

# Pioneering Wireless Communication in AC Charging Station Deployments



## Product Highlights



### AWK-3525A Series

- AWK-3525A: IEEE 802.11a/b/g/n/ac Wave 2
- Concurrent dual-band Wi-Fi with aggregated data rates up to 1.267 Gbps
- Latest WPA3 encryption for enhanced wireless network security
- Universal (UN) models with configurable country or region code for more flexible deployment
- Easy network setup with Network Address Translation (NAT)
- Millisecond-level Client-based Turbo Roaming
- Built-in 2.4 GHz and 5 GHz band pass filter for more reliable wireless connections



### OnCell G4302-LTE4 Series

- Integrated LTE Cat. 4 module with US/EU/AU/JP band support
- Cellular link redundancy with dual-SIM GuaranLink support
- Supports WAN redundancy between cellular and Ethernet
- Rugged and compact design for harsh environments
- Developed according to IEC 62443-4-2 with Secure Boot
- Firewall, NAT, VPN for secure network connection
- Supports MRC (Moxa Remote Connect) service for remote maintenance

## Introduction

The successful adoption of electric vehicles (EVs) depends on integrating them smoothly into our daily routines without compromising our current lifestyles. The fear of not finding charging stations and the lengthy charging process discourages many potential EV buyers. The solution to these problems is to install charging stations in large outdoor parking lots, providing drivers with a convenient way to charge their vehicles while parked.

The setting for this case study is a large parking lot in the U.S. To embrace the EV era, the parking lot owner wanted to install hundreds of AC charging stations to allow drivers to charge their vehicles while parked. What's more, it would also generate additional income from parking and charging fees. Yet, because of site limitations and wiring difficulties, the owner needed an effective wireless network solution to oversee and gather data from the charging stations. Using Wi-Fi was necessary for stations to gather data and transfer it to the owner's cloud platform through 4G LTE. Also, with long-term maintenance and operation in mind, the owner looked for a solution that allows easy status monitoring and diagnosis, reducing the need for on-site troubleshooting in case of malfunctions.

The solution required employing a mesh architecture, connecting dozens of charging stations to small hubs, which then upload data to the cloud. Given the challenges of outdoor environments, previous commercial products often faced connectivity issues. Therefore, the owner urgently needed a reliable and stable solution to overcome these obstacles.

## System Requirements

- **Wireless networking deployment:** A Wi-Fi mesh architecture to provide seamless and robust connectivity across the entire charging station network.
- **Industrial-grade equipment and adaptability to harsh environments:** Equipment that can withstand extreme weather conditions and other challenging outdoor factors, ensuring continuous operation and minimal maintenance. Deploying industrial-grade hardware designed for high durability and reliability, tailored to meet the rigorous demands of large-scale installations.
- **Network reliability and stability:** Ensuring the network maintains high reliability and stability, incorporating redundancy features to prevent downtime and guarantee uninterrupted data transmission. Additionally, ensuring the network maintains high security by incorporating firewalls and VPNs to prevent malicious disruptions of service.
- **Simple and secure remote access:** For diagnosis and troubleshooting, a straightforward and secure way to remotely access the system in the event of a malfunction.

## Why Moxa

- **Industry expertise:** Moxa is a trusted leader in industrial communications, known for its high-quality, innovative solutions tailored for challenging environments.
- **Reliable performance:** Our products are built to perform reliably in harsh outdoor conditions, ensuring consistent and uninterrupted service.
- **Network stability:** The OnCell G4302 supports dual flexibility, LTE/Ethernet-to-WAN redundancy, and GuaranLink cellular auto-recovery features, ensuring continuous data connectivity. Additionally, the firewall/NAT/VPN/Router all-in-one solution ensures system security and continuous operation.
- **Remote maintenance:** By integrating an OnCell G4302-LTE4 cellular router and Moxa's MRC service with each charging system, the owner can easily operate and maintain systems.

Moxa's solutions address connectivity challenges in EV charging stations, ensuring stable and reliable data transmission. Using Moxa's industrial-grade products, parking lot owners can enhance operational efficiency, improve user experience, and boost profitability. Moxa goes beyond being a hardware provider, serving as a strategic partner for comprehensive EV infrastructure solutions.

## System Diagram

