




 <b>AWK-4131A</b>	 <b>AWK-3131A</b>	 <b>AWK-1131A</b>	 <b>AWK-1137C</b>
Operation Mode	AP, Client, Master, Slave, Client Router, Sniffer	AP, Client, Master, Slave, Client Router, Sniffer	AP, Client, Sniffer	Client, Slave, Client Router, Sniffer
Wi-Fi interface	IEEE 802.11a/b/g/n with MIMO up to 300 Mbps			
Ethernet	1 x 10/100/1000Mbps			
Serial	1 x RS-232/422/485			
PoE	802.3af PoE	802.3af PoE	-	-
Max. No. of Clients per AP Device	100 connections, 60 concurrent streams	100 connections, 60 concurrent streams	30 connections, 30 concurrent streams	-
Dual Power	12 to 48 VDC			9 to 30 VDC
Operating Temperature	Standard models: 0 to 60°C (-25 to 60°C for AWK-3131A) Wide temp. models: -40 to 75°C			
IP Rating	IP68	IP30	IP30	IP30
Radio Certificates	FCC, CE, MIC, ANATEL, WPC, SRRC, KC, RCM			
Special Certificates	-	UL/cUL Class 1 Division 2, ATEX Zone 2, IECEx	-	eMark

LTE Solutions	 <b>OnCell G3150A-LTE Series</b>	 <b>OnCell G3470A-LTE Series</b>
Key Features	<ul style="list-style-type: none"> <li>European and US LTE band support</li> <li>Dual SIM for dual cellular operator backup</li> <li>GuaranLink for reliable cellular connectivity</li> <li>Dual power inputs and built-in DI/DOs</li> </ul>	
Interfaces	1-port Ethernet, 1-port RS-232/422/485	4-port Gigabit Ethernet
Network Management	GRE, IPsec, and OpenVPN	NAT, port forwarding, IP/MAC/port filtering
Operating Temperature	0 to 55°C / -30 to 70°C	-30 to 55°C / -30 to 70°C
Interference Protection	ESD Level 4 antenna protection	ESD Level 4 antenna protection with isolation design

## 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. With over 30 years of industry experience, Moxa has connected more than 50 million devices worldwide and has a distribution and service network that reaches customers in more than 70 countries. Moxa delivers lasting business value by empowering industry with reliable networks and sincere service for industrial communications infrastructures.

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## Boost Productivity with Industrial Wireless Connectivity



# Boost Productivity with Industrial Wireless Connectivity

Wireless technology is an integral part of today's industrial network infrastructure, enabling flexibility in communication, manufacturing, and automation systems so that businesses can keep pace with rapid changes in the market.

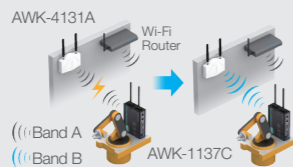
Moxa's industrial Wi-Fi and cellular products are designed to boost productivity and flexibility in industrial applications by overcoming distance and coverage constraints and minimizing signal leakage, interference, and signal degradation. By combining innovative technologies, such as fast roaming, effortless Wi-Fi device deployment, wireless connection redundancy, and end-to-end security, Moxa's wireless solutions guarantee reliable and efficient Wi-Fi and cellular connectivity in any operating environment.

## AWK Series 802.11n MIMO Solutions



### Optimal Deployment and Easy Maintenance

- One-step setup for multiple Wi-Fi devices
- One-click optimization of Wi-Fi channels
- Zero configuration needed to add new devices to an existing network

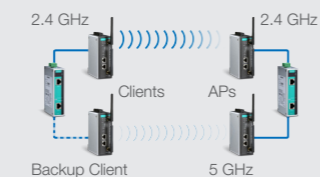


AeroMag for effortless Wi-Fi device deployment and optimal channel selection to adapt to changes in the operating environment.



### Maximum Availability

- Turbo Roaming for handover times under 150 ms
- AeroLink Protection for redundant network links
- DFS for stable channel links
- Transparent PROFINET communication



Fast roaming under 150 ms and redundant Wi-Fi links for uninterrupted wireless connectivity.



### Device Reliability

- 500 V insulation on power and antenna ports
- -40 to 75°C operation
- IP68 rating (AWK-4131A only)
- Diverse industry certifications (AWK-3131A only)



Dual power inputs and dual-isolation for hardened device reliability in harsh environments.



## OnCell Series LTE Cellular Solutions



### Secure Access

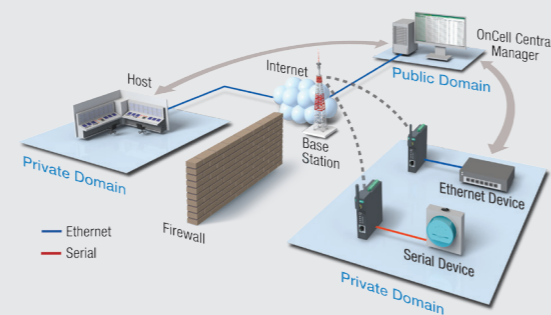
- VPN tunneling
- Private IP connections over Internet
- Device security based on IEC 62443 standards

### OnCell Central Manager

Moxa's OnCell Central Manager software centralizes private IP management facilitating cost-effective and secure access to public networks.

### Solid Connectivity

- Dual SIM for cellular service redundancy
- GuaranLink for maximum cellular uptime



### Robust Reliability

- Dual power inputs
- ESD Level-4 antenna protection
- High EMC level with power isolation
- ATEX and IECEx certifications (OnCell-G3150-LTE only)



## Smart Street Lighting Systems Over Wireless

As governments continue to embrace the smart city trend, street lights are connecting to networks with sensors, which allow them to adjust brightness and conserve energy while still maintaining public safety. The networks that are being deployed also support other devices such as surveillance cameras. Moxa simplifies the process of transforming legacy lighting systems into smart energy-conserving systems, by offering rugged wireless solutions that ensure seamless data communication for adaptive street lighting as well as supporting applications such as surveillance monitoring.

Smart City

### System Requirements

- Compact form factor for installation inside small wayside cabinets
- Stable data communication
- Device durability to withstand outdoor environments

### Moxa's Solution

The AWK-1137C's palm-sized form factor makes it convenient to install the device as a wireless client in pole-mounted wayside cabinets. To create Wi-Fi hotspots along the way, multiple AWK-4131A units are installed on the rooftops of buildings around cities. The IP68-rated housing of the AWK-4131A makes it an ideal choice for outdoor installation.

The 802.11n broadband AWK-1137Cs collect temperature and humidity readings, light conditions, and video streaming from street sensors and IP cameras to transmit to an AWK-4131A base station, which then backhauls the data and video through the Ethernet backbone to the data center.

The Wi-Fi network enables continuous access to all the street lights so that they can be monitored and controlled from a remote control center. The street lights can be switched on or off or dimmed according to a fixed schedule or based on current conditions such as weather, time of day, and even traffic.

To ensure uninterrupted network connectivity for the street lighting system, the AWK-4131A and AWK-1137C support a wide range of 5 GHz DFS channels to avoid interference from existing network infrastructures.

### Why Moxa

- The products' small form factor enables easy installation inside pole-mounted wayside cabinets
- 5 GHz DFS channel support for better channel assignment
- Industrial-grade devices that can withstand harsh temperatures and strong vibrations

### Moxa Products



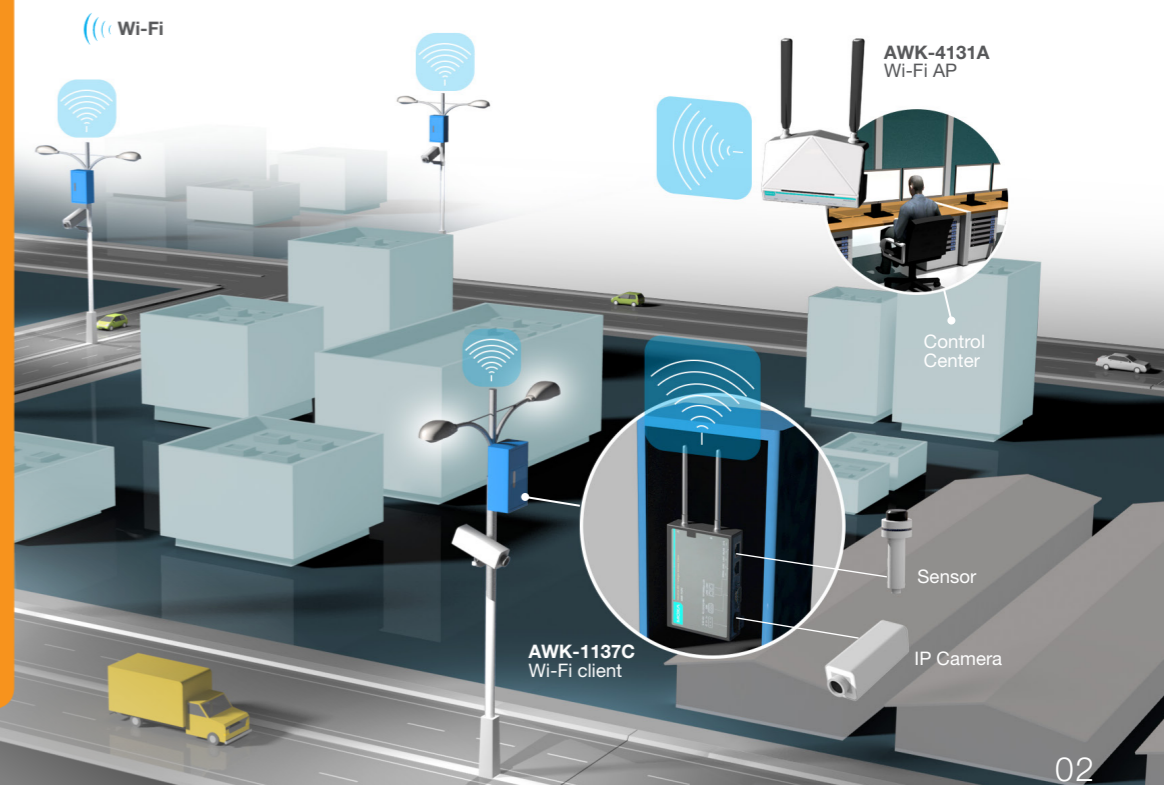
**AWK-1137C**  
802.11n wireless client



**AWK-4131A**  
802.11n wireless AP/client with IP68-rated housing



Build Wi-Fi Into Your Machines Effortlessly





## Remote Monitoring of CNC Machines for Higher Equipment Efficiency

A leading metal parts manufacturer sought Ethernet solutions to increase the utilization of their CNC machines and reduce setup costs to meet increasing demands for a wide variety of products. The factory required an easy-to-run network infrastructure that could connect both serial and Ethernet CNC machines to the control network to support centralized monitoring and control of these machines to increase overall equipment efficiency (OEE) and also support future expansions of the system.

### System Requirements

- Data collection from serial and Ethernet CNC machines and PLCs
- Interoperability with third-party Wi-Fi devices
- Reliable high-bandwidth communication in the shop floor environment

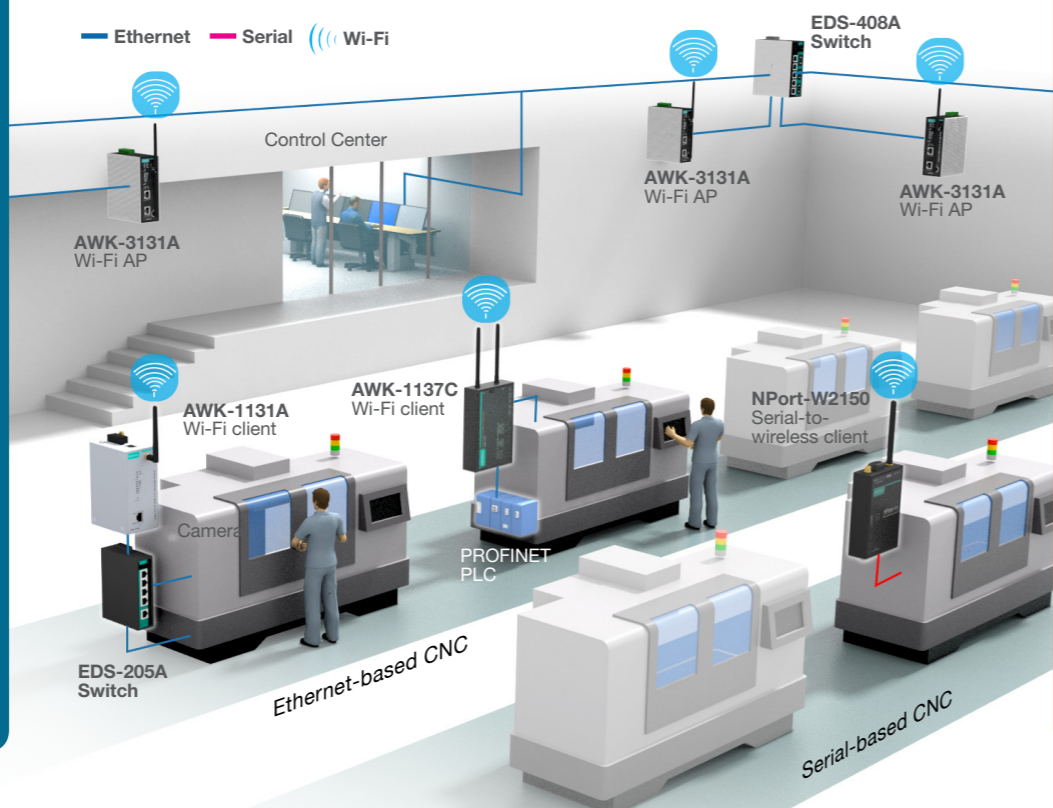
### Moxa's Solution

Moxa's NPort-W2150A serial-to-wireless device servers are used to connect the serial-based CNC machines to the AWK-3131A access points.

Each AWK-3131A can connect up to 100 CNC machines to the factory's Ethernet backbone. The Wi-Fi certified AWK-3131A provides interoperability with multi-vendor Wi-Fi clients facilitating communication with PLCs. The AWK-3131A AP master/slave mode provides transparent connections to PROFINET devices.

Both the NPort-W2150A and the AWK-3131A provide strong 802.11n MIMO radio connection and advanced surge protection to prevent electromagnetic interference on the factory floor.

The robust wireless infrastructure enables mass data exchange with the control center. The remote monitoring capability can facilitate access to both live and historical data on the performance of the CNC machines, which can then be analyzed to improve machine utilization, reduce idle time, and improve machine output.



## Mobile AGVs for Flexible Manufacturing Systems

A motorcycle manufacturer intends to establish a flexible manufacturing system (FMS) to manufacture a variety of products to meet the increasing demand for their products in the market. Moxa was employed to integrate automated guided vehicles (AGVs) as mobile and flexible conveyors to enable automated material handling and processing of parts.

### System Requirements

- Compact form factor that allows integration into machines
- Seamless connectivity
- Robust radio signals to protect against EMI

### Moxa's Solution

Palm-sized AWK-1137C wireless clients were mounted inside the mobile AGV machines while AWK-3131A wireless APs installed on the shop floor provided 802.11n MIMO wireless coverage throughout the production floor, enabling efficient seamless navigation for the AGVs.

The FMS control center receives data from all AGVs dispersed around the shop floor, and dispatches commands to guide the AGVs to new positions and paths based on changes in the production-line schedule and plan. The performance data collected is then analyzed to make production improvements in the future.

Optimized device mobility is the key factor for AGV system efficiency. Both the AWK-1137C and the AWK-3131A support Turbo Roaming technology that enables millisecond-level handoff times to ensure reliable connection with AGV systems while they are on the move. Turbo Roaming capability enables the AWK-1137C client on the AGV machine to proactively search and switch to stronger access points before the wireless link goes down, which ensures better channel loading in the AWK-3131A APs leading to stronger Wi-Fi connections.



### Why Moxa

- Serial and Ethernet interfaces and multiple operation modes
- Advanced surge protection for antenna and power
- Interoperability with multi-vendor Wi-Fi clients

### Moxa Products



**AWK-3131A**

802.11n wireless AP/client



**AWK-1137C/1131A**

Ethernet-to-802.11n wireless client



**NPort W2150A**

Serial-to-802.11n wireless device server



Industry 4.0 for Smart Connectivity in Factories

### Why Moxa

- Palm-sized device for easy installation inside machines and equipment
- Power and RF isolation for reliability
- Turbo Roaming for millisecond-level secure handover

### Moxa Products



**AWK-1137C**

802.11n wireless client



**AWK-3131A**

802.11n wireless AP/client



The Missing Piece for Your AGV and AS/RS Systems



## Redundant Wireless for Crane Slewing Control

Downtime in crane operations could spell disaster and lead to losses, especially if it occurs during a manufacturing operation or at busy ports. A crane manufacturer integrated Moxa's redundant wireless solutions into their heavy lift mast cranes that are used for offshore wind turbine installation to ensure maximum operational uptime.

### System Requirements

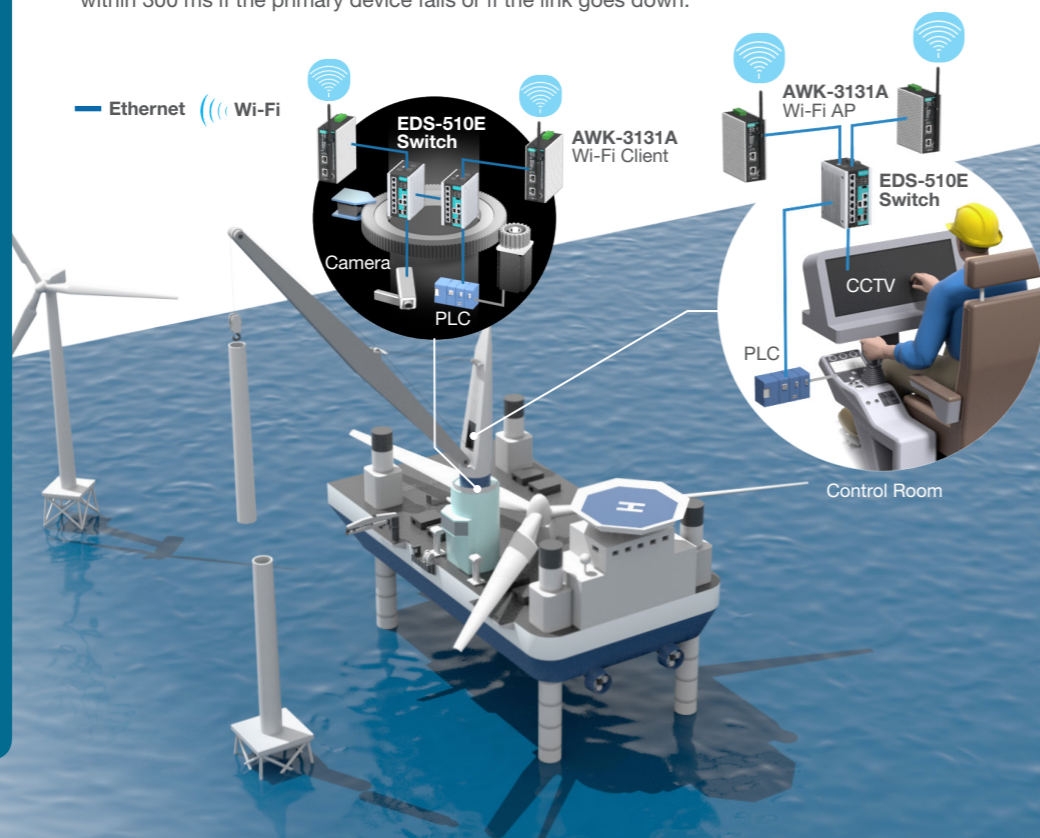
- PROFINET communication for efficient PLC operations
- Network-level redundancy to ensure maximum uptime

### Moxa's Solution

An end-to-end redundant wireless network was built to help the crane operator rotate the crane superstructure using a PROFINET-based slewing drive system located beneath the operator's cabin. The crane slewing system is monitored by a field CCTV surveillance system, and controlled by a PROFINET-based PLC system, both of which connect to an AWK-3131A wireless client to send real-time information to the control center. The master/slave mode setting on the AWK-3131A provides transparent transmission of PROFINET traffic to the control center.

At the control end, two AWK-3131A wireless APs were used to set up dual-band hot spots to transfer the video recording and data received to an upstream EDS-510E Ethernet switch, which in turn transferred the information to the control center to enable monitoring and control of the crane operations.

To ensure maximum network availability and system reliability, the AWK-3131A wireless clients use AeroLink Protection technology to build redundant wireless connections between the slewing drive systems and the control center. AeroLink Protection enables one of the AWK-3131A wireless clients to be on standby as a backup node in a different frequency (5 GHz) and take over within 300 ms if the primary device fails or if the link goes down.



### Why Moxa

- AeroLink Protection enables redundant network communication for maximum uptime
- Master/slave connection enables transparent PROFINET communication

### Moxa Product



**AWK-3131A**

802.11n wireless AP/client



Unbreakable Wireless Networks



## Wireless Control and Monitoring for Driverless Mining Trucks and Loaders

A global provider of mining automation solutions partnered with Moxa to develop state-of-the-art solutions that allow operators to control and monitor driverless trucks and loaders in underground tunnels from the safety of their control rooms using highly reliable wireless communication.

### System Requirements

- Seamless communication in underground mines
- Hardened devices for reliable performance in harsh environments
- Stable video streaming for live view of mine operations

### Moxa's Solution

A reliable and robust communication network is crucial to enable machine operators to remotely control the mining trucks and loaders from the comfort of their control center. The communication network must facilitate reliable real-time video and data communication between the mobile vehicles and the operator station.

Moxa's industrial-grade AWK-4131A clients were installed on each of the mining trucks and loaders to enable remote access of the vehicles from the operator station while AWK-4131A access points were installed along the tunnel walls to provide maximum coverage. The devices are vibration-proof, moisture-proof, operate reliably in extreme temperatures, and come with an IP68-rated housing.

The AWK-4131A clients onboard the vehicles uplink large volumes of data and stream live video from each of these driverless vehicles to the operator station through the wireless access network. The AWK-4131A clients provide fast roaming with handoff times under 150 ms to ensure seamless connectivity while the load-carrying vehicles are in motion.

The AWK-4131A APs provide 802.11n MIMO coverage on standard 2.4 GHz/5 GHz and 5 GHz DFS channels to maximize radio performance and to reduce interference caused by the hard rock walls of the mines.

The AWK-4131A supports AeroMag technology that enables greater efficiency, reliability, and ease in wireless network deployment, and also optimizes channel maintenance so that machine operators can focus on operating the vehicles remotely rather than worrying about communication time lag.

### Why Moxa

- IP68-rated enclosure for waterproof and dustproof protection
- Stable live video streaming coupled with 802.11n MIMO and 5 GHz DFS support
- Turbo Roaming for fast and secure data handover under 150 ms
- AeroMag for effortless network deployment

### Moxa Product

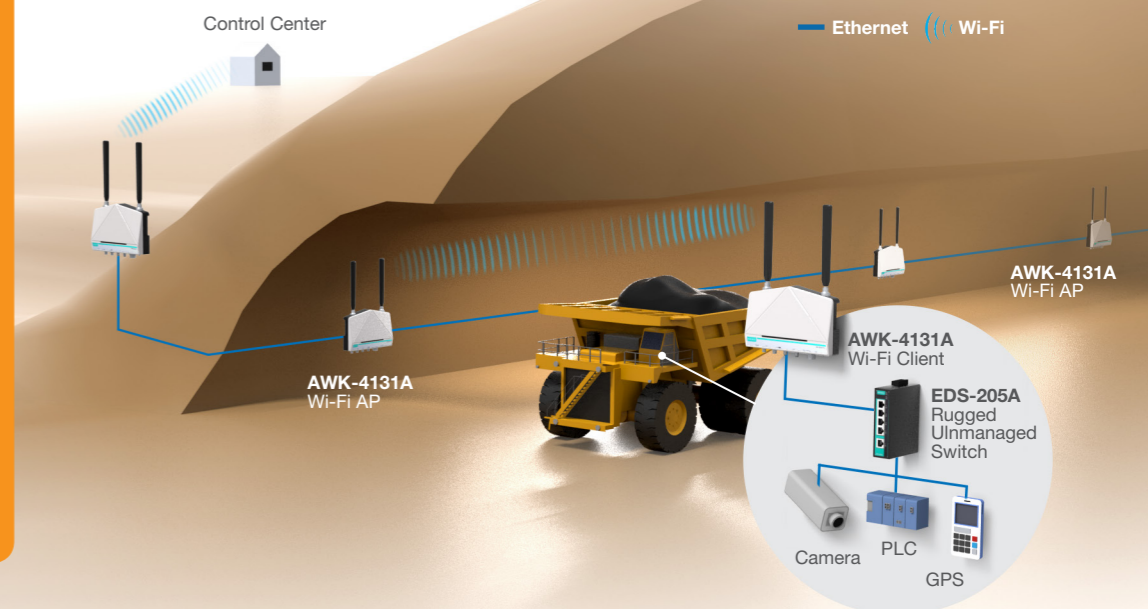


**AWK-4131A**

802.11n wireless AP/client with IP68-rated housing



AeroMag Technology: Fast and Easy Wi-Fi Network Deployment





## Video Transmission for Bus Surveillance

An urban bus system adopted onboard IP surveillance to enhance passenger safety. Each bus was equipped with several cameras that were set to record 20-minute 720P footage in the event of an incident. Event video would be transmitted over wireless to the control center when the bus returned to the parking depot.

### System Requirements

- Sufficient upstream bandwidth
- Wi-Fi access coverage at bus depot
- Weatherproofed wireless APs for outdoor applications

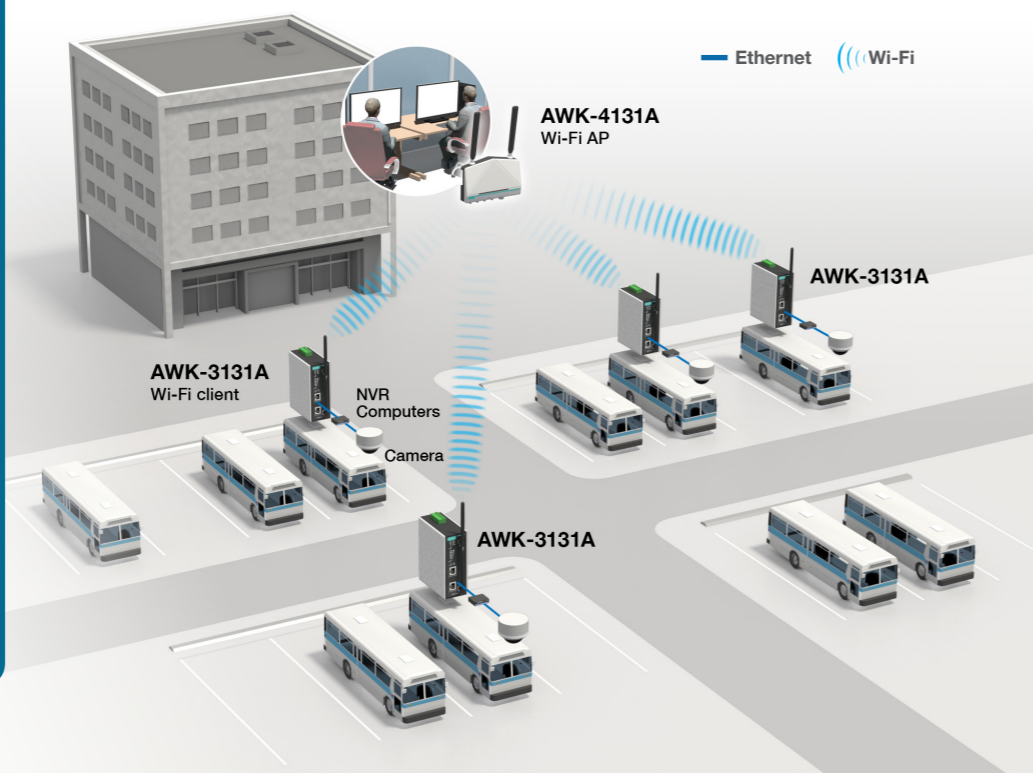
### Moxa's Solution

Moxa utilized IEEE 802.11n broadband technology to deploy the network required to backhaul the large volume of HD video data from the buses over wireless.

One AWK-3131A wireless client was installed in each bus to upload video from the onboard cameras over 802.11n when the bus returned to the depot. The AWK-4131A wireless APs were mounted onto the outer wall of the depot building to provide 802.11n MIMO coverage and enable access to broadband frequencies.

To ensure constant data throughput and seamless roaming, both the AWK-3131A and AWK-4131A feature Turbo Roaming, which helps mobile clients seek and stay connected to APs that provide optimal radio coverage and stable network access.

The outdoor AWK-4131A APs are key to ensuring network reliability. The waterproof corrosion-resistant design of the AWK-4131A and the IP68-rated enclosure protect the device from harsh outdoor conditions.



## LTE Cellular Broadband for Intelligent Transportation Systems

High-speed transportation poses a challenge to traffic control systems. To cope with this challenge, high-speed data communications were deployed to improve traffic flow management and reduce accidents. Moxa's LTE cellular solutions were used to upgrade the long-distance communication capabilities of intelligent transportation systems with 4G broadband, providing enhanced availability, security, and effortless maintenance.

### System Requirements

- Reliable 4G cellular connectivity for 24/7 data and video communication
- A single converged network solution used for all communication needs
- Uninterrupted connectivity with cybersecurity

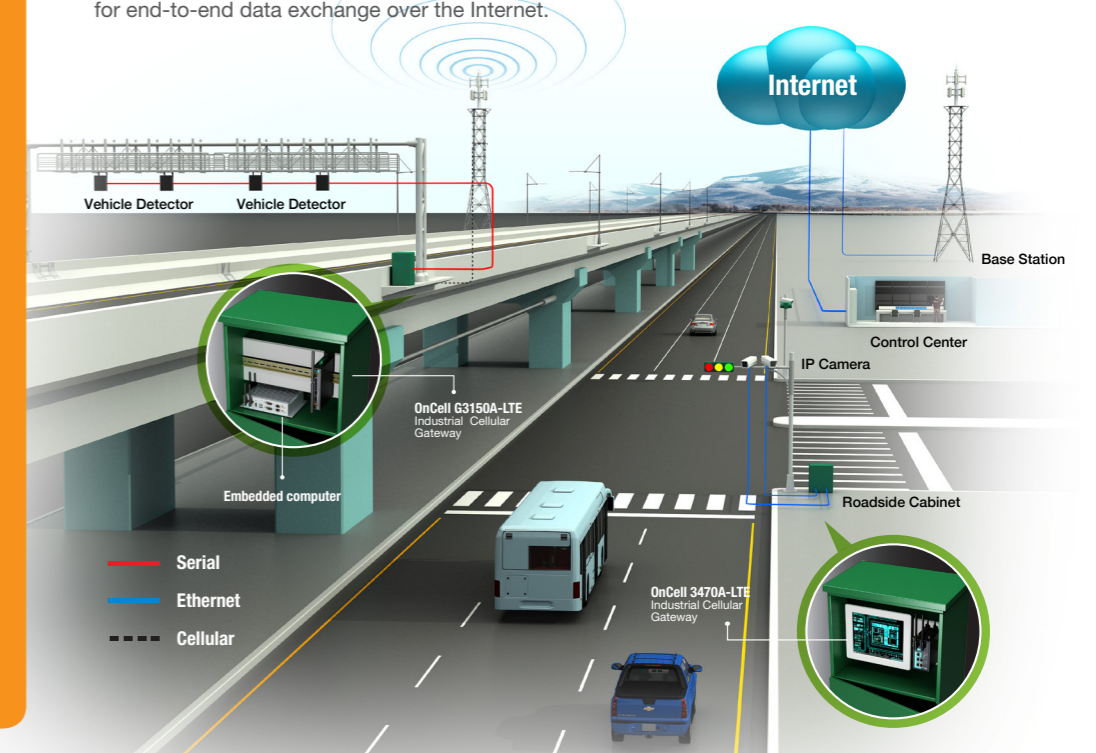
### Moxa's Solution

Moxa's LTE cellular solutions offer industrial-grade reliability and serial-over-cellular communication to streamline information collection and the complex integration required for intelligent transportation systems.

Moxa's OnCell G3150A-LTE cellular gateway was used to provide a serial-to-LTE connection to converge data, voice, and video collected from various road signs, signals, surveillance systems, and emergency systems into a single network. Alternatively, Moxa's OnCell G3470A-LTE cellular gateway can provide 4-port Gigabit and a 4G LTE cellular connection to combine additional data sources with high-volume video streaming, helping make traffic management more efficient.

Both the OnCell G3150A-LTE and the OnCell G3470A-LTE feature uninterrupted data transmission capabilities with dual SIM redundancy and GuaranLink connection checking to provide seamless cellular connectivity. OnCell G3150A-LTE also supports component-level security control and management based on IEC 62443 standards to secure data traffic and prevent hacking and unauthorized access to data.

The OnCell central manager (OCM) software enabled easy and secure remote access to cellular devices and helped system administrators build cost-effective and secure private IP connectivity for end-to-end data exchange over the Internet.



### Why Moxa

- IEEE 802.11n MIMO technology for up to 300 Mbps data uplink and broadband access
- IP68-rated enclosure for outdoor protection to reduce maintenance efforts
- Turbo Roaming for stronger signal coverage and AP load balancing

### Moxa Products



**AWK-3131A**  
802.11n wireless AP/client



**AWK-4131A**  
802.11n wireless AP/client with IP68-rated housing



How to Build Reliable, Responsive, Low-Cost Mobile Wi-Fi Networks for the Industrial Internet of Things

### Why Moxa

- 4G-LTE broadband connectivity
- Connection redundancy with dual SIM and GuaranLink technology
- Flexible serial/Ethernet-to-cellular links for ITS network integration
- Web-based OCM tool for easy and secure remote management

### Moxa Products



**OnCell G3150A-LTE Series**  
Cellular gateway with serial connectivity



**OnCell G3470A-LTE Series**  
Cellular router with 4-port Ethernet switch connectivity



The Top 3 Considerations to Choosing an Industrial LTE Solution



## Serial Over LTE for Scalable Power Distribution Monitoring

Feeder terminal units (FTU) are crucial for power distribution automation and can help provide instant notification about the location of a fault in a critical power distribution system. Moxa's LTE-based cellular solutions provide high-speed and reliable communication between FTUs and FRTUs (Feeder Remote Terminal Units) located at a remote control center to prevent the power grid from failing due a fault in the FTUs.

### System Requirements

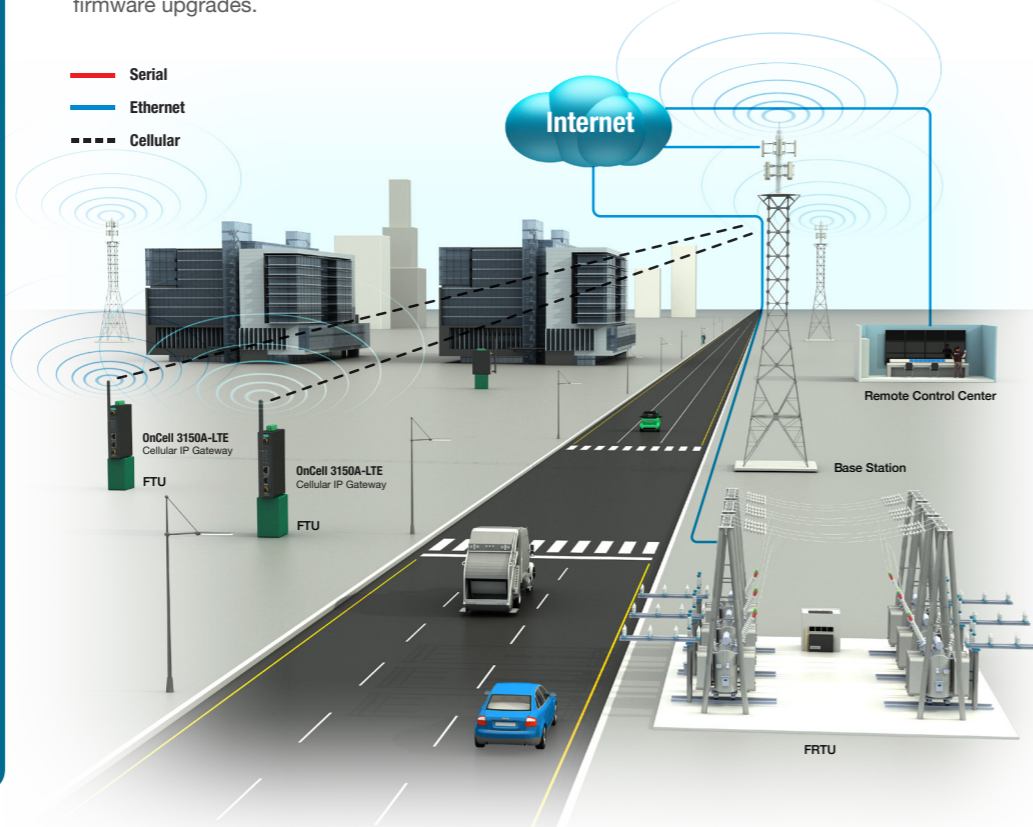
- A scalable IP-based solution for data communication between the FRTUs and the FTUs
- Maximum uptime with self-healing redundancy
- Serial and Ethernet interfaces for integration of legacy equipment

### Moxa's Solution

Electric power distribution networks are expanding to keep pace with growth in urban areas. Moxa's LTE cellular solutions provide reliable and secure connectivity with global LTE coverage to facilitate future scalability. Featuring a compact form factor, dual power inputs, and a high level of EMS immunity, OnCell G3150A-LTE cellular gateways are perfect for installing at FTUs to establish solid LTE cellular connections to and from the control center.

OnCell G3150A-LTE gateways provide serial and Ethernet ports, making it easy to accommodate both serial-based and Ethernet-based equipment into a broadband cellular network for centralized data control and monitoring. Their serial-to-cellular IP connectivity simplifies collaboration with legacy systems at no extra cost.

To ensure cellular reliability and maximum uptime, the OnCell G3150A-LTE comes with dual SIM slots for redundant cellular service, and a GuaranLink that enables a four-tier connection check and real-time alerts in the event of link failures. The OnCell G3150A-LTE can also accept SMS commands sent by users via the OnCell Central Manager for remote reboot, reconnection, and firmware upgrades.



## Secure Cellular Communication for Water-Treatment Applications

Water treatment systems require constant monitoring to ensure the safety and quality of drinking water. The network coverage for these systems must span a wide area so that city authorities can monitor the treatment and distribution processes, collect data from the devices, and analyze the data collected. The results of the analysis can be used to manage the quality of water and improve system operations. Moxa's LTE solutions provide high network capacity and coverage for efficient control and monitoring of water treatment plants and help protect the utility network from cyberattacks.

### System Requirements

- Secure connectivity for critical water safety
- Internet access for centralized management and control
- Easy troubleshooting for connectivity

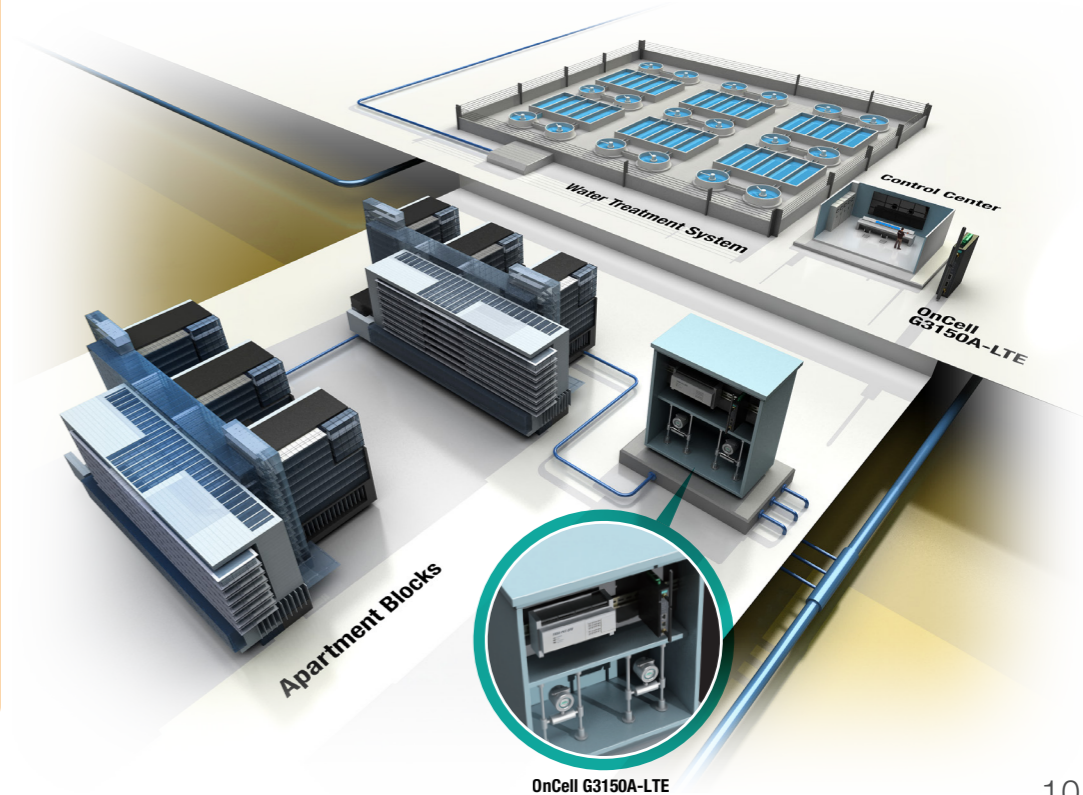
### Moxa's Solution

In a water treatment system, thousands of water quality parameters have to be measured and monitored as raw water goes through the treatment/purification process. OnCell G3150A-LTE gateways provide excellent LTE coverage and versatile serial and Ethernet connections to collect data over LTE cellular networks.

On the hardware side, the OnCell G3150A-LTE complies with the IEC 62443-4-2 cybersecurity standards defined for Industrial Automation and Control Systems (IACS) and has built-in security functions that facilitate protection of critical industrial control systems such as water-treatment systems.

The OnCell G3150A facilitates secure remote access through OnCell Central Manager (OCM) for efficient system operation. The OCM tool also provides centralized private IP connections that enable easy device management, secure data exchange, and device access control over the Internet.

The OnCell G3150A-LTE is easy to maintain in the field with LED indicators on the front panel showing the current signal strength and cellular mode status. System operators in a control center can use SMS commands to reset the device via the OCM platform.



### Why Moxa

- IP-based cellular architecture for scalable network expansion
- Transparent serial and Ethernet connections for flexible device integration at the FTUs
- Supports SMS commands for remote reboot, reconnect, and firmware upgrades

### Moxa Product



**OnCell G3150A-LTE Series**  
Cellular gateway with serial connectivity



Remote Access Made Secure and Easy

### Why Moxa

- Device-embedded security capability and private IP management via OCM utility
- Transparent serial and Ethernet connections for versatile data collection
- Easy maintenance with LED indicators for local check and web-based remote monitoring through the OCM interface

### Moxa Product



**OnCell G3150A-LTE Series**  
LTE cellular gateway with serial connectivity



Choosing a Cellular Network Management Solution that Works for You