

Signal control system for Tianjin subway
2008-12-29

Location / Country : China

Product Solutions:

[EDS-505A/508A Series](#)

5 and 8-port managed Ethernet switches

Introduction

Project Introduction

The Tienjing Subway No. 1 from Liuyuan to Shuanglin, has a total length of just over 26 km, which includes a 14 km stretch underground. The subway has 22 stations, 13 of which are underground, with one train-distribution center, one train storage area, and a distribution control center. The course from Liuyuan to Shuanglin is the stretch to the North and the South. The Subway No. 1 is divided into three sections. One section links Liuyuan to the West Station, another newly-built section goes Xinhuan Road to Shuanglin, and the original section goes from the West Station to Xinhua Road.

As Subway No.1 expanded, engineers wanted a scalable network infrastructure that covered a large geographic area and could provide the most cost-effective performance to support all data acquisition, communications, and monitoring needs well into the future.

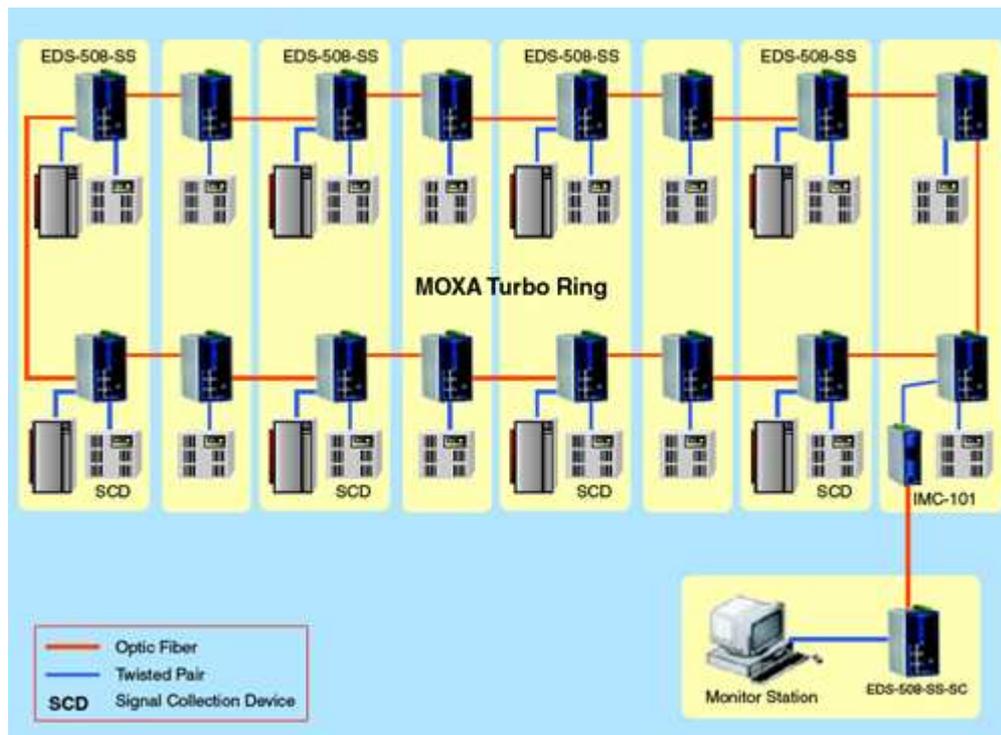
Moxa Solution

The trains use 750 VDC third-track power. To get an idea of the complexity of the system, note that there are 4 bulk substations, 6 propulsion power substations, and 3 voltage-reduction substations, with signals transmitted by an ATP, ATS system. The trains are domestically manufactured with DC voltage powered. A total of 156 cars in 26 trains serve 48,100 passengers each hour, but the average waiting time is only 2 minutes between shuttles.

A subway system has many different sub-systems, including Environment Monitoring Control System (EMCS), Fire Alarm System (FAS), Fire Extinguisher System (FES), Supervisory Control And Data Acquisition (SCADA) system, Automatic Fair Collection (AFC) system, and Distributed Supervisory System (DSS). The DSS is the most important sub-system. The core of the DSS is the signal communication system for the entire Subway No. 1. The reliability, security, stability, and response time affects the safety of the railway.

The signal collection devices use equipment from Westinghouse, which is well known around the world for providing reliable and stable devices. Eight of the twenty two stations in the subway line are equipped with signal collection devices, and four of these eight stations have two signal communication devices. The signal collection and communication devices are used for signal and data collection and on-site control, respectively. These devices must be extremely reliable and connect to a safe and reliable network system to maintain an effective communication status. In addition, the system needs network devices with a wide bandwidth

to achieve efficient communication and immediacy when collecting signals for distribution. The Moxa EDS-508-SS-SC industrial Ethernet switch is chosen to handle network communication for this project. With media redundancy, a high MTBF, and the benefit of using single mode fiber, the Moxa EDS-508-SS-SC fulfills the system's performance requirements. In particular, the network system must be highly reliable and free of interference. Moxa's Turbo Ring provides fast media redundancy and the optical fiber makes the communication network immune from EMI/EMC, satisfying the railway's real-time operation demands.



Why Moxa

- Moxa Turbo Ring supports fast media redundancy (recovery within 300 ms) to activate the backup path, helping to ensure the security of the network system.
- In addition to configuring and managing the EDS-508-SS-SC over the network, engineers can also use SNMP-OPC Server to monitor the status of the switch.
- The EDS-508-SS-SC is equipped with signal mode fiber ports and can communicate end-to-end over a long distance.
- The fan-less and low-power design ensures a 260000-hour MTBF for EDS-508 series switches.
- The EDS-508 series provides automatic warning by email and relay output.