

FLEXIBLE SOLUTIONS FOR GRADUAL AUTOMATION IN PRODUCTION LOGISTICS

SSI SCHAEFER
BEST
PRACTICE
GUIDE

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A best-practice guide to achieving higher throughput and profit, with less effort

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PRODUCTION SUPPLY AUTOMATICALLY UNDER CONTROL



Repeated disruptions to global supply chains have presented the economy with significant challenges in recent months. Industrial companies that had proactively built up their own stocks of raw materials and semi-finished goods or purchased parts to avoid supply bottlenecks were confronted with significantly fewer problems in maintaining production. At the same time, the individual process steps of production logistics, as well as the manufacturing machines and systems, must be able to be adapted quickly and flexibly to further varying general conditions and sustained growth. In this context, the demand for scalable, semi- and fully automated intralogistics solutions in production-related warehouses, which is being driven further by ongoing cost pressure, is increasing. The focus here is on increasing efficiency and performance as well as on gaining space, reducing complexity and significantly increasing transparency.

Therefore, logistics managers are faced with the task of finding out which technologies are individually suitable to adequately serve the current situation and the expected further sales development. With this Best Practice Guide, SSI SCHAEFER would like to support you in assessing the respective benefit for your application and thus contribute to facilitating your decision-making. The presented semi and fully automated storage and picking modules are sustainable, future-proof system solutions that can be customized and implemented in partnership.

Challenges for industrial logistics

With market volatility, the manufacturing industry is called upon to closely interlink its production and logistics processes. Supply principles such as "just-in-time" and "just-in-sequence" can only be implemented in an efficiently timed manner with these interlinked processes. Additionally, the storage and picking of raw materials, semi-finished products, and vendor parts, in an ever-increasing number of variants, need to be considered. It is no longer possible to master these challenges, and economically, solely by conventional manual methods. Nor can the importance of data for continuous improvement processes be underestimated. Another widespread problem is the need to save storage space to install a new machine or an additional production line, for example. Another important aspect relates to safety, as the number of accidents caused by forklift trucks not only affects the supply chain, but also poses a risk to employees. In addition, solutions must be found to relieve staff of arduous tasks.

Modular, flexibly scalable semi and fully automated material flow solutions in combination with intelligent logistics software, which cleverly controls the individual modules in the network, provide a solution to these challenges for industrial logistics. But what should be considered when selecting a system? Key indicators are the number of SKUs (stock keeping units), the type of articles being stored and moved through the system, the load carriers in use, and the required capacity and performance of the system. It is also extremely important to differentiate between greenfield (new) and brownfield (adaptation of existing) installations to be able to identify any limitations at an early stage. A new building is associated with the greatest possible degree of freedom and offers the possibility of planning sufficient space for the precisely fitting installation of production supply components. Historically existing structures, on the other hand, can come with structural and other restrictions. Although complex technical adaptations are often required in this case, conversions or investments in an existing property can pay off compared to new construction.

Intralogistics solutions – modular, but not off the shelf

Provided that the available floor space allows for the installation of semi and fully automated systems that can efficiently handle a large number of SKUs, operators benefit from additional advantages:

- Increase in storage capacity
- Increase in throughput
- Energy savings
- Attractive working environment

With semi-automated systems, it is also possible to combine both production supply and spare parts logistics under one roof. The latter is also possible in smaller warehouses, however, it is difficult to implement end-to-end automation there. As a first step, a coordinated mix of manual and semi-automated intralogistics solutions is recommended here, which can be retrofitted as needed.



STORAGE

Future-proof logistics solutions must fit seamlessly into your processes, be infinitely expandable, and be flexible enough to adapt to new conditions. Modular solution components that can be individually tailored to your requirements are essential, especially in relation to storage.

Mobile racking systems – your entry into automation

Mobile racking systems are a good choice, especially when space is limited. By using this semi-automatic solution, you increase your vertical storage capacity and at the same time gain additional free space that can be used productively for other purposes. Mobile racking systems can be flexibly utilized, for example with spare parts, tools, tires, or machine components, can be combined with other performance modules and can be expanded over time.

YOUR ADVANTAGES

- Increased storage capacity of up to 90 %
- Space savings of up to 45 %
- High efficiency and long service life
- Possibility to combine with conveyor technology and automated guided vehicles





Storage-retrieval machines for pallets – more performance, less space required

Energy-efficient storage-retrieval machines (SRMs) are well suited for the fully automatic handling of pallets. They can be used in standard, channel, live storage and picking warehouses, are modular in design and can be extended to heights of up to 45 meters. Taking into account your specific requirements, the SRMs can be equipped with one or two load handling devices for single-, double- or multiple-deep storage.

YOUR ADVANTAGES

- Optimization of storage volume
- Reduction of order lead times
- Flexible adaptation to changed logistics parameters and processes
- Energy savings

Vertical Lift Modules - storage and picking in one system

Vertical Lift Modules for order picking can also provide a successful entry into automation. They can be used as a stand-alone solution, in combination with other lifts or integrated into an automated application including warehouse management software. By using vertical lift modules, you can also save costs and space to a considerable extent and, in parallel, increase picking safety significantly. Additionally, walking and transport distances are reduced which benefits personnel.

YOUR ADVANTAGES

- Warehouse consolidation and space optimization
- Inventory and process reliability
- Ergonomic guidance
- Possibility to combine with conveyor technology, robotics and automated guided vehicles



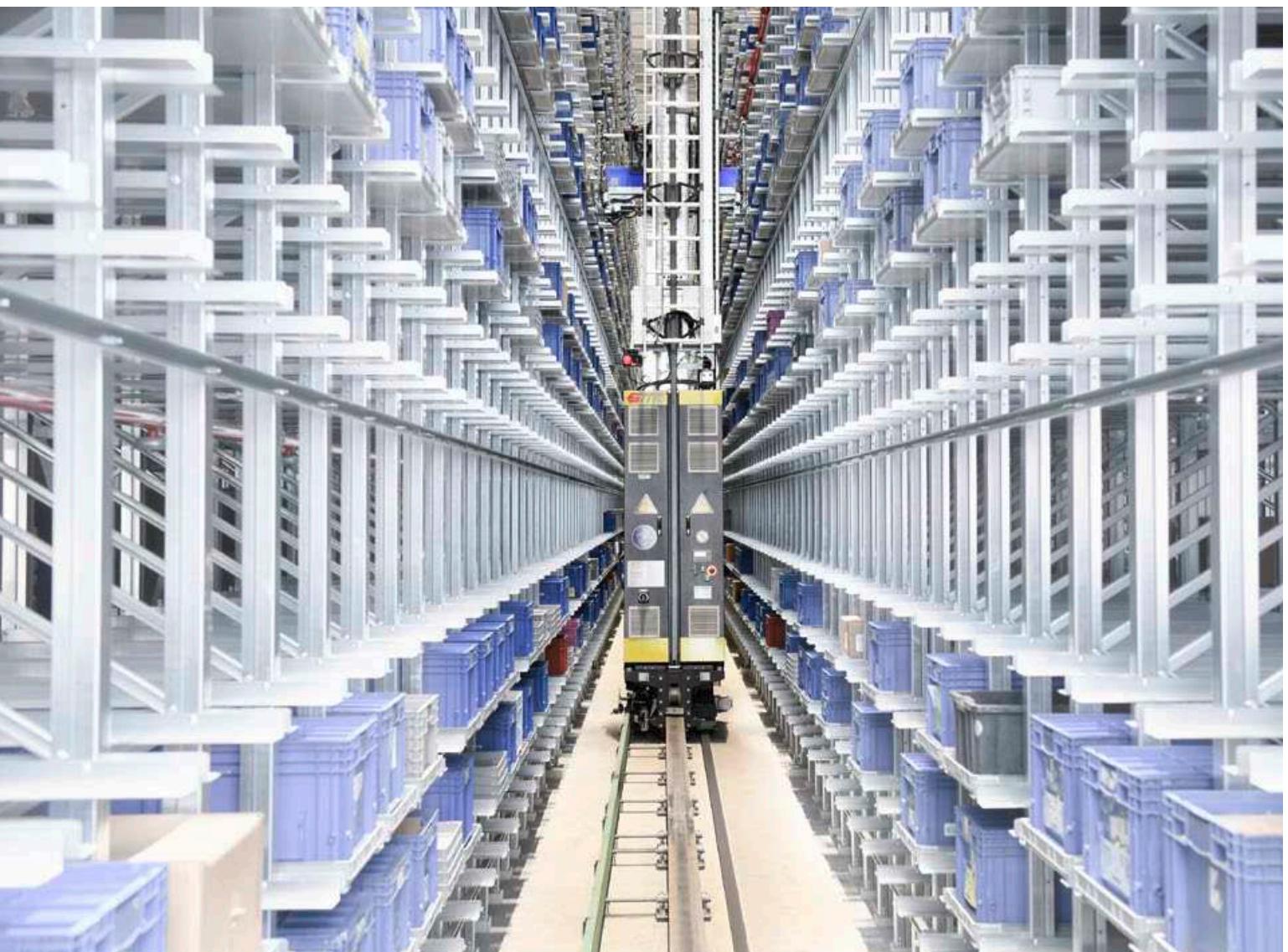


Shuttle systems – boosters for your performance

In terms of capacity and performance, shuttle systems are convincing. The selection is large and offers ideal solutions for every application where fast and flexible material transport in combination with short access times is required: Single-level or multi-level shuttles for containers, cartons, trays or pallets handle fully automatic storage and retrieval in the racking system. The load carriers are fed to the shuttles by front-side lifters. A further increase in throughput can be generated by integrating additional lifts for vertical transport of the load carriers. By integrating high-performance lifters, whose positioning in the storage aisle can be freely selected, highly dynamic solutions with automated storage, buffering and sequencing can be realized in just one system.

YOUR ADVANTAGES

- High dynamics, flexibility, and sustainability
- Modular and scalable solution
- High storage density and fast access
- Excellent space utilization
- Ease of maintenance
- Connection to higher-level ERP systems



Small parts storage – compact, flexible, powerful

An automatic small parts warehouse is a solution for the fully automatic storage of small parts in containers, cartons or on trays, which also makes optimum use of existing space in terms of height and only requires a small footprint. The automatic system provides particularly high storage capacity and can be easily connected to other manual or automatic equipment – from goods receiving to picking and shipping.

YOUR ADVANTAGES

- Optimal use of space and area
- Fast and direct access
- Maximum storage density
- Integrated energy management
- High process speed and reliability
- Excellent availability (24/7)



Automation containers – the reliable all-rounder

Automated conveyor and shuttle systems place special demands on the stability and running properties of load carriers such as bins, totes, containers, and trays. With an optimized reusable container solution, both internal and external cost factors are reduced. The floor characteristics of the automation containers ensure particularly safe running properties even in curved and inclined areas. At the same time, the running surfaces contribute to quiet transport and reduce wear on a system. Intelligent markings such as barcodes, QR codes or RFID can be attached directly to the container and enable clear, fast identification.

YOUR ADVANTAGES

- Sustainable reusable containers
- Quiet running properties on conveyor lines
- Container markings for clear identification
- 100% recyclable

PICKING

Semi-automatic picking solutions follow the „goods-to-person“ principle and reduce the physical strain on your employees. At the same time, they improve process efficiency, picking errors are minimized and throughput increases. The semi-automated system solutions can be operated intuitively and are ideally suited as a supplement to live storage, shelving, and pallet racking.

Small parts picking for high picking performance

Solutions that enable companies to integrate fast, ergonomic, and error-free multi-order picking into their processes are suitable for smaller or throwable items. Up to 1,000 picks per hour at peak times can be processed in parallel. Picking takes place directly into order containers, quantities are recorded via light grid and the operator guidance is intuitively designed.

YOUR ADVANTAGES

- Error rates tend towards 0
- Increase in picking performance up to 1,000 picks per hour
- No false picks thanks to light grid monitoring
- Picking directly into order containers
- Ergonomically optimized



Picking sensitive goods ergonomically

For ergonomic and gentle handling of heavy or sensitive items that need to be transferred into containers or cartons, work stations are recommended where the picker can process their orders with system support over a long period of time at constant quality. An output of up to 800 picks per hour is possible. Physical effort can be minimized by placing the source and destination totes at the same height and pushing the goods effortlessly towards the destination carrier via a confirmation bar.

YOUR ADVANTAGES

- Ergonomic and gentle picking
- Minimization of picking errors, consistent quality
- Parallel picking in four order containers with a capacity of 800 picks per hour
- Automatic transport of source and destination totes to/from the station
- User guidance through graphical user interface and Put to Light
- Height-adjustable platform for optimized ergonomics



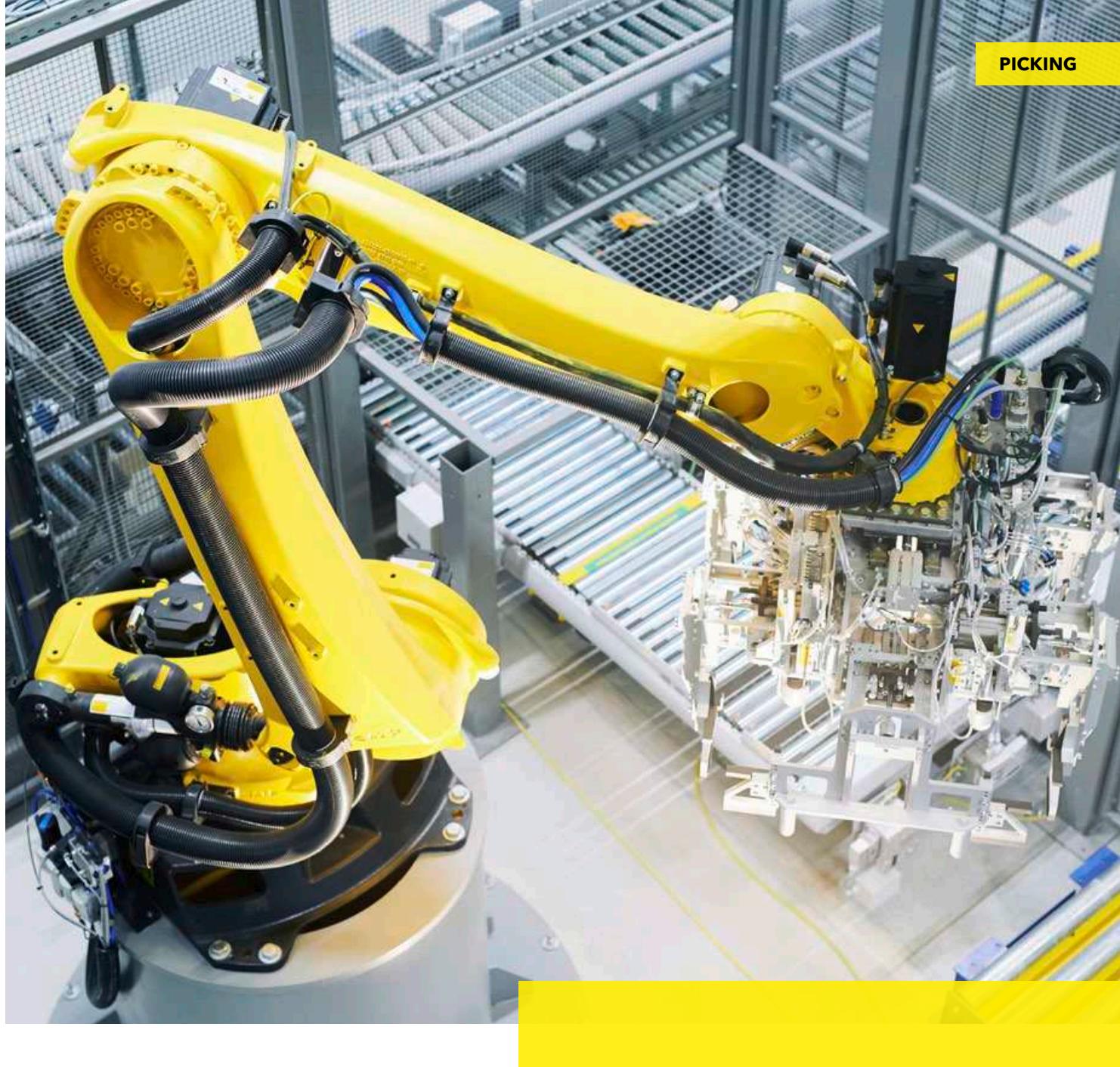
Harmonized human-machine interface

Despite advancing automation, humans are still a central performer in the value chain and will remain so in the future. In this context, concepts are important that aim to design workplaces according to highly ergonomic criteria that are easy on the worker's strength and health. This should be part of all products in a portfolio.

YOUR ADVANTAGES

- Ergonomically optimized human-machine interface
- Avoidance of lifting work using a scissor lift table
- Goods delivery by pallet directly to the work station
- Use of standing work station mats for fatigue-free standing
- Arrangement of goods and storage containers close to each other
- Sophisticated waste management for used cardboard, plastic, and residual waste
- Software support for the storage process





Robotics – flexible, smart assistants

Robots are increasingly becoming indispensable, tireless helpers in order picking. They release humans from monotonous tasks and ensure maximum process reliability. The intelligence required to handle picking tasks is provided by high-performance logistics software. Whether articulated or gantry robots, by integrating robotic solutions into overall systems, you benefit from numerous advantages.

YOUR ADVANTAGES

- High functional reliability, dynamics, and cost-effectiveness
- Gentle product handling and low error rate
- Reduced workload for employees
- Reduction of operating costs (total cost of ownership)
- Constant performance independent of product size, weight, working hours, and environmental conditions

CONVEYING

Production logistics are only as good as the materials handling and transportation systems that keep it moving. Materials and goods must be safely stored, transported, sorted and available at the right place, at the right time. The optimal flow of goods ensures effective distribution, and an intelligent system is the best prerequisite for the efficient and successful processing of orders.

Conveying systems for small load carriers - effective and scalable

The ideal small parts conveying system is flexible within the working environment and optimally designed for the employees. Health hazards should be eliminated without compromising the required throughput. The system can be used to convey, sort, transfer and discharge containers, cartons, trays and products weighing up to 50 kg. A high-performance accumulating roller conveyor can also be integrated for the gapless accumulation of different conveyed product lengths, which can be used primarily as a sorter infeed or in the shipping area.

YOUR ADVANTAGES

- High efficiency and throughput thanks to state-of-the-art technology
- Modularly expandable light conveying system
- Long-lasting productivity thanks to reliable components
- Ergonomically optimized workflows
- Low operating costs

Conveying systems for large load carriers - modular and reliable

For the simplified and, at the same time, efficient transport of large load carriers such as pallets and roller containers, you can use pallet conveying systems that are characterized by their modular design and frequency-controlled drive technology. Alternatively, or additionally, roller container conveying systems can be integrated, which also enable mixed transports. Loading of the roll carts is automatic, eliminating an additional work step for the employees.

YOUR ADVANTAGES

- High throughput and sustained productivity
- Optimization of workflows
- Modular and scalable conveyor systems
- State-of-the-art technology and reliable components
- Consistently high quality due to in-house manufacturing



Automated guided vehicles – autonomous and on track

Automated guided vehicles (AGVs) are gaining ground in the production-related logistics environment. They perform the tasks assigned to them autonomously and operate reliably 24/7 if required. The application range of AGVs extends from production and assembly, to goods and warehouse logistics, and is possible across all industries in mixed traffic, involving automated guided vehicles and people. The seamless integration of holistic AGV solutions for small or large load carriers into corporate, production and merchandise management control systems allows, for example, many production and warehouse processes to be measured more closely and reliably. Many sources can be networked. Users benefit from short payback times.

YOUR ADVANTAGES

- Minimal infrastructure adjustments required
- Flexible and scalable automation of internal material flows
- Optimal adaptation to dynamic market requirements
- Increased operational safety and improved working conditions
- Mixed AGVs and people traffic possible in production and logistics
- Flexible use of space and area



Tugger trains – constant supply reliability in the forklift-free factory

Tugger trains are a proven and continuously refined concept, allowing the required materials to be supplied to production, in the required quantities, at the right time. Transportation of finished goods is also possible. This transport solution is a genuine alternative to forklifts, which, unlike tugger trains, can only pick up one load carrier per journey and therefore they often travel unnecessary distances between the warehouse and production, which are difficult to control. At the same time, the changeover allows you avoid damage due to collision. The purchase and operating cost calculation is also significantly more positive.

YOUR ADVANTAGES

- Avoidance of operational accidents and interruptions
- Time savings due to parallel picking of several load carriers
- Simplified handling
- Minimized operating costs
- Just-in-time and just-in-sequence concepts can be implemented
- Easy entry into automation



Smart software - process support and end-to-end digital workflow

As supply processes become increasingly complex, the importance of intelligent software solutions, that are both modular and flexible in use, as well as creating end-to-end transparency at inventory and process level, is growing. Logistics software allows you to combine all intralogistics modules into a powerful overall system. The wide range of options for controlling manual, semi and fully automated solutions can be tailored precisely to your requirements profile. The software can be easily linked to existing ERP systems via open interfaces.



YOUR ADVANTAGES

- Modular standard software for the entire intralogistics process
- Process optimization through innovative KPI analysis
- Dashboards for real-time visualization of data
- Consulting, implementation, and training

Service & Support - continuous maximum availability in view

Proactive service and short response times are crucial for consistently operating intralogistics systems at the highest level of availability. Failures and downtimes cost money and can interrupt supply continuity to production facilities and assembly work stations. Therefore, you should attach great importance to service and support concepts that can be flexibly adapted to your requirements.

YOUR ADVANTAGES

- Highest availability of all systems
- Short response times, 24/7 support
- Preventive Services - fast problem solving
- Reactive Services - optimum system protection
- Life-cycle management - extension of service life





CASE STUDIES FOR PRODUCTION LOGISTICS

C+C Krug

The plastic electroplating specialist C+C Krug GmbH has taken the path to partial automation of its processes between warehouse and production with SSI LOGIMAT® vertical lift modules, WEASEL® automated guided vehicles and a short container conveying system. The result: barrier-free connection of warehouse and production, time savings due to the conversion 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.



Brose

In Ostrava, Czech Republic, SSI SCHAEFER has implemented a material flow concept for dynamic and sequenced production supply for the automotive supplier Brose, which is supported by SAP EWM. In the small parts warehouse, 23,520 containers can be stored dynamically in single or double deep configuration. These are sequenced and automatically loaded onto the trailer storage bins via front-side routing train stations. The result is type-, quantity- and time-optimized supply to the assembly line, where work can continue without delays due to interrupted supply of parts.



Conclusion

More than ever, industry is dependent on semi and fully automated warehousing and order picking solutions. These need to make a decisive contribution to increasing throughput and delivery quality in terms of internal production and offer a rapid return on investment (ROI). Further benefits are unlocked through individually matching inventories that ensure delivery capability, harmonized processes, space optimization, ergonomic work station design and scalability. It is also possible to eliminate superfluous processes and save associated costs. In addition, with the use of logistics software, data can be collected and evaluated beyond intelligent process control, providing status information on speeds, individual conveyors, switching points and much more. The information obtained can then be used specifically for life cycle management.

But there are no off-the-shelf solutions. With the help of this Best Practice Guide, you can draw initial conclusions as to which performance modules are suitable for your specific requirements. If necessary, this can also be in combination with your strategic objectives for the future. With SSI SCHAEFER, you have a partner with many years of experience by your side who offers intralogistics solutions, from manual to fully automated, including software from a single source and in-house production. The aim is to provide holistic, investment-safe end-to-end solutions for maximum availability that can be implemented successively within a short time if required - both for new buildings and in existing properties.



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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