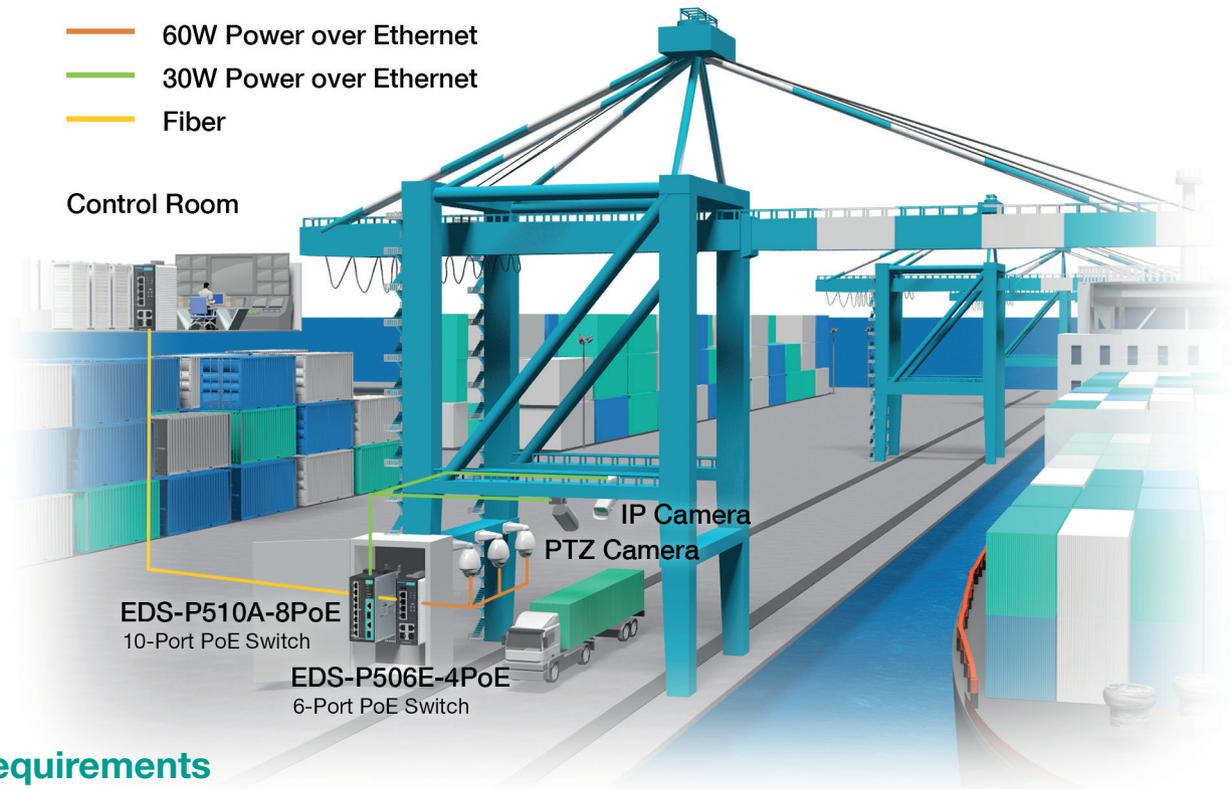
Location: **North America**

# Building Reliable Networks for a Crane OCR System with Smart High-Power PoE Switches

Focus: **Marine**

## Background

A global port operator selected Moxa's PoE switches to provide highly reliable data transmissions for their crane optical character recognition (OCR) system. The crane OCR system is used to track and monitor the loading and unloading of freight containers at port terminals. As the key to automating the cargo handling process, the reliable OCR system improves the efficiency of moving containers from ship to shore and reduces occupational hazards for personnel. In order to realize these benefits, the port system integrator had to overcome critical challenges to building a reliable crane OCR system. These challenges include deploying wiring in an environment with many obstacles, providing power supply for a variety of high-resolution outdoor cameras, ensuring reliable data transmissions, and reducing maintenance efforts.



## Requirements

- Power over Ethernet (PoE) switches to overcome the obstacles that occur when deploying multiple wires
- Power output of 60 W per port to equip high-resolution cameras for accurate container recognition, including PTZ cameras
- Robust switches that can withstand outdoor environments and high-salinity sea air
- High-reliability networks to ensure real-time image data processing and transmission
- Easy-to-use network management software for operators to remotely visualize and administer the crane OCR system network effectively

## ► Moxa's Solution

To automate the container checking process, the crane OCR system is equipped with multiple cameras to capture images of all passing containers, including each container's serial number, from different angles. Some of these cameras are high-resolution PTZ cameras that have above-standard requirements, such as power input of 60 W per port. Moxa provided a complete portfolio of switches to satisfy all camera requirements. Solutions included the EDS-P506E-4PoE managed switch, which provides high power output of up to 60 W per port. If the demand for power is not high, there are other cost-efficient options such as the EDS-P510A-8PoE, which is a managed switch with 8 PoE ports. The managed switches provide high MTBF and protect against extreme environments where outdoor crane systems are often used. Moreover, Moxa PoE managed switches include a built-in "Smart PoE" feature to support remote powered device (PD) management, including PD status monitoring, remote PoE port power cycling, and PoE port power cycle scheduling. These switches not only satisfy all of the system requirements, but also enable smooth operation and reduce overall maintenance costs.

Moreover, reliable data transmission is necessary for sending real-time images back to the port terminal's remote control center for further identification and analysis. Moxa's redundancy technologies, Turbo Ring and Turbo Chain, are specially designed to protect networks against transmission failures. Turbo Ring and Turbo Chain both support millisecond-level fast recovery to ensure that there are no interruptions to image data transmissions. However, there are certain situations when redundancy technologies alone do not suffice. For example, a device could malfunction or lose cable communications. By using Moxa's easy-to-use MXview or MXview ToGo graphical network management software, system administrators can remotely and effectively visualize the crane OCR system network to gain immediate insights and take the necessary steps to resolve network problems.

## ► Why Moxa

- 01 Moxa provided a complete PoE switch portfolio to satisfy all camera requirements
- 02 Support for up to four 60 W PoE ports with a 180 W power budget for multiple cameras
- 03 Moxa's PoE switches provide high EMI/surge protection and a -40 to 75°C operating temperature range, which makes the switches suitable for harsh outdoor environments
- 04 Supports automatic PD failure detection and device rebooting for network recovery without manual inspection or maintenance
- 05 Moxa redundancy technologies, Turbo Ring and Turbo Chain, ensure reliable data transmission
- 06 Moxa MXview and MXview ToGo network management software enables remote visualization of crane OCR system status anytime, anywhere

## Featured Products



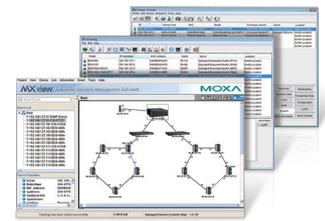
### EDS-P506E-4PoE

4+2G-port Gigabit PoE+ managed Ethernet switches



### EDS-P510A-8PoE

8+2G-port Gigabit PoE+ managed Ethernet switches



### MXstudio

Industrial network management suite



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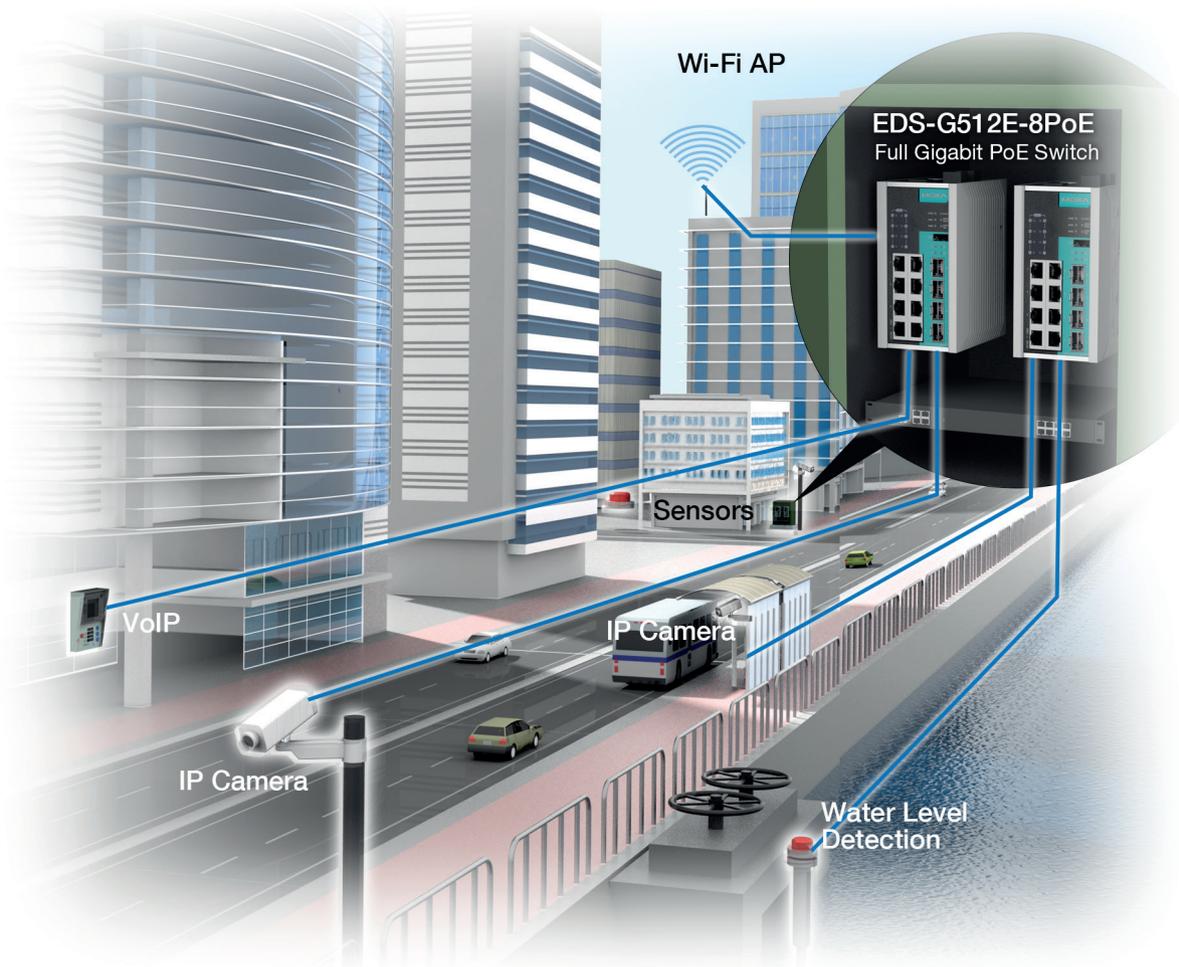


# A City Implements Better Connectivity for Better Opportunities

Focus: Smart City

## Background

An Asian capital planned to utilize ICT (information and communication technology) to construct city infrastructure to keep ahead of global competition with improved public services and business conditions. The infrastructure would need to support 24/7 services, including data collection from sensors, surveillance video from cameras, and urban network access.



## ► Requirements

- Broadband data collection and power-supply
- Uninterrupted network reliability
- Network protection against cyber attacks

## ► Moxa's Solution

To simplify such a varied network infrastructure, 12-port Gigabit EDS-G512E-8PoE switches were used to support mixed data collection and power supply for the variety of field instruments installed inside street facilities.

Built with full Gigabit capabilities, the switches provide up to 8 channels of 36 W output to feed electricity to a large number of PoE powered devices (PDs) including sensors, cameras, and wireless access points, all of which must receive sufficient power to provide full functionality and performance.

With the Smart PoE utility, the EDS-G512E-8PoE switch provides auto-detection of a PD's power class to facilitate plug-and-play deployment and startup. Smart PoE allows for remote monitoring and auto reboot of PDs, simplifying basic troubleshooting and maintenance and cutting down on manual tasks needed.

The EDS-G512E-8PoE switches provide cybersecurity that prevents malicious network access, and also provides extreme robustness against environmental threats, including EMI, surge, noise, shock, and extreme temperature variations.

## ► Why Moxa

- 01 12-port Gigabit and high PoE+ output for bandwidth and power-hungry IP cameras and wireless APs
- 02 Extreme robustness against extreme conditions
- 03 Device-level cybersecurity for access protection

## Featured Products



### EDS-G512E-8PoE

12G-port full gigabit PoE+ managed Ethernet switches



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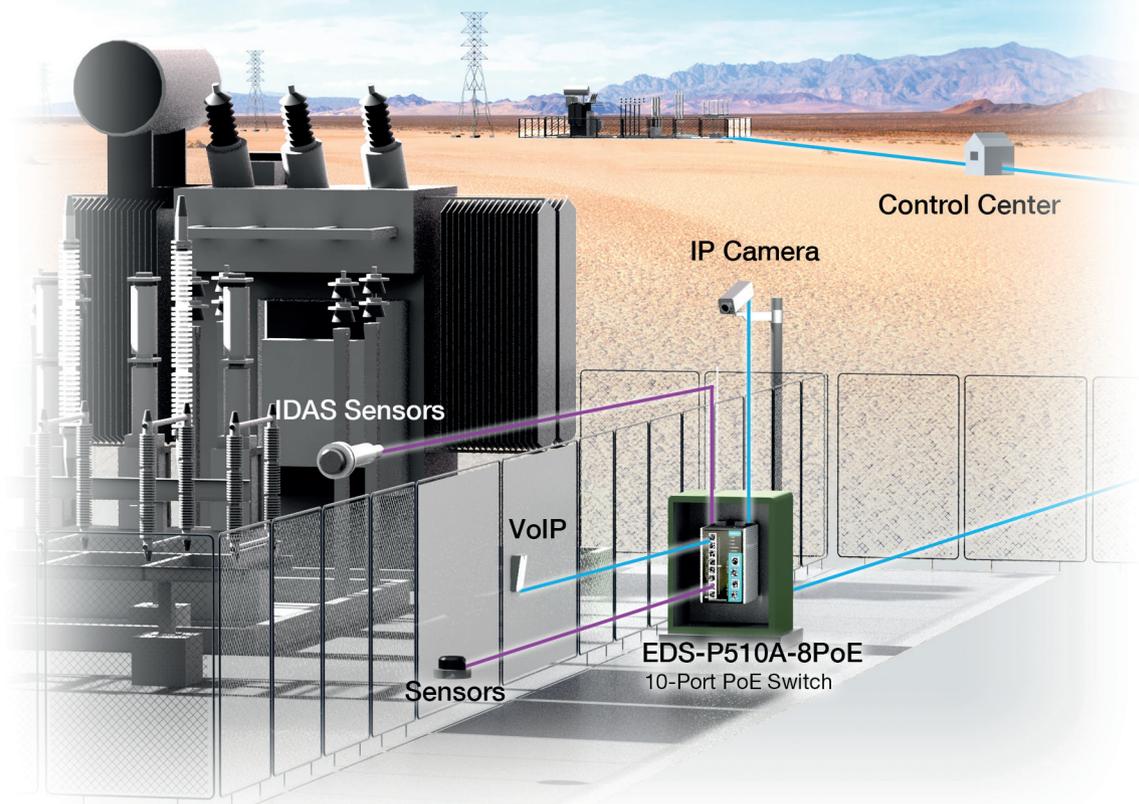
Location: **Middle East**

# A Centralized Security Network for Substation Monitoring

Focus: Smart Grid

## Background

A national power grid located in the desert planned to deploy a centralized security system to connect more than 150 substations and consolidate management of multiple security systems—video surveillance, physical access control, and IP phone systems—within a single room.



## ► Requirements

- 24/7 reliability for continuous operation
- Connectivity and availability even during EMI and surge conditions
- Remote management of operations to reduce costly onsite visits to unmanned locations

## ► Moxa's Solution

Extreme weather was the first challenge for achieving year-round operational reliability. All Moxa's switches used in this network, from the edge to the core, are fanless units designed with 3kV LAN surge protection, extended operating temperature ranges and dual-power inputs to ensure long-lasting system durability and connection reliability.

To build an efficient layer-3 network architecture, the backbone uses hot-swappable 10GbE/48-port full-Gigabit modular switches to construct a high-speed backbone for routing and switching.

To ensure the safety and security of every substation, two types of PoE+ switches—the IKS-6728A-8PoE 24+4G and the EDS-P510A-8PoE 2G+8 switches—were installed at each substation to link access security control and deliver surveillance video back to the control center. Both switches provide 8-port/24-port 36 W outputs to supply the power needed for IP cameras, door access controllers, and VoIP equipment over Ethernet, and are built to withstand harsh desert environments.

To save on manual checks and personnel trips to remote and unmanned substations, these PoE switches provide Smart PoE management, which allows the security center to remotely monitor connected PDs to perform status detection, failure checks, threshold cutoffs, reboots, and active event warnings. All of these features provide improved efficiency for widespread control and monitoring, saving time and related costs.

## ► Why Moxa

- 01 Industrial-grade products that can withstand harsh operating conditions
- 02 High-density high-power PoE-port connectivity
- 03 Remote PoE network management and maintenance

## Featured Products



### ICS-G7848A

48G-port Layer 3 full Gigabit modular managed Ethernet switches



### IKS-6728A-8PoE

24+4G-port Gigabit modular managed PoE+ Ethernet switches



### EDS-P510A-8PoE

8+2G-port Gigabit PoE+ managed Ethernet switches



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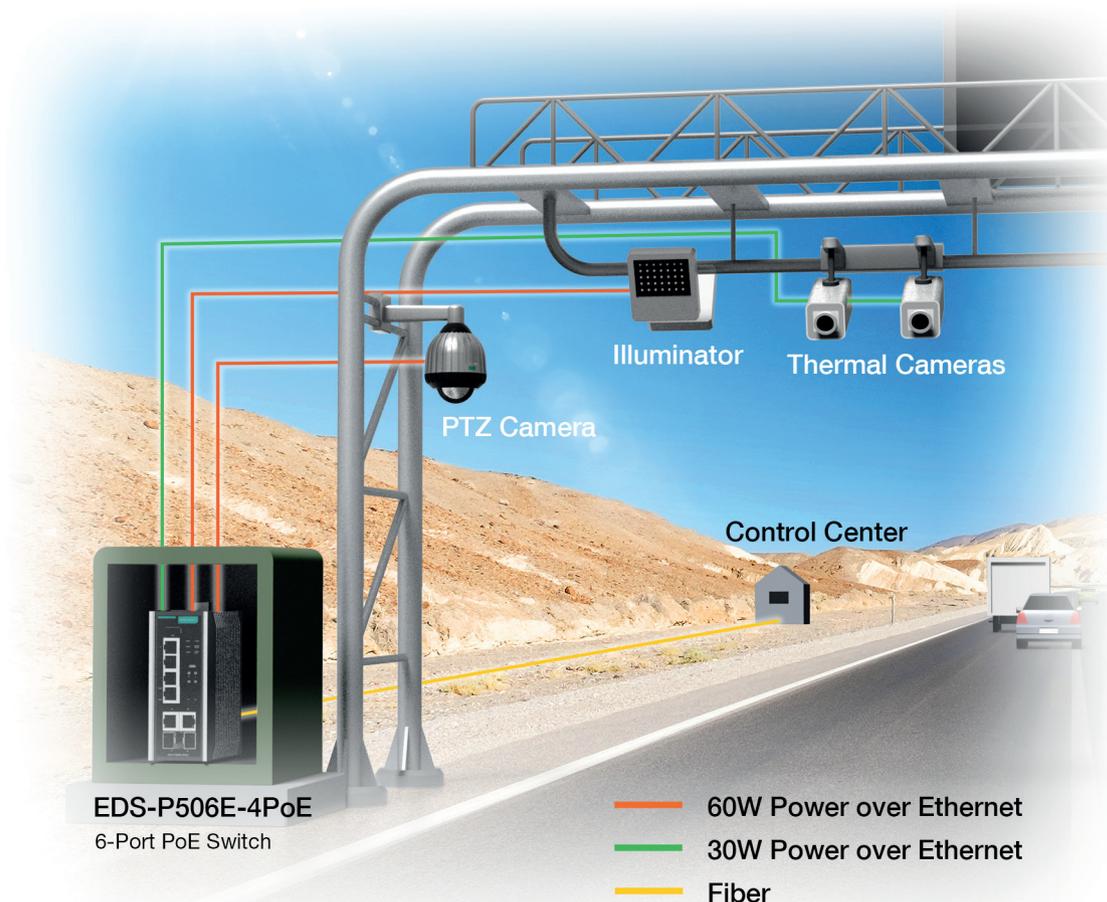


# PTZ Traffic Monitoring and Plate Recognition for Highway Surveillance

Focus: Intelligent Transportation System

## Background

Safety is priceless, but challenging for busy commuter highways. A regional traffic management center (TMC) planned to deploy a surveillance system for vehicle detection and speed measurement. The environment would face a wide variety of environmental conditions, and cameras would have to monitor traffic day and night, and in rain, snow, or shine. The surveillance system would be composed of HD PTZ cameras for panoramic monitoring and IR cameras for plate recognition, both of which needed to be powered by high-power PoE switches to simplify system deployment and future maintenance.



## Requirements

- High-power power sources
- Outdoor network reliability
- Easy system monitoring and maintenance

## ► Moxa's Solution

Moxa's EDS-P506E-4PoE 4FE+2GE switches were used as they can provide up to 60 watts per PoE link, giving the cameras the power they needed for pan, tilt, zoom, and focus control. The EDS-P506E-4PoE was also able to feed power to infrared (IR) cameras and illumination peripherals at the same time with 4 PoE+ ports and a total power capacity of 180 watts.

The compact EDS-P506E-4PoE switches feature two-port Gigabit uplinks, millisecond-level failover redundancy, and dual power inputs, ensuring constant and robust connections for traffic surveillance monitoring. They were also used to secure the surveillance network by providing device-level cybersecurity to defend against both internal and external threats.

PoE network deployment was simplified through the built-in Smart PoE functionality, which helped automatically identify the different types of PoE powered devices (PDs) and performed configuration and connection with just a few clicks. It was also used for failure checks and auto reboots to ensure that all the connected cameras and illuminators were working properly. If a reboot of a PD couldn't solve the problem, engineers could now check on the problem through the web console or viewing the PoE link status shown by the LED indicators on the switch's front panel.

## ► Why Moxa

- 01 High PoE output up to 60 watts for power-hungry cameras and peripherals
- 02 Smart PoE for easy configuration, monitoring, and maintenance of connected PDs
- 03 Device-level cybersecurity to protect the network

## Featured Products



### EDS-P506E-4PoE

4+2G-port Gigabit PoE+ managed Ethernet switches



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