

BEST PRACTICE

# Maschinenfabrik Reinhausen

—> Compact, flexible and  
highly-precise sequences

## PRODUCTION LOGISTICS

# HIGH-PERFORMANCE INTRALOGISTICS

## COMPACT, FLEXIBLE AND PRECISE SEQUENCES



The new Materials Management Center (MMC) of Maschinenfabrik Reinhausen provides a maximum degree of transparency and availability for a precise production supply. It is hardly possible to implement high-performance intralogistics in a more compact and transparent way. With three warehouse systems, multi order picking stations, supply trains which are loaded according to withdrawal sequence, and an intelligent Warehouse Management System (WMS) including an innovative fork lift control system, the MMC organizes the needs-oriented and timely production supply. This way, MR fulfills a delivery reliability of 99.3 percent.

The entire in-house logistics installation of the new MMC for Maschinenfabrik Reinhausen GmbH (MR), seated in Regensburg (Bavaria), was implemented by psb intralogistics.

»There were many reasons for establishing the new MMC«, says Jürgen Liebl, Project Manager and Head of Production Logistics at MR. With the available space and warehouse capacities it was impossible to keep pace with the company growth, and there was no realistic option for any expansions either. On the plant sites in Regensburg-Reinhausen and Haslbach there were nine company-owned warehouse facilities, plus two external locations, on a total surface of about 15,000 square meters. Jürgen Liebl: »From the logistics aspect, this had been a disastrous situation.« For one logistical transport round trip, 32 km had to be covered. Furthermore, parts of the storage technology were obsolete. In addition, there was a large number of interfaces and parties involved, like for example an external service provider for

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### CUSTOMER

Maschinenfabrik  
Reinhausen,  
Regensburg | GER

### SYSTEM

Materials Management Center (MMC) with 4 *sprinter* AS/RS stacker cranes type *sprinter* and 5 AS/RS stacker cranes type *maxloader*, conveyor technology for bins and pallets, order picking stations, *selektron* WMS with *selektron* SCADA, fork lift control system and interface to SAP

### CONTACT

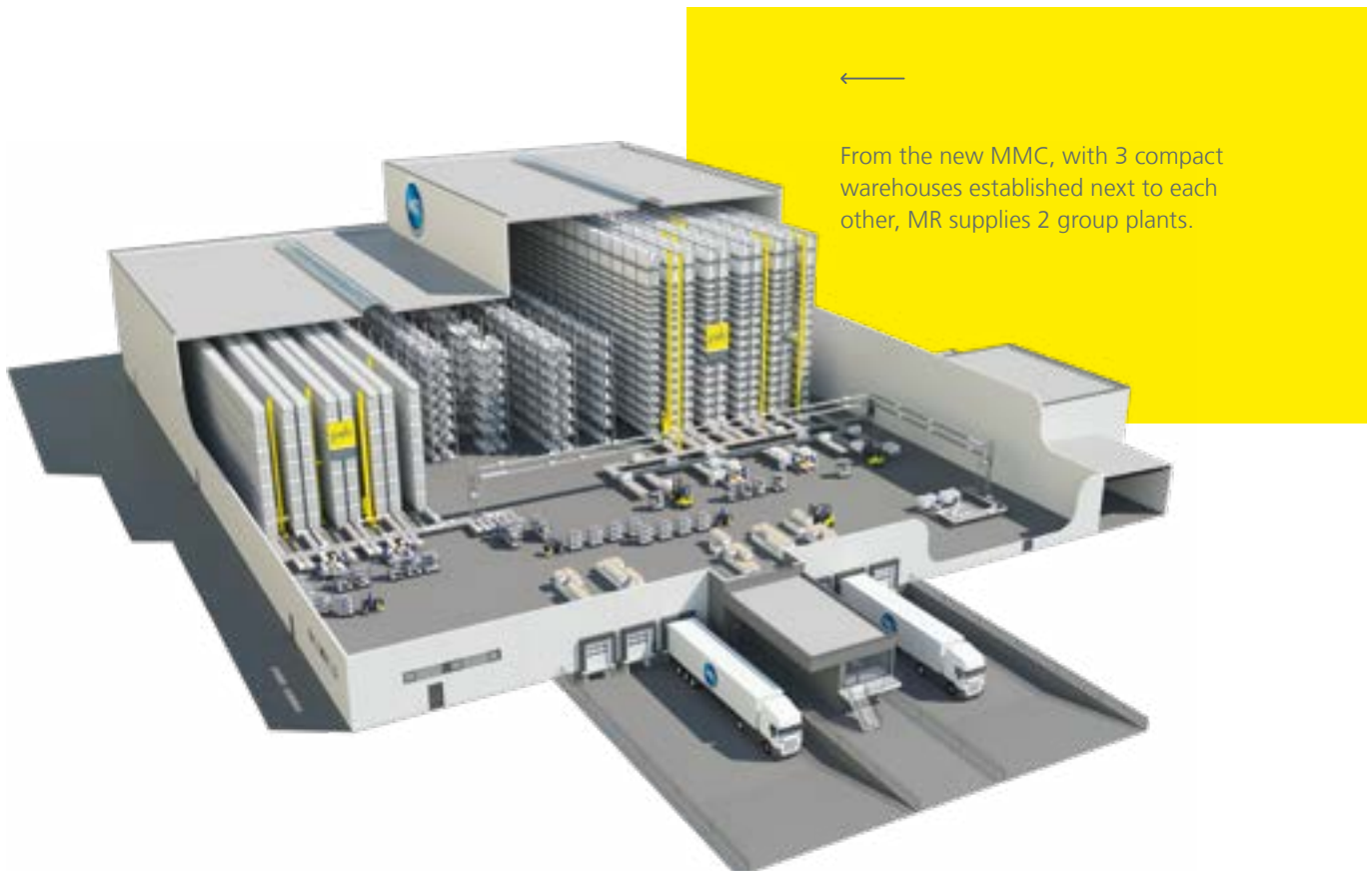
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The compact architecture of the warehouse systems and the sophisticated control system allow for accurate intralogistics processes and very high availability.



←  
From the new MMC, with 3 compact warehouses established next to each other, MR supplies 2 group plants.

the rarely used parts, plus »a low degree of IT support and automation«.

After a detailed and thorough examination, the responsible management at MR decided to realize the MMC on a new property adjacent to the production site in Haslbach and to implement the new building and the intralogistics technology with the support of general contractors for each trade.

MR awarded the order for the concept design and realization of the entire in-house logistics system to psb intralogistics, expert supplier from Pirmasens. »We had deliberately chosen a family-owned, medium-sized company as partner«, emphasizes Liebl, »with whom we can discuss at eye level and who treats us as A-customer, with the associated direct communication and fast decision-making processes.«

The strategic objectives of the new MMC include increased competitiveness, higher quality standards, reduction of stock and costs, higher availability and the TCO analysis with lower logistics expenses including the quality costs.

The psb contract volume comprises of the automated small parts warehouse and the high-bay warehouse, both with AS/RS stacker cranes, the manual warehouse for large load carriers, conveyors for pallets and bins, the psb *selektron* WMS with *selektron* SCADA for visualization, and the control system for the fork lifts and supply trains.



→ The high bay warehouse is operated by 5 AS/RS stacker cranes type *maxloader*. The load handling units are designed for double-deep storage.

### Three highly efficient warehouse systems

In the new MMC building (100 m long, 76 m wide and 26 m high), the three warehouse systems are installed next to each other, with optimal use of space.

The high bay warehouse (five aisles) is operated by five *maxloader* AS/RS stacker cranes and offers 8,700 storage locations for euro pallets (1,200 x 800 mm) and pallet cages. A large number of half-pallets is stored double-deep in the high bay warehouse as well. The loaded large load carriers can be up to 1,800 mm high, with a maximum weight of 1,000 kg. The high bay warehouse can perform in each aisle 40 double cycles with euro pallets in an hour.

The automated small parts warehouse (four aisles) is operated by four AS/RS stacker cranes type *sprinter*; it has 46,000 storage locations for bins and trays, which can be stored double-deep, i.e. two behind each other. Besides the currently used load handling units of 600 x 400 mm, the system installation has already been prepared for the future

handling of units measuring 400 x 300 mm. The automated small parts warehouse has a performance of about 120 double cycles per hour.

The warehouse for large items (four aisles), which has been established between the automated small parts warehouse and the high bay warehouse, is operated by a reach truck. It can take oversize pallets and pallet cages in up to 2,000 storage locations.

### Versatile production structure and order-related assembly

The large number of storage locations in the different warehouse systems is necessary because of the large variance of the parts: MR produces »only« around ten products, these, however, in »several thousand model variations«, explains Jürgen Liebl.

The three different warehouse systems and their precise interaction are very important for MR's production-related logistics processes. Liebl: »The MMC was built as buffer for externally procured parts, and as buffer and stockpiling for our own parts.«

Each year, up to 6,000 deliveries with the required parts pass through the receiving area. Before storage, the items are checked at specific stations, prepared for being stored, if necessary repacked into standard bins, and in the system »married« with the bin.

### High bay warehouse with variable warehousing and handling concept

After palletizing, the parts which shall be stored in the high bay warehouse, are put by a fork lift truck, or an electric high lift truck respectively, onto one of two putaway lanes. Photocells and scanners recognize and distinguish between europallet, pallet cage and pallet box or half-pallet.

The system also decides whether an entire pallet or a sub-quantity shall be taken out of the high bay warehouse. Accordingly, the units are conveyed either to one of two complete-removal lanes or one of four picking workstations. There the employee can move the pallet to an ergonomically optimal height and withdraw heavy parts with the installed column swivel crane.

### Automated small parts warehouse with multi order picking

»The automated small parts warehouse is the storage area with the most activities«, Liebl says about the storage system with in total 46,000 locations for trays. Each tray can hold

up to ten small bins with different articles. At each of the four picking workstations in the pre-zone of the small parts warehouse, up to 60 trays per hour are provided for withdrawals. By multi order picking procedure, parts for up to five orders can be withdrawn at the picking stations at the same time. The employee picks, weighs, labels and packs parts needed for production or assembly in one step and sends them to one of six sorter lanes.

The employee is guided by dialogues on a touch-screen monitor. It is displayed, for example by different colors, whether he has to carry out individual or complete withdrawals via Kanban, or if negative picking is requested, which is also programmed in *psb selektron*.

In the small parts warehouse, about 4,000 picks are carried out per day in 2-shift operation, on average around 250 per hour. In peak times, 500 picks per hour can be reached. A pick means either a single withdrawal from a bin, or the removal of the entire bin.

Conveyors transport the bins, which are prepared at the picking stations of the small parts warehouse, to one of six sorter lanes. By decoupling the work steps in the picking of the trays, and the distribution to the supply trains, the output at the picking workstations is significantly increased.



The automated small parts warehouse (4 aisles) offers 46,000 storage locations for bins and trays, which can be stored double-deep.



In the course of the manufacturing process, small bins are repeatedly withdrawn from the trays, which are stored in the small parts warehouse. For this reason, the psb WMS automatically identifies trays with a filling level of less than 50 percent (parametrizable value) and conveys them to the receiving area for replenishment. This ensures a constantly high storage density of the small parts warehouse.

Prior to being stored, each individual small bin is automatically photographed on the conveyor, so that by calling-up the material number stored in the psb *selektron* WMS, the contents of the entire tray can be checked; this approach is a further increase in process quality.

**Manual warehouse for oversize loads**

The manual warehouse for large load carriers accommodates all units exceeding the basic dimensions of a euro pallet or which are higher than 1,800 mm. Pallets up to a size of 3.75 x 1.3 x 2 m (width x length x height) can be stored. The warehouse is operated by a reach truck with a mast height of 13 m. The truck is equipped with assistance systems, such as height selection, mast stabilizer and camera system mounted on the forks. Via a touch monitor, the operator receives the travel orders by the psb fork lift control system.

**Innovative control system for the supply trains**

In the supply train concept in total ten tugger trains with transport trolleys are operated to provide all areas of production and assembly. The fork lift control system also serves as control system for the supply trains and is integrated in the *selektron* WMS. On a transport mask, the driver of the supply train is shown the material which has been made available and by barcode has been posted to a workplace; he books it to his supply train and, after delivery, to the destination workplace. By this complete tracking, it is exactly defined in the system, who transports which material, where and when, and to which recipient.

**Project goals achieved**

With the new MMC, a number of significant improvements could be achieved. On the one hand, Liebl points out the compactness of the entire system installation: »We now have around 7,630 m<sup>2</sup> of space and thus could reduce the square footage by 50 percent, compared with the previous warehouses at different locations«. Due to the small area, it is »imperative to comply with the processes in order to guarantee a rapid flow of materials«. The production areas can now be supplied with material within two to four hours, depending on the specific requirements.

Order picking stations with parallel handling of up to 5 order bins (trays)



The fork lift control system in the manual warehouse is also part of the psb *selektron* WMS





Depending on their destination in the production and assembly areas, the picked bins are distributed to sorter lanes in the order of withdrawal.

The supply trains are controlled by a management system, which was especially developed for MR and which is integrated in the *selektron* WMS.

### **IT competence as important success factor**

The psb Warehouse Management System *selektron* WMS plays a significant role in many respects: starting with the transparency of the material numbers, the exact part and container acquisition via barcode and scanning, to the production supply in system-controlled routes.

### **Successful and trustful cooperation »at eye level«**

As far as the cooperation between MR and psb is concerned, Liebl is very satisfied: »I have experienced myself that the project teams complemented each other perfectly with their expert knowledge, with the result of a very good project cooperation.«

CREATING YOUR  
**INTRALOGISTICS.**

—→ **psb intralogistics GmbH** | 66955 Pirmasens | [psb-gmbh.de](http://psb-gmbh.de)