

After Sales & Service

Railway



Mobility. Materials. Photonics. | united by passion.

CONTENTS

Mobility

Making mobility happen. 4

Service

After Sales & Service 6

Gangway systems 8

Top services for top products

- Initial installation 12

- Utilization phase 14

- Maintenance phase 16

- Strategy development 18

- Refurbishment 20

- End-of-life service 22

The company

HÜBNER worldwide 24



Mobility | Making mobility happen.

Hardly anything in today's globalized society shapes life as much as mobility. In addition to data and goods, it is people who are on the move more than ever before. Traveling and commuting between different locations, between workplace and home, between the suburbs and the city center have become essential to our standard of living in the 21st century.

As the global leader for gangway systems and a major supplier of sealing systems for buses and trains, the HÜBNER Group plays an integral part in this megatrend. For decades, the company has been delivering innovative products for the transport sector. The extensive portfolio ranges from customized gangways to chassis technology for commercial vehicles to airport technology applications.

With increasing mobility, however, there is also growing demand for protection of the environment and resources. HÜBNER innovations such as lightweight articulation systems or aerodynamically streamlined corrugated bellows for railway vehicles are making significant contributions to greater energy efficiency in public transportation – while at the same time allowing for higher speeds.

And the materials used in HÜBNER products – many developed specifically for these applications – feature outstanding durability, thus reducing the consumption of resources over the whole product life cycle. HÜBNER has been developing innovative mobility concepts and solutions around the world for decades. These are making mobility happen today and are opening up new mobility horizons for the future.



The best in service? Right this way... After Sales & Service

As the global market leader for gangway systems, HÜBNER develops and produces extremely reliable high-performance products. Materials and workmanship of the highest quality give HÜBNER gangways the best possible starting conditions for a long service life. And the benefits that customers receive do not end simply with the delivery of a superior product. HÜBNER supports its customers throughout the entire product life cycle with its comprehensive know-how and experience. And with a wide spectrum of services – ranging from installation training to wear and tear assessment, to repairs, refurbishments and maintenance work of all sorts, to obsolescence management and finally to environmentally sound disposal solutions.

HÜBNER sees these services as an important responsibility and therefore has created a dedicated organizational unit to handle them – the new After Sales & Service segment. In this unit, the relevant competencies from sales, project management, design, technical services and repairs have been brought together. The experienced

and effective team that has been created is there to concentrate entirely on the after sales and service needs of HÜBNER customers. Without lengthy waiting times.

In each phase of the product life cycle, our aim is to provide maximum customer benefit. In addition to providing customized product solutions – the family-owned company HÜBNER has set itself the goal of minimizing downtimes and costs for transport operators and increasing the profitability of vehicles in operation. HÜBNER experts work closely together with specialists and practitioners on the customer side – with a minimum of bureaucracy and a maximum of shared purpose.

Both sides benefit from the exchange: Customers receive optimal, customized support solutions. And HÜBNER is able to use the experience it gains from this closeness to daily operations to make its products even better.



Quality – Where it counts Gangway systems

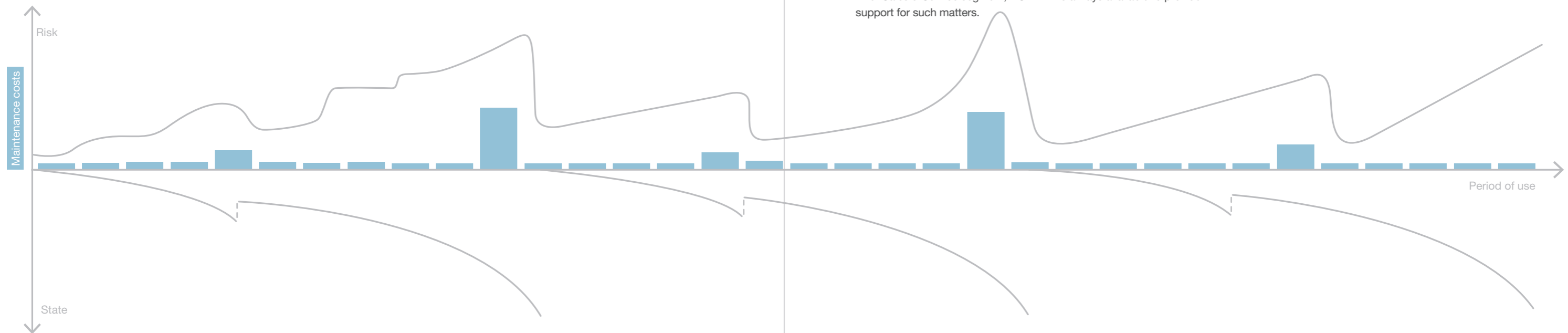
Typically railway vehicles have an operating life of 30 to 40 years. The gangway systems of the vehicles, however, have a shorter life cycle because they are one of the vehicle components that is subject to the highest stress levels. During every kilometer of travel gangways compensate for the different motions between the cars. Particularly on curves, enormous forces are exerted on the folding or corrugated bellows and the other elements of the gangways. Exposure to weather conditions also causes the flexible connections to age more quickly than components that are not directly exposed to the outside environment. Depending on the routes that are traveled, climate factors, operating hours and the quality of maintenance, gangways on average need to be replaced or refurbished every 12 to 15 years.

Wear is a continual process and begins on the first day of use. To provide optimal care, maintenance and refurbishment for gangway systems, operators need to have a good understanding of the installed products. HÜBNER provides this type of knowledge through on-site training when gangway systems are first put into use as well as in special servicing and refurbishment training sessions. In addition, users receive detailed documentation material. On this basis, it is possible to detect atypical wear and tear and to take appropriate counter measures. With its After Sales & Service segment, HÜBNER is always available to provide support for such matters.

The gangway systems are designed so that numerous adjustments and repairs can be performed simply and easily without long periods in the workshop. Larger maintenance procedures, on the other hand, inevitably involve some downtime, particularly for the installation of a complete new system.

It is unavoidable that gangways will have to be replaced – at the latest at some point in the middle of a railway vehicle's overall life cycle. With the right planning, however, the costs of this necessary step can be reduced considerably. For example, gangway replacement should be planned for times when the vehicle is going to be uncoupled in any case for a general inspection procedure. The same applies for major maintenance of the gangways. This makes it possible to avoid unnecessary downtimes; concurrently, delivery of the necessary new parts and systems can be arranged so that they are ready and waiting. By contrast, if a vehicle is unavailable due to an unplanned failure, this can result in bottlenecks in operation and to waiting times for new acquisitions.

Experience proves that with proper and regular maintenance of components, the risk of an unexpected failure can be reduced to a minimum.





Service

Top services for top products

HÜBNER is a company you can count on. The company's railway vehicle experts are always there ready to provide practical assistance and technical expertise – from the beginning to the end of the product life cycle. Whether for training, advice, maintenance or repair, service will be provided at the customer's location whenever feasible. This makes it possible to minimize downtimes and costs. HÜBNER offers service support for each and every phase of the gangway system life cycle. Some of these services may be performed multiple times or take place in different phases of the product life cycle.



Installation training
and warranty extension

Initial installation

When gangway systems are first integrated into the vehicle, HÜBNER conducts a comprehensive installation training. The training is customized exactly for the particular gangway product and for the needs of the individual customer. Highly experienced and specialized trainers share know-how and best practices with the technicians of the customer to support safe, efficient and economical installation and handling of the new gangway systems. This ensures that the new system delivers maximum performance. At the same time, damages or risks resulting from improper installation are avoided. The training covers the entire installation process of the gangway system and the related components.

Theoretical training:

- Function of the gangway
- Safety regulations
- Required tools

Practical training:

- Unpacking and handling
- Pre-assembly and installation in the vehicle
- Testing for correct installation

Training materials, safety instructions, certificates of participation and, if desired, testing for achievement of training goals round out the training package.

With this approach, customers benefit from the long experience of the HÜBNER experts from the first moment of commissioning the new gangway systems. In addition to installation training, HÜBNER also offers the possibility of an extended warranty for its products. With this offer, the manufacturer's warranty is extended from the statutory length – for example to three, four or five years. If defects or damage covered by the warranty occur in this time, HÜBNER takes care of replacement – quickly, with little bureaucracy involved and without any co-payment from the customer.

Checks and training

Utilization phase

Wear and tear begins starting from day one. Gangway systems are not only exposed to the weather during operation but also to extreme levels of stress produced by the relative movements of the carriages. The After Sales & Service unit supports the customers in keeping an eye on this wear and tear and limiting it as much as possible. HÜBNER's offerings include fleet checks, anticipatory review for probable wear and tear developments, functional checks, safety and accident inspections as well as evaluations of wear and tear.

The key to clever service management is the effective involvement of the customer's own technicians. HÜBNER aims to give the customer's technical team the understanding of the gangway systems that they need for effective maintenance work. Specialized instructors from HÜBNER provide the necessary know-how in customized training for the individual customers. In addition to extensive theoretical knowledge on the functions and components of the gangways, practical exercises are the central focus of this work.

HÜBNER service and maintenance training enables the participants to undertake a wide range of maintenance activities correctly, safely and efficiently.

Theoretical training:

- Safety regulations
- Required tools
- Corrective and preventive maintenance procedures in accordance with the service plan
- Details and recommendations for planning of maintenance tasks

Practical training:

- Visual inspections and criteria for evaluation of the condition of the components
- Handling, repair and replacement of components
- Use of HÜBNER Repair Kits for the repair of bellow materials and frames

Refurbishment training from HÜBNER deals with issues of fleet management and is intended for refurbishment specialists. These employees get the necessary know-how to manage efficiently demanding overhaul projects for the vehicle fleet in a manner that is economical, ecological and directly related to the actual condition of the fleet.

- Detailed information on the development and function of components
- Critical elements of the gangway systems in refurbishment projects
- Inspection and review regarding refurbishment or replacement
- Required tools and replacement parts
- Practical training on the various components

Training materials, safety instructions, certificates of participation and, if desired, testing for achievement of training goals round out the training package.

The benefits for the customer are clear: Employees are in the position to perform maintenance work and refurbishments by themselves – economically and flexibly. That increases fleet availability. At the same time, well-trained technicians ensure that the gangway systems deliver maximum performance for the longest possible time – because damage and unusual signs of wear are detected at an early point in time and technicians know what action should be taken.





Fast service and
outstanding spare parts management

Maintenance phase

During maintenance work, HÜBNER is there to provide all the necessary support to customers. The focus is on quick communication and short distances to the customer. Experienced service technicians perform maintenance work and corrective repairs directly on site to reduce downtimes. This is made possible by an international network of service partners. If desired, customers can conclude fixed maintenance contracts with a multiple-year duration. HÜBNER then takes on all the maintenance work for the gangway systems for the agreed time and scope of the contract.

HÜBNER has established internal processes that make it possible to react quickly to maintenance requests. The company has created a separate production area for in-house maintenance requirements that is completely separate from new project business. This makes it possible to deliver repairs and replacement parts more quickly. All service work is based on a detailed damage survey and assessment and leads to a professional offer with clear and understandable presentation of contents and costs. Customers are informed about possible alternatives to new acquisitions – because often it is possible to save costs through further use of individual components.

HÜBNER's service portfolio also includes detailed, multi-lingual documentation: exploded view drawings, 3D descriptions, training videos and complete spare parts catalogs make it easier for users to perform repairs or to order parts. HÜBNER delivers components in OEM quality and can ensure a high level of availability due to comprehensive stocking and a high percentage of in-house production. In the event of the obsolescence of individual components, the company guarantees technically equivalent replacements.

In special training programs, HÜBNER experts give their knowledge to customers' personnel. The participants receive theoretical and practical training. In this way they can learn about initial installation, how the gangway systems function and what is required for installation (page 13). In the service and maintenance training, all types of maintenance activities are dealt with (page 14). In refurbishment training, the focus is on effective overhaul of the systems and the exchange of components (page 14).

Smart planning, repair and analysis

Strategy development

To avoid unnecessary downtimes and costs for customers, HÜBNER makes use of a preventive and status-oriented maintenance planning system. In accordance with this, the gangway maintenance intervals are aligned with the maintenance intervals for the whole vehicle. Gangway examinations take place exactly at that point when the railway vehicle must in any case be uncoupled – for example, for a general inspection. If any damage occurs to the gangway system which cannot wait until the next planned uncoupling, the HÜBNER experts offer "life-prolonging measures": smart repair solutions which will ensure safe operation until the next planned maintenance time. And, of course, these are economical interventions – performed either on site at the customer's location or at a HÜBNER facility.

Optimization of maintenance intervals, procedures that preserve functionality and servicing recommendations are all part of a customer-oriented service strategy. HÜBNER also performs an individual LifeCycleCost and Risk Analysis procedure for customers. The aim of the procedure is to minimize costs and downtimes for gangway systems throughout the entire product life cycle by means of a timely planning approach. These life cycle costs for HÜBNER products are low in any case, due to the high-quality materials and workmanship that make the gangway systems particularly durable and robust.

Live Recording Railway Network (LRRN)

HÜBNER makes use of the latest technology for planning purposes. The company has developed a computer-based process that measures the relative movements of the carriage bodies to one

another – for each individual section of a certain rail route. The sensors of the Live Recording Railway Network system record all of the relative movements of the vehicle. The system registers roll, swivel and pitch angles, as well as transverse and height offsetting all relative to the coupling rod. GPS data and time points are also recorded. This data provides critical information about the real levels of strain that are to be expected for the gangway system when in actual operation. With endurance testing it is possible to make a reliable prognosis on a gangway's service life.

The measurement system also yields valuable data for refurbishment processes. For example, it is possible to determine whether the route conditions have deteriorated since the initial installation of the gangways.

HÜBNER doesn't only use the Live Recording Railway Network technology in connection with its own products but also when the gangways of other manufacturers are installed.

The sophisticated measurement procedure can even be used when the vehicles do not have any gangway system and possibly need to be retrofitted with one. This allows operators to estimate the probable future costs of a gangway integration and evaluate those costs relative to the increased benefits of vehicles equipped with gangways – which feature more space, comfort and an improved sense of security for passengers as well as optimized ventilation and air-conditioning possibilities.





Cost-efficient overhauls

Refurbishment

When a gangway system is getting on in years, HÜBNER looks for the optimal solution that will be most economical for the customer. Instead of automatically replacing the complete gangway with a new one, the possibility of exchanging some portion of the existing components is reviewed. In this way it is sometimes possible – depending on the design – to retain the screw-on or coupling frame of the system and exchange the folding or corrugated bellows, disposing of the old bellows in an environmentally appropriate way.

The HÜBNER experts are experienced in "Smart Repair" and find customized solutions when required. For example, if the upper part of the bellows is showing signs of damage, a protective covering will be put over it or the affected area of the material can be reinforced. This conserves resources and prolongs the service life of the gangway system.

The refurbishment work takes place directly at the customer site or in the servicing area of HÜBNER. And the work is always done in accordance with the highest quality standards. In addition to its certifications under ISO 9001 and ISO/TS 22163, HÜBNER is also a certified provider for maintenance welding work in accordance with EN 15085-2.

A gangway overhaul also represents an opportunity to implement an upgrade or modification in the system. HÜBNER checks how it may be possible to optimize the functionality or service life of the gangway through technical changes. In providing this support, the HÜBNER experts don't only take into account the individual needs of the customer but also bring their wide experience from the field into play in finding the best solution.



Environmentally sound disposal
End-of-life service

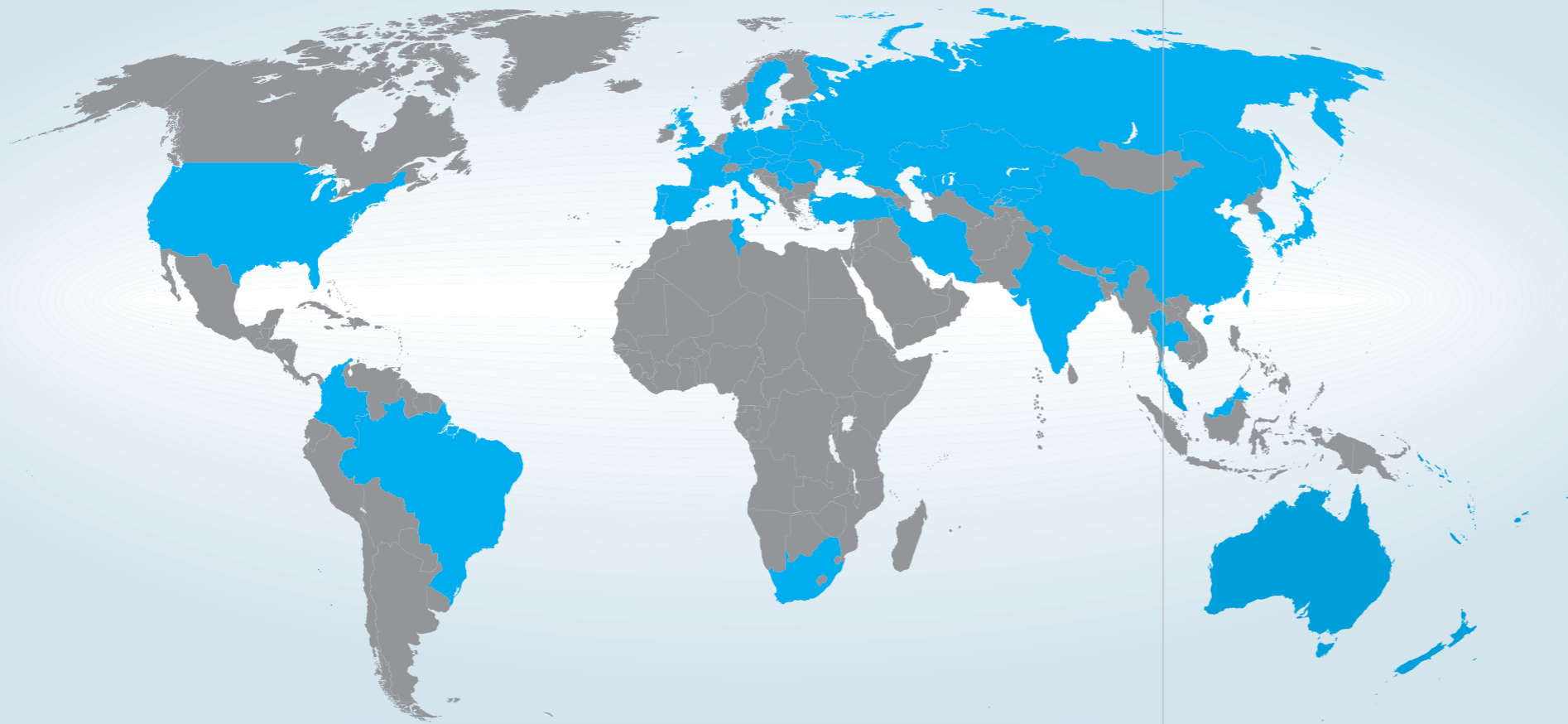
Whether it's a mid-life overhaul or the final decommissioning of a gangway system – when parts, materials or systems are no longer required, HÜBNER can take care of environmentally sound disposal for the customer when desired. That means that customers don't have to get directly involved in managing disassembly, removal and locating a suitable collection for the decommissioned parts. Whenever it is possible, HÜBNER recycles old parts with modern methods or reuses them. This conserves resources and the environment.

Obsolescence management

If a component needs to be replaced, only the original is good enough. HÜBNER maintains flexible production capacities that are

independent of ongoing manufacturing activities and the company has a high degree of in-house production depth. This ensures that there is optimal availability of spare parts.

If an external supplier discontinues a certain component, HÜBNER makes sure that a validated replacement in OEM quality is quickly available. This gives customers a high degree of security: They avoid downtimes and can make uninterrupted use of their railway vehicles over long periods.



HÜBNER worldwide

Think globally, act locally: HÜBNER is there where its customers are – because close contact helps us to understand business partners better and to provide better support. Individual wishes and requirements can be determined quickly and then put into effect and implemented without delay. Customers thus have direct benefits from our strong local presence.

In addition to the company headquarters in Kassel, Germany in the heart of Europe, HÜBNER has built up 25 locations around the world in the preceding years and decades. The company now has major plants in Hungary, the USA, China, Russia and Brazil. This network of company-owned locations is supported by sales partners and trade representatives in more than 30 additional countries.

And the company's offering to customers does not end with the delivery of the products. The HÜBNER Group is also continually expanding its service structures – in personnel and in the technical facilities that are provided. To be on hand ready to provide support as quickly as possible – in locations around the world.

www.hubner-group.com/en/worldwide

1 group | sales partners & representatives
with more than **25 locations** | in more than **30 countries**
founded in **1946** | approx. **1,000** patents worldwide
approx. **3,300** employees

www.hubner-group.com



HÜBNER GmbH & Co. KG

Heinrich-Hertz-Straße 2
34123 Kassel

Tel. +49 561 998-0

Fax +49 561 998-1515

as&s-rail@hubner-germany.com

www.hubner-group.com