FESTO

High performance controller CEPE

Highlights

- High-performance industrial PC
- Real-time platform with Festo AX OS, based on PLCnext Technology – the open ecosystem for modular automation
- Easy programming with standardised CODESYS programming interface
- Extend software functions: motion application frameworks, software development kits, software packages and third-party apps
- Seamless combination of servo technology and stepper motor technology

AX Festo AX Controls
> www.festo.com/ax-controls

CEPE has high processing power and an open software ecosystem to control and automate assembly lines and machines as well as production processes; it can gather and analyse local data, program its own applications and install third-party applications via various app stores.

Control unit for industrial motion and IoT applications

CEPE stands for "Control Electronic PC series Edge". It is an industrial control unit designed to control and monitor electric actuators in automated systems. Designed as a high-performance programmable logic controller, CEPE offers a wide range of interfaces and software functions and is a configurable control system for industrial motion and IoT applications.

Festo AX OS platform

The real-time platform Festo AX OS offers a complete software ecosystem with application frameworks, software development kits, motion function blocks and software packages and apps from third-party providers.

Main applications

- High-performance industrial PC
- Programming and real-time monitoring of production processes and automation tasks
- Motion applications, such as conveyor belts, rotary tables, pick & place, palletising, rotary knives, flying saws, servo presses and many more
- Machine visualisation
- IoT data acquisition and analysis
- Remote monitoring and control
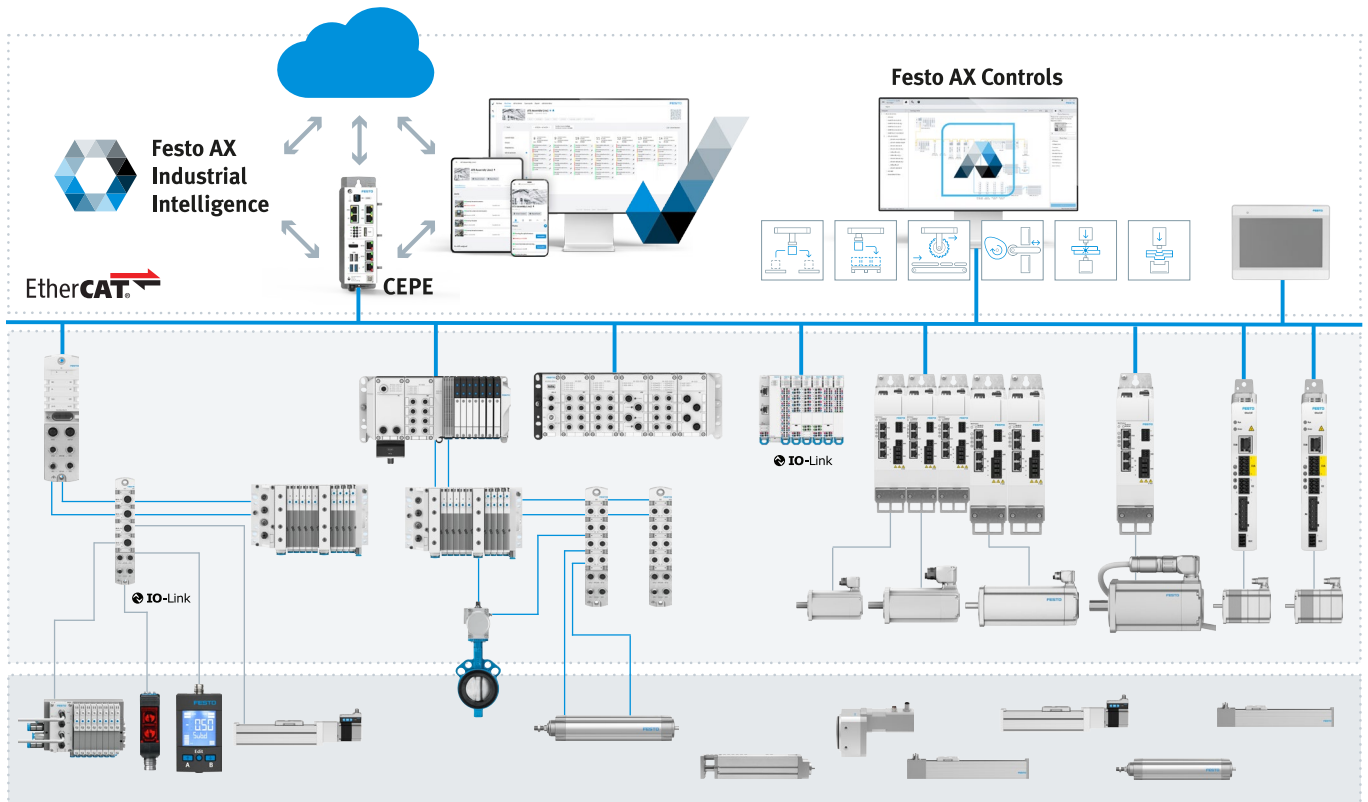- Connectivity to on-premise or cloud software services

Additional Information:
Product page
> www.festo.com/catalogue/cepe
> www.festo.com/ax-controls

Sample set-up

Modular design

The high-performance controller CEPE is available with two different software packages (IoT & Motion) with the pre-installed operating system AX OS. Thanks to the modular concept further functionalities and licences can be added quickly and easily at any time via the Festo or PLCnext app stores.

Both versions include the following functions as standard:
• Festo AX OS based on PLCnext
• Festo AX Controls CODESYS PLC Basic including
  – CODESYS V3
  – EtherCAT® master
  – Modbus® TCP master
  – OPC UA server & client
  – WebVisu
  – MQTT
  – Remote Target Visualization
  – CANopen
  – Modbus RTU

Package 1 with pre-installed software package IOT
• Festo AX Controls CODESYS PLC X86

Including the following functions and licences
• Festo AX Controls CODESYS PLC Basic   GSBE-PLC1-P

Package 2 with pre-installed software package Motion:
• Festo AX Controls CODESYS PLC X86
• Festo AX Controls WEB IQ X86

Including the following functions and licences
• Festo AX Controls CODESYS PLC Basic   GSBE-PLC1-P
• Festo AX Controls CODESYS PLC Standard   GSBE-PLC2-P
• Festo AX Controls CODESYS PLC Advanced   GSBE-PLC3-P
• Festo AX Controls CODESYS SoftMotion 4   GSBE-SM1-P
• Festo AX Controls CODESYS SoftMotion 8   GSBE-SM2-P
• Festo AX Controls Motion Robotic   GSBE-M-P
• Festo AX Controls WebIQ 1000   GSBE-WIQ1-P

Depending on the application requirements, each variant can be individually expanded with further software packages and licences.

Technical data

CEPE

Processing system	Intel® Core™ i3-1115GRE, 2x 2.2 GHz 8 GB DDR4, 128 GB m.2 SSD, 128 kB NVRAM (non-volatile memory)
Connectivity	1 Gbit/s Ethernet engineering interface 1 Gbit/s EtherCAT® master interface Prepared Industrial Ethernet multi interfaces: PROFINET, EtherCAT®, EtherNet/IP Prepared AP master interface Prepared interface of the AP device USB2 and USB3 Display port SD card interface

Overview of all apps, functions and licences

Festo AX OS

Operating system	Description
Festo AX OS	The integrated Linux real-time operating system Festo AX OS, based on PLCnext, has been specially developed for industrial automation. It enables the integration of real-time control with high-level programming languages, cloud connectivity and IoT functionality. The most important functions of Festo AX OS include: • Real-time performance: It supports deterministic control tasks that are required in industrial automation. • Open source architecture: as it is based on Linux, it allows various software tools and libraries to be integrated, making it very flexible and adaptable to different applications. • Multi-programming environment: Developers can use a variety of programming languages (such as IEC 61131, C++, C#, Python, etc.) to create applications that facilitate interdisciplinary collaboration. • Scalability and connectivity: Festo AX OS is designed so that it can be easily connected to cloud services, thus enabling remote monitoring, data analysis, and other IoT-related functionalities. • Security: It has robust cybersecurity features to safeguard the security and integrity of industrial systems.

Overview of all apps, functions and licences

Festo AX Controls CODESYS PLC App

App / Licence	Description
Festo AX Controls CODESYS PLC Basic	The Festo AX PLC Basic Licence enables CODESYS to support up to 256 I/Os and to act as an EtherCAT® master and Modbus® TCP controller. It also offers the functionality of a WebVisu, MQTT and OPC UA server & client for seamless data management and visualisation.
Festo AX Controls CODESYS PLC Standard	The Festo AX PLC Standard Licence extends the capabilities of CODESYS to support up to 1,024 I/Os, remote target visualisation and multicore processing.
Festo AX Controls CODESYS PLC Advanced	The Festo AX PLC Advanced Licence extends the capabilities of CODESYS to support up to 2,048 I/Os and to enable CNC and robotics functions in motion control.
Festo AX Controls CODESYS PLC Performance	The PLC Performance Licence enhances the Festo AX Advanced Licence by upgrading CODESYS to support unlimited I/Os.
Festo AX Controls CODESYS SoftMotion 4	The Festo AX Motion 4 Licence enables extended motion functions for up to 4 real and 4 virtual axes and covers everything from standard movements to synchronised operations.
Festo AX Controls CODESYS SoftMotion 8	The Festo AX Motion 8 Licence extends the motion control capabilities of the Festo AX Motion 4 Licence to up to 8 real and 8 virtual axes.
Festo AX Controls CODESYS SoftMotion 16	The Festo AX Motion 16 Licence extends the motion control capabilities of the Festo AX Motion 8 Licence to up to 16 real and 16 virtual axes.
Festo AX Controls CODESYS SoftMotion Unlimited	The Festo AX Motion Unlimited Licence extends the motion control capabilities of the Festo AX Motion 16 Licence to unlimited motion control capabilities both real and virtual axes.

Festo AX Controls Motion Robotic Package, based on CODESYS V3 and SoftMotion

App / Licence	Description
Festo AX Controls Motion Robotic	The Festo AX Controls Motion Robotic Licence enables programming within CODESYS with the FTL (Festo Teach Language) interpreter. This provides a practical solution for creating handling and robotics applications with PTP (point-to-point) and CP (continuous path) movements. The solution becomes even more user-friendly when combined with the optional CDSA-D3-RV teach pendant, which adds functions such as teach-in, confirmation and emergency off. In addition, with a practical API programming can be carried out via external software without being dependent on CODESYS, for example with Visual Studio Code or the Python app. New functions, such as improved trigger points based on distance, event or time offset, improve cycle times in certain applications through precise triggering of movements (e.g. gripping).
Festo AX Controls Motion Robotic Tracking	The Festo AX Controls Motion Robotic Tracking Licence is an extension of the Festo AX Controls Motion Robotic Licence. The licence permits tracking functions that are particularly useful for tasks such as encoder tracking (e.g. conveyor belt tracking) or signal tracking (e.g. pressing applications).

Overview of all apps, functions and licences

Festo AX Controls WebIQ Designer

App / Licence	Description
Festo AX Controls WebIQ 1000	The Festo AX Controls WebIQ 1000 Licence offers 1,000 tags, 2,500 alarms, 50 logging tags and 5 curve/trend widgets. In addition, the licence includes 2 web clients (web browser connections) and 2 IO handlers (OPC UA connections). With this licence the WebIQ Designer can be used in online mode with a connected Festo AX Controls WebIQ Controller (e.g. CEPE).
Festo AX Controls WebIQ 2500	The Festo AX Controls WebIQ 2500 Licence extends the functions to 2,500 tags, 10,000 alarms, 5,000 logging tags and 20 curve/trend widgets. In addition, the licence includes 2 web clients (web browser connections) and 2 IO handlers (OPC UA connections). With this licence the WebIQ Designer can be used in online mode with a connected Festo AX Controls WebIQ Controller (e.g. CEPE).
Festo AX Controls WebIQ 7500	The Festo AX Controls WebIQ 7500 Licence extends the functions to 7,500 tags, 10,000 alarms, 5,000 logging tags and 20 curve/trend widgets. In addition, the licence includes 2 web clients (web browser connections) and 2 IO handlers (OPC UA connections). With this licence the WebIQ Designer can be used in online mode with a connected Festo AX Controls WebIQ Controller (e.g. CEPE).
Festo AX Controls WebIQ CLIENT 5	The Festo AX Controls WebIQ Client 5 Licence extends any existing licence by adding 3 additional web clients (web browser connections), increasing the total number of web clients to 5.
Festo AX Controls WebIQ IO 5	The Festo AX Controls WebIQ IO 5 Licence extends any existing licence by adding 3 additional IO handlers (OPC UA connections), increasing the total number of IO handlers to 5.

Festo AX Controls Python App

App / Licence	Description
Festo AX Controls Python	The web-based Python app is an integrated development environment for programming with the Python programming language. This app can be used directly via a web-browser. Visual Studio Code can also be used as an integrated development environment (IDE). By providing access to all existing signals and information (variables) the Python app offers all options for creating application programs. With the API motion control applications can be programmed in Python and it offers new development opportunities beyond the traditional IEC standard. This is a licence that is purchased and has an unlimited period of use.

Festo AX Controls Node-RED App

App / Licence	Description
Festo AX Controls Node-RED	The Node-RED app provides an intuitive, flow-based development tool for connecting hardware devices, APIs and online services in a visually designed user interface. It simplifies the process of creating complex automation workflows and makes it accessible for both beginners and advanced end users. The app can be used directly in a web browser. With access to all existing signals and information (variables) all options for creating application programs with monitoring functions are available. A pre-installed demo flow sequence helps customers get started with the app. This is a free software licence with an unlimited period of use.