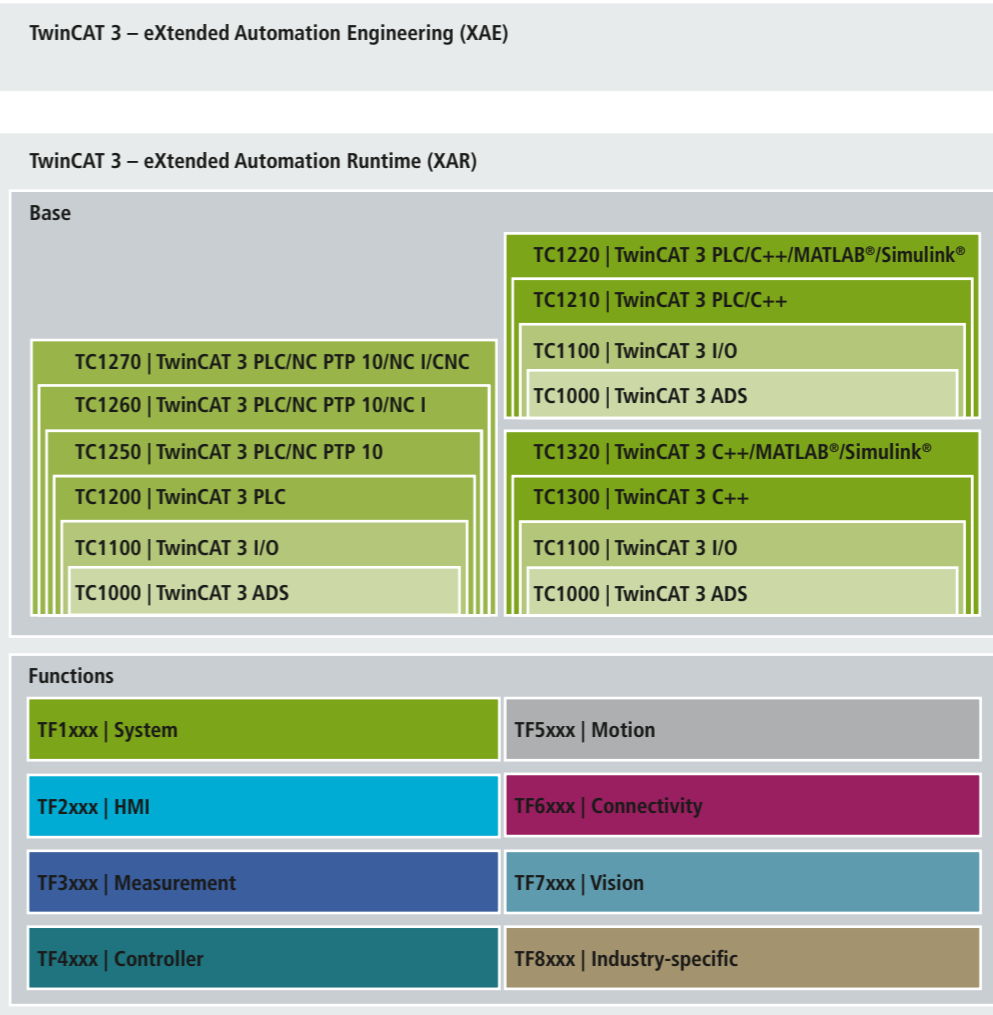
The TwinCAT 3 runtime components are available for different platform levels.

The platform levels correspond to the various TwinCAT 3 platform levels of the Beckhoff PCs. The TwinCAT 3 platform level of a Beckhoff PC depends on the configuration and the technical data of the PC (including the processor).

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



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



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

TExxxx   TwinCAT 3, Engineering		
TwinCAT 3 Engineering	TE1000	TwinCAT 3 engineering environment
TwinCAT 3 Realtime Monitor	TE1010	tool for precise diagnostics and optimization of the runtime behavior of tasks in the TwinCAT 3 runtime
TwinCAT 3 Documentation Generation	TE1030	tool for simplified creation of documentation from the current PLC code of the machine via specific markups <i>i</i>
TwinCAT 3 EtherCAT Simulation	TE1111	easy configurations of simulation environments with several EtherCAT slaves
TwinCAT 3 XCAD Interface	TE1120	interface between ECAD tools and TwinCAT 3
TwinCAT 3 CAD Simulation Interface	TE1130	link between TwinCAT and a 3D CAD system for SiL simulation <i>i</i>
TwinCAT 3 PLC Static Analysis	TE1200	analysis tool that tests PLC software on the basis of coding rules
TwinCAT 3 PLC Profiler	TE1210	analyzes the runtime characteristics of a PLC project and identifies time-intensive call-ups and program sections <i>i</i>
TwinCAT 3 Scope View Professional	TE1300	software oscilloscope for the graphical display of data captured from several target systems
TwinCAT 3 Filter Designer	TE1310	graphical engineering tool for determining coefficients of digital filters
TwinCAT 3 Target for Simulink®	TE1400	TwinCAT target for Simulink® for generating TwinCAT 3 modules
TwinCAT 3 Target for MATLAB®	TE1401	TwinCAT target for MATLAB® for generating TwinCAT 3 modules
TwinCAT 3 Interface for MATLAB®/Simulink®	TE1410	communication interface between MATLAB®/Simulink® and the TwinCAT 3 runtime
TwinCAT 3 Target for FMI	TE1420	interface for simulation tools that support the Functional Mockup Interface (FMI)
TwinCAT 3 Valve Diagram Editor	TE1500	graphical tool for designing the characteristic curve of a hydraulic valve
TwinCAT 3 Cam Design Tool	TE1510	graphic design tool for electronic cam plates
TwinCAT 3 EAP Configurator	TE1610	tool for visualizing and configuring communication networks, in which data exchange based on the EtherCAT Automation Protocol (EAP) takes place
TwinCAT 3 HMI Engineering	TE2000	tool for developing platform-independent user interfaces
TwinCAT 3 Analytics Workbench	TE3500	engineering tool for creating continuous data analysis of machines and plants with automatic code and dashboard generation
TwinCAT 3 Analytics Service Tool	TE3520	tool for process data analysis, ideal for commissioning and service technicians
TwinCAT 3 Motion Designer	TE5910	TwinCAT 3 Motion Designer for drive dimensioning
TwinCAT 3 Cogging Compensation for linear motors	TE5920	engineering environment for AL8000 linear motors, to reduce cogging forces <i>i</i>
TwinCAT 3 Drive Manager 2	TE5950	TwinCAT 3 Drive Manager 2 for commissioning the AX8000 multi-axis servo system, AX5000 digital compact servo drive, AMP8000 distributed servo drive system, AMI8100 integrated servo drives or the I/O components EL72xx, EL74xx, EL70x7, ELM72xx, EP72xx and EJ72xx

TC1xxx   TwinCAT 3, Base		
TwinCAT 3 ADS	TC1000	The Automation Device Specification (ADS) is the communication protocol of TwinCAT. It enables the data exchange and the control of TwinCAT systems. ADS is media-independent and can communicate via serial or network connections.
TwinCAT 3 I/O	TC1100	Using TwinCAT I/O, cyclic data can be collected by different fieldbuses in process images. Cyclic tasks drive the corresponding fieldbuses. Various fieldbuses can be operated with different cycle times on one CPU. Applications can directly access the process image. The fieldbuses and the process images are configured in TwinCAT Engineering.
TwinCAT 3 PLC	TC1200	TwinCAT PLC realizes one or more PLCs on an Industrial PC. The international standard IEC 61131-3 3 <sup>rd</sup> is used to program the PLC; all programming languages described in this standard are supported. Various convenient debugging options facilitate troubleshooting and commissioning. Program modifications can be carried out at any times and in any size on-line, i.e. when the PLC is running.
TwinCAT 3 PLC/C++	TC1210	Based on the TwinCAT PLC TC1200, TC1210 offers the additional option of using C++ modules in the runtime parallel to the PLC through TC1300 TwinCAT 3 C++.

TC1xxx   TwinCAT 3, Base		
TwinCAT 3 PLC/C++/MATLAB®/Simulink®	TC1220	MATLAB® and Simulink® are established development environments in science and industry. Using the TE140x products from Beckhoff and the MATLAB Coder™ or the Simulink Coder™ from MathWorks, TwinCAT 3 runtime modules (TcCOM objects and PLC function blocks) can be created from MATLAB® and Simulink®. TC1220 is an extension of TC1210 with the possibility to execute these modules.
TwinCAT 3 PLC/NC PTP 10	TC1250	Extension of the TwinCAT PLC TC1200 by the possibility to realize point-to-point movements in software (TwinCAT Motion Control PTP 10). The axes are represented by axis objects and provide a cyclic interface, e.g. for the PLC. This axis object is then linked to a corresponding physical axis.
TwinCAT 3 PLC/NC PTP 10/NC I	TC1260	Extension of the TwinCAT PLC/NC PTP 10 by the possibility to interpolate movements with up to three path axes and up to five auxiliary axes. Various axis types with various fieldbus interfaces are supported. The movement is usually programmed in DIN 66025, but it can also alternatively be carried out via PLC function blocks.
TwinCAT 3 PLC/NC PTP 10/NC I/CNC	TC1270	Extension of the TwinCAT PLC/NC PTP 10/NC I by the possibility to realize an interpolation with up to 32 simultaneously interpolating axes. The number of axes and/or the number of channels can be adapted to the requirements of the application via the option packages. Various transformations can be supplemented via option packages.
TwinCAT 3 PLC/NC PTP 10/NC I/CNC E	TC1275	TwinCAT CNC export version (E version) is an extension of the TwinCAT PLC/NC PTP 10 by the possibility to realize an interpolation with up to 4 simultaneously interpolating axes. The number of axes and/or the number of channels can be adapted to the requirements of the application via the option packages. Various transformations can be supplemented via option packages.
TwinCAT 3 C++	TC1300	TwinCAT C++ implements a real-time execution of C++ code on an Industrial PC. For programming, the widely used programming language C++ is supported, which is connected to the real-time via the TwinCAT SDK and CRT. Extensive debugging interfaces are supported by Visual Studio® and also supplemented by representations typical of real-time.
TwinCAT 3 C++/MATLAB®/Simulink®	TC1320	MATLAB® and Simulink® are established development environments in science and industry. Using the TE140x products from Beckhoff and the MATLAB Coder™ or the Simulink Coder™ from MathWorks, TwinCAT 3 runtime modules (TcCOM objects and PLC function blocks) can be created from MATLAB® and Simulink®. TC1320 is an extension of TC1300 with the possibility to execute these modules.
TwinCAT 3 Usermode Runtime	TC1700	The TwinCAT 3 Usermode Runtime provides a way to run the applications programmed in TwinCAT without real-time properties in the user mode of the operating system. The TwinCAT 3 Usermode Runtime can be used free of license costs purely for engineering purposes and only requires (trial) licenses of the TwinCAT products used. <i>i</i>
TwinCAT 3 Usermode Runtime: External Control	TC1701	The TwinCAT Usermode runtime provides a way to run the applications programmed in TwinCAT without real-time properties in the user mode of the operating system. The "External Control" option provides an interface that runs the application, clocked by an external application. Synchronization with other programs can be achieved with this option. <i>i</i>
TwinCAT 3 Usermode Runtime: Fast As Possible	TC1702	The TwinCAT Usermode runtime provides a way to run the applications programmed in TwinCAT without real-time properties in the user mode of the operating system. The "Fast As Possible" option provides an interface that runs the application as fast as the hardware allows. A simulation of calculated results of an application can be realized with this option. <i>i</i>

TF1xxx   TwinCAT 3, Functions, System		
TwinCAT 3 Controller Redundancy	TF1100	provides an extension to enable redundant processing of TwinCAT 3 PLC programs in two run-time environments and increases the availability of the entire system in the process <i>i</i>
TwinCAT 3 Runtime for MATLAB®/Simulink®	TF1400	execution of runtime modules in TwinCAT 3 generated from MATLAB®/Simulink®
TwinCAT 3 Runtime for FMI	TF1420	enables the execution of TwinCAT 3 runtime modules generated via the TE1420 simulation tools interface
TwinCAT 3 PLC HMI	TF1800	stand-alone tool for displaying visualizations from the PLC development environment
TwinCAT 3 PLC HMI Web	TF1810	display of visualizations from the PLC development environment in a web browser
TwinCAT 3 UML	TF1910	UML (Unified Modeling Language) for modeling of PLC software

## TF2xxx | TwinCAT 3, Functions, HMI

<b>TwinCAT 3 HMI Server</b>	TF2000	modular web server, includes a client connection and a target connection
<b>TwinCAT 3 HMI Clients Packs</b>	TF20x0	optional extension of the TwinCAT 3 HMI Server with up to 100 additional client connections
<b>TwinCAT 3 HMI Targets Packs</b>	TF20xx	optional extension of the TwinCAT 3 HMI Server with up to 100 additional control systems
<b>TwinCAT 3 HMI OPC UA</b>	TF2110	server extension for access to TwinCAT target systems or other controllers via OPC UA
<b>TwinCAT 3 HMI Extension SDK</b>	TF2200	software development kit (C++/.NET) for programming application-specific solutions
<b>TwinCAT 3 HMI Scope</b>	TF2300	software oscilloscope for graphic display of time sequences

## TF3xxx | TwinCAT 3, Functions, Measurement

<b>TwinCAT 3 Scope Server</b>	TF3300	data recording and preparation for visual display in TwinCAT 3 Scope View
<b>TwinCAT 3 Analytics Logger</b>	TF3500	analytics logger for cycle-synchronous data recording, storage and sending via MQTT to a message broker
<b>TwinCAT 3 Analytics Library</b>	TF3510	PLC library with analysis algorithms from simple edge counters and extreme value calculations to more complex correlation methods and unsupervised clustering algorithms
<b>TwinCAT 3 Analytics Storage Provider</b>	TF3520	IoT client as part of the Analytics workflow: Raw and analytic data can be received and stored in a storage; access for all Analytics tools.
<b>TwinCAT 3 Analytics Runtime</b>	TF3550	container running the Analytics application configured and developed in Analytics Workbench; including HMI server and client pack for Analytics dashboards
<b>TwinCAT 3 Analytics Runtime Base</b>	TF3551	container running the Analytics application configured and developed in Analytics Workbench; without HMI; ideal for headless applications or existing visualizations
<b>TwinCAT 3 Analytics Controller Packs</b>	TF356x	extension of the TwinCAT 3 Analytics Workbench for the analysis of up to 128 additional controllers
<b>TwinCAT 3 Condition Monitoring</b>	TF3600	PLC library for the realization of a condition monitoring for a machine with algorithms like magnitude spectrum, envelope, kurtosis, order analysis or zoom FFT
<b>TwinCAT 3 Power Monitoring</b>	TF3650	PLC library for realization of power monitoring applications; algorithms for calculation of RMS values of current, voltage and power as well as THD fit to EL3773 and EL3783
<b>TwinCAT 3 Filter</b>	TF3680	PLC library for implementing digital filters
<b>TwinCAT 3 Interface for LabVIEW™</b>	TF3710	enables the exchange of data between LabVIEW™ and the TwinCAT runtime
<b>TwinCAT 3 Machine Learning Inference Engine</b>	TF3800	execution module of trained classical machine learning algorithms
<b>TwinCAT 3 Neural Network Inference Engine</b>	TF3810	execution module of trained neural networks
<b>TwinCAT 3 Machine Learning Server</b>	TF3820	inference engine for trained machine learning and deep learning models with support for hardware accelerators
<b>TwinCAT 3 Solar Position Algorithm</b>	TF3900	precise calculation of the sun's position

## TF4xxx | TwinCAT 3, Functions, Controller

<b>TwinCAT 3 Controller Toolbox</b>	TF4100	basic controllers (P, I, D), complex controllers (PI, PID), pulse width modulation, ramps, signal generators and filters
<b>TwinCAT 3 Temperature Controller</b>	TF4110	temperature control for monitoring and controlling different temperature ranges
<b>TwinCAT 3 Speech</b>	TF4500	TwinCAT 3 Speech enables multilingual input and output of queries and information implemented in an industrially compatible way

## TF5xxx | TwinCAT 3, Functions, Motion

<b>TwinCAT 3 NC PTP 10 Axes</b>	TF5000	TwinCAT 3 NC PTP enables point-to-point movements to be implemented in software; the axes are represented by axis objects and provide a cyclic interface for e.g. the PLC, the axis object is then linked to a corresponding physical axis
<b>TwinCAT 3 NC PTP Axes Pack 25</b>	TF5010	extension of TwinCAT 3 NC PTP to a maximum of 25 axes
<b>TwinCAT 3 NC PTP Axes Pack unlimited</b>	TF5020	extension of TwinCAT 3 NC PTP to 255 axes
<b>TwinCAT 3 NC Camming</b>	TF5050	TwinCAT 3 NC Camming (cam plates) enables the modeling of a non-linear relationship between master and slave axes
<b>TwinCAT 3 NC Flying Saw</b>	TF5055	TwinCAT 3 NC Flying Saw enables the coupling of a slave axis to a master axis in a specific synchronous position (flying saw)
<b>TwinCAT 3 NC FIFO Axes</b>	TF5060	TwinCAT 3 NC FIFO Axes enables the output of externally generated position setpoints to an axis group
<b>TwinCAT 3 Motion Control XFC</b>	TF5065	TwinCAT 3 Motion Control XFC enables time-accurate acquisition and switching of digital signals related to axis positions in conjunction with EtherCAT XFC terminals
<b>TwinCAT 3 NC I</b>	TF5100	TwinCAT 3 NC I enables interpolating path movements with three path axes and up to five auxiliary axes, whereby master/slave couplings can also be formed
<b>TwinCAT 3 Kinematic Transformation L1</b>	TF5110	TwinCAT 3 Kinematic Transformation L1 enables the control of various robot kinematics at level 1
<b>TwinCAT 3 Kinematic Transformation L2</b>	TF5111	TwinCAT 3 Kinematic Transformation L2 enables the control of various robot kinematics at level 2
<b>TwinCAT 3 Kinematic Transformation L3</b>	TF5112	TwinCAT 3 Kinematic Transformation L3 enables the control of various robot kinematics at level 3
<b>TwinCAT 3 Kinematic Transformation L4</b>	TF5113	TwinCAT 3 Kinematic Transformation L4 enables the control of various robot kinematics at level 4
<b>TwinCAT 3 Robotics mxAutomation</b>	TF5120	TwinCAT 3 Robotics mxAutomation allows direct communication between the PLC and a KUKA robot control via a common interface
<b>TwinCAT 3 Robotics uniVAL PLC</b>	TF5130	TwinCAT 3 Robotics uniVAL PLC allows direct communication between the PLC and a Stäubli robot control via a common interface
<b>TwinCAT 3 CNC</b>	TF5200	CNC path control software
<b>TwinCAT 3 CNC E</b>	TF5210	CNC path control software export version
<b>TwinCAT 3 CNC Axes Pack</b>	TF5220	extension to up to a total of 64 axes/controlled spindles, of which a maximum of 32 can be path axes and a maximum of 12 can be controlled spindles
<b>TwinCAT 3 CNC Measurement</b>	TF5225	optional package of CNC cycles that supports the measurement of tools or workpieces directly on the machine
<b>TwinCAT 3 CNC Channel Pack</b>	TF5230	further CNC channel, extension to a maximum of 12 channels, channel synchronization, axis transfer between channels
<b>TwinCAT 3 CNC Transformation</b>	TF5240	transformation functionality (5-axis functionality)
<b>TwinCAT 3 CNC Kinematic Optimization</b>	TF5245	optional CNC package that optimizes the determination of kinematic parameters for rotary axes in 5-axis kinematics
<b>TwinCAT 3 CNC HSC Pack</b>	TF5250	extending the CNC with HSC technology (high-speed cutting)
<b>TwinCAT 3 CNC Spline Interpolation</b>	TF5260	path programming via splines with programmable spline type, Akima-spline, B-spline
<b>TwinCAT 3 CNC Realtime Cycles</b>	TF5261	allows concurrent execution of G code in the interpolation cycle of the TwinCAT CNC
<b>TwinCAT 3 CNC Virtual NCK Basis</b>	TF5270	virtual TwinCAT CNC for simulation in a Windows environment
<b>TwinCAT 3 CNC Virtual NCK Options</b>	TF5271	virtual TwinCAT CNC for simulation in a Windows environment
<b>TwinCAT 3 CNC Volumetric Compensation</b>	TF5280	allows compensation of geometric machine errors according to DIN ISO 230 or ISO/TR 16907
<b>TwinCAT 3 CNC Cutting Plus</b>	TF5290	technology package for extending the CNC functionality for cutting operations
<b>TwinCAT 3 Motion Collision Avoidance</b>	TF5410	TwinCAT 3 Motion Collision Avoidance enables collision avoidance when operating multiple axes with TwinCAT 3 NC PTP in linear and/or translational dependency
<b>TwinCAT 3 Motion Pick-and-Place</b>	TF5420	TwinCAT 3 Motion Pick-and-Place enables the implementation of handling tasks by gantry robots or other kinematics

TF5xxx   TwinCAT 3, Functions, Motion		
TwinCAT 3 Hydraulic Positioning	TF5810	manufacturer-independent control of hydraulic axes and replacement of external controllers; support of a wide variety of applications and different axis control concepts; number of axes depends only on the performance of the PC
TwinCAT 3 XTS Extension	TF5850	TwinCAT 3 XTS Extension enables the individual movement of XTS movers along a specific path; basic software package for the use and integration of XTS into the TwinCAT 3 environment; further use of the extensive possibilities of TwinCAT and XTS
TwinCAT 3 XPlanar	TF5890	TwinCAT 3 XPlanar enables free movement of XPlanar movers on freely arranged XPlanar tiles; basic software package for integration of the XPlanar system into the TwinCAT 3 environment; access to further extensive TwinCAT functions
TwinCAT 3 Planar Motion	TF5430	TwinCAT 3 Planar Motion enables efficient and intelligent implementation of individual XPlanar applications and is a component of TF5890 TwinCAT 3 XPlanar
TwinCAT 3 Cogging Compensation Runtime	TF5920	runtime for AL8000 linear motors, to reduce cogging forces <a href="#">i</a>

TF6xxx   TwinCAT 3, Functions, Connectivity		
TwinCAT 3 ADS Monitor	TF6010	recording and diagnostics functions for the communication of TwinCAT systems
TwinCAT 3 JSON Data Interface	TF6020	interface for the exchange of data in JSON format between the TwinCAT system and custom applications
TwinCAT 3 OPC UA	TF6100	access to TwinCAT in accordance with OPC UA with UA server (DA/HA/AC) and UA client (DA)
TwinCAT 3 OPC UA Pub/Sub	TF6105	protocol implementation for OPC UA Pub/Sub (UDP and MQTT) <a href="#">i</a>
TwinCAT 3 EtherCAT Redundancy 250	TF6220	extension of the TwinCAT EtherCAT master with cable redundancy capability for up to 250 slaves
TwinCAT 3 EtherCAT Redundancy 250+	TF6221	extension of the TwinCAT EtherCAT master with cable redundancy capability for more than 250 slaves
TwinCAT 3 EtherCAT External Sync	TF6225	extension of the TwinCAT EtherCAT master with an option to synchronize the Beckhoff real-time communication with external signals
TwinCAT 3 Parallel Redundancy Protocol (PRP)	TF6230	TwinCAT Parallel Redundancy Protocol (PRP) provides a redundant network communication according to IEC 62439-3. It offers a transparent Ethernet connection via two separate networks. The diagnostics information is provided in TwinCAT. <a href="#">i</a>
TwinCAT 3 Modbus TCP	TF6250	communication with Modbus TCP devices (server and client functionality)
TwinCAT 3 Modbus RTU	TF6255	serial communication with Modbus end devices
TwinCAT 3 PROFINET RT Device	TF6270	communication via PROFINET (PROFINET slave)
TwinCAT 3 PROFINET RT Controller	TF6271	communication via PROFINET (PROFINET master)
TwinCAT 3 EtherNet/IP Adapter	TF6280	communication via EtherNet/IP (EtherNet/IP adapter)
TwinCAT 3 EtherNet/IP Scanner	TF6281	communication via EtherNet/IP (EtherNet/IP scanner)
TwinCAT 3 FTP Client	TF6300	easy access from TwinCAT PLC to FTP server
TwinCAT 3 TCP/IP	TF6310	communication via generic TCP/IP server
TwinCAT 3 TCP/UDP Realtime	TF6311	TwinCAT 3 TCP/UDP Realtime enables fast and convenient access from real-time to an Ethernet network
TwinCAT 3 Serial Communication	TF6340	communication via serial Bus Terminals or PC COM ports with the 3964R and RK512 protocol
TwinCAT 3 SMS/SMTP	TF6350	sending SMS and e-mails from the PLC
TwinCAT 3 Virtual Serial COM	TF6360	virtual serial COM driver for Windows platforms
TwinCAT 3 Database Server	TF6420	interface for communication with various database systems from Microsoft SQL to MySQL and SQLite to MongoDB or InfluxDB
TwinCAT 3 XML Server	TF6421	read and write access to XML files from the PLC
TwinCAT 3 IEC 60870-5-10x	TF6500	communication according to IEC 60870-101 (master and slave), -102 (master), -103 (master), -104 (master and slave)
TwinCAT 3 IEC 61850/IEC 61400-25	TF6510	communication according to IEC 61850 and IEC 61400-25 in the versions client and server, as well as via GOOSE as publisher and subscriber
TwinCAT 3 RFID Reader Communication	TF6600	connection of RFID readers to the TwinCAT PLC
TwinCAT 3 S7 Communication	TF6620	enables TCP/IP based communication with variables of a Siemens S7 controller

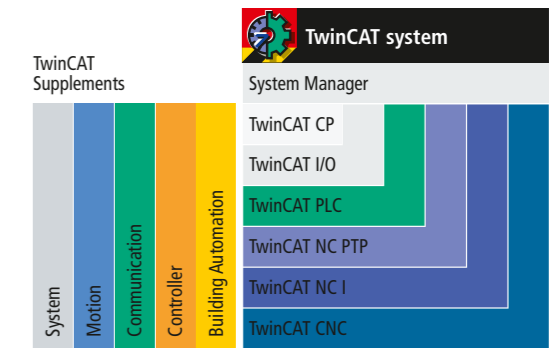
TF6xxx   TwinCAT 3, Functions, Connectivity		
TwinCAT 3 DBC File Import for CAN	TF6650	reading of DBC file formats
TwinCAT 3 FDT ComDTM	TF6680	With the TwinCAT 3 FDT ComDTM, the FDT/DTM technology can be used with Beckhoff components in third-party systems. For this purpose, the ComDTM establishes the connection between the FDT frame application and the target system, e.g. a TwinCAT-based controller. This allows the configuration of the connected field devices via their device-specific DTMs.
TwinCAT 3 IoT Communication (MQTT)	TF6701	provides basic publisher/subscriber-based data connectivity via MQTT
TwinCAT 3 IoT Functions	TF6710	provides connectivity for cloud-based communication services
TwinCAT 3 IoT Data Agent	TF6720	gateway application for data connectivity between TwinCAT runtime and IoT services
TwinCAT 3 IoT Communicator	TF6730	sends process data and notifications from TwinCAT to smartphones and tablets through a messaging service
TwinCAT 3 IoT Communicator App	TF6735	smartphone and tablet app to receive and visualize live data and push notifications sent from TwinCAT
TwinCAT 3 IoT HTTPS/REST	TF6760	basic functions for HTTP/HTTPS communication in the form of a PLC library providing the ability to address REST APIs as a client
TwinCAT 3 IoT WebSockets	TF6770	basic functions for WebSockets communication as server and client <a href="#">i</a>
TwinCAT 3 IoT OCPP	TF6771	basic functions for communication with charging stations for electric vehicles and higher-level management systems <a href="#">i</a>

TF7xxx   TwinCAT 3, Functions, Vision		
TwinCAT 3 GigE Vision Connector	TF700x	interface for the configuration and integration of GigE Vision cameras directly into TwinCAT
TwinCAT 3 Vision Base	TF7100	extensive PLC library with a large number of different functions and algorithms for solving image processing tasks in TwinCAT real-time
TwinCAT 3 Vision Matching 2D	TF7200	extension of the basic package with the possibility to find and compare objects based on taught-in references, contours, feature points or other properties
TwinCAT 3 Vision Code Reading	TF7250	extension of the basic package with functions for reading various 1D and 2D codes
TwinCAT 3 Vision Metrology 2D	TF7300	extension of the basic package with a variety of functions: calibration, subpixel-accurate detection of edges, holes and circular arcs, determination of lengths, distances, diameters, angles and coordinates

TF8xxx   TwinCAT 3, Functions, Industry-specific		
TwinCAT 3 HVAC	TF8000	library covering all technical systems in building automation
TwinCAT 3 Building Automation Basic	TF8010	software library with basic functions for room automation: lighting (constant light control, touch dimmer, sequencer, ...), facade control, scaling functions, filter modules (PT1 and PT2 filters), timer functions, maximum guard for energy optimization
TwinCAT 3 BACnet	TF8020	communication with data networks of building automation and building control systems
TwinCAT 3 Building Automation	TF8040	PLC library for the automation of heating, ventilation and air conditioning technology, as well as the automation of rooms with the functions of sun protection and lighting
TwinCAT 3 Lighting Solution	TF8050	TwinCAT 3 lighting solution: software package for easy commissioning of DALI-2 lighting controllers
TwinCAT 3 Wind Framework	TF8310	framework for the development of operational management software for wind turbines
TwinCAT 3 MTP Runtime	TF8400	implementation of directive-compliant MTP interfaces in plant modules <a href="#">i</a>
TwinCAT 3 MTP Engineering	TF8401	engineering environment for specifying properties and services of a software-based plant module and for defining the dependencies <a href="#">i</a>
TwinCAT 3 Plastic Processing Framework	TF8540	software library with temperature controller especially for plastics machines
TwinCAT 3 Plastic HMI Framework	TF8550	assembly of HMI elements for plastics machinery in NuGet packages
TwinCAT 3 Plastic Technology Functions	TF8560	technology package including abstracting motion control level for plastics machinery based on PLCopen standard
TwinCAT 3 AE570 (OCA)	TF8810	communication library for operating a system as an OCA (Open Control Architecture) controller in an OCA network

# TwinCAT 2

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



## TX1000 | TwinCAT 2, TwinCAT CP

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

Windows driver for Beckhoff Control Panel

## TX1100 | TwinCAT 2, TwinCAT I/O

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

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

## TX1200 | TwinCAT 2, TwinCAT PLC

PC hardware	standard PC/IPC hardware, no extras
Operating systems	Windows 7/10, Windows CE*
Real-time	Beckhoff real-time kernel
I/O system	EtherCAT, Lightbus, PROFIBUS DP/MC, Interbus, CANopen, DeviceNet, SERCOS, Ethernet
Runtime system	4 multi-tasking PLCs each with 4 tasks in each PLC runtime system, development and runtime systems on one PC or separately (CE: only runtime)
Memory	process image size, flags area, program size, POU size, number of variables only limited by the size of the user memory (max. 2 GB with NT/2000/XP/Vista)
Cycle time	adjustable from 50 µs
Link time	1 µs (Intel® Core™ 2 Duo)
Programming	IEC 61131-3: IL, FBD, LD, SFC, ST, CFC, powerful library management

## TX1250 | TwinCAT 2, TwinCAT NC PTP

TwinCAT PLC	inclusive
PC hardware	standard PC/IPC hardware, no extras
Operating systems	Windows 7/10, Windows CE*
Real-time	Beckhoff real-time kernel
I/O system	EtherCAT, Lightbus, PROFIBUS DP/MC, Interbus, CANopen, DeviceNet, SERCOS, Ethernet
Programming	performed using function blocks for TwinCAT PLC according to IEC 61131-3 (standardized PLCopen motion control libraries), convenient axis commissioning menus in the System Manager
Runtime system	NC point-to-point including TwinCAT PLC
Number of axes	up to 255
Axis types	electrical and hydraulic servo drives, frequency converter drives, stepper motor drives, switched drives (fast/crawl axes)
Cycle time	50 µs upwards, typically 1 ms (selectable)
Axis functions	standard axis functions: start/stop/reset/reference, velocity override, special functions: master/slave cascading, cam plates, electronic gearings, online distance compensation of segments, flying saw

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

## TX1260 | TwinCAT 2, TwinCAT NC I

TwinCAT PLC	inclusive
TwinCAT NC PTP	inclusive
PC hardware	standard PC/IPC hardware, no extras
Operating systems	Windows 7/10, Windows CE*
Real-time	Beckhoff real-time kernel
I/O system	EtherCAT, Lightbus, PROFIBUS DP/MC, Interbus, CANopen, DeviceNet, SERCOS, Ethernet
Programming	DIN 66025 programs for NC interpolation, access via function blocks from TwinCAT PLC according to IEC 61131-3
Runtime system	NC interpolation, including TwinCAT NC PTP and PLC
Number of axes	max. 3 axes and up to 5 auxiliary axes per group, 1 group per channel, max. 31 channels
Axis types	electrical servo axes, stepper motor drives
Interpreter functions	subroutines and jumps, programmable loops, zershifts, tool compensations, M and H functions
Geometries	straight lines and circular paths in 3D space, circular paths in all main planes, helixes with base circles in all main planes linear, circular, helical interpolation in the main lanes and freely definable planes, Bezier splines, look-ahead function
Axis functions	online reconfiguration of axes in groups, path override, slave coupling to path axes, auxiliary axes, axis error and sag compensation, measuring functions
Operation	automatic operation, manual operation (jog/inching), single block operation, referencing, handwheel operation (motion/superposition)
Options	TSS11x TwinCAT Kinematic Transformation

## TX1270 | TwinCAT 2, TwinCAT CNC

TwinCAT PLC	inclusive
TwinCAT NC PTP	inclusive
TwinCAT NC I	inclusive
PC hardware	standard PC/IPC hardware, no extras
Operating systems	Windows 7/10*
Real-time	Beckhoff real-time kernel
I/O system	EtherCAT, Lightbus, PROFIBUS DP/MC, CANopen, DeviceNet, SERCOS, Ethernet
Programming	DIN 66025 programming language with high-level language extensions, access via function blocks from TwinCAT PLC according to IEC 61131-3
Runtime system	CNC, including TwinCAT NC I, NC PTP, PLC
Axes/spindles	8 path axes/controlled spindles, max. of 64 axes/controlled spindles (optional), max. 12 channels (optional)
Axis types	electrical servo-axes, analog/encoder interface via fieldbus, digital interface via fieldbus
Interpreter functions	subroutines and jumps, programmable loops, zero shifts, tool compensations, M and H functions, mathematical functions, programming of parameters/variables, user macros, spindle and help functions, tool functions
Geometries	linear, circular, helical interpolation in the main planes and freely definable planes, max. 32 interpolating path axes per channel, look-ahead function
Axis functions	coupling and gantry axis function, override, axis error and sag compensation, measuring functions
Operation	automatic operation, manual operation (jog/inching), single block operation, referencing, block search, handwheel operation (motion/superposition)
Options	TSS220 TwinCAT CNC Axes Pack TSS230 TwinCAT CNC Channel Pack TSS240 TwinCAT CNC Transformation TSS250 TwinCAT CNC HSC Pack TSS260 TwinCAT CNC Spline Interpolation

## TSxxxx | TwinCAT 2, Supplements, System

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

## TS4xxx | TwinCAT 2, Supplements, Controller

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

## TSxxxx | TwinCAT 2, Supplements, Motion

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

## TS6xxx | TwinCAT 2, Supplements, Communication

<b>TwinCAT OPC UA Server</b>	TS6100	access to TwinCAT in accordance with OPC UA with UA server (DA/HA/AC) and UA client (DA)
<b>TwinCAT Modbus TCP Server</b>	TS6250	communication with Modbus TCP devices (server and client functionality)
<b>TwinCAT PLC Modbus RTU</b>	TS6255	serial communication with Modbus end devices
<b>TwinCAT PROFINET RT Device</b>	TS6270	license for using the TwinCAT PROFINET RT Device
<b>TwinCAT PROFINET RT Controller</b>	TS6271	license for using the TwinCAT PROFINET RT Controller
<b>TwinCAT EtherNet/IP Adapter</b>	TS6280	TwinCAT EtherNet/IP Adapter turns every PC-based controller into an EtherNet/IP adapter.
<b>TwinCAT FTP Client</b>	TS6300	basic access from TwinCAT PLC to FTP server
<b>TwinCAT TCP/IP Server</b>	TS6310	communication via generic TCP servers
<b>TwinCAT PLC Serial Communication</b>	TS6340	communication via serial Bus Terminals or PC COM ports
<b>TwinCAT PLC Serial Communication 3964R/RK512</b>	TS6341	communication via serial Bus Terminals or PC COM ports with the 3964R and RK512 protocol
<b>TwinCAT SMS/SMTP Server</b>	TS6350	sending SMS and e-mails from the PLC
<b>TwinCAT Virtual Serial COM Driver</b>	TS6360	virtual serial COM driver for Windows and Windows CE platforms
<b>TwinCAT DriveTop Server</b>	TS6371	configuring Indramat SERCOS drives with DriveTop software on TwinCAT systems
<b>TwinCAT PLC IEC 60870-5-101, -102, -103, -104 Master</b>	TS650x	license for using a PLC library for the implementation of IEC 60870-5-10x masters
<b>TwinCAT PLC IEC 60870-5-101, -104 Slave</b>	TS650x	license for using a PLC library for the implementation of IEC 60870-5-10x slaves
<b>TwinCAT PLC IEC 61400-25 Server</b>	TS6509	IEC 61400-25 communication
<b>TwinCAT PLC IEC 61850 Server</b>	TS6511	IEC 61850 communication
<b>TwinCAT PLC RFID Reader Communication</b>	TS6600	connection of RFID readers to the TwinCAT PLC

## TS8xxx | TwinCAT 2, Supplements, Building Automation

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

# TwinSAFE

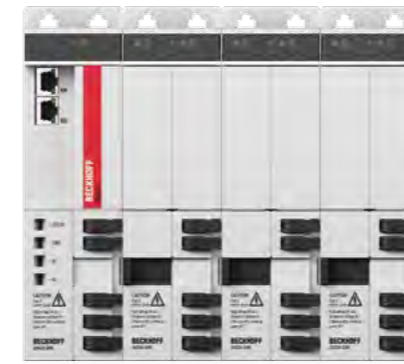
► [www.beckhoff.com/twinsafe](http://www.beckhoff.com/twinsafe)



EK1960



EJ1914



AX8000



AMI8000



AMP8x00



Software

## TwinSAFE hardware, I/O

	Input	Dedicated Logic	Output	Input and Logic	Logic and Output	Input, Logic and Output
<b>EtherCAT Terminals</b>	<b>EK1914</b> 4 standard inputs, 4 standard outputs, 2 safe inputs, 2 safe outputs	<b>EL6900</b> TwinSAFE Logic	<b>EK1914</b> 4 standard inputs, 4 standard outputs, 2 safe inputs, 2 safe outputs	<b>EL1918</b> TwinSAFE Logic, 8 safe inputs	<b>EL2912</b> TwinSAFE Logic, 2 safe outputs	<b>EK1960</b> TwinSAFE Logic, 20 safe inputs, 24 safe outputs
	<b>EL1904</b> TwinSAFE, 4 safe inputs	<b>EL6910</b> TwinSAFE Logic, PROFIsafe master and slave support	<b>EL2904</b> TwinSAFE, 4 safe outputs			<b>EL2911</b> TwinSAFE Logic, 4 safe inputs, 1 safe output
		<b>EL6930</b> TwinSAFE Logic, PROFIsafe slave support			<b>ELM72xx-9016</b> $I_{ms} = 4.5\text{ A}$ , 48 V DC, TwinSAFE Logic, TwinSAFE: STO/SS1	
					<b>ELM72xx-9018</b> $I_{ms} = 4.5\text{ A}$ , 48 V DC, Safe Motion, TwinSAFE Logic	
<b>EtherCAT Box</b>	<b>EP1908-0002</b> TwinSAFE, 8 safe inputs		<b>EP1918-0002</b> TwinSAFE Logic, 8 safe inputs	<b>EP2918-0032</b> TwinSAFE Logic, 8 safe outputs		<b>EP1957-0022</b> TwinSAFE Logic, 8 safe inputs, 4 safe outputs
<b>EtherCAT plug-in modules</b>		<b>EJ6910</b> TwinSAFE Logic		<b>EJ1914</b> TwinSAFE Logic, 4 safe inputs	<b>EJ2914</b> TwinSAFE Logic, 4 safe outputs	<b>EJ1957</b> TwinSAFE Logic, 8 safe inputs, 4 safe outputs
				<b>EJ1918</b> TwinSAFE Logic, 8 safe inputs	<b>EJ2918</b> TwinSAFE Logic, 8 safe outputs	
<b>Bus Terminals</b>	<b>KL1904</b> TwinSAFE, 4 safe inputs		<b>KL2904</b> TwinSAFE, 4 safe outputs		<b>KL6904</b> TwinSAFE Logic, 4 safe outputs	

## TwinSAFE hardware, Drive Technology

	Output		
<b>AX5000, TwinSAFE drive option card</b>	<b>AX5801</b> drive-integrated safety functions: STO, SS1	<b>AX5805</b> drive-integrated safety functions: Safe Motion, for AX5x01 to AX5140	<b>AX5806</b> drive-integrated safety functions: Safe Motion, for AX5160 to AX5193

## TwinSAFE hardware, Drive Technology

	Input, Logic and Output		
<b>AX8000, multi-axis servo drives</b>	<b>AX8108</b> single-axis module 8 A, feedback: OCT, multi-feedback interface, TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion	<b>AX8118</b> single-axis module 18 A, feedback: OCT, multi-feedback interface, TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion	<b>AX8206</b> dual-axis module 2 x 6 A, feedback: OCT, multi-feedback interface, TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion
	<b>AX8525</b> combined power supply and axis module 25 A, feedback: OCT, multi-feedback interface, TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion	<b>AX8540</b> combined power supply and axis module 40 A, feedback: OCT, multi-feedback interface, TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion	
<b>AMI8000, compact integrated servo drives</b>	<b>AMI8121</b> $M_0 = 0.48\text{ Nm}$ , TwinSAFE Logic, TwinSAFE: STO/SS1	<b>AMI8122</b> $M_0 = 0.78\text{ Nm}$ , TwinSAFE Logic, TwinSAFE: STO/SS1	<b>AMI8123</b> $M_0 = 1.00\text{ Nm}$ , TwinSAFE Logic, TwinSAFE: STO/SS1
	<b>AMP8000, distributed servo drives</b>	<b>AMP8031</b> $M_0 = 1.36 \dots 1.38\text{ Nm}$ , $nn = 3000 \dots 9000\text{ min}^{-1}$ , TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion	<b>AMP8032</b> $M_0 = 2.35 \dots 2.37\text{ Nm}$ , $nn = 3000 \dots 9000\text{ min}^{-1}$ , TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion
<b>AMP8041</b> $M_0 = 2.35 \dots 2.40\text{ Nm}$ , $nn = 3000 \dots 8000\text{ min}^{-1}$ , TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion		<b>AMP8042</b> $M_0 = 3.84 \dots 4.10\text{ Nm}$ , $nn = 2500 \dots 7000\text{ min}^{-1}$ , TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion	<b>AMP8043</b> $M_0 = 5.30 \dots 5.40\text{ Nm}$ , $nn = 2500 \dots 5000\text{ min}^{-1}$ , TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion
<b>AMP8051</b> $M_0 = 4.40 \dots 4.60\text{ Nm}$ , $nn = 2500 \dots 8000\text{ min}^{-1}$ , TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion		<b>AMP8052</b> $M_0 = 7.60\text{ Nm}$ , $nn = 2000 \dots 4000\text{ min}^{-1}$ , TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion	<b>AMP8053</b> $M_0 = 9.60 \dots 10.2\text{ Nm}$ , $nn = 2000 \dots 4000\text{ min}^{-1}$ , TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion
<b>AMP8500, distributed servo drives, higher rotor inertia</b>	<b>AMP8531</b> $M_0 = 1.36 \dots 1.38\text{ Nm}$ , $nn = 3000 \dots 9000\text{ min}^{-1}$ , TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion	<b>AMP8532</b> $M_0 = 2.35 \dots 2.37\text{ Nm}$ , $nn = 3000 \dots 9000\text{ min}^{-1}$ , TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion	<b>AMP8533</b> $M_0 = 3.10 \dots 3.15\text{ Nm}$ , $nn = 3000 \dots 8000\text{ min}^{-1}$ , TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion
	<b>AMP8541</b> $M_0 = 2.35 \dots 2.40\text{ Nm}$ , $nn = 3000 \dots 8000\text{ min}^{-1}$ , TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion	<b>AMP8542</b> $M_0 = 3.84 \dots 4.10\text{ Nm}$ , $nn = 2500 \dots 7000\text{ min}^{-1}$ , TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion	<b>AMP8543</b> $M_0 = 4.70 \dots 5.40\text{ Nm}$ , $nn = 2500 \dots 7000\text{ min}^{-1}$ , TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion
	<b>AMP8551</b> $M_0 = 4.40 \dots 4.60\text{ Nm}$ , $nn = 2500 \dots 8000\text{ min}^{-1}$ , TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion	<b>AMP8552</b> $M_0 = 5.60 \dots 7.60\text{ Nm}$ , $nn = 2000 \dots 7300\text{ min}^{-1}$ , TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion	<b>AMP8553</b> $M_0 = 9.60 \dots 10.2\text{ Nm}$ , $nn = 2000 \dots 4000\text{ min}^{-1}$ , TwinSAFE Logic, TwinSAFE: STO/SS1, Safe Motion

## TwinSAFE software

<b>TwinCAT 3 Safety Editor</b>	<b>TE9000</b>	implementing of safety applications in graphical environment
<b>TwinSAFE Loader/User</b>	<b>TE9200</b>	TwinSAFE command line tools: Loader for downloading/customizing safety projects at runtime; User for handling user management of TwinSAFE logic components
<b>TwinSAFE Logic Simulator</b>	<b>TE9100</b>	virtual commissioning of a safety application based on TE1111 TwinCAT 3 EtherCAT Simulation



# The System Company

For the first time in machine and system engineering, the MX-System enables completely control cabinet-free automation solutions. By consistently combining, applying and further developing Beckhoff's expertise, a holistic, modular pluggable system has been created. The combination of MX-System baseplate and MX-System function modules resulting from the modular construction kit combines all tasks and features of a control cabinet: energy supply, fuse protection and distribution, generation and monitoring of auxiliary voltages, sequence control with the inputs and outputs, control of motors and actuators as well as the connection level for the field devices. The full system integration of all machine functionalities is achieved via freely selectable IPC, coupler, I/O, drive, relay and system modules, which can be configured and combined suitable for the specific application.

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

## IPC modules 115

- robust industrial PCs of various performance classes
- control of the function modules
- fanless design
- Microsoft Windows or TwinCAT/BSD

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

## Coupler modules 115

- connection to external control architectures
- EtherCAT, PROFINET RT or EtherNet/IP
- The MX-System can be used as a sub-station.

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

## I/O modules 116

- modules for all signal types and directions
- integrated electronic fuse
- diagnostic functions as well as diverse setting options

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

## Baseplates 114

- basis of the MX-System
- real-time Ethernet performance retained into each module
- standardized interfaces
- integrated housekeeping functions

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



## System modules 121

- power distribution and fieldbus connection
- modules for power infeed and power output
- power supplies, switches and UPS

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

## Drive modules 119

## Relay modules 120

- compact multi-axis systems for drives of all kinds
- frequency inverter for controlling three-phase asynchronous motors
- servo drives for controlling synchronous servomotors
- DC link power supplies and capacitors

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

- direct switching of high currents
- relay modules for direct switching of lighting or fans
- motor direct starter and motor reversing starter
- solid-state relay

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



- designed for the greatest possible resistance over a long period of time
- distribution of voltage and EtherCAT via standardized connectors
- assembly and wiring in the shortest possible time thanks to the modular design principle
- flexible and precisely adaptable to production requirements
- advantages throughout the entire machine life cycle with the MX-System

# Baseplates

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



MBxxxx   Baseplates			
	8 slots	12 slots	18 slots
<b>1-row</b>	<b>MB1008-0000-0000</b> <small>data slots</small>	<b>MB1012-0000-0000</b> <small>data slots</small>	
<b>2-row</b>		<b>MB2012-0000-0000</b> <small>combined data/power slots</small>	<b>MB2018-0000-0000</b> <small>combined data/power slots</small>

# IPC modules

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



MCxxxx   IPC modules			
	Type Intel Atom®	Intel® Celeron®/Core™	ARM, Xilinx Zynq®
<b>IPC module</b>	<b>MC6015-0030-1217</b> <small>2, 4, 6 or 8 cores</small>	<b>MC6030-0080-2217</b> <small>2 or 4 cores</small>	<b>MC9240-0000-1217</b> <small>4 cores</small>

# Coupler modules

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



MKxxxx   Coupler modules			
	Type EtherCAT	PROFINET RT	EtherNet/IP
<b>Coupler module</b>	<b>MK1100-0002-1111</b> <small>100 Mbit/s</small>	<b>MK9300-0002-1212</b> <small>100 Mbit/s</small>	<b>MK9500-0002-1212</b> <small>100 Mbit/s</small>

# I/O modules

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



## MO1xxx | I/O modules, digital input

Input voltage	2-channel	4-channel	8-channel
24 V DC	MO1512-0000-1112 counter, 1 kHz, M12	MO1034-0000-1112 potential-free, M12	MO1008-0000-1111 M8
		MO1254-0000-1112 1 µs, M12, timestamping	MO1008-0000-1112 M12
			MO1088-0000-1111 ground switching, M8

## MO2xxx | I/O modules, digital output

Output voltage, type	1-channel	2-channel	4-channel	8-channel
24 V DC		MO2252-0000-1112 0.5 A, M12, timestamping	MO2024-0000-1112 2.0 A, M12	MO2008-0000-1111 0.5 A, M8
		MO2262-0000-1112 0.5 A, M12, oversampling		MO2008-0000-1112 0.5 A, M12
Relay (mechanical), up to 250 V AC			MO2624-0000-1112 0.5 A AC, 2 A DC, M12	
PWM		MO2502-0000-1112 0.5 A, M12		
Pulse train	MO2521-0124-1112 1 A, M12			
LED control	MO2596-0000-1112 3 A, M12			

## MO3xxx | I/O modules, analog input

Type	1-channel	4-channel
Multi-function, 12 bit, ±10 V, ±20 mA		MO3004-2255-1112 single-ended, 1 ksps, M12
Multi-function, 16 bit, ±200 mV... ±30 V, ±20 mA, ±50 mA		MO3114-2233-1112 single-ended, 10 ksps, galv. isolated, M12
Temperature (RTD/TC)		MO3204-6666-1112 16 bit, 1 ksps, M12
Measuring bridge (strain gauge)	MO3501-0008-1112 24 bit, 20 ksps, M12	
Acceleration (IEPE)	MO3601-0007-1112 24 bit, 50 ksps, M12	

## MO4xxx | I/O modules, analog output

Type	4-channel
Universal input/output	MO4004-1122-1112 12 bit, single-ended, 1 ksps, M12

## MO5xxx | I/O modules, position measurement

Type	1-channel	2-channel
Absolute	MO5001-0000-1112 SSI, M12	
Incremental	MO5021-0000-1112 Sin/Cos 1 V <sub>r</sub> , M12	MO5112-0000-1112 RS422, TTL, open collector, 5 MHz, M12
		MO5162-0000-1112 HTL, 100 kHz, M12

# Drive modules

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



## MO6xxx | I/O modules, communication

Type	1-channel	2-channel	4-channel
<b>PROFINET</b>		MO6631-0000-1112 PROFINET RT, controller, M12, D-coded	<a href="#">i</a>
<b>EtherNet/IP</b>		MO6652-0000-1112 EtherNet/IP, scanner, M12, D-coded	<a href="#">i</a>
<b>IO-Link</b>			MO6224-0020-1112 IO-Link, master, Class A, M12 <a href="#">i</a> MO6224-0039-1112 IO-Link, master, Class B, M12 <a href="#">i</a>
<b>RS485/RS422</b>		MO6022-0000-1112 RS422/RS485, M12, B-coded	<a href="#">i</a>
<b>EtherCAT</b>	MO6695-0000-1112 EtherCAT bridge, M12, D-coded	<a href="#">i</a>	

## MO7xxx | I/O modules, compact drive technology

Type	1-channel	2-channel
<b>Servomotor</b>	MO7221-9016-1114 24 V DC, 7 A, B17, STO/SS1 <a href="#">i</a>	MO7221-9016-1124 48 V DC, 7 A, B17, STO/SS1 <a href="#">i</a>
	MO7221-9018-1114 24 V DC, 7 A, B17, Safe Motion <a href="#">i</a>	MO7221-9018-1124 48 V DC, 7 A, B17, Safe Motion <a href="#">i</a>
<b>Stepper motor</b>		MO7062-9016-1112 24 V DC, 3 A, M12, STO <a href="#">i</a>
		MO7062-9016-1122 48 V DC, 3 A, M12, STO <a href="#">i</a>
<b>DC motor</b>		MO7342-0000-1112 24 V DC, 3.5 A, M12 <a href="#">i</a>
		MO7342-0000-1122 48 V DC, 3.5 A, M12 <a href="#">i</a>

## MOx9xx | I/O modules, TwinSAFE

I/O module	-	2-channel	4-channel	8-channel
	MO6910-0000-1110 communication	MO2962-0000-1112 relay output <a href="#">i</a>	MO2904-0000-1112 digital output, 0.5 A <a href="#">i</a>	MO1918-0000-1112 digital input <a href="#">i</a>
			MO2934-0000-1112 digital output, 2 A <a href="#">i</a>	

## MD3xxx | Drive modules, frequency inverters

Output current	1-channel	2-channel
<b>1.5 A</b>	MD3101-0100-2254 1.5 A per channel, STO/SS1	<a href="#">i</a> MD3201-0100-2254 1.5 A per channel, STO/SS1
<b>3 A</b>	MD3103-0100-2254 3 A per channel, STO/SS1	<a href="#">i</a> MD3203-0100-2254 3 A per channel, STO/SS1
<b>6 A</b>	MD3106-0100-2254 6 A per channel, STO/SS1	<a href="#">i</a> MD3206-0100-2254 6 A per channel, STO/SS1
<b>12 A</b>	MD3112-0100-2254 12 A per channel, STO/SS1	<a href="#">i</a>

## MD6xxx | Drive modules, DC link power supplies

Output current		
<b>15 A</b>	MD6015-0003-2345 15 A	<a href="#">i</a> MD6115-0005-2345 15 A, output AMP8000

## MD8xxx | Drive modules, servo drives

Output current	1-channel		2-channel	
<b>3 A</b>	MD8103-0100-2254 3 A per channel, STO/SS1 <a href="#">i</a>	MD8103-0200-2254 3 A per channel, Safe Motion <a href="#">i</a>	MD8203-0100-2254 3 A per channel, STO/SS1 <a href="#">i</a>	MD8203-0200-2254 3 A per channel, Safe Motion <a href="#">i</a>
<b>6 A</b>	MD8106-0100-2254 6 A per channel, STO/SS1 <a href="#">i</a>	MD8106-0200-2254 6 A per channel, Safe Motion <a href="#">i</a>	MD8206-0100-2254 6 A per channel, STO/SS1 <a href="#">i</a>	MD8206-0200-2254 6 A per channel, Safe Motion <a href="#">i</a>
<b>12 A</b>	MD8112-0100-2254 12 A per channel, STO/SS1 <a href="#">i</a>	MD8112-0200-2254 12 A per channel, Safe Motion <a href="#">i</a>		

## MD9xxx | Drive modules, capacitors

Capacity		
<b>2025 µF</b>	MD9000-2025-2250 2025 µF	<a href="#">i</a>

# Relay modules

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



## MRxxxx | Relay modules

Category/ Version	1-channel	2-channel	3-channel
Relay output			MR1307-0011-2242 7 A <i>i</i>
Motor starter	MR3107-2001-2245 7 A <i>i</i>	MR3203-1001-2244 2.8 A <i>i</i>	
	MR3107-2901-2245 7 A, safe shutdown <i>i</i>	MR3203-1901-2244 2.8 A, safe shutdown <i>i</i>	
Solid-state relay			MR4307-1011-2242 7 A <i>i</i>

# System modules

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



## MS1xxx | System modules, power infeed

External supply voltage	Output voltage			
	24 V DC	24/48 V DC	400...480 V AC	400 V AC/600 V DC
24/48 V DC		MS1010-0021-1114 infeed <i>i</i>		
		MS1010-0022-1214 infeed + forwarding <i>i</i>		
230 V AC	MS1410-1001-1334 infeed + main switch, black <i>i</i>			
	MS1010-1001-1334 infeed <i>i</i>			
	MS1010-1002-1334 infeed + forwarding <i>i</i>			
400 V... 480 V AC			MS1432-1101-2349 infeed + main switch, black <i>i</i>	
			MS1132-2201-2349 infeed + main switch, red <i>i</i>	
400 V... 480 V AC/ 600 V DC				MS1020-0051-1145 infeed <i>i</i>
				MS1020-0052-1245 infeed + forwarding <i>i</i>

### MS2xxx | System modules, EtherCAT power infeed

External supply voltage	Output voltage		
	24 V DC	24/48 V DC	400 V AC/600 V DC
24 V DC	MS2204-0002-1112 <i>i</i> infeed + forwarding		
	MS2306-0002-1111 <i>i</i> infeed + forwarding, EtherCAT P		
24/48 V DC		MS2210-0021-1114 <i>i</i> infeed	
		MS2210-0022-1214 <i>i</i> infeed + forwarding	
230 V AC	MS2610-1002-1334 <i>i</i> infeed + forwarding		
400 V... 480 V AC/ 600 V DC			MS2520-8051-2245 <i>i</i> infeed, EtherCAT P
			MS2620-1051-2245 <i>i</i> MS2620-1052-2245 <i>i</i> infeed infeed + forwarding

### MS3xxx | System modules, power output

Supply voltage from backplane	Output voltage forwarding	
	24/48 V DC	400 V AC/600 V DC
24/48 V DC	MS3010-1023-1114 <i>i</i> output	
400 V AC/ 600 V DC		MS3020-1051-2245 <i>i</i> output

### MS4xxx | System modules, EtherCAT power output

Supply voltage from backplane	Output voltage forwarding		
	24 V DC	24/48 V DC	400 V AC/600 V DC
24 V DC	MS4306-1903-1111 <i>i</i> output, 1-port EtherCAT P		
	MS4306-2903-1111 <i>i</i> output, 2-port EtherCAT P		
24/48 V DC	MS4208-2003-1112 <i>i</i> output, EtherCAT	MS4210-1023-1114 <i>i</i> output, EtherCAT	
400 V AC/ 600 V DC			MS4520-1051-2245 <i>i</i> output, EtherCAT P
			MS4620-1051-2245 <i>i</i> output, EtherCAT

### MS6xxx | System modules, power supplies

Output current	Output voltage	
	24 V DC	48 V DC
10 A		MS6010-2100-2240 <i>i</i> MS6010-2100-2250 <i>i</i> 400...480 V AC 600 V DC
	MS6018-1100-2240 <i>i</i> MS6018-1100-2250 <i>i</i> 400...480 V AC 600 V DC	
20 A		MS6020-2100-2240 <i>i</i> MS6020-2100-2250 <i>i</i> 400...480 V AC 600 V DC

### MS7xxx | System modules, Ethernet switches

	4-port
Ethernet switch	MS7204-0000-1112 <i>i</i> 2.5 Gbit/s

### MS8xxx | System modules, UPS

	2-channel
UPS	MS8132-0120-1212 <i>i</i> 0.12 kW

### MS9xxx | System modules, empty housing

Baseplate extension	MS9230-1011-2109 <i>i</i> 24/48 V DC, 400 V AC/600 V DC
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# The Vision Company

As a specialist for PC-based control technology, Beckhoff consistently aims to integrate all machine functionalities into one control platform. With TwinCAT Vision, this has included image processing within software since 2017. The machine vision product spectrum is now complete thanks to the introduction of the comprehensive hardware range from Beckhoff. Machine builders and end users thus have a complete image processing system at their disposal that covers all the necessary components from software to illumination which, integrated into the system, provides users with significant competitive advantages.

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



## Full scalability of the vision system

All components are optimally matched to each other and can be combined according to the modular principle to suit the vision application.

### Cameras 126

- 2.5 Gbit/s area scan cameras
  - robust IP65/67 anodized aluminum housing with flexible mounting options
  - color or monochrome image sensors with a resolution of 1.6 to 24 MP
  - full synchronization with all EtherCAT-based machine processes via distributed clocks
- [www.beckhoff.com/cameras](http://www.beckhoff.com/cameras)

### Lenses 127

- robust and universal thanks to C-mount connection
  - vibration/shock resistant up to 10 g
  - for up to 2.0  $\mu\text{m}$  pixel size and image circle diameters of 11 and 19.3 mm
  - broadband anti-reflection coating for the visible spectrum (VIS) and near infrared region (NIR)
- [www.beckhoff.com/lenses](http://www.beckhoff.com/lenses)

### Illumination 128

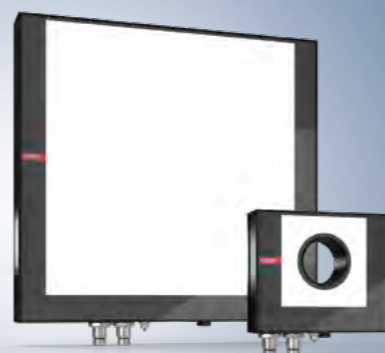
- multicolor LED panel, ring illumination or bar light in IP65/67
  - spectrally complete white light
  - spectrally adjustable pulse mode
  - simple wiring and full EtherCAT integration
  - precisely synchronized through distributed clocks
- [www.beckhoff.com/illumination](http://www.beckhoff.com/illumination)

### Units 129

- unit consisting of camera, ring illumination and focusable optics in IP65/67 aluminum anodized housing
  - color or monochrome image sensors with a resolution of 1.6 to 5 MP
  - directly integrated into the PC-based control technology
  - focus adjustment during runtime
- [www.beckhoff.com/units](http://www.beckhoff.com/units)

### TwinCAT Vision 105

- program and configure vision applications directly in TwinCAT Engineering
  - superior real-time applications: PLC, motion control, robotics, high-end measurement technology and vision on one platform
  - hardware-independent and open
- [www.beckhoff.com/twincat-vision](http://www.beckhoff.com/twincat-vision)



- complete hardware portfolio for industrial image processing
- ultra-fast EtherCAT performance and robust design
- perfect synchronization with any process
- simple, direct integration into the control
- open and scalable machine vision system

# Cameras

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



## VCS2000 | Area scan cameras, 2.5 Gbit/s

Number of pixels	Spectral sensitivity			
	monochrome	color	polarization/monochrome	polarization/color
1.6...3.1 MP	VCS2000-0100 1.6 MP, 60 fps, Δpx = 3.45 μm	VCS2001-0100 1.6 MP, 60 fps, Δpx = 3.45 μm		
	VCS2000-0200 2.3 MP, 167 fps, Δpx = 3.45 μm	VCS2001-0200 2.3 MP, 167 fps, Δpx = 3.45 μm		
	VCS2000-0300 3.1 MP, 55 fps, Δpx = 3.45 μm	VCS2001-0300 3.1 MP, 55 fps, Δpx = 3.45 μm		
5.0...8.1 MP	VCS2000-0500 5.0 MP, 35 fps, Δpx = 3.45 μm	VCS2001-0500 5.0 MP, 35 fps, Δpx = 3.45 μm	VCS2002-0500 5.0 MP, 35 fps, Δpx = 3.45 μm	VCS2003-0500 5.0 MP, 35 fps, Δpx = 3.45 μm
	VCS2020-0500 5.1 MP, 56 fps, Δpx = 2.74 μm	VCS2021-0500 5.1 MP, 56 fps, Δpx = 2.74 μm		
	VCS2020-0800 8.1 MP, 35 fps, Δpx = 2.74 μm	VCS2021-0800 8.1 MP, 35 fps, Δpx = 2.74 μm		
12.4...16.2 MP	VCS2020-1200 12.4 MP, 23 fps, Δpx = 2.74 μm	VCS2021-1200 12.4 MP, 23 fps, Δpx = 2.74 μm		
	VCS2030-1600 16.2 MP, 17 fps, Δpx = 2.74 μm	VCS2031-1600 16.2 MP, 17 fps, Δpx = 2.74 μm		
20.4...24.6 MP	VCS2030-2000 20.4 MP, 14 fps, Δpx = 2.74 μm	VCS2031-2000 20.4 MP, 14 fps, Δpx = 2.74 μm		
	VCS2030-2400 24.6 MP, 11 fps, Δpx = 2.74 μm	VCS2031-2400 24.6 MP, 11 fps, Δpx = 2.74 μm		

Specified values for the product: number of pixels, max. frame rate, pixel size

**i** Product announcement for availability status see [www.beckhoff.com](http://www.beckhoff.com)

# Lenses

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



VOS2000



VOS3000

## VOS2000 | Lenses

Focal length	Image circle Ø 11 mm
6 mm	VOS2000-0625 2.0 μm, f = 6 mm, f/2.5
8 mm	VOS2000-0822 2.0 μm, f = 8 mm, f/2.2
12 mm	VOS2000-1218 2.0 μm, f = 12 mm, f/1.8
16 mm	VOS2000-1616 2.0 μm, f = 16 mm, f/1.6
25 mm	VOS2000-2516 2.0 μm, f = 25 mm, f/1.6
35 mm	VOS2000-3522 2.0 μm, f = 35 mm, f/2.2
50 mm	VOS2000-5028 2.0 μm, f = 50 mm, f/2.8

## VOS3000 | Lenses

Focal length	Image circle Ø 19.3 mm
16 mm	VOS3000-1632 2.0 μm, f = 16 mm, f/3.2
25 mm	VOS3000-2532 2.0 μm, f = 25 mm, f/3.2
35 mm	VOS3000-3528 2.0 μm, f = 35 mm, f/2.8

Specified values for the product: pixel size, focal length, starting aperture

We reserve the right to make technical changes.

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# Illumination

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



## VIP2000 | Panel illumination

Light emitting surface (W x H)	Light color			
	OGB-IR850			
100 x 100 mm	VIP2000-1010 wide beam, 90°	i	VIP2001-1010 narrow beam, 50°	i
150 x 150 mm	VIP2000-1515 wide beam, 90°	i	VIP2001-1515 narrow beam, 50°	i
200 x 200 mm	VIP2000-2020 wide beam, 90°	i	VIP2001-2020 narrow beam, 50°	i
250 x 250 mm	VIP2000-2525 wide beam, 90°	i	VIP2001-2525 narrow beam, 50°	i
300 x 300 mm	VIP2000-3030 wide beam, 90°	i	VIP2001-3030 narrow beam, 50°	i

## VIR2000 | Ring illumination

Light emitting surface (W x H)	Light color			
	OGB-IR850			
100 x 100 mm	VIR2000-1010 wide beam, 90°	i	VIR2001-1010 narrow beam, 50°	i
150 x 150 mm	VIR2000-1515 wide beam, 90°	i	VIR2001-1515 narrow beam, 50°	i
200 x 200 mm	VIR2000-2020 wide beam, 90°	i	VIR2001-2020 narrow beam, 50°	i
250 x 250 mm	VIR2000-2525 wide beam, 90°	i	VIR2001-2525 narrow beam, 50°	i
300 x 300 mm	VIR2000-3030 wide beam, 90°	i	VIR2001-3030 narrow beam, 50°	i

## VIB2000 | Bar light

Light emitting surface (W x H)	Light color			
	OGB-IR850			
150 x 50 mm	VIB2000-0155 wide beam, 90°	i	VIB2001-0155 narrow beam, 50°	i
200 x 50 mm	VIB2000-0205 wide beam, 90°	i	VIB2001-0205 narrow beam, 50°	i
250 x 50 mm	VIB2000-0255 wide beam, 90°	i	VIB2010-0255 narrow beam, 50°	i
300 x 50 mm	VIB2000-0305 wide beam, 90°	i	VIB2010-0305 narrow beam, 50°	i
400 x 50 mm	VIB2000-0405 wide beam, 90°	i	VIB2010-0405 narrow beam, 50°	i
500 x 50 mm	VIB2000-0505 wide beam, 90°	i	VIB2010-0505 narrow beam, 50°	i
600 x 50 mm	VIB2000-0605 wide beam, 90°	i	VIB2010-0605 narrow beam, 50°	i
800 x 50 mm	VIB2000-0805 wide beam, 90°	i	VIB2010-0805 narrow beam, 50°	i
1000 x 50 mm	VIB2000-1005 wide beam, 90°	i	VIB2010-1005 narrow beam, 50°	i

Specified values for the product: light distribution, beam angle

**i** Product announcement for availability status see [www.beckhoff.com](http://www.beckhoff.com)

# Units

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



## VUI2000 | Units

Number of pixels	Spectral sensitivity	
	monochrome	color
1.6 MP	VUI2000-0108 1.6 MP, f = 8 mm, 60 fps, Δpx = 3.45 μm	VUI2001-0108 1.6 MP, f = 8 mm, 60 fps, Δpx = 3.45 μm
	VUI2000-0208 2.3 MP, f = 8 mm, 167 fps, Δpx = 3.45 μm	VUI2001-0208 2.3 MP, f = 8 mm, 167 fps, Δpx = 3.45 μm
2.3 MP	VUI2000-0212 2.3 MP, f = 12 mm, 167 fps, Δpx = 3.45 μm	VUI2001-0212 2.3 MP, f = 12 mm, 167 fps, Δpx = 3.45 μm
	VUI2000-0308 3.1 MP, f = 8 mm, 55 fps, Δpx = 3.45 μm	VUI2001-0308 3.1 MP, f = 8 mm, 55 fps, Δpx = 3.45 μm
3.1 MP	VUI2000-0312 3.1 MP, f = 12 mm, 55 fps, Δpx = 3.45 μm	VUI2001-0312 3.1 MP, f = 12 mm, 55 fps, Δpx = 3.45 μm
	VUI2000-0512 5.0 MP, f = 12 mm, 35 fps, Δpx = 3.45 μm	VUI2001-0512 5.0 MP, f = 12 mm, 35 fps, Δpx = 3.45 μm
5.0 MP	VUI2000-0516 5.0 MP, f = 16 mm, 35 fps, Δpx = 3.45 μm	VUI2001-0516 5.0 MP, f = 16 mm, 35 fps, Δpx = 3.45 μm

Specified values for the product: number of pixels, focal length, max. frame rate, pixel size

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