XR EASY
MEET YOUR REALITY

Virtual Reality Software for Work System Planning

How virtual hands can be used to optimize workflows in the early planning phase

XR-EASY® in use at the lightning protection expert DEHN

The VR tool from R3DT really gives you a feel for the haptics right from the planning stage, especially during the ergonomics check.

The Virtual Reality (VR) standard software XR-EASY® has been used in work system planning and factory planning at lightning protection specialist DEHN since October 2019. With the new technology, planning tasks can be completed better and faster as a team with colleagues, customers and suppliers.

The VR tool from R3DT makes it possible to present workstations or assembly lines, including the product, as a prototype in virtual space at the touch of a button using the 3D CAD data or point clouds developed for design.
With a standard VR headset and a unique hand tracking technology, it is thus possible for anyone within a few minutes to work in and on the 3D models with their bare hands and intuitively make professional changes. So as soon as CAD data of a new production line or workplace is available, optimizations in the assembly process of a new product and, for example, an ergonomics check at the future workplace can be anticipated. Michael Mohren, head of process planning at DEHN, says: "The Leap Motion technology used in R3DT's VR tool provides a super insight into the later reality. It really gives you a feel for the haptics right from the planning stage, especially during the ergonomics check."

DEHN protects human life, buildings, electrical and electronic systems from damage

DEHN SE is a German medium-sized company based in Neumarkt in southeast of Nuremberg. According to its motto "DEHN protects." the company has been active in the field of electrical engineering for over 110 years. The company specializes in protection solutions and services for external and internal lightning protection, for surge protection, grounding and industrial safety, which are customized for building, energy and infrastructure applications. DEHN itself produces components, devices and systems with a high vertical range of manufacture at the sites in Neumarkt and Mühlhausen. The family-run company, now in its fourth generation, is present in over 70 countries and generates annual sales of around 300 million euros with around 2000 employees worldwide.

For more information, visit:
www.dehn-international.com

Virtual Reality in the Workflow

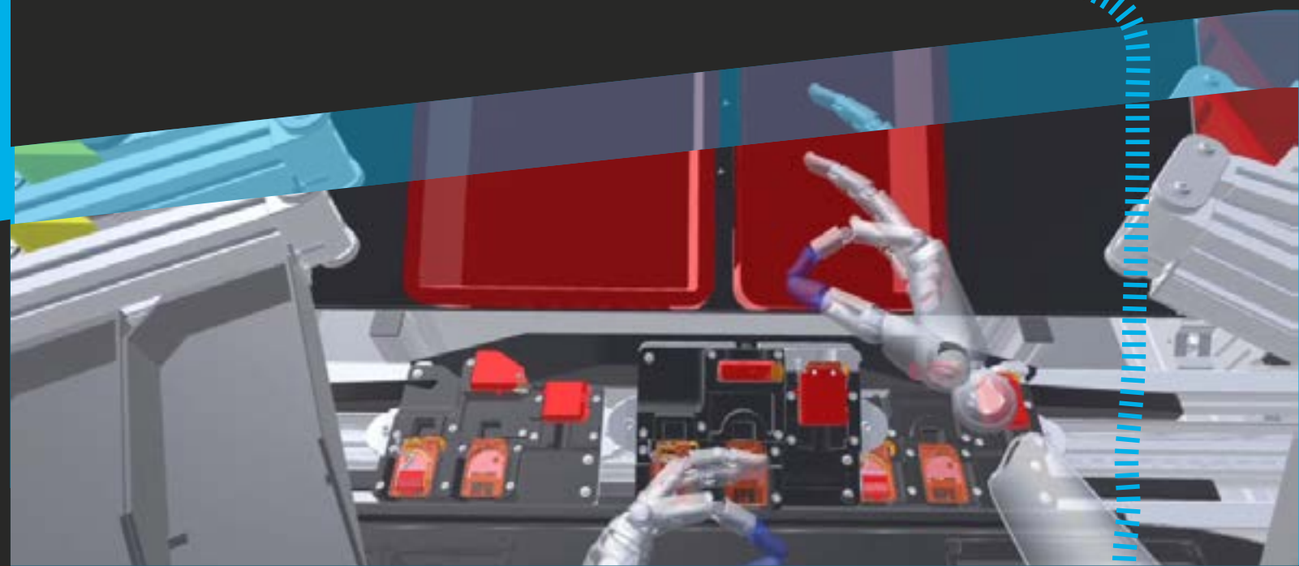
Process optimization made easy

1.
Development

How workstations are developed more ergonomically with VR

At DEHN, the VR tool is not only used for design reviews of entire plants, operating equipment and workstations, but even beforehand: The workstation model is created on the basis of the processes determined by the MTM planning analysis. The models are stored in a model library and are then put together accordingly. Only in the second step are in-house or external CAD designer involved, who adopt the documented workshop results and reconstruct them in CAD. The clear advantage over conventional cardboard workshops or tools where you have to start "from scratch": Previous plans, which are available as 3D data, as well as standard and supplier parts serve as a blueprint and can be imported into the virtual workshop space in advance. In other words, previous experience is used to arrange the new workstations in several rapid planning steps, followed by ergonomics checks. The latter include, among other things, checking and optimizing the grap areas and the field of view of the people who will later be working there. In this way, the arrangement and working height of the equipment used as well as the provision of materials and picking containers at the virtual workstation can be checked and adjusted at a very early stage according to anthropometric aspects. The possibility of being able to evaluate and optimize the ergonomics of a workstation while a design is still being considered saves DEHN a great deal of time and results in healthier workstations for its assembly team.

You can find out more about our ergo check tool here



2. Simulation

Virtual simulation of assembly sequences

After completion of the virtual workplace optimization, the MTM planning analyses created are validated again and adjusted if necessary. Through the sequence simulation, the determined methods and sequences are evaluated regarding feasibility, tolerability and reasonableness. The generated time data is thus much closer to reality, which saves valuable resources and time during the production ramp-up.
According to Mr. Mohren, a classic CIP process during subsequent operation is becoming increasingly difficult, as the rapid succession of projects and the time to market leaves little room for further optimization. Therefore, it is even more important to be aware of the optimal situation even before commissioning and to track this as a benchmark through on-site shopfloor management. With the VR tool from R3DT, this is possible at any time and from anywhere.

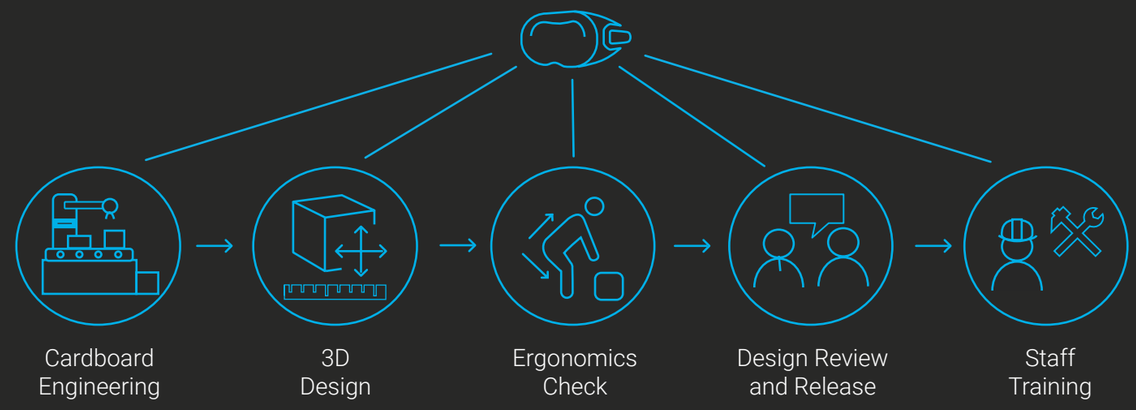
3. Review

Collaboration with stakeholders in assembly planning

The involvement of those affected even before the work systems are designed is made much easier with R3DT's VR tool: Design reviews in VR are conducted at DEHN in groups of two to seven people in the meeting room or at the planner's desk. Meanwhile, virtual meetings are likewise possible in full or in part as an online conference, since the virtual 3D image from the VR software XR-EASY® can be shared via the desktop screen. Brand new is the possibility to conduct online sessions with multiple headsets. VR users can be headquartered at different sites or even be from different companies.
The use of VR thus makes it possible to obtain feedback from employees, customers or service providers much earlier than with conventional planning processes. Under the heading of "turning stakeholders to team players," Mr. Mohren emphasizes the advantages of this approach: Colleagues who will later handle the new machines and use the workstations can in this way make change requests significantly earlier or simply try out ideas. Exchanging experiences within the session is very easy, as changes can be saved at various stages of development and can thus be tracked later. All comments on design and workflow can be tested directly with each other in the virtual room and logged if necessary.

[...] Turning stakeholders to team players.

Applications of Virtual Reality in Work System Planning



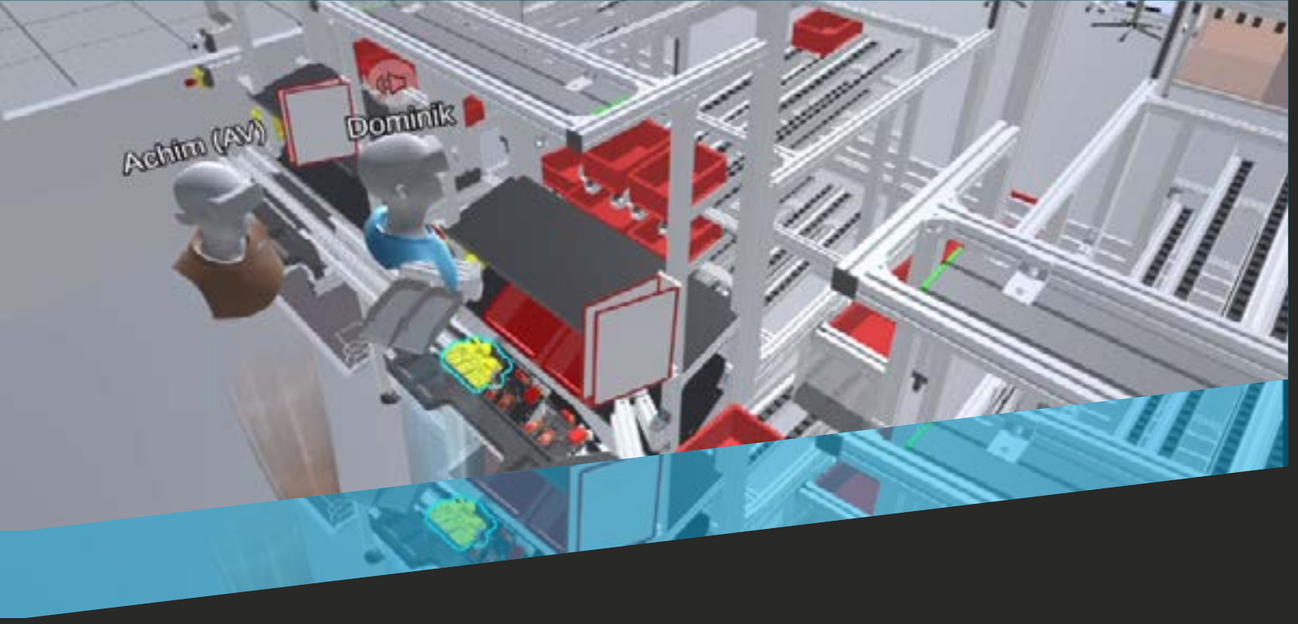
Michael Mohren
Head of process planning at DEHN

Michael Mohren is a state-certified technician for automation technology and mechatronics. He started his professional career in the plastics industry. Later, he worked in the automotive supplier industry in the field of industrial engineering. As a consultant and project manager, Mr. Mohren accompanied the relocation, development and ramp-up of production and assembly lines. Afterwards, he was working for the German MTM Association as an MTM instructor and head of the MTM Training Center in Stuttgart. Since 2018, Michael Mohren is in charge of the topics MTM and ergonomics as well as planning and consulting in work system design at DEHN with the aim of sustainably increasing work ergonomics and efficiency.

Early staff training and involvement of external business partners

In addition to facilitating the design process, the use of the VR tool has more advantages. For example, staff training for new workstations can be carried out virtually even before the plant has been built. This saves time during ramp-up. Collaboration with external parties, such as suppliers or designers, is also possible easily and at an early stage. Thanks to the cross-location functions, this is even possible without the need for travel: the virtual room can be entered jointly by several people from different locations, provided they all have the latest VR software. But if not everyone involved has the VR hardware, that's not a problem: Even without a VR headset, it's possible to follow what's happening in the virtual room on the screen using your own camera perspective.

XR EASY



Hand tracking technology is a unique characterstic of R3DT‘s software

In Mr. Mohren‘s experience, the integration of Leap Motion‘s hand tracking technology, i.e. working with bare hands in virtual reality, means that the barriers to using R3DT‘s VR tool are significantly lower than with other systems. The awkward handling of controllers, a data glove or even dressing up in a special suit put off people without intensive experience in VR, Mr. Mohren said. The VR tool from R3DT, on the other hand, is understood and accepted very quickly. The intuitive handling of the system is extremely helpful in engaging employees and business partners.

Michael Mohren: “At first, everyone says it‘s a toy. But once you‘ve tried it out, you‘re quickly enthusiastic and the benefits are then self-explanatory.”
For example, it minimizes change costs that would otherwise be incurred after feedback from practitioners as a result of the ramp-up. The system also helps to eliminate traditional lines of conflict between designers, planners and those affected. Mr. Mohren speaks kindly of the anticipated “clever clogs effect” because the experience of practitioners can be taken into account much earlier.

Anyone who has tried it is quickly enthusiastic and the benefits are then self-explanatory.

VR benefits at a glance

The effects at DEHN SE

Increased efficiency

Industrial engineering moves forward much more efficiently primarily because of the simplified possibility for collaborative reviews and validation of the MTM analysis: Ideas from the CAD engineering team or from third parties can be concretely tested and documented in the VR model. This saves the time-consuming logging of meeting results.

Less time spent on meetings

Fewer meetings are also needed overall because measures can be tested immediately that would have had to be designed in the traditional way so they could be evaluated at another discussion.

Reduction in need for travel

There are also considerable savings in travel costs, as participants can attend meetings remotely and at a more flexible time on the virtual model. Travel to or from suppliers is often unnecessary: At DEHN, acceptance now takes place in part directly in VR without face-to-face meetings.

Faster modification of existing plants

The process can also be significantly shortened for necessary modifications to existing plants: Specifications for a modified product from the engineering department are tested on the machinery in virtual space together with the operators. The result can lead directly to a modification.

More collaboration and feedback

In the past, stakeholders often did not get access to a workstation until it was physically built. As a result, the planner got late feedback on problems that might arise during operation. With a collaboratively planned system in VR, operator’s experiences and ideas are already incorporated before installation begins.

Leveraging the CIP process

A higher number of virtual test runs, which would not be possible in reality, can provide better assurance that the line will quickly run optimally. Expert Mohren says:
“Today, there is hardly any time for optimizations on existing plants, as the next project is usually coming up already.”

XR EASY

XR EASY
MEET YOUR REALITY

R3DT - VR for Engineering + Planning

R3DT offers the most user-friendly Virtual Reality (VR) software XR-EASY® for everyday use in engineering and planning. Users can virtualize CAD data anytime and anywhere at the push of a button (without special knowledge). Anyone can put on the VR headset and work hands-free. Within a few minutes, 3D models can be experienced like real in a 1:1 scale. The main applications are in work system and assembly planning, including ergonomics studies, in factory layout planning, houses or rooms, and in the development of machines and systems.

For more information, visit www.xr-easy.com

R3DT GmbH
Haid-und-Neu-Str. 7
76131 Karlsruhe / Germany

+49 721 964 951 74
info@xr-easy.com
www.xr-easy.com