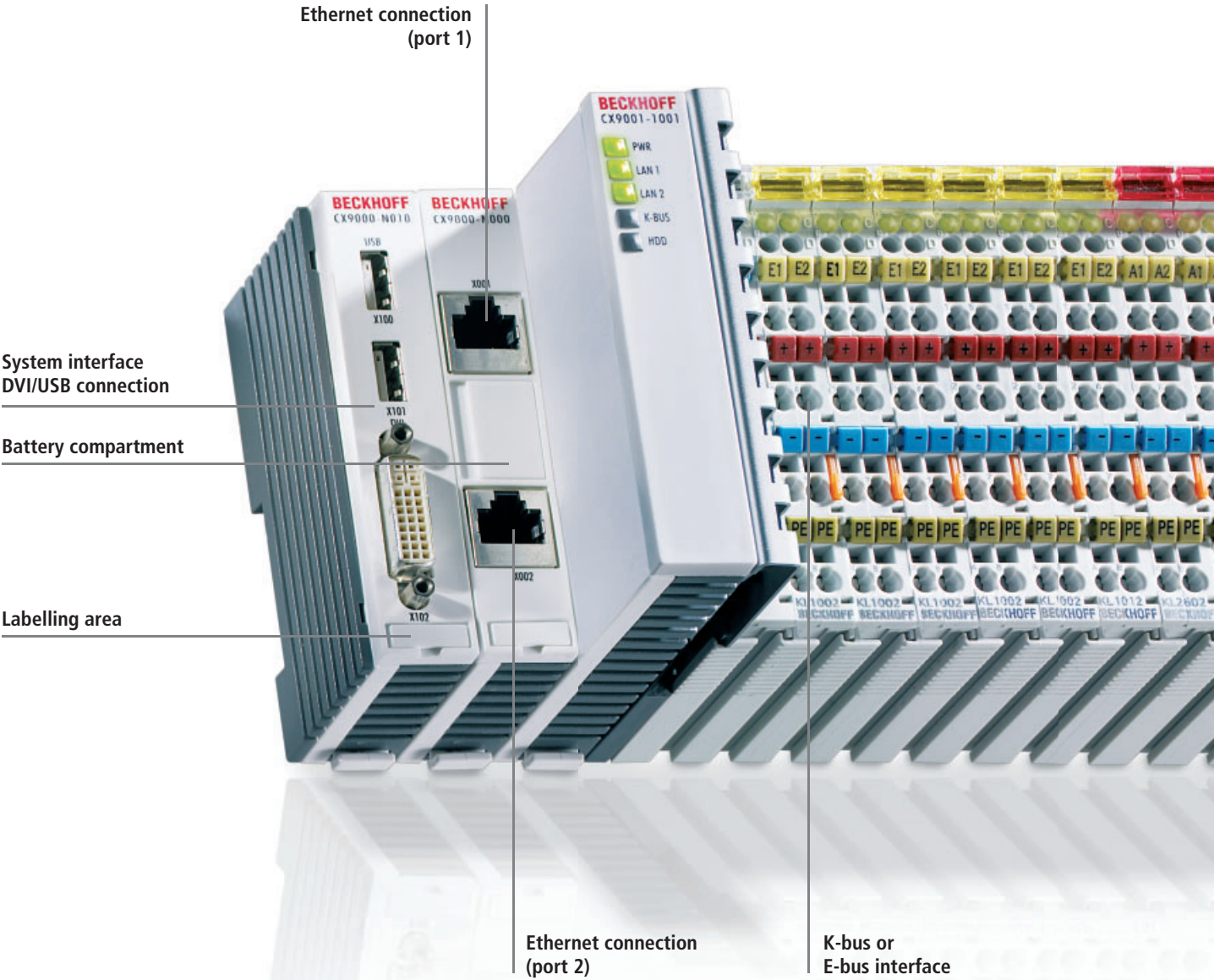
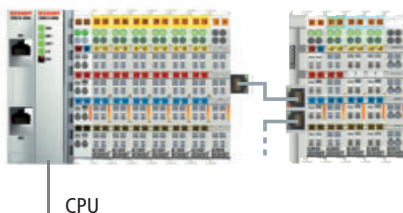


CX9000, CX9010 | Embedded PCs





Application example
"Headless" PLC system

- PLC system without control panel
- Windows CE and TwinCAT PLC

Components

- CPU CX9010-1001

The CX9000 and CX9010 Embedded PCs offer a compact and high-performance yet cost-effective PLC and Motion Control system for DIN rail installation. Within the Beckhoff control world they are positioned between the BX Bus Terminal Controller series and the CX1010 Embedded PC.

The main feature of these units is the energy-saving Intel® IXP420 CPU with XScale® technology and the Microsoft Windows CE operating system. Two controllers with different processors are available:
CX9010: Intel® IXP420, 533 MHz
CX9000: Intel® IXP420, 266 MHz

The CX9000 family requires no external storage media – the device boots the operating system from the internal flash. The CX9000/CX9010 Embedded PCs are passively cooled and therefore do without rotating components. As usual for the CX series, the device features a modular mechanical design. In its basic configuration, the compact device only measures 58 x 100 x 91 mm.

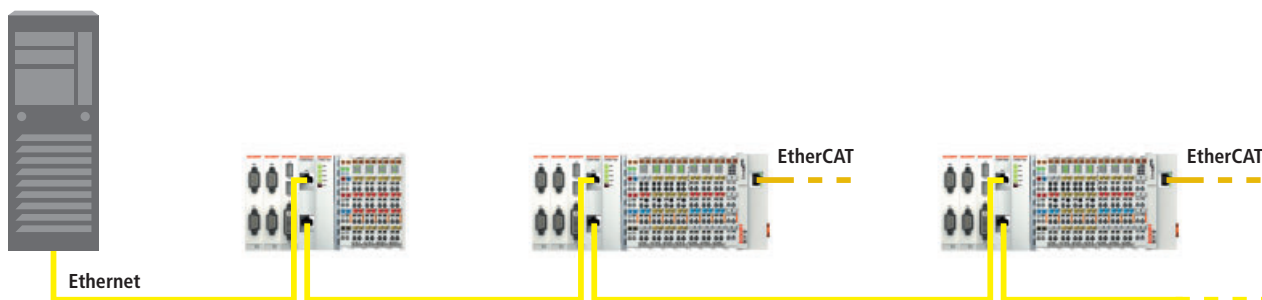
The CX9000/CX9010 controllers are available in two versions: with K-bus for direct connection of Bus Terminals, and as an E-bus version for direct connection of EtherCAT Terminals. In the basic configuration, two RJ 45 sockets that are internally connected to an integrated switch are available as interfaces. This simplifies wiring of several CX9000/CX9010 within a line topology. No separate switch hardware is required. The two externally accessible Ethernet ports are independent of the EtherCAT interface, which is served by a second MAC (Media Access Controller) provided by the CPU.

Further interfaces may be added ex works as required. If a screen display is desired, this is realised by a CX90x0-N010 – a combined DVI/VGA + 2 x USB 2.0 module. The combination of DVI and USB enables all types of Beckhoff Control Panels with DVI/USB interface to be used. Touch functionality is connected via USB. As further optional interfaces, two RS232 modules or two

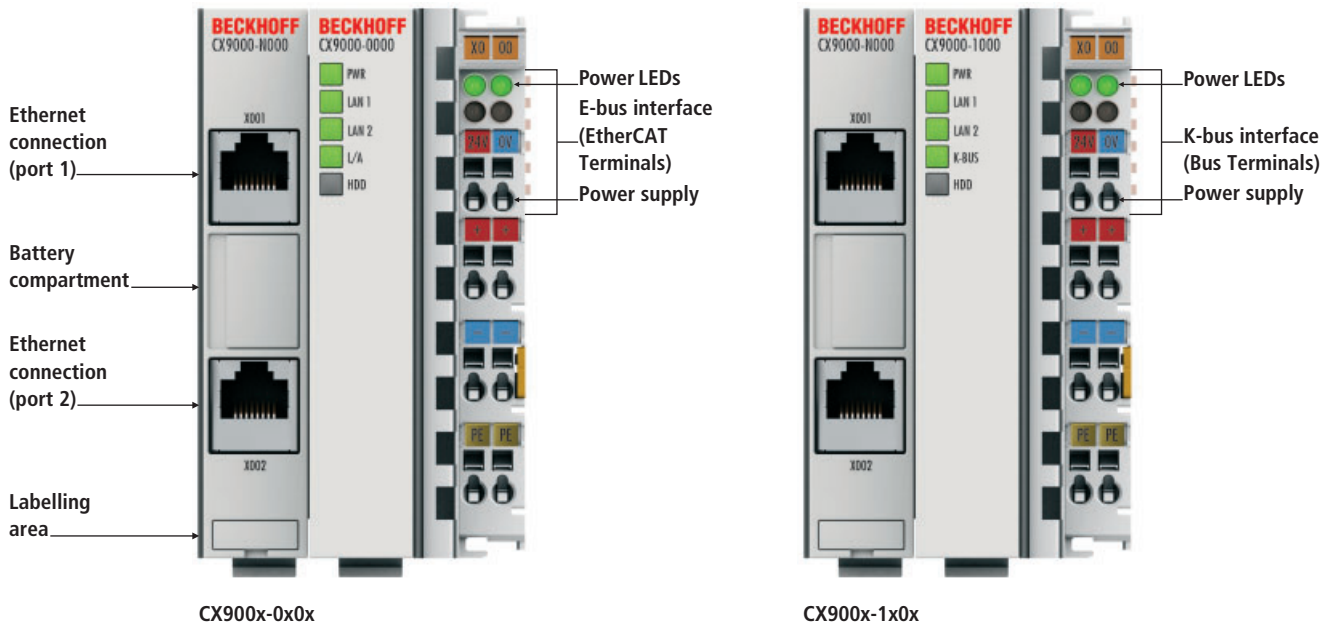
RS422/RS485 modules can be configured as – opto-decoupled – COM1 and COM2. Mass storage devices, in the form of a Compact Flash card, can be used with the aid of the CX9000-A001 module.

As with all Beckhoff controllers, programming as an automation device takes place using TwinCAT; the runtime environment for PLC (CX9000/CX9010) and Motion Control (CX9010) is located on the device itself. One of the two Ethernet interfaces is used as programming interface.

Microsoft Windows CE enables the creation of fully graphic user programs, which are able to satisfy high expectations thanks to the graphics chip integrated in the CX9000/CX9010. The result is a compact Ethernet controller that enables short I/O cycle times in conjunction with EtherCAT Terminals and offers high-performance software with Windows CE and TwinCAT.



The CX9000 and the CX9010 enable configuration of an IT line topology with subordinate EtherCAT devices.



CX9000 | Basic CPU module

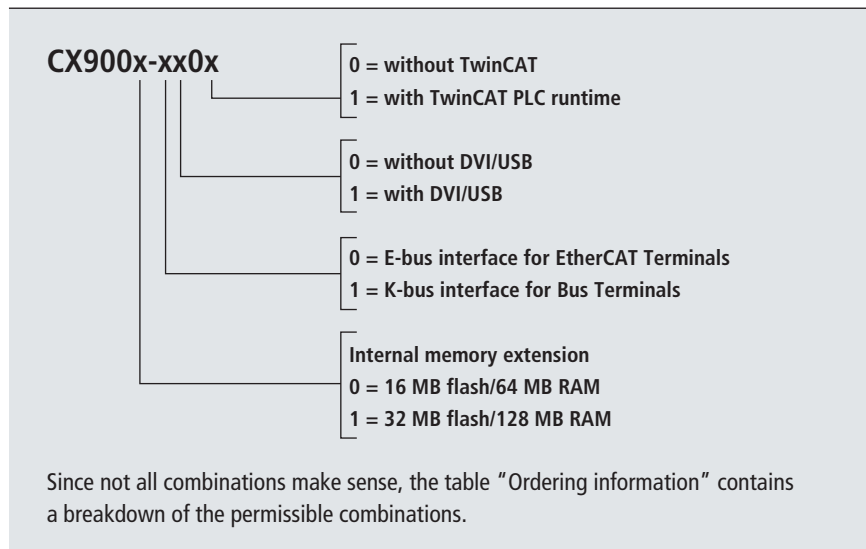
The CX9000 is a compact, DIN rail-mountable Ethernet controller with Intel® IXP420 with XScale® technology and 266 MHz clock frequency. The connection for the Beckhoff I/O systems is directly integrated in the CPU module. The CX9000 is available in two basic versions: one version for Bus Terminals with K-bus, the other one for EtherCAT Terminals with E-bus. The CX9000 comprises the CPU, the internal flash memory with two configuration options, the main memory (RAM) (available in two different sizes), and NOVRAM as non-volatile memory. Two Ethernet RJ 45 interfaces are also part of the basic configuration.

These interfaces are connected to an internal switch and offer a simple option for creating a line topology without the need for additional Ethernet switches.

A memory medium in Compact Flash format I and II is available as an optional module. The operating system is Microsoft Windows CE. The TwinCAT automation software transforms a CX9000 system into a powerful PLC and Motion Control system that can be operated with or without visualisation. Further system interfaces can be connected to the CPU module ex factory. The CX9000-N010 option can be connected

to Beckhoff Control Panels or standard monitors with DVI or VGA input via the DVI and USB interfaces. Devices such as printer, scanner, mouse, keyboard, mass storage, CR-RW, etc. can be connected via the USB 2.0 interfaces. The module CX9000-N030 offers two serial RS232 interfaces with a maximum transfer speed of 115 kbaud. These two interfaces can be implemented as RS422/RS485, in which case they are identified as CX9000-N031.

The order identifier of the basic CPU module is derived as follows:



Technical data	CX900x-0x0x	CX900x-1x0x
Processor	266 MHz Intel® IXP420 with XScale® technology	
Flash memory	16 MB flash (internal, optionally 32 MB)	
Internal main memory	64 MB RAM (internal, optionally 128 MB)	
Interfaces	2 x RJ 45 (Ethernet, internal switch), 10/100 Mbit/s	
Diagnostics LED	1 x power, 2 x LAN, 1 x L/A, 1 x flash access	1 x power, 2 x LAN, 1 x K-bus, 1 x flash access
Clock	internal battery-backed clock for time and date (battery exchangeable)	
Operating system	Microsoft Windows CE	
Control software	TwinCAT CE PLC runtime	
Power supply	24 V DC (-15 %/+20 %)	
Dielectric strength	500 V (supply/internal electronics)	
I/O connection	E-bus (EtherCAT Terminals)	K-bus (Bus Terminals)
NOVRAM	128 kbytes	
I/O-DPRAM	–	4 kbytes
Current supply I/O terminals	2 A	
Max. power loss	6 W (including the system interfaces CX9000-xxxx)	
Dimensions (W x H x D)	58 mm x 100 mm x 91 mm	
Weight	approx. 295 g (without heat sink), approx. 375 g (with heat sink for variants with DVI/USB interface)	
Operating/storage temperature	0...+55 °C/-25...+85 °C	
Relative humidity	95 %, no condensation	
Vibration/shock resistance	conforms to EN 60068-2-6/EN 60068-2-27/29	
EMC immunity/emission	conforms to EN 61000-6-2/EN 61000-6-4	
Protection class	IP 20	
Approvals	CE, UL	
Further information	www.beckhoff.com/CX9000	

Ordering information	16 MB flash	32 MB flash	E-bus	K-bus	DVI/USB	no TwinCAT	TwinCAT PLC runtime
	64 MB RAM	128 MB RAM					
CX9000-0000	x	–	x	–	–	x	–
CX9000-0001	x	–	x	–	–	–	x
CX9001-0000	–	x	x	–	–	x	–
CX9001-0001	–	x	x	–	–	–	x
CX9001-0100	–	x	x	–	x	x	–
CX9001-0101	–	x	x	–	x	–	x
CX9000-1000	x	–	–	x	–	x	–
CX9000-1001	x	–	–	x	–	–	x
CX9001-1000	–	x	–	x	–	x	–
CX9001-1001	–	x	–	x	–	–	x
CX9001-1100	–	x	–	x	x	x	–
CX9001-1101	–	x	–	x	x	–	x