



BOSCH

Invented for life

Solutions for railways and train station facilities

[bosch.com/railways](https://www.bosch.com/railways)

Smart. Safe. Accelerating.



Bosch solutions for railways
and train station facilities



When you choose Bosch as a supplier of products and solutions for railways and train station facilities, you can be assured of cutting-edge technologies from a global provider. True to our company slogan "Invented for life", our products and solutions are designed with our customers in mind. As a leading global supplier of technology and services, Bosch understands that professionals need to be able to rely on their industry partners for technical expertise and innovative thinking.

Bosch provides a comprehensive range of products and solutions for railways and train station facilities across the world, has a choice of products that are commonplace across the industry requirements, whether it is energy-efficient heating and hot-water systems, building and parking solutions or a comprehensive security system.

All solutions for railway and train station facilities

SAFETY & SECURITY



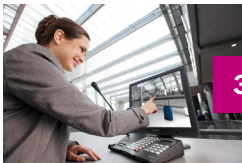
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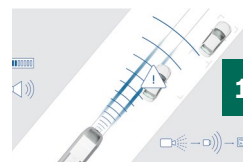
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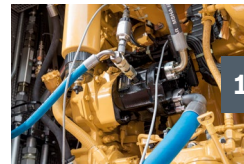
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Security and life safety

The safety requirements for infrastructures and buildings are increasing worldwide. The goal: People and values are protected as much as possible. Trust the Bosch long-standing expertise in consulting, planning, implementing and operating your individual security and life safety solution.

Benefits

- + Minimize risks, maximize security: no matter what your security task looks like, Bosch offers the best solution for every building.
- + Bosch offers comprehensive services and consultancy for monitoring, maintenance, modernization, and operation as well as attractive and flexible rental and operator models.
- + Bosch assists in all project phases and finds therefore the best solution for you: Planning, realization and operation complement each other perfectly, creating maximum security.

Bosch implements special requirements for a safe, economic, and comfortable building and offers a broad spectrum of services for it: from video surveillance, access control, fire-, evacuation-, and speech-alarm systems, robbery and break-in notification systems via networked time and building management systems, up to energy solutions. As an installer, service provider and consultant, Bosch supports in multifaceted challenges and provides customers with networked and intelligent overall solutions for safety and security from a single source. The Bosch experts have specific industry expertise and create individual solutions with future-oriented products and services that always focuses on the customers needs and requirements.



Fire alarm and voice evacuation systems

The Bosch portfolio covers the most reliable systems that include fire sensors, voice evacuation and control software to quickly locate, detect, verify and to contain fires. The systems are comprehensive, tailor-made solutions for almost any project. They fulfill and even exceed aesthetic standards and market requirements.

Station concourses can pose special challenges, with due to crowds, high ceilings, large open areas, and considerable distances to emergency escape routes. Bosch systems can quickly and accurately locate a fire and trigger immediate evacuation. At the same time, advanced technology minimizes false alarms. The public address system allows the operator to guide people to safety and avoid danger areas. Surveillance cameras can monitor evacuation proceedings and help the authorities coordinate rescue operations. All these systems incorporate high levels of redundancy and can be integrated centrally using the Bosch building integration system to ensure seamless operation under any situation.

Benefits

- + Superior fire protection with intelligent solutions
- + Advanced public address and voice evacuation systems
- + Solutions range from simple installations to highly complex applications



Public address

With more than 60 years' experience in designing and developing communications products, Bosch has established unrivalled leadership in the field of public address and voice alarm systems.



Benefits

- + Advanced public address and voice evacuation systems
- + Solutions range from simple installations to highly complex applications
- + Compliant to evacuation standards

High-quality public address and voice evacuation systems are essential for making announcements and dealing with security and safety challenges such as evacuating individual platforms or the entire station. Bosch public address and emergency sound systems are ideal for everything from routine to emergency announcements – always with maximum reliability and speech intelligibility for even the largest train stations.

[boschsecurity.com](https://www.boschsecurity.com)

Solution provided by: Bosch Building Technologies

Video systems

Railway stations have to process a large number of passengers each day. This, combined with the need for easy access, makes securing such a site a challenging task. Due to the variety of security challenges a railway station faces, a wide product portfolio is needed. That's exactly what Bosch offers.



With the video security portfolio, Bosch offers a wide variety of both fixed and moving cameras, different form factors and excellent image quality. For example, the 4K ultra HD solutions provide a comprehensive overview of a large area, without losing details. The camera portfolio goes the extra mile as the cameras have built-in video analytics at the edge as a standard. This makes sure operators are alerted when needed and allows you to quickly retrieve correct data. Furthermore, this technology helps to enforce safety and health regulations by notifying the operator when an emergency exit is blocked, for example.

Benefits

- + Video analytics built-in as standard as of the IP 4000 cameras
- + Reduce bitrate up to 80% and save storage costs without compromising video quality
- + Integrated hardware and software measures to keep video data secure, such as a built in trusted platform module

boschsecurity.com

Solution provided by: Bosch Building Technologies

Intrusion alarm systems

From single applications to extensive projects, Bosch provides solutions that are fully integrated and meet the highest security standards. The Bosch detectors and panels offer a finely-tuned balance between quick response to real security breaches and ignoring costly false alarm triggers.



Passengers with luggage can tempt thieves, and shops are vulnerable to shoplifters. There is a risk of valuables, equipment, freight, or personal items being stolen from restricted areas after hours. Personnel may steal items, and patrons may leave restaurants without paying. ATMs can be broken into, and copper wire can be stolen out of train yards. Bosch can help deal with all this as well, for example with intrusion systems to monitor windows, entrances, and off-limits areas. If a detector picks up a possible threat, a security operator is alerted and can use high-resolution cameras and intelligent video analysis to verify the alarm, activate an appropriate action plan, and support subsequent forensic searches.

Benefits

- + Portfolio covers panels, detectors, communicators and accessories
- + Scalable intrusion solutions for various needs
- + Reliable intrusion detection with decades of experience

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Solution provided by: Bosch Building Technologies

Access control systems

Flexible access control systems allow workers to get on with their jobs, while protecting staff from uninvited guests and public buildings from property and information theft. Bosch offers integrated systems for many different applications

A Bosch IP-based access control system is ideal for keeping unauthorized individuals from entering restricted areas such as train maintenance facilities, ticket offices, mailrooms, and luggage storage areas. It supports a large range of readers, and integration with video surveillance makes it possible to capture and record access events. Access violations automatically trigger an alarm.

Benefits

- + Complete Bosch access control solution covering software, controllers and a variety of readers and credentials
- + Comprehensive system with many features and possible integration with third-party devices
- + Easy to install and maintain thanks to its modular concept



Management software

Bosch management software is specialized in complex enterprise solutions. The management software portfolio covers video and alarm management such as the building integration system or the Bosch video management system. The Bosch building integration system offers a tool box to allow integration with third party applications via open standards (OPC, ONVIF, OSDP) and software development kits.



The building integration system provides a single web-based control point for monitoring all security, safety, and facility management systems. This includes alarm management, fast alarm identification via location maps and follow-up procedures. It seamlessly integrates fire and intrusion alarms, evacuation, access control, video surveillance and building automation systems into a single platform. The building integration system enables a single operator to monitor and control all security systems, as well as to respond faster to emergencies and achieve greater overall effectiveness. The Bosch video management system provides seamless management of digital video, audio and data across an IP network.

Benefits

- + Seamless integration of all Bosch safety and security subsystems as well as third party applications via SDK and open interfaces
- + Easy to operate, increasing operator efficiency, and allowing for a faster emergency response
- + One complete solution to enhance security, including a fully embedded access control

boschsecurity.com

Solution provided by: Bosch Building Technologies

Energy services

Global energy consumption is continuously increasing and buildings are the number one consumer of energy. Bosch's energy services contribute to enhance energy efficiency, saving operating costs and reducing the carbon footprint.

With a combination of customized system solutions, services and modern technology, Bosch provides a comprehensive portfolio on energy services. All measures are always perfectly matched in order to save energy and operating costs. The Bosch range of services comprises energy analysis, planning and implementation of supply solutions and efficient long-term operation of energy systems.

Benefits

- + Increasing energy efficiency, reducing operating costs – Bosch develops tailor-made and future-proof energy solutions for buildings.
- + An attractive business model ensures that Bosch is a reliable long-term energy partner.
- + Bosch assists in all project phases and can therefore find the best solution for the customer: Analysis, planning, installation and operation complement each other perfectly, creating maximum efficiency.



Energy-efficient heating, domestic hot water solutions and cogeneration

Bosch's modular and comprehensive product portfolio provides the optimum solution meeting the specific requirements of each railway station. Key benefits of Bosch systems are outstanding efficiency, reliability and innovative control systems.

Benefits

- + Maximum reliability of heating and hot water supply by using different energy sources. Integration of renewable energies for a carbon footprint that sets an example in ecological terms.
- + Intelligent controls balance the different energy sources in the most cost and energy effective way. Secure remote access allows the personnel to monitor the plant anywhere and anytime to make use of the remote support of a Bosch service engineer if required.
- + Bosch's modular product portfolio enables quick installation, low cost of ownership and high reliability. Experienced Bosch experts support along the whole product life cycle – from planning, to commissioning to 24/7 support and remote connectivity.

Modern building complexes comprehend decentral power generation with CHP's. This can save up to 76% on electricity bills and reduces the building's carbon footprint significantly. CHP isolated solutions provide electricity also during power blackouts, e.g. for critical systems, servers, lighting, and ventilation. Surplus heat from the cogeneration is used for heating and domestic hot water. Efficient heating boilers cover peak loads with up to 110% efficiency and are supported by solar thermal systems.



bosch-industrial.com

Solution provided by: Bosch Thermotechnology

Connected logistics services – for security in rail freight transportation

Bosch connected logistics is an IoT solution that enables the constant tracking and monitoring of transnational flows of goods. Information such as geo location and condition of goods is recorded by sensors and gateways attached to trailers and packaging, and is transferred to the cloud in real time. A redundant and certified 24/7 monitoring center takes action in case of unusual events.

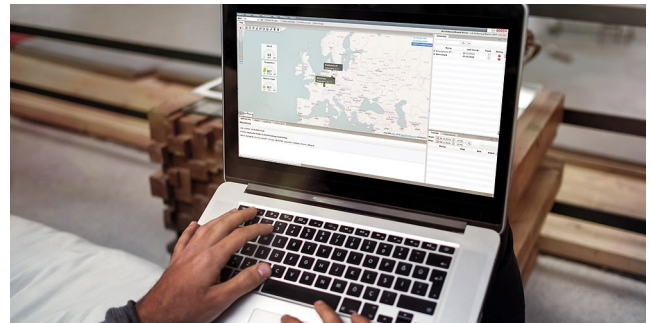


GPS tracking helps locating containers in international rail freight transport in real-time. Furthermore it provides information on the transported freight in a dedicated web portal enabling effective tracking & tracing. Condition parameters such as temperature, humidity etc. can be included and transferred by special sensors and data gateways.

Deviations from fixed parameters such as changes to the defined route, the opening of doors outside of loading and unloading locations or condition data trigger events. To ensure immediate reaction to critical events, Bosch monitoring center is available 24/7 in order to take action and alert intervention partners or emergency services.

Benefits

- + The real-time tracking of expected transports and deliveries of goods increases planning accuracy especially for long transnational routes. This high level of transparency enables an early detection of potential delivery delays and the prevention of warehouse bottlenecks or production interruptions.
- + Damages of sensitive freight can be prevented by monitoring quality parameters inside the freight areas. Interruptions of the cold chain or loss of quality due to increased humidity are reduced to an inevitable minimum by automatically generated alerts and the immediate rectification of dysfunctions.
- + In many cases, theft of valuable, rare, or easily sold cargo can be prevented by monitoring doors or deviations from defined routes. The geo-redundant network of two alarm receiving centers, certified according to the European norm EN 50518 and VdS 3138, is available 24/7 and guarantees the highest security standards.



boschservicesolutions.com

Solution provided by: Bosch Service Solutions

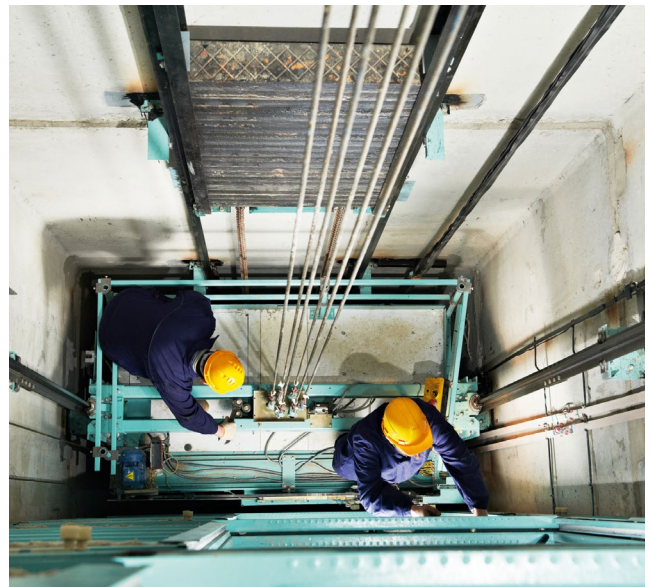
Predictive maintenance – a preventive service solution

Bosch predictive maintenance is a cloud-based analysis system that connects elevators with a central service instance. Existing elevator systems can be retroactively fitted with sensors, which help identifying inefficient operation parameters and dysfunctions without resorting to the expensive services of technicians on-site. Malfunctions, maintenance and upcoming repairs are coordinated and documented by a central service team.

Sensor systems implemented in elevators allow on-going monitoring, with data visualized via a web portal. A status dashboard provides real-time information. This facilitates the correctly functioning elevators or reduces their downtimes. If fixed parameters are exceeded, the relevant parties are informed, and repairs and maintenances are initiated – as pre-defined with the operator.

Benefits

- + Information such as system status, covered distance, door openings, start and stop procedures and emergency stops are transferred and analyzed by a central station that initiates maintenance procedures. Downtimes are reduced to an inevitable minimum due to the high level of transparency.
- + Function checks conducted by expensive on-site technicians can be reduced with the help of remote diagnosis. This leads to cost savings.
- + The possibility of a quick retrofit was taken into account in the early stages of product development. This means elevators continue operating during the retrofit installation procedure, and downtimes are minimized.



Automated valet parking

As a pioneer of automated mobility, Bosch has developed a driverless system that employs connected technology to save drivers not just the wearisome search for a parking space, but also the parking maneuver itself. Thanks to automated valet parking, every experience begins more convenient – whether it's flying off on holiday or going to a concert. Therefore, the driver simply drops off the vehicle at the drop-off area. Then the vehicle will be navigated to a free parking space with the help of the intelligent sensor technology.



Automated valet parking is made possible by combining the intelligent sensor system supplied by Bosch with the automotive technology. The sensors, guiding the vehicle, are installed in the parking garage monitor, the driving corridor and its surroundings. Hereby, Bosch provides the system for both the parking provider and the car manufacturer.

The usage of the intelligent parking garage sensor systems automated driving. The intelligent infrastructure allows mixed traffic of automated and manual driving vehicles and passengers in the parking garage, hence, allowing an incremental implementation of automated valet parking vehicles.

Benefits

- + Automated valet parking offers the car driver comfort and saving of time, as the vehicle takes over the driverless parking maneuver itself. Meanwhile, the driver can already proceed to his destination. Getting in and out of the vehicles takes place in comfortable and safe transfer areas. In addition, precise automated guidance eliminates the risk of incidents and damages while parking.
- + Automated valet parking increases efficiency due to the optimization of the parking garage capacity. The premium service opens up a range of additional potential service offerings, like a car wash, which excites the customers. The infrastructure based approach allows mixed traffic in the parking garage.



bosch-mobility-solutions.com

Solution provided by: Connected Mobility Solutions

Community-based parking

With community-based parking Bosch simplifies the search for free parking spaces in the cities. Thereby, car drivers will be navigated straight to the next free parking space. This happens with the help of the ultrasonic parking sensors of the cars which detect free parking spaces on the street. The received information will be processed in the cloud and provided to drivers seeking a parking space.

Community-based parking includes drivers actively seeking a parking space, as well as those who are simply making their way around the city. The transmitter vehicle identifies empty parking spaces on the street as it drives past them. This data is anonymized and sent to the cloud. There, it is collected, aggregated, and processed further into digital parking maps. Based on the processed data, the receiving vehicle is given precise information on where free parking spaces are. The required connectivity hardware and the ultrasonic parking sensors of the car are already widely spread and facilitate a realization of community-based parking based on the latest technology.



Benefits

- + Thanks to community-based parking the traffic of searching for parking spaces decreases significantly. In addition, the environment benefits from the direct and shorter drive to a free parking space.
- + Community-based parking enables car drivers to drive directly and relaxed to a free parking space. Thereby, the drivers save time. Furthermore, the on-board instruments indicate specific parking spaces (e.g. E-charging stations or disabled parking spaces).

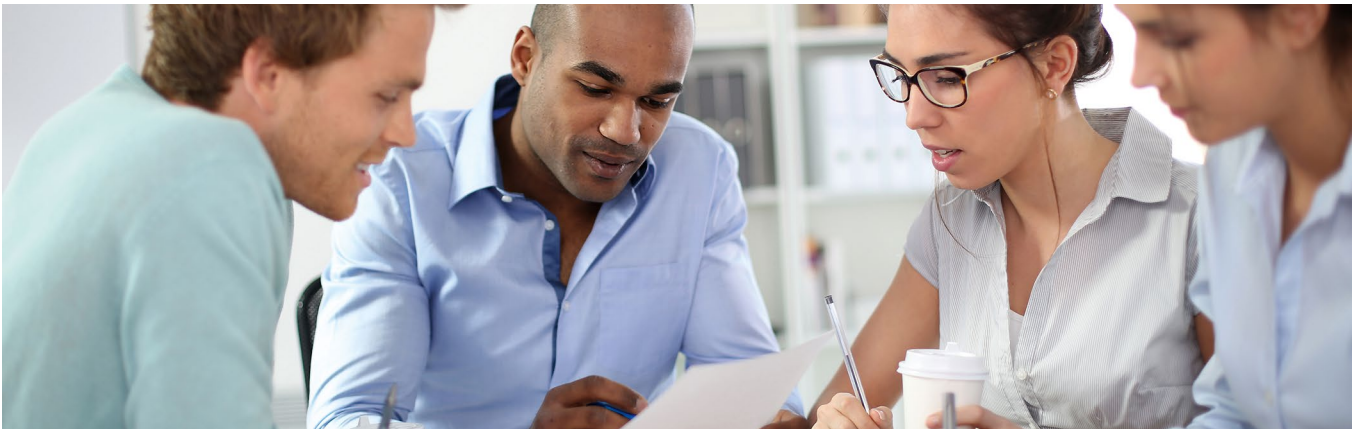


bosch-mobility-solutions.com

Solution provided by: Connected Mobility Solutions

Energy and building solutions

As a reliable partner, Bosch provides connected and integrated solutions which make buildings safer, more comfortable and more efficient. The Bosch experts support as consultants, installers and service providers. They have an extensive expertise and integrated solutions based on the latest technologies. Bosch offers integrated solutions for building security, building automation and energy services. All of Bosch's services are provided from a single source: from consulting and planning across implementation to operation. This enables Bosch to comprehensively meet the customers' needs. Bosch is active at more than 60 locations in Europe, the U.S. and Asia Pacific, and more than 100,000 customers benefit from experts' know-how.



Benefits

- + Due to Bosch's long-standing competence, buildings will be made fit for the future with a targeted approach and experienced staff.
- + Short distances, competent teams and local contacts ensure professional consultation, optimal project implementation and long-term on-site support.
- + Bosch offers integrated overall solutions and attractive financing and operating models, are optimally tailored to every individual requirement.

Scarce resources, climate change, urbanization, demographic shifts, digitalization, and demands for greater quality of life – the mega-issues of our time require major changes in the infrastructures and commercial buildings. The need for security, efficiency, and comfort is rising, as well as the demand for connected overall solutions. The Internet of Things is opening up many new possibilities and opportunities. Connectivity is bringing scores of new developments! One of it is that key areas of building services will be closely interconnected in the future. Leveraging and applying all the synergies in a sustainable way requires an integrated approach and course of action. Bosch has the essential areas of expertise needed to integrate all key aspects into a single solution. Bosch is focused on a clear vision – to be the number-one choice for the technologies and services that make buildings more secure, more comfortable and more efficient.

boschbuildingsolutions.com

Solution provided by: Bosch Building Technologies

Professional power tools for trade and industry

A craftsman puts his heart and soul into his projects. Expectations are high: client requirements, appointments and construction challenges. That's what drives a professional to maintain high standards, deliver the best possible result and work with uncompromising efficiency. For that, skills and robust tools are needed. Bosch Professional offers the best support with innovative technologies and smart solutions. From planning and organizing to successful completion, Bosch provides an intelligent range of products and services with the quality to rely on.

Bosch professional power tools are engineered for excellence, meeting the highest standards in speed, precision and robustness for consistent, professional results. Therefore, Bosch Professional Power Tools is a competent partner for all craftsmen.



As one of the world's leading manufacturers of power tools and accessories, Bosch offers professionals virtually every tool they could ever need, from state-of-the-art lithium-ion cordless (battery-powered) to class-leading corded products. Bosch Professional Power Tools focuses on providing the trust a craftsman relies on when it comes to his tools and accessories.

Bosch power tools is consistently expanding its expertise in connected measuring and power tools for professionals: from 2017 onwards the new tools are available for trades-people, from laser measures with integrated Bluetooth modules to angle grinders, lights and drill drivers.

With these tools, Bosch is driving the trend of digitization and is offering professionals a system, from products to inventory management, that optimizes processes and enables all tradespeople to work more efficient.

Benefits

- + Bosch provides services and consulting for all professional power tools and measuring tools beyond the legal warranty period. From online information to a dedicated team of trained customer service personnel.
- + Bosch ensures an excellent availability of spare parts and a fast turnaround time for warranty and chargeable repairs.

bosch-professional.com

Solution provided by: Bosch Power Tools

Elevator emergency call – important modifications for operators

Technical standards and legal regulations make elevators the safest mean of transportation. The most important requirement specifies that emergency calls have to be passed onto a permanently staffed alarm receiving station. A new version of the industrial safety regulation states that all elevator systems transporting people need to be equipped with a two-way communication system. This is a challenge for operators.

The Bosch elevator emergency call combines fitting of emergency devices with the activation of emergency calls, so the operator can concentrate on his main business. The retrofitting of the required two-way communication system including its activation takes little time.

If trapped people trigger the emergency call, an immediate voice connection is established with the Bosch alarm receiving station. Agents calm the affected and organize their swift release. Bosch works with a nationwide network of intervention partners.

Furthermore, Bosch employees organize the repairs of the elevator. Every notification and event is documented for the elevator operator.



Benefits

- + Bosch's network of intervention partners is one of the most effective in Germany. Due to the high amount of partners, trained security forces will quickly reach the site. With 50,000 monitored elevator systems, Bosch offers security for almost every system.
- + Bosch offers producer-independent and preconfigured emergency packages inclusive installation and the connection to the alarm receiving station for almost every kind of installation.
- + The technology can provide information on the operation status of other elements e.g. errors of the heating or air conditioning system, or the leakage of water and gas. Bosch's predictive maintenance services visualize the current conditions via a web portal. Potential breakdowns are detected early and repairs are initiated.

boschservicesolutions.com

Solution provided by: Bosch Service Solutions

Solutions for maintenance and repair of vehicles spare parts, diagnostics and workshop services

In commercial operations such as train stations, reliability is essential. Every breakdown or unplanned repair leads to downtime and costs. For this reason, Bosch is constantly expanding its product range. In addition to spare parts and workshop services from a single source, Bosch offers customers a complete range of diagnostic and repair shop equipment.



Benefits

- + System competence and know-how
- + Service for all commercial, off road and agricultural vehicles
- + Parts, diagnostics and workshop services from a single source

The wide range of high-quality Bosch products are suitable for passenger cars, commercial vehicles, construction equipment and special-purpose vehicles such as those used in train stations. In all types of vehicles, technical systems are becoming increasingly diverse and complex. Bosch make the daily lives easier by providing a wide range of testing and repair-shop technology, diagnostic software, service training and information services. More than 16,000 Bosch Car Service partners worldwide provide vehicle owners with technically advanced and cost-effective workshop services – from bumper to bumper for passenger cars and LCV. With their extensive expertise and specialized workshop equipment, Bosch Diesel Centers and Bosch Diesel Services offer diagnosis, components testing, and repairs for even the latest diesel systems, components and vehicles.

Moreover, they are the only authorized partners for processing warranty claims for Bosch diesel components. With parts, diagnostics, and workshop services from one single source, Bosch is uniquely positioned to put its experience and expertise to work for train stations.



bosch-automotive-aftermarket.com

Solution provided by: Bosch Automotive Aftermarket

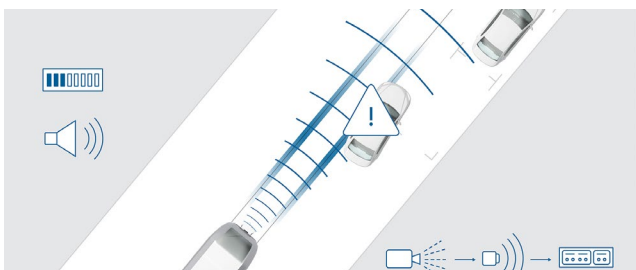
Collision warning system for light rail trains and trams

For drivers of light rail vehicles and trams, complex situations such as heavy rush-hour traffic or poor visibility can quickly turn into real challenges. In particular, obstacles on the lines or other road users who approach the lines must be detected in good time so that the risks can be identified.



Benefits

- + Active assistance for the tram driver in critical urban traffic situations
- + Improved safety for the driver and passengers as well as for all the other road users in the immediate vicinity
- + Reduced repair costs through the avoidance or reduction of accident damage

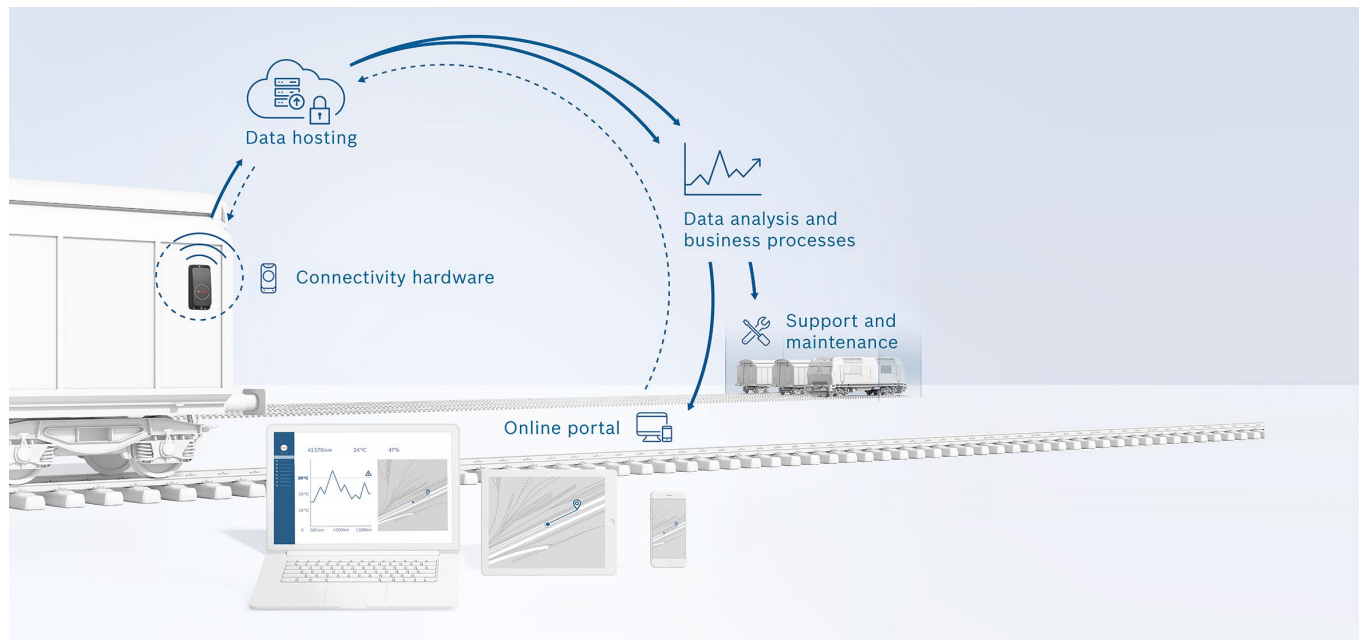


To actively prevent accidents and/or to significantly reduce their consequences, Bosch's collision warning system for light rail vehicles and trams relies on tried and trusted components from the automotive industry. If the system detects a potential collision hazard, the driver is given a warning. If the driver doesn't react or reacts too late, the system can initiate automatic braking. The collision warning system consists of a multi-function camera, a radar sensor, and a control unit. The multi-function camera records the rails and transmits a real-time picture of their course to the radar sensor. Irrespective of the weather and light conditions, the radar sensor detects potential obstacles in front of the rail vehicle or tram. On this basis the system is capable of determining the current danger of a collision taking account of the vehicle's own speed.

bosch-engineering.com
Solution provided by: Bosch Engineering

Asset monitoring for railway applications

Heavy goods are transported over long distances of railway track. However, the fact that freight cars still don't have their own power supply or their own sensors is due not least to the exacting requirements of such systems in terms of railway technology: vibrations, temperature differences, dirt and humidity demand especially tough and simple solutions.



Asset monitoring for railway applications – the condition monitoring system for rail traffic – collects current data on the exact position and adherence to the planned route throughout the journey. In addition, the temperatures in the freight compartments, the distance travelled, jolting during transportation, and shunting impacts suffered by the wagon are recorded. Once the data is transferred to a server, it is evaluated, and the information obtained as a result is linked together, which gives rise to new functions relating to the business process and its quality. By integrating this digital information into IT systems, the asset monitoring for railway applications provide the basis for controlling logistics processes so as to ensure that the use and loading of goods wagons is optimized.

Furthermore, the data forms a reliable basis for the predictive planning and implementation of servicing and maintenance measures.

Benefits

- + Improved rolling stock efficiency through optimized scheduling
- + Improved availability of wagons thanks to condition monitoring
- + Higher supply quality due to load monitoring and improved customer information

bosch-engineering.com

Solution provided by: Bosch Engineering

Hydrostatic auxiliary drives

Fans, compressors or generator drives: The right output power in the right place. With the widest range of hydraulic pumps and motors in the market, Rexroth provides virtually unlimited opportunities for optimal system implementation. Broad component selection possibilities, in terms of output power and configuration, provide a perfect fit for diesel-powered rail vehicles.

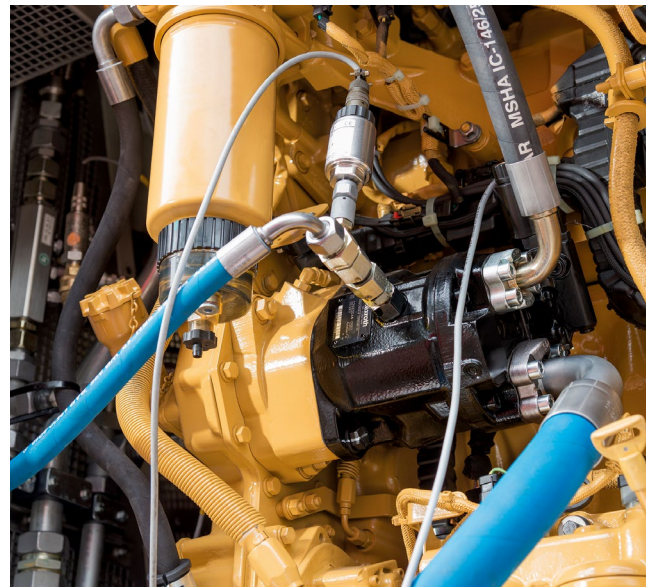


Benefits

- + Variable step-less fan speed optimization to match demand levels, ambient temperature and air density. Reducing fan noise and fuel consumption
- + Delivery of hydrostatic auxiliary drive power over a wide range and independent of diesel engine speed
- + Reduced fuel use and lower operation costs by use of high efficiency variable flow pumps
- + The greatest power density available among any and all drive technologies, allows for savings to be made in terms of installation space and weight
- + Flexible layout possibilities of hydraulic components inside of the engine compartment
- + CAN-bus connectivity provides operational data for preventive maintenance monitoring

Limited installation space in rail vehicles makes a flexible modular arrangement indispensable. Auxiliary drive components can be laid out and configured, such that the best possible arrangement of the hydraulic components is achieved. Ease of maintenance and service accessibility within the rail vehicle can be enhanced instead of being sacrificed to size constraints.

Hydrostatic auxiliary drives typically have multiple duties to perform. Dissipating engine heat as it arrives at the cooler by fan control, driving on-board power generators at a very accurate rate, and providing a reliable energy source for braking system air compressors.



boschrexroth.com

Solution provided by: Bosch Rexroth

Custom cooling system solutions

Fulfillment of environmental requirements from a technical and economic perspective: for decades Rexroth has been a system partner providing the engineering and manufacture of complete hydrostatically and electrically-driven cooling systems for rail vehicles. Rexroth rail experts satisfy those special requirements of energy efficiency, project specific contingencies, and noise reduction.

Rexroth produces energy-efficient cooling systems for propulsion systems of railway vehicles, and auxiliary units. Whether cooling diesel engines, transformers, traction drive systems, generators or converters, Rexroth provides standardized and tailor-made solutions. They use all the opportunities offered by electrical and hydrostatic solutions. The scope of the services which provided for the implementation of cooling systems ranges from modular assemblies and components to complete systems. An integrated approach is used to evaluate the cooling system as a whole. Using state-of-the-art software Bosch Rexroth simulates and optimizes all media flows within its systems or even for complete vehicles and their air-distribution characteristics.



Benefits

- + Reduction of time-to-market to 3 months due to standardized modular solutions
- + Minimization of the life-cycle costs for standardized systems through increase of reliability, availability and maintainability
- + Fast commissioning utilizing 'plug & play' functionality
- + Possibility for local production of cooling systems and maintaining optimal quality management and compliance of customary „local content“ requirements

boschrexroth.com

Solution provided by: Bosch Rexroth

Hydrostatic traction drives



Specialized railroad vehicles have to maintain extremely low speeds while smoothly and steadily moving loads weighing several tons. Rexroth's hydrostatic traction drives carry out these tasks adroitly and efficiently. As the world's largest supplier of equipment for mobile work machinery, Rexroth offers you a combination of best-in-class components and integrated system solutions.

Rexroth provides both hydro-mechanical control and electronic control systems. This enables the customer to choose the right solution for his machine: hydro-mechanical control with no need for electronics and classic operational schemes, or electronic control in which the drive specific characteristics can be mapped into software, and via Rexroth RC controllers (PLC) provide single-source advanced system solutions in an integrated package.

Benefits

- + The highest power density of all drive technologies enables savings to be made in terms of installation space and weight
- + Simple, quick and jerk-free reversing, full torque in both directions of travel without reversing gearboxes
- + Flexible installation configurations are possible due to the modular system design, and in particular, allowing optimization of the layout of the diesel engine in the machine
- + High efficiency level ensures that there is low heat build-up when working at high traction force and low speeds

boschrexroth.com

Solution provided by: Bosch Rexroth

Maintenance of way hydraulics

Maintenance of way machines must be able to deliver powerful forces and provide accurate control processes. Rexroth has been collaborating with the manufacturers of railway maintenance machinery for decades. That is why Rexroth understands the industry requirements involved, and implements them in tailor-made system solutions.



With a complete and varied range of products Rexroth has a great solution for nearly every application. Our optimal blend of hydraulic and electrical drives maximizes productivity.

Benefits

- + Reduced life cycle costs due to reliable and proven components
- + Highly efficient centralized drive systems coupled to decentralized hydraulic energy use
- + Complete system solutions for high levels of performance, including multi technological systems for specific application demands
- + Comprehensive simulation tools, industry know how and expertise bringing machines to virtual life before it is turned into reality

Chassis control systems for rail transport

Enhancing performance of railway vehicles requires innovative products. Modern chassis control systems for railway vehicles face many challenges. These include: increasing track speed around curves, significant reduction of wheel-rail wear, enhancing riding comfort and lowering of noise emission. These rail requirements already have and will lead to more developments of new reliable and efficient electro-hydraulic systems.



Rexroth provides diverse solutions and components for chassis control technology. There is a wide variety of chassis control applications: electro-hydraulic systems for axle/bogie steering, systems for vehicle tilting/levelling and systems/components for active/semi-active dampers. To provide electro-hydraulic solutions with extreme reliability, higher efficiency and reduced life cycle costs, Rexroth developed a scalable digital hydraulic system for tilting applications. The high quality and performance of Rexroth chassis control solutions guarantees maximum service life and therefore maximum cost-efficiency.

Benefits

- + Comprehensive simulation tools during the complete development process will speed up the time to market and optimize the system and component performance
- + Fast commissioning and system (re)configuration by means of 'plug & play' functionality
- + Easy vehicle specific adaptability will reduce development time and costs
- + Excellent electro-hydraulic expertise in harsh industries improves the reliability and life cycle costs of system solutions for rail

boschrexroth.com

Solution provided by: Bosch Rexroth

The Bosch Group












The Bosch Group is a leading global supplier of technology and services. Its operations are divided into four business sectors: Mobility solutions, industrial technology, consumer goods, and energy and building technology. As a leading IoT company, Bosch offers innovative solutions for smart homes, smart cities, connected mobility, and connected manufacturing. It uses its expertise in sensor technology, software, and services, as well as its own IoT cloud, to offer its customers connected, cross-domain solutions from a single source. The Bosch Group's strategic objective is to deliver innovations for a connected life. Bosch improves quality of life worldwide with products and services that are innovative and spark enthusiasm. In short, Bosch creates technology that is "Invented for life". The Bosch Group comprises Robert Bosch GmbH and its roughly 440 subsidiaries and regional companies in some 60 countries. Including sales and service partners, Bosch's global manufacturing and sales network covers nearly every country in the world. The basis for the company's future growth is its innovative strength. At 120 locations across the globe, Bosch employs a huge number of associates in research and development.

The company was set up in Stuttgart in 1886 by Robert Bosch (1861-1942) as "Workshop for Precision Mechanics and Electrical Engineering". The special ownership structure of Robert Bosch GmbH guarantees the entrepreneurial freedom of the Bosch Group, making it possible for the company to plan over the long term and to undertake significant up-front investments in the safeguarding of its future. Ninety-two percent of the share capital of Robert Bosch GmbH is held by Robert Bosch Stiftung GmbH, a charitable foundation. The majority of voting rights are held by Robert Bosch Industrietreuhand KG, an industrial trust. The entrepreneurial ownership functions are carried out by the trust. The remaining shares are held by the Bosch family and by Robert Bosch GmbH.

More information is available online at
www.bosch.com
www.bosch-press.com



Bosch divisions for selected verticals

	Airport facilities 	Automotive industry 	Commercial buildings 	Entertainment facilities 	Food and confectionery industry 	Hotel facilities 	Mining 	Pharmaceutical industry 	Railways and train station facilities 	Residential buildings 	Theaters 
PROVIDER											
Building Technologies	■	■	■	■	■	■	■	■	■		■
Thermotechnology	■	■	■	■	■	■	■	■	■	■	■
Power Tools	■	■	■	■	■	■	■	■	■	■	■
Household Appliances										■	
Service Solutions		■	■		■			■	■	■	
Connected Mobility	■	■	■	■		■			■	■	■
Rexroth		■	■	■	■		■	■	■		■
Automotive Aftermarket	■	■					■		■		
Packaging Technology					■			■			
Smart Home										■	
Software Innovations			■							■	
Bosch Engineering	■	■					■		■		
Integrated Solutions							■				

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