



we make logistics simple

World of Intralogistics and Automation





Innovative Automation in Intralogistics

Living Visions

Fast response times, increased throughput, shorter delivery times

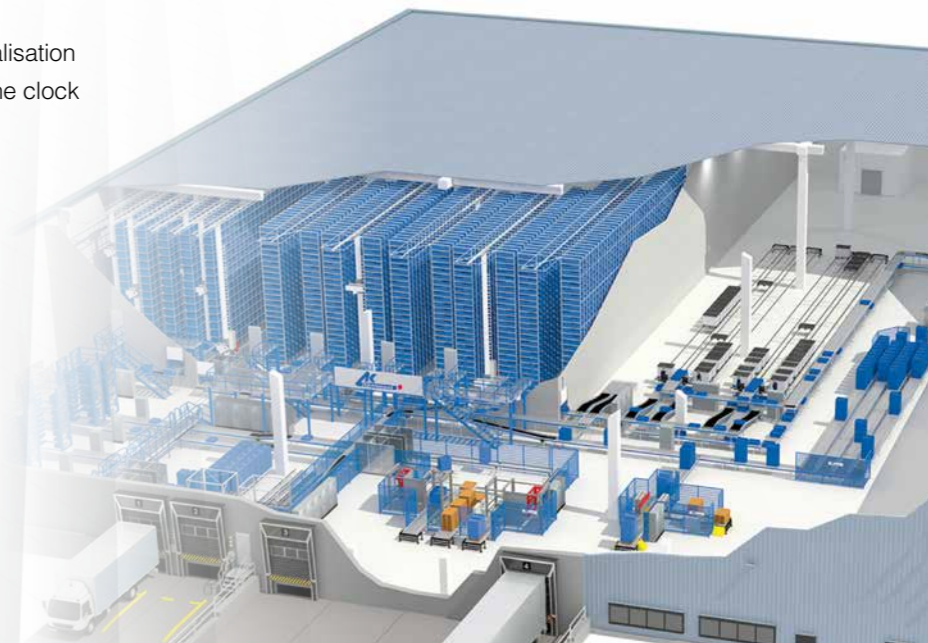
Whether building a new warehouse, expanding or retrofitting an existing facility - Klinkhammer is a specialist in optimised logistics processes. From innovative logistics concepts and the installation of warehouse technology, order picking or robotics to future-orientated software, we offer everything from one source.

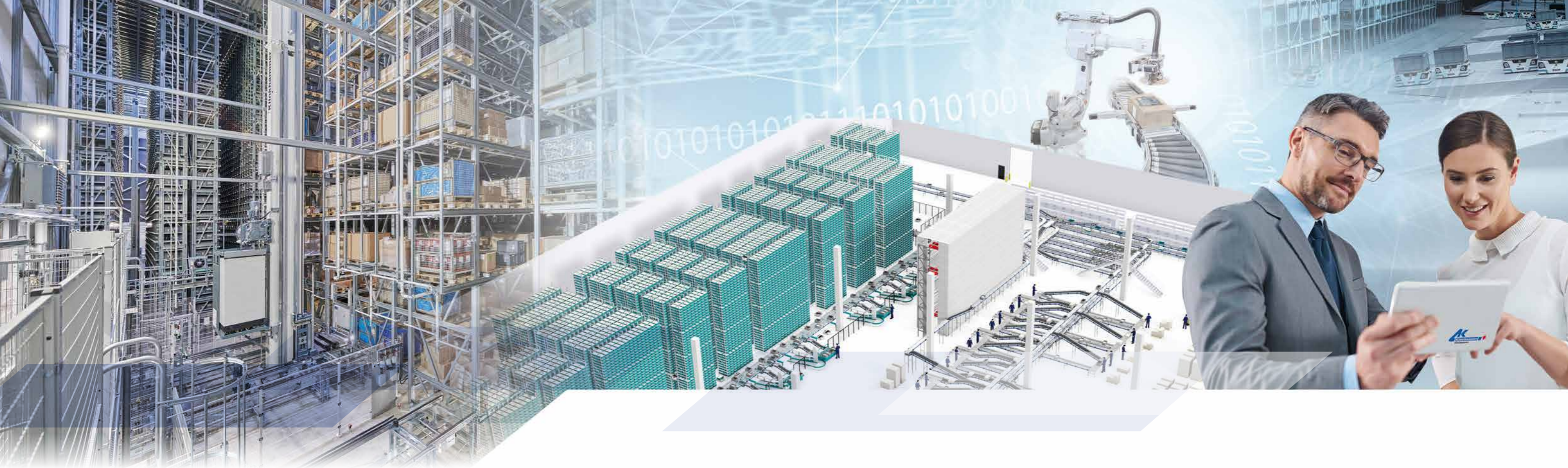
System integrator and general contractor in intralogistics

As an independent intralogistics expert with an international focus, Klinkhammer has been realising automation solutions for a wide range of industries and company sizes and has been one of the leading providers in Europe for over 50 years. With its 360° philosophy, Klinkhammer sees itself as a life-time partner from analysis and planning to software development and turnkey handover - including all-round support through our Service24 concept. Software solutions such as the warehouse management system KlinkWARE® or the visualisation system KlinkVISION® allow you to work efficiently and easily. Klinkhammer - logistics is our passion!

Since 1972 Klinkhammer has been standing for:

- Manufacturer-neutral and forward-looking logistics planning
- Pioneering warehouse, picking and robot systems
- State-of-the-art warehouse management software
- Efficiency-enhancing control technology and visualisation
- Individual customer service and support around the clock
- Innovative logistics processes to simplify business processes





Logistics planning

Manufacturer-independent, technology-neutral

Identifying potential savings

Professional logistics planning guarantees a manufacturer-independent view of the most economically sensible and effective solution for internal logistics tasks.

Broad portfolio of solutions

Klinkhammer utilises system components from numerous established manufacturers on the market and therefore offers an extremely broad portfolio of solutions. We consider profitability and performance over the entire service life, analyse parameters that can influence this and take material, personnel and time factors into account.

Future-oriented solution concept

The logistics concept must not only fulfil the current requirements of internal logistics. It must be able to react and adapt flexibly to future developments. The aim of warehouse and logistics planning is neither to build up unnecessary overcapacity nor to operate permanently at the limit.

Strategic planning phases

Our logistics planning is based on optimised standards and processes. The key to success lies in the disciplined adherence to established steps. In a new planning project, we always go through similar strategic planning phases in order to be able to present our customers with the optimum overall solution at the end of the day.

Phase 1: Data analysis

- Analysis of master data, transaction data and inventory data
- Actual material flow between the functional areas
- Identification and elimination of bottlenecks
- Scaling of the data based on the planned company development
- Target parameters using a material flow diagram

Phase 2: Rough concept

- Drawing up solution variants, considering the optimum degree of automation
- Design of the warehouse and conveyor technology, adapted to performance and capacity requirements
- Options for connecting individual functional areas, such as warehouse, production or existing systems

Phase 3: Logistics concept

- Consideration of building requirements (e.g. fire protection) and existing equipment
- IT specifications for your processes, functions and strategies
- Selection of the preferred solution alternatives
- Budget pricing of investment costs
- Estimation of operating costs
- Analysis and determination of operating strategies

Phase 4: Detailed planning

- Drawing system layout
- System performance and limit capacities incl. cycle time calculation
- Realisation schedule
- Documentation of all results of the detailed planning in the results report incl. presentation

Phase 5: Optional - Tender

- Work out a RFP for the logistics concept
- Support during the selection process



Warehouse management system KlinkWARE®

Excellence in Touch

Intuitive and flexible

There are many software solutions. But only a few like KlinkWARE®, the Klinkhammer warehouse management system. KlinkWARE® is based on the latest, pioneering technology and is optimally tailored to the requirements of intralogistics - the perfect combination of hardware and software for simplified processes and high cost efficiency in modern warehouse management.

Flexboard, a customisable dashboard

The Klinkhammer Flexboard, for monitoring key performance indicators, is easy to configure individually for each user and very flexible. It shows important key figures of the logistics system and offers variance analyses and comparisons. Weak points are thus quickly identified. The dashboard is also available on tablets and smartphones, eliminating the need to walk to the control centre.

State-of-the-art technology and software architecture

The fast and powerful KlinkWARE® is based on state-of-the-art technology and software architecture. The basis for programming is the modern Blazor technology based on HTML and CSS. The Blazor web framework offers a common software architecture for server and app applications, guarantees a standardised design on different end devices and is easy to update. The app runs independently of the operating system in all modern browsers.

User-friendly

During development, our specialists placed great emphasis on the user-friendly operation of touch panels, tablets and forklift terminals as well as the clear, ergonomic user interface of the stationary workstation dialogues. With the KlinkWARE® warehouse management system, customers get a durable and reliable software solution.

Intuitive Menüs

The menus of the stationary PCs and mobile terminals are logically structured, self-explanatory and provide the best basis for daily work. Meaningful symbols and simple graphical

guidance through the warehouse management processes enable quick and easy orientation within the system. This minimises staff training.

- Multi Order Picking
- Control Station
- Tolerant FiFo
- Permanent Inventory
- Crossdocking
- Formation of bills of material and sets
- Multi-client capable
- Batches
- Pick-by-Voice
- RFID Labels
- Best-before date
- Multilingualism



Pioneering warehouse technology

Driving change

Automated high-bay warehouses, small parts warehouses, shuttle

As a system- and manufacturer-independent general contractor, Klinkhammer can choose from a wide range of storage systems and offer the best on the market. Whether AMR systems, shelving or pallet racking, automated high-bay warehouses, small parts warehouses, shuttle systems, silo or built-in systems or complex conveyor and picking systems. It is always important to customise the solution perfectly to the conditions of the warehouse and the individual requirements of our customers.

Automatic pallet high-bay warehouse

The compact design of an automatic high-bay warehouse enables high space utilisation and storage density. Our storage systems are available in a wide range of designs: single- or multi-deep classic high-bay warehouses in an in-house or silo design as well as special solutions such as channel storage systems.

Automatic small parts warehouses (bins, trays, cartons)

Klinkhammer offers customised systems. We ensure optimum volume utilisation through single or double-deep storage as well as compliance with the given performance requirements. The use of robust and proven technology guarantees a high level of efficiency. Depending on the industry, we can also design our automated small parts warehouses and pallet high-bay warehouses as cool or deep-freeze variants.

One-Level-Shuttle-Systeme

In one-level shuttle systems, each level is served by its own shuttle and connected to the further conveyor technology via lifts. The high-performance technology enables high storage and retrieval capacities of 500 to 1000 double cycles per aisle. A further advantage of these shuttle systems is their low space

requirement combined with high storage density thanks to multi-deep storage.

KlinCAT® multi-level shuttle system

Multi-level shuttle systems combine the advantages of a storage and retrieval crane and a shuttle system and are located in the medium to high performance range. With a lifting height of up to 1.5 m, the KlinCAT® can reach up to 9 container levels and, like a shuttle, can be used several times on top of each other. The load handling attachment of the device is designed for cartons, trays or containers with a maximum weight of 50 kg per loading device.

Cube systems for stacked containers

This storage technology consists of containers stacked on top of each other and battery-powered transport vehicles that

move on an aluminium grid above the containers. They take over the storage and retrieval processes. The system is easily scalable in terms of performance with additional vehicles and can stack a large number of containers on top of each other.

Picking systems

- Pick-by-voice, Pick-by-light
- Pick-by-scan (barcode)
- Forklift control system
- Piece picking systems



Robotics in the warehouse

Innovation and top performance

Warehouse robots, piece picking, pallet and carton handling

Warehouse and material flow solutions are increasingly being supported and automated by robots. Together with our specialists, we develop innovative robotics solutions that we seamlessly integrate into systems as a system integrator or general contractor and connect to the software.

AI-supported warehouse robots

The transport and storage of containers is being revolutionised by AI-controlled warehouse robots such as the Skypod® robot from Exotec®. The warehouse robots can adapt flexibly to performance peaks, order situations and structures. They remove containers or trays from the shelving system, which can be up to 14 metres high, and move to the transfer point or workstation. The Skypod® system can be expanded at any time with additional Skypod® robots and picking workstations. It is easily scalable in terms of assembly and modification as well as picking performance, system performance and storage capacity.

Robot-controlled carton handling

Solutions such as automatic carton cutters, carton erectors, delivery note inserters, carton volume reducers, carton sealers and label applicators make it possible to achieve high outputs and avoid time-consuming or difficult manual handling. Among others, Klinkhammer relies on solutions in which shipping cartons are individually produced for products in order to minimise shipping volumes. All special machines are connected to the conveyor system and displayed in the system visualisation.

Robot-based picking

Piece picking uses a gripper system to automatically move small parts between source and target containers. Permanently high outputs of 600 to 1000 picks per hour can be achieved. The robots work reliably and safely day and night in multi-shift operation. Integrated cameras record each individual product and can, for example, also identify a pharmaceutical centre number when handling medicines. This minimises the error rate.

Robot-controlled palletising and depalletising

Automatic palletisers, depalletisers or pallet winders connected to the conveyor system can be used to automate heavy and time-consuming work steps for incoming and outgoing goods. These solutions reduce the workload on personnel and allow them to focus on value-adding activities.

AMR - Autonomous Mobile Robots

Autonomous mobile robots are ideal for low room heights of up to approx. 2.7 metres. They transport pallets or entire shelves of goods to the order picker, thus reducing long walking distances. The racks are quickly installed, easy to expand and flexible in terms of dismantling and reconstruction. The performance can be scaled as required by adding additional robots.

AGV - Automated Guided Vehicles

Automated guided vehicle systems are used for the internal, automated material flow. An AGV reduces manpower and increases productivity by a reduction in transportation times. An AGV does not require separate transport routes and can be flexibly adapted to changed hall layouts.



Fresh, dry and deep-freeze storage

Cool concepts

Your specialist in fresh food logistics

In times of an increasing shortage of skilled workers, the automation of cold and deep-freeze warehouses is becoming an increasingly important challenge for companies in the food industry. Klinkhammer offers customised solutions, that are specially tailored to the individual requirements in cool and frozen logistics. We focus on simplifying logistics processes, reducing costs and improving the working conditions for the staff, for example by relocating workstations to the positive temperature range.

High storage density and energy efficiency

Our cold, dry and deep-freeze warehouses are designed for maximum storage density, energy efficiency, short throughput times and product and process-optimised storage and retrieval. The racking systems of automated deep-freeze warehouses offer storage locations in different height classes, precisely adapted to the product range. Transports between different cooling areas are designed in such a way that energy losses are minimised.

Minimise failure rates and throughput times

In the automated deep-freeze and cold storage area, we rely on proven technologies that guarantee high system performance and ensure long-term efficiency and reliability. Automation enables us to define precise and efficient picking and storage processes, employees are clearly guided and the failure rate is significantly reduced. A precise analysis of article stock, orders, seasonal behaviour, picking figures, storage areas and container or tray capability is crucial, to maximise the efficiency of the warehouse system.

Cost optimisation along the entire supply chain

An important aspect is the optimisation of costs along the entire supply chain, from the receipt of the food to loading into the final delivery vehicle. Our experience shows that every customer has individual requirements and wishes, which we address with the utmost care and attention to detail. Among other things, we consider internal processes and route planning for deliveries and pick-up orders. We also integrate information such as best-before date, batches and partial

goods into our automated strategy in order to exploit the full potential for our customers.

Pre-picking and sequencing

We perform a comprehensive analysis of the logistics processes. This includes looking at incoming goods, the order structure, peak times and outgoing goods. We consolidate partial goods, differentiate between piece and weight goods and develop efficient storage and retrieval strategies using our KlinkWARE® warehouse management software. These allow, for example pre-picking of goods in order to utilise automation and personnel as efficiently as possible. In the area of cool logistics the order in which the goods are provided by the automation and conveyor technology is crucial. Our sequencing technology ensures that the goods are complete, on time and in the right order for the customer.

Klinkhammer stands for efficient processes in the:

- Fresh food warehouse
- Ultra-fresh storage
- Deep-freeze warehouse
- Dry storage
- Buffer warehouse
- Supply storage
- Ripening warehouse
- Distribution warehouse



Lean automation

Control technology and system visualisation

Everything from a single source

We at Klinkhammer have been making automated storage, picking and robotic systems for the most demanding customers for many decades. We know the market and its possibilities at any time and know about all the innovative possibilities that modern technology has to offer. Naturally, our complete solutions include not only storage, picking, conveying and robot technology, but also control technology, system visualisation, assembly and comprehensive service. Everything fits together perfectly and ensures a smooth material flow right from the start.

KlinCONTROL® control technology

The Klinkhammer technicians rely on the freely programmable Siemens S7 generation for the conveyor control system. The control technology processes the transport orders from the higher-level material flow control system at PLC level, but also features functions that enable autonomous operation.

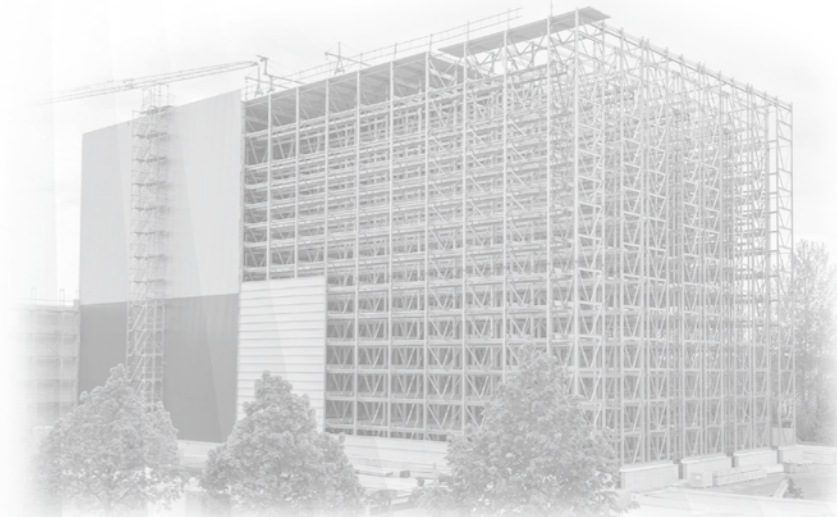
KlinkVISION® visualisation system

The KlinkVISION® visualisation system is used to operate and monitor the system. The use of the diagnostic and maintenance tool enables the operating personnel to recognise irregularities before a failure occurs. Sensors provide data on the status of the conveyor technology and systems. This data can be analysed in combination with failure messages and statistics. Based on experience with a large number of automated warehouses that Klinkhammer maintains for customers, the integrated remote maintenance tool enables failures to be diagnosed and eliminated quickly and reliably.

The KlinkVISION® system is set up as a digital twin during the programming of the control technology in order to carry out communication and interface tests before the system is commissioned. This significantly shortens the test phases on site.

Your benefits with Klinkhammer:

- Use of future-proof technology
- Cost-effective complete solutions
- Personalised consulting
- More than 50 years of experience
- Long service life of your system
- State-of-the-art software
- System monitoring and remote maintenance
- Everything from a single source





Ready for the future with a retrofit

Old warehouse - new drive

Extend the service life of your system

Changing business needs, changing market requirements, updated safety regulations and legal standards, evolving technology - all this does not necessarily lead to an investment in a new system. Regardless of the supplier of the original system, no relevant aspect will be omitted during modernization.

Depending on the individual requirements, a retrofit may include the following aspects:

Safety evaluation to identify weak points

- On-site system analysis
- Availability of spare parts
- Compatibility of replacement items
- Safety and performance evaluation with risk assessment
- Detailed retrofit concept

Expansion and optimisation of systems

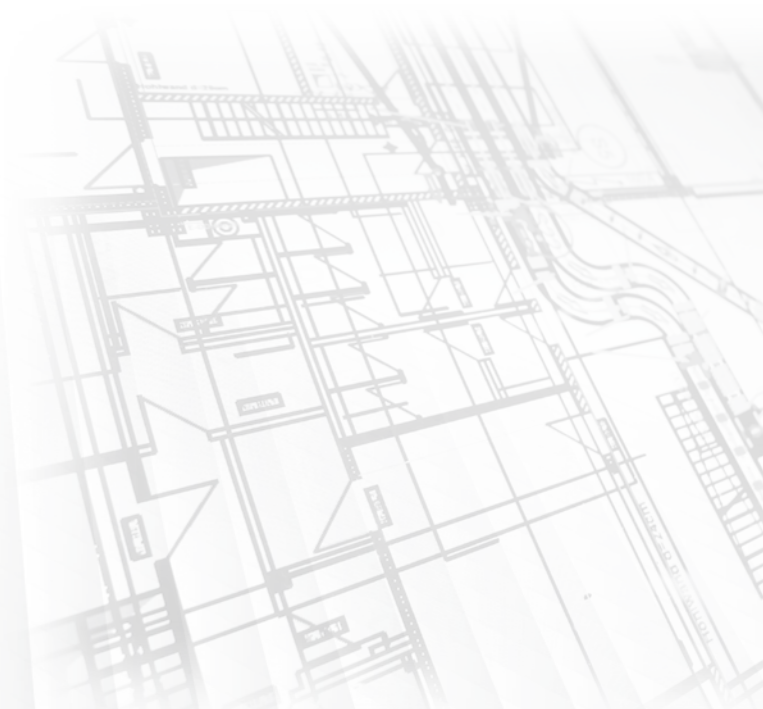
- Expansion of rack aisles, conveyor technology and workstations
- Gradual conversion and expansion during ongoing operation

Updating the software and IT landscape including training

- Reprogramming modern PLC controls
- Integration of mobile touch panels and tablets
- Implementation of our system visualisation for fast alarm diagnostics
- Replacement of discontinued warehouse management software
- Updating of operating systems and database systems

Replacement of outdated components

- Computer, PLC/control, sensor and bus systems
- Motors, frequency converters, drives
- Mechanical components through to complete storage and retrieval cranes
- Safety systems





Service 24/7

Round-the-clock support

Short response times, fast and competent help

To operate economically in the long term, logistics systems must be continuously supported and maintained. Klinkhammer's Service 24/7 provides all-round support throughout the year, plans revisions and modernisations, trains employees and is available on site or via hotline to ensure that the processes run smoothly.

Help Desk – Always there for you

- Troubleshooting via remote access
- Control centre at the Nuremberg site
- First point of contact for questions relating to IT, control technology and mechanics

Remote maintenance – Immediate help from experts

- All systems are monitored centrally
- With the help of the KlinkVISION® system visualisation software

On-Site service – system availability guaranteed

- Residential on-site service: Your all-round carefree package
- Klinkhammer experts look after your system on site
- Individual operator models

Maintenance & inspection – Avoiding downtime

- Electrical testing
- Shelf inspection
- Safety inspection

Spare parts supply – Planned with foresight

- Individual spare parts packages - tailored to your needs
- Spare parts management
- Minimising downtime with spare parts on site

Training – Knowledge made easy

- Operating the system
- KlinkWARE® and KlinkVISION® software
- KlinkRESCUE® height rescue training



Satisfied customers are the best references



Klinkhammer Intralogistics GmbH

Wiesbadener Str. 13 · 90427 Nuremberg, Germany
Phone +49 911 930 64 0 · Fax +49 911 930 64 50
info@klinkhammer.com · www.klinkhammer.com

Klinkhammer Intralogistics Poland

www.klinkhammer.com

Klinkhammer Intralogistics Denmark

www.klinkhammer.com

Klinkhammer Förderanlagen Stahl- und Montagebau GmbH, Halle (Saale)

www.klinkhammer-laser.de

