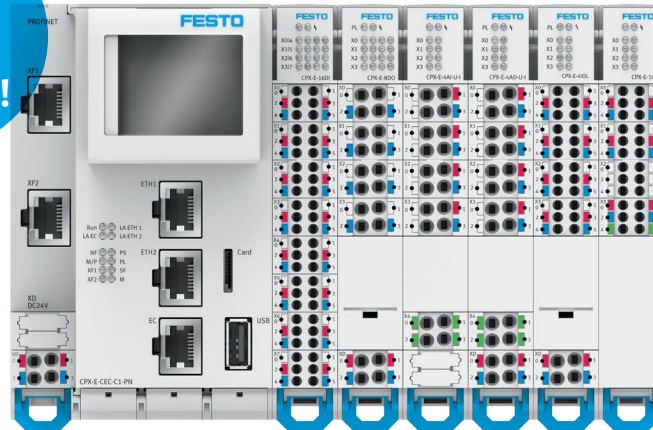


Modular control system CPX-E

FESTO

Compact
and
low cost!



Powerful!

Highlights

- High performance (dual core 766 MHz, 512 MB RAM)
- EtherCAT master interface
- Bus slave interfaces
 - PROFINET
 - EtherNet/IP
- USB interface
- SD card interface
- Optional display
- CODESYS V3 as of Service Pack 10
- Motion functions such as SoftMotion
- UL/CSA, C-Tick, IEC Ex certifications

Designed as an EtherCAT® master controller and motion controller with protection to IP20, the powerful automation system CPX-E for factory and process automation with NE21-specific certifications is becoming the central control system for handling technology. Several bus modules are available for the configuration as a compact and low-cost remote I/O.

Powerful control

In addition to comprehensive PLC functions right up to multiple axis applications with interpolation, the CPX-E can be easily integrated into existing host systems. This is made possible by the EtherCAT® master interface, the integrated PROFINET device interface or the EtherNet/IP slave interface. The OPC UA client and server functions ensure easy integration and interoperability in Industry 4.0 host environments with cloud and digitalisation concepts.

Everything included for a variety of applications

CPX-E features specific software functions that make it highly flexible in many products and solution packages from Festo, for example in handling systems

- Parts handling
- Assembly systems
- Palletising
- Gluing, dispensing

or in a complete automation system

- Packaging machines (flow wrappers)
- Palletising systems
- Selective soldering systems
- Wafer handling.

The automation system for factory and process automation

CPX-E: the interface for many functions

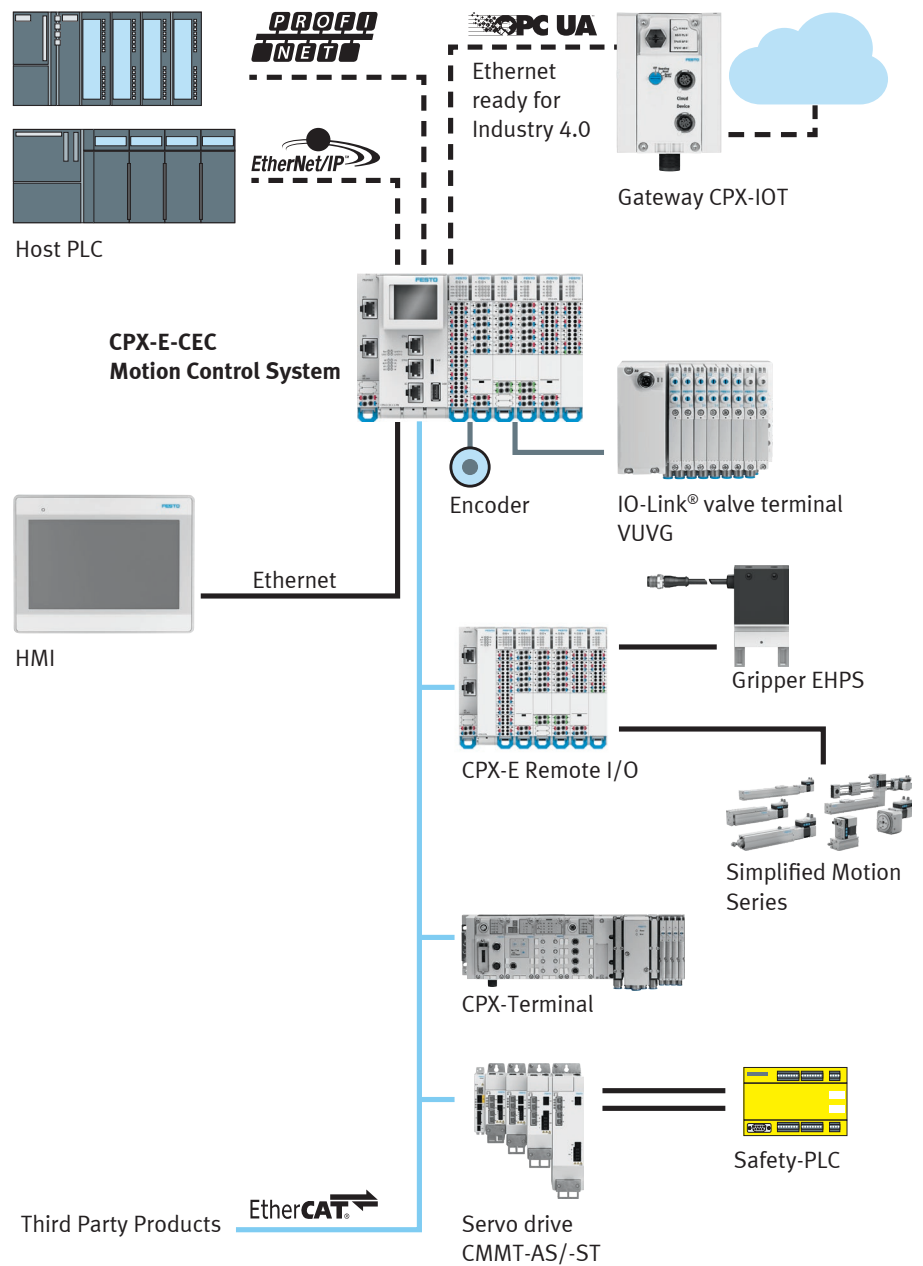
As the interface between the host controller and modular automation solution, CPX-E is the point where pneumatics, electric drive technology as well as sensors and camera systems come together. The integrated decentralised control function is realised in the decentralised network via EtherCAT® masters. EtherCAT® is also used for the direct connection of servo drives. IO-Link® provides greater flexibility for point-to-point communication.

The benefits of the system to you

With CPX-E, you can effortlessly combine many benefits of a control system:

- CPX-E provides a complete answer to your tasks or those of your customers, either universally or as a Festo system solution.
- Standardised CODESYS programming interface for easy programming.
- Your engineering effort is significantly reduced with our software Automation Suite which offers integrated data management.
- The fast way to a complete solution: extended software functions for achieving seamless integration and easy actuation of electric drives from Festo.
- The consistent and uniform platform allows you to seamlessly combine servo technology and stepper motor technology. Ideal for smooth mixed operation, and an identical appearance on the customer interface.
- All motion control functions are integrated in the control system.
- High I/O component density.
- H-rail for quick and easy mounting of the CPX-E.

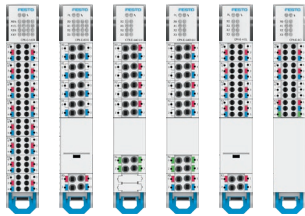
System overview



The highly communicative CPX-E node for decentralised and modular automation

CODESYS controller and EtherCAT® master included! Modules and components in detail

I/O and bus modules

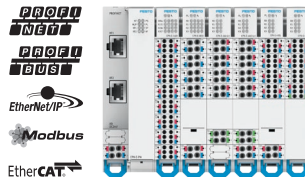


Variety for flexible use:

- Digital input modules (16DI)*
- Digital output modules (8 DO/0.5 A)*
- Analogue input module (4 AI current/voltage)
- Analogue output module (4 AO current/voltage)
- IO-Link® master modules (4 channels)*
- Counter module (1 channel)

*These modules meet the requirements for process automation applications in accordance with NE21 “Interference immunity requirements for process and laboratory control equipment”.

Bus modules



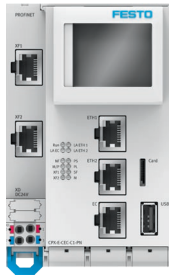
Remote I/O or controller?

The choice is yours!

Depending on the module combination, you can use the system with a bus module as a purely remote I/O system or with a control unit as a control system.

The EtherNet/IP module CPX-E-EP also supports the Modbus/TCP protocol.

Two options for the control units



The control units are currently available in two versions.

1 Controller CPX-E-CEC-C1-...: the powerful CODESYS V3 control unit with EtherCAT® master and comprehensive PLC functions does not have any specific motion control functions. Communication optionally via PROFINET (slave) or EtherNet/IP (slave), Modbus TCP or TCP/IP.

2 Motion controller CPX-E-CEC-M1-...: the motion controller supports CODESYS V3 as well as SoftMotion, the powerful software library for simple and complex motion control applications.

Communication optionally via PROFINET (slave) or EtherNet/IP (slave), Modbus TCP or TCP/IP. SoftMotion includes:

- PLCopen Parts 1 and 2
- Robotics (PLCopen Part 4)
- Cam disc editor
- CNC editor (.dxf file import)

Creating handling applications is straightforward with the CPX-E motion licence

With the “Motion and robotics” software licence for the controller CPX-E-CEC-M1-xx, you get a user-friendly solution that enables to design handling quickly and conveniently. The two licences are available in the Festo AppWorld → www.festo.com/appworld

PTP licence

- Point-to-point interpolation
- Actuation of simple kinematic systems
- Graphic visualisation for hand-held operator unit CDSA-D3-RV
- Teach-in function in combination with visualisation
- For applications such as pick & place, loading/unloading

CP licence

- Cartesian linear and circular interpolation
- Interpolation of orientation
- Contour applications
- Graphic visualisation for hand-held operator unit CDSA-D3-RV
- Teach-in function in combination with visualisation

Supported kinematic systems

- Linear gantries YXCL/EXCT
- Planar surface gantries YXCF/EXCH, EXCM
- Three-dimensional gantries YXCR

Convenient programming with the Festo Teach Language FTL

The software FTL is included in the CPX-E motion licences. It provides a variety of functions for programming motion and actuating I/Os. Thanks to its simple design and intuitive operation, programming motions is very quick and requires no extensive programming skills or special training. This means the programmer can focus fully on the application.

Features of FTL

- Easy editing using text format
- Macros for point-to-point as well as Cartesian linear and circular motions
- Macros for setting speed, acceleration and jerk
- Smooth motion transitions to reduce the mechanical load
- Reference systems (zero point offsets) with six degrees of freedom

Quick and easy optimisation – thanks to teach-in

With the optional operator unit CDSA and the teach-in function, you can optimise processes quickly and easily and influence motions directly without any problem. You can correct the positions directly in the application using CDSA, add them to the program via teach-in and get started immediately. No additional compilation is required.

Online? Offline? Just program!

FTL offers you both: depending on the application and the situation, you can create and customise the program online using the handheld operator unit CDSA directly at the kinematic system or offline using FTL Editor.

It couldn't be easier: an example from the FTL program

```
→ 1 Vel(dynCart, 1000)
   2 Acc(dynCart, 5000)
   3
   4 Index := 0
   5
   6 WHILE(Index < 100)DO
   7 Lin(Pos1)
   8 WaitTime(100)
   9 Lin(Pos2)
  10 Vel(dynCart, 500)
  11 Lin(Pos3)
  12 Lin(Pos4)
```

Optimal cycle times – perfect motions

The intelligent dynamic limiter monitors the limit values of the motors and mechanical systems, resulting in 100% path accuracy and optimum cycle times.

For mobile commissioning and optimisation: handheld operator unit CDSA



- Graphical, intuitive software for teach-in
- Easy-to-learn, dialog-based software on a touchscreen
- Integrated message system
- User management
- 7-inch touchscreen
- Integration in two-channel safety circuits with emergency stop and enabling button
- Interface unit for control cabinet assembly
- Cables in 5, 10 and 15 m lengths