Using Centralized Wi-Fi Network Management to Optimize Crane Operations in a Steel Plant
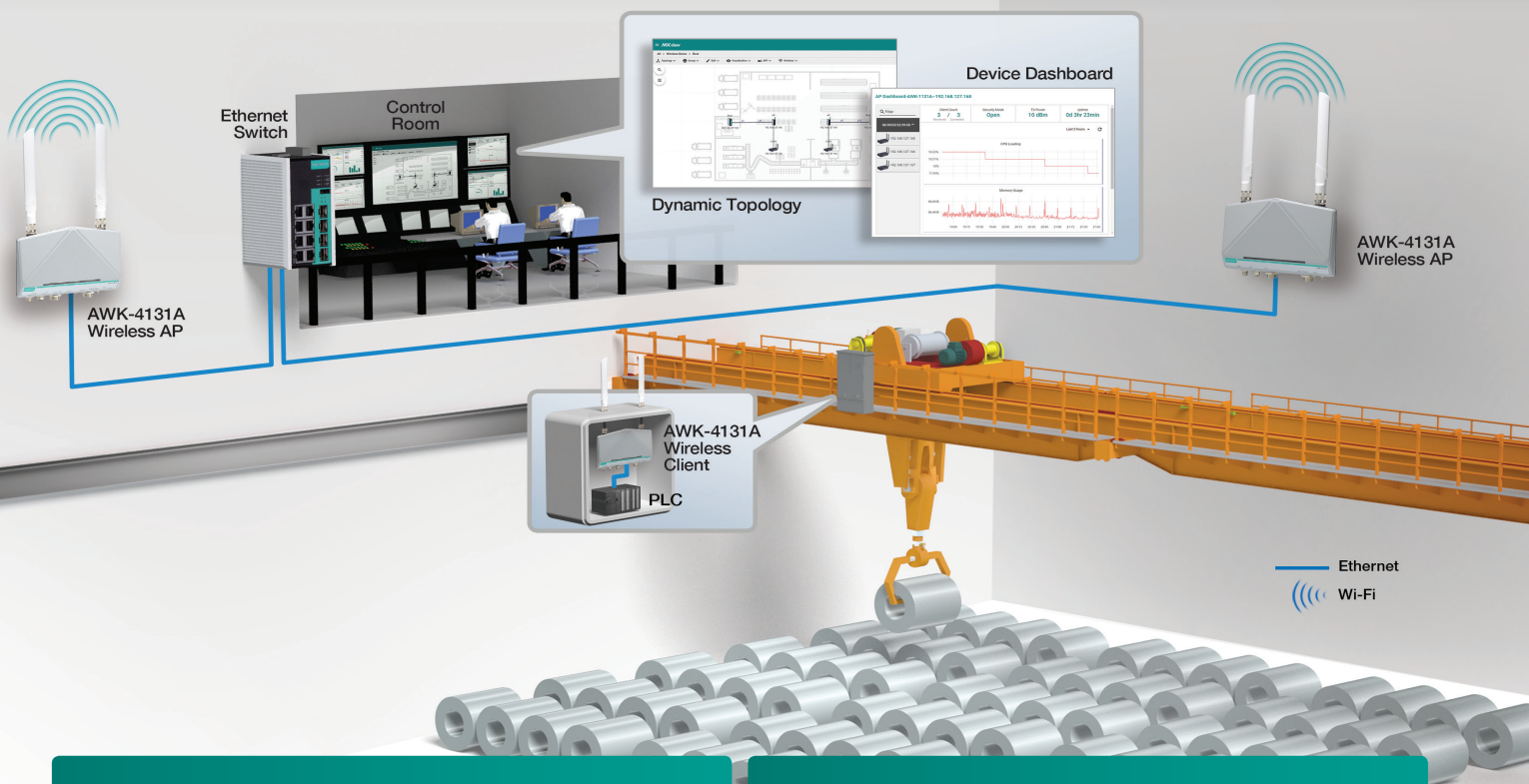
Location: **China**

Application:

Cranes

Customer Requirements

- Seamless transition to digital operations to increase operational efficiency
- The ability to monitor and manage the on-site wireless network in real-time
- Rugged design to protect network devices against wireless interference

Moxa's Advantages

- Integrated industrial wireless solution consisting of robust hardware and accessible software, tailored for automated material handling (AMH) applications
- Network management software to visualize the Wi-Fi network status for easy management
- Rugged wireless devices with fast roaming features

Device Dashboard

Dynamic Topology

Control Room

Ethernet Switch

AWK-4131A Wireless AP

AWK-4131A Wireless AP

AWK-4131A Wireless Client

PLC

— Ethernet

≈ Wi-Fi

Project Background

In the steel industry, workers often manually operate heavy-duty cranes to move steel between temporary storage and delivery transport. Operating these cranes is difficult, dangerous, and inefficient. To improve safety, increase operational efficiency, and lower costs, a big steel plant in China looked for a solution to upgrade its plant with automated cranes that are managed through a central control hub.

The plant operator decided to use a wireless network to operate the cranes. The operating environment inside the plant is very demanding as equipment is constantly exposed to electromagnetic interference, heavy vibration, and dust which can easily affect wireless signals. Any disruption on the factory floor could result in significant business loss. To ensure operations run smoothly, the plant needed both reliable software that would allow the engineers to closely monitor and manage the wireless network in real-time and industrial-grade hardware that was rugged enough to withstand the tough environmental conditions.

System Requirements

- Easy-to-use, centralized network management software for swift and easy troubleshooting
- The ability to visualize the invisible wireless connections to ensure wall-to-wall Wi-Fi connectivity
- Industrial-grade hardware that can withstand severe electromagnetic interference, vibration, and dust

MOXA®

Moxa's Solution

To help the plant transition to intelligent wireless crane systems, Moxa provided an integrated industrial wireless solution including robust hardware and easy-to-use network management software, tailored for automated material handling (AMH) applications.

To control the crane hook remotely, a total of 23 AWK-4131A APs were mounted across the factory floor to transmit control data from the management center to 26 AWK-4131A client devices connected to PLCs installed inside the crane system. Moxa's highly durable AWK-4131A Series wireless AP/Clients are compliant with industrial standards and certifications covering operating temperature, power input voltage, ESD, and vibration, making them capable of withstanding the harsh operating conditions in the plant.

The Wireless add-on for Moxa's MXview network management software provided plant engineers with the capability to monitor and manage the invisible wireless network in real-time from a central location to ensure wall-to-wall Wi-Fi connectivity throughout the plant. From the dynamic topology view, engineers could see the most-recent status of the wireless crane connections at a glance. The wireless device summary provided important information for all devices such as the channels used and the AP-Client connection information. Furthermore, MXview Wireless let engineers build an early warning mechanism to avoid unexpected downtime. Engineers configured performance thresholds based on long-term observations and requirements. When thresholds were exceeded, real-time alerts notified the engineers of the anomaly immediately. In the control center, staff could call up detailed device information including signal strength and consult AP and Client device dashboards with performance charts to understand the status of the network and make adjustments where necessary. In addition, MXview Wireless allowed engineers to play back the roaming history of a client up to 30 days to review an incident to identify and fix the root cause of the problem quickly. Plant engineers no longer had to rely on maintenance providers, but were now able to troubleshoot the crane system themselves. These improvements significantly reduced the cost of troubleshooting and the risk of downtime.

By introducing Moxa's integrated industrial wireless solution, the steel plant was able to seamlessly transition into intelligent wireless operations. Additionally, the plant's productivity and operational efficiency both increased while the total cost of ownership dropped.

Benefits

- MXview and MXview Wireless add-on module for better wireless network management
  - Visualize invisible wireless signals
  - Individual device dashboards with detailed information and performance charts
  - Roaming playback to review client roaming history and identify issues

- AWK-4131A Industrial Wireless AP/Client for reliable wireless network infrastructure
  - IP68-rated housing protects the device from dust and other foreign particles
  - Antenna and power isolation design helps protect against electrical interference
  - Millisecond-level client-based Turbo Roaming for smooth connection handovers

Featured Products

MXview and MXview Wireless Add-on Module
Industrial network management software

http://www.moxa.com/product/MXview.htm

AWK-4131A
Outdoor industrial IEEE 802.11a/b/g/n wireless AP/bridge/client

http://www.moxa.com/product/AWK-4131A.htm

Learn more

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Learn more about our wireless solutions on Moxa's website.

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Building a Reliable Wireless Network at a Cargo Port for Automatic Material Handling Systems
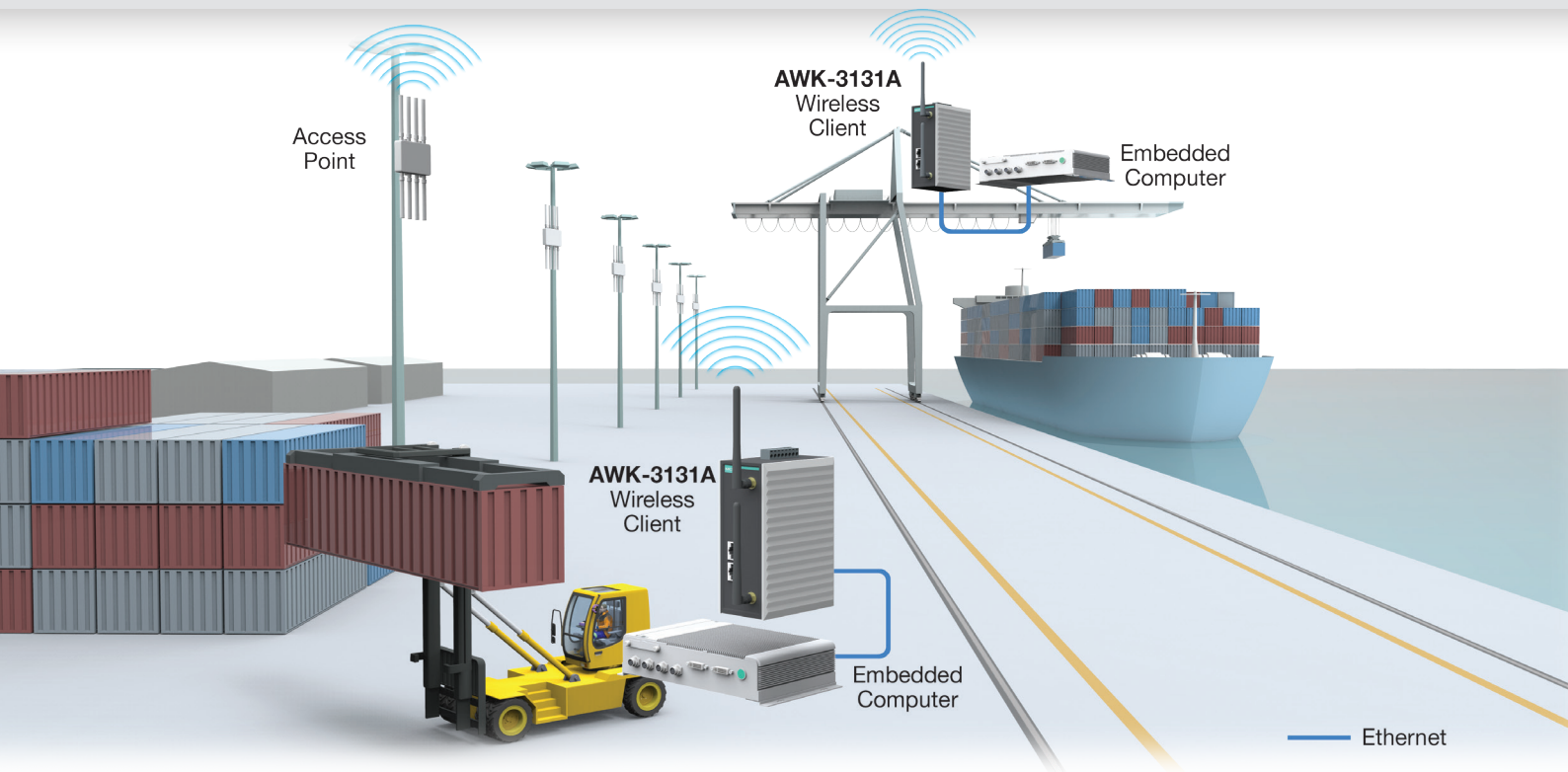
Location: **Mexico**

Application:

Forklifts and Cranes

Customer Requirements

- Devices with a compact form factor for installation in forklifts and cranes
- A wireless solution that can be implemented within the limited budget available
- Ability to interoperate with 3rd party access points (APs) and establish stable connections

Moxa's Advantages

- Compact devices that make it easy to add Wi-Fi capabilities to forklifts and cranes
- Cost-effective wireless solutions
- Capability to integrate 3rd party APs into the network and provide reliable connectivity

Access Point

AWK-3131A Wireless Client

Embedded Computer

AWK-3131A Wireless Client

Embedded Computer

Ethernet

Project Background

Automated material handling (AMH) systems are widely used in cargo ports for efficient handling of containers and pallets. Forklifts and rubber-tyred gantry cranes are the two most common types of AMH equipment used in cargo ports.

In this study, we describe how a cargo port in Mexico has improved the operational efficiency of its AMH systems by deploying reliable wireless networks using Moxa's AWK-3131A clients. Operators in the control center can now receive the real-time statuses of both the AMH systems and the cargo that the operators handle. This real-time status information helps the cargo port monitor and control its AMH equipment better, thereby increasing operational efficiency.

System Requirements

- Wireless devices with a compact form factor for easy integration into machines
- Reliable wireless connection with 3rd party APs
- Easy network expansion in the future
- Industrial-grade design for operational efficiency in harsh environments

MOXA®

Moxa's Solution

The port facility spans hundreds of hectares consisting of waterways, docks, and storage areas. Several AMH systems, such as gigantic forklifts and cranes, operate in the storage area to retrieve and store containers. The key to efficient cargo management is ensuring that these AMH systems find and pick up cargo from the correct location, and transport it to the loading docks without any delay. In order to do that, the barcode and GPS information of the cargo containers need to be transmitted between the AMH systems and the control center in real time. The network devices deployed on the forklifts and cranes in the AMH systems should be able to maintain a stable connection with the wireless network in spite of constant movement and vibration. A total of one hundred and fifty of Moxa's AWK-3131A wireless clients were installed inside the forklifts and cranes operating in the port facility to ensure uninterrupted connectivity for the port's AMH equipment.

Wireless client devices with a compact form factor were necessary so that they could be installed in space-constrained cabinets inside forklifts and cranes. Moxa's AWK-3131A wireless clients have a compact form factor that lends itself to installation in such restricted spaces, while the rugged design minimizes the effects of industrial vibration and interference from other equipment. The NAT function in the devices ensures easy network expansion in the future. In addition, the AWK-3131A wireless clients can interoperate with 3rd party access points installed on top of light poles to provide seamless connectivity.

Moxa's AWK-3131A wireless clients provide excellent functionality at an affordable price, making it an ideal solution for our customers.

Benefits

- Devices with a compact form factor that can be installed inside machines
- Seamless interoperability with 3rd party APs to ensure reliable wireless connections
- NAT function for easy network expansion
- Dual-isolation design to protect power inputs and antenna ports from EMI
- IEC 60068-2-6 certified devices that can operate in environments with constant vibration
- MIMO technology to maximize Wi-Fi coverage

Featured Products

AWK-3131A
Industrial IEEE 802.11a/b/g/n wireless client

↗ http://www.moxa.com/product/AWK-3131A.htm

Learn more

White Paper
Five Critical Elements of Uninterrupted Wireless Connectivity for AS/RS and AGV Systems

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Building Reliable Wireless Networks for Automobile Factories Using Radiating Cables

Location: **China**

Application:

AGVs for assembly lines

Customer Requirements

- Build a reliable wireless network in space-limited environments
- Ensure stable wireless connections for system operation
- Rugged design to protect devices against wireless interference

Moxa's Advantages

- Comprehensive wireless solutions for radiating-cable applications
- Power and antenna isolation to prevent interference
- Cost-effective wireless solutions

Control Center

Ethernet Switch

PLC

AWK-3131A
Wireless AP

AWK-1131A
Wireless Client

PLC

Ethernet
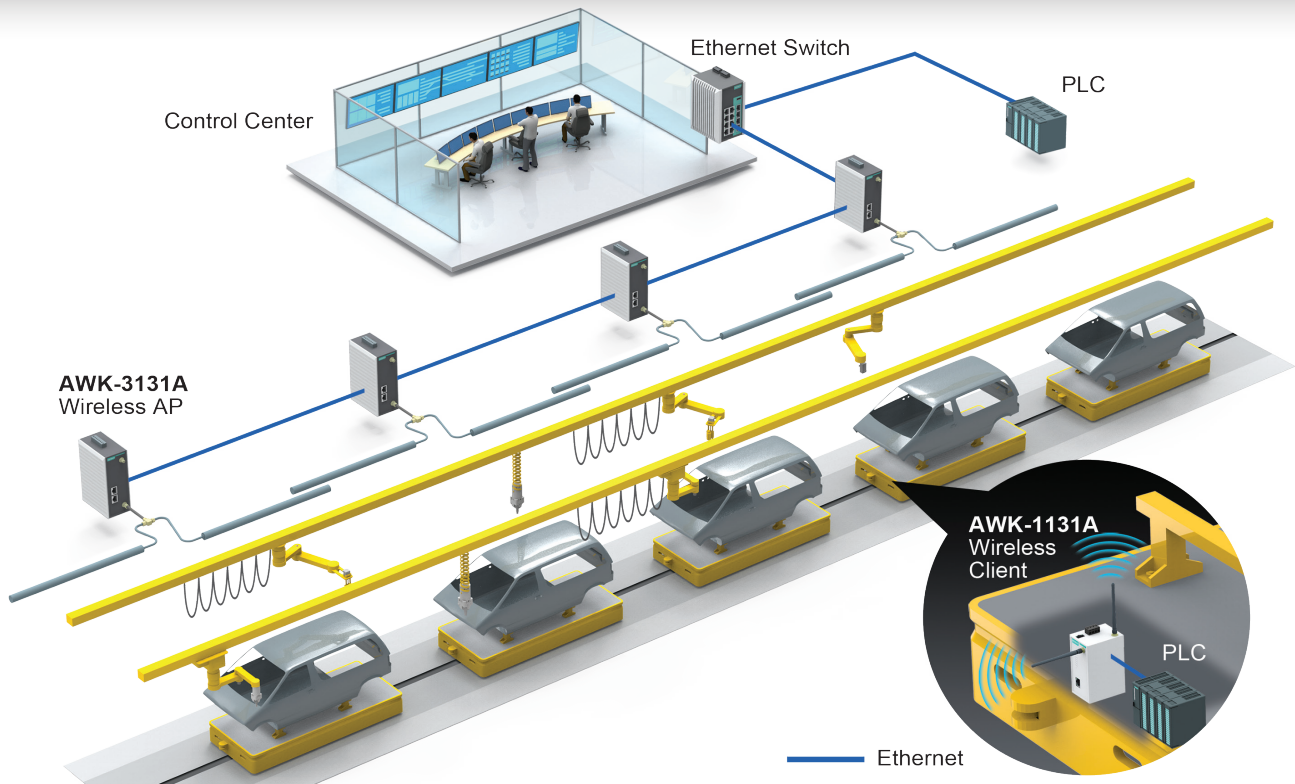
Project Background

An automobile manufacturer in China requires a large automotive assembly line to ensure efficiency and precision at each stage in the production process. Each assembly line has several AGVs that are used to move automobile parts, one-by-one, to the next assembling stage. The manufacturer wants to build a wireless network between the control center and the AGVs for data transmission. Due to the harsh operating environment and the limited space available for deploying the wireless network, the manufacturer must build a wireless solution using radiating cables to minimize signal interference and provide consistently strong wireless signals along the production line.

System Requirements

- Provide a comprehensive wireless network plan for a radiating-cable installation
- Rugged design to protect against EMI interference
- Reliable yet cost-effective wireless solution

MOXA®

Moxa's Solution

The automobile factory in China has two automotive assembly lines, each 400 meters in length. Several AGVs operate in these two production lines to carry unfinished automobile parts from one assembly stage to the next. A PLC is installed in each of these AGVs to receive control signals and process data from the control center. Developing a reliable wireless network that can relay instructions from the control room to the AGVs is the key to ensuring smooth operation of the AGVs and the production line.

The key challenge in this project is providing consistently strong wireless coverage over a wide area with space constraints. Moxa, with its years of experience in developing wireless networks for a variety of applications, offers customers a radiating-cable wireless solution that ensures strong wireless coverage over a wide area and stable connections in space-constrained environments. Tests conducted using radiating cables and Moxa's AWK-3131A wireless AP have achieved stable wireless transmission performance that make it possible to reliably transmit control data from the PLC in the control center to the AWK-1131A wireless clients connected to PLCs installed on the AGVs in the production line.

In addition, the dozens of AWK-3131A wireless APs and AWK-1131A wireless clients installed in the production facility are built on a dual isolation design that protects both the power input and RF module against EMI interference.

Moxa's solution provides ruggedized wireless design, reliable wireless communication testing, and a cost-effective wireless solution so that the automobile factory can enjoy smooth operation day in and day out.

Benefits

- Experience in developing reliable wireless networks with radiating cables
- Antenna and power isolation design to protect against EMI interference
- Vibration-proof design for constantly mobile operations
- 2 x 2 MIMO technology for wireless coverage over a wide area

Featured Products

AWK-3131A
Industrial IEEE 802.11a/b/g/n wireless AP

http://www.moxa.com/product/AWK-3131A.htm

AWK-1131A
Entry-level industrial IEEE 802.11a/b/g/n wireless client

http://www.moxa.com/product/AWK-1131A_Series.htm

Learn more

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Uninterrupted Wireless Connectivity for Smooth Operations in a Beverage Factory

Location: **Taiwan**

Application:

AS/RS

Customer Requirements

- Fast roaming for continuous data transmission from shuttle systems to a control center
- Seamless connectivity between APs and clients
- Fast and easy wireless device setup

Moxa's Advantages

- Millisecond-level handoff provided by Turbo Roaming technology for efficient operation of moving equipment
- High device interoperability to ensure smooth data transmission
- Easy-to-use web UI enables fast device setup
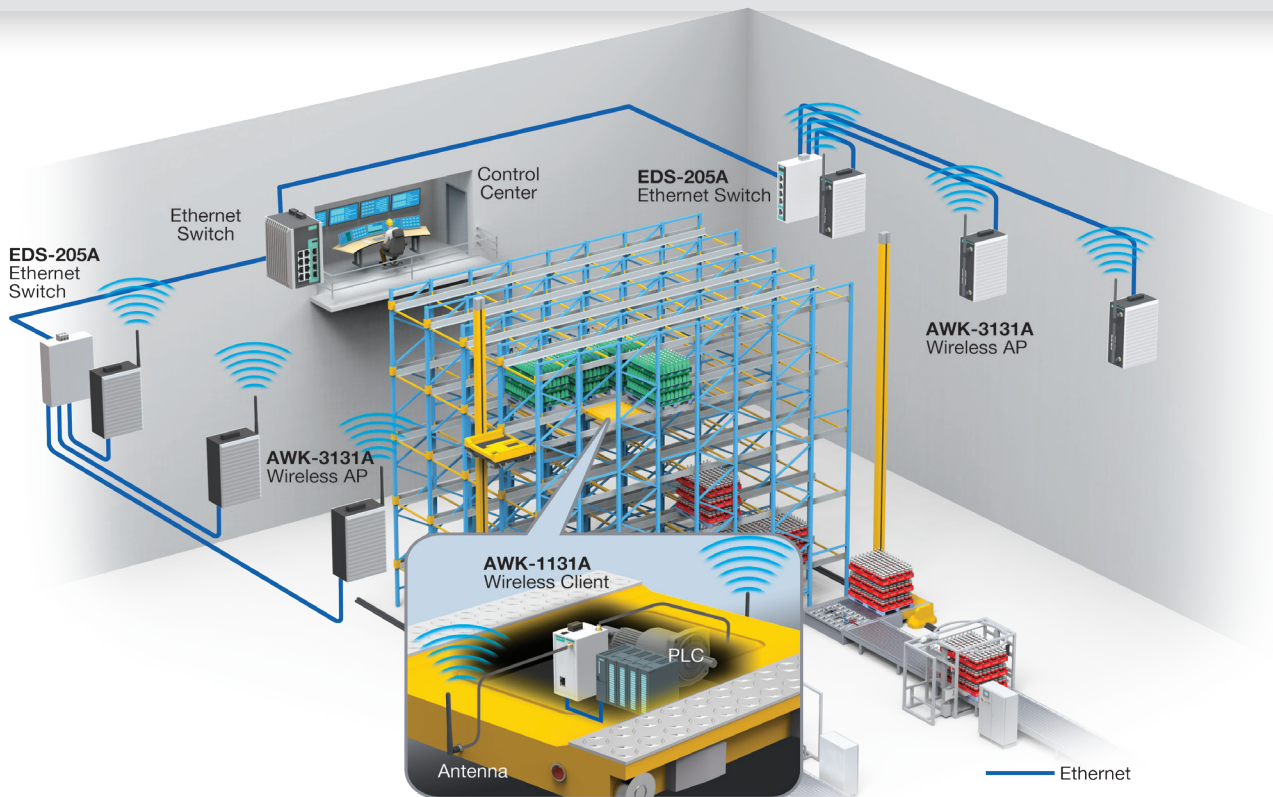
Project Background

To increase efficiency in factories, wireless technology is essential to communicate with automatic mobile equipment, such as shuttle systems, so that they can easily move around the AS/RS systems. A large beverage manufacturer in Taiwan installed AS/RS systems in their factory to increase the efficiency of storage and retrieval of goods. To ensure smooth system operations, wireless devices are required to transmit data from the moving shuttle systems to an on-site control center.

The beverage manufacturer turned to Moxa for a solution that can provide stable and seamless wireless communications for mobile operations because their existing wireless devices could not ramp up to meet their needs.

System Requirements

- Able to deliver seamless wireless connectivity even when the shuttle systems are moving around
- Stable wireless connection between AP and clients to ensure timely data transmission
- Easy wireless device setup process to speed up device installation

MOXA®

Moxa's Solution

A renowned beverage company—which owns numerous factories around the world that produce, pack, store, and distribute beverages—has installed automatic materials handling systems, such as AS/RS and automatic conveyors, inside their factories to enhance process efficiency. The shuttle systems used in the AS/RS are constantly on the move to store goods from the production line and retrieve them from shelves when they are ready for shipment. Monitoring the status of shuttle systems can help operators quickly identify problems and find a solution when there is an emergency. To receive data in real time, a wireless client is installed on each shuttle system to collect data from the Siemens PLC that controls the AS/RS. The data is then transmitted to a control center through a wireless AP.

However, the existing wireless system was not stable enough to deliver data reliably. The system integrator who helped this operator deploy the AS/RS system was looking for a better wireless solution. Moxa, having established its sincere service and quality credentials in a previous collaboration with the system integrator, was approached for this project.

In this project, 10 AWK-1131A wireless clients were installed inside the shuttle systems and 16 AWK-3131A wireless APs were mounted on fixed poles in the AS/RS systems to receive information from the moving shuttles and transmit it to a control center through our EDS-205A Ethernet switches. In the device setup stage, Moxa wireless devices offered an easy to understand web UI that helped speed up the wireless device configuration for operators. During operation, seamless connection to the mobile shuttle systems was achieved through Moxa's client-based Turbo Roaming technology, which provides fast roaming between APs, and through high interoperability between the AWK-1131A wireless client and AWK-3131A wireless AP. Finally, Moxa's sincere service helped the manufacturer/operator achieve project success, increasing customer satisfaction.

Benefits

- Millisecond-level Turbo Roaming technology ensures seamless mobile operation
- Easy-to-use web UI makes device setup fast and easy
- Power and antenna isolation design ensures uninterrupted wireless connectivity
- Vibration-proof design ensures device connectivity during constantly mobile operation

Featured Products

AWK-3131A
Industrial IEEE 802.11a/b/g/n wireless AP

http://www.moxa.com/product/AWK-3131A.htm

AWK-1131A
Entry-level industrial IEEE 802.11a/b/g/n wireless client

http://www.moxa.com/product/AWK-1131A_Series.htm

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Reliable Wireless Network for Live Video Streaming from Cameras Installed on Forklifts

Location: **Italy**

Application:

Forklift

Customer Requirements

- Easy-to-deploy wireless devices for installation on forklifts
- Ability to seamlessly connect with 3rd party APs
- Sufficient Wi-Fi bandwidth for live video streaming

Moxa's Advantages

- Smart client-router mode simplifies deployment of devices in forklifts
- Device interoperability for smooth connection with existing 3rd party APs
- Up to 300 Mbps data rate for video-streaming applications
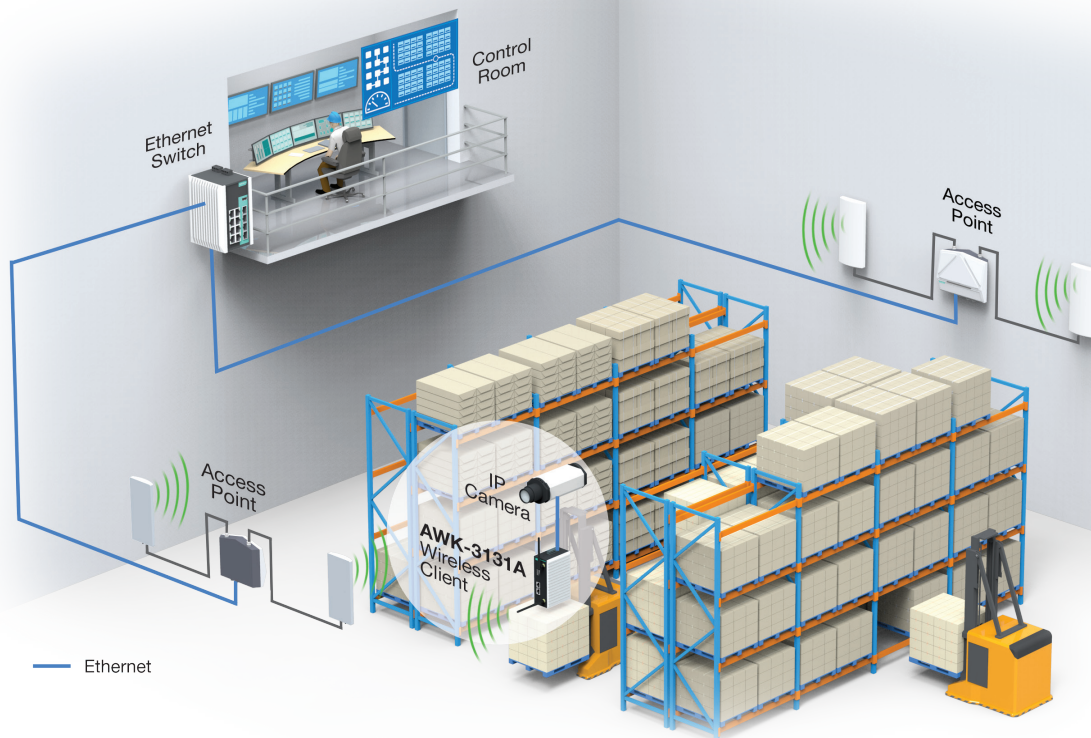
Project Background

A forklift manufacturer in Italy, with many years of experience in helping customers enhance logistic efficiency with innovative storage and retrieval systems, recently upgraded the surveillance systems on its forklifts to provide real-time on-site monitoring capabilities to customers.

To deliver live video streaming capabilities, the storage and retrieval system manufacturer needs wireless devices that are easy to deploy in existing networks and that can continuously transmit high-quality video data.

System Requirements

- Support client-router mode in wireless clients to simplify installation
- Support interoperability of wireless clients with existing 3rd party APs
- High-bandwidth wireless network to continuously transmit live video recording from cameras deployed on forklifts to a control center

MOXA®

Moxa's Solution

Forklifts are used in a warehouse to store and retrieve goods such as food, beverages, paper, and pharmaceuticals. To provide an operator in the warehouse control room with a better picture of the on-site operations, a forklift manufacturer wants to add surveillance cameras on board the forklifts so that the operator can monitor the movement of goods. Over 200 forklifts installed with surveillance cameras need a reliable wireless network to ensure live streaming of video to the control center. To achieve this, each IP camera onboard the forklifts is connected to an AWK-3131A wireless client, which transmits real-time video data to the control center.

Moxa's AWK-3131A supports the client-router mode, which eliminates the need for an extra switch thereby simplifying the installation of devices. The AWK-3131A can operate with third-party APs making it easy to deploy them in existing wireless networks and to connect them to the SCADA system in the control center.

The AWK-3131A supports the 802.11n standard to provide data rates of up to 300, which is ideal for live video streaming over a wireless network. Turbo Roaming technology enables millisecond-level handoff for AWK-3131A wireless clients ensuring continuous wireless connectivity so that the forklifts can perform their tasks more efficiently.

Benefits

- Client-router mode in devices to simplify network deployment
- Interoperability with existing 3rd party APs
- Data rates up to 300 Mbps for video-streaming applications
- 150 ms client handoff with Turbo Roaming technology

Featured Product

AWK-3131A
Industrial IEEE 802.11a/b/g/n wireless AP/client

http://www.moxa.com/product/AWK-3131A.htm

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802.11 n

Turbo Roaming

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Seamless Video Streaming over Wireless Networks in Cold Storage Warehouses

Location: **Japan**

Application:

Automated Storage and Retrieval System

Customer Requirements

- Stable Wi-Fi connections in harsh operating environments
- Sufficient Wi-Fi bandwidth to support video streaming
- Ability to withstand sub-zero operating temperatures

Moxa's Advantages

- DFS certified network devices to ensure noise-free Wi-Fi channels
- Up to 300 Mbps data rate for video transmissions
- -40 to 75°C wide operating temperature range
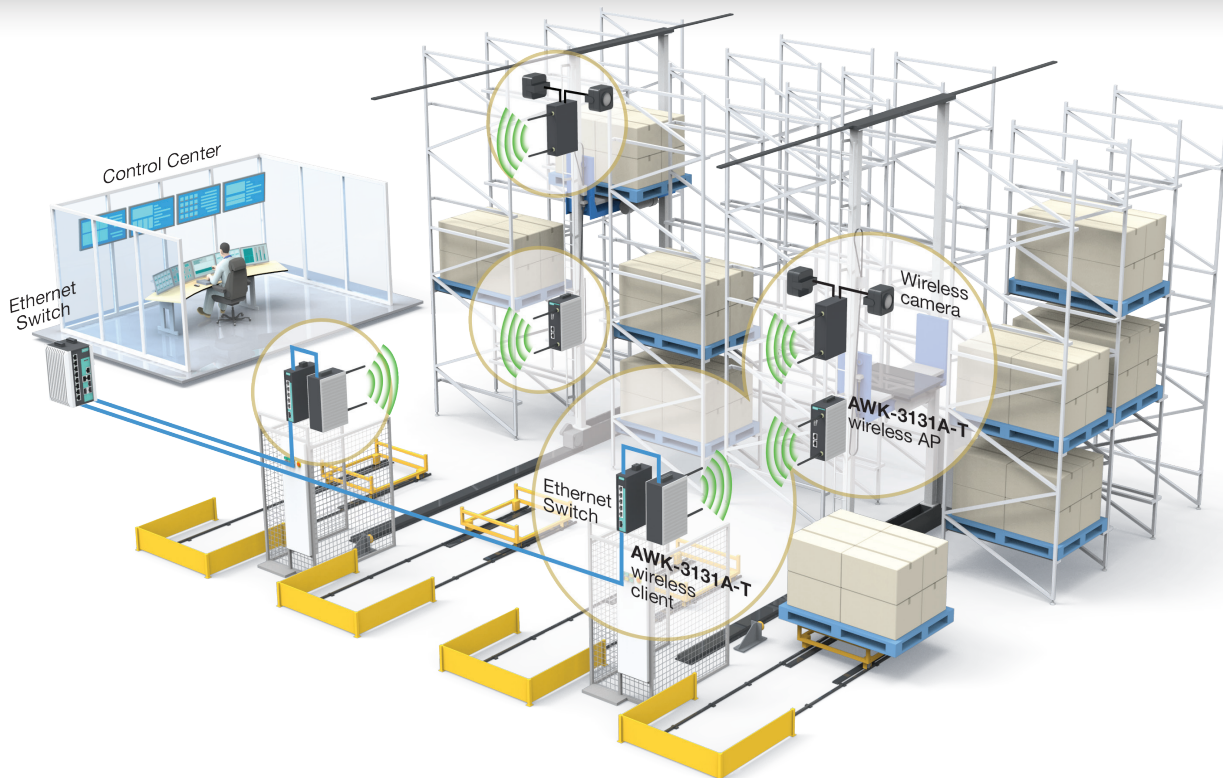
Project Background

To ensure smooth running of their warehouse operations, a Japanese cold storage warehouse company requires 24/7 surveillance to monitor their automated storage and retrieval system (AS/RS). Each AS/RS consists of 10 sets of cranes that move goods, such as food and medicine, in and out of warehouse shelves. A high-bandwidth wireless network is required to continuously transmit video data to the control center from IP cameras that are mounted on mobile cranes in the AS/RS. In order to build and maintain a reliable wireless network, the network devices need to be able to withstand the sub-zero temperatures in the cold storage warehouses and perform in an environment with constant noise and vibration interference.

System Requirements

- Stable Wi-Fi signals to ensure seamless video transmission via a wireless network
- Ability to operate in the sub-zero environment of a cold storage warehouse
- High-bandwidth network to ensure continuous transmission of video data from IP cameras in the warehouses to a control center

MOXA®

Moxa's Solution

In order to transmit real-time video data to the control center, an AWK-3131A wireless AP is mounted on each crane system in the AS/RS to connect with all the wireless cameras in the system. An AWK-3131A wireless client is installed on a pole located in front of each crane system to receive video data from the AP. An Ethernet switch transmits the video data for the wireless clients in the AS/RS to a control center.

To enable the wireless clients to continuously transmit video data to the control center, the wireless network must support three critical elements. First, the APs in the network must be able to maintain strong Wi-Fi signals in harsh industrial environments. Wi-Fi signals from other sources can cause interference in a network leading to unstable Wi-Fi connections. Moxa's AWK-3131A wireless devices not only support 802.11n 2x2 MIMO technology for optimized Wi-Fi coverage, but are also DFS-enabled for connections on a 5 GHz channel, which reduces your dependency on the weak Wi-Fi signals in overcrowded 2.4 GHz channels. Second, the wireless devices need to operate in the sub-zero temperatures of a cold storage warehouse. The environment of a cold storage warehouse needs to be constantly maintained at a low temperature to preserve the quality of the goods stored. Moxa's AWK-3131A wireless devices can withstand temperatures as low as -40°C and hence are ideal for warehouse refrigeration applications. Finally, the wireless network must support video-over-wireless with high-bandwidth continuous transmission of video data. Moxa's AWK-3131A supports data rates of up to 300 Mbps for high-bandwidth video transmission.

Benefits

- 5 GHz DFS support for a noise-free Wi-Fi channel connection
- 802.11n 2x2 MIMO technology for Wi-Fi coverage over a wide area
- -40 to 75°C operating temperature range
- Data rates of up to 300 Mbps for video transmissions

Featured Product

AWK-3131A-T
Industrial IEEE 802.11a/b/g/n wireless AP/client

http://www.moxa.com/product/AWK-3131A.htm

Learn more

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Smart Wireless Sends Warehouses Into Smart Territory

Location: **Japan**

Application:

Automated Guided Vehicles

Customer Requirements

- Fast roaming time under 200 milliseconds
- The ability to configure roaming sensitivity to adapt the same solution in different-sized factories
- Industrial-grade design to withstand harsh environments

Moxa's Advantages

- Turbo Roaming supports 150-ms roaming time
- The ability to adjust roaming parameters to fulfill different roaming requirements
- Dual isolation protects power and RF ports from inrush current
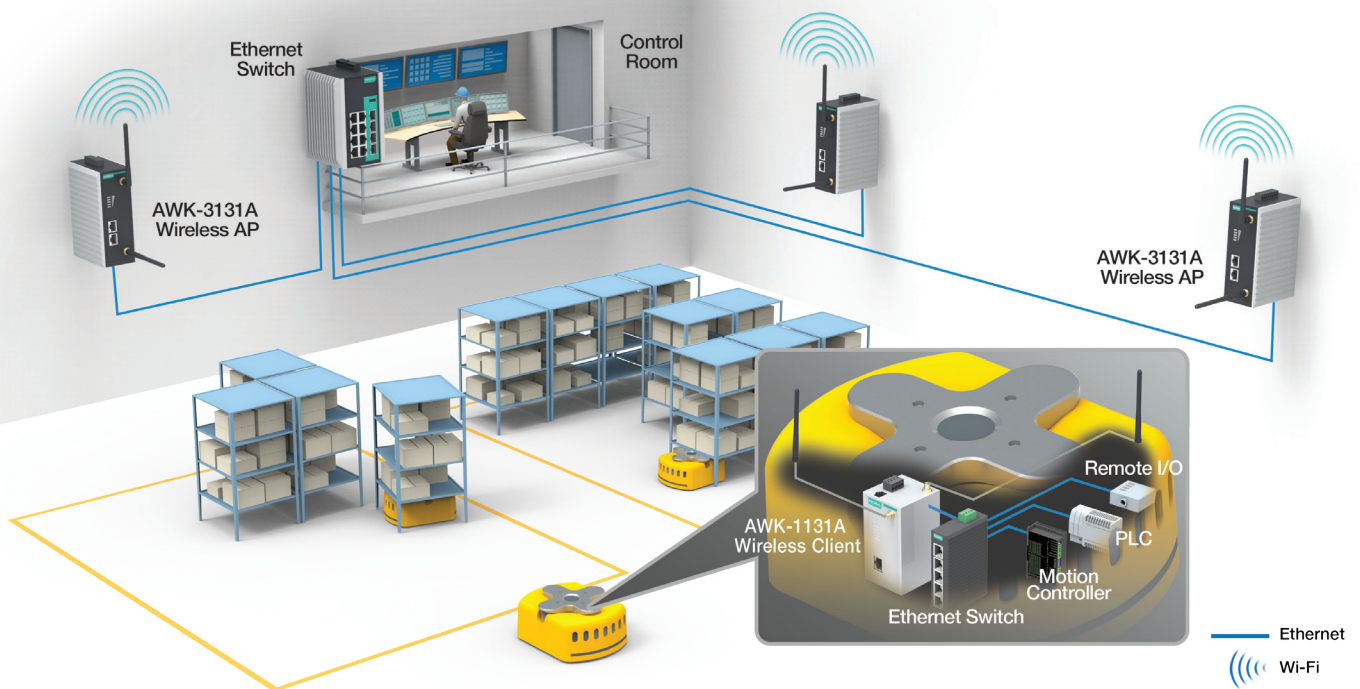
Project Background

Many Automated Materials Handling (AMH) systems have been implemented in factories to increase productivity. AGV systems are a common AMH system used in factory logistics to enhance operational accuracy and efficiency. One of our customers in Asia, who provides logistics services, wanted to deploy AGV systems in warehouses to ensure efficient delivery of goods to their customers.

These AGV systems rely on wireless networks to communicate with a control center. Even a single point of failure in the wireless devices has the potential to disrupt wireless connectivity, leading to delays in the delivery of goods and increase in operational costs. To take advantage of AGV systems, the wireless devices must be reliable and rugged enough to provide seamless wireless communication while the AGVs are on the move.

System Requirements

- Seamless roaming ability is a must to ensure wireless connections between different access points (APs) when AGV systems move around inside warehouses

- The ability to allow users to adjust the roaming parameter to adapt to the requirements of different deployment venues

- Power and RF isolation to protect wireless devices from inrush current generated by motors installed on the AGVs

- Anti-vibration design to ensure continuous wireless device operation under constantly mobile operating environments

MOXA®

Moxa's Solution

Reliable wireless networks are required to enable AGV systems in warehouses. Different requirements from APs and clients (devices) determine the formation of a reliable wireless network. In this case, AWK-3131A wireless devices have been used as APs to provide Wi-Fi coverage. The AWK-3131A supports 802.11n with 2x2 MIMO antenna output, allowing a wider coverage of Wi-Fi communication. Furthermore, it provides sufficient bandwidth with a 300 Mbps data rate, keeping your options wide open for possible future system expansions. With 5 GHz channel support, AGV systems can operate in a cleaner environment than under the over-saturated 2.4 GHz frequency. As the ideal wireless client in an AGV system, the AWK-1131A wireless device offers three benefits: compactness, ruggedness, and mobility.

Moxa's small-sized AWK-1131A is the perfect solution for space-limited vehicle systems that need compact wireless devices to fit easily on an AGV. The AWK-1131A has a rugged design that can endure harsh, onboard conditions, and it provides both power and antenna port isolation to prevent unexpected electrical interference. For example, when a wireless device shares the same power source with motors, wireless communication can easily be interrupted due to inrush current generated by the motors. Equipped with 500-volt insulation on power ports and level-4 ESD on antenna ports, the AWK-1131A devices are protected against external electro-static and RF interference.

More importantly, device mobility is the major concern for AGV systems. The AWK-1131A supports client-based Turbo Roaming technology that provides 150-ms handoff times between APs to enable seamless mobile operations for warehouses.

Benefits

- Turbo Roaming's millisecond-level handoff times ensure seamless AGV system operation while on the move
- A configurable roaming threshold to ensure reliable roaming performance in different-sized venues
- With 500-volt insulation on power ports and level-4 ESD on antenna ports, AGV systems can withstand electrostatic and RF interferences, for worry-free integration
- A throughput rate of up to 300 Mbps and 2x2 MIMO technology to maximize Wi-Fi coverage for shuttle systems
- Anti-vibration design meets the IEC 60068-2-6 standard, protecting wireless communications under constant motion

Featured Products

AWK-3131A
Industrial IEEE 802.11a/b/g/n wireless AP

http://www.moxa.com/product/AWK-3131A.htm

AWK-1131A
Entry-level industrial IEEE 802.11a/b/g/n wireless client

http://www.moxa.com/product/AWK-1131A_Series.htm

Learn more

White Paper
Five Critical Elements of Uninterrupted Wireless Connectivity for AS/RS and AGV Systems

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The Cold Storage Warehouse Where Wireless Doesn't Freeze Up
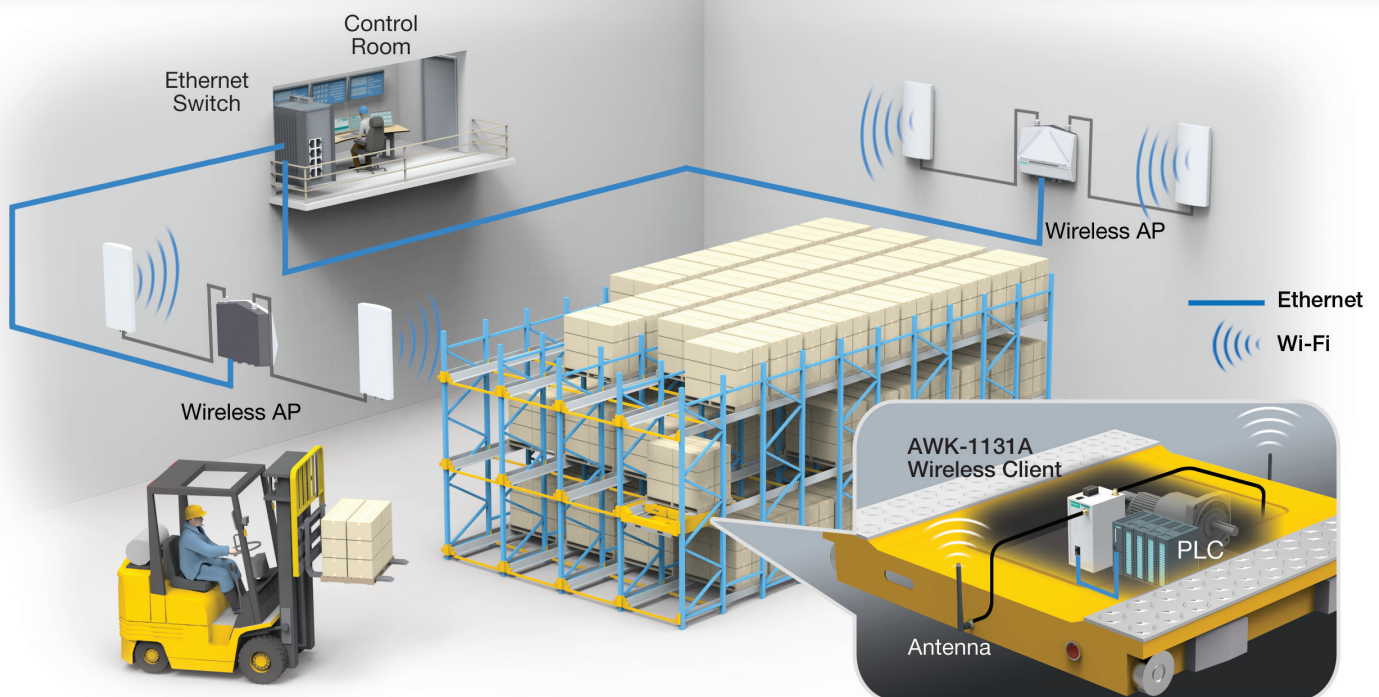
Location: China

Application:

Automated Storage/Retrieval Systems

Customer Requirements

- Wireless devices that can withstand low temperatures in a cold storage warehouse
- A small device to fit in limited spaces on shuttle systems
- Fast roaming performance for nonstop operations

Moxa's Advantages

- Capable of operating at temperatures as low as -40°C
- Compact but sturdy design to deliver supreme performance in limited spaces
- Turbo Roaming supports 150-ms handover time

Control Room

Ethernet Switch

Wireless AP

Wireless AP

Ethernet

Wi-Fi

AWK-1131A Wireless Client

PLC

Antenna

Project Background

An automated storage and retrieval system (AS/RS) is a smart system used in warehouses to enhance the efficiency of storage processes. This AS/RS features a shuttle-storage-shelving design that automatically moves goods up and down and back and forth between shelves, eliminating the possibility of human error. An AS/RS manufacturer in China helped a food company develop a smart storage warehouse to store fresh food at low temperatures. The application required a reliable wireless network.

At the heart of the constantly mobile equipment are wireless devices that enable communications between the control center and the large number of shuttle systems. As these shuttle systems have limited space to carry a large number of devices, the wireless apparatus has to be small but rugged in design to ensure seamless operations.

System Requirements

- Maintain normal operation even in sub-zero temperature environments
- Small-sized wireless devices mounted in space-limited shuttle systems
- Fast handover time to ensure real-time control and monitoring of shuttle systems
- Full wireless coverage on shuttle systems to stay connected with the control center
- Isolation design to protect wireless devices from electrical interference generated by motors on the shuttle systems

MOXA®

Moxa's Solution

An AS/RS makes it easy to store and retrieve goods and increases productivity compared with manual processes. The success of an AS/RS depends heavily on the deployment of reliable wireless devices throughout a network. To ensure that the shuttle systems in an AS/RS operate at peak performance, Moxa's AWK-1131A wireless devices offer three benefits: a compact but rugged design, seamless roaming ability, and greater wireless coverage.

The rugged, palm-sized AWK-1131A was designed to keep wireless operations stable in harsh industrial environments, including cold storage warehouses in which the temperature could get as cold as -40°C, and to fit comfortably in space-restricted shuttle systems. Moreover, the AWK-1131A has power and RF isolation built in to protect wireless devices from electrical interference generated by motors. These two design features save space and eliminate the cost of installing extra isolator accessories.

Roaming performance is always an essential feature of wireless devices. The AWK-1131A series has client-based Turbo Roaming technology that offers millisecond-level handover times to ensure that client devices on shuttle systems can always connect with access points (APs), which increases productivity by ensuring that shuttle equipment can move smoothly between shelves.

Finally, the AWK-1131A supports the 802.11n standard to offer a throughput rate of up to 300 Mbps and MIMO technology to maximize wireless availability in shuttle systems. Installing an antenna on both the front and back of the shuttle system ensures seamless connections with APs mounted on the wall. Moreover, the 5 GHz channel offers a low-traffic channel for wireless communications to avoid unexpected timeout due to oversaturated channel usage.

Featured Product

AWK-1131A-T

Entry-level industrial IEEE 802.11a/b/g/n wireless client

http://www.moxa.com/product/AWK-1131A_Series.htm

Benefits

- The ability to operate at -40°C ensures nonstop operations in cold storage warehouses

- Palm-sized design to save space in space-limited shuttle systems

- Turbo Roaming's millisecond-level handoff times ensure seamless shuttle system operations

- With 500-volt insulation on power ports and level-4 ESD on antenna ports, AGV systems can withstand electrical interference, for worry-free integration

- A throughput rate of up to 300 Mbps and 2x2 MIMO technology to maximize Wi-Fi coverage for shuttle systems

Learn more

White Paper
Five Critical Elements of Uninterrupted Wireless Connectivity for AS/RS and AGV Systems

www.moxa.com/wireless-AGV-wp

Microsite
Learn more about our wireless solutions on Moxa's website.

www.moxa.com/wireless-AGV

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