Under control and in motion
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Complete subsystems from a single source

Complete subsystems for automation of your process – that is what Festo offers as your partner. The full process and control sequence for factory and process automation is covered.

You’ll also find the matching control architecture at Festo, tailored to your application, whether it’s pneumatic, servopneumatic, electric, or a mechatronic mix.

That is our promise: to deliver more than mere components.

**Total mechatronic solutions**

Mechatronic Motion Solutions from Festo is a unique system of components, modules, and software. It integrates all types of pneumatic, servopneumatic and (electro)mechanical automation motion and combines them according to your task. Irrespective of the control system environment you use, Mechatronic Motion Solutions always provides the appropriate interfaces.

**Programming to standard**

A standardised programming environment makes your tasks easier, gets them done faster and with more reliable results. That is why Festo offers you programming with CoDeSys to IEC 61131-3 standard. You can program your applications exactly how you want to, without learning an additional programming language.

Selecting the right, compatible solution at the right time is straightforward as we simplify the planning, configuration, layout and commissioning of your subsystem with a host of software tools.

**Integration into the control system**

Easy integration into your overall system: Festo’s control architecture offers a multitude of communication protocols commonly used in industry.
Controls for drive technology

**Management level**

- **Control level**
  - **Control**
  - **Operation visualisation**
    - CPX web server
    - Displays
    - Visualisation

**Controller**

- Electrical installation concepts
  - Centralised
  - Decentralised
  - On-site
  - Hybrid
- CPI installation systems
- Stand-alone units on site

**Field level**

- **Activation**
- **Drives**
  - Standard cylinder
    - DSBC
  - Compact/short-stroke cylinders
    - ADN
  - Guided drive
    - DFM
  - Round cylinder
    - DSNU
  - Quarter turn actuator
    - DFPB
  - Linear drive
    - DFPI
  - I/O modules
    - Compact
    - Robust
    - Economical

**Pneumatic**

**Servopneumatic**

- Axis controller SPC200
- End-position controller SPC11
- Position controller CMAX
- End-position controller CMPX

- Axis interface SPC-AIF
- Proportional valve VPWP
- Proportional valve VPWP
- Sensor interface CASM

- Linear drives with displacement encoder
  - DNCI
  - DNPB
  - Swivel modules with displacement encoder
  - DSMi-B
  - DGCI

- Robust
- Economical
- I/O modules compact
- I/O modules compact
**System**

- Compact controller: CECC
- Robotic controller: CMIXR
- Integrated controller: CPX-CEC

**Diagnostics**

- CPX web server
- Visualization
- Diagnostics and preprocessing
- On-site diagnostics

**Fieldbus**

- Ethernet (Profinet, Ethernet/IP, EtherCat, TCP)
- FHPP: Festo Handling and Positioning Profile
- CoDeSys: provided by Festo
- FST 4: Festo software tool

**Fieldbus (Profibus, Interbus, DeviceNet, CANopen, CC-Link)**

**Motor controller**
- CMFL
- SFC-DC
- SFC-LACI

**Servo motor controllers**
- CMMP-AS
- CMMS-AS
- CMMD-AS
- CMMS-ST

**Stepper motor controllers**
- CMMS-ST

**Servo motors**
- EMM5-AS
- EMMST

**Stepper motors**
- MTR-DCI

**Linear motor axes**
- ELGL-LAS
- DNCE-LAS
- DFME-LAS
- ADNE-LAS

**Gantry axes**
- EGC-TB/BS
- EGSK/EGSP
- ELGR
- DGE-ZR-RF

**Electric cylinder**
- EPCO
- ESBF
- DNCE-BS/LS
- ELGG

**Slide**
- EGSL

**Cantilever axes**
- DGEA

**PositioningDrives**

- Exhibition and calculation software for electric drives
The application is key

Festo – your partner for every stage of the process automation sequence

Your application determines the solution – that holds true for control technology, too. Festo's control architecture is designed to meet your needs in three ways:

• Tailored to your application
• Ideal for integration into your overall coordinating/control systems
• Optimally designed for drive activation systems, whether electric, servopneumatic or pneumatic

Just tell us what your requirements are – and we will provide you with a control concept optimised to your application.

Early cooperation for more success

The earlier you involve Festo in the planning phase, the better! The greatest potential for optimisation is to be had when our system experts can support you right from the beginning and are thus able to tailor the solution perfectly to your needs.

Make the most of our core business expertise right from the start and reduce your total cost of ownership (TCO). By taking advantage of a total solution, which is adapted and optimised to your machine or application, you can achieve savings in day-to-day operations, for example through higher output or maximised process reliability.
If, in addition to the control system, you also require visualisation for the automation of the manual workstation, the graphic display and operator unit CDPX is the perfect choice:

• Perfect graphic displays on high-resolution widescreen touch displays
• Perfect graphic displays, simple, intuitive project planning and programming with Designer Studio – the complete package for man-machine applications
• Integrated: client-server structure for greater flexibility. CDPX visualises data and allows access to external client equipment via the worldwide data network
• Can be expanded into a compact control concept with CoDeSys V3

Application example: automation of manual workstations
When automating workstations as in manual welding workstations, the control technology presents special challenges:
• Extremely compact production units require space-saving design
• Components in the immediate working environment must be sturdy and resistant to disturbances
• Quick and easy commissioning
• Interfacing with valves and I/Os

The valve terminal CPX with integrated CPX-CEC controller meets these challenges with ease and many others too. The CPX-CEC is right for your application if you are looking for a compact solution for:
• Direct connection of valves
• Digital I/Os
• Quick and direct error detection
Centralised or decentralised control: the choice is yours

Centralised solutions
Are you looking for a centralised control solution? For integration into a control cabinet, for example? Then you’ll appreciate the following advantages:
- A simple structure that is easier to program and commission due to the elimination of additional nodes
- A larger and more attractively priced range of components
- Tamper protection

If you would like to combine these advantages with a modular control system that gives you further benefits, we recommend the CECX control range:
- Simple, powerful programming environment to IEC 61131-3 standard
- Configuration tools, drivers, and libraries of modules are included
- Plus numerous interfaces such as Profibus, CANopen and Ethernet

Depending on the application, CECX is used as a traditional PLC or with motion control for the activation of electric drives.

When everything is supplied from a single source, as in the case of the control cabinet solution described above, you could reduce your TCO further by letting us construct your control cabinet. That lowers costs in areas where the invisible costs are usually highest, i.e. in engineering, procurement, assembly and operation. The cost of the components alone usually makes up only a small part of the total cost. You can cut that cost by opting for a complete solution for the control cabinet: assembled, adjusted, programmed – and tested and documented as well.
Decentralised solutions
With a decentralised design, you benefit from the following:
• Savings on tubing and cable lengths of up to 65%
• Increased energy efficiency
• Up to 35% higher cycle rate at
• A simultaneous reduction in flow rate by 50%

The valve terminal platform with integrated CPX controller provides an optimised solution.

With CoDeSys integrated in the CPX-CEC control system, you benefit from the advantages of a stand-alone, on-site control unit and from a customisable system with a wide variety of modules for diverse tasks.

• Stand-alone control of a subsystem – costs for control cabinet are eliminated
• Integrated diagnostic function
• Architecture is easy to upgrade due to the connection options for any fieldbuses and networks
• Flexibility for IO expansion with CANopen master

Your application determines the solution.
Ask your local Festo sales engineer for advice.
Application examples from actual practice

**Gluing solar cells**
A company with headquarters in India specialises in manufacturing solar cells. The 3D gantry solution for the motion is supplied completely by Festo and is a mix of electric axes in the X and Y planes and pneumatic mini-slide DGSL. The gluing heads are mounted on the Z axis, and must travel to up to 4320 gluing points depending on the size of the cells. The entire gluing process is controlled by a control unit CECX-X-M1 with 48 digital inputs and 24 digital outputs.

**Winding interference suppression chokes**
A German machine manufacturer for suppliers to the automotive industry developed a new fully-automatic winding machine for interference suppression chokes. Festo provided assistance in automation of the machine. The complete solution by Festo includes the controller, motion and final parts control are implemented via a vision system SBOC-Q. The control system consists of a combination of the valve terminal CPX-MPA and the CPX-CEC-M1 Softmotion. Festo specialists were also responsible for all programming of the CoDeSys-based controller. The drive package for the electric EGC axes is a controller CMMP, and the pneumatic drives are controlled directly by CPX-MPA.
Packaging biscuits
A renowned baking company from Germany uses the robotic controller CMXR-C2 combined with a tripod for packaging biscuits. From the machine frame to the controller, Festo provided all components: our specialists were also responsible for the CoDeSys programming. The control panel CDSA and touch display CDPX make operation easy and intuitive.

The drive package is the motor controller CMMP. Of particular interest is that the vision system SBOC-Q with Motion Control records the path (tracking), checks the quality and performs stand-alone control tasks like web edge control. The vision system also coordinates vacuum gripping technology.

Purifying exhaust gases in lead production
A lead processing plant in the Czech Republic had to retrofit 12 boilers for smelting lead and alloy processing to modern environmental standards. The fumes must be treated to separate hazardous and poisonous substances, which are released from additives in the very hot smelt. This secondary process is controlled and visualised by a CPX-CEC controller, from opening the valves for the path to exhaust fume treatment, up to the fresh air supply and mechanical beating of the filters. A GFDM Energy Monitoring by Festo monitors and supports the energy processes.
Motion Control for assembling and packing

Asynchronous processes
If a pick and place process is asynchronous and not very complex – such as packing bars of chocolate into cartons, for example – a multi-axis control system with the CPX-CM-HPP gateway will generally be suitable. The bars are fed to the packaging station at irregular intervals. The X and Y move into the pick-up position and wait until the next bar comes; the Z-axis then grips it and places it in the carton.

Synchronous, fast, simple
If you want to use a synchronous and simpler motion of the electric axes without interpolation with the advantages of the CPX platform, then it’s highly likely that the multi-axis interface CPX-CMXX is the right solution for you.

Quick, precise, coordinated
When manufacturing electronic products, the electric drives must work with the greatest precision and speed. To maximise speed, the positioning axes are coordinated and travel is smoothed. The control platform CECX handles this challenge superbly.

Perfectly matched – through development in partnership
Talk to us. Together we can work out the right control architecture for your application.

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Motion control for gluing and cutting operations

Gluing and cutting in 2D space
When cutting tiles, cardboard, textiles or other flat materials, the finished product is cut from a continuous strip. This process requires a controlled gluing or cutting operation.

The continuous material flow cannot be interrupted while the material is being processed. That makes a special motion sequence necessary: the processing axis must be synchronised with the speed of the material flow.

CECX provides a solution for these demanding multi-axis motions. Thanks to the CoDeSys SoftMotion module libraries (PLCopen), even quite complex multi-axis applications can be realised very simply in a PLC environment. If the axis for material flow is not controlled by the CECX, the speed of the conveyor belt can be loaded into the control system via an encoder input.

Gluing process in three dimensional space
Motion control for gluing processes requires great precision and control as the same amount of glue has to be applied to a surface each time. The robotic controller CMXR, with its synchronised path motions, can master applications which were hitherto reserved for robots.

Even working on an inclined surface or tilted workpieces is easily and quickly dealt with: the tool coordinate system ensures easy set-up of applications even with inclined tools. The CDSA handheld terminal makes it easy to define the positions and quickly enter them.

Talk to us.
Together we can work out the right control architecture for your application. And you’ll only pay for the functions that your application really needs. Your task is what determines the solution.
An overview of control platforms and their functionality

A quick overview of the entire portfolio of motion control and multi-axis control systems and their possible applications. More detailed information can be found on the following pages.

New display generation: CDPX with integrated controller
Powerful processors are combined with widescreen technology for greater functionality, higher resolution and versatile access options.

Compact controller CECC
Compact and with more functions. For controlling electric and pneumatic drives for small tasks. Stand-alone or in mechatronic solutions via CoDeSys V3 provided by Festo.

CoDeSys integrated: controller CPX-CEC for CPX-Terminal
As an intelligent remote I/O terminal to IP65/IP67 directly on the machine, the CPX-CEC reduces installation costs. Ideal for CPX and motion applications with up to 31 electric drives.

Features
• Perfect graphic displays
• Very simple intuitive project engineering and programming
• Visualisation and remote access to data from anywhere in the world

Features
• Innovative: IO-Link master
• Hybrid: control electric and pneumatic drives directly and connect valve terminals
• Can be integrated with TCP/IP in higher-order systems

Features
• On-site installation
• Control platform to IP65
• Integrated in a valve terminal
• For easy control of valve terminal configurations with MPA or VTSA

Features
• Modular controller for control cabinet installation
• Soft motion functions
• Robotic functions (CMXR)

Modular: control platforms CECX and CMXR
A high performance option for electric and pneumatic drives, CECX expands the control range to include fieldbus master functionalities and electric actuation options. CMXR with robotics functions ensures minimal positioning times and enables path applications.
### Multi-axis control systems

<table>
<thead>
<tr>
<th>Module</th>
<th>Compact controller</th>
<th>Integrated controller</th>
<th>CPX terminal</th>
<th>Modular controller</th>
<th>Robot control systems</th>
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**Functionality**

- **Single axis (PTP asynchronous)**
- **C1: single axis (2D)**
- **M1: Interpolation (2D)**
- **Interpolation (2.5D)**
- **3D path interpolation**

**Maximum number of permissible axes**

- 4 axes: One axis is treated as a CANopen-participant. 128 participants (spec. according to CANopen).
- 8 axes: One axis is treated as a CANopen-participant. 128 participants (spec. according to CANopen).

**Motion**

- **PTP asynchronous**
- **3D interpolation with M1 variants**
- **Each axis moves with its own predefined parameter**
- **The axes do not reach their end positions at the same time and the path is not defined**

**Special features**

- **Stand-alone controllers**
- **Integration of two fast inputs (200 kHz)**
- **4 IO-Link masters for CEC-LK**
- **CoDeSys**
- **Function integration on the CPX terminal**
- **CoDeSys**
- **CoDeSys PLC**
- **Encoder interface**
- **Interupt function**
- **Fast clock pulse inputs**
- **Profibus master**
- **Two Can bus masters**
- **RS-232/ RS-485-A/422-A**
- **Handling systems**
- **Pick and place, palletising**
- **Path control**
- **Gluing**
- **Cutting**
- **Handling**
- **Flying saw**
- **Cam disc**
- **Path control**
- **Gluing**
- **Cutting**
- **Handling**
- **Flying saw**
- **Cam disc**
- **Handling**
- **Palletising**
- **Gluing**
- **Metering**
- **Painting**
- **Cutting**
- **Tracking applications such as processing moving parts on a conveyor belt or synchronous kinematic movement with up to 6D**

**Softmotion**

- PLC open
- CNC editor
- DXF import
- Cam disc editor

**Softmotion**

- PLC open
- CNC editor
- DXF import
- Cam disc editor

**Application example**

- Handling systems
- Pick and place, palletising
- Path control
- Gluing
- Cutting
- Handling
- Flying saw
- Cam disc
- Path control
- Gluing
- Cutting
- Handling
- Flying saw
- Cam disc
- Handling
- Palletising
- Gluing
- Metering
- Painting
- Cutting

**Enhanced flexibility due to CoDeSys PLC e.g. integration of vision system**

**Tracking function**

**Other axes (not mutually interpolating) can be actuated via the integrated CoDeSys PLC (PTP asynchronous). Recommended: 16 axes**

**3D path interpolation with an orientation axis for kinematic systems with up to 4 degrees of freedom. For example, three-dimensional gantry with an axis of rotation on the front unit.**
The mini control system that does more: compact controller CECC

CECC is a next-generation mini control system: the powerful processor in the mini control system range has significant reserves for tasks which reach far into mechatronics fields. Combined with the actuators and sensors of the machine part, Festo’s overall solutions are unique.

The CECC enables simple activation of electric or pneumatic drives, especially for small tasks. It can be used as a stand-alone unit or conveniently integrated into mechatronic solutions via the platform CoDeSys V3 provided by Festo. Simple programming and navigation to IEC 61131-3.

For programming of the control applications, all editors defined in the standard can be used to program the controller application, i.e. structured text (ST), sequential function chart (SFC), continuous function chart (CFC), function chart (FC), ladder diagram (LD) and instruction list (IL).

Special features
- Object-oriented programming
- Modern editors for simplified input
- Simplified configuration for fieldbus
- Multiple controllers in one project
- Improved troubleshooting functions
- Simplified project navigation
Benefits
• Hybrid: use CANopen Master and integrated IO-Link to directly activate electric and pneumatic drives and connect valve terminals
• Communicative: server and client Modbus TCP are easy to integrate into higher-level systems
• Convenient: simple data handling with USB interface
• 4 interfaces compatible with IO-Link Master

CECC features
• 12 digital I, 8 digital O
• 2 fast digital I, 200 kHz fast counters
• 32-bit ARM9 400 MHz processor
• Overall dimensions 130 mm x 100 mm x 40 mm
• Programming in CoDeSys V3
• Ethernet 10/100 MB
• CANopen Master
• Cage clamp plug
• USB interface
• LEDs for I/O, run/error and Ethernet
• Real-time clock with 21 days of buffer time

Variants
CECC-LK with additional:
• 4 IO-Link master interfaces
• 1 IO-Link device interface
Controller CPX-CEC

Intelligent and simple simultaneously: controller CPX-CEC for CPX terminal

As an intelligent remote system to IP65/IP67 installed directly on the machine, CPX-CEC reduces installation costs. It's ideally adapted for CPX and motion applications with up to 31 electric drives. Easy control of valve terminal configurations with MPA or VTSA is another bonus.

Integrated in the controller: CANopen master for intelligent controller of pneumatic and electric axes via fieldbus. Depending on the application, either with RS232 interface or softmotion function for 2.5 dimension interpolation. Flexible electronic camming functions included. The specialised CoDeSys function library provides diagnostics and condition monitoring options.

Benefits
- Total flexibility with modular I/O system; up to 512 I/O
- Economic: e.g. for manual workstations with stand-alone control and regulation
- Connection to all fieldbuses as remote controller and for pre-processing
- Diagnostics with flexible monitoring options for pressure, flow rate, cylinder run time, air consumption, early warnings and visualisation options
- Control of decentralised installation systems based on CPI, and of proportional and servoneumatics
- AS-interface control via gateway

Properties
- CPX-CEC variants:
  - RS232: CPX-CEC
  - CANopen master: CPX-CEC-C1
  - Softmotion: CPX-CEC-M1
- Powerful 32-bit microprocessor, 20 MB flash, 8 MB RAM
- Data memory 32 MB flash/32 MB RAM
- Communication network Ethernet 10/100 Base-T
- CANopen optional, only for CPX-CEC-C1
- Handheld for CPX terminal
- RS 232 interface optional, only for CPX-CEC
- OPC server for connection to any SCADA packages
- Run/stop switch
- LED indicators
Motion Control for multi-axis motions in CPX

**Powerplay on all fieldbuses: CPX-CM-HPP gateway**

Uniform control of up to four Festo electric drive units for handling, via fieldbus gateway and positioning profile FHPP. The gateway is ideally suited for integrating single-axis applications (point-to-point, asynchronous) on fieldbus/Ethernet.

**Benefits**
- Compatible with all electric drive units from Festo
- No programming required
- Improved diagnostics with plain text error messages
- Simplified engineering through uniform actuation of all Festo electric drive units
- Great economy: up to 8 single axes can be controlled in the system

**Properties**
- No interpolation
- Configuration via CPX-MMI

**Designed for multi-dimensional control: multi-axis interface CPX-CMXX**

The only multi-axis interface in IP65 for decentralised peripheral systems controls up to 8 Festo electric drive units in 2 groups. As a module in the CPX terminal, it offers a PLC-compatible interface for multi-dimensional axis control. Its CAN-Bus interface facilitates both simple single axis movements and coordinated movements.

**Benefits**
- Teach-in or input of positions into a pre-defined record structure
- Reduction of cycle times by “smoothing” the motions
- Integrated malfunction management
- Configuration of two axis groups with up to four axes each is possible
- Synchronous axis travel is possible

**Properties**
- Ethernet 10/100 BaseT (RJ45)
- DIP switch for operating modes and RUN/STOP
- Service interface (M12) for connecting the CPX-MMI handheld
- 1024 positioning records
- CAN bus interface
- Connection to additional fieldbuses
Control unit CECX

Powerful control unit CECX

The modular control unit CECX expands the control range to include fieldbus master functionalities and electric actuation options.

Simple commissioning, programming and service: The CoDeSys software provides a powerful programming environment via the SoftMotion module for controlling all electric drives with CANopen fieldbus connections. Also available are module libraries, configuration tools and drivers. The IEC 61131-3 standard means that CECX is flexible and open, and compatible with all types of control tasks. Whether for individual control of electric drives or interpolation with 2.5 degrees of freedom, CECX is the ideal combination of control and motion.

Benefits
- Control of electric drives with CANopen fieldbus connection
- Certified for CE, UL/CSA
- With top expertise for innovative integrated front-end solutions
- Standard CoDeSys software
- For PLC functions and multi-axis motions with interpolation
- Full compatibility through Profibus, CANopen and Ethernet

Properties
- Compact assembly, easy to handle
- Mounting on H-rail

Module selection
- CPU unit
  - Power PC 400 MHz
  - Ethernet
  - CAN-Bus
  - RS 485
  - USB
- Compact Flash card as removable storage
- Slots for optional modules

Optional modules
- Ethernet interface
- CAN-Bus interface
- RS 232 serial interface
- RS485/422 serial interface

Input/output modules
- Digital modules
- Analogue modules for current and voltage
- Temperature input modules (PT 100, NiCrNi, FeCuNi)
- Counter modules (encoder, SSI)

Communication
- Profibus master DP-V1
- Profibus slave DP V1

Two product versions

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Two product versions

CECX-X-C1 Modular master controller with CoDeSys

CECX-X-M1 Motion controller with CoDeSys and SoftMotion
For minimal positioning times: robotic controller CMXR

The multi-axis controller CMXR with robotic functions ensures minimal positioning times and allows path applications with up to six degrees of freedom, for tasks such as adhesive application, labelling or laser welding. The intelligent dynamic limiter monitors the limit values of the connected motors and mechanical drive components, resulting in 100% path accuracy and optimum cycle times.

An additional bonus: quick application creation thanks to efficient engineering with the Festo Configuration Tool (FCT) and intuitive programming with the Festo Teach Language (FTL).

Benefits
• For controlling simple and complex kinematic systems: free path control in 3D
• Fast commissioning due to harmonised interfaces to higher-order systems
• Reduced cycle times through skipping of positions, ramping of accelerations and constant path speed

Properties
• Modular controller with a number of extension modules from the CECX range, e.g. digital, analogue I/O
• Powerful motion control core:
  - Synchronous point-to-point (PTP) Movement
  - Cartesian linear and circular interpolation
• Optional wrist axes for aligning tools
• Individual programming of speed, acceleration and jerk
• Definition of tool centre points (TCP) and tool coordinate system for easy teaching

Optional: teach pendant CDSA for easy teach-in of positions
• With 2-channel permission button and emergency off
• With teach-in and positioning function with plain text display
• Flexible: online optimisation of motion programs with graphical dialogue system
Display and operator units FED and CDPX

Simple but multifunctional: display and operator units FED and CDPX

FED human-machine interfaces simplify the control of automation tasks at field level and set new standards in functionality and integration. The text-based, semi-graphical FED-40 ... -90 and touchscreen displays FED-301 ... -5000 make design extremely easy thanks to the supplied programming tool FED Designer.

Benefits of FED

- Straightforward designing of human-machine dialogues
- Convenient FED Designer WYSIWYG design tool
- Software for uploading projects

FED-40 ... -90

- Semi-graphical display of process values makes them easier to read
- Simple graphics are possible, and therefore scalable font size and simple illustration of pictograms and bar graphs can be displayed
- No parametrisation required

Properties

- Display: monochrome, backlit LCD, 4x20 characters
- Recipe memory: 16 kByte
- Serial interface
- Optional Ethernet interface
- Multi-language function
- Realtime clock from FED-50
- Battery backup of the alarm and event data

FED-301 ... -5000

- Simple logging of events and alarms
- Graphics-capable for maximum flexibility when displaying processes and data

Properties

- Freely-definable user interface
- Display: LCD monochrome, TFT colour
- Display size: 3.8 ... 15"
- Display resolution: 320 x 240 ... 1280 x 800 pixel
- Ethernet interface (FED 301/501 optional)
The next-generation display that is also a server: CDPX

Powerful processors combined with widescreen technology. Thanks to modern touch technology, the planned dialogue with machines and systems is extremely easy. Perfect graphic displays, simple, intuitive project planning and programming with Designer Studio – the complete package for man-machine applications. CDPX visualises data and acts as a server for external clients worldwide. Ideally matched to Festo controllers (CoDeSys V2.3 and V3) and Modbus TCP networks, they display data and parameters in graphic format simply and flexibly. In combination with the local I/O module and/or CAN interface, the optional CoDeSys V3 controller turns an MMI into a full-fledged control system – the display and PLC form a single unit.

Benefits
• Perfect graphic displays on high-resolution widescreen touch displays
• Simple, intuitive project planning and programming with Designer Studio – the complete package for human-machine applications
• Communicative: Simple networking and setup via the integrated Ethernet interface
• Added functionality: Modbus TCP allows data and parameters from Modbus devices by other manufacturers to be displayed

Variants
CDPX-X-A-W-4
• 4.3” TFT display
• Resolution 480 x 272, WQVGA

CDPX-X-A-W-7
• 7” TFT display
• Resolution 800 x 480, WVGA

CDPX-X-A-S-10
• 10.4” TFT display
• Resolution 800 x 600, SVGA

CDPX-X-A-W-13
• 13.3” TFT display
• Resolution 1280 x 800, WXGA

Properties
Interfaces
• 2 Ethernet connections 10/100 MBd (switch functionality)
• 2 USB connections (CDPX-...4 with 1 x USB)
• 1 serial interface
• 1 SD card slot
• RTC

Options
CDPX-SL-C3
• CoDeSys V3 provided by Festo

CDPX-EA-V1
• 20 digital inputs
• 12 digital outputs
• 4 analogue inputs
• 2 analogue outputs

CDPX-F-CO
• CANopen module
Software tools – faster project design, commissioning and operation

Intelligent automation
Festo continuously analyses and identifies potential improvements so that tasks can be made faster, simpler, better and more targeted through the use of software tools, Festo is active, with continuous analysis and identification of potential improvement.

Convenient configuration:
Festo Configuration Tool FCT
• All the drives in a system can be managed and stored in a common project
• Project and data management for all supported device types
• Simple to use thanks to graphically supported parameter entry
• Universal mode of operation for all drives

Convenient communication:
Festo Handling and Positioning Profile FHPP
• Optimised data profile
• For handling and positioning tasks
• FHPP permits the actuation of Festo motor controllers via standardised control and status bytes

Convenient design:
PositioningDrives planning tool for electric drives
• Simple and fast project planning of axis-motor combinations
• Calculates the ideal combination of electric linear axes, motors, gear units and controllers
• Displays characteristic load values
Convenient and flexible programming: CoDeSys software

CoDeSys allows standardised programming to IEC 61131-3 and is perfect for configuring, programming, commissioning, and maintaining pneumatic and electric automation solutions.

Multifunctional in use
- Flexible and open for all types of control tasks, module libraries, configuration tools and drivers for control of electric drives with fieldbus
- Ethernet communication

Multiple languages and functions
- Ladder diagram
- Structured text
- Instruction list
- Function chart
- Sequential function chart
- Expansion for object-oriented programming
- Function block library for all Festo drives
- All programming languages usable in combination

PLC programming conforming to IEC 61131-3 standards ...

... can be learned. Festo Didactic, the global market leader in industrial automation training and education offers special training courses for controllers CECC and CPX-CEC with the CoDeSys software. Companies increase flexibility significantly by using various programmable logic controllers (PLC) and programming which conforms to standards. After this seminar, participants are up-to-speed in programming to standards and have the technical and methodical expertise required to prepare their trainees for examinations, for example.

More information:
www.festo-didactic.com

Convenient teaching and intuitive programming: Festo Teach Language FTL for CMXR

Movement programs for kinematics: you don’t need extensive programming training to use the FTL programming language. It focuses entirely on the application.
- Intuitive FTL language with macros
- Straightforward storage of project data thanks to clear project structures

- Correct positions quickly
- Text files for easy editing and transfer to existing programming systems
- The data can easily be imported and exported using the FCT or a USB stick
- Forward-looking processing avoids risks such as overloading; the CMXR controller and the FTL programs calculate events in upcoming movement commands

Example of FTL program

Macros
- Movement, dynamics and robot macros

Variables
- BOOL, integer, real, string

Logic commands
- IF ... THEN ... ELSE
- WHILE ... DO
- LOOP

Companies increase flexibility significantly by using various programmable logic controllers (PLC) and programming which conforms to standards. After this seminar, participants are up-to-speed in programming to technical and methodical expertise required to prepare their trainees for examinations, for example.

More information:
www.festo-didactic.com
Customised handling systems

Festo’s problem-solving expertise means more than just products
Whether you’re “just” using our components or you want a complete system solution, our specialists use suitable software tools to make sure that the solution is always right for your machine. We accompany you every step of the way, from offering advice to designing complete handling solutions through to the commissioning of turnkey subsystems – not to mention our comprehensive after-sales service.

Components for handling
Everything for the entire handling chain.
- Linear movements: with numerous linear axes such as the powerful and stable electric linear axis EGC
- Rotating, gripping, vacuum solutions, for example with the highly modular vacuum generator OVEM, the sturdy T-slot gripper HGPT-B, or the extremely precise and compact swivel module DSM-B
- For quality assurance, diagnostics, commissioning and function monitoring of rapid motions: the low-cost compact vision systems SBOx-M or SBOx-Q

Turnkey handling systems from the multi-axis modular system
Our wide portfolio of handling systems is based on many years of experience. Whether pneumatic, servopneumatic, electric or a combination – all systems are tested and ready for installation:
- Pick and Place
- Linear gantries
- Cantilever
- Three-dimensional gantries
- Tripod kinematics

Profit from our know-how
Our experts will design the complete system solution according to your requirements and will take care of testing and commissioning. Not only that, they’ll use suitable control architecture to integrate the complete solution into your communications networks and coordinating systems.
Compact vision systems

Our innovative and intelligent compact vision systems are versatile in application thanks to their compact industrial design, and simple to integrate thanks to standardised interfaces and open fieldbus communication.

Compact vision system SBO..-Q CoDeSys 2.3 embedded:
Intelligent vision systems for a wide range of applications: From 100% quality inspection and measuring of parts, position sensing and rotary orientation sensing, or reading 1D and 2D codes and normal text. The parameters for test and inspection programs can be set easily using the CheckKon & CheckOpti software packages – no programming knowledge required.

Complex inspection sequences are simple to create using the integrated PLC with the standardised languages of IEC 61131-3. Stand-alone production areas can also be controlled via the vision system: with CANopen master functionality, servo controllers and decentralised I/O can be connected directly even without using a centralised PLC. A further advantage is the optimal connection of the camera to a host of Festo and third-party control systems through standardised software interfaces via Ethernet (TCP-IP, Easy IP, Telnet, ModbusTCP) and CAN, as well as integrated 24V I/O.