

Fresh to the Table: Solutions for Food Retail

Single-source system solutions
to guarantee quality, optimize
processes and reduce costs

[ssi-schaefer.com](https://www.ssi-schaefer.com)



SSI SCHÄFER



Solutions to Suit Your Taste

The food trade comes up with some demanding requirements for intralogistics specialists. The technological development of retail business is increasingly augmented by a rapidly growing online food trade. SSI SCHAEFER provides flexible, scalable and modular solutions to guarantee maximum efficiency for both areas.

The food sector is characterized by extensive product handling requirements, together with a broad customer structure that encompasses international wholesalers with hypermarkets, hotels, large kitchens and kiosks. Diverse shop formats offer an extensive range of dry, fresh and deep frozen products. Every shop format has a different goods turnover. This results in a vast spectrum of requirements for the various distribution networks which affects quantities, load carriers and delivery options.

The growing online supermarket business plays an increasingly important role. Established supermarket chains and new start-ups share the market. Fulfillment

for online retail faces additional logistics challenges such as high growth, high delivery peaks, narrow delivery windows, a low drop rate on the last mile along with greater pressure on margins.

The right level of warehouse automation is, therefore, highly customer specific. Furthermore, many providers are also increasing the number of articles offered in order to remain competitive. The market is in a constant state of flux and the rate of change is increasing. As a consequence, a warehouse is never "finished". That is why process optimizations after commissioning the warehouse and throughout the entire operational life-cycle round out our portfolio.



Requirements for intralogistics

- Foodstuffs perish. That is why the monitoring of expiry dates and batch numbers is essential.
- Seasonal and even weekly peaks, in particular for online supermarkets, demand exceptional flexibility from the warehouse layout.
- The massive growth of online supermarkets requires modular and scalable solutions.
- Products are fragile and depend on an appealing presentation in retail business. This makes gentle handling essential.
- Ergonomics has become a critical factor for efficient warehousing and picking concepts and it is also becoming an important aspect when competing for the workforce.

SSI SCHAEFER implements your specific requirements as a tailored logistics solution. We coordinate your goods flow throughout all temperature zones and enable an optimum service level, regardless of whether you require manual, semi- or fully automated solutions for warehousing, picking and transport.

Solutions from SSI SCHAEFER

- Individually tailored, modular warehousing, picking and transportation systems, from high-bay warehouses to automated guided vehicles
- Automatic handling of different article units such as cartons, bins, PET and glass bottles as well as shrink-wrapped items
- Efficient shipping buffers
- Web-based visualization and dashboards with standard and customer-specific KPIs
- Ergonomic work stations
- High-performance WAMAS and SAP software solutions for manual, semi- or fully automated warehouses

SSI SCHAEFER Provides the Full Spectrum of Intralogistics

Future-proof logistics solutions must fit seamlessly into your operational processes, be infinitely expandable, and adapt flexibly to new conditions. This requires absolute specialists. Experts who do not think in terms of individual solutions but in terms of systems.



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 8,600 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.

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.

Specialists for the food retail market

SSI SCHAEFER has a long history in food retail. In addition to constructing semi- and fully automated warehouses, we have also become one of the world’s largest providers of software solutions for manual warehousing with our WAMAS logistics software. The diverse range of industry-specific and award-winning products and solutions reflects this extensive experience.

Our team of food retail experts develops future-proof solutions for all sector’s requirements. Regardless of the size of your project, we utilize our extensive expertise to design and implement modular and scalable intralogistics solutions which are perfectly harmonized and can be integrated seamlessly into your processes.

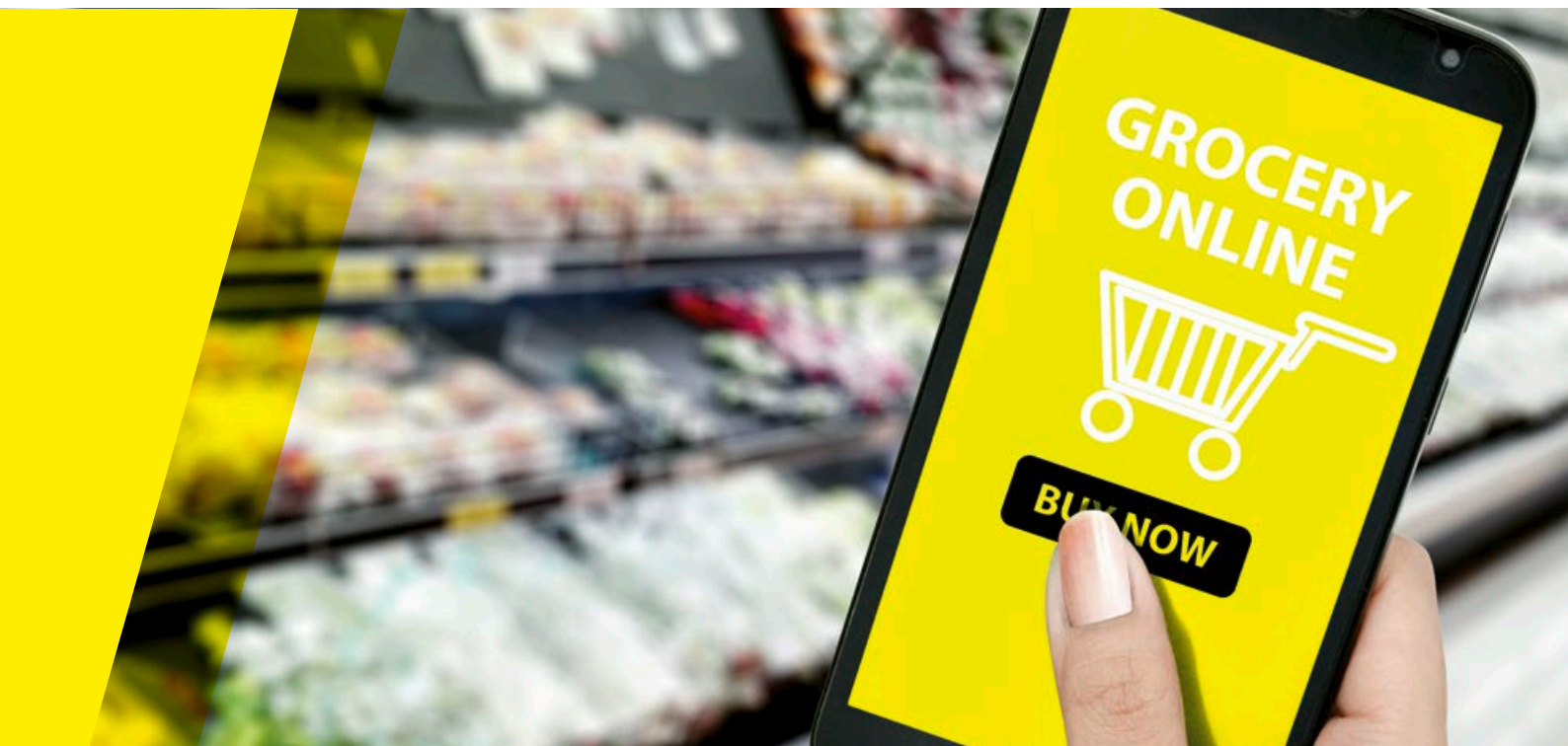


Ordered Today, Delivered Today: The Demanding World of Online Retail

The rapidly growing online food retail places highest demands on intra-logistics processes in which the integrated optimization of the entire process chain is a key success factor. This encompasses the supply to the distribution center, delivery to the customer and returning the empty order bins to the warehouse.

Typical challenges along the process chain:

- The supply with conventional, optimized mixed pallets and their unloading for sorting into the picking warehouse slows down the goods-in process.
 - More goods are purchased than the logistical optimum in order to obtain better procurement conditions. These items need to be stored, managed and made available efficiently in the warehouse without eliminating the savings achieved during purchasing by additional work steps or high investments in storage technology.
 - Major delivery peaks result in corresponding picking peaks, causing further difficulties if the two processes are not decoupled.
 - Consolidation plays an important role: products from different temperature zones need to be compiled into a complete order at the right time. The higher the throughput in the warehouse, the more difficult it is to implement these processes error-free manually.
- Without buffering, it requires parallel picking of the entire order in all temperature zones promptly before shipping. This results in an uneven distribution of the picking workload.
- The allocation of order bins and cartons in the shipping area usually happens manually, stacked on pallets or in shipping frames. This frequently creates ergonomic problems, is time-intensive and, therefore, expensive.
 - Customers expect the take-back of beverage crates and empties. Therefore suppliers have to be able to sort and stack empties in the warehouse.
 - The infamous “last mile” of delivery is expensive due to the generally low drop density. Tightly meshed upstream and downstream shipping processes accelerate the delivery procedure



Particularly new companies have a limited budget for warehouse equipment. That is why modular and expandable solutions that grow with the company are essential.

With this in mind, SSI SCHAEFER draws on a portfolio of modular solutions developed or adapted specifically for online food retail. These manual, semi- or fully automated solutions include every step of the process chain.



Targeted application of automation

Automation is utilized specifically wherever employees carry out repetitive or physically demanding tasks and where today's technology works faster and more reliably than humans do. Ergonomic workstation systems, resources and sophisticated interfaces with the equipment reduce the demands on employees. This applies to tasks such as:

Transport of pallets, bins and cartons from goods-in to the stock warehouse and the picking warehouse:

Conveying systems and automated guided vehicles handle any type of goods.

Supplying picking lines with products:

Automated guided vehicles, storage and retrieval machines and shuttles automatically transfer source bins, cartons, trays and even pallets to flow racks, handling the transport and sorting in the picking aisles automatically.

Picking:

Modern technology supports and guides employees during the picking process, reducing error rates. Intelligent control by our award-winning WAMAS logistics software enables the handling of orders with a similar structure in batches. This increases the picking density, allows the smoothing of peaks, and takes into account batch and expiry dates. Zone picking using Pick by Light together with ergonomic and high-performance goods-to-person work stations provides attractive alternatives to conventional picking with the person-to-goods approach.

Buffering and consolidation of order bins:

Picked order bins can be automatically buffered and combined with additional bins to complete the order to be dispatched.

Completion with last-minute articles:

Last-minute articles can be added to the bins removed from the consolidation buffer at ergonomic stations immediately before shipping. This enables the addition of articles that were unavailable during picking or where freshness is particularly important.

Stacking of shipping bins or filling of shipping frames:

SSI SCHAEFER's technology allows the stacking of shipping bins fully automatically in accordance with routes and orders. The bins can be stacked on pallets or inserted into shipping frames.

Sorting and stacking of empty beverage crates:

Beverage crates collected during delivery runs can be reliably identified in the warehouse by high-performance optical identification technology, sorted fully automatically and stacked on pallets for the transport back to the beverage suppliers.



Worldwide Success: E-Grocery Solutions by SSI SCHAEFER

RedMart: Intelligent linkage of standardized modules

SSI SCHAEFER set up a warehouse with approximately 10,000 m² for Singapore's leading online food retailer. RedMart has the broadest range of dry and fresh foodstuffs in Singapore. The narrow time window for delivering the goods and the perishability of the fresh foodstuffs require an intelligent combination of storage and picking systems.

Different manual solution elements are linked to form an intelligent process including pallet racks with 1,140 spaces, a two-level freestanding mezzanine with 940 m², a long-span shelving with 1,000 rack levels and live storage shelving with approximately 500 shelves for cartons.



“Online food retail presents a number of challenges, and we are pleased that we chose SSI SCHAEFER as our partner for racking. Their team played an important role in the design and implementation of the project, and the results exceeded our expectations.”

Vikram Rupani
Co-founder, COO & CFO, RedMart

BienManger.com: Optimized flow of goods with new rack systems

BienManger.com is the French market leader among online delicatessens and offers more than 5,000 items.

The 1,800 m² warehouse is divided into four areas: one for incoming goods, one for storage on pallets and shelves along with two areas for picking and shipping. To improve the goods flow for the warehouse management and picking processes of numerous small articles, SSI SCHAEFER realized a shelving on a 2,400 m², three-level mezzanine. This included 10,830 meters of shelving along with a five-level pallet rack system for storing incoming pallets with 42 storage frames and 624 pallet positions, each with a load bearing capacity of 1,000 kg.



SSI Case Picking: Solutions for all Degrees of Automation

Fully automated, semi-automated or manual – flexible case picking solutions for all requirements

Our technology covers all temperature zones and throughputs. All of the process steps from the replenishment warehouse to depalletizing, picking, sequencing, palletizing or shipping area can be implemented manually or automatically, as shown on the overview table.

The SSI Case Picking is based upon proven standard elements. The key factors are your requirements and the practical aspects of the specific project such as availability of warehouse employees, quality of the pallets packaged by suppliers, volatility of the demand or the structural conditions.

Storage of bins, cartons and trays with the multi-level shuttle SSI Flexi/SSI Cuby as a picking and sequencing warehouse, implemented as a 3D-Matrix

Semi-automated palletizing at ergonomic pallet packing stations

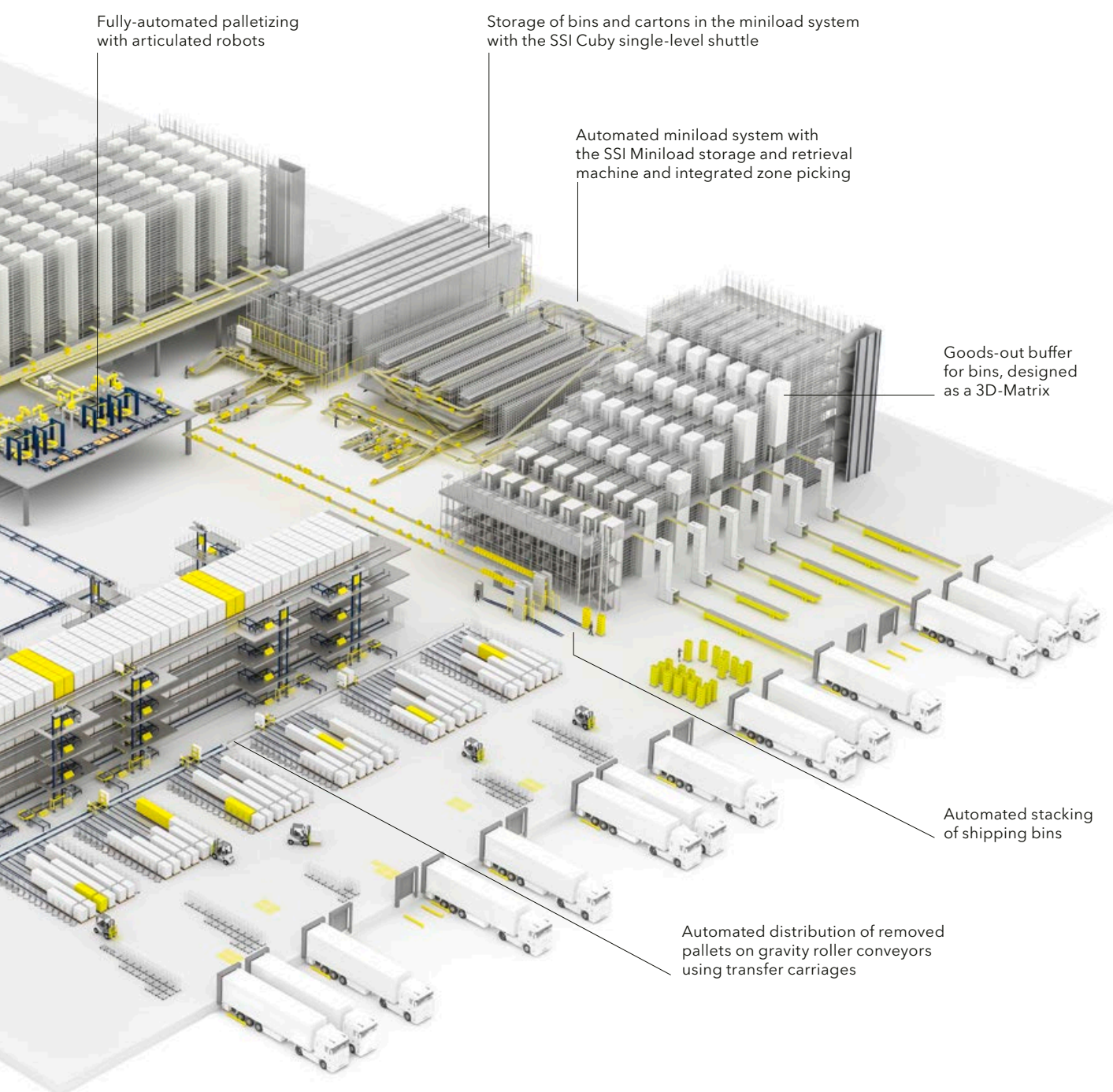
Pallet storage with the SSI Exyz storage and retrieval machine with integrated tunnel picking

Pallet storage with the SSI Lift & Run multi-level shuttle incl. ORBITER® load handling device

Goods-out buffer for pallets, designed as a 3D-Matrix

Automation levels

Goods-in	Conventional
Replenishment warehouse	Automatic / Manual / None
Depalletizing	Automatic / Hybrid / Manual / None
Picking warehouse	Single case / Layers / Pallets
Picking/ sequencing	Automatic with 3D-Matrix / Automatic without 3D-Matrix / Manual
Palletizing	Automatic / Hybrid / Manual
Goods-out	Automatic / Hybrid / Manual





Maximum Efficiency: Fully Automated Case Picking

The fully automated SSI Case Picking system receives entire pallets from suppliers and stores them in an automated high-bay pallet warehouse via conveying systems.

Depalletizing is carried out automatically and when required, with robots unloading the pallets either completely or layer by layer. The layers of the cases are then buffered either completely or individually in an automated picking warehouse. Depending on the requirements, SSI SCHAEFER's single-level shuttles, multi-level shuttles or conventional storage and retrieval machines are utilized.

The picked cases are then transported to the palletizing robots in the correct sequence. These then rapidly and reliably pack the goods onto pallets or into roller containers using the previously calculated, optimum packing pattern according to the desired optimization targets: store-friendly, maximum stability, minimum volume or a mixture thereof. In the final step, the pallets are wrapped in plastic foil. The finished pallets are automatically transported to the goods-out where they are distributed via gravity roller conveyors or temporarily stored in an automated goods-out buffer.



The perfect pallet

An efficient logistics should always strive to achieve an optimum that encompasses all of the processes. That is why our solutions optimize the logistics costs throughout the supply chain, not only in the warehouse. Perfectly packaged pallets are an important aspect.

However, the concept of the perfect pallet can differ from customer to customer. Pallets need optimum stability for long transport distances on poor roads. They require volume optimization to reduce the transport costs. If pallets also need to be as store-friendly as possible to accelerate restocking supermarket shelves, then the packing pattern is tailored to the branch layout. The SSI Pack Pattern Generator enables the packing layout for each individual pallet and branch to be defined individually and considered automatically.

The sequenced palletizing of all cases is essential to create the "perfect pallet". The temporary stored cases are unloaded in the picking warehouse in a precise sequence. Thanks to the 3D-Matrix this takes place without any performance loss in the case warehouse and without any additional work for subsequent sequencing.

3D-MATRIX Solution®: Dynamics and performance

The picking warehouse can be designed for high throughput as an element of the SSI Case Picking system using the 3D-Matrix. The patented 3D-MATRIX Solution® is a highly dynamic shuttle warehouse with automated buffering and sequencing. The special design treats the warehousing cube as a system open on all sides, eliminating the front-side bottlenecks at the transfer areas along with the restrictions of conventional solutions. The Matrix consists of three key system components: shuttle vehicles, lifts and conveying systems. They simultaneously serve all three axes and transfer the goods directly to the connected picking or shipping work stations.

ASKO
– vi forsyner Norge med mat

Customized solution for absolute sequence

SSI SCHAEFER has been appointed as the general contractor for ASKO's highly automated distribution center in Sande, Norway. The center comprises two temperature zones with a total of 28,700 pallet spaces and efficient cross-docking and consolidation areas. In the deep freeze area, 84 SSI Flexi Shuttles are employed to store containers after manual depalletization. The ambient area incorporates a high-bay warehouse with eight SSI Exyz type storage-retrieval machines as well as a 90,000 locations SSI Navette system with 64 multi-level

shuttles for small load carriers and 80 lifts ensures processes are as efficient as possible.

The 3D-MATRIX Solution® enables precise sequencing and transfer of cases to the palletizing robots, which assemble fully automated store-ready pallets. The entire material flow and inventory management are coordinated by the WAMAS software, ensuring optimal capacity utilization.



Maximum Flexibility in all Areas: Semi-Automated Case Picking

When throughputs are too low for a fully automated solution, investments need to be kept to a minimum or other reasons oppose a high degree of automation, sophisticated semi-automated concepts still allow efficient storage and picking. The degree of automation and the implementation both depend upon the specific project.

The picking process is often carried out manually whereas the storage, the replenishment supply of the picking warehouse as well as the transport of pallets and roller containers take place automatically. Supporting processes such as identifying and stacking empties and bins are also frequently automated to

enable the employees to focus on manual, value-creating core processes. The market-leading WAMAS logistics software ensures the intelligent and efficient control of all material flows in the warehouse and functions either independently or in combination with an existing warehouse management system.



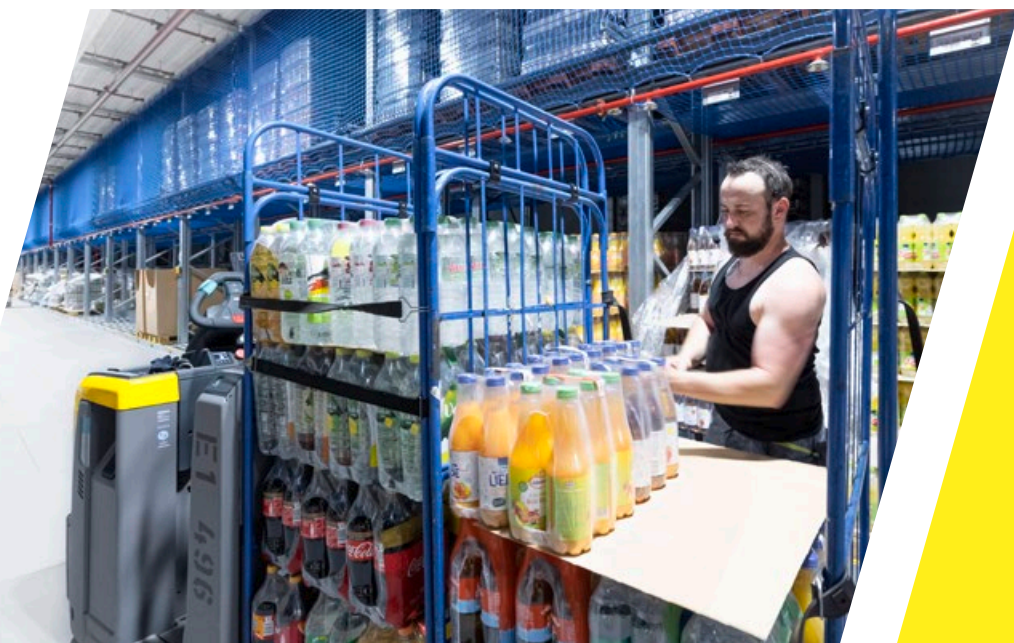
Netto: Semi-automated distribution center

SSI SCHAEFER implemented a 20,000 m² semi-automated distribution center for dry goods products in Wustermark near Berlin for the Danish discounter, Netto. The high-bay warehouse for pallets has approximately 9,700 locations for the storing of the entire range of supplies of a typical food discount store. Eight storage and retrieval machines ensure efficient processing.

The composition of orders for Netto stores is carried out with entire pallets from the high-bay warehouse as well as with order-picking pallets. These are compiled in a semi-automated picking area where storage and retrieval machines automatically place the replenishment pallets on gravity roller conveyors supplying them to the pickers as source pallets.

When developing this area, importance was attached to creating a bright, open, and optically pleasant design of these areas. The components of the orders are compiled via low-floor order-picking vehicles in the eight aisles of the picking warehouse according to the person-to-goods principle. The transport vehicles have space for two euro pallets. The picking itself is carried out without paperwork using Pick by Voice.

An electric monorail system and extensive conveying systems designed for both euro and half pallets together with the logistics software from SSI SCHAEFER create a more efficient and economical material flow.





IT Perfectly Manages Complex Procedures

Modern logistics is unthinkable without software-based process optimization and visualization. That is why SSI SCHAEFER developed its own WAMAS software that shares the same modular design as our solutions. It features standard interfaces to external systems, enabling it to be effortlessly and seamlessly integrated into your existing IT landscape.

coop The Coop Group Cooperative

What once began as a small consumer cooperative is today an internationally active retail and wholesale company. Behind the sales outlets is a reliable stock management system that guarantees full shelves and thus maximum customer satisfaction day after day.

The heart of the system, the WAMAS logistics software, creates the prerequisites for effectively managing an unlimited number of locations with varying characteristics with a single warehouse management system.

WAMAS manages the complex procedures in manual, semi- or automated warehouses and can be scaled to your precise requirements.



Modular logistics concept for EDEKA

The EDEKA Group is the largest German supermarket corporation. Numerous warehouses of the cooperatively organized EDEKA group benefit from both manual and automated logistics concepts provided by SSI SCHÄFER, supplying hundreds of retail stores.

Warehouse management is handled by the WAMAS logistics software from SSI SCHAEFER. This software has been in use for a large number of trading companies in the EDEKA network nationwide since 2003. The successful collaboration is complemented by service and maintenance contracts for the locations.

Tasks handled by WAMAS:

- Waveless picking: enables any incoming order to be optimally integrated into the picking process
- Flexibility up until the very end of the process (loading) even in the event of additional orders or changes
- Control of diverse picking techniques tailored to the product range and the order structure
- Empty and full goods handling, transport aids management (crates, pallets, roller containers, etc.)
- Expiry date and batch management
- Solutions also for temporary work stations during peak times
- Returns handling solutions
- Cross docking: incoming deliveries are recorded, picked and immediately distributed without being stored
- Support of other processes such as quality controls, value added services (e.g. special packaging, labeling, assembly / set formation) and packing processes
- Management support via web-based dashboards, KPIs and the ability to generate figures and dashboards using integrated tools
- Weighed goods handling: dual stock management for non-leveled weighed goods

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.

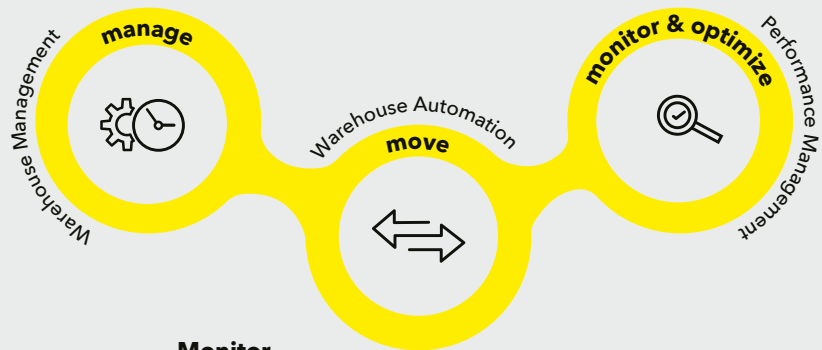
WAMAS® Portfolio

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 brands are making a comeback and becoming a real bestseller, 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

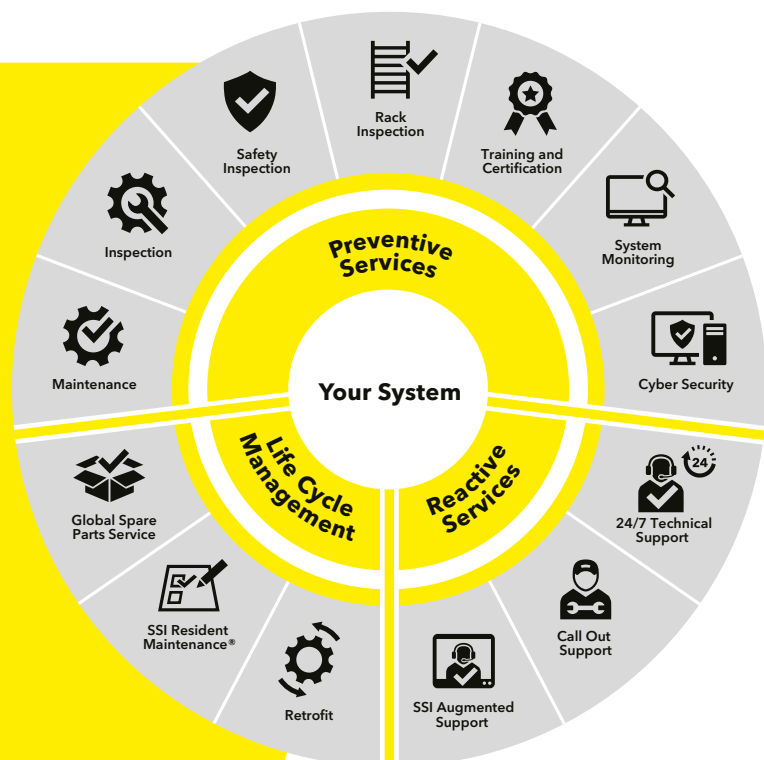
- Retrofit
- SMP
- Global Spare Parts Service

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 80 operative subsidiaries, our team of experts speak your language.

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