



3D SIMULATION FOR ENHANCED AGILITY AND EFFICIENCY

PIA Automation reap the benefits of virtual reality

Mechanical engineering and plant manufacturing is one of many sectors in which virtual reality (VR) is itself becoming a reality. Among other benefits, digital simulation makes it easier to gain a handle on complex automation scenarios and predict processes. As a specialist in advanced mechanical engineering and automation technology, PIA Automation use the 3D simulation platform Visual Components as an effective tool for applications in the fields of engineering, robotics, PLC, and sales. Distributed by DUALIS GmbH IT Solution, the user-friendly platform paves the way for processes that are fast, efficient, and reliable – from workflow simulation right through to the virtual commissioning of machines and plants.

PIA Automation are an international corporate group specializing in advanced mechanical engineering and automation technology. The group has ten sites on three continents and provides products and services ranging from workstations for manual assembly processes to fully automated production lines and smart Industry 4.0 solutions. Its Austrian site has a workforce of around 400 employees and is a market leader in the manufacturing of production systems for powertrain components. PIA Automation Austria is also the PIA group's global competence center for powertrain applications, Industry 4.0, 3D simulation, virtual reality (VR), and augmented reality (AR).

3D layouts that leave minimal room for interpretation

A need for optimized knowledge exchange between sales, operations and customers was identified at the PIA Automation site in Grambach (AT). The 2D layouts that had been used to date left too much room for interpretation. The introduction of 3D layouts was designed to increase the transparency, efficiency, and reliability of concepts in areas such as transfer processes, simulations, and robot availability, and, in turn, secure corporate success well into the future.

In-depth exploration of potential solutions resulted in a decision in favor of the Visual Components 3D simulation platform. Technological advantages and the level of service quality offered by DUALIS were the clinchers. The software was presented in 2015, with the first round of training taking place

in mid-2016. The solution provided by DUALIS facilitates the realistic simulation and predictive planning of factory processes. In addition to representing Visual Components as a specialist distributor, DUALIS also develop their own add-ons and services for the platform.



All the benefits of 3D simulation – without the need for programming skills

In addition to the platform's strengths in a number of key areas, PIA Automation also opted for Visual Components due to positive experiences with the initial demo license. The fact that the software empowered employees with no programming expertise to generate a simulation of a material

flow was among the deciding factors. In the words of Nikolaus Szlavik, Managing Director of PIA Automation Austria: "We chose Visual Components because of its versatility, user-friendly GUI, and extensive library."

Integration into routine business operations, individual adjustments

PIA Automation use the Essentials and Premium versions of Visual Components for everything from simulation to virtual commissioning. Their Engineering, Robotics, Sales and Marketing departments all benefit.



"We are also very impressed by the opportunities to create our own add-ons and the continuous development of the platform, which we see in the form of regular updates. Sure, the product itself is highly innovative, but it was distributor DUALIS and their own add-ons, library, and excellent customer support that clinched it."

Nikolaus Szlavik, Managing Director of PIA Automation Austria



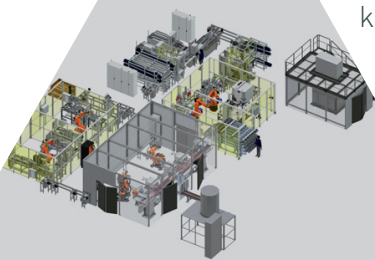
The overall solution facilitates the use of features such as 3D layouts, modelling, and the simulation of robots and plants. It has also been possible to achieve a high degree of connectivity: “Implementation occurred as part of our day-to-day operations, but first we had to ensure that all the technical prerequisites had been fulfilled. That involved freeing up resources and adapting the standard library to our requirements,” explains Thomas Kaufmann, Simulation Engineer at PIA Automation Austria.

Stakeholders at PIA Automation Austria elected to develop standard modules that are tailored to their applications. Employees also had to learn how to use the new software. As Thomas Kaufmann reports: “We made various suggestions and requests. To give an example, the ‘Crossing Conveyor Lift Function’ was an idea of ours that needed to be integrated into the system in order to help us meet the demands of the future. Implementation wasn’t over in a flash, but it ran extremely smoothly.”

Tangible benefits for Engineering and Sales

The platform was quick to demonstrate its outstanding versatility in practical scenarios. In particular, it soon became clear that Visual

Components can be used in a variety of areas, makes the integration of VR a simple process, and offers a highly effective mix of features for applications in the fields of engineering, sales and marketing. Highlights range from the processing of videos and images to more technical elements such as 3D layouts/simulations and VIBN.



PIA Automation also rate the ease of handling large amounts of data and standard import/export options as two of the platform’s key strengths. What is more, Visual Components started returning on the firm’s investment right from day one. To give an example, employees without any previous experience with the software were immediately able to generate 3D layouts for sales purposes.

Use Case: VR for human-factor engineering

Visual Components is set up to cope with the challenges of the future, and especially increasing digitalization in the field of advanced mechanical engineering and automation technology. Virtual reality is an area of growing focus: „VR headsets enable us to give any customer anywhere in the world a realistic introduction to new systems. Here in Grambach we have therefore set up a group responsible for not only optimizing our existing VR capabilities, but also developing new applications that offer enhanced customer benefits,” explains Nikolaus Szlavik.

The advantages of 3D simulation and VR are clearly demonstrated by the following example: Many OEMs test and assess the quality of a plant’s ergonomics by asking around ten of their customer’s employees to build cardboard templates on site as part of a “station development workshop”. The measuring of the templates by the plant engineer is followed by the production of model stations for further assessment. This process generally takes 3-4 weeks and is extremely labor-intensive. As Thomas Kaufmann puts it: “The evaluation of the model in 3D using a VR headset enables both us and our customers to become considerably faster, more efficient, and more agile. Digital models can also be expanded to include elements such as logistics, station equipment, and routes through and around the plant. In other words: VR allows the customer to see and experience exactly what they are getting from us.” The technology also opens the door for enhanced efficiency where training is concerned. Whether online or offline, VR enables operators to familiarize with their future workstation as early as possible – and without the need for plant downtime. Station simulation takes just a few days, with any changes required implemented quickly, simply, and at the earliest possible stage.

A 3D view of the future

PIA Automation see themselves not only as a plant manufacturer but also as a vital source of support for their customers as they navigate the digital age. Numerous new add-ons are planned, for example the integration of RCS modules and an augmented reality interface. A haptic feedback function based on hand tracking and the coverage of “real” distances in simulated environments are also in the pipeline.

Facts and figures



Company size:

Global powertrain competence center for the PIA group, 400 employees

3D

Scope of licenses:

Visual Components Essential and Visual Components Premium



High degree of connectivity



Features used (selection):

3D layout, modelling, robot and plant simulation



“Our users find the solution both innovative and practical. The generation of 3D layouts and simulations might look like a time-consuming task at first glance, but it turns out that the process is actually intuitive and simple. And if we do hit any snags, the customer support team at DUALIS is always on hand to advise us on potential solutions”

Thomas Kaufmann, Simulation Engineer at PIA Automation Austria



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