FORWARD LOOKING PLANT PLANNING IN 3D

DALEX – saving time and money with optimized processes

DALEX are welding technology experts who deliver industrial solutions ranging from standard plant equipment through to highly specialized robotic based fabrication cells. Based on over 100 years of experience, DALEX welding systems feature high levels of flexibility, reliability and quality. Their expertise is evident throughout the complete business cycle, from initial concept planning, to plant commissioning, customer support and planning for future capacity. In all of these stages, DALEX use the 3D simulation platform from VISUAL COMPONENTS to achieve maximum time and cost savings while implementing fully optimized system for their customers.

DALEX: the solution provider for complex fabrication cells

DALEX business is based on the delivery of resistance welding equipment. They provide solutions for: spot, projection, roller-seam, foil seam, mesh, MAG- & laser welding applications. In addition they offer a competitive line of transformers, manual welding guns, and X and C type spot guns for use with robot arms.

The high level of vertical integration combined with their centralized project management team are key attributes, that allow DALEX to react decisively to all customer requests and deliver complex one-off turnkey systems effectively.

In 2015 DALEX started collaboration with DUALIS GmbH IT Solution to support their design, planning and production processes. DUALIS is the largest partner for VISUAL COMPONENTS in the German speaking region. The initial roll-out was based on 3DCreate, which has a similar feature set to the current VISUAL COMPONENTS Professional package.

After a successful introduction of the 3D simulation software, DALEX further purchased VISUAL COMPONENTS Premium package (formerly 3D Automate) to take advantage of the off-line programming and controller interface functionality for industrial robots.

With training and support from DUALIS, DALEX employees were given the skills to expand their VISUAL COMPONENTS libraries with customer specific models and new equipment designs. Working with the full flexibility of the Premium software, DUALIS supported DALEX to implement new functions for specific customer projects. At all stages DUALIS staff expertise was on hand to support the project when needed.

The initial situation: low flexibility with significant manual input

The original approach to design a complex welding system started with a CAD layout using a static robot model. This gave a limited perspective of the robot's work-space for reachibilty, and areas of potential collisions with other equipment.

The CAD designer had minimal tools to assess the dynamic issues related to any robot operations, so fixture designs and gun specifications could only be finalised during the commissioning phase, and any cycle-time estimates were not very accurate. To improve the situation, and check weld accessibilty, verify cycle times, and finalize gun, gripper and fixture design during the design stage, a full dynamic analysis of the robot process was needed. In addition the proposed design should be presentable in a clear and understandable way to the customer.

„With increasing application of robots in our fabrication layouts we needed tools to understand robot performance metrics, that would help us select the best layout alternative, optimize the layout, and support the programming task. The VISUAL COMPONENTS platform did all of this."

Dr. Henning Grebe, Head of Production, DALEX Schweißmaschinen GmbH & Co. KG

A supplier independent 3D robot simulation

DALEX elected to use the 3D package from VISUAL COMPONENTS based on their experience from simulation projects already completed with DUALIS. The application scope for the simulation platform included the mechanical and electrical construction departments for the layout creation, modeling, advanced robot programming and cycle-time analysis. In addition, the software is also used to create layouts in the project planning in order to prepare visually appealing offers.

„We were convinced by VISUAL COMPONENTS generic and independent approach to modeling robots and their midfield pricing compared to competitors," explains Dr. Henning Grebe.

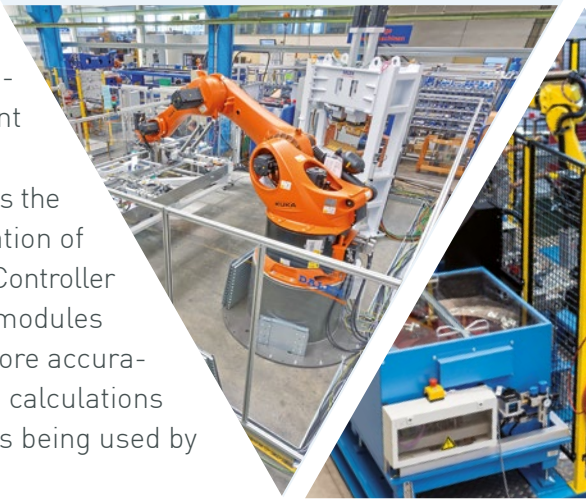
Implementing VISUAL COMPONENTS starts with a standard software installation by the IT department. The main requirement is a CAD capable laptop, that can handle 3D graphical applications. Execution of a setup file installs the software, followed by license activation to enable the software's use. Once installed, a one week training course introduces new users to the main program features.

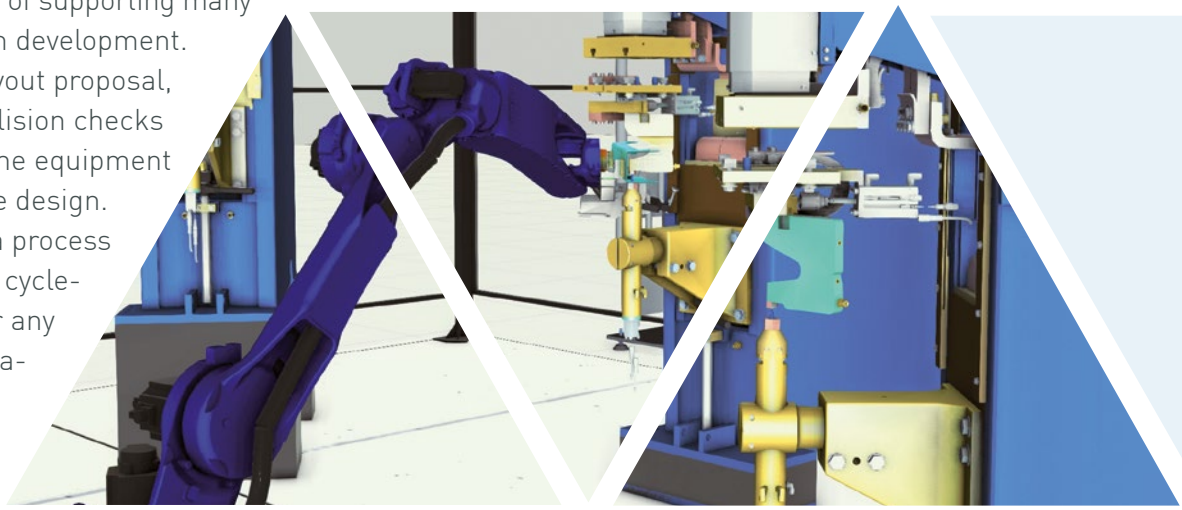
Relief, savings and performance gains

Using an accurate dynamic 3D model generated in the VISUAL COMPONENTS environment, has the added value of supporting many stages in the system development. Starting with the layout proposal, reachability and collision checks help narrow down the equipment selection and fixture design. This is followed by a process simulation to give a cycle-time estimate. After any required design iterations, a final layout can be used to define the actual robot programs and exported to the robot controller through a Post Processor Add-on supplied by DUALIS. For DALEX employees, there is also a big sense of relief that now many potential problems that were previously very hard to recognize before the commissioning phase can be spotted at the early stages in the design. Making adjustments to robots, grippers, and fixtures in a model, is a lot less stressful and expensive than making adjustments on the factory floor. From a customer's point of view, seeing and approving modifications in the design phase is also more acceptable than time delays during the commissioning period.

„A big benefit from using VISUAL COMPONENTS, is the considerable time and cost savings achieved by testing the equipment configuration in its early stages, and identifying and correcting any problems sooner than later," explains Dr. Henning Grebe.

Based on the positive experience with the simulation platform, and in support of the company's own growth, new development projects are planned for the 3D software. One project is the development of an in-house DALEX specific component library. Another project is the implemen-tation of RCS (Robot Controller Simulation) modules to provide more accurate cycle time calculations for the robots being used by DALEX.





Facts and figures

Investment level:
Approximately 50,000 euros
plus maintenance costs

All three licensing levels in a perfect interplay:
Essentials for Sales, Professional for planning and development, Premium for robot programming

Time and cost savings,
by checking and catching design errors early in the process

Time savings through early proof-of-concept of the complete layout

Faster delivery time
for the customer

Fewer on-site changes
during commissioning

Faster modification or expansion
to existing systems based on an existing simulation model

"VISUAL COMPONENTS helps us achieve reduced lead times on orders through shorter construction times and shorter commissioning times. We have less on-site surprises, and existing systems that have already been modelled, can be more quickly adapted or expanded based on the original simulation data."

Björn Lahne, Electrical Design Engineer
DALEX Schweißmaschinen GmbH & Co. KG

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