

Academic
Research

ePLAN[®]
electric P8

ePLAN[®]
fluid

OTTO BRENNER School

implemented EPLAN Electric P8

The first to use the new EPLAN Platform

Anyone doubting the existence of practical, modern, and professionally relevant education for engineers should pay a visit to the Otto-Brenner school. It's a Hanover area vocational institution that educates state-sponsored students in three disciplines: electrical, mechanical and metals engineering.

Among other things, the laboratory at the technical university is equipped with a flexible production system that can automate a wide range of work processes such as feeding, verification, handling, sorting and conveying. The system elements can be individually programmed and controlled, or operated as a networked system.

“This vocational school in the Hanover area is among the first to implement EPLAN Electric P8. As part of a final project, five students took on the task of designing and constructing a production system using the newest E-CAD/CAE technology. And there's more: During system operation, the EPLAN E-CAD/CAE system can even be used to simplify maintenance tasks and facilitate the quick handling of malfunctions.”

ePLAN your engineering

MECHATRONICS

designed with

continuous processes and concrete examples

As a result, the five mechanical and electrical engineering students had all of the hardware specifications stored in EPLAN Electric P8 and EPLAN Fluid, and because of the standardized data platforms of the two CAE programs, they were able to design the entire electrical and fluid power structure for the flexible production system all in one single project.



Good contacts in industry

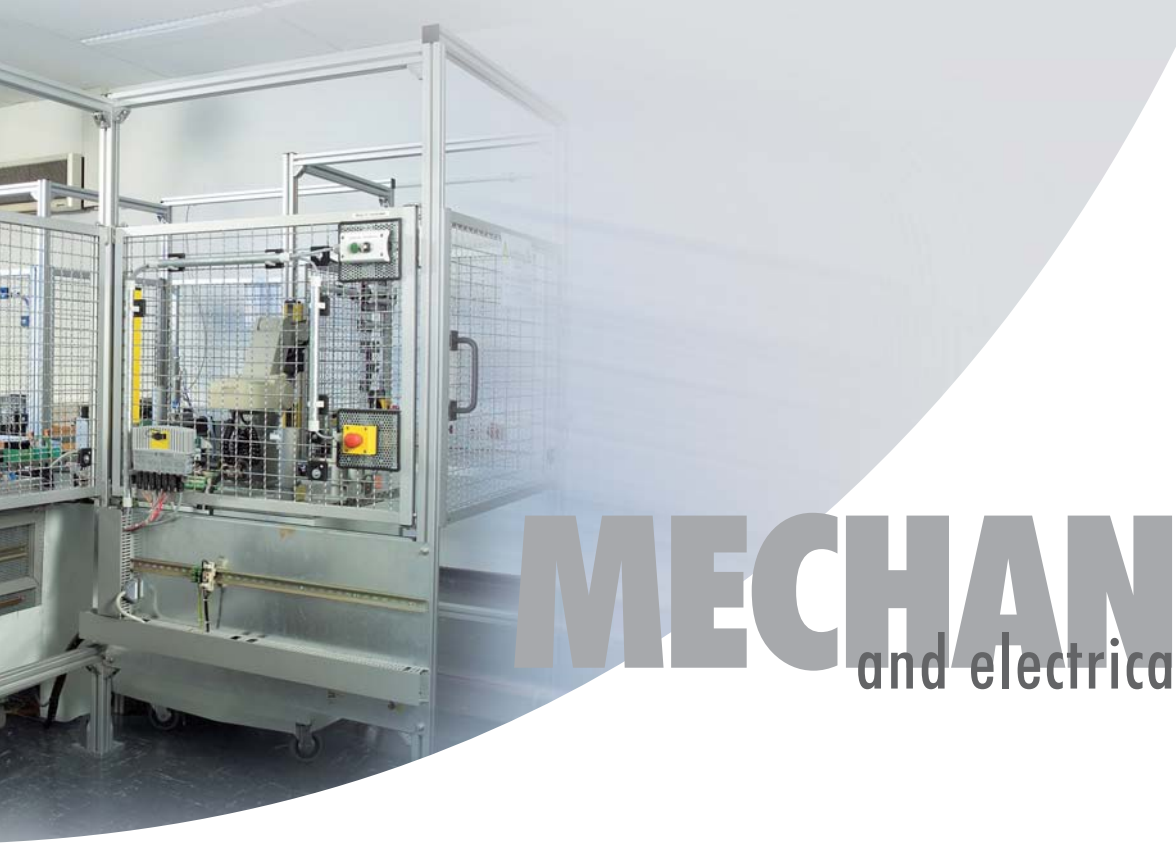
According to senior teacher and graduate engineer, Heinz-Georg Meyer, the system conforms to the high standards used in the automotive industry. A Siemens S7 type PLC is used for controlling and WinCC is used for visualization. The safety technology is also state-of-the-art. Working closely with Phoenix Contact, the school is one of the first to gather experience using the Interbus Safety system. Given the tight public funding, it is no surprise that the central components of the robot, linear and mounting technologies were donated by industry enterprises such as Festo, Lenze, and Phoenix Contact. This shows how solid the cooperation is between the technical university and the business community. Indeed, many final projects are developed based on suggestions from companies, and are designed to achieve goals that will ultimately be put into practice.

Integration of mechanical design and electrical engineering

The main focus of many of the projects is the challenge of integrating mechanical design with electrical engineering, and this is something that is experienced first-hand at the university. That was certainly the case for one project sponsored by EPLAN Software & Service in the summer of 2006. The challenge: The entire flexible production system was to be designed using the new EPLAN Platform (that is, EPLAN Electric P8 and EPLAN Fluid) and, on the mechanical design side, Autodesk® Inventor™ Professional.

Systematic approach, continuous workflow

The assignment was tackled by a team of three prospective electrical engineers and two future mechanical engineers. Before starting, they of course had to familiarize themselves with the software, which had just been launched on the market. To do this they were provided with training by EPLAN Software & Service. In the first phase of the practical work, the five project participants (Jörg Machens, Marcus Mohr, Claas Röver, Matthias Lautenschläger-Schreiber and Andres Dörfler) gathered all of the electrical engineering and fluid power components. To do so, they were able to use the digital catalogs of the manufacturers, such as the product catalog from Festo to which EPLAN Fluid has an interface. The 3D views of components available in this catalog were then exported for the 3D view in Autodesk® Inventor™. The students worked with a two-track workflow. Jörg Machens: "We entered the components into EPLAN Electric P8 and EPLAN Fluid project parts management, and simultaneously created a 3D image of the equipment in Autodesk® Inventor™,



ePLAN[®]
electric **P8**

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fluid

MECHANICAL and electrical engineering come together

which simplifies the creation of cable runs." Using the cable paths established in Autodesk[®] Inventor,[™] the cable diagrams could then be transferred to EPLAN Electric P8.

Electrical engineering and fluid power in one project

This allows electrical and mechanical elements to work smoothly together and simplify the designer's work. That leads not only to time savings, but also to synchronized data both on the electrical engineering and mechanical design levels.

Interface with maintenance software

Up to this point the project had only used the possibilities offered by innovative Computer Aided Engineering (CAE) tools. The next phase included the development work. The challenge: Development of a communications system that transfers data to EPLAN Electric P8 and EPLAN Fluid in case of a system malfunction.

New tasks for CAE: Find the causes of malfunctions more quickly

This too was a success. When a malfunction occurs and is registered by the PLC, the control system sends a message to EPLAN Electric P8 where the device tag associated with the error is then called up. This in turn brings up the schematic in which the device tag in question is identified on the screen. The screen view is also linked to additional component images and data in order to provide an additional visual display of the error source. Machine users will be pleased with this news: simplified maintenance will shorten planned and, in particular, unplanned downtimes because service personnel will be able to locate the faults more quickly.

Electrical engineering students at Otto-Brenner have long been involved with discovering new intervention technologies for minimizing malfunctions and downtimes. The flexible manufacturing plant can also be operated and even programmed via the "remote-controlled laboratory" on the Internet (www.tsh.ipactive.de). Using a webcam, operations and service personnel can always check the current status of the system, whether they are on location or not.

Jörg Machens: "Visual pinpointing of the error source allows us to further benefit from the CAE system, which is actually necessary for development in subsequent machine or system life cycles."



Heinz-Georg Meyer: // This project is definitely something special for our lab. It has a research character to it because EPLAN Electric P8 and EPLAN Fluid are so new – it's great that EPLAN Software & Service had confidence in us and was willing to provide us with the software early on. //

Successful cooperation between Otto-Brenner School and EPLAN

SUMMARY

Follow-up projects on the horizon

The work of the five prospective engineers is not quite done yet – and of course their two supervising teachers, Heinz-Georg Meyer (mechanical engineering) and Dieter Hennigs (electrical engineering), won't inform them yet of the grades they will be getting for their final project. But they are satisfied with the way the students approached and tackled the tasks. Traditionally, all final projects at the Hanover technical school are publicly presented. By doing this the school is not only speaking to other engineers, but also to the HR departments in the industry to establish contacts between graduates and hiring companies. The TechnikerForum this year, where Jörg Machens and his teammates presented their EPLAN project, took place on May 10, 2007 in the Otto-Brenner School forum.

Find out more about Otto-Brenner School on www.bbs-me.de

ePLAN your engineering



EPLAN Software & Service GmbH & Co. KG · Monheim · Germany
info@eplan.de · www.eplan.de

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