

Study on parallel kinematic system with CPX/EMCA

FESTO



Robotics without a control cabinet!

Highlights

- Robot controller without control cabinet – with IP65/67 protection thanks to CPX
- All-in-one integrated electric drive EMCA
- Very fast, light and compact
- Maximum economy
- Virtual commissioning with CIROS by Festo Didactic
- Paving the way for Industry 4.0

Robotics is getting ready for Industry 4.0 with the high-speed handling system EXPT with CPX/EMCA. CPX control technology from Festo for an IP65/67 environment and the numerous functions included in the new “integrated drive” EMCA facilitate robotic functionality without a control cabinet that is close to revolutionary. The pioneering combination of standard and cost-effective components is further enhanced by the latest Festo hardware and software. And it offers even more:

Such as virtual commissioning, OPC-UA interfaces for Industry 4.0 or the Internet of Things (IoT) and Codesys V3 Softmotion transformation models with calibration options. The delta kinematics with free movement in 3D space make pick & place extremely dynamic.

Light, compact, agile

The extremely lightweight and compact research model with CPX/EMCA saves space in integration and is very economical. All components are above the working space, wiring is minimised and the

control cabinet-free IP65 design makes it quick to install. Connect 24 V and you're done.

Virtual modelling and commissioning

With the CIROS software from Festo Didactic, the virtual behaviour model is created and configured using the library, and serves as a simulation for the real system which is still to be produced. This means that the controller can already be developed and tested for the entire installation. This paves the way for Industry 4.0.

Study on parallel kinematic system with CPX/EMCA

Robot controller without control cabinet

The robot controller with CPX revolutionises decentralised automation in the machine – as does control with our latest “integrated electric drives” EMCA. Thanks to IP65/67 protection, the controller and the parallel kinematic system

do not need a control cabinet. The electro-pneumatic control chain runs via an integrated CODESYS controller, from I/O signals and simple motion control to transformation of the parallel kinematic system with a calibration option. It is programmed in X, Y and Z Cartesian coordinates.

EMCA function integration

The latest generation of intelligent electric drives is particularly easy to use and efficient. The maintenance-free EC motors are brushless DC motors with absolute position recording, integrated regulator, power electronics, absolute encoders and offer the option

of adding absolute multiturn encoders, integrated holding brakes and fieldbus interfaces. CANopen is used in the parallel kinematic system, and is easy to control with CANsync and the interpolated mode.



Function integration CPX

The integrated CODESYS V3 controller with SoftMotion makes on-site robot path control possible. It is networked via Ethernet in the Internet of Things (IoT), and OPC-UA is integrated as a new communications interface option for vertical and horizontal networking as part of Industry 4.0. The motors for the EMCA are controlled directly by CPX via CANsync, as are all remote I/O and pneumatic functions for pick & place. The complete sub-system can thus be controlled from the automation platform CPX.

AML for virtual modelling and commissioning

Automation Markup Language is designed for the virtual programming and commissioning of automation systems. Conveyor belts and parallel kinematic systems are synchronised and operated by linking the real and virtual world. The data can be further processed virtually to ensure that PLC programming is continuously optimised before the hardware is delivered.

The system can be created and optimised virtually in CIROS. The parallel kinematic system is integrated in the model as a sub-function. The virtual components are then gradually replaced with real ones. The complex controller is developed and tested from the outset; this improves the quality and reduces commissioning time. As a data exchange format, AML is a planned standard for I4.0, as it can map the geometry, kinematics, behaviour and sequence of programmes, and represents hierarchies.

Software tools for programming can thus use data from other software tools, e.g. for project planning and development. The data, which is described semantically in a non-proprietary, non-domain-specific format, is kept in one file for the entire system description, and for the duration of the complete engineering process.



Parallel kinematic system/delta kinematics EXPT from the regular Festo catalogue range can be adapted to the application

- Length of the axes, angle of incidence and thus load and dynamics
- Up to 150 picks/s
- Type of control
- Integration in existing installations and control concepts
- Camera/vision systems
- Path synchronisation (currently not available for parallel kinematic system with CPX/EMCA)

The experts at Festo will be happy to help you.

LxWxH: 962x548x412 mm

LxWxH: 223x120x100 mm

LxWxH: 210x100x55 mm

-98%
Reduced volume

Significant space savings with the CPX terminal as a parallel kinematic system controller and the integrated EMCA drives.

Industry 4.0 – Modular, changeable, decentralised installation and control concepts with Festo CPX, CODESYS Softmotion and OPC-UA

Factory automation

Control complete machine cells or small machines, for example for assembling small parts, at manual workstations, in test and inspection machines, for upstream functions such as dancer regulators and handling devices right up to 3D, including T/H-planar surface gantry, and parallel kinematic system. With automation platform CPX.

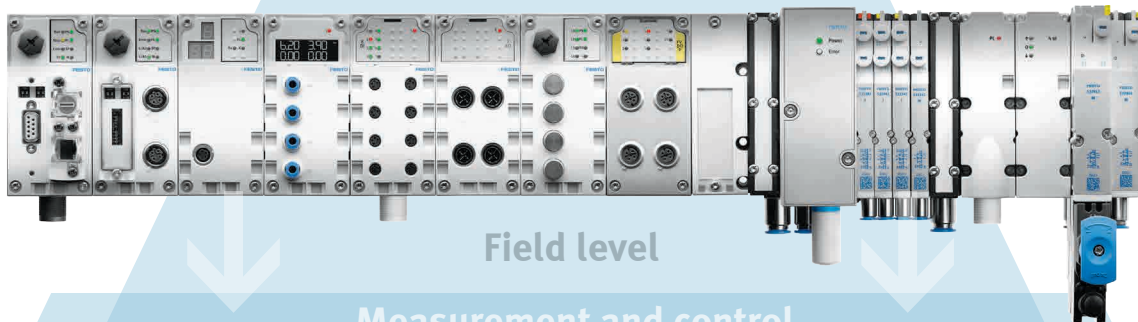
Process automation

Control fluid and discrete processes with fluid and motion control, for example for filtration and osmosis, in the biotech/pharma and chemical industries, packaging machines and machine tools, for dispensing, mixing, cooling, lubricating, washing, cleaning and sterilising. With automation platform CPX.

Management level

Interface

Control level



Field level

Measurement and control

Sensor/actuator level

