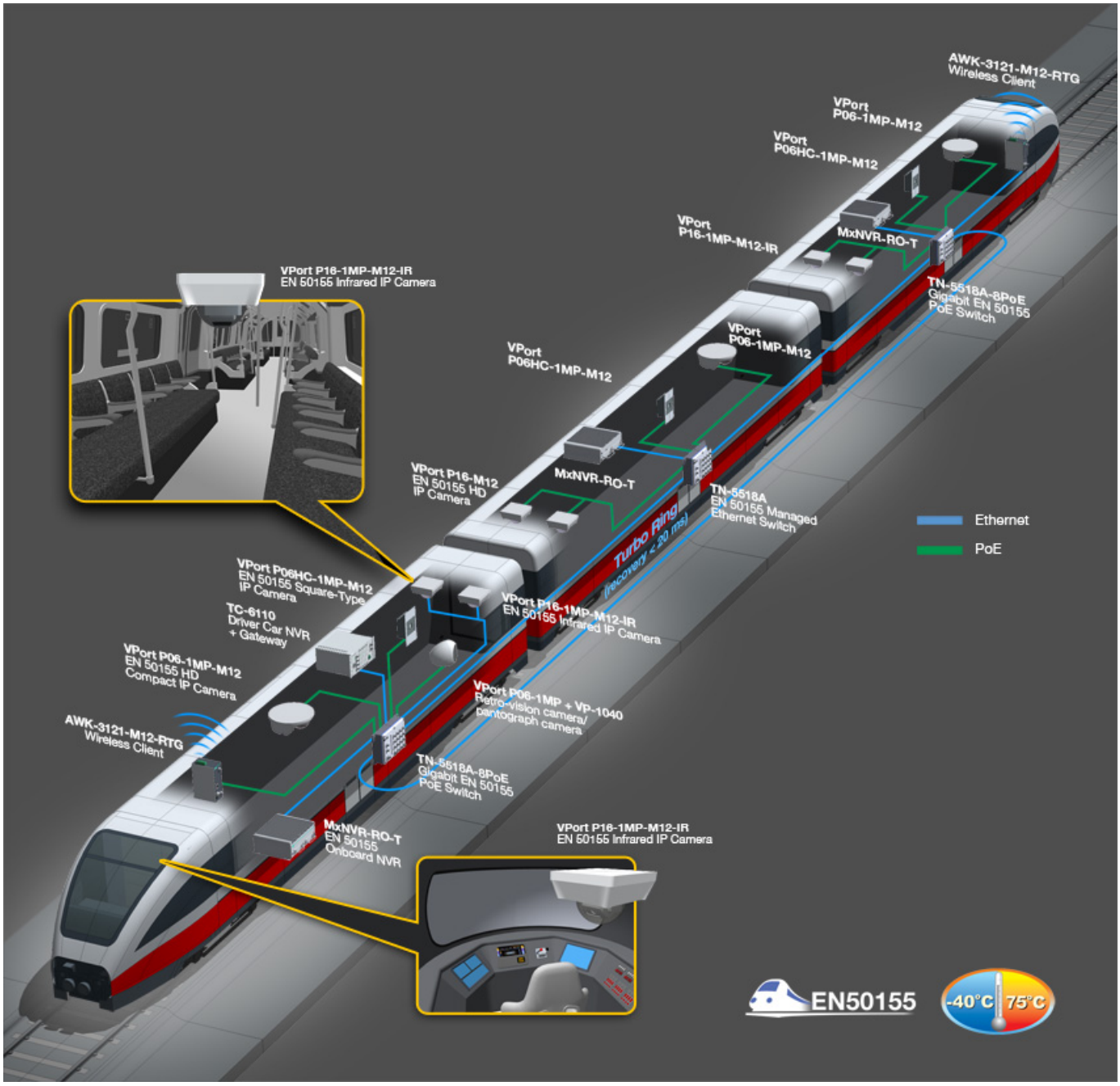
Onboard CCTV

Any Scene, Any View, Any Condition



IP-based CCTV systems are becoming an absolute requirement for metro operations. Effective video surveillance protects passenger safety and makes metro operations more efficient, which has led to increased investment in onboard IP CCTV systems. These systems have expanded in scope and reach, and cameras and

NVR computing platforms are now being deployed in more and more locations throughout the train. These new video surveillance applications have introduced important new IP video requirements: as IP cameras and computers are deployed in more and more locations onboard a train, there is a corresponding increase in the performance, reliability, and design requirements for those IP cameras and computers.

New Locations and New Requirements for Onboard IP CCTV

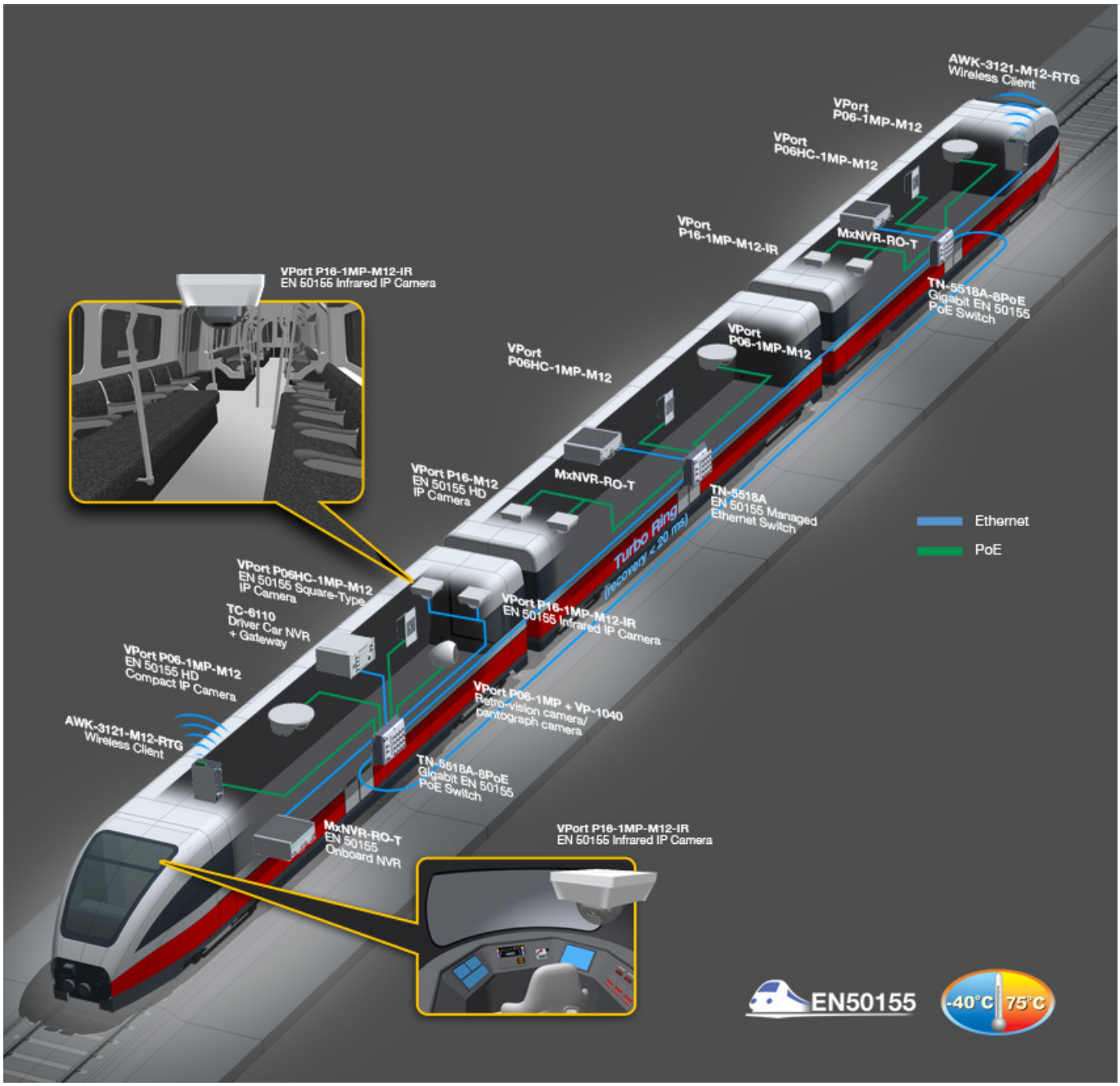
- More cameras with different form factors and easy installation for different locations on the trains
- Crystal-clear image quality in a wide dynamic range of dark and light environments
- High performance video streams for smooth video surveillance

High Quality Video and Dependable Data Archives on Ethernet Networks

Complete Security, Even in Total Darkness and Extreme Temperatures

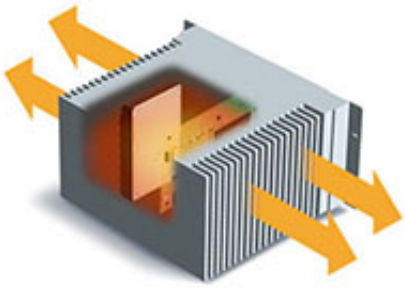
To ensure passenger safety, IR cameras are located in both the driver´s cab and passenger cars, where images are recorded while the train is in operation. In the driver´s cab, the IR camera can distinguish different LED indicator colors on the control panel, which is especially critical when monitoring the operation of a driverless train. When in the depot, the IR maintains the security of the train by continuously recording clear images, even in complete darkness.

Moxa´s industrial grade VPort P16-1MP-M12-IR infrared IP camera is designed to meet the challenges of onboard and other rolling stock applications. The built-in IR illuminator and ICR (Infrared Cutfilter Removal) is suitable for low lux environments, and provides high resolution black and white images in the dark of night. In addition, the VPort P16-1MP-M12-IR is EN 50155 compliant (T model: -40 to 70°C), ensuring reliability and safety for onboard operations under temperature extremes.



-40 to 70°C Temperature Tolerance

All of Moxa?s EN 50155 products are compliant with the essential sections of EN 50155 and EN 50121-3-2. The VPort P06-1MP-M12-T is the world?s first IP camera that can operate safely in -40 to 70° C temperatures without fan or heater, and complies with the highest EN 50155 TX temperature criteria. In addition, Moxa?s computers with SafeGuard? technology use passive heat exchange to keep the computers cool in high temperatures, allowing. This allows them to easily meet the 70°C heat tolerance demanded by EN 50155 TX. For extremely low temperatures, Moxa?s Intelligent Heat Solution guarantees that your system will boot up with an automated, PCB-integrated hardware utility that will postpone system initialization as it heats up the hard drive.



Optimal Streaming Performance in Low-Bandwidth Environments

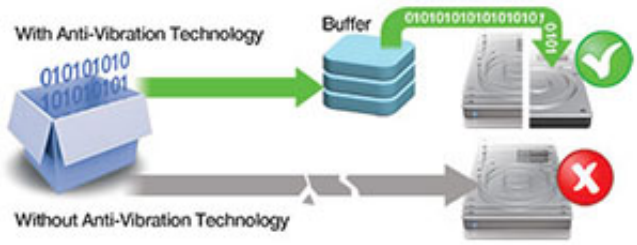
CBR ProVideo streaming is a major component of IP surveillance systems, and affects both the network and video performance. Moxa?s systems use custom technology to deliver consistent video quality without overwhelming network resources. Moxa?s IP cameras deliver up to a maximum of three independent video streams (two H.264, one MJPEG) simultaneously, and CBR Pro? technology stabilizes the bit rate and guarantees that even in low-bandwidth environments, the system will maintain consistent video performance.

- DynaStream?: Control video frame rate for system and network efficiency
- Advanced CBR Pro?: Secure your video stream transmission to provide better image quality by eliminating dropped packets
- Multi-stream video: Supported for different application requirements

Secure & Reliable Disk Access under Extreme Vibrations

The first priority in NVR is to maintain the integrity of the video data and avoid any data loss. Moxa?s SafeGuard? technology secures the data on NVR computers and rugged NAS devices with intelligent protection against data corruption, even during extreme vibrations or shocks.

For NVRs, SafeGuard includes a patented bracket that protects the hard disk by directly absorbing kinetic energy and balancing the hard disk to avoid excessive vibration and shock. For NAS devices, SafeGuard will prevent data loss when disk vibration exceeds a pre-set threshold by automatically saving data to a non- volatile 1.5 GB solid-state memory buffer and storing it there until the vibrations drop to tolerable levels. Even if the system suddenly crashes, all the data will remain in the buffer when power is restored.



Wide Selection of EN 50155 prodcuts for all Onboard Locations

Versatile Camera Types and Installations for Any Location

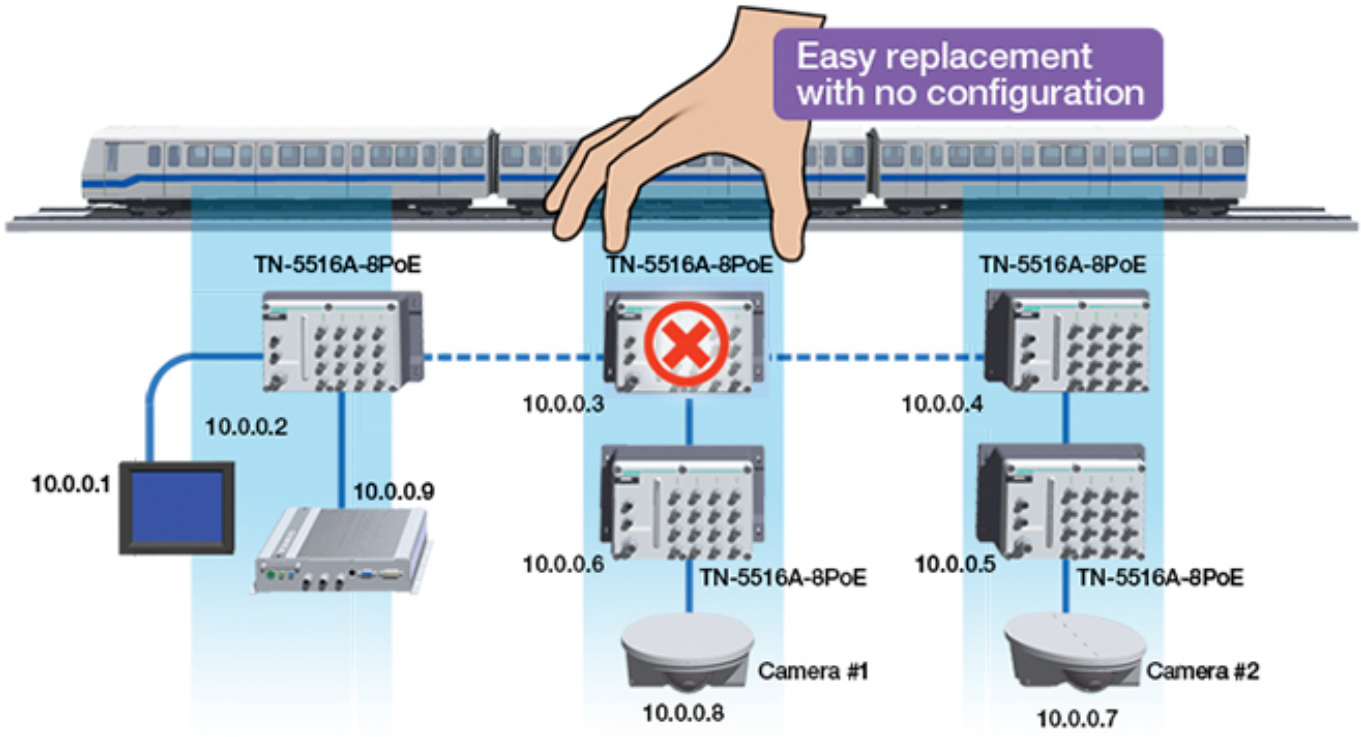
Moxa provides a variety of EN 50155 IP cameras and all the different applications, carriages, and installation environments in onboard CCTV systems. Choice of IP Cameras.

Wide Selection of Railway Computers for Different Performance Levels

Moxa provides diverse NVR computing platforms and NAS devices to fulfill various customer demands. The choice and versatility of Moxa?s onboard NVR portfolio includes solutions for driver car NVR, passenger car NVR, NAS, or gateway applications. Additional options include different performance levels (from entry level to extreme performance), device role, functionality, and form factor, so that there is a Moxa solution that will excel in any type of application.

Easier Maintenance via Industrial Auto Configuration Technology

For railway service to stay on schedule, the onboard systems must maintain high availability and minimize the amount of time spent on maintenance--a tall order in dynamic, complex network environments. Moxa?s FLI (Flexibile, Location-based, Intelligent) technology improves system availability by making maintenance and replacement of network devices faster and more consistent. Moxa?s railway devices can automatically determine their own device and network settings based on where they are attached to the network, so device maintenance and replacement is quick and error-free, even when maintenance staff are unfamiliar with IP network technology.


Easy replacement
with no configuration
TN-5516A-8PoE
TN-5516A-8PoE
TN-5516A-8PoE
10.0.0.2
10.0.0.3
10.0.0.4
10.0.0.1
10.0.0.9
10.0.0.6
10.0.0.5
TN-5516A-8PoE
TN-5516A-8PoE
Camera #1
Camera #2
10.0.0.8
10.0.0.7