

VISIONS BECOME SOLUTIONS

Special issue for HANNOVER MESSE 2019

**MAXOLUTION®-Automation solutions
for the automotive industry**



Visions become solutions – MAXOLUTION® automotive smart factory

Digitalization is not only changing the automobile and mobility, but also the automobile factory itself. The smart factory is less about technical-mechanical strengths than about maximum flexibility and establishing efficient procedures and processes as well as cost-optimized implementation of batch size 1. The basic building block for the factory of the future is therefore switching from a rigid structure to a more modular, flexible, and adaptable one.

Whatever the needs in the materials handling technology of automobile production, MAXOLUTION® automation solutions from SEW-EURODRIVE always has the right answer for more flexibility, more productivity and more efficiency – tailor-made for the special requirements in automotive manufacturing. Whether it is cost-efficient material flow, precise positioning or innovative solutions with limited space – continuous productivity, the highest level of flexibility and ergonomic handling is most important in the entire process chain of automobile production.

The special feature of MAXOLUTION® solutions:

- Modular, parameterizable, scalable solutions up to the complete mobile unit
- Implementing individual and flexible solutions for premium standards
- Maximum flexibility, highest efficiency and implementation of batch size 1 while reducing costs

10 good reasons for MAXOLUTION® automation solutions

- **Innovative and successful technologies – ready for industry 4.0**
- **Worldwide and from a single source – the entire control and drive system**
- **For any track – track guided or autonomously**
- **Modular system – maximum flexibility and efficiency**
- **Mobile logistics concepts for intelligent networking in assembly and production**
- **Safety functions for high demands and any load**
- **Disruption-free and shielded communication**
- **Smart software solutions integrate technology modules – transparent and user friendly**
- **Data transparency, maintenance forecasts, and high plant availability**
- **Reliable planning and minimized risk due to project planning, visualization, and simulation**



Our innovative MAXOLUTION® automation solutions for factory automation offer technologies that are required for modern automobile production – smart, safe, scalable, and integrated in your system.

With MAXOLUTION®, SEW-EURODRIVE offers automation solutions for the entire distribution chain and is an attractive partner both as supplier of product solutions and end-to-end solutions – for OEMs and end customers. Now available: an intelligent fleet of autonomous automated guided vehicles, and assembly, logistics and handling assistants.

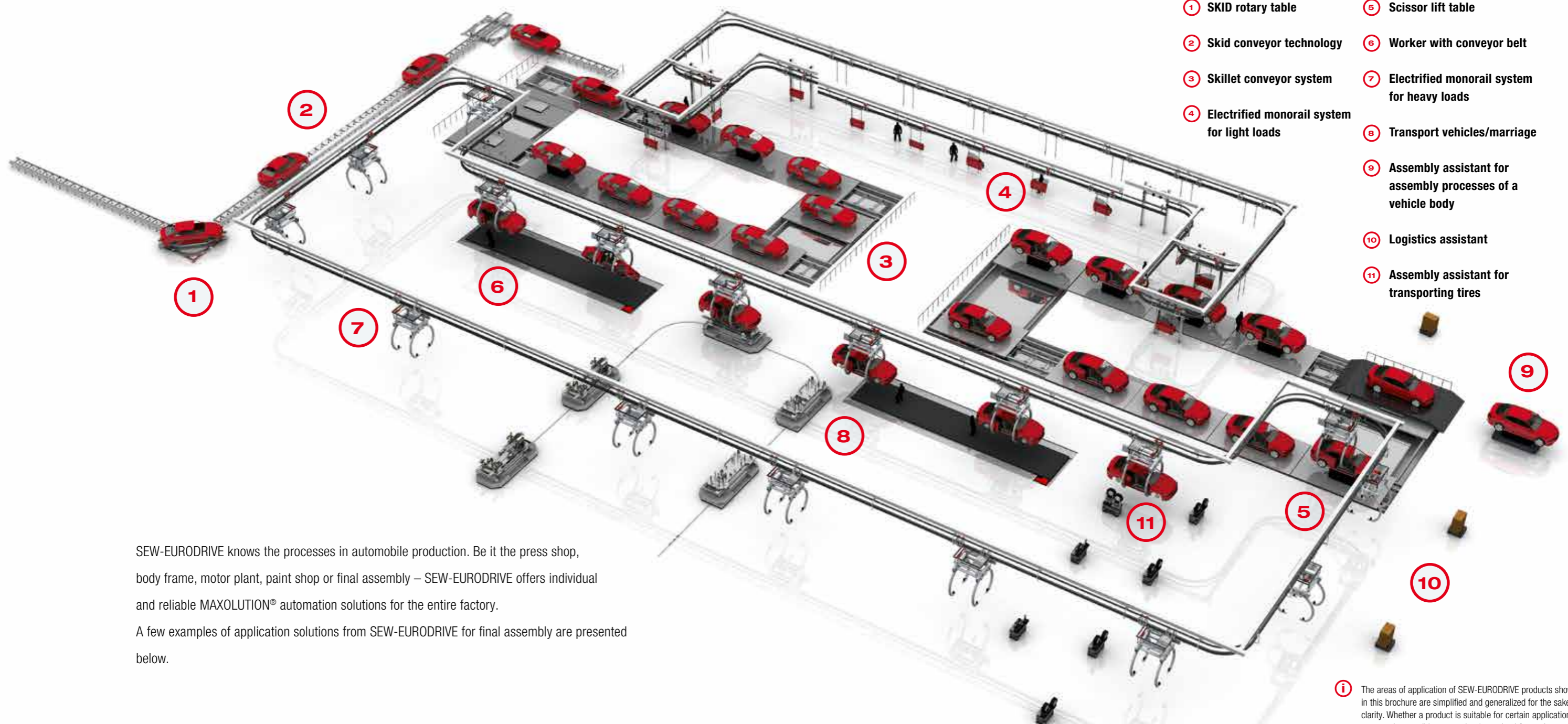
**With SEW-EURODRIVE from the
component to the system –
national and international.**

Find out more about our products and solutions for the automotive industry at
www.sew-eurodrive.de/maxolution-automotive

MAXOLUTION® automation solutions

for materials handling technology in the automotive smart factory

Track guided and autonomous system solutions taking final assembly as an example



- | | |
|---|---|
| ① SKID rotary table | ⑤ Scissor lift table |
| ② Skid conveyor technology | ⑥ Worker with conveyor belt |
| ③ Skillet conveyor system | ⑦ Electrified monorail system for heavy loads |
| ④ Electrified monorail system for light loads | ⑧ Transport vehicles/marriage |
| | ⑨ Assembly assistant for assembly processes of a vehicle body |
| | ⑩ Logistics assistant |
| | ⑪ Assembly assistant for transporting tires |

SEW-EURODRIVE knows the processes in automobile production. Be it the press shop, body frame, motor plant, paint shop or final assembly – SEW-EURODRIVE offers individual and reliable MAXOLUTION® automation solutions for the entire factory.

A few examples of application solutions from SEW-EURODRIVE for final assembly are presented below.

i The areas of application of SEW-EURODRIVE products shown in this brochure are simplified and generalized for the sake of clarity. Whether a product is suitable for certain applications or operating conditions must be determined for each case on the basis of the valid operating instructions.

Assembly becomes added value – Solutions for flexible automobile production

Ground-breaking solutions for the automotive industry

SEW-EURODRIVE knows the processes in automobile production. Be it the press shop, body frame, motor plant, paint shop or final assembly – SEW-EURODRIVE offers individual and reliable MAXOLUTION® automation solutions for any requirement. A few examples of solutions from SEW-EURODRIVE for final assembly are presented below.



Skillet conveyor system ③ ⑤

The skillet conveyor system is an assembly of lined up skillets that continuously pass through various work stations. Each skillet is equipped with a lift table, to which power is supplied via contactless energy transfer, for example. This system solution positions the car bodies in ergonomic working heights at the different work stations.

Your added value:

- High availability
- Standardization and high stability in the electronics
- Very short run-up time for the control system

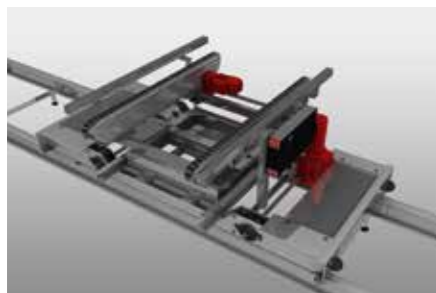


Electrified monorail system for light and heavy loads ④ ⑦

Employing classical electrified monorail systems (EMS) requires extensive and costly technical retooling. Often, components are not specifically matched to each other. This is why these systems are not only time-consuming and cost-intensive in the planning phase, they are also prone to errors during operation. As an alternative, SEW-EURODRIVE offers a two-level concept for intelligent and modular EMS systems, which meets the increased financial demands.

Your added value:

- Simple startup and operation
- Low costs for installation and operation
- Increased safety



Floor track system

MAXOLUTION® features low-maintenance and scalable solutions for highly dynamic floor track systems. Comprehensive and flexible safety functions increase system availability. Our portfolio comprises floor track systems with shielded WLAN communication EBB Advanced and floor track systems with safe communication EBB Safety.

Your added value:

- High availability
- Data transparency and high plant availability
- Reliable planning and minimized risk



Assembly assistant for assembly processes of a vehicle body ⑨

The mobile assistants for assembly processes involving a vehicle body in final vehicle assembly assist and relieve workers in their tasks. Used as an intelligent workbench, they improve ergonomics during work.

Your added value:

- Linking assembly steps
- Improved throughput times
- Safe working



Logistics assistants ⑩

The mobile logistics assistants carry out logistics tasks autonomously and cooperatively and actively support the assembly technician during his work. They know what they are transporting and can calculate their route through the factory based on the order.

Your added value:

- Intelligent interaction of man and machine
- Customer-specific load handling
- Ergonomic adjustment of the working height
- Saving valuable production time



Transport vehicles ⑪

The standardized, compact vehicles perform transportation tasks in production and distribution logistics. They have standard interfaces and can interact with various higher-level customer systems to travel the predefined routes statically and dynamically. Depending on the type, the vehicles can transport a payload of up to 3000 kg.

Your added value:

- Easy startup
- Efficient processes
- Intuitive operation
- Perfect networking

Tailored to your needs – MAXOLUTION® modular technology system for your solutions



MAXOLUTION® slotted waveguide (SHL) for improved resistance to interference

Your added value:

- Consistent communication
- Safe
- Shielded
- Robust
- No disruptions



Data matrix PXV 100 A (with multi-color code tape)

Your added value:

- 4 times larger code field
- Gap in barcode possible up to approx. 60 mm (expansion joint without L cut)
- No wheel sensors needed due to self-test routine
- Detection of degree of soiling of barcode



MOVISAFE® HM31-B for more safety

Your added value:

- Easy replacement without software
- Fast Boot option, e.g. for feeding in skilnet conveyors
- Reduction of WLAN traffic e.g. for skilnet conveyors
- DIP switch for CAN terminating resistor for reducing external components



Safe Distance Monitoring (SDM®) for safe monitoring of distances on assembly lines

Your added value:

- Safe variable distances due to SDM® software function
- Safe distances between vehicles without mechanical collision protection
- Space-optimized production due to dynamic work cycles
- Work cycles can also be implemented in critical areas, such as in curves



DRC.. electronic motor for increased setting range and IE4 efficiency

Your added value:

- Increased setting range
- Large speed range
- IE4 efficiency
- Highly efficient drive
- Reduced operating costs
- Can be overloaded by up to 250%
- Drive and control electronics on the motor
- Optimal utilization due to the adaptation to all requirements in any operating situation



MOVIVISION® parameterizable plant software

Your added value:

- Fast and simple startup
- 3D simulation/emulation
- Simple planning and configuration
- High degree of flexibility
- Accurate fault diagnostics and troubleshooting
- Increased productivity

New: Autonomous mobile systems

We offer all the components required for automating your factory from individual modules through to finished vehicles. Besides simply performing transportation tasks, extended functions and interfaces enable our mobile systems to assist people with logistics and production processes in the form of intelligent workbenches or collaborative robots, for example. Our offer includes: Assembly assistants, logistics assistants, handling assistants, and transport vehicles.

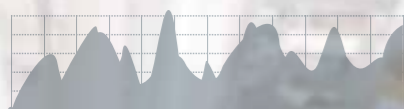
Your added value:

- Maximum flexibility
- Optimized scalability
- High productivity through lean principles



DriveRadar®: Condition Monitoring and Predictive Maintenance

7022011-0002899-770-000
339611900-SDFL-WQQ-



Smart system portfolio for MAXOLUTION® solutions

Thanks to integrated systems, our smart systems are capable of collecting data along the product life cycle, communicating and networking. Special condition monitoring solutions tailored precisely to the needs of customers in the automotive industry determine the condition of our smart systems at

regular intervals and generate the data base for condition-based maintenance. The data is evaluated and interpreted using cutting-edge predictive analytics procedures. This makes it possible to create an accurate maintenance forecast.

Already used by automakers as part of our MAXOLUTION® system solutions!

Your added value

- Early warning in case of critical system conditions or abnormal operating characteristics
- Prevents malfunctions and unplanned downtimes
- Maximum plant availability and productivity
- Displays the condition and operating characteristics of the system, thus providing transparency
- Improved ability to plan measures for maintenance and repair
- Maximum use of component and system lifecycles

Realizing tomorrow today – Smart factory services

As an automation partner and system supplier, we also provide a broad basis of infrastructure systems and software solutions – all adapted to suit the specific processes and interfaces. This includes digital services, including augmented reality, which open up new possibilities. In smart factory halls, tablets and smart glasses project assembly and maintenance information into the real visual field of staff as a 3D animation and make complex information simpler and easier to understand. The “see more, know more” concept provides support during initial training and reduces potential for error, particularly where a high level of variation is involved.

Besides drive and system solutions, we offer advice on factory design and production automation. Seminars and training courses give participants the opportunity to find out more about our solutions and sample applications. They also offer tips and highlight the kinds of obstacles that crop up while designing a Lean Smart Factory.

We took the first step: Companies link their internal processes and make their production processes become transparent. Machines are connected to the intranet and provide data making it possible for production planners to identify potential improvements.

Now we need to take the second – crucial – step towards industry 4.0: introducing smart services. Intelligent data transformation and processing no longer only controls in-house production. It is used to specifically improve the customer benefits and thus increase not only the customer's performance but also in-house performance. Smart services open up new potentials for value creation; they are the growth factor for industry 4.0.

MAXOLUTION® smart factory services at a glance

- Simulation/emulation
- Augmented and virtual reality
- Project management for smooth order processing
- Logistics consulting
- Analysis, inventory, startup, production monitoring, and retrofit
- Trainings/seminars 4.0

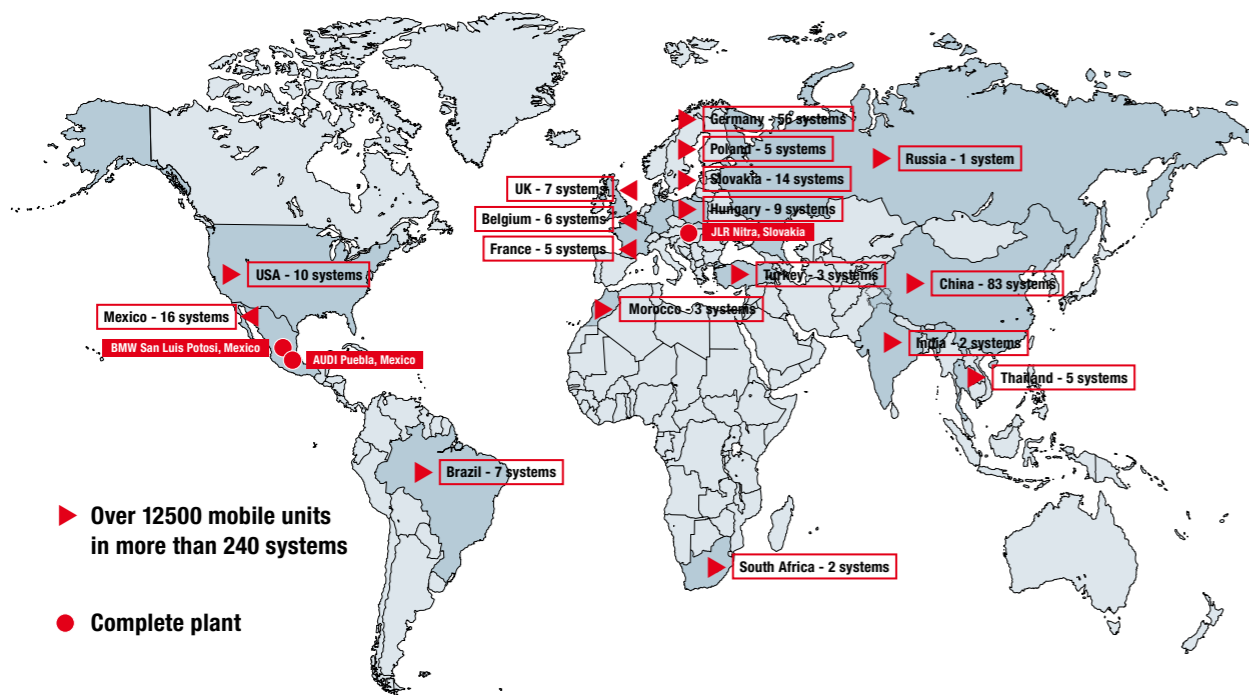
**Do you need help realizing your vision of the smart factory?
We will gladly provide our assistance.
With SEW-EURODRIVE, you have an experienced partner by your side.
We turn your vision into reality. Get in touch.**



Successful all over the world in the automotive industry

We do not only talk about visions, we turn them into reality: MAXOLUTION® automation solutions. Our company's plants and a large number of customer projects are proof of successful automation with MAXOLUTION®. Innovative concepts for a range of different logistics, assembly and manufacturing tasks are tested and developed continuously at our sites according to the principles of value creation. We want to work closely with you, our customers, to formulate perfect concepts and turn them into reality. Because our goal is your success.

MAXOLUTION® reference projects



▶ Over 12500 mobile units in more than 240 systems

● Complete plant

MAXOLUTION® installed mobile units

AUDI	FIAT	Hongqui	MAN	RBS
Aiways	Ford	Iveco	Maxus	Sokon
BMW	Freightliner	JAC	Mitsubishi	VW
BAIC Motor	Geely	Jinkang	Mitsubishi Fuso	
Borgward	GM	JLR	mtu	
Changjiang	GMC Ford	John Deere	Nissan	
Daimler	Great Wall	KIA	Porsche	... and many
FCA	Honda	Lamborghini	PSA	others.

Taking materials handling technology to the next level – New solutions for the smart factory



Your benefits with our MAXOLUTION® automation solutions:

The MAXOLUTION® services of SEW-EURODRIVE offer you real added value. Together with our customers, we have been implementing optimized and successful solutions for more than 15 years.

- Logistics and assembly consulting
- Analysis, review and concept development
- Project and system engineering
- Customer-focused project management
- Visualization with augmented reality
- Energy consulting and energy infrastructure design
- Software creation, simulation and emulation of processes
- Virtual startup with virtual reality and digital twin
- On-site assembly support and startup
- DriveRadar® and Smart Services for product support
- Installed base management/retrofit
- All from a single source – worldwide

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How we're driving the world



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