Connected Learning

-

FESTO

00

Connected Learning The new dimension in learning

Connected Learning creates a new dimension in learning by seamlessly connecting the virtual and the real worlds. It combines familiar learning methods such as face-to-face, hands-on and self-guided learning and hereby vanishes the boundary between theory and practice through direct interaction between software and hardware. This makes simple and intuitive learning possible.

The learning methods are tailored to the individual abilities of the student as part of a comprehensive learning scenario. This is the key to fast and enduring success in learning. The learning process for basic and ongoing technical education and training is raised to a higher level of quality and sustainability.

Connected Learning enhances professional competence and media literacy while increasing independence. Furthermore, it maximizes the appeal of the training and guarantees that the learning experience is enjoyable and motivating.



Tec2Screen[®] Bringing Connected Learning into the learning laboratory

Connect The interface between the virtual and the real worlds

Base Base unit, connects the iPad to the Connects

> With its patented Connect interface, Tec2Screen® represents the link between the real and the virtual worlds, and together with the base forms the core of the system. Courses and simulations developed by Festo Didactic deliver the content for learning, informing, controlling, measuring, regulating and programming, which can be linked to hardware via the Connects. Students can thus explore the exciting world of technology through interactive experiments.



Connected Learning The key to success

Technology trends in ever shorter cycles are leading to greater complexity in dynamic, increasingly networked industrial environments. Specialist staff constantly find themselves faced with new challenges in their workdays, which demand an ever-increasing level of professional competence and media literacy as well as the ability to act independently.

Qualified and highly trained specialist staff are thus becoming a scarce resource for companies and for economies – yet they are also the key to their success. New and attractive learning concepts encourage qualified trainees and students to take up basic and ongoing technical education and training, thus allowing employers or educational institutions to position themselves as innovative and attractive.

As a leading global supplier to technical educational institutions and as a provider of consulting and training services to industry, Festo Didactic supports its partners in overcoming these challenges. The new Connected Learning concept systematically prepares and trains individuals for working in dynamic and complex industrial environments.

Connected Learning focuses specifically on the individual abilities of students by making sure not only that training content is communicated effectively and in line with their needs, but also that it can be applied efficiently in every day working practice. This will ensure that learning is successful in the long term.

Connected Learning is implemented using the mobile, multimedia and interactive learning companion Tec2Screen[®] from Festo Didactic.



From conveyor of knowledge to learning coach

Changing roles of teachers and trainers

High-quality training must be geared towards work and business processes and use future-oriented technologies in everyday training activities. Having a strong link between training and operational processes as well as modern technologies allows the development of a wide range of skills and aptitudes and therefore develops the student's professional competence.

This presents trainers with a major challenge, as the individual learning paths require guided learning that is tailored to the needs of the student. Instead of being mere conveyors of knowledge, trainers are developing into learning coaches who are able to identify and foster student potential. Specific support can be provided for the students' weak areas, while their strengths can be actively developed.

The transformation into learning coach is supported by the learning management system "Classroom Manager", which allows trainers to assign training content individually and to document and evaluate learning progress as well as learning statuses. Learning methods and learning content can be recommended and assigned in line with the student's learning path and previous knowledge as well as his or her needs.



Enjoyable and motivating learning

The focus is on the student

The patented Connects of Tec2Screen[®] provide a seamless and clear link between theory and practice. On the one hand, they ensure successful learning for the student, while on the other, the interactive and exploratory experiments maximize motivation and the joy of learning, despite complex technology. The direct feedback provided by the learning system makes a significant contribution to this.

In addition, Tec2Screen[®] connects students and encourages them to exchange themselves through collaborative learning. With the support of the trainer as the learning coach, new knowledge is acquired, consolidated and applied directly in practice. The modular and flexible structure of the learning units means that Tec2Screen[®] can be used anywhere and at any time and can be adapted to the specific learning process as well as to the student's learning speed. Training content can be repeated and relevant information can easily be looked up, thus promoting exploratory and self-directed learning.

The system's mobility also makes it possible for users to learn at home or on the move. Using Tec2Screen[®] with the iPad teaches students how to work with new digital media and develops their media literacy. The iPad can be integrated into training in other ways, too – for example when giving presentations. This ensures that training remains at the cutting edge of technology.

Connected Learning will support technical education and training in virtually all areas offered by Festo Didactic in the future, including **automation technology**, **electrical engineering**, **mechatronics** and **fluid engineering**; it can therefore be integrated into a wide range of current and future learning systems from Festo Didactic, as well as into various learning scenarios.



Connected Learning in automation technology

Multimedia support for practical tasks



In order to be able to follow all the work steps when designing mechatronic systems or when carrying out commissioning, maintenance and fault finding in actual practice, an in-depth understanding of their relationships and functionality is required. The project-based and practical exercises in the Tec2Screen® courses are supported by multimedia content (videos, animations, tests, programming and measurement exercises) to ensure that the learning process is interesting and motivating. In practical hands-on training, students can explore the training packages, MPS[®] modules and stations or individual components themselves using a QR code scanner and therefore gain a better understanding of the associated technologies.

Practical work is supported by instructions during the design, commissioning and fault finding processes. At the same time, digital media literacy is encouraged by providing background information (testing physical laws through experiments, reading wiring diagrams and data sheets, fault finding in mechatronic systems). For example, practical fault finding can be supported by technical documentation. Interactive, multimedia dialogue with the technology and learning systems makes it possible not only to learn about processes through the virtual SimuBox of Tec2Screen®, but also to read signals in order to gain a stepby-step understanding of the processes by establishing a clear visual link between the virtual and the real application.

The modular production system MPS® From module to training factory



Practical at every level

The modular production system MPS[®] sets the right challenges and provides appropriate learning environments for various requirements:

- Differentiated functions
- Individual and combined units
- Different drive technologies
- Material and information flow
- Modern and variable control concepts



MPS® stations

This system is for anyone who attaches great importance to industrial education and training in mechatronics and automation technology, and the enduring value and robustness of the equipment:

- The system for the WorldSkills mechatronics world championships since 1991
- Stations represent the most common sub-processes in any automated production system
- Platform for problem-based practical training
- Maximum industrial relevance in automation and handling technology



Each station has its own focus

Two stations – Distributing and Sorting – are sufficient to represent a simple, practical process for basic training in automation technology.

This simplest of all combinations offers numerous basic functions of automated production: separating, feeding, identifying and sorting. Each additional station adds new learning objectives. But all stations were designed with one common goal: transferring user knowledge to the actual operation of modern automated production as efficiently as possible.

Connected Learning in automation technology

Practical simulations for application in the real world



The representation of complex subject matter using simple, clear simulations is an essential part of modern training systems.

With Tec2Screen® different technologies, programming languages and application areas of PLC programming can be realistically tested and simulated, both in terms of structure and representation. Logic control systems with basic logic functions as well as simple and complex process controls with sequences can be created. It is thus possible to learn through experimentation in a safe and practical way without any real effects or consequences.

The direct link between real and virtual systems is provided via a user-friendly interface. Students literally have the process in the palms of their hands and the signal flow can be followed thanks to the lines connected to the iPad. Simulations for a set of pedestrian lights, a sorting system or a linear axis, for example, allow the newly gained knowledge to be applied and consolidated, while also making the student aware of possible fields of application from many different areas of learning and working.

Furthermore, by connecting Tec2Screen[®] to a control system the process model can be realistically programmed and simulated. The student can change the parameters of the simulated process to identify the effects in a direct and practical way and to gain an understanding of the relationships and consequences. PLC training packages From buttons to automation solutions



Control, process, training

Forward-looking training is ultimately all about reliable and efficient automation of production processes:

- Automation systems must correspond to those of future workplaces.
- Processes must be as close as possible to those used in actual production.
- The training content and
- methods must lead to professional competence, which prospective specialist staff can use to secure the future for themselves and their companies'.

These requirements are met by the PLC training packages from Festo Didactic in order to ensure that training is as realistic as possible.



The process is the key

An ongoing production process cannot be taken "out of operation" for training purposes. Therefore, the key is to offer the right "artificial" training processes that are economical, flexible and practical:

- Virtual: CIROS[®], FluidSIM[®] or EasyVeep offer hundreds of different processes that can be controlled via EasyPort or OPC.
- Real: the best process environment is provided by the modular production system MPS[®].



From manual to automatic

Clarity on the one hand, maximum industrial relevance and practical transfer on the other. Devices and solutions for automation/PLC technology meet all requirements:

- From simple to complex models
- From manual control to relay
- From digital mini control system to PLC

The balance is achieved because the learning system for automation technology is integrated vertically and horizontally.

Connected Learning in electrical engineering

Exiting fault finding through interactive measurement



Measurement technology is a useful instrument for fault finding and optimizing systems not only in electrical engineering, but also in many other areas. Tec2Screen® provides exercises and tools for recording and measuring values. Virtual measuring instruments such as the multimeter or oscilloscope can record both analog and digital signals. They can be used to measure various values in electrical engineering, such as voltage, current or resistance. Tec2Screen® offers an ideal format for editing the measured values, making it easy to analyze the recorded measurements. Setpoint/actual value differences simplify the identification of cause-and-effect relationships. When examining electricity-consuming devices, for example, students can easily recognize the potential for savings. Supporting documents such as textbooks, circuit diagrams or technical documentation are available in digital format and can be used to analyze the values. Theoretical training content such as Ohm's Law can thus be taught in the same practical and exciting way as the world of semiconductor and digital technology. Tec2Screen® can also be used as a function generator for learning about alternating current technology.

Electrical engineering/electronics training packages Modern and exciting training



Everything from a single source

Regardless of the control and drive technology used, electrical engineering always plays a role: Whatever the focus of the training, electrical engineering and electronics are part of the basic knowledge for all areas of production, process and automation technology.

With learning systems from Festo Didactic, learning laboratories – be they complete, individual or modular – can be equipped for any application and budget, whether for teaching basic principles in building systems or control or drive technology.



Proven concept

Festo Didactic's proven and continuously upgraded teachware concept also underpins the training packages for electrical engineering. It is based on project-related exercises that increase in complexity from one exercise to the next. The knowledge gained is revisited, reinforced and consolidated in subsequent exercises.

Theoretical content is illustrated and communicated more clearly with the help of the accompanying photos and videos. The documents are available in teacher and student versions and exercise sheets can simply be printed as required. All projects include practical problems. Drawings, images and videos give a broad view of real-world industry.



Rapid transfer

Whether in initial professional training or more advanced courses, it is essential to be able to recall what has been learned and apply it immediately. This is easier to do if the worlds of learning and work are as similar as possible.

That is why the training packages for electrical engineering contain only industrial components, and the exercises in the course documents are based on a professional environment.

Connected Learning in fluid engineering

The easy way to explore and learn complex technology



Project-oriented experiments in the courses are always illustrated using concrete problems and case studies in order to support practical learning.

Pure theory is made exciting and interesting thanks to the close link to reality and everyday working experience. Practical experience is all about making learning last so that students retain the information they have acquired in the long term and are able to use it in their daily work. Control systems are easy to analyze with Tec2Screen[®]. In addition to recording end positions, the pressure and flow rate can also be displayed. The signal flow from the sensor to the user's hand is clearly visible at all times.

Students can learn about the technology and study the training content either independently or in groups. The integrated QR code scanner in Tec2Screen® provides a new means of acquiring information with access to relevant media content in the form of videos, animations or technical documentation. Unknown components can thus be looked up and more detailed information can be retrieved.

Most of the features of the iPad can also be used for modern teaching. For example, projects can be documented with the integrated camera or logs can be created using the iPad. The use of state-of-the-art media not only increases student motivation, but also enhances the way they deal with new digital media.

Technology that moves



Didactic plus

The workbooks accompanying the training packages contain project-related exercises of increasing complexity. There are also positional sketches, illustrations, videos, cross-sectional drawings and animations, which explain how things look in the real world. For a complete and expert treatment of the topic of pneumatics and hydraulics, the training also covers basic physics, technical calculations, safety, efficiency, analytical fault-finding and professional documentation.

Practice-oriented basic and ongoing technical education and training using industrial components provides students with the confidence to apply the acquired knowledge in the workplace. The components of the training packages are specially selected for the exercises in the workbook.

Pneumatics and hydraulics training packages



Choice of learning environment

Festo Didactic offers convenient and diverse training environments for a wide range of topics:

- Self-study with the multimedia training programs
- Designing and documentation with FluidSIM®
- Practical implementation with the training packages and the exercises in the workbooks as well as Tec2Screen[®] courses and simulations
- Functional testing and optimization with measurement technology and FluidLab®



Modular and flexible

The training packages from Festo Didactic have a modular structure. For example, you could start with the basic level of electropneumatics and then move onto the advanced level. Or you could begin with electrohydraulics. The choice is yours.

If you would like to explore a particular specialized topic, all the equipment set components of our training packages can be ordered separately, so you can turn your own ideas into reality.

Connected Learning Networking the learning laboratory

Connected Learning brings together not only the real and virtual worlds, but also the entire learning laboratory thanks to a simple, complete solution.

WLAN allows the simple and uncomplicated setup of an independent network without a connection to the local network or Internet. This means that the system can operate independently of the available IT infrastructure. Integration into the existing network environment is also possible.

The relevant hardware can be purchased together with support for initial installation and commissioning, if required.

To accelerate the learning process, courses and individual learning units can simply be transferred to the student's Tec2Screen® via WLAN. This is done using the learning management system "Classroom Manager" which is installed on the trainer's PC workstation. With Classroom Manager, training content can be managed and assigned, and the learning progress of each individual can be assessed and documented as well.



The role of new media in the learning laboratory of the future To share learning progress and experiences within a group and to make it easy for trainers to present new information, Festo Didactic has developed a concept that allows the content of different devices including tablets, PC workstations, etc. to be shown on a projection screen. The trainer can decide centrally which device is to be projected via a WLAN signal and display the content for everyone in a fast and simple process. This additional feature makes it easy to integrate new media into modern training methods.



USA

Festo Didactic Inc. Eatontown, NJ 07724 Phone: +1-732-938-2000 Toll Free: +1-800-522-8658

Canada

Festo Didactic Ltée/Ltd Québec (Québec) G2N 2K7 Phone: +1-418-849-1000 Toll Free: +1-800-522-8658

Germany

Festo Didactic SE Rechbergstraße 3 73770 Denkendorf Phone: +49(0)711/3467-0

did@festo.com www.festo-didactic.com