Westfalia®

WAREHOUSE SYSTEMS & **TECHNOLOGIES**

STORAGE TECHNOLOGY

SUSTAINABLE SUPPLY CHAIN AUTOMATION

FOR ROBUST AND SUSTAINABLE SUPPLY CHAINS

Supply chains from raw material suppliers to end customers must adapt to fast-changing markets, variable conditions, and fluctuations in consumption. They need to be shorter and consume less resources – for sustainable procurement, production, and distribution logistics.

Optimizing the production, processing and sales of raw materials and goods rely on tight interaction between warehousing, buffer, order picking, loading and unloading zones – and on their intelligent control.

With our expertise as a general contractor and in the fields of IT and in control and system engineering, we enable sustainable, energy-efficient automation along the entire supply chain. We streamline intralogistics for processes that are faster, more comprehensive, and more sustainable.

Special storage and automation strategies open up dynamic capacities. Shorter routes and clearly structured processes save time, relieve the burden on staff, and boost productivity. Bundled and automated warehouse logistics maximize safety, efficiency, flexibility, and reliability along the entire value chain. Intelligent intermediate storage prevents expensive set-up times and down-time.

Our systems are designed for complex intralogistics and all temperature requirements. They can be tailored to various load carriers or palletless storage of boxes, layers, and rolls. All our automated storage and logistics systems are designed and implemented to the client-specific requirements.

PRACTICAL SOLUTIONS
HIGH AVAILABILITY
EFFECTIVE PERFORMANCE

New construction | Expansion | Modernization

Single-deep storage system

Double-deep storage system

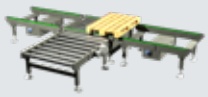
Satellite® storage system

Storage & retrieval machines

Software

Savanna.NET®

Conveyor systems



Design | Manufacturing | Installation | Commissioning | Training

SINGLE AND DOUBLE-DEEP STORAGE SYSTEMS

Single and double-deep storage systems have one or several aisles. Each aisle has compartments arranged single or double deep on both sides. The storage and retrieval machines are equipped with telescopic forks for especially fast storage and retrieval.

These storage systems provide the optimum trade-off between high access frequency and medium storage density. This can be ideal in the case of, for example, a large variety of goods and tight storage and retrieval schedules. Compared to manual storage processes, process errors are minimized, and the throughput rate is increased. The system accelerates shipping and order picking, relieves the burden on staff and enables higher production speed and storage capacity, even at times when skilled personnel are unavailable. Forklift traffic and the risk of accidents are reduced.

This space-saving storage system with access heights of up to 40 meters can be particularly well tailored where space is limited in existing facilities.

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LOAD HANDLING DEVICE: TELESCOPIC FORK

Telescopic forks with two tines quickly, safely, and gently move and store palletized or non-palletized unit loads weighing up to 1,500 kg in single or double-deep compartments. We can equip storage and retrieval machines, transfer cars and vertical conveyors with durable, robust telescopic technology designed to handle the necessary loads. Depending on the task, we offer standard and custom designs, e.g., for freezing temperature, including anti-slip features and other optional equipment, and with optimized installation heights. Thanks to height grids in the storage rack, there is no need for depth supports.

FAST ACCESS

HIGH FLEXIBILITY

SPACE-SAVING

For example, it can enable the necessary replenishments along production lines and the creation of a production buffer for delayed orders.

Our warehouse management and control software allow for complete data transparency and seamless connection to ERP systems. Storage parameters such as retrieval dates or reservations are assigned to goods and load units even before feeding.

SINGLE-DEEP STORAGE

Function
Direct and extra fast access to each load unit on both sides of each storage and retrieval machine.

Use Cases
Companies with a large variety of goods or special access requirements.

Load handling
Telescopic fork for maximum access frequency. Flexible and optimum utilization of compartments through use of multiple telescopic forks.

DOUBLE-DEEP STORAGE

Function
Access to each load unit with double-deep storage on both sides of a storage and retrieval machine. When operating by the first in first out principle, stock transfers may occur.

Use Cases
Companies with a large variety of goods and variable quantities.

Load handling
Telescopic fork for maximum access frequency and tailored storage layout in existing buildings, e.g.,storage between hall girders. Flexible and optimum utilization of compartments through use of multiple telescopic forks.

SATELLITE® STORAGE SYSTEMS

Satellite® storage systems are optimized for multi-deep storage and ensure maximum storage density. Depending on the relevant requirements, the layout can be reduced to one aisle and one storage and retrieval machine. The patented Satellite® load handling device stores and retrieves on both sides in storage channels of any depth.

We first developed this key technology for multi-deep storage in 1983 and have been manufacturing the devices at our Borgholzhausen site ever since. Satellite® storage systems are uncompromisingly space-saving as they allow the maximum density and utilization of area and space. They offer maximum capacity for medium access frequency and are especially well-suited for high loads and storage channels with single-variety items. In cases of low to medium variety of products, large numbers of items can be bundled. If necessary, high capacity and access frequency can be combined through additional sequencing buffers.

To store goods in a particularly material-friendly manner, they can be handled on loading aids or without pallets. The rails prevent damage by supporting the loading aids and goods. Palletless storage saves pallet costs. Existing space can be used efficiently with a narrow footprint and storage heights of up to approx. 40 meters.

A combination of transfer, storage, and retrieval of stock improves lane efficiency; compactness and having fewer vehicles on standby improves energy efficiency, and the need for fewer vehicles compared with single- or double-deep storage systems lowers service costs. Satellite® storage systems can be the answer for production buffering, minimum quantity levels and significant fluctuation in demand.

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LOAD HANDLING DEVICE: SATELLITE®

We have developed the flat Satellite® shuttle specifically for multi-deep storage setups. The storage and retrieval machine positions itself in front of the rack channel. The Satellite® travels in from the storage and retrieval machine, moving along Satellite® rails, and passes underneath the goods, which it then stores or retrieves through lifting or lowering. Satellites are particularly effective in using limited storage heights. Chain satellites allow for fast drop-off and handover cycles. Lift satellites are used for special and low-quality pallets. Long satellites can simultaneously handle large, bulky formats and multiple load units.

MAXIMUM CAPACITY

RIGOROUSLY SPACE-SAVING

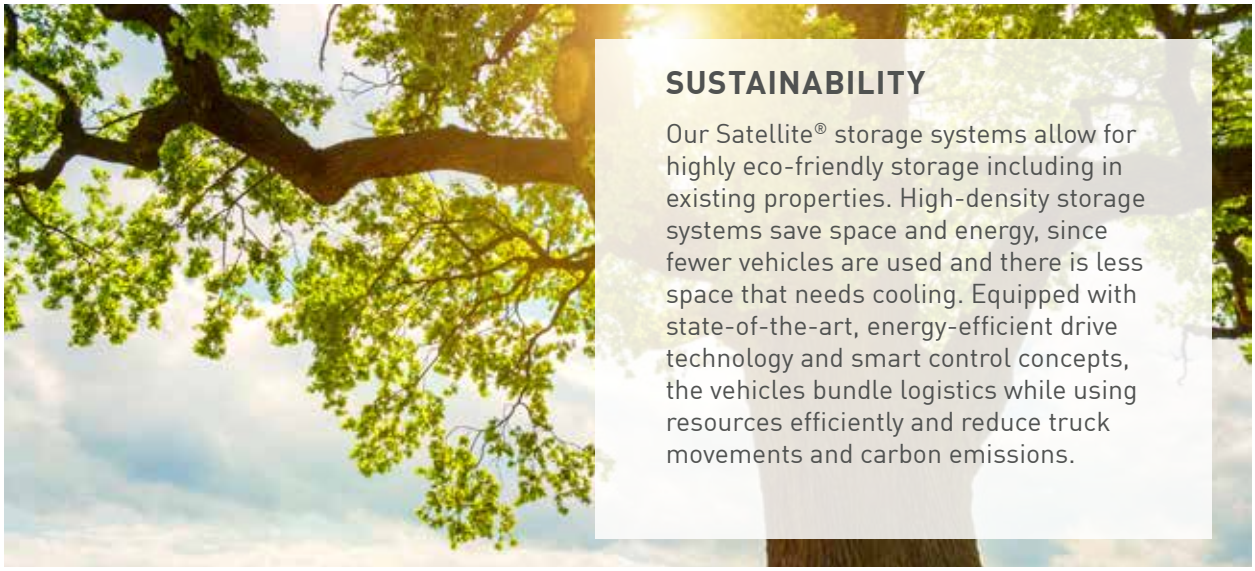
ENERGY-EFFICIENT

SATELLITE® STORAGE SYSTEMS

Function
Access on both sides of the storage and retrieval machine (SRM) to load units stored one behind the other in multi-deep channels on pallets or other loading aids or without pallets. The load handling device disengages from the SRM and travels into these channels.

Use Cases
Companies with a small to medium variety of goods.

Load handling
Satellite® for maximum capacity and space utilization in facilities where space is minimal or highly fractured.



SUSTAINABILITY

Our Satellite® storage systems allow for highly eco-friendly storage including in existing properties. High-density storage systems save space and energy, since fewer vehicles are used and there is less space that needs cooling. Equipped with state-of-the-art, energy-efficient drive technology and smart control concepts, the vehicles bundle logistics while using resources efficiently and reduce truck movements and carbon emissions.

Savanna.NET®

LOGISTICS SOFTWARE AND PLC SYSTEMS

Stable supply chains begin with your in-house automation. Our Savanna.NET® Warehouse Execution System (WES) combines functionalities for warehouse management, material flow control and visualization in one logistics software solution. Our proprietary PLC systems bring more power to the rails of your automated storage system. What's more, you get all components from a single source.

Savanna.NET® signifies efficiency and is the key to an automated storage system that makes full use of all its strengths. To obtain the maximum output from each supply chain and production line, our warehouse execution system offers maximum system compatibility, stability, ease of use, streamlined process management, precise data analysis and a range of functions that outperforms any standalone software solution.

All functions for warehouse management and material flow control tasks as well as system visualization are integrated within one single application. Savanna.NET® has been the proven tool for successful warehouse logistics and supply chain automation since 2005.

It is easily integrated with virtual environments, built for modular scalability, and capable of centrally controlling and synchronizing several warehouses at a time. And it provides a holistic IT support with faster and permanent releases and updates. If required, we can also supply the IT infrastructure with peripherals and TERRA products.

A powerful Programmable Logic Controller (PLC) acts as a switchboard between software and installation. With Westfalia TERRA Automation, we have in-house expertise in building and programming PLC control systems. Our high-quality assemblies are consistently equipped with state-of-the-art, fast, and powerful central processing units (CPUs). Also, we believe in employing our own experts to get things done.

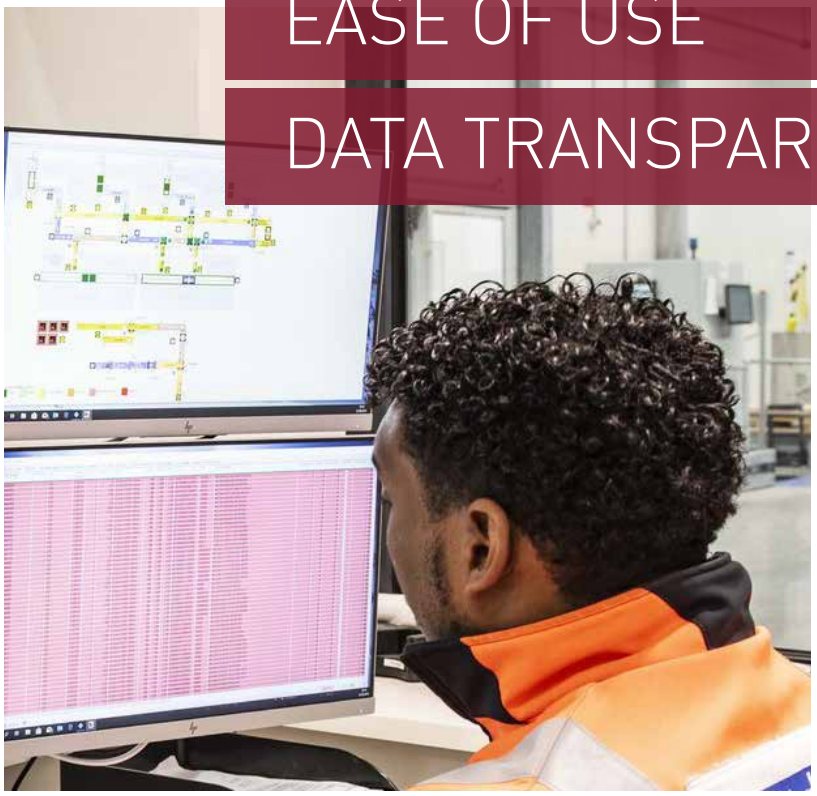
Our experts develop, produce, program, and install control systems that are tailor-made for each specific warehouse layout. They install and program interfaces for seamless processes, using our high-performance warehouse execution system or, alternatively, the third-party software that you use for material flow control and warehouse management.

PLCs are ideally suited to automated intralogistics. Sophisticated automated warehouse and logistics systems provide numerous storage and retrieval strategies depending on the situation and the machine states. For example, if maintenance is being conducted on individual storage and retrieval machines, vertical conveyors, transfer cars or continuous conveyors, the warehouse execution system can come up with comprehensive special strategies for storage and retrieval. This means that an automated high-bay warehouse can continue working efficiently even if individual parts break down or require maintenance.

STABILITY

EASE OF USE

DATA TRANSPARENCY



A powerful PLC system can process these complex and closely interlinked intra-logistics processes required by the software and convert them into the appropriate output signals for the warehouse technology. At the same time, the PLC supplies the real-time data required for visualizing and controlling live operations, or for a digital twin, to optimize processes, perform remote maintenance, and prepare for modernization. By using an up-to-date PLC, we can integrate even older existing systems into a modern IT infrastructure.

WHAT IS A WES?

A Warehouse Execution System (WES) is a software that combines warehouse management and material flow control, allowing for a much more efficient exchange of data between warehouse management and warehouse controlling. This simplifies communication and control of warehouse applications as well as the use of function-specific applications.

STORAGE AND RETRIEVAL MACHINES

When implemented for the first time in 1962, combining a chassis, hoist unit and load handling device represented a pioneering milestone in automated warehouse logistics. In 1983, with our invention of the Satellite® load handling device, we went a step further – and revolutionized compact multi-deep storage with the especially deep storage channels facilitated by our equipment.

For more than 50 years, we have been implementing economical, automated, and sustainable high-bay warehouses of now 40 meters in height and more – well beyond the reach of manual forklifts and automated industrial trucks – with our powerful storage and retrieval machines manufactured by us in-house. We permanently continue to enhance the high standards that we place on our technologies. Our storage and retrieval machines work reliably – for decades, thanks to our system support. Even at great heights, they impress with their fast travel speeds and maximum precision. Directed by a high-performance warehouse execution system, our storage and retrieval machines find their precise target position using laser distance measurement and camera-based accurate location positioning. Moved by high-quality drives and guided by smart control solutions, they are particularly energy-efficient thanks to modern traction converters. These may optionally feature intermediate circuit coupling or energy recovery equipment. Our storage and retrieval machines come with the components needed for normal temperature, chilled and cold storage.

ROCKET SCIENCE SATELLITE® - SCIENCE!

Our patented Satellite® load handling device optimizes storage density to storage channels with maximum depth. Special storage profiles with multiple supporting points bolster the load carriers for especially gentle handling. Therefore, even with heavy use, loading aids can be used for a long time without becoming damaged, jamming, or causing failures. Equipped with the Satellite®, our storage and retrieval machines are designed for high loads and all kinds of different formats.

We equip storage and retrieval machines with multiple load handling devices to improve throughput in storage systems and meet specific requirements. Special length satellites allow taking up multiple load units, thereby increasing the speed of storage and retrieval. We use especially flat-mounted satellites for low approach dimensions and optimum use of space, e.g., in existing buildings with limited room. The Satellite® technology opens up additional storage capacities, such as between hall girders.

Chain Satellite®, double support Longitudinal storage

Chain Satellite®, double support Transverse storage

Chain Satellite®, triple support Transverse storage

Lift Satellite®, triple support Transverse storage

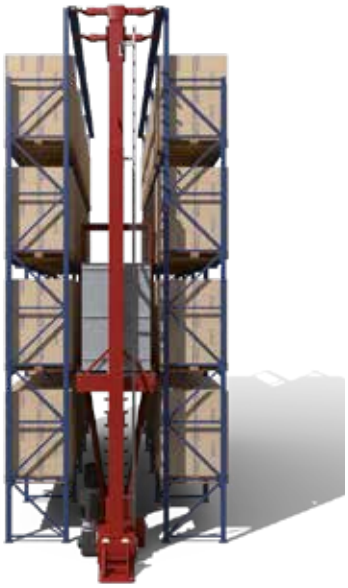
Lift Satellite®, double support Longitudinal storage

Lift Satellite®, double support Transverse storage

DURABILITY

AVAILABILITY

PRECISION



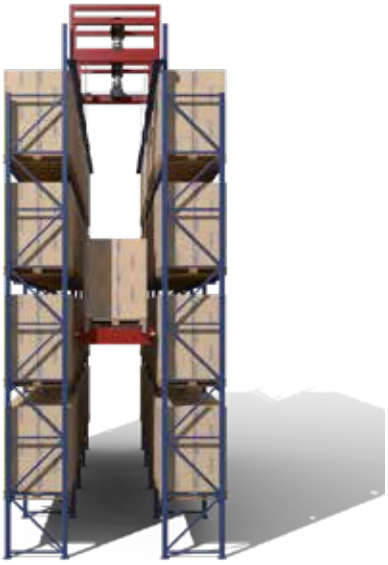
FLOOR-BOUND STORAGE AND RETRIEVAL MACHINES

Function
Access to a load unit in single-, double-, or multi-deep storage at both sides of each storage and retrieval machine with the help of a load handling device.

Use Cases
Companies with a small to large variety of goods.

Load handling
Telescopic fork or Satellite®

Thanks to their highly flexible design, our rail-guided storage and retrieval machines can be used for high-bay warehouses of different heights. Floor-bound storage and retrieval machines move on single-track rails on the floor. This ensures mechanically stable power transmission and control. The required load capacities, throughput values, height classes, and handling determine the design of our single and twin mast floor-bound machines.



OFF-FLOOR STORAGE AND RETRIEVAL MACHINES

Function
Access to a load unit in single or multi-deep storage at both sides of each storage and retrieval machine with the help of a load handling device.

Use Cases
Companies with a small to medium variety of goods requiring manual and automated access to aisles.

Load handling
Telescopic fork or Satellite®

We can seamlessly link up manual areas of your warehouse logistics with partially or fully automated storage systems. That goes so far that storage and retrieval with industrial trucks and storage and retrieval machines can take place in aisles at the same time and forklift routes can cross storage and retrieval machine aisles. This is made possible by our Aviator® off-floor storage and retrieval machine with rack guide and suspended lifting unit.

CONVEYOR TECHNOLOGY

We move your business forward. Our modern conveyor systems offer a high degree of automation, can be used anywhere within your facility, and are flexible and modular. They ensure an interlinked, seamless, and fast material flow that is precisely adapted to your requirements and setup – from the feeding station to the automated preparation of trucks for transport.

Our optimally controlled units guarantee reliable, energy-saving, and noiseless transportation of goods. Effectiveness and accessibility are the hallmarks of our design work. This then simplifies inspection and maintenance.

We can handle different temperature zones and pallet types, such as Euro, industrial and Düsseldorf pallets as well as plastic and custom pallets with standard load capacities of up to 1,200 kg per load unit. We also manufacture system versions for heavy and special loads and adapt standard designs to suit individual requirements.

Vertical conveyors are key units of many conveyor and storage systems. In high-bay warehouses, the standard version of this central lifting component bridges differences in height of up to 25 meters, custom designs reach even further.

Our **transfer cars** connect continuous conveyors and collect and distribute load units. They can be equipped with the Satellite® to create a shuttle, replace continuous or multi-directional conveyors and map complex material flows more efficiently. Long, fixed longitudinal and transverse transport routes can be set up with **continuous conveyors**, such as roller, chain, or accumulating chain conveyors. These units create a continuous flow of goods during the loading and unloading of load units, are height-adjustable and use both rollers and chains for noiseless and gentle transport.

Change-of-direction conveyors change the direction in which a load travels. Turntables maintain the pallet running direction, which is changed by 90° during angular transfers. Anti-clockwise and clockwise movements of up to 180° as well as standard and high-performance versions are possible.

A high throughput requires a high level of precision: **Feeding and checking stations** make sure that each load unit fed in is suitable for the handling system. This is crucial to ensuring safety and reliability and preventing failures in the conveyor and storage systems.

Pallets are some of the most important loading aids and load carriers in logistics. We implement **pallet magazines** as effective elements of a material flow system. These handle and stack empty pallets in an effective manner and automatically feed them into a conveyor and storage system.

RELIABLE
MODULAR
EFFICIENT

PALLET CONVEYOR SYSTEMS

- Vertical conveyors
- Transverse shuttles
- Continuous conveyors
- Multi-directional conveyors
- Feeding and checking stations
- Pallet magazines

LOADING AND UNLOADING SYSTEMS

- Conveyor belt system
- Slat conveyor system

FROM THE INITIAL IDEA TO INSTALLATION

As a general contractor, Westfalia is synonymous with expertise, continuity, reliability, and outstanding automated logistics systems from a single source. We aim to achieve what matters most – your success and a long-term relationship with you, our client. That's why we shoulder our responsibility and stand behind every single project – from the first consultation through to implementation and continuous upgrading. You can rely on dedicated contacts, solutions based on cooperation, and complete transparency at every stage of the project.

We are motivated by your needs and make your challenges ours. We are committed to getting every project over the finish line within the best possible budget and schedule, tailored to our client's needs and with maximum reliability – by using components that deliver quality down to the smallest detail and working with people who understand your business. Westfalia is there for you throughout the entire system lifecycle.

We consider ourselves a partner to the SME sector, which means we place particular value on developing economical, future-proof solutions of any size that enable gradual automation of your systems and software. Automated intralogistics is a real game-changer but also an investment that must be well prepared, planned and supported.

This is what you get from us. Our portfolio as a general contractor includes consulting, planning, design and manufacturing, software, IT infrastructure and PLC systems. On top of that, we can take care of all project management, implementation, installation, and commissioning needs and provide extensive customer support with training along with other services, including inspections and the modernization, expansion, and conversion of proprietary and third-party systems.

You save yourself friction losses, have dedicated contacts available at all times in the consulting and implementation phases as well as throughout the entire system lifecycle, enjoy maximum project transparency and – most importantly – benefit from automated logistics and storage systems that exactly meet your business requirements. These are no off-the-shelf storage systems.

We discuss with you the best solutions for your objectives and clearly set out how our technologies can benefit you. Expect us to provide you with a comprehensive requirements analysis, system advice, a range of solutions including 3D simulation, and fair and transparent quotations for systems that we can quickly implement with our own key components, test centers, and software developers. We are committed to maximizing your return on investment. More than 500 customers worldwide are already reaping the benefits.

EXPERTISE
CONTINUITY
RELIABILITY

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