

On-Board Train IP Network for French Railway



⇒ Project Intro

A global technology leader in the fields of Security, Defense and Transportation, delivers solutions for ground transportation to customers around the world, including a large French public enterprise that operates rail services for passengers, maintenance and signalling of rail infrastructure. In a rail network of about 32,000 km they operate about 14,000 trains daily. The rail service provider's objective was the refurbishment of two regional train lines in the suburbs of Paris, and they were looking for a reliable on-board train IP network. The solution provider turned to Moxa to deliver train certified industrial Ethernet switches for building the network backbones.

Company: **A global technology leader in transportation solutions**

Location: **Suburbs of Paris, France**

System Requirements

- Industrial-grade devices that are designed for applications in harsh environments
- EN-50155 certified products that guarantee uninterrupted operation in the train environment with vibration and shock
- Certification for environments with smoke and fire
- Leading edge reliable industrial Ethernet technology
- A global partner that delivers support and responsiveness

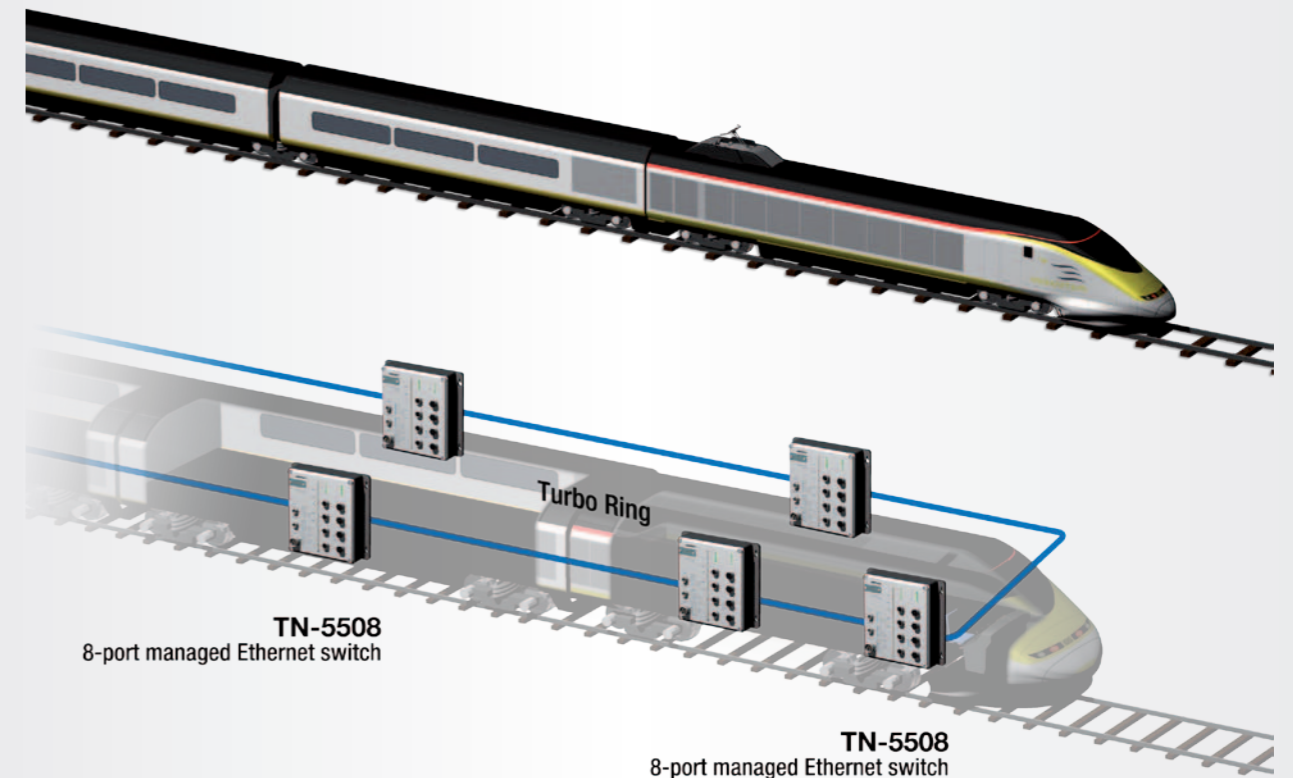
Moxa Solution

Starting in 2010, two French regional railway lines will be refurbished with on-board IP networks. IP networks are able to process different large amounts of data, such as voice or IP video, and they can also integrate wireless solutions. They are widely used to offer comprehensive passenger information services.

One train consists of a locomotive and five passenger cars. Inside the locomotive, three of Moxa's TN-5508 EN50155 8-port managed Ethernet switches are installed. Inside every passenger car, two switches are installed. Together, the switches form a Moxa Turbo Ring. Moxa's new generation Turbo Ring, which has the world's fastest fault recovery speed of under 20 ms at a full load of 250 switches, helps to minimize downtime caused by network failures. If any path in the network is broken, the system will return to normal communication in under 20 ms, even at the full, 250-switch load for one ring. Various topologies can be configured using Moxa Turbo Ring to reduce cabling and network planning costs. Options include ring coupling without a coupling control line, dual rings in one switch, and dual-homing. Moxa's TN-5508 switches provide a high bandwidth network at 100 Mbps/s, allowing the integration of multiple data applications in the same backbone. Ideally suited for PIS (Passenger Information Systems) and IP video surveillance, it can also accommodate comfort and be used as redundant network for the safety related systems. Moxa will deliver the switches into the refurbishment project throughout the next three years.

System Diagram

Twisted Pair Cable



Why Moxa?

- Moxa offered comprehensive technical support from the planning phase throughout maintenance
- Specific TN-5508 software modifications to allow the train management application to access the TN-5508 network information
- Compliance to specific French fire and smoke certificates was included in the comprehensive project services
- Hardware modifications to meet specific end user requirements and the French regulations for vibration proof connectors

⇒ Product



TN-5508 EN50155 M12 8-port Managed Ethernet Switch with Redundant Power Inputs

- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
 - Leading EN50155-compliant industrial Ethernet switches for rolling stock applications
 - DHCP Option 82 for IP address assignment with different policies
 - Modbus/TCP industrial Ethernet protocol supported
 - Turbo Ring, Turbo Chain, and IEEE 802.1D-2004 RSTP/STP for network redundancy/GMP snooping and GMRP for filtering multicast traffic
 - Port-based VLAN, IEEE 802.1Q VLAN, and GVRP to ease network planning
 - QoS (IEEE 802.1p/1Q and TOS/DiffServ) to increase determinism
 - IEEE 802.3ad, LACP for optimum bandwidth utilization
 - SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- And many more features. For details please refer to www.moxa.com