



Reliable Positioning System for Stacker Cranes in Automobile Logistics

Modernization of High-Bay Warehouses

Volkswagen AG decided to retrofit their vehicle body warehouse in Wolfsburg, Germany, and chose PSI Technics' ARATEC® as a replacement for their existing ICS5000 positioning systems. ARATEC® is an efficient, reliable system that easily integrates into the existing warehouse infrastructure.

Warehouse logistics present a challenge for many German companies. Outdated positioning systems are still being used in many high-bay warehouses—a situation that is not limited to the automotive industry. At worst, malfunctions or failures lead to warehouse downtimes that can last for several days—a dreadful scenario in terms of “just-in-time” production processes.

Volkswagen AG was faced with this challenge. All stacker cranes in one of their high-bay warehouses in Wolfsburg were still controlled by Trimble's ICS5000 system. The support for this system was discontinued at the end of 2009 and Volkswagen had been looking for a state-of-the-art system that could provide at least an equivalent if not better performance.

High reliability, high throughput and long-term availability were vital criteria when it came to choosing a system. Volkswagen opted for ARATEC® manufactured by PSI Technics with headquarters near Koblenz, Germany.

*On right:
A fast installation and a reliable operation are indispensable in production environments.*



Project Description

Fast and Easy Retrofitting

The ARATEC® Positioning Solution System is a stand-alone digital control system that automatically positions stacker cranes in industrial facilities such as high-bay warehouses. The new positioning system was installed at Volkswagen AG's high-bay storage facility in Wolfsburg. Approximately 990 vehicle bodies for Volkswagen Golf, Golf Plus and Tiguan models are stored in an area of 131.2 x 229.6 ft (40 x 70 m). The warehouse serves as an interim storage prior to paint finishing. The system handles approximately 6000 runs per day on each axis and lifts the vehicle bodies to a height of 65.6 ft (20 m).

Since PSI Technics was involved in the modernization analysis and planning early on, the retrofitting was completed very quickly. The process took on average one day per stacker crane. This way, costly downtimes could be kept to a minimum.

**Jürgen Bastek,
Manager
of Maintenance,
Volkswagen AG**



„The retrofitting was well-organized and well-prepared. As a result, the new positioning systems were commissioned even prior to the completion date.

PSI Technics' positioning solution was most convincing as a replacement for the ICS5000L system. ARATEC® is technically sophisticated and can therefore readily be used in production environments.“

So far, PSI Technics retrofitted the traveling and retractable axles of four stacker cranes and is going to modernize a total of ten warehouse stacker cranes.



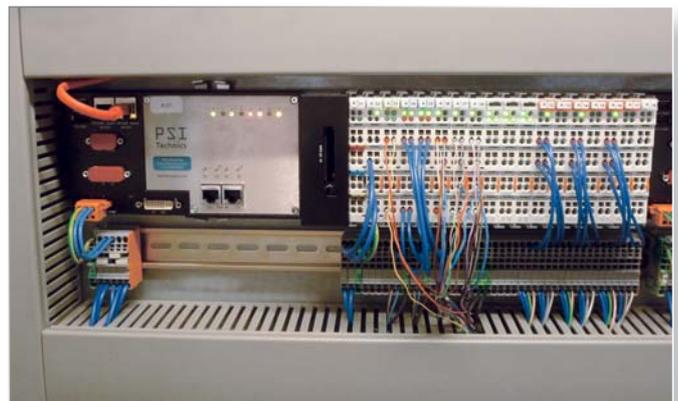
The New Positioning System

The fast and easy integration into Volkswagen AG's existing logistics facilities was a major advantage of the new positioning system ARATEC®. The system permits the continued use of existing components such as PLCs, converters or motor drives. It interfaces with all major process control computers, controllers and inventory management systems.

At Volkswagen, the ARATEC® Positioning Solution System is controlled by a PLC using the MODBUS TCP protocol. The system provides analog converter control within a range of -10V to +10V. A brake and a safety contact for each axis provide additional system control.

Below:

The ARATEC® Positioning Solution System can be integrated into existing installation in a single day.



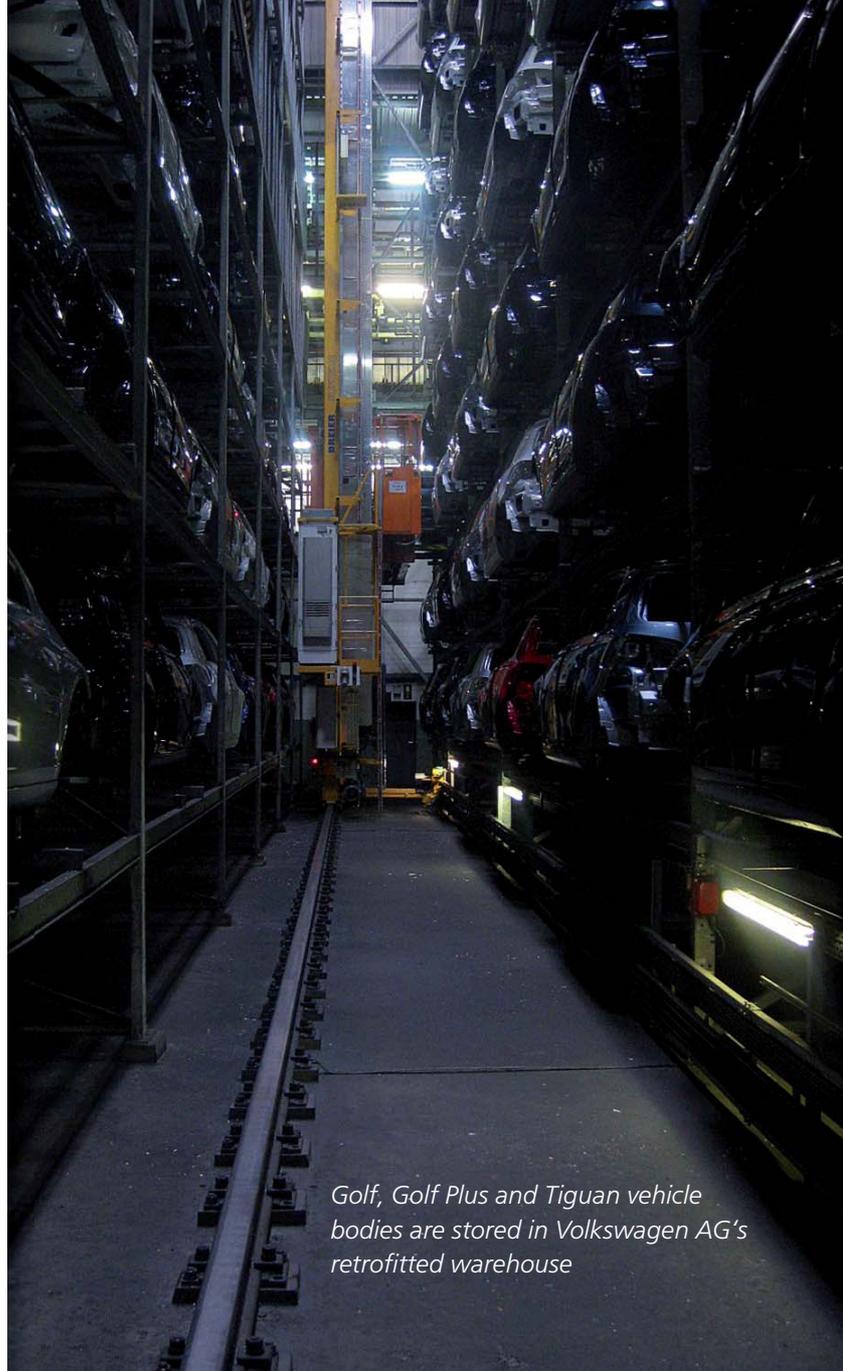
Advantages of Retrofitting: Easy Integration and Increased Efficiency

Another unique feature that supports a fast commissioning is the system's largely automated configuration. ARATEC® automatically performs a characterization, eliminating the need for a time-consuming manual control parameter configuration and adjustment.

The characterization provides an optimized motion path based on the existing conditions. The system calculates motion profiles, placing particular emphasis on maximum speed and acceleration. During system operation, ARATEC® uses feedback from optical distance meters to continuously monitor the stacker crane's movements. It optimizes the motion path in real time and completes storage and retrieval tasks within the shortest possible time. Acceleration and velocity profiles are based solely on linear ramps, irrespective of load, which completely eliminates creeping speed.

The shorter storage and retrieval times ensure the high throughput required by Volkswagen. PSI Technics' web-based software interface provides access to all of the system's characterization, control and diagnostic functionalities. The user-friendly software only requires a brief introduction—no programming skills are needed.

Failure detection is another innovative feature of the software. It recognizes minute travel changes or irregularities and triggers early warnings. If problems occur, the software detects them, so they can be addressed proactively at an early stage—an important feature that helps to prevent costly downtimes. The system is also equipped with a 1GB diagnostic memory. Service support is based on system error analyses, which can be performed remotely by PSI Technics' service technicians, if required.



Golf, Golf Plus and Tiguan vehicle bodies are stored in Volkswagen AG's retrofitted warehouse

Conclusion

Reduced downtimes lead to increased productivity

The new positioning solution ARATEC® completely fulfilled Volkswagen AG's expectations.

The occasional downtimes that occurred with the previous positioning system are no longer an issue. According to Jürgen Bastek, the precision and the performance of the new positioning system were other convincing factors. ARATEC® guarantees a reliable warehouse operation with retrofitted stacker cranes for years to come.



Jürgen Bastek,
Manager of Maintenance,
Volkswagen AG, Wolfsburg



Awards



ISB Success 2008

ISB Success 2008, awarded by
Investitions- und Strukturbank
Rheinland-Pfalz (ISB), Germany

PSI Technics offers intelligent and efficient solutions that improve productivity and quality in the following fields: Factory automation, industrial positioning systems, industrial image processing, thermal protection of sensors, EMC analyses, temperature/humidity monitoring and analysis, safety engineering as well as R&D for energy efficiency and energy management.

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