

montratec and Cideon

Design Automation for Innovative Intralogistics Systems

montratec GmbH develops and produces monorail transport systems for intralogistics. In the past, systems designed with 3D factory planning software had to be redesigned in the CAD system. Now, a bridge solution developed by Cideon ensures that the configuration data is automatically transferred to the PLM system. The new solution eliminates many intermediate steps and sources of error, and significantly speeds up project implementation.

Changing market requirements, individualized products with an enormous range of variants and increasingly shorter production cycles are presenting intralogistics with major challenges. Fixed handling and transport systems lack the necessary adaptability. Fully networked, automated production in line with the principles of Industry 4.0 requires integrated transport and process solutions with intelligent control, high energy efficiency, maximum flexibility and maximum availability.



montratec
By Columbus McKinnon

montratec

montratec GmbH, based in Dauchingen (Baden-Württemberg, Germany), is a medium-sized high-tech company from Germany and a globally active manufacturer of dynamic solutions for in-plant transportation. With around 150 employees, global distribution locations and over 25 years of experience, they are a reliable partner for individual process chaining. Since 2023, they have been a subsidiary of the listed US group Columbus McKinnon Corporation.

Intelligent Process Linking

With the modular monorail system montrac®, the German manufacturer montratec GmbH offers new possibilities to handle complex internal transport tasks and assembly processes more intelligently, quickly and efficiently. The globally active company, headquartered in Dauchingen (Baden-Württemberg, Germany), has been part of the US-based Columbus McKinnon Corporation since 2023, but can draw on many years of expertise in the development and production of innovative intralogistics solutions. In 2024, the company was recognized for the third time in a row as one of the TOP 100 innovators among German SMEs in a scientifically based selection process.



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Faster Process Automation with Cideon Solution

The montrac® modular transfer system is based on a modular, flexibly expandable aluminum monorail system. Various types of transport shuttles with a maximum load capacity of up to 70 kg run on this system at speeds of up to 55 m/min with minimal impact. Autonomously driven and controlled, they independently find the optimal route to the transport destination, even over different transport levels and under the ceiling.

As a result, production processes can be linked between robots and workstations in a highly flexible manner, maximizing the automation of manufacturing processes regardless of the batch size. It is therefore no surprise that leading medical facilities and industrial companies in the automotive, plastics, consumer goods, optical, food, medical and pharmaceutical industries, among others, use montrac® to maximize material throughput and minimize cycle times.



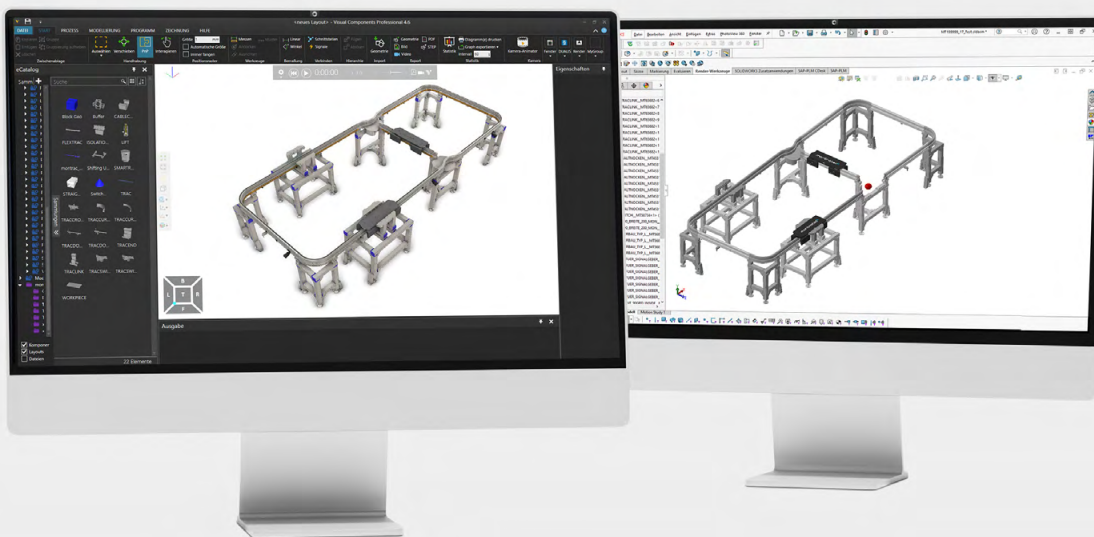
Challenges: Efficient engineering of customized intralogistics systems

Approach: Automatic creation of an assembly structure in the PLM system based on a component file with position matrices from the configuration software

Cideon Solution: Cideon Conversion Engine, customized adaptations

Cideon Service: Process consulting, implementation, configuration, creation of conversion and correction mechanisms, training and support as well as detailed documentation for users and administrators

Outcome: Faster, more responsive system planning without data translation errors



Plant design using the montrac® configurator software based on Visual Components, then detailing in SOLIDWORKS with placeholders.

PROCESS CONSULTING

ENGINEERING SOFTWARE

IMPLEMENTATION

GLOBAL SUPPORT

FRIEDHELM LOH GROUP



Eliminate Sources of Error, Automate Data Transfer

Media Discontinuity Delays Implementation

The flexible and compact transport system allows a task-specific, individual system layout with diverters, crossings, tight curves and lift elements for connecting workstations on several levels. This is created by montratec's specialist planners using the montrac® configurator. Based on commercially available system planning software, the montrac® configurator enables planning, visualization and simulation of the montrac® system design in 3D. External 3D data, for example from machines or building components, can be imported and taken into account.

Although this solution works to the satisfaction of everyone involved, until a few years ago it had a decisive disadvantage. "Since there was no connection to our PLM software, our engineers had to completely recreate the final configuration," explains Matthias Magrian, Product Manager at montratec. "To save them from having to do this twice and to eliminate the associated sources of error, we wanted to eliminate this media discontinuity and automate the data transfer."

Data Consistency is Vital

montratec uses SOLIDWORKS software for mechanical design (MCAD). This is connected via SAP CAD Desktop to the ERP system, where product data management takes place. The use of real design data in the configurator would overload it, which is why it contains its own models of all montrac® elements. "We were looking for a solution to transfer all elements, assemblies and subassemblies installed in a configuration to SAP," says Andreas Fröher, Technical Manager at montratec, describing the task. "Using the material numbers as keys, the CAD files were to be called up automatically and merged into an overall project in the CAD system and the ERP system."



Added Value for montratec

- **Faster and better system development** through automated import of configuration data
- **Reduced engineer workload** by eliminating multiple tasks and detailed assignments without time pressure
- **Improved traceability** through complete and consistent documentation throughout the system lifecycle
- **Enabled business growth** in the face of skills shortages by significantly increasing engineering to order (ETO) throughput with the same number of employees

After the search for a standard solution proved unsuccessful, Fröher turned to Cideon Software & Services. The software service provider with many years of experience in the areas of CAD, PDM/PLM, interfaces, ERP integration and process optimization from the Friedhelm Loh Group had already created a smooth connection between the CAD and ERP systems at montratec.

"At this point, we couldn't pull a ready-made solution out of the drawer either," explains Daniel Hügel, Account Manager at Cideon. "However, during the development of Cideon Conify, the Cideon Conversion Engine Framework had already created many prerequisites on which we could build." Cideon Conify acts as a control center for consistent data in configuration processes.



Ensure Compatibility with Two Systems

Challenging Realization

The road to realization was not without its hurdles. Initially, based on a preliminary concept developed by Cideon, a requirement specification was drawn up, which montratec then provided with a number of key implementation milestones. It was at this stage that the first challenges became apparent.

The models created for the visualization in the plant design software have different coordinate origins than the CAD models. This needed to be corrected during the transfer without having to revise the models in the authoring systems first. In addition, there was no fixed date for the migration from the discontinued SAP CAD Desktop to its successor, SAP Engineering Control Center (SAP ECTR). The new solution therefore had to be compatible with both systems. “The biggest hurdle was the fact that complete design data sets were not available for all the parts to be imported, partly because these are often created in detail only when they are needed for the first time,” recalls Ullrich Pohl, Principal Consultant at Cideon.

In such a case, the Cideon Conversion Engine would normally cancel the import as unsuccessful. “At montratec, however, there was a clear requirement to perform out the import and replace the missing parts in the overall project with placeholders.” This was also intended to provide the engineers with a quick and easy-to-understand indication of what needed to be done.



Ullrich Pohl

Principal Consultant, CIDEON Software & Services GmbH & Co. KG

“The data import from the configuration program is performed even if design data sets are missing, and the missing parts in the overall project are replaced by appropriate placeholders.”



Multi-Stage Solution

It was not possible to import the data directly from the configurator. Therefore, Cideon implemented a multi-stage solution within the Cideon Conversion Engine Framework. First, the data from the configurator is saved in the form of a JavaScript Object Notation (JSON) file and a correction matrix for position determination in a directory that is monitored by the Cideon RFC server.

Breaking New Ground Together in an Agile Way

This automatically creates a new document info record (DIR) for the new CAD assembly and stores the file there as an empty assembly file in SOLIDWORKS format. In the second step, the Cideon Conversion Engine loads the existing DIR from SAP based on the stored material numbers, inserts the originals (SOLIDWORKS components), corrects the translation matrix and inserts the placeholders for DIR not found or missing originals (taking into account the status of the documents). These are displayed geometrically as a red sphere with the name of the missing component in the assembly. Finally, the complete CAD structure created in this way is checked into the PLM system.

The first step was to create a set of rules that would allow the automation system to recognize which original files could be integrated into a new assembly and which could not. In addition, Cideon also had to repeatedly implement new rules as the project progressed, for example, because older components had file names or missing attributes that differed from the specifications, or because montratec had created only one design data set for each geometry for parts made of different materials. Such problems often only became apparent during implementation, for example, when the resulting assemblies contained more placeholders than actual models.



Andreas Fröher

Technical Director,
montratec GmbH



“The Cideon solution allows our engineers to concentrate on their actual tasks and the detailing of individual designs without time pressure.”



Achieving Automation Success Together

In constant close cooperation, Cideon and montratec overcame not only these challenges, but also several others. “Our engineers do not have access to internal SAP support, so we always had to rely on our external service provider to make adjustments in SAP,” says Andreas Fröher. “In addition, our relocation and the change of ownership, as well as the very high order backlog during the implementation phase due to our success, had a negative impact on the availability of resources.”

Nevertheless, the implementation of the automation solution for the development of customer-specific montratec® projects was completed within a relatively short period of time. The willingness of all parties involved to break new ground in an agile manner instead of strictly following a fixed plan played a significant role in this success. “The Cideon solution allows our engineers to concentrate on their core tasks instead of having to deal with unpopular tasks,” confirms Andreas Fröher. “It also reduces their stress, as the detailing of the individual designs can be carried out without time pressure.”



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Advantages of the Solution Become Clear

“This allows us to complete customer projects much faster than before,” adds Matthias Magrian. “For a typical larger project, the time required is reduced from several weeks to just a few days.” This is a not insignificant competitive advantage for montratec, as is the fact that complete, consistent, and fully traceable documentation is created for the entire product lifecycle of the systems without any additional effort.



The company headquarters of montratec GmbH in Dauchingen (Germany).

Now that the advantages of the solution have become abundantly clear, montratec is planning to expand it, for example by adding automated bill of material creation in order to further increase the degree of automation in plant planning and design.



About Cideon

Cideon advises and supports companies in optimizing their product development processes – from the initial concept through to engineering, production and services. Cideon's innovative solutions ensure continuous data flow along process chains making data accessible and cost-effective throughout the company. In this way, Cideon's customers can fully exploit the potential of digitalization to benefit themselves and their clients. Cideon employs 310 staff at 13 locations in Germany and Austria. It is part of the Friedhelm Loh Group, a globally successful Group with 12 production facilities and 95 subsidiaries.

Further information can be found at:

cideon.com and
friedhelm-loh-group.com

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