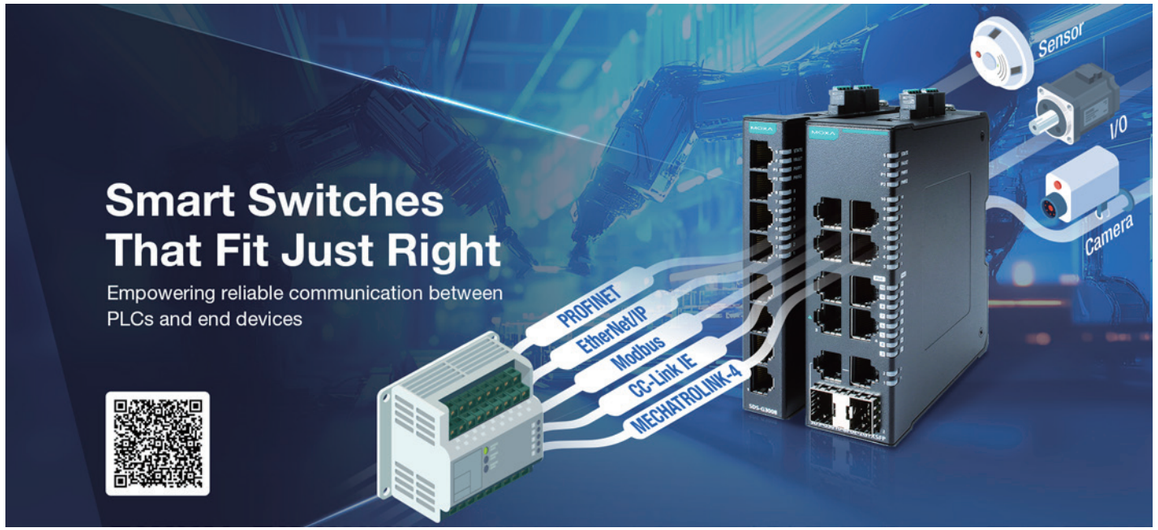

Your Trusted Partner in Automation

Moxa is a leading provider of edge connectivity, industrial computing, and network infrastructure solutions for enabling connectivity for the Industrial Internet of Things (IIoT). With over 35 years of industry experience, Moxa has connected more than 111 million devices worldwide and has a distribution and service network that reaches customers in more than 91 countries. Moxa delivers lasting business value by empowering industries with reliable networks and sincere service. Information about Moxa's solutions is available at www.moxa.com.

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Realizing Futureproof Industrial Networks


Network and Security Management


Secure Routers


LAN Firewalls


Next-generation Managed Switches


Unmanaged Switches


Industrial Wi-Fi® 6 & 5G

www.moxa.com

Building Tomorrow's Connectivity Today

Unlock growth opportunities and elevate your digital operations through the optimization of your IT/OT converged network infrastructure. This investment ensures uninterrupted connectivity and speeds up the integration of emerging technologies such as AI, IIoT, TSN, and 5G—bridging the gap between the digital and physical domains.

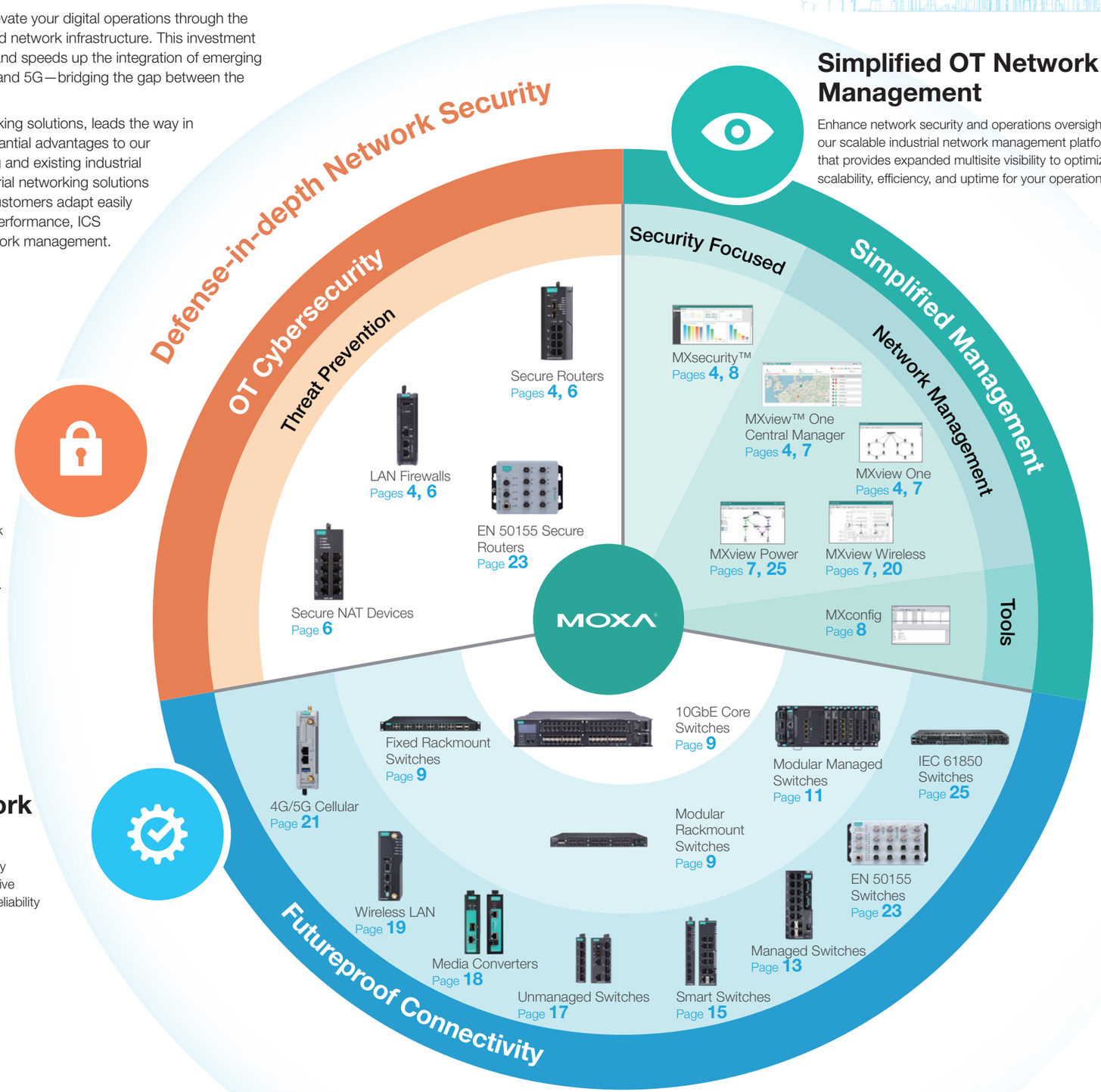
Moxa, a pioneer in industrial networking solutions, leads the way in IT/OT convergence, providing substantial advantages to our partners and customers in emerging and existing industrial automation applications. Our industrial networking solutions provide proven reliability and help customers adapt easily to trends and changes in scalable performance, ICS tailored security, and simplified network management.

Defense-in-depth Network Security

Build strong network security at every level, including real-time visibility, network segmentation, and secure infrastructure, along with proactive threat detection, analysis, and intelligent threat responses.

Futureproof Network Infrastructure

Transform your network's performance by implementing smart designs and innovative flexibility to meet speed, versatility, and reliability requirements.



Simplified OT Network Management

Enhance network security and operations oversight with our scalable industrial network management platform that provides expanded multisite visibility to optimize scalability, efficiency, and uptime for your operations.

▸ HIGHLIGHTS

Easy Security Upgrades

The EDF-G1002-BP LAN firewall simplifies security updates for critical OT assets and internal LAN protection. The bump-in-the-wire installation offers firewall, IPS, and DPI protections*, as well as real-time visibility and security updates via the MXsecurity platform.

See pages 4-6

On-demand Network Flexibility

Meet the MDS-G4000 Family modular switch platform with up to 28 1GbE ports and a flexible mix-and-match design that supports 10GbE, 1GbE, and FE—built to keep pace with evolving connectivity demands. Choose from a variety of Ethernet modules—including RJ45, SFP, PoE, and PRP/HSR**—along with multiple power options (24/48 VDC or 110/220 VAC/VDC) to easily adapt to diverse installation scenarios.

See page 11

One Click for Smart Integration

With our smart switches, network connectivity and system integration have never been easier. The SDS-3000/G3000 Series smart switches offer 6 to 16 port options for 1GbE/FE/PoE/fiber, allowing field engineers to easily set up industrial protocols for system integration with a simple click on a single-page dashboard.

See page 15

3-in-1 Industrial Wi-Fi 6 Devices

Offering reliable Wi-Fi 6 features, the 3-in-1 industrial wireless AP/bridge/client AWK™ 3262A/4262A Series ensure Gigabit speeds, low latency, and minimal congestion for high-density wireless connectivity. Both models support PoE for flexible and easy deployment.

See page 19

*IPS stands for intrusion protection system, DPI for deep packet inspection.
**The MDS-G4012/G4020/G4028 Series support PRP/HSR in MX-NOS™ v5.0 (Q3, 2025).

Build Up Manageable Secure Network Infrastructure

As industries and companies embrace remote and distributed operations, the threat of cyberattacks is growing. Industrial control system (ICS) networks are often the target of such attacks because of their low tolerance for downtime. Therefore, strengthening network security infrastructure is of utmost importance to safeguard against cyberthreats.

Moxa offers comprehensive IT/OT integrated network security solutions referencing IEC 62443-4-2 Security Level 2 standards, bolstering OT-specific network security with three layers of defense-in-depth protection.

Identify Network Statuses

Moxa helps customers detect and respond to cyberthreats faster by providing centralized visibility of OT networks and security statuses.

Protect Your Networks

Moxa uses a defense-in-depth architecture to protect network infrastructure through secure segmentation and threat defense.

Start by establishing secure segments using VLANs, VPNs, firewalls, access control, DPI, and security policies for security control. Then, enhance threat defenses by using IDS/IPS devices and virtual patching.

Select Secure Devices

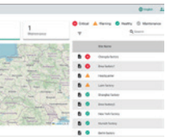
Featuring embedded security features and IEC 62443-4-2 Security Level 2 certification*, Moxa's industrial Ethernet products prioritize security features during the design and development phases to set a new benchmark for industrial network reliability, including for:

- Industrial Ethernet switches
- Industrial device servers
- Industrial protocol gateways
- Modular remote I/Os

*For specific products only.

Moxa Security Advisories

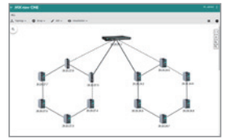
Moxa's Product Security Incident Response Team (PSIRT) takes a proactive approach to protect our products from security vulnerabilities and helps our customers better manage security risks. Stay informed by scanning this QR code to subscribe to our Security Advisories and receive notifications about product vulnerabilities and security updates.



MXview One Central Manager

Centralized Platform for MXview One Sites

- Manage MXview One sites, groups, accounts, and licenses
- Monitor and access sites easily with an intuitive dashboard
- Customize event severities, notifications, and reports



MXview One

Industrial Network Management

- Full visibility of real-time network statuses, traffic, and activities
- Security View for viewing the security level of network devices
- Scalable add-on modules for vertical market applications, including MXview Wireless, MXview Power
- MXview Security tailored add-on module to visualize industrial network security

MXsecurity

Network Security Management

- Centralized network security and unified policy management
- Full visibility of real-time network security activities and threat analysis
- Unified mass deployment of security configurations and virtual patch updates
- Aggregate security logs based on configurable security policies to issue real-time alerts

EDR-G9010/8010 Series

Industrial Multiport Secure Routers

- IEC 62443-4-2 Security Level 2 certified (EDR-G9010 Series)
- All-in-one firewall/NAT/VPN/router/switch for network segmentation, data encryption, and security control
- Access control and traffic filtering with OT protocol deep packet inspection (DPI)
- IPS/IDS functions for defense against malicious activity
- Supports MXsecurity for security updates and real-time monitoring

EDR-G9004 Series

Industrial Secure Routers

- All-in-one firewall/NAT/VPN/router
- Gen3 LAN Bypass for system fault tolerance
- Dual WAN redundancy
- IPS/IDS functions for defense against malicious activity
- Supports MXsecurity for security updates and real-time monitoring

EDF-G1002-BP Series

Industrial LAN Firewall

- Stateful firewall for critical asset protection
- OT-centric DPI to prevent data-driven attacks
- IPS/IDS functions for defense against malicious activity
- Gen3 LAN Bypass for system fault tolerance
- Bump-in-the-wire installation without impacting networks

EDS-4000/G4000 Series

8/9/12/14-port Managed Switches

- IEC 62443-4-2 Security Level 2 certified
- Component-level security for an extra layer of network protection
- Supports MXview One to visualize device security level and network status

NPort™ 6000-G2 Series

1/2/4/8/16/32-port* Secure Terminal Servers

- Compliant with IEC 62443-4-2 Security Level 2 requirements
- Supports Serial Port Monitoring in MXview One for full visibility of the Ethernet and serial network status

*4/8/16/32-port models will be available in Dec, 2025.

ioThinx 4510 Series

Modular Remote I/O

- Set up devices easily with the Security Hardening Guide
- Secure device configurations with AES-128 encryption
- Protect your data in SNMPv3 with the SHA-256 cryptographic hash function and AES-128 encryption

Customize Defense-in-depth

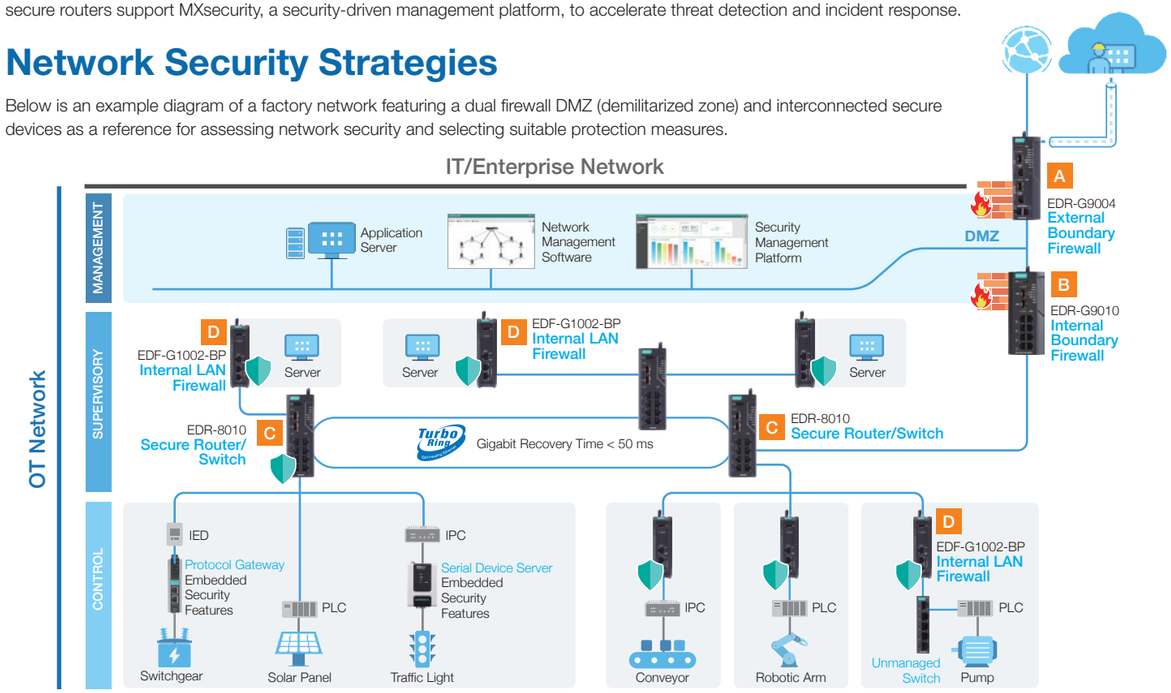
Cybersecurity for Your IIoT Network

OT cyberthreats are evolving quickly as OT environments embrace more interconnectivity across IT, OT, and IIoT assets. Traditional zones and conduits may no longer be enough to protect against emerging malware or cyberattacks. Industries like manufacturing, energy, utilities, and transportation, require more advanced and highly customized solutions to safeguard staff, critical operations, and infrastructure.

Moxa offers a range of industrial secure routers that integrate firewall, VPN, NAT, and IPS functions to provide defense-in-depth cybersecurity for OT networks. The all-in-one protection mechanisms can be deployed at various control points to protect operations and minimize potential downtime. Some router/switch combo models provide an extra layer of security while also offering switch connectivity for optimal cost-effectiveness. Moreover, all our secure routers support MXsecurity, a security-driven management platform, to accelerate threat detection and incident response.

Network Security Strategies

Below is an example diagram of a factory network featuring a dual firewall DMZ (demilitarized zone) and interconnected secure devices as a reference for assessing network security and selecting suitable protection measures.



	EDR-G9010	EDR-G9004	EDR-8010	EDF-G1002-BP	NAT-102	NAT-108
Use Cases	• Configurable multiport connectivity and security • Security between WAN and LAN	• Dual WAN redundancy • Security between WAN and LAN	• Configurable multiport connectivity and security	• Protection between devices within a LAN	• Protection within a machine network	• IP translation within a machine network
Ports for DMZ/ WAN	User-configurable	1/2	User-configurable	–	–	–
Ethernet Ports	8 1GbE + 2 2.5GbE SFP	8 1GbE + 2 2.5GbE Combo	2 1GbE SFP + 8 FE	2 1GbE	2 FE	8 FE
Redundancy Protocols	VRRP, Turbo Ring™, Turbo Chain™, RSTP/STP	VRRP	VRRP, Turbo Ring, Turbo Chain, RSTP/STP	–	–	–
Throughput	Up to 2 Gbps		Up to 500 Mbps		Up to 100 Mbps	
Firewall	DDoS, Ethernet protocols, ICMP, IP address, MAC address, Ports				IP address, MAC address	
Deep Packet Inspection	DNP3, EtherNet/IP, IEC 60870-5-104, IEC 61850 MMS, Modbus TCP, Modbus UDP, Omron FINS, Siemens S7 Comm., Siemens S7 Comm. Plus, OPC UA, MELSEC communication protocol				–	–
VPN	Up to 250 IPsec VPN tunnels		Up to 50 IPsec VPN tunnels	–	–	–
Certifications	IEC 62443-4-2 SL2*, IEEE 1613, IEC 61850-3 Ed. 2.0, DNV, ATEX, CID2, EN 50121-4, NEMA TS2			NEMA TS2, EN 50121-4, CID2, ATEX, DNV	ATEX, CID2	–
Software Management	MXview One, MXsecurity				MXview One	MXview One

*Only available for the EDR-G9010 Series.

Security Requirements | *Security Roles and Moxa Solutions*

Scenario A

- To protect the factory network, the external firewall needs to be deployed at the IT/OT boundary and segment a DMZ area to allow secure information exchange

Role: External Boundary Firewall

EDR-G9004 Series

4-port Gigabit Secure Router/Firewall/VPN

- Supports dual WAN firewall with a data rate of up to 2 Gbps
- Supports VPN for secure remote access
- Supports MXsecurity to identify cyberthreats, ideal for securing the boundary between public and private networks
- Tailored size and functionality to prevent unnecessary overhead

Scenario B

- The internal boundary firewall should isolate the DMZ from internal LAN traffic to prevent breaches affecting internal operations

Role: Internal Boundary Firewall

EDR-G9010 Series

10-port Full Gigabit Secure Router/Firewall/VPN/Switch

- 10-port 1GbE switch performance
- Built-in firewall for LAN segments, access control, and data protection
- Supports OT-centric DPI to prevent data-driven attacks
- Supports IPS and virtual patching for vulnerable system protection
- Supports MXsecurity for security updates and real-time threat monitoring

Scenario C

- Factory floor needs micro-segmentation for granular security
- Protective measures to guard vulnerable systems

Role: Secure Router/Switch

EDR-8010 Series

8-port FE + 2-port Gigabit Secure Router/Firewall/VPN/Switch

- All-in-one functionality for multi-layered defense
- Supports OT-centric DPI for traffic filtering
- Supports IPS and virtual patching for vulnerable system protection
- Cost-efficient protection with multiport connectivity
- Supports MXsecurity for IPS updates and real-time threat monitoring

Scenario D

- Ability to detect malware and threats within the internal zone for growing data traffic from field systems
- Minimal impact on regular network operations
- Seamless upgrading of the existing network with security features

Role: Internal LAN Firewall

EDF-G1002-BP Series

2-port Gigabit LAN Firewall

- Bump-in-the-wire installation enables seamless security upgrades for legacy OT assets
- Stateful firewall and IPS features for critical system protection
- OT-centric DPI to prevent data-driven attacks
- Gen3 LAN Bypass to prevent single points of failure
- Supports MXsecurity for monitoring and managing network security

Simple and Secure

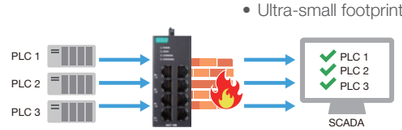
Scenario: Machine Network Defense With IP Twins Mapping

The compact NAT-108 Series fits perfectly inside most machines and provides IP translation to protect your machines against unauthorized access and streamline SCADA communications. Meanwhile, the market-leading IP Twins Mapping feature to remap multiple identical LAN IP addresses* prevents IP conflicts and boosts network efficiency.

NAT-108 Series

Industrial NAT Device

- OT-friendly NAT functionality
- Automatic network access control
- Suitable for multi-line factories
- Ultra-small footprint



*IP Twins Mapping supports up to 3 devices with an identical LAN IP.

Expand Visibility and Intelligence
to Ensure Network Availability

Moxa's scalable industrial network management and security management suites visualize real-time operations to boost network efficiency and availability throughout all stages of network deployment, management, and maintenance.

- **MXview One**

Network management software to visualize network devices and topology changes with Rogue Device Detection to identify unknown connected devices. Additional features such as product warranty tracking and bulk firmware management further streamline inventory management and boost the efficiency of your operations.

- **MXview One Central Manager**

Central management platform to simplify monitoring for large-scale multisite MXview One deployments.

- **MXsecurity**

Security management platform designed to identify cyberthreats and prevent security misconfiguration to bolster network defenses.

Optimize Industrial Network Management Throughout the Entire Network Life Cycle

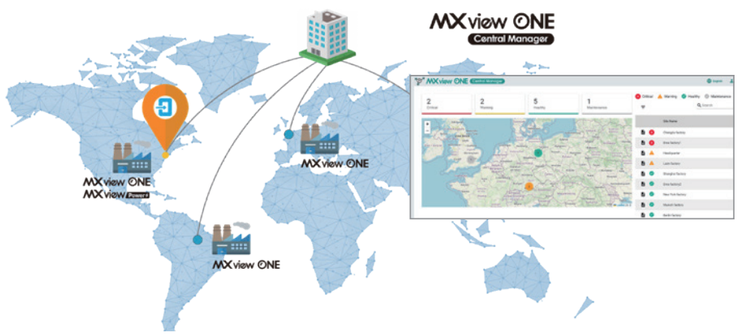
	Deployment	Operation	Maintenance	Troubleshooting
▶ Challenges	Deploying factory-default devices one by one is both time-consuming and prone to errors.	Ensuring network resilience and availability against evolving cyberthreats and unplanned downtime is resource-intensive.	Network maintenance takes up a lot of resources and involves repetitive and error-prone manual tasks.	Unstructured troubleshooting often leads to inefficiencies and errors, wasting time and resources.
▶ Why Moxa	**Faster Mass Deployment** • **MXconfig** speeds up device deployment through group configuration and duplication • **MXsecurity** allows users to configure and apply bulk firewall policies for secure devices at scale	**Smart Visualization** • **MXview One** visualizes the network topology, offers real-time email alerts, and enhances security by detecting default passwords and disabling unused ports and unsecured links • **MXsecurity** offers enhanced visibility by showing real-time network activity and notifying users when detecting cyberthreats	**Efficiency and Security** • **MXview One** supports mandatory regular password changes, shows the firmware and patch update status, and features SCADA-like buttons to easily run batch configurations • **MXsecurity** supports scheduled batch updates for policy rules and IPS patterns	**Quick Diagnostics** • **MXview One** supports event searching - **MXview Wireless** can retrieve the roaming history of Wi-Fi clients to assist troubleshooting - **MXview Power** provides GOOSE packet path tracking and step-by-step resolution instructions within GOOSE events for efficient troubleshooting

▶ **Industrial Network Management Software**

MXview One Central Manager

Centralized Platform for Remote MXview One Site Management and Monitoring

- Centralized management of remote sites, groups, accounts, and licenses
- Intuitive dashboard to easily monitor the status of MXview One sites
- Remote access to specific MXview One sites for troubleshooting
- Customizable event severity and notifications
- User-defined schedules to automatically generate reports



MXview One

Industrial Network Management Software

- Automatic device and topology visualization
- Real-time dashboard with a complete network summary
- Enable single-pane monitoring through a RESTful API, web widgets, and syslog support
- Send device information to SCADA systems via OPC UA
- Run CLI scripts and configure customizable automation buttons for easy bulk configuration

Management Add-ons

MXview Wireless

- Dynamic topology view for Wi-Fi networks
- Client roaming playback for troubleshooting
- Device dashboards and performance charts for wireless devices

MXview Power

- Automatic concise visibility of PRP/HSR dual LAN topologies
- Automatically scans and detects unauthorized IEDs for preemptive threat management
- Real-time visibility of GOOSE control messages for quick troubleshooting

MXview Security

- Centrally manage and deploy firewall policies, IPS patterns, and cybersecurity packages
- Cybersecurity event monitoring and customizable notifications
- At-a-glance cybersecurity event dashboard

MXsecurity

Industrial Network Security Management Software

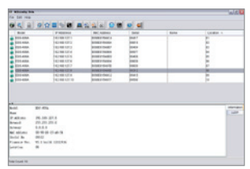
- At-a-glance dashboard showing cyberthreat events and their location
- Centralize security settings and policies to increase efficiency and minimize configuration errors
- Automatic IPS pattern upgrades from the Moxa server*
- Real-time alerts with email notifications

*This feature requires a separate IPS license.

MXconfig

Industrial Network Configuration Tool

- Bulk configuration to deploy devices ten times faster than one-by-one deployment
- Link sequence detection eliminates manual configuration errors
- Security Wizard for device security setup and updates



Embrace a Scalable Backbone That Grows With Your Application

To power the digital transformation driving IT/OT convergence, Moxa's industrial rackmount switches create a high-speed backbone that surpasses 10GbE/GbE to ensure seamless and scalable interconnectivity. With flexible port trunking and 24- to 64-port modules supporting copper, fiber, and PoE interfaces, these switches ensure adaptive, reliable, and secure data aggregation from edge to core in demanding environments.

Expand Your Backbone Scalability

MRX-Q4064/G4064 Series

Layer 3 64-port 10GbE/2.5GbE/1GbE Modular Industrial Rackmount Switches

MRX-Q4064/G4064 Series modular industrial switches are designed to expand backbone bandwidth and availability, which are essential for IT/OT converged applications. With a 16-port 10GbE uplink capacity, MRX-Q4064 switches allow strategic aggregation of multiple 10GbE links to expand backbone bandwidth up to 80 Gbps. Featuring multiple hot-swappable components—media modules, power supplies, and fans—the rugged MRX Series switches deliver industrial-grade reliability, ensuring uninterrupted network communication.

High Performance

- Up to 16 10GbE uplinks
- Up to 48 2.5GbE ports for data aggregation
- Supports HAST* trunking for enhanced bandwidth and availability
- Supports hardware-based IEEE 1588 PTPv2 for high-precision time synchronization

Non-stop Reliability

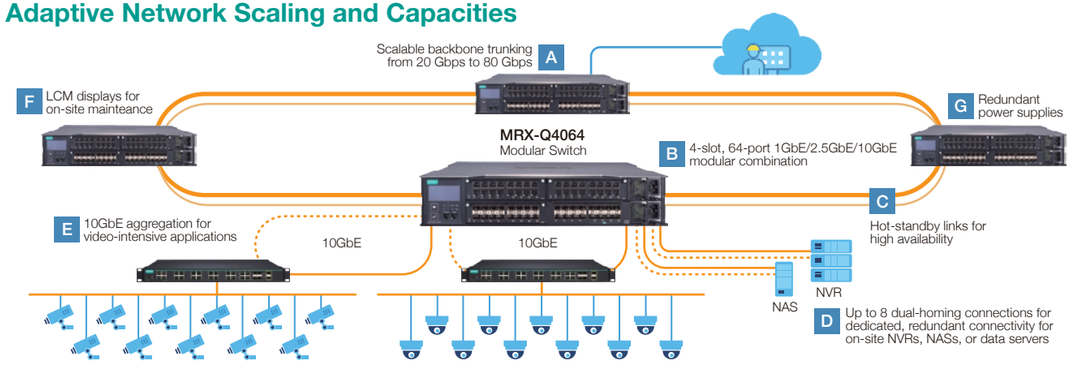
- Supports millisecond-level failover network redundancy
- Supports ITC* to prevent overheating and ensure stable operation
- 6+2 redundant fan design ensures active heat dissipation for non-stop operation

Easy Maintenance

- Interactive LCM* for easy on-site maintenance and troubleshooting
- Supports out-of-band access for remote diagnostics and troubleshooting
- Supports MXview One for easy device monitoring and management

*HAST stands for High-availability Static Trunk, ITC for Intelligent Temperature Control, and LCM for Liquid Crystal (Display) Module.

Adaptive Network Scaling and Capacities



	MRX-Q4064-L3-16XGS/ MRX-G4064-L3-8XGS	ICS-G7852A/ ICS-G7850A	ICS-G7828A/ ICS-G7826A	ICS-G7848A	RKS-G4028-L3	IKS-G6824A
10GbE Ports	16/8	4/2	4/2	–	–	–
2.5GbE Ports	Up to 48/–	–	–	–	–	–
10/100/1000 BaseT(X) or 100/1000 BaseSFP Ports	Up to 48/56 (1000 BaseT(X) or 1000 BaseSFP)	Up to 48	24	Up to 48	Up to 28	24
PoE Ports	–	Up to 48	–	Up to 48	Up to 24	–
Operating Temperature	-10 to 60°C	-10 to 60°C	-40 to 75°C	-10 to 60°C	-40 to 75°C	-40 to 75°C

Industrial Rackmount Switches

10GbE Backbone Convergence

Moxa's industrial rackmount switches offer 10GbE backbone convergence and diverse fiber/copper/PoE scalability to simplify your edge-to-core network infrastructure.

- 4- to 16-port 10GbE options
- Up to 48 PoE ports
- Supports 1GbE/2.5GbE/10GbE redundancy under 50 milliseconds
- Supports Turbo Chain* to create redundant sub-chain expansion without disruption

*Available for the ICS/RKS/IKS Series only.
**Available for the RKS-G4028 Series only.

Robust Reliability

If your core network can't withstand harsh conditions such as extreme temperatures, power surges, or EMI noise, look to Moxa's industrial rackmount switches for robust durability and reliable performance.

- Industrial-grade EMI/EMC shielding
- Fanless design*
- Extended operating temperature ranges
- Dual isolated power supplies
- Diverse industry certifications

IACS-level Device Security

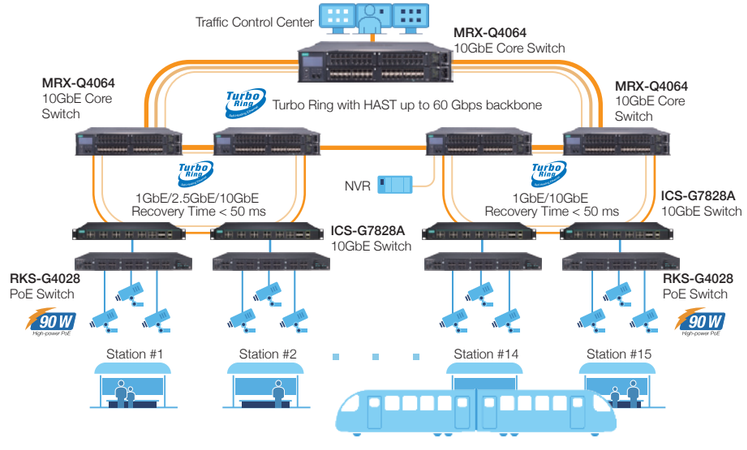
All our industrial rackmount switches feature IACS-compliant (Industrial Automation Control System) security features that are available through firmware updates.

- IEC 62443-4-2 Security Level 2 Certified**
- Device-based security for data protection and access control
- Supports MXview One for device security profiling and status monitoring

Use Case

10GbE Backbone for Tram Station Surveillance

An urban tram system required a reliable network backbone across 15 stations to ensure operational safety and security.



Network Requirements

- High-capacity data aggregation and long-distance transmissions
- Network resilience for operational safety and security
- MXview One support for real-time visibility of network devices, topology, and activity

Why Moxa

- MRX-Q4064 switches facilitate up to 8 10GbE trunking ports for remote station data backhaul
- RKS-G4028 switches deliver up to 24 PoE++ links to PoE powered devices (PDs) for reduced cabling and Smart PoE efficiency
- Supports Turbo Ring and Turbo Chain for 1GbE/2.5GbE/10GbE recovery time under 50 ms for up to 250 switches

	ICS-G7752A/ ICS-G7750A	ICS-G7528A/ ICS-G7526A	ICS-G7748A	RKS-G4028	IKS-G6524A	IKS-6728A/ IKS-6726A
10GbE Ports	4/2	4/2	–	–	–	–
10/100/1000 BaseT(X) or 100/1000 BaseSFP Ports	Up to 48	24	Up to 48	Up to 28	24	4/2
FE Ports	–	–	–	–	–	Up to 24
PoE Ports	Up to 48	–	Up to 48	Up to 24	–	Up to 24*
Operating Temperature	-10 to 60°C	-40 to 75°C	-10 to 60°C	-40 to 75°C		

*For IKS-6728A only.

Turn Connectivity Into Operational Advantages

Industrial networks need to keep up with increasing complexity, speed, and scale to meet changing demands and add value to provide a competitive edge.

The MDS-G4000 family of modular switches is designed to help turn every challenge into an opportunity, thanks to its wide variety of Ethernet and power modules you can freely mix and match as needed. The MDS-G4000-4XGS Series features 10GbE ports to facilitate large-scale IT/OT convergence.

Standards-based security and industry-certified reliability are built into all modules to support sustainable operations. Meanwhile, the hot-swappable modules can be replaced without causing any interruptions or downtime.

With a variety of power, interface, and installation options, the MDS-G4000 Family lets you customize your network to meet your needs for today and tomorrow.

MDS-G4000 Family

Industrial Layer 2/3 10GbE/1GbE/FE Modular Managed Switches

Network Scalability

- Layer 3 routing interconnects multiple LAN segments
- Layer 2 switching supports Turbo Chain for uninterrupted and unlimited sub-ring expansions

Connection Flexibility

- 10GbE/1GbE/FE port speed options
- Six module options provide connection flexibility, including 4-port RJ45, SFP, PoE, and 2-port PRP/HSR modules.*
- Up to 6 module slots for 12/20/28 ports

Availability

- Supports VRRP for routing redundancy
- Supports Turbo Ring and Turbo Chain redundancy for Gigabit recovery times under 50 ms and PRP/HSR* for seamless failover
- Dual isolated redundant power units

Security

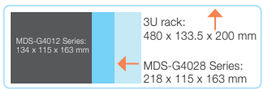
- Role-based access control
- MAC-based IP assignment

Continuity

- Hot-swappable modules for uninterrupted operations
- Power outage protection during firmware upgrades

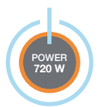
Reliability

- Die-cast design with superior vibration and shock resistance
- Diverse industry certifications



Installation Adaptability

- Ultra-compact to fit in most cabinets
- Supports DIN-rail, rackmount**, and wall-mounting options



Smart PoE Delivery

- Up to 24 PoE links with 36 W output per port and a 720 W budget
- Built-in Smart PoE firmware for easy PD links, diagnostics, and monitoring

OT-friendly Usability

- HTML5 dashboard for device summary, smart search, and configuration
- Supports MXview One for simplified network management

*The MDS-G4012/G4020/G4028 Series switches support PRP/HSR in MX-NOS v5.0 (Q3, 2025).

**Rack-mounting is available with an optional installation kit.

10GbE IT/OT Convergence for Mining Automation

Underground mines rely on high-speed and robust network infrastructure to support real-time control and monitoring systems to ensure overall operational continuity, safety, and productivity. MDS-G4000 modular switches provide futureproof performance, industry-proven reliability, and extensive flexibility to accommodate large, complex, and mission-critical mining network communications.

Network Requirements

- Simultaneously support multiple applications
- Non-stop communications to ensure operational safety, continuity, and productivity
- Fast responses to critical events
- Maximized network flexibility to support additional network services
- Hardened reliability and security to minimize downtime and maintenance

Why the MDS-G4000 Family

Futureproof Scalability

- Build 10GbE network backbones to aggregate massive data flows from underground subsystems
- Interchangeable 1GbE/FE modules with RJ45/SFP/PoE interface options to connect different devices

Constant Availability

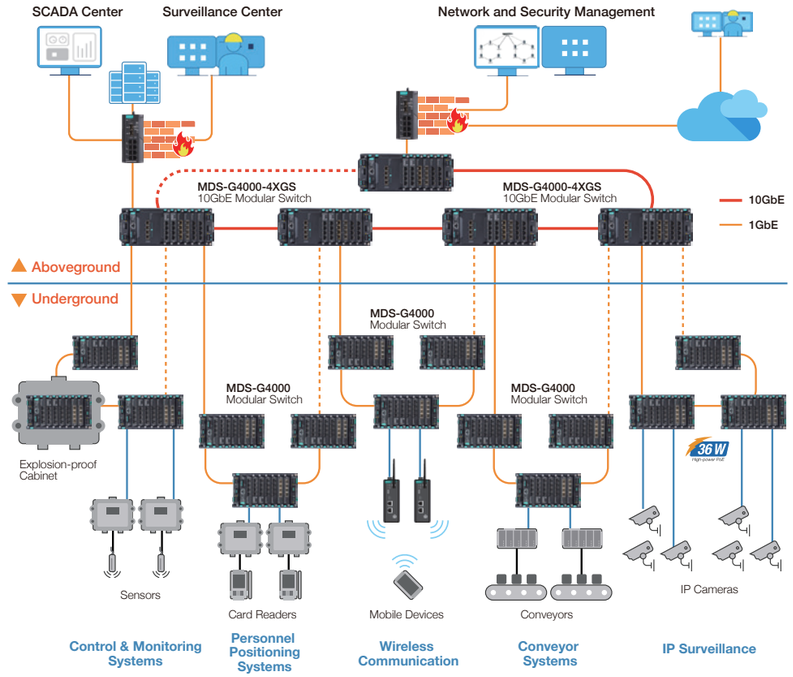
- Failover with millisecond-fast redundancy for maximum uptime
- Hot-swappable modules for maintenance without downtime
- Built-in security against unauthorized access

Robust Reliability

- Die-cast design with superior vibration and shock resistance
- CID2 and ATEX Zone 2 certified for use in hazardous locations**

Simplified Operation

- HTML5 dashboard for enhanced network visibility and control
- Supports MXview One network management for real-time alerts and troubleshooting






	MDS-G4000	MDS-G4000-L3	MDS-G4000-4XGS	MDS-G4000-L3-4XGS
Layer	Layer 2	Layer 3	Layer 2	Layer 3
No. of Ports	12, 20, 28	12, 20, 28	12, 20, 28	12, 20, 28
10GbE Ports	–	–	4	4
1GbE Ports	Up to 28	Up to 28	Up to 24	Up to 24
Fiber Ports	Up to 24	Up to 24	Up to 28	Up to 28
Fiber Type	SFP			
Industrial Certifications	CID2, ATEX Zone 2, IEC 61850-3, IEEE 1613, EN 50121-4, NEMA TS2		IEC 61850-3, IEEE 1613, EN 50121-4, NEMA TS2	

**Available for the MDS-G4000/MDS-G4000-L3 Series only.

Built-in Scalability to Strengthen Network Resilience

Industrial networks need to evolve to support resilient operations. When integrating new network components, even small changes can run into unexpected challenges, such as limited installation space.

The EDS-4000/G4000 Series industrial managed Ethernet switches offer 68 interchangeable models with a unified form factor for unprecedented scalability and versatile connectivity to effortlessly expand your network and meet changing demands. Adding more bandwidth or more PoE power is now easier than ever. More importantly, the EDS-4000/G4000 switches are certified for the latest security and industry standards to ensure robust network resilience.

EDS-4000/G4000 Series

Industrial Managed Ethernet Switches

- 68 models with 8 to 14 ports
- 2.5GbE/1GbE/FE/PoE port options
- Supports Turbo Ring and Turbo Chain millisecond-level failover redundancy
- IEC 62443-4-2 Security Level 2 certified
- Diverse industry certifications
- Compact size of 55 x 140 x 122.5 mm

OT Security Benchmark

With a portfolio of 68 IEC 62443-4-2 Security Level 2 certified models, the EDS-4000/G4000 Series switches are designed to help build secure, scalable infrastructure that ensures operational security.

Smart Usability

The intuitive user interface streamlines and simplifies network management. LED indicators on both sides help identify the device status while the unique rotatable, replaceable power module helps speed up installation and maintenance.

Industry-proven Reliability

Network reliability remains a top priority for industries that can't afford unplanned downtime. The EDS-4000/G4000 switches are certified for multiple industry standards to ensure reliability in demanding industrial applications.

	EDS-4008	EDS-4009	EDS-4012	EDS-4014	EDS-G4008	EDS-G4012	EDS-G4014
2.5GbE Ports	–	–	–	2	–	Up to 4	6
1GbE Ports	Up to 4	–	4	4	8	Up to 12	8
FE Ports	Up to 8	9	8	8	–	–	–
90-W PoE Ports	Up to 4	–	Up to 8	–	–	Up to 8	–
Operating Temp.	-10 to 60°C, -40 to 75°C (-T models)						
Power Input	-LV models: 12/24/48 VDC, -HV models: 110/220 VDC/VAC						
Industrial Certifications	IEC 62443-4-2 Security Level 2, IEC 61850-3, IEEE 1613 (Class 1), DNV*, ABS*, NK*, LR*, EN 50121-4, NEMA TS2 ATEX**, CID2**, IECEx**						

*Only available for -LV and PoE models. **Only available for -LV models.

TSN-enabled Networks

Moxa provides TSN-enabled industrial switches that prioritize network traffic and deliver time-critical data to the right place at the right time for truly real-time IIoT applications.

TSN-G5004/G5008 Series

Industrial Managed TSN Switches

- Compact design to fit into confined spaces
- IP40-rated metal housing
- Web-based GUI for easy device configuration and management
- Obtain the World's First TSN Component Certification from Avnu Alliance®

EDS-400A/500A/500E Series

Optimized for Reliability and Productivity

Moxa's rugged DIN-rail managed switches feature robust durability and failover redundancy to enable uninterrupted connectivity required for industrial applications.

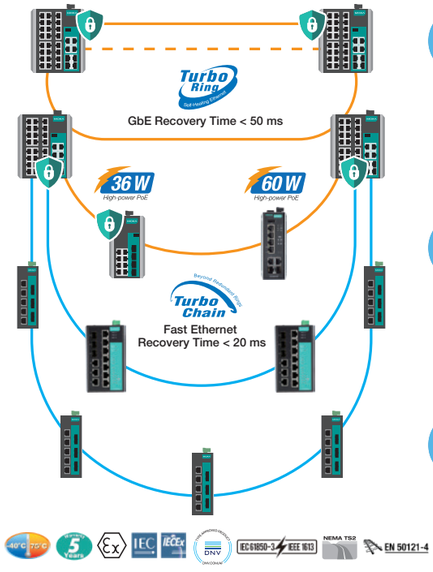
The EDS-400A/500A/500E Series switches offer diverse capabilities while sharing industry-proven availability, reliability, and security features to enable seamless integration, build strong resilience, and improve network efficiency.

Security

- EDS-500E Series embeds security features such as TACACS+ to enhance access control
- Supports MXview One to audit user accounts and firmware updates

SCADA Integration

- Supports multiple industrial automation (IA) protocols for easy SCADA and PLC network integration



Constant Availability

- Millisecond-level failover recovery
- Unlimited subnetwork expansion
- Live node expansion without network interruptions
- Large savings on cabling costs

Smart PoE

- Up to 60 W PoE+ output
- Built-in Smart PoE for remote PD links, diagnostics, and failure recovery

Industrial Reliability

- High EMI resistance
- Diverse industry certifications
- Fanless and wide operating temperature

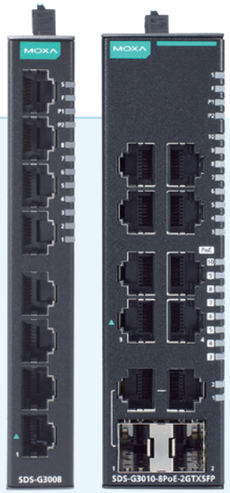
Simplified Management

- Error-free and time-saving mass configuration
- Live topology monitoring and instant alerts

	TSN-G5000	EDS-G500E	EDS-500E/P500E	EDS-500A/P500A	EDS-400A
No. of Ports	4, 8	8, 12, 16	6, 10, 18, 28	5, 8, 10	5, 8
GbE Ports	4, 8	8, 12, 16	2, 3, 4, 4	Max. 3*	–
Fiber Ports	Max. 2 (Combo)	Max. 4*	2, 3, 4, 4	Max. 3*	Max. 3*
Fiber Type	SFP	SFP	SFP	ST, SC, SFP	ST, SC
PoE Ports	–	Up to 8 (EDS-G512E only)	Up to 4 (EDS-P506E-4PoE only)	Up to 8 (EDS-P510A-8PoE only)	–
PoE Output	–	36 W	Up to 60 W	36 W	–
Industrial Certifications	–	CID2, ATEX, IEC 61850-3, IEEE 1613, DNV, ABS, LR, NK, EN 50121-4, NEMA TS2		CID2, ATEX, IECEx*, DNV, EN 50121-4*, NEMA TS2*	

*Available for selected models only.

Simplify to Amplify
Your Efficiency in the Field



OT field engineers often face a range of networking challenges, such as protocol incompatibility, complex deployment, and limited installation space. To help them face these challenges, Moxa's smart switches are designed with features that address these pain points to simplify deployment and maintenance, and ensure smooth operations.

The SDS-3000/G3000 Series smart switches give you fast, easy integration and interoperability with industrial control systems (ICS) through one-step industrial protocol configuration via the web GUI or the rotary DIP switch*. With this simple step, automation engineers can monitor the status of both the control system and the network from their SCADA/HMI systems, allowing rapid response to minimize issues and downtime.

Additionally, Moxa's smart switch portfolio offers a wealth of connectivity options for machine and control cabinet deployment. With an ultra-slim design as thin as 20 mm wide, the SDS-3000/G3000 Series includes models with diverse 6- to 16- port Gigabit, copper, fiber, and PoE connectivity packed in a versatile DIN-rail mountable device. All SDS models are built with an IP40 rugged design and support full MRP functionality to provide the best value to build reliable networks for industrial automation applications.

*Not supported by SDS-3008 Series hardware version 1.0.

Smart Monitoring

Seamless SCADA/HMI integration and monitoring with support for a variety of industrial protocols.

Scalable Versatility

High-density Gigabit and PoE options provide versatile solutions to meet the needs of different networks.

Smart UI

One-page dashboard makes efficient navigation and configuration a breeze.

SDS-3000/G3000 Series
6/8/10/16-port Smart Switches

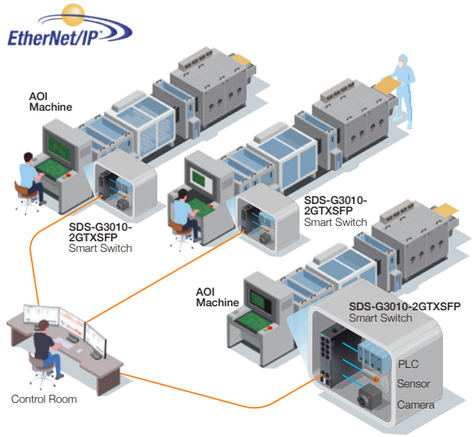
- Up to 16 1GbE ports
- Up to 8 1GbE/FE PoE+ ports
- Supports the EtherNet/IP, Modbus TCP, PROFINET, and MECHATROLINK-4 protocols
- Supports RSTP/STP/MRP network redundancy
- Supports Smart PoE for remote diagnosis and recovery
- Flexible mounting options and double-sided LEDs
- -40 to 75°C operating temperature (-T models)

	SDS-G3016	SDS-G3010	SDS-G3008	SDS-G3006	SDS-3016	SDS-3010	SDS-3008	SDS-3006
Total Ports	16	10	8	6	16	10	8	6
1GbE Ports	16	10	8	6	Up to 2	2	–	Up to 2
FE Ports	–	–	–	–	Up to 16	8	8	Up to 6
Fiber Ports	Up to 2	2 (Combo)	–	Up to 2 (Combo)	Up to 2	2 (Combo)	–	Up to 2 (Combo)
PoE Ports	–	Up to 8	–	Up to 4	–	Up to 8	–	Up to 4
Industrial Protocols	EtherNet/IP, Modbus TCP, PROFINET, MECHATROLINK-4							

Application

Automated Optical Inspection for PCB Manufacturing

A PCB manufacturer wanted to adopt modern automated optical inspection (AOI) systems to enhance their production efficiency. Each AOI machine needed Ethernet switches for network connectivity. The entire production line used EtherNet/IP.



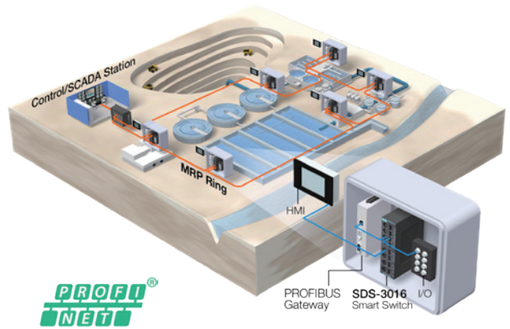
Network Requirements
- High bandwidth for high-definition image transmission
- EtherNet/IP support for integration with existing systems
- Ease of use is crucial for field engineers to improve operational efficiency

Why the SDS-G3010-2GTXSFP Smart Switch
- 10 1GbE ports provide sufficient bandwidth for machine vision data transmission
- Supports SCADA/HMI integration through one-click EtherNet/IP configuration
- One-page dashboard streamlines network operations

Application

Control and Monitoring for Mining Wastewater Treatment Plant

A diamond mining customer needed to build a wastewater treatment plant for their process control. The plant needed an industrial Ethernet switch compatible with PROFINET and Media Redundancy Protocol (MRP: IEC 62439-2) to support the control and monitoring of the entire wastewater treatment system.



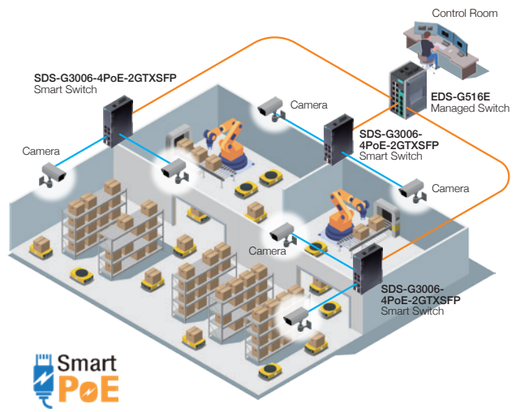
Network Requirements
- PROFINET support for field network interoperability
- MRP support for fast network redundancy
- Hardened design to ensure operational reliability
- Compact design with high port density required for installation in cabinets with limited space

Why the SDS-3016 Smart Switch
- 16 Fast Ethernet ports for scalable IoT connectivity
- One-click PROFINET setup for easy device monitoring
- Supports both MRP client and manager for redundant connectivity
- Three installation options and a slim design that fits into most cabinets

Application

Remote IP Surveillance for Factory Automation

A large material handling company sought to deploy extensive IP surveillance for multiple new plants that were spread out geographically. High-speed video transmission for remote diagnostics and monitoring was a key requirement to ensure operational safety, security, and efficiency.



Network Requirements
- High bandwidth and high-power PoE capacity to facilitate extensive IP camera deployment
- Support for remote network monitoring and troubleshooting for operational efficiency
- Long-lasting reliability to minimize maintenance needs

Why the SDS-G3006-4PoE-2GTXSFP Smart Switch
- The 6-port full Gigabit PoE switch provides 4 PoE ports to connect and power IP cameras, and 2 fiber uplink ports for long-distance video streaming
- Built-in Smart PoE software enables monitoring, diagnosis, and recovery of remote PDs (powered devices)
- Durable design with IP40 protection and a -40 to 75°C wide operating temperature range

Reliable Network Expansion Made Easy

Fast and reliable network expansion is crucial for industrial applications to ensure safety and productivity, especially for critical data collection or continuous manufacturing operations.

Our incredibly compact EDS-2000/G2000 Series unmanaged switches feature 5- to 18-port FE/1GbE/fiber connectivity with advanced data control, to meet evolving connectivity demands while saving time and effort. They provide the rugged reliability you can depend on for seamless performance in demanding environments.

If that is not enough, their plug-and-forget design offers optimal performance with minimal effort. Our unmanaged switches have gained the trust and satisfaction of customers worldwide with thousands of long-term deployments.

EDS-2000/G2000 Series

Industrial Unmanaged Ethernet Switches

Performance

- 5 to 18 ports with FE/1GbE/fiber options
- Up to 8 1GbE ports

Easy Deployment

- Plug-and-play simplicity
- QoS and BSP can be enabled via DIP switches
- Multiple DIN-rail mounting options*

Advanced Efficiency

- Microsecond-level latency for faster MES response times
- Supports automatic warnings for power and port failures*

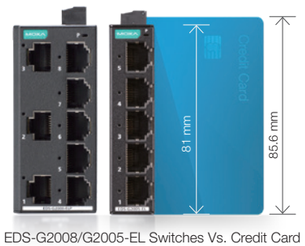
Reliability

- Power redundancy*
- -40 to 75°C wide operating temperature
- Supports PROFINET Real-Time (RT) communication**

*Only available for the EDS-2000-ML Series.
**Only available for the PROFINET Conformance Class A compliant EDS-2000/G2000-EL/ELP Series.

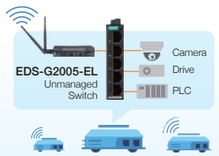
Ultra-compact Design

For easy deployment inside cabinets

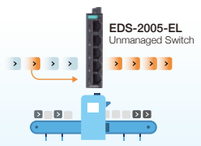


EDS-G2008/G2005-EL Switches Vs. Credit Card

Best-fit Scenarios



AGV/AMR



Data-critical Applications

Cabinets and Machinery With Limited Space

	Extra-compact Full 1GbE	Extra-compact Best Value	Advanced High Port Density	Standard Hardened Design	Advanced Full 1GbE
	EDS-G2000-EL/ELP	EDS-2000-EL/ELP	EDS-2000-ML	EDS-200A/P200A	EDS-G200/G300/G200A
Features	• Extra-compact size • Enable QoS and BSP via DIP switches • Compliant with PROFINET Conformance Class A		• High port density • Enable QoS and BSP via DIP switches • Relay output warnings	• Redundant dual 12/24/48 VDC inputs	• Fiber Gigabit connections • Jumbo frames for enhanced performance
1GbE Ports	5/8	–	Up to 2	–	5/8
FE Ports	–	5/8	Up to 16	5/6/8	–
Fiber Ports	–	Up to 1	Up to 2	Up to 2	Up to 2
PoE Ports	–	–	–	Up to 4 PoE+	Up to 4 PoE+
Operating Temperature	-10 to 60°C / -40 to 75°C (-T models)				
Industrial Certifications	CE, FCC, FCC Part 15B Class A, CISPR 32, EN IEC 62368-1, UL 61010-2-201		CE, FCC, FCC Part 15B Class A, CID2, ATEX, IECEx, DNV, ABS, LR, NK, EN 50121-4, EN IEC 62368-1, NEMA TS2*, UL 508, UL 61010-2-201*		

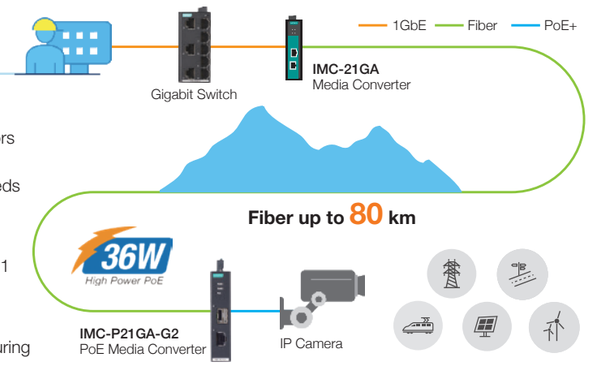
*Available for selected models only.

Empower Long-distance Connectivity

Network operators often prefer wired connections over wireless for critical long-distance data transmissions to avoid interference that can lead to errors and downtime. Moxa's Ethernet-to-fiber industrial media converters (IMCs) ensure interference-free Ethernet extensions up to 80 km with Gigabit speeds and high-power PoE capabilities, even in harsh conditions.

The PoE models provide up to 36 W of power to PTZ cameras and other wireless devices. Featuring an ultra-slim 20-mm design, the robust IMC-P21 Series PoE models are ideal for space-constrained installations, such as outdoor pole-mounted cabinets.

The IMC Series also features link fault pass-through to prevent data loss during link failures and smart LED indicators for easy diagnosis and maintenance.



IMC-P21A/P21GA-G2 Series

Industrial PoE Ethernet-to-fiber Media Converters

Performance

- FE/1GbE speeds
- Up to 80 km transmission distances
- Up to 36 W power supply

Easy Deployment

- Compact size
- Plug-and-play
- DIN-rail installation

Easy Maintenance

- Link fault pass-through for tracing link failures
- LED indicators for easy troubleshooting and maintenance

Reliability

- Dual power inputs
- Surge protection up to 2 kV for power and 1 kV for LAN
- -10 to 60°C operating temperature

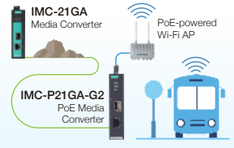
Ultra-slim Design

For easy installation in small cabinets

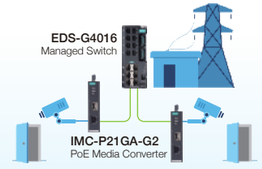
IMC-P21GA-G2 Vs. Credit Card

Best-fit Scenarios

Traffic Monitoring



Bus Stops



Entrance Surveillance

	Cost-effective	1GbE	PoE	PoE	Certified Reliability	1GbE	PoE
	IMC-21A	IMC-21GA	IMC-P21A-G2	IMC-P21GA-G2	IMC-101	IMC-101G	IMC-P101
Ethernet Ports	1 FE	1GbE	1 FE	1GbE	1 FE	1GbE	1 FE
Fiber Ports	100BaseFX (SC/ST)	1GbE SX/LX or 1GbE SFP slot	100BaseFX (SC/ST)	1GbE SX/LX or 1GbE SFP slot	100BaseFX (SC/ST)	1GbE SFP slot	100BaseFX (SC/ST)
Single-mode Transmission Distance	Up to 40 km	Up to 120 km	Up to 40 km	Up to 80 km	Up to 80 km	Up to 120 km	Up to 40 km
PoE Power Budget	–	–	36 W		–	–	30 W
Operating Temperature	-10 to 60°C / -40 to 75°C (-T models)		-10 to 60°C		0 to 60°C / -40 to 75°C (-T models)		
Industrial Certifications	UL 60950-1		UL 62368		UL 508, CID2, ATEX Zone 2, IECEx, DNV	UL 508, CID2, ATEX Zone 2, IECEx	UL 508

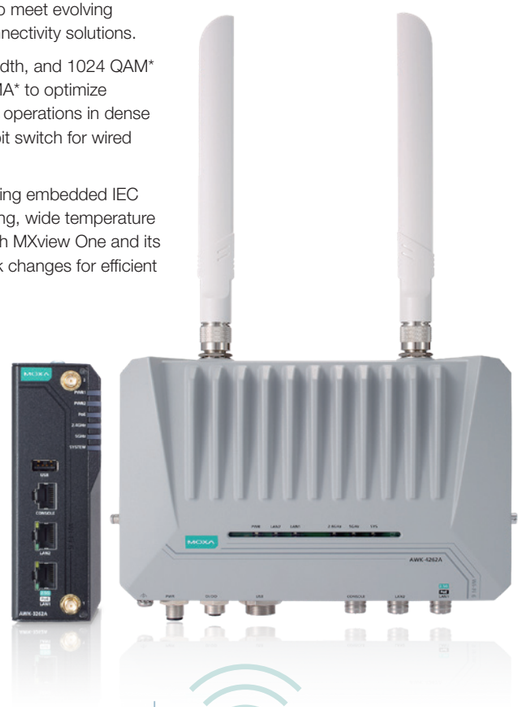
Boost Your IIoT With Wi-Fi 6

As IIoT expands, Moxa's AWK 802.11ac/ax industrial wireless solutions stand ready to meet evolving wireless communication needs with high-density, high-speed, reliable, and secure connectivity solutions.

Our AWK 802.11ax Wi-Fi 6 solutions offer speeds exceeding Gigabit, 80 MHz bandwidth, and 1024 QAM* to power demanding IIoT applications. Our AWK 802.11ax APs and clients use OFDMA* to optimize spectrum efficiency and ensure high-speed, low-latency, and congestion-free wireless operations in dense and noisy environments. The AWK-1165A/C Series features a built-in 5-port full Gigabit switch for wired connections, saving on dedicated hardware and cabling costs.

To maximize wireless reliability, all our AWK products offer field-proven features, including embedded IEC 62443-4-2 Security Level 1 certified security functions**, millisecond-level client roaming, wide temperature tolerance, and strong electromagnetic immunity. In addition, using the AWK Series with MXview One and its Wireless add-on provides real-time visibility into dynamic wireless connections and link changes for efficient monitoring, management, and troubleshooting.

*QAM: Quadrature amplitude modulation; OFDMA: Orthogonal frequency-division multiple access.
**For specific AWK Series models only.



AWK-3262A/4262A Series

Industrial IEEE 802.11ax Wireless AP/Clients

- Concurrent 2.4/5 GHz dual-band with aggregated data rates up to 1.775 Gbps
- Self-healing and easy-to-extend Wi-Fi coverage with AeroMesh™
- Security features referencing IEC 62443-4-2 Security Level 2*
- Millisecond-level client-based Turbo Roaming
- UN model available with multiregion RF compliance
- -40 to 75°C operating temperature range

*AWK Wi-Fi 6 Series are embedded with security features that meet IEC 62443-4-2 Security Level 2 functional requirements. Contact us for further details.

Availability

- Turbo Roaming for sub 150 ms client handovers
- AeroMesh for reducing dead zones and swift recovery from AP failures
- MXview Wireless support for monitoring dynamic connections and quick troubleshooting through roaming playback

Reliability

- 500-V power input insulation resistance
- Level-4 ESD protection on antenna ports
- Anti-vibration design
- -40 to 75°C operating temperature range (-T models)

Security

- IEC 62443-4-2 Security Level 1 certified for specific models
- WPA3 data encryption support
- One-to-many NAT to secure and simplify outbound connections

	AWK-1151C	AWK-3252A	AWK-4252A	AWK-1161A/ AWK-1165A	AWK-1161C/ AWK-1165C	AWK-3262A	AWK-4262A
Operation Mode	Client/Client-router/ Slave/Sniffer	AP/Client/Client-router/Master/ Slave/Sniffer		AP/Master/ Sniffer	Client/Client-router/ Slave/Sniffer	AP/Client/Client-router/Master/ Slave/Sniffer	
Standards	802.11a/b/g/n/ac Wave 2			802.11ax			
Data Rate	400 Mbps (2.4 GHz) / 867 Mbps (5 GHz)			574 Mbps (2.4 GHz) / 1201 Mbps (5 GHz)			
Link Interface	1GbE	1GbE (PoE-powered)		1GbE/ 5 1GbE	1GbE/ 5 1GbE	1GbE + 2.5GbE (PoE-powered)	
Roaming Ability	Turbo Roaming (Client-based handover < 150 ms)			–	Turbo Roaming (Client-based handover < 150 ms)		
Security	WPA3, IEC 62443-4-2 Security Level 1 certified			WPA3, Security features referencing IEC 62443-4-2 Security Level 2			
Mesh	–	AeroMesh		–		AeroMesh*	
Operating Temperature	-25 to 60°C / -40 to 75°C (-T models)		-40 to 75°C	-25 to 60°C / -40 to 75°C (-T models)			-40 to 75°C
RF Certifications	EN 300 328, EN 301 893, ANATEL, FCC, MIC, NCC, RCM, SRRC, WPC, KC, IC			EN 300 328, EN 301 489-1/17, EN 301 893, FCC, MIC, NCC, RCM, SRRC, KC			

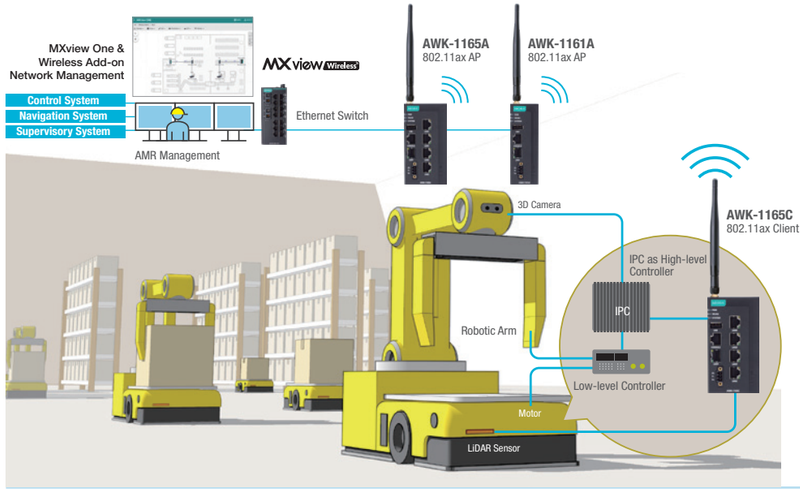
*Available in Q3, 2025.

Speeding Up Material Handling on the Move

A global autonomous mobile robot (AMR) manufacturer aimed to upgrade their automated guided vehicles (AGVs) and AMRs to Wi-Fi 6 to enable effortless handling of growing volumes of materials in challenging operating environments.

Moxa Solutions

Our AWK Wi-Fi 6 APs and clients offer broader IoT capabilities with Gigabit wired and wireless speeds, millisecond-level client-based roaming, reduced network congestion, and flexibility to accommodate growing connectivity needs. The compact AWK-1165C Series clients fit perfectly into the confined spaces onboard AGVs and AMRs, offering reliable mobility with minimal interference in dense and noisy operating environments.



Network Requirements

- Compact Wi-Fi devices for tight machine spaces
- High-speed, low-latency wireless to ensure smooth navigation and coordination among robots
- Reliable operations in environments with vibration and EMI

Why Moxa

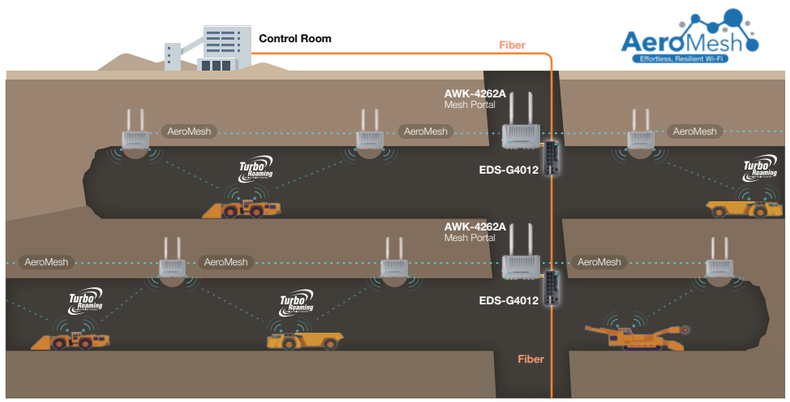
- Compact, robust design for easy machine integration and enhanced EMC and RF protection
- 802.11ax performance with integrated 5-port switch for cost efficiency
- UN model available with multiregion RF compliance and certifications

Driverless Trucks for Safety and Productivity in Mining

A mining machinery manufacturer needed a robust wireless solution to solidify driverless truck operations for non-coal underground mining.

Moxa Solutions

The IP68-rated AWK-4262A 802.11ax devices double as Wi-Fi access points mounted on the tunnel walls and as Wi-Fi clients installed on the autonomous trucks. The AP devices support Moxa's AeroMesh to create a self-healing mesh that extends the radio coverage and facilitates fast recovery in case of AP failures. The client devices feature high EMC and robust mobility to transmit real-time video and telemetry, ensuring operational safety and efficiency.



Network Requirements

- Robust and high-speed wireless to support bandwidth-heavy data and video streaming
- Ability to withstand harsh underground conditions, including EMI from nearby machines and motors
- Robust wireless coverage for mobile connectivity

Why Moxa

- 802.11ax and resilient wireless technologies such as Turbo Roaming and AeroMesh™ for reliable wireless connectivity
- Industrial hardened devices with high EMC and antenna protection to prevent downtime
- IP68 sealed waterproof design to withstand extreme underground conditions

Ensure **Secure Cellular Operations** Over Private and Public Networks

Experience the power of Moxa's industrial cellular solutions tailored for smart manufacturing and distributed operations, offering best-in-class cellular security, reliability, and easy management.

5G Cellular Gateways Elevate OT-to-5G data transmissions in a controlled cellular environment with the CCG-1500 Series 5G gateways, ensuring on-site data security.

5G Gateways for Energy-efficient Operations

Moxa's 5G solutions connect OT devices to private 5G networks without any wiring hassle. The CCG-1500 Series gateways deliver 5G speeds of up to 920 Mbps downlink and 440 Mbps uplink to enable low-latency serial/Ethernet-to-5G data transmissions at a minimal average power consumption of just 8 W. Combined with a compact size of only 100 x 125 x 35 mm, these power-efficient gateways are ideal for battery or solar-powered operations in remote applications.

CCG-1500 Series
Industrial 5G Gateways

- Serial/Ethernet-to-5G converter
- Dual SIM for network redundancy
- Supports Keep Alive for forced recovery
- Low 8 W power consumption
- -40 to 70°C operating temperature

Additional Benefits

- Specialized 5G accessories to improve signal strength and coverage
- Supports cloud-based Device Lifecycle Management (DLM) Service for streamlined device monitoring and management
- Strong ecosystem partnership to ensure network interoperability and reliability
- Provides diagnostic tools and technical support

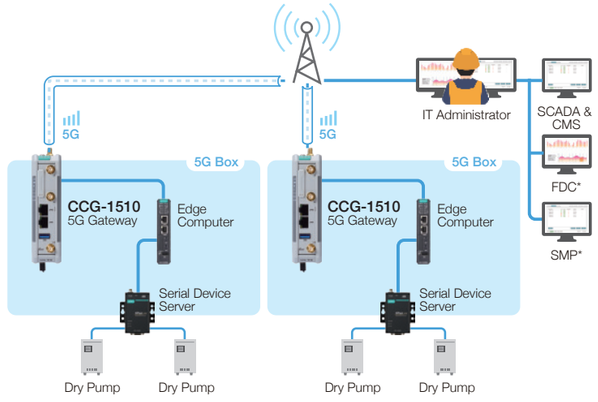
Success Case

Dry Pump Monitoring for Critical Manufacturing

Dry pump monitoring is crucial for achieving high vacuum purity in dust-free production. Real-time monitoring of I/O modules on dry pumps over a private 5G network was required to support critical asset monitoring and operations.

Moxa Solutions

The CCG-1500 Series 5G gateway was selected for its stable performance, dedicated 5G band spectrum, and Layer 2 tunneling for end-to-end field communications.



*FDC stands for Fault Detection & Classification, SMP for Super Manufacturing Platform.

Network Requirements

- High-speed operation and stable reliability
- Machine-to-machine field communication
- Easy integration with third-party 5G equipment

Why Moxa

- Proven stability and reliability, strong compatibility with other third-party 5G systems
- Supports autonomous 5G traffic analysis for swift troubleshooting
- Professional technical support and troubleshooting

	CCG-1520-T	CCG-1510-T
Cellular Bands	5G R15 NR: N79	5G R15 NR: N1 / N3 / N28 / N41 / N48 / N77 / N78 LTE: B1 / B3 / B7 / B8 / B28 / B38
Ports	2 1GbE + 1 Serial	
Power Consumption	8 W (avg.)	
Dimensions	100 x 125 x 35.2 mm (3.93 x 4.92 x 1.38 in)	
Operating Temperature	-40 to 70°C (-40 to 158°F)	

LTE Cellular Routers/Gateways Leverage OnCell™ Series industrial cellular products to facilitate secure remote access for prompt machine maintenance via the cloud-based MRC platform.

Secure Remote Access Over LTE Cellular

Remote access to PLCs, SCADAs, and critical machines is crucial for prompt support services in distributed environments. Moxa Remote Connect (MRC) is a cloud-based secure remote access platform that features connection encryption and scalable tunneling to protect your remote device interactions. MRC enables better and safer remote operations, allowing field engineers to minimize on-site troubleshooting and perform more efficient remote maintenance from anywhere.

MRC Solutions ▶

MRC Client
A Windows-based application installed on a PC to build a secure link to the MRC gateway and its connected systems.

MRC Quick Link
A cloud-based server that manages secure connections between MRC Clients and MRC gateways.

MRC Gateways
Moxa OnCell devices with built-in MRC functionality that protect connected systems by managing MRC Client access.

Success Case

Remote Maintenance for EV Charging Systems

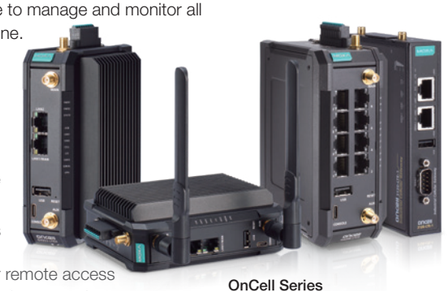
A charging point operator (CPO) deployed a chain of unmanned electric vehicle (EV) charging stations. By integrating Moxa's OnCell cellular routers and MRC Quick Link service into each charging station, the CPO was able to manage and monitor all systems with ease. This solution also minimized on-site troubleshooting when a system goes offline.

Moxa Solutions

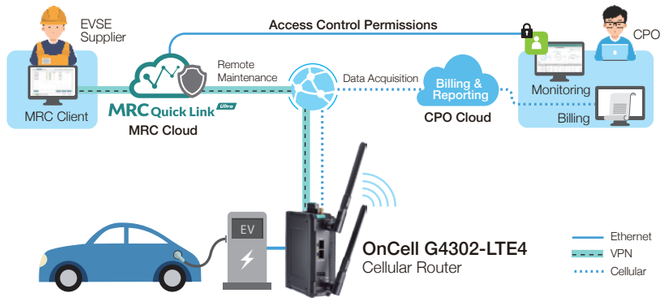
To ensure 24/7 charging services, the OnCell routers provide stable data transfer from each charging system to the CPO cloud. The dual SIM, LTE/Ethernet-to-WAN redundancy, and GuaranLink cellular auto-recovery features further enhance operational reliability.

For EV supply equipment (EVSE) maintenance, the OnCell acts as an MRC gateway, allowing the CPO to remotely monitor all connected systems through the MRC cloud.

- The MRC server allows customizable access control for the CPO and EVSE provider to access MRC gateways for EVSE diagnostics and troubleshooting
- MRC access control is managed by the CPO via dedicated access accounts and time slots for remote access
- EVSE engineers can use the MRC Client software to remotely access EVSE for troubleshooting from anywhere



OnCell Series
Industrial Secure Cellular Routers



Network Requirements

- Reliable data acquisition to sustain EV charging operations
- Simple and secure online management for monitoring and maintaining multiple systems at once
- Easy-to-use tools for diagnosing and troubleshooting EV charging systems

Why Moxa

- Data segregation for charging service operations and EVSE maintenance
- Cloud-based MRC Quick Link for secure remote management and service scalability
- Easy for non-IT CPO staff to set up and leverage on-demand remote access to devices via the MRC Quick Link service

Preliminary*

	OnCell 3120-LTE-1	OnCell G4302-LTE4	OnCell G4308-LTE4
WWAN	4G LTE Cat. 1	4G LTE Cat. 4	
Ports	2 FE + 1 Serial	2 1GbE + 1 Serial	8 1GbE + 1 Serial
Layer 2 Switching	–	Yes	
VPN	IPsec VPN, GRE, OpenVPN	IPsec VPN, GRE, OpenVPN (Client only)	
Firewall	ICMP, IP address, MAC address, Ports	DDoS, Ethernet protocols, ICMP, IP address, MAC address, Ports, DPI	
Hardware-based Security	–	Secure Boot	
Redundancy	• GuaranLink for cellular failover • Cellular and Ethernet WAN failover • VRRP for routing redundancy (except for OnCell 3120)		

*Available in Q3, 2025.

Enable Smart Rail With Ethernet

Rail systems are designed to operate for decades. Using divergent networks to support multiple services in rail systems can be costly and hard to deploy, maintain, and scale. As an IRIS certified company, Moxa provides Ethernet-compliant rail solutions for onboard, train-to-ground (T2G), and trackside communication and control systems that enhance operational capacity, efficiency, and passenger services.

Moxa Offers

- Co-developing rail industry standards
- Expertise in cyber-resilient networks
- 15-year product supply commitment for onboard TN switches and routers
- Certified for IRIS rev. 0.4 quality management

EN 50155 EN 50121-4 IT PT IRIS Certification

Ethernet-connected Onboard Networks

Moxa's EN 50155 Ethernet solutions enable high-bandwidth communications for CCTV, passenger information systems (PIS), passenger Wi-Fi, and other train-wide communication services in space-constrained onboard environments.

TN-4500B Series
Gigabit PoE Switches

- Up to 28 Ethernet ports with M12 push-pull connectors
- Up to 24 PoE ports with a 150 W total PoE power budget
- NIS2/CRA-based security features and ITxPT labeling

V3400 Series
Secure T2G Onboard Computers

- Dual 5G and Wi-Fi 6 connectivity in OT4 (-40 to 70°C)
- Multi-core processor and multi-LAN design for smart application integration
- Three-layered security architecture with MIL3 Secure OS

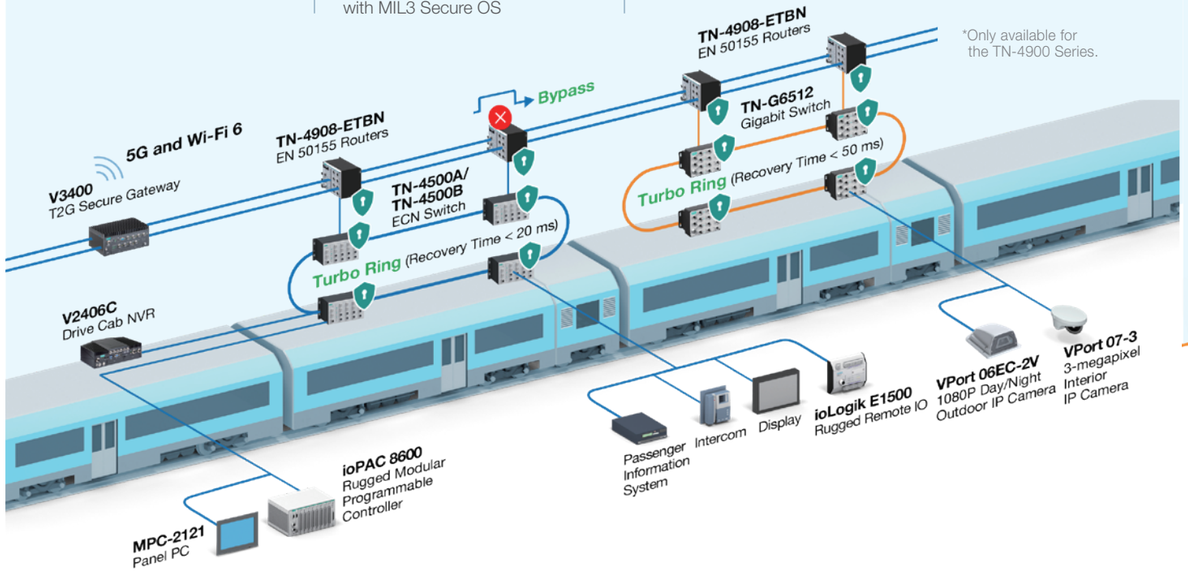
VPort™ 07-3 Series
3MP H.265 IP Cameras

- Resolutions up to 2048 x 1536
- -40 to 70°C operating temperature
- IP66, IK8 housing

Performance
» 1GbE and 10GbE for network convergence

Security
» IEC 62443-4-2 Security Level 2 certified*

Reliability
» Complies with all EN 50155 mandatory test items
» Seamless failover with network redundancy and bypass



Train-to-ground Wireless Solutions

From vital train-to-ground (T2G) communications (such as CBTC) to onboard infotainment systems, high bandwidth and rapid handoffs for wireless transmissions on fast-moving trains are more crucial than ever. Moxa provides robust train-to-ground Wi-Fi 6 connectivity solutions to ensure real-time train status updates and control for smoother rides and improved passenger safety.

TAP-M310R Series
T2G Wi-Fi 6 AP/Clients

- IP67-rated modular design with switch and power modules
- Controller-based Turbo Roaming handover time under 50 ms (with WAC-M300 Series)
- AeroLink Protection for wireless redundancy

WAC-M300 Series
Wireless Access Controller

- L2 controller-based roaming support
- Central management and monitoring of TAP-M310R Series Wi-Fi 6 devices
- Device and link redundancy

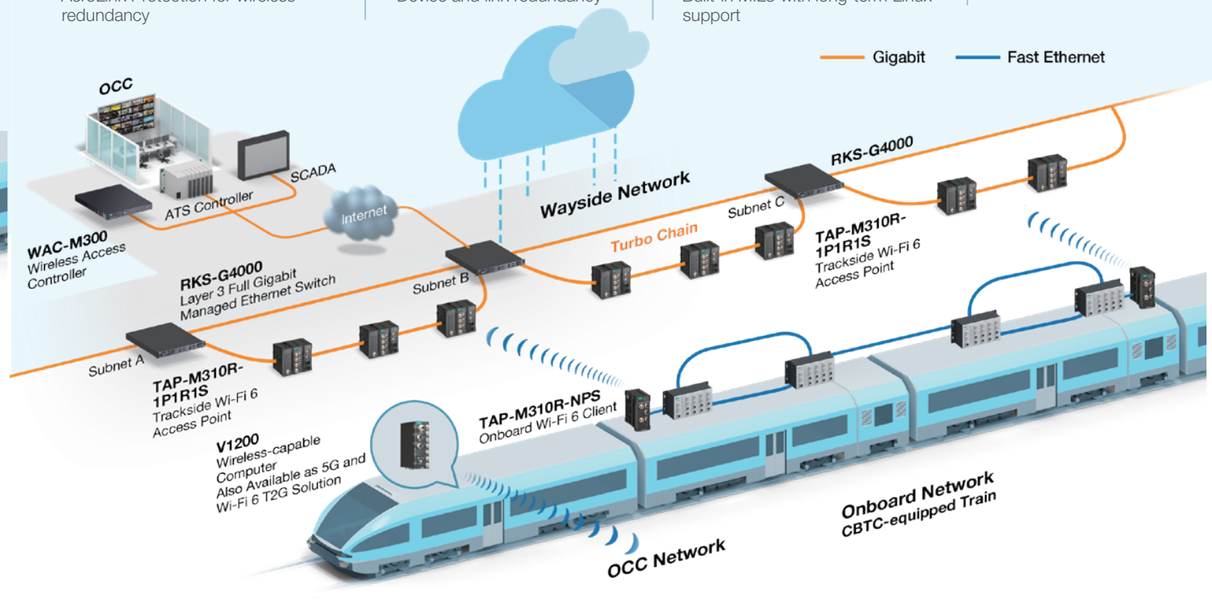
V1200 Series
Wireless-capable Computers

- Model with integrated EN 50155 OT4 compliant 5G and Wi-Fi 6 modules available
- Compact, single-sided connector layout for installation in tight spaces
- Built-in MIL3 with long-term Linux support

Performance
» Selectable dual-band Wi-Fi with data rates up to 574 Mbps (2.4 GHz) or 1,201 Mbps (5 GHz)

Security
» WPA3 Personal/Enterprise (IEEE 802.1X RADIUS)

Reliability
» Complies with EN 50121-4
» Built-in band pass filter
» AeroLink Protection for wireless redundancy



▶ EN 50155 Switches

	TN-4900-ETBN	TN-G6512/G4516	TN-4500A	TN-4500B
10GbE Ports	–	4 (TN-G4516)	–	–
1GbE Ports	Up to 8	12	Up to 4	Up to 8
1GbE Fiber Ports	–	–	Up to 2	–
FE Ports	Up to 12	–	Up to 24	Up to 20
PoE Ports	Up to 12 PoE+	Up to 12 PoE+	Up to 20 PoE+	Up to 24 PoE+

▶ EN 50155 IP Cameras

	VPort 07/06	VPort 06EC
Day/Night	Day	Day/Night
Resolution	3MP/1080P & HD	1080P
Power Input	PoE or 24 VDC	PoE (24 VDC for heater)
Operating Temperature	-25 to 55°C -40 to 70°C (-T models)	
Protection	IP66, IK10/IK8	IP67, IK7

▶ Controllers and EN 50121-4/50155 WLAN

	TAP-M310R-NPS	TAP-M310R-1P1R1S	WAC-M300	AWK-3251A-RCC
Best Scenarios	Onboard Client	Trackside Access Point	Wi-Fi Controller	Inter-carriage, P Wi-Fi
Wi-Fi Capability	802.11a/b/g/n/ac/ax		–	802.11a/b/g/n/ac
Network Interfaces	2.5GbE		1GbE	1GbE
Wi-Fi Roaming	Controller-based Turbo Roaming < 50 ms handover time (with WAC Series)*		–	Client-based Turbo Roaming < 150 ms handover time*
Reliability	IP67-rated, -40 to 75°C		0 to 50°C	-40 to 75°C

▶ EN 50155 Computers

	V3400	V1200
CPU	11th Gen Intel® Core™ i3, i7	Armv8 Cortex-A53 quad-core
GbE Ports	1 x 2.5GbE, Up to 7 1GbE	2 x 1GbE
Power Input	24 to 110 VDC	
Operating Temperature	-40 to 70°C	
Wireless Functionality	2 x 5G, Wi-Fi 6, LTE or Wi-Fi 5	5G or LTE, Wi-Fi 6

*Turbo Roaming performance may vary based on infrastructure and parameter configurations. Refer to the product manual for more information.

IEC 61850 Visibility and Reliability for Substation Digitalization

The IEC 61850 standard defines communication protocols for intelligent electronic devices (IEDs) and enables interoperability between devices from different vendors. However, interoperability alone is not enough to ensure reliability and visibility into modern substations.

Moxa introduces MXview Power for deep visibility into substation communication and monitoring. Dedicated to IEC 61850 power network monitoring, MXview Power provides visibility not only into industrial Ethernet networks but also into IED statuses, GOOSE messages, and redundant connections in PRP/HSR networks.

Moreover, MXview Power coupled with the PT-G7728/G7828 Series switches is ideal for transforming traditional substation communication for a digitalized substation automation system (SAS).

The PT-G7728/G7828 switches are compliant with the latest IEC 61850-3 Edition 2 Class 2 and IEEE 1613 Class 2 standards to achieve error-free delivery in harsh conditions. Embedded with the innovative GOOSE Check function, MMS server capability, and nanosecond-level time synchronization, the PT-G7728/G7828 switches ensure reliable data transmission in power substations.

Built for Maximum System Availability

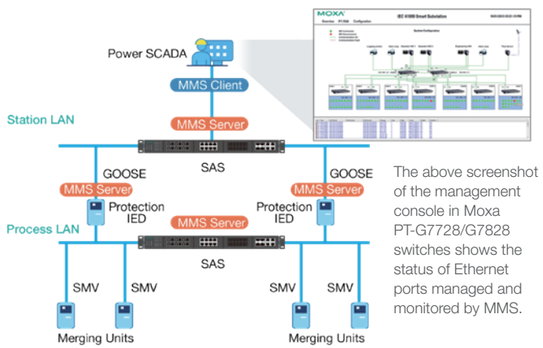
PT-G7728/G7828 Series

28-port Layer 2 and Layer 3 Gigabit rackmount switches

- **Minimize Errors**
- **Detect Errors**
- **Fix Errors**

MMS for Power SCADA Supervision

With a built-in MMS server, the PT-G7728/G7828 switches can be controlled, monitored, and managed via a centralized Power SCADA system for enhanced efficiency and availability.

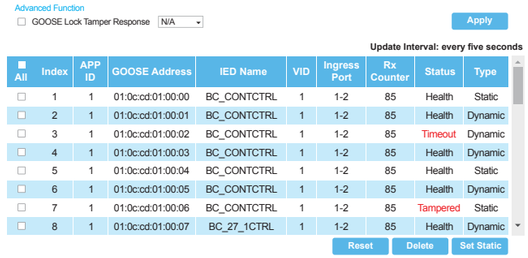


The above screenshot of the management console in Moxa PT-G7728/G7828 switches shows the status of Ethernet ports managed and monitored by MMS.

GOOSE Check

The PT-G7728/G7828 switches feature the GOOSE Check function that monitors GOOSE packets and sends instantaneous alerts to the Power SCADA system and MXview Power when timed-out and tampered GOOSE packets are detected.

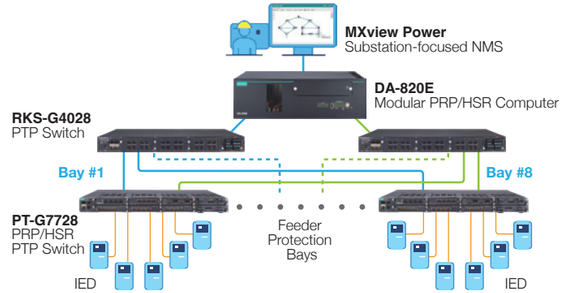
Together with GOOSE Lock, which creates an allowlist of legitimate GOOSE packets, the PT-G7728/G7828 switches can block malicious traffic to effectively defend substation networks.



Use Case

PRP/HSR Networks and IEC 61850 System Visibility for Substation Digitalization

A conventional substation operator wants to upgrade to a digital IEC 61850 substation by implementing accurate time synchronization between its feeder protection bays. Moxa PT-G7728 switches are used to scale up existing networks for seamless PRP/HSR data transmissions and MXview Power is used for network visibility and management.



Enhanced Performance

- Up to 28 1GbE ports with RJ45/SFP modules
- PRP/HSR module support for seamless failover
- IEEE 1588 v2 PTP support on all ports
- IEC 61850 QoS to prioritize critical GOOSE/SMV transmissions

Purpose-built Management

- Real-time visibility of network and device statuses
- Built-in IEC 61850-90-4 MMS server for centralized monitoring by Power SCADA
- Embedded GOOSE packet monitoring for quick troubleshooting
- Dying gasp support to trigger alarms and logs for quick troubleshooting
- PTP SYNC LED that shows the time-sync status

All-round Reliability

- IEC 61850-3 and IEEE 1613 compliance
- Turbo Ring, Turbo Chain, and PRP/HSR support for seamless failover
- Dual isolated power modules for power redundancy
- Hot-swappable modules for continuous availability and easy maintenance

Network Requirements

- Redundancy to ensure seamless failover and precise time synchronization
- Ensure always-on zero-packet-loss communication
- Easy management of IEC 61850 data and networks

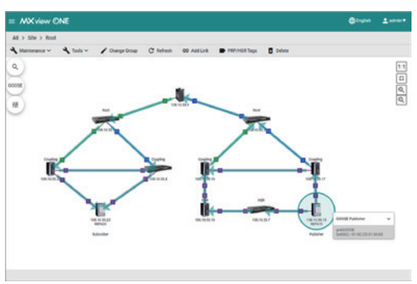
Why Moxa

- Comprehensive portfolio that supports IEEE 1588 PTP solutions
- Zero-packet-loss transmission support in harsh environments
- Hot-swappable expansion modules for scalability without system downtime
- Real-time visibility into PRP/HSR topology and GOOSE packet flow in the substation network

MXview Power

Substation-focused Network Management Software

- Visualize the substation network topology in real time
- Automatically scan and detect unauthorized IED devices for preemptive protection
- Automatic and concise visibility of PRP/HSR dual LAN topology for simplified management
- Real-time visibility of critical packets such as GOOSE messages to speed up troubleshooting
- Visualization of key components, such as fiber interfaces, to speed up troubleshooting



▶ IEC 61850-3 Switches

	PT-G7828	PT-G7728	PT-7528	PT-G503	PT-G510	RKS-G4000	MDS-G4000
		PRP/HSR		PRP/HSR	PRP/HSR		PRP/HSR
Device Design	Modular	Modular	Fixed ports with single-slot module	Compact fixed ports	Fixed ports	Modular	Modular
Max. No. of Ports	28 1GbE	28 1GbE	4 1GbE + 24 FE	3 1GbE	10 1GbE	28 1GbE	28 1GbE
Max. No. of PTP Ports	28	28	–	3	10	28	28
Seamless Failover	–	PRP/HSR	–	PRP/HSR	PRP/HSR	–	PRP/HSR*
Proprietary Redundancy	Turbo Ring, Turbo Chain (Fast Ethernet recovery time < 20 ms, Gigabit Ethernet recovery time < 50 ms)						
RSTP Grouping	–	✓	–	✓	✓	–	–
MMS Server	✓	✓	✓	✓	✓	✓	✓
GOOSE Check	✓	✓	–	–	✓	✓(MX-NOS v5.0 or higher version)	
IEC 61850 QoS	✓	✓	✓	–	✓	–	–
Industrial Certifications	IEC 61850-3, IEEE 1613 Class 2						IEC 61850-3 , IEEE 1613 Class 1
Operating Temperature	-40 to 85°C				-40 to 75°C		

*The MDS-G4012/G4020/G4028 Series support PRP/HSR in MX-NOS v5.0 (Q3, 2025).