

Tecnomatix

Symax

Winning customers via optimized robot scenarios

Industry
Machinery

Business initiatives
New product development
Value chain synchronization
Production efficiency

Business challenges
Shorter cycle times for production equipment
Need to innovate to differentiate from the competition

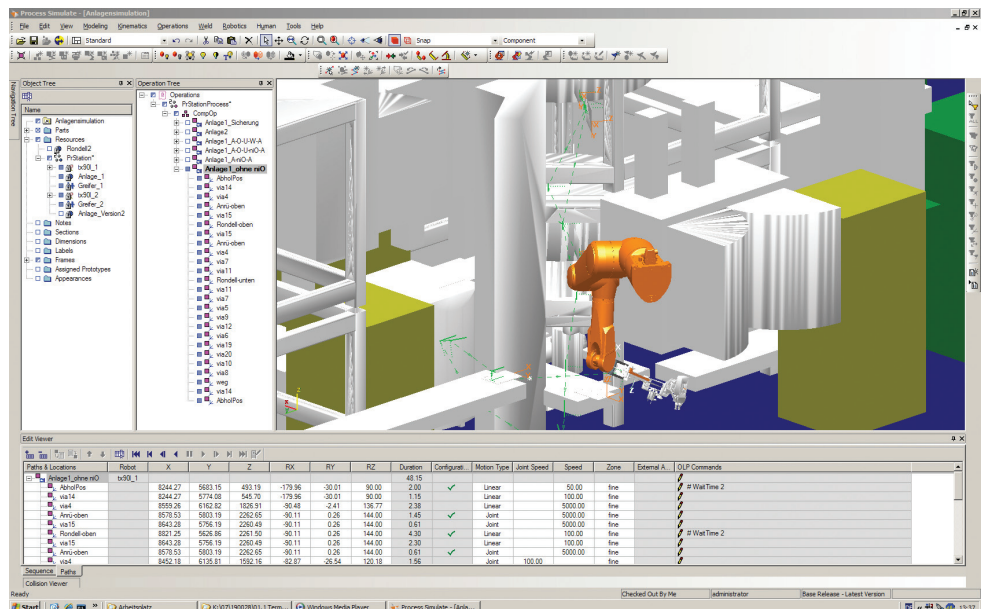
Keys to success
Ability to visualize robot operations in a 3D environment
Early feedback about the feasibility of new ideas
Simulation videos used in meetings instead of drawings
Offline programming and validation

Results
More effective sales presentations; high dollar sales
Better ability to innovate
Optimized robots reduce production costs for clients

The ability to simulate operations with Tecnomatix Process Simulate results in innovative, cost-effective robot solutions

Production faces time-to-market pressures
Manufacturers today are bringing products to market faster than ever, even though the products have become more complex. This puts pressure on the companies that develop production equipment. They must work faster while continuing to meet customers' cost and quality requirements.

Symax Systemtechnik Sondermaschinenbau GmbH is well aware of these challenges. Its 100+ employees develop and manufacture machines and systems that automate production and assembly processes. The company also produces test systems, hydraulic systems and material handling equipment. Symax handles everything from concept planning to the development and manufacturing of the customized solutions. Its equipment can be found across Europe, the USA, Japan, China and Mexico. The company recently opened a new facility, but already management is planning to expand again. In 2004 and 2005, the Bavarian Ministry of Economics



A complete cycle is simulated to determine how long it takes a robot to reach a certain position.

“Using an efficient tool such as Process Simulate gives us time to investigate innovative ideas while at the same time proving from the very beginning that they can be realized trouble free.”

Robert Lehner, Dipl.-Ing.
Managing Director
Symax Systemtechnik
Sondermaschinenbau GmbH

honored Symax as one of the “Bavarian Top 50” for its clear commitment to innovation and expansion.

Keeping complexity under control

Approximately 40 percent of Symax’s projects involve robots. “As our processes are becoming more complex, we often face questions at the beginning of the planning phase about whether a robot will work under the given circumstances,” explains Robert Lehner, managing director at Symax. “We needed a simple tool that we could use to virtually evaluate our production concepts over the entire lifecycle of the new product, including production ramp up.” The company found its solution in the Tecnomatix® Process Simulate software from Siemens PLM Software. Process Simulate makes it possible to simulate production processes in a dynamic 3D environment. Symax uses this software everyday.

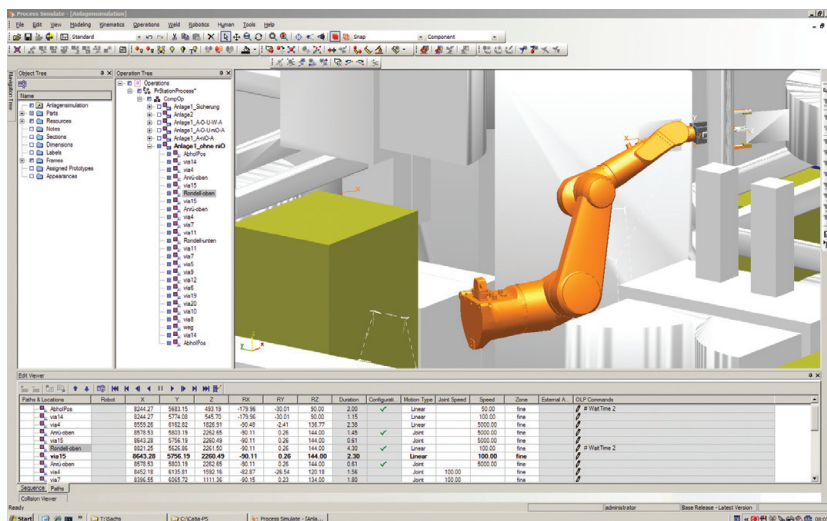
Process Simulate’s user interface corresponds to the Windows standard, incorporating familiar icons, tabs and established navigation practices. Data transfer to office solutions can be done seamlessly. At Symax, Process Simulate is connected to an Oracle database that manages all component data.

To set up a simulation, robot motion is programmed using complete kinematic sequences imported from related databases. Product data (in the form of 3D models) and floor plans are also imported. The robot tracks and assembly lines are virtually generated. The simulation allows engineers to determine whether the allotted space is sufficient for the prospective solution. They can also see, in real time, whether the production process can run safely according to the specified motion paths and workstation times, and can also determine whether there are any collisions. Typically the engineers run a variety of scenarios – such as replacing three big robots with four smaller ones – to easily evaluate alternative solutions.

With Process Simulate, Symax can understand, as early as the planning phase, the behavior of assembly processes, manual and tool operations, equipment and robots. They can also synchronize areas with more than one robot. This understanding allows them to optimize the equipment and have the assurance that complex processes will work perfectly even before the initial operation. With potential manufacturing problems recognized at an early stage, this information can be transmitted to product development, significantly reducing cost of changes and improvements.

Presenting options to the customer

Symax has found Process Simulate to be an important tool for communicating with potential clients. A simulation scenario can be exported as a video in avi format and shown in a presentation to prospective clients at their facilities. The video can be shown in real time or step-by-step in slow motion to show every procedure. A 360-degree rotation gives an overview of the whole facility while zoom tools allow observations from different points of view, such as from a wide angle to a detailed view.



Interferences and collisions are quickly detected in the simulation.

Solutions/Services

Tecnomatix Process Simulate
www.siemens.com/tecnomatix

Customer's primary business

Symax designs and manufactures customized automated production solutions.
www.symax-gmbh.de

Customer location

Neutraubling
Germany

"By showing 3D simulations to the client in planning meetings, we show them in detail what we have developed."

Christian Ruhland, Dipl.-Ing.
Project Manager
Symax Systemtechnik
Sondermaschinenbau GmbH

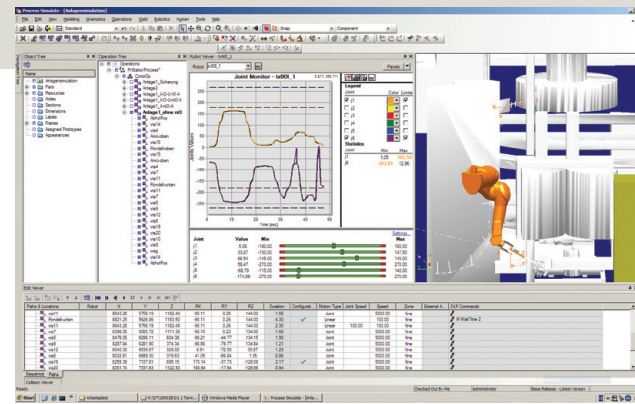
An animated demonstration conveys the basic concepts of a production process in just a few minutes, without the need for extensive technical drawings. In a short video sequence of three or four minutes, for example, engineers at Symax can show the fully automated installation of rubber gaskets onto car bodies, or the handling of front axles during installation on a moving assembly line.

"By digitally showing that our solution works, we have a good possibility of winning the sale," says Christian Ruhland, project manager at Symax. "Typically we present complex robot solutions that neither our clients nor our competitors have considered."

To date, Symax engineers have used the software for new projects, many of which will soon be up and running. Symax stays in close contact with Siemens PLM Software and provides feedback about how the solution can be enhanced. The company is also collaborating with the Department of Production and Automation Engineering at the University of Applied Sciences in Regensburg to assist in student research projects using Process Simulate.

Innovation in action

Another project where Process Simulate has played an important role is in the development of a robot-assisted assembly process. This differs from the traditional arrangement where the robot operates within an enclosed cell. Here it acts in cooperation with a human worker. Although the regulations regarding this type of robot have just been defined in Germany, Symax already has the first order for this type of solution.



An analysis of a joint angle provides information about every axis.

A simulation created in Process Simulate shows the detailed manufacturing process: a robot automatically fetches a roof module from the conveyor belt and takes it to the activity area of the worker who does the final installation step. The worker can control the movements of the robot using a joystick. To ensure the worker's safety, an absolutely reliable depiction of the direction and velocity of the robot movement was necessary. Using Process Simulate, Symax has clearly shown that the robot moves at a slower speed within the hazard zone than outside it. Moreover, the simulation of the manual steps shows the worker's field of view and posture and allows for analysis of ergonomic factors.

Using Process Simulate allows Symax to move forward with innovative projects like the robot-assisted assembly process, and to gain momentum in the market. "We really profit from having an innovative solution such as Process Simulate in our company," Lehner says. "Process Simulate is becoming indispensable in our daily routine. It provides us with critical information about feasibility and safety during the planning phase. And at the same time, simulations are helpful in convincing our clients to place multi-million dollar orders."

Siemens Industry Software

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