CCTV - Ensure Wayside Operation Safety with EN 50121 Robust and Intelligent Video Surveillance

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Level crossing accidents comprise up to 50% of all fatalities caused by railway operations. The major cause of these crashes and accidents is the behavior of the public, and not the malfunctioning of technical equipment. Still, this makes level crossings a weak point in road and railway infrastructure, and improving the safety of level crossings is an important subject in both academic research and in practical real-world applications. Improving the safety of people interacting with the rail system and the security of the facilities themselves is a key part of ensuring smooth road and rail transportation. New sophisticated strategies such as advanced barriers and road signs have been proposed to enhance security.

Moxa can deliver a unique solution based on intelligent video surveillance. Since most accidents are caused by human behavior, accidents can be prevented by quickly detecting and responding to dangerous situations. For example, the video system could automatically detect obstacles, such as a vehicle stopped on the level crossing. The system can also measure the degree of movement in a predefined detection zone, then apply intelligent video analysis algorithms to interpret the context of an image and isolate key subjects of interest. These new technologies

will give railway staff earlier warnings about potential issues and allow them to quickly respond to developing emergencies by stopping oncoming trains. In addition, any events will be recorded as evidence by the video surveillance.

Moxa railway solutions for wayside operation saftey

Smart Surveillance: IVA Alarms for Real-Time Reactions

Intruder detection, perimeter protection, and alarms comprise 70% of the security market, a category that is by far the biggest application segment. Moxa´s CCTV surveillance systems cover all segments with a single IVA (intelligent video analysis) algorithm that is able to run on a wide range of devices such as cameras, video encoders and video management systems.

With IVA functionality, Moxa CCTV surveillance systems can quickly detect a wide variety of threats. Moxa IVA can be configured to detect a virtual fence, an alert zone, missing objects, and unattended objects. Combined with a 24 MB pre-alarm buffer and prompt alert functions, Moxa´s rugged IP cameras enables surveillance staff to quickly retrieve and review details of abnormal events from the inserted SD/SDHC card and send alarm messages through CGI commands or email.

Wayside Detection

The wayside is one of the highest risk zones of the rail infrastructure, and lack automated high-accuracy solutions. Remote wayside locations are difficult to access

and tough to monitor, and thus present significant deployment challenges. Moxa IVA offers unique, highly optimized capabilities that can be deployed to meet the sensitive security requirements of these sites.

Moxa IVA can automatically detect several key wayside scenarios:

- **People entering the level-crossing at any time**
- **Any moving object other than trains identified on the track**
- **Objects abandoned at trackside**
- **Large metallic or organic objects on the tracks such as logs, shopping carts, or a motorcycle**
- **People crossing the railroad tracks**

Rugged Industrial-Grade Environmental Protection

Moxa´s IP surveillance products are rugged enough for outdoor and harsh industrial environments.

Rugged IP Cameras

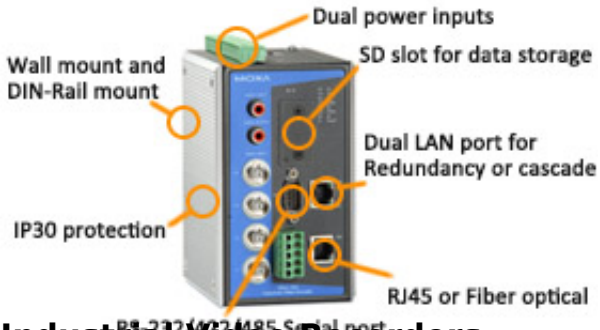
With an IP66 rating and high Level 3 EMI/EMC protection, Moxa´s IP cameras provide consistent performance in rainy, dusty, and high EMI environments. For protection against vandalism and tampering, the dome-type camera enclosure is IK-10 (EN 62262) rated, the highest level of vandal resistance for outdoor applications.

- -40 to 75°C operating temperature, without heater or fan
- IP68 or IP66-rated for rain and dust protection
- Level 3 EMI/EMC protection
- IK-10 (EN 62262) vandal-resistant form factor
- Long MTBF of over 200,000 hours
- Versatile installation options for outdoor environments
- Industry Certified Reliability and 5-year Warranty

Rugged Industrial Video Encoders/Decoders

Moxa´s industrial video servers are tough enough to perform reliably in extreme temperatures and other harsh environmental conditions. They support the H.264/MJPEG compression algorithm, and allow for easy integration of CCTV cameras into IP surveillance solutions. For a reliable network surveillance system, use Moxa´s video servers as a part of your remote monitoring solution.

- 12/24 VDC or 24 VAC redundant power inputs
- DIN rail mounting and panel mounting accessories available
- IP30 protected housing
- -40 to 75°C operating temperature for T models
- Choose either RJ45 or fiber optic Ethernet ports
- MTBF of over 200,000 hours
- Level 3 EMI/ESD protection



Industrial Video Recorders

Moxa´s industrial network video recorder is designed for recording the VPort´s MJPEG, MPEG4, and H.264 video streams in harsh environments. With rugged design features, the network video recorders are tailor-made for field applications.

- Embedded Linux system for high reliability
- Anti-vibration hard disk for protecting the disk´s operation
- -40 to 75°C operating temperature for T models (with solid state disk)
- No heater or fan for high MTBF
- Level 3 EMI/ESD protection

-40 to 75°C Operating Temperature, without Fan or Heater

Devices must be able stand up to environmental adversity in order to succeed in railway applications. Moxa´s IP surveillance products are designed for outdoor and harsh environments, and deliver unparalleled reliability thanks to their exceptional tolerance of extreme temperatures. Moxa´s IP surveillance products can run comfortably in extreme temperatures ranging from -40 to 75°C without using fans or heaters. These industrial-grade IP cameras capture brilliant HD images and

deliver reliable video streaming in any environment, from snowy mountains to scorching deserts and everything in between, and excel in rolling stock and wayside side applications.

Since they do not need a heater or fan to operate, Moxa´s IP surveillance products are more reliable and require less power than other cameras, greatly simplifying the electrical installation and maintenance of the system. The cameras are also IEEE 802.3af PoE compliant, so they can be powered simply through an Ethernet cable.

Moxa´s IP surveillance products are certified to meet the strictest industry standards.

These rugged surveillance products comply with EN 50121 and EN 50155, certifications which ensure reliable performance when exposed to extreme shock/vibration, high levels of surge/EMI, and explosive environments. In addition, Moxa offers the rail industry´s leading warranty to demonstrate our commitment to product reliability and excellent customer service for HD IP cameras, video servers, and video recorders.