Innovative learning solutions for Industry 4.0

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Maximum flexibility with an integrated learning system

Industry 4.0 sustainably transforms work environments. Increased networking, flexibility, and complexity of processes require new skills and qualifications. Employees with technical and vocational education, and subsequent specialized training, must understand complex process workflows to ensure trouble-free system operations.

The prerequisite for this is experience mastering systems with decentralized intelligence, mastering data handling and analysis, and developing confidence in the ability to ensure problem-free system operation.

The learning solutions from Festo Didactic bridge the gap between basic, theoretical knowledge and practical, hands-on experience, empowering learners to perform competent work.

With a modular and integrated Industry 4.0 learning concept, we offer you the maximum flexibility to define individually customized learning content and learning scenarios.

Start small with Industry 4.0 fundamentals. An extension of your existing system to different levels is possible at any time.

MPS® 203 I4.0 – Basic level

MPS® 203 I4.0 not only conveys the fundamentals of automation technology, but also provides a simple and logical introduction to the essential uses and principles of Industry 4.0, especially for mechatronics technicians.

CP Lab – Advanced level

The Cyber-Physical Lab is our professional and compact Industry 4.0 learning system. It includes the relevant technologies and components for conveying comprehensive knowledge of Industry 4.0.

CP Factory – Expert level

CP Factory, the smart, universal Industry 4.0 learning factory, meets tomorrow's production requirements for flexibility, agility, versatility, and efficiency. CP Factory is characterized by standardized and mobile factory modules, open interfaces according to industry standards, and Plug & Produce solutions.

MPS® 203 I4.0 – Basic level

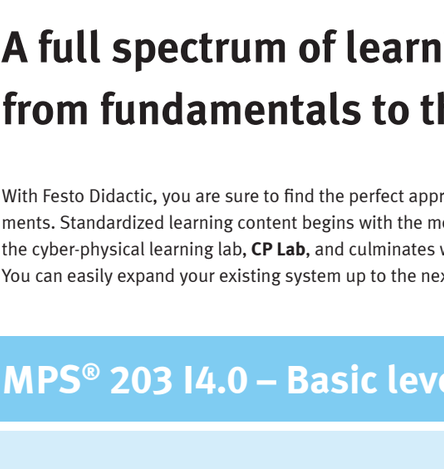
CP Lab – Advanced level

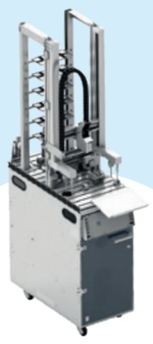
CP Factory – Expert level

A full spectrum of learning solutions – from fundamentals to the learning factory

With Festo Didactic, you are sure to find the perfect approach to Industry 4.0 – adapted to your learning level and course requirements. Standardized learning content begins with the modular, mechatronic production system, **MPS® 203 I4.0**, continues with the cyber-physical learning lab, **CP Lab**, and culminates with the **CP Factory**, our smart, universal Industry 4.0 learning factory. You can easily expand your existing system up to the next level at any time.

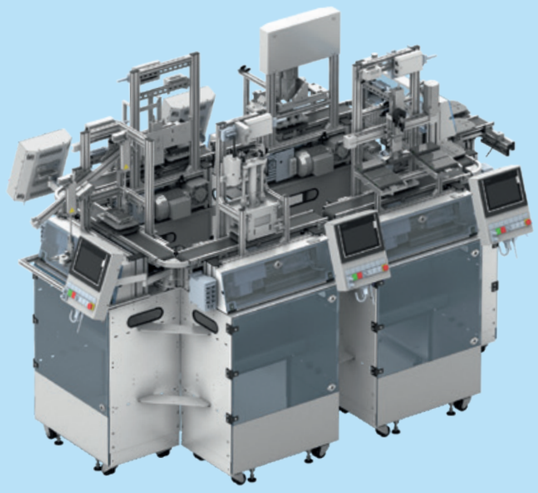
MPS® 203 I4.0 – Basic level





Planned connection by CP feeder

CP Lab – Advanced level



Connection through the mobile robot platform Robotino®

CP Factory – Expert level

i4.0

Learning Content

- RFID technology
- Digital product memory
- Service-Oriented Architecture
- Augmented Reality
- Assisted commissioning
- Manufacturing Execution System (mini MES)
- Basics of network technology
- OPC communication
- PLC programming
- Application of web services in a production environment
- Maintenance tasks
- Sensor technology in manufacturing

Additional learning content

- IT security
- Plug & Produce
- MES4 / Cloud
- HMI & failure procedure
- Push mail
- Creation of resources and processes
- Creation of part numbers
- KPI / OEE
- Pallet transfer
- Fleet management mobile robots
- RFID + BCD coding
- QR code / data matrix
- Rotary encoder
- Frequency converter
- Control technology
- Energy monitoring and management

Additional learning content

- Distributed production systems
- Cloud-MES
- SAP ERP interface
- Flexible manufacturing / FMS
- Multi-variant production
- Smart maintenance
- Dynamic routing
- Logistics / factory planning
- Collaborative robotics
- Robot assembly with camera
- Multi-vendor systems
- Servo drive technology
- MCS (Multi-Carrier-System)
- Energy recovery / efficiency
- Laser engraving
- 3D printing

Advanced Industrial Control Systems

Industrial Control Technology, PLC, and HMI

Working on modern control systems as a basis for future Industry 4.0 concepts:
- PLC / industrial computer
- Human Machine Interface
- Drive regulator

Embedded Controller, IoT, Plug & Produce, Cyber-Physical Systems

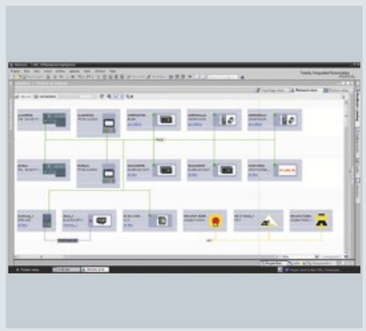
Become familiar with modern Industry 4.0 standards, such as smart components:
- Decentralized control
- Self-configuration
- Data collection and pre-processing

Identification and Object Related Data

Demonstrate the close integration between individual components and order data through data storage directly on the product:
- RFID / QR code
- Batch size 1 manufacturing / tracking

Data Communication, Processing, and Security

Open Communication Standards

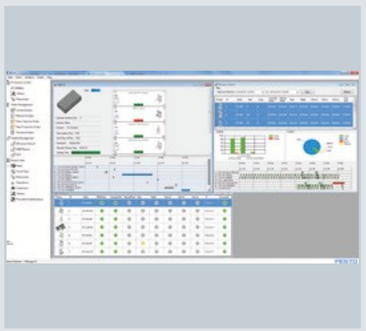


Acquire basic Industry 4.0 competencies using industrial communication based on open standards:
- TCP/IP / Profinet / Ethernet IP
- OPC-UA
- AMQP

ICT, Cloud, and ICS Cyber Security

Acquire competencies for reliable and secure data communication:
- Highly available network rings
- Mains separation via VLAN
- Firewalls, encrypted VPN connections
- Securing (cloud) services

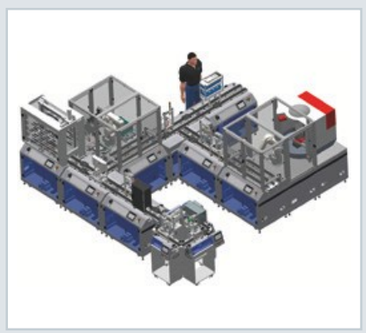
ERP, MES, Data Processing, Analytics, and KPIs



Develop skills for selecting relevant production data to increase productivity:
- KPI calculation
- Data analysis
- Production planning and control

Advanced Manufacturing Concepts

Factory Layout Planning and Simulation



3D factory simulation for modeling, visualizing, and analyzing robot cells and production facilities:
- Layout planning of new systems
- Optimization of existing systems
- Digital twin for Industry 4.0

Advanced Robotics Concepts

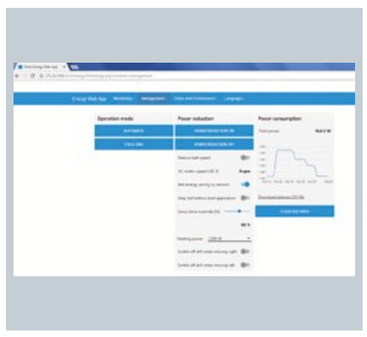
While robots assume a steadily growing number of automation tasks, they still require operators and workers to learn new skills:
- Collaborative robotics
- Mobile and autonomous robotics

Flexible and Additive Manufacturing Concepts

Modern CNC technology, as well as innovative 3D printing, require comprehensive specialist and process knowledge:
- 3D print editing
- CAD / CAM / CNC
- Automation / robotization

Data Driven Optimization of Manufacturing

Quality Control and Energy and Resource Efficient Manufacturing



Systematic acquisition and control of operating conditions and energy consumption:
- Industrial energy measurement
- Web-based energy management
- Efficiency, cost, and environmental considerations

From Monitoring to Smart Maintenance Strategies

Management of service and maintenance orders:
- Error messages and assisted order processing with mobile devices
- Spare parts management

Next Generation HMI – AR, Smart Glasses

Intuitive and continuously available data visualization for human-machine interactions:
- AR for smart phones and tablets
- Efficient use of wearables
- Open format for own extension