

Digital 3D twins for logistics facilities in warehouse planning

## **Ehrhardt + Partner Group (EPG) allows for virtual commissioning of warehouses**

**Ever-growing demands placed on delivery performance as well as the skills shortage crisis have increased many companies' willingness to automate their logistics processes. As the degree of automation increases, so does the complexity of warehouse planning. This is why the Ehrhardt + Partner Group (EPG) offers the option of visualizing and testing logistics facilities in the form of digital 3D twins as early as during the planning stage, and to use this digital twin throughout the entire project life cycle. What makes this so special is that EPG can bring the 3D model to virtual life using the LFS.mfc material flow controller. This allows all processes in the warehouse to be simulated, emulated, and optimized long before the warehouse is put into actual service.**

The growing complexity and automation in logistics leads to a strong need for systems that efficiently control, monitor, and analyze automated storage units and materials handling technology. With the LFS.mfc material flow controller, Ehrhardt + Partner Group (EPG) offers a non-proprietary and technology agnostic solution that meets the special requirements of the various controllers and systems. EPG's logistics experts also make use of the system in the early stages of warehouse planning and visualization. "We create a digital twin of the logistics facility as early as at the planning stage, which forms the basis for all further steps and adjustments," Marcel Mands explains, logistics consultant at Ehrhardt + Partner Consulting (EPC). "The 3D model stays with users throughout the entire project life cycle: from the planning stage to simulation and emulation all the way to actual commissioning, and as a visual representation at the actual control station."

By connecting the LFS.mfc controller to the model, all functions of the material flow calculator can also be used in the virtual planning environment. This allows for automated warehouses to be optimized because vulnerabilities in systems technology or bottlenecks in the process-engineering workflow will be detected early – long before the warehouse is built in real life. During this stage, any potential for optimization in the main structural parts of the warehouse will also become visible.

### **Virtual commissioning of the warehouse**

The LFS.mfc controller has a modular design. This poses a distinct advantage to users because, in addition to the material flow controller's basic module, they can also configure the software in accordance with their individual requirements. In terms of logistics planning this means that, in a first step, a simple visual representation of the material flow is possible, whereby materials handling technology and storage units are depicted as animations. In a further usage scenario, the behavior of the materials handling technology can also be tested virtually and realistically by means of emulation. When using the LFS.mfe module specifically developed for this purpose, the 3D model behaves like an actual logistics facility. Here, the software works with real data from the warehouse management system and from the LFS.mfc material flow controller. Users benefit from a significant increase in long-term planning ability and security of investment. Risks, such as production outages or system downtimes, are minimized by conducting extensive preliminary tests on the 3D model.

### **A 3D model for the entire project life cycle**

Thus, the 3D model from the planning stage follows a logistics project throughout its entire duration. After physical completion and commissioning of the warehouse, the model is then used at the control station to visualize live operations. Another advantage: If future optimizations of the warehouse infrastructure are planned, the digital twin can be re-used as a test environment. The planning cycle will then start again from the beginning. The model behaves like a real-life system. All workflow processes scheduled for the future can be tested in real time or in an accelerated fashion – and without having to interrupt live operations that are running in parallel.

## **LFS.mfc info box: EPG's material flow controller**

LFS.mfc is a non-proprietary solution for connecting automated warehouse and materials handling technologies within a warehouse. The material flow controller allows for convenient and flexible control of the flow of materials in warehouses and distribution centers. LFS.mfc receives transport commands from the warehouse management system and executes them in such a way that the transport units are guided to their destination without any errors. The automation technology software is connected via an open system interface and is compatible with all common warehouse management systems, be they centralized or decentralized, and regardless of platform or database. The material flow controller controls, among others, high-bay warehouses, container technology, and automated guided vehicles. The modular system design allows for a three-dimensional visualization of all transport processes to be integrated, giving the operator at the control station continuous insight into the automated systems.

Further insight will be available to LogiMAT visitors at the large EPG practice forum for the cognitive era in logistics, in Hall 8, Stand A71. You can register for a guided tour at [www.epg.com/logimat](http://www.epg.com/logimat).

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**Photo 1 + 2:** The Ehrhardt + Partner Group (EPG) offers the option of visualizing and testing logistics facilities in the form of digital 3D twins as early as during the planning stage, and to then use this digital twin throughout the entire project life cycle.

**Photo 3:** The 3D model stays with users throughout the entire project life cycle: from the planning stage to simulation and emulation all the way to actual commissioning, and as a visual representation at the actual control station.

## **Ehrhardt + Partner Group**

The Ehrhardt + Partner Group (EPG) is one of the world's leading logistics experts and offers a comprehensive solution for all industries in the form of the LFS software suite. LFS as a supply chain execution system is currently in successful use across five continents and allows all logistics processes to be managed and controlled across departments. The globally active E+P Group was founded in 1987 and now has more than 500 employees at 14 locations. More than 60,000 users all over the world use the LFS system for their supply chain management. The features offered by the LFS software suite include everything that is necessary for comprehensive logistics management: The LFS.wms warehouse management system for managing and controlling intralogistics, the LFS.mfc material flow calculator, the LFS.tms transportation management solutions for efficient tour handling and planning, and the LFS.iss international shipping system for processing shipping logistics. Radio data transmission solutions, warehouse planning and consulting, private cloud and hosting services as well as warehouse seminars conducted at the LFS.academy round out the list of comprehensive solutions provided by the E+P Group. Together with in-depth consulting services for warehouse technology, extensive expert knowledge in the area of warehouse logistics and reliable technical support, this makes E+P a one-stop solution provider. At present, more than 1,000 customers across all industries can be found on our list of references.

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