

## Axis cameras monitor safety on Croatian and Bosnian trains.

Railways in Croatia and Bosnia are under the watchful gaze of Axis network cameras.



**Organization:**  
KONČAR - Electrical  
Vehicles, Inc.

**Location:**  
Zagreb, Croatia

**Industry segment:**  
Transportation

**Application:**  
Safety and security,  
onboard surveillance

**Axis partner:**  
Elektrokem

### Mission

Increasing safety of train commuting, improving indoor and outdoor surveillance technology and keeping up with public transport security trends – these were the reasons why KONČAR, a producer of railway vehicles from Croatia, decided to invest in new video surveillance system for their trains. However, running a surveillance system onboard a train has specific requirements and challenges, such as electromagnetic compatibility (EMC), length of the vehicle and securing connection between coaches. With analogue solutions unable to fulfill the tasks with the desired quality, a system based on IP cameras was chosen.

### Solution

In cooperation with Croatian Axis partner, Elektrokem, KONČAR decided to install a system based on Axis IP cameras both inside and outside their trains. While indoor cameras have a traditional surveillance role and they monitor passenger safety in the vehicle, the cameras installed outside the train have two functions:

they serve as a rear mirror for the driver and monitor the situation on the track in front of the train and behind it.

### Result

At the moment, there are three types of Axis network cameras used in the project. AXIS P1355 and AXIS P1365 Mk II Network Cameras monitor the situation outside the vehicle and also serve as rearview device for the driver. Inside each coach, there are two indoor cameras for monitoring passengers. Both AXIS 209MFD-R and AXIS P3905-R M12 are used for this task. The new system provides more comfort for the passengers and also for the train driver, who is now able to better evaluate the situation inside and outside the train.

**“The Axis cameras are robust and provide high quality and the stable video stream we needed. They also outmatch traditional analog solutions in terms of electromagnetic compatibility, scalability, connectivity and, last but not least, easy maintenance.”**

Engineer from technical department of KONČAR - Electrical Vehicles, Inc.

### Task to commute safely

With global environmental challenges increasing, it is of great importance to promote environmentally-friendly public transportation as a favorable commuting alternative. Train public transportation excels in its sustainability and minimal environmental impact – however, its growing popularity brings new challenges. In order to ensure the maximum level of safety, KONČAR, a producer of railway vehicles from Croatia, decided to invest in new surveillance system onboard their trains. “We wanted to increase the quality of our service in terms of safety and comfort for everyone on the train – not only the passengers, but also the drivers. The first idea of the project was to replace rear view mirrors with cameras. We knew it would dramatically improve driver’s overview of the situation, which is very important,” says an engineer from the technical department of KONČAR - Electrical Vehicles, Inc.

### IP cameras for demanding environments

Once the company decided to implement IP cameras, new areas occurred that would benefit from the surveillance system. Besides two rearview cameras, each driver’s cabin has one front camera to monitor the situation in front of the train. Moreover, there are two indoor cameras in every coach to monitor passenger safety. The system is based solely on Axis network cameras. “The Axis cameras are robust and provide high quality and the stable video stream we needed. They also outmatch traditional analog solutions in terms of electromagnetic compatibility, scalability, connectivity and, last but not least, easy maintenance,” explains the engineer.

The cameras used in the system are AXIS P1355 and AXIS P1365 Mk II Network Cameras for the outdoor area monitoring. AXIS P1365 Mk II delivers HDTV 1080p and support for 50 or 60 fps in H.264 and motion JPEG. It means it captures fast-moving objects and people in high-resolution image quality, which is extremely important when mounted on moving objects, such as trains. AXIS 209MFD-R and AXIS P3905-R with M12 lens are used as indoor cameras for passenger area surveillance. The video stream is displayed in the driver’s cabin, and is also recorded. In total, there are almost 400 cameras installed on KONČAR trains.

### Increasing comfort of public transportation

“Video surveillance creates a much more comfortable atmosphere in the vehicle for our passengers and staff. We’re very satisfied with the new surveillance solution – it brings a new level of security to our trains. When it comes to commuting, driving safe is the number one priority, and now we do the maximum to ensure it,” concludes the engineer.



## KONČAR

Končar - Električna vozila d.d.

**ELEKTROKEM**  
industrial electronics

**For more information on Axis solutions, visit [www.axis.com/transportation](http://www.axis.com/transportation)  
To find a reseller of Axis products & solutions, visit [www.axis.com/where-to-buy](http://www.axis.com/where-to-buy)**