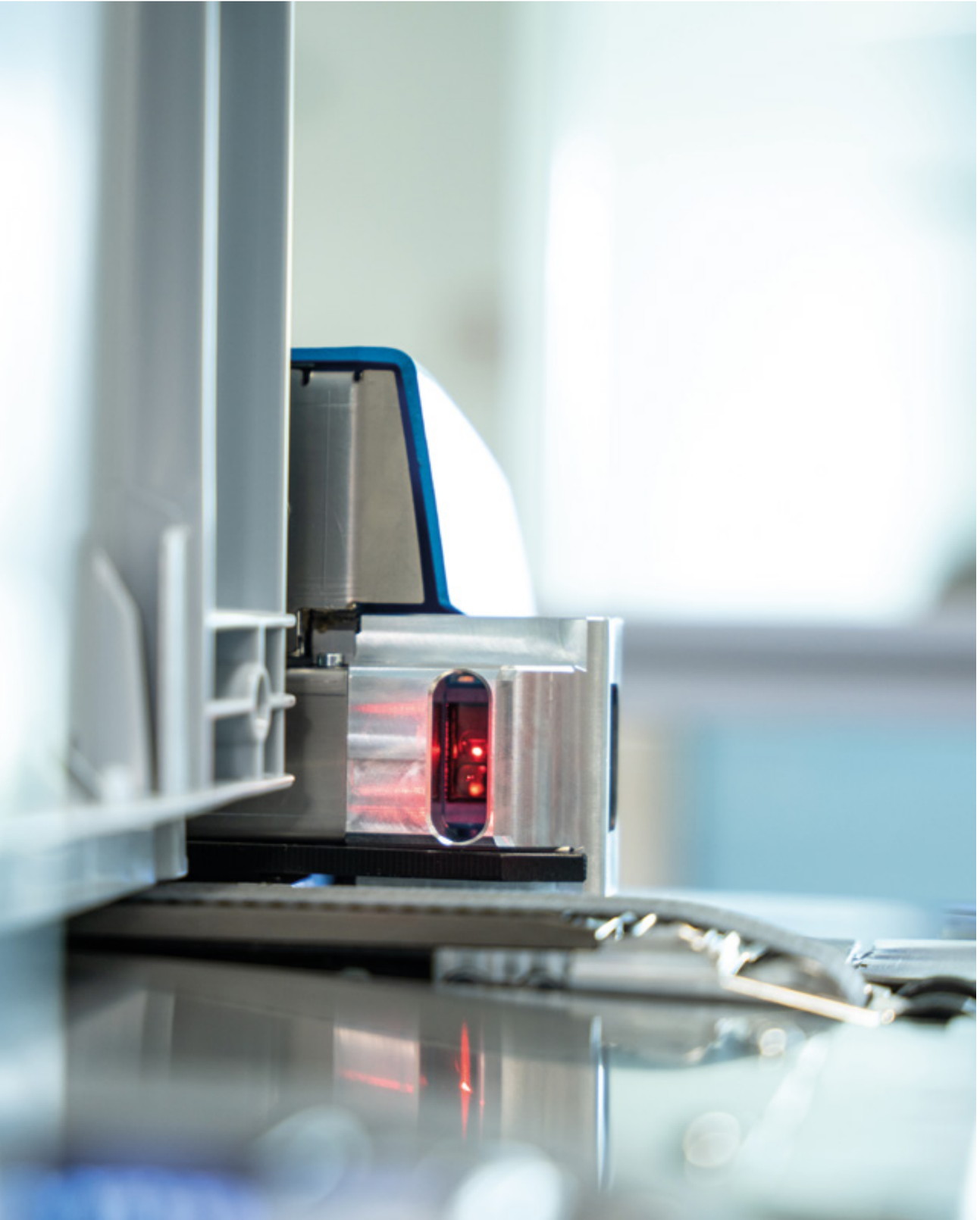
SERVUS®

The ARC5 - optimized for your success

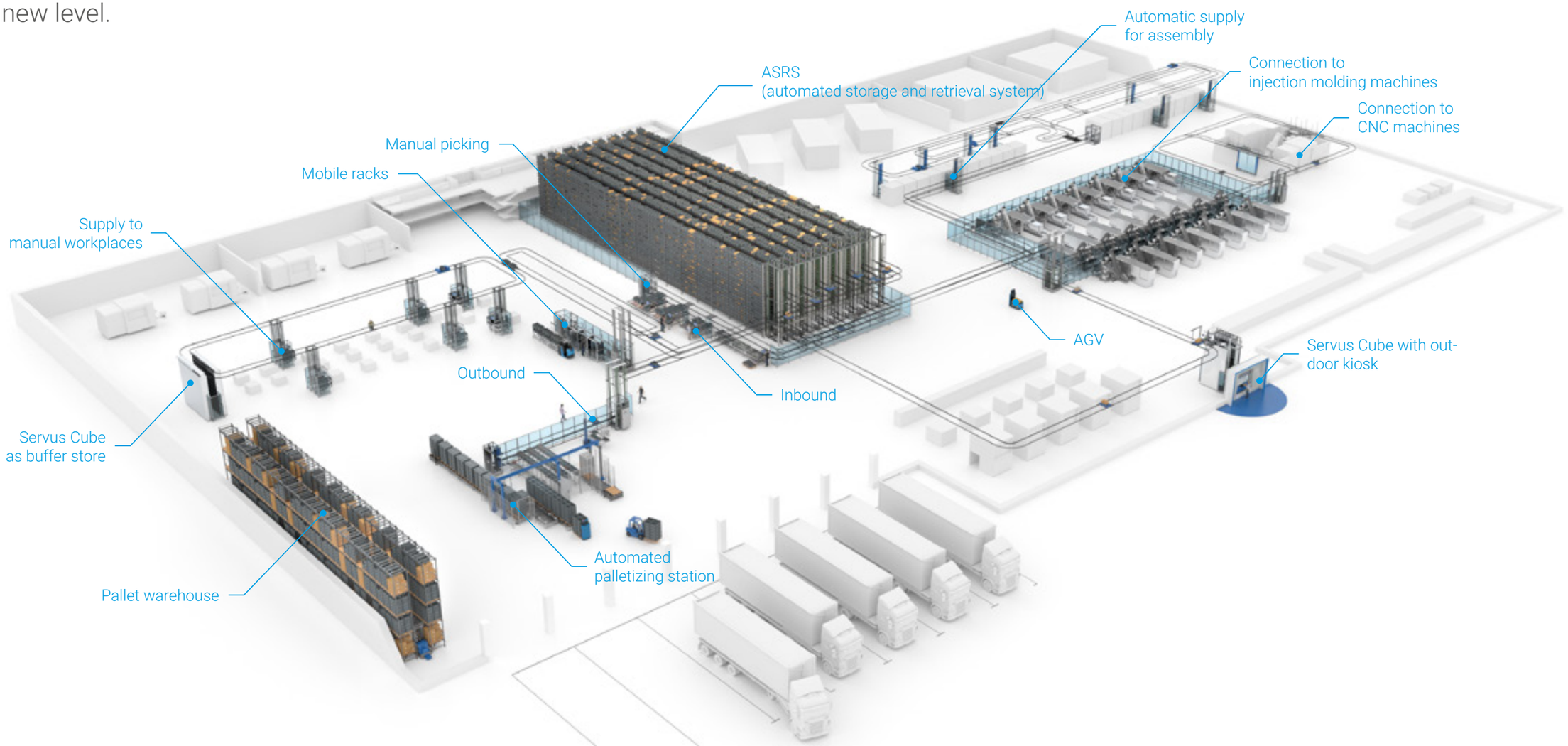
More power. More speed. More efficiency.



ARC5 - A new standard for energy efficiency

A single system for the entire in-house value chain

Servus is the first company to provide seamless connection of the warehouse and production with a single system. How? Our autonomous transport robots integrate all in-house logistics processes using the pull principle. The result is an efficient, simple interface flow in which warehouse and production merge into a single dynamic process, thus raising efficiency and productivity to a new level.



>> Special solutions for special industries

Customized solutions tailored to our customers' needs

As a full integrator, we provide turnkey, fully automated intralogistics systems for a wide range of industries worldwide. For production logistics, retail and e-commerce as well as medical and healthcare, we offer our customers solutions that are tailored to their individual requirements.

Highly dynamic solutions for retail and e-commerce

Medical and healthcare: intralogistics for the highest demands

Maximum efficiency and productivity for industrial plants

Flexibility meets efficiency: our modular design for your customized intralogistics solution

From inbound to outbound: the Servus modular design guarantees you maximum process reliability, easy scalability and perfect interaction between logistics and production. Should your requirements change, the system can be easily adapted to your individual needs. The maximum flexibility of our modular design gives you a head start for all future changes.

The components of the modular Servus intralogistics system

>> Servus transport robots (ARCs)

>> Load handling devices and superstructures

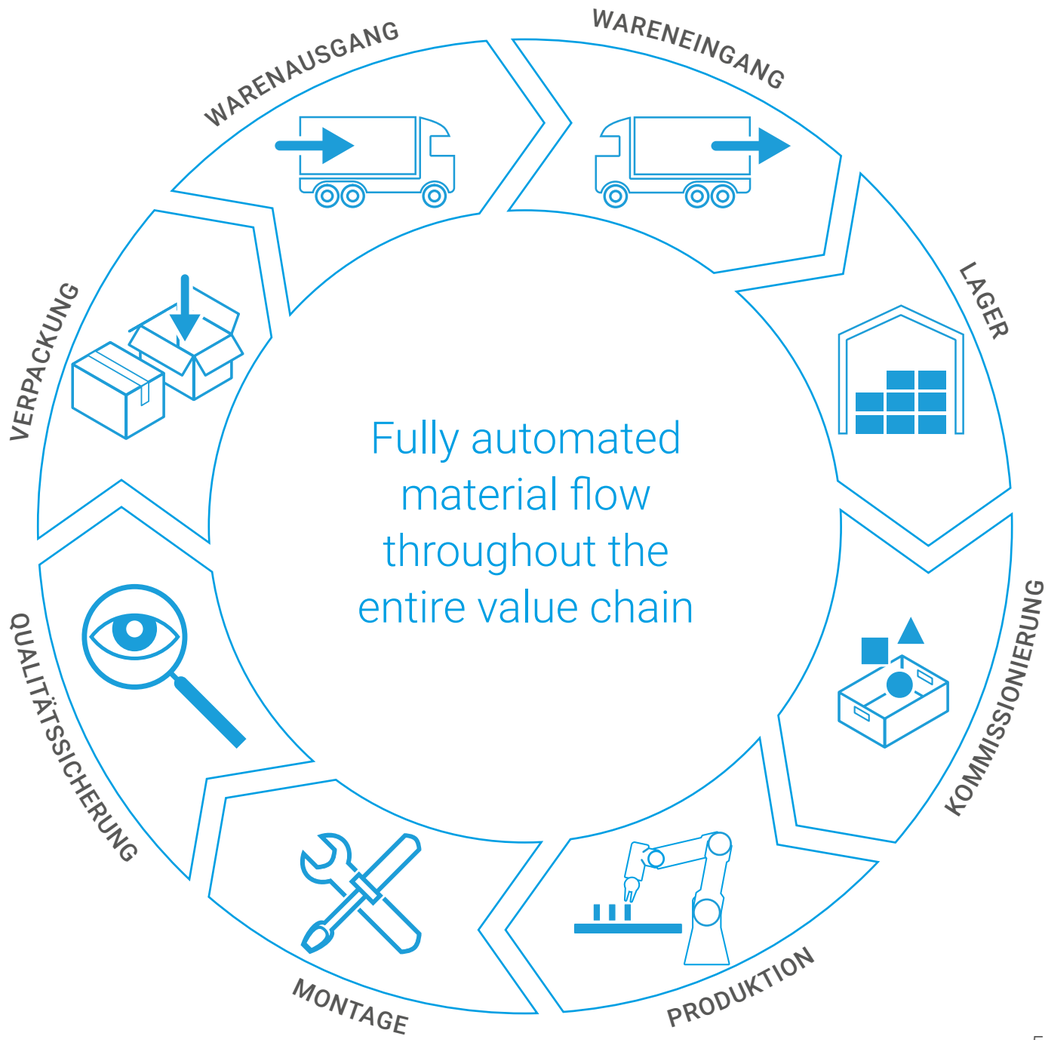
>> Automated storage and retrieval system (ASRS)

>> Connection to production and logistics

>> Track system and assistants

>> Software and user interface

>> Service and maintenance



The core of the system

The ARC is much more than an ordinary shuttle that travels back and forth in a storage rack aisle. As an autonomous swarm robot, it drops off any load in the correct quantity, at the right time, at the desired location. The ARCs deliver your product and material just-in-time using the pull principle. The integrated load handling devices enable independent loading and unloading on the left or right and even from above along the track. The autonomous robots get their orders from the control center via WLAN and always choose the shortest route.

> The intelligent and autonomous ARCs are the core of the modular Servus intralogistics system.
> In order to understand how it works, just imagine you are in a New York cab...

ARCs...

...are intelligent and autonomous

...have their own energy on board

...communicate by radio with the control center.

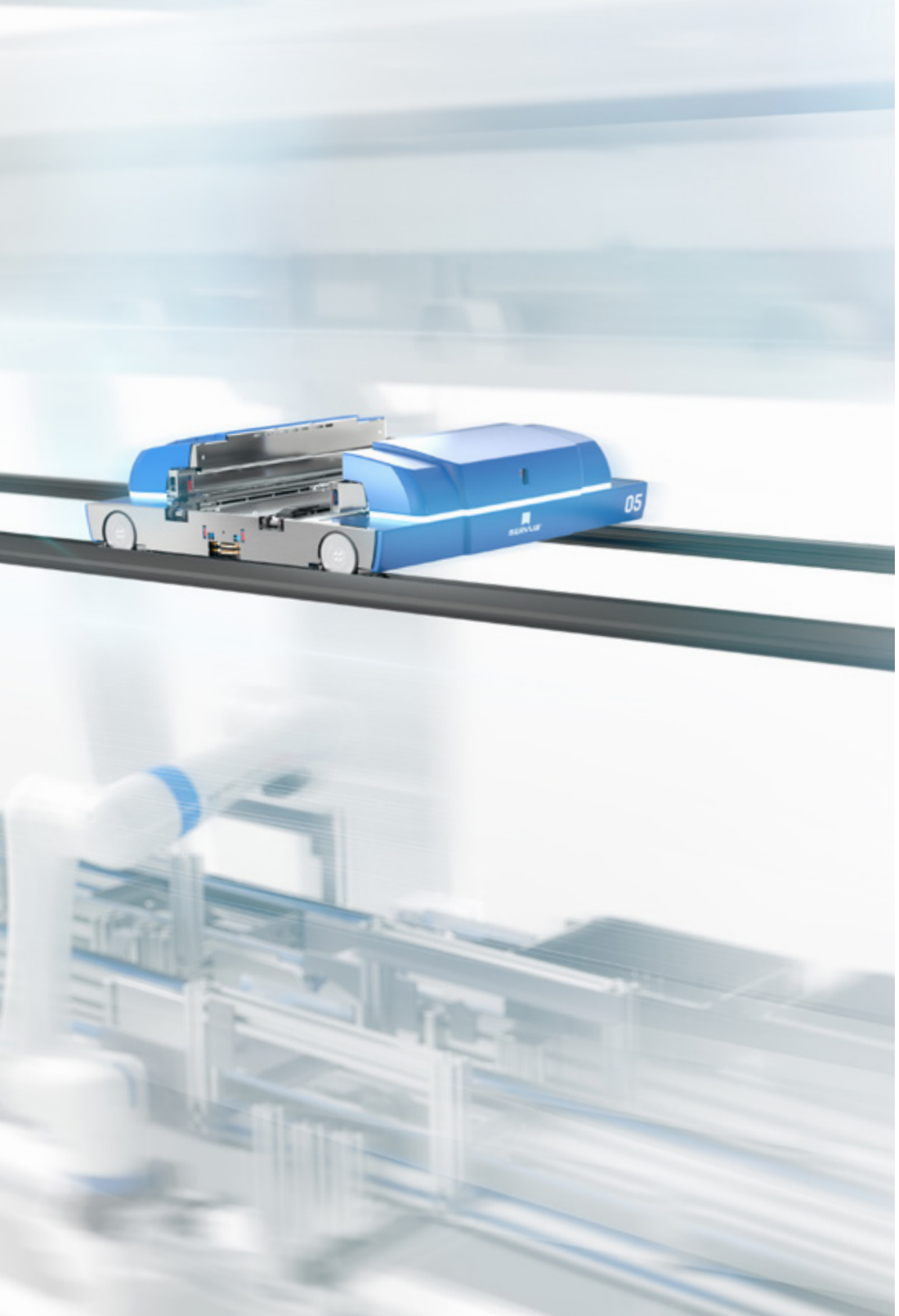
...know the fastest way to their target

...work their way through the system independently

...park in "standby" mode when no transport is requested

...use swarm intelligence and are always there, when and where they are needed

Welcome to the fifth generation



>> Servus ARC - the most energy efficient transport robot

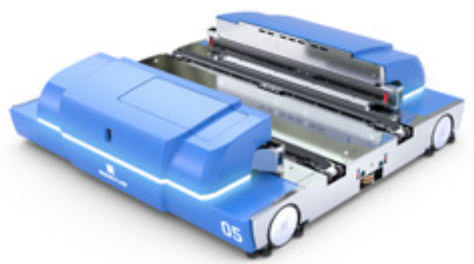
ARC5 - optimized for your success!

For more than a decade, the innovative ARC3 has proven successful at our customers' plants. Based on this real world experience and our own profound know-how, the new generation - the ARC5 - was developed: A transport robot that combines the unique attributes of its predecessor with the technological development and innovative strength of Servus.

What does that mean for you? More power, higher speed and impressive dynamics. These are only some of the outstanding features that guarantee you even higher efficience, flexibility, safety and ease of use.

ARC3

ARC5



>> ARC5 - multifunctional use

One for all.
All with one.

The ARC5 transports any load quickly, safely and quietly. Configurable in terms of size, performance and load handling device, it transports everything from simple cardboard boxes, plastic totes and trays to bulk material or workpieces with a payload of up to 50 kg. The ARC5 therefore adjusts with utmost flexibility to your individual requirements.

Totes

Cardboard boxes

Trays

Bulk material

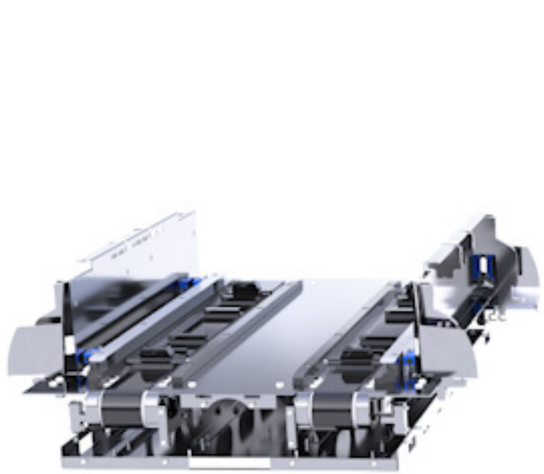
Workpieces

Customized

One size fits all

The main feature of the ARC5 is its modular design. This means: one frame that suits all load handling devices. Who knows what changes the future will bring? Complex plant expansions, new product lines or flows of goods often require extensive adjustments.

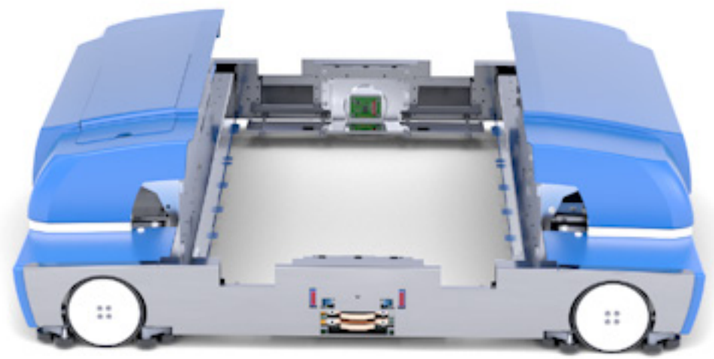
The ARC 5 makes it possible to quickly and easily change the load handling device at any time. For example, a Leanloader can be converted into a Smartloader in just a few steps. Feel safe with the ARC5 today because it covers all requirements for tomorrow.



Leanloader

Hopper

Smartloader



Rapid replacement in record time

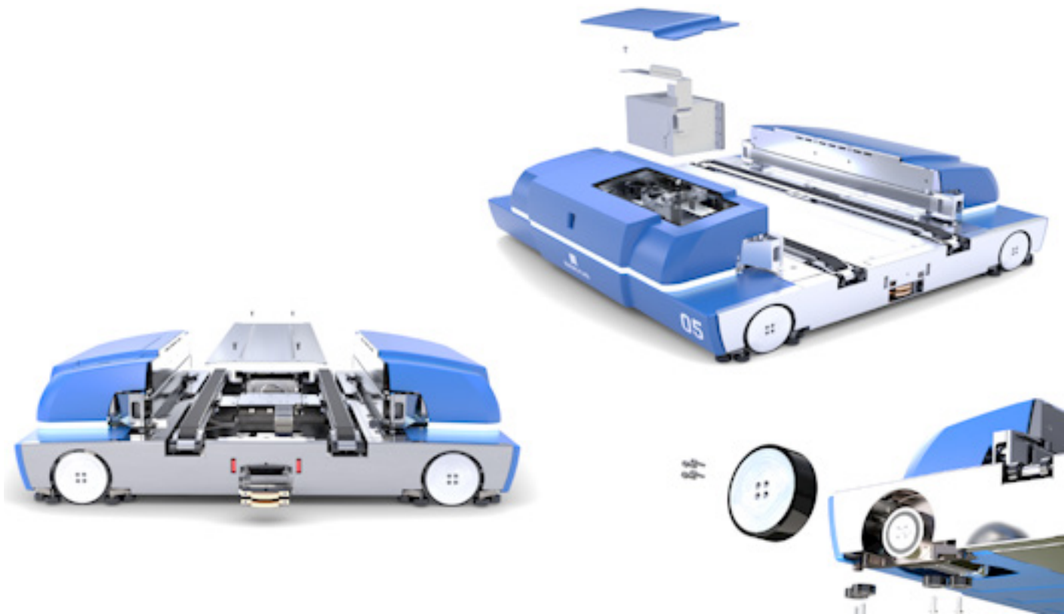
- Power pack
- Charging contacts of the charging unit
- Drive wheels
- Guide rollers

>> Modular structure

Faster than a pit stop

As in a car race, pit stops (maintenance) should be as quick and efficient as possible. A modular design can save time and enable rapid parts replacement. This is crucial to minimize vehicle downtime and gain valuable up time.

The new ARC5's simple design offers you this advantage. All wear parts - including power pack, charging contacts, drive wheels and guide rollers - can be replaced in the shortest possible time. You can benefit from maximum availability with minimal effort.



Every detail is well thought out: the perfect combination of shape and function

Every detail of the ARC5 has been carefully thought out to ensure maximum functionality for a wide range of applications and easy maintenance. The housing is made of high-quality plastic, is cleanroom compatible and extremely robust.

A housing for the toughest demands

- all metal parts made of stainless steel
- easy to wipe clean
- cleanroom compatible
- extremely robust

Monitoring the status: anytime, anywhere

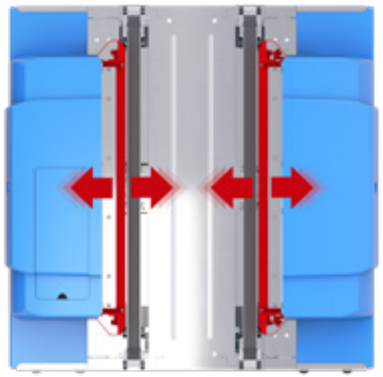
Our innovative, color-coded information system (HMI) allows you to intuitively grasp what is going on. From the pickup to the drop off of a transport unit, each step is clearly communicated by the dynamic status displays. Even from a great distance, the LED status bar remains clearly visible, so no matter where you are - you can always watch the progress and actions of each ARC5.

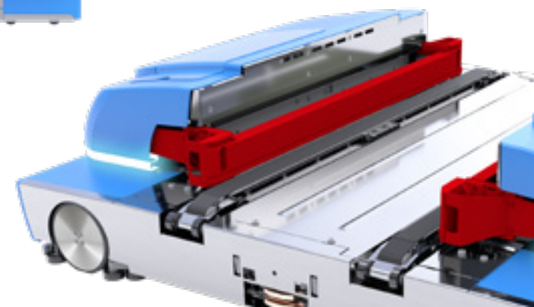
Intuitive, precise and highly visible:
status display via integrated LED bar

Making sure that every transport unit reaches its target safely

The intelligent side guide never lets go: even during operation, it adapts to the loaded transport unit.

The ARC5 has an optional, intelligent side guide that adapts to the loaded transport unit even during ongoing operation. This prevents slipping and ensures precise and gentle transport. Different tote widths can be used in a system.





Always charged, always ready, always efficient

Thanks to the highly efficient charging concept, there are no downtimes for energy charging. The ARC5 charges at every stop on the way. This unique energy management system combines the advantages of two technologies.

A super capacitor is charged in a very short time with high charging current. This provides the ARC5 with the necessary energy for the transport and simultaneously charges a built-in lithium-ion battery. This built-in battery pack allows for longer distances as well as more flexible charging strategies. The ARC5 uses the full potential of both these charging strategies: the high charging currents, outstanding cycle stability of the super capacitor and the high energy density of the lithium-ion battery.

By means of regenerative braking, the braking energy is fed back into the ARC5 energy system. The maximum charging and operating voltage of 48V allows easy maintenance and operation of the ARCs.

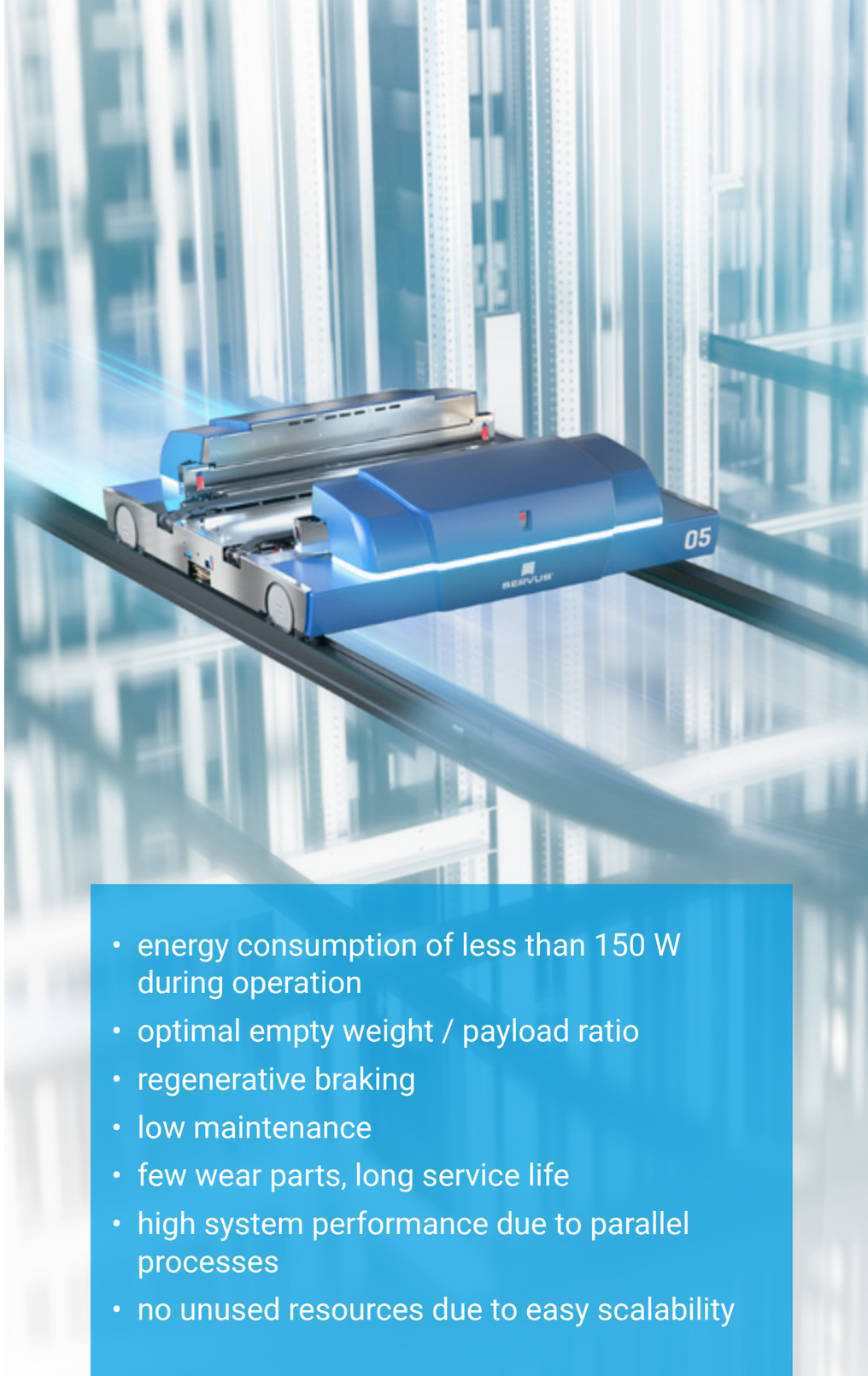
- 24/7/365 operation - requires no downtimes for energy charging
- A highly efficient and low-maintenance energy system through the combination of super capacitor and lithium ion battery
- regenerative braking
- reliable power transmission through retractable charging contacts

The world's most energy-efficient transport robot

Saving resources for today and tomorrow

With state-of-the-art technology and a sophisticated design, the ARC5 sets new standards in sustainability.

By using the ARC5, you make a measurable contribution to protecting the environment and saving valuable resources. Low energy consumption allows you to increase your efficiency while reducing your costs and at the same time reduce your ecological footprint.



- energy consumption of less than 150 W during operation
- optimal empty weight / payload ratio
- regenerative braking
- low maintenance
- few wear parts, long service life
- high system performance due to parallel processes
- no unused resources due to easy scalability

>> Minimum energy consumption

Around the world for 80 euros

At a speed of 4 m/s, the ARC5 covers a distance of 345.6 km every day. In doing so, it consumes only 3.6 kWh of energy - that is: 0.0019 euros per kilometer. Covering a 40,000 km distance therefore costs only 75 euros.

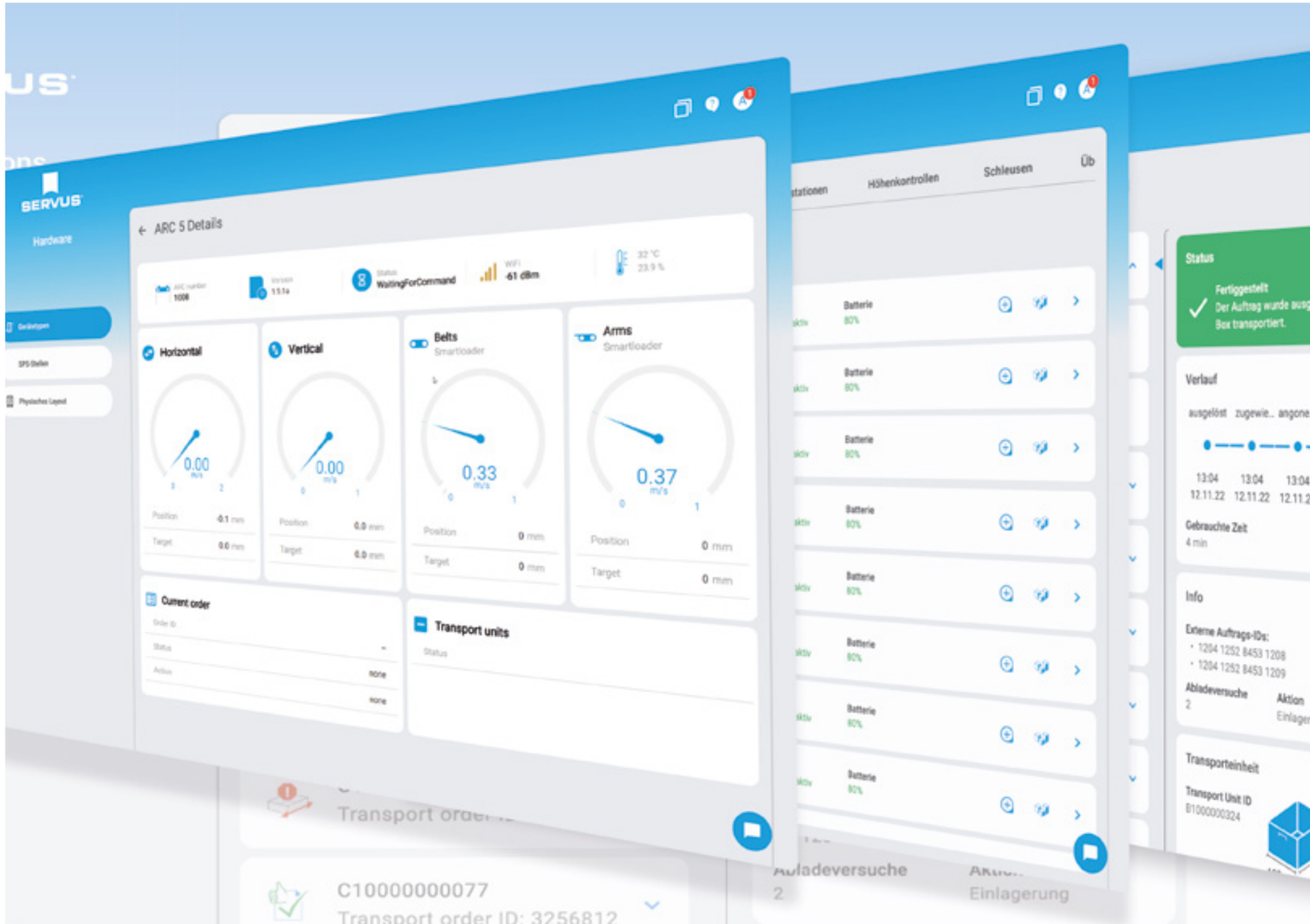
This clearly shows how economical and efficient the ARC5 is and sets new standards in terms of efficiency.

Strong hardware and clever software from a single source

Just like the Servus systems, our software is tailored to meet your individual requirements.

Since the software is operated in your own IT system on site, you always have full control over your data. The local implementation ensures fast job processing and maximum security. Even in the event of an Internet outage, your system remains operational and continues to ensure a smooth flow of materials.

With our software solution, you have a reliable and flexible solution that integrates seamlessly into your existing infrastructure.



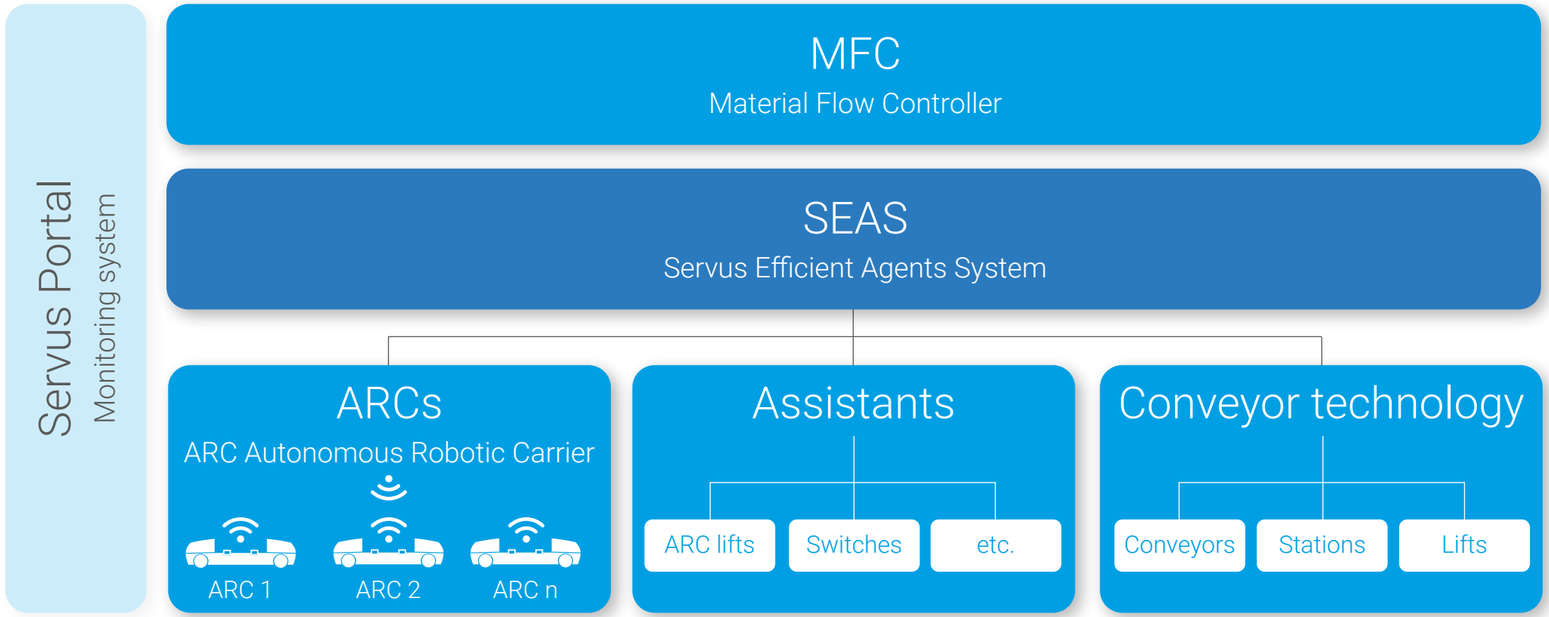
Servus Manager ensures full control and maximum efficiency

Thanks to seamless integration with WMS or ERP, the Servus Manager enables smooth connection to all third-party systems. From storage locations and tote management to the precise generation of efficient transport orders, it effortlessly controls all of the system components.

With intelligent algorithms and optimized warehouse strategies, the Servus Manager minimizes empty runs and maximizes efficiency. Even during idle phases, it self-optimizes the warehouse by intelligent relocation of storage units to ensure the best possible performance. Even with a high storage ratio.

Using modern artificial intelligence (AI) methods, the Servus Manager acts as a command center and independently controls all hardware components - from transport robots and track assistants to conveyors and picking stations. Your business will benefit from the maximum security and efficiency that Servus Manager brings.

The Servus Manager at a glance



Intuitive operation and easy configuration

- simple and fast connection to customer WMS
- optimal storage strategies for maximum efficiency
- efficient and safe execution of transport orders
- intelligent relocations of storage units during idle phases
- height and weight control for higher process reliability
- control and monitoring of all system components

Efficiency through real-time control and monitoring

The Servus Portal gives you a quick and clear overview of your system. All processes and the overall system status are logged in real time and clearly structured in apps. This allows operators and system supervisors to view this information directly at their workstations or on mobile devices. Trouble-shooting made easy!

A modern 3D representation links the digital world with the real world and provides quick orientation even for large systems. This creates maximum transparency, efficiency and process reliability. The Servus Portal enables you to always keep an eye on current processes and to make smart decisions.

- overview at the workplace and on all mobile devices
- system control in real time
- quick and easy trouble-shooting
- 3D real-time visualization of all system states
- state-of-the-art web-based technologies, no client installations necessary
- On-premises software: data remains in the hands of the customer

Optimization of maintenance strategies

With real-time data and state-of-the-art machine data collection, you are always one step ahead. Basic data such as speed and battery status as well as diagnostic information from sensors and encoders are available at all times, even in stand-by mode. So you will always know whether storage locations are full or empty, and be informed right away if a RFID node or a charging station does not work properly. The system continues to run without any interruption. Thanks to the continuous recording of distances and charging cycles, maintenance work can be planned ahead.

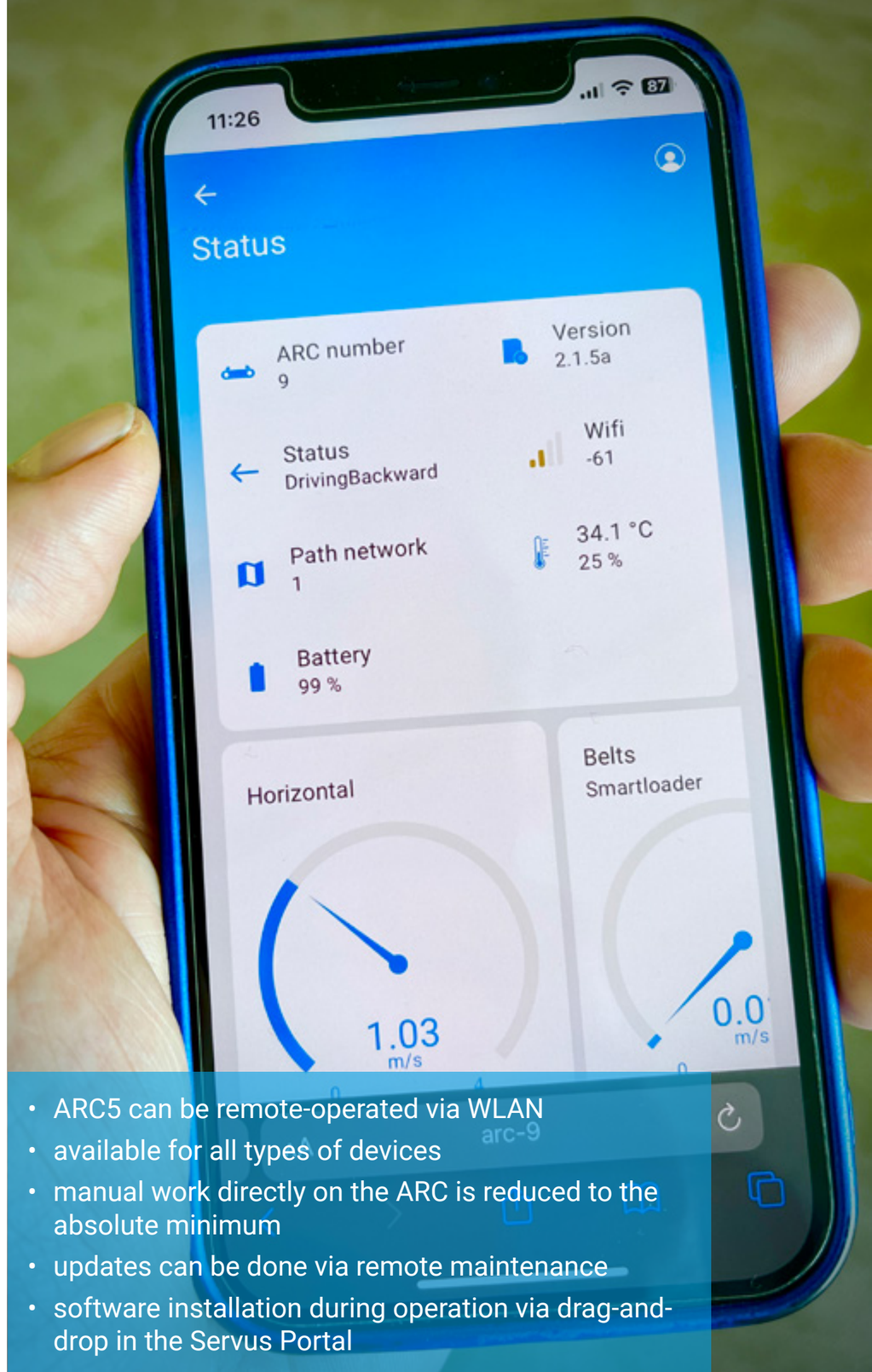
This gives you full control over maintenance intervals. You can avoid downtime through predictive maintenance and thus increase productivity. This helps you optimize your individual maintenance strategy and increase your operating efficiency.

Remote control: easy operation, maximum usability and high efficiency

Discover the benefits of remote control for the ARC5. Our innovative WLAN-based solution allows you to operate the ARC5 with maximum ease of use from any device: whether PC, smartphone or tablet. No more climbing ladders or cherry pickers.

The pioneering drag-and-drop software installation in the Servus Portal simplifies setup even during ongoing operation. Cables are a thing of the past and updates are easily carried out via remote maintenance. With our scheduled release cycle, you will receive the latest features and customizations on a regular basis.

The innovative remote solution simplifies your everyday work, saves valuable time, increases your efficiency and gives you full control at any time.



- ARC5 can be remote-operated via WLAN
- available for all types of devices
- manual work directly on the ARC is reduced to the absolute minimum
- updates can be done via remote maintenance
- software installation during operation via drag-and-drop in the Servus Portal

Did you know that the ARC5 ...

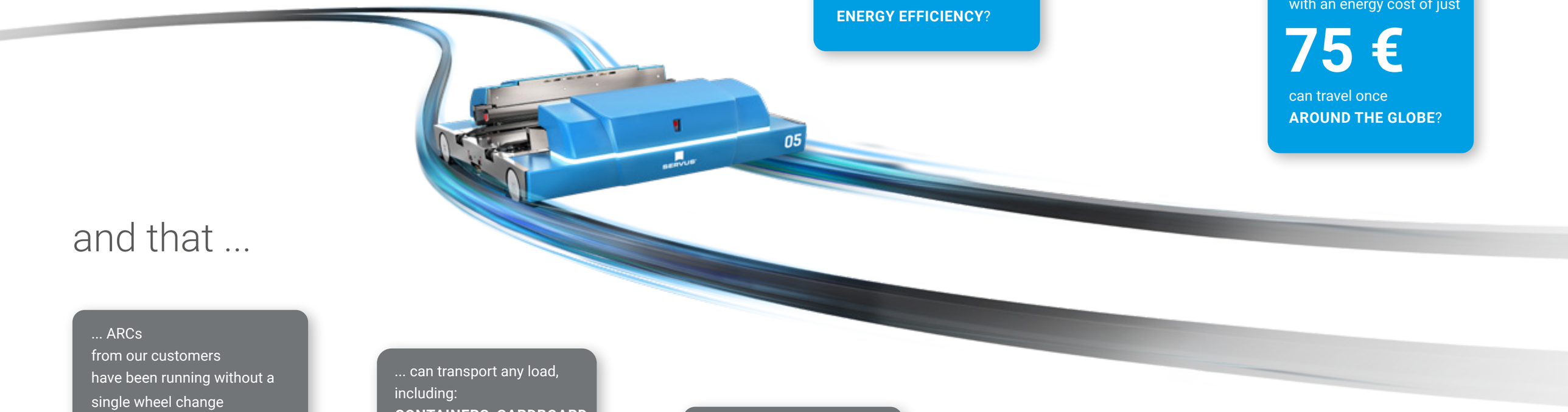
... can reach a
PEAK SPEED up to
5 m/s ?

... is
CLEANROOM CERTIFIED?

... with a
PAYLOAD RATIO
of almost
1:1
can still achieve maximum ENERGY EFFICIENCY?

reaches a speed of up to
3 m/s²
DURING ACCELERATION?

with an energy cost of just
75 €
can travel once
AROUND THE GLOBE?



and that ...

... ARCs
from our customers
have been running without a
single wheel change
for over
10 years
in
24/7
CONTINUOUS OPERATION?

... can transport any load,
including:
CONTAINERS, CARDBOARD BOXES, SMD MAGAZINES, WORKPIECE CARRIERS
or
BULK MATERIAL?

... every **ARC5** has about
300 m
of cables installed?

... SOFTWARE UPDATES
by **DRAG-AND-DROP**
during **OPERATION**
are completed in
1 min ?

... the **ARC5** uses
REGENERATIVE BRAKING
to increase its efficiency?

SERVUS®

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