Festo Didactic Industry 4.0 Learning Systems

FAQ – Frequently Asked Questions

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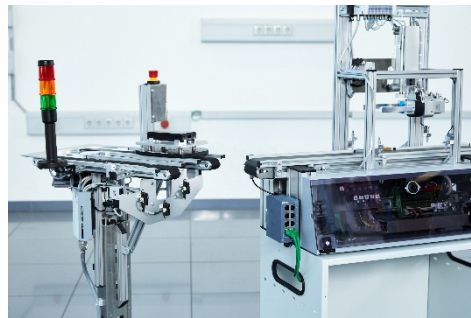
Questions

Answers

General	
What does Industry 4.0 exactly mean?	The term "Industry 4.0" stands for the fourth industrial revolution, a new level of organization and control of the complete value chain over the entire lifecycle of products. It is the next phase in the digitization of the manufacturing sector, driven by four facts: • the rise in data volumes, computational power, and connectivity; • the emergence of analytics and business-intelligence capabilities; • new forms of human-machine interaction such as touch interfaces and augmented reality systems; • improvements in transferring digital instructions to the physical world. It is based on cyber-physical production systems that combine communications, IT, data and physical elements.

What are the major Industry 4.0 features?	Several technologies underpin today's smart factory:
	• Blending of the physical world of production with the virtual world of information technology and the Internet • People, machines, objects. and systems are networked and communicate in real time • All instances of the value chain are connected across the company in these intelligent (cyber-physical) production systems • Industrial production meets individualized customer requests at a high level of quality, while delivering greater flexibility and robustness, as well as optimum use of resources • From the hierarchical to the decentralized, intelligent network • Production systems are all digitally networked • Intelligent, plug & produce-compatible components • System has a virtual image; this permits automatic commissioning and reconfiguration • Automated adaptation of production lines to order volume by simply and quickly increasing or reducing the size of the system • Easy compensation for defective production units • Production control becomes more intelligent and more adaptive • People and technology come closer and closer together
Festo Didactic Equipment	
Do you have any learning system to teach Industry 4.0 topics?	We can provide our customers with a wide range of learning systems to teach Industry 4.0 topics. Depending on the topics, education level and budget, we can fulfill the different customer needs.
What does CP mean?	CP stands for cyber-physical. Cyber-physical systems (CPS) are systems equipped with software and electronics. They can connect to each other or to the outside world (internet) by sensors and actuators. Cyber-physical systems transform traditional plants into smart factories. Here, machines "talk" to products and other machines, objects deliver decision-critical data, and information is processed and distributed in real time resulting in profound changes to the entire industrial ecosystem.
How modular and scalable is your learning concept?	The modularity is the most important feature of our products (CP Lab and CP Factory). The main objective is to offer a complete learning concept starting from

	the basic level of mechatronics up to the full-integrated manufacturing and production line (Smart Factory).
What are the main differences between CP Lab and CP Factory?	The CP Lab module is a compact stand-alone system designed for only 1 application. It can either used on lab furniture or on mobile trolley. The CP Factory has a real industrial look and allows training in various stations of a real production plant. The double-sided design of a CP Factory module allows student to work in team with 2 different applications. Due to the industrial design, CP Factory can be perfectly used for research projects.
How to combine between CP Lab and CP Factory?	The combination between CP Lab and CP Factory can be done by using the CP Bridge. In addition, mobile transport vehicles (mobile robots) can be used in order to move workpieces between CP Lab and CP Factory.
What are the Industry 4.0 features available in CP Lab and CP Factory?	Industry 4.0 features available in CP Lab and CP Factory: • Modularity (reconfigurable and adaptable system) • Lean assembly • Mobile robotics • Cyber Physical systems • Cloud • OPC-UA • Augmented reality • Near Field Communication (NFC) • RFID Technology • Smart manufacturing (batch size 1) • Internet of Things • Open interfaces • Plug & Produce • IT-Security • Simulation
What is the minimum budget to start investing in CP Factory?	200.000 Euro
What does MES mean?	Manufacturing execution systems are computerized systems used in manufacturing, to track, document and monitor the transformation of raw materials to finished goods. MES works in real time to enable the control of

	multiple elements of production process (e.g. inputs, personnel, machines and support services)
Festo Didactic offers MES for order entry. Is it possible to go one level higher and use an ERP system such SAP ME?	Yes. ERP system can be implemented in CP Lab as well as in CP Factory.
What are the customer benefits investing in Industry 4.0 learning systems of Festo didactic?	Customer benefits: • Didactically and functionally balanced learning environment to convey Industry 4.0 skills with a practical orientation • Easy and modular introduction to the world of Industry 4.0 which can be expanded in a needs-oriented way • Flexible definition of learning content and training scenarios • Flexible usage for undependable team work scenarios • Access to latest innovative industrial technologies like Cyber-Physical Systems, RFID, NFC, Plug & Produce, mobile robotics, OPC-UA etc. • Improvement of technical knowledge and increase of student´s employability due to real-life experience
Can CP Factory be used for research purposes?	CP Factory is a learning system in industrial environment. Due to the open interfaces, CP Factory can be perfectly used for technical research purposes (e.g. Plug & Produce, IT-Security, Energy management, Predictive maintenance, etc.) It is currently used by different research institutes in Germany (e.g. Fraunhofer IPA, Institut für Industrielle Fertigung und Fabrikbetrieb (IFF) Universität Stuttgart) for the following topics: • Machine configuration according to equitable construction unit in the production • Easy and flexible networking in production (Creation of individual rules for networked production) • Resource-efficient production (manufacturing processes to the same or higher output at lower energy consumption and resource input) • Scalable control technology for networked manufacturing • System dimensioning with simulation • Lean Production in complex production processes • Designing adaptable factories

How long can Festo Didactic guarantee to keep the modularity of the concept? How sustainable is your concept?	The modularity and expandability of CP Lab and CP Factory are the greatest strength that makes our concept very attractive and beneficial for our customers. We will retain our concept and continue to improve it in the future.
What training opportunities are provided in your system?	Many learning contents can be covered by CP Lab and CP Factory. The training plan can be divided into 2 levels: • Basic level: - Electrical and pneumatics circuits - Electrical drives - Sensor technology - Fieldbus technology - PLC programming - Robotics - Vision control - Process control • Advanced level: - Manufacturing Execution System (MES) - Flexible Manufacturing System (FMS) - Cyber Security - Energy Management - Logistics - Networked production
Training and qualification	
What trainings can be offered on the CP product line? What can you tell me about your qualification program?	**AUT511: Industry 4.0 – The Interplay between Components and Technologies** Benefits: Explore the CP factory training system together with our experts, Jointly develop first applications for customer´s lessons, Plan customer´s first training lesson Target group: Vocational Teachers, Instructors, Trainer Contents/modules: the CP factory training system - from the sensor/actuator level to industrial networks and MES, didactic transposition in vocational education, planning of learning units based on the CP factory

	Module 1: Introduction to I 4.0 - Introduction to Industry 4.0, VDMA toolbox and self-check /evaluation on the way to Industry 4.0, Safety briefing, First contact with the CP Factory
	Module 2: Interaction between components - Knowledge of components and their functions, Getting information of the components via QR-Codes, Basic understanding of the connection between the components
	Module 3: PLC programming I 4.0 – Basic knowledge of PLC programming, Understanding of the PLC structure of the CP Factory, Connection between PLC and Industry 4.0
	Module 4: Human Machine Interface - Basic Knowledge of the Human Machine Interfaces used in the CP Factory, Ability to program a Human Machine Interface
	Module 5: RFID as key technology - Importance of information technologies in context with Industry 4.0, Basics of product identification, RFID technology used in the CP Factory, Needs, benefits and opportunities of RFID in context with industry 4.0
	Module 6: MES - Structure and functions of the MES4, MES in context with Industry 4.0
	Module 7: Project work – Workshop: How can vocational trainers integrate the CP Factory and AUT 511 into their own lessons
	Duration: 3-5 days
	AUT 521: Industry 4.0 – Applications in Practice
	Benefits: Get to know the Industry 4.0 fields of action concerning operation and maintenance of production plants, Jointly develop first applications for customer´s lessons, Plan customer´s first training lesson
	Target group: Vocational Teachers, Instructors, Trainer
	Contents/modules: Smart maintenance, Energy transparent machines/systems, Flexible production: visualization, parameterization and control of orders, Dealing with data: analysis of key parameters, data storage and security

	Module 1: Introduction to I4.0 - Introduction to Industry 4.0, VDMA toolbox and self-check /evaluation on the way to Industry 4.0, Safety briefing, First contact with the CP Factory
	Module 2: Material- & information flow - Knowledge of the functions and elements of the CP Factory, Ability to work with the CP Factory in the "Default Mode"
	Module 3: Value stream I 4.0 - Added value and waste, Value stream mapping at the CP Factory, Value stream design at the CP Factory, Value stream in context with Industry 4.0
	Module 4: Production control - General methods of production control, The function of MES 4, Production control in context with Industry 4.0
	Module 5: Smart Maintenance - Different maintenance strategies, Using Big Data and OEE to improve maintenance and processes, Augmented reality as support for smart maintenance
	Module 6: Project work - Workshop: How can vocational trainers integrate the CP Factory and AUT 521 into their own lessons
	Duration: 3-5 days
Upgrade existing mechatronics learning systems	
I have a Festo Didactic mechatronics learning system. It is possible to upgrade the system to an Industry 4.0 solution? Is it possible to upgrade step-by-step?	An upgrade of mechatronics system to an industrial solution is possible and can be done step by step. Please contact Solution Center Sales Team: did_sc@festo.com
Is it better to invest in upgrading an existing system or in purchasing a CP Factory?	Depending on the existing system and the customer´s budget. Please contact Solution Center Sales Team: did_sc@festo.com
I have my own robot, PLC and CNC machine in my lab. Can I easily integrate them in your solution?	Depending on the existing system. Please contact Solution Center Sales Team: did_sc@festo.com
How can I upgrade my existing MPS line to Industry 4.0?	By adding palette transfer system with RFID technology and MES. Please contact Solution Center Sales Team: did_sc@festo.com
Services	

How can I update my I4.0-learning system in the future?	Due to the modular design, stations, and modules can be easily added any time. Please contact Solution Center Sales Team: did_sc@festo.com
Can Festo Didactic offer a maintenance and service contract on a long term?	Yes. Up to 5 years.
How fast can you deliver my system?	Depending on the extent and complexity of the system, the delivery time takes about 12-18 weeks.
Where to find references?	A reference list will be prepared and published in January 2017.

If you have any further questions frequently asked by your customers and want to learn the answer don´t hesitate to let us know!

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