Didactic Product Highlight

FESTO



Technical education
The key to progress

”

The most relevant innovations in the smart factory environment arise in the software area. We pay particular attention to making these topics visible and thus understandable.

“

Dr. Stefan Kapp,
Product Manager for Factory Automation Software, Festo Didactic SE

Our holistic approach

Technical education thought through




Curriculum
Courseware
Festo
Learning
Experience



Factory automation in the professional world

Technical education – the key to success

Changing requirements in industry
Industry is undergoing a process of permanent and increasingly rapid change. In addition to core technologies such as pneumatic, hydraulics, and mechatronics, new subject areas are constantly being added to the competencies of factory automation through constant innovation.

Industry 4.0-related technologies such as IT security, machine learning, and energy efficiency are creating new opportunities, and equally new challenges, in the factory environment. Integrating new technologies is only half the story. Finding well-trained specialists remains the decisive factor for manufacturers. Festo Didactic is your trusted industrial education partner for technical competencies and Industry 4.0 skills development.



The skills gap
Technological innovations are finding their way onto factory floors faster than ever before.

For successful application, both existing employees and new employees must be trained accordingly.

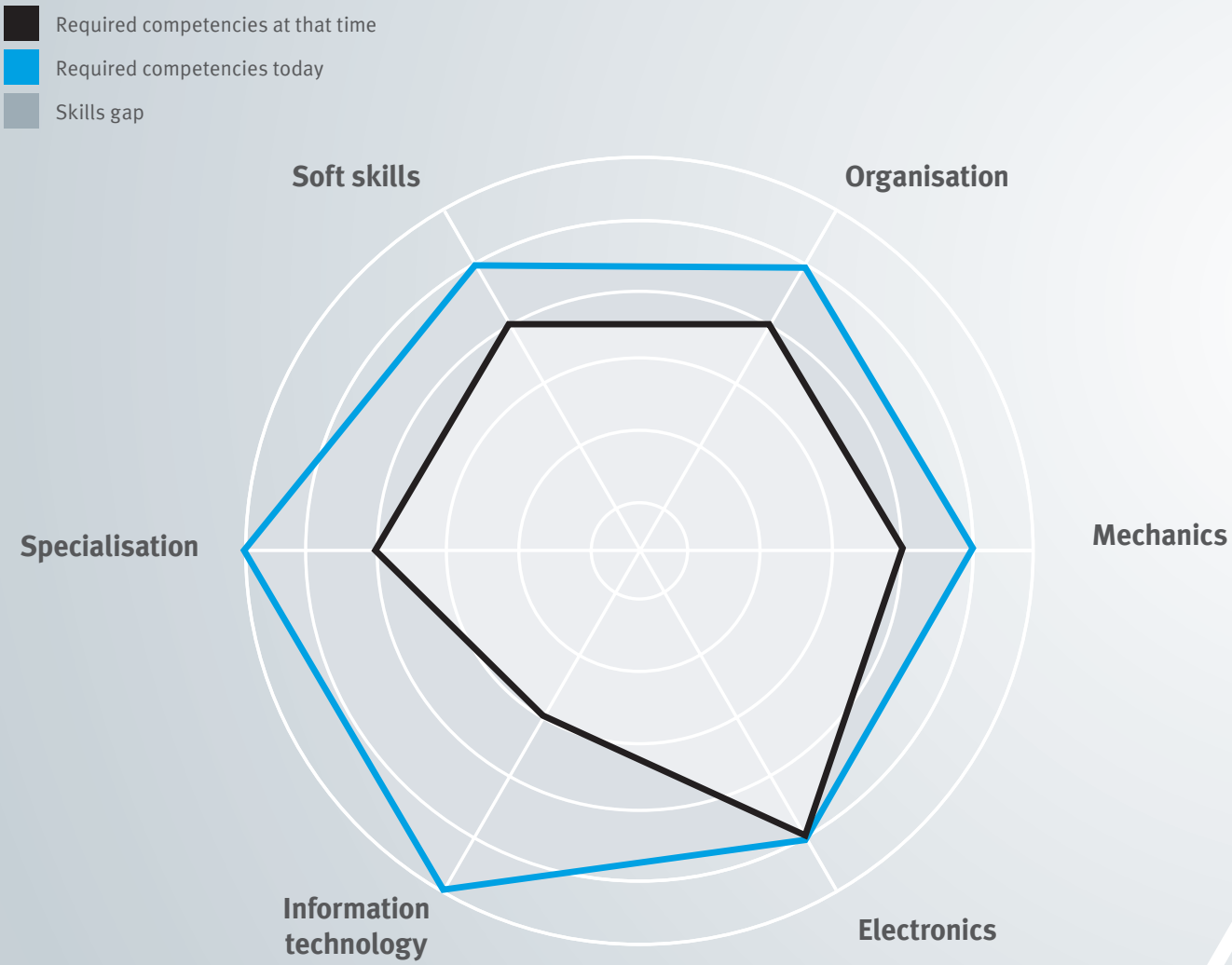
In practice, it often takes a while for new competencies to become embedded into curricula and training regulations. This process often cannot keep up with the rapid pace at which new technologies establish themselves on the market. Likewise, existing training methods often no longer fit today's requirements for lifelong learning.

This has created a skills gap – that is, a difference between the skills needed in the industry and those that employees actually possess. We are closing this gap through advanced training and development programs.

→ www.festo.com

Competency requirements in view

Tailored education for the skilled workers of tomorrow



Schematic illustration of the competency profile for the job profile mechatronics technician

The competency diagram of a mechatronics technician shows the technologies and soft skills that will be required alongside the traditional fundamentals of mechanical engineering and automation technology. A clear shift in the need for information technology expertise is also discernible.

As a globally networked education partner with industrial DNA, we first translate current and future skill requirements from industry and educational institutions for various occupational profiles into competence diagrams. These diagrams visualise the changes in competence requirements and thereby make the necessary qualification needs clearly visible.

Technological changes influence the competencies of different job profiles. Our qualification program is based on an analysis of current and future competencies that will adequately prepare the technicians and engineers of tomorrow.

We focus primarily on the following job profiles:
In vocational education
- Mechatronics technician
- Industrial electrician
- Industrial mechanic
- IT specialist

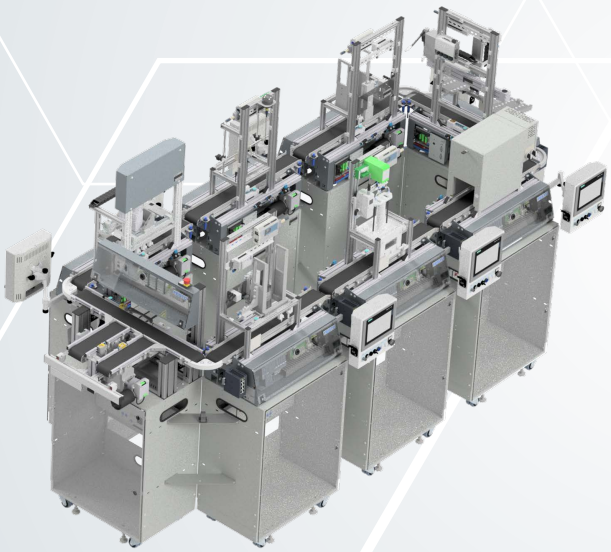
In advanced education
- Maintenance technician
- Automation engineer
- Data scientist/- analyst
- Production specialist

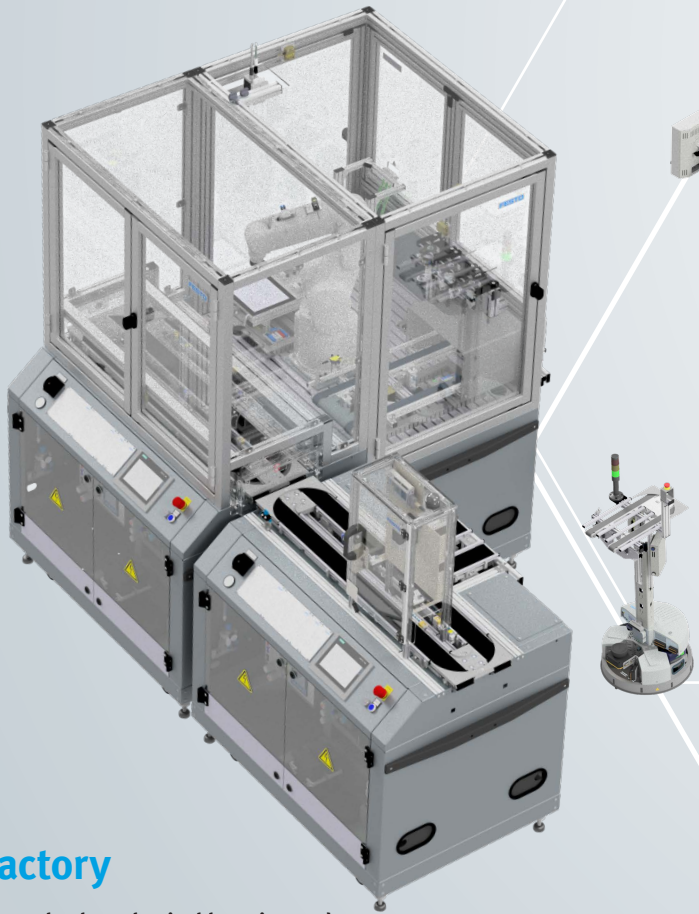
The right solution for every requirement

Industry 4.0 learning factory portfolio

CP Lab

Festo CP Lab learning systems are used for Industry 4.0 competitions at national, regional, and international skill competitions.



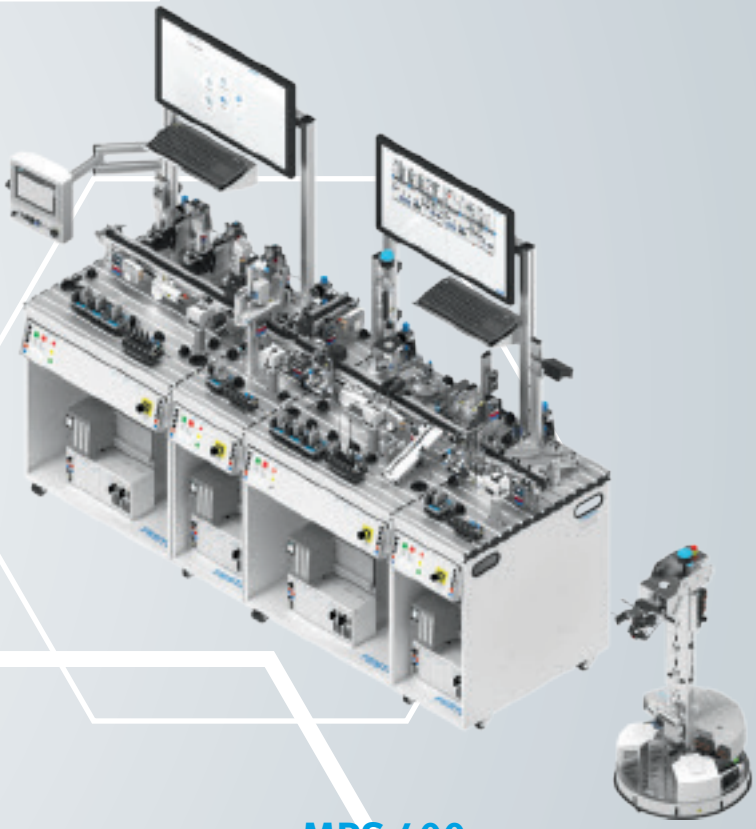


CP Factory

Our universal cyber-physical learning and research platform for Industry 4.0 models the technologies of networked production and provides a smart factory construction kit for teaching and research.

Learning factories pallet circulation

Comprehensive I4.0 learning factories – CP Systems
Our cyber-physical learning factories are the right choice for those with the highest demands for industry proximity, seamless extensibility and customisation in education, research and training. They are based on a pallet transfer system and enable closed-loop layouts. CP systems support the teaching of in-depth I4.0 knowledge of fully automated digital production facilities with robotics and flexible manufacturing concepts for highly individualised products – from the simplified lab version (CP Lab) to the authentic factory model (CP Factory).



Learning factories single workpiece flow

Compact I4.0 all-round learning factories – MPS 400
The MPS 400 all-round learning factories are the right choice for those who want access to a lot of learning content in one workstation. MPS 400 covers not only a wide range of state-of-the-art Industry 4.0 content, but also the fundamentals of mechanics, mechatronics, and automation. Learning factories for different occupational and training profiles can be assembled from modular system modules.

MPS 400

Festo MPS 400 series are compact learning factories in the field of automation technology with the focus on mechatronics and Industry 4.0. Depending on the desired learning content, the MPS 400 systems can be expanded step by step with MPS 400 system modules and thus expanded into extensive Industry 4.0 learning factories.

The MPS systems is also the preferred equipment used in the WorldSkills competition for the Mechatronics trade.

worldskills



WorldSkills International

30 years of partnership – WorldSkills and Festo

Promote talents
Young talents who participate in the WorldSkills vocational competitions are already winners. That's because the first milestone on the way to becoming the world's best skilled worker is a national competition in their own country. Proud winners then compete at regional competitions, e.g. EuroSkills, AfricaSkills or ASEAN Skills, or the WorldSkills World Championships.

Festo was the first Global Industry Partner (GIP) of WorldSkills in 1991. Global Industry Partners play a key role in collaboration between industry, education, government and policy makers. Their common goal is to improve education and recognition of skilled professionals around the world.

This is where Festo Didactic provides cutting-edge, industry-focused learning and training solutions for WorldSkills competitions. Together with WorldSkills, we are contributing to nextgen education and innovation in vocational fields.

Table of Content

Products

Learning factories

CP Factory 14
CP Lab 16

Fundamentals of Factory Automation

Pneumatic training packages 18
Hydraulics training packages 19
Pneumatic equipment set 20
Hydraulics equipment set 22

Learning factory kits

Modular Production System - MPS 20
MPS 400 22
MPS IoT kit machine learning 24
Energy efficiency package 24
Networks and IT security 25
Smart sensors 25
EduTrainer® Universal 26
EduTrainer® Compact 26
EasyKit 27
EasyPort USB 27

Industrial trades

Mechanical system 28
Pump training system 28
Industrial wiring system 28
Basic metrology 29
Geometric Dimensioning and Tolerance 29
Statistical process control 29

Digital learning and simulation

Festo Learning Experience 30
FluidSIM® 32
CIROS® 32

STEM

Bionic4Education 33

Radar and communication system

Radar training system 34
Antenna training system 34
Microwave training system 35
Communication technologies system 35

Electric power technology

Electromechanical training system 0.2kW 36
Protective relay 36
Basic motor control 37
EV charging station 37

Electric power technology

Basic electrical/electronics 38
Microcontrollers (PIC/ARD) 38
FACET 38
Solar/Wind system 39
Nacelle 39
EDS water technology 39

CP Factory
Individual solutions



Requirements analysis
Standard solutions might seem like a good value at first glance, but at Festo we focus on the long-term benefit for the customer. For this reason, a qualified requirements analysis is performed before each CP Factory quotation. In this analysis, experienced project advisors discuss the expectations for the new training equipment with the customer and share insights from everyday use in order to avoid poor investments.

Consulting
On the basis of the requirements analysis, the customer receives expert advice about the suitable training equipment. Our primary objective here is to meet the customer's objectives, irrespective of the product range. Because Festo cooperates with a number of renowned partners, we will design the optimal solution for you. Festo is a Siemens Automation solution partner.

Engineering service
The experienced technicians and engineers at Festo Didactic are specialists in planning and equipping learning systems and have at their disposal powerful, state-of-the-art tools. PLC and robot programming systems, simulation systems, EPLAN and CAD programs are efficient tools for translating customer requirements into reality. Festo will help you to implement your ideas – quickly, reliably and cost-effectively.

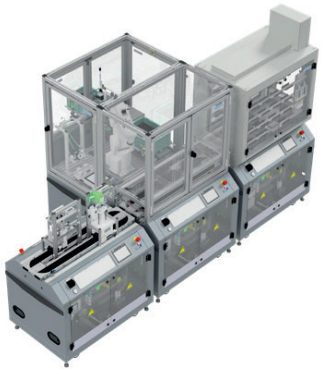
System integration
Existing system parts can often be integrated as subsystems, provided suitable interfaces are available. This protects earlier investments.

Customised training
You know your strengths – and your weaknesses. Festo gives you the opportunity to define your training profile. The result? A training course tailored to your exact personal requirements!
- Networking
- Robotics
- Cyber-physical systems
- IT systems
- MES production control systems
- Energy efficiency
- Image processing
- PLC programming
- Fieldbus
- RFID technology
- System simulation
- Troubleshooting
- Logistics, etc.

Upgrade
Festo Didactic offers planning reliability and continuity. Systems can be gradually expanded and updated over a number of years.
Give us a call – we're happy to assist you with your stage-by-stage project planning.

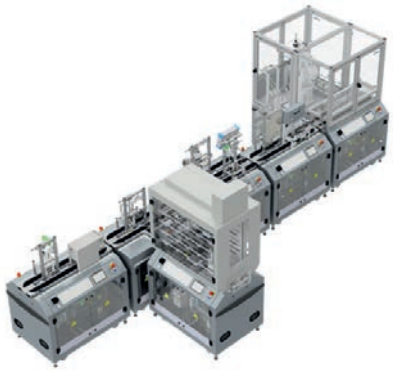
CP Factory – Industry 4.0 research and learning platform
The learning platform is used worldwide for research and technical training in the areas of production and automation technology as well as for mechatronics.

Recommended configurations



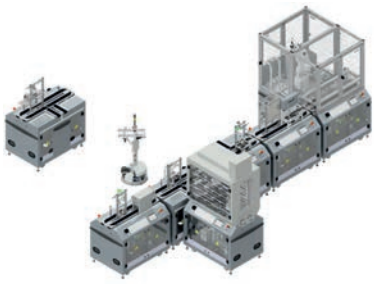
Variant F1, comprising:
– 1x CP Factory Station Straight
– 1x CP Factory Robot Assembly
– 1x CP Factory Automatic Warehouse
– 1x Magazine application module
– 1x Muscle Press application module
– 1x MES software, including PC
– 1x Programming package
– 1x Accessory package

Including commissioning and technical instruction on-site.



Variant F3, comprising:
– 2x CP Factory Station Straight
– 1x CP Factory Station Deflector
– 1x CP Factory Station Bypass
– 1x CP Factory Robot Assembly
– 1x CP Factory Automatic Warehouse
– 1x Magazine application module
– 1x Measurement application module
– 1x iDrilling application module
– 1x Camera application module
– 1x Muscle Press application module
– 1x Heating tunnel application module
– 1x Output application module
– 1x MES software, including PC
– 1x Smart Maintenance package
– 1x Programming package
– 1x Accessory package

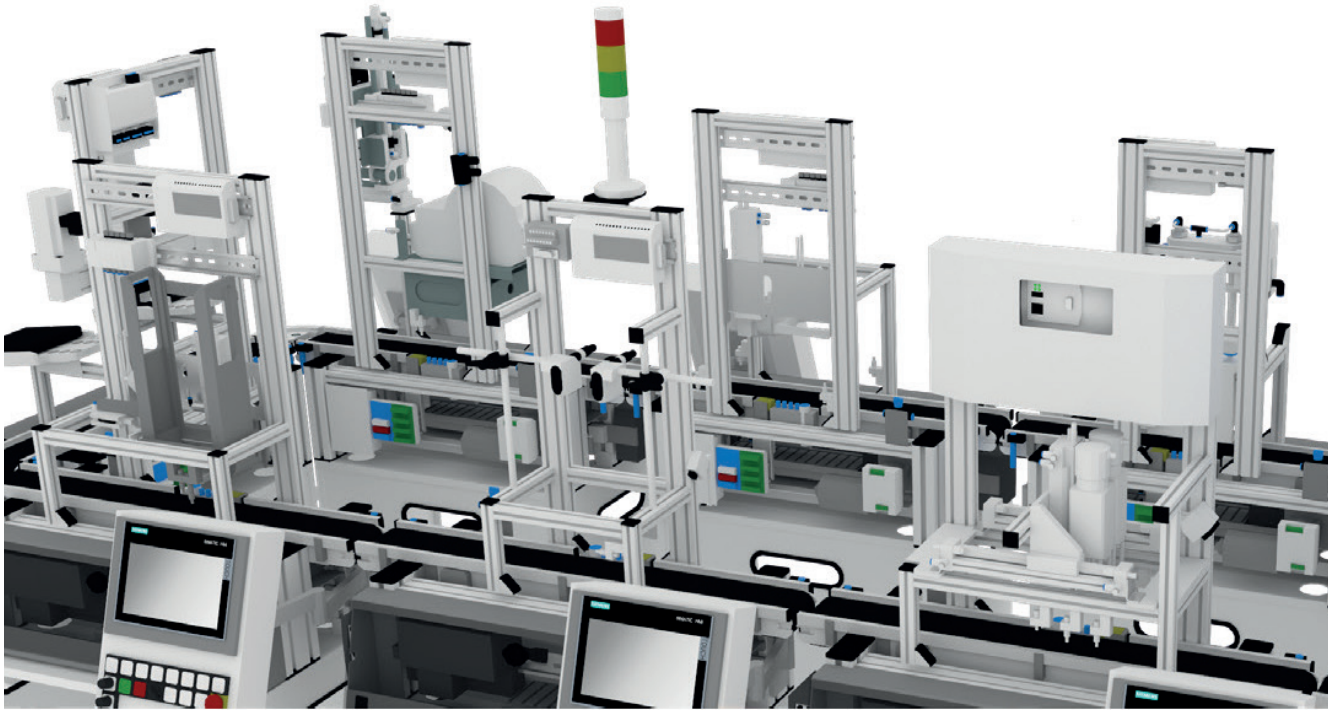
Including commissioning and technical instruction on-site.



Variant F4, comprising:
– 2x CP Factory Station Straight
– 3x CP Factory Station Deflector
– 1x CP Factory Robot Assembly
– 1x CP Factory Automatic Warehouse
– 1x Mobile robot for pallet transport
– 1x Magazine application module
– 1x Measurement application module
– 1x iDrilling application module
– 1x Camera application module
– 1x Muscle Press application module
– 1x Heating tunnel application module
– 1x Output application module
– 1x MES software, including PC
– 1x Smart Maintenance package
– 1x Energy Management package
– 1x Programming package
– 1x Accessory package

Including commissioning and technical instruction on-site.

CP Lab 400 complete systems



The CP Lab 400 complete systems include four predefined systems.

These are compiled based on the experience of many implemented CP Lab systems, and it forms typical, logical combinations for an introduction to the world of Industry 4.0.

Fully-equipped with the application modules, each system represents a production process. This enables the diverse areas of Industry 4.0 to be clearly illustrated and taught.

The configurations build upon one another, creating meaningful processes from even the smallest system.

Industry 4.0 topics:

- Digital product memory
- RFID, QR, data matrix
- UID product identification*

- System planning
- System simulation
- SIL/HIL*

- Error control
- Maintenance planning*
- Predictive maintenance*

- Safer networking*
- Remote service concepts*
- Cloud applications*

- Cyber-physical systems
- Embedded controller
- Web technology

- Energy efficiency
- Energy monitoring*
- Energy management*

- Modern, decentralised control technology
- HMI, touch panels

- MES
- ERP*
- Web store*
- Data analytics*

- IP communication
- Open industrial standards
- Web standards

- Worker guidance
- Virtual reality (VR)*
- Augmented reality (AR)*

*Optional Supplement for CP Lab 400

CP Lab 404-1



Process operation:
- Feeding components
- Quality inspection I, SPC
- Flexible production with parameters
- Flexible handling, logistics

CP Lab 406-1



Process operation:
- Feeding components
- Quality inspection I, SPC
- Flexible production with parameters
- Feeding components, assembly
- Connecting components, assembly
- Flexible handling, logistics

CP Lab 408-1



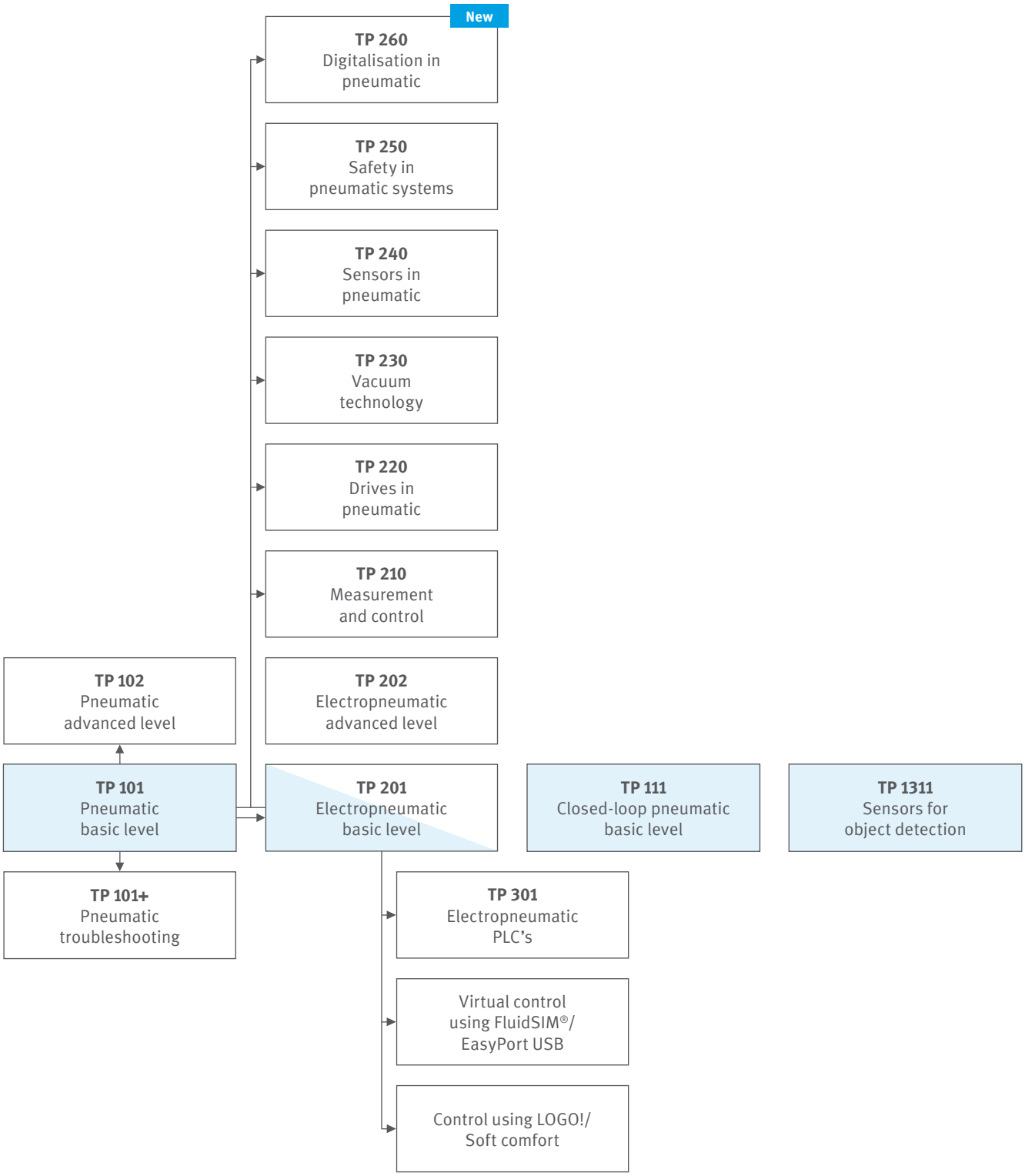
Process operation:
- Feeding components
- Quality inspection I, SPC
- Flexible production with parameters
- Feeding components, assembly
- Connecting components, assembly
- Process-dependent operation
- QR code, UID, product tracking
- Flexible handling, logistics

CP Lab 410-1

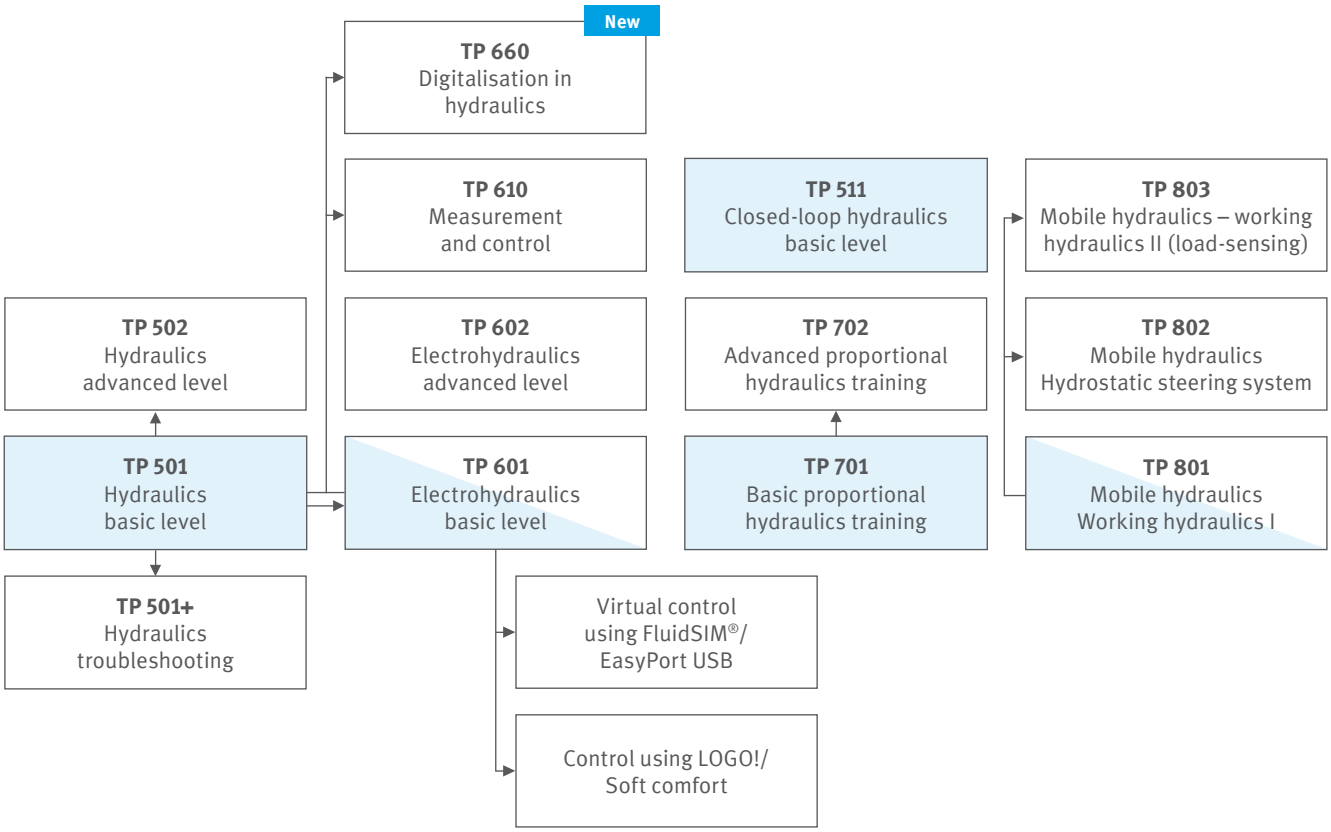


Process operation:
- Feeding components
- Quality inspection I, SPC
- Flexible production with parameters
- Worker guidance, PCB assembly
- Quality inspection II
- Feeding components, assembly
- Connecting components, assembly
- Process-dependent operation
- QR code, UID, product tracking
- Flexible handling, logistics

Pneumatic training packages



Hydraulics training packages



Legend:

Basic/ precondition

Basic-level training packages provide a foundation that will introduce participants to the topic. The components and training content of the basic-level packages must be completed before the participants can move to the advanced level.

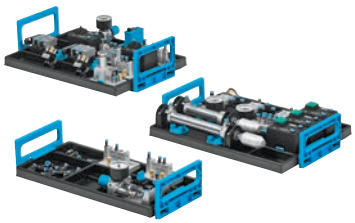
Advanced/ supplement

Advanced-level training packages allow participants to develop more in-depth knowledge in a number of specialist areas, depending entirely on their own needs.

Supplementary equipment sets are an efficient way to add additional basic levels to any basic-level training package.

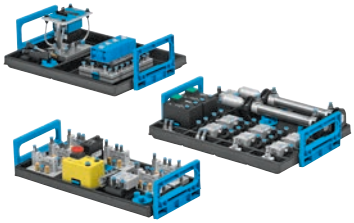
Pneumatic equipment set

TP 101 - Basic pneumatic



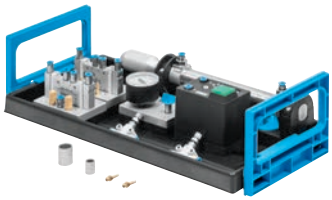
The classic: with experience from over a thousand pneumatic courses
TP 101 provides the basics for training in pneumatic control technology. Knowledge of the physical principles of pneumatic as well as the function and use of pneumatic components is taught. Optimally coordinated with the training media, which provide illustrative project tasks.

TP 102 - Advanced pneumatic



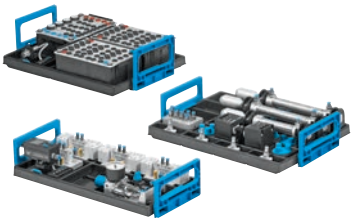
Pneumatic for advanced users
Further training in pneumatic control technology is the subject of the TP 102 set. The equipment set can be used to set up extensive combinatorial circuits with links of input and output signals as well as controls with cycle-chain modules. Building on Pneumatic, Basic level, the training media of the advanced level contain sophisticated project tasks.

TP 101+ - Systematic troubleshooting



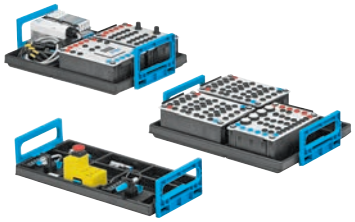
Systematic troubleshooting and expert fault rectification
TP 101+ contains components with realistic faults. In this way, pneumatic control systems can be set up with the components of the TP 101 equipment set, and individual components can be replaced by faulty components. Systematic troubleshooting is taught and learnt professionally and realistically.

TP 201 - Basic electropneumatic



The most basics of electropneumatic control technology in compact form
Basic training in electropneumatic control technology is the focus of the TP 201 set. Knowledge of the function and use of pneumatic and electrical components is conveyed. The focus is on solenoid valves, electronic proximity switches and relay controls. Optimally coordinated with the training media, which provide illustrative project tasks.

TP 202 - Advanced electropneumatic



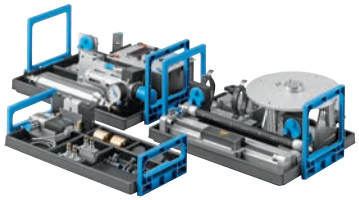
Electropneumatic for advanced users
TP 202 equipment set is aimed at further training in electropneumatic control technology. Knowledge of valve terminals, the emergency stop function and the use of an electronic preset counter in complex electropneumatic controllers is taught.

TP 210 - Measurement and control in pneumatic



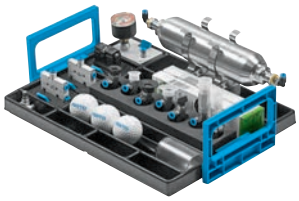
Diagnostics, maintenance, and energy efficiency
TP 210 teaches measurement and control in pneumatic. The contents range from measuring individual pneumatic components to the basics of condition monitoring and control technology. In addition, awareness of the responsible use of “compressed air” as a form of energy is awakened vividly and impressively.

TP 220 - Drives in pneumatic



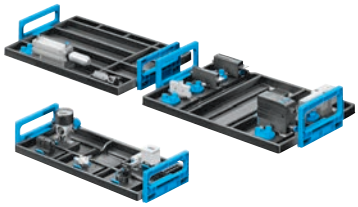
Optimal drives for applications
The selection and dimensioning of different modern types of drives, considering their special characteristics, is taught in the equipment set TP 220. In addition, economic and safety engineering considerations are dealt with.

TP 230 - Vacuum technology



Handling with vacuum
Handling workpieces with suction pads has become an indispensable part of handling technology, as it offers advantages such as the simple design of suction pads and gentle workpiece handling. In addition, fast cycle times are possible, and the investment costs are comparatively low. These contents are comprehensively dealt with in the equipment set TP 230.

TP 240 - Sensor in pneumatic



The benefit of a pneumatic control system
TP 240 is an expansion of TP 201 training package to include the topic of sensors in pneumatic. From contents such as the use of pressure and flow sensors to the application of analogue position transmitters to sensors for vacuum technology - the special problems of sensors in the environment of pneumatic controls are comprehensively covered here.

TP 250 - Safety in pneumatic



Risk reduction!
The learning contents of TP 101 and TP 201 are expanded by the equipment set TP 250 to include the systematic optimisation of safety in systems with pneumatic drives. The aim is to recognise hazards in pneumatic processes, to assess the risks of a simple machine and to learn about suitable measures for risk reduction and to implement them professionally.

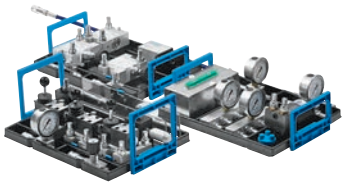
TP 260.v2 - Digitalisation in pneumatic



Ready for digitalisation and Industry 4.0!
TP 260 introduces intelligent maintenance and the collection of operating data. It involves the collection and evaluation of continuously acquired data from electropneumatic controllers. A programmable logic controller takes over the control of the drives and the processing of the sensor signals and transmits recorded data to a web server.

Hydraulics equipment set

TP 501 - Basic hydraulics



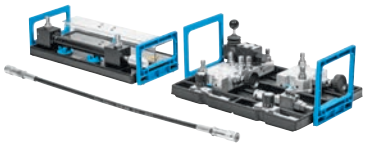
The solid foundation for practice-oriented basic and further training in hydraulics control technology
The equipment set TP 501 teaches the basics of hydraulics control technology. Knowledge of the physical principles of hydraulics as well as the function and use of hydraulics components is taught. The equipment set can be used to set up simple hydraulics controllers.

TP 502 - Advanced hydraulics



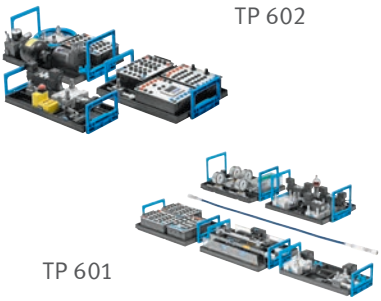
Hydraulics for advanced users
Knowledge of the physical principles of hydraulics is deepened with the TP 502 equipment set. The structure, function and use of other hydraulics components are explained.

TP 501+ - Systematic troubleshooting



Systematic troubleshooting and expert fault rectification
TP 501+ contains components with defined, realistic faults. As a result, hydraulics control systems can be set up with the components of the equipment set TP 501, and individual components can be replaced by faulty components. Systematic troubleshooting is taught and learnt professionally and realistically.

TP 601/602 - electrohydraulics



The most important basics of electrohydraulics control technology in compact form
TP 601 is suitable for basic training in electrohydraulics control technology. Based on practice-oriented problems, the training media impart knowledge of the physical principles of electrohydraulics, the function and use of electrohydraulics components and the typical basic electrical circuits.

TP 610 - Measurement and control in hydraulics



Diagnostics, maintenance, and energy efficiency
The topics of measurement and control in hydraulics are taught in the equipment set TP 610. The contents range from measuring individual hydraulics components to the basics of condition monitoring and control technology. In addition, awareness of the responsible use of “hydraulics” as a form of energy is awakened vividly and impressively.

TP 660 - Digitalisation in hydraulics



A guide to the real production environment
In this training package, a real production environment will be simulated, and you will be trained not only about the technology, but how to use a machine to produce with the best production results, which will prepare you for the real industrial world.

TP 701/702 - Proportional hydraulics



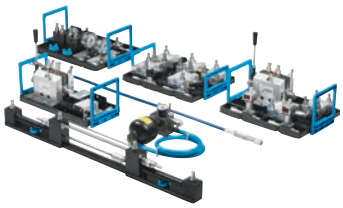
Proportional hydraulics
TP 701 provides information on proportional valves, their function and control by means of a proportional amplifier and setpoint card. It makes it possible to construct, set and commission simple proportional controls.
TP 702 is based on TP 701, using additional hydraulics and electrical components enables the construction of comprehensive proportional controllers.

TP 511 - Closed-loop hydraulics



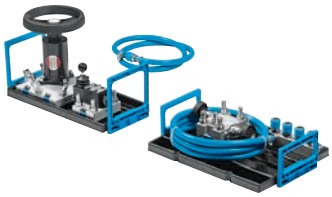
Systematic troubleshooting and expert fault rectification
TP 501+ contains components with defined, realistic faults. As a result, hydraulics control systems can be set up with the components of the equipment set TP 501, and individual components can be replaced by faulty components. Systematic troubleshooting is taught and learnt professionally and realistically.

TP 801 - Working mobile hydraulics



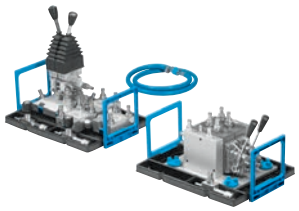
Discover and understand mobile hydraulics
The basics of mobile hydraulics are taught with TP 801. The energy balances in different hydraulics system - also under load - are examined and evaluated. The behaviour of consumers under load and possibilities for safely holding and lowering a load are taught. Optimally coordinated with the training media, which provide illustrative project tasks.

TP 802 - Mobile hydraulics - hydrostatic



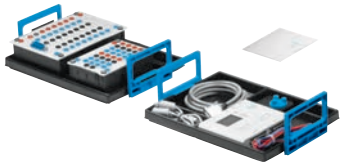
Mobile machines hydrostatic steering
Hydrostatic steering systems on suitable hydraulics controllers are set up and tested with the equipment set TP 802. The control units contain typical components of a steering system such as steering valve, shock and suction valve, steering cylinder and, if required, a secondary consumer.

TP 803 - Working mobile hydraulics



Efficient operation with load-sensing systems
In-depth knowledge of working hydraulics and hydraulics controls with load-sensing controlled variable displacement pump are developed and examined with the equipment set TP 803.

TP 810 - Diagnostic system FluidLab® - M



Measuring, visualising, and analysing
The optimum setting of a fluid power system can only be achieved if measurements are taken at the right points. A permanent recording of measured values with associated visualisation of the measurement curves is necessary. It gives the operating and maintenance personnel the decisive information for the tasks at hand and the necessary settings.

The Modular Production System

A production line in a factory can be made up of individual production cells. Each cell has a specific function in the process (distribution, testing, processing, handling, assembly, storage). You can select an application or process that meets your requirements from a range of individual stations.

By effectively combining individual stations, you can assemble your production system.

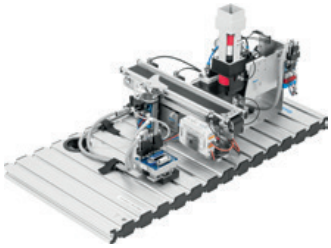
Learn about the functions and training aims of the individual stations as well as their possible combinations on the following pages.

Make more of your potential

Either:
Simple to set up/commission yourself:
- Mount control console to the trolley with 2 screws
- Place EduTrainer Universal in trolley
- Connect the EduTrainer Universal to the control console and the station using our universal SysLink plug connector
- ... finished!

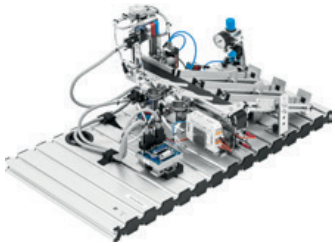
Or:
MPS commissioning service
On request, we can also commission systems for you – particularly in the case of larger systems – to ensure that your training projects run smoothly right from the start.

Distribution Station D



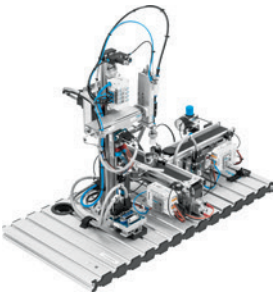
The MPS distribution station D covers topics such as basic principles of PLC programming and sensor technology. In addition to this, the station provides an introduction to conveyor control using motor controllers and the associated transport of materials.

Sorting Station D



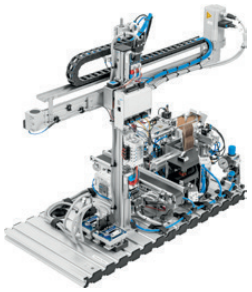
The MPS sorting station D covers topics such as combining different types of sensor to detect materials. The station controls a sorting process based on workpiece properties.

Joining station D



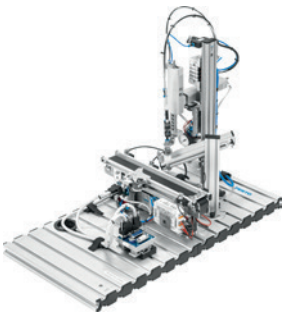
The MPS joining station D covers topics such as checking the orientation of workpieces using sensors, automated assembly and monitoring downstream transport.

Packaging station D



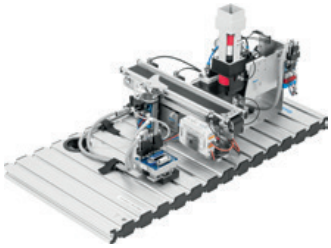
The MPS Packaging station D deals with the pneumatic control of a complex packaging process, and the control of stepper motors by motor controllers. The station also provides an introduction to the use of digital sensors.

Pick&Place station D



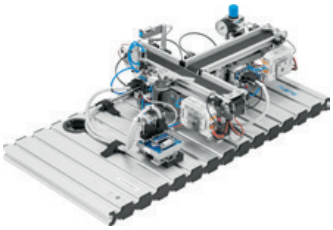
The MPS Pick&Place station D covers topics such as basic principles of vacuum technology and how to use it in an automated process. A pneumatic gripper and the conveyor module are used to transport workpieces.

Measuring station D



The MPS measuring station D covers topics such as how to record and process analog and digital signals. The station also provides insight into how pneumatic actuators work and are used, and how actuators are calibrated.

Separating station D



The MPS separating station D covers topics such as the use of digital sensors and actuators. The station controls a distribution process based on workpiece properties. The workpiece dimensions measured by the sensors are used to determine the subsequent process.

Storing station D



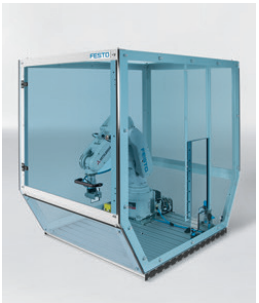
The MPS storing station addresses, among other things, the topics of parameterisation and commissioning of multi-axis controllers and advanced PLC programming. Workpieces can be stored on several high rack storage levels using a combination of sensors and actuators during the process sequence. A modern web interface serves as a state-of-heart HMI.

Robot station with MPS modules D



This equipment level is created based on the basic design of the MPS robot station and the two robot handling and robot assembly modules as a introduction to industrial robotics.

Robot station D



The Robot station features a Mitsubishi Electric RV-2FB 6-axis jointed-arm robot with high movement speed to cover a large working area. In its basic version, the station is equipped with robot controller, teach box, safety enclosure, maintenance unit and pneumatic multifunction gripper. Additional MPS modules are available for individual robot applications.

MPS 400 Stations

Modular hardware
An MPS 400 system building block is an MPS station built on a trolley containing all elements for seamless integration into a learning factory, which might consist of several system building blocks. Each system module represents a process step that is modelled on real-world production.

The trolley is equipped with a control panel that contains buttons for basic controls and signals the status of the station by means of three lights. An emergency stop button stops all actuators within the system module. Some of the input and output signals as well as 24 V and GND can be tapped at 4mm safety lab sockets on the left and right of the control panel.

Industry 4.0 right from the start
The system building blocks are equipped with an Ethernet switch and PLC. The PLC program connects the system module with the MES and the entire plant. An RFID read/write device is connected to the PLC via an RFID controller. This can read and write the digital product memory in RFID tags of individual workpieces.

Vertical integration
The required production steps (with individual parameters if needed) can be transferred individually for each workpiece from the MES to the PLC of the system building block. This teaches the learner concepts such as variant diversity in production up to batch size 1.

MPS 400 Distribution Pro



Industrial HMI and smart sensors

The MPS 400 Distribution Pro system building block pushes workpieces from three stacking magazines individually onto the conveyor belt using double-acting cylinders.

Learning topics
- Fundamentals of mechatronics sub systems/complete systems
- Digital sensors and actuators
- Intelligent sensors with IO Link
- Object identification with RFID
- Visualisation with HMI
- Plant control with MES
- Programming and graphic representation of simple control sequences
- Data protection and security
- Commissioning and troubleshooting
- Recycling and economic aspects

MPS 400 Joining



Industrial Ethernet, vacuum and parallel gripper technology

The MPS 400 Joining system building block checks the position of the workpieces with a laser sensor and mounts various attachments if the position is correct.

Learning topics
- Fundamentals of mechatronics sub-systems/complete systems
- Optical sensors and actuators
- Machine safety and occupational health and safety
- Pneumatic and vacuum technology
- Intelligent maintenance with AR
- Condition monitoring
- Industrial communication with OPC-UA and PROFINET
- Programming and graphic representation of simple control sequences
- Commissioning and troubleshooting
- Energy efficiency and environmental protection

MPS 400 Measuring Pro



Industrial measurement technology and analogue value processing

The MPS 400 Measuring Pro system building block measures height and fill level as well as the weight of the workpieces. Defective parts are ejected on a chute.

Learning topics
- Basics of mechatronics sub-systems/ total systems
- Tactile sensors
- Pneumatic and electropneumatic
- Measurement technology with strain gauges and measurement amplifiers
- Data acquisition and quality assurance
- Statistical process control (SPC)
- Production transparency and operating cost reduction

MPS 400 Sorting Inline



IIoT retrofitting and machine learning

The MPS 400 Sorting Inline system building block sorts the workpieces according to detected color and material or passes them on in the process.

Learning topics
- Basics of mechatronics sub-systems/ complete systems
- PLC programming advanced
- PLC programming in the context of I4.0 (HMI I RFID)
- Artificial intelligence (AI/ML)
- New business models through retrofitting (IoT)
- Data and information security
- Commissioning troubleshooting strategies
- Ecological and economic

MPS 400 Robotino



Flexible manufacturing through mobile robotics

The MPS 400 Robotino system building block grips workpieces with a parallel gripper and transports them from one MPS 400 system building block to the next.

Learning topics
- Analysing electronic systems and testing functions
- Analysing and adapting controls
- Programming and implementing controls according to IEC 61131
- Getting to know the omnidirectional drive concept
- Integrating control and communication systems
- Mapping and autonomous navigation
- Motor control

SkillsConveyor

The new standard learning system for basic training in automation technology

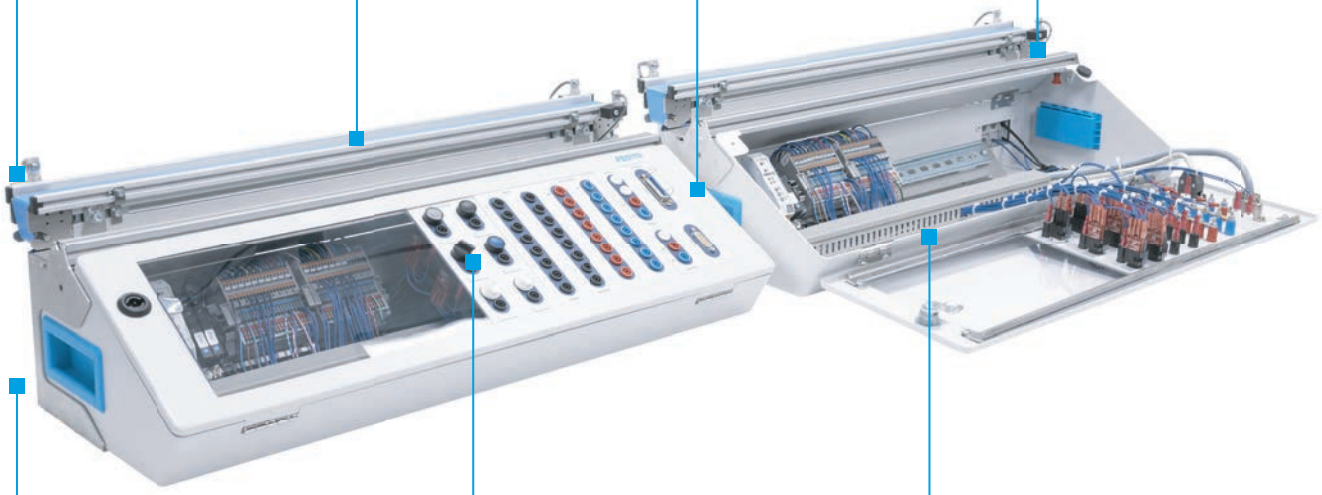
Flexible drive concepts
The DC motor supplied is connected to the SkillsConveyor via a universal flange. The motor can be easily exchanged and the learning system can be supplemented with a corresponding AC motor with the appropriate learning content including frequency inverter.

Special conveyor belt
Through simple conversions, the SkillsConveyor enables the transport of single workpieces as well as pallets.

External controls
Our universal interface to the control level enables different control concepts up to the simple integration of own solutions.

- PLC EduTrainer
- PLC via control cabinet
- Easyport / FluidSIM
- Simulation box I/O

Sensors and actuators
Through the simple and flexible exchange of sensors and actuators, learners can quickly and easily build their own automation solutions and independently acquire new learning content.

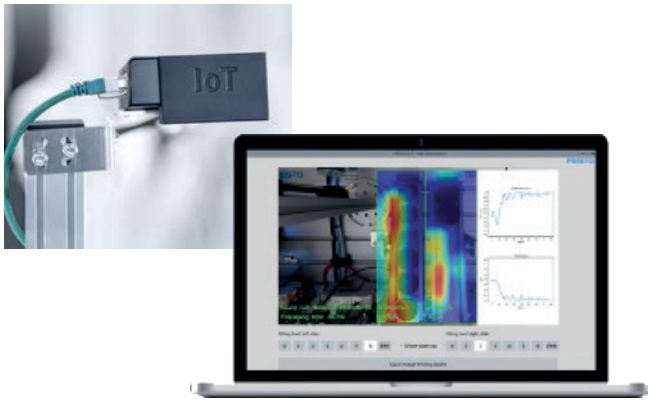


Ergonomic and simple design
The removable drawer and the hinged control box provide flexibility in handling – particularly advantageous in confined space situations. In addition, the simple design facilitates easy commissioning and ergonomic operation.

Intuitive operation and individualisation
The variable labelling of the operating and signal elements enables the independent development of circuits and circuit diagrams beyond the learning scenarios of basic education.

Equipped for different education needs
Our SkillsConveyor is available in two versions – as a kit for self-wiring or ready-to-use and pre-wired. This way, we offer the right learning system for various time budgets and differentiated needs for practical wiring skills.

MPS IoT kit machine learning



Machine learning in image processing

The key feature of the “MPS IoT Retrofit” package is the fact that students learn the most important topics in the domain of image processing with machine learning in an easy way. Not only is the main learning schemes like supervised/unsupervised learning are discussed, but also the most prominent applications in the computer vision domain – i.e., image classification, object localisation, and multi-object detection – are introduced and discussed by means of a series of practical experiments. Otherwise, all kind of objects can be detected and localised. Furthermore, powerful neural net architectures like so-called convolutional neural nets are being used.

Learning topics
- Artificial Intelligence/Machine learning based image processing
- Practical application of (convolutional) neutral nets/deep learning
- Supervised and unsupervised learning
- Computer vision (image classification, object localisation, multi -object detection)
- IoT Retrofitting of legacy systems

Benefits
- The device can either be used stand-alone or be integrated in an existing learning factory
- Option to apply the algorithms to new objects and images
- Focus on practical application of AI/ML solving real-world challenges

Energy efficiency package



Energy efficiency package

The topic of energy efficiency is finding its way into many technical curricula and is an important factor in the design of sustainable and competitive production plants of tomorrow. The energy efficiency package for the MPS System 403-1 offers a holistic training approach from awareness raising and consumption analysis to planning and implementation of optimisation measures, as well as cost effectiveness, so as to prepare students for these changes.

Hardware
The energy measurement box with industrial components measures the electricity and compressed air consumption of three stations independently of one another, and provides measurement and metadata via OPC UA. With the components supplied for compressed air-saving vacuum generation and the leakage simulators, the respective training tasks can be carried out in practice. All connecting cables and tubing are included in the scope of delivery.

Software
The Energy app for FactoryViews takes over communication via OPC UA with the energy measurement box, data recording in an open MariaDB database as well as visualisation and analysis on didactically prepared dashboards. The dashboards make it possible to visualise the recorded measured values, analyse consumption over selected time intervals, display costs and emissions, parameterise settings as well as export measured values as CSV data. Dashboards can be accessed via web browsers, e.g. with the tablet.

Networks and IT security



Networks and IT security

Communication networks are the spinal cord of Industry 4.0. Under this new production paradigm, networking of plants, processes, systems and components will accelerate, with data flowing not only within the company and across its locations, but also across partners of the value creation chain. The amount of data exchanged will increase at an exponential rate.

In the context of automation, new, complex topics related to cybersecurity and privacy are emerging, such as Ethernet, switching, routing, remote access, encryption, VPN, access control, virtual LAN, etc., but have not yet been well integrated in training programs.

NetLab offers a complete and valuable didactic solution designed to make learning efficient, while mitigating the difficulty of teaching such intricate topics.

Learning topics
- Networking fundamentals
- Ethernet technology
- Packet-oriented communication
- IPv4- addressing schemes
- Switching and Routing
- Layered communication system
- Loop recognition, Redundancy, Ring structure
- Media redundancy protocol
- Prioritised switching and Quality of Service (QoS)
- Network Address Translation (NAT)
- VLAN in networks, Firewall
- Introduction to cryptography
- Virtual Private Network (VPN)

Smart sensors



Smart sensors

Smarter manufacturing is required in today's complex and increasingly interconnected manufacturing environment, obtaining relevant, timely input from processes is key to higher efficiency and productivity.

Clever integration of smart sensor in automation equipment provides plant workers with useful, live information about the status of system and process so that they can perform predictive maintenance and make improvements to the processes.

Equipment set TP 1312 combines industrial components with project oriented learning activities to efficiently build proficiency in smart sensor technology for I4.0.

Learning topics
- Understanding the benefits of smart sensors in the context of Industry 4.0
- Selecting up, parameterising, monitoring and adjusting sensors
- Setting up IO-Link® communication
- Integrating sensors into different manufacturing layers
- Performing predictive maintenance
- Replacing sensor and uploading settings automatically
- Troubleshooting sensor

EduTrainer® Universal

with Festo CPX-CEC





with SIMATIC S7-1500

For maximum flexibility

The EduTrainer® Universal units are built to suit various control systems. It combines them with the power supply unit and simulations with alternative connections for 4 mm and SysLink. You get exactly what you need as it is fully setup and configured to your own design.

Learning topics
- Characteristics, functions and applications of programmable logic controllers
- Characteristics and functions of input and output devices
- Characteristics and functions of the different programming languages
- Writing PLC software programs
- Writing programs with logic functions
- Testing and debugging the software program
- Simulating the software program

Available brands:
- Festo
- Siemens
- Mitsubishi
- Allen Bradley

EduTrainer® Compact

with SIMATIC ET 200SP





with Festo CECC

Integration into the workstation systems

The EduTrainer® Compact units fits into the ER mounting frame or be used as a tabletop device. Several control systems can be incorporated into the unit. Various connections such as the 4 mm sockets, simulation units and SysLink can be configured to the unit to suit your design.

Learning topics
- Characteristics, functions and applications of programmable logic controllers
- Characteristics and functions of input and output devices
- Characteristics and functions of the different programming languages
- Writing PLC software programs
- Writing programs with logic functions
- Testing and debugging the software program
- Simulating the software program

Available brands:
- Festo
- Siemens

Mechanical system



Mechanical training system

The mechanical training system covers the installation, use, maintenance, and troubleshooting of mechanical drive components. It is divided into four levels. Each level is further divided into specific topics which deal with the components encountered in industry. Engineered for ease of use, the system comes with a universal steel base unit on which the students prepare the setups using T-slotted extrusion bars, allowing the base to be configured as required by the task. The modularity of the system allows the development of training programs that meet specific needs.

Learning topics
- Introduction to mechanical drive systems
- Belt, chains, and gear drives
- Couplings and shaft alignment bearings and seals
- Linear bearing, ball screws, clutches, and brakes
- Optional laser alignment, and vibration analysis

Pump training system



Pump training system

Practical experimentation with single- and multiple-pump systems is conducted on the ergonomic and rugged pumping circuit bench. It is designed to withstand the rigors of the workshop environment while providing a comfortable workspace for building circuits.

The workbench's storage capabilities, combined with comprehensive training packages, enable students to efficiently access all necessary materials for circuit assembly.

Learning topics
- Learn the fundamentals of pump operation and their main parts.
- Inspect a pumping circuit, identify its main components, and safely start it.
- Understand fluid dynamics concepts that regulate the behaviour of liquids inside a pump.
- Perform preventive maintenance and part replacement procedures.
- Detect symptoms of common pumping circuit failures and take corrective actions

Industrial wiring system



Industrial wiring system

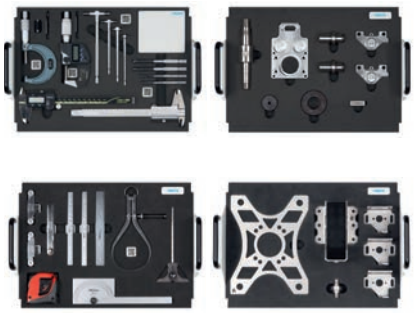
The Industrial Wiring System(IWS) curriculum uses a project approach to help the students develop their organisational skills. They can progress at their own pace by following the instruction in the courseware and the project documentation.

A built-in power supply allows the students to learn how to build, commission, and troubleshoot their projects in a safe environment.

IWS uses a 3 phases network supply for the power section of the circuit, allowing the students to understand how to wire 3 phases components like the induction motor.

Learning topics
- Introduction to technical drawing and electrical enclosures
- Select and install pull boxes, junction boxes and conduit bodies
- Conduit fittings, raceways and cable tray
- Symbols and graphics of electrical schematics and wiring tables
- Select and install DIN rails, wiring ducts and electrical panel components
- Commissioning procedure and precautions
- Troubleshooting methods and tools
- Maintenance and modification

Basic metrology

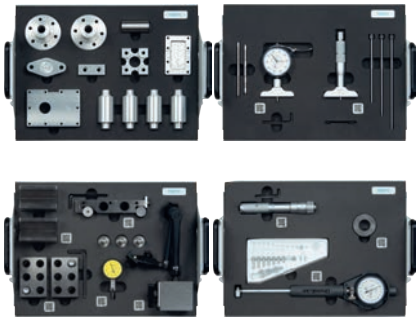


Basic metrology

The training package teaches basic metrology with semi-precision and precision instruments. It uses parts that simulate real consumer and industrial components and test students' skills in different scenarios. The parts enable various measurements and are consistent across equipment sets. The package also includes master rings and a gauge block for self-evaluation and field checks, which are essential for metrology. The parts are stored in foam blocks with trays and optional Systainers for easy inventory and organisation.

Learning topics
- Explain metrology concepts (measurement, errors, precision, accuracy…) and SI and US unit systems
- Use and maintain precision and semi-precision measuring instruments
- Perform field check tasks
- Take and read measurements
- Read technical drawings
- Develop relevant transversal skills

Geometric dimensioning



Geometric Dimensioning and Tolerance (GD&T)

Geometric dimensioning and tolerance includes precision measuring instruments along with manufactured parts. Reference parts are also included in the set. Guided exercises and unguided projects are available for students to get an in depth understanding and hands-on practice on the selection, proper use and care of a variety of measuring instruments, especially in the context of geometric dimensioning and tolerance. All instruments and parts are stored in a protective foam on stackable trays equipped with handles.

Learning topics
- Interpret GD&T symbols on drawings
- Identify geometric tolerances and their categories
- Use gauge blocks, dial indicators and sine bars
- Apply datum concept and reference frame for geometric tolerance validation
- Measure parallelism, perpendicularity, straightness, circularity, cylindricity and run out with dial indicators
- Understand material conditions and hard gauge design for geometric tolerance validation
- Define position tolerance and paper gauging
- Apply and validate profile tolerance
- Understand optical comparators and CMM operation and technologies

Statistical process control



Statistical process control

Statistical Process Control includes precision measuring instruments and manufactured parts. Guided exercises and unguided projects are available for students to get an in depth understanding and hands-on practice on the use and interpretation of the main statistical tools of SPC. They will use measuring instruments to collect data that will be analysed using SPC tools on a computer. All instruments and parts are stored in a protective foam on a stackable tray equipped with handles.

Learning topics
- Understand the concepts of variability, quality characteristics, variables data and attributes data
- Use the major tools of SPC
- Apply the methodology of data collection and summarisation in the industry
- Recognise the normal distribution curve and its properties, patterns, variance and mean
- Differentiate between natural and unnatural variation and their causes
- Construct and interpret x and R control chart and fraction non-conforming control chart
- Calculate process capability and process capability indices
- Use Cameron table, producer's risk and consumer's risk

Festo Learning Experience





Holistic approach to learning
The digitalised world needs a holistic approach to technical education and training. The digital learning portal Festo LX for individual learning experiences offers professionally prepared training content for many technical areas. We combine industry expertise with didactic know-how to create unique learning experiences. Thanks to the smart combination of eLearning courses and practical exercises, students will be sure they are ready for working in the high-tech industry.



A wide range of topics
You will find a wealth of training content on Festo LX covering a wide range of areas of technical education and training. From factory automation and pneumatic to hydraulics, electrical engineering, process automation, renewable energy and STEM. There are eLab courses for hardware-related hands-on learning with our training factory and training packages as well as completely independent eLearning courses.



From nuggets to learning paths
Festo LX is based on multimedia learning nuggets that are worked through modularly and can be put together to form customised learning paths. The exercises are processed either based on simulations or on real systems. A didactically structured sequence of information, question and task nuggets is bundled into learning units. Learning paths and curriculums are developed from multiple courses. Since each learning nugget can be individually processed and arranged as a module, Festo LX offers enormous flexibility.

Experience customisation
On Festo LX you can easily customise courses or create your own training content based on learning nuggets. You can track the learning progress of all users on a dashboard, allowing you to address each individual even in groups with very different levels of proficiency.



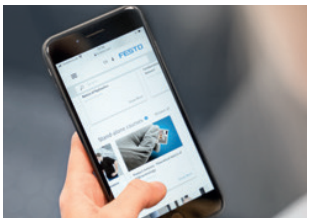
The digital learning portal for customised learning experiences

Festo LX is our self-developed online portal for teachers and learners to access and create a customised learning experience. All our didactical knowledge and learning materials can be found on Festo LX in digital optimised formats for you to start your learning journey.



Experience productivity
Festo LX allows skills gaps to be closed. Thanks to the multimedia learning support, users achieve learning success more quickly and often show productivity on-site through the eLearning options.

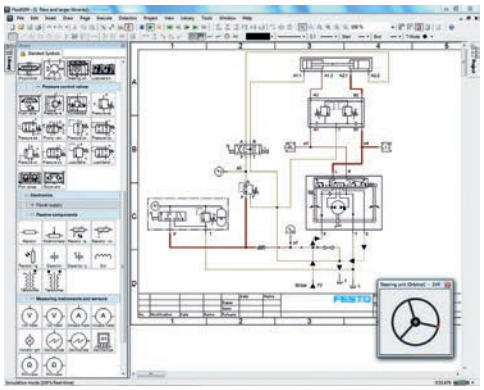
Experience reliability
Our industry know-how as an automation specialist ensures qualifications that are oriented on competencies and meet the requirements of the industry. High-quality didactic learning resources ensure the effective transfer of knowledge and experiential learning experiences. Modern, reliable data security is ensured and applied in all areas, taking into account the latest IT security standards.



Simpler access
Festo LX is a cloud-based learning portal. That is why it doesn‘t need to be installed locally and you have access to the latest updates to functions and training content at all times. Use of Festo LX takes place via license packages that are tailored to the number of users and the period of use.

Outstanding education
Festo LX was awarded the Comenius eduMedia Seal 2021.

FluidSIM®



Design. Simulate. Learn.

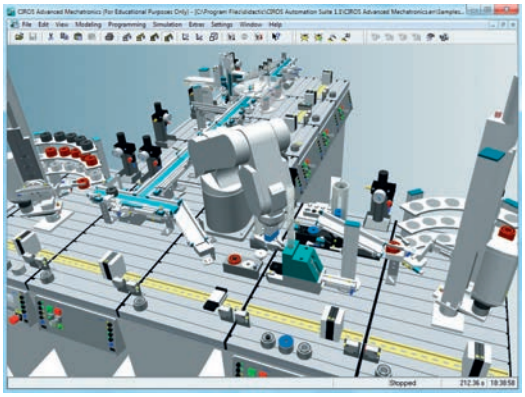
Leading circuit design and simulation program for pneumatic, hydraulics and electrical engineering

FluidSIM® is a comprehensive software for the creation, simulation, instruction and study of electro-pneumatic, electro-hydraulics, electrical, electronic and digital circuits

All of the programme functions interact smoothly, combining different media forms and sources of knowledge in an easily accessible fashion. FluidSIM® unites an intuitive circuit diagram editor with detailed descriptions of all components, component photos, sectional view animations and video sequences.

Learning topics
- Drawing of the fluid power circuits according to standards
- Simulation of the designed circuits
- Usage of the training materials provided such as slides, videos, sectional drawings, etc.
- Creating documents of the projects

CIROS®



Professional training in virtual learning environments

CIROS® is the universal, 3D virtual commissioning software program for factory automation and robotics.

Enabling VR in CIROS®

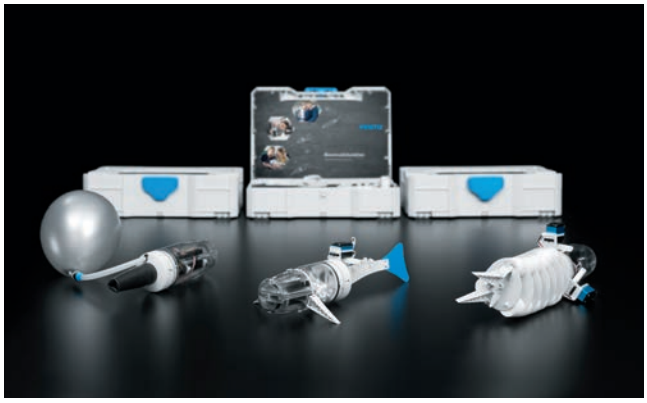
Thanks to the VR simulator integrated into CIROS® software, a simple button-click sends learners to a 3D world, simulating complex factory automation equipment, mechanisms, and processes – without any risk to people or equipment – and allowing location-independent learning.

Learning topics
- Analysing the function and system structure of automated production environments
- Training and developing PLC and robot programming
- Adopting the right approach to troubleshooting and fault finding
- Understand the fundamentals of production planning and control
- Virtual commissioning enables quick familiarisation training

STEM

Bionics4Education

Bionics kit



Bionics kit

Bionics, or bio-inspired engineering recognises that nature has something to teach us. For billions of years, nature has successfully engineered natural, adaptive technologies for its survival. The organisms and ecosystems we are surrounded by face many of the same challenges that we do.

Studying how nature has developed solutions for living organisms can be very effective in terms of solving today's engineering problems and has inspired human engineers to mimic many natural designs to solve complex problems and develop incredible technologies.

Learning topics
- Explore bionics concepts
- Understand and apply the Fin Ray Effect®
- Demonstrate how to use micro-controllers
- Create four bionic inspired models
- Control robots using a smartphone
- Discover technical innovations inspired by nature

Bionics flower



Bionics flower

The Bionic Flower is a construction kit inspired by the plant world. It opens and closes its petals in response to external influences such as approach or light. These mechanisms of action are simulated with sensors and actuators and can be learned in a playful way by students in class. The bio-inspired design applies the principles from the plant world to technology by means of scientific and technical questions. This rounds off the teaching of curriculum topics in STEM education (Science, Technology, Engineering, and Maths).

Learning topics
- Modular concept
- Getting to know the concepts of bionics
- Understanding and applying biological phenomena
- Simple control via mobile devices
- Gain first experiences with programming
- Using a micro-controller

Radar training system



Radar training system (multi tension)

The radar system combines real- world radar with the power of modern surveillance technology, using patented technology to detect and track passive targets at very short range in the presence of noise and clutter. The computer-based control of the radar's processing and display functions ensures its longevity as a leading-edge pedagogical tool. The system provides students with real — not simulated — hands-on experience. It consists of seven subsystems, allowing instructors to configure a system tailored to their training needs and budget.

Learning topics
- Principles of radar systems
- Analogue MTI processing
- Digital MTD processing
- Tracking radar
- Radar in an active target environment
- Phased Array Antenna Radar
- Radar Cross-Section (RCS) and ISAR measurement
- Synthetic Aperture Radar (SAR) measurement
- Phase-coded pulse compression processor

Antenna training system



Antenna training and measurement system

The antenna training and measuring system is a complete, cost-efficient, working system for hands-on experimentation on antennas in the 1-GHz and 10-GHz bands. It can be used by students in a classroom, as well as by design and research teams.

The system includes sets of antennas, an RF generator, and a receiving system with a rotating antenna positioner, linked to a data acquisition interface. It is designed for low-power, safe operation allowing measurements of antenna characteristics (radiation pattern).

Learning topics
- Basic antenna measurements
- Measurement and display of antenna radiation pattern
- Experimentation with different antenna types
- Microstrip and array antennas
- Optional multi-beam array antenna
- Optional two elements antenna phasing

Microwave training system



Microwave training system

The Microwave training system is a complete, state-of-the-art microwave training program that includes data acquisition and instrumentation.

Specifically designed for hands-on training, this integrated package of software, hardware, and courseware contains all power supplies, high quality microwave components, and accessories required to perform the experiments.

Computer-based data acquisition
The experiments are performed using the Data Acquisition and Management for Microwave systems software (LVDAM-MW). This modern software is built around a Data Acquisition Interface (DAI), that performs 12-bit A/D acquisition on four channels.

The software uses the acquired data received from the interface to calculate and display the values of power and SWR measurements on a computer screen. This approach eliminates the need for a separate power meter and standing-wave ratio (SWR) meter, thereby providing high flexibility at a reduced cost.

Learning topics
- Hands-on, system-level training in microwave technologies
- Rugged, high-quality components designed for educational purposes
- Each component is identified with standard micro-wave symbol
- Microwave devices and components
- Rapid assembly and disassembly of system configurations
- USB Data Acquisition Interface (DAI) providing virtual instrumentation for the LVDAM®-MW software
- Comprehensive courseware

Communication technologies system



Communication technologies training system

The Communications Technologies Training Systems are specifically designed for hands-on training in a wide range of communication technologies. Training starts from the basic pulse modulation techniques (PAM, PWM, and PPM), covers the various digital modulation schemes used in data transmission (PCM, DPCM, Delta CVSD, ASK, FSK, BPSK, QPSK, and QAM), and extends to modern, spectrally efficient, digital communication techniques such as ADSL, CDMA and spread spectrum technologies (direct-sequence spread spectrum and frequency hopping spread spectrum).

The study of the spread spectrum technologies using the training systems allows coverage of several other relevant topics such as the principles of code-division multiple access (CDMA), Gold code sequence generation, auto-correlation and cross-correlation properties of code sequences, as well as an introduction to modern applications of these technologies such as CDMA-based cellular telephony, Global Positioning System (GPS), residential cordless telephone sets, Bluetooth specification for wireless personal area networks (WPAN), etc.

Learning topics
- Pulse Modulation and Sampling (PAM/PWM/PPM)
- Digital Modulation (PCM/DPCM/Delta)
- Basic Modems and Data Transmission (ASK/FSK/BPSK)
- Quadrature Phase Shift Keying (QPSK/DQPSK)
- Quadrature Amplitude Modulation (QAM/DQAM)
- Asymmetric Digital Subscriber Line (ADSL)
- Spread Spectrum (DSSS/FHSS/CDMA)
- Troubleshooting

Electromechanical training system 0.2kW



Electric power technology training system

The Electric power technology training program was developed to answer the increasingly diversified needs for training. The modular design approach, coupled with wide range of topics, allows flexibility and customisation according to course's needs. 43 topics to choose from.

SCADA and OPC ready

The latest development of the series, the unrivalled Data Acquisition & Control Interface (DACI), can be upgraded with SCADA function set option which communicates over OPC Server. This allow either one or multiple supervisory user to parameterise, control and analyse on a single workstation.

Learning topics
- DC power circuits
- Lead-acid batteries
- Ni-MH batteries
- Single-phase AC power circuits
- Single-phase power transformer
- Three-phase AC power circuits
- Permanent magnet DC motor
- Conventional DC machines and universal motor
- Three-phase rotating machines
- Three-phase wound rotor induction machine
- BLDC and permanent-magnet
- Synchronous motors
- Hydro-power electricity generation
- Directional Protection
- Introduction to Electric Power Substations

Protective relay



Protective relay

Protective relaying provides detection of abnormal operating conditions in electrical systems and is needed in order to act quickly to protect circuits, equipment, and the general public.

Relay programming
Relay programming (e.g., protection function selection, function settings) is achieved via the Siemens DIGSI 5 software via a USB connection (both the software and USB are included with each relay and the software license is free for educational purposes). Relay function settings can also be performed using the keypad and displaylocated on the front panel of the relay. Once programmed, the relays can be tested using a built-in relay testing unit to ensure it is programmed to operate as expected. This eliminates the need for users to purchase a costly external relay tester to perform relay testing. Access to the voltage and current inputs of the Numerical Distance Relay is through a removable panel located at the back of the relay enclosure.

Learning topics
- Overcurrent/Overload protection
- Directional protection
- Differential protection
- Distance protection

Basic motor control



Basic motor control

Motor control systems are critical to the performance and protection of industrial equipment powered by electric motors. Devices like sensors, drives, and PLCs can be used, but basic motor control technologies like switches, relays or contactors are widely used.

Skilled workers are required to install, maintain, and troubleshoot control circuits and their components.

To support vocational and technical education teachers and students, Festo created a new course aligned to professional skill requirements, along with training equipment for hands-on experimentation. It is most relevant for students in the fields of mechatronics, electrotechnology, industrial maintenance, instrumentation and process control, and more.

Learning topics
- Fundamental of basic motor control technology
- Troubleshooting simple motor control
- Two-wire control/three-wire control
- Two-wire jogging control
- Jogging control using a relay
- Starters:
  - Automatic starters
  - Reversible motor starters
  - Reduced Voltage Starters
  - Primary Resistor Starters
- Timed circuit
- Working principle of motor protection
- Working principle and design of induction motor
- Electrical interlock
- Braking

TP 1423 Stepper and Servo Motor



TP 1423 Stepper and Servo Motor Contol Technology

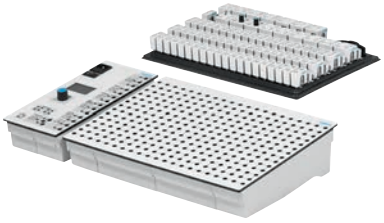
Stepper and servo motors are essential in industry for precise and controlled motion. They enable automation, accuracy, and efficiency in various industrial applications for increased productivity and competitiveness.

The new stepper and servo motor control courses focus on teaching the fundamentals of position, speed, and torque control.

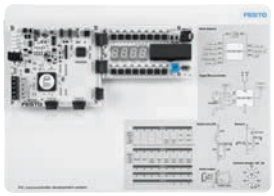
Safe, modular training packages allow learners to gain hands-on experience in the configuration of stepper motor and servo motor controls before engaging with complex, real-world applications.

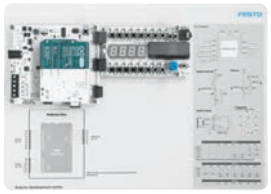
Learning topics
- Stepper and/or servo motor working principles, construction, and applications
- Torque calculations and motor selection for specific tasks
- Drive configuration and commissioning
- Diagnostics and troubleshooting techniques
- Wiring and manual motor operation
- Homing and creating smooth motion trajectories
- Power transmission methods for angular and linear motion
- Advantages and limitations of different transmission methods
- Open- and closed-loop control using encoders and feedback devices
- PID control for position, speed, and torque
- Control strategies using a PLC for motor applications
- Control and coordination of multiple axes independently

Basic electrical /electronics



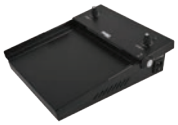
Microcontrollers (PIC/ARD)





FACET









Basic electrical/electronics

The TP 1011 is basis for electrical engineering and electronics, which has universal patch panel of this training package uses the proven 19 mm grid. The universal patch panel and basic power supply unit, which provides a function generator among other things, form the basis on which the digital and control technology component sets can be used.

The set enables students to explore the combined use of electronics and light. They will learn about optical semiconductor behaviour, construction, and characteristics.

Learning topics
- Direct current
- Alternating current
- Semiconductor
- Basic electronics circuits

Microcontrollers (PIC/ARD)

The TP 1515/1516 equipment sets offer an affordable and expandable introduction to microcontroller systems. They are ideal for learning about electronic systems and digital electronics, and for rapid prototyping. The sets are primarily aimed at students but can also be used by industrial engineers. The real-world, modern-day technology provides a strong foundation for training the next generation of engineers and technicians.

Learning topics
- Micro-controller chip architecture and hardware
- Coding structures: if-else, variable type, while, delays, break, case, read/ write, etc.
- Simple programming of I/O, LED, switch
- Analogue and digital signals
- Communication and devices
- Sensors signal processing, motor controls
- Interrupts, timer, loops

FACET electronics training system

The FACET electronics training system is based on a program consisting of courses carefully designed to foster recognition, understanding, experimentation, troubleshooting, application, design and evaluation of analogue and digital electronics circuitry.

Learning topics
- Basic principles of electricity and electronics
- Digital electronics
- Industrial electronics
- Communications systems

Solar/Wind System



Solar and wind energy training system

The solar/wind energy training system forms a complete hybrid energy training system. This modular program covers the history, fundamentals, installation, operation, maintenance, and servicing of alternative energy systems. It fits the needs of high school and college students.

The solar/wind energy training system includes everything required to function as a stand alone, hands-on learning workstation: instructor guide, student guide, training modules with fault insertion, and power-generating equipment. The trainer is made with real-world components that are used in industry; the same components that students will see on their own.

Learning topics
- Energy fundamentals
- Trainer familiarisation and safety
- Solar module
- Wind turbine
- Solar/wind systems
- Going green

Nacelle



Nacelle (wind turbine) training system

The Nacelle is a complete replica of the nacelle of a commercial wind turbine that demonstrates how wind energy is captured and converted into electrical power. The learning system consists of a complete and exposed drive train that allows students to observe and extensively manipulate the various components.

The system includes the main shaft, a gearbox with a transparent side cover, speed sensors, a hydraulics brake, and an asynchronous generator. The yaw system is fully operational and features a slewing bearing, a gear motor, a drive, a position sensor, and fail-safe hydraulics brakes.

Learning topics
- Nacelle familiarisation, safety, and control system
- User interface and wind simulation
- Gearbox, coupling, and alignment
- Basic hydraulics circuit
- Hydraulics brakes
- Electrical circuit and panel
- Troubleshooting

EDS water technology



Discovering water circuits

With the EDS® system comprising of the four main stations, you are ideally equipped to get to know the world of process command, measurement and control technology.

If you operate the stations individually, up to three students can work on the following learning areas:
- Plant engineering, process and laboratory technology
- Electrical engineering
- Automation/process control engineering and administration

Learning topics
- Controlling, regulating and monitoring physical variables such as level, flow and pressure
- Technical/physical functions of sensors and actuators as well as wiring, adjustment and parameterisation
- Analysing controlled systems, parameterising and optimising regulators
- System operation, maintenance, troubleshooting and repair
- Plant engineering
- Optimisation and energy monitoring
- Electronic data processing
- Reading and interpreting process flowcharts, electrical and pneumatic circuit diagrams

Australia

Festo Pty. Ltd.
Head Office
Melbourne
179 –187 Browns Road
Noble Park Nth VIC 3174,
Australia
Call Toll Free: 1300 88 96 96
Call Toll Fax: 1300 88 95 95

Germany

Festo SE & Co. KG
Postfach
73726 Esslingen
Ruiter Straße 82
73734 Esslingen - Berkheim
Tel: +49 (0) 711 347 0
Fax: +49 (0) 711 347 2628

Festo Didactic SE
Rechbergstraße 3
73770 Denkendorf
Germany
Tel: +49 (0) 711 3467 0
Fax: +49 (0) 711 347 54 88500

India

Festo India Pvt. Ltd.
Head Office
237-B, Hosur Road,
Bommasandra Industrial Area,
Bangalore 560 099 India
Tel: 1 800 425 0036
1 800 121 0036
Fax: +91 80 27832058

Indonesia

PT Festo
Head Office
Jl. Tekno V Blok A/1 Sektor XI
Kawasan Industri BSD
Serpong - tangerang 15314
Banten - Indonesia
Contact Centre
Tel : 0804 1 2 FESTO (33786)
Fax: 0804 1 4 FESTO (33786)

Japan

Festo K.K.
Head Office
1-26-10 Hayabuchi, Tsuzuki-ku,
Yokohama 224-0025
Japan
Tel: +81-(0) 50 3852 6000
Fax: +81-(0) 50 3852 6140

Korea

Festo Korea Co., Ltd.
Head Office
25, Mullae-ro 28-gil,
Yeongdeungpo-gu, Seoul,
Republic of Korea
(Young City N Tower, 12F)
Tel: +82 1666 0202
Fax: +82 2864 7040

Malaysia

Festo Sdn Berhad
Head Office
14A, Jalan Teknologi, Taman Sains Selangor 1
Kota Damansara 47180 Petaling Jaya
Selangor - Malaysia
Tel: +60 (3) 6144 1122
Fax: +60 (3) 6141 6122

Mongolia

Inter Science LLC
Bayanzurkh district,
Peace Avenue -46,
Ulaanbaatar, 13381, Mongolia
Tel : +976 7015 8002
+976 7015 8003
Fax: +976 7015 8001
Email: info@interscience.mn

Myanmar

Sea Lion Co. Ltd
181 Bo Myat Tun St.
Botataung, Yangon 11161,
Myanmar
Tel : +95 1 299797
+95 9 7330 0300
Fax: +95 1 202751
Email: info@sealiongroup.com

New Zealand

Festo Ltd
Head Office
20 Fisher Crescent
Mount Wellington
Auckland
Tel: +64 (09) 574 10 94
Fax: +64 (09) 574 10 99

Philippines

Festo Inc
Head Office
Festo Building, KM 18, West Service Road
South Super Highway
1700 Paranaque City, Metro Manila
Tel: +63 1800 10 12 FESTO (33786)
Fax: +63 1800 10 14 FESTO (33786)

Singapore

Festo Pte Ltd.
6 Kian Teck Way
Singapore 628754
Tel: +65 6285 8585
Fax: +65 6415 6900

Sri Lanka

Nikini Automation Systems (Pvt) Ltd
249 High Level Road,
Colombo 5
Sri Lanka
Tel: +94(0) 11 2826894 Ext. 240
Fax: +94(0) 11 2826252
E-mail: sales@nikiniautomation.com

Thailand

Festo Ltd.
Head Office
200, 202 Kanchanapisek Road,
Ramintra, Khannayao,
Bangkok 10230 Thailand
Tel: 1 800 019 051
Fax: 1 800 019 052

Vietnam

Festo Co., Ltd
(Công Ty TNHH Festo)
Head Office
Floor 2, HQ Tower, 9 Tran Nao Street,
Binh An Ward, District 2,
Ho Chi Minh City, Viet Nam
Tel: +84 (28) 3514 5600
Fax: +84 (28) 3514 5601

For all Festo Didactic Sales & Support:
support.didactic.apac@festo.com

AP_PODHIGH_07.2024