Machinery

EPLAN electric P8

EPLAN engineering center

SIEMPELKAMP

Maschinen und Anlagenbau

Modular design on a mechatronic platform

Setting new standards for design automation

For a 125-year-old company, Germany's Siempelkamp Maschinen und Anlagenbau has no reluctance when it comes to breaking with the traditional separation of engineering disciplines. Designers access a library of mechatronic modules in the EEC. Each module combines mechanical and electrical engineering elements for assemblies and sub-assemblies used in a Siempelkamp product, ensuring faster competition of the project and a higher product quality because only tested and proven function modules are used.

"A market leader in manufacturing machines for producing engineered wood products, Siempelkamp is setting new standards for design automation by employing the EPLAN Engineering Center (EEC)."

EPLAN your Engineering

FRIEDHELM LOH GROUP

HIGH functionality between EPLAN Electric P8 and EPLAN Engineering Center

"The company took a major step towards realizing this goal by combining the functionality of EPLAN Electric P8 and the EPLAN Engineering Center, which made it possible to accelerate the design process considerably and also reproduce the motor, valve and limit switch lists in the E-CAD."

Upgrading homegrown mechatronic tools

Siempelkamp's machines and integrated production lines are used worldwide to manufacture products like oriented strand board and medium density fiberboard as well as for rubber and metal forming/forging. The company, resident near Düsseldorf, had developed its own design automation tools, including a powerful interface between mechanical and electrical engineering.

"Originally we used a motor, valve and limit switch list (MVG list), for this interface," says Werner Schischkowski, head of automation technology. "This list corresponds to a very complex standardized function description in which, for example, every single initiator is described." Using the MVG list, the company could produce enclosures automatically to a very large extent but could not reproduce the MVG list in its legacy CAE system, which became a problem whenever orders deviated from standard variants. Whenever parameters changed, a great deal of engineering was required to modify existing designs.

Saving time, gaining efficiency

That caused Siempelkamp to seek out a modern E-CAD system. "Our aim is to only have to parameterize and then assemble the machines from modules," says Schischkowski. It also achieves a milestone on the road to realizing the company's ultimate vision of using design to drive modular manufacturing – based entirely on mechatronic modules stored in the EEC. At that point, each machine would only have to be parameterized – a simple, quick process – and not re-designed. A solid foundation is already available on the mechanical side. "We input our MVG lists including the device-tag and cable data directly into the EEC, which means we have an excellent database ready for immediate use," adds Schischkowski.

Relieving resources for new developments

Siempelkamp has decided to structure the EEC into several levels. Basic circuits for drive technology are stored as components or modules. These are again combined at a higher level into modules that can, in part, be very extensive, encompassing as many as 500-2,000 I/Os. These modules are combined further to create a complete system, such as a mat-forming machine consisting of high level modules like the material supply, fiber bunker, mat forming head and leveling head. These high level modules consist of sub-modules such as height adjusters and distribution rolls. The designer can call up these modules pre-stored as functional units and specify the parameters. Significant time is saved and Siempelkamp engineers can focus on more productive activities such as new product development.

MODULAR manufacturing for more productivity

Configuring customer requirements

Each Siempelkamp machine or system is built with the control technology specified by the customer. Here again, "The EEC is a great aid," says Schischkowski's colleague, David Friedrich. "While in the past we had to redesign each machine to accommodate a customer's specification, today we can incorporate all the bus systems and any PLC supplier's products by using EEC modules," adds Friedrich. Siempelkamp uses the S7 tools from Siemens and Rockwell's ControlLogix for the programming software and has already stored software modules in the EEC – an example of very high level standardization. The same applies to the modeling process, which is accessible through the EEC to all engineering disciplines.

Incorporating simulation into design

Future plans call for integrating simulation completely into design. Siempelkamp already has implemented virtual simulation for mat forming machines – a central machine in a press line for wooden materials. The functions of all the limit switches and sensors are displayed on screen and simulated with the customer-specific parameters. The goal is to create the same capability for press and forming line.

Towards a fully integrated automated design

"Development is by no means complete," says Werner Schischkowski. "Our aim is to automate as many steps as possible so that designers can spend their time on real engineering tasks. In addition, modular engineering increases the quality of the complete machine since we are using tested and proven system components."

As a global supplier, Siempelkamp also makes extensive use of the multilingual capability of both EPLAN Electric P8 and EPLAN Engineering Center. "The master plans are drawn up in German and English, and the translations are stored in the dictionary," says David Friedrich. "The documentation is translated at the click of a button into Portuguese, Russian or Chinese. This alone saves a lot of time that can be better used for other purposes."

Machinery

Closer collaboration between electrical and mechanical design

SUMMARY

Siempelkamp Maschinen und Anlagenbau is exerting leadership by employing the EPLAN Engineering Center (EEC) mechatronic tool to achieve closer collaboration between electrical and mechanical design. With the use of mechatronic modules stored in the EEC that include both mechanical and electrical design elements of assemblies and sub-assemblies of its wood presses and other machines, Siempelkamp is able to scale orders and incorporate each customer's specified components with minimum design time. Besides achieving significant savings and product quality improvement in the order fulfillment process, Siempelkamp views its increasing use of mechatronic design as an important step towards modular manufacturing, which will further enhance productivity and customer satisfaction.

Find out more about Siempelkamp on www.siempelkamp.com

EPLAN your engineering

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