HUBMASTER®
MULTI-AISLE STACKER CRANE SYSTEM

ADVANCED STORAGE FOR SMART INDUSTRIES

HUBMASTER®

STORAGE AND HANDLING SOLUTIONS

PROPERTIES

AISLE CHANGE

The **HUBMASTER®** allows a single stacker crane to move through multiple aisles of the automatic warehouse via a simple transition carried out in very little space. In this way, the use of a single machine is shared throughout several aisles.

This makes for a very effective design in those layouts where planning for a traditional AS/RS stacker crane in each aisle represents an oversizing of the solution.

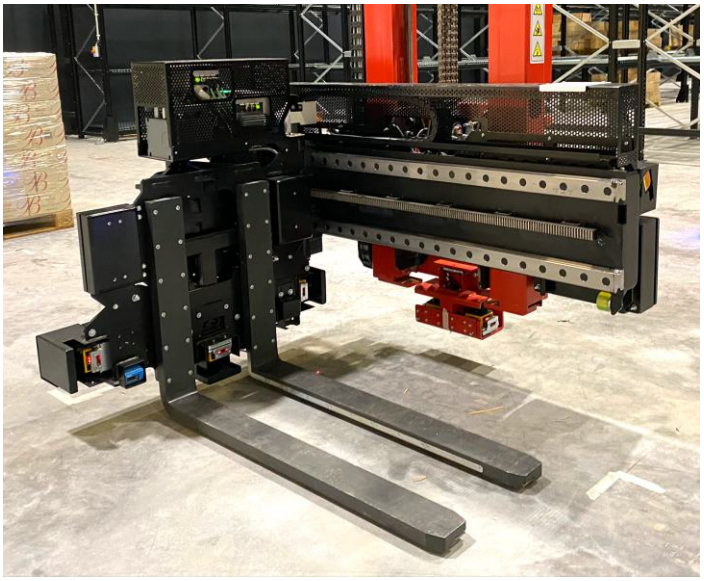
When compared with the transfer aisle requirements of an AGV forklift, the multi-aisle stacker crane achieves a great space saving and faster transitions.

The HUBMASTER® multi-aisle stacker crane can pick up and drop the loads directly on the floor, and a volumetric and weighting check is possible directly from the fork-carriage itself.

TYPE OF LOADS

The **HUBMASTER®** system is available for:

- **PALETIZED LOADS EITHER FULL PERIMETER OR NON PERIMETER PALLETS**
- **EXTRA LONG LOADS OVER 6M (20FT) LONG**
- **NON-PALLETIZED LOADS AND SPECIALS**



FORKS CARRIAGE SYSTEMS

In its standard configuration, the **HUBMASTER®** is configured with a single or trilateral fork carriage.

The **HUBMASTER®** system can operate in multiple pallet deep configurations (LIFO), with either push-back racking or in a double-deep configuration with a telescopic fork carriage.

PICKUP AND DROP STATIONS (P&D)

The **HUBMASTER®** system offers P&D stations for the automatic storage and retrieval of loads from the automatic warehouse, with fully integrated conveyors, contour checking and weighting stations.

The versatility of the **HUBMASTER®** system allows it to accept and position loads directly on the floor, as a collaborative system with personnel on foot. In such case the fork carriage will directly check the picked up pallet for its dimensions and weight.

COMPETITIVE ADVANTAGES

The **HUBMASTER®** automatic multi-aisle stacker crane system provides for a very attractive alternative, and is especially relevant in the following applications::

•CEILING HEIGHTS

Ideally suited for multi-aisle operations in buildings with 15 m high ceilings, and as a single aisle stacker crane system in higher ceiling applications, when the application does not justify the investment in classic AS/RS high productivity systems.

•FLOORS

The **HUBMASTER®** system works on rails installed on the racks or directly supported from the building, and is not supported on the floor. Therefore, the floor condition has no strict requirements in terms of flatness or local imperfections.

•ENVIRONMENTALLY FRIENDLY

The **HUBMASTER®** system is a fully electromechanical machine, with no polluting hydraulic oils. It works without batteries directly connected to the electricity mains, thus reducing the impact of battery replacement in its product life cycle. The consumption is strictly according to its use and not conditioned by the efficiency of the battery loading requirements.

•DENSITY AND SAFETY

Ideally suited in warehouses and processes which would benefit from improvements in storage density, while at the same time improving operation safety.

Typically, chemical or frozen product warehouses, where environmental conditions are demanding.

•TRACEABILITY

Warehouses that could benefit from improvements in traceability and error reduction.

•HARSH ENVIRONMENTS

The lack of batteries and high storage density make the system ideal for Cold, Hot, and Chemical Storage applications.

The automatic **HUBMASTER®** multi-aisle stacker crane system offers a solution for all those storage applications which can be automated.

APPLICATIONS

PALLET AUTOMATIC STORAGE AND RETRIEVAL SYSTEMS

Accepting a variety of standard and non-standard pallets of various size and configurations, as multiple or single-aisle stacker cranes:

- **100% autonomous operation, without human intervention**
- **Suitable for full and non perimeter (open) pallets.**
- **The system is controlled by the HMWare™ WCS System, specially developed by HUBMASTER® for the system management.**

TYPICAL APPLICATIONS:
- General storage and distribution
- Feeze, Chill, or Hot storage
- Chemical storage
- Work-in-progress (WIP) buffers integrated in manufacturing processes
- Heavy Tool storage

RACK SUPPORTED BUILDINGS

Purposely designed and built buildings with a rack supported structure, for automatic storage and retrieval operations, with multiple or single-aisle HUBMASTER(R) stacker cranes inside, for the primary purpose of achieving a **perfect ratio between capacity and investment costs**.

LONG LOAD AUTOMATIC STORAGE AND RETRIEVAL SYSTEMS

Accepting a variety of oversized and long pallets up to 6m (20ft) long, as multiple or single-aisle stacker cranes:

MODELS

HUBMASTER® has developed an automatic systems program consisting of the following standard models. This program is complemented by customized systems according to the specific applications.

HUBMASTER MODEL	MAX. LOAD CAPACITY (kg)	(lbs)	STORAGE HEIGHT [multiple-aisle applications] (m)	(ft)	STORAGE HEIGHT [single-aisle applications] (m)	(ft)	AISLE WIDTH (m)	(ft)
HMA50	500	1102	12	39	22	72	1.75	5.74
HMA100	1000	2205	12	39	22	72	1.75	5.74
HMA150	1500	3307	12	39	22	72	1.85	6.06
HMA200	2000	4409	8	26	22	72	1.9	6.23
HMA250	2500	5512	6	20	22	72	1.9	6.23

RETURN ON INVESTMENT (ROI)

HUBMASTER® MULTI-AISLE AS/RS SYSTEM

There are multiple technologies that enable automating the work of storing and retrieving loads in a warehouse.

The market trend of AS/RS system manufacturers is defined by the main consumers of these technologies, which tend to be Retailers and Large Distribution. In this context, the trend is clear and tends towards high-speed, high-productivity systems.

This situation found in the market presents an unavoidable dilemma: Current automatic technologies do not offer an acceptable ROI for medium throughput applications.

The following graphs provide an outline:

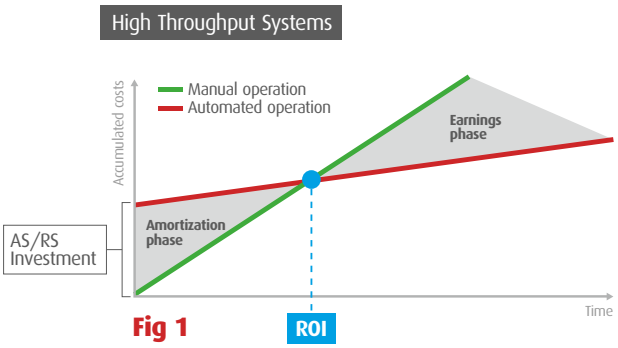


Fig 1

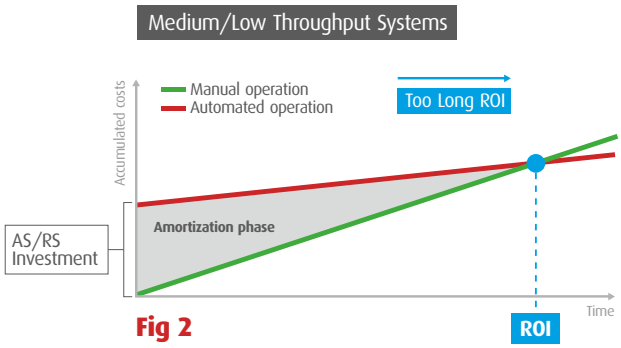


Fig 2

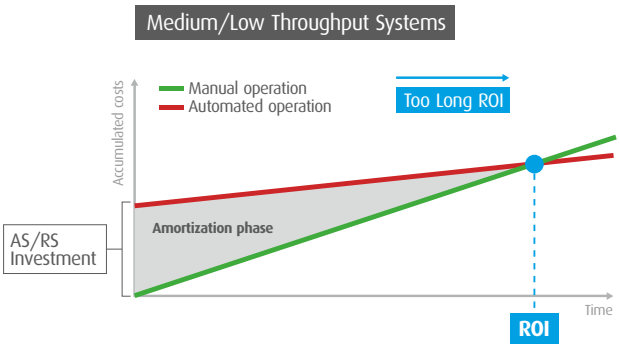
Fig 1: The first graph shows that a major investment in an AS/RS system obtains an attractive return if the daily costs of manual operation are significantly higher than the daily costs generated by an automatic operation.

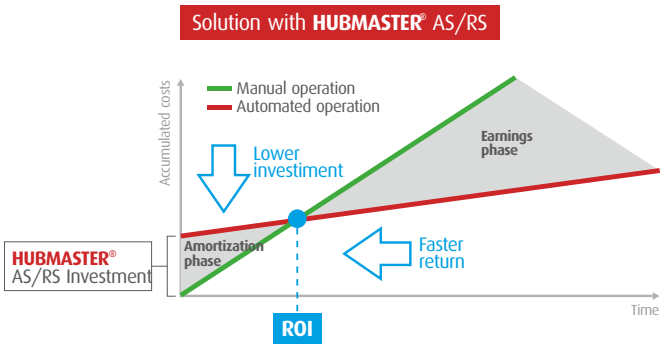
This is the case for intense logistic flow operations since they generate high manual operating costs.

Fig 2: When the material flows are medium/low, they accumulate lower manual operating costs, thus making the investment in a traditional AS/RS solution not interesting due to the return being excessively delayed.

The HUBMASTER® vision has been to devise a stacker crane system which can operate in multiple aisles with one single crane, guaranteen an ROI that would be impossible to achieve with technologies currently on the market.

Comparatively:





SYSTEMS INTEGRATION

The customization of our automatic systems is key to offer unique solutions which deliver high performance and cost savings to our worldwide customers.

The HUBMASTER(R) AS/RS multi-aisle stacker crane systems enable an integration with existing equipment, while also anticipating future expansions.

According to each case, we make proposals of greater or lesser scope, which include the following equipment:

- **Rack supported buildings.**
- **Structural engineering for seismic compliance of the**

The **HUBMASTER®** multi-aisle stacker crane system operates fully automatically and represents a great alternative to other automation systems such as AGV forklifts and traditional single aisle AS/RS systems.

ADVANTAGES AND BENEFITS

The interest for the **HUBMASTER®** automatic systems is motivated by the advantages that they offer and the benefits derived from their integration in existing and new warehouses, distribution centers, and manufacturing and production facilities.

- **OPTIMIZE OPERATIONS WITH A FULLY AUTOMATIC STORAGE PROCESS.**
- **MAXIMIZE THE STORAGE VOLUME IN EXISTING FACILITIES.**
- **REDUCTION OF OPERATING COSTS.**
- **SIMPLIFICATION OF OPERATOR TASKS.**
- **TRACEABILITY AND ELIMINATION OF ERRORS.**
- **WORK 24/7 ALSO IN HARSH ENVIRONMENTS SUCH AS IN COLD STORES AND CHEMICAL FACILITIES.**

The **HUBMASTER®** automatic system maintains all the same benefits of the semi-automatic **HUBMASTER®** system with an operator, but this time with adapted sensorization and software to enable a 100% autonomous operation.

The **HMWare™** warehouse control software by **HUBMASTER®** is designed to control the multi-aisle stacker crane system, while offering a seamless integration with the warehouse management software, thus assuring flexibility and efficiency of use 24 hours a day.

WCS - FUNCTIONALITIES AND INTEGRATION WITH WMS / ERP

HMWare™ WAREHOUSE CONTROL SOFTWARE

The **HMWare™** by **HUBMASTER®** controls the stacker crane PLCs and the P&D stations in real time for easy and efficient integration with other intralogistics subsystems in the warehouse (such as robots, sorters, palletizers, labelers, etc).

The software has been especially designed for its integration with any warehouse management software (WMS) and enables the management of retrieval and load storage orders according to predefined strategies. These can be defined according to the operation's specific requirements.

For example, storage strategies can be defined according to the popularity requirements of each reference (e.g. ABC sorting), or retrieval strategies can be defined according to the needs of later processes such as automatic processing of orders.

Similarly, the **HMWare™** software can:

- REGISTER NEW MERCHANDISE THAT IS ENTERED INTO THE SYSTEM
- KEEP TRACK OF INCIDENT LOGS
- GENERATE REPORTS WITH DEFINED KPIs
- CONTROL THE LOCATIONS AND UNITS STORED, AND REASSIGN THEM AUTOMATICALLY ACCORDING TO THEIR POPULARITY

AFTER-SALES

WARRANTY AND SERVICE

The multi-aisle stacker crane systems by **HUBMASTER®** benefit from a 3-year international warranty covering against any defect in materials, workmanship and/or product design.

HUBMASTER® offers different levels of technical support for compliance with maintenance and service requirements, providing priority access to trained technical personnel and offering different guaranteed response times in corrective interventions.

We base our support in a direct after-sales team providing remote diagnostics and troubleshooting, and a global network of technical service centres for the preventive and corrective maintenance of the equipment.

PRODUCT CERTIFICATIONS

HUBMASTER® systems have been assessed to meet high safety, health, and environmental protection requirements, and are fully certified and compliant to the most strict European and American Standards.

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BASSTECH ENGINEERING GROUP S.L.

HUBMASTER® Storage and Handling Solutions also available through our partners