

Keep Your Production Line Moving

Comprehensive material flow
concepts for warehouse and
production logistics

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SSI SCHÄFER



Intelligent Solutions for the Internal Supply Chain

Integrated solutions are becoming increasingly important within the complex material flow processes between storage and production. These solutions encompass manual, semi-automated and fully automated processes.



Raw materials and production materials are accepted into incoming goods, buffered, prepared and delivered to the production location or assembly work station just-in-time or just-in-sequence. Complete orders are often sequenced and sent to outgoing goods, where they are prepared for dispatch. It is important that all products can be trace across the entire supply chain.

Challenges:

- **Automotive:** Special solutions for production and assembly supply, and spare parts handling for just-in-time and just-in-sequence along with precise delivery to production lines
- **Chemical industry:** Storage and transport of hazardous substances across different temperature ranges
- **Pulp & Paper:** Space-optimized storage and safe transport of heavy duty loads and large volumes
- **Mechanical engineering:** Complex processes, demanding workplace designs and ergonomics



For many years, our solutions have supported the intelligent networking of people, machines, systems and products that form the focus of industry 4.0. Because as we all know, IT plays a central role in intralogistics. SSI SCHAEFER develops the right solution based on our WAMAS logistics software or SAP. These solutions cover the complete spectrum from material flow control to warehouse management and they include both consulting and implementation. The WAMAS Control Center from SSI SCHAEFER combines classic visualization capabilities with a display of logistics performance indicators. You can view and analyze the heartbeat of your system, enables you to make effective decisions.

LEAN solutions

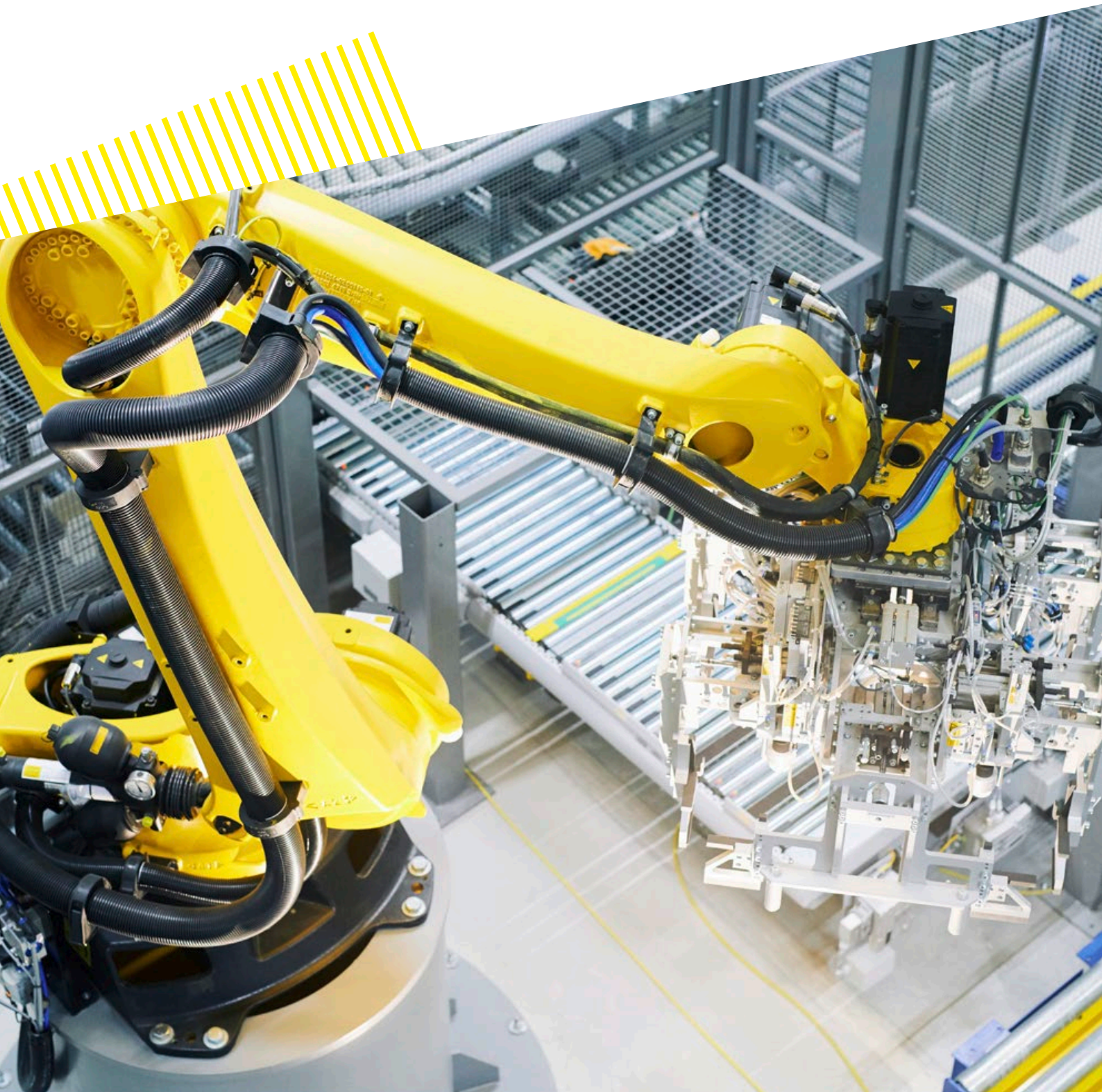
Wasted time and resources need to be minimized in order to cost effectively produce high-quality products. Lean management is also the key within intralogistics. Solutions from SSI SCHAEFER ensure the intelligent use of employees and machines together with short paths and time savings.

Solutions from SSI SCHAEFER

- Static and dynamic rack systems
- Modular bin systems
- Scalable pallet storage and miniload systems
- Dynamic storage and retrieval machines and shuttles
- Flexible picking systems
- High-performance sequencing systems
- Automatic palletizing and depalletizing with robots
- Perfectly matching conveying systems and automated guided vehicles
- Ergonomic work station systems
- Efficient mobile racks and storage lifts
- Performant WAMAS and SAP software solutions

SSI SCHAEFER – We Optimize Your Supply Chain

Future-proof logistics solutions should integrate seamlessly into your individual processes, be modular and upgradeable, and adapt flexibly to new conditions. For this, you need specialists who think in terms of systems rather than individual services.



All-in-one solutions from a single source

Our wide range of products and services forms the basis of industry-specific solutions that we can tailor to your needs. With such a portfolio, our experts can provide bespoke solutions that cover all areas of your internal material flow. Our customers benefit from the fact that we make all of the SSI SCHAEFER Group's components ourselves. Having more than 10,000 employees globally makes us a strong and reliable partner.

At SSI SCHAEFER, holistic thinking has been the key to our success for many decades. As a global general contractor, we implement complete logistics systems. Our team of consultants provide comprehensive system planning and project management services, which are certified by the International Project Management Association (IPMA). This approach enables us to provide turn-key systems with tailored service and maintenance packages. Upon request, we can also plan and build your project with our in-house construction department.

Experienced specialists for Warehouse and Production Logistics

SSI SCHAEFER has established its own team of experts that focus on addressing the challenges of the industrial market sector. Our experts develop forward-thinking solutions for industrial companies and help you to implement more efficient and sustainable intralogistics.

We support you with modular and scalable system solutions combined with our own WAMAS logistics software. These one-stop solutions are designed specifically for your entire value chain. They range from connecting the automated warehouse to the production and assembly systems to picking, retrieval and shipping staging.

Dedication and commitment

If you know anything about SSI SCHAEFER, you will be aware that we put our customers at the center of everything we do.

This includes the obligation:

- to always provide the optimum solution
- to always be there for our customers
- to always keep our word

You can expect us to be fully dedicated to your concerns. Whether it be the devotion that our employees give to developing new solutions or the all round service we ensure during the life cycle of your systems, we will always be by your side, no matter where you are in the world. As a family company, we always think of the future and plan for the long term.





Scalable, Precise and Variable Automated Miniload Systems

Logistics processes play an increasingly important role in value creation within the automotive industry but due to their complexity, they now pose a major challenge. Automated Miniload systems represent one solution. These systems provide space-saving storage for a diverse range of articles in bins, cartons or on trays. The warehouse is connected to the production facility via conveyor systems or automated guided vehicles.

SSI SCHAEFER is one of the few specialists that can provide complete solutions including storage systems for special tools, process optimized solution for storage of wheels tires, and parts warehouse concepts based on the locator system in addition to the rack constructions, storage machines and load carriers. This allows us to create solutions tailored to your specific needs.



Schaeffler Groupe: European distribution center with state-of-the-art logistics solutions

The automotive and industry supplier commissioned SSI SCHAEFER as the general contractor for the intra-logistics of its new European distribution center (EDC Mitte) in Kitzingen. The solution consists of an automated high-bay warehouse and a miniload system combined with innovative robot technology, and is one of the most modern logistics facilities in Europe.

SSI SCHAEFER constructed a 7-aisle high-bay warehouse, installed extensive pallet and bin conveyor systems along with an electric floor track. The 28,000 spaces for euro pallets and 56,000 spaces for Düsseldorfer pallets are served by seven energy-efficient and high-performance SSI Exyz double-boom storage and retrieval machines. These are each equipped with two load handling devices for the corresponding pallet types. The miniload storage consists of a 6-aisle automated miniload system. Twelve SSI Miniload work on two levels. The entire system will include 100,000 LTB type bins from SSI SCHAEFER.

The WAMAS logistics software from SSI SCHAEFER controls the storage and conveying systems. This software is connected to the SAP EWM.

Brose: Intelligent material flow concept for fully automated production supply

SSI SCHAEFER developed an innovative material flow concept for highly dynamic and sequenced production supply for a logistics center in the Czech city of Ostrava. Supported by a precisely tailored SAP EWM system, this logistics center is now a key resource for the Brose Group, the world's fifth largest family-owned automotive supplier.

The 7-aisle automated miniload system is capable of storing 23,520 bins dynamically in a single or double-depth system. The system includes four tigger train stations where the bins are loaded in sequence for the production supply. A tigger train with four trailers arrives at the corresponding station in accordance with the loading schedule. When a tigger train reaches the loading position, the corresponding bins are released and automatically roll onto the trailer spaces.

brose
Technik für Automobile

"The new solution allows for minimal manual handling, direct, optimized material provision, reduced effort by staff and improved ergonomics. Thanks to the system automation, the material flow changeover and the consistent SAP solution, we have simplified and streamlined processes and made them more transparent, thereby increasing performance. This is an intelligent solution for fully automated production supply and we are very happy with it."

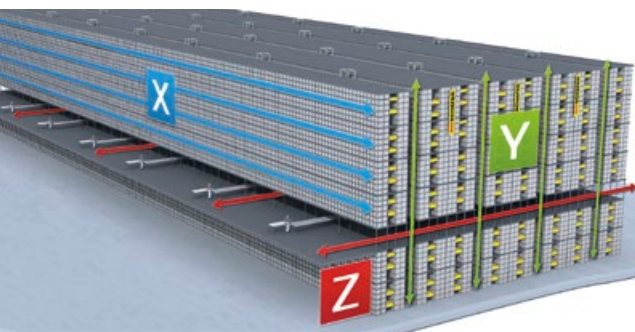
Claudia Vogel-Daniel
Project Coordinator Brose Fahrzeugteile GmbH & Co. KG





Efficient and Modular: High Dynamic Shuttle Warehouse

Shuttle systems from SSI SCHAEFER are a critical element of a cost-optimized logistics chain.



The increasing demand for mini or specialized series represents a major challenge for logistics, especially in the machinery industry. SSI SCHAEFER's shuttle systems provide a solution. They provide efficient processes wherever optimized storage is combined with rapid material transport and short access times. The flexible capacities and high-performance of the shuttle systems are key elements. Combined with the 3D-MATRIX Solution®, a highly dynamic solution for storage and picking of bins, cartons and trays along with entire tray layers and pallets, this enables unmatched throughput.

SSI Flexi: Intelligent functionality

The SSI Flexi is a pioneering solution for use in highly dynamic automated small parts warehouses with a high variance of transport units up to 50 kg and dynamically adaptable storage location sizes.

The modular concept consisting of shuttle, lift and racking system enables tailored system

concepts with excellent space utilization and throughput rates with high flexibility.

Thanks to the universal load handling device with width adjustment, the SSI Flexi allows single, double and multiple-deep storage even under deep-freeze conditions.



SSI Cuby: High-performance solution for maximum storage density

The SSI Cuby is a single-level shuttle and the ideal solution for the fully automated storage of bins and cartons weighing up to 35 kg. The highly-efficient and dynamic solution sized 600 mm x 400 mm guarantees high availability and energy efficiency. A scalable lifting system with double-deck load handling devices combined with a compact facility layout ensures high performance and optimum material flow.

Automotive suppliers: Miniload system with 120 Cuby shuttles

SSI SCHAEFER set up a new distribution center in France for a leading player in the automotive spare parts market. The system is designed to ship 60,000 vehicle parts per day. The facility stores 120,000 different articles.

In order to ensure efficient order processing, SSI SCHAEFER constructed a 5-aisle shuttle warehouse with 81,600 bin storage spaces for double-deep storage along with a 2-aisle miniload storage system with SSI Miniload storage and retrieval machines for 15,000 storage spaces. The shuttle warehouse was designed using the goods-to-person system and includes 120 SSI Cuby shuttles and ten integrated lifts. The installed bin conveyor system serves four Pick to Tote picking stations, enabling up to seven orders to be processed simultaneously.

Klingspor: Shuttle warehouse for abrasives

SSI SCHAEFER constructed a distribution center in Haiger for Klingspor AG, an abrasive technologies specialist. Every day, the company ships more than 200 tonnes of adhesive to 80 countries worldwide. The solution consists of a 3-aisle double-deep pallet rack with approximately 13,400 spaces as well as a shuttle warehouse with more than 36,000 spaces designed according to the 3D-MATRIX Solution®.

Three energy-efficient SSI Exyz storage and retrieval machines form the foundation for efficient processes in the pallet rack system with 2 x 120 flow storage locations. The 26-meter-high facility is connected to three picking locations as well as the goods-in and goods-out areas via pallet conveyors with a PLC control system.

SSI SCHAEFER also installed the SAP EWM warehouse management system.



A High-Bay Warehouse, Conveyor Systems and Innovative Software Provide Maximum Efficiency for Heavy Goods

Pulp and paper is often a heavy-weight industry. These heavy duty, heavy-weight goods of every type need special handling. They also require space-optimized storage and safe transport. To meet these demanding needs, SSI SCHAEFER's experts develop tailored solutions. These combine efficient rack storage technology with innovative conveying systems and the WAMAS logistics software.

SSI Exyz: Highest energy and cost efficiency in pallet warehouses

The SSI Exyz from SSI SCHAEFER is the ideal solution for the fully automated storage of pallets in high-bay warehouses. The storage-retrieval machine can be used in tropical conditions as well as in deep-freeze warehouses down to - 28 °C and its extremely compact design enables efficient high-bay warehouses from 5 to 45 meters high.

SSI Exyz offers maximum flexibility: our storage-retrieval machine can be used as a single or double master with one or two load handling devices for single, double or multiple-deep storage and retrieval, including SSI Orbiter LHD. The SSI Exyz components are manufactured in series, pre-assembled in the factory and can therefore be put into operation within a very short time.

ICT: Automated high-bay warehouse for enhanced efficiency

The Italian company Industrie Cartarie Tronchetti S.p.A. (ICT) is a leading hygiene paper manufacturer in Europe. SSI SCHAEFER was commissioned to plan and construct a logistics facility in Poland. A silo-design high-bay warehouse with 60,000 spaces, single and double-deep storage, two kilometers of innovative pallet conveying systems along with nine storage and retrieval machines form the foundation of the warehouse.

The WAMAS logistics software controls the entire goods-in and goods-out process, the picking along with production disposal. In addition, it also handles the specifically tailored yard management.

In a second expansion, SSI SCHAEFER was assigned the task of delivering five additional storage aisles for 30,000 pallet spaces together with the conveying systems and control integration into the material flows.

Beiersdorf AG: Logistics center in Vienna

As the general contractor, SSI SCHAEFER handled the construction and equipment of the Vienna site for Beiersdorf AG. This location serves as the logistics hub for Central and Eastern Europe. The computer-controlled high-bay warehouse is the heart of the facility

and one of the most modern within the group. Three storage and retrieval machines serve 2,700 square meters of storage space along with six aisles with 10,100 pallet spaces, providing the fully automated storage and retrieval of 100 pallets per hour.

"With the new high-bay warehouse and optimized processes we were able to meet our objectives exactly as planned. SSI SCHAEFER displayed high flexibility, exact work methods, and consequent customer orientation in this project. We are really entirely satisfied."

Dariusz Drzazga
Logistics Manager, ICT

"We are absolutely satisfied. Already within the shortest startup period, the fully automatic pallet handling could be put into full operation. Re-controlling was hardly required. Our objectives with regard to efficiency and cost minimization have been more than just achieved."

Gabor Izay
Head of Material Management CEE Region, Beiersdorf AG

Flexible and Efficient Material Flows with Automated Guided Vehicles

How to ensure an intelligent material flow from the warehouse to the production or assembly and from there to goods-out? This is a key issue especially for operations with limited space or where maximum flexibility is essential. Auto-guided transport systems from SSI SCHAEFER for large and small load carriers provide the solution. They economically and reliably supply production and assembly around the clock.

Automated guided vehicles are efficient, flexible, and scalable

Auto-guided transport systems become an integral part of the solution portfolio for fully automated intralogistics systems. The fleet for large load carriers from SSI SCHAEFER features a diverse range of solutions that are capable of

creating a logistics network, encompassing various warehouse and working areas. The solution can be configured and also flexibly expanded to keep up with the pace with your specific requirements.





WEASEL® always on track even without a driver

Whether bins, cartons, trays or hanging goods - the WEASEL can handle almost any transport task, delivering the goods gently and safely to the desired destination. The product is also distinguished by its exceptionally rapid ROI. So it is no surprise that the WEASEL received the IFOY award in the Intralogistics Solution category.

Benefits

- Loads of up to 35 kg
- Standardized control software
- Easy integration into the existing material flow system
- Barrier-free transport solution with low space requirements
- Simple scalability
- Diverse constructions for the best ergonomics
- Personnel safety without extensive sensor equipment
- Freely accessible transport paths



ALPLA ensures flexible transport to and from production

ALPLA Werke Alwin Lehner GmbH & Co. KG are one of the world's leading manufacturers of packaging solutions. Auto-guided transport systems safeguard the supply and disposal at Toluca in Mexico. They automatically collect the output from the production machines and transport them to the warehouse or shipping area, carrying out up to 850 runs per day. In addition, the automated vehicles also supply the machine with empty pallets.

C+C Krug: The path to automation

Plastic galvanizing specialist C+C Krug GmbH has embarked on the path to automating its processes between warehouse and production with SSI LOGIMAT® storage lifts, WEASEL automated guided vehicles and a short container conveyor system. The result: barrier-free connection between warehouse and production, time savings by switching to the goods-to-person principle, high storage density and short walking distances, a 90% increase in availability speed and satisfied employees thanks to improved ergonomics.

Software Solutions: The Driving Force for Consistently Synchronized Processes

WAMAS logistics software

Our WAMAS logistics software guarantees intelligent solutions for the challenges of today and tomorrow. WAMAS encompasses around 30 years of expertise in the development and implementation of sustainable and scalable intralogistics solutions.

The logistics software can be seamlessly integrated into ERP systems, creating the perfect prerequisites for efficient control of all the logistics processes - from

customer order to the PLC and mobile end devices in manual areas. The software grows with your requirements, supporting your company through any and all expansions.

Proven SAP competence

As a system provider, we are your trusted partner for the selection, implementation, ongoing maintenance and further development of SAP logistics solutions. Our broad range of consulting and implementation expertise is reflected in numerous international projects.

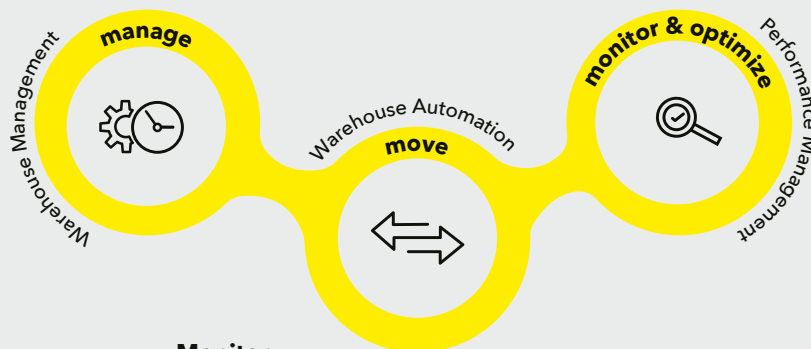
WAMAS® Portfolio

Manage

The state-of-the-art software controls and optimizes manual or highly complex automated processes based on the current daily orders.

Move

Whether forklift transportation, conveyor technology, shuttles or AGVs - WAMAS integrates all components into a high-performance overall system.



Monitor

The central information platform WAMAS Control Center provides insights into warehouse operations in real time and constantly shows potential areas for improvement.

Optimize Processes and Save Costs: More Power Through Modernization

Just as some forgotten products are making a comeback as a retro variant with new technology, your warehouse performance can also be pushed forward with new warehouse technologies and software releases.

Technology updates streamline warehouse and picking processes and reduces costs. This includes also updates to previous investments. It does not matter if you purchased an installation from us or from another provider. We analyze your logistical situation together with you to increase sustainable performance and profitability. With our years of expertise, we advise you on areas for optimization and recommend customized solutions.

After preparing a return on investment analysis, we offer you:

- Optimization of organizational and warehouse processes
- Implementation of new picking methods
- Expansion to new warehouse areas
- Extension/modernization of mechanics, electrical engineering, control
- Software and hardware upgrading

Innovative Service Portfolio for Maximum Availability of all Systems

Once your system has been successfully commissioned, our experts will continue to support you. Our comprehensive service portfolio offers customized solutions for all requirements.

Preventive Services

- Maintenance
- Inspection
- Safety Inspection
- Rack Inspection
- Training and Certification
- System Monitoring
- System Security

Reactive Services

- 24/7 Technical Support
- Call Out Support
- SSI Augmented Support

Life Cycle Management

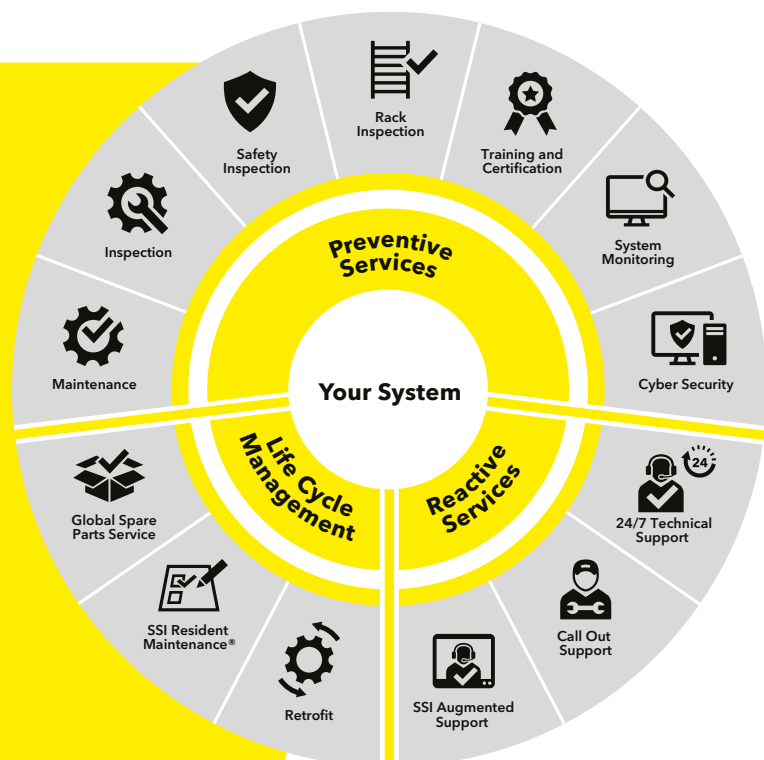
- Retrofit
- SMP
- Global Spare Parts Service

SSI SCHAEFER Maintenance Philosophy (SMP)

With our improved SSI Resident Maintenance® solution, we offer our customers "more than just service".

The SSI SCHAEFER Maintenance Philosophy is based on three core elements:

- Expert employees (SSI Resident Maintenance Team)
- Best-practice processes for technical maintenance and repair work
- Integrated service tools and systems



Six Reasons for Choosing SSI SCHAEFER

■ **Stability**

As a financially independent family business, SSI SCHAEFER is committed to long-term solutions. You can trust that our team of experts will be there for you today, tomorrow and in years to come.

■ **Efficiency**

SSI SCHAEFER solutions are scalable and able to grow with your business. You can always upgrade or retrofit.

■ **Quality**

As a systems specialist and original equipment manufacturer, SSI SCHAEFER provides tailor-made and high-quality solutions from a single source, specifically designed to meet your challenges.

■ **Reliability**

Thanks to our worldwide Customer Service & Support network, SSI SCHAEFER ensures smooth operation of your system, both during and after installation.

■ **Know-how**

SSI SCHAEFER solutions are always up-to-date with the latest technological standards and can be easily integrated into an existing (IT) landscape.

■ **Internationality**

As a global organization, SSI SCHAEFER has local offices worldwide. With over 70 operative subsidiaries, our team of experts speak your language.

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