

Mobile assistance systems

Reference portfolio

2023/24



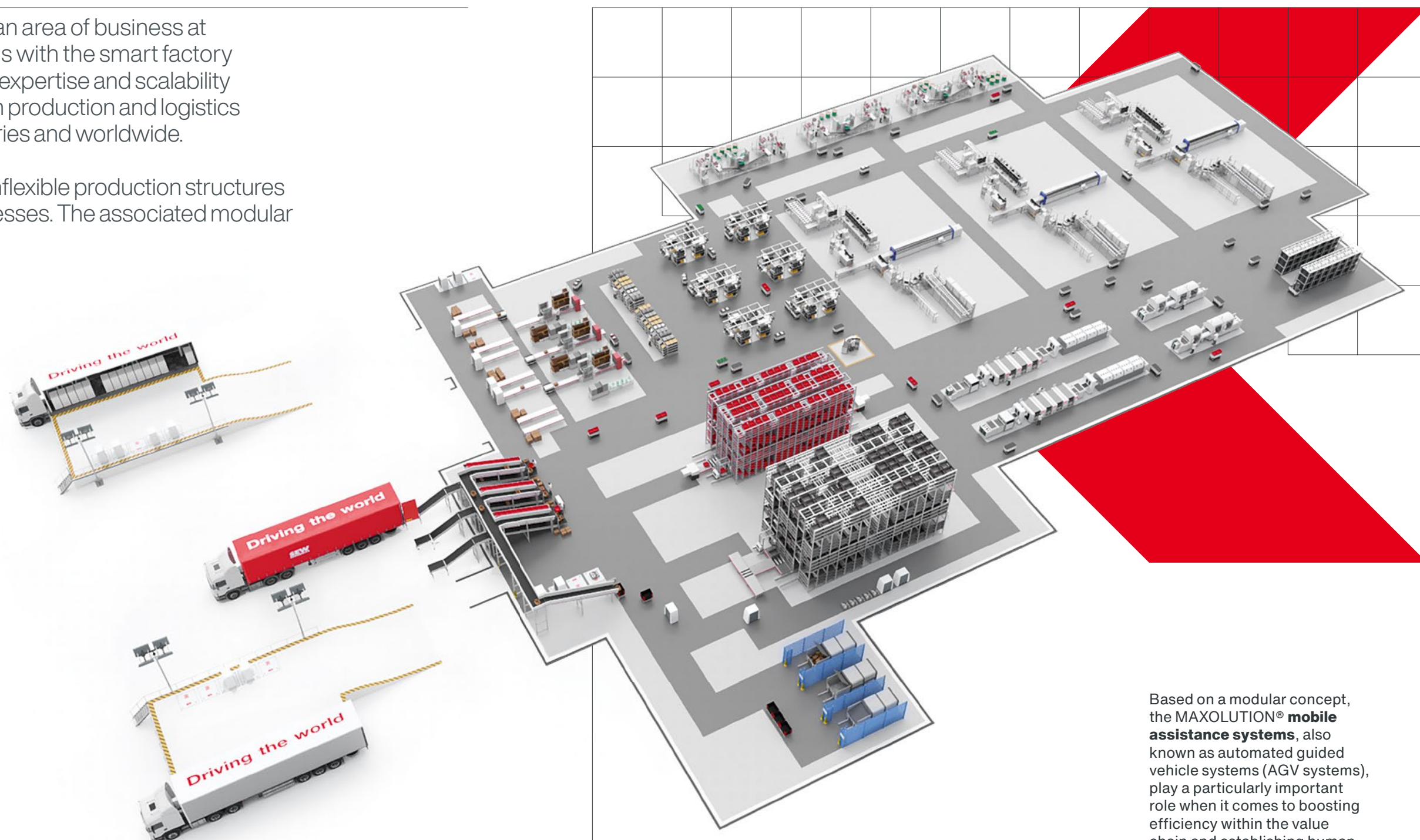
MAXOLUTION

Moving toward the modular factory

MAXOLUTION® System Solutions is an area of business at SEW-EURODRIVE that is synonymous with the smart factory of the future. It offers system solutions expertise and scalability for all kinds of customer applications in production and logistics operations – across a variety of industries and worldwide.

Intelligent system solutions help turn inflexible production structures into agile, self-organizing factory processes. The associated modular portfolio includes:

- Autonomous assistance systems, along with track-guided assembly and transport systems
- Smart services and flexibly adaptable software solutions



Based on a modular concept, the MAXOLUTION® **mobile assistance systems**, also known as automated guided vehicle systems (AGV systems), play a particularly important role when it comes to boosting efficiency within the value chain and establishing human-technology cooperation.

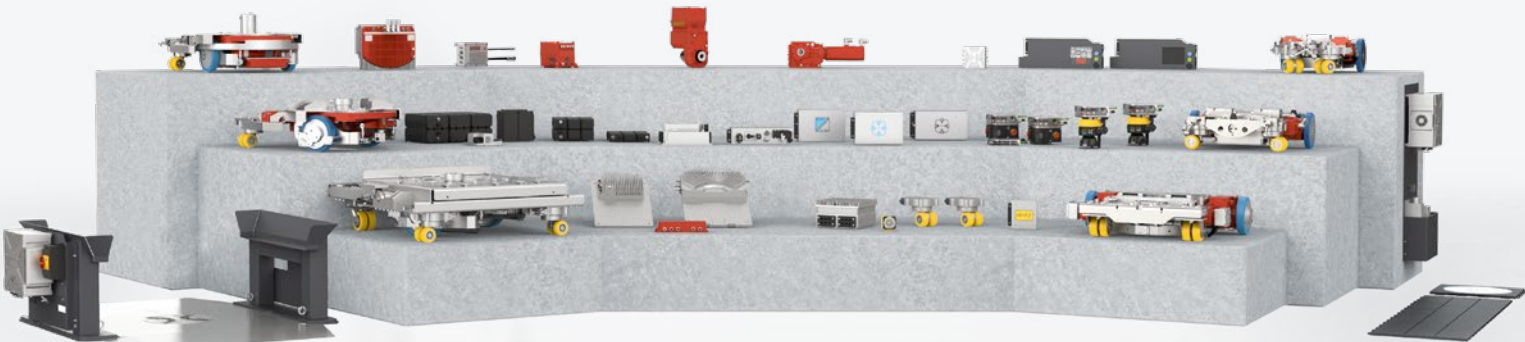
- **A made-to-measure scope of services for each and every customer**
The optimum solution for any application

→ Discover MAXOLUTION®
System Solutions



Modular concept for mobile assistance systems

The modular concept for mobile assistance systems consists of standardized components and modules that are designed in a way that means they can be combined to create all kinds of vehicle solutions.



The modular system includes solutions for

- Drive technology (bidirectional and omnidirectional solutions for various performance classes)
- Inverter technology (various performance classes)
- Control technology (various performance classes)
- Energy absorption (inductive point charging and inductive line charging)
- Energy storage devices (batteries, MOVI-DPS® double-layer capacitors, hybrid solutions)
- Navigation and positioning solutions (laser contour navigation, inductive, optical, RFID)
- Communication
- Safety technology
- Stationary technology

The MAXOLUTION® reference vehicles ...

- **Modular concept**
... are based on the modular concept and thus the verified modules of our mobile assistance systems.
- **Process and application**
... were developed for one process and one specific application in a particular sector of industry.
- **Documentation and service**
... offer you comprehensive documentation and a whole host of services.
- **Approved, sustainable, and reliable**
... are approved, sustainably tested, reliable, and available worldwide.
- **Successful**
... are already being used successfully in a large number of customer projects.
- **Reduced outlay**
... require minimal design adaptations. Using the same system modules for designs minimizes the outlay involved.
- **Fast and efficient**
... are incorporated into the design and project planning of related applications by our system planning team – quickly and with minimum outlay.

Creating vehicle solutions

Supporting in-house production processes with people and technology in perfect harmony

Our mobile, autonomous assistance systems benefit from intelligent vehicle software for connection to a VDA 5050 interface, contactless, inductive energy transfer, and WLAN communication – a perfect fit for your fleet and logistics management.

- This results in:
- Networked value creation and **maximum flexibility**
 - Swarm intelligence thanks to **decentralized** control technology
 - Maximum **safety of processes, systems, and personnel**

Did you know? Besides hardware and software solutions, MAXOLUTION® System Solutions offers services such as:

- Planning
- Conceptual design
- Functional safety concepts
- Process analyses
- Process planning

Many other services for a successful system solution are also available.



- 1 Production of motor components (synchronous motor)
- 2 Delivery of rotors for further processing
- 3 Provision of raw materials for assembly
- 4 Assistance system in the assembly line
- 5 Pallet transfer



Small load carrier transport

For interlinking materials handling technology

The integrated conveyor unit makes the vehicle an attractive alternative to conventional materials handling technology. Stationary station detection and reliable conveying direction detection make the vehicle ideal for interlinking stationary conveyor lines. No safety barrier is required during use, which means staff can come into direct contact with the solution.



Reference data

 Dimensions L = 1000 mm, W = 1000 mm, H = 650 mm	 Navigation Inductive / RFID	 Drive concept Differential drive
 Weight 400 kg	 Power supply MOVITRANS® line (inductive)	 Travel time Permanent power supply
 Load capacity Max. 50 kg per small load carrier	 Energy storage Double-layer capacitor	
 Speed Max. 1.6 m/s	 Load handling device Transverse roller conveyor, including load securing	



Small load carrier transport

For transporting goods in battery production

The special feature of this vehicle is its stainless steel structure. It was developed for cleanroom applications. The high structure makes it possible to load the vehicle ergonomically.



Reference data

 Dimensions L = 900 mm, W = 600 mm, H = 825 mm	 Navigation Laser contour navigation / data matrix code	 Drive concept Rear differential drive
 Weight 350 kg	 Power supply MOVITRANS® spot (inductive)	 Travel time Up to 3 hours
 Load capacity Max. 40 kg	 Energy storage Lithium battery	
 Speed Max. 1.6 m/s (forward) and 0.3 m/s (reverse)	 Load handling device Cover plate with centering for small load carrier and occupancy detection	



Pallet transport

For transporting pallets in production and distribution logistics

Configuration options mean this vehicle can be customized to suit specific requirements perfectly. Despite its very compact design, the vehicle can transport heavy loads. Thanks to its omnidirectional drive system, the vehicle can be maneuvered in the tightest of spaces, enabling a more compact design of production and distribution areas.



Reference data

 Dimensions L = 1000 mm, W = 1000 mm, H = 300 mm	 Navigation Laser contour navigation / camera system / RFID	 Drive concept Omnidirectional drive
 Weight 440 kg	 Power supply MOVITRANS® spot (inductive)	 Travel time Up to 1.5 hours
 Load capacity Max. 1500 kg	 Energy storage Lithium battery	
 Speed Max. 1.6 m/s	 Lifting height Max. 235 mm	



Pallet transport

For transporting pallets in distribution logistics

This vehicle has been optimized for transporting euro pallets (1200 × 800 mm) and enables efficient handling of logistics requirements. The integrated lifting system means pallets can be picked up from a variety of transfer stations. Thanks to the inductive point charging solution, the vehicle is charged up sufficiently for its onward travel during the load change.



Reference data

 Dimensions L = 1500 mm, W = 1000 mm, H = 420 mm	 Navigation Laser contour navigation	 Drive concept Center differential drive
 Weight 600 kg	 Power supply MOVITRANS® spot (inductive)	 Travel time Up to 3 hours
 Load capacity Max. 1000 kg	 Energy storage Lithium battery	
 Speed Max. 1.6 m/s	 Lifting height Max. 130 mm	



Pallet transport

For transporting pallets in distribution logistics

With its omnidirectional operation and compact design, this modular vehicle can pick up pallets both lengthways and sideways in the tightest of spaces. Thanks to the load handling device, pallets can be flexibly picked up from conveyors and racks, so existing systems can be seamlessly interlinked. Optimize your operations with our innovative solution!



Reference data

 Dimensions L = 1200 mm, W = 890 mm, H = 555 mm	 Navigation Laser contour navigation / RFID	 Drive concept Omnidirectional drive
 Weight 415 kg	 Power supply MOVITRANS® spot (inductive)	 Travel time Up to 3 hours
 Load capacity Max. 600 kg	 Energy storage Lithium battery	
 Speed Max. 1.6 m/s	 Lifting height Max. 150 mm	



Pallet transport

For transporting pallets in the construction materials industry

This vehicle was developed specifically for use in rough environmental conditions. Thanks to inductive charging and navigation technology, it is very robust and therefore ideally suited to the demanding conditions of the construction materials industry.



Reference data

 Dimensions L = 1400 mm, W = 1000 mm, H = 782 mm	 Navigation Inductive / RFID	 Drive concept Center differential drive
 Weight 800 kg	 Power supply MOVITRANS® line (inductive)	 Travel time Permanent power supply
 Load capacity Max. 1000 kg	 Energy storage Double-layer capacitor	
 Speed Max. 1.6 m/s	 Load handling device Longitudinal conv., incl. load securing and GAP control (FS)	



Pallet transport

For transporting pallets in battery production

The special feature of this vehicle is its stainless steel structure. It was developed for cleanroom applications. Thanks to the inbuilt sensor technology, the pallet can be transferred from vehicle to vehicle or from the vehicle to stationary materials handling technology.



Reference data

- | | | |
|---|---|--|
|  Dimensions
L = 1400 mm, W = 1200 mm,
H = 620 mm |  Navigation
Laser contour navigation /
data matrix code |  Drive concept
Center differential drive |
|  Weight
850 kg |  Power supply
MOVITRANS® spot
(inductive) |  Travel time
Up to 3 hours |
|  Load capacity
Max. 1000 kg |  Energy storage
Lithium battery | |
|  Speed
Max. 1.5 m/s |  Load handling device
Longitud. conv., incl. GAP
control (FS), centering,
securing | |



Pallet transport

For transporting special pallets in distribution centers

A vehicle powertrain that is particularly resistant to tipping was used in this application. High load carriers can therefore be transported at maximum speed.



Reference data

 Dimensions L = 1400 mm, W = 1400 mm, H = 360 (base)	 Navigation Laser contour navigation / RFID / data matrix code	 Drive concept Center differential drive
 Weight 1120 kg	 Power supply MOVITRANS® spot (inductive)	 Travel time Up to 3 hours
 Load capacity Max. 1110 kg	 Energy storage Lithium battery	
 Speed Max. 1.6 m/s (forward) and 0.5 m/s (reverse)	 Load handling device Transverse conveyor	



Frame transport

For transporting frames in production logistics

Thanks to its particularly compact and flat design, this assistant is perfect for transporting various frame structures. Omnidirectional operation means it can pick up and transport these structures in the tightest of spaces.



Reference data

 Dimensions L = 1200 mm, W = 860 mm, H = 410 mm	 Navigation Laser contour navigation / RFID	 Drive concept Omnidirectional drive
 Weight 425 kg	 Power supply MOVITRANS® line (inductive)	 Travel time Up to 3 hours
 Load capacity Max. 600 kg	 Energy storage Lithium battery	
 Speed Max. 1.6 m/s	 Lifting height Max. 150 mm	



Frame transport

For transporting frames in production logistics

Thanks to the vehicle's stepless lifting mechanism, it can deal with different transfer heights, so it can pick up and drop off load carriers that are between 600 mm and 800 mm high. Its omnidirectional operation also means it can navigate the tightest of spaces.



Reference data

 Dimensions L = 1200 mm, W = 860 mm, H = 570 mm	 Navigation Laser contour navigation	 Drive concept Omnidirectional drive
 Weight 610 kg	 Power supply MOVITRANS® line (inductive)	 Travel time Up to 3 hours
 Load capacity Max. 510 kg	 Energy storage Lithium battery	
 Speed Max. 1.6 m/s	 Lifting height Max. 310 mm	



Frame transport

Standard vehicle for transporting racks

Its flat design and omnidirectional operation make this vehicle ideal for transporting frames. The fact that the vehicle is standardized means it can transport various types of frames.



Reference data

 Dimensions L = 1500 mm, W = 620 mm, H = 250 mm	 Navigation Laser contour navigation / RFID	 Drive concept Omnidirectional drive
 Weight 300 kg	 Power supply Contact charging	 Travel time Up to 6 hours
 Load capacity Max. 700 kg	 Energy storage Lithium battery	
 Speed Max. 2.0 m/s	 Lifting height Max. 50 mm	



Assembly assistant

For automated and manual assembly work

Assembly mode makes it possible to work safely on the vehicle itself. Thanks to its integrated lifting system, the vehicle adjusts to the perfect ergonomic height for each employee.



Reference data

 Dimensions L = 1200 mm, W = 600 mm, H = 717 mm	 Navigation Laser contour navigation / inductive / RFID	 Drive concept Rear differential drive
 Weight 450 kg	 Power supply MOVITRANS® line (inductive)	 Travel time Up to 3 hours
 Load capacity Max. 350 kg	 Energy storage NiMH accumulator	
 Speed Max. 1.6 m/s	 Lifting height Max. 300 mm	



Assembly assistant

For the interlinked assembly of asynchronous motors

This vehicle was specifically designed for the motor production process and accompanies the motor from order picking and assembly all the way through to final testing.



Reference data

 Dimensions L = 1200 mm, W = 700 mm, H = 900 – 1000 mm (lifting)	 Navigation Laser contour navigation / inductive / RFID	 Drive concept Center differential drive
 Weight 520 kg	 Power supply MOVITRANS® line (inductive)	 Travel time Up to 3 hours
 Load capacity Max. 500 kg	 Energy storage Lithium battery	
 Speed Max. 1.6 m/s (forward) and 0.8 m/s (reverse)	 Load handling device Passive plate with mech. adaptation and lifting system	



Assembly assistant

For transporting Euro containers in electric motor production

The inbuilt sensor technology means the vehicle detects the transfer station and adapts the transfer height thanks to its incorporated lifting system. The special feature of this vehicle is that it is used for logistics tasks (distribution of load carriers) and also accompanies the motor assembly process.



Reference data

- | | | |
|---|---|--|
|  Dimensions
L = 1200 mm, W = 717 mm,
H = 903 – 1038 mm (lifting) |  Navigation
Laser contour navigation /
inductive / RFID |  Drive concept
Center differential drive |
|  Weight
725 kg |  Power supply
MOVITRANS® line
(inductive) |  Travel time
Up to 3 hours |
|  Load capacity
Max. 2 × 100 kg |  Energy storage
Lithium battery | |
|  Speed
Max. 1.6 m/s |  Load handling device
2 × telescopic table | |



Assembly assistant

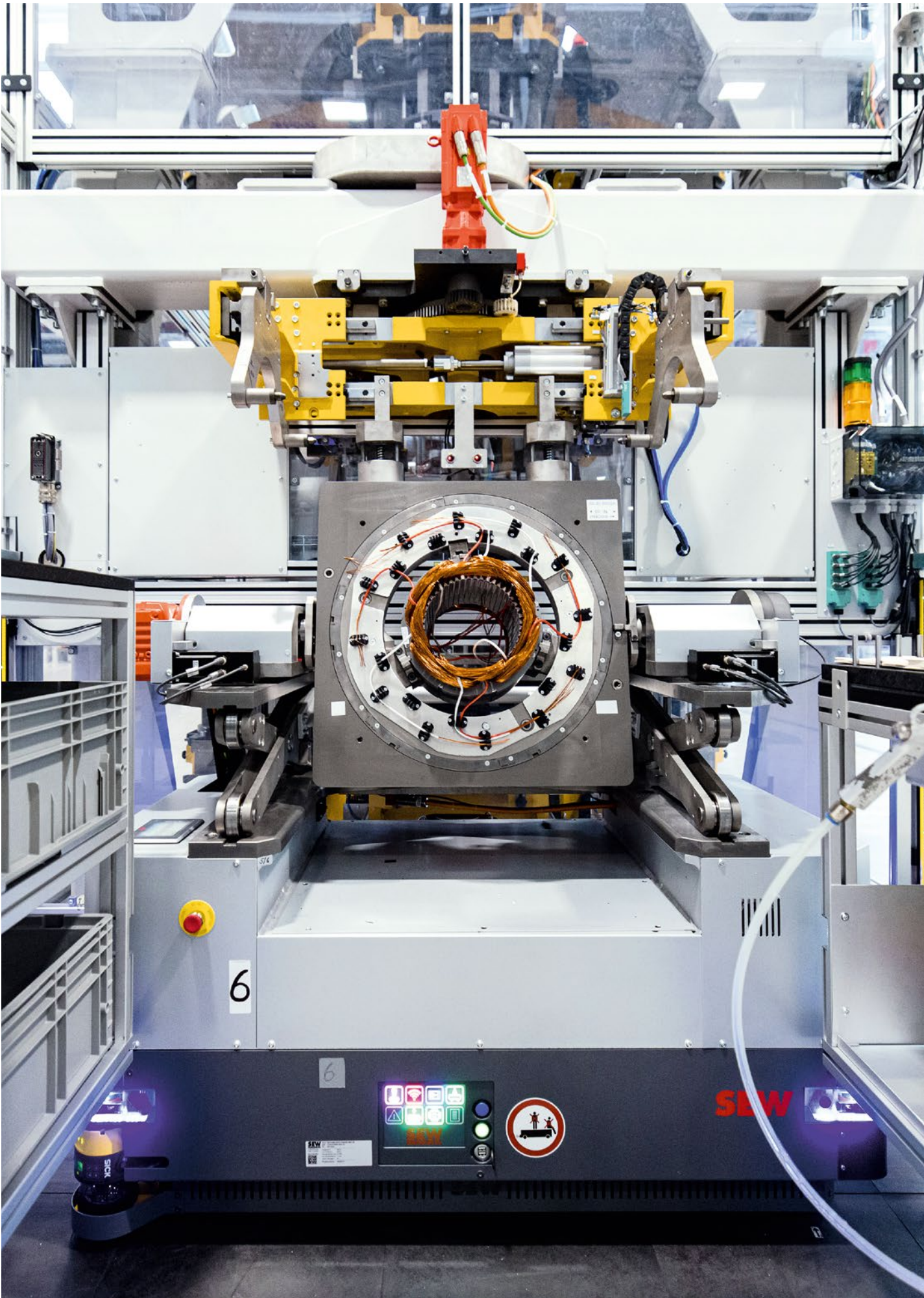
For process interlinking in electric motor production

Thanks to the maximum flexibility of the load handling device and the inbuilt sensor technology in this application, the vehicle moves to various production steps and thus accompanies the product from the first production stage to the last.



Reference data

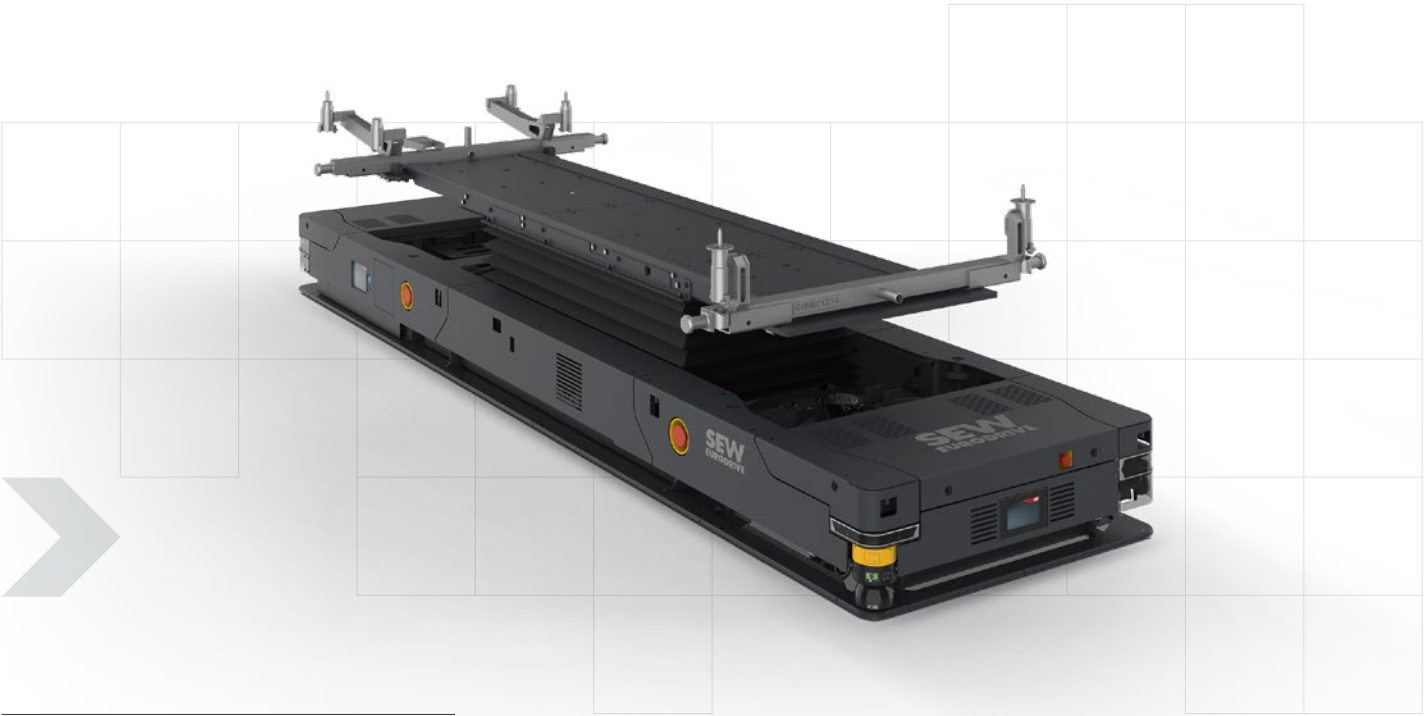
- | | | |
|--|---|--|
|  Dimensions
L = 1400 mm, W = 870 mm,
H = 650 mm |  Navigation
Laser contour navigation /
inductive / RFID |  Drive concept
Center differential drive |
|  Weight
420 kg |  Power supply
MOVITRANS® line
(inductive) |  Travel time
Permanent power
supply |
|  Load capacity
Max. 700 kg |  Energy storage
Double-layer capacitor | |
|  Speed
Max. 1.5 m/s (forward) and
0.3 m/s (reverse) |  Load handling device
Customized load handling
devices | |



Heavy-duty transport

For transporting vehicle bodies in the automotive industry

Omnidirectional operation makes this vehicle perfect for maneuvering in the area buffer. The mobile assistant picks up the vehicle bodies and takes them to the painting cell for finishing.



Reference data

 Dimensions L = 3800 mm, W = 1000 mm, H = 345 mm	 Navigation Laser contour navigation / optical / RFID	 Drive concept Omnidirectional drive
 Weight 1425 kg	 Power supply MOVITRANS® spot (inductive)	 Travel time Up to 3 hours
 Load capacity Max. 1000 kg	 Energy storage Hybrid storage technology	
 Speed Max. 1.2 m/s	 Lifting height Max. 350 mm	



Heavy-duty transport

For the “marriage” in the automotive industry

This assistant handles the “marriage” of the drive train and the vehicle body on the fly, in parallel / in sync with the electrified monorail system.



Reference data

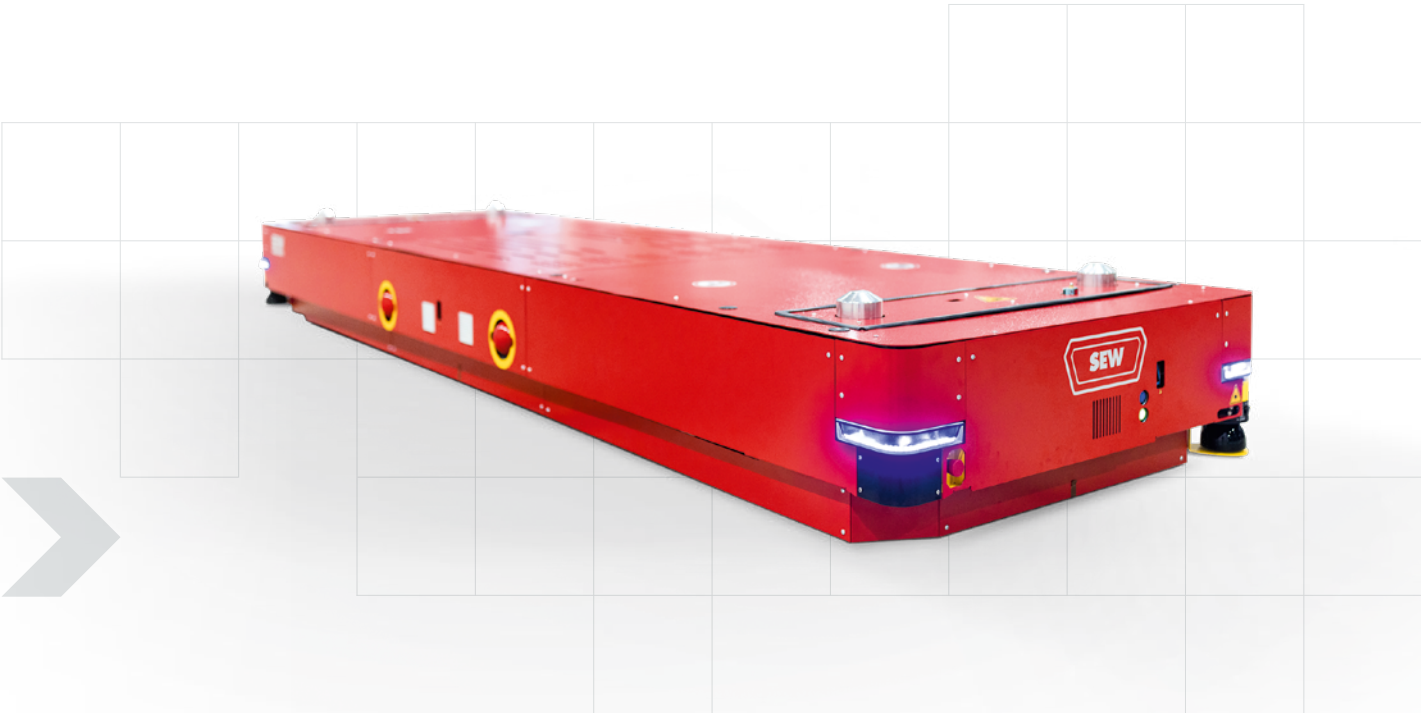
- | | | |
|---|---|--|
|  Dimensions
L = 5443 mm, W = 2493 mm,
H = 435 mm |  Navigation
Laser contour nav./inductive/
data matrix code/RFID |  Drive concept
Omnidirectional drive |
|  Weight
7500 kg |  Power supply
MOVITRANS® line
(inductive) |  Travel time
Permanent power
supply |
|  Load capacity
Max. 11 000 kg |  Energy storage
Hybrid storage technology | |
|  Speed
Max. 0.5 m/s |  Lifting height
3 independent lifting
systems (max. 800 mm) | |



Heavy-duty transport

For transporting a customized rack in the wood processing industry

This vehicle's omnidirectional travel means it can move large loads in the tightest of spaces. A particularly long powertrain was designed due to the considerable size of the load carrier.



Reference data

 Dimensions L = 3800 mm, W = 1100 mm, H = 450 mm	 Navigation Laser contour navigation / optical / RFID	 Drive concept Omnidirectional drive
 Weight 1370 kg	 Power supply MOVITRANS® spot (inductive)	 Travel time Up to 3 hours
 Load capacity Max. 3000 kg	 Energy storage Hybrid storage technology	
 Speed Max.1.0 m/s (forward/ reverse) and 0.5 m/s (transverse)	 Lifting height Max. 105 mm	



Special load carriers

For transporting domestic appliances

This vehicle was developed to flexibly interlink processes between two assembly lines and multiple automatic machining centers (matrix production). Thanks to the integrated belt conveyor, goods can be collected and delivered directly.



Reference data

 Dimensions L = 1900 mm, W = 1280 mm, H = 983 mm	 Navigation Laser contour navigation	 Drive concept Omnidirectional
 Weight 850 kg	 Power supply MOVITRANS® line (inductive)	 Travel time Up to 3 hours
 Load capacity Max. 400 kg	 Energy storage Lithium battery	
 Speed Max. 1.6 m/s	 Load handling device Belt conveyor	



Handling assistant

For mobile robotics

This handling assistant uses a mobile and autonomous cobot to support the work being done by employees. The integrated articulated arm robot relieves the strain on staff by helping them with pick-and-place, order-picking, assembly, and joining work.



Reference data

- | | | |
|--|---|--|
|  Dimensions
L = 1000 mm, W = 780 mm,
H = 850 mm |  Navigation
Laser contour navigation /
inductive / RFID |  Drive concept
Powertrain for mobile
robotics |
|  Weight
700 kg |  Power supply
MOVITRANS® line
(inductive) |  Travel time
Up to 3 hours |
|  Load capacity
Max. 400 kg (vehicle) and
max. 11 kg (robot) |  Energy storage
Hybrid storage technology | |
|  Speed
Max. 1.5 m/s (forward) and
0.3 m/s (reverse) | | |



Outdoor logistics assistant

For urban logistics

Thanks to this vehicle's special outdoor powertrain and weather-resistant sensor technology, SEW-EURODRIVE is implementing completely new processes and applications. The interlinking of multiple processes, even in outdoor applications, is becoming increasingly important, particularly due to the growth of end-to-end production strategies.



Reference data

 Dimensions L = 941 mm, W = 618 mm, H = 504 mm	 Navigation GNS / stereo camera / laser contour navig. / QR code	 Drive concept Outdoor all-wheel drive
 Weight 150 kg	 Power supply MOVITRANS® spot (inductive)	 Travel time Up to 2 hours
 Load capacity Max. 100 kg	 Energy storage Lithium battery	
 Speed Max. 1.4 m/s	 Load handling device Transport box	



Concept study

Mobile assistance system powered by hydrogen

In the future, assistance systems powered by hydrogen will help boost the productivity of systems. As an alternative to the battery storage solutions being used at present, hydrogen offers many advantages, such as faster charging/refueling and less maintenance work on the batteries.



Reference data

 Dimensions L = 1200 mm, W = 600 mm, H = 1049 mm	 Navigation Laser contour navig./inductive/ RFID/data matrix code	 Drive concept Center differential drive
 Weight 450 kg	 Power supply MOVITRANS® line (inductive)	 Travel time Up to 3 hours
 Load capacity Max. 150 kg	 Energy storage Lithium battery with fuel cell module	
 Speed Max. 1.6 m/s	 Load handling device Passive load handling device	



Software

MAXOLUTION® offers a wide-ranging portfolio of software solutions (MAXOLUTION® connected) and ensures agile factory processes. You can obtain an overview of the modular software system for our automated guided vehicle systems (AGV systems).

SEW-EURODRIVE's software solution for AGV systems includes startup and parameterization software, modular vehicle software, an intelligent fleet manager, and standardized interfaces to higher-level and peripheral systems.

Communication takes place via the simple and lightweight MQTT network protocol. The MQTT broker manages and administers all data traffic and makes it easy to connect all participating systems.



➤ **MAXOLUTION® connected**
Software portfolio
for the factory of the future

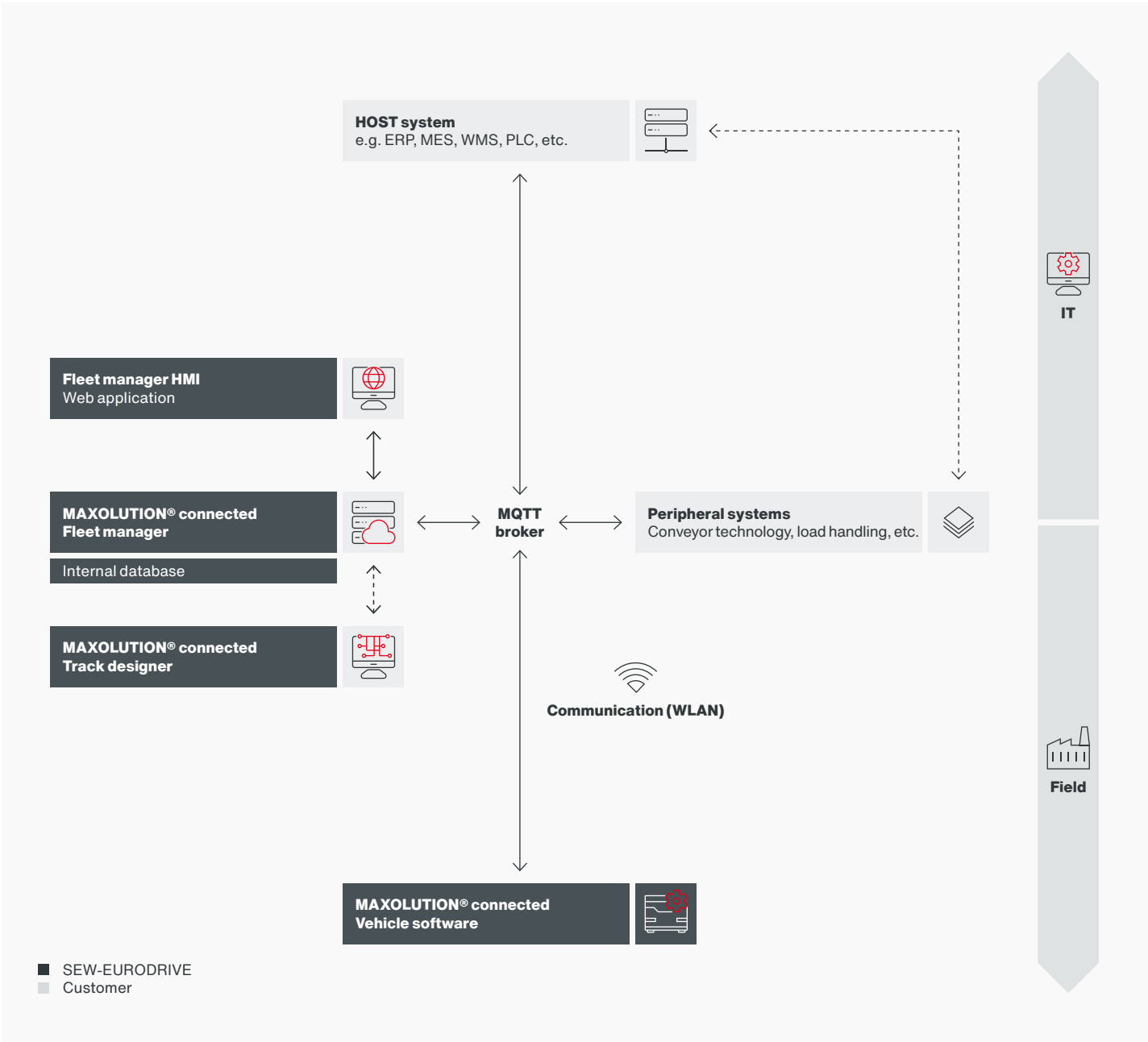
- 1

Fleet manager
Guidance control system and transport order management
→ [Page 54](#)
- 2

Track designer
Parameterization of travel sections and transfer scenarios
→ [Page 56](#)
- 3

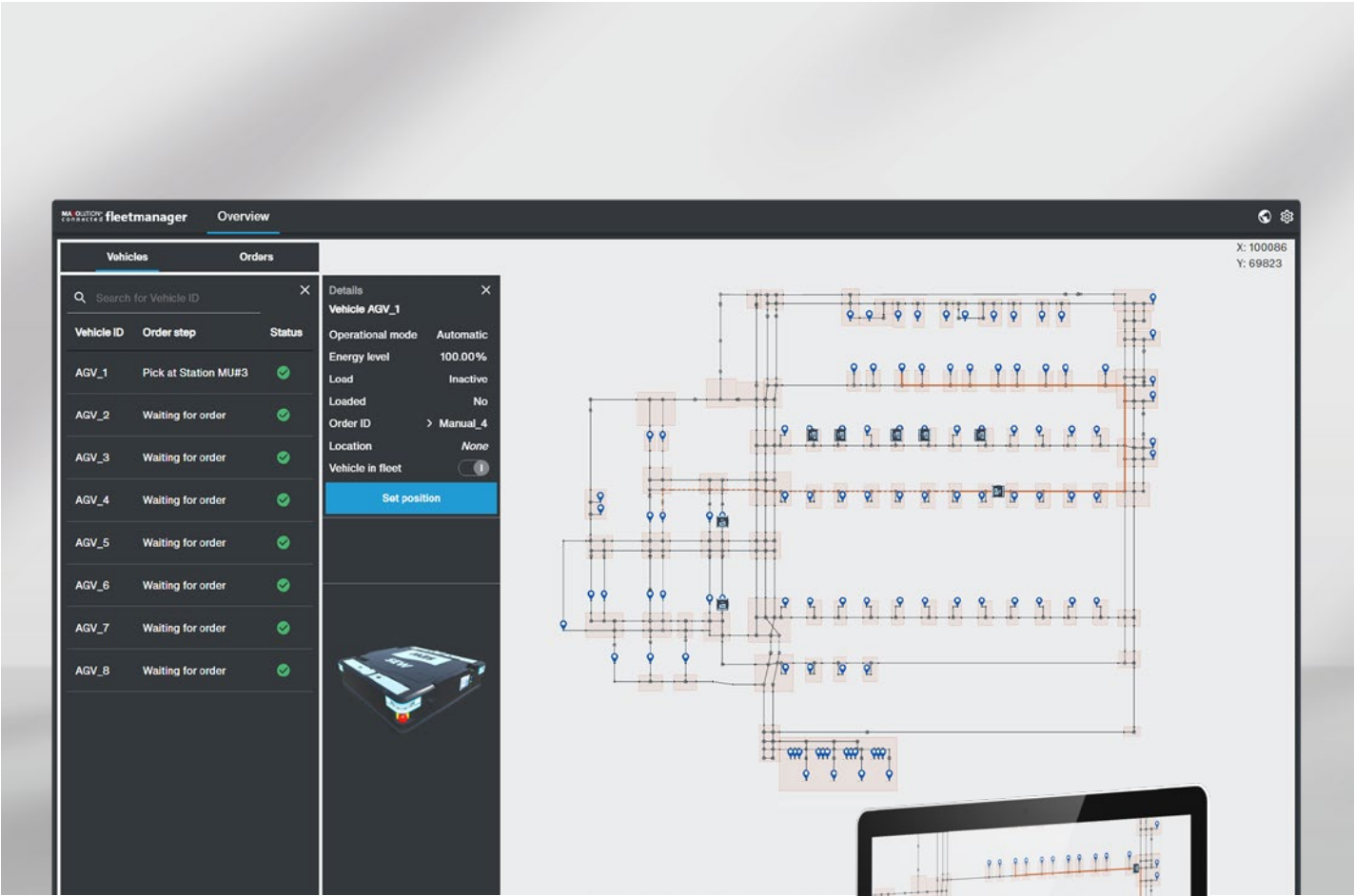
Vehicle software
Control of automated guided vehicle systems
→ [Page 58](#)

The modular software system



How is the modular software system structured?
The software architecture of MAXOLUTION® connected

Fleet manager
MAXOLUTION® connected



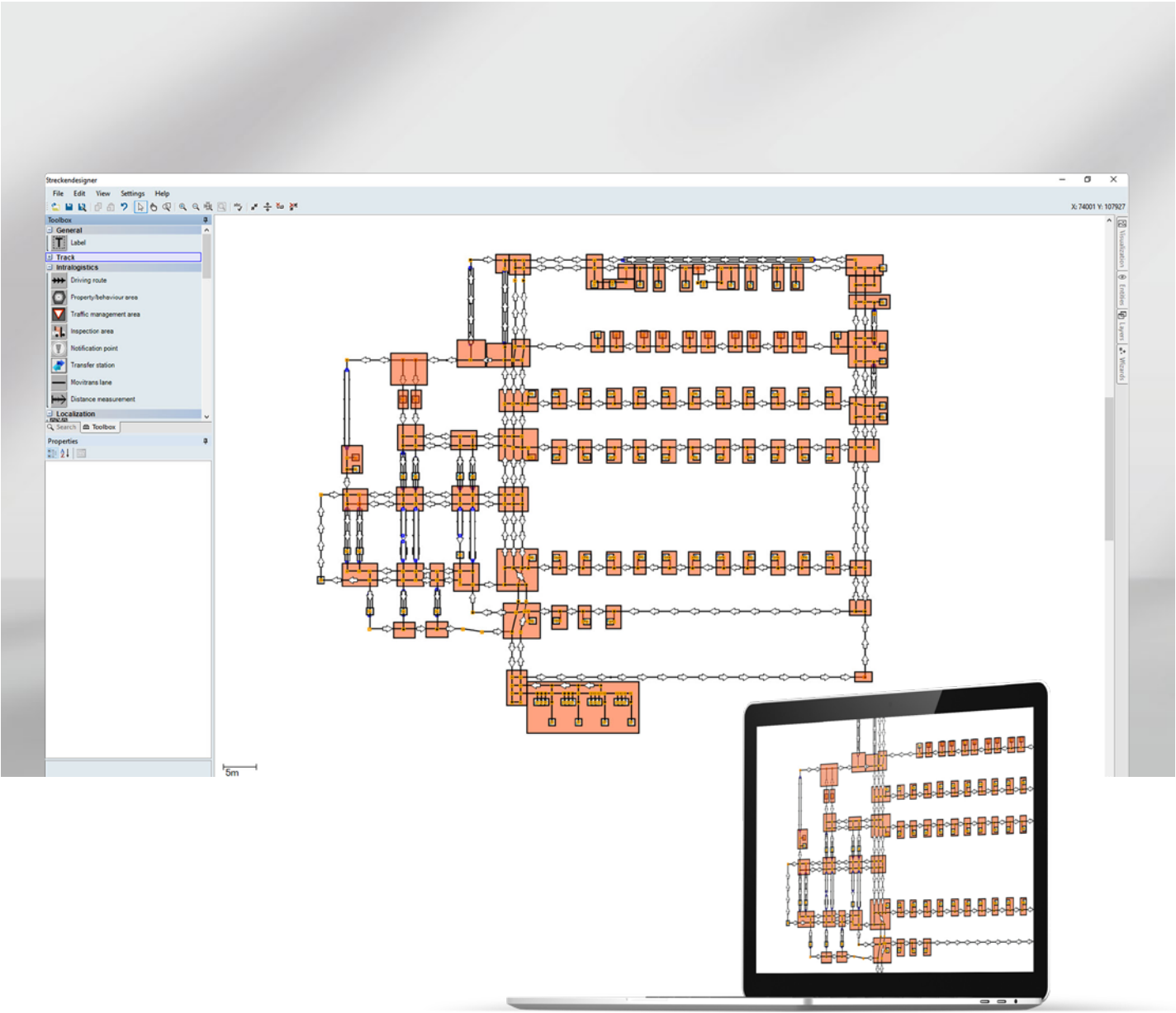
The fleet manager uses the standardized interface for this purpose. VDA 5050 is a standardized interface between automated guided vehicle systems and a guidance control system. This standard was defined in cooperation with the German Association of the Automotive Industry (VDA) and the VDMA Materials Handling and Intralogistics Association.

➤ Acting as the AGVS guidance control system, the fleet manager handles transport order management, vehicle planning, and travel order processing.

Features and benefits

- **Transport order management**
Accepting and prioritizing transport orders from the higher-level system
- **Vehicle planning**
Determining the most suitable vehicle
- **Traffic management**
Ensuring a smooth flow of traffic, taking vehicle dimensions into account
- **Energy management**
Providing the vehicle fleet with a reliable, high-performance power supply
- **Routing management**
Calculating possible path combinations and selecting the optimal route
- **User-friendly**
Easy access via the web browser thanks to a web-based user interface
- **Interfaces**
VDA 5050 interfaces for communication with standardized interfaces to customer systems and to automated guided vehicle systems
- **Availability**
Flexible software installation on an industrial PC or a virtual machine
- **Uniform**
Uniform communication architecture with the vehicles
- **Monitoring**
Condition monitoring and data logging

Track designer
MAXOLUTION® connected



➤ The user-friendly track designer application software parameterizes travel sections and transfer scenarios.

Features and benefits

- **Creation**

Of travel sections – manually or automatically – by importing CAD data
- **Configuration**

Of directions of travel, speeds, and vehicle orientation
- **Definition**

Of traffic areas to avoid deadlocks and optimize the material flow
- **Positioning**

Positioning and configuration of transfer stations and charging stations
- **Transfer**

Simplified upload process for straight-forward uploading of route files to the fleet manager
- **Effective**

Quick and easy integration of process logic
- **Simple**

No programming expertise required to start up processes
- **Monitoring**

Condition monitoring and data logging
- **Productivity**

User-friendly software operation for easier work processes

Vehicle software
MAXOLUTION® connected



➤ The modular vehicle software controls the automated guided vehicle and processes the VDA 5050 travel order.

Features and benefits

- **Modular**

Vehicle software for standardized and customized vehicles
- **Kinematics**

Compatible with all kinematic models – unidirectional, bidirectional, and omnidirectional
- **Navigation functions**

Supporting various types of navigation, such as laser navigation, inductive track guidance, and optical track guidance
- **VDA 5050**

Standardized and simple connection to a VDA 5050-compatible AGVS guidance control system by means of a VDA 5050 interface
- **Interface**

Predefined interfaces to standardized and customized load handling devices
- **Reliability**

Comprehensive self-diagnosis function for identifying and rectifying problems quickly
- **User-friendly operation**

Easy access via the web browser thanks to a web-based user interface
- **Monitoring**

Condition monitoring and data logging
- **Availability**

Platform-independent user interface, consistent display, and operation on multiple devices

Contactless energy transfer system

MOVITRANS® spot



Mobile components
– Charging power **up to 11 kW** per pick-up

Stationary components
– Decentralized supply up to **8 kW at 50 kHz**
– Magnetoresistor can be installed **in** or **on the ground**
– **Heavy-duty design** available

MOVITRANS® line



Mobile components
– Charging power **up to 1.5 kW** per pick-up

Stationary components
– Decentralized supply up to **14/16 kW at 50/25 kHz**, connected load up to **48 kW** possible (parallel connection of multiple devices)
– **Line cable** or **wedge-shaped cable solution**
– **Quick, easy, and open** installation of wedge-shaped cables
– Can be installed **in** or **on the ground**
– **Inductive conductor** can be used for both **charging** and **navigating** (measuring accuracy +/- 2 mm)



Your benefits at a glance

- Contactless energy transfer
- Very high efficiency
- Decentralized IP65 technology – no control cabinet required
- All connections are pluggable
- Maintenance-free and wear-free energy transfer
- Maximum flexibility thanks to a variety of installation options



SEW-EURODRIVE

What can we do for you?

Other topics that might
be of interest to you

**Automation bundles
for mobile assistance systems**



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