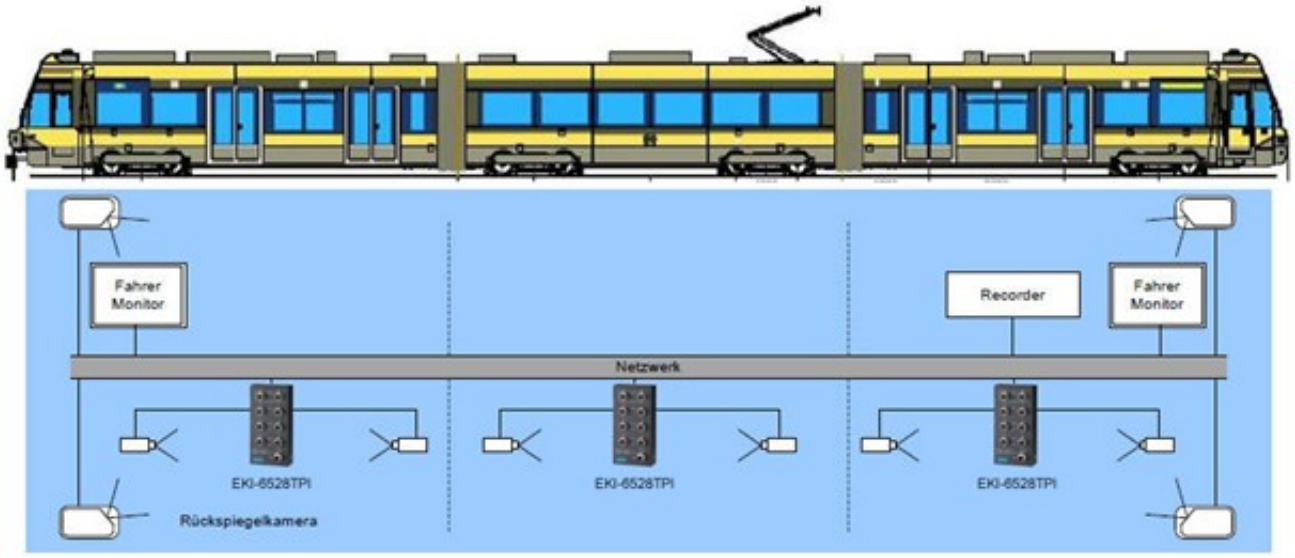
Funkwerk Information Technology

IP Cameras with PoE Assure Passenger Safety



IP Cameras with PoE Assure Passenger Safety

Market: Intelligent Transportation

Location: Germany

Customer: Funkwerk Information Technology

Project Introduction:

Increasing concerns over public safety has meant that video surveillance applications are growing fast. In particular, public transport systems like trains and metro systems can now take advantage of the latest technologies and industry standards. Surveillance systems play an important role in reassuring and protecting the public, but by far the most common video surveillance applications in trains are for crime/vandalism prevention and accident investigation. Video surveillance plays its part by preventing crime and keeping mishaps from becoming tragedies. The challenge for today´s transportation system integrators developing video

surveillance solutions for trains is designing solutions that doesn?t rely on dedicated power outlets, can accommodate existing technology, yet still be robustenough to meet the rigors and vibration of trains speeding along steel tracks and through tunnels.

System Requirements:

Funkwerk Information Technology are based in Karlsfeld near Munich and specialize in Passenger Information Systems and Mr Bruno Hoefer is their hardware development leader. Recently they were awarded an important train video surveillance project for a large customer in Europe. The project required several cameras to be placed throughout the carriages and above the doors, with rear-view cameras and display monitors in the front and rear driver compartments. The system needed an independent power supply and high quality video, so it was decided that IP cameras with Powerover Ethernet (PoE) switches in each carriage were the best solution. This configuration also had the added benefit of reducing additional cost on cabling for power because PoE switches supply power to the cameras as well as transmit data. Additionally, the switches have a bypass function so in case a switch fails, additional network components would not be affected. The IP cameras were connected to PoE switches and data was transmitted to the drivers cab for storage on a video recorder. The whole system was designed to be "standalone" meaning power for the cameras was acquired through the PoE switches and all video data was to be downloaded to the central control hub at the end of each day.

Future upgrades might include automatic real-time downloads to the fixed network for faster more economic data handling. Also, because IP cameras are digital, analytical video applications could be implemented such as for face or unused baggage recognition.

System Implementation:

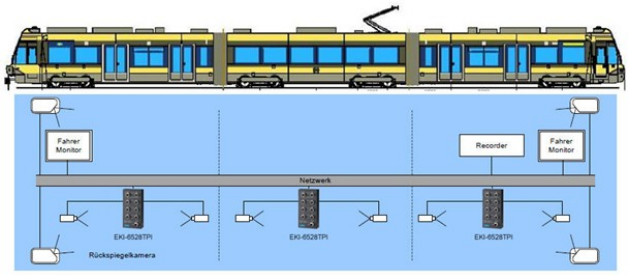
To implement a video surveillance system on a moving train requires unique considerations. Power outlet locations, fluctuating voltages, underground tunnels, and synchronized data transmission and storage were all good reasons to choose a PoE based solution. The benefits of PoE are numerous from both a network efficiency standpoint as well as a cost standpoint. With PoE, the constraint of having power outlets is eliminated. This provides flexibility in placing PoE-enabled network equipment and IP cameras in the most optimal locations instead of choosing locations where power is available. Optimal placement of networking devices leads to more efficient network designs and better application performance. PoE enables the easy placement of equipment on ceilings, high on walls, or in outdoor locations that may yield betternetwork performance.

Strict adherence to industry standards is important so systems can be expanded and scale up over time. New cameras and technologies can be added when required thanks to compliance with industry standards. Mr Hoefer told us, "We selected Advantech´s EKI-6528TPI PoE switch because first it is compliant with the EN50155 standard for equipment used on rolling stock, and it has 4 ports with PoE supply. But the main advantage in respect to other products was the fact that we can supply the PoE switch with 24Vdc. In trains there are mainly 2 supply voltages 110Vdc and 24Vdc. Due to safety reasons we convert 110Vdc direct into 24Vdc, so it is available in the train. Most competitor´s products use a 48Vdc input, so an additional DC/DC converterperswitch would have been needed, but not with Advantech´s PoE switch. Thus the most economical and safe way was to use the available 24Vdc supply."

Project Implementation:

EKI-6528TPI	EN50155 8-port M12 Unmanaged PoE Switch with Wide Temperature

System Diagram:



Conclusions:

Mr Hoefer told us, ?Funkwerk offers infrastructure operators a market-proven and powerful portfolio of solutions for safe and efficient railway operations. As safety is key for us we deploy Advantech?s EKI-6528TPI with the EN50155 certification. Advantech?s products provide highly reliable connectivity and allow us to deploy

the PoE switches with 24Vdc. We appreciate working with Advantech who is a leader in industrial automation. Their products make it possible to guarantee smooth train communication in the event of power failure in a carriage.?

Funkwerk maintains a close working relationship with Advantech who were able to supply several product samples at short notice for testing which in turn helped theirapplication development and validation early on. Mr Hoefer explained, "In order to keep being successful, we need to offer advanced technology and competitive prices. If problems occur there is always a fast reaction from their engineers so that we can keep our customers satisfied?and in this business, that´s important."