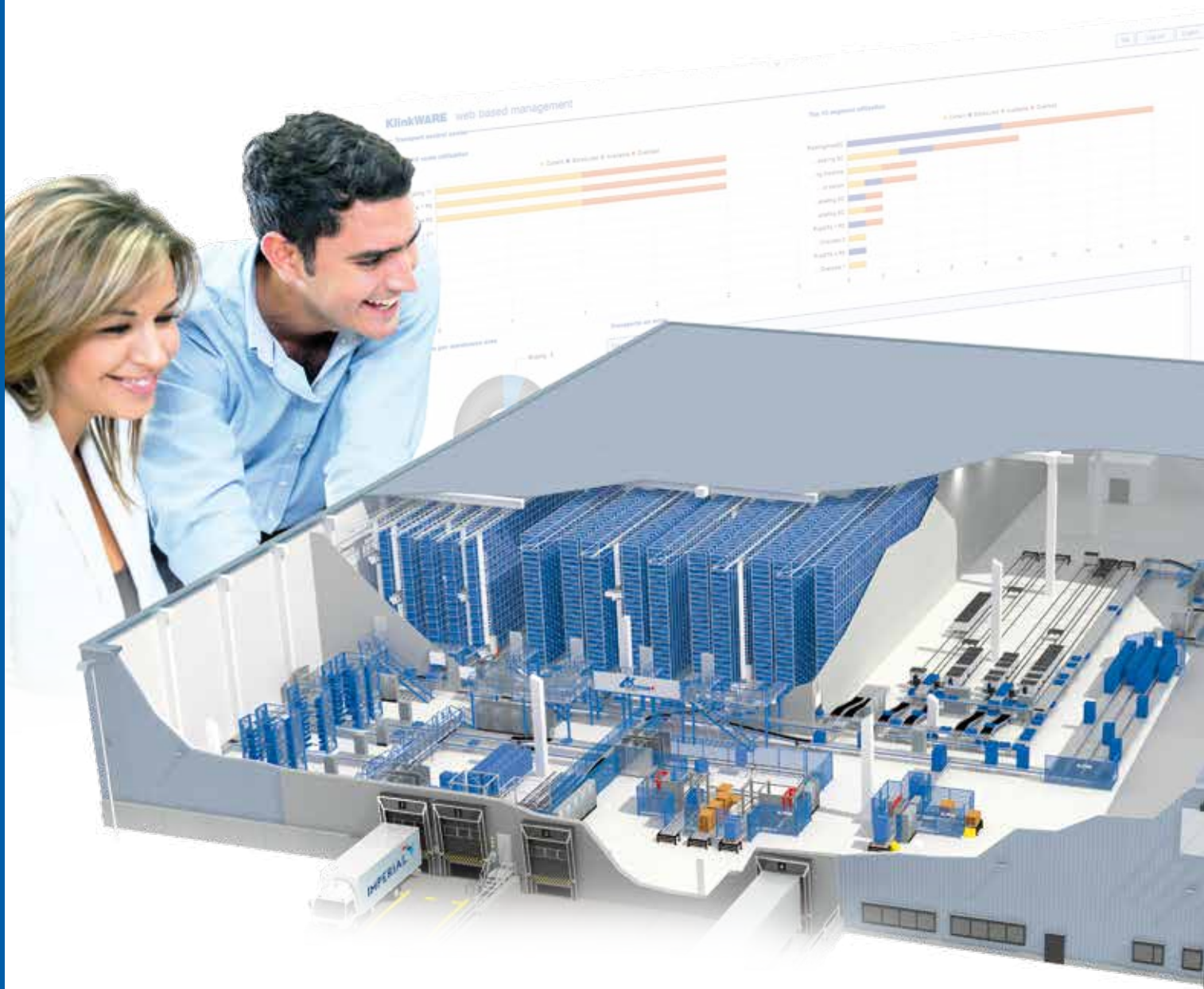


World of Intralogistics and Automation





Living Visions - Innovative Automation in Intralogistics

Fast response times, increased throughput, shorter delivery times

Whether building a new central warehouse, expanding or retrofitting an existing plant – the Klinkhammer Group is a specialist for optimized logistics processes. From the innovative logistics concept and installation of the warehouse technology right through to trendsetting software Klinkhammer offers all services from one source.

As independent intralogistics expert with an international focus the Klinkhammer Group has been realizing automation solutions for all branches of industry and company sizes. For

almost 50 years Klinkhammer has been one of the leading providers in Europe. With its 360° philosophy the Klinkhammer Group sees itself as lifetime partner from analysis and planning to software development and turnkey delivery – including “All-round support” package thanks to the Service24 concept. Software solutions such as the KlinkWARE® Warehouse Management System or the KlinkVISION® visualization program allow an efficient and simple way of working.

Klinkhammer – logistics is our passion!



»Anyone who wants to offer its customers a forward-looking solution needs to plan ahead.«

Frank Klinkhammer, Managing Director

For almost 50 years the Klinkhammer Group has been standing for

- Future-proof and forward-looking logistics planning
- Pathbreaking intralogistics systems and warehouse technology
- Cutting-edge Warehouse Management Software
- Efficiency-increasing visualization & control engineering
- Individual after-sales service and support around the clock
- Innovative logistics processes that really simplify business workflows



Identifying Saving Potentials – Logistics Planning for the Future

Transparently visualizing complex processes

Profitability and performance of the logistics system must be considered and analyzed over the entire service life to ensure companies are one step ahead of their competition. Allowance is also made for all material, personal and time factors. The specialists of the Klinkhammer Group will do this with a great deal of experience and the expertise gathered from numerous intralogistics projects of any size and branch of industry. This is the basis for making sound and future-oriented decisions.

Data acquisition – on-site recording

- Strategic business processes
- Key operating figures

Data analysis – identifying weak points and saving potentials

- Modern, meaningful analysis techniques
- Access frequency analysis, diurnal variation analysis, pick analysis
- Order distribution analysis, order average values
- Incoming goods analysis, article analysis, stock analysis
- Material flow analysis
- Analysis of staff, IT and organizational structure

Comparison of variants & profitability analysis

- Presentation of different solution approaches
- List of possible assembly section versions including capacity and/or key performance indicators
- Manpower requirements and profitability analysis
- Budgeted costs as basis for the investment decision

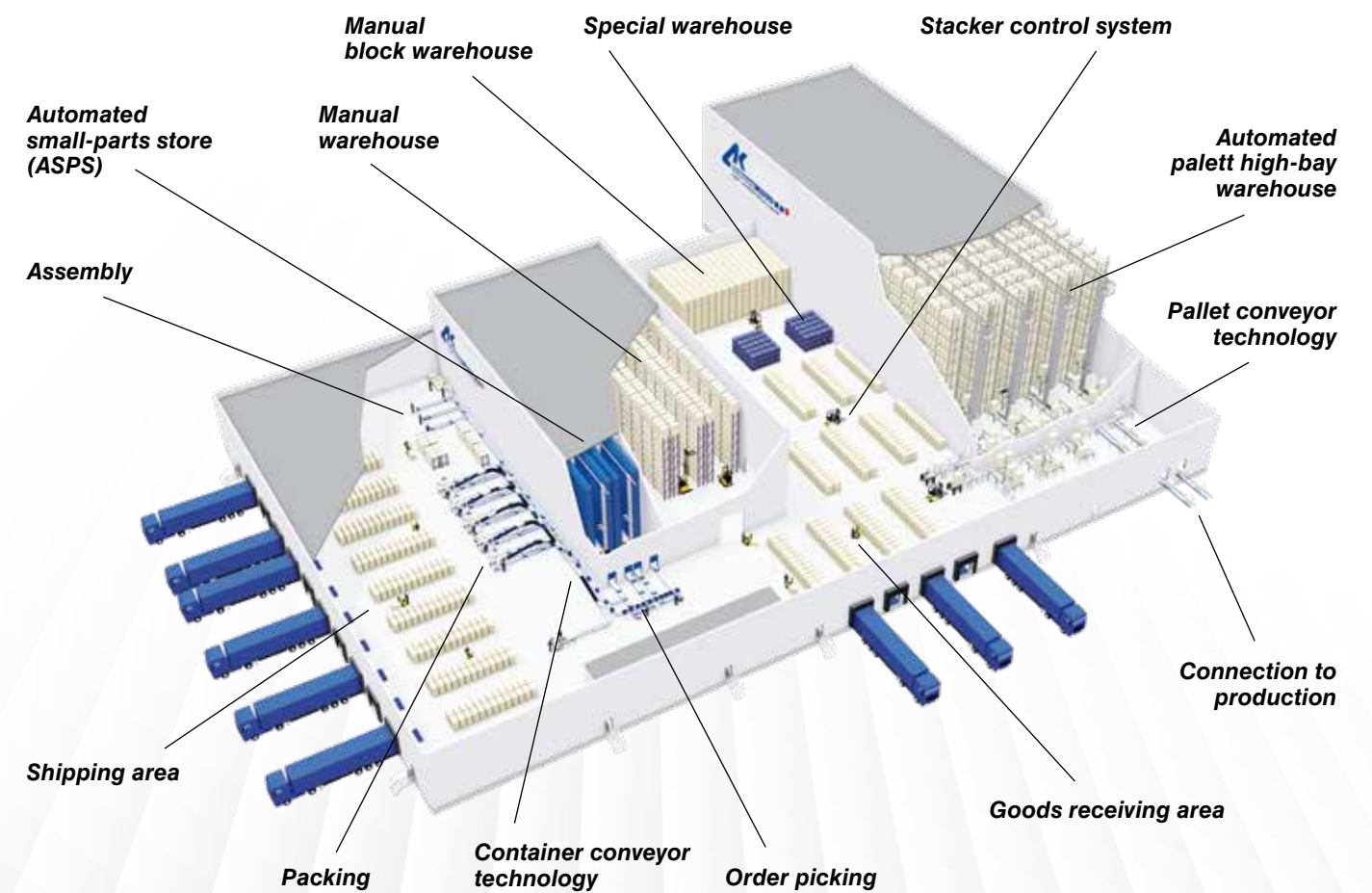
Simulation

- Influence of storage strategies
- Analysis of the system load
- Assessment of breakeven performances
- Capacity expansions
- Identification of bottlenecks

Emulation

- Reproduction of the system behaviour with real data
- Validation of system or plant layout and material flow

360°-Planning





Smart Solutions for Complex Processes – Intelligent Intralogistics

Detailed planning and realization

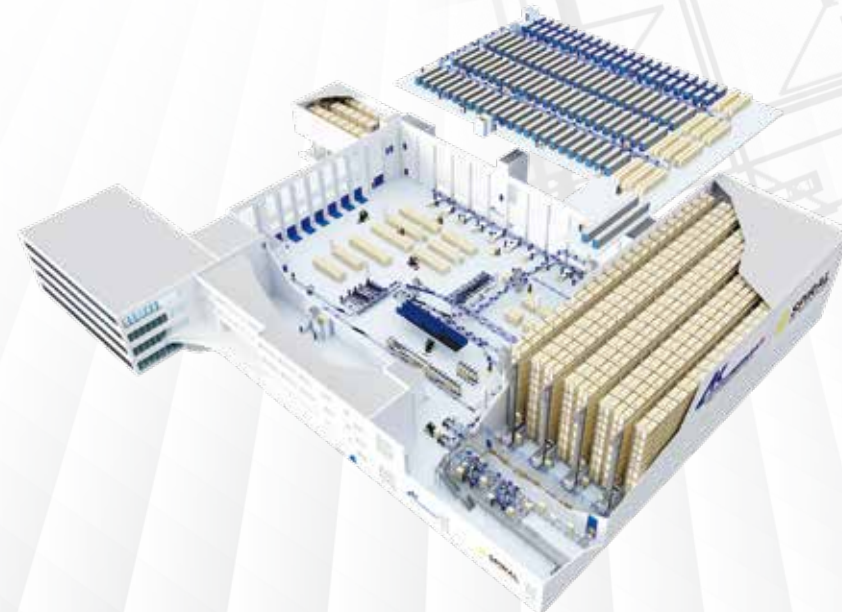
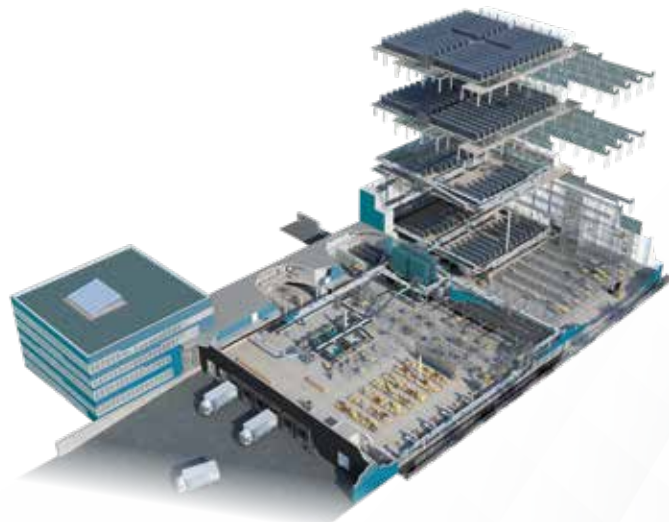
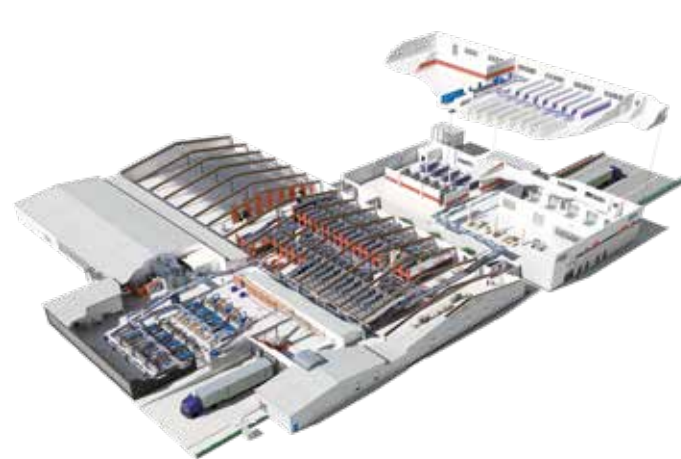
Following thorough and comprehensive analyses the space usage is visualized and optimized with the materials flow planning and the system layout. Throughput times are minimized and efficient flows of material are illustrated. With these tools, solutions are simulated and the best possible variant is worked out fitting the individual requirements - for a solution that perfectly implements even the most complex processes.

Detailed layout

- Warehouse types with capacity
- Automated warehouse control concepts with exact calculation of the storage and retrieval performance
- Conveyors and material flow computer
- Buffer capacities
- Work stations (incoming goods, order picking, dispatch preparation) and manpower requirements

Plant engineering

- Load diagrams for floor plates
- Technical specifications
- Dimensioning calculations
- Load calculation for ceiling suspensions
- Fire protection (sprinkler systems, inertization, etc.)
- Tender documents
- Budgets and schedules





Excellence in Touch – Warehouse Management Software KlinkWARE®

New generation of warehouse management and material flow control

There are many software solutions on the market – but only few ones like KlinkWARE® the new generation of the warehouse management system of the Klinkhammer Group. It is based on cutting-edge, trendsetting technology and perfectly tailored to the requirements of intralogistics – the ideal basis for simplified processes and high cost-efficiency in modern warehouse management.

Up to 5 times faster

- Latest technology and software architecture
- Processing speed of control jobs in form of PLC-telegrams up to 5 times faster

Mobile and “excellence in touch”

- Lean touch screen operation of panels, tablets and forklift truck terminals
- No time-consuming, laborious scrolling thanks to slide function
- Facile navigation by tapping and brushing

Intuitive and highest user comfort

- User friendly design
- Rapid familiarization
- Easy and intuitive operation

More compatible thanks to simple interfaces

- Modern, modularly structured software
- Interfaces to all ERP systems
- Easy integration into existing system environments
- Link to shipping and special systems by the WRX adapter for interfaces

If desired, the Klinkhammer Group experts will also take over the complete IT logistics control and assist with complex migration and connection processes.

Individually adaptable and flexible

- Process-based modules guarantee flexibility, transparency and individual expandability
- Already after a short familiarization time: you will be able to select by yourself the warehousing strategies, FiFo, ABC-classification, height- and weight classes, order release rules, order picking sequences or the supply to the packing stations

Service24 – faster, more reliable, more comprehensive

- Training during the introduction phase and prior to commissioning
- Consulting and support when going live

RFID

Tolerant FiFo

**Formation of
bills of material
and sets**

Best-before date

Multi Order Picking

Production batch tracing

**Permanent
inventory Support**

Pick-by-Voice

Radio Data Transmission

control station

EAN

Multi-client capable

Multilingualism

Labels



Lean Automation – Efficient Conveyors, Control Engineering and Visualization

All components for a perfect material flow from one single source

With the conveyors, the transport media may vary greatly depending on the requirements: Chain, roller or modular belt conveyors, vertical conveyors, transfer carriages or storage machines – there are various options. Thanks to its experience in the field of mechanics and as manufacturer- and brand-independent provider the Klinkhammer Group is able to give best possible advice to companies. Besides the conveyor technology, the all-in-one solutions incorporate, of course, also control engineering, visualization, assembly and a comprehensive service. This way, everything fits together perfectly ensuring a faultless, smooth material flow from the beginning to the end.

KlinCONTROL® control technique

As to the conveyor control system, the technicians of the Klinkhammer Group rely on the freely programmable technology of the Siemens S7 generation or on the TIA-Portal S7 1500. The control system processes transport jobs from the higher-level material flow computer, but also features functionalities allowing an independent, stand-alone operation.

- For an optimum transport of the goods to their destination
- Tests at the customer site before commissioning
- For storage and retrieval cranes, shuttles and conveyors

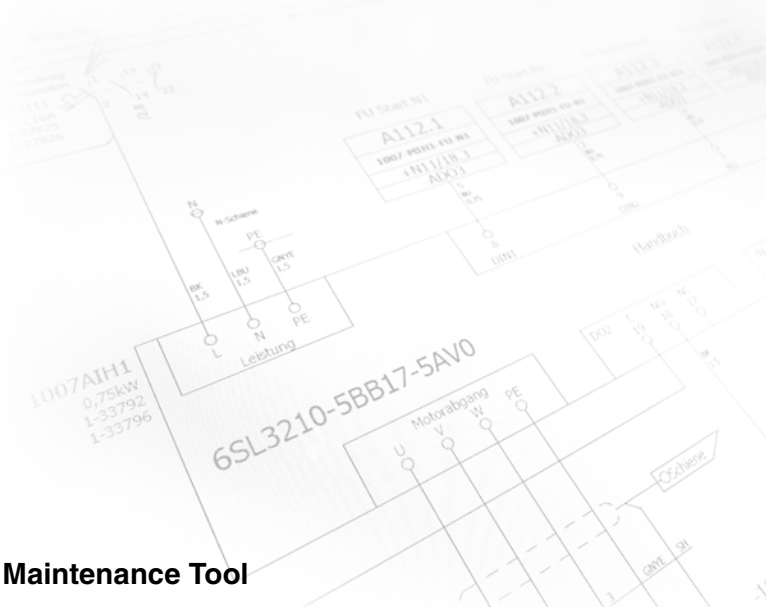
System visualization KlinkVISION®

The system is operated and monitored using the Klinkhammer visualization system KlinkVISION®. Using the system visualization allows the operating staff to identify irregularities before a breakdown of the system occurs. Sensors provide data on the state of the machines and systems and can be analyzed together with error messages and statistics. Based on the experiences gathered in many automated warehouses that Klinkhammer supports and services at the customers', the integrated remote maintenance tool eliminates faults in automated logistics systems.

Maintenance Tool

The innovative Maintenance Tool with operating life oriented maintenance indicator supports the operating and service staff with preventive maintenance activities.

- rapid alarm diagnostics in the warehouse to minimize down-times
- Real-time data analysis and remote maintenance
- Detail screens down to sensor and drive level





Pushing Ahead Change – Trend-Setting Warehouse Technology and New Systems

High-bay warehouse, channel storage system, small-parts warehouse or shuttle warehouse

Which type does perfectly meet the requirements, which warehouse concept does optimally use the existing storage space and fulfil highest performance requirements? With its experience, know-how and using the available analysis and planning tools Klinkhammer offers best prerequisites for systems that are perfectly tailored to the respective needs. Taking into account loading equipment, loaded goods, performance requirements and fields of application Klinkhammer solutions guarantee high profitability.

Klinkhammer stands for efficient workflows in

- Production warehouses
- Buffer warehouses
- Storage warehouses
- Ripening storages
- Cold stores
- Distribution warehouses
- Dispatch warehouses
- Central stores

Optimum utilization, more storage capacity

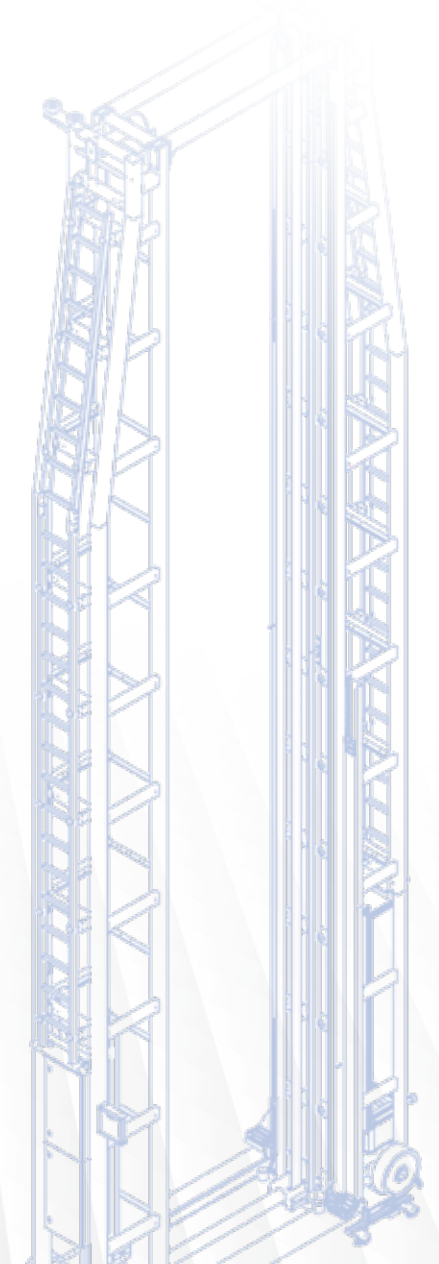
As system- and market-independent general contractor, the Klinkhammer Group can choose from a wide variety of products and services and thus offer the best options available on the market. No matter if racking systems, small parts storage shelving or pallet racks, drive-in, flow or high-bay racks, silo-type or installation plants, container concepts or complex conveyor systems - it is always vital to adapt the solution perfectly to the warehouse topology and the requirements of the goods that need to be stored.

Storage and retrieval cranes and shuttles of all performance categories

- Automated storage and retrieval cranes (AS/RS)
- Shuttle systems, level-bound
- Multilevel shuttle – New: KlinCAT®
- Shuttle systems, with level change
- Autonomous shuttle systems

Order picking systems

- Pick-by-light, pick-by-voice, pick-by-vision
- Pick-by-RFID, Pick-by-scan (bar code)
- Stacker control system
- High-performance order picking systems





KlinCAT® Combines the Benefits of Automatic Storage and Retrieval Crane and Shuttle

High-performance multilevel shuttle system in lightweight design

With a lifting height of around 1.5 m KlinCAT® is able to reach up to 9 tote levels and can be used like a shuttle on several levels above each other. Thus, it can be scaled almost without limit. The load handling attachment of the device has been designed for cardboard boxes, trays or totes with a maximum weight of 50 kg each per loading device. KlinCAT® stands out for its compact design and its low weight and substantially contributes to enhanced dynamics and higher throughput. When comparing the drive parameters to automatic storage/retrieval cranes featuring a speed of around 5 m/s and to shuttle systems featuring a speed of around 2 m/s, KlinCAT® reaches powerful 4 m/s. Other advantages: Small bottom and top approach dimension to ensure a high storage density, an innovative, energy-efficient drive concept and low maintenance and investment costs.

Low investment and life-cycle costs

- Less devices, easily accessible
- Each shuttle level can be walked on
- During maintenance no outage of the entire aisle

Ultralight and compact

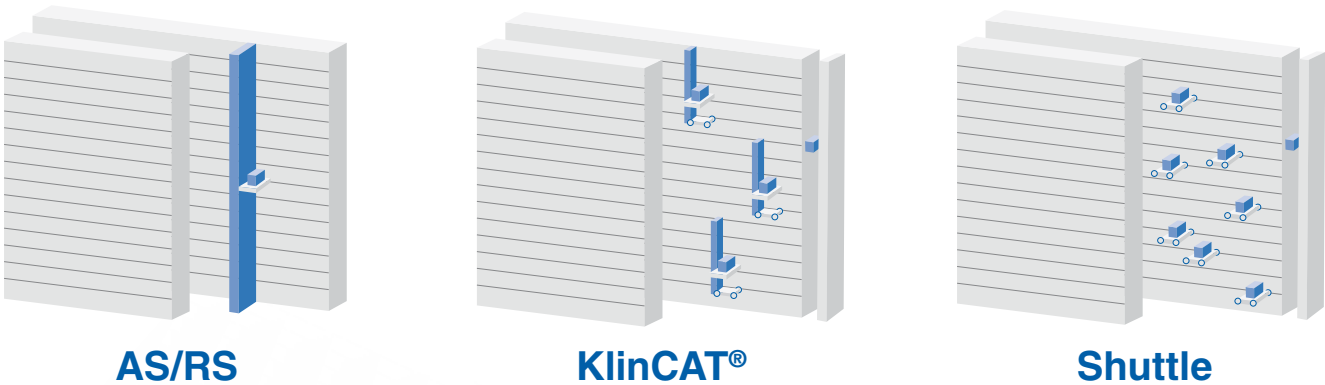
- Telescopic table with 50% weight reduction
- Redesign of the belt conveyors, lightweight material

Small approach dimensions

- Drives not under the telescopic table, but laterally mounted
- High storage density

Optimal energy balance

- Lightweight design
- Energy-efficient drive concept



Speed of travel axis		
5 m/s	4 m/s	2 m/s
Acceleration		
3 m/s²	2 m/s²	2 m/s²

Advantages compared to AS/RS

- High performance, multiplied throughput
- Flexible and adaptable
- Scalable thanks to modular structure
- Easy maintenance, each shuttle level can be reached by foot

Advantages compared to shuttle

- Low investment despite high performance
- Easy maintenance, less devices, easily accessible
- Access to several levels



Ready for the Challenges of the Future – Enhancing the Warehouse Performance by Retrofitting

We will bring your old system up-to-date

Changing business needs, changing market requirements, updated safety and regulatory standards and constantly evolving technology – all this does not inevitably have to lead to investing in an entirely new system or installation. No matter who supplied the old system - when planning the retrofit of an existing installation no aspects will be omitted.

For a retrofit, the Klinkhammer Group examines the individual requirements and brings old systems up-to-date. Replacing outdated computer and control systems will increase productivity, profitability and efficiency of your old installation and extend the life of the investment.

From initial conception through to commissioning:

- Working out a retrofit concept
- Replacing outdated computer, control and bus systems
- Performance optimizations
- Restructuring of systems
- Checking the availability of spare parts
- Updating the system documentation
- Professional service and maintenance

Increasing productivity, profitability and efficiency

- Ensuring the availability by replacing outdated components
- Reduction of upkeep expenses by using more energy-efficient drives
- Enhanced communication of material flow control and warehouse management software
- Step-by-step execution of renovation and upgrading activities during ongoing operation
- Reduced maintenance costs





Around-the-Clock Support – Individual Customer Service 24/7

To make sure that material flow runs smoothly

To ensure maximum reliability and safety for its customers, the Klinkhammer Group offers round-the-clock support including active prevention, immediate help in case of a malfunction and an extensive spare parts management. Additionally, the customer staff will receive on-site, hands-on training such that users can operate the systems perfectly and without making mistakes. The service team of the Klinkhammer Group plans revisions and modernizations. It will look after software, mechanics and control technology, be available via remote access in case of a malfunction or be present in person by sending service technicians to the customer site.

Service 24/7, on-call duty

- Service24-hotline in the event of technical problems
- Software, control engineering and mechanics helpdesk
- In action around the clock

Remote maintenance

- Diagnosis and elimination of faults and malfunctions online via remote access
- Fast and efficient immediate help

Software support

- Intervention via secure remote access
- No disturbance of the ongoing system operation

Repair

- Complete service for all maintenance groups / subsections from mechanics all the way through to control engineering, automation and material flow computer

Preventive maintenance and troubleshooting

- Customized to the maintenance intervals
- Complemented by own test routines
- Anticipatory plant and investment protection

Racking inspection, automatic storage and retrieval crane testing pursuant to DIN EN 528

- Conducting the internal and statutory safety checks
- Hazards will be identified and remedied at an early stage
- Exclusively by qualified and knowledgeable staff

Spare Parts supply

- Customized spare parts packages
- Allowance is made for profitability, optimal system availability, procurement time and transport times

Training

- Practice-oriented training sessions for staff
- Workshops and professional qualification of employees protects the overall investment

Zufriedene Kunden sind die beste Referenz



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