



## **Train station solutions** to ensure safety & security from Bosch Energy and Building Solutions

Security, safety, and communication solutions



**BOSCH**  
Invented for life



# A huge responsibility

How to meet the security challenges of train stations – with solutions from Bosch Energy and Building Solutions.



Public transportation plays an important role in the lives of people everywhere – and as populations age this role will continue to grow. However, in recent years the transportation industry has become increasingly vulnerable to security risks. One of the greatest challenges is to protect train stations, where the rail industry faces a crucial need to guard passengers, employees, goods, infrastructure, and assets against possible threats. These facilities in particular have become at least as vulnerable as airports. They must therefore meet very demanding criteria with regard to security, safety, communications, and building automation – also to uphold their reputation as providers of safe, well-organized services that travelers and freight forwarders can rely on.

The security and safety risks at a train station can include vandalism and graffiti, theft, drug dealing, fire, and acts of terrorism. Managing them is a challenging task, since many different areas need to be monitored: tracks, underground passageways, bicycle and car parking areas, buildings, luggage storage facilities, and parked railway cars and engines. The lack of access restrictions at most train stations also means that there is a need for special solutions for monitoring all areas.

## **Human safety: the number one priority**

Like in many other areas of life, progress is also being made in connection with building, expanding, and modernizing train stations. Because human safety takes absolute priority, the only responsible choice is to take advantage of the best available state-of-the-art technologies – like the solutions we offer. They are ideal for meeting the security, safety, and communication requirements of train stations.



## Security, safety and effective communication **for train stations**

Train stations comprise diverse outdoor and indoor facilities, many of which are accessible at all hours. They therefore face daunting security issues.

The security challenges include:

- ▶ Preventing and/or responding to diverse acts of terrorism such as bombings, bomb threats, suicide attacks, and sabotage
- ▶ Dealing with the fire and explosion risks associated with the on-site storage of flammable liquids
- ▶ Identifying and checking abandoned bags
- ▶ Access control for restricted areas
- ▶ In dangerous situations, quickly getting people to safety in an organized way

When these challenges are successfully met, it gives employees and passengers confidence in the safety of train stations and the railway system.

### **Bosch products and solutions**

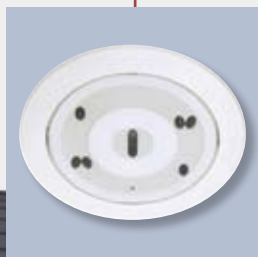
Bosch offers a wide range of products and solutions for effectively managing security, safety, and communications at train stations. They let you:

- ▶ Efficiently monitor all areas and activities to immediately detect fires, emergencies, and threats
- ▶ Detect potentially dangerous individuals before they can cause any trouble
- ▶ Make public announcements to inform travelers of arriving and departing trains and, for example, remind them not to leave bags unattended
- ▶ Conduct fast, controlled evacuations
- ▶ Integrate all safety, security, and communications solutions in a building management system for central monitoring and control
- ▶ Monitor all approaches to the station

You can count on solutions from Bosch to meet your challenges, no matter how complex, with customized security based on intelligent functionality and modular concepts that grow with your needs.



# Get on track with Bosch solutions



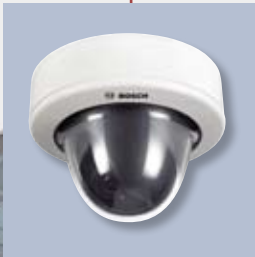
Fire alarm systems



Intrusion  
alarm systems



Public address  
and voice  
evacuation  
systems



IP-based video  
surveillance systems



Access control  
systems



Building management system



Public address and voice  
evacuation systems





## Stay on track in **preventing terrorism**

1. Abandoned luggage
2. Identification by advanced intelligent video analysis and alarm notification with the video management system
3. Initiation of security measures



Defending train stations from terrorism focuses on dealing with anonymously phoned-in bomb threats, explosive devices concealed in parked cars, trash cans along platforms, luggage, or lockers. The ability to manage these safety and security risks is crucial. Bosch advanced intelligent video analysis (IVA) enables early detection of

suspicious behavior and identification of abandoned luggage and bags left innocently unattended. Tracking cameras can help verify or disprove alarms, alerting a security operator as appropriate. A “forensic search” function permits fast retrieval of relevant video sequences.

## **Detect** suspicious activity



1. Person jumping over a turnstile
2. Identification by PTZ cameras
3. Alerting of a security operator

The same approach can be used to monitor access points such as turnstiles. If an unauthorized person enters, a security operator is alerted, and video sequences are captured for identification and use as

evidence. The video management system from Bosch enables complete management of all video surveillance components.

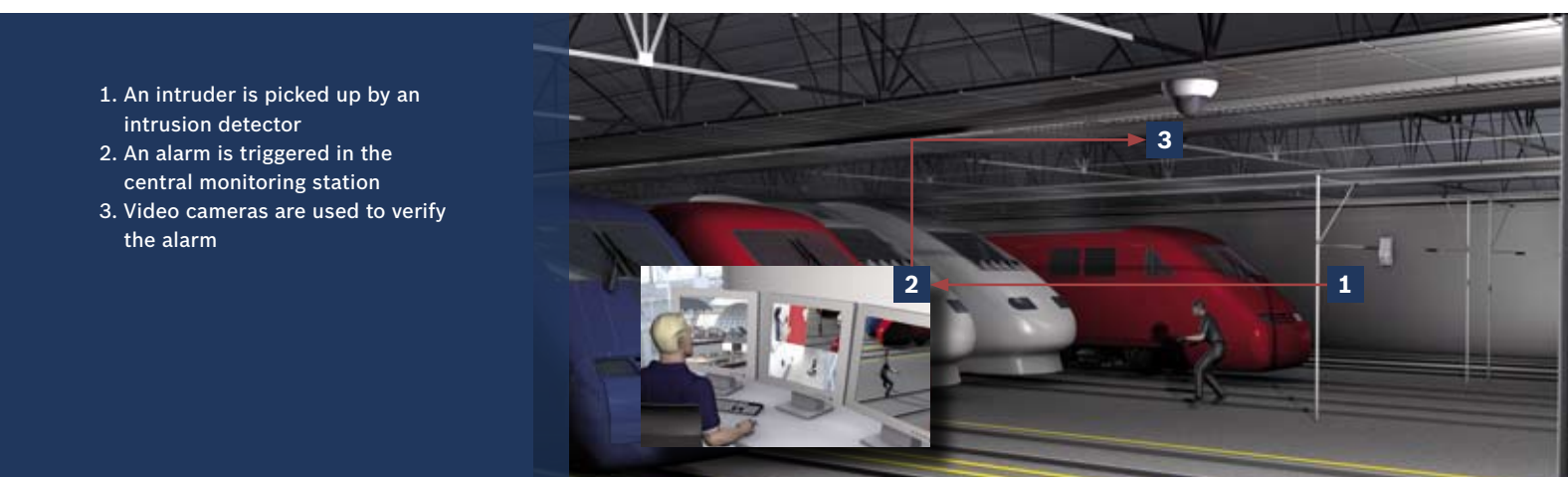
## Run a tight operation – **keep unauthorized individuals out**



An IP-based access control system from Bosch 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.

## Stop **intruders**



Bosch can help here too: e.g. with intrusion alarm systems to monitor sensitive areas for intruders. State-of-the-art detectors reliably deliver maximum performance under all environmental conditions.

Various types of cameras from the large Bosch portfolio can be installed for verifying alarms. Captured video images also serve as evidence in court.

1. Fire
2. Fire detector detects fire
3. Signal to fire panel and alarm notification in Building Management System, including video verification
4. Notification of passengers via voice evacuation system



## Clamp down on **fires**

In order to protect lives and property at train stations, it is vital to quickly detect, locate, verify, and contain fires. Station halls can pose special challenges, with their crowds, high ceilings, large open areas, and considerable distances to emergency escape routes.

Bosch modular fire panels and detectors are ideal for this and more. They apply multiple intelligent criteria to ensure early, reliable detection – with high immunity to false alarms – and fast responses. A large number of detectors can be connected in loops of up to 3,000 m and networked to cover multiple buildings and structures.

The panels automatically notify the local fire department, in addition to interfacing with sprinkler, ventilation, and public address systems as well as the building integration system (BIS) from Bosch to fight fire events of all kinds and coordinate the evacuation of large groups of people.



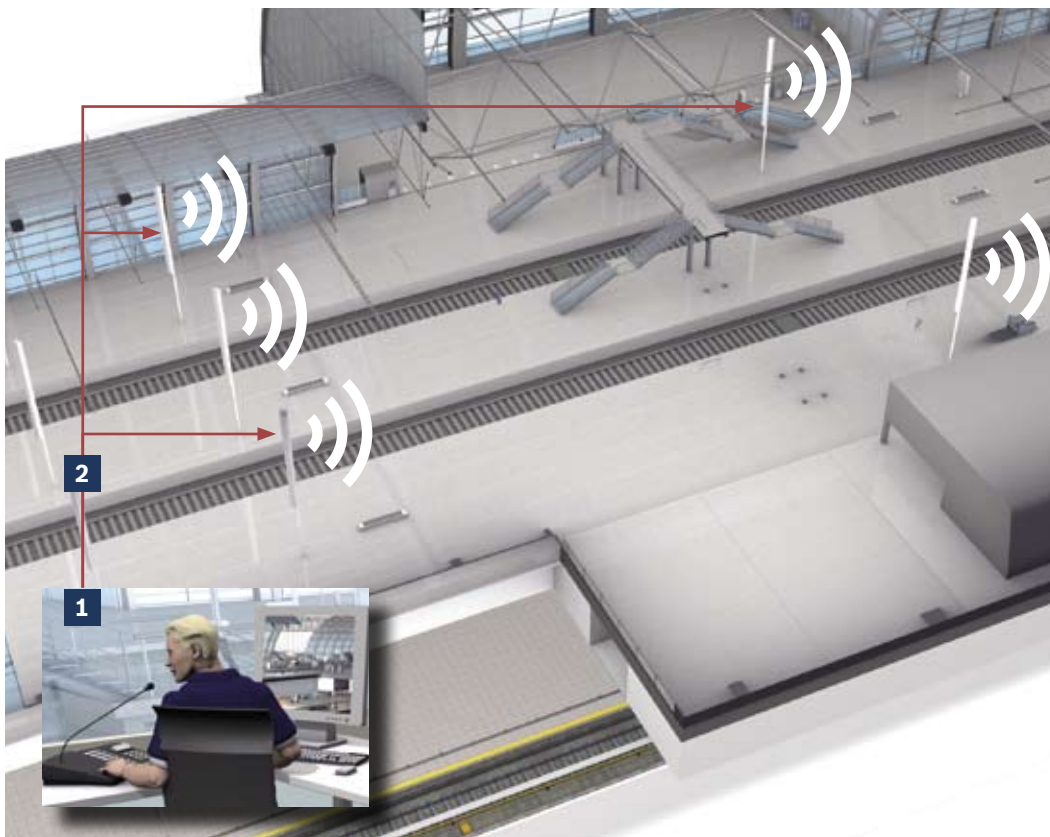
## Get the **message across**

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. They also need to be integrated with existing railway databases, software, and security systems.

Public address and emergency sound systems from Bosch are ideal for everything from routine to emergency announcements – always with maximum reliability and speech intelligibility. Digital public address and emergency sound systems from Bosch are suitable for even the largest train stations. A daisy-chain optical system bus permits the use of distributed equipment racks.

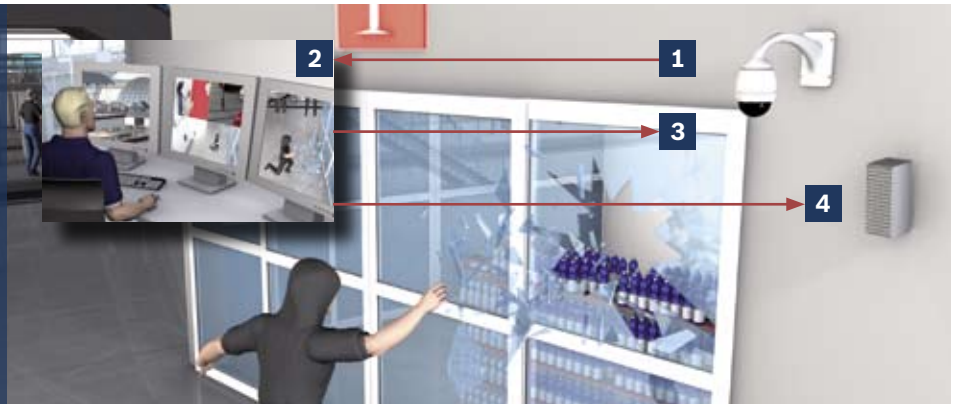
There are built-in monitoring capabilities and redundancy features including a system bus loop and automatic activation of a spare amplifier when required.

Because most stations are located in densely populated areas, announcements must normally be loud to be understood. At night, however, this would disturb nearby residents. Our sound systems therefore supports automatic adjustment of the volume to the ambient noise level.



1. Alerting of passengers to arriving trains and changes in platform assignments
2. Routing of announcements to relevant areas

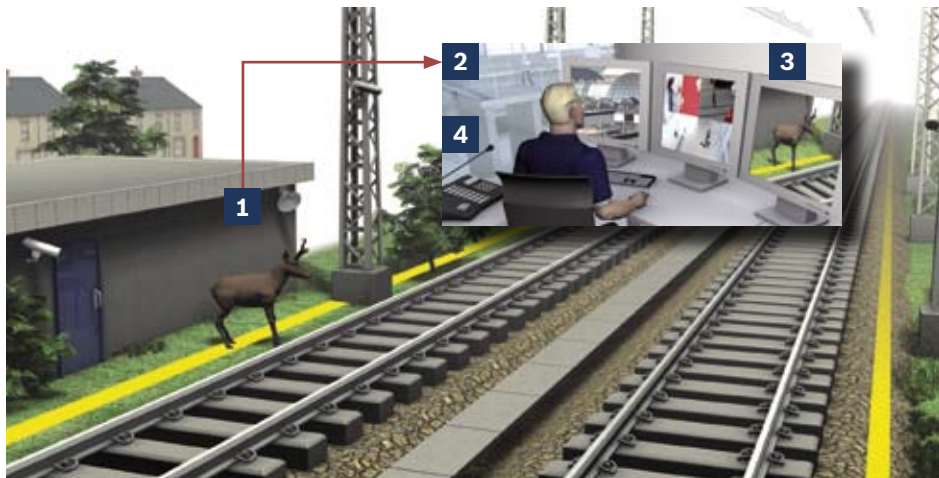
1. A possible thief triggers a window contact
2. An alarm appears on an operator's building plan in the central monitoring station
3. Live video verification of the event
4. Immediate implementation of an appropriate action plan



## Stop **thieves**

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 can steal, and patrons can 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 video surveillance cameras and intelligent video analysis to verify the alarm, activate an appropriate action plan, and support subsequent forensic searches.



1. An animal passes a virtual perimeter fence at train tracks
2. A security operator in the central monitoring station is alerted
3. Live video verification of the event
4. Immediate notification of train drivers

## Prevent **accidents**

Train tracks pose major risks, resulting in the death or serious injury of thousands of people a year. Children can play alongside tracks and get too close to passing trains. Persons can take shortcuts across tracks and be hit. Animals such as cattle or deer can provoke collisions. Intelligent video analysis can guard against

all of these risks by establishing a “virtual perimeter fence” that, if crossed, alerts a security operator. Cameras can then be used to check the situation and enable appropriate action, for instance notifying train drivers in time to prevent accidents.



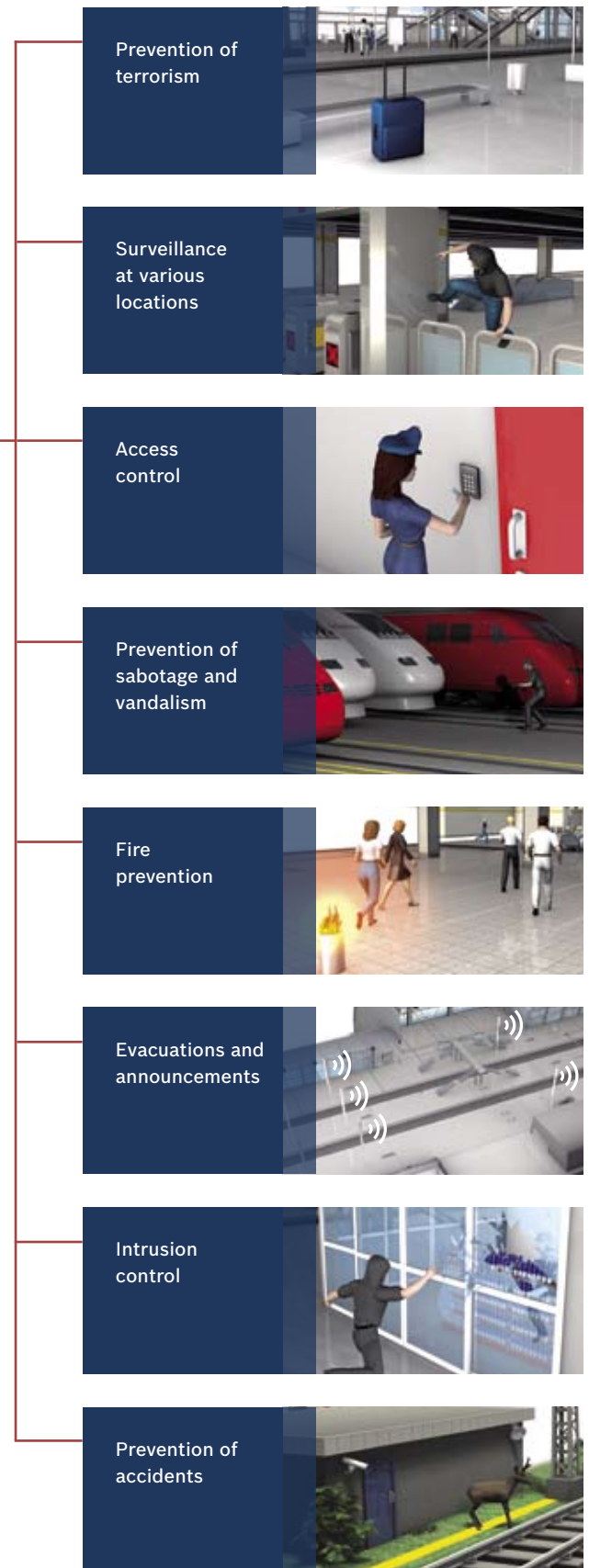
# Complete integration of security, safety, communication, and facility automation

With all of the security, safety, communication and building automation systems that can be installed in a train station, it is a challenge to efficiently manage and coordinate them all.



The building integration system (BIS) from Bosch provides a single web-based cockpit for monitoring all security, safety, and building management systems. This includes alarm management, fast alarm pinpointing via location maps, and follow-up procedures. It also seamlessly integrates fire and intrusion alarms, as well as evacuation, access control, video surveillance and building automation systems.

Use of the BIS lets a single operator monitor and control all security systems, in addition to enable faster responses to emergencies and greater overall effectiveness.



## Selected reference projects



### The metro of São Paulo, Brazil

The subway system of this South American metropolis, which has a high incidence of violence, needed a sophisticated electronic monitoring solution to increase the security of the three million passengers who ride it each day.

The new Bosch video surveillance system for the city's five subway lines with 55 stations has 121 fixed and 17 dome cameras in a gigabit ring network, managed by 10 DiBOS digital video recorders and a BIS video engine. The video streams are monitored at a leading-edge

security control center equipped with six monitors and two plasma screens. State-of-the-art digital recording and communication technology lets staff quickly retrieve images and immediately take appropriate action to deal with critical situations.

### The Channel Tunnel between France and the U.K.

Extreme series EX82 cameras from Bosch have proven themselves under challenging conditions.

The Channel Tunnel is the world's longest underwater tunnel and an extreme environment due to its low-light conditions, high-pressure air flows, high humidity, and salinity. But the EX82 cameras installed in 2003 have enabled uninterrupted underground surveillance ever

since. Extreme series cameras capture images under the most challenging conditions, including corrosive or volatile atmospheres and vandal-prone areas. The new IP version of the EX82 provides full compatibility with all Bosch products.





Left:  
Photo provided  
by Via Quatro:  
Digna Imagem/  
Clóvis Ferreira

Right:  
Photo Credit  
Metro  
divulgarion

## The subway of Munich, Germany

The subway system of Munich, Germany wanted to efficiently network its proliferating CCTV surveillance cameras for easy central monitoring.

Bosch was contracted to install a gigabit-scale ethernet with eight rings, six for the 800 cameras at the roughly 95 subway stations and another two for the train yards and external users. Now the cameras' images are transmitted in MPEG2 quality at

a bandwidth of six megabits. They are displayed in freely definable cycles on six TFT monitors at each of six monitoring stations. Data are stored on 12 NVR servers with 80 terabytes of capacity.

## The Ladozhsky Rail Terminal in St. Petersburg, Russia

The world's first Praesideo railway installation is still going strong.

Ladozhsky Rail Terminal is one of Russia's largest train stations. Here Bosch installed the world's first fully digital voice evacuation system with advanced functionalities such as a single optical cable for digital audio, control data distribution, and high-performance

amplifiers with digital audio equalization. For future expansion of rail projects like these, the Bosch IP audio module is a unique solution for digital audio transmission between PA and emergency sound systems in rail terminals, both centrally and at remote locations.

## Our commitment

Bosch Energy and Building Solutions is an innovative, customer-focused global system integrator for security, safety and communication solutions. We are committed to be the number one choice by consistently offering top-quality solutions backed by superb service.

### **A consistently high standard of quality worldwide**

All Bosch manufacturing facilities uphold the same high standards of quality to deliver first-class, internationally acknowledged product performance. This is supported by unflagging efforts to continually improve all products and processes.

Bosch designs its products so you can count on them to work as intended and are free to focus on your core business.

### **Leaders in innovation**

Bosch invests heavily in research and development, channeling a double-digit percentage of its sales revenues into these activities. Over the years, this commitment has consistently generated reliable, award-winning technologies and products to benefit customers.







## Bosch and its **family of brands**



### **DYNACORD – Preeminence in professional audio design and manufacture**

One of DYNACORD's main strengths is the extensive audio expertise it has acquired since its founding back in 1945. This competence covers everything from mixers to loudspeakers, and together with the company's traditionally close relationship with users has spawned many unique solutions to once-vexing problems, building a reputation as a maker of first-class audio equipment at the absolute cutting edge of technology.



### **Electro-Voice – Complete professional audio solutions**

For over 80 years, Electro-Voice has been behind some of the most significant innovations in the history of sound reinforcement. Given this company's success in delivering professional audio solutions, it should come as no surprise that Electro-Voice products are relied on in train stations around the world.

### **A Tradition of quality and innovation**

For over 100 years, the Bosch name stands for quality and reliability. Bosch is the global supplier of choice for innovative technology, backed by the highest standards for service and support.

Bosch Energy and Building Solutions proudly offers a wide range of security, safety, communications and sound solutions that are relied upon every day in applications around the world, from government facilities and public venues to businesses, schools and homes.

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