



**BOSCH**

Invented for life

# Solutions for the mining industry

[bosch.com/mining](https://bosch.com/mining)

Smart. Safe. Automated.





# Bosch solutions for the mining industry



When you choose Bosch as a supplier of products and solutions for the mining industry, 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 mines across the world, has a choice of products that are commonplace across mining projects, whether the project requires energy-efficient heating and hot-water systems, drive systems and components or a comprehensive security system.

# All solutions for the mining industry

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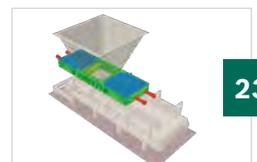
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# Security and life safety

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

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- + 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

Fires constitute a major threat. To protect lives and property at mining facilities, it is vital to quickly detect, locate, verify, and contain fire events. Bosch fire panels and detectors are ideal for this. But they can also do much more.

They apply multiple intelligent criteria to ensure early, reliable detection, with high immunity to false alarms and fast responses. The panels automatically notify on-site firefighters or the local fire department, in addition to interfacing with sprinkler, ventilation, and public address systems as well as with facility management systems to coordinate evacuation. Bosch offers explosion-resistant products such as cameras for alarm verification and horn loudspeakers that are specially designed and approved as safe for use in the hazardous atmospheres that may also be found in mining operations.

## Benefits

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



# Video systems

On an industrial site such as a mine, extreme video security solutions are a must. Video cameras installed at such a location have quite a few environmental challenges to overcome in order to give a relevant image. That's why Bosch offers video security solutions that are built to suit your needs, delivering relevant data to operators ensuring safety and security.



Bosch offer solutions to make sure you have a suitable video security network, even in the most extreme environments. The Bosch MIC IP camera family is the right choice for a mining application. Not only do these cameras perform in the most adverse circumstances due to their robust design and excellent image quality, they also have built-in intelligent video analytics at the edge. This type of video analysis is also built to still give spot on alerts, even in extreme weather conditions, making it the perfect combination with the MIC IP camera design. Not only do intelligent video analytics alert the operator when needed; they help to quickly retrieve data. Moreover, they can help to optimize the work processes at the mine to become more efficient

## Benefits

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- + 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](https://www.boschsecurity.com)**

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.

The access control systems guarantee reliable access management both indoors and outdoors and permit easy integration of third-party equipment. All this can be combined with video surveillance to boost security in critical situations. REG license plate cameras ensure reliable plate number capture, even under the most challenging conditions. They are protected by a weatherproof casing and capture high-contrast plate images under all possible ambient lighting conditions, from total darkness to direct glare from sunlight and vehicle headlights.

## Benefits

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- + 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



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

Solution provided by: Bosch Building Technologies

# 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

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- + 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.



# Process heat: Steam boiler systems

The mining industry comprises many energy-intensive processes. Energy cost reduction thus are a crucial factor to competitiveness. Bosch's industrial's system solutions provide an uniquely high efficiency that enable extremely short payback times.



## Benefits

- + Reliable and cost-effective generation of high-quality steam for process heat reduces CO<sub>2</sub> emissions and energy costs. Intelligent controls and innovative automation technology ensure flexibility of operation tailored to the production's requirements.
- + Bosch boiler systems can achieve high boiler load in a very short time and thus can cover sudden steam requirements. High amounts of steam are generated quickly and reliably. For special applications with unsteady, but high steam requirements Bosch also provides tailored system solutions comprising of steam boilers and steam accumulator modules.
- + 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.

In the mining industry, process heat is used e.g. for the brick production in the sand-lime brick mining or for back-up steam of turbines in the copper industry. Therefore, the generation of the required process heat has a huge influence on the energy-efficiency of the production. Further, maximum availability is crucial in order to avoid costly production downtimes.

The high efficiency and reliability of Bosch's process heat solutions thus helps maximizing productivity and profitability.

**[bosch-industrial.com](https://www.bosch-industrial.com)**

Solution provided by: Bosch Thermotechnology

# Solutions for maintenance and repair of vehicles: Spare parts, diagnostics and workshop services

In commercial sectors such as mining, 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 mining. In all types of vehicles, technical systems are becoming increasingly diverse and complex. Bosch makes 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 the mining industry.

[bosch-automotive-aftermarket.com](http://bosch-automotive-aftermarket.com)

Solution provided by: Bosch Automotive Aftermarket

# Electrified drive systems

Bulldozers inside the mine remove the material after blasting operations. Since diesel engines produce emissions and waste heat and they also consume oxygen, there is a large need for ventilation inside the mine. A diesel-free solution avoids creating this additional outlay.

Bosch's electric drive consists of three coordinated components: The electrical motor, the inverter, and the transmission system. Developed for the mass production of cars, the inverter and electric motor are not based on an industrial design, instead they are designed and tested for mobile operation under an expanded range of environmental influences. In addition to the advantages of their compact design and low weight, the components are optimized so that they have a high power density. The high level of product maturity means that it is easy to use the system straight away.

## Benefits

- + Battery-powered electric operation enables emissions and waste heat to be reduced. This considerably reduces the effort involved in ventilating the mine.
- + 100% maintenance free
- + Compact: The space-saving design can easily be fitted into existing mechanical and hydraulic systems.



# 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

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- + 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](https://www.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.

**bosch-professional.com**

Solution provided by: Bosch Power Tools

## 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.

# Bucket wheel reclaimers

When customers have to deal with the risk of shock loads and need a robust system that will keep on working even in the toughest environments, Rexroth has the drive and control solutions.



The high-performance solutions ensure quick payback and minimal maintenance for bucket wheel. They are ideal for both new machines and existing equipment upgrades. Many customers have already taken advantage of Bosch Rexroth extensive application knowledge, comprehensive portfolio and familiarity with optimizing performance and productivity in the industry.

## Benefits

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- + Bucket wheel drives
- + Slewing drives
- + Luffing drives
- + Long travel drives

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

Solution provided by: Bosch Rexroth

# Kilns and drums

Mineral processing is a difficult balance. On the one hand, you need a high degree of force to twist, turn and crush unforgiving materials. On the other, you need fine control and versatility to get the job done right. That balance is just what Bosch Rexroth offers.

## Pelletizing kilns

With the high starting torque of Bosch Rexroth drive solutions, your pelletizing kilns can start up easily in any load condition. Multiple motors and pumps give the drive systems built-in redundancy, while their excellent load sharing keeps vibration risk to a minimum.

## Rotating drums

When it comes to rotating drums, vibration is a key concern. Bosch Rexroth drive solutions eliminate it altogether, thanks to their superior load-sharing capabilities. The drives offer high starting torque, which enables a start up in any load condition. And with their highly compact design, they save much of valuable space.

## Benefits

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- + Perfect load sharing
- + High torque providing starting torque for an unlimited period of time
- + Trouble-free inching with the main drive
- + Flexible systems solution
- + Reliability through redundancy



# Feeders

Apron and belt feeders handle high starting torque and frequent load spikes in harsh environments. The Bosch Rexroth modular drive solutions offer built-in protection against shock loads, which safeguards the machine's functionality and reduces the risk of production stops.

The moment of inertia of Bosch Rexroth hydraulic direct drive systems is a mere 0.1% compared with that of an equivalent electromechanical drive system with a gear reducer. This feature is significant when increasing the uptime on the feeders by limiting stress on machinery, chains and drive line.

## Benefits

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- + Full starting torque for an unlimited time
- + Built-in overload protection
- + Easy handling of frequent starts and stops
- + Variable speed for process optimization



# Ship unloaders

Bosch Rexroth compact drive systems minimize the need for space in your continuous ship unloaders. Unlike electro-mechanical systems, they can also withstand an unlimited number of starts and stops which eliminates any risk of overheating.



## Benefits

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- + Outstanding, 100% control of acceleration, deceleration and positioning
- + Able to run forward and reverse in both, driving and braking mode, without limitations
- + Compact and low weight design that minimizes the need for space, allowing a lean design and a minimum of counterweight

# Conveyors

No matter which material, getting it from one place to another is seldom as easy as it sounds. Loading, unloading and transporting pose unique challenges for the equipment. Drive system solutions from Bosch Rexroth are easy to tailor, both to the task and to the load. By helping maximize uptime, they let you get your materials in the right place – at the right time.

## **Belt conveyors**

With their unique ability to start and stop softly, Bosch Rexroth drive solutions keep the stresses on the conveyor belts to a minimum. Variable speed allows inching of the belt in forward and reverse for inspection and for positioning when slicing the belt.

## **Scraper chain conveyors**

Scraper chain conveyors must be able to start up in any load condition, which is easily ensured with the high starting torque delivered by Bosch Rexroth drive solutions. The drive systems can start and stop as frequently as needed, without the risk of overheating experienced by electro-mechanical drives. With their built-in overload protection, they simply do away with the risk of trip-outs.



## **Benefits**

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- + Torque control protects the belt from overloads.
- + Soft starts and stops keep belt stress to a minimum.
- + Low speeds can be used for easy inspection.
- + High starting torque that can be maintained for an unlimited period of time.

**boschrexroth.com**

Solution provided by: Bosch Rexroth

# Mobile applications: Services for the mining industry

Whether there is a demand for robust technology or the need to move extremely heavy loads precisely, Bosch Rexroth offers customized products, system solutions and services for technical applications in mobile working machines.

Bosch Rexroth components are designed to meet the hardest requirements in mining applications all over the world. Bosch Rexroth knows that the reliability of machinery is crucial for the mining business. With Bosch Rexroth hydraulic components installed in mining excavators and dumpers, expensive downtimes can be kept to a minimum. Place your trust in the expertise of Bosch Rexroth and rely on the full scope of the Bosch Rexroth high-quality service.

## Benefits

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- + Broad portfolio of hydraulic spare parts typically used in the mining industry
- + Eco-friendliness and cost-effectiveness of remanufactured parts and repairs
- + Reduction of downtimes due to original spare parts



# Start/stop off-highway truck

Based on the experience from the passenger vehicle industry, Bosch's start/stop system was conceived to offer lower fuel consumption and a reduction in particulate matter and CO<sub>2</sub> emissions.



## Benefits

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- + Reduces emissions and fuel consumption, assisting our clients looking for efficient and sustainable technologies, that reduce operational costs and are environmentally conscious.
- + Real-time monitoring ensures high system availability through condition monitoring and precise data to demonstrate savings and emissions reduction.
- + According to data on different operations of open-pit mining, fuel consumption can be reduced from 7 to 10% of the total operational time, promoting expressive gains into mining operations.

The start/stop system automatically turns the engine off during periods of inactivity, when there is no movement, and turns the engine back on when the vehicle needs to regain movement. By remote and real-time monitoring it is possible to keep track of the amount of reduction in fuel consumption and to control the scale of pollutants emitted by the vehicle, the system also makes it possible to monitor the actual state of the vehicle's battery. Presented as a retrofit solution, the system can be adapted and installed into different mining machines.

[bosch-smartmine.com](https://www.bosch-smartmine.com)

Solution provided by: Bosch Integrated Solutions

# Connected screen

The benefits promoted by predictive maintenance are hard to keep track, every unplanned repair or breakdown can lead to long periods of downtime, and the heavy impacts in costs and productivity are a problem mines have to deal with frequently. With this scenario in mind, Bosch developed a solution to build up the predictive maintenance of a mine's screen, a fundamental step in every mining operation.

Once Bosch sensors are installed in these machines, mine operators are able to monitor the vibration pattern of the screens, facilitating preventive maintenance. Our system is able to define the best moment to stop for maintenance based on the need and ideal period to maximize the useful life of the components. By close monitoring the state of the screens not only is possible to avoid premature structural failure, but also to increase screening efficiency and detect deviations in the previous processes, bringing a new range of information to our clients.

## Benefits

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- + Real-time monitoring of the vibration conditions of each machine combined with expert analysis to detect inadequate behavior.
- + Wireless self powered sensors guarantee robustness and convenient operation.
- + Prevents structural failures, increasing the service life of the machine and reduces maintenance costs and machine downtime.



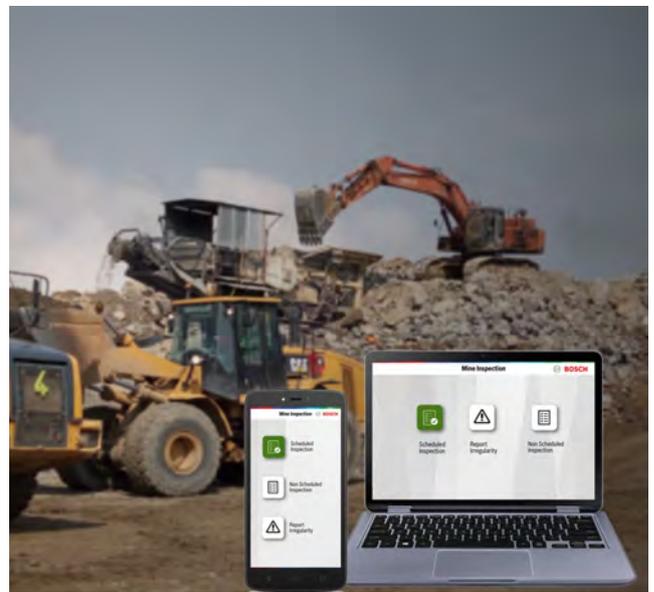
# Connected inspection

In the search to develop solutions that can optimize existing processes, Bosch came up with the connected inspection system. Composed by an app, that enables a simpler procedure for mining operators to do inspections in their working space, getting rid of paper reports, and a management interface that allows planning inspections, defining action plans for identified deviations and issuing reports for all realized inspection activities.

Coming across the current process to execute an inspection in a mining site, Bosch realized the need to develop a mechanism that would improve this operation. Through the system, a manager is capable of scheduling inspections to designated employees, towards different equipment in a specific period of time. Every machine, equipment or object is identified by a QR Code, facilitating the localization of the item by both parts, the employees who will perform the service, and the personnel responsible for organizing the inspections.

The features in the system also allow the dissemination of the responsibility to promote a safer work environment among any employee in the mine with access to the app, in case of observing any irregularity, all a worker has to do is scan the QR Code of the item and send an alert to the system, the system will then send an alarm to the responsible personnel.

Bosch's system not only provides a more agile inspection routine, but it also offers an upgrade for data security, data storage and enables an easy way to do reports.



## Benefits

- + A mobile app to perform a simpler inspection and report non-compliance circumstances.
- + Shared responsibility for a safer work place with all employees.
- + Configuration for sending scheduled inspections to employees and to control alarms for expired inspections and identified deviations.

**bosch-smartmine.com**

Solution provided by: Bosch Integrated Solutions

# Connected conveyor belt

The convenience of a wireless, online system to monitor the state of conveyor belt idle rollers is bringing noticeable changes to the mining sector. Through a central dashboard, operators are now able to keep track of the status of each roller from all conveyor belts in the mine.



Safety is a major concern in any type of business, and as the mining industry has a reputation for being extra risky, it is important to take action in order to create a safer working environment. Therefore, Bosch developed a system to avoid catastrophic and costly failures such as fires, damage or ruptures in conveyor belts, which are formed by thousand of idle rollers. If a problem rises in only one of these rollers, there is a risk of fire or that the sharp broken parts will cut the belt. To prevent this, Bosch has developed sensors that monitor the rolls in real time and send the data to an online platform where the managers can follow the status of the operation in a central dashboard. Thus, it is possible to identify in advance when any device requires maintenance.

## Benefits

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- + Real-time monitoring of the condition of each idler roller and alarms in case of deviations
- + Wireless self powered sensors guarantee robustness and convenient operation
- + Predictive maintenance: Predicts the lifetime of the idle rollers and the ideal data for replacement, preventing costly failures such as fire or ruptures of the belt

**[bosch-smartmine.com](https://www.bosch-smartmine.com)**

Solution provided by: Bosch Integrated Solutions

# Connected lockout system

The connected lockout system allows to drastically reduce energy downtime in maintenance processes, respecting maximum safety requirements. Through connectivity, this solution significantly reduces the transit time of the operators between the lockout point and maintenance point, resulting in a safer and faster maintenance process.

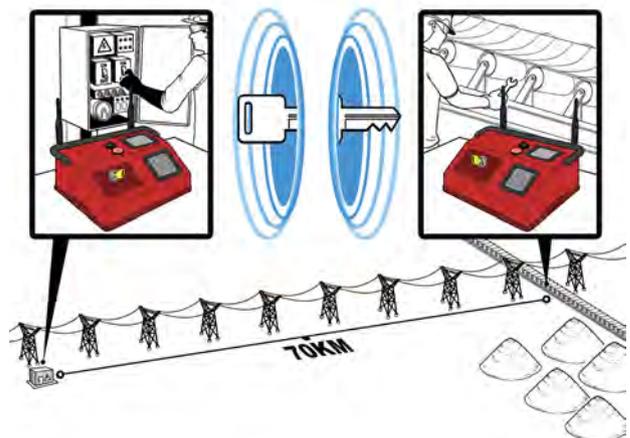
Machines such as mills, conveyor belts and ore ducts are subject to frequent periodic maintenance. To ensure the safety of workers, the energy sources must be locked out during the intervention period, as a measure to avoid accidents.

In order to simplify the time-consuming and manual procedure, Bosch has developed a lockout system capable of performing the operation remotely, in an agile and flexibly way, following strict safety standards.



## Benefits

- + Reduces maintenance downtime by eliminating the need of transporting the lockout device (typically a key) between lockout point and maintenance point.
- + Allows the combination of several lockout points (more than one energy source involved) and several maintenance points, in an easy and practical way.
- + Ensures state-of-the-art safety standards, with a lockout process that is: individual, non-transferable, personal, intuitive and error-proof. All lockout processes are registered without human influence, creating a reliable and verifiable database for future audits or any sort of verification.

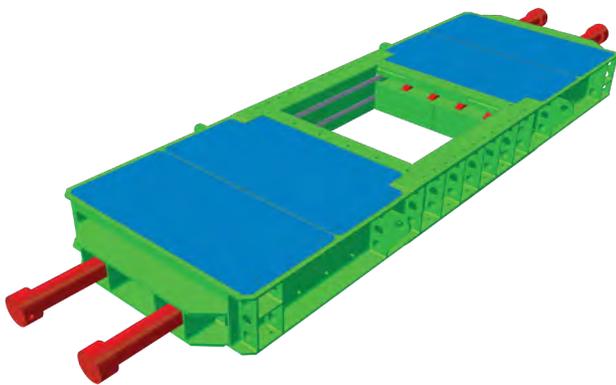


[bosch-smartmine.com](http://bosch-smartmine.com)

Solution provided by: Bosch Integrated Solutions

# Smart feeder

Safety and high productivity are targets in any type of business, therefore Bosch is offering new solutions to the mining sector in order to fulfill these demands. Smart Feeder is an equipment for closing reserve bins and chutes, through the operation of one or two sliding plates, driven by an intelligent hydraulic system. It ensures interruption of mineral flow in any operation conditions. When integrated to the feeder drive, it will detect any abnormal situation and automatically close the chute, indicating the need for maintenance, without any further damage.

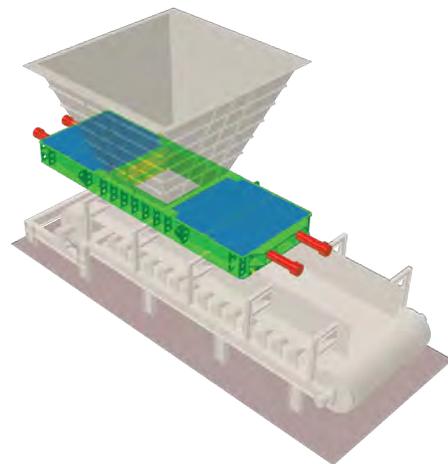


## Benefits

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- + Closes silos and chutes without human intervention and in any operating situation (empty, flow or clogged), eliminating dangerous spill bars process and other operators' interventions to block / unblock chutes
- + Automatic operation with remote or local activation
- + Intelligent hydraulic control, that can be combined with the feeder drive, thus closing automatically the silo when detecting any unexpected situation and avoiding unnecessary damage to other equipment

At various stages of the mining process, the extracted minerals are stored in silos. When it is necessary to do the maintenance of an equipment under the reserve bins or chute (e.g. feeders, vibrating screen, crushers, etc.) or in case of clogs, the smart feeder, driven by an intelligent hydraulic system, moves through the mineral pile closing the bin's flow. The sliding plates isolate the lower part of the reserve bin or chute at any operation conditions. The system can be operated locally or with remote activation, taking only a few minutes to completely block the silo's outlet. By avoiding human intervention, with a fully automatized operation, the smart feeder eliminates any risk for the operators' live and it allows fast and safe access to the equipment for maintenance.



# 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 
<b>PROVIDER</b>											
<b>Building Technologies</b>	■	■	■	■	■	■	■	■	■		■
<b>Thermotechnology</b>	■	■	■	■	■	■	■	■	■	■	■
<b>Power Tools</b>	■	■	■	■	■	■	■	■	■	■	■
<b>Household Appliances</b>										■	
<b>Service Solutions</b>		■	■		■			■	■	■	
<b>Connected Mobility</b>	■	■	■	■		■			■	■	■
<b>Rexroth</b>		■	■	■	■		■	■	■		■
<b>Automotive Aftermarket</b>	■	■					■		■		
<b>Packaging Technology</b>					■			■			
<b>Smart Home</b>										■	
<b>Software Innovations</b>			■							■	
<b>Bosch Engineering</b>	■	■					■		■		
<b>Integrated Solutions</b>							■				





## 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](http://www.bosch.com)  
[www.bosch-press.com](http://www.bosch-press.com)

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