

Step by step towards digital consistency

Modularity and seamless interfaces for control cabinet manufacturing 4.0

Automation continues to forge ahead, including in the field of control cabinet manufacturing – and, with consistent communication between the configuration software and terminal strip assembly, Blumenbecker Automatisierungstechnik GmbH aims to further optimize its concept for control cabinet manufacturing 4.0. For this purpose, the company is considering the Project complete software because the data processed by this software allow for individual terminal strip assembly and marking during the engineering process.



Planning in the CAE system: The starting point for digitalizing a process that is still overwhelmingly manual

Blumenbecker Automatisierungstechnik GmbH, headquartered in Beckum, North-Rhine Westphalia, is part of the international Blumenbecker Group, which specializes in industrial automation, industrial service, and industrial trade. With 1,450 employees, the Group offers individual solutions and services for process automation, control technology, industrial maintenance, and industrial needs. "We cover the entire spectrum of production and assembly of various switchgears – from individual switching devices all the way to highly complex technical equipment," explains Florian Sontowski, Project Manager for Innovation Process Management at Blumenbecker. "As an innovation driver, we work closely with all the latest trends in the world of automation."

From digital planning in a CAE system to terminal strip assembly all the way to marking, wiring, and in-house UL labeling by an authorized UL representative, the company has in-depth expertise in in all aspects of control cabinet construction. As the preferred technology supplier for a large customer base from vastly different industries, Blumenbecker uses an extremely wide range of components. Sontowski: "Often, the question is how to most efficiently get the wide range of parts into the correct position in the control cabinet."

In the fields of research and industry, the topic of efficiency in control cabinet manufacturing is nothing new: consistency across processes, high-quality data, and seamless interfaces have been required for some time now. Most people agree on the theoretical aspects, and yet how can we turn this idea on its head? By using a "smart" commissioning system, Blumenbecker Automatisierungstechnik GmbH can reduce effort in the double-digit percentage range, depending on the task at hand. The company also sees similar potential for savings in the optimization of the entire workflow all the way to terminal strip assembly using the Project complete planning and marking software.

From paper to digital assembly diagrams

Conventional parts lists and assembly diagrams on paper force electricians to waste time searching. Given the vastly different parts used for a wide range of control cabinet assemblies, every electrician must have comprehensive experience in order to work quickly and effectively. "We are currently in the midst of a shortage of skilled workers. As a result, we want our workers to be able to move quickly to the wiring stage," explains Sontowski. "Manually looking for components on printed diagrams no longer makes sense."

In addition to the paperless component search, the focus is on optimized handling of the terminal block. In terms of purchase price, this is not a key cost driver in control cabinet manufacturing. But when quantities are as low as one, oftentimes the parts to be installed are not included in the terminal diagrams. "As a result, terminal strip engineering was often outsourced directly to production," says Sontowski.

Seen from this angle, if we look at the process costs for a simple connection point in a control cabinet from planning through to production, the situation looks very different. The majority of the overall costs arise in the engineering process, while the material costs for the terminal strip usually play an insignificant role. "If we observe the process chain from start to finish, a great deal of savings potential becomes clear," says Sontowski. "That is why, when it comes to terminals, we are working on a smart solution that will support us digitally from engineering through to production."

A smart digital solution for control cabinet manufacturing 4.0

In order to design a consistent process chain, the entire approach was examined from top to bottom. The EIP system was designed in line with the motto "flexibility through modularity" –

the abbreviation "EIP" stands for *easy intelligent process*. The system allows the electrician to scan pre-commissioned, labeled product assemblies. The system then immediately

displays the correct position, either in a digital assembly diagram or with a point of light on the actual control cabinet. The component is then directly assembled, without the need to waste time searching on a paper diagram.

In order to optimize the process chain and improve terminal block handling, Blumenbecker decided to complete a test assembly with the Project complete planning and marking software from Phoenix Contact. The comprehensive integration of the software into all common CAE systems, such as Eplan Electric P8, Eplan Pro Panel, WSCAD Suite X, and the E³ series from Zuken, provided the necessary data consistency.

This saves valuable time during the engineering process. The connection points are transferred with the click of a mouse - Project complete uses this data to create a fully assembled digital terminal strip. The bidirectional interface then writes all required part numbers, including the accessories such as end covers and end brackets, back into the CAE system. "This information is rarely updated in our customers' CAE projects because it involves a lot of time and effort. For us, this interface could be a real efficiency factor," says Sontowski, discussing the decision to test the software. Furthermore, Project complete can also be integrated directly into production.



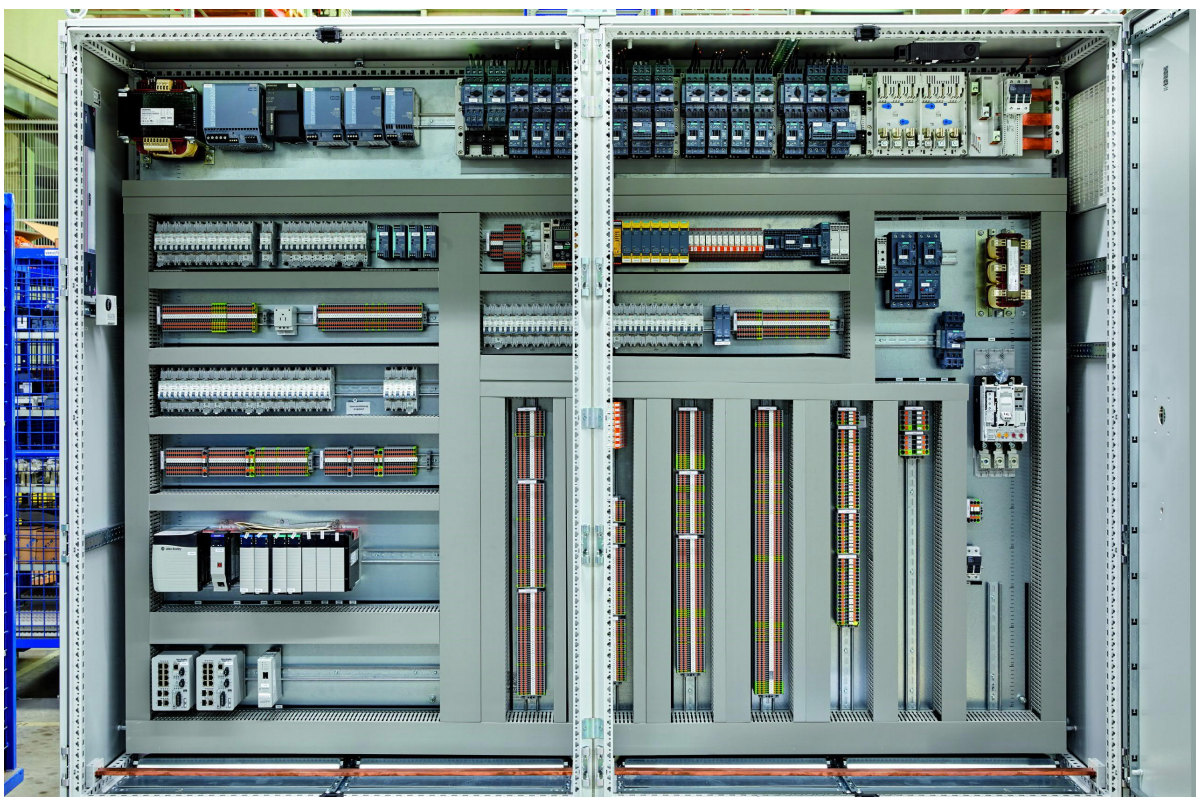
From digital to the real world: The freshly assembled DIN rail is compared to the digital image in the Project complete planning software

DIN rails with terminal blocks can be assembled at the station with Project complete based on their digital images, paperless and directly after engineering, over the long term. In this way, the optimized assembly process with the part assemblies extends through to terminal blocks as well.

The challenge in terms of conversion to the new digital solution in day-to-day production is generating acceptance among employees. "After all, we are fundamentally changing the production process," says Sontowski, "and we want to actively involve our employees and demonstrate the advantages from day one. Our colleagues are already huge fans of the EIP system - and we expect the same results from the implementation of Project complete."

Control cabinet manufacturing 4.0 turned on its head

With the introduction of the EIP system and the test assembly with the Project complete planning and marking software based on high-quality data and seamless interfaces, Blumenbecker has already taken a major step towards achieving its target consistency in the day-to-day work of its production facilities. But there is still much to be done on the way to automating terminal strip assembly as comprehensively as possible.



Efficiency in control cabinet manufacturing: Depending on the task, Blumenbecker can save time and effort during commissioning

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