

PIXIM REVIEW

Train Security

Pixim-Powered Cameras Play an Important Role in Transport Security

In North America, trains most often are used to transport cargo economically. In Europe and Asia, trains play a more important role in passenger transportation, as well. But everywhere they are used, trains – and the tracks, stations, and cargo loading areas that serve them – pose particular challenges for security. Video cameras are ideal tools because they can operate 24/7 even in remote or lightly traveled areas, providing a cost-effective way to keep an eye on the rail infrastructure. Cameras located at underpasses and stations, for example, can be used to identify and monitor specific trains, which helps with the rapid and efficient movement of the trains. The round-the-clock nature of train travel, as well as the extreme lighting conditions caused by the physical layout of rail facilities, makes it difficult for traditional CCD-based security cameras to

capture accurate images, especially when there's high contrast between very bright and very dark areas of a scene.

Common security camera problems for trains include:

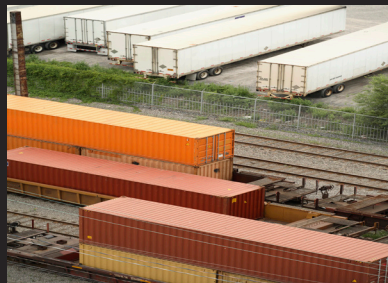
- › Lack of detail in high-contrast conditions, backlight, under fluorescent lights, or outdoors
- › Low clarity in shadows, such as inside or next to trains or inside stations or cargo loading areas
- › Image washes out due to glare and reflections from glass and metal
- › Color inaccuracies in varying lighting conditions
- › Low-quality Digital Video Recorder (DVR) recordings

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At-A-Glance:

Pixim Digital Pixel System[®] (DPS) Technology

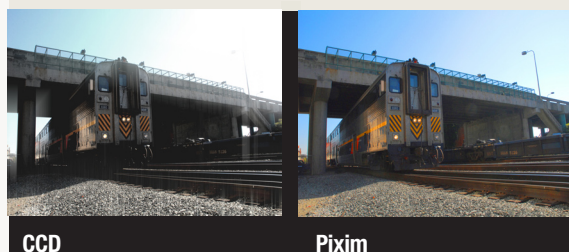
- › Widest Dynamic Range (WDR): Captures up to 1024 times more data (dynamic range) than standard CCD cameras
- › Signal-to-noise ratio (SNR): >50 dB (max)
- › Sensitivity: <0.5 lux (CMY) minimum illumination f/1.2, 50 IRE
- › Resolution: 540 horizontal TV lines (HTVL) equivalent



Pixim-Powered Cameras Play an Important Role in Transport Security [continued]

Pixim's Digital Pixel System® (DPS) ultra-wide dynamic range technology, a true breakthrough in imaging technology, delivers unprecedented image quality in all lighting conditions. Cameras powered by Pixim's specialized image processing chipsets can significantly enhance security for trains through the following capabilities:

- › Widest dynamic range: Captures highlight and shadow detail in the same scene.
- › Highest total resolution: Makes it easy to distinguish image features and details, even in highly variable lighting conditions.
- › Superior color rendering: Accurately displays color even in difficult lighting such as backlight, high-contrast scenes, glare, reflection, and fluorescent lighting.
- › No "camera blindness": Eliminates the vertical smear, pixel blooming, and other image artifacts commonly encountered in high-contrast scenes.
- › High image compression: Improves image quality with smaller file size – allowing DVRs to record with higher frame rate or higher resolution, or both, while maintaining the same total recording time.



- › Loss of image detail in dark and bright areas
- › Camera "blindness"

- › Superior image quality despite harsh lighting conditions

According to Transport for London officials, nearly 90 percent of passengers backed the recent roll-out of security cameras in the London Underground rail system, believing it will help improve passenger safety on trains and in stations.

Security cameras based on Pixim technology enable train operators to capture details of trains, passengers, and cargo in high resolution, even in variable and challenging lighting conditions and despite low DVR compression. The ability to record activities clearly and accurately makes it easier to track trains as they traverse their routes, as well as to identify criminal activity aimed at the trains themselves (e.g., vandalism) or their passengers, staff, or cargo. If incidents do occur, the images captured by Pixim-Powered security cameras can be used to determine what happened and who was responsible, so that appropriate actions can be taken.



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