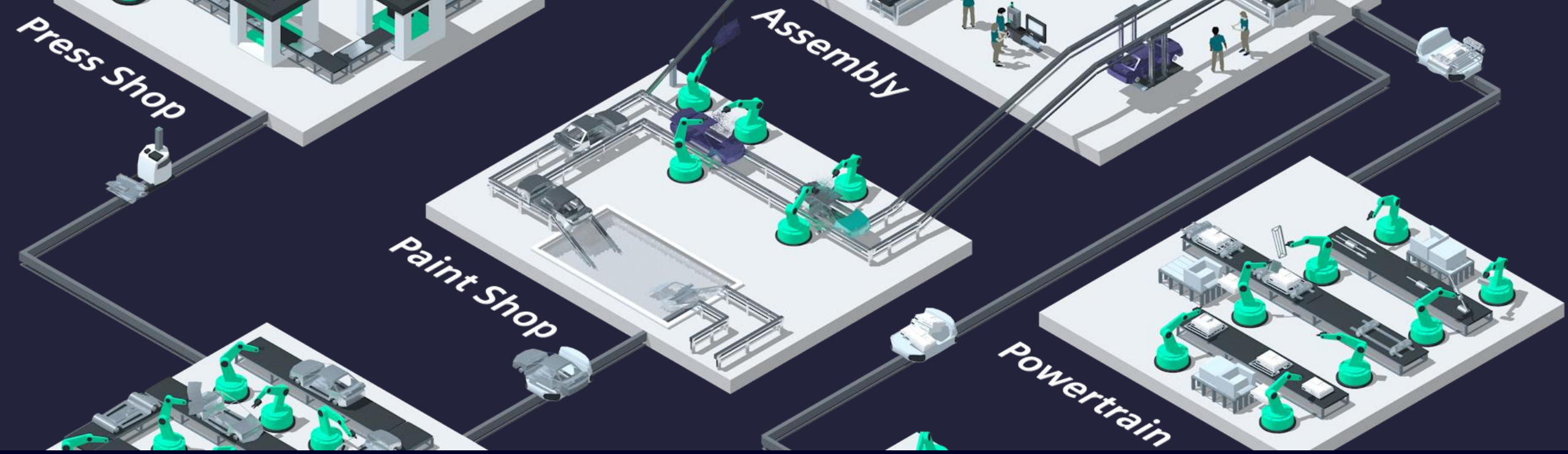
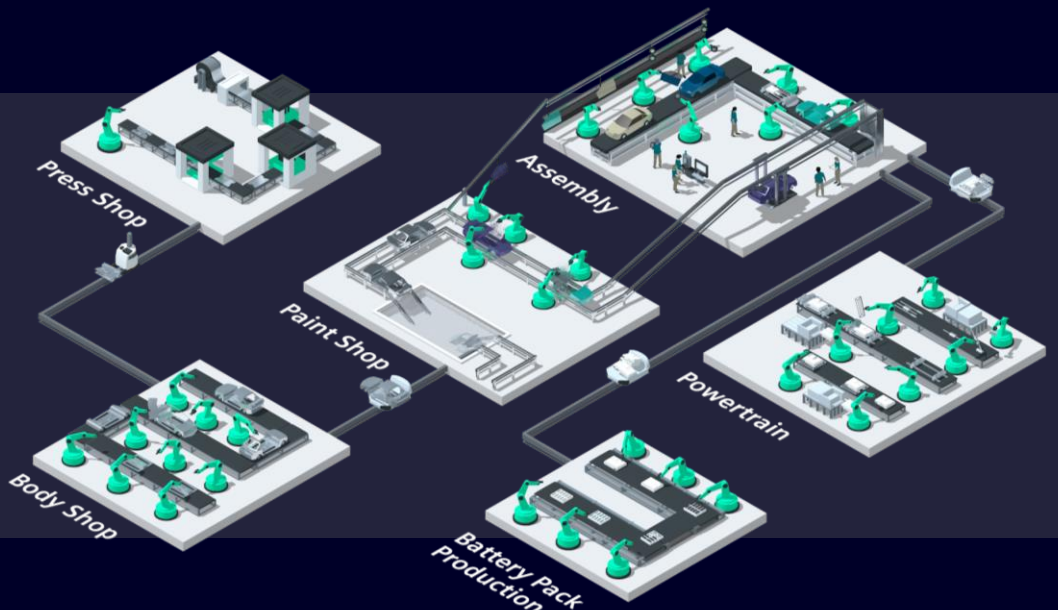


SIMATIC IDENT

Industrial identification for digital production in the automotive industry

SIEMENS

Digital production in the **automotive industry**



Press Shop

- UHF – Process safety through UHF
- HF – Fast and reliable transport processes
- OID – Optimization of the material flow

Body Shop

- UHF – Process control for customer vehicles
- Access control – User management
- OID – Identification for optimal process control

Paint Shop

- UHF – Process control in the paint shop
- HF – Robust Ident solutions in the paint shop
- OID – Identification for flexible production in the paint shop

Assembly

- UHF – Tire logistics in the assembly
- HF – Intelligent material management
- OID – Identification of add-on parts

Powertrain

- UHF – Optimization of e-motor assembly
- HF – Fast and reliable transport processes in e-motor assembly
- OID – Identification of e-motors

Battery Pack

- UHF – AGVs in the battery pack assembly
- HF – Intelligent product carriers for the battery module assembly
- OID – Identification of battery cells

Press Shop

The first steps are networking, data analysis, and tracking. The focus is on boosting productivity, reducing downtime, and identifying raw materials and tools.

SIMATIC RF600
Process safety through UHF

- Safe processes thanks to smart filters and algorithms for detecting transponders, as well as comprehensive integrated diagnostic options
- Scalable solutions through comprehensive antenna portfolio
- Maximum flexibility and time savings via integration of numerous interfaces into a wide range of automation and management systems

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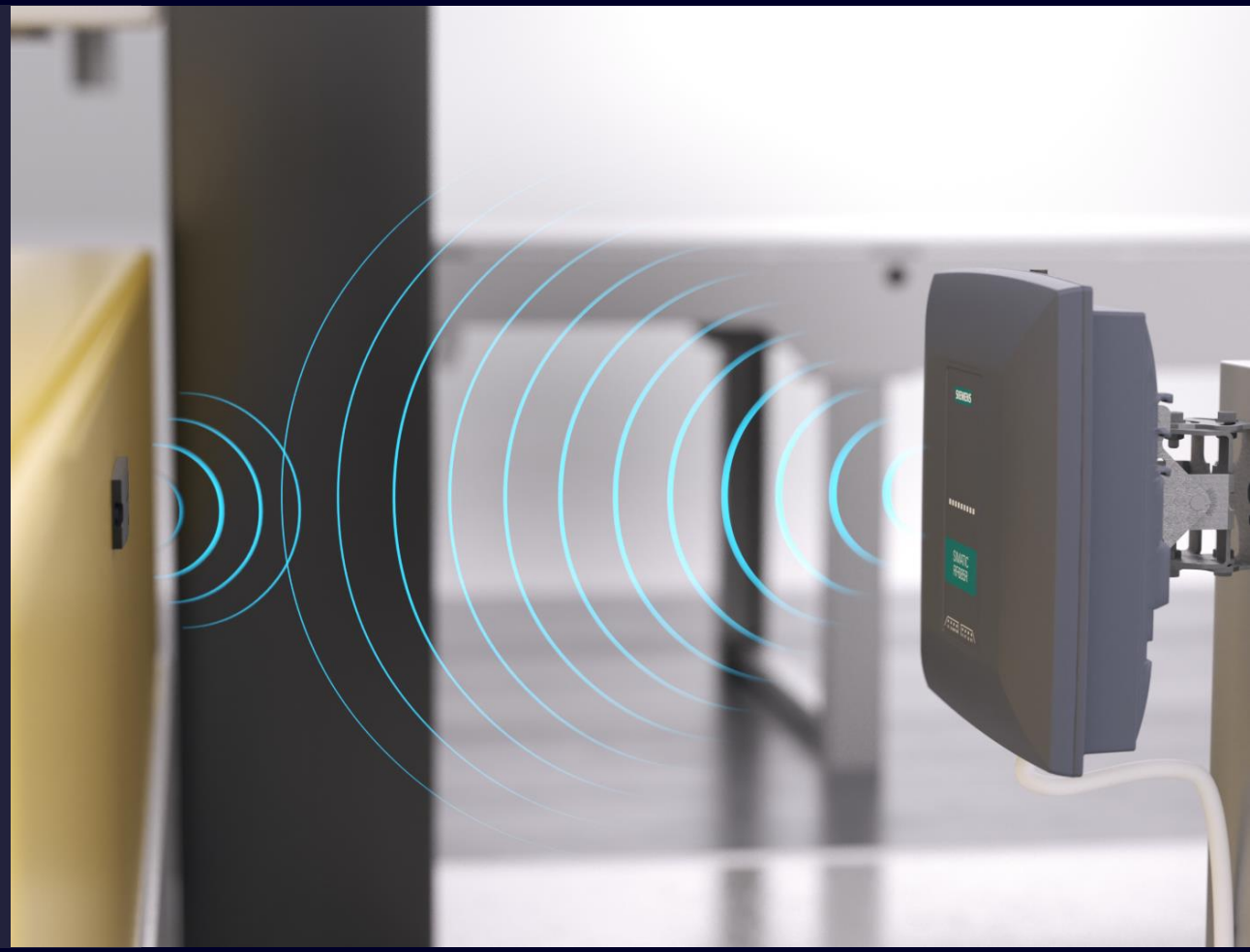
SIMATIC RF600
Process safety through UHF

- High degree of flexibility thanks to the connection to all automation systems via PROFINET, Ethernet/IP, and PROFIBUS; simultaneous connection to management systems via OPC/UA or TCP/IP (XML) is also possible.
- In the SIMATIC environment, a UHF application program is created within minutes thanks to a wizard and ready-made modular solutions.
- Fast commissioning and fault analysis made possible by an integrated web-based management (WBM) system. WBM serves to activate smart filters and algorithms in order to start reading the transponders and evaluate the read quality.



SIMATIC RF300

Fast and reliable transport processes with HF technology

- Increasing efficiency via fast data transmission, particularly of larger volumes of data for process documentation
- High transparency thanks to comprehensive diagnostic options via WBM and the TIA Portal when commissioning and during ongoing processes
- Integrated security mechanisms to guarantee data integrity during the data exchange

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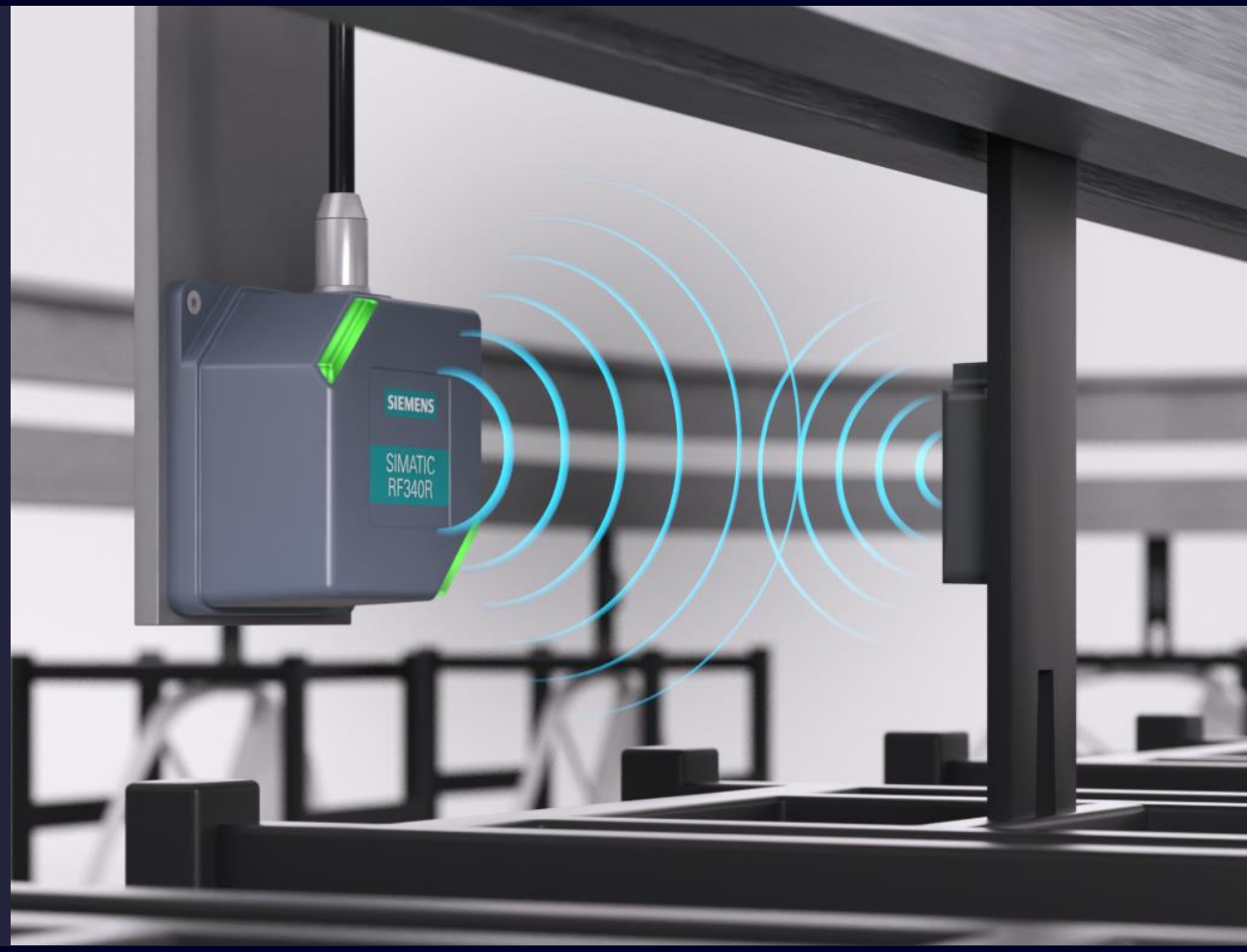
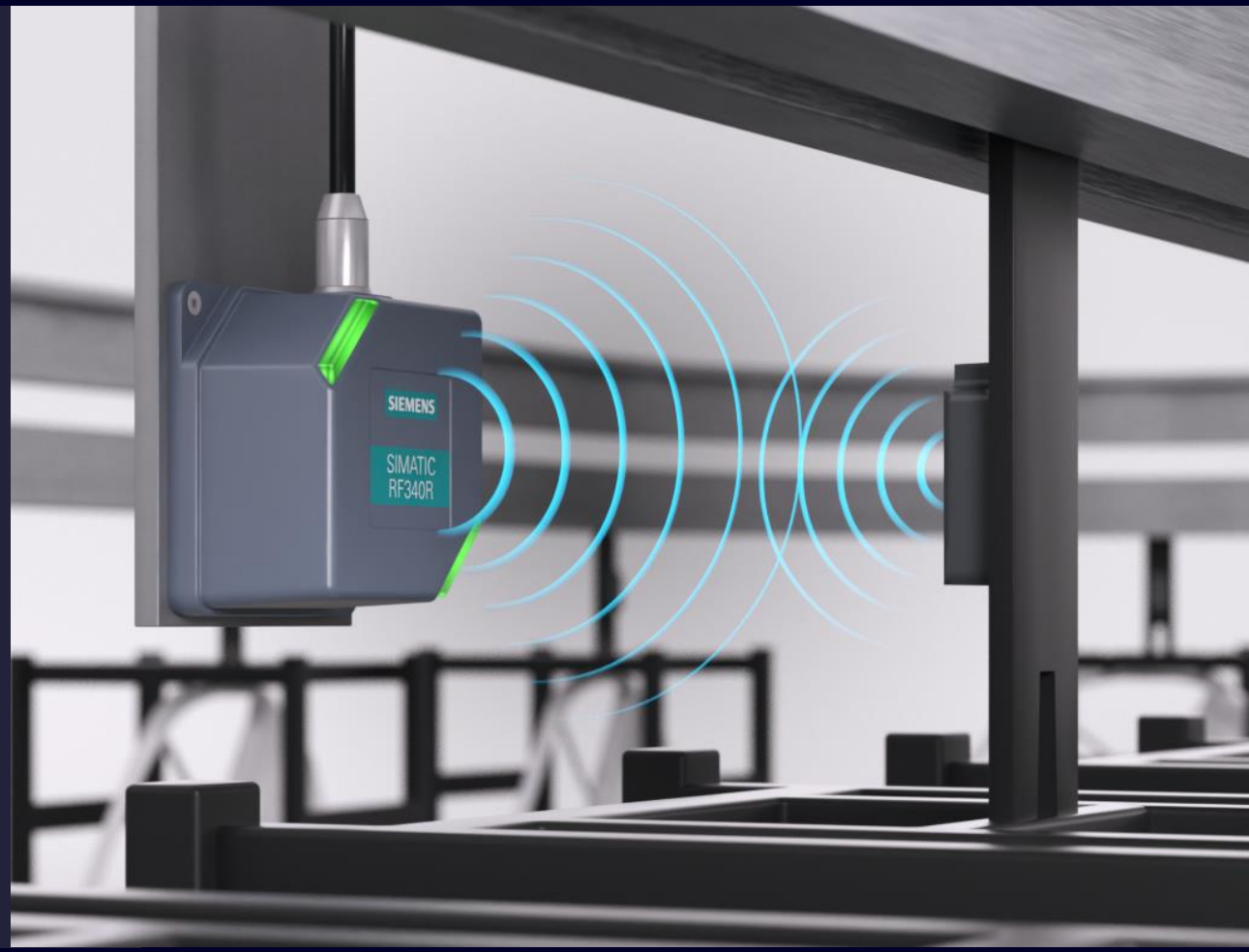


SIMATIC RF300

Fast and reliable transport processes with HF technology

- Stable, operationally reliable transfer via HF technology is ensured along with short clock cycles and large volumes of data for process control.
- 24/7, mid-process monitoring by observing the plant, supported by comprehensive diagnostic options during commissioning and ongoing operation for long-term optimization over long periods of time, e.g., acceptance test.
- Safeguarding of data integrity during communication between reader and transponder thanks to implemented security mechanisms and the identification of individual errors on the bit level, e.g., error correction mode.



SIEMENS
SIMATIC
RF340R

SIMATIC MV500
Optical identification for optimizing the material flow

- Robust concept with IP67 degree of protection for camera and lighting
- High degree of flexibility due to modular, scalable design of the hardware in combination with self-optimizing algorithms
- Industry-tested cybersecurity features for long-term, secure use, including in critical infrastructure

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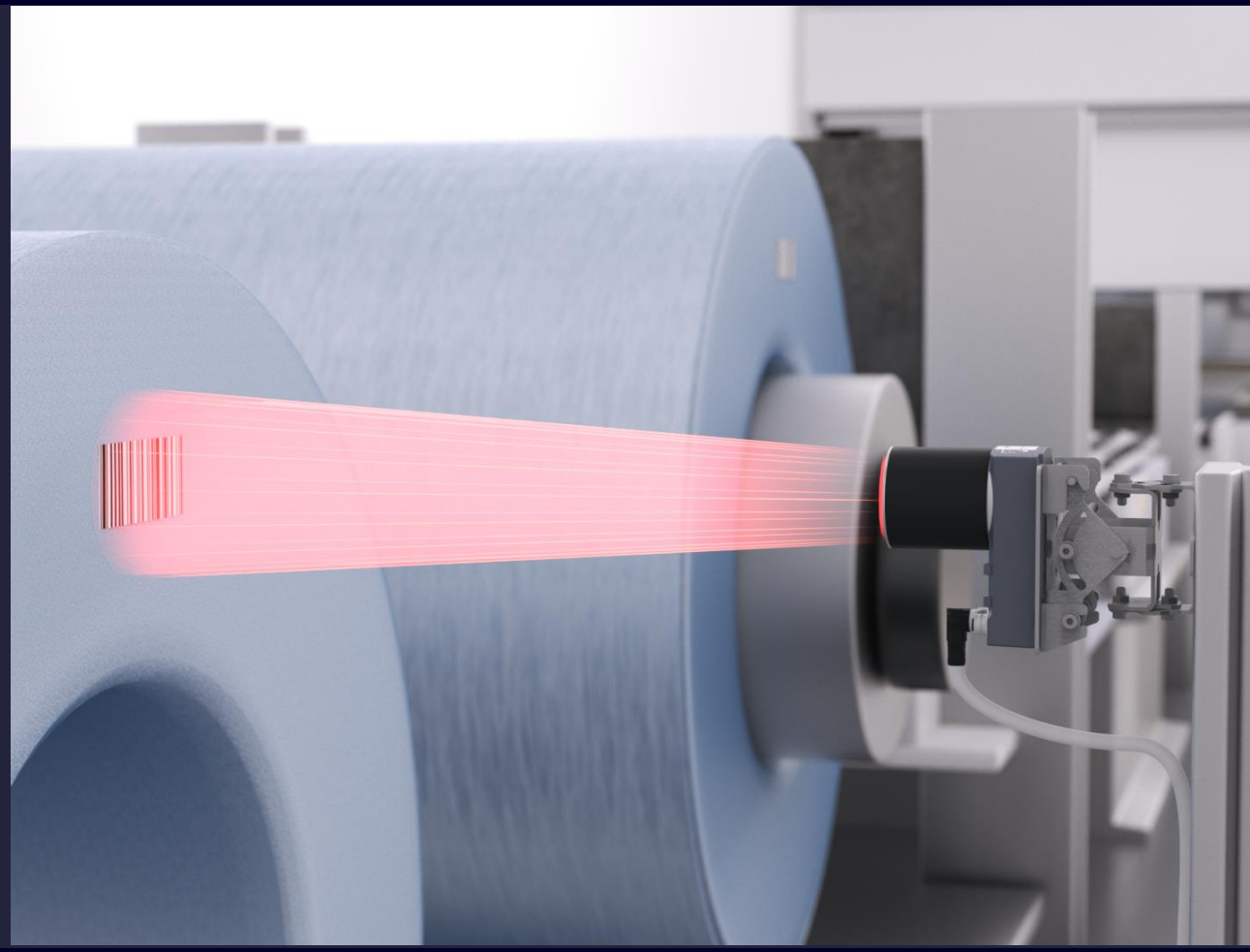
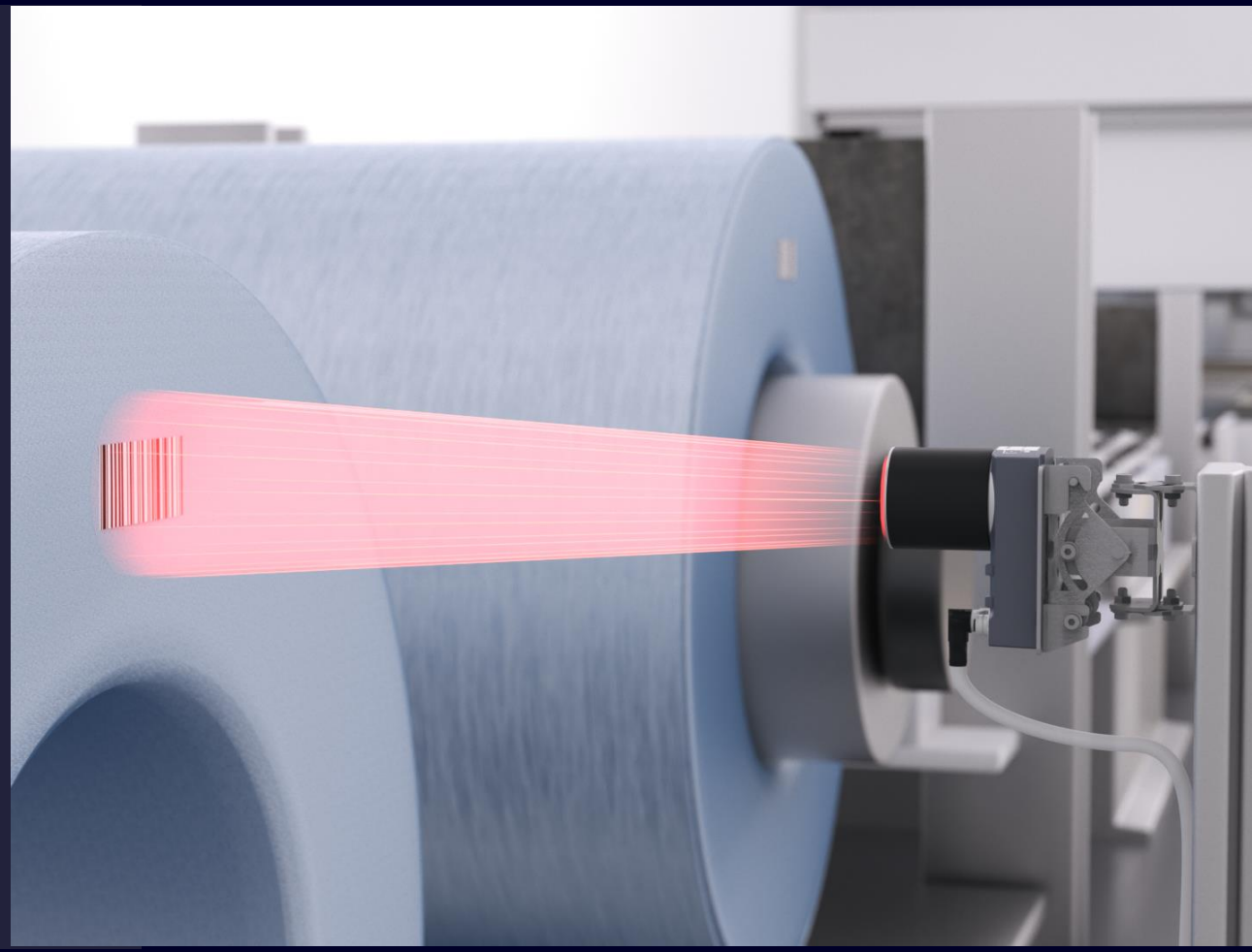
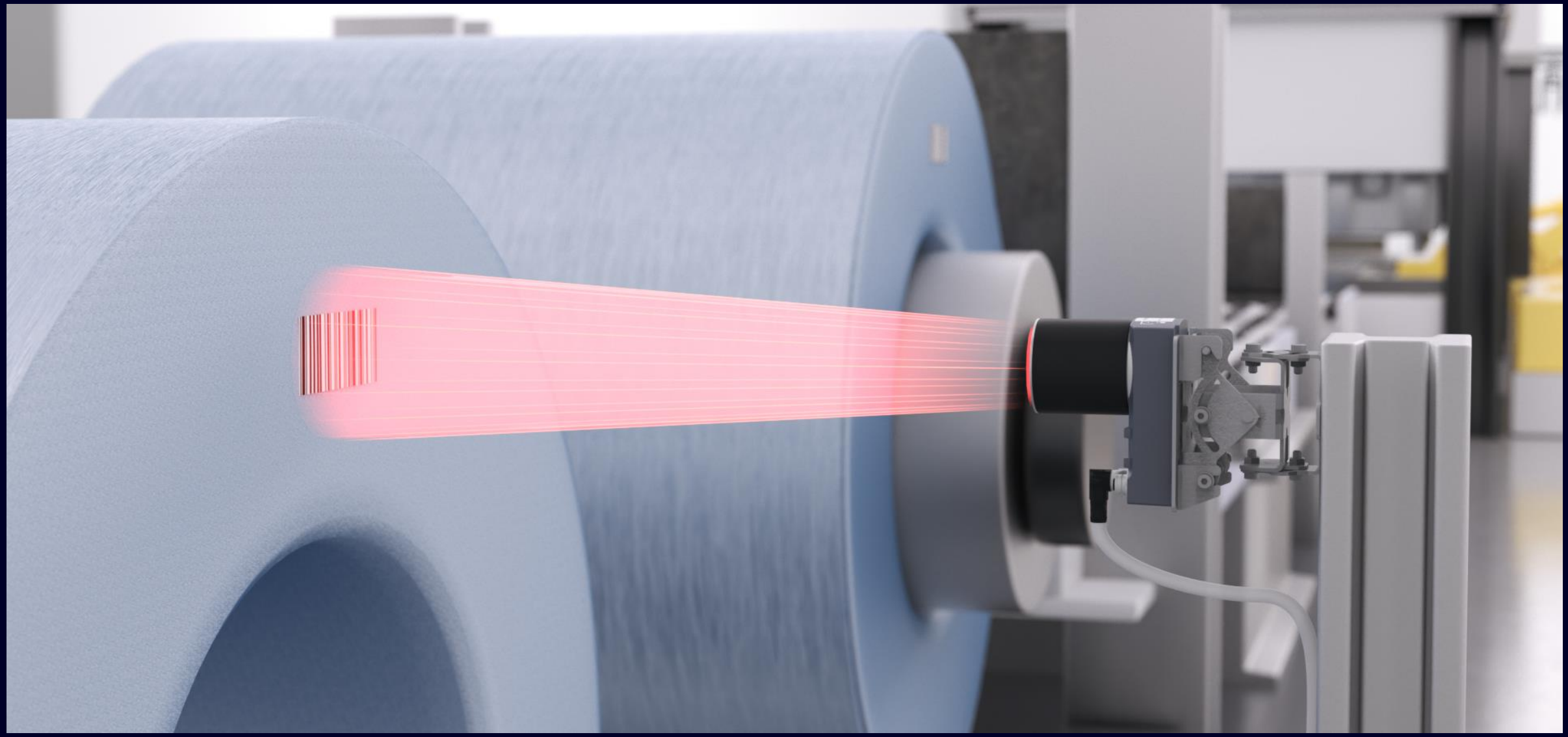


SIMATIC MV500
Optical identification for optimizing the material flow

- The wear-free design of the liquid lens of the e-focus guarantees a long service life without the need for maintenance. Varying distances can also be reliably compensated during the ongoing process thanks to the integrated industrial e-focus.
- High degree of flexibility and scalability thanks to a large selection of lenses and camera resolutions in order to reliably enable operating distances ranging from 3 cm to 3 m as well as large capture ranges and different code placements.
- Strong protection against cyberattacks thanks to certificate-based, encrypted communication with the camera’s web interface and regular product and security updates.





Body Shop

Full type flexibility. Each material can be identified and processed using the right Ident technology. Just in time and just in sequence.

SIMATIC RF600
Process control for customer-specific vehicles

- Reliable prevention of incorrect readings and overranges thanks to algorithms tested for use in the automotive industry
- Industry-standard versions with wide temperature ranges and high degree of protection make the entire system resistant to outside influences
- Reliable sequencing with short distances between workpiece carriers thanks to an evaluation of the quality values of all transponders in the UHF field

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SIMATIC RF600
Process control for customer-specific vehicles

- Reliable operation without errors due to overranges or incorrect readings is made possible by comprehensive filters and algorithms integrated directly into the reader for qualified results in the user program.
- All RF600 components are tested and protected against environmental influences like dust, electromagnetic disturbances, chemical additives, lubricants, and elevated temperatures.
- Possibility of evaluating and qualifying (RSSI value) all transponders in order to determine relative positions in the conveyor line, e.g., supplying add-on parts.

SIMATIC RF1000

Processes controlled by the user management system

- Using existing company ID cards for secure and efficient process operation and visualization as well as authentications and monitoring of authorization levels
- A wide range of integration options for easy retrofits
- High data security thanks to support from modern protocols; suitable for the company's cybersecurity concept

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SIMATIC RF1000

Processes controlled by the user management system

- Individualized control of access rights via existing employee ID cards using LF and HF reader versions.
- Extremely simple integration and migration to new and existing plants via USB and RS-232 interfaces and in PROFINET networks via an interface module.
- Encryption methods based on ISO-14443 ensure high data security for the company-wide industrial cybersecurity concept.

SIEMENS
SIMATIC RF1070R

SIMATIC MV500
Optical identification for optimizing process control

- Self-optimizing algorithms enable the adaption to different surfaces of the car body parts
- Intelligent use of lighting options of the MV500 series enables stable processes even under changing conditions and difficult lighting situations
- Best practice-based readability indicators to simplify commissioning and mid-process quality assessment of the read process

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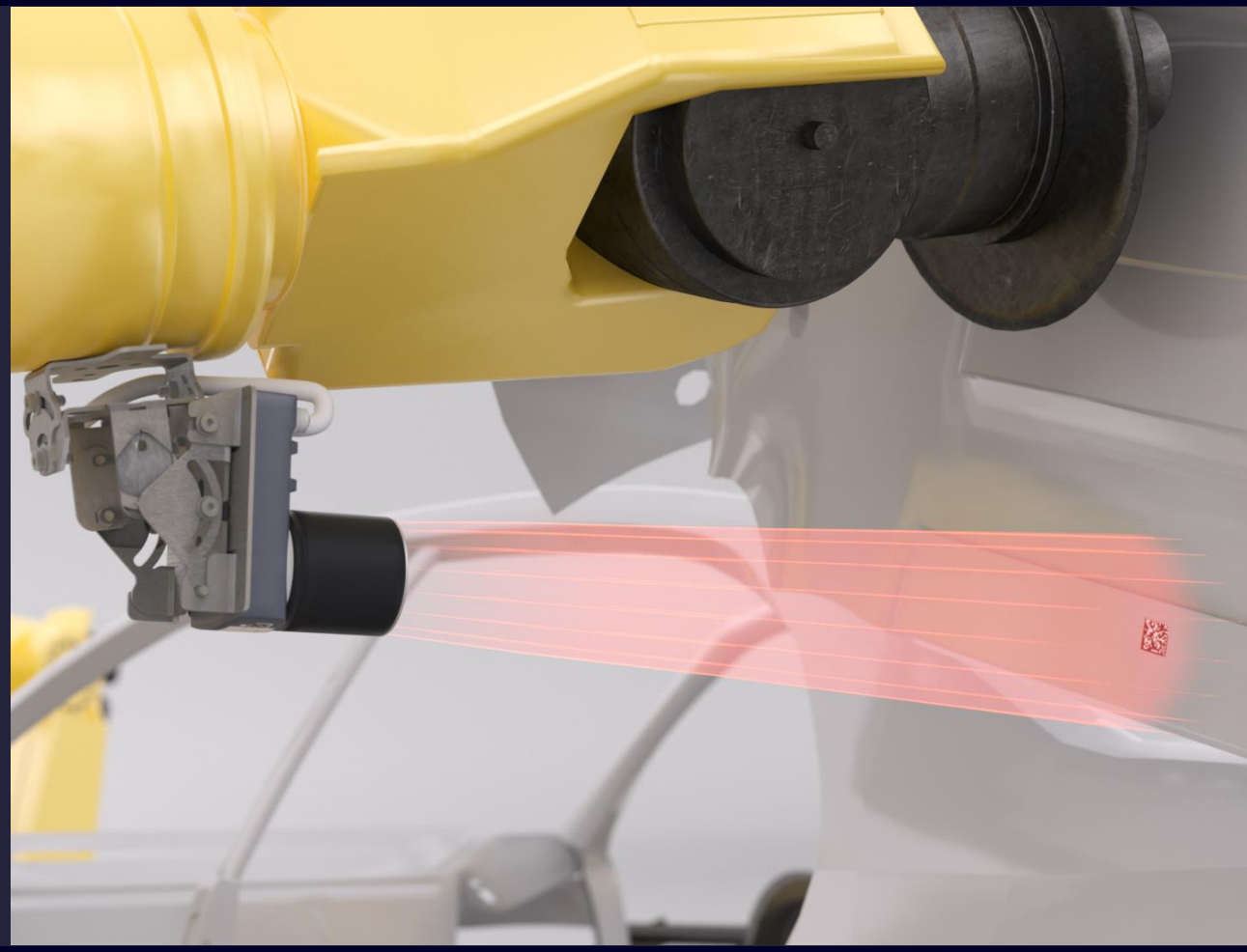
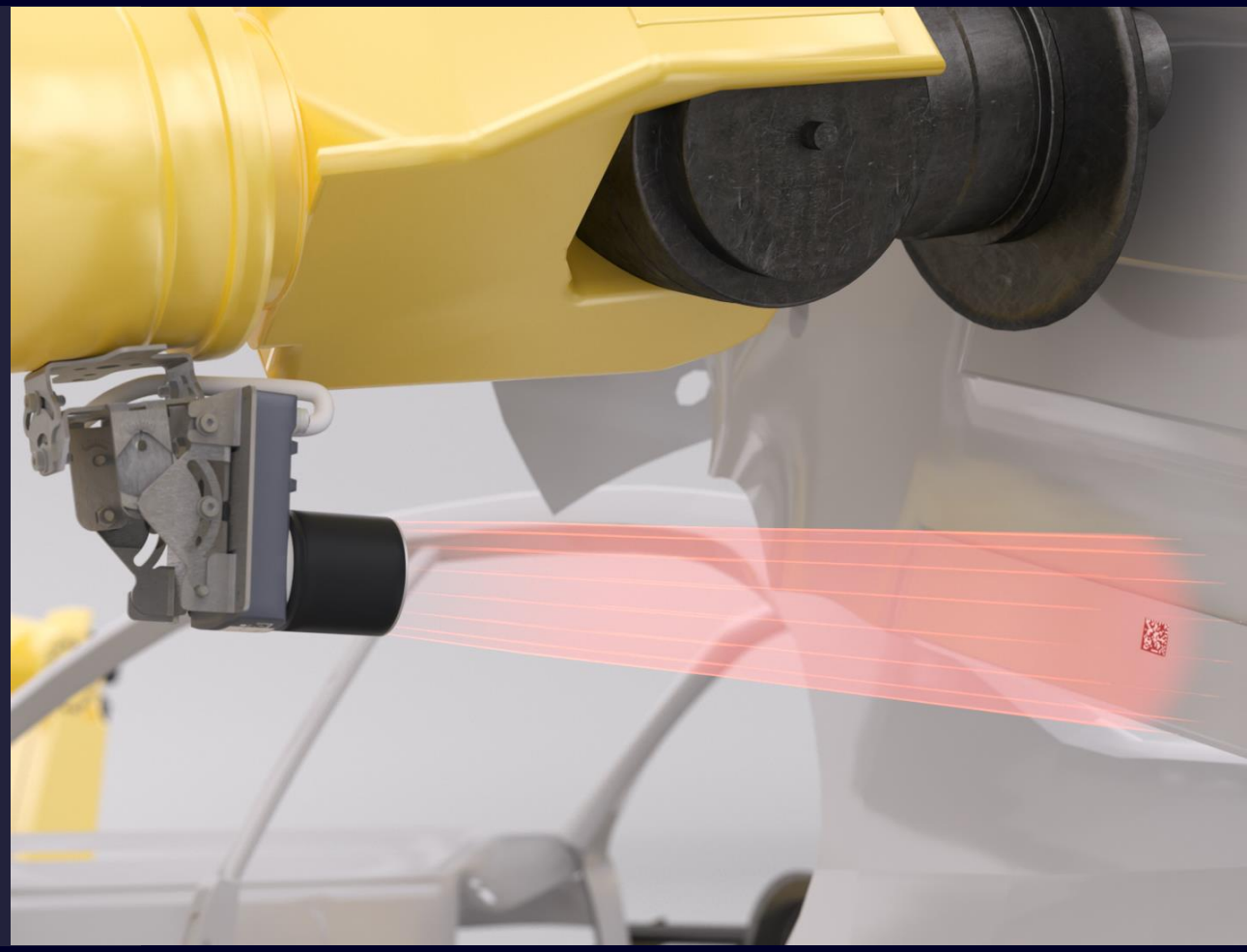
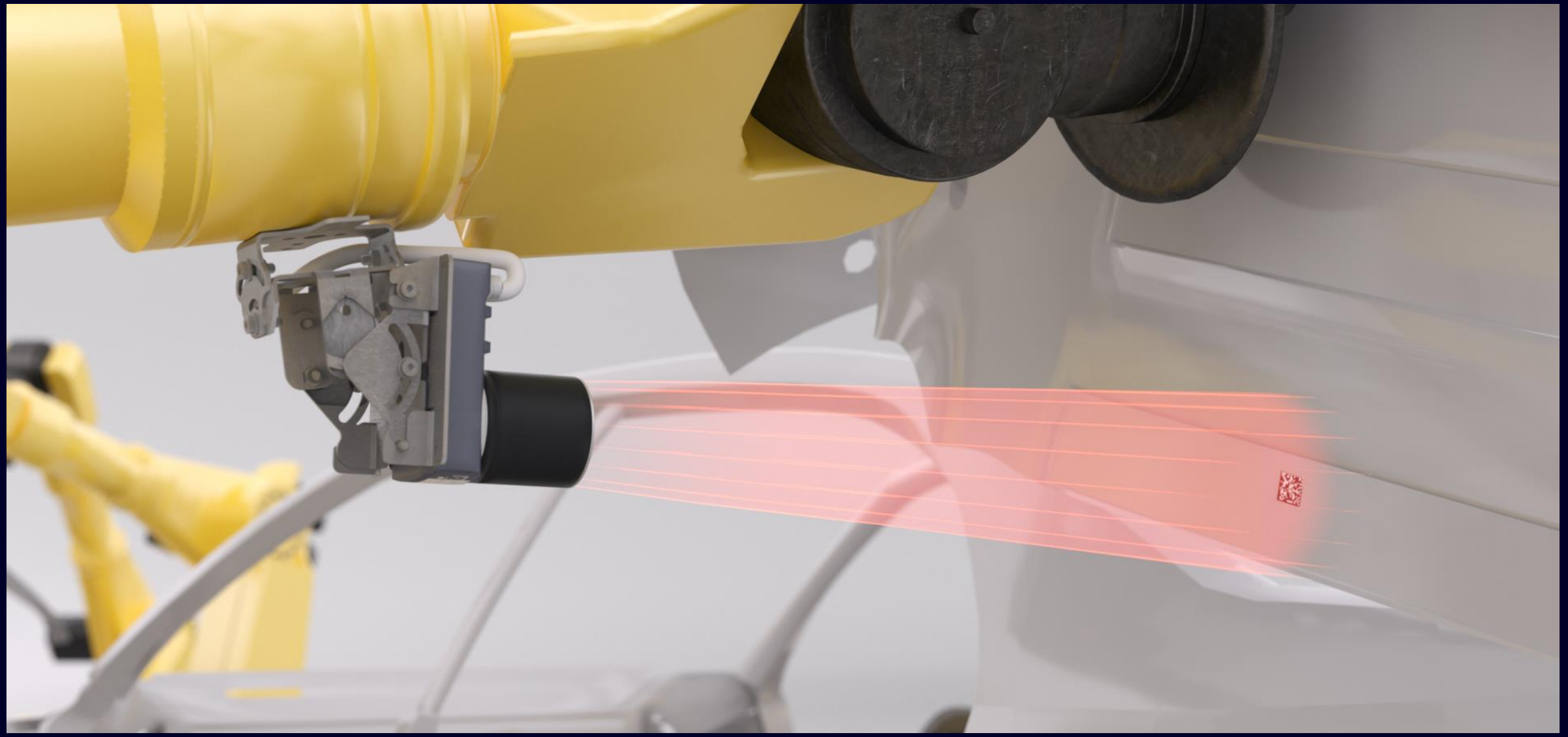


SIMATIC MV500
Optical identification for optimizing process control

- High degree of flexibility thanks to the “ID-Genius” self-optimizing algorithm for adapting to different surfaces of car body parts in case of large fluctuations in brightness, extreme reading angles, or interfering reflections.
- Optimal image contrast thanks to the flexible configuration of the internal ring light (including polarization filter) even on metallic and shiny surfaces for reliable car body identification.
- Fast, intuitive assessment of read quality thanks to Siemens’ readability indicator, an uncomplicated, practice-oriented benchmark for assessing readability.





Paint Shop

Lower energy consumption and less pollution: It all starts with flexible production and the intelligent control of process steps for brilliant colors and long product life cycles.

SIMATIC RF600
Process control in the paint shop

- Flexible positioning of RFID transponders on the workpiece or carrier thanks to robust data transmission, including in the presence of contamination or layers of paint
- Simple adaptation to a wide range of models on the production line and fast type change via transponders with high memory reserves
- Industry-standard versions with large temperature ranges, including heat-resistant transponders and a high degree of protection, make the entire system resistant to external influences

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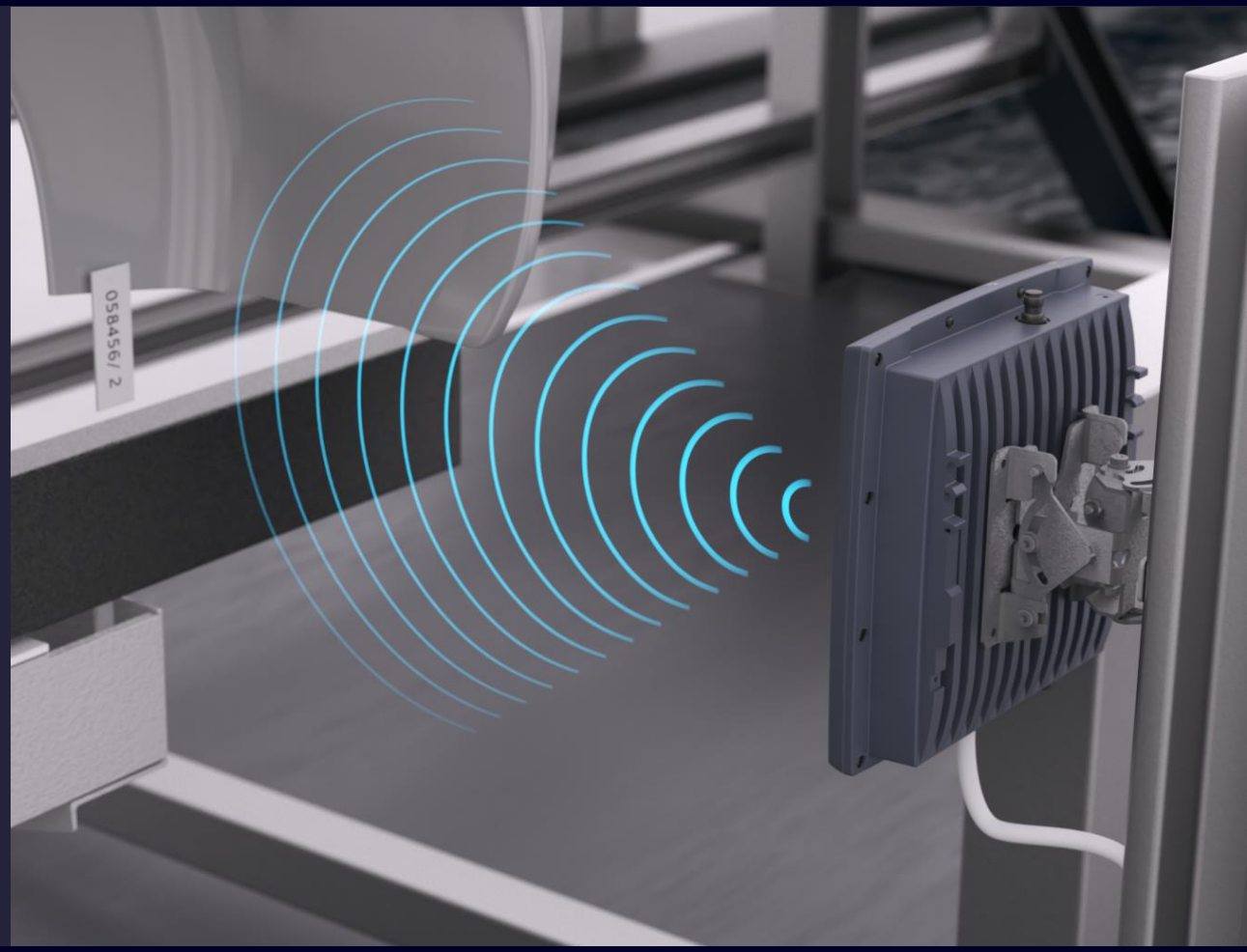
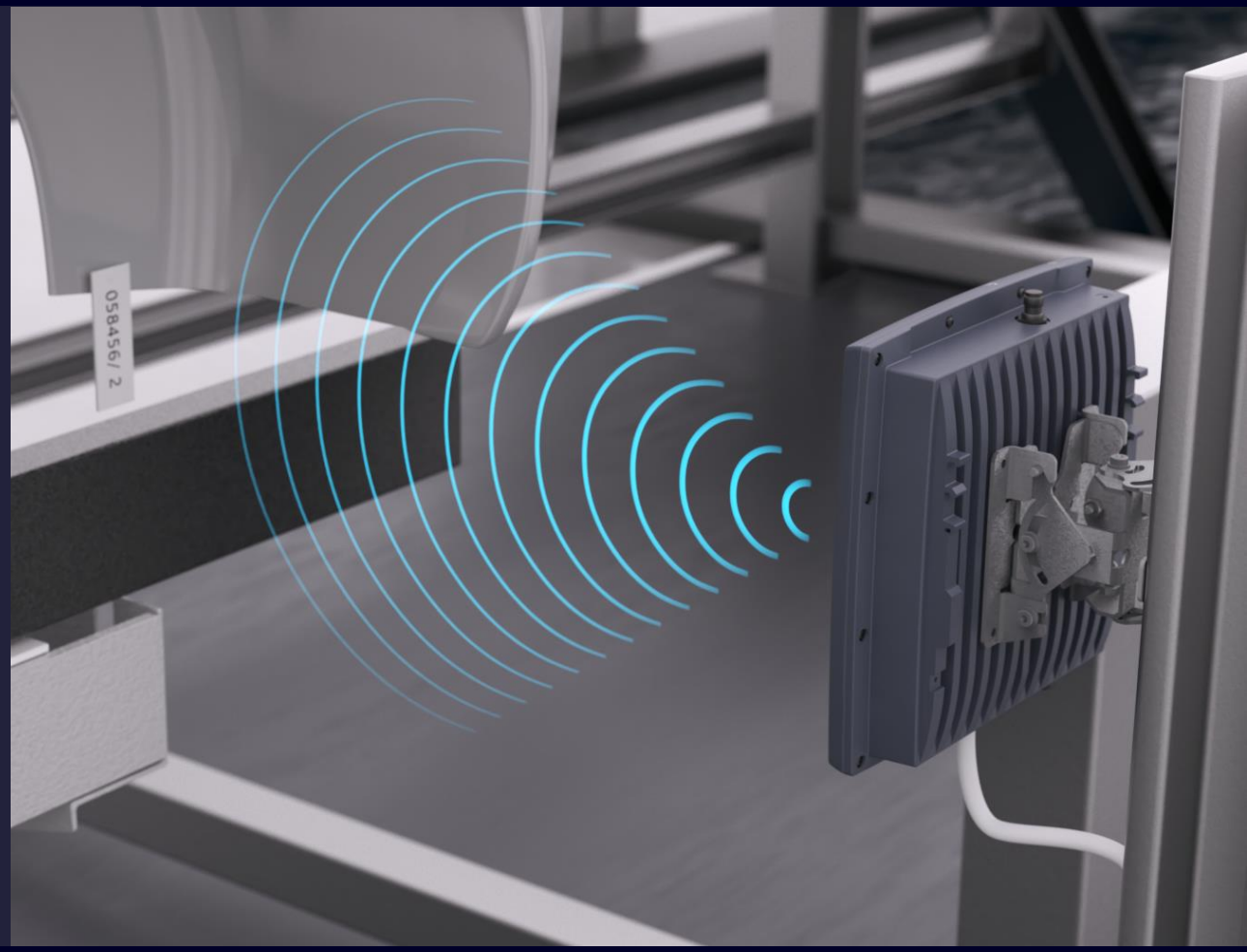
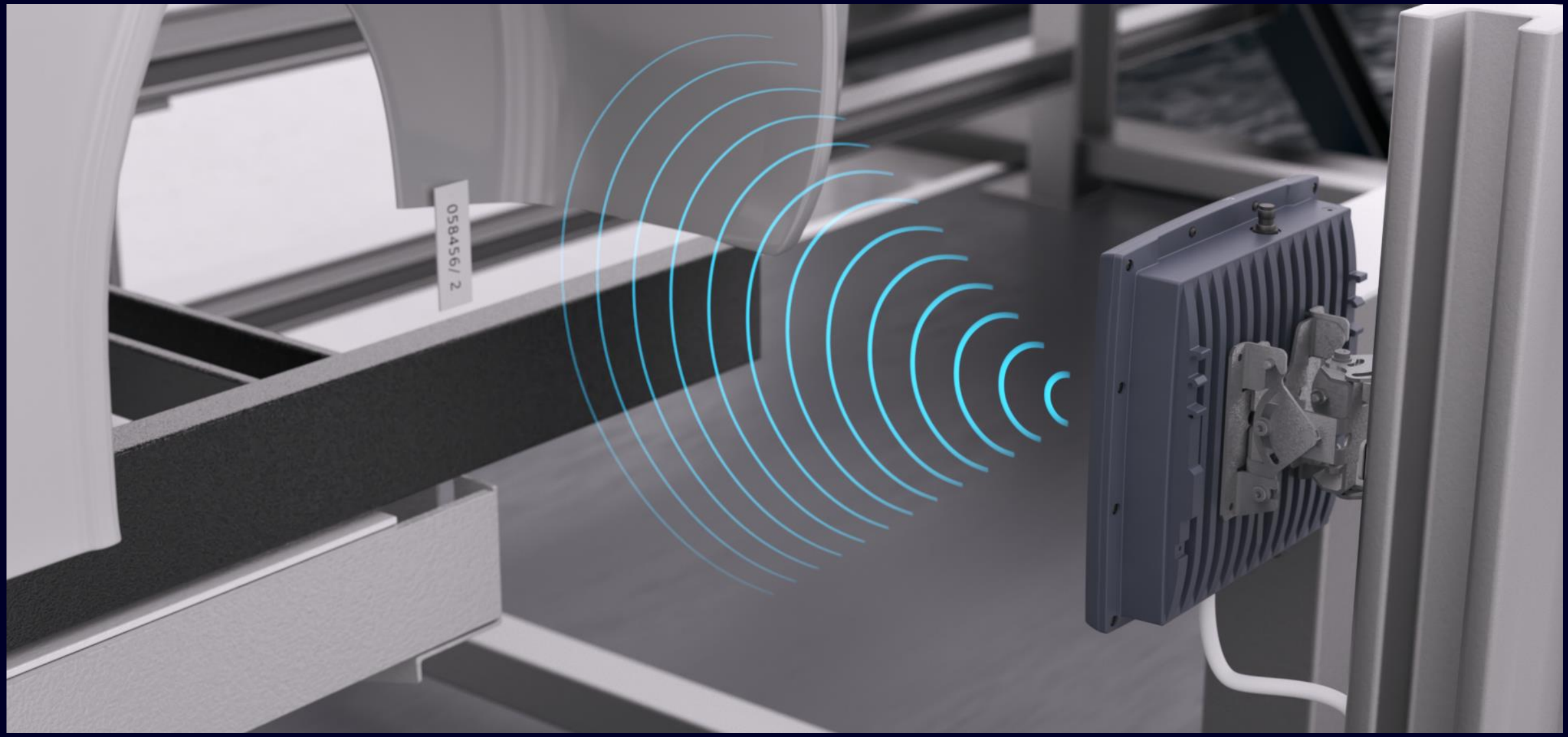


SIMATIC RF600
Process control in the paint shop

- A wide variety of designs and battery-free operation enable the flexible positioning of transponders even without a line of sight or maintenance requirements.
- With up to 64 bytes of add-on memory, the heat-resistant transponder is able to store quality and process data directly at the workpiece. Communication with a central database is eliminated and the process step operates autonomously.
- All RF600 components are tested and protected against environmental influences like dust, paint layers, chemical additives, lubricants, and elevated temperatures.

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SIMATIC RF300

Robust Ident solutions in the paint shop

- High cost-efficiency thanks to heat-resistant data carriers for identifying paint skids
- 24/7 availability of comprehensive process and quality data positively supported due to short transmission times
- The industry-standard design with a wide temperature range and high degree of protection IP65 and higher make the HF system resistant to external influences

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SIMATIC RF300

Robust Ident solutions in the paint shop

- High availability via integrated security mechanisms that mainly monitor transmission between transponders and readers for error-free data exchange, including in severe electromagnetic conditions, e.g., defective motors. Errors on the data carrier are also detected and reported.
- Efficiency even after operational faults thanks to fail-safe storage of process data from the complete painting process on RF300 transponders - a tremendous speed increase compared to standard HF systems.
- All RF300 components are tested and protected against environmental influences like dust, paint layers, chemical additives, lubricants, and elevated temperatures.

SIEMENS
SIMATIC
RF-600R

SIMATIC MV500

Optical identification for flexible production in the paint shop

- Reliable identification of data matrix codes, included in the top-coat area, via smart lighting solutions and supported by comprehensive accessories for fast commissioning
- High degree of scalability thanks to a consistent synchronization of image captures with the current conveyor speed of the production line
- Smart algorithms enable an automatic adjustment of brightness, even with fast conveyor speeds and optimizes the illumination of the most difficult image areas

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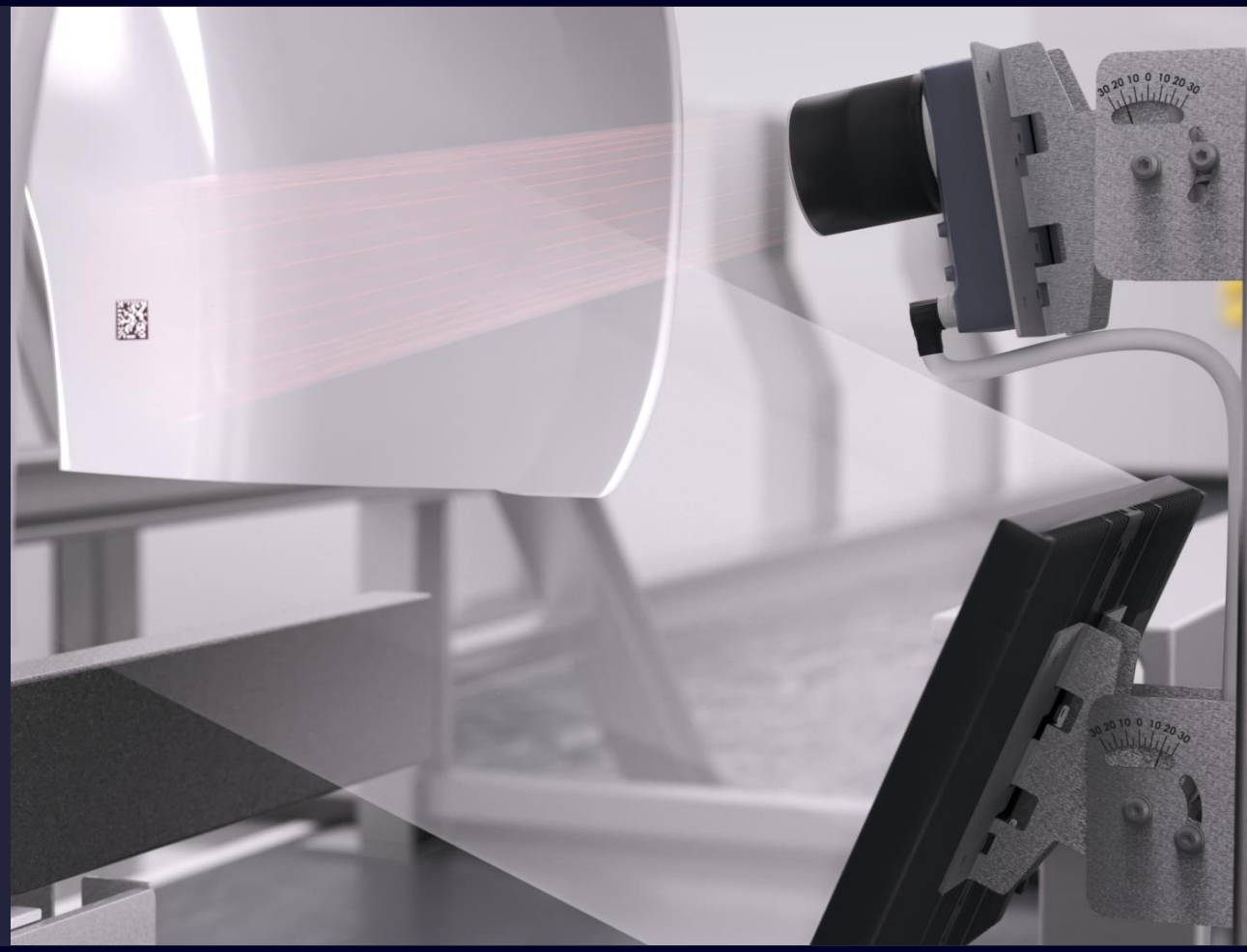
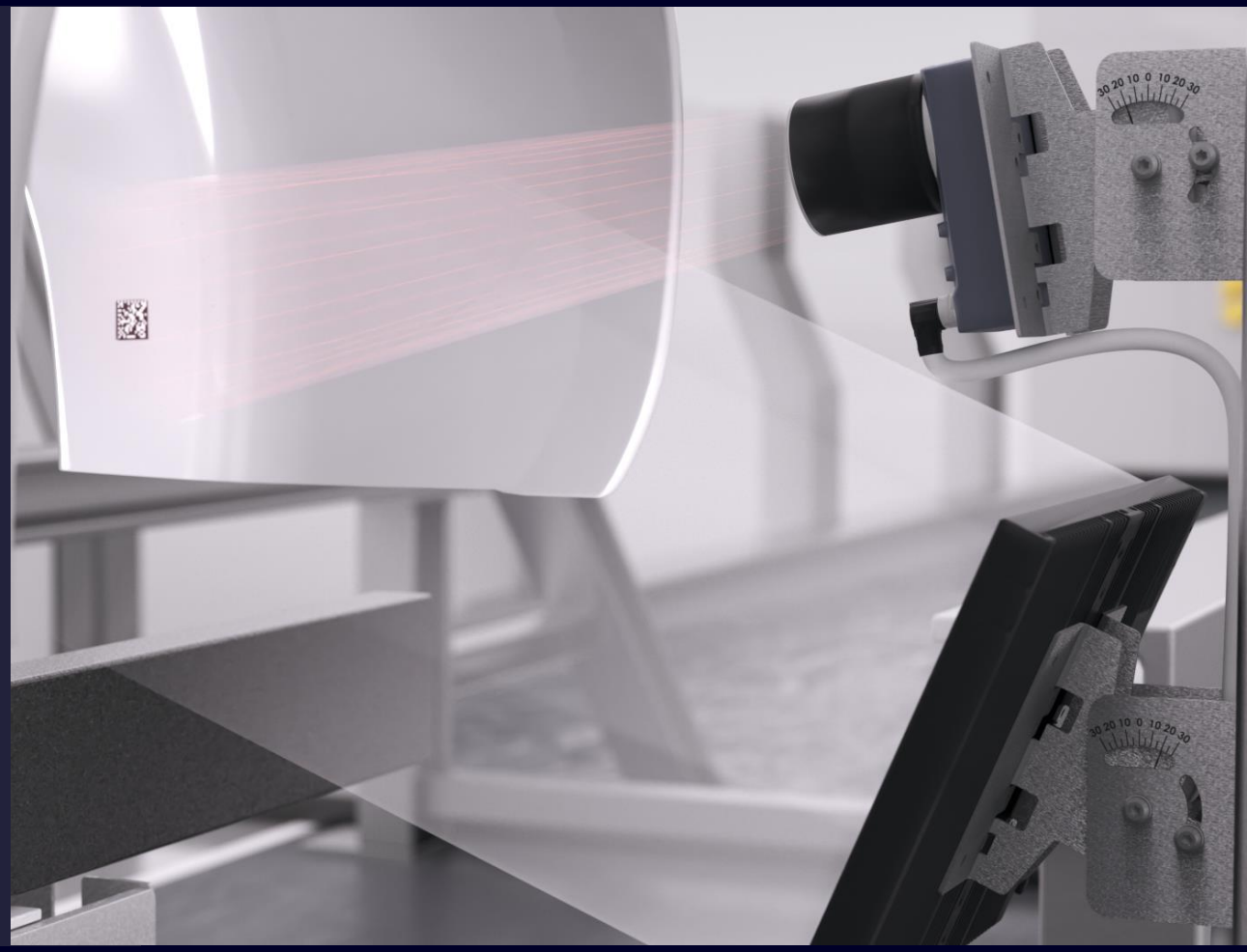


SIMATIC MV500

Optical identification for flexible production in the paint shop

- Easy commissioning and optimization of camera and lighting through intuitive setting options without the need of expert knowledge.
- High scalability thanks to just-in-time adaptation of the scan frequency to the speed of the conveyor line without additional hardware.
- Innovative automatic exposure with subsequent filters make it possible to optimize illumination, including of the most difficult image areas, so codes that are almost invisible can be evaluated, regardless of the color or reflectance of the components that are painted over.



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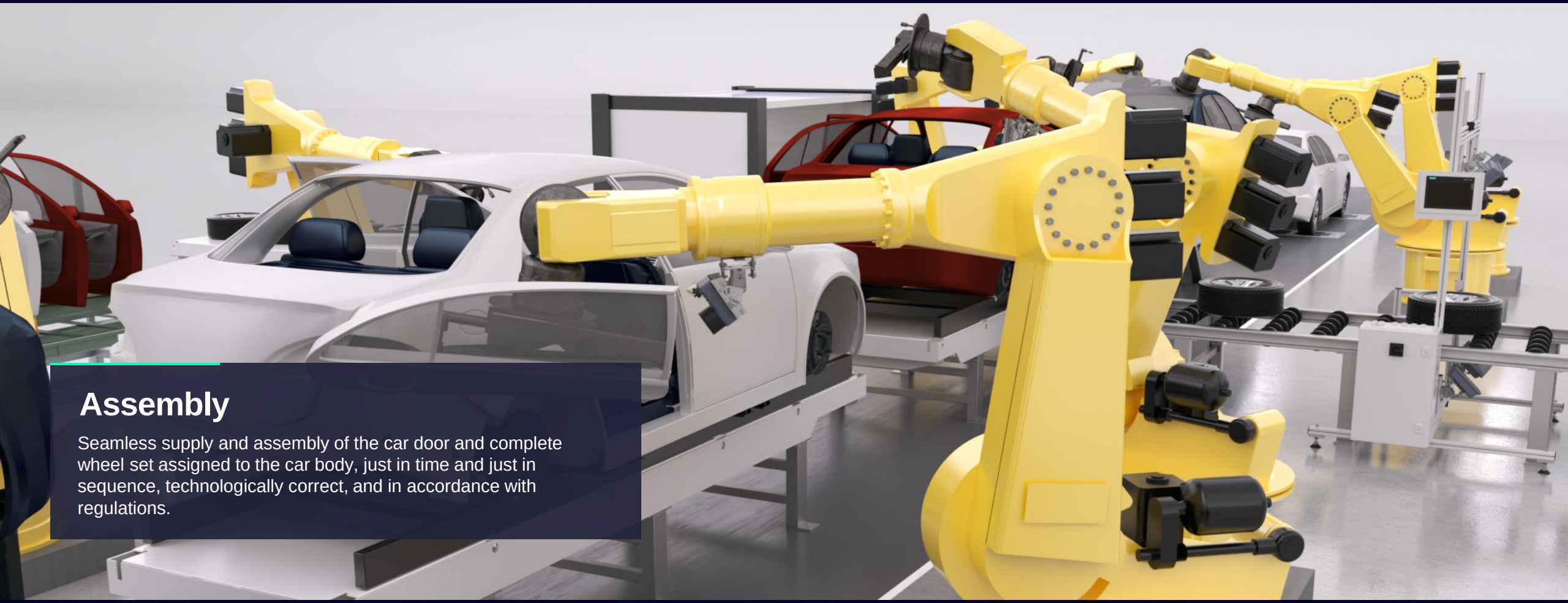

Assembly

Seamless supply and assembly of the car door and complete wheel set assigned to the car body, just in time and just in sequence, technologically correct, and in accordance with regulations.

SIMATIC RF600
Optimal tire logistics in assembly

- Powerful antennas and a variety of designs permit the reliable processing of RFID transponders vulcanized by the manufacturer
- High transparency via the monitoring of all tire logistics processes through UHF technology
- Quick and easy integration thanks to UHF system solutions, e.g., Siemens Ident Conveyer Belt Gate

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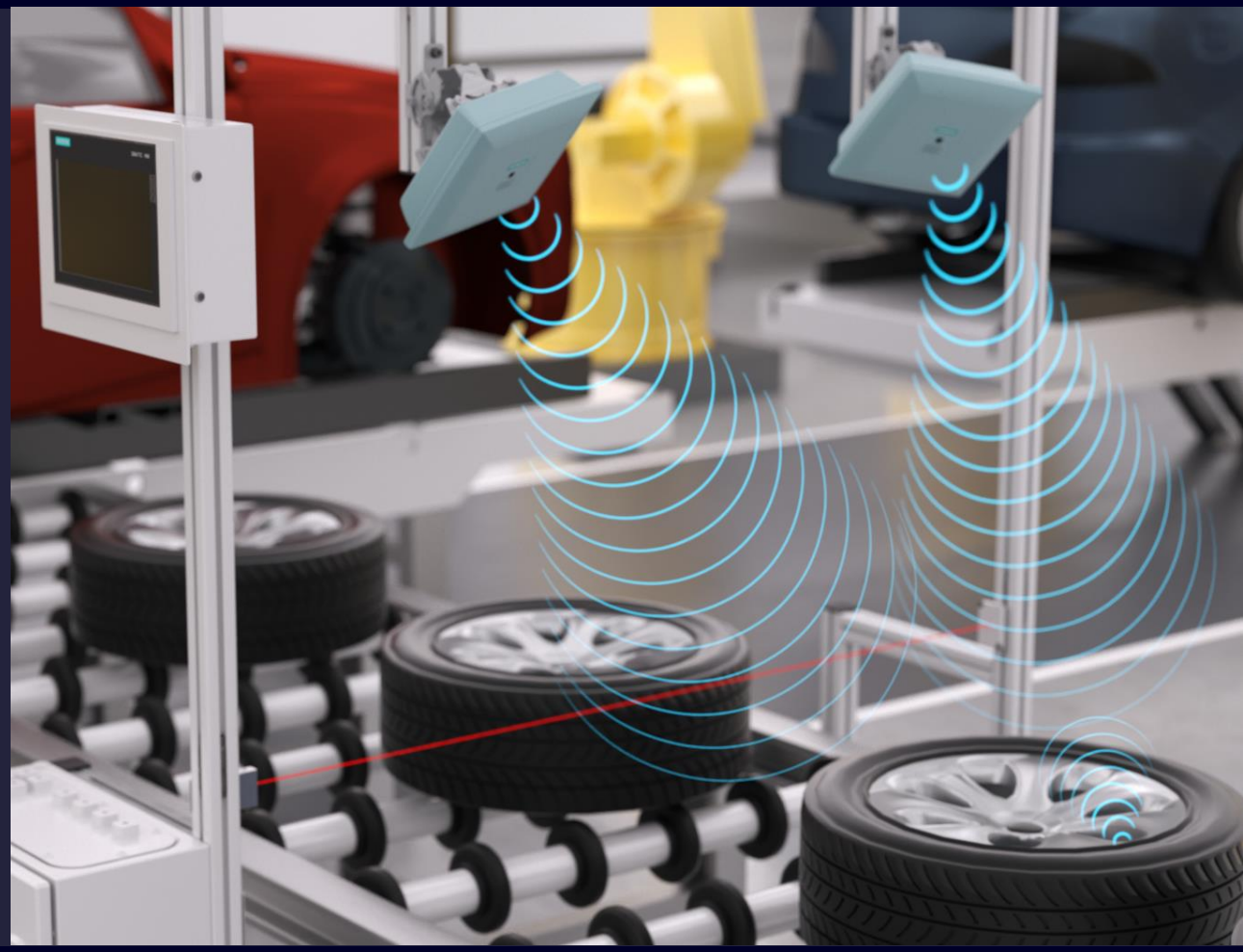
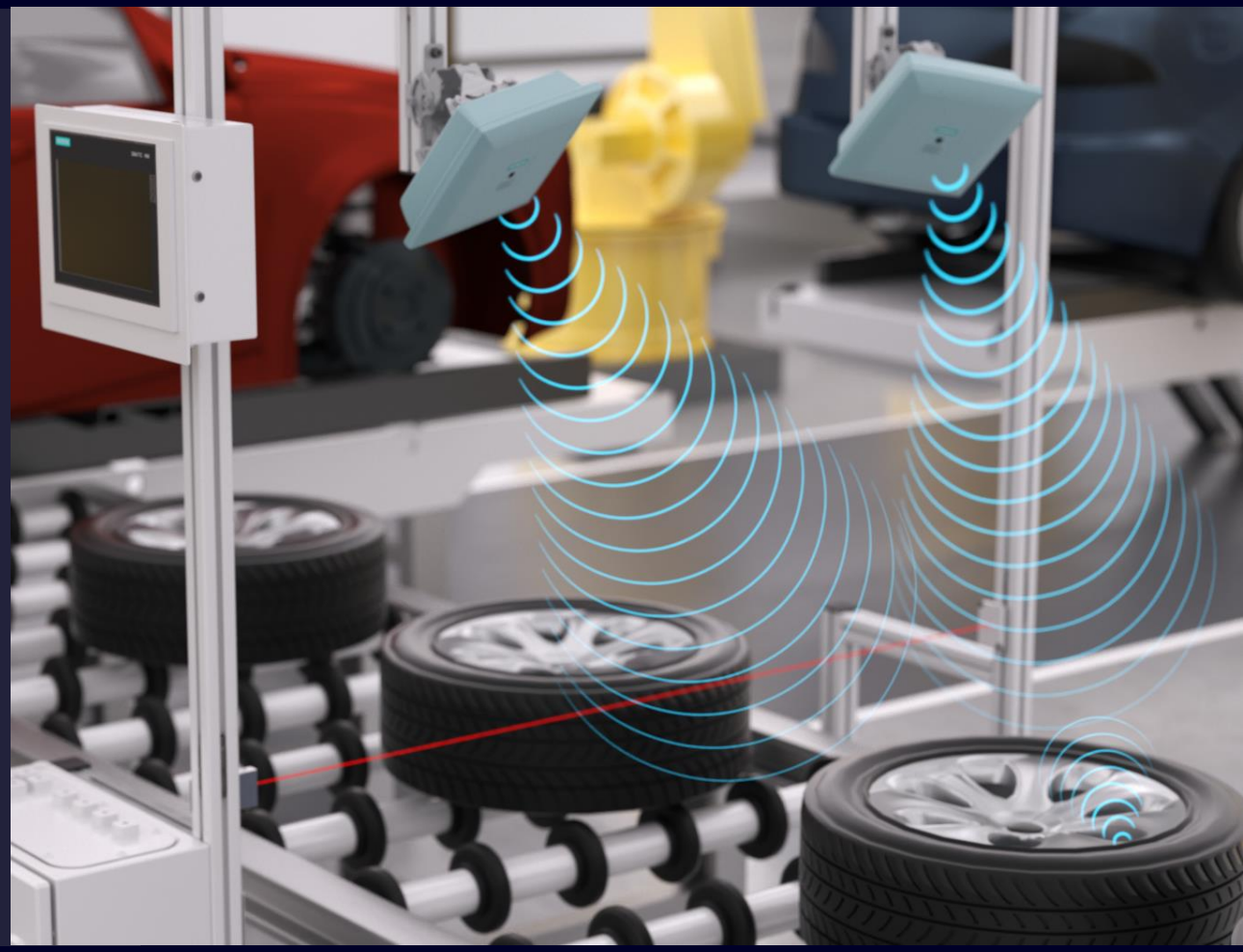
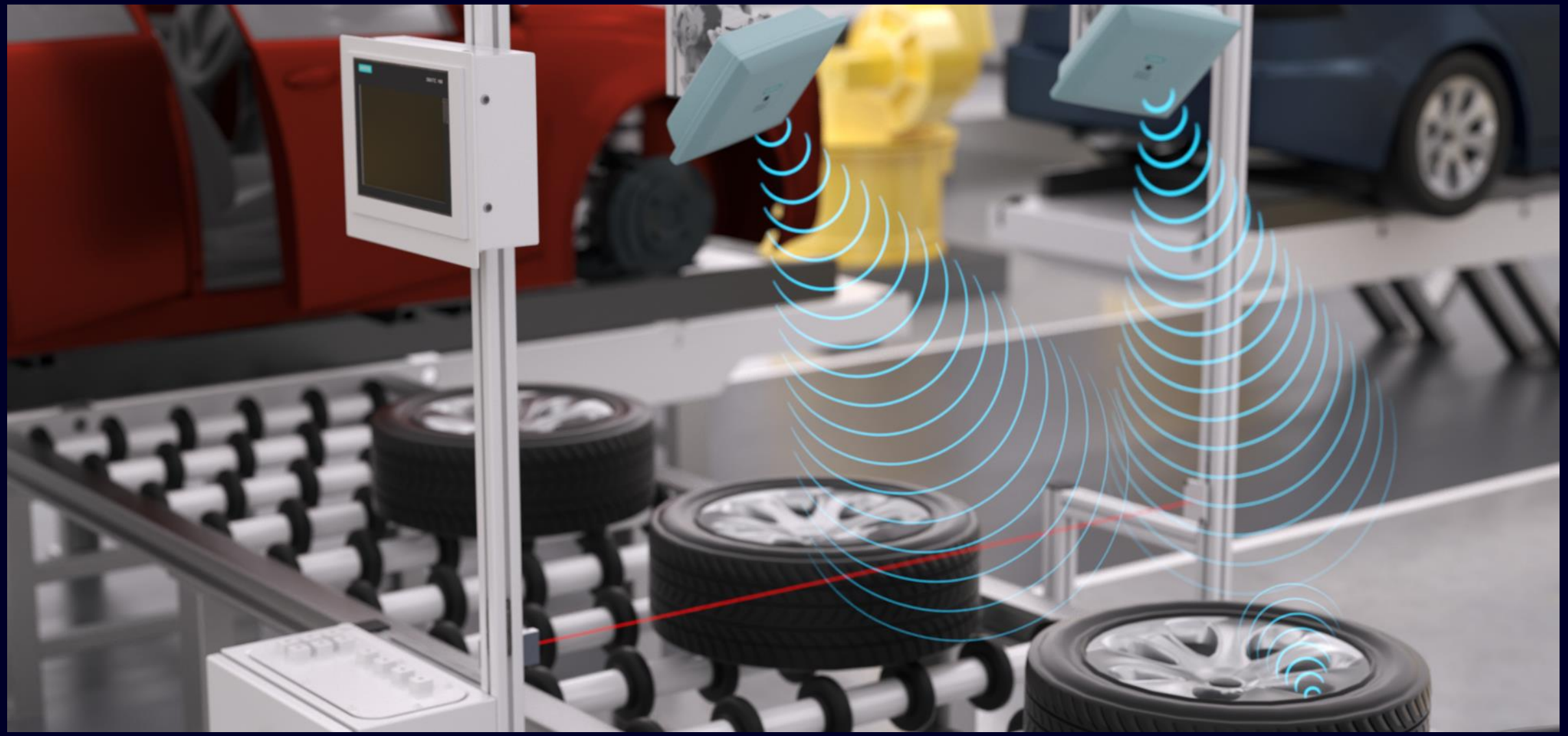


SIMATIC RF600
Optimal tire logistics in assembly

- The transponders already embedded in the tire during the manufacturing process make it possible not only to control all logistics processes but also to monitor the workflow from the tire to the mounted wheel. Adaptive, linear, and circularly polarized antennas enable a reliable reading of transponders in different configurations.
- The UHF technology used is largely for quality control, to prevent assembly errors, and to check country-specific regulations.
- High degree of flexibility thanks to the connection to all automation systems via PROFINET, Ethernet/IP, and PROFIBUS; simultaneous connection to management systems via OPC/UA or TCP/IP (XML) is also possible. In addition to standard components, RFID gates with specific programs for tire applications are also available.





SIMATIC RF300
Intelligent material management

High degree of efficiency due to the RF300 system's high reading rates in a metallic environment enables fast process control and a high product throughput

The high scalability of the RF300 system ensures just-in-time and just-in-sequence delivery for each production step

Quick and easy commissioning and comprehensive diagnostic options reduce downtime

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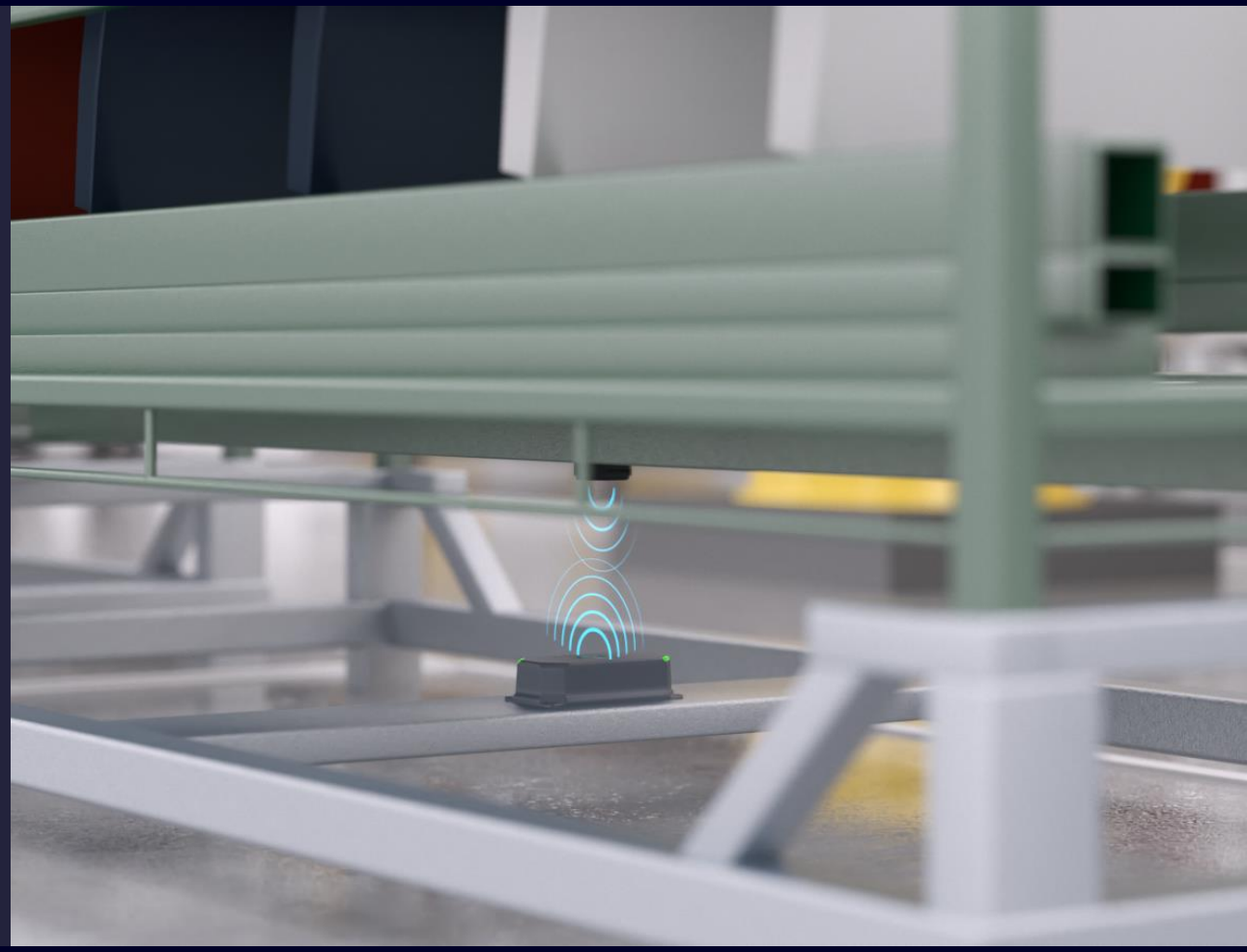
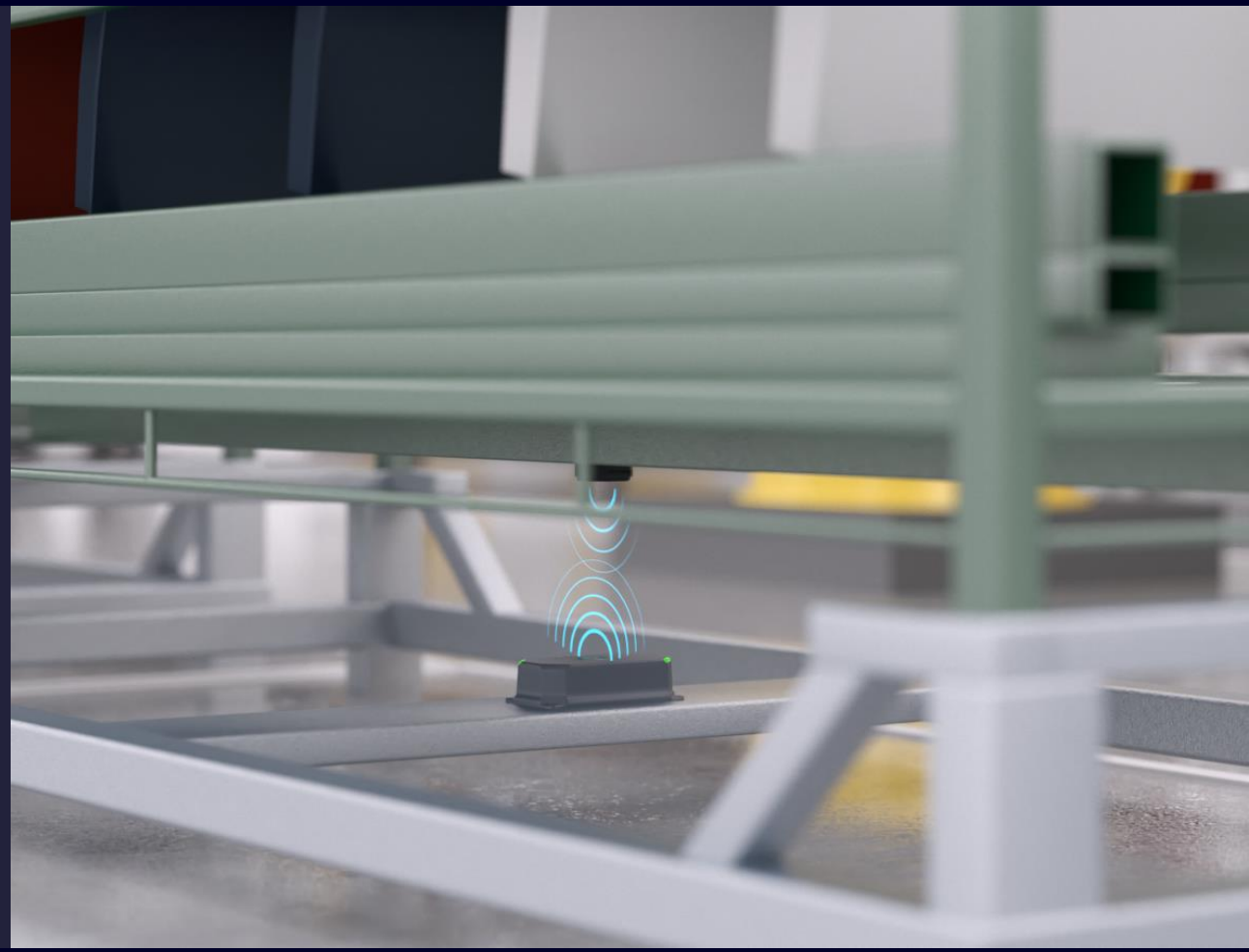
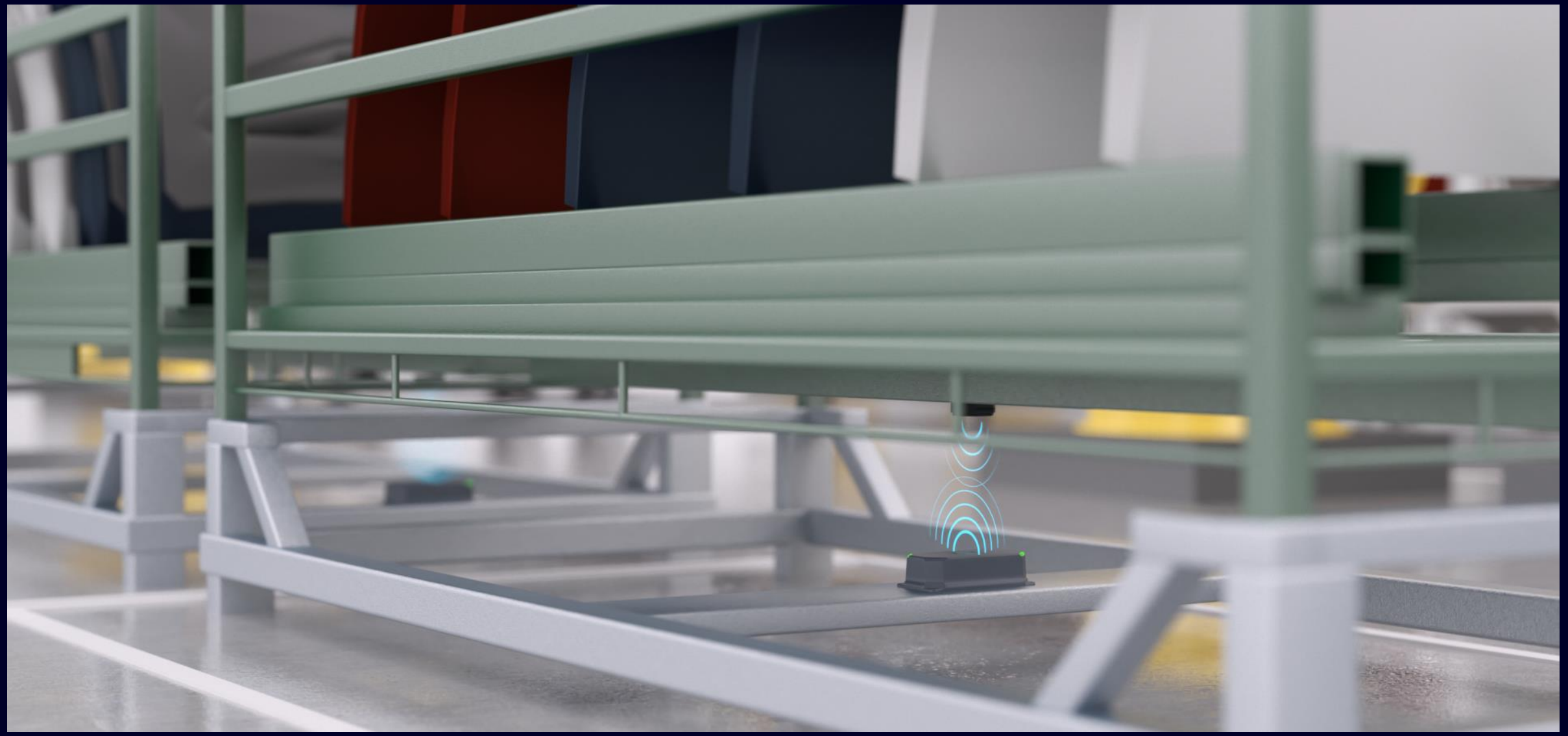


SIMATIC RF300
Intelligent material management

- All production-related data is stored on the RF300 transponder and is available to the work process regardless of network availability. This reliably prevents downtime caused by a lack of components or production data.
- Increasingly complex production sequences can be met with seamless logistics processes. A comprehensive selection of different RF300 readers and transponders is available for this purpose.
- Teach-in mode helps to correctly position the transponder and antenna for a physically reliable application. Web-based management of the interface modules enable diagnosis at any time during the ongoing process.





SIMATIC MV500
Optical identification of add-on parts

- Reliable protection of optical components and the image sensor against vibrations via a robust design
- Smart lighting minimizes reflections on metallic and painted surfaces
- Easy commissioning thanks to preset and preassembled cameras for use where space is limited

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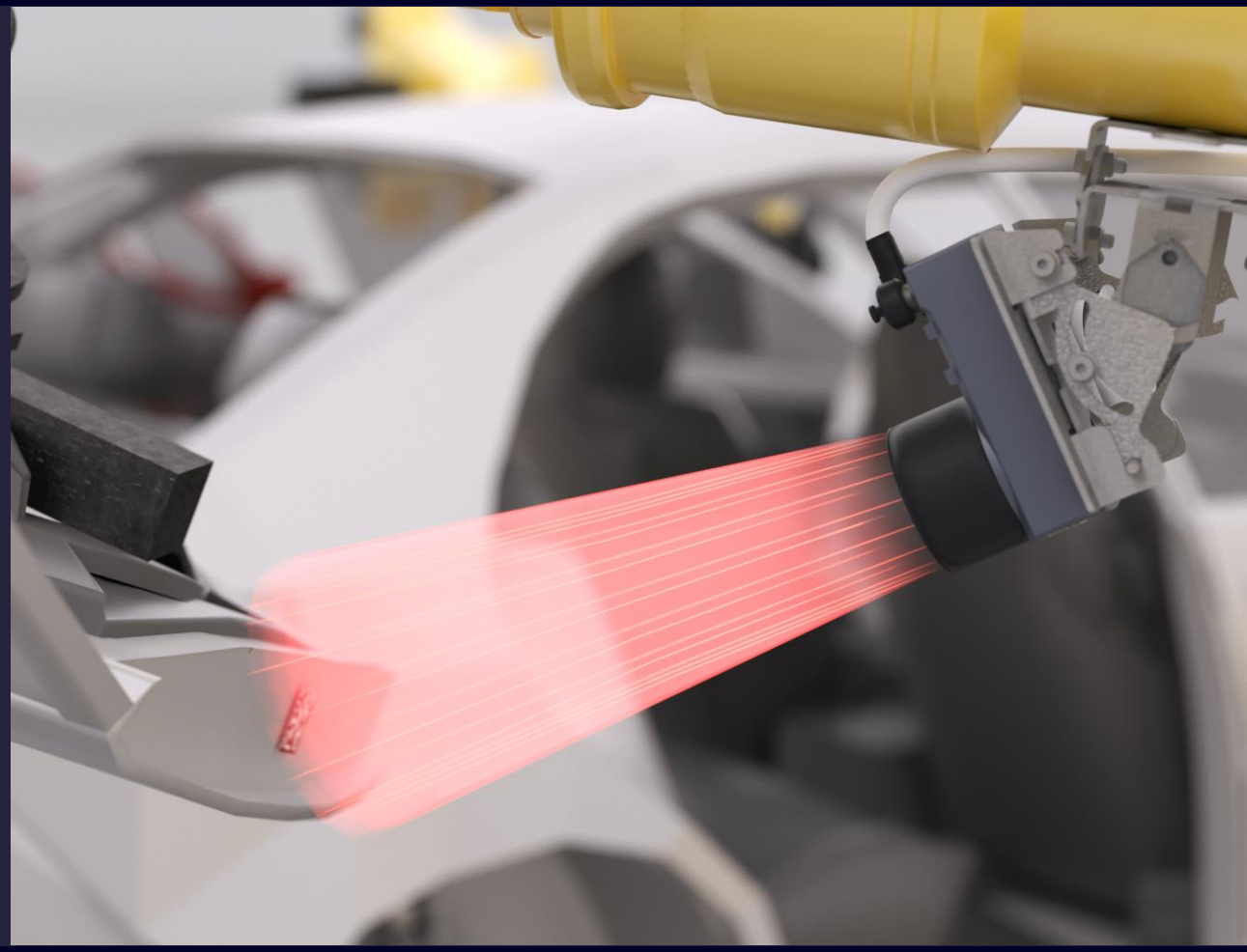
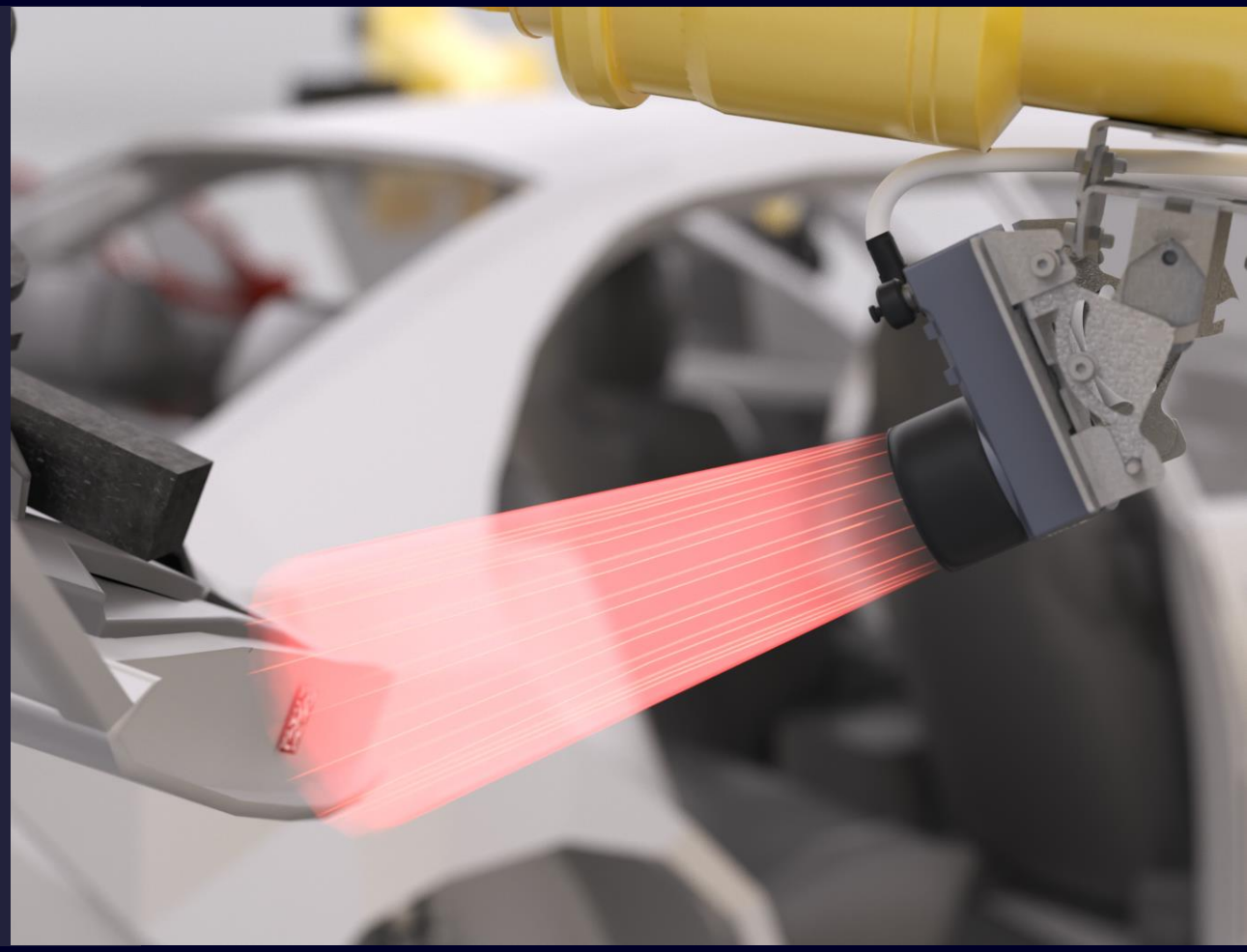
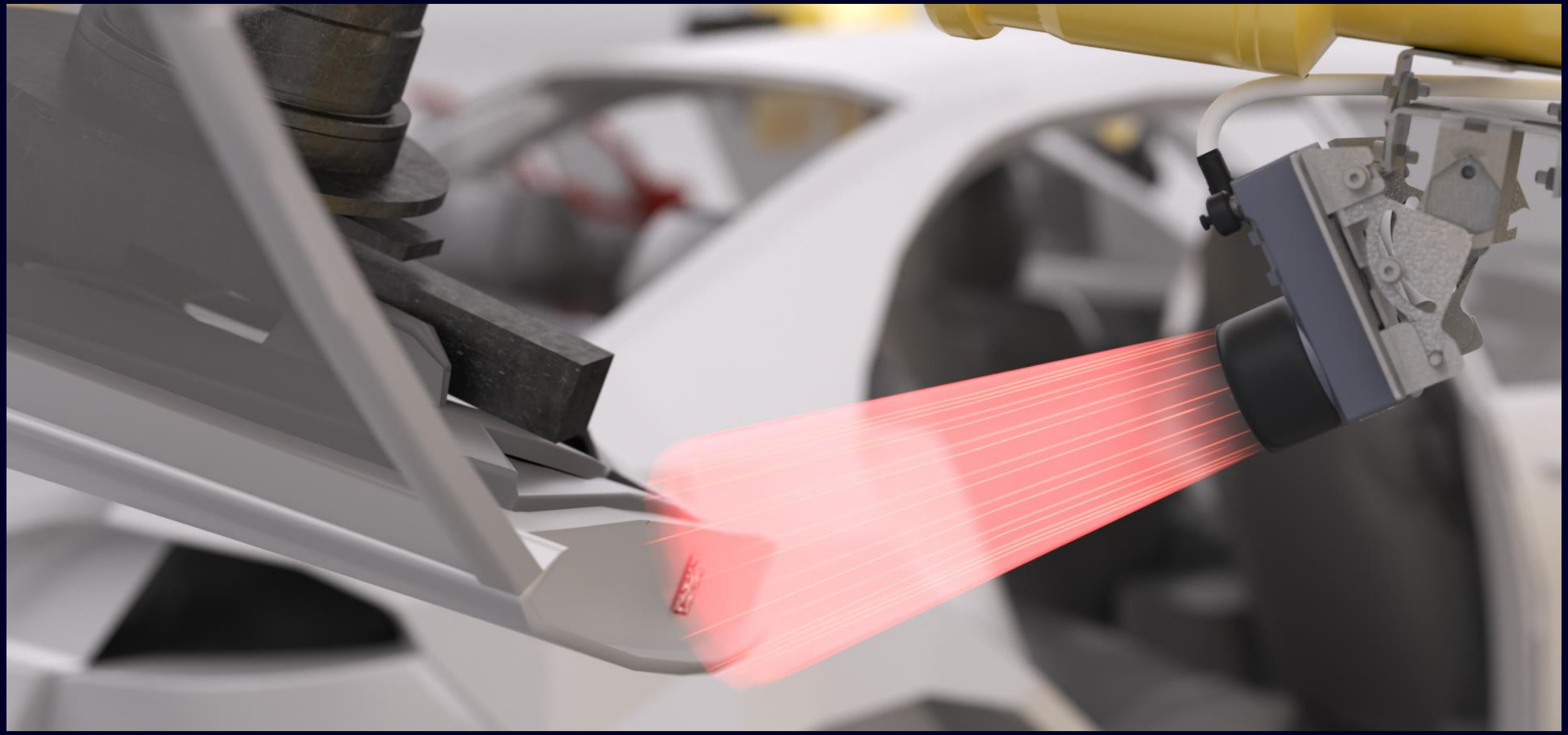
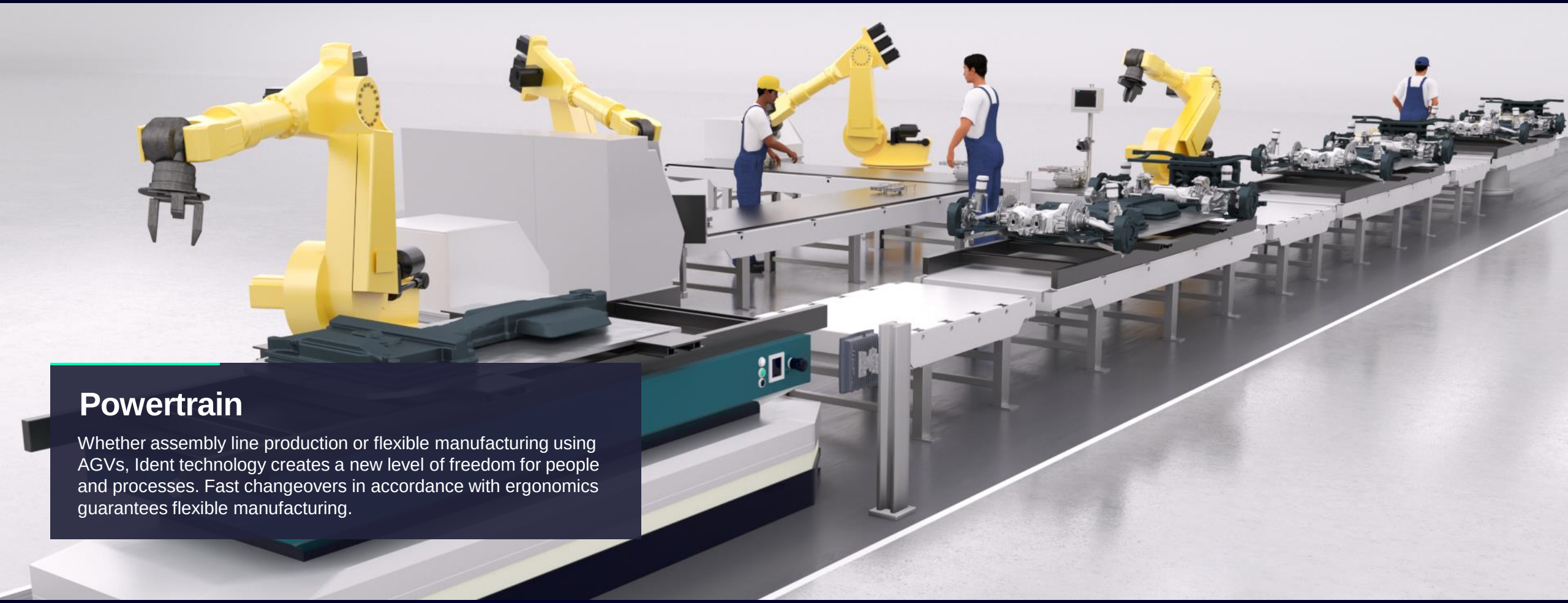


SIMATIC MV500
Optical identification of add-on parts

- All optical sensors in the MV500 series are tested according to IEC 60068-2, meaning that they are resistant to strong vibrations and shocks caused by the robot's movement.
- If applicable, the camera selects the best lighting setup for the current situation. This can be activated by the user or fully integrated by the PLC program.
- The auto-adapt feature makes the MV530 an easily integrated code reader that is ideal for use on a robot beginning with an identification range of 30 mm.







Powertrain

Whether assembly line production or flexible manufacturing using AGVs, Ident technology creates a new level of freedom for people and processes. Fast changeovers in accordance with ergonomics guarantees flexible manufacturing.

SIMATIC RF600

UHF for optimizing e-motor assembly

- Seamless tracking of fully assembled e-motors via UHF technology regardless of transport medium
- Reliable sequencing with short distances between workpiece carriers and long reading range
- Algorithms like power ramp and blacklisting ensure reliable and error-free reading of the transported goods under the most difficult local conditions

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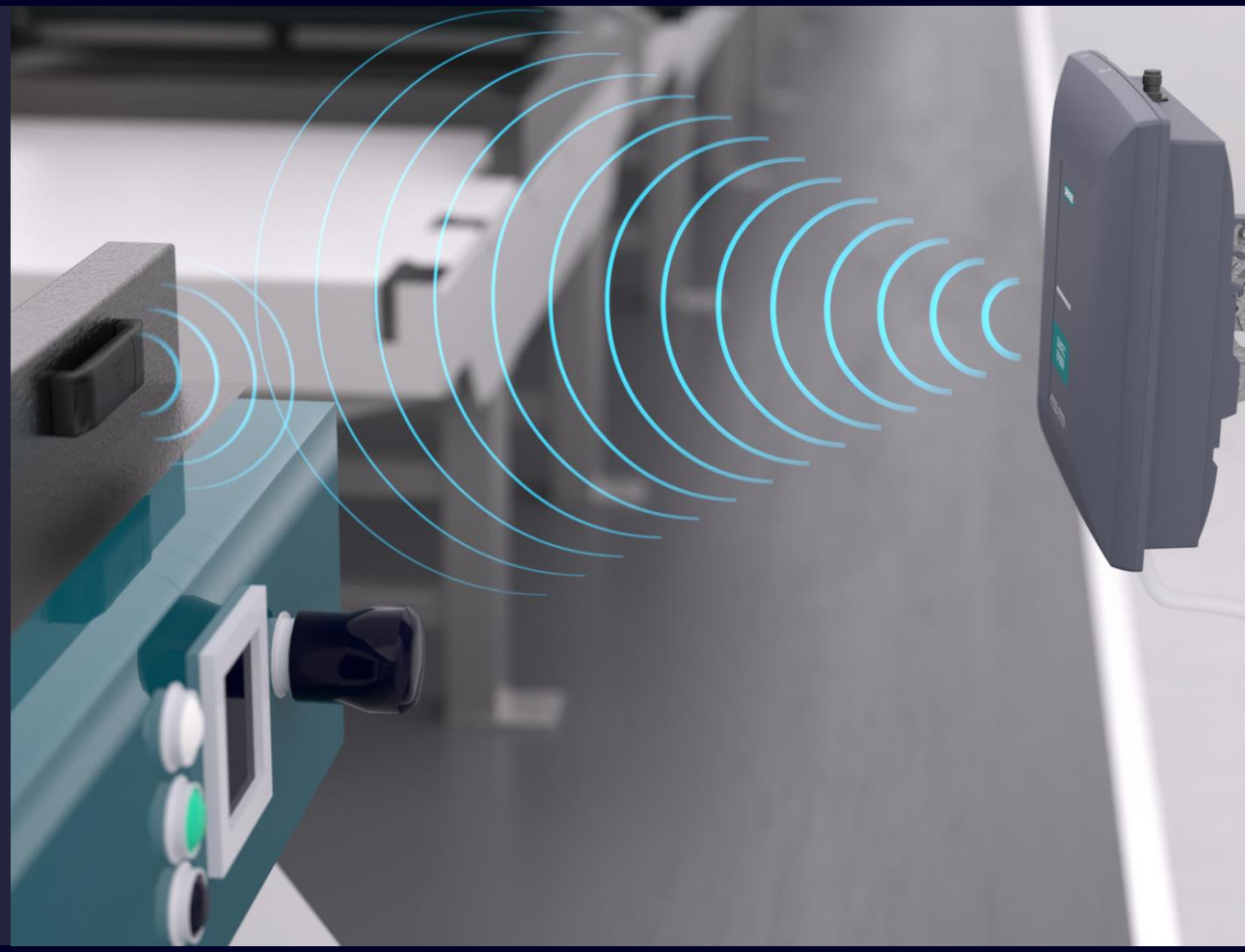
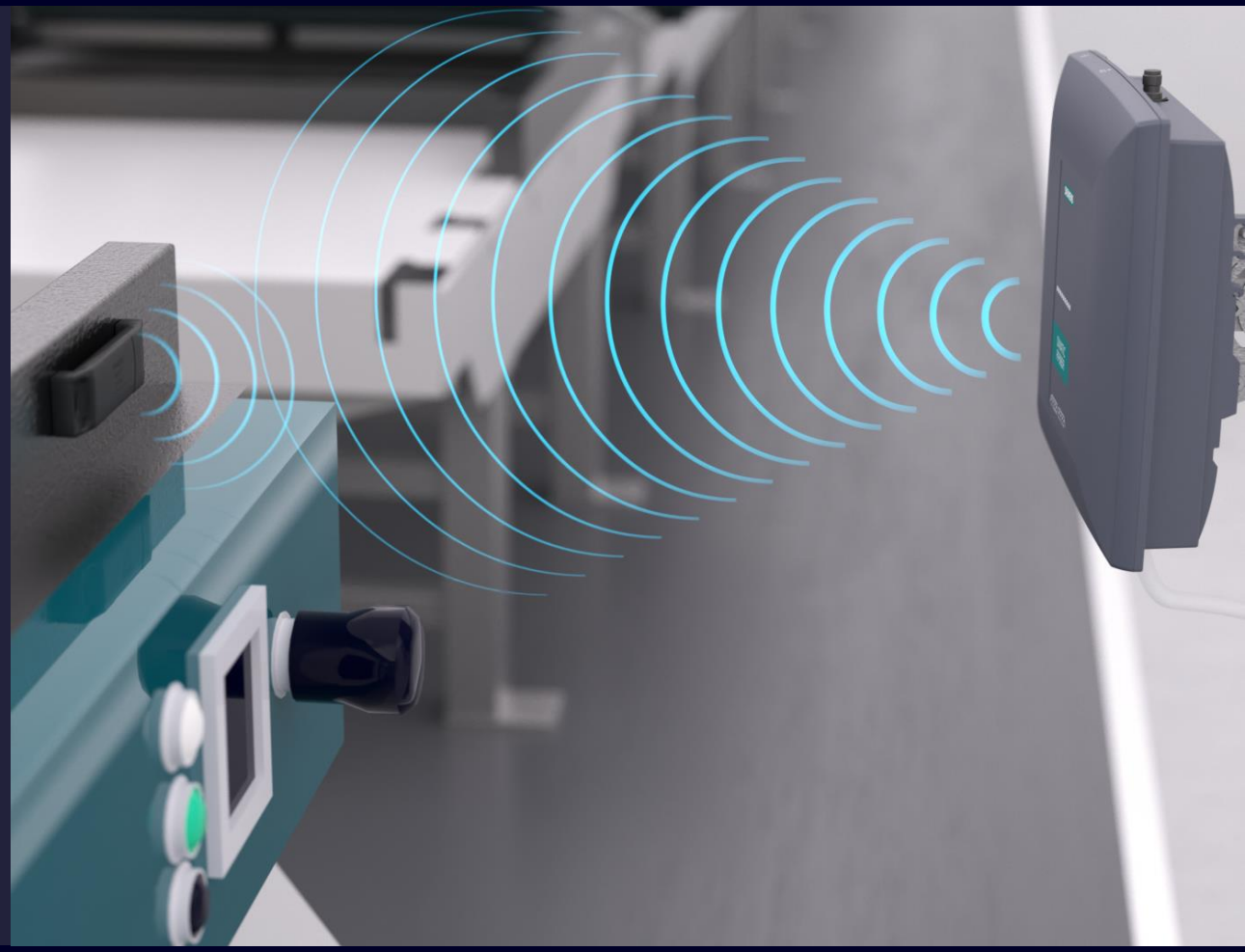
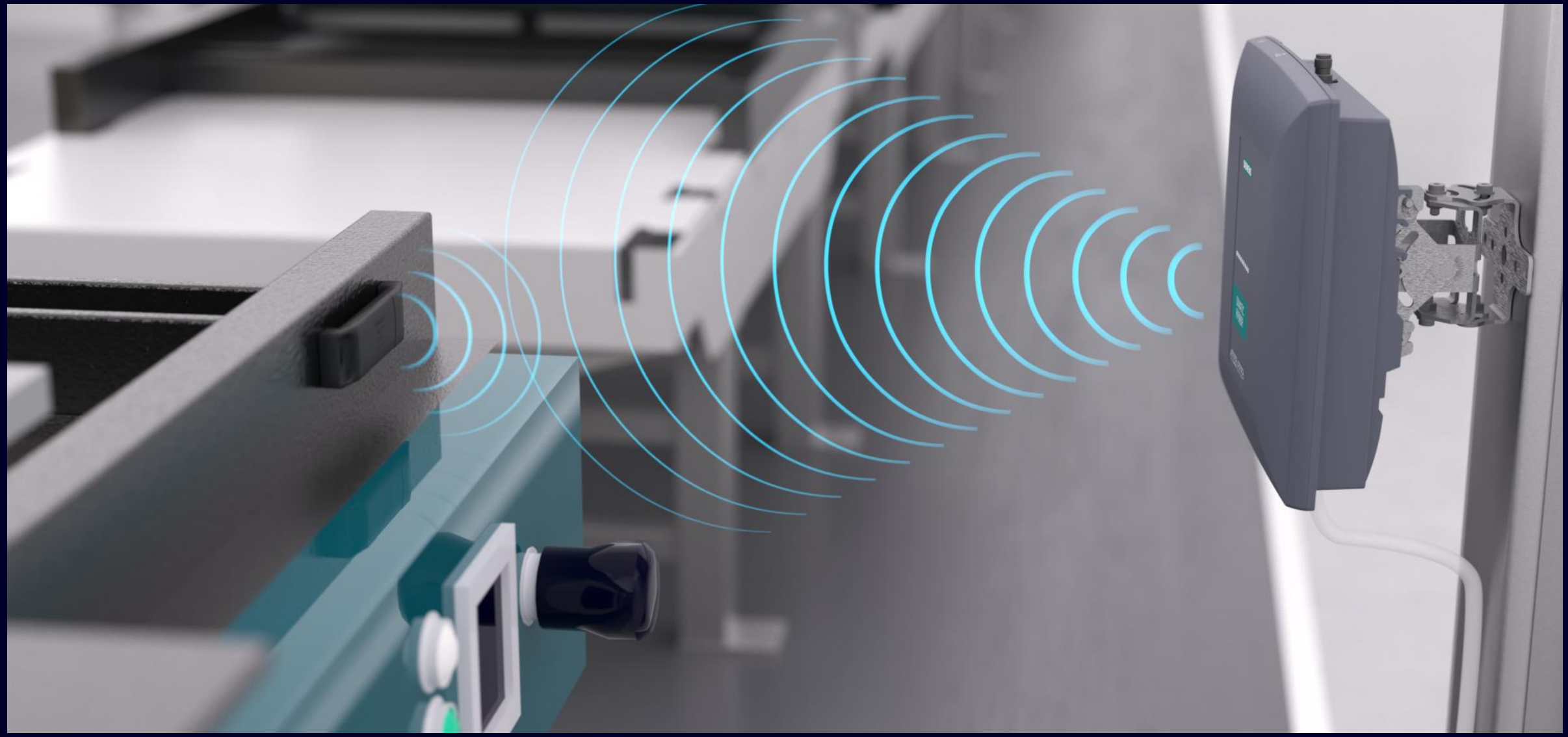


SIMATIC RF600
UHF for optimizing e-motor assembly

- Despite different product carrier systems, Siemens' scalable power settings and antenna versions permit seamless tracking regardless of varying operating distances and geometries.
- Possibility of evaluating and qualifying (RSSI value) all transponders in order to determine their relative positions in the conveyor line. Previously processed workpiece carriers are suppressed by blacklisting.
- Integrated algorithms like power ramp and smoothing enable reliable and error-free reading of transported goods, including in the challenging environments of automotive production. This suppresses overranges and prevents false readings.





SIMATIC RF300

Fast and reliable transport processes in e-motor assembly

- High throughput when process steps follow in quick succession thanks to impressive reading rates in a metallic environment
- Great degree of flexibility through a comprehensive portfolio simplifies the changeover between manual and automatic assembly and processing
- Efficiency gain via the storage of all data and tests at the product, making it possible to reduce the load on the network and establish a fallback strategy in the event of an error

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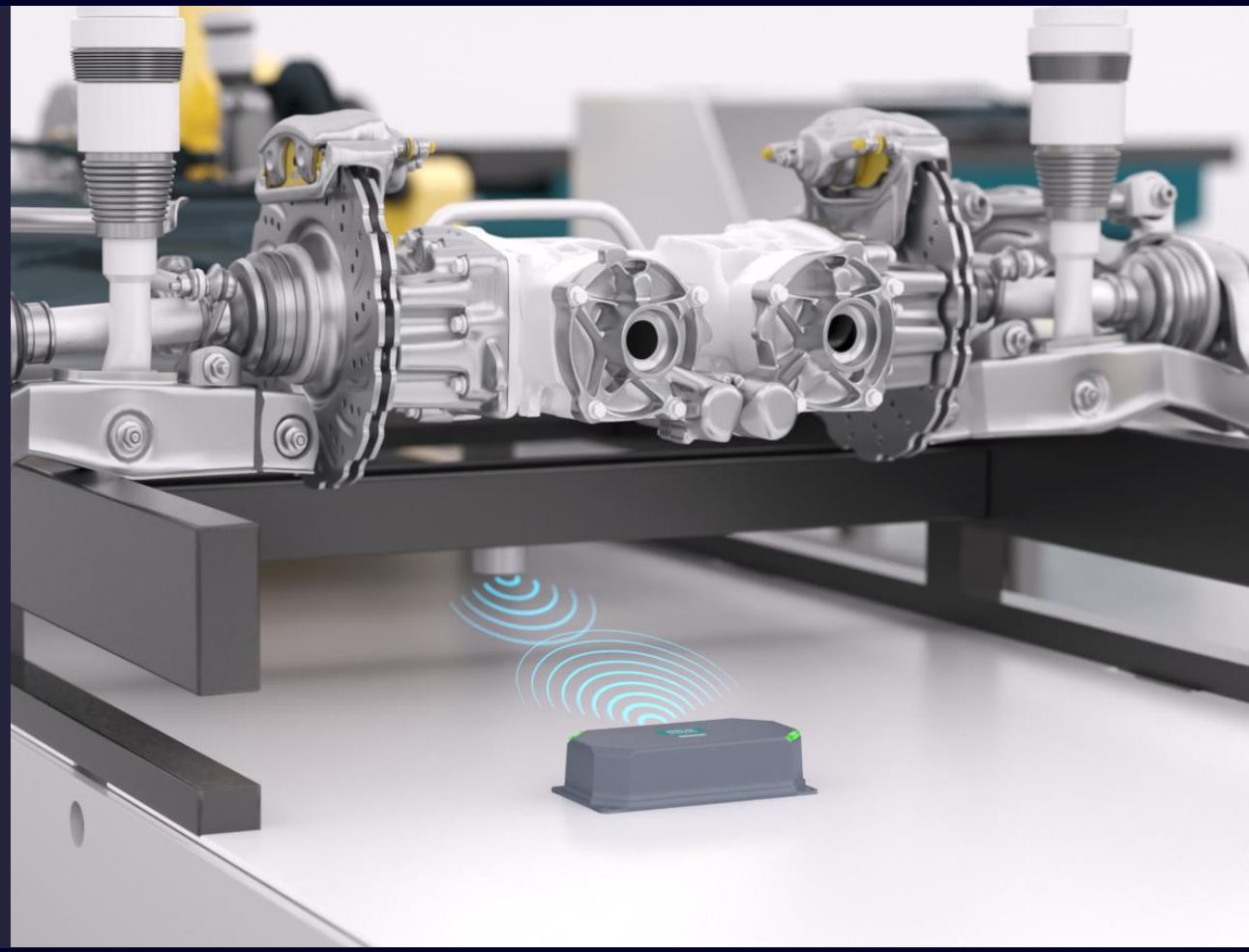
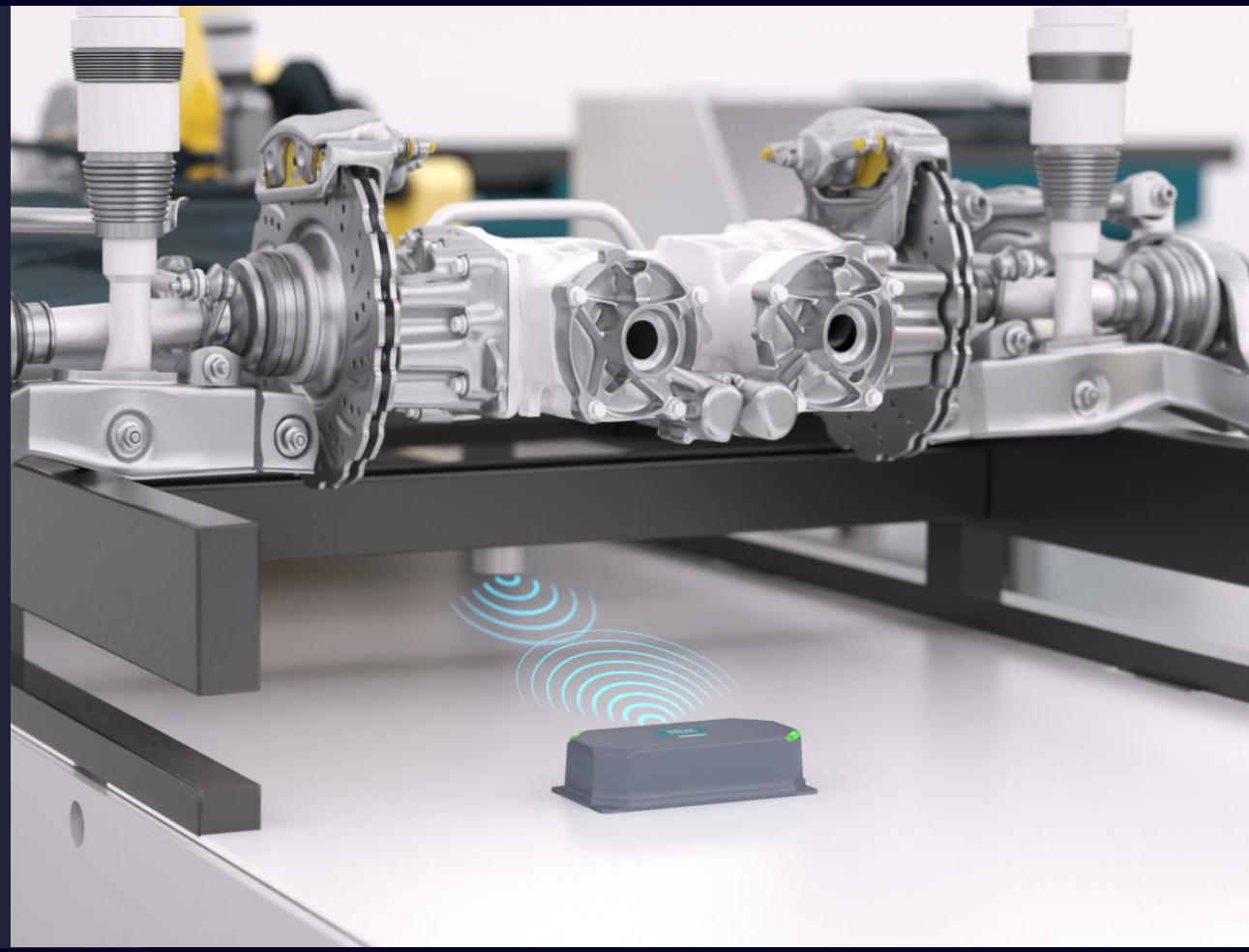
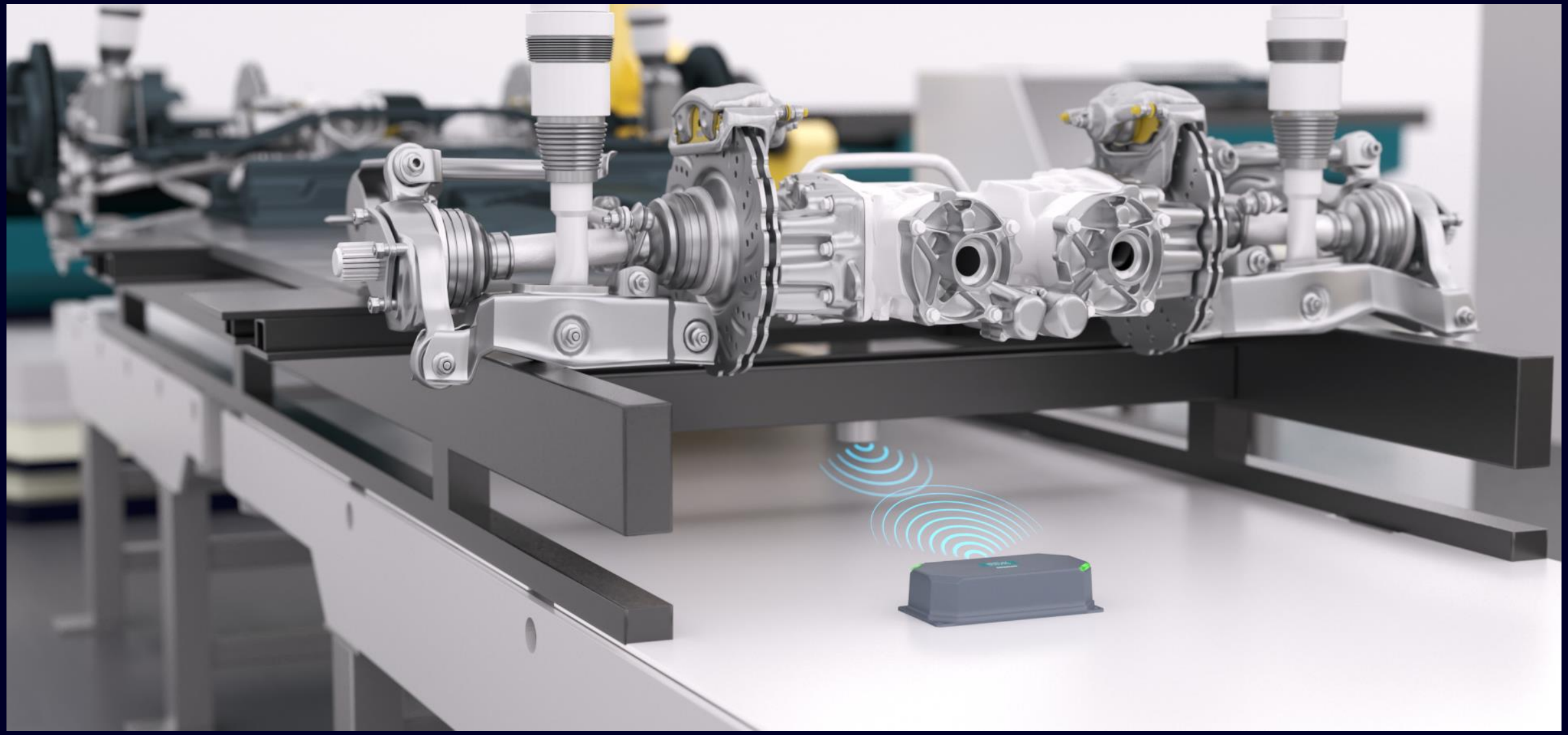


SIMATIC RF300

Fast and reliable transport processes in e-motor assembly

- The RF300 system enables a quick succession of process steps many times faster than the ISO data throughput. RF300-specific algorithms guarantee error-free readings.
- The Siemens portfolio contains both the smallest antenna designs measuring several centimeters for automated production, and handheld scanners or large antennas with a long range for manual production.
- Process data is accessible at all times and stored at the product.
  As a result, irregularities in the network or power supply have no direct effect on the data integrity of the identification. With the RF300 system, a restart is possible at any time.





SIMATIC MV500
Optical identification of e-motors

- Optimal image quality in the case of challenging and long reading distances without compromise in terms of assembly and ergonomics thanks to the integrated ring lights of Siemens' SIMATIC MV500
- Despite the structured and granular surfaces of aluminum die-cast parts, high reading rates are guaranteed
- High cost-efficiency when implementing large capture ranges using Siemens' SIMATIC MV500

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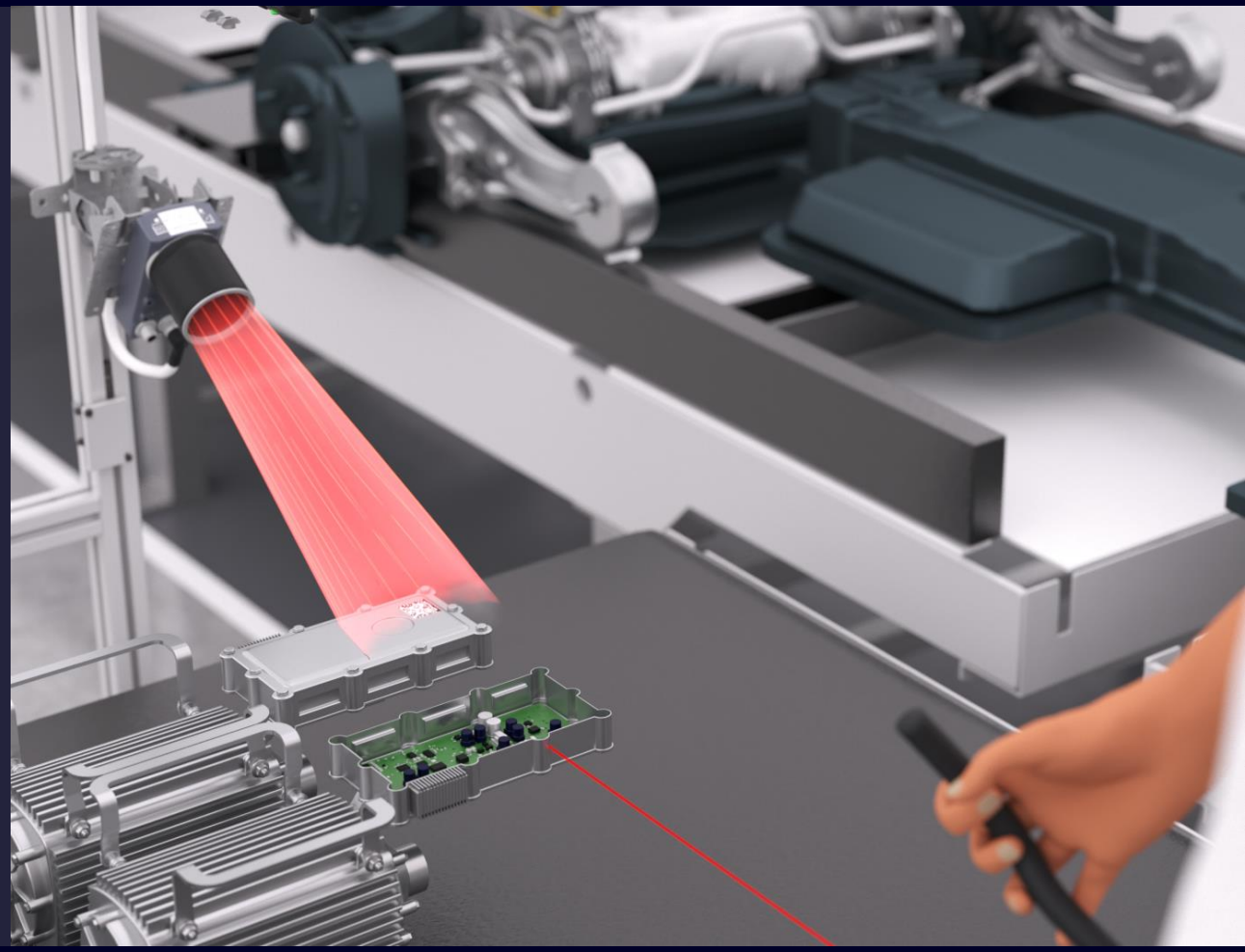
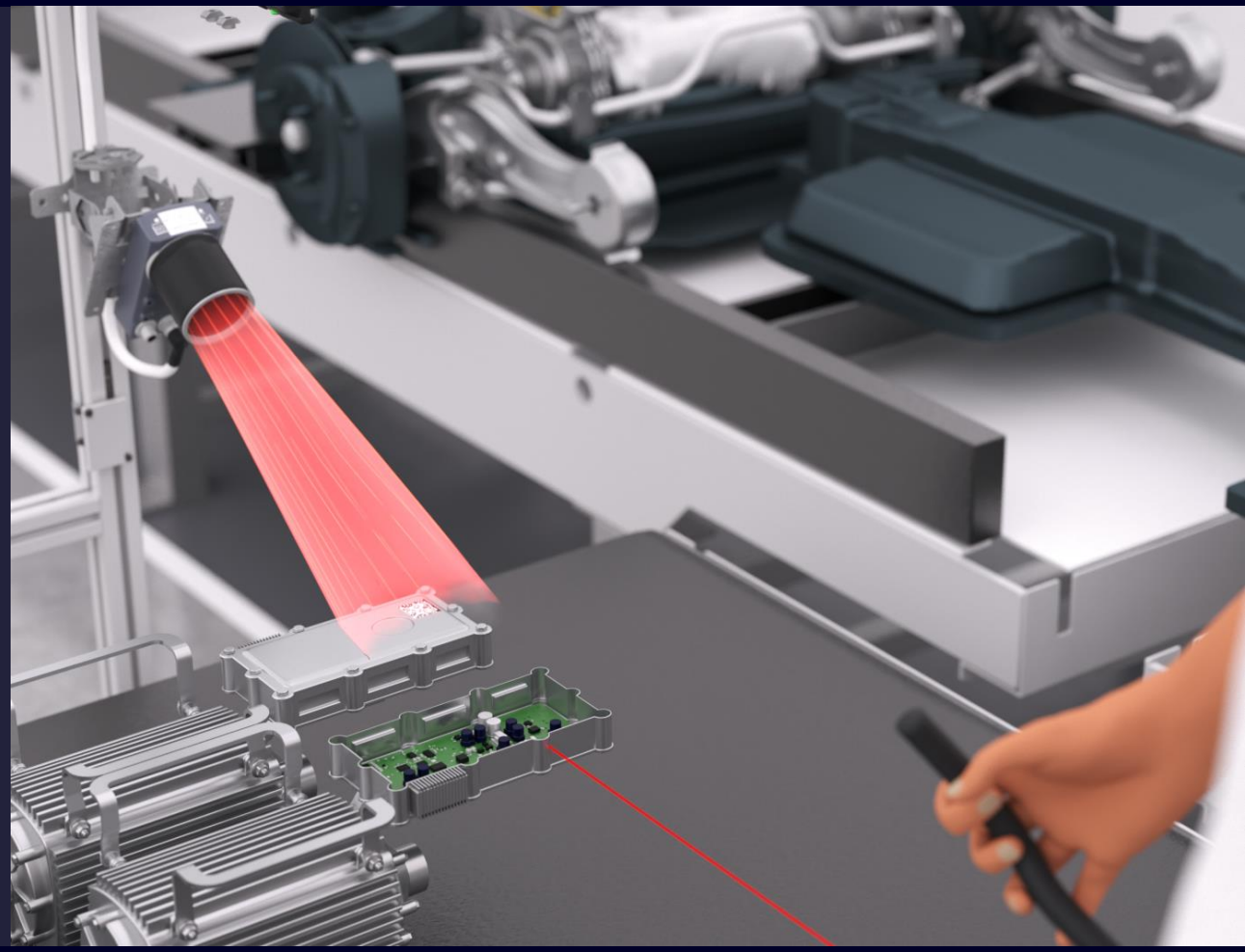
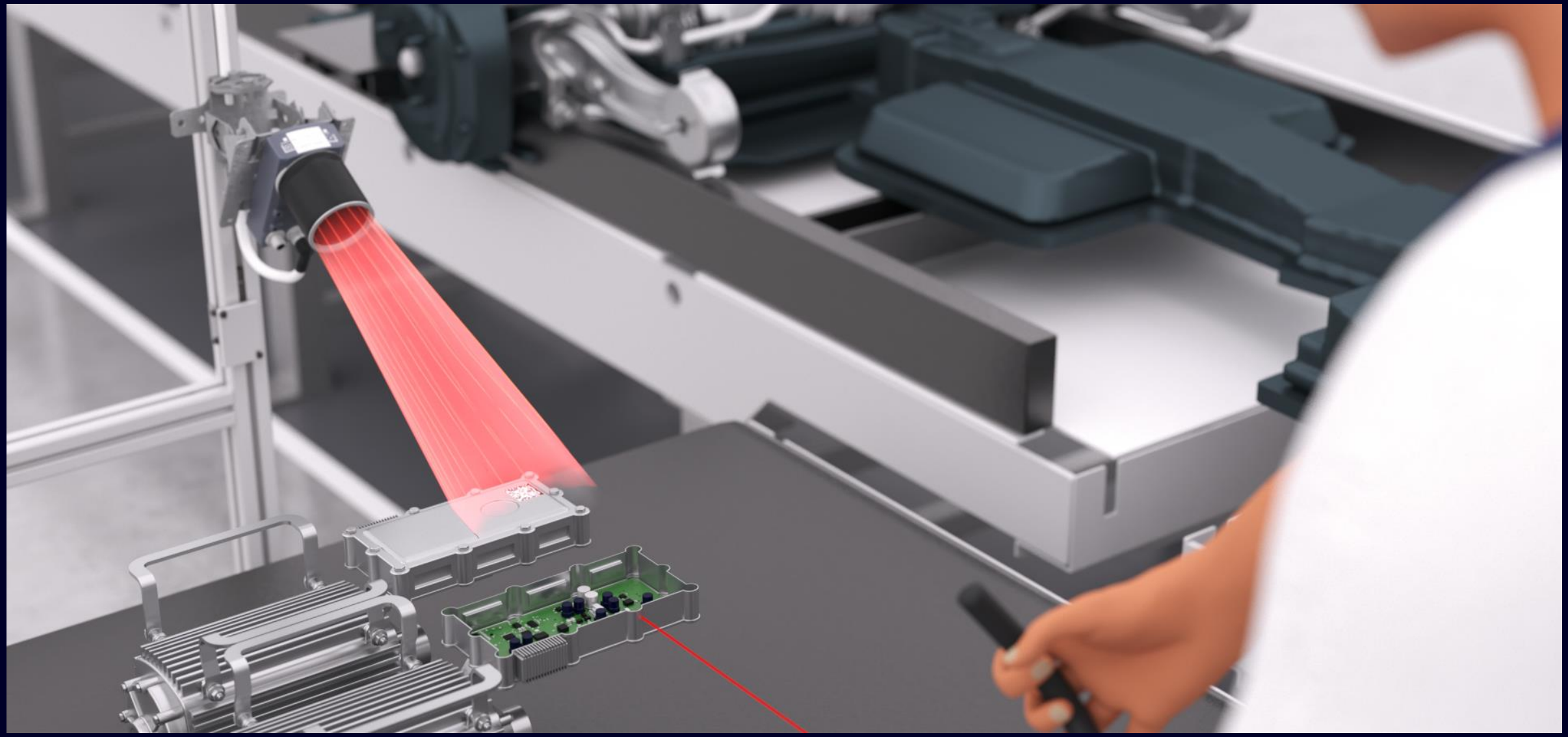


SIMATIC MV500
Optical identification of e-motors

- Large reading angles outside the optical axis enable ergonomic working.
- Quick and easy adaptation of lighting and support from ID-Genius, including smoothing of surface structures, optimized contrasts, and homogeneous brightness.
- High optical resolution and efficient algorithms enable the reliable reading of small-sized images beginning with three pixels per dot. This yields an image field that is more than 50% larger than comparable systems.





Battery Pack

From the individual battery cell to the complete traction battery, all product and quality data is collected and stored for use in the vehicle and a sustainable life cycle.

SIMATIC RF600
AGVs in battery pack assembly

- Higher degree of freedom thanks to the use of automated guided vehicles in combination with RF600 readers from Siemens
- The comprehensive RF600 portfolio enables the adaption to all the local conditions of the different sections of the production process
- Integrated industrial algorithms enable additional support and improvement of reading rates even in complex assembly situations

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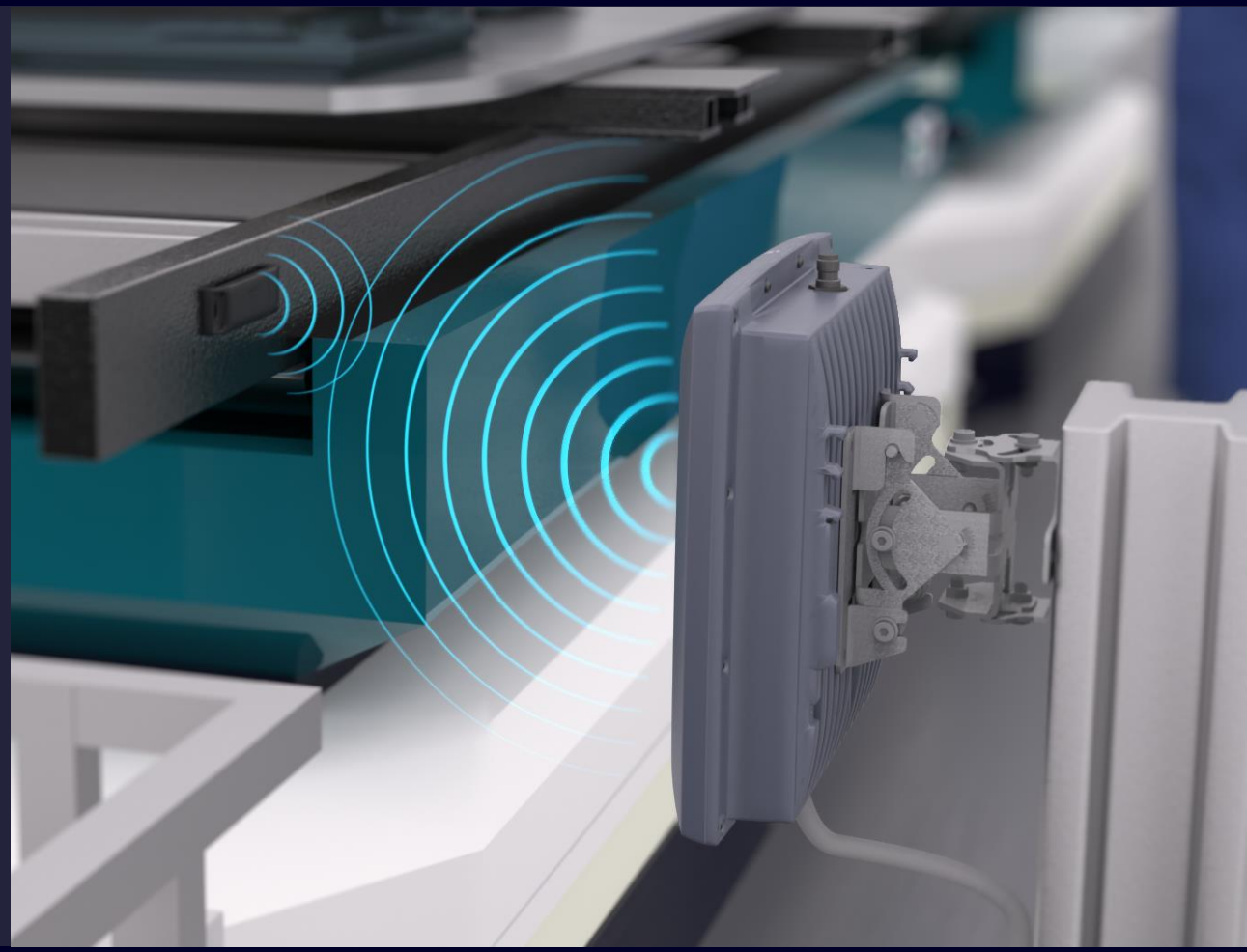
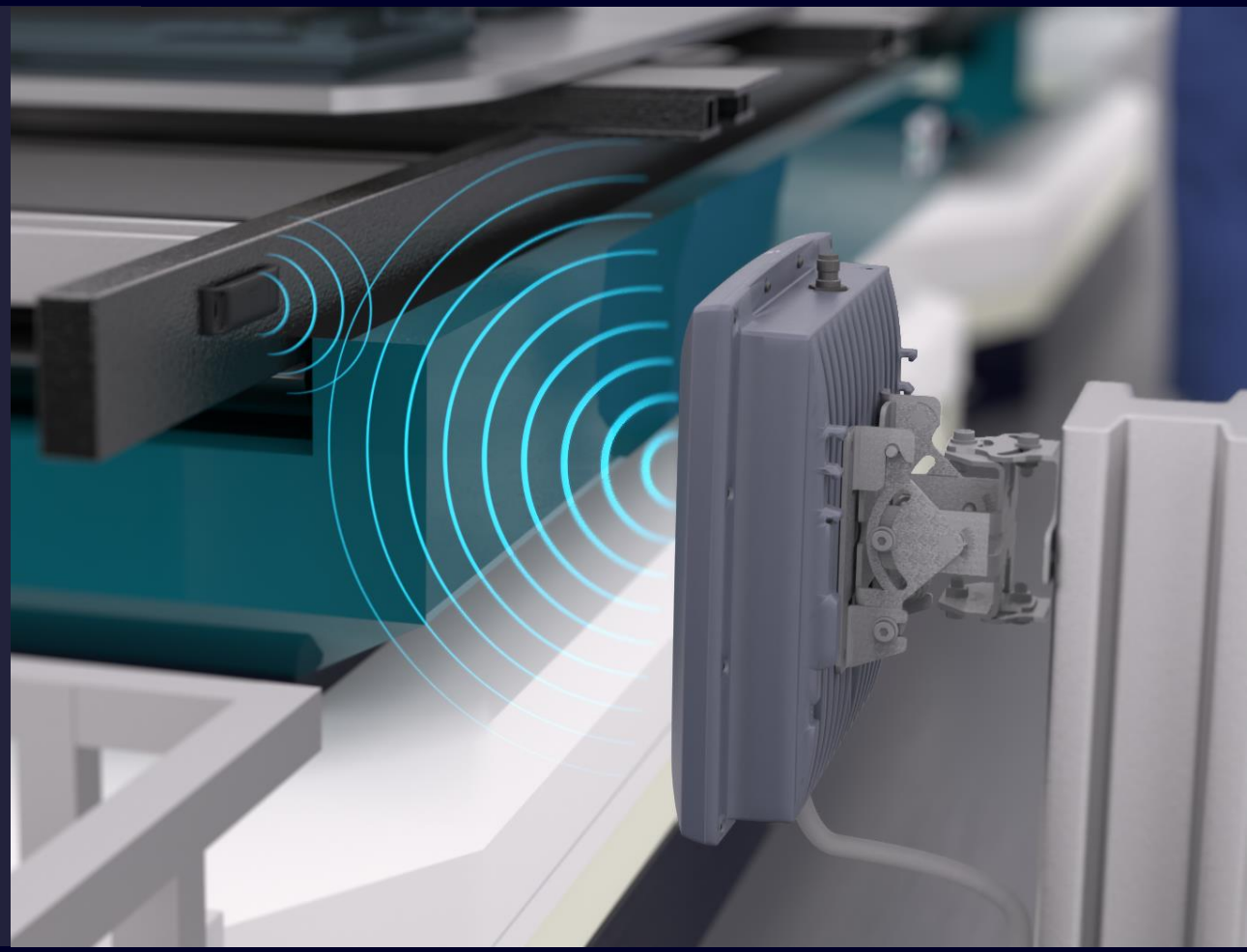
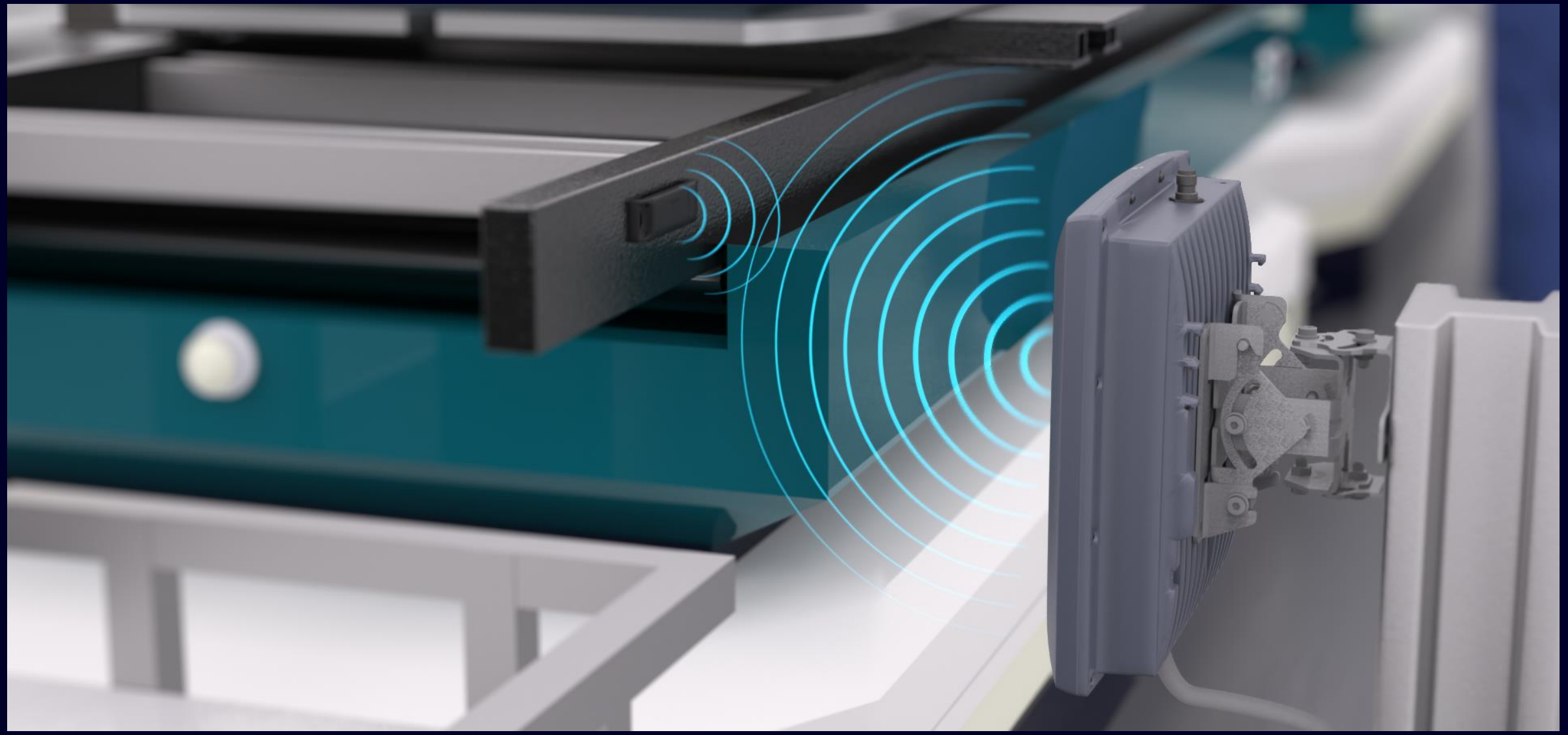


SIMATIC RF600
AGVs in battery pack assembly

- Siemens products enable long operating distances of up to 4 meters. This allows the battery to be accessed from all sides and permits ergonomic position changes of the load carriers.
- Designing the different read points, from track-guided conveyor technology to AGVs, is easily possible with the right readers and antennas. The same UHF transponder serves as a data carrier in all process steps.
- Reliable readings are obtained even in complex assembly situations using features like power ramp and blacklisting. Overranges are suppressed and false readings are prevented despite the densely packed production environment.





SIMATIC RF300
Intelligent product carriers in battery module assembly

- High throughputs and storage capacities in the assembly of the traction battery
- Quick and easy commissioning and comprehensive diagnostic options reduce downtimes
- An immediate restart following a production stop is guaranteed at all times thanks to data storage within the product

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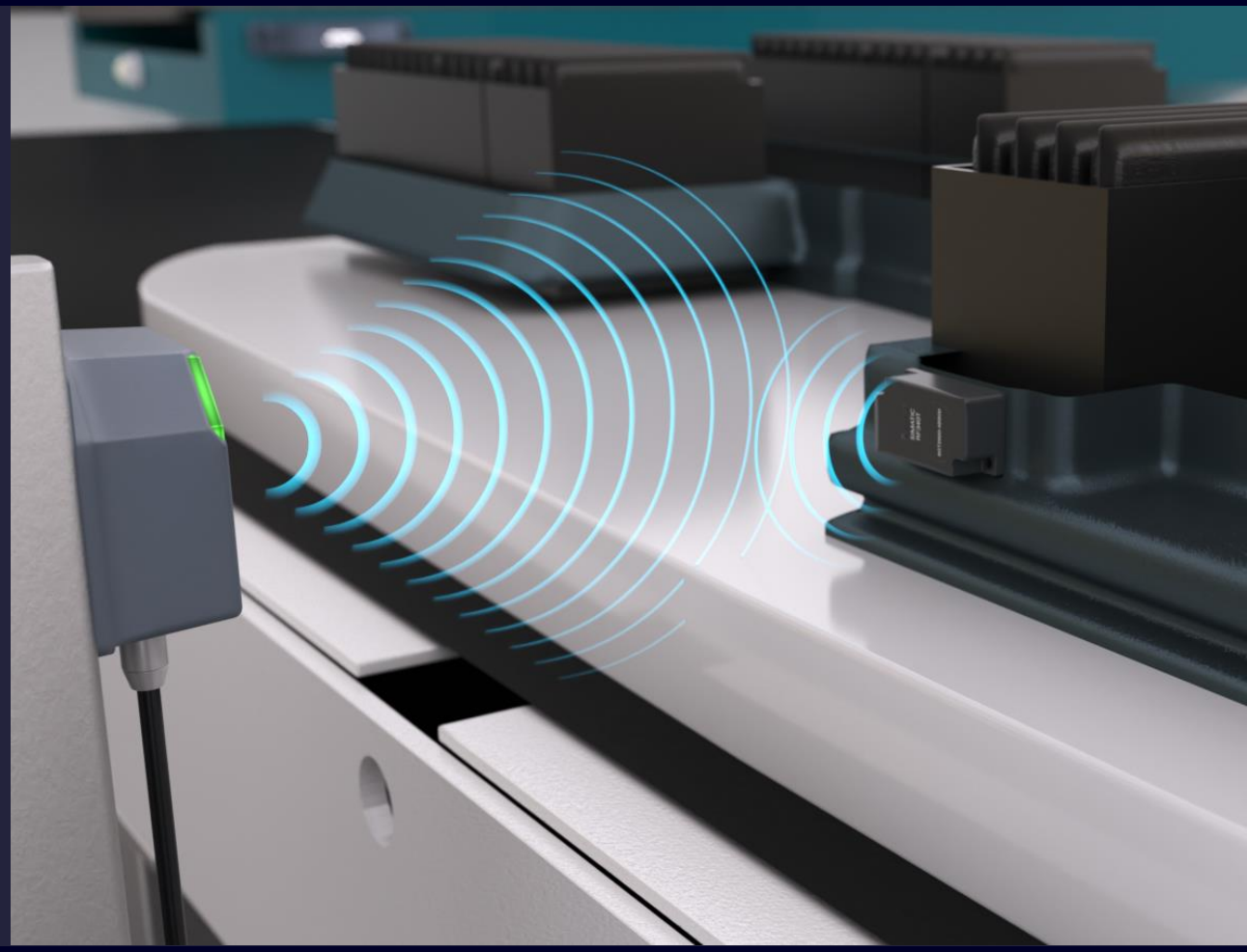
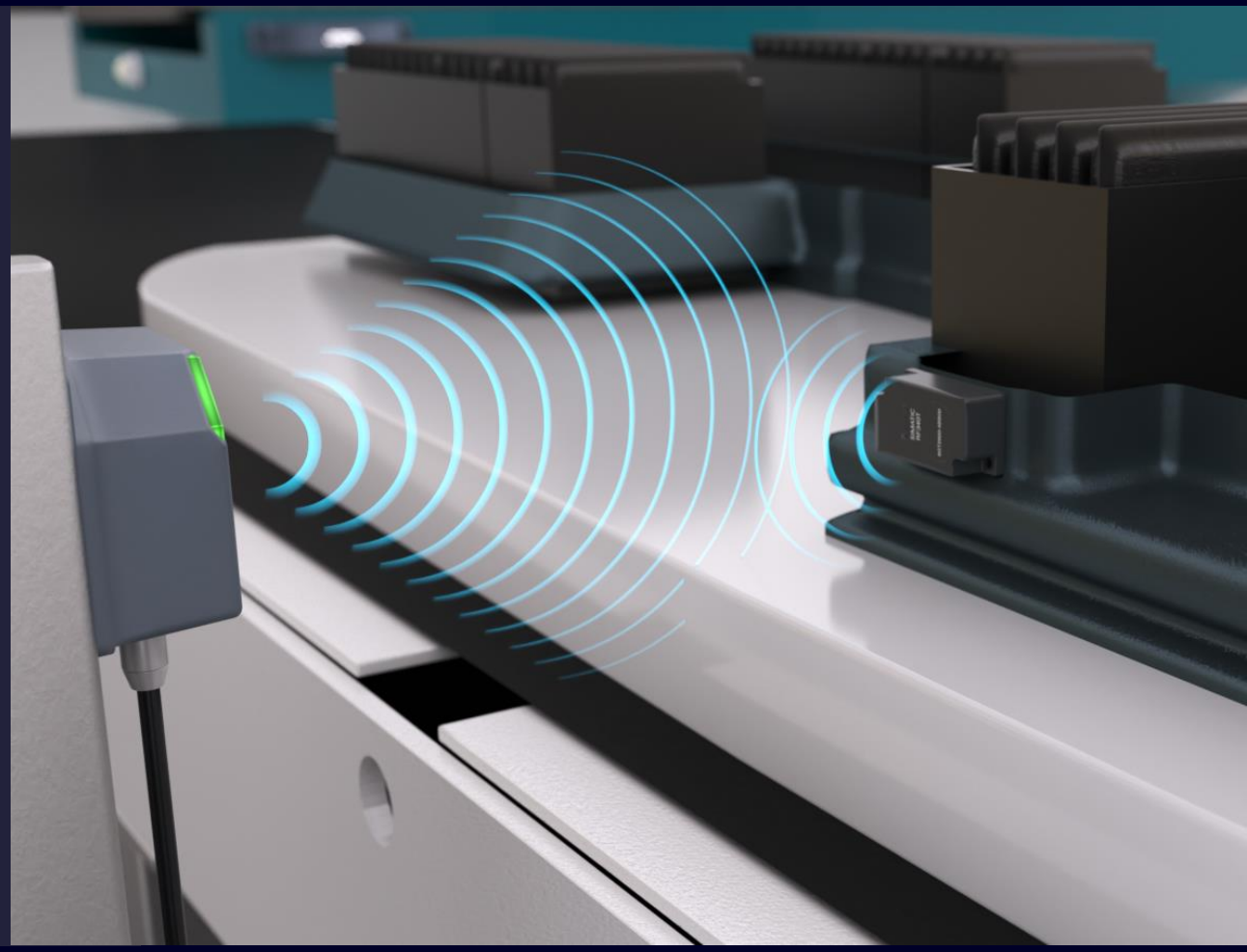
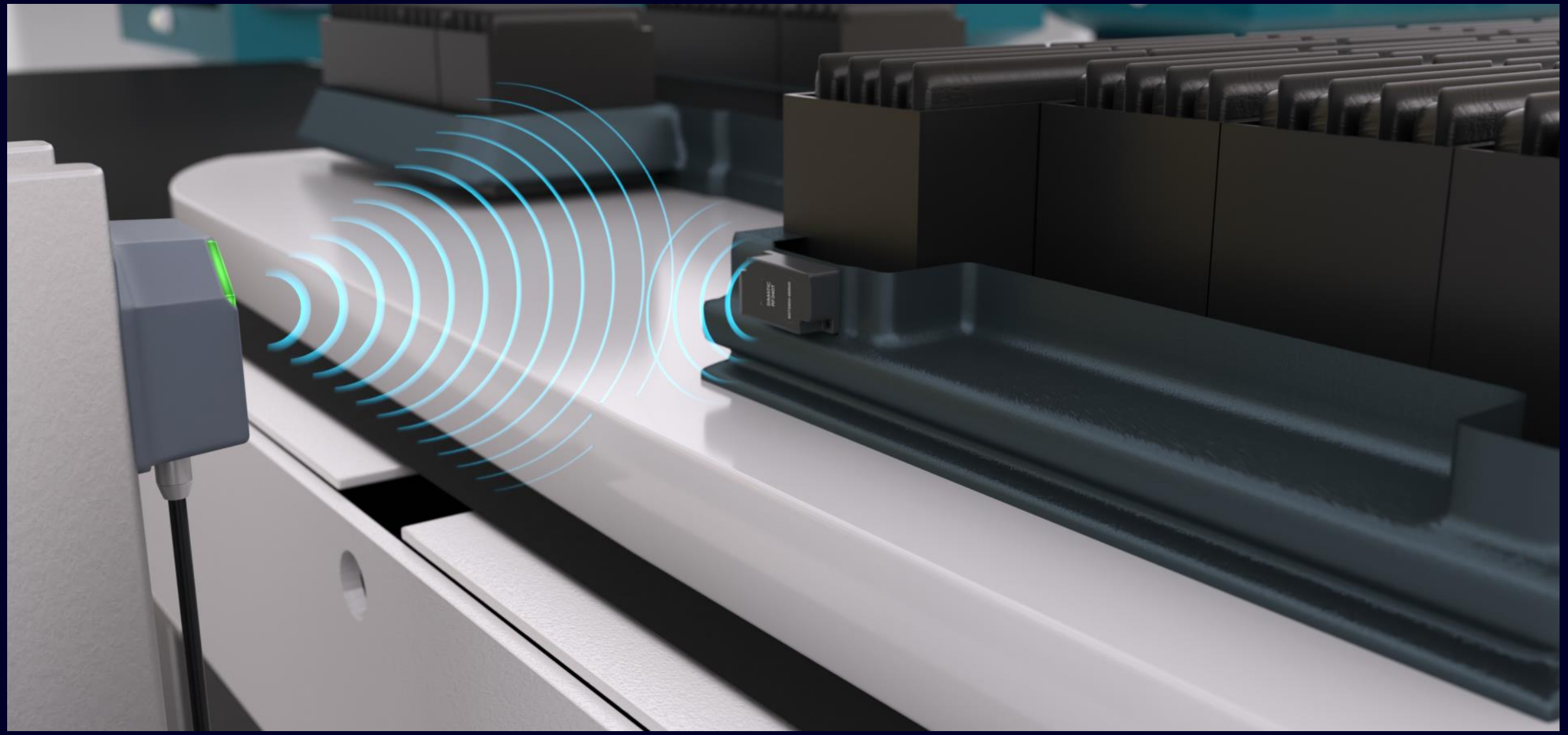


SIMATIC RF300
Intelligent product carriers in battery module assembly

- The RF300 system enables a high throughput of product carriers in the assembly of the traction battery. Data storage devices of up to 64 kb offer sufficient capacity for process and quality data, for example - for all installed battery cells.
- Teach-in mode supports the correct positioning of the transponder and antenna for a physically reliable application. In the SIMATIC environment, read-point user programs can be created within minutes thanks to the wizard and pre-finished modules. Web-based management of the interface modules enables diagnosis during the ongoing process at any time.
- The provision of all process data is guaranteed so that irregularities in the network or power supply have no effect on seamless identification. In this way, we reduce the time it takes to restore production readiness to a minimum.





SIMATIC MV500
Optical identification of battery cells

- Highly efficient processing and identification of codes enable short cycle times and high throughput performance
- Fast image preprocessing for multi-code applications, including harsh conditions with interfering light and shading
- Efficient cost savings thanks to the grading feature based on the ISO 16022 or ISO 29158 standard

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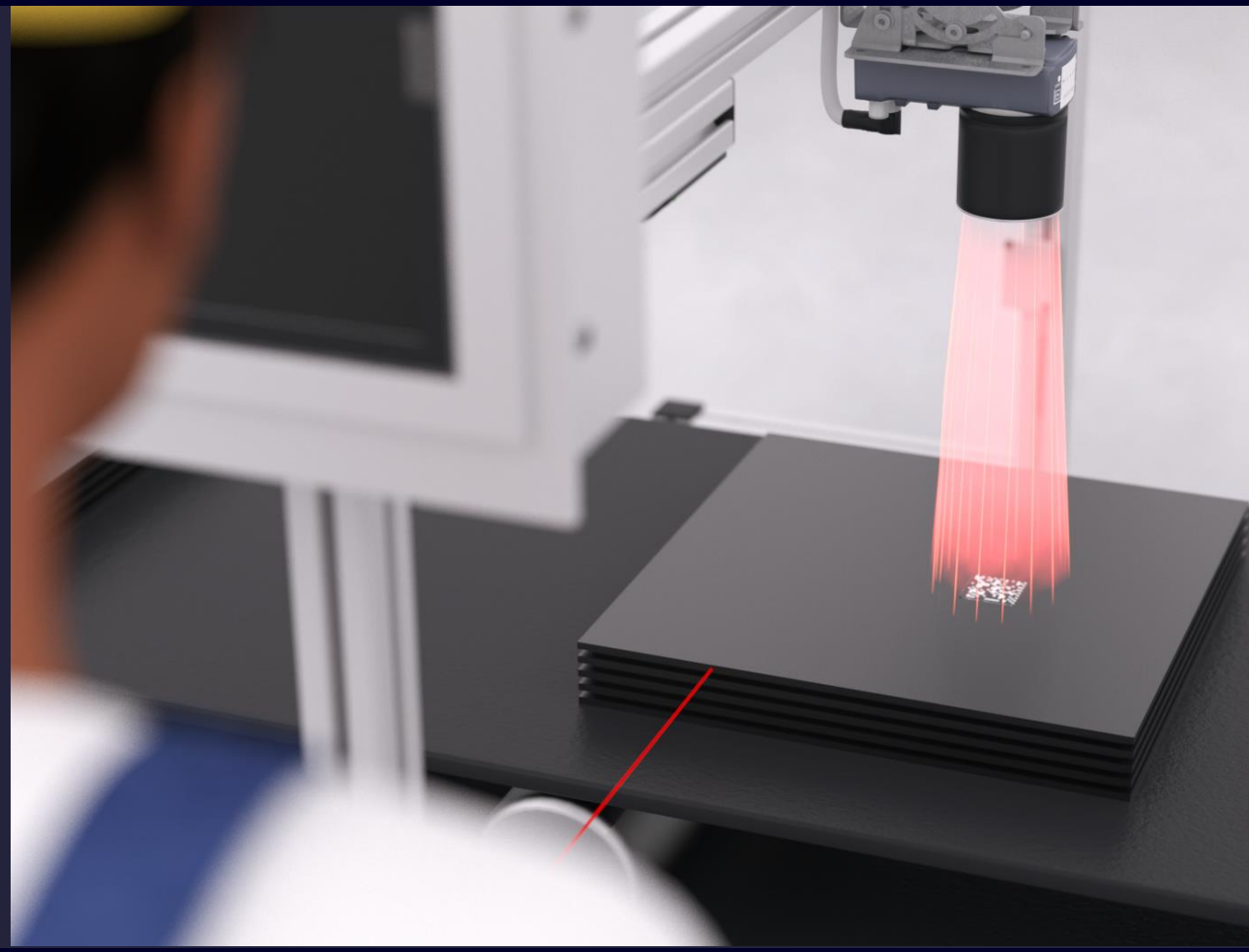
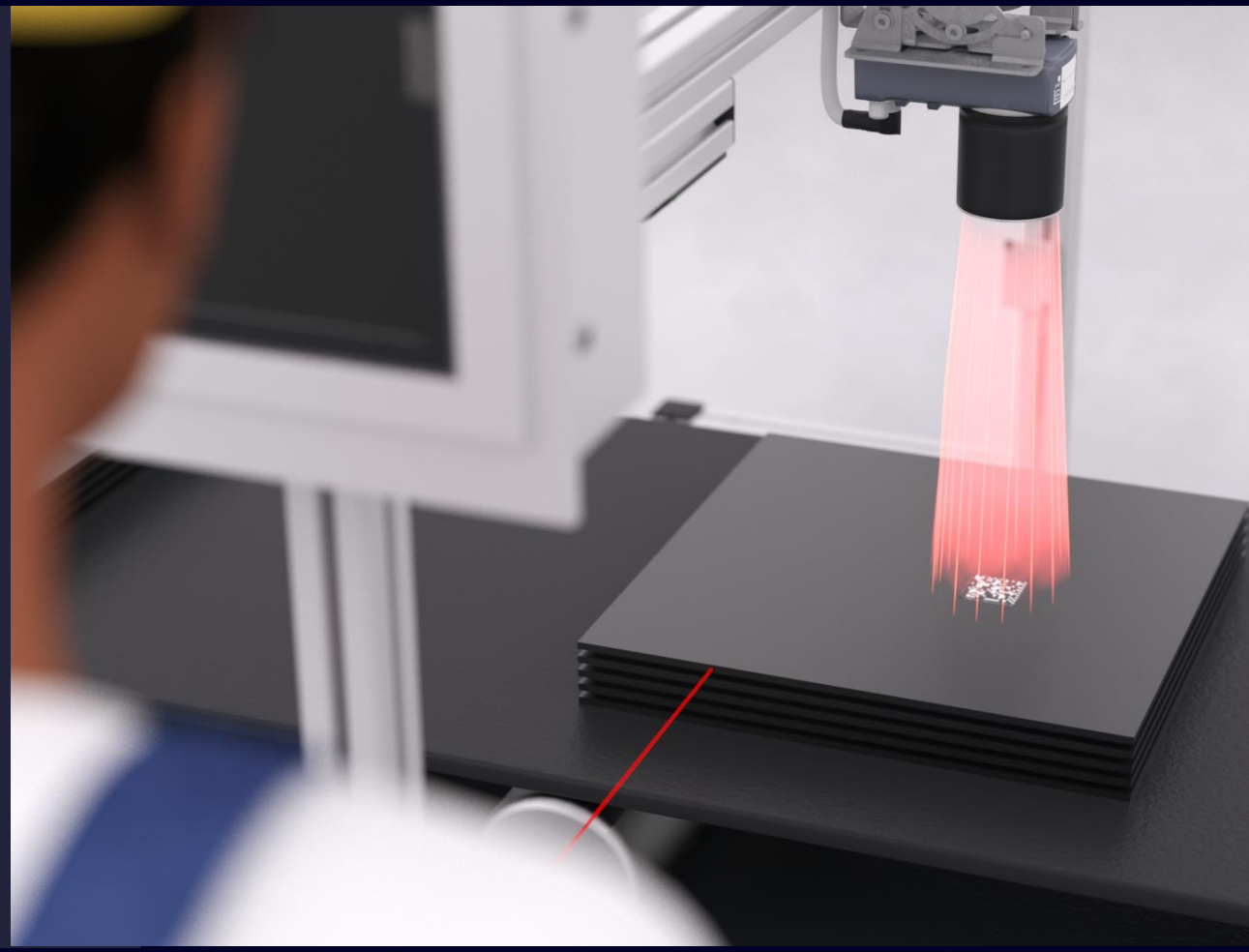
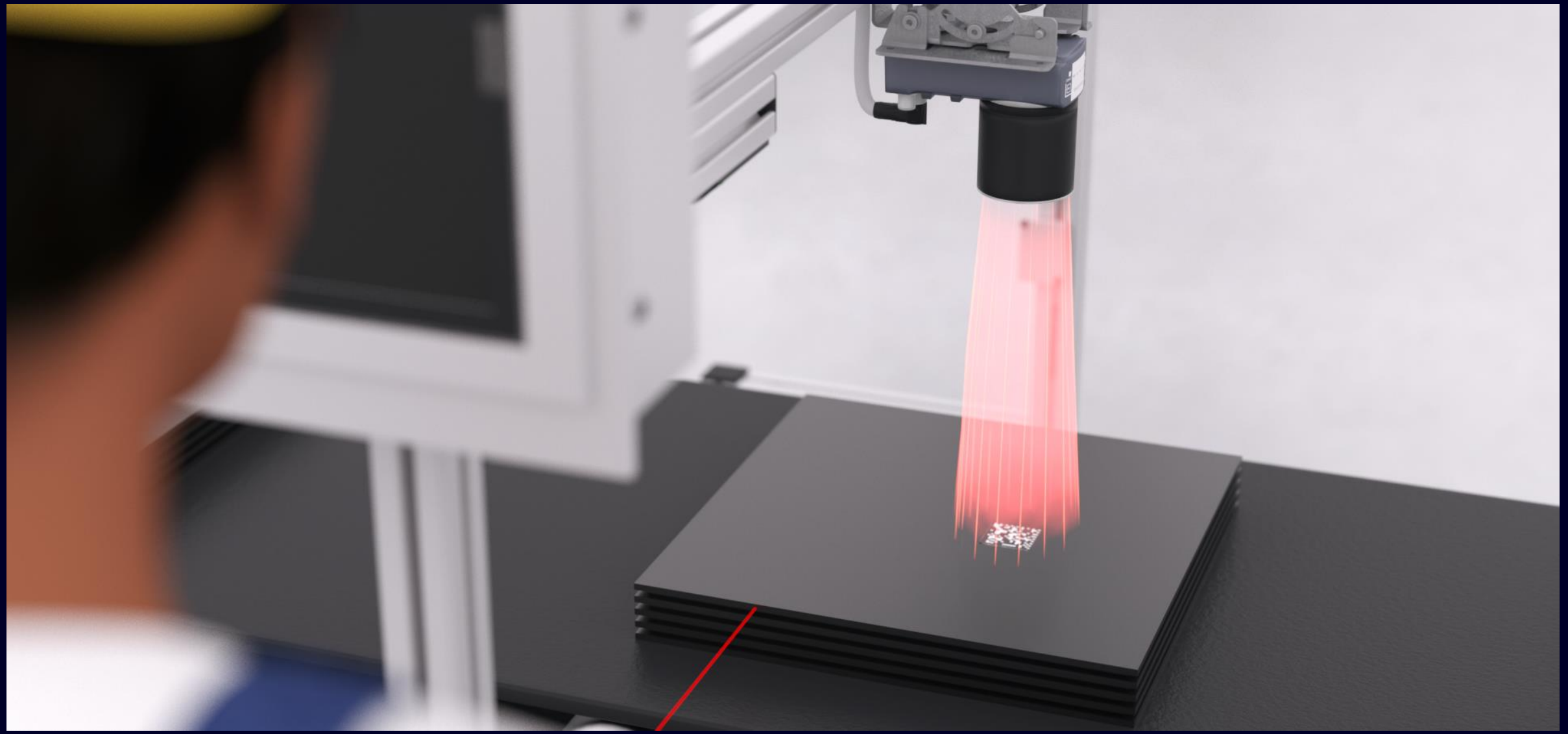


SIMATIC MV500
Optical identification of battery cells

- High performance thanks to smart algorithms and high camera resolutions allows up to 150 codes for multi-code captures.
- The image processing filters allow the minimization of ambient light sources and shading even without external lighting components.
- Consistent quality inspection of the identified product code via the grading feature enables an instant assessment of code quality and a response along the lines of preventive maintenance. A simple evaluation and adaptation of the results are made possible by the freely configurable output string.





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